Industrial Controls

Catalog News LV 1 N · April 2010

SIRIUS

Answers for industry.

SIEMENS

Related catalogs

Low-Voltage Controls and Distribution SIRIUS · SENTRON · SIVACON Order No.: E86060-K1002-A101-A9-7600	LV 1		Industrial communication • Controlgear: Contactors and contactor assemblies, soft starters and solid-state switching devices • Protection equipment • Load feeders and motor starters • Monitoring and control devices • Detecting devices • Commanding and signaling devices • Transformers • Power supplies • Planning and configuration with SIRIUS • Power Management System • SIVACON Power, distribution boards, busway and cubicle systems • SENTRON switching and protection devices for power distribution: Air circuit breakers, molded case circuit breakers, switch disconnectors, busbar systems • Software for power distribution • BETA low-voltage circuit protection
Low-Voltage Controls and Distribution Controls and Components for Applications according to UL Order No.: E86060-K1816-A101-A2-7600	LV 16		SIRIUS 3RV17 and 3RV18 circuit breakers according to UL 489/ CSA C22.2 No. 5-02 • SIVACON Components for Feeder Circuit • SENTRON 3WL5 air circuit breakers/non-automatic air circuit breakers according to UL 489/IEC 60947-2 • SENTRON 3VL Molded Case Circuit Breakers according to UL 489/IEC 60947-2 • ALPHA Devices according to UL Standard • BETA Devices according to UL standard
SIMATIC NET Industrial Communication Order No.: E86060-K6710-A101-B6-7600 E86060-K6710-A121-A3-7600	 IK PI IK PI N		PROFINET/Industrial Ethernet • Industrial Wireless Communicaton • PROFIBUS • SIMATIC ET 200 distributed I/Os • AS-Interface • Telecontrol • Routers • ECOFAST system
SIVACON **System Cubicles and Cubicle Air-Conditioning** Order No.: E86060-K1920-A101-A3-7600 (available only as PDF)	LV 50		System cubicles • Cubicle modifications • Cubicle expansion components • Accessories • Special cubicles • Cubicle solutions in applications • Cubicle air-conditioning • Special colors
SIDAC **Reactors and Filters** Order No.: E86060-K2803-A101-A5-7600 (available only as PDF)	LV 60		Commutating reactors for converters • Mains reactors for frequency converters • Iron-core output reactors • Ferrite output reactors • Iron-core smoothing reactors • Smoothing air-core reactors • Filter reactors • Application-specific reactors • Radio interference suppression filters • dv/dt filters • Sinewave filters
SIVACON 8PS **CD-L, BD01, BD2 Busbar Trunking Systems up to 1250 A** Order No.: E86060-K1870-A101-A4-7600 (available only as PDF)	LV 70		Busbar trunking systems, overview • CD-L system (25 A to 40 A) • BD01 system (40 A to 160 A) • BD2 system (160 A to 1250 A)
The Interactive Catalog Order No.: E86060-D4001-A510-C8-7600 (DVD)	CA 01		All products of automation, drives and installation technology, including those in the catalogs listed above.
The Industry Mall Internet: www.siemens.com/industrymall			All products of automation, drives and installation technology, including those in the catalogs listed above.
Catalog PDF Internet: www.siemens.com/industrial-controls/catalogs			All catalogs for low-voltage controls and distribution can be downloaded as PDF files.

Contents

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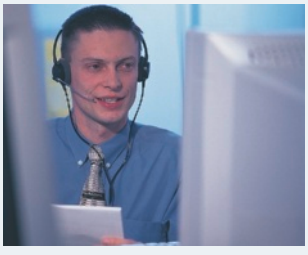
Further information about low-voltage controls is available on the Internet at:
www.siemens.com/industrial-controls

Technical Assistance



Expert technical assistance for industrial controls.

Tel.: +49 (9 11) 8 95-59 00

Fax: +49 (9 11) 8 95-59 07

E-mail: technical-assistance@siemens.com

Industrial Controls
SIRIUS

Catalog News LV 1 N · 04/2010

The products and systems listed in this catalog are manufactured/distributed using a certified quality management system which complies with EN ISO 9001 (for the Certificate Register Nos. see the Appendix to catalog LV 1 · 2010). The certificate is recognized in all IQNet countries.

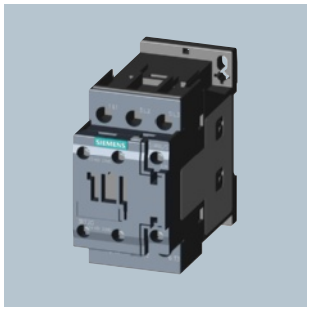
The corresponding sections in Catalog LV 1 · 2010 and in the Catalog News LV 1 N published in the period up 03/2010 are replaced by this news edition

For the latest updates of this catalog, please visit our Industry Mall:
www.siemens.com/industrymall

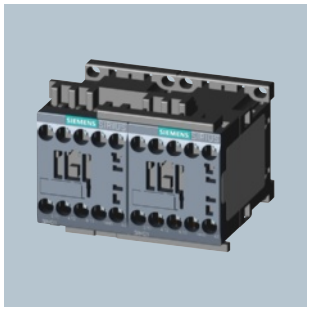
Contact your local Siemens sales office for further information

New

- **Function modules**
  for AS-Interface and I/O-Link
- Order No. 3RA2712-1AA00 and 3RA2711-1AA00
- Pages 2/8, 2/16 and 3/81, 3/85



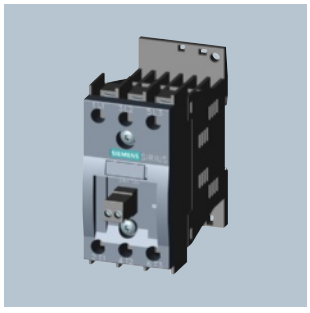
- **Contactors for switching motors**
  in the sizes S00 and S0
- Order No. 3RT2
- Page 3/2



- **Contactor assemblies, reversing starters**
- Order No. 3RA23
- Page 3/28

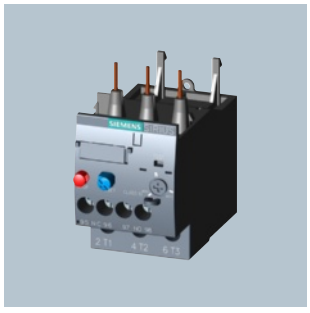
- **Contactor assemblies, wye-delta starters**
- Order No. 3RA24
- Page 3/36

- **Contactor relays**
- Order No. 3RH2
- Page 3/58



- **Solid-state contactors**
  Direct-on-line and reversing starters
- Order No. 3RF34
- Page 4/21

- **Motor starter protectors**
  up to 40 A in the sizes S00 and S0
- Order No. 3RV2
- Page 5/4

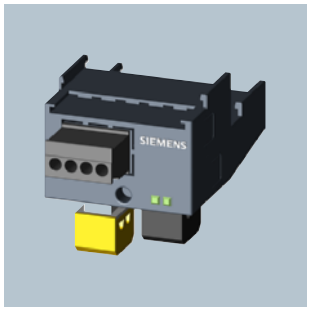


- **Thermal overload relays**
  in the sizes S00 and S0
- Order No. 3RU2
- Page 5/37

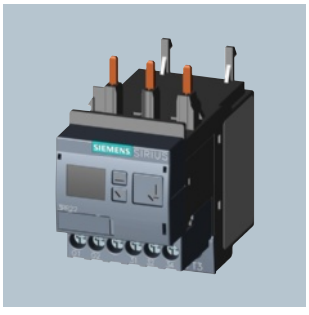
- **Solid-state overload relays**
  in the sizes S00 and S0
- Order No. 3RB3
- Page 5/47

- **Load feeders**
- Order No. 3RA2
- Page 6/2

- **I/O-Link master modules**
  for 3RA6 compact feeders
- Order No. 3RK1 005-0LB00-0AA0
- Page 6/46

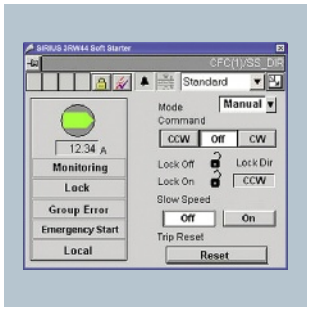


- **AS-Interface add-on modules**
  for 3RA6 compact feeders
- Order No. 3RA69 70-3B ... 3F
- Page 6/51

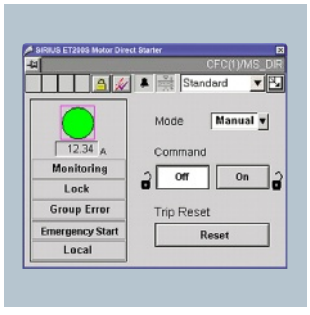


- **Monitoring relays**
  for mounting onto 3RT2 contactors
- Order No. 3RR2
- Page 7/2

- **Position switches** in metal enclosure
  with one or two contact blocks
- Order No. 3SE5 21, 3SE5 16
- Pages 8/10 and 8/15



- **SIRIUS 3RW44 soft starter function block library**
  for SIMATIC PCS 7
- Order No. 3ZS1 633-1XX00-0YA0
  3ZS1 633-2XX00-0YB0
- Page 12/2



- **SIRIUS motor starter function block library**
  for SIMATIC PCS 7
- Order No. 3ZS1 630-1XX00-0YA0
  3ZS1 630-1XX00-0YB0
- Page 12/4

Explanations

General information

Things you should know about Catalog News LV 1 N · 04/2010

Catalog News LV 1 N · 04/2010 contains all selection and order-relevant data.

Technical information is available at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators

- Configurators

Delivery time class (DT)

►	Preferred type
A	2 working days
B	1 week
C	3 weeks
D	6 weeks
X	On request

Preferred types are available immediately from stock, i. e. are dispatched within 24 hours.

Normal quantities of the products are usually delivered within the specified time following receipt of your order at our branch.

In exceptional cases, the actual delivery time may differ from that specified.

The delivery times apply up to the ramp at Siemens AG (products ready for dispatch). The transport times depend on the destination and type of shipping. The standard transport time for Germany is 1 day.

The delivery time classes specified here represent the status as of 04/2010. They are permanently optimized. Up-to-date information can be found at http://www.siemens.com/industrymall.

Price units (PU)

The price unit defines the number of units, sets or meters to which the specified price and weight apply.

Packaging sizes (PS)

The packaging size defines the number, e. g. of units, sets or meters, for outer packaging.

Only the quantity defined by the packaging size or a multiple thereof can be ordered!

For multi-unit packing and reusable packaging see Appendix.

Price groups (PG)

Each product is assigned to a price group.

Weight

The defined weight is the net weight in kg and refers to the price unit (PU).

Dimensions

All dimensions in mm.

Symbols

In the Catalog News LV 1 N · 04/2010 you will find the symbols listed alongside. These symbols are use in conjunction with an orange background to mark special selection criteria (e. g. connections, types of coordination, etc.).

Terminals	Screw terminals	
	Spring-type terminals	
	Combicon connectors	
	Flat connectors	
	Solder pin connections	
	Ring terminal lug connection	
Types of coordination	Type of coordination "1"	ToC 1
	Type of coordination "2"	ToC 2
Distinguishing between units	Complete units	
	Modular system	

Explanations

Low-voltage controls and distribution. The secrets of UL.

Our low-voltage control products are designed not only for the IEC market. Numerous devices have both UL and IEC approval. This makes it easier for manufacturers of switchgear and controlgear assemblies to enter the North American market.

Exports to North America require special approvals which differ from the IEC directives. On the IEC market, directives define only the essential functions of a system. The technical details are not listed. By contrast, directives on the American market go into the details of how to carry out the installation work etc.

For OEMs and machine manufacturers it is important to know the main differences between the two technical worlds and to work together respectively with manufacturers and suppliers who have the right products and know-how.

Siemens is a strong partner in this case. Our know-how extends from the production of UL-approved devices to the wiring of control cabinets according to UL directives.

These UL requirements are already taken into account when designing our low-voltage control devices. They are developed not only for the IEC market but also for the UL market.

We have been working with UL (Underwriters Laboratories Inc.®), the leading technical certification company in the USA, since 1969. We are also glad to share our knowledge with you in the form of training courses.

With our UL-certified products for low-voltage controls and distribution and low-voltage circuit protection you are on the safe side and can build control cabinets according to UL standard easily and quickly.

The Catalog News LV 1 N · 04/2010 presents controls, protection equipment, load feeders and overload relays in connection with this topic.

In the Main Catalog LV 1 · 2010 you will find for example the following UL-certified products:

- SIRIUS controls, from motor-protective circuit breakers and starters to contactors and overload relays
- SIRIUS transformers and power supplies
- SENTRON circuit breakers, motor starter protectors and switch disconnectors
- SIRIUS detecting devices and command devices
- ALPHA FIX terminal blocks
- SENTRON busbar systems
- Miniature circuit breakers and fuses from the BETA low-voltage circuit protection range

In addition to looking in the LV 1 you should also check out our Catalog LV 16 "Controls and Components for Applications According to UL" for UL-specific products:

- SIRIUS 3RV17 and 3RV18 circuit breakers
- Components for SENTRON 8US distribution systems
- SENTRON 3WL5 and 3VL circuit breakers
- ALPHA distribution boards and terminal blocks
- BETA low-voltage circuit protection

Take a look at our range of products and convince yourself. Or simply click on

www.siemens.com/lowvoltage/ul-europe

Here you will find information on for example UL standards, UL classification and a number of technical particularities of UL.

Under "UL Overview/Standards and Approvals" we provide a summary of the available products and product groups. A table lists the UL standards to which the products conform and contains links to the corresponding UL reports.

Under "Portfolio" we round off with a list of the most relevant products for low-voltage switching and protection technology (including links to the respective Internet product pages).

Simply click on the navigation bar and go on a UL discovery tour!

ATEX explosion protection

In many industries the production, processing, transport and storage of combustible substances are accompanied by escaping gases, vapor or spray which find their way into the environment. Other processes result in combustible dust. Together with the oxygen in the air, the result can be an explosive atmosphere which will explode if ignited.

Serious injury to persons and damage to property can result particularly in the chemical and petrochemical industry, mineral oil and natural gas production, mining, mills (e. g. grain, solid materials) and many other sectors.

To guarantee the maximum possible safety in these areas, the legislators of most countries have drawn up requirements in the form of laws, regulations and standards. In the course of globalization, great progress has been made with regard to uniform directives for explosion protection.

With Directive 94/9/EC, the European Union laid the foundations for complete harmonization by requiring that all new devices as from 1st July 2003 have to be approved in accordance with this directive.

In this catalog, special attention is drawn to devices which comply with the ATEX Directive. However, it does not replace intensive study of the relevant fundamentals and directives when planning and installing electrical systems.

Helpful Internet addresses

Industrial Controls	www.siemens.com/industrial-controls
Newsletter	www.siemens.com/industrial-controls/newsletter
Catalogs and Information Material (InfoCenter)	www.siemens.com/industrial-controls/catalogs
Demo Software (InfoCenter)	www.siemens.com/industrial-controls/demosoftware
InfoCenter "General"	www.siemens.com/industrial-controls/infomaterial
Manuals (Service & Support)	www.siemens.com/industrial-controls/manuals
Product Illustrations	www.siemens.com/industrial-controls/bilddb
Industry Mall	www.siemens.com/industrymall
Interactive Catalog CA 01	www.siemens.com/automation/ca01
Online Support	www.siemens.com/industrial-controls/support
Technical Assistance	www.siemens.com/industrial-controls/technical-assistance
Certificates	www.siemens.com/industrial-controls/approvals
ATEX	www.siemens.com/industrial-controls/atex
Training	www.siemens.com/industrial-controls/training

Notes

Introduction

With SIRIUS Innovations, everything fits together: Click and that's it.

To be able to meet industry's requirements tomorrow as well as today we are dedicated to the ongoing development of our portfolio. We continuously assimilate the feedback from our customers and combine it with the global trends of our joint future.

Systematic further development

SIRIUS has long been synonymous world-wide for industrial controls and was a trendsetter in this field from the very beginning. The SIRIUS modular system with its components for the switching, starting, protection and monitoring of motors and industrial systems stands for the fast, flexible and space-saving construction of control cabinets.

With its latest innovations for the main and control circuit, the new SIRIUS modular system has underlined its leading position once again.

The consistent further development of SIRIUS takes even better account of current market requirements, particularly the call for fewer variants, greater flexibility and reduced cost and time. The advantages for you are: higher productivity and cost efficiency in your company.

Clicking replaces wiring

In the portfolio of the SIRIUS modular system you can trust on finding perfectly coordinated and flexibly combinable components which now are even easier to install: plug in place, connect, click and that's it! Complicated wiring is a thing of the past, as are wiring errors. For you this means a significant reduction of time and cost.

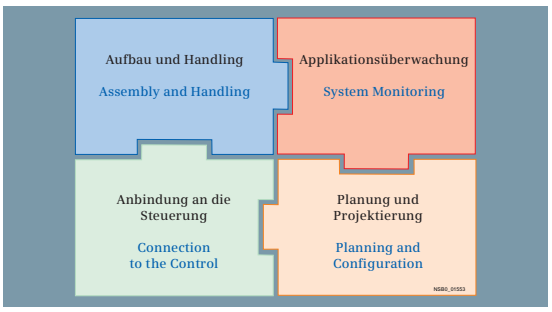
Innovative through and through

The SIRIUS modular system – sizes S00 and S0 up to 40 A – has been completely revised with respect to the main and control circuit. As the result, the innovative basic components such as motor starter protectors and contactors provide a host of advantages to optimize your plant, today and in the future. Often the innovation is to be found in the details. For example, more power in the same design and the bundling of functions in basic devices for notable space savings.

At the same time the innovations enable the greatest flexibility. Be it direct starting, reversing starting or wye-delta starting for customer assembly, as a tested combination or an "all-in-one" solution complete with the compact feeder, for soft starting or for frequent switching: the SIRIUS modular system has the answer to match.

Another aspect at the focus of the new developments was the enhancement of plant availability. In future, SIRIUS components from the modular system can even be used at minimum expense to monitor the application. Selective plant monitoring then becomes utterly simple - with current monitoring relays integrated directly in the load feeder or configured from the controller via the load feeder connection to AS-Interface or IO-Link.

These innovations are the perfect low-end supplement to today's S2-S12 modular system up to 250 kW/400 V and offer many new options for the construction of control cabinets.



Everything fits together: the new SIRIUS modular system

SIRIUS modular system: product family

More efficiency in control cabinet installation

The highlights of the new SIRIUS modular system are particularly numerous with regard to assembly and handling, application monitoring, connection to the controller, and customer support throughout the plant's lifecycle.

All these innovations add up to the many different possibilities of the new SIRIUS modular system as a whole – for the highest efficiency in control cabinet installation.

Assembly and handling: reduction of wiring outlay and prevention of errors, yet the greatest flexibility

- Far less wiring outlay in the main and control circuit and error-free assembly through innovative plug-in technology
- Reduced complexity of configuration and assembly through integration of functions in the basic devices
- Efficient and flexible power distribution thanks to related infeed systems
- Safety integrated with ease: configured quickly and on a line-oriented basis using the safety connector for contactors
- Highly flexible configuring options and planning reliability through different connection methods and tested feeder combinations
- Faster wiring thanks to a complete portfolio with spring-type connections

System monitoring: reliable operation and plant availability

- Very easy application monitoring beyond the motor through monitoring relays for current monitoring
- Enhanced operational reliability thanks to a weld-free compact feeder with indication of end of service life
- Very easy diagnostics and quick response for service purposes through concrete fault indications

Connection to the control system: optimum integration in the automation environment

- Far less wiring in the control circuit thanks to plug-in function modules for AS-Interface or IO-Link
- Reduced space requirement and no more parallel wiring to the controller thanks to bundling of the feeder signals
- Quick standardized configuration of the control circuit through control of complete feeders and full integration in STEP 7
- Greater transparency and higher density of information in the automation system through feedback of diagnostics/status from the load feeder
- Easy plant monitoring and maintenance - through indication of the diagnostics data/states at a central point in the control center

Planning and configuration: simplification of plant planning and documentation

- Planning reliability thanks to consistent combination tests for fuseless and fused configurations
- Products and systems with comprehensive approvals for use world-wide
- Technical information available daily on an international platform
- Concise and simple plant documentation available at the press of a button
- Easy and error-free configuration through provision of comprehensive CAx data

Click and that's it!

With SIRIUS Innovations, everything fits together!

SIRIUS controls for Safety Integrated.

Safety Integrated is the consistent implementation of safety technology in accordance with the concept of Totally Integrated Automation. Direct integration of safety-related functions in our standard products and the consistent integration of safety concepts in the standard automation environment offer many advantages for machine manufacturers and system operators.

Our SIRIUS Safety Integrated controls are a central element of the Siemens Safety Integrated concept. Whether for failsafe sensing, instructing and reporting, monitoring and evaluating or starting and reliable shutting down - our safety-oriented controls are expert at performing safety tasks in your plant.

SIRIUS Safety Integrated combined with standard fieldbus systems such as AS-Interface and PROFIBUS can solve even networked safety tasks of greater complexity. Integration in the world of Totally Integrated Automation offers numerous advantages in terms of cost efficiency, productivity and standardization.

Benefits

Cost efficiency:

- Precisely matching solutions thanks to a comprehensive and innovative product portfolio
- One bus system for standard and safety technology helps cut costs
- Easy reproducibility for series machines by means of software solution

Productivity:

- Shortening of downtimes through fast localization of faults plus comprehensive diagnostics functions
- Speedy restarts after essential plant modifications thanks to flexibility

Standardization:

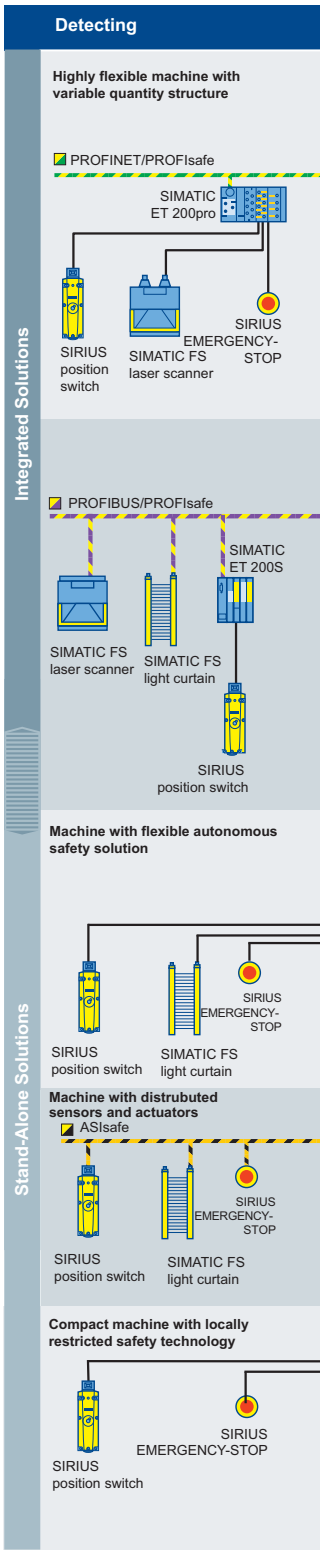
- Libraries increase re-usability
- Simpler installation technology in plants thanks to bus systems

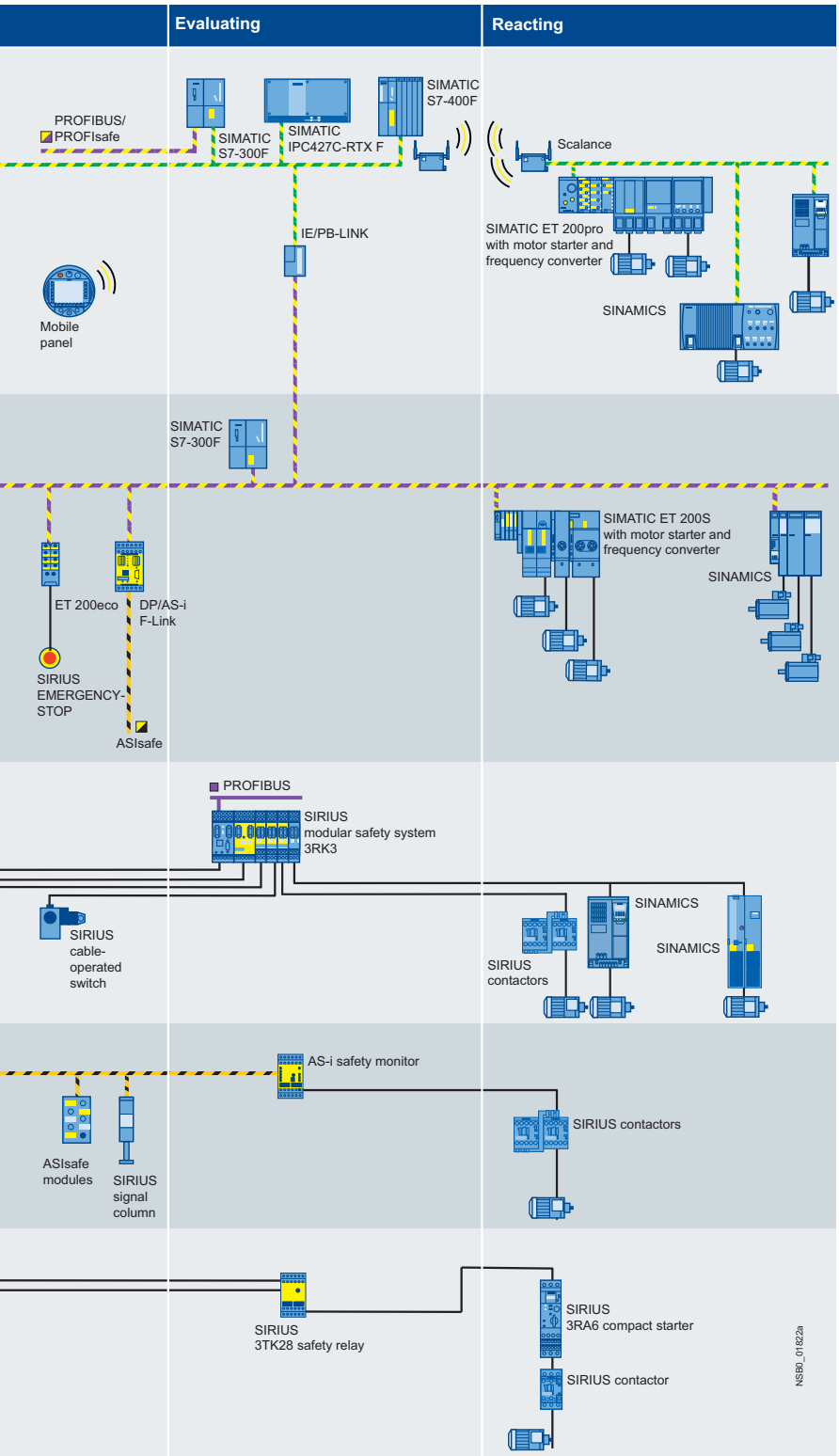
Applications

Safe sensing:

For the sensing of signals you need devices which you can rely on: SIRIUS detecting devices. In practically every application these mechanical sensors detect movement sequences of all types and pass them on in the form of an electric signal, thus enabling machines or plants to be shut down immediately in the event of a fault.

All mechanical position switches can be used for applications up to SIL 3 / PL e according to EN 62061 / EN ISO 13849-1 and have positively driven contacts according to IEC 60947-51. Whether for the monitoring of protective devices or for the sensing of hazardous movements by machine parts - SIRIUS Safety Integrated detects every wrong movement - even under the toughest conditions.





Safe instructing and reporting:

When things become critical, you must be able to intervene quickly and easily in order to bring machines and plants to a safe standstill. For such moments we offer a complete range of reliable commanding and signaling devices.

For example, EMERGENCY-STOP devices for the most diverse applications. Two-hand operation consoles for maximum safety on presses or punches. Effective cable-operated switches which can also be used as EMERGENCY-STOP devices in particularly long and endangered areas.

By the way: Many of our SIRIUS commanding and signaling devices can communicate through AS-Interface.

Safe evaluation:

For plants with safety requirements to run smoothly and with high availability they must be monitored. The 3RK3 modular safety system enables the graphic interconnection of several safety applications. Our 3TK28 safety relays have been doing their work, reliably and very cost-effectively, for many decades.

The evaluation of safety-oriented data is performed by the centerpiece of ASIsafe: the ASIsafe safety monitor. Evaluation functions are performed likewise by the safety modules for ET 200S motor starters.

Safe shutdown:

Contactors are still one of the most frequently used components in the control cabinet for safe shutting down. All the advantages of the SIRIUS modular system can also be used for safety-oriented applications.

ET 200 Safety Module provides failsafe stopping and shutdown for safety-oriented applications implemented at control level. While the ET 200S modules in degree of protection IP20 are suitable for operation in control cabinets and switchboxes, the ET 200pro modules in degree of protection IP65 are designed specially for cabinet-free use. They can be used for example as island solutions directly in the field, or for selective disconnection in PROFIsafe applications.

Safety Evaluation Tool:

Correct application of the EN 62061 or EN ISO 13849-1 standards puts you on the safe side. You are then in line with the directive which comes into force at the end of 2009. The Safety Evaluation Tool takes you straight to this goal. This TÜV-tested online tool from the Siemens range helps you quickly and reliably to assess your machine's safety functions. The result is a standards-conform report which can be integrated as a safety verification in the documentation.

Notes

Industrial Communication

2

Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

1) See Catalog LV 1
2) See Catalog IK PI
under
www.automation.siemens.com/infocenter

Overview

		Order No.	Page
AS-Interface			
	AS-Interface is an open, international standard according to EN 50295 and IEC 62026-2 for process and field communication. Leading manufacturers of actuators and sensors all over the world support the AS-Interface.		2/5
AS-Interface/Slaves			
	Slaves contain the AS-Interface electronics and connection options for sensors and actuators in the field and in the control cabinet. A total of up to 62 slaves can be connected to one bus. The slaves then exchange their data in cyclic mode with a control module (master).		
 3RT20 1.-1B...-0CC0 contactor	**Power contactors for switching motors and contactor assemblies** • SIRIUS 3RT2 contactors up to 18.5 kW • Notable reduction of wiring in the control circuit • Integrated mechanical interlocking • Prevention of wiring errors in the main circuit • Connection to AS-Interface through function modules • Connecting combs for screw terminals also result in: - Prevention of wiring errors in the control circuit - Reduction of testing costs - Ready-jumpered actuation of the auxiliary switches and the frame (A2) - Integrated electrical interlocking	**3RT2, 3RA23, 3RA24**	Ch. 3
 SIRIUS 3RA27 12... function module for AS-Interface	Function modules for mounting onto SIRIUS 3RT2 contactors, SIRIUS 3RA27 function modules for AS-Interface • Reduction of control current wiring through plug-in technology and integrated monitoring of circuit breaker and contactor • Reduced space requirement in the control cabinet through fewer digital inputs and outputs in the control system • Easy configuring through operation of feeders instead of individual contactors • Enhanced operational reliability and quick wiring thanks to spring-type connections • Small number of variants by using identical modules for size S00 and S0 contactors Your advantage: Shortening of mounting and start-up times	**3RA27 12**	2/16
 3RA61 compact feeder	**Motor starters for operation in the control cabinet** SIRIUS 3RA6 compact feeders, 3RA61 direct-on-line starters, 3RA62 reversing starters • Degree of protection IP20 • Up to 15 kW/400 V • Wide setting range • Practically weld-free contacts • Removable terminals • Optional AS-i add-on module Your advantage: Less space and wiring work needed in the control cabinet, no welding, connection to AS-Interface	**3RA6**	Ch. 6

	Order No.	Page
IO-Link		
IO-Link is a new communication standard for sensors and actuators - defined by the Profibus User Organization (PNO).		
• Dynamic changing of sensor/actuator parameters directly by the PLC • Hot swapping possible, without PG/PC, through reparameterization with the user program using function block (FB) • Fast commissioning thanks to central data storage • Consistent diagnostic information as far as the sensor/actuator level • Uniform and greatly reduced wiring of different sensors/actuators/controls Your advantage: Fast commissioning and flexible maintenance thanks to central data storage, less wiring outlay because no passive distributors are needed		2/9
IO-Link / master		
The IO-Link master modules form the heart of the IO-Link system.		2/11
IO-Link master modules for ET 200S	**6ES7**	2/11
IO-Link 4SI solid-state modules • Up to 4 IO-Link devices (three-conductor connection) can be connected • Up to 4 standard actuators/sensors (two-conductor/three-conductor connection) can be connected		
SIRIUS 4SI solid-state modules • Up to 16 SIRIUS controls can be connected with IO-Link (grouped) • Supports firmware update (STEP 7 V5.4 SP4 and higher).	**3RK1**	2/12
IO-Link master modules for ET 200eco PN • Up to 4 IO-Link devices (three-conductor connection) can be connected • Up to 8 standard sensors (8 DI) and up to 4 standard actuators (4 DO) can be connected in addition Your advantage: Easy connection to the control system in both IP20 and IP65/67	**6ES7**	2/13
IO-Link / I/O modules		
IO-Link I/O modules make full use of the potential of IO-Link and economically are a more attractive solution than a direct sensor/actuator connection.		2/14
IO-Link K20 module • Four or eight digital inputs • Degree of protection IP65/IP67 • Connection sockets in M8/M12 • Contacting protected against polarity reversal Your advantage: Reduction of mounting and start-up times by up to 40 %	**3RK5**	2/15
IO-Link / industrial controls		
Starters and contactor assemblies for direct-on-line, reversing and wye-delta starting can be connected to IO-Link through function modules without any additional, complicated wiring.		
Power contactors for switching motors and contactor assemblies • SIRIUS 3RT2 contactors up to 18.5 kW • Notable reduction of wiring in the control circuit • Integrated mechanical interlocking • Prevention of wiring errors in the main circuit	**3RT2, 3RA23, 3RA24**	Ch. 3
• Connecting combs for screw terminals also result in: - Prevention of wiring errors in the control circuit - Reduction of testing costs - Ready-jumpered actuation of the auxiliary switches and the frame (A2) - Integrated electrical interlocking	**3RA27 11**	2/16
Function modules for mounting onto SIRIUS 3RT2 contactors, SIRIUS 3RA27 function modules for IO-Link • Connection of the 3RT2, 3RA23, 3RA24 communication-capable power contactors to IO-Link • Reduction of control current wiring through plug-in technology, feeder groups and integrated monitoring of circuit breaker and contactor • Reduced space requirement in the control cabinet through fewer digital inputs and outputs in the control system • Easy user program through operation of feeders instead of individual contactors • Enhanced operational reliability and quick wiring thanks to spring-type connections • Can be flexibly combined with many automation solutions using the open, standardized IO-Link wiring system • Small number of variants by using identical modules for size S00 and S0 contactors Your advantage: Shortening of mounting and start-up times		

IO-Link family

SIRIUS 4SI solid-state modules for ET 200S

IO-Link K20 module with four digital inputs

3RT20 1.-1B...-0CC0 contactor

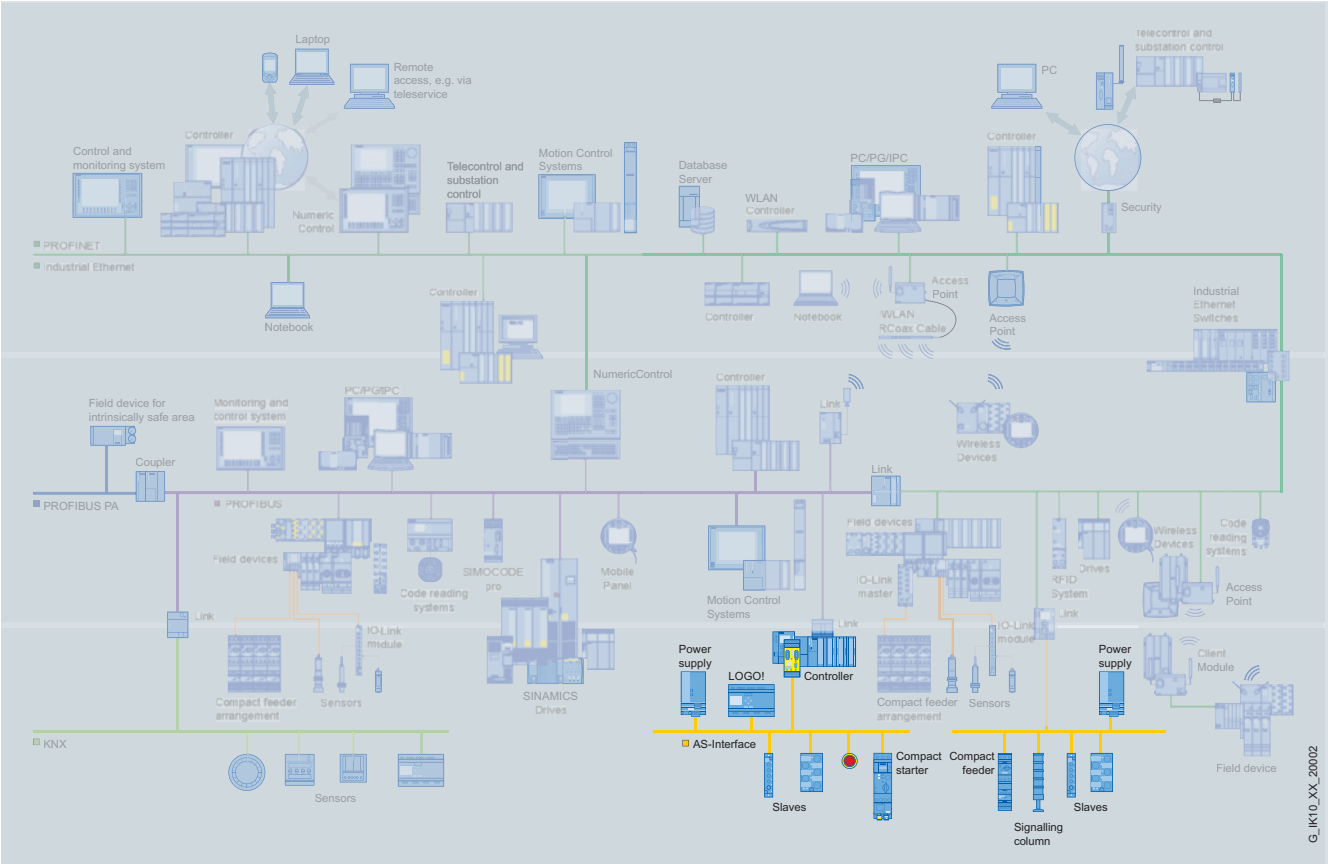
SIRIUS 3RA27 11 function module for IO-Link

		Order No.	Page
IO-Link / Industrial Controls (continued)			
 SIRIUS 3RA64 direct-on-line starter	**Load feeders and motor starters** SIRIUS 3RA6 compact feeders for IO-Link, 3RA64 direct-on-line starters, 3RA65 reversing starters, infeed system for 3RA6 • Degree of protection IP20 • Up to 15 kW/400 V • Wide setting range • Practically weld-free contacts • Removable terminals Your advantage: Less space and wiring work needed in the control cabinet, no welding, connection to AS-Interface	**3RA64, 3RA65**	Ch. 6

Overview

AS-Interface is an open, international standard according to EN 50295 and IEC 62026-2 for process and field communication. Leading manufacturers of actuators and sensors all over the world support the AS-Interface. Interested companies are provided with the electrical and mechanical specifications by the AS-Interface Association.

AS-Interface is a single master system. For automation systems from Siemens there are communications processors (CPs) and routers (links) which control the process or field communication as masters, and actuators and sensors which are activated as AS-Interface slaves.



Benefits

get Designed for Industry

A key feature of AS-Interface technology is the use of a shared two-wire cable for data transmission and the distribution of auxiliary power to the sensors/actuators. An AS-Interface power supply unit that meets the requirements of the AS-Interface transmission method is used for the distribution of auxiliary power. The AS-Interface cable used for the wiring is mechanically coded and hence protected against polarity reversal and can be easily contacted by the insulation piercing method.

Elaborately wired control cables in the control cabinet and marshalling racks can be replaced by AS-Interface.

With this concept you become extremely flexible and achieve high savings.

Application

Operating modes

Generally, master interfaces have the following operating modes:

I/O data exchange

In this operating mode the inputs and outputs of the binary AS-Interface slaves are read and written.

Analog value transmission

AS-Interface masters according to the AS-Interface Specification V2.1 or V3.0 support integrated analog value processing. This means that data exchange with analog AS-Interface slaves (according to Analog Profile 7.3 or 7.4) is just as easy as with digital slaves.

Command interface

In addition to I/O data exchange with binary and analog AS-Interface slaves the AS-Interface masters provide a number of other functions through the command interface.

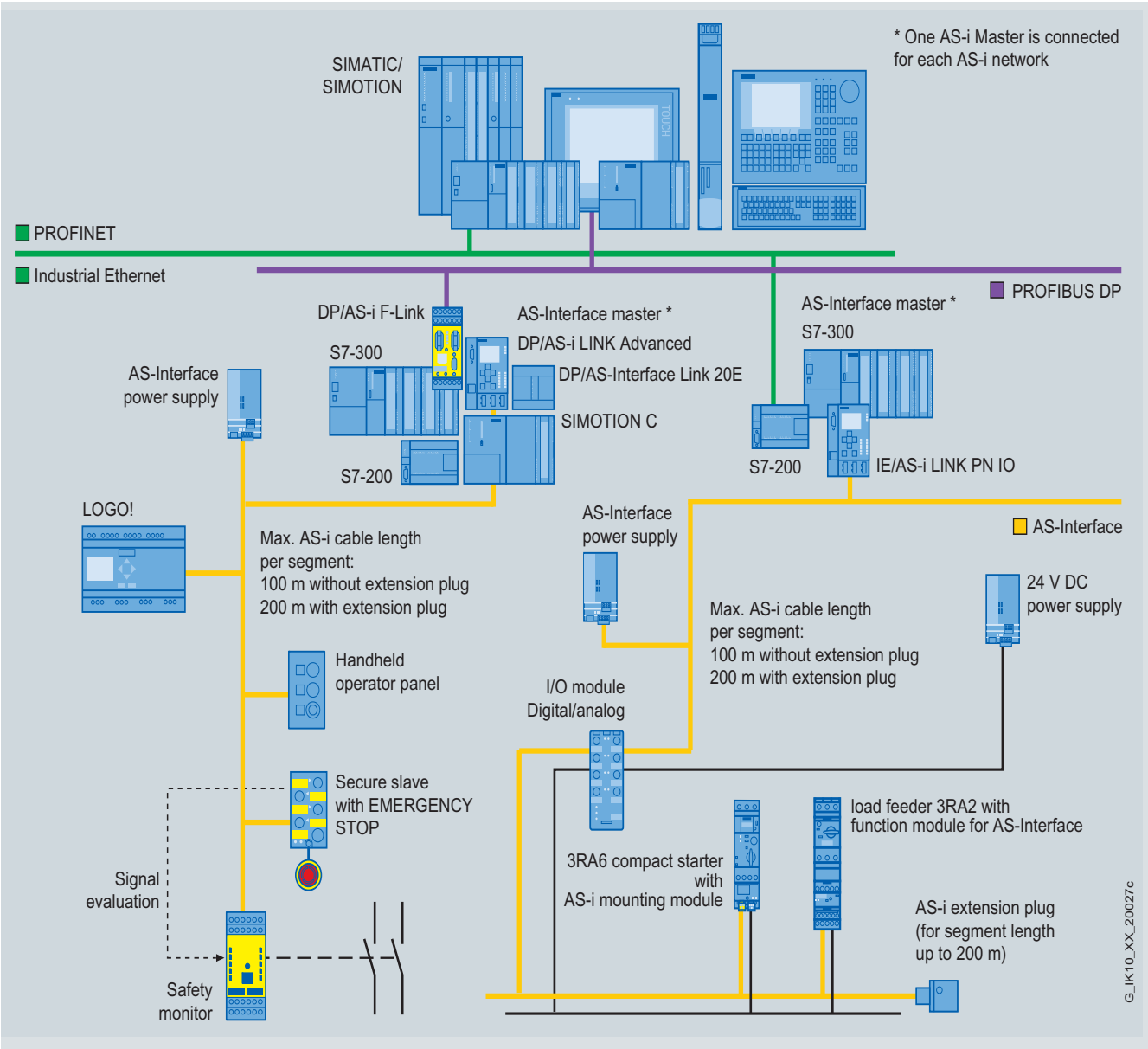
Hence it is possible, for example, for slave addresses to be issued, parameter values transferred or diagnostics information read out from user programs.

Overview

Process or field communication

AS-Interface is used where individual actuators/sensors are physically spread over the machine (e. g. in a bottling plant, production line and the like).
It replaces complicated cable harnesses and connects binary and analog actuators and sensors such as proximity switches, valves or indicator lights to a control system, e. g. the SIMATIC, or to a PC.

In practice this means: Installation is straightforward because data and energy are conveyed together over one cable. No special know-how for installation and commissioning is required. And thanks to the simple laying of the cable, its clear-cut structure and special version there is not only far less risk of errors but also less effort during maintenance and servicing.



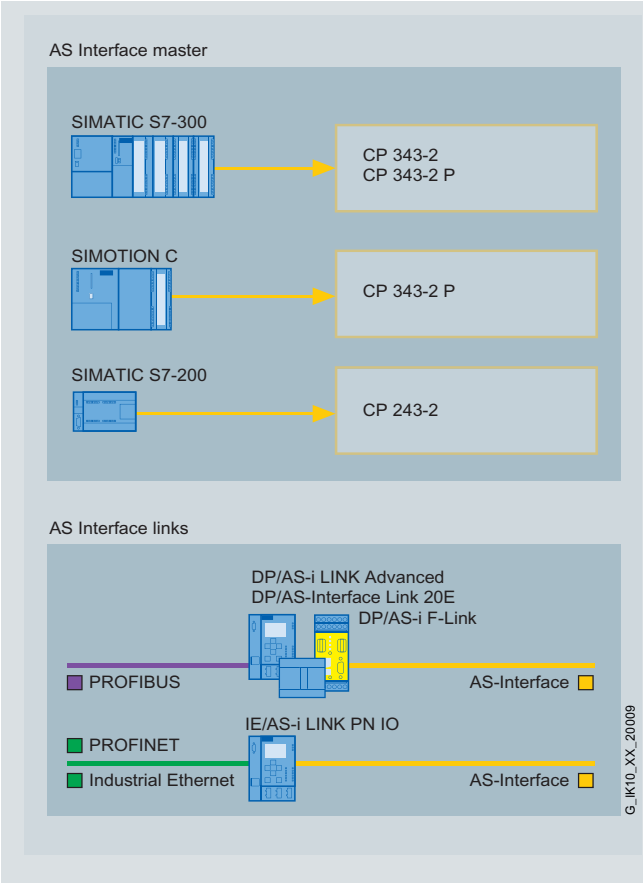
Example of a system configuration

Overview

System components

Numerous system components are offered for implementing the communication. The key elements of a system installation are:

- Master interface modules for central control units such as SIMATIC S5 and SIMATIC S7, ET 200M distributed peripherals or routers from PROFIBUS/PROFINET to AS-Interface
- AS-Interface shaped cables
- Network components such as repeaters and extension plugs
- Power supplies for the slaves
- Modules for connection of standard sensors/actuators
- Actuators and sensors with integrated AS-i slave
- Safety modules for transmitting safety-oriented data through AS-Interface
- Addressing units for setting the slave addresses during commissioning



AS-Interface masters and AS-Interface links (routers)

Features

Standard	EN 50295 / IEC 61158
Topology	Line, star or tree structure (same as electrical wiring)
Transmission medium	Unshielded two-conductor cable (2 x 1.5 mm^2) for data and auxiliary power
Connection methods	Contacting of the AS-Interface cable by insulation piercing method
Maximum cable length	• 100 m without repeater • 200 m with extension plug • 300 m with two repeaters in series connection • 600 m with extension plugs and two repeaters in parallel switching • Longer cable lengths also possible through parallel switching of more repeaters
Maximum cycle time	• 5 ms in full expansion with standard addresses • 10 ms in full expansion with A/B addresses, profile-specific for Spec 3.0 slaves
Number of stations per AS-Interface line	• 31 slaves according to AS-Interface Spec. V2.0 • 62 slaves (A/B technology) acc. to AS-Interface Spec. V2.1 and V3.0, integrated analog value transmission
Number of binary sensors and actuators	• Max. 124 DI/124 DO acc. to Spec. V2.0 • Max. 248 DI/186 DO acc. to Spec. V2.1 • Max. 496 DI/496 DO acc. to Spec. V3.0
Access control	Cyclic polling master slave method, cyclic data transfer by host (PLC, PC)
Error safeguard	Identification and repetition of faulty message frames

More information

For the modules referred to above please also note the conditions of application and the additional information.

AS-Interface system manuals

More information about AS-Interface is available in the AS-Interface System Manual.

The German-language AS-Interface System Manual can be downloaded free from the Internet at:
http://support.automation.siemens.com/WW/view/de/26250840

The English-language AS-Interface System Manual can be downloaded free from the Internet at:
http://support.automation.siemens.com/WW/view/en/26250840

Internet

You can find more information on the Internet at:
http://support.automation.siemens.com/WW/view/en/10805888/130000

Overview

SIRIUS 3RA27 12... function module for direct-on-line starting, AS-Interface connection

A motor feeder which is configured with 3RT2 contactors can be connected with the help of 3RA27 function modules to a higher-level control system. The SIRIUS function modules for connection to the control system are available in an AS-i version and in an IO-Link version.

The function modules for connecting to the control system are available for direct-on-line, reversing and wye-delta starters. They are plugged directly into the front interface of the 3RT2 contactors and therefore require one contactor with communication interface per feeder (see Chapter 3 "Controls - Contactors and Contactor Assemblies").

The function modules perform the following tasks:

- Communication, e. g. contactor operation and feedback, ready signal
- Electrical interlocking, e. g. for the reversing and wye-delta starter
- Timing relay function, e. g. wye-delta reversing time

Communication information and control supply voltage are passed on through module connectors so that the complete control current wiring on the starter is no longer needed.

The function modules are equipped with removable terminals with screw- or spring-type connections. They also have an input for local disconnection, which can be connected for example to a limit switch.

The 3RA27 function modules for AS-Interface connection are implemented in A/B technology, making it easy to connect up to 62 feeders (regardless of whether they are direct-on-line, reversing or wye-delta starters) to an AS-i master. This results in a significant reduction of wiring compared to the conventional parallel wiring method. The electrical connection is made using standard cables.

The process image corresponds to that of the compact feeder (see Chapter 6 "Load Feeders and Motor Starters") and to that of all motor starters. Easy, duplicatable programming of the control system is thus possible.

Benefits

The SIRIUS function modules for connecting to the control system offer many different advantages. The most important are:

- Reduction of control current wiring through plug-in technology and integrated monitoring of circuit breaker and contactor
- Reduced space requirement in the control cabinet through fewer digital inputs and outputs in the control system
- Easy configuring through operation of feeders instead of individual contactors
- Enhanced operational reliability and quick wiring thanks to spring-type connections
- Small number of variants by using identical modules for size S00 and S0 contactors

This means that the SIRIUS feeder is fully integrated in the automation landscape and can use all the advantages of TIA (e. g. integration in the TIA Maintenance Station).

Application

The SIRIUS function modules for connecting to the control system can be used wherever standard induction motors up to 38 A (approx. 18.5 kW/400 V) with 3RT2 contactors are started. The AS-Interface connection is recommended wherever load feeders are used in distributed applications.

Approvals according to IEC, UL and CSA standards have been issued for the function modules.

Selection and ordering data

For selection and ordering data see Chapter 3 "Controls - Contactors and Contactor Assemblies" (Accessories for 3RT2 Contactors) and Chapter 6 "Load Feeders and Motor Starters" (Accessories for 3RA2 Load Feeders).

Accessories

For the function modules there is a selection of different module connectors that can be used if contactor assemblies for wye-delta starting are to be configured for multiple sizes or non-side-by-side arrangements.

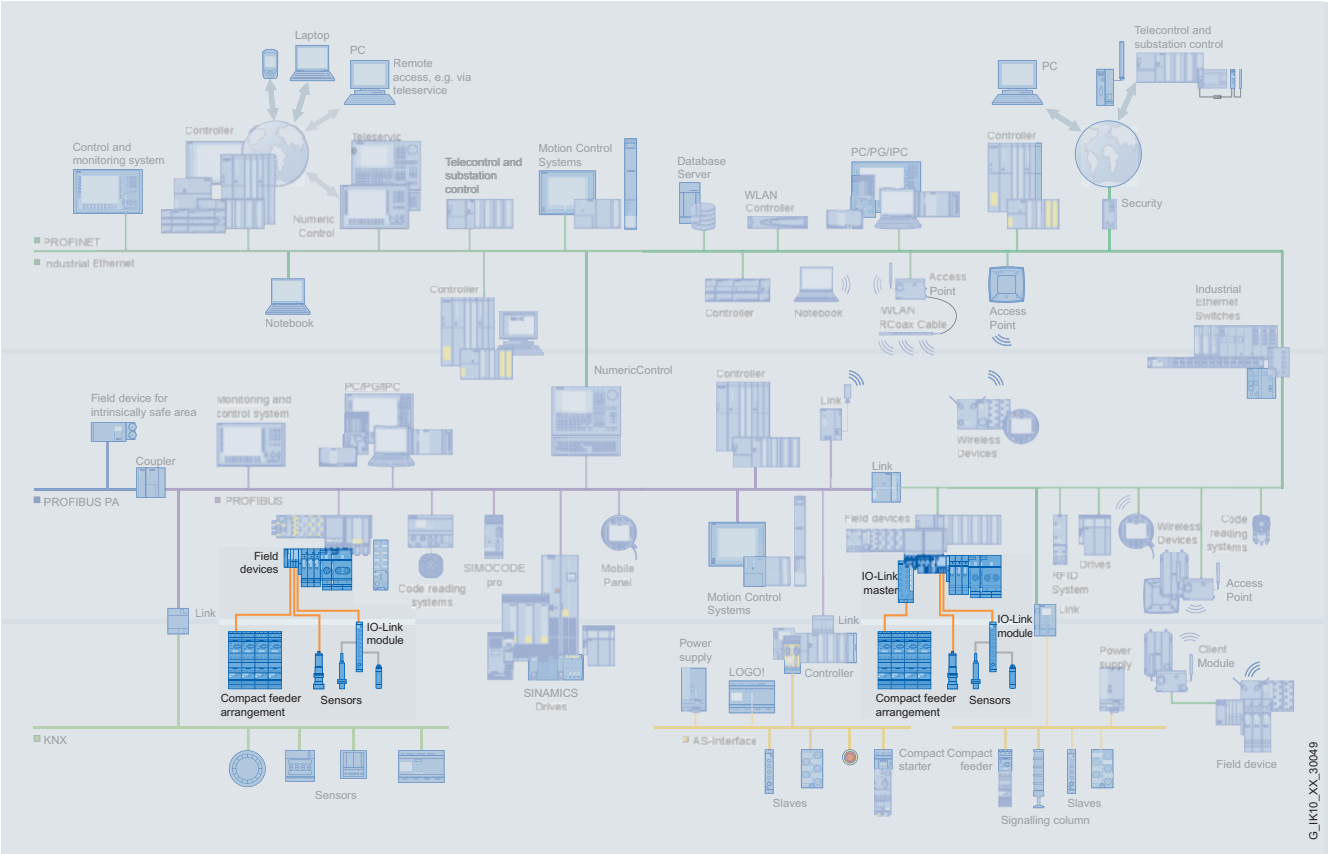
More information

More information

- about power contactors for switching motors and contactor assemblies
  - can be found in Chapter 3 or
  - in the Industry Mall: "Automation" --> "Industrial Communication" --> "AS-Interface" --> "Slaves" --> "Contactors and Contactor Assemblies".
- about function modules for AS-Interface
  - can be found in Chapter 3 or
  - in the Industry Mall: "Automation" --> "Industrial Communication" --> "AS-Interface" --> "Slaves" --> "Contactors and Contactor Assemblies" --> "SIRIUS Function Modules for AS-Interface".
- about motor starters for operation in the control cabinet
  - can be found in Chapter 6 or
  - in the Industry Mall: "Automation" --> "Industrial Communication" --> "AS-Interface" --> "Slaves" --> "Motor Starters for Operation in the Control Cabinet".
- The manual "Function Modules for AS-Interface" can be ordered through Chapter 3 or be downloaded from http://support.automation.siemens.com/WW/view/en/39318922

Overview

IO-Link is a new communication standard for sensors and actuators - defined by the Profibus User Organization (PNO). IO-Link technology is based on the point-to-point connection of sensors and actuators to the control system. Extensive parameter and diagnostics data are transmitted in addition to the cyclic operating data for the connected sensor/actuators. The simple, unshielded three-wire cable customary for standard sensors is used for this purpose.



Compatibility of IO-Link

IO-Link guarantees compatibility between IO-Link-capable modules and standard modules as follows:

- IO-Link sensors can be operated as a rule on IO-Link modules (masters) as well as on standard I/O modules.
- IO-Link sensors/actuators as well as today's standard sensors/actuators can be used on IO-Link masters.
- If conventional components are used in the IO-Link system, then of course only the standard functions are available at this point.

Expansion through IO-Link I/O modules

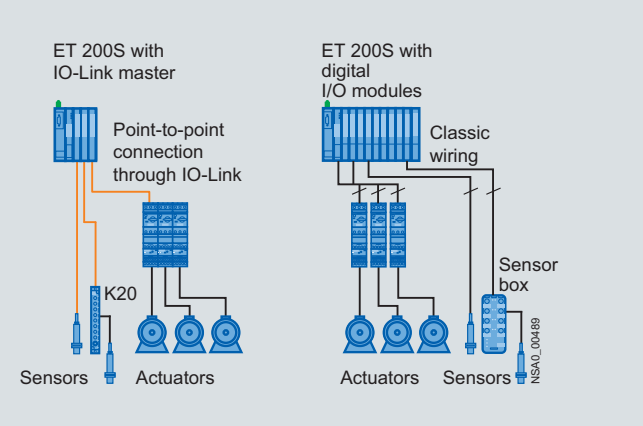
IO-Link compatibility also permits connection of standard sensors/actuators, i. e. conventional sensors/actuators can also be connected to IO-Link. This is done particularly economically with IO-Link I/O modules which enable several sensors/actuators to be connected to the control system simultaneously over one cable.

Analog signals

Another advantage of IO-Link technology is that analog signals are digitized already in the IO-Link sensor itself and are digitally transmitted by the IO-Link communication. As the result, faults are prevented and there is no extra cost for cable shielding.

Load Feeders and Motor Starters

Through IO-Link it is possible control not only sensors but also actuators in the form of load feeders and motor starters.



Possibilities for connecting load feeders and motor starters to IO-Link or in the conventional way

System overview

Components of an IO-Link system

IO-Link product family

IO-Link is comprised of 2 components: IO-Link masters and IO-Link devices. They are available as listed below:

IO-Link master

IO-Link 4SI electronic module

Masters

IO-Link master modules for ET 200S

- For IO-Link 4SI electronic modules see page 2/11
- For SIRIUS 4SI electronic modules see page 2/12

For IO-Link master modules for ET 200eco PN see page 2/13

IO-Link devices

IO-Link K20 module with four inputs

I/O modules

IO-Link K20 module

- IO-Link I/O modules in general see page 2/14
- IO-Link K20 module see page 2/15

SIRIUS 3RA27 11 function module for IO-Link

Industrial controls

Switching devices

Power contactors for switching motors

- SIRIUS 3RT2 contactors, 3-pole, up to 18.5 kW

see Chapter 3 "Controls – Contactors and Contactor Assemblies"

Contactor assemblies

- SIRIUS 3RA23 reversing contactor assemblies
- SIRIUS 3RA24 contactor assemblies for wye-delta starting

see Chapter 3 "Controls – Contactors and Contactor Assemblies"

SIRIUS 3RA64 direct-on-line starter

SIRIUS 3RA27 function modules for IO-Link

- For direct-on-line starters
- For reversing starters
- For wye-delta starters

See page 2/16

Load Feeders and Motor Starters

SIRIUS 3RA6 compact feeders for IO-Link

- 3RA64 direct-on-line starters
- 3RA65 reversing starters
- Infeed systems for 3RA6

See Chapter 6 "Load Feeders and Motor Starters"

Benefits

The IO-Link system offers decisive advantages for connecting complex (intelligent) sensors/actuators:

- Dynamic changing of sensor/actuator parameters directly by the PLC
- Consistent storage of parameters enables devices to be exchanged during operation, without a PC or programming device, through re-parameterization from the PLC
- Fast commissioning thanks to central data storage
- Consistent diagnostic information as far as the sensor/actuator level
- Uniform and greatly reduced wiring of different sensors/actuators/controls
- Integrated communication: Transmission of process data and service data between sensors/actuators and the control system
- Uniform and transparent configuring and programming through use of a parameterization tool integrated in SIMATIC STEP 7 (Port Configurator Tool, PCT)
- Transparent representation of all parameter and diagnostics data

Application

IO-Link can be used in the following main applications:

- Easy connection of complex IO-Link sensors/actuators with a large number of parameters and diagnostics data to the control system
- Wiring-optimized replacement of sensor boxes for the connection of binary sensors through IO-Link I/O modules
- Wiring-optimized connection of controls to the control system

In these cases, all the diagnostics data are transmitted to the higher-level control system through IO-Link. The parameter settings can be changed during operation. Central data storage means that it is possible to exchange an IO-Link sensor/actuator without a PC or programming device.

Integration in STEP 7

Integration of the device configuration in the STEP 7 environment guarantees:

- Easy and quick engineering
- Consistent data storage
- Speedy locating and rectifying of faults

Overview

IO-Link 4SI electronic module for ET 200S

The 4SI IO-Link electronic module is an IO-Link master and enables easy integration of sensors and actuators from different manufacturers in the SIMATIC ET 200S multifunctional, distributed I/O system at a total of four ports.

Features

- Up to 4 IO-Link devices (3-wire connections) can be connected to each IO-Link master module.
- Up to 4 standard actuators (3-wire connections) can be connected.
- The 4SI IO-Link electronic module has a width of 15 mm and can be used with the following universal terminal modules:
  - TM-E15S26-A1 (screw terminals)
  - TM-E15C26-A1 (spring-type terminals)
  - TM-E15N26-A1 (Fast Connect)
- Supports firmware update (STEP 7 V5.4 SP4 and higher).

Selection and ordering data

	Version	Connection	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
 6ES7 138-4GA50-0AB0	**4SI IO-Link electronic modules**	Screw terminals, spring-type terminals or Fast Connect	A	**6ES7 138-4GA50-0AB0**		1	1 unit	250	0.057

Accessories

Version	Connection	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Universal terminal modules for ET 200S								
• TM-E15S26-A1	Screw terminals	A	**6ES7 193-4CA40-0AA0**		1	1 unit	250	0.471
• TM-E15C26-A1	Spring-type terminals	A	**6ES7 193-4CA50-0AA0**		1	1 unit	250	0.397
• TM-E15N26-A1	Fast Connect	A	**6ES7 193-4CA80-0AA0**		1	1 unit	250	0.549

More information

The ET200S product manual for 4SI IO-Link electronic modules is available on the Internet at
http://support.automation.siemens.com/WW/view/en/29825814

Further information and technical specifications are available in the Industry Mall at:
"Automation" --> "Industrial Communication "
-->"IO-Link" --> "IO-Link Master Modules for ET200S".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

IO-Link master modules for ET200S SIRIUS 4SI electronic modules

Overview

SIRIUS 4SI electronic module for ET 200S

The 4SI SIRIUS electronic module allows for the simple and economical connection of SIRIUS controls with IO-Link to the multifunctional, decentral peripheral system SIMATIC ET 200S on a total of four ports.

Features

- Up to 4 SIRIUS control groups (with up to four controls per group) can be connected to each SIRIUS IO-Link module using IO-Link (3-wire connection).
- The SIRIUS 4SI electronic module has a width of 15 mm and can be used with the following universal terminal modules:
  - TM-E15S26-A1 (screw terminals)
  - TM-E15C26-A1 (spring-type terminals)
  - TM-E15N26-A1 (Fast Connect)
- Supports firmware update (STEP 7 V5.4 SP5 and higher)

Selection and ordering data

	Version	Connection	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
 3RK1 005-00LB00-0AA00	**SIRIUS 4SI electronic modules**	Screw terminals, spring-type terminals or Fast Connect	A	**3RK1 005-0LB00-0AA0**		1	1 unit	121	0.057

Accessories

	Version	Connection	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
	Universal terminal modules for ET 200S								
	• TM-E15S26-A1	Screw terminals	A	**6ES7 193-4CA40-0AA0**		1	1 unit	250	0.471
	• TM-E15C26-A1	Spring-type terminals	A	**6ES7 193-4CA50-0AA0**		1	1 unit	250	0.397
	• TM-E15N26-A1	Fast Connect	A	**6ES7 193-4CA80-0AA0**		1	1 unit	250	0.549
	ET200S product manuals for SIRIUS 4SI electronic-modules								
	• German		C	**3ZX1012-0LB00-0AA0**		1	1 unit	191	0.100
	• English		C	**3ZX1012-0LB00-0AA1**		1	1 unit	191	0.100
	• French		C	**3ZX1012-0LB00-0AA2**		1	1 unit	191	0.100
	• Spanish		C	**3ZX1012-0LB00-0AA3**		1	1 unit	191	0.100
	• Italian		C	**3ZX1012-0LB00-0AA4**		1	1 unit	191	0.100

More information

The ET200S product manual for SIRIUS 4SI electronic modules is available on the Internet at
http://support.automation.siemens.com/WW/view/en/37856470

Further information and technical specifications are available in the Industry Mall at:
"Automation" --> "Industrial Communication "
-->"IO-Link" --> "IO-Link Master Modules for ET200S".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

IO-Link master module for ET 200eco PN

The ET 200eco PN IO-Link master module is an IO-Link master and enables easy connection of sensors and actuators from different manufacturers to the I/Os directly in the machine's field area.

Features

- Up to 4 IO-Link devices (3-wire connections) can be connected to each IO-Link master module.
- Up to 8 standard sensors (8 DI) and up to 4 standard actuators (4 DO) can be connected in addition.

Selection and ordering data

	Version	Connection	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
 6ES7 148-6JA00-0AB0	**IO-Link master modules for ET 200eco PN** Block I/Os in IP65	M12	A	**6ES7 148-6JA00-0AB0**		1	1 unit	250	0.900

More information

Further information and technical specifications are available in the Industry Mall at:

"Automation" --> "Industrial Communication "
-->"IO-Link" --> "IO-Link Master Modules for ET200eco PN".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

General data

Overview

IO-Link I/O modules

Using IO-Link technology it is basically possible to connect standard sensors to IO-Link masters. However, connecting standard sensors directly to the IO-Link master does not exploit the full potential of IO-Link. The solution lies in the technology of the IO-Link modules. The use of this technology represents a more attractive solution in terms of cost than the direct connection of sensors/actuators.

IO-Link I/O modules are a useful addition to ET 200S distributed peripherals. The technology of the IO-Link I/O modules expands IO-Link from a pure point-to-point wiring method in the direction of distributed structures. The maximum cable length of an IO-Link connection between an IO-Link module and an IO-Link master is 20 m. The use of sensor boxes with accordingly complex and error-prone wiring is no longer necessary.

Transmission of parameter and diagnostic signals

With IO-Link I/O modules it is possible in addition to transmit parameter and diagnostic signals. This enables for example the inputs of modules to be parameterized as NC contacts or NO contacts through IO-Link. An overload or short-circuit in the sensor supply is signaled to the control system through the IO-Link master.

M8 and M12 terminals

M8 and M12 terminals are available for connecting the sensors. Connection to the IO-Link master is made using a standard M12 connecting cable.

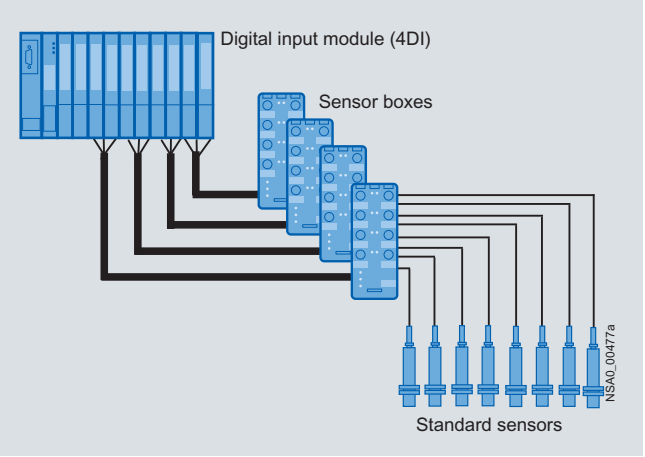
Benefits

The use of IO-Link I/O modules offers the following advantages:

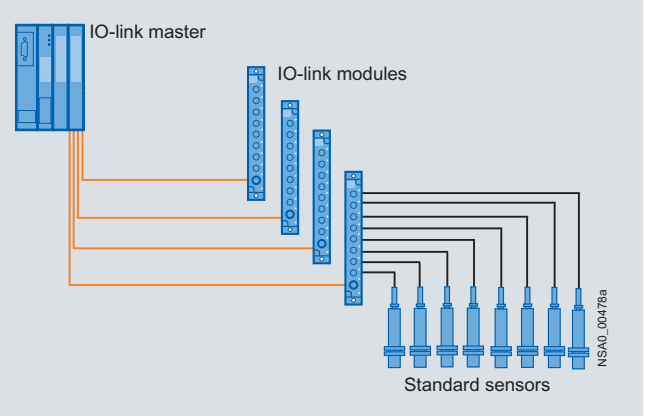
- Economical use of innovative IO-Link technology also for binary sensors
- Optimum use of all ports of the IO-Link master
- Connection of several binary sensors/actuators to one port of the IO-Link master, hence low-cost connection of also binary sensors/actuators to the control system through IO-Link
- Reduction of digital input modules in the peripheral station
- Use of parameters also for binary sensors (e. g. NC contacts, NO contacts and input delay can be parameterized)
- Reduction of cabling and hence less risk of wiring errors by dispensing with sensor boxes
- Expansion toward distributed structures using pure point-to-point wiring
- Easy and elegant integration of sensors within a radius of 20 m around an ET 200S station
- Possibility of transmitting parameter and diagnostic signals (e. g. sensor supply overload)
- Can also be used in harsh conditions thanks to the very compact design and degree of protection IP67

Application

IO-Link I/O modules are used in particular where sensor boxes were used up to now for the connection of binary sensors.



Former technology with sensor boxes



Technology with IO-Link I/O modules

Selection and ordering data

Type	Pin assignment	Connection method	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
IO-Link K20 modules									
• 4 inputs	Y	M12	A	**3RK5 010-0BA10-0AA0**		1	1 unit	121	0.075
• 8 inputs	Standard	M8	A	**3RK5 010-0CA00-0AA0**		1	1 unit	121	0.110


3RK5 010-0BA10-0AA0


3RK5 010-0CA00-0AA0

Accessories

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
M12 sealing caps For free M12 sockets	►	**3RK1 901-1KA00**		100	10 units	121	0.100
M8 sealing caps For free M8 sockets	A	**3RK1 901-1PN00**		100	10 units	121	0.100


3RK1 901-1KA00


3RK1 901-1PN00

Other accessories:

- See Catalog IK PI, section "IO Link" --> "Sensors"
- See Industry Mall, section "Sensors, Measurement and Testing Systems" --> "Proximity Switches" --> "Accessories" --> "Plug-in Connectors"

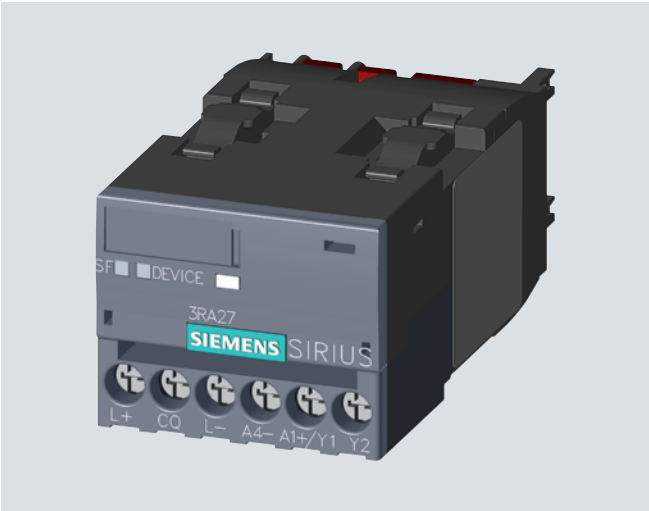
More information

Further information and technical specifications are available in the Industry Mall at:

"Automation" --> "Industrial Communication "
-->"IO-Link" --> "I/O Modules" -->"K20 IO-Link Modules".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview



SIRIUS 3RA27 11... function module for direct-on-line starting, IO-Link connection

A motor feeder which is configured with 3RT2 contactors can be connected with the help of 3RA27 function modules to a higher-level control system. The SIRIUS function modules for connection to the control system are available in an AS-i version and in an IO-Link version.

The SIRIUS 3RA27 function modules for IO-Link for connecting to the control system are available for direct-on-line, reversing and wye-delta starters. They are plugged directly into the front interface of the 3RT2 contactors and therefore require one contactor with communication interface per feeder (see Chapter 3 "Controls - Contactors and Contactor Assemblies").

The function modules perform the following tasks:

- Communication, e. g. contactor operation and feedback, ready signal
- Electrical interlocking, e. g. for the reversing and wye-delta starter
- Timing relay function, e. g. wye-delta reversing time

Communication information and control supply voltage are passed on through module connectors so that the complete control current wiring on the starter is no longer needed.

The function modules are equipped with removable terminals with screw- or spring-type connections. They also have an input for local disconnection, which can be connected for example to a limit switch.

Up to four feeders (direct-on-line, reversing or wye-delta starters) can be brought together and conveniently connected to a control system through a standardized IO-Link connection. This results in a significant reduction of wiring compared to the conventional parallel wiring method. The electrical connection is made using standard cables.

The process image corresponds to that of the compact feeder (see Chapter 6 "Load Feeders and Motor Starters") and to that of all motor starters. Easy, duplicatable programming of the control system is thus possible.

The IO-Link connection enables a high density of information in the local range.

Thanks to the optionally available operator panel, which can be installed in the control cabinet door, it is easy for control feeders equipped with function modules to be controlled from the control cabinet door.

Benefits

The SIRIUS 3RA27 function modules for connecting to the control system offer many different advantages. The most important are:

- Reduction of control current wiring through plug-in technology, feeder groups and integrated monitoring of circuit breaker/motor starter protector and contactor
- Reduced space requirement in the control cabinet through fewer digital inputs and outputs in the control system
- Easy configuring through operation of feeders instead of individual contactors
- Enhanced operational reliability and quick wiring thanks to spring-type connections
- Can be flexibly combined with many automation solutions using the open, standardized IO-Link wiring system
- Small number of variants by using identical modules for size S00 and S0 contactors

This means that the SIRIUS feeder is fully integrated in the automation landscape and can use all the advantages of TIA (e. g. integration in the TIA Maintenance Station).

Application

The SIRIUS 3RA27 function modules for IO-Link for connecting to the control system can be used wherever standard induction motors up to 38 A (approx. 18.5 kW/400 V) with 3RT2 contactors are started. The IO-Link solution is recommended for control cabinet applications in which a high density of information is required.
Approvals according to IEC, UL and CSA standards have been issued for the function modules.

Selection and ordering data

For selection and ordering data see:

- in Chapter 3 "Controls – Contactors and Contactor Assemblies", accessories for 3RT2 contactors
- in Chapter 6 "Load Feeders and Motor Starters", accessories for 3A2 load feeders.

Accessories

In addition to the 3RA6 935-0A operator panel there is a selection of different module connectors for the SIRIUS 3RA27 function modules that can be used if configurations are to be for multiple sizes or non-side-by-side arrangements.

More information

More information

- about power contactors for switching motors and contactor assemblies
  - can be found in Chapter 3 or
  - in the Industry Mall: "Automation" --> "Industrial Communication" --> "IO-Link" --> "Industrial Controls" --> "Contactors and Contactor Assemblies".
- about function modules for IO-Link
  - can be found in Chapter 3 or
  - in the Industry Mall: "Automation" --> "Industrial Communication" --> "IO-Link" --> "Industrial Controls" --> "Contactors and Contactor Assemblies" --> "SIRIUS Function Modules for IO-Link".
- about motor starters for operation in the control cabinet
  - can be found in Chapter 6 or
  - in the Industry Mall: "Automation" --> "Industrial Communication" --> "IO-Link" --> "Industrial Controls" --> "Motor Starters for Operation in the Control Cabinet".
- The manual "Function Modules for IO-Link" can be ordered via Chapter 3 or be downloaded from http://support.automation.siemens.com/WW/view/en/39319600

Controls – Contactors and Contactor Assemblies

3

Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

Introduction

Overview

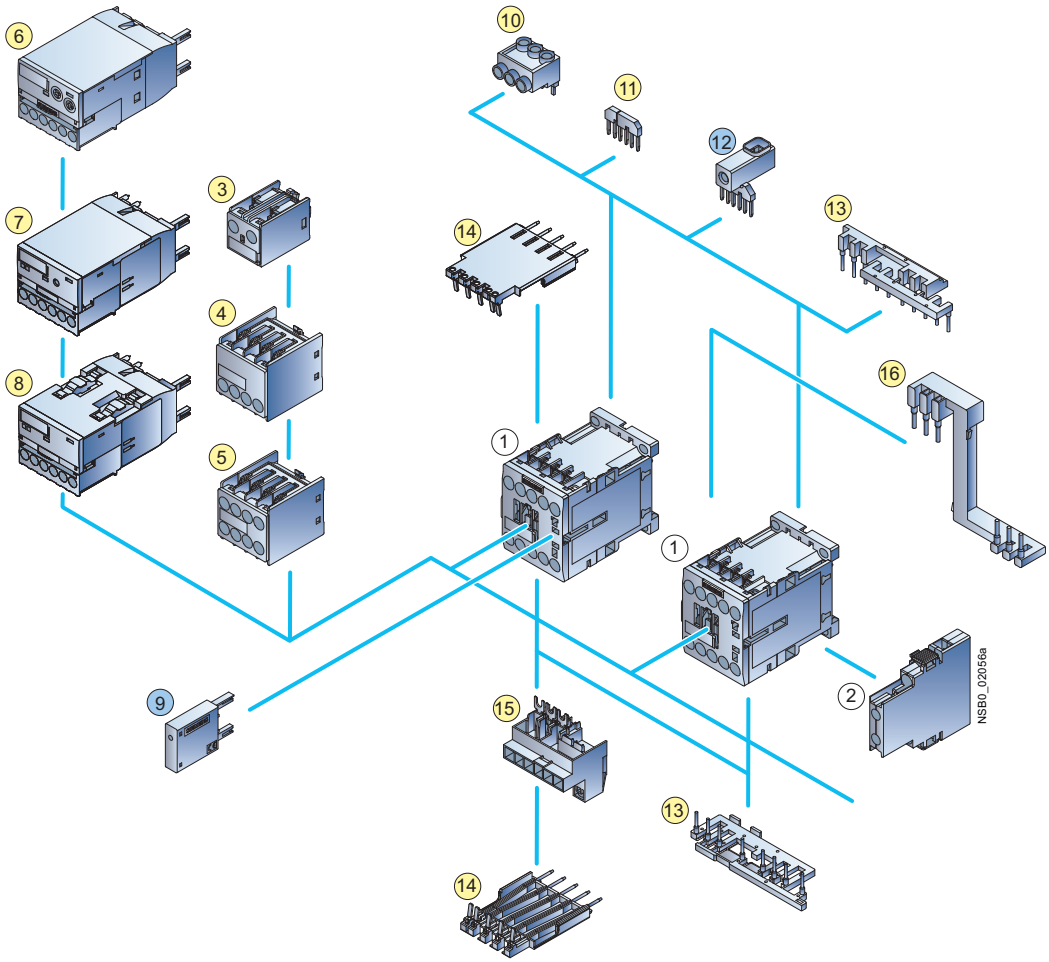
Size		S00				S0					
Type		3RT20 1				3RT20 2					
3RT20 contactors											
Type		**3RT20 15**	**3RT20 16**	**3RT20 17**	**3RT20 18**	**3RT20 23**	**3RT20 24**	**3RT20 25**	**3RT20 26**	**3RT20 27**	**3RT20 28**
AC, DC operation		(p. 3/8, 3/12)				(p. 3/10, 3/14)					
Type		--				--					
AC-3											
I_e/AC-3/400 V	A	7	9	12	16	9	12	16	25	32	38
400 V	**kW**	**3**	**4**	**5.5**	**7.5**	**4**	**5.5**	**7.5**	**11**	**15**	**18.5**
230 V	kW	2.2	3	3	4	3	3	4	5.5	7.5	7.5
500 V	kW	3.5	4.5	5.5	7.5	4.5	7.5	10	11	18.5	18.5
690 V	kW	4	5.5	5.5	7.5	5.5	7.5	11	11	18.5	18.5
1000 V	kW	--	--	--	--	--	--	--	--	--	--
AC-4 (for $I_a = 6 \times I_e$)											
400 V	**kW**	**3**	**4**	**4**	**5.5**	**4**	**5.5**	**7.5**	**7.5**	**11**	**11**
400 V (200 000 operating cycles)	kW	1.15	2	2	2.5	2	2.6	3.5	4.4	6	6
AC-1 (40 °C, ≤ 690 V)											
I_e 3RT20	**A**	**18**	**22**	**22**	**22**	**40**	**40**	**40**	**50**	**50**	**50**
Accessories for contactors											
Auxiliary switch blocks front		**3RH29 11**	(p. 3/93)			**3RH29 11**	(p. 3/93)				
lateral		**3RH29 11**				**3RH29 21**	(p. 3/96)				
Timing relay blocks		**3RA28 1.**	(p. 3/78)			**3RA28 1.**	(p. 3/78)				
Function modules		**3RA27 1.-. AA00**	(p. 3/83, 3/87)			**3RA27 1.-. AA00**	(p. 3/83, 3/87)				
Surge suppressors		**3RT29 16**	(p. 3/100)			**3RT29 26**	(p. 3/100)				
3RU2 and 3RB3 overload relays (Protection Equipment --> Overload Relays)											
3RU21, thermal, CLASS 10		**3RU21 16**	0.11 ... 16 A (Chap. 5)			**3RU21 26**	1.8 ... 40 A (Chap. 5)				
3RB30/31, solid-state, CLASS 5, 10, 20 and 30		**3RB30 16** **3RB31 13**	0.1 ... 16 A (Chap. 5)			**3RB30 26** **3RB31 23**	0.1 ... 40 A (Chap. 5)				
3RV20 motor starter protectors (Protection Equipment --> Motor Starter Protectors)											
Type		**3RV20 11**	0.11 ... 16 A (Chap. 5)			**3RV20 21**	11 ... 40 A (Chap. 5)				
Link modules		**3RA29 11**	(Chap. 5)			**3RA29 21**	(Chap. 5)				
3RA23 reversing contactor assemblies											
Complete units	Type	**3RA23 15**	**3RA23 16**	**3RA23 17**	**3RA23 18**	--	**3RA23 24**	**3RA23 25**	**3RA23 26**	**3RA23 27**	**3RA23 28**
		(p. 3/31)					(p. 3/33)				
400 V	**kW**	**3**	**4**	**5.5**	**7.5**		**5.5**	**7.5**	**11**	**15**	**18.5**
Assembly kits/wiring modules		**3RA29 13-2AA.**	(p. 3/34)			--	**3RA29 23-2AA.**	(p. 3/34)			
Function modules		**3RA27 1.-. BA00**	(p. 3/35)			--	**3RA27 1.-. BA0**	(p. 3/35)			
3RA24 contactor assemblies for wye-delta starting											
Complete units	Type	**3RA24 15**	**3RA24 16**	**3RA24 17**		**3RA24 23**		**3RA24 25**	**3RA24 26**		
		(p. 3/39)				(p. 3/41)					
400 V	**kW**	**5.5**	**7.5**	**11**		**11**		**15/18.5**	**22**		
Assembly kits/wiring modules		**3RA29 13-2BB.**	(p. 3/43)			**3RA29 23-2BB.**	(p. 3/43)				
Function modules		**3RA27 1.-. CA00**	(p. 3/44)			**3RA27 1.-. CA00**	(p. 3/44)				

Overview

The SIRIUS controls family

The SIRIUS modular system with its components for the switching, starting, protection and monitoring of motors and industrial systems stands for the fast, flexible and space-saving construction of control cabinets.

3RT2 contactors and coupling contactors Size S00 with mountable accessories



(1) Contactor size S00

(2) 1-pole auxiliary switch block, laterally mountable
(3) 1-pole auxiliary switch block, for snapping onto the front Cable entry from the top
(4) 2-pole auxiliary switch block, for snapping onto the front Cable entry from the bottom
(5) 4-pole auxiliary switch block, for snapping onto the front
(6) 3RA28 function module
(7) 3RA27 function module for AS-Interface, direct starting
(8) 3RA27 function module for IO-Link, direct starting
(9) Surge suppressor with/without LED
(10) Three-phase feeder terminal

(11) Star jumper, 3-pole, without terminal
(12) Link for paralleling, 3-pole, with terminal
(13) Wiring modules, on the top and bottom (reversing duty)
(14) Solder pin adapter
(15) Connection module (adapter and connector) for contactors with screw-type connection
(16) Safety main current connectors for two contactors

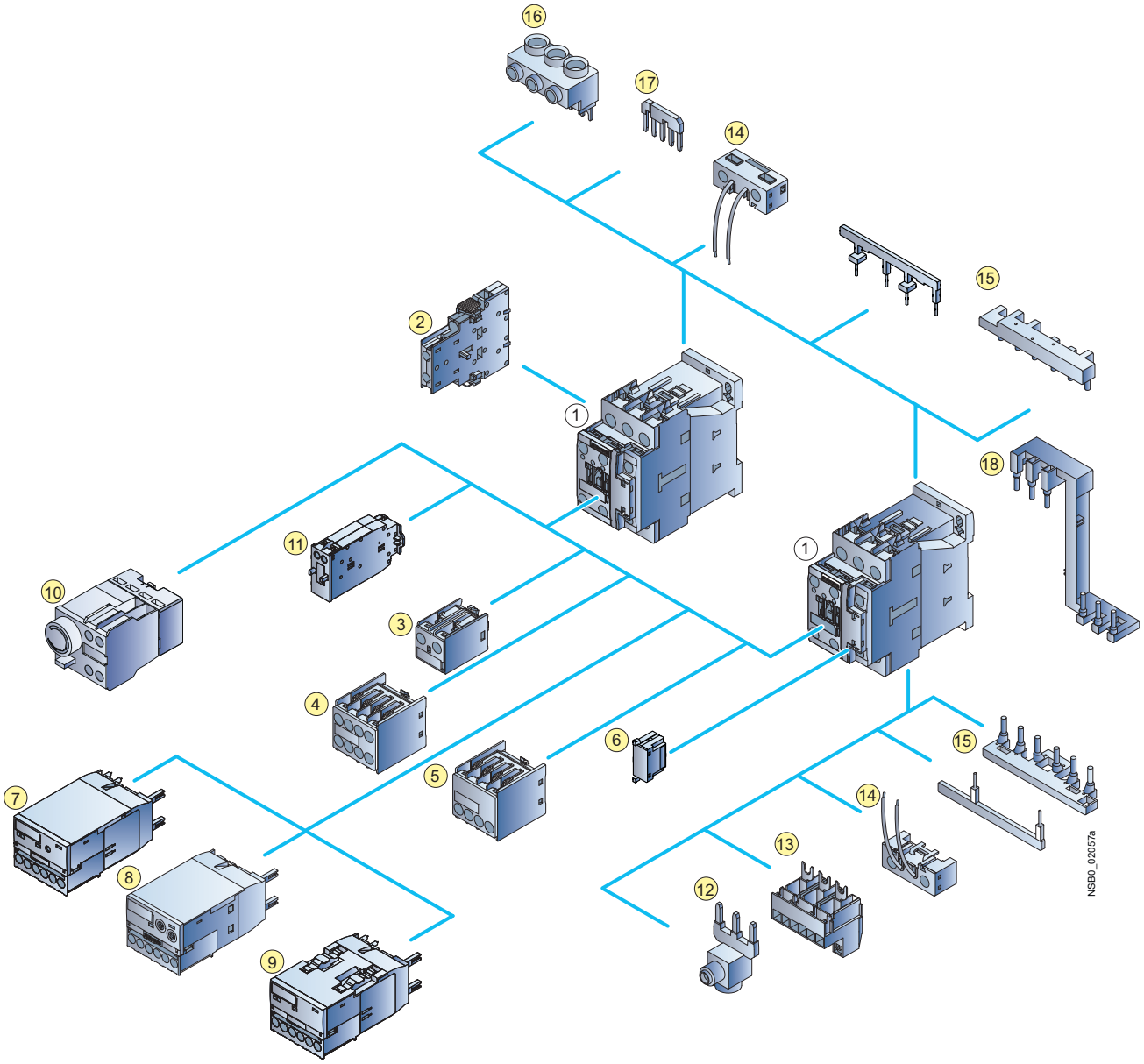
For contactors
For contactors and coupling contactors (interface)

For contactor assemblies see pages 3/28 to 3/44.
For assembly kit for reversing contactor assemblies (mech. interlocking, wiring modules) see page 3/34.
For function modules see pages 3/77 to 3/87.
For accessories see pages 3/93 to 3/104.

For mountable overload relays see Chapter 5 "Protection Equipment --> Overload Relays".
For fuseless load feeders see Chapter 6 "Load Feeders and Motor Starters" --> "3RA2 Load Feeders".

General data

3RT2 contactors
Size S0 with mountable accessories

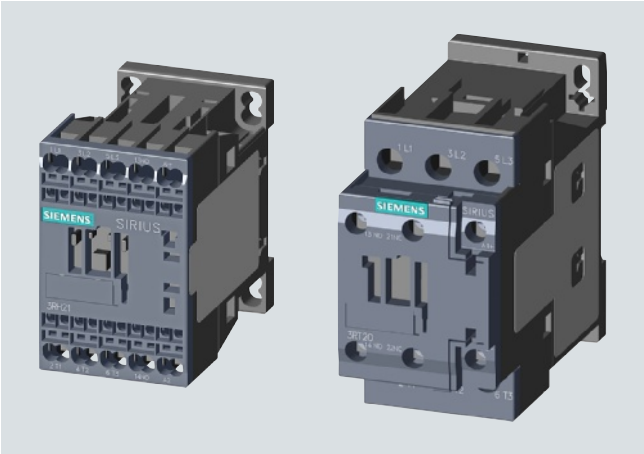


① Contactor size S0

② 1-pole auxiliary switch block, laterally mountable
③ 1-pole auxiliary switch block, for snapping onto the front Cable entry from the top
④ 4-pole auxiliary switch block, for snapping onto the front
⑤ 2-pole auxiliary switch block, for snapping onto the front Cable entry from the bottom
⑥ Surge suppressor with/without LED
⑦ 3RA27 function module for AS-Interface, direct starting
⑧ 3RA28 function module
⑨ 3RA27 function module for IO-Link, direct starting
⑩ Pneumatic delay block
⑪ Mechanical latching block
⑫ Link for paralleling, 3-pole, with terminal
⑬ Connection module (adapter and plug) for contactors with screw-type connection
⑭ Coil terminal module, on the top and bottom
⑮ Wiring modules, on the top and bottom (reversing duty)
⑯ Three-phase feeder terminal
⑰ Link for paralleling (star jumper), 3-pole, without connection terminal
⑱ Safety main current connectors for two contactors

Overview

Sizes S00 and S0, up to 18.5 kW



Standards

IEC 60947-1, EN 60947-1,
IEC 60947-4-1, EN 60947-4-1
IEC 60947-5-1, EN 60947-5-1 (auxiliary switches)

The 3RT2 contactors are climate-proof and are suitable and tested for use worldwide.

If the devices are used in ambient conditions which deviate from common industrial conditions (EN 60721-3-3 "Stationary Use, Weather-Protected"), information must be obtained about possible restrictions with regard to the reliability and endurance of the device and possible protective measures. In this case contact our Technical Assistance.

3RT2 contactors are finger-safe according to EN 50274. The devices with ring terminal lug connection comply with degree of protection IP20 when fitted with the related terminal cover.

Auxiliary contact complement

Size S00 contactors have an auxiliary contact integrated in the basic unit. The basic units size S0 contain two integrated auxiliary contacts (1 NO + 1 NC).

All basic units (excluding coupling contactors) can be expanded with auxiliary switch blocks. For size S0 and higher, complete units with 2 NO + 2 NC are available (terminal designation according to EN 50012). The auxiliary switch block can be removed.

- A maximum of 4 additional auxiliary contacts can be attached; the auxiliary switch blocks used can be of any version.
- Of the maximum number of auxiliary contacts possible on the device (integrated plus mountable), four NC contacts are permitted in the case of contactor size S00 and four NC contacts in the case of contactor size S0.

In addition, complete units with permanently mounted auxiliary switch block (2 NO + 2 NC according to EN 50012) are offered for sizes S00 and S0.

Contact reliability

If voltages ≤ 110 V and currents ≤ 100 mA are to be switched, the auxiliary contacts of the 3RT2 contactor or 3RH21 contactor relay should be used as they guarantee a high level of contact reliability.

These auxiliary contacts are suitable for solid-state circuits with currents ≥ 1 mA at a voltage ≥ 17 V.

Connection methods

The 3RT2 contactors are available with screw connections, spring-type terminals or ring terminal lug connections.

	Screw terminals
	Spring-type terminals
	Ring terminal lug connection
	These connections are indicated in the corresponding tables by orange backgrounds.

Short-circuit protection of the contactors

For short-circuit protection of the contactors without overload relay see "More Information" (pages 3/20, 3/23). For short-circuit protection of the contactors with overload relay see Chapter 5 "Overload Relays". To assemble fuseless motor feeders you must select combinations of motor starter protector and contactor as explained in "3RA2 Load Feeders" (see Chapter 6).

Motor protection

3RU21 thermal overload relays or 3RB30 solid-state overload relays can be fitted to the 3RT2 contactors for protection against overload. The overload relays must be ordered separately (see Chapter 5).

Ratings of induction motors

The quoted rating (in kW) refers to the output power on the motor shaft (according to the nameplate).

Control supply voltage

All contactors are available with AC or DC operation. For contactors of size S0, a UC operating mechanism is also available which allows for operation both with AC (45 to 70 Hz) and with DC.

Surge suppression

3RT2 contactors can be retrofitted with RC elements, varistors, suppressor diodes or diode assemblies (assembly of diode and Zener diode for short break times) for damping opening surges in the coil.

The surge suppressors are plugged onto the front of size S00 contactors. Space is provided for them next to a snap-on auxiliary switch block.

The surge suppressors can be plugged onto the front of size S0 contactors.

Note:
The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor and suppressor diode +2 to 5 ms).

S00 and S0 contactors with communication interface

The S00 and S0 contactors with communication interface are essential for mounting the SIRIUS function modules for connection to the control system through IO-Link or AS-Interface (see page 3/81 and 3/85).

Further information on IO-Link and AS-Interface can be found in Chapter 2 "Industrial Communication".

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Order No. scheme

Digit of the Order No.	1. - 3.	4.	5.	6.	7.		8.	9.	10.	11.	12.		13.	14.	15.	16.
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
SIRIUS power contactors	**3 R T**															
2nd generation		**2**														
Device type (e. g. 0 = 3-pole motor contactor, 3 = 4-pole AC-1 contactor)			□													
Contactor size (1 = S00, 2 = S0)				□												
Power dependent on size (e. g. 27 = 15 kW)					□											
Connection type (1 = screw, 2 = spring)							□									
Operating range / solenoid coil circuit (e. g. A = AC standard / without)								□								
Rated control supply voltage (e. g. P0 = 230 V, 50 Hz)									□	□						
Auxiliary switches (e. g. S0: 0 = 1 NO + 1 NC integrated)											□					
Special version													□	□	□	□
Example	**3 R T**	**2**	**0**	**2**	**7**	**–**	**1**	**A**	**P**	**0**	**0**					

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Accessories

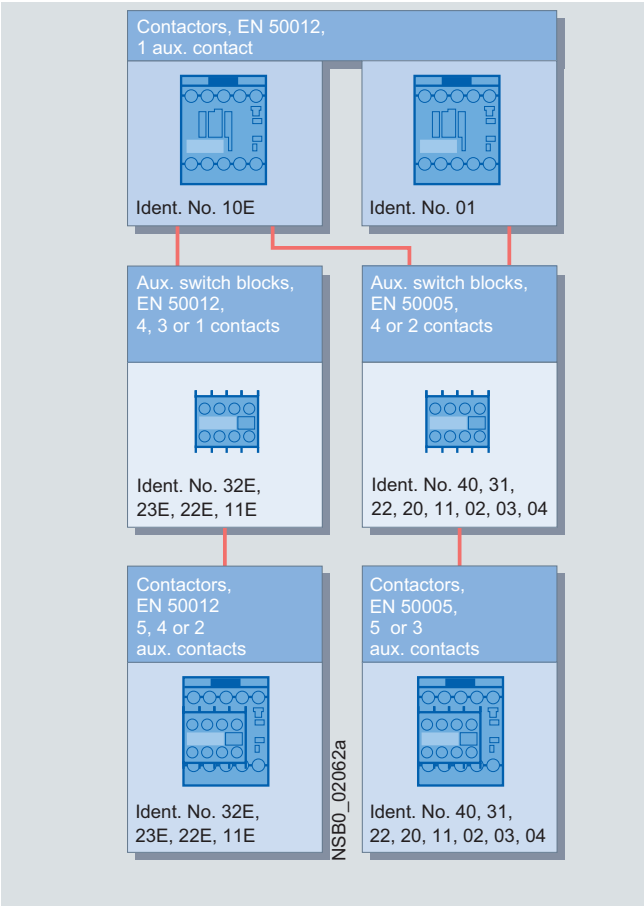
Auxiliary switch blocks

Various auxiliary switch blocks can be added to the 3RT2 basic units depending on the application:

Size S00, 3RT20 1. contactors

Terminal designations according to EN 50012 or EN 50005

Size S00 contactors have an auxiliary contact (NO or NC) integrated in the basic unit.



Contactor, size S00, with 4-pole auxiliary switch block

Contactors with a NO contact as auxiliary contact with screw or spring-type terminals and ring terminal lug connection, identification number 10E, can be expanded into contactors with 2, 3, 4 and 5 auxiliary contacts according to EN 50012 using auxiliary switch blocks. The identification numbers according to EN 50012, e. g. 11E, apply to the basic device plus mounted auxiliary switch.

All contactors of size S00 with one auxiliary contact (identification numbers 10E or 01) and the contactors with 4 main contacts can be expanded into contactors with 2 to 5 auxiliary contacts using auxiliary switch blocks with the identification numbers 40 to 04 (in the case of contactors with 4 main contacts: 1 to 4 auxiliary contacts) according to EN 50005.

Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted.

Single- or 2-pole auxiliary switch blocks with connection options from above or below enable easy and clearly arranged wiring especially for the installation of network access junctions. These auxiliary switch blocks are offered only with screw terminals.

If the installation space is limited in depth, 2-pole auxiliary switch blocks (screw or spring-type terminals and ring terminal lug connection) can be attached laterally for use on the right or on the left.

The solid-state compatible 3RH29 1.-1NF. . auxiliary switch blocks for contactors of size S00 include 2 enclosed contacts. They are suitable in particular for switching small voltages and currents (hard gold-plated contacts) and for operation in dusty atmospheres. The NC auxiliary contacts are not mirror contacts.

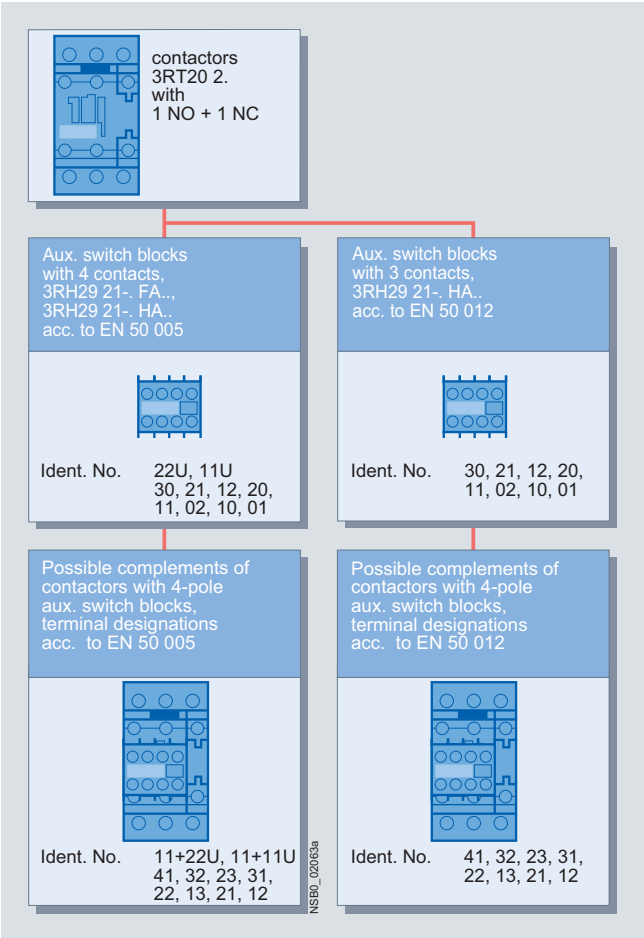
All the previously mentioned auxiliary switch variants can be snap-fitted onto the front of the contactor. The auxiliary switch block has a centrally positioned release lever for disassembly.

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Size S0, 3RT20 2. contactors

Terminal designations according to EN 50005 or EN 50012.

Size S0 contactors have 2 auxiliary contacts (1 NO and 1 NC) integrated in the basic unit.



Contactor, size S0, with 4-pole auxiliary switch block

A diverse range of auxiliary switch blocks is available for various applications.

One 4-pole auxiliary switch block (screw or spring-type terminals and ring terminal lug connection) can be snapped onto the front of the contactors. When the contactors are switched on, the NC contacts are opened first and then the NO contacts are closed.

Also available are 1- or 2-pole auxiliary switch blocks (screw terminals) for cable entry from above or below in the design of a quad block (feeder auxiliary switch).

If the installation space is limited in depth, 2-pole auxiliary switch blocks (screw or spring-type terminals and ring terminal lug connection) can be attached laterally for use on the right or on the left.

The auxiliary switch blocks attached to the front can be disassembled with the help of a centrally arranged release lever; the laterally attached auxiliary switch blocks are easy to remove by pressing on the checkered surfaces.

The terminal designation of the individual auxiliary switch blocks corresponds to EN 50005 or EN 50012, that of the complete contactor with auxiliary switch block 2 NO + 2 NC corresponds to EN 50012.

The laterally mountable auxiliary switch blocks according to EN 50012 can be used only when no 4-pole auxiliary switch blocks are snapped onto the front. As 2 auxiliary contacts 1 NO + 1 NC are already integrated in the basic device, mounting according to EN 50012 is permitted only on the right of the device.

The front 1- or 2-pole auxiliary switch blocks with connection option from below or above have fixed location identifiers. These auxiliary switch blocks are available only with screw terminals.

If the 4-pole and solid-state compatible auxiliary switch blocks are used, the location identifiers on the basic device must be noted.

Two enclosed contacts are available with the 3RH29 11-.NF11 solid-state compatible auxiliary switch block, which can be attached to the front. The 3RH29 21-2DE11 laterally mountable, solid-state compatible auxiliary switch block also contains 2 enclosed contacts (1 NO + 1 NC). The enclosed contacts are suitable in particular for switching small voltages and currents (hard gold-plated contacts) and for operation in dusty atmospheres. The front NC auxiliary contacts are not mirror contacts.

A maximum of 4 auxiliary contacts can be attached; the auxiliary switch blocks used can be of any version. Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted however.

For 4-pole contactors see 3RT23 and 3RT25.

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Selection and ordering data

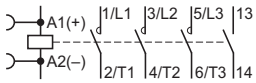
AC operation

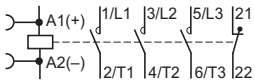
PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT3RT20 1.-1A...

3RT20 1.-2A...

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO	NC	Rated control supply voltage U_s at 50/60 Hz	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
A	**kW**	A		NO	NC	V AC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail														
Size S00[1)2)]														
Terminal designations according to EN 50012 or EN 50005														
• With auxiliary contact 1 NO, identification number **10 E**														
• With auxiliary contact 1 NC, identification number **01**														
7	**3**	18	**10 E**	1	--	24	A	**3RT20 15-1AB01**		0.280 A		**3RT20 15-2AB01**		0.300
						110	A	**3RT20 15-1AF01**		0.280 B		**3RT20 15-2AF01**		0.300
						230	A	**3RT20 15-1AP01**		0.280 A		**3RT20 15-2AP01**		0.300
			01	--	1	24	A	**3RT20 15-1AB02**		0.280 A		**3RT20 15-2AB02**		0.300
						110	A	**3RT20 15-1AF02**		0.280 B		**3RT20 15-2AF02**		0.300
						230	A	**3RT20 15-1AP02**		0.280 B		**3RT20 15-2AP02**		0.300
9	**4**	22	**10 E**	1	--	24	A	**3RT20 16-1AB01**		0.280 A		**3RT20 16-2AB01**		0.300
						110	A	**3RT20 16-1AF01**		0.280 B		**3RT20 16-2AF01**		0.300
						230	A	**3RT20 16-1AP01**		0.280 A		**3RT20 16-2AP01**		0.300
			01	--	1	24	A	**3RT20 16-1AB02**		0.280 B		**3RT20 16-2AB02**		0.300
						110	A	**3RT20 16-1AF02**		0.280 B		**3RT20 16-2AF02**		0.300
						230	A	**3RT20 16-1AP02**		0.280 B		**3RT20 16-2AP02**		0.300
12	**5.5**	22	**10 E**	1	--	24	A	**3RT20 17-1AB01**		0.280 B		**3RT20 17-2AB01**		0.300
						110	A	**3RT20 17-1AF01**		0.280 B		**3RT20 17-2AF01**		0.300
						230	A	**3RT20 17-1AP01**		0.280 B		**3RT20 17-2AP01**		0.300
			01	--	1	24	A	**3RT20 17-1AB02**		0.280 B		**3RT20 17-2AB02**		0.300
						110	B	**3RT20 17-1AF02**		0.280 B		**3RT20 17-2AF02**		0.300
						230	A	**3RT20 17-1AP02**		0.280 B		**3RT20 17-2AP02**		0.300
16	**7.5**	22	**10 E**	1	--	24	B	**3RT20 18-1AB01**		0.280 B		**3RT20 18-2AB01**		0.300
						110	B	**3RT20 18-1AF01**		0.280 B		**3RT20 18-2AF01**		0.300
						230	A	**3RT20 18-1AP01**		0.280 B		**3RT20 18-2AP01**		0.300
			01	--	1	24	B	**3RT20 18-1AB02**		0.280 B		**3RT20 18-2AB02**		0.300
						110	B	**3RT20 18-1AF02**		0.280 B		**3RT20 18-2AF02**		0.300
						230	A	**3RT20 18-1AP02**		0.280 B		**3RT20 18-2AP02**		0.300





For other voltages see page 3/17, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories, see page 3/93.

1) The 3RT20 contactors are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

2) For size S00: Coil operating range
at 50 Hz: 0.8 ... 1.1 × U_s,
at 60 Hz: 0.85 ... 1.1 × U_s.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

AC operation

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 1.-1AP04-3MA0

3RT20 1.-2AP04-3MA0

Rated data AC-2 and AC-3, T_u: up to 60 °C		AC-1, T_u: 40 °C	Auxiliary contacts		Rated control supply voltage U_s at 50/60 Hz	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	Operational current I_e up to 690 V	Ident. No.	Version			Order No.	Price per PU			Order No.	Price per PU	
A	**kW**	A		NO NC	V AC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail													
***Size S00*[1]**													
With permanently mounted auxiliary switch block Terminal designations according to EN 50012													
7	**3**	18	**22 E**	2 2	230	B	**3RT20 15-1AP04-3MA0**		0.280	B	**3RT20 15-2AP04-3MA0**		0.300
9	**4**	22	**22 E**	2 2	230	B	**3RT20 16-1AP04-3MA0**		0.280	B	**3RT20 16-2AP04-3MA0**		0.300
12	**5.5**	22	**22 E**	2 2	230	B	**3RT20 17-1AP04-3MA0**		0.280	B	**3RT20 17-2AP04-3MA0**		0.300
16	**7.5**	22	**22 E**	2 2	230	B	**3RT20 18-1AP04-3MA0**		0.280	B	**3RT20 18-2AP04-3MA0**		0.300
With permanently mounted auxiliary switch block and varistor plugged into the front Terminal designations according to EN 50012													
7	**3**	18	**22 E**	2 2	230	B	**3RT20 15-1CP04-3MA0**		0.280	B	**3RT20 15-2CP04-3MA0**		0.300
9	**4**	22	**22 E**	2 2	230	B	**3RT20 16-1CP04-3MA0**		0.280	B	**3RT20 16-2CP04-3MA0**		0.300
12	**5.5**	22	**22 E**	2 2	230	B	**3RT20 17-1CP04-3MA0**		0.280	B	**3RT20 17-2CP04-3MA0**		0.300
16	**7.5**	22	**22 E**	2 2	230	B	**3RT20 18-1CP04-3MA0**		0.280	B	**3RT20 18-2CP04-3MA0**		0.300

For other voltages see page 3/17, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories, see page 3/93.

[1] For size S00: Coil operating range at 50 Hz: 0.8 ... 1.1 × U_s, at 60 Hz: 0.85 ... 1.1 × U_s.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RT20 contactors, 3-pole, 3 ... 18.5 kW

AC operation

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 2.-1A.00

3RT20 2.-2A.00

3RT20 2.-1A.04

3RT20 2.-2A.04

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO	NC	Rated control supply voltage U_s at 50 Hz V AC	DT	**Screw terminals** Order No.	Price per PU	Weight per PU approx. kg	DT	**Spring-type terminals** Order No.	Price per PU	Weight per PU approx. kg
A	**kW**	A												
For screw and snap-on mounting onto TH 35 standard mounting rail														
Size S0[1]														
Terminal designations according to EN 50012														
12	**5.5**	40	**11 E**	1	1	24	A	**3RT20 24-1AB00**		0.460	B	**3RT20 24-2AB00**		0.440
						110	A	**3RT20 24-1AF00**		0.460	B	**3RT20 24-2AF00**		0.440
						230	A	**3RT20 24-1AP00**		0.460	B	**3RT20 24-2AP00**		0.440
16	**7.5**	40	**11 E**	1	1	24	A	**3RT20 25-1AB00**		0.460	B	**3RT20 25-2AB00**		0.440
						110	A	**3RT20 25-1AF00**		0.460	B	**3RT20 25-2AF00**		0.440
						230	A	**3RT20 25-1AP00**		0.460	B	**3RT20 25-2AP00**		0.440
25	**11**	40	**11 E**	1	1	24	A	**3RT20 26-1AB00**		0.460	A	**3RT20 26-2AB00**		0.440
						110	A	**3RT20 26-1AF00**		0.460	B	**3RT20 26-2AF00**		0.440
						230	A	**3RT20 26-1AP00**		0.460	B	**3RT20 26-2AP00**		0.440
32	**15**	50	**11 E**	1	1	24	B	**3RT20 27-1AB00**		0.460	B	**3RT20 27-2AB00**		0.440
						110	A	**3RT20 27-1AF00**		0.460	B	**3RT20 27-2AF00**		0.440
						230	A	**3RT20 27-1AP00**		0.460	B	**3RT20 27-2AP00**		0.440
38	**18.5**	50	**11 E**	1	1	24	B	**3RT20 28-1AB00**		0.460	B	**3RT20 28-2AB00**		0.440
						110	B	**3RT20 28-1AF00**		0.460	B	**3RT20 28-2AF00**		0.440
						230	A	**3RT20 28-1AP00**		0.460	B	**3RT20 28-2AP00**		0.440
With mounted auxiliary switch block (removable)[2]														
Terminal designations according to EN 50012														
12	**5.5**	40	**22 E**	2	2	24	B	**3RT20 24-1AB04**		0.460	B	**3RT20 24-2AB04**		0.440
						110	B	**3RT20 24-1AF04**		0.460	B	**3RT20 24-2AF04**		0.440
						230	A	**3RT20 24-1AP04**		0.460	B	**3RT20 24-2AP04**		0.440
16	**7.5**	40	**22 E**	2	2	24	B	**3RT20 25-1AB04**		0.460	B	**3RT20 25-2AB04**		0.440
						110	B	**3RT20 25-1AF04**		0.460	B	**3RT20 25-2AF04**		0.440
						230	A	**3RT20 25-1AP04**		0.460	B	**3RT20 25-2AP04**		0.440
25	**11**	40	**22 E**	2	2	24	B	**3RT20 26-1AB04**		0.460	B	**3RT20 26-2AB04**		0.440
						110	B	**3RT20 26-1AF04**		0.460	B	**3RT20 26-2AF04**		0.440
						230	A	**3RT20 26-1AP04**		0.460	B	**3RT20 26-2AP04**		0.440
32	**15**	50	**22 E**	2	2	24	B	**3RT20 27-1AB04**		0.460	B	**3RT20 27-2AB04**		0.440
						110	B	**3RT20 27-1AF04**		0.460	B	**3RT20 27-2AF04**		0.440
						230	A	**3RT20 27-1AP04**		0.460	B	**3RT20 27-2AP04**		0.440
38	**18.5**	50	**22 E**	2	2	24	B	**3RT20 28-1AB04**		0.460	B	**3RT20 28-2AB04**		0.440
						110	B	**3RT20 28-1AF04**		0.460	B	**3RT20 28-2AF04**		0.440
						230	A	**3RT20 28-1AP04**		0.460	B	**3RT20 28-2AP04**		0.440

For other voltages see page 3/17, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories, see page 3/93.
For spare parts, see page 3/110.

[1] The 3RT20 contactors are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

[2] Order No. for the auxiliary switch block (removable): 3RH29 11-.HA11

* You can order this quantity or a multiple thereof.
Illustrations are approximate

AC operation

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 2.-1AL24-3MA0

3RT20 2.-2AL24-3MA0

Rated data AC-2 and AC-3, T_u: up to 60 °C		AC-1, T_u: 40 °C	Auxiliary contacts		Rated control supply voltage U_s at 50/60 Hz	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	Operational current I_e up to 690 V	Ident. No.	Version			Order No.	Price per PU			Order No.	Price per PU	
A	**kW**	A		NO NC	V AC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail													
Size S0													
With permanently mounted auxiliary switch block[1] Terminal designations according to EN 50012													
12	**5.5**	40	**22 E**	2 2	230	B	**3RT20 24-1AL24-3MA0**		0.460	B	**3RT20 24-2AL24-3MA0**		0.440
16	**7.5**	40	**22 E**	2 2	230	B	**3RT20 25-1AL24-3MA0**		0.460	B	**3RT20 25-2AL24-3MA0**		0.440
25	**11**	40	**22 E**	2 2	230	B	**3RT20 26-1AL24-3MA0**		0.460	B	**3RT20 26-2AL24-3MA0**		0.440
32	**15**	50	**22 E**	2 2	230	B	**3RT20 27-1AL24-3MA0**		0.460	B	**3RT20 27-2AL24-3MA0**		0.440
38	**18.5**	50	**22 E**	2 2	230	B	**3RT20 28-1AL24-3MA0**		0.460	B	**3RT20 28-2AL24-3MA0**		0.440
With permanently mounted auxiliary switch block and varistor plugged into the front Terminal designations according to EN 50012													
12	**5.5**	40	**22 E**	2 2	230	B	**3RT20 24-1CL24-3MA0**		0.460	B	**3RT20 24-2CL24-3MA0**		0.440
16	**7.5**	40	**22 E**	2 2	230	B	**3RT20 25-1CL24-3MA0**		0.460	B	**3RT20 25-2CL24-3MA0**		0.440
25	**11**	40	**22 E**	2 2	230	B	**3RT20 26-1CL24-3MA0**		0.460	B	**3RT20 26-2CL24-3MA0**		0.440
32	**15**	50	**22 E**	2 2	230	B	**3RT20 27-1CL24-3MA0**		0.460	B	**3RT20 27-2CL24-3MA0**		0.440
38	**18.5**	50	**22 E**	2 2	230	B	**3RT20 28-1CL24-3MA0**		0.460	B	**3RT20 28-2CL24-3MA0**		0.440

For other voltages see page 3/17, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories, see page 3/93.
For spare parts, see page 3/110.

[1] No surge suppressors can be retrofitted.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RT20 contactors, 3-pole, 3 ... 18.5 kW

DC operation · DC solenoid system

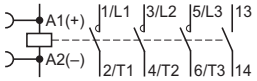
PU (UNIT, SET, M) = 1
PS* = 1 UNIT
PG = 101

3RT20 1.-1B...

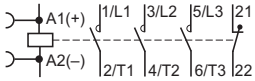
3RT20 1.-2B...

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and 400 V	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO	NC	Rated control supply voltage U_s	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
A	kW	A				V DC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail														
Size S00[1]														
Terminal designations according to EN 50012 or EN 50005														
• With auxiliary contact 1 NO, identification number **10 E**														
7	**3**	18	**10 E**	1	--	24	A	**3RT20 15-1BB41**	0.280	A		**3RT20 15-2BB41**		0.300
						220	A	**3RT20 15-1BM41**	0.280	B		**3RT20 15-2BM41**		0.300
			01	--	1	24	A	**3RT20 15-1BB42**	0.280	A		**3RT20 15-2BB42**		0.300
						220	B	**3RT20 15-1BM42**	0.280	B		**3RT20 15-2BM42**		0.300
9	**4**	22	**10 E**	1	--	24	A	**3RT20 16-1BB41**	0.280	A		**3RT20 16-2BB41**		0.300
						220	B	**3RT20 16-1BM41**	0.280	B		**3RT20 16-2BM41**		0.300
			01	--	1	24	A	**3RT20 16-1BB42**	0.280	A		**3RT20 16-2BB42**		0.300
						220	B	**3RT20 16-1BM42**	0.280	B		**3RT20 16-2BM42**		0.300
12	**5.5**	22	**10 E**	1	--	24	A	**3RT20 17-1BB41**	0.280	A		**3RT20 17-2BB41**		0.300
						220	B	**3RT20 17-1BM41**	0.280	B		**3RT20 17-2BM41**		0.300
			01	--	1	24	A	**3RT20 17-1BB42**	0.280	A		**3RT20 17-2BB42**		0.300
						220	B	**3RT20 17-1BM42**	0.280	B		**3RT20 17-2BM42**		0.300
16	**7.5**	22	**10 E**	1	--	24	A	**3RT20 18-1BB41**	0.280	B		**3RT20 18-2BB41**		0.300
						220	B	**3RT20 18-1BM41**	0.280	B		**3RT20 18-2BM41**		0.300
			01	--	1	24	A	**3RT20 18-1BB42**	0.280	B		**3RT20 18-2BB42**		0.300
						220	B	**3RT20 18-1BM42**	0.280	B		**3RT20 18-2BM42**		0.300
With integrated coil circuit (diode)														
Terminal designations according to EN 50012														
• With auxiliary contact 1 NO, identification number **10 E**														
7	**3**	18	**10 E**	1	--	24	B	**3RT20 15-1FB41**	0.280	B		**3RT20 15-2FB41**		0.300
			01	--	1	24	B	**3RT20 15-1FB42**	0.280	B		**3RT20 15-2FB42**		0.300
9	**4**	22	**10 E**	1	--	24	B	**3RT20 16-1FB41**	0.280	B		**3RT20 16-2FB41**		0.300
			01	--	1	24	B	**3RT20 16-1FB42**	0.280	B		**3RT20 16-2FB42**		0.300
12	**5.5**	22	**10 E**	1	--	24	B	**3RT20 17-1FB41**	0.280	B		**3RT20 17-2FB41**		0.300
			01	--	1	24	B	**3RT20 17-1FB42**	0.280	B		**3RT20 17-2FB42**		0.300
16	**7.5**	22	**10 E**	1	--	24	B	**3RT20 18-1FB41**	0.280	B		**3RT20 18-2FB41**		0.300
			01	--	1	24	B	**3RT20 18-1FB42**	0.280	B		**3RT20 18-2FB42**		0.300

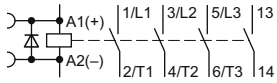
• With auxiliary contact 1 NO, identification number **10 E**



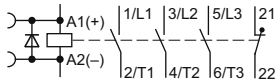
• With auxiliary contact 1 NC, identification number **01**



• With auxiliary contact 1 NO, identification number **10 E**



• With auxiliary contact 1 NC, identification number **01**



For other voltages see page 3/17, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories, see page 3/93.

[1] The 3RT20 contactors are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

DC operation · DC solenoid system

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

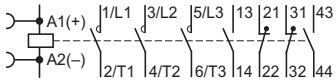

3RT20 1.-1BB4.-0CC0

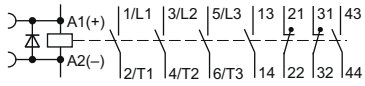

3RT20 1.-2BB4.-0CC0


3RT20 1.-1BB44-3MA0

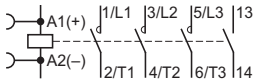

3RT20 1.-2BB44-3MA0

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO	NC	Rated control supply voltage U_s V DC	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
A	**kW**	A								kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail														
Size S00														
With permanently mounted auxiliary switch block Terminal designations according to EN 50012														
7	**3**	18	**22 E**	2	2	24	B	**3RT20 15-1BB44-3MA0**		0.280	B	**3RT20 15-2BB44-3MA0**		0.300
9	**4**	22	**22 E**	2	2	24	B	**3RT20 16-1BB44-3MA0**		0.280	B	**3RT20 16-2BB44-3MA0**		0.300
12	**5.5**	22	**22 E**	2	2	24	B	**3RT20 17-1BB44-3MA0**		0.280	B	**3RT20 17-2BB44-3MA0**		0.300
16	**7.5**	22	**22 E**	2	2	24	B	**3RT20 18-1BB44-3MA0**		0.280	B	**3RT20 18-2BB44-3MA0**		0.300
With permanently mounted auxiliary switch block and integrated coil circuit (diode) Terminal designations according to EN 50012														
7	**3**	18	**22 E**	2	2	24	B	**3RT20 15-1FB44-3MA0**		0.280	B	**3RT20 15-2FB44-3MA0**		0.300
9	**4**	22	**22 E**	2	2	24	B	**3RT20 16-1FB44-3MA0**		0.280	B	**3RT20 16-2FB44-3MA0**		0.300
12	**5.5**	22	**22 E**	2	2	24	B	**3RT20 17-1FB44-3MA0**		0.280	B	**3RT20 17-2FB44-3MA0**		0.300
16	**7.5**	22	**22 E**	2	2	24	B	**3RT20 18-1FB44-3MA0**		0.280	B	**3RT20 18-2FB44-3MA0**		0.300
Contactors with communication interface Terminal designations according to EN 50012 or EN 50005														
• With auxiliary contact 1 NO, identification number **10 E**														
7	**3**	18	**10 E**	1	--	24	B	**3RT20 15-1BB41-0CC0**		0.280	B	**3RT20 15-2BB41-0CC0**		0.300
			01	--	1	24	B	**3RT20 15-1BB42-0CC0**		0.280	B	**3RT20 15-2BB42-0CC0**		0.300
9	**4**	22	**10 E**	1	--	24	B	**3RT20 16-1BB41-0CC0**		0.280	B	**3RT20 16-2BB41-0CC0**		0.300
			01	--	1	24	B	**3RT20 16-1BB42-0CC0**		0.280	B	**3RT20 16-2BB42-0CC0**		0.300
12	**5.5**	22	**10 E**	1	--	24	B	**3RT20 17-1BB41-0CC0**		0.280	B	**3RT20 17-2BB41-0CC0**		0.300
			01	--	1	24	B	**3RT20 17-1BB42-0CC0**		0.280	B	**3RT20 17-2BB42-0CC0**		0.300
16	**7.5**	22	**10 E**	1	--	24	B	**3RT20 18-1BB41-0CC0**		0.280	B	**3RT20 18-2BB41-0CC0**		0.300
			01	--	1	24	B	**3RT20 18-1BB42-0CC0**		0.280	B	**3RT20 18-2BB42-0CC0**		0.300

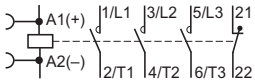




• With auxiliary contact 1 NO, identification number **10 E**



• With auxiliary contact 1 NC, identification number **01**



For other voltages see page 3/17, for contactors with permanently mounted auxiliary switch block please inquire.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

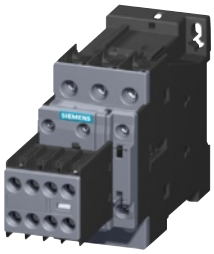
3RT20 contactors, 3-pole, 3 ... 18.5 kW

DC operation · DC solenoid system

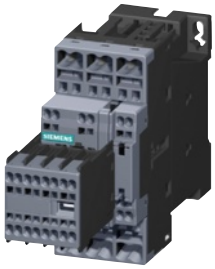
PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 2.-1B.40

3RT20 2.-2B.40



3RT20 2.-1B.44



3RT20 2.-2B.44

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and 400 V	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO	NC	Rated control supply voltage U_s	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
A	**kW**	A				V DC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail														
Size S0[1]														
Terminal designations according to EN 50012														
12	**5.5**	40	**11 E**	1	1	24	A	**3RT20 24-1BB40**		0.580	A	**3RT20 24-2BB40**		0.620
						220	B	**3RT20 24-1BM40**		0.580	B	**3RT20 24-2BM40**		0.620
16	**7.5**	40	**11 E**	1	1	24	A	**3RT20 25-1BB40**		0.580	A	**3RT20 25-2BB40**		0.620
						220	B	**3RT20 25-1BM40**		0.580	B	**3RT20 25-2BM40**		0.620
25	**11**	40	**11 E**	1	1	24	A	**3RT20 26-1BB40**		0.580	A	**3RT20 26-2BB40**		0.620
						220	B	**3RT20 26-1BM40**		0.580	B	**3RT20 26-2BM40**		0.620
32	**15**	50	**11 E**	1	1	24	A	**3RT20 27-1BB40**		0.580	B	**3RT20 27-2BB40**		0.620
						220	B	**3RT20 27-1BM40**		0.580	B	**3RT20 27-2BM40**		0.620
38	**18.5**	50	**11 E**	1	1	24	A	**3RT20 28-1BB40**		0.580	B	**3RT20 28-2BB40**		0.620
						220	B	**3RT20 28-1BM40**		0.580	B	**3RT20 28-2BM40**		0.620
With plugged-in coil circuit (diode assembly) Terminal designations according to EN 50012														
12	**5.5**	40	**11 E**	1	1	24	B	**3RT20 24-1FB40**		0.580	B	**3RT20 24-2FB40**		0.600
16	**7.5**	40	**11 E**	1	1	24	B	**3RT20 25-1FB40**		0.580	B	**3RT20 25-2FB40**		0.600
25	**11**	40	**11 E**	1	1	24	B	**3RT20 26-1FB40**		0.580	B	**3RT20 26-2FB40**		0.600
32	**15**	50	**11 E**	1	1	24	B	**3RT20 27-1FB40**		0.600	B	**3RT20 27-2FB40**		0.600
38	**18.5**	50	**11 E**	1	1	24	B	**3RT20 28-1FB40**		0.580	B	**3RT20 28-2FB40**		0.600
With mounted auxiliary switch block (removable)[2] Terminal designations according to EN 50012														
12	**5.5**	40	**22 E**	2	2	24	A	**3RT20 24-1BB44**		0.580	B	**3RT20 24-2BB44**		0.620
16	**7.5**	40	**22 E**	2	2	24	A	**3RT20 25-1BB44**		0.580	B	**3RT20 25-2BB44**		0.620
25	**11**	40	**22 E**	2	2	24	A	**3RT20 26-1BB44**		0.580	B	**3RT20 26-2BB44**		0.620
32	**15**	50	**22 E**	2	2	24	A	**3RT20 27-1BB44**		0.580	B	**3RT20 27-2BB44**		0.620
38	**18.5**	50	**22 E**	2	2	24	A	**3RT20 28-1BB44**		0.580	B	**3RT20 28-2BB44**		0.620

For other voltages see page 3/17, for contactors with mounted auxiliary switch block please inquire.

For accessories, see page 3/93.

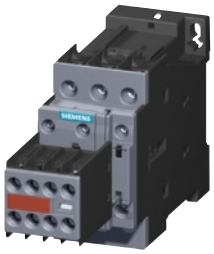
[1] The 3RT20 contactors are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

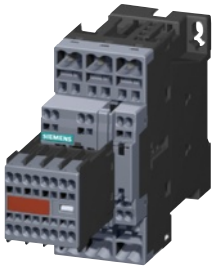
[2] Order No. for the auxiliary switch block (removable): 3RH29 11-.HA11

* You can order this quantity or a multiple thereof.
Illustrations are approximate

DC operation · DC solenoid system

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

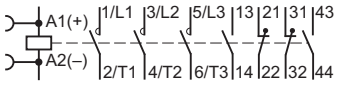

3RT20 2.-1BB44-3MA0

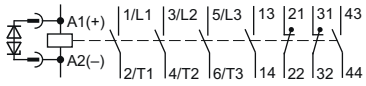

3RT20 2.-2BB44-3MA0

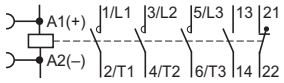

3RT20 2.-1BB40-0CC0


3RT20 2.-2BB40-0CC0

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO NC	Rated control supply voltage U_s V DC	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
A	**kW**	A											
For screw and snap-on mounting onto TH 35 standard mounting rail													
Size S0													
With permanently mounted auxiliary switch block[1] Terminal designations according to DIN 50012													
12	**5.5**	40	**22 E**	2 2	24	B	**3RT20 24-1BB44-3MA0**		0.580	B	**3RT20 24-2BB44-3MA0**		0.620
16	**7.5**	40	**22 E**	2 2	24	B	**3RT20 25-1BB44-3MA0**		0.580	B	**3RT20 25-2BB44-3MA0**		0.620
25	**11**	40	**22 E**	2 2	24	B	**3RT20 26-1BB44-3MA0**		0.580	B	**3RT20 26-2BB44-3MA0**		0.620
32	**15**	50	**22 E**	2 2	24	B	**3RT20 27-1BB44-3MA0**		0.580	B	**3RT20 27-2BB44-3MA0**		0.620
38	**18.5**	50	**22 E**	2 2	24	B	**3RT20 28-1BB44-3MA0**		0.580	B	**3RT20 28-2BB44-3MA0**		0.620
With permanently mounted auxiliary switch block and plugged-in coil circuit (diode assembly) Terminal designations according to EN 50012													
12	**5.5**	40	**22 E**	2 2	24	B	**3RT20 24-1FB44-3MA0**		0.580	B	**3RT20 24-2FB44-3MA0**		0.620
16	**7.5**	40	**22 E**	2 2	24	B	**3RT20 25-1FB44-3MA0**		0.580	B	**3RT20 25-2FB44-3MA0**		0.620
25	**11**	40	**22 E**	2 2	24	B	**3RT20 26-1FB44-3MA0**		0.580	B	**3RT20 26-2FB44-3MA0**		0.620
32	**15**	50	**22 E**	2 2	24	B	**3RT20 27-1FB44-3MA0**		0.580	B	**3RT20 27-2FB44-3MA0**		0.620
38	**18.5**	50	**22 E**	2 2	24	B	**3RT20 28-1FB44-3MA0**		0.580	B	**3RT20 28-2FB44-3MA0**		0.620
Contactors with communication interface Terminal designations according to EN 50012													
12	**5.5**	40	**11 E**	1 1	24	B	**3RT20 24-1BB40-0CC0**		0.580	B	**3RT20 24-2BB40-0CC0**		0.620
16	**7.5**	40	**11 E**	1 1	24	B	**3RT20 25-1BB40-0CC0**		0.580	B	**3RT20 25-2BB40-0CC0**		0.620
25	**11**	40	**11 E**	1 1	24	B	**3RT20 26-1BB40-0CC0**		0.580	B	**3RT20 26-2BB40-0CC0**		0.620
32	**15**	50	**11 E**	1 1	24	B	**3RT20 27-1BB40-0CC0**		0.580	B	**3RT20 27-2BB40-0CC0**		0.620
38	**18.5**	50	**11 E**	1 1	24	B	**3RT20 28-1BB40-0CC0**		0.580	B	**3RT20 28-2BB40-0CC0**		0.620







For other voltages see page 3/17, for contactors with mounted auxiliary switch block please inquire.

For accessories, see page 3/93.

[1] No surge suppressors can be retrofitted.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RT20 contactors, 3-pole, 3 ... 18.5 kW

UC operation · AC or DC operation
Extended operating range of the solenoid coils 0.7 ... 1.3 x U_s
Integrated coil circuit

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 2.-1N.30

3RT20 2.-2N.30

Rated data AC-2 and AC-3, T_u: up to 60 °C Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	AC-1, T_u: 40 °C Operational current I_e up to 690 V	Auxiliary contacts Ident. No.	Version NO	NC	Rated control supply voltage U_s	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
A	**kW**	A				V AC/DC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail														
Size S0[1]														
With integrated coil circuit (varistor)														
Terminal designations according to EN 50012														
12	**5.5**	40	**11 E**	1	1	21 ... 28	B	**3RT20 24-1NB30**		0.550	B	**3RT20 24-2NB30**		0.580
						95 ... 130	B	**3RT20 24-1NF30**		0.550	B	**3RT20 24-2NF30**		0.580
						200 ... 280[1]	B	**3RT20 24-1NP30**		0.550	B	**3RT20 24-2NP30**		0.580
16	**7.5**	40	**11 E**	1	1	21 ... 28	B	**3RT20 25-1NB30**		0.550	B	**3RT20 25-2NB30**		0.580
						95 ... 130	B	**3RT20 25-1NF30**		0.550	B	**3RT20 25-2NF30**		0.580
						200 ... 280[1]	B	**3RT20 25-1NP30**		0.550	B	**3RT20 25-2NP30**		0.580
25	**11**	40	**11 E**	1	1	21 ... 28	B	**3RT20 26-1NB30**		0.550	B	**3RT20 26-2NB30**		0.580
						95 ... 130	B	**3RT20 26-1NF30**		0.550	B	**3RT20 26-2NF30**		0.580
						200 ... 280[1]	B	**3RT20 26-1NP30**		0.550	B	**3RT20 26-2NP30**		0.580
32	**15**	50	**11 E**	1	1	21 ... 28	B	**3RT20 27-1NB30**		0.550	B	**3RT20 27-2NB30**		0.580
						95 ... 130	B	**3RT20 27-1NF30**		0.550	B	**3RT20 27-2NF30**		0.580
						200 ... 280[1]	B	**3RT20 27-1NP30**		0.550	B	**3RT20 27-2NP30**		0.580
38	**18.5**	50	**11 E**	1	1	21 ... 28	B	**3RT20 28-1NB30**		0.550	B	**3RT20 28-2NB30**		0.580
						95 ... 130	B	**3RT20 28-1NF30**		0.550	B	**3RT20 28-2NF30**		0.580
						200 ... 280[1]	B	**3RT20 28-1NP30**		0.550	B	**3RT20 28-2NP30**		0.580

[1] At 280 V: upper limit =1.1 x U_s.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Rated control supply voltages (the 10th and 11th position of the order number must be changed)

Contactor type Rated control supply voltage U_s		3RT20 1	3RT20 2	3RT23 1, 3RT25 1	3RT23 2, 3RT25 2
Sizes S00 ... S0					
AC operation [1]					
Solenoid coils for 50 Hz (exception: Size S00: 50 and 60 Hz[2])					
24 V AC		B0	B0	B0	B0
42 V AC		D0	D0	D0	--
48 V AC		H0	H0	H0	--
110 V AC		F0	F0	F0	F0
230 V AC		P0	P0	P0	P0
400 V AC		V0	V0	V0	V0
Solenoid coils for 50 and 60 Hz[2]					
24 V AC		B0	C2	B0	C2
42 V AC		D0	D2	D0	D2
48 V AC		H0	H2	H0	H2
110 V AC		F0	G2	F0	G2
220 V AC		N2	N2	N2	N2
230 V AC		P0	L2	P0	L2
Solenoid coils (for USA and Canada[3])					
50 Hz	**60 Hz**				
110 V AC	120 V AC	K6	K6	K6	K6
220 V AC	240 V AC	P6	P6	P6	P6
Solenoid coils (for Japan)					
50/60 Hz[4]	**60 Hz[5]**				
100 V AC	110 V AC	G6	G6	G6	G6
200 V AC	220 V AC	N6	N6	N6	N6
400 V AC	440 V AC	R6	R6	R6	R6
DC operation [1]					
12 V DC		A4	--	A4	--
24 V DC		B4	B4	B4	B4
42 V DC		D4	D4	D4	D4
48 V DC		W4	W4	W4	--
60 V DC		E4	E4	--	--
110 V DC		F4	F4	F4	F4
125 V DC		G4	G4	G4	G4
220 V DC		M4	M4	M4	M4
230 V DC		P4	P4	P4	--

Examples

AC operation	3RT20 23-1A**P0**0	Contactor with screw terminals; with solenoid coil for 50 Hz for rated control supply voltage 230 V AC.
	3RT20 23-1A**G2**0	Contactor with screw terminals; with solenoid coil for 50/60 Hz for rated control supply voltage 110 V AC.
DC operation	3RT20 25-2B**B4**0	Contactor with spring-type terminals; for rated control supply voltage 24 V DC.
	3RT20 25-2B**G4**0	Contactor with spring-type terminals; for rated control supply voltage 125 V DC.

1) For deviating coil voltages and coil operating ranges of sizes S00 and S0, the 24 V DC SITOP Power power supply unit with wide range input (93 to 264 V AC; 30 to 264 V DC) can be used for coil excitation (see Catalog LV 1, Chapter 11 "Power Supplies --> SITOP power Power Supplies").

2) Coil operating range
at 50 Hz: 0.8 ... 1.1 × U_s
at 60 Hz: 0.85 ... 1.1 × U_s.

3) Coil operating range
Size S00: at 50 Hz: 0.85.... 1.1 × U_s
at 60 Hz: 0.8 ... 1.1 × U_s
Size S0: at 50 Hz and 60 Hz: 0.8 ... 1.1 × U_s.

4) Coil operating range
Size S00: at 50/60 Hz: 0.85 ...1.1 × U_s
Size S0: at 50 Hz: 0.8 ...1.1 × U_s
at 60 Hz: 0.85 ... 1.1 × U_s.

5) Coil operating range
at 60 Hz: 0.8 ...1.1 × U_s.

3RT20 contactors, 3-pole, 3 ... 18.5 kW

More information

Contactors	Type Size Width	mm	3RT2 S00 and S0 45
Rated data of the auxiliary contacts			
According to IEC 60947-5-1/EN 60947-5-1 The data apply to integrated auxiliary contacts and contacts in the auxiliary switch blocks for contactor sizes S00 to S0[1)]			
Rated insulation voltage U_i (pollution degree 3)		V	690
Conventional thermal current I_{th} = **Rated operational current I_e/AC-12**		A	10
AC load			
Rated operational current I_e/AC-15/AC-14			
• For rated operational voltage U_e	24 V	A	10[1)]
	110 V	A	10[1)]
	125 V	A	10[1)]
	220 V	A	10[1)]
	230 V	A	10[1)]
	380 V	A	3
	400 V	A	3
	500 V	A	2
	660 V	A	1
	690 V	A	1
DC load			
Rated operational current I_e/DC-12			
• For rated operational voltage U_e	24 V	A	6
	60 V	A	6
	110 V	A	3
	125 V	A	2
	220 V	A	1
	440 V	A	0.3
	600 V	A	0.15
Rated operational current I_e/DC-13			
• For rated operational voltage U_e	24 V	A	6
	60 V	A	2
	110 V	A	1
	125 V	A	0.9
	220 V	A	0.3
	440 V	A	0.14
	600 V	A	0.1
Contact reliability at 17 V, 1 mA acc. to EN 60947-5-4			Frequency of contact faults $<10^{-8}$ i. e. <1 fault per 100 million operating cycles

Endurance of the auxiliary contacts

It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The contact endurance is mainly dependent on the breaking current.

The characteristic curves apply to:
- Integrated auxiliary contacts on 3RT20
- Auxiliary switch blocks 3RH 29 11, 3RH29 21 for contactors size S00 and S0.

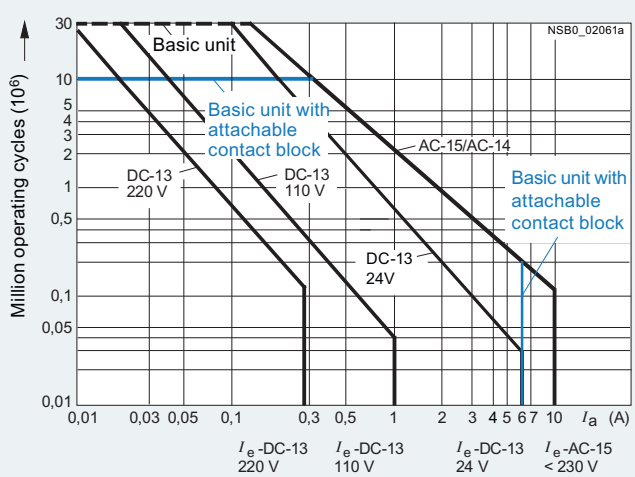


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

[1)] Integrated auxiliary contacts in size S0, auxiliary switches for snapping onto the front and for mounting onto the side in size S00 and S0: I_e = 6 A at AC-14/AC-15.

Endurance of the main contacts

The characteristic curves show the contact endurance of the contactors when switching resistive and inductive AC loads (AC-1/AC-3) depending on the breaking current and rated operational voltage. It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

The rated operational current I_e complies with utilization category AC-4 (breaking six times the rated operational current) and is intended for a contact endurance of at least 200 000 operating cycles.

If a shorter endurance is sufficient, the rated operational current I_e/AC-4 can be increased. I_e

If the contacts are used for mixed operation, i. e. normal switching (breaking the rated operational current according to utilization category AC-3) in combination with intermittent inching (breaking several times the rated operational current according to utilization category AC-4), the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100}\left(\frac{A}{B} - 1\right)}$$

Characters in the equation:

X Contact endurance for mixed operation in operating cycles

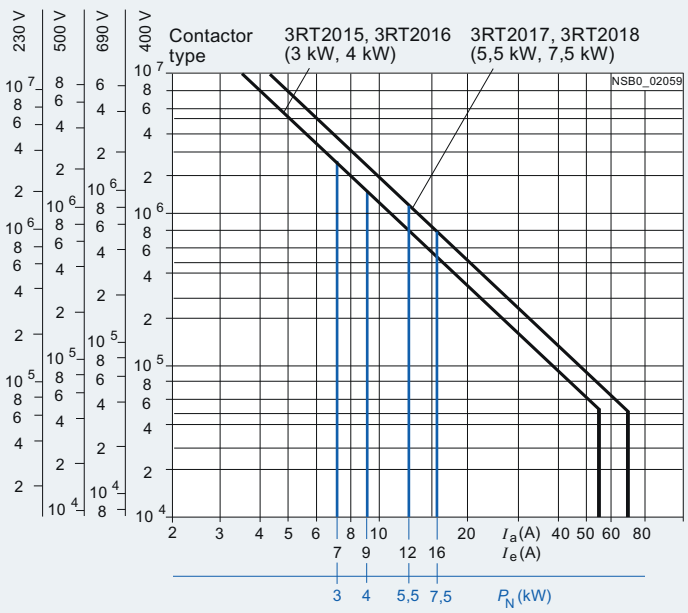
A Contact endurance for normal operation ($I_a = I_e$) in operating cycles

B Contact endurance for inching (I_a = multiple of I_e) in operating cycles

C Inching operations as a percentage of total switching operations

Size S00

Operating cycles at



Size S0

Operating cycles at

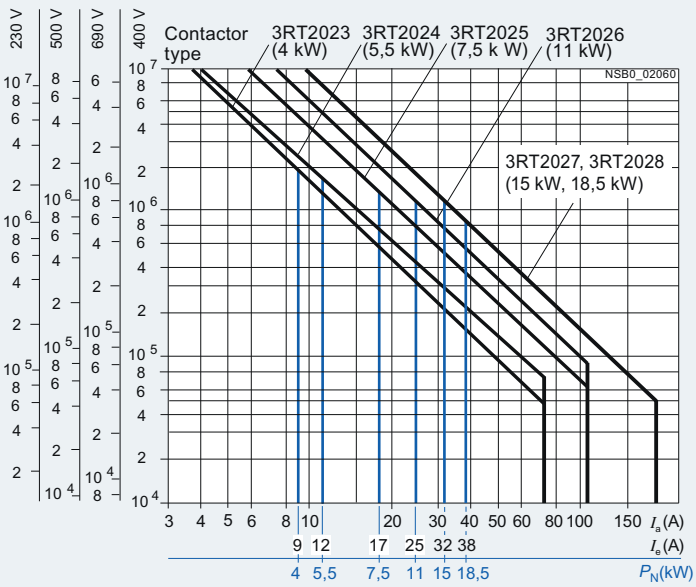
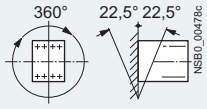


Diagram legend:
P_N= Rated power for squirrel-cage motors at 400 V
I_a = Breaking current
I_e = Rated operational current

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Contactors	Type Size Width	mm	**3RT20 15, 3RT20 16** **S00** **45**	**3RT20 17, 3RT20 18** **S00** **45**
General data				
Permissible mounting position				
The contactors are designed for operation on a vertical mounting surface.				
Upright mounting position:			 Special version required	
Mechanical endurance	• Basic units	Operating cycles	30 million	
	• Basic unit with snap-on auxiliary switch block		10 million	
	• Solid-state compatible auxiliary switch block		5 million	
Electrical endurance			1)	
Rated insulation voltage U_i (pollution degree 3)		V	690	
Rated impulse withstand voltage U_{imp}		kV	6	
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400	
Mirror contacts				
• A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.	- 3RT20 1., 3RT23 1. (removable auxiliary switch block)		Yes, this applies to both the basic unit as well as to between the basic unit and the mounted auxiliary switch block acc. to EN 60947-4-1, Appendix F	
	- 3RT20 1., 3RT23 1. (permanently fitted auxiliary switch block)		Yes, acc. to EN 60947-4-1, Appendix F	
• No mirror contacts for the solid-state compatible auxiliary switch blocks	- 3RH29 19-.NF..			
Ambient temperature	• During operation	°C	-25 ... +60	
	• During storage	°C	-55 ... +80	
Degree of protection acc. to EN 60947-1, Appendix C **Touch protection** acc. to EN 50274			IP20, coil assembly IP40 Finger-safe	
Shock resistance rectangular pulse	• AC operation	g/ms	6.7/5 and 4.2/10	7.3/5 and 4.7/10
	• DC operation	g/ms	6.7/5 and 4.2/10	7.3/5 and 4.7/10
Shock resistance sine pulse	• AC operation	g/ms	10.5/5 and 6.6/10	11.4/5 and 7.3/10
	• DC operation	g/ms	10.5/5 and 6.6/10	11.4/5 and 7.3/10
Conductor cross-sections			2)	
Short-circuit protection for contactors without overload relays				
			For short-circuit protection for contactors with overload relays see "Protection Equipment" --> "Overload Relays" For short-circuit protection for fuseless load feeders see "Load Feeders and Motor Starters" --> "3RA2 Load Feeders".	
Main circuit				
• Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE according to IEC 60947-4-1/ EN 60947-4-1				
- Type of coordination "1"		A	35	50
- Type of coordination "2"		A	20	25
- Weld-free[3]		A	10	10
• Miniature circuit breakers (up to 230 V) with C characteristic Short-circuit current 1 kA, type of coordination "1"		A	10	10
Auxiliary circuit				
• Fuse links, gG operational class: DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)		A	10	
• Miniature circuit breaker up to 230 V with C characteristic Short-circuit current $I_k < 400$ A		A	6	

1) For endurance of the main contacts see page 3/19.
2) For conductor cross-sections see page 3/22.
3) Test conditions according to IEC 60947-4-1.

Contactors	Type Size Width		mm	3RT20 15, 3RT20 16 S00 45	3RT20 17, 3RT20 18 S00 45
Control					
Solenoid coil operating range					
• AC operation		50 Hz 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s	
• DC operation		Up to 50 °C Up to 60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s	
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)					
• AC operation, 50/60 Hz, standard version	- Closing - P.f. - Closed - P.f.		VA VA 	27/24.3 0.8/0.75 4.2/3.3 0.25/0.25	37/33 0.8/0.75 5.7/4.4 0.25/0.25
• AC operation, 50 Hz, USA/Canada	- Closing - P.f. for closing - Closed - P.f. for closed		VA VA 	26.4 0.81 4.4 0.24	36 0.8 5.9 0.24
• AC operation, 60 Hz, USA/Canada	- Closing - P.f. for closing - Closed - P.f. for closed		VA VA 	31.7 0.81 4.8 0.25	43 0.8 6.5 0.25
• DC operation	Closing = Closed		W	4	4
Permissible residual current of the electronics (with 0 signal)					
	• AC operation			<3 mA x (230 V/U_s)[1]	<4 mA x (230 V/U_s)[1]
	• DC operation			<10 mA x (24 V/U_s)[1]	
Operating times[2]					
Total break time = Opening delay + Arcing time					
• AC operation at 0.8 ... 1.1 x U_s	- Closing delay - Opening delay		ms ms	9 ... 35 3.5 ... 14	8 ... 33 4 ... 15
• DC operation at 0.85 ... 1.1 x U_s	- Closing delay - Opening delay		ms ms	30 ... 100 7 ... 13	30 ... 100 7 ... 13
• Arcing time			ms	10 ... 15	10 ... 15
Operating times for 1.0 x U_s[2]					
• AC operation	- Closing delay - Opening delay		ms ms	9.5 ... 24 4 ... 14	9 ... 22 4.5 ... 15
• DC operation	- Closing delay - Opening delay		ms ms	35 ... 50 7 ... 12	35 ... 50 7 ... 12

1) The 3RT29 16-1GA00 additional load module is recommended for higher residual currents.

2) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Contactors	Type Size			3RT20 15 S00	3RT20 16 S00	3RT20 17 S00	3RT20 18 S00
Main circuit							
AC capacity							
Utilization category AC-1 **Switching resistive loads**							
• Rated operational current I_e		At 40 °C up to 690 V At 60 °C up to 690 V	A A	18 16	22 20	22 20	22 20
• Rated power for AC loads[1] P.f.= 0.95 (at 60 °C)		230 V 400 V 500 V 690 V	kW kW kW kW	6.3 11 13.8 19	7.5 13 17 22	7.5 13 17 22	7.5 13 17 22
• Minimum conductor cross-section for loads with I_e		At 40 °C At 60 °C	mm² mm²	2.5 2.5	2.5 2.5	2.5 2.5	2.5 2.5
Utilization categories AC-2 and AC-3							
• Rated operational currents I_e		Up to 400 V 440 V 500 V 690 V	A A A A	7 7 6 4.9	9 9 7.7 6.7	12 11 9.2 6.7	16 15 12.4 8.8
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz		At 230 V 400 V 500 V 690 V	kW kW kW kW	2.2 3 3.5 4	3 4 4.5 5.5	3 5.5 5.5 5.5	4 7.5 7.5 7.5
Thermal load capacity		10 s current[2]	A	56	72	96	128

1) Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

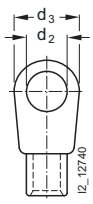
2) According to IEC 60947-4-1.
For rated values for various start-up conditions see "Protection Equipment" --> "Overload Relays".

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Contactors	Type Size Width	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
Main circuit						
AC capacity						
Power loss per conducting path	At I_e/AC-3	W	0.42	0.7	1.24	2.2
Utilization category AC-4 (for $I_a = 6 \times I_e$)[1]						
• Rated operational current I_e	Up to 400 V	A	6.5	8.5	8.5	11.5
• Rated power for squirrel-cage motors with 50 Hz and 60 Hz	Up to 400 V	kW	3	4	4	5.5
• The following applies to a contact endurance of about 200000 operating cycles:						
- Rated operational currents I_e	Up to 400 V	A	2.6	4.1	4.1	5.5
	690 V	A	1.8	3.3	3.3	4.4
- Rated power for squirrel-cage motors with 50 Hz and 60 Hz	At 230 V	kW	0.67	1.1	1.1	1.5
	400 V	kW	1.15	2	2	2.5
	500 V	kW	1.45	2	2	3
	690 V	kW	1.15	2.5	2.5	3.5
Switching frequency						
Switching frequency z in operating cycles/hour						
• Contactors without overload relays	No-load switching frequency AC	h^{-1}	10000			
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400\ V/U')^{1.5} \cdot 1/h$	No-load switching frequency DC	h^{-1}	10000			
	Rated operation					
	AC-1 (AC/DC)	h^{-1}	1000			
	AC-2 (AC/DC)	h^{-1}	750			
	AC-3 (AC/DC)	h^{-1}	750			
	AC-4 (AC/DC)	h^{-1}	250			
• Contactors with overload relays (mean value)		h^{-1}	15			

[1] The data only apply to 3RT25 16 and 3RT25 17 (2 NO + 2 NC) up to a rated operational voltage of 400 V.

Contactors	Type Size	mm	3RT20 15 S00 45	3RT20 16 S00 45	3RT20 17 S00 45	3RT20 18 S00 45
Conductor cross-sections						
Main conductors and auxiliary conductors (1 or 2 conductors can be connected)			**Screw terminals**			
• Solid		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] according to IEC 60947; max. 2 x (0.5 ... 4)			
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]			
• AWG cables, solid or stranded		AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]; 2 x 12			
• Terminal screw			M3 (for standard screwdriver size 2 and Pozidriv 2)			
• Tightening torque		Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)			
Main conductors, auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			**Spring-type terminals**			
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5			
• Solid		mm^2	2 x (0.5 ... 4)			
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 2.5)			
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 2.5)			
• AWG cables, solid or stranded		AWG	1 x (20 ... 12)			
Auxiliary conductors for front and laterally mounted auxiliary switches (1 or 2 conductors can be connected)						
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5			
• Solid		mm^2	2 x (0.5 ... 2.5)			
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)			
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 1.5)			
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)			
Main conductors and auxiliary conductors			**Ring terminal lug connection**			
• Terminal screw			M3, Pozidriv 2			
• Operating devices		mm	Ø 5 ... 6			
• Tightening torque		Nm	0.8 ... 1.2			
• Usable ring terminal lugs		mm	d_2 = min. 3.2			
- DIN 46234 without insulation sleeve		mm	d_3 = max. 7.5			
- DIN 46225 without insulation sleeve						
- DIN 46237 with insulation sleeve						
- JIS C2805 Type R without insulation sleeve						
- JIS C2805 Type RAV with insulation sleeve						
- JIS C2805 Type RAP with insulation sleeve						

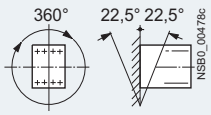


For tool for opening the spring-type terminals see Accessories, page 3/104.
Maximum external diameter of the conductor insulation: 3.6 mm.

An "insulation stop" must be used for conductor cross-sections ≤ 1 mm^2 (see Accessories on page 3/104).

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Contactors	Type Size Width	mm	3RT20 23 S0 45	3RT20 24 S0 45	3RT20 25 S0 45	3RT20 26 S0 45	3RT20 27 S0 45	3RT20 28 S0 45
General data								
Permissible mounting position The contactors are designed for operation on a vertical mounting surface.								
Upright mounting position:			 Special version required, also applies to 3RT20 2.-.K.40. coupling contactors.					
Mechanical endurance	• Basic units	Operating cycles	10 million					
	• Basic unit with snap-on auxiliary switch block	Operating cycles	10 million					
	• Solid-state compatible auxiliary switch block	Operating cycles	5 million					
Electrical endurance			1)					
Rated insulation voltage U_i (pollution degree 3)		V	690					
Rated impulse withstand voltage U_{imp}		kV	6					
Protective separation between the coil and the main contacts (acc. to EN 60947-1, Appendix N)		V	400					
Mirror contacts								
• A mirror contact is an auxiliary NC contact that cannot be closed simultaneously with a NO main contact.	- 3RT20 2., 3RT23 2. (removable auxiliary switch block)		Yes, acc. to EN 60947-4-1, Appendix F					
	- 3RT20 2., 3RT23 2. (permanently mounted auxiliary switch block)		Yes, acc. to EN 60947-4-1, Appendix F					
Permissible ambient temperature	• During operation	°C	-25 ... +60					
	• During storage	°C	-55 ... +80					
Degree of protection acc. to EN 60947-1, Appendix C **Touch protection** acc. to EN 50274			IP20, coil assembly IP20 Finger-safe					
Shock resistance rectangular pulse	• AC operation	g/ms	7.5/5 and 4.7/10			8.3/5 and 5.310		
	• DC operation	g/ms	>10/5 and 7.5/10			>10/5 and 7.5/10		
Shock resistance sine pulse	• AC operation	g/ms	11.8/5 and 7.4/10			13.5/5 and 8.3/10		
	• DC operation	g/ms	>15/5 and >10/10			>15/5 and >10/10		
Conductor cross-sections			2)					
Short-circuit protection for contactors without overload relays								
Main circuit			For short-circuit protection for contactors with overload relays see "Protection Equipment" --> "Overload Relays". For short-circuit protection for fuseless load feeders see "Load Feeders and Motor Starters" --> "3RA2 Load Feeders".					
• Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE according to IEC 60947-4-1/ EN 60947-4-1	- Type of coordination "1"	A	63			100	125	
	- Type of coordination "2"	A	25			35	50	
	- Weld-free[3]	A	10			16	16	
• Miniature circuit breakers with C characteristic (short-circuit current 3 kA, type of coordination "1")		A	25			32	40	
Auxiliary circuit								
• Fuse links, gG operational class: DIAZED 5SB, NEOZED 5SE (weld-free protection for $I_k \geq 1$ kA)		A	10					
• Miniature circuit breaker with C characteristic (short-circuit current $I_k < 400$ A)		A	10					

1) For endurance of the main contacts see page 3/19.
2) For conductor cross-sections see page 3/26.
3) Test conditions according to IEC 60947-4-1.

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Contactors	Type		3RT20 23 ... 3RT20 25	3RT20 26 ... 3RT20 28	3RT20 2. -.NB3	3RT20 2. -.NF3..	3RT20 2. -.NP3
	Size		**S0**	**S0**	**S0**	**S0**	**S0**
	Width	mm	**45**	**45**	**45**	**45**	**45**
Control							
Solenoid coil operating range	AC/DC		0.8 ... 1.1 x U_s		0.7 ... 1.3 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)							
• AC operation, 50 Hz, standard version	- Closing	VA	65	77	6.5	13.6	16.1
	- P.f.		0.82	0.82	0.98	0.98	0.98
	- Closed	VA	7.6	9.8	1.26	1.91	3.41
	- P.f.		0.25	0.25	0.25	0.25	0.25
• AC operation, 50/60 Hz, standard version	- Closing	VA	68/67	81/79	6.5/5.7	13.6/13.2	16.1/15.9
	- P.f.		0.72/0.74	0.72/0.74	0.98/0.96	0.98/0.99	0.99/0.99
	- Closed	VA	7.9/6.5	10.5/8.5	1.26/1.30	1.91/1.90	3.41/3.58
	- P.f.		0.25/0.28	0.25/0.28	0.78/0.8	0.61/0.61	0.36/0.45
• AC operation, 50 Hz, USA/Canada	- Closing	V	65	77	--	--	--
	- P.f.		0.82	0.82	--	--	--
	- Closed	VA	7.6	9.8	--	--	--
	- P.f.		0.25	0.28	--	--	--
• AC operation, 60 Hz, USA/Canada	- Closing	VA	73	87	--	--	--
	- P.f.		0.76	0.76	--	--	--
	- Closed	VA	7.2	9.4	--	--	--
	- P.f.		0.28	0.28	--	--	--
• DC operation	Closing/closed	W	5.9/5.9	5.9/5.9	6.7/0.8	13.2/1.56	15/1.83
Permissible residual current of the electronics (with 0 signal)							
	• AC operation	mA	< 6 mA x (230 V/U_s)	< 7 mA x (230 V/U_s)			
	• DC operation	mA	< 16 mA x (24 V/U_s)				
Operating times for 0.8 ... 1.1 x U_s[1)]							
Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay	ms	9 ... 38	8 ... 40	60 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	35 ... 45
• DC operation	- Closing delay	ms	50 ... 170	50 ... 170	60 ... 75	50 ... 70	50 ... 75
	- Opening delay	ms	15 ... 17.5	15 ... 17.5	30 ... 45	35 ... 45	40 ... 50
• Arcing time		ms	10	10	10	10	10
Operating times for 1.0 x U_s[1)]							
• AC operation	- Closing delay	ms	10 ... 18	10 ... 17	65 ... 80	50 ... 70	60 ... 80
	- Opening delay	ms	4 ... 16	4 ... 16	30 ... 45	35 ... 45	30 ... 50
• DC operation	- Closing delay	ms	55 ... 80	55 ... 80	60 ... 80	56 ... 70	60 ... 80
	- Opening delay	ms	16 ... 17	16 ... 17	30 ... 45	35 ... 45	30 ... 50

[1)] The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (varistor +2 ms to 5 ms, diode assembly: 2 to 6 times).

3RT20 contactors, 3-pole, 3 ... 18.5 kW

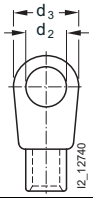
Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45
Main circuit								
AC capacity								
Utilization category AC-1, switching resistive loads								
• Rated operational current I_e	At 40 °C up to 690 V	A	40			50		
	At 60 °C up to 690 V	A	35			42		
• Rated power for AC loads[1] P.f. = 0.95 (at 60 °C)	230 V	kW	13.3			16		
	400 V	kW	23			28		
	500 V	kW	29			35		
	690 V	kW	40			48		
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm²	10			10		
	At 60 °C	mm²	10			10		
Utilization categories AC-2 and AC-3								
• Rated operational currents I_e	Up to 400 V	A	9	12	17	25	32	38
	440 V	A	9	12	17	22	32	35
	500 V	A	6.8	12.4	17	18	32	32
	690 V	A	6.7	9	13	13	21	21
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 110 V	kW	1.1	1.5	2.2	3	4	4
	230 V	kW	3	3	4	5.5	7.5	7.5
	400 V	kW	4	5.5	7.5	11	15	18.5
	500 V	kW	4	7.5	10	11	18.5	18.5
	660 V/690 V	kW	5.5	7.5	11	11	18.5	18.5
Thermal load capacity	10 s current[2]	A	80	110	150	200	260	300
Power loss per conducting path	at I_e/AC-3	W	0.4	0.5	0.9	1.6	2.7	3.8
Utilization category AC-4 (for $I_a = 6 \times I_e$)								
• Rated operational current I_e	Up to 400 V	A	8.5	12.5	15.5	15.5	22	
• Rated power for squirrel-cage motors with 50 and 60 Hz	At 400 V	kW	4	5.5	7.5	7.5	11	
• The following applies to a contact endurance of about 200000 operating cycles:								
- Rated operational currents I_e	Up to 400 V	A	4.1	5.5	7.7	9	12	
	690 V	A	3.3	5.5	7.7	9	12	
- Rated power for squirrel-cage motors with 50 and 60 Hz	At 110 V	kW	0.5	0.73	1	1.2	1.6	
	230 V	kW	1.1	1.5	2	2.5	3.4	
	400 V	kW	2	2.6	3.5	4.4	6	
	500 V	kW	2	3.3	4.6	5.6	7.5	
	690 V	kW	2.5	4.6	6	7.7	10.3	
Switching frequency								
Switching frequency *z* in operating cycles/hour								
• Contactors without overload relays	No-load switching frequency AC	h^{-1}	5000					
	No-load switching frequency DC	h^{-1}	1500					
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot (I_e/I') \cdot (400\ V/U')^{1.5} \cdot 1/h$	AC-1 (AC/DC)	h^{-1}	1000					
	AC-2 (AC/DC)	h^{-1}	1000			750		
	AC-3 (AC/DC)	h^{-1}	1000			750		
	AC-4 (AC/DC)	h^{-1}	300			250		
• Contactors with overload relays (mean value)		h^{-1}	15					

1) Industrial furnaces and electric heaters with resistance heating, etc. (increased power consumption on heating up has been taken into account).

2) According to IEC 60947-4-1.
For rated values for various start-up conditions see "Protection Equipment" --> "Overload Relays".

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Contactors	Type		3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size		S0	S0	S0	S0	S0	S0
	Width	mm	45	45	45	45	45	45
Conductor cross-sections (1 or 2 conductors connectable)								
Main conductors			**Screw terminals**					
Conductor cross-section								
• Solid		mm²	2 x (1 ... 2.5)[1]; 2 x (2.5 ... 10)[1] according to IEC 60947					
• Finely stranded with end sleeve		mm²	2 x (1 ... 2.5)[1]; 2 x (2.5 ... 6)[1]; 1 x 10					
• AWG cables, solid or stranded		AWG	2 x (16 ... 12); 2 x (14 ... 8)					
• Terminal screws			M4 (Pozidriv size 2)					
- Tightening torque		Nm	2 ... 2.5 (18 ... 22 lb.in)					
Auxiliary conductors								
• Solid		mm²	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] according to IEC 60947					
• Finely stranded with end sleeve		mm²	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]					
• Solid or stranded AWG (2 x)		AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]; 1 x 12					
• Terminal screws			M3					
- Tightening torque		Nm	0.8 ... 1.2 (7 ... 10.3 lb.in)					
Main conductors			**Spring-type terminals**					
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5					
• Solid		mm²	2 x (1 ... 10)					
• Finely stranded with end sleeve		mm²	2 x (1 ... 6)					
• Finely stranded without end sleeve		mm²	2 x (1 ... 6)					
• AWG cables, solid or stranded		AWG	2 x (18 ... 8)					
Auxiliary conductors								
• Operating devices			3.0 x 0.5; 3.5 x 0.5					
• Solid		mm²	2 x (0.5 ... 2.5)					
• Finely stranded with end sleeve		mm²	2 x (0.5 ... 1.5)					
• Finely stranded without end sleeve		mm²	2 x (0.5 ... 1.5)					
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)					
Main conductors			**Ring terminal lug connection**					
• Terminal screw		mm	M4, Pozidriv size 2					
• Operating devices		mm	Ø 5 ... 6					
• Tightening torque		Nm	2 ... 2.5					
• Usable ring terminal lugs		mm	d_2 = min. 4.3					
- DIN 46234 without insulation sleeve		mm	d_3 = max. 12.2					
- DIN 46225 without insulation sleeve								
- DIN 46237 with insulation sleeve								
- JIS C2805 Type R without insulation sleeve								
- JIS C2805 Type RAV with insulation sleeve								
- JIS C2805 Type RAP with insulation sleeve								
Auxiliary conductors								
• Terminal screw			M3, Pozidriv size 2					
• Operating devices		mm	Ø 5 ... 6					
• Tightening torque		Nm	0.8 ... 1.2					
• Usable ring terminal lugs		mm	d_2 = min. 3.2					
		mm	d_3 = max. 7.5					



[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Contactors	Size		S00	S0	
			Screw or spring-type terminals	**Screw or spring-type terminals**	**Screw or spring-type terminals**
			Integrated or snap-on auxiliary switch block	1- and 4-pole snap-on auxiliary switch block	Laterally mountable auxiliary switch block
CSA and UL rated data of the auxiliary contacts					
Rated voltage		V AC	600	600	600
Switching capacity			A 600, Q 600	A 600, Q 600	A 300, Q 300
Uninterrupted current	• At 240 V AC	A	10	10	10

3RT20 contactors, 3-pole, 3 ... 18.5 kW

Contactors	Type			3RT20 15	3RT20 16	3RT20 17	3RT20 18
	Size			S00	S00	S00	S00
	Width		mm	45	45	45	45
CSA and UL rated data							
Rated insulation voltage			V AC	600			
Uninterrupted current, at 40 °C	• Open and enclosed		A	20			
Maximum horsepower ratings (CSA and UL approved values)							
• Rated power for induction motors at 60 Hz		At 200 V	hp	1.5	2	3	3
		230 V	hp	2	3	3	5
		460 V	hp	3	5	7.5	10
		575 V	hp	5	7.5	10	10
Short-circuit protection[1] (contactor or overload relay)		At 600 V	kA	5	5	5	5
	• Fuse CLASS J[2]		A	40	40	40	40
	• Circuit breakers with overload protection according to UL 489		A	50	50	50	50
• Combination motor controllers type E according to UL 508				--[3]	--[3]	--[3]	--[3]
NEMA/EEMAC ratings							
NEMA/EEMAC size			hp	--		0	
• Uninterrupted current	- Open		A	--		18	
	- Enclosed		A	--		18	
• Rated power for induction motors at 60 Hz		At 200 V	hp	--		3	
		230 V	hp	--		3	
		460 V	hp	--		5	
		575 V	hp	--		5	
Overload relays	• Type			3RU21 1	/ 3RB30 1		
	• Setting range		A	0.11 ... 16	/ 0.1 ... 16		

Contactors	Type			3RT20 23	3RT20 24	3RT20 25	3RT20 26	3RT20 27	3RT20 28
	Size			S0	S0	S0	S0	S0	S0
	Width		mm	45	45	45	45	45	45
CSA and UL rated data									
Rated insulation voltage			V AC	600				600	
Uninterrupted current, at 40 °C	• Open and enclosed		A	35				42	
Maximum horsepower ratings (CSA and UL approved values)									
• Rated power for induction motors at 60 Hz		At 200 V	hp	2	3	5	7.5	10	10
		230 V	hp	3	3	5	7.5	10	10
		460 V	hp	5	7.5	10	15	20	25
		575 V	hp	7.5	10	15	20	25	25
Short-circuit protection[1] (contactor or overload relay)		At 600 V	kA	5	5	5	5	5	5
	• Fuse CLASS J[2]		A	45	45	45	70	110	110
	• Circuit breakers with overload protection according to UL 489		A	70	70	70	100	100	100
• Combination motor controllers type E according to UL 508									
	- At 480 V		Type	3RV20 2					
			A	--					
			kA	--[3]					
	- At 600 V		Type	3RV20 2					
			A	--					
			kA	--[3]					
NEMA/EEMAC ratings									
NEMA/EEMAC size			hp	--			1		
• Uninterrupted current	- Open		A	--			27		
	- Enclosed		A	--			27		
• Rated power for induction motors at 60 Hz		At 200 V	hp	--			7.5		
		230 V	hp	--			7.5		
		460 V	hp	--			10		
		575 V	hp	--			10		
Overload relays	• Type			3RU21 2	/ 3RB30 2				
	• Setting range		A	1.8 ... 40	/ 0.1 ... 40				

[1] For more information about short-circuit values, e. g. for protection against short.circuit currents, see the UL guides (Order No.: A5E02118883 for German) or UL reports (http://support.automation.siemens.com) for the individual devices.

[2] Values for RK5 fuses on request.

[3] Values on request.

3RA23 Reversing Contactor Assemblies

3RA23 complete units, 3 ... 18.5 kW

Overview

The 3RA23 contactor assemblies for reversing can be ordered as follows:

Size S00 and S0

- Fully wired and tested, with mechanical and electrical interlock. For assemblies with AC operation and 50/60 Hz, a dead interval of 50 ms must be provided when used with voltages ≥ 500 V; a dead interval of 30 ms is recommend for use with voltages ≥ 400 V. These dead times do not apply to assemblies with DC operation.
- As individual parts for customer assembly.

There is also a range of accessories (auxiliary switch blocks, surge suppressors, etc.) that must be ordered separately.

For overload relays for motor protection, see Chapter 5 "Protection Equipment" --> "Overload Relays".

The 3RA23 contactor assemblies have screw or spring-type terminals (main and control circuits) and are suitable for screwing or snapping onto TH 35 standard mounting rails.

Complete reversing contactor assemblies

The fully wired reversing contactor assemblies are suitable for use in any climate. They are finger-safe according to EN 61140.

The contactor assemblies size S00 and S0 each consist of 2 contactors with the same power, with one NC contact (S00) or one NO contact and one NC contact (S0) in the basic unit. The contactors are mechanically and electrically interlocked (NC contact interlock).

For motor protection, either 3RU2 or 3RB3 overload relays for direct mounting or stand-alone installation or thermistor motor protection releases must be ordered separately.

Reversing contactor assemblies with communication interface

The reversing contactor assemblies with communication interface are essential for mounting the SIRIUS function modules for connection to the control system.

Further information on the application and benefits of the SIRIUS function modules for connection to the control system through IO-Link or AS-Interface can be found in Chapter 2 "Industrial Communication".

Components for customer assembly

Assembly kits for all sizes are available for customer assembly of reversing contactor assemblies.

Contactors, overload relays and – for momentary-contact operation – auxiliary switch blocks for latching (required only for S00; with S0 the NO contacts integrated in the basic device can be used) must be ordered separately.

Operating times

The operating times of the individual 3RT20 contactors are rated in such a way that no overlapping of the contact making and the arcing time between two contactors can occur on reversing, providing they are interlocked by way of their auxiliary switches (NC contact interlock) and the mechanical interlock. For assemblies with AC operation and 50/60 Hz, a dead interval of 50 ms must be provided when used with voltages ≥ 500 V; a dead interval of 30 ms is recommend for use with voltages ≥ 400 V. These dead times do not apply to assemblies with DC operation.

The operating times of the individual contactors are not affected by the mechanical interlock.

Screw terminals

Rated data AC-2 and AC-3 for AC 50 Hz 400 V		Size	Order No.			
Power	Operational current I_e		Contactor	Mechanical interlock[1]	Assembly kit[2]	**Fully wired and tested contactor assemblies**
kW	A					
3	7	**S00**	3RT20 15-1	--	3RA29 13-2AA1	**3RA23 15-8XB30-1 . .**
4	9		3RT20 16-1			**3RA23 16-8XB30-1 . .**
5.5	12		3RT20 17-1			**3RA23 17-8XB30-1 . .**
7.5	16		3RT20 18-1			**3RA23 18-8XB30-1 . .**
5.5	12	**S0**	3RT20 24-1	--	3RA29 23-2AA1	**3RA23 24-8XB30-1 . .**
7.5	16		3RT20 25-1			**3RA23 25-8XB30-1 . .**
11	25		3RT20 26-1			**3RA23 26-8XB30-1 . .**
15	32		3RT20 27-1			**3RA23 27-8XB30-1 . .**
18.5	38		3RT20 28-1			**3RA23 28-8XB30-1 . .**

Spring-type terminals

Rated data AC-2 and AC-3 for AC 50 Hz 400 V		Size	Order No.			
Power	Operational current I_e		Contactors	Mechanical interlock[1]	Assembly kit	**Fully wired and tested contactor assemblies**
kW	A					
3	7	**S00**	3RT20 15-2	--	3RA29 13-2AA2[2]	**3RA23 15-8XB30-2 . .**
4	9		3RT20 16-2			**3RA23 16-8XB30-2 . .**
5.5	12		3RT20 17-2			**3RA23 17-8XB30-2 . .**
7.5	16		3RT20 18-2			**3RA23 18-8XB30-2 . .**
5.5	12	**S0**	3RT20 24-2	--	3RA29 23-2AA2[3]	**3RA23 24-8XB30-2 . .**
7.5	16		3RT20 25-2			**3RA23 25-8XB30-2 . .**
11	25		3RT20 26-2			**3RA23 26-8XB30-2 . .**
15	32		3RT20 27-2			**3RA23 27-8XB30-2 . .**
18.5	38		3RT20 28-2			**3RA23 28-8XB30-2 . .**

[1] The interlock can only be ordered with assembly kit.

[2] The assembly kit contains: mechanical interlock; connecting clips for 2 contactors; wiring modules on the top and bottom (main, control and auxiliary circuits).

[3] The assembly kit contains: mechanical interlock; connecting clips for 2 contactors; wiring modules on the top and bottom (main circuits).

Order No. scheme

Digit of the Order No.	1. - 3.	4.	5.	6.	7.		8.	9.	10.	11.	12.		13.	14.	15.	16.
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
SIRIUS contactor assemblies	**3 R A**															
2nd generation		**2**														
Device type (e. g. 3 = reversing contactor assembly)			**3**													
Contactor size (1 = S00, 2 = S0)				□												
Power dependent on size (e. g. 27 = 15 kW)					□											
Type of overload relay (8X = without)							□	□								
Assembly (B = ready-assembled, E = ready-assembled with communication)									□							
Interlock (3 = mechanical and electrical)										□						
Free auxiliary switches (e. g. S00: 0 = none, S0: 0 = 2 NO total)											□					
Connection type (1 = screw, 2 = spring)													□			
Operating range / solenoid coil circuit (e. g. A = AC standard / without)														□		
Rated control supply voltage (e. g. L2 = 230 V, 50/60 Hz)															□	□
Example	**3 R A**	**2**	**3**	**2**	**7**	**–**	**8**	**X**	**B**	**3**	**0**	**–**	**1**	**A**	**L**	**2**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Benefits

Using wiring kits for reversing starters has the following advantages:

- Notable reduction of wiring in the control circuit
- Integrated mechanical interlocking
- Prevention of wiring errors in the main circuit

Connecting combs for screw terminals also result in:

- Prevention of wiring errors in the control circuit
- Reduction of testing costs
- Ready-jumpered actuation of the auxiliary switches and the frame (A2)
- Integrated electrical interlocking

Accessories

Selecting the auxiliary switches

The following points should be noted:

Size S00

- For maintained-contact operation:
  Use contactors with an NC contact in the basic unit for the electrical interlock.
- For momentary-contact operation:
  Use contactors with an NC contact in the basic unit for the electrical interlock; in addition, an auxiliary switch block with at least one NO contact for latching is required per contactor.

Size S0

- For maintained-contact operation:
  The contactors have two integrated auxiliary contacts (1 NO + 1 NC); the NC contact can be used for electrical interlocking.
- For momentary-contact operation:
  Electrical interlock as for maintained-contact operation; the NO contact in the basic device can be used for the latching.

Surge suppression

Sizes S00 and S0

All contactor assemblies can be fitted with RC elements or varistors for damping opening surges in the coil.

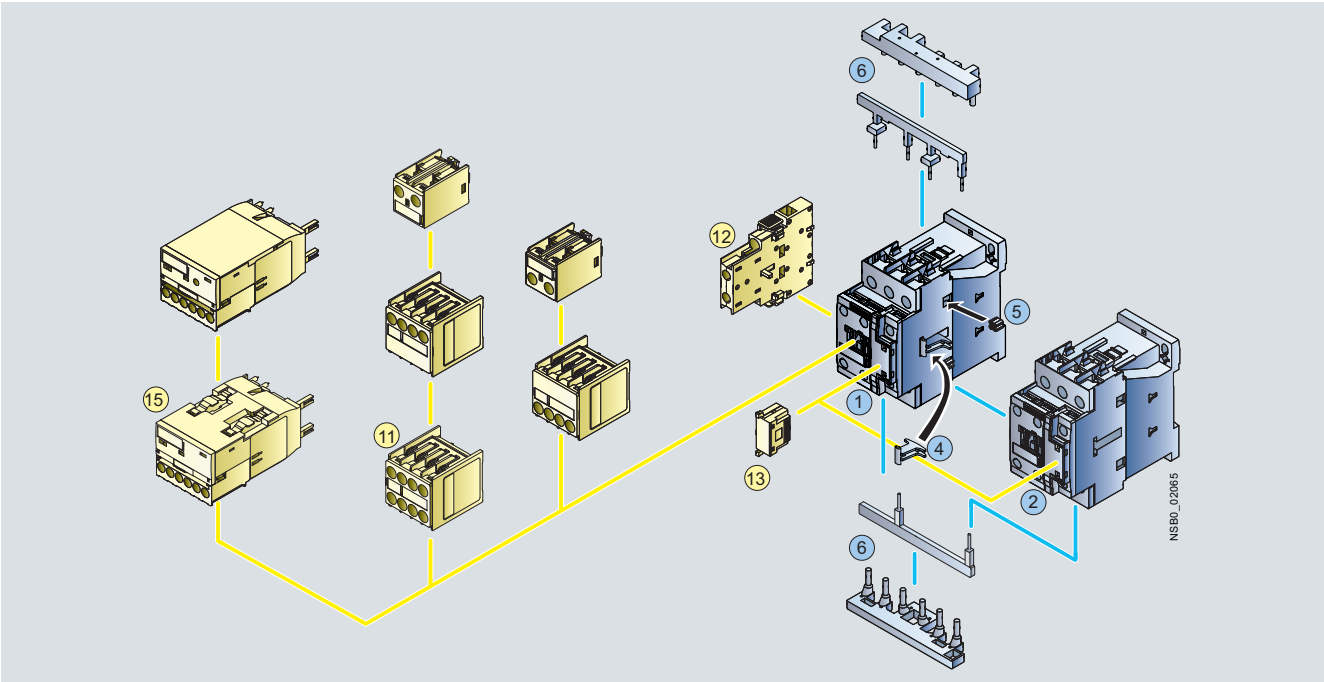
As with the individual contactors, the surge suppressors can either be plugged onto the top of the contactors (S00) or be plugged into the front of the contactors (S0).

3RA23 complete units, 3 ... 18.5 kW

Selection and ordering data

Fully wired and tested contactor assemblies · Size S00 · Up to 7.5 kW

The figure shows the version with screw terminals



Mountable accessories

Accessories	Order No.	Page
11 Auxiliary switch block, front[1]	3RH29 11-1....	3/93
12 Auxiliary switch block, lateral	3RH29 21-1DA..	3/96
13 Surge suppressor	3RT29 16-1....	3/100
14 Solder pin adapter	3RT19 16-4KA1	3/103
15 Function module for connection to the control system	3RT27 1.-1BA00	3/35

Fully wired and tested contactor assemblies

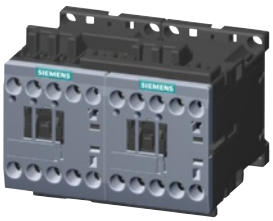
Individual parts		Order No. Q11	Order No. Q12	Page
1 2	Contactor, 3 kW	3RT20 15	3RT20 15	3/8
1 2	Contactor, 4 kW	3RT20 16	3RT20 16	3/8
1 2	Contactor, 5.5 kW	3RT20 17	3RT20 17	3/8
1 2	Contactor, 7.5 kW	3RT20 18	3RT20 18	3/8
4 5 6	Assembly kit comprising: 4 Mechanical interlocks 5 2 connecting clips for 2 contactors 6 Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included[2], interruptible (NC contact interlock)	3RA29 13-2AA1		3/34

[1] Auxiliary switch block according to EN 50005 must be used.

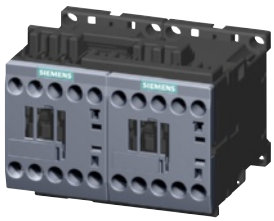
[2] 3RT20 1. contactors with one NC contact in the basic unit are required for the electrical interlock.

Fully wired and tested contactor assemblies[2] · Size S00 · Up to 7.5 kW

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101



3RA23 18-8XE30-1BB4



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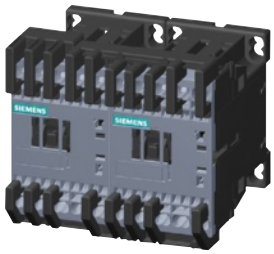


3RA23 1.-8XB30-2A.0

Rated data AC-2 and AC-3					Rated control supply voltage U_s [1]	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to	Ratings of induction motors at 50 Hz and						Order No.	Price per PU			Order No.	Price per PU	
400 V	230 V	**400 V**	500 V	690 V									
A	kW	**kW**	kW	kW	V				kg				kg
AC operation, 50/60 Hz													
7	2.2	**3**	3.5	4	24 AC	B	**3RA23 15-8XB30-1AB0**		0.460	B	**3RA23 15-8XB30-2AB0**		0.500
					110 AC	B	**3RA23 15-8XB30-1AF0**		0.460	B	**3RA23 15-8XB30-2AF0**		0.500
					230 AC	B	**3RA23 15-8XB30-1AP0**		0.460	B	**3RA23 15-8XB30-2AP0**		0.500
9	3	**4**	4.5	5.5	24 AC	B	**3RA23 16-8XB30-1AB0**		0.460	B	**3RA23 16-8XB30-2AB0**		0.500
					110 AC	B	**3RA23 16-8XB30-1AF0**		0.460	B	**3RA23 16-8XB30-2AF0**		0.500
					230 AC	B	**3RA23 16-8XB30-1AP0**		0.460	B	**3RA23 16-8XB30-2AP0**		0.500
12	3	**5.5**	5.5	5.5	24 AC	B	**3RA23 17-8XB30-1AB0**		0.460	B	**3RA23 17-8XB30-2AB0**		0.500
					110 AC	B	**3RA23 17-8XB30-1AF0**		0.460	B	**3RA23 17-8XB30-2AF0**		0.500
					230 AC	B	**3RA23 17-8XB30-1AP0**		0.460	B	**3RA23 17-8XB30-2AP0**		0.500
16	4	**7.5**	7.5	7.5	24 AC	B	**3RA23 18-8XB30-1AB0**		0.460	B	**3RA23 18-8XB30-2AB0**		0.500
					110 AC	B	**3RA23 18-8XB30-1AF0**		0.460	B	**3RA23 18-8XB30-2AF0**		0.500
					230 AC	B	**3RA23 18-8XB30-1AP0**		0.460	B	**3RA23 18-8XB30-2AP0**		0.500
DC operation													
7	2.2	**3**	3.5	4	24 DC	B	**3RA23 15-8XB30-1BB4**		0.580	B	**3RA23 15-8XB30-2BB4**		0.620
9	3	**4**	4.5	5.5	24 DC	B	**3RA23 16-8XB30-1BB4**		0.580	B	**3RA23 16-8XB30-2BB4**		0.620
12	3	**5.5**	5.5	5.5	24 DC	B	**3RA23 17-8XB30-1BB4**		0.580	B	**3RA23 17-8XB30-2BB4**		0.620
16	4	**7.5**	7.5	7.5	24 DC	B	**3RA23 18-8XB30-1BB4**		0.580	B	**3RA23 18-8XB30-2BB4**		0.620
With communication interface													
7	2.2	**3**	3.5	4	24 DC	B	**3RA23 15-8XE30-1BB4**		0.580	B	**3RA23 15-8XE30-2BB4**		0.620
9	3	**4**	4.5	5.5	24 DC	B	**3RA23 16-8XE30-1BB4**		0.580	B	**3RA23 16-8XE30-2BB4**		0.620
12	3	**5.5**	5.5	5.5	24 DC	B	**3RA23 17-8XE30-1BB4**		0.580	B	**3RA23 17-8XE30-2BB4**		0.620
16	4	**7.5**	7.5	7.5	24 DC	B	**3RA23 18-8XE30-1BB4**		0.580	B	**3RA23 18-8XE30-2BB4**		0.620

1) Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s;
at 60 Hz: 0.85 ... 1.1 x U_s.

2) The contactors integrated in the contactor assemblies have no unassigned auxiliary contacts.

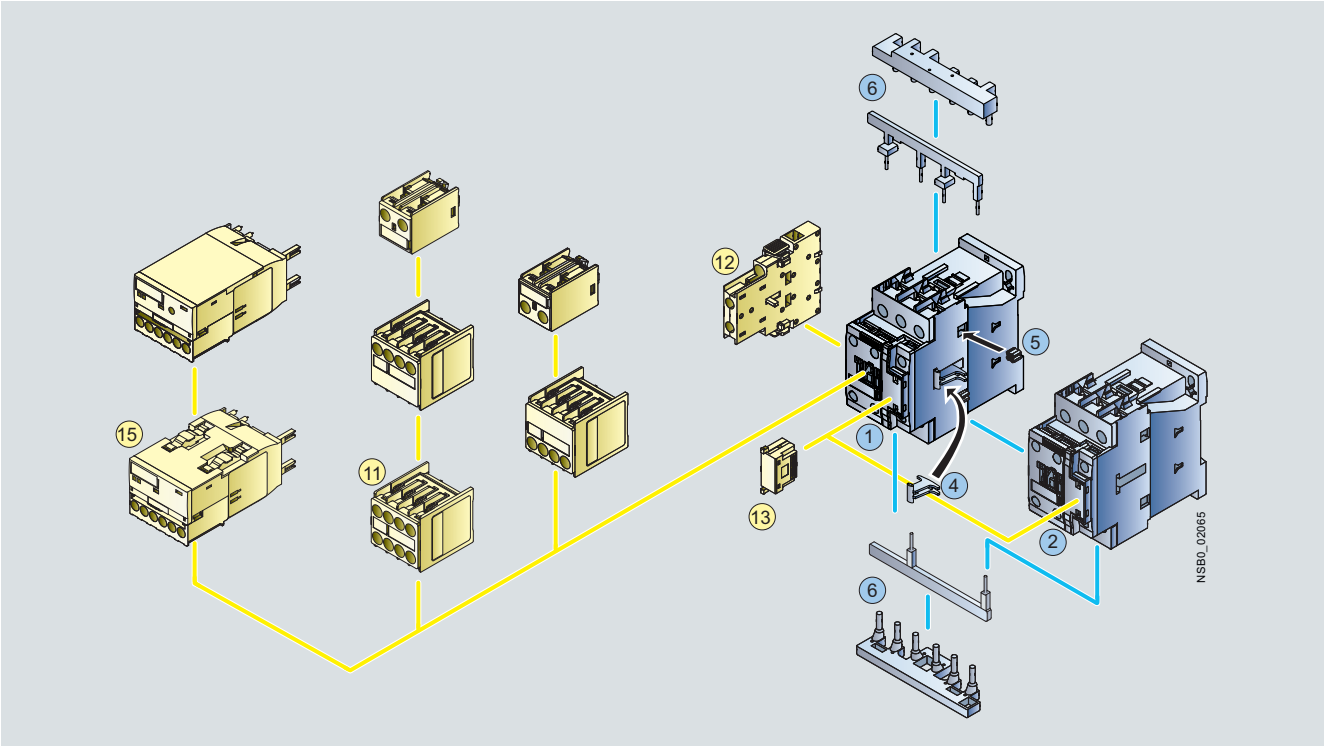
*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

3RA23 Reversing Contactor Assemblies

3RA23 complete units, 3 ... 18.5 kW

Fully wired and tested contactor assemblies · Size S0 · Up to 18.5 kW

The figure shows the version with screw terminals



Mountable accessories

Individual parts	Order No.	Page
11 Auxiliary switch block, front	3RH29 21-1....	3/93
12 Auxiliary switch block, lateral	3RH29 21-1DA..	3/96
13 Surge suppressor	3RT29 26-1....	3/100
15 Function module for connection to the control system	3RT27 1.-1BA00	3/35

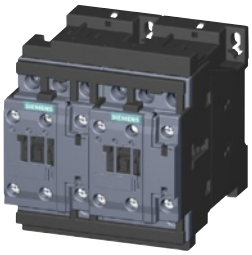
Fully wired and tested contactor assemblies

	Individual parts	Order No. Q11	Order No. Q12	Page
1 2	Contactor, 5.5 kW	3RT20 24	3RT20 24	3/10
1 2	Contactor, 7.5 kW	3RT20 25	3RT20 25	3/10
1 2	Contactor, 11 kW	3RT20 26	3RT20 26	3/10
1 2	Contactor, 15 kW	3RT20 27	3RT20 27	3/10
1 2	Contactor, 18.5 kW	3RT20 28	3RT20 28	3/10
4 5 6	Assembly kit comprising:	3RA29 23-2AA1		3/34

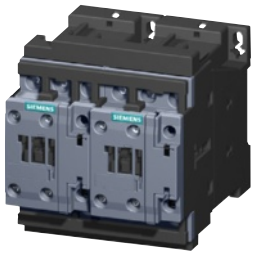
4 Mechanical interlocks
5 2 connecting clips for 2 contactors
6 Wiring modules on the top and bottom for connecting the main current paths, electrical interlock included (NC contact interlock)

Fully wired and tested contactor assemblies · Size S0 · up to 18.5 kW

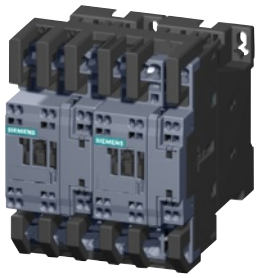
PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101



3RA23 24-8XE30-1BB4



3RA23 2.-8XB30-1A.2



3RA23 2.-8XB30-2A.2

Rated data AC-2 and AC-3					Rated control supply voltage U_s [1]	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to	Ratings of induction motors at 50 Hz and						Order No.	Price per PU			Order No.	Price per PU	
400 V	230 V	**400 V**	500 V	690 V									
A	kW	**kW**	kW	kW	V				kg				kg
AC operation, 50/60 Hz													
12	3	**5.5**	7.5	7.5	24 AC	B	**3RA23 24-8XB30-1AC2**		0.840	B	**3RA23 24-8XB30-2AC2**		0.940
					110 AC	B	**3RA23 24-8XB30-1AG2**		0.840	B	**3RA23 24-8XB30-2AG2**		0.940
					230 AC	B	**3RA23 24-8XB30-1AL2**		0.840	B	**3RA23 24-8XB30-2AL2**		0.940
16	4	**7.5**	10	11	24 AC	B	**3RA23 25-8XB30-1AC2**		0.840	B	**3RA23 25-8XB30-2AC2**		0.940
					110 AC	B	**3RA23 25-8XB30-1AG2**		0.840	B	**3RA23 25-8XB30-2AG2**		0.940
					230 AC	B	**3RA23 25-8XB30-1AL2**		0.840	B	**3RA23 25-8XB30-2AL2**		0.940
25	5.5	**11**	11	11	24 AC	B	**3RA23 26-8XB30-1AC2**		0.840	B	**3RA23 26-8XB30-2AC2**		0.940
					110 AC	B	**3RA23 26-8XB30-1AG2**		0.840	B	**3RA23 26-8XB30-2AG2**		0.940
					230 AC	B	**3RA23 26-8XB30-1AL2**		0.840	B	**3RA23 26-8XB30-2AL2**		0.940
32	7.5	**15**	18.5	18.5	24 AC	B	**3RA23 27-8XB30-1AC2**		0.860	B	**3RA23 27-8XB30-2AC2**		0.960
					110 AC	B	**3RA23 27-8XB30-1AG2**		0.860	B	**3RA23 27-8XB30-2AG2**		0.960
					230 AC	B	**3RA23 27-8XB30-1AL2**		0.860	B	**3RA23 27-8XB30-2AL2**		0.960
38	7.5	**18.5**	18.5	18.5	24 AC	B	**3RA23 28-8XB30-1AC2**		0.860	B	**3RA23 28-8XB30-2AC2**		0.960
					110 AC	B	**3RA23 28-8XB30-1AG2**		0.860	B	**3RA23 28-8XB30-2AG2**		0.960
					230 AC	B	**3RA23 28-8XB30-1AL2**		0.860	B	**3RA23 28-8XB30-2AL2**		0.960
DC operation													
12	3	**5.5**	7.5	7.5	24 DC	B	**3RA23 24-8XB30-1BB4**		1.220	B	**3RA23 24-8XB30-2BB4**		1.320
16	4	**7.5**	10	11	24 DC	B	**3RA23 25-8XB30-1BB4**		1.220	B	**3RA23 25-8XB30-2BB4**		1.320
25	5.5	**11**	11	11	24 DC	B	**3RA23 26-8XB30-1BB4**		1.220	B	**3RA23 26-8XB30-2BB4**		1.320
32	7.5	**15**	18.5	18.5	24 DC	B	**3RA23 27-8XB30-1BB4**		1.240	B	**3RA23 27-8XB30-2BB4**		1.340
38	7.5	**18.5**	18.5	18.5	24 DC	B	**3RA23 28-8XB30-1BB4**		1.240	B	**3RA23 28-8XB30-2BB4**		1.340
With communication interface													
12	3	**5.5**	7.5	7.5	24 DC	B	**3RA23 24-8XE30-1BB4**		1.220	B	**3RA23 24-8XE30-2BB4**		1.320
16	4	**7.5**	10	11	24 DC	B	**3RA23 25-8XE30-1BB4**		1.220	B	**3RA23 25-8XE30-2BB4**		1.320
25	5.5	**11**	11	11	24 DC	B	**3RA23 26-8XE30-1BB4**		1.220	B	**3RA23 26-8XE30-2BB4**		1.320
32	7.5	**15**	18.5	18.5	24 DC	B	**3RA23 27-8XE30-1BB4**		1.240	B	**3RA23 27-8XE30-2BB4**		1.340
38	7.5	**18.5**	18.5	18.5	24 DC	B	**3RA23 28-8XE30-1BB4**		1.240	B	**3RA23 28-8XE30-2BB4**		1.340

[1] Coil operating range
at 50 Hz: 0.8 ... 1.1 × U_s; at 60 Hz: 0.85 ... 1.1 × U_s.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

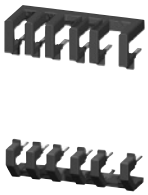
3RA23 Reversing Contactor Assemblies

Components for customer assembly

Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

3RA29 23-2AA1



3RA29 23-2AA2

For contactors	Size	Version	DT	Screw terminals	Weight per PU approx.	DT	Spring-type terminals	Weight per PU approx.
Type				Order No. Price per PU	kg		Order No. Price per PU	kg
Assembly kits for making 3-pole contactor assemblies								
3RT20 1	**S00-S00**	The assembly kit contains: mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom						
		• For main, auxiliary and control circuits	A	**3RA29 13-2AA1**	0.001	A	**3RA29 13-2AA2**	0.001
3RT20 2	**S0-S0**	The assembly kit contains: mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom						
		• For main, auxiliary and control circuits	A	**3RA29 23-2AA1**	0.001		**--**	
		• Only for main circuit[1]		**--**		A	**3RA29 23-2AA2**	0.001
Wiring modules (single)								
3RT20 1	**S00-S00**	Top (in-phase)	B	**3RA29 13-3DA1**	0.015	B	**3RA29 13-3DA2**	0.015
		Bottom (with phase reversal)	B	**3RA29 13-3EA1**	0.015	B	**3RA29 13-3EA2**	0.015
3RT20 2	**S0-S0**	Top (in-phase)	B	**3RA29 23-3DA1**	0.015	B	**3RA29 23-3DA2**	0.015
		Bottom (with phase reversal)	B	**3RA29 23-3EA1**	0.015	B	**3RA29 23-3EA2**	0.015
Mechanical connectors								
		For lateral interlock, without contactor gap						
3RT20 1	**S00-S00**	For 3- and 4-pole contactors	B	**3RA29 12-2H**	0.010	B	**3RA29 12-2H**	0.010
3RT20 2	**S0-S0**	For 3- and 4-pole contactors	B	**3RA29 22-2H**	0.010	B	**3RA29 22-2H**	0.010

[1] Version in size S0 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

3RA27 11-1BA00

3RA27 11-2BA00

For contactors Type	Size	Version	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Function modules for connection to the control system										
3RT20 1, 3RT20 2	**S00, S0**	**IO-Link connection**, comprising one basic and one coupling module and an additional module connector for assembling an IO-Link group	B	**3RA27 11-1BA00**		0.155	B	**3RA27 11-2BA00**		0.145
3RT20 1, 3RT20 2	**S00, S0**	**AS-Interface connection**, comprising one basic and one coupling module	B	**3RA27 12-1BA00**		0.150	B	**3RA27 12-2BA00**		0.145
Accessories for 3RA27 function modules										
		Module connectors								
3RT20 1, 3RT20 2	**S00, S0**	14-pole, 8 cm • For size jump S00-S0 + 1 space	B	**3RA27 11-0EE02**		0.001	B	**3RA27 11-0EE02**		0.001
3RT20 1, 3RT20 2	**S00, S0**	14-pole, 21 cm • For diverse space combinations	B	**3RA27 11-0EE03**		0.001	B	**3RA27 11-0EE03**		0.001
3RT20 1, 3RT20 2	**S00, S0**	10-pole, 8 cm • For separate auxiliary voltage supply within an IO-Link group	B	**3RA27 11-0EE04**		0.001	B	**3RA27 11-0EE04**		0.001
3RT20 1, 3RT20 2	**S00, S0**	**Sealable covers**	B	**3RA29 10-0**		0.002	B	**3RA29 10-0**		0.002

For operator panel for IO-Link see page 3/84.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

Overview

These 3RA24 contactor assemblies for wye-delta starting are designed for standard applications.

Note:
Contactor assemblies for wye-delta starting in special applications such as very heavy starting[1] or wye-delta starting of special motors must be customized. Help with designing such special applications is available from Technical Assistance.

The 3RA24 contactor assemblies for wye-delta starting can be ordered as follows:

Sizes S00 and S0

- Fully wired and tested, with electrical and mechanical interlock.
- As individual parts for customer assembly.

A dead interval of 50 ms on reversing is already integrated in the function module for wye-delta starting.

There is also a range of accessories (lateral auxiliary switch blocks, etc.) that must be ordered separately.

For overload relays for motor protection see Chapter 5 "Protection Equipment" --> "Overload Relays" --> "3RB3 Solid-State Overload Relays".

The 3RA24 contactor assemblies have screw or spring-type terminals and are suitable for screwing or snapping onto TH 35 standard mounting rails.

With the fully wired and tested 3RA24 contactor assemblies, the auxiliary contacts included in the basic devices are unassigned.

Motor protection

Overload relays or thermistor motor protection releases can be used for overload protection.

The overload relay can be either mounted onto the line contactor or separately fitted. It must be set to 0.58 times the rated motor current.

Surge suppression

Sizes S00 and S0

Surge suppression (varistor) is included in the function modules for wye-delta starting.

Function modules for wye-delta starting

The 3RA28 16-0EW20 wye-delta function module (see page 3/44) replaces the complete wiring in the control circuit and can be used in the voltage range from 24 to 240 V AC/DC. It is snapped onto the front of the contactor assembly size S00 or S0.

One function module comprises a complete module kit:

- One 3RA29 12-0 basic module with integrated control logic and time setting,
- And two 3RA29 11-0 coupling modules with related connecting cables.

The scope of supply thus comprises a complete module kit for one contactor assembly for wye-delta starting size S00 or S0, regardless of the connection method.

Screw terminals

Rated data at AC 50 Hz 400 V			Size			
Power kW	Operational current I_e A	Motor current A		Line/delta contactor	Star contactor	**Order No. complete**
5.5	12	9.5 ... 13.8	**S00-S00-S00**	3RT20 15-1	3RT20 15-1	**3RA24 15-8XF31-1...**
7.5	16	12.1 ... 17		3RT20 17-1	3RT20 15-1	**3RA24 16-8XF31-1...**
11	25	19 ... 25		3RT20 18-1	3RT20 16-1	**3RA24 17-8XF31-1...**
11	25	19 ... 25	**S0-S0-S0**	3RT20 24-1	3RT20 24-1	**3RA24 23-8XF32-1...**
15	32	24.1 ... 34		3RT20 26-1	3RT20 24-1	**3RA24 25-8XF32-1...**
18.5	40	34.5 ... 40		3RT20 26-1	3RT20 24-1	**3RA24 25-8XF32-1...**
22	50	31 ... 43		3RT20 27-1	3RT20 26-1	**3RA24 26-8XF32-1...**

Spring-type terminals

Rated data at AC 50 Hz 400 V			Size			
Power kW	Operational current I_e A	Motor current A		Line/delta contactor	Star contactor	**Order No. complete**
5.5	12	9.5 ... 13.8	**S00-S00-S00**	3RT20 15-2	3RT20 15-2	**3RA24 15-8XF31-2...**
7.5	16	12.1 ... 17		3RT20 17-2	3RT20 15-2	**3RA24 16-8XF31-2...**
11	25	19 ... 25		3RT20 18-2	3RT20 16-2	**3RA24 17-8XF31-2...**
11	25	19 ... 25	**S0-S0-S0**	3RT20 24-2	3RT20 24-2	**3RA24 23-8XF32-2...**
15	32	24.1 ... 34		3RT20 26-2	3RT20 24-2	**3RA24 25-8XF32-2...**
18.5	40	34.5 ... 40		3RT20 26-2	3RT20 24-2	**3RA24 25-8XF32-2...**
22	50	31 ... 43		3RT20 27-2	3RT20 26-2	**3RA24 26-8XF32-2...**

Note:

The selection of contactor types refers to fused configurations.

[1] For effective support from Technical Assistance you must provide the following details:
- Rated motor voltage,
- Rated motor current,
- Service factor, operating values,
- Motor starting current factor,
- Starting time,
- Ambient temperature.

Components for customer assembly

Assembly kits with wiring modules and mechanical connectors are available for contactor assemblies for wye-delta starting. Contactors, overload relays, function modules for wye-delta starting or wye-delta timing relays, auxiliary switches for electrical interlock – if required also feeder terminals and base plates – must be ordered separately.

The wiring kits for sizes S00 and S0 contain the top and bottom main conducting path connections between the line and delta contactors (top) and between the delta and star contactors (bottom).

Control circuit

Features:
- Time setting range 0.5 to 60 s (3 selectable settings)
- Wide voltage range 24 to 240 V AC/DC
- Dead interval of 50 ms, non-adjustable.

Screw terminals

Power	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
kW				A		A	
5.5	3RA28 16-0EW20	3RA29 13-2BB1[1)]	3RT29 16-4BA31	5.5 ... 8	3RU21 16-1HB0	4 ... 16	3RB30 16-1TB0
7.5				7 ... 10	3RU21 16-1JB0		
11				11 ... 16	3RU21 16-4AB0		
11	3RA28 16-0EW20	3RA29 23-2BB1[2)]	3RT29 26-4BA31	11 ... 16	3RU21 26-4AB0	6 ... 25	3RB30 26-1QB0
15				14 ... 20	3RU21 26-4BB0		
18.5				20 ... 25	3RU21 26-4DB0		
22				20 ... 25	3RU21 26-4DB0		

Spring-type terminals

Power	Accessories for customer assembly			Overload relay, thermal (trip class CLASS 10)		Overload relay, solid-state (trip class CLASS 10)	
	Function modules for wye-delta starting	Assembly kit B, for single infeed	Star jumper	Setting range	Order No.	Setting range	Order No.
kW				A		A	
5.5	3RA28 16-0EW20	3RA29 13-2BB2[1)]	3RT29 16-4BA32	5.5 ... 8	3RU21 16-1HC0	4 ... 16	3RB30 16-1TE0
7.5				7 ... 10	3RU21 16-1JC0		
11				11 ... 16	3RU21 16-4AC0		
11	3RA28 16-0EW20	3RA29 23-2BB2[2)]	3RT29 26-4BA32	11 ... 16	3RU21 26-4AC0	6 ... 25	3RB30 26-1QE0
15				14 ... 20	3RU21 26-4BC0		
18.5				20 ... 25	3RU21 26-4DC0		
22				20 ... 25	3RU21 26-4DC0		

[1)] The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper and auxiliary circuit wiring.

[2)] The assembly kit contains: mechanical interlock, 4 connecting clips; wiring modules on the top (connection between line and delta contactor) and on the bottom (connection between delta and star contactor); star jumper.

Order No. scheme

Digit of the Order No.	1. - 3.	4.	5.	6.	7.		8.	9.	10.	11.	12.		13.	14.	15.	16.
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
SIRIUS contactor assemblies	**3 R A**															
2nd generation		**2**														
Device type (e. g. 4 = contactor assembly for wye-delta starting)			**4**													
Contactor size (1 = S00, 2 = S0)				□												
Power dependent on size (e. g. 25 = 15 kW)					□											
Type of overload relay (8X = without)							□	□								
Assembly (F = ready-assembled, E, H = ready-assembled with communication)									□							
Interlock (3 = mechanical and electrical)										□						
Free auxiliary switches (e. g. S00: 1 = 3 NO total, S0: 2 = 3 NO + 3 NC total)											□					
Connection type (1 = screw, 2 = spring)													□			
Operating range / solenoid coil circuit (e. g. A = AC standard / without)														□		
Rated control supply voltage (e. g. L2 = 230 V, 50/60 Hz)															□	□
Example	**3 R A**	**2**	**4**	**2**	**5**	**–**	**8**	**X**	**F**	**3**	**2**	**–**	**1**	**A**	**L**	**2**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

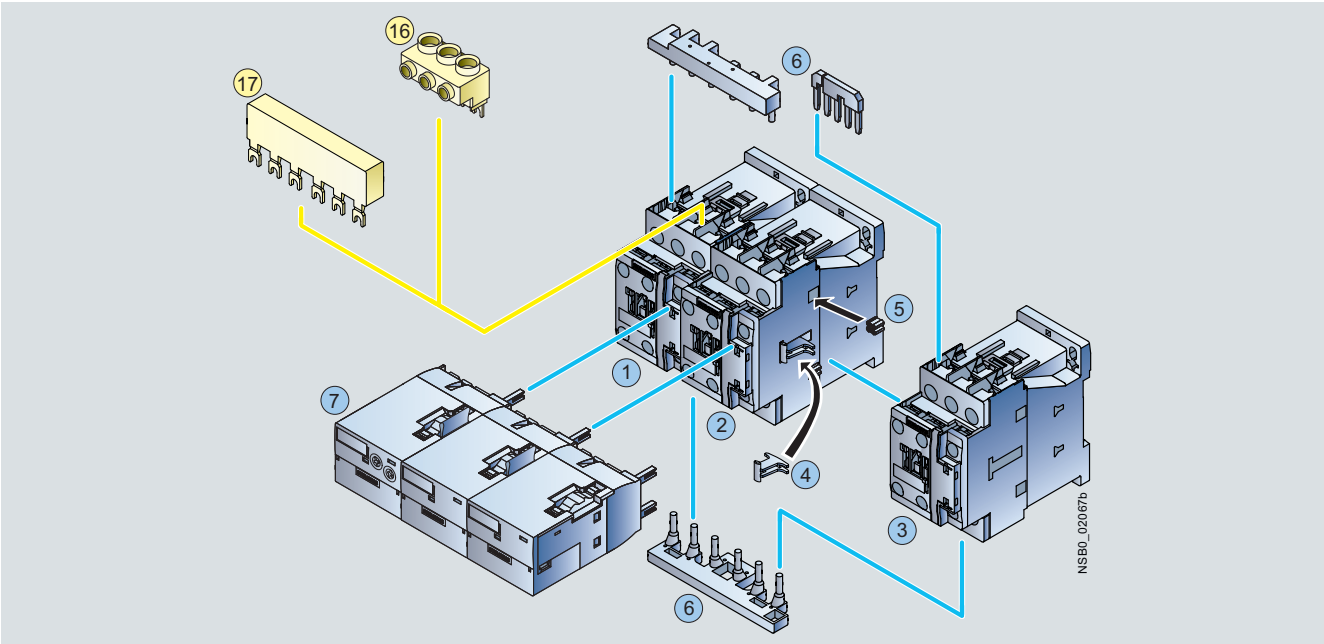
For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

3RA24 complete units, 5.5 ... 22 kW

Selection and ordering data

Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW

The figure shows the version with screw terminals



Mountable accessories

Individual parts	Order No.	Page
16 Three-phase feeder terminal[3]	3RA29 13-3K	3/44

Fully wired and tested contactor assemblies

Individual parts	Order No. Q11[1]	Q13[2]	Q12[2]	Page
1 2 3 Contactor, 5.5 kW	3RT20 15	3RT20 15	3RT20 15	3/8
1 2 3 Contactor, 7.5 kW	3RT20 17	3RT20 17	3RT20 15	3/8
1 2 3 Contactor, 11 kW	3RT20 18	3RT20 18	3RT20 16	3/8
4 5 6 Assembly kit comprising	3RA29 13-2BB1			3/44
4 Mechanical interlock				
5 4 connecting clips				
6 Wiring modules on the top and bottom for connecting the main current paths				
7 Function modules for wye-delta starting	3RA28 16-0EW20			3/44

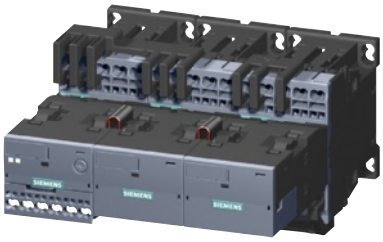
[1] Use version with 1 NO.
[2] Use version with 1 NC.
[3] Part 16 can only be mounted with contactors with screw terminal.

Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

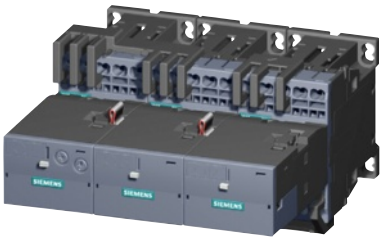
Fully wired and tested contactor assemblies · Size S00-S00-S00 · Up to 11 kW

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101



3RA24 1.-8XE31-2BB4

3RA24 1.-8XF31-1A.0



3RA24 1.-8XF31-2A.0

Rated data AC-3 Operational current I_e up to 400 V	Ratings of induction motors at 50 Hz and 230 V	**400 V**	500 V	690 V	Rated control supply voltage U_s [1]	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
A	kW	**kW**	kW	kW	V				kg				kg
AC operation, 50/60 Hz													
12	3.3	**5.5**	7.2	9.2	24 AC	B	**3RA24 15-8XF31-1AB0**		0.910	B	**3RA24 15-8XF31-2AB0**		0.910
					110 AC	B	**3RA24 15-8XF31-1AF0**		0.850	B	**3RA24 15-8XF31-2AF0**		0.910
					230 AC	B	**3RA24 15-8XF31-1AP0**		0.850	B	**3RA24 15-8XF31-2AP0**		0.910
16	4.7	**7.5**	10.3	9.2	24 AC	B	**3RA24 16-8XF31-1AB0**		0.910	B	**3RA24 16-8XF31-2AB0**		0.910
					110 AC	B	**3RA24 16-8XF31-1AF0**		0.850	B	**3RA24 16-8XF31-2AF0**		0.910
					230 AC	B	**3RA24 16-8XF31-1AP0**		0.850	B	**3RA24 16-8XF31-2AP0**		0.910
25	5.5	**11**	11	11	24 AC	C	**3RA24 17-8XF31-1AB0**		0.850	C	**3RA24 17-8XF31-2AB0**		0.910
					110 AC	C	**3RA24 17-8XF31-1AF0**		0.850	C	**3RA24 17-8XF31-2AF0**		0.910
					230 AC	B	**3RA24 17-8XF31-1AP0**		0.850	B	**3RA24 17-8XF31-2AP0**		0.910
DC operation													
12	3.3	**5.5**	7.2	9.2	24 DC	B	**3RA24 15-8XF31-1BB4**		0.910	B	**3RA24 15-8XF31-2BB4**		0.910
16	4.7	**7.5**	10.3	9.2	24 DC	B	**3RA24 16-8XF31-1BB4**		0.910	B	**3RA24 16-8XF31-2BB4**		0.910
25	5.5	**11**	11	11	24 DC	B	**3RA24 17-8XF31-1BB4**		1.030	B	**3RA24 17-8XF31-2BB4**		1.090
For IO-Link connection													
12	3.3	**5.5**	7.2	9.2	24 DC	B	**3RA24 15-8XE31-1BB4**		1.030	B	**3RA24 15-8XE31-2BB4**		1.090
16	4.7	**7.5**	10.3	9.2	24 DC	B	**3RA24 16-8XE31-1BB4**		1.030	B	**3RA24 16-8XE31-2BB4**		1.090
25	5.5	**11**	11	11	24 DC	B	**3RA24 17-8XE31-1BB4**		1.030	B	**3RA24 17-8XE31-2BB4**		1.090
For AS-Interface connection													
12	3.3	**5.5**	7.2	9.2	24 DC	B	**3RA24 15-8XH31-1BB4**		1.050	B	**3RA24 15-8XH31-2BB4**		1.110
16	4.7	**7.5**	10.3	9.2	24 DC	B	**3RA24 16-8XH31-1BB4**		1.050	B	**3RA24 16-8XH31-2BB4**		1.110
25	5.5	**11**	11	11	24 DC	B	**3RA24 17-8XH31-1BB4**		1.050	B	**3RA24 17-8XH31-2BB4**		1.110

[1] Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s; at 60 Hz: 0.85 ... 1.1 x U_s.

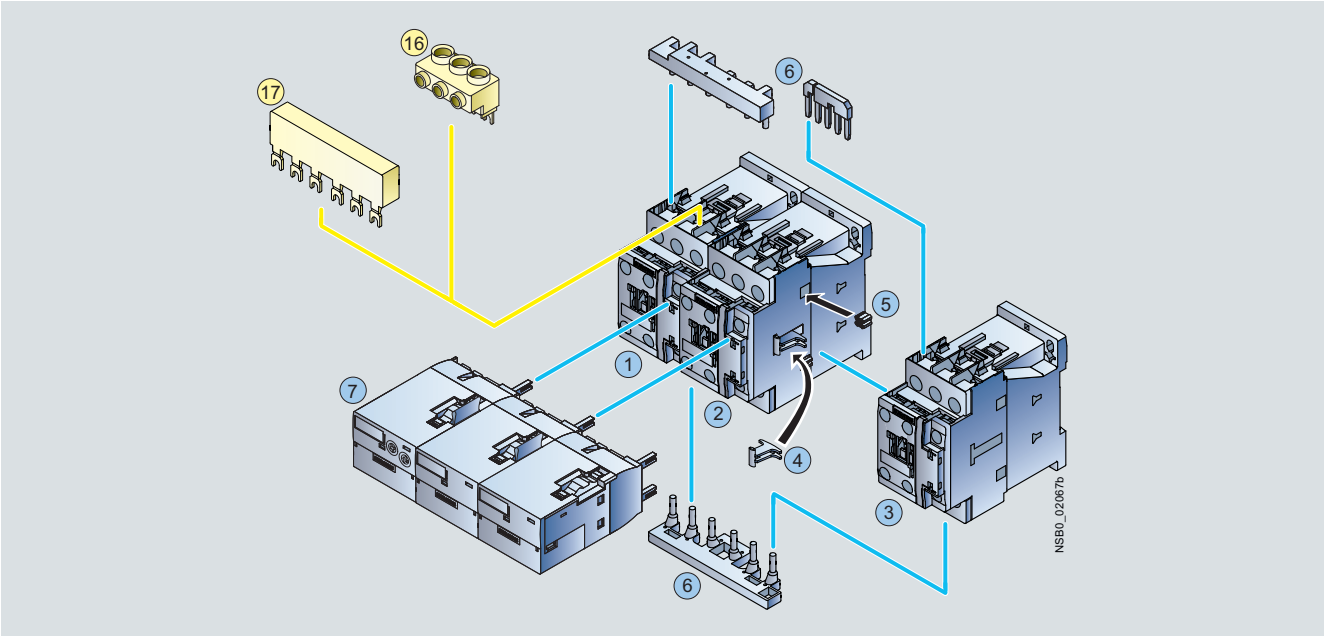
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW

The figure shows the version with screw terminals



Mountable accessories

Individual parts	Order No.	Page
16 Three-phase feeder terminal[1]	3RV29 25-5AB	3/43
17 Three-phase busbar[1]	3RV19 15-1AB	3/43

[1] The parts 16 and 17 can only be mounted with contactors with screw terminal.

Fully wired and tested contactor assemblies

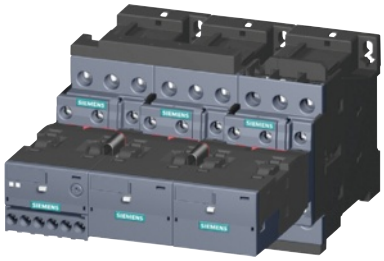
	Individual parts	Order No. Q11	Q13	Q12	Page
1 2 3	Contactor, 11 kW	3RT20 24	3RT20 24	3RT20 24	3/10
1 2 3	Contactors, 15/18.5 kW	3RT20 26	3RT20 26	3RT20 24	3/10
1 2 3	Contactor, 22 kW	3RT20 27	3RT20 27	3RT20 26	3/10
4 5 6	Assembly kit	3RA29 23-2BB1			3/43
	The assembly kit contains: 4 Mechanical interlock 5 Connecting clips 6 Wiring modules on the top and bottom for connecting the main current paths				
7	Function modules for wye-delta starting	3RA28 16-0EW20			3/44

Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

Fully wired and tested contactor assemblies · Size S0-S0-S0 · Up to 22 kW

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101



3RA24 2.-8XE32-1BB4

3RA24 2.-8XF32-1A.2

3RA24 2.-8XF32-2A.2

Rated data AC-3					Rated control supply voltage U_s [1]	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to	Ratings of induction motors at 50 Hz and						Order No.	Price per PU			Order No.	Price per PU	
400 V	230 V	**400 V**	500 V	690 V									
A	kW	**kW**	kW	kW	V				kg				kg
AC operation, 50/60 Hz													
25	7.1	**11**	15.6	19	24 AC	C	**3RA24 23-8XF32-1AC2**		1.370	C	**3RA24 23-8XF32-2AC2**		1.530
					110 AC	C	**3RA24 23-8XF32-1AG2**		1.370	C	**3RA24 23-8XF32-2AG2**		1.530
					230 AC	B	**3RA24 23-8XF32-1AL2**		1.370	B	**3RA24 23-8XF32-2AL2**		1.530
32 / 40	11.4	**15 / 18.5**	19	19	24 AC	C	**3RA24 25-8XF32-1AC2**		1.370	C	**3RA24 25-8XF32-2AC2**		1.530
					110 AC	C	**3RA24 25-8XF32-1AG2**		1.370	C	**3RA24 25-8XF32-2AG2**		1.530
					230 AC	B	**3RA24 25-8XF32-1AL2**		1.370	B	**3RA24 25-8XF32-2AL2**		1.530
50	--	**22**	19	19	24 AC	C	**3RA24 26-8XF32-1AC2**		1.390	C	**3RA24 26-8XF32-2AC2**		1.550
					110 AC	C	**3RA24 26-8XF32-1AG2**		1.390	C	**3RA24 26-8XF32-2AG2**		1.550
					230 AC	B	**3RA24 26-8XF32-1AL2**		1.390	B	**3RA24 26-8XF32-2AL2**		1.550
DC operation													
25	7.1	**11**	15.6	19	24 DC	B	**3RA24 23-8XF32-1BB4**		1.940	B	**3RA24 23-8XF32-2BB4**		2.100
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	B	**3RA24 25-8XF32-1BB4**		1.940	B	**3RA24 25-8XF32-2BB4**		2.100
50	--	**22**	19	19	24 DC	B	**3RA24 26-8XF32-1BB4**		1.960	B	**3RA24 26-8XF32-2BB4**		2.120
For IO-Link connection													
25	7.1	**11**	15.6	19	24 DC	B	**3RA24 23-8XE32-1BB4**		1.940	B	**3RA24 23-8XE32-2BB4**		2.100
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	B	**3RA24 25-8XE32-1BB4**		1.940	B	**3RA24 25-8XE32-2BB4**		2.100
50	--	**22**	19	19	24 DC	B	**3RA24 26-8XE32-1BB4**		1.960	B	**3RA24 26-8XE32-2BB4**		2.120
For AS-Interface connection													
25	7.1	**11**	15.6	19	24 DC	B	**3RA24 23-8XH32-1BB4**		1.960	B	**3RA24 23-8XH32-2BB4**		2.120
32 / 40	11.4	**15 / 18.5**	19	19	24 DC	B	**3RA24 25-8XH32-1BB4**		1.960	B	**3RA24 25-8XH32-2BB4**		2.120
50	--	**22**	19	19	24 DC	B	**3RA24 26-8XH32-1BB4**		1.980	B	**3RA24 26-8XH32-2BB4**		2.140

[1] Coil operating range at 50 Hz: 0.8 ... 1.1 x U_s ; at 60 Hz: 0.85 ... 1.1 x U_s.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA24 Contactor Assemblies for Wye-Delta Starting

3RA24 complete units, 5.5 ... 22 kW

More information

Starter	Type		3RA24 15	3RA24 16	3RA24 17	3RA24 23	3RA24 25	3RA24 26
	Sizes **S..-S..-S..**		**00-00-00**	**00-00-00**	**00-00-00**	**0-0-0**	**0-0-0**	**0-0-0**
	Width	mm	**45**	**45**	**45**	**45**	**45**	**45**
All technical specifications not mentioned in the table below are identical to those of the individual 3RT contactors and 3RU overload relays								
Mechanical endurance		Operating cycles	3 million					
Short-circuit protection without overload relay			1)					
Maximum rated current of the fuse								
Main circuit Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE Single or double infeed acc. to IEC 60947-4-1/EN 60947-4-1	• Type of coordination "1"	A	35	35	63	63	100	125
	• Type of coordination "2"	A	20	20	25	25	35	63
Control circuit Fuse links, gG operational class: DIAZED 5SB, NEOZED 5SE (short-circuit current $I_k \leq 1$ kA)		A	10					
		A	6 2), if the auxiliary contact of the overload relay is connected in the contactor coil circuit					
Miniature circuit breaker with C characteristic		A	10					
		A	6 2), if the auxiliary contact of the overload relay is connected in the contactor coil circuit					
Size of individual contactors	• Q11 line contactor	Type 3RT	20 15	20 17	20 18	20 24	20 26	20 27
	• Q13 delta contactor	Type 3RT	20 15	20 17	20 18	20 24	20 26	20 27
	• Q12 star contactor	Type 3RT	20 15	20 15	20 16	20 24	20 24	20 26
Unassigned auxiliary contacts of the individual contactors			3)					
Current-carrying capacity with reversing time up to 10 s								
• Rated operational current I_e	At 400 V	A	12	17	25	25	40	65
	500 V	A	8.7	11.3	20.8	20.8	31.2	55.4
	690 V	A	6.9	9	20.8	20.8	22.5	53.7
• Rated power for induction motors with 50 and 60 Hz	At 230 V	kW	3.3	4.7	7.2	7.2	12	20.4
	400 V	kW	5.8	8.2	12.5	12.5	21	35
	500 V	kW	5.3	6.9	13	13	20.5	38
	690 V	kW	5.8	7.5	18	18	20.4	51
	1000 V	kW	--	--	--	--	--	--
• **Switching frequency** with overload relay		h^{-1}	15	15	15	15	15	15
Current-carrying capacity with reversing time up to 15 s								
• Rated operational current I_e	At 400 V	A	12	17	25	25	31	44
	500 V	A	8.7	11.3	20.8	20.8	31	44
	690 V	A	6.9	9	20.8	20.8	22.5	44
• Rated power for induction motors with 50 and 60 Hz	At 230 V	kW	3.3	4.7	7.2	7.2	9.4	13.8
	400 V	kW	5.8	8.2	12.5	12.5	16.3	24
	500 V	kW	5.3	6.9	13	13	20.4	30
	690 V	kW	5.8	7.5	18	18	20.4	42
	1000 V	kW	--	--	--	--	--	--
• **Switching frequency** with overload relay		h^{-1}	15	15	15	15	15	15
Current-carrying capacity with reversing time up to 20 s								
• Rated operational current I_e	At 400 V	A	12	17	25	25	28	39
	500 V	A	8.7	11.3	20.8	20.8	28	39
	690 V	A	6.9	9	20.8	20.8	22.5	39
• Rated power for induction motors with 50 and 60 Hz	At 230 V	kW	3.3	4.7	7.2	7.2	8.5	12.2
	400 V	kW	5.8	8.2	12.5	12.5	14.7	21.3
	500 V	kW	5.3	6.9	13	13	18.4	26.7
	690 V	kW	5.8	7.5	18	18	20.4	37
	1000 V	kW	--	--	--	--	--	--
• **Switching frequency** with overload relay		h^{-1}	15	15	15	15	15	15

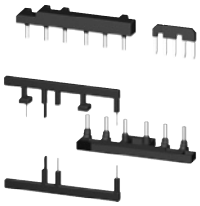
1) For short-circuit protection with overload relays see "Protection Equipment" --> "Overload Relays" --> "3RB3 Solid-State Overload Relays".

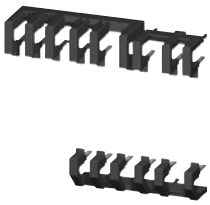
2) Up to $I_k < 0.5$ kA; ≤ 260 V.

3) For circuit diagrams of the control circuit see the note on technical information on page 3/1.

Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101


3RA29 23-2BB1


3RA29 23-2BB2

For contactors Type	Size	Version	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Assembly kits[1] for making 3-pole contactor assemblies										
3RT20 1	**S00**	The assembly kit contains: mechanical interlock; 4 connecting clips, star jumper, wiring modules on the top and bottom								
		• For main, auxiliary and control circuits	A	**3RA29 13-2BB1**		0.001	A	**3RA29 13-2BB2**		0.001
3RT20 2	**S0**	The assembly kit contains: mechanical interlock; 4 connecting clips, star jumper, wiring modules on the top and bottom								
		• For main, auxiliary and control circuits	A	**3RA29 23-2BB1**		0.001		**--**		
		• Only for main circuit[2]		**--**			A	**3RA29 23-2BB2**		0.001


3RV29 25-5AB


3RV19 15-1AB


3RT19 16-4BA31


3RT29 16-4BA32

Three-phase feeder terminals										
		Feeder terminal block for the line contactor for large conductor cross-sections								
3RT20 1	**S00**	• Conductor cross-section 6 mm²	A	**3RA29 13-3K**		0.001		**--**		
3RT20 2	**S0**	• Conductor cross-section 16 mm²	A	**3RV29 25-5AB**		0.043		**--**		
Three-phase busbars										
3RT20 2	**S0**	Bridging phase-by-phase of all input terminals of the line contactor (Q11) and the delta contactor (Q13)	►	**3RV19 15-1AB**		0.044		**--**		
Links for paralleling, 3-pole (star jumpers)										
3RT20 1	**S00**	Without connection terminal (the links for paralleling can be reduced by one pole)	►	**3RT19 16-4BA31**		0.010	B	**3RT29 16-4BA32**		0.010
3RT20 2	**S0**		►	**3RT19 26-4BA31**		0.010	B	**3RT29 26-4BA32**		0.020

[1] When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required.

[2] Version in size S0 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA24 Contactor Assemblies for Wye-Delta Starting

Components for customer assembly

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

3RA28 16-0EW20

3RA27 12-1CA00

3RA27 11-2CA00

For contactors Type	Size	Version	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Function modules for wye-delta starting										
3RT20 1, 3RT20 2	**S00, S0**	Comprising one basic module and two coupling modules. Rated control supply voltage 24 ... 240 V AC/DC Time setting range 0.5 ... 60 s (10, 30, 60 s selectable)	B	**3RA28 16-0EW20**		0.170	B	**3RA28 16-0EW20**		0.170
Accessories for 3RA28 function modules										
3RT20 1, 3RT20 2	**S00, S0**	**Sealable covers**	B	**3RA29 10-0**		0.002	B	**3RA29 10-0**		0.002
Function modules for contactor assemblies for wye-delta starting for connection to the control system										
3RT20 1, 3RT20 2	**S00, S0**	**IO-Link connection**, comprising one basic module and two coupling modules, plus an additional module connector for assembling an IO-Link group	B	**3RA27 11-1CA00**		0.190	B	**3RA27 11-2CA00**		0.185
3RT20 1, 3RT20 2	**S00, S0**	**AS-Interface connection**, comprising one basic module and two coupling modules	B	**3RA27 12-1CA00**		0.185	B	**3RA27 12-2CA00**		0.185
Accessories for 3RA27 function modules										
		Module connectors								
3RT20 1, 3RT20 2	**S00, S0**	14-pole, 8 cm long • For size jump S00-S0 + 1 space	B	**3RA27 11-0EE02**		0.001	B	**3RA27 11-0EE02**		0.001
3RT20 1, 3RT20 2	**S00, S0**	14-pole, 21 cm long • For diverse space combinations	B	**3RA27 11-0EE03**		0.001	B	**3RA27 11-0EE03**		0.001
3RT20 1, 3RT20 2	**S00, S0**	10-pole, 8 cm long • For separate auxiliary voltage supply within an IO-Link group	B	**3RA27 11-0EE04**		0.001	B	**3RA27 11-0EE04**		0.001
3RT20 1, 3RT20 2	**S00, S0**	**Sealable covers**	B	**3RA29 10-0**		0.002	B	**3RA29 10-0**		0.002

For operator panel for IO-Link see page 3/84.

Note:

When the function modules for contactor assemblies for wye-delta starting are used, no other auxiliary switches are allowed to be mounted on the basic units.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Overview

AC and DC operation

EN 60947-4-1 (VDE 0660 Part 102).

The contactors are suitable for use in any climate. They are finger-safe according to EN 50274.

The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole versions.

With size S0, two auxiliary contacts 1 NO + 1 NC are included in the basic version.

Mountable auxiliary contacts

Size S00

4 auxiliary contacts, of which up to 3 can be NC contacts.

Size S0

4 additional auxiliary contacts.

Application

The contactors are suitable for:

- Switching resistive loads
- Isolating systems with ungrounded or poorly grounded neutral conductors
- System transfers when alternative AC power supplies are used
- Use as contactors which only carry current and do not have to switch in case of inductive loads - e. g. variable-speed operating mechanisms
- Switching mixed loads in distribution systems (e. g. for supplying heaters, lamps, motors, PC power supply units) with p.f. > 0.8 according to IEC 60947-4-1, test conditions for utilization category AC-1

3RT23 Contactors for Switching Resistive Loads (AC-1)

4-pole, 4 NO, 18 ... 50 A

Selection and ordering data

AC operation

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

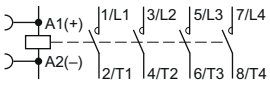

3RT23 1.-1A.00

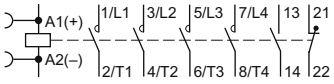

3RT23 1.-2A.00


3RT23 2.-1A.00


3RT23 2.-2A.00

Rated data AC-1, T_u: 40/60		Auxiliary contacts			Rated control supply voltage U_s	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e	Ratings of AC loads (p.f. = 0.95) at 50 Hz and 400 V	Ident. No.	Version NO	Version NC			Order No.	Price per PU			Order No.	Price per PU	
A	kW				V AC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail													
Size S00[1]													
Auxiliary switches can be retrofitted													
18 / 16	**12 / 11**	**--**	--	--	24, 50/60 Hz	B	**3RT23 16-1AB00**		0.220	B	**3RT23 16-2AB00**		0.240
					110, 50/60 Hz	B	**3RT23 16-1AF00**		0.220	B	**3RT23 16-2AF00**		0.240
					230, 50/60 Hz	B	**3RT23 16-1AP00**		0.220	B	**3RT23 16-2AP00**		0.240
22 / 20	**14.5 / 13**	**--**	--	--	24, 50/60 Hz	B	**3RT23 17-1AB00**		0.220	B	**3RT23 17-2AB00**		0.240
					110, 50/60 Hz	B	**3RT23 17-1AF00**		0.220	B	**3RT23 17-2AF00**		0.240
					230, 50/60 Hz	B	**3RT23 17-1AP00**		0.220	B	**3RT23 17-2AP00**		0.240
Size S0													
Terminal designations according to EN 50012													
1 NO + 1 NC, identification number **11E**													
35 / 30[2]	**22 / 20**	**11E**	1	1	24, 50 Hz	B	**3RT23 25-1AB00**		0.430	B	**3RT23 25-2AB00**		0.490
					110, 50 Hz	B	**3RT23 25-1AF00**		0.430	B	**3RT23 25-2AF00**		0.490
					230, 50 Hz	B	**3RT23 25-1AP00**		0.430	B	**3RT23 25-2AP00**		0.490
40 / 35[2]	**26 / 23**	**11E**	1	1	24, 50 Hz	B	**3RT23 26-1AB00**		0.430	B	**3RT23 26-2AB00**		0.490
					110, 50 Hz	B	**3RT23 26-1AF00**		0.430	B	**3RT23 26-2AF00**		0.490
					230, 50 Hz	B	**3RT23 26-1AP00**		0.430	B	**3RT23 26-2AP00**		0.490
50[2]	**33**	**11E**	1	1	24, 50 Hz	B	**3RT23 27-1AB00**		0.430	B	**3RT23 27-2AB00**		0.490
					110, 50 Hz	B	**3RT23 27-1AF00**		0.430	B	**3RT23 27-2AF00**		0.490
					230, 50 Hz	B	**3RT23 27-1AP00**		0.430	B	**3RT23 27-2AP00**		0.490





For other voltages see page 3/17.
For accessories, see page 3/93.
For spare parts, see page 3/110.

[1] For size S00: Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s,
at 60 Hz: 0.85 ... 1.1 x U_s.

[2] Minimum conductor cross-section 10 mm².

* You can order this quantity or a multiple thereof.
Illustrations are approximate

DC operation · DC solenoid system

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

3RT23 1.-1A.00

3RT23 1.-2A.00

3RT23 2.-1A.00

3RT23 2.-2A.00

Rated data AC-1, T_u: 40/60		Auxiliary contacts			Rated control supply voltage U_s	DT	**Screw terminals**		Weight per PU approx.	DT	**Spring-type terminals**		Weight per PU approx.
Operational current I_e	Ratings of AC loads (p.f. = 0.95) at 50 Hz and **400 V**	Ident. No.	Version				Order No.	Price per PU			Order No.	Price per PU	
A	**kW**		NO	NC	V DC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail													
Size S00													
Auxiliary switches can be retrofitted													
18 / 16	**12 / 11**	**--**	--	--	24	B	**3RT23 16-1BB40**		0.280	B	**3RT23 16-2BB40**		0.300
					220	B	**3RT23 16-1BM40**		0.280	B	**3RT23 16-2BM40**		0.300
22 / 20	**14.5 / 13**	**--**	--	--	24	B	**3RT23 17-1BB40**		0.220	B	**3RT23 17-2BB40**		0.300
					220	B	**3RT23 17-1BM40**		0.220	B	**3RT23 17-2BM40**		0.300
Size S0													
Terminal designations according to EN 50012													
1 NO + 1 NC, identification number **11E**													
35 / 30[1]	**22 / 20**	**11E**	1	1	24	B	**3RT23 25-1BB40**		0.620	B	**3RT23 25-2BB40**		0.680
					220	B	**3RT23 25-1BM40**		0.620	B	**3RT23 25-2BM40**		0.680
40 / 35[1]	**26 / 23**	**11E**	1	1	24	B	**3RT23 26-1BB40**		0.620	B	**3RT23 26-2BB40**		0.680
					220	B	**3RT23 26-1BM40**		0.620	B	**3RT23 26-2BM40**		0.680
50[1]	**33**	**11E**	1	1	24	B	**3RT23 27-1BB40**		0.620	B	**3RT23 27-2BB40**		0.680
					220	B	**3RT23 27-1BM40**		0.620	B	**3RT23 27-2BM40**		0.680

For other voltages see page 3/17.
For accessories, see page 3/93.
For spare parts, see page 3/110.

[1] Minimum conductor cross-section 10 mm².

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RT23 Contactors for Switching Resistive Loads (AC-1)

4-pole, 4 NO, 18 ... 50 A

More information

Contactors	Type		3RT23 16	3RT23 17	3RT23 25	3RT23 26	3RT23 27
	Size		S00		S0		
	Width	mm	45		45		
General data							
Permissible mounting position[1]							
Mechanical endurance		Operating cycles	30 million		10 million		
Electrical endurance at I_e/AC-1		Operating cycles	Approx. 0.5 million				
Rated insulation voltage U_i (pollution degree 3)		V	690				
Permissible ambient temperature	• During operation • During storage	°C °C	-25 ... +60 -55 ... +80				
Degree of protection Acc. to EN 60947-1, Appendix C	Device Connection range		IP20				IP20 IP00
Touch protection acc.to EN 50274			Finger-safe				
Short-circuit protection of contactors without overload relays							
Main circuit							
Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE	• Type of coordination "1"[1] • Type of coordination "2"[1]	A A	35 20		63 20		
according to IEC 60947-4-1/ EN 60947-4-1	• Weld-free	A	10		16		
Control							
Solenoid coil operating range							
• AC operation	- At 50 Hz - At 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• DC operation	- At 50 °C - At 60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s		-- --		
• AC/DC operation			--		0.8 ... 1.1 x U_s		
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)							
• AC operation, 50 Hz, standard version	- Closing - P.f.	VA	-- --		77 0.82		
	- Closed - P.f.	VA	-- --		9.8 0.25		
• AC operation, 50/60 Hz, standard version	- Closing - P.f.	VA	27/24.3 0.8/0.75	37/33 0.8/0.75	81/79 0.72/0.74		
	- Closed - P.f.	VA	4.2/3.3 0.25/0.25	5.7/4.4 0.25/0.25	10.5/8.5 0.25/0.28		
• AC operation, 60 Hz, USA, Canada	- Closing - P.f.	VA	31.7 0.77	43 0.77	87 0.76		
	- Closed - P.f.	VA	4.8 0.25	6.5 0.25	9.4 0.28		
• DC operation	- Closing = Closed	W	4		5.9		
Operating times for 0.8 ... 1.1 x U_s[2] Total break time = Opening delay + Arcing time							
• AC operation	- Closing delay - Opening delay	ms ms	8 ... 35 3.5 ... 14	8 ... 33 4 ... 15	9 ... 38 4 ... 16	8 ... 40 4 ... 16	
• DC operation	- Closing delay - Opening delay	ms ms	30 ... 100 7 ... 13		50 ... 170 15 ... 17.5		
• Arcing time		ms	10 ... 15		10		
Main circuit							
AC capacity							
Utilization categories AC-1, switching resistive loads							
• Rated operational currents I_e	At 40 °C, up to 690 V At 60 °C, up to 690 V	A A	18 16	22 20	35 30	40 35	50 42
• Rated power for AC loads P.f. = 0.95 (at 40 °C)	At 230 V 400 V	kW kW	6.5 12	7.5 14.5	11 23	13 26	16 33
• Minimum conductor cross-section for loads with I_e	At 40 °C At 60 °C	mm² mm²	2.5 2.5	2.5 2.5	10 10	10 10	10 10
Utilization categories AC-2 and AC-3							
• Rated operational currents I_e	At 60 °C, up to 400 V	A	9	12	15.5	17	17
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V 400 V	kW kW	3 4	3 5.5	4 7.5	4 9	4 9

[1] In accordance with the corresponding 3-pole 3RT2. contactors.

[2] With size S00, DC operation: Operating times at 0.85 ... 1.1 x U_s.

Overview

AC and DC operation

EN 60947-4-1 (VDE 0660 Part 102).

The contactors are suitable for use in any climate. They are finger-safe according to EN 50274.

The accessories for the 3-pole SIRIUS contactors can also be used for the 4-pole versions.

With size S0, two auxiliary contacts 1 NO + 1 NC are included in the basic version.

Mountable auxiliary contacts

Size S00 and S0

4 auxiliary contacts, of which up to 2 can be NC contacts.

Application

The contactors are suitable for:

- Changing the polarity of hoisting gear motors
- Switching two separate loads

Note:
Single device for pole reversal; not suitable for reversing duty. 3RT25 contactors are not suitable for switching a load between two current sources.

3RT25 Contactors

4-pole, 2 NO + 2 NC, 4 ... 11 kW

Selection and ordering data

AC operation, 2 NO + 2 NC[1)]

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

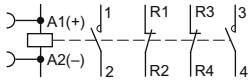

3RT25 1.-1....

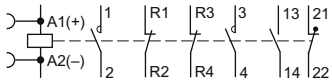

3RT25 1.-2....


3RT25 2.-1....


3RT25 2.-2....

Rated data			Auxiliary contacts		Rated control supply voltage U_s	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
AC-2/AC-3, T_u: up to 60 °C		AC-1, T_u: 40/60	Ident. No.	Version									
Operational current I_e At 400 V	Ratings of induction motors at 50 Hz and **400 V**	Operational current I_e					Order No.	Price per PU			Order No.	Price per PU	
A	**kW**	A	NO	NC	V AC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail													
Size S00[2)]													
Auxiliary switches can be retrofitted													
9	**4**	18 / 16	--	--	--	24, 50/60 Hz	B	**3RT25 16-1AB00**	0.220	B	**3RT25 16-2AB00**		0.240
						110, 50/60 Hz	B	**3RT25 16-1AF00**	0.220	B	**3RT25 16-2AF00**		0.240
						230, 50/60 Hz	B	**3RT25 16-1AP00**	0.220	B	**3RT25 16-2AP00**		0.240
12	**5.5**[3)]	22 / 20	--	--	--	24, 50/60 Hz	B	**3RT25 17-1AB00**	0.220	B	**3RT25 17-2AB00**		0.240
						110, 50/60 Hz	B	**3RT25 17-1AF00**	0.220	B	**3RT25 17-2AF00**		0.240
						230, 50/60 Hz	B	**3RT25 17-1AP00**	0.220	B	**3RT25 17-2AP00**		0.240
16	**7.5**[3)]	22 / 20	--	--	--	24, 50/60 Hz	B	**3RT25 18-1AB00**	0.220	B	**3RT25 18-2AB00**		0.240
						110, 50/60 Hz	B	**3RT25 18-1AF00**	0.220	B	**3RT25 18-2AF00**		0.240
						230, 50/60 Hz	B	**3RT25 18-1AP00**	0.220	B	**3RT25 18-2AP00**		0.240
Size S0													
Terminal designations according to EN 50011													
1 NO + 1 NC, identification number **11E**													
25	**11**	40 / 35	**11 E**	1	1	24, 50 Hz	B	**3RT25 26-1AB00**	0.430	B	**3RT25 26-2AB00**		0.490
						110, 50 Hz	B	**3RT25 26-1AF00**	0.430	B	**3RT25 26-2AF00**		0.490
						230, 50 Hz	B	**3RT25 26-1AP00**	0.430	B	**3RT25 26-2AP00**		0.490





For other voltages see page 3/17.
For accessories, see page 3/93.
For spare parts, see page 3/110.

1) Single device for pole reversal; not suitable for reversing duty.

2) For size S00: Coil operating range
at 50 Hz: 0.8 ... 1.1 x U_s
at 60 Hz: 0.85 ... 1.1 x U_s.

3) The NC contact can switch up to 4 kW.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

DC operation · DC solenoid system, 2 NO + 2 NC[1)]

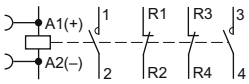
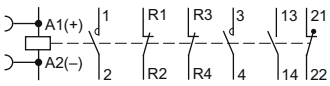
PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

3RT25 1.-1....

3RT25 1.-2....

3RT25 2.-1....

3RT25 2.-2....

Rated data			Auxiliary contacts		Rated control supply voltage U_s	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
AC-2/AC-3, T_u: up to 60 °C		AC-1, T_u: 40/60	Ident. No.	Version									
Operational current I_e	Ratings of induction motors at 50 Hz and	Operational current I_e					Order No.	Price per PU			Order No.	Price per PU	
At 400 V	**400 V**												
A	**kW**	A	NO	NC	V DC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail													
Size S00													
Auxiliary switches can be retrofitted													
													
9	**4**	18 / 16	**--**	--	--	24	B	**3RT25 16-1BB40**	0.280	B	**3RT25 16-2BB40**		0.300
						220	B	**3RT25 16-1BM40**	0.280	B	**3RT25 16-2BM40**		0.300
12	**5.5**[2)]	22 / 20	**--**	--	--	24	B	**3RT25 17-1BB40**	0.280	B	**3RT25 17-2BB40**		0.300
						220	B	**3RT25 17-1BM40**	0.280	B	**3RT25 17-2BM40**		0.300
16	**7.5**[2)]	22 / 20	**--**	--	--	24	B	**3RT25 18-1BB40**	0.280	B	**3RT25 18-2BB40**		0.300
						220	B	**3RT25 18-1BM40**	0.280	B	**3RT25 18-2BM40**		0.300
Size S0													
Terminal designations according to EN 50011													
1 NO + 1 NC, identification number **11E**													
													
20	**11**	40 / 35	**11 E**	1	1	24 DC	B	**3RT25 26-1BB40**	0.620	B	**3RT25 26-2BB40**		0.680
						220 DC	B	**3RT25 26-1BM40**	0.620	B	**3RT25 26-2BM40**		0.680

For other voltages see page 3/17.
For accessories, see page 3/93.
For spare parts, see page 3/110.

[1)] Single device for pole reversal; not suitable for reversing duty.

[2)] The NC contact can switch up to 4 kW.

3RT25 Contactors

4-pole, 2 NO + 2 NC, 4 ... 11 kW

More information

Contactors	Type Size Width	mm	3RT25 16 S00 45	3RT25 17 S00 45	3RT25 18 S00 45	3RT25 26 S0 45
General data						
Permissible mounting position[1]						
Mechanical endurance		Operating cycles	30 million			10 million
Electrical endurance at I_e/AC-1		Operating cycles	Approx. 0.5 million			
Rated insulation voltage U_i (pollution degree 3)		V	690			
Permissible ambient temperature	• During operation • During storage	°C °C	-25 ... +60 -55 ... +80			
Degree of protection acc. to EN 60947-1, Appendix C			IP20			IP20
• Terminal compartment			IP20			IP00
Touch protection acc.to EN 50274			Finger-safe			
Short-circuit protection of contactors without overload relays						
Main circuit						
Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE	• Type of coordination "1" • Type of coordination "2"	A A	35 20			63 35
Acc. to IEC 60947-4-1/EN 60947-4-1	• Weld-free	A	10			16
Control						
Solenoid coil operating range			See 3RT23 16	See 3RT23 17		See 3RT23 26
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)			See 3RT23 16	See 3RT23 17		See 3RT23 26
Operating times for 0.8 ... 1.1 x U_s Total break time = Opening delay + Arcing time			See 3RT23 16	See 3RT23 17		See 3RT23 26
Main circuit						
AC capacity						
Utilization categories AC-1, switching resistive loads						
• Rated operational currents I_e	At 40 °C up to 690 V At 60 °C up to 690 V	A A	18 16	22 20		40 35
• Rated power for AC loads P.f. = 0.95 (at 60 °C)	At 230 V 400 V	kW kW	6.5 11	7.5 13		15 26
• Minimum conductor cross-section for loads with I_e	At 40 °C	mm^2	2.5	2.5		10
Utilization categories AC-2 and AC-3						
• Rated operational currents I_e (at 60 °C)	Up to 400 V	A	9	12	16	25 / 20 [2]
• Rated power for slipring or squirrel-cage motors at 50 and 60 Hz	At 230 V NO contact at 400 V NC contact at 400 V	kW kW kW	3 4 4	3 5.5 4	4 7.5 4	5.5 11 11
Load rating with DC						
Utilization category DC-1, switching resistive load ($L/R \leq 1$ ms)						
• Rated operational currents I_e (at 60 °C)						
- 1 conducting path	Up to 24 V 60 V 110 V 220 V 440 V	A A A A A	16 16 2.1 0.8 0.6	20 20 2.1 0.8 0.6		35 20 4.5 1 0.4
- 2 conducting paths in series	Up to 24 V 60 V 110 V 220 V 440 V	A A A A A	16 16 12 1.6 0.8	20 20 12 1.6 0.8		35 35 35 5 1
Utilization category DC-3/DC-5[3], **shunt-wound and series-wound motors ($L/R \leq 15$ ms)**						
• Rated operational currents I_e (at 60 °C)						
- 1 conducting path	Up to 24 V 60 V 110 V 220 V 440 V	A A A A A	16 0.5 0.15 0.75 --	20 0.5 0.15 0.75 --		20 5 2.5 1 0.09
- 2 conducting paths in series	Up to 24 V 60 V 110 V 220 V 440 V	A A A A A	16 5 0.35 -- --	20 5 0.35 -- --		35 35 15 3 0.27

[1] In accordance with the corresponding 3-pole 3RT2. contactors.

[2] For AC operation: 25 A; for DC operation: 20 A.

[3] For U_s >24 V the rated operational currents I_e for the NC contact conducting paths are 50 % of the values for the NO contact conducting paths.

Overview

DC operation

IEC 60947-4-1, EN 60947-4-1, for requirements according to IEC 60077-1 and IEC 60077-2.

The contactor relays are finger-safe according to EN 50274. The size S00 contactor relays have spring-type connections for all terminals.

Ambient temperature

The permissible ambient temperature for operation of the contactor relays (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 x U_S and are fitted as standard with suppressor diodes to provide protection against overvoltage. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

Contactor relays without series resistor

Control and auxiliary circuits

These contactor relays have an extended operating range from 0.7 to 1.25 x U_S; the solenoid coils are fitted with a suppressor diode. An additional series resistor is not required.

Note:
An additional auxiliary switch block is cannot be mounted.

Side-by-side mounting

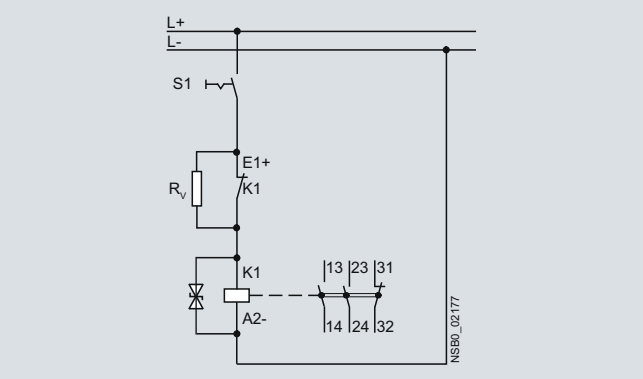
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

Contactor relays with series resistor

Control and auxiliary circuits

The DC solenoid systems of the contactor relays are modified (to hold-in coil) by means of a series resistor.

The size S00 contactor relays are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated.



A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

Side-by-side mounting

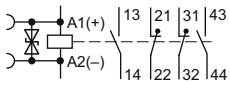
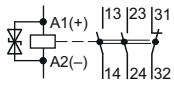
Side-by-side mounting is permitted at ambient temperatures up to 70 °C.

Selection and ordering data

DC operation · DC solenoid system
Spring-type terminals
For screw and snap-on mounting onto standard mounting rail
Solenoid coil fitted with suppressor diode

3RH21 22-2K.40

3RH21 22-2K.40-0LA0

Rated operational current I_e/AC-15/AC-14 T_u: 70 °C at 230 V	400 V	500 V	690 V	Contacts Version NO	NC	Rated control supply voltage U_s	DT	Spring-type terminals Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
A	A	A	A			V DC							kg
3RH21 contactor relays													
Size S00													
Without series resistor													
Terminal designations according to EN 50011													
2 NO + 2 NC, identification number **22E**													
													
10	3	2	1	2	2[1]	24	A	**3RH21 22-2KB40**		1	1 unit	101	0.300
						110	A	**3RH21 22-2KF40**		1	1 unit	101	0.300
With series resistor													
Terminal designations according to EN 50005													
2 NO + 1 NC, identification number **21E**													
													
10	3	2	1	2	1[2]	24	B	**3RH21 22-2KB40-0LA0**		1	1 unit	101	0.300
						110	B	**3RH21 22-2KF40-0LA0**		1	1 unit	101	0.300

[1] It is not possible to mount an auxiliary switch block.
[2] 4-pole auxiliary switch block according to EN 50005 cam be mounted.

More information

Contactors	Type		3RH21 ..
Upright mounting position			
• Contactors with series resistor			Special version (on request)
• Contactors without series resistor			Special version (on request)
Ambient temperature			
• During operation		°C	-40 ... +70
• During storage		°C	-55 ... +80
Solenoid coil operating range	DC		0.7 ... 1.25 x U_S
Power consumption of the solenoid coils			For cold coil and 1.0 x U_S
• Contactors with series resistor	- Closing	W	13
	- Closed	W	4
• Contactors without series resistor	- Closing	W	2.8
	- Closed	W	2.8

All specifications and technical specifications not mentioned here are identical to those of the standard contactor relays.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Contactors with Extended Operating Range 0.7 ... 1.25 x U_S, for Railway Applications

Overview

DC operation

IEC 60947-4-1, EN 60947-4-1,
for requirements according to IEC 60077-1 and IEC 60077-2.

The contactors are finger-safe according to EN 50274. The contactors have spring-type connections as well as screw connections. The size S00 and S0 contactors have spring-type connections for all terminals.

Ambient temperature

The permissible ambient temperature for operation of the contactors (across the full coil operating range) is -40 to +70 °C.

Uninterrupted duty at temperatures > +60 °C reduces the mechanical endurance, the current carrying capacity of the conducting paths and the switching frequency.

Control and auxiliary circuits

The solenoid coils of the contactor relays have an extended coil operating range from 0.7 to 1.25 or 1.3 x U_S and are fitted as standard with suppressor diodes. The opening delay is consequently 2 to 5 ms longer than for standard contactors.

Application

For operation in installations which are subject both to considerable variations in the control voltage and to high ambient temperatures, e. g. railway applications under extreme climatic conditions, rolling mills, etc.

Also for control supply voltages with battery buffer for longer operating times should the battery charging fail.

Contactors without series resistor

Control and auxiliary circuits

These contactors have an extended operating range from 0.7 to 1.25 x U_S; on size S00 the coils are fitted with suppressor diodes, on size S0 with varistors. An additional series resistor is not required.

Note:
An additional auxiliary switch block is cannot be mounted.

Side-by-side mounting

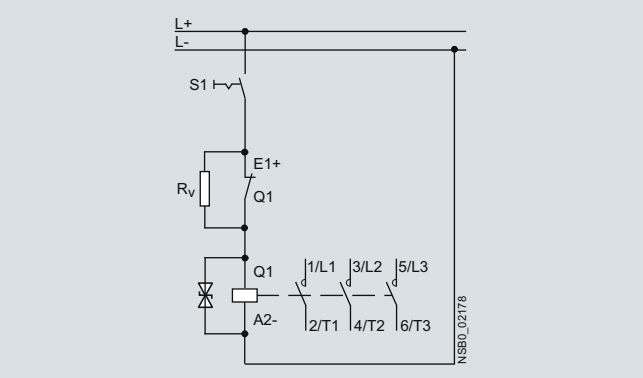
A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C ≤ 70 °C.

3RT20 1. contactors with series resistor

Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.25 x U_S and are fitted as standard with suppressor diodes to provide protection against overvoltage.

The DC solenoid systems of the contactors are modified (to holding excitation) by means of a series resistor.



The size S00 contactors are supplied prewired with a plug-on module containing the series resistor. The suppressor diode is integrated. A 4-pole auxiliary switch block (according to EN 50005) can be fitted additionally.

A circuit diagram showing the terminals is stuck onto each contactor. One NC of the auxiliary contacts is required for the series resistor function. The selection and ordering data shows the number of additional, unassigned auxiliary contacts. With size S00 it is possible to extend the number of auxiliary contacts.

Side-by-side mounting

At ambient temperatures up to 70 °C, the size S00 contactors and contactor relays are allowed to be mounted side by side.

3RT20 2. contactors with solid-state operating mechanism, extended operating range

Control and auxiliary circuits

The solenoid coils of the contactors have an extended coil operating range from 0.7 to 1.3 x U_S and are fitted as standard with varistors to provide protection against overvoltage.

The contactors are energized via upstream control electronics which ensure the coil operating range of 0.7 to 1.3 x U_S at an ambient temperature of 70 °C. They are supplied as complete units with integrated coil electronics. A varistor is integrated for damping opening surges in the coil.

The mounting possibilities for auxiliary switches correspond to those of the standard contactors for switching motors in the matching size (see page 3/6).

Side-by-side mounting

Side-by-side mounting is permitted at ambient temperatures up to 70 °C for these contactor versions in size S0.

Contactors with Extended Operating Range 0.7 ... 1.25 x U_s, for Railway Applications

3RT20 motor contactors, 5.5 ... 18.5 kW

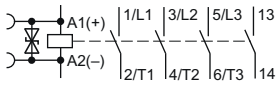
Selection and ordering data

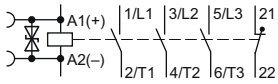
DC operation · DC solenoid system
Spring-type terminals
For screw and snap-on mounting onto standard mounting rail
Solenoid coil fitted with suppressor diode (S00)

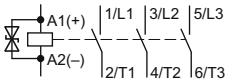
3RT20 1.-2K.4.

3RT20 1.-2K.42-0LA0

Rated data AC-2 and AC-3 T_u: 70 °C					Auxiliary contacts			Rated control supply voltage U_s	DT	Spring-type terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Operational current I_e at	Ratings of induction motors at				Ident. No.	Version									
400 V	230 V	**400 V**	500 V	690 V		NO	NC			Order No.	Price per PU				
A	kW	**kW**	kW	kW				V DC							kg
3RT20 contactors for switching motors															
Size S00															
Without series resistor															
Terminal designations according to EN 50012 or EN 50005															
• 1 NO, identification number **10E**															
12	3	**5.5**	5.5	5.5	**10E**[1]	1	--	24	A	**3RT20 17-2KB41**		1	1 unit	101	0.300
								110	B	**3RT20 17-2KF41**		1	1 unit	101	0.300
12	3	**5.5**	5.5	5.5	**01**[1]	--	1	24	A	**3RT20 17-2KB42**		1	1 unit	101	0.300
								110	B	**3RT20 17-2KF42**		1	1 unit	101	0.300
With series resistor															
12	3	**5.5**	5.5	5.5	--[2]	--	1[3]	24	B	**3RT20 17-2KB42-0LA0**		1	1 unit	101	0.300
								110	B	**3RT20 17-2KF42-0LA0**		1	1 unit	101	0.300
16	4	**7.5**	10	11	--[2]	--	1[3]	24	B	**3RT20 18-2KB42-0LA0**		1	1 unit	101	0.300
								110	B	**3RT20 18-2KF42-0LA0**		1	1 unit	101	0.300







For spare parts, see page 3/93.

1) It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

2) One 4-pole auxiliary switch block according to EN 50005 can be mounted; no distance required up to 70 °C.

3) NC contact cannot be used because it is required for switching the series resistor.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Contactors with Extended Operating Range 0.7 ... 1.25 x U_s, for Railway Applications

3RT20 motor contactors, 5.5 ... 18.5 kW

DC operation · DC solenoid system
Spring-type terminals
For screw and snap-on mounting onto standard mounting rail
Solenoid coil fitted with varistor (S0)

3RT20 2.-2K.40

3RT20 2.-2X.40-0LA2

Rated data AC-2 and AC-3 T_u: 70 °C					Auxiliary contacts			Rated control supply voltage U_s	DT	Spring-type terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Operational current I_e at	Ratings of induction motors at				Ident. No.	Version									
400 V	230 V	**400 V**	500 V	690 V		NO	NC			Order No.	Price per PU				
A	kW	**kW**	kW	kW				V DC							kg
3RT20 contactors for switching motors															
Size S0															
Terminal designations according to EN 50012															
1 NO + 1 NC, identification number **11E**															
Without series resistor[1]															
16	4	**7.5**	10	11	**11E**	1	1	24	B	**3RT20 25-2KB40**		1	1 unit	101	0.600
								110	B	**3RT20 25-2KF40**		1	1 unit	101	0.600
25	5.5	**11**	11	11	**11E**	1	1	24	B	**3RT20 26-2KB40**		1	1 unit	101	0.600
								110	B	**3RT20 26-2KF40**		1	1 unit	101	0.600
32	7.5	**15**	18.5	18.5	**11E**	1	1	24	B	**3RT20 27-2KB40**		1	1 unit	101	0.600
								110	B	**3RT20 27-2KF40**		1	1 unit	101	0.600
With solid-state operating mechanism															
16	4	**7.5**	10	11	**11E**	1	1	24	B	**3RT20 25-2XB40-0LA2**		1	1 unit	101	0.580
								110	B	**3RT20 25-2XF40-0LA2**		1	1 unit	101	0.580
25	5.5	**11**	11	11	**11E**	1	1	24	B	**3RT20 26-2XB40-0LA2**		1	1 unit	101	0.580
								110	B	**3RT20 26-2XF40-0LA2**		1	1 unit	101	0.580
32	7.5	**15**	18.5	18.5	**11E**	1	1	24	B	**3RT20 27-2XB40-0LA2**		1	1 unit	101	0.580
								110	B	**3RT20 27-2XF40-0LA2**		1	1 unit	101	0.580
38	7.5	**18.5**	18.5	18.5	**11E**	1	1	24	B	**3RT20 28-2XB40-0LA2**		1	1 unit	101	0.580
								110	B	**3RT20 28-2XF40-0LA2**		1	1 unit	101	0.580

For spare parts, see page 3/93.

[1] It is not possible to mount an auxiliary switch block. A clearance of 10 mm is required for side-by-side mounting at ambient temperatures > 60 °C.

More information

Contactors	Type		3RT20 17	3RT20 2.	3RT20 2.-2XB40-0LA2	3RT20 2.-2XF40-0LA2
Ambient temperature						
• During operation		°C	-40 ... +70			
• During storage		°C	-55 ... +80			
Solenoid coil operating range	DC		0.7 ... 1.25 x U_s		0.7 ... 1.3 x U_s	
Power consumption of the solenoid coils			For cold coil and 1.0 x U_s			
• Contactors with series resistor	- Closing	W	13	--	--	--
	- Closed	W	4	--	--	--
• Contactors without series resistor	- Closing	W	2.8	4.5	--	--
	- Closed	W	2.8	4.5	--	--
• Contactors with solid-state operating mechanism	- Closing	W	--	--	6.7	13.2
	- Closed	W	--	--	0.8	1.56

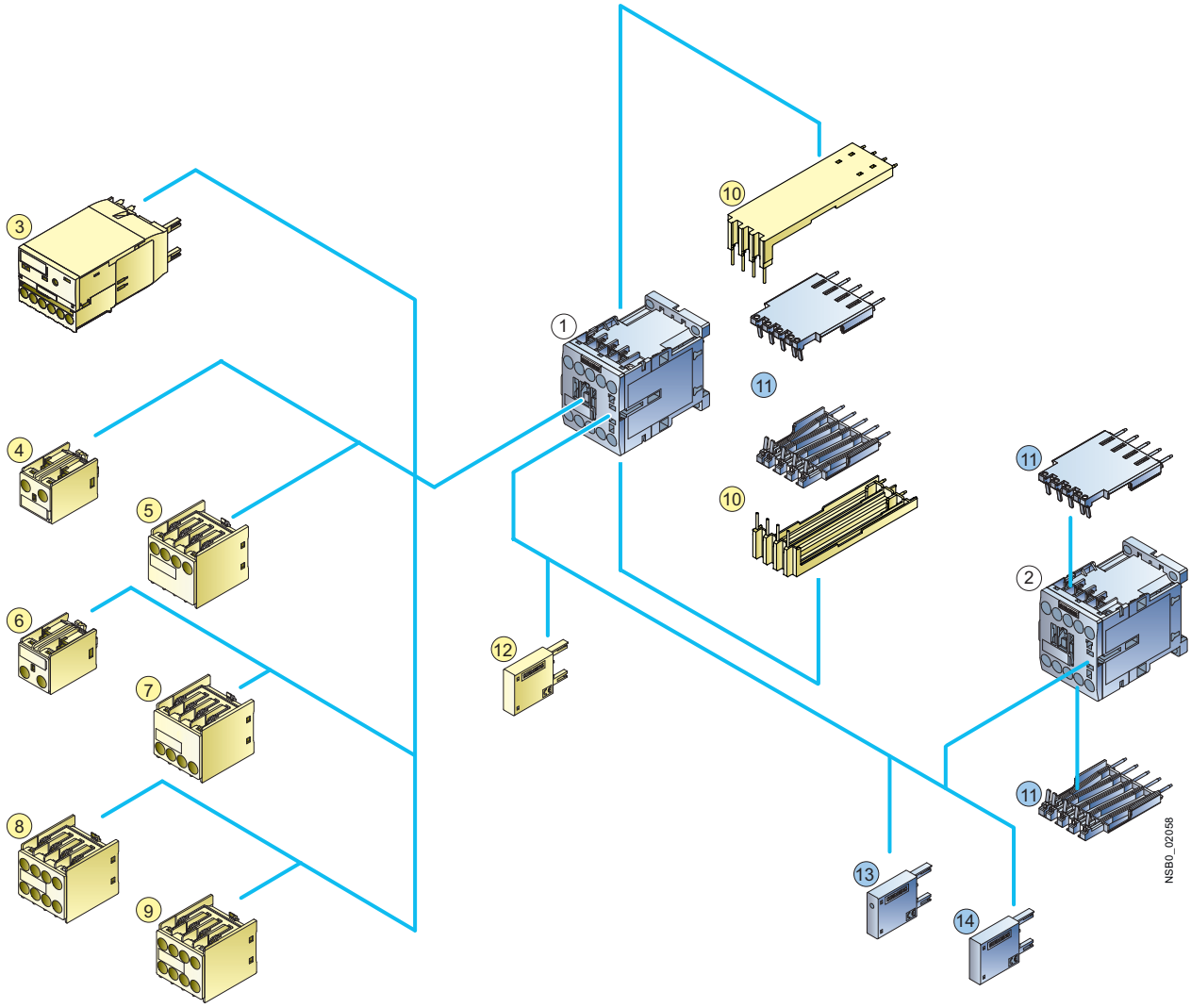
All specs and technical specs not mentioned here are identical to those of the standard contactors for switching motors.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

3RH2 contactor relays, 4- and 8-pole

Overview

Contactor relays and coupling relays
Size S00 with accessories



1. Contactor relay
2. Coupling relay for auxiliary circuits
3. Solid-state timing relay block
4. 1-pole auxiliary switch block, cable entry from above
5. 2-pole auxiliary switch block, cable entry from above
6. 1-pole auxiliary switch block, cable entry from below
7. 2-pole auxiliary switch block, cable entry from below
8. 4-pole auxiliary switch block (terminal designations according to EN 50011 or EN 50005)
9. 2-pole auxiliary switch block, solid-state compatible version Terminal designations according to EN 50005
10. Solder pin adapter for contactor relays with 4-pole auxiliary switch block
11. Solder pin adapter for contactor relays and coupling relays
12. Additional load module for increasing the permissible residual current
13. Surge suppressor with LED
14. Surge suppressor without LED

AC and DC operation

IEC 60947, EN 60947.

The 3RH2 contactor relays have screw, ring terminal lug or spring-type terminals. Four contacts are available in the basic unit.

The 3RH2 contactor relays are suitable for use in any climate. They are finger-safe according to EN 50274. The devices with ring terminal lug connection comply with degree of protection IP20 when fitted with the related terminal cover.

Contact reliability

High contact stability at low voltages and currents, suitable for solid-state circuits with currents ≥ 1 mA at a voltage of 17 V.

Surge suppression

RC elements, varistors, diodes or diode assemblies (combination of a diode and a Zener diode) can be plugged onto all contactor relays from the front for damping opening surges in the coil. The plug-in direction is determined by a coding device.

Note:
The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Auxiliary switch blocks

The 3RH2 contactor relays can be expanded by up to four contacts by the addition of snap-on auxiliary switch blocks.

The auxiliary switch block can easily be snapped onto the front of the contactors. The auxiliary switch block has a centrally positioned release lever for disassembly.

The contactor relays with 4 contacts according to EN 50011, with the identification number 40E, can be extended with 80E to 44E auxiliary switch blocks to obtain contactor relays with 8 contacts according to EN 50011. The identification numbers 80E to 44E on the auxiliary switch blocks apply to the complete contactors. These auxiliary switch blocks (3RH29 11–1GA..) cannot be combined with contactor relays with identification numbers 31E and 22E; they are coded.

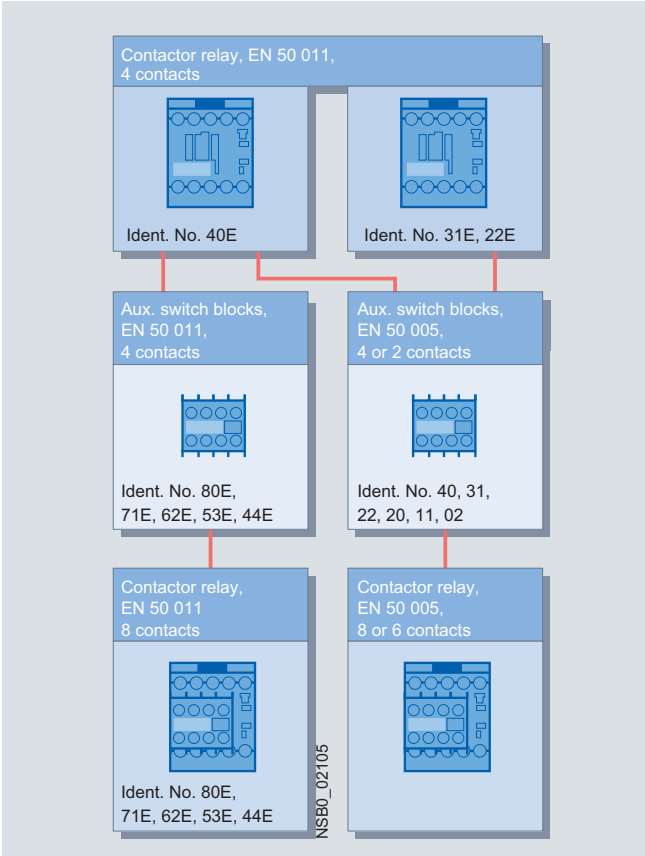
All contactor relays with 4 contacts according to EN 50011, identification numbers 40E to 22E, can be extended with auxiliary switch blocks 40 to 02 to obtain contactor relays with 6 or 8 contacts in accordance with EN 50005. The identification numbers on the auxiliary switch blocks apply only to the attached auxiliary switch blocks.

3RH2 contactor relays, 4- and 8-pole

In addition, fully mounted 3RH22 8-pole contactor relays are available; the mounted 4-pole auxiliary switch block in the 2nd tier is not removable. The terminal designations are according to EN 50011.

These versions are built according to special Swiss regulations SUVA and are distinguished externally by a red labeling plate.

Of the auxiliary contacts (integrated plus mountable) possible on the device, no more than four NC contacts are permitted.



Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
SIRIUS contactor relays	**3 R H**															
2nd generation		**2**														
Device type (e. g. 1 = 4-pole contactor relay, 3 = 8-pole contactor relay)			□													
Number of NO contacts (e. g. 2 = 2 NO)				□												
Number of NC contacts (e. g. 2 = 2 NC)					□											
Connection type (1 = screw, 2 = spring)							□									
Operating range / solenoid coil circuit (e. g. A = AC standard / without)								□								
Rated control supply voltage (e. g. P0 = 230 V, 50 Hz)									□	□						
No significance											□					
Special version													□	□	□	□
Example	**3 R H**	**2**	**1**	**2**	**2**	**–**	**1**	**A**	**P**	**0**	**0**					

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

3RH2 contactor relays, 4- and 8-pole

Selection and ordering data

AC operation

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

Size S00

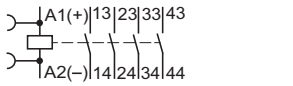

3RH21 ..-1....

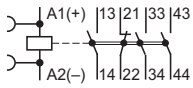

3RH21 ..-2....

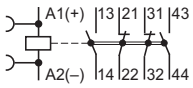

3RH22 ..-1....

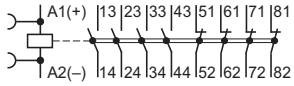

3RH22 ..-2....

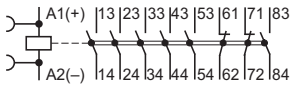
Rated operational current I_e/AC-15/AC-14 at **230 V**	Contacts Ident. No.	Version		Rated control supply voltage U_s at 50/60 Hz[2]	DT	**Screw terminals**[1] Order No.	Price per PU	Weight per PU approx.	DT	**Spring-type terminals** Order No.	Price per PU	Weight per PU approx.
A		NO	NC	V AC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail												
Terminal designations according to EN 50011												
4 NO, identification number **40E**				3 NO + 1 E, identification number **31E**					2 NO + 2 NE, identification number **22E**			
10	**40E**	4	--	24	A	**3RH21 40-1AB00**		0.220	B	**3RH21 40-2AB00**		0.240
				110	A	**3RH21 40-1AF00**		0.220	B	**3RH21 40-2AF00**		0.240
				230	A	**3RH21 40-1AP00**		0.220	A	**3RH21 40-2AP00**		0.240
	31E	3	1	24	A	**3RH21 31-1AB00**		0.220	B	**3RH21 31-2AB00**		0.240
				110	A	**3RH21 31-1AF00**		0.220	A	**3RH21 31-2AF00**		0.240
				230	A	**3RH21 31-1AP00**		0.220	A	**3RH21 31-2AP00**		0.240
	22E	2	2	24	A	**3RH21 22-1AB00**		0.220	B	**3RH21 22-2AB00**		0.240
				110	A	**3RH21 22-1AF00**		0.220	A	**3RH21 22-2AF00**		0.240
				230	A	**3RH21 22-1AP00**		0.220	A	**3RH21 22-2AP00**		0.240
• **With permanently mounted auxiliary switch block**												
4 NO + 4 NC, identification number **44E**				6 NO + 2 NC, identification number **62E**								
10[3]	**44E**	4	4	230	B	**3RH22 44-1AP00**		0.270	B	**3RH22 44-2AP00**		0.300
	62E	6	2	230	B	**3RH22 62-1AP00**		0.270	B	**3RH22 62-2AP00**		0.300











For other voltages see page 3/62, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories see pages 3/93 to 3/97.

1) The 3RH21 contactor relays are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

2) Coil operating range
at 50 Hz: 0.8 to 1.1 x U_s
at 60 Hz: 0.85 to 1.1 x U_s.

3) For AC-15/AC-14 the following applies: I_e = 6 A for mounted auxiliary contacts.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

DC operation · DC solenoid system

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

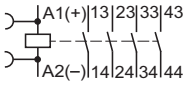
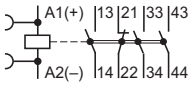
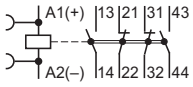
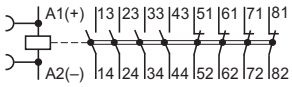
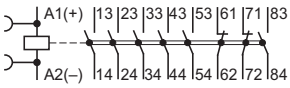
Size S00

3RH21 ..-1....

3RH21 ..-2....

3RH22 ..-1....

3RH22 ..-2....

Rated operational current I_e/AC-15/AC-14 at **230 V**	Contacts Ident. No.	Version NO	Version NC	Rated control supply voltage U_s	DT	**Screw terminals**[1] Order No.	Price per PU	Weight per PU approx.	DT	**Spring-type terminals** Order No.	Price per PU	Weight per PU approx.
A		NO	NC	V DC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail												
Terminal designations according to EN 50011												
4 NO, identification number **40E**				3 NO + 1 E, identification number **31E**						2 NO + 2 NE, identification number **22E**		
												
10	**40E**	4	--	24	A	**3RH21 40-1BB40**		0.280	A	**3RH21 40-2BB40**		0.300
				220	A	**3RH21 40-1BM40**		0.280	B	**3RH21 40-2BM40**		0.300
	31E	3	1	24	A	**3RH21 31-1BB40**		0.280	A	**3RH21 31-2BB40**		0.300
				220	A	**3RH21 31-1BM40**		0.280	B	**3RH21 31-2BM40**		0.300
	22E	2	2	24	A	**3RH21 22-1BB40**		0.280	A	**3RH21 22-2BB40**		0.300
				220	A	**3RH21 22-1BM40**		0.280	B	**3RH21 22-2BM40**		0.300
• **With permanently mounted auxiliary switch block**												
4 NO + 4 NC, identification number **44E**				6 NO + 2 NC, identification number **62E**								
												
10[2]	**44E**	4	4	24	A	**3RH22 44-1BB40**		0.330	B	**3RH22 44-2BB40**		0.350
	62E	6	2	24	A	**3RH22 62-1BB40**		0.330	B	**3RH22 62-2BB40**		0.350

For other voltages see page 3/62, for contactors with permanently mounted auxiliary switch block please inquire.

For accessories see pages 3/93 to 3/97.

[1] The 3RH21 contactor relays are also available with ring terminal lug connection. Please contact your local Siemens representative for information about the special contactor versions with ring terminal lug connection.

[2] For AC-15/AC-14 the following applies: I_e = 6 A for mounted auxiliary contacts.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RH2 contactor relays, 4- and 8-pole

Rated control supply voltages (the 10th and 11th position of the order number must be changed)

	Contactor type	**3RH21**
Rated control supply voltage U_s	Control supply voltage at	
AC operation		
Solenoid coils for 50/60 Hz and 60 Hz		
50/60 Hz[1)]	**60 Hz**	
24 V AC	--	B0
42 V AC	--	D0
48 V AC	--	H0
110 V AC	--	F0
220 V AC	--	N2
230 V AC	--	P0
400 V AC	--	V0
Solenoid coils for USA and Canada[2)]		
50 Hz	**60 Hz**	
110 V AC	120 V AC	K6
220 V AC	240 V AC	P6
Solenoid coils for Japan[3)]		
50/60 Hz	**60 Hz**	
100 V AC	110 V AC	G6
200 V AC	220 V AC	N6
400 V AC	440 V AC	R6
DC operation		
12 V DC		A4
24 V DC		B4
42 V DC		D4
48 V DC		W4
60 V DC		E4
110 V DC		F4
125 V DC		G4
220 V DC		M4
230 V DC		P4

1) Coil operating range
at 50 Hz: 0.8 to 1.1 x U_s
at 60 Hz: 0.85 to 1.1 x U_s.

2) Coil operating range
at 50 Hz: 0.85 to 1.1 x U_s
at 60 Hz: 0.8 to 1.1 x U_s.

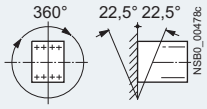
3) Coil operating range
at 50/60 Hz: 0.85 to 1.1 x U_s
at 60 Hz: 0.8 to 1.1 x U_s.

More information

Contactor	Type		**3RH2**
	Size		**S00**
	Width	mm	**45**

Permissible mounting position

The contactors are designed for operation on a vertical mounting surface.



Upright mounting position

Special version required

(for coupling relays and contactor relays with extended operating range 3RH21 22-2K.40, please ask)

Positively-driven operation of contacts in contactor relays

3RH2:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (removable) acc. to:
- ZH 1/457
- EN 60947-5-1, Appendix L

3RH22:
Yes, in the basic unit and the auxiliary switch block as well as between the basic unit and the snap-on auxiliary switch block (permanently mounted) acc. to:
- ZH 1/457
- EN 60947-5-1, Appendix L

Note:
3RH29 11-.NF. solid-state compatible auxiliary switch blocks have no positively-driven contacts.

Explanations:
There is positively-driven operation if it is ensured that the NC and NO contacts cannot be closed at the same time.

ZH1/457
Safety Rules for Controls on Power-Operated Metalworking Presses.

EN 60947-5-1, Appendix L
Low-Voltage Controlgear, Controls and Contact Blocks. Special requirements for positively-driven contacts

Contact reliability

Contact reliability at 17 V, 1 mA acc. to EN 60947-5-4

Frequency of contact faults $<10^{-8}$, i. e. <1 fault per 100 million operating cycles

Contact endurance for AC-15/AC-14 and DC-13 utilization categories

The contact endurance is mainly dependent on the breaking current. It is assumed that the operating mechanisms are switched randomly, i. e. not synchronized with the phase angle of the supply system.

If magnetic circuits other than the contactor coil systems or solenoid valves are present, e. g. magnetic brakes, protective measures for the load circuits are necessary, e.g. in the form of RC elements and free-wheel diodes.

The characteristic curves apply to:

- 3RH21/3RH22 contactor relays
- 3RH24 latched contactor relays
- 3RH29 11 auxiliary switch blocks[1)]
- Auxiliary switch blocks for snapping onto the front, max. 4-pole and for mounting onto the side in size S00

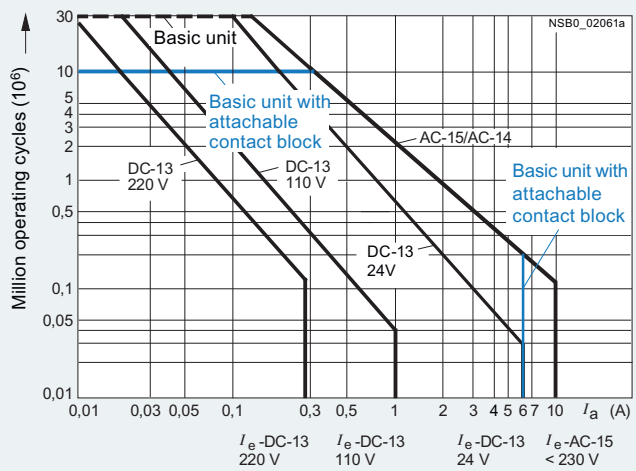
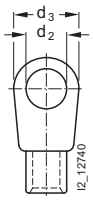


Diagram legend:
I_a = Breaking current
I_e = Rated operational current

[1)] I_e = 6 A at AC-14/AC-15.

3RH2 contactor relays, 4- and 8-pole

Contactors	Type		3RH21, 3RH22	3RH24
	Size		S00	S00
	Width	mm	45	45
General data				
Mechanical endurance	• Basic units	Operating cycles	30 million	5 million
	• Basic unit with snap-on auxiliary switch block	Operating cycles	10 million	
	• Solid-state compatible auxiliary switch block	Operating cycles	5 million	
Rated insulation voltage U_i (pollution degree 3)		V	690	
Rated impulse withstand voltage U_{imp}		kV	6	
Protective separation between the coil and the contacts in the basic unit acc. to EN 60947-1, Appendix N		V	400	
Permissible ambient temperature	• During operation • During storage	°C °C	-25 ... +60 -55 ... +80	
Degree of protection acc. to EN 60947-1, Appendix C			IP20, coil assembly IP40	
Touch protection acc.to EN 50274			Finger-safe	
Shock resistance				
• Rectangular pulse	- AC operation - DC operation	g/ms g/ms	7.3/5 and 4.7/10 >10/5 and >5/10	
• Sine pulse	- AC operation - DC operation	g/ms g/ms	11.4/5 and 7.3/10 >15/5 and >8/10	
Short-circuit protection				
(weld-free protection at I_k ≥1 kA)				
• Fuse links, gG operational class - DIAZED, Type 5SB - NEOZED, Type 5SE		 A A	 10 10	
• Or miniature circuit breakers with C characteristic (short-circuit current I_k < 400 A)		A	6	
Conductor cross-sections				
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			**Screw terminals**	
• Solid		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1] acc. to IEC 60947; max. 2 x (0.5 ... 4)	
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)[1]; 2 x (0.75 ... 2.5)[1]	
• AWG cables, solid or stranded		AWG	2 x (20 ... 16)[1]; 2 x (18 ... 14)[1]	
• Terminal screw - Tightening torque		 Nm	M3 (for standard screwdriver size 2 and Pozidriv 2) 0.8 ... 1.2 (7 ... 10.3 lb.in)	
Auxiliary conductors and coil terminals (1 or 2 conductors can be connected)			**Spring-type terminals**	
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5	
• Solid		mm^2	2 x (0.5 ... 4)	
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 2.5)	
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 2.5)	
• AWG cables, solid or stranded		AWG	2 x (20 ... 12)	
Auxiliary conductors for front and laterally mounted auxiliary switches				
• Operating devices		mm	3.0 x 0.5; 3.5 x 0.5	
• Solid		mm^2	2 x (0.5 ... 2.5)	
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)	
• Finely stranded without end sleeve		mm^2	2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)	
Auxiliary conductor and coil terminals			**Ring terminal lug connections**	
• Terminal screw		mm	M3, Pozidriv size 2	
• Operating devices		Nm	Ø 5 ... 6	
• Tightening torque		mm	0.8 ... 1.2	
• Usable ring terminal lugs - DIN 46234 without insulation sleeve - DIN 46225 without insulation sleeve - DIN 46237 with insulation sleeve - JIS C2805 Type R without insulation sleeve - JIS C2805 Type RAV with insulation sleeve - JIS C2805 Type RAP with insulation sleeve		mm mm	d_2 = min. 3.2 d_3 = max. 7.5	



For tool for opening the spring-type terminals see Accessories, page 3/104

An insulation stop must be used for conductor cross-sections ≤ 1 mm^2 (see Accessories on page 3/104).

Note:
Maximum external diameter of the conductor insulation: 3.6 mm.

[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Contactors	Type		**3RH2.**
	Size		**S00**
	Width	mm	**45**
Control			
Solenoid coil operating range			
• AC operation	At 50 Hz At 60 Hz		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s
• DC operation	At +50 °C At +60 °C		0.8 ... 1.1 x U_s 0.85 ... 1.1 x U_s
Power consumption of the solenoid coils (when coil is cold and 1.0 x U_s)			
• AC operation, 50 Hz	- Closing - Closed	VA/p.f. VA/p.f.	37/0.8 5.7/0.25
• AC operation, 60 Hz	- Closing - Closed	VA/p.f. VA/p.f.	33/0.75 4.4/0.25
• DC operation	- Closing = Closed	W	4.0
Permissible residual current of the electronics (with 0 signal)			
	• For AC operation[1)] • For DC operation		< 4 mA x (230 V/U_s) < 10 mA x (24 V/U_s)
Operating times[2)] (Total break time = OFF-delay + Arcing time)			
AC operation	Values apply with coil in cold state and at operating temperature for operating range		
• Closing			
- ON-delay of NO contact	0.8 ... 1.1 x U_s 1.0 x U_s 3RH24 minimum operating time	ms ms ms	8 ... 33 9 ... 22 ≥ 35
- OFF-delay of NC contact	0.8 ... 1.1 x U_s 1.0 x U_s	ms ms	6 ... 25 6.5 ... 19
• Opening			
- OFF-delay of NO contact	0.8 ... 1.1 x U_s 1.0 x U_s 3RH24 minimum operating time	ms ms ms	4 ... 15 4.5 ... 15 ≥ 30
- ON-delay of NC contact	0.8 ... 1.1 x U_s 1.0 x U_s	ms ms	5 ... 15 5 ... 15
DC operation			
• Closing			
- ON-delay of NO contact	0.8 ... 1.1 x U_s 1.0 x U_s 3RH24 minimum operating time	ms ms ms	30 ... 100 35 ... 50 ≥ 100
- OFF-delay of NC contact	0.8 ... 1.1 x U_s 1.0 x U_s	ms ms	25 ... 90 30 ... 45
• Opening			
- OFF-delay of NO contact	0.8 ... 1.1 x U_s 1.0 x U_s 3RH24 minimum operating time	ms ms ms	7 ... 13 7 ... 12 ≥ 30
- ON-delay of NC contact	0.8 ... 1.1 x U_s 1.0 x U_s	ms ms	13 ... 19 13 ... 18
• Arcing time		ms	10 ... 15

Dependence of the switching frequency z' on the operational current I' and operational voltage U':

$z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$

1) The 3RT29 16-1GA00 additional load module is recommended for higher residual currents (see page 3/101).

2) The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

3RH2 contactor relays, 4- and 8-pole

Contactors	Type			3RH2.
	Size			S00
	Width		mm	45
Load side				
Rated operational currents I_e				
AC-12			A	10[1)]
AC-15/AC-14 For rated operational voltage U_s		Up to 230 V	A	10[1)]
		400 V	A	3
		500 V	A	2
		690 V	A	1
DC-12 For rated operational voltage U_s				
• 1 conducting path		24 V	A	6
		60 V	A	6
		110 V	A	3
		220 V	A	1
		440 V	A	0.3
		600 V	A	0.15
• 2 conducting paths in series		24 V	A	10
		60 V	A	10
		110 V	A	4
		220 V	A	2
		440 V	A	1.3
		600 V	A	0.65
• 3 conducting paths in series		24 V	A	10
		60 V	A	10
		110 V	A	10
		220 V	A	3.6
		440 V	A	2.5
		600 V	A	1.8
DC-13 For rated operational voltage U_s				
• 1 conducting path		24 V	A	6
		60 V	A	2
		110 V	A	1
		220 V	A	0.3
		440 V	A	0.14
		600 V	A	0.1
• 2 conducting paths in series		24 V	A	10
		60 V	A	3.5
		110 V	A	1.3
		220 V	A	0.9
		440 V	A	0.2
		600 V	A	0.1
• 3 conducting paths in series		24 V	A	10
		60 V	A	4.7
		110 V	A	3
		220 V	A	1.2
		440 V	A	0.5
		600 V	A	0.26
Switching frequency z				
• In operating cycles/h		AC-12/DC-12	h^{-1}	1000
during rated operation		AC-15/AC-14	h^{-1}	1000
for utilization category		DC-13	h^{-1}	1000
• No-load switching frequency			h^{-1}	10000
Dependence of the switching frequency z' on the operational current I' and operational voltage U': $z' = z \cdot I_e/I' \cdot (U_e/U')^{1.5} \cdot 1/h$				
CSA and UL rated data				
Basic units and auxiliary switch blocks				
• Rated control supply voltage			V AC	Max. 600
• Rated voltage			V AC	600
• Switching capacity				A 600, Q 600
• Uninterrupted current at 240 V AC			A	10

1) Attachable auxiliary switch: I_e = 6A for AC-15/AC-14.

Overview

AC and DC operation

IEC 60947, EN 60947.

The terminal designations comply with EN 50011.

The contactor coil and the coil of the release solenoid are both designed for uninterrupted duty.

The number of auxiliary contacts can be extended by means of front auxiliary switch blocks (up to 4 poles).

RC elements, varistors diodes or diode assemblies can be fitted to both coils from the front for damping opening surges in the coil.

The contactor relay can also be switched on and released manually (for minimum actuating times, see Technical Specifications on page 3/65).

Selection and ordering data

3RH24 . . -1. . . .

Rated operational current I_e/AC-15/AC-14 at **230 V**	Contacts Ident. No. acc. to EN 50011	Version		Rated control supply voltage U_s	DT	**Screw terminals** Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
A		NO	NC	V							kg
With screw terminals · For screw and snap-on mounting onto TH 35 standard mounting rail											
Terminal designations according to EN 50011											
4 NO, identification number **40E**		3 NO + 1 E, identification number **31E**				2 NO + 2 NE, identification number **22E**					
AC operation											
				AC 50/60 Hz[1]							
10	**40 E**	4	--	24	B	**3RH24 40-1AB00**		1	1 unit	101	0.380
				110	B	**3RH24 40-1AF00**		1	1 unit	101	0.380
				230	B	**3RH24 40-1AP00**		1	1 unit	101	0.380
	31 E	3	1	24	B	**3RH24 31-1AB00**		1	1 unit	101	0.380
				110	B	**3RH24 31-1AF00**		1	1 unit	101	0.380
				230	B	**3RH24 31-1AP00**		1	1 unit	101	0.380
	22 E	2	2	24	B	**3RH24 22-1AB00**		1	1 unit	101	0.380
				110	B	**3RH24 22-1AF00**		1	1 unit	101	0.380
				230	B	**3RH24 22-1AP00**		1	1 unit	101	0.380
DC operation · DC solenoid system											
				DC							
10	**40 E**	4	--	24	B	**3RH24 40-1BB40**		1	1 unit	101	0.500
				110	B	**3RH24 40-1BF40**		1	1 unit	101	0.500
				220	B	**3RH24 40-1BM40**		1	1 unit	101	0.500
	31 E	3	1	24	B	**3RH24 31-1BB40**		1	1 unit	101	0.500
				110	B	**3RH24 31-1BF40**		1	1 unit	101	0.500
				220	B	**3RH24 31-1BM40**		1	1 unit	101	0.500
	22 E	2	2	24	B	**3RH24 22-1BB40**		1	1 unit	101	0.500
				110	B	**3RH24 22-1BF40**		1	1 unit	101	0.500
				220	B	**3RH24 22-1BM40**		1	1 unit	101	0.500

For accessories see pages 3/93 to 3/97.

[1] Coil operating range
at 50 Hz: 0.8 to 1.1 x U_s
at 60 Hz: 0.85 to 1.1 × U_s.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RH21 coupling relays for switching auxiliary circuits, 4-pole

Application

DC operation

IEC 60947, EN 60947.

The 3RH21 coupling relays for switching auxiliary circuits are tailored to the special requirements of working with electronic controls.

The 3RH21 coupling relays cannot be extended with auxiliary switch blocks.

Coupling relays have a low power consumption and an extended solenoid coil operating range.

Depending on the version, the solenoid coils are supplied either without overvoltage damping (versions 3RH21 ..-.HB40 or 3RH21 ..-.MB40-0KT0) or with a diode or suppressor diode connected as standard.

Selection and ordering data

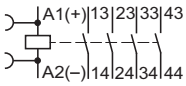
DC operation
Low power consumption
Extended operating range of the solenoid coil
Integrated coil circuit

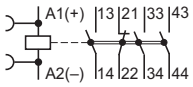
PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

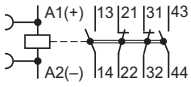
3RH21 ..-1.B40

3RH21 ..-2.B40

Rated operational current I_e/AC-15/AC-14 at **230 V**	Auxiliary contacts Ident. No. acc. to EN 50011	Version		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
					Order No.	Price per PU			Order No.	Price per PU	
A		NO	NC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail											
Size S00											
Diode, varistor or RC element, attachable											
Terminal designations according to EN 50011 (no auxiliary switch blocks can be attached)											
4 NO, identification number **40E**											
3 NO + 1 NC, identification number **31E**											
2 NO + 2 NC, identification number **22E**											
Rated control supply voltage U_s = 24 V DC, operating range **0.7 to 1.25 x U_s** Power consumption of the coils **2.8 W** at 24 V											
10	**40E**	4	--	B	**3RH21 40-1HB40**		0.280	B	**3RH21 40-2HB40**		0.300
	31E	3	1	B	**3RH21 31-1HB40**		0.280	B	**3RH21 31-2HB40**		0.300
	22E	2	2	B	**3RH21 22-1HB40**		0.280	B	**3RH21 22-2HB40**		0.300
Rated control supply voltage U_s = 24 V DC, operating range **0.85 to 1.85 x U_s** Power consumption of the coils **1.6 W** at 24 V											
10	**40E**	4	--	B	**3RH21 40-1MB40-0KT0**		0.280	B	**3RH21 40-2MB40-0KT0**		0.300
	31E	3	1	B	**3RH21 31-1MB40-0KT0**		0.280	B	**3RH21 31-2MB40-0KT0**		0.300
	22E	2	2	B	**3RH21 22-1MB40-0KT0**		0.280	B	**3RH21 22-2MB40-0KT0**		0.300







For surge suppressors see page 3/100.

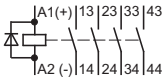
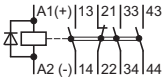
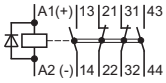
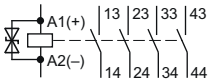
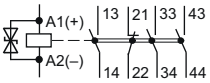
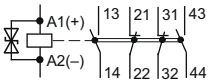
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RH21 coupling relays for switching auxiliary circuits, 4-pole

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RH21 . .-1.B40

3RH21 . .-2.B40

Rated operational current I_e/AC-15/AC-14 at **230 V**	Auxiliary contacts Ident. No. acc. to EN 50011	Version	DT	**Screw terminals** Order No.	Price per PU	Weight per PU approx.	DT	**Spring-type terminals** Order No.	Price per PU	Weight per PU approx.
A		NO NC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail										
Size S00										
With integrated coil circuit (diode)										
Terminal designations according to EN 50011 (no auxiliary switch blocks can be attached)										
4 NO, identification number **40E**	3 NO + 1 NC, identification number **31E**	2 NO + 2 NC, identification number **22E**								
										
Rated control supply voltage U_S = 24 V DC, operating range **0.7 to 1.25 x U_S**										
Power consumption of the coils **2.8 W** at 24 V										
10	**40E**	4 --	B	**3RH21 40-1JB40**	0.280	B		**3RH21 40-2JB40**		0.300
	31E	3 1	A	**3RH21 31-1JB40**	0.280	A		**3RH21 31-2JB40**		0.300
	22E	2 2	A	**3RH21 22-1JB40**	0.280	B		**3RH21 22-2JB40**		0.300
Rated control supply voltage U_S = 24 V DC, operating range **0.85 to 1.85 x U_S**										
Power consumption of the coils **1.6 W** at 24 V										
10	**40E**	4 --	B	**3RH21 40-1VB40**	0.280	B		**3RH21 40-2VB40**		0.300
	31E	3 1	B	**3RH21 31-1VB40**	0.280	B		**3RH21 31-2VB40**		0.300
	22E	2 2	B	**3RH21 22-1VB40**	0.280	B		**3RH21 22-2VB40**		0.300
With integrated coil circuit (suppressor diode)										
Terminal designations according to EN 50011 (no auxiliary switch blocks can be attached)										
4 NO, identification number **40E**	3 NO + 1 NC, identification number **31E**	2 NO + 2 NC, identification number **22E**								
										
Rated control supply voltage U_S = 24 V DC, operating range **0.7 to 1.25 x U_S**										
Power consumption of the coils **2.8 W** at 24 V										
10	**40E**	4 --	B	**3RH21 40-1KB40**	0.280	B		**3RH21 40-2KB40**		0.300
	31E	3 1	A	**3RH21 31-1KB40**	0.280	A		**3RH21 31-2KB40**		0.300
	22E	2 2	A	**3RH21 22-1KB40**	0.280	A		**3RH21 22-2KB40**		0.300
Rated control supply voltage U_S = 24 V DC, operating range **0.85 to 1.85 x U_S**										
Power consumption of the coils **1.6 W** at 24 V										
10	**40E**	4 --	B	**3RH21 40-1SB40**	0.280	B		**3RH21 40-2SB40**		0.300
	31E	3 1	B	**3RH21 31-1SB40**	0.280	B		**3RH21 31-2SB40**		0.300
	22E	2 2	B	**3RH21 22-1SB40**	0.280	B		**3RH21 22-2SB40**		0.300

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RH21 coupling relays for switching auxiliary circuits, 4-pole

More information

All technical specifications not mentioned in the table below are identical to those of the 3RH21 contactor relays (see page 3/63).
The size S00 coupling relays (3RH21) cannot be extended with auxiliary switch blocks.

Contactor type		**3RH21 ..-.HB40**	**3RH21 ..-.JB40**	**3RH21 ..-.KB40**
Size		**S00**	**S00**	**S00**
Width	mm	**45**	**45**	**45**
Solenoid coil operating range		0.7 ... 1.25 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed				
• At U_s = 17 V	W	1.4		
• At U_s = 24 V	W	2.8		
• At U_s = 30 V	W	4.4		
Permissible residual current of the electronics for 0 signal		< 10 mA x (24 V/U_s)		
Overvoltage configuration of the solenoid coil		Without overvoltage damping	With diode	With suppressor diode
Operating times				
• **Closing** at 17 V				
- ON-delay NO	ms	40 ... 130		
- OFF-delay NC	ms	30 ... 80		
• At 24 V				
- ON-delay NO	ms	35 ... 60		
- OFF-delay NC	ms	25 ... 40		
• At 30 V				
- ON-delay NO	ms	25 ... 50		
- OFF-delay NC	ms	15 ... 30		
• **Closing** at 17 ... 30 V				
- OFF-delay NO	ms	7 ... 20	38 ... 65	7 ... 20
- ON-delay NC	ms	20 ... 30	55 ... 75	20 ... 30
Upright mounting position		Request required		

Contactor type		**3RH21 ..-.MB40-0KT0**	**3RH21 ..-.VB40**	**3RH21 ..-.WB40**
Size		**S00**	**S00**	**S00**
Width	mm	**45**	**45**	**45**
Solenoid coil operating range		0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed at U_s = 24 V	W	1.6		
Permissible residual current of the electronics for 0 signal		< 8 mA x (24 V/U_s)		
Overvoltage configuration of the solenoid coil		Diode, varistor or RC element, attachable	Built-in diode	Built-in suppressor diode
Operating times of the coupling relays				
• Closing at 20.5 V				
- ON-delay NO	ms	30 ... 120		
- OFF-delay NC	ms	20 ... 110		
• At 24 V				
- ON-delay NO	ms	25 ... 90		
- OFF-delay NC	ms	15 ... 80		
• At 44 V				
- ON-delay NO	ms	15 ... 60		
- OFF-delay NC	ms	10 ... 50		
• Closing at 17 ... 30 V				
- OFF-delay NO	ms	5 ... 20	20 ... 80	5 ... 20
- ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30
Upright mounting position		Request required		

3RT20 coupling contactors (interface), for switching motors, 3-pole, 3 ... 15 kW

Application

DC operation

IEC 60947, EN 60947.

The 3RT20 coupling contactors for switching motors are tailored to the special requirements of working with electronic controls.

The 3RT20 1 coupling contactors cannot be expanded with auxiliary switch blocks.

Coupling contactors have a low power consumption and an extended solenoid coil operating range.

Depending on the version, the solenoid coils are supplied either without overvoltage damping (3RT20 1.-1HB4.and 3RT20 1.-.MB4.-0KT0) or with a diode, suppressor diode or varistor connected as standard.

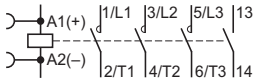
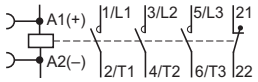
Selection and ordering data

DC operation
Low power consumption
Extended operating range of the solenoid coil

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 1.-1.B4.

3RT20 1.-2.B4.

Rated data AC-2 and AC-3 T_u: up to 60 °C		Auxiliary contacts		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and **400 V**	Ident. No.	Version		Order No.	Price per PU			Order No.	Price per PU	
A	**kW**		NO NC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail											
Size S00											
Diode, varistor or RC element, attachable											
Terminal designations according to DIN 50012 (no auxiliary switch blocks can be attached)											
• 1 NO, identification number **10E**											
											
• 1 NC, identification number **01**											
											
Rated control supply voltage U_s = 24 V DC, coil operating range **0.7 to 1.25** x U_s Power consumption of the coils **2.8 W** at 24 V											
7	**3**	**10E**	1	--	B	**3RT20 15-1HB41**	0.280	B	**3RT20 15-2HB41**		0.300
		01	--	1	B	**3RT20 15-1HB42**	0.280	B	**3RT20 15-2HB42**		0.300
9	**4**	**10E**	1	--	B	**3RT20 16-1HB41**	0.280	B	**3RT20 16-2HB41**		0.300
		01	--	1	B	**3RT20 16-1HB42**	0.280	B	**3RT20 16-2HB42**		0.300
12	**5.5**	**10E**	1	--	B	**3RT20 17-1HB41**	0.280	B	**3RT20 17-2HB41**		0.300
		01	--	1	B	**3RT20 17-1HB42**	0.280	B	**3RT20 17-2HB42**		0.300
Rated control supply voltage U_s = 24 V DC, operating range **0.85 to 1.85 x U_s** Power consumption of the coils **1.6 W** at 24 V											
7	**3**	**10E**	1	--	B	**3RT20 15-1MB41-0KT0**	0.280	B	**3RT20 15-2MB41-0KT0**		0.300
		01	--	1	B	**3RT20 15-1MB42-0KT0**	0.280	B	**3RT20 15-2MB42-0KT0**		0.300
9	**4**	**10E**	1	--	B	**3RT20 16-1MB41-0KT0**	0.280	B	**3RT20 16-2MB41-0KT0**		0.300
		01	--	1	B	**3RT20 16-1MB42-0KT0**	0.280	B	**3RT20 16-2MB42-0KT0**		0.300
12	**5.5**	**10E**	1	--	B	**3RT20 17-1MB41-0KT0**	0.280	B	**3RT20 17-2MB41-0KT0**		0.300
		01	--	1	B	**3RT20 17-1MB42-0KT0**	0.280	B	**3RT20 17-2MB42-0KT0**		0.300

For surge suppressors see page 3/100.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

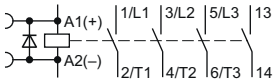
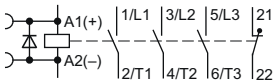
3RT20 coupling contactors (interface), for switching motors, 3-pole, 3 ... 15 kW

DC operation
Low power consumption
Extended operating range of the solenoid coil
Integrated coil circuit

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 1.-1.B4.

3RT20 1.-2.B4.

Rated data AC-2 and AC-3 T_u: up to 60 °C		Auxiliary contacts		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and 400 V	Ident. No.	Version		Order No.	Price per PU			Order No.	Price per PU	
A	kW		NO NC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail											
Size S00											
With integrated coil circuit (diode)											
Terminal designations according to DIN 50012 (no auxiliary switch blocks can be attached)											
• 1 NO, identification number **10E**											
											
• 1 NC, identification number **01**											
											
Rated control supply voltage U_s = 24 V DC, coil operating range **0.7 to 1.25** x U_s Power consumption of the coils **2.8 W** at 24 V											
7	**3**	**10E**	1	--	B	**3RT20 15-1JB41**	0.280 B		**3RT20 15-2JB41**		0.300
		01	--	1	B	**3RT20 15-1JB42**	0.280 B		**3RT20 15-2JB42**		0.300
9	**4**	**10E**	1	--	A	**3RT20 16-1JB41**	0.280 B		**3RT20 16-2JB41**		0.300
		01	--	1	A	**3RT20 16-1JB42**	0.280 B		**3RT20 16-2JB42**		0.300
12	**5.5**	**10E**	1	--	B	**3RT20 17-1JB41**	0.280 B		**3RT20 17-2JB41**		0.300
		01	--	1	B	**3RT20 17-1JB42**	0.280 B		**3RT20 17-2JB42**		0.300
Rated control supply voltage U_s = 24 V DC, operating range **0.85 to 1.85 x** U_s Power consumption of the coils **1.6 W** at 24 V											
7	**3**	**10E**	1	--	B	**3RT20 15-1VB41**	0.280 B		**3RT20 15-2VB41**		0.300
		01	--	1	B	**3RT20 15-1VB42**	0.280 B		**3RT20 15-2VB42**		0.300
9	**4**	**10E**	1	--	B	**3RT20 16-1VB41**	0.280 B		**3RT20 16-2VB41**		0.300
		01	--	1	B	**3RT20 16-1VB42**	0.280 B		**3RT20 16-2VB42**		0.300
12	**5.5**	**10E**	1	--	B	**3RT20 17-1VB41**	0.280 B		**3RT20 17-2VB41**		0.300
		01	--	1	B	**3RT20 17-1VB42**	0.280 B		**3RT20 17-2VB42**		0.300

* You can order this quantity or a multiple thereof.
Illustrations are approximate

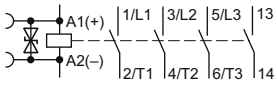
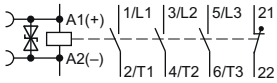
3RT20 coupling contactors (interface), for switching motors, 3-pole, 3 ... 15 kW

DC operation
Low power consumption
Extended operating range of the solenoid coil
Integrated coil circuit

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 1.-1.B4.

3RT20 1.-2.B4.

Rated data AC-2 and AC-3 T_u: up to 60 °C		Auxiliary contacts		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and 400 V	Ident. No.	Version		Order No.	Price per PU			Order No.	Price per PU	
A	kW		NO NC				kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail											
Size S00											
With integrated coil circuit (suppressor diode)											
Terminal designations according to DIN 50012 (no auxiliary switch blocks can be attached)											
• 1 NO, identification number **10E** 											
• 1 NC, identification number **01** 											
Rated control supply voltage U_s = 24 V DC, coil operating range **0.7 to 1.25** x U_s Power consumption of the coils **2.8 W** at 24 V											
7	**3**	**10E**	1	--	B	**3RT20 15-1KB41**	0.280	B	**3RT20 15-2KB41**		0.300
		01	--	1	B	**3RT20 15-1KB42**	0.280	A	**3RT20 15-2KB42**		0.300
9	**4**	**10E**	1	--	A	**3RT20 16-1KB41**	0.280	B	**3RT20 16-2KB41**		0.300
		01	--	1	B	**3RT20 16-1KB42**	0.280	B	**3RT20 16-2KB42**		0.300
12	**5.5**	**10E**	1	--	B	**3RT20 17-1KB41**	0.280	A	**3RT20 17-2KB41**		0.300
		01	--	1	B	**3RT20 17-1KB42**	0.280	A	**3RT20 17-2KB42**		0.300
Rated control supply voltage U_s = 24 V DC, operating range **0.85 to 1.85 x** U_s Power consumption of the coils **1.6 W** at 24 V											
7	**3**	**10E**	1	--	B	**3RT20 15-1SB41**	0.280	B	**3RT20 15-2SB41**		0.300
		01	--	1	B	**3RT20 15-1SB42**	0.280	B	**3RT20 15-2SB42**		0.300
9	**4**	**10E**	1	--	B	**3RT20 16-1SB41**	0.280	B	**3RT20 16-2SB41**		0.300
		01	--	1	B	**3RT20 16-1SB42**	0.280	B	**3RT20 16-2SB42**		0.300
12	**5.5**	**10E**	1	--	B	**3RT20 17-1SB41**	0.280	B	**3RT20 17-2SB41**		0.300
		01	--	1	B	**3RT20 17-1SB42**	0.280	B	**3RT20 17-2SB42**		0.300

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RT20 coupling contactors (interface), for switching motors, 3-pole, 3 ... 15 kW

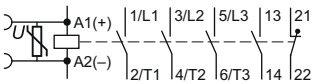
DC operation
Low power consumption
Extended operating range of the solenoid coil
Integrated coil circuit

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RT20 2.-1KB40

3RT20 2.-2KB40

Rated data AC-2 and AC-3 T_u: up to 60 °C		Auxiliary contacts		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Operational current I_e up to 400 V	Rating of induction motors at 50 Hz and 400 V	Ident. No.	Version NO NC		Order No.	Price per PU			Order No.	Price per PU	
A	kW						kg				kg
For screw and snap-on mounting onto TH 35 standard mounting rail											
Size S0											
With integrated coil circuit (varistor)											
Terminal designations according to DIN 50012 (no auxiliary switch blocks can be attached)											
1 NO + 1 NC, identification number **11E**											



Rated control supply voltage U_s = 24 V DC, operating range **0.7 to 1.25 x U_s**
Power consumption of the coils **4.5 W** at 24 V

12	**5.5**	**11E**	1	1	A	**3RT20 24-1KB40**	0.580	B	**3RT20 24-2KB40**	0.600
16	**7.5**	**11E**	1	1	B	**3RT20 25-1KB40**	0.580	B	**3RT20 25-2KB40**	0.600
25	**11**	**11E**	1	1	B	**3RT20 26-1KB40**	0.580	B	**3RT20 26-2KB40**	0.600
32	**15**	**11E**	1	1	B	**3RT20 27-1KB40**	0.600	B	**3RT20 27-2KB40**	0.600

For accessories, see page 3/97.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

All technical specifications not mentioned in the table below are identical to those of the 3RT20 contactors for switching motors (see 3/18).

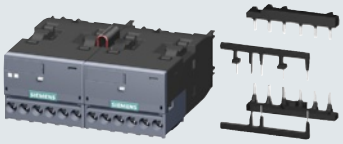
Contactors	Type		3RT20 1.-.HB4.	3RT20 1.-.JB4.	3RT20 1.-.KB4.	3RT20 2.-.KB4.
	Size		S00	S00	S00	S0
	Width	mm	45	45	45	45
General data						
Mechanical endurance		Operating cycles	30 million			10 million
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400			
Control						
Solenoid coil operating range			0.7 ... 1.25 x U_s			
Power consumption of the solenoid coil (for cold coil) Closing = Closed	At U_s 17 V	W	1.6			2.3
	24 V	W	2.8			4.5
	30 V	W	4.4			7
Permissible residual current of the electronics (for 0 signal)			< 10 mA x (24 V/U_s)			< 6 mA x (24 V/U_s)
Overvoltage configuration of the solenoid coil			Without overvoltage damping	With diode	With suppressor diode	With varistor
Operating times of the coupling contactors						
• Closing						
- At 17 V	ON-delay NO	ms	40 ... 130			70 ... 270
	OFF-delay NC	ms	30 ... 80			60 ... 250
- At 24 V	ON-delay NO	ms	35 ... 60			65 ... 90
	OFF-delay NC	ms	25 ... 40			55 ... 80
- At 30 V	ON-delay NO	ms	25 ... 50			52 ... 65
	OFF-delay NC	ms	15 ... 30			43 ... 57
• Closing at 17 ... 30 V	OFF-delay NO	ms	7 ... 20	38 ... 65	7 ... 20	19 ... 21
	ON-delay NC	ms	20 ... 30	55 ... 75	20 ... 30	25 ... 31

Contactors	Type		3RT20 1.-1MB4.-0KT0	3RT20 1.-1VB4.	3RT20 1.-1WB4.
	Size		S00	S00	S00
	Width	mm	45	45	45
General data					
Mechanical endurance		Operating cycles	30 million		
Protective separation between the coil and the main contacts acc. to EN 60947-1, Appendix N		V	400		
Control					
Solenoid coil operating range			0.85 ... 1.85 x U_s		
Power consumption of the solenoid coil (for cold coil) Closing = Closed	At U_s 24 V	W	1.6		
Permissible residual current, upright mounting position			On request		
Overvoltage configuration of the solenoid coil			Without overvoltage damping	With diode	With suppressor diode
Operating times of the coupling contactors					
• Closing					
- At 20.5 V	ON-delay NO	ms	30 ... 120		
	OFF-delay NC	ms	20 ... 110		
- At 24 V	ON-delay NO	ms	25 ... 90		
	OFF-delay NC	ms	15 ... 80		
- At 44 V	ON-delay NO	ms	15 ... 60		
	OFF-delay NC	ms	10 ... 50		
• Opening	OFF-delay NO	ms	5 ... 20	20 ... 80	5 ... 20
	ON-delay NC	ms	10 ... 30	30 ... 90	10 ... 30

Introduction

Overview

The function modules for mounting onto contactors enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular feeder, e. g. timing and interlocking, and can be connected to the control system by either parallel wiring or through IO-Link or AS-Interface.

Version	SIRIUS function modules	SIRIUS function modules for IO-Link[1]	SIRIUS function modules for AS-Interface[1]
For direct-on-line starting	Timing relays: ON or OFF-delay with semiconductor output With screw or spring-type terminals 	With screw or spring-type terminals 	With screw or spring-type terminals 
For reversing starting	Wiring modules for sizes S00 and S0 With screw or spring-type terminals · (with screw terminals for main and control circuit) 	1 function module for size S00 and S0, screw and spring-type connection, plus the respective wiring modules[1] 	1 function module for size S00 and S0, screw and spring-type connection, plus the respective wiring modules[1] 
For wye-delta starting	1 function module for size S00 and S0, screw and spring-type connection of the contactors, plus the respective wiring modules[2] 	For wye-delta starting: 1 function module for size S00 and S0, plus screw and spring-type connection, plus the respective wiring modules[2] 	For wye-delta starting: 1 function module for size S00 and S0, plus screw and spring-type connection, plus the respective wiring modules[2] 
Accessories	Sealable covers 	Operator panel for autonomous controlling of up to 4 feeders Module connector for the grouping of starters Connection cable between the operator panel and the feeder group Sealable covers 	AS-Interface addressing units Sealable covers 

[1] Use of the communication-capable function modules for IO-Link or AS-Interface requires contactors with communication interface (see pages 3/12 and 3/15).

[2] The modules for the control current wiring, which are included in the wiring kit, are not required.

Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

Function Modules for Mounting onto SIRIUS 3RT2 Contactors

Overview

Simply by being plugged in place, the SIRIUS function modules enable different functionalities required for the assembly of starters to be realized in the feeder. The function modules and wiring kits thus help to reduce the wiring work within the feeder practically to zero.

SIRIUS function modules for direct-on-line starting

All solid-state timing relays which can be mounted onto the contactor are designed for applications in the range from 24 to 240 V AC/DC (wide voltage range). Both the electrical and mechanical connection are made by simple snapping on and locking.

A protection circuit (varistor) is integrated in each module.

The solid-state timing relay with semiconductor output uses two contact limbs to actuate the contactor underneath by means of a semiconductor after the set time *t* has elapsed.

The switching state feedback is performed by a mechanical switching state indicator (plunger). In addition, the auxiliary switches in the contactors are freely accessible and can be used for feedbacks to the control system or for signal lamps.

A sealable cover is available to protect against careless adjustment of the set times.

SIRIUS function modules for reversing starting

The wiring kits for reversing starters enable the cost-effective assembly of contactor assemblies. They can be used for all applications with reversing duty up to 18.5 kW.

For a detailed description see page 3/28.

SIRIUS function modules for wye-delta starting

Both interlocking and timing functions are required for the assembly of wye-delta starters. With the function modules for wye-delta starting and the matching link modules for the main circuit, these starters can be assembled easily and with absolutely no errors.

The entire sequence in the control circuit is integrated in the snap-on modules. This covers:

- An adjustable wye time *t* from 0.5 to 60 s
- A non-adjustable dead interval of 50 ms
- Electrical contacting to the contactors by means of coil pick-off (contact legs)
- Feedback of the switching state at the contactor using a mechanical switch position indicator (plunger)
- Electrical interlocking between the contactors

These modules do not require their own terminals and can therefore be used for contactors with both screw and spring-type terminals in the two sizes S00 and S0. To start the wye-delta starter, only the first of the three contactors (line contactor) is actuated. All other functions then take place inside the individual modules.

This also offers advantages if the timing function was previously implemented in a controller, as it again results in a significant reduction in the number of PLC outputs, the programming work and the wiring outlay.

The kits for the main circuit include the mechanical interlock, the star jumper, the wiring modules at the top and at the bottom, and the required connecting clips.

A protection circuit (varistor) is integrated in the basic module.

Application

The snap-on function modules for direct-on-line starting are used above all for realizing timing functions independently of the control system.

With the OFF-delay variant of the timing relay it is possible for example for the fan motor for cooling a main drive to be switched off with a delay so that sufficient cooling after operation is guaranteed even if the plant and its control system have already been switched off.

The ON-delay timing relays enable for example the time-delayed starting of several drives so that the summation starting current does not rise too high, which could result in voltage failure.

The function modules for wye-delta starting are mostly used where current-limiting measures for starting a drive are required, e.g. for large fans and ventilators, and a high level of availability is essential at the same time. This technology has been used with success for several decades and has the additional advantage of requiring relatively little know-how. Through the use of function modules, the assembly work with simple standard components is even easier and error-free.

Benefits

The use of snap-on function modules for direct-on-line starting (timing relays) results in the following advantages:

- Reduction of control current wiring
- Prevention of wiring errors
- Reduction of testing costs
- Implementation of timing functions independently of the control system
- Less space required in the control cabinet compared to a separate timing relay
- No additive protection circuit required (varistor integrated)

For the advantages of using wiring kits for the assembly of reversing starters see page 3/29.

The use of function modules for wye-delta starting results in the following advantages:

- Operation solely through the line contactor A1/A2 – no further wiring needed
- Reduction of the control current wiring inside the contactor assembly and to the higher-level control system where applicable
- Prevention of wiring errors
- Reduction of testing costs
- Integrated electrical interlocking saves costs and prevents errors
- Less space needed in the control cabinet compared to using a separate timing relay
- Adjustable starting in star mode from 0.5 to 60 s
- Independent of the contactor's control supply voltage (24 to 240 V AC/DC)
- Varistor integrated – no additive protection circuit required
- No control current wiring thanks to plug-in technology and connecting cables
- Mechanically coded assembly enables easy configuration and reliable wiring
- Fewer versions – one module kit for screw and spring-type connection and for the two sizes S00 and S0
- Mechanical interlocking (with wiring kit for the main circuit)

SIRIUS function modules for direct-on-line starting

Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

3RA28 11-1. . . .

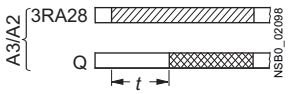
3RA28 12-2. . . .

For contactors	Rated control supply voltage U_s [1]	Time setting range *t*	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Type	V	s		Order No.	Price per PU	kg		Order No.	Price per PU	kg
Solid-state timing relays with semiconductor output, for snapping onto the front										
	The electrical connection between the timing relay and the contactor underneath is established automatically when it is snapped on and locked in place.									
	With ON-delay, two-wire version Varistor integrated									
3RT20 1., 3RT20 2. 3RH21[2] 3RH24	24 ... 240 AC/DC	0.05 ...100 (1, 10, 100, selectable)	B	**3RA28 11-1CW10**		0.070	B	**3RA28 11-2CW10**		0.070
	With OFF-delay with auxiliary voltage Varistor integrated									
3RT20 1., 3RT20 2. 3RH21[2] 3RH24	24 ... 240 AC/DC	0.05 ...100 (1, 10, 100, selectable)	B	**3RA28 12-1DW10**		0.070	B	**3RA28 12-2DW10**		0.070
Accessories										
	Sealable covers for 3RA27, 3RA28, 3RA29		B	**3RA29 10- 0**		0.002	B	**3RA29 10- 0**		0.002

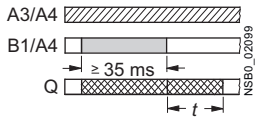
[1] AC voltage values apply for 50 Hz and 60 Hz.
[2] Cannot be fitted onto coupling relays.

Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

Function	Function charts
	Timing relay energized Contact closed Contact open
1 NO contact (semiconductor output)	
ON-delay (varistor integrated)	3RA28 11-.CW10



OFF-delay with auxiliary voltage (varistor integrated)	3RA28 12-.DW10

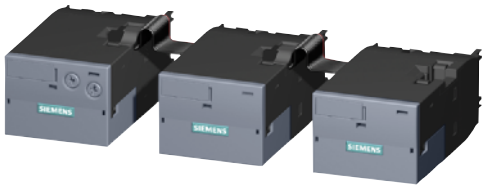


* You can order this quantity or a multiple thereof.
Illustrations are approximate

Function Modules for Mounting onto SIRIUS 3RT2 Contactors

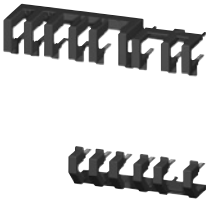
Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101



3RA28 16-0EW20

3RA29 13-2AA1



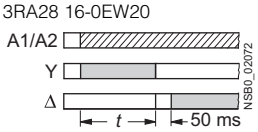
3RA29 13-2BB2

For contactors	Rated control supply voltage U_s [1]	Time setting range *t*	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Type	V	s		Order No.	Price per PU	kg		Order No.	Price per PU	kg
Assembly kits for reversing starting										
	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: Mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom									
3RT20 1.	• For size S00		A	**3RA29 13-2AA1**		0.001	A	**3RA29 13-2AA2**		0.001
3RT20 2.	• For size S0		A	**3RA29 23-2AA1**		0.001	A	**3RA29 23-2AA2**		0.001
Assembly kits for wye-delta starting										
	Assembly kits for making 3-pole contactor assemblies The assembly kit contains: Mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom									
3RT20 1.	• For size S00		A	**3RA29 13-2BB1**		0.001	A	**3RA29 13-2BB2**		0.001
3RT20 2.	• For size S0 (only main current for version with spring-type terminals)		A	**3RA29 23-2BB1**		0.001	A	**3RA29 23-2BB2**		0.001
Function modules for wye-delta starting										
	The electrical connection between the function module and the contactor assembly is established automatically by snapping on and plugging in the connecting cables. **Wye-delta function** (varistor integrated)									
3RT20 1. 3RT20 2. [2]	24 ... 240 AC/DC	0.5 ... 60 (10, 30, 60 selectable)	B	**3RA28 16-0EW20**		0.170	B	**3RA28 16-0EW20**		0.170
	Individual modules									
	24 ... 240 AC/DC	Basic modules for wye-delta starting	B	**3RA29 12-0**		0.085	B	**3RA29 12-0**		0.085
	--	Coupling modules for wye-delta starting	B	**3RA29 11-0**		0.095	B	**3RA29 11-0**		0.095
Accessories										
	Sealable covers for 3RA27, 3RA28, 3RA29		B	**3RA29 10-0**		0.002	B	**3RA29 10-0**		0.002

[1] AC voltage values apply for 50 Hz and 60 Hz.

[2] Cannot be fitted onto coupling relays.

Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

Function	Function charts
	Timing relay energized Contact closed Contact open
2 NO contacts (internally connected)	
Wye-delta function (varistor integrated) • 1 NO contact, delayed • 1 NO contact, instantaneous	3RA28 16-0EW20 

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS function modules

More information

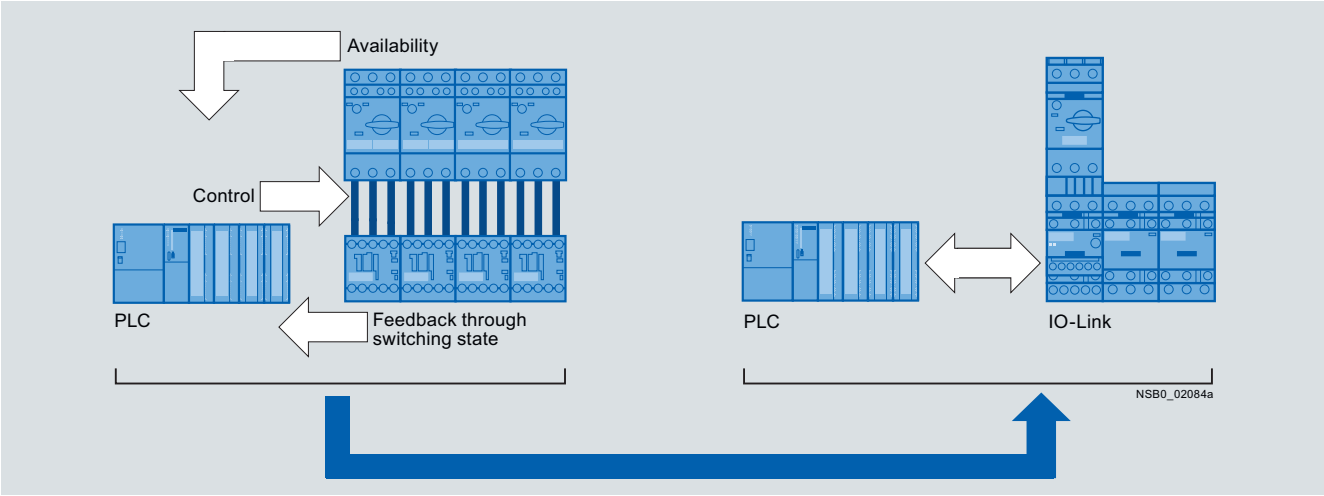
Type			3RA28 11 With ON-delay	3RA28 12 OFF-delay with auxiliary voltage	3RA28 16 Wye-delta function
General data					
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III		V AC	300		
Operating range of excitation			0.85 ... 1.1 x U_s, 0.95 ... 1.05 times the rated frequency		
Overvoltage protection			Varistor integrated		
Rated power		W	1		1
• Power consumption at 230 V AC, 50 Hz		VA	1		2
Rated operational currents I_e					
• AC-140	At 24 ... 240 V, 50 Hz	A	0.4		--
• DC-13	At 24 ... 240 V	A	0.4		--
• AC-15	At 24 ... 240 V, 50 Hz	A	--		3
• DC-13	- At 24 V	A	--		1
	- At 125 V	A	--		0.2
	- At 250 V	A	--		0.1
DIAZED fuse	Operational class gG	A	--		4
Switching frequency for load					
• With I_e at 230 V AC		h^{-1}	2500		--
• With 3RT2 contactor at 230 V AC		h^{-1}	2500		--
Recovery time		ms	50		150
Minimum ON period		ms	--	35	--
Residual current	Max.	mA	5		--
Voltage drop With conducting output	Max.	VA	3.5		--
Short-time loading capacity	Up to 10 ms	A	10		--
Setting accuracy With reference to upper limit of scale	Typ.		±15 %		
Repeat accuracy	Max.		±1 %		
Mechanical endurance		Operating cycles	100 x 10^6		10 x 10^6
Permissible ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-40 ... +80		
Degree of protection acc. to EN 60947-1, Appendix C			IP20		
Shock resistance Half-sine acc. to IEC 60068-2-27		g/ms	15/11		
Vibration resistance Acc. to IEC 60068-2-6		Hz/mm	10 ... 55/0.35		
Electromagnetic compatibility (EMC)			IEC 61000-6-2, IEC 61000-6-4, IEC 61812-1		IEC 60947-4-1
Permissible mounting position			Any		
Conductor cross-sections					
Connection type			**Screw terminals**		
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)		--
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)		--
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)		--
• Terminal screws			M3 (for standard screw driver size 2 or Pozidriv 2)		--
• Tightening torque		Nm	0.8 ... 1.2		--
Connection type			**Spring-type terminals**		
• Operating devices		mm	3.0 x 0.5		--
• Solid		mm^2	2 x (0.25 ... 1.5)		--
• Finely stranded with end sleeve		mm^2	2 x (0.25 ... 1.5)		--
• Finely stranded		mm^2	2 x (0.25 ... 1.5)		--
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)		--

Overview

The SIRIUS function modules for IO-Link enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular feeder, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additive protection circuit for the individual contactors can be dispensed with completely, and feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. The starters are connected to the higher-level control system through IO-Link, with the possibility of connecting up to four starters as a group to one port of the IO-Link master.

Through this type of connection to the control system, a maximum of wiring is saved. The following essential signals are transmitted:

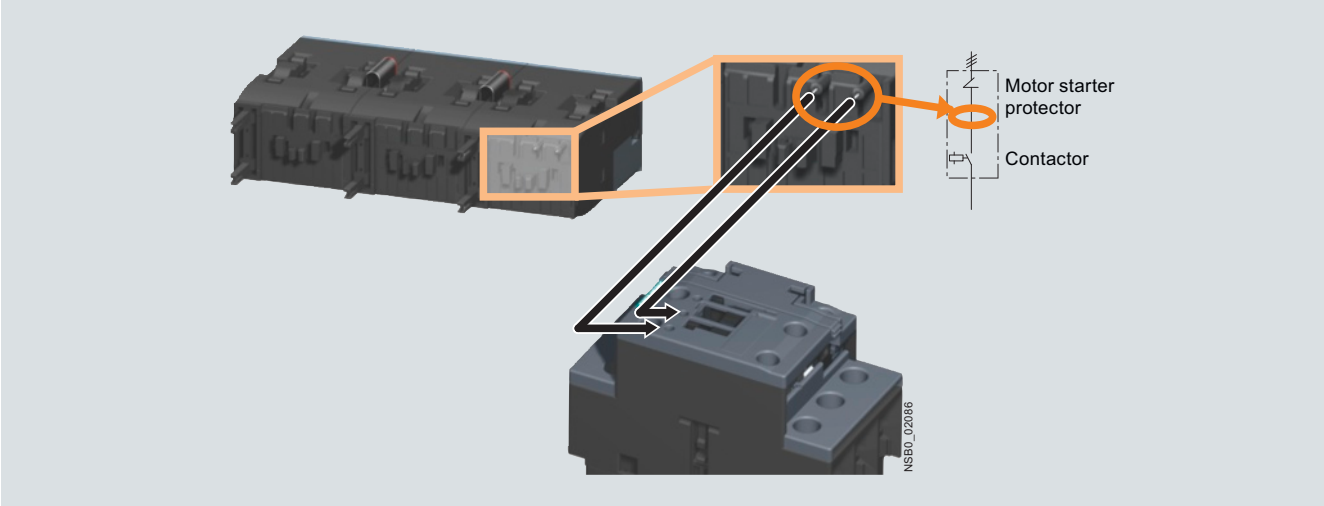
- Availability of the feeder in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through IO-Link

The inquiry from the motor starter protector does not take place through additive wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

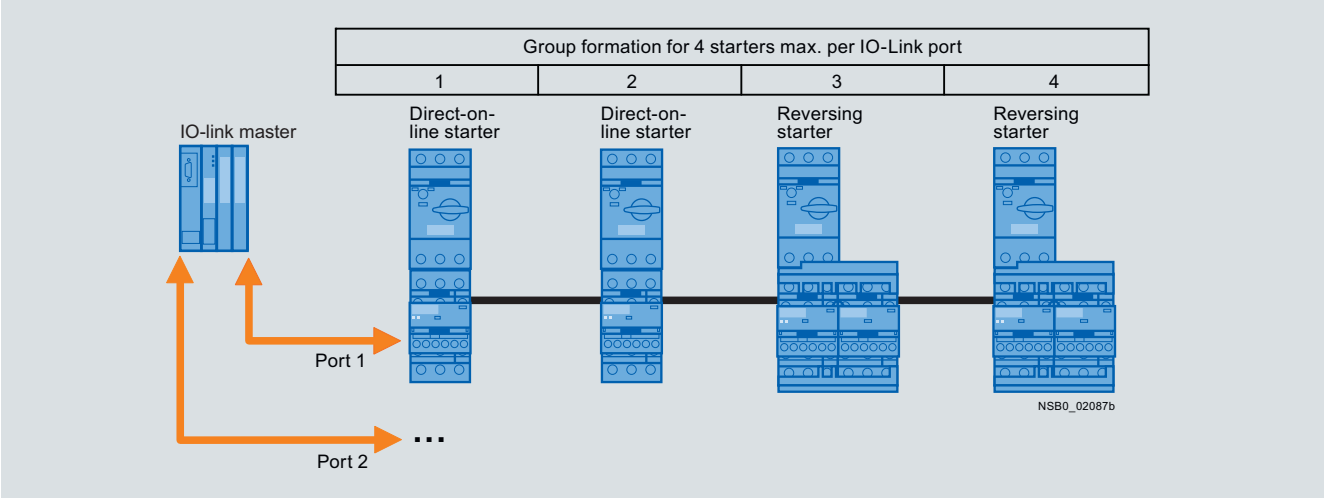
This requires special versions of the contactors with communication interface (see pages 3/12 and 3/15).



Availability signal through voltage pick-off

SIRIUS function modules for IO-Link

By grouping up to four starters it is possible to connect up to 16 starters to one master of the ET200S. All the signals of the individual controls are made available through only 3 individual wires per starter group directly in the process image. If the potential at the master of the ET200S is the same as that of the controls, a further reduction in wiring is possible by providing the control supply voltage to the contactors by jumpering the corresponding communication wires.



Group formation with IO-Link

In case of a malfunction, the corresponding error signals are also sent directly to the PLC in acyclic mode. This is in addition to transmission of the switching signals and status signals.

Possible error signals:

- Device defect
- No main voltage (motor starter protector tripped)
- No control supply voltage
- Limit position on the right / on the left
- Manual mode
- Process image fault

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

Local manual operation of the complete starter group is also straight-forward using a hand-held device. The latter is easily connected to the last starter and can be built into the front panel of the control cabinet if required. This offers significant advantages particularly for commissioning.

Application

The use of SIRIUS function modules with IO-Link is recommended above all in machines and plants in which there are several motor feeders in one control cabinet. Using IO-Link, the connection of these feeders to the automation level is easy, quick and error-free. And with IO modules no longer needed, the width of the ET200S is far smaller.

Benefits

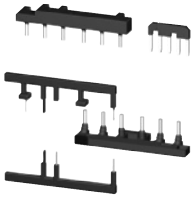
- Reduction of the control current wiring to no more than three cables for four feeders
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Integration in TIA means clear diagnostics if a fault occurs
- Dispensing with IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additive protection circuit required

Further information on the application and benefits of the SIRIUS function modules for connection to the control system through IO-Link can be found in Chapter 2 "Industrial Communication".

Function Modules for Mounting onto SIRIUS 3RT2 Contactors

Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

	Version	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Function modules for direct-on-line starting									
 3RA27 11-1AA00  3RA27 11-2AA00	**IO-Link connection** Includes one module connector for assembling an IO-Link group	B	**3RA27 11-1AA00**		0.080	B	**3RA27 11-2AA00**		0.075
Function modules for reversing starting[1]									
 3RA27 11-1BA00	**IO-Link connection**, comprising one basic and one coupling module and an additional module connector for assembling an IO-Link group	B	**3RA27 11-1BA00**		0.155	B	**3RA27 11-2BA00**		0.145
 3RA29 23-2AA1	**Assembly kits for making 3-pole contactor assemblies**[3] The assembly kit contains: mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom								
	• For size S00	A	**3RA29 13-2AA1**		0.001	A	**3RA29 13-2AA2**		0.001
	• For size S0								
	- For main, auxiliary and control circuit	A	**3RA29 23-2AA1**		0.001		**--**		
	- Only for main current[4]		**--**			A	**3RA29 23-2AA2**		0.001
Function modules for wye-delta starting[2]									
 3RA27 11-1CA00	**IO-Link connection**, comprising one basic module and two coupling modules, plus an additional module connector for assembling an IO-Link group	B	**3RA27 11-1CA00**		0.190	B	**3RA27 11-2CA00**		0.185
 3RA29 23-2BB1	**Assembly kits for making 3-pole contactor assemblies**[3] The assembly kit contains: Mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom								
	• For size S00	A	**3RA29 13-2BB1**		0.001	A	**3RA29 13-2BB2**		0.001
	• For size S0								
	- For main, auxiliary and control circuit	A	**3RA29 23-2BB1**		0.001		**--**		
	- Only for main current[4]		**--**			A	**3RA29 23-2BB2**		0.001

Matching contactors with communication interface required (see pages 3/12 and 3/15).

For matching IO-Link masters, routers and power supply units see Chapter 2 "Industrial Communication".

Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

1) For prewired contactor assemblies for reversing starting with communication interface see pages 3/31 and 3/33. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.

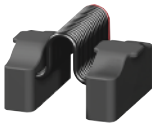
2) For complete contactor assemblies for wye-delta starting including function modules see pages 3/39 and 3/41.

3) When using the function modules for wye-delta starting, the wiring modules for the auxiliary current are not required.

4) Version in size S0 with spring-type terminals:
Only the wiring modules for the main circuit are included.
No connectors are included for the auxiliary and control circuit.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS function modules for IO-Link

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories								
 3RA27 11-0EE0.	**Module connector sets**, comprising: • 2 module connectors, 14-pole, short + 2 interface covers	B	**3RA27 11-0EE01**		1	1 unit	101	0.001
	Module connectors, 14-pole, 8 cm • For size jump S00-S0 + 1 space	B	**3RA27 11-0EE02**		1	1 unit	101	0.001
	Module connectors, 14-pole, 21 cm • For diverse space combinations	B	**3RA27 11-0EE03**		1	1 unit	101	0.001
	Module connectors, 10-pole, 8 cm • For separate auxiliary voltage supply within an IO-Link group	B	**3RA27 11-0EE04**		1	1 unit	101	0.001
 3RA29 10-0	**Sealable covers** for 3RA27, 3RA28, 3RA29	B	**3RA29 10-0**		1	5 units	101	0.002
	Device manuals Function Modules for IO-Link	C	**3ZX1 012-0RA27-1AB1**		1	1 unit	191	0.240
Operator panels[1]								
 3RA69 35-0A	**Operator panels (set)** • 1 x operator panel • 1 x enabling module • 1 x interface cover • 1 x fixing terminal	A	**3RA69 35-0A**		1	1 unit	121	0.052
	Connection cables, length 2 m, 10- to 14-pole For connecting the operator panel to the communication module	B	**3RA27 11-0EE11**		1	1 unit	101	0.001
	Enabling modules (replacement)	A	**3RA69 36-0A**		1	1 unit	121	0.002
	Interface covers (replacement)	A	**3RA69 36-0B**		1	5 units	121	0.001

[1] Suitable only for communication through IO-Link.

More information

Type			3RA27 11
General data			
Suitable for IO-Link masters acc. to Specification			1.0
Permissible ambient temperature			
• During operation	Acc. to EN 60947-1	°C	-25 ... +60
• During storage	Acc. to EN 60721-3-1	°C	-40 ... +80
• During transport	Acc. to EN 60721-3-2	°C	-40 ... +80
Degree of protection			IP20
Operational voltage U_{Hi}		V DC	24 ± 20 %
Power consumption, max. at U_{Hi}		A	2
Max. length of the cables for the input Y1–Y2	Acc. to EN 50295	m	30
EMC interference immunity			
• Electrostatic discharge	Acc. to EN 61000-4-2	kV	6/8
• Field-related interference	Acc. to EN 61000-4-3	V/m	10 (80 MHz ... 3 GHz)
• Burst	Acc. to EN 61000-4-4	kV	2/1
• Conductor-related interference	Acc. to EN 61000-4-5	kV	0.5/1
• High-frequency, asymmetric	Acc. to EN 61000-4-6	V rms	10 (150 kHz ... 80 MHz)
Conductor cross-sections			
Connection type			**Screw terminals**
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
• AWG cables		AWG	2 x (20 ... 14)
• Terminal screws			M3 (for standard screwdriver Ø 6 mm or Pozidriv 2)
• Tightening torque of the terminal screws		Nm	0.8 ... 1.2
Connection type			**Spring-type terminals**
• Operating devices		mm	3.0 x 0.5
• Solid		mm^2	2 x (0.25 ... 1.5)
• Finely stranded with end sleeve		mm^2	2 x (0.25 ... 1.5)
• Finely stranded		mm^2	2 x (0.25 ... 1.5)
• AWG cables		AWG	2 x (24 ... 16)

* You can order this quantity or a multiple thereof.
Illustrations are approximate

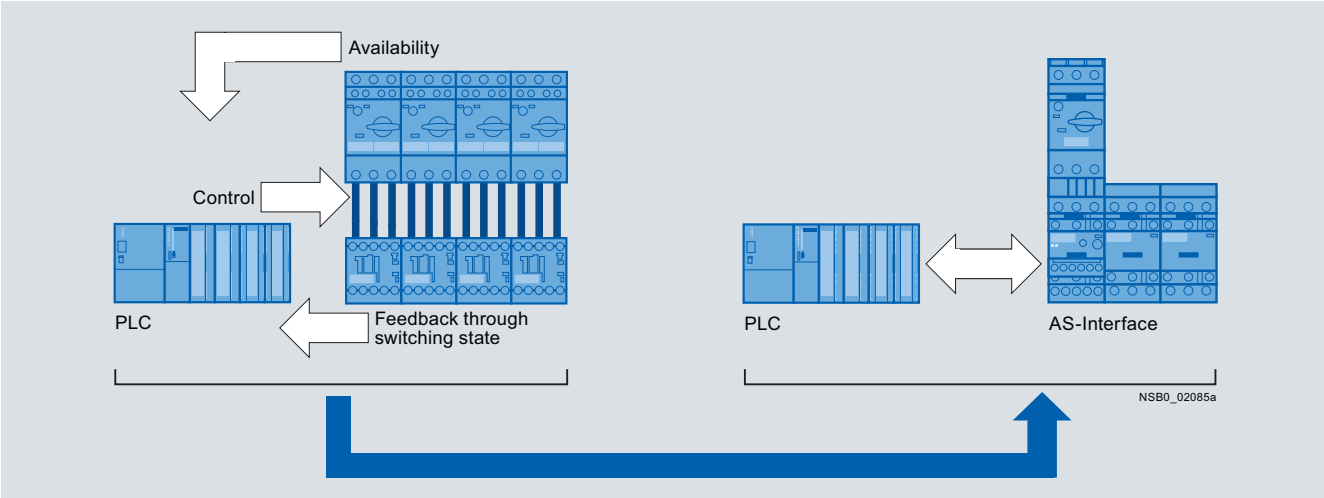
Overview

The SIRIUS function modules for AS-Interface enable the assembly of starters and contactor assemblies for direct-on-line, reversing and wye-delta starting without any additional, complicated wiring of the individual components. They include the key control functions required for the particular feeder, e. g. timing and interlocking. The electrical and mechanical connection to the contactor is established by snapping on and locking. An additive protection circuit for the individual contactors can be dispensed with completely because a varistor is integrated in the modules. Feedback from the contactor contacts is performed with Hall sensors which provide reliable feedback concerning the switching state even under extremely dusty conditions. Connection of the starters to the higher-level control system takes place through AS-Interface with the Specification V2.1 in A/B technology. As the result, up to 62 starters can be connected to one master and the address is entered in normal manner with an addressing unit.

Through the AS-Interface connection to the control system, a maximum of wiring is saved. The wiring outlay is reduced to the control supply voltage and the two individual wires for AS-Interface.

The following essential signals are transmitted:

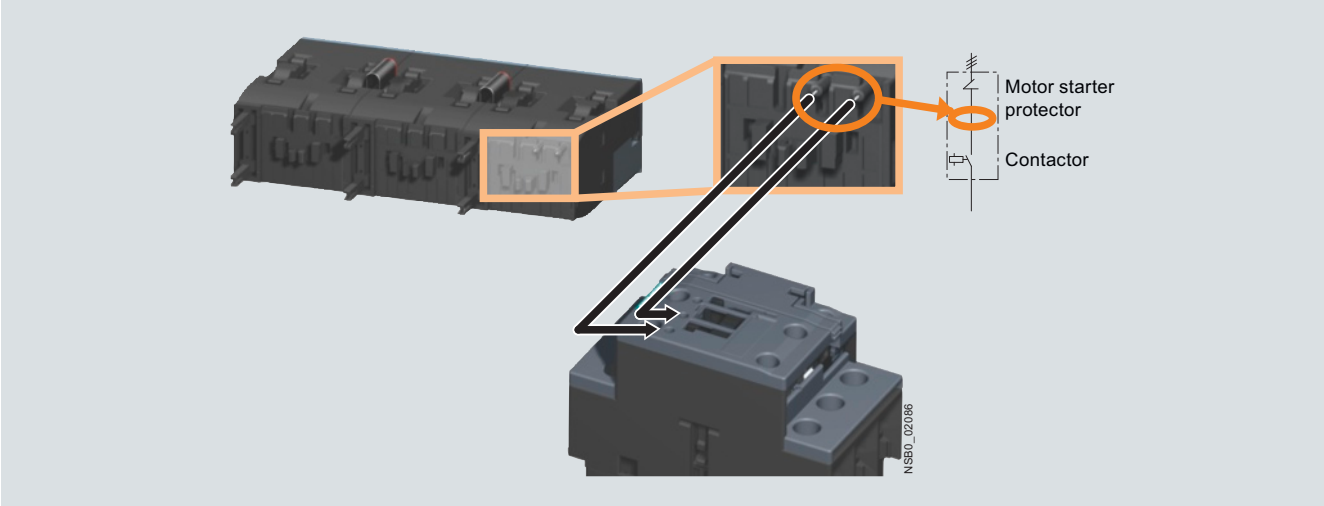
- Availability of the feeder in response to an indirect inquiry from the motor starter protector
- Starter operation
- Feedback concerning the switching state of the starter



Signal transmission through AS-Interface

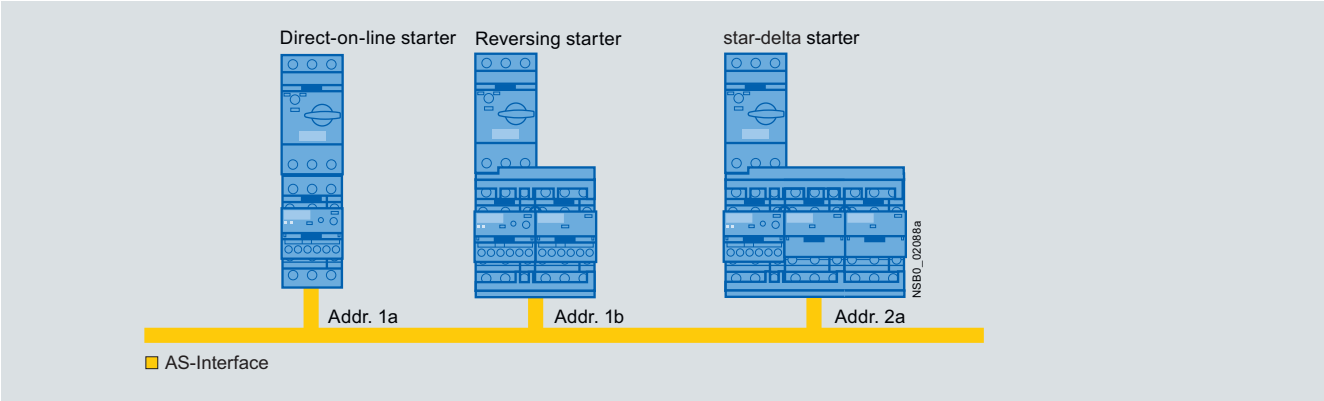
The inquiry from the motor starter protector does not take place through additive wiring between the auxiliary switch and the module but by means of a voltage inquiry at the contactor input.

This requires special versions of the contactors with communication interface (see pages 3/12 and 3/15).



Availability signal through voltage pick-off

SIRIUS function modules for AS-Interface



Topology with AS-Interface

This easy integration of the starters in the TIA world does not limit the flexibility in the field in the least. For example, all function modules have special terminals in order to enable direct local disconnection. These terminals can be connected for example to a position switch. The input interrupts the voltage supply to the contactor coil directly, i. e. without going through the PLC. These terminals are jumpered in the as-delivered state.

Application

The use of SIRIUS function modules with AS-Interface is recommended above all in machines and plants requiring easy connection of several different sensors and actuators both inside and outside the control cabinet to the higher-level control system. And with IO modules no longer needed, the width of the ET200S is far smaller.

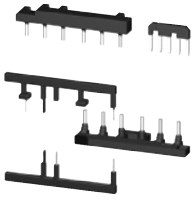
Benefits

- Reduction of control current wiring
- Elimination of testing costs and wiring errors
- Reduction of configuration work
- Dispensing with IO modules saves space in the control cabinet
- All essential timing and interlocking functions for reversing duty and wye-delta starting are integrated
- No additive protection circuit required

Function Modules for Mounting onto SIRIUS 3RT2 Contactors

Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 UNIT
PG = 101

	Version	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Function modules for direct-on-line starting									
 3RA27 12-1AA00  3RA27 12-2AA00	**AS-Interface connection**	B	**3RA27 12-1AA00**		0.075	B	**3RA27 12-2AA00**		0.075
Function modules for reversing starting[1]									
 3RA27 12-1BA00	**AS-Interface connection**, comprising one basic and one coupling module	B	**3RA27 12-1BA00**		0.150	B	**3RA27 12-2BA00**		0.145
 3RA29 23-2AA1	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: mechanical interlock; 2 connecting clips for 2 contactors, wiring modules on the top and bottom								
	• For size S00	A	**3RA29 13-2AA1**		0.001	A	**3RA29 13-2AA2**		0.001
	• For size S0								
	- For main, auxiliary and control circuit	A	**3RA29 23-2AA1**		0.001		**--**		
	- Only for main current		**--**			A	**3RA29 23-2AA2**		0.001
Function modules for wye-delta starting[2]									
 3RA27 12-1CA00	**AS-Interface connection**, comprising one basic module and two coupling modules	B	**3RA27 12-1CA00**		0.185	B	**3RA27 12-2CA00**		0.185
 3RA29 23-2BB1	**Assembly kits for making 3-pole contactor assemblies** The assembly kit contains: Mechanical interlock, 4 connecting clips for 3 contactors; star jumper, wiring modules on the top and bottom								
	• For size S00	A	**3RA29 13-2BB1**		0.001	A	**3RA29 13-2BB2**		0.001
	• For size S0								
	- For main, auxiliary and control circuit	A	**3RA29 23-2BB1**		0.001		**--**		
	- Only for main current		**--**			A	**3RA29 23-2BB2**		0.001

Matching contactors with communication interface required (see pages 3/12 and 3/15).

For matching AS-Interface masters, routers and power supply units see Chapter 2 "Industrial Communication".

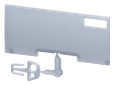
Note:
When the function modules are used, no other auxiliary switches are allowed to be mounted on the basic units.

[1] For prewired contactor assemblies for reversing starting with communication interface see pages 3/31 and 3/33. When these contactor assemblies are used, the assembly kit for the wiring is already integrated.

[2] For complete contactor assemblies for wye-delta starting including function modules see pages 3/39 and 3/41.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS function modules for AS-Interface

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories								
 3RA29 10-0	**Sealable covers** for 3RA27, 3RA28, 3RA29	B	**3RA29 10-0**		1	5 units	101	0.002
	Device manuals Function modules for AS-Interface	C	**3ZX1 012-0RA27-0AB0**		1	1 unit	191	0.175

More information

	Type		**3RA27 12**
General data			
Slave type			A/B slave
Suitable for AS-i masters acc. to Spec.			2.1 or higher
AS-i Slave Profile IO.ID.ID2			7.A.E
ID1 Code (factory setting)			7
Permissible ambient temperature			
• During operation	Acc. to EN 60947-1	°C	-25 ... +60
• During storage	Acc. to EN 60721-3-1	°C	-40 ... +80
• During transport	Acc. to EN 60721-3-2		-40 ... +80
Degree of protection			IP20
Operational voltage			
• AS-Interface		V	26.5 ... 31.6
• AUX PWR 24 V DC		V	24 ± 20 %
Power consumption, max.			
• AS-Interface		mA	30
• AUX PWR			
- Maximum pick-up/hold current	Size S00 Size S0	mA mA	200 300
Max. length of the cables for the input Y1–Y2	Acc. to EN 50295	m	30
EMC interference immunity			
• Electrostatic discharge	Acc. to EN 61000-4-2	kV	6/8
• Field-related interference	Acc. to EN 61000-4-3	V/m	10 (80 MHz ... 3 GHz)
• Burst	Acc. to EN 61000-4-4	kV	1/2
• Conductor-related interference	Acc. to EN 61000-4-5	kV	0.5/1
• High-frequency, asymmetric	Acc. to EN 61000-4-6	V rms	10 (150 kHz ... 80 MHz)
Conductor cross-sections			
Connection type			**Screw terminals**
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)
• AWG cables		AWG	2 x (20 ... 14)
• Terminal screws			M3 (for standard screwdriver Ø 6 mm or Pozidriv 2)
• Tightening torque of the terminal screws		Nm	0.8 ... 1.2
Connection type			**Spring-type terminals**
• Operating devices		mm	3.0 x 0.5
• Solid		mm^2	2 x (0.25 ... 1.5)
• Finely stranded with end sleeve		mm^2	2 x (0.25 ... 1.5)
• Finely stranded		mm^2	2 x (0.25 ... 1.5)
• AWG cables		AWG	2 x (24 ... 16)

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

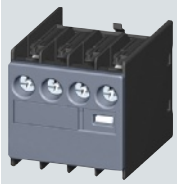
Selection aid for mountable auxiliary switch blocks for motor contactors and contactor relays

The auxiliary switch blocks from the 3RH29 series for mounting on the front and side can be used for the motor contactors in sizes S00 and S0 as well as for the contactor relays. The exact application possibilities are listed in the following tables.

The auxiliary switch blocks and their use are described in the sections "Motor Contactors" and "Contactor Relays".

Note:
The auxiliary switches according to EN 50012 also meet the requirements according to EN 50005.

Motor contactors

Contactor		Exam-ples	**All auxiliary contacts with mirror contact function according to EN 60947-4-1**					
Size	Integrated auxiliary switches		**EN 50005**				**EN 50012**	
		Version	Mountable on front			Laterally mountable	Mountable on front	Laterally mountable
			1-pole	2-pole	4-pole	2-pole	4-pole	2-pole
			 3RH29 11-1AA.. 3RH29 11-1BA..	 3RH29 11-1LA.. 3RH29 11-1MA..	 3RH29 11-.F... 3RH29 11-.H...	 3RH29 11-.D... 3RH29 21-.D...	 3RH29 11-.HA..	 3RH29 11-.D... 3RH29 21-.D...
S00	1 NO or 1 NC	A	1	--	--	1	--	--
		B	--	1	1	--	1	--
		C	--	--	--	2 (1 x left and 1 x right)	--	1 (right)
S0	1 NO + 1 NC	A	1	--	--	1	--	--
		B	--	1	1	--	1	--
		C	--	--	--	2 (1 x left and 1 x right)	--	1 (right)

Examples according to EN 50005

Version A, S00: S00 basic unit + one single-pole front-side auxiliary switch block + one 2-pole lateral auxiliary switch block

--> 3RT20 16-1AP01 + 3RH29 11-1AA01 + 3RH29 11-1DA11

Version B, S0: S0 basic unit + one 4-pole front-side auxiliary switch block

--> 3RT20 27-2AP00 + 3RH29 11-2HA22

Example according to EN 50012

Version C, S0: S0 basic unit + one 2-pole lateral auxiliary switch block, mounted on the right

--> 3RT20 26-2AP00 + 3RH29 11-2DA11

Note:
The front solid-state compatible auxiliary switches have no mirror contact functionality.

Contactor relays

Contactor relay		Exam-ples	**All front auxiliary contacts with positively-driven operation according to EN 60947-5-1**				
Size	Integrated auxiliary switches		**EN 50005**				**EN 50011**
		Version	Mountable on front			Lateral[1)]	Mountable on front
			1-pole	2-pole	4-pole	2-pole	4-pole
			 3RH29 11-1AA.. 3RH29 11-1BA..	 3RH29 11-1LA.. 3RH29 11-1MA..	 3RH29 11-.F... 3RH29 11-.H...	 3RH29 11-.DA.. 3RH29 21-.DA..	 3RH29 11-.GA..
S00	2 NO + 2 NC or 3 NO + 1 NC or 4 NO	A	1	--	--	1	1
		B	--	1	1	--	1
		C	--	--	--	2 (1 x left and 1 x right)	1

[1)] Lateral auxiliary contacts without positively-driven operation.

General data

Terminal designations and identification numbers for auxiliary contacts

Terminal designations

The terminal designations have 2 digits, e.g. 13, 14, 21, 22:

- Tens position: Identification number
  - Related terminals have the same identification number
- Units position: Function number
  - 1-2 for normally closed contact (NC)
  - 3-4 for normally open (NO)

Identification numbers

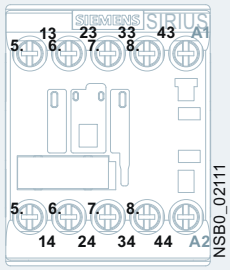
The identification number indicates the quantity and type of auxiliary contacts, e.g. 40, 31, 22, 13:

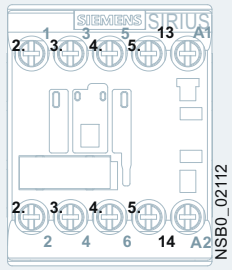
- 1st digit: Number of NO contacts
- 2nd digit: Number of NC contacts

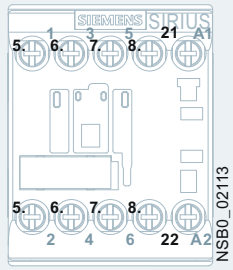
Examples:

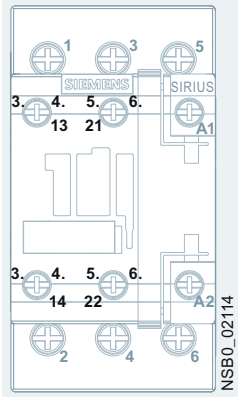
- 31 = 3 NO + 1 NC
- 40 = 4 NO

3RH2 contactor relays and 3RT2 motor contactors (basic units) – Overview of identification numbers



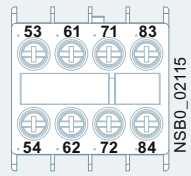


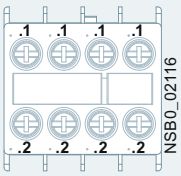


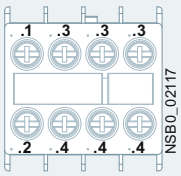


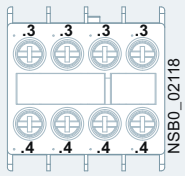
Contactor with integrated auxiliary contacts	3RH21 contactor relay, S00, with 4 normally open contacts (4 NO)	3RT20 motor contactor, S00, with 1 normally open contact (1 NO)	3RT20 motor contactor, S00, with 1 normally closed contact (1 NC)	3RT20 motor contactor, S0, with 1 NO + 1 NC
Identification numbers for front auxiliary switches	5th 6th 7th 8th (only with auxiliary switches acc. to EN 50005 and EN 50011)	2nd 3rd 4th 5th	5th 6th 7th 8th (only with auxiliary switches acc. to EN 50005)	3rd 4th 5th 6th

3RH29 auxiliary switch blocks – Overview of function numbers (examples)



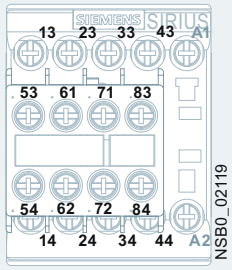


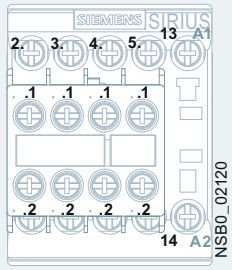


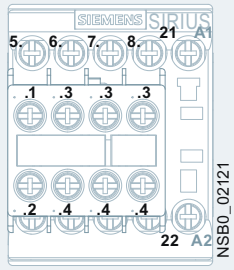


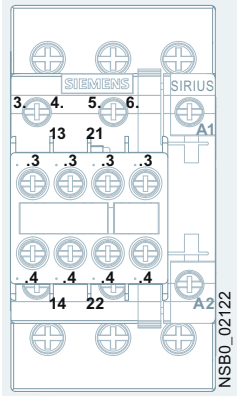
Auxiliary switch block with auxiliary contacts	3RH29 auxiliary switch, 4 contacts 2 NO + 2 NC	3RH29 auxiliary switch, 4 contacts 4 NC	3RH29 auxiliary switch, 4 contacts 3 NO + 1 NC	3RH29 auxiliary switch, 4 contacts 4 NO
Function numbers for front auxiliary switches	.3 .1 .1 .3 .4 .2 .2 .4	.1 .1 .1 .1 .2 .2 .2 .2	.1 .3 .3 .3 .2 .4 .4 .4	.3 .3 .3 .3 .4 .4 .4 .4

3RH29 basic units with mounted 3RH29 auxiliary switch blocks – Overview of terminal designations (examples)









Contactor with mounted auxiliary switch block	3RH29 auxiliary switch, 4 contacts 2 NO + 2 NC	3RH29 auxiliary switch, 4 contacts 4 NC	3RH29 auxiliary switch, 4 contacts 3 NO + 1 NC	3RH29 auxiliary switch, 4 contacts 4 NO
Terminal designations of all auxiliary contacts	13 23 33 43 53 61 71 83 14 24 34 44 54 62 72 84	13 21 31 41 51 14 22 32 42 52	21 51 63 73 83 22 52 63 74 84	13 21 33 43 53 63 14 22 34 44 54 64

Solid-state time-delay auxiliary switches

All solid-state delayed auxiliary switch which can be mounted onto the contactor are designed for applications in the range from 24 to 240 V AC/DC (wide voltage range). Both the electrical and mechanical connection are made by simple snapping on and locking.

The time-delay auxiliary switch is supplied with power directly by two plug-in contacts through the coil terminals of the contactor, in parallel with A./A2.

A protection circuit (varistor) is integrated in each module.

A sealable cover is available to protect against careless adjustment of the set times.

Note:
It is not allowed to mount more auxiliary switches onto the contactor.

OFF-delay devices for contactors

AC and DC operation

IEC 60947, EN 60947.

For screw and snap-on mounting onto TH 35 standard mounting rails. The OFF-delay devices have screw terminals.

The OFF-delay device prevents a contactor from dropping out unintentionally when there is a short-time voltage dip or voltage failure. It supplies a downstream, DC-operated contactor with the necessary energy during a voltage dip, ensuring that the contactor does not trip. The 3RA29 16 OFF-delay devices are specifically designed for operation with the 3RT contactors and 3RH contactor relays in the SIRIUS series.

The OFF-delay device operates without external voltage on a capacitive basis, and can be energized with either AC or DC (24 V version only for DC operation). Voltage matching, which is only necessary with AC operation, is performed using a rectifier bridge.

A contactor opens after a delay when the capacitors of the solenoid coil, built into the OFF-delay device, are switched in parallel. In the event of voltage failures, the capacitors are discharged via the solenoid coil and thereby delay the opening of the contactor.

If the command devices are upstream of the OFF-delay device in the circuit, the OFF-delay takes effect with every opening operation. If the opening operation is downstream of the OFF-delay device, an OFF-delay only applies in the event of failure of the mains voltage.

Operation

In the case of the versions for rated control supply voltages of 110 and 230 V, either AC voltage or DC voltage can be applied on the line side, whereas the variant for 24 V is designed for DC operation only.

A DC-operated contactor is connected to the output in accordance with the input voltage that is applied.

The mean value of the OFF-delay is approximately 1.5 times the specified minimum time.

Additional load module

Size S00 for plugging onto the front of the contactors with and without auxiliary switch block.

This module is used for increasing the permissible residual current and for limiting the residual voltage. It ensures safe opening of contactors with direct control via 230 V AC semiconductor outputs of SIMATIC controllers, and acts simultaneously as a surge suppressor.

Surge suppressors

- Without LED (also for spring-type terminals)
  Sizes S00 and S0
- With LED (also for spring-type terminals)
  Sizes S00 and S0

All 3RT2 contactors and 3RH2 contactor relays can be retrofitted with RC elements or varistors for damping opening surges in the coil. Diodes or diode assemblies (comprising noise suppression diodes and Zener diodes for short break times) can be used.

The surge suppressors are plugged onto the front of size S00 contactors. Space is provided for them next to a snap-on auxiliary switch block.

Varistors, RC elements or diode assemblies can be plugged onto the front of size S0 contactors.

Coupling relays are supplied either without overvoltage damping or with a suppressor diode, varistor or diode connected as standard, according to the version.

Note:
The OFF-delay of the NO contact and the ON-delay of the NC contact are increased if the contactor coils are attenuated against voltage peaks (noise suppression diode 6 to 10 times; diode assemblies 2 to 6 times, varistor +2 to 5 ms).

Coupling links for control by PLC

DC operation

IEC 60947 and EN 60947.

The coupling link is suitable for use in any climate. It is finger-safe according to EN 50274. The terminal designations comply with EN 50005.

System-compatible operation with 24 V DC,
operating range 17 to 30 V.

Low power consumption of 0.5 W in conformity with the technical specifications of the solid-state systems. An LED indicates the switching state.

Surge suppression

The 3RH29 24-1GP11 coupling link has an integrated surge suppressor (varistor) for the contactor coil being switched.

Mounting

The 3RH29 24-1GP11 coupling link is mounted on the contactor coil size S0 using a coil terminal module.

Sealable covers

When contactors and contactor relays are used in safety-oriented applications, it must be ensured that it is impossible to operate the contactors manually.

For SIRIUS contactors there are sealable covers available for this purpose as accessories; these prevent accidental manual operation. These are transparent molded-plastic caps with a bracket that enables the contactor to be sealed.

Solder pin adapters

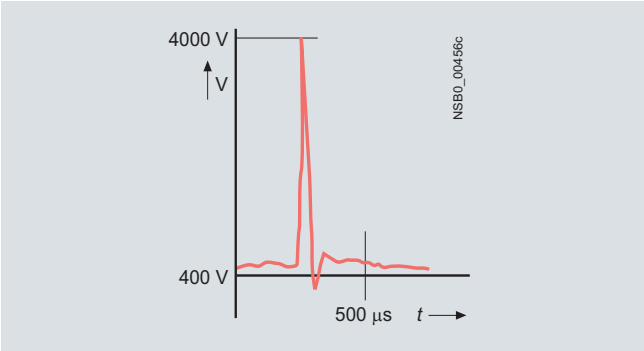
The solder pin adapters for the contactors size S00, up to 5.5 kW or 12 A (AC-1/AC-3), are available in two versions:

- Solder pin adapter for contactors with one integrated auxiliary contact
- Solder pin adapter for contactors with mounted 4-pole auxiliary switch block

General data

Electromagnetic interference suppression module, three-phase for size S00 contactors

A so-called counter-e.m.f. (electromotive force) is produced when motors or various inductive loads are turned off. Voltage peaks of up to 4000 V may occur as a result, with a frequency spectrum from 1 kHz to 10 MHz and a rate of voltage variation from 0.1 to 20 V/ns.



Capacitive input to various analog and digital signals makes it necessary to suppress interference in the load circuit.

Reducing contact arcing

The connection between the main current path and the EMC suppression module enables contact arcing, which is responsible for contact erosion and the majority of clicking noises, to be reduced; this in turn is conducive to an electromagnetically compatible design.

Higher operational reliability

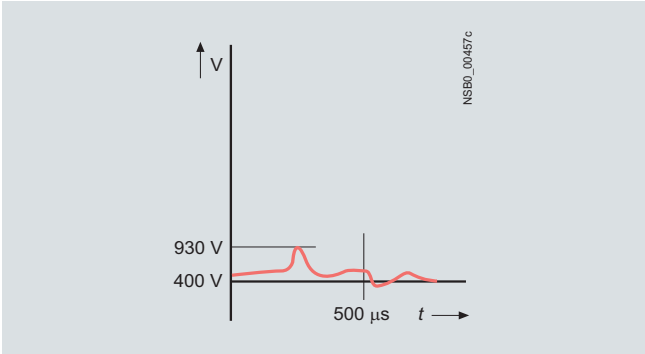
Since the EMC suppression module achieves a significant reduction in radio-frequency components and the voltage level in three phases, the contact endurance is also improved considerably. This makes an important contribution towards enhancing the reliability and availability of the system as a whole.

Dispensing with fine graduations

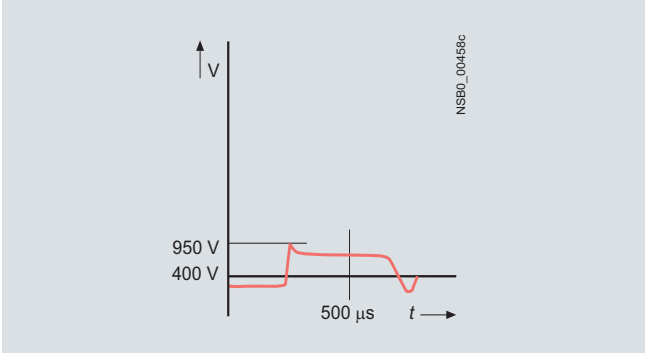
There is no need for fine graduations within each performance class, as smaller motors inherently have a higher inductance, so that one solution for all fixed-speed operating mechanisms up to 5.5 kW is adequate.

Two electrical versions are available:

- The advantages of the RC circuit lie mainly in the reduction in the rate of rise and in its RF damping ability. The selected values ensure effective interference suppression over a wide range.



- The varistor circuit can absorb a high energy level and can also be used for frequencies ranging from 10 to 400 Hz (closed-loop controlled operating mechanisms). There is no limiting below the knee-point voltage, however.



Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101


3RH29 11-1HA..


3RH29 11-2HA..

For contactors / contactor relays	Contactor with HS block Ident. No.	Auxiliary contacts Version		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
					Order No.	Price per PU			Order No.	Price per PU	
Type		NO	NC				kg				kg
Auxiliary switch blocks for snapping onto the front according to EN 50012 (also compliant with the requirements according to EN 50005)											
Size S00[1)2)]											
For assembling contactors with 2, 3, 4 or 5 auxiliary contacts											
3RT20 1., Ident. No. 10E 3RT23 1. 3RT25 1.	**11E**	--	1	A	**3RH29 11-1HA01**		0.050	A	**3RH29 11-2HA01**		0.050
	12 E	--	2	A	**3RH29 11-1HA02**		0.050	A	**3RH29 11-2HA02**		0.050
	13 E	--	3	C	**3RH29 11-1HA03**		0.050	C	**3RH29 11-2HA03**		0.050
	21E	1	1	A	**3RH29 11-1HA11**		0.050	A	**3RH29 11-2HA11**		0.050
	22E	1	2	A	**3RH29 11-1HA12**		0.050	A	**3RH29 11-2HA12**		0.050
	23E	1	3	A	**3RH29 11-1HA13**		0.050	A	**3RH29 11-2HA13**		0.050
	31E	2	1	C	**3RH29 11-1HA21**		0.050	C	**3RH29 11-2HA21**		0.050
	32E	2	2	A	**3RH29 11-1HA22**		0.050	A	**3RH29 11-2HA22**		0.050
	41E	3	1	A	**3RH29 11-1HA31**		0.050	A	**3RH29 11-2HA31**		0.050
Size S0[1)]											
For assembling contactors with 3, 4 or 5 auxiliary contacts											
3RT20 2., Ident. No. 11E 3RT23 2. 3RT25 2.	**12 E**	--	1	A	**3RH29 11-1HA01**		0.050	A	**3RH29 11-2HA01**		0.050
	13 E	--	2	A	**3RH29 11-1HA02**		0.050	A	**3RH29 11-2HA02**		0.050

1) The 3RH29 auxiliary switches are also available with ring terminal lug connection. In the 8th position of the Order No. the **"1"** must be replaced with **"4"**, e. g. 3RH29 11-1HA22 -> 3RH29 11-**4**HA22.

2) Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Auxiliary switch blocks

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101

3RH29 11-1HA..,
3RH29 11-1GA..

3RH29 11-2HA..,
3RH29 11-2GA..

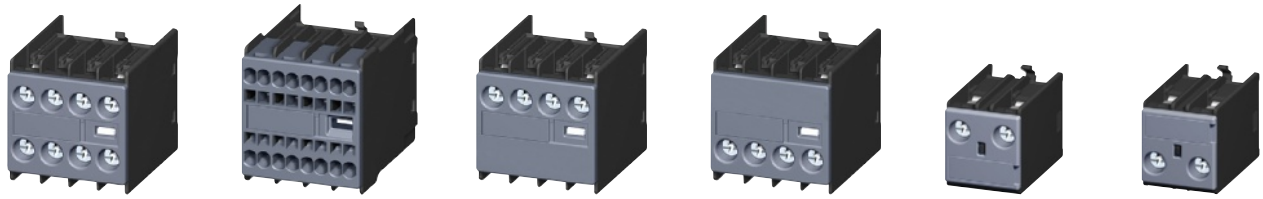
For contactors / contactor relays	Contactor with HS block Ident. No.	Auxiliary contacts Version			DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
Type		NO	NC			Order No.	Price per PU	kg		Order No.	Price per PU	kg
Auxiliary switch blocks for snapping onto the front according to EN 50012 (also compliant with the requirements according to EN 50005)												
Size S0[1]												
For assembling contactors with 3, 4 or 5 auxiliary contacts												
3RT20 2., Ident. No. 11E 3RT23 2. 3RT25 2.	**21E**	1	--	.3 .4	C	**3RH29 11-1HA10**		0.050	C	**3RH29 11-2HA10**		0.050
	22E	1	1	.1 .3 .2 .4	A	**3RH29 11-1HA11**		0.050	A	**3RH29 11-2HA11**		0.050
	23E	1	2	.1 .1 .3 .2 .2 .4	A	**3RH29 11-1HA12**		0.050	A	**3RH29 11-2HA12**		0.050
	31E	2	--	.3 .3 .4 .4	A	**3RH29 11-1HA20**		0.050	A	**3RH29 11-2HA20**		0.050
	32E	2	1	.1 .3 .3 .2 .4 .4	C	**3RH29 11-1HA21**		0.050	C	**3RH29 11-2HA21**		0.050
	41E	3	--	.3 .3 .3 .4 .4 .4	C	**3RH29 11-1HA30**		0.050	C	**3RH29 11-2HA30**		0.050
Auxiliary switch blocks for snapping onto the front according to EN 50011												
Size S00[2]												
For assembling contactor relays with 8 contacts												
3RH21 40, 3RH24 40, Ident. No. 40E	**80E**	4	--	53 63 73 83 54 64 74 84	A	**3RH29 11-1GA40**		0.050	A	**3RH29 11-2GA40**		0.050
	71E	3	1	53 61 73 83 54 62 74 84	A	**3RH29 11-1GA31**		0.050	A	**3RH29 11-2GA31**		0.050
	62E	2	2	53 61 71 83 54 62 72 84	A	**3RH29 11-1GA22**		0.050	A	**3RH29 11-2GA22**		0.050
	53E	1	3	53 61 71 81 54 62 72 82	A	**3RH29 11-1GA13**		0.050	A	**3RH29 11-2GA13**		0.050
	44E	--	4[2]	51 61 71 81 52 62 72 82	C	**3RH29 11-1GA04**		0.050	C	**3RH29 11-2GA04**		0.050

[1] The 3RH29 11-.HA.. auxiliary switches are also available with ring terminal lug connection. In the 8th position of the Order No. the **"1"** must be replaced with **"4"**, e. g. 3RH29 11-1HA22 -> 3RH29 11-**4**HA22.

[2] The 3RH29 11-.GA.. auxiliary switches are also available with ring terminal lug connection. In the 8th position of the Order No. the **"1"** must be replaced with **"4"**, e. g. 3RH29 11-1GA22 -> 3RH29 11-**4**GA22.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101



3RH29 11-1FA.. | 3RH29 11-2FA.. | 3RH29 11-1LA.. | 3RH29 11-1MA.. | 3RH29 11-1AA.. | 3RH29 11-1BA..

For contactors / contactor relays	Auxiliary switches Ident. No.	Auxiliary contacts Version				DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
							Order No.	Price per PU			Order No.	Price per PU	
Type		NO	NC	NO	NC				kg				kg
Auxiliary switch blocks for snapping onto the front according to EN 50005													
Sizes S00 and S0													
2 and 4-pole auxiliary switch blocks for assembling contactors with 3 and 5-pole or 4 and 6-pole auxiliary contacts													
3RT2. 1., 3RT2. 2., 3RH21 .., 3RH24 ..	**40**	4	--	--	--	A	**3RH29 11-1FA40**		0.050	A	**3RH29 11-2FA40**		0.050
	04 [1]	--	4	--	--	C	**3RH29 11-1FA04**		0.050	C	**3RH29 11-2FA04**		0.050
	11U	--	--	1	1	A	**3RH29 11-1FB11**		0.050	A	**3RH29 11-2FB11**		0.040
	11 / 11U	1	1	1	1	A	**3RH29 11-1FB22**		0.050	A	**3RH29 11-2FB22**		0.050
	22U	--	--	2	2	A	**3RH29 11-1FC22**		0.050	A	**3RH29 11-2FC22**		0.050
1- and 2-pole auxiliary switch blocks with cable entry from one side													
• Cable entry from above													
3RT2. 1., 3RT2. 2., 3RH21 .., 3RH24 ..	**--**	1	--	--	--	A	**3RH29 11-1AA10**		0.020		**--**		
	--	--	1	--	--	A	**3RH29 11-1AA01**		0.020		**--**		
	--	1	1	--	--	A	**3RH29 11-1LA11**		0.050		**--**		
	--	2	--	--	--	A	**3RH29 11-1LA20**		0.050		**--**		
• Cable entry from below													
3RT2. 1., 3RT2. 2., 3RH21 .., 3RH24 ..	**--**	1	--	--	--	A	**3RH29 11-1BA10**		0.020		**--**		
	--	--	1	--	--	A	**3RH29 11-1BA01**		0.020		**--**		
	--	1	1	--	--	A	**3RH29 11-1MA11**		0.050		**--**		
	--	2	--	--	--	A	**3RH29 11-1MA20**		0.050		**--**		

[1] Mounting is permitted only on basic units which have no integrated NC contact.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Auxiliary switch blocks

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101


3RH29 11-1DA..


3RH29 11-2DA..


3RH29 21-1DA..


3RH29 21-2DA..

For contactors / contactor relays	Contactor with HS block Ident. No.	Auxiliary contacts Version NO	NC	Left	Right	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Laterally mountable auxiliary switch blocks according to EN 50012 • Mounting on the right													
Size S00													
3RT20 1. Ident.No. 10E	**12E**	--	2	--	21 31 / 22 32	A	**3RH29 11-1DA02**		0.020	A	**3RH29 11-2DA02**		0.050
	21E	1	1	--	21 33 / 22 34	A	**3RH29 11-1DA11**		0.040	A	**3RH29 11-2DA11**		0.050
Size S0													
3RT20 2. Ident.No. 11E 3RT23 2. 3RT25 2.	**13E**	--	2	--	31 41 / 32 42	A	**3RH29 21-1DA02**		0.050	A	**3RH29 21-2DA02**		0.050
	22E	1	1	--	31 43 / 32 44	A	**3RH29 21-1DA11**		0.050	A	**3RH29 21-2DA11**		0.050
	31E	2	--	--	33 43 / 34 44	A	**3RH29 21-1DA20**		0.050	A	**3RH29 21-2DA20**		0.050
Laterally mountable auxiliary switch blocks according to EN 50005 • Mounting on the right and/or on the left													
Size S00													
3RT20 1., Ident.No. 10E 3RT23 2. 3RT25 2.	**02**	--	2	41 51 / 42 52	21 31 / 22 32	A	**3RH29 11-1DA02**		0.020	A	**3RH29 11-2DA02**		0.050
	11	1	1	41 53 / 42 54	21 33 / 22 34	A	**3RH29 11-1DA11**		0.040	A	**3RH29 11-2DA11**		0.050
	20	2	--	43 53 / 44 54	23 33 / 24 34	A	**3RH29 11-1DA20**		0.040	A	**3RH29 11-2DA20**		0.050
Size S0													
3RT20 2. 3RT23 2.[1] 3RT25 2.[1]	**02**	--	2	51 61 / 52 62	31 41 / 32 42	A	**3RH29 21-1DA02**		0.050	A	**3RH29 21-2DA02**		0.050
	11	1	1	51 63 / 52 64	31 43 / 32 44	A	**3RH29 21-1DA11**		0.050	A	**3RH29 21-2DA11**		0.050
	20	2	--	53 63 / 54 64	33 43 / 34 44	A	**3RH29 21-1DA20**		0.050	A	**3RH29 21-2DA20**		0.050

[1] 3RT23 2., 3RT25 2. are only moutable on the right

* You can order this quantity or a multiple thereof.
Illustrations are approximate

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101


3RH29 11-2DE11


3RH29 11-1NF. .


3RH29 11-2NF. .

For contactors / contactor relays	Contactor with HS block Ident. No.	Contacts Version		DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
					Order No.	Price per PU			Order No.	Price per PU	
Type		NO	NC				kg				kg
Solid-state compatible auxiliary switch blocks											
• For operation in dusty atmospheres • For solid-state circuits with rated operational currents I_e/AC-14 and DC-13 from 1 ... 300 mA at 3 ... 60 V • Hard gold-plated contacts • Mirror contacts acc. to EN 60947-4-1, Appendix F, for laterally mountable auxiliary switches											
Auxiliary switch blocks for snapping onto the front according to EN 50005 [1]											
Sizes S00 and S0											
3RT2. 1., 3RT2. 2., 3RH21 .., 3RH24 ..	**02**	--	2	A	**3RH29 11-1NF02**		0.040	A	**3RH29 11-2NF02**		0.050
	11	1	1	A	**3RH29 11-1NF11**		0.040	A	**3RH29 11-2NF11**		0.050
	20	2	--	A	**3RH29 11-1NF20**		0.040	A	**3RH29 11-2NF20**		0.050
Laterally mountable auxiliary switch blocks according to EN 50012 • Mounting on the right											
Size S00 [2]			Left	Right							
3RT2. 1., Ident. No. 10E	**21E**	1	1	--	--			A	**3RH29 11-2DE11**		0.040
Size S0			Left	Right							
3RT2. 2., Ident. No. 11E	**22E**	1	1	--	--			A	**3RH29 21-2DE11**		0.050
Laterally mountable auxiliary switch blocks according to EN 50005 • Mounting on the right and/or on the left											
Size S00			Left	Right							
3RT2. 1., Ident. No. 10E	**11**	1	1		--			A	**3RH29 11-2DE11**		0.040
Size S0			Left	Right							
3RT2. 2.	**11**	1	1		--			A	**3RH29 21-2DE11**		0.050

[1] The 3RH29 11-.NF.. auxiliary switches are also available with ring terminal lug connection. In the 8th position of the Order No. the **"1"** must be replaced with **"4"**, e. g.: 3RH29 11-**1**NF11 -> 3RH2911-**4**NF11

[2] Size S00 can be mounted according to EN 50012 only on basic units which have no integrated NC contact.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Auxiliary switch blocks, delayed

Selection and ordering data

PU (UNIT, SET, M)= 1
PS* = 1 unit
PG = 101


3RA28 14-1


3RA28 14-2

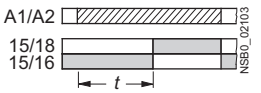
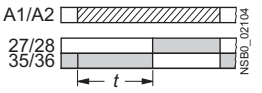
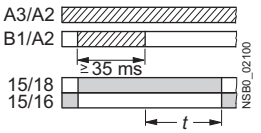
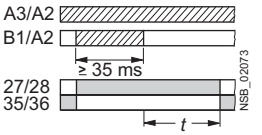
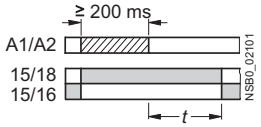
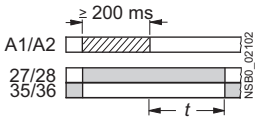
For contactors Type	Rated control supply voltage U_s[1] V	Time setting range *t* s	Output / auxiliary contacts	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Solid-state time-delay auxiliary switch blocks for snapping onto the front, terminal designations according to DIN 46199-5											
Sizes S00 and S0											
	The electrical connection between the solid-state time-delay auxiliary switch and the contactor underneath is established automatically when it is snapped on and locked in place.										
	With ON-delay Varistor integrated										
3RT2., 3RH21[2] 3RH24	24 ... 240 AC/DC	0.05 ...100, (1, 10, 100, selectable)	1 CO	B	**3RA28 13-1AW10**		0.080	B	**3RA28 13-2AW10**		0.075
			1 NO + 1 NC	B	**3RA28 13-1FW10**		0.080	B	**3RA28 13-2FW10**		0.075
	With OFF-delay with auxiliary voltage Varistor integrated										
3RT2., 3RH21[2] 3RH24	24 ... 240 AC/DC	0.05 ...100, (1, 10, 100, selectable)	1 CO	B	**3RA28 14-1AW10**		0.080	B	**3RA28 14-2AW10**		0.075
			1 NO + 1 NC	B	**3RA28 14-1FW10**		0.080	B	**3RA28 14-2FW10**		0.075
	With OFF-delay without auxiliary voltage[3] Varistor integrated										
3RT2., 3RH21[2] 3RH24	24 ... 240 AC/DC	0.05 ...100, (1, 10, 100, selectable)	1 CO	B	**3RA28 15-1AW10**		0.080	B	**3RA28 15-2AW10**		0.075
			1 NO + 1 NC	B	**3RA28 15-1FW10**		0.080	B	**3RA28 15-2FW10**		0.075

1) AC voltage values apply for 50 Hz and 60 Hz.
2) Cannot be fitted onto coupling relays.
3) Setting of output contacts in as-supplied state not defined (bistable relay). Application of the control supply voltage once results in contact changeover to the correct setting.

For technical specifications see page 3/105.

Note:
When the solid-state time-delay auxiliary switches are used, no other auxiliary switches are allowed to be mounted on the basic units.

More information

Function	Function charts	
	Timing relay energized Contact closed Contact open	
Solid-state time-delay auxiliary switches	**With 1 CO contact**	**With 1 NO + 1 NC**
ON-delay (varistor integrated)	3RA28 13-.AW10	3RA28 13-.FW10
		
OFF-delay with auxiliary voltage (varistor integrated)	3RA28 14-.AW10	3RA28 14-.FW10
		
OFF-delay Without auxiliary voltage (varistor integrated)	3RA28 15-.AW10	3RA28 15-.FW10
		

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

	For contactors	Rated control supply voltage U_s	Time setting range t	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Type	V	s		Order No.	Price per PU				kg
OFF-delay devices										
	Sizes S00 and S0									
	For contactors with DC operation									
	Non-adjustable delay time									
 3RT29 16-2B.01	3RT2. 1, 3RT2. 2, 3RH2. ..-1BF40	110 AC/DC	S00: > 0.1 S0:> 0.08	D	**3RT29 16-2BK01**		1	1 unit	101	0.150
	3RT2. 1, 3RT2. 2, 3RH2. ..-1BM40	220/230 AC/DC	S00: > 0.5 S0: > 0.3	D	**3RT29 16-2BL01**		1	1 unit	101	0.150
	3RT2. 1, 3RT2. 2, 3RH2. ..-1BB40	24 DC	S00: > 0.2 S0: > 0.1	B	**3RT29 16-2BE01**		1	1 unit	101	0.150
Pneumatic delay blocks, terminal designation according to EN 50005										
	Size S0									
	For snapping onto the front of contactors[1)2)]									
	Auxiliary contacts 1 NO and 1 NC									
 3RT29 26-2P...	**• With ON-delay**									
	3RT2. 2	--	0.1 ... 30	C	**3RT29 26-2PA01**		1	1 unit	101	0.080
			1 ... 60	C	**3RT29 26-2PA11**		1	1 unit	101	0.080
	• With OFF-delay									
	3RT2. 2	--	0.1 ... 30	C	**3RT29 26-2PR01**		1	1 unit	101	0.080
			1 ... 60	C	**3RT29 26-2PR11**		1	1 unit	101	0.080
Mechanical latching blocks										
	Size S0									
	For snapping onto the front of contactors									
 3RT29 26-3A.31	**The contactor remains in the energized state even after a voltage failure**									
	3RT2. 2	24 AC/DC	--	B	**3RT29 26-3AB31**		1	1 unit	101	0.100
		110 AC/DC	--	C	**3RT29 26-3AF31**		1	1 unit	101	0.100
		230 AC/DC	--	C	**3RT29 26-3AP31**		1	1 unit	101	0.100

For technical specifications see pages 3/106 and 3/107.

1) In addition to these, no other auxiliary contacts are permitted.

2) Versions according to DIN VDE 0116 on request.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Surge suppressors

Selection and ordering data

For contactors Type	Version	Rated control supply voltage U_s [1] AC operation V AC	DC operation V DC	DT	Order No. [2]	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Surge suppressors without LED (also for spring-type terminals)										
Size S00										
	For plugging onto the front side of the contactors (with and without auxiliary switch block)									
3RT2.1, 3RH2.	**Varistors**	24 ... 48	24 ... 70	A	**3RT29 16-1BB00**		1	1 unit	101	0.010
		48 ... 127	70 ... 150	A	**3RT29 16-1BC00**		1	1 unit	101	0.010
		127 ... 240	150 ... 250	A	**3RT29 16-1BD00**		1	1 unit	101	0.010
		240 ... 400	--	A	**3RT29 16-1BE00**		1	1 unit	101	0.010
		400 ... 600	--	B	**3RT29 16-1BF00**		1	1 unit	101	0.010
3RT2.1, 3RH2.	**RC elements**	24 ... 48	24 ... 70	A	**3RT29 16-1CB00**		1	1 unit	101	0.010
		48 ... 127	70 ... 150	A	**3RT29 16-1CC00**		1	1 unit	101	0.010
		127 ... 240	150 ... 250	A	**3RT29 16-1CD00**		1	1 unit	101	0.010
		240 ... 400	--	A	**3RT29 16-1CE00**		1	1 unit	101	0.010
		400 ... 600	--	B	**3RT29 16-1CF00**		1	1 unit	101	0.010
3RT2.1, 3RH2.	**Noise suppression diodes**	--	12 ... 250	A	**3RT29 16-1DG00**		1	1 unit	101	0.010
3RT2.1, 3RH2.	**Diode assemblies** (diode and Zener diode) for DC operation	--	12 ... 250	A	**3RT29 16-1EH00**		1	1 unit	101	0.010
Size S0										
	For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)									
3RT2. 2	**Varistors**	24 ... 48	24 ... 70	A	**3RT29 26-1BB00**		1	1 unit	101	0.010
		48 ... 127	70 ... 150	A	**3RT29 26-1BC00**		1	1 unit	101	0.010
		127 ... 240	150 ... 250	A	**3RT29 26-1BD00**		1	1 unit	101	0.010
		240 ... 400	--	A	**3RT29 26-1BE00**		1	1 unit	101	0.010
		400 ... 600	--	A	**3RT29 26-1BF00**		1	1 unit	101	0.010
3RT2. 2	**RC elements**	24 ... 48	24 ... 70	A	**3RT29 26-1CB00**		1	1 unit	101	0.010
		48 ... 127	70 ... 150	A	**3RT29 26-1CC00**		1	1 unit	101	0.010
		127 ... 240	150 ... 250	A	**3RT29 26-1CD00**		1	1 unit	101	0.010
		240 ... 400	--	A	**3RT29 26-1CE00**		1	1 unit	101	0.010
		400 ... 600	--	A	**3RT29 26-1CF00**		1	1 unit	101	0.010
3RT2. 2	**Diode assemblies** for DC operation	--	24	A	**3RT29 26-1ER00**		1	1 unit	101	0.010
		--	30 ... 250	A	**3RT29 26-1ES00**		1	1 unit	101	0.010


3RT29 16-1B.00


3RT29 26-1E.00

[1] Can be used for AC operation for 50/60 Hz. Please inquire about further voltages.

[2] For packs of 10 or 5 units, **"-Z"** and order code "**X90**" must be added to the Order No.

For contactors Type	Version	Rated control supply voltage U_s [1] AC operation V AC	DC operation V DC	Power consumption P of the LED at U_s mW	DT	Order No. [2]	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Surge suppressors with LED (also for spring-type terminals)											
Size S00											
	For plugging onto the front side of the contactors (with and without auxiliary switch block)										
3RT2.1, 3RH2.	**Varistors**	24 ... 48	12 ... 24	10 ... 120	A	**3RT29 16-1JJ00**		1	1 unit	101	0.010
		48 ... 127	24 ... 70	20 ... 470	A	**3RT29 16-1JK00**		1	1 unit	101	0.010
		127 ... 240	70 ... 150	50 ... 700	A	**3RT29 16-1JL00**		1	1 unit	101	0.010
		--	150 ... 250	160 ... 950	A	**3RT29 16-1JP00**		1	1 unit	101	0.010
3RT2.1, 3RH2.	**Noise suppression diodes**	--	24 ... 70	20 ... 470	A	**3RT29 16-1LM00**		1	1 unit	101	0.010
		--	50 ... 150	50 ... 700	A	**3RT29 16-1LN00**		1	1 unit	101	0.010
		--	150 ... 250	160 ... 950	A	**3RT29 16-1LP00**		1	1 unit	101	0.010
Size S0											
	For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)										
3RT2. 2	**Varistors**	24 ... 48	12 ... 24	10 ... 120	A	**3RT29 26-1JJ00**		1	1 unit	101	0.010
		48 ... 127	24 ... 70	20 ... 470	A	**3RT29 26-1JK00**		1	1 unit	101	0.010
		127 ... 240	70 ... 150	50 ... 700	A	**3RT29 26-1JL00**		1	1 unit	101	0.010
3RT2. 2	**Diode assemblies**	--	24	20 ... 470	A	**3RT29 26-1MR00**		1	1 unit	101	0.010


3RT29 16-1J.00


3RT29 26-1MR00

[1] Can be used for AC operation for 50/60 Hz. Please inquire about further voltages.

[2] For packs of 10 or 5 units, **"-Z"** and order code "**X90**" must be added to the Order No.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

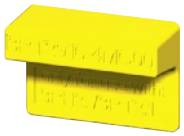
For contactors Type	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
EMC suppression modules; three-phase ≤ 5.5 kW								
Size S00 (for contactors with AC or DC operation)[1]								
			Screw terminals					
3RT20 1	**RC elements** (3 x 220 Ω/0.22 µF)							
	Up to 400 V	B	**3RT29 16-1PA1**		1	1 unit	101	0.010
	Up to 575 V	B	**3RT29 16-1PA2**		1	1 unit	101	0.010
	Up to 690 V	C	**3RT29 16-1PA3**		1	1 unit	101	0.010
3RT20 1	**Varistors**							
	Up to 400 V	B	**3RT29 16-1PB1**		1	1 unit	101	0.010
	Up to 575 V	C	**3RT29 16-1PB2**		1	1 unit	101	0.010
	Up to 690 V	C	**3RT29 16-1PB3**		1	1 unit	101	0.010
Additional load modules								
Size S00								
3RT2. 1, 3RH2.	**For plugging onto the front side of the contactors with and without auxiliary switch block**[2] For increasing the permissible residual current and for limiting the residual voltage. It ensures safe opening of contactors with direct control via 230 V AC semiconductor outputs of SIMATIC controllers and acts simultaneously as a surge suppressor. Rated voltage: AC 50/60 Hz, 180 to 255 V. Operating range: 0.8 to 1.1 x U_s	A	**3RT29 16-1GA00**		1	1 unit	101	0.010
LED modules for indicating contactor operation								
Size S0								
3RT2. 2	For snapping into the location hole of an inscription label on the front of a contactor either directly on the contactor or on the front auxiliary switch. The LED module is connected to coil terminals A1 and A2 of the contactor and indicates its energized state. Yellow LED. Rated voltage: 24 ... 240 V AC/DC, polarized	B	**3RT29 26-1QT00**		1	5 units	101	0.260
Coupling links for control by PLC								
Size S0								
3RT2. 2	**For mounting onto the coil terminals of the contactors** With LED for indicating switching state. With integrated varistor for limiting the opening surges. Operating range 17 ... 30 V DC Power consumption: 0.5 W at 24 V DC Permissible residual current of the electronics (with 0 signal): 2.5 mA Rated operational current I_e: • AC-15/AC-14 at 230 V: 3 A • DC-13 at 230 V: 0.1 A	A	**3RH29 24-1GP11**		1	1 unit	101	0.040
Control kits								
Size S00								
3RT2. 1, 3RH2.	For manual operation of the contactor contacts for start-up and service[3]	B	**3RT29 16-4MC00**		1	5 units	101	0.010


3RT29 16-1PA.


3RT29 16-1GA00


3RT29 26-1QT00
(mounted to contactor)


3RH29 24-1GP11


3RT29 16-4MC00

For technical specifications for coupling links see page 3/109.

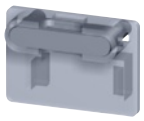
[1] See also description on page 3/92.

[2] For packs of 10 units, the Order No. must be supplemented with "**-Z**" and the order code "**X90**".

[3] See Catalog LV 1, Chapter 6 "Load Feeders and Motor Starters" --> "ET 200S Motor Starters, 3RK1 903-0CA00".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

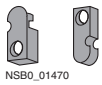
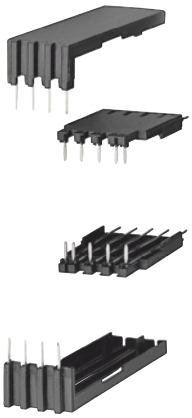
Selection and ordering data

	For contactors Type	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Sealable covers									
	Sizes S00 and S0								
 3RT29 16-4MA10	3RT2. 1, 3RT2. 2, 3RH2. [1]	Sealable covers for preventing manual operation	B	**3RT29 16-4MA10**		1	5 units	101	0.010
Connection modules for contactors with screw terminals									
	Sizes S00 and S0								
 3RT19 26-4RD01		**Adapters for contactors** Ambient temperature $T_{u\ max.}$ = 60 °C		**Screw terminals**					
	3RT2. 1, 3RH2.	Size S00, rated operational current I_e at AC-3/400 V: 20 A	B	**3RT19 16-4RD01**		1	1 unit	101	0.020
	3RT2. 2	Size S0, rated operational current I_e at AC-3/400 V: 25 A	B	**3RT19 26-4RD01**		1	1 unit	101	0.200
 3RT19 00-4RE01	3RT2. 1, 3RT2. 2, 3RH2.	**Plugs for contactors** Size S00, S0	B	**3RT19 00-4RE01**		1	1 unit	101	0.025
Coil terminal modules									
	Size S0								
 3RT29 26-4RA11	3RT2. 2	Connection from top	B	**3RT29 26-4RA11**		1	1 unit	101	0.010
		Connection from below	B	**3RT29 26-4RB11**		1	1 unit	101	0.010
		Connection diagonally	B	**3RT29 26-4RC11**		1	1 unit	101	0.010
				Spring-type terminals					
	3RT2. 2	Connection from top	B	**3RT29 26-4RA12**		1	1 unit	101	0.010
		Connection from below	B	**3RT29 26-4RB12**		1	1 unit	101	0.010
Covers for contactors with ring terminal lug connection									
	Size S00								
				Ring terminal lug connection					
 3RT29 16-4EA13	3RT2. 1, 3RH2	**Covers for ring terminal lug connections** Single covers	B	**3RT29 16-4EA13**		1	10 units	101	0.001
	Size S0								
 3RT29 26-4EB13	3RT2. 2	**Covers for ring terminal lug connections** Set for one device, comprising 4 single covers	B	**3RT29 26-4EB13**		1	1 unit	101	0.005

For technical specifications for connection modules see page 3/108.

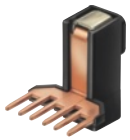
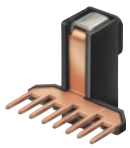
[1] Exception: contactors and contactor relays with auxiliary switch block mounted onto the front.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

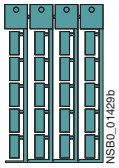
	For contactors Type	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Screw adapters for mounting the contactors									
	Size S0								
 NSB0_01470 3RT19 26-4P	3RT2. 2	Screw adapters for easier screw fixing 2 units are required per contactor (1 pack contains 10 sets for 10 contactors)	C	**3RT19 26-4P**		1	10 units	101	0.010
Solder pin adapters for contactors up to 5.5 kW / 12 A									
	Size S00, up to 5.5 kW (12 A, AC-1/AC-3)								
				Screw terminals					
  3RT19 16-4KA1	3RT2. 1, 3RH21	Assembly kit for soldering contactors onto a printed circuit board. For 1 contactor, 1 set is required.	A	**3RT19 16-4KA1**		1	4 units	101	0.030
Solder pin adapters for contactors up to 5.5 kW / 12 A with mounted 4-pole auxiliary switch block									
	Size S00, up to 5.5 kW (12 A, AC-1/AC-3)								
 3RT19 16-4KA2	3RT2. 1, 3RH21	Assembly kit for soldering contactors with an auxiliary switch block onto a printed circuit board. For 1 contactor, 1 set is required.	B	**3RT19 16-4KA2**		1	4 units	101	0.070
Safety main current connectors for 2 contactors									
	Sizes S00 and S0								
 3RA29 16-1A		**For series connection of 2 contactors**							
	3RT2. 1		A	**3RA29 16-1A**		1	1 unit	101	0.001
	3RT2. 2		A	**3RA29 26-1A**		1	1 unit	101	0.001

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Terminals, covers, adapters, connectors

	For contactors Type	Max. conductor cross-sections mm²	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Links for paralleling									
	Sizes S00 and S0								
 3RT19 16-4BB31	**3-pole, with connection terminal**[1)2)]			**Screw terminals**					
	3RT20 1	25, stranded	▶	**3RT19 16-4BB31**		1	1 unit	101	0.015
	3RT20 2	50, stranded	B	**3RT29 26-4BB31**		1	1 unit	101	0.020
 3RT29 26-4BB31									
 3RT19 16-4BB41	**4-pole, with connection terminal**[1)2)]								
	3RT23 1, 3RT25 1	25, stranded	C	**3RT19 16-4BB41**		1	1 unit	101	0.015

1) The links for paralleling can be reduced by one pole.
2) With sizes S00 and S0 the links for paralleling are insulated.

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Insulation stop for securely holding back the conductor insulation on conductors up to 1 mm²								
			Spring-type terminals					
 3RT19 16-4JA02	**Insulation stop strips** can be inserted in cable entry of the spring-type terminal (2 strips per contactor required)							
	• For basic devices S00 (3RT20 1. or 3RH2.), removable individually	B	**3RT29 16-4JA02**		1	20 units	101	0.005
	• For auxiliary and control circuit on basic devices size S0 (3RT20 2.) and for mountable 3RH29 auxiliary switches, removable in pairs	B	**3RT19 16-4JA02**		1	20 units	101	0.010
Tools for opening spring-type terminals								
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals Length: approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels								
 3RT19 00-1SB20	**Unit labeling plates**[1)] for SIRIUS devices							
	• 20 mm × 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200

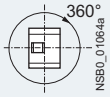
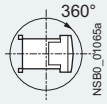
1) PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de

* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

Version	Type		3RA28 13	3RA28 14	3RA28 15
			Solid-state time-delay auxiliary switches		
General data					
Rated insulation voltage U_i Pollution degree 3 Overvoltage category III		V AC	300		
Operating range of excitation			0.85 ... 1.1 x U_s, 0.95 ... 1.05 times the rated frequency		
Rated power		W	1		
• Power consumption at 230 V AC, 50 Hz		VA	2		
Rated operational currents I_e					
• AC-140	At 24 ... 240 V, 50 Hz	A	--		
• DC-13	At 24 ... 240 V	A	--		
• AC-15	At 24 ... 240 V, 50 Hz	A	3		
• DC-13	- At 24 V	A	1		
	- At 125 V	A	0.2		
	- At 250 V	A	0.1		
DIAZED fuse	Operational class gG	A	4		
Switching frequency for load					
• With I_e at 230 V AC		h^{-1}	2500		
• With 3RT2 contactor at 230 V AC		h^{-1}	2500		
Recovery time		ms	150		--
Minimum ON period		ms	--	35	200
Residual current	Max.	mA	--		
Voltage drop With conducting output	Max.	VA	--		
Short-time loading capacity	Up to 10 ms	A	--		
Setting accuracy With reference to upper limit of scale	Typ.		±15 %		
Repeat accuracy	Max.		±1 %		
Mechanical endurance		Operating cycles	10×10^6		
Permissible ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-40 ... +80		
Degree of protection acc. to EN 60947-1, Appendix C			IP20		
Conductor cross-sections					
Connection type			**Screw terminals**		
• Solid		mm^2	1 x (0.5 ... 4), 2 x (0.5 ... 2.5)		
• Finely stranded with end sleeve		mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.5)		
• AWG cables, solid or stranded		AWG	2 x (20 ... 14)		
• Terminal screws			M3 (for standard screw driver size 2 or Pozidriv 2)		
• Tightening torque		Nm	0.8 ... 1.2		
Connection type			**Spring-type terminals**		
• Operating devices		mm	3.0 x 0.5		
• Solid		mm^2	2 x (0.25 ... 1.5)		
• Finely stranded with end sleeve		mm^2	2 x (0.25 ... 1.5)		
• Finely stranded		mm^2	2 x (0.25 ... 1.5)		
• AWG cables, solid or stranded		AWG	2 x (24 ... 16)		
Permissible mounting position			Any		
Shock resistance Half-sine acc. to IEC 60068-2-27		g/ms	15/11		
Vibration resistance Acc. to IEC 60068-2-6		Hz/mm	10 ... 55/0.35		
Electromagnetic compatibility (EMC)			IEC 61000-6-2, IEC 61000-6-4, IEC 61812-1		
Overvoltage protection			Varistor integrated		

Accessories

Version	Type		3RT29 16-2BE01	3RT29 16-2BK01	3RT29 16-2BL01
			OFF-delay devices		
Connectable contactor sizes Caution! Only contactors and contactor relays with DC operation can be connected.					
• DC supply			S00 ...S3	S00/S0	S00/S0
• AC supply			--	S00/S0	S00/S0
	Type		3RT20 . .-1BB4., 3RH2. . .-1BB40	3RT20 1.-1BF4, 3RT20 2.-1BF4, 3RH2. . .-1BF40	3RT20 1.-1BM4./1BP4., 3RT20 2.-1BM4./1BP4., 3RH2. . .-1BM40/1BP40
Permissible mounting position					
Rated control supply voltage U_s Primary operating range		V	24 (DC) 0.9 ... 1.1 U_s	110 (AC/DC)	220/230 (AC/DC)
Rated frequency/ies with AC supply	f	Hz ±5 %	--	50/60	50/60
Ambient temperature permissible:					
• During operation					
- Side-by-side mounting without distance	T_u	°C	-25 ... +50		
- Side-by-side mounting with 5 mm distance	T_u	°C	-25 ... +60		
• During storage	T_u	°C	-40 ... +80		
OFF-delay[1] (minimum times at U_{sp} = 0.9 x U_s, T_{sp} = 20 °C)			Notes: In practice the mean value is 1.5 times the minimum time.		
• S00	t_{off} >	ms	200	100	500
• S0	t_{off} >	ms	100	80	300
Installed capacity C 3RT19 16-2B.01 Capacitor voltage		µF V	2000 35	68 180	68 350
ON-delay (maximum at U_{sp} = 0.9 x U_s, T_{sp} = 20 °C)			Note: The total ON-delay = Contactor make-time + t_{on}		
• S00	t_{on} <	ms	10	60	200
• S0	t_{on} <	ms	10	80	250
Mechanical endurance		Operating cycles	30 million		
Endurance, electrical approx.		Operating cycles	>1 million		
Switching frequency z max. (at T_u = 60 °C)		h^{-1}	300		
Power loss P_v max. approx.		W	0.4	0.5	1
Surge suppression			With varistor, integrated		
Conductor cross-sections			[2]		

U_{sp} = Coil voltage
T_{sp} = Coil temperature

[1] Doubling the delay time can be achieved by doubling the capacitance. Commercially available capacitors can be used, which can be connected to terminals C+ and Z–.

[2] See 3RT20 1 contactors, page 3/20.

Version	Type		3RT29 26-2P Pneumatic delay block[1]
General data			
Mechanical endurance		Operating cycles	5 million
Electrical endurance at I_e		Operating cycles	1 million
Rated insulation voltage U_i (pollution degree 3)		V	690
Permissible ambient temperature			
• During operation		°C	-25 ... +60
• During storage		°C	-50 ... +80
Rated operational currents I_e Acc. to utilization categories EN 60947			
• AC-12		A	10
• AC-15/AC-14 at U_e	Up to 230/220 V	A	6
	400/380 V	A	4
	500 V	A	2.5
	690/660 V	A	1.5
• DC-13 at U_e	24 V	A	4
	48 V	A	2
	110 V	A	0.7
	220 V	A	0.3
	440 V	A	0.15
Conductor cross-sections			
• Solid, stranded		mm^2	2 x 0.5 ... 2.5[2] or 2 x 2.5 ... 4[2]
• Finely stranded with end sleeve		mm^2	2 x 0.5 ... 2.5
• AWG cables		AWG	2 x 22 ... 14
• Tightening torque of the terminal screws		Nm	0.8 ... 1.1
Time delay			
• Accuracy			±10 %
CSA and UL rated data			
• Rated voltage		V AC	600
• Switching capacity			A 600, Q 600

[1] For size S0.
In addition to the pneumatic delay block, no other auxiliary contacts are permitted.

[2] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Technical specifications according to EN 61812-1 (VDE 0435 Part 2021)

Version	Type		3RT29 26-3A Mechanical latching block for the 3RT2. 2. contactors
Rated insulation voltage U_i (pollution degree 3)		V	690
Mechanical endurance	• With 3RT2. 2	Operating cycles	3 million
Permissible ambient temperature			
• During operation		°C	-25 ... +60
• During storage		°C	-50 ... +80
Degree of protection acc. to EN 60947-1, Appendix C			IP20
Operating range of the solenoid coil At AC 50/60 Hz and DC			0.85 ... 1.1 x U_s
Power consumption of the solenoid coils of the unlocking magnet (for cold coil and 1.0 x U_s) AC and DC operation		W	Approx. 4
Command duration for de-energizing			
• AC operation		ms	18 ... 31
• DC operation		ms	18 ... 26
Conductor cross-sections			
• Solid		mm^2	2 x (0.5 ... 2.5); 1 x 4
• AWG cables, solid		AWG	2 x 14; 1 x 12
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 2.5); 1 x 2.5
• AWG cables, finely stranded with end sleeve		AWG	2 x 14; 1 x 12
Tightening torque of the terminal screws		Nm lb.in	0.8 ... 1.1 7 ... 9.5

Accessories

Version	Type		3RT1900-4RE01	3RT1916-4RD01	3RT1926-4RD01
Connection modules for contactors with screw terminals			Plugs S00, S0	Adapters S00	Adapters S0
General data					
Mechanical endurance		Operating cycles	10 million		
Electrical endurance at I_e		Operating cycles	1 million		
Rated operational voltage U_e		V	440		
Rated insulation voltage U_i (pollution degree 3)		V	690		
Rated impulse withstand voltage U_{imp} (pollution degree 3)		kV	6		
Protective separation acc. to EN 60947-1 (pollution degree 3)		V	400		
Rated operational current I_e AC-3 at 400 V		A	25	20	25
Rated frequency f For AC operation		Hz	50/60		
Permissible ambient temperature					
• During operation		°C	-25 ... +60		
• During storage		°C	-50 ... +80		
Degree of protection acc. to EN 60529			IP20		
Conductor cross-sections Screw terminals					
• Solid		mm^2	1 x (0.5 ... 6)		
• Finely stranded without/with end sleeve		mm^2	1 x (0.5 ... 6)		
• Stranded		mm^2	1 x (0.5 ... 6)		
• AWG cables, solid or stranded		AWG	1 x (20 ... 10)		
• Tightening torque		Nm	0.6 ... 0.8		
• Corresponding opening tool			Short-slot screwdriver PZ2		
CSA and UL rated data					
• Rated operational voltage U_e		V	480		
• Rated insulation voltage U_i		V	600		
• Uninterrupted current, at 40 °C		A	16/25	16	25
• Short-circuit protection[1]					
	• At 600 V	kA	5		
	• CLASS RK5 fuse	A	100	60	100
	• Circuit breakers with overload protection acc. to UL 489	A	100	60	100
Combination motor controllers type E acc. to UL 508	• At 480 V	Type	3RV20 2		
		A	22	--	22
		kA	65	--	65
	• At 600 V	Type	3RV20 2		
		A	22	--	22
		kA	10	--	10

[1] For more information about short-circuit values, e.g. for protection against short-circuit currents, see the UL guide (Order No.: A5E02118883) or the UL reports (www.support.automation.siemens.com) of the individual devices.

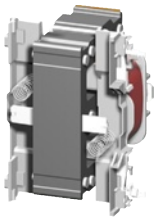
Version	Type		3RH29 24-1GP11 Coupling links for PLC, for mounting on contactors acc. to IEC 60947/EN 60947
General data			
Rated insulation voltage U_i (pollution degree 3)		V	300
Protective separation between the coil and the contacts acc. to EN 60947-1, Appendix N		V AC	Up to 300
Degree of protection acc. to EN 60947-1, Appendix C			
• Terminals			IP20
• Enclosures			IP40
Permissible ambient temperature			
• During operation		°C	-25 ... +60
• During storage		°C	-40 ... +80
Conductor cross-section			
• Solid		mm^2	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve		mm^2	2 x (0.5 ... 1.5)
Terminal screws			M3
Short-circuit protection (weld-free protection at $I_k \geq 1$ kA)			
• Fuse links, gG operational class: LV HRC 3NA, DIAZED 5SB, NEOZED 5SE		A	6
Control side			
Rated control supply voltage U_s		V DC	24
Primary operating range		V DC	17 ... 30
Power consumption at U_s		W	0.5
Nominal current input		mA	20
Release voltage		V	≥ 4
Function display			Yellow LED
Protection circuit			Varistors
Load side			
Mechanical endurance	In million operating cycles		20
Electrical endurance at I_e	In million operating cycles		0.1
Switching frequency	Operating cycles	h^{-1}	5000
Make-time		ms	Approx. 7
Break-time		ms	Approx. 4
Bounce time		ms	Approx. 2
Contact material			AgSnO
Switching voltage		V AC/DC	24 ... 250
Permissible residual current of the electronics (for 0 signal)		mA	2.5
Rated operational currents[1)] Conventional thermal current I_{th}		A	6
Rated operational currents I_e Acc. to utilization categories EN 60947			
• AC-15	- At 24 V	A	3
	- At 110 V	A	3
	- At 230 V	A	3
• DC-13	- At 24 V	A	1
	- At 110 V	A	0.2
	- At 230 V	A	0.1
Switching current with resistive load to EN 60255 (relay standard) and EN 60947			
• AC-12	- At 24 V	A	6
	- At 110 V	A	6
	- At 230 V	A	6
• DC-12	- At 24 V	A	6
	- At 110 V	A	0.3
	- At 230 V	A	0.2[1)]

[1)] Capacitive loads can result in micro-weldings on the contacts.

Spare parts for 3RT2 contactors

Selection and ordering data

For screw, spring-type and ring terminal lug connection



3RT29 24-5A.01

For contactors Size	Type	Rated control supply voltage U_s 50 Hz V	50/60 Hz V	60 Hz V	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Solenoid coils · AC operation											
S0	3RT20 23, 3RT20 24, 3RT20 25	24	--	--	B	**3RT29 24-5AB01**		1	1 unit	101	0.100
		42	--	--	B	**3RT29 24-5AD01**		1	1 unit	101	0.100
		48	--	--	B	**3RT29 24-5AH01**		1	1 unit	101	0.100
		110	--	--	B	**3RT29 24-5AF01**		1	1 unit	101	0.100
		230	--	--	B	**3RT29 24-5AP01**		1	1 unit	101	0.100
		400	--	--	B	**3RT29 24-5AV01**		1	1 unit	101	0.100
		--	24	--	B	**3RT29 24-5AC21**		1	1 unit	101	0.100
		--	42	--	B	**3RT29 24-5AD21**		1	1 unit	101	0.100
		--	48	--	B	**3RT29 24-5AH21**		1	1 unit	101	0.100
		--	110	--	B	**3RT29 24-5AG21**		1	1 unit	101	0.100
		--	220	--	B	**3RT29 24-5AN21**		1	1 unit	101	0.100
		--	230	--	B	**3RT29 24-5AL21**		1	1 unit	101	0.100
		110	--	120	B	**3RT29 24-5AK61**		1	1 unit	101	0.100
		220	--	240	B	**3RT29 24-5AP61**		1	1 unit	101	0.100
		--	100	110	B	**3RT29 24-5AG61**		1	1 unit	101	0.100
		--	200	220	B	**3RT29 24-5AN61**		1	1 unit	101	0.100
		--	400	440	B	**3RT29 24-5AR61**		1	1 unit	101	0.100
S0	3RT20 26, 3RT20 27, 3RT20 28	24	--	--	B	**3RT29 26-5AB01**		1	1 unit	101	0.100
		42	--	--	B	**3RT29 26-5AD01**		1	1 unit	101	0.100
		48	--	--	B	**3RT29 26-5AH01**		1	1 unit	101	0.100
	3RT23 25, 3RT23 26, 3RT23 27	110	--	--	B	**3RT29 26-5AF01**		1	1 unit	101	0.100
		230	--	--	B	**3RT29 26-5AP01**		1	1 unit	101	0.100
		400	--	--	B	**3RT29 26-5AV01**		1	1 unit	101	0.100
	3RT25 26	--	24	--	B	**3RT29 26-5AC21**		1	1 unit	101	0.100
		--	42	--	B	**3RT29 26-5AD21**		1	1 unit	101	0.100
		--	48	--	B	**3RT29 26-5AH21**		1	1 unit	101	0.100
		--	110	--	B	**3RT29 26-5AG21**		1	1 unit	101	0.100
		--	220	--	B	**3RT29 26-5AN21**		1	1 unit	101	0.100
		--	230	--	B	**3RT29 26-5AL21**		1	1 unit	101	0.100
		110	--	120	B	**3RT29 26-5AK61**		1	1 unit	101	0.100
		220	--	240	B	**3RT29 26-5AP61**		1	1 unit	101	0.100
		--	100	110	B	**3RT29 26-5AG61**		1	1 unit	101	0.100
		--	200	220	B	**3RT29 26-5AN61**		1	1 unit	101	0.100
		--	400	440	B	**3RT29 26-5AR61**		1	1 unit	101	0.100

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Controls – Soft Starters and Solid-State Switching Devices

4

Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

Introduction

Overview

3RW30

3RW40

		Order No.	Page
3RW soft starters			
3RW soft starters for standard applications			
3RW30 soft starters	• SIRIUS 3RW30 soft starters for soft starting of three-phase asynchronous motors • Performance range of up to 55 kW (at 400 V)	3RW30	4/6
3RW40 soft starters	• SIRIUS 3RW40 soft starters with the integral functions - Solid-state motor overload and intrinsic device protection - Adjustable current limiting For the soft starting and stopping of three-phase asynchronous motors • Performance range of up to 55 kW (at 400 V)	3RW40	4/11

3RF34 05-1BB..

3RF34 05-1BD..

		Order No.	Page
SIRIUS solid-state switching devices for switching motors			
Solid-state contactors			
Solid-state contactors, solid-state reversing contactors	• Complete units in the insulated enclosure with integrated heat sink, "ready to use" • Compact and space-saving design • Version for motors, "instantaneous switching"	3RF34 ..-1BB.. 3RF34 ..-1BD..	4/23 4/26

Connection methods

The devices are available with screw terminals or spring-type terminals.

⊕	Screw terminals
	Spring-type terminals
	These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Overview

		SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications
Rated current at 40 °C	*A*	*3 ... 106*	*12.5 ... 106*
Rated operational voltage	V	200 ... 480	200 ... 600
Motor rating at 400 V	kW	1.5 ... 55	5.5 ... 55
Ambient temperature	°C	-25 ... +60	-25 ... +60
Soft starting/ramp-down		✓[1]	✓
Voltage ramp		✓	✓
Starting/stopping voltage	%	40 ... 100	40 ... 100
Starting and ramp-down time	s	0 ... 20	0 ... 20
Integral bypass contact system		✓	✓
Intrinsic device protection		--	✓
Motor overload protection		--	✓
Thermistor motor protection		--	✓[2]
Integrated remote RESET		--	✓
Adjustable current limiting		--	✓
Power semiconductors (thyristors)		2 controlled phases	2 controlled phases
Screw terminals		✓	✓
Spring-type terminals		✓	✓
UL/CSA		✓	✓
CE marking		✓	✓
ATEX explosion protection		--	✓[3]
Configuring support		Win-Soft Starter, electronic selection slider ruler, Technical Assistance Telephone: +49 (911) 895 - 5900	

✓ Function is available
-- Function not available

[1] Only soft starting available for 3RW30
[2] Optional
[3] Use upstream disconnect mechanism

You can find further information on the Internet at:
www.siemens.com/softstarter

General data

Selection aid for soft starters


Application	SIRIUS 3RW30 Standard applications	SIRIUS 3RW40 Standard applications
Normal starting (CLASS 10)		
Pump	●	●
Pump with special pump ramp-down (to prevent water hammer)		
Heat pump	●	●
Hydraulic pump	❍	●
Press	❍	●
Conveyor belt	❍	●
Roller conveyor	❍	●
Screw conveyor	❍	●
Escalator		●
Piston compressor		●
Screw compressor		●
Small fan[1]		●
Centrifugal blower		●
Bow thruster		●
Heavy starting (CLASS 20)		
Stirrer		❍
Extruder		❍
Lathe		❍
Milling machine		❍

● Recommended soft starter
❍ Possible soft starter

[1] The mass inertia of the fan is <10 times the mass inertia of the motor.

Boundary conditions

Type	Maximum starting time s	Current limiting %	Starts per hour 1/h
Normal starting (CLASS 10)			
• **3RW30**	3	300	20
• **3RW40**	10	300	5
Heavy starting (CLASS 20)			
• **3RW40 2., 3RW40 3., 3RW40 4.**	20	300	5

The quoted motor ratings are only approximate values. The soft starter should always be designed on the basis of the motor current (rated operational current). In the event of deviating conditions, it may be necessary to choose a larger device.

Motor rating data are based on DIN 42973 (kW) and NEC 96/UL 508 (hp).

Benefits

The advantages of the SIRIUS soft starters at a glance:

- Soft starting and smooth ramp-down (only soft starting available for 3RW30)
- Stepless starting
- Reduction of current peaks
- Avoidance of mains voltage fluctuations during starting
- Reduced load on the power supply network
- Reduction of the mechanical load in the operating mechanism
- Considerable space savings and reduced wiring compared with conventional starters
- Maintenance-free switching
- Very easy handling

Fits perfectly in the SIRIUS modular system

More information

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Soft starters	**3 R W**															
SIRIUS soft starter generation		□	□													
Size				□												
Rated operational current I_e					□											
Connection type (screw terminals / spring-type terminals)							□									
Soft starter functionality (bypass, thermistor, etc.)								□	□							
Rated control supply voltage U_s										□						
Rated operational voltage U_e											□					
Special versions													□	□	□	□
Example	**3 R W**	**4**	**0**	**2**	**4**	**–**	**1**	**B**	**B**	**1**	**4**					

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

3RW30

Overview

The SIRIUS 3RW30 soft starters reduce the motor voltage through variable phase control and increase it in ramp-like mode from a selectable starting voltage up to mains voltage. During starting, these devices limit the torque as well as the current and prevent the shocks which arise during direct starts or wye-delta starts. In this way, mechanical loads and mains voltage dips can be reliably reduced.

Soft starting reduces the stress on the connected equipment and results in lower wear and therefore longer periods of trouble-free production. The selectable start value means that the soft starters can be adjusted individually to the requirements of the application in question and unlike wye-delta starters are not restricted to two-stage starting with fixed voltage ratios.

The SIRIUS 3RW30 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

Various versions of the SIRIUS 3RW30 soft starters are available:

- Standard version for fixed-speed three-phase motors, sizes S00, S0, S2 and S3, with integrated bypass contact system
- Version for fixed-speed three-phase motors in a 22.5 mm enclosure without bypass

Soft starters rated up to 55 kW (at 400 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple commissioning are just three of the many advantages of this soft starter.

Functionality

The space required by the compact SIRIUS 3RW30 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e.g.brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this asymmetry, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %. The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause.

It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the ongoing dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

- Soft starting with voltage ramp; the starting voltage setting range U_s is 40 to 100 % and the ramp time t_R can be set from 0 to 20 s.
- Integrated bypass contact system to minimize power loss
- Setting with two potentiometers
- Simple mounting and commissioning
- Mains voltages 50/60 Hz, 200 to 480 V
- Two control voltage versions 24 V AC/DC and 110 to 230 V AC/DC
- Wide temperature range from -25 to +60 °C
- The built-in auxiliary contact ensures user-friendly control and possible further processing within the system (for status graphs see page 4/10)

Application

The 3RW30 soft starters are suitable for soft starting of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time. Due to continuous voltage influencing, the current and torque peaks which are unavoidable in the case of wye-delta starters for instance do not occur.

Application areas

See "Selection aid for soft starters" on page 4/4.

Selection and ordering data


3RW30 18-1BB14


3RW30 28-1BB14


3RW30 38-1BB14


3RW30 47-1BB14

Ambient temperature 40 °C				Ambient temperature 50 °C					Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 230 V	400 V	500 V	Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 200 V	230 V	460 V	575 V								
A	kW	kW	kW	A	hp	hp	hp	hp								kg
Rated operational voltage U_e 200 ... 480 V 2)																
• With screw terminals																
3.6	0.75	**1.5**	--	3	0.5	0.5	**1.5**	--	**S00**	▶	**3RW30 13-1BB□4**		1	1 unit	131	0.580
6.5	1.5	**3**	--	4.8	1	1	**3**	--	**S00**	▶	**3RW30 14-1BB□4**		1	1 unit	131	0.580
9	2.2	**4**	--	7.8	2	2	**5**	--	**S00**	▶	**3RW30 16-1BB□4**		1	1 unit	131	0.580
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S00**	▶	**3RW30 17-1BB□4**		1	1 unit	131	0.580
17.6	4	**7.5**	--	17	3	3	**10**	--	**S00**	▶	**3RW30 18-1BB□4**		1	1 unit	131	0.580
• Spring-type terminals																
3.6	0.75	**1.5**	--	3	0.5	0.5	**1.5**	--	**S00**	B	**3RW30 13-2BB□4**		1	1 unit	131	0.580
6.5	1.5	**3**	--	4.8	1	1	**3**	--	**S00**	B	**3RW30 14-2BB□4**		1	1 unit	131	0.580
9	2.2	**4**	--	7.8	2	2	**5**	--	**S00**	B	**3RW30 16-2BB□4**		1	1 unit	131	0.580
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S00**	B	**3RW30 17-2BB□4**		1	1 unit	131	0.580
17.6	4	**7.5**	--	17	3	3	**10**	--	**S00**	B	**3RW30 18-2BB□4**		1	1 unit	131	0.580
• With screw terminals																
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	▶	**3RW30 26-1BB□4**		1	1 unit	131	0.690
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	▶	**3RW30 27-1BB□4**		1	1 unit	131	0.690
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	▶	**3RW30 28-1BB□4**		1	1 unit	131	0.690
• Spring-type terminals																
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	B	**3RW30 26-2BB□4**		1	1 unit	131	0.690
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	B	**3RW30 27-2BB□4**		1	1 unit	131	0.690
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	B	**3RW30 28-2BB□4**		1	1 unit	131	0.690
• With screw or spring-type terminals																
45	11	**22**	--	42	10	15	**30**	--	**S2**	▶	**3RW30 36-□BB□4**		1	1 unit	131	1.200
63	18.5	**30**	--	58	15	20	**40**	--	**S2**	▶	**3RW30 37-□BB□4**		1	1 unit	131	1.200
72	22	**37**	--	62	20	20	**40**	--	**S2**	▶	**3RW30 38-□BB□4**		1	1 unit	131	1.200
• With screw or spring-type terminals																
80	22	**45**	--	73	20	25	**50**	--	**S3**	▶	**3RW30 46-□BB□4**		1	1 unit	131	1.710
106	30	**55**	--	98	30	30	**75**	--	**S3**	▶	**3RW30 47-□BB□4**		1	1 unit	131	1.710

Order No. supplement for connection types		
• With screw terminals	**1**	
• With spring-type terminals 3)	**2**	
Order No. supplement for rated control supply voltage U_s		
• 24 V AC/DC		**0**
• 110 ... 230 V AC/DC		**1**

1) Stand-alone installation.

2) Soft starter with screw terminals: delivery time class ▶ (preferred type).

3) Main circuit connection: screw terminals.

Note:
Selection of the soft starter depends on the rated motor current.

Please observe the notes for the selection of soft starters on page 4/4.

The SIRIUS 3RW30 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device.
Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see "Technical specifications".

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

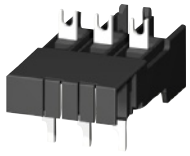
3RW30

Accessories

	Conductor cross-section Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For soft starters	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm²	mm²	AWG	Nm	Size							kg
Three-phase feeder terminals												
 3RV29 25-5AB	2.5 ... 16	2.5 ... 16	10 ... 4	3 ... 4	S00 (3RW30 1.), S0 (3RW30 2.)	A	**3RV29 25-5AB**		1	1 unit	101	0.043

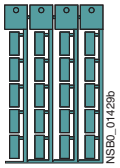
	For soft starters Type	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
									kg
Auxiliary terminals									
	Auxiliary terminals, 3-pole								
	3RW30 4.	**S3**	B	**3RT19 46-4F**		1	1 unit	101	0.035
Covers for soft starters									
	**Terminal covers for box terminals** Additional touch protection to be fitted at the box terminals (2 units required per device)								
	3RW30 3.	**S2**	►	**3RT19 36-4EA2**		1	1 unit	101	0.020
	3RW30 4.	**S3**	►	**3RT19 46-4EA2**		1	1 unit	101	0.025
	**Terminal covers for cable lugs and busbar connections** For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)								
	3RW30 4.	**S3**	►	**3RT19 46-4EA1**		1	1 unit	101	0.040
Device manuals 3RW30/3RW40									
	3RW30 1.	**S00**	C	**3ZX10 12-0RW30-1AB1**		1	1 unit	191	0.550
	3RW30 2.	**S0**							
	3RW30 3.	**S2**							
	3RW30 4.	**S3**							
Operating instructions[1]									
	3RW30 1.	**S00** --		**3ZX10 12-0RW30-2DA1**					
	3RW30 2.	**S0**							
	3RW30 3.	**S2**							
	3RW30 4.	**S3**							

[1] The operating instructions are included in the scope of supply.

	For soft starters Type	Size	Motor starter protector Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
										kg
Link modules for soft starters to motor starter protectors[1]										
 3RA29 21-1BA00	• With screw terminals				**Screw terminals**					
	3RW30 1.	**S00**	**S00**	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
	3RW30 2.	**S0**	**S00/S0**	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
	3RW30 36	**S2**	**S2**	►	**3RA19 31-1AA00**		1	1 unit	101	0.042
	3RW30 46, 3RW30 47	**S3**	**S3**	►	**3RA19 41-1AA00**		1	1 unit	101	0.090
	• Spring-type terminals				**Spring-type terminals**					
	3RW30 1.	**S00**	**S00**	A	**3RA29 11-2GA00**		1	1 unit	101	0.038
	3RW30 2.	**S0**	**S0**	A	**3RA29 21-2GA00**		1	1 unit	101	0.072

[1] Can be used in size S0 up to maximum 32 A.
Can be used in size S00/S0 only for 3RV2 motor starter protectors.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for opening spring-type terminals by hand								
			Spring-type terminals					
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels								
 3RT19 00-1SB20	**Unit labeling plates**[1)] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200

[1)] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

4

* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

Application examples for normal starting (Class 10)

Normal starting Class 10 (up to 20 s with 300 % $I_{n\ motor}$),
The soft starter rating can be selected to be as high as the rating of the motor used

Application		Conveyor belt	Roller conveyor	Compressor	Small fan[1)]	Pump	Hydraulic pump
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	40	40	40
- Starting time	s	10	10	20	20	10	10

1) The mass inertia of the fan is <10 times the mass inertia of the motor.

Note:
These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.
The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state motor controllers are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

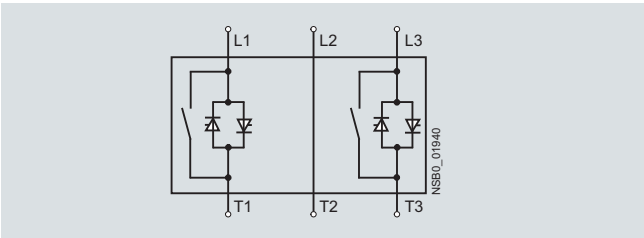
If necessary, an overload relay for heavy starting must be selected where long starting times are involved. PTC sensors are recommended.

No capacitive elements are permitted in the motor feeder between the SIRIUS 3RW soft starter and the motor (e.g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses, controls and overload relays) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

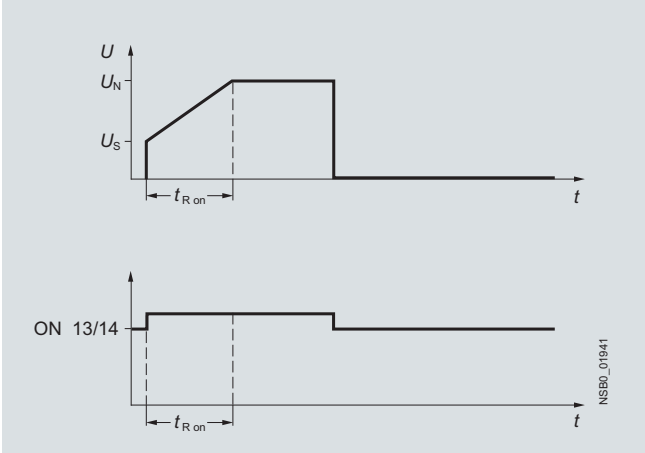
Note:
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Power electronics schematic circuit diagram



A bypass contact system is already integrated in the 3RW30 soft starter and therefore does not have to be ordered separately.

Status graphs



Manual for SIRIUS 3RW30/40

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices.

Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:
www.siemens.com/softstarter --> Software

You can find more information about soft starters on the Internet likewise at:
www.siemens.com/softstarter

Training course for SIRIUS soft starters (SD-SIRIUSO)

Siemens offers a 2-day training course on the SIRIUS solid-state soft starters to keep customers and own personnel up-to-date on configuring, commissioning and maintenance issues.

Please direct enquiries and applications to:

Siemens AG
Information and Training Center
Gleiwitzer Strasse 555
D-90475 Nürnberg
Telephone: +49 (911) 895 - 3202
Telefax: +49 (911) 895 - 3275
E-mail: ingeborg.hoier@siemens.com
www.siemens.com/sitrain-cd

Overview

SIRIUS 3RW40 soft starters have all the same advantages as the 3RW30 soft starters.

The SIRIUS 3RW40 soft starters are characterized above all by their small space requirements. Integrated bypass contacts mean that no power loss has to be taken into the bargain at the power semiconductors (thyristors) after the motor has started up. This cuts down on heat losses, enabling a more compact design and making external bypass circuits superfluous.

At the same time this soft starter comes with additional integrated functions such as adjustable current limiting, motor overload and intrinsic device protection, and optional thermistor motor protection. The higher the motor rating, the more important these functions because they make it unnecessary to purchase and install protection equipment such as overload relays.

Internal intrinsic device protection prevents the thermal overloading of the thyristors and the power section defects this can cause. As an option the thyristors can also be protected by semiconductor fuses from short-circuiting.

Thanks to integrated status monitoring and fault monitoring, this compact soft starter offers many different diagnostics options. Up to four LEDs and relay outputs permit differentiated monitoring and diagnostics of the operating mechanism by indicating the operating state as well as for example mains or phase failure, missing load, non-permissible tripping time/class setting, thermal overloading or device faults.

Soft starters rated up to 55 kW (at 400 V) for standard applications in three-phase networks are available. Extremely small sizes, low power losses and simple start-up are just three of the many advantages of the SIRIUS 3RW40 soft starters.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RW40 soft starter sizes S0 to S12 are suitable for the starting of explosion-proof motors with "increased safety" type of protection EEx e.
See Chapter 20 "Appendix" --> "Standards and approvals" --> "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)".

Functionality

The space required by the compact SIRIUS 3RW40 soft starter is often only about one third of that required by a contactor assembly for wye-delta starting of comparable rating. This not only saves space in the control cabinet and on the standard mounting rail but also does away completely with the wiring work needed for wye-delta starters. This is notable in particular for higher motor ratings which are only rarely available as fully wired solutions.

At the same time the number of cables from the starter to the motor is reduced from six to three. Compact dimensions, short start-up times, easy wiring and fast commissioning make themselves felt as clear-cut cost advantages.

The bypass contacts of these soft starters are protected during operation by an integrated solid-state arc quenching system. This prevents damage to the bypass contacts in the event of a fault, e.g.brief disconnection of the control voltage, mechanical shocks or life-related component defects on the coil operating mechanism or main contact spring.

The starting current of particularly powerful operating mechanisms can place an unjustifiable load on the local supply system. Soft starters reduce this starting current by means of their voltage ramp. Thanks to the adjustable current limiting, the SIRIUS 3RW40 soft starter takes even more pressure off the supply system. It leaves the set start ramp during the ramp-up – the ramp gradient is fixed by the starting voltage and the ramp time – as soon as the selected current limit is reached. From this moment the voltage of the soft starter is controlled so that the current supplied to the motor remains constant. This process is ended either by completion of the motor ramp-up or by tripping by the intrinsic device protection or the motor overload protection. As the result of this function the actual motor ramp-up can well take longer than the ramp time selected on the soft starter.

Thanks to the integrated motor overload protection according to IEC 60947-4-2 there is no need of an additional overload relay on the new soft starters. The rated motor current, the setting of the overload tripping time (CLASS times) and the reset of the motor overload protection function can be adjusted easily and quickly. Using a 4-step rotary potentiometer it is possible to set different overload tripping times on the soft starter. In addition to CLASS 10, 15 and 20 it is also possible to switch off the motor overload protection if a different motor management control device is to be used for this function, e.g. with connection to PROFIBUS.

Device versions with thermistor motor protection evaluation are available up to a rating of 55 kW (at 400 V). A "Thermoclick" measuring probe can be connected directly, as can a PTC of type A. Thermal overloading of the motor, open-circuits and short-circuits in the sensor circuit all result in the direct disconnection of the soft starter. And if ever the soft starter trips, various reset options are available the same as with intrinsic device protection and motor load protection: manually with the reset button, automatically or remotely through brief disconnection of the control voltage.

The new series of devices comes with the "polarity balancing" control method, which is designed to prevent direct current components in two-phase controlled soft starters. On two-phase controlled soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. This results for physical reasons in an asymmetric distribution of the three phase currents during the motor ramp-up. This phenomenon cannot be influenced, but in most applications it is non-critical.

Controlling the power semiconductors results not only in this asymmetry, however, but also in the previously mentioned direct current components which can cause severe noise generation on the motor at starting voltages of less than 50 %.

The control method used for these soft starters eliminates these direct current components during the ramp-up phase and prevents the braking torque which they can cause. It creates a motor ramp-up that is uniform in speed, torque and current rise, thus permitting a particularly gentle, two-phase starting of the motors. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled soft starter. This is made possible by the on-going dynamic harmonizing and balancing of current half-waves of different polarity during the motor ramp-up. Hence the name "polarity balancing".

Application

The SIRIUS 3RW40 solid-state soft starters are used for the soft starting and stopping of three-phase asynchronous motors.

Due to two-phase control, the current is kept at minimum values in all three phases throughout the entire starting time and disturbing direct current components are eliminated in addition. This not only enables the two-phase starting of motors up to 55 kW (at 400 V) but also avoids the current and torque peaks which occur e.g. with wye-delta starters.

Application areas

See "Selection aid for soft starters" on page 4/4.

Selection and ordering data

SIRIUS 3RW40 for normal starting (CLASS 10)


3RW40 28-1BB14


3RW40 38-1BB14


3RW40 47-1BB14

Ambient temperature 40 °C				Ambient temperature 50 °C					Size	DT	Normal starting (CLASS 10)		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 230 V	400 V	500 V	Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 200 V	230 V	460 V	575 V			Order No.	Price per PU				
A	kW	kW	kW	A	hp	hp	hp	hp								kg
Rated operational voltage U_e 200 ... 480 V 2)																
• With screw terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	▶	**3RW40 24-1BB□4**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	▶	**3RW40 26-1BB□4**		1	1 unit	131	0.770
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	▶	**3RW40 27-1BB□4**		1	1 unit	131	0.770
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	▶	**3RW40 28-1BB□4**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	B	**3RW40 24-2BB□4**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	B	**3RW40 26-2BB□4**		1	1 unit	131	0.770
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	B	**3RW40 27-2BB□4**		1	1 unit	131	0.770
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	B	**3RW40 28-2BB□4**		1	1 unit	131	0.770
• With screw or spring-type terminals																
45	11	**22**	--	42	10	15	**30**	--	**S2**	▶	**3RW40 36-□BB□4**		1	1 unit	131	1.350
63	18.5	**30**	--	58	15	20	**40**	--	**S2**	▶	**3RW40 37-□BB□4**		1	1 unit	131	1.350
72	22	**37**	--	62	20	20	**40**	--	**S2**	▶	**3RW40 38-□BB□4**		1	1 unit	131	1.350
• With screw or spring-type terminals																
80	22	**45**	--	73	20	25	**50**	--	**S3**	▶	**3RW40 46-□BB□4**		1	1 unit	131	1.900
106	30	**55**	--	98	30	30	**75**	--	**S3**	▶	**3RW40 47-□BB□4**		1	1 unit	131	1.900
Rated operational voltage U_e 400 ... 600 V																
• With screw terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 24-1BB□5**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 26-1BB□5**		1	1 unit	131	0.770
32	--	15	**18.5**	29	--	--	20	**25**	**S0**	B	**3RW40 27-1BB□5**		1	1 unit	131	0.770
38	--	18.5	**22**	34	--	--	25	**30**	**S0**	B	**3RW40 28-1BB□5**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 24-2BB□5**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 26-2BB□5**		1	1 unit	131	0.770
32	--	15	**18.5**	29	--	--	20	**25**	**S0**	B	**3RW40 27-2BB□5**		1	1 unit	131	0.770
38	--	18.5	**22**	34	--	--	25	**30**	**S0**	B	**3RW40 28-2BB□5**		1	1 unit	131	0.770
• With screw or spring-type terminals																
45	--	22	**30**	42	--	--	30	**40**	**S2**	B	**3RW40 36-□BB□5**		1	1 unit	131	1.350
63	--	30	**37**	58	--	--	40	**50**	**S2**	B	**3RW40 37-□BB□5**		1	1 unit	131	1.350
72	--	37	**45**	62	--	--	40	**60**	**S2**	B	**3RW40 38-□BB□5**		1	1 unit	131	1.350
• With screw or spring-type terminals																
80	--	45	**55**	73	--	--	50	**60**	**S3**	B	**3RW40 46-□BB□5**		1	1 unit	131	1.900
106	--	55	**75**	98	--	--	75	**75**	**S3**	B	**3RW40 47-□BB□5**		1	1 unit	131	1.900

Order No. supplement for connection types

- With screw terminals **1**
- With spring-type terminals 3) **2**

Order No. supplement for rated control supply voltage U_s

- 24 V AC/DC **0**
- 110 ... 230 V AC/DC **1**

1) Stand-alone installation without auxiliary fan.

2) Soft starter with screw terminals: delivery time class ▶ (preferred type).

3) Main circuit connection: screw terminals.

Note:

Selection of the soft starter depends on the rated motor current.

Please observe the notes for the selection of soft starters on page 4/4.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see "Technical specifications".

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate


3RW40 28-1TB04


3RW40 38-1TB04


3RW40 47-1TB04

Ambient temperature 40 °C				Ambient temperature 50 °C					Size	DT	Normal starting (CLASS 10)		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 230 V	400 V	500 V	Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 200 V	230 V	460 V	575 V			Order No.	Price per PU				
A	kW	kW	kW	A	hp	hp	hp	hp								kg
Rated operational voltage U_e 200 ... 480 V,2), with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC																
• With screw terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	▶	**3RW40 24-1TB04**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	▶	**3RW40 26-1TB04**		1	1 unit	131	0.770
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	▶	**3RW40 27-1TB04**		1	1 unit	131	0.770
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	▶	**3RW40 28-1TB04**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	B	**3RW40 24-2TB04**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	B	**3RW40 26-2TB04**		1	1 unit	131	0.770
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S0**	B	**3RW40 27-2TB04**		1	1 unit	131	0.770
38	11	**18.5**	--	34	10	10	**25**	--	**S0**	B	**3RW40 28-2TB04**		1	1 unit	131	0.770
• With screw or spring-type terminals																
45	11	**22**	--	42	10	15	**30**	--	**S2**	▶	**3RW40 36-□TB04**		1	1 unit	131	1.350
63	18.5	**30**	--	58	15	20	**40**	--	**S2**	▶	**3RW40 37-□TB04**		1	1 unit	131	1.350
72	22	**37**	--	62	20	20	**40**	--	**S2**	▶	**3RW40 38-□TB04**		1	1 unit	131	1.350
• With screw or spring-type terminals																
80	22	**45**	--	73	20	25	**50**	--	**S3**	▶	**3RW40 46-□TB04**		1	1 unit	131	1.900
106	30	**55**	--	98	30	30	**75**	--	**S3**	▶	**3RW40 47-□TB04**		1	1 unit	131	1.900
Rated operational voltage U_e 400 ... 600 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC																
• With screw terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 24-1TB05**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 26-1TB05**		1	1 unit	131	0.770
32	--	15	**18.5**	29	--	--	20	**25**	**S0**	B	**3RW40 27-1TB05**		1	1 unit	131	0.770
38	--	18.5	**22**	34	--	--	25	**30**	**S0**	B	**3RW40 28-1TB05**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 24-2TB05**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 26-2TB05**		1	1 unit	131	0.770
32	--	15	**18.5**	29	--	--	20	**25**	**S0**	B	**3RW40 27-2TB05**		1	1 unit	131	0.770
38	--	18.5	**22**	34	--	--	25	**30**	**S0**	B	**3RW40 28-2TB05**		1	1 unit	131	0.770
• With screw or spring-type terminals																
45	--	22	**30**	42	--	--	30	**40**	**S2**	B	**3RW40 36-□TB05**		1	1 unit	131	1.350
63	--	30	**37**	58	--	--	40	**50**	**S2**	B	**3RW40 37-□TB05**		1	1 unit	131	1.350
72	--	37	**45**	62	--	--	40	**60**	**S2**	B	**3RW40 38-□TB05**		1	1 unit	131	1.350
• With screw or spring-type terminals																
80	--	45	**55**	73	--	--	50	**60**	**S3**	B	**3RW40 46-□TB05**		1	1 unit	131	1.900
106	--	55	**75**	98	--	--	75	**75**	**S3**	B	**3RW40 47-□TB05**		1	1 unit	131	1.900

Order No. supplement for connection types

- With screw terminals **1**
- With spring-type terminals3) **2**

1) Stand-alone installation without auxiliary fan.

2) Soft starter with screw terminals: delivery time class ▶ (preferred type).

3) Main circuit connection: screw terminals.

Note:

Selection of the soft starter depends on the rated motor current.

Please observe the notes for the selection of soft starters on page 4/4.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see "Technical specifications".

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

3RW40

SIRIUS 3RW40 for heavy starting (CLASS 20)


3RW40 28-1BB14


3RW40 38-1BB14


3RW40 47-1BB14

Ambient temperature 40 °C				Ambient temperature 50 °C					Size	DT	Heavy starting (CLASS 20)		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 230 V	400 V	500 V	Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 200 V	230 V	460 V	575 V			Order No.	Price per PU				
A	kW	kW	kW	A	hp	hp	hp	hp								kg
Rated operational voltage U_e 200 ... 480 V 2)																
• With screw terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	▶	**3RW40 26-1BB□4**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	▶	**3RW40 27-1BB□4**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	B	**3RW40 26-2BB□4**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	B	**3RW40 27-2BB□4**		1	1 unit	131	0.770
• With screw or spring-type terminals																
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S2**	▶	**3RW40 36-□BB□4**		1	1 unit	131	1.350
38	11	**18.5**	--	34	10	10	**25**	--	**S2**	▶	**3RW40 37-□BB□4**		1	1 unit	131	1.350
45	11	**22**	--	42	10	15	**30**	--	**S2**	▶	**3RW40 37-□BB□4**		1	1 unit	131	1.350
63	18.5	**30**	--	58	15	20	**40**	--	**S3**	▶	**3RW40 47-□BB□4**		1	1 unit	131	1.900
72	22	**37**	--	62	20	20	**40**	--	**S3**	▶	**3RW40 47-□BB□4**		1	1 unit	131	1.900
Rated operational voltage U_e 400 ... 600 V																
• With screw terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 26-1BB□5**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 27-1BB□5**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 26-2BB□5**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 27-2BB□5**		1	1 unit	131	0.770
• With screw or spring-type terminals																
32	--	15	**18.5**	29	--	--	20	**25**	**S2**	B	**3RW40 36-□BB□5**		1	1 unit	131	1.350
38	--	18.5	**22**	34	--	--	25	**30**	**S2**	B	**3RW40 37-□BB□5**		1	1 unit	131	1.350
45	--	22	**30**	42	--	--	30	**40**	**S2**	B	**3RW40 37-□BB□5**		1	1 unit	131	1.350
63	--	30	**37**	58	--	--	40	**50**	**S3**	B	**3RW40 47-□BB□5**		1	1 unit	131	1.900
72	--	37	**45**	62	--	--	40	**60**	**S3**	B	**3RW40 47-□BB□5**		1	1 unit	131	1.900
Order No. supplement for connection types																
• With screw terminals											**1**					
• With spring-type terminals 3)											**2**					
Order No. supplement for rated control supply voltage U_s																
• 24 V AC/DC												**0**				
• 110 ... 230 V AC/DC												**1**				

1) Stand-alone installation without auxiliary fan.

2) Soft starter with screw terminals: delivery time class ▶ (preferred type).

3) Main circuit connection: screw terminals.

Note:

Selection of the soft starter depends on the rated motor current.

Please observe the notes for the selection of soft starters on page 4/4.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see "Technical specifications".

* You can order this quantity or a multiple thereof.
Illustrations are approximate


3RW40 28-1TB04


3RW40 38-1TB04


3RW40 47-1TB04

Ambient temperature 40 °C				Ambient temperature 50 °C					Size	DT	Heavy starting (CLASS 20)		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 230 V	400 V	500 V	Rated operational current I_e 1)	Rated power of induction motors for rated operational voltage U_e 200 V	230 V	460 V	575 V			Order No.	Price per PU				
A	kW	kW	kW	A	hp	hp	hp	hp								kg
Rated operational voltage U_e 200 ... 480 V,2), with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC																
• With screw terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	▶	**3RW40 26-1TB04**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	▶	**3RW40 27-1TB04**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	3	**5.5**	--	11	3	3	**7.5**	--	**S0**	B	**3RW40 26-2TB04**		1	1 unit	131	0.770
25	5.5	**11**	--	23	5	5	**15**	--	**S0**	B	**3RW40 27-2TB04**		1	1 unit	131	0.770
• With screw or spring-type terminals																
32	7.5	**15**	--	29	7.5	7.5	**20**	--	**S2**	▶	**3RW40 36-□TB04**		1	1 unit	131	1.350
38	11	**18.5**	--	34	10	10	**25**	--	**S2**	▶	**3RW40 37-□TB04**		1	1 unit	131	1.350
45	11	**22**	--	42	10	15	**30**	--	**S2**	▶	**3RW40 37-□TB04**		1	1 unit	131	1.350
63	18.5	**30**	--	58	15	20	**40**	--	**S3**	▶	**3RW40 47-□TB04**		1	1 unit	131	1.900
72	22	**37**	--	62	20	20	**40**	--	**S3**	▶	**3RW40 47-□TB04**		1	1 unit	131	1.900
Rated operational voltage U_e 400 ... 600 V, with thermistor motor protection, rated control supply voltage U_s 24 V AC/DC																
• With screw terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 26-1TB05**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 27-1TB05**		1	1 unit	131	0.770
• Spring-type terminals																
12.5	--	5.5	**7.5**	11	--	--	7.5	**10**	**S0**	B	**3RW40 26-2TB05**		1	1 unit	131	0.770
25	--	11	**15**	23	--	--	15	**20**	**S0**	B	**3RW40 27-2TB05**		1	1 unit	131	0.770
• With screw or spring-type terminals																
32	--	15	**18.5**	29	--	--	20	**25**	**S2**	B	**3RW40 36-□TB05**		1	1 unit	131	1.350
38	--	18.5	**22**	34	--	--	25	**30**	**S2**	B	**3RW40 37-□TB05**		1	1 unit	131	1.350
45	--	22	**30**	42	--	--	30	**40**	**S2**	B	**3RW40 37-□TB05**		1	1 unit	131	1.350
63	--	30	**37**	58	--	--	40	**50**	**S3**	B	**3RW40 47-□TB05**		1	1 unit	131	1.900
72	--	37	**45**	62	--	--	40	**60**	**S3**	B	**3RW40 47-□TB05**		1	1 unit	131	1.900

Order No. supplement for connection types

• With screw terminals	**1**
• With spring-type terminals3)	**2**

1) Stand-alone installation without auxiliary fan.

2) Soft starter with screw terminals: delivery time class ▶ (preferred type).

3) Main circuit connection: screw terminals.

Note:

Selection of the soft starter depends on the rated motor current.

Please observe the notes for the selection of soft starters on page 4/4.

The SIRIUS 3RW40 solid-state soft starters are designed for easy starting conditions. $J_{Load} < 10 \times J_{Motor}$. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. Siemens recommends the use of the selection and simulation program Win-Soft Starter. For information about rated currents for ambient temperatures > 40 °C, see "Technical specifications".

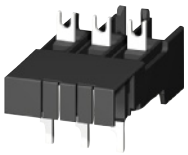
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RW40

Accessories

	Conductor cross-section Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For soft starters	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm²	mm²	AWG	Nm	Size							kg
Three-phase feeder terminals												
 3RV29 25-5AB	2.5 ... 16	2.5 ... 16	10 ... 4	3 ... 4	S00 (3RW30 1.), S0 (3RW30 2.)	A	**3RV29 25-5AB**		1	1 unit	101	0.043

	For soft starters Type	Size	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
										kg
Auxiliary terminals										
	Auxiliary terminals, 3-pole									
	3RW40 4.	**S3**		B	**3RT19 46-4F**		1	1 unit	101	0.035
Covers for soft starters										
	**Terminal covers for box terminals**									
	3RW40 3.	**S2**	Additional touch protection to be fitted at the box terminals (2 units required per device)	►	**3RT19 36-4EA2**		1	1 unit	101	0.020
	3RW40 4.	**S3**		►	**3RT19 46-4EA2**		1	1 unit	101	0.025
	**Terminal covers for cable lugs and busbar connections**									
	3RW40 4.	**S3**	For complying with the phase clearances and as touch protection if box terminal is removed (2 units required per contactor)	►	**3RT19 46-4EA1**		1	1 unit	101	0.040
	Sealing covers									
	3RW40 2. to 3RW40 4.	**S0, S2, S3**		►	**3RW49 00-0PB10**		1	1 unit	131	0.005
Fans (to increase switching frequency and for device mounting in positions different from the normal position)										
	3RW40 2.	**S0**		►	**3RW49 28-8VB00**		1	1 unit	131	0.010
	3RW40 3., 3RW40 4.	**S2, S3**		►	**3RW49 47-8VB00**		1	1 unit	131	0.020

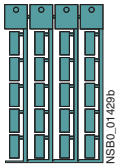
	For soft starters Type	Size	Motor starter protector Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
										kg
Link modules for soft starters to motor starter protectors[1)]										
 3RA29 21-1BA00	• With screw terminals				**Screw terminals**					
	3RW40 2.	**S0**	**S00/S0**	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
	3RW40 36.	**S2**	**S2**	►	**3RA19 31-1AA00**		1	1 unit	101	0.042
	3RW40 46., 3RW40 47.	**S3**	**S3**	►	**3RA19 41-1AA00**		1	1 unit	101	0.090
	• Spring-type terminals				**Spring-type terminals**					
	3RW40 2.	**S0**	**S0**	A	**3RA29 21-2GA00**		1	1 unit	101	0.072

1) Can be used in size S0 up to maximum 32 A.
Can be used in size S0 only for 3RV2 motor starter protectors.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

For soft starters Type	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Device manuals 3RW30/3RW40								
3RW40 2. 3RW40 3. 3RW40 4.	**S0** **S2** **S3**	C	**3ZX10 12-0RW30-1AB1**		1	1 unit	191	0.550
Operating instructions[1]								
3RW40 2. 3RW40 3. 3RW40 4.	**S0** **S2** **S3**		**3ZX10 12-0RW40-1AA1**					

[1] The operating instructions are included in the scope of supply.

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for opening spring-type terminals by hand								
			Spring-type terminals					
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels								
 3RT19 00-1SB20	**Unit labeling plates**[1] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

4

More information

Application examples for normal starting (CLASS 10)

Normal starting CLASS 10 (up to 20 s with 350 % $I_{n\ motor}$),
The soft starter rating can be selected to be as high as the rating of the motor used.

Application		Conveyor belt	Roller conveyor	Compressor	Small fan[1)]	Pump	Hydraulic pump
Starting parameters							
• Voltage ramp and current limiting							
- Starting voltage	%	70	60	50	40	40	40
- Starting time	s	10	10	10	10	10	10
- Current limit value		5 x I_M	5 x I_M	4 x I_M	4 x I_M	4 x I_M	4 x I_M
Ramp-down time	s	5	5	0	0	10	0

1) The mass inertia of the fan is <10 times the mass inertia of the motor.

Application examples for heavy starting (CLASS 20)

Heavy starting CLASS 20 (up to 40 s with 350 % $I_{n\ motor}$),
The soft starter has to be selected at least one performance class higher than the motor used.

Application		Stirrer	Centrifuge
Starting parameters			
• Voltage ramp and current limiting			
- Starting voltage	%	40	40
- Starting time	s	20	20
- Current limit value		4 x I_M	4 x I_M
Ramp-down time		0	0

Note:
These tables present sample set values and device sizes. They are intended only for the purposes of information and are not binding. The set values depend on the application in question and must be optimized during commissioning.
The soft starter dimensions should be checked where necessary with the Win-Soft Starter software or with the help of Technical Assistance.

Configuration

The 3RW solid-state soft starters are designed for easy starting conditions. In the event of deviating conditions or increased switching frequency, it may be necessary to choose a larger device. For accurate dimensioning, use the Win-Soft Starter selection and simulation program.

Where long starting times are involved, the integrated solid-state overload relay for heavy starting should not be disconnected. PTC sensors are recommended. This also applies for the smooth ramp-down because during the ramp-down time an additional current loading applies in contrast to free ramp-down.

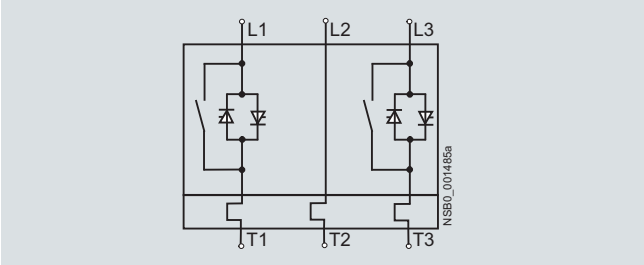
In the case of high switching frequencies in S4 mode, Siemens recommends the use of PTC sensors. For corresponding device versions with integrated thermistor motor protection or separate thermistor evaluation devices see Catalog LV 1.

No capacitive elements are permitted in the motor feeder between the SIRIUS 3RW soft starter and the motor (e.g. no reactive-power compensation equipment). In addition, neither static systems for reactive-power compensation nor dynamic PFC (Power Factor Correction) must be operated in parallel during starting and ramp-down of the soft starter. This is important to prevent faults arising on the compensation equipment and/or the soft starter.

All elements of the main circuit (such as fuses and controls) should be dimensioned for direct starting, following the local short-circuit conditions. Fuses, controls and overload relays must be ordered separately. Please observe the maximum switching frequencies specified in the technical specifications.

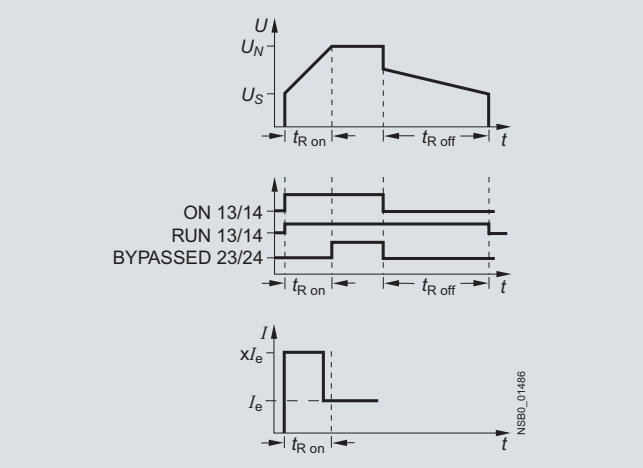
Note:
When induction motors are switched on, voltage drops occur as a rule on starters of all types (direct starters, wye-delta starters, soft starters). The infeed transformer must always be dimensioned such that the voltage dip when starting the motor remains within the permissible tolerance. If the infeed transformer is dimensioned with only a small margin, it is best for the control voltage to be supplied from a separate circuit (independently of the main voltage) in order to avoid the potential switching off of the soft starter.

Power electronics schematic circuit diagram



A bypass contact system and solid-state overload relay are already integrated in the 3RW40 soft starter and therefore do not have to be ordered separately.

Status graphs



Manual for SIRIUS 3RW30/40

Besides containing all important information on configuring, commissioning and servicing, the manual also contains example circuits and the technical specifications for all devices.

Win-Soft Starter selection and simulation program

With this software, you can simulate and select all Siemens soft starters, taking into account various parameters such as mains properties, motor and load data, and special application requirements.

The software is a valuable tool, which makes complicated, lengthy manual calculations for determining the required soft starters superfluous.

The Win-Soft Starter selection and simulation program can be downloaded from:
www.siemens.com/softstarter --> *Software*

More information about soft starters can be found on the Internet at:
www.siemens.com/softstarter

Training course for SIRIUS soft starters (SD-SIRIUSO)

Siemens offers a 2-day training course on the SIRIUS solid-state soft starters to keep customers and own personnel up-to-date on configuring, commissioning and maintenance issues.

Please direct enquiries and applications to:

Siemens AG
Information and Training Center
Gleiwitzer Strasse 555
D-90475 Nürnberg
Telephone: +49 (911) 895 - 3202
Telefax: +49 (911) 895 - 3275
E-mail: ingeborg.hoier@siemens.com
www.siemens.com/sitrain-cd

SIRIUS 3RW44 soft starter function block library for SIMATIC PCS 7

Overview

SIRIUS 3RW44 soft starter function block library for SIMATIC PCS 7

The SIRIUS 3RW44 soft starter PCS 7 function block library can be used for simple and easy integration of SIRIUS 3RW44 soft starters into the SIMATIC PCS 7 process control system. The SIRIUS 3RW44 soft starter PCS 7 function block library contains the diagnostics and driver blocks corresponding with the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring.

For detailed information about the SIRIUS 3RW44 soft starter library for SIMATIC PCS 7 see Chapter 12 "Planning, Configuration and Visualizing for SIRIUS".

Benefits

- Uniform and continuous integration into SIMATIC PCS 7
- Standardized function blocks for simple integration and optimal operation
- Greater process transparency due to greater information density in the I&C system
- System-wide device parameterization and diagnostics with SIMATIC PDM

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
SIRIUS 3RW44 soft starter function block library for SIMATIC PCS 7								
 3ZS1 633-1XX00-0YA0	Scope of supply: AS modules and faceplates for integrating SIRIUS 3RW44 into the PCS 7 process control system, for PCS 7 Version V 6.1/V 7.0							
	Engineering software For one engineering station (single license) including runtime software for execution of the AS module in an automation system (single license), German/English/French, Type of delivery: on CD incl. electronic documentation in German/English/Portuguese	▶	**3ZS1 633-1XX00-0YA0**		1	1 unit	131	0.240
	Runtime software for execution of the AS module in an automation system (single license), Type of delivery: License without software and documentation	▶	**3ZS1 633-2XX00-0YB0**		1	1 unit	131	0.240

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Solid-state contactors for switching motors

The solid-state contactors for switching motors are intended for frequently switching on and off three-phase current operating mechanisms up to 7.5 kW and reversing up to 3.0 kW. The devices are constructed with complete insulation and can be mounted directly on SIRIUS motor starter protectors, overload relays and current monitoring relays, resulting in a very simple integration into motor feeders.

These three-phase solid-state contactors are equipped with a two-phase control which is particularly suitable for typical motor current circuits without connecting to the neutral conductor.

Important features:

- Insulated enclosure with integrated heat sink
- Degree of protection IP20
- Integrated mounting foot to snap on a standard mounting rail or for assembly onto a support plate
- Variety of connection methods
- Plug-in control connection
- Display via LEDs
- Wide voltage range for AC control supply voltage

Switching functions

The solid-state contactors for switching motors are "Instantaneous switching", because this method is particularly suited for inductive loads. By distributing the ON point over the entire sine curve of the mains voltage, disturbances are reduced to a minimum.

Connection methods

You can choose between the following connection methods for the solid-state contactors for switching motors:

Screw connection

The screw connection system is the standard among industrial controls. Open terminals and a plus-minus screw are just two features of this technology. Two conductors of up to 6 mm² can be connected in just one terminal.

Spring-type terminals

This innovative technology manages without any screw connection. This means that very high vibration resistance is achieved. Two conductors of up to 2.5 mm² can be connected to each terminal.

Selecting solid-state contactors

The solid-state contactors are selected on the basis of details of the network, the load and the ambient conditions.

The following procedure is recommended:

- Determine the rated current of the load and the mains voltage
- Select a solid-state contactor with the same or higher rated current than the load
- Testing the maximum permissible switching frequency based on the characteristic curves (see note on Technical Information on page 4/1). To do this, the starting current, the starting time and the motor loaded in in the operating phase must be known.
- If the permissible switching frequency is under the desired frequency, it is possible to achieve the required increase by overdimensioning the motor and the solid-state contactor!

Alternatively, the tool for "Selection of solid-state contactors for switching motors" can be used. The correct device size can be determined by entering the network and motor data along with the application and ambient conditions. You will find the tool on the Internet at:

www.siemens.com/solid-state-switching-devices

Short-circuit protection

Despite the rugged power semiconductors that are used, solid-state switching devices respond more sensitively to short-circuits in the load feeder. Consequently, special precautions have to be taken against destruction, depending on the type of design.

Siemens generally recommends using SITOR semiconductor fuses. These fuses also provide protection against destruction in the event of a short-circuit even when the solid-state contactors and solid-state relays are fully utilized.

Alternatively, if there is lower loading, protection can also be provided by standard fuses or miniature circuit breakers. This protection is achieved by overdimensioning the solid-state switching devices accordingly.

Benefits

- Units with integrated heat sink, "ready to use"
- Compact and space-saving design
- Reversing contactors with integrated interlocking

Application

Use in load feeders

There is no typical design of a load feeder with solid-state relays or solid-state contactors; instead, the great variety of connection methods and control voltages offers universal application opportunities. SIRIUS solid-state relays and solid-state contactors can be installed in fuseless or fused feeders, as required.

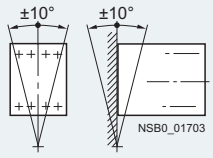
Standards and approvals

- IEC 60947-4-3
- UL 508, CSA for North America[1)]
- CE marking for Europe
- C-Tick approval for Australia
- CCC approval for China

[1)] Please note: Use overvoltage protection device;
max. cut-off-voltage 6000 V;
min. energy handling capability 100 J.

General data

More information

Type		3RF34 ..-1BB.., 3RF34 ..-1BD..	3RF34 ..-2BB..
General technical specifications			
Ambient temperature			
• During operation, derating from 40 °C	°C	-25 ... +60	
• During storage	°C	-55 ... +80	
Installation altitude	m	0 ... 1000; derating above 1000 m on request	
Shock resistance acc. to IEC 60068-2-27	*g*/ms	15/11	
Vibration resistance acc. to IEC 60068-2-6	*g*	2	
Degree of protection		IP20	
Insulation strength at 50/60 Hz (main/control circuit to floor)	V rms	4000	
Electromagnetic compatibility (EMC)			
• Emitted interference acc. to IEC 60947-4-3			
- Conducted interference voltage		Class A for industrial applications[1]	
- Emitted, high-frequency interference voltage		Class A for industrial applications	
• Interference immunity			
- Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	Contact discharge: 4; Air discharge: 8; Behavior criterion 2	
- Induced RF fields acc. to IEC 61000-4-6	MHz	0.15 ... 80; 140 dBµV; behavior criterion 1	
- Burst acc. to IEC 61000-4-4	kV	2: at 5 kHz; behavior criterion 1	
- Surge acc. to IEC 61000-4-5[2]	kV	Conductor - Ground: 2; Conductor - Conductor: 1; Behavior criterion 2	
Connection type		**Screw terminals**	**Spring-type terminals**
Operating devices		Standard screwdriver size 2 and Pozidriv 2	3.0 x 0.5 and 3.5 x 0.5
Conductor cross-sections, main contacts			
• Solid	mm^2	2 x (1.5 ... 2.5)[3], 2 x (2.5 ... 6)[3]	2 x (0.5 ... 2.5)
• Finely stranded with end sleeve	mm^2	2 x (1 ... 2.5)[3], 2 x (2.5 ... 6)[3], 1 x 10	2 x (0.5 ... 1.5)
• Finely stranded without end sleeve	mm^2	--	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded		2 x (AWG 14 ... 10)	2 x (AWG 18 ... 14)
Conductor cross-sections, auxiliary/control contacts			
• With/without end sleeve	mm^2	1 x (0.5 ... 2.5), 2 x (0.5 ... 1.0)	0.5 ... 2.5
• AWG cables, solid or stranded		AWG 20 ... 12	AWG 20 ... 12
Permissible mounting position			

[1] These products were built as Class A devices. The use of these devices in residential areas could result in lead in radio interference. In this case these may be required to introduce additional interference suppression measures.

[2] The following applies for reversing contactors: To maintain the values, a 3TX7 462-3L surge suppressor (see Catalog LV 1, Chapter 3, page 3/120) should be used between the phases L1 and L3 as close as possible to the reversing contactor.

[3] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified.

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th
	□□□	□	□	□	□	–	□	□	□	□	□
Solid-state switching devices	**3 R F**										
SIRIUS solid-state switching device generation		□									
Design			□								
Rated operational current				□	□						
Connection type							□				
Switching function								□			
Number of controlled phases									□		
Rated control supply voltage										□	
Rated operational voltage											□
Example	**3 R F**	**3**	**4**	**1**	**0**	**–**	**1**	**B**	**B**	**0**	**4**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Overview

These two-phase controlled, instantaneous switching solid-state contactors in the insulting enclosure are offered in 45 mm width to 5.2 A – and in 90 mm width to 16 A. This means that it is possible to operate motors up to 7.5 kW.

The devices can use a link module to directly connect to a motor starter protector. Also possible is the direct mounting of a 3RB30/3RB31 solid-state overload relay (see Chapter 5 "Protection Equipment") or a 3RR2 current monitoring relay (see Chapter 7 "Monitoring and Control Devices"). Rapid-switching fuseless and fuse motor feeders can thereby be implemented in a time-saving manner.

Selection and ordering data

Motor contactors · Instantaneous switching · Two-phase controlled

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101

Start of delivery on request


3RF34 05-1BB


3RF34 05-2BB


3RF34 10-1BB

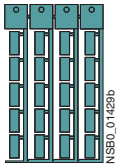

3RF34 10-2BB

Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
A	400 V kW	V		Order No.	Price per PU	kg		Order No.	Price per PU	kg
Rated operational voltage U_e 48 ... 480 V AC										
5.2	**2.2**	24 DC acc. to EN 61131-2	A	**3RF34 05-1BB04**		0.250	B	**3RF34 05-2BB04**		0.250
9.2	**4.0**		B	**3RF34 10-1BB04**		0.380	B	**3RF34 10-2BB04**		0.380
12.5	**5.5**		B	**3RF34 12-1BB04**		0.380	B	**3RF34 12-2BB04**		0.380
16	**7.5**		B	**3RF34 16-1BB04**		0.380	B	**3RF34 16-2BB04**		0.380
5.2	**2.2**	110 ... 230 AC	B	**3RF34 05-1BB24**		0.250	B	**3RF34 05-2BB24**		0.250
9.2	**4.0**		B	**3RF34 10-1BB24**		0.380	B	**3RF34 10-2BB24**		0.380
12.5	**5.5**		B	**3RF34 12-1BB24**		0.380	B	**3RF34 12-2BB24**		0.380
16	**7.5**		B	**3RF34 16-1BB24**		0.380	B	**3RF34 16-2BB24**		0.380
Rated operational voltage U_e 48 ... 600 V AC, blocking voltage 1600 V										
5.2	**2.2**	24 DC acc. to EN 61131-2	B	**3RF34 05-1BB06**		0.250	B	**3RF34 05-2BB06**		0.250
9.2	**4.0**		B	**3RF34 10-1BB06**		0.380	B	**3RF34 10-2BB06**		0.380
12.5	**5.5**		B	**3RF34 12-1BB06**		0.380	B	**3RF34 12-2BB06**		0.380
16	**7.5**		B	**3RF34 16-1BB06**		0.380	B	**3RF34 16-2BB06**		0.380
5.2	**2.2**	110 ... 230 AC	B	**3RF34 05-1BB26**		0.250	B	**3RF34 05-2BB26**		0.250
9.2	**4.0**		B	**3RF34 10-1BB26**		0.380	B	**3RF34 10-2BB26**		0.380
12.5	**5.5**		B	**3RF34 12-1BB26**		0.380	B	**3RF34 12-2BB26**		0.380
16	**7.5**		B	**3RF34 16-1BB26**		0.380	B	**3RF34 16-2BB26**		0.380

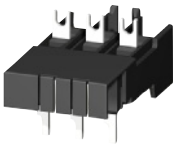
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RF34 solid-state contactors, three-phase

Accessories



3SB19 00-1SB20


3RA29 21-1BA00


3RA29 08-1A

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Link modules for solid-state contactors to motor starter protectors							
Link modules between solid-state contactor and motor starter protector with screw terminals		**Screw terminals**					
For 3RV2 motor starter protectors size S00/S0	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
Insulation stop for securely holding back the conductor insulation on conductors up to 1 mm²							
Insulation stop strips for all SIRIUS devices with spring-type terminals		**Spring-type terminals**					
Can be inserted in cable entry of the spring-type terminal (2 strips per contactor required; removable in pairs) For conductor cross-sections up to 2.5 mm²	B	**3RT29 16-4JA02**		1	20 units	101	0.005
Tools for opening spring-type terminals by hand							
Screwdrivers for all SIRIUS devices with spring-type terminals		**Spring-type terminals**					
Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels							
Unit labeling plates[1] for SIRIUS devices							
20 mm × 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

Type		3RF34 05-.BB..	3RF34 10-.BB..	3RF34 12-.BB..	3RF34 16-.BB..
Fuseless design with 3RV2 motor starter protector, CLASS 10					
Rated operational current I_{AC-53}[1] acc. to IEC 60947-4-2					
• At 40 °C	A	5.2 (4.5)	9.2	12.5	16
• UL/CSA, at 50 °C	A	4.6 (4.0)	8.4	11.5	14
• At 60 °C	A	4.2 (3.5)	7.6	10.5	12.5
Power loss at I_{AC-53}					
• At 40 °C	W	10 (8)	16	22	28
Short-circuit protection with type of coordination "1" at an operational voltage of U_e up to 440 V					
• Motor starter protectors, type		3RV20 21-1GA10	3RV20 21-1JA10	3RV20 21-1KA10	3RV20 21-4AA10
• Current I_q	kA	50	20	5	5

[1] The reduced values in brackets apply to a directly mounted motor starter protector and simultaneous butt-mounting.

Type		3RF34 05-.BB.4	3RF34 05-.BB.6	3RF34 10-.BB..	3RF34 12-.BB.4	3RF34 12-.BB.6	3RF34 16-.BB..
Fused design with directly connected 3RB3 overload relay							
Rated operational current I_{AC-53} acc. to IEC 60947-4-2							
• At 40 °C	A	4		7.8	9.5		11
• UL/CSA, at 50 °C	A	3.6		7	8.5		10
• At 60 °C	A	3.2		6.2	7.6		9
Power loss at I_{AC-53}							
• At 40 °C	W	7		13	16		18
Minimum load current	A	0.5					
Max. leakage current	mA	10					
Rated impulse withstand capacity I_{tsm}	A	200	600	600	1200	1150	1150
I^2t value	A^2s	200	1800	1800	7200	6600	6600

Type		3RF34 ..-.BB.4	3RF34 ..-.BB.6
Main circuit			
Controlled phases		Two-phase	Two-phase
Rated operational voltage U_e	V AC	48 ... 480	48 ... 600
• Primary operating range	V AC	40 ... 506	40 ... 660
• Rated frequency	Hz	50/60 ± 10 %	50/60 ± 10 %
Rated insulation voltage U_i	V	600	600
Rated impulse withstand voltage U_{imp}	kV	6	6
Blocking voltage	V	1200	1600
Rage of voltage rise	V/µs	1000	1000

Type		3RF34 ..-.BB0.	3RF34 ..-.BB2.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24 according to EN 61131-2	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ± 10 %
Control supply voltage, max.	V	30	253
Typical actuating current	mA	20	15
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times			
• ON-delay	ms	1	5
• OFF-delay	ms	1 + max. one half-wave	30 + max. one half-wave

3RF34 solid-state reversing contactors, three-phase

Overview

The integration of four conducting paths to a reverse switch, combined in one enclosure makes this device a particularly compact solution. Compared to conventional systems, for which two contactors are required, it is possible to save up to 50 % width with the three-phase reversing contactors. Devices with 45 mm width cover motors up to 2.2 kW – and those with 90 mm width up to 3 kW.

Due to the integration into the SIRIUS modular system, it is possible to make a connection to a SIRIUS motor starter protector using a link module or with a 3RB30/3RB31 solid-state overload relay (see Chapter 5 "Protection Equipment") or 3RR2 current monitoring relay (see Chapter 7 "Monitoring and Control Devices") without additional steps. It is possible to mount fuseless or fused motor feeders easily and quickly.

Selection and ordering data

Reversing contactors · Instantaneous switching · Two-phase controlled

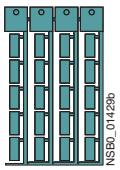
Start of delivery on request

3RF34 03-1BD

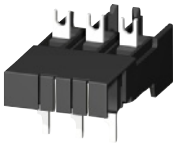
3RF34 10-1BD

Rated operational current I_e	Rated power at I_e and U_e	Rated control supply voltage U_s	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
A	400 V kW	V		Order No.	Price per PU				kg
Rated operational voltage U_e 48 ... 480 V AC									
3.8	**1.5**	24 DC acc. to EN 61131-2	B	**3RF34 03-1BD04**		1	1 unit	101	0.280
5.4	**2.2**		B	**3RF34 05-1BD04**		1	1 unit	101	0.280
7.4	**3.0**		B	**3RF34 10-1BD04**		1	1 unit	101	0.410
3.8	**1.5**	110 ... 230 AC	B	**3RF34 03-1BD24**		1	1 unit	101	0.280
5.4	**2.2**		B	**3RF34 05-1BD24**		1	1 unit	101	0.280
7.4	**3.0**		B	**3RF34 10-1BD24**		1	1 unit	101	0.410

Accessories



3SB19 00-1SB20



3RA29 21-1BA00

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
							kg
Link modules for solid-state contactors to motor starter protectors							
Link modules between solid-state reversing contactor and motor starter protector with screw terminals		**Screw terminals**					
For 3RV2 motor starter protectors size S00/S0	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
Blank labels							
Unit labeling plates[1] for SIRIUS devices							
20 mm × 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

Type		3RF34 03-.BD.4	3RF34 05-.BD.4	3RF34 10-.BD.4
Fuseless design with 3RV2 motor starter protector, CLASS 10				
Rated operational current I_{AC-53}[1] acc. to IEC 60947-4-2				
• At 40 °C	A	3.8 (3.4)	5.4 (4.8)	7.4
• UL/CSA, at 50 °C	A	3.5 (3.1)	5 (4.3)	6.8
• At 60 °C	A	3.2 (2.8)	4.6 (3.8)	6.2
Power loss at I_{AC-53}				
• At 40 °C	W	7 (6)	9 (8)	13
Short-circuit protection with type of coordination "1" at an operational voltage of U_e up to 440 V				
• Motor starter protectors, type		3RV20 21-1FA10	3RV20 21-1GA10	3RV20 21-1JA10
• Current I_q	kA	50	50	10

[1] The reduced values in brackets apply to a directly mounted motor starter protector and simultaneous butt-mounting.

Type		3RF34 03-.BD.4	3RF34 05-.BD.4	3RF34 10-.BD.4
Fused design with directly connected 3RB3 overload relay				
Rated operational current I_{AC-53} acc. to IEC 60947-4-2				
• At 40 °C	A	3.8	5.4	7.4
• UL/CSA, at 50 °C	A	3.5	5	6.8
• At 60 °C	A	3.2	4.6	6.2
Power loss at I_{AC-53}				
• At 40 °C	W	6	8	16
Minimum load current	A	0.5		
Max. leakage current	mA	10		
Rated impulse withstand capacity I_{tsm}	A	200	600	
I^2t value	A^2s	200	1800	

Type		3RF34 ..-.BD.4
Main circuit		
Controlled phases		Two-phase
Rated operational voltage U_e[1]	V AC	48 ... 480
• Primary operating range	V AC	40 ... 506
• Rated frequency	Hz	50/60 ±10 %
Rated insulation voltage U_i	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Blocking voltage	V	1 200
Rage of voltage rise	V/µs	1 000

[1] To reduce the risk of a phase short circuit due to overvoltage, we recommend using a varistor type 3TX7 462-3L between the phases L1 and L3 and as close as possible to the switchgear. We recommend a design with semiconductor protection as short-circuit protection.

Type		3RF34 ..-.BD0.	3RF34 ..-.BD2.
Control circuit			
Method of operation		DC operation	AC operation
Rated control supply voltage U_s	V	24 acc. to EN 61131-2	110 ... 230
Rated frequency of the control supply voltage	Hz	--	50/60 ±10 %
Control supply voltage, maximum	V	30	253
Typical actuating current	mA	15	10
Response voltage	V	15	90
Drop-out voltage	V	5	< 40
Operating times			
• ON-delay	ms	5	20
• OFF-delay	ms	5 + max. one half-wave	10 + max. one half-wave
• Interlocking time	ms	60 ... 100	50 ... 100

Notes

Protection Equipment

5

Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

Introduction

Overview

Type		3RV20	3RV21	3RV23	3RV24	3RV27	3RV28
SIRIUS 3RV2 motor starter protectors and circuit breakers up to 40 A							
Uses							
System protection		✓[1]	✓[1]	--	--	✓	✓
Motor protection		✓	--	--	--	--	--
Motor protection with overload relay function		--	✓	--	--	--	--
Starter combinations		--	--	✓	--	--	--
Transformer protection		--	--	--	✓	✓	✓
Size		S00, S0	S00, S0	S00, S0	S00, S0	S00	S00
Rated current I_n Size S00 Size S0	 A A	 Up to 16 Up to 40	 Up to 16 Up to 32	 Up to 16 Up to 40	 Up to 16 Up to 25	 Up to 15 --	 Up to 15 --
Rated operational voltage U_e acc. to IEC	V	690 AC[2]	690 AC[2]	690 AC[2]	690 AC[2]	690 AC	690 AC
Rated frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60
Trip class		CLASS 10	CLASS 10	--	CLASS 10	--	--
Thermal overload release	A A	0.11 ... 0.16 to 34 ... 40	0.11 ... 0.16 to 27 ... 32	None[3]	0.11 ... 0.16 to 20 ... 25	0.16 ... 15 non-adjustable	0.16 ... 15 non-adjustable
Electronic releases A multiple of the rated current		13 times	13 times	13 times	20 times	13 times	20 times
Short-circuit breaking capacity I_{cu} at 400 V AC	kA	20/55/100	55/100	20/55/100	55/100	[4]	[4]
Pages		5/10, 5/11	5/12	5/13	5/14	5/15	5/16
Accessories							
For sizes		S00 S0	S00 S0	S00 S0	S00 S0	S00	S00
Auxiliary switches		✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓	✓
Signaling switches		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Undervoltage releases		✓ ✓	-- --	✓ ✓	✓ ✓	✓	✓
Shunt releases		✓ ✓	-- --	✓ ✓	✓ ✓	✓	✓
Isolator modules		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Insulated three-phase busbar system		✓ ✓	-- --	✓ ✓	✓ ✓	--	--
Busbar adapters		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Door-coupling rotary operating mechanisms		✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓	✓
Link modules		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Enclosures for surface mounting		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Enclosures for flush mounting		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Front plates		✓ ✓	✓ ✓	✓ ✓	✓ ✓	--	--
Infeed system		✓ ✓	-- --	✓ ✓	✓ ✓	--	--
Terminal covers for ring terminal lug connections		--[5] --[5]	-- --	-- --	-- --	--	--
Sealable scale covers for setting knobs		✓ ✓	✓ ✓	-- --	✓ ✓	--	--
Pages		5/17 ... 5/33					

✓ Has this function or can use this accessory

-- Does not have this function or cannot use this accessory

1) For symmetrical loading of the three phases.

2) With molded-plastic enclosure 500 V AC.

3) For overload protection of the motors, appropriate overload relays must be used.

4) According to UL 489 at 480 Y/277 V AC: 65 kA.

5) Terminal covers are available for 3RV20 motor starter protectors with ring terminal lug connection for motor protection.



Type		3RU21	3RB30	3RB31
SIRIUS overload relays up to 40 A				
Uses				
System protection		✓[1]	✓[1]	✓[1]
Motor protection		✓	✓	✓
Alternating current, three-phase		✓	✓	✓
Alternating current, single-phase		✓	--	--
Direct current		✓	--	--
Size of contactor		S00, S0	S00, S0	S00, S0
Rated operational current I_e Size S00 Size S0	 A A	 Up to 16 Up to 40	 Up to 16 Up to 40	 Up to 16 Up to 40
Rated operational voltage U_e	V	690 AC	690 AC	690 AC
Rated frequency	Hz	50/60	50/60	50/60
Trip class		CLASS 10	CLASS 10, 20	CLASS 5, 10, 20, 30 adjustable
Thermal overload release	A A	0.11 ... 0.16 to 34 ... 40	--	--
Solid-state overload release	A A	--	0.1 ... 0.4 to 10 ... 40	0.1 ... 0.4 to 10 ... 40
Rating for induction motor at 400 V AC	kW	0.04 ... 18.5	0.04 ... 18.5	0.04 ... 18.5
Pages		5/43, 5/44	5/52, 5/53	5/54

Accessories						
For sizes	S00	S0	S00	S0	S00	S0
Terminal brackets for stand-alone installation	✓	✓	✓	✓	✓	✓
Mechanical RESET	✓	✓	✓	✓	✓	✓
Cable releases for RESET	✓	✓	✓	✓	✓	✓
Electrical remote RESET	✓	✓	--	--	Integrated in the unit	
Terminal covers for ring terminal lug connections	--[2]	--[2]	--	--	--	--
Sealable covers for setting knobs	✓	✓	✓	✓	✓	✓
Pages	5/45, 5/46		5/55, 5/56		5/55, 5/56	

✓ Has this function or can use this accessory

-- Does not have this function or cannot use this accessory

[1] The units are responsible in the main circuit for overload protection of the assigned electrical loads (e.g. motors), feeder cable and other switching and protection devices in the respective load feeder.

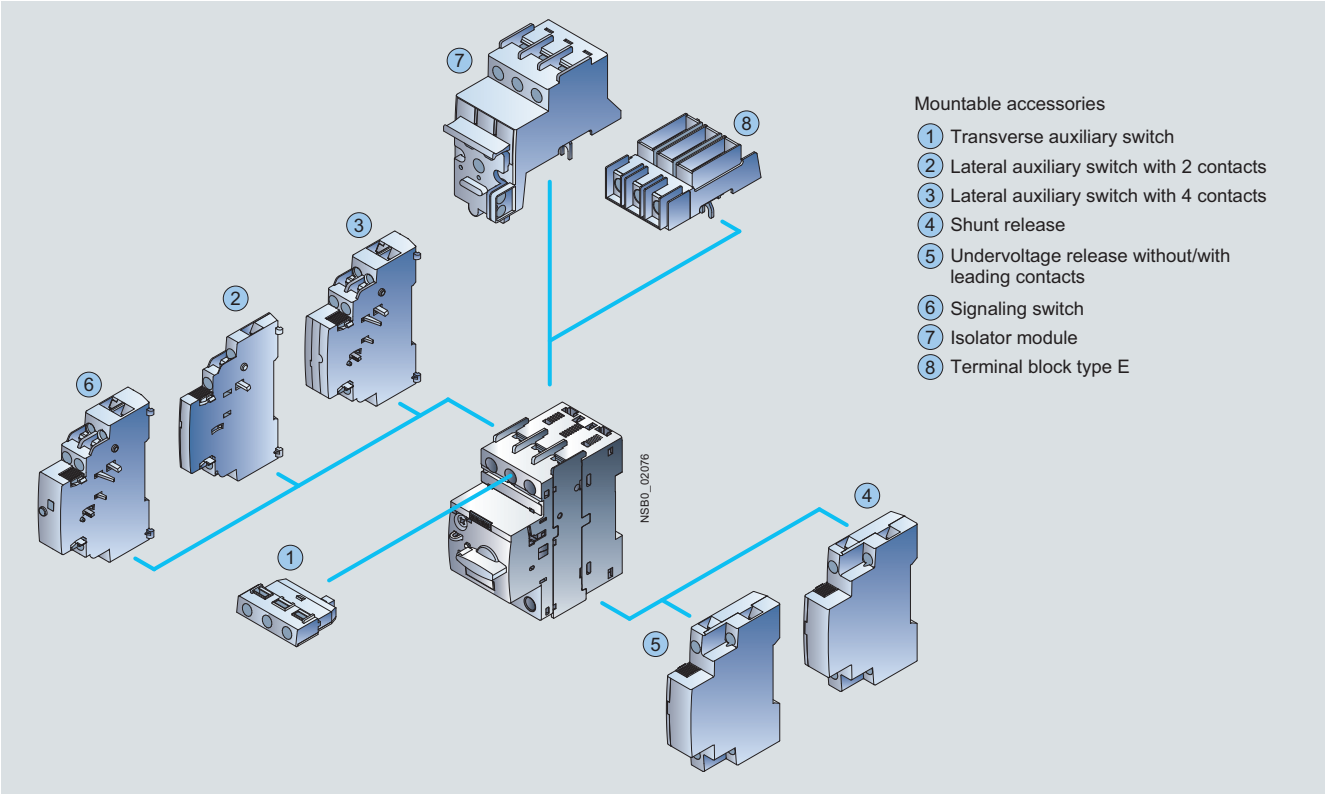
[2] Terminal covers for ensuring finger-safe touch protection are available for 3RU21 overload relays with ring terminal lug connections for mounting onto contactors.

General data

Overview

The following illustration shows our 3RV2 motor starter protectors with the accessories which can be mounted for the various sizes, see also "Introduction" --> "Overview" on page 5/2.

For accessories, see page 5/17 onwards.



Mountable accessories for 3RV2 motor starter protectors

Motor starter protectors with spring-type terminals, size S0 (left) and motor starter protectors with screw terminals, size S00 (right)

The new 3RV2 motor starter protectors are compact, current limiting motor starter protectors which are optimized for load feeders. The motor starter protectors are used for switching and protecting three-phase induction motors of up to 18.5 kW at 400 V AC and for other loads with rated currents of up to 40 A.

Type of construction

The motor starter protectors are available in 2 sizes:

- Size S00 - width 45 mm,
  max. rated current 16 A,
  at 400 V AC suitable for induction motors up to 7.5 kW.
- Size S0 - width 45 mm,
  max. rated current 40 A,
  at 400 V AC suitable for induction motors up to 18.5 kW.

Note

⊕	Screw terminals
⊟	Spring-type terminals
⊕	Ring terminal lug connection
	These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RV20 motor starter protectors are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e; see Chapter 20 "Appendix" --> "Standards and Approvals" --> "Type Overview of Approved Devices for Explosion-Protected Areas (ATEX Explosion Protection)".

EC type test certificate for Category (2)G/D has been submitted. More details on request.

Application

Operating conditions

3RV2 motor starter protectors are suitable for use in any climate. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. When installed in dusty and damp areas, suitable enclosures must be provided.

3RV2 motor starter protectors can optionally be fed from the top or from below.

The permissible ambient temperatures, the maximum switching capacities, the tripping currents and other boundary conditions can be found in the technical specifications and tripping characteristics, see note on Technical Information on page 5/1.

3RV2 motor starter protectors are suitable for operation in IT systems (IT networks). In this case, the different short-circuit breaking capacity in the IT system must be taken into account.

Since operational currents, starting currents and current peaks are different even for motors with identical power ratings due to the inrush current, the motor ratings in the selection tables are only guide values. The specific rated and start-up data of the motor to be protected is always paramount to the choice of the most suitable motor starter protector. This also applies to motor starter protectors for transformer protection.

Possible uses

The 3RV2 motor starter protectors can be used:

- For short-circuit protection
- For motor protection (also with overload relay function)
- For system protection
- For short-circuit protection for starter combinations
- For transformer protection
- As main and EMERGENCY-STOP switches
- For operation in IT systems (IT networks)
- For switching of DC currents
- In areas subject to explosion hazard (ATEX)

For more information see the note on Technical Information on page 5/1.

More information

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
Motor starter protector	**3 R V**															
SIRIUS 2nd generation		**2**														
Type of motor starter protector			□													
Size				□												
Switching capacity					□											
Setting range for overload release							□	□								
Trip class (CLASS)									□							
Connection method										□						
With or without auxiliary switch											□					
Special versions													□	□	□	□
Example	**3 R V**	**2**	**0**	**1**	**1**	**–**	**1**	**A**	**A**	**1**	**0**					

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

General data

General technical specifications

Type			**3RV2. 1**	**3RV2. 2**
Size			S00	S0
Width			45 mm	45 mm
Standards				
• IEC 60947-1, EN 60947-1 (VDE 0660 Part 100)			Yes	
• IEC 60947-2, EN 60947-2 (VDE 0660 Part 101)			Yes	
• IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)			Yes	
• UL 489, CSA C22.2-No.5-02			Yes	
Number of poles			3	
Max. rated current $I_{n\,max}$ (= max. rated operational current I_e)		A	16	40
Permissible ambient temperature				
• Storage/transport		°C	–50 ... +80	
• Operation	I_n: 0.16 ... 32 A	°C	–20 ... +70[1]	
	I_n: 36 ... 40 A	°C	–20 ... +40[2]	
Permissible rated current at inside temperature of control cabinet				
• +60 °C		%	100	
• +70 °C		%	87	
Permissible rated current at ambient temperature of enclosure (applies to motor starter protectors inside enclosure ≤ 32 A)				
• +35 °C		%	100	
• +60 °C		%	87	
Rated operational voltage U_e				
• Acc. to IEC		V AC	690[3]	
• Acc. to UL/CSA		V AC	600	
Rated frequency		Hz	50/60	
Rated insulation voltage U_i		V	690	
Rated impulse withstand voltage U_{imp}		kV	6	
Utilization category				
• IEC 60947-2 (motor starter protector/circuit breaker)			A	
• IEC 60947-4-1 (motor starter)			AC-3	
Trip class CLASS	Acc. to IEC 60947-4-1		10	
DC short-circuit breaking capacity (time constant t = 5 ms)				
• 1 conducting path 150 V DC		kA	10	
• 2 conducting paths in series 300 V DC		kA	10	
• 3 conducting paths in series 450 V DC		kA	10	
Power loss P_v for each motor starter protector Dependent on the rated current I_n (upper setting range) $R_{proStrombahn} = \frac{P}{I^2 \times 3}$	I_n: 0.16 ... 0.63 A	W	5	
	I_n: 0.8 ... 6.3 A	W	6	
	I_n: 8 ... 16 A	W	7	
	I_n: 16 A	W	--	7
	I_n: 20 ... 25 A	W	--	8
	I_n: 28 ... 32 A	W	--	11
	I_n: 36 ... 40 A	W	--	14
Shock resistance	Acc. to IEC 60068-2-27	*g*/ms	25/11 (square and sine pulse)	
Degree of protection	Acc. to IEC 60529		IP20[4]	
Touch protection	Acc. to EN 50274		Finger-safe	
Temperature compensation	Acc. to IEC 60947-4-1	°C	–20 ... +60	
Phase failure sensitivity	Acc. to IEC 60947-4-1		Yes	
Explosion protection – safe operation of motors with "increased safety" type of protection			Yes for 3RV20	
EC type test certificate number according to directive 94/9/EC (ATEX)			On request	
Isolating function	Acc. to IEC 60947-2		Yes	
Main and EMERGENCY-STOP switch characteristics[5]	Acc. to IEC 60204-1 (VDE 0113)		Yes	
Protective separation between main and auxiliary circuits, required for PELV applications	Acc. to EN 60947-1			
• Up to 400 V + 10 %			Yes	
• Up to 415 V + 5 % (higher voltage on request)			Yes	
Permissible mounting position			Any, acc. to IEC 60447 start command "I" right-hand side or top	
Mechanical endurance		Operating cycles	100 000	
Electrical endurance		Operating cycles	100 000	
Max. switching frequency per hour (motor starts)		1/h	15	

1) Over +60 °C current reduction.

2) The devices must not be mounted side-by-side and they must not be assembled with link modules with contactors. A lateral clearance of 9 mm is required.

3) With molded-plastic enclosure 500 V.

4) Terminal compartment IP00 (exception: 3RV20 11-..2. motor starter protectors with spring-type terminals in degree of protection IP20).

5) With appropriate accessories.

Rated data of the auxiliary switches and signaling switches

		Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC	Signaling switch	Transverse auxiliary switch with 1 CO	Transverse auxiliary switch with 1 NO + 1 NC, 2 NO
Max. Rated voltage					
• Acc. to NEMA (UL)	V AC	600			250
• Acc. to NEMA (CSA)	V AC	600			250
Uninterrupted current	A	10	10	5	2.5
Switching capacity		1 NO + 1 NC, 2 NO, 2 NC: A600, Q300; 2 NO + 2 NC: A300, Q300	A600, Q300	B600, R300	C300, R300

Front transverse auxiliary switches

		Switching capacity for different voltages: 1 CO	Switching capacity for different voltages: 1 NO + 1 NC, 2 NO
Rated operational current I_e			
• At AC-15, alternating voltage			
- 24 V	A	4	2
- 230 V	A	3	0.5
- 400 V	A	1.5	--
- 690 V	A	0.5	--
• At AC-12 = I_{th}, alternating voltage			
- 24 V	A	10	2.5
- 230 V	A	10	2.5
- 400 V	A	10	--
- 690 V	A	10	--
• At DC-13, direct voltage *L/R* 200 ms			
- 24 V	A	1	1
- 48 V	A	--	0.3
- 60 V	A	--	0.15
- 110 V	A	0.22	--
- 220 V	A	0.1	--
Minimum load capacity	V	17	
	mA	1	

Front transverse solid-state compatible auxiliary switches

			Switching capacity for different voltages: 1 CO
Rated operational voltage U_e	Alternating voltage	V	125
Rated operational current I_e/AC-14 at U_e = 125 V		A	0.1
Rated operational voltage U_e	Direct voltage *L/R* 200 ms	V	60
Rated operational current I_e/DC-13 at U_e = 60 V		A	0.3
Minimum load capacity		V	5
		mA	1

Lateral auxiliary switches with signaling switch

		Switching capacity for different voltages: Lateral auxiliary switch with 1 NO + 1 NC, 2 NO, 2 NC, 2 NO + 2 NC; Signaling switches
Rated operational current I_e		
• At AC-15, alternating voltage		
- 24 V	A	6
- 230 V	A	4
- 400 V	A	3
- 690 V	A	1
• At AC-12 = I_{th}, alternating voltage		
- 24 V	A	10
- 230 V	A	10
- 400 V	A	10
- 690 V	A	10
• At DC-13, direct voltage *L/R* 200 ms		
- 24 V	A	2
- 110 V	A	0.5
- 220 V	A	0.25
- 440 V	A	0.1
Minimum load capacity	V	17
	mA	1

General data

Auxiliary releases

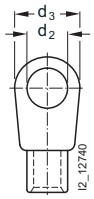
		Undervoltage releases	Shunt releases
Power consumption			
• During pick-up			
- AC voltages	VA/W	20.2/13	20.2/13
- DC voltages	W	20	13 ... 80
• During uninterrupted duty			
- AC voltages	VA/W	7.2/2.4	--
- DC voltages	W	2.1	--
Response voltage			
• Tripping	V	0.35 ... 0.7 x U_s	0.7 ... 1.1 x U_s
• Pickup	V	0.85 ... 1.1 x U_s	--
Maximum opening time	ms	20	

Short-circuit protection for auxiliary and control circuits

Melting fuses gG	A	10
Miniature circuit breaker, C characteristic	A	6[1)]

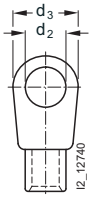
[1)] Prospective short-circuit current < 0.4 kA.

Type		**3RV2. 11**	**3RV2. 21**	**3RV27 11, 3RV28 11**
Size		S00	S0	S00
Width		45 mm	45 mm	45 mm
Conductor cross-sections of main circuit				
Connection type screw terminals		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	2.5 ... 3
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid	mm^2	2 x (0.75 ... 2.5)[1)], 2 x 4	2 x (1 ... 2.5)[1)], 2 x (2.5 ... 10)[1)]	1 ... 10, max. 2 x 10
• Stranded	mm^2	2 x (0.75 ... 2.5)[1)], 2 x 4	2 x (1 ... 2.5)[1)], 2 x (2.5 ... 10)[1)]	1.5 ... 25, max. 10 + 25
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)[1)], 2 x (0.75 ... 2.5)[1)]	2 x (1 ... 2.5)[1)], 2 x (2.5 ... 6)[1)], 1 x 10	1 ... 16, max. 6 + 16
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)[1)], 2 x 12	2 x (16 ... 12)[1)], 2 x (14 ... 8)[1)]	2 x (14 ... 10)
Connection type spring-type terminals		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid	mm^2	2 x (0.5 ... 4)	2 x (1 ... 10)	--
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 2.5)	2 x (1 ... 6)	--
• AWG cables, solid or stranded	AWG	2 x (20 ... 12)	2 x (18 ... 8)	--
Max. external diameter of the conductor insulation	mm	3.6	3.6	--
Connection type ring terminal lugs		**Ring terminal lug connection**		
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2	--
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6	--
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5	--
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5	d_2 = min. 4.3, d_3 = max. 12.2	--
• DIN 46234 without insulation sleeve				
• DIN 46225 without insulation sleeve				
• DIN 46237 with insulation sleeve				
• JIS C2805 Type R without insulation sleeve				
• JIS C2805 Type RAV with insulation sleeve				
• JIS C2805 Type RAP with insulation sleeve				



[1)] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

Type		3RV2. 11	3RV2. 21	3RV27 11, 3RV28 11
Size		S00	S0	S00
Width		45 mm	45 mm	45 mm
Conductor cross-sections for auxiliary and control circuits				
Connection type screw terminals		**Screw terminals**		
Terminal screw		M3, Pozidriv size 2		
Operating devices	mm	⌀ 5 ... 6		
Prescribed tightening torque	Nm	0.8 ... 1.2		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid or stranded	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]		
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]		
• AWG cables, solid or stranded	AWG	2 x (18 ... 14)[1], 2 x (20 ... 16)[1]		
Connection type spring-type terminals		**Spring-type terminals**		
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5		
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid	mm^2	2 x (0.5 ... 2.5)		
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 1.5)		
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)		
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)		
Max. external diameter of the conductor insulation	mm	3.6		
Connection type ring terminal lugs		**Ring terminal lug connection**		
Terminal screw		M3, Pozidriv size 2		
Operating devices	mm	⌀ 5 ... 6		
Tightening torque	Nm	0.8 ... 1.2		
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5		
• DIN 46234 without insulation sleeve				
• DIN 46225 without insulation sleeve				
• DIN 46237 with insulation sleeve				
• JIS C2805 Type R without insulation sleeve				
• JIS C2805 Type RAV with insulation sleeve				
• JIS C2805 Type RAP with insulation sleeve				



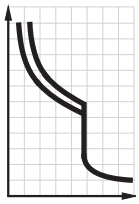
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

For motor protection

Selection and ordering data

CLASS 10, without auxiliary switches[1)]

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101



3RV20 11-0AA10

3RV20 11-0EA20

3RV20 21-4AA10

3RV20 21-4AA20

Rated current	Suitable for induction motors[2)] with *P*	Setting range for thermal overload release	Instantaneous electronic releases	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
I_n			$I >$	I_{cu}		Order No.	Price per PU			Order No.	Price per PU	
A	kW	A	A	kA				kg				kg
Size S00												
0.16	0.04	0.11 ... 0.16	2.1	100	A	**3RV20 11-0AA10**		0.260	B	**3RV20 11-0AA20**		0.280
0.2	0.06	0.14 ... 0.2	2.6	100	A	**3RV20 11-0BA10**		0.260	B	**3RV20 11-0BA20**		0.290
0.25	0.06	0.18 ... 0.25	3.3	100	A	**3RV20 11-0CA10**		0.260	B	**3RV20 11-0CA20**		0.290
0.32	0.09	0.22 ... 0.32	4.2	100	A	**3RV20 11-0DA10**		0.260	B	**3RV20 11-0DA20**		0.280
0.4	0.09	0.28 ... 0.4	5.2	100	A	**3RV20 11-0EA10**		0.260	B	**3RV20 11-0EA20**		0.290
0.5	0.12	0.35 ... 0.5	6.5	100	A	**3RV20 11-0FA10**		0.260	B	**3RV20 11-0FA20**		0.290
0.63	0.18	0.45 ... 0.63	8.2	100	A	**3RV20 11-0GA10**		0.260	B	**3RV20 11-0GA20**		0.280
0.8	0.18	0.55 ... 0.8	10	100	A	**3RV20 11-0HA10**		0.260	B	**3RV20 11-0HA20**		0.280
1	0.25	0.7 ... 1	13	100	A	**3RV20 11-0JA10**		0.320	B	**3RV20 11-0JA20**		0.350
1.25	0.37	0.9 ... 1.25	16	100	A	**3RV20 11-0KA10**		0.320	B	**3RV20 11-0KA20**		0.350
1.6	0.55	1.1 ... 1.6	21	100	A	**3RV20 11-1AA10**		0.320	B	**3RV20 11-1AA20**		0.350
2	0.75	1.4 ... 2	26	100	A	**3RV20 11-1BA10**		0.320	B	**3RV20 11-1BA20**		0.350
2.5	0.75	1.8 ... 2.5	33	100	A	**3RV20 11-1CA10**		0.320	B	**3RV20 11-1CA20**		0.350
3.2	1.1	2.2 ... 3.2	42	100	A	**3RV20 11-1DA10**		0.330	B	**3RV20 11-1DA20**		0.350
4	1.5	2.8 ... 4	52	100	A	**3RV20 11-1EA10**		0.320	B	**3RV20 11-1EA20**		0.350
5	1.5	3.5 ... 5	65	100	A	**3RV20 11-1FA10**		0.330	B	**3RV20 11-1FA20**		0.350
6.3	2.2	4.5 ... 6.3	82	100	A	**3RV20 11-1GA10**		0.330	B	**3RV20 11-1GA20**		0.360
8	3	5.5 ... 8	104	100	A	**3RV20 11-1HA10**		0.330	B	**3RV20 11-1HA20**		0.360
10	4	7 ... 10	130	100	A	**3RV20 11-1JA10**		0.330	B	**3RV20 11-1JA20**		0.360
12.5	5.5	9 ... 12.5	163	100	A	**3RV20 11-1KA10**		0.330	B	**3RV20 11-1KA20**		0.360
16	7.5	11 ... 16	208	55	A	**3RV20 11-4AA10**		0.340	B	**3RV20 11-4AA20**		0.360
Size S0												
16	7.5	11 ... 16	208	55	A	**3RV20 21-4AA10**		0.340	B	**3RV20 21-4AA20**		0.390
20	7.5	14 ... 20	260	55	A	**3RV20 21-4BA10**		0.340	B	**3RV20 21-4BA20**		0.400
22	11	17 ... 22	286	55	A	**3RV20 21-4CA10**		0.340	B	**3RV20 21-4CA20**		0.390
25	11	20 ... 25	325	55	A	**3RV20 21-4DA10**		0.340	B	**3RV20 21-4DA20**		0.400
28	15	23 ... 28	364	55	A	**3RV20 21-4NA10**		0.350	B	**3RV20 21-4NA20**		0.410
32	15	27 ... 32	400	55	A	**3RV20 21-4EA10**		0.350	B	**3RV20 21-4EA20**		0.410
36	18.5	30 ... 36	432	20	A	**3RV20 21-4PA10**		0.360		**--**		
40	18.5	34 ... 40	480	20	A	**3RV20 21-4FA10**		0.360		**--**		

1) The 3RV20 .1-..A.0 motor starter protectors up to 32 A are also available with ring terminal lug connection. The Order No. must be changed in the 11th position to **"4"**: e. g. 3RV20 11-0AA**4**0.

2) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

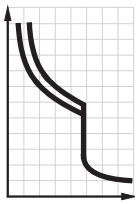
Auxiliary switches can be ordered separately (see "Mountable accessories").

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS 3RV2 Motor Starter Protectors/Circuit Breakers up to 40 A

CLASS 10, with transverse auxiliary switch (1 NO + 1 NC)

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101



3RV20 11-4AA15
with integrated trans-
verse auxiliary switch

3RV20 11-0EA25
with integrated trans-
verse auxiliary switch

3RV20 21-4AA15
with integrated trans-
verse auxiliary switch

3RV20 21-4AA25
with integrated trans-
verse auxiliary switch

Rated current	Suitable for induction motors[1] with *P*	Setting range for thermal overload release	Instantaneous over-current releases	Short-circuit breaking capacity at 400 V AC	DT	**Screw terminals**		Weight per PU approx.	DT	**Spring-type terminals**		Weight per PU approx.
I_n			$I >$	I_{cu}		Order No.	Price per PU			Order No.	Price per PU	
A	kW	A	A	kA				kg				kg
Size S00												
0.16	0.04	0.11 ... 0.16	2.1	100	B	**3RV20 11-0AA15**		0.280	B	**3RV20 11-0AA25**		0.300
0.2	0.06	0.14 ... 0.2	2.6	100	B	**3RV20 11-0BA15**		0.280	B	**3RV20 11-0BA25**		0.310
0.25	0.06	0.18 ... 0.25	3.3	100	B	**3RV20 11-0CA15**		0.280	B	**3RV20 11-0CA25**		0.310
0.32	0.09	0.22 ... 0.32	4.2	100	B	**3RV20 11-0DA15**		0.280	B	**3RV20 11-0DA25**		0.300
0.4	0.09	0.28 ... 0.4	5.2	100	B	**3RV20 11-0EA15**		0.280	B	**3RV20 11-0EA25**		0.310
0.5	0.12	0.35 ... 0.5	6.5	100	B	**3RV20 11-0FA15**		0.280	B	**3RV20 11-0FA25**		0.310
0.63	0.18	0.45 ... 0.63	8.2	100	B	**3RV20 11-0GA15**		0.280	B	**3RV20 11-0GA25**		0.300
0.8	0.18	0.55 ... 0.8	10	100	B	**3RV20 11-0HA15**		0.280	B	**3RV20 11-0HA25**		0.300
1	0.25	0.7 ... 1	13	100	B	**3RV20 11-0JA15**		0.340	B	**3RV20 11-0JA25**		0.370
1.25	0.37	0.9 ... 1.25	16	100	B	**3RV20 11-0KA15**		0.340	B	**3RV20 11-0KA25**		0.370
1.6	0.55	1.1 ... 1.6	21	100	B	**3RV20 11-1AA15**		0.340	B	**3RV20 11-1AA25**		0.370
2	0.75	1.4 ... 2	26	100	B	**3RV20 11-1BA15**		0.340	B	**3RV20 11-1BA25**		0.370
2.5	0.75	1.8 ... 2.5	33	100	B	**3RV20 11-1CA15**		0.340	B	**3RV20 11-1CA25**		0.370
3.2	1.1	2.2 ... 3.2	42	100	B	**3RV20 11-1DA15**		0.350	B	**3RV20 11-1DA25**		0.370
4	1.5	2.8 ... 4	52	100	B	**3RV20 11-1EA15**		0.340	B	**3RV20 11-1EA25**		0.370
5	1.5	3.5 ... 5	65	100	B	**3RV20 11-1FA15**		0.350	B	**3RV20 11-1FA25**		0.370
6.3	2.2	4.5 ... 6.3	82	100	B	**3RV20 11-1GA15**		0.350	B	**3RV20 11-1GA25**		0.380
8	3	5.5 ... 8	104	100	B	**3RV20 11-1HA15**		0.350	B	**3RV20 11-1HA25**		0.380
10	4	7 ... 10	130	100	B	**3RV20 11-1JA15**		0.350	B	**3RV20 11-1JA25**		0.380
12.5	5.5	9 ... 12.5	163	100	B	**3RV20 11-1KA15**		0.350	B	**3RV20 11-1KA25**		0.380
16	7.5	11 ... 16	208	55	B	**3RV20 11-4AA15**		0.360	B	**3RV20 11-4AA25**		0.380
Size S0												
16	7.5	11 ... 16	208	55	B	**3RV20 21-4AA15**		0.360	B	**3RV20 21-4AA25**		0.410
20	7.5	14 ... 20	260	55	B	**3RV20 21-4BA15**		0.360	B	**3RV20 21-4BA25**		0.420
22	11	17 ... 22	286	55	B	**3RV20 21-4CA15**		0.360	B	**3RV20 21-4CA25**		0.410
25	11	20 ... 25	325	55	B	**3RV20 21-4DA15**		0.360	B	**3RV20 21-4DA25**		0.420
28	15	23 ... 28	364	55	B	**3RV20 21-4NA15**		0.370	B	**3RV20 21-4NA25**		0.430
32	15	27 ... 32	400	55	B	**3RV20 21-4EA15**		0.370	B	**3RV20 21-4EA25**		0.430
36	18.5	30 ... 36	432	20	B	**3RV20 21-4PA15**		0.380		--		
40	18.5	34 ... 40	480	20	B	**3RV20 21-4FA15**		0.380		--		

[1] Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

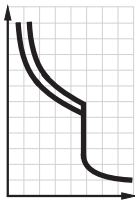
Auxiliary switches can be ordered separately (see "Mountable accessories").

* You can order this quantity or a multiple thereof.
Illustrations are approximate

For motor protection with overload relay function

Selection and ordering data

CLASS 10, with overload relay function (automatic RESET), without auxiliary switches



3RV21 11-0FA10

3RV21 21-4BA10

Rated current	Suitable for induction motors[1] with *P*	Setting range Thermal overload releases	Instantaneous electronic releases	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
I_n			$I >$	I_{cu}		Order No.	Price per PU				
A	kW	A	A	kA							kg
Size S00[2]											
0.16	0.04	0.11 ... 0.16	2.1	100	B	**3RV21 11-0AA10**		1	1 unit	101	0.320
0.2	0.06	0.14 ... 0.2	2.6	100	B	**3RV21 11-0BA10**		1	1 unit	101	0.320
0.25	0.06	0.18 ... 0.25	3.3	100	B	**3RV21 11-0CA10**		1	1 unit	101	0.320
0.32	0.09	0.22 ... 0.32	4.2	100	B	**3RV21 11-0DA10**		1	1 unit	101	0.320
0.4	0.09	0.28 ... 0.4	5.2	100	B	**3RV21 11-0EA10**		1	1 unit	101	0.320
0.5	0.12	0.35 ... 0.5	6.5	100	B	**3RV21 11-0FA10**		1	1 unit	101	0.320
0.63	0.18	0.45 ... 0.63	8.2	100	B	**3RV21 11-0GA10**		1	1 unit	101	0.320
0.8	0.18	0.55 ... 0.8	10	100	B	**3RV21 11-0HA10**		1	1 unit	101	0.320
1	0.25	0.7 ... 1	13	100	B	**3RV21 11-0JA10**		1	1 unit	101	0.380
1.25	0.37	0.9 ... 1.25	16	100	B	**3RV21 11-0KA10**		1	1 unit	101	0.380
1.6	0.55	1.1 ... 1.6	21	100	B	**3RV21 11-1AA10**		1	1 unit	101	0.380
2	0.75	1.4 ... 2	26	100	B	**3RV21 11-1BA10**		1	1 unit	101	0.380
2.5	0.75	1.8 ... 2.5	33	100	B	**3RV21 11-1CA10**		1	1 unit	101	0.380
3.2	1.1	2.2 ... 3.2	42	100	B	**3RV21 11-1DA10**		1	1 unit	101	0.390
4	1.5	2.8 ... 4	52	100	B	**3RV21 11-1EA10**		1	1 unit	101	0.380
5	1.5	3.5 ... 5	65	100	B	**3RV21 11-1FA10**		1	1 unit	101	0.390
6.3	2.2	4.5 ... 6.3	82	100	B	**3RV21 11-1GA10**		1	1 unit	101	0.390
8	3	5.5 ... 8	104	100	B	**3RV21 11-1HA10**		1	1 unit	101	0.390
10	4	7 ... 10	130	100	B	**3RV21 11-1JA10**		1	1 unit	101	0.390
12.5	5.5	9 ... 12.5	163	100	B	**3RV21 11-1KA10**		1	1 unit	101	0.390
16	7.5	11 ... 16	208	55	B	**3RV21 11-4AA10**		1	1 unit	101	0.400
Size S0[2]											
16	7.5	11 ... 16	208	55	B	**3RV21 21-4AA10**		1	1 unit	101	0.400
20	7.5	14 ... 20	260	55	B	**3RV21 21-4BA10**		1	1 unit	101	0.400
22	11	17 ... 22	286	55	B	**3RV21 21-4CA10**		1	1 unit	101	0.400
25	11	20 ... 25	325	55	B	**3RV21 21-4DA10**		1	1 unit	101	0.400
28	15	23 ... 28	364	55	B	**3RV21 21-4NA10**		1	1 unit	101	0.410
32	15	27 ... 32	400	55	B	**3RV21 21-4EA10**		1	1 unit	101	0.410

1) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

2) Accessories for mounting on the right and 3RV29 15 three-phase busbars cannot be used.

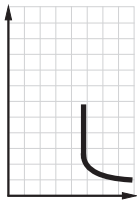
Auxiliary switches can be ordered separately (see "Mountable accessories").

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

Without auxiliary switches

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101



3RV23 11-4AC10

3RV23 11-0JC20

3RV23 21-4AC10

3RV23 21-4AC20

Rated current	Suitable for induction motors[1] with *P*	Thermal overload releases[2]	Instantaneous overcurrent releases	Short-circuit breaking capacity at 400 V AC	DT	**Screw terminals**	Weight per PU approx.	DT	**Spring-type terminals**	Weight per PU approx.
I_n			$I >$	I_{cu}		Order No. / Price per PU			Order No. / Price per PU	
A	kW	A	A	kA			kg			kg
Size S00										
0.16	0.04	Without	2.1	100	B	**3RV23 11-0AC10**	0.260	B	**3RV23 11-0AC20**	0.270
0.2	0.06	Without	2.6	100	B	**3RV23 11-0BC10**	0.260	B	**3RV23 11-0BC20**	0.280
0.25	0.06	Without	3.3	100	B	**3RV23 11-0CC10**	0.260	B	**3RV23 11-0CC20**	0.280
0.32	0.09	Without	4.2	100	B	**3RV23 11-0DC10**	0.260	B	**3RV23 11-0DC20**	0.280
0.4	0.09	Without	5.2	100	B	**3RV23 11-0EC10**	0.260	B	**3RV23 11-0EC20**	0.290
0.5	0.12	Without	6.5	100	B	**3RV23 11-0FC10**	0.260	B	**3RV23 11-0FC20**	0.290
0.63	0.18	Without	8.2	100	B	**3RV23 11-0GC10**	0.260	B	**3RV23 11-0GC20**	0.280
0.8	0.18	Without	10	100	B	**3RV23 11-0HC10**	0.260	B	**3RV23 11-0HC20**	0.280
1	0.25	Without	13	100	B	**3RV23 11-0JC10**	0.320	B	**3RV23 11-0JC20**	0.340
1.25	0.37	Without	16	100	B	**3RV23 11-0KC10**	0.320	B	**3RV23 11-0KC20**	0.350
1.6	0.55	Without	21	100	B	**3RV23 11-1AC10**	0.320	B	**3RV23 11-1AC20**	0.350
2	0.75	Without	26	100	B	**3RV23 11-1BC10**	0.320	B	**3RV23 11-1BC20**	0.350
2.5	0.75	Without	33	100	B	**3RV23 11-1CC10**	0.320	B	**3RV23 11-1CC20**	0.350
3.2	1.1	Without	42	100	B	**3RV23 11-1DC10**	0.320	B	**3RV23 11-1DC20**	0.350
4	1.5	Without	52	100	B	**3RV23 11-1EC10**	0.320	B	**3RV23 11-1EC20**	0.350
5	1.5	Without	65	100	B	**3RV23 11-1FC10**	0.320	B	**3RV23 11-1FC20**	0.350
6.3	2.2	Without	82	100	B	**3RV23 11-1GC10**	0.330	B	**3RV23 11-1GC20**	0.350
8	3	Without	104	100	B	**3RV23 11-1HC10**	0.320	B	**3RV23 11-1HC20**	0.350
10	4	Without	130	100	B	**3RV23 11-1JC10**	0.330	B	**3RV23 11-1JC20**	0.360
12.5	5.5	Without	163	100	B	**3RV23 11-1KC10**	0.320	B	**3RV23 11-1KC20**	0.350
16	7.5	Without	208	55	B	**3RV23 11-4AC10**	0.330	B	**3RV23 11-4AC20**	0.360
Size S0										
16	7.5	Without	208	55	B	**3RV23 21-4AC10**	0.340	B	**3RV23 21-4AC20**	0.390
20	7.5	Without	260	55	B	**3RV23 21-4BC10**	0.330	B	**3RV23 21-4BC20**	0.390
22	11	Without	286	55	B	**3RV23 21-4CC10**	0.330	B	**3RV23 21-4CC20**	0.390
25	11	Without	325	55	B	**3RV23 21-4DC10**	0.340	B	**3RV23 21-4DC20**	0.390
28	15	Without	364	55	B	**3RV23 21-4NC10**	0.350	B	**3RV23 21-4NC20**	0.400
32	15	Without	400	55	B	**3RV23 21-4EC10**	0.350	B	**3RV23 21-4EC20**	0.400
36	18.5	Without	432	20	B	**3RV23 21-4PC10**	0.001		--	
40	18.5	Without	480	20	B	**3RV23 21-4FC10**	0.001		--	

[1] Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

[2] For overload protection of the motors, appropriate overload relays must be used.

Auxiliary switches can be ordered separately (see "Mountable accessories").

* You can order this quantity or a multiple thereof.
Illustrations are approximate

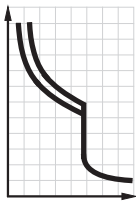
For transformer protection

Selection and ordering data

CLASS 10, without auxiliary switches

Motor starter protectors for the protection of transformers with high inrush current

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101



3RV24 11-0AA10

3RV24 11-0AA20

3RV24 21-4AA10

3RV24 21-4AA20

Rated current	Setting range Thermal overload releases	Instantaneous overcurrent releases	Short-circuit breaking capacity at 400 V AC	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
I_n		$I >$	I_{cu}		Order No.	Price per PU			Order No.	Price per PU	
A	A	A	kA				kg				kg
Size S00											
0.16	0.11 ... 0.16	3.3	100	A	**3RV24 11-0AA10**		0.260	B	**3RV24 11-0AA20**		0.290
0.2	0.14 ... 0.2	4.2	100	A	**3RV24 11-0BA10**		0.260	B	**3RV24 11-0BA20**		0.290
0.25	0.18 ... 0.25	5.2	100	A	**3RV24 11-0CA10**		0.260	B	**3RV24 11-0CA20**		0.290
0.32	0.22 ... 0.32	6.5	100	A	**3RV24 11-0DA10**		0.260	B	**3RV24 11-0DA20**		0.290
0.4	0.28 ... 0.4	8.2	100	A	**3RV24 11-0EA10**		0.260	B	**3RV24 11-0EA20**		0.290
0.5	0.35 ... 0.5	10	100	A	**3RV24 11-0FA10**		0.260	B	**3RV24 11-0FA20**		0.290
0.63	0.45 ... 0.63	13	100	A	**3RV24 11-0GA10**		0.260	B	**3RV24 11-0GA20**		0.290
0.8	0.55 ... 0.8	16	100	A	**3RV24 11-0HA10**		0.320	B	**3RV24 11-0HA20**		0.350
1	0.7 ... 1	21	100	A	**3RV24 11-0JA10**		0.320	B	**3RV24 11-0JA20**		0.350
1.25	0.9 ... 1.25	26	100	A	**3RV24 11-0KA10**		0.320	B	**3RV24 11-0KA20**		0.350
1.6	1.1 ... 1.6	33	100	A	**3RV24 11-1AA10**		0.320	B	**3RV24 11-1AA20**		0.350
2	1.4 ... 2	42	100	A	**3RV24 11-1BA10**		0.320	B	**3RV24 11-1BA20**		0.350
2.5	1.8 ... 2.5	52	100	A	**3RV24 11-1CA10**		0.320	B	**3RV24 11-1CA20**		0.350
3.2	2.2 ... 3.2	65	100	A	**3RV24 11-1DA10**		0.330	B	**3RV24 11-1DA20**		0.360
4	2.8 ... 4	82	100	A	**3RV24 11-1EA10**		0.330	B	**3RV24 11-1EA20**		0.350
5	3.5 ... 5	104	100	A	**3RV24 11-1FA10**		0.330	B	**3RV24 11-1FA20**		0.360
6.3	4.5 ... 6.3	130	100	A	**3RV24 11-1GA10**		0.330	B	**3RV24 11-1GA20**		0.360
8	5.5 ... 8	163	100	A	**3RV24 11-1HA10**		0.320	B	**3RV24 11-1HA20**		0.350
10	7 ... 10	208	100	A	**3RV24 11-1JA10**		0.330	B	**3RV24 11-1JA20**		0.360
12.5	9 ... 12.5	260	100	A	**3RV24 11-1KA10**		0.330	B	**3RV24 11-1KA20**		0.360
16	11 ... 16	286	55	A	**3RV24 11-4AA10**		0.330	B	**3RV24 11-4AA20**		0.360
Size S0											
16	11 ... 16	286	55	A	**3RV24 21-4AA10**		0.340	B	**3RV24 21-4AA20**		0.390
20	14 ... 20	325	55	A	**3RV24 21-4BA10**		0.320	B	**3RV24 21-4BA20**		0.380
22	17 ... 22	364	55	A	**3RV24 21-4CA10**		0.350	B	**3RV24 21-4CA20**		0.400
25	20 ... 25	400	55	A	**3RV24 21-4DA10**		0.350	B	**3RV24 21-4DA20**		0.410

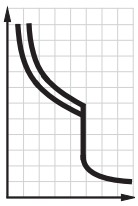
Auxiliary switches can be ordered separately
(see "Mountable accessories").

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

Without auxiliary switches

Circuit breakers for system protection and non-motor loads according to UL/CSA



3RV27 11-0AD10

Rated current[1]	Thermal overload releases (non-adjustable)	Instantaneous overcurrent release	Short-circuit breaking capacity at 480 Y/277 V AC[2]	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
I_n[1]		$I >$	I_{bc}		Order No.	Price per PU				
A	A	A	kA							kg
Size S00										
0.16	0.16	2.1	65	C	**3RV27 11-0AD10**		1	1 unit	101	0.390
0.2	0.2	2.6	65	C	**3RV27 11-0BD10**		1	1 unit	101	0.390
0.25	0.25	3.3	65	C	**3RV27 11-0CD10**		1	1 unit	101	0.390
0.32	0.32	4.2	65	C	**3RV27 11-0DD10**		1	1 unit	101	0.390
0.4	0.4	5.2	65	C	**3RV27 11-0ED10**		1	1 unit	101	0.390
0.5	0.5	6.5	65	C	**3RV27 11-0FD10**		1	1 unit	101	0.390
0.63	0.63	8.2	65	C	**3RV27 11-0GD10**		1	1 unit	101	0.390
0.8	0.8	10	65	C	**3RV27 11-0HD10**		1	1 unit	101	0.390
1	1	13	65	C	**3RV27 11-0JD10**		1	1 unit	101	0.450
1.25	1.25	16	65	C	**3RV27 11-0KD10**		1	1 unit	101	0.450
1.6	1.6	21	65	C	**3RV27 11-1AD10**		1	1 unit	101	0.460
2	2	26	65	C	**3RV27 11-1BD10**		1	1 unit	101	0.460
2.5	2.5	33	65	C	**3RV27 11-1CD10**		1	1 unit	101	0.460
3.2	3.2	42	65	C	**3RV27 11-1DD10**		1	1 unit	101	0.460
4	4	52	65	C	**3RV27 11-1ED10**		1	1 unit	101	0.450
5	5	65	65	C	**3RV27 11-1FD10**		1	1 unit	101	0.460
6.3	6.3	82	65	C	**3RV27 11-1GD10**		1	1 unit	101	0.460
8	8	104	65	C	**3RV27 11-1HD10**		1	1 unit	101	0.460
10	10	130	65	C	**3RV27 11-1JD10**		1	1 unit	101	0.460
12.5	12.5	163	65	C	**3RV27 11-1KD10**		1	1 unit	101	0.460
15	15	208	65	C	**3RV27 11-4AD10**		1	1 unit	101	0.470

[1] Rated value 100 % according to UL 489 and IEC 60947-2 ("100 % rated breaker").

[2] Values for 600 Y/347 V AC can be found in the Technical Specifications under "Permissible rated data of devices approved for North America (UL/CSA)" --> "3RV27 and 3RV28 motor starter protectors as circuit breakers", see note on Technical Information on page 5/1.

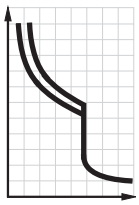
Lateral and transverse auxiliary switches can be ordered separately (see "Mountable accessories").

For transformer protection according to UL 489/CSA C22.2 No. 5-02

Selection and ordering data

Without auxiliary switches

Circuit breakers for system and transformer protection according to UL/CSA, specially designed for transformers with high inrush current



3RV28 11-0AD10

Rated current[1]	Thermal overload releases (non-adjustable)	Instantaneous overcurrent release	Short-circuit breaking capacity at 480 Y/277 V AC[2]	DT	Screw terminals		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
I_n[1]		I >	I_{bc}		Order No.	Price per PU				
A	A	A	kA							kg
Size S00										
0.16	0.16	3.3	65	C	**3RV28 11-0AD10**		1	1 unit	101	0.390
0.2	0.2	4.2	65	C	**3RV28 11-0BD10**		1	1 unit	101	0.390
0.25	0.25	5.2	65	C	**3RV28 11-0CD10**		1	1 unit	101	0.390
0.32	0.32	6.5	65	C	**3RV28 11-0DD10**		1	1 unit	101	0.390
0.4	0.4	8.2	65	C	**3RV28 11-0ED10**		1	1 unit	101	0.390
0.5	0.5	10	65	C	**3RV28 11-0FD10**		1	1 unit	101	0.390
0.63	0.63	13	65	C	**3RV28 11-0GD10**		1	1 unit	101	0.400
0.8	0.8	16	65	C	**3RV28 11-0HD10**		1	1 unit	101	0.450
1	1	21	65	C	**3RV28 11-0JD10**		1	1 unit	101	0.450
1.25	1.25	26	65	C	**3RV28 11-0KD10**		1	1 unit	101	0.460
1.6	1.6	33	65	C	**3RV28 11-1AD10**		1	1 unit	101	0.460
2	2	42	65	C	**3RV28 11-1BD10**		1	1 unit	101	0.460
2.5	2.5	52	65	C	**3RV28 11-1CD10**		1	1 unit	101	0.460
3.2	3.2	65	65	C	**3RV28 11-1DD10**		1	1 unit	101	0.460
4	4	82	65	C	**3RV28 11-1ED10**		1	1 unit	101	0.460
5	5	104	65	C	**3RV28 11-1FD10**		1	1 unit	101	0.460
6.3	6.3	130	65	C	**3RV28 11-1GD10**		1	1 unit	101	0.460
8	8	163	65	C	**3RV28 11-1HD10**		1	1 unit	101	0.460
10	10	208	65	C	**3RV28 11-1JD10**		1	1 unit	101	0.460
12.5	12.5	260	65	C	**3RV28 11-1KD10**		1	1 unit	101	0.460
15	15	286	65	C	**3RV28 11-4AD10**		1	1 unit	101	0.470

[1] Rated value 100 % according to UL 489 and IEC 60947-2 ("100 % rated breaker").

[2] Values for 600 Y/347 V AC can be found in the Technical Specifications under "Permissible rated data of devices approved for North America (UL/CSA)" --> "3RV27 and 3RV28 motor starter protectors as circuit breakers", see note on Technical Information on page 5/1.

Lateral and transverse auxiliary switches can be ordered separately (see "Mountable accessories").

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Mounting location and function

The 3RV2 motor starter protectors have three main contact elements. In order to achieve maximum flexibility, auxiliary switches, signaling switches, auxiliary releases and isolator modules can be supplied separately.

These components can be fitted as required on the motor starter protectors without using tools.

An overview graphic can be found on page 5/4.

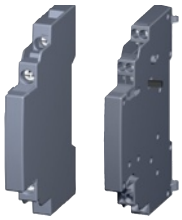
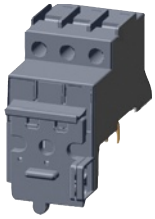
Front side *Note:* • *A maximum of 4 auxiliary contacts with auxiliary switches can be attached per motor starter protector.*	**Transverse auxiliary switch, solid-state compatible transverse auxiliary switch** 1 NO + 1 NC or 2 NO or 1 CO	An auxiliary switch block can be inserted transversely on the front. The overall width of the motor starter protectors remains unchanged.
Left-hand side *Notes:* • *A maximum of 4 auxiliary contacts with auxiliary switches can be attached per motor starter protector.* • *Auxiliary switches (2 contacts) and signal switches can be mounted separately or together.* • *The signaling switch cannot be used for the 3RV27 and 3RV28 motor starter protectors.*	**Lateral auxiliary switches (2 contacts)** 1 NO + 1 NC or 2 NO or 2 NC	One of the three lateral auxiliary switches can be mounted on the left side per motor starter protector. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector. The overall width of the lateral auxiliary switch with 2 contacts is 9 mm.
	Lateral auxiliary switches (4 contacts) 2 NO + 2 NC	One lateral auxiliary switch with four contacts can be mounted on the left side per motor starter protector. The contacts of the auxiliary switch close and open together with the main contacts of the motor starter protector. The overall width of the lateral auxiliary switch with 4 contacts is 18 mm.
	Signaling switch Tripping 1 NO + 1 NC Short-circuit 1 NO + 1 NC	One signaling switch can be mounted on the left side of each motor starter protector. The signaling switch has two contact systems. One contact system always signals tripping irrespective of whether this was caused by a short-circuit, an overload or an auxiliary release. The other contact system only switches in the event of a short-circuit. There is no signaling as a result of switching off with the handle. In order to be able to switch on the motor starter protector again after a short-circuit, the signaling switch must be reset manually after the error cause has been eliminated. The overall width of the signaling switch is 18 mm.
Right-hand side *Notes:* • *One auxiliary release can be mounted per motor starter protector.* • *Accessories cannot be mounted at the right-hand side of the 3RV21 motor starter protectors for motor protection with overload relay function.*	**Auxiliary releases**	
	Shunt releases	For remote-controlled tripping of the motor starter protector. The release coil should only be energized for short periods (see schematics).
	or	
	Undervoltage releases	Trips the motor starter protector when the voltage is interrupted and prevents the motor from being restarted accidentally when the voltage is restored. Used for remote-controlled tripping of the motor starter protector. Particularly suitable for EMERGENCY-STOP disconnection by way of the corresponding EMERGENCY-STOP pushbutton according to EN 60204-1 (VDE 0113).
	or	
	Undervoltage releases with leading auxiliary contacts 2 NO	Function and use as for the undervoltage release without leading auxiliary contacts, but with the following additional function: the auxiliary contacts will open in switch position OFF to deenergize the coil of the undervoltage release, thus interrupting energy consumption. In the "tripped" position, these auxiliary contacts are not guaranteed to open. The leading contacts permit the motor starter protector to reclose. The overall width of the auxiliary release is 18 mm.
Top *Notes:* • *The isolator module cannot be used for the 3RV27 and 3RV28 motor starter protectors.* • *The isolator module covers the terminal screws of the transverse auxiliary switch. If the isolator module is used, we therefore recommend that either the lateral auxiliary switches be fitted or that the isolator module not be mounted until the auxiliary switch has been wired.*	**Isolator modules**	Isolator modules can be mounted to the upper terminal end of the motor starter protectors. The supply cable is connected to the motor starter protector through the isolator module. The plug can only be unplugged when the motor starter protector is open and isolates all 3 poles of the motor starter protector from the network. The shock-protected isolation point is clearly visible and secured with a padlock to prevent reinsertion of the plug.

For a complete overview of which accessories can be used for the various motor starter protectors see page 5/2.

Mountable accessories

Selection and ordering data

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101

	Version	For motor starter protectors Size	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Auxiliary switches[1)]										
 3RV29 01-1E	**Transverse auxiliary switches** for front mounting									
	1 CO	S00, S0	A	**3RV29 01-1D**		0.014		**--**		
	1 NO + 1 NC[3)]		A	**3RV29 01-1E**		0.016	A	**3RV29 01-2E**		0.016
	2 NO		A	**3RV29 01-1F**		0.017	A	**3RV29 01-2F**		0.017
 3RV29 01-2E  3RV29 01-1G	**Solid-state compatible transverse auxiliary switches** for mounting on the front, for operation in dusty atmosphere and in solid-state circuits with low operating currents									
	1 CO	S00, S0	A	**3RV29 01-1G**		0.015		**--**		
 3RV29 01-0H	**Covers for transverse auxiliary switch**	S00, S0	A	**3RV29 01-0H**		0.001		**--**		
 3RV29 01-1A 3RV29 01-2A	**Lateral auxiliary switches** mountable on the left									
	1 NO + 1 NC[3)]	S00, S0	A	**3RV29 01-1A**		0.036	A	**3RV29 01-2A**		0.035
	2 NO		A	**3RV29 01-1B**		0.037	A	**3RV29 01-2B**		0.035
	2 NC		A	**3RV29 01-1C**		0.037	A	**3RV29 01-2C**		0.035
	2 NO + 2 NC		A	**3RV29 01-1J**		0.066		**--**		
Signaling switches[2)]										
 3RV29 21-1M 3RV29 21-2M	**Signaling switches[3)]** One signaling switch can be mounted on the left per motor starter protector. Separate tripped and short-circuit alarms, 1 NO + 1 NC each	S0	A	**3RV29 21-1M**		0.068	A	**3RV29 21-2M**		0.070
Isolator modules[2)]										
 3RV29 28-1A with padlock	**Isolator modules** Visible isolating distance for isolating individual motor starter protectors from the network, lockable in disconnected position.	S0, S00	A	**3RV29 28-1A**		0.132		**--**		

1) One transverse auxiliary switch and one lateral auxiliary switch can be attached per motor starter protector. The lateral auxiliary switch with 2 NO + 2 NC is used without a transverse auxiliary switch.

2) This accessory cannot be used for the 3RV27 and 3RV28 motor starter protectors.

3) The 3RV29 auxiliary and signaling switches with 1 NO + 1 NC are also available with ring terminal lug connection. The Order No. must be changed in the 8th position to **"4"**: e. g. 3RV29 01-**4**E.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RV29 02-1AV0


3RV29 02-2AV0


3RV29 22-1CP0


3RV29 02-2DB0

Rated control supply voltage U_s AC 50 Hz	AC 60 Hz	AC 50/60 Hz 100 % ON period[1]	AC/DC 50/60 Hz, DC 5 s ON period[2]	DC	For motor starter protectors	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
V	V	V	V	V	Size				kg				kg
Auxiliary releases[3]													
Undervoltage releases													
--	--	--	--	24	S00, S0	A	**3RV29 02-1AB4**		0.121		**--**		
24	--	--	--	--	S00, S0	A	**3RV29 02-1AB0**		0.118		**--**		
110	120	--	--	--	S00, S0	A	**3RV29 02-1AF0**		0.117		**--**		
--	208	--	--	--	S00, S0	A	**3RV29 02-1AM1**		0.111		**--**		
230	240	--	--	--	S00, S0 [4]	A	**3RV29 02-1AP0**		0.110	A	**3RV29 02-2AP0**		0.112
400	440	--	--	--	S00, S0 [4]	A	**3RV29 02-1AV0**		0.112	A	**3RV29 02-2AV0**		0.110
415	480	--	--	--	S00, S0	A	**3RV29 02-1AV1**		0.114		**--**		
500	600	--	--	--	S00, S0	A	**3RV29 02-1AS0**		0.111		**--**		
Undervoltage releases with leading auxiliary contacts 2 NO													
230	240	--	--	--	S00, S0	A	**3RV29 22-1CP0**		0.122	A	**3RV29 22-2CP0**		0.119
400	440	--	--	--	S00, S0	A	**3RV29 22-1CV0**		0.121	A	**3RV29 22-2CV0**		0.118
415	480	--	--	--	S00, S0 [4]	A	**3RV29 22-1CV1**		0.121	A	**3RV29 22-2CV1**		0.118
Shunt releases													
--	--	20 ... 24	20 ... 70	--	S00, S0	A	**3RV29 02-1DB0**		0.117	A	**3RV29 02-2DB0**		0.116
--	--	90 ... 110	70 ... 190	--	S00, S0 [4]	A	**3RV29 02-1DF0**		0.119	A	**3RV29 02-2DF0**		0.115
--	--	210 ... 240	190 ... 330	--	S00, S0 [4]	A	**3RV29 02-1DP0**		0.114	A	**3RV29 02-2DP0**		0.112
--	--	350 ... 415	330 ... 500	--	S00, S0	A	**3RV29 02-1DV0**		0.111		**--**		
--	--	500	500	--	S00, S0	A	**3RV29 02-1DS0**		0.110		**--**		

1) The voltage range is valid for 100 % (infinite) ON period.
The response voltage lies at 0.9 of the lower limit of the voltage range.

2) The voltage range is valid for 5 s ON period at AC 50/60Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range.

3) One auxiliary release can be mounted on the right per motor starter protector (does not apply to 3RV21 motor starter protectors with overload relay function).

4) The 3RV29 auxiliary releases are also available with ring terminal lug connection. The Order No. must be changed in the 8th position to **"4"**: e. g. 3RV29 02-**4**AP0.

Busbar accessories

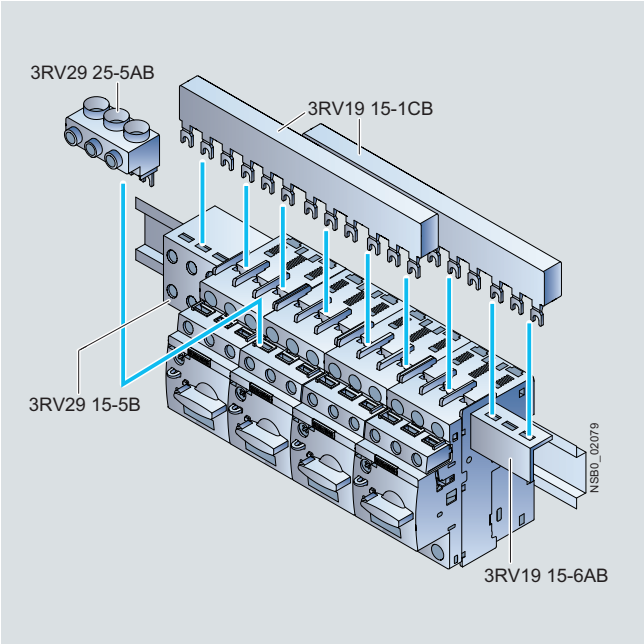
Overview

Insulated three-phase busbar systems

Three-phase busbar systems provide an easy, time-saving and clearly arranged means of feeding 3RV2 motor starter protectors with screw terminals. They can be used for the different types of motor starter protector up to 32 A. The 3RV19 15 three-phase busbar systems are generally unsuitable for the 3RV21 motor starter protectors for motor protection with overload relay function and for the 3RV27 and 3RV28 circuit breakers according to UL 489 / CSA C22.2 No.5-02.

The busbars are suitable for between 2 and 5 circuit breakers/ motor starter protectors. However, any kind of extension is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor starter protector.

A combination of motor starter protectors of different sizes is possible. The motor starter protectors are supplied by appropriate feeder terminals.



Three-phase busbar system size S00/S0

The three-phase busbar systems are finger-safe. They are designed for any short-circuit stress which can occur at the output side of connected motor starter protectors.

The three-phase busbar systems can also be used to construct "Type E Starters" according to UL/CSA. Special feeder terminals must be used for this purpose, however (see "Selection and ordering data").

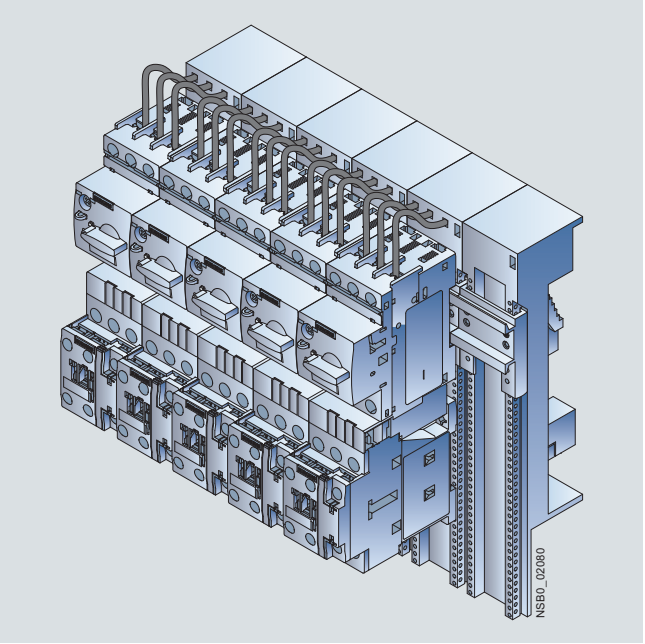
8US busbar adapters for 60 mm systems

The motor starter protectors are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs.

The busbar adapters for busbar systems with 60 mm center-to-center clearance are suitable for copper busbars with a width of 12 to 30 mm. The busbars can be 5 mm or 10 mm thick.

The motor starter protectors are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

Further busbar adapters for snap-mounting direct-on-line starters and reversing starters as well as additional accessories such as line terminals and outgoing terminals, flat copper profile, etc., can be found in Catalog LV 1, Chapter 17 "SENTRON Switching and Protection Devices, Switch Disconnectors, 8US Busbar Systems" --> "SENTRON 8US Busbar Systems".



SIRIUS load feeders with busbar adapters snapped onto busbars

Selection and ordering data

	Modular spacing	Number of motor starter protectors that can be connected: Without lateral accessories	Incl. lateral auxiliary switch	Incl. auxiliary release	Rated current I_n at 690 V	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm				A	Size							kg
Three-phase busbars[1)2)]													
 3RV19 15-1AB	For feeding several motor starter protectors with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection.												
	45	2	--	--	63	S00, S0[1)]	▶	**3RV19 15-1AB**		1	1 unit	101	0.044
		3				S00, S0[1)]	▶	**3RV19 15-1BB**		1	1 unit	101	0.071
 3RV19 15-1BB		4				S00, S0[1)]	▶	**3RV19 15-1CB**		1	1 unit	101	0.099
		5				S00, S0[1)]	▶	**3RV19 15-1DB**		1	1 unit	101	0.124
	55	--	2	--	63	S00, S0[1)]	▶	**3RV19 15-2AB**		1	1 unit	101	0.048
			3			S00, S0[1)]	▶	**3RV19 15-2BB**		1	1 unit	101	0.079
 3RV19 15-1CB			4			S00, S0[1)]	▶	**3RV19 15-2CB**		1	1 unit	101	0.111
			5			S00, S0[1)]	▶	**3RV19 15-2DB**		1	1 unit	101	0.140
	63	--	--	2	63	S00, S0[1)]	▶	**3RV19 15-3AB**		1	1 unit	101	0.052
				4		S00, S0[1)]	▶	**3RV19 15-3CB**		1	1 unit	101	0.120
 3RV19 15-1DB													

1) Not suitable for 3RV21 motor starter protectors for motor protection with overload relay function and for 3RV27 and 3RV28 motor starter protectors according to UL 489 / CSA C22.2 No.5-02.

2) Approved up to 32 A.

	Conductor cross-section: Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm²	mm²	AWG	Nm	Size							kg
Three-phase feeder terminals												
	Connection from top											
 3RV29 25-5AB	2.5 ... 16	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	A	**3RV29 25-5AB**		1	1 unit	101	0.043
	Connection from below[1)]											
 3RV29 15-5B	2.5 ... 16	2.5 ... 16	10 ... 4	Input: 4, Output: 2 ... 2.5	S00, S0	A	**3RV29 15-5B**		1	1 unit	101	0.093
Three-phase feeder terminals for constructing "Type E Starters"												
	Connection from top											
 3RV29 25-5EB	2.5 ... 16	2.5 ... 16	10 ... 4	3 ... 4	S00, S0	A	**3RV29 25-5EB**		1	1 unit	101	0.044

1) This terminal is connected in place of a switch, please take the space requirement into account.

	Version	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		Size							kg
Covers for connection tags									
 3RV19 15-6AB	Touch protection for empty positions	S00, S0	▶	**3RV19 15-6AB**		1	10 units	101	0.003

5

Accessories

Busbar accessories

Busbar adapters

8US12 51-5DS10

8US12 51-5DT11

8US12 50-5AS10

8US12 50-5AT10

For motor starter protector	Rated current	Connecting cable	Adapter length	Adapter width	Rated voltage	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Size	A	AWG	mm	mm	V							kg
Busbar adapters for 60 mm systems												
For flat copper profiles according to DIN 46433 Width: 12 mm and 30 mm Thickness: 5 mm and 10 mm also for T and double-T special profiles												
• For motor starter protectors with screw terminals							**Screw terminals**					
S00	16	12	200	45	690	▶	**8US12 51-5DS10**		1	1 unit	143	0.183
S0	32	10	260	45	690	▶	**8US12 51-5NT10**		1	1 unit	143	0.183
• For motor starter protectors with spring-type terminals							**Spring-type terminals**					
S00	16	12	260	45	690	▶	**8US12 51-5DT11**		1	1 unit	143	0.183
S0	32	10	260	45	690	▶	**8US12 51-5NT11**		1	1 unit	143	0.183
Accessories												
Device holders For lateral attachment to busbar adapters	--	--	200	45	--	▶	**8US12 50-5AS10**		1	1 unit	143	0.183
	--	--	260	45	--	▶	**8US12 50-5AT10**		1	1 unit	143	0.183
Side modules For widening of busbar adapters	--	--	200	9	--	A	**8US19 98-2BJ10**		1	1 unit	143	0.023
Spacers Fixes the load feeder onto the busbar adapter	--	--	--	--	--	▶	**8US19 98-1BA10**		1	10 units	143	0.183
Vibration and shock kits For high vibration and shock loads	--	--	--	--	--	▶	**8US19 98-1CA10**		1	1 unit	143	0.183

For additional busbar adapters see Catalog LV 1, Chapter 17 "SENTRON Switching and Protection Devices, Switch Disconnectors, 8US Busbar Systems" --> "SENTRON 8US Busbar Systems".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

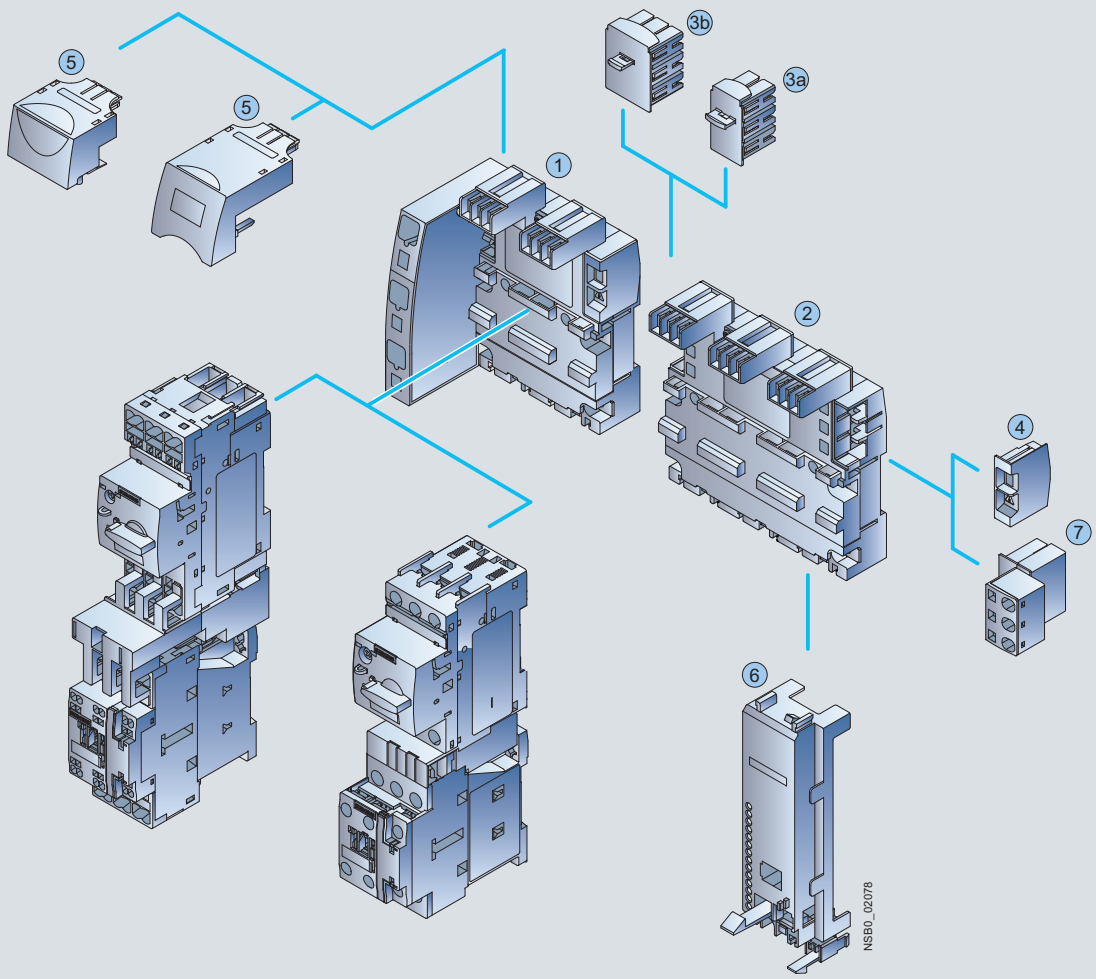
The 3RV29 infeed system is a convenient means of energy supply and distribution for a group of several motor starter protectors or complete load feeders with a screw or spring-type connection in sizes S00 and S0 (exception: this system cannot be used for the 3RV21, 3RV27 and 3RV28 motor starter protectors).

The system is based on a basic module complete with a lateral incoming unit (three-phase busbar with infeed). This infeed with spring-type terminals is mounted on the right or left depending on the version and can be supplied with a maximum conductor cross-section of 25 mm^2 (with end sleeve). A basic module has two sockets onto each of which a motor starter protector can be snapped.

Expansion modules are available for extending the system (three-phase busbars for system expansion). The individual modules are connected through an expansion plug.

The electrical connection between the three-phase busbars and the motor starter protectors is implemented through plug-in connectors. The complete system can be mounted on a TH 35 standard mounting rail to EN 60715 and can be expanded as required up to a maximum current carrying capacity of 63 A.

The system is mounted extremely quickly and easily thanks to the simple plug-in technique. Thanks to the lateral infeed, the system also saves space in the control cabinet. The additional overall height required for the infeed unit is only 30 mm. The alternative infeed possibilities on each side offer a high degree of flexibility for configuring the control cabinet: Infeed on left-hand or right-hand side as well as infeed on one side and out-feed on the other side to supply further loads are all possible. A terminal block with spring-type connections in combination with a standard mounting rail enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components such as 5SY miniature circuit breakers or SIRIUS relay components.



1 3-phase busbar with infeed
2 3-phase busbar for system expansion
3a Expansion plug
3b Extra-wide expansion plug
4 End cover
5 Plug-in connector
6 Contactor base
7 Terminal block

3RV29 infeed system

3RV29 infeed system

① *Three-phase busbars with infeed*

A three-phase busbar with infeed unit is required for connecting the energy supply. This module comprises one infeed module and 2 sockets which each accept one motor starter protector. A choice of two versions with infeed on the left or right is available. The infeed is connected using spring-type terminals. The spring-type terminals permit conductor cross-sections of up to 25 mm^2 with end sleeves. An end cover is supplied with each module.

② *Three-phase busbars for system expansion*

The three-phase busbars for system expansion allow the system to be expanded. There is a choice of modules with 2 or 3 sockets. The system can be expanded as required up to a maximum current carrying capacity of 63 A. An expansion plug is supplied with each module.

③a *Expansion plug*

The expansion plug is used for electrical connection of adjacent three-phase busbars. The current carrying capacity of this plug equals 63 A. One expansion plug is supplied with each three-phase busbar for system expansion. Additional expansion plugs are therefore only required as spare parts.

③b *Extra-wide expansion plug*

The wide expansion plug makes the electrical connection between two three-phase busbars, thus performing the same function as the 3RV29 17-5BA00 expansion plug; the electrical characteristics (e.g. a current carrying capacity of 63 A) are identical.

The 3RV29 17-5E expansion plug is 10 mm wider than the 3RV29 17-5BA00 expansion plug, hence in the plugged state there is a distance of 10 mm between the connected three-phase busbars. This distance can be used to lay the auxiliary current and control current wiring ("wiring duct"). The motor starter protector and contactor can be wired from underneath, which means that the complete cable duct above the system can be omitted.

④ *End cover*

The end cover is used to cover the three-phase busbar at the open end of the system. This cover is therefore only required once for each system. An end cover is supplied with each three-phase busbar system with infeed. Further end covers are therefore only required as spare parts.

⑤ *Plug-in connector*

The plug-in connector is used for the electrical connection between the three-phase busbar and the 3RV2 motor starter protector. These plug-in connectors are available in versions for screw or spring-type terminals.

⑥ *Contactor base*

Load feeders can be assembled in the system using the contactor base. The contactor bases are suitable for contactors sizes S00 and S0 with spring-type and screw terminals and are simply snapped onto the three-phase busbars. Direct-on-line starters and reversing starters are possible. One contactor base is required for direct-on-line starters and two are required for reversing starters.

To assemble load feeders for reversing starters, the contactor bases can be arranged alongside each other (90 mm overall width). In this case the mechanical interlocking of the contactors is possible. The contactor bases are also suitable for soft starters size S00 and S0 with screw connection.

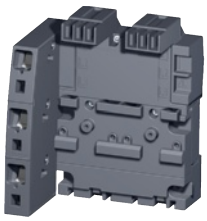
The infeed system is designed for mounting on a 35 mm standard mounting rail with 7.5 mm overall depth. This standard mounting rail gives the contactor base a stable mounting surface to sit on. If standard mounting rails with a depth of 15 mm are used, the spacer connected to the bottom of the contactor base must be knocked out and plugged into the mating piece that is also on the underside. Then the contactor base also has a stable mounting surface. When standard mounting rails with a depth of 7.5 mm are used, the spacer has no function and can be removed.

The link modules are used for direct start load feeders, in which case the use of a contactor base is not absolutely necessary. Motor starter protector and contactor assemblies can then be directly snapped onto the sockets of the three-phase busbars. For feeders of size S00 and S0, the corresponding 3RA19 21-1...., 3RA29 11-2...., 3RA29 21-1.... or 3RA29 21-2.... link modules should generally be used.

⑦ *Terminal block*

The 3RV29 17-5D terminal block enables the integration of not only SIRIUS motor starter protectors but also single-phase, 2-phase and 3-phase components. Using the terminal block the 3 phases can be fed out of the system; which means that single-phase loads can also be integrated in the system. The terminal block is plugged into the slot of the expansion plug and thus enables outfeeding from the middle or end of the infeed system. The terminal block can be rotated through 180° and be locked to the support modules of the infeed system. The 3RV19 17-7B 45 mm standard mounting rail for screwing onto the support plate is available in addition in order to be able to plug the single-phase, 2-phase and 3-phase components onto the infeed system.

Selection and ordering data

	Type	Version	For 3RV20, 3RV23, 3RV24 motor starter protectors Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Three-phase busbars with infeed										
 3RV29 17-1A	**3-phase busbars with infeed** incl. end cover 3RV29 17-6A	For 2 motor starter protectors with screw connection or spring-type terminals								
		• With infeed on the left	S00, S0	A	**3RV29 17-1A**		1	1 unit	101	0.369
		• With infeed on the right	S00, S0	A	**3RV29 17-1E**		1	1 unit	101	0.369
Three-phase busbars for system expansion										
 3RV29 17-4A	**Three-phase busbars** incl. 3RV29 17-5BA00 expansion plug	For motor starter protectors with screw connection or spring-type terminals								
		• For 2 motor starter protectors	S00, S0	A	**3RV29 17-4A**		1	1 unit	101	0.229
		• For 3 motor starter protectors	S00, S0	A	**3RV29 17-4B**		1	1 unit	101	0.328
Plug-in connectors										
 3RV29 17-5AA00	**Plug-in connectors** to make contact with the motor starter protectors	• For spring-type terminals			**Spring-type terminals**					
		- Single-unit packaging	S00[1)] S0[2)]	A A	**3RV29 17-5AA00** **3RV29 27-5AA00**		1 1	1 unit 1 unit	101 101	0.046 0.059
		- Multi-unit packaging	S00[1)] S0[2)]	A A	**3RV29 17-5A** **3RV29 27-5A**		1 1	10 units 10 units	101 101	0.046 0.059
 3RV29 17-5CA00		• For screw terminals			**Screw terminals**					
		- Single-unit packaging	S00[1)] S0[2)]	A A	**3RV29 17-5CA00** **3RV19 27-5AA00**		1 1	1 unit 1 unit	101 101	0.029 0.040
		- Multi-unit packaging	S00[1)] S0[2)]	A A	**3RV29 17-5C** **3RV19 27-5A**		1 1	10 units 10 units	101 101	0.029 0.036

	Type	Version	For contactors Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Contactor bases										
 3RV29 27-7AA00	**Contactor bases** for mounting direct-on-line or reversing starters	Single-unit packaging	S00, S0	A	**3RV29 27-7AA00**		1	1 unit	101	0.050

1) I > 14 A, note derating; see the system manual "SIRIUS Innovations", Chapter "Motor Starter Protectors".

2) I > 16 A, note derating; see the system manual "SIRIUS Innovations", Chapter "Motor Starter Protectors".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

3RV29 infeed system

	Type	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminal blocks									
 3RV29 17-5D	**Terminal blocks** For integration of single-phase, two-phase and three-phase components	Single-unit packaging	A	**3RV29 17-5D**		1	1 unit	101	0.049
45 mm standard mounting rails									
 3RV19 17-7B	**45 mm standard mounting rails** for mounting onto three-phase busbars	Single-unit packaging	A	**3RV19 17-7B**		1	1 unit	101	0.261
Extra-wide expansion plugs									
 3RV29 17-5E	**Extra-wide expansion plugs as accessory**	Single-unit packaging	A	**3RV29 17-5E**		1	1 unit	101	0.037
Expansion plugs									
 3RV29 17-5BA00	**Expansion plugs**[1] as spare part	Single-unit packaging	A	**3RV29 17-5BA00**		1	1 unit	101	0.026
End covers									
 3RV29 17-6A	**End covers**[2] as spare part	Multi-unit packaging	A	**3RV29 17-6A**		1	10 units	101	0.005

[1] The expansion plug is included in the scope of supply of the 3RV29 17-4 three-phase busbars for system expansion.

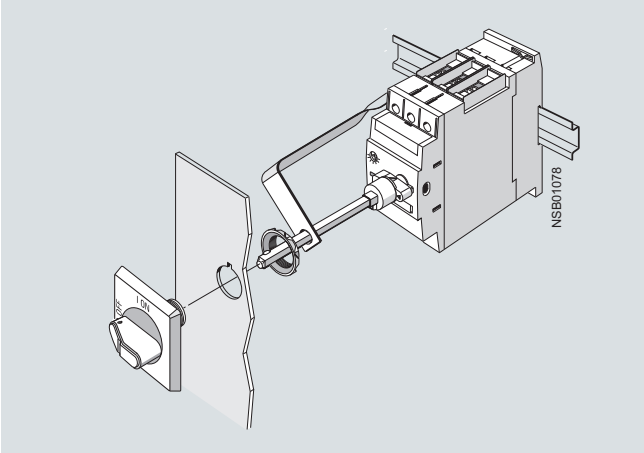
[2] The end cover is included in the scope of supply of the 3RV29 17-1 three-phase busbars with infeed system.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

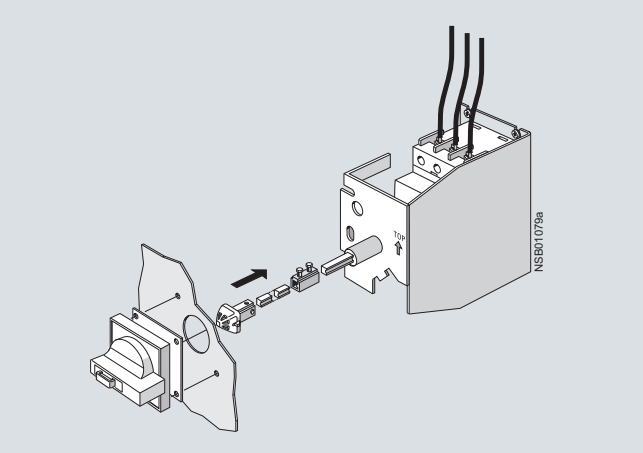
Overview

Door-coupling rotary operating mechanisms

Motor starter protectors with a rotary operating mechanism can be mounted in a control cabinet and operated externally by means of a door-coupling rotary operating mechanism. When the cabinet door with motor starter protector is closed, the operating mechanism is coupled. When the motor starter protector closes, the coupling is locked which prevents the door from being opened unintentionally. This interlock can be defeated by the maintenance personnel. In the OPEN position, the rotary operating mechanism can be secured against reclosing with up to 3 padlocks. Inadvertent opening of the door is not possible in this case either.



3RV29 26-0K door-coupling rotary operating mechanism



3RV29 26-2B door-coupling rotary operating mechanism for arduous conditions

Selection and ordering data

	Version	Color of handle	Version of extension shaft	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
			mm	Size							kg
Door-coupling rotary operating mechanisms											
 3RV29 26-0B	The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and a 130/330 mm long extension shaft (6 mm x 6 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door locking device prevents accidental opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks.										
	Door-coupling rotary operating mechanisms	Black	130	S00, S0	▶	**3RV29 26-0B**		1	1 unit	101	0.111
			330	S00, S0	▶	**3RV29 26-0K**		1	1 unit	101	0.324
	EMERGENCY-STOP door-coupling rotary operating mechanisms	Red/ Yellow	130	S00, S0	▶	**3RV29 26-0C**		1	1 unit	101	0.110
			330	S00, S0	▶	**3RV29 26-0L**		1	1 unit	101	0.316
Door-coupling rotary operating mechanisms for arduous conditions											
 3RV29 26-2B	The door-coupling rotary operating mechanisms consist of a knob, a coupling driver, an extension shaft of 300 mm in length (8 mm x 8 mm), a spacer and two metal brackets, into which the motor starter protector is inserted. The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking reliably prevents opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks. Laterally mountable auxiliary releases and two-pole auxiliary switches can be used. The door-coupling rotary operating mechanisms thus meet the requirements for isolating functions according to IEC 60947-2.										
	Door-coupling rotary operating mechanisms	Gray	300	S00, S0	▶	**3RV29 26-2B**		1	1 unit	101	1.180
	EMERGENCY-STOP door-coupling rotary operating mechanisms	Red/ Yellow	300	S00, S0	▶	**3RV29 26-2C**		1	1 unit	101	1.188

* You can order this quantity or a multiple thereof.
Illustrations are approximate

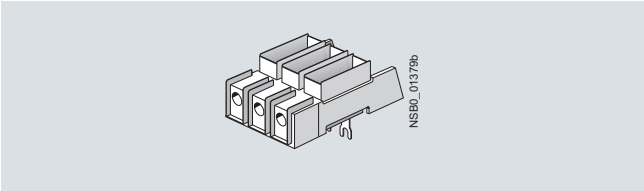
Mounting accessories

Overview

Accessories for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508

The 3RV20 motor starter protectors are approved according to UL 508 as "Self-Protected Combination Motor Controllers (Type E)".

This requires increased clearance and creepage distances (1 inch and 2 inches respectively) at the input side of the device, which are achieved by mounting terminal blocks. The 3RV29 28-1H terminal block is simply screwed onto the basic unit.



3RV29 28-1H terminal block

Another way to obtain the increased clearance and creepage distances for Type E is to mount the 3RV29 28-1K phase barriers.

Special three-phase feeder terminals are required for constructing "Type E Starters" with an insulated three-phase busbar system (see "Busbar Accessories").

Note:
According to CSA, the terminal blocks and the phase barriers can be omitted when the device is used as a "Self-Protected Combination Motor Controller" (Type E).

Link modules

Feeders can be easily assembled from single devices with the help of the link modules. The following table shows the various possible combinations for devices with screw connection or spring-type terminals.

Combination device	3RV2 motor starter protectors Size	3RT2 contactors; 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors Size	Link modules Screw terminals	Link modules Spring-type terminals
Link modules for connecting switching devices to 3RV2 motor starter protectors[1)]				
3RT2 contactors with AC or DC coil	S00	S00	3RA19 21-1DA00	3RA29 11-2AA00
	S0	S00		--
3RT2 contactors with AC coil	S0	S0	3RA29 21-1AA00	3RA29 21-2AA00
	S00	S0		--
3RT2 contactors with DC coil	S0	S0	3RA29 21-1BA00	3RA29 21-2AA00
	S00	S0		--
3RW30 soft starters	S00	S00	3RA29 21-1BA00	3RA29 11-2GA00
	S0	S00		--
3RW30/3RW40 soft starters	S0	S0	3RA29 21-1BA00	3RA29 21-2GA00
	S00	S0		--
3RF34 solid-state contactors	S00/S0	S00	3RA29 21-1BA00	--
Hybrid link modules for connecting contactors with spring-type terminals to 3RV2 motor starter protectors with screw connection[1)]				
3RT2 contactors with AC or DC coil	S00	S00	3RA29 11-2FA00	--
3RT2 contactors with AC or DC coil	S0	S0	3RA29 21-2FA00	--

Note:
Link modules and hybrid link modules can be used up to max. 32 A.

1) Link modules and hybrid link modules cannot be used for 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

Selection and ordering data

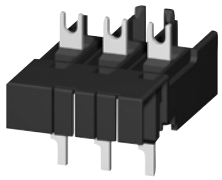
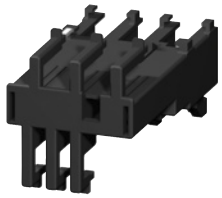
Accessories

	Version	For motor starter protector Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Covers									
 3RV29 08-0P	**Scale covers** Sealable, for covering the set current scale	3RV20, 3RV21, 3RV24: S00, S0	A	**3RV29 08-0P**		100	10 units	101	0.100
	Covers for devices with ring terminal lug connection (ensure finger-safety)			**Ring terminal lug connection**					
 3RV29 28-4AA00	• Main current level	3RV20: S00, S0	C	**3RV29 28-4AA00**		1	1 unit	101	0.010
 3RV29 08-4AA10	• For transverse auxiliary switches		C	**3RV29 08-4AA10**		1	1 unit	101	0.010

* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Version	For motor starter protector Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Fixing material									
 3RV29 28-0B	**Push-in lugs** For screwing the motor starter protector onto mounting plates. For each motor starter protector, 2 units are required.	S00, S0	A	**3RV29 28-0B**		100	10 units	101	0.100
Tools for opening spring-type terminals by hand									
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals			**Spring-type terminals**					
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	S00, S0	A	**3RA29 08-1A**		1	1 unit	101	0.045
Terminal blocks and phase barriers for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508									
 3RV29 28-1H	*Note: UL 508 demands 1-inch clearance and 2-inch creepage distance at line side for "Combination Motor Controller Type E". The following terminal blocks or phase barriers must be used in 3RV20 motor starter protectors.* The terminal blocks or phase barriers cannot be used in combination with the 3RV19 .5 three-phase busbars. For construction with three-phase busbars, see "Busbar accessories".								
	Terminal blocks type E For extended clearance and creepage distances (1 and 2 inch)	S00, S0	A	**3RV29 28-1H**		1	1 unit	101	0.065
 3RV29 28-1K	**Phase barriers** For extended clearance and creepage distances (1 and 2 inch)	S00, S0	A	**3RV29 28-1K**		1	1 unit	101	0.010

Link modules

	Actuating voltage of contactor	Size: 3RT2 contactors	Size: 3RV2 motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Link modules for motor starter protector to contactor[1)]										
 3RA29 21-1AA00	For mechanical and electrical connection between motor starter protector and contactor with screw terminals				**Screw terminals**					
	Single-unit packaging									
	AC/DC	S00	S00/S0	▶	**3RA19 21-1DA00**		1	1 unit	101	0.028
	AC	S0	S00/S0	A	**3RA29 21-1AA00**		1	1 unit	101	0.001
	DC	S0	S00/S0	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
	Multi-unit packaging									
	AC/DC	S00	S00/S0	▶	**3RA19 21-1D**		1	10 units	101	0.021
	AC	S0	S00/S0	A	**3RA29 21-1A**		1	10 units	101	0.001
	DC	S0	S00/S0	A	**3RA29 21-1B**		1	10 units	101	0.001
 3RA29 11-2AA00	For mechanical and electrical connection between motor starter protector and contactor with spring-type terminals				**Spring-type terminals**					
	Single-unit packaging									
	AC/DC	S00	S00	A	**3RA29 11-2AA00**		1	1 unit	101	0.040
	AC[2)]	S0	S0	A	**3RA29 21-2AA00**		1	1 unit	101	0.077
	DC	S0	S0	A	**3RA29 21-2AA00**		1	1 unit	101	0.077
	Multi-unit packaging									
	AC/DC	S00	S00	A	**3RA29 11-2A**		1	10 units	101	0.400
	AC[2)]	S0	S0	A	**3RA29 21-2A**		1	10 units	101	0.770
	DC	S0	S0	A	**3RA29 21-2A**		1	10 units	101	0.770
	Spacers[2)] for compensating the height on AC contactors									
	Single-unit packaging	S0	S0	A	**3RA29 11-1CA00**		1	1 unit	101	0.001
	Multi-unit packaging	S0	S0	A	**3RA29 11-1C**		1	5 units	101	0.001

1) The link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

2) A spacer for height compensation on AC contactors size S0 is optionally available.

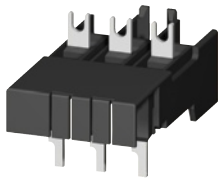
Note:
Link modules can be used up to max. 32 A.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

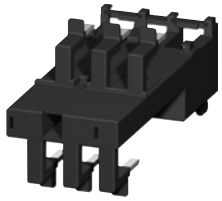
Accessories

Mounting accessories

Link modules for motor starter protector to soft starter[1] and motor starter protector to solid-state contactor



3RA29 21-1BA00



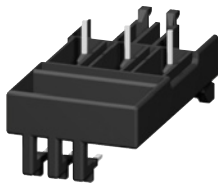
3RA29 21-2GA00

Size: 3RW30, 3RW40 soft starters; 3RF34 solid-state contactors	Size: 3RV2 motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Connection between motor starter protector and soft starter / solid-state contactor with screw terminals			**Screw terminals**					
Single-unit packaging								
S00	S00/S0	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
S0	S00/S0	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
Multi-unit packaging								
S00	S00/S0	A	**3RA29 21-1B**		1	10 units	101	0.001
S0	S00/S0	A	**3RA29 21-1B**		1	10 units	101	0.001
Connection between motor starter protector and soft starter with spring-type terminals			**Spring-type terminals**					
Single-unit packaging								
S00	S00	A	**3RA29 11-2GA00**		1	1 unit	101	0.038
S0	S0	A	**3RA29 21-2GA00**		1	1 unit	101	0.072
Multi-unit packaging								
S00	S00	A	**3RA29 11-2G**		1	10 units	101	0.380
S0	S0	A	**3RA29 21-2G**		1	10 units	101	0.720

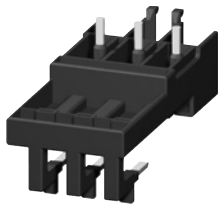
1) The link modules for motor starter protector to soft starter and for motor starter protector to solid-state contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

Note:
Link modules can be used up to max. 32 A.

Hybrid link modules for motor starter protector to contactor[1]



3RA29 11-2FA00



3RA29 21-2FA00

Actuating voltage of contactor	Size: 3RT2 contactors	Size: 3RV2 motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals									
Single-unit packaging									
AC/DC	S00	S00	A	**3RA29 11-2FA00**		1	1 unit	101	0.029
AC[2]/DC	S0	S0	A	**3RA29 21-2FA00**		1	1 unit	101	0.056
Multi-unit packaging									
AC/DC	S00	S00	A	**3RA29 11-2F**		1	10 units	101	0.290
AC[2]/DC	S0	S0	A	**3RA29 21-2F**		1	10 units	101	0.560
Spacers[2] for compensating the height on AC contactors									
Single-unit packaging	S0	S0	A	**3RA29 11-1CA00**		1	1 unit	101	0.001
Multi-unit packaging	S0	S0	A	**3RA29 11-1C**		1	5 units	101	0.001

1) The hybrid link modules for motor starter protector to contactor cannot be used for the 3RV2. 21-4PA1., 3RV2. 21-4FA1., 3RV27 and 3RV28 motor starter protectors.

2) A spacer for height compensation on AC contactors size S0 is optionally available.

Note:
Hybrid link modules can be used up to max. 32 A.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

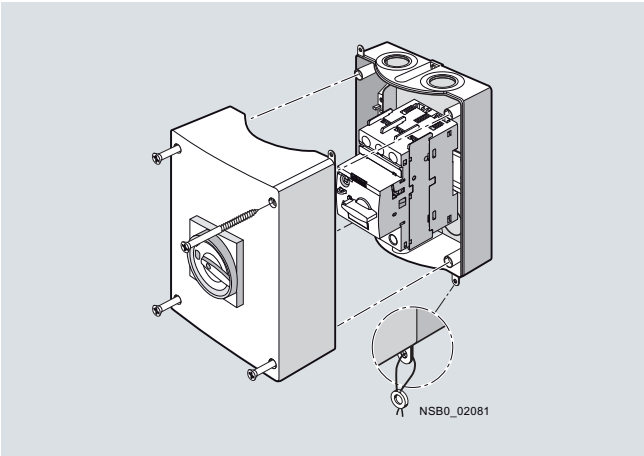
Overview

Enclosures

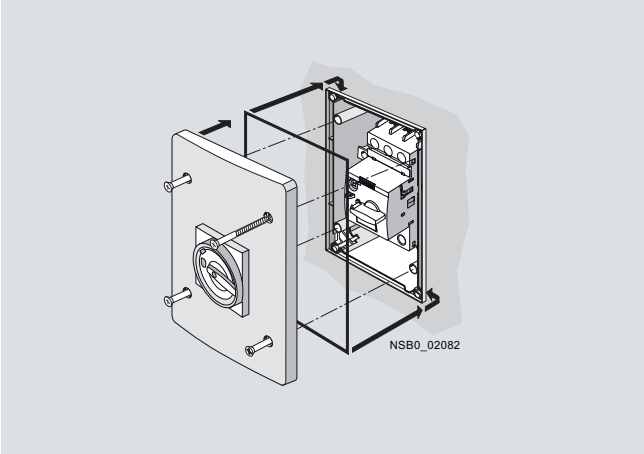
For stand-alone installation of 3RV20 to 3RV24 motor starter protectors size S00 ($I_{n\ max}$ = 16 A) and S0 ($I_{n\ max}$ = 32 A), cast aluminum enclosures for surface mounting and molded-plastic enclosures for flush mounting are available in various dimensions.

When installed in a molded-plastic enclosure the motor starter protectors have a rated operational voltage U_e of 500 V.

The enclosures for surface mounting have the degree of protection IP55; the enclosures for flush mounting also comply with the degree of protection IP55 at the front (the flush-mounted section complies with IP20).



Enclosures for surface mounting



Enclosures for flush mounting

All enclosures are equipped with N and PE terminals. There are two knock-out cable entries for cable glands at the top and two at the bottom; also on the rear corresponding cable entries are scored. There is a knockout on the top of the enclosure for indicator lights that are available as accessories.

The narrow enclosure can accommodate a motor starter protector without accessories, with transverse auxiliary switch and with lateral auxiliary switch. There is no provision for installing a motor starter protector with a signaling switch.

With the motor starter protectors size S00 and S0, the molded-plastic enclosures are equipped with a rotary operating mechanism.

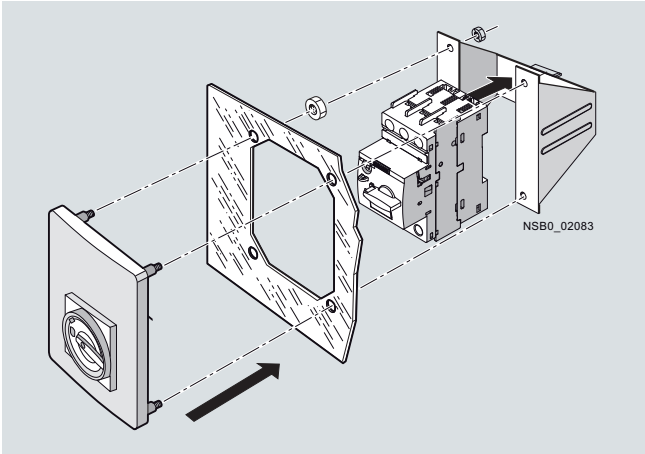
The enclosures can be supplied with either a black rotary operating mechanism or with an EMERGENCY-STOP rotary operating mechanism with a red/yellow handle.

All rotary operating mechanisms can be locked in the Open position with up to 3 padlocks.

Front plates

Motor starter protectors are frequently required to be actuated in any enclosure. Front plates equipped with a rotary operating mechanism for 3RV20 to 3RV24 motor starter protectors size S00 and S0 are available for this purpose.

A holder for the motor starter protectors size S00 and S0, into which the motor starter protectors can be snapped, is available for the front plates.



Front plate (including holder) for sizes S00 and S0

Enclosures and front plates

Selection and ordering data

	Version	Degree of protection	Integrated terminals	Width	For 3RV20 to 3RV24 motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
				mm	Size							kg
Molded-plastic enclosures for surface mounting												
	With rotary operating mechanism, lockable in 0 position	IP55	N and PE	54 (for switch + lateral auxiliary switch)	S00, S0	▶	**3RV19 23-1CA00**		1	1 unit	101	0.332
				72 (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	▶	**3RV19 23-1DA00**		1	1 unit	101	0.381
 3RV19 23-1FA00	**With EMERGENCY-STOP rotary operating mechanism,** lockable in 0 position	IP55	N and PE	54 (for switch + lateral auxiliary switch)	S00, S0	▶	**3RV19 23-1FA00**		1	1 unit	101	0.329
				72 (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	▶	**3RV19 23-1GA00**		1	1 unit	101	0.372
Cast aluminum enclosures for surface mounting												
 3RV19 23-1DA01	**With rotary operating mechanism,** lockable in 0 position	IP65	PE[1)]	72 (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	▶	**3RV19 23-1DA01**		1	1 unit	101	1.015
	With EMERGENCY-STOP rotary operating mechanism, lockable in 0 position	IP65	PE[1)]	72 (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	A	**3RV19 23-1GA01**		1	1 unit	101	1.008
Molded-plastic enclosure for flush mounting												
 3RV19 23-2DA00	**With rotary operating mechanism,** lockable in 0 position	IP55 (front side)	N and PE	72 (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	A	**3RV19 23-2DA00**		1	1 unit	101	0.426
	With EMERGENCY-STOP rotary operating mechanism, lockable in 0 position	IP55 (front side)	N and PE	72 (for switch + lateral auxiliary switch + auxiliary release)	S00, S0	A	**3RV19 23-2GA00**		1	1 unit	101	0.417

[1)] If required, an additional N terminal can be mounted (e.g. 8WA1 011-1BG11).

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Front plates

3RV19 23-4B + 3RV19 23-4G

Version	Degree of protection	For 3RV20 to 3RV24 motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		Size							kg
Molded-plastic front plates with rotary operating mechanism, lockable in 0 position For actuation of 3RV2 motor starter protectors in any enclosure.	IP55 (front side)	S00, S0	▶	**3RV19 23-4B**		1	1 unit	101	0.124
Molded-plastic front plates with EMERGENCY-STOP rotary operating mechanism, red/yellow, lockable in 0 position EMERGENCY-STOP actuation of 3RV2 motor starter protectors in any enclosure.	IP55 (front side)	S00, S0	A	**3RV19 23-4E**		1	1 unit	101	0.124
Holders for front plates Holder is mounted on front plate, motor starter protector with and without accessories is snapped in.	--	S00, S0	▶	**3RV19 23-4G**		1	1 unit	101	0.188

Indicator lights

3RV19 03-5B

Version	Rated control supply voltage U_s	For 3RV20 to 3RV24 motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	V	Size							kg
Indicator lights for all enclosures and front plates With glow lamp and colored lenses red, green, yellow, orange and clear	110 ... 120	S00, S0	C	**3RV19 03-5B**		1	1 unit	101	0.027
	220 ... 240		C	**3RV19 03-5C**		1	1 unit	101	0.026
	380 ... 415		C	**3RV19 03-5E**		1	1 unit	101	0.026
	480 ... 500		C	**3RV19 03-5G**		1	1 unit	101	0.027

* You can order this quantity or a multiple thereof.
Illustrations are approximate

General data

Overview

Features	3RU21	3RB30/3RB31	Benefits
			
General data			
Sizes	S00, S0	S00, S0	• Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, soft starters, ...) • Permit the mounting of slim and compact load feeders in widths of 45 mm (S00 and S0) • Simplify configuration
Seamless current range	0.11 ... 40 A	0.1 ... 40 A	• Allows easy and consistent configuration with one series of overload relays (for small to large loads)
Protection functions			
Tripping in the event of overload	✓	✓	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload
Tripping in the event of phase unbalance	✓	✓	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to phase unbalance
Tripping in the event of phase failure	✓	✓	• Minimizes heating of induction motors during phase failure
Protection of single-phase loads	✓	--	• Enables the protection of single-phase loads
Tripping in the event of a ground fault by **internal ground-fault detection (activatable)**	--	✓ (only 3RB31)	• Provides optimum protection of loads against high-resistance short-circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. • Eliminates the need for additional special equipment. • Saves space in the control cabinet • Reduces wiring outlay and costs
Features			
RESET function	✓	✓	• Allows manual or automatic resetting of the relay
Remote RESET function	✓ (by means of separate module)	✓ (only 3RB31 with 24 V DC)	• Allows the remote resetting of the relay
TEST function for auxiliary contacts	✓	✓	• Allows easy checking of the function and wiring
TEST function for electronics	--	✓	• Allows checking of the electronics
Status display	✓	✓	• Displays the current operating state
Integrated auxiliary contacts (1 NO + 1 NC)	✓	✓	• Allows the load to be switched off if necessary • Can be used to output signals

✓ Available
-- Not available

Features	3RU21	3RB30/3RB31	Benefits
Design of load feeders			
Short-circuit strength up to 100 kA at 690 V (in conjunction with the corresponding fuses or the corresponding motor starter protector)	✓	✓	• Provides optimum protection of the loads and operating personnel in the event of short-circuits due to insulation faults or faulty switching operations
Electrical and mechanical matching to 3RT2 contactors	✓	✓	• Simplifies configuration • Reduces wiring outlay and costs • Enables stand-alone installation as well as space-saving direct mounting
Spring-type terminal connection system for main circuit	✓	✓	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Spring-type terminal connection system for auxiliary circuits	✓	✓	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
Other features			
Temperature compensation	✓	✓	• Allows the use of the relays at high temperatures without derating • Prevents premature tripping • Allows compact installation of the control cabinet without distance between the devices/load feeders • Simplifies configuration • Enables space to be saved in the control cabinet
High long-term stability	✓	✓	• Provides safe protection for the loads even after years of use in severe operating conditions
Wide setting ranges	--	✓ (1:4)	• Reduce the number of variants • Minimize the configuration outlay and costs • Minimize storage overhead, storage costs, tied-up capital
Trip class CLASS 5	--	✓ (only 3RB31)	• Enables solutions for very fast starting motors requiring special protection
Trip classes > CLASS 10	--	✓	• Enable heavy starting solutions
Low power loss	--	✓	• Reduces power consumption and energy costs (up 98 % less power is used than for thermal overload relays) • Minimizes temperature rises of the contactor and control cabinet – in some cases this may eliminate the need for controlgear cabinet cooling • Direct mounting to contactor saves space, even for high motor currents (i.e. no heat decoupling is required)
Internal power supply	--[1]	✓	• Eliminates the need for configuration and connecting an additional control circuit
Variable adjustment of the trip classes (The required trip class can be adjusted by means of a rotary switch depending on the current start-up condition.)	--	✓ (only 3RB31)	• Reduces the number of variants • Minimizes the configuring outlay and costs • Minimizes storage overhead, storage costs, and tied-up capital

✓ Available

-- Not available

[1] The SIRIUS 3RU21 thermal overload relays use a bimetal contactor and therefore do not require a control supply voltage.

General data

	Overload relays	Current measurement	Current range	**Contactors** (type, size, rating in kW)	
				3RT20 1	**3RT20 2**
				S00	S0
	Type	Type	A	3/4/5.5/7.5	5.5/7.5/11/15/18.5
3RU21 thermal overload relays[1)]					
	3RU21 1	Integrated	0.11 … 16	✓	--
	3RU21 2	Integrated	1.8 … 40	--	✓
3RB30[1)] solid-state overload relays					
	3RB30 1	Integrated	0.1 … 16	✓	--
	3RB30 2	Integrated	0.1 … 40	--	✓
3RB21[1)] solid-state overload relays					
	3RB31 1	Integrated	0.1 … 16	✓	--
	3RB31 2	Integrated	0.1 … 40	--	✓

✓ Available
-- Not available

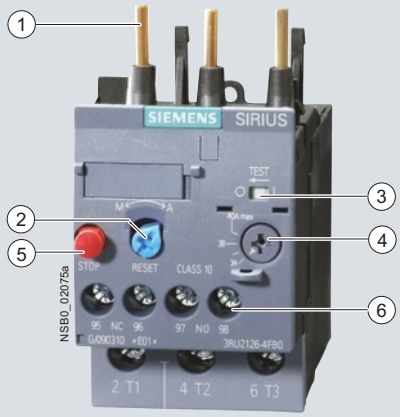
[1)] "Technical Specifications" for use of the overload relays with trip class ≥ CLASS 20 can be found under "Short-circuit protection with fuses for motor feeders", see the note on Technical Information on page 5/1; and in the project planning aid "Configuring SIRIUS Fuseless Load Feeders".

Connection methods

Depending on the device version of the 3RU2 and 3RB3 overload relays, the terminals for screw, spring-type or ring terminal lug connection are configured for both the main and auxiliary circuit.

⊕	Screw terminals
⊡	Spring-type terminals
⊕	Ring terminal lug connection
	These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Overview



(1) Connection for mounting onto contactors:
Optimally adapted in electrical, mechanical and design terms to the contactors. The overload relay can be connected directly to these contactor using these pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).

(2) Selector switch for manual/automatic RESET and RESET button:
With this switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. A remote RESET is possible using the RESET modules (accessories), which are independent of size.

(3) Switch position indicator and TEST function of the wiring:
Indicates a trip and enables the wiring test.

(4) Motor current setting:
Setting the device to the rated motor current is easy with the large rotary knob.

(5) STOP button:
If the STOP button is pressed, the NC contact is opened. This switches off the contactor downstream. The NC contact is closed again when the button is released.

(6) Supply terminals:
Depending on the device version, the terminals for screw, spring-type or ring terminal lug connection are configured for the main and auxiliary circuit.

A sealable transparent cover can be optionally mounted (accessory). It secures the motor current setting against adjustment.

3RU21 26-4FB00 thermal overload relays

The 3RU21 thermal overload relays up to 40 A have been designed for inverse-time delayed protection of loads with normal starting (for "Function" see note on Technical Information on page 5/1) against excessive temperature rises due to overload or phase failure.

An overload or phase failure results in an increase of the motor current beyond the set rated motor current. Via heating elements, this current rise heats up the bimetal strips inside the device which then bend and as a result trigger the auxiliary contacts by means of a tripping mechanism. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and set current I_e and is stored in the form of a long-term stable tripping characteristic (for "Characteristic Curves" see the note on Technical Information on page 5/1).

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after a recovery time has elapsed (for "Function" see note on Technical Information on page 5/1).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials.

They comply with all important worldwide standards and approvals.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RU21 thermal overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e. The relays meet the requirements of EN 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e"); see Chapter 20 "Appendix" --> "Standards and approvals" --> "Type overview of approved devices for explosion-protected areas (ATEX Explosion Protection)".

EC type test certificate for Category (2) G/D has been submitted. More details on request.

Benefits

The most important features and benefits of the 3RU21 thermal overload relays are listed in the overview table (see "General data" on page 5/34).

General data

Application

Industries

The 3RU21 thermal overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed protection of their electrical loads (e. g. motors) under normal starting conditions (CLASS 10).

Application

The 3RU21 thermal overload relays have been designed for the protection of three-phase and single-phase AC and DC motors.

If single-phase AC or DC loads are to be protected by the 3RU21 thermal overload relays, all three bimetal strips must be heated. For this purpose, all main current paths of the relay must be connected in series.

Ambient conditions

The 3RU21 thermal overload relays have temperature compensation in accordance with IEC 60947-4-1 for the temperature range of -40 to +60 °C. For temperatures from +60 to +80 °C the upper set value of the setting range must be reduced by the factor listed in the table below.

Ambient temperature	Derating factor for the upper set value	
	Current ranges	
°C	0.11 ... 20 A	17 ... 40 A
+60	1.0	1.0
+65	0.94	0.97
+70	0.87	0.94
+75	0.81	0.90
+80	0.73	0.86

Accessories

The following optional accessories are available for the 3RU21 thermal overload relays:

- Terminal bracket for stand-alone installation with screw or spring-type terminals for each size
- Mechanical RESET for all sizes
- Cable release for resetting devices which are difficult to access for all sizes
- Electrical remote RESET module in three voltage variants for all sizes
- Sealable cover for all sizes
- Terminal covers for devices with ring terminal lug connection

More information

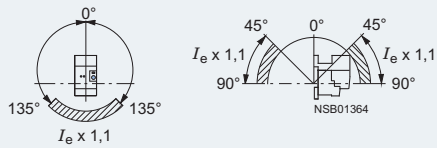
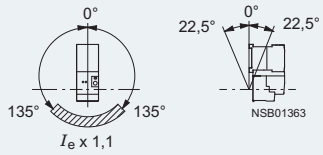
Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th
	□□□	□	□	□	□	–	□	□	□	□
Thermal overload relays	**3 R U**									
SIRIUS 2nd generation		**2**								
Device series			□							
Size, rated operational current and power				□	□					
Setting range of the overload release							□	□		
Connection method									□	
Installation type										□
Example	**3 R U**	**2**	**1**	**1**	**6**	**–**	**0**	**A**	**B**	**0**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Type		3RU21 16	3RU21 26
Size		S00	S0
Width		45 mm	45 mm
General technical specifications			
Trips in the event of		Overload and phase failure	
Trip class acc. to IEC 60947-4-1	CLASS	10	
Phase failure sensitivity		Yes	
Overload warning		No	
Reset and recovery			
• Reset options after tripping		Manual, automatic and remote RESET[1]	
• Recovery time			
- For automatic RESET	min	Depends on the strength of the tripping current and characteristic	
- For manual RESET	min	Depends on the strength of the tripping current and characteristic	
- For remote RESET	min	Depends on the strength of the tripping current and characteristic	
Features			
• Display of operating state on device		Yes, by means of TEST function/switch position indicator slide	
• TEST function		Yes	
• RESET button		Yes	
• STOP button		Yes	
Safe operation of motors with "increased safety" type of protection EC type test certificate number acc. to directive 94/9/EC (ATEX)		On request	
Ambient temperature			
• Storage/transport	°C	-55 ... +80	
• Operation	°C	-40 ... +70	
• Temperature compensation	°C	Up to 60	
• Permissible rated current at			
- Temperature inside control cabinet 60 °C	%	100 (over +60 °C current reduction is not required)	
- Temperature inside control cabinet 70 °C	%	87	
Repeat terminals			
• Coil repeat terminals		Yes	Not required
• Auxiliary contact repeat terminal		Yes	Not required
Degree of protection acc. to IEC 60529		IP20	
Touch protection acc. to IEC 61140		Screw and spring-type terminals: Finger-safe Ring terminal lug connection: Finger-safe only with optional terminal covers	
Shock resistance with sine acc. to IEC 60068-2-27	*g*/ms	15/11[2]	
Electromagnetic compatibility (EMC) – Interference immunity			
• Conductor-related interference			
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	EMC interference immunity is not relevant for thermal overload relays	
- Surge acc.to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	EMC interference immunity is not relevant for thermal overload relays	
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	EMC interference immunity is not relevant for thermal overload relays	
• Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	EMC interference immunity is not relevant for thermal overload relays	
Electromagnetic compatibility (EMC) – Emitted interference		EMC interference immunity is not relevant for thermal overload relays	
Resistance to extreme climates – Air humidity	%	90	
Dimensions		For "Dimensional drawings" see the note on Technical Information on page 5/1.	
Installation altitude above sea level	m	Up to 2000; above this, please enquire	
Mounting position		The diagrams show the permissible mounting positions for mounting onto contactors and stand-alone installation. For installation in the hatched area, a setting correction of 10 % must be implemented. Stand-alone installation:  Contactor + overload relay: 	
Type of mounting		Mounting onto contactor/stand-alone installation with terminal bracket[3]	

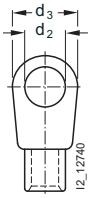
[1] Remote RESET in combination with the corresponding accessories.

[2] Auxiliary contacts 95/96 and 97/98: 8 *g*/11 ms.

[3] For screw and snap-on mounting on TH 35 standard mounting rail. For the technical specifications of the terminal brackets see the note on Technical Information on page 5/1.

General data

Type		3RU21 16	3RU21 26
Size		S00	S0
Width		45 mm	45 mm
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	690	
Type of current			
• Direct current		Yes	
• Alternating current		Yes, frequency range up to 400 Hz	
Current setting	A A	0.11 ... 0.16 to 11 ... 16	1.8 ... 2.5 to 34 ... 40
Power loss per unit (max.)	W	3.9 ... 6.6	3.9 ... 6
Short-circuit protection			
• With fuse without contactor		See "Selection and ordering data"	
• With fuse and contactor		See "Technical specifications" --> "Short-circuit protection with fuses/motor starter protectors for motor feeders", see note on Technical Information on page 5/1.	
Protective separation between main and auxiliary conducting path acc. to IEC 60947-1	V	≥ 440	
Conductor cross-sections of main circuit			
Connection type screw terminals		**Screw terminals**	
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1], 2 x (0.5 ... 4)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 10)[1]
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (1 ... 2.5)[1], 2 x (2.5 ... 6)[1]; max. 1 x 10
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1], 2 x 12	2 x (16 ... 12)[1], 2 x (14 ... 8)[1]
Connection type spring-type terminals		**Spring-type terminals**	
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm^2	1 x (0.5 ... 4)	1 x (1 ... 10)
• Finely stranded without end sleeve	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)
Connection type ring terminal lugs		**Ring terminal lug connection**	
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5	d_2 = min. 4.3, d_3 = max. 12.2
• DIN 46234 without insulation sleeve			
• DIN 46225 without insulation sleeve			
• DIN 46237 with insulation sleeve			
• JIS C2805 Type R without insulation sleeve			
• JIS C2805 Type RAV with insulation sleeve			
• JIS C2805 Type RAP with insulation sleeve			



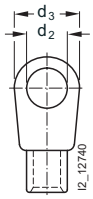
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

Type		3RU21 16	3RU21 26
Size		S00	S0
Width		45 mm	45 mm
Auxiliary circuit			
Number of NO contacts		1	
Number of NC contacts		1	
Auxiliary contacts – Assignment		1 NO for the signal "tripped", 1 NC for disconnecting the contactor	
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Contact rating of the auxiliary contacts			
• NC contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:			
- 24 V	A	4	
- 120 V	A	4	
- 125 V	A	4	
- 230 V	A	3	
- 400 V	A	2	
- 600 V	A	0.75	
- 690 V	A	0.75	
• NO contact with alternating current AC-14/AC-15, rated operational current I_e at U_e:			
- 24 V	A	3	
- 120 V	A	3	
- 125 V	A	3	
- 230 V	A	2	
- 400 V	A	1	
- 600 V	A	0.75	
- 690 V	A	0.75	
• NC contact, NO contact with direct current DC-13, rated operational current I_e at U_e:			
- 24 V	A	1	
- 60 V	A	On request	
- 110 V	A	0.22	
- 125 V	A	0.22	
- 220 V	A	0.11	
• Conventional thermal current I_{th}	A	6	
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
Short-circuit protection			
• With fuse			
- Operational class gG	A	6	
- Quick	A	10	
• With miniature circuit breaker (C characteristic)	A	6[1)]	
Protective separation between main and auxiliary conducting path acc. to IEC 60947-1	V	≥ 440	
CSA, UL, UR rated data			
Auxiliary circuit – Switching capacity		B600, R300	

1) Up to I_k ≤ 0.5 kA; ≤ 260 V.

General data

Type		3RU21 16	3RU21 26
Size		S00	S0
Width		45 mm	45 mm
Conductor cross-sections for auxiliary circuit			
Connection type screw terminals		**Screw terminals**	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	⌀ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1]	
Connection type spring-type terminals		**Spring-type terminals**	
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm^2	2 x (0.5 ... 2.5)	
• Finely stranded without end sleeve	mm^2	2 x (0.5 ... 1.5)	
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 x (20 ... 14)	
Connection type ring terminal end		**Ring terminal lug connection**	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	⌀ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Usable ring terminal lugs	mm	d_2 = min. 3.2, d_3 = max. 7.5	
• DIN 46234 without insulation sleeve			
• DIN 46225 without insulation sleeve			
• DIN 46237 with insulation sleeve			
• JIS C2805 Type R without insulation sleeve			
• JIS C2805 Type RAV with insulation sleeve			
• JIS C2805 Type RAP with insulation sleeve			



[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

Selection and ordering data

3RU21 thermal overload relays for mounting onto contactor[1], CLASS 10

Features and technical specifications:
- Screw, spring-type or ring terminal lug connection[2]
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicators
- TEST function
- STOP button
- Sealable covers (optional accessory)
- Terminal covers for devices with ring terminal lug connection (optional accessory)

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RU21 16-4AB0


3RU21 16-4AC0


3RU21 26-4FB0


3RU21 26-4AC0

Size contactor[3]	Rating for induction motor, rated value[4]	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", gG operational class[5]	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
	kW	A	A				kg				kg
Size S00											
S00	0.04	0.11 ... 0.16	0.5	A	**3RU21 16-0AB0**		0.130	B	**3RU21 16-0AC0**		0.150
	0.06	0.14 ... 0.2	1	A	**3RU21 16-0BB0**		0.130	B	**3RU21 16-0BC0**		0.150
	0.06	0.18 ... 0.25	1	A	**3RU21 16-0CB0**		0.130	B	**3RU21 16-0CC0**		0.150
	0.09	0.22 ... 0.32	1.6	A	**3RU21 16-0DB0**		0.130	B	**3RU21 16-0DC0**		0.150
	0.09	0.28 ... 0.4	2	A	**3RU21 16-0EB0**		0.130	B	**3RU21 16-0EC0**		0.150
	0.12	0.35 ... 0.5	2	A	**3RU21 16-0FB0**		0.130	B	**3RU21 16-0FC0**		0.150
	0.18	0.45 ... 0.63	2	A	**3RU21 16-0GB0**		0.130	B	**3RU21 16-0GC0**		0.150
	0.18	0.55 ... 0.8	4	A	**3RU21 16-0HB0**		0.130	B	**3RU21 16-0HC0**		0.150
	0.25	0.7 ... 1	4	A	**3RU21 16-0JB0**		0.130	B	**3RU21 16-0JC0**		0.150
	0.37	0.9 ... 1.25	4	A	**3RU21 16-0KB0**		0.130	B	**3RU21 16-0KC0**		0.150
	0.55	1.1 ... 1.6	6	A	**3RU21 16-1AB0**		0.130	B	**3RU21 16-1AC0**		0.150
	0.75	1.4 ... 2	6	A	**3RU21 16-1BB0**		0.130	B	**3RU21 16-1BC0**		0.150
	0.75	1.8 ... 2.5	10	A	**3RU21 16-1CB0**		0.130	B	**3RU21 16-1CC0**		0.150
	1.1	2.2 ... 3.2	10	A	**3RU21 16-1DB0**		0.130	B	**3RU21 16-1DC0**		0.150
	1.5	2.8 ... 4	16	A	**3RU21 16-1EB0**		0.130	B	**3RU21 16-1EC0**		0.150
	1.5	3.5 ... 5	20	A	**3RU21 16-1FB0**		0.130	B	**3RU21 16-1FC0**		0.150
	2.2	4.5 ... 6.3	20	A	**3RU21 16-1GB0**		0.130	B	**3RU21 16-1GC0**		0.150
	3	5.5 ... 8	25	A	**3RU21 16-1HB0**		0.130	B	**3RU21 16-1HC0**		0.150
	4	7 ... 10	35	A	**3RU21 16-1JB0**		0.130	B	**3RU21 16-1JC0**		0.150
	5.5	9 ... 12.5	35	A	**3RU21 16-1KB0**		0.130	B	**3RU21 16-1KC0**		0.150
	7.5	11 ... 16	40	A	**3RU21 16-4AB0**		0.130	B	**3RU21 16-4AC0**		0.150
Size S0											
S0	0.75	1.8 ... 2.5	10	A	**3RU21 26-1CB0**		0.160	B	**3RU21 26-1CC0**		0.220
	1.1	2.2 ... 3.2	10	A	**3RU21 26-1DB0**		0.160	B	**3RU21 26-1DC0**		0.220
	1.5	2.8 ... 4	16	A	**3RU21 26-1EB0**		0.160	B	**3RU21 26-1EC0**		0.220
	1.5	3.5 ... 5	20	A	**3RU21 26-1FB0**		0.160	B	**3RU21 26-1FC0**		0.220
	2.2	4.5 ... 6.3	20	A	**3RU21 26-1GB0**		0.160	B	**3RU21 26-1GC0**		0.220
	3	5.5 ... 8	25	A	**3RU21 26-1HB0**		0.160	B	**3RU21 26-1HC0**		0.220
	4	7 ... 10	35	A	**3RU21 26-1JB0**		0.160	B	**3RU21 26-1JC0**		0.220
	5.5	9 ... 12.5	35	A	**3RU21 26-1KB0**		0.160	B	**3RU21 26-1KC0**		0.220
	7.5	11 ... 16	40	A	**3RU21 26-4AB0**		0.160	A	**3RU21 26-4AC0**		0.220
	7.5	14 ... 20	50	A	**3RU21 26-4BB0**		0.160	A	**3RU21 26-4BC0**		0.220
	11	17 ... 22	63	A	**3RU21 26-4CB0**		0.160	A	**3RU21 26-4CC0**		0.220
	11	20 ... 25	63	A	**3RU21 26-4DB0**		0.160	A	**3RU21 26-4DC0**		0.220
	15	23 ... 28	63	A	**3RU21 26-4NB0**		0.160	A	**3RU21 26-4NC0**		0.220
	15	27 ... 32	80	A	**3RU21 26-4EB0**		0.160	A	**3RU21 26-4EC0**		0.220
	18.5	30 ... 36	80	A	**3RU21 26-4PB0**		0.160	A	**3RU21 26-4PC0**		0.220
	18.5	34 ... 40	80	A	**3RU21 26-4FB0**		0.160	A	**3RU21 26-4FC0**		0.220

1) For matching terminal brackets see "Accessories" on page 5/45.

2) The 3RU21 overload relays are also available with ring terminal lug connection. The Order No. must be changed in the 10th position to **"J"**: e. g. 3RU21 16-0A**J**0.

3) Observe maximum rated operational current of the devices.

4) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

5) Maximum protection by fuse for overload relay, type of coordination "2". For fuse values in connection with contactors see "Technical specifications" --> "Short-circuit protection with fuses/motor starter protectors for motor feeders", see note on Technical Information on page 5/1.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS 3RU2 Thermal Overload Relays

3RU2 up to 40 A for standard applications

3RU21 thermal overload relays for stand-alone installation[1], CLASS 10

Features and technical specifications:
- Screw or spring-type terminals
- Overload and phase failure protection
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicators
- TEST function
- STOP button
- Sealable covers (optional accessory)

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RU21 16-4AB1


3RU21 16-4AC1


3RU21 26-4FB1


3RU21 26-4FC1

Size contactor[2]	Rating for induction motor, rated value[3]	Current setting value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", gG operational class[4]	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
	kW	A	A				kg				kg
Size S00											
S00	0.04	0.11 ... 0.16	0.5	B	**3RU21 16-0AB1**		0.170	B	**3RU21 16-0AC1**		0.190
	0.06	0.14 ... 0.2	1	B	**3RU21 16-0BB1**		0.170	B	**3RU21 16-0BC1**		0.190
	0.06	0.18 ... 0.25	1	B	**3RU21 16-0CB1**		0.170	B	**3RU21 16-0CC1**		0.190
	0.09	0.22 ... 0.32	1.6	B	**3RU21 16-0DB1**		0.170	B	**3RU21 16-0DC1**		0.190
	0.09	0.28 ... 0.4	2	B	**3RU21 16-0EB1**		0.170	B	**3RU21 16-0EC1**		0.190
	0.12	0.35 ... 0.5	2	B	**3RU21 16-0FB1**		0.170	B	**3RU21 16-0FC1**		0.190
	0.18	0.45 ... 0.63	2	B	**3RU21 16-0GB1**		0.170	B	**3RU21 16-0GC1**		0.190
	0.18	0.55 ... 0.8	4	B	**3RU21 16-0HB1**		0.170	B	**3RU21 16-0HC1**		0.190
	0.25	0.7 ... 1	4	B	**3RU21 16-0JB1**		0.170	B	**3RU21 16-0JC1**		0.190
	0.37	0.9 ... 1.25	4	B	**3RU21 16-0KB1**		0.170	B	**3RU21 16-0KC1**		0.190
	0.55	1.1 ... 1.6	6	B	**3RU21 16-1AB1**		0.170	B	**3RU21 16-1AC1**		0.190
	0.75	1.4 ... 2	6	B	**3RU21 16-1BB1**		0.170	B	**3RU21 16-1BC1**		0.190
	0.75	1.8 ... 2.5	10	B	**3RU21 16-1CB1**		0.170	B	**3RU21 16-1CC1**		0.190
	1.1	2.2 ... 3.2	10	B	**3RU21 16-1DB1**		0.170	B	**3RU21 16-1DC1**		0.190
	1.5	2.8 ... 4	16	B	**3RU21 16-1EB1**		0.170	B	**3RU21 16-1EC1**		0.190
	1.5	3.5 ... 5	20	B	**3RU21 16-1FB1**		0.170	B	**3RU21 16-1FC1**		0.190
	2.2	4.5 ... 6.3	20	B	**3RU21 16-1GB1**		0.170	B	**3RU21 16-1GC1**		0.190
	3	5.5 ... 8	25	B	**3RU21 16-1HB1**		0.170	B	**3RU21 16-1HC1**		0.190
	4	7 ... 10	35	B	**3RU21 16-1JB1**		0.170	B	**3RU21 16-1JC1**		0.190
	5.5	9 ... 12.5	35	B	**3RU21 16-1KB1**		0.170	B	**3RU21 16-1KC1**		0.190
	7.5	11 ... 16	40	B	**3RU21 16-4AB1**		0.170	B	**3RU21 16-4AC1**		0.280
Size S0											
S0	7.5	14 ... 20	50	B	**3RU21 26-4BB1**		0.200	B	**3RU21 26-4BC1**		0.280
	11	17 ... 22	63	B	**3RU21 26-4CB1**		0.200	B	**3RU21 26-4CC1**		0.280
	11	20 ... 25	63	B	**3RU21 26-4DB1**		0.200	B	**3RU21 26-4DC1**		0.280
	15	23 ... 28	63	B	**3RU21 26-4NB1**		0.200	B	**3RU21 26-4NC1**		0.280
	15	27 ... 32	80	B	**3RU21 26-4EB1**		0.200	B	**3RU21 26-4EC1**		0.280
	18.5	30 ... 36	80	B	**3RU21 26-4PB1**		0.200	B	**3RU21 26-4PC1**		0.280
	18.5	34 ... 40	80	B	**3RU21 26-4FB1**		0.200	B	**3RU21 26-4FC1**		0.280

1) Screw and snap-on mounting onto TH 35 standard mounting rail

2) Observe maximum rated operational current of the devices.

3) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

4) Maximum protection by fuse for overload relay, type of coordination "2". For fuse values in connection with contactors see "Technical specifications" --> "Short-circuit protection with fuses/motor starter protectors for motor feeders", see note on Technical Information on page 5/1.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Overload relays for standard applications

The following optional accessories are available for the 3RU21 thermal overload relays:

- Terminal bracket for stand-alone installation with screw or spring-type terminals for each size
- Mechanical RESET for all sizes
- Cable release for resetting devices which are difficult to access for all sizes
- Electrical remote RESET module in three voltage variants for all sizes
- Sealable cover for all sizes
- Terminal covers for devices with ring terminal lug connection

Selection and ordering data

	Version	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminal brackets for stand-alone installation[1)]									
 3RU29 16-3AA01  3RU29 26-3AA01	**Terminal brackets for overload relays with screw terminals**			**Screw terminals**					
	For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00	A	**3RU29 16-3AA01**		1	1 unit	101	0.040
		S0	A	**3RU29 26-3AA01**		1	1 unit	101	0.050
 3RU29 16-3AC01  3RU29 26-3AC01	**Terminal brackets for overload relays with spring-type terminals**			**Spring-type terminals**					
	For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00	B	**3RU29 16-3AC01**		1	1 unit	101	0.040
		S0	B	**3RU29 26-3AC01**		1	1 unit	101	0.060
Mechanical RESET									
 3RU29 00-1A with pushbutton and extension plunger	**Resetting plungers, holders and formers**	S00, S0	▶	**3RU29 00-1A**		1	1 unit	101	0.038
	Pushbuttons with extended stroke (12 mm), IP65, ⌀ 22 mm	S00, S0	B	**3SB30 00-0EA11**		1	1 unit	102	0.020
	Extension plungers For compensation of the distance between the pushbutton and the unlatching button of the relay	S00, S0	A	**3SX1 335**		1	1 unit	102	0.004
Cable releases with holder for RESET									
 3RU29 00-1.	For ⌀ 6.5 mm hole in the control panel; max. control panel thickness 8 mm								
	• Length 400 mm	S00, S0	▶	**3RU29 00-1B**		1	1 unit	101	0.063
	• Length 600 mm	S00, S0	▶	**3RU29 00-1C**		1	1 unit	101	0.073

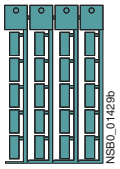
[1)] The accessories are identical to those of the 3RB30/3RB31 solid-state overload relays.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	Version	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Modules for remote RESET, electrical									
 3RU19 00-2A.71	Operating range 0.85 ... 1.1 x U_s, power consumption AC 80 VA, DC 70 W, ON period 0.2 ... 4 s, switching frequency 60/h								
	• 24 ... 30 V AC/DC	S00, S0	▶	**3RU19 00-2AB71**		1	1 unit	101	0.066
	• 110 ... 127 V AC/DC	S00, S0	▶	**3RU19 00-2AF71**		1	1 unit	101	0.067
	• 220 ... 250 V AC/DC	S00, S0	▶	**3RU19 00-2AM71**		1	1 unit	101	0.066
Sealable covers									
 3RV29 08-0P	For covering the setting knobs	S00, S0	A	**3RV29 08-0P**		100	10 units	101	0.100
Terminal covers									
 3RU29 16-3BJ21	**Covers for devices with ring terminal lug connection** (ensure finger-safety)			**Ring terminal lug connection**					
	• Main current level								
 3RU29 26-3BJ21	- Cover between contactor and overload relay for direct mounting of the overload relay	S00	C	**3RU29 16-3BJ21**		1	10 units	101	0.001
		S0	C	**3RU29 26-3BJ21**		1	10 units	101	0.001
 3RU29 16-3BJ20	- Cover for overload relay on load side	S00	C	**3RU29 16-3BJ20**		1	10 units	101	0.001
 3RV29 28-4AA00		S0	C	**3RV29 28-4AA00**		1	1 unit	101	0.010
	• Auxiliary current level	S00, S0	B	**3RT29 16-4EA13**		1	10 units	101	0.001
 3RT29 16-4EA13									

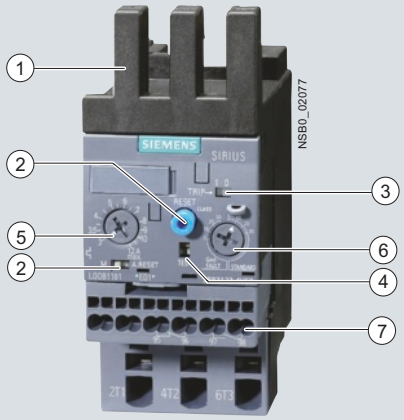
General accessories

	Version	Use	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for opening spring-type terminals									
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals			**Spring-type terminals**					
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RU2, 3RB3	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels									
 3RT19 00-1SB20	**Unit labeling plates**[1] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	3RU2, 3RB3	C	**3RT19 00-1SB20**		100	340 units	101	0.200

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview



1. Connection for mounting onto contactors:
   Optimally adapted in electrical, mechanical and design terms to the contactors and soft starters. The overload relay can be connected directly using these connection pins. Stand-alone installation is possible as an alternative (in conjunction with a terminal bracket for stand-alone installation).
2. Selector switch for manual/automatic RESET and RESET button:
   With the slide switch you can choose between manual and automatic RESET. A device set to manual RESET can be reset locally by pressing the RESET button. On the 3RB31 an electrical remote RESET is integrated.
3. Switch position indicator and TEST function of the wiring:
   Indicates a trip and enables the wiring test.
4. Solid-state test (device test):
   Enables a test of all important device components and functions.
5. Motor current setting:
   Setting the device to the rated motor current is easy with the large rotary knob.
6. Trip class setting/internal ground-fault detection (only 3RB31):
   Using the rotary switch you can set the required trip class and activate the internal ground-fault detection dependent on the start-up conditions.
7. Connecting terminals (removable joint block for auxiliary circuits):
   Depending on the device version, the terminals for screw and spring-type connection are configured for the main and auxiliary circuit.

A sealable transparent cover can be optionally mounted (accessory). It secures the motor current setting against adjustment.

3RB31 23-4VE00 solid-state overload relays

The 3RB30 and 3RB31 solid-state overload relays up to 40 A with internal power supply have been designed for inverse-time delayed protection of loads with normal and heavy starting (for "Function" see note on Technical Information on page 5/1) against excessive temperature rises due to overload, phase unbalance or phase failure. An overload, phase unbalance or phase failure result in an increase of the motor current beyond the set rated motor current. This current rise is detected by the current transformers integrated into the devices and evaluated by corresponding solid-state circuits which then output a pulse to the auxiliary contacts. The auxiliary contacts then switch off the load by means of a contactor. The break time depends on the ratio between the tripping current and set current I_e and is stored in the form of a long-term stable tripping characteristic (for "Characteristic Curves" see the note on Technical Information on page 5/1).

In addition to inverse-time delayed protection of loads against excessive temperature rises due to overload, phase unbalance and phase failure, the 3RB31 solid-state overload relays also allow internal ground-fault detection (not possible in conjunction with contactor assemblies for wye-delta starting). This provides protection of loads against high-resistance short-circuits due to damage to the insulation material, moisture, condensed water etc.

The "tripped" status is signaled by means of a switch position indicator. Resetting takes place either manually or automatically after a recovery time has elapsed (for "Function" see note on Technical Information on page 5/1).

The devices are manufactured in accordance with environmental guidelines and contain environmentally friendly and reusable materials. They comply with all important worldwide standards and approvals.

"Increased safety" type of protection EEx e according to ATEX directive 94/9/EC

The 3RB30/3RB31 solid-state overload relays are suitable for the overload protection of explosion-proof motors with "increased safety" type of protection EEx e. The relays meet the requirements of EN 60079-7 (Electrical apparatus for areas subject to explosion hazards – Increased safety "e"); see Chapter 20 "Appendix" --> "Standards and approvals" --> "Type overview of approved devices for explosion-protected areas (ATEX Explosion Protection)".

EC type test certificate for Group II, Category (2) G/D exists. It has the number PTB 09 ATEX 3001.

Benefits

The most important features and benefits of the 3RB30/3RB31 solid-state overload relays are listed in the overview table (see "General data" on page 5/34).

General data

Application

Industries

The 3RB30/3RB31 solid-state overload relays are suitable for customers from all industries who want to guarantee optimum inverse-time delayed protection of their electrical loads (e.g. motors) under normal and heavy starting conditions (CLASS 5 to CLASS 30), minimize project completion times, inventories and power consumption, and optimize plant availability and maintenance management.

Application

The 3RB30/3RB31 solid-state overload relays have been designed for the protection of induction motors in sinusoidal 50/60 Hz voltage networks. The relays are not suitable for the protection of single-phase AC or DC loads.

The 3RU21 thermal overload relay or the 3RB22/3RB23 solid-state overload relay can be used for single-phase AC loads. For DC loads we recommend the 3RU21 thermal overload relay.

Ambient conditions

The devices are insensitive to external influences such as shocks, corrosive environments, ageing and temperature fluctuation.

For the temperature range from –25 to +60 °C, the 3RB30/3RB31 solid-state overload relays compensate the temperature according to IEC 60947-4-1.

Accessories

The following optional accessories are available for the 3RB30/3RB31 solid-state overload relays:

- Terminal bracket for stand-alone installation with screw or spring-type terminals for all sizes
- Mechanical RESET for all sizes
- Cable release for resetting devices which are difficult to access for all sizes
- Sealable cover for all sizes

More information

Order No. scheme

Digit of the Order No.	1. - 3.	4.	5.	6.	7.		8.	9.	10.	11.
	□□□	□	□	□	□	–	□	□	□	□
Solid-state overload relays	**3 R B**									
SIRIUS 3rd generation		**3**								
Device series			□							
Size, rated operational current and power				□						
Version of the automatic RESET, electrical remote RESET					□					
Trip class (CLASS)							□			
Setting range of the overload release								□		
Connection method									□	
Installation type										□
Example	**3 R B**	**3**	**0**	**1**	**6**	**–**	**1**	**R**	**B**	**0**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Type		3RB30 1., 3RB31 1.	3RB30 2., 3RB31 2.
Size		S00	S0
Width		45 mm	45 mm
General technical specifications			
Trips in the event of		Overload, phase failure, and phase unbalance + ground fault (for 3RB31 only)	
Trip class acc. to IEC 60947-4-1	CLASS	3RB30: 10, 20; 3RB31: 5, 10, 20 and 30 adjustable	
Phase failure sensitivity		Yes	
Overload warning		No	
Reset and recovery			
• Reset options after tripping		Manual, automatic and remote RESET (depending on the version)	
• Recovery time			
- For automatic RESET	min	Approx. 3	
- For manual RESET	min	Immediately	
- For remote RESET	min	Immediately	
Features			
• Display of operating state on device		Yes, by means of switch position indicator slide	
• TEST function		Yes, test of electronics by pressing the TEST button / test of auxiliary contacts and wiring of control circuit by actuating the switch position indicator slide / self-monitoring	
• RESET button		Yes	
• STOP button		No	
Explosion protection – Safe operation of motors with "increased safety" type of protection			
EC type test certificate number acc. to directive 94/9/EC (ATEX)		PTB 09 ATEX 3001 Ex II (2) GD	
Ambient temperatures			
• Storage/transport	°C	-40 ... +80	
• Operation	°C	-25 ... +60	
• Temperature compensation	°C	+60	
• Permissible rated current at			
- Temperature inside control cabinet 60 °C	%	100	100[1]
- Temperature inside control cabinet 70 °C	%	On request	
Repeat terminals			
• Coil repeat terminals		Yes	Not required
• Auxiliary contact repeat terminal		Yes	Not required
Degree of protection acc. to IEC 60529		IP20	
Touch protection acc. to IEC 61140		Finger-safe	
Shock resistance with sine acc. to IEC 60068-2-27	*g*/ms	15/11[2]	
Electromagnetic compatibility (EMC) – Interference immunity			
• Conductor-related interference			
- Burst acc. to IEC 61000-4-4 (corresponds to degree of severity 3)	kV	2 (power ports), 1 (signal ports)	
- Surge acc. to IEC 61000-4-5 (corresponds to degree of severity 3)	kV	2 (line to earth), 1 (line to line)	
• Electrostatic discharge acc. to IEC 61000-4-2 (corresponds to degree of severity 3)	kV	8 (air discharge), 6 (contact discharge)	
• Field-related interference acc. to IEC 61000-4-3 (corresponds to degree of severity 3)	V/m	10	
Electromagnetic compatibility (EMC) – Emitted interference		Degree of severity B according to EN 55011 (CISPR 11) and EN 55022 (CISPR 22)	
Resistance to extreme climates – Air humidity	%	95	
Dimensions		For "Dimensional drawings" see the note on Technical Information on page 5/1.	
Installation altitude above sea level	m	Up to 2000	
Mounting position		Any	
Type of mounting		Direct mounting/stand-alone installation with terminal bracket	

1) Permissible rated current for heavy starting
Size S0 at 10 to 40 A:
- CLASS 20, $I_{e\,max}$ = 32 A,
- CLASS 30, $I_{e\,max}$ = 25 A.

2) Signaling contact 97/98 in position "tripped": 4/11 *g*/ms.

General data

Type		3RB30 1., 3RB31 1.	3RB30 2., 3RB31 2.
Size		S00	S0
Width		45 mm	45 mm
Main circuit			
Rated insulation voltage U_i (pollution degree 3)	V	690	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	690	
Type of current			
• Direct current		No	
• Alternating current		Yes, 50/60 Hz ±5 %	
Current setting	A A	0.1 ... 0.4 to 4 ... 16	0.1 ... 0.4 to 10 ... 40
Power loss per unit (max.)	W	0.05 ... 0.2	
Short-circuit protection			
• With fuse without contactor		See "Selection and ordering data"	
• With fuse and contactor		See "Technical specifications" --> "Short-circuit protection with fuses/motor starter protectors for motor feeders", see note on Technical Information on page 5/1.	
Protective separation between main and auxiliary conducting path acc. to IEC 60947-1 (pollution degree 2)	V	690[1]	
Conductor cross-sections of main circuit			
Connection type screw terminals		**Screw terminals**	
Terminal screw		M3, Pozidriv size 2	M4, Pozidriv size 2
Operating devices	mm	⌀ 5 ... 6	⌀ 5 ... 6
Prescribed tightening torque	Nm	0.8 ... 1.2	2 ... 2.5
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm^2	2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2], 2 x (0.5 ... 4)[2]	2 x (1 ... 2.5)[2], 2 x (2.5 ... 10)[2]
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	2 x (0.5 ... 1.5)[2], 2 x (0.75 ... 2.5)[2]	2 x (1 ... 2.5)[2], 2 x (2.5 ... 6)[2]; max. 1 x 10
• AWG cables, solid or stranded	AWG	2 x (20 ... 16)[2], 2 x (18 ... 14)[2], 2 x 12	2 x (16 ... 12)[2], 2 x (14 ... 8)[2]
Connection type spring-type terminals		**Spring-type terminals**	
Operating devices	mm	3.0 x 0.5 and 3.5 x 0.5	
Conductor cross-sections (min./max.)			
• Solid	mm^2	1 x (0.5 ... 4)	1 x (1 ... 10)
• Finely stranded without end sleeve	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• Finely stranded with end sleeves (DIN 46228 T1)	mm^2	1 x (0.5 ... 2.5)	1 x (1 ... 6)
• AWG cables, solid or stranded	AWG	1 x (20 ... 12)	1 x (18 ... 8)

1) For grounded networks, otherwise 600 V.

2) If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

Type		3RB30 1., 3RB31 1.	3RB30 2., 3RB31 2.
Size		S00	S0
Width		45 mm	45 mm
Auxiliary circuit			
Number of NO contacts		1	
Number of NC contacts		1	
Auxiliary contacts – Assignment		1 NO for the signal "tripped", 1 NC for disconnecting the contactor	
Rated insulation voltage U_i (pollution degree 3)	V	300	
Rated impulse withstand voltage U_{imp}	kV	4	
Auxiliary contacts – Contact rating			
• NC contact with alternating current AC-14/AC-15 Rated operational current I_e at U_e:			
- 24 V	A	4	
- 120 V	A	4	
- 125 V	A	4	
- 250 V	A	3	
• NO contact with alternating current AC-14/AC-15: Rated operational current I_e at U_e:			
- 24 V	A	4	
- 120 V	A	4	
- 125 V	A	4	
- 250 V	A	3	
• NC, NO contact with direct current DC-13: Rated operational current I_e at U_e:			
- 24 V	A	2	
- 60 V	A	0.55	
- 110 V	A	0.3	
- 125 V	A	0.3	
- 250 V	A	0.11	
• Conventional thermal current I_{th}	A	5	
• Contact reliability (suitability for PLC control; 17 V, 5 mA)		Yes	
Short-circuit protection			
• With fuse, gG operational class	A	6	
Ground-fault protection (only 3RB31)		The information refers to sinusoidal residual currents at 50/60 Hz	
• Tripping value I_Δ		> 0.75 × I_{motor}	
• Operating range I		Lower current setting value < I_{motor} < 3.5 × upper current setting value	
• Response time t_{trip} (in steady-state condition)	s	< 1	
Integrated electrical remote RESET (only 3RB31)			
Connecting terminals A3, A4		24 V DC, max. 200 mA for approx. 20 ms, then < 10 mA	
Protective separation between main and auxiliary conducting path acc. to IEC 60947-1	V	300	
CSA, UL, UR rated data			
Auxiliary circuit – Switching capacity		3RB30: B600, R300; 3RB31: B300, R300	
Conductor cross-sections for auxiliary circuit			
Connection type screw terminals		**Screw terminals**	
Terminal screw		M3, Pozidriv size 2	
Operating devices	mm	⌀ 5 ... 6	
Prescribed tightening torque	Nm	0.8 ... 1.2	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm^2	1 × (0.5 ... 4), 2 × (0.5 ... 2.5)	
• Finely stranded with end sleeve	mm^2	1 × (0.5 ... 2.5), 2 × (0.5 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 × (20 ... 14)	
Connection type spring-type terminals		**Spring-type terminals**	
Operating devices	mm	3.0 x 0.5	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid	mm^2	2 × (0.25 ... 1.5)	
• Finely stranded without end sleeve	mm^2	2 × (0.25 ... 1.5)	
• Finely stranded with end sleeve	mm^2	2 × (0.25 ... 1.5)	
• AWG cables, solid or stranded	AWG	2 × (24 ... 16)	

Selection and ordering data

3RB30 solid-state overload relays for mounting onto contactor[1], CLASS 10

Features and technical specifications:
- Screw and spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicators
- TEST function and self-monitoring
- Sealable covers (optional accessory)

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RB30 16-1TB0


3RB30 16-1TE0


3RB30 26-1VB0


3RB30 26-1VE0

Size of contactor[2]	Rating for induction motor Rated value[3]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", gG operational class[4]	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
	kW	A	A				kg				kg
Size S00[1]											
S00	0.04 … 0.09	0.1 … 0.4	4	A	**3RB30 16-1RB0**		0.172	A	**3RB30 16-1RE0**		0.172
	0.12 … 0.37	0.32 … 1.25	6	A	**3RB30 16-1NB0**		0.172	A	**3RB30 16-1NE0**		0.172
	0.55 … 1.5	1 … 4	20	A	**3RB30 16-1PB0**		0.172	A	**3RB30 16-1PE0**		0.172
	1.1 … 5.5	3 … 12	25	A	**3RB30 16-1SB0**		0.172	A	**3RB30 16-1SE0**		0.172
	2.2 … 7.5	4 ... 16	25	A	**3RB30 16-1TB0**		0.172	A	**3RB30 16-1TE0**		0.172
Size S0[1]											
S0	0.04 … 0.09	0.1 … 0.4	4	A	**3RB30 26-1RB0**		0.250	A	**3RB30 26-1RE0**		0.240
	0.12 … 0.37	0.32 … 1.25	6	A	**3RB30 26-1NB0**		0.250	A	**3RB30 26-1NE0**		0.240
	0.55 … 1.5	1 … 4	20	A	**3RB30 26-1PB0**		0.250	A	**3RB30 26-1PE0**		0.240
	1.1 … 5.5	3 … 12	25	A	**3RB30 26-1SB0**		0.250	A	**3RB30 26-1SE0**		0.240
	3 … 11	6 … 25	50	A	**3RB30 26-1QB0**		0.250	A	**3RB30 26-1QE0**		0.240
	5.5 … 18.5	10 ... 40	50	A	**3RB30 26-1VB0**		0.250	A	**3RB30 26-1VE0**		0.240

1) With the suitable terminal brackets (see "Accessories", page 5/55), these overload relays can also be installed as stand-alone units.

2) Observe maximum rated operational current of the devices.

3) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

4) Maximum protection by fuse for overload relay, type of coordination "2". For fuse values in connection with contactors see "Technical specifications" --> "Short-circuit protection with fuses for motor feeders", see note on Technical Information on page 5/1.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RB30 solid-state overload relays for mounting onto contactor[1], CLASS 20

Features and technical specifications:
- Screw and spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Switch position indicators
- TEST function and self-monitoring
- Sealable covers (optional accessory)

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RB30 16-2TB0


3RB30 16-2TE0


3RB30 26-2VB0


3RB30 26-2VE0

Size of contactor[2]	Rating for induction motor Rated value[3]	Set current value of the inverse-time delayed over-load release	Short-circuit protection with fuse, type of coordination "2", gG operational class[4]	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
	kW	A	A				kg				kg
Size S00[1]											
S00	0.04 … 0.09	0.1 … 0.4	4	A	**3RB30 16-2RB0**		0.172	A	**3RB30 16-2RE0**		0.172
	0.12 … 0.37	0.32 … 1.25	6	A	**3RB30 16-2NB0**		0.172	A	**3RB30 16-2NE0**		0.172
	0.55 … 1.5	1 … 4	20	A	**3RB30 16-2PB0**		0.172	A	**3RB30 16-2PE0**		0.172
	1.1 … 5.5	3 … 12	25	A	**3RB30 16-2SB0**		0.172	A	**3RB30 16-2SE0**		0.172
	2.2 … 7.5	4 ... 16	25	A	**3RB30 16-2TB0**		0.172	A	**3RB30 16-2TE0**		0.172
Size S0[1]											
S0	0.04 … 0.09	0.1 … 0.4	4	A	**3RB30 26-2RB0**		0.200	A	**3RB30 26-2RE0**		0.250
	0.12 … 0.37	0.32 … 1.25	6	A	**3RB30 26-2NB0**		0.200	A	**3RB30 26-2NE0**		0.250
	0.55 … 1.5	1 … 4	20	A	**3RB30 26-2PB0**		0.200	A	**3RB30 26-2PE0**		0.250
	1.1 … 5.5	3 … 12	25	A	**3RB30 26-2SB0**		0.200	A	**3RB30 26-2SE0**		0.250
	3 … 11	6 … 25	50	A	**3RB30 26-2QB0**		0.200	A	**3RB30 26-2QE0**		0.250
	5.5 … 18.5	10 ... 40	50	A	**3RB30 26-2VB0**		0.200	A	**3RB30 26-2VE0**		0.250

1) With the suitable terminal brackets (see "Accessories", page 5/55), these overload relays can also be installed as stand-alone units.

2) Observe maximum rated operational current of the devices.

3) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

4) Maximum protection by fuse for overload relay, type of coordination "2". For fuse values in connection with contactors see "Technical specifications" --> "Short-circuit protection with fuses for motor feeders", see note on Technical Information on page 5/1.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS 3RB3 Solid-State Overload Relays

3RB30, 3RB31 up to 40 A for standard applications

3RB31 solid-state overload relays for mounting onto contactor[1], CLASS 5, 10, 20 and 30 adjustable

Features and technical specifications:
- Screw and spring-type terminals
- Overload protection, phase failure protection and unbalance protection
- Internal ground-fault detection (activatable)
- Internal power supply
- Auxiliary contacts 1 NO + 1 NC
- Manual and automatic RESET
- Electrical remote RESET integrated
- Switch position indicators
- TEST function and self-monitoring
- Sealable covers (optional accessory)

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RB31 13-4TB0


3RB31 13-4TE0


3RB31 23-4VB0


3RB31 23-4VE0

Size of contactor[2]	Rating for induction motor Rated value[3]	Set current value of the inverse-time delayed overload release	Short-circuit protection with fuse, type of coordination "2", gG operational class[4]	DT	Screw terminals Order No.	Price per PU	Weight per PU approx.	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx.
	kW	A	A				kg				kg
Size S00[1]											
S00	0.04 … 0.09	0.1 … 0.4	4	A	**3RB31 13-4RB0**		0.175	A	**3RB31 13-4RE0**		0.175
	0.12 … 0.37	0.32 … 1.25	6	A	**3RB31 13-4NB0**		0.175	A	**3RB31 13-4NE0**		0.175
	0.55 … 1.5	1 … 4	20	A	**3RB31 13-4PB0**		0.175	A	**3RB31 13-4PE0**		0.175
	1.1 … 5.5	3 … 12	25	A	**3RB31 13-4SB0**		0.175	A	**3RB31 13-4SE0**		0.175
	2.2 … 7.5	4 ... 16	25	A	**3RB31 13-4TB0**		0.175	A	**3RB31 13-4TE0**		0.175
Size S0[1]											
S0	0.04 … 0.09	0.1 … 0.4	4	A	**3RB31 23-4RB0**		0.200	A	**3RB31 23-4RE0**		0.250
	0.12 … 0.37	0.32 … 1.25	6	A	**3RB31 23-4NB0**		0.175	A	**3RB31 23-4NE0**		0.175
	0.55 … 1.5	1 … 4	20	A	**3RB31 23-4PB0**		0.200	A	**3RB31 23-4PE0**		0.250
	1.1 … 5.5	3 … 12	25	A	**3RB31 23-4SB0**		0.200	A	**3RB31 23-4SE0**		0.250
	3 … 11	6 … 25	50	A	**3RB31 23-4QB0**		0.200	A	**3RB31 23-4QE0**		0.250
	5.5 … 18.5	10 ... 40	50	A	**3RB31 23-4VB0**		0.200	A	**3RB31 23-4VE0**		0.250

1) With the suitable terminal brackets (see "Accessories", page 5/55), these overload relays can also be installed as stand-alone units.

2) Observe maximum rated operational current of the devices.

3) Guide value for 4-pole standard motors at AC 50 Hz 400 V. The actual starting and rated data of the motor to be protected must be considered when selecting the units.

4) Maximum protection by fuse for overload relay, type of coordination "2". For fuse values in connection with contactors see "Technical specifications" --> "Short-circuit protection with fuses for motor feeders", see note on Technical Information on page 5/1.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Overview

Overload relays for standard applications

The following optional accessories are available for the 3RB30/3RB31 solid-state overload relays:

- Terminal bracket for stand-alone installation with screw or spring-type terminals for all sizes
- Mechanical RESET for all sizes
- Cable release for resetting devices which are difficult to access for all sizes
- Sealable cover for all sizes

Selection and ordering data

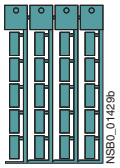
	Version	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminal brackets for stand-alone installation[1)]									
 3RU29 16-3AA01	Terminal brackets for overload relays with screw terminals			**Screw terminals**					
	For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00 S0	A A	**3RU29 16-3AA01** **3RU29 26-3AA01**		1 1	1 unit 1 unit	101 101	0.040 0.050
 3RU29 26-3AA01									
 3RU29 16-3AC01	**Terminal brackets for overload relays with spring-type terminals**			**Spring-type terminals**					
	For separate mounting of the overload relays; screw and snap-on mounting onto TH 35 standard mounting rail	S00 S0	B B	**3RU29 16-3AC01** **3RU29 26-3AC01**		1 1	1 unit 1 unit	101 101	0.040 0.060
 3RU29 26-3AC01									
Mechanical RESET									
 3RB39 80-0A with pushbutton and extension plunger	**Resetting plungers, holders and formers**	S00, S0	▶	**3RB39 80-0A**		1	1 unit	101	0.038
	Pushbuttons with extended stroke (12 mm), IP65, ⌀ 22 mm	S00, S0	B	**3SB30 00-0EA11**		1	1 unit	102	0.020
	Extension plungers For compensation of the distance between a pushbutton and the unlatching button of the relay	S00, S0	A	**3SX1 335**		1	1 unit	102	0.004
Cable releases with holder for RESET									
 3RB39 80-0.	For ⌀ 6.5 mm holes in the control panel; max. control panel thickness 8 mm								
	• Length 400 mm	S00, S0	▶	**3RB39 80-0B**		1	1 unit	101	0.063
	• Length 600 mm	S00, S0	▶	**3RB39 80-0C**		1	1 unit	101	0.073
Sealable covers									
 3RB39 84-0	For covering the setting knobs	S00, S0	A	**3RB39 84-0**		1	1 unit	101	0.001

[1)] The accessories are identical to those of the 3RU21 thermal overload relays.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

General accessories

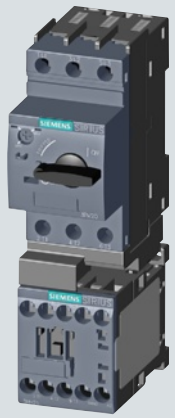
	Version	Use	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for opening spring-type terminals									
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	Main and auxiliary circuit connection: 3RU2, 3RB3	A	**Spring-type terminals**		1	1 unit	101	0.045
Blank labels									
 3RT19 00-1SB20	**Unit labeling plates**[1] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	3RU2, 3RB3	C	**3RT19 00-1SB20**		100	340 units	101	0.200

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Load Feeders and Motor Starters

6



Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

Note:
For safety characteristics for motor starters see catalog LV 1 2010, "Appendix"
--> "Standards and Approvals"
--> "Overview"

General data

Overview

3RA2 load feeders

The 3RA2 fuseless load feeders consist of the 3RV2 motor starter protector and the 3RT2 electromechanical contactor. The devices are electrically and mechanically connected using pre-assembled assembly kits (link modules, wiring kits and standard mounting rail or busbar adapters).

Around 500 preassembled 3RA2 combinations of these innovative 3RT2 controls and 3RV2 protection equipment can be ordered for direct-on-line and reversing starting of standard induction motors up to 32 A (approx.15 kW/400 V).

In the 3RA2 load feeder, the 3RV2 motor starter protector is responsible for overload and short-circuit protection. Back-up protective devices, such as melting fuses or limiters, are superfluous here, as the motor starter protector is capable of withstanding short-circuits of up to 153 kA at 400 V.

The 3RT2 contactor is particularly suitable for extremely complex switching tasks requiring the greatest endurance.

The 3RA2 load feeders are available with setting ranges from 0.14 to 32 A in sizes S00 and S0:

Size	Width mm	Max. rated current $I_{n\,max}$ A	For induction motors up to kW
S00	45	16	7.5
S0	45	32	15

The size of the 3RA2 load feeders is based on the size of the contactor:

Size of 3RA2	S00	S0
Size of 3RV2 motor starter protector	S00	S00[1], S0
Size of 3RT2 contactor	S00	S0

[1] The combination of an S00 motor starter protector with an S0 contactor is possible only for screw connection versions.

Operating conditions

3RA2 load feeders are climate-proof. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

Behavior in the event of short-circuit

EN 60947-4-1 (VDE 0660 Part 102) and IEC 60947-4-1 make a distinction between two different types of coordination, which are designated type of coordination "1" and type of coordination "2". Any short-circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the device by a short-circuit.

ToC 1 — Type of coordination "1"
The fuseless load feeder may be non-operational after a short-circuit has been cleared. Damage to the contactor or to the overload release is permissible. For 3RA2 load feeders, the motor starter protector itself always achieves type of coordination "2".

ToC 2 — Type of coordination "2"
There must be no damage to the overload release or to any other component after a short-circuit has been cleared. The 3RA2 fuseless load feeder can resume operation without needing to be renewed. At most, it is permissible to weld the contactor contacts if they can be disconnected easily without any significant deformation.

These types of coordination are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Tripping times

All 3RA2 load feeders described here are designed for normal starting, in other words for overload tripping times of less than 10 s (CLASS 10). At rated-load operating temperature the tripping times are shorter, depending on the particular equipment and the setting range. The exact values can be derived from the tripping characteristics of the motor starter protectors.

Connection methods

For all 3RA2 feeders up to 32 A, spring-type connection is available as well as screw connection. To connect two devices with spring-type connection there are plug-in connection modules for sizes S00 and S0 which enable very quick mounting of the feeders and a vibration-resistant assembly.

To connect a motor starter protector with screw connection to a contactor with spring-type connection there are special hybrid connection modules for S00 and S0.

Screw terminals

Spring-type terminals

These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

3RA2 complete units

The 3RA2 fuseless load feeders can be ordered as preassembled complete units for direct-on-line starting (3RA21) or for reversing duty (3RA22) with screw or spring-type connection.

Control supply voltages of AC 50/60 Hz 230 V and 24 V DC are available to choose from.

A distinction is also drawn between whether the feeder is mounted on a 35 mm standard mounting rail, on a flat surface using screws, or on a 60 mm busbar system.

Accessories

As the 3RA2 fuseless load feeders are constructed from 3RV2 motor starter protectors and 3RT2 contactors, the same accessories - such as auxiliary switches, undervoltage releases or door-coupling rotary operating mechanisms - can be used for the 3RA2 fuseless load feeders as for these motor starter protectors and contactors.

In particular, certain accessories have been optimized for the fuseless load feeders. They include the top-connected, transverse auxiliary switch on the motor starter protector, which is available with 1 CO contact or 1 NO contact + 1 NC contact. Special auxiliary switch blocks that can be snapped on from below are available for the contactor. These two accessories enable the fuseless load feeders to be wired simply without having to route cables through the device.

Incoming energy supply

On the whole four different infeed possibilities are available (see "3RV29 Infeed System for Load Feeders" on page 6/31).

Customer assembly of fuseless load feeders

While the preassembled 3RA2 can be ordered up to 32 A, combinations in customer assembly without link modules are also possible up to 40 A (approx. 18.5 kW/400 V).

Thanks to the SIRIUS modular system, the standard devices can be optimally combined in terms of both technical specifications and dimensions.

The fuseless load feeders can thus be assembled easily by the customer. It is simply necessary to assemble the standard 3RV2 motor starter protector, the 3RT2 contactor and the appropriate assembly kit.

For single devices and assembly kits see "Selection and ordering data" for 3RA21 direct-on-line starters and 3RA22 reversing starters.

For assembly kits for direct-on-line starting or reversing duty for mounting on standard mounting rails or busbars see "Selection and ordering data" for "Accessories".

For reversing starters size S0 it is imperative to use a standard mounting rail adapter in order to ensure the necessary mechanical strength. A standard mounting rail adapter is not necessary if a busbar adapter is used.

The 3RA1 fuseless load feeders can be used for the fuseless load feeders between 32 A and 100 A.

The SENTRON 3VL circuit breakers and the SIRIUS 3RT contactors are available for rated currents >100 A.

Special equipment for customer assembly can be ordered if other rated control supply voltages are required. Assembly kits can be used to facilitate assembly.

Customers can also assemble tested combinations of motor starter protectors with solid-state controls (soft starters, solid-state contactors) and load feeders with additional monitoring and control devices (3RR monitoring relays, SIMOCODE 3UF).

For the electrical and mechanical connection of protection equipment and controls there are preassambled assembly kits (link modules, wiring kits and standard mounting rail or busbar adapters).

The following types of configuration are possible:

- Direct-on-line/reversing starting (see preassembled 3RA2 combinations)
- Wye-delta starting (only customer assembly with link module)
- Solid-state/soft starting (only customer assembly with link module)

For more information and assignment tables for combinations of the 3RA2 generation for customer assembly see the Configuration Manual, which can be ordered on page 6/28.

General data

Communications integration using IO-Link

Load feeders can also be assembled with IO-Link for connection to the higher-level control system. For each feeder this requires a communication-capable contactor onto which a 3RA27 11 function module is plugged (various versions for direct-on-line, reversing and wye-delta starts). The design of the SIRIUS load feeders permits a group of up to 4 SIRIUS controls to be conveniently connected through a standardized IO-Link to a control system, thus reducing wiring work considerably compared to the conventional parallel wiring method. The electrical connection is made using only three standard cables.

The function modules perform not only the communication (contactor operation and feedback, ready signal) but also the electrical interlocking (for reversing and wye-delta starters) and the timing relay function (wye-delta reversing time).

Communication information and control supply voltages are passed on through ribbon cables so that the complete control current wiring on the feeder is no longer needed.

The monitoring and maintenance of a plant is made considerably easier by transmitting diverse diagnostics data from the function modules (e. g. missing main and auxiliary voltage, local disconnection…) through IO-Link to the higher-level control system. Also, feeders equipped for IO-Link can be conveniently controlled from the control cabinet door using the optional operator panel.

More information:

- For IO-Link see Chapter 2 "Industrial Communication"
- For 3RA27 function modules see Chapter 3 "Controls – Contactors and Contactor Assemblies" --> "Function Modules".

Communications integration through AS-Interface

Connection of the load feeders to the higher-level control system is possible not only through IO-Link but also through AS-Interface. The AS-Interface connection is recommended wherever load feeders are used in distributed applications. This solution also requires a communication-capable contactor and a corresponding 3RA27 12 function module (various versions for direct-on-line, reversing and wye-delta starts). The devices are implemented in A/B technology, making it easy to connect up to 62 feeders to an AS-i master (regardless of whether they are direct-on-line, reversing or wye-delta starters). This results in a significant reduction of wiring compared to the conventional parallel wiring method. The electrical connection is made using standard cables.

The function modules perform not only the communication (contactor operation and feedback, ready signal) but also the electrical interlocking (for reversing and wye-delta starters) and the timing relay function (wye-delta reversing time).

Communication information and control supply voltages are passed on through ribbon cables so that the complete control current wiring on the starter is no longer needed.

More information:

- For AS-Interface see Chapter 2 "Industrial Communication"
- For 3RA27 function modules see Chapter 3 "Controls – Contactors and Contactor Assemblies" --> "Function Modules".

Contactors with communication interface

For assembling load feeders with communications integration (AS-i/IO-Link) you need contactors with a communications interface. These contactors are not included as standard in the pre-assembled 3RA2 load feeders. A load feeder with communications interface must be assembled therefore from individual devices.

Complete integration in the automation landscape

As the result of the communication connection through IO-Link or AS-i, the SIRIUS load feeders are fully integrated in the automation landscape and can draw on all the advantages of TIA (e. g. integration in the TIA Maintenance Station).

Mounting

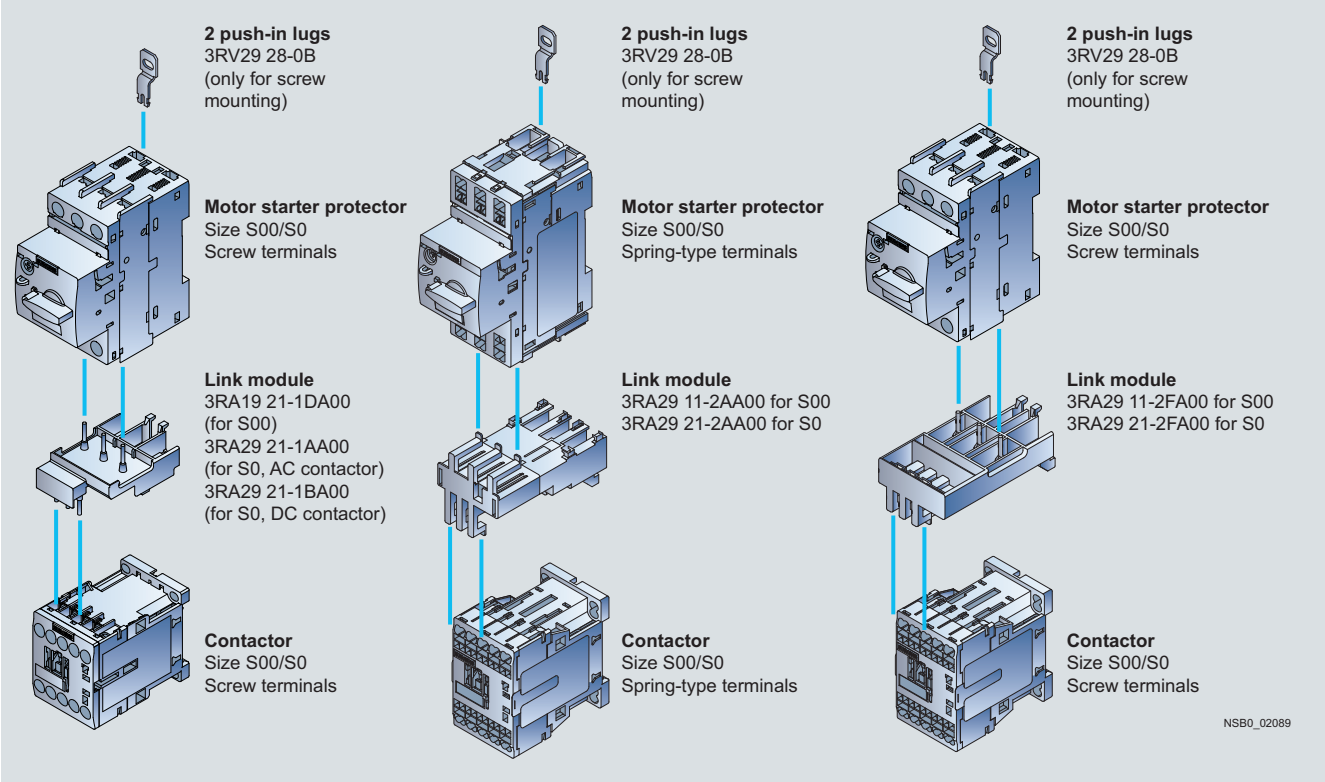
3RA2 fuseless load feeders are available:

- For mounting onto standard mounting rails TH 35 according to EN 60715 (depth 15 mm)
- For mounting onto busbar adapters (busbar center-to-center clearance 60 mm, bar thickness 5 to 10 mm, with chamfered edges)

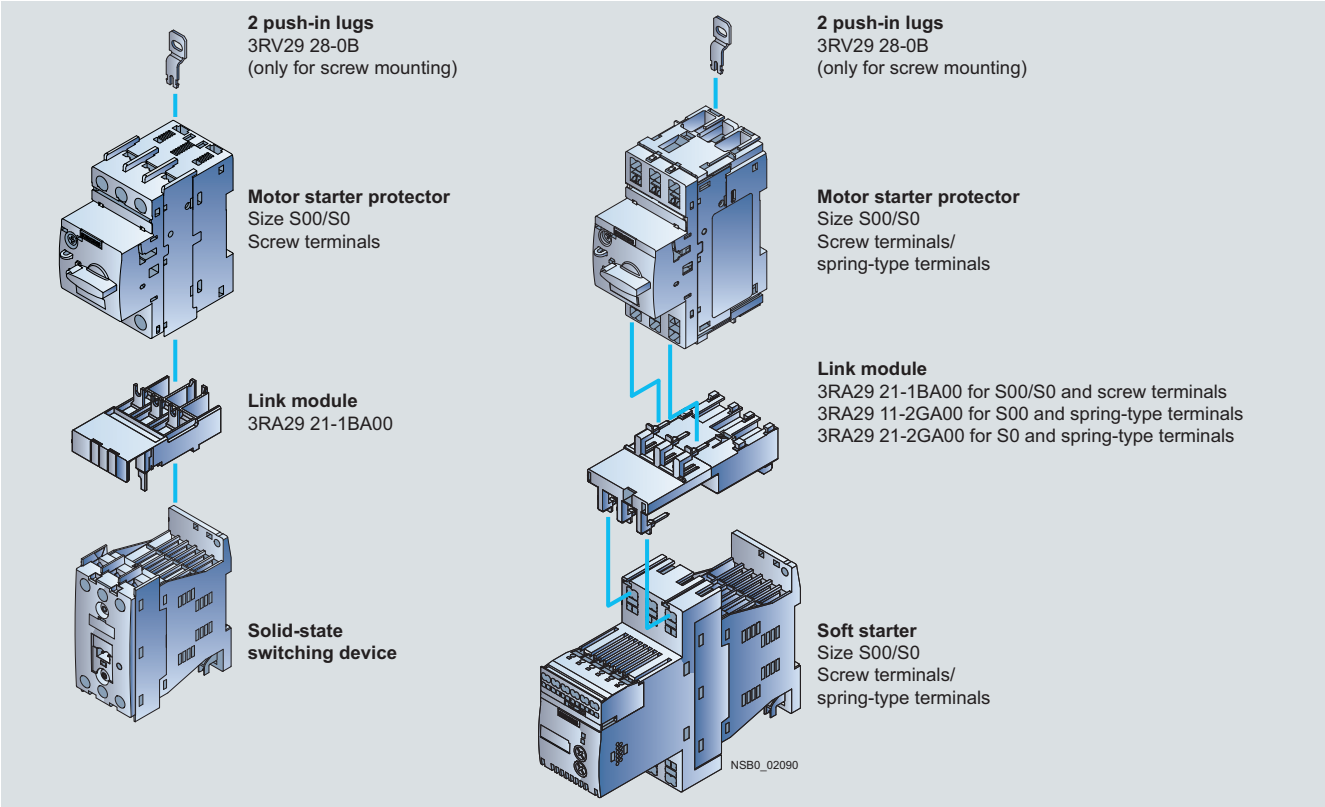
The fuseless load feeders are also suitable for screw fixing using two 3RV29 28-0B push-in lugs.

The 3RA2 fuseless load feeders can also be configured with the 3RV29 infeed system (see Chapter 5 "Protection Equipment" --> "SIRIUS 3RV2 Motor Starter Protectors up to 40 A" --> "Accessories" --> "3RV29 Infeed System").

Direct-on-line starting • For standard rail mounting or screw fixing • Sizes S00 and S0



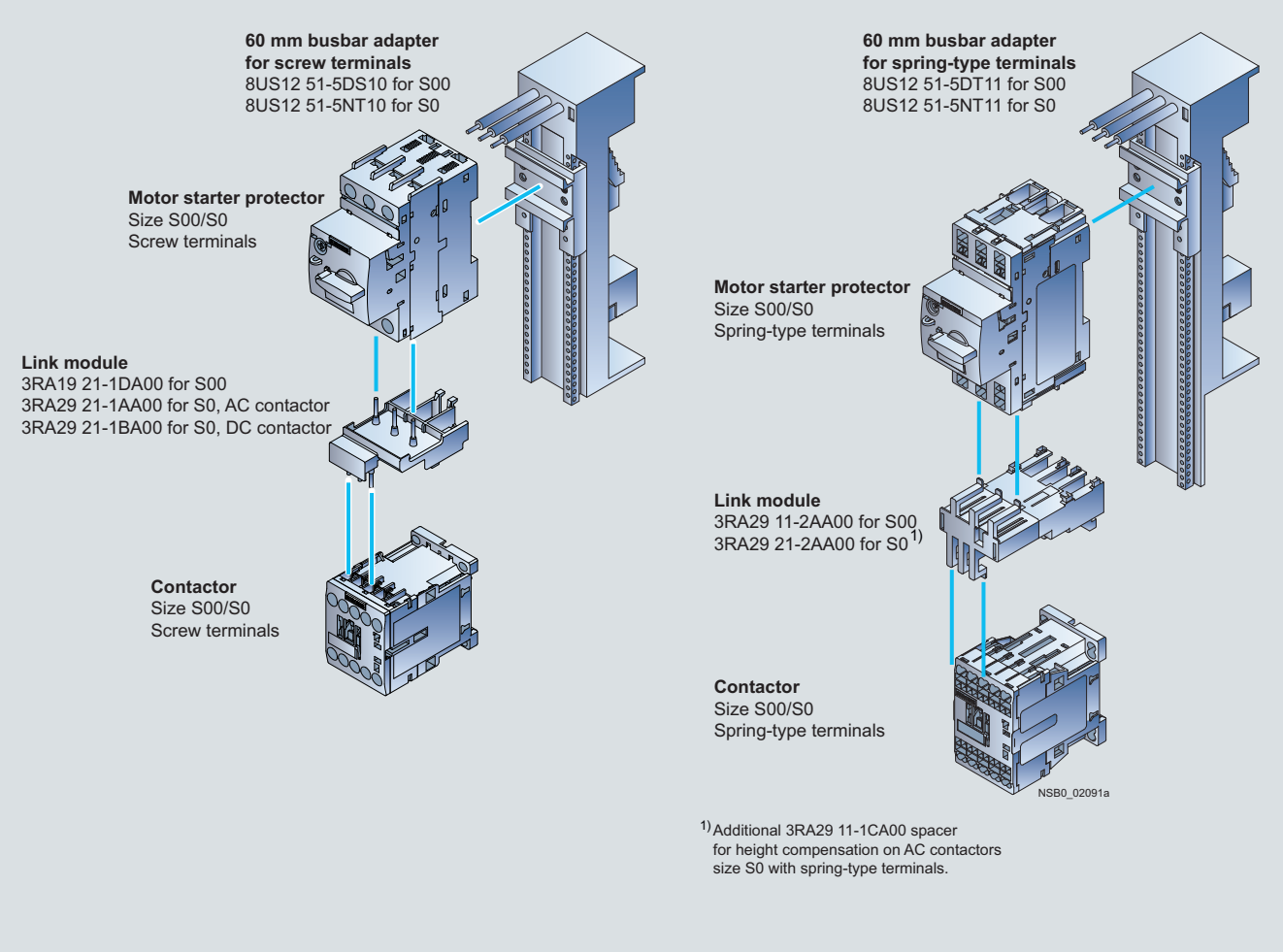
Left: 3RA21 load feeder with screw connection
Center: 3RA21 load feeder with spring-type connection
Right: Motor starter protector combination with screw connection, with contactor with spring-type connection



Left: Motor starter protector combination with solid-state switching device with screw connection
Right: Motor starter protector combination with soft starter with spring-type connection

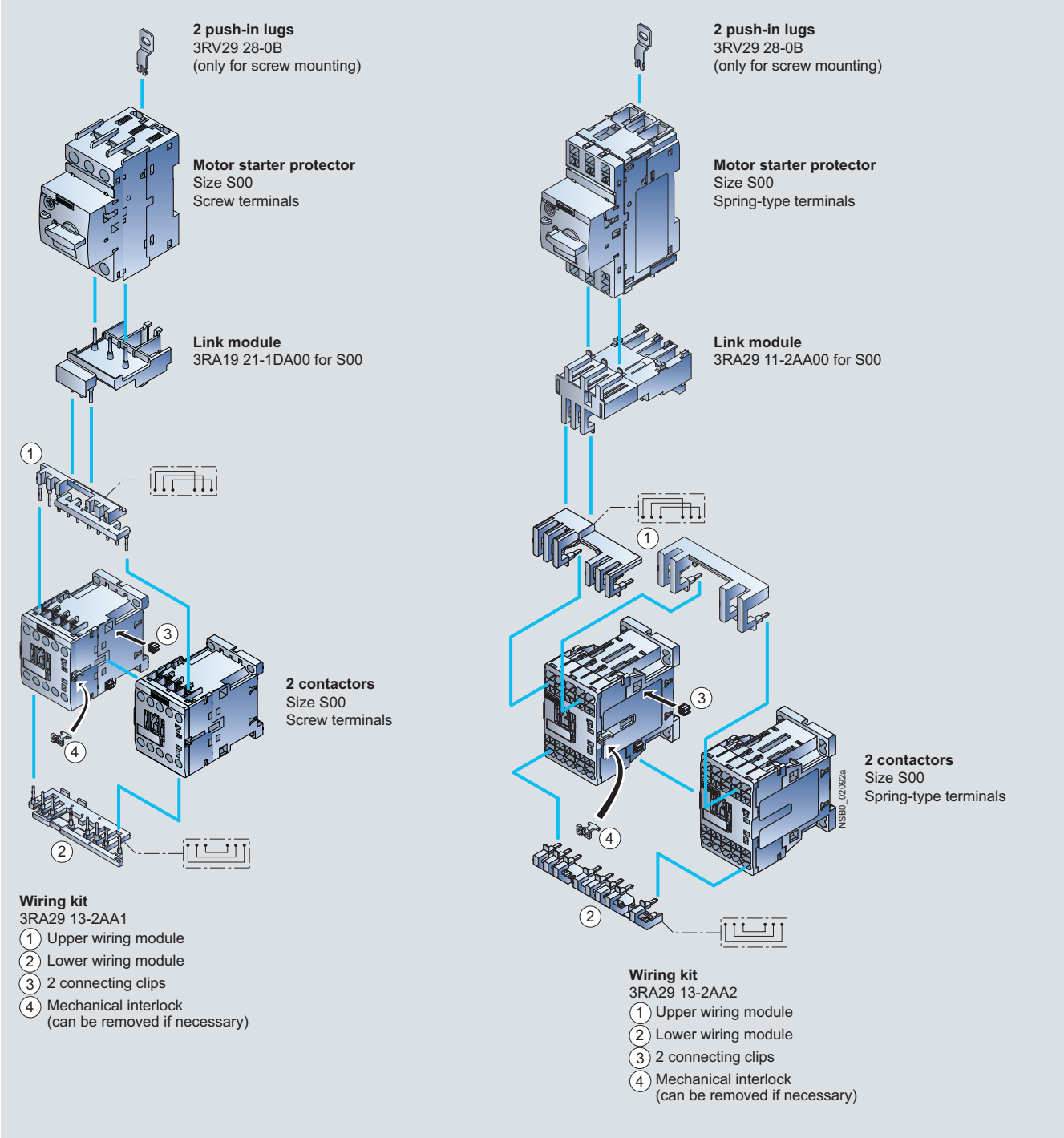
General data

Direct-on-line starting • For 60 mm busbar systems • Sizes S00 and S0



Left: 3RA21 load feeder for direct-on-line starting with busbar adapters with screw connection
Right: 3RA21 load feeder for direct-on-line starting with busbar adapters with spring-type connection

Reversing duty • For standard rail mounting or screw fixing • Size S00



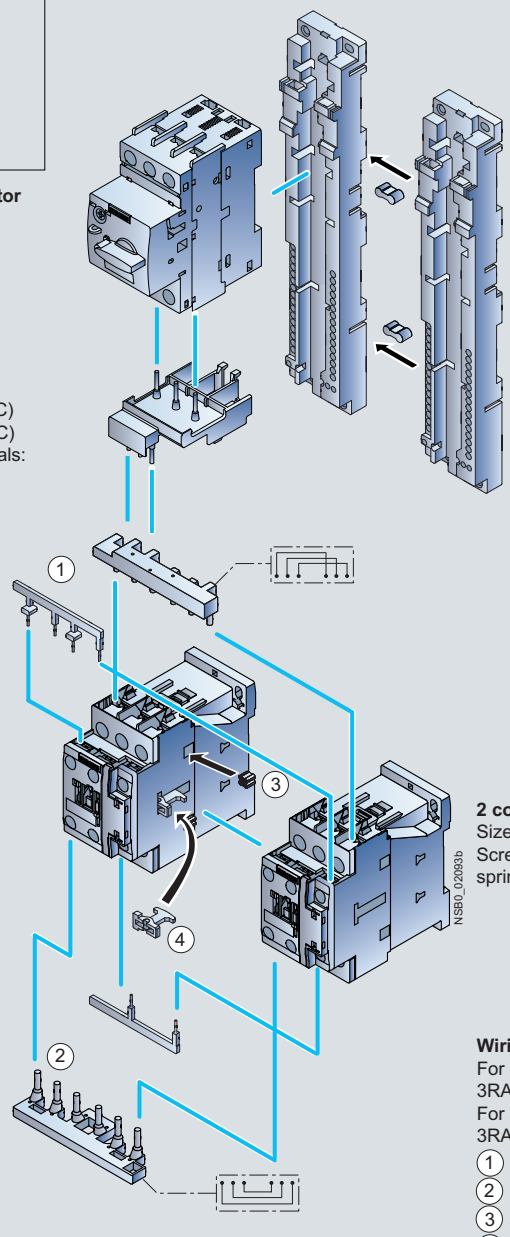
Left: 3RA22 load feeder with screw connection, push-in lugs, 2 contactors for reversing duty and 3RA29 13-2AA1 wiring kit for connecting the contactors (incl. mechanical interlocking and connecting clips)
Right: 3RA22 load feeder with spring-type connection, push-in lugs, 2 contactors for reversing duty and 3RA29 13-2AA2 wiring kit (incl. mechanical interlocking and connecting clips)

General data

Reversing duty • For standard rail mounting • Size S0

RH assembly kit for reversing duty and standard rail mounting in size S0
For screw terminals:
3RA29 23-1BB1
For spring-type terminals:
3RA29 23-1BB2[1)]
Comprising:
1 wiring kit
2 standard mounting rail adapters
2 connecting wedges

[1)] Also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.



Motor starter protector
Size S0
Screw terminals/
spring-type terminals

Link module
For screw terminals:
3RA29 21-1AA00 (AC)
3RA29 21-1BA00 (DC)
For spring-type terminals:
3RA29 21-2AA00[2)]

2 standard mounting rail adapters
3RA29 22-1AA00
with 2 connecting wedges
8US19 98-1AA00

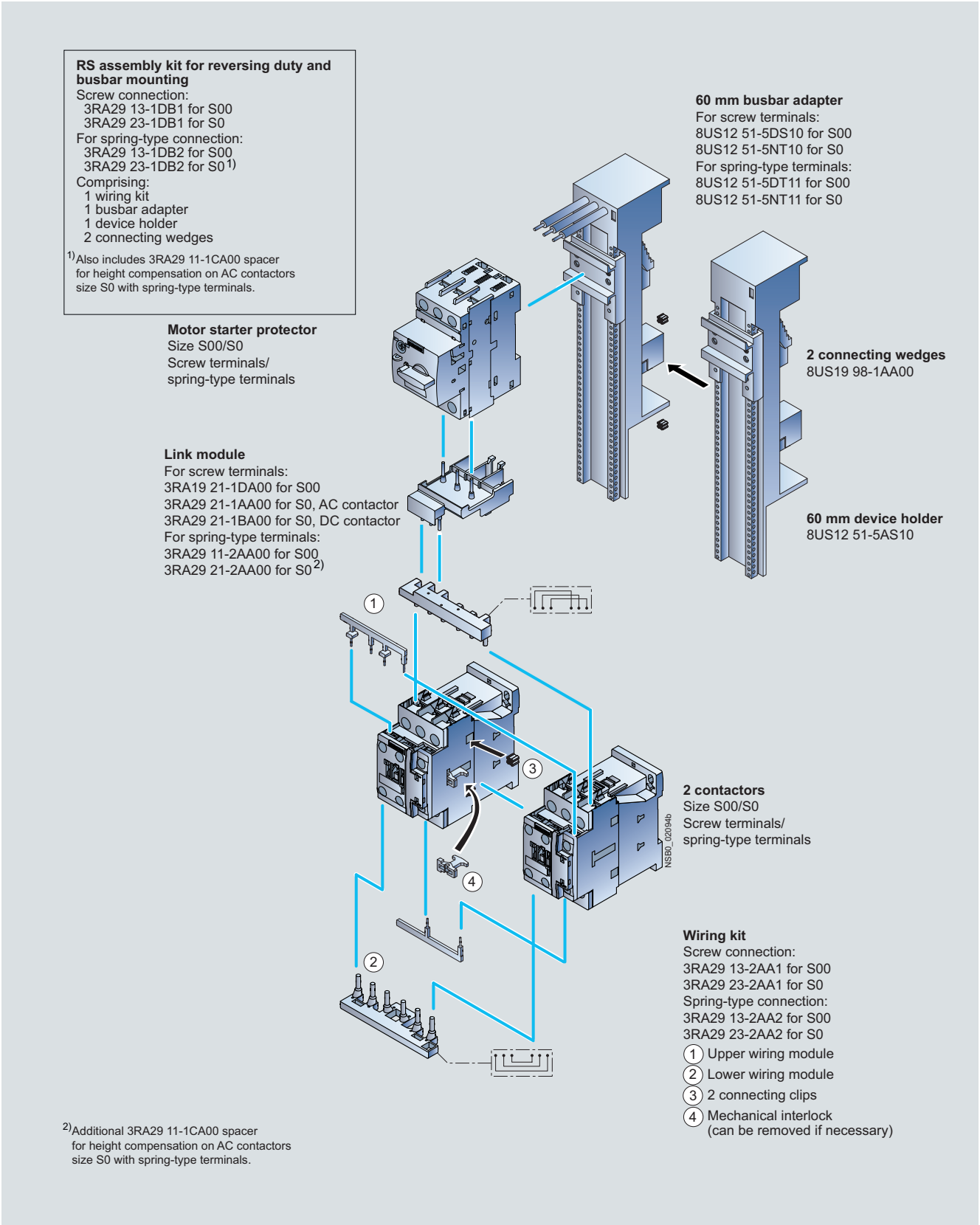
2 contactors
Size S0
Screw terminals/
spring-type terminals

Wiring kit
For screw terminals:
3RA29 23-2AA1
For spring-type terminals:
3RA29 23-2AA2
1 Upper wiring module
2 Lower wiring module
3 2 connecting clips
4 Mechanical interlock
(can be removed if necessary)

[2)] Additional 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals

3RA22 load feeder for reversing duty and standard rail mounting in size S0
(the version with screw connection is shown in the picture)

Reversing duty • For 60 mm busbar systems • Sizes S00 and S0



3RA22 load feeder for reversing duty and 60 mm standard mounting rail in size S00/S0
(the version with screw connection is shown in the picture)

General data

Order No. scheme

Digit of the Order No.	1st - 3rd	4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□	□	□	□	**0**	**–**	□	□	□	□	□	**–**	□	□	□	□
SIRIUS feeders	**3 R A**															
SIRIUS 2nd generation		**2**														
Type of feeder (direct-on-line starter = 1, reversing starter = 2)			□													
Size (S00 = 1, S0 = 2)				□												
Setting range for overload release							□	□								
Design type and connection method									□							
Rated power a 400 V AC										□	□					
Integrated auxiliary switches of the contactor													□			
Operating range / solenoid coil circuit (contactor)														□		
Rated control supply voltage (contactor)															□	□
Example	**3 R A**	**2**	**1**	**1**	**0**	**–**	**0**	**B**	**A**	**1**	**5**	**–**	**1**	**A**	**P**	**0**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Benefits

The 3RA2 fuseless load feeders offer a number of advantages:

- Minimum planning and assembly work and far less wiring with the preassembled complete units (only one order number 3RA2)
- Plug-in connectors from the motor starter protector to all types of SIRIUS controls, for quicker and error-free assembly of feeders with screw and spring-type connection
- High planning reliability through consistent combination tests for fuseless (400 V according to IEC) and fused configuration (400 V, 500 V and 690 V according to IEC)
- Comprehensive approvals for use world-wide (for overview of approvals see Chapter 20, "Appendix"; please ask for details of availability)
- High operational reliability through short-circuit breaking capacity of 153 kA with type of coordination "1" and "2"
- Uniform accessories for the two sizes S00 and S0
- Spring-type connection possible throughout: Enhanced operational reliability (vibration-resistant wiring) and less wiring work thanks to plug-in connections
- Power loss 5 to 10 % smaller than for comparable devices, hence lower power consumption
- Connection of feeders to the control system through standardized system connection (IO-Link and AS-i), for fast integration in TIA and less wiring work

More information

Type Size Number of poles			3RA2. 1 S00 3	3RA2. 2 S0 3
General data				
Standards			IEC 60947-1, EN 60947-1 (VDE 0660 Part 100) IEC 60947-2, EN 60947-2 (VDE 0660 Part 101) IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)	
Max. rated current $I_{n\ max}$ (= max. rated operational current I_e)		A	16	32
Permissible ambient temperature		°C °C	-20 ... +60 for operation -55 ... +80 during storage/transport	
Rated operational voltage U_e		V	690	
Rated frequency		Hz	50/60	
Rated insulation voltage U_i (pollution degree 3)		V	690	
Rated impulse withstand voltage U_{imp}		kV	6	
Trip class (CLASS)	Acc. to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)		10	
Rated short-circuit current I_q **at AC 50/60 Hz 400 V acc. to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)**		kA	153	
Types of coordination acc. to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)			See "Selection and ordering data"	
Power loss $P_{v\ max}$ **of all main current paths** Dependent on the rated current I_n (upper setting range)	Up to 1.25 A 1.6 ... 6.3 A 8 ... 12 A 16 A 5 ... 6.3 A 8 ... 12 A 16 ... 32 A	W W W W W W W	2 2.3 3.5 4.3 -- -- --	-- -- -- -- 2.3 3.5 4.3
Power consumption of the solenoid coils for contactors as a function of the standard output P of the motor (when coil is cold and U_s, 50 Hz)				
• AC operation				
- Closing	Up to 4 kW 5.5 ... 7.5 kW Up to 5.5 kW 7.5 ... 15 kW P.f.	VA VA VA VA	27 37 -- -- 0.8	-- -- 65 77 0.82
- Closed	Up to 4 kW 5.5 ... 7.5 kW Up to 5.5 kW 7.5 ... 15 kW P.f.	VA VA VA VA	4.2 5.7 -- -- 0.25	-- -- 8.5 9.8 0.25
• DC operation	Closing = Closed	W	4	5.9
Solenoid coil operating range for contactors			0.8 ... 1.1 x U_s	
	Lower limit at 55 °C At 60 °C		0.8 x U_s 0.85 x U_s	-- --
Endurance of the motor starter protector				
• Mechanical endurance	Operating cycles		100000	
• Electrical endurance	Operating cycles		100000	
• Max. switching frequency per hour (motor starts)		1/h	15	
Endurance of contactor				
• Mechanical endurance	Operating cycles		30 million	10 million
• Electrical endurance	Operating cycles		See endurance characteristic curves of the contactors --> Chapter 3 "Controls – Contactors and Contactor Assemblies"	
Shock resistance (sine-wave pulse)	Acc. to IEC 60086 Part 2-27	*g*	Up to 6	Up to 6
Degree of protection	Acc. to IEC 60947-1		IP20	
Touch protection	Acc. to EN 50274		Finger-safe	
Phase failure sensitivity of the motor starter protector	Acc. to IEC 60947-1, EN 60947-1 (VDE 0660 Part 102)		Yes	
Isolating features of the motor starter protector	Acc. to IEC 60947-2, EN 60947-2 (VDE 0660 Part 101)		Yes	
Main control and EMERGENCY-STOP switch characteristics of the motor starter protector and accessories	Acc. to IEC 60204-1, EN 60204-1 (VDE 0113 Part 1)		Yes (with overvoltage releases of category "1" under conditions of proper use)	
Protective separation between main and auxiliary circuits	Acc. to EN 60947-1, Appendix N	V	Up to 400	
Mirror contacts for contactors			Yes	Yes, from main contact to auxiliary NC contact

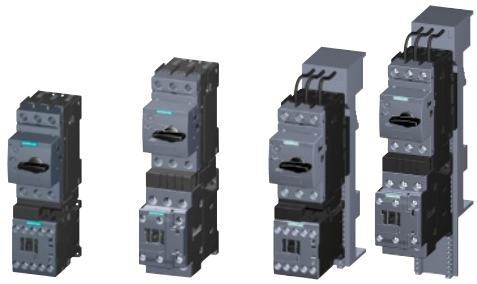
General data

Type		SIRIUS 3RA2 Load Feeders	
Connection type		Screw terminals	Spring-type terminals
Conductor cross-sections for main conductors Size S00			
		Motor starter protectors, contactors	**Motor starter protectors, contactors**
Terminal screw		M3, Pozidriv size 2	--
Operating devices	mm	∅ 5 ... 6	3.0 x 0.5 and 3.5 x 0.5
Prescribed tightening torque	Nm	0.8 ... 1.2	--
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid and stranded	mm² mm² mm²	2 x (0.5 … 1.5)[1] only for contactors, 2 x (0.75 ... 2.5)[1], max. 2 x 4	2 x (0.5 ... 4)
• Finely stranded without end sleeve	mm²	--	2 x (0.5 ... 2.5)
• Finely stranded with end sleeves (DIN 46 228 T1)	mm² mm²	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (0.5 ... 2.5)
• AWG cables, solid or stranded	AWG AWG AWG	2 x (20 … 16)[1] only for contactors, 2 x (18 ... 14)[1], 2 x 12	2 x (20 ... 12)
Max. external diameter of the conductor insulation	mm	--	3.6
Conductor cross-sections for main conductors Size S0			
		Motor starter protectors, contactors	**Motor starter protectors, contactors**
Terminal screw		M4, Pozidriv size 2	--
Operating devices	mm	∅ 5 ... 6	3.0 x 0.5 and 3.5 x 0.5
Prescribed tightening torque	Nm	2.0 ... 2.5	--
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected			
• Solid and stranded	mm² mm²	2 x (1.0 ... 2.5)[1], 2 x (2.5 ... 10)[1]	2 x (1.0 ... 10)
• Finely stranded without end sleeve	mm²	--	2 x (1.0 ... 6.0)
• Finely stranded with end sleeves (DIN 46 228 T1)	mm² mm² mm²	2 x (1.0 ... 2.5)[1], 2 x (2.5 ... 6)[1] max. 1 x 10	2 x (1.0 ... 6.0)
• AWG cables, solid or stranded	AWG AWG	2 x (16 ... 12)[1], 2 x (14 ... 8)[1]	2 x (18 ... 8)
Max. external diameter of the conductor insulation	mm	--	3.6

Conductor cross-sections for auxiliary conductors, Size S00/S0				
		Contactors (basic unit), motor starter protectors (accessories), contactors (mountable accessories), overload relays	**Contactors S00**	**Contactors S0, motor starter protectors (accessories), contactors (accessories), overload relays**
Terminal screw		M3, Pozidriv size 2	--	
Operating devices	mm	∅ 5 ... 6	3.0 x 0.5 and 3.5 x 0.5	
Prescribed tightening torque	Nm	0.8 ... 1.2	--	
Conductor cross-sections (min./max.), 1 or 2 conductors can be connected				
• Solid and stranded	mm² mm² mm²	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1], max. 2 x 4 only for contactors S00	2 x (0.5 ... 4)	2 x (0.5 ... 2.5)
• Finely stranded without end sleeve	mm²	--	2 x (0.5 ... 2.5)	2 x (0.5 ... 1.5)
• Finely stranded with end sleeve	mm² mm²	2 x (0.5 ... 1.5)[1], 2 x (0.75 ... 2.5)[1]	2 x (0.5 ... 2.5)	2 x (0.5 ... 1.5)
• AWG cables, solid or stranded	AWG AWG AWG	2 x (20 ... 16)[1], 2 x (18 ... 14)[1], 2 x 12 only for contactors S00	2 x (20 ... 12)	2 x (20 ... 14)
Max. external diameter of the conductor insulation	mm	--	3.6	3.6

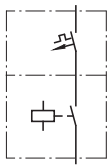
[1] If two different conductor cross-sections are connected to one clamping point, both cross-sections must lie in the range specified. If identical cross-sections are used, this restriction does not apply.

Selection and ordering data



3RA21 10 3RA21 20 3RA21 10 3RA21 20

Direct-on-line starting



Rated control supply voltage 50/60 Hz 230 V AC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  Contactor size S00: 1 NO;
  Contactor size S0: 1 NO + 1 NC

Size	Standard induction motor 4-pole at 400 V AC[2]		Setting range for thermal overload releases	Consisting of the following single devices			DT	Fuseless load feeders		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Standard output P	Motor current I (guide value)		Motor starter protector	+ Contactor	+ Link module + Busbar adapter[3]		Screw terminals					
								Order No.	Basic price per PU				
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	3RT20	3RA			ToC 2				
S00	0.06	0.2	0.14 ... 0.2	11-0BA10	15-1AP01	19 21-1DA00	B	**3RA21 10-0B□15-1AP0**		1	1 unit	101	0.575
	0.06	0.2	0.18 ... 0.25	11-0CA10		+ 8US12 51-	B	**3RA21 10-0C□15-1AP0**		1	1 unit	101	0.575
	0.09	0.3	0.22 ... 0.32	11-0DA10		5DS10	B	**3RA21 10-0D□15-1AP0**		1	1 unit	101	0.575
	0.09	0.3	0.28 ... 0.4	11-0EA10			B	**3RA21 10-0E□15-1AP0**		1	1 unit	101	0.575
	0.12	0.4	0.35 ... 0.5	11-0FA10			B	**3RA21 10-0F□15-1AP0**		1	1 unit	101	0.575
	0.18	0.6	0.45 ... 0.63	11-0GA10			B	**3RA21 10-0G□15-1AP0**		1	1 unit	101	0.575
	0.18	0.6	0.55 ... 0.8	11-0HA10			B	**3RA21 10-0H□15-1AP0**		1	1 unit	101	0.575
	0.25	0.85	0.7 ... 1	11-0JA10			B	**3RA21 10-0J□15-1AP0**		1	1 unit	101	0.575
	0.37	1.1	0.9 ... 1.25	11-0KA10			B	**3RA21 10-0K□15-1AP0**		1	1 unit	101	0.575
	0.55	1.5	1.1 ... 1.6	11-1AA10			B	**3RA21 10-1A□15-1AP0**		1	1 unit	101	0.575
	0.75	1.9	1.4 ... 2	11-1BA10			B	**3RA21 10-1B□15-1AP0**		1	1 unit	101	0.575
	0.75	1.9	1.8 ... 2.5	11-1CA10			B	**3RA21 10-1C□15-1AP0**		1	1 unit	101	0.575
	1.1	2.7	2.2 ... 3.2	11-1DA10			B	**3RA21 10-1D□15-1AP0**		1	1 unit	101	0.575
	1.5	3.6	2.8 ... 4	11-1EA10			B	**3RA21 10-1E□15-1AP0**		1	1 unit	101	0.575
S0	1.5	3.6	3.5 ... 5	11-1FA10	24-1AP00	29 21-1AA00	B	**3RA21 20-1F□24-0AP0**		1	1 unit	101	0.761
	2.2	4.9	4.5 ... 6.3	11-1GA10		+ 8US12 51-	B	**3RA21 20-1G□24-0AP0**		1	1 unit	101	0.761
	3	6.5	5.5 ... 8	11-1HA10		5NT10	B	**3RA21 20-1H□24-0AP0**		1	1 unit	101	0.761
	4	8.5	7 ... 10	11-1JA10			B	**3RA21 20-1J□24-0AP0**		1	1 unit	101	0.761
	5.5	11.5	9 ... 12.5	11-1KA10			B	**3RA21 20-1K□24-0AP0**		1	1 unit	101	0.761
	7.5	15.5	11 ... 16	21-4AA10	26-1AP00		B	**3RA21 20-4A□26-0AP0**		1	1 unit	101	0.761
	7.5	15.5	14 ... 20	21-4BA10			B	**3RA21 20-4B□26-0AP0**		1	1 unit	101	0.761
	11	22	17 ... 22	21-4CA10	27-1AP00		B	**3RA21 20-4C□27-0AP0**		1	1 unit	101	0.761
	11	22	20 ... 25	21-4DA10			B	**3RA21 20-4D□27-0AP0**		1	1 unit	101	0.761
	15	29	27 ... 32	21-4EA10			B	**3RA21 20-4E□27-0AP0**		1	1 unit	101	0.761
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".								ToC 1				
	1.5	3.6	3.5 ... 5	11-1FA10	15-1AP01	19 21-1DA00	B	**3RA21 10-1F□15-1AP0**		1	1 unit	101	0.575
	2.2	4.9	4.5 ... 6.3	11-1GA10		+ 8US12 51-	B	**3RA21 10-1G□15-1AP0**		1	1 unit	101	0.575
	3	6.5	5.5 ... 8	11-1HA10		5DS10	B	**3RA21 10-1H□15-1AP0**		1	1 unit	101	0.575
	4	8.5	7 ... 10	11-1JA10	16-1AP01		B	**3RA21 10-1J□16-1AP0**		1	1 unit	101	0.575
	5.5	11.5	9 ... 12	11-1KA10	17-1AP01		B	**3RA21 10-1K□17-1AP0**		1	1 unit	101	0.575
	7.5	15.5	11 ... 16	11-4AA10	18-1AP01		B	**3RA21 10-4A□18-1AP0**		1	1 unit	101	0.575

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing Screw fixing with 1 push-in lug each per load feeder is possible (see "Accessories for Direct-On-Line and Reversing Starters").		**A**	None		
Order No. supplement for mounting onto 60 mm busbar With busbar adapter	**1** **2**	**D** **D**	x x	for size S00 for size S0	0.263 0.295

x = Additional price

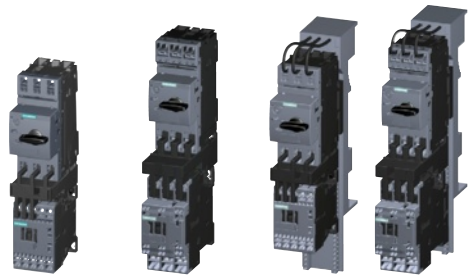
1) For auxiliary switches see Accessories.

2) Selection depends on the concrete startup and rated data of the protected motor.

3) Only for corresponding ordering option.

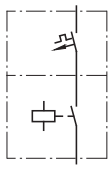
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA21 direct-on-line starters 50/60 Hz 230 V AC



3RA21 10 3RA21 20 3RA21 10 3RA21 20

Direct-on-line starting



Rated control supply voltage 50/60 Hz 230 V AC
With spring-type connection

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  Contactor size S00: 1 NO;
  Contactor size S0: 1 NO + 1 NC

Size	Standard induction motor 4-pole at 400 V AC[2] Standard output P	Motor current I (guide value)	Setting range for thermal overload releases	Consisting of the following single devices: Motor starter protector	+ Contactor	+ Link module + Busbar adapter[3]	DT	Fuseless load feeders, Spring-type terminals: Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA**			ToC 2				
S00	0.06	0.2	0.14 ... 0.2	11-0BA20	15-2AP01	29 11-2AA00	B	**3RA21 10-0B□15-1AP0**		1	1 unit	101	0.641
	0.06	0.2	0.18 ... 0.25	11-0CA20		+ 8US12 51-	B	**3RA21 10-0C□15-1AP0**		1	1 unit	101	0.641
	0.09	0.3	0.22 ... 0.32	11-0DA20		5DT11	B	**3RA21 10-0D□15-1AP0**		1	1 unit	101	0.641
	0.09	0.3	0.28 ... 0.4	11-0EA20			B	**3RA21 10-0E□15-1AP0**		1	1 unit	101	0.641
	0.12	0.4	0.35 ... 0.5	11-0FA20			B	**3RA21 10-0F□15-1AP0**		1	1 unit	101	0.641
	0.18	0.6	0.45 ... 0.63	11-0GA20			B	**3RA21 10-0G□15-1AP0**		1	1 unit	101	0.641
	0.18	0.6	0.55 ... 0.8	11-0HA20			B	**3RA21 10-0H□15-1AP0**		1	1 unit	101	0.641
	0.25	0.85	0.7 ... 1	11-0JA20			B	**3RA21 10-0J□15-1AP0**		1	1 unit	101	0.641
	0.37	1.1	0.9 ... 1.25	11-0KA20			B	**3RA21 10-0K□15-1AP0**		1	1 unit	101	0.641
	0.55	1.5	1.1 ... 1.6	11-1AA20			B	**3RA21 10-1A□15-1AP0**		1	1 unit	101	0.575
	0.75	1.9	1.4 ... 2	11-1BA20			B	**3RA21 10-1B□15-1AP0**		1	1 unit	101	0.641
	0.75	1.9	1.8 ... 2.5	11-1CA20			B	**3RA21 10-1C□15-1AP0**		1	1 unit	101	0.641
	1.1	2.7	2.2 ... 3.2	11-1DA20			B	**3RA21 10-1D□15-1AP0**		1	1 unit	101	0.641
	1.5	3.6	2.8 ... 4	11-1EA20			B	**3RA21 10-1E□15-1AP0**		1	1 unit	101	0.641
S0	1.5	3.6	3.5 ... 5	11-1FA20	24-2AP00			4)					
	2.2	4.9	4.5 ... 6.3	11-1GA20				4)					
	3	6.5	5.5 ... 8	11-1HA20				4)					
	4	8.5	7 ... 10	11-1JA20				4)					
	5.5	11.5	9 ... 12.5	11-1KA20				4)					
	7.5	15.5	11 ... 16	21-4AA20	26-2AP00	29 21-2AA00	B	**3RA21 20-4A□26-0AP0**		1	1 unit	101	0.925
	7.5	15.5	14 ... 20	21-4BA20		+ 8US12 51-	B	**3RA21 20-4B□26-0AP0**		1	1 unit	101	0.925
	11	22	17 ... 22	21-4CA20	27-2AP00	5NT11	B	**3RA21 20-4C□27-0AP0**		1	1 unit	101	0.925
	11	22	20 ... 25	21-4DA20		+ 3RA29 11-	B	**3RA21 20-4D□27-0AP0**		1	1 unit	101	0.925
	15	29	27 ... 32	21-4EA20		1CA00[5]	B	**3RA21 20-4E□27-0AP0**		1	1 unit	101	0.925
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".								ToC 1				
	1.5	3.6	3.5 ... 5	11-1FA20	15-2AP01	29 11-2AA00	B	**3RA21 10-1F□15-1AP0**		1	1 unit	101	0.641
	2.2	4.9	4.5 ... 6.3	11-1GA20		+ 8US12 51-	B	**3RA21 10-1G□15-1AP0**		1	1 unit	101	0.641
	3	6.5	5.5 ... 8	11-1HA20		5DT11	B	**3RA21 10-1H□15-1AP0**		1	1 unit	101	0.641
	4	8.5	7 ... 10	11-1JA20	16-2AP01		B	**3RA21 10-1J□16-1AP0**		1	1 unit	101	0.641
	5.5	11.5	9 ... 12	11-1KA20	17-2AP01		B	**3RA21 10-1K□17-1AP0**		1	1 unit	101	0.641
	7.5	15.5	11 ... 16	11-4AA20	18-2AP01		B	**3RA21 10-4A□18-1AP0**		1	1 unit	101	0.575

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing[4] Screw fixing with 1 push-in lug each per load feeder is possible (see "Accessories for Direct-On-Line and Reversing Starters").		**E**	None		
Order No. supplement for mounting onto 60 mm busbar With busbar adapter	**1**	**H**	x	for size S00	0.260
	2	**H**	x	for size S0	0.304

x = Additional price

1) For auxiliary switches see Accessories.

2) Selection depends on the concrete startup and rated data of the protected motor.

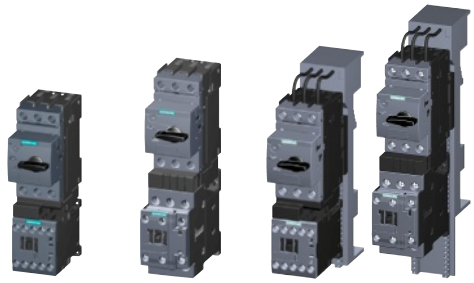
3) Only for corresponding ordering option.

4) These combinations are not available as ready-made 3RA2 feeders, but they can be discretely assembled. Mounting on standard mounting rails (3RA29 22-1AA00) is possible for feeder-orientated assembly, in which case the contactor must be screwed onto the adapter.

5) For size S0 with screw fixing, a 3RA29 11-1CA00 spacer is required for height compensation of the contactor.

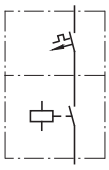
*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

3RA21 direct-on-line starters 24 V DC



3RA21 10 3RA21 20 3RA21 10 3RA21 20

Direct-on-line starting



Rated control supply voltage 24 V DC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  Contactor size S00: 1 NO;
  Contactor size S0: 1 NO + 1 NC

Size	Standard induction motor 4-pole at 400 V AC[2]		Setting range for thermal overload releases	Consisting of the following single devices			DT	Fuseless load feeders		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Standard output *P*	Motor current *I* (guide value)		Motor starter protector	+ Contactor	+ Link module + Busbar adapter[3]		Screw terminals					
								Order No.	Basic price per PU				
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA**			ToC 2				
S00	0.06	0.2	0.14 ... 0.2	11-0BA10	15-1BB41	19 21-1DA00	B	**3RA21 10-0B□15-1BB4**		1	1 unit	101	0.630
	0.06	0.2	0.18 ... 0.25	11-0CA10		+ 8US12 51-	B	**3RA21 10-0C□15-1BB4**		1	1 unit	101	0.630
	0.09	0.3	0.22 ... 0.32	11-0DA10		5DS10	B	**3RA21 10-0D□15-1BB4**		1	1 unit	101	0.630
	0.09	0.3	0.28 ... 0.4	11-0EA10			B	**3RA21 10-0E□15-1BB4**		1	1 unit	101	0.630
	0.12	0.4	0.35 ... 0.5	11-0FA10			B	**3RA21 10-0F□15-1BB4**		1	1 unit	101	0.630
	0.18	0.6	0.45 ... 0.63	11-0GA10			B	**3RA21 10-0G□15-1BB4**		1	1 unit	101	0.630
	0.18	0.6	0.55 ... 0.8	11-0HA10			B	**3RA21 10-0H□15-1BB4**		1	1 unit	101	0.630
	0.25	0.85	0.7 ... 1	11-0JA10			B	**3RA21 10-0J□15-1BB4**		1	1 unit	101	0.630
	0.37	1.1	0.9 ... 1.25	11-0KA10			B	**3RA21 10-0K□15-1BB4**		1	1 unit	101	0.630
	0.55	1.5	1.1 ... 1.6	11-1AA10			B	**3RA21 10-1A□15-1BB4**		1	1 unit	101	0.630
	0.75	1.9	1.4 ... 2	11-1BA10			B	**3RA21 10-1B□15-1BB4**		1	1 unit	101	0.630
	0.75	1.9	1.8 ... 2.5	11-1CA10			B	**3RA21 10-1C□15-1BB4**		1	1 unit	101	0.630
	1.1	2.7	2.2 ... 3.2	11-1DA10			B	**3RA21 10-1D□15-1BB4**		1	1 unit	101	0.630
	1.5	3.6	2.8 ... 4	11-1EA10			B	**3RA21 10-1E□15-1BB4**		1	1 unit	101	0.630
S0	1.5	3.6	3.5 ... 5	11-1FA10	24-1BB40	29 21-BA00	B	**3RA21 20-1F□24-0BB4**		1	1 unit	101	0.948
	2.2	4.9	4.5 ... 6.3	11-1GA10		+ 8US12 51-	B	**3RA21 20-1G□24-0BB4**		1	1 unit	101	0.948
	3	6.5	5.5 ... 8	11-1HA10		5NT10	B	**3RA21 20-1H□24-0BB4**		1	1 unit	101	0.948
	4	8.5	7 ... 10	11-1JA10			B	**3RA21 20-1J□24-0BB4**		1	1 unit	101	0.948
	5.5	11.5	9 ... 12.5	11-1KA10			B	**3RA21 20-1K□24-0BB4**		1	1 unit	101	0.948
	7.5	15.5	11 ... 16	21-4AA10	26-1BB40		B	**3RA21 20-4A□26-0BB4**		1	1 unit	101	0.948
	7.5	15.5	14 ... 20	21-4BA10			B	**3RA21 20-4B□26-0BB4**		1	1 unit	101	0.948
	11	22	17 ... 22	21-4CA10	27-1BB40		B	**3RA21 20-4C□27-0BB4**		1	1 unit	101	0.948
	11	22	20 ... 25	21-4DA10			B	**3RA21 20-4D□27-0BB4**		1	1 unit	101	0.948
	15	29	27 ... 32	21-4EA10			B	**3RA21 20-4E□27-0BB4**		1	1 unit	101	0.948
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".								ToC 1				
	1.5	3.6	3.5 ... 5	11-1FA10	15-1BB41	19 21-1DA00	B	**3RA21 10-1F□15-1BB4**		1	1 unit	101	0.630
	2.2	4.9	4.5 ... 6.3	11-1GA10		+ 8US12 51-	B	**3RA21 10-1G□15-1BB4**		1	1 unit	101	0.630
	3	6.5	5.5 ... 8	11-1HA10		5DS10	B	**3RA21 10-1H□15-1BB4**		1	1 unit	101	0.630
	4	8.5	7 ... 10	11-1JA10	16-1BB41		B	**3RA21 10-1J□16-1BB4**		1	1 unit	101	0.630
	5.5	11.5	9 ... 12	11-1KA10	17-1BB41		B	**3RA21 10-1K□17-1BB4**		1	1 unit	101	0.630
	7.5	15.5	11 ... 16	11-4AA10	18-1BB41		B	**3RA21 10-4A□18-1BB4**		1	1 unit	101	0.630

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing Screw fixing with 1 push-in lug each per load feeder is possible (see "Accessories for Direct-On-Line and Reversing Starters").		**A**	None		
Order No. supplement for mounting onto 60 mm busbar With busbar adapter	**1** **2**	**D** **D**	x x	for size S00 for size S0	0.263 0.301

x = Additional price

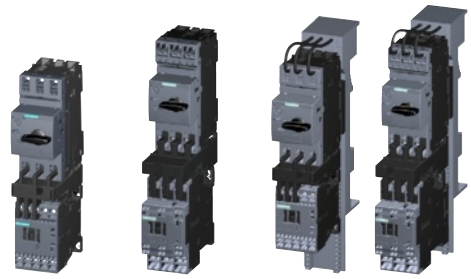
1) For auxiliary switches see Accessories.

2) Selection depends on the concrete startup and rated data of the protected motor.

3) Only for corresponding ordering option.

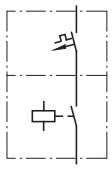
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA21 direct-on-line starters 24 V DC



3RA21 10 3RA21 20 3RA21 10 3RA21 20

Direct-on-line starting



Rated control supply voltage 24 V DC
With spring-type connection

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- Integrated auxiliary switches:
  Contactor size S00: 1 NO;
  Contactor size S0: 1 NO + 1 NC

Size	Standard induction motor 4-pole at 400 V AC[2]		Setting range for thermal overload releases	Consisting of the following single devices			DT	Fuseless load feeders		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Standard output *P*	Motor current *I* (guide value)		Motor starter protector	+ Contactor	+ Link module + Busbar adapter[3]		Spring-type terminals					
	kW	A	A					Order No.	Basic price per PU				kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA**		ToC 2					
S00	0.06	0.2	0.14 ... 0.2	11-0BA20	15-2BB41	29 11-2AA00	B	**3RA21 10-0B□15-1BB4**		1	1 unit	101	0.696
	0.06	0.2	0.18 ... 0.25	11-0CA20		+ 8US12 51-	B	**3RA21 10-0C□15-1BB4**		1	1 unit	101	0.696
	0.09	0.3	0.22 ... 0.32	11-0DA20		5DT11	B	**3RA21 10-0D□15-1BB4**		1	1 unit	101	0.696
	0.09	0.3	0.28 ... 0.4	11-0EA20			B	**3RA21 10-0E□15-1BB4**		1	1 unit	101	0.696
	0.12	0.4	0.35 ... 0.5	11-0FA20			B	**3RA21 10-0F□15-1BB4**		1	1 unit	101	0.696
	0.18	0.6	0.45 ... 0.63	11-0GA20			B	**3RA21 10-0G□15-1BB4**		1	1 unit	101	0.696
	0.18	0.6	0.55 ... 0.8	11-0HA20			B	**3RA21 10-0H□15-1BB4**		1	1 unit	101	0.696
	0.25	0.85	0.7 ... 1	11-0JA20			B	**3RA21 10-0J□15-1BB4**		1	1 unit	101	0.696
	0.37	1.1	0.9 ... 1.25	11-0KA20			B	**3RA21 10-0K□15-1BB4**		1	1 unit	101	0.696
	0.55	1.5	1.1 ... 1.6	11-1AA20			B	**3RA21 10-1A□15-1BB4**		1	1 unit	101	0.696
	0.75	1.9	1.4 ... 2	11-1BA20			B	**3RA21 10-1B□15-1BB4**		1	1 unit	101	0.696
	0.75	1.9	1.8 ... 2.5	11-1CA20			B	**3RA21 10-1C□15-1BB4**		1	1 unit	101	0.696
	1.1	2.7	2.2 ... 3.2	11-1DA20			B	**3RA21 10-1D□15-1BB4**		1	1 unit	101	0.696
	1.5	3.6	2.8 ... 4	11-1EA20			B	**3RA21 10-1E□15-1BB4**		1	1 unit	101	0.696
S0	1.5	3.6	3.5 ... 5	11-1FA20	24-2BB40			4)					
	2.2	4.9	4.5 ... 6.3	11-1GA20				4)					
	3	6.5	5.5 ... 8	11-1HA20				4)					
	4	8.5	7 ... 10	11-1JA20				4)					
	5.5	11.5	9 ... 12.5	11-1KA20				4)					
	7.5	15.5	11 ... 16	21-4AA20	26-2BB40	29 21-2AA00	B	**3RA21 20-4A□26-0BB4**		1	1 unit	101	1.100
	7.5	15.5	14 ... 20	21-4BA20		+ 8US12 51-	B	**3RA21 20-4B□26-0BB4**		1	1 unit	101	1.100
	11	22	17 ... 22	21-4CA10	27-2BB40	5NT11	B	**3RA21 20-4C□27-0BB4**		1	1 unit	101	1.100
	11	22	20 ... 25	21-4DA10			B	**3RA21 20-4D□27-0BB4**		1	1 unit	101	1.100
	15	29	27 ... 32	21-4EA10			B	**3RA21 20-4E□27-0BB4**		1	1 unit	101	1.100
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".							ToC 1					
	1.5	3.6	3.5 ... 5	11-1FA20	15-2BB41	29 11-2AA00	B	**3RA21 10-1F□15-1BB4**		1	1 unit	101	0.696
	2.2	4.9	4.5 ... 6.3	11-1GA20		+ 8US12 51-	B	**3RA21 10-1G□15-1BB4**		1	1 unit	101	0.696
	3	6.5	5.5 ... 8	11-1HA20		5DT11	B	**3RA21 10-1H□15-1BB4**		1	1 unit	101	0.696
	4	8.5	7 ... 10	11-1JA20	16-2BB41		B	**3RA21 10-1J□16-1BB4**		1	1 unit	101	0.696
	5.5	11.5	9 ... 12	11-1KA20	17-2BB41		B	**3RA21 10-1K□17-1BB4**		1	1 unit	101	0.696
	7.5	15.5	11 ... 16	11-4AA20	18-2BB40		B	**3RA21 10-4A□18-1BB4**		1	1 unit	101	0.696

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing Screw fixing with 1 push-in lug each per load feeder is possible (see "Accessories for Direct-On-Line and Reversing Starters").		**E**	None		
Order No. supplement for mounting onto 60 mm busbar With busbar adapter	**1**	**H**	x	for size S00	0.260
	2	**H**	x	for size S0	0.299

x = Additional price

1) For auxiliary switches see Accessories.

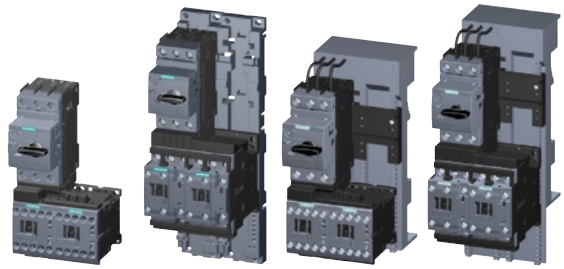
2) Selection depends on the concrete startup and rated data of the protected motor.

3) Only for corresponding ordering option.

4) These combinations are not available as ready-made 3RA2 feeders, but they can be discretely assembled. Mounting on standard mounting rails (3RA29 22-1AA00) is possible for feeder-orientated assembly, in which case the contactor must be screwed onto the adapter.

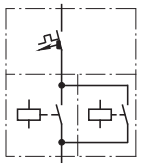
*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Selection and ordering data



3RA22 10 3RA22 20 3RA22 10 3RA22 20

Reversing duty



Rated control supply voltage 50/60 Hz 230 V AC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- For size S0 with 2 standard mounting rail adapters for mechanical reinforcement
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With contactor S0, 1 NO contact is integrated

Size	Standard induction motor 4-pole at 400 V AC[2] Standard output P	Motor current I (guide value)	Setting range for thermal overload release	Consisting of the following single devices: Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS[3]	DT	Fuseless load feeders, Screw terminals: Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA**			ToC 2				
S00	0.06	0.2	0.14 ... 0.2	11-0BA10	15-1AP02	19 21-1DA00	B	**3RA22 10-0B□15-2AP0**		1	1 unit	101	0.824
	0.06	0.2	0.18 ... 0.25	11-0CA10		+	B	**3RA22 10-0C□15-2AP0**		1	1 unit	101	0.824
	0.09	0.3	0.22 ... 0.32	11-0DA10		29 13-2AA1[4]	B	**3RA22 10-0D□15-2AP0**		1	1 unit	101	0.824
	0.09	0.3	0.28 ... 0.4	11-0EA10		/29 13-1DB1 (RS)	B	**3RA22 10-0E□15-2AP0**		1	1 unit	101	0.824
	0.12	0.4	0.35 ... 0.5	11-0FA10			B	**3RA22 10-0F□15-2AP0**		1	1 unit	101	0.824
	0.18	0.6	0.45 ... 0.63	11-0GA10			B	**3RA22 10-0G□15-2AP0**		1	1 unit	101	0.824
	0.18	0.6	0.55 ... 0.8	11-0HA10			B	**3RA22 10-0H□15-2AP0**		1	1 unit	101	0.824
	0.25	0.85	0.7 ... 1	11-0JA10			B	**3RA22 10-0J□15-2AP0**		1	1 unit	101	0.824
	0.37	1.1	0.9 ... 1.25	11-0KA10			B	**3RA22 10-0K□15-2AP0**		1	1 unit	101	0.824
	0.55	1.5	1.1 ... 1.6	11-1AA10			B	**3RA22 10-1A□15-2AP0**		1	1 unit	101	0.824
	0.75	1.9	1.4 ... 2	11-1BA10			B	**3RA22 10-1B□15-2AP0**		1	1 unit	101	0.824
	0.75	1.9	1.8 ... 2.5	11-1CA10	15-1AP02		B	**3RA22 10-1C□15-2AP0**		1	1 unit	101	0.824
	1.1	2.7	2.2 ... 3.2	11-1DA10			B	**3RA22 10-1D□15-2AP0**		1	1 unit	101	0.824
	1.5	3.6	2.8 ... 4	11-1EA10			B	**3RA22 10-1E□15-2AP0**		1	1 unit	101	0.824
S0	1.5	3.6	3.5 ... 5	11-1FA10	24-1AP00	29 21-1AA00	B	**3RA22 20-1F□24-0AP0**		1	1 unit	101	1.434
	2.2	4.9	4.5 ... 6.3	11-1GA10		+	B	**3RA22 20-1G□24-0AP0**		1	1 unit	101	1.434
	3	6.5	5.5 ... 8	11-1HA10		29 23-1BB1 (RH)	B	**3RA22 20-1H□24-0AP0**		1	1 unit	101	1.434
	4	8.5	7 ... 10	11-1JA10		/29 23-1DB1 (RS)	B	**3RA22 20-1J□24-0AP0**		1	1 unit	101	1.434
	5.5	11.5	9 ... 12.5	11-1KA10			B	**3RA22 20-1K□24-0AP0**		1	1 unit	101	1.434
	7.5	15.5	11 ... 16	21-4AA10	26-1AP00		B	**3RA22 20-4A□26-0AP0**		1	1 unit	101	1.434
	7.5	15.5	14 ... 20	21-4BA10			B	**3RA22 20-4B□26-0AP0**		1	1 unit	101	1.434
	11	22	17 ... 22	21-4CA10	27-1AP00		B	**3RA22 20-4C□27-0AP0**		1	1 unit	101	1.434
	11	22	20 ... 25	21-4DA10			B	**3RA22 20-4D□27-0AP0**		1	1 unit	101	1.434
	15	29	27 ... 32	21-4EA10			B	**3RA22 20-4E□27-0AP0**		1	1 unit	101	1.434
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".								ToC 1				
S00	1.5	3.6	3.5 ... 5	11-1FA10	15-1AP02	19 21-1DA00	B	**3RA22 10-1F□15-2AP0**		1	1 unit	101	0.824
	2.2	4.9	4.5 ... 6.3	11-1GA10		+	B	**3RA22 10-1G□15-2AP0**		1	1 unit	101	0.824
	3	6.5	5.5 ... 8	11-1HA10		29 13-2AA1[4]	B	**3RA22 10-1H□15-2AP0**		1	1 unit	101	0.824
	4	8.5	7 ... 10	11-1JA10	16-1AP02	/29 13-1DB1 (RS)	B	**3RA22 10-1J□16-2AP0**		1	1 unit	101	0.824
	5.5	11.5	9 ... 12	11-1KA10	17-1AP02		B	**3RA22 10-1K□17-2AP0**		1	1 unit	101	0.824
	7.5	15.5	11 ... 16	11-4AA10	18-1AP02		B	**3RA22 10-4A□18-2AP0**		1	1 unit	101	0.824

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing					
• Without standard mounting rail adapter for size S00[4]	**1**	**A**	None		
• With 2 standard mounting rail adapters for size S0	**2**	**B**	None		
Screw fixing with 1 push-in lug each per load feeder is possible					
Order No. supplement for mounting onto 60 mm busbar	**1**	**D**	x	for size S00	0.486
With busbar adapter	**2**	**D**	x	for size S0	0.293

x = Additional price

1) For auxiliary switches see Accessories.

2) Selection depends on the concrete startup and rated data of the protected motor.

3) According to ordering option:
RH = assembly kit for reversing duty and standard rail mounting in size S0.
RS = assembly kit for reversing duty and busbar mounting.

4) With standard rail mounting or screw fixing, only the 3RA29 13-2AA1 wiring kit is needed for size S00.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

3RA22 reversing starters 50/60 Hz 230 V AC

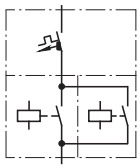

3RA22 10


3RA22 20


3RA22 10


3RA22 20

Reversing duty



Rated control supply voltage 50/60 Hz 230 V AC
With spring-type connection

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- For size S0 with 2 standard mounting rail adapters for mechanical reinforcement
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With contactor S0, 1 NO contact is integrated

Size	Standard induction motor 4-pole at 400 V AC[2] Standard output P	Motor current I (guide value)	Setting range for thermal overload release	Consisting of the following single devices: Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS[3]	DT	Fuseless load feeders, Spring-type terminals: Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA**							
S00	0.06	0.2	0.14 ... 0.2	11-0BA20	15-2AP02	29 11-2AA00	B	**3RA22 10-0B□15-2AP0**		1	1 unit	101	0.930
	0.06	0.2	0.18 ... 0.25	11-0CA20		+	B	**3RA22 10-0C□15-2AP0**		1	1 unit	101	0.930
	0.09	0.3	0.22 ... 0.32	11-0DA20		29 13-2AA2[4]	B	**3RA22 10-0D□15-2AP0**		1	1 unit	101	0.930
	0.09	0.3	0.28 ... 0.4	11-0EA20		/29 13-1DB2 (RS)	B	**3RA22 10-0E□15-2AP0**		1	1 unit	101	0.930
	0.12	0.4	0.35 ... 0.5	11-0FA20			B	**3RA22 10-0F□15-2AP0**		1	1 unit	101	0.930
	0.18	0.6	0.45 ... 0.63	11-0GA20			B	**3RA22 10-0G□15-2AP0**		1	1 unit	101	0.930
	0.18	0.6	0.55 ... 0.8	11-0HA20			B	**3RA22 10-0H□15-2AP0**		1	1 unit	101	0.930
	0.25	0.85	0.7 ... 1	11-0JA20			B	**3RA22 10-0J□15-2AP0**		1	1 unit	101	0.930
	0.37	1.1	0.9 ... 1.25	11-0KA20			B	**3RA22 10-0K□15-2AP0**		1	1 unit	101	0.930
	0.55	1.5	1.1 ... 1.6	11-1AA20			B	**3RA22 10-1A□15-2AP0**		1	1 unit	101	0.930
	0.75	1.9	1.4 ... 2	11-1BA20			B	**3RA22 10-1B□15-2AP0**		1	1 unit	101	0.930
	0.75	1.9	1.8 ... 2.5	11-1CA20			B	**3RA22 10-1C□15-2AP0**		1	1 unit	101	0.930
	1.1	2.7	2.2 ... 3.2	11-1DA20			B	**3RA22 10-1D□15-2AP0**		1	1 unit	101	0.930
	1.5	3.6	2.8 ... 4	11-1EA20			B	**3RA22 10-1E□15-2AP0**		1	1 unit	101	0.930
S0	1.5	3.6	3.5 ... 5	11-1FA20	24-2AP00	29 23-2AA2		5)					
	2.2	4.9	4.5 ... 6.3	11-1GA20				5)					
	3	6.5	5.5 ... 8	11-1HA20				5)					
	4	8.5	7 ... 10	11-1JA20				5)					
	5.5	11.5	9 ... 12.5	11-1KA20				5)					
	7.5	15.5	11 ... 16	21-4AA20	26-2AP00	29 21-2AA00	B	**3RA22 20-4A□26-0AP0**		1	1 unit	101	1.648
	7.5	15.5	14 ... 20	21-4BA20		+	B	**3RA22 20-4B□26-0AP0**		1	1 unit	101	1.648
	11	22	17 ... 22	21-4CA20		29 23-1BB2 (RH)	B	**3RA22 20-4C□27-0AP0**		1	1 unit	101	1.648
	11	22	20 ... 25	21-4DA20	27-2AP00	/29 23-1DB2	B	**3RA22 20-4D□27-0AP0**		1	1 unit	101	1.648
	15	29	27 ... 32	21-4EA20		(RS)[6]	B	**3RA22 20-4E□27-0AP0**		1	1 unit	101	1.648
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".												
S00	1.5	3.6	3.5 ... 5	11-1FA10	15-2AP02	29 11-2AA00	B	**3RA22 10-1F□15-2AP0**		1	1 unit	101	0.930
	2.2	4.9	4.5 ... 6.3	11-1GA10		+	B	**3RA22 10-1G□15-2AP0**		1	1 unit	101	0.930
	3	6.5	5.5 ... 8	11-1HA10		29 13-2AA2[4]	B	**3RA22 10-1H□15-2AP0**		1	1 unit	101	0.930
	4	8.5	7 ... 10	11-1JA10	16-2AP02	/29 13-1DB2 (RS)	B	**3RA22 10-1J□16-2AP0**		1	1 unit	101	0.930
	5.5	11.5	9 ... 12	11-1KA10	17-2AP02		B	**3RA22 10-1K□17-2AP0**		1	1 unit	101	0.930
	7.5	15.5	11 ... 16	11-4AA10	18-2AP02		B	**3RA22 10-4A□18-2AP0**		1	1 unit	101	0.930

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing					
• Without standard mounting rail adapter for size S00	**1**	**E**	None		
• With standard mounting rail adapter for size S0	**2**	**F**	None		
Screw fixing with 1 push-in lug each per load feeder is possible					
Order No. supplement for mounting onto 60 mm busbar	**1**	**H**	x	for size S00	0.477
With busbar adapter	**2**	**H**	x	for size S0	0.322

x = Additional price

1) For auxiliary switches see Accessories.

2) Selection depends on the concrete startup and rated data of the protected motor.

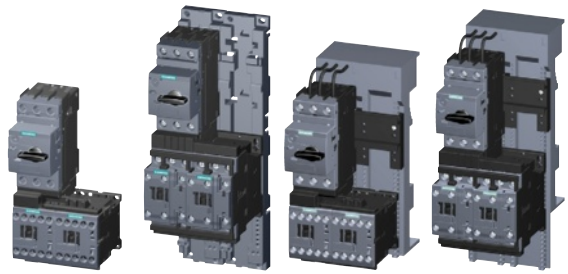
3) According to ordering option:
RH = assembly kit for reversing duty and standard rail mounting in size S0.
RS = assembly kit for reversing duty and busbar mounting.

4) With standard rail mounting or screw fixing, only the 3RA29 13-2AA2 wiring kit is needed for size S00.

5) These combinations are not available as ready-made 3RA2 feeders, but they can be discretely assembled. For feeder-orientated assembly it is possible to use the RH assembly kit for reversing duty and standard rail mounting (3RA29 23-1BB2) instead of the 3RA29 23-2AA2 wiring kit, in which case the contactors must be screwed onto the adapter.

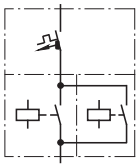
6) The RH/RS assembly kit also includes 3RA29 11-1CA00 spacer for height compensation on AC contactors size S0 with spring-type terminals.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate



3RA22 10 3RA22 20 3RA22 10 3RA22 20

Reversing duty



Rated control supply voltage 24 V DC
With screw connections

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- For size S0 with 2 standard mounting rail adapters for mechanical reinforcement
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With contactor S0, 1 NO contact is integrated

Size	Standard induction motor 4-pole at 400 V AC[2] Standard output P	Motor current I (guide value)	Setting range for thermal overload release	Consisting of the following single devices: Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS[3]	DT	Fuseless load feeders, Screw terminals: Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA**			ToC 2				
S00	0.06	0.2	0.14 ... 0.2	11-0BA10	15-1BB42	19 21-1DA00	B	**3RA22 10-0B□15-2BB4**		1	1 unit	101	0.934
	0.06	0.2	0.18 ... 0.25	11-0CA10		+	B	**3RA22 10-0C□15-2BB4**		1	1 unit	101	0.934
	0.09	0.3	0.22 ... 0.32	11-0DA10		29 13-2AA1[4]	B	**3RA22 10-0D□15-2BB4**		1	1 unit	101	0.934
	0.09	0.3	0.28 ... 0.4	11-0EA10		/29 13-1DB1 (RS)	B	**3RA22 10-0E□15-2BB4**		1	1 unit	101	0.934
	0.12	0.4	0.35 ... 0.5	11-0FA10			B	**3RA22 10-0F□15-2BB4**		1	1 unit	101	0.934
	0.18	0.6	0.45 ... 0.63	11-0GA10			B	**3RA22 10-0G□15-2BB4**		1	1 unit	101	0.934
	0.18	0.6	0.55 ... 0.8	11-0HA10			B	**3RA22 10-0H□15-2BB4**		1	1 unit	101	0.934
	0.25	0.85	0.7 ... 1	11-0JA10			B	**3RA22 10-0J□15-2BB4**		1	1 unit	101	0.934
	0.37	1.1	0.9 ... 1.25	11-0KA10			B	**3RA22 10-0K□15-2BB4**		1	1 unit	101	0.934
	0.55	1.5	1.1 ... 1.6	11-1AA10			B	**3RA22 10-1A□15-2BB4**		1	1 unit	101	0.934
	0.75	1.9	1.4 ... 2	11-1BA10			B	**3RA22 10-1B□15-2BB4**		1	1 unit	101	0.934
	0.75	1.9	1.8 ... 2.5	11-1CA10			B	**3RA22 10-1C□15-2BB4**		1	1 unit	101	0.934
	1.1	2.7	2.2 ... 3.2	11-1DA10			B	**3RA22 10-1D□15-2BB4**		1	1 unit	101	0.934
	1.5	3.6	2.8 ... 4	11-1EA10			B	**3RA22 10-1E□15-2BB4**		1	1 unit	101	0.934
S0	1.5	3.6	3.5 ... 5	11-1FA10	24-1BB40	29 21-1BA00	B	**3RA22 20-1F□24-0BB4**		1	1 unit	101	1.811
	2.2	4.9	4.5 ... 6.3	11-1GA10		+	B	**3RA22 20-1G□24-0BB4**		1	1 unit	101	1.811
	3	6.5	5.5 ... 8	11-1HA10		29 23-1BB1 (RH)	B	**3RA22 20-1H□24-0BB4**		1	1 unit	101	1.811
	4	8.5	7 ... 10	11-1JA10		/29 23-1DB1 (RS)	B	**3RA22 20-1J□24-0BB4**		1	1 unit	101	1.811
	5.5	11.5	9 ... 12.5	11-1KA10			B	**3RA22 20-1K□24-0BB4**		1	1 unit	101	1.811
	7.5	15.5	11 ... 16	21-4AA10	26-1BB40		B	**3RA22 20-4A□26-0BB4**		1	1 unit	101	1.811
	7.5	15.5	14 ... 20	21-4BA10			B	**3RA22 20-4B□26-0BB4**		1	1 unit	101	1.811
	11	22	17 ... 22	21-4CA10	27-1BB40		B	**3RA22 20-4C□27-0BB4**		1	1 unit	101	1.811
	11	22	20 ... 25	21-4DA10			B	**3RA22 20-4D□27-0BB4**		1	1 unit	101	1.811
	15	29	27 ... 32	21-4EA10			B	**3RA22 20-4E□27-0BB4**		1	1 unit	101	1.811
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".								ToC 1				
S00	1.5	3.6	3.5 ... 5	11-1FA10	15-1BB42	19 21-1DA00	B	**3RA22 10-1F□15-2BB4**		1	1 unit	101	0.934
	2.2	4.9	4.5 ... 6.3	11-1GA10		+	B	**3RA22 10-1G□15-2BB4**		1	1 unit	101	0.934
	3	6.5	5.5 ... 8	11-1HA10		29 13-2AA1[4]	B	**3RA22 10-1H□15-2BB4**		1	1 unit	101	0.934
	4	8.5	7 ... 10	11-1JA10	16-1BB42	/29 13-1DB1 (RS)	B	**3RA22 10-1J□16-2BB4**		1	1 unit	101	0.934
	5.5	11.5	9 ... 12	11-1KA10	17-1BB42		B	**3RA22 10-1K□17-2BB4**		1	1 unit	101	0.934
	7.5	15.5	11 ... 16	11-4AA10	18-1BB42		B	**3RA22 10-4A□18-2BB4**		1	1 unit	101	0.934

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing					
• Without standard mounting rail adapter for size S00	**1**	**A**	None		
• With standard mounting rail adapter for size S0	**2**	**B**	None		
Screw fixing with 1 push-in lug each per load feeder is possible					
Order No. supplement for mounting onto 60 mm busbar	**1**	**D**	x	for size S00	0.486
With busbar adapter	**2**	**D**	x	for size S0	0.306

x = Additional price

1) For auxiliary switches see Accessories.

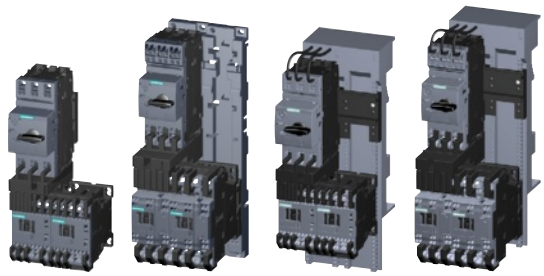
2) Selection depends on the concrete startup and rated data of the protected motor.

3) According to ordering option:
RH = assembly kit for reversing duty and standard rail mounting in size S0.
RS = assembly kit for reversing duty and busbar mounting.

4) With standard rail mounting or screw fixing, only the 3RA29 13-2AA1 wiring kit is needed for size S00.

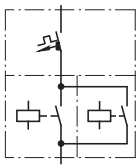
* You can order this quantity or a multiple thereof.
Illustrations are approximate

3RA22 reversing starters 24 V DC



3RA22 10 3RA22 20 3RA22 10 3RA22 20

Reversing duty



Rated control supply voltage 24 V DC
With spring-type connection

- The motor starter protector and contactor are mechanically and electrically connected by means of the link module.
- For size S0 with 2 standard mounting rail adapters for mechanical reinforcement
- Auxiliary switches[1] on the motor starter protector and the contactor can be easily fitted due to the modular system.
- With contactor S0, 1 NO contact is integrated

Size	Standard induction motor 4-pole at 400 V AC[2] Standard output P	Motor current I (guide value)	Setting range for thermal overload release	Consisting of the following single devices: Motor starter protector	+ 2 contactors	+ Link module + Assembly kit RH/RS[3]	DT	Fuseless load feeders, Spring-type terminals: Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	kW	A	A										kg
Type of coordination "2" at I_q = 153 kA at 400 V (compatible with type of coordination "1")													
				3RV20	**3RT20**	**3RA29**			ToC 2				
S00	0.06	0.2	0.14 ... 0.2	11-0BA20	15-2BB42	29 11-2AA00	B	**3RA22 10-0B□15-2BB4**		1	1 unit	101	1.042
	0.06	0.2	0.18 ... 0.25	11-0CA20		+	B	**3RA22 10-0C□15-2BB4**		1	1 unit	101	1.042
	0.09	0.3	0.22 ... 0.32	11-0DA20		29 13-2AA2[4]	B	**3RA22 10-0D□15-2BB4**		1	1 unit	101	1.042
	0.09	0.3	0.28 ... 0.4	11-0EA20		/29 13-1DB2 (RS)	B	**3RA22 10-0E□15-2BB4**		1	1 unit	101	1.042
	0.12	0.4	0.35 ... 0.5	11-0FA20			B	**3RA22 10-0F□15-2BB4**		1	1 unit	101	1.042
	0.18	0.6	0.45 ... 0.63	11-0GA20			B	**3RA22 10-0G□15-2BB4**		1	1 unit	101	1.042
	0.18	0.6	0.55 ... 0.8	11-0HA20			B	**3RA22 10-0H□15-2BB4**		1	1 unit	101	1.042
	0.25	0.85	0.7 ... 1	11-0JA20			B	**3RA22 10-0J□15-2BB4**		1	1 unit	101	1.042
	0.37	1.1	0.9 ... 1.25	11-0KA20			B	**3RA22 10-0K□15-2BB4**		1	1 unit	101	1.042
	0.55	1.5	1.1 ... 1.6	11-1AA20			B	**3RA22 10-1A□15-2BB4**		1	1 unit	101	1.042
	0.75	1.9	1.4 ... 2	11-1BA20			B	**3RA22 10-1B□15-2BB4**		1	1 unit	101	1.042
	0.75	1.9	1.8 ... 2.5	11-1CA20			B	**3RA22 10-1C□15-2BB4**		1	1 unit	101	1.042
	1.1	2.7	2.2 ... 3.2	11-1DA20			B	**3RA22 10-1D□15-2BB4**		1	1 unit	101	1.042
	1.5	3.6	2.8 ... 4	11-1EA20			B	**3RA22 10-1E□15-2BB4**		1	1 unit	101	1.042
S0	1.5	3.6	3.5 ... 5	11-1FA20	24-2BB40	29 23-2AA2		5)					
	2.2	4.9	4.5 ... 6.3	11-1GA20				5)					
	3	6.5	5.5 ... 8	11-1HA20				5)					
	4	8.5	7 ... 10	11-1JA20				5)					
	5.5	11.5	9 ... 12.5	11-1KA20				5)					
	7.5	15.5	11 ... 16	21-4AA20	26-2BB40	29 21-2AA00	B	**3RA22 20-4A□26-0BB4**		1	1 unit	101	1.998
	7.5	15.5	14 ... 20	21-4BA20		+	B	**3RA22 20-4B□26-0BB4**		1	1 unit	101	1.998
	11	22	17 ... 22	21-4CA20	27-2BB40	29 23-1BB2 (RH)	B	**3RA22 20-4C□27-0BB4**		1	1 unit	101	1.998
	11	22	20 ... 25	21-4DA20		/29 23-1DB2 (RS)	B	**3RA22 20-4D□27-0BB4**		1	1 unit	101	1.998
	15	29	27 ... 32	21-4EA20			B	**3RA22 20-4E□27-0BB4**		1	1 unit	101	1.998
Type of coordination "1" at I_q = 153 kA at 400 V (the motor starter protector is compatible with type of coordination "2")													
S00	For load feeders for lower outputs, see this table at type of coordination "2".								ToC 1				
S00	1.5	3.6	3.5 ... 5	11-1FA20	15-2BB42	29 11-2AA00	B	**3RA22 10-1F□15-2BB4**		1	1 unit	101	1.042
	2.2	4.9	4.5 ... 6.3	11-1GA20		+	B	**3RA22 10-1G□15-2BB4**		1	1 unit	101	1.042
	3	6.5	5.5 ... 8	11-1HA20		29 13-2AA2[4]	B	**3RA22 10-1H□15-2BB4**		1	1 unit	101	1.042
	4	8.5	7 ... 10	11-1JA20	16-2BB42	/29 13-1DB2 (RS)	B	**3RA22 10-1J□16-2BB4**		1	1 unit	101	1.042
	5.5	11.5	9 ... 12	11-1KA20	17-2BB42		B	**3RA22 10-1K□17-2BB4**		1	1 unit	101	1.042
	7.5	15.5	11 ... 16	11-4AA20	18-2BB42		B	**3RA22 10-4A□18-2BB4**		1	1 unit	101	1.042

			Additional price		Add. weight
Order No. supplement for mounting onto standard mounting rail or screw fixing					
• Without standard mounting rail adapter for size S00	**1**	**E**	None		
• With standard mounting rail adapter for size S0	**2**	**F**	None		
Screw fixing with 1 push-in lug each per load feeder is possible					
Order No. supplement for mounting onto 60 mm busbar	**1**	**H**	x	for size S00	0.495
With busbar adapter	**2**	**H**	x	for size S0	0.322

x = Additional price

1) For auxiliary switches see Accessories.

2) Selection depends on the concrete startup and rated data of the protected motor.

3) According to ordering option:
RH = assembly kit for reversing duty and standard rail mounting in size S0.
RS = assembly kit for reversing duty and busbar mounting.

4) With standard rail mounting or screw fixing, only the 3RA29 13-2AA2 wiring kit is needed for size S00.

5) These combinations are not available as ready-made 3RA2 feeders, but they can be discretely assembled. For feeder-orientated assembly it is possible to use the RH assembly kit for reversing duty and standard rail mounting (3RA29 23-1BB2) instead of the 3RA29 23-2AA2 wiring kit, in which case the contactors must be screwed onto the adapter.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Overview

The accessories listed here are parts and add-ons for the 3RA2 direct-on-line and reversing starters as well as components for the customer assembly of fuseless load feeders.

Selection and ordering data

Accessories for motor starter protectors

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RV29 01-1E


3RV29 01-2E


3RV29 01-1A


3RV29 01-2A

Version	For motor starter protectors	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
			Order No.	Price per PU			Order No.	Price per PU	
	Size				kg				kg
Auxiliary switches for motor starter protectors[1)]									
Transverse auxiliary switches for front mounting									
1 CO	S00/S0	A	**3RV29 01-1D**		0.014		**--**		
1 NO + 1 NC		A	**3RV29 01-1E**		0.016	A	**3RV29 01-2E**		0.016
Lateral auxiliary switches mountable on the left									
1 NO + 1 NC	S00/S0	A	**3RV29 01-1A**		0.036	A	**3RV29 01-2A**		0.035

1) One transverse auxiliary switch and one lateral auxiliary switch can be attached per motor starter protector. The lateral auxiliary switch with 2 NO + 2 NC is used without a transverse auxiliary switch.

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101


3RV29 02-1A..


3RV29 02-2A..

Rated control supply voltage U_s AC 50 Hz	AC 60 Hz	AC 50/60 Hz 100 % ON period[1)]	AC/DC 50/60 Hz, DC 5 s ON period[2)]	For motor starter protectors	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
						Order No.	Price per PU			Order No.	Price per PU	
V	V	V	V	Size				kg				kg
Auxiliary releases for motor starter protectors[3)]												
Undervoltage releases												
230	240	--	--	S00/S0	A	**3RV29 02-1AP0**		0.110	A	**3RV29 02-2AP0**		0.112
Shunt releases												
--	--	210 ... 240	190 ... 330	S00/S0	A	**3RV29 02-1DP0**		0.114	A	**3RV29 02-2DP0**		0.112

1) The voltage range is valid for 100 % (infinite) ON period. The response voltage lies at 0.9 of the lower limit of the voltage range.

2) The voltage range is valid for 5 s ON period at AC 50 Hz/60 Hz and DC. The response voltage lies at 0.85 of the lower limit of the voltage range.

3) One auxiliary release can be mounted on the right per motor starter protector (does not apply to 3RV21 motor starter protectors with overload relay function).

The complete range of accessories for the motor starter protectors can be found in Chapter 5 "Protection Equipment" --> "SIRIUS 3RV2 Motor Starter Protectors up to 40 A" --> "Accessories".

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Accessories

Accessories for contactors

	For contactors Size	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Auxiliary switch blocks for snapping onto the front for contactors									
 3RH29 11-1BA..				**Screw terminals**					
		Cable entry from below							
	S00	1-pole							
		- 1 NO	A	**3RH29 11-1BA10**		1	1 unit	101	0.020
		- 1 NC	A	**3RH29 11-1BA01**		1	1 unit	101	0.020
 3RH29 11-1MA..	S00	2-pole							
		- 1 NO + 1 NC	A	**3RH29 11-1MA11**		1	1 unit	101	0.050
		- 2 NO	A	**3RH29 11-1MA20**		1	1 unit	101	0.050
Laterally mountable auxiliary switch blocks for contactors									
 3RH29 11-1DA..				**Screw terminals**					
	S00	2 NC	A	**3RH29 11-1DA02**		1	1 unit	101	0.020
	S00	1 NO + 1 NC	A	**3RH29 11-1DA11**		1	1 unit	101	0.040
	S00	2 NO	A	**3RH29 11-1DA20**		1	1 unit	101	0.040
	S0	2 NC	A	**3RH29 21-1DA02**		1	1 unit	101	0.050
	S0	1 NO + 1 NC	A	**3RH29 21-1DA11**		1	1 unit	101	0.050
	S0	2 NO	A	**3RH29 21-1DA20**		1	1 unit	101	0.050
 3RH29 11-2DA..				**Spring-type terminals**					
	S00	2 NC	A	**3RH29 11-2DA02**		1	1 unit	101	0.050
	S00	1 NO + 1 NC	A	**3RH29 11-2DA11**		1	1 unit	101	0.050
	S00	2 NO	A	**3RH29 11-2DA20**		1	1 unit	101	0.050
	S0	2 NC	A	**3RH29 21-2DA02**		1	1 unit	101	0.050
	S0	1 NO + 1 NC	A	**3RH29 21-2DA11**		1	1 unit	101	0.050
	S0	2 NO	A	**3RH29 21-2DA20**		1	1 unit	101	0.050
Connection modules for contactors with screw terminals									
 3RT19 26-4RD01				**Screw terminals**					
		Adapters for contactors Ambient temperature $T_{u\,max.}$ = 60 °C							
	S00	Rated operational current I_e at AC-3/400 V: 20 A	B	**3RT19 16-4RD01**		1	1 unit	101	0.020
	S0	Rated operational current I_e at AC-3/400 V: 25 A	B	**3RT19 26-4RD01**		1	1 unit	101	0.200
 3RT19 00-4RE01		**Plugs for contactors**							
	S00, S0	--	B	**3RT19 00-4RE01**		1	1 unit	101	0.025

The complete range of accessories for the contactors can be found in Chapter 3 "Controls – Contactors and Contactor Assemblies" --> "Accessories and Spare Parts".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Surge suppressors without LED for contactors

3RT29 16-1B.00

3RT29 26-1E.00

For contactors	Version	Rated control supply voltage U_s [1]	DT	Order No. [2]	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Type		V							kg
Size S00									
For plugging onto the front side of the contactors with and without auxiliary switch blocks									
3RT2.	**Varistors**	24 ... 48 AC, 24 ... 70 DC	A	**3RT29 16-1BB00**		1	1 unit	101	0.010
		127 ... 240 AC, 150 ... 250 DC	A	**3RT29 16-1BD00**		1	1 unit	101	0.010
3RT2.	**RC elements**	24 ... 48 AC, 24 ... 70 DC	A	**3RT29 16-1CB00**		1	1 unit	101	0.010
		127 ... 240 AC, 150 ... 250 DC	A	**3RT29 16-1CD00**		1	1 unit	101	0.010
3RT2.	**Noise suppression diodes**	12 ... 250 DC	A	**3RT29 16-1DG00**		1	1 unit	101	0.010
3RT2.	**Diode assemblies** (diode and Zener diode) for DC operation and short break times	12 ... 250 DC	A	**3RT29 16-1EH00**		1	1 unit	101	0.010
Size S0									
For plugging onto the front side of the contactors (prior to mounting of the auxiliary switch block)									
3RT20 2	**Varistors**	24 ... 48 AC, 24 ... 70 DC	A	**3RT29 26-1BB00**		1	1 unit	101	0.010
		127 ... 240 AC, 150 ... 250 DC	A	**3RT29 26-1BD00**		1	1 unit	101	0.010
3RT20 2	**RC elements**	24 ... 48 AC, 24 ... 70 DC	A	**3RT29 26-1CB00**		1	1 unit	101	0.010
		127 ... 240 AC, 150 ... 250 DC	A	**3RT29 26-1CD00**		1	1 unit	101	0.010
3RT20 2	**Diode assemblies** For DC operation and short break times	24 DC	A	**3RT29 26-1ER00**		1	1 unit	101	0.010
		30 ... 250 DC	A	**3RT29 26-1ES00**		1	1 unit	101	0.010

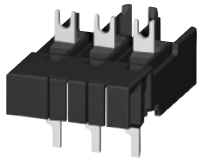
1) Can be used for AC operation for 50/60 Hz. Please inquire about further voltages.

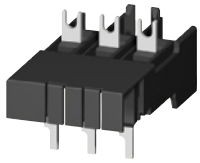
2) For packs of 10 or 5 units **"-Z"** and order code **"X90"** must be added to the Order No.

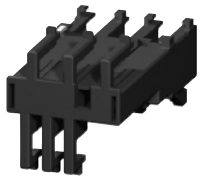
Accessories

Accessories for the customer assembly of fuseless load feeders

Link modules from motor starter protector to contactor

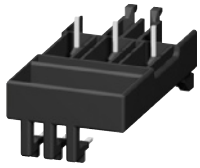

3RA29 21-1AA00

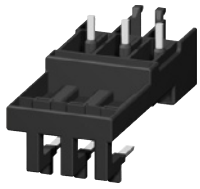

3RA29 21-1BA00


3RA29 11-2AA00

For motor starter protector Size	For contactors Size	Actuating voltage of contactor	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Electrical and mechanical link between motor starter protector and contactor				**Screw terminals**					
Single-unit packaging									
S00/S0	S00	AC and DC	▶	**3RA19 21-1DA00**		1	1 unit	101	0.028
S00/S0	S0	AC	A	**3RA29 21-1AA00**		1	1 unit	101	0.001
S00/S0	S0	DC	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
Multi-unit packaging									
S00/S0	S00	AC and DC	▶	**3RA19 21-1D**		1	10 units	101	0.021
S00/S0	S0	AC	A	**3RA29 21-1A**		1	10 units	101	0.001
S00/S0	S0	DC	A	**3RA29 21-1B**		1	10 units	101	0.001
Electrical and mechanical link between motor starter protector and contactor				**Spring-type terminals**					
Single-unit packaging									
S00	S00	AC and DC	A	**3RA29 11-2AA00**		1	1 unit	101	0.040
S0	S0	AC[1] and DC	A	**3RA29 21-2AA00**		1	1 unit	101	0.077
Multi-unit packaging									
S00	S00	AC and DC	A	**3RA29 11-2A**		1	10 units	101	0.400
S0	S0	AC[1] and DC	A	**3RA29 21-2A**		1	10 units	101	0.770

Hybrid link modules from motor starter protector to contactor

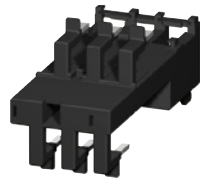

3RA29 11-2FA00


3RA29 21-2FA00

For mechanical and electrical connection between motor starter protector with screw terminals and contactor with spring-type terminals									
Single-unit packaging									
S00	S00	AC and DC	A	**3RA29 11-2FA00**		1	1 unit	101	0.029
S0	S0	AC[1] and DC	A	**3RA29 21-2FA00**		1	1 unit	101	0.056
Multi-unit packaging									
S00	S00	AC and DC	A	**3RA29 11-2F**		1	10 units	101	0.290
S0	S0	AC[1] and DC	A	**3RA29 21-2F**		1	10 units	101	0.560

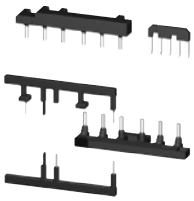
[1] A spacer for height compensation on AC contactors with spring-type terminals, size S0 is optionally available, see page 6/28.

Link modules from motor starter protector to soft starter


3RA29 21-2GA00

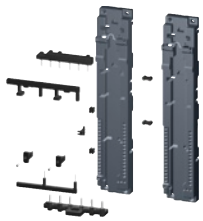
For motor starter protector Size	For soft starters Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Electrical and mechanical link between motor starter protector and soft starter			**Screw terminals**					
Single-unit packaging								
S00/S0	S00/S0	A	**3RA29 21-1BA00**		1	1 unit	101	0.001
Multi-unit packaging								
S00/S0	S00/S0	A	**3RA29 21-1B**		1	10 units	101	0.001
Electrical and mechanical link between motor starter protector and soft starter			**Spring-type terminals**					
Single-unit packaging								
S00	S00	A	**3RA29 11-2GA00**		1	1 unit	101	0.038
S0	S0	A	**3RA29 21-2GA00**		1	1 unit	101	0.072
Multi-unit packaging								
S00	S00	A	**3RA29 11-2G**		1	10 units	101	0.380
S0		A	**3RA29 21-2G**		1	10 units	101	0.720

* You can order this quantity or a multiple thereof.
Illustrations are approximate

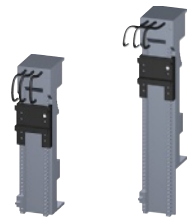
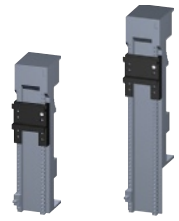
	For contactors Size	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Wiring kits for contactors									
 3RA29 23-2AA1				**Screw terminals**					
		Reversing duty							
	S00	Electrical and mechanical connection for	A	**3RA29 13-2AA1**		1	1 unit	101	0.001
	S0	reversing contactors, optionally with inte-	A	**3RA29 23-2AA1**		1	1 unit	101	0.001
		grated electrical and mechanical interlock							
 3RA29 23-2BB1		**Wye-delta starting**							
	S00	Electrical and mechanical link for three	A	**3RA29 13-2BB1**		1	1 unit	101	0.001
	S0	contactors of same size	A	**3RA29 23-2BB1**		1	1 unit	101	0.001
				**Spring-type terminals**					
		Reversing duty							
	S00	Electrical and mechanical connection for	A	**3RA29 13-2AA2**		1	1 unit	101	0.001
	S0	reversing contactors, optionally with inte-	A	**3RA29 23-2AA2**		1	1 unit	101	0.001
		grated electrical and mechanical interlock							
 3RA29 23-2AA2		**Wye-delta starting**							
	S00	Electrical and mechanical link for three	A	**3RA29 13-2BB2**		1	1 unit	101	0.001
	S0	contactors of same size	A	**3RA29 23-2BB2**		1	1 unit	101	0.001
Safety main current connectors for 2 contactors									
 3RA29 16-1A		Switches 2 contactors in series		**Screw terminals**					
	S00		A	**3RA29 16-1A**		1	1 unit	101	0.001
	S0		A	**3RA29 26-1A**		1	1 unit	101	0.001

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	For motor starter protector	For contac-tors	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Size	Size								kg
Standard mounting rail adapters										
 3RA29 22-1AA00			For mechanical fixing of motor starter protector and contactor; for snapping onto standard mounting rail or for screw fixing							
	S00, S0	S00, S0	**Single-unit packaging**	A	**3RA29 22-1AA00**		1	1 unit	101	0.001
	S00, S0	S00, S0	**Multi-unit packaging**	A	**3RA29 22-1A**		1	5 units	101	0.001
Side modules for standard mounting rail adapters										
 3RA19 02-1B	S00/S0	S00/S0	For standard mounting rail adapters 10 mm wide, 96 mm long, for widening standard mounting rail adapters when using lateral auxiliary switches, 2 units required	►	**3RA19 02-1B**		1	10 units	101	0.009
RH assembly kits for reversing duty and standard rail mounting in size S0										
 3RA29 23-1BB1	**RH assembly kits for screw terminals**				**Screw terminals**					
	S0	S0	Comprising: • Wiring kits • 2 standard mounting rail adapters • 2 connecting wedges Link modules must be ordered separately.	A	**3RA29 23-1BB1**		1	1 unit	101	0.001
	RH assembly kits for spring-type terminals				**Spring-type terminals**					
	S0	S0	Comprising: • Wiring kits • 2 standard mounting rail adapters • 2 connecting wedges • Spacers Link modules must be ordered separately.	A	**3RA29 23-1BB2**		1	1 unit	101	0.001
Push-in lugs for screw fixing										
 3RV29 28-0B	S00, S0	--	For screwing the motor starter protector onto mounting plates; for each motor starter protector, 2 units are required.	A	**3RV29 28-0B**		100	10 units	101	0.100

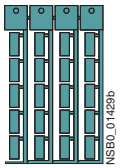
* You can order this quantity or a multiple thereof.
Illustrations are approximate

	For motor starter protector	For contac-tors	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	Size	Size								kg
Busbar adapters for 60 mm systems										
 8US12 51-5DS10 8US12 51-5DT11	For flat copper profiles according to DIN 46433 Width: 12 mm and 30 mm Thickness: 5 mm and 10 mm also for T and double-T special profiles									
	For motor starter protectors and contactors with screw terminals				**Screw terminals**					
	S00	S00	Rated current 16 A, 45 mm wide, 200 mm long	▶	**8US12 51-5DS10**		1	1 unit	143	0.183
	S0	S0	Rated current 32 A, 45 mm wide, 260 mm long	▶	**8US12 51-5NT10**		1	1 unit	143	0.183
	For motor starter protectors and contactors with spring-type terminals				**Spring-type terminals**					
	S00	S00	Rated current 16 A, 45 mm wide, 260 mm long	▶	**8US12 51-5DT11**		1	1 unit	143	0.183
	S0	S0	Rated current 32 A, 45 mm wide, 260 mm long	▶	**8US12 51-5NT11**		1	1 unit	143	0.183
Device holders for lateral mounting onto busbar adapters for 60 mm system										
 8US12 50-5AS10 8US12 50-5AT10	S00, S0	S00, S0	Up to 25 A, 45 mm wide, 200 mm long	▶	**8US12 50-5AS10**		1	1 unit	143	0.183
	S0	S0	Up to 400 A, 45 mm wide, 260 mm long	▶	**8US12 50-5AT10**		1	1 unit	143	0.183
Side modules for widening busbar adapters										
	--	--	Including connecting wedges, for widening busbar adapters or device holders, 9 mm wide, 200 mm long	A	**8US19 98-2BJ10**		1	1 unit	143	0.023
Spacers for fixing the load feeder onto the busbar adapter										
	--	S00, S0	(1 pack = 100 units)	▶	**8US19 98-1BA10**		1	10 units	143	0.183
Vibration and shock kits for high vibration and shock loads										
	--	S00, S0		▶	**8US19 98-1CA10**		1	1 unit	143	0.183
RS assembly kits for reversing duty for 60 mm busbar systems										
	RS assembly kits for screw terminals				**Screw terminals**					
	S00, S0	S00	Comprising:	A	**3RA29 13-1DB1**		1	1 unit	101	0.001
	S0	S0	• Wiring kits	A	**3RA29 23-1DB1**		1	1 unit	101	0.001
	S00	S0	• Busbar adapters • Device holders • 2 connecting wedges • Side modules	A	**3RA29 23-1EB1**		1	1 unit	101	0.001
			Link modules must be ordered separately.							
	RS assembly kits for spring-type terminals				**Spring-type terminals**					
	S00	S00	Comprising:	A	**3RA29 13-1DB2**		1	1 unit	101	0.001
	S0	S0	• Wiring kits • Busbar adapters • Device holders • 2 connecting wedges • Spacers • Side modules	A	**3RA29 23-1DB2**		1	1 unit	101	0.001
			Link modules must be ordered separately.							

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	For motor starter protector Size	For contac-tors Size	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Connecting wedges										
 8US19 98-1AA00	For mechanical linking of busbar adapters and device holders or of standard mounting rail adapt-ers (2 units per combination required)			▶	**8US19 98-1AA00**		100	100 units	143	0.100
Spacers										
 3RA29 11-1CA00	For height compensation on AC contactors size S0 with spring-type terminals				**Spring-type terminals**					
	S0	S0	**Single-unit packaging**	A	**3RA29 11-1CA00**		1	1 unit	101	0.001
	S0	S0	**Multi-unit packaging**	A	**3RA29 11-1C**		1	5 units	101	0.001

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for opening spring-type terminals by hand								
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals		**Spring-type terminals**					
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels								
 3RT19 00-1SB20	**Unit labeling plates**[1] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200
Documentation								
	Configuration manuals for new combinations of load feeders Information and assignment tables for combinations for customer assembly							
	• German	C	**3ZX1012-0RA21-1AB0**		1	1 unit	191	0.165
	• English	C	**3ZX1012-0RA21-1AC0**		1	1 unit	191	0.165

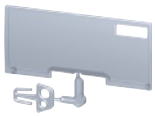
[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Function modules for mounting onto SIRIUS 3RT2 contactors for connection to the control system[1) 2)]

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101

	Version	DT	Screw terminals Order No.	Price per PU	Weight per PU approx. kg	DT	Spring-type terminals Order No.	Price per PU	Weight per PU approx. kg
Function modules for direct-on-line starting									
 3RA27 11-1AA00	**IO-Link connections** include: • 1 module connector (short) for assembling an IO-Link group • 2 interface covers	B	**3RA27 11-1AA00**		0.080	B	**3RA2711-2AA00**		0.075
 3RA27 11-2AA00	**AS-Interface connections**	B	**3RA27 12-1AA00**		0.075	B	**3RA27 12-2AA00**		0.075
Function modules for reversing starting									
 3RA27 11-1BA00	**IO-Link connections** include: • 1 basic module • 1 coupling module • 2 module connectors (short) for assembling an IO-Link group • 2 Interface covers	B	**3RA27 11-1BA00**		0.155	B	**3RA27 11-2BA00**		0.145
 3RA27 11-2BA00	**AS-Interface connections** include: • 1 basic module • 1 coupling module • 1 module connector (short) • 1 interface cover	B	**3RA27 12-1BA00**		0.150	B	**3RA27 12-2BA00**		0.145
Function modules for wye-delta starting									
 3RA27 12-1CA00	**IO-Link connections** include: • 1 basic module • 2 coupling modules • 3 module connectors (short) for assembling an IO-Link group • 2 Interface covers	B	**3RA27 11-1CA00**		0.190	B	**3RA27 11-2CA00**		0.185
 3RA27 11-2CA00	**AS-Interface connections** include: • 1 basic module • 2 coupling modules • 2 module connectors (short) • 1 interface cover	B	**3RA27 12-1CA00**		0.185	B	**3RA27 12-2CA00**		0.185

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories for function modules								
 3RA27 11-0EE0.	**Module connectors**							
	• 10-pole, 8 cm, for additional auxiliary voltage supply inside an IO-Link group	B	**3RA27 11-0EE04**		1	1 unit	101	0.001
	• 14-pole							
	- 8 cm, for size jump S00-S0 + 1 space	B	**3RA27 11-0EE02**		1	1 unit	101	0.001
	- 21 cm, for size jump S00-S0, for diverse space combinations	B	**3RA27 11-0EE03**		1	1 unit	101	0.001
 3RA29 10-0	**Sealable covers** for wye-delta function modules	B	**3RA29 10-0**		1	5 units	101	0.002

1) For description see Chapter 3 "Controls – Contactors and Contactor Assemblies".

2) The function modules for connection to the control system can be used only in combination with a contactor with a communications interface. These contactors are not included as standard in the preassembled 3RA2 load feeders. The corresponding contactors can be found in Chapter 3 "Controls – Contactors and Contactor Assemblies".

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Operator panels for communication through IO-Link								
 3RA69 35-0A	**Operator panels (set)** • 1 x operator panel • 1 x 3RA69 36-0A enabling module • 1 x blanking cover • 1 x fixing terminal For size S00/S0	A	**3RA69 35-0A**		1	1 unit	121	0.052
	Connection cables Length 2 m, 10- to 14-pole, for connection from the operator panel to the coupling module, for size S00/S0	B	**3RA27 11-0EE11**		1	1 unit	101	0.001
	Enabling modules (spare part) for size S00/S0	A	**3RA69 36-0A**		1	1 unit	121	0.002
	Interface covers for size S00/S0	A	**3RA69 33-0B**		1	5 units	121	0.012

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Types of infeed for 3RA2 fuseless load feeders

On the whole four different power infeed possibilities are available:

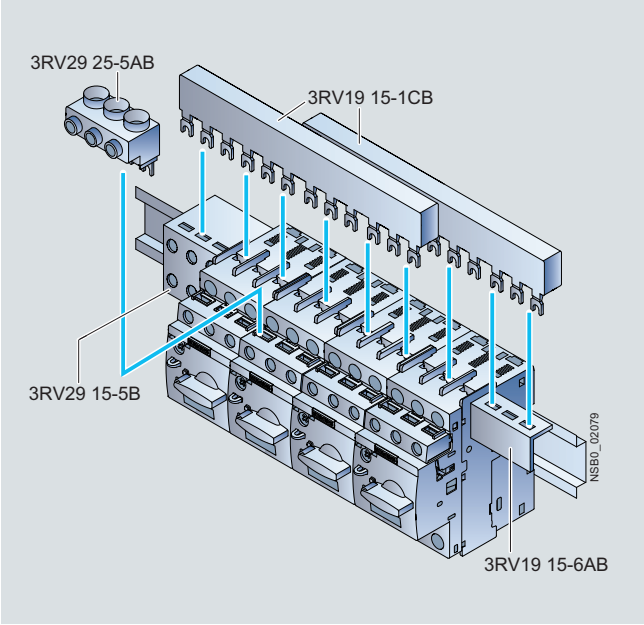
- Parallel wiring
- Use of three-phase busbars (combination with SIRIUS motor starter protectors and contactors possible)
- 8US busbar adapters
- SIRIUS 3RV29 infeed systems

Insulated three-phase busbar systems

Three-phase busbar systems provide an easy, time-saving and clearly arranged means of feeding 3RA2 load feeders with screw terminals. Different versions are available for sizes S00 and S0 and can also be used for the various different types of motor starter protectors.

The busbars are suitable for between 2 and 5 feeders. However, any kind of extension is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor starter protector.

A combination of feeders of different sizes is possible with sizes S00 and S0. Connecting pieces are available for this purpose. The motor starter protectors are supplied by appropriate feeder terminals.



Three-phase busbar system size S00/S0

The three-phase busbar systems are finger-safe. They are designed for any short-circuit stress which can occur at the output side of connected motor starter protectors.

The three-phase busbar systems can also be used to construct "Type E Starters" of size S0 or S2 according to UL/CSA. Special feeder terminals must be used for this purpose however.

For selection and ordering data see Chapter 5 "Protection Equipment" --> "SIRIUS 3RV2 Motor Starter Protectors up to 40 A" --> "Accessories" --> "Busbar Accessories".

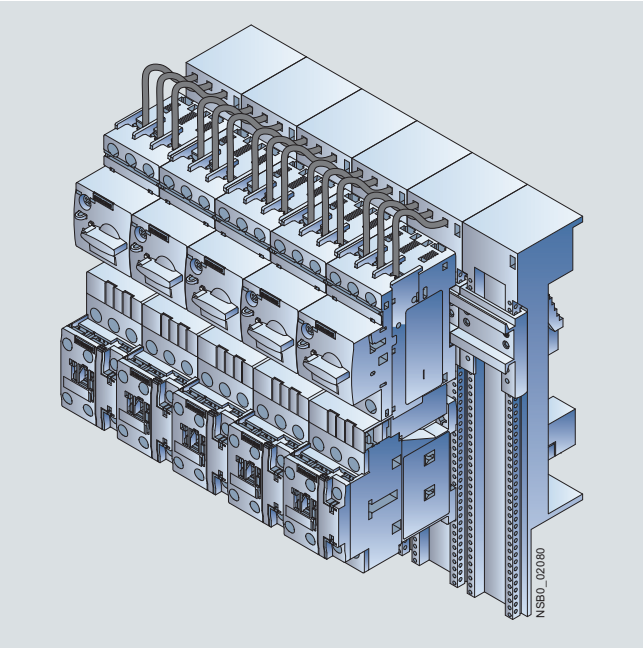
8US busbar adapters for 60 mm systems

The load feeders are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs.

The busbar adapters for busbar systems with 60 mm center-to-center clearance are suitable for copper busbars with a width of 12 to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The feeders are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For "Selection and ordering data" see page 6/27.



Load feeders with busbar adapters snapped onto busbars

SIRIUS 3RV29 infeed systems

The 3RV29 infeed system is a convenient means of energy supply and distribution for a group of several motor starter protectors or complete load feeders with a screw or spring-type connection up to size S0.

The system is based on a basic module complete with a lateral incoming unit (three-phase busbar with infeed) which has two slots.

Expansion modules are available for extending the system (three-phase busbars for system expansion).

For 3RV29 infeed system see Chapter 5 "Protection Equipment" --> "SIRIUS 3RV2 Motor Starter Protectors up to 40 A" --> "Accessories" --> "3RV29 Infeed System".

Overview

3RA6 fuseless compact starters and infeed system for 3RA6

3RA62 reversing starter

Integrated functionality

The SIRIUS 3RA6 compact starters are a generation of innovative load feeders with the integrated functionality of a motor starter protector, contactor and solid-state overload relay. In addition, various functions of optional mountable accessories (e. g. auxiliary switches, surge suppressors) are already integrated in the SIRIUS compact starter.

Application

The SIRIUS compact starters can be used wherever standard induction motors up to 32 A (approx. 15 kW/400 V) are directly started.

Approvals according to IEC, UL and CSA standards have been issued for the compact starters.

Low equipment variance

Thanks to wide setting ranges for the rated current and wide voltage ranges, the equipment variance is greatly reduced compared to conventional load feeders.

Very high operational reliability

Through the high short-circuit breaking capacity and defined shut-down when the end of service life is reached means that the SIRIUS compact starter achieves a very high level of operational reliability that would otherwise have only been possible with considerable additional outlay. This sets it apart from devices with similar functionality.

Safe disconnection

The auxiliary switches of the 3RA6 compact starters are designed as mirror contacts. It is thus possible to use the devices for safe disconnection, e. g. emergency-stops, up to Category 2 (EN 954-1) and together with other redundancy switching devices up to Category 3 or 4.

Communications integration through AS-Interface

To enable communications integration through AS-Interface there is an AS-i add-on module available in several versions for mounting instead of the control circuit terminals on the SIRIUS compact starter.

The design of the AS-i add-on module permits a group of up to 62 feeders with a total of four cables to be connected to the control system. This reduces wiring work considerably compared to the parallel wiring method.

Communications integration using IO-Link

Up to 4 compact starters in IO-Link version (reversing and direct-on-line starters) can be connected together and conveniently linked to the IO-Link master through a standardized IO-Link connection. The SIRIUS 4SI solid-state module is used for example as an IO-Link master for connection to the SIMATIC ET 200S distributed I/O system.

The IO-Link connection enables a high density of information in the local range.

For details of the communications integration using IO-Link see Chapter 2 "Industrial Communication" --> "IO-Link".

The diagnostics data of the process collected by the 3RA6 compact starter, e. g. short-circuit, end of service life, limit position etc., are not only indicated on the compact starter itself but also transmitted to the higher-level control system through IO-Link.

Thanks to the optionally available operator panel, which can be installed in the control cabinet door, it is easy to control the 3RA6 compact starter with IO-Link from the control cabinet door.

Permanent wiring / easy replacement

Using the SIRIUS infeed system for 3RA6 (see page 6/52) it is possible to carry out the wiring in advance without a compact starter needing to be connected.

A compact starter is very easily replaced simply by pulling it out of the device without disconnecting the wiring.

Even with screw connections or mounting on a standard mounting rail there is no need to disconnect any wiring (on account of the removable main and control circuit terminals) in order to replace a compact starter.

Consistent solution from the infeed to the motor feeder

The SIRIUS infeed system for 3RA6 with integrated PE bar is offered as a user-friendly possibility of feeding in summation currents up to 100 A with a maximum conductor cross-section of 70 mm² and connecting the motor cable directly without additional intermediate terminals.

Screw and spring-type connections

The SIRIUS compact starters and the infeed system for 3RA6 are available with screw and spring-type connections.

	Screw terminals
	Spring-type terminals
	These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

System configurator for engineering

A free system configurator is available to reduce further the amount of engineering work for selecting the required compact starters and matching infeed.

Types of infeed for the 3RA6 fuseless compact starters

On the whole four different infeed possibilities are available:

- Parallel wiring
- Use of three-phase busbars (combination with SIRIUS motor starter protectors and SIRIUS contactors possible)
- 8US busbar adapters
- SIRIUS infeed system for 3RA6 (see page 6/52)

To comply with the clearance and creepage distances demanded according to UL 508 there are the following infeed possibilities:

Type of infeed	Feeder terminal (according to UL 508, type E)	Type
Parallel wiring	Terminal block for "Self-Protected Combination Motor Controller (Type E)"	**3RV19 28-1H**
Three-phase busbars	Three-phase infeed terminal for constructing "Type E Starters", UL 508	**3RV19 25-5EB**
Infeed systems for 3RA6	Infeed on left, 50/70 mm^2, screw terminal with 3 sockets, outgoing terminal with screw/spring-type connections, including PE bar	**3RA68 13-8AB** (screw terminals), **3RA68 13-8AC** (spring-type terminals)

SIRIUS 3RA6 compact starters

The SIRIUS 3RA6 compact starters are universal motor feeders according to IEC/EN 60947-6-2. As control and protective switching devices (CPS) they can connect, convey and disconnect the thermal, dynamic and electrical loads from short-circuit currents up to I_q = 53 kA, i.e. they are practically weld-free. They combine the functions of a motor starter protectors, a contactor and a solid-state overload relay in a single enclosure and can be used wherever standard induction motors up to 32 A (up to approx. 15 kW at 400 V AC) are started directly. Available versions are the direct-on-line starters are available with 45 mm width and the reversing starters with 90 mm width.

The reversing starter version comes with not only an internal electrical interlock but also with a mechanical interlock to prevent simultaneous actuation of both directions of rotation.

3RA6 fuseless compact starters are supplied in 5 current setting ranges. The 3RA61 and 3RA62 have 3 control voltage ranges (AC/DC), the 3RA64 and 3RA65 have one control voltage range (DC):

Current setting range	At 400 V AC for induction motors Standard output P	Rated control supply voltage for 3RA61, 3RA62 compact starters	Rated control supply voltage for 3RA64, 3RA65 compact starters for IO-Link
A	kW	V AC/DC	V DC
0.1 ... 0.4	0.09	24 42 ... 70 110 ... 240	24
0.32 ... 1.25	0.37		
1 ... 4	1.5		
3 ... 12	5.5		
8 ... 32	15		

Note:

The 3RA1 load feeders can be used for fuseless load feeders > 32 A up to 100 A.

The SENTRON 3VL circuit breakers and the SIRIUS 3RT contactors can be used for fuseless load feeders >100 A.

Operating conditions

The SIRIUS 3RA6 compact starters are suitable for use in any climate. They are intended for use in enclosed rooms in which no severe operating conditions (such as dust, caustic vapors, hazardous gases) prevail. Suitable covers must be provided for installation in dusty and damp locations.

The SIRIUS compact starters are generally designed to degree of protection IP20. The permissible ambient temperature during operation is -20 to +60 °C.

The limited short-circuit current based on IEC/EN 60947-6-2 is 53 kA at 400 V.

Note:

More technical specifications can be found in the system manual at

www.siemens.com/compactstarter

Overload tripping times

The overload tripping time can be set on the device to less than 10 s (CLASS 10) and less than 20 s (CLASS 20 for heavy starting). As the breaker mechanism still remains closed after an overload, resetting is possible by either local manual reset or autoreset after 3 minutes cooling time.

With autoreset there is no need to open the control cabinet.

Diagnostics options

The compact starter provides the following diagnostics options on site:

- With LEDs
  - Connection to the control voltage
  - Position of the main contacts
- With mechanical indication
  - Tripping due to overload
  - Tripping due to short-circuit
  - Tripping due to malfunction (end of service life reached because of worn switching contacts or a worn switching mechanism or faults in the control electronics)

These states can also be evaluated in the higher-level control system:

- With parallel wiring using the integrated auxiliary and signaling switches of the compact starter
- With AS-Interface or IO-Link in even greater detail using the respective communication interface

Four complement variants for 3RA6 compact starters

- For standard mounting rail or screw fixing:
  basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals
- For standard mounting rail or screw fixing when using the AS-i add-on module:
  without control circuit terminals because the AS-i add-on module is plugged on instead
- For use with the infeed system for 3RA6:
  without main circuit terminals because they are supplied with the infeed system and the expansion modules
- For use with the infeed system for 3RA6 and AS-i add-on module:
  without terminal complement (also for reordering when replacing the compact starter)
- The control circuit terminals are always required by the compact starters for IO-Link; the main circuit terminals depend on the use of the infeed system.

General data

Order No. scheme

Digit of the Order No.	1st - 4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□□	□	□	□	–	□	□	□	□	□	–	□	□	□	□
SIRIUS 3RA6 compact starters	**3 R A 6**														
Version (direct-on-line starter = 1, reversing starter = 2, direct-on-line starter for IO-Link = 4, reversing starter for IO-Link = 5, infeed system = 8, accessories = 9)		□													
Details of accessories			□	□											
Connection method (0 = without terminals, 1 = screw terminals, 2 = spring-type terminals)						□									
Setting range							□								
Rated control supply voltage								□	□						
Terminals complement variant										□					
Special versions												□	□	□	□
Example	**3 R A 6**	**1**	**2**	**0**	**–**	**0**	**A**	**B**	**3**	**0**					

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Benefits

The SIRIUS 3RA6 compact starters offer a number of advantages:

- Compact design saves space in the control cabinet
- Little planning and assembly work and far less wiring thanks to a single complete unit with one order number
- Little variance through 3 wide voltage ranges and 5 wide setting ranges for the rated current mean low stock levels
- High plant availability through integrated functionalities such as prevention of main contact welding and shut-down at end of service life
- Greater productivity through automatic device reset in case of overload and differentiated detection of overload and short-circuit
- Easy checking of the wiring and testing of the motor direction prior to start-up thanks to optional control kits
- Speedy replacement of devices thanks to removable terminals with spring-type and screw connections in the main and control circuit
- Efficient power distribution through the related SIRIUS infeed system for 3RA6
- Direct connection of the motor feeder cable to the SIRIUS infeed system for 3RA6 thanks to integrated PE bar
- Connecting and looping through incoming feeders up to a cross-section of 70 mm^2
- When using the infeed system for 3RA6, possibility of directly connecting the motor cable without intermediate terminals
- Integration in Totally Integrated Automation thanks to the optional connection to AS-Interface or IO-Link

The SIRIUS 3RA6 compact starters create the basis for high-availability and future-proof machine concepts.

More information

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
General technical specifications						
Device standard			IEC/EN 60947-6-2			
Max. rated current I_e in the respective setting range	0.1 ... 0.4 A 0.32 ... 1.25 A 1 ... 4 A 3 ... 12 A 8 ... 32 A	A A A A A	0.4 1.25 4 12 32			
Permissible ambient temperature • During operation • For installation in SIRIUS infeed system for 3RA6 • During storage • During transport	 Acc. to IEC/EN 60721-3-3 IEC/EN 60732-3-1 IEC/EN 60721-3-2	 °C °C °C °C	 -20 ... +60, with restriction up to +70 -20 ... +40 -55 ... +80 -55 ... +80			
Permissible rated current of the compact starter, when several compact starters are mounted side-by-side on a vertical standard mounting rail or in the 3RA6 infeed system • For a control cabinet inside temperature of • For a control cabinet inside temperature of	 +40 °C +60 °C	 % %	 100 80			
Relative air humidity		%	10 ... 90			
Installation altitude		m	Up to 2000 above sea level without restriction			
Rated frequency		Hz	50/60			
Rated insulation voltage U_i (pollution degree 3)		V	690			
Rated impulse withstand voltage U_{imp}		kV	6			
Trip class (CLASS)	Acc. to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)		10/20			
Rated short-circuit current I_q **at AC 50/60 Hz 400 V**	Acc. to IEC 60947-4-1, EN 60947-4-1 (VDE 0660 Part 102)	kA	53 kA			
Types of coordination	Acc. to IEC 60947-6-2, EN 60947-6-2 (VDE 0660 Part 102)		Continuously			
Power loss $P_{v\,max}$ of all main current paths Dependent on the rated current I_e (upper setting range)	0.4 A 1.25 A 4 A 12 A 32 A	mW mW W W W	10 100 1 1.8 5.4			
Max. switching frequency	AC-41 AC-43 AC-44	1/h 1/h 1/h	750 250 15			
Drive losses Active power	 At 24 V • 0.1 ... 12 A • 8 ... 32 A At 42 ... 70 V • 0.1 ... 12 A • 8 ... 32 A At 110 ... 240 V • 0.1 ... 12 A • 8 ... 32 A	 W W W W W W	 2.7 2.95 2.5 3.0 3.4 3.8			
Overload function Ratio of lower to upper current mark			1:4			
Shock resistance (sine-wave pulse)			a = 60 m/s² = 6 g with 10 ms; for every 3 shocks in all axes			
Vibratory load			f = 4 ... 5.8 Hz; d =15 mm; f = 5.8 ... 500 Hz; a = 20 m/s²;10 cycles			
Degree of protection	Acc. to IEC 60947-1		IP20			
Touch protection	Acc. to DIN VDE 0106, Part 100		Finger-safe			
Isolating features of the compact starter	Acc. to IEC/EN 60947-3		Yes			
Main and EMERGENCY-STOP switch characteristics of the compact starter and accessories	Acc. to IEC/EN 60204		Yes			

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
General technical specifications (continued)						
Protective separation	Acc. to IEC 60947-2					
Control circuit to auxiliary circuit						
• Horizontal standard mounting rail		V	Up to 400			
• Other mounting position		V	Up to 250			
Auxiliary circuit to auxiliary circuit						
• Horizontal standard mounting rail		V	Up to 400			
• Other mounting position		V	Up to 250			
Main circuit to auxiliary circuit						
• Any mounting position		V	Up to 400			
EMC interference immunity	Acc. to IEC/EN 60947-1		Corresponds to degree of severity 3			
Conductor-related interference	BURST acc. to IEC/EN 61000-4-4					
• In the main circuit		kV	4		4	
• In the auxiliary circuit		kV	3		2	
Conductor-related interference	SURGE acc. to IEC/EN 61000-4-5					
• In the main circuit						
- Conductor - Ground		kV	4		2	
- Conductor - Conductor		kV	2		1	
• In the auxiliary circuit						
- Conductor - Ground		kV	2		0.5[1]	
- Conductor - Conductor		kV	1		0.5[1]	
Auxiliary switches						
• Integrated						
- Position of the main contacts			1 NO + 1 NC	2 NO	1 NO + 1 NC	2 NO
- Overload/short-circuit signal			1 CO/1 NO			
• Expandable						
- Position of the main contacts			2 NO, 2 NC, 1 NO, 1 NC			
Surge suppressors			Integrated (Varistor)			
Pollution degree			3			
Depth from standard mounting rail		mm	160			
Electromagnetic operating mechanism						
Control voltage		V V V	24 AC/DC 42 ... 70 AC/DC 110 ... 240 AC/DC		24 DC -- --	
Frequency	At AC	Hz	50/60 (±5 %)			
Primary operating range			0.7 ... 1.25 U_s		0.85 ... 1.2 U_s	
No-load switching frequency		1/h	3600			
Make-time		ms	max. 70		Max. 70 + IO-Link communication	
Break-time		ms	max. 120		Max. 120 + IO-Link communication	

[1] To maintain maximum interference immunity in a harsh electromagnetic environment, additional overvoltage protection should be provided in the control supply current circuit. A suitable choice is for example the Dehn Blitzductor BVT AD 24 V, Art. No. 918 402 or an equivalent protective element.
Manufacturer: DEHN+SÖHNE GmbH+Co. KG, Hans-Dehn-Straße. 1, Postfach 1640, D-92306 Neumarkt

General data

Type Size Number of poles			3RA61 S0 3	3RA62	3RA64	3RA65
Electromagnetic operating mechanism (continued)						
Switching capacity at 400 V		kA	53			
Switching capacity at 690 V		kA	3			
Line protection	At 10 kA At 50 kA	mm² mm²	2.5 4			
Shock resistance • Breaker mechanism OFF • Breaker mechanism ON		 *g* *g*	 25 15			
Normal switching duty						
Making capacity			12 x I_n			
Breaking capacity			10 x I_n			
Switching capacity dependent on rated current	Up to 12 A Up to 32 A	kW kW	5.5 15			
Endurance in operating cycles • Electrical endurance	 At I_e = 0.9 x I_n and 400 V		 3 ... 10 000 000	 2 x 3 ... 10 000 000	3 000 000	2 x 1 500 000
Control circuit						
Rated operational voltage • External auxiliary switch block • Internal auxiliary switch • Short-circuit signaling switch • Overload signaling switch		 V V V V	 400/690 400/690 400 400			
Switching capacity • External auxiliary switch block	**AC-15** • At U_e = 230 V • At U_e = 400 V • At U_e = 289/500 V • At U_e = 400/690 V **DC-13** • At U_e = 24 V • At U_e = 60 V • At U_e = 125 V • At U_e = 250 V	 A A A A A A A A	 6 3 2 1 6 0.9 0.55 0.27			
• Internal auxiliary switch	**AC-15** • At U_e = 230 V • At U_e = 400 V • At U_e = 289/500 V • At U_e = 400/690 V **DC-13** • At U_e = 24 V • At U_e = 60 V • At U_e = 125 V • At U_e = 250 V • At U_e = 480 V	 A A A A A A A A A	 6 3 2 1 10 2 1 0.27 0.1			
• Signaling switch	**AC-15** • At U_e = 230 V • At U_e = 400 V **DC-13** • At U_e = 24 V • At U_e = 250 V	 A A A A	 3 1 2 0.11			

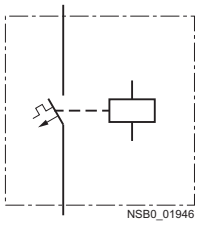
Type Size Number of poles			**3RA61** **S0** **3**	**3RA62**	**3RA64**	**3RA65**
External auxiliary switch block, internal auxiliary switch						
Endurance in operating cycles						
• Mechanical endurance			10 000 000		3 000 000	
• Electrical endurance	**AC-15, 230 V**					
	• At 6 A		200 000			
	• At 3 A		500 000			
	• At 1 A		2 000 000			
	• At 0.3 A		10 000 000			
	DC-13, 24 V					
	• At 6 A		300 00			
	• At 3 A		100 000			
	• At 0.5 A		2 000 000			
	• At 0.2 A		10 000 000			
	DC-13, 110 V					
	• At 1 A		40 000			
	• At 0.55 A		100 000			
	• At 0.3 A		300 000			
	• At 0.1 A		2 000 000			
	• At 0.04 A		10 000 000			
	DC-13, 220 V					
	• At 0.3 A		110 000			
	• At 0.1 A		650 000			
	• At 0.05 A		2 000 000			
	• At 0.018 A		10 000 000			
Contact stability	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
Short-circuit protection						
• Short-circuit current $I_K \leq 1.1$ kA	Fuse links operational class gG - NEOZED Type 5SE - DIAZED Type 5SB - LV HRC Type 3NA	A	10			
• Short-circuit current $I_K < 400$ A	Miniature circuit breaker up to 230 V with C characteristic	A	10			
Signaling switches						
Endurance in operating cycles						
• Mechanical endurance			20000			
• Electrical endurance AC-15	At 230 V and 3 A		6050			
Contact stability	At 17 V and 5 mA	Operating cycles	1 incorrect switching operation per 100 000 000			
Short-circuit protection						
• Short-circuit current $I_K \leq 1.1$ kA	Fuse links operational class gG - NEOZED Type 5SE - DIAZED Type 5SB - LV HRC Type 3NA	A	6			
• Short-circuit current $I_K < 400$ A	Miniature circuit breaker up to 230 V with C characteristic	A	6			
Overload (short-circuit current $I_K \leq 1.1$ kA)	Fuse links operational class gG - NEOZED Type 5SE - DIAZED Type 5SB - LV HRC Type 3NA	A	4			

Selection and ordering data

3RA61 20-1CB32

3RA61 20-2EB32

Direct-on-line starting



A set of 3RA69 40-0A adapters is required for screw fixing.

Standard induction motor 4-pole at 400 V AC[1)] Standard output *P*	Setting range for solid-state overload release	DT	Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
kW	A							kg
3RA61 direct-on-line starters (width 45 mm)								
0.09	0.1 ... 0.4	C	**3RA61 20-□A□3□**		1	1 unit	121	1.355
0.37	0.32 ... 1.25	A	**3RA61 20-□B□3□**		1	1 unit	121	1.355
1.5	1 ... 4	A	**3RA61 20-□C□3□**		1	1 unit	121	1.355
5.5	3 ... 12	A	**3RA61 20-□D□3□**		1	1 unit	121	1.379
15	8 ... 32	A	**3RA61 20-□E□3□**		1	1 unit	121	1.396

			Additional price/ Price reduction
Order No. supplements for connection types			
• Without terminals for use with the infeed system for 3RA6 and the AS-i add-on module	**0**	**0**	Δ
• With screw terminals	**1**		None
• Spring-type terminals	**2**		x
Order No. supplements for rated control supply voltage			
• 24 V AC/DC (for combining with AS-i add-on module)		**B**	None
• 42 ... 70 V AC/DC		**E**	None
• 110 ... 240 V AC/DC		**P**	None
Order No. supplements for complement variant			
• For standard mounting rail or screw fixing: Basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals		**2**	None
• For use with the infeed system for 3RA6: without main circuit terminals (with control circuit terminals)		**3**	Δ For screw terminals Δ For spring-type terminals
• For standard mounting rail or screw mounting when using the AS-i add-on module: without control circuit terminals (with main circuit terminals)		**4**	Δ For screw terminals Δ For spring-type terminals

Δ = Price reduction

x = Additional price

1) Selection depends on the concrete startup and rated data of the protected motor.

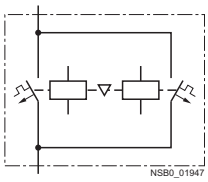
* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

3RA62 50-1CP32

3RA62 50-2DP32

Reversing duty



Two sets of 3RA69 40-0A adapters are required for screw fixing.

Standard induction motor 4-pole at 400 V AC[1] Standard output *P*	Setting range for solid-state overload release	DT	Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
kW	A							kg
3RA62 reversing starters (width 90 mm)								
0.09	0.1 ... 0.4	C	**3RA62 50-□A□3□**		1	1 unit	121	2.341
0.37	0.32 ... 1.25	C	**3RA62 50-□B□3□**		1	1 unit	121	2.341
1.5	1 ... 4	A	**3RA62 50-□C□3□**		1	1 unit	121	2.341
5.5	3 ... 12	A	**3RA62 50-□D□3□**		1	1 unit	121	2.357
15	8 ... 32	C	**3RA62 50-□E□3□**		1	1 unit	121	2.405

				Additional price/ Price reduction
Order No. supplements for connection types				
• Without terminals for use with the infeed system for 3RA6 and the AS-i add-on module	**0**		**0**	Δ
• With screw terminals	**1**			None
• Spring-type terminals	**2**			x
Order No. supplements for rated control supply voltage				
• 24 V AC/DC (for combining with AS-i add-on module)		**B**		None
• 42 ... 70 V AC/DC		**E**		None
• 110 ... 240 V AC/DC		**P**		None
Order No. supplements for complement variant				
• For standard mounting rail or screw fixing: Basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals			**2**	None
• For use with the infeed system for 3RA6: without main circuit terminals (with control circuit terminals)			**3**	Δ For screw terminals Δ For spring-type terminals
• For standard mounting rail or screw mounting when using the AS-i add-on module: without control circuit terminals (with main circuit terminals)			**4**	Δ For screw terminals Δ For spring-type terminals

Δ = Price reduction

x = Additional price

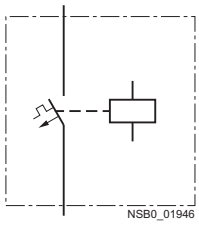
1) Selection depends on the concrete startup and rated data of the protected motor.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

3RA64 with 3RA69 11-1A auxiliary switch block

Direct-on-line starting



A set of 3RA69 40-0A adapters is required for screw fixing.

Standard induction motor 4-pole at 400 V AC[1)] Standard output *P*	Setting range for solid-state overload release	DT	Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
kW	A							kg
3RA64 direct-on-line starters with IO-Link (width 45 mm) Rated control supply voltage 24 V DC								
0.09	0.1 ... 0.4	C	**3RA64 00-□AB4□**		1	1 unit	121	1.300
0.37	0.32 ... 1.25	A	**3RA64 00-□BB4□**		1	1 unit	121	1.300
1.5	1 ... 4	A	**3RA64 00-□CB4□**		1	1 unit	121	1.300
5.5	3 ... 12	A	**3RA64 00-□DB4□**		1	1 unit	121	1.300
15	8 ... 32	C	**3RA64 00-□EB4□**		1	1 unit	121	1.300

			Additional price/ Price reduction
Order No. supplements for connection types			
• With screw terminals	**1**		None
• Spring-type terminals	**2**		x
Order No. supplements for complement variant			
• For standard mounting rail or screw fixing: Basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals		**2**	None
• For use with the infeed system for 3RA6: without main circuit terminals (with control circuit terminals)		**3**	Δ For screw terminals Δ For spring-type terminals

Δ = Price reduction

x = Additional price

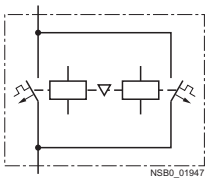
1) Selection depends on the concrete startup and rated data of the protected motor.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

3RA65 with 3RA69 11-1A auxiliary switch block

Reversing duty



Two sets of 3RA69 40-0A adapters are required for screw fixing.

Standard induction motor 4-pole at 400 V AC[1] Standard output *P*	Setting range for solid-state overload release	DT	Order No.	Basic price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
kW	A							kg
3RA65 reversing starters with IO-Link (width 90 mm) Rated control supply voltage 24 V DC								
0.09	0.1 ... 0.4	C	**3RA65 00-□AB4□**		1	1 unit	121	2.300
0.37	0.32 ... 1.25	A	**3RA65 00-□BB4□**		1	1 unit	121	2.300
1.5	1 ... 4	A	**3RA65 00-□CB4□**		1	1 unit	121	2.300
5.5	3 ... 12	A	**3RA65 00-□DB4□**		1	1 unit	121	2.300
15	8 ... 32	C	**3RA65 00-□EB4□**		1	1 unit	121	2.300

			Additional price/ Price reduction
Order No. supplements for connection types			
• With screw terminals	**1**		None
• Spring-type terminals	**2**		x
Order No. supplements for complement variant			
• For standard mounting rail or screw fixing: Basic version including 1 pair of main circuit terminals and 1 pair of control circuit terminals		**2**	None
• For use with the infeed system for 3RA6: without main circuit terminals (with control circuit terminals)		**3**	Δ For screw terminals Δ For spring-type terminals

Δ = Price reduction

x = Additional price

[1] Selection depends on the concrete startup and rated data of the protected motor.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

Overview

Accessories for SIRIUS 3RA6 compact starters

The following accessories are available specially for the 3RA6 compact starters:

- AS-i add-on module: see AS-Interface Add-On Modules for 3RA6, page 6/50
- External auxiliary switch blocks: Snap-on auxiliary switch as versions 2 NO, 2 NC and 1 NO +1 NC with screw or spring-type connections; the contacts of the auxiliary switch block open and close jointly with the main contacts of the compact starter. The NC contacts are designed as mirror contacts.
- Control kit: aid for manually closing the main contacts in order to check the wiring and motor direction under conditions of short-circuit protection
- Adapter for screw fixing the compact starter, including push-in lugs
- Main circuit terminals: Available with screw and spring-type terminals
- Main circuit terminals for mixed connection method:
  With the main circuit terminal for the mixed connection method it is also possible in the main circuit to change over from the screw connection method on the incoming side to the spring-type connection method on the outgoing side.
  This enables for example the side-by-side mounting of several compact starters and their cost-effective connection using the three-phase busbars on the infeed side. The motors are then connected directly by the quick and reliably contacting spring-type connection method.

Accessories for UL applications

The terminal block for "Self-Protected Combination Motor Controller", type E is available for complying with the clearance and creepage distances demanded according to UL 508.

Accessories for infeed using three-phase busbar systems

The three-phase busbars can be used as an easy, time-saving and clearly arranged means of feeding SIRIUS 3RA6 compact starters with screw connection. Motor starter protectors size S00 and S0 can also be integrated.

The busbars are suitable for between 2 and 5 devices. However, any kind of extension up to a maximum summation current of 63 A is possible by clamping the tags of an additional busbar (rotated by 180°) underneath the terminals of the respective last motor circuit protector.

A connecting piece is required for the combination with motor starter protector size S00. The motor starter protectors are supplied by appropriate feeder terminals. Special feeder terminals are required for constructing "Type E Starters" according to UL/CSA.

The three-phase busbar systems are finger-safe but empty connection tags must be fitted with covers. They are designed for any short-circuit stress which can occur at the output side of connected SIRIUS 3RA6 compact starters or motor starter protectors.

Busbar adapters for 60 mm systems

The compact starters are mounted directly with the aid of busbar adapters on busbar systems with 60 mm center-to-center clearance in order to save space and to reduce infeed times and costs. These feeders are suitable for copper busbars with a width from 12 to 30 mm. The busbars can be 4 to 5 mm or 10 mm thick.

The 8US busbar system can be loaded with a maximum summation current of 630 A.

The "reversing starter" version requires a device holder along side the busbar adapter for lateral mounting.

The compact starters are snapped onto the adapter and connected on the line side. This prepared unit is then plugged directly onto the busbar system, and is thus connected both mechanically and electrically at the same time.

For more accessories such as incoming and outgoing terminals, flat copper profiles etc., see Catalog LV 1, Chapter 17 "SENTRON Switching and Protection Devices for Power Distribution --> "SENTRON 8US Busbar Systems" --> "60 mm Busbar System".

Accessories for operation with closed control cabinet doors

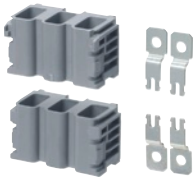
Door-coupling rotary operating mechanisms for standard and emergency-stop applications are available for operating the compact starter with closed control cabinet doors.

Accessories for SIRIUS 3RA6 compact starters in IO-Link version

The following accessories are available specially for the 3RA64, 3RA65 compact starters:

- The 4SI SIRIUS solid-state module as IO-Link master allows for the simple and economical connection of SIRIUS controls with IO-Link (e.g up to four groups of 4 compact starters) to the multifunctional SIMATIC ET 200S distributed I/O system.
- Additional connection cables for side-by-side mounting of up to 4 compact starters
- Operator panel for local control and diagnostics of up to 4 compact starters coupled to each other

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories specially for 3RA6 compact starters								
 3RA69 50-0A	**Control kits** For mechanical actuation of the compact starter	A	**3RA69 50-0A**		1	1 unit	121	0.004
 3RA69 40-0A	**Adapters for screw fixing the compact starter** (set including push-in lugs Direct-on-line starters require 1 set, reversing starters 2 sets.	A	**3RA69 40-0A**		1	1 unit	121	0.152
			Screw terminals					
 3RA69 11-1A	**Auxiliary switch blocks for compact starters**							
	• 2 NO	A	**3RA69 11-1A**		1	1 unit	121	0.018
	• 2 NC	A	**3RA69 12-1A**		1	1 unit	121	0.018
	• 1 NO +1 NC	A	**3RA69 13-1A**		1	1 unit	121	0.018
 3RA69 20-1A	**Main circuit terminals** (incoming and outgoing side)	A	**3RA69 20-1A**		1	1 unit	121	0.038
 3RA69 20-1B	**Control circuit terminals**							
	• For 3RA61	A	**3RA69 20-1B**		1	1 unit	121	0.042
	• For 3RA62	A	**3RA69 20-1C**		1	1 unit	121	0.042
			Spring-type terminals					
 3RA69 11-2A	**Auxiliary switch blocks for compact starters**							
	• 2 NO	A	**3RA69 11-2A**		1	1 unit	121	0.018
	• 2 NC	A	**3RA69 12-2A**		1	1 unit	121	0.018
	• 1 NO +1 NC	A	**3RA69 13-2A**		1	1 unit	121	0.018
 3RA69 20-2A	**Main circuit terminals** (incoming and outgoing side)	A	**3RA69 20-2A**		1	1 unit	121	0.049
 3RA69 20-2B	**Control circuit terminals**							
	• For 3RA61	A	**3RA69 20-2B**		1	1 unit	121	0.036
	• For 3RA62	A	**3RA69 20-2C**		1	1 unit	121	0.036

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories specially for 3RA6 compact starters (continued)								
 3RA69 20-3A	**Main circuit terminals for mixed connection method** One set comprises: • 1 joint block on the incoming side for the screw connection method • 1 joint block on the outgoing side for the spring-type connection method	C	**3RA69 20-3A**		1	1 unit	121	0.044

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories especially for 3RA64, 3RA65 compact starters with IO-Link								
 3RA69 31-0A	**Additional connection cables (flat) for side-by-side mounting of up to 4 compact starters**							
	• 10-pole							
	- 8 mm[1]	A	**3RA69 32-0A**		1	5 units	121	0.007
	- 200 mm[1]	A	**3RA69 33-0B**		1	5 units	121	0.012
	• 14-pole							
	- 8 mm[2]	A	**3RA69 31-0A**		1	5 units	121	0.007
	- 200 mm	A	**3RA69 33-0C**		1	5 units	121	0.014
 3RA69 35-0A	**Operator panels** (incl. enabling module, blanking cover and assembly bracket)	A	**3RA69 35-0A**		1	1 unit	121	0.052
	Enabling modules	A	**3RA69 36-0A**		1	1 unit	121	0.002
	Blanking covers	A	**3RA69 36-0B**		1	5 units	121	0.001
	Connection cables (round) for connecting the operator panel 10-pole, 2000 mm	A	**3RA69 33-0A**		1	1 unit	121	0.114
 3RK1 005-0LB00-0AA0	**SIRIUS 4SI solid-state modules** IO-Link master for connection of up to 4 SIRIUS controls (max. 16 in groups of 4) with IO-Link (3-conductor connection) to SIMATIC ET 200S, width 15 mm, supports firmware update (STEP 7 V5.4 SP5 and higher) Can be used with the following terminal modules: • TM-E15S26-A1 (screw terminals) • TM-E15C26-A1 (spring-type terminals) • TM-E15N26-A1 (Fast Connect)	A	**3RK1 005-0LB00-0AA0**		1	1 unit	121	0.057
	Manuals for SIRIUS 4SI solid-state modules 3RK1 005 German	C	**3ZX10 12-0LB00-0AA0**		1	1 unit	191	0.100

[1] 10-pole connection cables are required for EMERGENCY-STOP group concepts.

[2] Is included in the scope of supply of the SIRIUS 3RA6 compact starter in IO-Link version.

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminals for "Self-Protected Combination Motor Controllers (Type E)" according to UL 508 for infeed through parallel wiring with compact starters								
 3RV19 28-1H	*Note:* *UL 508 demands for "Combination Motor Controller Type E" 1-inch clearance and 2-inch creepage distance at line side. Terminal blocks are not required for use according to CSA. With size S0, these terminal blocks cannot be used in combination with 3RV19 .5 three-phase busbars.*							
	Terminal blocks type E For extended clearance and creepage distances (1 and 2 inch)	►	**3RV19 28-1H**		1	1 unit	101	0.083

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Three-phase busbars for infeed with 3RA6

For feeding several compact starters and/or motor starter protectors with screw terminals, mounted side by side on standard mounting rails, insulated, with touch protection.

Number of compact starters and motor starter protectors that can be connected without lateral accessories	Modular spacing	Rated current I_n at 690 V	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm	A	Size							kg
2	45	63	S0[1]	▶	**3RV19 15-1AB**		1	1 unit	101	0.044
3	45	63	S0[1]	▶	**3RV19 15-1BB**		1	1 unit	101	0.071
4	45	63	S0[1]	▶	**3RV19 15-1CB**		1	1 unit	101	0.099
5	45	63	S0[1]	▶	**3RV19 15-1DB**		1	1 unit	101	0.124


3RV19 15-1AB


3RV19 15-1BB


3RV19 15-1CB


3RV19 15-1DB

[1] Not suitable for 3RV11/3RV21 motor starter protectors for motor protection with overload relay function and for 3RV17/3RV27 and 3RV18/3RV28 motor starter protectors according to UL 489 / CSA C22.2 No.5-02.
The joint clamping of motor starter protectors size S00 and size S0 is not possible due to the different modular spacings and the different height of the terminals. The 3RV19 15-5DB connecting piece is available for connecting the compact starters to motor starter protectors size S00.

Connecting pieces for three-phase busbars

Version	Modular spacing	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
	mm	Size							kg
For connecting compact starters (left) and motor starter protectors size S00 (right)	45	S00	▶	**3RV19 15-5DB**		1	1 unit	101	0.042


3RV19 15-5DB

Covers for connection tags of the three-phase busbars

Version	Modular spacing	For motor starter protector	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Touch protection for empty positions	--	S00, S0	▶	**3RV19 15-6AB**		1	10 units	101	0.003


3RV19 15-6AB

Three-phase feeder terminals for three-phase busbars

Conductor cross-section: Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For compact starters and motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
mm²	mm²	AWG	Nm	Size							kg
Connection from top											
2.5 ... 25	4 ... 16	10-4	4	S0	▶	**3RV19 25-5AB**		1	1 unit	101	0.041
Connection from below[1]											
2.5 ... 25	4 ... 16	10-4	Input: 4; Output: 2 ... 2.5	S00, S0	▶	**3RV19 15-5B**		1	1 unit	101	0.110


3RV19 25-5AB


3RV19 15-5B

Three-phase feeder terminals for constructing "Type E Starters" according to UL 508 for three-phase busbars

Conductor cross-section: Solid or stranded	Finely stranded with end sleeve	AWG cables, solid or stranded	Tightening torque	For compact starters and motor starter protectors	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
Connection from top											
2.5 ... 25	4 ... 16	10-4	--	S0	C	**3RV19 25-5EB**		1	1 unit	101	0.055

[1] This terminal is connected in place of a switch, please take the space requirement into account.

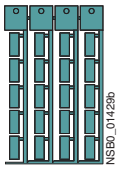
* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Busbar adapters for 60 mm systems								
 8US12 11-1NS10	For flat copper profiles according to DIN 46433 Width: 12 ... 30 mm Thickness: 4 ... 5 mm or 10 mm	►	**8US12 11-1NS10**		1	1 unit	143	0.337
Device holders for lateral mounting along side the busbar adapter for 60 mm systems								
 8US12 50-1AA10	Required in addition to the busbar adapter for mounting a reversing starter	►	**8US12 50-1AA10**		1	1 unit	143	0.239

	Version	Color of handle	Version of extension shaft mm	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Door-coupling rotary operating mechanisms for operating the compact starter with closed control cabinet doors										
 3RV29 26-0B	The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and an extension shaft of 130/330 mm in length (6 mm x 6 mm). The door-coupling rotary operating mechanisms are designed to degree of protection IP65. The door interlocking prevents accidental opening of the control cabinet door in the ON position of the motor starter protector. The OFF position can be locked with up to 3 padlocks.									
	Door-coupling rotary operating mechanisms	Black	130	►	**3RV29 26-0B**		1	1 unit	101	0.111
	EMERGENCY-STOP door-coupling rotary operating mechanisms	Red/ Yellow	130	►	**3RV29 26-0C**		1	1 unit	101	0.110

* You can order this quantity or a multiple thereof.
Illustrations are approximate

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Tools for opening spring-type terminals by hand								
 3RA29 08-1A	**Screwdrivers** for all SIRIUS devices with spring-type terminals		**Spring-type terminals**					
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045
Blank labels								
 3RT19 00-1SB20	**Unit labeling plates**[1] for SIRIUS devices 20 mm x 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200
Documentation[2]								
	System manuals SIRIUS Compact Starters and Accessories German	X	**3RA69 91-0A**		1	1 unit	121	0.460

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de .

[2] This manual and other language versions are currently available from the download center of the Service & Support portal at https://support.automation.siemens.com/WW/view/de/27136554/133300 .

Overview

Various AS-i add-on modules are available for communication of the 3RA6 compact starter with the control system using AS-Interface:

- Standard version
- With two local inputs
- With two free external inputs
- With one free external input and one free external output
- With two free external outputs
- For local control

The AS-i add-on modules can be combined only in connection with compact starters with a rated control supply voltage of 24 V AC/DC.

AS-i add-on module for on-site controller

With this new module it is also possible for the connected compact starter to be operated directly using simple switches, i.e. without recourse to AS-i Communication, if required.

"Automatic" mode

NC contacts can be connected to the inputs Y2 and Y4 through the local terminals on the AS-i add-on module. If the "+" connections are connected simultaneously to both local inputs, the AS-i add-on module will be in "Automatic" mode, i.e. it will communicate with the control system through AS-Interface.

Local control

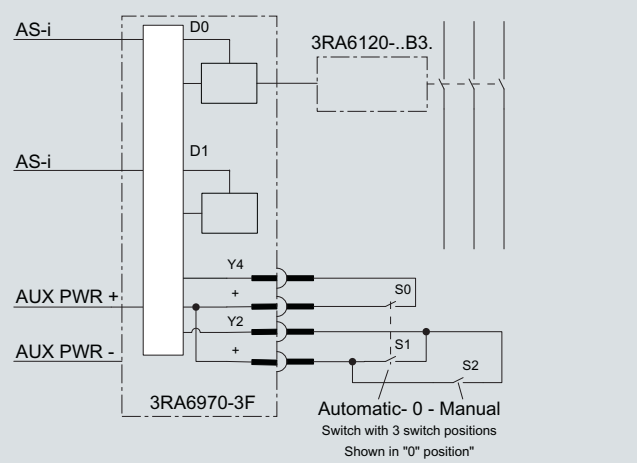
Opening the two inputs Y2 and Y4 will result in the direct disconnection of the compact starter. Operation through AS-i Communication is ended and the compact starter can now be switched on and off directly using NO contacts (one NO contact per direction of rotation on the reversing starter).

"LED AUX Power" must light up green, the 24 V DC supply must be assured and the AS-i control supply voltage must no longer be applied.

Resetting to "Automatic" mode

Simultaneous application of a "1" signal at the local inputs. The availability bit DI 0 is switched to a "1" signal.

If AS-i Communication is reset, the motor is first switched off and then on again when requested by the control system.



Switch with 3 switch positions			
Switch	Automatic	0	Manual
S0	Closed	Open	Open
S1	Closed	Open	Open
S2	Open	Open	Closed

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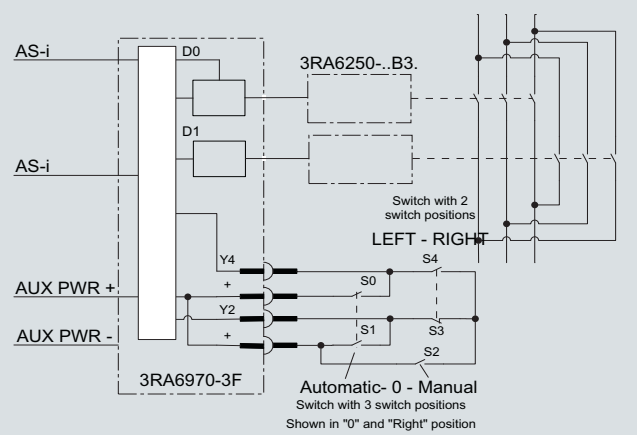
Circuit diagram example for operating a 3RA61 20 direct-on-line starter using an AS-i add-on module for on-site controller



Switch with 3 switch positions			
Switch	Automatic	0	Manual
S0	Closed	Open	Open
S1	Closed	Open	Open
S2	Open	Open	Closed

Switch with 2 switch positions		
Switch	Left	Right
S3	Open	Closed
S4	Closed	Open

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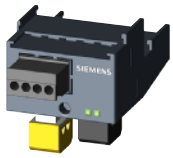
Circuit diagram example for operating a 3RA62 50 reversing starter using an AS-i add-on module for on-site controller

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
AS-i add-on modules								
 3RA69 70-3A	**Standard version** For communication of the compact starter with the control system using AS-Interface	A	**3RA69 70-3A**		1	1 unit	121	0.045
	With two local inputs For safe disconnection through local safety relays, e.g. cable-operated switches	A	**3RA69 70-3B**		1	1 unit	121	0.045
 3RA69 70-3B to -3F	**With two free external inputs** Replaces the digital standard inputs "Motor On" and "Group warning"	A	**3RA69 70-3C**		1	1 unit	121	0.045
	With one free external input and one free external output Replaces the digital standard input "Group warning"	A	**3RA69 70-3D**		1	1 unit	121	0.045
	With two free external outputs Only for direct-on-line starters, replaces the digital standard output "Motor left"	A	**3RA69 70-3E**		1	1 unit	121	0.045
	For local control Control of the compact starter optionally using AS-Interface or local switches	A	**3RA69 70-3F**		1	1 unit	121	0.045
Accessories for AS-i add-on modules								
 3RK19 04-2AB01	**Addressing units** • For active AS-Interface modules, intelligent sensors and actuators • According to AS-Interface Version 2.1 • Including expanded addressing mode • Scope of supply - 1 addressing unit - 1 operating manual (German, English, French, Spanish, Italian) - 1 addressing cable (1.5 m, with jack plug)	►	**3RK19 04-2AB01**		1	1 unit	121	0.540

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Infeed systems for 3RA6

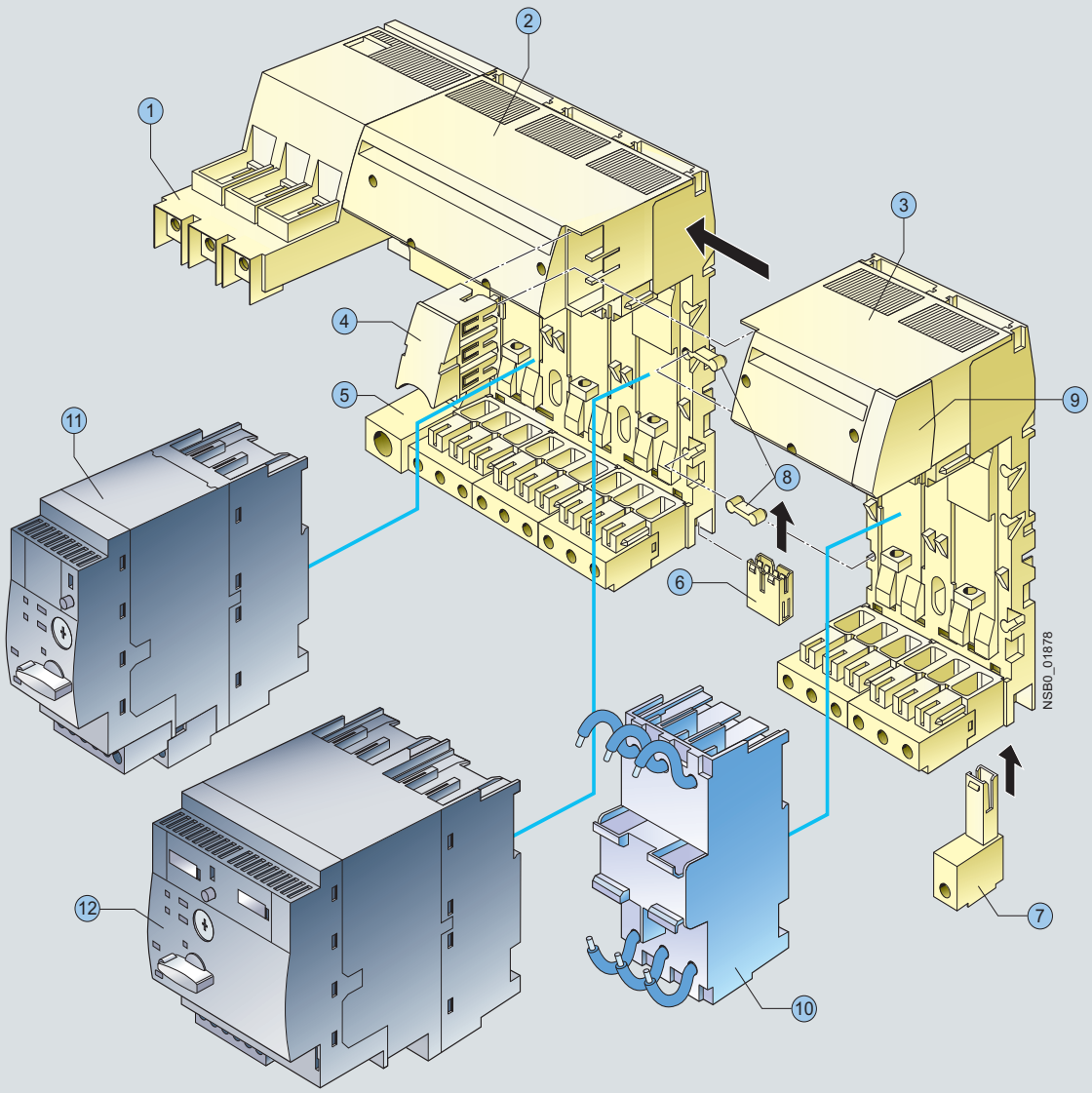
Overview

The infeed system for 3RA6 compact starters enables far less wiring in the main circuit and, thanks to the easy exchangeability of the compact starters, reduces the usual downtimes for maintenance work during the plant's operating phase.

The infeed system provides the possibility of completely prewiring the main circuit without a compact starter needing to be connected at the same time. As the result of the removable terminals in the main circuit, compact starters can be integrated in an infeed system in easy manner (without the use of tools).

In addition, the integrated PE bar means it is optionally possible to connect the motor cable directly to the infeed system without additional intermediate terminals. The infeed system for 3RA6 compact starters is designed for summation currents up to 100 A with a conductor cross-section of max. 70 mm² on the feeder terminal block.

The infeed system can be mounted on a standard mounting rail or flat surfaces.



1. Feeder terminal
2. Three-socket expansion module
3. Two-socket expansion module
4. Expansion plug
5. PE infeed
6. PE expansion plug
7. PE pick-off
8. Connecting plates
9. End cover
10. 45 mm adapter for SIRIUS motor starter protector size S0
11. 3RA61 direct-on-line starter
12. 3RA62 reversing starter

Infeed system for 3RA6 compact starters

① Infeed

The 3-phase infeed is available as an infeed with screw connection (25/35 mm² up to 63 A or 50/70 mm² up to 100 A) and a an infeed with spring-type connection (25/35 mm² up to 63 A).

The infeed with spring-type terminal can be fitted on the left as well on as the right to an expansion module.

The infeed with screw terminal is supplied only with a 3-socket expansion module and permanently fitted on the left side.

The infeeds with screw connection enable connection of the main conductors (L1, L2, L3) either from above or from below.

The infeed with screw connection is supplied complete with 1 end cover, the infeed with spring-type connection complete with 2 end covers.

② Three-socket expansion modules

The expansion module with 3 sockets for compact starters is available with screw connection and with spring-type connection.

Expansion modules enable the infeed system to be expanded and can be fitted to each other in any number.

Two expansion modules are held together with the help of 2 connecting wedges and 1 expansion plug. These assembly parts are included in the scope of supply of the respective expansion module.

When the infeed system for 3RA6 compact starters is used, the compact starters (plug-in modules) are easily mounted and removed even when live.

Optional possibilities:
- PE connection on motor outgoing side
- Outfeed for external auxiliary devices
- Connection to 3RV19 infeed system
- Integration of SIRIUS 3RV1 motor starter protectors size S0 (using 3RA68 90-0BA adapter)

③ Two-socket expansion modules

If only 2 instead of 3 additional sockets are required, then the 2-socket expansion module is the right choice. It has the same functionality as the 3-socket expansion module.

④ Expansion plug

Two expansion modules can be connected together using the expansion plug. Flexible expansion of the infeed system is thus possible.

⑤ PE infeeds

This module enables a PE cable to be connected.

The PE infeed can be ordered with screw connection and spring-type connection (35 mm²) and can be fitted on the right or left to the expansion block.

⑥ PE expansion plug

The PE expansion plug is inserted from below and enables two PE bars to be connected.

⑦ PE pick-off

The PE pick-off is available with screw connection and spring-type connection (6/10 mm²). It is snapped into the infeed system from below.

⑧ Connecting wedges

Two connecting wedges are used to hold together 2 expansion modules.

⑨ End covers

On the last expansion module of a row, the slot provided for the expansion plug can be covered by inserting the end cover.

⑩ 45 mm adapters for SIRIUS 3RV1 motor starter protectors

SIRIUS 3RV1 motor starter protectors size S0 with screw connection can be fitted to the adapter, enabling them to be plugged into the infeed system.

Terminal blocks

Using the terminal block the 3 phases can be fed out of the system; this means that single-phase, two-phase and three-phase components can also be integrated in the system.

After the end cover is pulled out, the terminal block can be plugged onto an expansion module.

Expansion plug for SIRIUS 3RV19 infeed systems

After the end cover is pulled out, the expansion plug for the SIRIUS 3RV19 infeed system can be plugged onto an expansion module. It connects the infeed system for 3RA6 compact starters with the SIRIUS 3RV19 infeed system.

Maximum rated operational current

The following maximum rated operational currents apply for the components of the infeed system for 3RA6:

Component	Maximum rated operational current A
Infeed with screw connection 50/70 mm²	100
Infeed with screw connection 25/35 mm²	63
Infeed with spring-type connection 25/35 mm²	63
Expansion plugs	63

When several expansion modules are mounted side by side, the maximum rated operational current from the 2nd expansion module to the end of the row is 63 A.

Proposal for upstream short-circuit protection devices

The following short-circuit data apply for the components of the infeed system for 3RA6 compact starters:

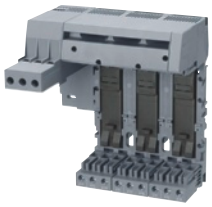
Conductor cross-section mm²	Inscriptions	Proposal for upstream short-circuit protection device
Short-circuit protection for infeed block (25/35 mm²) with screw connection		
2.5 ... 35	$I_{d,\,max}$ = 19 kA, I^2t = 440 kA²s	**3RV10 41-4JA10**
Short-circuit protection for infeed block (50/70 mm²) with screw connection		
2.5 ... 70	$I_{d,\,max}$ = approx. 22 kA	**3RV10 41-4MA10**
Short-circuit protection for infeed block with spring-type connection		
4	$I_{d,\,max}$ = 9.5 kA, I^2t = 85 kA²s	**3RV10 21-4DA10**
6	$I_{d,\,max}$ = 12.5 kA, I^2t = 140 kA²s	**3RV10 31-4EA10**
10	$I_{d,\,max}$ = 15 kA, I^2t = 180 kA²s	**3RV10 31-4HA10**
16/25	$I_{d,\,max}$ = 19 kA, I^2t = 440 kA²s	**3RV10 41-4JA10**
Short-circuit protection for terminal block		
1.5	$I_{d,\,max}$ = 7.5 kA	**5SY...** [1]
2.5	$I_{d,\,max}$ = 9.5 kA	
4	$I_{d,\,max}$ = 9.5 kA	
6	$I_{d,\,max}$ = 12.5 kA	

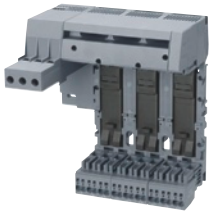
[1] To prevent the possibility of short-circuits, the cables on the terminal block must be installed so that they are short-circuit proof according to EN 60439-1 Section 7.5.5.1.2.

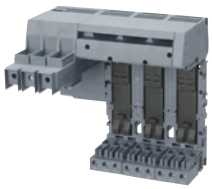
Infeed systems for 3RA6

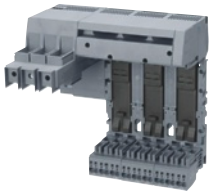
Selection and ordering data

Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Three-phase infeeds and expansion modules							
Infeeds with screw connection 25/35 mm² left							
Infeed with screw connection with permanently fitted **3-socket expansion module with screw or spring-type terminals on the outgoing side and integrated PE bar** Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter		**Screw terminals**					
• Screw terminals on outgoing side	A	**3RA68 12-8AB**		1	1 unit	121	0.957
• Spring-type terminals on outgoing side	A	**3RA68 12-8AC**		1	1 unit	121	0.990
Infeeds with screw connection 50/70 mm² left							
Infeed with screw connection with permanently fitted **3-socket expansion module with screw or spring-type terminals** on the outgoing side and integrated PE bar Expansion module with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter, suitable for UL duty according to UL 508 Type E		**Screw terminals**					
• Screw terminals on outgoing side	A	**3RA68 13-8AB**		1	1 unit	121	1.146
• Spring-type terminals on outgoing side	A	**3RA68 13-8AC**		1	1 unit	121	1.179
Infeeds with spring-type connection 25/35 mm² left or right							
		Spring-type terminals					
Up to 63 A	A	**3RA68 30-5AC**		1	1 unit	121	0.283


3RA68 12-8AB


3RA68 12-8AC


3RA68 13-8AB


3RA68 13-8AC


3RA68 30-5AC

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Expansion modules

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
	Two-socket expansion modules							
 3RA68 22-0AB	**With screw or spring-type terminals** and integrated PE bar with 2 sockets for 2 direct-on-line starters or 1 reversing starter Expansion plug and 2 connecting wedges are included in the scope of supply.							
			Screw terminals					
	• Screw terminals	A	**3RA68 22-0AB**		1	1 unit	121	0.505
			Spring-type terminals					
 3RA68 22-0AC	• Spring-type terminals	A	**3RA68 22-0AC**		1	1 unit	121	0.527
	Three-socket expansion modules							
 3RA68 23-0AB	**With screw or spring-type terminals** and integrated PE bar with 3 sockets for 3 direct-on-line starters or 1 direct-on-line starter and 1 reversing starter Expansion plug and 2 connecting wedges are included in the scope of supply.							
			Screw terminals					
	• Screw terminals	A	**3RA68 23-0AB**		1	1 unit	121	0.717
			Spring-type terminals					
 3RA68 23-0AC	• Spring-type terminals	A	**3RA68 23-0AC**		1	1 unit	121	0.750

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Infeed systems for 3RA6

Accessories

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories for infeed systems for 3RA6								
	PE infeeds 25/35 mm²							
			Screw terminals					
 3RA68 60-6AB	• Screw terminals	A	**3RA68 60-6AB**		1	1 unit	121	0.060
			Spring-type terminals					
 3RA68 60-5AC	• Spring-type terminals	A	**3RA68 60-5AC**		1	1 unit	121	0.070
	PE pick-offs 6/10 mm²							
			Screw terminals					
 3RA68 70-4AB	• Screw terminals	A	**3RA68 70-4AB**		1	1 unit	121	0.019
			Spring-type terminals					
 3RA68 70-3AC	• Spring-type terminals	A	**3RA68 70-3AC**		1	1 unit	121	0.017
	Expansion plugs							
 3RA68 90-0EA	**PE expansion plugs**	A	**3RA68 90-0EA**		1	1 unit	121	0.008
 3RA68 90-1AB	**Expansion plugs** between 2 expansion modules Is included in the scope of supply of the expansion modules.	A	**3RA68 90-1AB**		1	1 unit	121	0.029
 3RA68 90-1AA	**Expansion plugs for SIRIUS 3RV19 infeed system** Connects infeed system for 3RA6 to 3RV19 infeed system	A	**3RA68 90-1AA**		1	1 unit	121	0.079

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Accessories for infeed systems for 3RA6 (Continued)								
	Adapters 45 mm							
 3RA68 90-0BA	For SIRIUS 3RV1 motor starter protectors size S0		**Screw terminals**					
	• Screw terminals	A	**3RA68 90-0BA**		1	1 unit	121	0.152
	Terminal blocks							
 3RV19 17-5D	**For integration of single-phase, two-phase and three-phase external components**		**Spring-type terminals**					
	• Spring-type terminals	A	**3RV19 17-5D**		1	1 unit	101	0.050
Tools for opening spring-type terminals by hand								
	Screwdrivers							
 3RA29 08-1A	For all SIRIUS devices with spring-type terminals		**Spring-type terminals**					
	Length approx. 200 mm, 3.0 mm x 0.5 mm, titanium gray/black, partially insulated	A	**3RA29 08-1A**		1	1 unit	101	0.045

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Software: SIRIUS motor starter function block library for SIMATIC PCS 7

Overview

With the SIRIUS motor starter PCS 7 function block library, SIRIUS ET 200S motor starters (direct-on-line and reversing starters, direct-on-line soft starters) can be easily and simply integrated into the SIMATIC PCS 7 process control system. The SIRIUS motor starter PCS 7 function block library contains the diagnostics and driver blocks corresponding with the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring.

For detailed information about the SIRIUS motor starter function block library for SIMATIC PCS 7 see Catalog LV 1, Chapter 12 "Planning, Configuration and Visualizing for SIRIUS".

Benefits

- Uniform and continuous integration into SIMATIC PCS 7
- Standardized function blocks for simple integration and optimal operation
- Greater process transparency due to greater information density in the I&C system

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
SIRIUS motor starter function block library for SIMATIC PCS 7								
	Scope of supply: AS modules and faceplates for integrating SIRIUS motor starters into the PCS 7 process control system, for PCS 7 Version V 6.1/V 7.0							
	Engineering software For one engineering station (single license) including runtime software for execution of the AS module in an automation system (single license), German/English/French, Type of delivery: on CD incl. electronic documentation in German/English	►	**3ZS1 630-1XX00-0YA0**		1	1 unit	131	0.240
	Runtime software for execution of the AS module in an automation system (single license), Type of delivery: License without software and documentation	►	**3ZS1 630-2XX00-0YB0**		1	1 unit	131	0.240

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Monitoring and Control Devices

7

Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

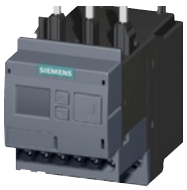
SIRIUS 3RR2 Monitoring Relays for Mounting onto 3RT2 Contactors

General data

Overview

Features	3RR21 	3RR22 	Benefits
General data			
Sizes	S00, S0	S00, S0	• Are coordinated with the dimensions, connections and technical characteristics of the other devices in the SIRIUS modular system (contactors, soft starters, ...) • Permit the mounting of slim and compact load feeders in widths of 45 mm (S00 and S0) • Simplify configuration
Current range	S00: 1.6 ... 16 A S0: 4 ... 40 A	S00: 1.6 ... 16 A S0: 4 ... 40 A	• Is adapted to the other devices in the SIRIUS modular system • Just a single version per size with a wide setting range enables easy configuration
Monitoring functions			
Current overshoot	✓ (Two-phase)	✓ (Three-phase)	• Provides optimum inverse-time delayed protection of loads against excessive temperature rises due to overload • Enables detection of filter blockages or pumping against closed gate valves • Enables drawing conclusions about wear, poor lubrication or other maintenance-relevant phenomena
Current undershoot	✓ (Two-phase)	✓ (Three-phase)	• Enables detection of overload due to a slipping or torn belt • Guarantees protection of pumps against dry running • Facilitates monitoring of the functions of resistive loads such as heaters • Permits energy savings through monitoring of no-load operation
Apparent current monitoring	✓	✓ (selectable)	• Precision current monitoring especially in a motor's rated and upper torque range
Active current monitoring	--	✓ (selectable)	• Optimum current monitoring over a motor's entire torque range through the patented combination of power factor and apparent current monitoring
Range monitoring	✓ (Two-phase)	✓ (Three-phase)	• Simultaneous monitoring of current overshoot and undershoot with a singe device
Phase failure, open-circuit	✓ (Two-phase)	✓ (Three-phase)	• Minimizes heating of induction motors during phase failure through immediate disconnection • Prevents operation of hoisting equipment with reduced load carrying capacity
Phase sequence monitoring	--	✓ (selectable)	• Prevents starting of motors, pumps or compressors in the wrong direction of rotation
Internal ground-fault detection (residual current monitoring)	--	✓ (selectable)	• Provides optimum protection of loads against high-resistance short-circuits or ground faults due to moisture, condensed water, damage to the insulation material, etc. • Eliminates the need for additional special equipment. • Saves space in the control cabinet • Reduces wiring outlay and costs
Blocking current monitoring	--	✓ (selectable)	• Minimizes heating of induction motors when blocked during operation through immediate disconnection • Minimizes mechanical loading of the system by acting as an electronic shear pin

✓ Available
-- Not available

Features	3RR21 	3RR22 	Benefits
Features			
RESET function	✓	✓	• Allows manual or automatic resetting of the relay • Resetting directly on the device or by switching the control supply voltage off and on (remote reset)
ON-delay time	0 ... 60 s	0 ... 99 s	• Enables motor starting without evaluation of the starting current • Can be used for monitoring motors with lengthy start-up
Tripping delay time	0 ... 30 s	0 ... 30 s	• Permits brief threshold value violations during operation • Prevents frequent warnings and disconnections with currents near the threshold values
Operating and display elements	LEDs and rotary potentiometers	Displays and buttons	• For setting the threshold values and delay times • For selectable functions • For quick and selective diagnostics • Displays for permanent indication of measured values
Integrated contacts	1 CO	1 CO, 1 semiconductor output	• Enable disconnection of the system or process when there is an irregularity • Can be used to output signals
Design of load feeders			
Short-circuit strength up to 100 kA at 690 V (in conjunction with the corresponding fuses or the corresponding motor starter protector)	✓	✓	• Provides optimum protection of the loads and operating personnel in the event of short-circuits due to insulation faults or faulty switching operations
Electrical and mechanical matching to 3RT2 contactors	✓	✓	• Simplifies configuration • Reduces wiring outlay and costs • Enables stand-alone installation as well as space-saving direct mounting
Spring-type connection for main circuit and auxiliary circuit	✓ (optional)	✓ (optional)	• Enables fast connections • Permits vibration-resistant connections • Enables maintenance-free connections
More features			
Suitable for single- and three-phase loads	✓	✓	• Enables the monitoring of single-phase systems through parallel infeed at the contactor or looping the current through the three phase connections
Wide setting ranges	✓	✓	• Reduce the number of variants • Minimize the configuration outlay and costs • Minimize storage overhead, storage costs, tied-up capital
Wide voltage supply range	✓ (optional)	✓ (optional)	• Reduces the number of variants • Minimizes the configuring outlay and costs • Minimize storage overhead, storage costs, tied-up capital

✓ Available

SIRIUS 3RR2 Monitoring Relays for Mounting onto 3RT2 Contactors

General data

Possible combinations of 3RR2 monitoring relays with 3RT2 contactors

Monitoring relays	Current range	**Contactors** (type, size, rating)	
		3RT20 1	**3RT20 2**
		S00	S0
Type	A	3/4/5.5/7.5 kW	5.5/7.5/11/15/18.5 kW
3RR21 41	1.6 ... 16	✓	With stand-alone installation holder
3RR22 41	1.6 ... 16	✓	With stand-alone installation holder
3RR21 42	4 ... 40	With stand-alone installation holder	✓
3RR22 42	4 ... 40	With stand-alone installation holder	✓

✓ Possible

Connection method

Depending on the device version of the 3RR2 monitoring relays, the terminals for screw or spring-type connection are configured for both the main and auxiliary circuit.

⊕	Screw terminals
	Spring-type terminals
	These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

More information

Order No. scheme

Digit of the Order No.	1. - 3.	4.	5.	6.	7.		8.	9.	10.	11.	12.
	□□□	□	□	□	□	–	□	□	□	□	
Monitoring relays	**3 R R**										
SIRIUS 2nd generation		**2**									
Type of setting			□								
Type of monitoring relay				□							
Size					□						
Connection method							□				
Number and type of outputs								□			
Signal type of the supply voltage									□	□	
Example	**3 R R**	**2**	**1**	**4**	**1**	**–**	**1**	**A**	**A**	**3**	**0**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Overview

3RR22 42 and 3RR21 42 current monitoring relays

The SIRIUS 3RR2 current monitoring relays are suitable for the load monitoring of motors or other loads.
In two or three phases they monitor the rms value of AC currents for overshooting or undershooting of set threshold values.

Whereas apparent current monitoring is used above all in connection with the rated torque or in case of overload, the active current monitoring option can be used to observe and evaluate the load factor over a motor's entire torque range.

The 3RR2 current monitoring relays can be integrated directly in the feeder by mounting onto the 3RT2 contactor; separate wiring of the main circuit is therefore superfluous. Separate transformers are not required.

For a line-oriented configuration or simultaneous use of an overload relay, terminal brackets for stand-alone installation are available for separate standard rail mounting.

Versions

- Basic versions
  The basic versions with two-phase apparent current monitoring, a CO contact output and analog adjustability provide a high level of monitoring reliability especially in the rated and overload range.
- Standard versions
  The standard versions monitor the current in three phases with selectable active current monitoring. They have additional diagnostics options such as residual current monitoring and phase sequence monitoring, and they are also suitable for monitoring motors below the rated torque. These devices have an additional independent semiconductor output, an actual value indicator, and are digitally adjustable.

Both versions are available optionally with screw terminals or spring-type terminals, in each case for sizes S00 and S0.

Benefits

- Directly mountable onto 3RT2 contactors, i.e. no additional wiring outlay in the main circuit
- Optimally coordinated with the technical characteristics of the 3RT2 contactors
- No separate current transformer required
- Versions with wide voltage supply range
- Variably adjustable to overvoltage, undervoltage or range monitoring
- Freely configurable delay times and RESET response
- Display of ACTUAL value and status messages
- All versions with removable control current terminals
- All versions with screw terminals or alternatively with spring-type terminals
- Simple determination of the threshold values through direct reference to actually measured values for setpoint loading
- Range monitoring and selectable active current measurement mean that only one device for monitoring a motor is required along the entire torque curve
- In addition to current monitoring it is also possible to monitor for broken cables, phase failure, phase sequence, residual current and motor blocking.

Application

- Monitoring of current overshoot and undershoot
- Monitoring of broken conductors
- Monitoring of no-load operation and load shedding, e.g. in the event of a torn V-belt or no-load operation of a pump
- Monitoring of overload, e.g. on pumps due to a dirty filter system
- Monitoring the functionality of electrical loads such as heaters
- Monitoring of wrong phase sequence on mobile equipment such as compressors or cranes
- Monitoring of high-resistance short-circuits, e.g. due to damaged insulation or dampness.

SIRIUS 3RR2 Monitoring Relays for Mounting onto 3RT2 Contactors

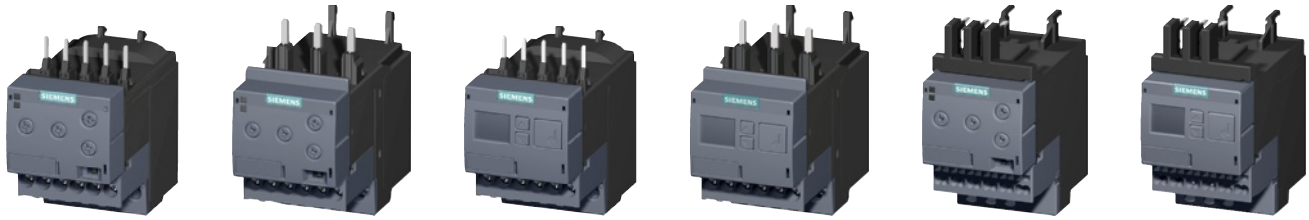
Current monitoring

Selection and ordering data

SIRIUS 3RR2 current monitoring relays

- For load monitoring of motors or other loads
- Multi-phase monitoring of undercurrent and overcurrent
- Starting and tripping delay can be adjusted separately
- Tripping delay 0 ... 30 s
- Auto or manual RESET

PU (UNIT, SET, M)=1
PS* =1 unit
PG =101

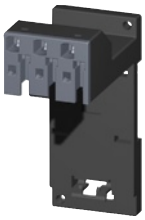
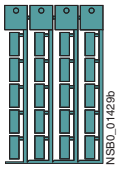


3RR21 41-1AW30 | 3RR21 42-1AW30 | 3RR22 41-1FW30 | 3RR22 42-1FW30 | 3RR21 41-2AA30 | 3RR22 41-2FA30

Size	Measuring range	Hysteresis	Supply voltage U_s	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
	A	A	V		Order No.	Price per PU	kg		Order No.	Price per PU	kg
Basic versions											
Analog adjustable, closed-circuit principle, 1 CO, 2-phase current monitoring, apparent current monitoring, start-up delay 0 ... 60 s											
S00	1.6 ... 16	6.25 % of threshold value	24 AC/DC	A	**3RR21 41-1AA30**		0.180	A	**3RR21 41-2AA30**		0.180
			24 ... 240 AC/DC	A	**3RR21 41-1AW30**		0.185	A	**3RR21 41-2AW30**		0.185
S0	4 ... 40	6.25 % of threshold value	24 AC/DC	A	**3RR21 42-1AA30**		0.205	A	**3RR21 42-2AA30**		0.250
			24 ... 240 AC/DC	A	**3RR21 42-1AW30**		0.210	A	**3RR21 42-2AW30**		0.255
Standard versions											
Digitally adjustable, LCD, open-circuit or closed-circuit principle, 1 CO, semiconductor output, 3-phase current monitoring, active or apparent current monitoring, phase sequence monitoring, residual current monitoring, blocking current monitoring, reclosing delay time 0 ... 300 min, startup delay 0 ... 99 s, separate settings for warning and alarm thresholds											
S00	1.6 ... 16	0.1 ... 3	24 AC/DC	A	**3RR22 41-1FA30**		0.205	A	**3RR22 41-2FA30**		0.205
			24 ... 240 AC/DC	A	**3RR22 41-1FW30**		0.205	A	**3RR22 41-2FW30**		0.205
S0	4 ... 40	0.1 ... 8	24 AC/DC	A	**3RR22 42-1FA30**		0.230	A	**3RR22 42-2FA30**		0.280
			24 ... 240 AC/DC	A	**3RR22 42-1FW30**		0.230	A	**3RR22 42-2FW30**		0.280

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

	Use	Version	Size	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Terminal brackets for stand-alone installation[1)]										
 3RU29 16-3AA01	For 3RR2	For separate mounting of the overload relays or monitoring relays; screw and snap-on mounting onto TH 35 standard mounting rail			**Screw terminals**					
		• Screw connection	S00	A	**3RU29 16-3AA01**		1	1 unit	101	0.040
			S0	A	**3RU29 26-3AA01**		1	1 unit	101	0.050
 3RU29 26-3AC01					**Spring-type terminals**					
		• Spring-type connection	S00	B	**3RU29 16-3AC01**		1	1 unit	101	0.040
			S0	B	**3RU29 26-3AC01**		1	1 unit	101	0.060
Blank labels										
 3RT19 00-1SB20	For 3RR2	**Unit labeling plates[2)]** For SIRIUS devices								
		20 mm x 7 mm, pastel turquoise		C	**3RT19 00-1SB20**		100	340 units	101	0.200
Sealable covers										
 3RR29 40	For 3RR2	For securing against accidental or unauthorized adjustment of the settings		A	**3RR29 40**		1	5 units	101	0.001
Tools for screw terminals										
 8WA2 803	For main and auxiliary circuit connections	**Screwdrivers** 3.5 mm x 0.5 mm; suitable for a max. conductor cross-section of 2.5 mm²			**Screw terminals**					
		• Length approx. 175 mm; green, partially insulated		C	**8WA2 880**		1	1 unit	041	0.035
		• Length approx. 175 mm; green		C	**8WA2 803**		1	1 unit	041	0.024
Tools for opening spring-type terminals by hand										
 3RA29 08-1A	For auxiliary circuit connections	**Screwdrivers** for all SIRIUS devices with spring-type terminals 3.0 mm x 0.5 mm; length approx. 200 mm; titanium gray/black, partially insulated		A	**Spring-type terminals** **3RA29 08-1A**		1	1 unit	101	0.045

1) The accessories are identical to those of the 3RU21 thermal overload relays and the 3RB3 solid-state overload relays.

2) PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de.

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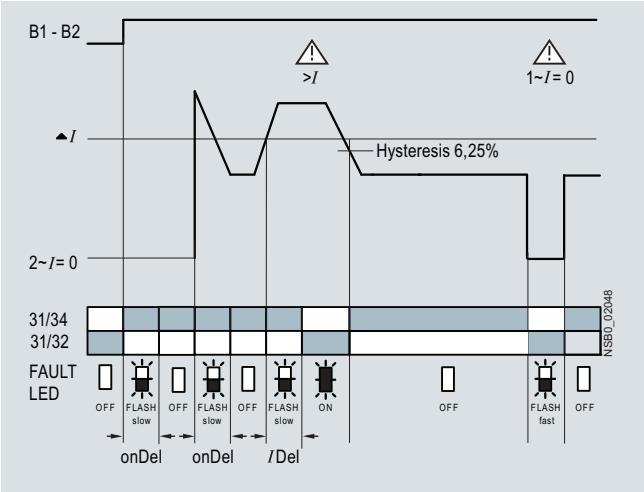
* You can order this quantity or a multiple thereof.
Illustrations are approximate

More information

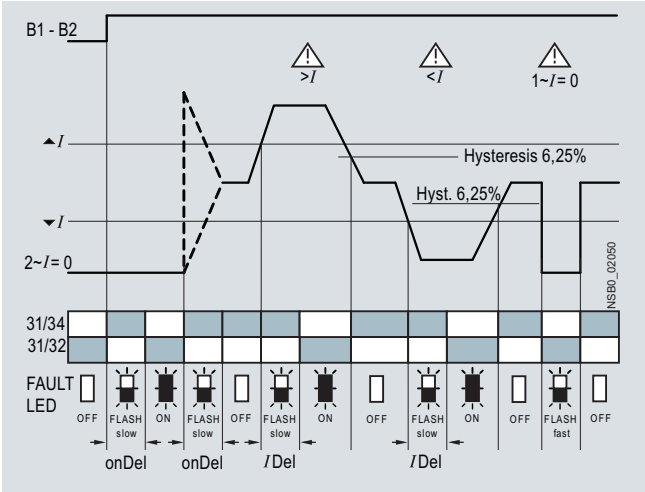
Function diagrams of 3RR21 4.-.A.30 basic versions, analog adjustable

Closed-circuit principle upon application of the control supply voltage

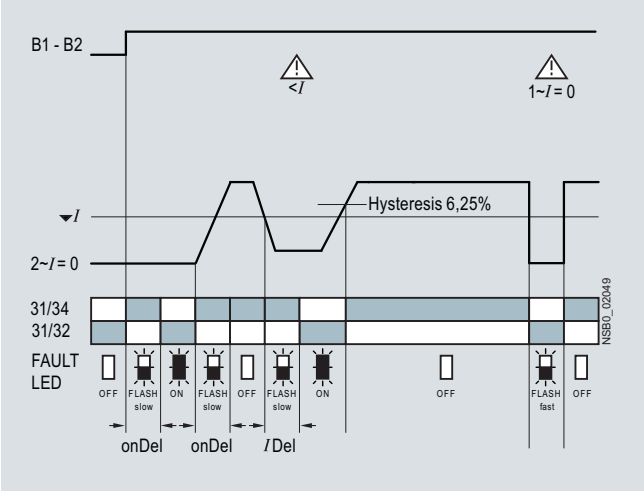
Current overshoot



Range monitoring



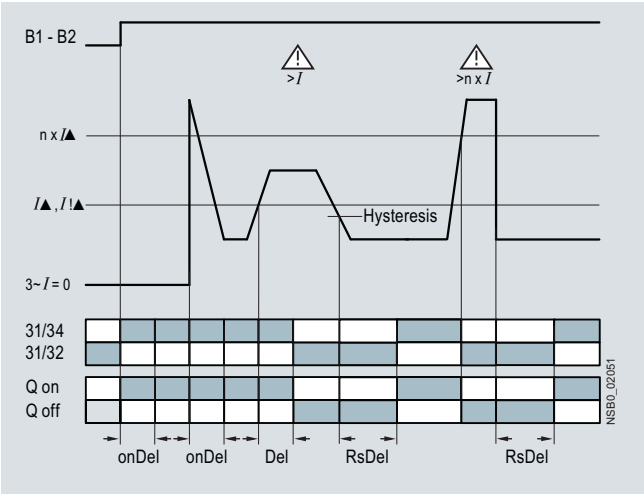
Current undershoot



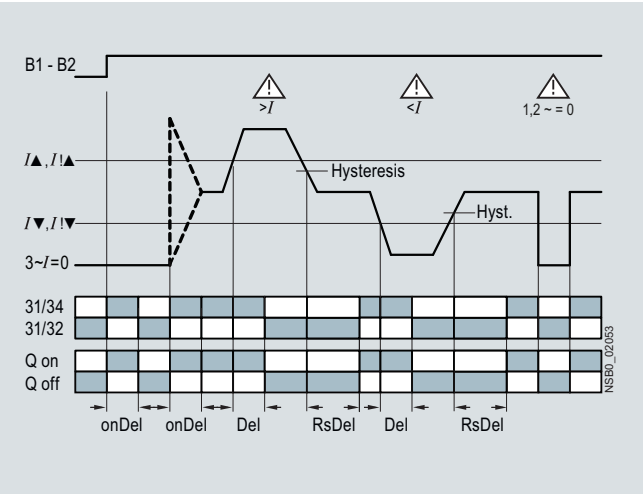
Function diagrams of 3RR22 4.-.F.30 standard versions, digitally adjustable

With the closed-circuit principle selected upon application of the control supply voltage

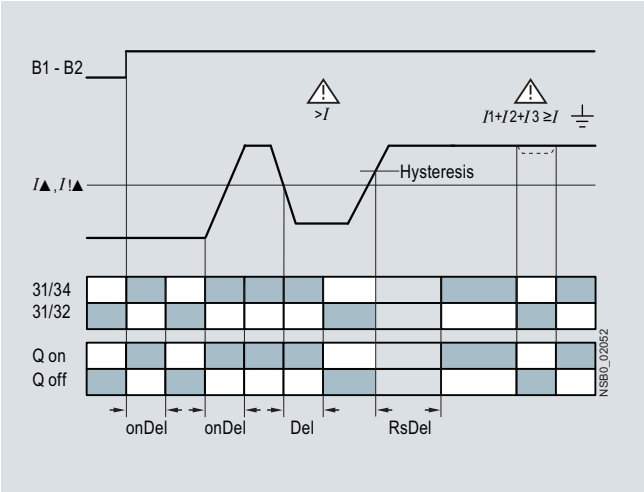
Current overshoot



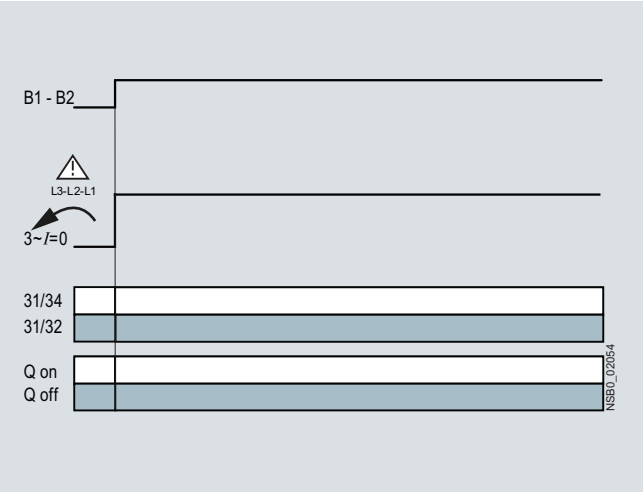
Range monitoring



Current undershoot with residual current monitoring



Phase sequence monitoring



General data

Overview

3TK28 10-1 overspeed monitor

SIRIUS safety relays are the key modules of a consistent and cost-effective safety chain. Be it EMERGENCY-STOP disconnection, protective door monitoring or the protection of presses or punches – with SIRIUS safety relays every safety application can be implemented to optimum effect in terms of engineering and price.

SIRIUS safety relays provide numerous safety-related functions:

- Monitoring the safety functions of sensors
- Monitoring the sensor leads
- Monitoring the correct operation of the safety relay
- Monitoring actuators for stoppage
- Monitoring actuators for speed
- Safety-oriented disconnection when dangers arise

Depending on the version, SIRIUS safety relays meet the highest requirements (PL e) according to ISO 13849-1 and achieve the highest safety integrity level (SIL 3) according to IEC 61508.

3TK28 10-1 overspeed monitors

The overspeed monitor unites two safety functions in one device in that it continuously monitors for stoppage and overspeed in machines and plants.

Through simple parameterization and permanent diagnostics via the display, faults can be quickly remedied - often before they lead to plant downtimes - at any time.

Connection method

Depending on the device version of the 3TK28 10-1 safety relays, the terminals are configured for screw or spring-type connection.

⊕	Screw terminals
	Spring-type terminals
	These terminals are indicated in the corresponding tables by the symbols shown on orange backgrounds.

Benefits

General

- Can be used for all safety applications thanks to compliance with the highest safety requirements (PL e according to ISO 13849-1 or SIL 3 according to IEC 61508)
- Suitable for use all over the world through compliance with all globally established certifications
- Compact, service-proven SIRIUS design creates more space in the control cabinet
- Flexible connectability and expendability make subsequent changes easy
- Removable terminals for greater plant availability
- Yellow front plate clearly identifies the device as an item of safety technology

Relay outputs

- Different voltages can be switched through the floating contacts
- Higher currents can be switched with relay contacts

Solid-state outputs

- Wear-free
- Insensitive to vibrations and dirt
- Good electrical endurance

Microprocessor systems

- Easy parameterization using the front display
- High functional reliability based on extensive monitoring functions
- Connection of pnp sensors, npn sensors and encoders is possible

3TK28 10-1 overspeed monitors

- Menu-prompted, easy parameterization
- Direct diagnostics via the display and therefore reduction of downtimes through early detection of faults
- Integrated protective door monitoring and therefore a higher level of safety through enabling of the plant only when it is in a safe state
- Suitable for all common sensors, i.e. a high level of flexibility

Application

SIRIUS safety relays are used mainly in autonomous safety applications which are not connected to a safety-oriented bus system. Their function here is to evaluate the sensors and the safety-oriented shutdown of hazards. Also they check and monitor the sensors, actuators and safety-oriented functions of the safety relay.

More information

Order No. scheme for 3TK28 10-1 overspeed monitors

Digit of the Order No.	1. - 5.	6.	7.		8.	9.	10.	11.	12.
	□□□□□	□	□	–	□	□	□	□	□
Safety relay	**3 T K 2 8**								
Type of safety relay		**1**	**0**						
Device type					□				
Rated control supply voltage						□			
Communication							□		
Delay time								□	
Connection method									□
Example	**3 T K 2 8**	**1**	**0**	**–**	**1**	**B**	**A**	**4**	**1**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Selection and ordering data

3TK28 10-1 overspeed monitor

Type	3TK28 10-1
Sensors	
• Inputs	4
• Solid-state	3
• With contacts	1
• Without sensors (measuring inputs)	--
Safety mats	--
Start	
• Auto	✓
• Monitored	✓
Cascading input 24 V DC	--
Key-operated switch	--
Enabling circuit, floating	
• Stop category 0	2
• Stop category 1	--
Enabling circuit, solid-state	
• Stop category 0	--
• Stop category 1	--

✓ Available
-- Not available

Type	3TK28 10-1
Signaling outputs	
• Floating	--
• Solid-state	2
Standards	IEC 60947-5-1, EN ISO 13849-1, EN 60204-1, IEC 61508
Test certificates	TÜV
Category according to EN 954-1 max	4
SIL level max. according to IEC 61508	3
Performance level PL acc. to ISO 13849-1	e
Probability of a dangerous failure per hour (PFH_d)	3.38 x 10^{-9} 1/h
Rated control supply voltage	
• 24 V DC	✓
• 120 ... 240 V AC/DC	✓

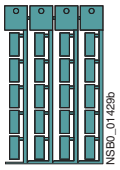
With special functions
Overspeed monitor

3TK28 10-1BA41

PU (UNIT, SET, M)=1
PS* =1 unit
PG =102

Rated control supply voltage U_s	OFF-delay t_v	DT	Screw terminals		Weight per PU approx.	DT	Spring-type terminals		Weight per PU approx.
			Order No.	Price per PU	kg		Order No.	Price per PU	kg
V	s								
Overspeed monitors									
24 DC	0 ... 600	A	**3TK28 10-1BA41**		0.500	A	**3TK28 10-1BA42**		0.500
120 ... 240 AC/DC	0 ... 600	A	**3TK28 10-1KA41**		0.500	A	**3TK28 10-1KA42**		0.500

Accessories

	Use	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Blank labels									
 3RT19 00-1SB20	For 3TK28	**Unit labeling plates**[1] For SIRIUS devices 20 mm x 7 mm, pastel turquoise	C	**3RT19 00-1SB20**		100	340 units	101	0.200
	For 3TK28	**Inscription labels for sticking** For SIRIUS devices							
		• 19 mm x 6 mm, pastel turquoise	D	**3RT19 00-1SB60**		100	3060 units	101	0.100
		• 19 mm x 6 mm, zink yellow	C	**3RT19 00-1SD60**		100	3060 units	101	0.100
Tools for screw terminals									
 8WA2 803	For main and auxiliary circuit connections	**Screwdrivers** 3.5 mm x 0.5 mm; suitable for a max. conductor cross-section of 2.5 mm²		**Screw terminals**					
		• Length approx. 175 mm; green, partially insulated	C	**8WA2 880**		1	1 unit	041	0.035
		• Length approx. 175 mm; green	C	**8WA2 803**		1	1 unit	041	0.024
Tools for opening spring-type terminals by hand									
	For auxiliary circuit connections	**Screwdrivers** 2.5 mm x 0.4 mm, length approx. 160 mm; green, suitable for a max. conductor cross-section of 1.5 mm²	C	**Spring-type terminals**					
				8WH9 200-0AA00		1	10 units	044	0.045

[1] PC labeling system for individual inscription of unit labeling plates available from: murrplastik Systemtechnik GmbH www.murrplastik.de.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Detecting Devices

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Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

Note:
For safety characteristics for position switches and hinge switches, see Catalog LV 1 · 2010, "Appendix" --> "Standards and Approvals"

Introduction

Overview




	3SE5 21., 3SE5 23 3SF1 214	3SE5 11., 3SF1 114	3SE5 12., 3SF1 124	3SE5 16.
	Position switches, standard			
Enclosures				
Plastic	✔	--	--	--
Metal	✔	✔	✔	✔
Dimensions (W x H x D) in mm	31 × 68 × 33	40 × 78 × 38	56 × 78 × 38	56 x 107 x 38
Degree of protection	IIP66/IP67	IP66/IP67	IP66/IP67	IP66/IP67
Standards IEC 60947-5-1	Mounting and operating points acc. to EN 50047	Mounting and operating points acc. to EN 50041	Operating points acc. to EN 50041	Operating points acc. to EN 50041
Approvals	CE[1)]	CE, UL, CSA, CCC		CE[1)]
Contact blocks				
2 slow-action contacts	1 NO + 1 NC, 2 NC			--
2 snap-action contacts	1 NO + 1 NC, 2 NC			--
3 slow-action contacts	1 NO + 2 NC, 2 NO + 1 NC			--
• With make-before-break	1 NO + 2 NC			--
3 snap-action contacts	1 NO + 2 NC			--
4 slow-action contacts	--			2 × (1 NO + 1 NC)
4 snap-action contacts	--			2 × (1 NO + 1 NC)
6 slow-action contacts with make-before-break	--			2 × (1 NO + 2 NC)
Special features				
LED status display	✔			--
Increased corrosion protection	✔			✔
Explosion protection (ATEX)	--	✔	✔	--
ASIsafe integrated	✔			--
Electrical specifications				
Insulation voltage U_i	400 V			400 V
Conventional thermal current I_{the}	6 A/10 A (3-/2-pole)			10 A
Terminals				
Cable entry	1 × (M20 × 1.5)	1 × (M20 × 1.5)	3 × (M20 × 1.5)	3 × (M20 × 1.5)
M12 connector socket 4-, 5- or 8-pole	✔	✔	✔	--
Connector socket, 6-pole + PE	--	✔	✔	--
Actuators				
Standard, rounded and roller plunger	✔	✔	✔	✔
Roller and angular roller lever	✔	✔	✔	✔
Spring rod	✔	✔	✔	✔
Twist levers and rod actuator	✔	✔	✔	✔
Fork lever	--	✔	✔	✔
Page				
Complete units	8/10 (metal enclosure)	8/14	8/14	8/15
Modular system	8/12 (metal enclosure)	LV 1 · 2010	LV 1 · 2010	8/16
Ambient temperature –40 °C	8/8 (plastic enclosure)	8/18	8/18	--
ASIsafe	8/28 (metal enclosure)	LV 1 · 2010	LV 1 · 2010	--

✔ Available
-- Not available

[1)] Under application: UL, CSA, CCC.

3SE5 21., 3SF1 214

3SF1 324

3SE5 212, 3SF1 214

	Position switches with separate actuator	Position switches with solenoid interlocking	Hinge switches
Enclosures			
Plastic	--	✔	--
Metal	✔	--	✔
Dimensions (W x H x D) in mm	31 × 68 × 33	54 x 185 x 44	31 × 68 × 33
Degree of protection	IP66/IP67	IP66/IP67	IP66/IP67
Standards IEC 60947-5-1	Mounting according to EN 50047	EN 1088, GS-ET 19	Mounting and operating points acc. to EN 50047
Approvals	CE[1)]	CE, UL, CSA, CCC	CE[1)]
Contact blocks			
2 slow-action contacts	1 NO + 1 NC	--	--
2 snap-action contacts	--	--	1 NO + 1 NC
3 slow-action contacts	1 NO + 2 NC	--	--
3 snap-action contacts	--	--	1 NO + 2 NC
6 slow-action contacts	--	2 × (1 NO + 2 NC)	--
Special features			
LED status display	✔	✔	✔
Increased corrosion protection	✔	✔	✔
Explosion protection (ATEX)	--	--	--
ASIsafe integrated	✔	✔	✔
Electrical specifications			
Insulation voltage U_i	400 V	400 V	400 V
Conventional thermal current I_{the}	6 A	6 A	6 A/10 A (3-/2-pole)
Terminals			
Cable entry	1 × (M20 × 1.5)	3 × (M20 × 1.5)	1 × (M20 × 1.5)
M12 connector socket, 4- or 5-pole	✔	✔	✔
AS-Interface	✔	✔	✔
Actuators			
Separate actuator	✔	✔	--
Hinges for mounting	--	--	✔
Page			
Complete units	8/23	LV 1 · 2010	8/26
Modular system	--	--	--
Ambient temperature –40 °C	--	--	--
ASIsafe	8/31	8/33	8/34

✔ Available
-- Not available

1) Under application: UL, CSA, CCC.

General data

Overview

The innovative SIRIUS 3SE5 position switches are modern in design, compact, modular and simple to connect. They save time and increase flexibility during installation of a whole range of switch variants In principle it is possible to combine any enclosure with any operating mechanism, paying due consideration to the EN 50041 and EN 50047 standards where necessary.

Complete units

Popular versions of the position switches in standard enclosures are available as complete units.

New versions of the 3SE5 position switches with metal enclosure

Modular system

The 3SE5 series features a new modular system comprising different sizes of the basic switch and an actuator which must be ordered separately. Thanks to the modular design of the switch the user can select the right solution for his application from numerous versions and install it himself in a very short time.

An easy plug-in method enables fast replacement of the twist actuators.

Examples of selection options in the modular system

Design

All enclosure variants have an integrated chlorinated rubber diaphragm (high functional safety in cold and aggressive environments).

Enclosure sizes

The 3SE5 switches are available in five different enclosure sizes with 2 or 3 contacts and in an XL enclosure:

- Open-type position switch IP20 or IP10
- Plastic and metal enclosure according to EN 50047, 31 mm wide, 1 cable entry
- Plastic enclosure, 50 mm wide, 2 cable entries
- Metal enclosure according to EN 50041, 40 mm wide, 1 cable entry
- Metal enclosure, 56 mm wide, 3 cable entries
- XL metal enclosure with 4 to 6 contacts, 56 mm wide, 3 cable entries

Enclosure versions

Various basic switches can be selected for the 3SE5 series:

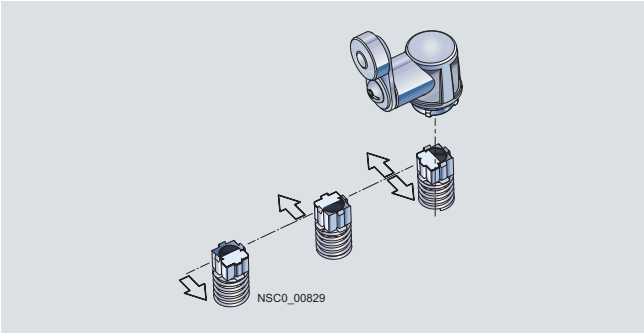
- With contact blocks with two or three contacts (screw terminals) designed as slow-action or snap-action contacts; the slow-action contacts also with make-before-break
- Optional LED status display
- With mounted four- or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- Versions with increased corrosion protection
- Versions for ambient temperature up to –40 °C
- Metal enclosures for explosion protection (ATEX) (see Catalog LV 1 · 2010)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 8/27)

Actuator variants

All operating mechanisms can be rotated around the axis in increments of 22.5°. The following actuator variants are available:

- Plain plungers
- Rounded plungers
- Roller plungers
- Roller levers
- Angular roller levers
- Spring rod
- Twist levers and rod actuators with twist actuator
- Fork lever

The actuator rollers are available with various materials and diameters.



Twist actuators for twist levers and rod actuators, with setting of switching to right, left or right/left (standard for all twist actuators except fork levers)

Contact reliability

The contact blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e.g. 1 mA at 5 V DC.

Positive opening ⊖

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

Benefits

The 3SE5 position switches differ from the previous series through the following new characteristics:

- The modular structure of the product range allows a number of versions with a smaller number of bearing types for enclosures and operating mechanisms.
- All operating mechanisms can be rotated around the axis in increments of 22.5°.
- Rounded and roller plungers according to EN 50041 with 3 mm overtravel (total travel 9 mm) for greater tolerance when switching.
- All enclosure sizes – now also including the small metal enclosure 31 mm wide – are optionally available with an LED signaling indicator.
- NEW: XL metal enclosure with 2- or 3-pole contact blocks
- All enclosure variants have an integrated chlorinated rubber diaphragm (high functional safety in cold and aggressive environments).
- All contact blocks are replaceable (see page 8/20).
- The three-pole contact blocks are available for all enclosure sizes.
- NEW: Blocks with slow-action contacts 1 NO + 2 NC with make-before-break and 2 NO + 1 NC.
- The short-stroke contact block 1 NO + 1 NC improves the precision of the switching operation through a reduced actuation path.
- The contact block with 1 NO + 1 NC snap-action contacts with 2 x 2 mm contact opening is suitable for simultaneous disconnection and signaling, particularly in the elevator industry.
- The plastic enclosure 31 mm wide has simple and fast wiring equipment which makes it possible to save from approx. 20 to 25 % of the time when connecting.
- XL enclosure for accommodating 2 contact blocks
- The ASIsafe electric component is integrated for the versions with the AS-Interface connection (see page 8/27); an additional adapter is not required.

Application

With the standard position switches, mechanical positions of moved machine parts are converted into electrical signals. Through their modular and uniform design and large number of variants, the devices can meet practically all requirements in industry.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. And many different actuator variants are available to match the mechanical configuration of the moved machined parts. Dimensions, fixing points and characteristics are largely in accordance with the EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

Standards

IEC 60947-5-1 or EN 60947-5-1.

The protective measure of "total insulation" by the molded-plastic enclosure is guaranteed by the use of molded-plastic screw-glands.

Safety position switches

For controls according to IEC 60204-1 or EN 60204-1 the devices can be used as a safety position switch. To secure position switches against changes in their position, keyed techniques must be employed on installation.

Safety circuits

IEC 60947-5-1 and EN 60947-5-1 require positive opening of the NC contacts, i.e. for the purposes of personal safety, the assured opening of NC contacts is expressly stipulated for the electrical equipment of machines in all safety circuits and marked according to the IEC standard 60947-5-1 with the symbol ⊖.

Category 2 according to ISO 13849-1 (EN 954-1) can be attained with 3SE5 position switches with ⊖, and category 3 or 4 when using an additional position switch, if the corresponding failsafe evaluation units are selected and correctly installed, e.g. the 3TK28 safety relays or matching devices from the ASIsafe, SIMATIC or SINUMERIK product ranges. The operating mechanisms (actuators) must also be connected to the enclosure by keyed techniques. The corresponding operating mechanisms are marked in the catalog with ⊖.

General data

More information

Type		3SE5 1.., 3SE5 2..	
General data			
Standards		IEC 60947-5-1, EN 60947-5-1	
Rated insulation voltage U_i	V	400	
Pollution degree acc. to EN 60664-1		Class 3	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	400 AC, over 300 V AC only for equal potential[1)]	
Conventional thermal current I_{th}	A	10	6
Rated operational current I_e		2-pole	3-pole
• With alternating current 50/60 Hz		I_e/AC-15	I_e/AC-15
- At 24 V	A	6	6
- At 120 V	A	6	3
- At 240 V	A	3	1.5
- At 400 V	A	--	--
- At 500 V	A	--	--
• For direct current		I_e/DC-13	I_e/DC-13
- At 24 V	A	3	3
- At 125 V	A	0.55	0.55
- At 250 V	A	0.27	0.27
- At 48 V		--	--
- At 110 V		--	--
- At 220 V	A	--	--
- At 440 V	A	--	--
Short-circuit protection[1)]			
• With DIAZED fuse links, operational class gG	A	6	
• With fuse links, quick	A	--	
• With miniature circuit breaker, Char. C	A	1	
Mechanical endurance			
• Basic switches		15 $\times 10^6$ operating cycles	
• With spring rod, 3SE5 ...-..R..		10 $\times 10^6$ operating cycles	
• With fork lever, 3SE5 1..-..T..		1 $\times 10^6$ operating cycles	
Electrical endurance			
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		10 $\times 10^6$ operating cycles	
• For utilization category AC-15 when switching off I_e/AC-15 at 240 V		0.1 $\times 10^6$ operating cycles	
• With utilization category DC-12/DC-13		For direct current depending on the loading of the switch	
Switching frequency with 3RH11, 3RT10 16 to 3RT10 26 contactors		6000 operating cycles/h	
Switching accuracy For repeated switching, measured at the plunger of the contact block	mm	0.05	
Rated data according to ⓒ, ⓤ **and** ⓡ.			
• Rated voltage	V	300	
• Uninterrupted current	A	6	
• Switching capacity		Heavy duty, A 300/ B 300 /Q 300	

1) For slow-action contacts 1 NO + 2 NC with make-before-break and 2 NO + 1 NC the following applies: over 250 V AC only equal potential

Note: On the following pages you will find these new items:

- *Metal enclosure in width of 31 mm*
- *Metal enclosure in width of 40 and 56 mm with plain plunger*
- *XL metal enclosure in width of 56 mm with 4 or 6 contacts*
- *Versions for ambient temperature up to –40 °C*
- *New versions of the switches with interlock for AS-Interface*

Options

On the following pages you will find selection tables for complete units as well as components of the modular system.

☐	Complete units
◇	Modular system
	The difference between units is indicated in the selection and ordering data by orange backgrounds.

Using the modular system you can assemble switch variants which are not available as complete units. Each complete unit can also be supplied as a module.

A basic switch for the modular system comprises an enclosure with a contact block and a cover. Among the basic switches the following versions, for example, can be selected:

- Basic enclosure with plunger
- Version with increased corrosion protection
- Version with 2 LEDs
- Version with M12 connector socket or 6-pole + PE
- Version with M12 connector socket and with 2 LEDs

For the plastic enclosures with a width of 31 and 50 mm the basic switches are designed as complete units with rounded plunger (according to standard).

Online configurator

The online configurator helps you not only to select and order the right position switch but also to create complete product documentation.

- Product data sheets
- Dimensional drawings
- Operating travel diagrams
- CAD data in 2D and 3D model images
- Ordering data
- Product photos

www.siemens.com/lowvoltage/configurators

Complete units

Ordering example

Required:
- Position switch according to EN 50047 in a metal enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Angular roller lever, metal lever and plastic roller

To be ordered:

	Version	Complete units ☐
		Order No.
Complete units • Enclosure width 31 mm		
	***Angular roller levers*** **With metal lever and plastic roller 13 mm** Slow-action contacts 1 NO + 1 NC	**3SE5 212-0BF10**

Modular system

Ordering example 1

Required:
- Position switch according to EN 50047 in a metal enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Angular roller lever, metal lever and plastic roller

To be ordered separately:

	Version	Modular system ◇
		Order No.
Basic switches • Enclosure width 31 mm		
	**With plunger** Slow-action contacts 1 NO + 1 NC	**3SE5 212-0BC05**
		+
Operating mechanisms		
	**Angular roller levers** Metal lever, plastic roller	**3SE5 000-0AF10**

Ordering example 2

Required:
- Position switch according to EN 50047 in a metal enclosure
- Contact block with slow-action contacts 1 NO + 1 NC
- Twist lever, high-grade steel lever and plastic roller

To be ordered separately:

	Version	Modular system ◇
		Order No.
Basic switches • Enclosure width 31 mm		
	**With plunger** Slow-action contacts 1 NO + 1 NC	**3SE5 212-0BC05**
		+
Twist actuators		
	**Twist actuators**	**3SE5 000-0AK00**
	**Twist levers** High-grade steel lever, plastic roller	**3SE5 000-0AA31**

➔ Positively driven actuator, necessary in safety circuits.

Plastic enclosures
Ambient temperature up to –40 °C

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units □ Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units[1] • Enclosure width 31 mm									
Twist levers, type A acc. to EN 50047									
With high-grade steel lever 21 mm and plastic roller 19 mm									
Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 232-0CK31-1AJ0**		1	1 unit	102	0.085
Twist levers, adjustable length									
With high-grade steel lever with grid hole and plastic roller 19 mm									
Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 232-0CK62-1AJ0**		1	1 unit	102	0.100
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 232-0LK62-1AJ0**		1	1 unit	102	0.120
Complete units[1] • Enclosure width 50 mm									
Twist levers									
With metal lever 21 mm and plastic roller 19 mm									
Snap-action contacts • Integrated[2]	1 NO + 1 NC	--	➔ B	**3SE5 242-0HK21-1AJ0**		1	1 unit	102	0.950
Twist levers, adjustable length									
With high-grade steel lever with grid hole and plastic roller 19 mm									
Snap-action contacts • Integrated[2]	1 NO + 1 NC	--	➔ B	**3SE5 242-0HK62-1AJ0**		1	1 unit	102	0.115


Twist lever


Twist lever, adjustable length


Twist lever, adjustable length

Modular system

2 or 3 contacts · Degree of protection IP65 or IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system ◇ Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Basic switches • Enclosure width 31 mm (with rounded plunger[1])									
With teflon plunger									
Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 232-0CC05-1AJ0**		1	1 unit	102	0.065
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 232-0KC05-1AJ0**		1	1 unit	102	0.070
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 232-0LC05-1AJ0**		1	1 unit	102	0.070
Basic switches • Enclosure width 50 mm (with rounded plunger[1])									
With teflon plunger									
Slow-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 242-0BC05-1AJ0**		1	1 unit	102	0.065
Snap-action contacts • Integrated[2]	1 NO + 1 NC	--	➔ B	**3SE5 242-0HC05-1AJ0**		1	1 unit	102	0.065


Basic switch


Basic switch

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

[1] On the plastic version the basic switch is a complete unit with rounded plunger.

[2] Subsequent replacement of contact blocks is not possible.

Note: For selection aid, see page 8/7.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Plastic enclosures
Ambient temperature up to –40 °C

	Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		mm		Order No. / Price per PU				kg
Operating mechanisms								
 Roller plunger	**Roller plungers, type C according to EN 50047**							
	Plastic rollers	10	➔ B	**3SE5 000-0AD03-1AJ0**	1	1 unit	102	0.010
 Roller lever	**Roller levers, type E according to EN 50047**							
	Metal lever, plastic roller	13	➔ B	**3SE5 000-0AE10-1AJ0**	1	1 unit	102	0.015
	High-grade steel lever, plastic roller	13	➔ B	**3SE5 000-0AE12-1AJ0**	1	1 unit	102	0.015
 Angular roller lever	**Angular roller levers**							
	Metal lever, plastic roller	13	➔ B	**3SE5 000-0AF10-1AJ0**	1	1 unit	102	0.015
	High-grade steel lever, plastic roller	13	➔ B	**3SE5 000-0AF12-1AJ0**	1	1 unit	102	0.015
Twist actuators								
 Twist actuator	**Twist actuators**, plastic (without lever)							
	Switching right and/or left, adjustable		➔ B	**3SE5 000-0AK00-1AJ0**	1	1 unit	102	0.025
 Twist lever	**Twist levers straight, 21 mm, type A according to EN 50047**							
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA21-1AJ0**	1	1 unit	102	0.010
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA31-1AJ0**	1	1 unit	102	0.010
 Twist lever, adjustable length	**Twist levers, adjustable length, with grid hole**							
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA60-1AJ0**	1	1 unit	102	0.025
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA62-1AJ0**	1	1 unit	102	0.025

➔ Positively driven actuator, necessary in safety circuits.

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

Metal enclosures
Enclosure width 31 mm according to EN 50047

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs		DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units[1] • Enclosure width 31 mm											
 Rounded plunger	***Rounded plungers, type B, acc. to EN 50047***										
	With plunger										
	Slow-action contacts	1 NO + 1 NC	--	➔	A	**3SE5 212-0BC05**		1	1 unit	102	0.170
	Snap-action contacts	1 NO + 1 NC	--	➔	A	**3SE5 212-0CC05**		1	1 unit	102	0.170
	Slow-action contacts	1 NO + 2 NC	--	➔	A	**3SE5 212-0KC05**		1	1 unit	102	0.180
	Snap-action contacts	1 NO + 2 NC	--	➔	A	**3SE5 212-0LC05**		1	1 unit	102	0.180
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	A	**3SE5 212-0MC05**		1	1 unit	102	0.180
	Slow-action contacts	2 NO + 1 NC	--		A	**3SE5 212-0PC05**		1	1 unit	102	0.180
 With increased corrosion protection	**With increased corrosion protection**										
	Slow-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 212-0BC05-1CA0**		1	1 unit	102	0.170
	Snap-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 212-0CC05-1CA0**		1	1 unit	102	0.170
	Slow-action contacts	1 NO + 2 NC	--	➔	B	**3SE5 212-0KC05-1CA0**		1	1 unit	102	0.180
	Snap-action contacts	1 NO + 2 NC	--	➔	B	**3SE5 212-0LC05-1CA0**		1	1 unit	102	0.180
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔	B	**3SE5 212-0MC05-1CA0**		1	1 unit	102	0.180
	Slow-action contacts	2 NO + 1 NC	--		B	**3SE5 212-0PC05-1CA0**		1	1 unit	102	0.180
	With M12 connector socket, 5-pole (125 V, 4 A)										
	Slow-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 214-0BC05-1AC5**		1	1 unit	102	0.185
	Snap-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 214-0CC05-1AC5**		1	1 unit	102	0.185
	Slow-action contacts	2 NC	--	➔	B	**3SE5 214-0KC05-1AE1**		1	1 unit	102	0.195
	Snap-action contacts	2 NC	--	➔	B	**3SE5 214-0LC05-1AE1**		1	1 unit	102	0.195
 With 2 LEDs	**With 2 LEDs, yellow/green**										
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔	B	**3SE5 212-1KC05**		1	1 unit	102	0.190
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔	A	**3SE5 212-1LC05**		1	1 unit	102	0.190
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔	B	**3SE5 212-3KC05**		1	1 unit	102	0.190
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔	B	**3SE5 212-3LC05**		1	1 unit	102	0.190
	With M12 connector socket, 5-pole (125 V, 4 A) **and 2 LEDs**										
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔	B	**3SE5 214-1BC05-1AF3**		1	1 unit	102	0.195
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔	B	**3SE5 214-1CC05-1AF3**		1	1 unit	102	0.195
 Plain plunger	***Plain plungers***										
	With high-grade steel plunger										
	Slow-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 212-0BB01**		1	1 unit	102	0.195
	Snap-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 212-0CB01**		1	1 unit	102	0.190
	Slow-action contacts	1 NO + 2 NC	--	➔	B	**3SE5 212-0KB01**		1	1 unit	102	0.200
	Snap-action contacts	1 NO + 2 NC	--	➔	B	**3SE5 212-0LB01**		1	1 unit	102	0.200
 Roller plunger	***Roller plungers, type C acc. to EN 50047***										
	With plastic roller 10 mm										
	Slow-action contacts	1 NO + 1 NC	--	➔	A	**3SE5 212-0BD03**		1	1 unit	102	0.180
	Snap-action contacts	1 NO + 1 NC	--	➔	B	**3SE5 212-0CD03**		1	1 unit	102	0.180
	Slow-action contacts	1 NO + 2 NC	--	➔	A	**3SE5 212-0KD03**		1	1 unit	102	0.190
	Snap-action contacts	1 NO + 2 NC	--	➔	B	**3SE5 212-0LD03**		1	1 unit	102	0.190

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Metal enclosures
Enclosure width 31 mm according to EN 50047

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units[1] • Enclosure width 31 mm									
Roller levers, type E acc. to EN 50047									
With metal lever and plastic roller 13 mm									
Slow-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0BE10**		1	1 unit	102	0.185
Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 212-0CE10**		1	1 unit	102	0.185
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0KE10**		1	1 unit	102	0.195
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0LE10**		1	1 unit	102	0.195
Angular roller levers									
With metal lever and plastic roller 13 mm									
Slow-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 212-0BF10**		1	1 unit	102	0.185
Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 212-0CF10**		1	1 unit	102	0.185
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0KF10**		1	1 unit	102	0.195
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0LF10**		1	1 unit	102	0.195
Twist levers, type A acc. to EN 50047									
With metal lever 21 mm and plastic roller 19 mm									
Slow-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0BK21**		1	1 unit	102	0.205
Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0CK21**		1	1 unit	102	0.205
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0KK21**		1	1 unit	102	0.195
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0LK21**		1	1 unit	102	0.220
Twist levers, adjustable length									
With metal lever with grid hole and plastic roller 19 mm									
Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0CK60**		1	1 unit	102	0.220
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0KK60**		1	1 unit	102	0.230
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0LK60**		1	1 unit	102	0.230
With metal lever and plastic roller 19 mm									
Slow-action contacts	1 NO + 1 NC	--	A	**3SE5 212-0BK50**		1	1 unit	102	0.220
Snap-action contacts	1 NO + 1 NC	--	B	**3SE5 212-0CK50**		1	1 unit	102	0.220
Snap-action contacts	1 NO + 2 NC	--	B	**3SE5 212-0LK50**		1	1 unit	102	0.230


Roller lever


Angular roller lever


Twist lever


Twist lever, adjustable length

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

Note: If the device you require is not available as a complete unit, see "Modular system" on the next page.

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

Metal enclosures
Enclosure width 31 mm according to EN 50047

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version	Contacts	LEDs	DT	Modular system Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Basic switches • Enclosure width 31 mm (with rounded plunger[1])										
 Basic switch	**With plunger**									
	Slow-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0BC05**		1	1 unit	102	0.170
	Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0CC05**		1	1 unit	102	0.170
	Slow-action contacts	1 NO + 2 NC	--	➔ A	**3SE5 212-0KC05**		1	1 unit	102	0.180
	Snap-action contacts	1 NO + 2 NC	--	➔ A	**3SE5 212-0LC05**		1	1 unit	102	0.180
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ A	**3SE5 212-0MC05**		1	1 unit	102	0.180
	Slow-action contacts	2 NO + 1 NC	--	A	**3SE5 212-0PC05**		1	1 unit	102	0.180
 With increased corrosion protection	**With increased corrosion protection[2]**									
	Slow-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 212-0BC05-1CA0**		1	1 unit	102	0.170
	Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 212-0CC05-1CA0**		1	1 unit	102	0.170
	Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0KC05-1CA0**		1	1 unit	102	0.180
	Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0LC05-1CA0**		1	1 unit	102	0.180
	Slow-action contacts with make-before-break	1 NO + 2 NC	--	➔ B	**3SE5 212-0MC05-1CA0**		1	1 unit	102	0.180
	Slow-action contacts	2 NO + 1 NC	--	B	**3SE5 212-0PC05-1CA0**		1	1 unit	102	0.180
 With M12 connector	**With M12 connector socket, 5-pole** (125 V, 4 A)									
	Slow-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 214-0BC05-1AC5**		1	1 unit	102	0.185
	Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 214-0CC05-1AC5**		1	1 unit	102	0.185
	Slow-action contacts	2 NC	--	➔ B	**3SE5 214-0KC05-1AE1**		1	1 unit	102	0.195
	Snap-action contacts	2 NC	--	➔ B	**3SE5 214-0LC05-1AE1**		1	1 unit	102	0.195
 With 2 LEDs	**With 2 LEDs, yellow/green**									
	Slow-action contacts	1 NO + 2 NC	24 V DC	➔ B	**3SE5 212-1KC05**		1	1 unit	102	0.190
	Snap-action contacts	1 NO + 2 NC	24 V DC	➔ A	**3SE5 212-1LC05**		1	1 unit	102	0.190
	Slow-action contacts	1 NO + 2 NC	230 V AC	➔ B	**3SE5 212-3KC05**		1	1 unit	102	0.190
	Snap-action contacts	1 NO + 2 NC	230 V AC	➔ B	**3SE5 212-3LC05**		1	1 unit	102	0.190
 With M12 socket and 2 LEDs	**With M12 connector socket, 5-pole** (125 V, 4 A) **and 2 LEDs**									
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔ B	**3SE5 214-1BC05-1AF3**		1	1 unit	102	0.195
	Snap-action contacts	1 NO + 1 NC	24 V DC	➔ B	**3SE5 214-1CC05-1AF3**		1	1 unit	102	0.195

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

1) With enclosure width 31 mm the basic switch is a complete unit with rounded plunger.

2) Use corresponding high-grade steel lever.

Note: For selection aid, see page 8/7.

	Version	Diameter mm	DT	Modular system Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Operating mechanisms									
 Plain plunger	**Plain plungers**								
	High-grade steel plungers	10	➔ A	**3SE5 000-0AB01**		1	1 unit	102	0.005
 Roller plunger	**Roller plungers, type C according to EN 50047**								
	Plastic rollers	10	➔ A	**3SE5 000-0AD03**		1	1 unit	102	0.010
	High-grade steel rollers	10	➔ B	**3SE5 000-0AD04**		1	1 unit	102	0.010

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Metal enclosures
Enclosure width 31 mm according to EN 50047

	Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		mm		Order No. / Price per PU				kg
Operating mechanisms								
 With central fixing	**Roller plungers with central fixing**							
	Plastic rollers	10	➔ B	**3SE5 000-0AD10**	1	1 unit	102	0.035
	High-grade steel rollers	10	➔ B	**3SE5 000-0AD11**	1	1 unit	102	0.030
 Roller lever	**Roller levers, type E according to EN 50047**							
	Metal lever, plastic roller	13	➔ A	**3SE5 000-0AE10**	1	1 unit	102	0.015
	Metal lever, high-grade steel roller	13	➔ B	**3SE5 000-0AE11**	1	1 unit	102	0.020
	High-grade steel lever, plastic roller	13	➔ B	**3SE5 000-0AE12**	1	1 unit	102	0.010
	High-grade steel lever, high-grade steel roller	13	➔ B	**3SE5 000-0AE13**	1	1 unit	102	0.055
 Angular roller lever	**Angular roller levers**							
	Metal lever, plastic roller	13	➔ A	**3SE5 000-0AF10**	1	1 unit	102	0.015
	Metal lever, high-grade steel roller	13	➔ B	**3SE5 000-0AF11**	1	1 unit	102	0.015
	High-grade steel lever, plastic roller	13	➔ A	**3SE5 000-0AF12**	1	1 unit	102	0.015
	High-grade steel lever, high-grade steel roller	13	➔ B	**3SE5 000-0AF13**	1	1 unit	102	0.020
 Spring rod	**Spring rods** (for switches with snap-action contacts only)							
	Plastic plunger:							
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	**3SE5 000-0AR01**	1	1 unit	102	0.060
	• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	**3SE5 000-0AR03**	1	1 unit	102	0.020
	• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	**3SE5 000-0AR04**	1	1 unit	102	0.040
	High-grade steel plunger:							
	• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	**3SE5 000-0AR02**	1	1 unit	102	0.040
Twist actuators								
 Twist actuator	**Twist actuators**, plastic (without lever)							
	Switching right and/or left, adjustable		➔ A	**3SE5 000-0AK00**	1	1 unit	102	0.025
	Levers for twist actuators							
 Twist lever	**Twist levers, straight, type A according to EN 50047**							
	Metal lever 21 mm, plastic roller	19	➔ A	**3SE5 000-0AA21**	1	1 unit	102	0.010
	Metal lever 21 mm, high-grade steel roller	19	➔ B	**3SE5 000-0AA22**	1	1 unit	102	0.025
	Metal lever 21 mm, roller with ball bearing	19	➔ B	**3SE5 000-0AA23**	1	1 unit	102	0.020
	Metal lever 21 mm, plastic roller	30	➔ B	**3SE5 000-0AA25**	1	1 unit	102	0.010
	High-grade steel lever 21 mm, plastic roller	19	➔ B	**3SE5 000-0AA31**	1	1 unit	102	0.015
	High-grade steel lever 21 mm, high-grade steel roller	19	➔ B	**3SE5 000-0AA32**	1	1 unit	102	0.020
 Twist lever, adjustable length	**Twist levers 30 mm, straight**[1]							
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA24**	1	1 unit	102	0.020
	Twist levers, adjustable length, with grid hole							
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA60**	1	1 unit	102	0.025
	Metal lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA61**	1	1 unit	102	0.040
	Metal lever, plastic roller	50	➔ B	**3SE5 000-0AA67**	1	1 unit	102	0.025
	Metal lever, rubber roller	50	➔ B	**3SE5 000-0AA68**	1	1 unit	102	0.045
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA62**	1	1 unit	102	0.025
	High-grade steel lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA63**	1	1 unit	102	0.040
 Rod actuator	**Twist levers, adjustable length**							
	Metal lever, plastic roller	19	A	**3SE5 000-0AA50**	1	1 unit	102	0.025
	Metal lever, high-grade steel roller	19	B	**3SE5 000-0AA51**	1	1 unit	102	0.035
	Metal lever, plastic roller	30	B	**3SE5 000-0AA55**	1	1 unit	102	0.025
	Metal lever, plastic roller	50	B	**3SE5 000-0AA57**	1	1 unit	102	0.025
	Metal lever, rubber roller	50	B	**3SE5 000-0AA58**	1	1 unit	102	0.040
	High-grade steel lever, plastic roller	19	B	**3SE5 000-0AA52**	1	1 unit	102	0.025
	High-grade steel lever, high-grade steel roller	19	B	**3SE5 000-0AA53**	1	1 unit	102	0.035
	Rod actuators, type D according to EN 50041							
	Aluminum rod, length 200 mm	6	B	**3SE5 000-0AA80**	1	1 unit	102	0.070
	Spring rod, length 200 mm	6	B	**3SE5 000-0AA81**	1	1 unit	102	0.030
	Plastic rod, length 200 mm	6	B	**3SE5 000-0AA82**	1	1 unit	102	0.020
	Plastic rod, length 330 mm	6	B	**3SE5 000-0AA83**	1	1 unit	102	0.020

➔ Positively driven actuator, necessary in safety circuits.

[1] Can be mounted on turnover (turned through 180°, rear side of the lever).

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Metal enclosures
Enclosure width 40 mm acc. to EN 50041 / 56 mm

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units[1] • Enclosure width 40 mm									
Plain plungers									
With high-grade steel plunger									
Slow-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 112-0BB01**		1	1 unit	102	0.265
Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 112-0CB01**		1	1 unit	102	0.265
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 112-0KB01**		1	1 unit	102	0.275
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 112-0LB01**		1	1 unit	102	0.275


Plain plunger

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Version	Contacts	LEDs	DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units[1] • Enclosure width 56 mm									
Plain plungers									
With high-grade steel plunger									
Slow-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 122-0BB01**		1	1 unit	102	0.320
Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 122-0CB01**		1	1 unit	102	0.320
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 122-0KB01**		1	1 unit	102	0.330
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 122-0LB01**		1	1 unit	102	0.330


Plain plunger

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions are available as complete units.

Note: More complete units and the modular system can be found in Catalog LV 1 · 2010.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Selection and ordering data

Complete units

4 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

	Version	Contacts	LEDs		DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units[1] • Enclosure width 56 mm, XL											
 Plain plunger	***Plain plunger*** **With high-grade steel plunger**										
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	B	**3SE5 162-0CB01**		1	1 unit	102	0.435
 Rounded plunger	***Rounded plunger*** **With high-grade steel plungers, with 3 mm overtravel**										
	Slow-action contacts	1 × (1 NO + 1 NC)	--	➔	B	**3SE5 162-0EC02**		1	1 unit	102	0.480
	Snap-action contacts	1 × (1 NO + 1 NC)									
	2 mm travel difference										
 Roller plunger	***Roller plunger*** **With high-grade steel roller 13 mm, with 3 mm overtravel**										
	Slow-action contacts	2 × (1 NO + 1 NC)	--	➔	B	**3SE5 162-0BD02**		1	1 unit	102	0.480
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	A	**3SE5 162-0CD02**		1	1 unit	102	0.480
 Roller lever	***Roller levers*** **With metal lever and plastic roller 22 mm**										
	Slow-action contacts	2 × (1 NO + 1 NC)	--	➔	B	**3SE5 162-0BE01**		1	1 unit	102	0.475
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	A	**3SE5 162-0CE01**		1	1 unit	102	0.475
	With metal lever and high-grade steel roller 22 mm										
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	B	**3SE5 162-0CE02**		1	1 unit	102	0.480
 Angular roller lever	***Angular roller levers*** **With metal lever and plastic roller 22 mm**										
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	B	**3SE5 162-0CF01**		1	1 unit	102	0.475
 Twist lever	***Twist levers*** **With metal lever 27 mm and plastic roller 19 mm**										
	Snap-action contacts	2 × (1 NO + 1 NC)	--	➔	A	**3SE5 162-0CH01**		1	1 unit	102	0.515

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Popular versions.

Note: If the device you require is not available as a complete unit, see "Modular system" on the next page.

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

XL metal enclosures, enclosure width 56 mm

Modular system

4 or 6 contacts · Degree of protection IP66/IP67 · Cable entry 3 × (M20 × 1.5)

Basic switches • Enclosure width 56 mm, XL

Basic switch

Version	Contacts	LEDs	DT	Modular system Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
With 3 x M20 x 1.5 connecting thread									
Slow-action contacts	2 × (1 NO + 1 NC)	--	➔ A	**3SE5 162-0BA00**		1	1 unit	102	0.430
Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ A	**3SE5 162-0CA00**		1	1 unit	102	0.430
Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	--	➔ A	**3SE5 162-0DA00**		1	1 unit	102	0.450
With increased corrosion protection[1]									
Slow-action contacts	2 × (1 NO + 1 NC)	--	➔ B	**3SE5 162-0BA00-1CA0**		1	1 unit	102	0.430
Snap-action contacts	2 × (1 NO + 1 NC)	--	➔ B	**3SE5 162-0CA00-1CA0**		1	1 unit	102	0.430
Slow-action contacts with make-before-break	2 × (1 NO + 2 NC)	--	➔ B	**3SE5 162-0DA00-1CA0**		1	1 unit	102	0.450

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

[1] Use corresponding high-grade steel lever.

Note: For selection aid, see page 8/7.

Operating mechanisms

Version	Diameter mm	DT	Modular system Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Plain plungers								
High-grade steel plungers	10	➔ A	**3SE5 000-0AB01**		1	1 unit	102	0.005
Rounded plungers, type B according to EN 50041								
High-grade steel plungers, with 3 mm overtravel		➔ B	**3SE5 000-0AC02**		1	1 unit	102	0.030
Roller plungers, type C according to EN 50041								
High-grade steel roller, with 3 mm overtravel	13	➔ B	**3SE5 000-0AD02**		1	1 unit	102	0.050
Roller levers								
Metal lever, plastic roller	22	➔ A	**3SE5 000-0AE01**		1	1 unit	102	0.045
Metal lever, high-grade steel roller	22	➔ B	**3SE5 000-0AE02**		1	1 unit	102	0.065
High-grade steel lever, plastic roller	22	➔ B	**3SE5 000-0AE03**		1	1 unit	102	0.040
High-grade steel lever, high-grade steel roller	22	➔ B	**3SE5 000-0AE04**		1	1 unit	102	0.065
Angular roller levers								
Metal lever, plastic roller	22	➔ A	**3SE5 000-0AF01**		1	1 unit	102	0.050
Metal lever, high-grade steel roller	22	➔ B	**3SE5 000-0AF02**		1	1 unit	102	0.075
High-grade steel lever, plastic roller	22	➔ B	**3SE5 000-0AF03**		1	1 unit	102	0.050
High-grade steel lever, high-grade steel roller	22	➔ B	**3SE5 000-0AF04**		1	1 unit	102	0.075
Spring rods (for switches with snap-action contacts only)								
Plastic plunger:								
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	**3SE5 000-0AR01**		1	1 unit	102	0.060
• Length 76 mm (spring 23.5 mm, plunger 10 mm)		B	**3SE5 000-0AR03**		1	1 unit	102	0.020
• Length 242.5 mm (spring 150 mm, plunger 50 mm)		B	**3SE5 000-0AR04**		1	1 unit	102	0.040
High-grade steel plunger:								
• Length 142.5 mm (spring 50 mm, plunger 50 mm)		B	**3SE5 000-0AR02**		1	1 unit	102	0.040

Plain plunger

Rounded plunger

Roller plunger

Roller lever

Angular roller lever

Spring rod

➔ Positively driven actuator, necessary in safety circuits.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Version	Diameter mm	DT	Modular system Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Twist actuators								
 Twist actuator								
Twist actuators, metal (without lever)								
• For twist levers and rod actuators, switching right and/or left, adjustable		➔ A	**3SE5 000-0AH00**		1	1 unit	102	0.070
• For fork levers, latching		➔ B	**3SE5 000-0AT10**		1	1 unit	102	0.070
Levers for twist actuators								
 Twist lever								
Twist levers 27 mm, offset, type A according to EN 50041								
Metal lever, plastic roller	19	➔ A	**3SE5 000-0AA01**		1	1 unit	102	0.015
Metal lever, high-grade steel roller	19	➔ A	**3SE5 000-0AA02**		1	1 unit	102	0.035
Metal lever, roller with ball bearing	19	➔ B	**3SE5 000-0AA03**		1	1 unit	102	0.020
Metal lever, 2 plastic rollers	19	➔ B	**3SE5 000-0AA04**		1	1 unit	102	0.015
Metal lever, plastic roller	30	➔ B	**3SE5 000-0AA05**		1	1 unit	102	0.015
Metal lever, plastic roller	50	➔ B	**3SE5 000-0AA07**		1	1 unit	102	0.020
Metal lever, rubber roller	50	➔ B	**3SE5 000-0AA08**		1	1 unit	102	0.030
High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA11**		1	1 unit	102	0.015
High-grade steel lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA12**		1	1 unit	102	0.025
Twist levers 35 mm, offset								
Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA15**		1	1 unit	102	0.050
Twist levers 30 mm, straight[1]								
Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA24**		1	1 unit	102	0.020
Metal lever, plastic roller	30	➔ B	**3SE5 000-0AA26**		1	1 unit	102	0.025
 Twist lever, adjustable length								
Twist levers, adjustable length, with grid hole								
Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA60**		1	1 unit	102	0.025
Metal lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA61**		1	1 unit	102	0.040
Metal lever, plastic roller	50	➔ B	**3SE5 000-0AA67**		1	1 unit	102	0.025
Metal lever, rubber roller	50	➔ B	**3SE5 000-0AA68**		1	1 unit	102	0.045
High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA62**		1	1 unit	102	0.025
High-grade steel lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA63**		1	1 unit	102	0.040
Twist levers, adjustable length								
Metal lever, plastic roller	19	A	**3SE5 000-0AA50**		1	1 unit	102	0.025
Metal lever, high-grade steel roller	19	B	**3SE5 000-0AA51**		1	1 unit	102	0.035
Metal lever, plastic roller	30	B	**3SE5 000-0AA55**		1	1 unit	102	0.025
Metal lever, plastic roller	50	B	**3SE5 000-0AA57**		1	1 unit	102	0.025
Metal lever, rubber roller	50	B	**3SE5 000-0AA58**		1	1 unit	102	0.040
High-grade steel lever, plastic roller	19	B	**3SE5 000-0AA52**		1	1 unit	102	0.025
High-grade steel lever, high-grade steel roller	19	B	**3SE5 000-0AA53**		1	1 unit	102	0.035
 Fork lever								
Fork levers (for switches with snap-action contacts only)								
2 metal levers, 2 plastic rollers	19	➔ B	**3SE5 000-0AT01**		1	1 unit	102	0.050
2 metal levers, 2 high-grade steel rollers	19	➔ B	**3SE5 000-0AT02**		1	1 unit	102	0.050
2 high-grade steel levers, 2 plastic rollers	19	➔ B	**3SE5 000-0AT03**		1	1 unit	102	0.050
2 high-grade steel levers, 2 high-grade steel rollers	19	➔ B	**3SE5 000-0AT04**		1	1 unit	102	0.050
 Rod actuator								
Rod actuators, type D according to EN 50041								
Aluminum rod, length 200 mm	6	B	**3SE5 000-0AA80**		1	1 unit	102	0.070
Spring rod, length 200 mm	6	B	**3SE5 000-0AA81**		1	1 unit	102	0.030
Plastic rod, length 200 mm	6	B	**3SE5 000-0AA82**		1	1 unit	102	0.020
Plastic rod, length 330 mm	6	B	**3SE5 000-0AA83**		1	1 unit	102	0.020

➔ Positively driven actuator, necessary in safety circuits.

[1] Can be mounted on turnover (turned through 180°, rear side of the lever).

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* You can order this quantity or a multiple thereof.

Illustrations are approximate

Metal enclosures
Ambient temperature up to –40 °C

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Complete units □ Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Complete units • Enclosure width 40 mm									
Twist levers, adjustable length									
With high-grade steel lever with grid hole and plastic roller 19 mm									
Snap-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 112-0CH62-1AJ0**		1	1 unit	102	0.300

Twist lever, adjustable length

Modular system

2 or 3 contacts · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

Version	Contacts	LEDs	DT	Modular system ◇ Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Basic switches • Enclosure width 40 mm									
With plunger									
Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 112-0CA00-1AJ0**		1	1 unit	102	0.260
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 112-0KA00-1AJ0**		1	1 unit	102	0.270
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 112-0LA00-1AJ0**		1	1 unit	102	0.270
Basic switches • Enclosure width 56 mm									
With 3 x M20 x 1.5 connecting thread									
Snap-action contacts	1 NO + 1 NC	--	➔ B	**3SE5 122-0CA00-1AJ0**		1	1 unit	102	0.315
Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 122-0KA00-1AJ0**		1	1 unit	102	0.325
Snap-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 122-0LA00-1AJ0**		1	1 unit	102	0.325

Basic switch

Basic switch

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, necessary in safety circuits.

Note: For selection aid, see page 8/7.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Metal enclosures
Ambient temperature up to –40 °C

	Version	Diameter	DT	Modular system	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
		mm		Order No. / Price per PU				kg
Operating mechanisms								
 Rounded plunger	**Rounded plungers, type B acc. to EN 50041**							
	High-grade steel plungers, with 3 mm overtravel	10	➔ B	**3SE5 000-0AC02-1AJ0**	1	1 unit	102	0.030
 Roller plunger	**Roller plungers, type C acc. to EN 50041**							
	High-grade steel roller, with 3 mm overtravel	10	➔ B	**3SE5 000-0AD02-1AJ0**	1	1 unit	102	0.050
 Roller lever	**Roller levers**							
	Metal lever, plastic roller	13	➔ B	**3SE5 000-0AE01-1AJ0**	1	1 unit	102	0.050
	High-grade steel lever, plastic roller	13	➔ B	**3SE5 000-0AE03-1AJ0**	1	1 unit	102	0.050
 Angular roller lever	**Angular roller levers**							
	Metal lever, plastic roller	13	➔ B	**3SE5 000-0AF01-1AJ0**	1	1 unit	102	0.050
	High-grade steel lever, plastic roller	13	➔ B	**3SE5 000-0AF03-1AJ0**	1	1 unit	102	0.050
Twist actuators								
 Twist actuator	**Twist actuators**, metal (without lever)							
	Switching right and/or left, adjustable		➔ B	**3SE5 000-0AH00-1AJ0**	1	1 unit	102	0.070
 Twist lever	**Twist levers, type A acc. to EN 50041**							
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA01-1AJ0**	1	1 unit	102	0.015
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA11-1AJ0**	1	1 unit	102	0.015
 Twist lever, adjustable length	**Twist levers, adjustable length, with grid hole**							
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA60-1AJ0**	1	1 unit	102	0.025
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA62-1AJ0**	1	1 unit	102	0.025

➔ Positively driven actuator, necessary in safety circuits.

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories and spare parts

Selection and ordering data

	Version	Color/ contacts		DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Optional accessories for 3SE51, 3SE52										
	**Protective caps, plastic**, for rounded plungers acc. to EN 50047, 3SE5. ..-..C05	Black		A	**3SE5 000-0AC30**		1	1 unit	102	0.003
Spare parts for 3SE51, 3SE52										
 Enclosure width 31 mm	**Empty enclosures, metal**	Turquoise								
	Enclosure width 31 mm			B	**3SE5 212-0AC05**		1	1 unit	102	0.115
	• With increased corrosion protection			B	**3SE5 212-0AC05-1CA0**		1	1 unit	102	0.115
	• With increased corrosion protection			B	**3SE5 212-0AC05-1CA0**		1	1 unit	102	0.115
	Enclosure width 40 mm			B	**3SE5 112-0AA00**		1	1 unit	102	0.230
 Enclosure width 40 mm	• With increased corrosion protection			B	**3SE5 112-0AA00-1CA0**		1	1 unit	102	0.230
	Enclosure width 56 mm			B	**3SE5 122-0AA00**		1	1 unit	102	0.250
	• With increased corrosion protection			B	**3SE5 122-0AA00-1CA0**		1	1 unit	102	0.250
	• XL enclosures			B	**3SE5 162-0AA00**		1	1 unit	102	0.330
 2 contacts	**Contact blocks with 2 contacts**									
	• Slow-action contacts	1 NO + 1 NC	➔	B	**3SE5 000-0BA00**		1	1 unit	102	0.050
	• Snap-action contacts	1 NO + 1 NC								
	- Standard		➔	B	**3SE5 000-0CA00**		1	1 unit	102	0.050
	- Gold-plated contacts		➔	B	**3SE5 000-0CA00-1AC1**		1	1 unit	102	0.050
	- 2 × 2 mm switching interval		➔	B	**3SE5 000-0GA00**		1	1 unit	102	0.050
	- Short stroke		➔	B	**3SE5 000-0NA00**		1	1 unit	102	0.050
 3 contacts	**Contact blocks with 3 contacts**									
	• Slow-action contacts	1 NO + 2 NC	➔	B	**3SE5 000-0KA00**		1	1 unit	102	0.060
	• Snap-action contacts	1 NO + 2 NC	➔	B	**3SE5 000-0LA00**		1	1 unit	102	0.060
	• Slow-action contacts with make-before-break	1 NO + 2 NC	➔	A	**3SE5 000-0MA00**		1	1 unit	102	0.060
	• Slow-action contacts	2 NO + 1 NC	➔	A	**3SE5 000-0PA00**		1	1 unit	102	0.060

➔ Positive opening according to IEC 60947-5-1, Appendix K.

	Version	Rated voltage LED V	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Spare parts for 3SE51, 3SE52									
 31 mm, turquoise with LED	**Covers for metal enclosures, width 31 mm**								
	• Turquoise with LED	24 DC	B	**3SE5 210-1AA00**		1	1 unit	102	0.040
		230 AC	B	**3SE5 210-3AA00**		1	1 unit	102	0.040
	• Yellow	--	B	**3SE5 210-0AA00-1AG0**		1	1 unit	102	0.040
	• Yellow with LED	24 DC	B	**3SE5 210-1AA00-1AG0**		1	1 unit	102	0.040
		230 AC	B	**3SE5 210-3AA00-1AG0**		1	1 unit	102	0.040
 40 mm, yellow with LED	**Covers for metal enclosures, width 40 mm**								
	• Turquoise with LED	24 DC	B	**3SE5 110-1AA00**		1	1 unit	102	0.060
		230 AC	B	**3SE5 110-3AA00**		1	1 unit	102	0.060
	• Yellow	--	B	**3SE5 110-0AA00-1AG0**		1	1 unit	102	0.055
	• Yellow with LED	24 DC	B	**3SE5 110-1AA00-1AG0**		1	1 unit	102	0.060
		230 AC	B	**3SE5 110-3AA00-1AG0**		1	1 unit	102	0.060
 56 mm, yellow with LED	**Covers for metal enclosures, width 56 mm**								
	• Turquoise with LED	24 DC	B	**3SE5 120-1AA00**		1	1 unit	102	0.085
		230 AC	B	**3SE5 120-3AA00**		1	1 unit	102	0.085
	• Yellow	--	B	**3SE5 120-0AA00-1AG0**		1	1 unit	102	0.080
	• Yellow with LED	24 DC	B	**3SE5 120-1AA00-1AG0**		1	1 unit	102	0.085
		230 AC	B	**3SE5 120-3AA00-1AG0**		1	1 unit	102	0.085
	Covers for metal enclosures XL, width 56 mm								
	• Yellow	--	B	**3SE5 160-0AA00-1AG0**		1	1 unit	102	0.100

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

3SE5 position switches with separate actuator have the same enclosures as the standard switches (modular system).

Design

Enclosure sizes

The 3SE5 switches are available in various enclosure sizes:

- Plastic and metal enclosure according to EN 50047, 31 mm wide, 1 cable entry
- Plastic enclosures, 50 mm wide, 2 cable entries
- Metal enclosures according to EN 50041, 40 mm wide, 1 cable entry
- Metal enclosures, 56 mm wide, 3 cable entries

Also available is a switch in the 3SE2 series which has arisen in this form according to general market requirements:

- Molded-plastic enclosure outside of the standards, enclosure width 52 mm.

Enclosure versions

Various basic versions can be selected for the enclosures of the 3SE5 series:

- Available with two- or three-pole contact blocks designed as slow-action contacts
- Optional LED status display
- With mounted four- or five-pole M12 connector socket (available for the wide enclosures as an accessory for self-assembly)
- With 6-pole connector socket + PE on the metal enclosures
- Similarly with a combination of connector socket and LED indicators
- Metal enclosures for explosion protection (ATEX) (see Catalog LV 1 · 2010)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 8/27)

For a description of the basic switches see page 8/4.

Operation

The twist actuator is included in the scope of supply. For actuation from four directions it can be adjusted through 4 × 90°. The switches can also be approached from above.

The twist actuators of the 3SE2 243 and 3SE2 257 switches with special enclosures cannot be changed. The switches can be approached from the two broad sides and from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application (see page 8/24).

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

Radius actuators

The position switches with radius actuators are particularly suitable for rotatable protective devices. The movable actuation key allows even small radii to be approached. Damage to the switch and the actuator due to inaccurate approach is prevented.

Locking devices

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety (see page 8/24).

Blocking inserts with padlock

Dust protection

A rubber cap to protect the twist actuator from contamination is available for operation in dusty environments (see page 8/24).

Contact reliability

The new contact blocks ensure an extremely high contact stability. This applies even when the devices are switching low voltages and currents, e.g. 1 mA at 5 V DC.

Positive opening ⊖

The NC contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger. This is referred to as "positive opening".

General data

More information

Type		3SE5 1..-..V.., 3SE5 2..-..V..	
General data			
Standards		IEC 60947-5-1, EN 60947-5-1	
Rated insulation voltage U_i	V	400	
Pollution degree acc. to EN 60664-1		Class 3	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated operational voltage U_e	V	400 AC; over 300 V AC only equal potential	
Conventional thermal current I_{th}	A	6	
Rated operational current I_e		2-pole	3-pole
• With alternating current 50/60 Hz		I_e/AC-15	I_e/AC-15
- At 24 V	A	6	6
- At 120 V	A	6	3
- At 240 V	A	3	1.5
- At 400 V	A	--	--
- At 500 V	A	--	--
• For direct current		I_e/DC-13	I_e/DC-13
- At 24 V	A	3	3
- At 125 V	A	0.55	0.55
- At 250 V	A	0.27	0.27
- At 110 V	A	--	--
- At 220 V	A	--	--
- At 440 V	A	--	--
Short-circuit protection[1)]			
• With DIAZED fuse links, operational class gG	A	6	
• With fuse links, quick		--	
• With miniature circuit breaker, Char. C	A	1	
Mechanical endurance		1×10^6 operating cycles	
Electrical endurance			
• With 3RH11, 3RT10 16 to 3RT10 26 contactors		10×10^6 operating cycles	
• For utilization category AC-15 when switching off I_e/AC-15 at 240 V		0.1×10^6 operating cycles	
Switching frequency with 3RH11, 3RT10 16 to 3RT10 26 contactors		6000 operating cycles/h	

Selection and ordering data

Complete units

2 or 3 contacts · 5 directions of approach · Degree of protection IP66/IP67 · Cable entry M20 × 1.5

	Version[1]	Contacts	LEDs	DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Enclosure width 31 mm according to EN 50047										
 With separate actuator	**5 directions of approach**									
	Slow-action contacts	1 NO + 1 NC	--	➔ A	**3SE5 212-0RV40**		1	1 unit	102	0.275
	Slow-action contacts	1 NO + 2 NC	--	➔ B	**3SE5 212-0QV40**		1	1 unit	102	0.265
 With 2 LEDs	**With 2 LEDs, yellow/green**									
	Slow-action contacts	1 NO + 1 NC	24 V DC	➔ B	**3SE5 212-1RV40**		1	1 unit	102	0.285
	Slow-action contacts	1 NO + 1 NC	230 V AC	➔ B	**3SE5 212-3RV40**		1	1 unit	102	0.285

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately (see page 8/24).

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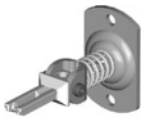
* You can order this quantity or a multiple thereof.
Illustrations are approximate

Accessories

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Actuators for 3SE5								
 3SE5 000-0AV01	Standard actuators, length 75.6 mm	►	**3SE5 000-0AV01**		1	1 unit	102	0.040
 3SE5 000-0AV02	With vertical fixing, length 53 mm	A	**3SE5 000-0AV02**		1	1 unit	102	0.070
 3SE5 000-0AV03	With transverse fixing, length 47 mm	A	**3SE5 000-0AV03**		1	1 unit	102	0.070
 3SE5 000-0AV06	Radius actuators, length 51 mm							
	• Direction of approach from the left	A	**3SE5 000-0AV04**		1	1 unit	102	0.070
	• Direction of approach from the right	A	**3SE5 000-0AV06**		1	1 unit	102	0.070
 3SE5 000-0AV05	Universal radius actuator, length 77 mm	A	**3SE5 000-0AV05**		1	1 unit	102	0.090
 3SE5 000-0AV07	Universal radius actuators, heavy-duty							
	• Length 67 mm	A	**3SE5 000-0AV07-1AK2**		1	1 unit	102	0.120
	• Length 77 mm	A	**3SE5 000-0AV07**		1	1 unit	102	0.090
Optional accessories for 3SE5								
 3SE5 000-0AV08-1AA3	**Blocking inserts**, high-grade steel, for twist actuator, for up to 8 padlocks	B	**3SE5 000-0AV08-1AA3**		1	1 unit	102	0.065

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

3SE5 hinge switches have the same enclosures as the standard switches (modular system).

Hinge switches

Design

Enclosure sizes

The 3SE5 switches are available as complete units in two enclosure sizes:

- Plastic and metal enclosure according to EN 50047, 31 mm wide, 1 cable entry
- Metal enclosures according to EN 50041, 40 mm wide, 1 cable entry

Enclosure versions

Various basic versions can be selected for the enclosures:

- Available with two or three-pole contact blocks designed as snap-action contacts
- Metal enclosures for explosion protection (ATEX) (see Catalog LV 1 · 2010)
- AS-Interface version with integrated ASIsafe electronics for all enclosure designs (see page 8/34)

For a description of the basic switches see page 8/4.

Operating mechanisms

The hinge switches are provided for mounting on hinges. The twist actuator is included in the scope of supply. There are two versions:

- Operating mechanism with hollow shaft, inner diameter 8 mm, outer 12 mm
- Operating mechanism with solid shaft, diameter 10 mm

Metal enclosures
Enclosure width 31 mm according to EN 50047

Selection and ordering data

Complete units

2 or 3 contacts · Degree of protection IP65 · Cable entry M20 × 1.5

	Version	Snap-action contacts		DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Enclosure width 31 mm according to EN 50047										
 With hollow shaft	**With hollow shaft** Operating angle 10°	1 NO + 2 NC	➔	B	**3SE5 212-0LU21**		1	1 unit	102	0.210
 With solid shaft	**With solid shaft** Operating angle 10°	1 NO + 2 NC	➔	B	**3SE5 212-0LU22**		1	1 unit	102	0.220

➔ Positive opening according to IEC 60947-5-1, Appendix K.

Accessories/spare parts

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Actuators heads								
 Actuator head with hollow shaft	**With hollow shaft** Operating angle 10°	B	**3SE5 000-0AU21**		1	1 unit	102	0.030
 Actuator head with solid shaft	**With solid shaft** Operating angle 10°	B	**3SE5 000-0AU22**		1	1 unit	102	0.052

Note:
The respective actuators are included in the scope of supply for the complete units.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Overview

The 3SF1 position switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

Examples of selection options in the modular system

Modular system

The position switches of the 3SF1 1.4 and 3SF1 2.4 series are constructed from a modular system comprising different versions of the basic switch and an actuator which must be ordered separately. Thanks to the modular design of the switch the end user can select the right solution for his application from numerous versions and install it himself in a very short time.

Design

The 3SF1 switches are available in four different enclosure sizes:

- Plastic and metal enclosures according to EN 50047, 31 mm wide, with M12 connector so
- Plastic enclosures, 50 mm wide, with M12 plug and M12 socket
- Metal enclosures according to EN 50041, 40 mm wide, with M12 plug
- Metal enclosures, 56 mm wide, with M12 plug and M12 socket

Display

The switches have a status display with three LEDs:

- LED 1 (yellow): F-IN1
- LED 2 (yellow): F-IN2
- LED 3 (green/red):AS-i/FAULT

Connection

Connection to the AS-Interface is by means of a 4-pole M12 connector socket (plastic version) connected to the yellow AS-Interface bus cable.

The wide enclosures (50 or 56 mm) also have an M12 connector socket for connecting a second position switch. Category 4 according to EN 954-1 is thus achieved.

Benefits

3SF1 position switches with separate actuator offer:

- ASIsafe Electronics integrated in the enclosure, with low power consumption < 60 mA
- An extensive range of actuators
- Status display with three LEDs

Application

Position switches with separate actuator are used where the position of doors, covers or protective grills must be monitored for safety reasons.

The position switch can only be operated with the matching coded actuator. Simple overruling by hand or auxiliary devices is impossible.

Devices are available with enclosure versions to suit the particular ambient conditions. Different control tasks can be performed with the best contact blocks suited for the particular purpose. Dimensions, fixing points of the enclosure are in accordance with EN 50041 or EN 50047 standards.

The devices are suitable for use in any climate.

Standards

The switches comply with the standards IEC 60947-1 (Low-Voltage Controls, General) and IEC 60947-5-1 (Electromechanical Control Circuit Devices).

The mechanical design of the switch corresponds to the requirements of the failsafe principle to EN 1088.

Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

With a 3SF1 position switch it is possible to achieve category 3 according to ISO 13849-1 (EN 954-1) or SIL 2 according to IEC 61508.

Category 4 according to ISO 13849-1 (EN 954-1) or SIL 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

Metal enclosures
Enclosure width 31 mm according to EN 50047

Selection and ordering data

Modular system

For the ASIsafe version of the position switch, the basic switch and actuator must be ordered separately.

2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 plug

Version	Contacts	LEDs		DT	Modular system		PU (UNIT, SET, M)	PS*	PG	Weight per PU approx.
					Order No.	Price per PU				kg
Basic switches (with rounded plunger[1]) · Enclosure width 31 mm according to EN 50047										
With plunger										
With M12 connector socket, 4-pole, channel 1 on NC contact, channel 2 on NC contact										
Slow-action contacts	2 NC	24 V DC	➔	B	**3SF1 214-1KC05-1BA1**		1	1 unit	121	0.275
Snap-action contacts	2 NC	24 V DC	➔	B	**3SF1 214-1LC05-1BA1**		1	1 unit	121	0.275

ASIsafe basic switch

➔ Positive opening according to IEC 60947-5-1, Appendix K, or positively driven actuator, usable in safety circuits.

1) With the enclosure width 31 mm the basic switch is a complete unit with a rounded plunger.

Note: For selection aid, see page 8/7.

For 4-pole cable boxes see Catalog LV 1 · 2010.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Metal enclosures
Enclosure width 31 mm according to EN 50047

	Version	Roller diameter mm	DT	Modular system Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Operating mechanisms									
 Plain plunger	**Plain plungers**								
	High-grade steel plungers	10	➔ A	**3SE5 000-0AB01**		1	1 unit	102	0.005
 Roller plunger	**Roller plungers, type C according to EN 50047**								
	Plastic rollers	10	➔ A	**3SE5 000-0AD03**		1	1 unit	102	0.010
	High-grade steel rollers	10	➔ B	**3SE5 000-0AD04**		1	1 unit	102	0.010
 With central fixing	**Roller plungers with central fixing**								
	Plastic rollers	10	➔ B	**3SE5 000-0AD10**		1	1 unit	102	0.035
	High-grade steel rollers	10	➔ B	**3SE5 000-0AD11**		1	1 unit	102	0.030
 Roller lever	**Roller levers, type E according to EN 50047**								
	Metal lever, plastic roller	13	➔ A	**3SE5 000-0AE10**		1	1 unit	102	0.015
	Metal lever, high-grade steel roller	13	➔ B	**3SE5 000-0AE11**		1	1 unit	102	0.020
	High-grade steel lever, plastic roller	13	➔ B	**3SE5 000-0AE12**		1	1 unit	102	0.010
	High-grade steel lever, high-grade steel roller	13	➔ B	**3SE5 000-0AE13**		1	1 unit	102	0.055
 Angular roller lever	**Angular roller levers**								
	Metal lever, plastic roller	13	➔ A	**3SE5 000-0AF10**		1	1 unit	102	0.015
	Metal lever, high-grade steel roller	13	➔ B	**3SE5 000-0AF11**		1	1 unit	102	0.015
	High-grade steel lever, plastic roller	13	➔ A	**3SE5 000-0AF12**		1	1 unit	102	0.015
	High-grade steel lever, high-grade steel roller	13	➔ B	**3SE5 000-0AF13**		1	1 unit	102	0.020
Twist actuators with lever									
 Twist actuator	**Twist actuators**, plastic (without lever)								
	Switching right or left, adjustable		➔ A	**3SE5 000-0AK00**		1	1 unit	102	0.025
 Twist lever	***Levers for twist actuators***								
	Twist levers, type A acc. to EN 50047								
	Metal lever, plastic roller	19	➔ A	**3SE5 000-0AA21**		1	1 unit	102	0.010
	Metal lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA22**		1	1 unit	102	0.025
	Metal lever, roller with ball bearing	19	➔ B	**3SE5 000-0AA23**		1	1 unit	102	0.020
	Metal lever, plastic roller	30	➔ B	**3SE5 000-0AA25**		1	1 unit	102	0.010
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA31**		1	1 unit	102	0.015
	High-grade steel lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA32**		1	1 unit	102	0.020
 Twist lever, adjustable length	**Twist levers 30 mm, straight**[1]								
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA24**		1	1 unit	102	0.020
	Twist levers, adjustable length, with grid hole								
	Metal lever, plastic roller	19	➔ B	**3SE5 000-0AA60**		1	1 unit	102	0.025
	Metal lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA61**		1	1 unit	102	0.040
	Metal lever, plastic roller	50	➔ B	**3SE5 000-0AA67**		1	1 unit	102	0.025
	Metal lever, rubber roller	50	➔ B	**3SE5 000-0AA68**		1	1 unit	102	0.045
	High-grade steel lever, plastic roller	19	➔ B	**3SE5 000-0AA62**		1	1 unit	102	0.025
	High-grade steel lever, high-grade steel roller	19	➔ B	**3SE5 000-0AA63**		1	1 unit	102	0.040

➔ Positively driven actuator, usable in safety circuits.

[1] Can be mounted on turnover (turned through 180°, rear side of the lever).

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* You can order this quantity or a multiple thereof.
Illustrations are approximate

3SF1 AS-Interface Position Switches

With Separate Actuator

General data

Overview

The 3SF1 position switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

3SF1 position switches with separate actuator and with integrated ASIsafe electronics

3SF1 position switches with separate actuator have the same enclosures as the standard switches.

- Degree of protection IP66/IP67
- Contacts: 1 or 2 slow-action contacts

Operation

The twist actuator is included in the scope of supply. For actuation from four directions it can be adjusted through 4 x 90°. The switches can also be approached from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application.

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

A rubber cap to protect the metal enclosure from contamination is available for operation in dusty environments.

Display

The switches have a status display with three LEDs:

- LED 1 (yellow): F-IN1
- LED 2 (yellow): F-IN2
- LED 3 (green/red):AS-i/FAULT

Connection

Connection to the AS-Interface is by means of a 4-pole M12 connector socket (plastic version) connected to the yellow AS-Interface bus cable.

The wide enclosures (50 or 56 mm) also have an M12 connector socket for connecting a second position switch. Category 4 according to EN 954-1 is thus achieved.

Benefits

3SF1 position switches with separate actuator offer:

- ASIsafe Electronics integrated in the enclosure, with low power consumption < 60 mA
- An extensive range of actuators
- Status display with three LEDs

Application

Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

With a 3SF1 position switch with separate actuator it is possible to achieve category 3 according to ISO 13849-1 (EN 954-1) or SIL 2 according to IEC 61508.

Category 4 according to ISO 13849-1 (EN 954-1) or SIL 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

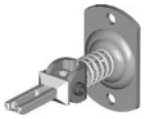
Selection and ordering data

	Version[1]	Contacts		DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Enclosure width 31 mm according to EN 50047										
	**5 directions of approach** With M12 connector socket, 4-pole; channel 1 on NC contact, channel 2 on NC contact Slow-action contacts	2 NC	➔	B	**3SF1 214-1QV40-1BA1**		1	1 unit	121	0.385

➔ Positive opening according to IEC 60947-5-1, Appendix K.

[1] Supplied without actuator. Please order separately.

Accessories

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Actuators								
	Actuators							
	• Standard actuators, length 75.6 mm	►	**3SE5 000-0AV01**		1	1 unit	102	0.040
	• With vertical fixing, length 53 mm	A	**3SE5 000-0AV02**		1	1 unit	102	0.070
	• With transverse fixing, length 47 mm	A	**3SE5 000-0AV03**		1	1 unit	102	0.070
	• Radius actuators, left, length 51 mm, direction of approach from the left	A	**3SE5 000-0AV04**		1	1 unit	102	0.070
	• Radius actuatosr, length 51 mm, direction of approach from the right	A	**3SE5 000-0AV06**		1	1 unit	102	0.070
	• Universal radius actuators, length 77 mm	A	**3SE5 000-0AV05**		1	1 unit	102	0.090
	• Universal radius actuators, heavy-duty							
	- Length 67 mm	A	**3SE5 000-0AV07-1AK2**		1	1 unit	102	0.120
	- Length 77 mm	A	**3SE5 000-0AV07**		1	1 unit	102	0.090
Optional accessories								
	**Blocking inserts**, high-grade steel, for twist actuator, for up to 8 padlocks	B	**3SE5 000-0AV08-1AA3**		1	1 unit	102	0.065

For 4-pole cable boxes see Catalog LV 1 · 2010.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

General data

Overview

The 3SF1 position switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

3SF1 position switch with solenoid interlocking and integrated ASIsafe electronics

Operation

The twist actuator is included in the scope of supply. For actuation from four directions it can be adjusted through 4 x 90°. The switches can also be approached from above.

The actuators are not included in the scope of supply of the position switch and must be ordered separately from a choice of six versions to suit the application.

The actuator is encoded. Simple overruling by hand or auxiliary devices is impossible.

A high-grade steel blocking insert for attaching up to eight padlocks is available for even more safety.

A rubber cap to protect the enclosure from contamination is available for operation in dusty environments.

Solenoid interlocking

There are two versions for locking the actuator:

- Spring-actuated lock (closed-circuit principle) with various release mechanisms
- Magnetic field lock (open-circuit principle)

For more explanations see Catalog LV 1 · 2010.

Display

The switches have a status display with four LEDs:

- LED 1 (green): AS-i
- LED 2 (red): FAULT
- LED 3 (yellow): F-IN1
- LED 4 (yellow): F-IN2

Connection

Connection to the AS-Interface is by means of a 4-pole M12 plug (plastic version) connected to the yellow AS-Interface bus cable (no additional supply of auxiliary power is required thanks to the low current consumption of the solenoid of max. 170 mA).

Benefits

3SF1 3 position switches with interlock offer:

- More safety through higher locking forces:
  - 1300 N for the plastic version
  - 2600 N for the metal version
- Various release mechanisms: lock release, escape release and emergency release
- ASIsafe Electronics integrated in the enclosure; connected through 4-pole M12 connector socket
- Current consumption of the solenoid max. 170 mA
- Two switching blocks as standard equipment, hence fewer versions needed
- Same dimensions for all enclosure variants: Plastic, metal
- An extensive range of actuators
- Status display with four LEDs

Application

Standards

The switches comply with the standards IEC 60947-1 (Low-Voltage Controls, General) and IEC 60947-5-1 (Electromechanical Control Circuit Devices).

The mechanical design of the switch corresponds to the requirements of the failsafe principle to EN 1088.

Approvals

AS-Interface according to EN 50295 and IEC 62026-2.

The switches are approved for use with locking devices according to EN 1088 and EN 292, Parts 1 and 2.

3SE5 3 position switches with solenoid interlocking bear the VDE test mark.

With a 3SF1 3 position switch with interlock it is possible to achieve category 3 according to ISO 13849-1 (EN 954-1) or SIL 2 according to IEC 61508.

Category 4 according to ISO 13849-1 (EN 954-1) or SIL 3 according to IEC 61508 can be achieved by using a second 3SE5 position switch.

The 3SF1 position switches are approved according to UL 508, UL 50 and UL 746-C.

New version -1BA4

- Channel 1: 2-channel actuator monitoring
- Channel 2: 1-channel solenoid monitoring

SIL 2 / PL d with setting in the AS-Interface Monitor: 2-channel conditionally dependent:

- Feedback from solenoid is available
- Reclose condition: Door must not be opened

Version -1BA1

- Channel 1: 1-channel actuator monitoring
- Channel 2: 1-channel solenoid monitoring

SIL 1 / PL c with setting in the AS-Interface Monitor: 2-channel conditionally dependent:

- Feedback from solenoid is available
- Reclose condition: Door must not be opened

SIL 2 / PL d with setting in the AS-Interface Monitor: 2-channel dependent:

- Feedback from solenoid is available
- Reclose condition: Door must be opened

Overview

5 directions of approach · Degree of protection IP66/IP67

- Slow-action contacts:
  - Version -1BA1: ASIsafe channel 1 on 1 NC contact from the actuator and channel 2 on 1 NC contact from the solenoid
  - Version -1BA3: ASIsafe channel 1 on first NC contact from the actuator and channel 2 on second NC contact from the actuator
  - Version -1BA4: ASIsafe channel 1 on 2 NC contact from the actuator and channel 2 on 1 NC contact from the solenoid Any discrepancy between the two contacts of the actuator are evaluated in the switch.[1)]
- Solenoid: Rated operational voltage 24 V DC
- Locking force 1300 N (1000 N according to GS-ET 19)
- Status display with 4 LEDs 24 V DC; 1: AS-i, 2: FAULT, 3: F–IN1, 4: F–IN2

Selection and ordering data

	Interlock[2)]	Contacts Actuators / Solenoids		DT	Complete units Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
1300 N locking force · Enclosure width 54 mm										
 3SF1 324-1SD21-...	**Spring-actuated locks**									
	• With auxiliary release	1 NC/1 NC	➔	B	**3SF1 324-1SD21-1BA1**		1	1 unit	121	0.600
		2 NC/--	➔	C	**3SF1 324-1SD21-1BA3**		1	1 unit	121	0.600
		2 NC[1)] / 1 NC	➔	B	**3SF1 324-1SD21-1BA4**		1	1 unit	121	0.600
	• With auxiliary release with lock	1 NC/1 NC	➔	C	**3SF1 324-1SE21-1BA1**		1	1 unit	121	0.760
 3SF1 324-1SF21-...	• With escape release from the front	1 NC/1 NC	➔	B	**3SF1 324-1SF21-1BA1**		1	1 unit	121	0.620
		2 NC[1)] / 1 NC	➔	B	**3SF1 324-1SF21-1BA4**		1	1 unit	121	0.620
	• With escape release from the back and auxiliary release from the front	1 NC/1 NC	➔	B	**3SF1 324-1SG21-1BA1**		1	1 unit	121	0.640
		2 NC[1)] / 1 NC	➔	B	**3SF1 324-1SG21-1BA4**		1	1 unit	121	0.640
	• With emergency release from the back and auxiliary release from the front	1 NC/1 NC	➔	C	**3SF1 324-1SJ21-1BA1**		1	1 unit	121	0.650
 3SF1 324-1SB21-...	**Magnetic field lock**	1 NC/1 NC	➔	C	**3SF1 324-1SB21-1BA1**		1	1 unit	121	0.600
		2 NC/--	➔	C	**3SF1 324-1SB21-1BA3**		1	1 unit	121	0.600
Actuators										
	Actuators[3)]									
	• Standard actuators, length 75.6 mm			►	**3SE5 000-0AV01**		1	1 unit	102	0.040
	• With vertical fixing, length 53 mm			A	**3SE5 000-0AV02**		1	1 unit	102	0.070
	• With transverse fixing, length 47 mm			A	**3SE5 000-0AV03**		1	1 unit	102	0.070
Optional accessories										
	**Protective caps** made of black rubber for the twist actuator, to protect the actuator openings from contamination			B	**3SE5 000-0AV08-1AA2**		1	1 unit	102	0.010
	**Blocking inserts**, high-grade steel, for twist actuator, for up to 8 padlocks			B	**3SE5 000-0AV08-1AA3**		1	1 unit	102	0.065

➔ Positive opening according to IEC 60947-5-1, Appendix K.

1) See also page 8/32, "Application".

2) Supplied without actuator. Please order separately.

3) For more actuators see page 8/31.

For 4-pole cable boxes see Catalog LV 1 · 2010.

*** You can order this quantity or a multiple thereof.**
Illustrations are approximate

Hinge switches

Metal enclosures
Enclosure width 31 mm according to EN 50047

Overview

The 3SF1 hinge switches with safety-oriented communication can be directly connected using the AS-Interface bus system. The safety functions no longer have to be conventionally wired up.

With the 3SF1 position switches the ASIsafe electronics are integrated in the switch enclosure.

The hinge switches are provided for mounting on hinges. There are two actuator variants here:
- Hollow shaft, diameter inside 8 mm, outside 12 mm
- Solid shaft, diameter 10 mm

For the ASIsafe version of the hinge switch, the basic switch and twist actuator must be ordered separately. The basic switches correspond to the position switches of the standard version (only use versions with snap-action contacts).

The standards and approvals are the same as for the 3SF1 standard switches (see page 8/27).

Selection and ordering data

Modular system

2 contacts · 3 LEDs · Degree of protection IP66/IP67 · M12 plug

	Version	Contacts	LEDs	DT	Modular system ◇ Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
Basic switches · Enclosure width 31 mm acc. to EN 50047										
 ASIsafe basic switch	**With plunger** With M12 plug, 4-pole, channel 1 on NC contact, channel 2 on NC contact Snap-action contacts	2 NC	24 V DC ➔	B	**3SF1 214-1LC05-1BA1**		1	1 unit	121	0.275
Actuators heads										
 Actuator head with hollow shaft	**With hollow shaft** Operating angle 10°			B	**3SE5 000-0AU21**		1	1 unit	102	0.030
 Actuator head with solid shaft	**With solid shaft** Operating angle 10°			B	**3SE5 000-0AU22**		1	1 unit	102	0.052

➔ Positive opening according to IEC 60947-5-1, Appendix K.

For 4-pole cable boxes see Catalog LV 1 · 2010.

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Planning, Configuration and Visualizing for SIRIUS

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Technical Information

can be found at
www.siemens.com/industrial-controls/support

under Product List:
- Technical specifications

under Entry List:
- Updates
- Download
- FAQ
- Manuals
- Characteristics
- Certificates

and at
www.siemens.com/industrial-controls/configurators
- Configurators

SIRIUS 3RW44 soft starter function block library for SIMATIC PCS 7

Overview

The SIRIUS 3RW44 soft starter PCS 7 function block library can be used for simple and easy integration of SIRIUS 3RW44 soft starters into the SIMATIC PCS 7 process control system. The SIRIUS 3RW44 soft starter PCS 7 function block library contains the diagnostics and driver blocks corresponding with the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring.

Integrated functionality for optimal process control for all process control systems

In addition to the general sensor technology, the motor feeder data is increasingly being integrated into the process control system. By integrating the SIRIUS 3RW44 soft starters into the process control system it becomes possible to prevent errors in the motor feeder simply and reliably, or to detect these errors quickly and rectify them. Downtimes are reduced to a minimum or can be prevented before they happen.

For example, the output and display of the key measured values calculated by the 3RW44 is also a good aid for being able to assess and monitor the current system status.

Easy integration with the PCS 7 function block library

The PCS 7 function block library can be used for simple and easy integration of SIRIUS 3RW44 soft starters into the SIMATIC PCS 7 process control system. The focus here is simple configuration. The function of the modules is based on the PCS 7 standard libraries and is optimally harmonized with the functions of the SIRIUS 3RW44.

Users who have previously integrated motor feeders into conventional technology via signal blocks and motor or valve blocks or, for example, already have experience with SIMOCODE modules, are easily able to switch to SIRIUS 3RW44.

All blocks required for the automation systems are provided by the PCS 7 function block library – as are the block symbols and faceplates for the operator station required for monitoring and control.

With the integration of the SIRIUS 3RW44 into SIMATIC PDM, the system-wide device parameterization and diagnostics of the SIRIUS 3RW44 soft starters are possible from a central point.

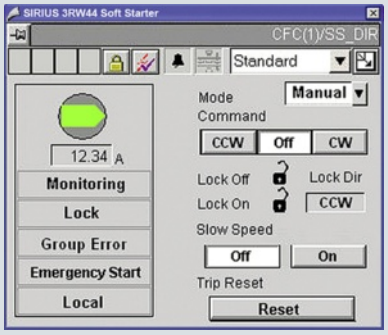
Motor block for the direct control of the drive

The low-voltage motors started and protected by SIRIUS 3RW44 soft starters can be integrated into the process automation via the motor blocks. This means that they form the interface between the process control system and the motors controlled by the SIRIUS 3RW44.

To reduce the amount of configuring work required, functions for signal processing and technological functions are integrated into one motor block.

The important measurement – the current in the motor feeder – is recorded via the 3RW44 and monitored for motor protection. The motor current is accessible from the I&C system via the motor blocks.

The block symbols and faceplates for the motor blocks display the motor feeders on the operator station and provide all the required information for monitoring and control as well as detailed diagnostics.



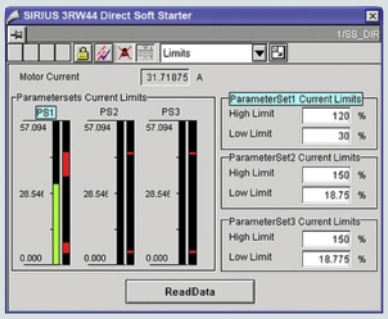
Faceplate of the motor block

Evaluation of additional motor feeder measurements

All measured values calculated by the soft starter, such as current, voltage and output of the feeder, are displayed and output via the measured value blocks. A key advantage here is that where required, a wide range of information on important motor feeder measurements is available, e. g. for load monitoring.

The 3RW44 is not only able to detect measured values here, but also to react if these values are exceeded or undershot, for example, via custom settings – e.g. with a motor shut-down or with a warning.

The faceplate for the measured values is accessed from the motor block faceplate.



Faceplate for measured values

Evaluation of maintenance-related motor feeder data

The 3RW44 has powerful functions to detect and monitor maintenance-related motor feeder data. For example, the operating and downtimes of the motor, operating cycles and overload tripping events are detected and stored directly on the device. If required, the information already on the device is available via the statistics block in the I&C system. The display is provided on a separate faceplate for the statistics block on the operator station.

Types of delivery and license

The SIRIUS 3RW44 soft starter PCS 7 function block library supplied on CD-ROM allows the user to run the required engineering software on the engineering station (single license) including the runtime software for executing the AS modules in an automation system (single license). If the AS modules are to be used in additional automation systems, the corresponding number of runtime licenses are required which are supplied without a data carrier.

Order No. scheme

Digit of the Order No.	1st - 4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□□	□	□	□	–	□	X	X	□	□	–	□	□	□	□
SIRIUS engineering software	**3 Z S 1**														
Software type		**6**													
Package number PCS 7			**3**												
Soft starters				**3**											
Type						□									
Function version start of delivery									□	□					
Product category												**0**			
Language (multilingual)													**Y**		
Delivery version														□	
License type															□
Example	**3 Z S 1**	**6**	**3**	**3**	**–**	**1**	**X**	**X**	**0**	**0**	**–**	**0**	**Y**	**A**	**0**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Benefits

- Uniform and continuous integration into SIMATIC PCS 7
- Standardized function blocks for simple integration and optimal operation
- Greater process transparency due to greater information density in the I&C system
- System-wide device parameterization and diagnostics with SIMATIC PDM

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
SIRIUS 3RW44 soft starter function block library for SIMATIC PCS 7								
 3ZS1 633-1XX00-0YA0	Scope of supply: AS modules and faceplates for integrating SIRIUS 3RW44 into the PCS 7 process control system, for PCS 7 Version V 6.1/V 7.0							
	Engineering software For one engineering station (single license) including runtime software for execution of the AS module in an automation system (single license), German/English/French, Type of delivery: on CD incl. electronic documentation in German/English/Portuguese	►	**3ZS1 633-1XX00-0YA0**		1	1 unit	131	0.240
	Runtime software For execution of the AS module in an automation system (single license), Type of delivery: License without software and documentation	►	**3ZS1 633-2XX00-0YB0**		1	1 unit	131	0.240

* You can order this quantity or a multiple thereof.
Illustrations are approximate

SIRIUS motor starter function block library for SIMATIC PCS 7

Overview

With the SIRIUS motor starter PCS 7 function block library, SIRIUS ET 200S motor starters (direct-on-line and reversing starters, direct-on-line soft starters) can be easily and simply integrated into the SIMATIC PCS 7 process control system. The SIRIUS motor starter PCS 7 function block library contains the diagnostics and driver blocks corresponding with the SIMATIC PCS 7 diagnostics and driver concept as well as the elements (symbols and faceplates) required for operator control and process monitoring.

Integrated functionality for optimal process control for all process control systems

In addition to the general sensor technology, the motor feeder data is increasingly being integrated into the process control system. By integrating the SIRIUS ET 200S motor starter into the process control system, it becomes possible to prevent errors in the motor feeder simply and reliably, or to detect these errors quickly and rectify them. Downtimes are reduced to a minimum or can be prevented before they happen.

For example, the output and display of the key measured values calculated by the motor starter is also a good aid for being able to assess and monitor the current system status.

Easy integration with the PCS 7 function block library

The PCS 7 function block library can be used for simple and easy integration of ET 200S motor starters into the SIMATIC PCS 7 process control system. The focus here is simple configuration. The function of the modules is based on the PCS 7 standard libraries and is optimally harmonized with the functions of the ET 200S motor starters.

Users who have previously integrated motor feeders into conventional technology via signal blocks and motor or valve blocks or, for example, already have experience with SIMOCODE modules, are easily able to switch to ET 200S motor starters.

All blocks required for the automation systems are provided by the PCS 7 function block library – as are the block symbols and faceplates for the operator station required for monitoring and control.

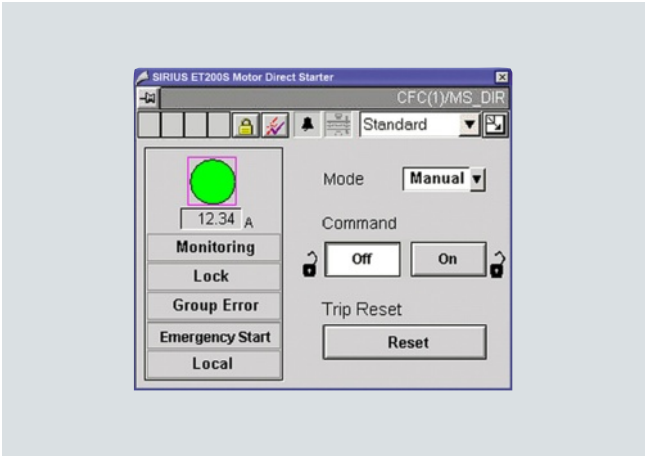
Motor block for the direct control of the drive

The low-voltage motors started and protected by ET 200S motor starters (direct and reversing starters, direct on-line soft starters) can be integrated into the process automation via the motor blocks. This means that they form the interface between the process control system and the motors controlled by the ET 200S motor starters.

To reduce the amount of configuring work required, functions for signal processing and technological functions are integrated into one motor block.

The current in the motor feeder is detected by the ET 200S motor starter and monitored by the motor protection. The motor current is accessible from the I&C system via the motor blocks.

The block symbols and faceplates for the motor blocks display the motor feeders on the operator station and provide all the required information for monitoring and control as well as detailed diagnostics.

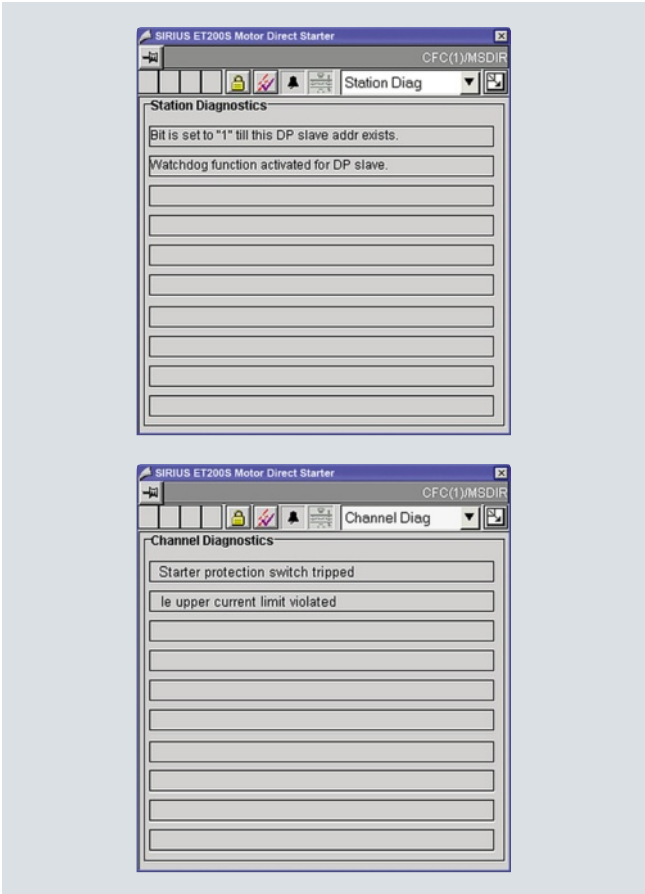


Faceplate of the motor block

Diagnostics blocks for motor starters

The diagnostics blocks are made visible by the signals and errors supplied by the motor starter. A key advantage of this is that the motor feeder can be analyzed in a specific way as required.

The faceplate for the diagnostics is opened from the motor block faceplate.



Faceplates for diagnostics

Types of delivery and license

The SIRIUS motor starter PCS 7 function block library supplied on CD-ROM allows the user to run the required engineering software on the engineering station (single license) including the runtime software for executing the AS modules in an automation system (single license). If the AS modules are to be used in additional automation systems, the corresponding number of runtime licenses are required which are supplied without a data carrier.

Order No. scheme

Digit of the Order No.	1st - 4th	5th	6th	7th		8th	9th	10th	11th	12th		13th	14th	15th	16th
	□□□□	□	□	□	–	□	X	X	□	□	–	□	□	□	□
SIRIUS engineering software	**3 Z S 1**														
Software type		**6**													
Package number PCS 7			**3**												
Motor starter				**0**											
Type						□									
Function version start of delivery									□	□					
Product category												**0**			
Language (multilingual)													**Y**		
Delivery version														□	
License type															□
Example	**3 Z S 1**	**6**	**3**	**0**	**–**	**1**	**X**	**X**	**0**	**0**	**–**	**0**	**Y**	**A**	**0**

Note:

The Order No. scheme is presented here merely for information purposes and for better understanding of the logic behind the order numbers.

For your orders, please use the order numbers quote in the catalog in the Selection and ordering data.

Benefits

- Uniform and continuous integration into SIMATIC PCS 7
- Standardized function blocks for simple integration and optimal operation
- Greater process transparency due to greater information density in the I&C system

Selection and ordering data

	Version	DT	Order No.	Price per PU	PU (UNIT, SET, M)	PS*	PG	Weight per PU approx. kg
SIRIUS motor starter function block library for SIMATIC PCS 7								
 3ZS1 630-1XX00-0YA0	Scope of supply: AS modules and faceplates for integrating SIRIUS motor starters into the PCS 7 process control system, for PCS 7 Version V 6.1/V 7.0							
	Engineering software For one engineering station (single license) including runtime software for execution of the AS module in an automation system (single license), German/English/French, Type of delivery: on CD incl. electronic documentation in German/English	▶	**3ZS1 630-1XX00-0YA0**		1	1 unit	131	0.240
	Runtime software For execution of the AS module in an automation system (single license), Type of delivery: License without software and documentation	▶	**3ZS1 630-2XX00-0YB0**		1	1 unit	131	0.240

* You can order this quantity or a multiple thereof.
Illustrations are approximate

Notes

Appendix

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1) See Catalog LV 1 · 2010 at www.automation.siemens.com/infocenter.

Glossary

8US busbar adapter

8US busbar adapters enable the mechanical mounting and electrical contacting of motor starter protectors, load feeders or compact feeders on a single busbar system.

"a" release

Short designation for a current-sensitive delayed overload release.

Adapter for screw fixing

Adapters for screw fixing can be used for mounting a compact feeder onto a flat surface.

Arc quenching space

During a control's switching operations, in particular during disconnection of highly inductive load currents or short-circuit currents, the ionized gases produced by the arc are forced out through the arc chute openings. To ensure that the concentration of these ionized gases does not reach a hazardous level, a certain clearance is required above or in front of the device. This arc quenching space is quoted by the manufacturer (normally on the dimensional drawings) and depends on the presence of exposed live conductors (e.g. busbars), conducting structures and insulation partitions at the control. Arc chute attachments can be mounted onto large motor starter protectors in order to reduce the clearance and therefore the space required in the control cabinet. No arc quenching space is required for vacuum circuit breakers and vacuum contactors because the arc does not leave the vacuum chute and no ionized gases are released.

AS-Interface

AS-Interface is an open, international standard according to EN 50295 and IEC 62026-2 for process and field communication. Leading manufacturers of actuators and sensors all over the world support the AS-Interface. Interested companies are provided with the electrical and mechanical specifications by the AS-Interface Association.

Auxiliary switch block for compact feeders

Optional auxiliary switch blocks in versions with 2 NO, 2NC or 1 NO plus 1 NC.

AWG (American Wire Gauge)

A standard wire size used in the USA, which is based on the cross-sectional area of the conductor or wire. With each AWG number the cross-sectional area is incremented by 26 %. The thicker the wire, the smaller the AWG number.

Basic module

Function modules are comprised of at least one basic module, supplemented by coupling modules as required. The basic module includes the control logic and, in the case of wye-delta modules, the time setting for ramp-up in star mode, and a 10-pin plug connector for accommodating the plug of the coupling modules.

Bypass operation

When a motor ramp-up is completed, the thyristors on SIRIUS soft starters are fully operated and the complete mains voltage is applied therefore to the motor terminals. As no controlling of the motor voltage is necessary during operation, the thyristors are bridged by internal bypass contacts designed for AC1 current. The waste heat arising during uninterrupted duty due to thyristor power loss is thus reduced. This reduces heating of the switchgear environment.

Certification

Approval of controls and switchgears on the basis of sometimes mandatory national standards which exist in addition to sets of rules such as "IEC", "CENELEC" and "CEE". For example, UL certification or CSA certification are required for the North American market (USA, Canada). Additional marking is also mandatory is such cases, i.e. the certification symbol must be applied as an inscription to the device.

CLASS (time)

see --> Trip class (CLASS).

Closed

This refers to the power consumption of a contactor's solenoid coil which results from the continuously absorbed current and is required to hold the magnetic system in the closed state.

Connection method

SIRIUS offers the right connection method for every environment: Screw terminals, spring-type terminals or ring terminal lugs.

Contactor

A switching device with only one off position, usually without mechanical lock, which is not operated manually and which, under normal conditions, can switch on, transmit and switch off the circuit, including normal overload currents. Contactors are preferably used for high switching frequencies. A distinction is made between contactors for switching motors (motor load switches) and contactor relays for control.

Control kit

An aid for manually closing the main contacts by actuating a handle.

Coupling module

Function modules are comprised of at least one basic module, supplemented by coupling modules as required. The coupling module includes one NO contact and a 10-pole connecting cable with plugs to the coupling module and the basic module and is used for the reciprocal interlocking of wye and delta operation. The communication-capable version transmits the signals of the other contactors and realizes the electrical interlocking (reversing/wye-delta starting); there is no integrated connecting cable.

Current limiting with soft starters

SIRIUS 3RW40 soft starters continuously measure the phase current (motor current) by means of integrated current transformers. During the start-up operation, the flowing motor current can be actively limited by the soft starter. The current limiting function is superimposed on the voltage ramp function. This means that as soon as a parameterized current limit value is reached, the voltage ramp is aborted and the motor is started with the current limiting function until the ramp-up is completed.

On SIRIUS 3RW40 soft starters the current limiting is always active. If the current limiting potentiometer is set to the far right (maximum), the starting current is limited to the factor 5 of the set rated motor current.

The current limit value is set as a factor of the rated motor current to the required current during start-up. Due to the current unbalance in the start-up operation, the set current corresponds to the arithmetic means over the 3 phases.

Current monitoring relay

Current monitoring relays are used for underload monitoring and overload monitoring of motors or other loads. The level of current permits extensive conclusions to be drawn about the powered process or plant, e.g. a torn belt, no-load operation of a pump, tool wear, hoist overload or blockage. With multi-phase monitoring it is possible in addition to perform phase sequence, phase failure or residual current monitoring. If the measured current values lies outside the defined range there will follow an instant or time-delayed alarm or disconnection.

Current setting range (of an electronic release)

Range between the smallest and the biggest value of the current to which the release can be set.

Door-coupling rotary operating mechanism

Door-coupling rotary operating mechanisms enable the operation of motor starter protectors and compact feeders with closed control cabinet doors.

Electrical interlock

The electrical interdependence of controls through circuit-related measures. Customary for contactor controls: For example, a contactor is only allowed to be switched on when another contactor was switched off first. Auxiliary contacts or auxiliary switches are used to implement an electrical interlock.

Endurance

The period in which the control works problem-free under normal operating conditions. It is expressed in numbers of operating cycles (operating cycles), electrical endurance (contact erosion of the contacts) and mechanical endurance (operating cycles without load).

Explosion protection

Essential for the use of electrical equipment in potentially explosive atmospheres according to EN 50014 (VDE 0170 / 0171). Explosion protection requires equipment which is liable to produce ignition-capable electric arcs (plasma) during operation to be enclosed in a flameproof casing. The explosive mix can enter the enclosure, but an ignition-capable flame produced during an explosion inside the casing is prevented from escaping to the outside.

Fast short-circuit trip unit

A motor starter protector's release which provides short-circuit protection for the downstream load or cable. In the event of a short-circuit, the fast short-circuit trip unit must disconnect all poles of the motor starter protector instantaneously or with a short-time delay.

Function module

Function modules are differentiated according to their use:

- for direct-on-line starting
- for reversing starting
- for wye-delta starting

Function modules are also available in versions with AS-i or IO-Link in order to create a link to a higher-level control system.

Function module for direct-on-line starting

These function modules are used for the time-delayed switching of contactors.

Function module for reversing starting

Function modules for reversing starting are used for operating reversing starters. The version without a fieldbus interface is comprised of bridge modules, the version for AS-Interface or IO-Link has one basic module and one coupling module. In all three cases the electrical interlocks of the two directional contactors are already included.

Function module for wye-delta starting

Function modules for wye-delta starting are used for changing over from star mode to delta mode. They are comprised of one basic module and two coupling modules. The electrical interlocks are already included in the modules.

Heavy starting

Heavy starting exists if a motor requires more than 10 to 15 s from being switched on to reaching its rated speed on account of its special load conditions. When heavy starting exists, the load torque of the machine to be driven is greater during start-up than in rated operation. It takes longer to reach the rated speed because large centrifugal masses need to be accelerated (e.g. on rolling mills, centrifuges, etc.). The protection of heavy-starting motors requires special overload relays (heavy-starting relays, solid-state overload relays) or thermistor motor protection devices.

Heavy starting with soft starters

According to the specific boundary conditions, the SIRIUS soft starter has to be selected for heavy starting characteristics (CLASS 20 start-up) at least one power level higher than the rating of the motor used. Sample set values and device sizes are listed in tables in the product manual list.

Infeed system for 3RA6

The infeed system for 3RA6 enables several compact feeders to be fed in through one modular infeed system with permanent wiring.

Intrinsic device protection for soft starters

SIRIUS 3RW40 soft starters have integrated intrinsic device protection which prevents thermal overloading of the thyristors. This is realized on the one hand by current measurement using transformers in the three phases and additionally by temperature measurement using thermal sensors on the thyristor heat sink. If the internal permanently set switch-off value is exceeded, the soft starter will switch off automatically.

Inverse-time delayed overload release ("a" release)

A thermal overload release which works with a time delay that decreases as the current increases.

IO-Link

IO-Link is a new communication standard for sensors and actuators - defined by the PROFIBUS User Organization (PNO). IO-Link technology is based on the point-to-point connection of sensors and actuators to the control system. As such it is not a bus system but an upgrade of the classic point-to-point connection. Extensive parameter and diagnostics data are transmitted in addition to the cyclic operating data for the connected sensor and actuators. The connection method is based on a three-pole standard cable or 3 individual wires.

Leakage current

When the current flow is controlled by means of semiconductors, there can be no electrical separation in the device. A small residual current, i.e. leakage current, still flows therefore in the disconnected state when a load is connected.

Low-voltage switchgear and controlgear assembly

A switchgear and controlgear assembly is a combination of one or more low-voltage controls with related units for controlling, measuring and indicating, plus the related protective and control devices. It must be fully assembled under the manufacturer's responsibility, with all internal electrical and mechanical connections and structural parts.

Glossary

Main control switch

Every industrial machine covered by EN 60204 Part 1 (VDE 0113, Part 1) must be fitted with a main control switch which disconnects the entire electrical equipment from the mains for the duration of cleaning work, maintenance, repairs and lengthy downtimes. Usually a switch which can be operated by hand is stipulated in order to prevent electrical or mechanical hazards. A main control switch can also be an emergency-stop device.

The following requirements must be met:

1. Handle can be reached from the outside
2. Only one "Off" position and one "On" position with allocated stops
3. Identification of the two positions with "0" and "I"
4. "Off" can be locked
5. Mains terminals with cover to prevent touching by accident
6. The switching capacity must comply with AC-23 in the case of motor load switches and AC-22 in the case of load-break switches (utilization category)
7. Positive indication of the switch position

Mirror contact for power contactors

A mirror contact is an NC contact that cannot be closed simultaneously with an NO main contact (according to EN 60947-5-1, Appendix F).

Modular system

The SIRIUS modular system offers everything that you need for switching, starting, protecting and monitoring motors and industrial systems. It is a modular selection of standard components which are optimally coordinated, can be combined with ease and use the same accessories.

Motor protection

Protection of induction motors against overload and short-circuit, i.e. protection of the winding insulation against unacceptable heating.

Motor starter protector

Generally key-operated switching devices that switch on, control and switch off currents in circuits under normal operating conditions. Under prescribed conditions that are not normal through to short-circuit, they can also switch on the current, control it for a specified interval and interrupt it.

Mounting methods

SIRIUS offers a maximum of configuration flexibility. The system components can be configured on a feeder-oriented or line-oriented basis.

"n" release

Short designation for an instantaneous electromagnetic electronic release.

Off-delay

The time span effected by a timing relay or timer (e.g. on contactors) between the opening command for the contacts of the timing relay or timer and the actual reaching of their original position.

ON period in %

The relative ON period in % is the ratio between load period and cycle duration for loads which are frequently disconnected and switched on.

Overload release

An overload trip unit is an electronic release for protecting against overload.

Phase control for soft starters

With phase control of two inverse-parallel switched thyristor pairs, the rms value of the motor voltage on SIRIUS soft starters is increased within a selectable starting time from a selectable starting voltage to the rated motor voltage.

The motor current changes in proportion to the voltage applied to the motor. The starting current is thus reduced by the factor of the voltage applied to the motor.

The torque changes in squared proportion to the voltage applied to the motor. The start-up torque is thus reduced in squared proportion to the voltage applied to the motor.

Phase failure sensitivity

A product feature which enables a protective device to respond also during single-phase operation of a three-phase asynchronous motor before the motor suffers thermal damage (DIN VDE 0660 Part 102).

Pick-up power

The pick-up power is the power consumption of a contactor's solenoid coils which is required to set the magnetic system in motion. With alternating current operation this is usually higher than the closed power. With direct current operation on SIRIUS contactors, the pick-up power equals the closed power.

Polarity balancing for soft starters

On two-phase controlled SIRIUS 3RW30 and 3RW40 soft starters the current resulting from superimposition of the two controlled phases flows in the uncontrolled phase. The advantages of two-phase control lie in the more compact size, compared for example to a three-phase solution, and in the lower device costs.

A negative physical effect of the two-phase control during start-up is the occurrence of DC components due to the leading-edge phase and the superimposition of the phase currents, which can lead to severe noise generation on the motor. The SIEMENS patented "Polarity Balancing" control method was developed to prevent the DC components during start-up.

"Polarity Balancing" reliably eliminates these direct current components during the ramp-up phase. It creates a motor ramp-up that is uniform in speed, torque and current rise. At the same time the acoustic quality of the starting operation comes close to the quality of a three-phase controlled starting operation. This is made possible by the on-going dynamic harmonizing or balancing of current half-waves of different polarity during the motor ramp-up.

Positively-driven contact in contactor relays

Positively-driven contact elements are a combination of "n" NO contact and "m" NC contact which are designed such that they cannot be closed simultaneously (EN 60947-5-1, Appendix L).

Preferred circuit for wye-delta starters

In the preferred circuit for a clockwise rotating motor the motor terminals are correctly connected when phase L1 is connected to motor terminals U1 and V2, L2 to V1 and W2, and L3 to W1 and U2. This order should be observed during installation in order to minimize the changeover current peak in a clockwise rotating motor when switching over from wye to delta.

Primary operating range

The range in which a contactor's actuating voltage is allowed to deviate from the rated actuating voltage without the reliable operation of the control being impaired (e.g. dropping out of the contactor).

Protection technology

Basically a distinction is drawn between two current-based protection technologies: Thermal and solid-state protection. Motor starter protectors and thermal overload relays protect with bimetal trip units; solid-state overload relays, 3RW40 soft starters and 3RA6 compact feeders protect on a solid-state basis. The solid-state options feature not only a far lower power loss but also a wide setting range of 1:4, which means that they offer a far smaller variance than the thermal releases. The SIRIUS modular system has the right solution for each switching technology.

Ramp-down time

On SIRIUS 3RW40 soft starters the "ramp-down time" potentiometer can be used to define how long the power supply to the motor is to be upheld after the ON command is removed. During this ramp-down time the torque generated in the motor is reduced using a voltage ramp function and the application is brought to a smooth halt.

Ramp time

With SIRIUS soft starters, the length of the set ramp time defines in which time the motor voltage is raised from a selected starting voltage to the mains voltage. This has an influence on the motor's acceleration moment, which drives the load during the ramp-up operation. As the result, a longer ramp time has a smaller acceleration moment throughout the motor ramp-up. The latter is therefore longer and smoother. The length of the ramp time should be selected such that the motor reaches its rated speed within this period. If the time selected is too short, i.e. if the ramp time ends before the motor ramp-up is finished, a very high starting current will arise at this moment and can reach the value of the direct-on-line starting current at this speed.

Rated conditional short-circuit current I_q

Guaranteed short-circuit breaking capacity of controlgear assemblies and load feeders, also referred to as the rated conditional short-circuit current.

Rated data of the control circuit

The most important rated data of the control circuit for selecting a contactor are the rated control supply voltage U_s (the voltage of the coil terminal) with related frequency (e.g. 50 Hz) and the power consumption of the coil (pick-up power and closed power).

Rated data of the main circuit

The most important rated data of the main circuit for selecting a contactor are the rated operational current I_e (the current which is defined by the conditions of use) or the rated power (motor rating) and the corresponding rated voltage U_e.

Rated insulation voltage U_i

The voltage value which specifies the insulation resistance of the control or accessory part and to which the insulation tests and creepage and clearances refer. On no account must the highest rated operational voltage exceed the rated insulation voltage.

Rated service short-circuit breaking capacity I_{cs}

Compared to the rated ultimate short-circuit breaking capacity I_{cu}, the test conditions are more exacting and the short-circuit current is usually lower. Determined with test sequence II, switching sequence O-t-CO-t-CO (O = Open , t = Time , CO = Close-Open). After the test, the motor starter protector must be unrestricted in its functions.

Rated short-circuit breaking capacity I_{cn}

The rated short-circuit breaking capacity of a motor starter protector is (according to IEC 60947-2 and EN 60947-2) the value of the short-circuit current that it can switch off at the rated operational voltage, rated frequency and specified power factor (or specified time constant). The value of the prospective current applies (in the case of alternating current: rms value of the AC components) as specified by the manufacturer. With AC motor starter protectors the rated short-circuit breaking capacity must be independent of the size of the DC components (DC component). The rated short-circuit breaking capacity means that the motor starter protector can disconnect any current up to the rated short-circuit breaking capacity at a line-frequency recovery voltage of 110 % of the rated operational voltage.

This applies

- for alternating current with every value of the power factor, but not lower than specified in the respective testing guidelines,
- for direct current, unless otherwise stated by the manufacturer, with every time constant but not greater than defined in the respective testing directive.

The short-circuit breaking capacity does not apply for line-frequency recovery voltage of more than 110 % of the rated operational voltage.

Rated ultimate short-circuit breaking capacity I_{cu}

The maximum short-circuit current I_K (limit value of the rated short-circuit breaking capacity) which the motor starter protector can disconnect under defined conditions. Determined with test sequence III, switching sequence O-t-CO (O = Open , t = Time , CO = Close-Open). After the test, the motor starter protector may be restricted in its functions.

Recovery time

After a protection function in a control (e. g. motor starter protector, soft starter, overload relay or current monitoring relay) has tripped, the motor cannot be restarted until a recovery time has elapsed. The recovery time varies in length according to the cause of the fault. Details can be found in the related product documentation.

Response delay

The response delay is the time from the beginning of a command's entry to the first making of the contact, e.g. at the contactor.

RoHS

EC Directive 2002 / 95 / EC concerning the restriction of certain dangerous substances in electrical and electronic devices regulates the use of hazardous substances in devices and components. The directive and its respective implementation in national law is known for short by the abbreviation RoHS (Restriction of the use of certain Hazardous Substances).

Short-circuit strength

Resistance of a control in the closed state with its parts (e. g. releases) or of a complete switchgear against the electrodynamic (dynamic short-circuit strength) and thermal (thermal short-circuit strength) stress that occurs in the event of a short-circuit. The characteristic for the dynamic stress is the peak short-circuit current as the highest instantaneous value of the short-circuit current. The characteristic for the thermal stress of the short-circuit current is the mean value of the short-circuit current for its duration.

Glossary

SIL (Safety Integrity Level)

A discrete level (one of three possible levels) for defining the requirements to be met by the safety integrity of safety-related control functions. SIL 3 is the highest and SIL 1 the lowest safety integrity level.

Smooth ramp-down

The same principle is used during the ramp-down operation as for soft starting. This way the torque generated in the motor is slowly reduced, thus enabling a smooth ramp-down of the application.

During a smooth ramp-down, the free or natural ramp-down of the load is prolonged. This function is set if there is a need to prevent the load from being stopped abruptly. Applications involving small mass inertia values or high counter-rotating torques are typical examples.

Soft starter

A motor starter which reduces the motor's starting torque (tightening torque) and starting current in order to reduce vibrations on the driven machine and current peaks in the line supply. The starting torque is reduced because the control supply voltage at the beginning is lower than the motor's rated voltage (the starting torque is proportional to the square of the applied voltage). The terminal voltage can be increased as soon as the motor is running. Classic methods for reducing the terminal voltage are for example wye-delta starting, start-up through resistors in the stator and starting with an autotransformer. The use of solid-state motor controllers with switched thyristor circuits for controlling the terminal voltage on squirrel-cage motors is becoming increasingly widespread. See also "Soft starting" and "Smooth ramp-down".

Soft starting

During the start-up operation, the absorbed starting current and the starting torque generated in the motor are regulated by a solid-state soft starter on the basis of the motor voltage control (phase control).

Start-up detection on soft starters

SIRIUS 3RW40 soft starters feature internal start-up detection. When a motor ramp-up is detected, the motor voltage is increased immediately to 100 % of the mains voltage. The internal bypass contacts close and the thyristors are bridged.

Starting current

Three-phase asynchronous motors have a high direct-on-line starting current. Depending on the motor version it can amount to between three times and fifteen times the rated operational current. Seven to eight times the rated motor current can be taken as a typical value.

Starting voltage

With SIRIUS soft starters, the level of the starting voltage defines the switch-on torque of the motor. A lower starting voltage results in a lower tightening torque and a lower starting current. The starting voltage should be selected such that the motor starts up immediately and smoothly once the start command goes to the soft starter.

Switching frequency

Number of operating cycles per unit of time (e. g. 15 operations per hour).

To prevent thermal overloading of the SIRIUS soft starters, it is imperative to comply with the maximum permissible switching frequency. The switching frequency of SIRIUS soft starters size S0 to S3 can be increased by using an optional auxiliary fan.

Switching technology

Basically a distinction is drawn between two switching technologies: On the electromechanical side there are contactors, contactor assemblies and compact starters which can be used to implement solutions for direct-on-line starting, reversing starting and wye-delta starting. Frequent switching or reversing, soft starting and smooth ramp-down are performed on the hand with solid-state controls: solid-state switching devices and soft starters. The SIRIUS modular system has the right solution for each switching technology.

Temperature compensation

On inverse-time (thermally) delayed overload releases and relays, the tripping time is influenced not only by the current but also by the ambient temperature. The effect of the ambient temperature is compensated by an additional bimetal strip which is not heated by the current. Solid-state compensation is possible for solid-state overload relays.

Terminals for "self-protected combination motor controller (type E)"

The terminals comply with the required clearance and creepage distances according to UL 508 (type E).

Thermistor motor protection

Protection of the motor through temperature sensors fitted in the windings (PTC sensors). These directly monitor the winding temperature.

Three-phase busbar

The three-phase busbar enables several motor starter protectors or compact feeders to be fed in through one feeder terminal.

Tightening torque

The tightening torque and the breakdown torque can normally be assumed to amount to between two and four times the rated torque. For the loaded machine this means that the start-up and acceleration forces give rise to a higher mechanical load on the machine and the goods being conveyed than compared to operation at rated values.

Time-delayed auxiliary switch

A component which unites various auxiliary switch combinations and as a general rule can also be retrofitted to a control.

Timing relay

A control with solid-state time delay which opens or closes contacts after a delay according to the set time.

Trip class (CLASS)

The trip class of an inverse-time delayed overload relay (including thermal and solid-state overload relays and releases) indicates the maximum tripping time under a given load from cold. The trip class number (e.g. CLASS 10, 20, 30) stands for the maximum permissible tripping time in seconds when the relay is loaded with symmetrical 3-pole loading from cold with 7.2 times the set current (IEC 947-4-1; DIN VDE 0660 Part 107). Trip classes 20 and 30 are used for example for motor protection in heavy starting conditions.

Tripping characteristic

The graphical representation of the connection between the tripping time and the influencing variable is shown in the tripping characteristic curve. The time/current diagram shows for example how long the release or the tripping relay takes to respond to a specific current.

Tripping current (of an overload release)

Value of the current at which a trip releases within a specified time.

Two-phase control

Two of three active phases are controlled by means of semiconductors. With SIRIUS 3RW30 and 3RW40 soft starters, for example, two inverse-parallel switched thyristors lie in each of the phases L1 and L3. Phase L2 is passed through the starter as an uncontrolled phase using a copper link and is connected directly to the corresponding output terminal.

Types of coordination

EN 60947-4-1 (VDE 0660 Part 102) and IEC 60947-4-1 make a distinction between two different types of coordination which are referred to as type of coordination "1" and type of coordination "2". Any short-circuits that occur are cleared safely by both types of coordination. The only differences concern the extent of the damage caused to the device by a short-circuit.

With type of coordination "1" the fuseless load feeder may be non-operational after a short-circuit has been cleared. Damage to the contactor or to the overload release is permissible. For 3RA2 load feeders, the motor starter protector itself always achieves type of coordination "2".

By contrast, with type of coordination "2" there must be no damage to the overload release or to any other component after a short-circuit has been cleared. The 3RA2 fuseless load feeder can resume operation without needing to be partially renewed. At most, it is permissible to weld the contactor contacts if they can be disconnected easily without any significant deformation.

Utilization category

According to EN 60947-4-1, the intended use and loading of power contactors can be identified by specifying the utilization category in conjunction with the rated operational current or motor rating and the rated voltage. An example is utilization category AC-3 for starting and switching off squirrel-cage motors.

Voltage ramp

With SIRIUS 3RW30 and 3RW40 soft starters, soft starting is achieved using a voltage ramp. The motor's terminal voltage is raised during an adjustable starting time from a parameterizable starting voltage to the mains voltage.

Wye-delta contactor assembly

A contactor assembly which during start-up switches the motor into a star circuit (one third the starting current compared to delta starting) and after a while changes over to the delta circuit. Wye-delta contactor assemblies are used where a high starting current has to be prevented in order to reduce the effects on the mechanical components or mains.

Wye-delta starter

See wye-delta contactor assembly

Ordering notes

Logistics

General

With regard to delivery service, communications and environmental protection, our logistics service ensures "quality from the moment of ordering right through to delivery". By designing our infrastructure according to customer requirements and implementing electronic order processing, we have successfully optimized our logistics processes.

We are proud of our personal consulting service, on-time deliveries and 1-day transport within Germany.

To achieve this, we supply the preferred types marked with ► ex warehouse.

We regard the DIN ISO 9001 certification and consistent quality checks as an integral part of our services.

Electronic order processing is fast, cost-efficient and error-free. Please contact us if you want to benefit from these advantages.

Packaging, packing units

The packaging in which our equipment is dispatched provides protection against dust and mechanical damage during transport, thus ensuring that all our products arrive in perfect condition.

We select our packaging for maximum environmental compatibility and reusability (e. g. crumpled paper instead of polystyrene chips for protection during transport in packages up to 32 kg) and, in particular, with a view to reducing waste.

With our multi-unit packaging and reusable packaging, we offer you specific types of packaging that are both kind to the environment and tailored to your requirements:

Your advantages at a glance:

- Lower order costs
- Cost savings through uniform-type packaging: Low or no disposal costs
- Reduced time and cost thanks to short unpacking times
- "Just-in-time" delivery directly to the production line helps reduce stock: Cost savings through reduction of storage area
- Fast assembly thanks to supply in sets
- Standard Euro boxes - corresponding to the Euro pallet modular system - suitable for most conveyor systems
- Active contribution to environmental protection

Unless stated otherwise in the "Selection and ordering data" of this catalog, our products are supplied individually packed.

For small parts/accessories, we offer you economical packaging units as standard packs containing more than one item, e.g. 5, 10, 50 or 100 units. It is essential that whole number multiples of these quantities be ordered to ensure satisfactory quality of the products and problem-free order processing.

The products are delivered in a neutral carton. The label includes warning notices, the CE mark, the open arrow recycling symbol, and product description information in English and German. In addition to the Order No. (MLFB) and the number of items in the packaging, the Instr. Order No. is also specified for the operating instructions. It can be obtained from your local Siemens representative (you will find a list of your local Siemens representatives at www.siemens.com/automation/partner).

The device Order No. of most devices can also be acquired through the EAN barcode to simplify ordering and storage logistics.
The Order Nos. are assigned electronically to the EAN code in the master data of low-voltage controls and distribution.

Ordering notes

Multi-unit and reusable packaging

The devices can be ordered in multi-unit or reusable packagings (further versions on request).

If ordering multi-unit or reusable packagings for the first time, please first consult your local Siemens representative with regard to pack type, quantity, delivery time and the precise order designation. For transport reasons, the use of reusable packaging is recommended only for Germany and EU countries.

For both pack types, the quantity of devices ordered (per Order No.) must be divisible by the pack quantity. If this is not the case, the electronic order processing system rounds up to the next integer multiple of packagings.

Multi-unit packaging

Products in a quantity sufficient to fill a multi-unit packaging:
1/2 (W96) and 1/4 (W97) ENK

As standard, multi-unit packs contain uniform-type, unpacked individual products (1 device type) in an appropriately sized carton made of recyclable cardboard. The products of the SIRIUS range can be ordered in units of 1/1, 1/2, 1/4 and 1/8 standard Euro boxes (ENK).

Reusable packaging (uniform type)

Standard reusable packagings contain uniform-type, non-packed individual products (1 device type) in a reusable standard Euro box (ENK) made of durable molded plastic with foam inserts for protection during transport.

The standard Euro box (ENK) also serves as transport packaging. The reusable packagings (ENK) plus foam inserts are returned by the customer (free of charge) to the supply base.

Delivery details

Please contact your Siemens representative (you will find Siemens representatives at www.siemens.com/automation/partner) to clarify the delivery details or conditions for delivery in multi-unit or reusable packagings. We can then find a delivery solution that best meets your requirements.

Set deliveries (reusable, different devices)

On request, we can also deliver larger quantities of separate loose items packed together in standard Euro boxes.

Please contact your Siemens representative (you will find Siemens representatives at www.siemens.com/automation/partner) to clarify the delivery details or conditions for set supply or delivery in reusable packagings.
Suitable arrangements will then be agreed with you.

Small orders

When small orders are placed, the costs associated with order processing are greater than the order value. We recommend therefore that you combine several small orders. Where this is not possible, we regret that we find it necessary to charge a processing supplement of € 20.-- to cover our costs for order processing and invoicing for all orders with a net goods value of less than € 250.--.

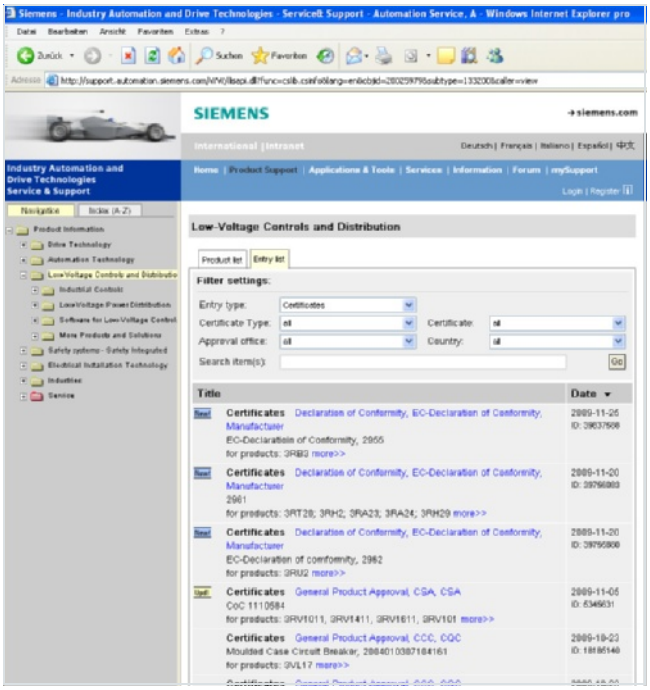
Standards and approvals

Overview

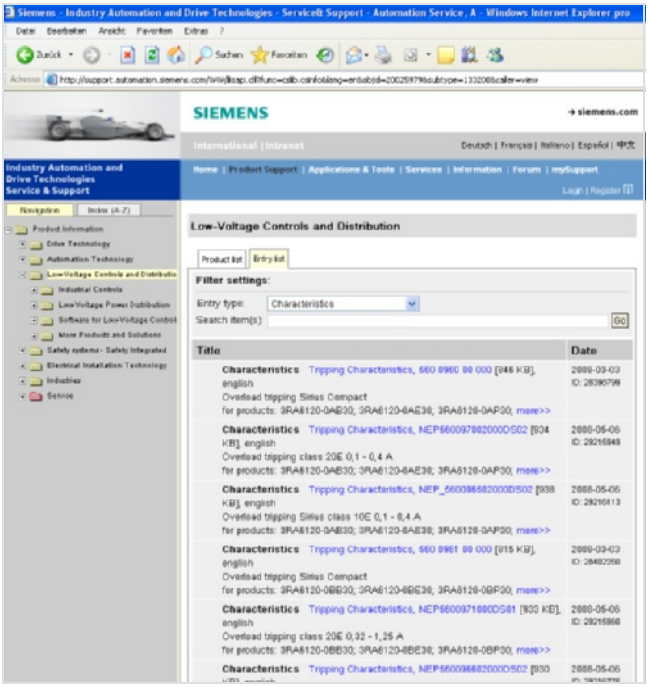
Approvals, test certificates, characteristic curves

An overview of the certificates available for low-voltage control products along with more technical documentation can be consulted daily on the Internet at:

www.siemens.com/industrial-controls/support



Product support: Approvals / Certificates



Product support: Characteristic curves

Standards

IEC	EN	DIN VDE	Title
60947-1 60947-2 60947-3	60947-1 60947-2 60947-3	-- -- --	Low-voltage controlgear and switchgear: General requirements • Circuit-breakers • Load-break switches, disconnectors, switch disconnectors and fuse-combination units
60947-4-1 60947-4-2 60947-4-3	60947-4-1 60947-4-2 60947-4-3	-- -- --	• Contactors and motor starters: Electromechanical contactors and motor starters • Contactors and motor starters: Semiconductor motor controllers and starters, soft starters • AC semiconductor controllers and contactors for non-motor loads
60947-5-1	60947-5-1	--	• Control devices and switching elements: Electromechanical control circuit devices
60947-6-2	60947-6-2	--	• Multifunctional controlgear and switchgear - Control and protection switchgear (CPS)
60947-8	60947-8	--	• Releases for the integrated thermal Protection (PTC) of rotating electric machines
62026-2	50295	--	• Actuator-Sensor Interface (AS-i)
60050-441	--	--	International dictionary/switchgear and/or switching devices and fuses
-- -- 61140	60439-1 50274 61140	-- -- --	Low-voltage switchgear and controlgear assemblies: Type-tested and partially type-tested assemblies Low-voltage switchgear and controlgear assemblies - Protection from electric shock - Protection from accidental touching of dangerous active parts Protection from electric shock - General requirements for apparatus and equipment
60664-1	60664-1	--	Insulation coordination for electrical equipment in low-voltage systems; Principles, requirements and tests
60204-1 -- 60079-14 60079-2	60204-1 50178 60079-14 60079-2	-- -- -- --	Electrical equipment of machines: General requirements Equipment of electrical power installations with electronic equipment Electrical apparatus for potentially explosive gas atmospheres Installing electrical apparatus in potentially explosive gas atmospheres (except mining) Electrical equipment for potentially explosive gas atmospheres - Part 2 Pressurized enclosures M "p"
61810-1 61812-1 60999-1	61810-1 61812-1 60999-1	-- -- --	Electromechanical elementary relays (electromechanical switching relays without a fixed time response); General and safety-related requirements Relays with a fixed time response (timing relays) for industrial applications - Part 1: Requirements and tests Connecting materials - Safety requirements for screw terminals and screwless clamping points for electrical copper conductors - Part 1: General requirements and special requirements for clamping points for conductors from 0.2 mm^2 to 35 mm^2
61000-4-1 61000-6-3 61000-6-4	61000-4-1 61000-6-3 61000-6-4	-- -- --	Electromagnetic compatibility (EMC) - Part 4: Testing and measuring techniques; Main Section 1: Overview of measuring techniques for interference immunity; Basic EMC standard Electromagnetic compatibility (EMC); Basic specification for emitted interference in residential and commercial environments as well as in light industry Electromagnetic compatibility (EMC); Basic specification for emitted interference in industrial environments

UL	CSA C22.2	ASME	JIS	Title
508 489 1059 486A-486B	-- -- -- --	-- -- -- --	-- -- -- --	Industrial control equipment Molded case circuit breakers, molded case switches, and circuit breaker enclosures Terminal blocks Wire connectors
486E	--	--	--	Equipment wiring terminals for use with aluminum and/or copper conductors
-- --	No. 14 No. 5	-- --	-- --	Industrial control equipment Molded case circuit breakers, molded case switches, and circuit breaker enclosures
--	--	A17.5 / B 44.1	--	Elevator and escalator electrical equipment
--	--	--	C 8201-4-1	Low-voltage switchgear and controlgear; Contactors and motor-starters

Approval requirements valid in different countries

Siemens low-voltage switchgear and controlgear are designed, manufactured and tested according to the relevant German standards (DIN and VDE), IEC publications and European standards (EN) as well as CSA and UL standards. The standards assigned to the single devices are stated in the relevant parts of this catalog.

As far as is economically viable, the requirements of the various standards valid in other countries are also taken into account in the design of the equipment.

In some countries (see table below), an approval is required for certain low-voltage switchgear and controlgear components. Depending on the market requirements, these components have been submitted for approval to the authorized testing institutes.

In some cases, CSA for Canada and UL for the USA only approve special switchgear versions. Such special versions are listed separately from the standard versions in the individual parts of this catalog.

For this equipment, partial limitations of the maximum permissible voltages, currents and ratings can be imposed, or special approval and, in some cases, special identification is required.

For use on board ship, the specifications of the marine classification societies must be observed (see page 20/12). In some cases, they require type tests of the components to be approved.

The approvals and certifications of the marine classification societies for SIRIUS Innovations will be subsequently submitted if they are not confirmed below. The current status for each individual product can be checked daily at

www.siemens.com/automation/support -->

(then select "Product Support").

Standards and approvals

Testing bodies, approval identification and approval requirements

Country	Canada [1]	USA [1]	China
Government-appointed or private, officially recognized testing bodies	CSA UL (USA)	UL	CQC
Approval symbol	c UL c FL c FL us c UL us	UL FL c FL us c UL us	CCC
Approval requirements	+	+	+
Remarks	UL and CSA are authorized to grant approvals according to Canadian or US regulations. Please note: these approvals are frequently not recognized and additional approval often has to be obtained from the national testing authority.		CCC

For more information about UL and CSA see page 20/14.

[1] For registration numbers and file numbers for approvals, please visit www.siemens.com/automation/support and select "Product Support".

Marine classification societies

Country	Germany	United Kingdom	France	Norway	CIS	Italy	Poland	USA
Name	Germanischer Lloyd	Lloyds Register of Shipping	Bureau Veritas	Det Norske Veritas	Russian Maritime Register of Shipping	Registro Italiano Navale	Polski Rejestre Statków	American Bureau of Shipping
Codes	GL	LRS	BV	DNV	RMRS	RINA	PRS	ABS

CE mark of conformity

Manufacturers of products which fall within the subject area to which EC directives apply must identify their products, operating instructions or packaging with a CE mark of conformity.

The CE mark of conformity confirms that a product fulfills the appropriate basic requirements of all pertinent directives. The mark of conformity is a mandatory requirement for putting products into circulation throughout the EC.

All the products in this catalog are in conformance with the EC directives and bear the CE mark of conformity.

- Low-voltage directive
- EMC directive
- Machinery directive
- Ex protection directive

The CE mark of conformity: CE.

ALPHA/LOVAG

Siemens AG is a member of the "Gesellschaft zur Prüfung und Zertifizierung von Niederspannungsgeräten e.V. ALPHA" (Society for Testing and Certification of Low-Voltage Controlgear), Frankfurt am Main.

The responsibility of manufacturers and the high quality of products are promoted by ALPHA by means of supportive procedural guidelines for testing equipment according to the currently valid standards.

Providing specific conditions are fulfilled, ALPHA can also issue officially recognized product certificates if required. As a member of LOVAG, ALPHA is also working towards obtaining international recognition for declarations of conformity and certificates.

LOVAG (Low-Voltage Agreement Group) is a body comprising international specialists from certification bodies and industry who are working together to create a standardized European certificate.

List of LOVAG members

ALPHA	Germany
ASEFA	France
ACAE	Italy
SGS CEBEC	Belgium
Intertek Semko AB	Sweden
APPLUSS + CTC	Spain
VEIKI-VNL	Hungary

Accident prevention

Test certificates and approvals from the BIA (German statutory industrial accident insurance institution in Bonn) and from SUVA (Swiss institute for accident prevention) are available for some devices in safety control systems. For details, see the respective product descriptions.

Ex protection certificates for SIRIUS controls

Motor protection devices that protect a motor installed in a potentially explosive atmosphere against overloading must comply with certain special requirements. These requirements are laid down in the following standards:

- EN 60079-0
- EN 60079-1
- EN 60079-7
- EN 60079-14
- EN 60079-17
- EN 60947-1
- EN 60947-4-1
- EN 60947-5-1
- EN 60947-8

Certification

July 1, 2003 saw the dawning of a new era in the field of explosion protection. Since this date, only those devices and protection systems that have been certified for operation in potentially explosive atmospheres according to directive 94/9/EC can be brought into circulation within the European Union.

Only those motor protection devices that have been constructed according to the above-mentioned standards and which have a conformity declaration from the manufacturer based on a prototype test certificate may be brought into circulation within the member states of the EC.

The quality management system of the manufacturer is also subjected to certain requirements and a "QM certificate" must be obtained for the manufacturer from a recognized authority.

Certification of the QM system

A certificate of approval for quality assurance production has been issued by DEKRA EXAM GmbH[1)] with the number BVS 08 ATEX ZQS/E111 of DEKRA EXAM GmbH[1)] according to Directive 94/9/EC.

This certificate is valid for equipment groups I and II and categories M2 and 2: Safety and control devices for electrical equipment.

Certificates

For the 3RV, 3RU, 3RB, 3UF, 3RN and 3RW motor protection devices, the corresponding conformity declarations and prototype test certificates for Category 2G, and to some extent 2D, are available and can be supplied on request. More details can also be found in the section "Type overview of approved devices for potentially explosive areas (ATEX explosion protection)" on page 20/18.

Identifying markings

All equipment must be marked in according to the ATEX guideline. The ATEX identification code contains the equipment group, the approved environment, the number of the certification authority and other technical data that was determined from the type test.

1) DEKRA EXAM GmbH
The certification authority of the "DEKRA EXAM GmbH" numbered as authority number 0158 according to Article 9 of Directive 94/9/EC of the European Parliament and Council dated March 23, 1994, certifies that Siemens Amberg and Cham maintains a quality system for production that satisfies Appendix IV of this Directive.

Certificate of the AS-International Association for AS-Interface products

AS-Interface products are tested and certified by the AS-International Association. The products have been tested in an accredited test laboratory according to testing guidelines.

Standards and approvals

Special standards for the USA and Canada

In the USA and Canada, for machine tools and processing machines in particular, supply lines are laid using rubber insulated cable enclosed in heavy-duty steel piping similar to that used for gas or water pipe systems.

The tubing system must be completely watertight and electrically conductive (especially sleeving and elbows). Since the tubing system can also be grounded, the cable entries of enclosed units equipped with heavy-gauge or metric threads must be fitted with metal adapters between these threads and the tube thread. The necessary adapters are specified for the switchgear as accessories; they should be ordered separately unless otherwise specified.

Low-voltage switchgear and controlgear for auxiliary circuits (e.g. contactor relays, commanding and signaling devices and auxiliary switches/auxiliary contacts in general) are generally only approved by CSA and UL for *"Heavy Duty"* or *"Standard Duty"* and are identified either with these specifications in addition to the maximum permissible voltage or by using an abbreviation.

The abbreviations are harmonized with IEC 60947-5-1 Appendix 1 Table A.1 and correspond to the stated utilization categories.

For various switching devices detailed in the catalog, a note has been included to the effect that, above a certain voltage, the auxiliary switches/auxiliary contacts can only be used if they have the same polarity. This means that the input terminals can only be connected to the same pole of the actuating voltage, e. g. "600 V AC above 300 V AC same polarity".

Different features of UL approvals (for USA and Canada)

Recognized Component	Listed Product
Devices are identified on the rating plate using the "UL recognition mark": USA: ℞, c℞us Canada: c℞, c℞us	Devices are identified using the "UL listing mark" on the rating plate e.g. USA: ℔ LISTED 165 C IND. CONT. EQ. Canada: c℔ LISTED 165 C IND. CONT. EQ. (165 C stands for: Siemens, I IA CE Division, Amberg plant)
Devices are approved as modules for "factory wiring", i.e.: as devices for installation in control systems, which are selected, installed, wired and tested entirely by trained personnel in factories, workshops or elsewhere, **according to the operating conditions**.	Devices are approved for "field wiring", i.e.: • As devices for installation in control systems, which are completely wired by trained personnel in factories, workshops or elsewhere. • As single devices for sale in retail outlets in the USA/Canada.
If devices are ℔ or c℔ approved as "listed products", they are also approved as ℞ or c℞ "recognized components".	

For more information about UL and CSA see page 20/11.

Special standards for Russia, Australia and China

GOST approval for Russia

A GOST approval is required for all products that are to be sold in Russia. The GOST mark has been obligatory on the packaging of all devices since mid-1998.

All devices delivered to any part of the Russian Federation must have this customs certification.

C-Tick licensing for Australia

The C-Tick license is required for marketing Siemens components in Australia. Electronic devices must provide proof of EMC clearance in Australia, similar to the CE mark of conformity laid down by the EMC directive applicable in the EC and bear the "C-Tick" mark. These requirements have been in force since October 1st, 1999.

CCC approval

Since August 1, 2003, CCC approval is required for many products that are marketed in China.

Type overview of approved devices

Devices	Type	Approvals				Marine classifications							
		Canada 1) 2)	USA 1)	1)	China	Germany	United Kingdom	France	Norway	CIS	Italy	Poland	USA
		CSA	UL	cUL	CCC	GL	LRS	BV	DNV	RMRS	RINA	PRS	ABS
Chapter 2													
Masters													
CP 343-2/2P (V2.1)	**6GK7 343-2**	+	+	×	--	+	o	--	+	--	o	--	--
CP 343-2/2P (V3.0)	**6GK7 343-2/-2P**	o	o	×	--	+	o	--	+	--	--	--	--
Routers													
DP/AS-i LINK Advanced	**6GK1 415**	+	+	×	--	+	+	+	+	--	+	+	+
DP/AS-Interface LINK 20E	**6GK1 415**	+	+	×	--	+	+	+	+	--	+	+	+
DP/AS-i F-LINK	**3RK3 141**	+	+	×	o	--	--	--	--	--	--	--	--
IE/AS-i LINK PN I0	**6GK1 411**	+	+	×	--	+	+	+	+	--	+	+	+
Power supply units AS-Interface, IP20	**3RX9 501**	+	+	×	--	+	+	+	+	--	+	+	+
Chapter 3													
SIRIUS 3RT20 contactors	**3RT20 1.**	+	+	×	o	o	o	o	o	o	o	o	o
	3RT20 2.	+	+	×	o	o	o	o	o	o	o	o	o
SIRIUS 3RA23 reversing contactor assemblies	**3RA23 1./2.**	+	+	×	--	o	--	--	--	--	--	--	--
SIRIUS 3RA24 contactor assemblies for wye-delta starting	**3RA24 1./2.**	--	--	--	--	o	o	o	o	o	o	o	o
Accessories for 3RA2	**3RA27 11**	+	+	x	o	o	o	o	o	o	o	o	o
	3RA27 12	+	+	x	o	o	o	o	o	o	o	o	o
	3RA28 16	+	+	x	o	o	o	o	o	o	o	o	o
	3RA29 10	+	+	x	o	o	o	o	o	o	o	o	o
	3RA29 13	--	--	+	o	o	o	o	o	o	o	o	o
	3RA29 16	--	--	o	o	o	o	o	o	o	o	o	o
	3RA29 23	--	--	+	o	o	o	o	o	o	o	o	o
	3RA29 26	--	--	+	o	o	o	o	o	o	o	o	o
SIRIUS 3RT23 contactors for switching resistive loads	**3RT23 16**	o	o	x	o	o	o	o	o	o	o	o	o
	3RT23 17	o	o	x	o	o	o	o	o	o	o	o	o
	3RT23 25	o	o	x	o	o	o	o	o	o	o	o	o
	3RT23 26	o	o	x	o	o	o	o	o	o	o	o	o
	3RT23 27	o	o	x	o	o	o	o	o	o	o	o	o
	3RT25 16	o	o	x	o	o	o	o	o	o	o	o	o
	3RT25 17	o	o	x	o	o	o	o	o	o	o	o	o
	3RT25 26	o	o	x	o	o	o	o	o	o	o	o	o
3RT, 3RH contactors with extended operating range	**3RT20 1.-2K**	+	+	x	o	o	o	o	o	o	o	o	o
	3RT20 2.-3K	+	+	x	o	o	o	o	o	o	o	o	o
	3RT20 2.-2X	+	+	x	o	o	o	o	o	o	o	o	o
	3RH21 22-2K	+	+	x	o	o	o	o	o	o	o	o	o
3RH contactor relays	**3RH21, 3RH22, 3RH24**	+	+	x	o	o	o	o	o	o	o	o	o
3RT, 3RH coupling relays	**3RT20**	+	+	x	o	o	o	o	o	o	o	o	o
	3RH21	+	+	x	o	o	o	o	o	o	o	o	o
Function modules for 3RT, 3RH	**3RA28 11**	+	+	x	o	o	o	o	o	o	o	o	o
	3RA28 12	+	+	x	o	o	o	o	o	o	o	o	o
	3RA28 13	+	+	x	o	o	o	o	o	o	o	o	o
	3RA28 14	+	+	x	o	o	o	o	o	o	o	o	o
	3RA28 15	+	+	x	o	o	o	o	o	o	o	o	o
	3RA29 11	+	+	x	o	o	o	o	o	o	o	o	o
	3RA29 12	+	+	x	o	o	o	o	o	o	o	o	o
	3RH29 11	+	+	x	o	o	o	o	o	o	o	o	o
	3RH29 21	+	+	x	o	o	o	o	o	o	o	o	o
	3RT19 .6	+	+	x	m	o	o	o	o	o	o	o	o
	3RT29 .6	+	+	x	m	o	o	o	o	o	o	o	o

+ Standard version approved.
-- Not yet submitted for approval.
o Device submitted for approval, please inquire.
× cUL approval not required because UL approved.
m For exporting products to the People's Republic of China, CCC marking is not necessary.

1) For guide numbers and file numbers for the approvals, visit our website at www.siemens.com/automation/support.
2) cUL and cUL approvals are available in accordance with US approval.

Standards and approvals

Devices	Type	Approvals				Marine classifications							
		Canada 1) 2)	USA 1)	1)	China	Germany	United Kingdom	France	Norway	CIS	Italy	Poland	USA
					CCC	GL	LRS	BV	DNV	RMRS	RINA	PRS	ABS
Chapter 4													
SIRIUS solid-state soft starters	**3RW30**	+	+	×	+	--	--	--	--	--	--	--	--
	3RW40 2 ... 40 4	+	+	×	+	+	o	--	+	--	--	+	--
	3RW40 5, 3RW40 7	+	+	×	+	+	+	--	+	--	--	o	--
	3RW44	+	+	×	+	+	+	+	+	--	--	+	--
Chapter 5													
SIRIUS motor starter protectors up to 40 A[3]													
For motor protection	**3RV20**	+	+	×	o	o	o	o	o	o	o	o	o
For motor protection with overload relay function	**3RV21**	+	+	×	o	o	o	o	o	o	o	o	o
For starter combinations	**3RV23**	+	+	×	o	o	o	o	o	o	o	o	o
For transformer protection	**3RV24**	+[4]	+[4]	×	o	o	o	o	o	o	o	o	o
For system protection according to UL 489	**3RV27**	+	+	×	o	o	o	o	o	o	o	o	o
For transformer protection acc. to UL 489	**3RV28**	+	+	×	o	o	o	o	o	o	o	o	o
Accessories[4]													
Auxiliary switches	**3RV29 01**	+	+	×	o	o	o	o	o	o	o	o	o
Signaling switches	**3RV29 21**	+	+	×	o	o	o	o	o	o	o	o	o
Isolator modules	**3RV29 28**	+	+	×	m	o	o	o	o	o	o	o	o
Undervoltage releases / shunt releases	**3RV29 .2**	+	+	×	m	o	o	o	o	o	o	o	o
Feeder terminals type E	**3RV29 15, 3RV29 25**	+	+	×	m	o	o	o	o	o	o	o	o
For 3RV2 infeed systems	**3RV29**	+	+	×	m	o	o	o	o	o	o	o	o
Rotary operating mechanisms	**3RV29 26**	+	+	×	m	--	--	--	--	--	--	--	--
Terminal blocks type E	**3RV29 28-1.**	+	+	×	m	o	o	o	o	o	o	o	o
Link modules	**3RA19 21**	o	o	×	m	o	o	o	o	o	o	o	o
	3RA29 11	o	o	x	m								
	3RA29 21	o	o	x	m								
Molded-plastic enclosures	**3RV19 23-1.A00**	--	--	--	m	--	--	--	--	--	--	--	--
	3RV19 23-1.A01	--	--	--	m	--	--	--	--	--	--	--	--
Cast aluminum enclosures for surface mounting													
Thermal overload relays	**3RU21 1.**	+	+	x	o	o	o	o	o	o	o	o	o
	3RU21 2.	+	+	x	o	o	o	o	o	o	o	o	o
Solid-state overload relays	**3RB30**	+	+	x	o	o	o	o	o	o	o	o	o
	3RB31	+	+	x	o	o	o	o	o	o	o	o	o
Accessories for 3RU and 3RB	**3RU29 .6-3A**	+	+	x	m	o	o	o	o	o	o	o	o
	3RB39 8.	+	+	x	m	o	o	o	o	o	o	o	o

+ Standard version approved.
-- Not yet submitted for approval.
o Device submitted for approval, please inquire.
× approval not required because approved.
m For exporting products to the People's Republic of China, CCC marking is not necessary.

1) For guide numbers and file numbers for the approvals, visit our website at www.siemens.com/automation/support.
2) and approvals are available in accordance with US approval.
3) Approval for motorized loads only (not for transformers).
4) For approved rated data see Chapter 5 "Protection Equipment --> "Motor Starter Protectors".

Devices	Type	Approvals				Marine classifications							
		Canada 1) 2)	USA 1)	1)	China	Germany	United Kingdom	France	Norway	CIS	Italy	Poland	USA
		c	UL		CCC	GL	LRS	BV	DNV	RMRS	RINA	PRS	ABS
Chapter 6													
3RA2 load feeders	**3RA21, 3RA22**	o	o	×	--	o	o	o	o	o	o	o	o
Compact feeders													
Direct-on-line starters	**3RA61**	+3)	+3)	×	+	o	+	o	+	+	o	+	+
Reversing starters	**3RA62**	+3)	+3)	×	+	o	+	o	+	+	o	+	+
Direct-on-line starters for I/O-Link	**3RA64**	+3)	+3)	×	o	o	+	o	+	+	o	+	+
Reversing starters for I/O-Link	**3RA65**	+3)	+3)	×	o	o	+	o	+	+	o	+	+
Add-on modules for AS-Interface	**3RA69 70-3**	+	+	×	m	o	+	o	+	+	o	+	+
Auxiliary switches for 3RA6	**3RA69**	+	+	×	+	o	+	o	+	+	o	+	+
Infeed systems for 3RA6	**3RA68**	+	+	×	m	o	+	o	+	+	o	+	+
ET 200S motor starters and safety motor starters	**3RK1 301**	+	+	×	+	--	--	--	--	--	--	--	--
ET 200pro motor starters	**3RK1 304**	+	+	×	+	--	--	--	--	--	--	--	--
M200D motor starters													
AS-i Basic	**3RK1 315**	o	+	×	o	--	--	--	--	--	--	--	--
AS-i Standard	**3RK1 325**	o	+	×	o	--	--	--	--	--	--	--	--
Communication modules	**3RK1 305**	o	+	×	o	--	--	--	--	--	--	--	--
- For PROFIBUS	**3RK1 335**	o	+	×	o	--	--	--	--	--	--	--	--
- For PROFINET													
Motor starter modules - For PROFIBUS/ PROFINET	**3RK1 395**	o	+	×	o	--	--	--	--	--	--	--	--
Chapter 7													
SIRIUS monitoring relays for mounting onto 3RT2 contactors	**3RR21**	+	+	×	o	o	o	o	o	o	o	o	o
	3RR22	+	+	×	o	o	o	o	o	o	o	o	o
3TK28 safety relays													
Overspeed monitors	**3TK28 10-1**	o	o	o	--	--	--	--	--	--	--	--	--
Chapter 8													
Standard position switches	**3SE5 112/114, 3SE5 115/122**	+	+	×	+	--	--	--	--	--	--	--	--
	3SE5 162	o	o	×	o	--	--	--	--	--	--	--	--
	3SE5 211	o	o	×	o	--	--	--	--	--	--	--	--
Safety position switches	**3SE5 1/2**	+	+	×	+	--	--	--	--	--	--	--	--

+ Standard version approved.
-- Not yet submitted for approval.
o Device submitted for approval, please inquire.
× UL approval not required because UL approved.
m For exporting products to the People's Republic of China, CCC marking is not necessary.

1) For guide numbers and file numbers for the approvals, visit our website at www.siemens.com/automation/support.
2) cUL and cUL approvals are available in accordance with US approval.
3) Approval as "Type E" combination motor controller (UL und c) and as tap conductor protection device (only UL).

Standards and approvals

Type overview of approved devices for potentially explosive areas (ATEX explosion protection)

	Type	Size	Certificate number	Certification based on	Type of protection/ Identification Ex
Contactors[1)]					
Motor starter protectors					
For motor protection	3RV20 11	S00	DMT 02 ATEX F 001, DMT 02 ATEX F 001 N1	EN 60947-4-1, EN 60079-14	Ex II (2) GD
	3RV20 21 (on request)	S0			
3RB solid-state overload relays					
For standard applications	3RB30, 3RB31	S00, S0	PTB 09 ATEX 3001	EN 60079-1, EN 60079-7, EN 60079-14, EN 60947-4-1, EN 60947-5-1, EN 60947-8 EN 61241-14 EN 61508	Ex II (2) GD
3RU thermal overload relays					
For standard applications	3RU21 1	S00	On request	IEC 60079-14, EN 60079-14	Ex II (2) GD
	3RU21 2	S0			
Starting					
Soft starters					
For standard applications	3RW40	S00, S0	BVS 05 ATEX F 002	EN 60079-14, EN 60947-4-2, EN 61508	Ex II (2) GD

1) Information for the implementation of current monitoring motor protection devices.
Definition of the locked-rotor time t_E: if the rotor of an explosion-protected induction motor of protection type "Increased Safety" EEx e stalls (locks) at operating temperature during runtime, the motor must be switched off, at the very latest, when either the rotor or the stator winding have reached their maximum temperature. The time that elapses until the rotor or stator winding has reached maximum temperature is called the locked-rotor time t_E or t_E time.
The demands made on overload protective devices with regard to t_E time: For releases and relays with inverse-time delayed operation, tripping characteristics must be available at the operating site. The characteristic curves should show the tripping time for 3-pole loading, assuming a cold state and a room temperature of 20 °C, depending on at least a 3 - 8-fold set current. The protective devices must comply with the specified tripping times with a permissible deviation of ±20 %.
The releases and relays for machines with cage rotors must be selected such that the tripping times for 3-pole loading do not exceed the locked-rotor time t_E specified on the type plate.
Tripping characteristics for our motor starter protectors and overload relays can be found on the Internet at:
www.siemens.com/industrial-controls/manuals

More information

For more information about standards and approvals go to http://www.siemens.com/automation/support and select "Product Support".

If you have any questions concerning UL/CSA approvals, contact Technical Assistance, Tel.: +49 (0) 911/895-5900.

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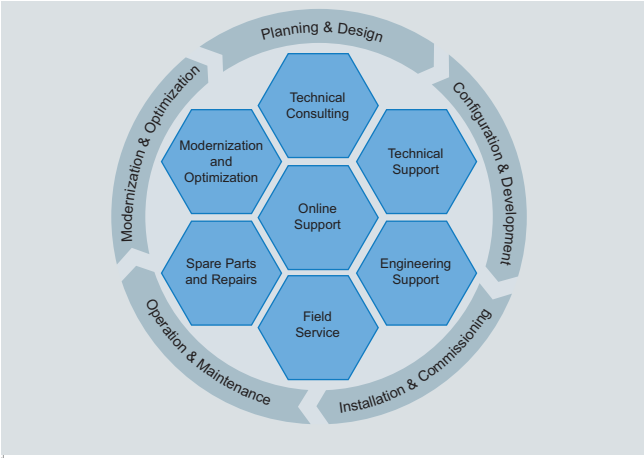

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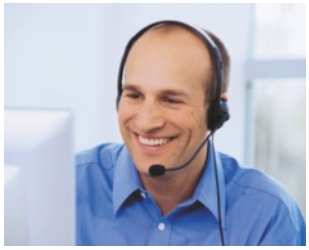
Technical Support



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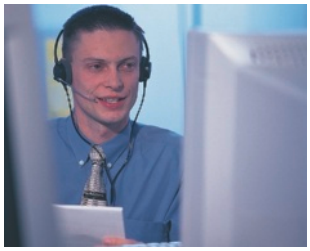
Technical Assistance



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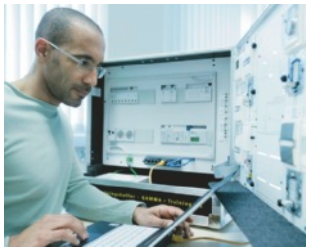

Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project.[2]

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With Field Service, we offer services for startup and maintenance essential for ensuring system availability.

In Germany
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In the operating phase of a machine or automation system, we offer comprehensive repair and spare parts services ensuring the highest degree of plant availability.

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After startup or during the operating phase, additional potential for inceasing the productiviy or for reducing costs often arises. For this purpose, we offer you high-quality services in optimization and upgrading.[2]

[1] Please contact:
Technical Assistance for product selection · old/new conversions · competitive conversion measures · special versions · special requirements.
Your regional contact for sales assistance (price, discounts, delivery times). Technical Support for start-up support and after-sales service.

[2] Country-specific telephone numbers can be found at our Internet page www.siemens.com/automation/service&support

Subject index

Subject index

Overview

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3RA19 1	N	N	6/24
3RA19 2	N	N	5/29, 6/24
3RA19 3	N	N	4/8, 4/16
3RA19 4	N	N	4/8, 4/16
3RA21 1	N	N	6/13 ... 16
3RA21 20-1F	N	N	6/13, 6/15
3RA21 20-1G	N	N	6/13, 6/15
3RA21 20-1H	N	N	6/13, 6/15
3RA21 20-1J	N	N	6/13, 6/15
3RA21 20-1K	N	N	6/13, 6/15
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3RA21 20-4C	N	N	6/13 ... 16
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3RA21 20-4EA	N	N	6/13, 6/15
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3RA22 20-1F	N	N	6/17, 6/19
3RA22 20-1G	N	N	6/17, 6/19
3RA22 20-1H	N	N	6/17, 6/19
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3RA22 20-1K	N	N	6/17, 6/19
3RA22 20-4A	N	N	6/17 ... 20
3RA22 20-4B	N	N	6/17 ... 20
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3RA22 20-4D	N	N	6/17 ... 20
3RA22 20-4E	N	N	6/17 ... 20
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3RA24 16-8XF	EAR99	N	3/39
3RA24 16-8XH	N	N	3/39
3RA24 17-8XE	N	N	3/39
3RA24 17-8XF	EAR99	N	3/39
3RA24 17-8XH	N	N	3/39
3RA24 23-8XE32-1	EAR99	N	3/41
3RA24 23-8XE32-2	N	N	3/41
3RA24 23-8XF	EAR99	N	3/41
3RA24 23-8XH32-1	EAR99	N	3/41
3RA24 23-8XH32-2	N	N	3/41
3RA24 25-8XE32-1	EAR99	N	3/41
3RA24 25-8XE32-2	N	N	3/41
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