

## Belt Scales

### Speed sensors

#### SITRANS WS100

##### Overview



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.

##### Benefits

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

##### Application

SITRANS WS100 speed sensor operates in conjunction with a conveyor belt scale, providing a signal to an integrator (Milltronics BW500, or SIWAREX FTC module) which computes the rate of material being conveyed. It is lightweight at 1.22 kg (2.68 lb) and durable, for easy installation and prolonged bearing life.

The WS100 converts shaft rotation into a pulse train of 8 pulses per revolution. 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. In non-belt scale applications, the WS100 can be used to monitor rotational speed when directly connected to a PLC.

The WS100 IS (intrinsically safe) version contains an inductive proximity switch which transmits the pulses via a switch isolator for hazardous area locations.

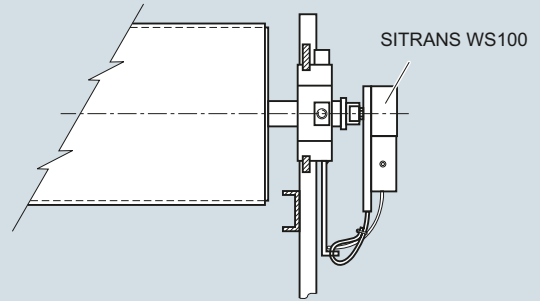
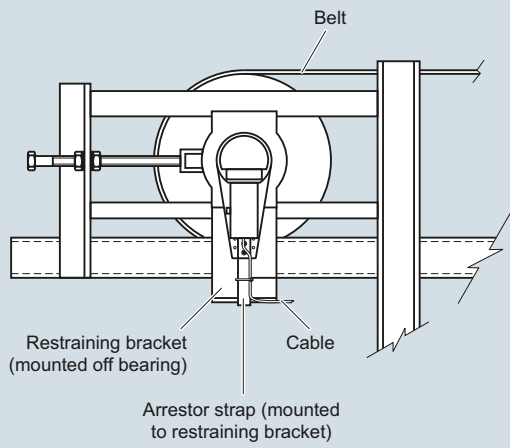
##### Design

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 flexible arresting strap stops it from rotating with the shaft, without causing bearing stress, and can be fitted to any rigid member close to the sensor.

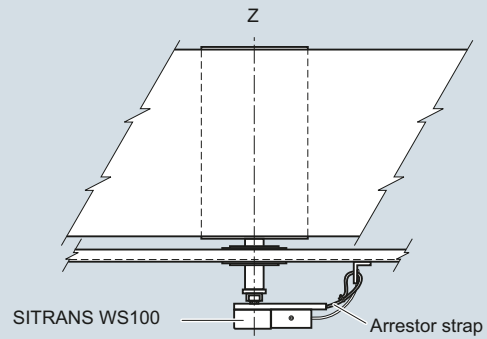
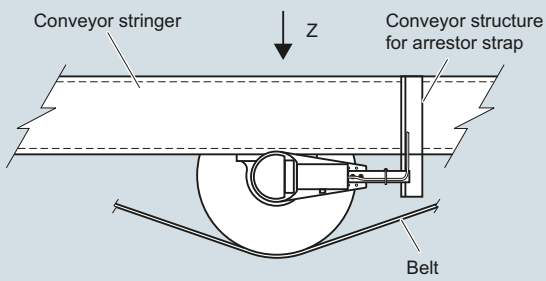
When mounting, ensure the unit and the pulley shaft are concentric to avoid stresses on the unit's bearings.

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.

Mounting to a Tail Pulley



Mounting to a Bend or Snub Pulley



WS100 installation

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#### Technical specifications

SITRANS WS100	
<b>Mode of operation</b>	
Measuring principle	Proximity sensor provides pulse to integrator
<b>Typical application</b>	
<b>Input</b>	Shaft rotation 15 ... 1 500 rpm, bi-directional  Shaft rotation 15 ... 300 rpm, bi-directional with magnetic connector
<b>Output</b>	<ul style="list-style-type: none"> <li>• 8 pulses per revolution</li> <li>• 0 ... 200 Hz, 0 ... 40 Hz with magnetic connection</li> <li>• WS100 standard: open collector, NPN, sinking output, 25 mA</li> <li>• WS100 IS: NAMUR NC, load current, 0 ... 15 mA</li> <li>• Integrator minimum usable frequency 2 Hz</li> </ul>
<b>Rated operating conditions</b>	
Standard	-40 ... +110 °C (-40 ... +230 °F)
Intrinsically Safe	-25 ... +100 °C (-14 ... +212 °F)
Degree of protection	IP67
<b>Enclosure</b>	
	Polypropylene base and target enclosure with 304 (1.4301) stainless steel access cover  304 (1.4301) stainless steel shaft, bearings and hardware
<b>Power</b>	
Standard	4.5 ... 28 V DC, 16 mA
Intrinsically Safe	5 ... 25 V DC from IS switch isolator
<b>Cable</b>	
Standard	<ul style="list-style-type: none"> <li>• 3 m (10 ft), 3 conductor 22 AWG (0.324 mm<sup>2</sup>), PVC shielded cable</li> <li>• 300 m (1 000 ft) maximum cable run</li> </ul>
Intrinsically Safe	<ul style="list-style-type: none"> <li>• 2 m (6.5 ft), 2 conductor 26 AWG (0.129 mm<sup>2</sup>), PVC covered cable</li> <li>• 300 m (1 000 ft) maximum cable run to IS switch isolator</li> <li>• 300 m (1 000 ft) maximum cable run from IS switch isolator and integrator</li> </ul>

SITRANS WS100	
<b>Approvals</b>	
WS100	CE, GOST-R, RCM <sup>1)</sup>
WS100 IS (with suitable IS switch isolator or switch amplifier) <sup>2)</sup>	<ul style="list-style-type: none"> <li>• ATEX II 1G EEx ia IIC T6</li> <li>• ATEX II 1D Ex iaD 20 T 108 °C</li> <li>• CSA/UL: Class I, Div. 1, Groups A, B, C, and D; Class II, Div. 1, Groups E, F, and G; Class III, Div. 1</li> <li>• CE, RCM<sup>2)</sup></li> </ul>
Proximity Switch Approval Ratings (Pepperl+Fuchs #NCN4- 12GM35-N0)	<ul style="list-style-type: none"> <li>• ATEX II 1G EEx ia IIC T6</li> <li>• ATEX II 1D Ex iaD 20 T 108 °C</li> <li>• CSA, UL</li> <li>• CE<sup>2)</sup></li> </ul>
Optional Switch isolator (required for WS100 IS) <sup>3)</sup>	<ul style="list-style-type: none"> <li>• Pepperl+Fuchs #KFA5-SOT2-Ex2 or #KFA6-SOT2-Ex2</li> <li>• ATEX II (1) G [EEx ia] IIC</li> <li>• CSA/UL: Class 1, Div. 1, Groups A, B, C, and D; Class II, Div. 1, Groups E, F, and G, Class III</li> <li>• CE<sup>2)</sup></li> </ul>

<sup>1)</sup> EMC performance available upon request.

<sup>2)</sup> 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.

<sup>3)</sup> 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>.

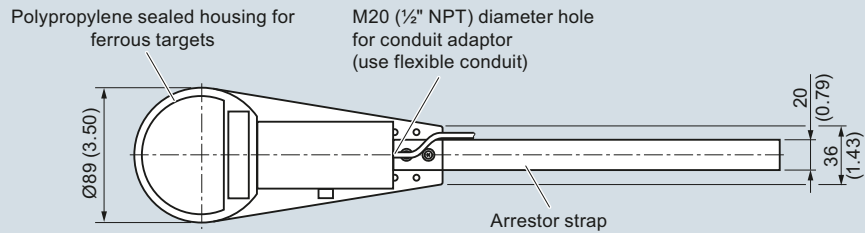
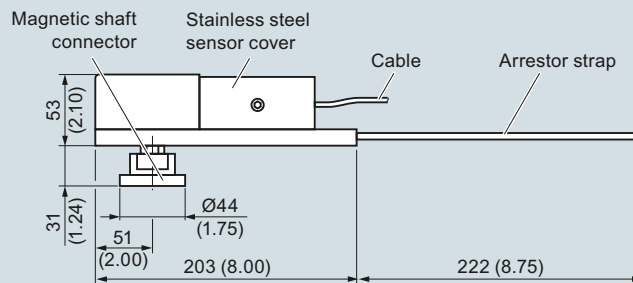
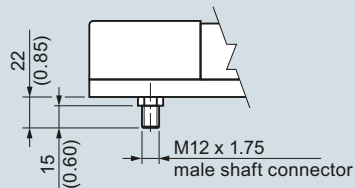
Selection and ordering data	Article No.
<b>SITRANS WS100 speed sensor</b> A compact, medium-resolution, pulley shaft-driven belt speed sensor with magnetic mounting; ideal for aggregate and mineral processing industries. <a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>	<b>7MH7176-</b>
<b>Model</b>	
8 PPR	1
<b>Fabrication</b>	
Polycarbonate construction with 304 stainless steel sensor cover	A
<b>Mounting</b>	
M12 x 1.75 threaded shaft	A
Magnetic connector	B
<b>Approvals</b>	
Standard CE, RCM	0
CE, RCM, ATEX II 1G, EEx ia IIC T6, ATEX II 1D Ex iaD 20 T 108 °C, and CSA/UL Class I, Div. 1, Groups A, B, C and D; Class II, Div. 1, Groups E, F and G; Class III, Div. 1 <sup>1)</sup>	1
<b>Switch isolator</b>	
Not required	0
115 V AC (required with IS option 1)	1
230 V AC (required with IS option 1)	2
<b>Further designs</b>	Order Code
Please add <b>"-Z"</b> to article no. and specify order code(s).	
Stainless steel tag [69 x 38 mm (2.7 x 1.5 inch)], Measuring-point number / identification (max 27 characters), specify in plain text.	<b>Y15</b>
Manufacturer's test certificate: According to EN 10204-2.2	<b>C11</b>
<b>Operating instructions</b>	Article No.
SITRANS WS100, English	<b>7ML1998-5LU02</b>
SITRANS WS100, German Note: The operating instructions should be ordered as a separate item on the order.	<b>7ML1998-5LU31</b>
This device is shipped with the Siemens Milltronics manual DVD containing the complete operating instructions library.	
<b>Spare parts</b>	
Magnetic proximity switch	<b>7MH7723-1GA</b>
Switch, inductive, NCN4-12GM35-N0 for Approvals option 1	<b>7MH7726-1AS</b>
WS100 magnetic connector	<b>7MH7723-1GF</b>
P & F switch isolator, 115 V AC, required for approvals option 1	<b>7MH7723-1EB</b>
P & F switch isolator, 230 V AC, required for approvals option 1	<b>7MH7723-1EC</b>

<sup>1)</sup> Switch isolator required.

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**Dimensional drawings****Dimensions****Magnetic shaft connector option****Male shaft connector option**

WS100 dimensions in mm (inch)