

Photoelectric Sensors/Controls

18 mm Cylindrical Photoelectric Sensors

CP18 Series

NEW
Wide
Voltage
AC/DC
and
Polarized
Scan



GENERAL INFORMATION

CP18 Series photoelectric sensors are designed for simple industrial and commercial applications that do not require heavy duty controls or sensitivity adjustments. The small package size of MICRO SWITCH CP18 Series photoelectric sensors fits in limited access and/or restricted space areas.

FEATURES

- 18 mm x 1 fully threaded housing
- Unique, one-piece polycarbonate lens/housing
 - Sealing rated to NEMA 4 (IP67)
- Short housings: DC – 55 mm, AC – 81 mm
- Thru-, retroreflective and diffuse scanning
- Scan ranges from 100 mm to 30 meters
- Modulated infrared LED for ambient light rejection
- Standard 2-meter prelead cable (AC or DC), or 4-pin DIN style
- Alignment indicator to facilitate installation
- 10 to 30 VDC and wide voltage 20 to 260 VAC (12 to 260 VDC)
- Fast response times: DC – 1 msec, AC – 10 msec
- High load capacity: DC – 150 mA, AC – 300 mA
- Protected against short circuit (DC), false pulse (on), reverse polarity (DC), industrial interference and transients

TYPICAL APPLICATIONS

- Conveyor control
- Jam detection
- Part count
- Part position
- Bin or hopper level control
- Packaging machinery
- Web break detection

ORDER GUIDE 10 to 30 VDC SENSORS

Scan Type	Output*	Scan Distance	Catalog Listings/Prelead Cable		Catalog Listings/Quick Disconnect	
			Light Operate	Dark Operate	Light Operate	Dark Operate
Diffuse	PNP	100 mm (3.94 in.)	CP18D1DPL2	CP18D1DPD2	CP18D1DPLC	CP18D1DPDC
	NPN		CP18D1DNL2	CP18D1DND2	CP18D1DNLC	CP18D1DNDC
	PNP	200 mm (7.87 in.)	CP18D2DPL2	CP18D2DPD2	CP18D2DPLC	CP18D2DPDC
	NPN		CP18D2DNL2	CP18D2DND2	CP18D2DNLC	CP18D2DNDC
	PNP	400 mm (15.74 in.)	CP18D4DPL2	CP18D4DPD2	CP18D4DPLC	CP18D4DPDC
	NPN		CP18D4DNL2	CP18D4DND2	CP18D4DNLC	CP18D4DNDC
Polarized	PNP	1.5 m (4.9 ft.)	CP18PDPL2	CP18PDPD2	CP18PDPLC	CP18PDPCDC
	NPN		CP18PDNL2	CP18PDND2	CP18PDNLC	CP18PDNDC
Retroreflective	PNP	4 m (13 ft.)	CP18LDPL2	CP18LDPD2	CP18LDPLC	CP18LDPCDC
	NPN		CP18LDNL2	CP18LDND2	CP18LDNLC	CP18LDNDC
Thru-scan Receiver	PNP	30 m (98 ft.)	CP18RDPL2	CP18RDPD2	CP18RDPLC	CP18RDPCDC
	NPN		CP18RDNL2	CP18RDND2	CP18RDNLC	CP18RDNDC
Emitter	—	—	CP18EDX2	—	CP18EDXC	—

ORDER GUIDE WIDE VOLTAGE 20 to 260 VAC (12 to 260 VDC) SENSORS

Scan Type	Scan Distance	Catalog Listings/Prelead Cable		Catalog Listings/Quick Disconnect	
		Light Operate	Dark Operate	Light Operate	Dark Operate
Diffuse	100 mm (3.94 in.)	CP18D1BAL2	CP18D1BAD2	CP18D1BALC	CP18D1BADC
	200 mm (7.87 in.)	CP18D2BAL2	CP18D2BAD2	CP18D2BALC	CP18D2BADC
	400 mm (15.74 in.)	CP18D4BAL2	CP18D4BAD2	CP18D4BALC	CP18D4BADC
Retroreflective	4 m (13 ft.)	CP18LBAL2	CP18LBAD2	CP18LBALC	CP18LBADC
Thru-scan Receiver	30 m (98 ft.)	CP18RBAL2	CP18RBAD2	CP18RBALC	CP18RBADC
Emitter	—	CP18EBX2 (Use only with AC receiver)		CP18EBXC (Use only with AC receiver)	

NOTICE

CP18 Series photoelectric sensors are not designed for high pressure washdown or exposure to ketones, halogenated hydrocarbons, esters, amines or acids and alkalis. They should be cleaned with mild soap, warm water and a clean cloth.

The clear polycarbonate connector features a bright red alignment LED which causes the back end to glow when the LED is on.

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18 mm Cylindrical Sensors

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OPTICAL SPECIFICATIONS

Scan Type	Distance*
Diffuse	100 mm (3.94 in.) typ.
Diffuse	200 mm (7.87 in.) typ.
Diffuse	400 mm (15.75 in.) typ.
Retroreflective	4 m (13 feet) min.
Thru-scan	30 m (98 feet) min.

* Diffuse scan distance is rated using an 8 x 10" 90% reflective card. Retroreflective scan distance is rated using an FE-RR1 (3" diameter) reflector. Actual scan range will vary, based on reflectivity of the object being sensed.

MECHANICAL/ENVIRONMENTAL SPECIFICATIONS

Temperature Operating Storage	-30 to +60°C (-22 to +140°F) – Wide Voltage, Polar -30 to +70°C (-22 to +160°F) – DC -55 to +85°C (-67 to +185°F) – All
Shock	50 G
Vibration	10 G, 10 to 500 Hz
Sealing	NEMA 1, 3, 4, 12, 13 (IP67)
Approvals	DC controls UL certified (File No. E145799) and CSA recognized (File No. LR57323)
Alignment indicator	Red LED
Materials Housing Back cover Connector (Q-C style)	Polycarbonate Acrylic Polycarbonate

ELECTRICAL SPECIFICATIONS

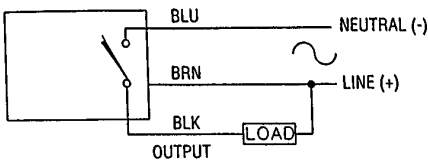
	Wide Voltage	DC
Supply voltage	20-260 VAC (12 to 260 VDC)	10-30 VDC (10% ripple)
Current consumption	≤ 4 mA typ.	<20 mA typ.
Output Type	Mosfet (L.O./D.O.)	Open collector (L.O./D.O.)
Load current	300 mA	150 mA max.
Leakage current	≤ 1 mA	10 µA max.
Voltage drop	≤ 5 volt avg.	1 volt max. @ full load
Rate of operation	50/second	500/second
Response time, max.	10 msec On/10 msec Off	1 msec ON/1 msec Off
Delay on power-up	100 ms max.	100 ms
Electrical protection	Industrial interference, line transients, false pulse (on)	Industrial interference, line transients, short circuit, false pulse (on), reverse polarity

NOTICE

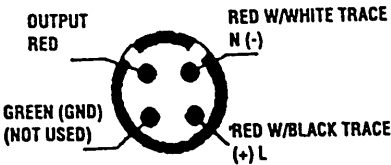
CP18 wide voltage sensors are polarity sensitive.

WIRING DIAGRAMS

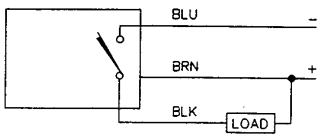
AC WIRING, Retroreflective, Diffuse
Sensors, Thru-scan Receiver



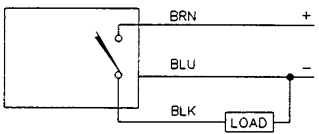
Note: One side of load to black lead, the other side to brown lead. Sensor will not function if load is tied to blue lead.



DC WIRING
NPN (Sinking)



PNP (Sourcing)



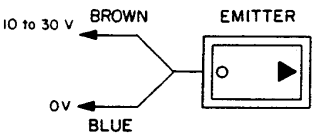
NOTICE

DC units are protected against short circuits. However, damage to output circuit may result if load requires current in excess of rated specifications.

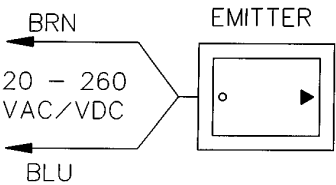
Industry standards recommend not placing leadwires of DC controls in conduit with AC control wiring. Place in separate conduit or with wiring to other low voltage, low current solid state devices.

EMITTER WIRING

CP18EDX2 (DC only)



CP18EBX2 (AC/DC)



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SWIVEL TYPE MOUNTING BRACKET ASSEMBLY

Catalog listing **CPZ18B02BK** offers maximum protection from physical damage or tinkering. The CP18 is mounted in a spherical plastic swivel nut which is assembled to a two-piece plastic bracket and surrounded by an 1/8-inch thick steel mounting bracket that allows 180° beam adjustment. (See drawing.)

The integral ball and swivel bracket allows the CP18 to be tilted 10° and enables full swivel capabilities. In addition, there is a 7/16 x 1-inch slot in the steel mounting bracket that allows viewing of the LED indicator.

Two 7/16-inch dia. mounting holes on 3-inch centers are provided in front of the bracket for direct mounting to conveyor side or to facilitate spacer use (mounting hardware not provided.)

When matched with the high-power scanning of the CP18, this assembly can often replace more expensive photoelectric controls — without compromising rugged performance standards demanded by material handling applications. The CPZ18B02BK is flat black, but other colors can be furnished to match your needs.

SWIVEL TYPE BRACKET ONLY

Catalog listing **CPZ18B03** Consists of the same spherical plastic swivel nut and two-piece plastic bracket as supplied with the CPZ18B02BK assembly. The bracket can be directly mounted to a surface or the MPZB07 mounting bracket may be used.

RIGHT ANGLE ADAPTER

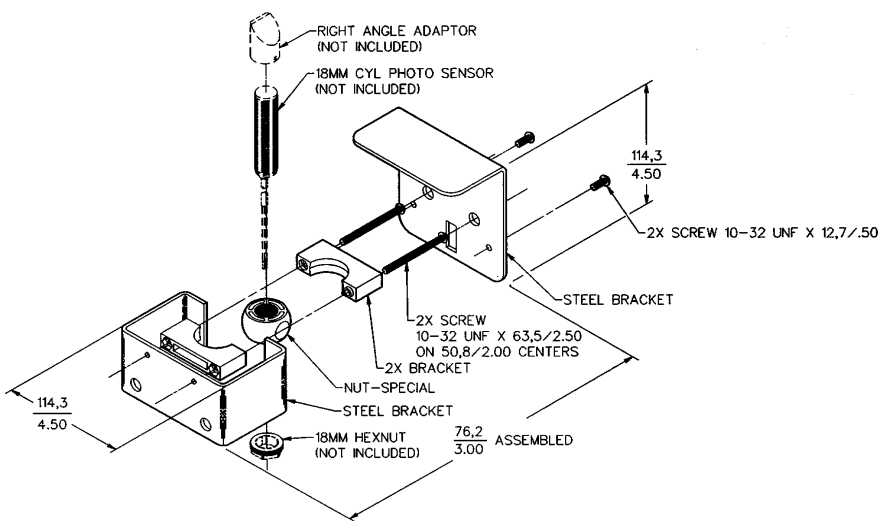
Screw-on right angle adapters allow sensing at right angles to the sensor housing. Catalog listing **CPZ18RAW** is a sealed version intended for retroreflective/thru scan use only. **CPZ18RA0** is an open version for diffuse scanning. The clear CPZ18RAP is for polarized sensors.

NOTICE

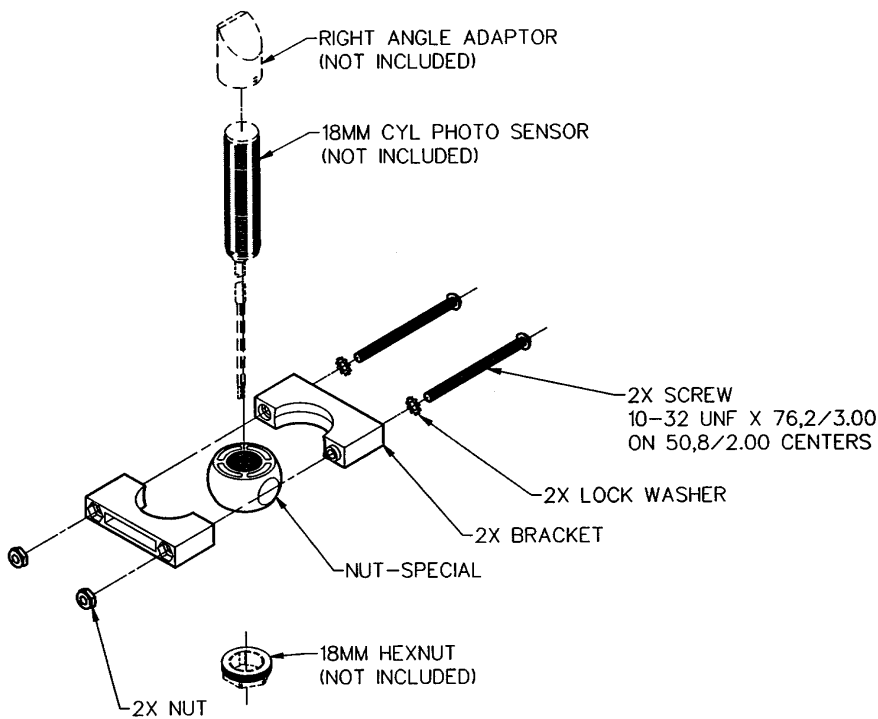
The open version must be used with diffuse sensors because the sealed adapter will cause a lock-on condition when light is reflected off the sealing window.

Adapters reduce scan power 30 to 40% and add one inch to CP18 overall length. Outside diameter of adapters at their base is 0.9 inch.

CPZ18B02BK



CPZ18B03



CPZ18RAW/CPZ18RA0/CPZ18RAP

Wgt. .16 oz (4.5 g)



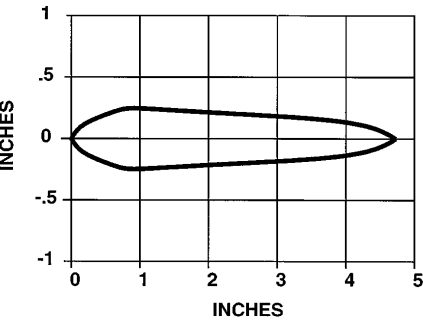
Photoelectric Sensors/Controls

18 mm Cylindrical Sensors

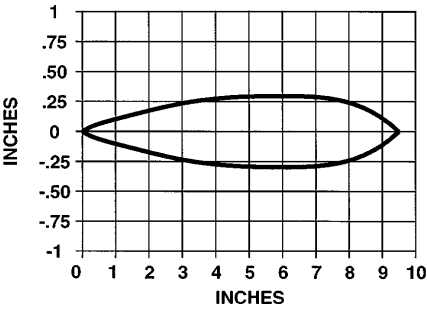
CP18 Series

BEAM DIAMETER

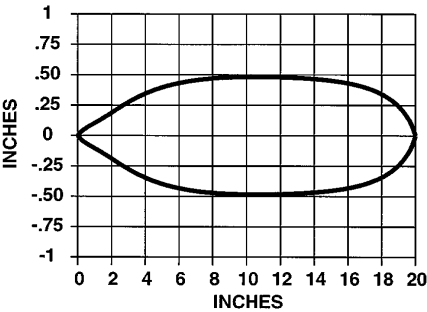
Diffuse Scan* 100 mm (3.94 in.)



Diffuse Scan* 200 mm (8.87 in.)

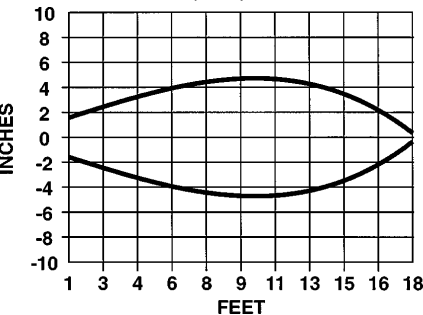


Diffuse Scan* 400 mm (15.74 in.)

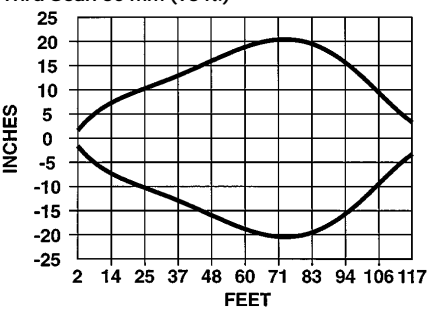


* To an 8 x 10 in. white card

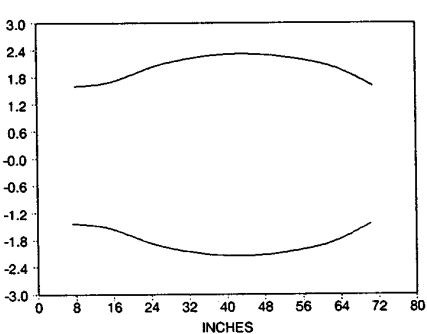
Retroreflective* 4 m (13 ft.)



Thru Scan 30 mm (98 ft.)



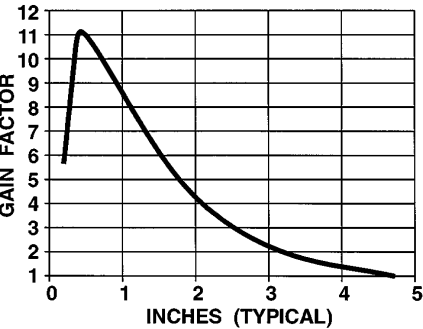
Polarized 1,5 m (4.9 ft)



* To a 3 in. reflector

EXCESS GAIN

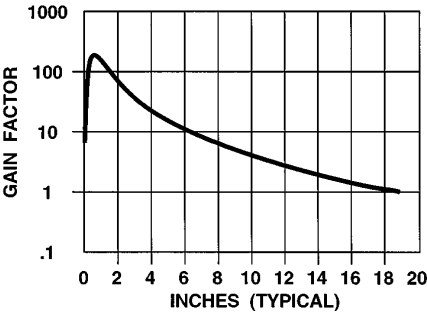
Diffuse Scan* 100 mm (3.94 in.)



Diffuse Scan* 200 mm (8.87 in.)

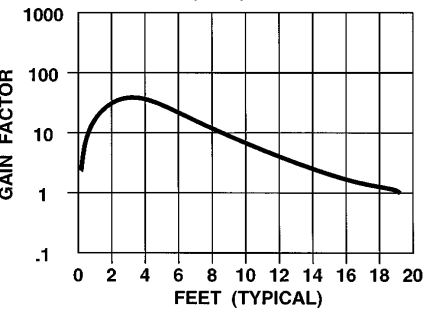


Diffuse Scan* 400 mm (15.74 in.)

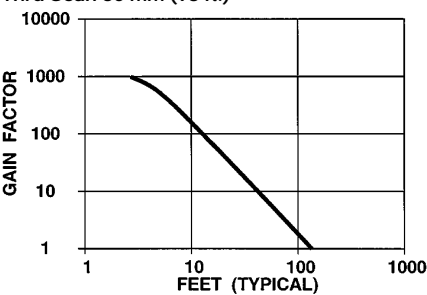


* To an 8 x 10 in. white card

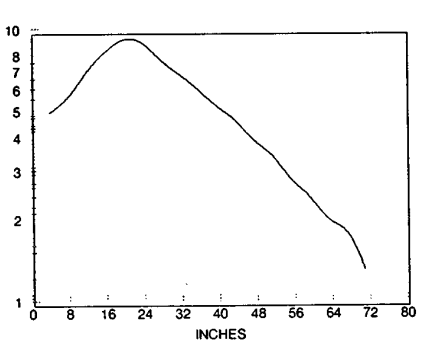
Retroreflective* 4 m (13 ft.)



Thru Scan 30 mm (98 ft.)



Polarized 1,5 m (4.9 ft)



* To a 3 in. reflector

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FLUSH MOUNT QUARTER-TURN QUICK-ASSEMBLY BRACKET

Catalog listing **CPZ18B01** is a flush mount quick-assembly bracket which simplifies mounting the CP18 and offers a flush, protected sensing face. The CP18 label area is matched up with the internal thread of the bracket, slid into the bracket until flush on top, then a quarter-turn clockwise locks the control in place. (See drawing.) The locking ring is inserted from the back of the bracket and pushed up snug against your mounting surface.

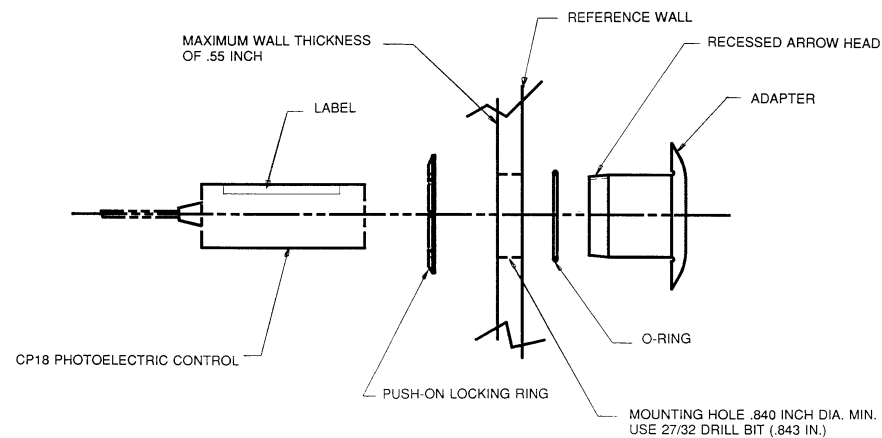
CPZ18A01 APERTURE HOOD

The CPZ18A01 aperture hood fits over the lens face of the CP18. It is designed to scan between conveyor rollers with clearance gaps as close as 1/8" without locking onto the rollers. This allows object sensing from underneath the conveyor, looking between the rollers. The aperture hood slides onto the lens face and needs only a twist to position it. When aperture is properly positioned, tighten one of the mounting nuts against the aperture to hold it in place. The .080" aperture slot provides a very tight beam for beam control and very fine detection purposes. The aperture reduces the scan range by 55-60%. The outside diameter of an aperture is 0.85 inch. An aperture adds 0.100 inch to the length of the unit.

ORDER GUIDE ACCESSORIES

Description	Catalog Listing
Flush mount/Quick Assembly mounting bracket assembly	CPZ18B01
Swivel type mounting bracket assembly	CPZ18B02BK
Swivel bracket only	CPZ18B03
Screw on right angle adapter — retro and thru scan only	CPZ18RAW
Screw on right angle adapter — diffuse	CPZ18RAO
Screw on right angle adapter — polarized	CPZ18RAP
Pair of Black Mounting nuts	CPZ18BKNTS
Conduit Adapter, aluminum (1/2"-14NPT)	925AZ18S
Mounting bracket, aluminum	925BZ18S
10 Aperture hoods for precise sensing	CPZ18A01

CPZ18B01

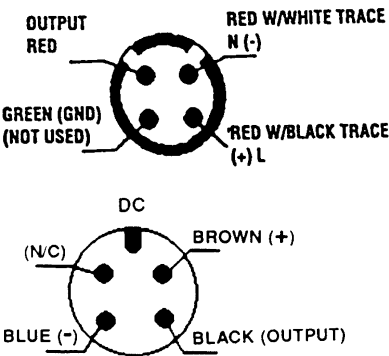


CONNECTOR CABLES ORDER GUIDE

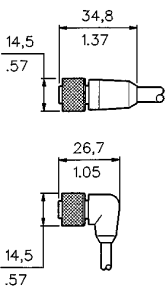
Connector Style	Cable Length	Catalog Listings
4-Pin DC, Standard Key Straight w/Aluminum Nut	2 m (6 ft.)	80256A
	5 m (16 ft.)	80259A
	Straight w/Nylon Nut	80256N-A
	Straight w/303 SS Nut	80256SS-A
	Right Angle w/Aluminum Nut	80296A
		80299A
	Right Angle w/LED, NPN	80326-NE
		80329-NE
	Right Angle w/LED, PNP	80326-PE
		80329-PE
4-Pin AC, Dual Key, 1/2 in.-20 UNF Straight w/Aluminum Nut	2 m (6 ft.)	70432
	5 m (16 ft.)	70434
	Straight w/Nylon Nut	70432N
		70434N
	Straight w/303 SS Nut	70432SS
		70428
	Right Angle w/Aluminum Nut	70429
		70428N
	Right Angle w/Nylon Nut	70429N
		70428SS

CONNECTOR PINOUT/MALE PINS
(View of back end of CP18)

Colors shown for typical mating cables. (+) and (-) symbols for DC wiring.



Connector Cables



Photoelectric Sensors/Controls

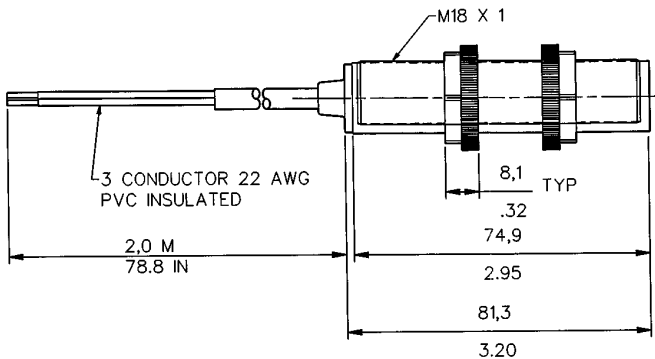
18 mm Cylindrical Sensors

CP18 Series

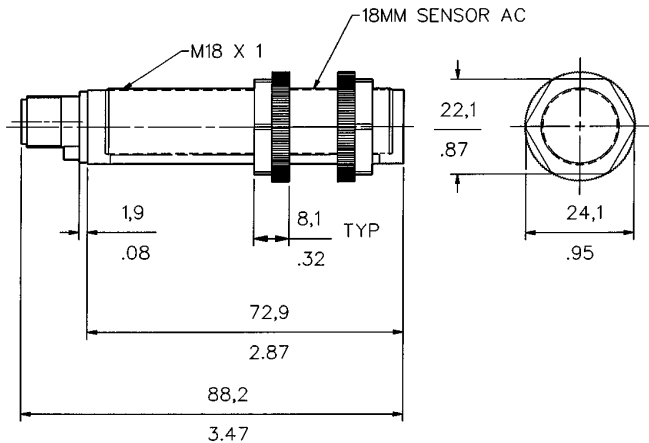
MOUNTING DIMENSIONS

(For reference only)

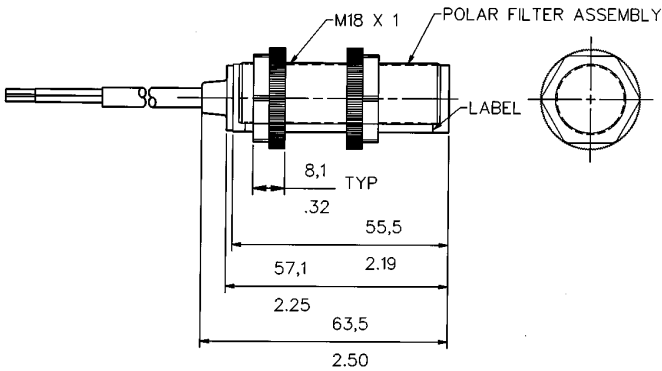
AC Preleaded (AA and BA Types)
Retroreflective/Diffuse Controls, Thru scan Receiver



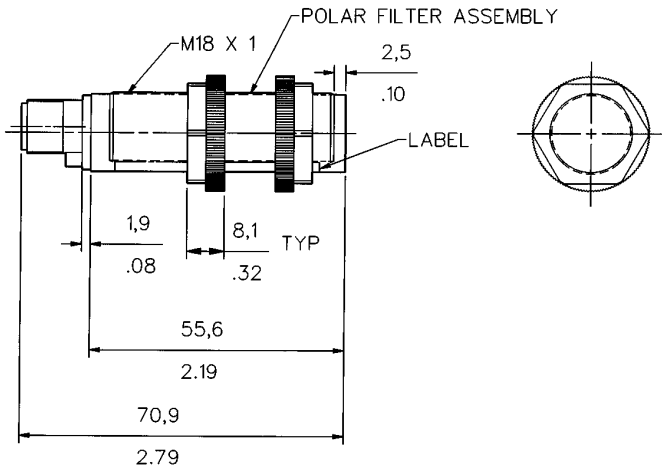
AC Connector Version
Retroreflective/Diffuse Control, Thru scan Receiver



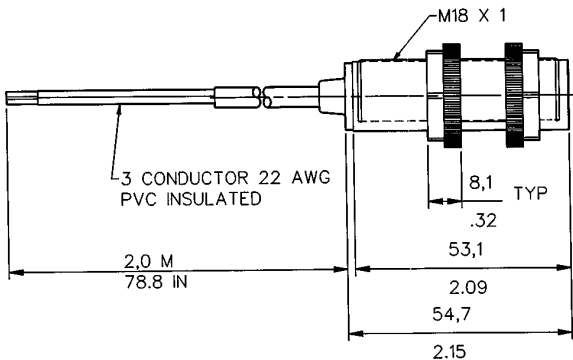
Preleaded Polar Control



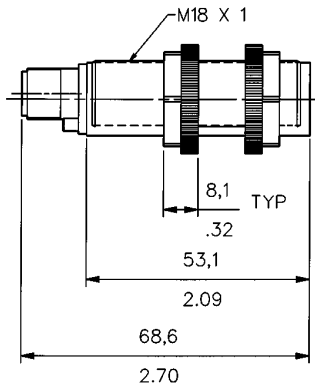
Polar Connector Version



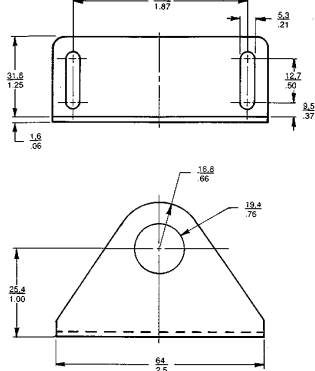
All Preleaded DC and AC/DC Emitters



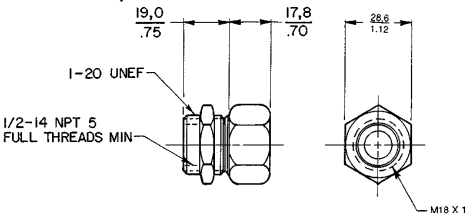
All DC Connector Versions



Mounting Bracket 925BZ18S



Conduit Adapter 925AZ18S



CP18 Series weight ~ 2.7 oz (77 g)

Photoelectric