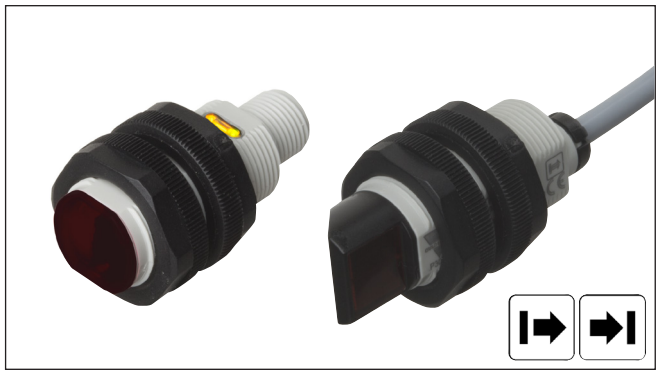
# Photoelectrics
# Through-beam
# Type PA18C.T..., DC

CARLO GAVAZZI



- **Miniature sensor range**
- **Range: 20 m (Axial), 16 m (Radial)**
- **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 and plug versions**
- **Excellent EMC performance**

## Product Description

The PA18C.T... is part of a family of inexpensive general purpose through-beam sensors in industrial standard 18 mm cylindrical 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

**PA18CAT20PAM1SA**

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

## Type Selection

| Housing type | Range $S_n$ | Connection | Ordering no. Emitter | Ordering no. Receiver NPN Make or break switching | Ordering no. Receiver PNP Make or break switching |
|---|---|---|---|---|---|
| M18 Axial type | 20 m | Cable | **PA 18 CAT 20** | **PA 18 CAT 20 NASA** | **PA 18 CAT 20 PASA** |
| M18 Axial type | 20 m | Plug | **PA 18 CAT 20M1** | **PA 18 CAT 20 NAM1SA** | **PA 18 CAT 20 PAM1SA** |
| M18 Radial type | 16 m | Cable | **PA 18 CRT 16** | **PA 18 CRT 16 NASA** | **PA 18 CRT 16 PASA** |
| M18 Radial type | 16 m | Plug | **PA 18 CRT 16M1** | **PA 18 CRT 16 NAM1SA** | **PA 18 CRT 16 PAM1SA** |

## Specifications Receiver according to EN60947-5-2

| | |
|---|---|
| **Rated operating distance** ($S_n$) | |
| Axial type (A) | Up to 20 m, |
| Radial type (R) | Up to 16 m |
| **Blind zone** | 0 mm |
| **Sensitivity control** | Adjustable by potentiometer |
| Electrical adjustment | 210° |
| Mecanical adjustment | 240° |
| Adjustable distance to target | |
| Axial types | 1 - 20 m |
| Radial types | 1 - 16 m |
| **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** ($I_o$) | ≤ 15 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 |
| **Sensing angle** | |
| Axial | ± 4° |
| Radial | ± 3° |
| **Ambient light** | 30.000 lux Incandescent lamp |
| **Operating frequency** | 500 Hz |
| **Response time** | |
| OFF-ON ($t_{ON}$) | ≤ 1.0 ms |
| ON-OFF ($t_{OFF}$) | ≤ 1.0 ms |
| **Power ON delay** ($t_v$) | ≤ 200 ms |
| **Output function** | |
| Type | NPN or PNP |
| Switching function | NO and NC |
| **Indication** | |
| Output ON | LED, yellow |
| Signal stability and power ON | LED, green |



ООО «Сенсорен Электро» +7(495)150-48-00 info@sensoren.ru
Sensoren

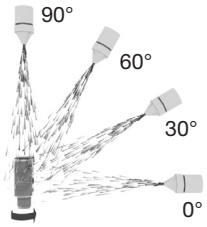
## Specifications Emitter according to EN60947-5-2

| | |
|---|---|
| **Rated operational volt.** ($U_B$) | 10 to 30 VDC (ripple included) |
| **Ripple** ($U_{rpp}$) | ≤ 10% |
| **Supply current** ($I_o$) | ≤ 25 mA |
| **Light source** | LED, 850 nm |
| **Light type** | Infrared, modulated |
| **Sensing angle** | |
| Axial | ± 4° |
| Radial | ± 3° |
| **Light spot Diameter** | Ø 1500 mm @ 10 m |
| **Protection** | Reverse polarity and transients |
| **Indication function** | |
| Power supply ON | LED, green |
| Signal stability and power ON | LED, green |
| **Power on delay** | < 200 ms |

## Specifications Common according to EN60947-5-2

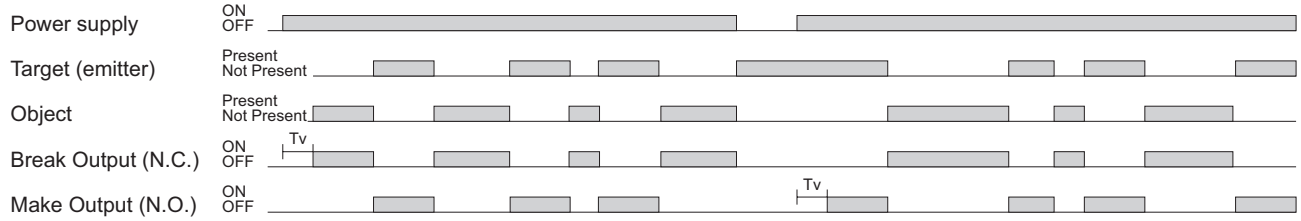
| | |
|---|---|
| **Environment** | |
| Installation category | III (IEC 60664/60664A; 60947-1) |
| Pollution degree | 3 (IEC 60664/60664A; 60947-1) |
| Degree of protection | IP 67, IP 69K* |
| **Ambient temperature** | |
| Operating | -25° to +60°C (-13° to +140°F) |
| Storage | -40° to +70°C (-40° to +158°F) |
| **Vibration** | 10 to 150 Hz, 1 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 |
| Front material | PMMA, red |
| Cable gland | POM, Black |
| Trimmer shaft | POM, Dark Grey |
| Locknuts | PBTB, black |
| Mounting bracket | PPA, black |
| **Connection** | |
| Cable | PVC, grey, 2 m |
| Receiver | 4 x 0.25 mm², Ø = 4.5 mm |
| Emitter | 2 x 0.25 mm², Ø = 4.5 mm |
| Plug | M12, 4-pin (CON.14NF..W series) |
| **Weight** | With cable: 85 g<br>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





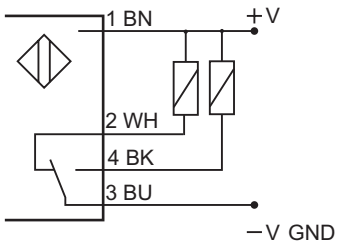

ООО «Сенсорен Электро» +7(495)150-48-00 info@sensoren.ru
Sensoren

CARLO GAVAZZI

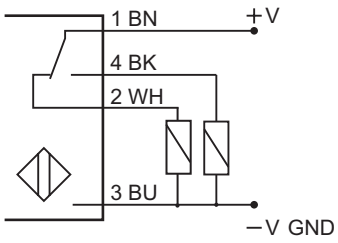
## Wiring Diagrams

Receiver

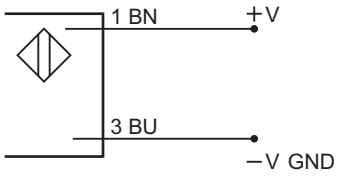
NPN



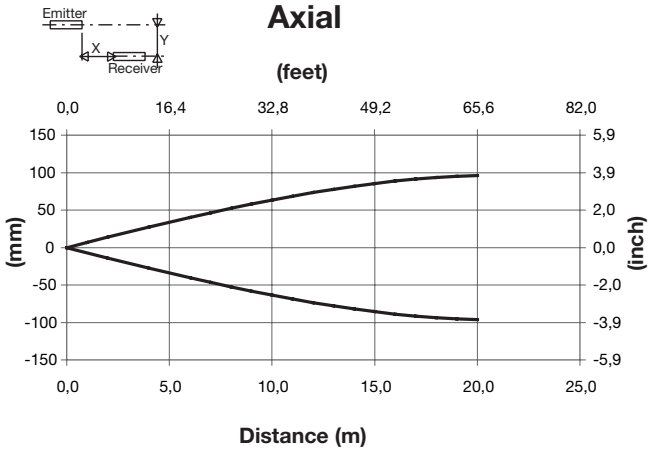

PNP

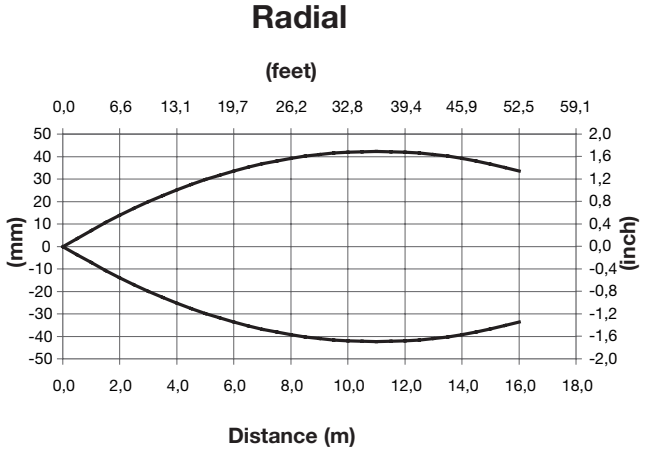



Emitter

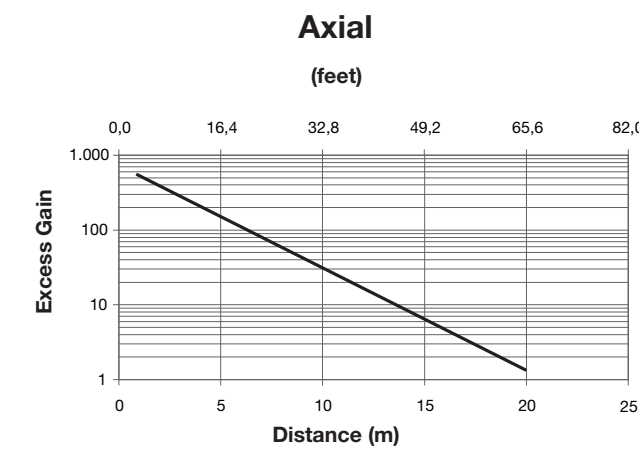


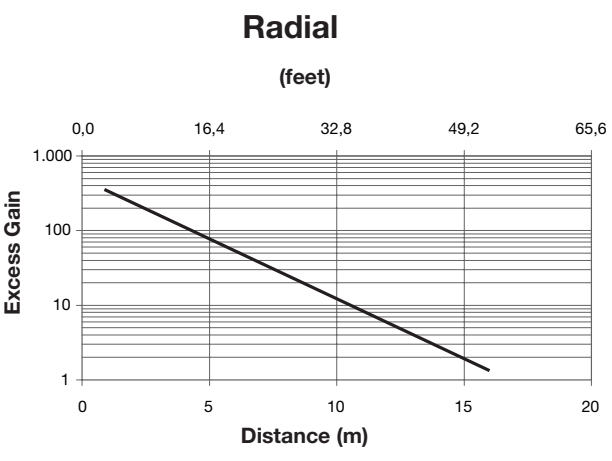

## Detection Diagram




## Excess Gain



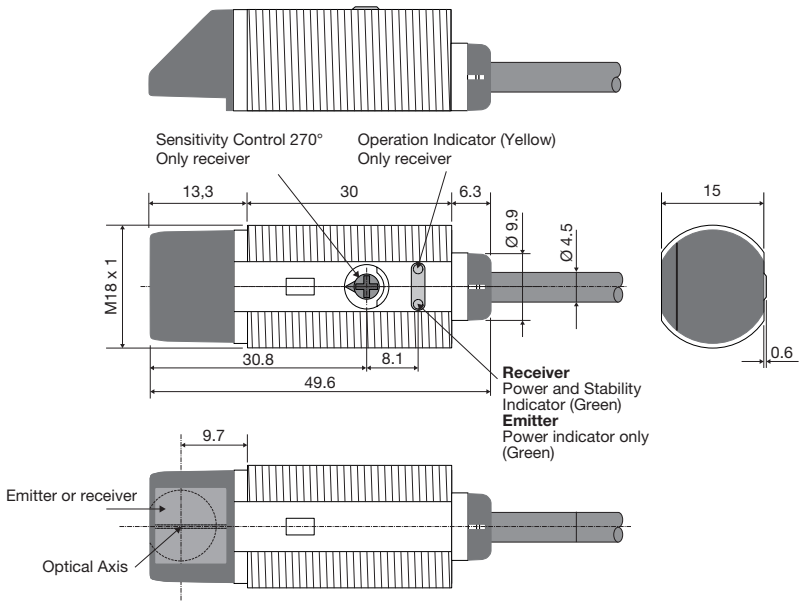



ООО «Сенсорен Электро» +7(495)150-48-00 info@sensoren.ru
Sensoren

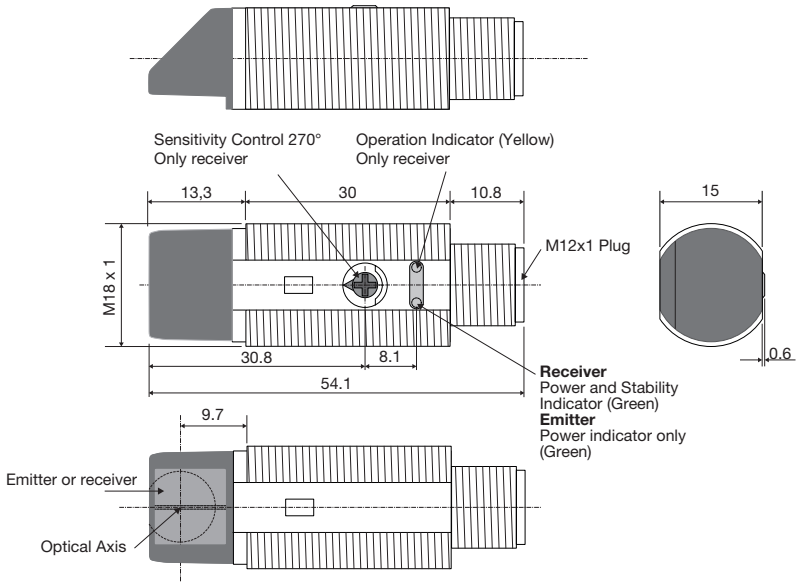
CARLO GAVAZZI

# Dimensions Radial version

## Cable version




## Plug version



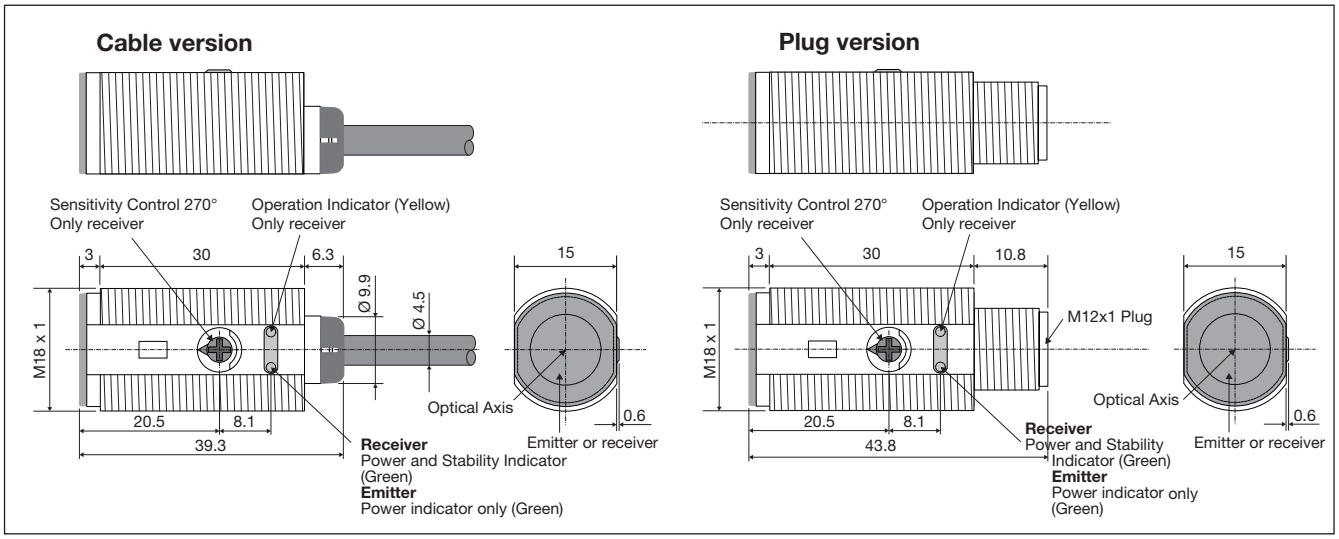



ООО «Сенсорен Электро» +7(495)150-48-00 info@sensoren.ru

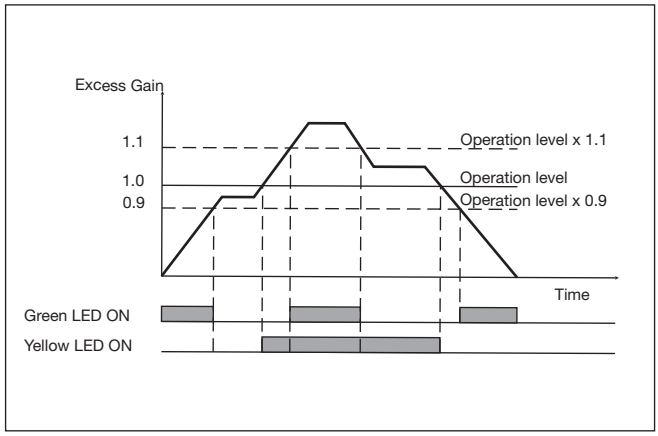
Sensoren

CARLO GAVAZZI

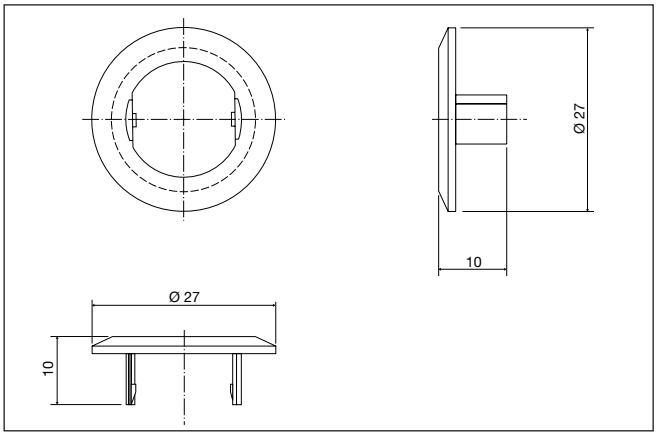
## Dimensions Axial version




## Signal Stability Indication




## APA18-MB1



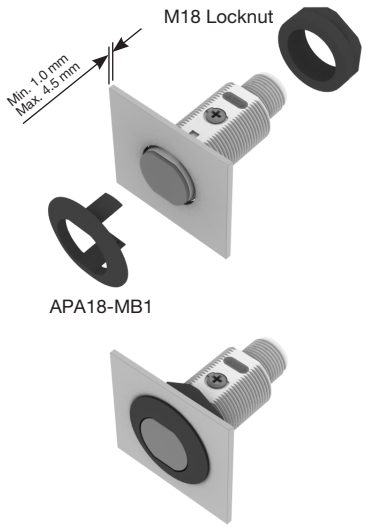



ООО «Сенсорен Электро» +7(495)150-48-00 info@sensoren.ru
Sensoren

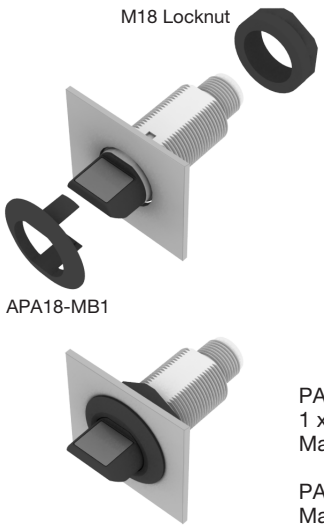
CARLO GAVAZZI

## Mounting Systems

**Axial version**




**Radial version**

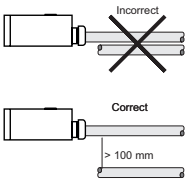



PA18 mounting with a combination of 1 x APA18-MB1 and 1 x M18 locknut.
Maximum torque 0.9 NM

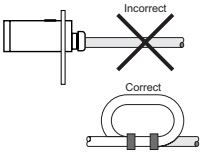
PA18 mounting with a combination of 2 x M18 locknuts.
Maximum torque 2.0 NM

## 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*

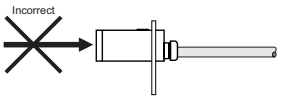



*Relief of the cable strain*



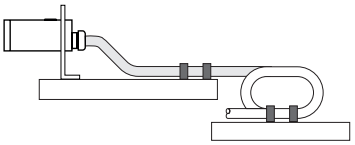

*The cable should not be pulled*

*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*

## Delivery Contents

- Photoelectric switch: PA 18 C.T...
- Installation instruction on plastic bag
- Screwdriver
- Mounting bracket APA18-MB1
- 2 M18 locknuts
- **Packaging:** Plastic bag
- Emitter and receiver is packed separately

## Accessories

- Connector type CON.14NF..W series



ООО «Сенсорен Электро» +7(495)150-48-00 info@sensoren.ru

Sensoren