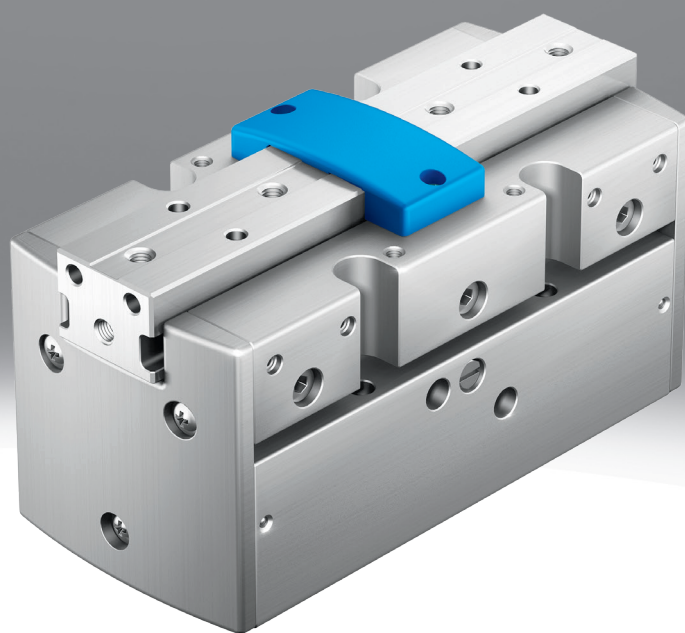


Parallel gripper HGPP

FESTO



Characteristics

At a glance

[Link](#) [hgpp](#)

- Double-acting piston drive
- Compression springs for supporting or retaining gripping forces, or for use as a single-acting gripper with only one supply port.
- Variable gripping direction (external/internal gripping)
- High-precision gripper jaw guide
- Wide range of supply ports
- Integrated sensing electronics
- Adaptable proximity switch with switch lugs

Highly flexible to versatile mounting, assembly and application options:

- Drives
- Externally adaptable gripper fingers
- Holder

These grippers are not designed for the following or similar application examples:

- Machining
- Aggressive media
- Grinding dust
- Welding spatter

Engineering tools

[Link](#) [engineering tools](#)



Save time with engineering tools Smart Engineering for the optimal solution. Our goal is to increase your productivity. Our engineering tools play an integral part in this. They help you size your system correctly, tap into unimagined productivity reserves and generate additional productivity along the entire value chain. In every phase of your project, from the initial contact to the modernisation of your machine, you will come across a number of different tools which will be of use to you.

Gripper selection:

- This tool helps you to select the right grippers by simply entering the exact parameters for your application

Diagrams

[Link](#) [hgpp](#)



The diagrams shown in this document are also available online. These can be used to display precise values.

Position sensing

[A] For proximity sensor

By using proximity switches, any position can be detected.

Gripping force backup

[G1] Opening



Opened by spring force in depressurised state

[G2] N/O contact



Closed by spring force in depressurised state

Type code

001	Series
HGPP	Parallel gripper, precise

002	Size [mm]
10	10
12	12
16	16
20	20
25	25
32	32

003	Position sensing
A	For proximity sensor

004	Gripping force backup
	None
G1	Opening
G2	N/O contact

Datasheet

General technical data

Size	10	12	16	20	25	32
Stroke per gripper jaws	2	2.5	5	7.5	10	12.5
Design	Rack and pinion					
Drive system	Pneumatic					
Mode of operation	Double-acting					
Gripping force backup	None Opening N/O contact					
Gripper function	Parallel					
Number of gripper jaws	2					
Max. mass per external gripper finger ¹⁾	50 g	100 g	150 g	200 g	250 g	300 g
Pneumatic connection ²⁾	M3		M5			G1/8
Repetition accuracy, gripper ³⁾	≤0.02 mm					
Max. replacement accuracy	0.1 mm					
Max. gripper jaw backlash Sz	0 mm					
Max. angular gripper jaw backlash ax, ay	0 deg					
Max. operating frequency of gripper	4 Hz					
Rotationally symmetrical	0.05 mm					
Position detection	Via Hall sensor Via inductive sensors					
Type of mounting	Via female thread					

1) Applies to unthrottled operation

2) HGPP-32: pneumatic port lateral G1/8; pneumatic port underneath M5

3) Under constant exposure to operating conditions, end position variation occurs in the direction of movement of the gripper jaws, at 100 consecutive strokes

Operating and environmental conditions

Size	10	12	16	20	25	32
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]					
Note on operating and pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)					
Ambient temperature ¹⁾	5 ... 60°C					
Corrosion resistance class CRC ²⁾	2 - Moderate corrosion stress					

1) Note the operating range of the proximity switches

2) More information www.festo.com/catalogue/ukb

Operating pressure – HGPP-10 ... 16

Size	10			12			16		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact	None	Opening	N/O contact
Operating pressure	2 ... 8 bar		5 ... 8 bar	2 ... 8 bar		5 ... 8 bar	2 ... 8 bar		5 ... 8 bar

Operating pressure – HGPP-20 ... 32

Size	20			25			32		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact	None	Opening	N/O contact
Operating pressure	2 ... 8 bar		5 ... 8 bar	2 ... 8 bar		5 ... 8 bar	2 ... 8 bar		5 ... 8 bar

Weight – HGPP-10 ... 16

Size	10			12			16		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact	None	Opening	N/O contact
Product weight	126 g	127 g		172 g	173 g		315 g	316 g	317 g

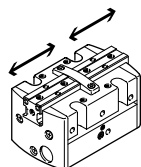
Weights – HGPP-20 ... 32

Size	20			25			32		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact	None	Opening	N/O contact
Product weight	604 g	611 g	615 g	884 g	910 g	898 g	1,408 g	1,438 g	1,427 g

Datasheet

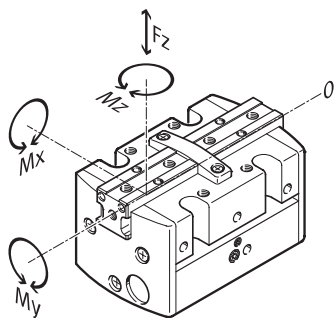
Materials						
Size	10	12	16	20	25	32
Material housing	Hard anodised wrought aluminium alloy					
Material gripper jaws	Wrought aluminium alloy, nickel-plated					
Material cover cap	POM					
Note on materials	RoHS-compliant					
LABS (PWS) conformity	VDMA24364-B2-L					

Measured gripping force with a lever arm of 20 mm



Size	10	12	16	20	25	32
Total gripping force, closing, 0.6MPa (6bar, 87 psi)	80 N	116 N	204 N	340 N	500 N	830 N
Total gripping force, opening, 0.6MPa (6bar, 87 psi)	80 N	116 N	204 N	340 N	500 N	830 N
Gripper force per gripper jaw, closing, 0.6 MPa (6 bar, 87 psi)	40 N	58 N	102 N	170 N	250 N	415 N
Gripper force per gripper jaw, opening, 0.6 MPa (6 bar, 87 psi)	40 N	58 N	102 N	170 N	250 N	415 N

Characteristic load values for the gripper jaws

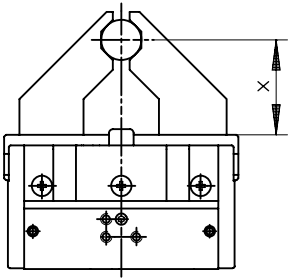


The indicated permissible forces and torques refer to a single gripper jaw. They include the lever arm, additional applied loads created by the workpiece or external gripper fingers, and acceleration forces occurring during movement. The zero coordinate line (centre of rotation of the gripper jaws) must be taken into account when calculating the torques. Furthermore, the maximum permissible forces that can be transferred to the housing have been applied; for example, the forces that can be absorbed by a guiding plate during a press-fit process.

Size	10	12	16	20	25	32
Max. force on gripper jaw Fz static	40 N	70 N	130 N	220 N	380 N	720 N
Max. torque at gripper Mx static	1.5 Nm	3 Nm	7 Nm	14 Nm	21 Nm	30 Nm
Max. torque at gripper My static	1.5 Nm	3 Nm	7 Nm	14 Nm	21 Nm	30 Nm
Max. torque at gripper Mz static	1.5 Nm	3 Nm	7 Nm	14 Nm	21 Nm	30 Nm

Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x

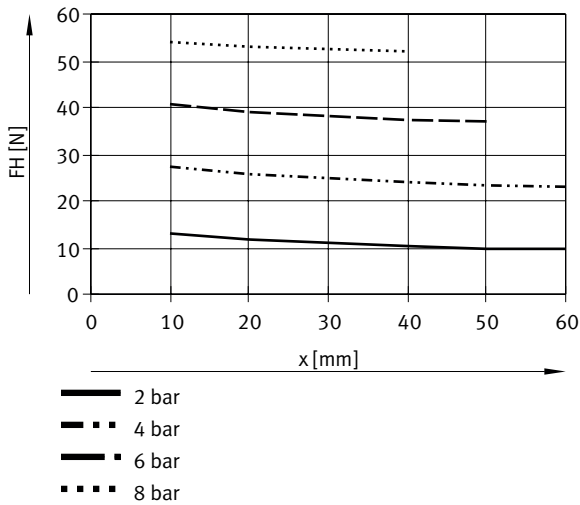


The gripping forces as a function of operating pressure and lever arm can be determined using the following graphs.

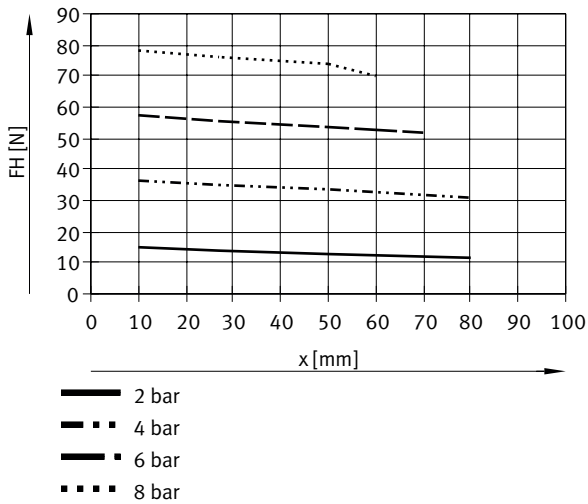
The gripping torque is not constant across the opening angle.

Sizing software for gripper selection → <https://www.festo.com/x/topic/eng>

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – HGPP-10

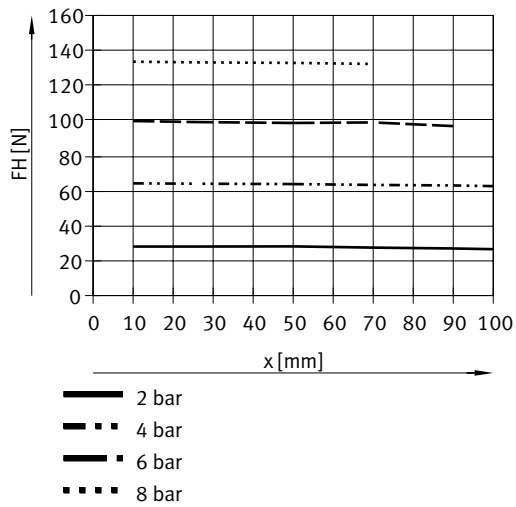


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – HGPP-12

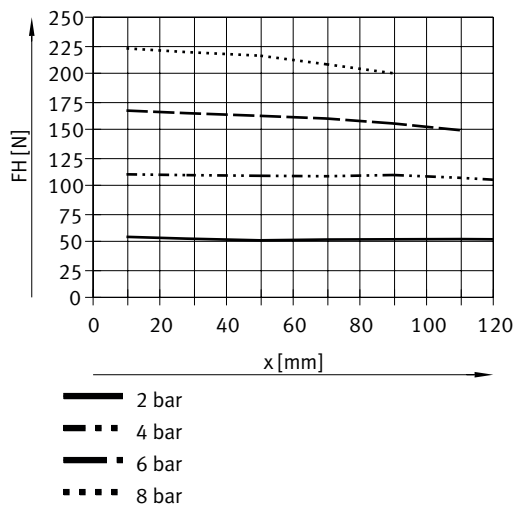


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x - HGPP-16

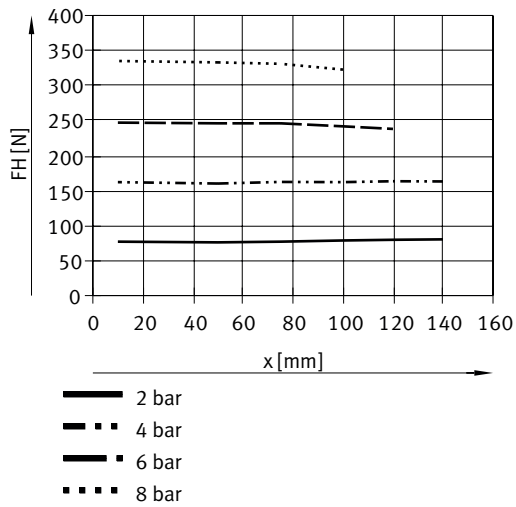


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x - HGPP-20

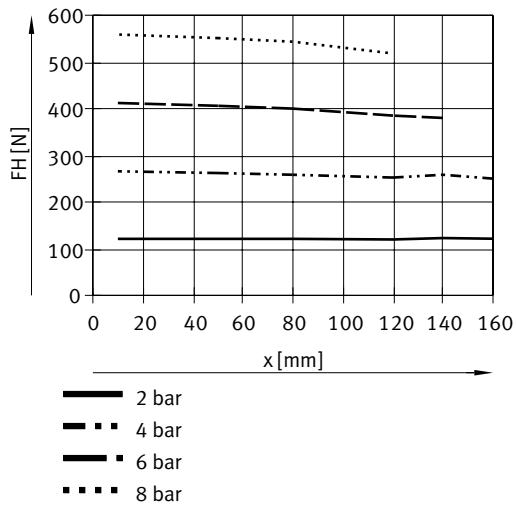


Datasheet

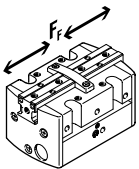
Gripping force F_H per gripper jaw as a function of operating pressure and lever arm x – HGPP-25



Gripping force F_H per gripper jaw as a function of operating pressure and lever arm x – HGPP-32

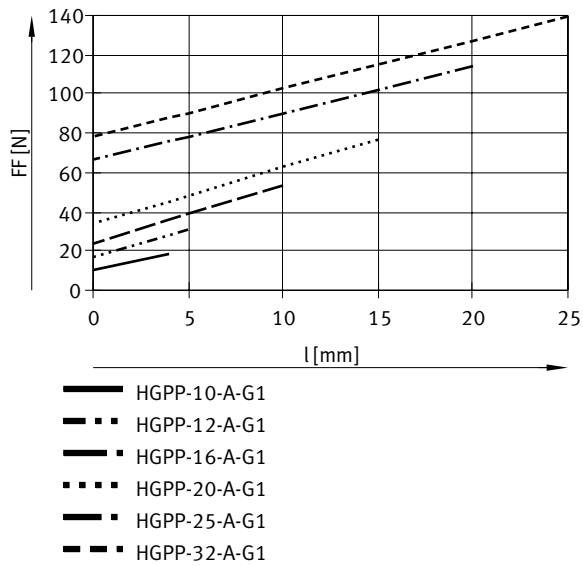


Spring force F_F as a function of size and gripper jaw stroke l – with gripping force retention

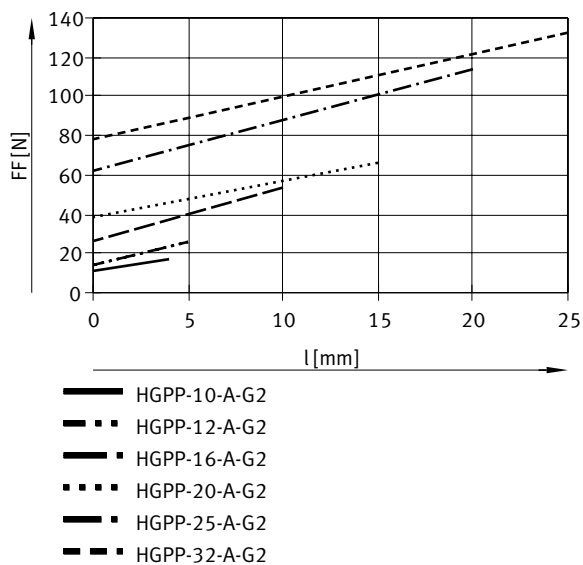


Datasheet

Spring force FF as a function of size and total stroke length l – with gripping force retention, opening – HGPP-...-G1



Spring force FF as a function of size and the total stroke length l – with gripping force retention, closing – HGPP-...-G2



Determining actual gripping forces FG_r for HGPP-...-G1 and HGPP-...-G2 as a function of the application

The grippers with integrated spring type HGPP-...-G1 (gripping force retention, opening) and HGPP-...-G2 (gripping force retention, closing) can be used as:

- Single-acting grippers
 - Gripper with gripping force support and
 - Gripper with gripping force retention
- can be used.

To calculate the available gripping forces FG_r (per gripper jaw), the data for gripping force FH and spring force FF must be combined accordingly.

Datasheet

Determining actual gripping forces F_{Gr} for HGPP-...-G1 and HGPP-...-G2 as a function of the application – application

The resulting gripping force F_{Gr} as a function of the application depends on the gripping direction (external/internal gripping) and the gripper design (with/without return spring). The spring force is added according to the design and gripping direction.

Single-acting:

- Gripping with spring force: $F_{Gr} = FF$
- Gripping with pressure force: $F_{Gr} = FH - FF$

Gripping force support:

- Gripping with pressure and spring force: $F_{Gr} = FH + FF$

Gripping force retention

- Gripping with spring force: $F_{Gr} = FF$

HGPT-... (internal/external gripping):

- Pressurised (in gripping direction): $F_{Gr} = FH$
- Unpressurised: $F_{Gr} = 0$

HGPT-...-G1 (internal gripping):

- Pressurised (in gripping direction): $F_{Gr} = FH + FF$
- Unpressurised: $F_{Gr} = FF$

HGPT-...-G1 (external gripping):

- Pressurised (in gripping direction): $F_{Gr} = FH - FF$
- Unpressurised: $F_{Gr} = 0$

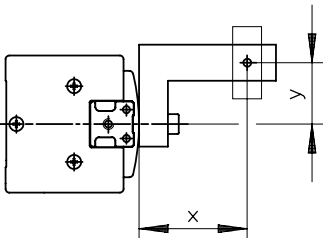
HGPT-...-G2 (internal gripping):

- Pressurised (in gripping direction): $F_{Gr} = FH - FF$
- Unpressurised: $F_{Gr} = 0$

HGPT-...-G2 (external gripping):

- Pressurised (in gripping direction): $F_{Gr} = FH + FF$
- Unpressurised: $F_{Gr} = FF$

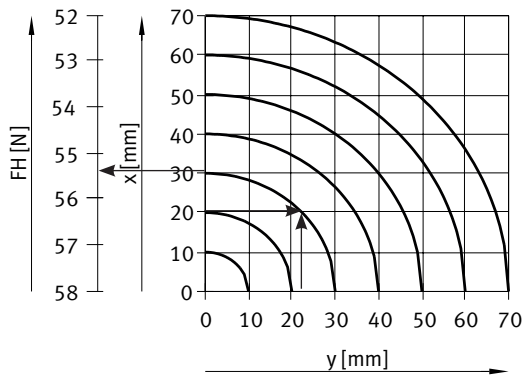
Gripping force F_H per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y



Gripping forces at 0.6 MPa (6 bar, 87 psi) as a function of eccentric application of force and the maximum permissible off-centre point of force application can be determined for the various sizes using the following graphs.

Datasheet

Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y – calculation example



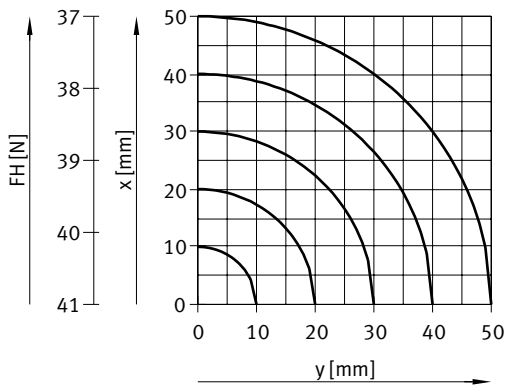
Where:
 HGPP-12-A
 Lever arm $x = 20 \text{ mm}$
 Eccentricity $y = 22 \text{ mm}$

To be determined:
 At 0.6 MPa (6 bar, 87 psi)

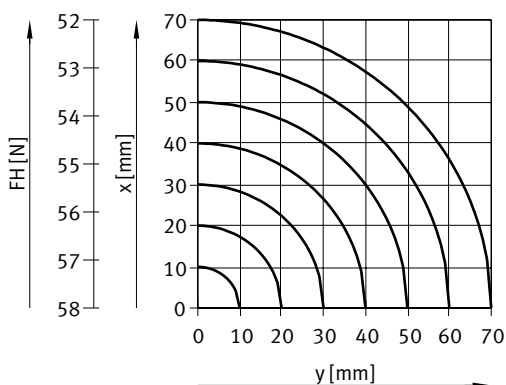
- Procedure:
- Determine the intersection xy between lever arm x and eccentricity y in the graph for HGPP-12-A
 - Draw an arc (with centre at origin) through the intersection xy
 - Determine the intersection between the arc and X-axis
 - Reading the gripping force

Results:
 Gripping force = approx. 55 N

Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y - HGPP-10

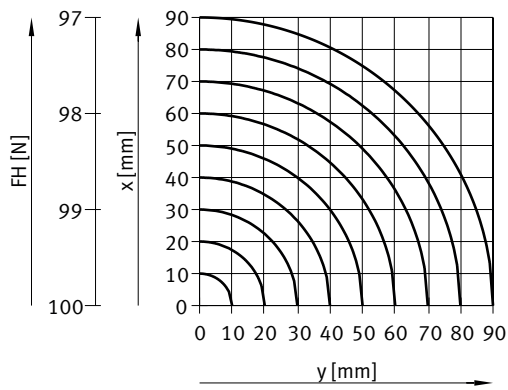


Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y - HGPP-12

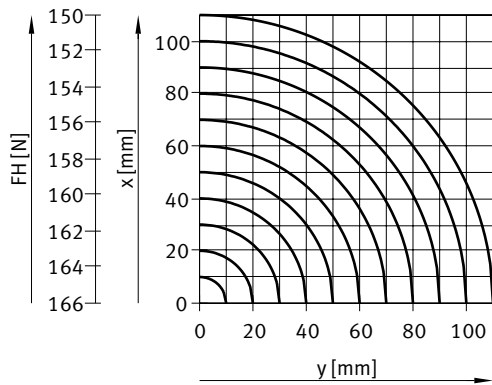


Datasheet

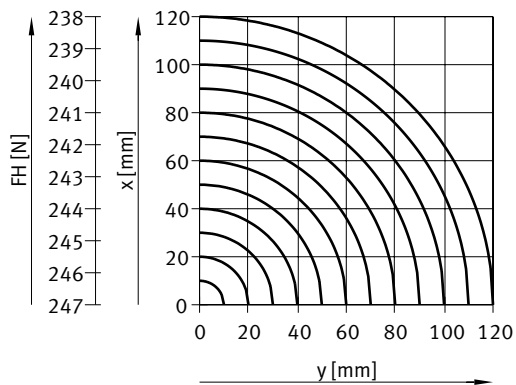
Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y – HGPP-16



Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y – HGPP-20

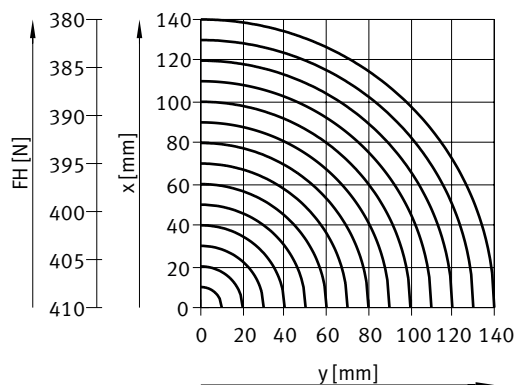


Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y – HGPP-25

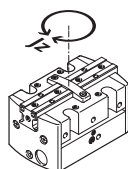


Datasheet

Gripping force FH per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity y – HGPP-32



Mass moments of inertia



Mass moment of inertia of the parallel grippers in relation to the central axis, without external gripper fingers, with no load.

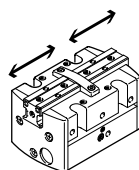
Mass moments of inertia – HGPP-10 ... 16

Size	10			12			16		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact	None	Opening	N/O contact
Mass moment of inertia	0.43 kgcm ²	0.45 kgcm ²	0.43 kgcm ²	0.73 kgcm ²	0.76 kgcm ²	0.74 kgcm ²	2.39 kgcm ²	2.58 kgcm ²	2.45 kgcm ²

Mass moments of inertia – HGPP-20 ... 32

Size	20			25			32		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact	None	Opening	N/O contact
Mass moment of inertia	6.22 kgcm ²	6.71 kgcm ²	6.27 kgcm ²	16.68 kgcm ²	17.45 kgcm ²	16.85 kgcm ²	38.34 kgcm ²	39.21 kgcm ²	38.63 kgcm ²

Opening and closing times – HGPP-10 ... 12



The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 0.6 MPa (6 bar, 87 psi) with a horizontally mounted gripper without additional gripper fingers.

The mass [g] to be moved is increased by attaching external gripper fingers. This means that the kinetic energy, which is determined by the mass of the gripper fingers and the speed, increases at the same time. If the permissible kinetic energy is exceeded, various components of the gripper can be destroyed. This happens when the moving mass hits the end position and the cushioning is only able to partially convert the kinetic energy into potential and thermal energy. This shows that the specified maximum permissible mass per gripper finger must be checked and adhered to.

The gripper must be throttled for higher masses. Opening and closing times must then be set accordingly.

Size	10			12		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact
Min. opening time at 0.6 MPa (6 bar, 87 psi)	22 ms	24 ms	26 ms	27 ms	30 ms	37 ms
Min. closing time at 0.6 MPa (6 bar, 87 psi)	34 ms	95 ms	32 ms	40 ms	70 ms	40 ms

Datasheet

Opening and closing times – HGPP-16 ... 20

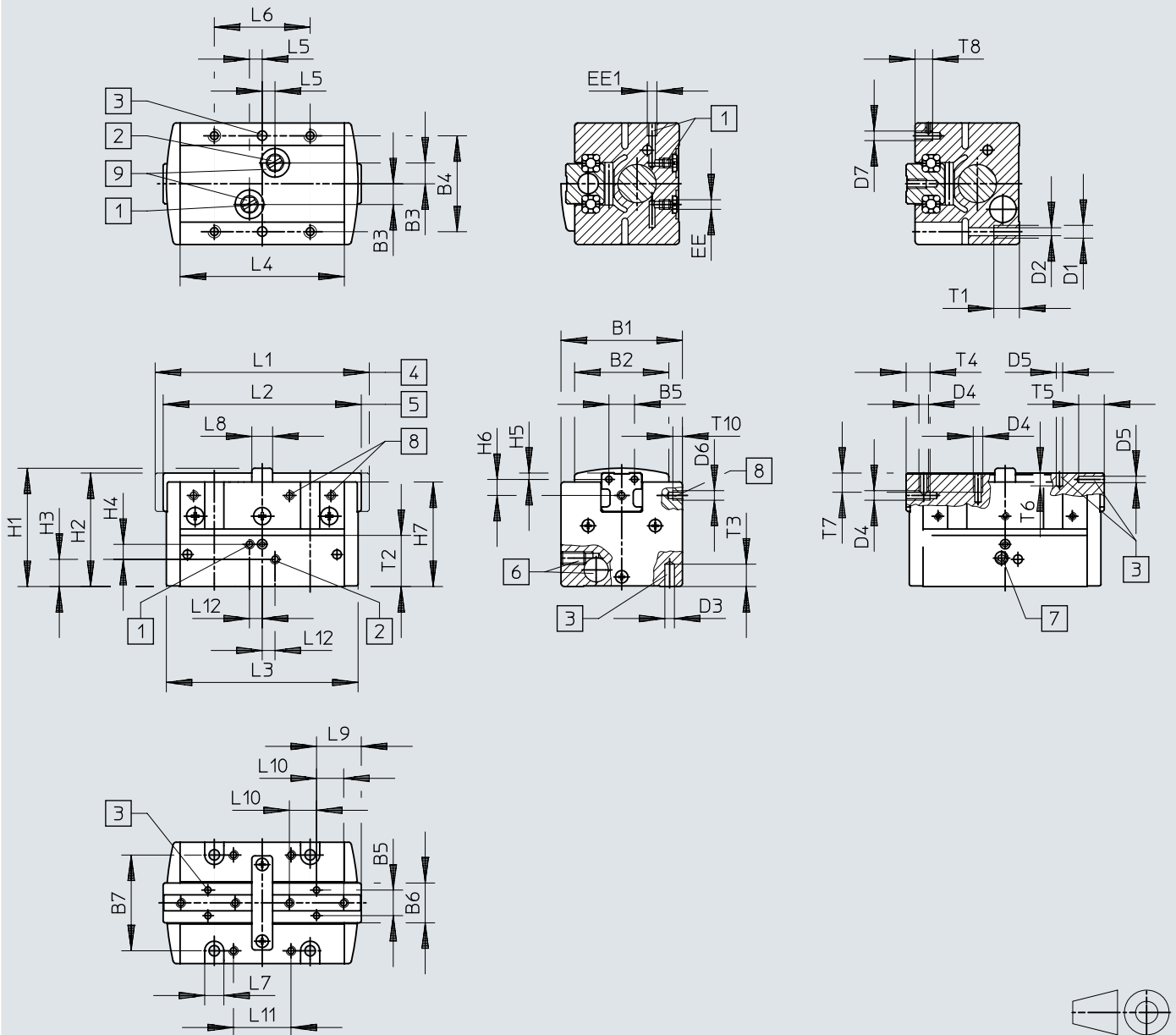
Size	16			20		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact
Min. opening time at 0.6 MPa (6 bar, 87 psi)	40 ms	34 ms	57 ms	44 ms	45 ms	62 ms
Min. closing time at 0.6 MPa (6 bar, 87 psi)	53 ms	70 ms	46 ms	59 ms	92 ms	58 ms

Opening and closing times – HGPP-25 ... 32

Size	25			32		
Gripping force backup	None	Opening	N/O contact	None	Opening	N/O contact
Min. opening time at 0.6 MPa (6 bar, 87 psi)	64 ms	58 ms	105 ms	76 ms	64 ms	103 ms
Min. closing time at 0.6 MPa (6 bar, 87 psi)	92 ms	164 ms	90 ms	110 ms	173 ms	101 ms

Dimensions

Dimensions – Parallel gripper HGPP

Download CAD data www.festo.com

Dimensions

	B1 +0,3	B2 ±0,1	B3 ±0,05	B4 ±0,02 ¹⁾ ±0,1 ²⁾	B5 ±0,02	B6 ±0,1	B7 ±0,1	D1	D2 ∅ +0,1	D3 ∅ H8	D4	D5 ∅ H8
HGPP-10	33	26	6,5	27	8	12,5	27	M4	3,3	3	M3	2
HGPP-12	38	29,5	6,5	30	8	12,5	30	M4	3,3	3	M3	2
HGPP-16	42	30,5	8,5	32	10	16	32	M4	3,3	3	M3	2,5
HGPP-20	48	36,5	10	40	12	20	40	M5	4,2	3	M4	3
HGPP-25	55	42	12	45	15	25	45	M6	5,1	5	M5	4
HGPP-32	62	45	14	52	18	30	52	M6	5,1	5	M6	5

	D6	D7	D8 ∅ H11	EE	EE1	H1	H2 ±0,1	H3	H4 ±0,1	H5 ±0,02
HGPP-10	M2	M3	9	M3	M3	32,7 ±0,15	31,4	8,9 ±0,25	3,7	2
HGPP-12	M2	M3	9	M3	M3	37 +0,3/-0,1	35,5	8,5 ±0,3	4,7	2
HGPP-16	M2	M3	12,1	M5	M5	42,5 +0,4/-0,1	40,9	8,3 ±0,2	6,8	3
HGPP-20	M2	M3	12,1	M5	M5	55,5 +0,4/-0,1	53,48	15,5 ±0,2	8	3
HGPP-25	M2	M3	12,1	M5	M5	57,5 ±0,15	56	12,5 ±0,25	7,5	4
HGPP-32	M2	M4	12,1	M5	G1/8	68,6 ±0,15	67	12,5 ±0,25	11	5

	H6 ±0,12	H7 -0,3	L1 ±0,5	L2 ±0,5	L3 ±0,25	L4 ±0,05	L5 ±0,05	L6 ±0,1	L7	L8 ±0,1	L9 ±0,02	L10 ±0,05
HGPP-10	2,6	28,7	62	58	56	47,4	5	27	6	6	13,5	7,5
HGPP-12	5	32,7	67	62	60	51,4	4	30	6	6,5	14	8,5
HGPP-16	5	37,1	98	88	86	76	6,5	40	6	12	17,5	11,5
HGPP-20	7	48,5	120	105	103	92	7,5	40	8	18	21	13,5
HGPP-25	8	51	163	143	139,4	127,4	12	45	9	22	29,8	17
HGPP-32	9	60,5	197,4	172,4	169,4	155,4	15	52	9	27	33,5	20

	L11 ±0,1	L12 ±0,05	T1	T2	T3	T4	T5	T6	T7	T8	T9 +0,1	T10
HGPP-10	15	4	8	14,85	6	8	5	4	6	3,8	1	3
HGPP-12	18	4	8	16	6	7,5	5	4	6	5,5	1	3
HGPP-16	24	6,5	10	19,5	7	8	6	4,5	6	5	1,3	4
HGPP-20	26	7,5	12	28,5	7	10	8	7	8	6	1,3	7
HGPP-25	28	12	12	27	10	10	8	8	10	6	1,3	8
HGPP-32	35	15	12	34,5	10	10	10	10	10	8	1,3	8

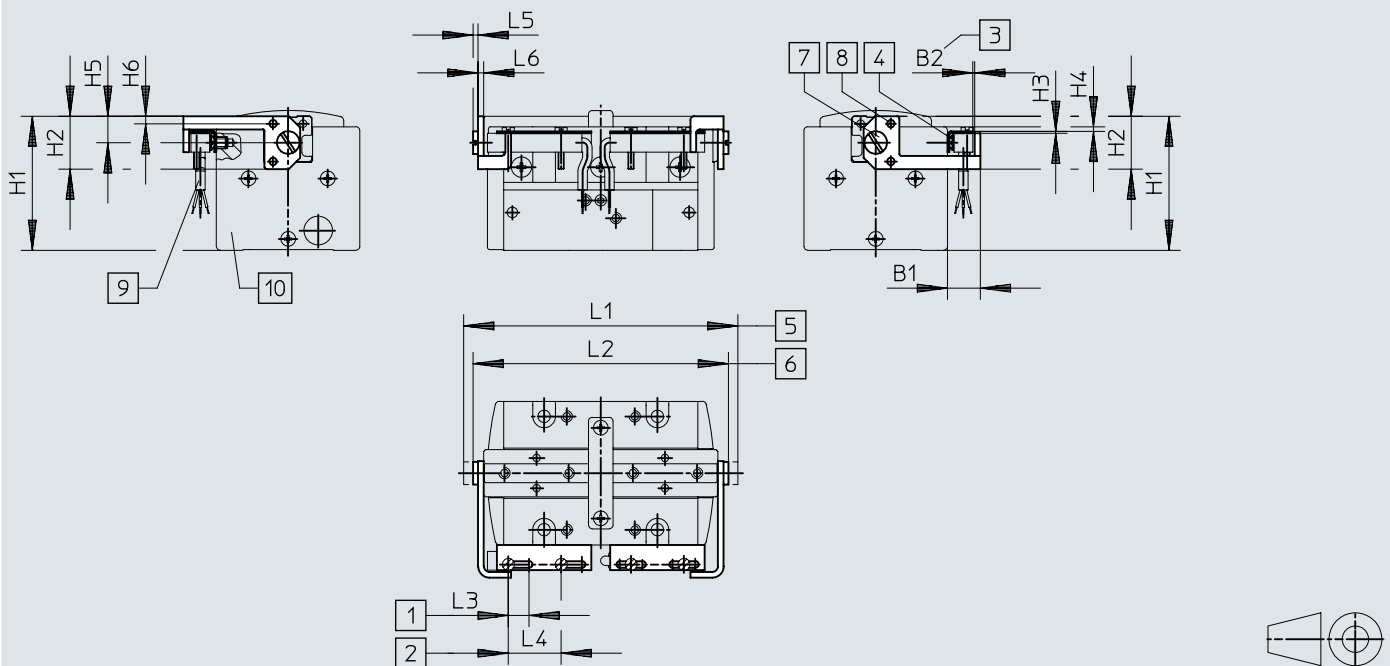
1) For locating hole

2) For thread and through-hole

Dimensions

Dimensions – Mounting kit HGPP-HWS-Q5

Download CAD data www.festo.com



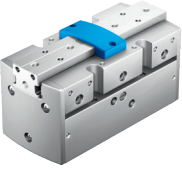
- [1] Adjusting range for position sensing
- [2] Mounting distance for proximity switch SIES-Q5B
- [3] Sensing distance
- [4] Mounting for sensor bracket
- [5] Gripper jaws open
- [6] Gripper jaws closed
- [7] Retaining screw for switch lug
- [8] Dowel pin
- [9] Proximity switch SIES-Q5B (must be ordered separately)
- [10] Parallel gripper HGPP

		B1	B2	H1	H2	H3	H4	H5
HGPP-10	HGPP-HWS-Q5-1	8,7	0,5	35,5	14	0,5	1,2	7
HGPP-12	HGPP-HWS-Q5-2	8,7	0,5	35,5	14	0,5	1,2	7
HGPP-16	HGPP-HWS-Q5-3	8,5	0,5	35,4	16	0,5	1,2	8
HGPP-20	HGPP-HWS-Q5-4	8,5	0,5	36	20	0,5	2	10
HGPP-25	HGPP-HWS-Q5-5	9,5	0,55	46,3	24	1	3,7	12
HGPP-32	HGPP-HWS-Q5-6	9,5	0,55	55,5	28	1	4	14

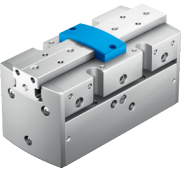
		H6	L1	L2	L3	L4	L5	L6
HGPP-10	HGPP-HWS-Q5-1	2	67,6	63,6	5,5	14	1,8	1,5
HGPP-12	HGPP-HWS-Q5-2	2	73,6	68,6	5,5	14	1,8	1,5
HGPP-16	HGPP-HWS-Q5-3	3	105,6	95,6	8,5	14	1,8	2
HGPP-20	HGPP-HWS-Q5-4	3	126,8	111,8	8,5	14	2,4	2
HGPP-25	HGPP-HWS-Q5-5	4	171	151	28	14	3	2
HGPP-32	HGPP-HWS-Q5-6	5	206,6	181,6	28	14	3,6	2

Ordering data


Double-acting, without compression spring

	Size	Stroke per gripper jaws	Product weight	Part no.	Type
	10	2 mm	126 g	525658	HGPP-10-A
	12	2.5 mm	172 g	187867	HGPP-12-A
	16	5 mm	315 g	187870	HGPP-16-A
	20	7.5 mm	604 g	187873	HGPP-20-A
	25	10 mm	884 g	525661	HGPP-25-A
	32	12.5 mm	1,408 g	525664	HGPP-32-A

Single-acting or with gripping force retention, opening

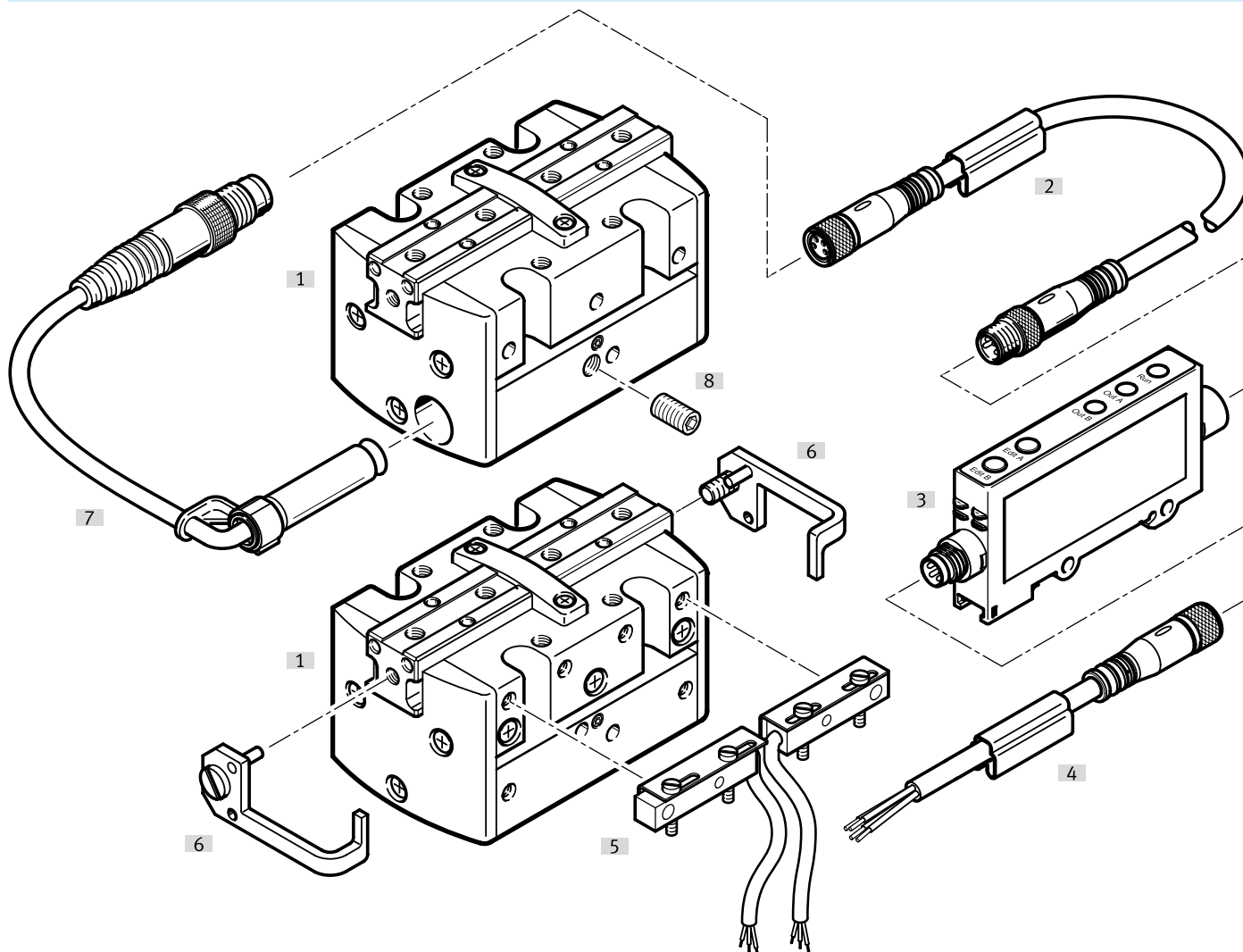
	Size	Stroke per gripper jaws	Product weight	Part no.	Type
	10	2 mm	127 g	525659	HGPP-10-A-G1
	12	2.5 mm	173 g	187868	HGPP-12-A-G1
	16	5 mm	316 g	187871	HGPP-16-A-G1
	20	7.5 mm	611 g	187874	HGPP-20-A-G1
	25	10 mm	910 g	525662	HGPP-25-A-G1
	32	12.5 mm	1,438 g	525665	HGPP-32-A-G1

Single-acting or with gripping force retention, closing

	Size	Stroke per gripper jaws	Product weight	Part no.	Type
	10	2 mm	127 g	525660	HGPP-10-A-G2
	12	2.5 mm	173 g	187869	HGPP-12-A-G2
	16	5 mm	317 g	187872	HGPP-16-A-G2
	20	7.5 mm	615 g	187875	HGPP-20-A-G2
	25	10 mm	898 g	525663	HGPP-25-A-G2
	32	12.5 mm	1,427 g	525666	HGPP-32-A-G2

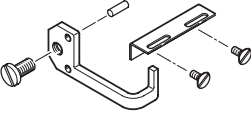
Peripherals

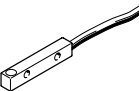
Peripherals overview

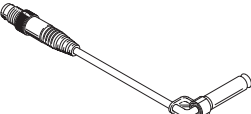


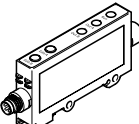
Accessories			→ Link
Type/order code	Description		
[1] Parallel gripper HGPP	Double-acting		hgpp
[2] Connecting cable NEBU	Connection between position sensor and signal converter		20
[3] Signal converter SVE	For evaluating signals for position sensor SMH-S1		20
[4] Connecting cable NEBU	Connection between signal converter and controller		20
[5] Proximity switch SIES-Q5B	Can be mounted with mounting kit HGPP-HWS-Q5		20
[6] Mounting kit HGPP-HWS-Q5	For mounting proximity switches SIES-Q5B, consisting of a retainer and a switch lug with retaining screws		20
[7] Position sensor SMH-S1	Can be integrated into the gripper		20
[8] Threaded pin	For mounting proximity switch SMH-S1		hgpp
[9] Adapter kit DHAA, HAPG	Drive/gripper connections		dhaa


Accessories

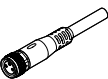
Mounting kit HGPP-HWS						
	Description	Part no.	Type			
	For size 10	532272	HGPP-HWS-Q5-1			
	For size 12	532273	HGPP-HWS-Q5-2			
	For size 16	532274	HGPP-HWS-Q5-3			
	For size 20	532275	HGPP-HWS-Q5-4			
	For size 25	532276	HGPP-HWS-Q5-5			
	For size 32	532277	HGPP-HWS-Q5-6			

Proximity switch SIES-Q5B Link sies						
	Description	Switching output	Electrical connection	Cable length	Part no.	Type
	For sizes 10...32	NPN	Open end	2.5 m	174548	SIES-Q5B-NO-K-L
		PNP			178290	SIES-Q5B-NS-K-L
		174549			SIES-Q5B-PO-K-L	
		178291			SIES-Q5B-PS-K-L	

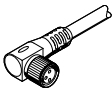
Position sensor SMH-S1 Link smh						
	Description	Output signal	Electrical connection	Cable length	Part no.	Type
	For size 10, For size 12	Analogue	Plug M8, A-coded	0.5 m	189040	SMH-S1-HGPP10/12
	For size 16				189041	SMH-S1-HGPP16
	For sizes 20, 25				189042	SMH-S1-HGPP20/25
	For size 32				526895	SMH-S1-HGPP32

Signal converter SVE4 Link sve4						
	analog input	Electrical connection (signal input)	Electrical connection (switching output)	Switching output	Part no.	Type
	Adapted for position sensors SMH-S1-HG	Socket M8x1, 4-pin	Plug M8x1, 4-pin	2xNPN	544219	SVE4-HS-R-HM8-2N-M8
				2xPNP	544216	SVE4-HS-R-HM8-2P-M8

Connecting cables NEBU, straight – connection between position sensor and signal converter						
	Electrical connection 1, connector system	Electrical connection 2, connector system	Electrical connection 2, number of connections/cores	Cable length	Part no.	Type
	M8x1, A-coded, to EN 61076-2-104	M8x1, A-coded to EN 61076-2-104	4	2.5 m	554035	NEBU-M8G4-K-2.5-M8G4

Connecting cables NEBU, straight – connection between signal converter and controller						
	Electrical connection 1, connector system	Electrical connection 2, connector system	Electrical connection 2, number of connections/cores	Cable length	Part no.	Type
	M8x1, A-coded, to EN 61076-2-104	Open end	4	2.5 m	541342	NEBU-M8G4-K-2.5-LE4
				5 m	541343	NEBU-M8G4-K-5-LE4

Accessories

Connecting cables NEBU, angled – connection between signal converter and controller						
	Electrical connection 1, connector system	Electrical connection 2, connector system	Electrical connection 2, number of connections/cores	Cable length	Part no.	Type
	M8x1, A-coded, to EN 61076-2-104	Open end	4	2.5 m	541344	NEBU-M8W4-K-2.5-LE4
				5 m	541345	NEBU-M8W4-K-5-LE4