Photoelectrics
Retro-reflective, Industrial Door Market
Type PD86.AP12, Polarized, Relay Output, Mute Input

- **Range: 12 m @ ER 4 (15 m @ ER100)**
- **Adjustable lenses ±4.5°**
- **Modulated, visible light, polarized**
- **Switching function, selectable by DIP-switch**
- **Active high or active low mute function (switch selectable)**
- **LED-indication for target detected and power**
- **Multi supply voltage: 12-24 VDC/VAC, 50/60 Hz**
- **86 x 44 x 39 mm PC or ZAMAK 5 housing, IP 66**
- **SPST relay output**
- **High EMC and ambient light immunity**
- **CE, UL325 and UL508 approved**

Product Description

The PD86 is a powerful polarized retro reflective sensor. The sensor is designed to meet the harsh requirements in industrial door and gate environments. With a sensing distance of 12 m, the sensor is useful in applications where dust and weather conditions will influence on the sensing distance. The sensor is made of a strong glass reinforced PC housing or ZAMAK 5 housing.
With its mute input, the sensor fulfils European and North American regulations for industrial doors.

Ordering Key

PD86HAP12QPTF-01C

- **Type**
- **Housing style**
- **Housing size**
- **Housing material**
- **Not used**
- **Detection principle**
- **Sensing distance**
- **Supply voltage**
- **Output Function**
- **Terminals, fixed or detachable**
- **Housing colour for HAP version**

Type Selection

Housing W x H x D	Housing material Outer cover	Range (S_n)	Terminals	Ordering no.
86 x 44 x 39 mm	PC	12 m	Fixed	**PD86CAP12QPTF**
86 x 44 x 39 mm	PC	12 m	Detachable	**PD86CAP12QPTD**
86 x 44 x 39 mm	ZAMAK 5	12 m	Fixed	**PD86HAP12QPTF-01C**
86 x 44 x 39 mm	ZAMAK 5	12 m	Detachable	**PD86HAP12QPTD-01C**

Specifications

Rated operating dist. (S_n)		12 m @ ER4 ref. target (0 to 5,000 lux)
Blind zone		≤ 0.15 m
Sensitivity		Fixed
Temperature drift		≤ 0.6 %/°C
Differential travel (H)		
Hysteresis		3 to 20%
Rated operational volt. (U_B)		12-24 VDC, - 15% +20%
AC: 45 to 65 Hz		12-24 VAC, - 15% +20%
Rated operational power		
(Relay ON)	12 VAC	648 mW
	24 VAC	1680 mW
	12 VDC	324 mW
	24 VDC	840 mW
Output		
Contact ratings (Ag alloy)		µ (micro gap)
Resistive loads	AC 1	0.5 A/30 VAC
	DC 1	1 A/30 VDC
Small inductive loads	AC 15	0.5 A/48 VAC
	DC 13	1 A/30 VDC
Mechanical life (typical)		≥ 1,000 000 cycles
Electrical life (typical)		> 100,000 AC11 or DC11 1,800 operations per hour
Minimum load power		1 mW
Dielectric voltage		1,000 VAC (rms) (cont./supply)
Light source		GaAlAs, LED, 620 nm
Light type		Visible, modulated
Optical angle		± 1.5°
Alignment		
Horizontal		±4.5°
Vertical		±4.5°
Light spot size		280 mm at 4 m
Ambient light		Max. 10,000 lux
Operating frequency		20 Hz
Response time (object related)		
OFF-ON (tON)		≤ 20 ms
ON-OFF (tOFF)		≤ 30 ms
Power ON delay (t_v)		≤ 300 ms (typ. 100 ms)

Specifications (cont.)

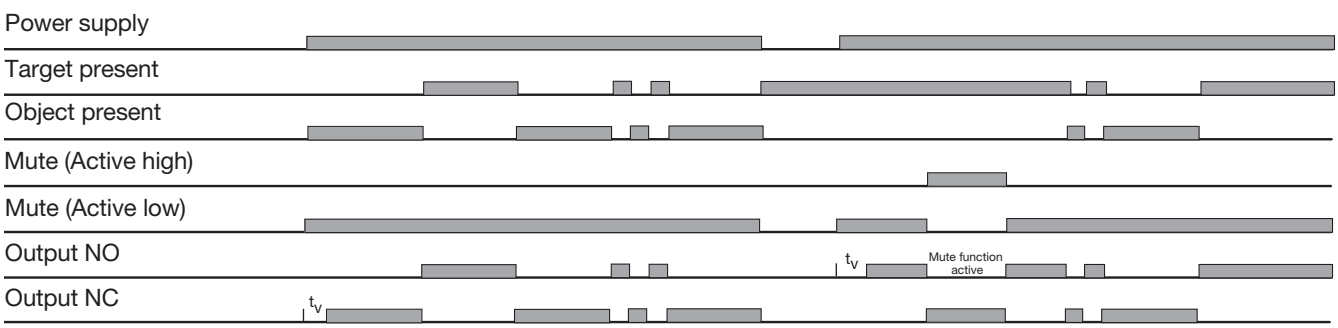
DIP-switch Selectable functions	
Mute input	Active high or active low
Relay output	NO (make) or NC (break)
Mute function	
Active high	≥ 12 VDC/VAC
Response time	< 45 ms
Hold time	< 70 ms
Active low	< 6 VDC/VAC
Response time	< 70 ms
Hold time	< 45 ms
Max current	35 mA @ 24 VDC 70 mA @ 24 VAC
Indication	
Target detected	LED, yellow
Power	LED, green
Signal	LED, green
Environment	
Overvoltage category	III (IEC 60664/EN 60947-1)
Pollution degree	3 (IEC 60664/EN 60947-1)
Degree of protection	IP 66 (IEC 60529; 60947-1)
Ambient light	
Incandescent light @ 3000 … 3200 °K	≥ 50 000 lux (EN 60947-5-2)
Incandescent light 3200 °K	≥ 10 000 lux* (EN 61496-2)
Fluorescent light	≥ 3 000 lux* (EN 61496-2)
Stroboscopic light	0.05 J @ 200 Hz to 0.5 J @ 5 Hz* (EN 61496-2)
Flashing beacon light	3 to 5 J @ 0.5 to 2 Hz* (EN 61496-2)
Temperature	
Operating	-25° to +60°C (-76° to +140°F)
Storage	-35° to +80°C (-31° to +176°F)
Vibration	10 to 150 Hz, 0.5 mm/7.5 g (EN 60068-2-6)
Drop test	2 x 1 m & 100 x 0.5 m (IEC 60068-2-31)

Rated insulation voltage	250 VAC (rms)
Housing material	
Outer cover	
CAP version	PC, grey
HAP version -01C	ZAMAK 5, basalt grey
Inner cover	PMMA, red
Backpart	ABS, black
Cable outlet	Kraiburg TC5MLZ or TP5VCZ
Connection	
Screw terminal (TF version)	6 x 1.5 mm^2 terminal block
Screw terminal (TD version)	6 x 1.5 mm^2 terminal block
One entry	for cable 3 to 6.5 mm
Cable through the back	Max. 7.5 mm
Weight	
CAP version	110 g
HAP version	120 g
UL-Approval	UL325, UL508
CE-marking	Yes EN 12453, EN 12445, EN 12978, EN 61496-1, Type 2 ESPE
General reference	Sensor designed according to EN 60947-5-2
$MTTF_d$ related to product life time	243 years @ 40°C (+104°F) (EN ISO 13849-1 (Parts count method, annex D.1), SN 29500)
ESPE category	2 (EN 61496-2)
Performance level (PL)	C (EN 12453)
PFHd	4.7 x 10^{-7} Errors per hour (EN ISO 13849-1)
Mission Time	20 years (EN ISO 13849-1)

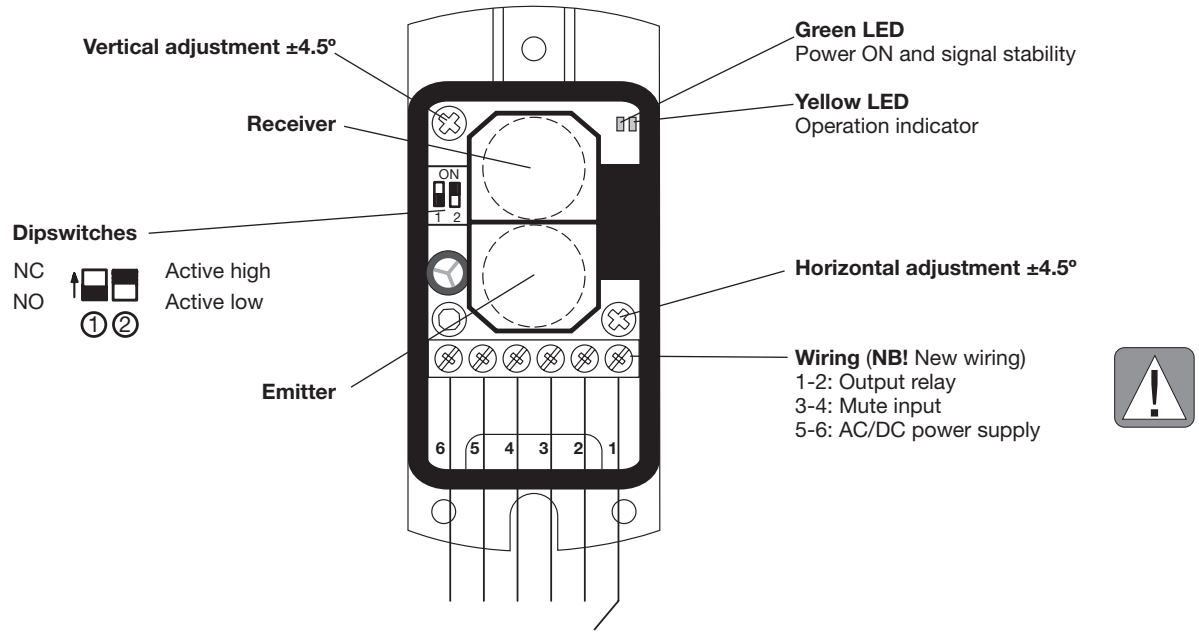
* Failure to danger (worst case alignment)

Operation Diagram

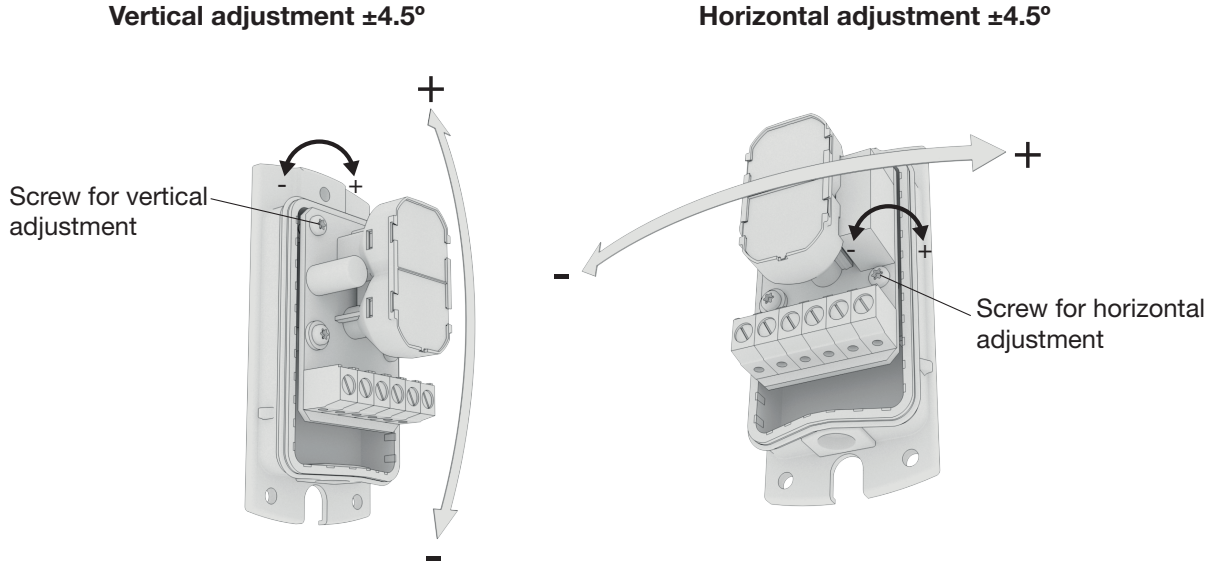
tv = Power ON delay



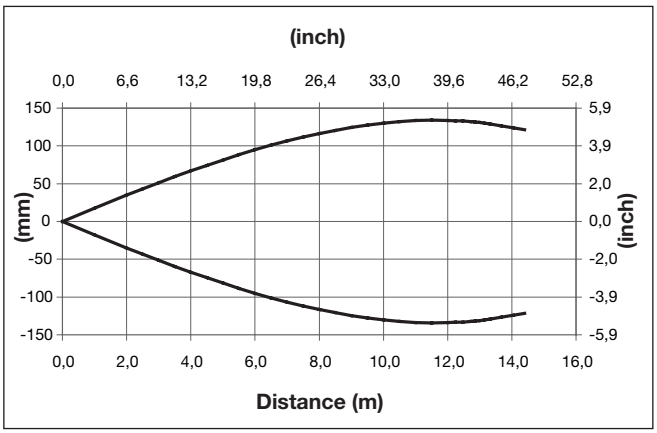
Wiring Diagram



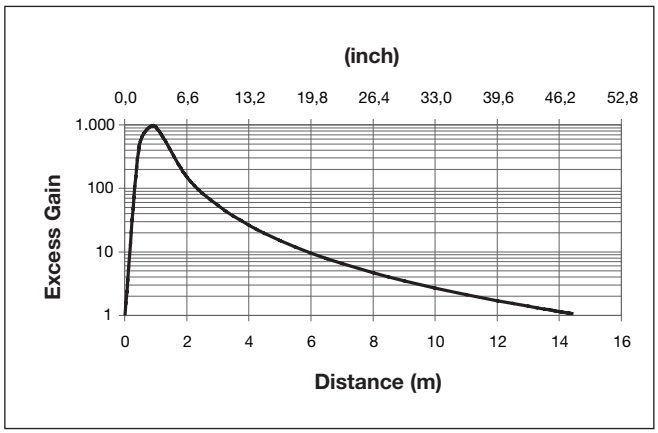
Vertical and Horizontal Adjustment



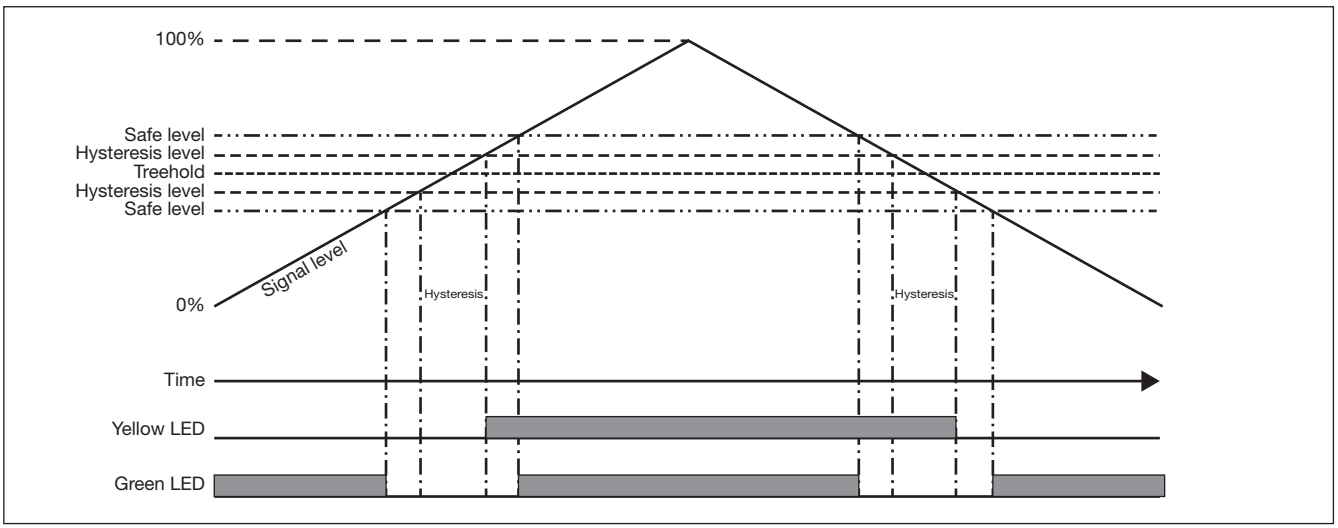
Detection Diagram



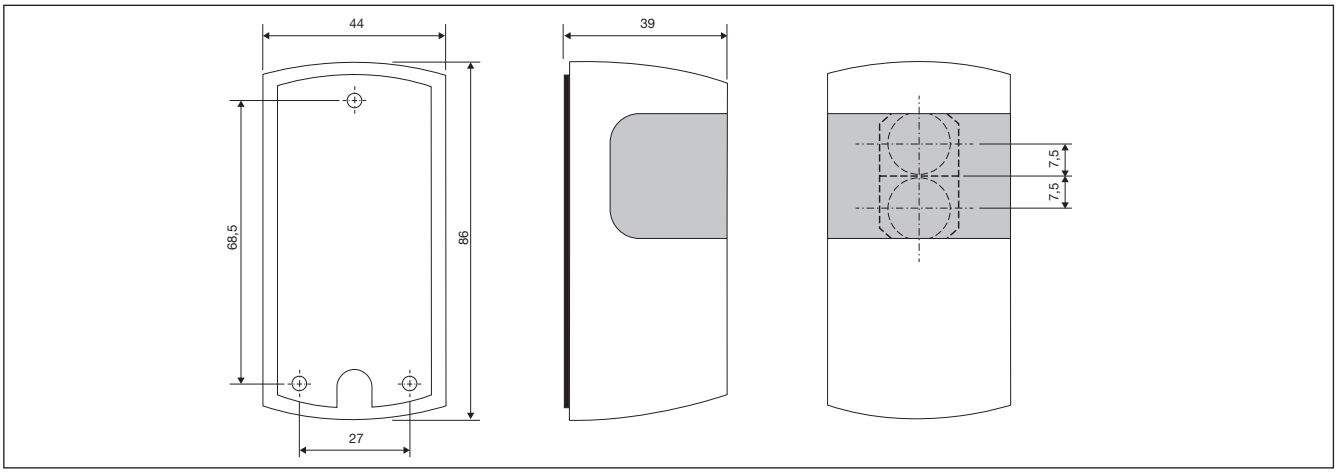
Excess Gain



LED



Dimensions



Delivery Contents

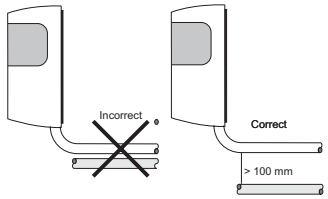
- Photoelectric switch: PD86.AP12QP...
- Screws and rawlplugs
- Installation instruction
- Packaging: Cardboard box

Accessories

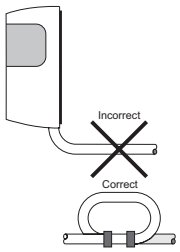
- Reflectors: ER series

Installation Hints

To avoid interference from inductive voltage / current peaks, separate the proximity switch cables from any other power cables. E.g. Engine, contactor or solenoid cables

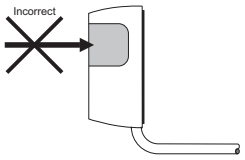


Relief of the cable strain



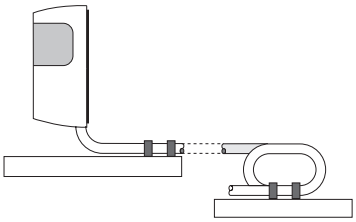
The cable should not be pulled

Protection of the sensing face



A proximity switch should not serve as mechanical stop

Sensor mounted on a mobile carrier



Any repetitive flexing of the cable should be avoided