

SITRANS WS300

Overview



SITRANS WS300 is a low- to high-resolution shaft-driven speed sensor.

Benefits

- Light and rugged design, IP65 rated
- Compact and economical
- Easy, low-cost installation
- Accurate belt speed detection
- Optional resolutions for measurement over a range of belt speeds.
- Corrosion resistant

Application

SITRANS WS300 speed sensor operates in conjunction with a conveyor belt scale, providing a signal to an integrator which computes the rate of material being conveyed. At only 1.22 kg (2.68 lbs), it is one of the lightest and most durable units ever developed for monitoring conveyor belt speed. With its rugged cast aluminium housing, it is suitable for outdoor installation, and its low weight prolongs bearing life.

It is directly coupled to a rotating tail or bend pulley shaft to ensure accurate belt-travel readout, eliminating problems caused by belt slippage or material build-up. The WS300 converts shaft rotation into a pulse train of 32, 256, 1000, or 2000 pulses per revolution using a high precision rotary optical encoder. The digital signal is transmitted as speed input to any Siemens integrator for calculation of belt speed, flow rate and totalized weight.

This low- to high-resolution speed sensor provides a frequency signal proportional to the shaft speed, enabling a range of speeds to be read accurately. The quadrature type shaft encoder prevents erroneous speed signals due to vibration or shaft oscillation. The WS300 is easily mounted and is bi-directional for either clockwise or counter-clockwise belt travel.

The IS version uses an inductive proximity switch detecting rotating targets.

Technical specifications

Mode of operation	
Measuring principle	<p>standard: pulse from shaft rotation using high precision rotary optical encoder</p> <p>IS: pulse from inductive proximity switch</p>
Typical application	When a low- to high-resolution speed sensor is required
Input	Shaft rotation 0.5 to 2000 rpm, bi-directional, resolution dependent
Output	<ul style="list-style-type: none"> • Unidirectional open collector sinking output • standard: +10 to +30 V DC, 25 mA max. • IS: load current, 0 to 15 mA • 32, 256, 1000, or 2000 pulses per revolution (ppr) • 32 ppr: 2000 max. rpm, 1066 Hz • 256 ppr: 2000 max. rpm, 8530 Hz • 1000 ppr: 900 max. rpm, 15000 Hz • 2000 ppr: 450 max. rpm, 15000 Hz
Rated operating conditions	
Ambient temperature	<p>standard: -40 to +55 °C (-40 to +131 °F)</p> <p>IS: -25 to +60 °C (-13 to +140 °F)</p>
Degree of protection	NEMA 4X, Type 4X, IP65
Design	
Enclosure	<ul style="list-style-type: none"> • Rated NEMA 4X, Type 4X, IP65 • Painted aluminum • Stainless Steel (Optional)
Power supply	<ul style="list-style-type: none"> • standard: +10 to +30 V DC, 60 mA max. • IS: +5 to +16 V DC, 25 mA max. (from IS Switch Isolator)
Cable	
Recommended	<ul style="list-style-type: none"> • standard, 3-wire shielded, 0.82 mm² (18 AWG) • IS: 2-wire shielded 0.324 mm² (22 AWG) • Max. run 305 m (1000 ft)

Approvals

WS300 standard

General

Hazardous

- CE, C-TICK
- CSA/FM Class II, Div. 1, Groups E, F, G; Class III
- ATEX II 2D Ex tD A21 IP65 T70 °C
- IECEx Ex tD A21 IP65 T70 °C

WS300 IS (with suitable IS switch isolator or switch amplifier)¹⁾

General

Hazardous

Proximity Switch Approval Ratings (Pepperl+Fuchs #NJ0.8-5GM-N)

Optional Switch Isolator (required for WS300 IS)²⁾
(Pepperl+Fuchs #KFA5-SOT2-Ex2 or #KFA6-SOT2-Ex2)

- CE, C-TICK
- IS Rating based on Switch and Isolator Approvals below
- ATEX II 2G EEx ia IIC T6
- CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G (system approval)
- ATEX II (1) G [EEx ia] IIC
- CSA/FM: Class 1, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G

¹⁾ Approvals for WS300 IS are based on internally mounted NAMUR proximity switch (Pepperl+Fuchs #NJ0.8-5GM-N) and use of suitable IS Switch Isolator (Amplifier). Please see WS300 instruction manual for more information.

²⁾ Approval ratings for the Proximity Switch and IS Switch Isolator are the property of Pepperl+Fuchs. Copies of these Approval Certificates may be obtained at <http://www.siemens.com/continuous-weighing>.

SITRANS WS300

Selection and Ordering data

Order No.

SITRANS WS300 Speed Sensor

C) **7MH7177-**

A medium- to high-resolution shaft-driven speed sensor used with Milltronics belt scales.

Resolution (pulses per revolution)

32
256
1000
2000 ¹⁾

1
2
3
4

Enclosure

Polyester painted aluminum, NEMA 4X
304 (1.4301) stainless steel, NEMA 4X

A
B

Approvals

CSA/FM Class II, Div. 1, Groups E, F, G and Class III
ATEX II 2D, Ex tD A21 IP65 T70 °C, CE, C-TICK, IECEx, Ex tD A21 IP65 T70 °C
CSA/FM Class I, Div. 1, Groups A, B, C, D, and Class II, Div. 1, Groups E, F, G, ATEX II 1G, EEx ia IIC T6, CE, C-TICK ^{2) 3)}
CE, C-TICK

A
B
D

Connections

Standard, up to 2 integrators
Multiple, up to 10 integrators

1
2

Switch Isolator

Not required
115 V AC
230 V AC

0
1
2

Further designs

Please add **"-Z"** to Order No. and specify Order code(s).

Order Code

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75")]: Measuring-point number/identification (max. 16 characters), specify in plain text
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000

Y17
C11

Operating Instructions

English
German

C) **7ML1998-5ML01**
C) **7ML1998-5ML31**

Note: The Operating Instructions should be ordered as a separate item on the order.

Selection and Ordering data

Order No.

SITRANS WS300 Speed Sensor

C) **7MH7177-**

A medium- to high-resolution shaft-driven speed sensor used with Milltronics belt scales.

Spare parts

Circuit card 32 PPR, up to 2 integrators
Circuit card 32 PPR, up to 10 integrators
Circuit card 256 PPR, up to 2 integrators
Circuit card 256 PPR, up to 10 integrators
Circuit card 1000 PPR, up to 2 integrators
Circuit card 1000 PPR, up to 10 integrators
Circuit card 2000 PPR, up to 2 integrators
Circuit card 2000 PPR, up to 10 integrators
Circuit card 32 PPR, IS
Rubber coupling
Coupling hub for 32, 256 PPR versions
Coupling hub for 1000, 2000 PPR versions

7MH7723-1GK
7MH7723-1GL
7MH7723-1GM
7MH7723-1GN
7MH7723-1GP
7MH7723-1GQ
7MH7723-1JL
7MH7723-1JM
7MH7723-1HC
7MH7723-1CM
7MH7723-1CN
7MH7723-1GR

Enclosure cover
Enclosure bearing assembly
Enclosure cover, stainless steel
Enclosure bearing assembly, stainless steel
Threaded shaft coupling
Arrestor rod

7MH7723-1CJ
7MH7723-1CK
7MH7723-1GS
7MH7723-1GT
7MH7723-1GH
7MH7723-1FV

Cable for speed sensor connection to termination box (order per meter)
Cable for IS speed sensor connection to termination box (order per meter)

7MH7723-1JP
7MH7723-1JQ

Pepperl+Fuchs IS switch isolator, 115 V AC
Pepperl+Fuchs IS switch isolator, 230 V AC

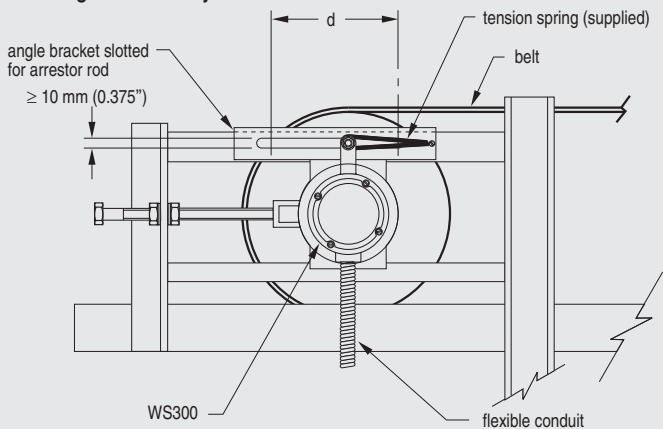
7MH7723-1EB
7MH7723-1EC

- 1) Available with Approval option D only
- 2) 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>.
- 3) Approval option B requires use of Switch Isolator to interface with the belt scale integrator, and is available with Resolution option 1, and Connections option 1 only.

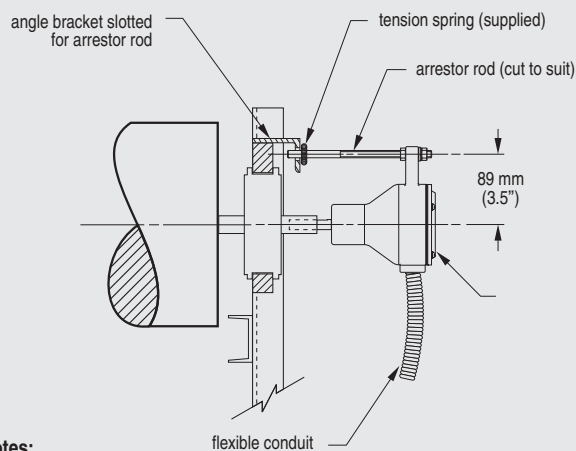
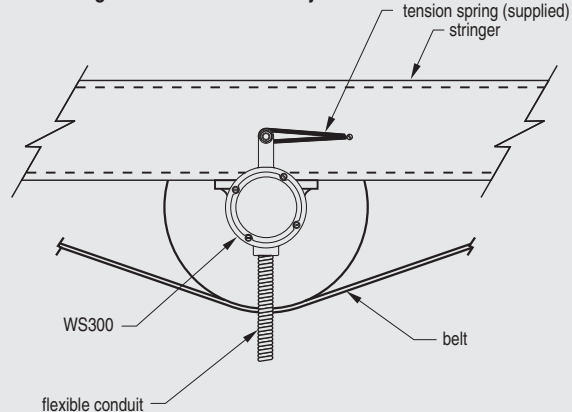
Design

Mounting

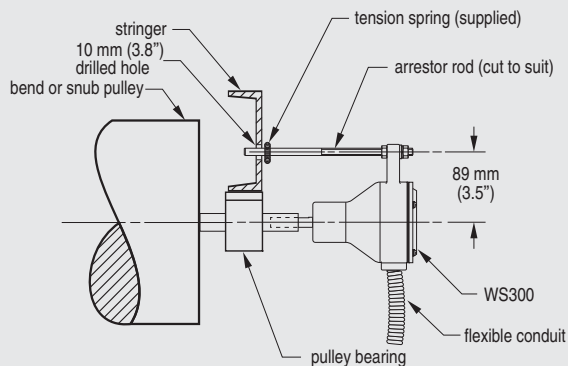
Mounting to a Tail Pulley



Mounting to a Bend or Snub Pulley



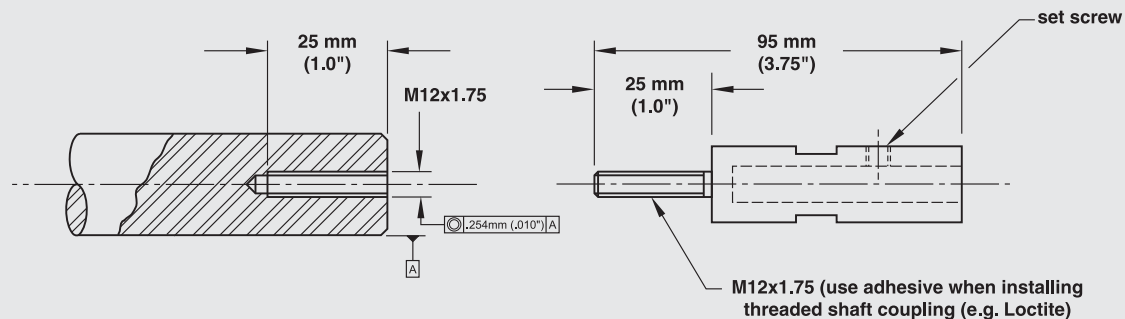
Notes:
 Distance 'd' is the take-up travel on the tail pulley.
 When adjusting the belt take-up, ensure that there is play on the arrestor rod.
 If the arrestor rod is pushed against the end of its travel slot, premature bearing wear may result.



Notes:
 When mounting to a bend or a snub pulley only, a 3/8" (10 mm) drilled hole is required for the arrestor rod.

WS300 mounting

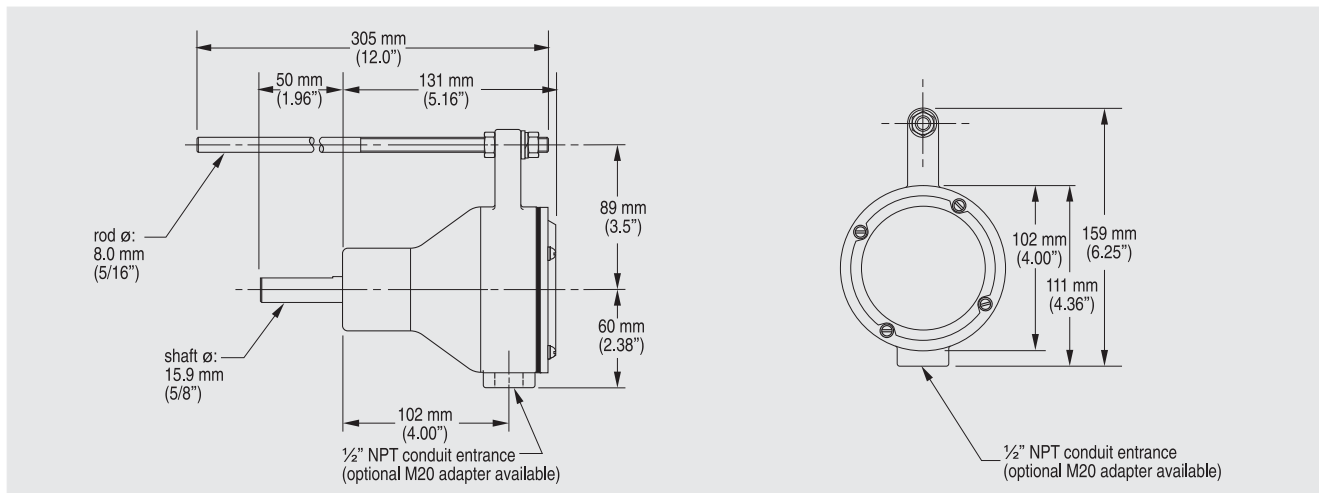
Mounting using optional threaded shaft coupling



WS300 mounting using threaded shaft coupling

SITRANS WS300

Dimensional drawings



WS300 dimensions

Schematics (standard)

Connections

Description	Terminal
+10 to +30 V DC	1
speed out-CW	2
speed out-CCW	3
common	4
ground	GND

- Determine the pulley shaft rotation on the end of the pulley shaft to which the WS300 is attached.
- If the pulley shaft is rotating clockwise, connect the appropriate wire to terminal 2. If the pulley shaft is rotating counter-clockwise, connect the appropriate wire to terminal 3.
- Do not connect terminals 2 and 3 at the same time.
- Connection between the WS300 standard unit and the integrator should be made with three-wire shielded, 0.82 mm² (18 AWG) cable.

- Ground shield of cable at integrator only.
- Connect shield to appropriate terminal at the integrator.

Terminal Connections to Siemens Milltronics Integrators

WS300	1 +V	2 CW	3 CCW	4 Cmn	GND
Milltronics BW100	8	7	7	6	N/C
Milltronics BW500	19	16	16	17	N/C

Terminal Connections to SIWAREX FTC Integrator

WS300	1 +V	2 CW	3 CCW	4 Cmn	GND
SIWAREX FTC	24 V (back-plane bus)	X1.9 (CI+)	X1.9 (CI+)	X1.10 (CI- and Com- mon)	N/C

Schematics (IS)

Connections

Description	Terminal
+5 to +16 V DC, 25 mA max. (from IS Switch Isolator)	1
speed out	2
ground	GND

- Only terminals 1 and 2 are required; rotation in a clockwise or counter-clockwise direction is not required.
- To connect 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 shield of cable at integrator only.
- Connect shield to appropriate terminal at the integrator.

Terminal Connections to Siemens Milltronics Integrators

WS300 IS	IS Switch Isolator Terminal	Integrator
1	1	
2	3	
	7	speed signal input
	8	- excitation

Terminal Connections to SIWAREX FTC Integrator

WS300 IS	IS Switch Isolator Terminal	FTC
1	1	
2	3	
	7	CI+
	8	IL+

Connect CI- to Common