

SIMATIC PXS sonar proximity switches from 2.5 cm to 10 m - they hear everything!

Sonar proximity switches SIMATIC PXS ensure non-contact sensing with millimeter precision in the range from 2.5 cm to 10 m.

Principle: Sonar proximity switches transmit ultrasonic pulses; when reflected by objects or surfaces, the echoes can be received by the proximity switch and the distances calculated and converted to an output signal.

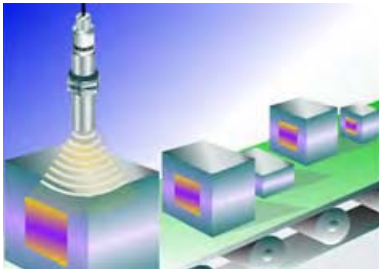
Sonar proximity switches feature large sensing distances up to 10 meters, high accuracy in the millimeter range, good reproducibility and require little maintenance.

Sensing is not affected by dust and contamination common in harsh industrial environments. Liquids can be sensed with the same precision as solids, granulates or powders.

Sonar proximity switches are suitable for a wide range of applications, such as level measurement, position detection, limit detection, thickness measurement and stack height measurement.



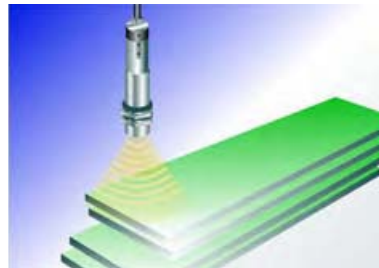
Distance monitoring



Size measurement



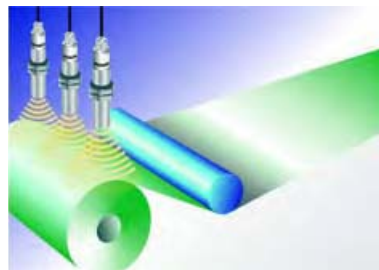
Loop monitoring



Measurement of stack height



Measurement of diameter and speed indicator



Contour measurement



Quality control

Overview of SIMATIC PXS sonar proximity switches

SIMATIC PXS100

SIMATIC PXS200



Type	K0 compact range		Sonar thru-beam sensor	3SG16 compact range	K21 compact range				M30 K1 compact range				K08 compact range			M18 S compact range											
	6 ... 30 cm	20 ... 100 cm			5 ... 150 cm	20 ... 100 cm	25 ... 40 cm	0 ... 40 cm	0 ... 80 cm	2 ... 25 cm	0 ... 25 cm	6 ... 30 cm	20 ... 130 cm	40 ... 300 cm	60 ... 600 cm	5 ... 40 cm	0 ... 80 cm	0 ... 40 cm	0 ... 20 cm	3 ... 20 cm	0 ... 40 cm	5 ... 40 cm	0 ... 70 cm	10 ... 70 cm	5 ... 70 cm	2,5 ... 40 cm	
Sensing range																											
Operating mode																											
• Diffuse sensor	■	■		■	■			■		■	■	■	■	■					■		■		■	■	■	■	■
• Reflex sensor				■			■		■		■	■	■			■			■			■					
• Thru-beam sensor			■				■								■												
Design																											
• Fixed transformer	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
• Angular sensor area																											
• Swivel-mounted sensor																											
• Separate sensor head	■	■																									
Output																											
• 1 switching output	■	■	■		■	■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■	■
• 2 switching outputs				■											■	■	■									■	■
• Analog output 0 to 20 mA																											
• Analog output 4 to 20 mA																											
• Analog output 0 to 10 V	■	■																									
• Frequency output						■		■												■		■		■			
Direct communication with PLC																											
Temperature compensation	■	■																									
Adjustment																											
• 1 potentiometer	■	■																									
• 2 potentiometers														■	■	■	■										
• Teach-in						■	■	■	■	■					■	■	■	■	■	■	■	■	■	■	■	■	■
• Plug-in jumper				■																							
• SONPROG																											
Connection																											
• M8 connector			■		■	■	■	■	■																		
• M12 connector	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
• Cable			■		■	■	■	■	■																		
• Terminals				■																							
Degree of protection																											
• IP 65	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
• IP 67			■		■	■	■	■	■																		
Product selection code	3RG6342	3RG63 43	3RG62 43	3SG1667	6GR6241	6GR6241	6GR6241	6GR6242	6GR6242	3RG6012 3RG6022	3RG6013 3RG6023	3RG6015 3RG6025	3RG6014 3RG6024	3RG6451	3RG6451	3RG6451	3RG6432 3RG6422	3RG6432 3RG6422	3RG6431 3RG6421	3RG6431 3RG6421	3RG6433 3RG6423	3RG6433 3RG6423	3RG6433 3RG6423	3RG6433 3RG6423	3RG6431 3RG6421	3RG6431 3RG6421	

*) = Depending on implementation

SIMATIC PXS sonar proximity switches

Functionality and highlights

Function

The sonar proximity switches only operate through the medium of air and can detect any objects that reflect ultrasound.

They emit ultrasonic pulses cyclically. When an object reflects these pulses, the resulting echo is received and converted into an electrical signal. The incoming echo is detected in accordance with its intensity which, in turn, is dependent on the distance between the object and the sonar proximity switch.

Sonar proximity switches operate according to the echo propagation principle, i.e. the time difference between the emitted pulse and the echo pulse is evaluated.

The construction of the sensor causes the ultrasonic beam to be emitted in the shape of a cone.

Temperature compensation

The proximity switches of compact ranges M30 K2, M30 K3 and M18 are fitted with temperature sensors and a compensation circuit that equalizes changes in operating distances caused by temperature changes.

Synchronization

In compact ranges M30 K2, M30 K3 and M18, several devices can be synchronized with each other by simply interconnecting the synchronization outputs of the devices. Up to 10 devices can be synchronized (or 6 devices in the case of compact range 0).

This allows the sensors to be mounted extremely close to each other in many cases without causing mutual interference.

Programming with SONPROG

- Programming the devices of the compact ranges M18, M30 K2 and M30 K3
- Possible settings include:
 - Operating range beginning and end
 - Analog range beginning and end
 - Switching hysteresis
 - Mean value generation
 - Multiplex mode
 - NO/NC contact switchover

Sensors for Ex Zone 2/22

The PXS800 sonar proximity switches are approved according to EU Guideline 94/9/EG (ATEX) Appendix VIII.

The approval is for:

- Gas EX II 3G EEx nA II T6 X and
- Dust EX II 3D IP65 T 80 °C X

The functionality of the sonar proximity switches with ATEX approval is identical to that of the standard proximity switches.

Highlights

- Millimeter-accurate measurement
- Color and material-independent, even transparent objects
- Individual parameter setting
- Small, compact housing
- Very high degree of repeat accuracy
- UL/CSA approvals
- Sensors available for Ex Zone 2/22
- Insensitive to temperature, noise, light and water



Product lines

The sonar proximity switches are organized in different product families in accordance with their technical version and design:

SIMATIC Sensors	Form
PXS100	Compact range 0, compact form 3SG16, sonar barrier
PXS200	Compact range K21, compact range M30 K1, compact range M18S, compact form K08
PXS300	Compact range M30 K2, compact range M18, compact form K65
PXS400	M30 K3 compact range
PXS800	M18 ATEX compact range, M30 K3 ATEX compact range
PXS900	Double-layer sheet monitoring