

Safety Light Curtains

Perimeter Access Control



Description

Multi-beam safety light curtains from Rockwell Automation are infrared protection devices with 1 to 4 infrared beams. They operate on the through-beam principle, consisting of a sender and receiver unit and are suitable for access control and perimeter guarding.

The PAC fulfils the pr EN 50100 requirements, safety category 4, in that it is a self monitoring device.

- Integrated evaluation with state-of-the-art electronics and especially developed ICs (ASICs)
- Beam coding for high interference immunity
- Actively monitored semiconductor outputs
- Mini style quick disconnect connectors
- Fast response time
- Large signal reserve (factor 2)
- Optical synchronization of sender and receiver units
- Multiple safeguarding by means of corner mirrors and columns
- Operating modes:
 - Electronic Device Monitoring (EDM)
 - Restart Interlock
- Muting configuration available

The devices were designed for industrial applications and offer the following advantages:

- Beam coding for optimal interference immunity
- Adaptability for safe PLC
- Robust modular construction
- Universal application possibilities
- Simple installation

Maximum scanning range	70m
Maximum beam gap	500mm
Minimum beam count	1 beam
Maximum beam count	4 beams
Minimum housing length	320mm
Maximum housing length	1800mm

Specifications

Standards	EN 50100
Approvals	BG and CE marked for all applicable directives
Protected Height	Depends on product selection
Scanning Range	70m (225ft), single beam PAC 7.5m
Beam Gap	Depends on product selection
Enclosure Rating	IP 65
Connection Type	7-pin mini style on transmitter and 8-pin on receiver
Supply Voltage U_v Maximum Residual Ripple	24V DC \pm 20% 5 Vss
Power Consumption	7 watts—Transmitter 6 watts—Receiver
Synchronization	Optical, without separate synchronization channel
Outputs Minimum output voltage	2 x PNP, 0.5 A, short circuit protected $U_v - 2V$
Response Time	≤ 20 ms
Protection	Short circuit and overload
Connection Max. wire cross section	1.0mm ² with jacket 1.5mm ² without jacket
Cable length	60m (196.8ft) maximum Protection against over-voltage (≥ 1 kV) from Level 3 or higher (IEC 801 part 5; 2 kV) between PE and +V.
Mode of Operation	Guard-only with manual restart
Safety Category	Type 4 (self-checking)
Requirement	According to EN 50100
Operating Ambient Temp.	0°C to 55°C (32°F to 131°F)
Air Humidity	15%..95% (not condensing)
Storage Temperature	-25°C to 70°C (-13°F to 158°F)
Approximate Dimensions Height	Length dependent upon protected height; (see dimensional drawings)
Housing Cross Section	52 mm x 55 mm (2.05in x 2.17in)

Product Selection

1a. Multiple-Beam PAC

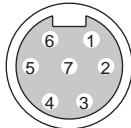
The Allen-Bradley Guardmaster PAC multiple beam safety light curtains are ordered as pairs—transmitter and receiver—and shipped under one part number. After selecting the appropriate light curtain pair, ensure that required interfaces and accessories are ordered as well. The single-beam PAC can be ordered with a passive mirror column (**440L-AMIRSTDZ500**) or two right angle mirrors (**440L-AMIRR2**).

Non muting Models				Muting Models			
Size mm (inches)	Beam Spacing mm	Number of Beams	Catalogue Number	Size mm (inches)	Beam Spacing mm	Number of Beams	Catalogue Number
684 (27)	500	2	440L-P4H2500-N	684 (27)	500	2	440L-P4H2500M-N
600 (24)	220	3	440L-P4H3220-N	600 (24)	220	3	440L-P4H3220M-N
1000 (40)	400	3	440L-P4H3400-N	1000 (40)	400	3	440L-P4H3400M-N
534 (21)	120	4	440L-P4H4120-N				

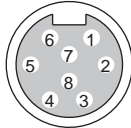
1b. Single-Beam PAC (Note: Maximum scanning range is 7.5 meters.)

Non muting Models				Muting Models			
Size mm (inches)	Beam Spacing mm	Number of Beams	Catalogue Number	Size mm (inches)	Beam Spacing mm	Number of Beams	Catalogue Number
684 (27)	500	1	440L-P4G1500-N	684 (27)	500	1	440L-P4G1500M-N
Required mirror unit			440L-AMIRSTDZ500	Required mirror unit			440L-AMIRSTDZ500

2a. Cordsets—Required—PAC Transmitter

Female Connector		Cable			Catalogue Number
Face View of Female	Connector Style	Pin Wire Colour	Wire Rating	Length—m (ft)	
PAC Transmitter 	Straight	1 Black 2 White 3 Blue 4 Brown 5 Grey 6 Yellow 7 Green	(5)/18AWG (2)20AWG 300V 3A	2 (6.5)	889N-F7AG-2
				5 (16.4)	889N-F7AG-5
				10 (32.8)	889N-F7AG-10
				15 (49.2)	889N-F7AG-15
				20 (65.6)	889N-F7AG-20
				30 (98.4)	889N-F7AG-30

2b. Cordsets—PAC Receiver and PAC Single Beam

Female Connector		Cable			Catalogue Number
Face View of Female	Connector Style	Pin Wire Colour	Wire Rating	Length—m (ft)	
PAC Single Beam and PAC Receiver 	Straight	1 Red 2 White 3 Blue 4 Brown 5 Grey 6 Yellow 7 Green 8 Pink	18AWG 300V 3A	2 (6.5)	889N-F8AE-2
				5 (16.4)	889N-F8AE-5
				10 (32.8)	889N-F8AE-10
				15 (49.2)	889N-F8AE-15
				20 (65.6)	889N-F8AE-20
				30 (98.4)	889N-F8AE-30


Presence Sensing Safety Devices

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3a. Safety Relay Interfaces—Required


	Input Voltage	Reset	Floating Blanking	Fixed Blanking	PSDI	Muting	Outputs	More Details	Catalogue Number
	24V DC	Manual/ Automatic	no	no	no	no	4 amp 2 N.O. Safety 1 N.C. Aux.	58	440L-M8200

3b. Safety Relay Interfaces—Optional


Relay	Input	Safety Outputs	Auxiliary Outputs	Terminals	Power Supply	Reset	Catalogue Number					
 MSR127RP	1NC, 2NC, or Light Curtain	3 N.O.	1 N.C.	Removable	24V AC/DC	Automatic/Manual	440R-N23132					
						Monitored Manual	440R-N23135					
					115V AC	Automatic/Manual	440R-N23131					
						Monitored Manual	440R-N23134					
					230V AC	Automatic/Manual	440R-N23130					
						Monitored Manual	440R-N23133					
 MSR126	Light Curtain or Single Channel (MSR126T)	2 N.O.	None	Fixed	24V AC/DC	Automatic/Manual	440R-N23117					
					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)				230V AC	2 N.O.	None	Fixed	24V AC/DC	Monitored Manual	440R-N23123	
											115V AC	440R-N23122
											230V AC	440R-N23121
											24V AC/DC	440R-N23120
											115V AC	440R-N23119
											230V AC	440R-N23118
 MSR131RTP	Light Curtain or Safety Mat	3 N.O.	2 N.C. 2 PNP Solid State	Removable	24V AC/DC	Automatic/Manual or Monitored Manual	440R-C23139					
					115V AC		440R-C23137					
					230V AC		440R-C23136					

Product Selection







4. Safety Relay Interfaces—Optional (Used for muting applications)

Relay	Input Voltage	Reset	Floating Blanking	Fixed Blanking	PSDI	Muting	Outputs	More Details	Catalogue Number
 MSR22LM	24V DC	Manual	no	no	yes	yes	2 N.O. Safety 1 N.C. Aux.	4-21	440R-P23071

5. Power Supply

	Description	Catalogue Number
	Power supply: Input—93...265V AC Output—24V DC, 3 Amps	1794-PS3

6. Accessories—Optional

	Description	Catalogue Number
	L-Mounting bracket, fixed (4 per package)	440L-AF6102 (1 package per system)
	Mounting bracket, adjustable (4 per package)	440L-AF6103 (1 package per system)
	Mounting bracket, adjustable with shock mount (4 per package)	440L-AF6104 (1 package per system)
	Laser alignment aid	440L-ALAT
	SafeShield adaptor for laser alignment aid	440L-ALBRK
	Sliding nut kit (4 included)—Supplied with PAC	440L-AF6105
	Muting lamp with 2m cable	440L-AMUTLP2M
	Muting lamp with 10m cable	440L-AMUTLP10M

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7. Accessories—Mirrors and Mounting Columns

Corner Mirror

Specially constructed mirrors for 2 and 3 sided safeguarding applications. **NOTE:** Each mirror reduces maximum scan range by 10% per mirror.

	For PAC Models	Catalogue Number
	2 Beam 500mm beam spacing	440L-A2MIRSTND
	3 Beam 400mm beam spacing	440L-A3MIRSTND
Mirror mounting shims		440L-ASHIM

Mounting Columns

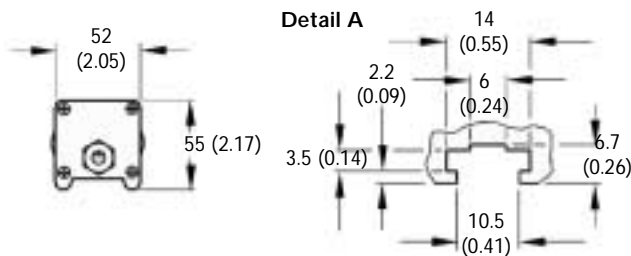
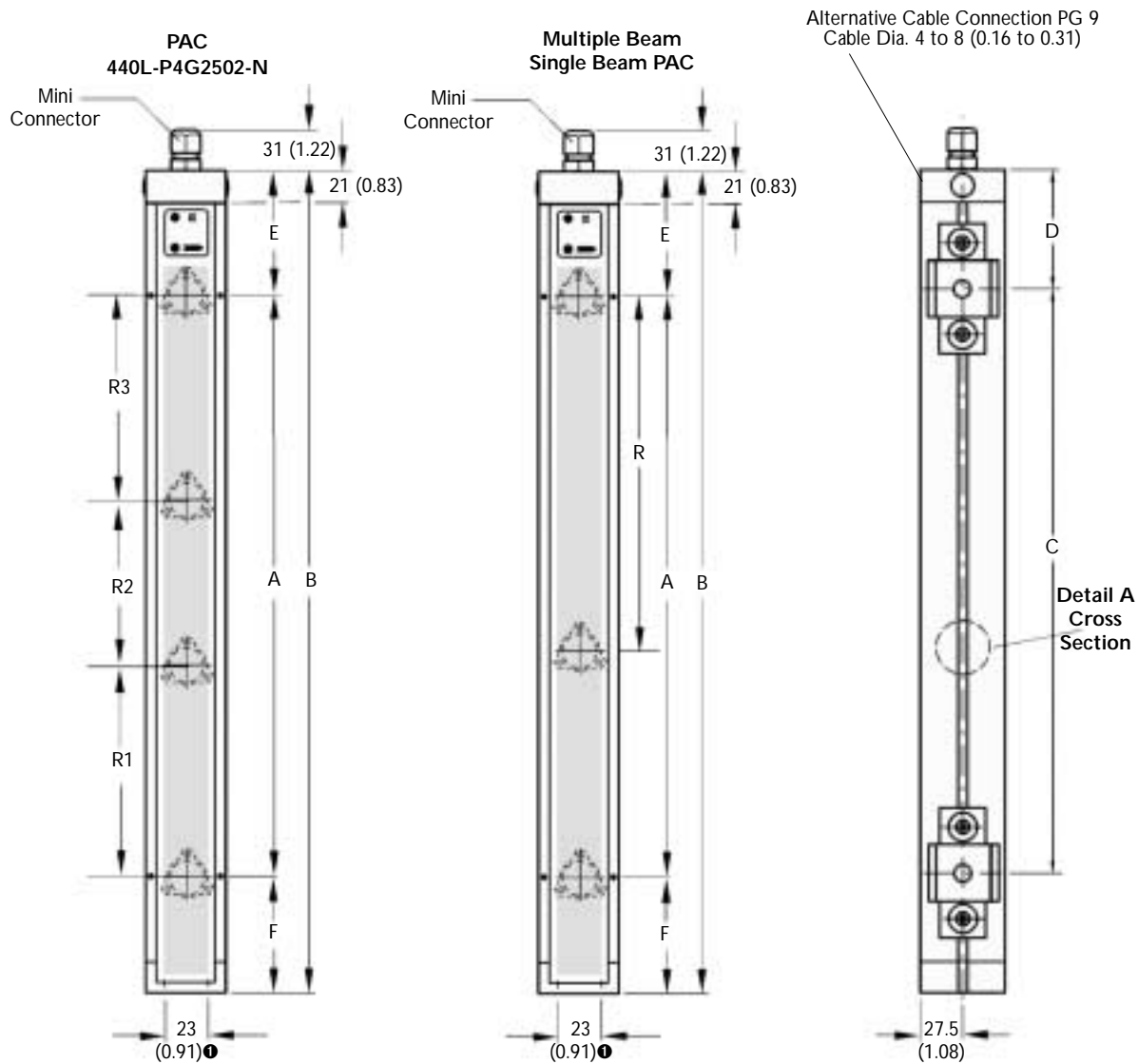
	Description	Catalogue Number
	Floor mounted column for 2 beam PAC 500mm beam spacing	440L-AMTSTND2B
	Floor mounted column for 3 beam PAC 400mm beam spacing	440L-AMTSTND3B
	Floor mounted column for 2 beam PAC column with muting lamp 500mm beam spacing	440L-AMUTSTDLP2B
	Floor mounted column for 3 beam PAC column with muting lamp 400mm beam spacing	440L-AMUTSTDLP3B

Muting Sensors

Sensor	Connection Location	Type	Catalogue Number
Transmitted Beam	Transmitter (powered from an external supply)	Dark Switching	42GRL-9000-QD ^②
	Receiver (connected directly to the muting module or 8100)		42GRR-9000-QD ^{①②}
Retroreflective	Connected directly to muting module or 8100		42GRU-9000-QD ^{①②}
	3 inch standard reflector		92-39
Polarized Retroreflective	Connected directly to muting module or 8100		42GRU-9200-QD ^{①②}
	3 inch standard reflector		92-39
Mechanical Limit Switch	Connected directly to muting module or 8100 (Operating Lever must be selected separately.)		802M-NX10 ^{①②}
			889D-F3ACDM-5
^① Use with 4-pin, 3-wire DC Micro patchcord when connecting to muting module (5m length shown). 1m, 2m, 3m, and 5m lengths available, catalogue number 889D-F3ACDM-*. Where * = length in meters.			889D-F4AC-5
^② Recommended cordset. when connecting to the 440L-M8100. Five meter length shown, other lengths available, see page 15-10 of this catalogue.			

Approximate Dimensions—mm (inches)

Approximate Dimensions are not intended to be used for installation purposes.



① With respect to centre of housing

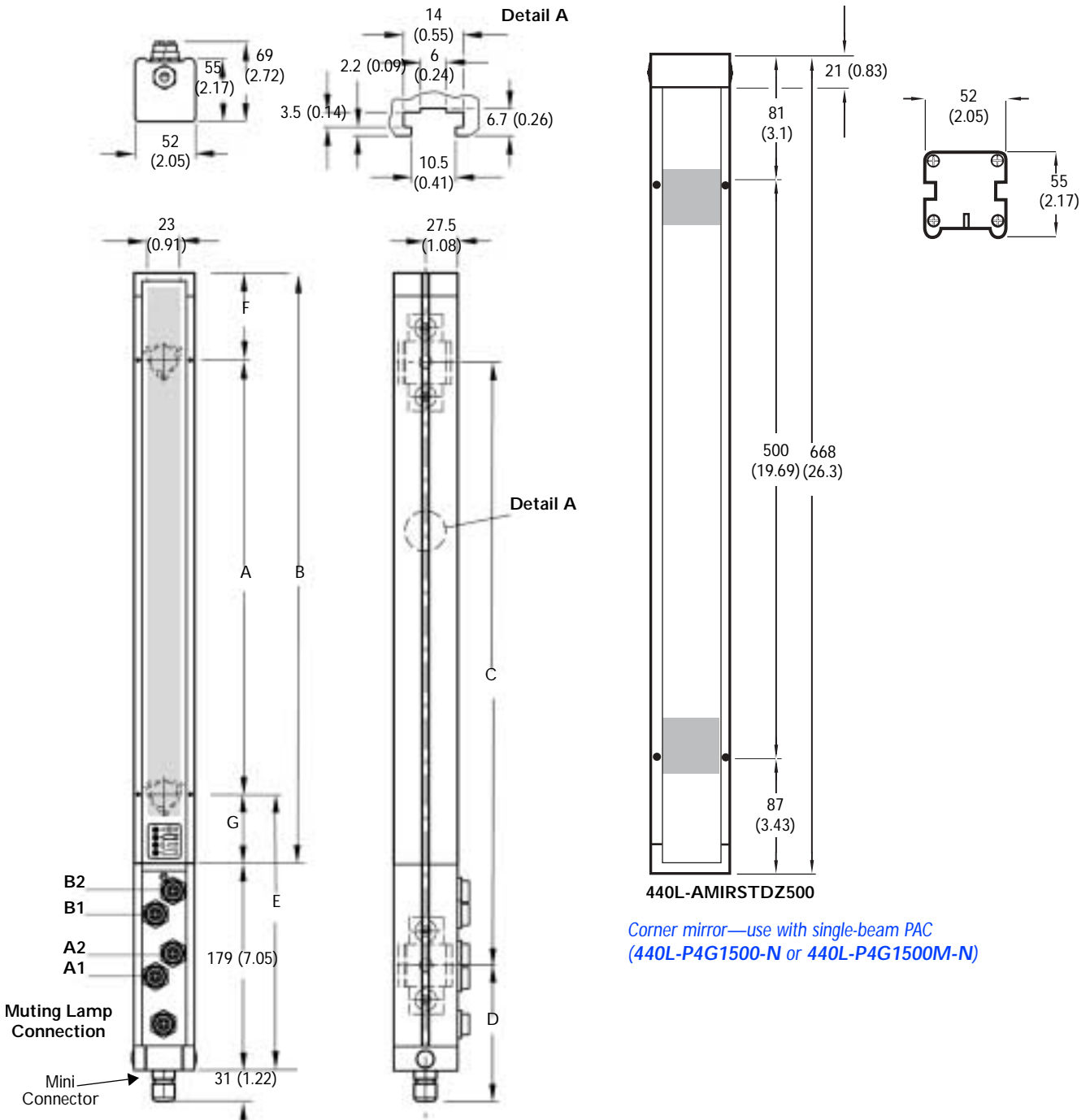
440L	A	B	C	D	E	F	R
T4H-2500-N	500	684	524	80	107	77	500
T4H-3220-N	440	597	437	80	107	50	220
T4H-3400-N	800	985	825	80	107	78	400
T4H-4120-N	360	534	374	80	107	67	120
PAC single beam P4G 1500-N	500	684	524	80	97	87	500

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Approximate Dimensions—mm (inches) (continued)

Approximate Dimensions are not intended to be used for installation purposes.



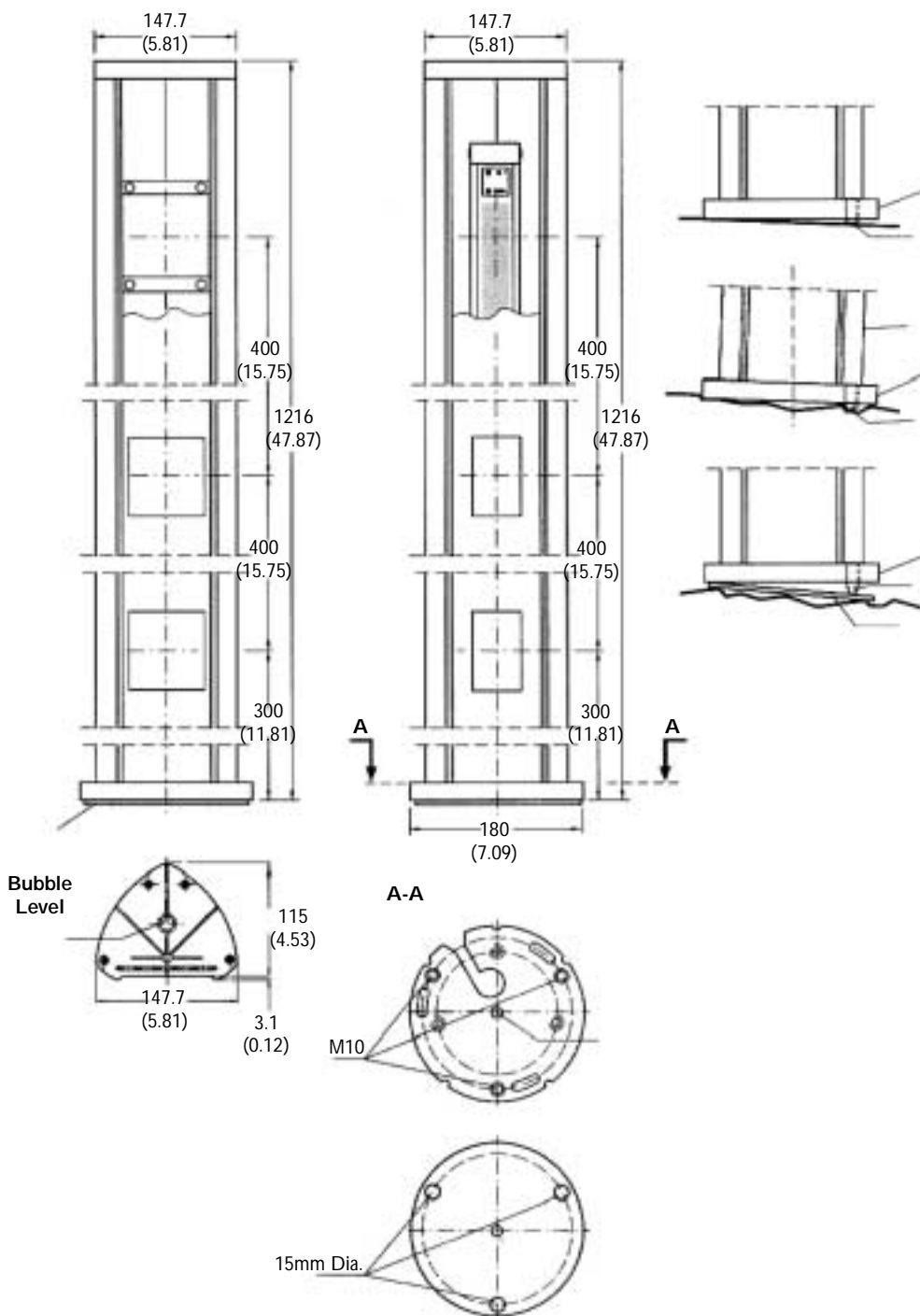
440L-AMIRSTDZ500

Corner mirror—use with single-beam PAC
(440L-P4G1500-N or 440L-P4G1500M-N)

	A	B	C	D	E	F	G
440L-R4H 2500M-N	500	663	524	80	265	77	86
440L-R4H 3220M-N	440	576	437	80	265	50	86
440L-R4H 3400M-N	800	964	825	80	265	78	86
440L-R4H 1500M-N	500	663	524	80	255	87	76

Approximate Dimensions—mm (inches) (continued)

Approximate Dimensions are not intended to be used for installation purposes.



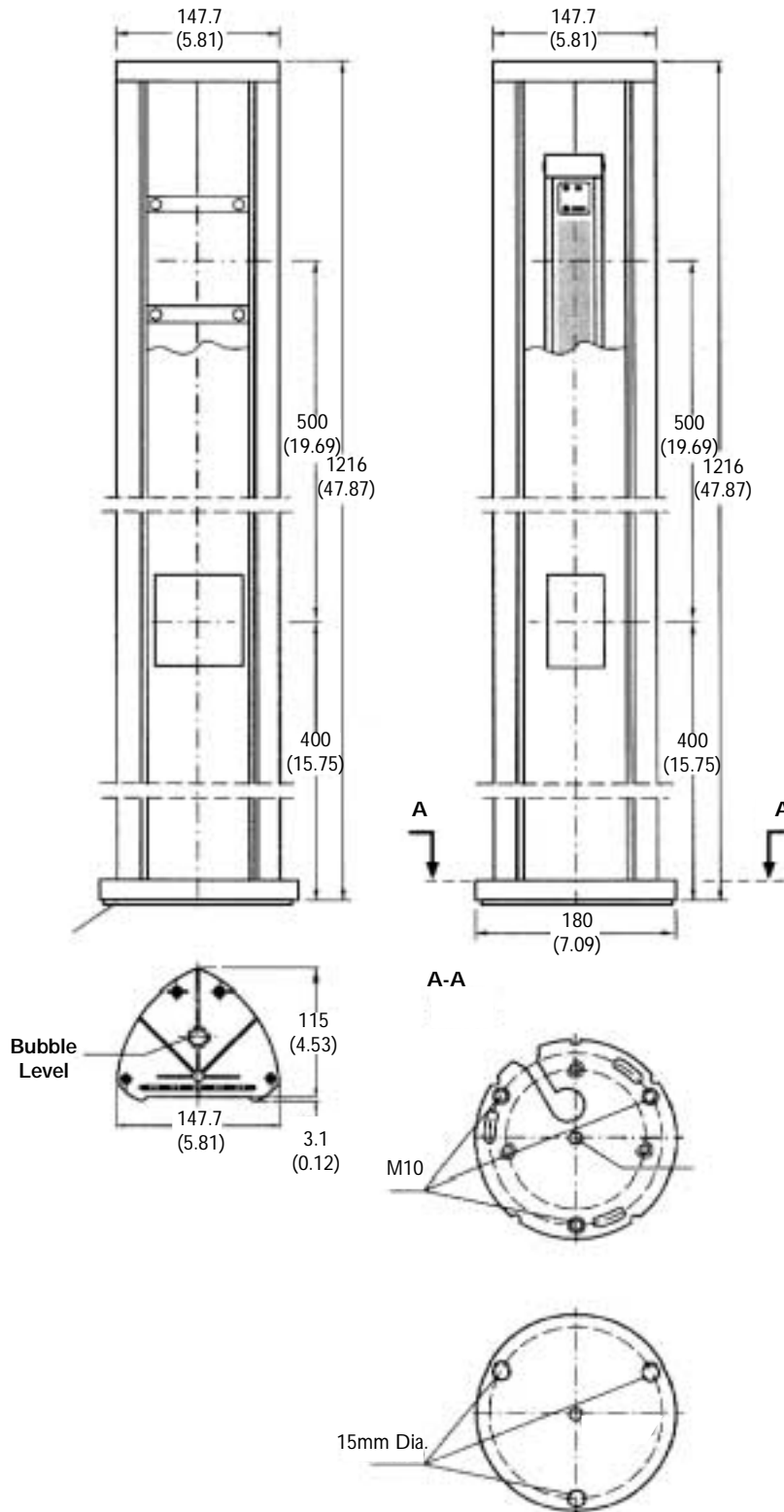
Mounting the mirror columns—column 400

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Approximate Dimensions—mm (inches) (continued)

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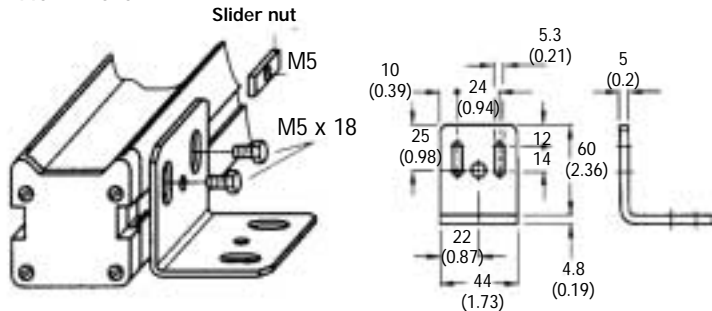


Mounting the mirror columns—column 500

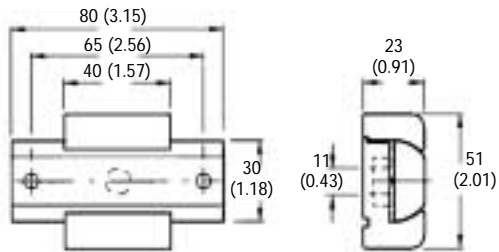
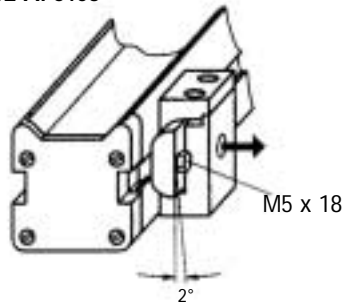
Approximate Dimensions—mm (inches) (continued)

Approximate Dimensions are not intended to be used for installation purposes.

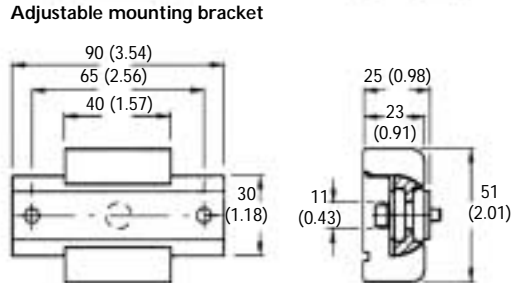
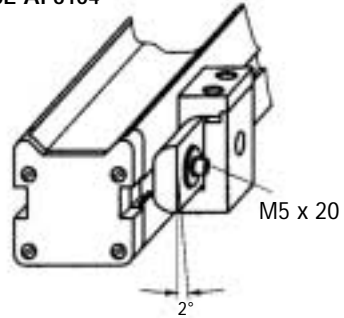
440L-AF6102



440L-AF6103



440L-AF6104



Adjustable mounting bracket

Adjustable bracket with shock mount 4 required

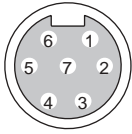
Attachment to machine

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Typical Wiring Diagrams

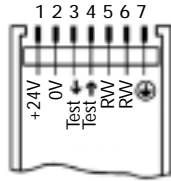
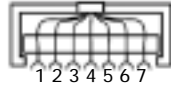
7-pin connector



Pin	Color
1	Black
2	White
3	Blue
4	Brown
5	Grey
6	Yellow
7	Green

Connection Terminal

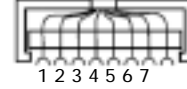
Transmitter unit



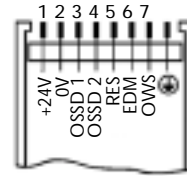
NC = No Connection

Receiver unit and single-beam PAC

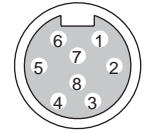
Connection Terminal



- 1 Red
- 2 White
- 3 Blue
- 4 Brown
- 5 Grey
- 6 Yellow
- 7 Green
- 8 Pink

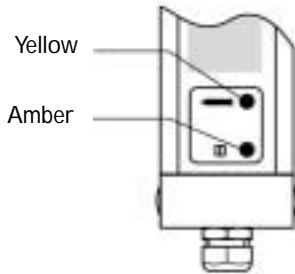


8-pin connector

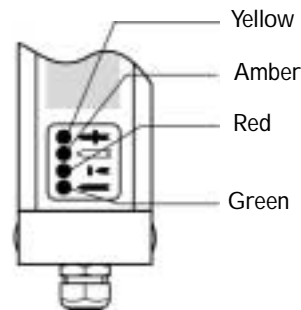


Pin	Color
1	Red
2	White
3	Blue
4	Brown
5	Grey
6	Yellow
7	Green
8	Pink

Transmitter



Receiver

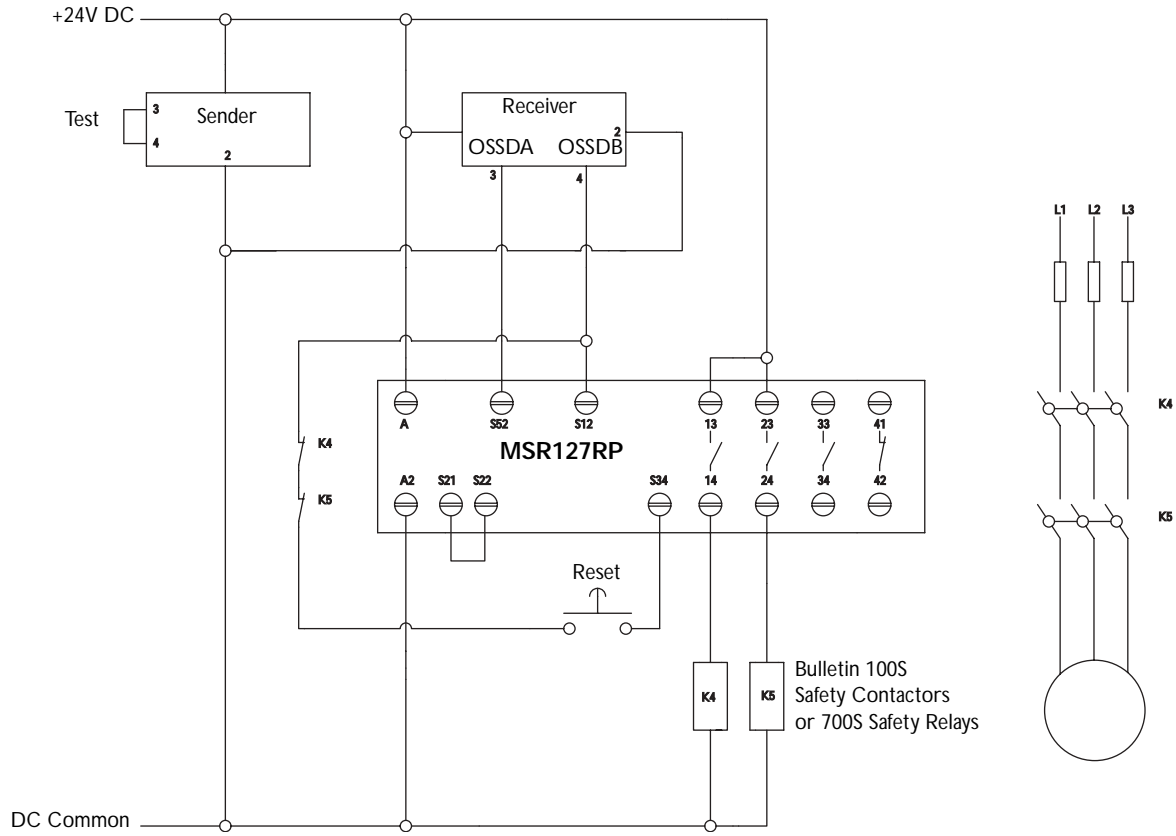


LED indicator

Transmitter		Receiver	
Yellow	sender range: high/low MCC test	Yellow	press restart switch
Amber	operating voltage is applied	Amber	contamination
		Red	outputs inactive
		Green	light beam unobstructed, outputs active

Typical Wiring Diagram

440L Light Curtain to 440R-N23135 (MSR127RP)



Note: For the 440L PAC unit, set the dip switches as follows:

SW 1, 5, 6, 7, 8 to "B"

SW 2, 3, 4 to "A"

The dip switches are accessed by removing the connection cap of the receiver unit. The sender unit will not need dip switch configuration if these receiver settings are used.