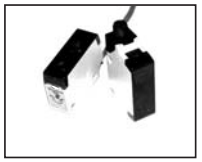
PM SERIES
INSTALLATION MANUAL



CAT8EFG0525001

INPROX SENSORS

INPROX CORPORATION
28 State Street Suite 1100
Boston, MA USA 02109
1-877-INPROX-7
Tel. 1-617-507-2663 Fax 1-617-507-2665
www.inproxsensors.com

Declaration of conformity
INPROX Corporation
Declare under our sole responsibility that these products are in conformity with the following EEC directive: 89/336 and 73/23 and emendment.

PACK CONTENT

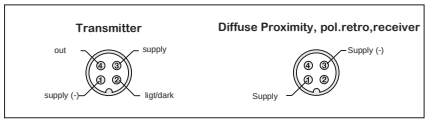
- (1) INPROX Operating Manual
- IN82 knob regulation accessory for the models with sensitivity adjustment
- INN1 mounting bracket + INN2 screws with bolts and washers
- INN2 mounting bracket + INN4 screws with bolts and washers, only for PTV25MCARM1
- INN1 OX123 retro, only for PPV009 series

GENERAL DESCRIPTION

- Photoelectric switch series characterized by large scanning ranges
- Cable output with revolving connector
- NPN or PNP output (DC models)
- SPDT voltage free relay output (AC models)
- Selectable LO/DO output status
- High detection distances
- Totally pr against electrical damages
- IP 67 protection degree
- Approvals:
- Background suppression models: 300mm, 550mm
- Photoelectric reflex switch, with polarizing filter 9 m
- Through-beam photoelectric switch: 20 m,
- Sensitivity adjustment models
- Plastic housing

WARNING These products are NOT safety sensors and are NOT suitable for use in personal safety

Wiring diagrams M12 plug versions / K2 part



Specification: Background suppression models:

Models	PBV310	PBV600	PBV310-R	PBV600-R
Function	Background suppression			
Sensing distance mm (1)	90 - 310	110- 600	90 - 310	110 - 600
Blind zone mm	5 - 15	10 - 35	5 - 15	10 -35
Scanning distance adjusting	Potentiometer 2 turns with position indicator			
Light source	Red visible LED light			
Spot diameter	Approx.35 mm @ 500 mm			
Light on-Dark on select.	control wire		Light on	
Supply voltage	10 - 30 V dc limit value		12 - 240 Vdc - 24 ÷ 240 Vac	
Ripple max	5 Vpp			
No load supply current	< 35 mA		<2 VA	
Load current max	100 mA		-	
Output voltage drop	1.8 V max@ 100 mA			
Max output switching current	1.8 V max @ 100 mA		3 A/240 V ac (2) 3 A/30 V dc (2)	
Output type	PNP or NPN - open collector		Relay SPDT electrically isolated	
Switching frequency	250 Hz max		33 Hz max	
Response time	2 mS		15 mS	
Time delay before availability	70 mS		150 mS	
Supply electrical protections	Overvoltage pulses and polarity reversal			
Output electrical protections	Short circuit, overcurrent, overvoltage		-	
Operation temperature range	- 25 °C…+ 55 °C			
Storage temperature	- 40 °C…+ 70 °C			
Ambient light immunity	10 000 Lux minimum sunlight 3000 Lux min HF lamp			
Enclosure rating	IP 67			
LED indicators	Red (output status)			
Housing material	Housing: ABS;optic: PC			
Cable PVC 2m	4 x 0.18 mmq, ø 3.8 mm		5 x 0.76 mmq, ø 6.3 mm	
Weight approx	80g cable 40g plug		160 g	

(1) White target 90% 100x100 mm
(2) Ensure spark extinguishing for inductive or capacitive load

Specification: Reflex polarized models

Model	PPV09M	PPV09M-R
Function	Polarized retro reflective models	
Sensing distance (1)	9 m max. typical	
Blind zone mm	0.01 m	
Sensitivity adjusting	Potentiometer 2 turns with position indicator	
Light source	Red polarized visible LED light	
Spot diameter	Approx. 400 mm @ 8 m	
Light on-Dark on select.	Control wire	Light on
Supply voltage	10 - 30 V dc limit value	12 - 240 Vdc - 24 - 240 Vac
Ripple (Max)	5 Vpp	-
No load supply current	< 35 mA	<2 VA
Load current max	100 mA	-
Output voltage drop	1.8 V max @ 100 mA	
Max output switching current	–	3 A/240 V ac (2) 3 A/30 V dc (2)
Output type	PNP or NPN open collector	Relay SPDT electrically isolated
Switching frequency	1 KHz max	33 Hz max
Response time	0,5 mS	15 mS
Time delay before availability	70 mS	150 mS
Supply electrical protections	Overvoltage pulses and polarity reversal	
Output electrical protections	Short circuit, overcurrent, over-voltage	-
Operation temperature range	- 25 °C…+ 55 °C	
Storage temperature	- 40 °C…+ 70 °C	
Ambient light immunity	10 000 Lux minimum sunlight 3000 Lux minimo min HF lamp	
Enclosure rating	IP 67	
LED indicators	Red (output status)	
Housing material	Housing: ABS; optics: PC	
Cable PVC 2m	4 x 0,18 mmq, ø 3,8 mm	5 x 0,76 mmq, ø 6,3 mm
Weight approx	80g cable 40g plug	160 g

(1) With OX123 included reflector
(2) Ensure spark extinguishing for inductive or capacitive load

Specification: Through - beam models:

Model	PTF/RF SET		PTX/RE SET	
	PTF25	PRF25	PTX25-R	PRE25-R
Function	Trasnmitter	Receiver	Transmitter	Receiver
Sensing distance	20 m			
Sensitivity adjusting	Not available		potentiometer 2 turns with position indicator	
Light source	LED red light	-	LED red light	-
Spot diameter	1.5 m @ 20 m	-	1.5 m @ 20 m	-
Light on-Dark on select	-	control wire	-	Light on
Supply voltage	10 - 30 V dc - limit value		12 - 240 Vdc - 24 - 240 Vac	
Ripple max	5 Vpp			
No load supply current	< 20 mA	< 35 mA	< 2 VA	< 2 VA
Load current max	-	100 mA	-	-
Output voltage drop	-	1.8 V max @ 100 mA	-	-
Max output switching current	-	-	-	3 A/240 V ac (2) 3 A/30 V dc (2)
Output type	-	PNP or NPN open collector	-	Relay SPDT electrically isolated
Switching frequency	-	1 KHz	-	33 Hz
Response time	-	0,5 ms	-	15 ms
Time delay before availability	70 ms		150 ms	
Supply electrical protections	Overvoltage pulses and polarity reversal			
Output electrical protections	-	Short circuit, over current, over voltage	-	-
Operation temperature range	- 25 °C…+ 55 °C			
Storage temperature	- 40 °C…+ 70 °C			
Ambient light immunity	10 000 Lux minimum sunlight 3000 Lux min HF lamp			
Enclosure rating	IP 67			
LED indicators	-	Red (output status)	-	Red (output status)
Housing material	housing: ABS; optics: PC			
Cable PVC 2m	3 x 0,18 mmq, ø 3,8 mm	4 x 0,18 mmq, ø 3,8 mm	2 x 0,76 mmq, ø 6,3 mm	5 x 0,76 mmq, ø 6,3 mm
Weight approx.	150g cable 70g connector		290 g	

(2) Ensure spark extinguishing for inductive or capacitive load

CODE DESCRIPTION

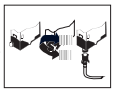
PBV310CAN6M1

Photoelectric sensor	P	M1	Cable output 5m
		K2	M12 connector plug
background suppression 600 mm	BV		
background suppression 310 mm	BV		
polarized retro-relective 9m	PV		
Transmitter/Receiver Set 20 m adjustable	TR	6	LO/DO
Transmitter/Receiver Set 20 m	SF		
310mm (BV)	310	R	AC/DC Relay
600mm (BV)	600	P	PNP
9m (PV)	09M	N	NPN
20m (TR & SF)	20M		
micro cubic housing	C	A	ABS body with PC optics window

CONNECTIONS AND INSTALLATION

Installation and adjustment

- Make sure that the supply voltage is correctly settled with a ripple corresponding to the values indicated on the catalog.
- In case the noise produced by the power lines exceed the values foreseen by the CE norm (interference immunity), separate the sensor cables from both the power and high tension lines, and insert it in a rounding metal raceway. Moreover, it is advisable to connect the sensor directly to the supply source and not to other devices.
- Avoid contact with organic solvents.
- Avoid direct exposition of the receiver to strong light or sun light.
- Use a wet cloth to clean the optic and then dry it.
- To extend the supply and output cables, it is necessary to use a cable having conductors with a minimum size of 1 mm². The maximum length of extension is 100m (this value is referred to a minimum tension and power supply at a load of 100mA).



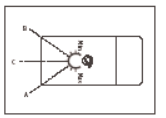
- **Only with connector:**

Connector moving horizontally (H) and vertically (V).
After having decided the connector position, fix it with the suitable blocking strip.

ALIGNMENT AND ADJUSTMENT

Diffuse proximity with background suppression

Mount the unit using the suitable mounting brackets (supplied), connect and align the sensor following the connection diagrams.
Place the object to be detected at the required reading distance, checking that the optic axis is perpendicular to the object surface.
NOTE In case of reflecting or flat objects, it could be convenient to recline the sensor of some degrees with respect to the perpendicular.
Reproducing the worst possible conditions (for example object with dimensions statistically smaller than the usual ones or with parts darkest than the background), place the object as far as possible from the sensor.
Adjust light reception setting on Max. the detection distance.
Position the object checking that the red beam strikes it. The reception indicator must be permanently switched on, if it switches off or lights, it is necessary to re-adjust the sensor position. If necessary, clean the optic or check the operating conditions.
Set the detection distance, remove the object ; the reception indicator must switch off (position A=MAX). If not, turn the control knob to Min. until the indicator switches off (e.g. position A). Turn the control knob to Min.. Place the object again. Turn the control knob to Max. until the reception indicator switches on (e.g. position B). If position B < position A, select middle position C. Check overall function. If function is o.k. the setting procedure is over. If the setting is not o.k. check the operating conditions and re-adjust. If position A < position B, background influence is too high.



Photoelectric retro switch, with reflector models

Mount the reflector so that its surface is perpendicular to the sensor optic axis. Check that the distance between the sensor and the reflector does not exceed the values specified for the polarizing filter itself. Fix the sensor safely but not permanently and select the output type. To obtain a perfect alignment, follow the instructions below.
Turn the control knob to Max., adjust the sensor by moving it vertically and horizontally until the LED permanently switches on. Permanently fix the sensor and check switches off if you interrupt the beam to the object to be detected. If this happens, you've realized a correct centering on the reflector and a fine sensitivity adjustment of the device.

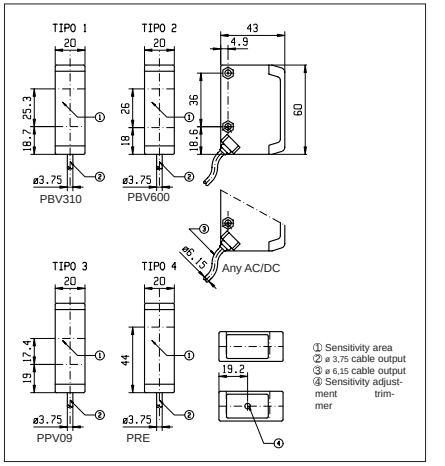
Transmitter / Receiver models

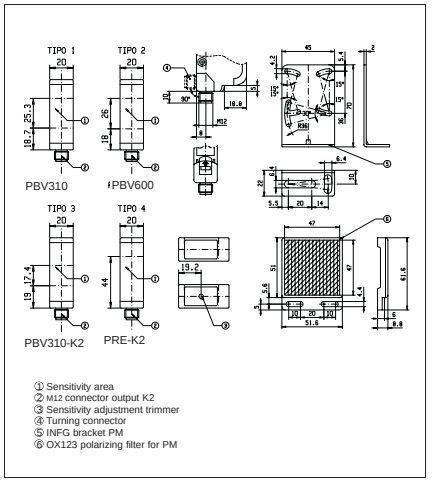
Using the suitable brackets, mount, not permanently, the emitter and receiver according to the detection distance. Place the element strictly on the optic axis.
Adjust the emitter moving it vertically and horizontally until the LED on the receiver switches on.
Adjust the receiver moving it vertically and horizontally until the LED remains permanently switched on. Fix definitively the system.
The LED on the receiver must permanently switch on when the object is absent.

Transmitter / Receiver with adjustment models

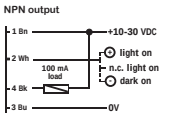
Using the suitable brackets, mount, not permanently, the emitter and receiver according to the detection distance. Place the element strictly on the optic axis.
Check that the position of the sensitivity adjustment trimmer is on Max..
Adjust the emitter moving it vertically and horizontally until the LED on the receiver switches on.
Adjust the receiver moving it vertically and horizontally until the LED remains permanently switched on. Fix definitively the system.
The LED on the receiver must permanently switch on when the object is absent. Turn the sensitivity adjustment trimmer anticlockwise until the LED switches off. Turn the trimmer clockwise until you obtain the permanent switching on of the signal LED. This position is the optimum one to detect with the same precision both empty or full spaces. If the object to be detected does not present problems, it is possible to turn to the maximum the trimmer and obtain highest performances.
The LED on the receiver must switch off if you interrupt the light beam.

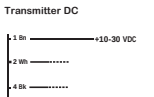
MECHANICAL DRAWINGS

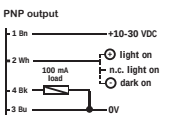


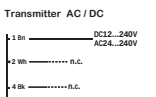


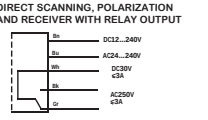
ELECTRIC DIAGRAMS OF THE CONNECTIONS











CODE DESCRIPTION

1/Bn : Brown
2/Wh: White
3/Bu : Blue
4/Bk : Black
5/Gr : Gray