

# Perimeter Access Guarding BeamSafe® II



Rev. 8.12

## Long-Range, Single-Beam Safety Control

- 60 m (200 ft.) range
- Four possible transmit codes eliminate crosstalk from multiple units in the same area
- Signal strength indicator and integral “Gun Sight” allow easy installation
- No interconnecting cables required, which speeds long-range installations
- Adjustable mounting brackets allow easy alignment
- Three models available:
  - Relay output with 24 VDC power input
  - Relay output with 85 to 250 VAC power input
  - Solid-state output with 24 VDC power input
- Switch-selected Automatic Start or Start/Restart Interlock operation
- Lens heater
- Designed in accordance with IEC61496, EN954-1 and ANSI B11.19-2003



Shown here with optional quick-disconnect cable kit.

## Specifications

Performance	
Protected Height:	Single Beam
Operating Range:	0.3 to 60 m (1 to 200 ft.)
Beam Diameter:	31 mm (1.2 in.)
Maximum Response Time:	<0.035 seconds for all models
DC Models Input Power:	24 V ±10% (negative ground)
	Receiver/Relay Output: 0.45 A Max
	Receiver/SS Output: 0.80 A Max
AC Models Input Power: 100 to 230 VAC ±10%, 50/60 Hz;	Transmitter: 0.17 A Max
	Receiver 115 VAC: 16 VA
	Receiver 230 VAC: 25 VA
Effective Aperture Angle:	Transmitter 115 VAC: 10.5 VA
	Transmitter 230 VAC: 20 VA
Frequency Selection:	2.5° maximum half angle
Diagnostics:	4 non-interfering codes, all models
Output:	Built-in diagnostic indicators
	Relay Output Version: Two relays with force-guided contacts, NO rated 4 A at 115 VAC, 200 W switched power (2.0 kVA). DC Loads are limited to 100 V maximum. Estimated mechanical life is 50,000,000 operations. Electrical life is typically 1,000,000 operations at 200 VA.
	Auxiliary Monitoring Relay: 400 V AC/DC maximum, 0.1 A; total power 180 mW maximum.
Construction:	Solid-State Output Version: Two safety solid-state relay outputs. Each output sources (PNP) up to 0.25 A at 24 VDC.
	Polyester powder-painted aluminum body. Anodized aluminum end-caps.
Operating Temperature:	0 to 55°C (32 to 131°F)
Protection Category:	IP65; NEMA 4
Agencies:	Designed in accordance with IEC 61496, type 4 and UL/CSA requirements.

Specifications are subject to change without notice.



File No. LR90200

## Description

The BeamSafe II is a long-range single-beam safety control designed for perimeter and access guarding. “Diverse redundant” microprocessor design provides safe, control reliable operation.

A BeamSafe II system consists of one transmitter and one receiver. No interconnecting cables or separate control enclosure are required. Mounted on the receiver, four separate visible indicators provide instant information on system clear, blocked or interlocked status as well as signal strength. Additional diagnostic indicators on the receiver provide codes to assist with troubleshooting. Output options include redundant solid-state or force-guided relays located in the receiver.

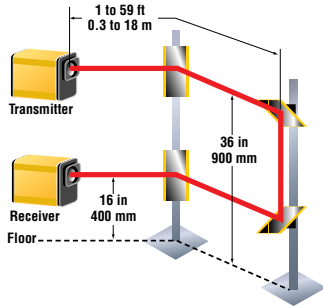
Immunity to weld flash and ambient light are enhanced by coding the infrared beam. This feature also eliminates interference from other BeamSafe II units installed in close proximity. A tight beam angle reduces problems associated with reflective surfaces. The BeamSafe II's built-in lens heater is effective in environments where condensation may form on the transmitter or receiver lens.

## Applications

(mm/in.)

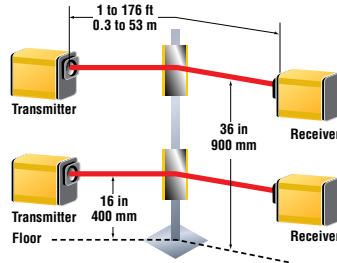
### Perimeter Guarding

Shown here with one transmitter and receiver. Mirrors are used to form two beams and also turn corners.



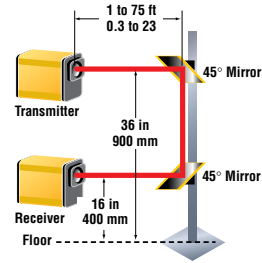
### Long-Range Perimeter Guarding

Two transmitter/receiver pairs using two mirrors and Omron STI mounting stands to direct the beam around a corner.



### Double Bounce

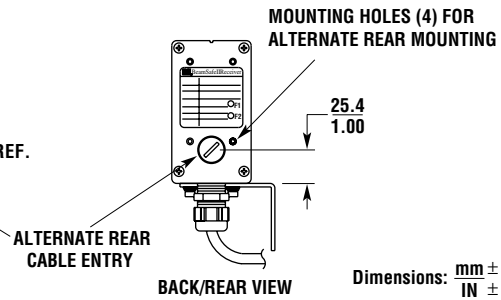
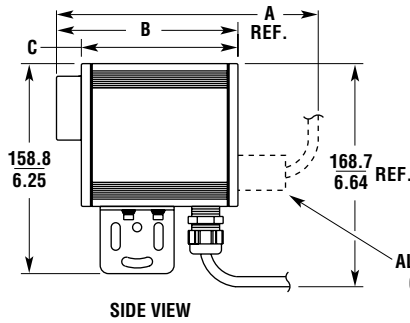
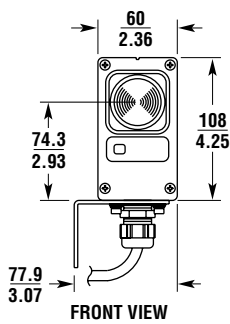
This configuration guards access to hazardous work cells. One transmitter and receiver combined with two Omron STI 4 in. mirrors and mounting brackets.



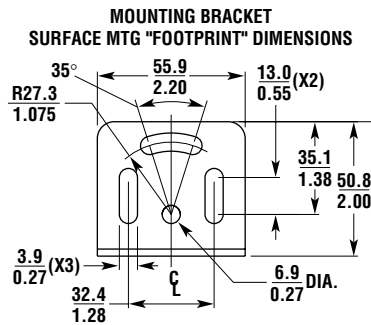
## Dimensions

(mm/in.)

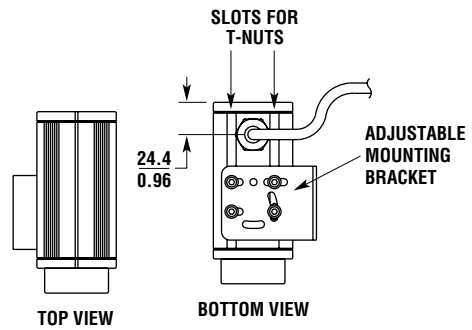
### BeamSafe II, Relay Output Version



Dimensions: mm ± 0.25  
IN ± 0.01



BeamSafe II, Relay Output Version Unit Length Dims	A	B	C
AC Receiver	239.6 9.44	178.9 7.05	160.1 6.31
AC Transmitter	197.7 7.79	137.2 5.40	118.4 4.66
DC Receiver	197.7 7.79	137.2 5.40	118.4 4.66
DC Transmitter	197.7 7.79	137.2 5.40	118.4 4.66

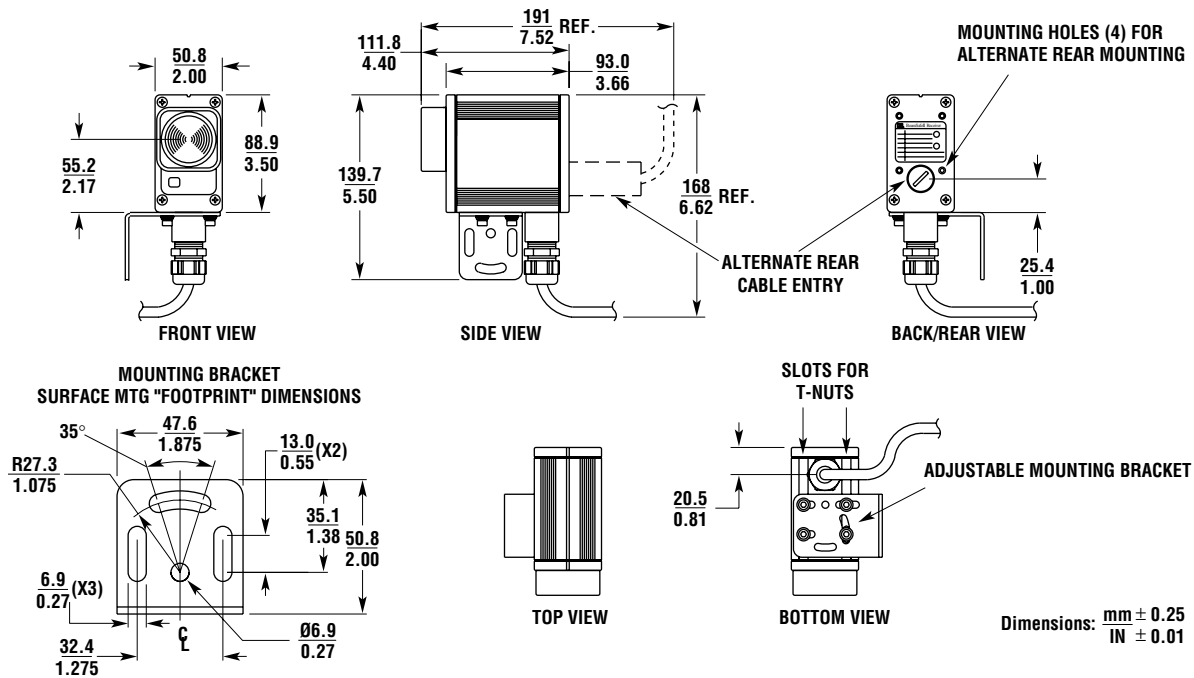


Dimensions (continued)

(mm/in.)

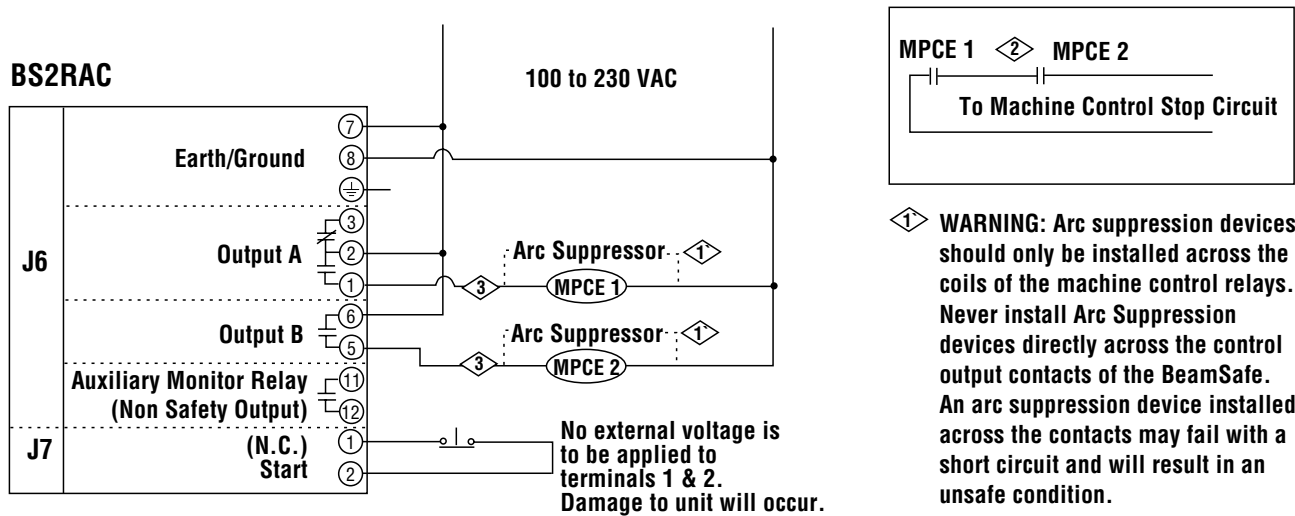
BeamSafe II,  
Solid-State Output Version, Transmitter and Receiver

This drawing is available in CAD format at [www.sti.com](http://www.sti.com)



Wiring

Two Normally Open Contacts AC Voltage Connections



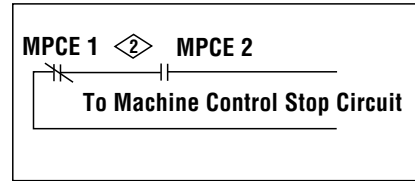
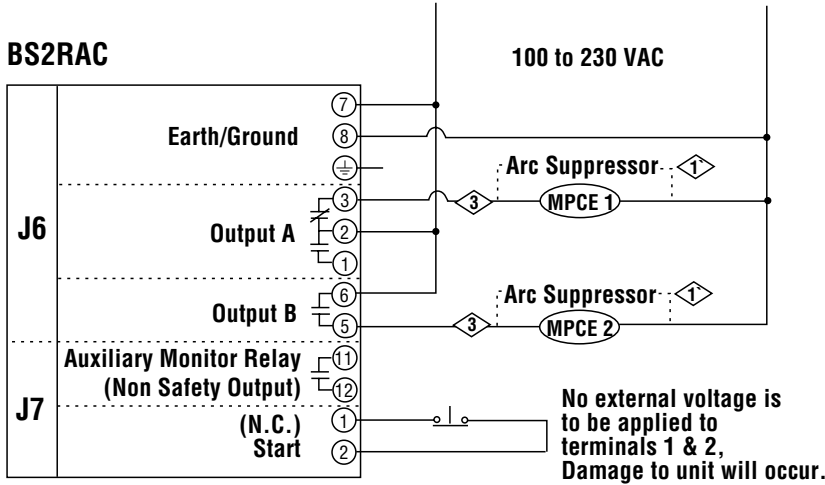
**1** **WARNING:** Arc suppression devices should only be installed across the coils of the machine control relays. Never install Arc Suppression devices directly across the control output contacts of the BeamSafe. An arc suppression device installed across the contacts may fail with a short circuit and will result in an unsafe condition.

**2** These relay contacts must be force-guided contacts.

**3** User supplied over current protection, 4A max.

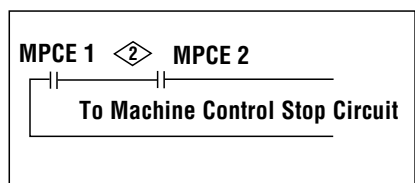
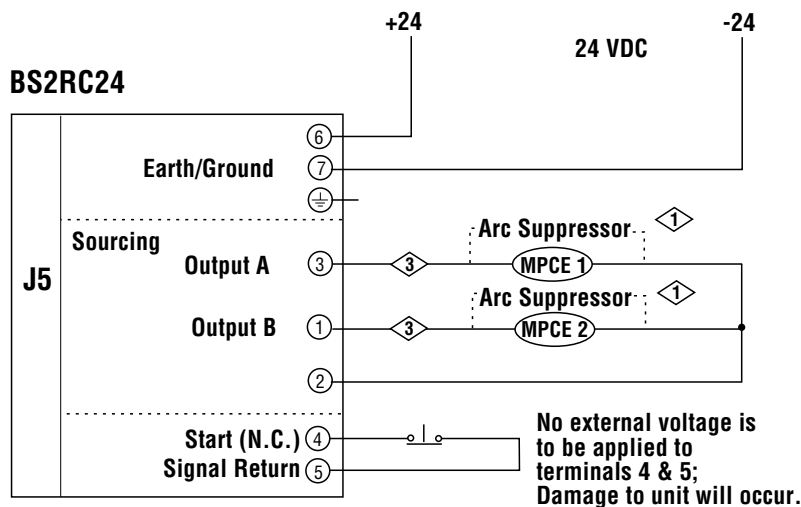
## Wiring (continued)

### Normally Open/Normally Closed Connection Diagram



- ① **WARNING:** Arc suppression devices should only be installed across the coils of the machine control relays. Never install Arc Suppression devices directly across the control output contacts of the BeamSafe. An arc suppression device installed across the contacts may fail with a short circuit and will result in an unsafe condition.
- ② These relay contacts must be force-guided contacts.
- ③ User supplied over current protection, 4A max.

### Two Normally Open Contacts DC Voltage Connections (Solid-State Output Model)



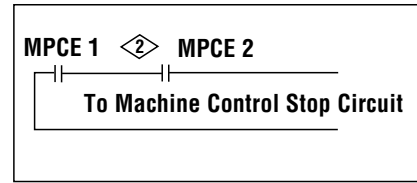
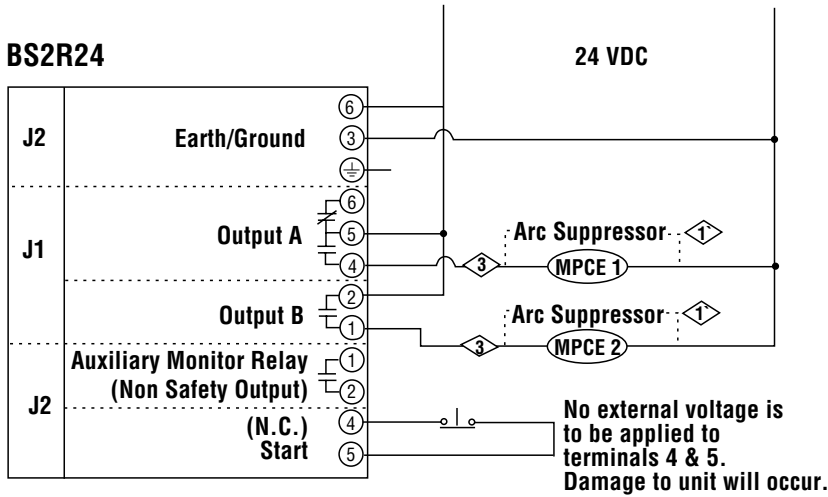
- ① **WARNING:** Arc suppression devices should only be installed across the coils of the machine control relays. Never install Arc Suppression devices directly across the control output contacts of the BeamSafe. An arc suppression device installed across the contacts may fail with a short circuit and will result in an unsafe condition.
- ② These relay contacts must be force guided contacts.
- ③ If load is less than 50 mA a resistor must be installed across the load.

C

Wiring (continued)

(mm/in.)

Two Normally Open Contacts 24 VDC Voltage Connections



- ⚠ **WARNING:** Arc suppression devices should only be installed across the coils of the machine control relays. Never install Arc Suppression devices directly across the control output contacts of the BeamSafe. An arc suppression device installed across the contacts may fail with a short circuit and will result in an unsafe condition.
- ② These relay contacts must be force-guided contacts.
- ③ User supplied over current protection, 4A max.

C

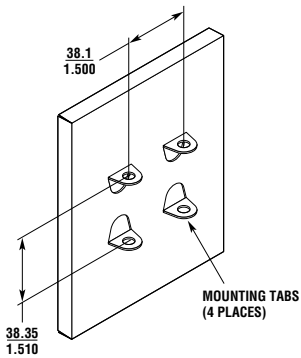
Accessories

(mm/in.)

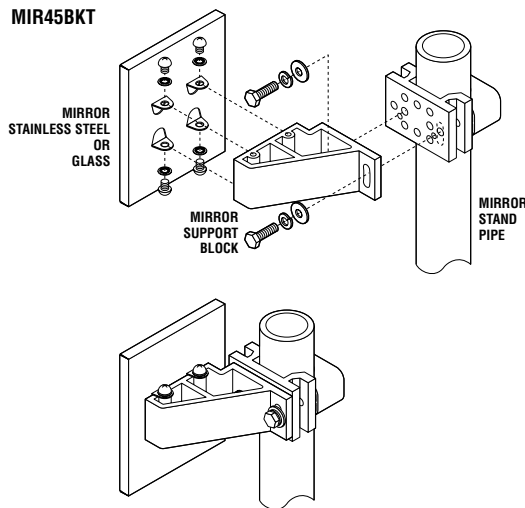
Front Surface Glass or Stainless Steel Mirror

Brackets

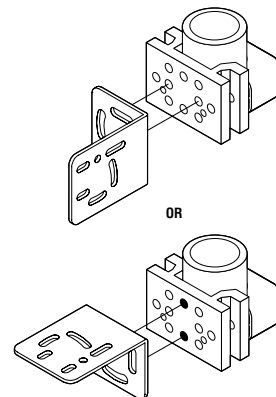
MIR45-FG and MIR45-SS



MIR45BKT



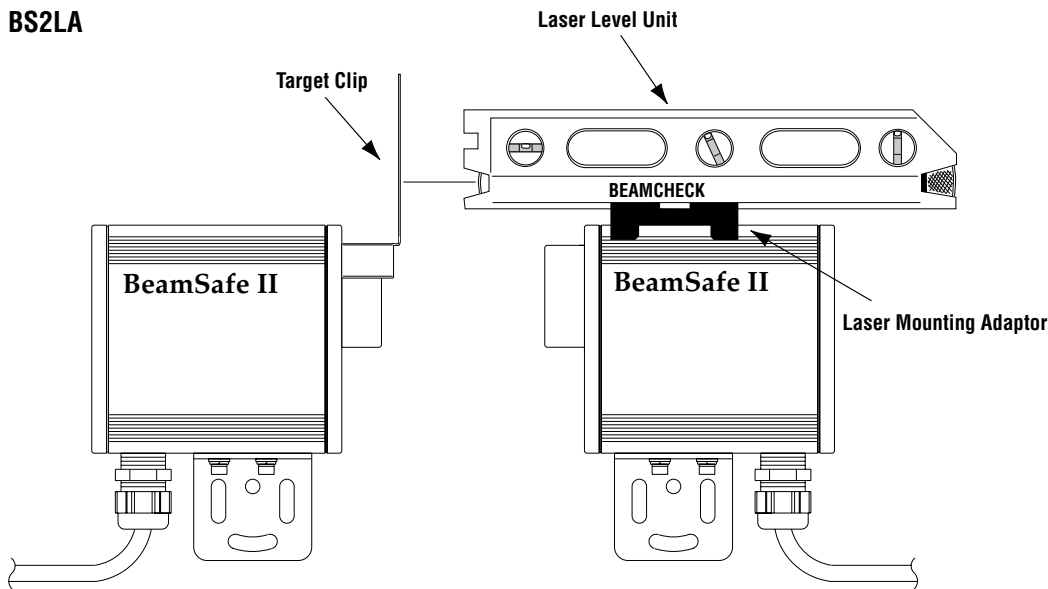
BSMK



Accessories

Laser Alignment Tool

BS2LA



Ordering


Model No.	Description
BS2X24	Transmitter, 24 VDC
BS2XAC	Transmitter, 85 to 250 VAC, 50/60 Hz
BS2XC24	Transmitter, 24 VDC, Compact Size (This is not compatible with QDX and QDR series connectors)
BS2R24	Receiver, 24 VDC, Relay Output
BS2RAC	Receiver, 85 to 250 VAC, 50/60 Hz, Relay Output
BS2RC24	Receiver, 24 VDC, Compact Size, Solid-state Output (This is not compatible with QDX and QDR series connectors)
Accessories	
MIR45-FG	4 in. mirror for use with MIR45BKT-Front Surface Glass
MIR45-SS	4 in. mirror for use with MIR45BKT-Stainless Steel
MIR45BKT	Bracket for mounting above mirrors at 45° angles for use in "double bounce" applications (kit mounts one mirror)
BSMK	Bracket kit. Allows mounting of one BeamSafe II transmitter and one BeamSafe II receiver to Omron STI mounting stands
MIRS-04	4 ft. stand for mounting mirrors and BeamSafe II units
MIRS-06	6 ft. stand for mounting mirrors and BeamSafe II units
QDR-12	12 ft., 12-conductor receiver cable, with quick-disconnect socket
QDR-20	20 ft., 12-conductor receiver cable, with quick-disconnect socket
QDR-35	35 ft., 12-conductor receiver cable, with quick-disconnect socket
QDX-12	12 ft., 3-conductor transmitter cable, with quick-disconnect socket
QDX-20	20 ft., 3-conductor transmitter cable, with quick-disconnect socket
QDX-100	100 ft., 3-conductor transmitter cable, with quick-disconnect socket
BS2LA	Laser Alignment Tool

Safety Standards and Precautions

The BeamSafe II meets applicable OSHA, ANSI and RIA standards and was designed in accordance with IEC61496, DIN EN 50100 and EN 954-1.

Only use the BeamSafe II on machinery that stops consistently and immediately anywhere in its cycle or stroke. Never use a BeamSafe II on a full-revolution clutched press or machine. The BeamSafe II is a single optical beam, not a curtain of light. Therefore it is not designed for use as a point-of-operation device. If one or more BeamSafe II systems do not protect all access to the hazardous machine area, the unprotected access must be guarded by fencing, barriers or other appropriate methods.

The purchaser, installer and employer are responsible for meeting all appropriate laws, rules and regulations relating to the proper use, installation, operation and maintenance of this control and the guarded machine.

 For information on safety light curtain accessories, see page D74

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