

Overview

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

Benefits

- 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 lb), 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.

Art No.	7MH7177-2BD10-0
Item No.	06SM-D-WI001

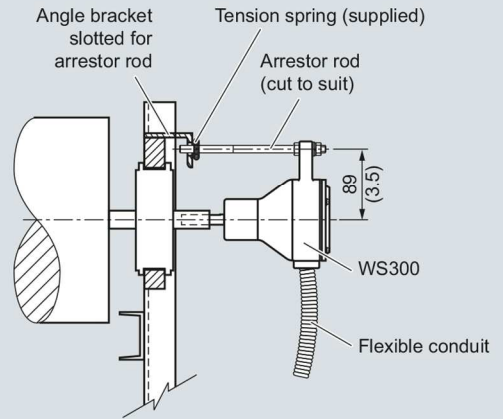
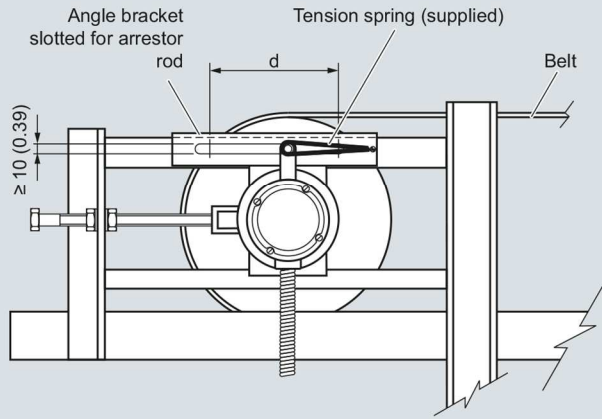
Belt Scales Speed Sensors



SITRANS WS300

Design

Mounting to a Tail Pulley

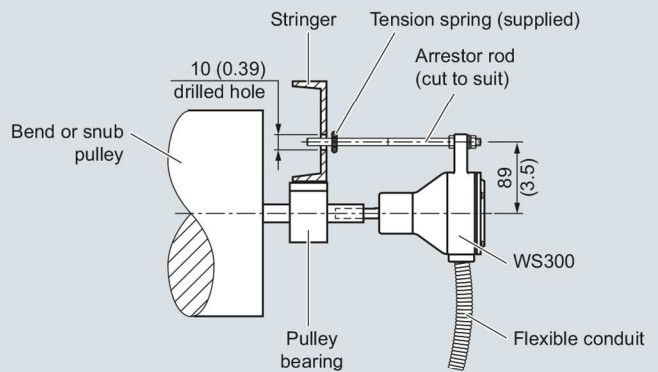
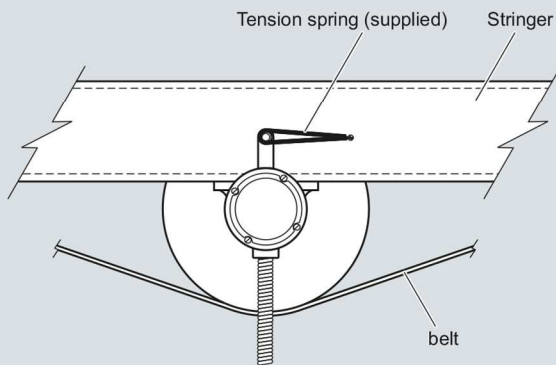


Notes:

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.

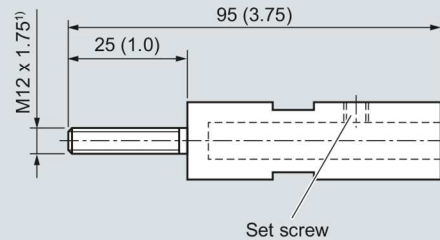
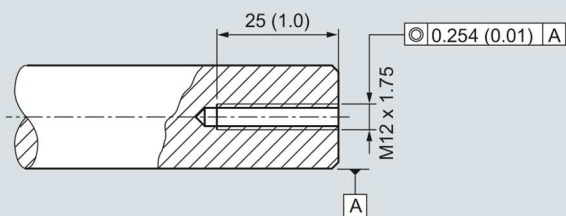
Mounting to a Bend or Snub Pulley



Notes:

When mounting to a bend or a snub pulley only, a 10 mm (0.39") drilled hole is required for the arrestor rod.

WS300 mounting, dimensions in mm (inch)



¹⁾ Use adhesive when installing threaded shaft coupling (e.g. Loctite).

WS300 mounting using threaded shaft coupling, dimensions in mm (inch)

Technical specifications

Milltronics WS300

Mode of operation

Measuring principle	Standard: pulse from shaft rotation using high precision rotary optical encoder IS: pulse from inductive proximity switch
Typical application	When a low- to high-resolution speed sensor is required

Input

Shaft rotation 0.5 ... 2000 rpm, bi-directional, resolution dependent

Output

- Unidirectional open collector sinking output
- Standard: 10 ... 30 V DC, 25 mA max.
- IS: load current, 0 ... 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	Standard: -40 ... +55 °C (-40 ... +131 °F) IS: -25 ... +60 °C (-13 ... +140 °F)
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)
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Power supply

- Standard: +10 ... +30 V DC, 60 mA max.
- IS: +5 ... +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)
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Approvals

WS300 Standard

General
Hazardous

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

Proximity switch approval ratings (Pepperl+Fuchs #NJ0.8-5GM-N)

Optional switch isolator (required for WS300 IS)³⁾

Pepperl+Fuchs #KFA5-SOT2-Ex2 or #KFA6-SOT2-Ex2

- 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
- ATEX II 1G EEx ia IIC T6
- ATEX II 1D Ex iaD 20 T 108 °C
- CSA/FM
- CE, C-TICK²⁾
- ATEX II 1G EEx ia IIC T6
- ATEX II 1D Ex iaD 20 T 108 °C
- CSA Class I, Div. 1, Groups A, B, C, and D, Class II, Div. 1, Groups E, F, and G, Class III (system approval)
- CE, FM²⁾
- ATEX II (1) G [EEx ia] IIC
- CSA/FM: Class 1, Div. 1, Groups A, B, C, and D, Class II, Div. 1, Groups E, F, and G, Class III
- CE²⁾

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 operating instructions for more information.

²⁾ Approvals for RBSS IS are based on internally mounted NAMUR slotted proximity switch (Pepperl+Fuchs #NJ0.8-5GM-N) and use of suitable IS switch isolator (amplifier). Please see RBSS operating instructions for more information.

³⁾ 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/processautomation>.

Belt Scales

Speed Sensors

SITRANS WS300

SIEMENS

Selection and Ordering data

SITRANS WS300 Speed Sensor
A medium- to high-resolution shaft-driven speed sensor used with Milltronics belt scales.

Order No.
C) **7MH7177-**
0

Resolution (pulses per revolution)

32	1
256	2
1000	3
2000 ¹⁾	4

Enclosure

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

Approvals

CSA/FM Class II, Div. 1, Groups E, F, G Class III ATEX II 2D, Ex tD A21 IP65 T70 °C, CE, C-TICK, IECEX, Ex tD A21 IP65 T70 °C	A
CSA/FM, ATEX II 1G, EEx ia IIC T6, ATEX II 1D Ex iaD 20 T108 °C, CE, C-TICK ^{2) 3)}	B
CE, C-TICK	D

Connections

Standard, up to 2 integrators	1
Multiple, up to 10 integrators	2

Switch Isolator

Not required	0
115 V AC ⁴⁾	1
230 V AC ⁴⁾	2

Further designs

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

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text
Manufacturer's Test Certificate:
According to EN 10204-2.2

Order Code

Y17

C11

SITRANS WS300 Speed Sensor

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

Order No.
C) **7MH7177-**
0

Operating Instructions

- English
- German

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

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

Spare parts

Circuit card 32 PPR, up to 2 integrators	C) 7MH7723-1GK
Circuit card 32 PPR, up to 10 integrators	C) 7MH7723-1GL
Circuit card 256 PPR, up to 2 integrators	C) 7MH7723-1GM
Circuit card 256 PPR, up to 10 integrators	C) 7MH7723-1GN
Circuit card 1000 PPR, up to 2 integrators	C) 7MH7723-1GP
Circuit card 1000 PPR, up to 10 integrators	C) 7MH7723-1GQ
Circuit card 2000 PPR, up to 2 integrators	C) 7MH7723-1JL
Circuit card 2000 PPR, up to 10 integrators	C) 7MH7723-1JM
Circuit card 32 PPR, IS	C) 7MH7723-1HC
Rubber coupling	C) 7MH7723-1CM
Coupling hub for 32, 256 PPR versions	C) 7MH7723-1CN
Coupling hub for 1000, 2000 PPR versions	7MH7723-1GR
Enclosure cover	7MH7723-1CJ
Enclosure bearing assembly	C) 7MH7723-1CK
Enclosure cover, stainless steel	C) 7MH7723-1GS
Enclosure bearing assembly, stainless steel	7MH7723-1GT
Threaded shaft coupling	7MH7723-1GH
Arrestor rod	7MH7723-1FV
Arrestor rod tension spring	7MH7723-1CP
Cable for speed sensor connection to termination box 3 cond, 18G (order per meter)	C) 7MH7723-1JP
Cable for IS speed sensor connection to termination box 3 cond, 22G (order per meter)	C) 7MH7723-1JQ
Pepperl+Fuchs IS switch isolator, 115 V AC	7MH7723-1EB
Pepperl+Fuchs IS switch isolator, 230 V AC	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>.

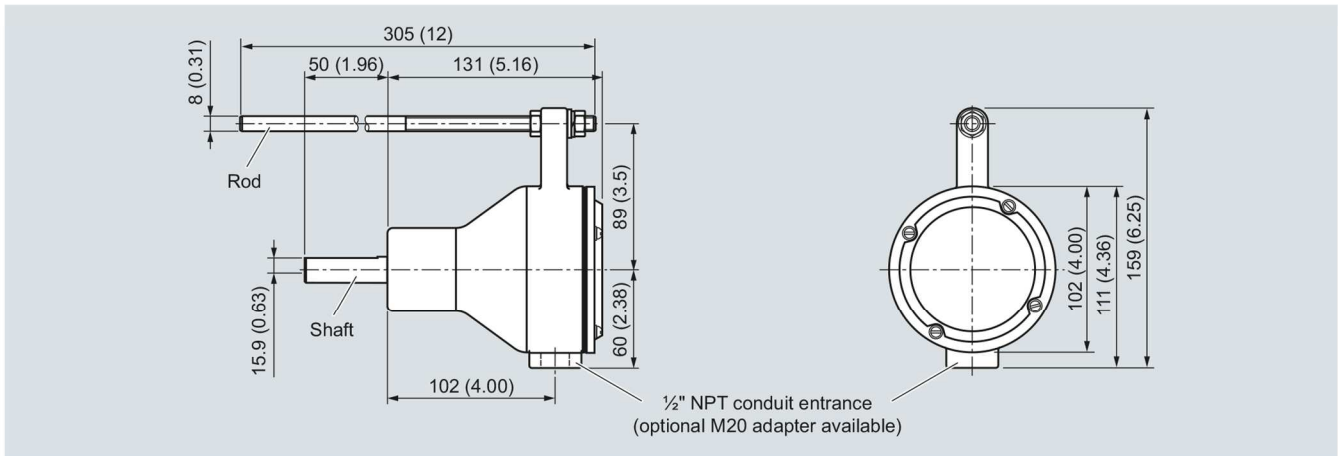
³⁾ Approval option B requires use of Switch Isolator to interface with the belt scale integrator, and is available with Resolution option 1, and Connections option 1 only.

⁴⁾ For use with IS approval option B

C) Subject to export regulations AL: N, ECCN: EAR99.



Dimensional drawings



WS300 dimensions in mm (inch)

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 Common)	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

W300 IS	IS Switch Isolator Terminal	Integrator
1	1	
2	3	
	7	speed signal input
	8	- excitation

Terminal Connections to SIWAREX FTC Integrator

W300 IS	IS Switch Isolator Terminal	Integrator
1	1	
2	3	
	7	CI+
	8	IL+

Connect CI- to Common