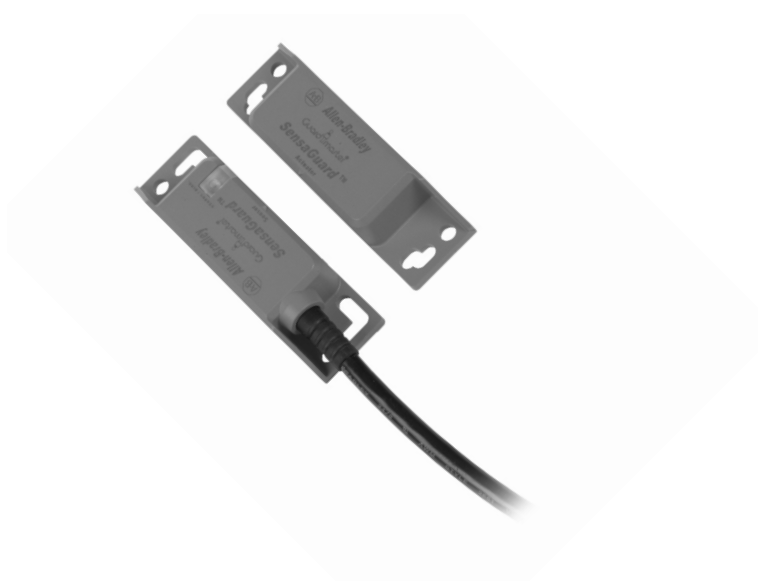


SensaGuard™ Rectangular Flat Pack Installation Instructions



Certifications



Tested To Comply
with FCC Standards



IMPORTANT:
SAVE THESE INSTRUCTIONS FOR FUTURE USE

440N-Z21SS2H-AS

Note: Refer to Technical Specifications for Certification information and ratings.

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ENGLISH:	This instruction sheet is available in multiple languages at www.rockwellautomation.com/literature . Select publication language and type "SensaGuard" in the search field.
GERMAN:	Dieses Instruktionsblatt kann in mehreren Sprachen unter www.rockwellautomation.com/literature gelesen werden. Bitte Ihre Sprache anwählen und "SensaGuard" im Suchfeld eingetippen.
FRENCH:	Ces instructions sont disponibles dans différentes langues à l'adresse suivante www.rockwellautomation.com/literature . Sélectionner la langue puis taper "SensaGuard" dans le champ de recherche.
ITALIAN:	La presente scheda d'istruzione è disponibile in varie lingue sul sito www.rockwellautomation.com/literature . Selezionare la lingua desiderata e digitare "SensaGuard" nel campo di ricerca.
SPANISH:	Puede encontrar esta hoja de instrucciones en varios idiomas en www.rockwellautomation.com/literature . Seleccione el idioma de publicación y escriba "SensaGuard" en el campo de búsqueda.
PORTUGUESE:	Esta folha de instruções está disponível em várias línguas em www.rockwellautomation.com/literature . Seleccione a língua de publicação e entre com "SensaGuard" no espaço de busca.
POLISH:	Ta kartka z instrukcjami jest dostępna w wielu językach na stronie: www.rockwellautomation.com/literature . Wybierz język publikacji i wpisz w polu poszukiwania "SensaGuard".

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Installation Instructions

Installation must be in accordance with the following steps and stated specifications and should be carried out by suitable competent personnel. The unit is not to be used as a mechanical stop. Guard stops and guides must be fitted. Adherence to the recommended maintenance instructions forms part of the warranty.

This device is intended to be part of the safety related control system of a machine. Before installation, a risk assessment should be performed to determine whether the specifications of this device are suitable for all foreseeable operational and environmental characteristics of the machine to which it is to be fitted. Refer to Technical Specifications for Certification information and ratings.

ATTENTION:



The presence of spare actuators compromise the integrity of the safety systems. Personal injury or death, property damage or economic loss can result. Appropriate management controls, working procedures and alternative protective measures should be introduced to control their use and availability.

Technical Specification

Safety Ratings

Standards	IEC60947-5-3, IEC61508, ISO 13849-1
Safety Classification	Cat. 4 Per ISO 13849-1, SIL CL3
Functional Safety Data	PFH _D : 1.12×10^{-9} Dual channel interlock may be suitable for use in application up to PLe (according to ISO 13849-1) and for use up to SIL3 systems (according to IEC 62061) depending application characteristics.
Certifications	CE marked for all applicable directives, cULus (UL 508), and TÜV.

Operating Characteristics

Sensing Distance, Assured Make (mm)	15
Sensing Distance, Assured OFF (mm)	27
Typical misalignment	See misalignment curve
Maximum output current (all outputs, mA)	200
Input Current	50 mA (no load supply current)
Operational Current, Min.	≥ 1 mA DC
Off-state Current	< 0.5 mA DC
Maximum # of switches, connected in series	Unlimited. See unit response time section
Operating Voltage	24V DC $\pm 10\%$ / -15%
Frequency of operating cycle	1 Hz
Response Time (Off)	54 ms first switch, 18 ms additional for each switch
Case Material	Valox® DR 48
Actuator Material	Valox® DR 48

Outputs (Guard door closed, Actuator in place)

Outputs	Description	Status
Safety	2 x PNP, 0.2 A max.	ON (+24vdc)
Auxiliary	1 x PNP, 0.2 A max.	OFF (0vdc)

Environmental

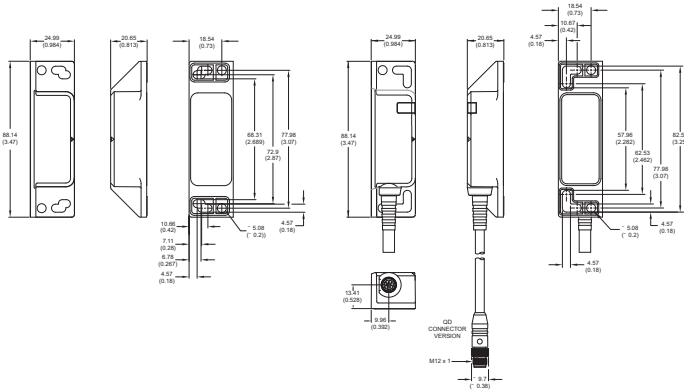
Operating Temperature	-10...+55°C (+14...+131°F)
Operating Humidity	5% -95% relative
Washdown rating	NEMA 3, 4X, 12, 13, IP 69K
Shock & Vibration	IEC68-2-27 30 g, 11 ms/IEC 68-2-6 10...55Hz
Radio Frequency	IEC 61000-4-3 IEC 61000-4-6

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Protection

Short-Circuit Protection	Incorporated
Current limitation	Incorporated
Overload Protection	Incorporated
False Pulse Protection	Incorporated
Transient Noise Protection	Incorporated
Reverse Polarity Protection	Incorporated
Overvoltage protection	Incorporated
Thermal shutdown/restart	Incorporated

Dimensions - mm (inches)



Mode of Operation

Status indicators:

- "Status/Diag" LED illuminates Green - Door/Guard closed, safety outputs active.
- "Status/Diag" LED illuminates Red - Door/Guard open, safety outputs off.
- "Status/Diag" LED flashes Red or Green: - Unit failure. See Diagnostic section below.
- "Status/Diag" LED flashes Amber when Sensor is approaching max. sensing distance.

Mounting Information

Use non-removable screws, bolts, or nuts to mount the switch and actuator. Do not over torque the mounting hardware.

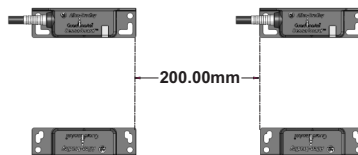
Position the switch and actuator so they are aligned with each other.

Mount the switch and actuator to removable guard, door or gate. Keep the switch and actuator within the sensing range shown in the sensing/misalignment curve.

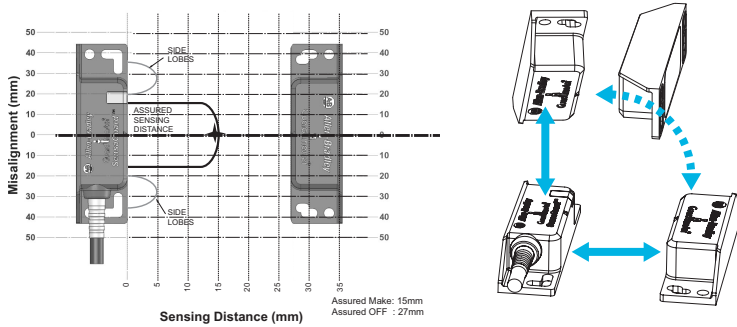
Nut Torque Specification

Switch/Actuator: 2.26 N•M (20 in•lbs)

Minimum Distance Between Sensors



Sensing/Misalignment Curve



Note: There must be a minimum spacing of 9mm (0.35") if the actuator and sensor face approaches laterally. This will prevent false triggering due to the side lobes areas.

Typical Wiring Diagram

Description		Plastic
8-Pin Micro (M12)		
8-Pin Cordset 889D-F8AB.* or cable version	Grey	Safety A
	Red	Safety A+
	Pink	Safety B
	Yellow	Safety B+
	White	Aux A
	Brown	24V DC+
	Blue	Gnd / 0V
Green	N/A	

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

Diagnostic

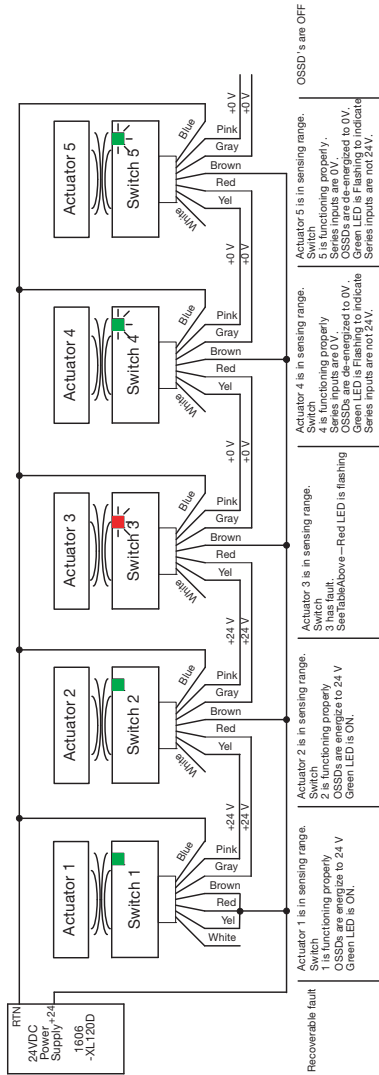
Unit Indicators (per IEC 60073)

Status/Diag 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 or OSSD inputs (yellow and red wire)
	Red Flash	1 Hz Flash Recoverable Fault 4 Hz Flash Non-recoverable Fault	Recoverable fault —check OSSD outputs are not shorted to GND, 24V DC or each other. Cycle power.
	Amber Flash	1 Hz Flash margin indicator safe, OSSD active	Sensor is reaching max. sensing distance; re-align sensor with actuator

Note: Refer to Technical Specifications for Certification information and ratings.

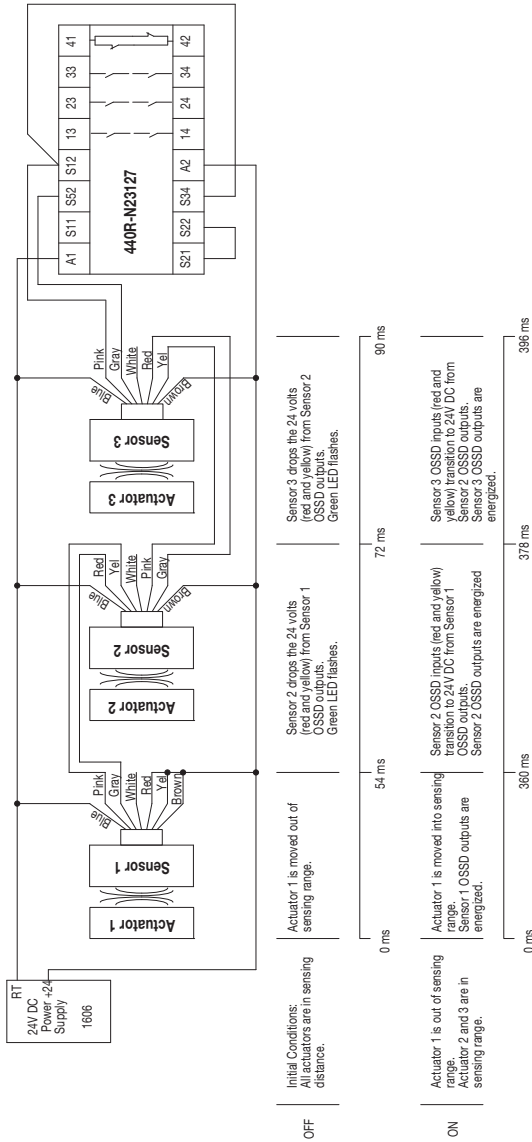
Troubleshooting

Series Circuit



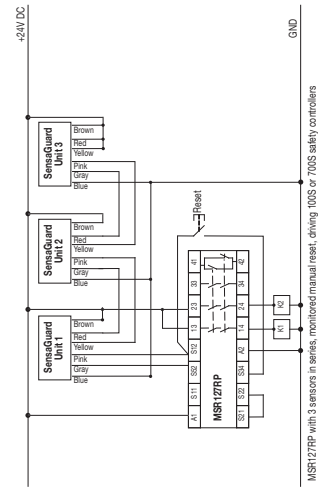
Note: Refer to Technical Specifications for Certification information and ratings.

Unit Response Time (does not include safety relay response time)

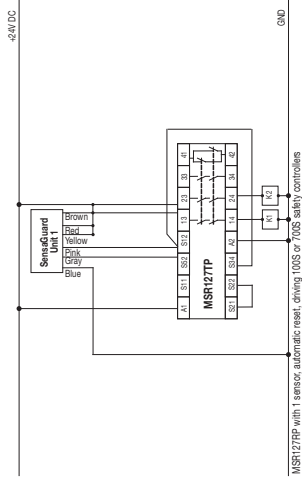


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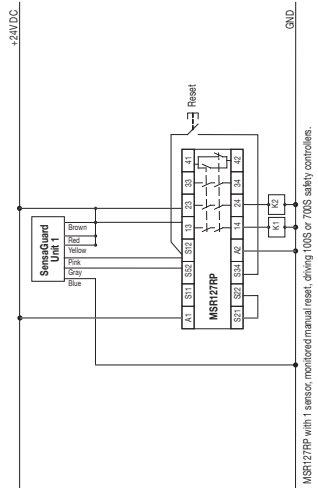
Application Wiring Examples



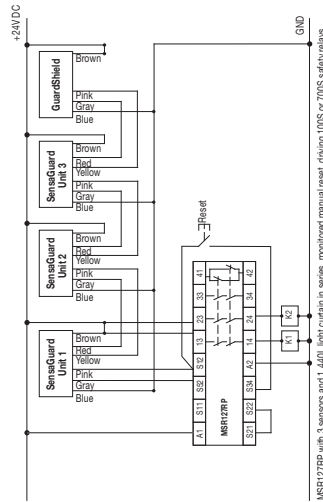
MSRI27RP with 3 sensors in series, monitored manual reset, driving 100S or 700S safety controllers



MSRI27TP with 1 sensor, automatic reset, driving 100S or 700S safety controllers



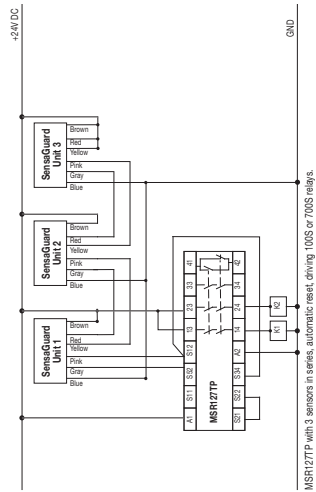
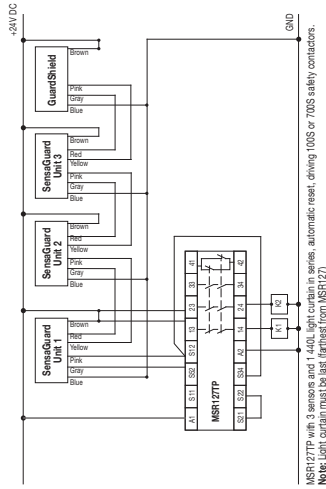
MSRI27RP with 1 sensor, monitored manual reset, driving 100S or 700S safety controllers.



MSRI27RP with 3 sensors and 1 440L light curtain in series, monitored manual reset, driving 100S or 700S safety relays.
Note: Light curtain must be last (farthest from MSRI27).

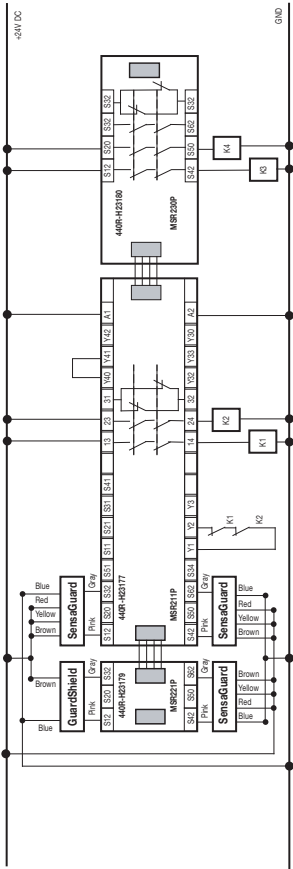
Note: Refer to Technical Specifications for Certification information and ratings.

Application Wiring Examples

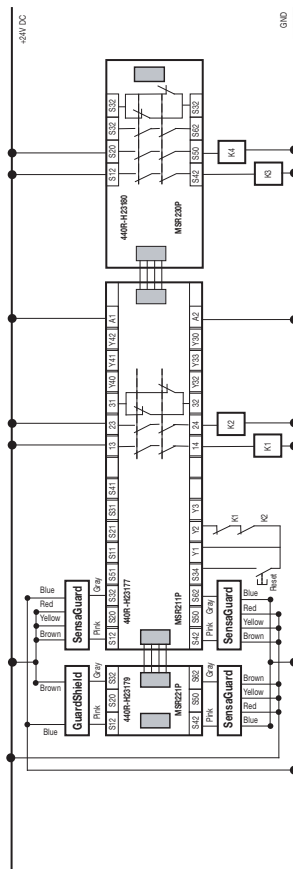


Note: Refer to Technical Specifications for Certification information and ratings.

Application Wiring Examples



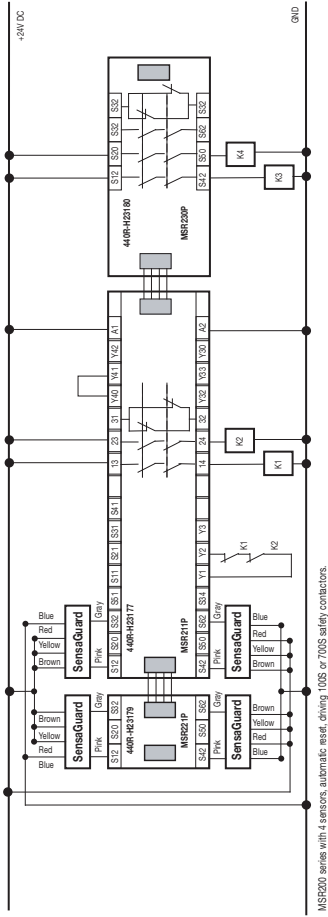
MSR200 series with 3 sensors and 1 4A, light curtain, automatic reset, driving 100S or 700S safety contactors.
 Note: Light curtain can be attached to any input.



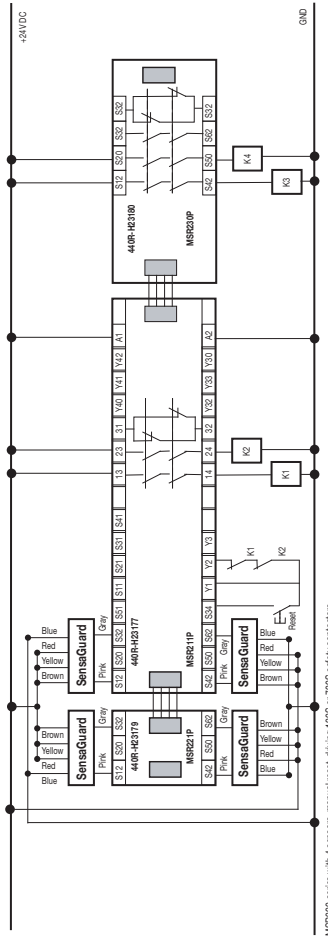
MSR200 series with 3 sensors and 1 4A, light curtain, manual reset, driving 100S or 700S safety contactors.
 Note: Light curtain can be attached to any input.

Note: Refer to Technical Specifications for Certification information and ratings.

Application Wiring Examples



MSR200 series with 4 sensors, automatic reset, driving 100S or 700S safety contactors.



MSR200 series with 4 sensors, manual reset, driving 100S or 700S safety contactors.

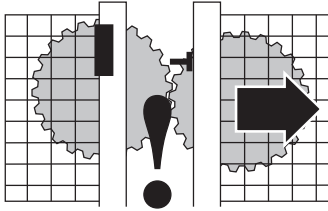
Note: Refer to Technical Specifications for Certification information and ratings.

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List of recommended relays

MSR126, MSR127, MSR123, MSR124, MSR131, MSR138, MSR211, MSR121, MSR200 Family (Except MSR210), MSR300 Family, SmartGuard, 1791 DS DeviceNet™ Safety I/O.

Relay must have light curtain inputs.



Check the machine is isolated and stopped whenever the interlocked guard door is open.

IMPORTANT: After installation and commissioning, the actuator, switch and switch lid fixing screws should be coated with tamper evident varnish or similar compound.

Maintenance

Monthly

Check the correct operation of the switching circuit. Also check for signs of abuse or tampering. Inspect the switch casing for damage

Repair

If there is any malfunction or damage, no attempts at repair should be made. The unit should be replaced before machine operation is allowed.

Declaration of Conformity



This is to declare that the products shown on this document conforms with the Essential Health and Safety Requirements (EHSR's) of the European Machinery Directive. These products also conform to EN 60947-5-3, EN 60204-1 and have Third Party Approval.

For a comprehensive certificate please visit: www.ab.com/safety.



Allen-Bradley

Guardmaster®