

Presence Sensing Safety Devices

POC Type 4 Safety Light Curtains

GuardShield

GuardShield with Integrated Laser Alignment and ArmorBlock Guard I/O Connectivity

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-P4JL0320YA	320 (12.6)	30 (1.18)	16	440L-P4KL0320YA
480 (18.9)	14 (0.55)	48	440L-P4JL0480YA	480 (18.9)	30 (1.18)	24	440L-P4KL0480YA
640 (25.2)	14 (0.55)	64	440L-P4JL0640YA	640 (25.2)	30 (1.18)	32	440L-P4KL0640YA
800 (31.5)	14 (0.55)	80	440L-P4JL0800YA	800 (31.5)	30 (1.18)	40	440L-P4KL0800YA
960 (37.8)	14 (0.55)	96	440L-P4JL0960YA	960 (37.8)	30 (1.18)	48	440L-P4KL0960YA
1120 (44.1)	14 (0.55)	112	440L-P4JL1120YA	1120 (44.1)	30 (1.18)	56	440L-P4KL1120YA
1280 (50.4)	14 (0.55)	128	440L-P4JL1280YA	1280 (50.4)	30 (1.18)	64	440L-P4KL1280YA
1440 (56.7)	14 (0.55)	144	440L-P4JL1440YA	1440 (56.7)	30 (1.18)	72	440L-P4KL1440YA
1600 (63.0)	14 (0.55)	160	440L-P4JL1600YA	1600 (63.0)	30 (1.18)	80	440L-P4KL1600YA

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with an "R" for a receiver. The GuardShield standard transmitter is used in the pair. To order a transmitter, replace the "P" with a "T" and the "A" with a "D."

Cascadable GuardShield with Integrated Laser Alignment and ArmorBlock Guard I/O Connectivity

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.	Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
320 (12.6)	14 (0.55)	32	440L-C4JL0320YA	320 (12.6)	30 (1.18)	16	440L-C4KL0320YA
480 (18.9)	14 (0.55)	48	440L-C4JL0480YA	480 (18.9)	30 (1.18)	24	440L-C4KL0480YA
640 (25.2)	14 (0.55)	64	440L-C4JL0640YA	640 (25.2)	30 (1.18)	32	440L-C4KL0640YA
800 (31.5)	14 (0.55)	80	440L-C4JL0800YA	800 (31.5)	30 (1.18)	40	440L-C4KL0800YA
960 (37.8)	14 (0.55)	96	440L-C4JL0960YA	960 (37.8)	30 (1.18)	48	440L-C4KL0960YA
1120 (44.1)	14 (0.55)	112	440L-C4JL1120YA	1120 (44.1)	30 (1.18)	56	440L-C4KL1120YA
1280 (50.4)	14 (0.55)	128	440L-C4JL1280YA	1280 (50.4)	30 (1.18)	64	440L-C4KL1280YA
1440 (56.7)	14 (0.55)	144	440L-C4JL1440YA	1440 (56.7)	30 (1.18)	72	440L-C4KL1440YA
1600 (63.0)	14 (0.55)	160	440L-C4JL1600YA	1600 (63.0)	30 (1.18)	80	440L-C4KL1600YA

Note: Cascadable GuardShields are sold in pairs. To select a transmitter or receiver replace the "C" with an "F" for a cascadable receiver. The cascadable GuardShield standard transmitter is used in these pairs. To order a cascadable transmitter, replace the "C" with a "G" and the "A" with a "D" to specify the appropriate transmitter cat. no.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
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	5-82	440R-H23176
MSR211	2 N.O.	1 N.C.	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	5-84	440R-H23177
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150)	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Presence Sensing Safety Devices

POC Type 4 Safety Light Curtains

GuardShield Safe 4

Product Selection

Standard System

The Allen-Bradley Guardmaster GuardShield Safe 4 safety light curtains are offered in 14 mm and 30 mm resolutions, are ordered as pairs—transmitter and receiver—and are shipped under one cat. no. Each GuardShield Safe 4 pair is shipped with standard mounting brackets. After selecting the appropriate Safe 4 protected height and resolution, ensure that the appropriate cordsets, interfaces, and accessories are ordered.

Protected Height [mm (in.)]	14 mm (0.55 in.) Number of Beams	30 mm (1.18 in.) Number of Beams	Pair Weight [kg (lbs)]	Cat. No.	
				14 mm (0.55 in.)	30 mm (1.18 in.)
120 (4.7)	16	8	1.0 (2.2)	445L-P4L0120YD	445L-P4S0120YD
240 (9.4)	32	16	1.4 (3.1)	445L-P4L0240YD	445L-P4S0240YD
360 (14.2)	48	94	1.8 (4.0)	445L-P4L0360YD	445L-P4S0360YD
480 (19.9)	64	94	2.2 (4.9)	445L-P4L0480YD	445L-P4S0480YD
600 (23.6)	80	94	2.6 (5.7)	445L-P4L0600YD	445L-P4S0600YD
720 (28.3)	96	94	3.0 (6.6)	445L-P4L0720YD	445L-P4S0720YD
840 (33.1)	112	94	3.5 (7.7)	445L-P4L0840YD	445L-P4S0840YD
960 (37.8)	128	94	4.0 (8.8)	445L-P4L0960YD	445L-P4S0960YD
1080 (42.5)	144	94	4.0 (8.8)	445L-P4L1080YD	445L-P4S1080YD
1200 (47.2)	160	94	4.5 (9.9)	445L-P4L1200YD	445L-P4S1200YD
1320 (52.0)	176	94	5.0 (11.0)	445L-P4L1320YD	445L-P4S1320YD
1440 (56.7)	172	94	5.5 (12.1)	445L-P4L1440YD	445L-P4S1440YD
1560 (61.4)	188	102	6.0 (13.2)	445L-P4L1560YD	445L-P4S1560YD
1680 (66.1)	204	102	6.5 (14.3)	445L-P4L1680YD	445L-P4S1680YD
1800(70.9)	220	110	7.0 (15.4)	445L-P4L1800YD	445L-P4S1800YD
1920 (75.6)	236	118	7.5 (16.5)	445L-P4L1920YD	445L-P4S1920YD

Note: The cat. nos. listed above are pair cat. nos., to specify a transmitter or receiver only, replace the "P" in the cat. no. with a "T" for transmitter or an "R" for receiver.

Required Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Presence Sensing Safety Devices

POC Type 4 Safety Light Curtains

GuardShield Micro 400

Micro 400 IP69K Light Curtains

The GuardShield Micro 400 is offered with the transmitter and receiver sealed in clear acrylic tubes with an environmental rating of IP69K. These IP69K Micro 400 light curtains are factory sealed and are ordered as pairs. They are offered in a 14 mm resolution in protected heights of 300 mm (11.8 in.), 600 mm (23.6 in.), 900 mm (35.4 in.) and 1200 mm (47.2 in.) with an operating range of five meters.

The required MSR 41 or MSR42 controllers maintain the IP20 rating and must be mounted in a suitable enclosure.

The Micro 400 IP69K transmitter and receiver are both offered with eight pin M12 connectors at the end of 500 mm (19.8 in.) integrated cables. The patchcords to connect the transmitter and receiver to the controller are the same cat. no. and are offered in 3 m (9.8 ft), 5 m (16.4 ft), and 8 m (26.2 ft) lengths.

These patchcords are configured on one end with M12 connectors, which mate to the integrated pigtail connectors and RJ45 connectors on the opposite end. These connectors plug into the MSR41 or MSR42 controller.

Areas of Use

- Light assembly machines/equipment
- Semi-conductor
- Micro-electronics
- Pharmaceutical
- Filling systems
- Clean rooms
- Food processing



Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Cat. No.
300 (11.8)	14 (0.55)	30	445L-P4C0300KD
600 (23.6)	14 (0.55)	60	445L-P4C0600KD
900 (35.4)	14 (0.55)	90	445L-P4C0900KD
1200 (47.2)	14 (0.55)	120	445L-P4C1200KD

Required Micro 400 Controller—Select One

	Mounting	Size	Cat. No.
 MSR41—ON/OFF	35 mm DIN Rail	22.5 mm	440R-P221AGS
 MSR42—Multi-functional module	35 mm DIN Rail	22.5 mm	440R-P226AGS-NNR

Optional Safety Relay Interfaces

Relay	Input Voltage	Reset	Outputs	Cat. No.
 MSR45E Safety Relay Expansion Model	Supplied by MSR41 or MSR42	Determined by MSR41 or MSR42	2 N.O.	440R-P4NANS

Possible Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117

Presence Sensing Safety Devices

POC Type 2 Safety Light Curtains

GuardShield Type 2

Product Selection

Standard System

The Allen-Bradley Guardmaster GuardShield safety light curtains are ordered as pairs—transmitter and receiver—and are shipped under one part number. Each GuardShield Type 2 transmitter and receiver is packaged with two right angle mounting brackets. After selecting the appropriate light curtain pair, ensure that required interfaces and accessories are ordered.

Resolution [mm (in.)]	Number of Beams	Protective Height—mm (in)	Pair Weight [kg (lb)]	Cat. No.	
				Guard Only	Restart Interlock with EDM
30 (1.18)	8	160 (6.3)	0.9 (1.9)	440L-P2KA0160YD	440L-P2KD0160YD
30 (1.18)	16	320 (12.6)	1.1 (2.4)	440L-P2KA0320YD	440L-P2KD0320YD
30 (1.18)	24	480 (18.9)	1.6 (3.5)	440L-P2KA0480YD	440L-P2KD0480YD
30 (1.18)	32	640 (25.2)	2.0 (4.4)	440L-P2KA0640YD	440L-P2KD0640YD
30 (1.18)	40	800 (31.5)	2.5 (5.5)	440L-P2KA0800YD	440L-P2KD0800YD
30 (1.18)	48	960 (37.8)	2.9 (6.4)	440L-P2KA0960YD	440L-P2KD0960YD
30 (1.18)	56	1120 (44.1)	3.4 (7.5)	440L-P2KA1120YD	440L-P2KD1120YD
30 (1.18)	64	1280 (50.4)	3.8 (8.4)	440L-P2KA1280YD	440L-P2KD1280YD
30 (1.18)	72	1440 (56.7)	4.3 (9.5)	440L-P2KA1440YD	440L-P2KD1440YD
30 (1.18)	80	1600 (63.0)	4.7 (10.4)	440L-P2KA1600YD	440L-P2KD1600YD
30 (1.18)	88	1760 (69.1)	5.2 (11.5)	440L-P2KA1760YD	440L-P2KD1760YD

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150)	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Note: The use of a category 4 safety relay module does not improve the category rating of the safety system beyond the category 2 rating of the Type 2 GuardShield light curtain.

Product Selection

Standard System Safety Light Curtain

The Allen-Bradley Guardmaster GuardShield Safe 2 safety light curtains are offered in 30 mm resolution, are ordered as pairs—transmitter and receiver—and are shipped under one cat. no. Each GuardShield Safe 2 pair are shipped with 180° mounting brackets. After selecting the appropriate light curtain pair, ensure that the appropriate cables, interfaces, and accessories are ordered.

Protected Height [mm (in.)]	Resolution [mm (in.)]	Number of Beams	Pair Weight [kg (lbs)]	Cat. No.
120 (4.7)	30 (1.18)	8	1.0 (2.2)	445L-P2S0120YD
240 (9.4)	30 (1.18)	16	1.4 (3.09)	445L-P2S0240YD
360 (14.2)	30 (1.18)	24	1.8 (3.97)	445L-P2S0360YD
480 (19.9)	30 (1.18)	32	2.2 (4.85)	445L-P2S0480YD
600 (23.6)	30 (1.18)	40	2.6 (5.73)	445L-P2S0600YD
720 (28.3)	30 (1.18)	48	3.0 (6.61)	445L-P2S0720YD
840 (33.1)	30 (1.18)	56	3.5 (7.72)	445L-P2S0840YD
960 (37.8)	30 (1.18)	64	4.0 (8.82)	445L-P2S0960YD
1080 (42.5)	30 (1.18)	72	4.0 (8.82)	445L-P2S1080YD
1200 (47.2)	30 (1.18)	80	4.5 (9.92)	445L-P2S1200YD
1320 (52.0)	30 (1.18)	88	5.0 (11.02)	445L-P2S1320YD
1440 (56.7)	30 (1.18)	86	5.5 (12.13)	445L-P2S1440YD
1560 (61.4)	30 (1.18)	94	6.0 (13.23)	445L-P2S1560YD
1680 (66.1)	30 (1.18)	102	6.5 (14.33)	445L-P2S1680YD
1800 (70.9)	30 (1.18)	110	7.0 (15.43)	445L-P2S1800YD
1920 (75.6)	30 (1.18)	118	7.5 (16.53)	445L-P2S1920YD

Note: The cat. nos. listed above are pair cat. nos., to specify a transmitter or receiver only, replace the "P" in the cat. no. with a "T" for transmitter or an "R" for receiver.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150)	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Note: The use of a category 4 safety relay module does not improve the category rating of the safety system beyond the Category 2 rating of the Type 2 light curtain in use.

Presence Sensing Safety Devices

PAC Type 4 Safety Light Curtains

GuardShield PAC

Product Selection

PAC Safety Light Curtains—Standard

The Allen-Bradley Guardmaster GuardShield PAC safety light curtains are ordered as a pair—transmitter and receiver—and are shipped under one Cat. No. After selecting the appropriate Cat. No. ensure that the required interfaces and accessories are ordered as well.

Protected Height [mm (in.)]	Beam Spacing	Number of Beams	Cat. No.
520 (20.4)	500 mm (19.7 in.)	2	440L-P4A2500YD
820 (32.3)	400 mm (15.7 in.)	3	440L-P4A3400YD

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Note: To select a transmitter or receiver substitute the "P" in the above cat. nos. with a "T" for a transmitter or an "R" for a receiver.

GuardShield PAC with Integrated Laser Alignment

Protected Height [mm (in.)]	Beam Spacing	Number of Beams	Cat. No.
520 (20.4)	500 mm (19.7 in.)	2	440L-P4AL2500YD
820 (32.3)	400 mm (15.7 in.)	3	440L-P4AL3400YD

Note: The GuardShield transmitter requires a 4-pin cable and the receiver requires an 8-pin cable.

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with a "T" for a transmitter or an "R" for a receiver.

GuardShield PAC with Integrated Laser Alignment and I/O Connectivity

Protected Height [mm (in.)]	Beam Spacing	Number of Beams	Cat. No.
520 (20.4)	500 mm (19.7 in.)	2	440L-P4AL2500YA
820 (32.3)	400 mm (15.7 in.)	3	440L-P4AL3400YA

Note: GuardShields are sold in pairs. To select a transmitter or receiver, replace the "P" in the cat. no. with an "R" for a receiver. PAC with integrated laser alignment and I/O connectivity uses a standard transmitter. To order a transmitter, replace the "P" with a "T" and the last "A" with a "D" (example: 440L-T2500YD).

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
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Single-Function Safety Relays for 2 N.C. Contact Switch

MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117

Modular Safety Relays

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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Muting Modules

MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Note: The use of a category 4 safety relay module does not improve the category rating of the safety system beyond the Category 2 rating of the Type 2 light curtain in use.

Product Selection

Safety Light Curtain—Standard PAC System

The Allen-Bradley Guardmaster GuardShield Safe 4 PAC safety light curtains are offered with two or three modules with various spacing for whole body detection. These are ordered as pairs (transmitter and receiver) and are shipped under one catalog number. Each GuardShield Safe 4 PAC pair is shipped with mounting brackets. After selecting the appropriate Safe 4 PAC, ensure that the appropriate cordsets, interfaces and accessories are ordered.

Protected Height [mm (in.)]	Number of Beams	Beam Spacing	Pair Weight [kg (lbs)]	Cat. No.
600 (23.6)	2	500 mm	4.0 (8.8)	445L-P4S2500YD
840 (33.0)	3	400 mm	4.5 (9.9)	445L-P4S3400YD

Note: The cat. nos. listed above are pair cat. nos. designated by the "P" in the cat. no. To specify a transmitter or receiver, replace the "P" with a "T" for transmitter and "R" for a receiver. The GuardShield Safe 4 PAC requires a 5-pin M12 cordset for the transmitter and the receiver.

Required Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Note: The use of a category 4 safety relay module does not improve the category rating of the safety system beyond the Category 2 rating of the Type 2 light curtain in use.

Product Selection

Selection Guide for Receiver

Operating Range	Connection Type	Cat. No.
0.5...20 m (1.64...65.5)	Terminal chamber with cable gland (PG13.5 thread)	440L-R4F0020Q
15...70 m (49.2...300 ft)		440L-R4F1570Q

Selection Guide for Transmitter

Operating Range	Connection Type	Cat. No.
0...70 m (0...300 ft)	Terminal chamber with cable gland (PG13.5 thread)	440L-T4F2070Q

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Note: The use of a category 4 safety relay module does not improve the category rating of the safety system beyond the Category 2 rating of the Type 2 light curtain in use.

Accessories

	Description	Cat. No.
	Laser alignment tool	440L-ALAT
	Adaptor for alignment aid on AAC	440L-ALBRK1
	Mounting bracket for AAC	440L-AMBRK4
	Corner mirror for scanning range 0...30 m	440L-AMIRR1
	Mounting kit for 440L-AMIRR1	440L-AMKIT
	Mounting bracket for mirror 440L-AMIRR1	440L-AMBRK1
	Glass corner mirror, 45° angle 0...30 m	440L-AMIRR2

Product Selection

Singlezone Safety Laser Scanner System Components

Item	Description	Cat. No.
1	 Scan head and I/O module assembly	442L-SFZNSZ
2	 Prewired 13 conductor cable with memory module (10 or 20 m (32.8 or 65.6 ft) required)	442L-CSFZNMZ-10 442L-CSFZNMZ-20
3	2 m (6.56 ft) RS232 program cable (required) or 10 m (32.8 ft) RS232 program cable	442L-ACRS232 442L-ACRS232-8

Multizone Safety Laser Scanner System Components

Item	Description	Cat. No.
1	 Scan head and I/O Module (required)	442L-SFZNMZ
2	 Prewired 13 conductor cable with memory module (10 or 20 m (32.8 or 65.6 ft) required)	442L-CSFZNMZ-10 442L-CSFZNMZ-20
3	2 m (6.56 ft) RS232 program cable (required) 10 m (32.8 ft) RS232 program cable	442L-ACRS232 442L-ACRS232-8

2-Opto-electronics

Note: A SafeZone safety laser scanner system requires the scan head and I/O module assembly (1) with either a 10 or 20 meter prewired memory module (2) and a programming cable (3).

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
Modular Safety Relays							
MSR211P Base 2 N.C. only	2 N.O.	1 N.C.	Removable	Auto./Manual or Monitored Manual	24V DC from the base unit	5-84	440R-H23177
MSR221P Input Module	—	—	Removable	—	24V DC from the base unit	5-88	440R-H23179
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218
Muting Modules							
MSR22LM	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	5-48	440R-P23071
MSR42 (requires optical interface to configure 445L-AF6150	2 PNP	2 PNP, configurable	Removable	Auto./manual or manual monitored	24V DC	5-52	440R-P226AGS-NNR

Product Selection

Contact			Actuator Type	Cat. No.			
Safety	Auxiliary	Action		M16 Conduit		Connector§	
				M16	1/2 inch NPT Adaptor	Connect to Distribution Box 6-Pin Micro (M12)	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)*
3 N.C.	—	—	Flat	440K-C21096	440K-C21048	440K-C21090	440K-C2NNFPS
			90°	440K-C21097	440K-C21057	440K-C21091	—
			GD2 Metal alignment guide w/semi-flex actuator	—	440K-C21062	440K-C21092	440K-C2NNAPS
			—	440K-C21070	—	—	—
2 N.C.	1 N.O.	BBM	Flat	440K-C21098	440K-C21050	440K-C21054	—
			90°	440K-C21061	440K-C21058	440K-C21067	—
			GD2 Metal alignment guide w/semi-flex actuator	—	440K-C21074	440K-C21088	—
			—	440K-C21055	—	—	—
		MBB	Flat	440K-C21052	440K-C21093	440K-C21060	—
			90°	440K-C21065	440K-C21094	440K-C21068	—
			GD2 Metal alignment guide w/semi-flex actuator	—	440K-C21095	440K-C21089	—
			—	440K-C21080	—	—	—

§ For connector ratings see page 3-9.

§ With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 3-17 for wiring details.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-24	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-24	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-22	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-74	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-78	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-94	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-98	440R-W23218

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.

For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.

For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

Description	6-Pin Micro (M12)	5-Pin Micro (M12)
Cordset	889R-F6ECA-*	—
Patchcord	889R-F6ECRM-*	889R-F5ECRM-*
Distribution Box	898R-P68MT-A5	—
Shorting Plug	898R-P61MU-RM	—
T-Port	NA	—

* 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.

Note: For additional information, see the Safety Connection System section (page 7-1) of this catalog.

Safety Switches

Tongue Switches

Trojan™ 5 & 6

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-24	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-24	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-22	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-74	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-78	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-94	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-98	440R-W23218

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.
For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.
For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

Description	Trojan 5		Trojan 6
	5-Pin Micro (M12)	6-Pin Micro (M12)	8-Pin Micro (M12)
Cordset	—	889R-F6ECA-*	889D-F8AB-*
Patchcord	889R-F5ECRM-*	889R-F6ECRM-*	889D-F8ABDM-*
Distribution Box	—	898R-F68MT-A5	—
Shorting Plug	—	898R-P61MU-RM	—
T-Port	—	—	—

* 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 System section (page 7-1) of this catalog.

Safety Switches

Tongue Switches

MT-GD2

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-24	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-24	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-22	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-74	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-78	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-94	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-98	440R-W23218

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.
For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-107) of this catalog.
For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

Description	4-Pin Micro (M12)	5-Pin Micro (M12)	8-Pin Micro (M12)	12-Pin M23
Cordset	889D-F4AC-*	—	889D-F8AB-*	889M-FX9AE-*
Patchcord	889D-F4ACDM-*	889D-F5ACDM-*	889D-F8ABDM-*	—
Distribution Box	898D-P4†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 System section (page 7-1) of this catalog.

Product Selection

Solenoid Voltage	Contact			Actuator Type	Cat. No.			
	Safety	Auxiliary	Action		M20 Conduit		Connector§	
					M20	1/2 inch NPT	12-Pin M23	8-Pin Micro (M12)♣
24V AC/DC	3 N.C.	1 N.O.	BBM	GD2 standard	440G-MT47037	440G-MT47039	440G-MT47041	440G-M3NBGDH-AC
				Fully-flexible	440G-MT47038	440G-MT47040	440G-MT47042	440G-M3NBBDH-AC
				—	440G-MT47007	440G-MT47008	440G-MT47043	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440G-MT47044	440G-MT47046	440G-MT47048	—
				Fully-flexible	440G-MT47045	440G-MT47047	440G-MT47049	—
				—	440G-MT47010	440G-MT47011	440G-MT47050	—
24V DC with diagnostic function and metal override key	3 N.C.	1 N.O.	BBM	GD2 standard	440G-MT47149	440G-MT47150	440G-MT47151	—
				Fully flexible	440G-MT47152	440G-MT47153	440G-MT47154	—
				No actuator	440G-MT47155	440G-MT47156	440G-MT47157	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440G-MT47158	440G-MT47159	440G-MT47160	—
				Fully flexible	440G-MT47161	440G-MT47162	440G-MT47163	—
				No actuator	440G-MT47164	440G-MT47165	440G-MT47166	—
110V AC/DC	3 N.C.	1 N.O.	BBM	GD2 standard	440G-MT47070	440G-MT47073	—	—
				Fully-flexible	440G-MT47071	440G-MT47074	—	—
				—	440G-MT47013	440G-MT47009	—	—
	2 N.C.	2 N.O.	BBM	GD2 standard	440G-MT47077	440G-MT47079	—	—
				Fully-flexible	440G-MT47078	440G-MT47080	—	—
				—	440G-MT47012	440G-MT47014	—	—
230V AC/DC	3 N.C.	1 N.O.	BBM	—	440G-MT47016	440G-MT47017	—	—
	2 N.C.	2 N.O.		—	440G-MT47015	440G-MT47024	—	—

§ For connector ratings see page 3-9.

♣ With an 8-pin micro (M12) connector, not all contacts are connected. See page 3-39 for wiring details.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Time Delay	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays								
MSR127RP	3 N.O.	1 N.C.	—	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	—	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	—	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	—	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Specialty Safety Relays								
MSR178	3 N.O.	2 N.C.	0.5 s...30 min	Removable	Automatic	24V AC/DC, 115V AC or 230V AC	5-40	440R-M23227
CU2	2 N.O.	1 N.C.	0.1 s...40 min	Fixed	—	24V AC/DC	5-56	440R-S07281
CU3	2 N.O.	1 N.C.	—	Fixed	Automatic/Manual	110V AC	5-64	440R-S35002
Modular Safety Relays								
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	5-82	440R-H23176
MSR220P Input Module	—	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	—	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	—	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.

For additional Safety I/O and Safety PLC connectivity, see page 5-116.

For application and wiring diagrams, see page 10-1.

Safety Switches

Guard Locking Switches

TLS-GD2

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Time Delay	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays								
MSR127RP	3 N.O.	1 N.C.	—	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	—	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	—	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	—	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Specialty Safety Relays								
MSR178	3 N.O.	2 N.C.	0.5 s...30 min	Removable	Automatic	24V AC/DC, 115V AC or 230V AC	5-40	440R-M23227
CU2	2 N.O.	1 N.C.	0.1 s...40 min	Fixed	—	24V AC/DC	5-56	440R-S07281
CU3	2 N.O.	1 N.C.	—	Fixed	Automatic/Manual	110V AC	5-64	440R-S35002
Modular Safety Relays								
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	5-82	440R-H23176
MSR220P Input Module	—	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	—	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	—	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Connection Systems

Description	8-Pin Micro (M12)	12-Wire, 12-Pin M23	9-Wire, 12-Pin M23§
Cordset	889D-F8AB-*	889M-F12AH-*	889M-FX9AE-*
Patchcord	889D-F8ABDM-*	889M-F12AHMU-‡	—

- * 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 0M3, (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard lengths.
- § The 9-wire cordset can be used only with the TLS3 versions.

Note: For additional information, see page 7-1.

Product Selection

Module Type	Actuator Type	Contact		Solenoid Contacts	Solenoid Voltage	Cat. No.			
		Safety	Auxiliary			M20 Conduit		Connector§	
						M20	1/2 inch NPT Adaptor	12-Pin M23	8-Pin Micro (M12)*
Standard	Standard	2 N.C.	1 N.O.	2 N.C. & 1 N.O.	24V AC/DC	440G-L07264	440G-L07258	440G-L07298	440G-L2NNSDH-3N
					110V AC/DC	440G-L07263	440G-L07257	—	—
					230V AC/DC	440G-L07262	440G-L07256	—	—
LH Key Lock					24V AC/DC	440G-L07255	440G-L07249	440G-L07301	440G-L2NNSDH-38
					110V AC/DC	440G-L07254	440G-L07248	—	—
					230V AC/DC	440G-L07253	440G-L07247	—	—

§ For connector ratings, see 3-9.

* With an 8-pin micro connector, not all contacts are connected. See page 3-49 for wiring details.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Time Delay	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays								
MSR127RP	3 N.O.	1 N.C.	—	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	—	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	—	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	—	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Specialty Safety Relays								
MSR178	3 N.O.	2 N.C.	0.5 s...30 min	Removable	Automatic	24V AC/DC, 115V AC or 230V AC	5-40	440R-M23227
CU2	2 N.O.	1 N.C.	0.1 s...40 min	Fixed	—	24V AC/DC	5-56	440R-S07281
CU3	2 N.O.	1 N.C.	—	Fixed	Automatic/Manual	110V AC	5-64	440R-S35002
Modular Safety Relays								
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	5-82	440R-H23176
MSR220P Input Module	—	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	—	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	—	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.

For additional Safety I/O and Safety PLC connectivity, see page 5-116.

For application and wiring diagrams, see page 10-1.

Connection Systems

Description	8-Pin Micro (M12)	12-Pin M23
Cordset	889D-F8AB-*	889M-F12AH-*
Patchcord	889D-F8ABDM-†	889M-F12AHMU-‡

* 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 0M3, (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard lengths.

Note: For additional information, see page 7-1.

Product Selection

Safety Contact Switching Capability	Connection Type	Housing Material	Safety Contacts	Auxiliary Contacts	Type	Cat. No.
250V AC 2 A max	Terminals	Red Molded ABS Plastic	1 N.C.	1 N.C.	FRS 3	440N-G02003
				1 N.O.	FRS 4	440N-G02008
				—	FRS 5	440N-G02009

Note: Contacts are described with the guard door closed, that is, actuator in place.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30T	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

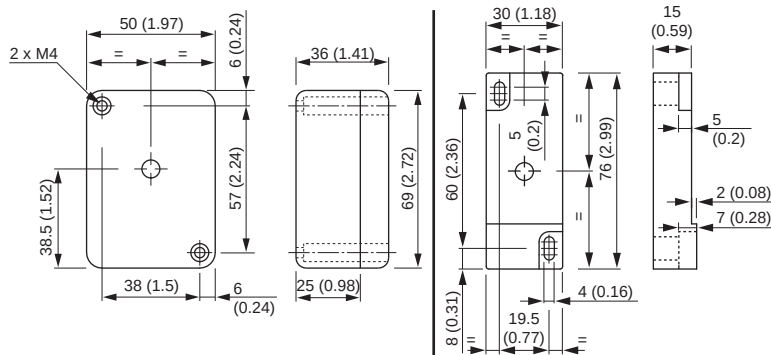
Note: For additional Safety Relays connectivity, see page 5-12.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Accessories

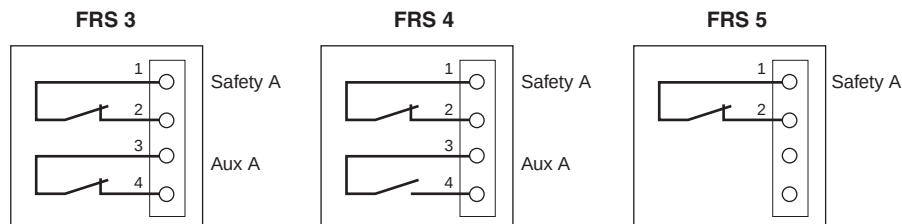
Description	Cat. No.
Replacement Actuator	440N-A02005

Approximate Dimensions

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



Typical Wiring Diagrams



Product Selection

Safety Contact Switching Capability	Safety Contacts	Auxiliary Contacts	Housing Material	Type	Connection	Cat. No.
250V AC, 2 A	1 N.C.	—	Red Molded ABS Plastic	FRS 6	2 m Cable	440N-G02023
					4 m Cable	440N-G02028
					6 m Cable	440N-G02032
					10 m Cable	440N-G02013
					4-Pin Micro QD	440N-G02095
24V DC, 1 A				FRS 9	2 m Cable	440N-G02044
					4 m Cable	440N-G02075
					6 m Cable	440N-G02082
					10 m Cable	440N-G02089
					4-Pin Micro QD	440N-G02096
110V AC, 3 A		FRS 10	2 m Cable	440N-G02045		
			4 m Cable	440N-G02088		
250V AC, 2 A		1 N.C.	Stainless Steel	FRS 13	2 m Cable	440N-G02154
					4 m Cable	440N-G02155
	4-Pin Micro QD				440N-G02160	
24V DC, 1 A	FRS 14			2 m Cable	440N-G02156	
				4 m Cable	440N-G02157	
				4-Pin Micro QD	440N-G02161	

Note: Contacts are described with the guard door closed, that is, actuator in place.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30T	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Connection Systems

Description	4-Pin Micro (M12)
Cordset	889D-F4AC-*
Patchcord	889D-F4ACDM-*

* 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.
Note: For additional information, see page 7-1.

Accessories

Description	Cat. No.
FRS 6, 9, 10 Plastic Replacement Actuator	440N-A02025
FRS 13, 14 Stainless Steel Replacement Actuator	440N-A02165

Product Selection

Safety Contact Switching Capability	Safety Contacts	Auxiliary Contacts	Connection	Type	Cat. No.
250V AC, 2 A max.	2 N.C.	—	3 m Cable	FRS 20 GD2	440N-G02113
	1 N.C.	1 N.O.	3 m Cable	FRS 2 GD2	440N-G02112
	2 N.C.		3 m Cable	FRS 21 GD2	440N-G02117
24V DC, 1 A max.	1 N.C.	1 N.O.	3 m Cable	FRS 2 GD2	440N-G02118
			10 m Cable	FRS 2 GD2	440N-G02147
	2 N.C.	—	3 m Cable	FRS 20 GD2	440N-G02119
	2 N.C.	1 N.O.	3 m Cable	FRS 21 GD2	440N-G02123
			6 m Cable	FRS 21 GD2	440N-G02143
			10 m Cable	FRS 21 GD2	440N-G02137
			8-Pin Micro (M12)	FRS 21 GD2	440N-G02149

Note: Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped with complete actuator.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30T	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Connection Systems

Description	8-Pin Micro (M12)
Cordset	889D-F8AB-*
Patchcord	889D-F8ABDM-*

* 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.
Note: For additional information, see page 7-1.

Accessories

Description	Cat. No.
Actuator	440N-A02128

Product Selection

Safety Contact Switching Capability	Safety Contacts	Auxiliary Contacts	Connection	Housing Material	Type	Cat. No.
250V AC, 2 A	1 N.C.	None	2 m Cable	Brass	GS 1	440N-G02048
				Stainless Steel		440N-G02049
			3 m Cable	Brass	GS2-Ex (brass)	440N-H02046
				Stainless Steel	GS2-Ex (stainless steel)	440N-H02047

Note: Contacts are described with the guard door closed, that is, actuator in place. Switch is shipped with complete actuator.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30T	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

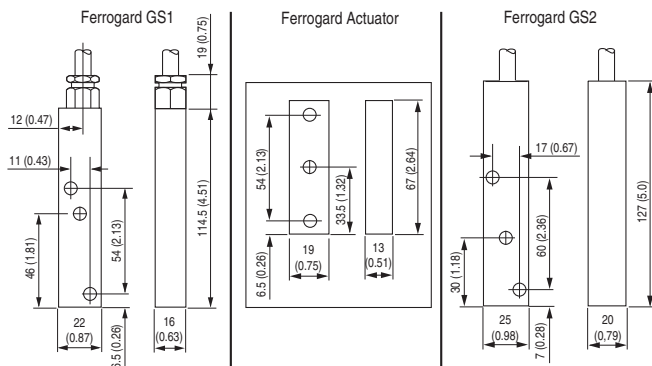
Note: For additional Safety Relays connectivity, see page 5-12.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Accessories

Description	Used with	Cat. No.
Actuator, Alnico	Brass Switch	440N-A02056
Actuator, Epoxy-painted	Stainless Steel	440N-A02057

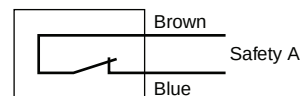
Approximate Dimensions

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



Typical Wiring Diagrams

Cable



External Fuse Safety Contacts



WARNING: All safety contacts fitted with internal non-resettable fuse and must be fused externally as detailed.

GS1 GS2	AC ≤ 1.6 A* (F) IEC 60127-2
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Recommended:
 *Bussman BK/GDA-1.6 A

Product Selection

Contact			Actuator Shaft Dimensions— mm (in)	Shaft Type	Cat. No.			
Safety	Auxiliary	Action			M16 Conduit		Connector❄	
					M16	1/2 inch NPT Adaptor	6-Pin Micro (M12)	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12) *
3 N.C.	—	—	80 x Ø10 (3.14 x 0.39)	Solid	440H-E22025	440H-E22050	440H-E22059	—
			60 x Ø8 (2.36 x 0.31)		440H-E22031	440H-E22051	440H-E22060	—
			50 x Ø10 (1.96 x 0.39)		440H-E22047	440H-E22052	440H-E22061	440H-E2NNPPS
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-E22067	440H-E22068	440H-E22069	440H-E2NNHPS
2 N.C.	1 N.O.	BBM	80 x Ø10 (3.14 x 0.39)	Solid	440H-E22027	440H-E22053	440H-E22037	—
			60 x Ø8 (2.36 x 0.31)		440H-E22033	440H-E22054	440H-E22039	—
			50 x Ø10 (1.96 x 0.39)		440H-E22048	440H-E22055	440H-E22062	—
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-E22064	440H-E22065	440H-E22066	—
		MBB	80 x Ø10 (3.14 x 0.39)	Solid	440H-E22029	440H-E22056	440H-E22038	—
			60 x Ø8 (2.36 x 0.31)		440H-E22035	440H-E22057	440H-E22040	—
			50 x Ø10 (1.96 x 0.39)		440H-E22049	440H-E22058	440H-E22063	—
			30 x Ø16 (1.18 x 0.63) bore Ø9.5 (0.37)	Pre-bored	440H-E22070	440H-E22071	440H-E22072	—

* With a 5-pin micro (M12) connector, not all contacts are connected. See page 3-97 for wiring details.

* For connector ratings, see 3-9.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.

For additional Safety I/O and Safety PLC connectivity, see page 5-116.

For application and wiring diagrams, see page 10-1.

Connection Systems

Description	6-Pin Micro	Connections to ArmorBlock Guard I/O 5-Pin Micro (M12)
	3 N.C.-2 N.C. & 1 N.O.	3 N.C.
Cordset	889R-F6ECA-‡	—
Patchcord	889R-F6ECRM-§	889D-F5ACDM-‡
Distribution Box	898R-P68MT-A5	—
Shorting Plug	898R-P61MU-RM	—

‡ 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.

Note: For additional information, see page 7-1.

Product Selection

Safety Contacts	Auxiliary Contacts	Contact Action	Shaft Dimensions	Operating Shaft Type	Cat. No.		
					M20 Conduit		Connector§
					M20	1/2 inch NPT Adaptor	8-Pin Micro (M12)
2 N.C.	1 N.O.	BBM	L = 30 (1.18) D = 16 (0.63)	Pre-Bored	440H-R03074	440H-R03078	440H-R03111
			L = 85 (3.35) D = 12.7 (0.5)	Solid	440H-R03079	440H-R03088	440H-R03112

§ For connector ratings, see 3-9.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-12.
For additional Safety I/O and Safety PLC connectivity, see page 5-116.
For application and wiring diagrams, see page 10-1.

Connection Systems

Description	8-Pin Micro (M12)
	2 N.C. & 1 N.O.
Cordset	889D-F8AB-*
Patchcord	889D-F8ABDM-*
Distribution Box	—
Shorting Plug	—
T-Port	—

* 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.
Note: For additional information, see page 7-1.

Product Selection

Contacts		Cat. No.				
Safety	Auxiliary	Conduits		Connectors*		
		M20	1/2 inch NPT	12-Pin M23	8-Pin Micro (M12)*	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)†
2 N.C.	2 N.O.	440E-D13118	440E-D13120	440E-D13132	440E-D21BNYH	440E-D2NNNYS
3 N.C.	1 N.O.	440E-D13112	440E-D13114	440E-D13124	—	—

* For connector ratings, see page 3-9.

† With an 8-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 4-9 for wiring details.

‡ For connection to ArmorBlock Guard I/O. With a 5-pin micro (M12) connector, not all contacts are connected. See *Typical Wiring Diagram* on page 4-9 for wiring details.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see the Safety Relays section (page 5-8) of this catalog.

For additional Safety I/O and Safety PLC connectivity, see the Programmable Safety System section (page 5-115) of this catalog.

For application and wiring diagrams, see the Safety Applications section (page 10-1) of this catalog.

Connection Systems

Description	5-Pin Micro (M12)*	8-Pin Micro (M12)	12-Pin M23
Cordset	—	889D-F8AB-§	889M-FX9AE-§
Patchcord	889D-F5ACDM-♣	889D-F8ABDM-♣	889M-F12AHMU-➤

§ 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 0M3 (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard lengths.

* To connect to ArmorBlock Guard I/O.

Product Selection

Cable Span	Safety Contacts	Auxiliary Contacts	Cat. No.				
			Conduits		Connectors*		
			M20	1/2 inch NPT	12-Pin M23	8-Pin Micro*	Connect to ArmorBlock Guard I/O 5-Pin Micro (M12)†
75 m (246 ft)	2 N.C.	2 N.O.	440E-L13137	440E-L13133	440E-L13140	440E-L21BNYH	440E-L2NNNYS
	3 N.C.	1 N.O.	440E-L13042	440E-L13043	440E-L13141	—	—
75...125 m (146...410 ft)	2 N.C.	2 N.O.	440E-L13153	440E-L13155	440E-L13163	440E-L21BTYH	—
	3 N.C.	1 N.O.	440E-L13150	440E-L13152	440E-L13164	—	—

* For connector ratings, see page 3-9.

† For connection to ArmorBlock Guard I/O. With a 5-pin micro (M12) connector, not all contacts are connected. See page 4-15 for wiring details.

‡ With an 8-pin micro (M12) connector, not all contacts are connected. See page 4-15 for wiring details.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-4.

For additional Safety I/O and Safety PLC connectivity, see page 5-116.

For application and wiring diagrams, see page 10-1.

Connection Systems

Description	5-Pin Micro (M12)	8-Pin Micro (M12)	12-Pin M23
Cordset	—	889D-F8AB-§	889M-FX9AE-§
Patchcord	889D-F5ACDM-*	889D-F8ABDM-♣	889M-F12AHMU->

* Replace symbol with 0M3 (0.3 m), 1 (1 m), 2 (2 m), 3 (3 m), 5 (5 m), or 10 (10 m) for standard lengths.

§ 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 0M3 (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard length.

Product Selection

Cable Span	Safety Contacts	Auxiliary Contacts	Cat. No.		
			Conduits		Connectors§
			M20	1/2 inch NPT	12-Pin M23
Up to 75 m (246 ft)	2 N.C.	2 N.O.	440E-L22BNSM	440E-L22BNST	440E-L22BNSL

§ For connector ratings, see 3-9.

Recommended Logic Interfaces

Description	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. Page No.	Cat. No.
Single-Function Safety Relays for 2 N.C. Contact Switch							
MSR127RP	3 N.O.	1 N.C.	Removable (Screw)	Monitored Manual	24V AC/DC	5-26	440R-N23135
MSR127TP	3 N.O.	1 N.C.	Removable (Screw)	Auto./Manual	24V AC/DC	5-26	440R-N23132
MSR126T	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	5-24	440R-N23117
MSR30RT	2 N.O. Solid State	1 N.O. Solid State	Removable	Auto./Manual or Monitored Manual	24V DC	5-16	440R-N23198
Modular Safety Relays							
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	5-82	440R-H23176
MSR220P Input Module	—	—	Removable	—	24V DC	5-86	440R-H23178
MSR310P Base	MSR300 Series Output Modules	3 PNP Solid State	Removable	Auto./Manual Monitored Manual	24V DC	5-102	440R-W23219
MSR320P Input Module	—	2 PNP Solid State	Removable	—	24V DC from the base unit	5-106	440R-W23218

Note: For additional Safety Relays connectivity, see page 5-4.
 For additional Safety I/O and Safety PLC connectivity, see page 5-116.
 For application and wiring diagrams, see page 10-1.

Connection Systems

Description	12-Pin M23
Cordset	889M-FX9AE-*
Patchcord	889M-F12AHMU-*

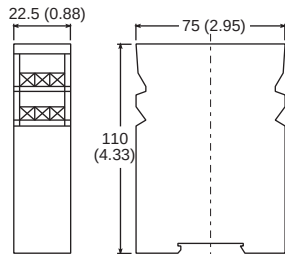
* Replace symbol with 2 (2 m), 5 (5 m), or 10 (10 m) for standard cable lengths.
 * Replace symbol with 0M3 (0.3 m), 0M6 (0.6 m), 1 (1 m), 2 (2 m) or 3 (3 m) for standard length.

Product Selection

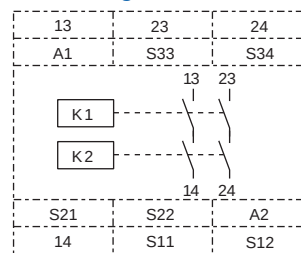
Inputs	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. No.
Light Curtain or Single Channel (MSR126T)	2 N.O.	None	Fixed	Auto./Manual	24V AC/DC	440R-N23117
Dual Channel 2 N.C. (MSR126.IT)					115V AC	440R-N23116
					230V AC	440R-N23115
					24V AC/DC	440R-N23114
					115V AC	440R-N23113
				230V AC	440R-N23112	
Light Curtain or Single Channel (MSR126R)				Monitored Manual	24V AC/DC	440R-N23123
Dual Channel 2 N.C. (MSR126.IR)					115V AC	440R-N23122
					230V AC	440R-N23121
					24V AC/DC	440R-N23120
	115V AC	440R-N23119				
	230V AC	440R-N23118				

Approximate Dimensions

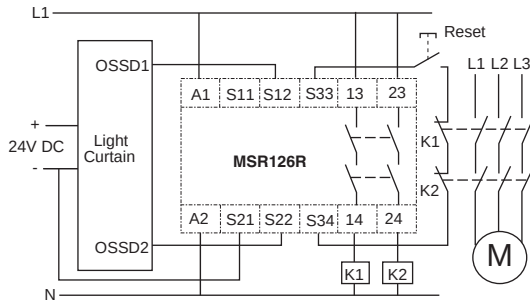
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



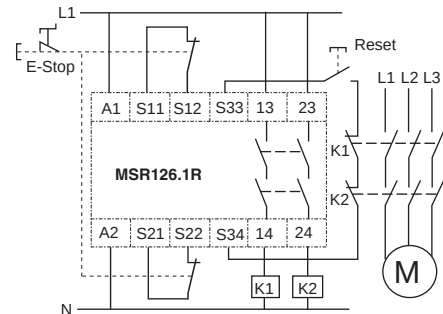
Block Diagram



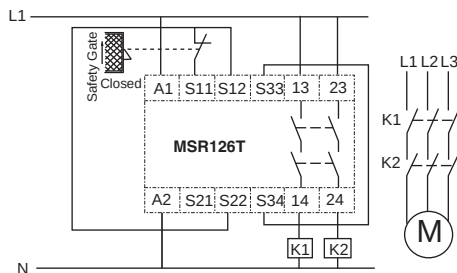
Typical Wiring Diagrams



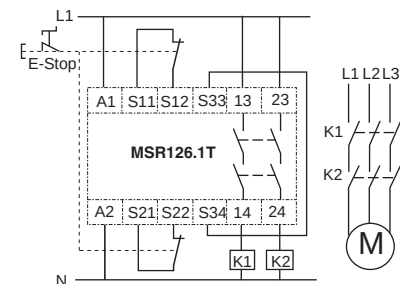
115/230V Supply, 24V DC Light Curtain, Monitored Manual Reset, Monitored Output



Dual Channel E-Stop Input, Monitored Manual Reset, Monitored Output



Single Channel Safety Gate, Automatic Reset, No Output Monitoring



Dual Channel E-Stop, Automatic Reset, No Output Monitoring

Product Selection

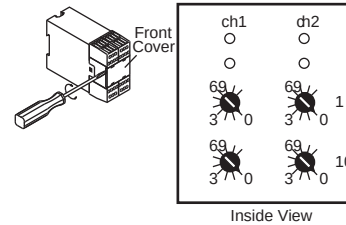
Inputs	Safety Outputs	Auxiliary Outputs	Terminals	Reset Type	Power Supply	Cat. No.
3 x 2 N.C.	2 N.O.	1 N.C.	Removable	Auto./Manual	24V DC	440R-P23071

Accessories

Description	Cat. No.
70 mm Tower Light Clear LED Module—Black Enclosure	855T-B24YL7
70 mm Tower Light Clear LED Module—Grey Enclosure	855T-G24YL7

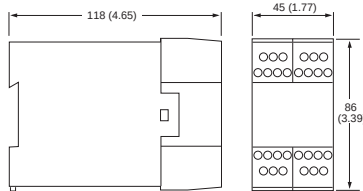
Application Details

Disconnect power. Use a screwdriver to pop open cover to reveal internal switches.

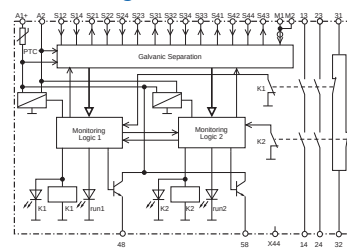


Approximate Dimensions

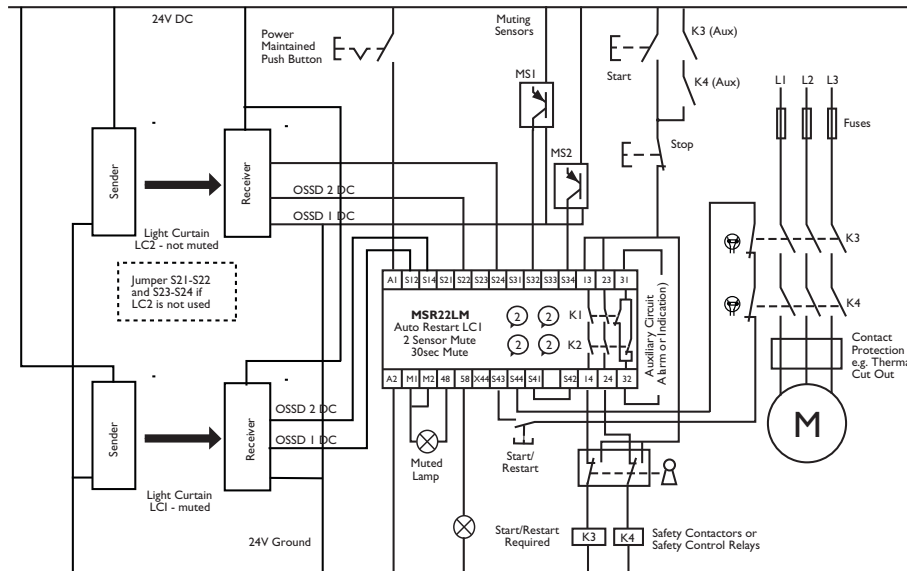
Dimensions are shown in mm (in.). Dimensions are not intended to be used for installation purposes.



Block Diagram



Typical Wiring Diagrams

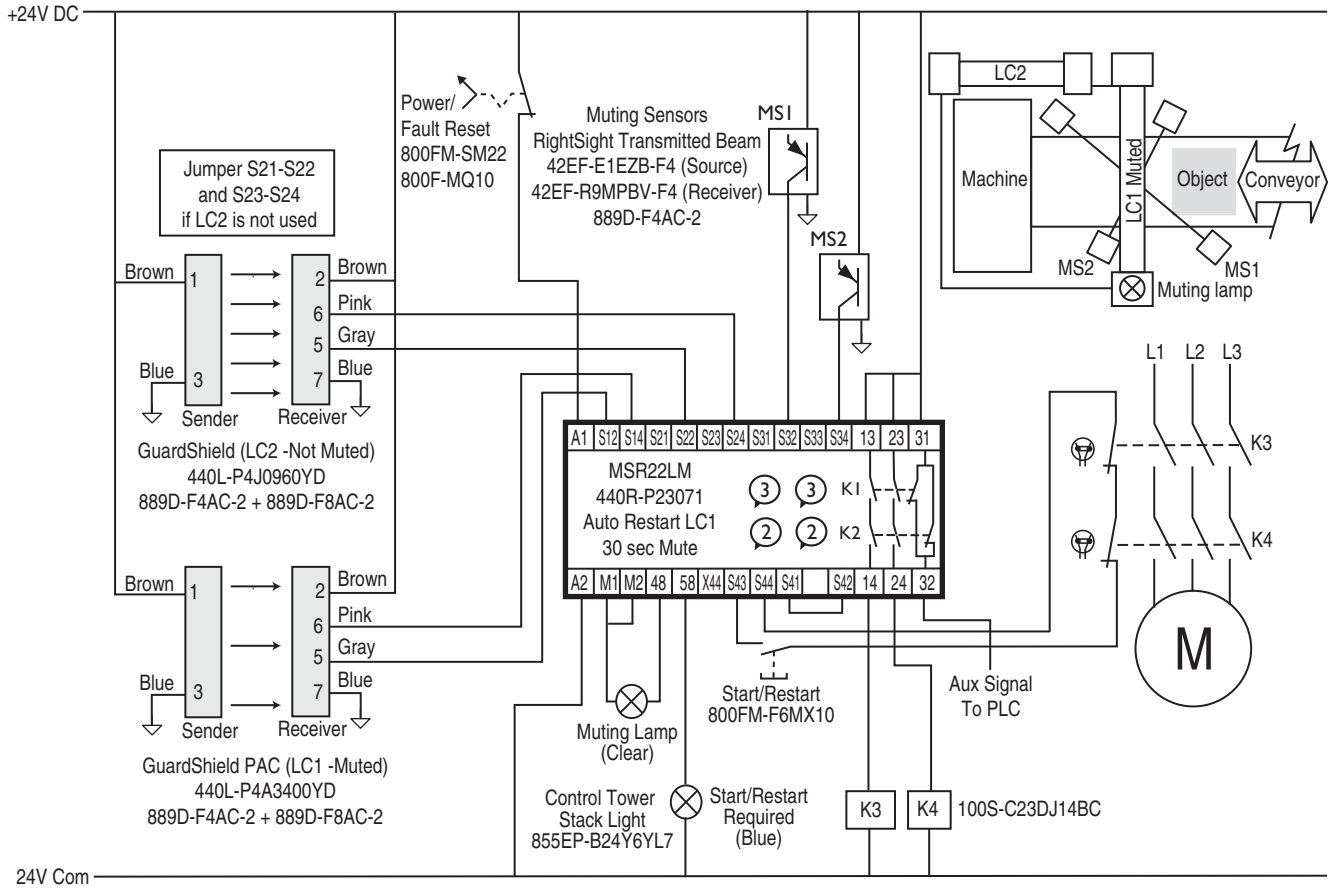


Note: Two light curtains with two-sensor muting and Auto Restart LC1.

Safety Applications and Wiring Diagrams

Light Curtain—Muting with Two Sensors

GuardShield, RightSight, 800F, Control Tower, MSR22LM, 100S



Circuit Status

The light curtain is clear. The muting sensors are clear. The outputs of the safety relay are de-energized, and the motor is off.

Operating Principle

The MSR22LM is designed for automated conveyor applications, where an object moves through a light curtain into or out of a hazardous area. With two sensor muting, the object can move in both directions.

STARTING: Upon initial power-up, the start/restart button must be pressed to energize the outputs of the MSR22LM and start the motor.

MUTING: The object must block the sensor MS1 and then MS2 prior to passing through the light curtain. After passing through the light curtain, the object must clear MS2 and then MS1 for the motor to continue running during the muting operation.

STOPPING: Obstructing the light curtain without blocking sensors MS1 and MS2 de-energizes the MSR22LM safety outputs. After clearing the light curtain, press the start/restart button to re-energize the safety outputs of the MSR22LM.

Fault Detection

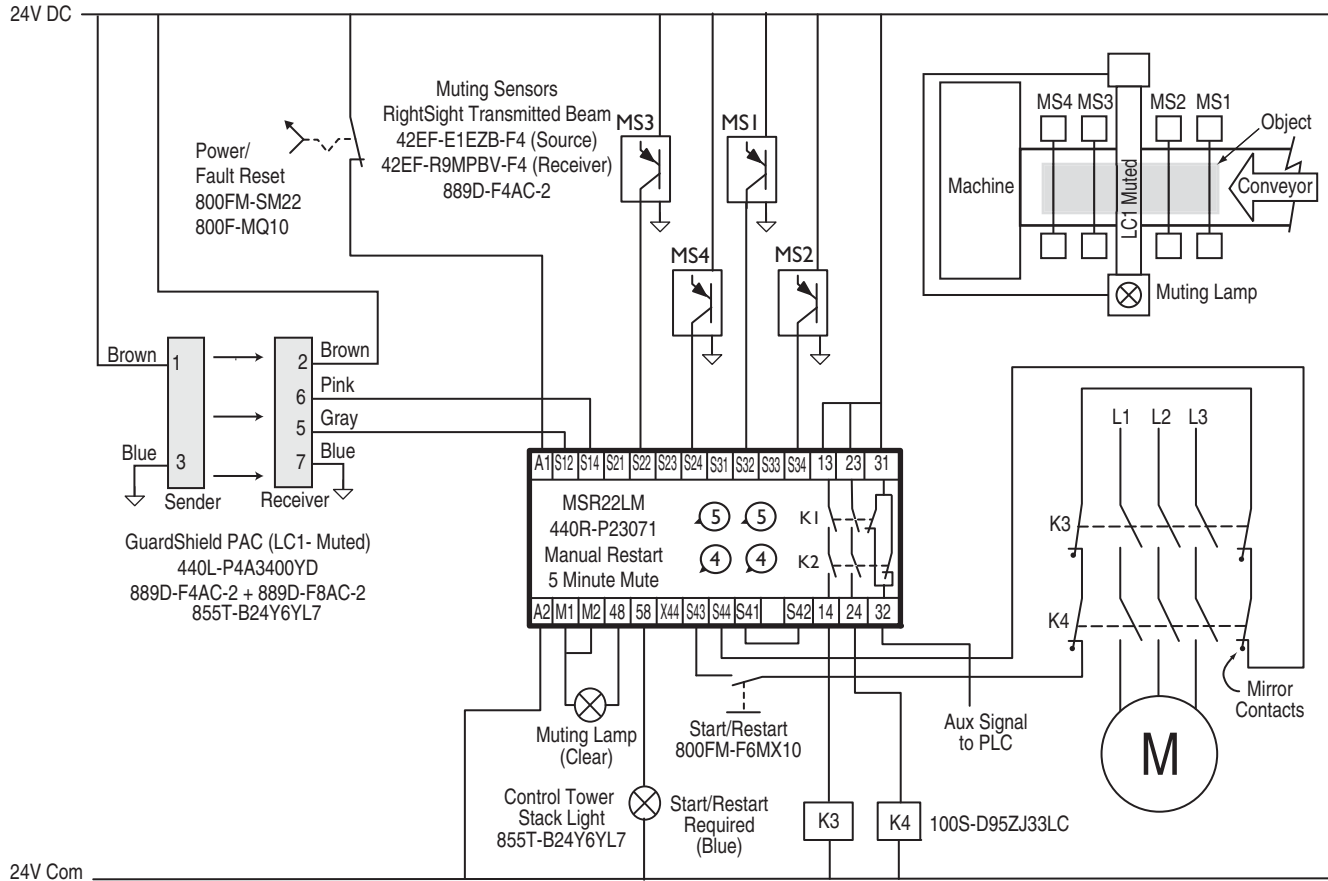
Upon power-up, the GuardShield and MSR22LM perform internal checks. If OK and clear, the GuardShield outputs turn on. The MSR22LM checks the muting inputs. If OK, the MSR22LM checks the light curtain for dual channel signals. If OK, the muting lamp blinks continuously and the start/restart required lamp turns on to indicate that the MSR22LM is ready to start. While running, an incorrect sequence of the muting sensors and light curtain operation or excessive time to move the object through the light curtain will de-energize the safety outputs of the MSR22LM. The run LEDs or the muting lamp blink at certain rates to indicate the type of fault that has occurred. The start/restart button can be held down for three seconds to manually move material through the conveyor. The motor will then run for 12 seconds. Some faults can be cleared by removing the object from the sensors. The start/restart required indicator will turn on when the MSR22LM is ready to go. Other faults may have to be cleared by cycling the power to the MSR22LM. The MSR22LM monitors the 100S contactors through mechanically linked contacts connected in series. If one contactor welds closed, the second contactor will stop the motor, and the MSR22LM will detect the fault at the next attempt to start the motor.

Ratings

The safety functions initiated by the two GuardShield light curtains meet the safety performance requirements of SIL CL 3 per IEC 62061:2005 and has Category 4 structure that can be used in systems requiring Performance Levels up to PLe per ISO 13849-1: 2006. This example circuit performs a Stop Category 0 function (coast to stop).

Light Curtain—Muting with Four Sensors

GuardShield, RightSight, 800F, Control Tower, MSR22LM, 100S



Circuit Status

The light curtain is cleared. The muting sensors are cleared. The outputs of the safety relay are de-energized, and the motor is off.

Operating Principle

The MSR22LM is designed for automated conveyor applications, where an object moves through a light curtain into or out of a hazardous area. With four sensor muting, the object can only move in one direction.

STARTING: Upon initial power-up, the start/restart button must be pressed to energize the outputs of the MSR22LM and start the motor.

MUTING: The object must block the sensors MS1 and MS2 prior to passing through the light curtain. The object must be large enough to block all four sensors, for the motor to continue running during the muting operation.

STOPPING: Obstructing the light curtain without blocking sensors MS1 and MS2 de-energizes the MSR22LM safety outputs. After clearing the light curtain, press the start/restart button to re-energize the safety outputs of the MSR22LM.

Fault Detection

Upon power-up, the GuardShield and MSR22LM perform internal checks. If OK and clear, the GuardShield outputs turn on. The MSR22LM checks the muting inputs. If OK, the MSR22LM checks the light curtain for dual channel signals. If OK, the muting lamp blinks continuously and the start/restart required lamp turns on to indicate that the MSR22LM is ready to start. While running, an incorrect sequence of the muting sensors and light curtain operation or excessive time to move the object through the light curtain will de-energize the safety outputs of the MSR22LM. The run LEDs or the muting lamp blink at certain rates to indicate the type of fault that has occurred. The start/restart button can be held down for three seconds to manually move material through the conveyor. The motor will then run for 12 seconds. Some faults can be cleared by removing the object from the sensors. The start/restart required button will turn on when the MSR22LM is ready to go. Other faults may have to be cleared by cycling the power to the MSR22LM. The MSR22LM monitors the 100S-D contactors through the mechanically linked "mirrored" contacts connected in series. If one contactor welds closed, the second contactor will stop the motor, and the MSR22LM will detect the fault at the next attempt to start the motor.

Ratings

The safety function initiated by the GuardShield light curtain meets the safety performance requirements of SIL CL 3 per IEC 62061:2005 and has Category 4 structure that can be used in systems requiring Performance Levels up to PLe per ISO 13849-1: 2006. This example circuit performs a Stop Category 0 function (coast to stop).