Sensors SOE..., opto-electronic

FESTO

- Light sensors and light barriers
- Light sensors with background fade-out
- Fibre-optic units
- Laser light sensors and light barriers
- Sensors for distance measurement
- Colour sensor
- Ranges up to 20,000 mm

From standard to high end applications: Pure functionality

The new generation of opto-electronic sensors stands out because of its combination of small dimensions with maximum functionality and reliability – whether for standard applications or for special requirements such as colour recognition or distance measurement using lasers. But this is not all. It also shines thanks to its large working range – irrespective of the format or the material involved and let us not forget its optimal price/performance ratio, which will put a smile on the face of even the most avid bargain hunter: everything under control, everything from a single source – with opto-electronic sensors SOE... from Festo.

Compact, high performance
Massively reduced: the dimensions. SOEG-RT and the colour sensor SOEC-RT-Q50 are, in fact, the smallest of their type in the world. They are reliable and include all the important functions. Naturally, the electronic parameters also correspond to those of their larger counterparts.

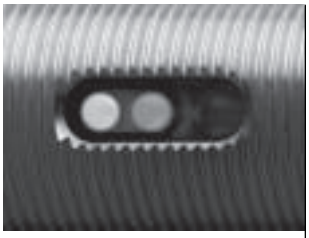
Simple and reliable
For maximum productivity: The sensitive internal parts of the sensors are offered the best of protection in the form of a sturdy housing, generally to protection class IP67. The simple teach-in mode featured on many of the sensors ensures that you can start working as quickly as possible. They really are easy to use.

Innovative and economical
Simple purchasing, quick installation, reliable operation: SOE... – this is where innovative, space-saving technology and an excellent cost/benefit ratio meet.

Sensors SOE..., opto-electronic

One principle – always
the right variant:
opto-electronic sensors SOE...

Compact & sturdy



Powerful & reliable

Economic

At a glance – a whole world of opto-electronic sensors

You will agree that it pays to take a closer look. SOE... – the right sensor for every application.

	Advantages for designers	Advantages for purchasers
Compact and sturdy	■ IP67 for use in critical zones ■ Small dimensions for installation in the tightest of spaces ■ For highly-dynamic applications and maximum productivity ■ Flexible mounting options	■ Greater system productivity possible ■ IP67 for a longer service life
Reliable and simple	■ Reduced commissioning complexity thanks to simple design and teach-in mode ■ Reliable object detection even at greater distances ■ Reliable object detection with the most varied of formats and materials ■ Reliable object detection even with very small objects	■ Easy-to-use feature saves time during installation ■ Teach-in function for quick commissioning
Economic	■ Install it and forget it ■ From standard through to special functions such as colour detection ■ All functionalities in a smaller space reduces plant size	■ One standard worldwide ■ Everything from a single source reduces the ordering complexity

Sensors SOE..., opto-electronic

Key features

Method of measurement

Through-beam sensors

Through-beam sensors comprise two devices, the transmitter and the receiver. Large ranges are made possible due to their separated layout.

Retro-reflective sensors

In retro-reflective sensors the transmitter and the receiver are located in the same housing. The light transmitted is thrown back to the receiver by means of a reflector.

Diffuse sensors

Diffuse sensors evaluate the light reflected back by the object itself. Thus a reflector is not necessary. As bright and dark objects absorb different levels of light, these purely energy-based sensors can often experience problems in critical applications. Here, sensors with background fade-out are used. These guarantee reliable operation practically independent of the color and surface of the object to be recorded.

Switching functions

Dark switching

A “dark switching” function means that the output concerned carries current (i.e. is activated), when no light is falling on the receiver. This is the equivalent of a normally closed function (NC).

Light switching

A “light switching” function means that the output concerned carries current (i.e. is activated), once light falls on the receiver. This is the equivalent of a normally open function (NO).

Parallel connection

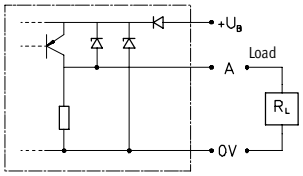
It is possible to connect opto-electronic sensors in parallel to obtain any desired logical functions.

Note

Current consumption will increase with parallel connection.
The inverse currents are accumulative, with the result that an impermissibly large voltage drop may occur across the load even when the sensors are non-conductive.

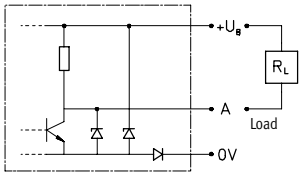
PNP circuit

The output stage includes a PNP transistor which switches the load to the positive power supply (+U_B). The load is connected between the output and ground (0 V).



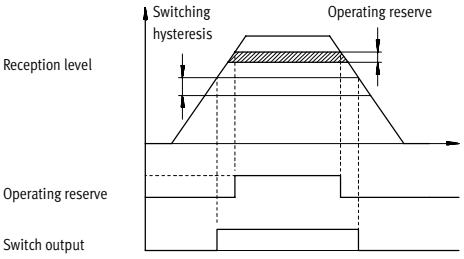
NPN circuit

The output stage includes an NPN transistor which switches the load to ground (0 V). The load is connected between the output and the positive power supply (+U_B).



Operating reserve

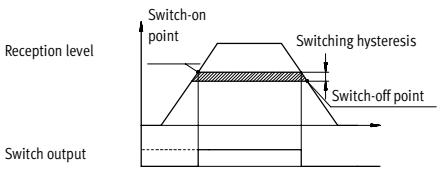
The operating reserve is a measure of the excess radiant energy which falls on the light-gathering surface and is evaluated by the light receiver. Operating reserve may diminish over a period of time due to contamination, changing reflection factor of the object to be scanned and ageing of the transmitter diode, so that reliable operation is no longer assured. Certain sensors are equipped with a second LED which lights up, once approx. 80% of the sensor’s available working range is being utilized. With certain other sensors, a yellow LED flashes or a red LED lights up when the available operating reserve is insufficient. This allows for prompt recognition of inadequate operating reliability.



Switching hysteresis

Hysteresis causes a defined switching behaviour of a sensor. The specified range always relates to the switch-on point (as an object approaches).

Distance hysteresis is meaningful only for diffuse sensors and the corresponding fibre optic cable version.



Sensors SOE..., opto-electronic

Key features

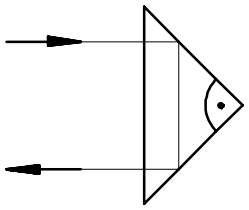
Working range

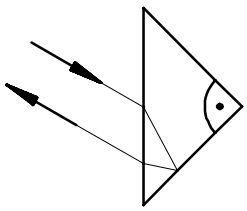
The working range is the maximum possible distance between the transmitter and receiver (through-beam sensor). To obtain this maximum, the potentiometer must be set to MAX and the specified reflector (retro-reflective sensor) must be used.

Unless otherwise specified in the data sheet, the working ranges for diffuse sensors are determined using Kodak Grey Cards (90% grey) as a reference.

Reflector

Retro-reflective sensors are equipped with polarizing filters which ensure that they respond only to light thrown back by special reflectors. These are designed on the principle of triple mirrors. The choice of the most suitable reflector for a given application will be governed by the required working range and the available mounting facilities.

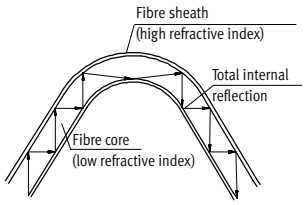




Fibre optics

A fibre optic cable can consist of a bundle of glass fibres, or one or more plastic fibres. The function of a fibre optic cable is to guide light from one place to another, even round corners. This is made possible by exploiting the phenomenon of total internal reflection. Total internal reflection occurs whenever light from a material with a high refractive index impinges on the boundary between this and a medium with a lower refractive index at an angle less than the maximum angle for total internal reflection.

The fibres of a fibre optic cable consist of a core (with a high refractive index) and a sheath (with a low refractive index). Within this, the light is constantly reflected back and forth as the result of total internal reflection and is thus able to travel even curved paths.



Laser

All of the laser components currently offered by Festo correspond to laser protection class 2 according to EN 60825-1/94

Laser protection class 2

- Maximum radiant energy 1 mW (cw). (cw = continuous wave)
- Beam only in the visible spectral range.
- Due to the high light intensity, the eye is protected by what is termed the lid shutting reflex (≤ 0.25 s).
- Appropriate laser warning notices must be displayed on the device.
- No protective measures (covers, encapsulation etc.) are required.
- The user does not require a laser protection officer.
- Class 2 lasers are completely harmless to use. Consequently no safety precautions are required for sensors of laser protection class 2.

Test input

The transmitter of a through-beam sensor is equipped with a test input. This can be used to switch the transmitter light on and off. The operation of the sensor can be tested by periodically activating the test input and evaluating the reaction of the receiver.

Installation

Opto-electronic sensors must not be allowed to interfere with each other during operation. A certain minimum distance must thus be maintained between sensors. This distance depends principally on the sensitivity to which the sensors have been set. For sensors fitted with fibre optic cables, the distance is heavily dependent on the type of fibre optic cable used. It is thus not possible to specify any general values.

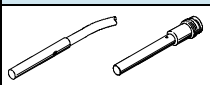
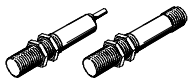
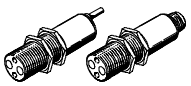
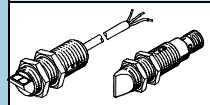
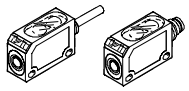
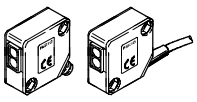
Alignment

Through-beam sensors	Retro-reflective sensors		Diffuse sensors
■ First position the receiver as desired and secure it. ■ Then align the transmitter as accurately as possible to the receiver.	■ First position the reflector as desired and secure it. ■ Cover the reflector so that only the centre remains exposed (25% of reflector area).	■ Install the retro-reflective sensor in such a way that reliable switching operation is obtained. ■ Finally, remove the cover from the reflector.	■ Align the sensor to the object to be scanned in such a way that reliable operation is obtained. ■ In order to obtain reliable operation, the operating reserve must be active.

Sensors SOE..., opto-electronic

Product range overview

FESTO

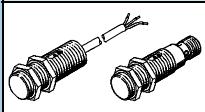
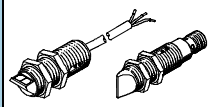
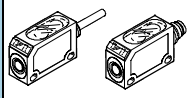
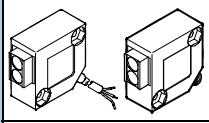
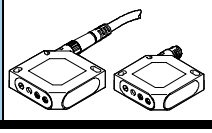
Function	Design	Type SOEG-...	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	→ Page
					Cable	Plug		
Diffuse sensor SOEG-RT	**Round design, ∅ 4 mm**							
		**RT-4** New	50	PNP, light switching	■	–	■	4 / 8.2-14
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	
	Round design, male thread M5							
		**RT-M5** New	50	PNP, light switching	■	–	■	4 / 8.2-14
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	
	Round design, male thread M12							
		**RT-M12**	0 ... 200	PNP, light switching	■	–	–	4 / 8.2-14
					–	■	–	
				NPN, light switching	■	–	–	
					–	■	–	
	Round design, male thread M18, beam exit straight							
		**RT-M18**	0 ... 430	PNP, light switching	■	–	–	4 / 8.2-14
					–	■	–	
				NPN, light switching	■	–	–	
					–	■	–	
	Round design, male thread M18, beam exit angled							
		**RT-M18W** New	0 ... 600	PNP, light switching	■	–	■	4 / 8.2-14
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	
	Block design, 20x32x12 mm							
		**RT-Q20** New	10 ... 300	PNP, switchable	■	–	■	4 / 8.2-18
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 30x30x15 mm							
		**RT-Q30**	0 ... 600	PNP, light switching	■	–	■	4 / 8.2-18
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	

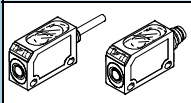
Sensors SOE..., opto-electronic

Product range overview

FESTO

Function	Design	Type SOEG-...	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	➔ Page
					Cable	Plug		
Diffuse sensor SOEG-RTZ with cylindrical light beam	**Round design, ∅ 4 mm**							
		**RTZ-4** New	10	PNP, light switching	■	–	■	4 / 8.2-21
				NPN, light switching	■	–	■	
	Round design, male thread M5							
		**RTZ-M5** New	10	PNP, light switching	■	–	■	4 / 8.2-21
				NPN, light switching	■	–	■	

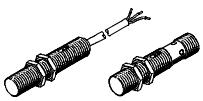
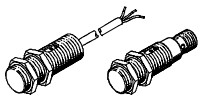
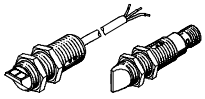
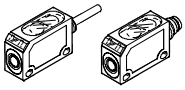
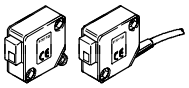
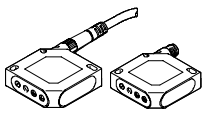
Function	Design	Type SOEG-...	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	➔ Page
					Cable	Plug		
Diffuse sensor SOEG-RTH with background fade-out	**Round design, male thread M18, beam exit straight**							
		**RTH-M18** New	10 ... 120	PNP, light switching	■	–	■	4 / 8.2-23
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	
	Round design, male thread M18, beam exit angled							
		**RTH-M18W** New	10 ... 120	PNP, light switching	■	–	■	4 / 8.2-23
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	
	Block design, 20x32x12 mm							
		**RTH-Q20** New	25 ... 100	PNP, switchable	■	–	■	4 / 8.2-26
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 30x30x15 mm							
		**RTH-Q30** New	15 ... 150	PNP, light switching	■	–	■	4 / 8.2-26
					–	■	■	
				NPN, light switching	■	–	■	
					–	■	■	
	Block design, 50x50x17 mm							
		**RTH-Q50** New	30 ... 300	PNP, antivalent	■	–	■	4 / 8.2-26
					–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	

Function	Design	Type SOEG-...	Working range [mm]	Switch output, analogue output	Electrical connection		Free of copper, PTFE and silicone	➔ Page
					Cable	Plug		
Diffuse sensor SOEG-RTD for distance measurement	**Block design, 20x32x12 mm**							
		**RTD-Q20** New	20 ... 80	PNP, 0 ... 10 V DC	■	–	■	4 / 8.2-29
					–	■	■	

Sensors SOE..., opto-electronic

Product range overview

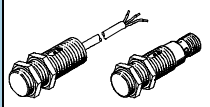
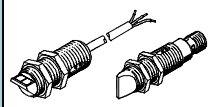
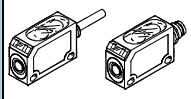
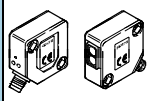
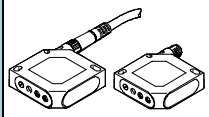
FESTO

Function	Design	Type SOEG-...	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	→ Page
					Cable	Plug		
Retro-reflective sensors SOEG-RSP with polarised light	**Round design, male thread M12**							
		**RSP-M12** New	1,500	PNP, dark switching	■	–	■	4 / 8.2-31
					–	■	■	
				NPN, dark switching	■	–	■	
					–	■	■	
	Round design, male thread M18, beam exit straight							
		**RSP-M18** New	2,000	PNP, dark switching	■	–	■	4 / 8.2-31
					–	■	■	
				NPN, dark switching	■	–	■	
					–	■	■	
	Round design, male thread M18, beam exit angled							
		**RSP-M18W** New	2,000	PNP, dark switching	■	–	■	4 / 8.2-31
					–	■	■	
				NPN, dark switching	■	–	■	
					–	■	■	
	Block design, 20x32x12 mm							
		**RSP-Q20** New	0 ... 2,500	PNP, switchable	■	–	■	4 / 8.2-34
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 30x30x15 mm							
		**RSP-Q30**	0 ... 2,000	PNP, dark switching	■	–	■	4 / 8.2-34
					–	■	■	
				NPN, dark switching	■	–	■	
					–	■	■	
	Block design, 50x50x17 mm							
		**RSP-Q50** New	0 ... 5,500	PNP, antivalent	■	–	■	4 / 8.2-34
					–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	

Sensors SOE..., opto-electronic

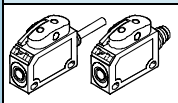
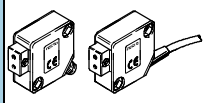
Product range overview

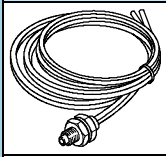
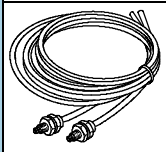
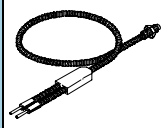
FESTO

Function	Design	Type SOEG-...	Working range [mm]	Switch output	Electrical connection: Cable	Electrical connection: Plug	Free of copper, PTFE and silicone	→ Page
Through-beam sensors SOEG-S/E	**Round design, male thread M18, beam exit straight**							
		Transmitter						
		S-M18	20,000	–	■	–	■	4 / 8.2-38
		New			–	■	■	
		Receiver						
		E-M18	20,000	PNP, antivalent	■	–	■	4 / 8.2-38
		New			–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	
	Round design, male thread M18, beam exit angled							
		Transmitter						
		S-M18W	20,000	–	■	–	■	4 / 8.2-38
		New			–	■	■	
		Receiver						
		E-M18W	20,000	PNP, antivalent	■	–	■	4 / 8.2-38
		New			–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	
	Block design, 20x32x12 mm							
		Transmitter						
		S-Q20	0 ... 6,000	–	■	–	■	4 / 8.2-41
		New			–	■	■	
		Receiver						
		E-Q20	0 ... 6,000	PNP, switchable	■	–	■	4 / 8.2-41
		New			–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 30x30x15 mm							
		Transmitter						
		S-Q30	0 ... 6,000	–	■	–	■	4 / 8.2-41
					–	■	■	
		Receiver						
		E-Q30	0 ... 6,000	PNP, dark switching	■	–	■	4 / 8.2-41
					–	■	■	
				NPN, dark switching	■	–	■	
					–	■	■	
	Block design, 50x50x17 mm							
		Transmitter						
		S-Q50	0 ... 15,000	–	■	–	■	4 / 8.2-41
		New			–	■	■	
		Receiver						
		E-Q50	0 ... 15,000	PNP, antivalent	■	–	■	4 / 8.2-41
		New			–	■	■	

Sensors SOE..., opto-electronic

Product range overview

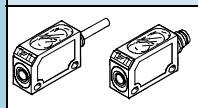
Function	Design	Type SOEG-...	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	→ Page
					Cable	Plug		
Fibre-optic units SOEG-L	**Block design, 20x32x12 mm**							
		**L-Q20** New	0 ... 250	PNP, switchable	■	–	■	4 / 8.2-45
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 30x30x15 mm							
		**L-Q30**	0 ... 120	PNP, antivalent	■	–	■	4 / 8.2-45
					–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	

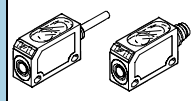
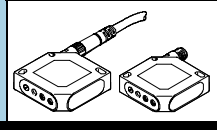
Function	Design	Use	Length [m]	Free of copper, PTFE and silicone	→ Page
Fibre optic cables	**Polymer fibre optic cable LLK**				
		Diffuse sensor	2	–	4 / 8.2-48
		Through-beam sensor	2	–	
	Glass fibre optic cable LLG				
		Diffuse sensor	0.5	–	4 / 8.2-48
		Through-beam sensor	0.5	–	
	Accessories				
		Fibre-optic cutter for polymer fibre optic cable LLK		–	4 / 8.2-50

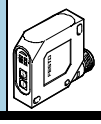
Sensors SOE..., opto-electronic

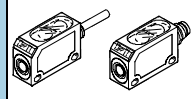
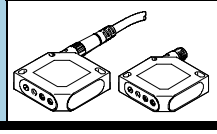
Product range overview

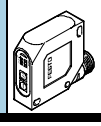
FESTO

Function	Design	Type SOEL-...	Working range [mm]	Switch output	Electrical connection: Cable	Electrical connection: Plug	Free of copper, PTFE and silicone	→ Page
Laser diffuse sensor SOEL-RT	**Block design, 20x32x12 mm**							
		**RT-Q20** New	10 ... 150	PNP, switchable	■	–	■	4 / 8.2-51
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	

Function	Design	Type SOEL-...	Working range [mm]	Switch output	Electrical connection: Cable	Electrical connection: Plug	Free of copper, PTFE and silicone	→ Page
Laser diffuse sensor SOEL-RTH with background fade-out	**Block design, 20x32x12 mm**							
		**RTH-Q20** New	30 ... 110	PNP, switchable	■	–	■	4 / 8.2-53
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 50x50x17 mm							
		**RTH-Q50** New	50 ... 300	PNP, antivalent	■	–	■	4 / 8.2-53
					–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	

Function	Design	Type SOEL-...	Working range [mm]	Switch output, analogue output	Electrical connection: Cable	Electrical connection: Plug	Free of copper, PTFE and silicone	→ Page
Laser diffuse sensor SOEL-RTD for distance measurement	**Block design, 50x50x17 mm**							
		**RTD-Q50** New	80 ... 300	PNP, 4 ... 20 mA	–	■	■	4 / 8.2-56

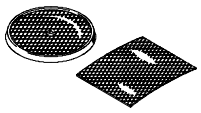
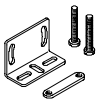
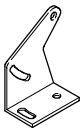
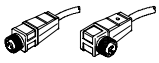
Function	Design	Type SOEL-...	Working range [mm]	Switch output	Electrical connection: Cable	Electrical connection: Plug	Free of copper, PTFE and silicone	→ Page
Laser retro-reflective sensors SOEL-RSP with polarised light	**Block design, 20x32x12 mm**							
		**RSP-Q20** New	100 ... 1,000	PNP, switchable	■	–	■	4 / 8.2-58
					–	■	■	
				NPN, switchable	■	–	■	
					–	■	■	
	Block design, 50x50x17 mm							
		**RSP-Q50** New	0 ... 12,000	PNP, antivalent	■	–	■	4 / 8.2-58
					–	■	■	
				NPN, antivalent	■	–	■	
					–	■	■	

Function	Design	Type SOEC-...	Working range [mm]	Switch output	Electrical connection: Cable	Electrical connection: Plug	Free of copper, PTFE and silicone	→ Page
Colour sensor SOEC-RT	**Block design, 50x50x17 mm**							
		**RT-Q50** New	12 ... 32	PNP, light switching	–	■	■	4 / 8.2-61

Sensors SOE..., opto-electronic

Product range overview – Accessories

FESTO

Function	Design	Description	Free of copper, PTFE and silicone	➔ Page
Reflectors	**for infra-red and red light**			
		Reflector, round ∅ 20 mm	–	4 / 8.2-63
		Reflector, round ∅ 40 mm	–	
		Reflector, round ∅ 80 mm	–	
		Reflector foil, square 100 x 100 mm	–	
	for laser light			
		Reflector, rectangular 10x50 mm	■	4 / 8.2-63
		Reflector, square 50x50 mm	■	
Mounting components		Mounting bracket for sensors 20x32x12 mm	■	4 / 8.2-64
		Mounting bracket for sensors 30x30x15 mm	–	
		Mounting bracket for sensors 50x50x17 mm	■	
Plug socket with cable		Plug socket with cable M8x1, 3-pin	–	4 / 8.2-65
		Plug socket with cable M8x1, 4-pin	■	
		Plug socket with cable M12x1, 3-pin	–	
		Plug socket with cable M12x1, 4-pin	–	
		Plug socket with cable M12x1, 8-pin	–	

Sensors SOE..., opto-electronic

Type codes

FESTO

Type	
SOE	Opto-electronic sensor

Construction	
G	Standard sensor
L	Laser sensor
C	Colour sensor

Function	
RT	Diffuse sensor
RSP	Retro-reflective sensor with polarised light
S	Through-beam sensor, transmitter
E	Through-beam sensor, receiver
L	Fibre-optic unit
RTH	Diffuse sensor with background fade-out
RTZ	Diffuse sensor with cylindrical light beam
RTD	Distance sensor
RSG	Retro-reflective sensor for transparent objects

Design	
4	Round, O.D. 4 mm
M5	Round, male thread M5
M12	Round, male thread M12
M18	Round, male thread M18
M18W	Round, male thread M18, beam outlet angled
Q20	Block design, size 20x32x12
Q30	Block design, size 30x30x15
Q50	Block design, size 50x50x17

Switch output	
PS	PNP, NO contact
NS	NPN, NO contact
PA	PNP, antivalent
NA	NPN, antivalent
PP	PNP, switchable
NP	NPN, switchable
PU	Analogue 0 ... 10 V

Electrical connection	
K	Cable
S	Plug

Display	
L	1 LED
2L	2 LEDs
3L	3 LEDs
7L	7 LEDs

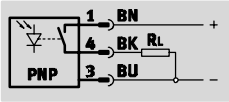
Options	
	Standard version
TI	Teach-in by means of a button and via electrical connection

Diffuse sensor SOEG-RT

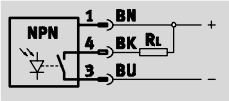
Technical data

FESTO

Function



PNP, NO contact, e.g. with plug



NPN, NO contact, e.g. with plug

- Beam exit straight or angled
- Round design

General technical data						
Size		round ∅ 4 mm	M5	M12	M18, straight	M18, angled
Method of measurement		Diffuse sensor				
Measured variable		Position				
Light type		infra-red	infra-red	infra-red	infra-red	red
Working range	[mm]	50	50	0 ... 200	0 ... 430	0 ... 600
Setting range, lower limit	[mm]	–	–	10	20	100
Setting range, upper limit	[mm]	–	–	200	430	600
Setting options		–	–	Potentiometer	Potentiometer	Potentiometer
Switching status display		Yellow LED				
Operating reserve display		Yellow LED[1)]	Yellow LED[1)]	Yellow LED[1)]	Yellow LED[1)]	Green LED
Type of mounting		Clamped	Via lock nut	Via lock nut	Via lock nut	Via lock nut
Tightening torque	[Nm]	–	1.5	10	20	20
Conforms to		DIN EN 60947-5-2				

1) LED flashes when available operating reserve is insufficient

Electrical data						
Size		round ∅ 4 mm	M5	M12	M18, straight	M18, angled
Switch output		PNP or NPN				
Switching element function		Light switching				
Electrical connection	Plug	M8 x 1, 3-pin	M8 x 1, 3-pin	M12 x 1, 3-pin	M12 x 1, 3-pin	M12 x 1, 3-pin
	Cable	3-wire	3-wire	3-wire	3-wire	3-wire
Cable length	[m]	2.5	2.5	2.5	2.5	2.5
Operating voltage range	[V DC]	10 ... 30	10 ... 30	10 ... 30	10 ... 30	10 ... 36
Residual ripple	[%]	20	20	10	10	20
Max. switching frequency	[Hz]	250	250	250	250	1,000
Max. output current	[mA]	100	100	200	200	200
Voltage drop	[V]	≤ 2.0	≤ 2.0	1.8	1.8	≤ 2.0
Idle current	[mA]	15	15	30	35	15
Protection against short circuit		Pulsed				
Protection against polarity reversal		For all electrical connections				
Protection class to EN 60 529		IP67	IP67	IP65	IP65	IP67
CE symbol		89/336/EEC (EMC)				

Diffuse sensor SOEG-RT

Technical data

FESTO

Materials					
Size	round ∅ 4 mm	M5	M12	M18, straight	M18, angled
Housing	High-alloy stainless steel		Brass, chrome-plated		Brass, nickel-plated
Union nut	–	High-alloy stainless steel	Brass, chrome-plated		Brass, nickel-plated
Cable sheath	Polyurethane				
Material note	Free of copper, PTFE and silicone		–		Free of copper, PTFE and silicone

Operating and environmental conditions										
Size	round ∅ 4 mm		M5		M12		M18, straight		M18, angled	
Cable installation	fixed	flexible	fixed	flexible	fixed	flexible	fixed	flexible	fixed	flexible
Ambient temperature [°C]	0 … 55		0 … 55		–5 … +55		–5 … +55		–25 … +55	–5 … +50
Corrosion resistance class CRC[1)]	4		4		2		2		2	

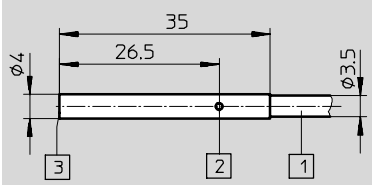
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.

Weight [g]					
Size	round ∅ 4 mm	M5	M12	M18, straight	M18, angled
Cable version	33	35	100	110	123
Plug version	3	4	32	85	56

Dimensions – ∅ 4 mm

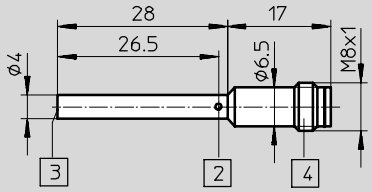
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)

Plug version

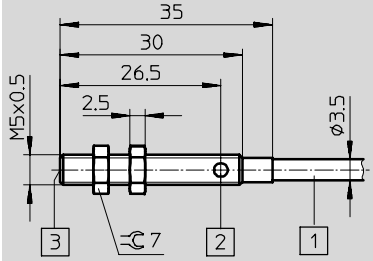


3 Light exit
4 Plug suitable for plug socket with cable SIM-M8…

Dimensions – M5

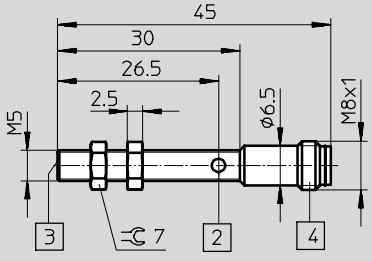
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)

Plug version



3 Light exit
4 Plug suitable for plug socket with cable SIM-M8…

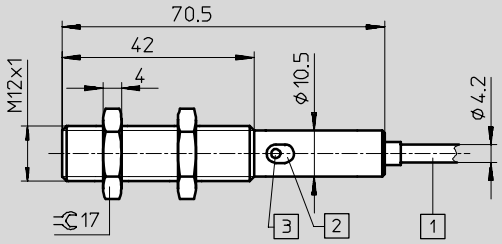
Diffuse sensor SOEG-RT

Technical data

Dimensions – M12

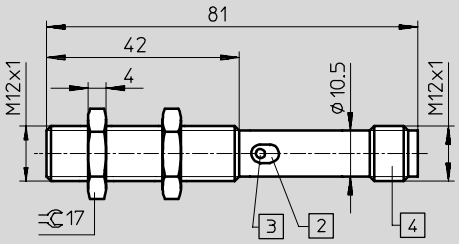
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)

Plug version

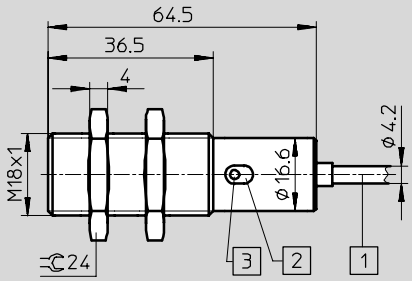


3 Potentiometer
4 Plug suitable for plug socket with cable SIM-M12-...

Dimensions – M18, beam exit straight

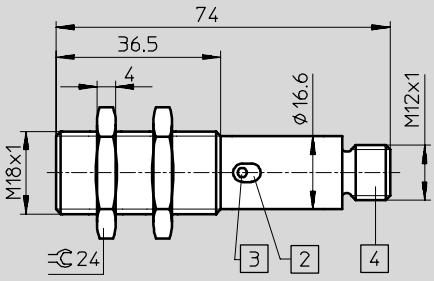
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)

Plug version

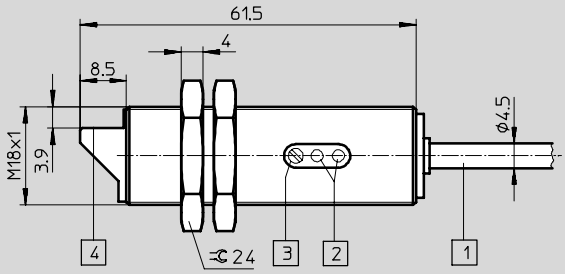


3 Potentiometer
4 Plug suitable for plug socket with cable SIM-M12-...

Dimensions – M18, beam exit angled

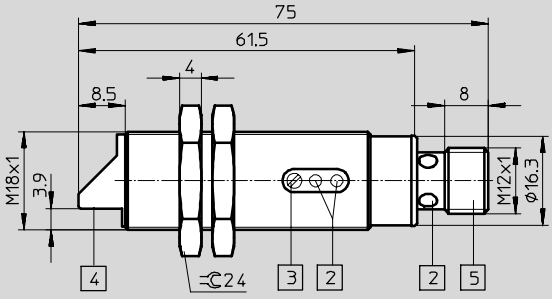
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)
3 Potentiometer
4 Light exit

Plug version

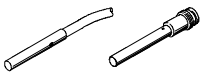
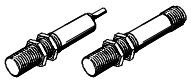
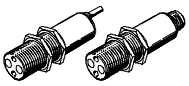
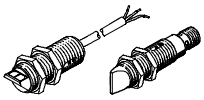


5 Plug suitable for plug socket with cable SIM-M12-...

Diffuse sensor SOEG-RT

Technical data

FESTO

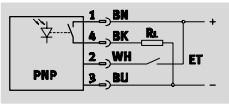
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
Round design, ∅ 4 mm							
	50	PNP, light switching	■	–	■	537 671	SOEG-RT-4-PS-K-L
			–	■	■	537 673	SOEG-RT-4-PS-S-L
		NPN, light switching	■	–	■	537 674	SOEG-RT-4-NS-K-L
			–	■	■	537 676	SOEG-RT-4-NS-S-L
Round design, male thread M5							
	50	PNP, light switching	■	–	■	537 677	SOEG-RT-M5-PS-K-L
			–	■	■	537 679	SOEG-RT-M5-PS-S-L
		NPN, light switching	■	–	■	537 680	SOEG-RT-M5-NS-K-L
			–	■	■	537 682	SOEG-RT-M5-NS-S-L
Round design, male thread M12							
	0 ... 200	PNP, light switching	■	–	–	165 338	SOEG-RT-M12-PS-K-L
			–	■	–	165 339	SOEG-RT-M12-PS-S-L
		NPN, light switching	■	–	–	165 336	SOEG-RT-M12-NS-K-L
			–	■	–	165 337	SOEG-RT-M12-NS-S-L
Round design, male thread M18, beam exit straight							
	0 ... 430	PNP, light switching	■	–	–	165 342	SOEG-RT-M18-PS-K-L
			–	■	–	165 343	SOEG-RT-M18-PS-S-L
		NPN, light switching	■	–	–	165 340	SOEG-RT-M18-NS-K-L
			–	■	–	165 341	SOEG-RT-M18-NS-S-L
Round design, male thread M18, beam exit angled							
	0 ... 600	PNP, light switching	■	–	■	537 701	SOEG-RT-M18W-PS-K-2L
			–	■	■	537 702	SOEG-RT-M18W-PS-S-2L
		NPN, light switching	■	–	■	537 717	SOEG-RT-M18W-NS-K-2L
			–	■	■	537 718	SOEG-RT-M18W-NS-S-2L

Diffuse sensor SOEG-RT

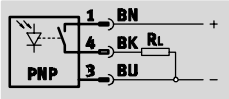
Technical data

FESTO

Function



e.g. 20x32x12 mm
PNP, switchable, with plug



e.g. 30x30x15 mm,
PNP, NO contact, with plug

- Beam exit straight
- Block design

General technical data			
Size		20x32x12 mm	30x30x15 mm
Method of measurement		Diffuse sensor	
Measured variable		Position	
Light type		red	infra-red
Working range	[mm]	10 ... 300	0 ... 600
Setting range, lower limit	[mm]	10	0
Setting range, upper limit	[mm]	300	600
Setting options		Teach-in via button Teach-in via electrical connection	Potentiometer
Max. light spot	[mm]	12x12 mm at a sensing range of 160 mm	–
Switching status display		Yellow LED	
Operating reserve display		Green LED	
Type of mounting		Via through-holes	
Conforms to		DIN EN 60947-5-2	

Electrical data			
Size		20x32x12 mm	30x30x15 mm
Switch output		PNP or NPN	
Switching element function		Switchable	Light switching
Electrical connection	Plug	M8 x 1, 4-pin	M8 x 1, 3-pin
	Cable	4-wire	3-wire
Cable length	[m]	2.0	2.5
Operating voltage range	[V DC]	10 ... 30	10 ... 30
Residual ripple	[%]	10	20
Max. switching frequency	[Hz]	1,000	1,000
Max. output current	[mA]	100	200
Voltage drop	[V]	≤ 2.4	2.0
Idle current	[mA]	35	25
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	IP65
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)	89/336/EEC (EMC)
Certification		c UL us - Listed (OL)	–

Diffuse sensor SOEG-RT

Technical data

FESTO

Materials		
Size	20x32x12 mm	30x30x15 mm
Housing	Acrylic butadiene styrene	Polybutylene terephthalate, reinforced
Cable sheath	Polyurethane	Polyurethane
Material note	Free of copper, PTFE and silicone	

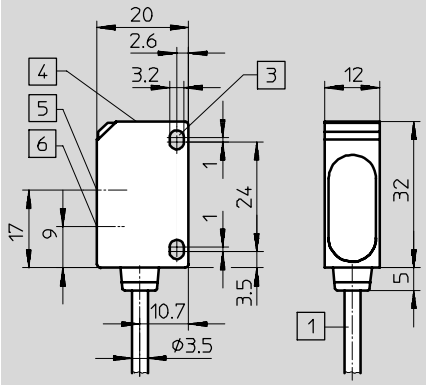
Operating and environmental conditions					
Size		20x32x12 mm		30x30x15 mm	
Cable installation		fixed	flexible	fixed	flexible
Ambient temperature	[°C]	–20 … +60	–5 … +60	–25 … +55	–5 … +55
Corrosion resistance class CRC[1]		4[2] / 2[3]		2	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]		
Size	20x32x12 mm	30x30x15 mm
Cable version	36	85
Plug version	7	18

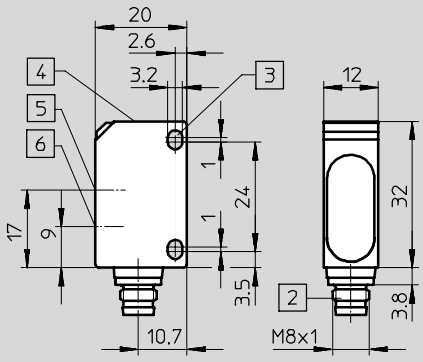
Dimensions – 20x32x12 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable

Plug version



2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

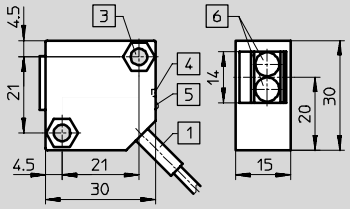
Diffuse sensor SOEG-RT

Technical data

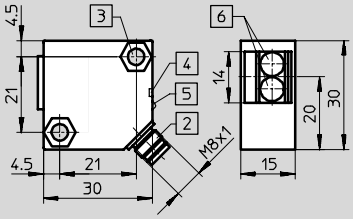
FESTO

Dimensions – 30x30x15 mm Download CAD data ➔ **www.festo.com/en/engineering**

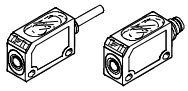
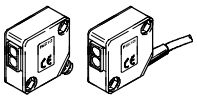
Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Potentiometer
5 Light emitting diode (LED)
6 Centre of optical beam

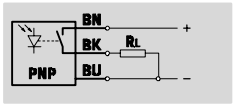
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	10 ... 300	PNP, switchable	■	–	■	537 732	SOEG-RT-Q20-PP-K-2L-TI
			–	■	■	537 731	SOEG-RT-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 734	SOEG-RT-Q20-NP-K-2L-TI
			–	■	■	537 733	SOEG-RT-Q20-NP-S-2L-TI
30x30x15 mm							
	0 ... 600	PNP, light switching	■	–	■	165 350	SOEG-RT-Q30-PS-K-2L
			–	■	■	165 351	SOEG-RT-Q30-PS-S-2L
		NPN, light switching	■	–	■	165 348	SOEG-RT-Q30-NS-K-2L
			–	■	■	165 349	SOEG-RT-Q30-NS-S-2L

Diffuse sensor SOEG-RTZ

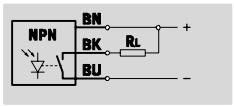
Technical data

FESTO

Function



PNP, NO contact



NPN, NO contact

- Cylindrical light beam
- Beam exit straight
- Round design

General technical data			
Size		round ∅ 4 mm	M5
Method of measurement		Diffuse sensor with cylindrical light beam	
Measured variable		Position	
Light type		infra-red	infra-red
Working range	[mm]	10	10
Setting options		–	–
Switching status display		Yellow LED	
Operating reserve display		Yellow LED[1)]	
Type of mounting		Clamped	Via lock nut
Tightening torque	[Nm]	–	1.5
Conforms to		DIN EN 60947-5-2	DIN EN 60947-5-2

1) LED flashes when available operating reserve is insufficient

Electrical data			
Size		round ∅ 4 mm	M5
Switch output		PNP or NPN	
Switching element function		Light switching	
Electrical connection	Cable	3-wire	
Cable length	[m]	2.5	
Operating voltage range	[V DC]	10 ... 30	
Residual ripple	[%]	20	
Max. switching frequency	[Hz]	250	
Max. output current	[mA]	100	
Voltage drop	[V]	≤ 2.0	
Idle current	[mA]	15	
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	
CE symbol		89/336/EEC (EMC)	

Diffuse sensor SOEG-RTZ

Technical data

FESTO

Materials		
Size	round ∅ 4 mm	M5
Housing	High-alloy stainless steel	High-alloy stainless steel
Union nut	–	High-alloy stainless steel
Cable sheath	Polyurethane	Polyurethane
Material note	Free of copper, PTFE and silicone	Free of copper, PTFE and silicone

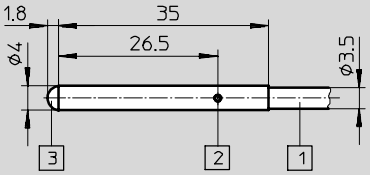
Operating and environmental conditions				
Size	round ∅ 4 mm		M5	
Cable installation	fixed	flexible	fixed	flexible
Ambient temperature [°C]	0 ... 55		0 ... 55	
Corrosion resistance class CRC[1)]	4		4	

1) Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.

Weight [g]		
Size	round ∅ 4 mm	M5
	28	30

Dimensions – ∅ 4 mm

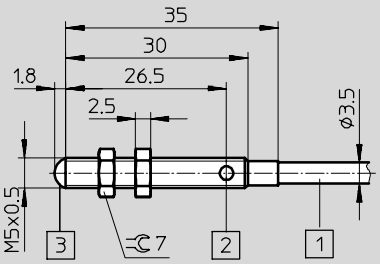
Download CAD data ➔ **www.festo.com/en/engineering**



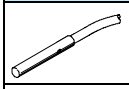
1 Connecting cable
2 Light emitting diode (LED)
3 Light exit

Dimensions – M5

Download CAD data ➔ **www.festo.com/en/engineering**



1 Connecting cable
2 Light emitting diode (LED)
3 Light exit

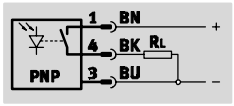
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
Round design, ∅ 4 mm							
	10	PNP, light switching	■	–	■	**537 672**	**SOEG-RTZ-4-PS-K-L**
		NPN, light switching	■	–	■	**537 675**	**SOEG-RTZ-4-NS-K-L**
Round design, male thread M5							
	10	PNP, light switching	■	–	■	**537 678**	**SOEG-RTZ-M5-PS-K-L**
		NPN, light switching	■	–	■	**537 681**	**SOEG-RTZ-M5-NS-K-L**

Diffuse sensor SOEG-RTH

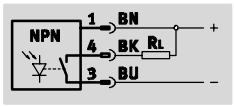
Technical data

FESTO

Function



PNP, NO contact, e.g. with plug



NPN, NO contact, e.g. with plug

- With background fade-out
- Beam exit straight or angled
- Round design

General technical data			
Size		M18, straight	M18, angled
Method of measurement		Diffuse sensor with background fade-out	
Measured variable		Position	
Light type		red	
Working range	[mm]	10 ... 120	
Setting range, lower limit	[mm]	10	
Setting range, upper limit	[mm]	120	
Setting options		Potentiometer	
Switching status display		Yellow LED	
Operating reserve display		Green LED	
Type of mounting		Via lock nut	
Tightening torque	[Nm]	20	
Conforms to		DIN EN 60947-5-2	

Electrical data			
Size		M18, straight	M18, angled
Switch output		PNP or NPN	
Switching element function		Light switching	
Electrical connection	Plug	M12 x 1, 3-pin	
	Cable	3-wire	
Cable length	[m]	2.5	
Operating voltage range	[V DC]	10 ... 36	
Residual ripple	[%]	20	
Max. switching frequency	[Hz]	500	
Max. output current	[mA]	200	
Voltage drop	[V]	≤ 2.0	
Idle current	[mA]	25	
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	
CE symbol		89/336/EEC (EMC)	

Materials		
Size	M18, straight	M18, angled
Housing	Brass, nickel-plated	
Union nut	Brass, nickel-plated	
Cable sheath	Polyurethane	
Material note	Free of copper, PTFE and silicone	

Diffuse sensor SOEG-RTH

Technical data

FESTO

Operating and environmental conditions				
Size	M18, straight		M18, angled	
Cable installation	fixed	flexible	fixed	flexible
Ambient temperature [°C]	–25 … +55	–5 … +55	–25 … +55	–5 … +55
Corrosion resistance class CRC[1)]	2		2	

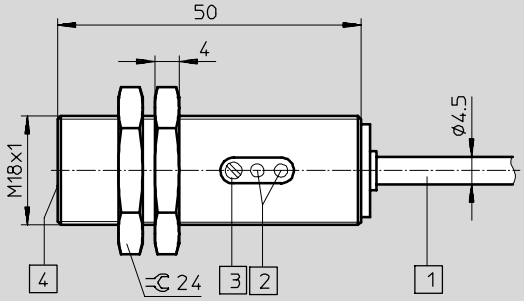
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Weight [g]		
Size	M18, straight	M18, angled
Cable version	121	124
Plug version	53	57

Dimensions – M18, beam exit straight

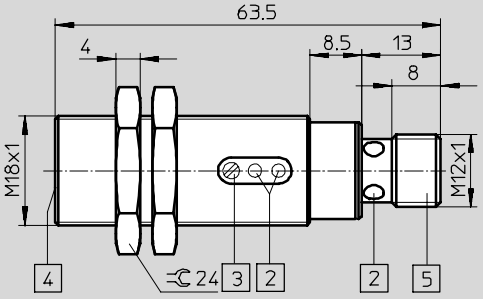
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)
3 Potentiometer
4 Light exit

Plug version

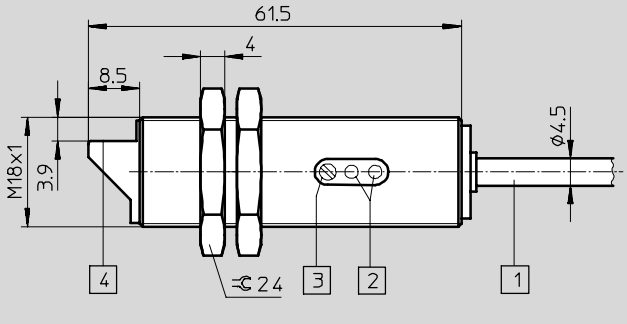


5 Plug suitable for plug socket with cable SIM-M12-...

Dimensions – M18, beam exit angled

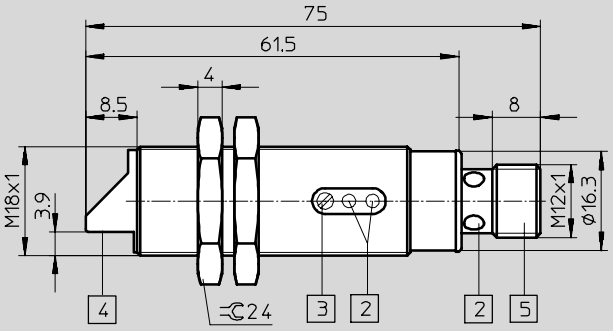
Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Light emitting diode (LED)
3 Potentiometer
4 Light exit

Plug version

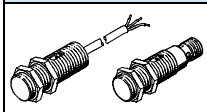
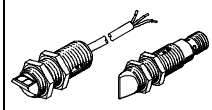


5 Plug suitable for plug socket with cable SIM-M12-...

Diffuse sensor SOEG-RTH

Technical data

FESTO

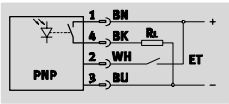
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
Round design, male thread M18, beam exit straight							
	10 ... 120	PNP, light switching	■	–	■	537 687	SOEG-RTH-M18-PS-K-2L
			–	■	■	537 689	SOEG-RTH-M18-PS-S-2L
		NPN, light switching	■	–	■	537 705	SOEG-RTH-M18-NS-K-2L
			–	■	■	537 707	SOEG-RTH-M18-NS-S-2L
Round design, male thread M18, beam exit angled							
	10 ... 120	PNP, light switching	■	–	■	537688	SOEG-RTH-M18W-PS-K-2L
			–	■	■	537690	SOEG-RTH-M18W-PS-S-2L
		NPN, light switching	■	–	■	537 706	SOEG-RTH-M18W-NS-K-2L
			–	■	■	537708	SOEG-RTH-M18W-NS-S-2L

Diffuse sensor SOEG-RTH

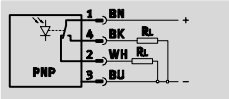
Technical data

FESTO

Function



e.g. 20x32x12 mm
PNP, switchable, with plug



e.g. 50x50x17 mm,
PNP, antivalent, with plug

- With background fade-out
- Beam exit straight
- Block design

General technical data				
Size		20x32x12 mm	30x30x15 mm	50x50x17 mm
Method of measurement		Diffuse sensor with background fade-out		
Measured variable		Position		
Light type		red		
Working range	[mm]	25 ... 100	15 ... 150	30 ... 300
Reference material		18%	90%	18%
Setting range, lower limit	[mm]	25	15	30
Setting range, upper limit	[mm]	100	150	300
Setting options		Teach-in via button Teach-in via electrical connection	Potentiometer	Potentiometer
Max. light spot	[mm]	5x5 mm at a sensing range of 60 mm	–	8x8 mm at a sensing range of 200 mm
Ready status display		–	–	Green LED
Switching status display		Yellow LED		
Operating reserve display		Green LED	Green LED	Red LED[1)]
Type of mounting		Via through-holes		
Conforms to		DIN EN 60947-5-2		

1) LED lights up when available operating reserve is insufficient

Electrical data				
Size		20x32x12 mm	30x30x15 mm	50x50x17 mm
Switch output		PNP or NPN		
Switching element function		Switchable	Light switching	Antivalent
Electrical connection	Plug	M8 x 1, 4-pin	M8 x 1, 3-pin	M12 x 1, 4-pin
	Cable	4-wire	3-wire	4-wire
Cable length	[m]	2.0	2.5	3.0
Operating voltage range	[V DC]	10 ... 30	10 ... 36	10 ... 30
Residual ripple	[%]	10	20	10
Max. switching frequency	[Hz]	1,000	500	1,000
Max. output current	[mA]	100	200	200
Voltage drop	[V]	≤ 2.4	≤ 2.0	≤ 2.4
Idle current	[mA]	35	25	35
Protection against short circuit		Pulsed		
Protection against polarity reversal		For all electrical connections		
Protection class to EN 60 529		IP67	IP65	IP67
CE symbol		89/336/EEC (EMC)		
Certification		c UL us - Listed (OL)	–	c UL us - Listed (OL)

Diffuse sensor SOEG-RTH

Technical data

FESTO

Materials			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Housing	Acrylic butadiene styrene	Polybutylene terephthalate	Acrylic butadiene styrene
Cable sheath	Polyurethane		
Material note	Free of copper, PTFE and silicone		

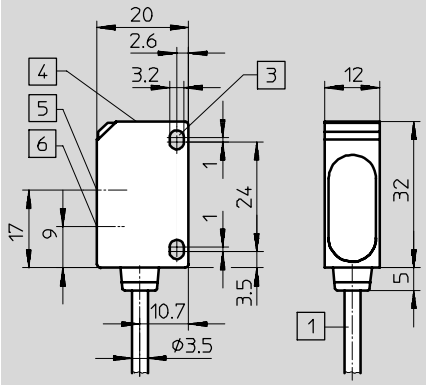
Operating and environmental conditions						
Size	20x32x12 mm		30x30x15 mm		50x50x17 mm	
Cable installation	fixed	flexible	fixed	flexible	fixed	flexible
Ambient temperature [°C]	–20 ... +60	–5 ... +60	–25 ... +55	–5 ... +55	–20 ... +60	–5 ... +60
Corrosion resistance class CRC[1]	4[2] / 2[3]		2		4	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Cable version	36	75	122
Plug version	7	17	32

Dimensions – 20x32x12 mm Download CAD data ➔ **www.festo.com/en/engineering**

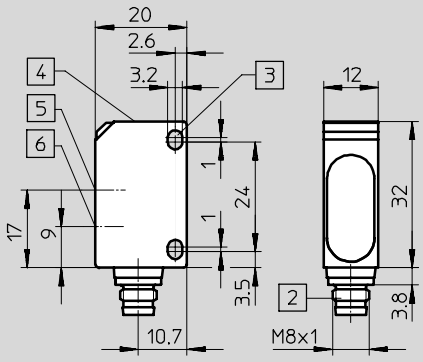
Cable version



1 Connecting cable

2 Plug suitable for plug socket with cable SIM-M8-...

Plug version



3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

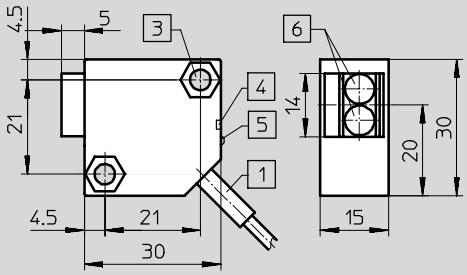
Diffuse sensor SOEG-RTH

Technical data

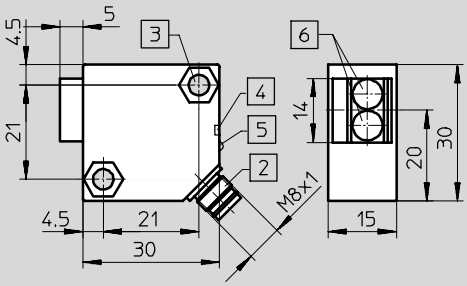
FESTO

Dimensions – 30x30x15 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



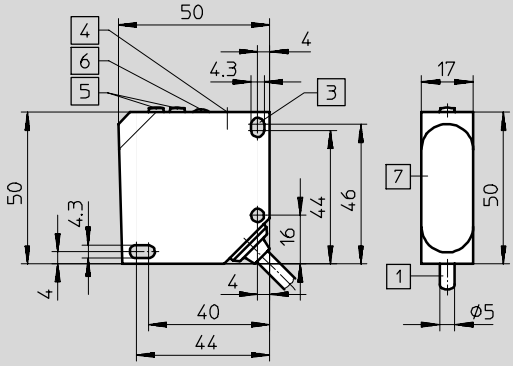
Plug version



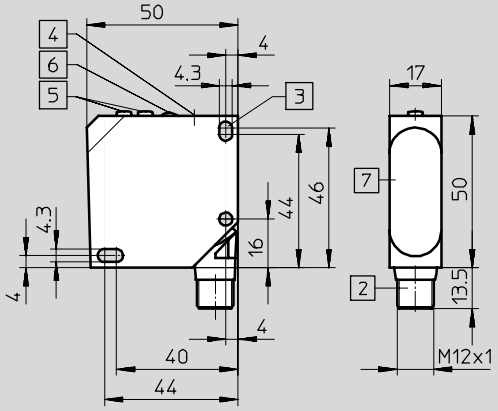
[1] Connecting cable
[2] Plug suitable for plug socket with cable SIM-M8-...
[3] Mounting holes
[4] Potentiometer
[5] Light emitting diode (LED)
[6] Centre of optical beam

Dimensions – 50x50x17 mm Download CAD data ➔ **www.festo.com/en/engineering**

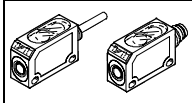
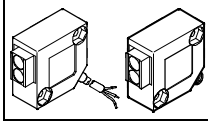
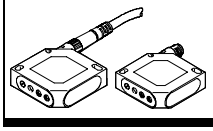
Cable version



Plug version



[1] Connecting cable
[2] Plug suitable for plug socket with cable SIM-M12-...
[3] Mounting holes
[4] Potentiometer
[5] Light emitting diode (LED)
[6] Numerical display
[7] Light exit

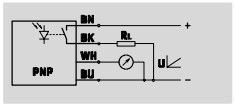
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	25 ... 100	PNP, switchable	■	–	■	537 724	SOEG-RTH-Q20-PP-K-2L-TI
			–	■	■	537 723	SOEG-RTH-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 726	SOEG-RTH-Q20-NP-K-2L-TI
			–	■	■	537 725	SOEG-RTH-Q20-NP-S-2L-TI
30x30x15 mm							
	15 ... 150	PNP, light switching	■	–	■	537 719	SOEG-RTH-Q30-PS-K-2L
			–	■	■	537 720	SOEG-RTH-Q30-PS-S-2L
		NPN, light switching	■	–	■	537 721	SOEG-RTH-Q30-NS-K-2L
			–	■	■	537 722	SOEG-RTH-Q30-NS-S-2L
50x50x17 mm							
	30 ... 300	PNP, antivalent	■	–	■	537 771	SOEG-RTH-Q50-PA-K-3L
			–	■	■	537 773	SOEG-RTH-Q50-PA-S-3L
		NPN, antivalent	■	–	■	537 772	SOEG-RTH-Q50-NA-K-3L
			–	■	■	537 774	SOEG-RTH-Q50-NA-S-3L

Diffuse sensor SOEG-RTD

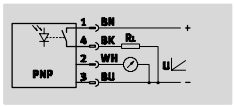
Technical data

FESTO

Function



PNP and analogue output with cable



PNP and analogue output with plug

- Sensor for distance measurement
- Beam exit straight
- Block design

General technical data		
Size		20x32x12 mm
Method of measurement		Diffuse sensor for distance measurement
Measured variable		Displacement
Light type		red
Working range	[mm]	20 ... 80
Setting range, lower limit	[mm]	20
Setting range, upper limit	[mm]	80
Setting options		Teach-in via button Teach-in via electrical connection
Switching status display		Yellow LED
Operating reserve display		Green LED
Type of mounting		Via through-holes
Conforms to		–

Electrical data		
Size		20x32x12 mm
Analogue output	[V]	0 ... 10
Switch output		PNP
Electrical connection	Plug	M8 x 1, 4-pin
	Cable	4-wire
Cable length	[m]	2.0
Operating voltage range	[V DC]	15 ... 30
Residual ripple	[%]	10
Max. switching frequency	[Hz]	200
Max. output current	[mA]	100
Voltage drop	[V]	≤ 2.4
Idle current	[mA]	25
Protection against short circuit		Pulsed
Protection against polarity reversal		For all electrical connections
Protection class to EN 60 529		IP67
CE symbol		89/336/EEC (EMC)
Certification		c UL us - Listed (OL)

Materials	
Size	20x32x12 mm
Housing	Acrylic butadiene styrene
Cable sheath	Polyurethane
Material note	Free of copper, PTFE and silicone

Diffuse sensor SOEG-RTD

Technical data

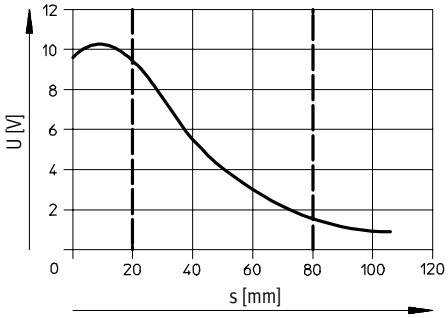
FESTO

Operating and environmental conditions		
Size		20x32x12 mm
Ambient temperature	[°C]	0 ... 60
Corrosion resistance class CRC[1)]		4[2)] / 2[3)]

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]	
Size	20x32x12 mm
Cable version	37
Plug version	7

Response curve

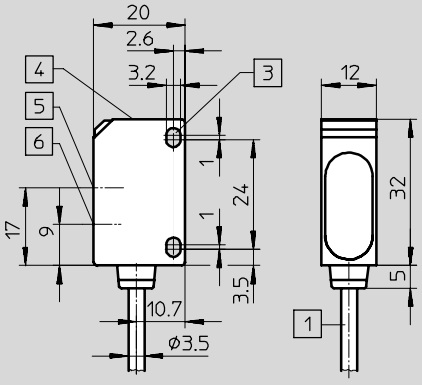


s Distance
U Output voltage

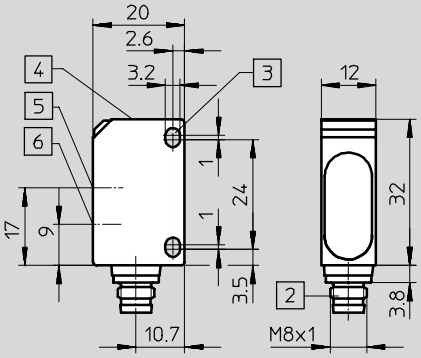
Dimensions – 20x32x12 mm

Download CAD data ➔ **www.festo.com/en/engineering**

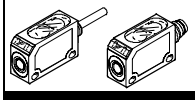
Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

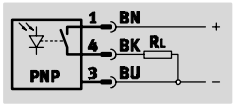
Design	Working range [mm]	Switch output, analogue output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	20 ... 80	PNP, 0 ... 10 V	■	–	■	537 758	SOEG-RTD-Q20-PP-K-2L-TI
			–	■	■	537 757	SOEG-RTD-Q20-PP-S-2L-TI

Retro-reflective sensors SOEG-RSP

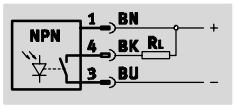
Technical data

FESTO

Function



PNP, NO contact, e.g. with plug



NPN, NO contact, e.g. with plug

- With polarised light
- Beam exit straight or angled
- Round design

General technical data				
Size		M12	M18, straight	M18, angled
Method of measurement		Retro-reflective sensor		
Measured variable		Position		
Light type		red		
Working range	[mm]	1,500	2,000	2,000
Setting options		–	–	–
Switching status display		Yellow LED		
Operating reserve display		Green LED		
Type of mounting		Via lock nut		
Tightening torque	[Nm]	10	20	20
Conforms to		DIN EN 60947-5-2		

Electrical data				
Size		M12	M18, straight	M18, angled
Switch output		PNP or NPN		
Switching element function		Dark switching		
Electrical connection	Plug	M12 x 1, 3-pin		
	Cable	3-wire		
Cable length	[m]	2.5		
Operating voltage range	[V DC]	10 ... 36		
Residual ripple	[%]	20		
Max. switching frequency	[Hz]	1,000		
Response time	[ms]	0.5		
Max. output current	[mA]	200		
Voltage drop	[V]	≤ 2.0		
Idle current	[mA]	15		
Protection against short circuit		Pulsed		
Protection against polarity reversal		For all electrical connections		
Protection class to EN 60 529		IP67		
CE symbol		89/336/EEC (EMC)		
Certification		–		

Retro-reflective sensors SOEG-RSP

Technical data

FESTO

Materials			
Size	M12	M18, straight	M18, angled
Housing	Brass, nickel-plated		
Union nut	Brass, nickel-plated		
Cable sheath	Polyurethane		
Material note	Free of copper, PTFE and silicone		

Operating and environmental conditions						
Size	M12		M18, straight		M18, angled	
Cable installation	fixed	flexible	fixed	flexible	fixed	flexible
Ambient temperature [°C]	–25 … +55	–5 … +55	–25 … +55	–5 … +55	–25 … +55	–5 … +55
Corrosion resistance class CRC[1)]	2		2		2	

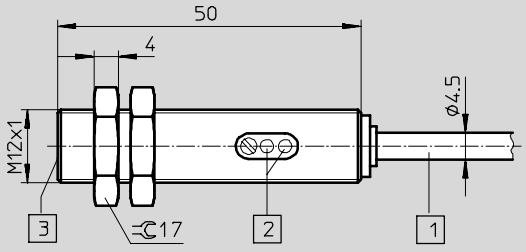
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Weight [g]			
Size	M12	M18, straight	M18, angled
Cable version	100	121	125
Plug version	20	53	56

Dimensions – M12

Download CAD data ➔ **www.festo.com/en/engineering**

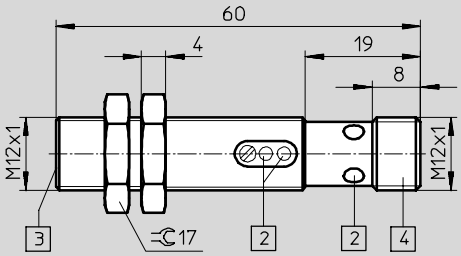
Cable version



1 Connecting cable

2 Light emitting diode (LED)

Plug version



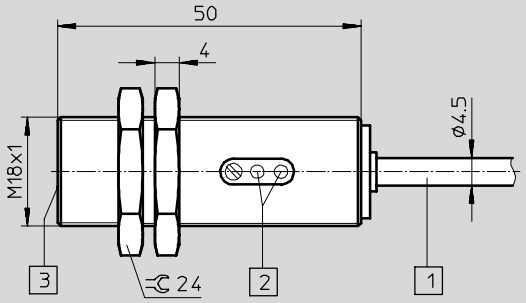
3 Light exit

4 Plug suitable for plug socket with cable SIM-M12…

Dimensions – M18, beam exit straight

Download CAD data ➔ **www.festo.com/en/engineering**

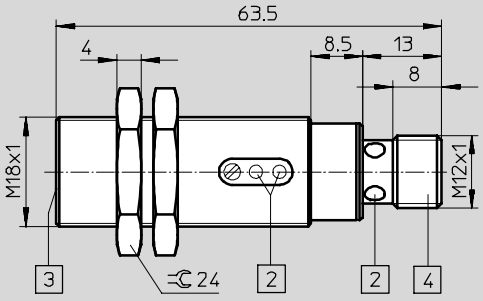
Cable version



1 Connecting cable

2 Light emitting diode (LED)

Plug version



3 Light exit

4 Plug suitable for plug socket with cable SIM-M12…

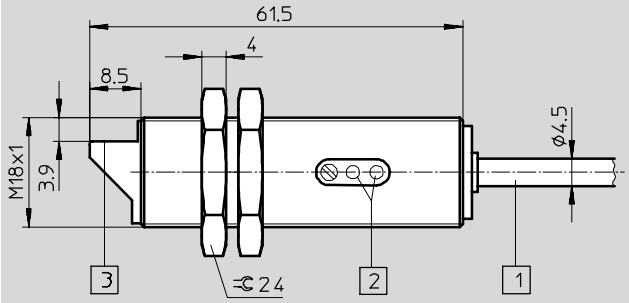
Retro-reflective sensors SOEG-RSP

Technical data

FESTO

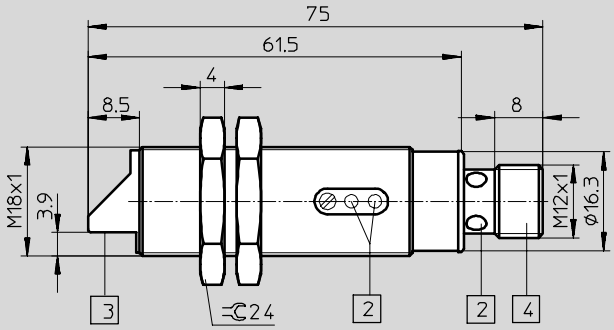
Dimensions – M18, beam exit angled Download CAD data ➔ **www.festo.com/en/engineering**

Cable version

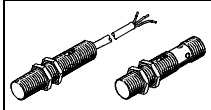
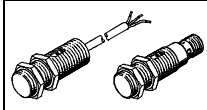
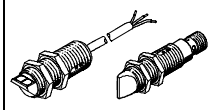


1 Connecting cable
2 Light emitting diode (LED)

Plug version



3 Light exit
4 Plug suitable for plug socket with cable SIM-M12...

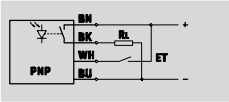
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
Round design, male thread M12							
	1,500	PNP, dark switching	■	–	■	537 683	SOEG-RSP-M12-PS-K-2L
			–	■	■	537 684	SOEG-RSP-M12-PS-S-2L
		NPN, dark switching	■	–	■	537 685	SOEG-RSP-M12-NS-K-2L
			–	■	■	537 686	SOEG-RSP-M12-NS-S-2L
Round design, male thread M18, beam exit straight							
	2,000	PNP, dark switching	■	–	■	537 697	SOEG-RSP-M18-PS-K-2L
			–	■	■	537 699	SOEG-RSP-M18-PS-S-2L
		NPN, dark switching	■	–	■	537 713	SOEG-RSP-M18-NS-K-2L
			–	■	■	537 715	SOEG-RSP-M18-NS-S-2L
Round design, male thread M18, beam exit angled							
	2,000	PNP, dark switching	■	–	■	537 698	SOEG-RSP-M18W-PS-K-2L
			–	■	■	537 700	SOEG-RSP-M18W-PS-S-2L
		NPN, dark switching	■	–	■	537 714	SOEG-RSP-M18W-NS-K-2L
			–	■	■	537 716	SOEG-RSP-M18W-NS-S-2L

Retro-reflective sensors SOEG-RSP

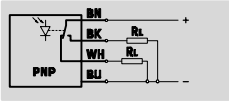
Technical data

FESTO

Function



e.g. 20x32x12 mm
PNP, switchable, with plug



e.g. 50x50x17 mm,
PNP, antivalent, with plug

- With polarised light
- Beam exit straight
- Block design

General technical data				
Size		20x32x12 mm	30x30x15 mm	50x50x17 mm
Method of measurement		Retro-reflective sensor		
Measured variable		Position		
Light type		red polarised		
Working range	[mm]	0 ... 2,500 [1]	0 ... 2,000	0 ... 5,000 [1]
Reference material		Laser reflector 51x51 mm	Reflector ∅ 80 mm	Reflector ∅ 80 mm
Setting range, lower limit	[mm]	0	0	0
Setting range, upper limit	[mm]	2,500	2,000	5,000
Setting options		Teach-in via electrical connection	Potentiometer	Potentiometer
Max. light spot	[mm]	75x75 mm at a sensing range of 2 m	–	–
Ready status display		–	–	Green LED
Switching status display		Yellow LED		
Operating reserve display		Green LED	Green LED	Red LED [2]
Type of mounting		Via through-holes		
Conforms to		DIN EN 60947-5-2		

1) independent of the reflector used ➔ Table
2) LED lights up when available operating reserve is insufficient

Working range [1]			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Reflector, rectangular 10x50 mm	–	–	–
Reflector, round ∅ 20 mm	1,200	800	1,200
Reflector, round ∅ 40 mm	2,000	1,200	3,000
Reflector, square 50x50 mm	2,500	1,200	3,000
Reflector, round ∅ 80 mm	2,500	2,000	5,500
Reflector foil, 100 x 100 mm	1,000	1,000	1,000

1) Reflectors ➔ 4 / 8.2-63

Retro-reflective sensors SOEG-RSP

Technical data

FESTO

Electrical data				
Size		20x32x12 mm	30x30x15 mm	50x50x17 mm
Switch output		PNP or NPN		
Switching element function		Switchable	Dark switching	Antivalent
Electrical connection	Plug	M8 x 1, 4-pin	M8 x 1, 3-pin	M12 x 1, 4-pin
	Cable	4-wire	3-wire	4-wire
Cable length	[m]	2.0	2.5	3.0
Operating voltage range	[V DC]	10 ... 30		
Residual ripple	[%]	10	20	10
Max. switching frequency	[Hz]	1,000	1,000	1,000
Max. output current	[mA]	100	200	200
Voltage drop	[V]	≤ 2.4	2.0	≤ 2.4
Idle current	[mA]	35	25	30
Protection against short circuit		Pulsed		
Protection against polarity reversal		For all electrical connections		
Protection class to EN 60 529		IP67	IP65	IP67
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)	89/336/EEC (EMC)	89/336/EEC (EMC) 73/23/EEC (low voltage)
Certification		c UL us - Listed (OL)	–	c UL us - Listed (OL)

Materials			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Housing	Acrylic butadiene styrene	Polybutylene terephthalate, reinforced	Acrylic butadiene styrene
Cable sheath	Polyurethane		
Material note	Free of copper, PTFE and silicone		

Operating and environmental conditions							
Size		20x32x12 mm		30x30x15 mm		50x50x17 mm	
Cable installation		fixed	flexible	fixed	flexible	fixed	flexible
Ambient temperature	[°C]	–20 ... +60	–5 ... +60	–25 ... +55	–5 ... +55	–20 ... +60	–5 ... +60
Corrosion resistance class CRC[1]		4[2] / 2[3]		2		4	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Cable version	37	85	122
Plug version	7	18	32

Retro-reflective sensors SOEG-RSP

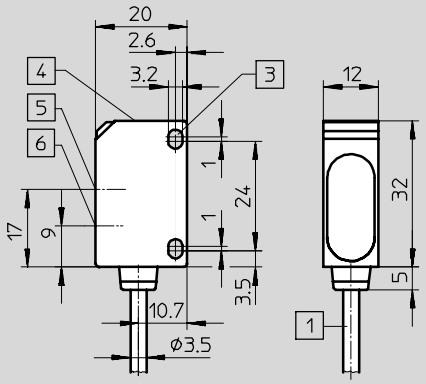
Technical data

FESTO

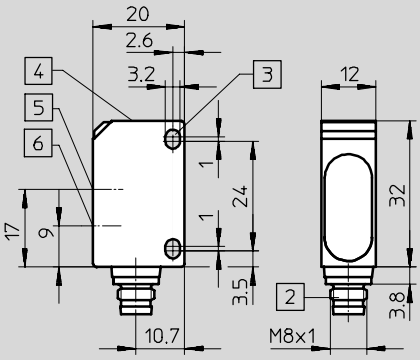
Dimensions – 20x32x12 mm

Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



Plug version

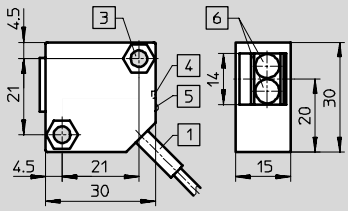


1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

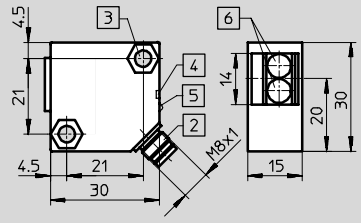
Dimensions – 30x30x15 mm

Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



Plug version

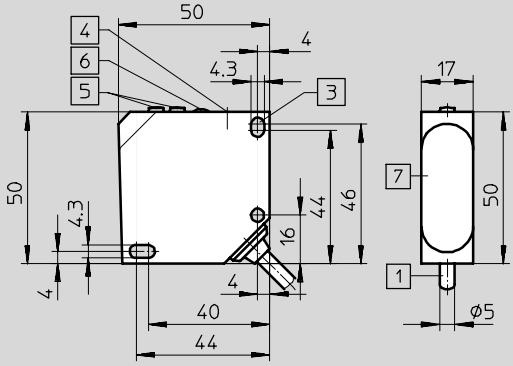


1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Potentiometer
5 Light emitting diode (LED)
6 Centre of optical beam

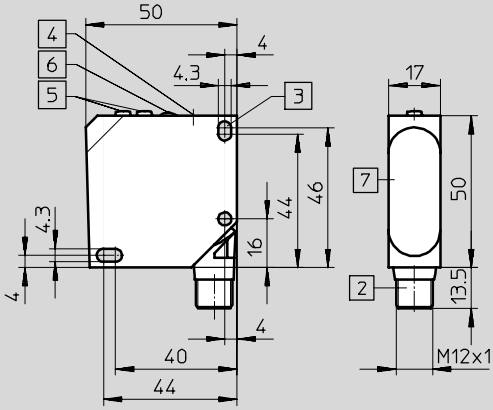
Dimensions – 50x50x17 mm

Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



Plug version

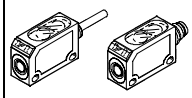
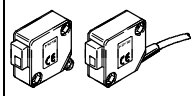
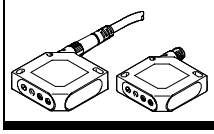


1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M12-...
3 Mounting holes
4 Potentiometer
5 Light emitting diode (LED)
6 Numerical display
7 Light exit

Retro-reflective sensors SOEG-RSP

Technical data

FESTO

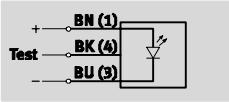
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	0 ... 2,500	PNP, switchable	■	–	■	537 750	SOEG-RSP-Q20-PP-K-2L-TI
			–	■	■	537 749	SOEG-RSP-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 752	SOEG-RSP-Q20-NP-K-2L-TI
			–	■	■	537 751	SOEG-RSP-Q20-NP-S-2L-TI
30x30x15 mm							
	0 ... 2,000	PNP, dark switching	■	–	■	165 330	SOEG-RSP-Q30-PS-K-2L
			–	■	■	165 331	SOEG-RSP-Q30-PS-S-2L
		NPN, dark switching	■	–	■	165 328	SOEG-RSP-Q30-NS-K-2L
			–	■	■	165 329	SOEG-RSP-Q30-NS-S-2L
50x50x17 mm							
	0 ... 5,500	PNP, antivalent	■	–	■	537 763	SOEG-RSP-Q50-PA-K-3L
			–	■	■	537 765	SOEG-RSP-Q50-PA-S-3L
		NPN, antivalent	■	–	■	537 764	SOEG-RSP-Q50-NA-K-3L
			–	■	■	537 766	SOEG-RSP-Q50-NA-S-3L

Through-beam sensors SOEG-S/E

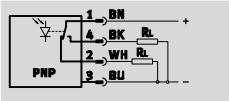
Technical data

FESTO

Function



Transmitter, e.g. with plug



Receiver, e.g. PNP, antivalent, with plug

- Beam exit straight or angled
- Round design

General technical data			
Size		M18, straight	M18, angled
Method of measurement		Through-beam sensor	
Measured variable		Position	
Light type		red	
Working range	[mm]	20,000	
Setting options		–	
Switching status display		Yellow LED	
Operating reserve display		Green LED	
Type of mounting		Via lock nut	
Tightening torque	[Nm]	20	
Conforms to		DIN EN 60947-5-2	

Electrical data			
Size		M18, straight	M18, angled
Switch output		PNP or NPN	
Switching element function		Antivalent	
Electrical connection	Plug	M12x1, 3-pin[1] or 4-pin[2]	
	Cable	3-wire	
Cable length	[m]	2.5	
Operating voltage range	[V DC]	10 ... 36	
Residual ripple	[%]	20	
Max. switching frequency[2]	[Hz]	1,000	
Max. output current[2]	[mA]	200	
Voltage drop	[V]	≤ 2.0	
Idle current	[mA]	15[1] / 10[2]	
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	
CE symbol		89/336/EEC (EMC)	

1) at the transmitter
2) at the receiver

Through-beam sensors SOEG-S/E

Technical data

FESTO

Materials		
Size	M18, straight	M18, angled
Housing	Brass, nickel-plated	
Union nut	Brass, nickel-plated	
Cable sheath	Polyurethane	
Material note	Free of copper, PTFE and silicone	

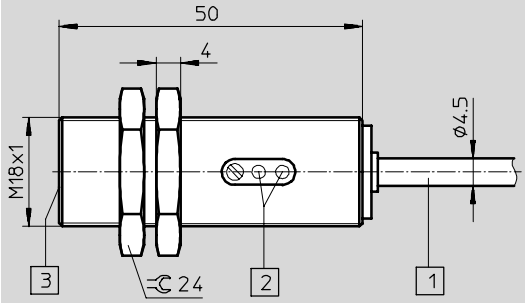
Operating and environmental conditions					
Size		M18, straight		M18, angled	
Cable installation		fixed	flexible	fixed	flexible
Ambient temperature	[°C]	–25 … +55	–5 … +55	–25 … +55	–5 … +55
Corrosion resistance class CRC[1)]		2		2	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

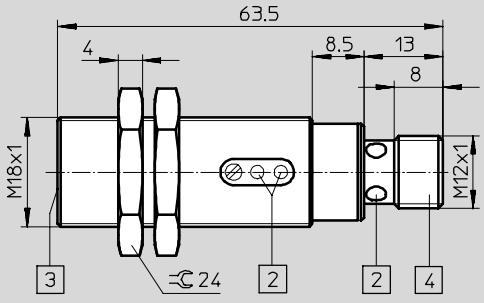
Weight [g]		
Size	M18, straight	M18, angled
Cable version	115	124
Plug version	40	57

Dimensions – M18, beam exit straight Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



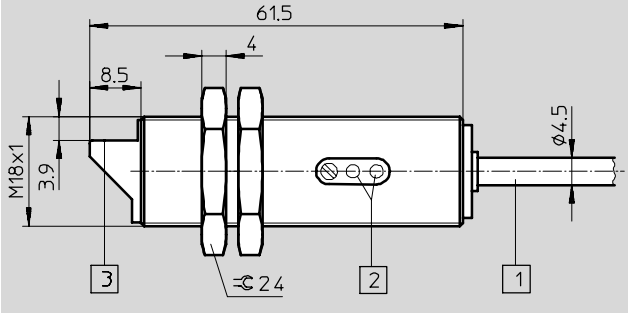
Plug version



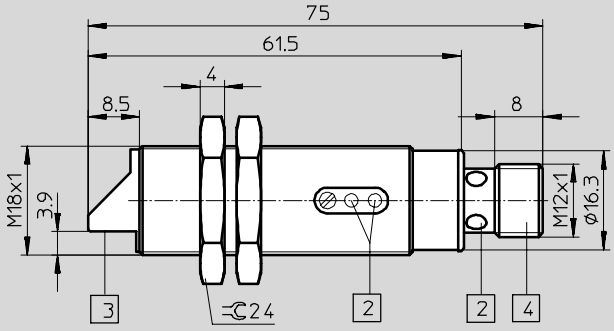
1 Connecting cable
2 Light emitting diode (LED)
3 Light exit
4 Plug suitable for plug socket with cable SIM-M12…

Dimensions – M18, beam exit angled Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



Plug version

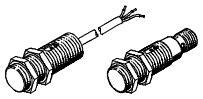
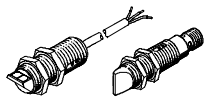


1 Connecting cable
2 Light emitting diode (LED)
3 Light exit
4 Plug suitable for plug socket with cable SIM-M12…

Through-beam sensors SOEG-S/E

Technical data

FESTO

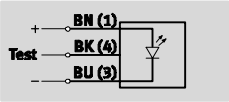
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
Round design, male thread M18, beam exit straight							
	Transmitter						
	20,000	–	■	–	■	537 691	SOEG-S-M18-K-L
			–	■	■	537 703	SOEG-S-M18-S-L
	Receiver						
	20,000	PNP, antivalent	■	–	■	537 692	SOEG-E-M18-PA-K-2L
			–	■	■	537 704	SOEG-E-M18-PA-S-2L
		NPN, antivalent	■	–	■	537 709	SOEG-E-M18-NA-K-2L
			–	■	■	537 711	SOEG-E-M18-NA-S-2L
Round design, male thread M18, beam exit angled							
	Transmitter						
	20,000	–	■	–	■	537 693	SOEG-S-M18W-K-L
			–	■	■	537 695	SOEG-S-M18W-S-L
	Receiver						
	20,000	PNP, antivalent	■	–	■	537 694	SOEG-E-M18W-PA-K-2L
			–	■	■	537 696	SOEG-E-M18W-PA-S-2L
		NPN, antivalent	■	–	■	537 710	SOEG-E-M18W-NA-K-2L
			–	■	■	537 712	SOEG-E-M18W-NA-S-2L

Through-beam sensors SOEG-S/E

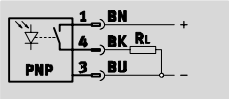
Technical data

FESTO

Function

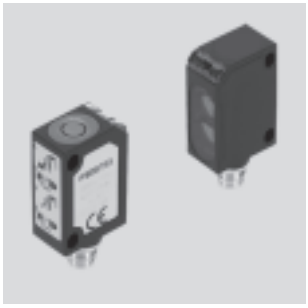


e.g. 30x30x15 mm,
Transmitter, with plug



e.g. 30x30x15 mm,
Receiver, PNP, with plug

- Beam exit straight
- Block design
- Transmitter with test input



General technical data				
Size		20x32x12 mm	30x30x15 mm	50x50x17 mm
Method of measurement		Through-beam sensor		
Measured variable		Position		
Light type		red	infra-red	infra-red
Working range	[mm]	0 ... 6,000	0 ... 6,000	0 ... 15,000
Setting options		Teach-in via button Teach-in via electrical connection	Potentiometer	Potentiometer
Ready status display		–	–	Green LED
Switching status display		Yellow LED		
Operating reserve display		Green LED	Green LED	Red LED[1]
Type of mounting		Via through-holes		
Conforms to		DIN EN 60947-5-2		

1) LED lights up when available operating reserve is insufficient

Electrical data				
Size		20x32x12 mm	30x30x15 mm	50x50x17 mm
Switch output		PNP or NPN		
Switching element function		Switchable	Dark switching	Antivalent
Electrical connection	Plug	M8 x 1, 4-pin	M8 x 1, 3-pin	M12 x 1, 4-pin
	Cable	4-wire	3-wire	4-wire
Cable length	[m]	2.0	2.5	3.0
Operating voltage range	[V DC]	10 ... 30		
Residual ripple	[%]	10	20	10
Max. switching frequency	[Hz]	500	1,000	1,000
Max. output current[1]	[mA]	100	200	200
Voltage drop	[V]	≤ 2.4	2.0	≤ 2.4
Idle current	[mA]	20	25[1] / 30[2]	30
Protection against short circuit		Pulsed		
Protection against polarity reversal		For all electrical connections		
Protection class to EN 60 529		IP67	IP65	IP67
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)	89/336/EEC (EMC)	89/336/EEC (EMC) 73/23/EEC (low voltage)
Certification		c UL us - Listed (OL)	–	c UL us - Listed (OL)

1) at the transmitter
2) at the receiver

Through-beam sensors SOEG-S/E

Technical data

FESTO

Materials			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Housing	Acrylic butadiene styrene	Polybutylene terephthalate, reinforced	Acrylic butadiene styrene
Cable sheath	Polyurethane		
Material note	Free of copper, PTFE and silicone		

Operating and environmental conditions						
Size	20x32x12 mm		30x30x15 mm		50x50x17 mm	
Cable installation	fixed	flexible	fixed	flexible	fixed	flexible
Ambient temperature [°C]	–20 ... +60	–5 ... +60	–25 ... +55	–5 ... +55	–20 ... +60	–5 ... +60
Corrosion resistance class CRC[1]	4[2] / 2[3]		2		4	

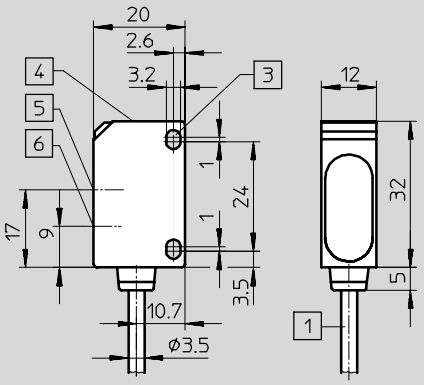
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]			
Size	20x32x12 mm	30x30x15 mm	50x50x17 mm
Cable version	37	85	121
Plug version	7	18	31

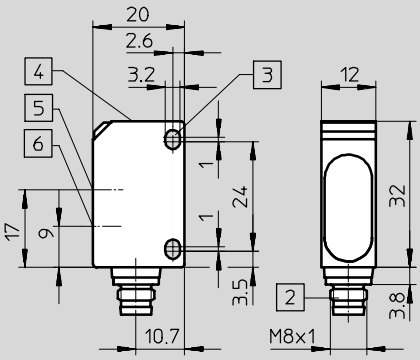
Dimensions – 20x32x12 mm

Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

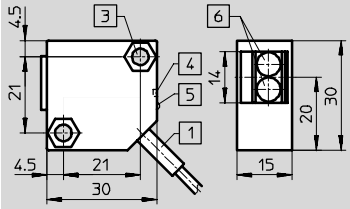
Through-beam sensors SOEG-S/E

Technical data

FESTO

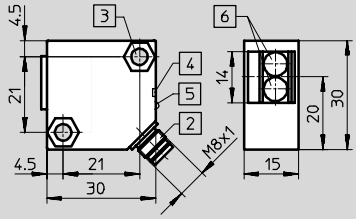
Dimensions – 30x30x15 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes

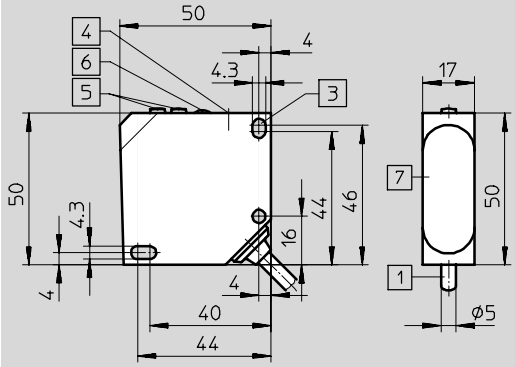
Plug version



4 Potentiometer
5 Light emitting diode (LED)
6 Centre of optical beam

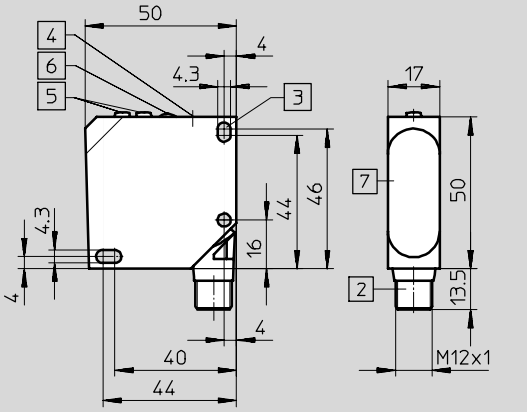
Dimensions – 50x50x17 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M12-...
3 Mounting holes

Plug version

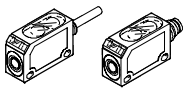
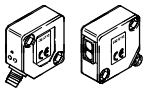
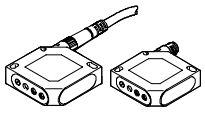


4 Potentiometer
5 Light emitting diode (LED)
6 Numerical display
7 Light exit

Through-beam sensors SOEG-S/E

Technical data

FESTO

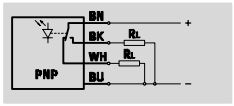
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	Transmitter						
	0 ... 6,000	–	■	–	■	537 744	SOEG-S-Q20-K-L-TI
			–	■	■	537 743	SOEG-S-Q20-S-L-TI
	Receiver						
	0 ... 6,000	PNP, switchable	■	–	■	537 746	SOEG-E-Q20-PP-K-2L-TI
			–	■	■	537 745	SOEG-E-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 748	SOEG-E-Q20-NP-K-2L-TI
			–	■	■	537 747	SOEG-E-Q20-NP-S-2L-TI
30x30x15 mm							
	Transmitter						
	0 ... 6,000	–	■	–	■	165 352	SOEG-S-Q30-K-L
			–	■	■	165 353	SOEG-S-Q30-S-L
	Receiver						
	0 ... 6,000	PNP, dark switching	■	–	■	165 322	SOEG-E-Q30-PS-K-2L
			–	■	■	165 323	SOEG-E-Q30-PS-S-2L
		NPN, dark switching	■	–	■	165 320	SOEG-E-Q30-NS-K-2L
			–	■	■	165 321	SOEG-E-Q30-NS-S-2L
50x50x17 mm							
	Transmitter						
	0 ... 15,000	–	■	–	■	537 779	SOEG-S-Q50-K-L
			–	■	■	537 780	SOEG-E-Q50-PA-K-3L
	Receiver						
	0 ... 15,000	PNP, antivalent	■	–	■	537 781	SOEG-S-Q50-S-L
			–	■	■	537 782	SOEG-E-Q50-PA-S-3L

Fibre-optic units SOEG-L

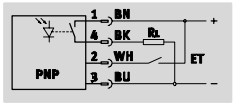
Technical data

FESTO

Function



e.g. 30x30x15 mm
PNP, NO contact, with plug



e.g. 20x32x12 mm
PNP, switchable, with plug

- For polymer and glass fibre optic cable
- Beam exit straight
- Block design

General technical data			
Size		20x32x12 mm	30x30x15 mm
Method of measurement		Fibre-optic unit	
Measured variable		Position	
Light type		red	
Working range	[mm]	0 ... 250[1]	0 ... 400[2]
Setting range, lower limit	[mm]	0	0
Setting range, upper limit	[mm]	100 ... 250[1]	100 ... 400[2]
Setting options		Teach-in via button Teach-in via electrical connection	Potentiometer
Switching status display		Yellow LED	
Operating reserve display		Green LED	
Type of mounting		Via through-holes	
Conforms to		DIN EN 60947-5-2	

1) depending on the fibre optic cable used ➔ 4 / 8.2-48:
100 mm at SOEZ-LLG-RT-0,5-M6 and
SOEZ-LLK-RT-2,0-M6
150 mm at SOEZ-LLG-SE-0,5-M4
250 mm at SOEZ-LLK-SE-2,0-M4

2) depending on the fibre optic cable used ➔ 4 / 8.2-48:
100 mm at SOEZ-LLG-RT-0,5-M6
120 mm at SOEZ-LLK-RT-2,0-M6
280 mm at SOEZ-LLG-SE-0,5-M4
400 mm at SOEZ-LLK-SE-2,0-M4

Electrical data			
Size		20x32x12 mm	30x30x15 mm
Switch output		PNP or NPN	
Switching element function		Switchable	Antivalent
Electrical connection	Plug	M8 x 1, 4-pin	
	Cable	4-wire	
Cable length	[m]	2.0	2.5
Operating voltage range	[V DC]	10 ... 30	
Residual ripple	[%]	10	20
Max. switching frequency	[Hz]	1,000	1,000
Max. output current[1]	[mA]	100	200
Voltage drop	[V]	≤ 2.4	2.0
Idle current	[mA]	25	25
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	IP65
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)	89/336/EEC (EMC)
Certification		c UL us - Listed (OL)	–

Fibre-optic units SOEG-L

Technical data

FESTO

Materials		
Size	20x32x12 mm	30x30x15 mm
Housing	Acrylic butadiene styrene	Polybutylene terephthalate, reinforced
Cable sheath	Polyurethane	
Material note	Free of copper, PTFE and silicone	

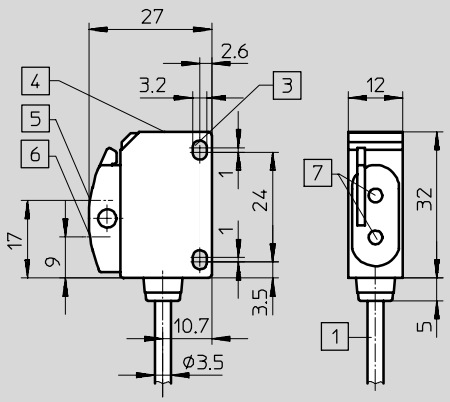
Operating and environmental conditions					
Size		20x32x12 mm		30x30x15 mm	
Cable installation		fixed	flexible	fixed	flexible
Ambient temperature	[°C]	0 ... +60	0 ... +60	–25 ... +55	–5 ... +55
Corrosion resistance class CRC[1)]		4[2)] / 2[3)]		2	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]		
Size	20x32x12 mm	30x30x15 mm
Cable version	37	88
Plug version	8	18

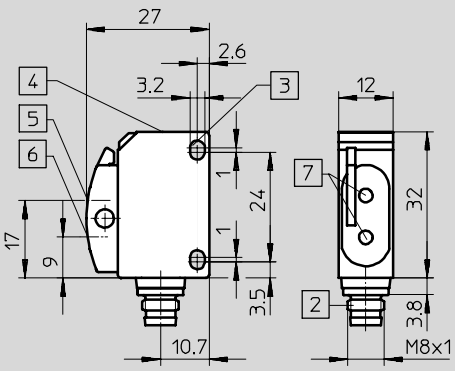
Dimensions – 20x32x12 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes

Plug version



4 Teach-in
5 Receiver
6 Transmitter
7 Mounting holes for fibre optic cable

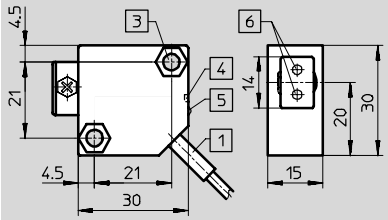
Fibre-optic units SOEG-L

Technical data

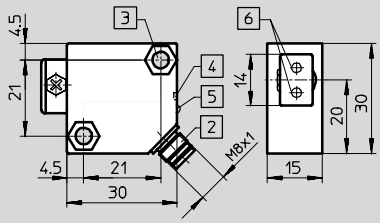
FESTO

Dimensions – 30x30x15 mm Download CAD data ➔ **www.festo.com/en/engineering**

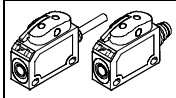
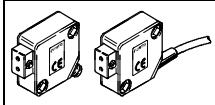
Cable version



Plug version



[1] Connecting cable
[2] Plug suitable for plug socket with cable SIM-M8-...
[3] Mounting holes
[4] Potentiometer
[5] Light emitting diode (LED)
[6] Mounting holes for fibre optic cable

Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	0 ... 250	PNP, switchable	■	–	■	537 740	SOEG-L-Q20-PP-K-2L-TI
			–	■	■	537 739	SOEG-L-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 742	SOEG-L-Q20-NP-K-2L-TI
				■	■	537 741	SOEG-L-Q20-NP-S-2L-TI
30x30x15 mm							
	0 ... 120	PNP, antivalent	■	–	■	165 324	SOEG-L-Q30-NA-K-2L
			–	■	■	165 325	SOEG-L-Q30-NA-S-2L
		NPN, antivalent	■	–	■	165 326	SOEG-L-Q30-P-A-K-2L
				■	■	165 327	SOEG-L-Q30-P-A-S-2L

Fibre-optic units SOEG-L

Accessories

FESTO

Polymer fibre optic cable LLK,
Glass fibre optic cable LLG

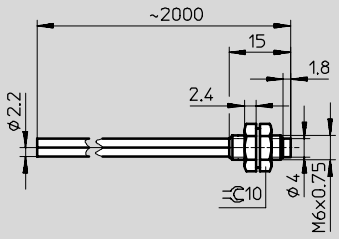
General technical data				
Type			Polymer fibre optic cable LLK	Glass fibre optic cable LLG
Setting range, upper limit				
Use	Diffuse sensor	[mm]	100[1] / 120[2]	100[1] / 100[2]
	Through-beam sensor	[mm]	250[1] / 400[2]	150[1] / 280[2]
Min. bending radius		[mm]	25	25
Temperature range		[°C]	–40 ... +70	–20 ... +250
Weights		[g]	20	50

1) with SOEG-L-Q20
2) with SOEG-L-Q30

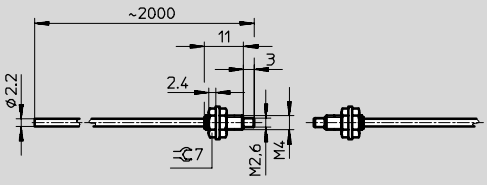
Materials		
Type	Polymer fibre optic cable LLK	Glass fibre optic cable LLG
Fibre optics	Polymethylmethacrylate	Glass fibre
Sheath	Polyethylene	Brass, chrome-plated
Probe	Brass, nickel-plated	Brass, nickel-plated

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

Polymer fibre optic cable LLK, use as a diffuse sensor



Polymer fibre optic cable LLK, use as a through-beam sensor



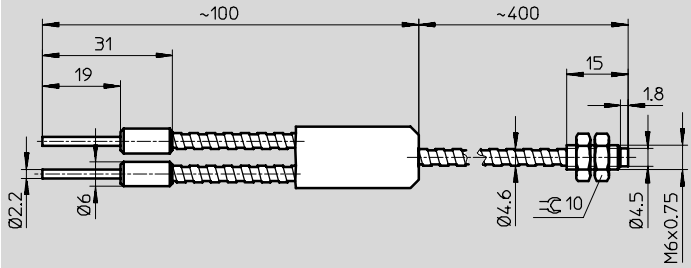
Fibre-optic units SOEG-L

Accessories

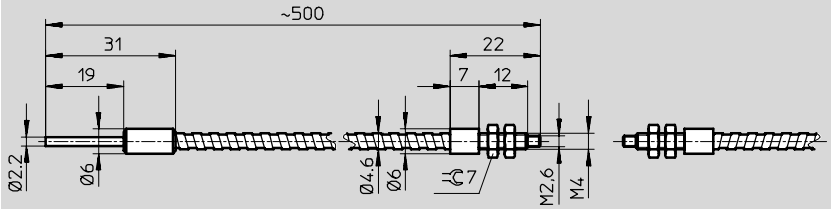
FESTO

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

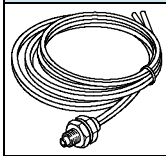
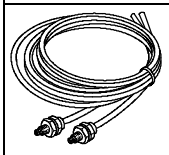
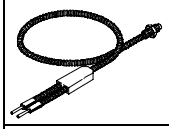
Glass fibre optic cable LLG, use as a diffuse sensor



Glass fibre optic cable LLK, use as a through-beam sensor



Ordering data

Design	Use	Length [m]	Part No.	Type
Polymer fibre optic cable LLK				
	Diffuse sensor	2	**165 358**	**SOEZ-LLK-RT-2,0-M6**
	Through-beam sensor	2	**165 360**	**SOEZ-LLK-SE-2,0-M4**
Glass fibre optic cable LLG				
	Diffuse sensor	0.5	**165 356**	**SOEZ-LLG-RT-0,5-M6**
	Through-beam sensor	0.5	**165 357**	**SOEZ-LLG-SE-0,5-M4**

Fibre-optic units SOEG-L

Accessories

Fibre-optic cutter for polymer fibre optic cable

The fibre optic cable is guided within the cutter to ensure a clean cut surface at a right angle to the conductor surface, thus keeping light losses to a minimum.

Note

In order to obtain the highest-quality cuts, each hole should be used once only.

Ordering data

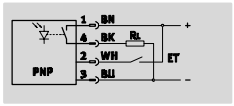
	Part No.	Type
Fibre-optic cutter for polymer fibre optic cable	**36 479**	**SOE-LKS**

Laser diffuse sensor SOEL-RT

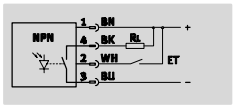
Technical data

FESTO

Function



PNP, switchable, e.g. with plug



NPN, switchable, e.g. with plug

- With laser light
- Beam exit straight
- Block design

General technical data		
Size		20x32x12 mm
Method of measurement		Diffuse sensor
Measured variable		Position
Light type		Laser, red
Laser protection class		2
Working range	[mm]	10 ... 150
Setting range, lower limit	[mm]	10
Setting range, upper limit	[mm]	150
Setting options		Teach-in via button Teach-in via electrical connection
Max. light spot	[mm]	0.7 mm in focus
Switching status display		Yellow LED
Operating reserve display		Green LED
Type of mounting		Via through-holes
Conforms to		DIN EN 60947-5-2

Electrical data		
Size		20x32x12 mm
Switch output		PNP or NPN
Switching element function		Switchable
Electrical connection	Plug	M8 x 1, 4-pin
	Cable	4-wire
Cable length	[m]	2.0
Operating voltage range	[V DC]	10 ... 30
Residual ripple	[%]	10
Max. switching frequency	[Hz]	1,000
Max. output current	[mA]	100
Voltage drop	[V]	≤ 2.4
Idle current	[mA]	25
Protection against short circuit		Pulsed
Protection against polarity reversal		For all electrical connections
Protection class to EN 60 529		IP67
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)
Certification		c UL us - Listed (OL)

Laser diffuse sensor SOEL-RT

Technical data

FESTO

Materials	
Size	20x32x12 mm
Housing	Acrylic butadiene styrene
Cable sheath	Polyurethane
Material note	Free of copper, PTFE and silicone

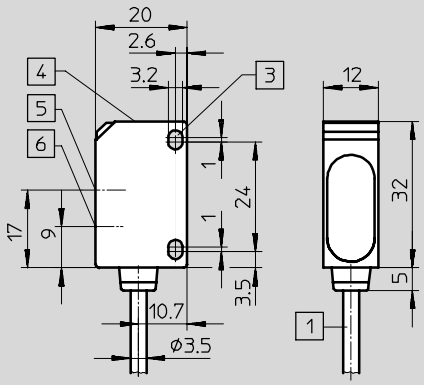
Operating and environmental conditions			
Size		20x32x12 mm	
Cable installation		fixed	flexible
Ambient temperature	[°C]	–20 ... +60	–5 ... +60
Corrosion resistance class CRC[1)]		4[2)] / 2[3)]	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

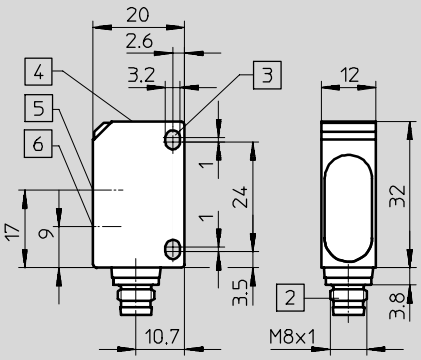
Weight [g]	
Size	20x32x12 mm
Cable version	36
Plug version	8

Dimensions – 20x32x12 mm Download CAD data ➔ **www.festo.com/en/engineering**

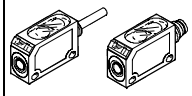
Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

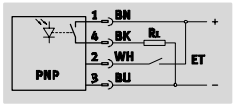
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	10 ... 150	PNP, switchable	■	–	■	537 736	SOEL-RT-Q20-PP-K-2L-TI
			–	■	■	537 735	SOEL-RT-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 738	SOEL-RT-Q20-NP-K-2L-TI
			–	■	■	537 737	SOEL-RT-Q20-NP-S-2L-TI

Laser diffuse sensor SOEL-RTH

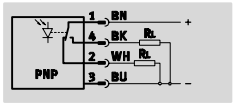
Technical data

FESTO

Function



e.g. 20x32x12 mm
PNP, switchable, with plug



e.g. 50x50x17 mm,
PNP, antivalent, with plug

- With laser light
- With background fade-out
- Beam exit straight
- Block design

General technical data			
Size		20x32x12 mm	50x50x17 mm
Method of measurement		Laser diffuse sensor with background fade-out	
Measured variable		Position	
Light type		Laser, red	
Laser protection class		2	
Working range	[mm]	30 ... 110	50 ... 300
Reference material		18%	
Setting range, lower limit	[mm]	30	50
Setting range, upper limit	[mm]	110	300
Setting options		Teach-in via button Teach-in via electrical connection	Potentiometer
Max. light spot	[mm]	0.7 mm in focus	–
Ready status display		–	Green LED
Switching status display		Yellow LED	
Operating reserve display		Green LED	Red LED[1)]
Type of mounting		Via through-holes	
Conforms to		DIN EN 60947-5-2	

1) LED lights up when available operating reserve is insufficient

Electrical data			
Size		20x32x12 mm	50x50x17 mm
Switch output		PNP or NPN	
Switching element function		Switchable	Antivalent
Electrical connection	Plug	M8 x 1, 4-pin	M12 x 1, 4-pin
	Cable	4-wire	
Cable length	[m]	2.0	3.0
Operating voltage range	[V DC]	10 ... 30	
Residual ripple	[%]	10	
Max. switching frequency	[Hz]	1,000	2,500
Max. output current	[mA]	100	200
Voltage drop	[V]	≤ 2.4	
Idle current	[mA]	30	50
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)	
Certification		c UL us - Listed (OL)	

Laser diffuse sensor SOEL-RTH

Technical data

FESTO

Materials		
Size	20x32x12 mm	50x50x17 mm
Housing	Acrylic butadiene styrene	
Cable sheath	Polyurethane	
Material note	Free of copper, PTFE and silicone	

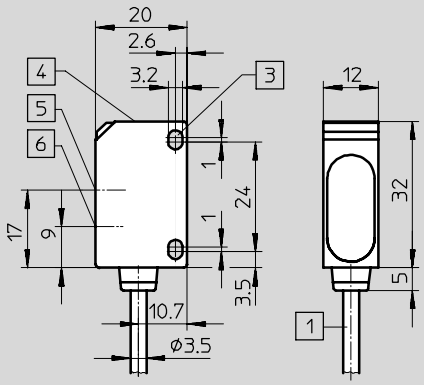
Operating and environmental conditions				
Size	20x32x12 mm		50x50x17 mm	
Cable installation	fixed	flexible	fixed	flexible
Ambient temperature [°C]	–20 ... +60	–5 ... +60	–20 ... +45	–5 ... +45
Corrosion resistance class CRC[1)]	4[2)] / 2[3)]		4	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

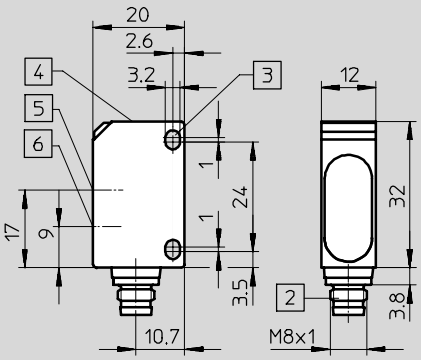
Weight [g]		
Size	20x32x12 mm	50x50x17 mm
Cable version	36	122
Plug version	7	32

Dimensions – 20x32x12 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

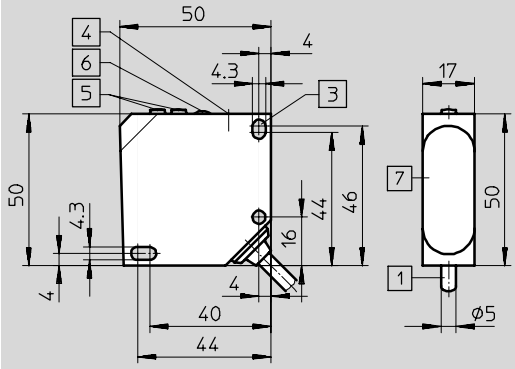
Laser diffuse sensor SOEL-RTH

Technical data

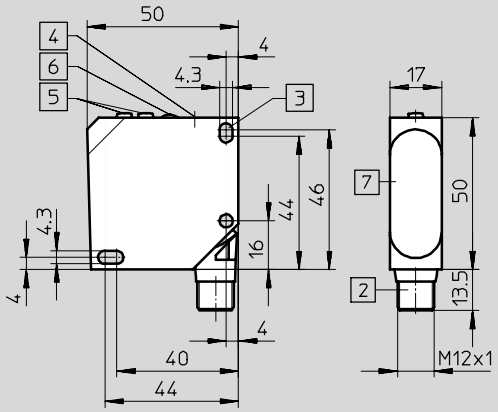
FESTO

Dimensions – 50x50x17 mm Download CAD data ➔ **www.festo.com/en/engineering**

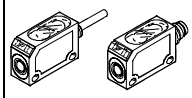
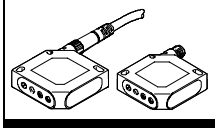
Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M12-...
3 Mounting holes
4 Potentiometer
5 Light emitting diode (LED)
6 Numerical display
7 Light exit

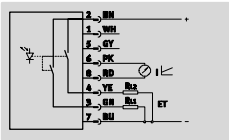
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone		
			Cable	Plug			
20x32x12 mm							
	30 ... 110	PNP, switchable	■	–	■	537 729	SOEL-RTH-Q20-PP-K-2L-TI
			–	■	■	537 727	SOEL-RTH-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 730	SOEL-RTH-Q20-NP-K-2L-TI
			–	■	■	537 728	SOEL-RTH-Q20-NP-S-2L-TI
50x50x17 mm							
	50 ... 300	PNP, antivalent	■	–	■	537 777	SOEL-RTH-Q50-PA-K-3L
			–	■	■	537 775	SOEL-RTH-Q50-PA-S-3L
		NPN, antivalent	■	–	■	537 778	SOEL-RTH-Q50-NA-K-3L
			–	■	■	537 776	SOEL-RTH-Q50-NA-S-3L

Laser diffuse sensor SOEL-RTD

Technical data

FESTO

Function



Analogue output

- With laser light
- Sensor for distance measurement
- Beam exit straight
- Block design

General technical data		
Size		50x50x17 mm
Method of measurement		Distance sensor
Measured variable		Displacement
Light type		Laser, red
Laser protection class		2
Working range	[mm]	80 ... 300
Reference material		18%
Setting range, lower limit	[mm]	80
Setting range, upper limit	[mm]	300
Setting options		Teach-in via button Teach-in via electrical connection
Max. light spot	[mm]	2x4
Resolution	[mm]	0.3
Ready status display		Green LED
Switching status display		Yellow LED
Operating reserve display		Green LED
Type of mounting		Via through-holes

Electrical data		
Size		50x50x17 mm
Analogue output	[mA]	4 ... 10
Switch output		Switchable
Electrical connection	Plug	M12 x 1, 8-pin
Operating voltage range	[V DC]	16 ... 30
Residual ripple	[%]	10
Max. switching frequency	[Hz]	1,000
Max. output current	[mA]	100
Voltage drop	[V]	≤ 2.4
Idle current	[mA]	40
Protection against short circuit		Pulsed
Protection against polarity reversal		For all electrical connections
Protection class to EN 60 529		IP67
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)
Certification		c UL us - Listed (OL)

Laser diffuse sensor SOEL-RTD

Technical data

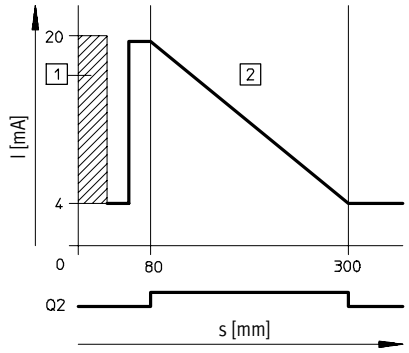
FESTO

Materials	
Size	50x50x17 mm
Housing	Acrylic butadiene styrene
Material note	Free of copper, PTFE and silicone

Operating and environmental conditions		
Size		50x50x17 mm
Ambient temperature	[°C]	–10 … +55
Corrosion resistance class CRC		4

Weight [g]	
Size	50x50x17 mm
Cable version	42

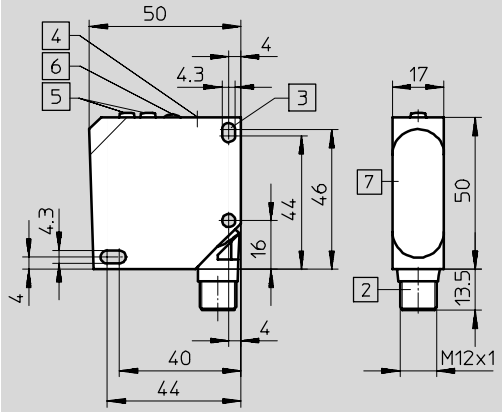
Response curve (condition upon delivery)



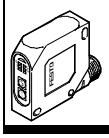
s Distance
I Output current
Q2 Digital output
1 Undefined range
2 Operating range

Dimensions – 50x50x17 mm

Download CAD data ➔ **www.festo.com/en/engineering**



2 Plug suitable for plug socket with cable SIM-M12-…
3 Mounting holes
4 Teach-in
5 Light emitting diode (LED)
6 Numerical display
7 Light exit

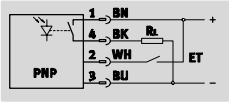
Design	Working range [mm]	Switch output, analogue output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
50x50x17 mm							
	80 … 300	PNP, 4 … 20 mA	–	■	■	537 823	SOEL-RTD-Q50-PP-S-7L

Laser retro-reflective sensors SOEL-RSP

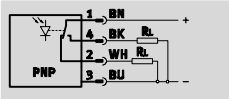
Technical data

FESTO

Function



e.g. 20x32x12 mm
PNP, switchable, with plug



e.g. 50x50x17 mm,
PNP, antivalent, with plug

- With polarised laser light
- Beam exit straight
- Block design

General technical data			
Size		20x32x12 mm	50x50x17 mm
Method of measurement		Retro-reflective sensor	
Measured variable		Position	
Light type		Laser, red	
Laser protection class		2	
Working range	[mm]	100 ... 1,000 [1]	0 ... 12,000 [1]
Reference material		Laser reflector 51x51 mm	Reflector ∅ 80 mm
Setting range, lower limit	[mm]	100	0
Setting range, upper limit	[mm]	1,000	12,000
Setting options		Teach-in via electrical connection	Potentiometer
Max. light spot	[mm]	1 mm at a sensing range of 300 mm	15 mm at a sensing range of 8 mm
Ready status display		–	Green LED
Switching status display		Yellow LED	
Operating reserve display		Green LED	Red LED [2]
Type of mounting		Via through-holes	
Conforms to		DIN EN 60947-5-2	

1) independent of the reflector used ➔ Table below
2) LED lights up when available operating reserve is insufficient

Working range [1]		
Size	20x32x12 mm	50x50x17 mm
Reflector, rectangular 10x50 mm	10 ... 1,000	5,000
Reflector, round ∅ 20 mm	2,500 [2]	6,000 [3]
Reflector, round ∅ 40 mm	2,500 [2]	12,000 [3]
Reflector, square 50x50 mm	10 ... 1,000	12,000 [3]
Reflector, round ∅ 80 mm	2,500 [2]	12,000 [3]

1) Reflectors ➔ 4 / 8.2-63
2) to be used only for sensing ranges > 1,000 mm
3) to be used only for sensing ranges > 5,000 mm

Laser retro-reflective sensors SOEL-RSP

Technical data

FESTO

Electrical data			
Size		20x32x12 mm	50x50x17 mm
Switch output		PNP or NPN	
Switching element function		Switchable	Antivalent
Electrical connection	Plug	M8 x 1, 4-pin	M12 x 1, 4-pin
	Cable	4-wire	
Cable length	[m]	2.0	3.0
Operating voltage range	[V DC]	10 ... 30	
Residual ripple	[%]	10	
Max. switching frequency	[Hz]	1,000	2,500
Max. output current	[mA]	100	200
Voltage drop	[V]	≤ 2.4	
Idle current	[mA]	25	40
Protection against short circuit		Pulsed	
Protection against polarity reversal		For all electrical connections	
Protection class to EN 60 529		IP67	
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)	
Certification		c UL us - Listed (OL)	

Materials		
Size	20x32x12 mm	50x50x17 mm
Housing	Acrylic butadiene styrene	
Cable sheath	Polyurethane	
Material note	Free of copper, PTFE and silicone	

Operating and environmental conditions					
Size		20x32x12 mm		50x50x17 mm	
Cable installation		fixed	flexible	fixed	flexible
Ambient temperature	[°C]	–20 ... +60	–5 ... +60	–20 ... +45	–5 ... +45
Corrosion resistance class CRC[1]		4[2] / 2[3]		4	

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.
2) Cable version
3) Plug version

Weight [g]		
Size	20x32x12 mm	50x50x17 mm
Cable version	37	122
Plug version	7	32

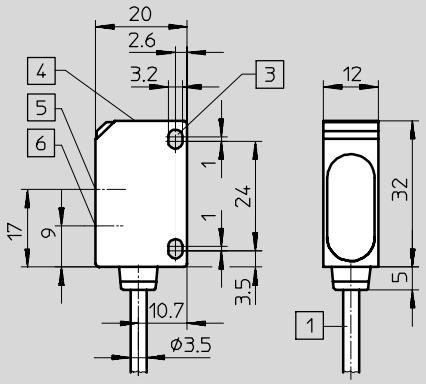
Laser retro-reflective sensors SOEL-RSP

Technical data

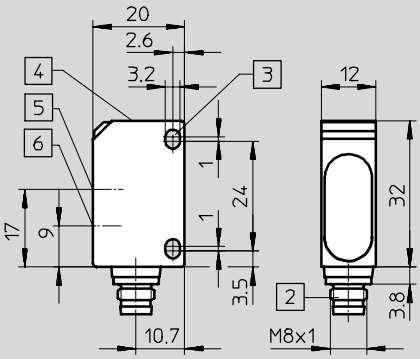
FESTO

Dimensions – 20x32x12 mm Download CAD data ➔ **www.festo.com/en/engineering**

Cable version



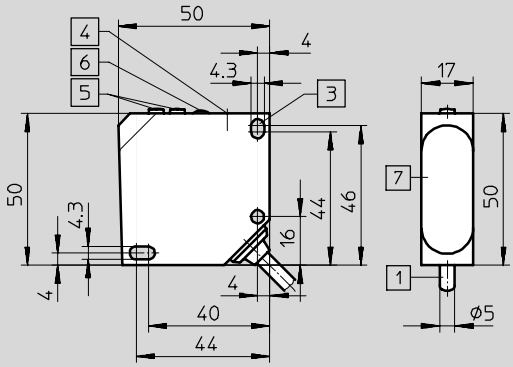
Plug version



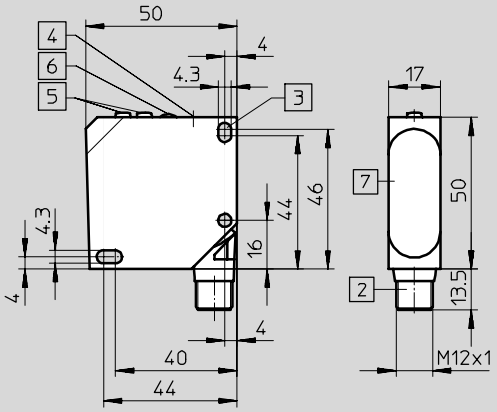
1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M8-...
3 Mounting holes
4 Teach-in
5 Receiver
6 Transmitter

Dimensions – 50x50x17 mm Download CAD data ➔ **www.festo.com/en/engineering**

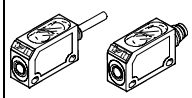
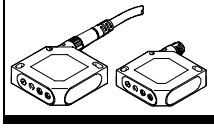
Cable version



Plug version



1 Connecting cable
2 Plug suitable for plug socket with cable SIM-M12-...
3 Mounting holes
4 Potentiometer
5 Light emitting diode (LED)
6 Numerical display
7 Light exit

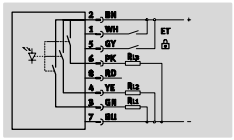
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
20x32x12 mm							
	100 ... 1,000	PNP, switchable	■	–	■	537 760	SOEL-RSP-Q20-PP-K-2L-TI
			–	■	■	537 759	SOEL-RSP-Q20-PP-S-2L-TI
		NPN, switchable	■	–	■	537 762	SOEL-RSP-Q20-NP-K-2L-TI
			–	■	■	537 761	SOEL-RSP-Q20-NP-S-2L-TI
50x50x17 mm							
	0 ... 12,000	PNP, antivalent	■	–	■	537 769	SOEL-RSP-Q50-PA-K-3L
			–	■	■	537 767	SOEL-RSP-Q50-PA-S-3L
		NPN, antivalent	■	–	■	537 770	SOEL-RSP-Q50-NA-K-3L
			–	■	■	537 768	SOEL-RSP-Q50-NA-S-3L

Colour sensor SOEC-RT

Technical data

FESTO

Function



3x PNP, NO contact, with plug

- Sensor for measuring colour
- Beam exit straight
- Block design

General technical data		
Size		50x50x17 mm
Method of measurement		Colour sensor
Measured variable		Position
Light type		white
Working range	[mm]	12 ... 32
Reference material		18%
Setting options		Teach-in via button Teach-in via electrical connection
Max. light spot	[mm]	∅ 4 mm at a sensing range of 22 mm
Ready status display		Green LED
Switching status display		LED
Operating reserve display		Green LED
Type of mounting		Via through-holes
Conforms to		DIN EN 60947-5-2

Electrical data		
Size		50x50x17 mm
Switch output		3x PNP
Switching element function		Light switching
Electrical connection	Plug	M12 x 1, 8-pin
Operating voltage range	[V DC]	16 ... 30
Residual ripple	[%]	10
Max. switching frequency	[Hz]	500
Max. output current	[mA]	100
Voltage drop	[V]	≤ 2.4
Idle current	[mA]	40
Protection against short circuit		Pulsed
Protection against polarity reversal		For all electrical connections
Protection class to EN 60 529		IP67
CE symbol		89/336/EEC (EMC) 73/23/EEC (low voltage)
Certification		c UL us - Listed (OL)

Colour sensor SOEC-RT

Technical data

FESTO

Materials	
Size	50x50x17 mm
Housing	Acrylic butadiene styrene
Material note	Free of copper, PTFE and silicone

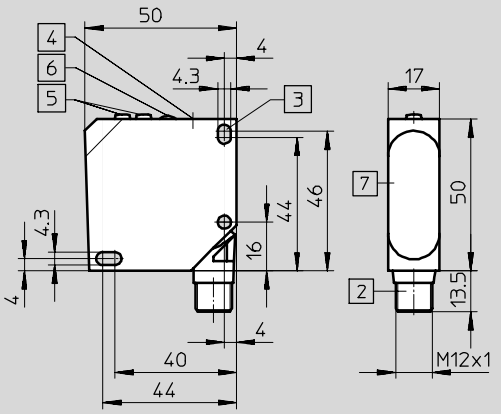
Operating and environmental conditions		
Size		50x50x17 mm
Cable installation		fixed
Ambient temperature	[°C]	–10 … +55
Corrosion resistance class CRC[1)]		4

1) Corrosion resistance class 4 according to Festo standard 940 070
Components requiring higher corrosion resistance. Parts used with aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.

Weight [g]	
Size	50x50x17 mm
Cable version	38

Dimensions – 50x50x17 mm Download CAD data ➔ **www.festo.com/en/engineering**

Plug version



2 Plug suitable for plug socket with cable SIM-M12-...
3 Mounting holes
4 Teach-in
5 Light emitting diode (LED)
6 Numerical display
7 Light exit

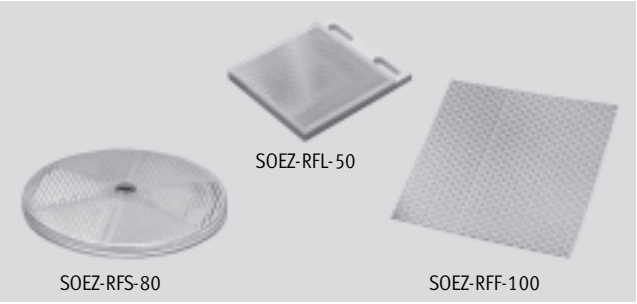
Design	Working range [mm]	Switch output	Electrical connection		Free of copper, PTFE and silicone	Part No.	Type
			Cable	Plug			
50x50x17 mm							
	12 … 32	PNP, light switching	–	■	■	**538 236**	**SOEC-RT-Q50-PS-S-7L**

Sensors SOE..., opto-electronic

Accessories

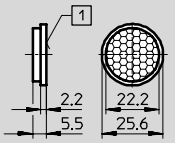
FESTO

Reflectors



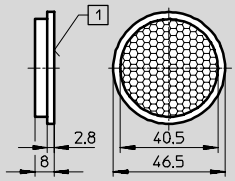
Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

Reflector SOEZ-RFS-20



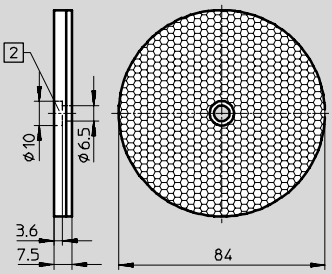
1 Bonding surface

Reflector SOEZ-RFS-40



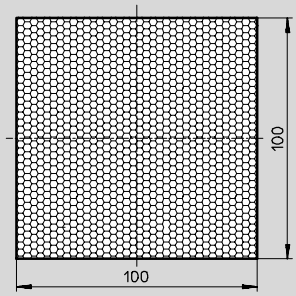
1 Bonding surface

Reflector SOEZ-RFS-80



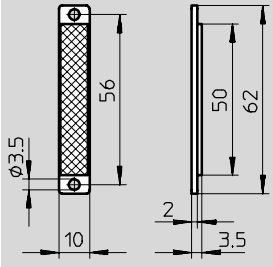
2 Mounting hole

Reflector foil SOEZ-RFF-100

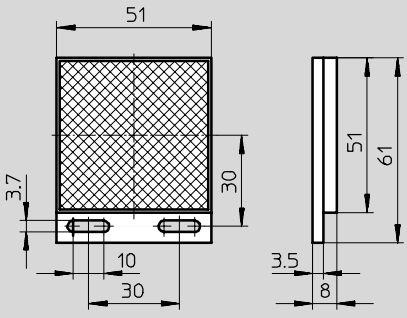


Reflectors for laser light

Reflector SOEZ-RFL-10



Reflector SOEZ-RFL-50



Ordering data

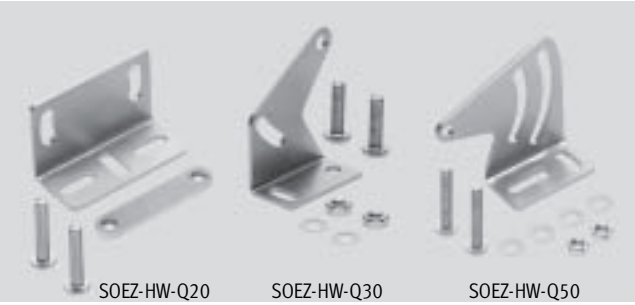
Designation	Description	Material	Free of copper, PTFE and silicone	Part No.	Type
Reflector	∅ 20 mm		–	**165 363**	**SOEZ-RFS-20**
	∅ 40 mm		–	**165 364**	**SOEZ-RFS-40**
	∅ 80 mm		–	**165 365**	**SOEZ-RFS-80**
Reflector foil	square 100 x 100 mm		–	**165 362**	**SOEZ-RFF-100**
Reflectors for laser light	square 50x50 mm	Polymethylmethacrylate, acrylic butadiene styrene	■	**537 788**	**SOEZ-RFL-50**
	rectangular 10x50 mm	Polymethylmethacrylate, acrylic butadiene styrene	■	**537 787**	**SOEZ-RFL-10**

Sensors SOE..., opto-electronic

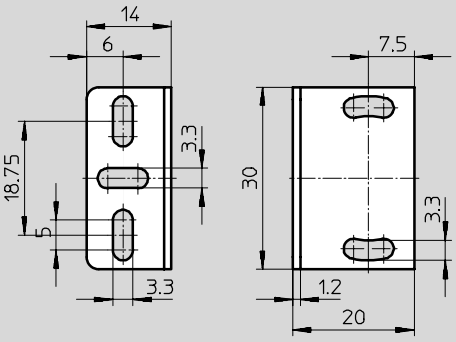
Accessories

FESTO

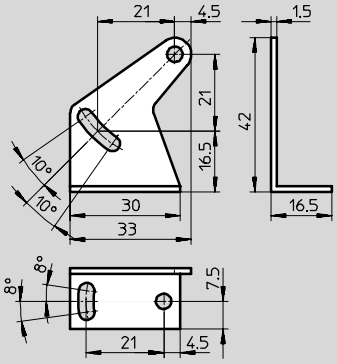
Mounting bracket SOEZ-HW



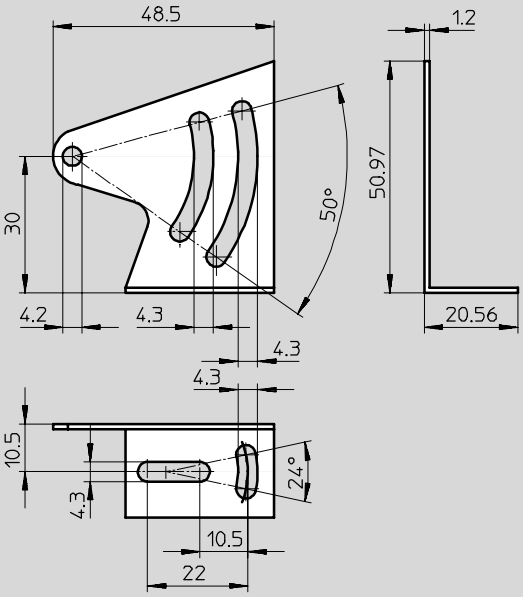
SOEZ-HW-Q20



SOEZ-HW-Q30



SOEZ-HW-Q50



Ordering data					
Designation	Use	Material	Free of copper, PTFE and silicone	Part No.	Type
Wall mounting bracket	Sensors in block design 20x32x12 mm	Steel, nickel-plated	■	**537 785**	**SOEZ-HW-Q20**
	Sensors in block design 30x30x15 mm	Steel, galvanised	■	**165 355**	**SOEZ-HW-Q30**
	Sensors in block design 50x50x17 mm	Steel, nickel-plated	■	**537 786**	**SOEZ-HW-Q50**

Sensors SOE..., opto-electronic

Accessories

FESTO

Ordering data – Plug sockets with cable M8x1 — Technical data ➔ 4 / 8.3-9

	Mounting	Connection	for switch output		Cable length	Part No.	Type
			PNP	NPN	[m]		
Straight plug socket							
	Locknut M8x1	3-pin	■	■	2.5	159 420	SIM-M8-3GD-2,5-PU
					5	159 421	SIM-M8-3GD-5-PU
		4-pin	■	■	2.5	158 960	SIM-M8-4GD-2,5-PU
					5	158 961	SIM-M8-4GD-5-PU
Angled plug socket							
	Locknut M8x1	3-pin	■	■	2.5	159 422	SIM-M8-3WD-2,5-PU
					5	159 423	SIM-M8-3WD-5-PU
			■	–	2.5	159 424	SIM-M8-3WD-2,5-PSL-PU
					5	159 425	SIM-M8-3WD-5-PSL-PU
			–	■	2.5	159 426	SIM-M8-3WD-2,5-NSL-PU
					5	159 427	SIM-M8-3WD-5-NSL-PU
		4-pin	■	■	2.5	158 962	SIM-M8-4WD-2,5-PU
					5	158 963	SIM-M8-4WD-5-PU

Ordering data – Plug sockets with cable M12x1 — Technical data ➔ 4 / 8.3-12

	Mounting	Connection	for switch output		Cable length	Part No.	Type
			PNP	NPN	[m]		
Straight plug socket							
	Locknut M12x1	3-pin	■	■	2.5	159 428	SIM-M12-3GD-2,5-PU
					5	159 429	SIM-M12-3GD-5-PU
		4-pin	■	■	5	164 259	SIM-M12-4GD-5-PU
		8-pin	■	■	2	525 616	SIM-M12-8GD-2-PU
			■	■	5	525 618	SIM-M12-8GD-5-PU
Angled plug socket							
	Locknut M12x1	3-pin	■	■	2.5	159 430	SIM-M12-3WD-2,5-PU
					5	159 431	SIM-M12-3WD-5-PU
			■	–	2.5	159 432	SIM-M12-3WD-2,5-PSL-PU
					5	159 433	SIM-M12-3WD-5-PSL-PU
			–	■	2.5	159 434	SIM-M12-3WD-2,5-NSL-PU
					5	159 435	SIM-M12-3WD-5-NSL-PU
		4-pin	■	■	5	164 258	SIM-M12-4WD-5-PU

Core Range