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sitrans

WS100 SPEED SENSOR

SIEMENS

Safety Guidelines: Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

Qualified Personnel: This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Unit Repair and Excluded Liability:

- The user is responsible for all changes and repairs made to the device by the user or the user's agent.
- All new components are to be provided by Siemens Milltronics Process Instruments Inc.
- Restrict repair to faulty components only.
- Do not reuse faulty components.

Warning: This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

This product is intended for use in industrial areas. Operation of this equipment in a residential area may cause interference to several frequency based communications.

Note: Always use product in accordance with specifications.

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- For a selection of Siemens Milltronics level measurement manuals, go to: **www.siemens.com/processautomation**. Under Process Instrumentation, select *Level Measurement* and then go to the manual archive listed under the product family.
- For a selection of Siemens Milltronics weighing manuals, go to: **www.siemens.com/processautomation**. Under Weighing Technology, select *Continuous Weighing Systems* and then go to the manual archive listed under the product family.

Table of Contents

Safety Notes	1
Safety Marking Symbols	1
The Manual	2
Technical Support	2
SITRANS WS100 Speed Sensor	3
Specifications	4
Installation	6
Dimensions	6
Mounting	7
Mounting to a Tail Pulley	8
Mounting to a Bend or Snub Pulley	9
General Installation Steps	10
Interconnection	11
Connection	11
Wiring	11
Terminal Connections to Siemens Integrators	12
Terminal Connections to SIWAREX FTC Integrator	12
Maintenance	13
Inspection	13

Safety Notes

Special attention must be paid to warnings and notes highlighted from the rest of the text by grey boxes.





WARNING: relates to a caution symbol on the product, and means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.



WARNING¹: means that failure to observe the necessary precautions can result in death, serious injury, and/or considerable material damage.

Note: means important information about the product or that part of the operating manual.

Safety Marking Symbols

In manual:	On product:	Description
		WARNING: refer to accompanying documents (manual) for details.

¹ This symbol is used when there is no corresponding symbol on the product.

The Manual

Note: This product is intended for use in industrial areas. Operation of this equipment in a residential area may cause interference to several frequency based communications.

This instruction manual covers the installation, operation and maintenance of the SITRANS WS100 speed sensor.

We strongly recommend reading this manual, and any manual for a product used in conjunction with the SITRANS WS100 (such as a belt scale integrator), for proper installation and operation of any component of the weighing system. Adhering to the installation and operating procedures ensures a quick, trouble-free installation and allows for the maximum accuracy and reliability of your weighing system.

Integrator and speed sensor instruction manuals are available for download from www.siemens.com/processautomation.

We always welcome suggestions and comments about manual content, design, and accessibility. Please direct your comments to techpubs.smpi@siemens.com.

Technical Support

Support is available 24 hours a day.

To find your local Siemens Automation Office address, phone or fax number go to:

www.siemens.com/automation/partner

- Click on the tab **Contacts by Product** and then find your product group (**+Process Automation > +Weighing Technology**).
- Select the team **Technical Support**. Click on **Next**.
- Click on the appropriate continent, then select the country followed by the city. Click on **Next**.

For on-line technical support go to:

www.siemens.com/automation/support-request

- Enter the device name (SITRANS WS100) or order number, then click on **Search**, and select the appropriate product type. Click on **Next**.
- You will be prompted to enter a keyword describing your issue. Then either browse the relevant documentation, or click on **Next** to email a detailed description of your issue to Siemens Technical Support staff.

Siemens A&D Technical Support Center: phone +49 180 50 50 222
fax +49 180 50 50 223

SITRANS WS100 Speed Sensor

SITRANS WS100 speed sensor is a compact, medium-resolution pulley shaft-driven belt speed sensor with magnetic mounting. It is ideal for aggregate and mineral processing industries.

This small, light-weight speed sensor features:

- Good resolution for accurate measurement, suitable for varying shaft speeds
- Long bearing life

Eight pulses are generated for each rotation of the SITRANS WS100 shaft. These pulses are typically fed into a Milltronics belt scale integrator. The integrator interprets the pulses and uses them in the calculation of belt speed, flow rate, and material totalization.

The SITRANS WS100 IS (Intrinsically Safe) speed sensor contains a Pepperl + Fuchs, NAMUR rated, inductive proximity switch, model number: NCN4-12GM-35-N0. The proximity switch detects the pulses, and transmits a signal to the integrator via the associated Switch Isolator.

The SITRANS WS100 works with the following Siemens integrators:

- Milltronics BW100
- Milltronics BW500
- SIWAREX FTC
- Competitive integrators – consult your local Siemens representative

SITRANS WS100 sensors can also be used with older model Siemens integrators:

- Compuscale
- Compuscale IIA
- Compu-M
- Compuscale II
- Compuscale III

For further information about Siemens products, go to www.siemens.com/processautomation.

Specifications

Power

- WS100 standard: 4.5 to 28 V DC, 16 mA
- WS100 IS (Intrinsically Safe): 5 to 25 V DC from IS Switch Isolator

Ambient Temperature

- WS100 standard: -40 to +110 °C (-40 to +230 °F)
- WS100 IS: -25 to +100 °C (-14 to +212 °F)

Input

- shaft rotation 15 to 1500 rpm, bi-directional
- shaft rotation 15 to 300 rpm, bi-directional with magnetic connector

Output

- 8 pulses per revolution
- 0 to 200 Hz, 0 to 40 Hz with magnetic connection
- WS100 standard: open collector sinking output, 25 mA
- WS100 IS: load current, 0 to 15 mA
- Integrator minimum usable frequency 2 Hz

Enclosure

- polypropylene base and target enclosure with 304 (1.4301) stainless steel access cover
- 304 (1.4301) stainless steel shaft, bearings and hardware

Cable

- WS100 standard:
 - 3 m (10 ft), 3 conductor 22 AWG (0.324 mm²), PVC shielded cable
 - 300 m (1000 ft) maximum cable run
- WS100 IS:
 - 2 m (6.5 ft), 2 conductor 26 AWG (0.129 mm²), PVC covered cable
 - 300 m (1000 ft) maximum cable run to IS switch isolator
 - 300 m (1000 ft) maximum cable run from IS switch isolator and integrator

Weight

- 1.22 kg (2.68 lbs)

Approvals

- WS100 standard: CE, C-TICK
- WS100 IS: uses CE, ATEX and CSA approved Pepperl + Fuchs Proximity Switch and IS Switch Isolator
(See Switch and Isolator Approvals on next page.)

Switch and Isolator Approvals

Note: The Approval Ratings for the Proximity Switch and the IS Switch Isolator are the property of Pepperl + Fuchs. For current approvals go to: <http://www.am.pepperl-fuchs.com/>.

Proximity Switch Approval Ratings (Pepperl + Fuchs #NCN4-12GM-35-N0)

- ATEX II 1D Ex iaD 20 T 108 °C (with suitable IS Switch Isolator)¹
- CSA (with suitable IS Switch Isolator or Switch Amplifier): General Purpose
- CE

IS Switch Isolator Approval Ratings (Pepperl + Fuchs #KFA5-SOT2-Ex2 and #KFA6-SOT2-Ex2)

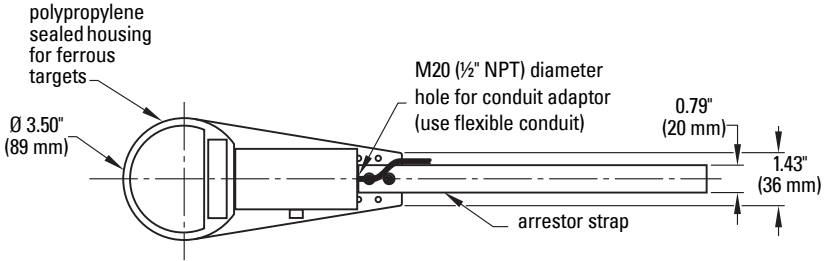
- ATEX II 1G D [EEx ia] II C
- CSA: Class I, Div. 1, Groups A,B,C, and D.
 Class II, Div. 1, Groups E,F, and G.
 Class III
- CE

¹ Based on the ATEX rating of the NAMUR sensor and CSA approvals.

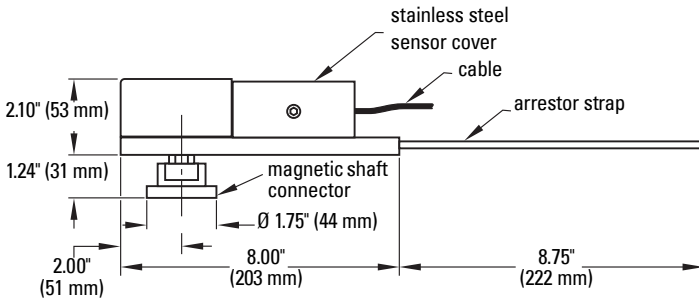
Installation

Note: Installation shall be performed only by qualified personnel in accordance with local governing regulations.

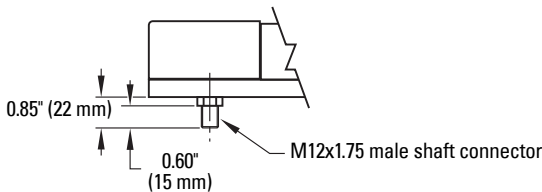
Dimensions



Magnetic shaft connector option



Male shaft connector option



Mounting

The input shaft on the SITRANS WS100 is coupled to the rotating shaft on a belt-driven pulley with a tapped hole, and is externally supported. The unit's arresting strap stops it from rotating with the shaft and can be fitted to any rigid support member close to the sensor.

When mounting, ensure the unit and the pulley shaft are concentric to avoid stresses on the unit's bearings.

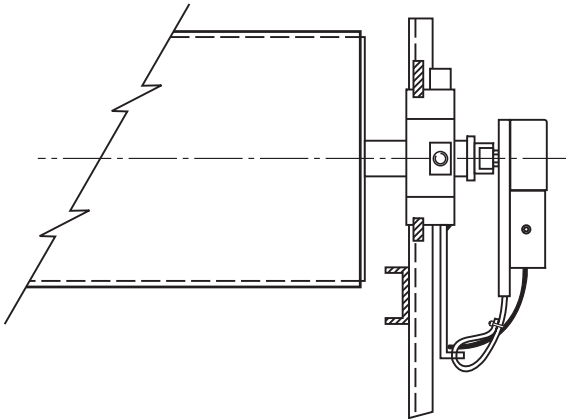
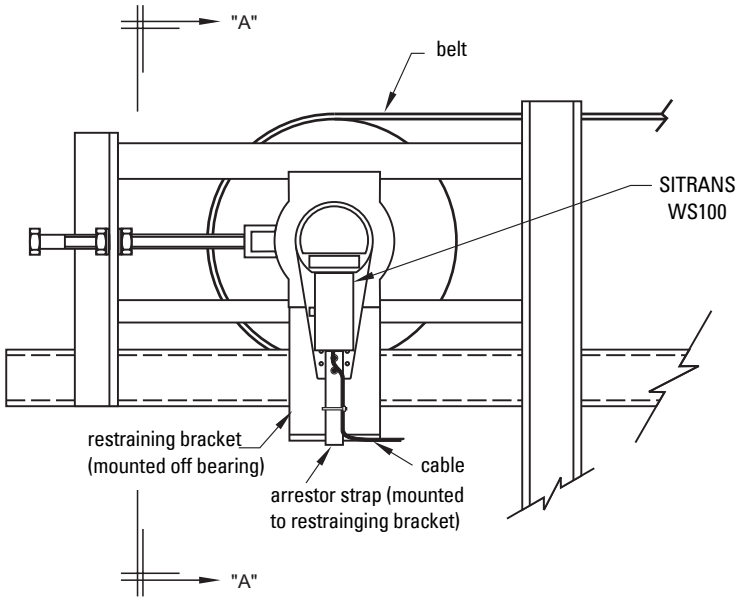
For mounting using the magnetic connector, ensure the face of the rotating shaft on the belt driven pulley is flat, and has no burrs or damage that may prevent flush mounting of the magnetic connector. Attach the SITRANS WS100 speed sensor to the shaft; the magnetic connector will center itself as the belt driven pulley rotates.



WARNING: The magnetic connector has over 68 kg (150 lbs) of pulling force. Ensure no objects are placed between the magnetic connector and the shaft to avoid personal injury.

For preferred mounting locations, refer to the associated belt scale or weighfeeder instruction manual.

Mounting to a Tail Pulley

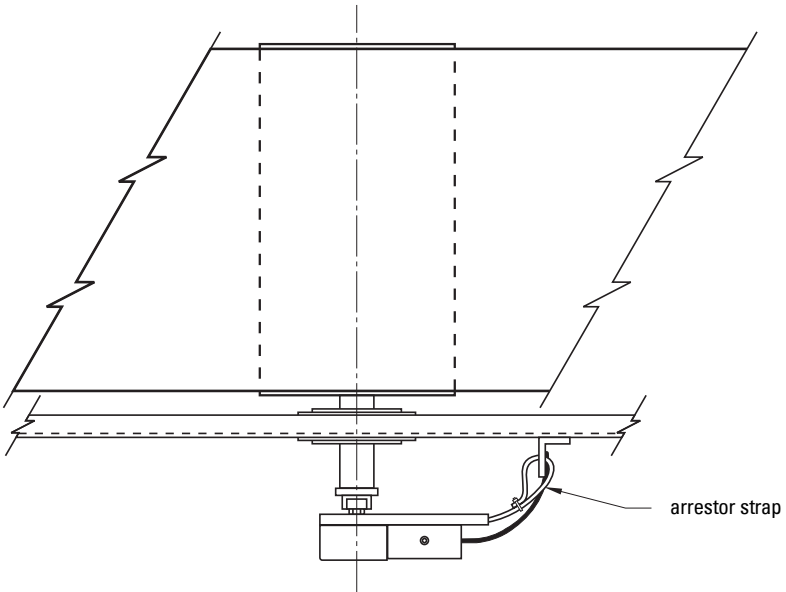
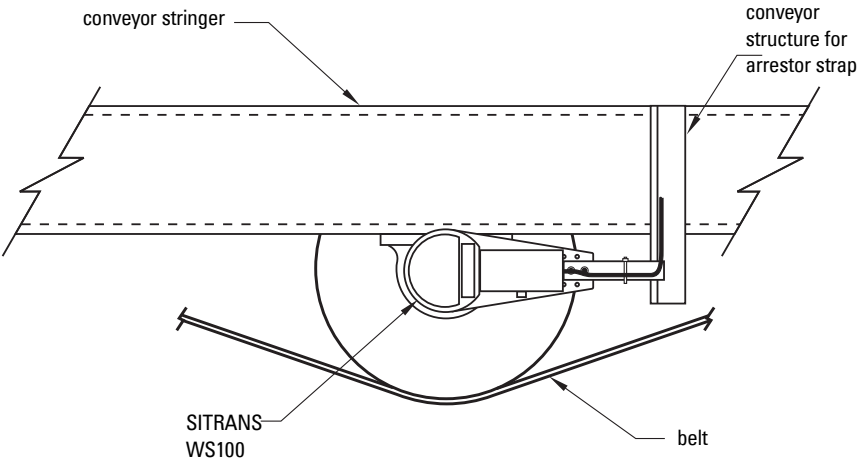


VIEW "A" - "A"

Note:

- When adjusting the belt take-up, ensure that the WS100 travels with the tail pulley bearing.

Mounting to a Bend or Snub Pulley

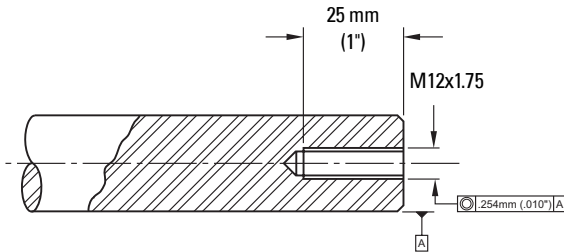


General Installation Steps

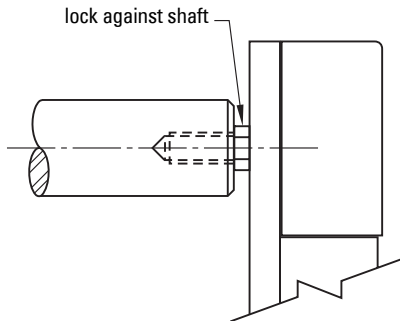
1. Drill and tap out pulley shaft to a depth of 25 mm (1") concentric to its centerline, and tap M12x1.75. If using magnetic connector, mount to shaft face, and go to step 3.

! WARNING: Exercise caution when completing step 1, and remain within specified tolerances.

2. Thread the SITRANS WS100 onto the machine shaft using 16 mm or 5/8" open-ended wrench and releasable thread-locking adhesive (Loctite or similar).



3. Attach arrestor strap to an existing support member or add a rigid support if necessary.



4. Encase wiring in flexible conduit to allow unit to move freely (without tension on the wires).
5. Wire the SITRANS WS100 to the integrator. See Terminal Connections to Siemens Integrators on page 12 for terminal post connections.

Interconnection

Note: Installation shall be performed only by qualified personnel and in accordance with local governing regulations.

Connection between the SITRANS WS100 standard unit and the integrator should be made with three-wire shielded, 0.324 mm² (22 AWG) cable.

To connect the SITRANS WS100 IS unit to the switch isolator, use two-wire shielded 0.324 mm² (22 AWG) cable. Use the same cable to connect the switch isolator to the integrator.

Ground the shield at the integrator end ONLY.

Notes:

- Flexible conduit is recommended so that excess stress is not applied to the shaft bearings.
- Use appropriate conduit and conduit fittings or cable glands to maintain local approvals.

Connection

WS100 standard

WS100 standard	Integrator
red	speed excitation
white	speed signal
black	speed common

WS100 IS

WS100 IS	IS Switch Isolator Terminal	Integrator
brown	1	
blue	3	
	7	speed signal
	8	speed common

Wiring

Red – +V DC

The positive power supply from the integrator connection.

White – Speed Out

The positive output connection of the measurement loop.

Black – Common

The common connection used as a reference point with the integrator.

GND – Ground

A ground connection. Do not use this ground for the cable shield.

Notes:

- Ground the cable shield at the integrator end only!
- For optimal performance the stainless steel cover of the Speed Sensor must be connected to a reliable earthed ground.

Terminal Connections to Siemens Integrators

SITRANS WS100	Red +V DC	White Speed	Black Cmn	GND
Milltronics BW100	8	7	6	N/C
Milltronics BW500	19	16	17	N/C

Terminal Connections to SIWAREX FTC Integrator

SITRANS WS100	Red +V DC	White Speed	Black Cmn	GND
SIWAREX FTC	24 V (backplane bus)	X1.9 (CI+)	X1.10 (CI-)	N/C

Notes:

- N/C indicates the terminal is not normally connected
- For terminal connections to older model Siemens integrators consult your local Siemens representative

Maintenance

Inspection

Periodically the cover should be removed and the sensor should be cleaned for dust and grime buildup. If cleaning is required, disconnect the power and use a vacuum cleaner and a clean, dry paint brush.

Wear on the bearings is detected by excess play or sound. If the bearings exhibit excess play or produce an unreasonably loud sound, the speed sensor should be returned to Siemens for repair.

Notes



www.siemens.com/processautomation

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