

# Radial grippers HGR



# Radial grippers HGR

Key features



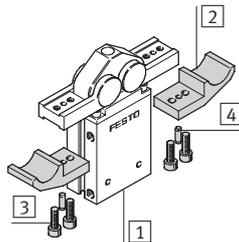
## At a glance

- 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

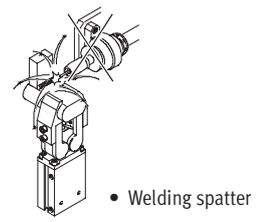
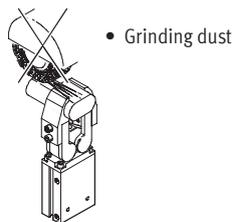
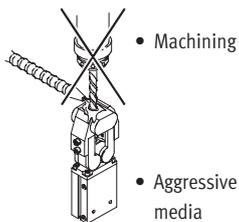
-  - Note  
Sizing software  
Gripper selection  
➔ [www.festo.com](http://www.festo.com)

## 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:

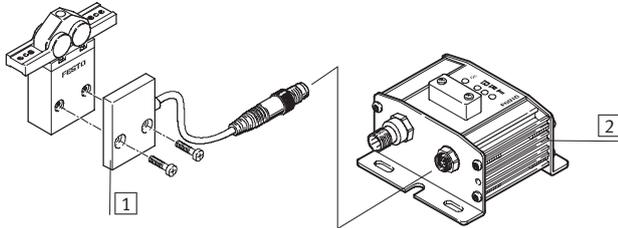


# Radial grippers HGR

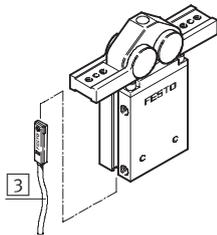
Peripherals overview and type codes

## Peripherals overview

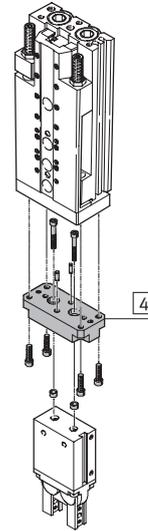
HGR-10



HGR-16 ... 40



## System product for handling and assembly technology



Accessories			
Type	Brief description		→ Page/Internet
1	Position sensor SMH-S1	Adaptable and integratable sensor technology, for sensing the piston position	11
2	Evaluation unit SMH-AE1	For position sensor SMH-S1	11
3	Proximity sensor SME/SMT-8	For sensing the piston position	11
4	-	Drive/gripper connections	adapter kit

## Type codes

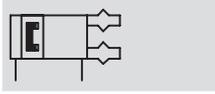
		HGR	-	16	-	A
<b>Type</b>						
HGR	Radial gripper					
<b>Size</b>						
<b>Position sensing</b>						
A	For proximity sensing					

# 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  
→ 10



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	G <sup>1</sup> / <sub>8</sub>	
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				

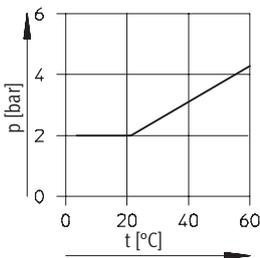
1) End position drift under constant conditions of use with 100 consecutive strokes in the direction of movement of the gripper jaws

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



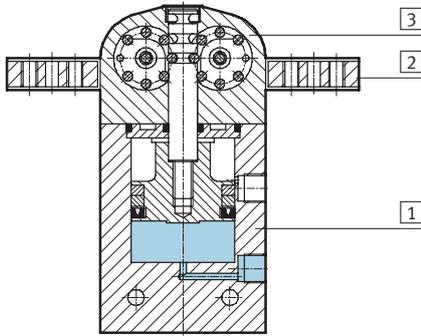
Weights [g]					
Size	10	16	25	32	40
HGR	39	110	250	420	710

# Radial grippers HGR

Technical data

## Materials

Sectional view

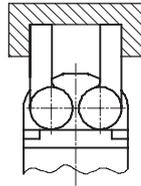
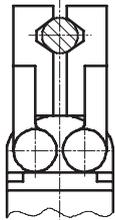


Radial gripper		
1	Body	Hard anodised aluminium
2	Gripper jaw	Hard anodised aluminium
3	Cover cap	Polyacetate
-	Note on materials	Copper, PTFE and silicone-free Conforms to RoHS

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

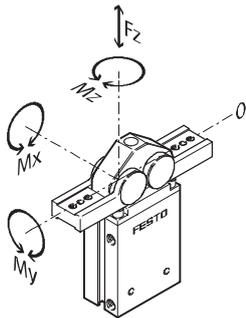
External gripping

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

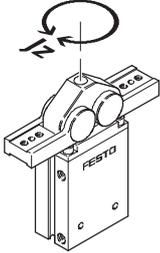
line (gripper jaws point of rotation) must be taken into consideration for the calculation of torques.

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 [ $\text{kgm}^2 \times 10^{-4}$ ]



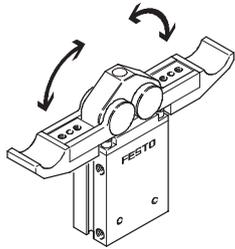
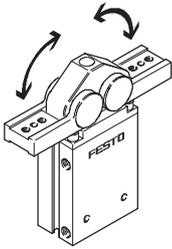
Mass moment of inertia [ $\text{kgm}^2 \times 10^{-4}$ ] for radial grippers in relation to the central axis, without external gripper fingers, without load.

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.

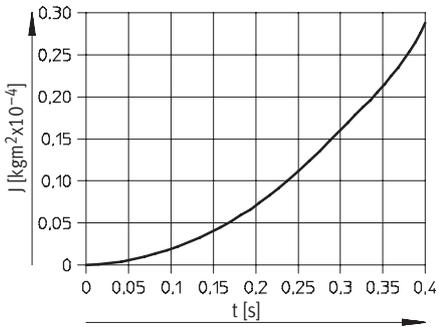
Size		10	16	25	32	40
Without external gripper fingers						
HGR	Opening	5	40	95	85	105
	Closing	5	45	80	75	100
With external gripper fingers → 7						

# Radial grippers HGR

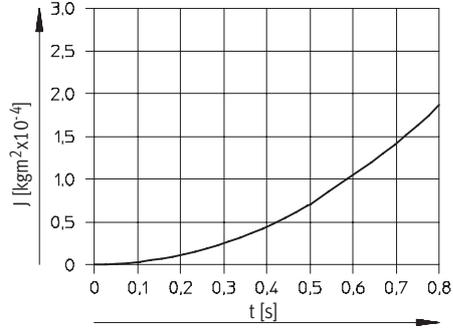
Technical data

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

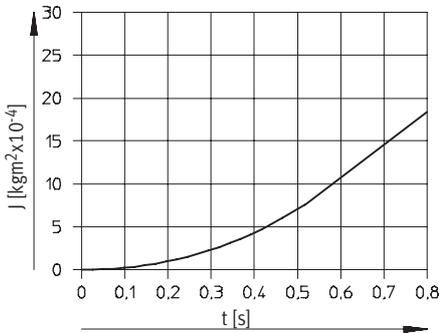
HGR-10-A



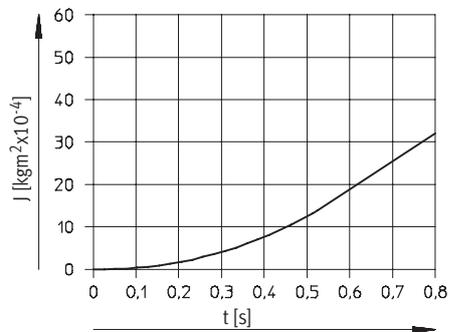
HGR-16-A



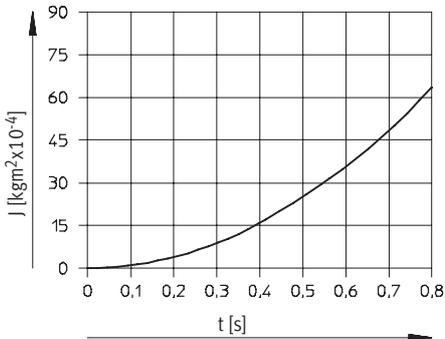
HGR-25-A



HGR-32-A



HGR-40-A

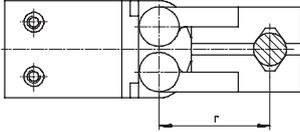


# Radial grippers HGR

Technical data

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

Gripping forces

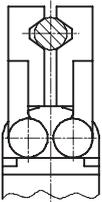


Gripping forces can be determined with the following diagrams for the various sizes in relation to operating

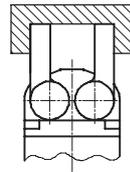
pressure and lever arm (distance from the zero co-ordinate line shown oppo-

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

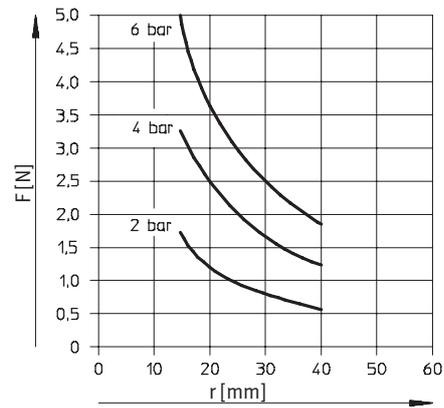
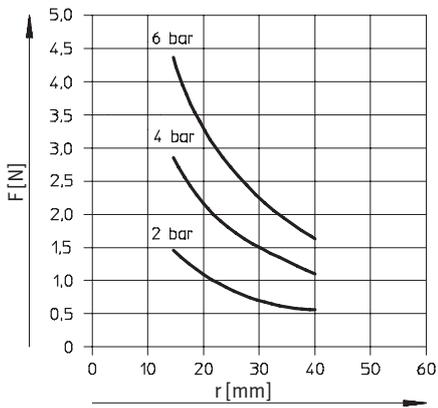
### External gripping (closing)



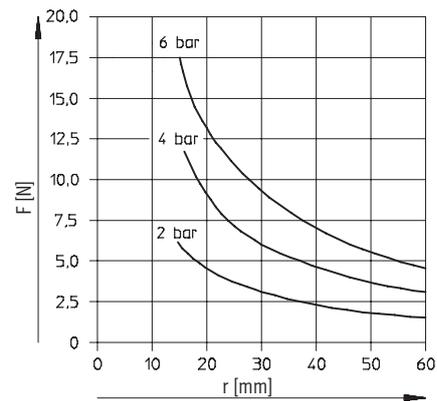
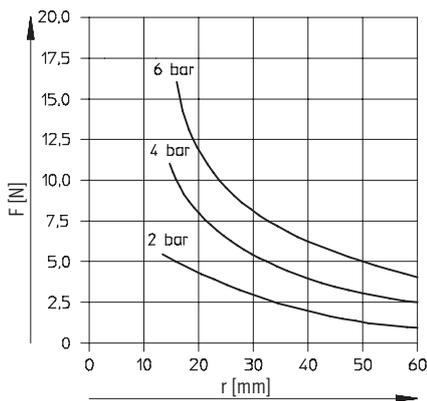
### Internal gripping (opening)



### HGR-10-A



### HGR-16-A



# Radial grippers HGR

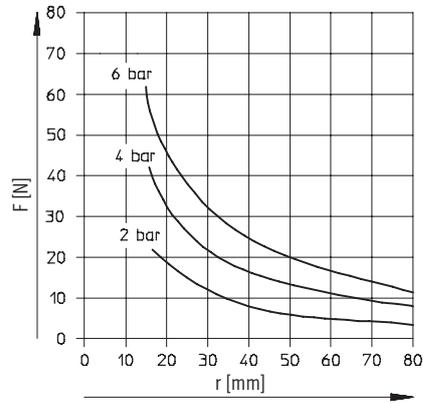
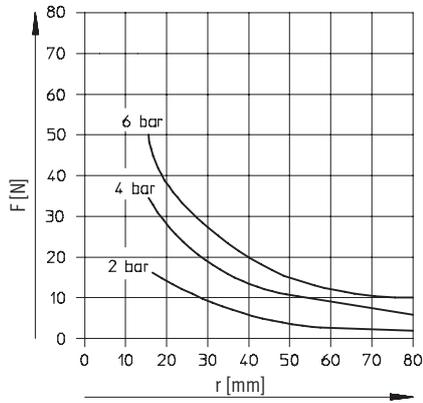
Technical data

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

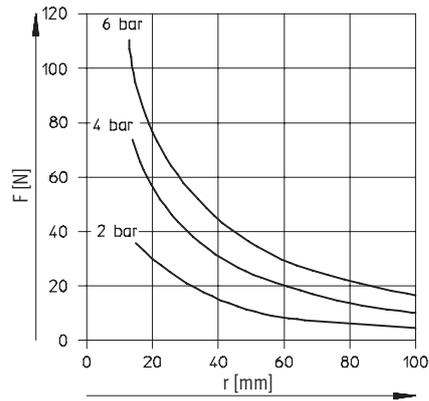
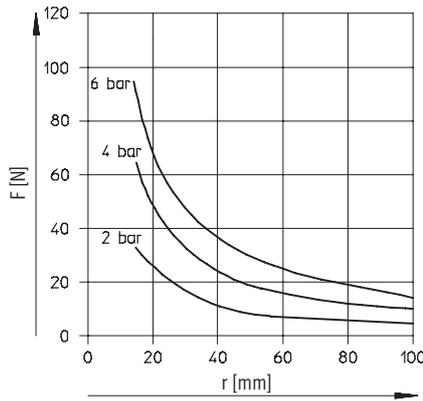
External gripping (closing)

Internal gripping (opening)

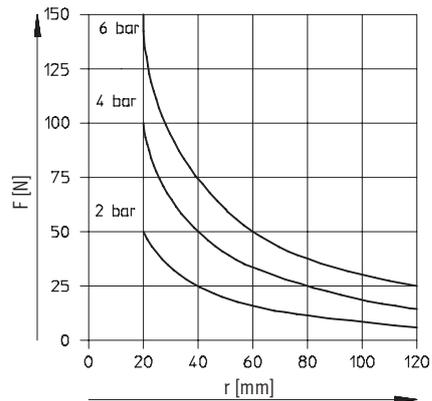
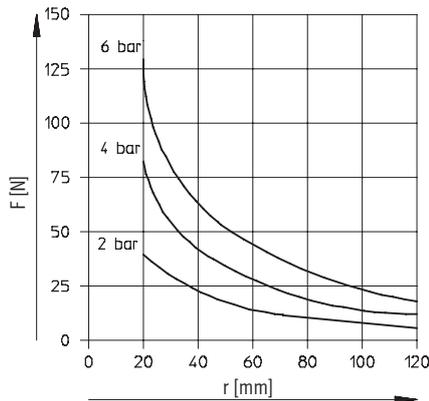
HGR-25-A



HGR-32-A



HGR-40-A



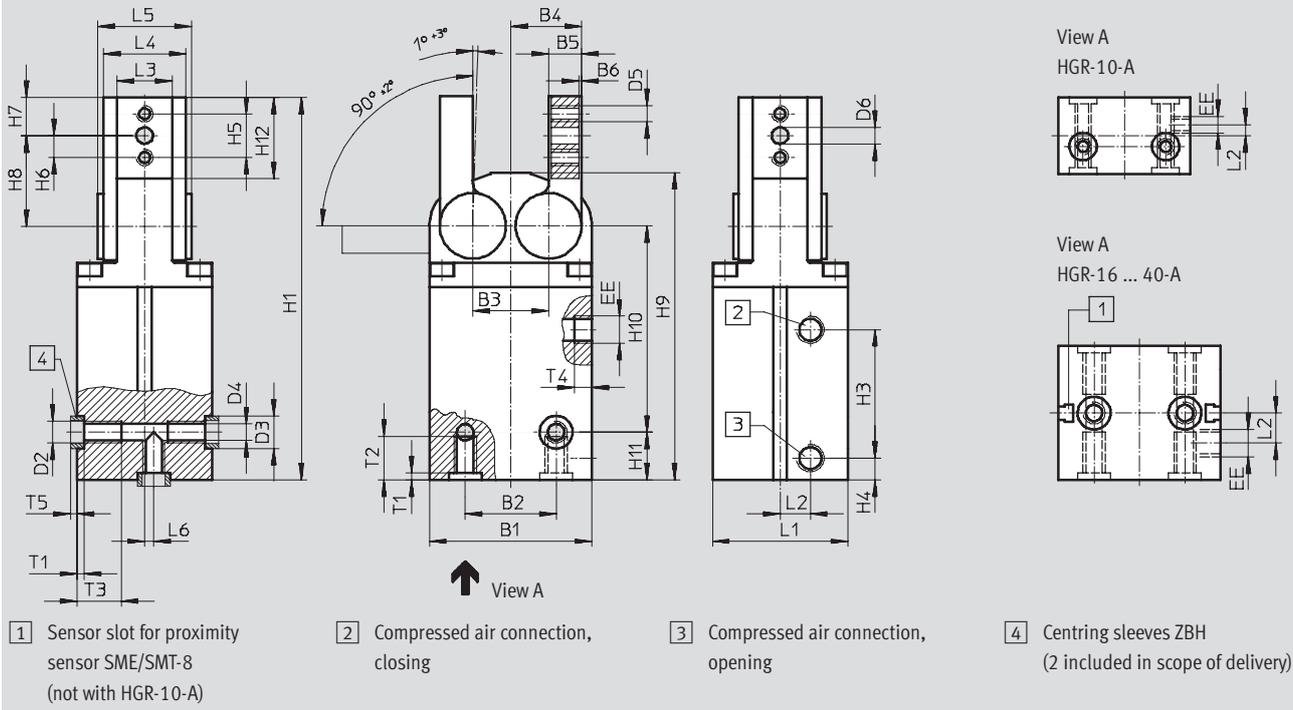
# Radial grippers HGR

Technical data

FESTO

## 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	G1/8	128.5	75	25	20	14	7
40	59	33	27.6	25.8	12	1	M8	12	6.4	M6	5	G1/8	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

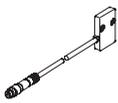
Ordering data		
Size	Double-acting	
[mm]	Part No.	Type
10	174 817	HGR-10-A
16	161 829	HGR-16-A
25	161 830	HGR-25-A
32	161 831	HGR-32-A
40	161 832	HGR-40-A

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

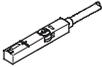
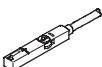
# Radial grippers HGR

Accessories

**FESTO**

Ordering data					
Type	For size	Weight [g]	Part No.	Type	PU <sup>1)</sup>
Position sensor SMH-S1			Technical data → Internet: smh-s1		
	10	20	175 712	SMH-S1-HGR10	1
Evaluation unit SMH-AE1			Technical data → Internet: smh-ae		
	10	170	175 708	SMH-AE1-PS3-M12	1
			175 709	SMH-AE1-NS3-M12	
Centring sleeve ZBH			Technical data → Internet: zbh		
	10, 16	1	189 652	ZBH-5	10
	25		186 717	ZBH-7	
	32		150 927	ZBH-9	
	40		189 653	ZBH-12	

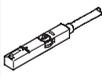
1) Packaging unit quantity

Ordering data – Proximity sensors for T-slot, magneto-resistive					
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	543 867 SMT-8M-PS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 866 SMT-8M-PS-24V-K-0,3-M8D
			Plug M12x1, 3-pin	0.3	543 869 SMT-8M-PS-24V-K-0,3-M12
	Insertable in the slot lengthwise, flush with the cylinder profile	NPN	Cable, 3-wire	2.5	543 870 SMT-8M-NS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 871 SMT-8M-NS-24V-K-0,3-M8D
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	Cable, 3-wire	2.5	175 436 SMT-8-PS-K-LED-24-B
			Plug M8x1, 3-pin	0.3	175 484 SMT-8-PS-S-LED-24-B
N/C contact					
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7.5	543 873 SMT-8M-PO-24V-K7,5-OE

# Radial grippers HGR

Accessories

FESTO

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data → Internet: sme	
	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 → Internet: nebu	
	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>

# Product Range and Company Overview

## A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



**Custom Automation Components**  
Complete custom engineered solutions



**Custom Control Cabinets**  
Comprehensive engineering support and on-site services



**Complete Systems**  
Shipment, stocking and storage services

## The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



**Electromechanical**  
Electromechanical actuators, motors, controllers & drives



**Pneumatics**  
Pneumatic linear and rotary actuators, valves, and air supply



**PLCs and I/O Devices**  
PLC's, operator interfaces, sensors and I/O devices

## Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

## Quality Assurance, ISO 9001 and ISO 14001 Certifications

Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.



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Printed on recycled paper at New Horizon Graphic, Inc., FSC certified as an environmentally friendly printing plant.

# Festo North America

## United States

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For technical support,

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