

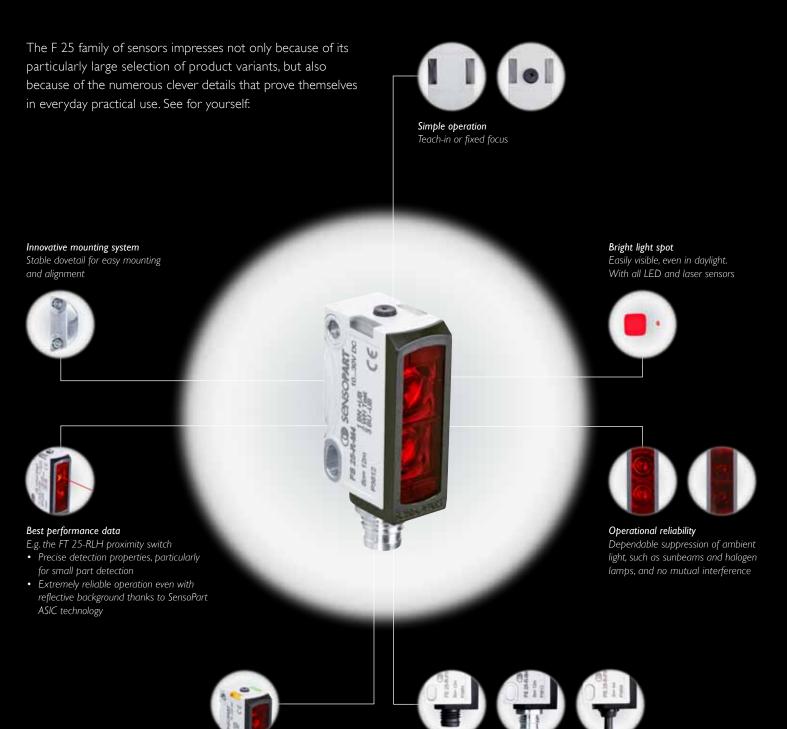
Whatever the situation.

F 25 – the sensor family with integrated diversity.



Unique diversity.

What sort of sensor would you prefer?



Large variety of connectionsM8 plastic connector

• M8 metal connector

• 150 mm pigtail, M 12

• 2 m cable

Clear LED indicators

The sensor's switching state

is easily visible from all sides

Compact and elegant:

Compact miniature design with glass-fibre reinforced plastic housing in the elegant light-grey SensoPart design. (Illustrations in original size)

34 mm



SensoPart provides you with choice: our F 25 family of sensors offers the largest range of variants in its class – from the LED through-beam photoelectric switch to the laser photoelectric reflex switch with adjustable background suppression. The programme includes every conceivable design.

Fundamentally, each F 25 sensor is available in a laser and an LED design, the latter offering further variants with fixed settings. Differing types of connections and switching variants, as well as special designs such as IO Link and Auto-detect, expand the choice

to about 100 different sensors – where else can this be found? All these variants share a uniform compact housing and a consistent mounting and operating concept.

The excellent properties of the F 25 sensors – from their optical performance data, through their robust design and reliable function, to the numerous user-friendly details – are particularly wideranging. So much all at once is really unique!

F 25 product overview					
		Scanning distance/range	Page		
Photoelectric proximity switches with background suppression					
Laser/Teach-in	FT 25-RLH	120 mm	8 – 9		
LED / Teach-in	FT 25-RH	200 mm	10 – 11		
LED / Teach-in	FT 25-RHD	400 mm	12 – 13		
LED / Fixed focus	FT 25-RF	60 mm / 80 mm	14 – 15		
Energetic photoelectric proximity	Energetic photoelectric proximity switches				
Laser / Teach-in	FT 25-RL	250 mm	16 – 17		
LED / Teach-in	FT 25-R	800 mm	18 – 19		
Photoelectric reflex switches					
Laser / Teach-in	FR 25-RL	15 m	20 – 21		
LED / Teach-in	FR 25-R	7 m	22 – 23		
LED / Fixed setting	FR 25-RF	5 m	24 – 25		
Through-beam photoelectric swit	ches				
Laser / Teach-in	FS/FE 25-RL	20 m	26 – 27		
LED / Teach-in	FS/FE 25-R	15 m	28 – 29		
LED / Fixed setting	FS/FE 25-RF	6 m	30 – 31		

Extremely reliable. The sensors of the F 25 series are stronger than they look. All-round robustness The glass-fibre reinforced plastic housings of the F 25 sensors are extremely resistant thanks to

The glass-fibre reinforced plastic housings of the F 25 sensors are extremely resistant thanks to special injection moulding processes in SensoPart production. The plug-in connections, optionally in plastic or metal designs, are also very stable and tough.



During the development of the F 25 range of sensors we placed particular value on a high level of reliability and robustness. For all components – from the housing made of glass-fibre reinforced plastic, through the plug or cable connection, to the mounting accessories – consistent care was taken to ensure that they are mechanically highly resilient and correspondingly long-lived. Which is why our sensors not only look very good, but also offer excellent operation.

Thanks to its highly watertight design (IP 67 and IP 69K) the smooth, light grey housing easily withstands daily high-pressure cleaning, and is also resistant to aggressive cleaning media – in accordance with ECOLAB requirements. Incidentally, the laseretched type designations are also immune to such treatment and remain as readable after years of maximum stress as on the first day.

AUTO-DETECT – EXCLUSIVE TO SENSOPART

The Auto-detect variants of the F 25 series combine a real PNP and a real NPN switching function (no push-pull output) in a single device: the sensor recognises from the load present whether switching is necessary as a NPN or PNP output. Adaptation of the switching function and the switching state indicator takes place automatically.

This function reduces warehousing costs and is unique amongst miniature optoelectronic sensors!



Identity loss ruled out:

All F 25 sensors are characterised by friction-proof and cleaning-resistant laser printing. This ensures that every sensor can be easily identified even after years of use.



Bright, reliable and precise:

The sensors in the F 25 series are optionally available with red light LED or red light laser diode. Both light sources generate a bright light spot, easily visible even in daylight. The highly precise laser beam poses absolutely no risk thanks to its being Laser Class 1.



Easy mounting, precise adjustment:

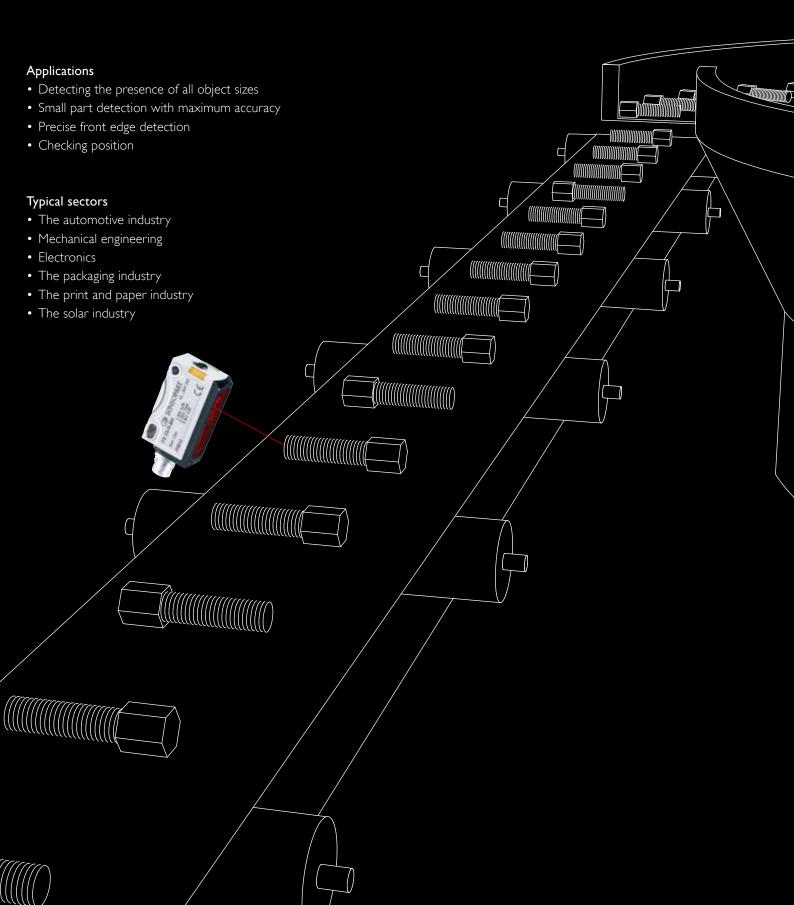
The robust aluminium dovetail proves particularly helpful for installation situations offering little space. It allows simple and precise fine alignment of the sensor even after mounting.





Astonishingly versatile.

The sensors of the F 25 series do well everywhere. In your application too.









Thanks to the diversity of variants, the F 25 range has proven itself in numerous industrial automation processes, from small part detection in automatic assembly to the checking of completeness on running conveyor systems. Excellent performance data, such as high scanning distances and ranges, a clearly contoured light spot also easily visible in daylight, minimal blackwhite shift, and extremely precise background suppression also permit these versatile sensors to be used in particularly demanding applications.



Users are also very pleased with the mounting and operation of F 25 sensors. Clever mounting accessories (such as dovetail fixing), user-friendly teach-in operation, the use of risk-free Class 1 laser light, and the status LEDs easily visible from all sides ensure uncomplicated and efficient operating processes. In your application soon too?

One sensor for every application case:

Whether in handling or in assembly, whether small or large objects made of paper or metal – the versatile F 25 series offers a suitable sensor variant for every conceivable application – ably mastering your automation problem.

FT 25-RLH

Laser photoelectric proximity switch with background suppression





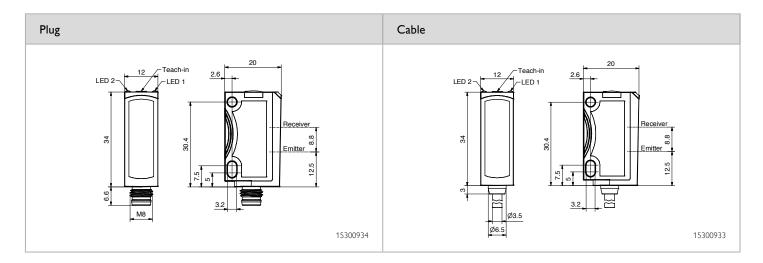
- Precise background suppression
- Reliable operation even with highly reflective backgrounds, thanks to SensoPart ASIC technology
- Particularly suitable for detecting the smallest of objects
- Very small, easily visible, laser light spot
- Durable laser printing

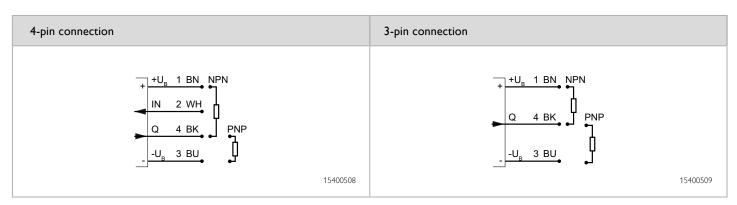
Optical data	Optical data		Functions	
Scanning distance	4 120 mm ¹	Indicator LED, green	Operating voltage indicator	
Adjustment range	10 120 mm ¹	Indicator LED, yellow	Switching output indicator	
Type of light	Laser, red, 650 nm	Scanning distance adjustment	Via Teach-in button and control inpu	
Laser Class (DIN EN 60825-1:2008-5)	1	Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
		Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input	
		Default settings	Max. scanning distance and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _B	10 30 V DC ²	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g	
Response time	500 µs	Resistance to vibrations	EN 60947-5-2	
Control input IN	+U _B = Teach-in / -U _B = Button locked Open = normal operation	and impacts		

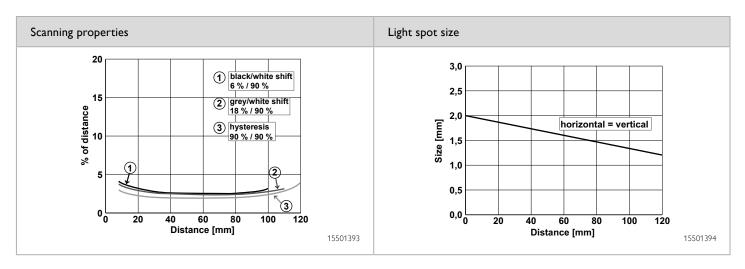
Scanning distance	Switching output	Type of connection	Order designation	Part no.
4 120 mm	PNP	Plug, M8x1, 4-pin	FT 25-RLH-PS-M4	609-11005
4 120 mm	NPN	Plug, M8×1, 4-pin	FT 25-RLH-NS-M4	609-11002
4 120 mm	PNP	Metal plug, M8×1, 3-pin	FT 25-RLH-PS-M3M	609-11007
4 120 mm	NPN	Metal plug, M8×1, 3-pin	FT 25-RLH-NS-M3M	609-11008
4 120 mm	PNP	Metal plug, M8×1, 4-pin	FT 25-RLH-PS-M4M	609-11009
4 120 mm	NPN	Metal plug, M8x1, 4-pin	FT 25-RLH-NS-M4M	609-11010
4 120 mm	PNP	Cable, 2 m, 4-wire	FT 25-RLH-PS-K4	609-11004
4 120 mm	NPN	Cable, 2 m, 4-wire	FT 25-RLH-NS-K4	609-11001
4 120 mm	PNP	Pigtail, 150 mm with plug M12x1, 4-pin	FT 25-RLH-PS-KL4	609-11006
4 120 mm	NPN	Pigtail, 150 mm with plug M12x1, 4-pin	FT 25-RLH-NS-KL4	609-11003

 $^{^{1}}$ Reference material white, 90% reflectivity 2 Max. 10% ripple, within $U_{gr} \sim 50$ Hz / 100 Hz 3 With connected IP 67 / IP 69K plug









Reference material	Detection range
white (90 %)	4 120 mm
grey (18 %)	5 110 mm
black (6 %)	8 100 mm

Accessories, page 32 onwards

FT 25-RH

Photoelectric proximity switch with background suppression







ECOLAB

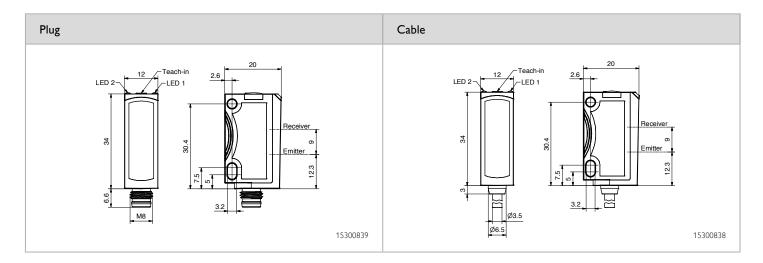
- Precise background suppression
- Reliable switching with differing object colours and surfaces
- Reliable operation even with highly reflective backgrounds, thanks to SensoPart ASIC technology
- Simple alignment thanks to easily visible light spot
- Robust, glass-fibre reinforced plastic housings
- Durable laser printing

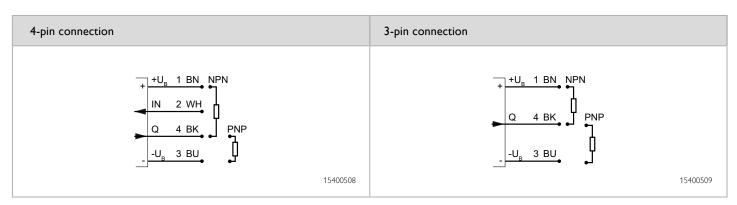
Optical data	Optical data		Functions		
Scanning distance	1 200 mm ¹	Indicator LED, green	Operating voltage indicator		
Adjustment range	10 200 mm ¹	Indicator LED, yellow	Switching output indicator		
Type of light	LED, red, 632 nm	Scanning distance adjustment	Via Teach-in button and control inpu		
		Teach-in modes	Mode 1: during running process Mode 2: during stationary process		
		Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input		
		Default settings	Max. scanning distance and N.O.		
Electrical data		Mechanical data			
Operating voltage +U _B	10 30 V DC ²	Dimensions	34 × 20 × 12 mm		
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³		
Output current le	≤ 100 mA	Material, housing	ABS		
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA		
	short-circuit protection (Q)	Type of connection	(see selection table)		
Protection Class	2	Ambient temperature: operation	-20 +60 °C		
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C		
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g		
Output function	N.O. / N.C.	Weight (cable)	40 g		
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g		
Response time	500 μs	Resistance to vibrations	EN 60947-5-2		
Control input IN	$+U_B$ = Teach-in / $-U_B$ = Button locked Open = normal operation	and impacts			

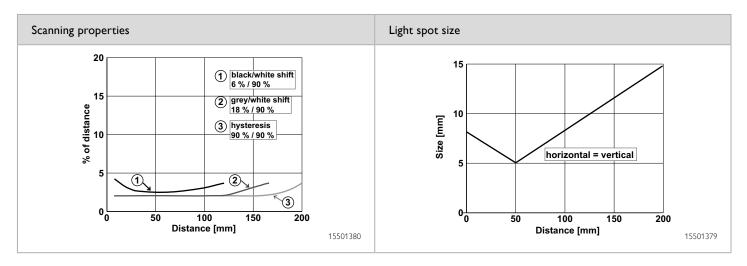
Scanning distance	Switching output	Type of connection	Order designation	Part no.
1 200 mm	PNP	Plug, M8x1, 4-pin	FT 25-RH-PS-M4	608-11004
1 200 mm	NPN	Plug, M8×1, 4-pin	FT 25-RH-NS-M4	608-11006
1 200 mm	PNP	Metal plug, M8x1, 3-pin	FT 25-RH-PS-M3M	608-11012
1 200 mm	NPN	Metal plug, M8×1, 3-pin	FT 25-RH-NS-M3M	608-11013
1 200 mm	PNP	Metal plug, M8x1, 4-pin	FT 25-RH-PS-M4M	608-11014
1 200 mm	NPN	Metal plug, M8×1, 4-pin	FT 25-RH-NS-M4M	608-11015
1 200 mm	PNP	Cable, 2 m, 4-wire	FT 25-RH-PS-K4	608-11005
1 200 mm	NPN	Cable, 2 m, 4-wire	FT 25-RH-NS-K4	608-11007
1 200 mm	PNP	Pigtail, 150 mm with plug M12x1, 4-pin	FT 25-RH-PS-KL4	608-11008
1 200 mm	NPN	Pigtail, 150 mm with plug M12x1, 4-pin	FT 25-RH-NS-KL4	608-11009

 $^{^{1}}$ Reference material white, 90% reflectivity 2 Max. 10% ripple, within $U_{\rm gr} \sim 50$ Hz / 100 Hz 3 With connected IP 67 / IP 69K plug









Detection range
1 200 mm
2 160 mm
4 120 mm

Accessories, page 32 onwards <u>11</u>

FT 25-RHD

Photoelectric proximity switch with background suppression







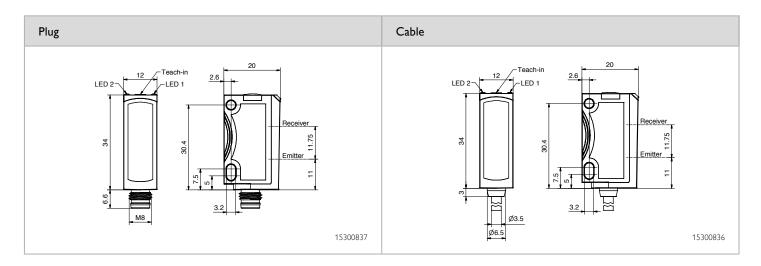
- Auto-detect photoelectric proximity switch with real PNP and real NPN function
- Precise background suppression
- High scanning range of 400 mm with small and compact housing
- · Reliable operation even with highly reflective backgrounds, thanks to SensoPart ASIC technology
- Simple alignment thanks to easily visible light spot
- Robust, glass-fibre reinforced plastic housings

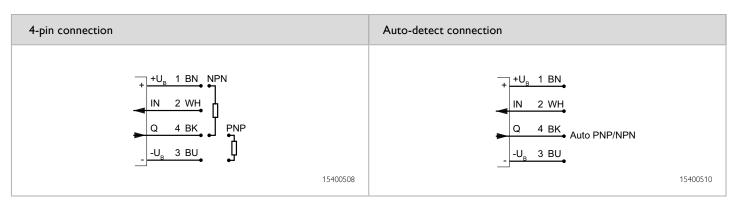
Optical data	Optical data		Functions		
Scanning distance	3 400 mm ¹	Indicator LED, green	Operating voltage indicator		
Adjustment range	30 400 mm ¹	Indicator LED, yellow	Switching output indicator		
Type of light	LED, red, 632 nm	Scanning distance adjustment	Via Teach-in button and control inpu		
		Teach-in modes	Mode 1: during running process Mode 2: during stationary process		
		Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input Auto-detect / NPN /PNP via Teach-in button and control input (only Auto-detect variants)		
		Default settings	Max. scanning distance and N.O.		
Electrical data		Mechanical data			
Operating voltage +U _B	10 30 V DC ²	Dimensions	34 × 20 × 12 mm		
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³		
Output current le	≤ 100 mA	Material, housing	ABS		
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA		
	short-circuit protection (Q)	Type of connection	(see selection table)		
Protection Class	2	Ambient temperature: operation	-20 +60 °C		
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C		
Switching output Q	PNP/NPN/Auto-detect (see selection table)	Weight (plug)	10 g		
Output function	N.O. / N.C.	Weight (cable)	40 g		
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g		
Response time	500 μs	Resistance to vibrations	EN 60947-5-2		
Control input IN	$+U_{B}$ = Teach-in / $-U_{B}$ = Button locked Open = normal operation	and impacts			

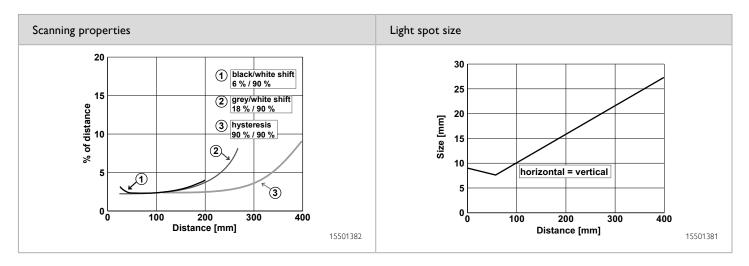
Scanning distance	Switching output	Type of connection	Order designation	Part no.
3 400 mm	PNP	Plug, M8x1, 4-pin	FT 25-RHD-PS-M4	608-11000
3 400 mm	NPN	Plug, M8x1, 4-pin	FT 25-RHD-NS-M4	608-11002
3 400 mm	PNP	Metal plug, M8×1, 4-pin	FT 25-RHD-PS-M4M	608-11016
3 400 mm	NPN	Metal plug, M8×1, 4-pin	FT 25-RHD-NS-M4M	608-11017
3 400 mm	PNP	Cable, 2 m, 4-wire	FT 25-RHD-PS-K4	608-11001
3 400 mm	NPN	Cable, 2 m, 4-wire	FT 25-RHD-NS-K4	608-11003
3 400 mm	PNP	Pigtail, 150 mm with plug M12×1, 4-pin	FT 25-RHD-PS-KL4	608-11010
3 400 mm	NPN	Pigtail, 150 mm with plug M12×1, 4-pin	FT 25-RHD-NS-KL4	608-11011
3 400 mm	Auto-detect	Metal plug, M8x1, 4-pin	FT 25-RHD-PNS-M4M	608-11019

¹ Reference material white, 90% reflectivity 2 Max. 10% ripple, within $U_{\text{N}} \sim 50 \,\text{Hz} / 100 \,\text{Hz}$ 3 With connected IP 67 / IP 69K plug









Reference material	Detection range
white (90 %)	3 400 mm
grey (18 %)	6 260 mm
black (6 %)	12 200 mm

Accessories, page 32 onwards <u>13</u>

FT 25-RF

Photoelectric proximity switch with background suppression, fixed focus







- Economical solution for numerous applications
- Tamperproof sensor design no spurious adjustment possible
- Simple alignment thanks to easily visible light spot
- Robust, glass-fibre reinforced plastic housings
- Durable laser printing

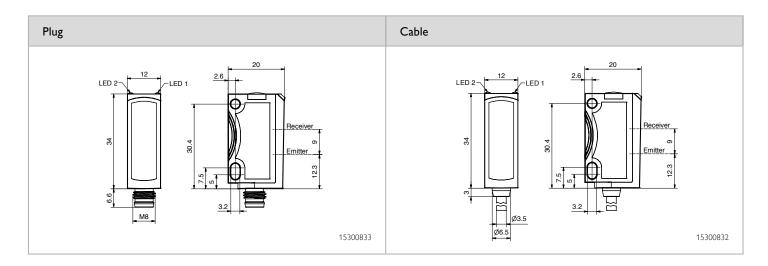
Optical data		Functions		
Scanning distance	1 60 mm ¹ / 1 80 mm ¹	Indicator LED, green	Operating voltage indicator	
Type of light	LED, red, 632 nm	Indicator LED, yellow	Switching output indicator	
Hysteresis	~ 5 %²	Adjustment possibilities	N.O./N.C. via control input	
		Default settings	N.O.	
Electrical data		Mechanical data		
Operating voltage +U _R	10 30 V DC ³	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K⁴	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g	
Response time	500 μs	Resistance to vibrations	EN 60947-5-2	
Control input IN	+U _B = N.C. -U _B /open = N.O.	and impacts		

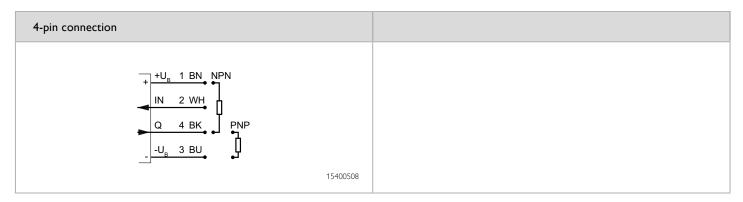
¹ Reference material white, 90% reflectivity

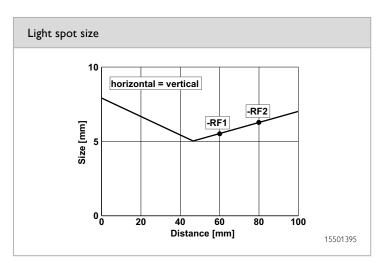
Scanning distance	Switching output	Type of connection	Order designation	Part no.
1 60 mm	PNP	Plug, M8x1, 4-pin	FT 25-RF1-PS-M4	608-11020
1 60 mm	PNP	Cable, 2 m, 4-wire	FT 25-RF1-PS-K4	608-11021
1 80 mm	PNP	Plug, M8x1, 4-pin	FT 25-RF2-PS-M4	608-11022
1 80 mm	PNP	Cable, 2 m, 4-wire	FT 25-RF2-PS-K4	608-11023
1 80 mm	NPN	Cable, 2 m, 4-wire	FT 25-RF2-NS-K4	608-11024

 $^{^2}$ Relating to scanning distance 3 Max. 10% ripple, within U_B, \sim 50 Hz / 100 Hz 4 With connected IP 67 / IP 69K plug









Reference material	Detection range	
white (90 %)	1 60 mm / 80 mm	
grey (18 %)	2 60 mm / 80 mm	
black (6 %)	4 60 mm / 80 mm	

Accessories, page 32 onwards <u>15</u>

FT 25-RL

Energetic laser photoelectric proximity switch





- Differentiation between even the smallest of grey value differences
- Sensitivity adjustment via Teach-in and control input
- Very small, easily visible laser light spot
- Durable laser printing
- Large number of variants

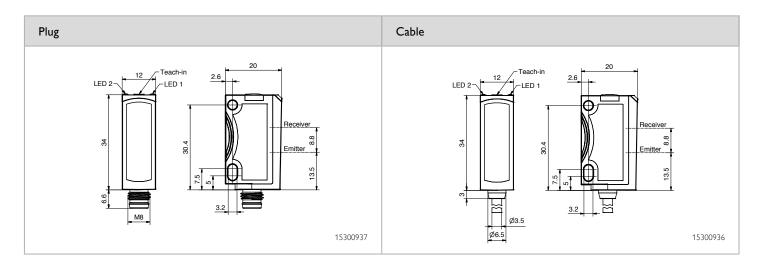
Optical data		Functions		
Scanning distance	1 250 mm ¹	Indicator LED, green	Operating voltage indicator	
Adjustment range	25 250 mm ¹	Indicator LED, yellow	Switching output indicator	
Type of light	Laser, red, 650 nm	Sensitivity adjustment	Via Teach-in button and control input	
Laser Class (DIN EN 60825-1:2008-5)	1	Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
Hysteresis	≤ 10 %²	Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input	
		Default settings	Max. scanning distance and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _B	10 30 V DC ³	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ⁴	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 1500 Hz	Weight (pigtail)	20 g	
Response time	333 µs	Resistance to vibrations	EN 60947-5-2	
response time	+U _R = Teach-in /-U _R = Button locked	and impacts		

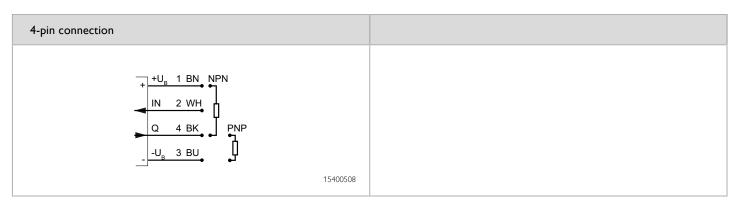
¹ Reference material white, 90 % reflectivity

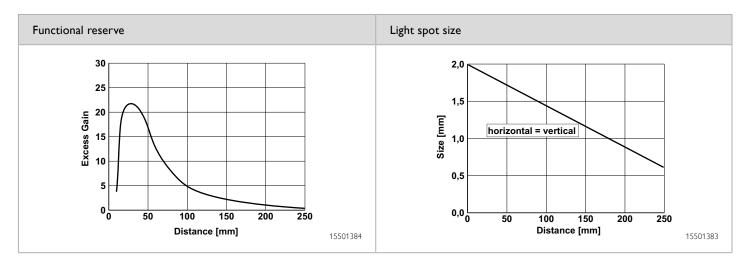
Scanning distance	Switching output	Type of connection	Order designation	Part no.
1 250 mm	PNP	Metal plug, M8x1, 4-pin	FT 25-RL-PS-M4M	609-21013
1 250 mm	NPN	Metal plug, M8×1, 4-pin	FT 25-RL-NS-M4M	609-21014
1 250 mm	PNP	Cable, 2 m, 4-wire	FT 25-RL-PS-K4	609-21010
1 250 mm	NPN	Cable, 2 m, 4-wire	FT 25-RL-NS-K4	609-21008
1 250 mm	PNP	Pigtail, 150 mm with plug M12x1, 4-pin	FT 25-RL-PS-KL4	609-21012
1 250 mm	NPN	Pigtail, 150 mm with plug M12x1, 4-pin	FT 25-RL-NS-KL4	609-21009

 $^{^{2}}$ Up to scanning distance of 150 mm 3 Max. 10% ripple, within U_B, 2 50 Hz / 100 Hz 4 With connected IP 67 / IP 69K plug









Reference material	Detection range
white (90 %)	1 250 mm
grey (18 %)	6 100 mm
black (6 %)	20 60 mm

Accessories, page 32 onwards

FT 25-R

Energetic photoelectric proximity switch





ECOLAB

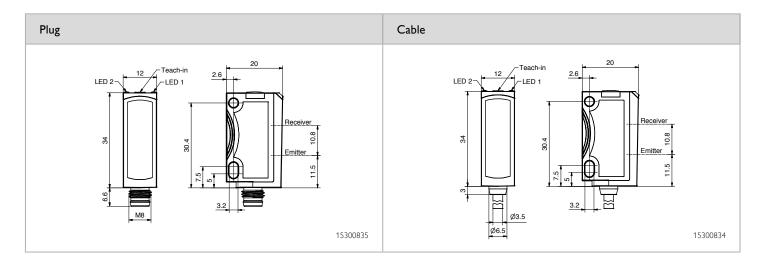
- Differentiation between even the smallest of grey value differences
- Sensitivity adjustment via Teach-in and control input
- Simple alignment thanks to easily visible light spot
- Robust, glass-fibre reinforced plastic housings
- Durable laser printing

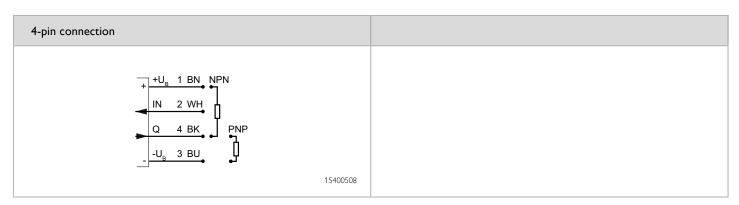
Optical data		Functions		
Scanning distance	0 800 mm ¹	Indicator LED, green	Operating voltage indicator	
Adjustment range	20 800 mm ¹	Indicator LED, yellow	Switching output indicator	
Type of light	LED, red, 632 nm	Sensitivity adjustment	Via Teach-in button and control input	
		Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
		Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input	
		Default settings	Max. scanning distance and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _B	10 30 V DC ²	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g	
Response time	500 µs	Resistance to vibrations	EN 60947-5-2	
Control input IN	$+U_{B}$ = Teach-in / $-U_{B}$ = Button locked Open = normal operation	and impacts		

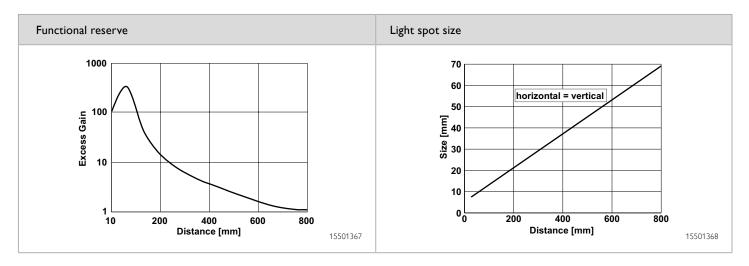
Scanning distance	Switching output	Type of connection	Order designation	Part no.
0 800 mm	PNP	Plug, M8x1, 4-pin	FT 25-R-PS-M4	607-21000
0 800 mm	NPN	Plug, M8×1, 4-pin	FT 25-R-NS-M4	607-21002
0 800 mm	PNP	Metal plug, M8x1, 4-pin	FT 25-R-PS-M4M	607-21006
0 800 mm	NPN	Metal plug, M8×1, 4-pin	FT 25-R-NS-M4M	607-21007
0 800 mm	PNP	Cable, 2 m, 4-wire	FT 25-R-PS-K4	607-21001
0 800 mm	NPN	Cable, 2 m, 4-wire	FT 25-R-NS-K4	607-21003
0 800 mm	PNP	Pigtail, 150 mm with plug M12×1, 4-pin	FT 25-R-PS-KL4	607-21004
0 800 mm	NPN	Pigtail, 150 mm with plug M12×1, 4-pin	FT 25-R-NS-KL4	607-21005

 $^{^1}$ Reference material white, 90% reflectivity 2 Max. 10% ripple, within U $_{\rm B'}$ \sim 50 Hz / 100 Hz 3 With connected IP 67 / IP 69K plug









Reference material	Detection range
white (90 %)	0 800 mm
grey (18 %)	1 450 mm
black (6 %)	3 250 mm

Accessories, page 32 onwards

FR 25-RL

Laser photoelectric reflex switch



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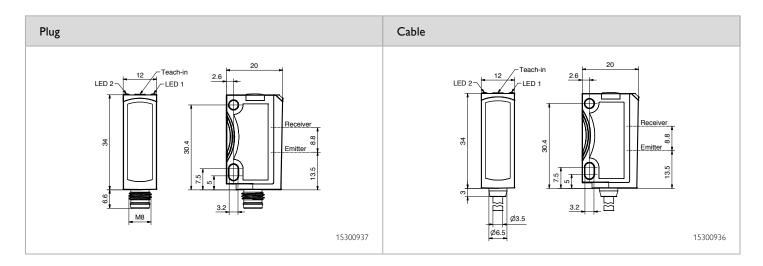
- Particularly suitable for close-range applications
- Suitable for numerous different reflectors
- Very small, easily visible laser light spot
- Sensitivity adjustment via Teach-in and control input
- Robust glass-fibre reinforced plastic housings

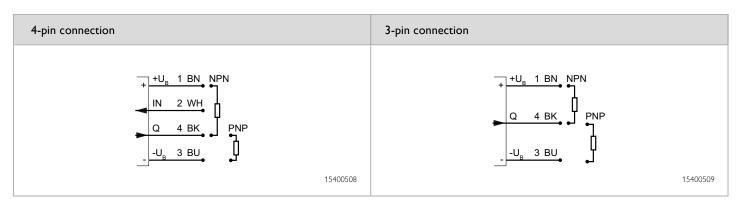
Optical data		Functions		
Limit scanning range	0.1 15 m ¹	Indicator LED, green	Operating voltage indicator	
Operating range	0.1 13 m ¹	Indicator LED, yellow	Switching output indicator	
Type of light	Laser, red, 650 nm	Sensitivity adjustment	Via Teach-in button and control input	
Laser Class (DIN EN 60825-1:2008-5)	1	Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
Polarisation filter	Yes	Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input	
		Default settings	Max. range and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _B	10 30 V DC ²	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 2000 Hz	Weight (pigtail)	20 g	
Response time	250 μs	Resistance to vibrations	EN 60947-5-2	
	$+U_{R} = Teach-in / -U_{R} = Button locked$	and impacts		

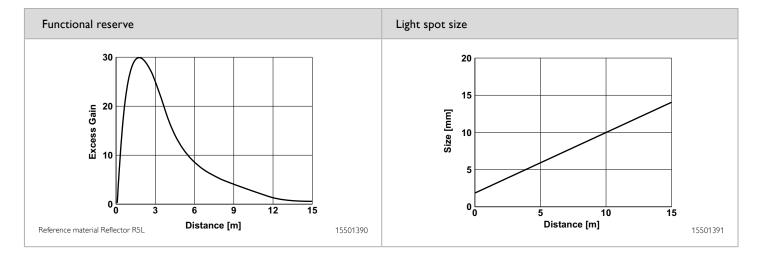
 $^{^{1}}$ Reference material Reflector R5L 2 Max, 10% ripple, within $U_{\rm B}$, \sim 50 Hz / 100 Hz 3 With connected IP 67 / IP 69K plug

Operating range	Switching output	Type of connection	Order designation	Part no.
0.1 13 m	PNP	Metal plug, M8x1, 3-pin	FR 25-RL-PS-M3M	609-31000
0.1 13 m	PNP	Metal plug, M8×1, 4-pin	FR 25-RL-PS-M4M	609-31001
0.1 13 m	NPN	Metal plug, M8×1, 4-pin	FR 25-RL-NS-M4M	609-31002
0.1 13 m	PNP	Cable, 2 m, 4-wire	FR 25-RL-PS-K4	609-21004
0.1 13 m	NPN	Cable, 2 m, 4-wire	FR 25-RL-NS-K4	609-21001
0.1 13 m	PNP	Pigtail, 150 mm with plug M12×1, 4-pin	FR 25-RL-PS-KL4	609-21006
0.1 13 m	NPN	Pigtail, 150 mm with plug M12×1, 4-pin	FR 25-RL-NS-KL4	609-21003









Accessories, page 32 onwards <u>21</u>

FR 25-R

Photoelectric reflex switch







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- Auto-detect photoelectric reflex switch with real PNP and real NPN function
- Suitable for numerous different reflectors
- Simple alignment thanks to easily visible light spot
- Robust glass-fibre reinforced plastic housings
- Durable laser printing
- High number of variants

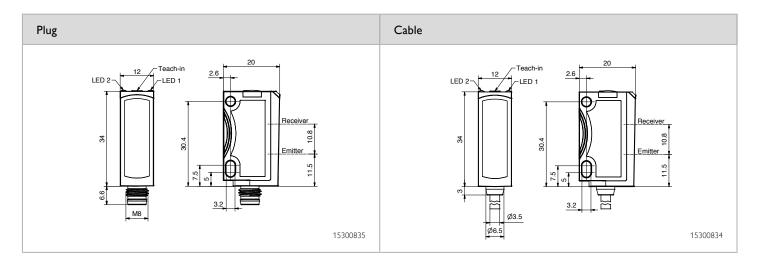
Optical data		Functions		
Limit scanning range	0.1 7 m ¹	Indicator LED, green	Operating voltage indicator	
Operating range	0.1 6 m ¹	Indicator LED, yellow	Switching output indicator	
Type of light	LED, red, 632 nm	Sensitivity adjustment	Via Teach-in button and control input	
Polarisation filter	Yes	Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
		Adjustment possibilities	N.O./N.C. via Teach-in button and control input Button lock via control input Auto-detect / NPN /PNP via Teach-in button and control input (only Auto-detect variants)	
		Default settings	Max. range and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _R	10 30 V DC ²	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _R /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN / Auto-detect	Weight (plug)	10 g	
	(see selection table)	Weight (cable)	40 g	
Output function	N.O. / N.C.	Weight (pigtail)	20 g	
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Resistance to vibrations	EN 60947-5-2	
Response time	500 μs	and impacts		
Control input IN	$+U_B = Teach-in / -U_B = Button locked$ Open = normal operation			

 $^{^{1}}$ Reference material Reflector R10 $^{-2}$ Max. 10% ripple, within U $_{\rm B}$ \sim 50 Hz / 100 Hz $^{-3}$ With connected IP 67 / IP 69K plug

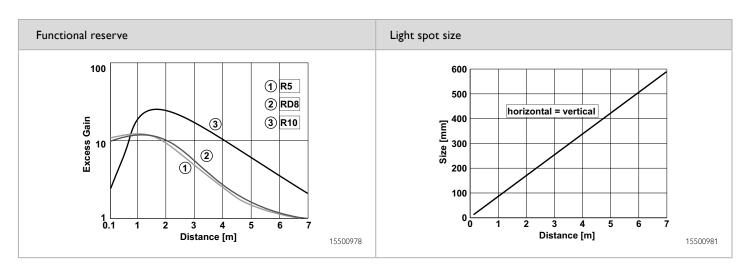
Operating range	Switching output	Type of connection	Order designation	Part no.
0.1 (PNP	DL = M0, 4, 4 = :-	FR 25-R-PS-M4	606-11000
0.1 6 m	PINP	Plug, M8×1, 4-pin	FR 25-R-P5-M4	606-11000
0.1 6 m	NPN	Plug, M8x1, 4-pin	FR 25-R-NS-M4	606-11002
0.1 6 m	PNP	Metal plug, M8×1, 3-pin	FR 25-R-PS-M3M	606-11006
0.1 6 m	NPN	Metal plug, M8×1, 3-pin	FR 25-R-NS-M3M	606-11007
0.1 6 m	PNP	Metal plug, M8×1, 4-pin	FR 25-R-PS-M4M	606-11008
0.1 6 m	NPN	Metal plug, M8×1, 4-pin	FR 25-R-NS-M4M	606-11009
0.1 6 m	PNP	Cable, 2 m, 4-wire	FR 25-R-PS-K4	606-11001
0.1 6 m	NPN	Cable, 2 m, 4-wire	FR 25-R-NS-K4	606-11003



Betriebsreichtweite	Switching output	Type of connection	Order designation	Part no.
0.1 6 m	PNP	Pigtail, 150 mm with plug M12x1, 4-pin Pigtail, 150 mm with plug M12x1, 4-pin Metal plug, M8x1, 4-pin	FR 25-R-PS-KL4	606-11004
0.1 6 m	NPN		FR 25-R-NS-KL4	606-11005
0.1 6 m	Auto-Detect		FR 25-R-PNS-M4M	606-11011



4-pin connection	3-pin connection	Auto-detect connection
+U _B 1 BN NPN IN 2 WH Q 4 BK PNP -U _B 3 BU 15400508	+U _B 1 BN NPN Q 4 BK PNP -U _B 3 BU 15400509	+ U _B 1 BN IN 2 WH Q 4 BK Auto PNP/NPN - U _B 3 BU



Reflector	Operating range
R10	0.1 6 m
RD8	0.1 4 m
R5	0.1 4 m

Zubehör ab Seite 32 <u>23</u>

FR 25-RF

Photoelectric reflex switch, fixed setting







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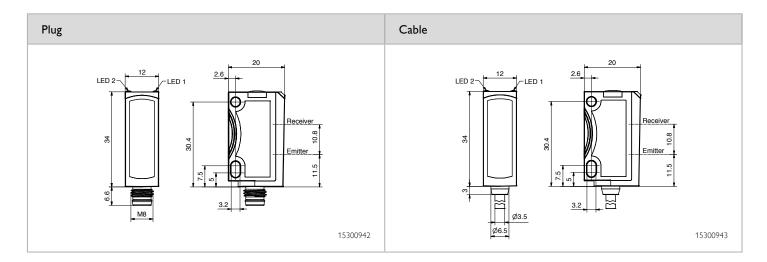
- Economical solution for numerous applications
- Tamperproof sensor design no spurious adjustment possible
- Suitable for numerous different reflectors
- Simple alignment through easily visible light spot
- Robust glass-fibre reinforced plastic housings

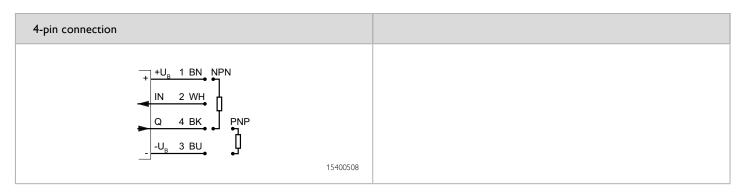
Optical data		Functions		
Limit scanning range	0.1 5 m ¹	Indicator LED, green	Operating voltage indicator	
Operating range	0.1 3 m ¹	Indicator LED, yellow	Switching output indicator	
Type of light	LED, red, 632 nm	Adjustment possibilities	N.O./N.C. via control input	
Polarisation filter	Yes	Default settings	N.O.	
Electrical data		Mechanical data		
Operating voltage +U _R	10 30 V DC ²	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ³	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _R /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g	
Response time	500 μs	Resistance to vibrations	EN 60947-5-2	
Control input IN	$+U_B = N.C.$ $-U_B / open = N.O.$	and impacts		

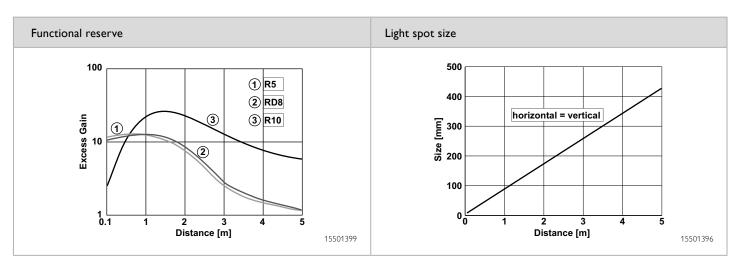
 $^{^{1}}$ Reference material Reflector R10 $^{-2}$ Max, 10% ripple, within U $_{\rm B}$ ~ 50 Hz / 100 Hz $^{-3}$ With connected IP 67 / IP 69K plug

Operating range	Switching output	Type of connection	Order designation	Part no.
0.1 3 m	PNP	Plug, M8×1, 4-pin	FR 25-RF-PS-M4	606-11012
0.1 3 m	NPN	Plug, M8x1, 4-pin	FR 25-RF-NS-M4	606-11013
0.1 3 m	PNP	Cable, 2 m, 4-wire	FR 25-RF-PS-K4	606-11014
0.1 3 m	NPN	Cable, 2 m, 4-wire	FR 25-RF-NS-K4	606-11015









Reflector	Operating range
R10 (904-51637)	0.1 3 m
RD8 (904-51531)	0.1 3 m
R5 (904-51533)	0.1 3 m

Accessories, page 32 onwards <u>25</u>

FS/FE 25-RL

Laser through-beam photoelectric switch







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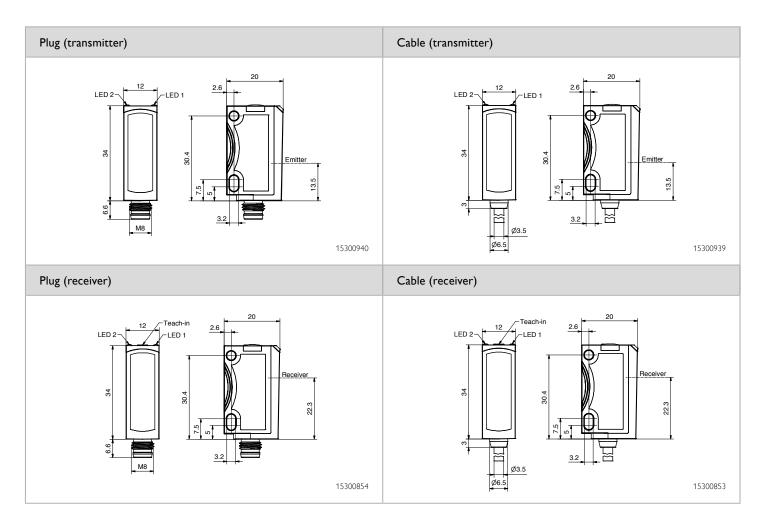
- Long range despite small, compact housing
- Test input to check function of sensor pair
- Very small, easily visible laser light spot
- Sensitivity adjustment via Teach-in and control input
- Robust glass-fibre reinforced plastic housings

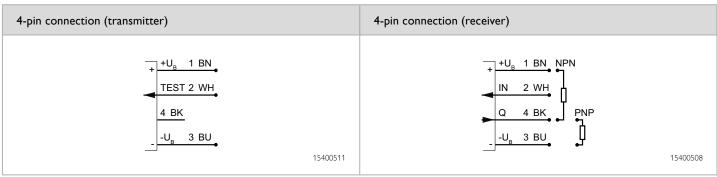
Optical data		Functions		
Limit scanning range	0 20 m	Indicator LED, green	Operating voltage indicator	
Operating range	0 18 m	Indicator LED, yellow	Switching output indicator	
Type of light Laser Class	Laser, red, 650 nm	Sensitivity adjustment (receiver)	Via Teach-in button and control input	
(DIN EN 60825-1:2008-5)		Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
		Adjustment possibilities (receiver)	N.O./N.C. via Teach-in button and control input Button lock via control input	
		Default settings	Max. range and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _B	10 30 V DC ¹	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ²	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 2000 Hz	Weight (pigtail)	20 g	
Response time	250 μs	Resistance to vibrations	EN 60947-5-2	
Control input IN (receiver)	$+U_{B}$ = Teach-in / $-U_{B}$ = Button locked Open = normal operation	and impacts		
Control input Test (transmitter)	+U _B = Test (transmitter off) -U _B / offen = normal operation			

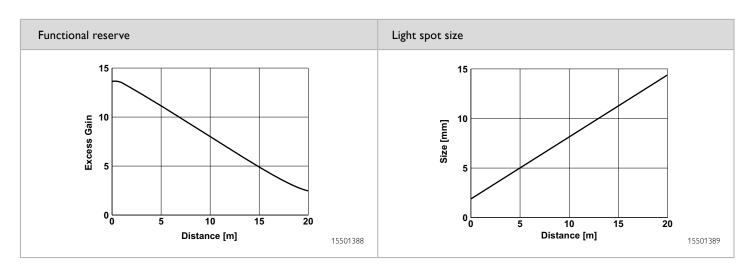
 $^{^{1}}$ Max. 10% ripple, within U_{p} , \sim 50 Hz / 100 Hz 2 With connected IP 67 / IP 69K plug

Operating range	Switching output	Type of connection	Order designation	Part no.
0 18 m	PNP	Metal plug, M8×1, 4-pin	FE 25-RL-PS-M4M	605-21014
0 18 m	NPN	Metal plug, M8×1, 4-pin	FE 25-RL-NS-M4M	605-21015
0 18 m	_	Metal plug, M8×1, 4-pin	FS 25-RL-M4M	605-11007
0 18 m	PNP	Cable, 2 m, 4-wire	FE 25-RL-PS-K4	605-21004
0 18 m	NPN	Cable, 2 m, 4-wire	FE 25-RL-NS-K4	605-21007
0 18 m	_	Cable, 2 m, 4-wire	FS 25-RL-K4	605-11002









Accessories, page 32 onwards 27

FS/FE 25-R

Through-beam photoelectric switch



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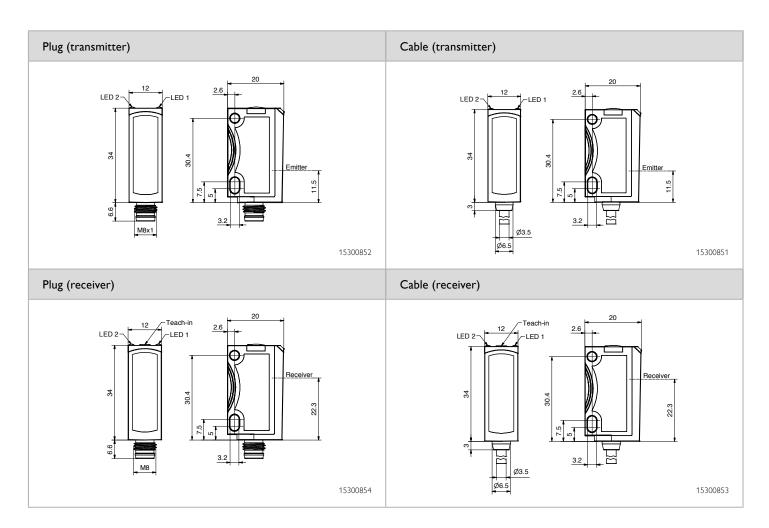
- Test input to check function of sensor pair
- Sensitivity adjustment via Teach-in and control input
- Simple alignment through easily visible light spot
- Robust glass-fibre reinforced plastic housings
- Durable laser printing

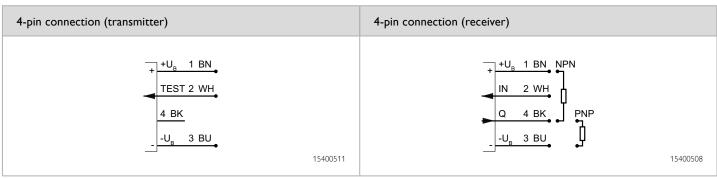
Optical data		Functions		
Limit scanning range	0 15 m	Indicator LED, green	Operating voltage indicator	
Operating range	0 13 m	Indicator LED, yellow	Switching output indicator	
Type of light	LED, red, 632 nm	Sensitivity adjustment (receiver)	Via Teach-in button and control input	
		Teach-in modes	Mode 1: during running process Mode 2: during stationary process	
		Adjustment possibilities (receiver)	N.O./N.C. via Teach-in button and control input Button lock via control input	
		Default settings	Max, range and N.O.	
Electrical data		Mechanical data		
Operating voltage +U _B	10 30 V DC ¹	Dimensions	34 × 20 × 12 mm	
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 & IP 69K ²	
Output current le	≤ 100 mA	Material, housing	ABS	
Protective circuits	Reverse-polarity protection U _B /	Material, front screen	PMMA	
	short-circuit protection (Q)	Type of connection	(see selection table)	
Protection Class	2	Ambient temperature: operation	-20 +60 °C	
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C	
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g	
Output function	N.O. / N.C.	Weight (cable)	40 g	
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g	
Response time	500 μs	Resistance to vibrations	EN 60947-5-2	
Control input IN (receiver)	$+U_{B}$ = Teach-in / $-U_{B}$ = Button locked Open = normal operation	and impacts		
Control input Test (transmitter)	+U _B = Test (transmitter off) -U _B / offen = normal operation			

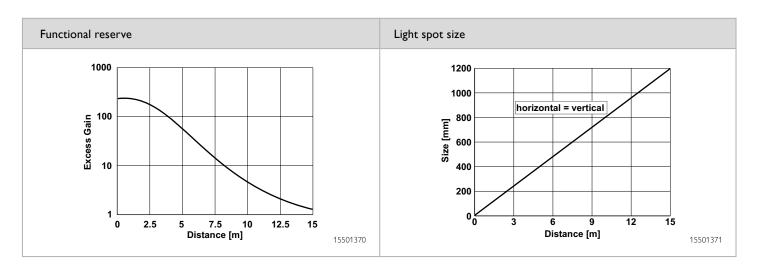
 $^{^{1}}$ Max. 10% ripple, within U_{p} , \sim 50 Hz / 100 Hz 2 With connected IP 67 / IP 69K plug

Operating range	Switching output	Type of connection	Order designation	Part no.
0 13 m	PNP	Metal plug, M8x1, 4-pin	FE 25-R-PS-M4M	605-21012
0 13 m	NPN	Metal plug, M8x1, 4-pin	FE 25-R-NS-M4M	605-21013
0 13 m	_	Metal plug, M8×1, 4-pin	FS 25-R-M4M	605-11006
0 13 m	PNP	Cable, 2 m, 4-wire	FE 25-R-PS-K4	605-21001
0 13 m	NPN	Cable, 2 m, 4-wire	FE 25-R-NS-K4	605-21003
0 13 m	_	Cable, 2 m, 4-wire	FS 25-R-K4	605-11001









Accessories, page 32 onwards 29

FS/FE 25-RF

Through-beam photoelectric switch, fixed setting







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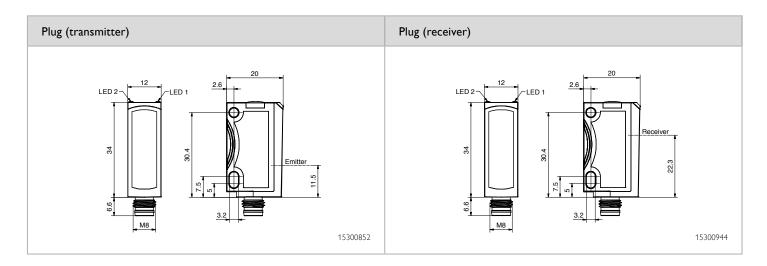
- Economical solution for numerous applications
- Tamperproof sensor design no spurious adjustment possible
- Simple alignment through easily visible light spot
- Robust glass-fibre reinforced plastic housings
- Durable laser printing

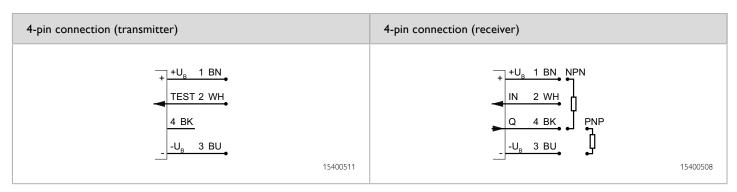
Optical data	Optical data		Functions		
Limit scanning range	0 6 m	Indicator LED, green	Operating voltage indicator		
Operating range	0 4 m	Indicator LED, yellow	Switching output indicator		
Type of light	LED, red, 632 nm	Adjustment possibilities (receiver)	N.O./N.C. via control input		
		Default settings	N.O.		
Electrical data		Mechanical data			
Operating voltage +U _R	10 30 V DC ¹	Dimensions	34 × 20 × 12 mm		
No-load current lo	≤ 30 mA	Enclosure rating	IP 67 / IP 69K ²		
Output current le	≤ 100 mA	Material, housing	ABS		
Protective circuits	Reverse-polarity protection U _R /	Material, front screen	PMMA		
	short-circuit protection (Q)	Type of connection	(see selection table)		
Protection Class	2	Ambient temperature: operation	-20 +60 °C		
Time to readiness	< 300 ms	Ambient temperature: storage	-20 +80 °C		
Switching output Q	PNP / NPN (see selection table)	Weight (plug)	10 g		
Output function	N.O. / N.C.	Weight (cable)	40 g		
Switching frequency f (ti/tp 1:1)	≤ 1000 Hz	Weight (pigtail)	20 g		
Response time	500 μs	Resistance to vibrations	EN 60947-5-2		
Control input IN (receiver)	$+U_B = N.C.$ $-U_B / open = N.O.$	and impacts			
Control input Test (transmitter)	$+U_B = Test (transmitter off)$ $-U_B / offen = normal operation$				

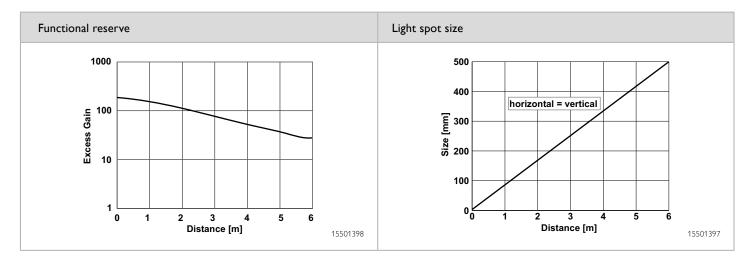
 $^{^{1}}$ Max. 10% ripple, within U_g, ~ 50 Hz / 100 Hz 2 With connected IP 67 / IP 69K plug

Operating range	Switching output	Type of connection	Order designation	Part no.
0 4 m 0 4 m 0 4 m	PNP NPN	Plug, M8, 4-pin Plug, M8, 4-pin Plug, M8, 4-pin	FE 25-RF-PS-M4 FE 25-RF-NS-M4 FS 25-RF-M4	605-21016 605-21017 605-11008



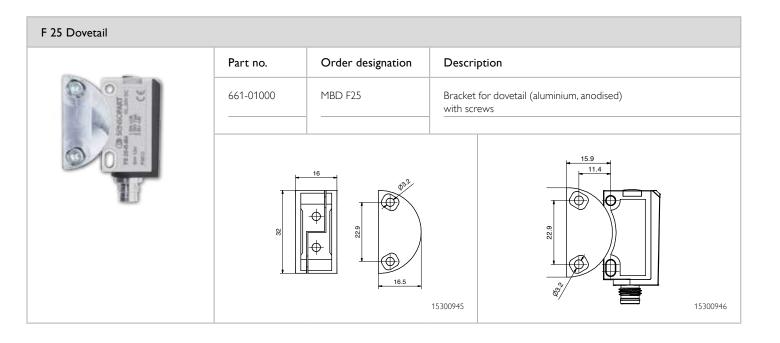


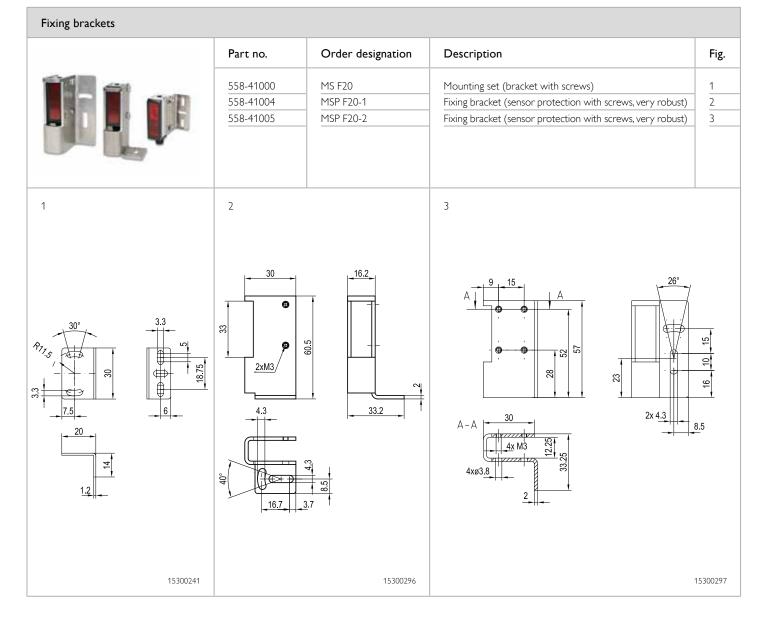




Accessories, page 32 onwards <u>31</u>

Accessories







Reflectors					
	Part no.	Order designation	Description		Fig.
	904-51533	R5	Reflector 51 x 61 mr	m, 2 mounting holes	1
	904-51637	R10		mm, 2 mounting holes	2
	904-51535	RD4	Reflector ø 42 mm, t		3
	904-51531	RD8	Reflector ø 83 mm, 1	1 mounting hole	4
	904-51543	R5/L	Reflector 51 x 61 mn 2 mounting holes	n, for laser photoelectric switches,	5
	904-51586	R2-2LB		n, for laser photoelectric switches,	6
	904-51590	RF-50 KL	Reflective foil 51 x 5	1 × 1 mm, self-adhesive	_
	904-51593	RF-230 KL	Reflective foil 230 x	230 mm, self-adhesive, cut-to-size	_
51 51 51 51 51 51 51 51 51 51	1000	100 92		M5 M5 041	
15300069			15300557		15300067
4	5		6		
4.8	30	51	3.5		
15300070			15300242		1530077

Accessories

Connection cables			
10			
Connection cable, M8, straight	Connection cable, M8, 90°	Connection cable, M8, 90° with LED	Connection cable, M12, shielded
Part no.	Order designation	Description	
		M8, 3-pin	
902-50679	K3-2m-G-PUR	2 m, straight, PUR	
902-50681	K3-2m-W-PUR	2 m, 90°, PUR	
902-50683	K3-2m-W-PL-PUR	2 m, 90°, PUR, with indicator LED	
902-51614	K3-5m-G-PUR	5 m, straight, PUR	
902-51615	K3-5m-W-PUR	5 m, 90°, PUR	
902-51616	K3-5m-W-PL-PUR	5 m, 90°, PUR, with indicator LED	
		M8, 4-pin	
902-50801	K4-2m-G-PUR	2 m, straight, PUR	
902-50803	K4-2m-W-PUR	2 m, 90°, PUR	
902-51642	K4-2m-W-PL-PUR	2 m, 90°, PUR, with indicator LED	
902-51617	K4-5m-G-PUR	5 m, straight, PUR	
902-51618	K4-5m-W-PUR	5 m, 90°, PUR	
902-51643	K4-5m-W-PL-PUR	5 m, 90°, PUR, with indicator LED	
		M12, 4-pin	
902-50805	L4-2m-G-PUR	2 m, straight, PUR	
902-50807	L4-2m-W-PUR	2 m, 90°, PUR	
902-50808	L4-2m-W-PL-PUR	2 m, 90°, PUR, with indicator LED	
902-51632	L4S-2m-G-PVC	2 m, straight, PVC, shielded	
902-51633	L4S-2m-W-PVC	2 m, 90°, PVC, shielded	
902-51612	L4-5m-G-PUR	5 m, straight, PUR	
902-51602	L4-5m-W-PUR	5 m, 90°, PUR	
902-51603	L4-5m-W-PL-PUR	5 m, 90°, PUR, with indicator LED	
902-51634	L4S-5m-G-PVC	5 m, straight, PVC, shielded	
902-51635	L4S-5m-W-PVC	5 m, 90°, PVC, shielded	

An impressive trio.



The F 10, F 25 and F 55 series from SensoPart.

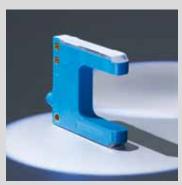


We look ahead.

Yesterday, today and in the future.











VISION

Since SensoPart was founded in 1994, we have constantly focussed on the future. Our motto has always been: We gauge ourselves not by what is possible today, but by our ideas for what can be achieved in the future. Many ground-breaking ideas from that time have since become successful products, which are now indispensible in modern automation technology - endorsed by the numerous prizes for innovation which we have received over recent years. Today, SensoPart is the technological leader in many areas of industrial sensor technology. And we still have many ideas for the future.

SENSOR TECHNOLOGY

Light barriers Vision sensors Proximity switches Smart cameras Object detection Laser sensors Miniature sensors Object measurement Colour detection Code reading Lighting Lenses

Distance sensors Colour sensors Contrast sensors Anti-collision sensors Slot sensors Fibre-optic amplifiers Inductive sensors Capacitive sensors Ultrasonic sensors

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