

Process Protection

Acoustic sensors for material flow monitoring

SITRANS AS100 Acoustic sensor

Overview



SITRANS AS100 is an acoustic sensor used for solids flow detection.

Benefits

- Non-invasive
- Screw in, bolt on, weld, or bond in place
- Analog output
- High and low sensitivity range of operation

Application

SITRANS AS100 detects changes in high frequency sound waves from equipment and materials in motion. It detects and reacts instantly to changes in solids flow to warn of blockages, product absence, or equipment failure such as burst filter bags. This allows an operator to take early preventative action and avoid costly damage.

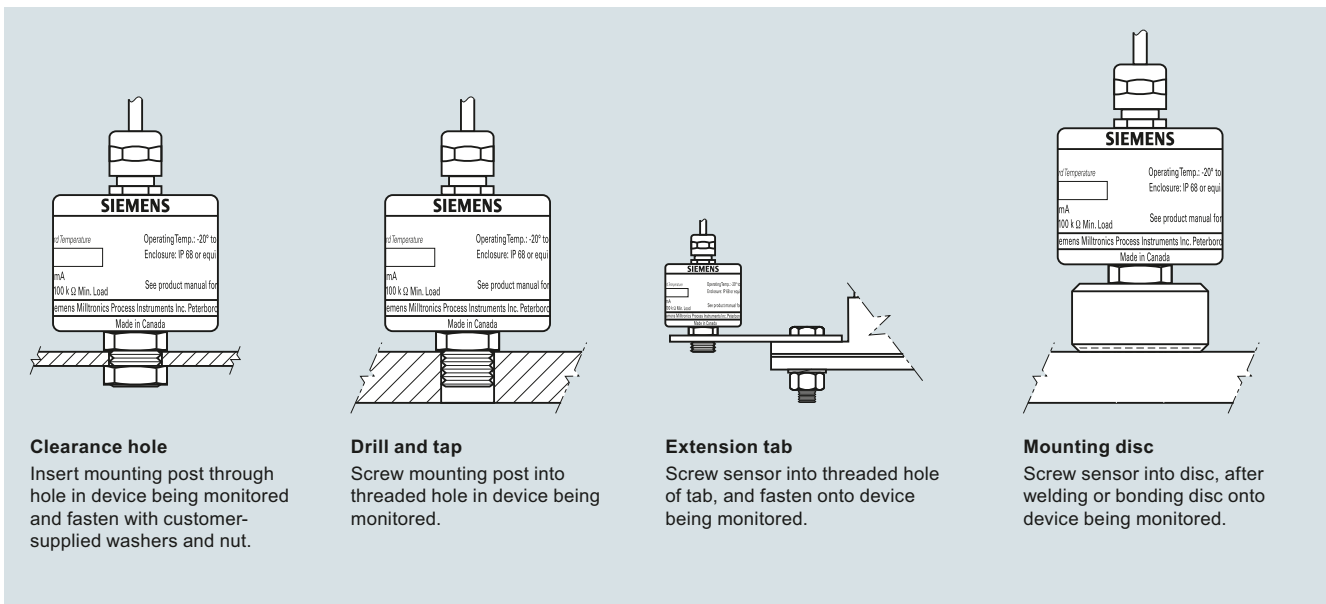
Common applications include pellets, powders and most bulk solids in pipes, chutes, vibratory feeders, pneumatic conveyors or aerated gravity flow systems.

Operating with a SITRANS CU02 control unit, the system detects conditions of high flow, low flow or no flow. It can be added to a control loop via a 4 to 20 mA output. Two relays are fully programmable and independent of each other and can be used to operate an alarm or control device.

With no moving parts and a type 304 or 303 stainless steel enclosure sealed against dust and moisture, this non-invasive unit requires little or no maintenance. With a dual operating range, the sensor offers an exceptionally wide range of application capabilities.

- Key applications: pipes, chutes, vibratory feeders, aerated gravity flow systems, burst filter bag detection

Design



SITRANS AS100 mounting

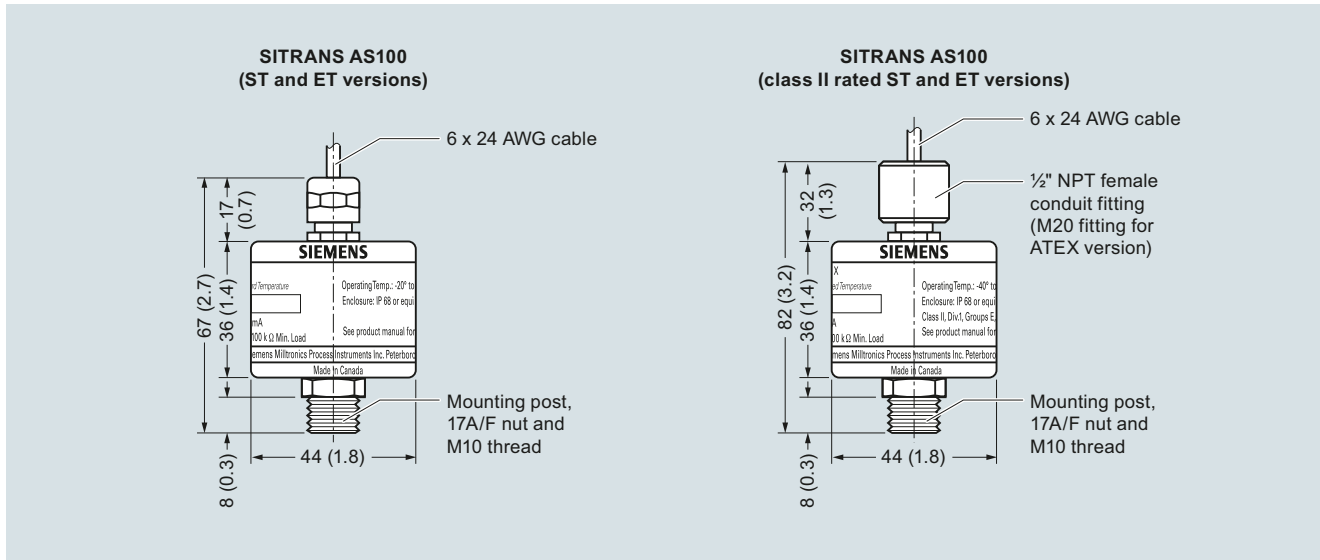
Technical specifications		Selection and Ordering data	Article No.
Mode of Operation		SITRANS AS100 Acoustic Sensor	7MH7560-
Operating principle	Acoustic sensing of high frequency emissions caused by impact or friction	An acoustic sensor used for solids flow detection.	0
Typical application	<ul style="list-style-type: none"> • Detects burst filter bags in dust collection systems • Detects material being conveyed in pneumatic conveyor lines • Route confirmation in chute work 	↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Model		Sensor	1
Standard	Standard operating temperature range	Standard temperature range [-20 ... +80 °C (-4 ... +176 °F)] ¹⁾	3
Extended	Extended operating temperature range	Extended temperature range [-40 ... +125 °C (-40 ... +257 °F)] ²⁾	4
Operation		Extended temperature range [-30 ... +120 °C (-22 ... +248 °F)] ³⁾	
Relative sensitivity	0.5 %/°C of reading, average over the operating range	Cable Length	A
Outputs	Analog, 0.08 ... 10 V DC nominal, 100 kΩ minimum load impedance	Sensor Mounting	A B C
Rated operating conditions		None	
Amb. temperature for enclosure		Mounting disk	
• Standard	-20 ... +80 °C (-4 ... +176 °F)	Mounting tab	
• Extended	<ul style="list-style-type: none"> • -40 ... +125 °C (-40 ... +257 °F) (CE only) • -30 ... +120 °C (-22 ... +248 °F) option 	Approvals	1
Design		CE, RCM, EAC, KCC	3
Weight	0.4 kg (1 lb)	CSA/FM Class II, Div. 1, Group E, F, and G (includes ½" NPT female fitting)	4
Enclosure	Enclosure: 304 (1.4301) stainless steel [303 stainless steel (1.4305) on Class II version, aluminum 231 on 2GD version]	CSA Class II, Div. 1, Group E, F, and G (includes ½" NPT female fitting), EAC Ex	5
Degree of protection	IP68 (waterproof)	CE, RCM, FM/CSA Class II, Div. 1, Group E, F and G, ATEX II 3D (includes M20 female fitting), EAC Ex	6
Cable		ATEX II 2GD, c/w cable gland, EAC Ex ⁴⁾	
• Standard	4 m (13 ft) cable, PVC jacketed, 3 twisted pairs, 24 AWG (0.25 mm ²), shielded		
• Extended	4 m (13 ft) cable, thermoplastic elastomer jacketed, 6 conductor, 24 AWG (0.25 mm ²) conductor, shielded		
Power supply			
20 ... 30 V DC, 18 mA (typical)			
Certificates and approvals			
CE, RCM, EAC, KCC CSA/FM Class II, Div. 1, Group E, F, and G (optional), ATEX II 2GD (optional), ATEX II 3D (optional), EAC Ex			
		Selection and Ordering data	Order code
		Further designs	
		Please add "-Z" to Article No. and specify Order code(s).	
		Manufacturer's test certificate: According to EN 10204-2.2	C11
		Acrylic coated, stainless steel tag [12 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters), specify in plain text	Y17
		Operating Instructions	
		All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
		Spare Parts	Article No.
		Mounting tab	7MH7723-1AA
		Mounting disk	7MH7723-1AB
		½" NPT adapter kit for standard temperature range sensor, not Class II approved	7MH7723-1BW
		M20 adapter kit for standard temperature range sensor, not Class II or ATEX approved	7MH7723-1BV
		½" NPT adapter kit for extended temperature range sensor, not Class II approved Note: Adapter kits are not CSA Class II approved	7MH7723-1BX

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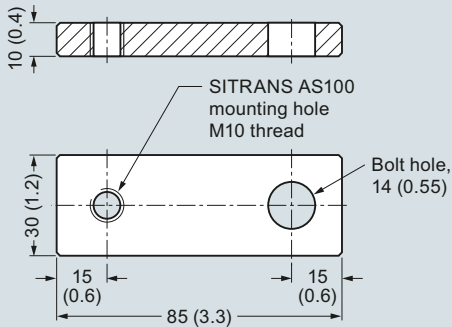
Dimensional drawings



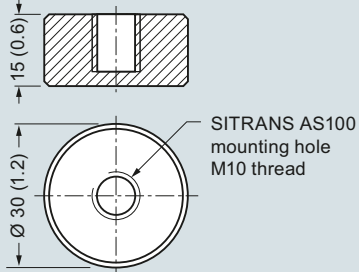
SITRANS AS100, dimensions in mm (inch)

Accessories

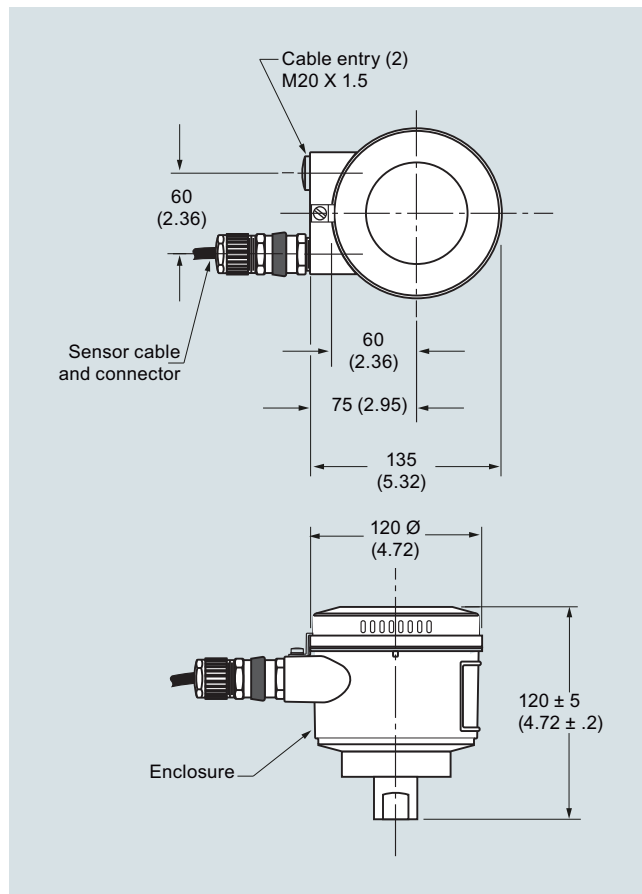
Extension tab - bolt on
(304 stainless steel)



Mounting disc - bonded or welded
(304 stainless steel)



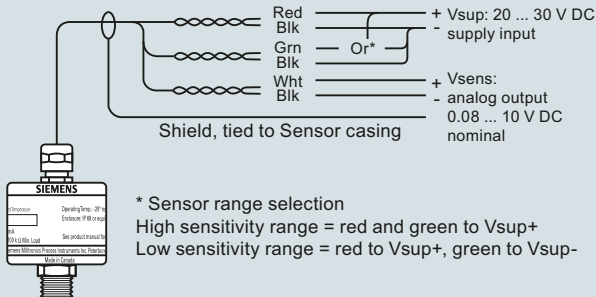
SITRANS AS100 accessories, dimensions in mm (inch)



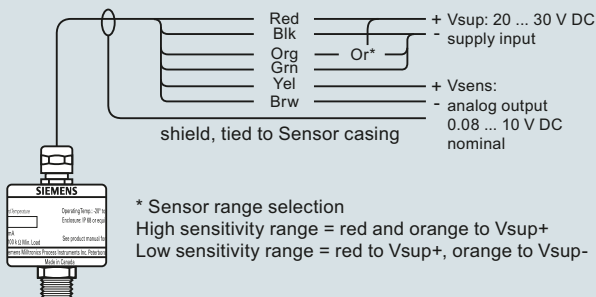
SITRANS AS100 (2D, 2G, XP version), dimensions in mm (inch)

Circuit diagrams

Standard temperature range



Extended temperature range



Interconnection

The longer the cable, the more susceptible it is to noise and earth loops. It is therefore recommended to use cable with heavy gauge conductors and good RF/electrical shielding (copper braid rather than drain and foil). A proper junction box close to the sensor is an ideal location not only to extend the cable but also to configure the wiring for high or low sensitivity range operation.

The following table provides a guideline for suitable wire gauges where distances are considerable.

Max. distance between sensor and supply
 (24 V or Control Unit).

AWG	Wire size		Distance	
	mm	mm ²	meters	feet
24	7 x 0.20	0.25	500	1 600
22	7 x 0.25	0.35	800	2 600
20	10 x 0.25	0.5	1 200	3 900

SITRANS AS100 connections