



Description

When it comes to machine safety, Rockwell Automation knows that protection of personnel and equipment is your main concern. At the same time, flexibility and productivity are points that must also be considered as you design your safety system. Optimize all of these with the new Allen-Bradley SensaGuard family of noncontact switches.

Featuring the latest generation of RFID technology for coding and Inductive technology for sensing, SensaGuard's large sensing range and tolerance to misalignment is a cost-effective solution that is ideally suited for a wide range of industrial safety applications.

The SensaGuard product line is a Category 4 /SIL 3 rated switch per EN954-1, TÜV functional safety approved to IEC 61508.

Features

- Switches can be connect to a standard safety relay, for example, the MSR126, MSR127, MSR200/300 Family, SmartGuard and Safety I/O Blocks
- Multiple actuator sizes for large sensing distance
- IP 69K environmental rating
- Short-circuit and over-voltage protection
- Led located on the switch for door status and troubleshooting

Benefits

- No dedicated controller required
- Cat 4/SIL 3 rating maintained even with multiple units connected in series
- Switches can be connected in series with other devices (light curtain, E-stops, key interlock switches)
- Extended diagnostics for easy troubleshooting
- Large sensing distances
- Tolerance to misalignment
- Multiple sensing directions
- Stainless steel version suitable for use in harsh environments
- Use standard proximity brackets

Specifications

Category	Cat. 4/SIL3		
Certifications	TÜV, CE, cULus (UL 508)		
Standards	IEC 60947-5-3, IEC 61508, EN 954		
PFHd	1.119...10 ⁻⁹		
Operating Characteristics			
Sensing Distance (Target)	18 mm Plastic	30 mm Plastic	18 mm SS
Operating Distance, Make—mm (in)	Assured: 15 (0.59)	Assured: 25 (0.98)	Assured: 10 (0.39)
Case Material	Valox® DR 48		304 Stainless Steel
Actuator Material	Valox® DR 48		304 Stainless Steel
Typical Misalignment	See misalignment curve.		
Repeat Accuracy	10% of Sensing Range		
Output Current, Max.	200 mA (all outputs)		
Switching Current @ Voltage, Max.	24V DC +10%/-15%		
Operating Voltage/Supply Current	24V DC, +10%/-15% Class 2 SELV power supply		
Frequency of Operating Cycle	1 Hz		
Response Time (Off)	54 ms		
Outputs (Guard Door Closed, Actuator in Place)			
Safety Outputs	2 x PNP, 0.2 A, max.; Status: ON (+24V DC)		
Auxiliary Outputs	1 x PNP, 0.2 A max.; Status: OFF (0V DC)		
Environmental			
Operating Temperature—C (F)	-10...+55° (+14...+131°)		
Relative Humidity	5...95%		
Enclosure Type Rating	NEMA 3, 4X, 12, 13, IP 69K		
Shock	IEC68-2-27 30 g, 11 ms		
Vibration	IEC 68-2-6 10...55 Hz		
Radio Frequency	IEC 61000-4-3, IEC 61000-4-6		
Protection			
Protection Type	Short Circuit, Current Limitation, Overload, False Pulse, Transient Noise, Reverse Polarity, Overvoltage (inc. load dump), Thermal Shutdown with restart, Loss of GND and Vdd		
Loss of GND and Vdd protection	Incorporated		
Electrical Life	10 x 10 ⁶		

Safety Switches

Noncontact Switches

SensaGuard™ 18 mm Barrel

Product Selection

Description	Operating Voltage/ Input Current	Safety Outputs	Auxiliary Outputs	Actuator Type	Assured Sensing Distance	Connection	Cat. No.
18 mm Plastic Barrel	24V DC, +10%/-15% / 50 mA max.	2 Solid State outputs	1 Solid State output	18 mm	15 mm (0.59 in)	6 in Pigtail, 8-Pin Micro (M12)	440N-Z21S16H
						3 m Cable	440N-Z21S16A
						10 m Cable	440N-Z21S16B
				30 mm	25 mm (0.98 in)	6 in Pigtail, 8-Pin Micro (M12)	440N-Z21S26H
						3 m Cable	440N-Z21S26A
						10 m Cable	440N-Z21S26B
18 mm Stainless Steel Barrel	24V DC, +10%/-15% / 50 mA max.	2 Solid State outputs	1 Solid State output	18 mm	10 mm (0.39 in)	6 in Pigtail, 8-Pin Micro (M12)	440N-Z21S17H
						3 m Cable	440N-Z21S17A
						10 m Cable	440N-Z21S17B

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Pg. No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable Screw	Monitored Manual	24V AC/DC	—	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable Screw	Automatic/Manual	24V AC/DC	—	440R-N23132
Modular Safety Relays							
MSR211P Base 2 N.C. only	2 N.O.	1 N.C. and 2 PNP Solid State	Removable	Automatic/Manual Monitored Manual	24V DC	—	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	—	440R-H23178
MSR310P Base	—	3 PNP Solid State	Removable	Automatic/Manual Monitored Manual	24V DC	—	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC	—	440R-W23218








Note: For additional Safety Relays connectivity, see the Logic section of this catalog.
For additional Safety I/O connectivity, see the Safety I/O section of this catalog.
For Application and wiring diagrams, see the Applications section of this catalog.

Connection Systems

Description	Cat. No.
Cordset	889D-F8AB-*

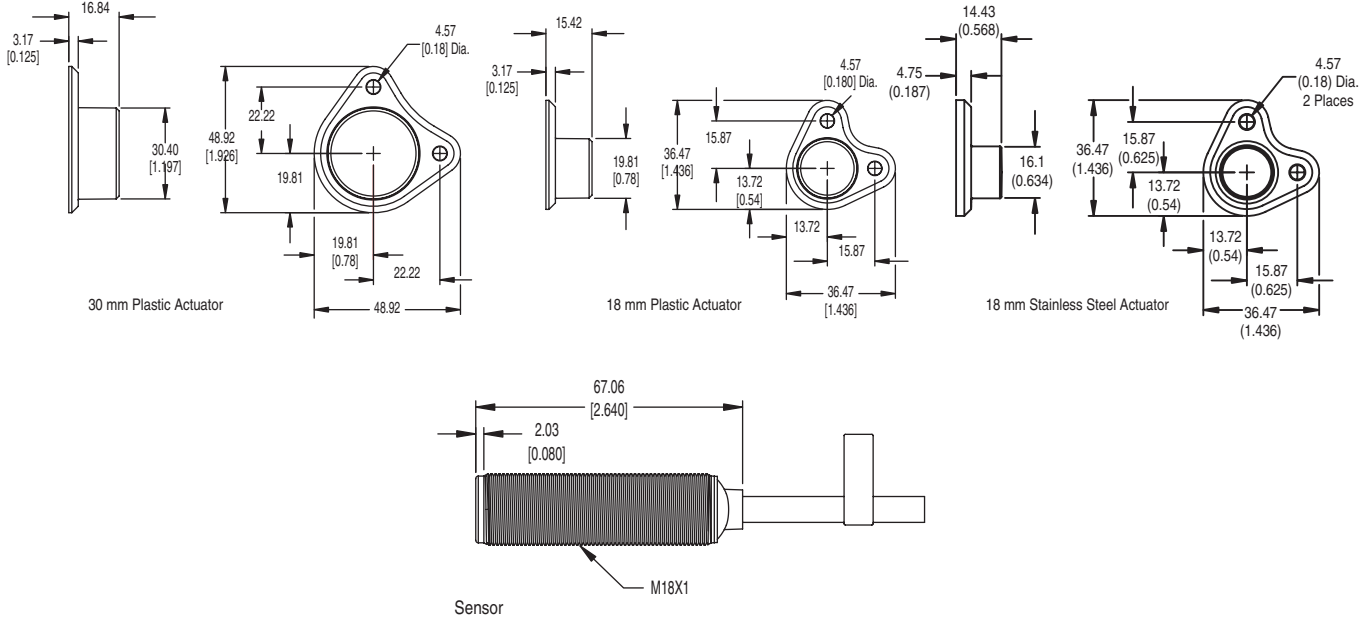
* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.

Accessories

	Description	Dimensions	Cat. No.
	18 mm Plastic Actuator	—	440N-Z18PT
	30 mm Plastic Actuator	—	440N-Z30PT
	18 mm Stainless Steel Actuator	—	440N-Z18SST
	Mounting Bracket for Tubular Sensors—Right Angle Style	—	871A-BRS18
	Mounting Bracket for Tubular Sensors—Clamp Style	—	871A-BP18
	Snap Clamp Mounting Bracket	—	871A-SCBP18
	Swivel/Tilt bracket allows ±10° vertical and 360° rotation adjustment.	—	60-2649

Approximate Dimensions—mm (inches)

Dimensions are not intended to be used for installation purposes.



Safety Switches

Noncontact Switches

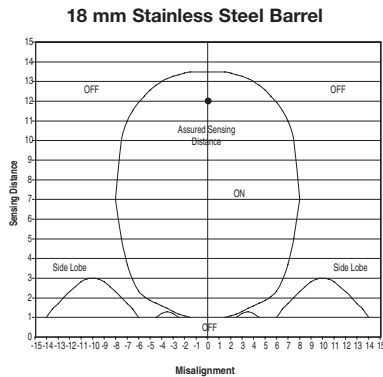
SensaGuard™ 18 mm Barrel

Typical Wiring Diagrams

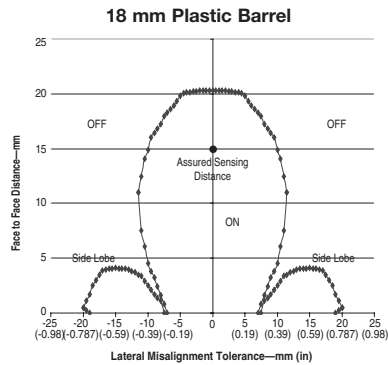
Description		Plastic	Stainless Steel
8-Pin Micro (M12)			
8-Pin Cordset 889D-F8AB-*	Grey	OSSD 1	OSSD 1
	Red	OSSD 1+	OSSD 1+
	Pink	OSSD 2	OSSD 2
	Yellow	OSSD 2+	OSSD 2+
	White	Aux A	
	Brown	24V DC	24V DC
	Blue	Gnd	Gnd
	Green	NA	
		Safety A	Safety A
		Safety B	Safety B
		Unit Power	Unit Power

* Replace symbol with 2 (2 m), 5 (5 m) or 10 (10 m) for standard cable lengths.

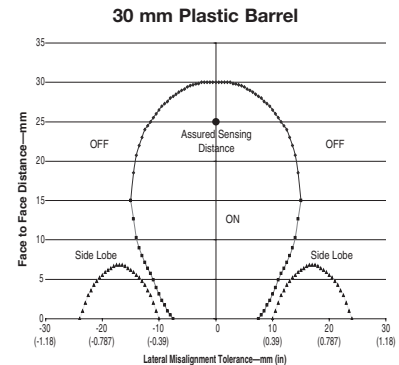
Misalignment Curve



Note: There must be a minimum spacing of 4 mm (0.157 in) if actuator and sensor face approaches laterally. This will prevent false triggering due to the side lobe areas.

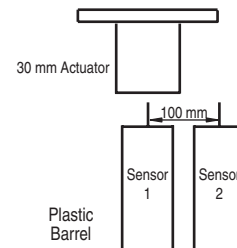
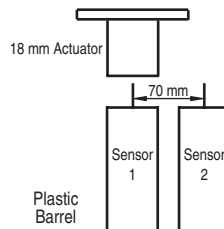
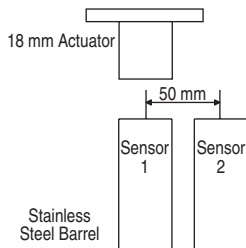


Note: There must be a minimum spacing of 4 mm (0.157 in) if actuator and sensor face approaches laterally. This will prevent false triggering due to the side lobe areas.



Note: There must be a minimum spacing of 7 mm (0.275 in) if actuator and sensor face approaches laterally. This will prevent false triggering due to the side lobe areas.

Minimum Distance Between Sensors



Diagnostic

Unit Indicators (per IEC 60073)

Device Output LED	State	Status	Troubleshooting
	Off	Not Powered	NA
	Red	Not Safe, OSSD Not Active	NA
	Green	Safe, OSSD Active	NA
	Green Flash	Power Up Test or OSSD Inputs Not Valid	Check 24V DC on OSSD Inputs (yellow and red wire)
	Red Flash	1 Hz Flash Recoverable Fault 4 Hz Flash Nonrecoverable Fault	Recoverable Fault: Check OSSD Outputs Are Not Shorted to GND, 24V DC or Each Other. Cycle Power.