Photoelectrics
Diffuse-reflective, Background Suppression
Type PA18CAB20...



- 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 PA18CAB20... is part of a family of inexpensive general purpose diffuse reflective sensors with backgrund suppression 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 switcing function is NO and NC.

Ordering Key

PA18CAB20NAM1SA

- **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 Axial type	200 mm	Cable	**PA 18 CAB 20 NASA**	**PA 18 CAB 20 PASA**
M18 Axial type	200 mm	Plug	**PA 18 CAB 20 NAM1SA**	**PA 18 CAB 20 PAM1SA**

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	10 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	± 3.0° @ 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
Output switching function	N.O. and N.C.

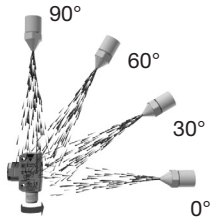
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Specifications (cont.)

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

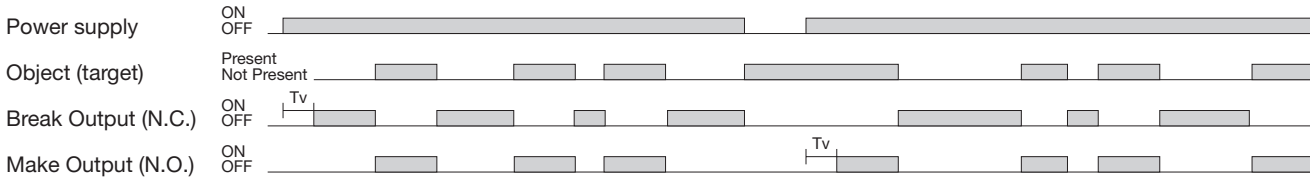
Housing material	
Body	ABS, grey
Front material	PMMA, red
Cable gland	POM, Black
Trimmer shaft	POM, Dark Grey
Locknuts	PBTP, black
Mounting bracket	PPA, black
Connection	
Cable	PVC, grey, 2 m 4 x 0.25 mm², Ø = 4.5 mm
Plug	M12, 4-pin (CON.14NF..W series)
Weight	
Cable version	≤ 85 g
Plug version	≤ 25 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.

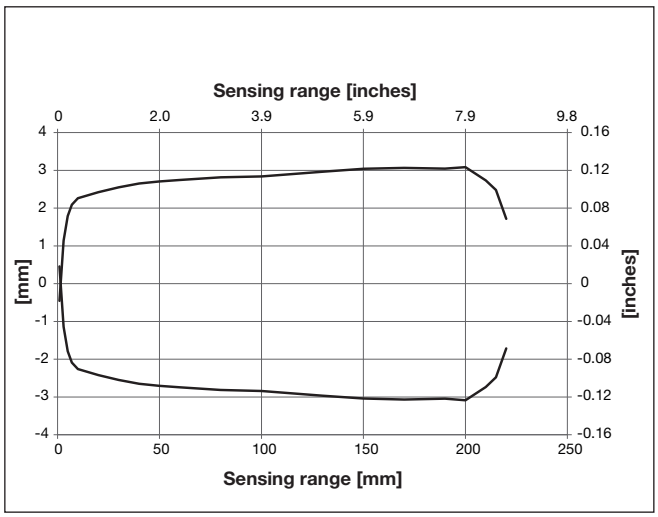


Operation Diagram

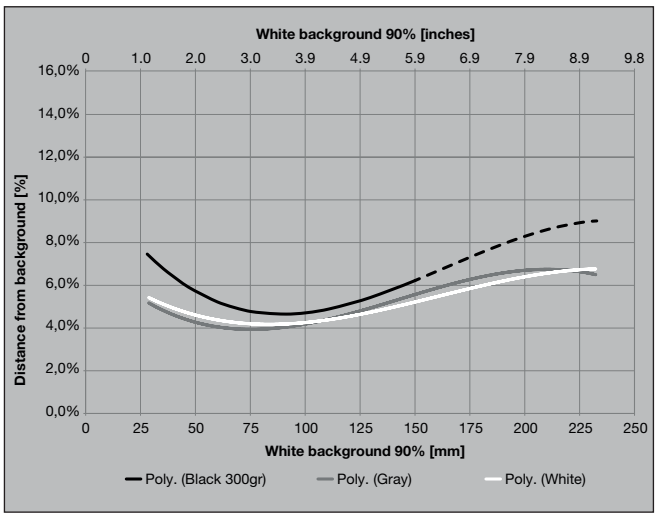
Tv = Power ON delay



Detection Diagram

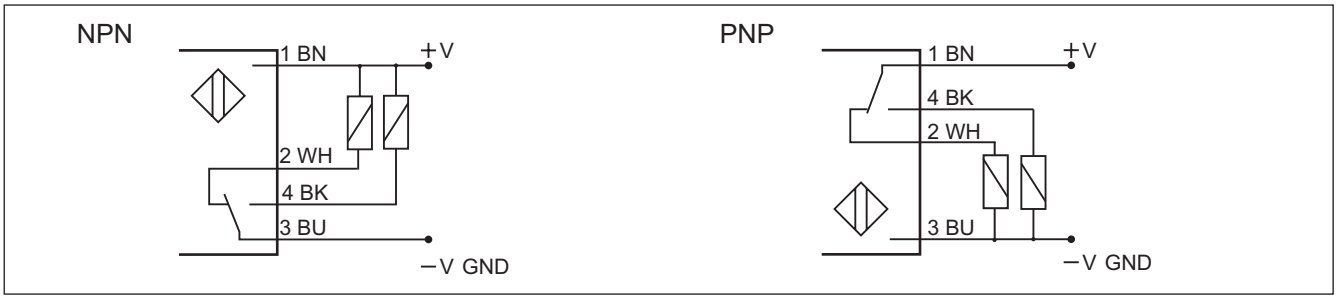


Sensing Conditions

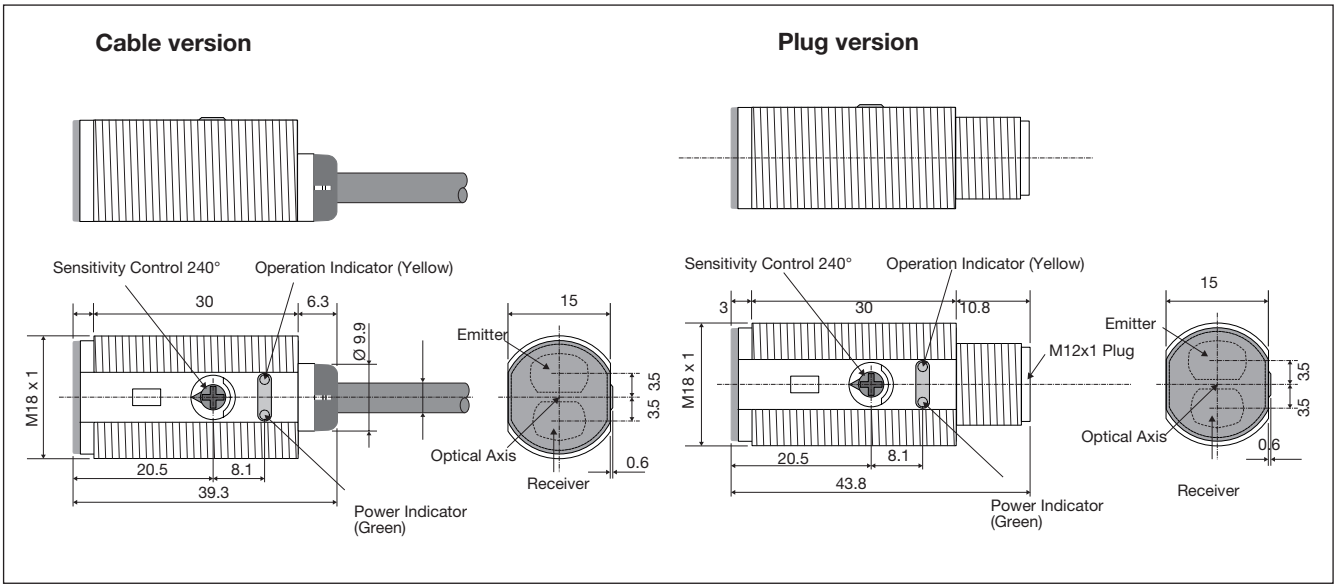


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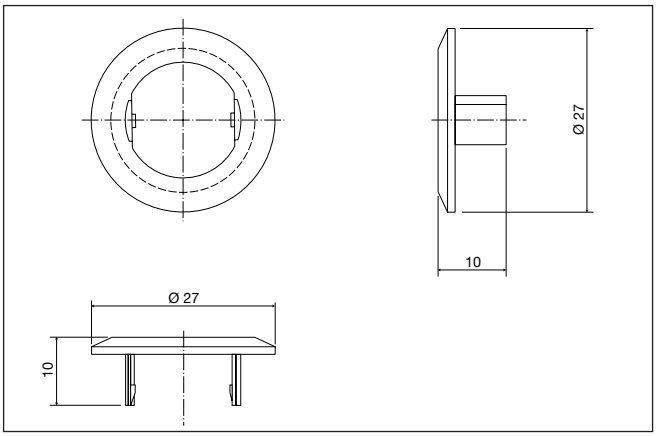
Wiring Diagrams



Dimensions

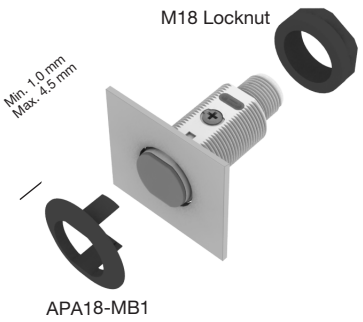


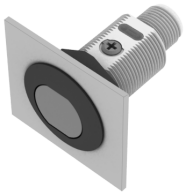
APA18-MB1



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Mounting Systems



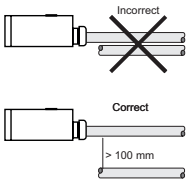


PA18 mounting with a combination of 1 x APA18-MB1 and 1 x M18 locknut.
Maximum torque 0.9 NM

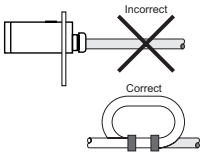
PA18 mounting with a combination of 2 x M18 locknuts.
Maximum torque 2.0 NM

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

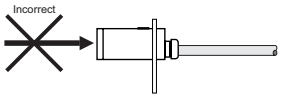


Relief of the cable strain



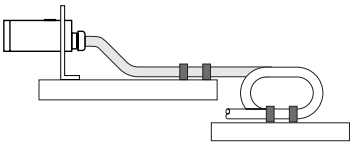
The cable should not be pulled

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: PA18CAB20 ...
- Installation instruction on plastic bag
- Screwdriver
- Mounting bracket APA18-MB1
- 2 M18 locknuts
- **Packaging:** Plastic bag

Accessories

- Connector type CON.14NF..W series

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