Photoelectrics
Diffuse-reflective, Background Suppression
Type PH18CNB20...

- **Miniature sensor range**
- **Range: 200 mm**
- **Sensitivity adjustment by potentiometer**
- **Modulated, red light 625 nm**
- **Supply voltage: 10 to 30 VDC**
- **Output: 100 mA, NPN or PNP preset**
- **Make and break switching function**
- **LED indication for output and power ON**
- **Protection: reverse polarity, short circuit and transients**
- **Cable and plug versions**
- **Excellent EMC performance**
- **Excelent colour matching**

Product Description

The PH18CNB20... is part of a family of inexpensive general purpose diffuse reflective sensors with backgrund suppression 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

PH18CNB20NAM1SA

- **Type**
- **Housing style**
- **Housing size**
- **Housing material**
- **Housing length**
- **Detection principle**
- **Sensing distance**
- **Output type**
- **Output configuration**
- **Connection type**
- **Sensitivity adjustment**

Type Selection

Housing style	Range S_n	Connection	Ordering no. NPN Make and break switching	Ordering no. PNP Make and break switching
M18 Square type	200 mm	Cable	**PH 18 CNB 20 NASA**	**PH 18 CNB 20 PASA**
M18 Square type	200 mm	Plug	**PH 18 CNB 20 NAM1SA**	**PH 18 CNB 20 PAM1SA**
M18 Square type	200 mm	Pigtail	**PH 18 CNB 20 NAT1SA**	**PH 18 CNB 20 PAT1SA**

Specifications

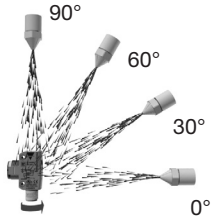
Rated operating distance (S_n)	Up to 200 mm, reference target: Kodak test card R27, white, 90% reflective, 100 x 100 mm
Maximum detecting distance	
White object 90% refl.	≤ 200 mm
Grey object 18% refl.	≤ 200 mm
Black object 6% refl.	≤ 150 mm
Blind zone	8 mm
Sensitivity control	Adjustable by potentiometer
Electrical adjustment	210°
Mecanical adjustment	240°
Temperature drift	≤ 0.2%/°C
Hysteresis (H)	≤ 10%
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)	≤ 20 mA @ U_B max ≤ 40 mA @ U_B min
Minimum operational current (I_m)	≤ 0.5 mA
OFF-state current (I_r)	≤ 100 µA
Voltage drop (U_d)	≤ 2 VDC @ I_e max
Protection	Short-circuit, reverse polarity and transients
Light source	InGaAlP, LED, 625 nm
Light type	Red, modulated
Emitter angle	± 3° @ half sensing distance
Ambient light	30.000 lux Incandescent lamp
Operating frequency (f)	≤ 500 Hz
Response time	
OFF-ON (t_{ON})	≤ 1 ms
ON-OFF (t_{OFF})	≤ 1 ms
Power ON delay (t_v)	≤ 100 ms
Output function	Open collector NPN or PNP

Specifications (cont.)

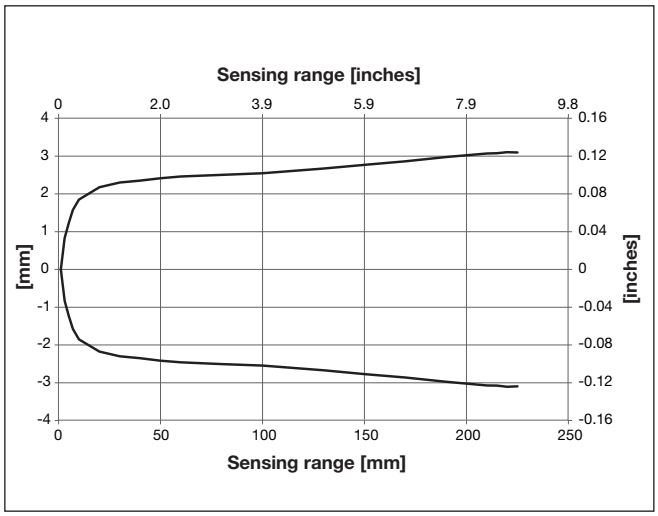
Output switching function	N.O. and N.C.
Indication	
Output ON	LED, yellow
Power ON	LED, green
Environment	
Installation category	III (IEC 60664/60664A; 60947-1)
Pollution degree	3 (IEC 60664/60664A; 60947-1)
Degree of protection	IP 67, IP 69K* (IEC 60529; 60947-1)
Ambient temperature	
Operating	-25° 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 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	
Cable version	≤ 85 g
Pigtail version	≤ 40 g
Plug version	≤ 25 g
CE-marking	Yes
Approvals	cULus (UL508) Supply class 2

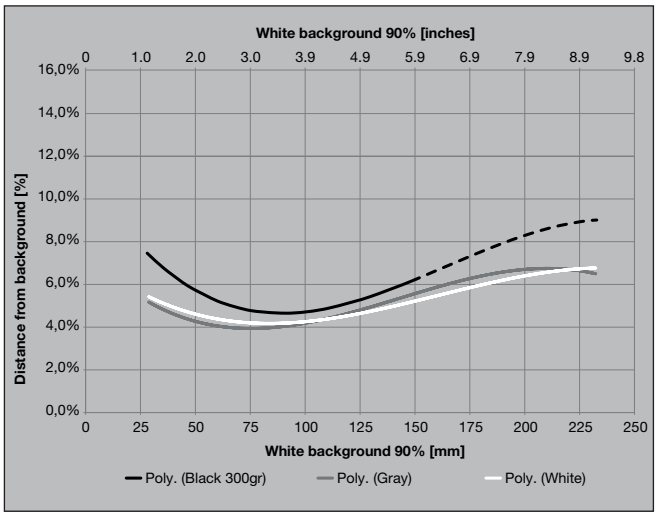
* The IP69K test according to DIN 40050-9 for high-pressure, high-temperature wash-down applications. The sensor must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The sensor is exposed to high pressure water from a spray nozzle that is fed with 80°C water 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.



Detection Diagram

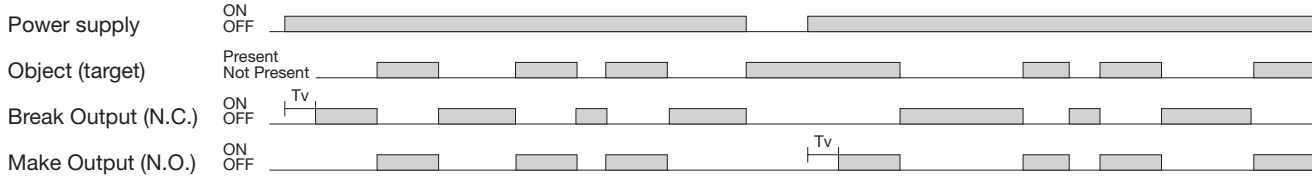


Sensing Conditions



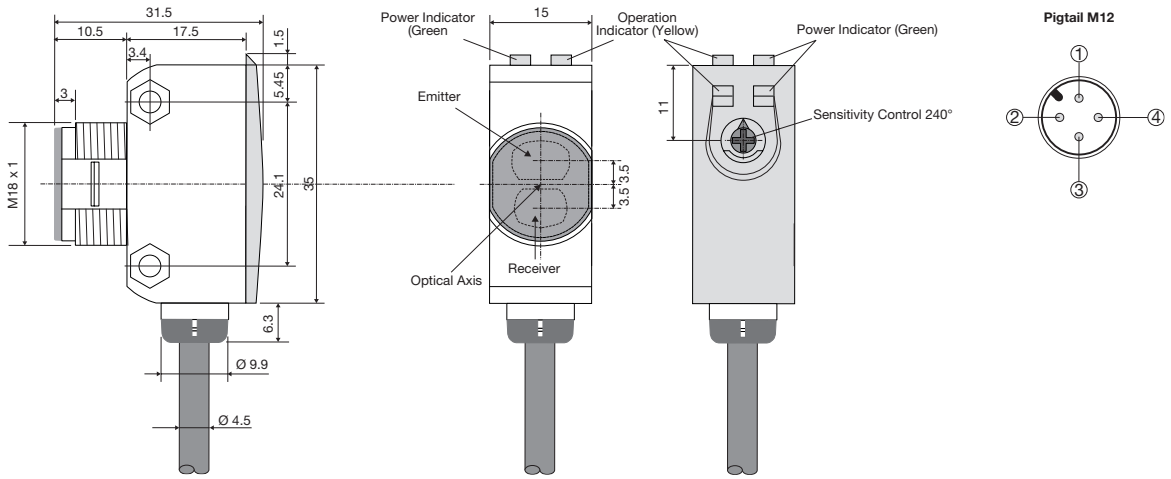
Operation Diagram

Tv = Power ON delay

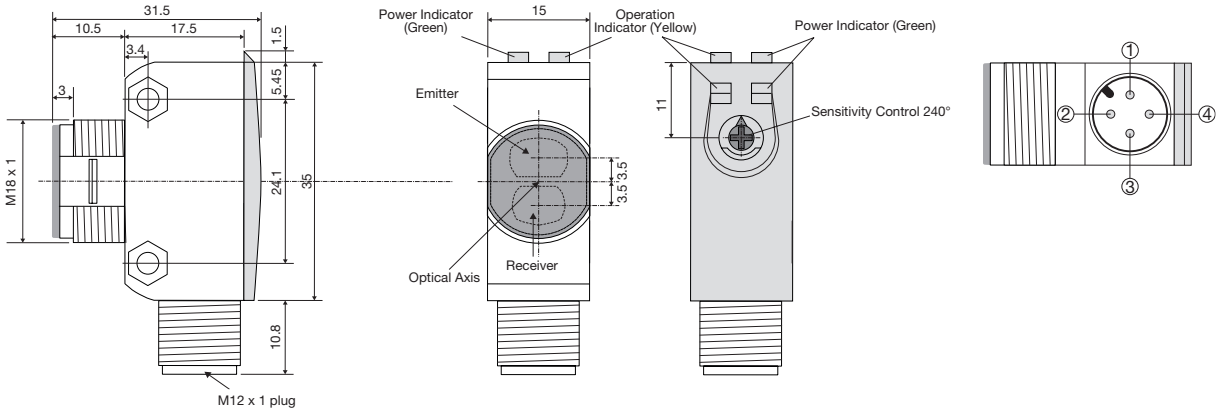


Dimensions

Cable/Pigtail version

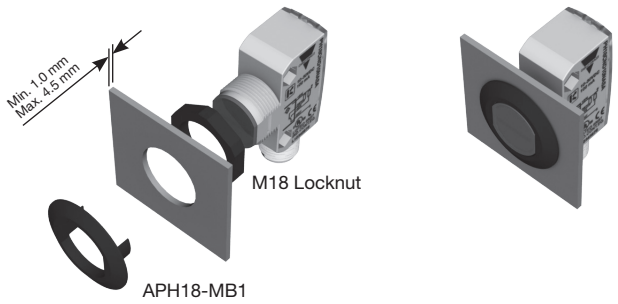


Plug version



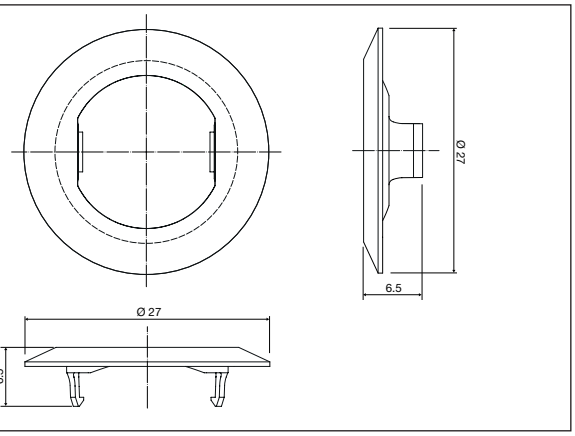
Wiring Diagrams

Mounting Systems

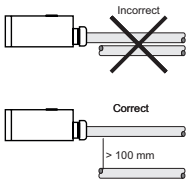
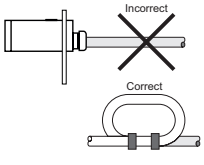
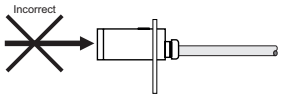
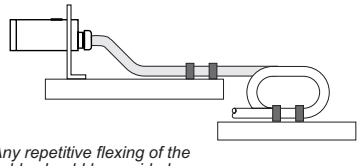


PH18 mounting with a combination of 1 x APH18-MB1 and 1 x M18 locknut.
Maximum torque 0.9 NM

APH18-MB1



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: PH18CNB20 ...
- Installation instruction on plastic bag
- Screwdriver
- Mounting bracket APH18-MB1
- 2 M18 locknuts
- **Packaging:** Plastic bag

Accessories

- Connector type CONG1A.. / CONB14NF.. series