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Photoelectrics
Retro-reflective
Type PH18CNR..., DC

- **Miniature sensor range**
- **Range: 6.5 m**
- **Sensitivity adjustment by potentiometer**
- **Modulated, infrared light 850 nm**
- **Supply voltage: 10 to 30 VDC**
- **Output: 100 mA, NPN or PNP, N.O & N.C.**
- **Degree of protection IP67, IP69K**
- **LED indication for output, stability and power ON**
- **Protection: reverse polarity, short circuit and transients**
- **Cable, plug and pigtail versions**
- **Excellent EMC performance**

Product Description

The PH18CNR... is part of a family of inexpensive general purpose retro-reflective sensors in industrial standard 18 mm cylindrical and square ABS housing.
The sensors are useful in applications where high-accuracy detection as well as small size is required.
Compact housing and high power LED for excellent performance-size ratio.
The potentiometer used for adjustment of the sensitivity makes the sensors highly flexible. The output type is NPN or PNP and the output switching function is NO and NC.

Ordering Key

PH18CNR65PAM1SA

- **Type**
- **Housing style square**
- **Housing size**
- **Housing material**
- **Housing type neutral**
- **Detection principle**
- **Sensing distance**
- **Output type**
- **Output configuration**
- **Connection type**
- **Sensitive adjustment**

Type Selection

Housing style	Range S_n	Connection	Ordering no. NPN Make & break switching	Ordering no. PNP Make & break switching
M18 Square type	6.5 m	Cable	**PH 18 CNR 65 NASA**	**PH 18 CNR 65 PASA**
M18 Square type	6.5 m	Plug	**PH 18 CNR 65 NAM1SA**	**PH 18 CNR 65 PAM1SA**
M18 Square type	6.5 m	Pigtail M12	**PH 18 CNR 65 NAT1SA**	**PH 18 CNR 65 PAT1SA**

Specifications according to EN60947-5-2

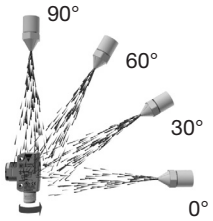
Rated operating distance (S_n)	Up to 6.5 m, reference target ER4 reflector ø 80 mm
Blind zone	50 mm @ Sn max.
Sensitivity control	Adjustable by potentiometer
Electrical adjustment	210°
Mecanical adjustment	240°
Adjustable distance to target	50-650 cm
Temperature drift	≤ 0.2%/°C
Hysteresis (H) (differential travel)	≤ 20%
Rated operational volt. (U_B)	10 to 30 VDC (ripple included)
Ripple (U_{rpp})	≤ 10%
Output current	
Continuous (I_e)	≤ 100 mA
Short-time (I)	≤ 100 mA
(max. load capacity 100 nF)	
No load supply current (I_o)	≤ 25 mA @ 24 VDC
Minimum operational current (I_m)	0.5 mA
OFF-state current (I_r)	≤ 100 µA

Voltage drop (U_d)	≤ 2.0 VDC @ 100 mA
Protection	Short-circuit, reverse polarity and transients
Light source	LED, 850 nm
Light type	Infrared, modulated
Sensing angle	± 2°
Ambient light	30.000 lux Incandescent lamp
Light spot Diameter	Ø 164 mm @ 3.25 m
Operating frequency	500 Hz
Response time	
OFF-ON (t_{ON})	≤ 1.0 ms
ON-OFF (t_{OFF})	≤ 1.0 ms
Power ON delay (t_v)	≤ 100 ms
Output function	
Type	NPN or PNP
Switching function	NO and NC
Indication	
Output ON	LED, yellow
Signal stability and power ON	LED, green

Specifications (cont.)

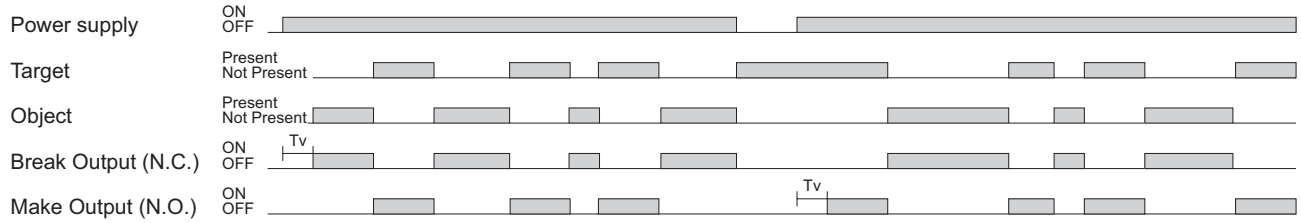
Environment	
Installation category	III (IEC 60664/60664A; 60947-1)
Pollution degree	3 (IEC 60664/60664A; 60947-1)
Degree of protection	IP 67, IP 69K*
Ambient temperature	
Operating	-25° to +60°C (-13° to +140°F)
Storage	-40° to +70°C (-40° to +158°F)
Vibration	10 to 150 Hz, 1.0 mm/15 g (IEC 60068-2-6)
Shock	30 g / 11ms, 3 pos, 3 neg per axis (IEC 60068-2-6, 60068-2-32)
Rated insulation voltage	500 VAC (rms) IEC protection class III
Housing material	
Body	ABS, grey
Backpart	PC-Transparent
Front material	PMMA, red
Cable gland	POM, Black
Trimmer shaft	POM, Dark Grey
Locknuts	PP, black
Mounting bracket	PPA, black
Connection	
Cable	PVC, grey, 2 m 4 x 0.25 mm², Ø = 4.5 mm
Plug	M12, 4-pin (CONB14NF-series)
Pigtail	PUR, grey, 30 cm 4 x 0.25 mm², Ø = 4.5 mm M12, 4-pin (CONB14NF-series)
Weight	With cable: 85 g With pigtail: 40 g With plug: 25 g
CE-marking	Yes
Approvals	cULus (UL508) supply class 2

* The IP69K test according to DIN 40050-9 for high-pressure, high-temperature wash-down applications. The sensor must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The sensor is exposed to high pressure water from a spray nozzle that is fed with 80°C water at 8'000–10'000 KPa (80–100bar) and a flow rate of 14–6L/min. The nozzle is held 100 –150 mm from the sensor at angles of 0°, 30°, 60° and 90° for 30s each. The test device sits on a turntable that rotates with a speed of 5 times per minute. The sensor must not suffer any damaging effects from the high pressure water in appearance and function.

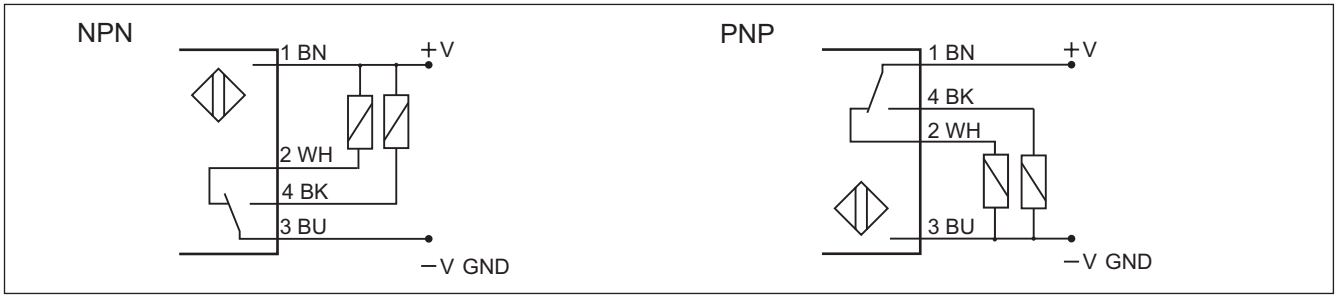


Operation Diagram

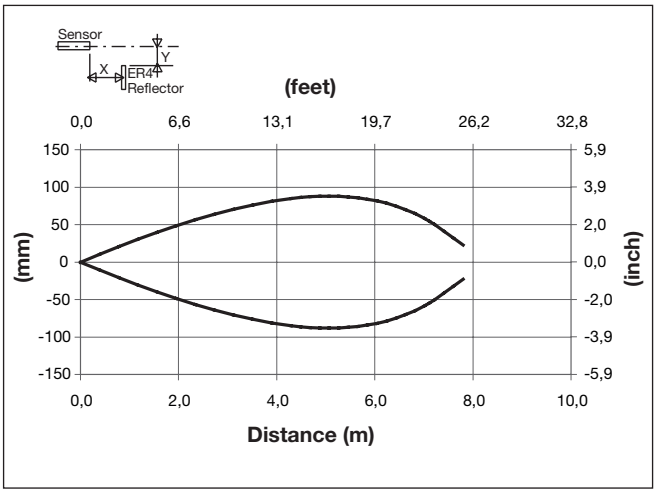
tv = Power ON delay



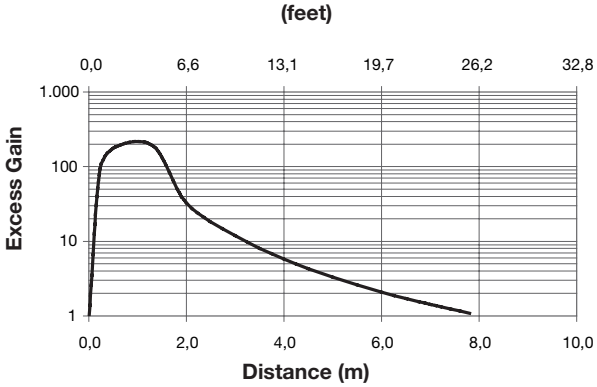
Wiring Diagrams



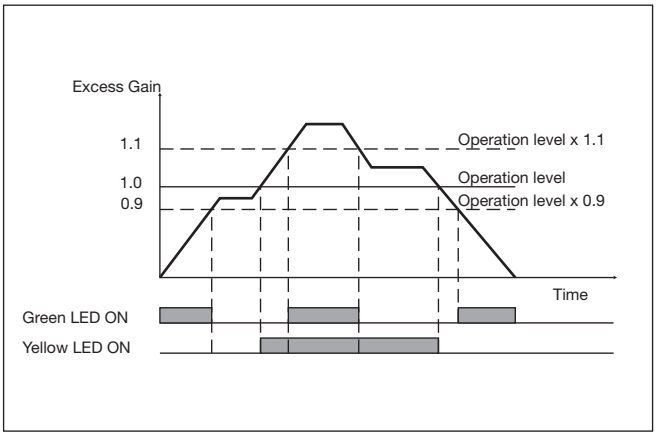
Detection Diagram



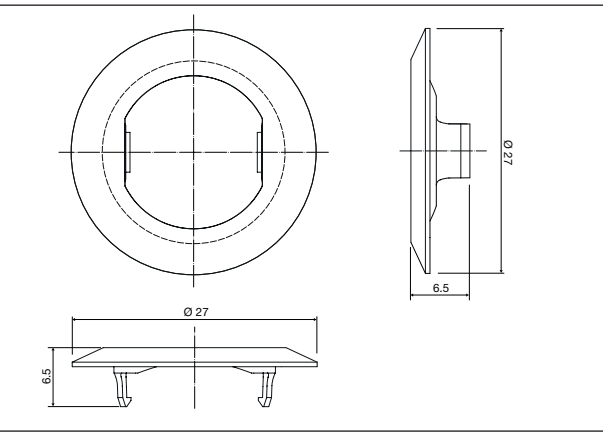
Excess Gain



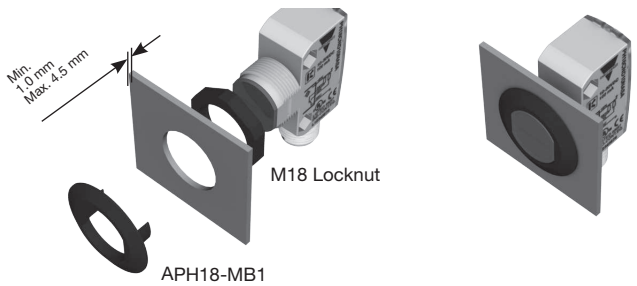
Signal Stability Indication



APH18-MB1



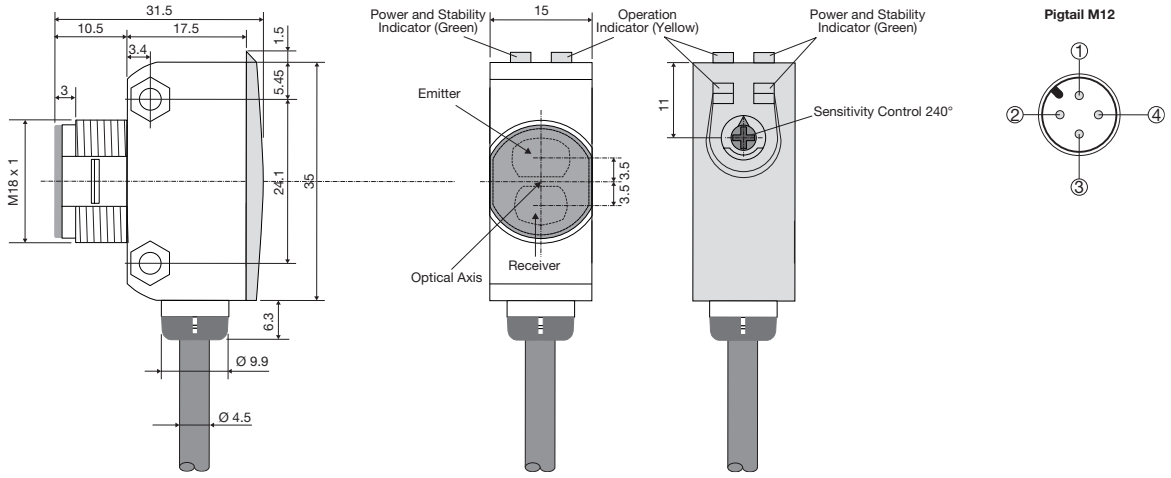
Mounting Systems



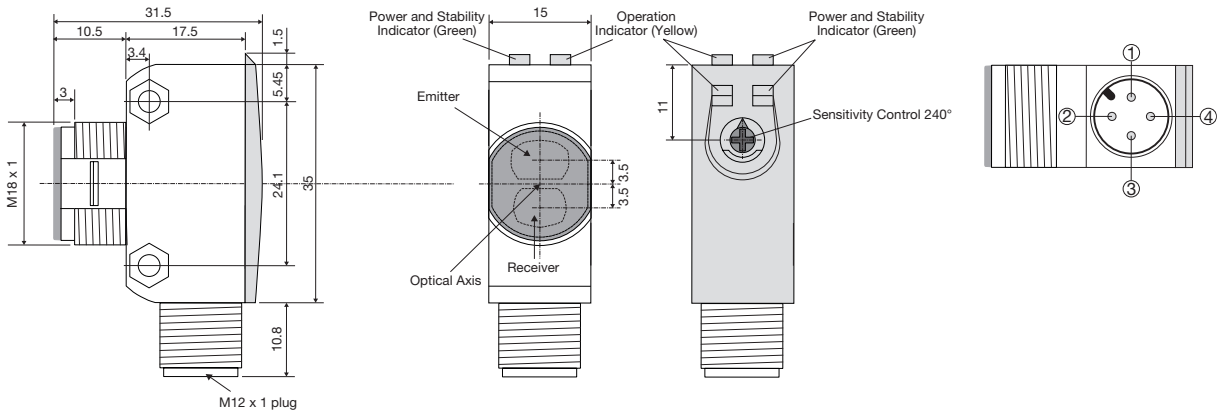
PH18 mounting with a combination of 1 x APH18-MB1 and 1 x M18 locknut.
Maximum torque 0.9 NM

Dimensions

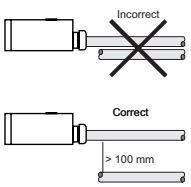
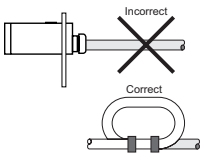
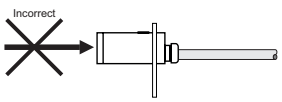
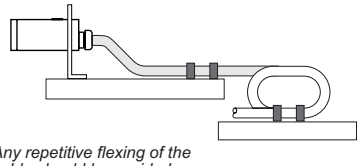
Cable/Pigtail version



Plug version



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*	*Protection of the sensing face*	*Sensor mounted on a mobile carrier*
	 *The cable should not be pulled*	 *A proximity switch should not serve as mechanical stop*	 *Any repetitive flexing of the cable should be avoided*

Delivery Contents

- Photoelectric switch: PH 18 CNR...
- Installation instruction on plastic bag
- Screwdriver
- Mounting bracket APH18-MB1
- 1 M18 locknuts
- **Packaging:** Plastic bag

Accessories

- Connector type CONG1A.. / CONB14NF.. series
- Reflector type ER.. - to be purchased separately