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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# Photoelectrics Retro-reflective Type PA18C.R..., DC

CARLO GAVAZZI



- Miniature sensor range
- Range: 6.5 m (Axial), 5 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.R... is part of a family of inexpensive general purpose retro-reflective 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 PA18CAR65PAM1SA

Type	PA18CAR65PAM1SA
Housing style	PA18CAR65PAM1SA
Housing size	PA18CAR65PAM1SA
Housing material	PA18CAR65PAM1SA
Housing type axial	PA18CAR65PAM1SA
Detection principle	PA18CAR65PAM1SA
Sensing distance	PA18CAR65PAM1SA
Output type	PA18CAR65PAM1SA
Output configuration	PA18CAR65PAM1SA
Connection type	PA18CAR65PAM1SA
Sensitive adjustment	PA18CAR65PAM1SA

## Type Selection

Housing style	Range S <sub>n</sub>	Connection	Ordering no. NPN Make & break switching	Ordering no. PNP Make & break switching
M18 Axial type	6.5 m	Cable	PA 18 CAR 65 NASA	PA 18 CAR 65 PASA
M18 Axial type	6.5 m	Plug	PA 18 CAR 65 NAM1SA	PA 18 CAR 65 PAM1SA
M18 Radial type	5.0 m	Cable	PA 18 CRR 50 NASA	PA 18 CRR 50 PASA
M18 Radial type	5.0 m	Plug	PA 18 CRR 50 NAM1SA	PA 18 CRR 50 PAM1SA

## Specifications according to EN60947-5-2

<b>Rated operating distance (S<sub>n</sub>)</b> Axial type (A) Radial type (R)	Up to 6.5 m, Up to 5.0 m reference target ER4 reflector ø 80 mm	<b>No load supply current (I<sub>0</sub>)</b>	≤ 25 mA @ 24 VDC
<b>Blind zone</b>	50 mm @ S <sub>n</sub> max.	<b>Minimum operational current (I<sub>m</sub>)</b>	0.5 mA
<b>Sensitivity control</b> Electrical adjustment Mechanical adjustment Adjustable distance to target Axial types Radial types	Adjustable by potentiometer 210° 240° 50-650 cm 50-500 cm	<b>OFF-state current (I<sub>r</sub>)</b>	≤ 100 µA
<b>Temperature drift</b>	≤ 0.2%/°C	<b>Voltage drop (U<sub>d</sub>)</b>	≤ 2.0 VDC @ 100 mA
<b>Hysteresis (H)</b> (differential travel)	≤ 20%	<b>Protection</b>	Short-circuit, reverse polarity and transients
<b>Rated operational volt. (U<sub>B</sub>)</b>	10 to 30 VDC (ripple included)	<b>Light source</b>	LED, 850 nm
<b>Ripple (U<sub>rpp</sub>)</b>	≤ 10%	<b>Light type</b>	Infrared, modulated
<b>Output current</b> Continuous (I <sub>a</sub> ) Short-time (I)	≤ 100 mA ≤ 100 mA (max. load capacity 100 nF)	<b>Sensing angle</b>	± 2°
		<b>Ambient light</b>	30.000 lux Incandescent lamp
		<b>Light spot Diameter</b>	Ø 164 mm @ 3.25 m
		<b>Operating frequency</b>	500 Hz
		<b>Response time</b> OFF-ON (t <sub>ON</sub> ) ON-OFF (t <sub>OFF</sub> )	≤ 1.0 ms ≤ 1.0 ms
		<b>Power ON delay (t<sub>v</sub>)</b>	≤ 100 ms
		<b>Output function</b> Type Switching function	NPN or PNP NO and NC

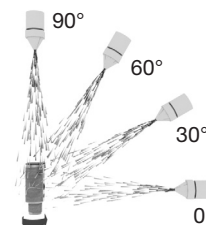




## Specifications (cont.)

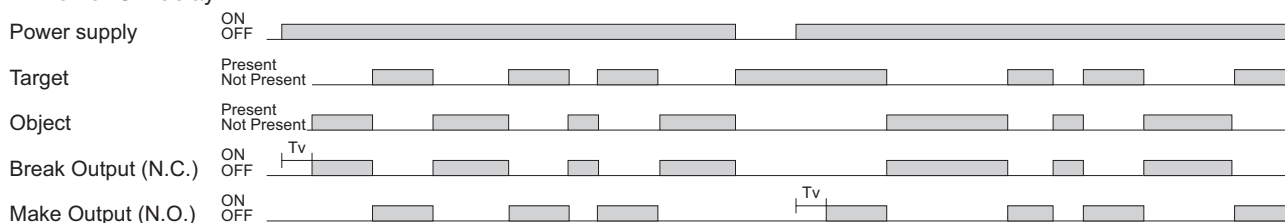
<b>Indication</b> Output ON Signal stability and power ON	LED, yellow LED, green	<b>Housing material</b> Body Front material Cable gland Trimmer shaft Locknuts Mounting bracket	ABS, grey PMMA, red POM, Black POM, Dark Grey PBTB, black PPA, black
<b>Environment</b> Installation category  Pollution degree  Degree of protection	III (IEC 60664/60664A; 60947-1)  3 (IEC 60664/60664A; 60947-1)  IP 67, IP 69K*	<b>Connection</b> Cable  Plug	PVC, grey, 2 m 4 x 0.25 mm <sup>2</sup> , Ø = 4.5 mm M12, 4-pin (CONB14NF-series)
<b>Ambient temperature</b> Operating Storage	-25° to +60°C (-13° to +140°F) -40° to +70°C (-40° to +158°F)	<b>Weight</b>	With cable: 85 g With plug: 25 g
<b>Vibration</b>	10 to 150 Hz, 1 mm/15 g (IEC 60068-2-6)	<b>CE-marking</b>	Yes
<b>Shock</b>	30 g / 11ms, 3 pos, 3 neg per axis (IEC 60068-2-6, 60068-2-32)	<b>Approvals</b>	cULus (UL508) supply class 2
<b>Rated insulation voltage</b>	500 VAC (rms) IEC protection class III		

\* 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.

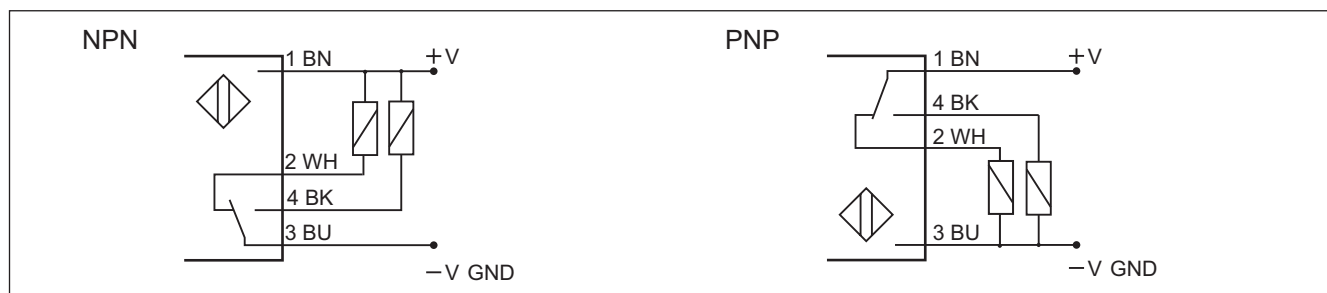


## Operation Diagram

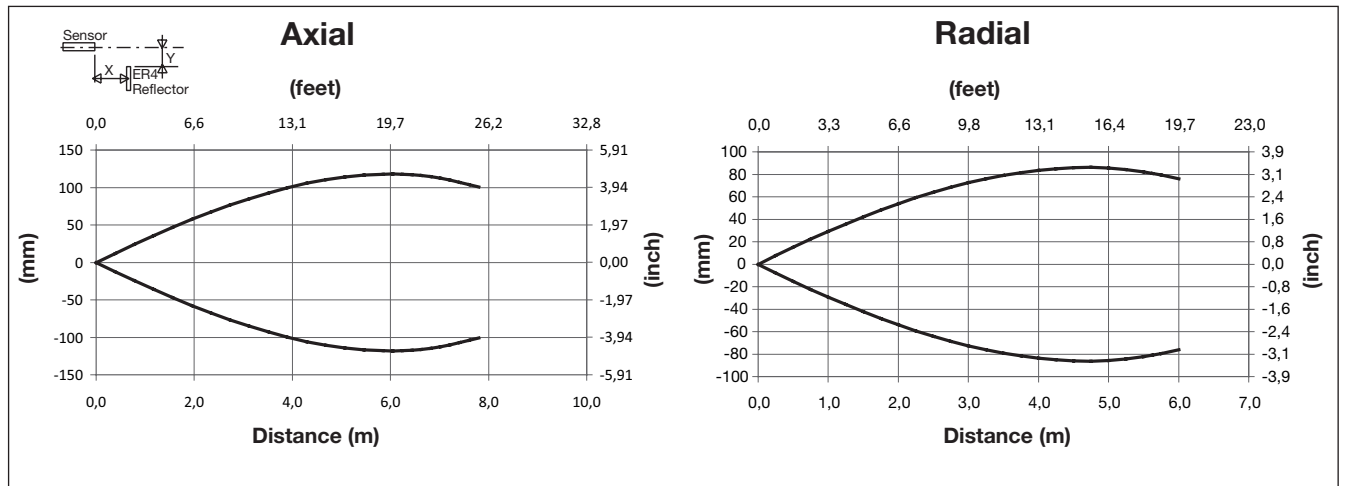
tv = Power ON delay



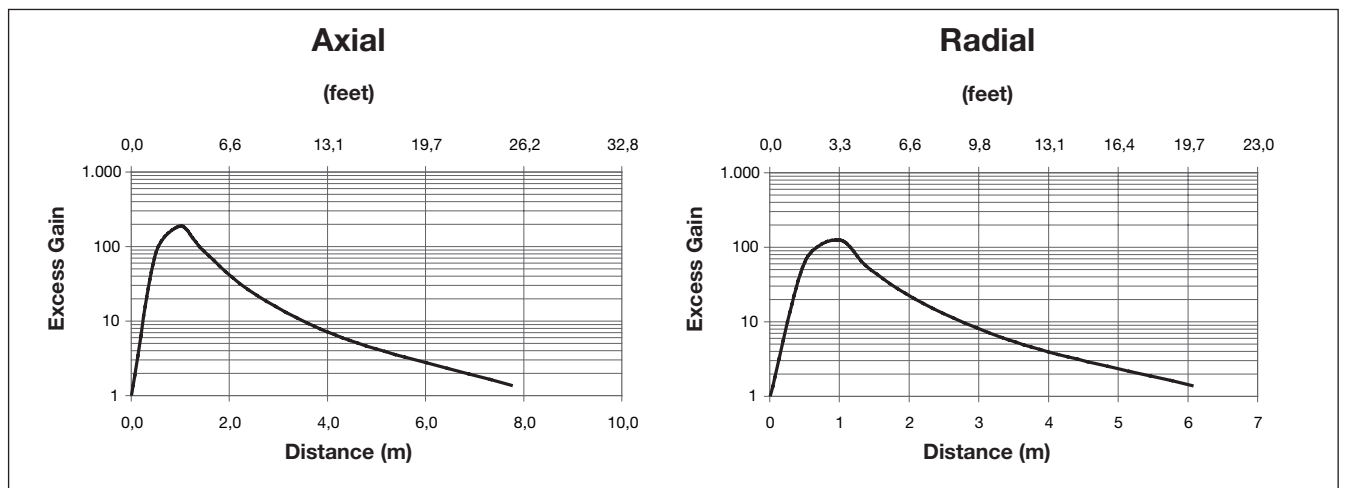
## Wiring Diagrams



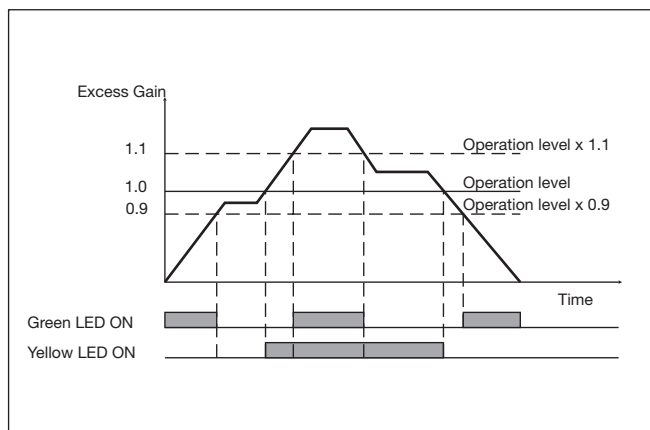
## Detection Diagram



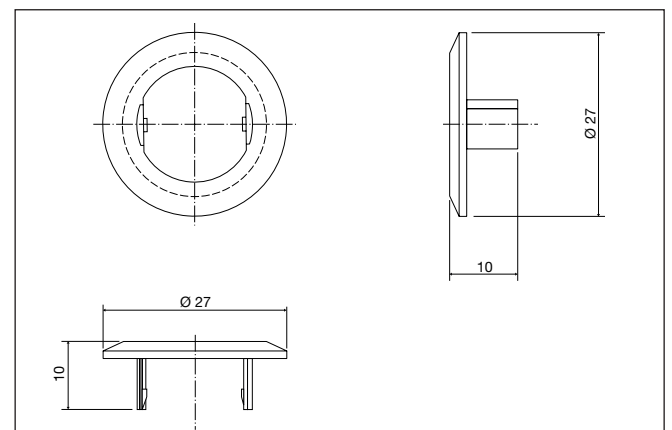
## Excess Gain



## Signal Stability Indication

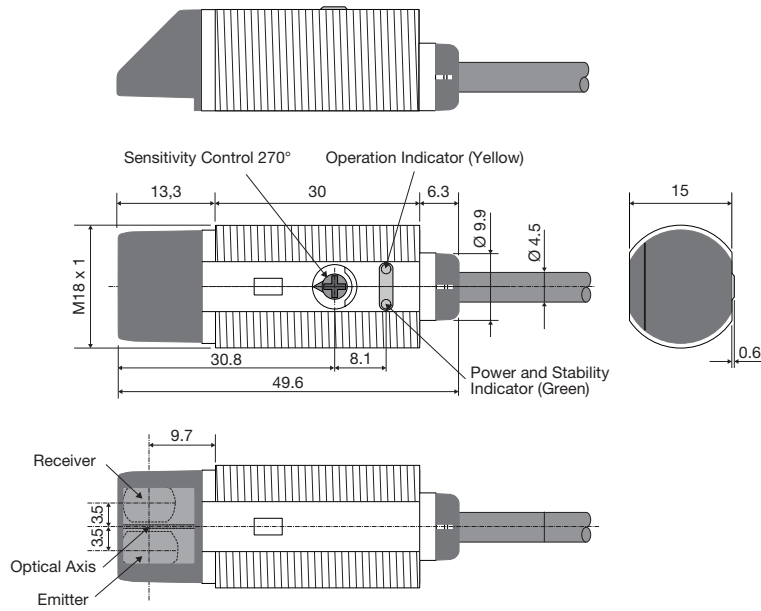


## APA18-MB1

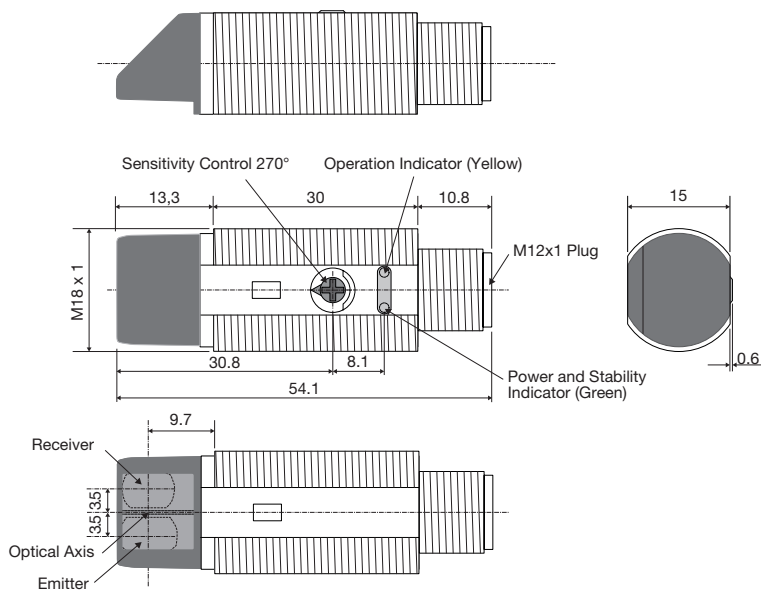


## Dimensions Radial version

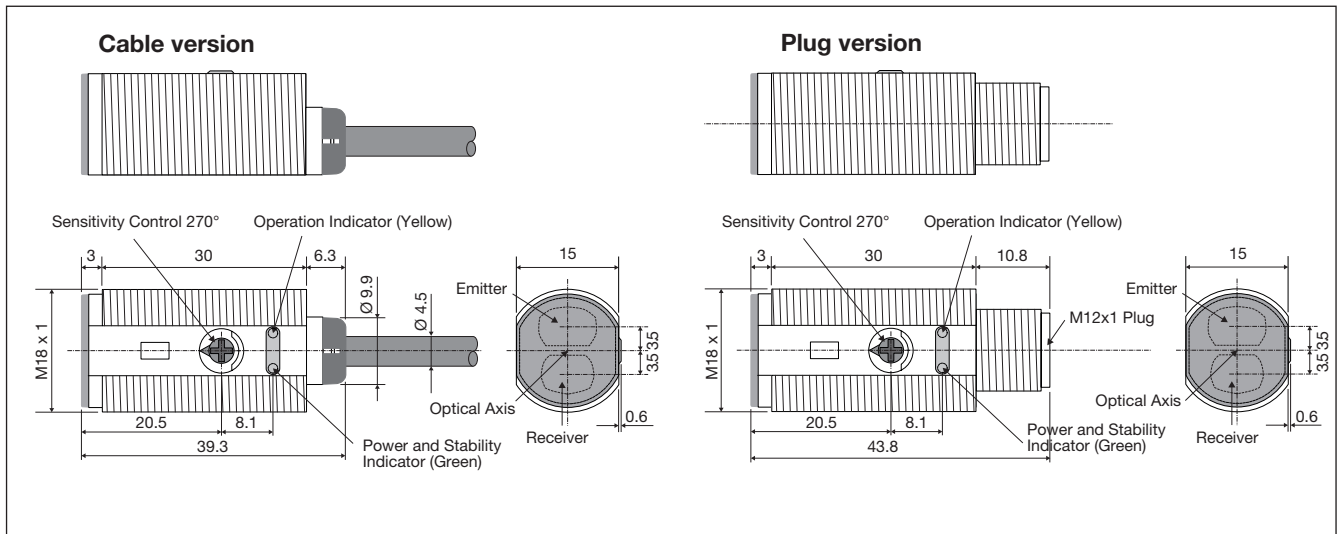
### Cable version



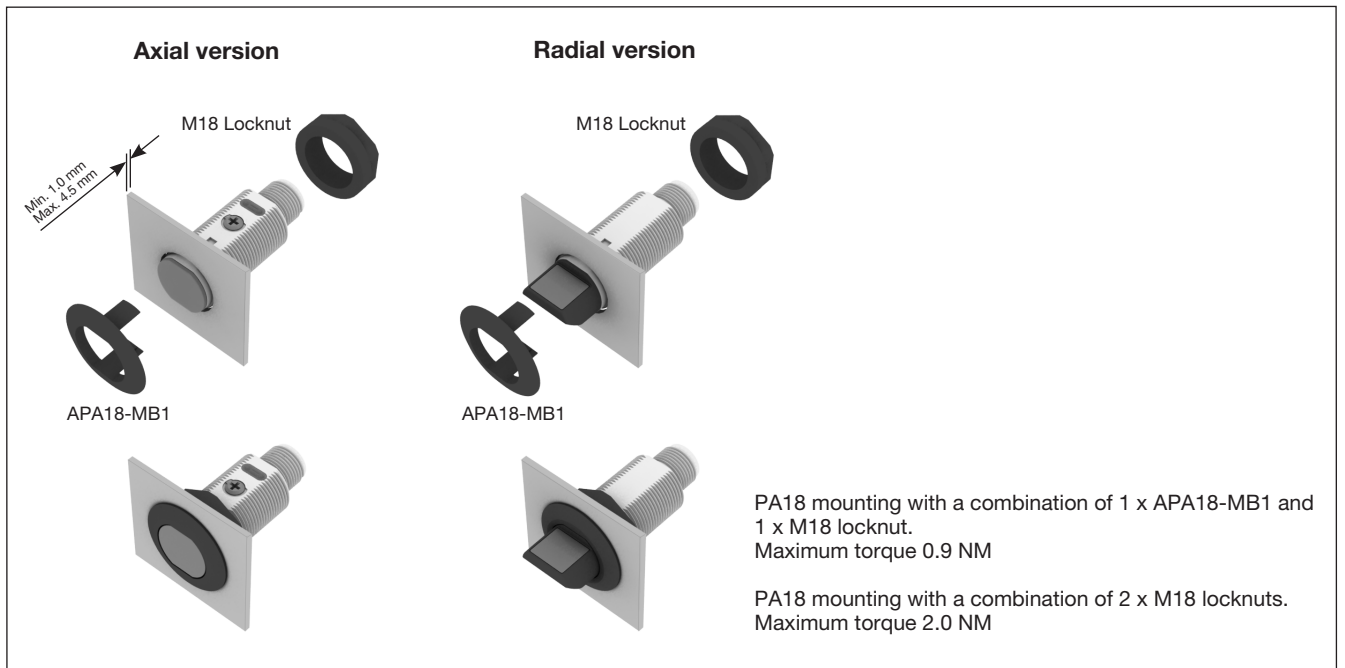
### Plug version



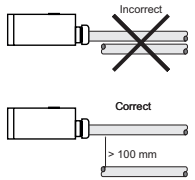
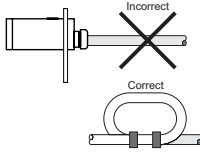
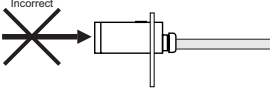
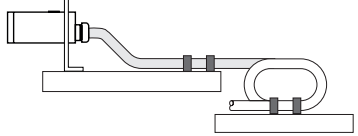
## Dimensions Axial version



## Mounting Systems



## Installation Hints

<p>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</p>  <p>Incorrect</p> <p>Correct</p> <p>&gt; 100 mm</p>	<p>Relief of the cable strain</p>  <p>Incorrect</p> <p>Correct</p> <p>The cable should not be pulled</p>	<p>Protection of the sensing face</p>  <p>Incorrect</p> <p>A proximity switch should not serve as mechanical stop</p>	<p>Sensor mounted on a mobile carrier</p>  <p>Any repetitive flexing of the cable should be avoided</p>
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## Delivery Contents

- Photoelectric switch: PA 18 C.R...
- Installation instruction on plastic bag
- Screwdriver
- Mounting bracket APA18-MB1
- 2 M18 locknuts
- **Packaging:** Plastic bag

## Accessories

- Connector type CONG1A.. / CONB14NF.. series
- Reflector type ER.. - to be purchased separately