

## Sensors SOE..., opto-electronic

Product overview

**FESTO**



- Diffuse sensors and retro-reflective sensors
- Sensors with background suppression
- Fibre-optic units
- Distance sensors
- Laser contrast sensors, diffuse sensors and retro-reflective sensors
- Colour sensors
- Ranges up to 20 m
- Adjustment using teach-in or potentiometer

Detailed product information

→ [www.festo.com/catalogue/soe](http://www.festo.com/catalogue/soe)

Product overview						
Variant	Type	Operating voltage	Switch output	Analogue output	Design	→ Page
Diffuse sensor	SOEG-RT Basic version	10 ... 36 V DC 10 ... 30 V DC	PNP NPN	–	Round Block-shaped	145
	SOEG-RTZ With cylindrical light beam		PNP NPN	–	Round	147
Sensor with back-ground suppression	SOEG-RTH	10 ... 36 V DC 10 ... 30 V DC	PNP NPN	–	Round Block-shaped	148
	SOEG-RSP Basic version	10 ... 36 V DC 10 ... 30 V DC	PNP NPN	–	Round Block-shaped	150
Retro-reflective sensor	SOEG-RSG For transparent objects		PNP NPN	–	Block-shaped	152
	SOEG-S Transmitter	10 ... 36 V DC 10 ... 30 V DC	–	–	Round Block-shaped	153
Through-beam sensor	SOEG-E Receiver	10 ... 36 V DC 10 ... 30 V DC	PNP NPN	–	Round Block-shaped	153
	SOEG-L Basic version	10 ... 30 V DC	PNP NPN	–	Block-shaped	155
Distance sensor	SOEG-RTD	15 ... 30 V DC	PNP	0 ... 10 V	Block-shaped	156
Laser diffuse sensor	SOEL-RT Contrast sensor	10 ... 30 V DC	PNP NPN	–	Block-shaped	157
	SOEL-RTH		PNP NPN	–	Block-shaped	157
Laser retro-reflective sensor	SOEL-RSP	10 ... 30 V DC	PNP NPN	–	Block-shaped	158
Laser distance sensor	SOEL-RTD	16 ... 30 V DC	2x PNP	4 ... 20 mA	Block-shaped	159
		18 ... 28 V DC	–	0 ... 10 V		
Colour sensor	SOEC-RT	10 ... 30 V DC	3x PNP	–	Block-shaped	160

## Sensors SOE..., opto-electronic

Type codes

		SOE	G	RSP	Q20	PP	K	2L	TI	
<b>Type</b>										
SOE	Opto-electronic sensors									
<b>Design</b>										
G	Standard sensor									
L	Laser sensor									
C	Colour sensor									
<b>Function</b>										
RT	Diffuse sensor									
RSP	Retro-reflective sensor									
S	Through-beam sensor, transmitter									
E	Through-beam sensor, receiver									
L	Fibre-optic unit									
RTH	Sensor with background suppression									
RTZ	Diffuse sensor with cylindrical light beam									
RTD	Distance sensor									
RSG	Retro-reflective sensor for transparent objects									
<b>Design, size, version</b>										
4	Round, dia. 4 mm									
M5	Round, M5									
M12	Round, M12									
M18	Round, M18, beam exit straight									
M18W	Round, M18, beam exit angled									
Q20	Block design, 20x32x12 mm									
Q30	Block design, 30x30x15 mm									
Q50	Block design, 50x50x17 mm									
<b>Switch output</b>										
PS	PNP, normally open									
NS	NPN, normally open									
PA	PNP, antivalent									
NA	NPN, antivalent									
PP	PNP, switchable									
NP	NPN, switchable									
PU	Analogue 0 ... 10 V									
<b>Electrical connection</b>										
K	Cable									
S	Plug									
<b>Indication</b>										
L	1 LED									
2L	2 LEDs									
3L	3 LEDs									
7L	7 LEDs									
<b>Options</b>										
	Standard version									
TI	Teach-in by means of a button and via electrical connection									
<b>Position measuring range</b>										

# Diffuse sensors SOEG-RT

Technical data

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General technical data							
Size	∅ 4 mm	M5	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm
Working range [mm]	50		70 ... 300	40 ... 600	0 ... 600	10 ... 300	0 ... 600
Light type	Infrared		Red			Red	Infrared
Setting options	-		Potentiometer			Teach-in Teach-in via electrical connection	Potentiometer

Electrical data								
Size	∅ 4 mm	M5	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	
Electrical connection	Cable	3-wire			4-wire	3-wire	4-wire	3-wire
	Plug	M8x1, 3-pin		M12x1, 3-pin	M12x1, 4-pin	M12x1, 3-pin	M8x1, 4-pin	M8x1, 3-pin
Operating voltage range [V DC]	10 ... 30		10 ... 36			10 ... 30		
Max. output current [mA]	100		200			100	200	
Max. switching frequency [Hz]	250		1,000			1,000		
Protection against short circuit	Pulsed							
Protection against polarity reversal	For all electrical connections							
Protection class	IP67		IP65, IP67			IP67	IP65	



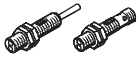




Operating and environmental conditions							
Size	∅ 4 mm	M5	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm
Ambient temperature [°C]	0 ... 55		-25 ... +55			-20 ... +60	-25 ... +55
Ambient temperature with flexible cable installation [°C]	0 ... 55		-5 ... +55			-5 ... +60	-5 ... +55
CE mark (see declaration of conformity)	In accordance with EU EMC directive						
Certification	c UL us - Listed (OL) C-Tick						

Materials							
Size	∅ 4 mm	M5	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm
Housing	High-alloy stainless steel		Brass, chrome-plated			Acrylic butadiene styrene	Polybutylene terephthalate, reinforced
Cable sheath	Polyurethane						

# Diffuse sensors SOEG-RT

Technical data

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Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
<b>∅ 4 mm</b>							
	50	Light switching	PNP	537 671	SOEG-RT-4-PS-K-L	537 673	SOEG-RT-4-PS-S-L
			NPN	537 674	SOEG-RT-4-NS-K-L	537 676	SOEG-RT-4-NS-S-L
<b>M5</b>							
	50	Light switching	PNP	537 677	SOEG-RT-M5-PS-K-L	537 679	SOEG-RT-M5-PS-S-L
			NPN	537 680	SOEG-RT-M5-NS-K-L	537 682	SOEG-RT-M5-NS-S-L
<b>M12</b>							
	70 ... 300	Light switching	PNP	547 908	SOEG-RT-M12-PS-K-2L	547 909	SOEG-RT-M12-PS-S-2L
			NPN	547 906	SOEG-RT-M12-NS-K-2L	547 907	SOEG-RT-M12-NS-S-2L
<b>M18, beam exit straight</b>							
	40 ... 600	Antivalent	PNP	547 912	SOEG-RT-M18-PA-K-2L	547 913	SOEG-RT-M18-PA-S-2L
			NPN	547 910	SOEG-RT-M18-NA-K-2L	547 911	SOEG-RT-M18-NA-S-2L
<b>M18, beam exit angled</b>							
	0 ... 600	Light switching	PNP	537 701	SOEG-RT-M18W-PS-K-2L	537 702	SOEG-RT-M18W-PS-S-2L
			NPN	537 717	SOEG-RT-M18W-NS-K-2L	537 718	SOEG-RT-M18W-NS-S-2L
<b>20x32x12 mm</b>							
	10 ... 300	Switchable	PNP	537 732	SOEG-RT-Q20-PP-K-2L-TI	537 731	SOEG-RT-Q20-PP-S-2L-TI
			NPN	537 734	SOEG-RT-Q20-NP-K-2L-TI	537 733	SOEG-RT-Q20-NP-S-2L-TI
<b>30x30x15 mm</b>							
	0 ... 600	Light switching	PNP	165 350	SOEG-RT-Q30-PS-K-2L	165 351	SOEG-RT-Q30-PS-S-2L
			NPN	165 348	SOEG-RT-Q30-NS-K-2L	165 349	SOEG-RT-Q30-NS-S-2L

# Diffuse sensors SOEG-RTZ, with cylindrical light beam



Technical data

General technical data		
Size	Ø 4 mm	M5
Working range [mm]	10	
Light type	Infrared	
Setting options	-	

Electrical data		
Size	Ø 4 mm	M5
Electrical connection	Cable, 3-wire	
Operating voltage range [V DC]	10 ... 30	
Max. output current [mA]	100	
Max. switching frequency [Hz]	250	
Protection against short circuit	Pulsed	
Protection against polarity reversal	For all electrical connections	
Protection class	IP67	

Operating and environmental conditions		
Size	Ø 4 mm	M5
Ambient temperature [°C]	0 ... 55	
Ambient temperature with flexible cable installation [°C]	0 ... 55	
CE mark (see declaration of conformity)	In accordance with EU EMC directive	
Certification	c UL us - Listed (OL) C-Tick	

Materials		
Size	Ø 4 mm	M5
Housing	High-alloy stainless steel	
Cable sheath	Polyurethane	

Ordering data					
Size	Working range [mm]	Switching element function	Switch output	Electrical connection	
				Cable	Part No. Type
Ø 4 mm					
	10	Light switching	PNP	537 672	SOEG-RTZ-4-PS-K-L
			NPN	537 675	SOEG-RTZ-4-NS-K-L
M5					
	10	Light switching	PNP	537 678	SOEG-RTZ-M5-PS-K-L
			NPN	537 681	SOEG-RTZ-M5-NS-K-L

# Sensors SOEG-RTH, with background suppression

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Technical data

General technical data					
Size	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Working range [mm]	10 ... 120	10 ... 120	25 ... 100	15 ... 150	30 ... 300
Light type	Red				
Setting options	Potentiometer		Teach-in Teach-in via electrical connection	Potentiometer	Potentiometer

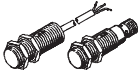
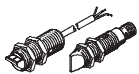
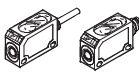
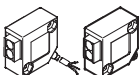

Electrical data					
Size	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Electrical connection	Cable	3-wire		4-wire	3-wire
	Plug	M12x1, 3-pin		M8x1, 4-pin	M12x1, 3-pin
Operating voltage range [V DC]	10 ... 36		10 ... 30	10 ... 36	10 ... 30
Max. output current [mA]	200		100	200	
Max. switching frequency [Hz]	500		1,000	500	1,000
Protection against short circuit	Pulsed				
Protection against polarity reversal	For all electrical connections				
Protection class	IP65, IP67		IP67	IP65	IP67

Operating and environmental conditions					
Size	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Ambient temperature [°C]	-25 ... +55		-20 ... +60	-25 ... +55	-20 ... +60
Ambient temperature with flexible cable installation [°C]	-5 ... +55		-5 ... +60	-5 ... +55	-5 ... +60
CE mark (see declaration of conformity)	In accordance with EU EMC directive		In accordance with EU EMC directive In accordance with EU Low Voltage Directive	In accordance with EU EMC directive	In accordance with EU EMC directive In accordance with EU Low Voltage Directive
Certification	c UL us - Listed (OL) C-Tick				

Materials					
Size	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Housing	Brass, chrome-plated		Acrylic butadiene styrene	Polybutylene terephthalate, reinforced	Acrylic butadiene styrene
Cable sheath	Polyurethane				

# Sensors SOEG-RTH, with background suppression

Technical data

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
<b>M18, beam exit straight</b>							
	10 ... 120	Antivalent	PNP	537 687	SOEG-RTH-M18-PS-K-2L	537 689	SOEG-RTH-M18-PS-S-2L
			NPN	537 705	SOEG-RTH-M18-NS-K-2L	537 707	SOEG-RTH-M18-NS-S-2L
<b>M18, beam exit angled</b>							
	10 ... 120	Light switching	PNP	537 688	SOEG-RTH-M18W-PS-K-2L	537 690	SOEG-RTH-M18W-PS-S-2L
			NPN	537 706	SOEG-RTH-M18W-NS-K-2L	537 708	SOEG-RTH-M18W-NS-S-2L
<b>20x32x12 mm</b>							
	25 ... 100	Switchable	PNP	537 724	SOEG-RTH-Q20-PP-K-2L-TI	537 723	SOEG-RTH-Q20-PP-S-2L-TI
			NPN	537 726	SOEG-RTH-Q20-NP-K-2L-TI	537 725	SOEG-RTH-Q20-NP-S-2L-TI
<b>30x30x15 mm</b>							
	15 ... 150	Light switching	PNP	537 719	SOEG-RTH-Q30-PS-K-2L	537 720	SOEG-RTH-Q30-PS-S-2L
			NPN	537 721	SOEG-RTH-Q30-NS-K-2L	537 722	SOEG-RTH-Q30-NS-S-2L
<b>50x50x17 mm</b>							
	30 ... 300	Light switching	PNP	537 771	SOEG-RTH-Q50-PA-K-3L	537 773	SOEG-RTH-Q50-PA-S-3L
			NPN	537 772	SOEG-RTH-Q50-NA-K-3L	537 774	SOEG-RTH-Q50-NA-S-3L

# Retro-reflective sensors SOEG-RSP

Technical data

General technical data						
Size	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Working range [mm]	1,500	2,000	2,000	0 ... 2,500	0 ... 2,000	0 ... 5,500
Light type	Red polarised					
Setting options	–			Teach-in Teach-in via electrical connection <sup>1)</sup>	Potentiometer	

1) Low-cost variants without the teach-in and programming functionality available

Electrical data						
Size	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Electrical connection	Cable	3-wire		4-wire	3-wire	4-wire
	Plug	M12x1, 3-pin		M8x1, 4-pin	M8x1, 3-pin	M12x1, 4-pin
Operating voltage range [V DC]	10 ... 36			10 ... 30		
Max. output current [mA]	200			100	200	
Max. switching frequency [Hz]	1,000					
Protection against short circuit	Pulsed					
Protection against polarity reversal	For all electrical connections					
Protection class	IP65, IP67			IP67	IP65	IP67

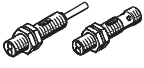
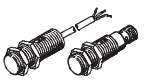
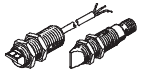
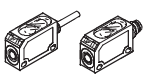
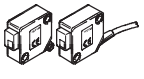
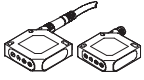
Operating and environmental conditions						
Size	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Ambient temperature [°C]	–25 ... +55			–20 ... +60	–25 ... +55	–20 ... +60
Ambient temperature with flexible cable installation [°C]	–5 ... +55			–5 ... +60	–5 ... +55	–5 ... +60
CE mark (see declaration of conformity)	In accordance with EU EMC directive			In accordance with EU EMC directive In accordance with EU Low Voltage Directive	In accordance with EU EMC directive	In accordance with EU EMC directive In accordance with EU Low Voltage Directive
Certification	c UL us - Listed (OL) C-Tick					

Materials						
Size	M12x1	M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Housing	Brass, chrome-plated			Acrylic butadiene styrene	Polybutylene terephthalate, reinforced	Acrylic butadiene styrene
Cable sheath	Polyurethane					



# Retro-reflective sensors SOEG-RSP

Technical data

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
<b>M12</b>							
	1,500	Dark switching	PNP	537 683	SOEG-RSP-M12-PS-K-2L	537 684	SOEG-RSP-M12-PS-S-2L
			NPN	537 685	SOEG-RSP-M12-NS-K-2L	537 686	SOEG-RSP-M12-NS-S-2L
<b>M18, beam exit straight</b>							
	2,000	Dark switching	PNP	537 697	SOEG-RSP-M18-PS-K-2L	537 699	SOEG-RSP-M18-PS-S-2L
			NPN	537 713	SOEG-RSP-M18-NS-K-2L	537 715	SOEG-RSP-M18-NS-S-2L
<b>M18, beam exit angled</b>							
	2,000	Dark switching	PNP	537 698	SOEG-RSP-M18W-PS-K-2L	537 700	SOEG-RSP-M18W-PS-S-2L
			NPN	537 714	SOEG-RSP-M18W-NS-K-2L	537 716	SOEG-RSP-M18W-NS-S-2L
<b>20x32x12 mm</b>							
	2,500	Switchable	PNP	537 750	SOEG-RSP-Q20-PP-K-2L-TI	537 749	SOEG-RSP-Q20-PP-S-2L-TI
			NPN	537 752	SOEG-RSP-Q20-NP-K-2L-TI	537 751	SOEG-RSP-Q20-NP-S-2L-TI
	2,500	Switchable	PNP	537 784	SOEG-RSP-Q20-PS-S-2L <sup>1)</sup>	-	
<b>30x30x15 mm</b>							
	0 ... 2,000	Dark switching	PNP	165 330	SOEG-RSP-Q30-PS-K-2L	165 331	SOEG-RSP-Q30-PS-S-2L
			NPN	165 328	SOEG-RSP-Q30-NS-K-2L	165 329	SOEG-RSP-Q30-NS-S-2L
<b>50x50x17 mm</b>							
	0 ... 5,500	Antivalent	PNP	537 763	SOEG-RSP-Q50-PA-K-3L	537 765	SOEG-RSP-Q50-PA-S-3L
			NPN	537 764	SOEG-RSP-Q50-NA-K-3L	537 766	SOEG-RSP-Q50-NA-S-3L

1) Low-cost variants without the teach-in and programming functionality

# Retro-reflective sensors SOEG-RSG, for transparent objects



Technical data

General technical data		
Size	20x32x12 mm	
Working range	[mm]	5 ... 500
Light type	Red polarised	
Setting options	Teach-in Teach-in via electrical connection	

Electrical data		
Size	20x32x12 mm	
Electrical connection	Cable	4-wire
	Plug	M8x1, 4-pin
Operating voltage range	[V DC]	10 ... 30
Max. output current	[mA]	100
Max. switching frequency	[Hz]	1,000
Protection against short circuit	Pulsed	
Protection against polarity reversal	For all electrical connections	
Protection class	IP67	

Operating and environmental conditions		
Size	20x32x12 mm	
Ambient temperature	[°C]	-20 ... +60
Ambient temperature with flexible cable installation	[°C]	-5 ... +60
CE mark (see declaration of conformity)	In accordance with EU EMC directive In accordance with EU Low Voltage Directive	
Certification	c UL us - Listed (OL) C-Tick	

Materials		
Size	20x32x12 mm	
Housing	Acrylic butadiene styrene	
Cable sheath	Polyurethane	

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
20x32x12 mm							
	5 ... 500	Switchable	PNP	537 754	SOEG-RSG-Q20-PP-K-2L-TI	537 753	SOEG-RSG-Q20-PP-S-2L-TI

# Through-beam sensors SOEG-S/E

Technical data

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General technical data						
Size		M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Working range	[mm]	20,000	20,000	6,000	2,000	15,000
Light type		Red			Infrared	
Setting options		-		Teach-in Teach-in via electrical connection	Potentiometer	

Electrical data							
Size		M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm	
Electrical connection	Transmitter	Cable	3-wire		4-wire	3-wire	4-wire
		Plug	M12x1, 3-pin		M8x1, 4-pin	M8x1, 3-pin	M12x1, 4-pin
	Receiver	Cable	4-wire		4-wire	3-wire	4-wire
		Plug	M12x1, 4-pin		M8x1, 4-pin	M8x1, 3-pin	M12x1, 4-pin
Operating voltage range	[V DC]	10 ... 36		10 ... 30			
Max. output current	[mA]	200		100	200		
Max. switching frequency	[Hz]	1,000		500	1,000		
Protection against short circuit		Pulsed					
Protection against polarity reversal		For all electrical connections					
Protection class		IP65, IP67		IP67	IP65	IP67	

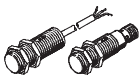
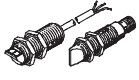
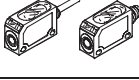


Operating and environmental conditions						
Size		M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Ambient temperature	[°C]	-25 ... +55		-20 ... +60	-25 ... +55	-20 ... +60
Ambient temperature with flexible cable installation	[°C]	-5 ... +55		-5 ... +60	-5 ... +55	-5 ... +60
CE mark (see declaration of conformity)		In accordance with EU EMC directive		In accordance with EU EMC directive In accordance with EU Low Voltage Directive	In accordance with EU EMC directive	In accordance with EU EMC directive In accordance with EU Low Voltage Directive
Certification		c UL us - Listed (OL) C-Tick				

Materials						
Size		M18x1, straight	M18x1, angled	20x32x12 mm	30x30x15 mm	50x50x17 mm
Housing		Brass, chrome-plated		Acrylic butadiene styrene	Polybutylene terephthalate, reinforced	Acrylic butadiene styrene
Cable sheath		Polyurethane				

# Through-beam sensors SOEG-S/E

Technical data

FESTO

Ordering data								
Size	Working range [mm]	Function	Switching element function	Switch output	Electrical connection			
					Cable		Plug	
					Part No.	Type	Part No.	Type
<b>M18, beam exit straight</b>								
	20,000	Transmitter	–	–	537 691	SOEG-S-M18-K-L	537 703	SOEG-S-M18-S-L
		Receiver	Antivalent	PNP	537 692	SOEG-E-M18-PA-K-2L	537 704	SOEG-E-M18-PA-S-2L
				NPN	537 709	SOEG-E-M18-NA-K-2L	537 711	SOEG-E-M18-NA-S-2L
<b>M18, beam exit angled</b>								
	20,000	Transmitter	–	–	537 693	SOEG-S-M18W-K-L	537 695	SOEG-S-M18W-S-L
		Receiver	Antivalent	PNP	537 694	SOEG-E-M18W-PA-K-2L	537 696	SOEG-E-M18W-PA-S-2L
				NPN	537 710	SOEG-E-M18W-NA-K-2L	537 712	SOEG-E-M18W-NA-S-2L
<b>20x32x12 mm</b>								
	6,000	Transmitter	–	–	537 744	SOEG-S-Q20-K-L-TI	537 743	SOEG-S-Q20-S-L-TI
		Receiver	Switchable	PNP	537 746	SOEG-E-Q20-PP-K-2L-TI	537 745	SOEG-E-Q20-PP-S-2L-TI
				NPN	537 748	SOEG-E-Q20-NP-K-2L-TI	537 747	SOEG-E-Q20-NP-S-2L-TI
<b>30x30x15 mm</b>								
	2,000	Transmitter	–	–	165 352	SOEG-S-Q30-K-L	165 353	SOEG-S-Q30-S-L
		Receiver	Dark switching	PNP	165 322	SOEG-E-Q30-PS-K-2L	165 323	SOEG-E-Q30-PS-S-2L
				NPN	165 320	SOEG-E-Q30-NS-K-2L	165 321	SOEG-E-Q30-NS-S-2L
<b>50x50x17 mm</b>								
	15,000	Transmitter	–	–	537 779	SOEG-S-Q50-K-L	537 781	SOEG-S-Q50-S-L
		Receiver	Antivalent	PNP	537 780	SOEG-E-Q50-PA-K-3L	537 782	SOEG-E-Q50-PA-S-3L

# Fibre-optic units SOEG-L

Technical data

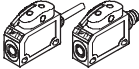
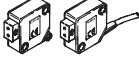
FESTO

General technical data		
Size	20x32x12 mm	30x30x15 mm
Working range [mm]	0 ... 250	0 ... 120
Light type	Red	
Setting options	Teach-in Teach-in via electrical connection	Potentiometer

Electrical data		
Size	20x32x12 mm	30x30x15 mm
Electrical connection	Cable	4-wire
	Plug	M8x1, 4-pin
Operating voltage range [V DC]	10 ... 30	
Max. output current [mA]	100	200
Max. switching frequency [Hz]	1,000	
Protection against short circuit	Pulsed	
Protection against polarity reversal	For all electrical connections	
Protection class	IP67	IP65

Operating and environmental conditions		
Size	20x32x12 mm	30x30x15 mm
Ambient temperature [°C]	0 ... 60	-25 ... +55
Ambient temperature with flexible cable installation [°C]	0 ... 60	-5 ... +55
CE mark (see declaration of conformity)	In accordance with EU EMC directive In accordance with EU Low Voltage Directive	In accordance with EU EMC directive
Certification	c UL us - Listed (OL) C-Tick	

Materials		
Size	20x32x12 mm	30x30x15 mm
Housing	Acrylic butadiene styrene	Polybutylene terephthalate, reinforced
Cable sheath	Polyurethane	

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
20x32x12 mm							
	0 ... 250	Switchable	PNP	537 740	SOEG-L-Q20-PP-K-2L-TI	537 739	SOEG-L-Q20-PP-S-2L-TI
			NPN	537 742	SOEG-L-Q20-NP-K-2L-TI	537 741	SOEG-L-Q20-NP-S-2L-TI
30x30x15 mm							
	0 ... 120	Antivalent	PNP	165 326	SOEG-L-Q30-P-A-K-2L	165 327	SOEG-L-Q30-P-A-S-2L
			NPN	165 324	SOEG-L-Q30-NA-K-2L	165 325	SOEG-L-Q30-NA-S-2L

# Distance sensors SOEG-RTD

Technical data



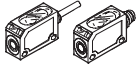
Sensors  
Optoelectronic sensors  
1.5

General technical data		
Size		20x32x12 mm
Working range	[mm]	20 ... 80
Displacement resolution	[mm]	0.5
Light type		Red
Setting options		Teach-in Teach-in via electrical connection

Electrical data		
Size		20x32x12 mm
Analogue output	[V]	0 ... 10
Electrical connection	Cable	4-wire
	Plug	M8x1, 4-pin
Operating voltage range	[V DC]	15 ... 30
Max. output current	[mA]	100
Max. switching frequency	[Hz]	200
Protection against short circuit		Pulsed
Protection against polarity reversal		For all electrical connections
Protection class		IP67

Operating and environmental conditions		
Size		20x32x12 mm
Ambient temperature	[°C]	0 ... 60
Ambient temperature with flexible cable installation	[°C]	0 ... 60
CE mark (see declaration of conformity)		In accordance with EU EMC directive In accordance with EU Low Voltage Directive
Certification		c UL us - Listed (OL) C-Tick

Materials		
Size		20x32x12 mm
Housing		Acrylic butadiene styrene
Cable sheath		Polyurethane

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
20x32x12 mm							
	20 ... 80	Switchable	PNP	537 758	SOEG-RTD-Q20-PP-K-2L-TI	537 757	SOEG-RTD-Q20-PP-S-2L-TI

# Laser sensors SOEL-RT...

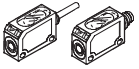
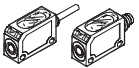

Technical data

General technical data			
Method of measurement	Contrast sensor (diffuse)	With background suppression	
Size	20x32x12 mm	20x32x12 mm	50x50x17 mm
Working range [mm]	10 ... 150	30 ... 110	50 ... 300
Light type	Laser, red		
Laser protection class	2		
Setting options	Teach-in Teach-in via electrical connection	Teach-in Teach-in via electrical connection	Potentiometer

Electrical data			
Method of measurement	Contrast sensor (diffuse)	With background suppression	
Size	20x32x12 mm	20x32x12 mm	50x50x17 mm
Electrical connection	Cable	4-wire	4-wire
	Plug	M8x1, 4-pin	M12x1, 4-pin
Operating voltage range [V DC]	10 ... 30	10 ... 30	
Max. output current [mA]	100	100	200
Max. switching frequency [Hz]	4,000	1,000	2,500
Protection against short circuit	Pulsed		
Protection against polarity reversal	For all electrical connections		
Protection class	IP67		

Operating and environmental conditions			
Method of measurement	Contrast sensor (diffuse)	With background suppression	
Size	20x32x12 mm	20x32x12 mm	50x50x17 mm
Ambient temperature [°C]	-20 ... +60	-20 ... +60	-20 ... +45
Ambient temperature with flexible cable installation [°C]	-5 ... +60	-5 ... +60	-5 ... +45
CE mark (see declaration of conformity)	In accordance with EU EMC directive In accordance with EU Low Voltage Directive		
Certification	c UL us - Listed (OL) C-Tick		

Materials	
Housing	Acrylic butadiene styrene
Cable sheath	Polyurethane

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
20x32x12 mm, contrast sensor (diffuse)							
	10 ... 150	Switchable	PNP	537 736	SOEL-RT-Q20-PP-K-2L-TI	537 735	SOEL-RT-Q20-PP-S-2L-TI
			NPN	537 738	SOEL-RT-Q20-NP-K-2L-TI	537 737	SOEL-RT-Q20-NP-S-2L-TI
20x32x12 mm, with background suppression							
	30 ... 110	Switchable	PNP	537 729	SOEL-RTH-Q20-PP-K-2L-TI	537 727	SOEL-RTH-Q20-PP-S-2L-TI
			NPN	537 730	SOEL-RTH-Q20-NP-K-2L-TI	537 728	SOEL-RTH-Q20-NP-S-2L-TI
30x30x15 mm, with background suppression							
	50 ... 300	Antivalent	PNP	537 777	SOEL-RTH-Q50-PA-K-3L	537 775	SOEL-RTH-Q50-PA-S-3L
			NPN	537 778	SOEL-RTH-Q50-NA-K-3L	537 776	SOEL-RTH-Q50-NA-S-3L

# Laser retro-reflective sensors SOEL-RSP

Technical data

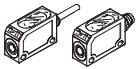

FESTO

General technical data		
Size	20x32x12 mm	50x50x17 mm
Working range [mm]	100 ... 1,000	20,000
Light type	Laser, red polarised	
Laser protection class	2	1
Setting options	Teach-in Teach-in via electrical connection	Potentiometer

Electrical data		
Size	20x32x12 mm	50x50x17 mm
Electrical connection	Cable	4-wire
	Plug	M8x1, 4-pin
		M12x1, 4-pin
	Operating voltage range [V DC]	10 ... 30
Max. output current [mA]	100	200
Max. switching frequency [Hz]	4,000	2,500
Protection against short circuit	Pulsed	
Protection against polarity reversal	For all electrical connections	
Protection class	IP67	

Operating and environmental conditions		
Size	20x32x12 mm	50x50x17 mm
Ambient temperature [°C]	-20 ... +60	-20 ... +45
Ambient temperature with flexible cable installation [°C]	-5 ... +60	-5 ... +45
CE mark (see declaration of conformity)	In accordance with EU EMC directive In accordance with EU Low Voltage Directive	
Certification	c UL us - Listed (OL) C-Tick	

Materials		
Size	20x32x12 mm	50x50x17 mm
Housing	Acrylic butadiene styrene	
Cable sheath	Polyurethane	

Ordering data							
Size	Working range [mm]	Switching element function	Switch output	Electrical connection			
				Cable		Plug	
				Part No.	Type	Part No.	Type
20x32x12 mm							
	100 ... 1,000	Switchable	PNP	537 760	SOEL-RSP-Q20-PP-K-2L-TI	537 759	SOEL-RSP-Q20-PP-S-2L-TI
			NPN	537 762	SOEL-RSP-Q20-NP-K-2L-TI	537 761	SOEL-RSP-Q20-NP-S-2L-TI
30x30x15 mm							
	20,000	Antivalent	PNP	537 769	SOEL-RSP-Q50-PA-K-3L	537 767	SOEL-RSP-Q50-PA-S-3L
			NPN	537 770	SOEL-RSP-Q50-NA-K-3L	537 768	SOEL-RSP-Q50-NA-S-3L



## Laser distance sensors SOEL-RTD

**FESTO**




Technical data

General technical data				
Size	50x50x17 mm			
Working range	[mm]	38 ... 58	44 ... 84	80 ... 300
Position measuring range	[mm]	20	40	220
Displacement resolution	[mm]	0.007	0.02	0.3
Light type	Laser, red			
Laser protection class	2			
Setting options	-		-	Teach-in Teach-in via electrical connection

Electrical data				
Size	50x50x17 mm			
Working range	[mm]	38 ... 58	44 ... 84	80 ... 300
Analogue output	[mA]	-	-	4 ... 20
	[V]	0 ... 10	0 ... 10	-
Electrical connection	Plug M12x1, 4-pin		Plug M12x1, 4-pin	Plug M12x1, 8-pin
Operating voltage range	[V DC]	18 ... 28	18 ... 28	16 ... 30
Max. load current on the analogue voltage output	[mA]	3,0	3,0	-
Max. output current	[mA]	-	-	100
Measuring frequency	[Hz]	40	40	-
Max. switching frequency	[Hz]	-	-	1,000
Protection against short circuit	Pulsed			
Protection against polarity reversal	For operating voltage		For operating voltage	For all electrical connections
Protection class	IP67			

Operating and environmental conditions	
Size	50x50x17 mm
Ambient temperature	[°C] 0 ... 45
CE mark (see declaration of conformity)	In accordance with EU EMC directive In accordance with EU Low Voltage Directive
Certification	c UL us - Listed (OL) C-Tick

Materials	
Size	50x50x17 mm
Housing	Acrylic butadiene styrene

Ordering data						
Size	Working range [mm]	Switching element function	Switch output	Analogue output	Electrical connection	
					Plug	Part No. Type
50x50x17 mm						
	80 ... 300	-	-	0 ... 10 V	549 315	SOEL-RTD-Q50-PU-S-2L-20 
	80 ... 300	-	-	0 ... 10 V	549 316	SOEL-RTD-Q50-PU-S-2L-40 
	80 ... 300	Switchable	2x PNP	4 ... 20 mA	537 823	SOEL-RTD-Q50-PP-S-7L

# Colour sensors SOEC

Technical data




General technical data	
Size	50x50x17 mm
Working range [mm]	12 ... 32
Light type	White
Setting options	Teach-in Teach-in via electrical connection

Electrical data	
Size	50x50x17 mm
Electrical connection	Plug M12x1, 8-pin
Operating voltage range [V DC]	10 ... 30
Max. output current [mA]	100
Max. switching frequency [Hz]	500
Protection against short circuit	Pulsed
Protection against polarity reversal	For all electrical connections
Protection class	IP67

Materials	
Size	50x50x17 mm
Housing	Acrylic butadiene styrene

Operating and environmental conditions	
Size	50x50x17 mm
Ambient temperature [°C]	-10 ... +55
CE mark (see declaration of conformity)	In accordance with EU EMC directive In accordance with EU Low Voltage Directive
Certification	c UL us - Listed (OL) C-Tick

Ordering data					
Size	Working range [mm]	Switching element function	Switch output	Electrical connection	
				Plug	Part No. Type
50x50x17 mm					
	12 ... 32	Light switching	3x PNP	538 236	SOEC-RT-Q50-PS-S-7L

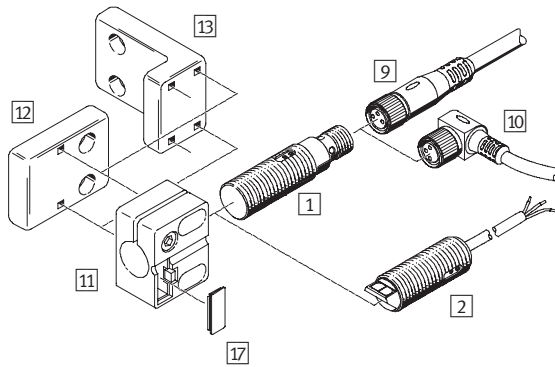
# Sensors SOE..., opto-electronic

Peripherals overview

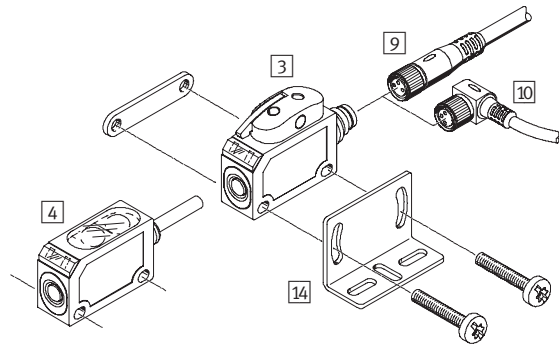


## Peripherals overview

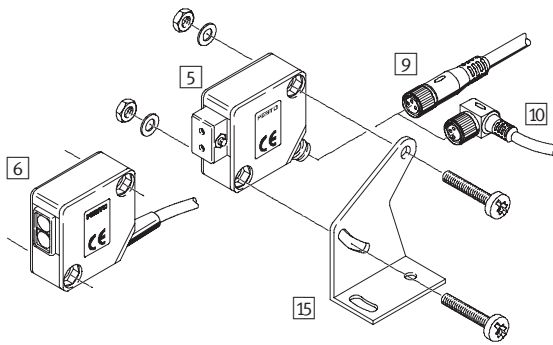
Round design, Ø 4 mm, M12, M18, M18W



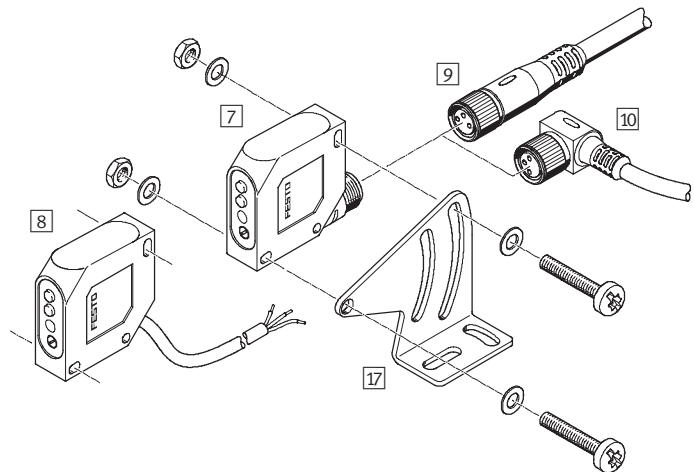
Block design, 20x32x12 mm



Block design, 30x30x15 mm



Block design, 50x50x17 mm



### Mounting attachments and accessories

#### Sensors

- 1 Round design, Ø 4 mm, M12, M18..., with plug
- 2 Round design, Ø 4 mm, M12, M18..., with cable
- 3 Block design, 20x32x12 mm, with plug
- 4 Block design, 20x32x12 mm, with cable
- 5 Block design, 30x30x15 mm, with plug
- 6 Block design, 30x30x15 mm, with cable
- 7 Block design, 50x50x17 mm, with plug
- 8 Block design, 50x50x17 mm, with cable

#### Connecting cables

- 9 NEBU-M...G...  
SIM-M...-...G
- 10 NEBU-M...W...  
SIM-M...-...W

#### Sensor retainers

- 11 SIEZ-NB-...
- 12 SIEZ-UV
- 13 SIEZ-UH

### Mounting attachments and accessories

#### Mounting brackets

- 14 SOEZ-HW-Q20
- 15 SOEZ-HW-Q30
- 16 SOEZ-HW-Q50

#### Inscription label

- 17 SIEZ-LB

#### Fibre-optic cables, polymer

- SOEZ-LLK-RT, diffuse sensor
- SOEZ-LLK-SE, through-beam sensor

#### Fibre-optic cables, glass fibre

- SOEZ-LLG-RT, diffuse sensor
- SOEZ-LLG-SE, through-beam sensor

#### Reflectors

- Reflector
- Reflector foil
- Reflector for laser light

# Sensors SOE..., opto-electronic

Accessories



Ordering data – Connecting cables M8x1		Technical data → 261		
	Number of wires	Cable length [m]	Part No.	Type
<b>Straight plug socket</b>				
	3	2.5	541 333	NEBU-M8G3-K-2.5-LE3
		5	541 334	NEBU-M8G3-K-5-LE3
	4	2.5	541 342	NEBU-M8G4-K-2.5-LE4
		5	541 343	NEBU-M8G4-K-5-LE4
<b>Angled plug socket</b>				
	3	2.5	541 338	NEBU-M8W3-K-2.5-LE3
		5	541 341	NEBU-M8W3-K-5-LE3
	4	2.5	541 344	NEBU-M8W4-K-2.5-LE4
		5	541 345	NEBU-M8W4-K-5-LE4

Ordering data – Connecting cables M12x1		Technical data → 264		
	Number of wires	Cable length [m]	Part No.	Type
<b>Straight plug socket</b>				
	3	2.5	541 363	NEBU-M12G5-K-2.5-LE3
		5	541 364	NEBU-M12G5-K-5-LE3
	4	5	541 328	NEBU-M12G5-K-5-LE4
		8	2	525 616
	5	525 618	SIM-M12-8GD-5-PU	
<b>Angled plug socket</b>				
	3	2.5	541 367	NEBU-M12W5-K-2.5-LE3
		5	541 370	NEBU-M12W5-K-5-LE3
	4	5	541 329	NEBU-M12W5-K-5-LE4

Ordering data – Mounting attachments			
	For design	Part No.	Type
<b>Mounting bracket</b>			
	Q20	537 785	SOEZ-HW-Q20
	Q30	165 355	SOEZ-HW-Q30
	Q50	537 786	SOEZ-HW-Q50
<b>Sensor retainer</b>			
	4	538 343	SIEZ-NB-4
	M12	538 348	SIEZ-NB-12
	M18, M18W	538 350	SIEZ-NB-18
	M12, M18, M18W	538 354	SIEZ-UH
		538 355	SIEZ-UV
<b>Inscription label</b>			
	M12, M18, M18W, M30	538 353	SIEZ-LB

Ordering data – Fibre-optic cables			
	Use	Part No.	Type
<b>Polymer</b>			
	RT <sup>1)</sup>	165 358	SOEZ-LLK-RT-2,0-M6
	S/E <sup>2)</sup>	165 360	SOEZ-LLK-SE-2,0-M4
<b>Glass fibre</b>			
	RT <sup>1)</sup>	165 356	SOEZ-LLG-RT-0,5-M6
	S/E <sup>2)</sup>	165 357	SOEZ-LLG-SE-0,5-M4
<b>Fibre-optic cable cutter</b>			
	For polymer fibre-optic cables	36 479	SOE-LKS

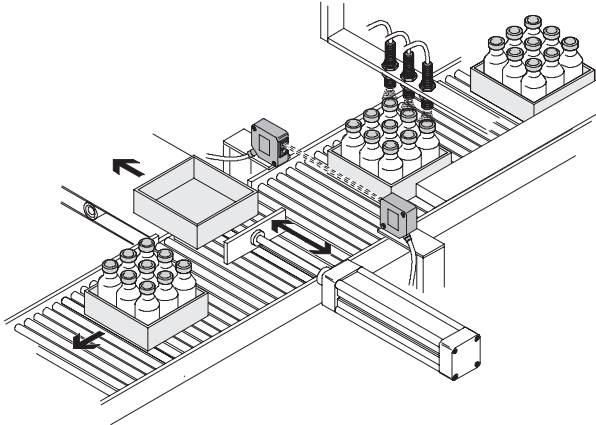
- 1) Diffuse sensor
- 2) Through-beam sensor

Ordering data – Reflectors			
	Size [mm]	Part No.	Type
<b>Reflector</b>			
	∅ 20	165 363	SOEZ-RFS-20
	∅ 40	165 364	SOEZ-RFS-40
	∅ 84	165 365	SOEZ-RFS-80
<b>Reflector foil</b>			
	100 x 100	165 362	SOEZ-RFF-100
<b>Reflector for laser light</b>			
	50 x 50	537 788	SOEZ-RFL-50
	10 x 50	537 787	SOEZ-RFL-10

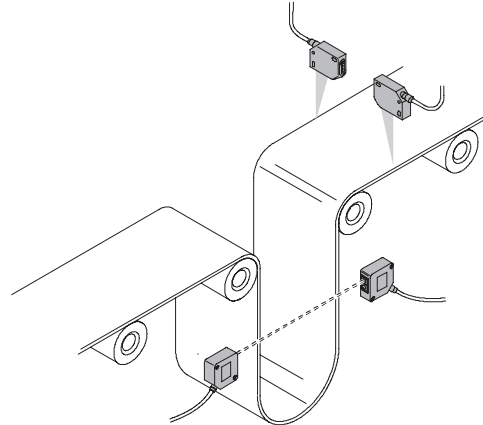
# Sensors SOE..., opto-electronic

Application examples

## General application examples

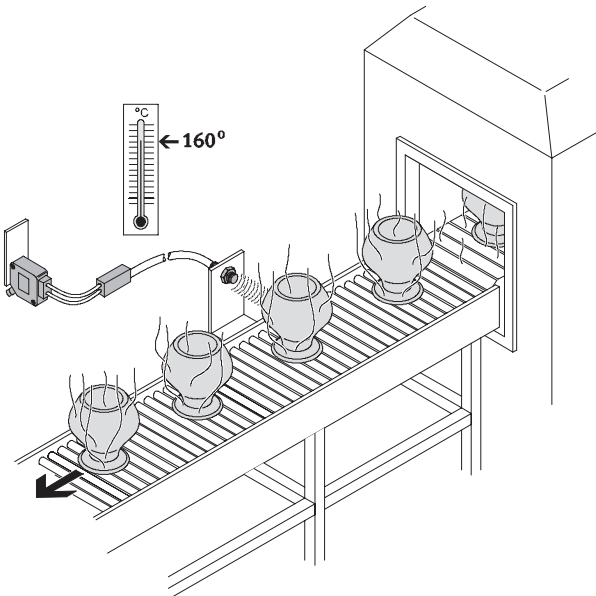


- Opto-electronic sensors SOEG check whether the boxes are filled.

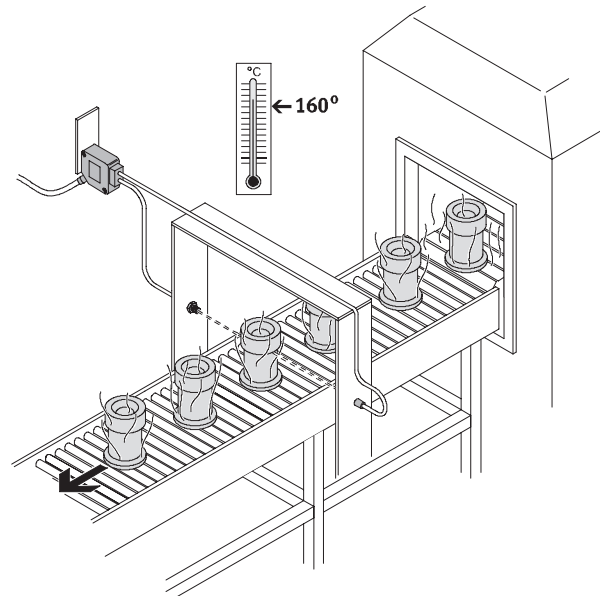


- Edge detection using opto-electronic sensors SOEG

## Fibre-optic technology for high-temperature ranges



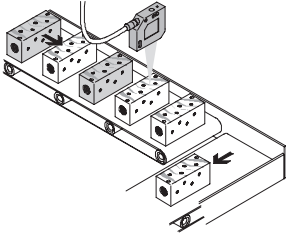
- SOEG-L can be combined with SOEZ-LLG glass fibre-optic cables to detect objects in high-temperature environments.



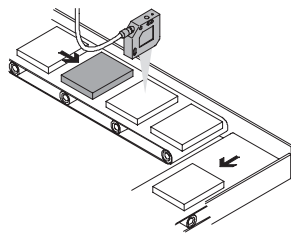
# Sensors SOE..., opto-electronic

Application examples

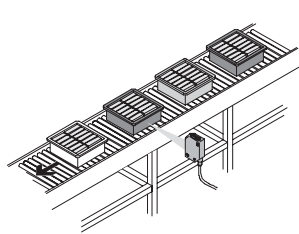
## Sensors with background suppression



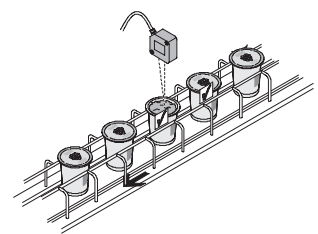
- Sensors SOEG-RTH with background suppression detect objects on the basis of their geometric position rather than the strength of the reflection.
- The objects are detected practically independently of their colour. It makes no difference how shiny any objects in the background are.



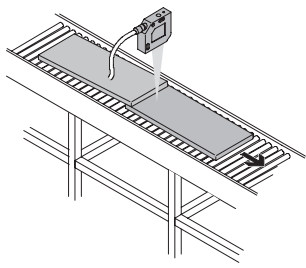
- Detection of objects of different colours at the same distance and close to the background.



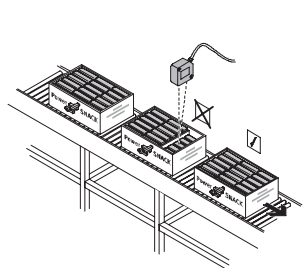
- Colour-independent detection of trays.



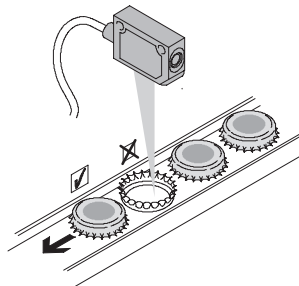
- Detection of lids of different colours on yogurt pots with a sensor SOEG-RTH with background suppression. Metallic lids can also be detected by inductive sensors SIEF.



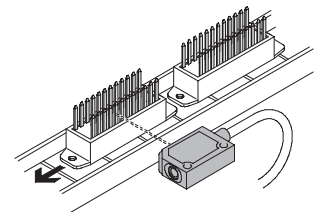
- Detection of overlaps with SOEG-RTH-Q30/Q50.



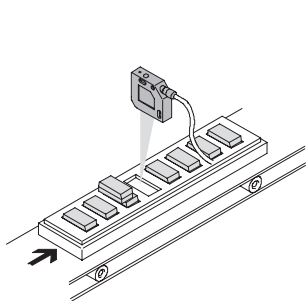
- Checking that snack food quantities are correct using sensors SOEG-RTH with background suppression.
- The distance sensor SOEG-RTD can also check that the number of items is correct.



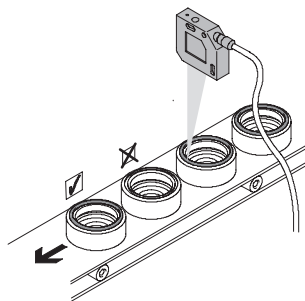
- Checking that the position of bowls is correct using sensors SOEG-RTH with background suppression.
- Metallic bowls can also be detected by inductive sensors SIE....



- Counting of connections using the laser sensor SOEL-RTH with background suppression.



- The presence or absence of small objects can be detected easily using the laser sensor SOEL-RTH with background suppression.

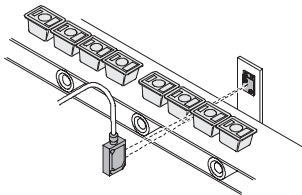


- Detection of O-rings using the laser sensor SOEL-RTH with background suppression.

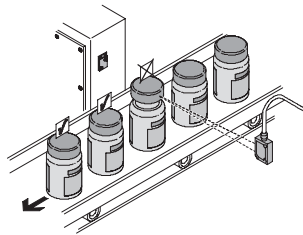
# Sensors SOE..., opto-electronic

Application examples

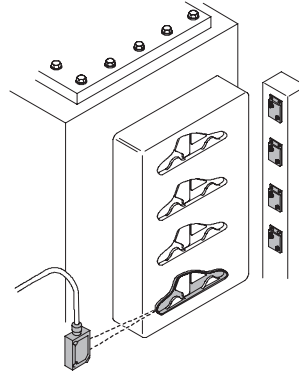
## Retro-reflective sensors



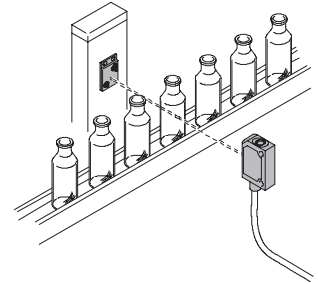
- The laser retro-reflective sensors SOEL-RSP detect small gaps between objects.



- The laser beam of a retro-reflective sensor SOEL-RSP can thus be set to detect variations in alignment.

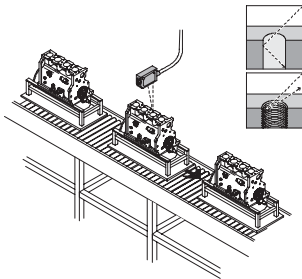


- After moulding, the laser retro-reflective sensor SOEL-RSP detects whether the workpieces are still in the metallic mould.



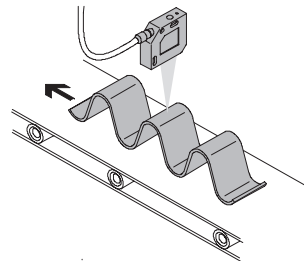
- SOEG-RSG – the perfect retro-reflective sensor for transparent objects.

## Contrast sensor



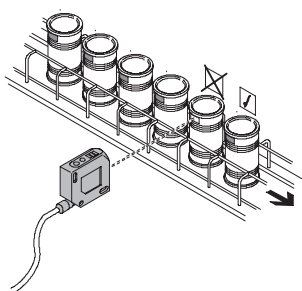
- The laser contrast sensor SOEL-RT-Q20 can detect a thread, even in a hole.

## Distance sensor

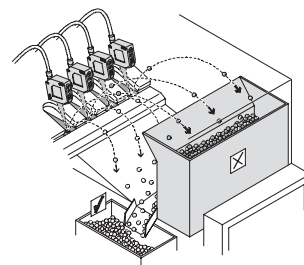


- The laser distance sensors SOEL-RTD can gauge the shapes of different workpieces.

## Colour sensor



- The colour sensor SOEC-RT-Q50 has three channels. Each of these channels can be adjusted separately by means of a simple teach-in procedure.



- Parts are sorted by colour using the colour sensor SOEC-RT-Q50.

