

Photoelectrics

Diffuse-reflective, Background Suppression

Type PH18CNB20...

CARLO GAVAZZI



- 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
- Excellent colour matching



Product Description

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

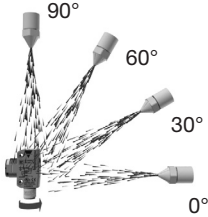
Rated operating distance (S_n)	Up to 200 mm, reference target: Kodak test card R27, white, 90% reflective, 100 x 100 mm	(max. load capacity 100 nF) No load supply current (I_o)	$\leq 20 \text{ mA @ } U_B \text{ max}$ $\leq 40 \text{ mA @ } U_B \text{ min}$
Maximum detecting distance White object 90% refl. Grey object 18% refl. Black object 6% refl.	$\leq 200 \text{ mm}$ $\leq 200 \text{ mm}$ $\leq 150 \text{ mm}$	Minimum operational current (I_m)	$\leq 0.5 \text{ mA}$
Blind zone	8 mm	OFF-state current (I_r)	$\leq 100 \mu\text{A}$
Sensitivity control Electrical adjustment Mechanical adjustment	Adjustable by potentiometer 210° 240°	Voltage drop (U_d)	$\leq 2 \text{ VDC @ } I_e \text{ max}$
Temperature drift	$\leq 0.2\%/^{\circ}\text{C}$	Protection	Short-circuit, reverse polarity and transients
Hysteresis (H)	$\leq 10\%$	Light source	InGaAlP, LED, 625 nm
Rated operational volt. (U_B)	10 to 30 VDC (ripple included)	Light type	Red, modulated
Ripple (U_{pp})	$\leq 10\%$	Emitter angle	$\pm 3^{\circ}$ @ half sensing distance
Output current Continuous (I_a) Short-time (I)	$\leq 100 \text{ mA}$ $\leq 100 \text{ mA}$	Ambient light	30.000 lux Incandescent lamp
		Operating frequency (f)	$\leq 500 \text{ Hz}$
		Response time OFF-ON (t_{ON}) ON-OFF (t_{OFF})	$\leq 1 \text{ ms}$ $\leq 1 \text{ ms}$
		Power ON delay (t_v)	$\leq 100 \text{ ms}$
		Output function	Open collector NPN or PNP



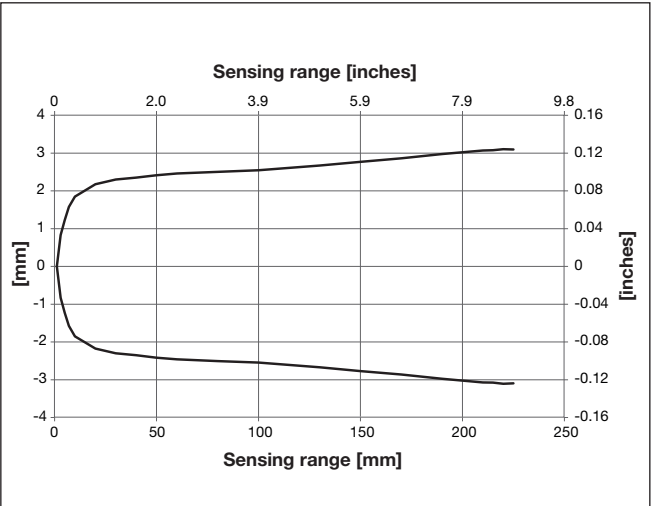
Specifications (cont.)

Output switching function	N.O. and N.C.	Housing material	
Indication		Body	ABS, grey
Output ON	LED, yellow	Backpart	PC-Transparent
Power ON	LED, green	Front material	PMMA, red
Environment		Cable gland	POM, Black
Installation category	III (IEC 60664/60664A; 60947-1)	Trimmer shaft	POM, Dark Grey
Pollution degree	3 (IEC 60664/60664A; 60947-1)	Locknuts	PP, black
Degree of protection	IP 67, IP 69K* (IEC 60529; 60947-1)	Mounting bracket	PPA, black
Ambient temperature		Connection	
Operating	-25° to +60°C (-13° to +140°F)	Cable	PVC, grey 4 x 0.25 mm², Ø = 4.5 mm
Storage	-40° to +70°C (-40° to +158°F)	Plug	M12, 4-pin (CONB14NF-series)
Vibration	10 to 150 Hz, 1.0 mm/15 G (IEC 60068-2-6)	Pigtail	PUR, grey, 30 cm 4 x 0.25 mm², Ø = 4.5 mm
Shock	30 g / 11ms, 3 pos, 3 neg per axis (IEC 60068-2-6, 60068-2-32)	Weight	
Rated insulation voltage	≤ 500 VAC (rms) IEC protection class III	Cable version	≤ 85 g
		Pigtail version	≤ 40 g
		Plug version	≤ 25 g
		CE-marking	Yes
		Approvals	cULus (UL508) Supply class 2

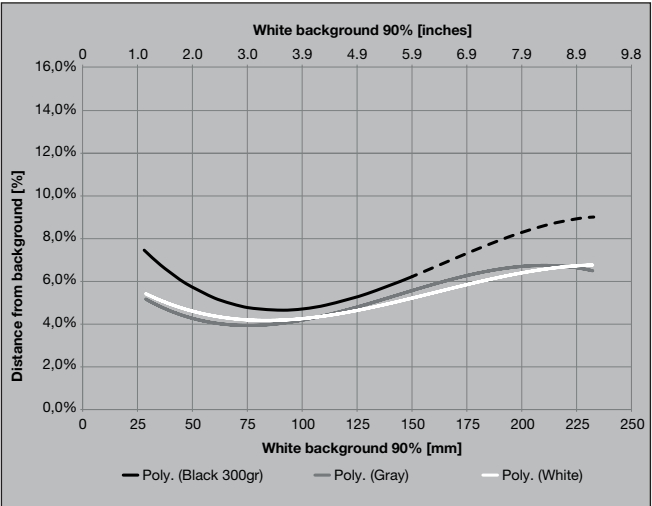
* The IP69K test according to DIN 40050-9 for high-pressure, high-temperature wash-down applications. The sensor must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The sensor is exposed to high pressure water from a spray nozzle that is fed with 80°C water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

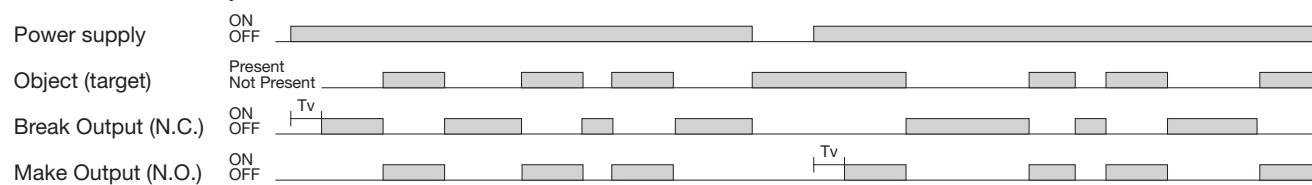


Sensing Conditions

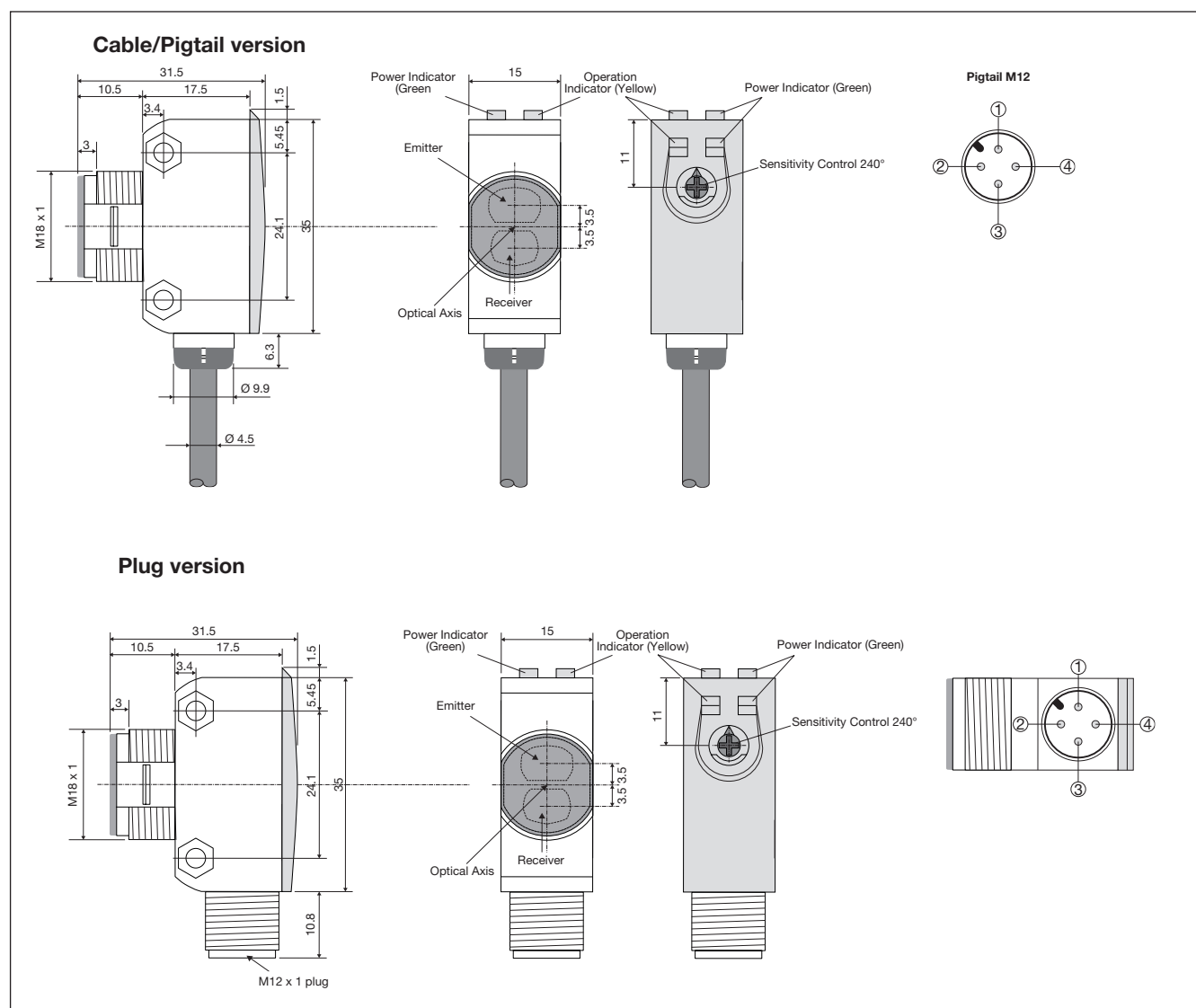


Operation Diagram

T_v = Power ON delay

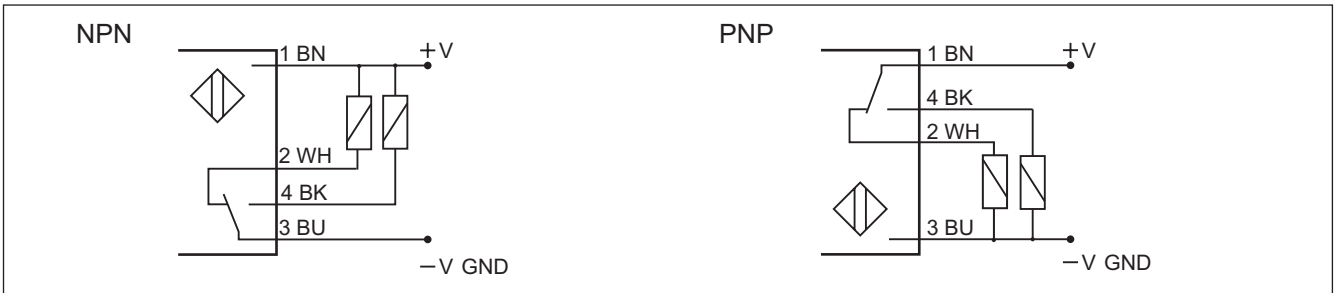


Dimensions

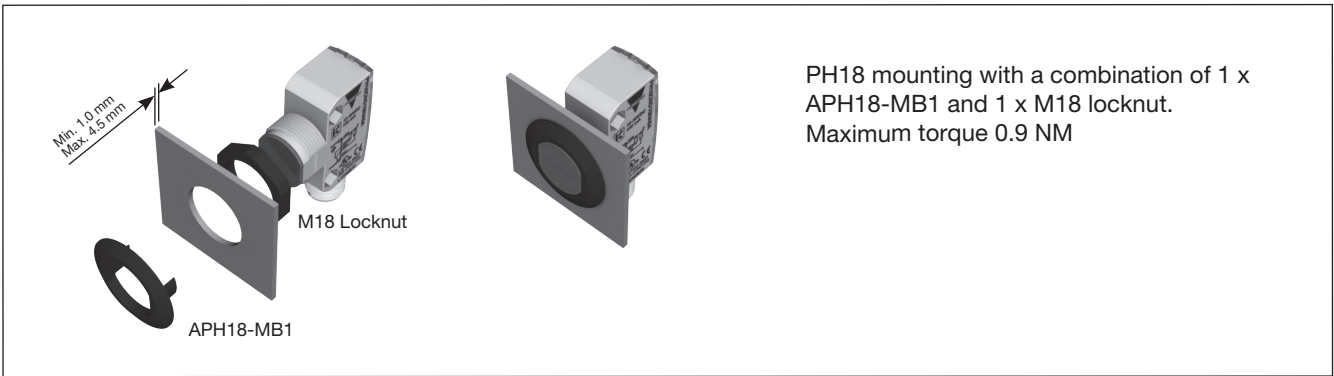




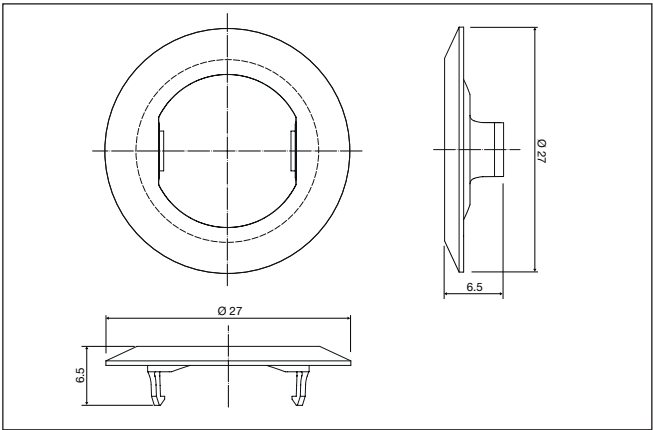
Wiring Diagrams



Mounting Systems



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 Incorrect Correct > 100 mm	Relief of the cable strain Incorrect Correct The cable should not be pulled	Protection of the sensing face Incorrect A proximity switch should not serve as mechanical stop	Sensor mounted on a mobile carrier Any repetitive flexing of the cable should be avoided
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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