

- Economical and versatile
- Self-centring

# Radial grippers HGR

Key features



## At a glance

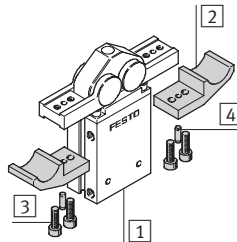
- Double-acting piston drive
- Self-centring
- Variable gripping action:
  - External/internal gripping
- Versatility thanks to externally adaptable gripper fingers
- Wide range of options for mounting on drive units
- Constant gripping torque over the entire angle range
- 180° opening angle
- Internal fixed flow control
- Sensor technology:
  - Adaptable proximity sensors on the small grippers
  - Integral proximity sensors for medium and large grippers




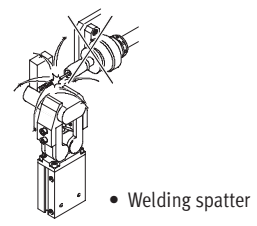
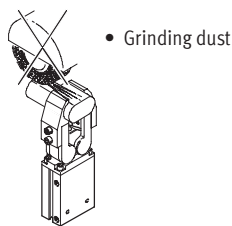
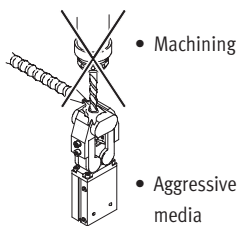
Gripper selection software  
[www.festo.com/en/engineering](http://www.festo.com/en/engineering)

## Mounting options for external gripper fingers (customer-specific)

- 1 Radial gripper
- 2 External gripper finger
- 3 Mounting screws
- 4 Centring pins



-  Note  
 grippers should always be used with G exhaust air flow control. They are not suitable for the following, or for similar applications:

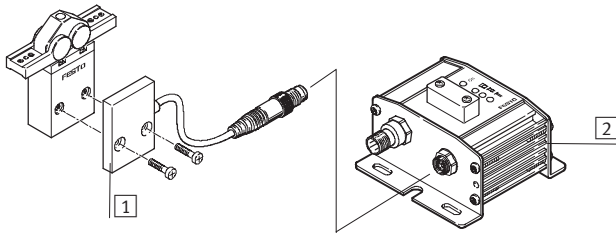


# Radial grippers HGR

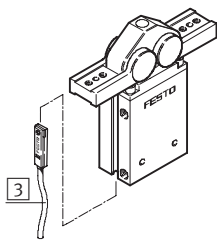
Peripherals overview and type codes

## Peripherals overview

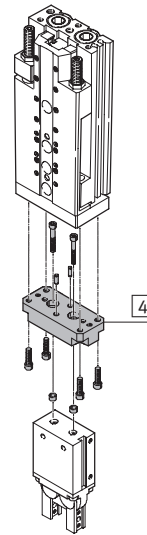
HGR-10



HGR-16 ... 40



## System product for handling and assembly technology



### Accessories

Type	Brief description	→ Page
1 Position sensor SMH-S1	Adaptable and integratable sensor technology, for sensing the piston position	1 / 7.5-37
2 Evaluation unit SMH-AE1	For position sensor SMH-S1	1 / 7.5-37
3 Proximity sensor SME/SMT-8	For sensing the piston position	1 / 7.5-37
4 -	Drive/gripper connections	Volume 5

### Type codes

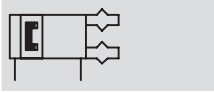
HGR		-	16	-	A
<b>Type</b>					
HGR	Radial gripper				
<b>Size</b>					
<b>Position sensing</b>					
A	For proximity sensing				

# Radial grippers HGR

Technical data

FESTO

Function  
Double-acting



[www.festo.com/en/Spare\\_parts\\_service](http://www.festo.com/en/Spare_parts_service)

Wearing parts kits  
→ 1 / 7.5-36



Size  
10 ... 40 mm

General technical data					
Size	10	16	25	32	40
Design	Rack and pinion				
Mode of operation	Double-acting				
Gripper function	Radial				
Number of gripper jaws	2				
Opening angle [°]	180				
Pneumatic connection	M3		M5		G1/8
Repetition accuracy <sup>1)</sup> [mm]	≤ 0.1				
Max. interchangeability [mm]	0.2				
Max. operating frequency [Hz]	4				
Position sensing	For proximity sensing				
Type of mounting	With female thread and centring hole				

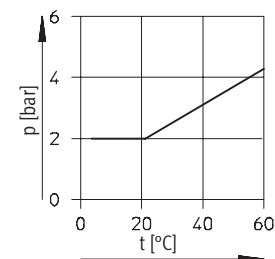
1) End position drift under constant conditions of use with 100 consecutive strokes in the direction of movement of the gripper jaws

Operating and environmental conditions		
Min. operating pressure [bar]		2
Max. operating pressure [bar]		8
Operating medium	Filtered compressed air, lubricated or unlubricated	
Ambient temperature [°C]	+5 ... +60	
Corrosion resistance class CRC <sup>1)</sup>	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

## Min. operating pressure p as a function of temperature range t

The required minimum operating pressure may vary depending on the temperature range of the device



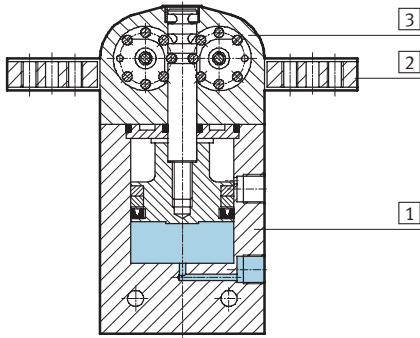
Weights [g]					
Size	10	16	25	32	40
HGR	39	110	250	420	710

# Radial grippers HGR

Technical data

## Materials

Sectional view

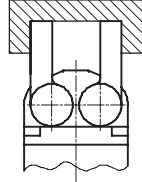
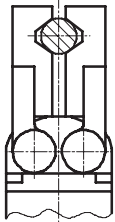


Radial gripper		
1	Body	Hard anodised aluminium
2	Gripper jaw	Hard anodised aluminium
3	Cover cap	Polyacetate
–	Note on materials	Copper, PTFE and silicone-free

## Total gripping torque [Ncm] at 6 bar, with external gripper fingers

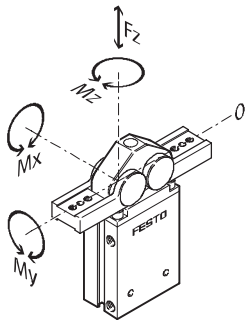
External gripping

Internal gripping



Size	10	16	25	32	40
Total gripping torque					
Opening	15	56	195	360	600
Closing	13	50	160	300	500

## Characteristic load values at the gripper jaws



The indicated permissible forces and torques apply to a single gripper jaw. Static forces and torques relate to additional applied loads caused by

the workpiece or external gripper fingers, as well as forces which occur during handling. The zero co-ordinate

line (gripper jaws point of rotation) must be taken into consideration for the calculation of torques.

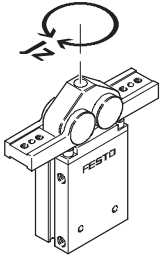
Size	10	16	25	32	40
Max. permissible force $F_z$	[N] 14	25	39	55	83
Max. permissible torque $M_x$	[Nm] 0.1	0.3	0.6	1	1.9
Max. permissible torque $M_y$	[Nm] 0.5	1.5	3	4.7	9.9
Max. permissible torque $M_z$	[Nm] 0.4	1	2	3.2	6.7

# Radial grippers HGR

Technical data



## Mass moment of inertia [kgm<sup>2</sup>x10<sup>-4</sup>]



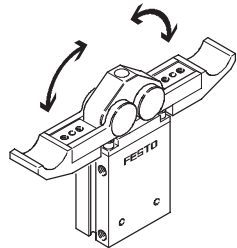
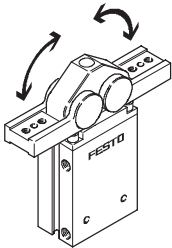
Mass moment of inertia [kgm<sup>2</sup>x10<sup>-4</sup>] for radial grippers in relation to the central axis, without external gripper fingers, without load.

Size	10	16	25	32	40
HGR	0.03	0.14	0.62	1.45	3.58

## Opening and closing times [ms] at 6 bar

Without external gripper fingers

With external gripper fingers



The indicated opening and closing times [ms] have been measured at room temperature and 6 bar operating pressure without external gripper fingers.

The grippers must be throttled for greater applied loads. Opening and closing times must then be adjusted accordingly.

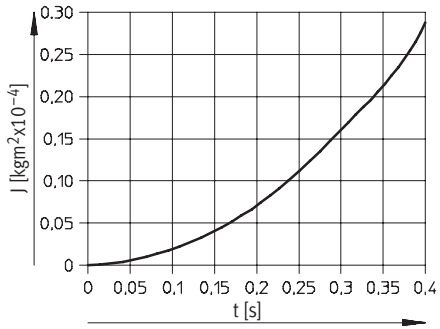
Size		10	16	25	32	40
Without external gripper fingers						
HGR	Opening	5	40	95	85	105
	Closing	5	45	80	75	100
With external gripper fingers → 1 / 7.5-33						

# Radial grippers HGR

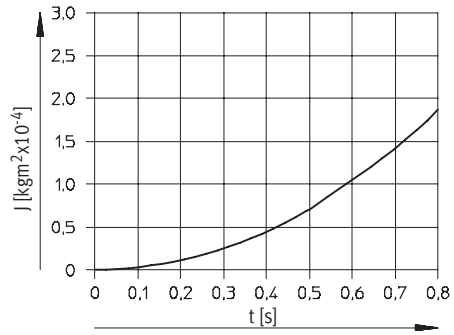
Technical data

## Opening and closing times $t$ as a function of gripper finger mass moment of inertia $J$

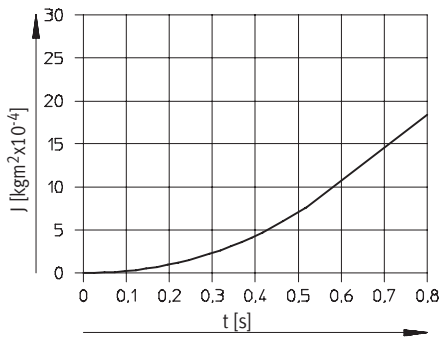
HGR-10-A



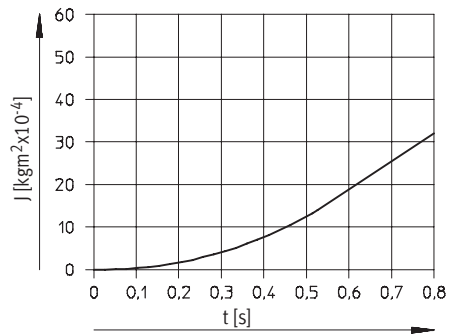
HGR-16-A



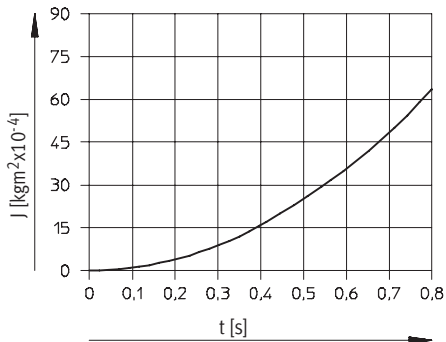
HGR-25-A



HGR-32-A



HGR-40-A



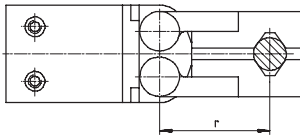
# Radial grippers HGR

Technical data



## Gripping force $F$ per gripper as a function of operating pressure and the lever arm $r$

Gripping forces

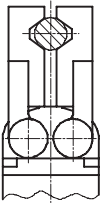


Gripping forces can be determined with the following diagrams for the various sizes in relation to operating

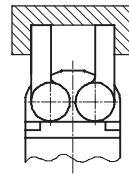
pressure and lever arm (distance from the zero co-ordinate line shown oppo-

site to the pressure point at which the external fingers grip the workpiece).

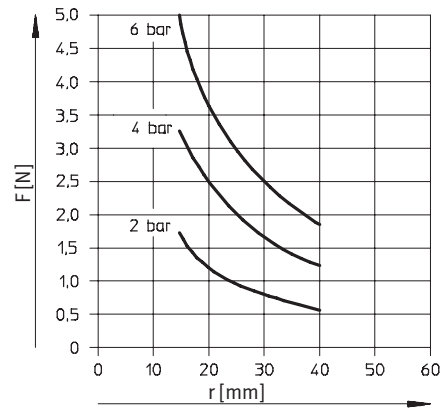
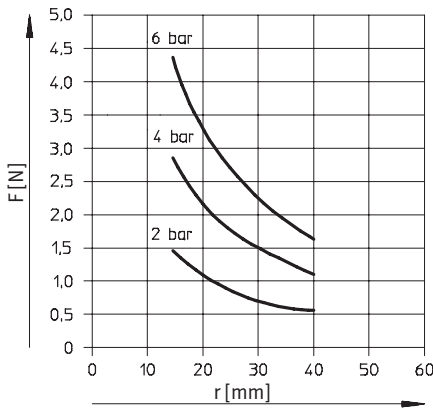
### External gripping (closing)



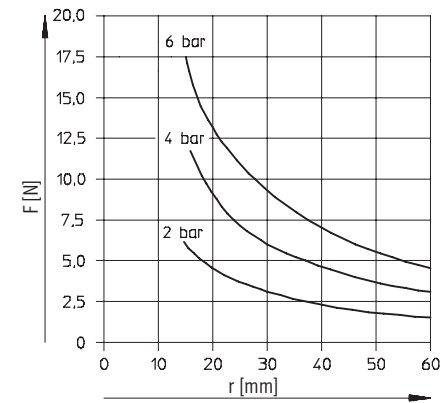
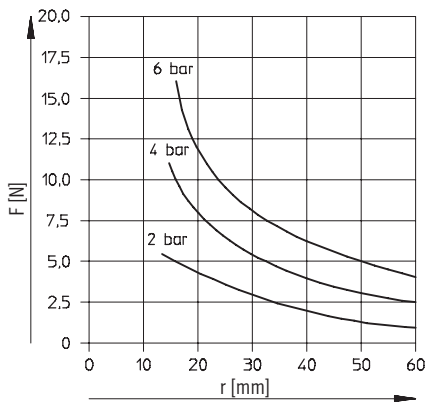
### Internal gripping (opening)



### HGR-10-A



### HGR-16-A





# Radial grippers HGR

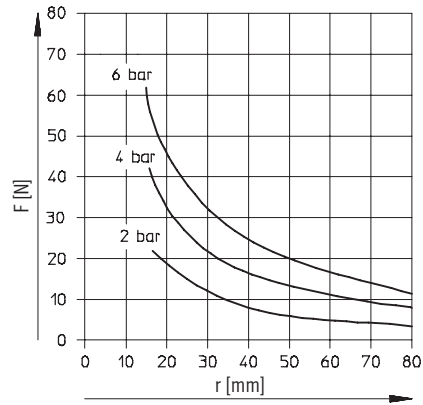
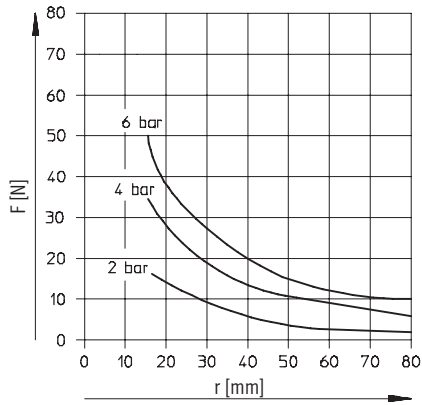
Technical data

## Gripping force $F$ per gripper as a function of operating pressure and the lever arm $r$

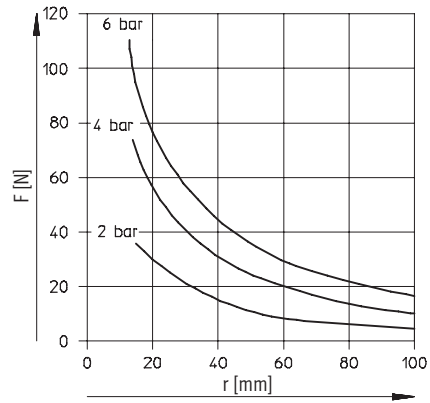
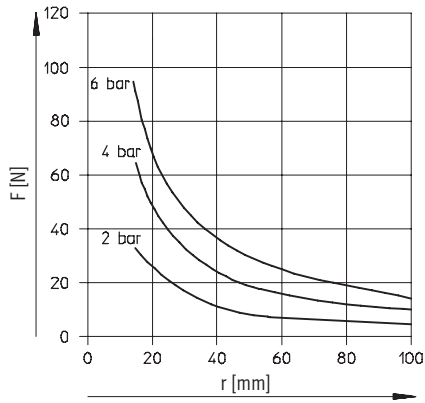
External gripping (closing)

Internal gripping (opening)

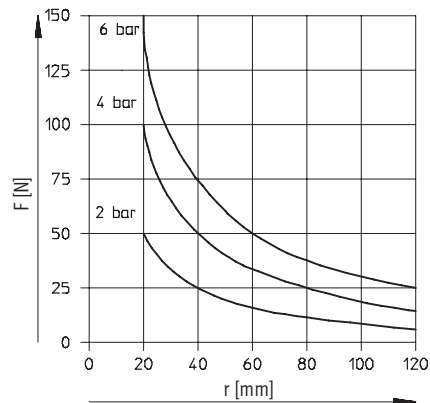
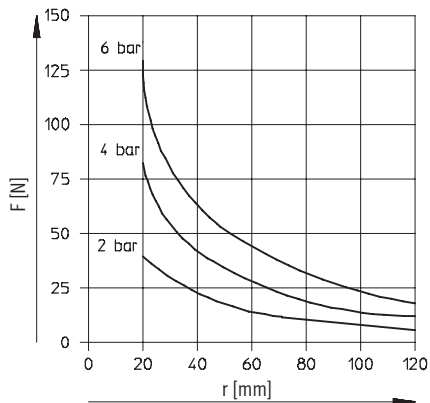
HGR-25-A



HGR-32-A



HGR-40-A



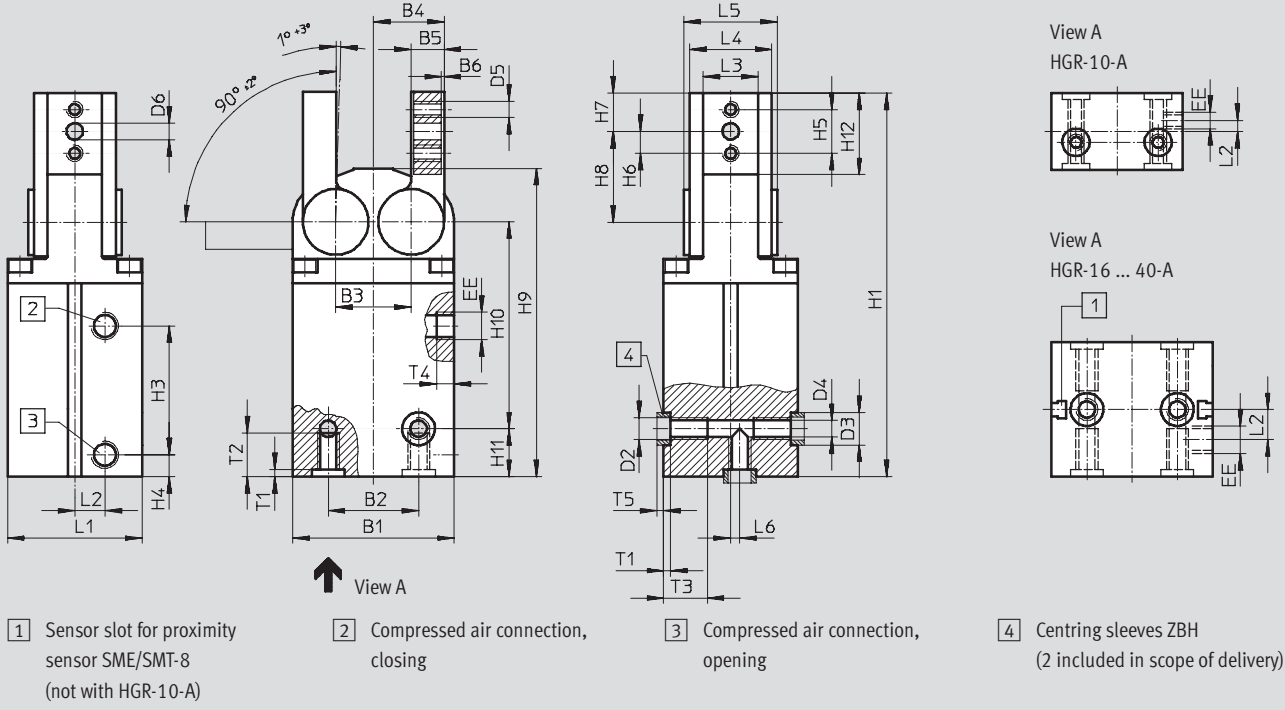
# Radial grippers HGR

Technical data



## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)



Size	B1	B2	B3	B4	B5	B6	D2	D3	D4	D5	D6	EE	H1	H2	H3	H4	H5	H6
[mm]		±0.02						∅ H8/h7	∅ +0.1	∅	∅ H8							
10	24	15	11	10.5	5	0.5	M3	5	2.5	M2.5	2	M3	60.8	34.5	16	8.8	8	4
16	33.4	16	16	15.5	6	1	M3	5	2.5	M3	2	M3	88.2	53.2	23	12.25	8	4
25	44	25	19.2	18.6	8	1	M4	7	3.3	M4	3	M5	107.2	63.5	24.7	14.3	10.5	5.25
32	51	29	22.8	21.4	10	1	M6	9	5.1	M5	4	G $\frac{3}{8}$	128.5	75	25	20	14	7
40	59	33	27.6	25.8	12	1	M8	12	6.4	M6	5	G $\frac{1}{2}$	140	80.5	47	8	16	8

Size	H7	H8	H9	H10	H11	H12	L1	L2	L3	L4	L5	L6	T1	T2	T3	T4	T5
[mm]	-0.3	±0.05			-0.05	±0.2			+0.01/+0.03			±0.02	+0.1			+1	+0.5
10	6.25	14.75	49.3	27.5	12.3	12.5	14	2	6.5	10.5	12	2	1.2	12.3	-	3.5	1.2
16	7	20	73.7	53.7	7.5	17.5	19	5.5	10	16	18.5	-	1.2	7	7	4.5	1.2
25	10.25	23.95	87.7	65.5	7.5	20.8	29.5	8.75	13	20	24	-	1.6	7	8	6.5	1.4
32	14	29	101.9	74.5	11	27.5	38	9.5	14	22	26	-	2.1	10	15	6.5	1.9
40	14	33.2	112.5	75.5	17.5	29.7	49	11	20	30	34	-	2.6	15	16	6.5	2.4

Ordering data		
Size	Double-acting	
[mm]	Part No.	Type
10	174 817	HGR-10-A
16	161 829	HGR-16-A
25	161 830	HGR-25-A
32	161 831	HGR-32-A
40	161 832	HGR-40-A

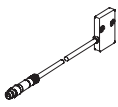


Ordering data – Wearing parts kits		
Size		
[mm]	Part No.	Type
10	378 522	HGR-10-A
16	125 668	HGR-16-A
25	125 669	HGR-25-A
32	125 670	HGR-32-A
40	125 671	HGR-40-A

Handling units  
Radial grippers  
7.5

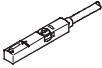

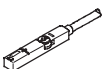
# Radial grippers HGR

Accessories

**FESTO**

Ordering data					
Type	For size	Weight [g]	Part No.	Type	PU <sup>1)</sup>
Position sensor SMH-S1			Technical data → 1 / 10.2-107		
	10	20	<b>175 712</b>	<b>SMH-S1-HGR10</b>	1
Evaluation unit SMH-AE1			Technical data → 1 / 10.2-110		
	10	170	<b>175 708</b>	<b>SMH-AE1-PS3-M12</b>	1
			<b>175 709</b>	<b>SMH-AE1-NS3-M12</b>	
Centring sleeve ZBH			Technical data → 1 / 10.1-3		
	10, 16	1	<b>189 652</b>	<b>ZBH-5</b>	10
	25		<b>186 717</b>	<b>ZBH-7</b>	
	32		<b>150 927</b>	<b>ZBH-9</b>	
	40		<b>189 653</b>	<b>ZBH-12</b>	

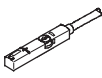


1) Packaging unit quantity



Ordering data – Proximity switches for T-slot, magneto-resistive					Technical data → <a href="http://www.festo.com/catalogue/sm">www.festo.com/catalogue/sm</a>	
Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	2,5	<b>543 867</b>	<b>SMT-8M-PS-24V-K-2,5-OE</b>
			Plug M8x1, 3-pin	0,3	<b>543 866</b>	<b>SMT-8M-PS-24V-K-0,3-M8D</b>
			Plug M12x1, 3-pin	0,3	<b>543 869</b>	<b>SMT-8M-PS-24V-K-0,3-M12</b>
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	Cable, 3-wire	2,5	<b>543 870</b>	<b>SMT-8M-NS-24V-K-2,5-OE</b>
			Plug M8x1, 3-pin	0,3	<b>543 871</b>	<b>SMT-8M-NS-24V-K-0,3-M8D</b>
N/C contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7,5	<b>543 873</b>	<b>SMT-8M-PO-24V-K7,5-OE</b>

# Radial grippers HGR

Accessories

FESTO

Ordering data – Proximity switches for T-slot, magnetic reed					Technical data → <a href="http://www.festo.com/catalogue/sm">www.festo.com/catalogue/sm</a>	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
<b>N/O contact</b>						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Cable, 3-wire	2,5	<b>543 862</b>	<b>SME-8M-DS-24V-K-2,5-OE</b>
				5,0	<b>543 863</b>	<b>SME-8M-DS-24V-K-5,0-OE</b>
			Cable, 3-wire	2,5	<b>543 872</b>	<b>SME-8M-ZS-24V-K-2,5-OE</b>
			Plug M8x1, 3-pin	0,3	<b>543 861</b>	<b>SME-8M-DS-24V-K-0,3-M8D</b>
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2,5	<b>150 855</b>	<b>SME-8-K-LED-24</b>
			Plug M8x1, 3-pin	0,3	<b>150 857</b>	<b>SME-8-S-LED-24</b>
<b>N/C contact</b>						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7,5	<b>160 251</b>	<b>SME-8-O-K-LED-24</b>

Ordering data – Connecting cables				Technical data → <a href="http://www.festo.com/catalogue/nebu">www.festo.com/catalogue/nebu</a>	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2,5	<b>541 333</b>	<b>NEBU-M8G3-K-2.5-LE3</b>
			5	<b>541 334</b>	<b>NEBU-M8G3-K-5-LE3</b>
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2,5	<b>541 363</b>	<b>NEBU-M12G5-K-2.5-LE3</b>
			5	<b>541 364</b>	<b>NEBU-M12G5-K-5-LE3</b>
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2,5	<b>541 338</b>	<b>NEBU-M8W3-K-2.5-LE3</b>
			5	<b>541 341</b>	<b>NEBU-M8W3-K-5-LE3</b>
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2,5	<b>541 367</b>	<b>NEBU-M12W5-K-2.5-LE3</b>
			5	<b>541 370</b>	<b>NEBU-M12W5-K-5-LE3</b>