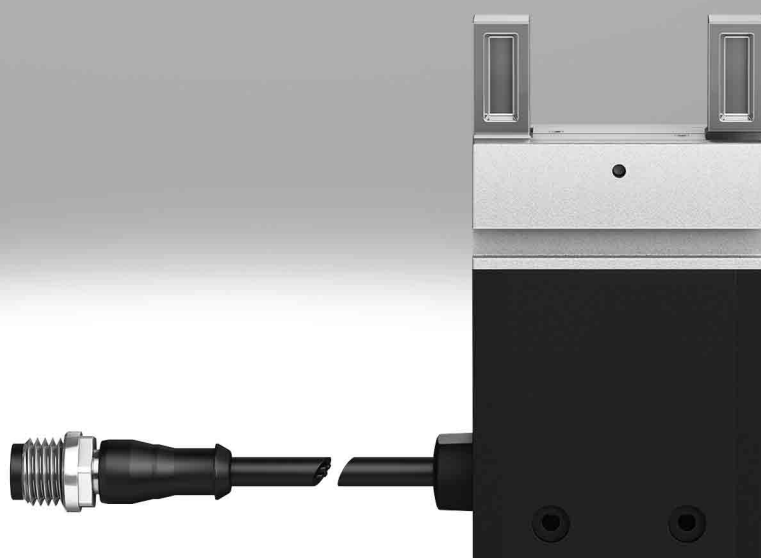


Parallel grippers EHPS, electric

FESTO



Parallel grippers EHPs, electric

Key features

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At a glance

Electrically driven

- Minimal installation effort – no valves, tubing or compressed air preparation required
- Low noise pollution
- Electrical safety to DIN EN 61010-1:2010

Actuation via digital I/O

- No external controller required
- Connection via terminal strip to terminal CPX or controller CECC

Adjustable gripping force (4 settings)

- Adaptation of the gripping force to sensitive workpieces
- Simple adjustment
- Very powerful

T-slot on the gripping head

- Direct position sensing of the gripper jaws possible
- Process reliability is guaranteed

Gripping force adjustment and status indication

Gripping force adjustment:

The gripping force of the gripper can be adjusted via the rotary switch. The switch has four settings and therefore four force levels, with no intermediate levels.

Status indication:

Ready lights up green:

Gripper ready for operation

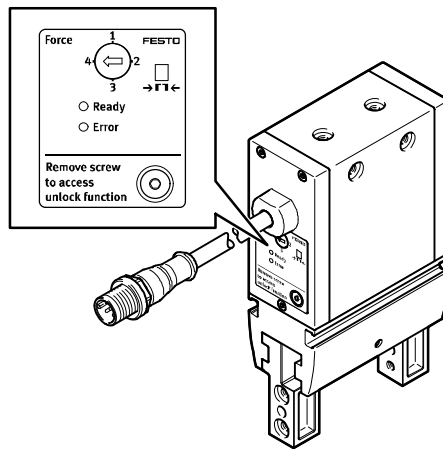
Error lights up red:

Problem with supply voltage

Error flashing red:

Device error

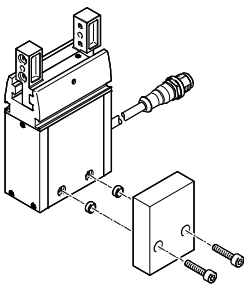
- Setting 1: approx. 50% of the maximum force
- Setting 2: approx. 70% of the maximum force
- Setting 3: approx. 85% of the maximum force
- Setting 4: maximum force



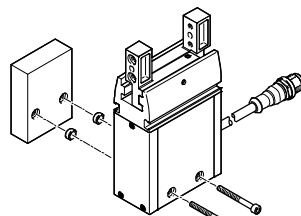
Mounting options

On the side

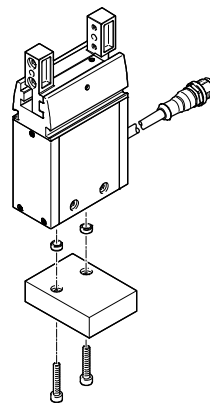
Via thread



Via through-hole

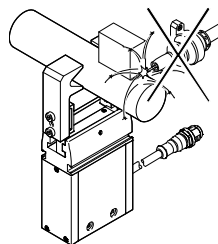


On the front face

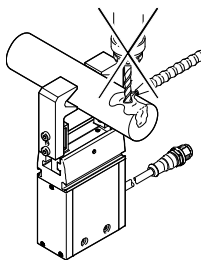


Note

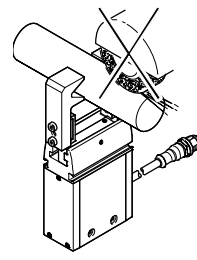
These grippers are not designed for the following or similar sample applications:



- Welding spatter



- Machining
- Aggressive media

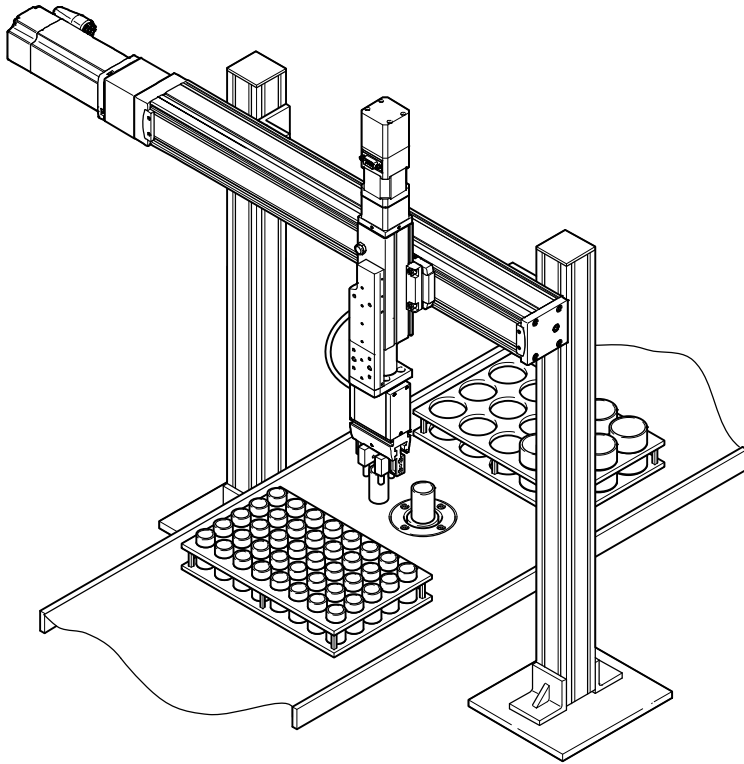


- Grinding dust

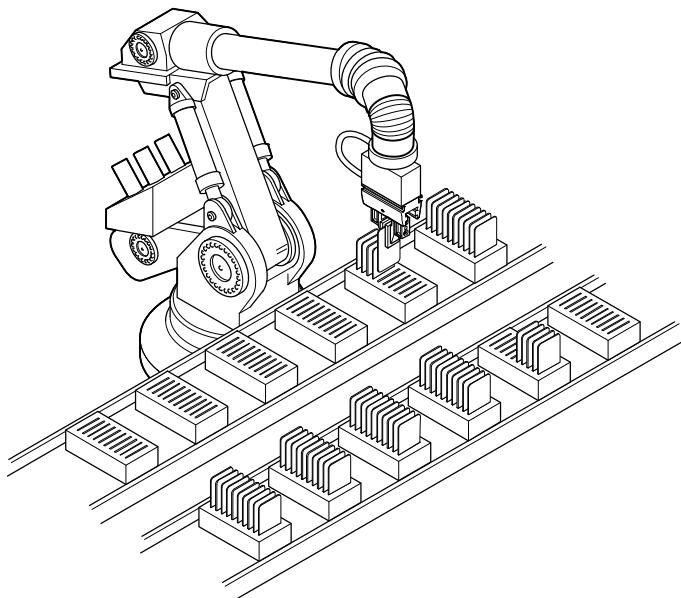
Parallel grippers EHPS, electric

Sample application

Sample preparation device with liquid dosing



Card handling



Parallel grippers EHPS, electric

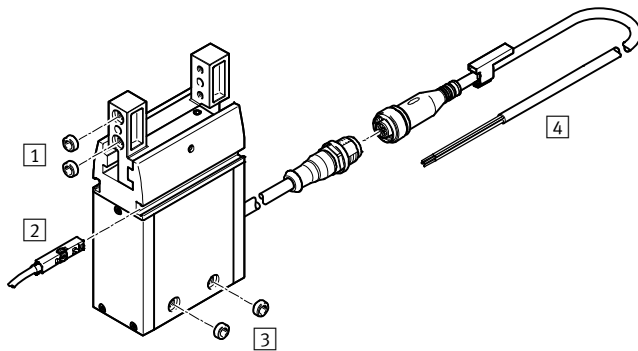
Type codes and peripherals overview

FESTO

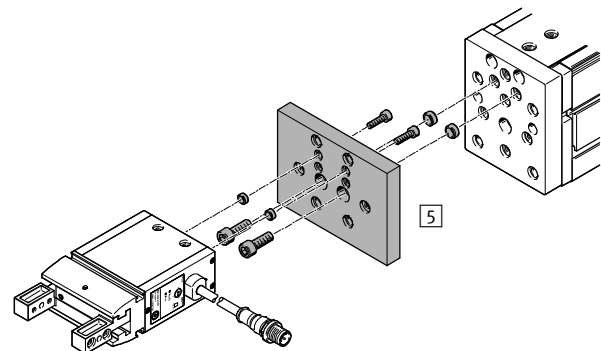
Type codes

		EHPS	–	20	–	A
Type						
EHPS	Parallel gripper					
Size						
16	16					
20	20					
25	25					
Position sensing						
A	Via proximity sensor					

Peripherals overview



System product for handling and assembly technology

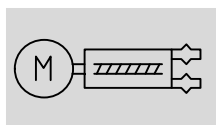


Accessories		
Type/order code	Description	→ Page/Internet
1 Centring sleeve ZBH	- For centring the gripper fingers on the gripper jaws 4 centring sleeves included in the scope of delivery of the gripper	15
2 Proximity sensor SMT-8M-A, SMT-8G	For sensing the gripper jaw position	15
Position sensor SMAT-8M	Continuously senses the position of the gripper jaws. It has an analogue output with an output signal in proportion to the gripper jaw position	16
3 Centring sleeve ZBH	- For centring the gripper during mounting 2 centring sleeves included in the scope of delivery of the gripper	15
4 Connecting cable NEBU-M12G5	For actuating the parallel gripper	15
5 Adapter kit DHAA-G-H1	Connecting plate between drive and gripper	14

Parallel grippers EHPS, electric

Technical data

Function



-  - Size
16 ... 25 mm

-  - Stroke
10 ... 16 mm



General technical data				
Size	16	20	25	
Design	Worm gear unit Rack and pinion principle			
Guide	Plain-bearing guide with T-slot			
Control components	Latched switch			
Ready status indication	LED			
Gripper function	Parallel			
Number of gripper jaws	2			
Stroke per gripper jaw [mm]	10	13	16	
Max. load per gripper finger [g]	100	150	230	
Max. cycle rate ¹⁾ [Hz]	2.2	1.7	1.3	
Repetition accuracy [mm]	≤ 0.03	≤ 0.01	≤ 0.01	
Max. interchangeability [mm]	≤ 0.2			
Rotational symmetry [mm]	≤ 0.2			
Max. gripper jaw backlash [mm]	≤ 0.05	≤ 0.05	≤ 0.04	
Max. gripper jaw angular backlash [°]	0.4	0.3	0.3	
Position sensing	Via proximity sensor and position sensor			
Type of mounting	Via through-holes and centring sleeves Via female thread and centring sleeves			
Electrical connection	M12x1			
	5-pin			
	Cable with plug			
Mounting position	Optional			
Product weight [g]	296	532	904	

1) At a housing temperature of > 60°C

Electrical data				
Size	16	20	25	
Motor type	DC servo motor			
Nominal operating voltage [V DC]	24 ± 10%			
Max. current consumption ¹⁾ [A]	1	2	2	
Quiescent current [mA]	30			

1) During travel.

Parallel grippers EHPS, electric

Technical data

FESTO

Operating and environmental conditions		
Ambient temperature	[°C]	+5 ... +60
Degree of protection		IP40
Noise level	[dB(A)]	70
Corrosion resistance class CRC ¹⁾		1
CE mark (see declaration of conformity) ³⁾		To EU EMC Directive ²⁾
		To EU RoHS Directive
KC mark		KC EMC
Approval		RCM compliance mark

- 1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
- 2) The product is suitable for industrial purposes only (Class A). Measures to suppress radio interference may be required in residential areas (Class B).
- 3) Additional information www.festo.com/sp → Certificates.

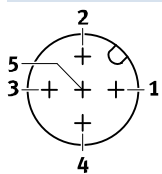
Opening and closing times [ms] as a function of position 1 ... 4

The opening and closing times stated have been measured with vertically mounted gripper, gripper jaws pointing up and without gripper fingers.

Size Position	16	20	25
1	337	470	580
2	291	408	507
3	271	362	449
4	245	295	404

Materials	
Housing	Anodised aluminium
Gripper jaws	High-alloy stainless steel
O-ring	NBR

Pin allocation of the connector plug



Plug M12, 5-pin		
Pin	Connection	Function
1	+24 V DC	Supply voltage
2	Input 1	Gripper jaw opening (with external gripping)
3	0 V	–
4	Input 2	Gripper jaw closing (with external gripping)
5	n.c.	Not connected

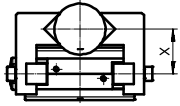
Parallel grippers EHPS, electric

Technical data

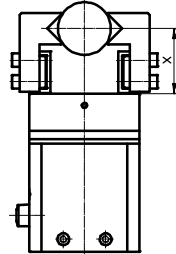
FESTO

Total gripping force F_H as a function of lever arm x , mounting position, external/internal gripping and setting 1 ... 4

Horizontal mounting position

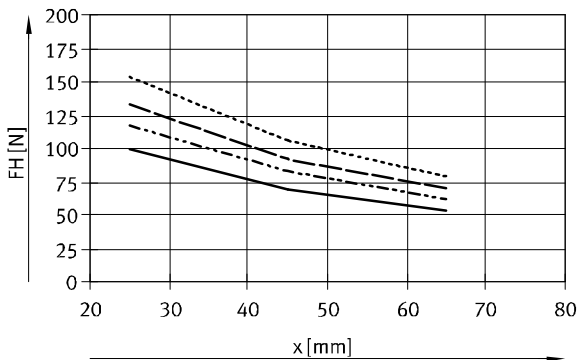


Vertical mounting position



EHPS-16

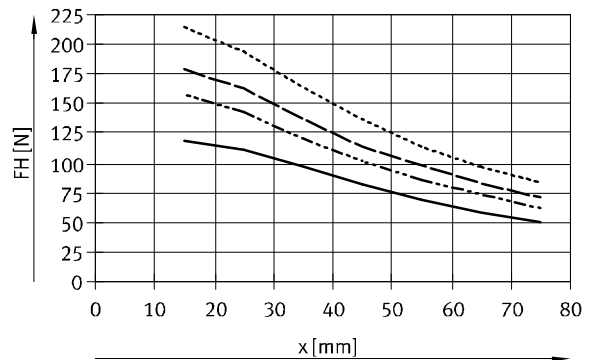
External gripping, horizontal



Setting 1 (solid line)
Setting 2 (dashed line)
Setting 3 (dash-dot line)
Setting 4 (dotted line)

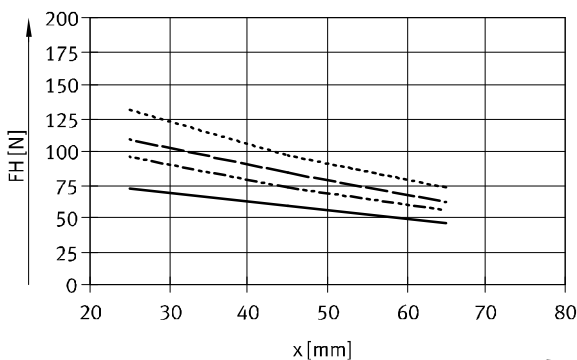
Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
25	98	116	132	154
45	68	84	92	106
65	54	62	70	78

External gripping, vertical



Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
15	118	158	178	214
45	82	102	114	138
75	50	62	72	84

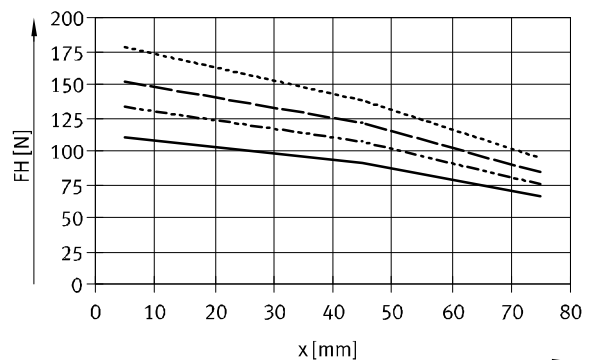
Internal gripping, horizontal



Setting 1 (solid line)
Setting 2 (dashed line)
Setting 3 (dash-dot line)
Setting 4 (dotted line)

Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
25	72	96	108	130
45	58	72	84	96
65	46	56	62	74

Internal gripping, vertical



Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
15	110	134	152	178
45	90	108	122	138
75	66	74	84	94

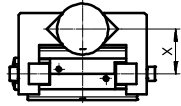
Parallel grippers EHPS, electric

Technical data

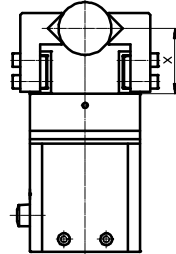
FESTO

Total gripping force F_H as a function of lever arm x , mounting position, external/internal gripping and setting 1 ... 4

Horizontal mounting position

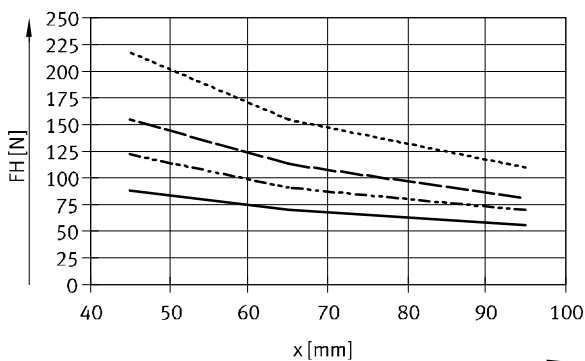


Vertical mounting position



EHPS-20

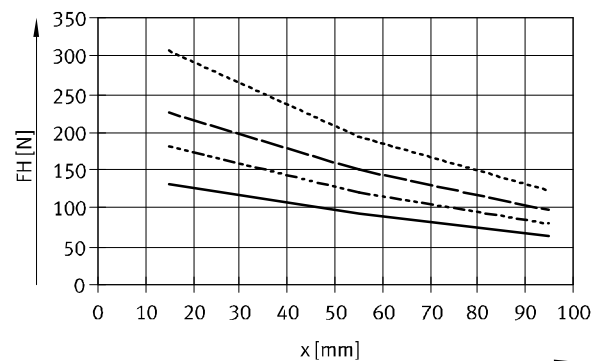
External gripping, horizontal



Setting 1 (solid line), Setting 2 (dashed line), Setting 3 (dash-dot line), Setting 4 (dotted line)

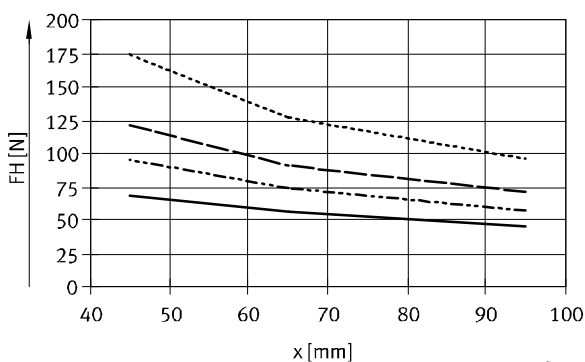
Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
45	88	122	156	218
65	70	90	114	154
95	56	70	82	110

External gripping, vertical



Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
15	132	182	226	306
55	94	120	150	194
95	64	80	98	124

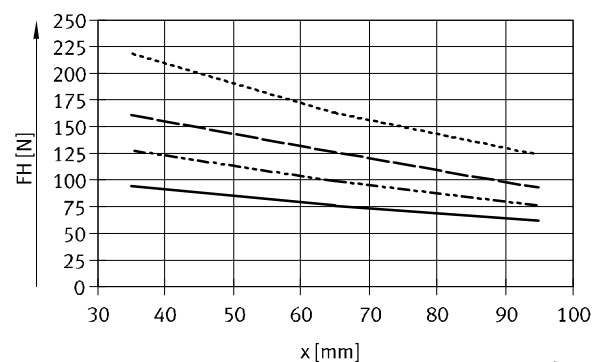
Internal gripping, horizontal



Setting 1 (solid line), Setting 2 (dashed line), Setting 3 (dash-dot line), Setting 4 (dotted line)

Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
45	68	96	120	174
65	56	74	92	128
95	46	58	72	96

Internal gripping, vertical



Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
35	94	128	160	220
65	76	100	126	162
95	62	76	92	124

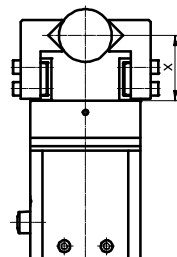
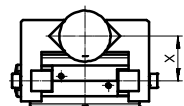
Parallel grippers EHPS, electric

Technical data

Total gripping force F_H as a function of lever arm x , mounting position, external/internal gripping and setting 1 ... 4

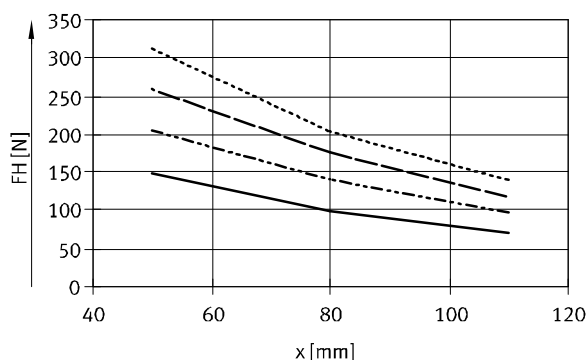
Horizontal mounting position

Vertical mounting position



EHPS-25

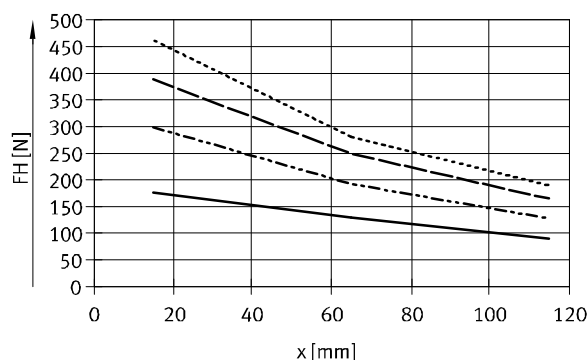
External gripping, horizontal



— Setting 1 - - - Setting 3
 - · - · - Setting 2 · · · · · Setting 4

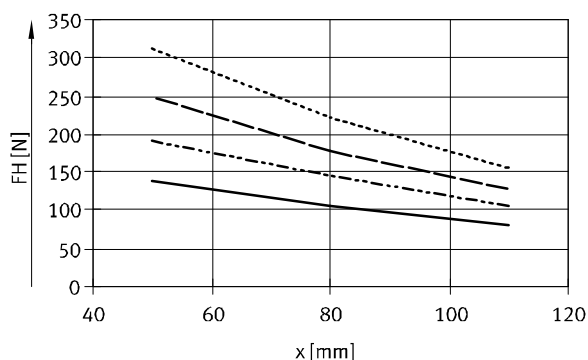
Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
50	148	204	260	312
80	98	140	176	204
110	70	96	118	140

External gripping, vertical



Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
15	176	298	388	462
65	130	194	250	280
115	90	128	166	190

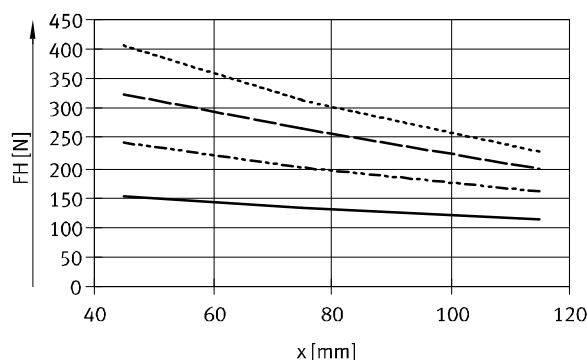
Internal gripping, horizontal



— Setting 1 - - - Setting 3
 - · - · - Setting 2 · · · · · Setting 4

Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
50	138	192	250	312
80	106	146	178	222
110	80	106	128	156

Internal gripping, vertical



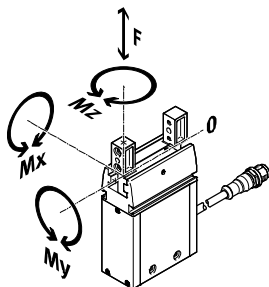
Lever arm [mm]	F_H [N] with setting			
	1	2	3	4
45	152	242	326	406
75	132	200	266	314
115	114	162	198	228

Parallel grippers EHPS, electric

Technical data

FESTO

Static characteristic load values at the gripper jaws

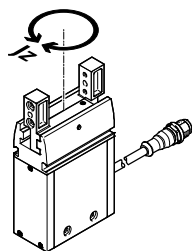


The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional weight forces due to the workpiece or external gripper fingers and acceleration forces during movement.

The zero coordinate line (gripper jaw guide groove) must be taken into consideration when calculating the torques.

Size		16	20	25
Max. permitted force F_z	[N]	200	325	450
Max. permitted torque M_x	[Nm]	7	13	28
Max. permitted torque M_y	[Nm]	4.4	8	16
Max. permitted torque M_z	[Nm]	7	13	28

Mass moment of inertia



Under the following conditions:

- The reference point is the central axis
- Without external gripper fingers
- In a load-free state

Size		16	20	25
Mass moment of inertia	[kgcm ²]	0.78	2.02	5.24

Parallel grippers EHPS, electric

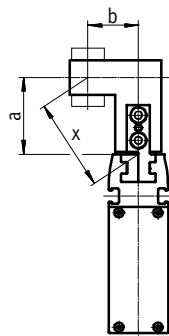
Technical data

Gripping force F_H per gripper jaw as a function of lever arm x and eccentricity a and b

The following formula must be used to calculate the lever arm x with eccentric gripping:

$$x = \sqrt{a^2 + b^2}$$

The gripping force F_H can be read from the graphs (→ page 7) using the calculated value x .



Calculation example

Given:

Distance $a = 40$ mm

Distance $b = 50$ mm

To be calculated:

The gripping force in setting 4, with an EHPS-16-A, used as an external gripper and in horizontal mounting position.

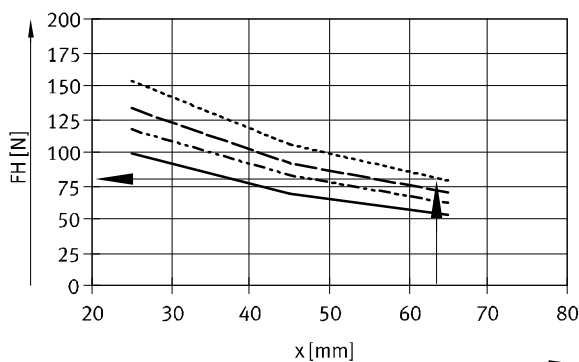
Approach:

Calculating the lever arm x

$$x = \sqrt{40^2 + 50^2}$$

$$x = 64$$
 mm

The graph (→ page 7) gives a value of $F_H = \text{approx. } 77$ N for the gripping force.



— Setting 1
 - - - Setting 2
 - · - Setting 3
 · · · Setting 4

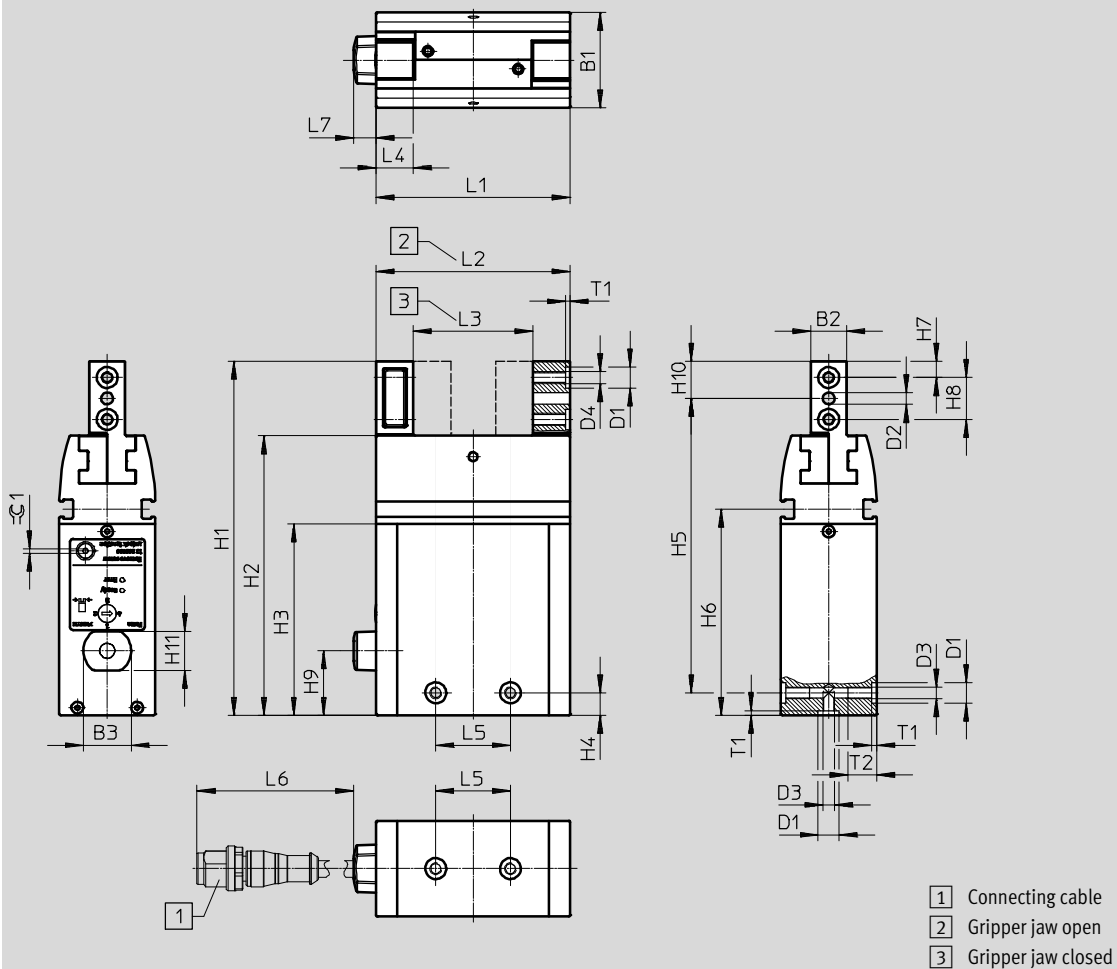
Parallel grippers EHPS, electric

Technical data

FESTO

Dimensions

Download CAD data → www.festo.com



Parallel grippers EHPS, electric

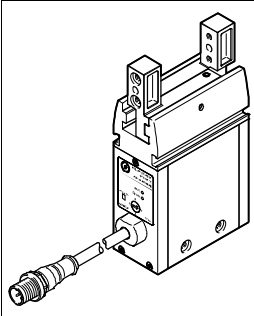
Technical data

Size	B1 ±0.03	B2 ±0.05	B3	D1 Ø H8	D2 Ø H8	D3	D4	H1 ±0.1	H2
16	26	10	16	7	3	M4	M4	99.5	78
20	32	12	16	7	4	M4	M4	118.5	93.5
25	39	15	16	9	4	M6	M5	139.5	110

Size	H3	H4 ¹⁾ ±0.2	H5	H6	H7 ¹⁾	H8 ¹⁾	H9	H10	H11
16	55	7.5	82	59.8	4.5	11	14.5	10	13
20	64	7.5	98.5	69	5.5	14	21.6	12.5	32
25	75	12.5	112	80	7	16	28.6	15	39

Size	L1 ±0.3	L2 +1	L3 ±0.5	L4 ±0.05	L5 ¹⁾	L6	L7	T1 +0.1	T2 min.	≈ 1
16	53.8	53.8	33.8	10.5	25	300	7.5	1.6	9.5	1.5
20	65	65	39	12.5	25	300	7.5	1.6	9.5	1.5
25	79.4	79.4	47.4	15	29	300	7.5	2.1	12	2

1) Tolerance for centring hole ±0.02 mm
Tolerance for thread ±0.1 mm

Ordering data			
	Size	Part No.	Type
	16	8070832	EHPS-16-A
	20	8070831	EHPS-20-A
	25	8070830	EHPS-25-A

Parallel grippers EHPS, electric

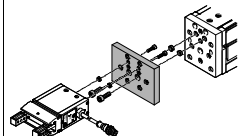
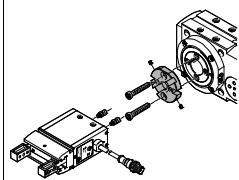
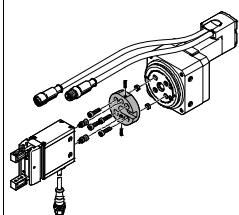
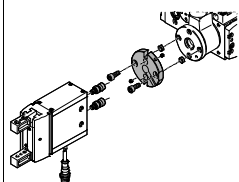
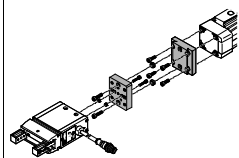
Accessories

FESTO

Adapter kit
DHAA, 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		
Combination	Drive	Gripper			Adapter kit		
	Size	Size	Mounting option		CRC ¹⁾	Part No.	Type
							
EGSL/EHPS	EGSL	EHPS			HMSV		
	45, 55	16	■	■	2	548785	HMSV-55
	75	20, 25	■	■		548786	HMSV-56
ERMB/EHPS	ERMB	EHPS			HAPG		
	20	16, 20	■	■	2	184479	HAPG-SD2-3
	25	16, 20	■	■		184482	HAPG-SD2-6
	20	25	■	■		184480	HAPG-SD2-4
	25	25	■	■		184483	HAPG-SD2-7
	32	25	■	■		184485	HAPG-SD2-9
ERMO/EHPS	ERMO	EHPS			DHAA		
	16	16	■	■	2	8079173	DHAA-G-R3-16-B18-16
	25	16, 20	■	■		8071956	DHAA-G-R3-25-B18-16
	32	20	■	■		8079214	DHAA-G-R3-32-B18-20
	32	25	■	■		8079208	DHAA-G-R3-32-B18-25
EHMB/EHPS	EHMB	EHPS			HAPG		
	20	25	■	■	2	184485	HAPG-SD2-9
	25, 32	25	■	■		8078739	DHAA-G-H1-25-B18-25
DGPL, DGE-..., DGEA/EHPS	DG...	EHPS			HMVA, HAPG, HMSV		
	Direct mounting						
	18 ²⁾ , 25, 32 ³⁾	16	■	■	2	196788	HMVA-DLA18/25
						193922	HAPG-37-S4
	40	16	■	■		196790	HMVA-DLA40
						193922	HAPG-37-S4
	Dovetail mounting						
	18 ²⁾ , 25	16	■	■	2	196788	HMVA-DLA18/25
						177768	HMSV-28
	40	16, 20	■	■		196790	HMVA-DLA40
				177768		HMSV-28	
40	25	■	■		196790	HMVA-DLA40	
					177769	HMSV-29	

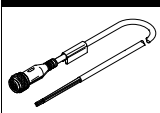
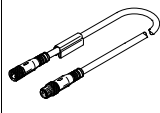
- 1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
- 2) For DGEA-... only
- 3) For DGPL only

Parallel grippers EHPS, electric

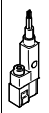
Accessories

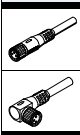
Ordering data						
	For size [mm]	Description	Weight [g]	Part No.	Type	PU ¹⁾
Centring sleeve ZBH Technical data → Internet: zbh						
	16, 20	Included in the scope of delivery of the gripper: 4 centring sleeves for the gripper jaws and 2 for mounting the gripper	1	186717	ZBH-7	10
	25		1	150927	ZBH-9	

1) Packaging unit

Ordering data – Connecting cables for the gripper's connector plugs						
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type	
	Straight socket, M12x1, 5-pin	Cable, open end, 4-wire	2.5	550326	NEBU-M12G5-K-2.5-LE4	
			5	541328	NEBU-M12G5-K-5-LE4	
	Angled socket, M12x1, 5-pin	Cable, open end, 4-wire	2.5	550325	NEBU-M12W5-K-2.5-LE4	
			5	541329	NEBU-M12W5-K-5-LE4	
	Straight socket, M12x1, 5-pin	Straight socket, M12x1, 5-pin	5	574321	NEBU-M12G5-E-5-Q8N-M12G5	
			7.5	574322	NEBU-M12G5-E-7.5-Q8N-M12G5	
	Straight socket, M12x1, 5-pin	Angled socket, M12x1, 5-pin	0.5	8003617	NEBU-M12G5-K-0.5-M12W5	
			2	8003618	NEBU-M12G5-K-2-M12W5	

Ordering data – Proximity sensor for T-slot, magneto-resistive						Technical data → Internet: smt	
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, short design	PNP	Cable, 3-wire	2.5	574335	SMT-8M-A-PS-24V-E-2,5-OE	
			Plug M8x1, 3-pin	0.3	574334	SMT-8M-A-PS-24V-E-0,3-M8D	
		NPN	Cable, 3-wire	2.5	574338	SMT-8M-A-NS-24V-E-2,5-OE	
			Plug M8x1, 3-pin	0.3	574339	SMT-8M-A-NS-24V-E-0,3-M8D	
N/C contact							
	Insertable in the slot from above, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7,5-OE	

Ordering data – Proximity sensor for T-slot, magneto-resistive						
	Type of mounting	Switching output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot lengthwise	PNP	Cable, 3-wire, lateral	2.5	547859	SMT-8G-PS-24V-E-2,5Q-OE
			Plug M8x1, 3-pin, lateral	0.3	547860	SMT-8G-PS-24V-E-0,3Q-M8D
		NPN	Cable, 3-wire, lateral	2.5	8065028	SMT-8G-NS-24V-E-2,5Q-OE
			Plug M8x1, 3-pin, lateral	0.3	8065027	SMT-8G-NS-24V-E-0,3Q-M8D

Ordering data – Connecting cables						
	Electrical connection, left	Electrical connection, right	Cable length [m]	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	

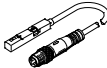
Parallel grippers EHPS, electric

Accessories

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Position sensor

The position sensor continuously senses the position of the gripper jaws. It has an analogue output with an output signal in proportion to the gripper jaw position.

Ordering data – Position sensor for T-slot							Technical data → Internet: position sensor	
	For size	Position measuring range	Analogue output	Type of mounting	Electrical connection	Cable length [m]	Part No.	Type
			[V]					
	10 ... 35	0 ... 40	0 ... 10	Insertable in the slot from above	Plug M8x1, 4-pin, in-line	0.3	553744	SMAT-8M-U-E-0,3-M8D

Ordering data – Connecting cables					Technical data → Internet: nebu	
	Electrical connection, left		Electrical connection, right		Cable length [m]	Part No. Type
	Straight socket, M8x1, 4-pin		Cable, open end, 4-wire		2.5	541342 NEBU-M8G4-K-2.5-LE4
					5	541343 NEBU-M8G4-K-5-LE4
	Angled socket, M8x1, 4-pin		Cable, open end, 4-wire		2.5	541344 NEBU-M8W4-K-2.5-LE4
					5	541345 NEBU-M8W4-K-5-LE4

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