

## Magnetically Coded

### Description

With the increasing speed and complexity of applications a simple magnetic switch may be insufficient to meet the increased risks, therefore the design incorporates several magnetically sensitive elements which must be triggered in a particular sequence to operate correctly.

The sensor with its molded-in brackets and diminutive size, is extremely versatile and simple to install. For high-risk applications the control unit is used with a single sensor to give a high-integrity system. For other applications, multiple sensors (including mechanical switches) can be connected.

### Features

- Non-contact actuation
- Magnetic coded sensing
- High tolerance to misalignment
- Designed for use with specified controllers

### Specifications



	MC1	MC2
<b>Safety Ratings</b>		
Standards	EN954-1, ISO13849-1, IEC/EN60204-1, NFPA79, EN1088, ISO14119, IEC60947-5-1, IEC/EN60947-5-3, ANSI B11.19, AS4024.1	
Safety Classification	Cat. 1 Device per EN 954-1; Dual channel interlocks suitable for Cat. 3 or 4 systems	
Functional Safety Data * Note: For up-to-date information, visit <a href="http://www.ab.com/Safety/">http://www.ab.com/Safety/</a>	B10d: > 2 x 10 <sup>6</sup> operations at min. PFH <sub>D</sub> : > 3 x 10 <sup>-7</sup> MTTFd: > 385 years Dual channel interlock may be suitable for performance levels PL <sub>e</sub> or PL <sub>d</sub> (according to ISO 13849-1:2006) and for use in SIL2 or SIL3 systems (according to IEC 62061) depending on application characteristics	
Certifications	CE Marked for all applicable directives, cULus, and TÜV	
<b>Outputs (Guard Door Closed, Actuator in Place)</b>		
Safety Outputs	2 N.C. REEDS	2 N.C. Solid-State Relays
Auxiliary Outputs	–	1 x PNP, 0.2 A max.; Status: OFF (0V DC)
<b>Operating Characteristics</b>		
Operating Distance, Make [mm (in.)]	8 (0.3)	10 (0.39)
Operating Distance, Break [mm (in.)]	15 (0.59)	25 (0.98)
Misalignment Tolerance, Min	See Misalignment Wire	
Repeat Accuracy	10% of Sensing Range	
Output Current, Max.	200 mA	200 mA
Switching Current @ Voltage, Max.	24V DC @ 200 mA	24V DC @ 200 mA +10%/-15%
Operating Voltage/Power Supply	–	24V DC, +10%/-15%/50 mA max./Class 2 SELV
Frequency of Operating Cycle	1 Hz	1 Hz
<b>Environmental</b>		
Enclosure Type Rating	IP67 (NEMA 6P)	IP 69K
Operating Temperature [C (F)]	-10...+55° (+14...+131°)	
Relative Humidity	5...95%	
Shock	IEC 68-2, 27, 30 g, 11 ms	
Vibration	IEC 68-2-6, 10...55 Hz	
Radio Frequency	IEC 61000-4-3, IEC 61000-4-6	
<b>Physical Characteristics</b>		
Housing Material	Molded ABS	Ultrador
Actuator Material	Molded ABS	Ultrador
Color	Red	

\* Usable for ISO 13849-1:2006 and IEC 62061. Data other than B10d is based on:

- Usage rate of 1op/10 mins., 24 hrs/day, 360 days/year, representing

51840 operations per year

- Mission time/Proof test interval of 38 years

## Product Selection

Type	Operating Voltage/Input Current	Safety Outputs	Auxiliary Outputs	Status Indicator	Connection	Cat. No.
MC1	–	2 N.C. REEDS	–	No	4-Pin Micro (M12)	440N-Z2NRS1C
					3 m Cable	440N-Z2NRS1A
					10 m Cable	440N-Z2NRS1B
MC2	24V DC, +10%/15%/50 mA max.	2 N.C. Solid-State Relays	1 x PNP, 0.2 A max.; Status: OFF (0V DC)	Yes	8-Pin Micro (M12)	440N-Z21W1PH
					3 m Cable	440N-Z21W1PA
					10 m Cable	440N-Z21W1PB

## Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
<b>Single-Function Safety Relays for 2 N.C. Contact Switch</b>							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	MSR127RP/TP	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	MSR127RP/TP	440R-N23132
<b>Modular Safety Relays</b>							
MSR210P Base 2 N.C. only	2 N.O.	1 N.C. and 2 PNP Solid State	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	MSR210P	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	MSR220P	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	MSR310P	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	MSR320P	440R-W23218

**Note:** For additional Safety Relays connectivity, see Safety Relays.  
For additional Safety I/O and Safety PLC connectivity, see Programmable Safety Solutions.  
For application and wiring diagrams, see Safety Applications and Wiring Diagrams.

## Connection Systems

Description	Connection to Distribution Box	8-Pin Micro (M12)
	4-Pin Micro (M12)	2 N.C. & 1 N.O.
Cordset	889D-F4AC-*	889D-F8AB-*
Patchcord	889D-F4ACDM-‡	889D-F8ABDM-‡
Distribution Box	898D-4S LT-DM4	—
Shorting Plug	898D-41LU-DM	—
T-Port	898D-43LY-D4	—

\* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.  
‡ Replace symbol with 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard cable lengths.  
§ Replace symbol with 4 or 8 for number of ports.

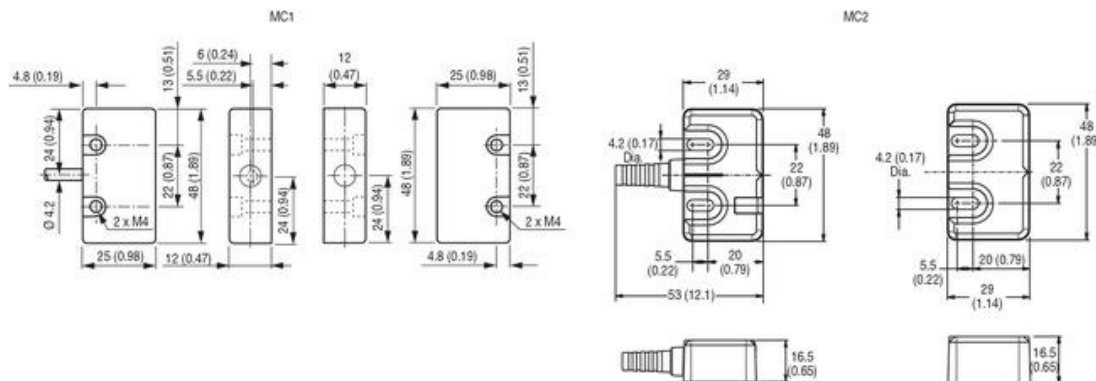
**Note:** For additional information, see the Safety Connection Systems.

## Accessories

Description	Cat. No.
MC1 Spare actuator	440N-A17233
MC2 Spare actuator	440N-A32114

## Approximate Dimensions

Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.

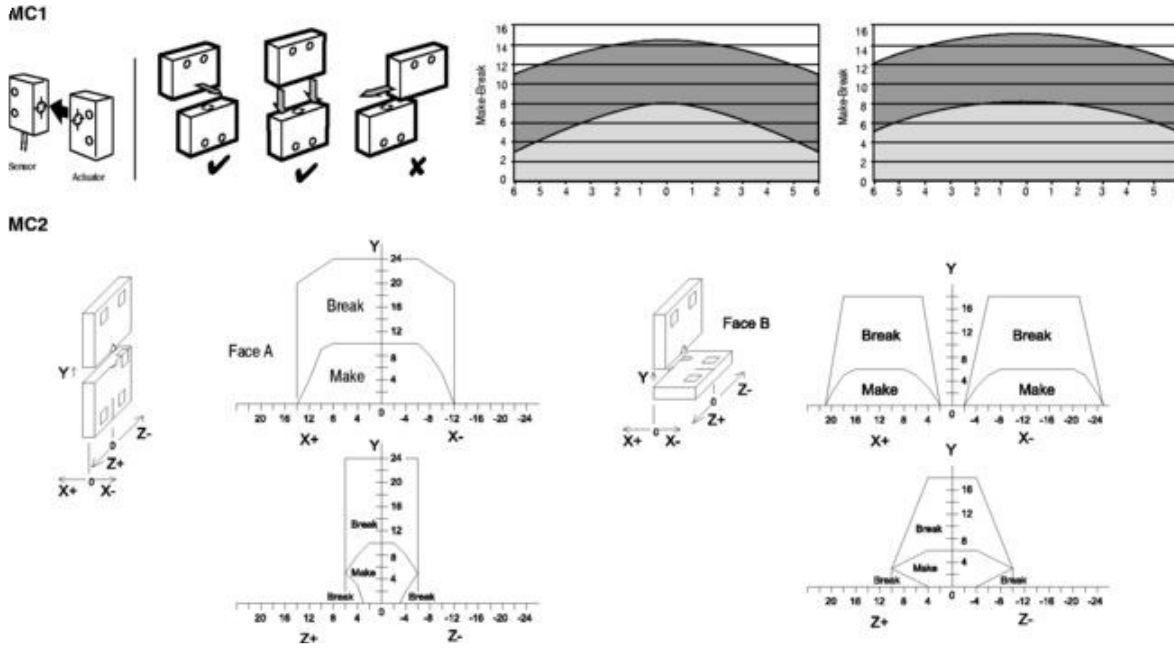


## Typical Wiring Diagrams

Description		MC1	MC2
		2 N.C.	2 N.C. + 1 N.O.
4-Pin Micro (M12)			—
8-Pin Micro (M12)		—	
Cordset 889D-F4AC-* or Cable Version	Brown	Safety A	—
	Blue		
	White	Safety B	—
	Black		
8-Pin Cordset 889D-F8AB-* or Cable Version	Grey	—	Safety A
	Red		Safety A
	Pink		Safety B
	Yellow		Safety B
	White		Aux
	Brown		24V DC +
	Blue		Gnd
	Green		NA

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

### Sensing & Misalignment Curve



### MC2 Application Wiring Example

