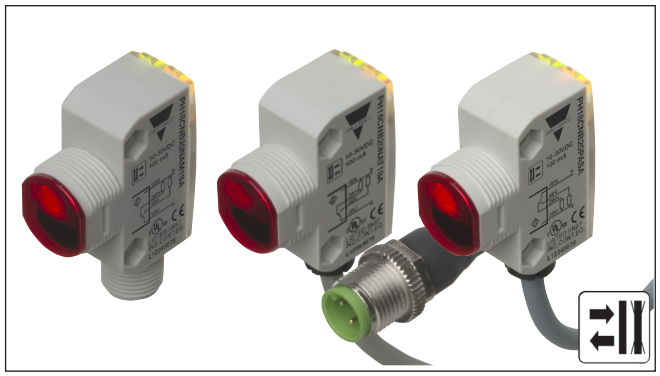
# Photoelectrics
# Diffuse-reflective, Background Suppression
# Type PH18CNB20...



- 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<br>≤ 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 |



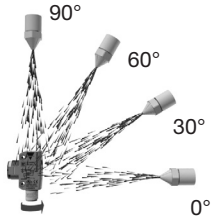
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## Specifications (cont.)

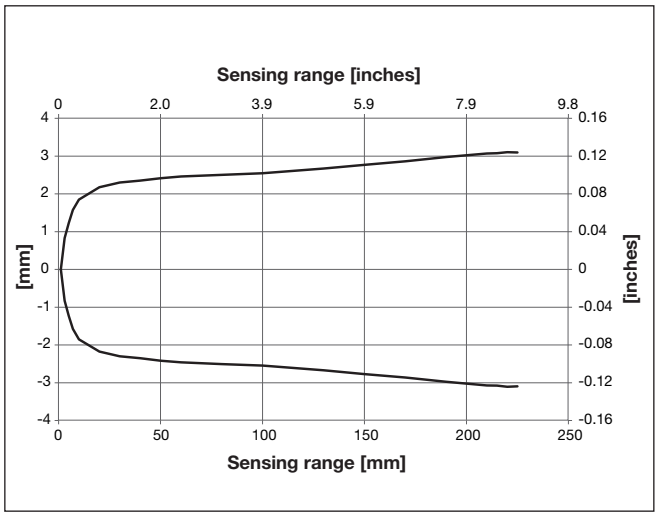
| | |
|---|---|
| **Output switching function** | N.O. and N.C. |
| **Indication** | |
| Output ON | LED, yellow |
| Power ON | LED, green |
| **Environment** | |
| Installation category | III (IEC 60664/60664A; 60947-1) |
| Pollution degree | 3 (IEC 60664/60664A; 60947-1) |
| Degree of protection | 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 (CON.14NF..W series) |
| Pigtail | PUR, grey, 30 cm 4 x 0.25 mm², Ø = 4.5 mm M12, 4-pin (CON.14NF..W series) |
| **Weight** | |
| Cable version | ≤ 85 g |
| Pigtail version | ≤ 40 g |
| Plug version | ≤ 25 g |
| **CE-marking** | Yes |
| **Approvals** | cULus (UL508) Supply class 2 |

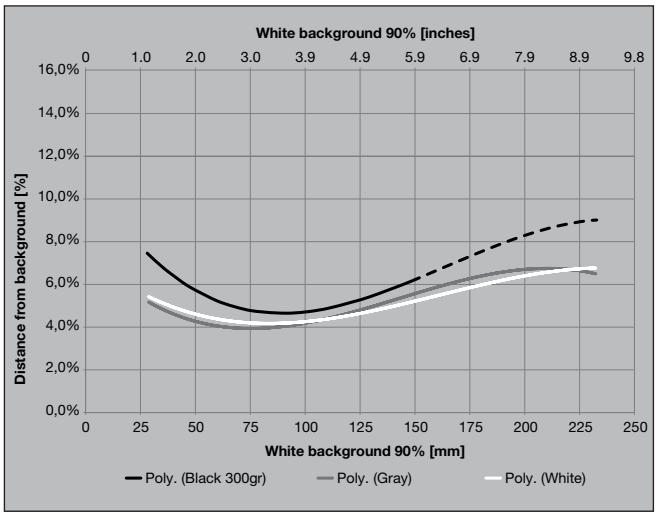
* The IP69K test according to DIN 40050-9 for high-pressure, high-temperature wash-down applications. The sensor must not only be dust tight (IP6X), but also able to withstand high-pressure and steam cleaning. The sensor is exposed to high pressure water from a spray nozzle that is fed with 80°C water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

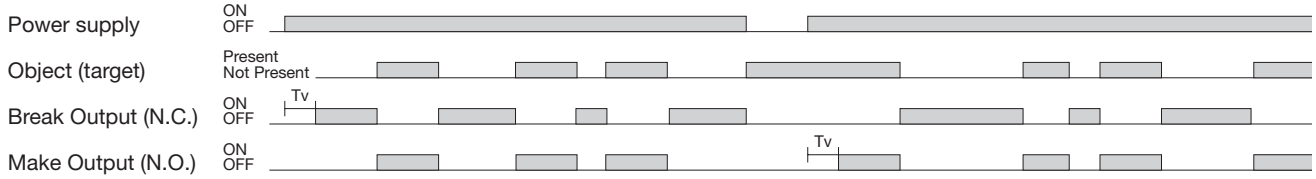





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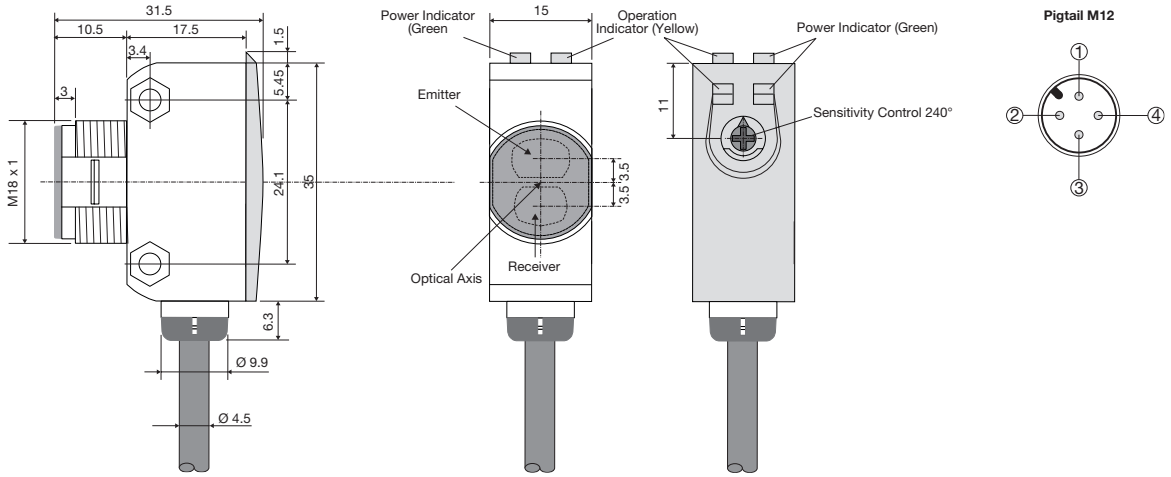
## Operation Diagram

Tv = Power ON delay

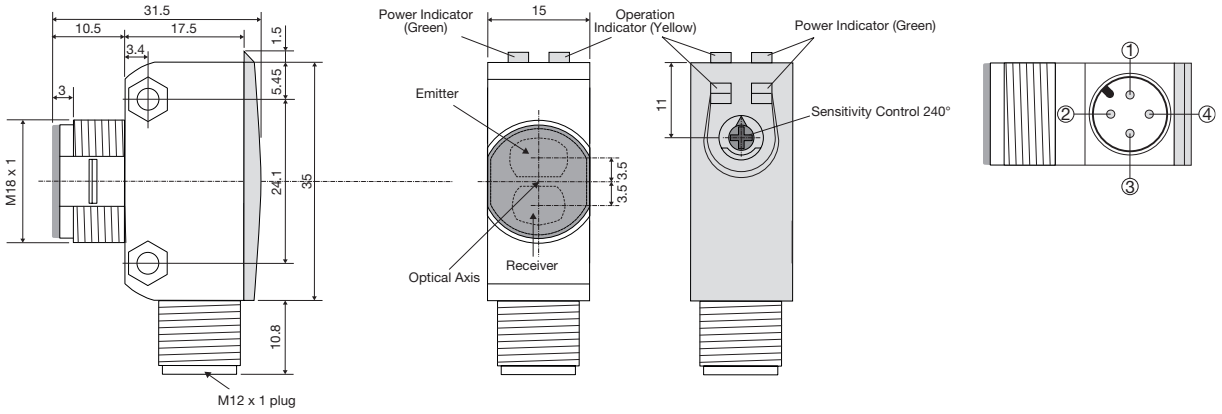



## Dimensions

**Cable/Pigtail version**



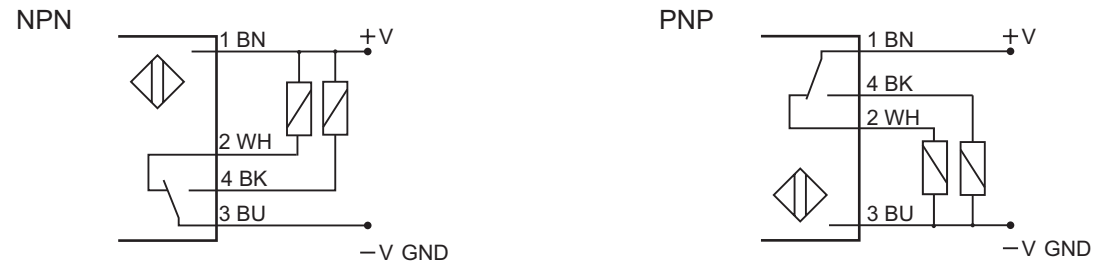

**Plug version**



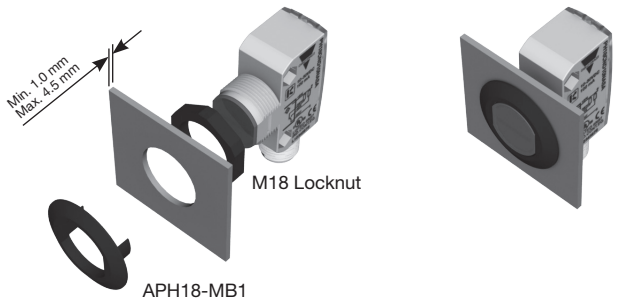



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## Wiring Diagrams

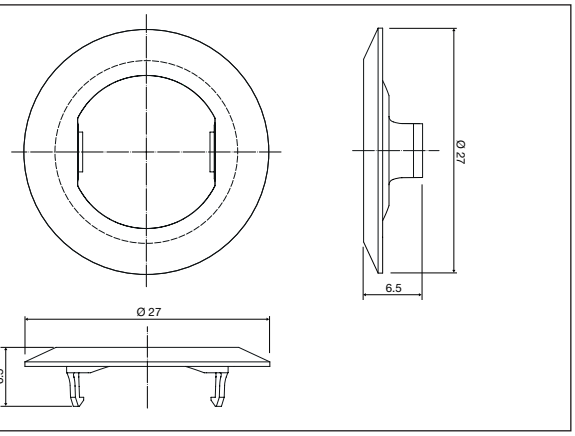



## Mounting Systems

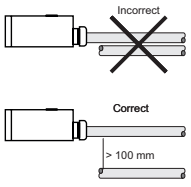
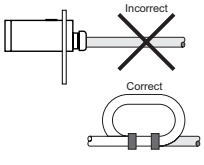
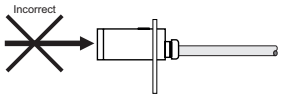
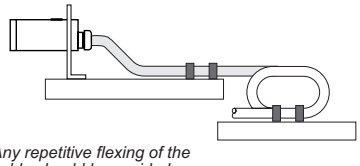



PH18 mounting with a combination of 1 x APH18-MB1 and 1 x M18 locknut.
Maximum torque 0.9 NM

## 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* |



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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 CON.14NF..W series



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