

## PA18 and PH18 Series - Photoelectric Sensors

**Sense**

# PA/PH18 Series

## Compact Photoelectric Sensors

This powerful PA/PH18 sensor series, with its cost effective, compact design and robust ABS housing, offers a space saving and easy-to-clean solution for a variety of applications in e.g. material handling, textile and food & beverage industries. Due to their longer sensing distance, their high-speed detection and their improved LED diagnostics, the PA/PH18 sensors provide an excellent price to performance ratio. Being resistant to high temperatures, high-pressure cleaning, strong cleaning agents and disinfectants, these sensors are especially well suited for reliable detection in harsh environments.

The PA/PH18 series is available in a variety of versions: The PA18 comes in an axial or a radial version and the PH18 in a square version. Both PA18 and PH18 are available as diffuse reflective with narrow or wide viewing angle, diffuse reflective with background suppression, retro-reflective, polarized retro-reflective and through-beam sensors.



### High Technology

A built-in microprocessor guarantees advanced filtering and detection ensuring flexible customized solutions.

### Easy Adjustment

A very precise and linear sensitivity adjustment and use of a manual potentiometer provide accurate and easy setting from close distances to full range.

### Easy Mounting

The PA/PH18 series comes with a new mounting accessory that facilitates fast and easy mounting.

### Easy to Clean

Due to the smart and simple mounting accessory and the robust design of the sensors, cleaning has become more efficient and easier.

### High Immunity

The PA/PH18 sensors possess a remarkably high immunity to light and electromagnetic disturbances. System maintenance is hereby reduced and the application uptime is increased.

### Harsh Environments

The PA/PH18 sensors have been developed to operate in the harshest conditions. They conform to the standards of ECOLAB, IP67 and IP69K.

### Approvals

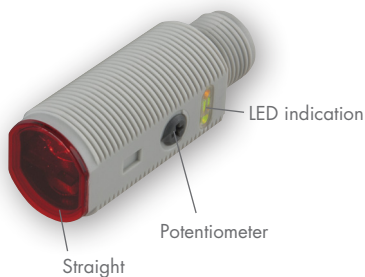
CE (EN60947-5-2)

cULus (UL508) supply class 2

Food & Beverage: ECOLAB certified

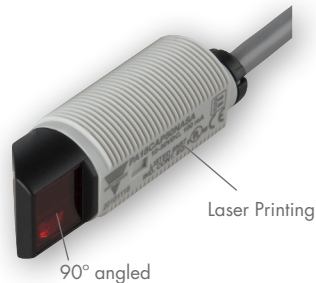


## Your Benefits



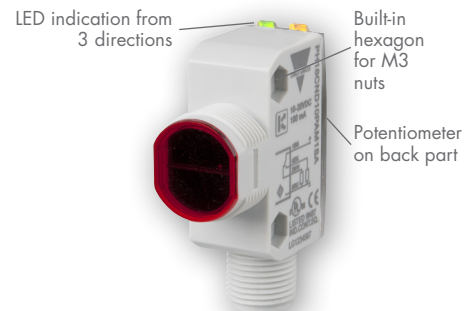
### PA18 Axial

PA18: M18 x 40 mm (Axial cable)  
PA18: M18 x 44 mm (Axial plug)



### PA18 Radial

PA18: M18 x 50 mm (Radial cable)  
PA18: M18 x 54 mm (Radial plug)



### PH18 Square

PH18: 31,5 x 42,8 (Square cable)  
PH18: 31,5 x 47,3 (Square plug)  
PH18: 31,5 x 42,8 (Square pig-tail)

### Manual Potentiometer

The potentiometer can be left on maximum for plug & play setup, or the sensitivity level can be optimized as circumstances may require. For retro-reflective and through-beam versions this allows detection of semitransparent objects.

### Clear Robust Laser Printing

Laser engraving has replaced the sensor label ensuring that the information stays intact after any cleaning process.

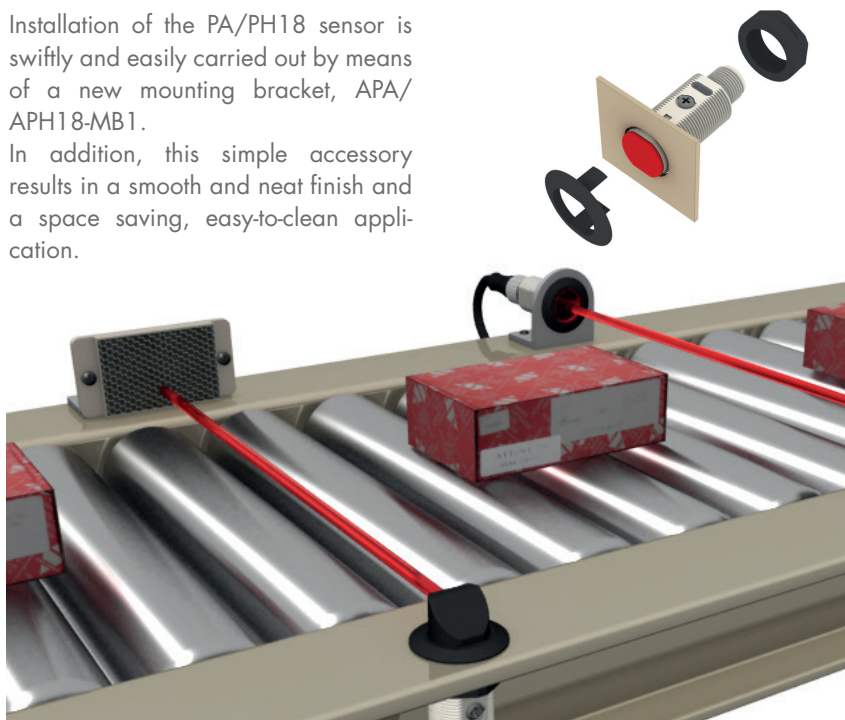
### LED Indication

The sensor functions are easily diagnosed by the dual LED indication in three combinations.

## Mounting

Installation of the PA/PH18 sensor is swiftly and easily carried out by means of a new mounting bracket, APA/APH18-MB1.

In addition, this simple accessory results in a smooth and neat finish and a space saving, easy-to-clean application.



## IP69K and ECOLAB

Built to withstand cleaning with water at 80°C (176°F), high pressure washing up to 100 bar (1,450 psi) and to resist alkaline and acidic cleaning agents, the PA/PH18 sensor series is an excellent solution for applications where harsh cleaning methods are required.



## Technologically Advanced

The PA/PH18 photoelectric sensor is technologically advanced yet small, economical and easy to use without compromising quality and durability



### NO and NC in One Sensor

The PA/PH18 sensors offer the freedom to choose between a normally open and normally closed output. This drastically reduces demands on storage capacity and stock control.

### Efficient Lens Design

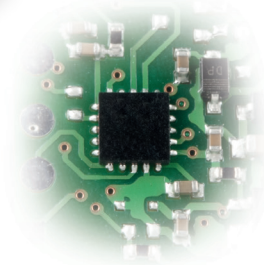
The optimized aspherical lens design results in a wide sensing angle and a much longer sensing range.



### Advanced Microprocessor

The built-in microprocessor uses advanced filtering and detection principles which efficiently eliminate false detection caused by common light sources, flash beacon lamps or electromagnetic interference.

Furthermore, this microprocessor achieves significantly faster detection.



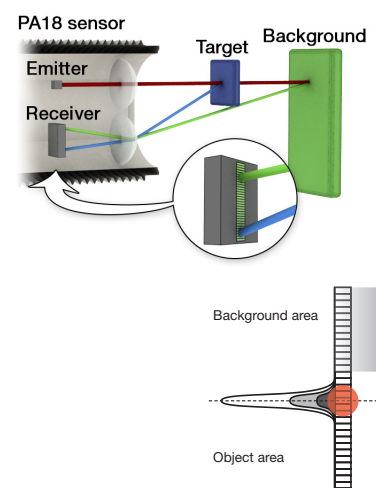
## New background suppression principle

The new PA/PH18 background suppression sensor (BGS) is based on a brand-new sensing principle. This considerably increases the sensing distance (200 mm for white and grey objects, 150 mm for black objects) and improves the detection accuracy of different colours, suppressing the background even more efficiently.

This revolutionary sensing technology uses an Active Pixel Sensor (APS) CMOS array of 64 x 1 sensors, where each pixel represents a specific position. It takes advantage of the fact that the reflected

light hits the APS array at exactly the same position. This way, the object's mass centre can be found regardless of the energy of the received light. Using this technology, grey, black and white objects are detected at almost exactly the same distance.

Furthermore, unlike traditional CCD arrays, the CMOS array benefits from being immune to the blooming effect - not letting the light bleed onto other pixels and disturbing the detection.





## PA18 and PH18 - specifications

PA18 and PH18			Diffuse reflective			Retro-reflective		Through-beam	
			Background suppression	WS	Standard	Standard	With Polarization filter	Receiver	Emitter
Cable 2 m	NPN	Axial	PA18CAB20NASA	PA18CAD04NASA	PA18CAD10NASA	PA18CAR65NASA	PA18CAP50NASA	PA18CAT20NASA	PA18CAT20
		Radial	-	-	PA18CRD08NASA	PA18CRR50NASA	PA18CRP40NASA	PA18CRT16NASA	PA18CRT16
		Square	PH18CNB20NASA	-	PH18CND10NASA	PH18CNR65NASA	PH18CNP50NASA	PH18CNT20NASA	PH18CNT20
	PNP	Axial	PA18CAB20PASA	PA18CAD04PAWS	PA18CAD10PASA	PA18CAR65PASA	PA18CAP50PASA	PA18CAT20PASA	PA18CAT20
		Radial	-	-	PA18CRD08PASA	PA18CRR50PASA	PA18CRP40PASA	PA18CRT16PASA	PA18CRT16
		Square	PH18CNB20PASA	-	PH18CND10PASA	PH18CNR65PASA	PH18CNP50PASA	PH18CNT20PASA	PH18CNT20
Plug M12	NPN	Axial	PA18CAB20NAM1SA	PA18CAD04NAM1WS	PA18CAD10NAM1SA	PA18CAR65NAM1SA	PA18CAP50NAM1SA	PA18CAT20NAM1SA	PA18CAT20M1
		Radial	-	-	PA18CRD08NAM1SA	PA18CRR50NAM1SA	PA18CRP40NAM1SA	PA18CRT16NAM1SA	PA18CRT16M1
		Square	PH18CNB20NAM1SA	-	PH18CND10NAM1SA	PH18CNR65NAM1SA	PH18CNP50NAM1SA	PH18CNT20NAM1SA	PH18CNT20M1
	PNP	Axial	PA18CAB20PAM1SA	PA18CAD04PAM1WS	PA18CAD10PAM1SA	PA18CAR65PAM1SA	PA18CAP50PAM1SA	PA18CAT20PAM1SA	PA18CAT20M1
		Radial	-	-	PA18CRD08PAM1SA	PA18CRR50PAM1SA	PA18CRP40PAM1SA	PA18CRT16PAM1SA	PA18CRT16M1
		Square	PH18CNB20PAM1SA	-	PH18CND10PAM1SA	PH18CNR65PAM1SA	PH18CNP50PAM1SA	PH18CNT20PAM1SA	PH18CNT20M1
Pigtail M12	NPN	Square	PH18CNB20NATT1SA	-	PH18CND10NATT1SA	PH18CNR65NATT1SA	PH18CNP50NATT1SA	PH18CNT20NATT1SA	PH18CNT20T1
	PNP	Square	PH18CNB20PATT1SA	-	PH18CND10PATT1SA	PH18CNR65PATT1SA	PH18CNP50PATT1SA	PH18CNT20PATT1SA	PH18CNT20T1
Rated operating distance ( $S_n$ )			Axial 0.2 m Square 0.2 m	Axial 0.4 m	Axial 1.0 m Radial 0.8 m Square 1.0 m	Axial 6.5 m Radial 5.0 m Square 6.5 m	Axial 5.0 m Radial 4.0 m Square 5.0 m	Axial 20 m Radial 16 m Square 20 m	
Blind Zone			PA: 10 mm PH: 8 mm	0 mm @ $S_n$ max	2 mm @ $S_n$ max	50 mm @ $S_n$ max		0 mm	-
Hysteresis (H)			≤ 10%		≤ 20%			-	
Rated operational voltage			10 to 30 V DC, Ripple included						
No load supply current ( $I_o$ )			≤ 20 mA @ $U_{max}$ ≤ 40 mA @ $U_{min}$	≤ 15 mA @ 24 V DC	≤ 25 mA @ 24 V DC			≤ 15 mA @ 24 V DC	≤ 25 mA @ 24 V DC
Output			NPN or PNP						-
Output function			N.O. and N.C.						-
Output current ( $I_o$ )			≤ 100 mA (max. Load capacity 100 nF)						-
Minimum operational current			≤ 0,5 mA						-
Off-State current ( $I_i$ )			≤ 100 μA						-
Voltage drop ( $U_d$ )			≤ 2.0 V DC @ 100 mA						-
Sensor protection			Shortcircuit (A), reverse polarity (B) and transients (C)						B + C
Response time			≤ 1.0 ms						-
Power on delay ( $t_r$ )			≤ 100 ms				≤ 200 ms		
Led indications			Output ON (Yellow LED), Signal stability and Power ON (Green LED)						Power ON
Sensitivity control			Adjustable by potentiometer						
Degree of protection			IP67 and IP69K						
Ambient temperature			Operating: -25 to +60°C (-13 to +140°F), Storage: -40 to +70°C (-40 to +158°F)						
Ambient light			≤ 30.000 Lux, incandescent lamp						
CE marking			According to EN 60947-5-2						
Approvals			cULus (UL508) Supply class 2						
Installation category			III (IEC60664/60664A; 60947-1)						
Pollution degree			3(IEC60664/60664A; 60947-1)						
Vibration			10 to 150 Hz; 1.0 mm/15G pr. axis (IEC 60068-2-6)						
Shock			30g / 11 ms. 3 positive and 3 negative pr. axis (IEC 60068-2-6)						
Emitting light source			Red LED		Infrared LED	Red LED	-	Infrared LED	
Material			Body: ABS grey; Front material: PMMA red						
Cable			PVC, grey, 2 m, 4 (2) x 0.25mm <sup>2</sup> , Ø=4.5 mm						( ) = Emitter
Connector			4-pin M12						
Dimensions			PA18: M18 x 43.3 mm, PH18: 10.8 x 20 x 30 mm						
Weight incl. packaging			PA18: Cable 85 g, Plug 25 g; PH18: Cable 85 g, Plug 25 g, Pigtail 40 g						

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