

Radial grippers HGRC



Radial grippers HGRC

Key features

At a glance

General information

The compact and cost-optimised radial gripper consists of a two-part mirror-symmetrical housing made of die-cast zinc. The force generated by the linear motion of the piston is translated into the gripper jaw movement via a pneumatic piston, which acts directly on the gripper jaws

installed in the housing by means of a moment compensator in accordance with the rack and pinion principle. To ensure a low-backlash plain-bearing guide for the gripper jaws, appropriate guide elements are fitted in the housing and pretensioned by means of socket head screws.

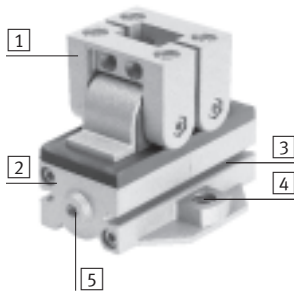
- Double-acting gripper
- Internal fixed flow control, does away with the need for external flow control in 90% of applications
- High force with minimal volume
- Suitable for external and internal gripping

- Opening angle of 180°
- Repetition accuracy of 0.05 mm
- Slot for proximity sensor SME/SMT-10
- Wide range of options for mounting on drives

Note

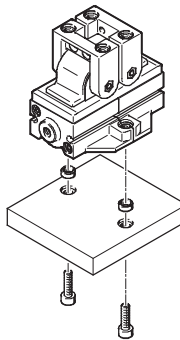
Sizing software for gripper selection
 → www.festo.com

Details

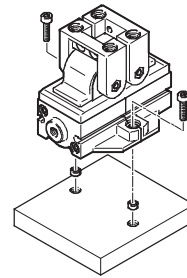


- 1 Gripper jaw
- 2 Housing based on half-shell principle
- 3 Slot for proximity sensor, for sensing the piston position
- 4 Mounting option
- 5 Supply port

Mounting option from underneath

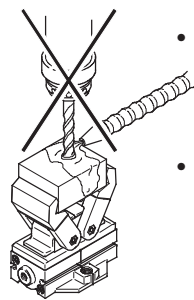


from above



Note

Radial grippers are not designed for the following sample applications:



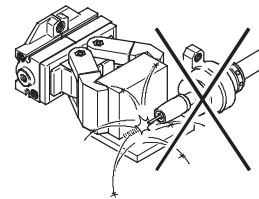
• Machining

• Aggressive media



• Grinding dust

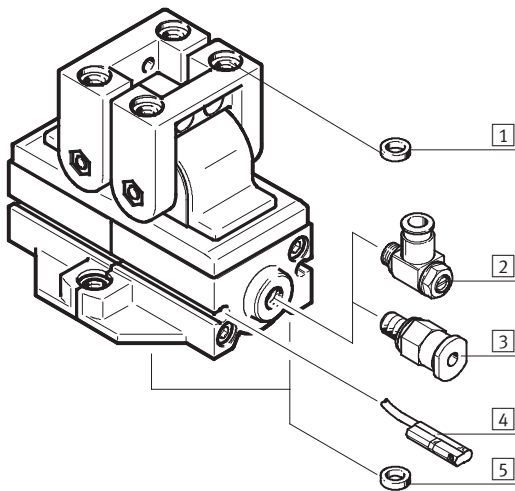
• Welding spatter



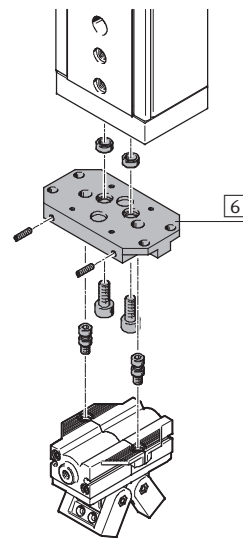
Radial grippers HGRC

Peripherals overview and type codes

Peripherals overview



System product for handling and assembly technology



Accessories			
Type	Brief description	Page/Internet	
1 Centring sleeve ZBH	<ul style="list-style-type: none"> For centring when attaching gripper fingers 4 included in the scope of delivery of the gripper 	12	
2 One-way flow control valve GRLA	For regulating speed	grla	
3 Push-in fitting QS	For connecting compressed air tubing with standard O.D.	quick star	
4 Proximity sensor SME/SMT-10	For sensing the piston position	12	
5 Centring sleeve ZBH	<ul style="list-style-type: none"> For centring when attaching to a drive or plate 2 included in the scope of delivery of the gripper 	12	
6 -	Drive/gripper connections	adapter kit	

Type codes

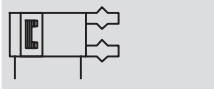
HGRC		-	12	-	A
Type					
HGRC	Radial gripper				
Size					
Position sensing					
A	Via proximity sensor				

Radial grippers HGRC

Technical data

FESTO

Function	-N-	Size
Double-acting		12, 16, 20 mm
HGRC-...-A	-T-	Opening angle
		180°



General technical data				
Size	12	16	20	
Design	Rack and pinion Force-guided motion sequence			
Mode of operation	Double-acting			
Gripper function	Radial			
Number of gripper jaws	2			
Max. opening angle	[°]	180		
Pneumatic connection	M5			
Repetition accuracy ¹⁾	[mm]	≤ 0.05		
Max. interchangeability	[mm]	≤ 0.2		
Max. gripper jaw backlash ²⁾	[mm]	≤ 0.1		
Max. gripper jaw angular backlash ³⁾	[°]	≤ 0.5		
Max. operating frequency	[Hz]	≤ 4		
Rotational symmetry	[mm]	≤ ∅ 0.2		
Position sensing	Via proximity sensor			
Type of mounting	Via female thread and centring sleeve			
Mounting position	Any			
Product weight	[g]	200	350	700

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

2) Perpendicular to the direction of motion of the gripper jaws

3) Pretensioned, backlash-free ball bearing guide

Operating and environmental conditions		
Operating pressure	[bar]	2 ... 8
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Ambient temperature ¹⁾	[°C]	+5 ... +60
Corrosion resistance class CRC ²⁾	2	

1) Note operating range of proximity sensors

2) Corrosion resistance class 2 according to Festo standard 940 070

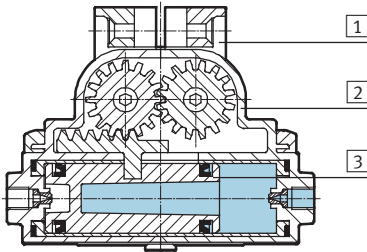
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

Radial grippers HGRC

Technical data

Materials

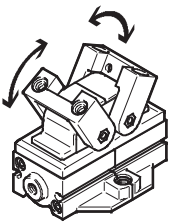
Sectional view



Radial gripper

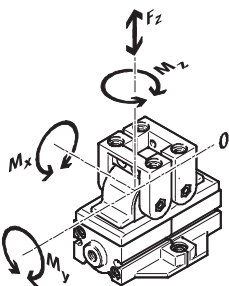
1	Gripper jaw	Die-cast zinc, painted
2	Housing	Die-cast zinc, painted
3	Piston	Polyamide
-	Seals	Polyurethane, nitrile rubber
-	Note on materials	Free of copper, PTFE and silicone
		RoHS-compliant

Total gripping torque at 6 bar



Size		12	16	20
Opening	[Ncm]	22	72	144
Closing	[Ncm]	22	72	144

Static characteristic load values at the gripper jaws



The indicated permissible forces and torques apply to a single gripper jaw. The indicated values include the lever arm, additional applied loads caused by the workpiece or external gripper fingers, as well as forces which occur

during movement.

The zero co-ordinate line (gripper jaw guide) must be taken into consideration for the calculation of torques.

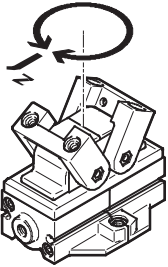
Size		12	16	20
Max. permissible force F_z	[N]	40	60	80
Max. permissible torque M_x	[Nm]	2.5	4	8
Max. permissible torque M_y	[Nm]	0.6	1	1.9
Max. permissible torque M_z	[Nm]	2	3.2	6.7

Radial grippers HGRC

Technical data

FESTO

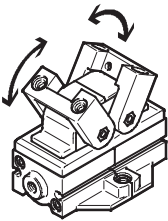
Mass moment of inertia



Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$] of the radial gripper in relation to the central axis with no load.

Size	12	16	20
HGRC-...-A	[$\text{kgm}^2 \times 10^{-4}$] 0.52	1.35	4.31

Opening and closing times [ms] at 6 bar



The indicated opening and closing times [ms] have been measured at room temperature and an operating pressure of 6 bar with vertically mounted gripper and without additional gripper fingers.

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

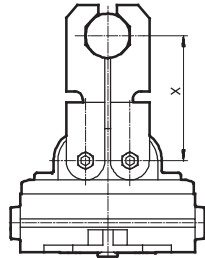
Size	12	16	20	
Without external gripper fingers				
HGRC-...-A	Opening	120	160	170
	Closing	100	150	160

Radial grippers HGRC

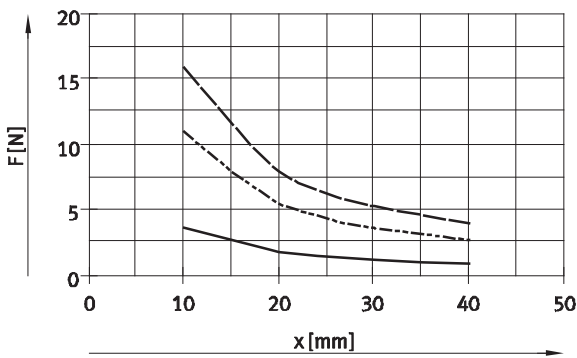
Technical data

Gripping force F_{Grip} per gripper jaw as a function of operating pressure and lever arm x

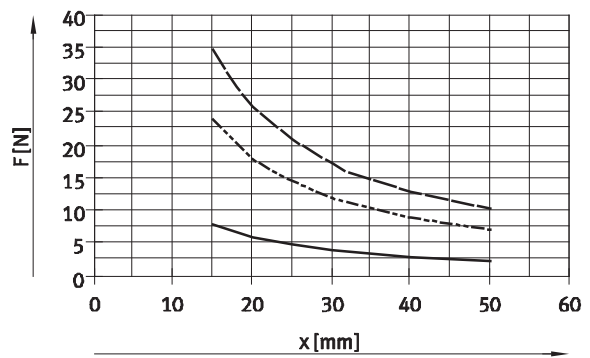
Gripping forces as a function of the operating pressure and the lever arm can be determined for the size using the following graph.



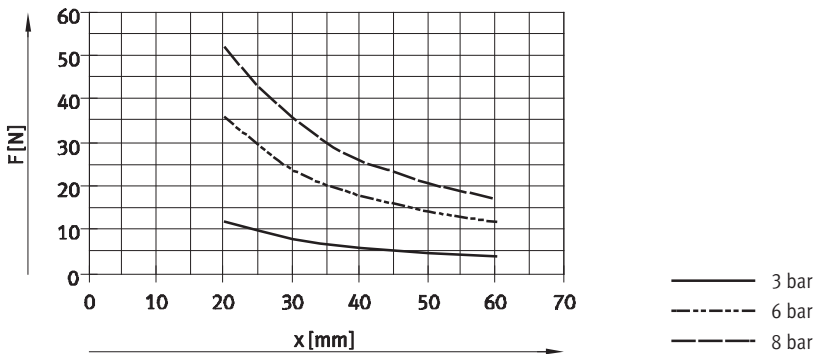
HGRC-12-A



HGRC-16-A



HGRC-20-A



- 3 bar
- - - 6 bar
- · - 8 bar

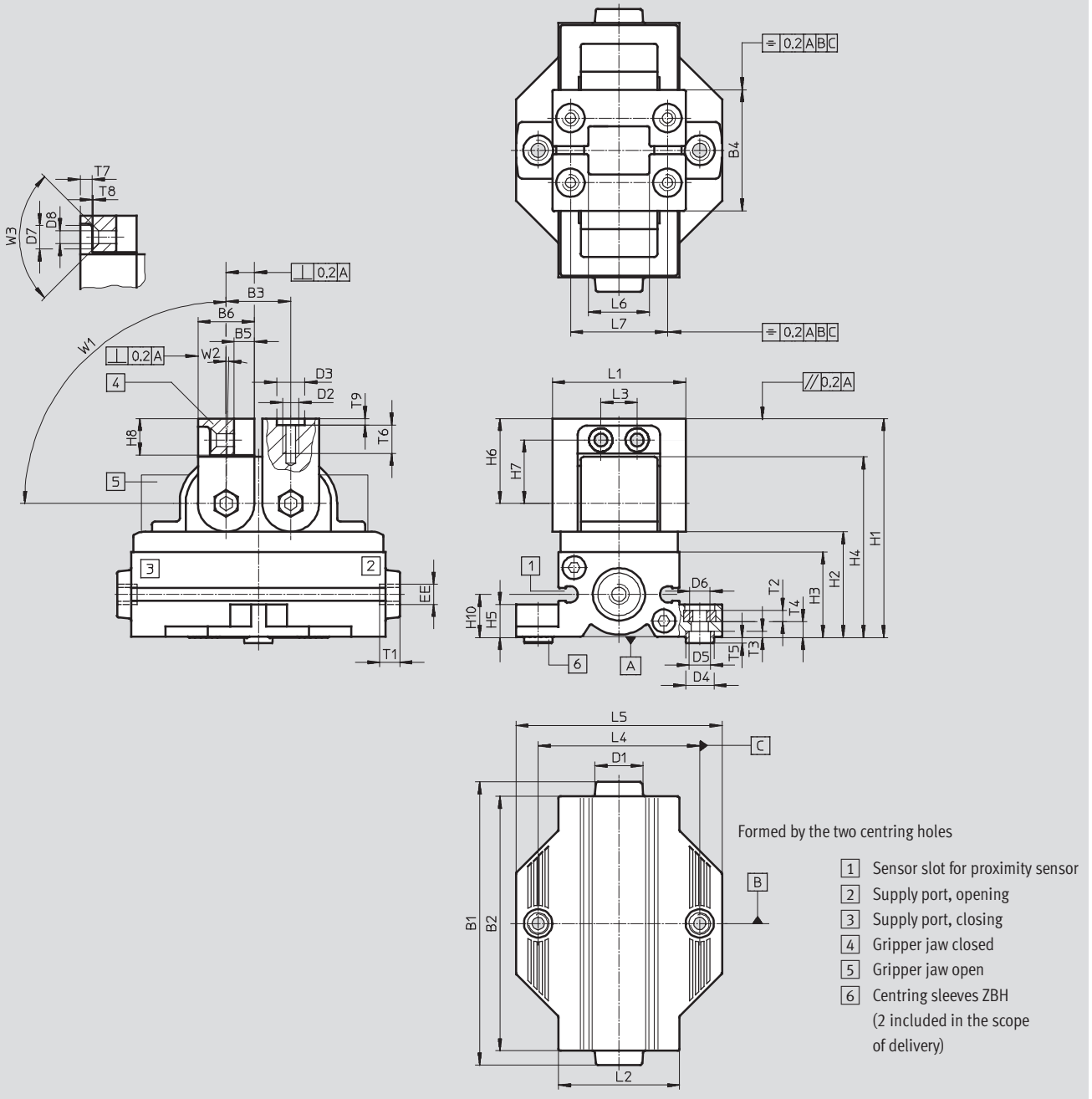
Radial grippers HGRC

Technical data

FESTO

Dimensions

Download CAD Data → www.festo.com/us/cad



Radial grippers HGRC

Technical data

FESTO

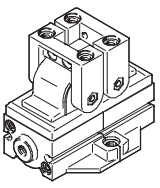
Type	B1	B2	B3 ±0.05	B4 +0.25 -0.05	B5 +0.5	B6 +0.1	D1	D2	D3 +0.05 -0.02	D4 F10/h7	D5
HGRC-12	57	52	12	23	4	11	12	M3	5	7	5.3
HGRC-16	70	63	16	30	5.5	14	12	M4	7	7	5.3
HGRC-20	86	79	20	38	6	18	12	M5	9	9	6.4

Type	D6	D7	D8	EE	H1 ±0.5	H2	H3	H4	H5	H6 ±0.2	H7
HGRC-12	M4	4.8	2.6	M5	43.2	20.7	18.2	35.2	6.9	17	12.5
HGRC-16	M5	5.8	3.2	M5	54.2	26.2	21.2	44.7	8.2	21	15.7
HGRC-20	M6	8.1	4.4	M5	68.2	32.7	27	55.7	10.2	26.5	19.5

Type	H8	H10	L1 ±0.2	L2	L3 ±0.1	L4 ¹⁾	L5	L6 +0.25 -0.05	L7 ¹⁾	T1 min.
HGRC-12	7.5	9.2	27.5	25.5	6	33	42	12	20	4.5
HGRC-16	9	10.7	33	30	9	40	51	15	24	5
HGRC-20	12	13.7	45	38	12	50	65	21	33	5

Type	T2	T3 ±0.1	T4 +0.4 -0.3	T5 +0.1 -0.3	T6 min.	T7 +0.2	T8	T9 +0.1	W1 ±2	W2 ±3	W3
HGRC-12	2.2	1.7	3.1	1.3	6	1.7	0.5	1.3	90°	1°	90°
HGRC-16	2.7	1.8	3.8	1.2	7	3	0.3	1.6	90°	1°	90°
HGRC-20	3.2	2.3	5.2	1.7	9	3.5	0.5	2.1	90°	1°	90°

1) Tolerance for centring hole ±0.03
Tolerance for thread ±0.2

Ordering data		
	Size [mm]	Double-acting Part No. Type
	12	565129 HGRC-12-A
	16	565131 HGRC-16-A
	20	565133 HGRC-20-A

Radial grippers HGRC

Accessories



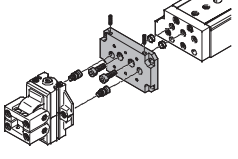
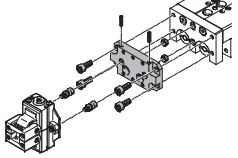
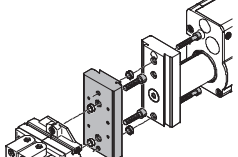
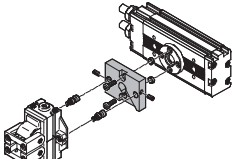
FESTO

Adapter kit HAPG

Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

Note

The kit includes the individual mounting interface as well as the necessary mounting material.

Permissible drive/gripper combinations with adapter kit					Download CAD Data → www.festo.com/us/cad	
Combination	Drive Size	Gripper Size	Mounting option		Adapter kit	
					CRC ¹⁾	Part No. Type
DGSL/HGRC	DGSL	HGRC			DHAA, HAPG	
	12, 16	12	■	■	2	529018 HAPG-58
	20, 25	16	■	■		191267 HAPG-49
	20, 25	20	■	■		191269 HAPG-51
SLT/HGRC	SLT	HGRC			DHAA, HAPG	
	10	12	–	■	2	542670 HAPG-100
	16	12	–	■		529018 HAPG-58
	16	16	–	■		542666 HAPG-101
	20	16	–	■		191267 HAPG-49
	20	20	–	■		542667 HAPG-102
	25	20	–	■		191269 HAPG-51
HMP/HGRC	HMP	HGRC			DHAA, HAPG	
	16	16	■	–	2	191263 HAPG-45
	20, 25	20	■	–		191264 HAPG-46
DRQD/HGRC	DRQD-...	HGRC			DHAA, HAPG	
	12, 16	12	■	■	2	542671 HAPG-SD2-41
	16, 20	16	■	■		542668 HAPG-SD2-42
	20	20	■	■		542669 HAPG-SD2-43
	25	20	■	■		542758 HAPG-SD2-44

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. 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.

Radial grippers HGRC

Accessories



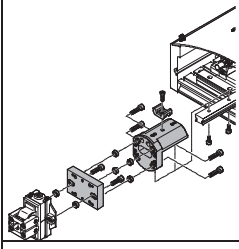
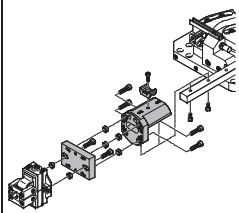
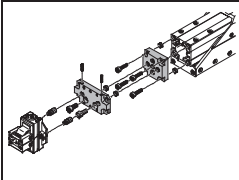
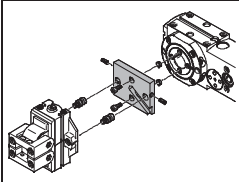


Adapter kit HAPG, HMSV

Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

Note

The kit includes the individual mounting interface as well as the necessary mounting material.


Permissible drive/gripper combinations with adapter kit					Download CAD Data → www.festo.com/us/cad		
Combination	Drive Size	Gripper Size	Mounting option		Adapter kit CRC ¹⁾	Part No.	Type
							
HSP/HGRC	HSP	HGRC			DHAA, HAPG		
	16	16	-	■	2	191901	HAPG-55
						540882	HAPG-71-B
	25	20	-	■		191901	HAPG-55
					540883	HAPG-72-B	
HSW/HGRC	HSW	HGRC			DHAA, HAPG		
	12	16	-	■	2	191901	HAPG-55
						540882	HAPG-71-B
	16	16	-	■		191901	HAPG-55
					540882	HAPG-71-B	
EGSA/HGRC	EGSA	HGRC			DHAA, HAPG, HMSV		
	50	12	■	■	2	560017	HMSV-61
						529018	HAPG-58
	60	16	■	■		560018	HMSV-62
						191267	HAPG-49
	60	20	■	■	560018	HMSV-62	
					191269	HAPG-51	
ERMB/HGRC	ERMB	HGRC			DHAA, HAPG		
	20	16	■	■	2	542668	HAPG-SD2-42
						542669	HAPG-SD2-43
	20	20	■	■		542758	HAPG-SD2-44
	25	20	■	■			

1) Corrosion resistance class 2 according to Festo standard 940 070
Components subject to moderate corrosion stress. 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.


Radial grippers HGRC


Accessories


FESTO



Ordering data – Centring sleeves			Technical data → Internet: zbh	
	For size [mm]	Part No.	Type	PU ¹⁾
	For attachment to a drive or on a plate			
	12, 16	186717	ZBH-7	10
	20	150927	ZBH-9	10
	For attaching gripper fingers			
	12	189652	ZBH-5	10
	16	186717	ZBH-7	10
	20	150927	ZBH-9	10

1) Packaging unit

Ordering data – Proximity sensors for C-slot, in-line connecting cable					
	Assembly	Electrical connection		Cable length [m]	Part No. Type
		Cable	Plug M8		
	N/O contact, magneto-resistive				Technical data → Internet: smt
	Insertable in slot	3-wire	–	2.5	551373 SMT-10M-PS-24V-E-2,5-L-OE
	from above	–	3-pin	0.3	551375 SMT-10M-PS-24V-E-0,3-L-M8D
	N/O contact, magnetic reed				Technical data → Internet: sme
	Insertable in slot	3-wire	–	2.5	173210 SME-10-KL-LED-24
	lengthwise	–	3-pin	0.3	173212 SME-10-SL-LED-24

Ordering data – Proximity sensors for C-slot, lateral connecting cable					
	Assembly	Electrical connection		Cable length [m]	Part No. Type
		Cable	Plug M8		
	N/O contact, magneto-resistive				Technical data → Internet: smt
	Insertable in slot	3-wire	–	2.5	551374 SMT-10M-PS-24V-E-2,5-Q-OE
	from above	–	3-pin	0.3	551376 SMT-10M-PS-24V-E-0,3-Q-M8D
	N/O contact, magnetic reed				Technical data → Internet: sme
	Insertable in slot	3-wire	–	2.5	173211 SME-10-KQ-LED-24
	lengthwise	–	3-pin	0.3	173213 SME-10-SQ-LED-24

Ordering data – Proximity sensors for C-slot, short design					
	Assembly	Electrical connection		Cable length [m]	Part No. Type
		Cable	Plug M8		
	N/O contact, magneto-resistive				Technical data → Internet: smt
	Insertable in slot	3-wire	–	2.5	547862 SMT-10G-PS-24V-E-2,5Q-OE
	lengthwise	–	3-pin	0.3	547863 SMT-10G-PS-24V-E-0,3Q-M8D

Ordering data – Connecting cables					
	Electrical connection, left	Electrical connection, right	Cable length [m]	Technical data → Internet: nebu	
				Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3
			5	541334	NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5	541341	NEBU-M8W3-K-5-LE3

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.



© Copyright 2008, Festo Corporation. While every effort is made to ensure that all dimensions and specifications are correct, Festo cannot guarantee that publications are completely free of any error, in particular typing or printing errors. Accordingly, Festo cannot be held responsible for the same. For Liability and Warranty conditions, refer to our "Terms and Conditions of Sale", available from your local Festo office. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of Festo. All technical data subject to change according to technical update.



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

Festo North America

Festo Regional Contact Center

5300 Explorer Drive
Mississauga, Ontario L4W 5G4
Canada

USA Customers:

For ordering assistance,

Call: 1.800.99.FESTO (1.800.993.3786)

Fax: 1.800.96.FESTO (1.800.963.3786)

Email: customer.service@us.festo.com

For technical support,

Call: 1.866.GO.FESTO (1.866.463.3786)

Fax: 1.800.96.FESTO (1.800.963.3786)

Email: product.support@us.festo.com

Canadian Customers:

Call: 1.877.GO.FESTO (1.877.463.3786)

Fax: 1.877.FX.FESTO (1.877.393.3786)

Email: festo.canada@ca.festo.com

USA Headquarters

Festo Corporation
395 Moreland Road
P.O. Box 18023
Hauppauge, NY 11788, USA
www.festo.com/us

USA Sales Offices

Appleton

North 922 Tower View Drive, Suite N
Greenville, WI 54942, USA

Boston

120 Presidential Way, Suite 330
Woburn, MA 01801, USA

Chicago

1441 East Business Center Drive
Mt. Prospect, IL 60056, USA

Dallas

1825 Lakeway Drive, Suite 600
Lewisville, TX 75057, USA

Detroit – Automotive Engineering Center

2601 Cambridge Court, Suite 320
Auburn Hills, MI 48326, USA

New York

395 Moreland Road
Hauppauge, NY 11788, USA

Silicon Valley

4935 Southfront Road, Suite F
Livermore, CA 94550, USA

United States



USA Headquarters, East: Festo Corp., 395 Moreland Road, Hauppauge, NY 11788

Phone: 1.631.435.0800; Fax: 1.631.435.8026;

Email: info@festo-usa.com

www.festo.com/us

Canada



Headquarters: Festo Inc., 5300 Explorer Drive, Mississauga, Ontario L4W 5G4

Phone: 1.905.624.9000; Fax: 1.905.624.9001;

Email: festo.canada@ca.festo.com

www.festo.ca

Mexico



Headquarters: Festo Pneumatic, S.A., Av. Ceylán 3, Col. Tequesquahuac,
54020 Tlalneantla, Edo. de México

Phone: 011 52 [55] 53 21 66 00; Fax: 011 52 [55] 53 21 66 65;

Email: festo.mexico@mx.festo.com

www.festo.com/mx

Central USA

Festo Corporation
1441 East Business
Center Drive
Mt. Prospect, IL 60056, USA
Phone: 1.847.759.2600
Fax: 1.847.768.9480



Western USA

Festo Corporation
4935 Southfront Road,
Suite F
Livermore, CA 94550, USA
Phone: 1.925.371.1099
Fax: 1.925.245.1286



Festo Worldwide

Argentina Australia Austria Belarus Belgium Brazil Bulgaria Canada Chile China Colombia Croatia Czech Republic Denmark
Estonia Finland France Germany Great Britain Greece Hong Kong Hungary India Indonesia Iran Ireland Israel Italy Japan Latvia
Lithuania Malaysia Mexico Netherlands New Zealand Norway Peru Philippines Poland Romania Russia Serbia Singapore
Slovakia Slovenia South Africa South Korea Spain Sweden Switzerland Taiwan Thailand Turkey Ukraine United States Venezuela

www.festo.com