Cylindrical photoelectric sensors with foolproof touch-teach for washdown areas

Product description

The V18V has a chemical and pressure cleaning resistant housing for wash down applications and includes patented touch (smart) teach for foolproof operation. These sensors are field-tested and are able to stand up to harsh environments. The sensors offer ease of use in wash down areas due to corrosion resistant and food grade materials, a wide sensing range and an extended temperature range.

The V18V sensors are certified by ECOLAB and JohnsonDiversey. Their IP 69K enclosure rating makes them ideal for applications in the food and beverage, pharmaceutical and packaging industries.

At a glance

- IP 69K-rated cylindrical photoelectric sensors in M18 stainless steel housing
- Resistant to all common cleaning agents and certified by independent institutes
- Extended temperature range: +85° C (long-term), +100°C / 15 min. (short-term)
- Touch (smart) teach-in adjustment
- All sensor materials, including the housing, LED and lens are resistant to chemicals
- IP 69K and IP 68 according to DIN 40050
- Laser-etched part numbers
- Ecolab & JohnsonDiversey certified for chemical resistance

Your benefits

- Simple, time-saving design ensures easy mounting, alignment and replacement
- IP 69K-rated stainless steel housing has a long service life that withstands wash down environments, reducing maintenance time and costs
- Unique touch-teach feature and lock/unlock functionality allow users to control who can change the sensor setting, which reduces the chances of disturbing a proven process and saves commissioning and maintenance time
- Laser-etched part numbers ensures the part numbers will not be washed off, saving maintenance time

Additional information

→ **www.mysick.com/en/V18V**

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

8015327/2014-02-08

Detailed technical data

Features

	VTB18V	VTF18V	VTE18V	VL18V	VS/VE18V
Sensor principle	Photoelectric proximity sensor			Photoelectric retro-reflective sensor	Through-beam photoelectric sensor
Detection principle	Background suppression	Energetic		Standard optics	–
Housing design (light emission)	Cylindrical, straight				
Housing length	83 mm				
Thread diameter (housing)	M18 x 1				
Sensing range max.	0 mm ... 140 mm [1]	0 mm ... 110 mm [1]	0 mm ... 900 mm [1] (depending on type)	0.035 m ... 5 m [2] (depending on type)	0 m ... 20 m
Sensing range	0 mm ... 130 mm	5 mm ... 100 mm	5 mm ... 800 mm (depending on type)	0.035 m ... 4.5 m [2] (depending on type)	0 m ... 18 m
Type of light	Visible red light		Infrared light	Visible red light	Infrared light
Light source [3]	LED				
Wave length	660 nm		880 nm	660 nm	880 nm
Adjustment	Single teach-in button			–	

[1] Object with 90 % reflectance (referred to standard white, DIN 5033)

[2] PL80A.

[3] Average service life of 100,000 h at T_A = +25 °C.

Mechanics/electronics

	VTB18V	VTF18V	VTE18V	VL18V	VS/VE18V
Supply voltage [1]	10 V DC ... 30 V DC				
Ripple [2]	≤ 10 %				
Power consumption [3]	≤ 50 mA	≤ 35 mA			–
Power consumption, sender	–				35 mA [3]
Power consumption, receiver	–				40 mA [3]
Output type	PNP, open collector/NPN, open collector (depending on type)				
Switching mode	Light/dark-switching (selectable via L/D control wire)				
Signal voltage PNP HIGH/LOW	Approx. VS – 2.0 V / 0 V				
Signal voltage NPN HIGH/LOW	Approx. VS / < 2.0 V				
Output current $I_{max.}$	≤ 100 mA				
Response time [4]	≤ 0.5 ms	≤ 1 ms			≤ 2 ms
Switching frequency [5]	1,000 Hz	500 Hz	± 500 Hz	500 Hz	250 Hz
Angle of reception	–				8°
Attenuation along light beam	–			≥ 20 %	
Attenuation difference along light beam	–			≥ 15 %	–
Attenuation difference of object	–			≥ 7.5 %	
Connection type [6]	Male connector, M12				
Circuit protection	A [7], B [8], C [9], D [10]				
Protection class	III				
Weight	120 g				240 g
Polarisation filter	–			–/ ✔ (depending on type)	–
Housing material	Stainless steel V4A (1.4404, 316L)				

	VTB18V	VTF18V	VTE18V	VL18V	VS/VE18V
Optics material	Plan, PPS (Grilamid)			Plan, PPS (Grilamid), Plan, PMMA, surface hardened and tempered (depending on type)	Plan, PPS (Grilamid)
Enclosure rating [11]	IP 67, IP 68, IP 69K				
Test input sender off	–				"Test" to 0V
Ambient operating temperature	–25 °C ... +80 °C [12]				
Ambient storage temperature	–40 °C ... +80 °C				

[1] Limit values.
[2] May not exceed or fall short of V_S tolerances.
[3] Without load, at VS 30 V DC.
[4] Signal transit time with resistive load.
[5] With light/dark ratio 1:1.
[6] With gold plated contact pins, PPS with FDA certificate.
[7] A = V_S connections reverse-polarity protected.
[8] B = interference suppression.
[9] D = outputs overcurrent and short-circuit protected.
[10] D = inputs and output reverse-polarity protected.
[11] With correct mounted IP 69K connector.
[12] +100 °C at max 15 minutes.

Ordering information

Other models available at www.mysick.com/en/V18V

VTB18V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** background suppression
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. [1]	Light spot size (distance)	Adjustment	Output type	Connection diagram	Model name	Part no.
0 mm ... 140 mm	Ø 15 mm (130 mm)	Single teach-in button	PNP	Cd-087	VTB18-4P1240V	6035493
			NPN	Cd-087	VTB18-4N1240V	6035494

[1] Object with 90 % reflectance (referred to standard white, DIN 5033)

VTF18V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. [1]	Light spot size (distance)	Adjustment	Output type	Connection diagram	Model name	Part no.
0 mm ... 110 mm	Ø 15 mm (100 mm)	Single teach-in button	PNP	Cd-087	VTF18-4P1240V	6035487
			NPN	Cd-087	VTF18-4N1240V	6035488

[1] Object with 90 % reflectance (referred to standard white, DIN 5033)

VTE18V

- **Sensor principle:** photoelectric proximity sensor
- **Detection principle:** energetic
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. [1]	Light spot size (distance)	Adjustment	Output type	Connection diagram	Model name	Part no.
0 mm ... 450 mm	Ø 60 mm (400 mm)	Single teach-in button	PNP	Cd-087	VTE18-4P4240V	6035489
			NPN	Cd-087	VTE18-4N4240V	6035490
0 mm ... 900 mm	Ø 100 mm (800 mm)	Single teach-in button	PNP	Cd-087	VTE18-4P8240V	6035491
			NPN	Cd-087	VTE18-4N8240V	6035492

[1] Object with 90 % reflectance (referred to standard white, DIN 5033)

VL18V, clear material detection

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. [1]	Light spot size (distance)	Output type	Connection diagram	Model name	Part no.
0.035 m ... 4.5 m	Ø 60 mm (1 m)	PNP	Cd-087	VL18-4P2240V	6035497
		NPN	Cd-087	VL18-4N2240V	6035498

[1] PL80A.

VL18V

- **Sensor principle:** photoelectric retro-reflective sensor
- **Detection principle:** standard optics
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max. [1]	Light spot size (distance)	Output type	Connection diagram	Model name	Part no.
0.1 m ... 5 m	Ø 200 mm (4.5 m)	PNP	Cd-087	VL18-4P3140V	6035495
		NPN	Cd-087	VL18-4N3140V	6035496

[1] PL80A.

VS/VE18V

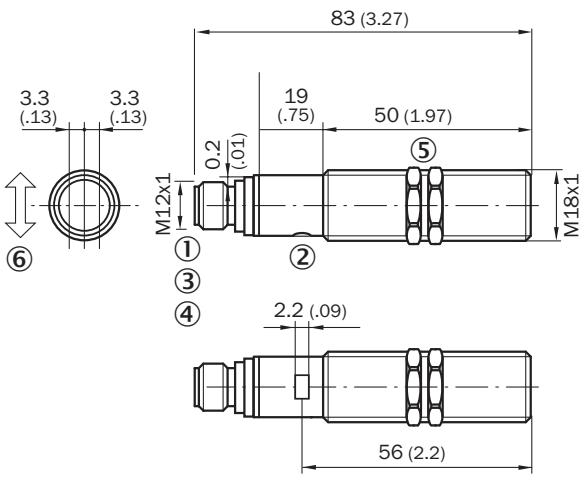
- **Sensor principle:** through-beam photoelectric sensor
- **Switching mode:** light/dark-switching
- **Connection:** connector M12, 4-pin PPS (Griamid)

Sensing range max.	Light spot size (distance)	Output type	Connection diagram	Model name	Part no.
0 m ... 20 m	Ø 600 mm (15 m)	PNP	Cd-219	VS/VE18-4P3140V	6035499
		NPN	Cd-219	VS/VE18-4N3140V	6035500

Dimensional drawings

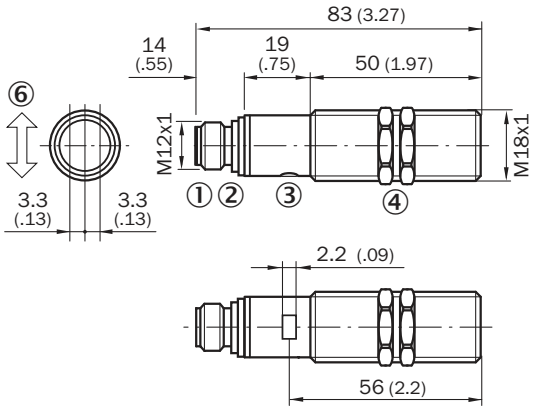
Dimensions in mm (inch)

VTB18V



① Connector M12, 4-pin
② Sensing range adjustment: Touch-Teach-In
③ Status indicator LED, green: signalizing Touch-Teach-in
④ Status indicator LED, yellow: Status of received light beam
⑤ Fastening nuts (2 x); width across 24, stainless steel
⑥ Standard direction of the material being detected

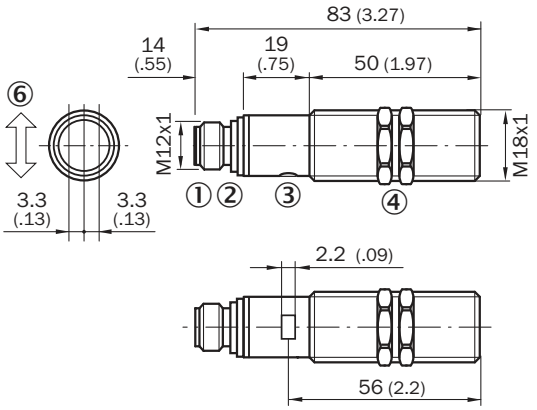
VL18V, VSE18V



① Connector M12, 4-pin
② Yellow LED indicator:
- lights continuously: Reception signal> reserve factor 2
- blinks: Reception signal< reserve factor 2 but > switching threshold 1

③ Fastening nuts (2 x); width across 24, stainless steel

VTF18V, VTE18V



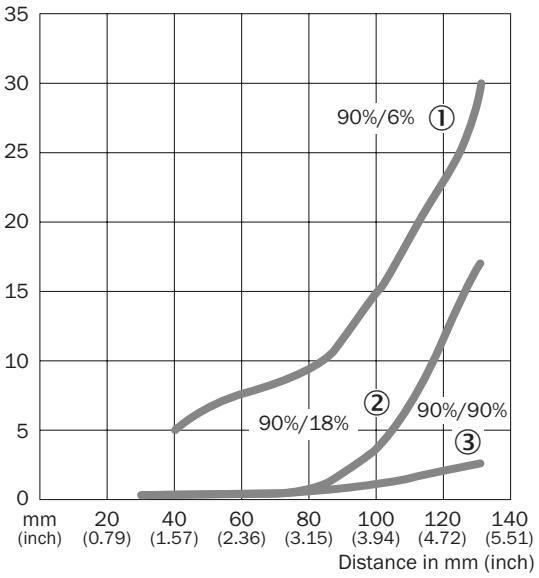
① Connector M12, 4-pin
② Sensing range adjustment: Touch-Teach-In
③ Status indicator LED, green: signalizing Touch-Teach-in
④ Yellow LED indicator:
- lights continuously: Reception signal> reserve factor 2
- blinks: Reception signal< reserve factor 2 but > switching threshold 1

⑤ Fastening nuts (2 x); width across 24, stainless steel

Characteristic curves

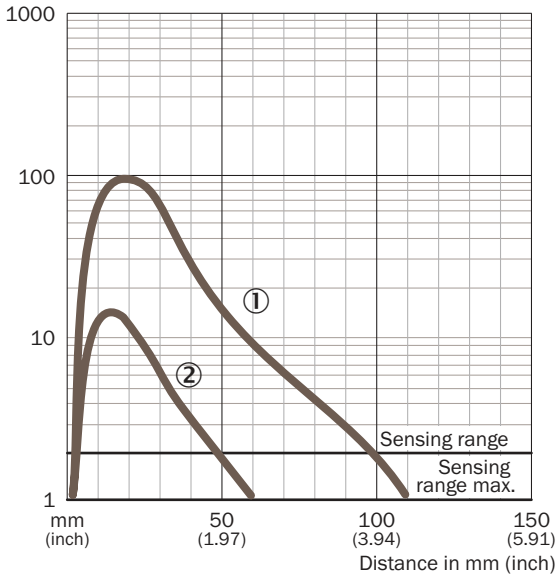
Black-white shift

VTB18V



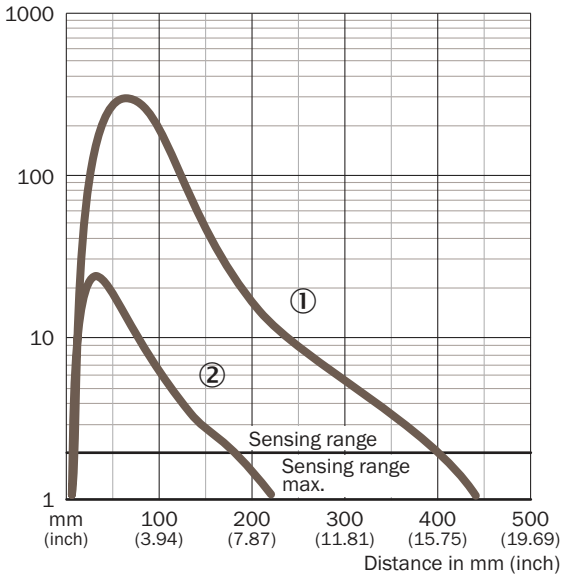
① Sensing range on black, 6 % remission
② Sensing range on gray, 18 % remission
③ Sensing range on white, 90 % remission

VTF18V



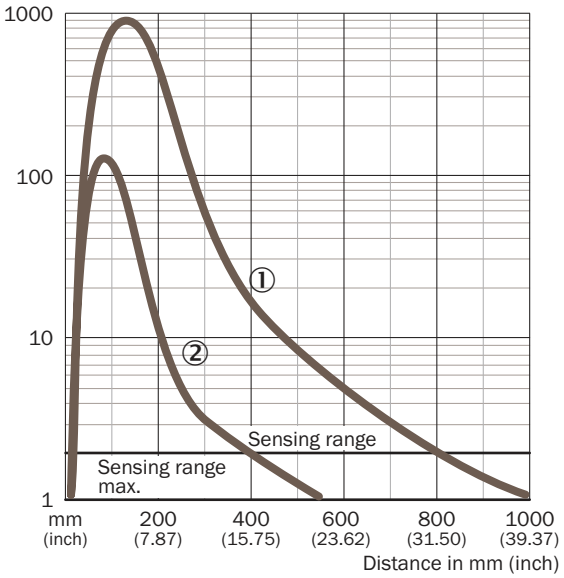
① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission

VTE18V, 450 mm



① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission

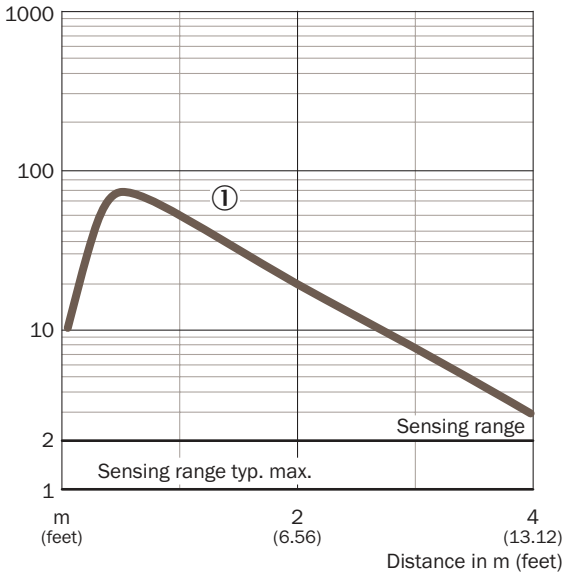
VTE18V, 900 mm



① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission

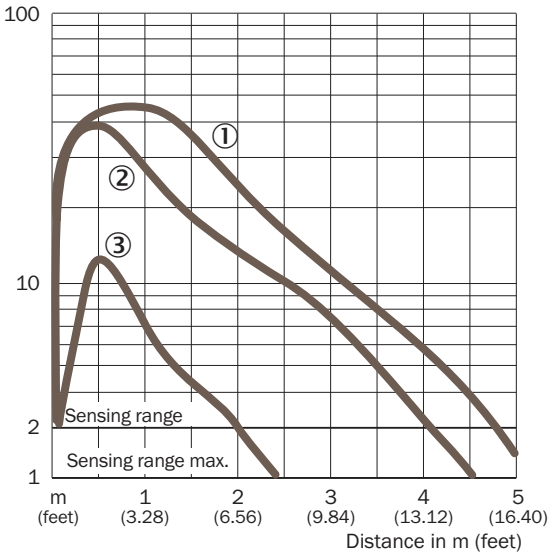
Operating reserve

VL18V, clear material detection



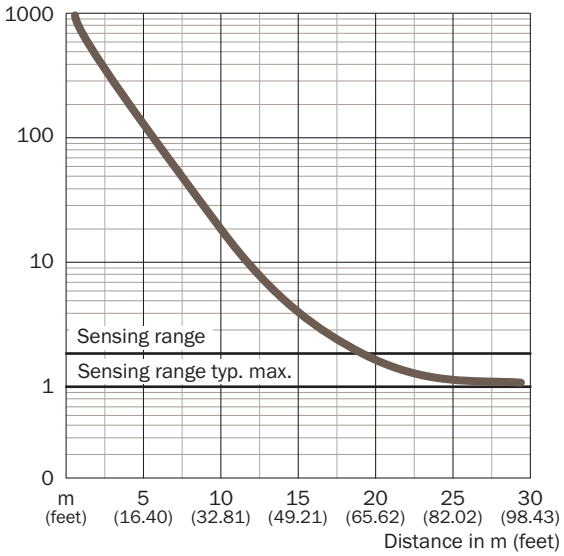
① PL80A

VL18V



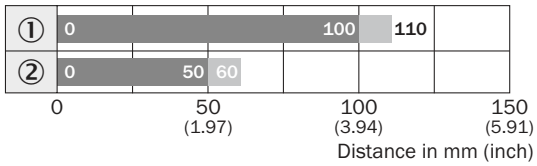
① PL80A
② C110A
⑤ P250 CHEM

VS/VE18V



Bar diagrams

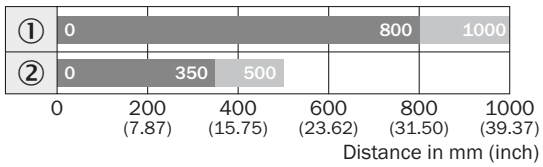
VTF18V



Sensing range Sensing range max.

① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission

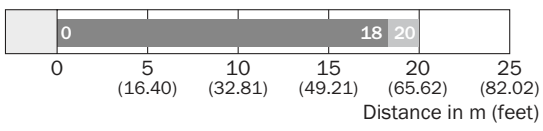
VTE18V, 900 mm



Sensing range Sensing range max.

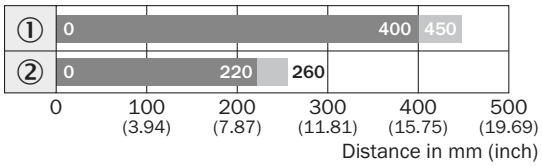
① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission

VS/VE18V



Sensing range Sensing range max.

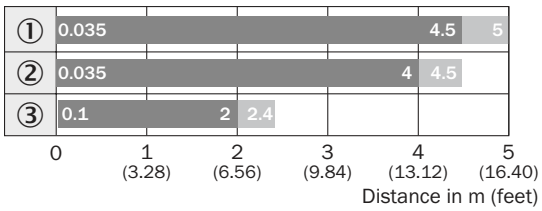
VTE18V, 450 mm



Sensing range Sensing range max.

① Sensing range on white, 90 % remission
② Sensing range on gray, 18 % remission

VL18V

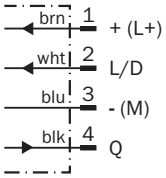


Sensing range Sensing range max.

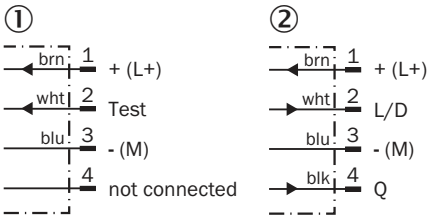
① PL80A
② C110A
③ Reflective tape Diamond Grade

Connection diagram

Cd-087



Cd-219



① Sender
② Receiver

Recommended accessories

Mounting brackets/plates

Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting plate for M18 housing	BEF-WG-M18N	5320948
		Mounting bracket	BEF-WN-M18N	5320947

Plug connectors and cables

Connecting cable (female connector-open)

- **Cable material:** PVC
- **Connector material:** PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Enclosure rating	Model name	Part no.
	Female connector, M12, 4-pin, straight	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-G02MN	6028128
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-G05MN	6028130
	Female connector, M12, 4-pin, angled	Cable, open conductor heads	2 m, 4-wire	IP 67, IP 69K	DOL-1204-W02MN	6028129
			5 m, 4-wire	IP 67, IP 69K	DOL-1204-W05MN	6028131

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N06N for universal clamp bracket, M18	BEF-KHS-N06N	2051622

Reflectors

Angular

Figure	Material	Description	Model name	Part no.
	Plastic	Chemically resistant, screw connection, 47 mm x 47 mm	P250 CHEM	5321097
	PMMA/ABS	Rectangular, screw connection, 80 mm x 80 mm	PL80A	1003865

Fine triple reflectors

Figure	Material	Description	Model name	Part no.
	Plastic	Fine triple, chemically resistant, screw connection, 18 mm x 18 mm	PL10F CHEM	5321636
		Fine triple, chemically resistant, screw connection, suitable for laser sensors, 16 mm x 38 mm	PL20F-CHEM	5326089

Reflective tape

Figure	Description	Model name	Part no.
	Self-adhesive, 50 mm x 60 mm	REF-IRF-56	5314244

Special reflectors

Figure	Material	Description	Model name	Part no.
	PMMA/ABS	Antifog, for prevention of moisture fogging on the reflection area, screw connection, 56 mm x 37 mm	PL40A Antifog	5322011
	Plastic	Rectangular, screw connection M3, countersunk screw head, chemical resistent, 56 mm x 37 mm	PL40B-CHEM	5326088
	Stainless steel V4A (1.4404, 316L)	Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, D12-adapter shaft, 25 mm x 25 mm	PLH25-D12	2063404
		Stainless steel reflector, hygienic design, chemically resistant, Enclosure rating IP 69K, M12-adapter thread, 25 mm x 25 mm	PLH25-M12	2063403
		Stainless steel reflector, wash-down design, chemically resistant, Enclosure rating IP 69K, screw connection, 14 mm x 14 mm	PLV14-A	2063405

Terminal and alignment brackets

Alignment brackets

Figure	Material	Description	Model name	Part no.
	Plastic	Mounting bracket with ball-and-socket	BEF-WN-M18-ST02	5312973

Terminal brackets

Figure	Material	Description	Model name	Part no.
	Plastic (PA12), glass-fiber reinforced	Clamping block for round sensors M18, without fixed stop	BEF-KH-M18	2051481
		Clamping block for round sensors M18, with fixed stop	BEF-KHF-M18	2051482
	Stainless steel	Mounting ring	BEF-WN-MH15-2V	4053358

→ **For additional accessories, please see page L-861**