

■ Description

The MiniSafe MS4600 three-box light curtain system is unique due to its superior response time — as fast as 16 msec. This speed allows the light curtain to be mounted closer to the point of hazardous operation.

The MiniSafe MS4600 series consists of an identical length transmitter and receiver, combined with a controller and appropriate interconnecting cables. The in-line connector cables allow the mounting of the transmitter and receiver in crowded locations where a standard connector would not fit.

For easy alignment, the MiniSafe features Omron STI's patented Individual Beam Indicator lights.

MiniSafe® MS4600 Three-Box System

- Simple 3-box design
- Rugged transmitter and receiver—35 x 50 mm (1.42 x 2.0 in.)
- Two 6-amp safety relay outputs
- 30 mm (1.2 in.) resolution
- Protected heights from 150 to 1809 mm (6.2 to 71.2 in.)
- Individual Beam Indicator lights
- In-line connector cables
- Mini connectors for power and output
- Adjustable mounting brackets
- Exact channel select
- Floating blanking
- Auxiliary outputs
- Restart interlock
- MPCE monitoring
- Response time as fast as 16 msec
- Two-digit diagnostic display
- IP65-rated lockable metal enclosure

Option

- Remote reset

A Go to the Engineering Guide
For in-depth information on
safety standards and use.

■ Specifications for Transmitter and Receiver

Performance
Protected Height: 159 to 1809 mm (6.2 to 71.2 in.)
Operating Range: 0.3 to 12 m (1 to 39 ft.)
Resolution: 30 mm (1.2 in.) Use of exact channel select and/or floating blanking may increase this value.
Effective Aperture Angle: ±2.5° transmitter and receiver
Light Source: 850 nm LED
Light Source Life: 100,000 hours
Indicators: Channel select or float blanking – yellow; Interlock or fault – yellow; Machine stop – red, individual beam indicators – red; machine run – green
Mechanical
Enclosure: Polyurethane powder-painted aluminum
Cable Length:
Transmitter – maximum 30 m (100 ft.)
Receiver – maximum 30 m (100 ft.)
Cable Connections: Circular style, 6-conductor for transmitter, 9-conductor for receiver
Environmental
Protection Rating: IP65; NEMA 4, 12
Operating Temperature: 0 to 55°C (32 to 133°F)
Storage Temperature: -25 to 75°C (-13 to 167°F)
Relative Humidity: 95% maximum, non-condensing
Vibration: 5–60 Hz maximum on all 3 axes
Shock: 10 g for 0.016 seconds; 1,000 shocks on two axes
Conformity/Approvals
Approvals: IEC61496
Conforming to Standards: ANSI/RIA R15.06-1999, ANSI B11.19-2003, OSHA 1910.27(c), OSHA 1910.212
Other Approvals: EC type examined to the requirements of category 4, EN 954-1 (type 4, IEC61496-1 and -2), UL listed

Specifications are subject to change without notice.

■ Specifications for Controller

Performance
Indicators: Safety output status, interlock status, exact channel select floating blanking, 2-digit diagnostic display
Electrical
Supply: Autoselecting 100-240 VAC ± 10%, 30 VA
Safety Output, Contact Ratings: 1 N.O. and 1 N.O./N.C. on a field-replaceable assembly. * 6 A at 115 VAC (mini-connectors). System contains 8 A relays. To obtain approvals, the relays are derated.
Auxiliary Output, Mechanical: 1 N.O./N.C. 3 A*
MPCE: 50 mA @ 24 VDC ±20% current source, steady state. Minimum wire size, 22 AWG unshielded. Maximum cable length 50 m (164 ft).
Remote Start: 20 mA @ 24 VDC ±20% current source, steady state. Minimum wire size, 22 AWG unshielded. Maximum cable length 50 m (164 ft).
Mechanical/Environmental
Metal Chassis: Lockable metal enclosure, protection rating IP65
Operating Temperature: 0 to 55°C (32 to 131°F)
Relative Humidity: 95% maximum, Non-condensing
Vibration: 5-60 Hz maximum on all three axes
Shock: 10 g for 0.016 seconds; 1,000 shocks for each axes on two axes

Specifications are subject to change without notice.

*Field replaceable relay assembly part number 68070-0010.

■ Controller Response Times

Protective Height mm/in.	# of Beams	Response Times–mS	
		Normally Open	Normally Closed
159/6.3	7	16.9	26.9
309/12.2	14	17.7	27.7
459/18.1	21	18.4	28.4
609/24.0	28	19.1	29.1
759/29.9	35	19.8	29.8
909/35.8	42	20.5	30.5
1059/41.7	49	21.3	31.3
1209/47.6	56	22.0	32.0
1359/53.3	63	22.7	32.7
1509/59.4	70	23.4	33.4
1659/65.3	77	24.2	34.2
1809/71.2	84	24.9	34.9

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safety light curtains

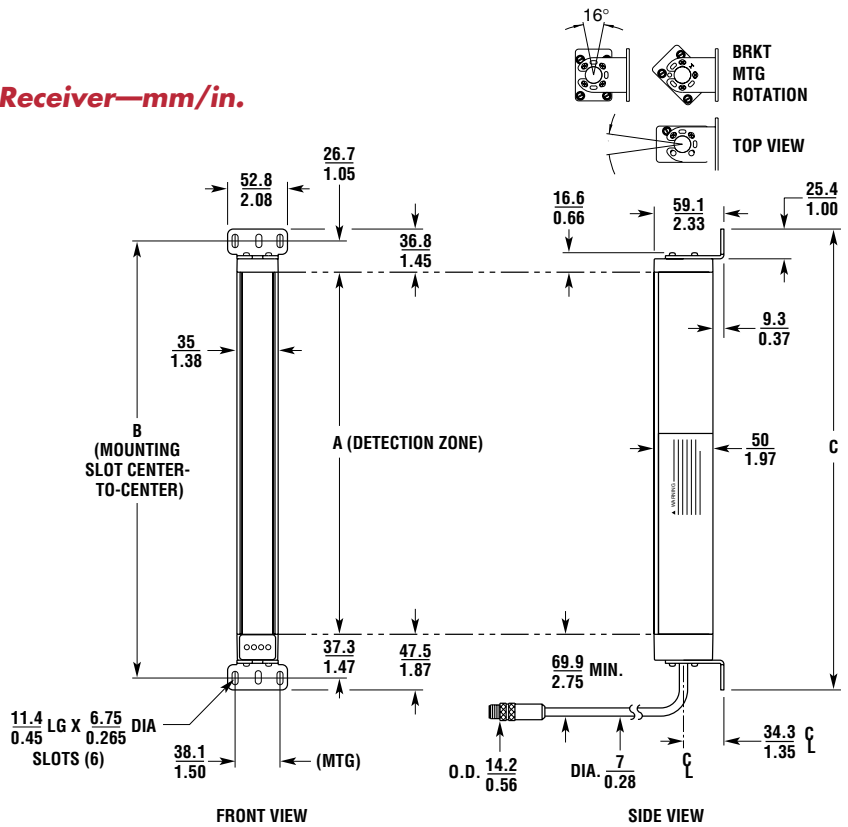
MS4600 Three-Box System

■ Dimensions of Transmitter and Receiver—mm/in.

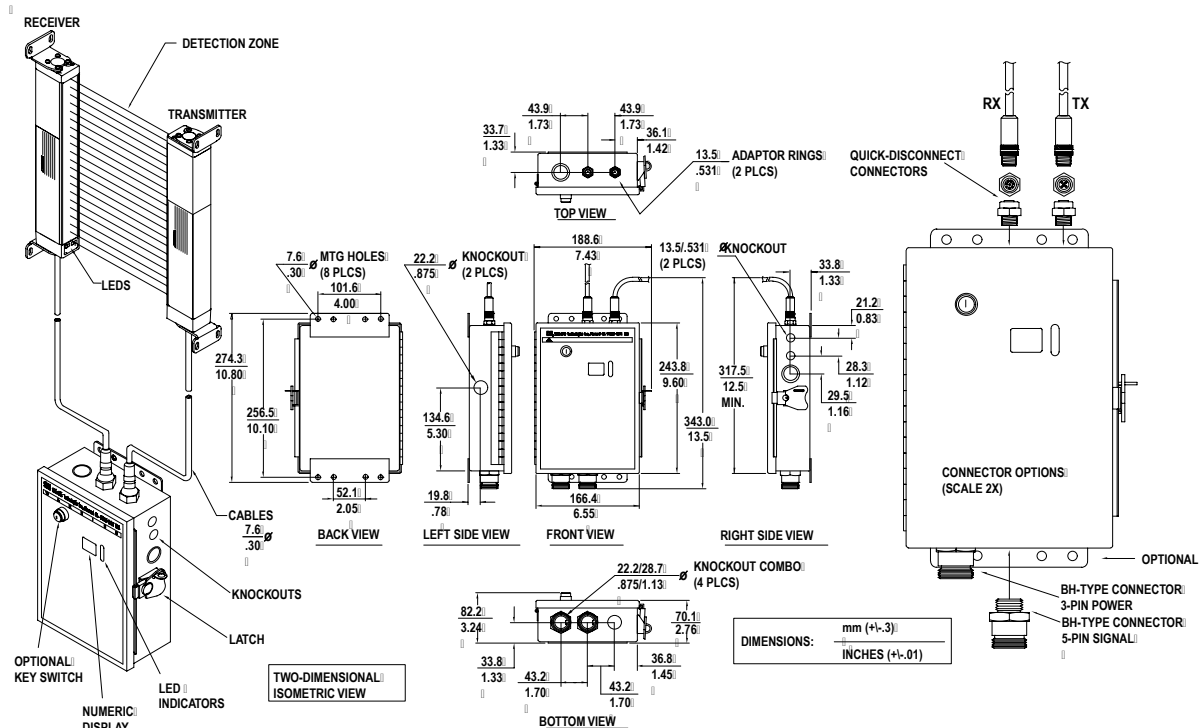
MiniSafe MS4600 Three-Box Series Dimensions

A mm/in.	B mm/in.	C mm/in.
159/6.3	224/8.8	244/9.6
309/12.2	374/14.7	394/15.5
459/18.1	524/20.6	544/21.4
609/24.0	674/26.5	694/27.3
759/29.9	824/32.4	844/33.2
909/35.8	974/38.3	994/39.1
1059/41.7	1124/44.2	1144/45.0
1209/47.6	1274/50.2	1294/50.9
1359/53.5	1424/56.1	1444/56.9
1509/59.4	1574/62.0	1594/62.8
1659/65.3	1724/67.9	1744/68.7
1809/71.2	1874/73.8	1894/74.6

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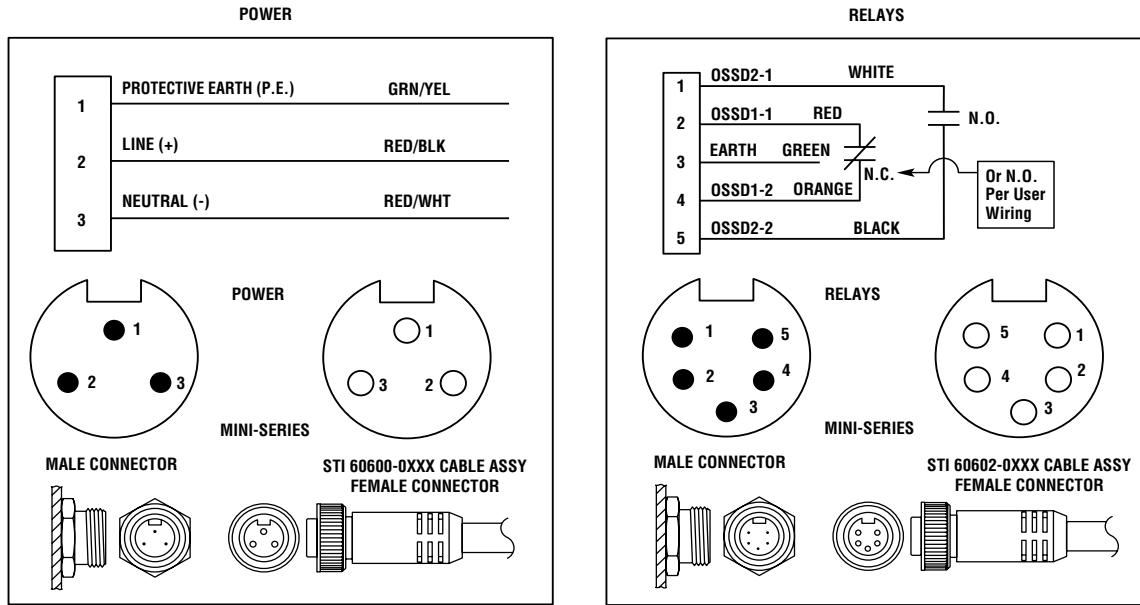
■ Dimensions of Metal Enclosure—mm/in.



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■ Input Power and Safety Output Connection

The MS4600-TB comes standard with a mini (3-pin) for power and a mini (5-pin) for safety outputs.



Ordering

To order a MiniSafe MS4600 three-box series system, simply fill in the fields in the model number sequence given below. Each field is numbered and information on completing a specific field can be found in the sections which follow.

-30 - - X - R
① ② ③ ④

Remember that all MS4600 three-box systems include the following components with the features listed below:

- **Controller:** Two force-guided, safety relay outputs; one auxiliary relay output; exact channel select; floating blanking; MPCE monitoring; two-digit diagnostic display; quick disconnect transmitter and receiver cables; quick disconnect connections for power and safety outputs (optional); IP65 metal enclosure with hasp for user supplied lock.
- **Transmitter and Receiver (coverage height specified below):** 1.2 inch (30 mm) resolution; Individual Beam Indicators on receiver; quick-disconnect, in-line cable connections; adjustable mounting brackets.
- **Cables (length specified below):** Quick-disconnect connections on both ends.

① Information required. Indicates presence or absence of a run/start switch or a connector for user to wire a remote run/start switch.

Designator	Description
MS46TB	Run/Start switch not supplied.
MS46TBK	Lid-mounted run/start switch installed.

② Information required. Represents coverage heights of the light curtain in millimeters.

Designator	Coverage Height
150	159 mm (6.3 in.)
300	309 mm (12.2 in.)
450	459 mm (18.1 in.)
600	609 mm (24.0 in.)
750	759 mm (29.9 in.)
900	909 mm (35.8 in.)
1050	1059 mm (41.7 in.)
1200	1209 mm (47.6 in.)
1350	1359 mm (53.3 in.)
1500	1509 mm (59.4 in.)
1650	1659 mm (65.3 in.)
1800	1809 mm (71.2 in.)

③ Information required. Represents transmitter (X) and receiver (R) cable length. Designators and descriptions are given below.

Designator	Description
5	5 m (17 ft.)
10	10 m (33 ft.)
15	15 m (49 ft.)
30	30 m (99 ft.)

Note: Quick disconnect connectors for power and safety outputs are available (optional).



For information on safety light curtain accessories, see page D184

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Go to the Engineering Guide
For in-depth information on safety standards and use.

■ Safety Standards and Precautions

All models of the MiniSafe meet ANSI/RIA R15.06-1999, ANSI B11.19-2003. When used with mechanical power presses, OSHA industrial safety standards apply, as stated in 1910.217(c). For other applications, the machine guarding requirements found in section 1910.212 apply. The MiniSafe meets ANSI control reliability requirements for point-of-operation presence sensing devices. All controllers have CSA-CUS acceptance and are designed to meet UL508.

MiniSafe systems employing controllers have been EC type examined to the requirements of category 4, EN 954-1 (type 4, IEC 61496).

The MiniSafe should only be used on machinery that can consistently and immediately stop anywhere in its cycle or stroke. Never use a MiniSafe on a full revolution clutched power press or machine. If the light curtain does not protect all access to the point of operation, the unprotected access must be guarded by other appropriate devices such as mechanical guards.

The purchaser, installer and employer have the responsibility to meet all local, state and federal government laws, rules, codes or regulations relating to the proper use, installation, operation and maintenance of this control and the guarded machine. See the Installation and Operation Manual for additional information.

All application examples described are for illustration purposes only. Actual installations will differ from those indicated.

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