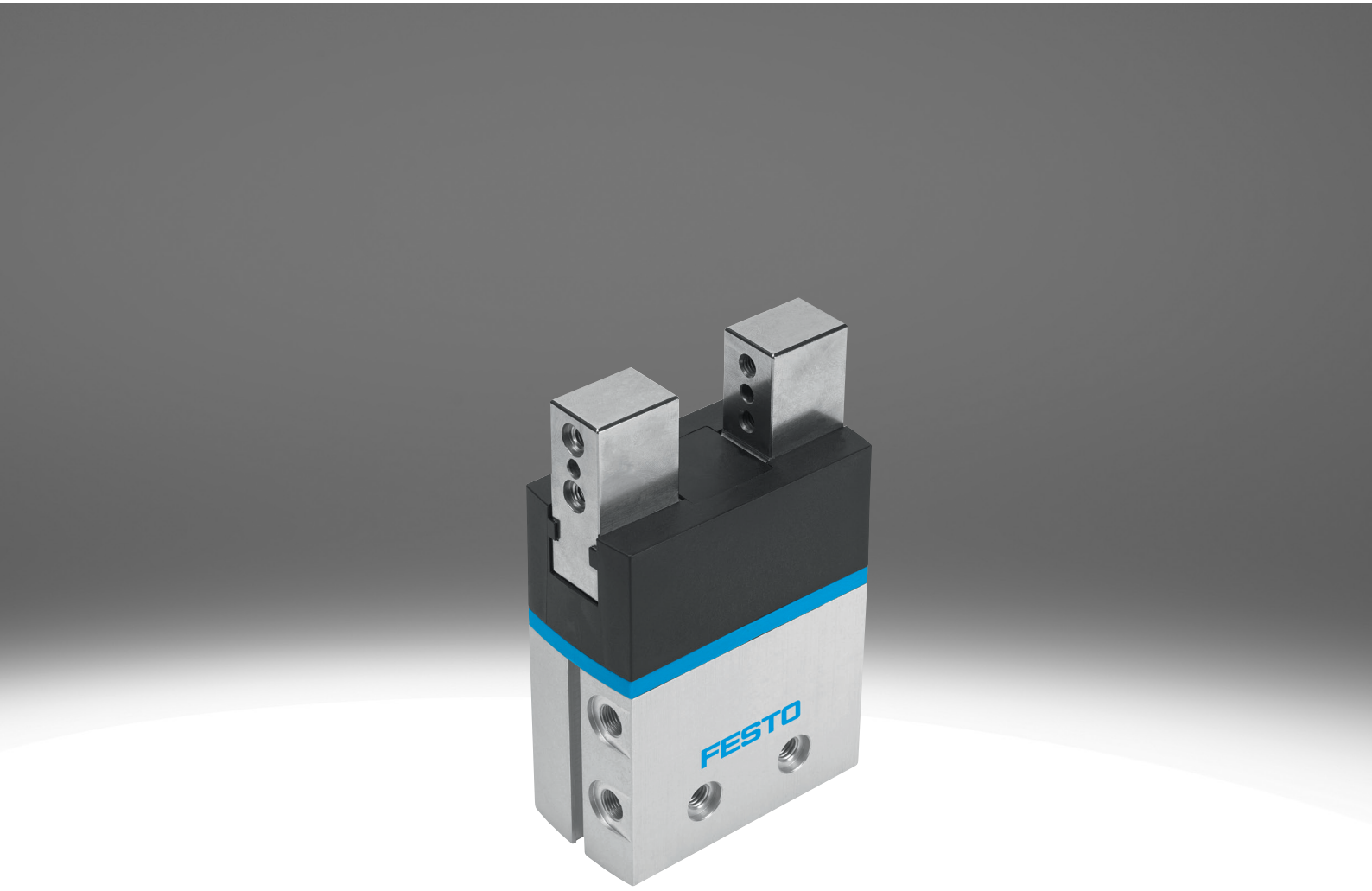
Parallel gripper DHPS

FESTO



Characteristics

At a glance

Further information ➔ dhps

General information:
- Resilient and precise T-slot guidance of the gripper jaws
- Oval piston for high gripping forces
- High gripping forces with compact dimensions
- Gripper jaw centring options
- Max. repetition accuracy
- Gripping force backup
- Internal fixed flow control
- Wide range of adaptation options on the drives

Sensors:
- Adaptable position sensor for small gripper sizes
- Integrated proximity switches for medium and large gripper sizes

Flexible range of applications:
- Can be used as a double-acting and single-acting gripper
- Compression spring for supporting or retaining the gripping forces
- Suitable for external and internal gripping

These grippers are not designed for the following or similar application examples:
- Machining
- Aggressive media
- Grinding dust
- Welding spatter

Engineering tools

Further information ➔ engineering tools

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

Diagrams

Further information ➔ dhps

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

Special material properties

Product:
Metals with more than 5% copper by mass are excluded from use. Exceptions are circuit boards, cables, electrical plug connectors and coils

Accessories:
Please contact your Festo representative for information on which accessories are suitable for manufacturing lithium-ion batteries

Position sensing

[A] For proximity sensor

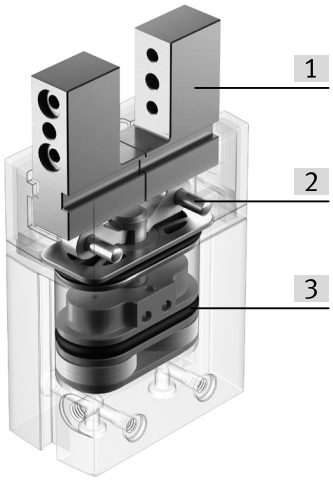
By using proximity switches, any position can be detected.

Characteristics

Gripping force backup

[NC]	N/O contact
[NO]	Opening
Closed by spring force in depressurised state	Opened by spring force in depressurised state

Overview



[1] Gripper jaw
[2] Reversing lever
[3] Piston with magnet

Type code

001	Series	
DHPS	Parallel gripper	

002	Size [mm]	
6	6	
10	10	
16	16	
20	20	
25	25	
35	35	

003	Position sensing	
A	For proximity sensor	

004	Gripping force backup	
	None	
NC	N/O contact	
NO	Opening	

Datasheet

General technical data						
Size	6	10	16	20	25	35
Stroke per gripper jaws	2 mm	3 mm	5 mm	6.5 mm	7.5 mm	12.5 mm
Design	Lever Force pilot operated motion sequence					
Mode of operation	Double-acting					
Gripper force back-up	None	During opening During closing		During opening During closing None		
Gripper function	Parallel					
Guide	Plain-bearing guide					
Number of gripper jaws	2					
Max. mass per external gripper finger [1]	10 g	60 g	150 g	250 g	350 g	450 g
Pneumatic connection	M3			M5	G1/8	
Repetition accuracy, gripper [2]	0.02 mm					
Max. replacement accuracy	0.2 mm					
Max. operating frequency of gripper	4 Hz		3 Hz		2 Hz	
Rotationally symmetrical	0.2 mm					
Position detection	Via Hall sensor	Via proximity switch				
Type of mounting	Either: Via female thread and centring sleeve Via through-hole and centring sleeve					
Mounting position	optional					

1) Valid for unthrottled operation

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

Operating and environmental conditions						
Size	6	10	16	20	25	35
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]	1 - Low corrosion stress					
Lubrication interval for guide components	10 MioCyc					

1) Note the operating range of the proximity switches

2) More information: www.festo.com/x/topic/crc

Operating pressure – DHPS-6 ... 16							
Size	6		10			16		
Gripping force backup	None		N/O contact	Opening		None	N/O contact	Opening
Operating pressure	0.2 ... 0.8 MPa		0.4 ... 0.8 MPa			0.2 ... 0.8 MPa	0.4 ... 0.8 MPa	
Operating pressure	29 ... 116 psi		58 ... 116 psi			29 ... 116 psi	58 ... 116 psi	
Operating pressure	2 ... 8 bar		4 ... 8 bar			2 ... 8 bar	4 ... 8 bar	

Operating pressure – DHPS-20 ... 35									
Size	20			25			35		
Gripping force backup	None	N/O contact	Opening	None	N/O contact	Opening	None	N/O contact	Opening
Operating pressure	0.2 ... 0.8 MPa	0.4 ... 0.8 MPa		0.2 ... 0.8 MPa	0.4 ... 0.8 MPa		0.2 ... 0.8 MPa	0.4 ... 0.8 MPa	
Operating pressure	29 ... 116 psi	58 ... 116 psi		29 ... 116 psi	58 ... 116 psi		29 ... 116 psi	58 ... 116 psi	
Operating pressure	2 ... 8 bar	4 ... 8 bar		2 ... 8 bar	4 ... 8 bar		2 ... 8 bar	4 ... 8 bar	

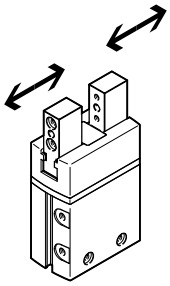
Weights – DHPS-6 ... 16							
Size	6		10			16		
Gripping force backup	None		N/O contact	Opening		None	N/O contact	Opening
Product weight	19 g		67 g	68 g		184 g	188 g	

Datasheet

Weights – DHPS-20 ... 35									
Size	20			25			35		
Gripping force backup	None	N/O contact	Opening	None	N/O contact	Opening	None	N/O contact	Opening
Product weight	380 g	387 g		700 g	713 g		1,285 g	1,345 g	

Materials						
Size	6	10	16	20	25	35
Material housing	Hard anodised wrought aluminium alloy					
Material gripper jaws	High-alloy stainless steel					
Material cover cap	PA					
Note on materials	RoHS-compliant					
LABS (PWIS) conformity	VDMA24364-B2-L					
Suitability for the production of Li-ion batteries	Metals with more than 5% copper by mass are excluded from use. Exceptions are printed circuit boards, cables, electrical plug connectors and coils					

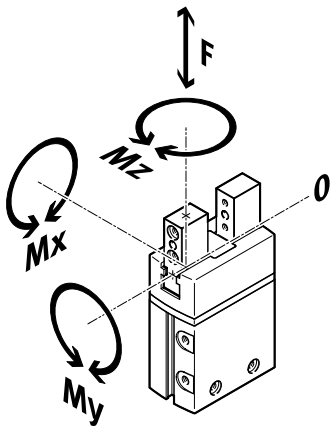
Measured gripping force with a lever arm of 20 mm



Size	6	10	16	20	25	35
Total gripping force, closing, 0.6MPa (6bar, 87 psi)	25 N	70 N	190 N	290 N	450 N	910 N
Total gripping force, opening, 0.6MPa (6bar, 87 psi)	30 N	80 N	210 N	320 N	500 N	970 N
Gripper force per gripper jaw, closing, 0.6 MPa (6 bar, 87 psi)	13.5 N	34.5 N	96 N	147 N	228 N	450 N
Gripper force per gripper jaw, opening, 0.6 MPa (6 bar, 87 psi)	15 N	39 N	105 N	162 N	249 N	483 N

Datasheet

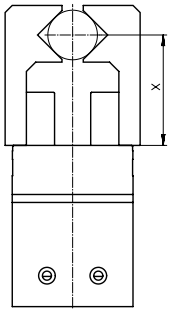
Characteristic load values at the gripper jaws



The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional applied loads created by the workpiece or external gripper fingers and acceleration forces occurring during movement. The zero coordinate line (gripper jaw guide) must be taken into account when calculating torques.

Size	6	10	16	20	25	35
Max. force on gripper jaw Fz static	10 N	60 N	150 N	250 N	350 N	450 N
Max. torque at gripper Mx static	0.5 Nm	3 Nm	8 Nm	14 Nm	30 Nm	50 Nm
Max. torque at gripper My static	0.5 Nm	3 Nm	8 Nm	14 Nm	30 Nm	50 Nm
Max. torque at gripper Mz static	0.5 Nm	3 Nm	8 Nm	14 Nm	30 Nm	50 Nm

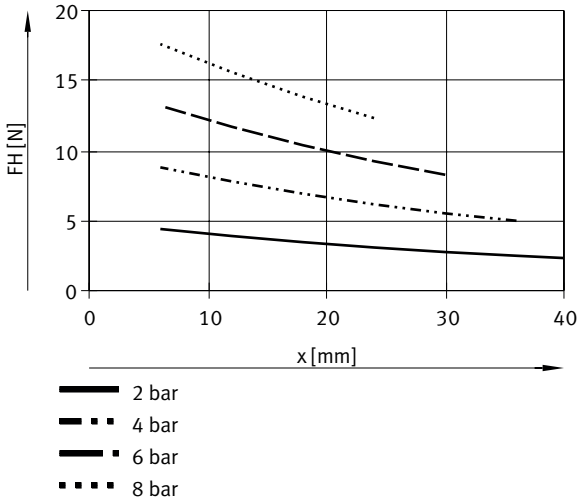
Gripping force FH per gripper jaw as a function of operating pressure and lever arm x



The gripping forces as a function of the operating pressure and lever arm can be determined from the following graphs.
The gripping torque is not constant across the opening angle.

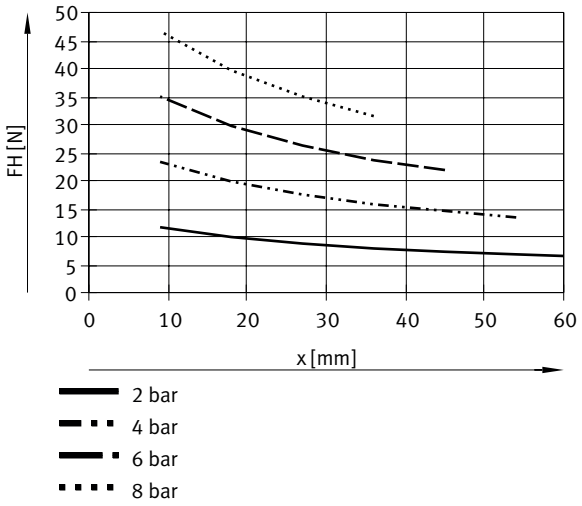
Engineering software for gripper selection → www.festo.com

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – external gripping (closing), double-acting – DHPS-6

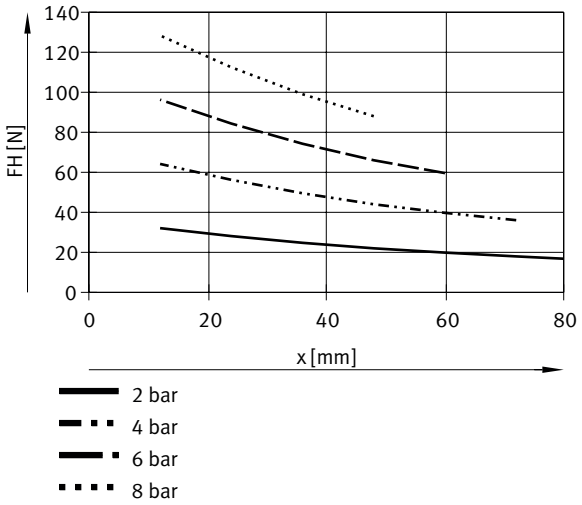


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – external gripping (closing), double-acting – DHPS-10

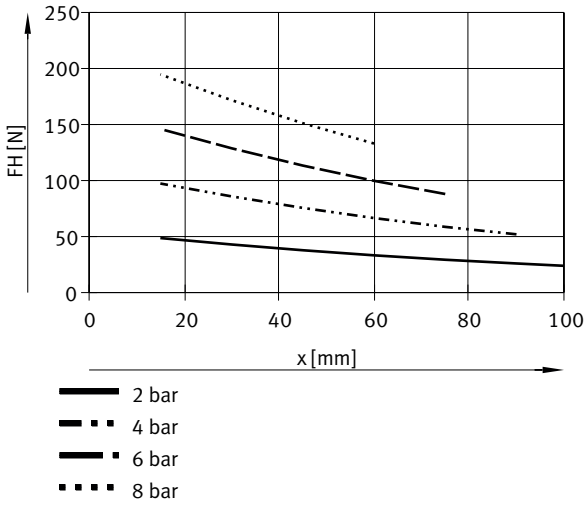


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – external gripping (closing), double-acting – DHPS-16

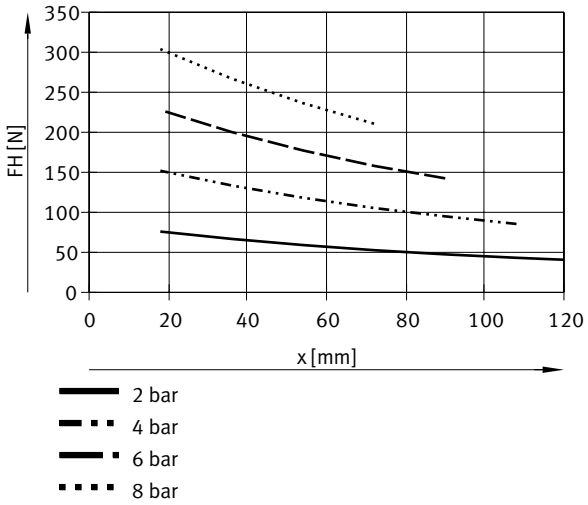


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – external gripping (closing), double-acting – DHPS-20

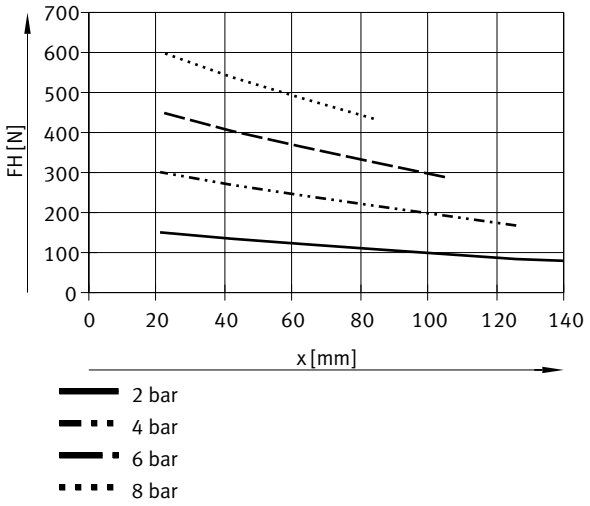


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – external gripping (closing), double-acting – DHPS-25

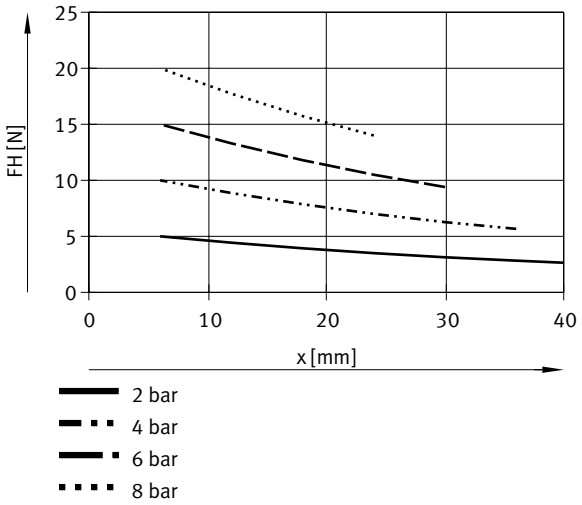


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – external gripping (closing), double-acting – DHPS-35

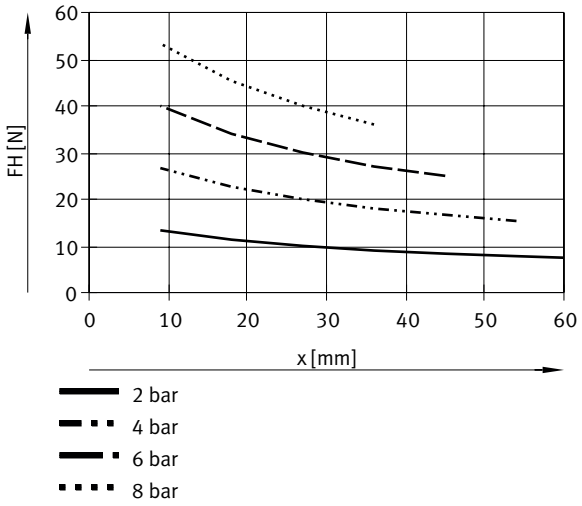


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – internal gripping (opening), double-acting – DHPS-6

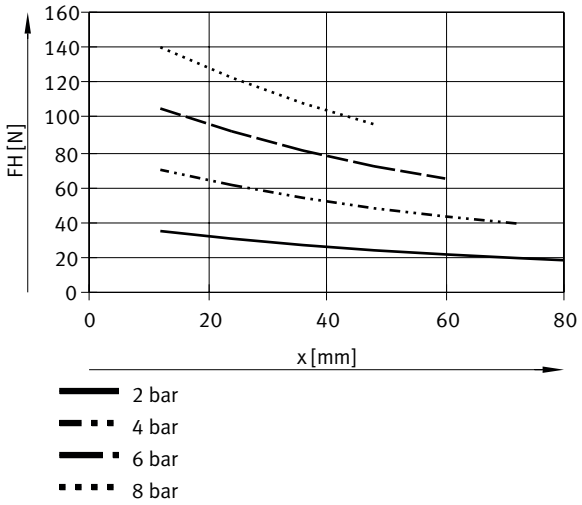


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – internal gripping (opening), double-acting – DHPS-10

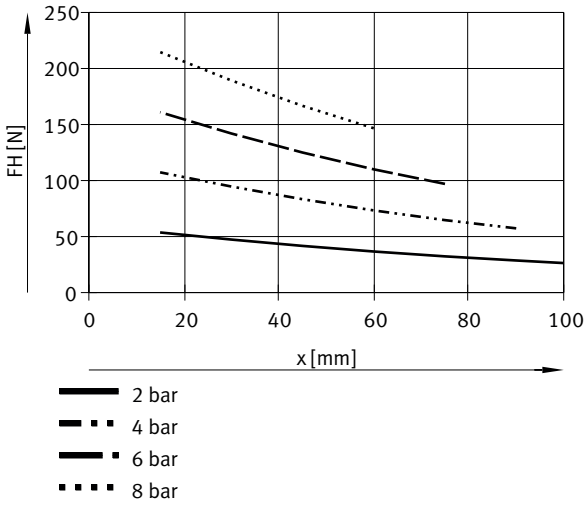


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – internal gripping (opening), double-acting – DHPS-16

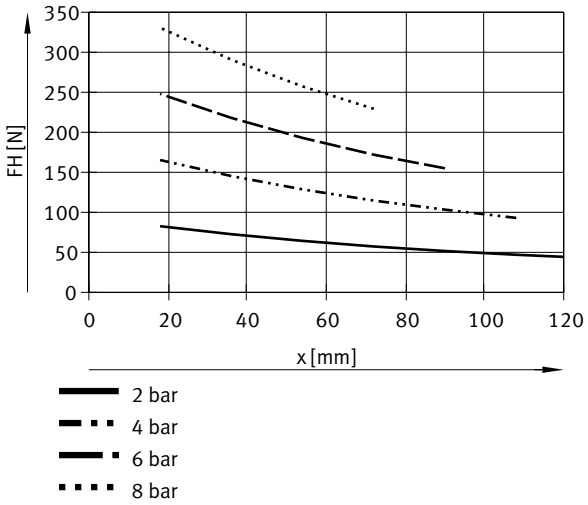


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – internal gripping (opening), double-acting – DHPS-20

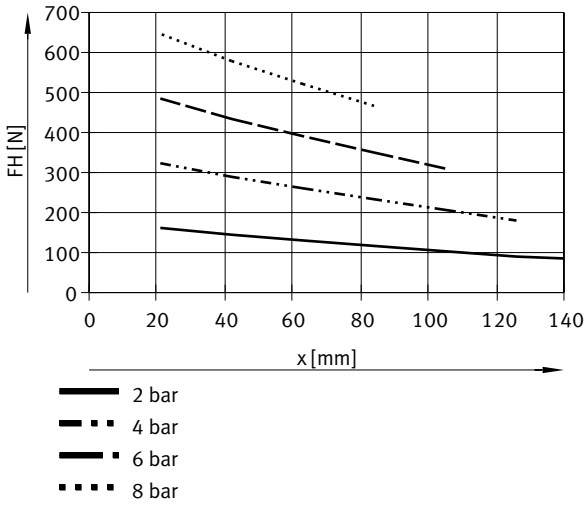


Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – internal gripping (opening), double-acting – DHPS-25

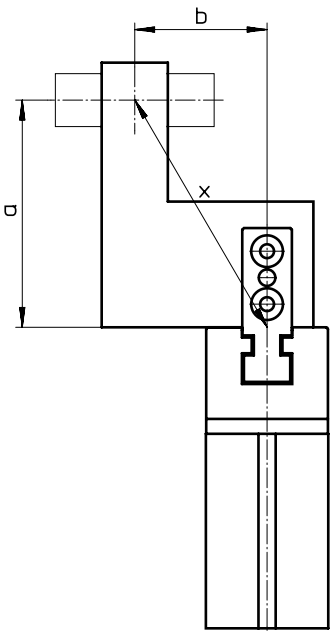


Datasheet

Gripping force FH per gripper jaw as a function of operating pressure and lever arm x – internal gripping (opening), double-acting – DHPS-35



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



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

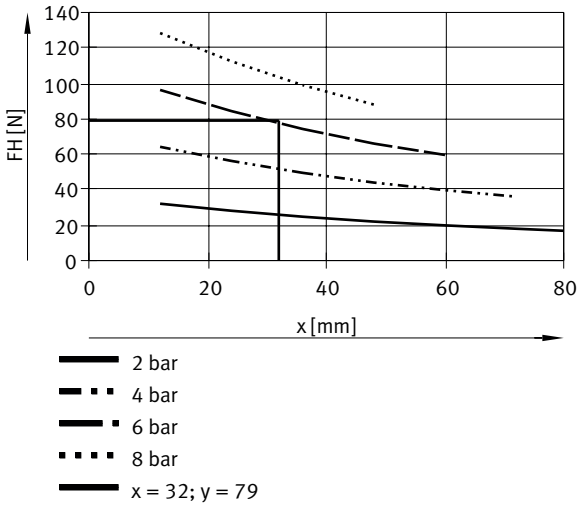
$x = \sqrt{a^2 + b^2} = \sqrt{25^2 + 20^2} = 32$ mm

The formula (on the left) must be used to calculate the lever arm x with eccentric gripping.
The gripping force F can then be read from the graphs using the calculated value x.

Calculation example:
Assuming:
Distance a = 25 mm
Distance b = 20 mm
To be determined:
The gripping force at 6 bar, with a DHPS-16 used as an external gripper.

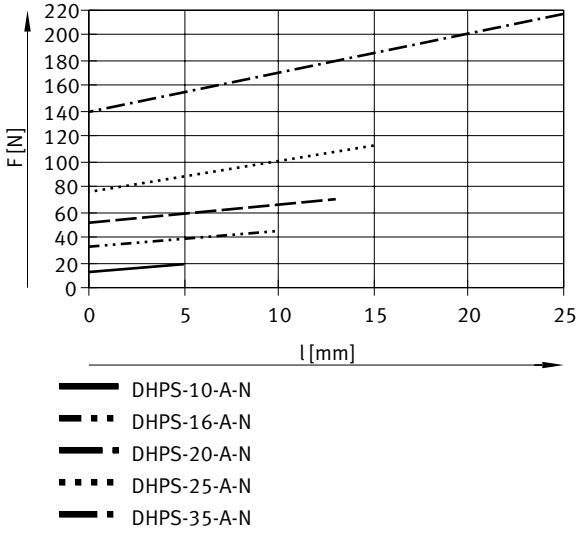
Datasheet

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



The graph gives a value of F = 79 N for the gripping force.

Spring force F as a function of the size and the total gripper jaw stroke l – gripping force backup for DHPS-...-N...



The spring forces F can be determined from the diagram (left) as a function of the gripper jaw stroke l.

Spring force F as a function of size, gripper jaw stroke l and lever arm x per gripper finger

To determine the actual spring force Ftot, the lever arm x must be taken into account.

Formulas for calculating the spring force Ftot per gripper finger:
DHPS-10: -0.02 * x + 0.5 * F
DHPS-16: -0.08 * x + 0.5 * F
DHPS-20: -0.1 * x + 0.5 * F
DHPS-25: -0.12 * x + 0.5 * F
DHPS-35: -0.19 * x + 0.5 * F

Determining the actual gripping forces FGr for DHPS-...-NO and DHPS-...-NC as a function of application

The parallel grippers with integrated spring, type DHPS-...-NO (opening gripping force retention) and DHPS-...-NC (closing gripping force retention) can be used as:
- Single-acting grippers
- Gripper with gripping force support and
- Grippers with gripping force retention

.

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

Datasheet

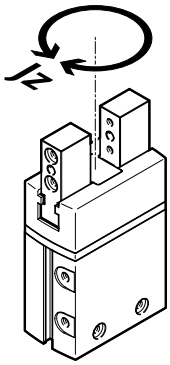
Determining the actual gripping forces FGr for DHPS-...-NO and DHPS-...-NC as a function of the application – application

Single-acting:
- Gripping with spring force: FGr = Ftot
- Gripping with pressure force: FGr = FH – Ftot

Gripping force support:
- Gripping with pressure and spring force: FGr = FH + Ftot

Gripping force backup
- Gripping with spring force: FGr = Ftot

Mass moments of inertia – DHPS-6 ... 16



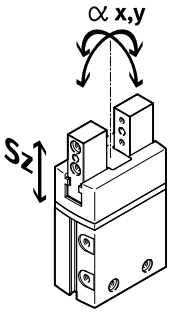
Mass moment of inertia of the parallel gripper in relation to the central axis, without external gripper fingers, without load.

Size	6	10			16		
Gripping force backup	None		N/O contact	Opening	None	N/O contact	Opening
Mass moment of inertia	0.008 kgcm²	0.079 kgcm²	0.081 kgcm²	0.082 kgcm²	0.465 kgcm²	0.468 kgcm²	0.472 kgcm²

Mass moments of inertia – DHPS-20 ... 35

Size	20			25			35		
Gripping force backup	None	N/O contact	Opening	None	N/O contact	Opening	None	N/O contact	Opening
Mass moment of inertia	1.489 kgcm²	1.494 kgcm²	1.521 kgcm²	3.831 kgcm²	3.835 kgcm²	3.92 kgcm²	12.7 kgcm²	12.726 kgcm²	12.832 kgcm²

Gripper jaw backlash

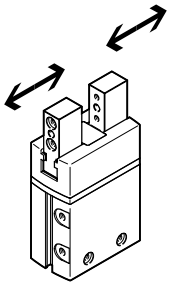


The plain-bearing guide used in the grippers means that there is backlash between the gripper jaws and the housing. The backlash values listed in the table have been calculated based on the traditional accumulative tolerance method.

Size	6	10	16	20	25	35
Max. gripper jaw backlash Sz	0.02 mm					
Max. angular gripper jaw backlash ax, ay	1 deg	0.5 deg				

Datasheet

Opening and closing times – DHPS-6 ... 16



The specified opening and closing times [ms] were measured at room temperature, 0.6 MPa (6 bar, 87 psi) operating pressure and with the gripper installed horizontally without additional gripper fingers. For higher masses [g], the grippers must be throttled. Opening and closing times must then be adjusted accordingly.

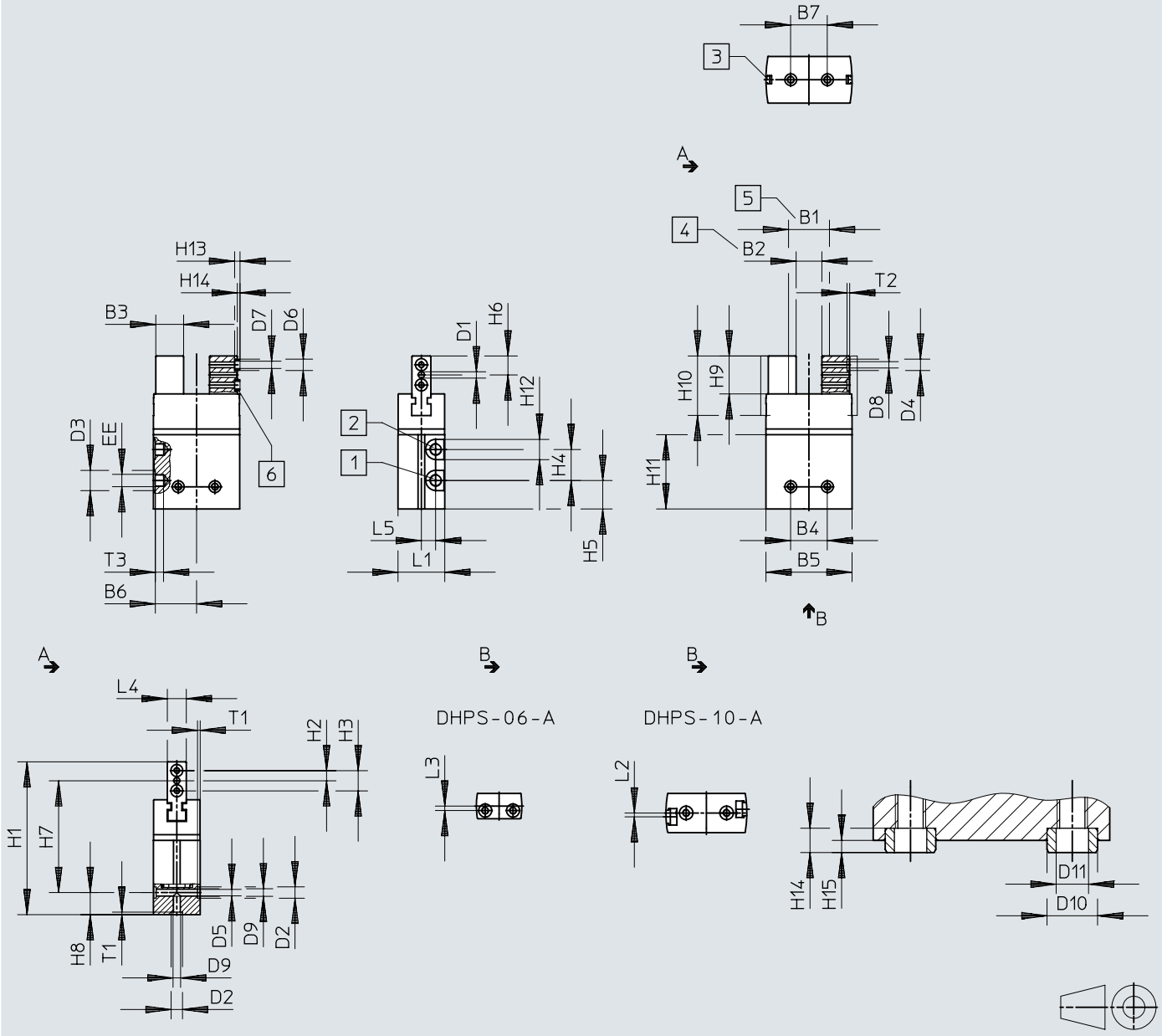
Size	6	10			16		
Gripping force backup	None		N/O contact	Opening	None	N/O contact	Opening
Min. closing time at 0.6 MPa (6 bar, 87 psi)	17 ms	28 ms	24 ms	30 ms	41 ms	37 ms	50 ms
Min. opening time at 0.6 MPa (6 bar, 87 psi)	8 ms	21 ms	58 ms	19 ms	33 ms	48 ms	32 ms

Opening and closing times – DHPS-20 ... 35

Size	20			25			35		
Gripping force backup	None	N/O contact	Opening	None	N/O contact	Opening	None	N/O contact	Opening
Min. closing time at 0.6 MPa (6 bar, 87 psi)	87 ms	62 ms	97 ms	63 ms	52 ms	78 ms	123 ms	99 ms	151 ms
Min. opening time at 0.6 MPa (6 bar, 87 psi)	59 ms	72 ms	58 ms	48 ms	68 ms	45 ms	95 ms	131 ms	88 ms

Dimensions

Dimensions – Parallel gripper DHPS Download CAD data ➔ www.festo.com



[1] Open compressed air supply port
[2] Close compressed air supply port
[3] Slot for proximity switch
[4] Initial position for DHPS-...-A and DHPS-...-A-NC
[5] Initial position for DHPS-...-A-NO
[6] Centring sleeves ZBH (size 10 and larger: 4 included in the scope of delivery)

Dimensions

	B1	B2	B3	B4[1]	B5	B6	B7[1]	D1	D2	D3	D4	D5	D6	D7	D8
								ø	ø	ø	ø	ø	ø	ø	
	±0,5	±0,5	–0,03		±0,1			H8	H8		H8	+0,1	h7		
DHPS-6	10	6	5,5	11	18	8,65	11	1,5	5	7	–	2,5	–	–	M2
DHPS-10	21,8	15,8	7	16	32	15,4	16	2	5	7	5	2,5	5	3,2	M3
DHPS-16	27,8	17,8	13	25	47	22,65	25	3	7	7	7	3,3	7	5,3	M4
DHPS-20	30	17	17,5	25	55,6	26,25	25	4	7	10	7	3,3	7	5,3	M4
DHPS-25	35,4	20,4	22	29	68,2	32,65	29	4	9	16	9	5,1	9	6,4	M5
DHPS-35	56	31	27	33	88	42,25	33	5	12	16	9	6,4	9	6,4	M6

	D9	D10	D11	EE	H1	H2	H3[1]	H4	H5	H6	H7	H8[2]	H9	H10	H11
		ø	ø												
		h7									±0,2				
DHPS-6	M3	–	–	M3	45,5	2,9	5,8	15	4	5	33	7,5	9,55	15,8	25,3
DHPS-10	M3	5	3,2	M3	66	4	8	15,5	10,5	7,5	51	7,5	15,2	23	35
DHPS-16	M4	7	5,3	M3	80	5,5	11	18	11	10	62,5	7,5	20	32,5	38,1
DHPS-20	M4	7	5,3	M5	101	7	14	23	16	12,5	81	7,5	25	39,5	50
DHPS-25	M6	9	6,4	G1/8	121	8	16	24,5	22,5	15	88,5	17,5	30	47	58,8
DHPS-35	M8	9	6,4	G1/8	142	8,5	17	29	24	16	108,5	17,5	32	53	65,3

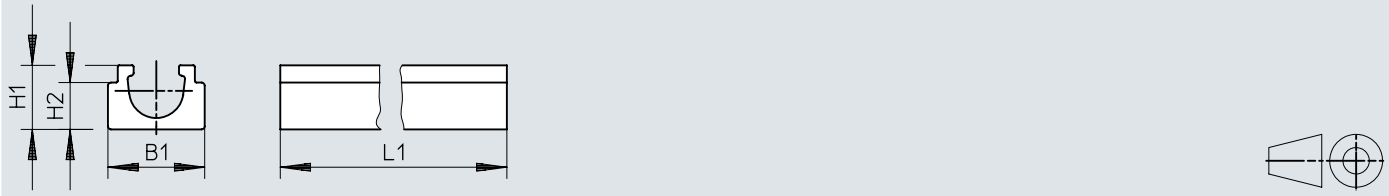
	H12	H13	H14				H15	L1	L2	L3[1]	L4	L5	T1	T2	T3
				[ZBH-5]	[ZBH-7]	[ZBH-9]									
		–0,2	–0,3	–0,2	–0,2	–0,2	–0,3				–0,05		+0,1	+0,1	+0,5
DHPS-6	7	–	–	–	–	–	–	$10^{+0,1}$	–	1,8	5	1,5	1,2	–	3,5
DHPS-10	7	2,4	1,2	2,4	–	–	2,4	$15,5^{+0,1}$	1,5	–	7	5	1,2	1,2	5
DHPS-16	7	3	1,4	–	3	–	3	$22^{+0,1}$	–	–	10	7	1,6	1,6	6
DHPS-20	10	3	1,4	–	3	–	3	30±0,1	–	–	12	9	1,6	1,6	6
DHPS-25	16	4	1,9	–	–	4	4	37±0,1	–	–	15	11,3	2,1	2,1	6,5
DHPS-35	16	4	1,9	–	–	4	4	$45^{+0,1}$	–	–	20	13,5	2,6	2,1	6,5

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

2) Tolerance for centring hole ±0.05 mm / tolerance for thread ±0.1 mm

Dimensions

Dimensions – Sensor rail HGP-SL Download CAD data ➔ www.festo.com



	B1 +0,05	H1 +0,05/–0,1	H2 –0,1	L1
HGP-SL-10-10	4,25	3,1	6,4	35
HGP-SL-10-16				38
HGP-SL-10-20				50
HGP-SL-10-25				58
HGP-SL-10-35				65

Ordering data

Double-acting, without compression spring

	Size	Stroke per gripper jaws	Product weight	Part no.	Type
	6	2 mm	19 g	★ 1254039	DHPS-6-A
	10	3 mm	67 g	★ 1254040	DHPS-10-A
	16	5 mm	184 g	★ 1254043	DHPS-16-A
	20	6.5 mm	380 g	★ 1254046	DHPS-20-A
	25	7.5 mm	700 g	★ 1254049	DHPS-25-A
	35	12.5 mm	1,285 g	★ 1254052	DHPS-35-A

Single-acting or with gripping force retention, opening

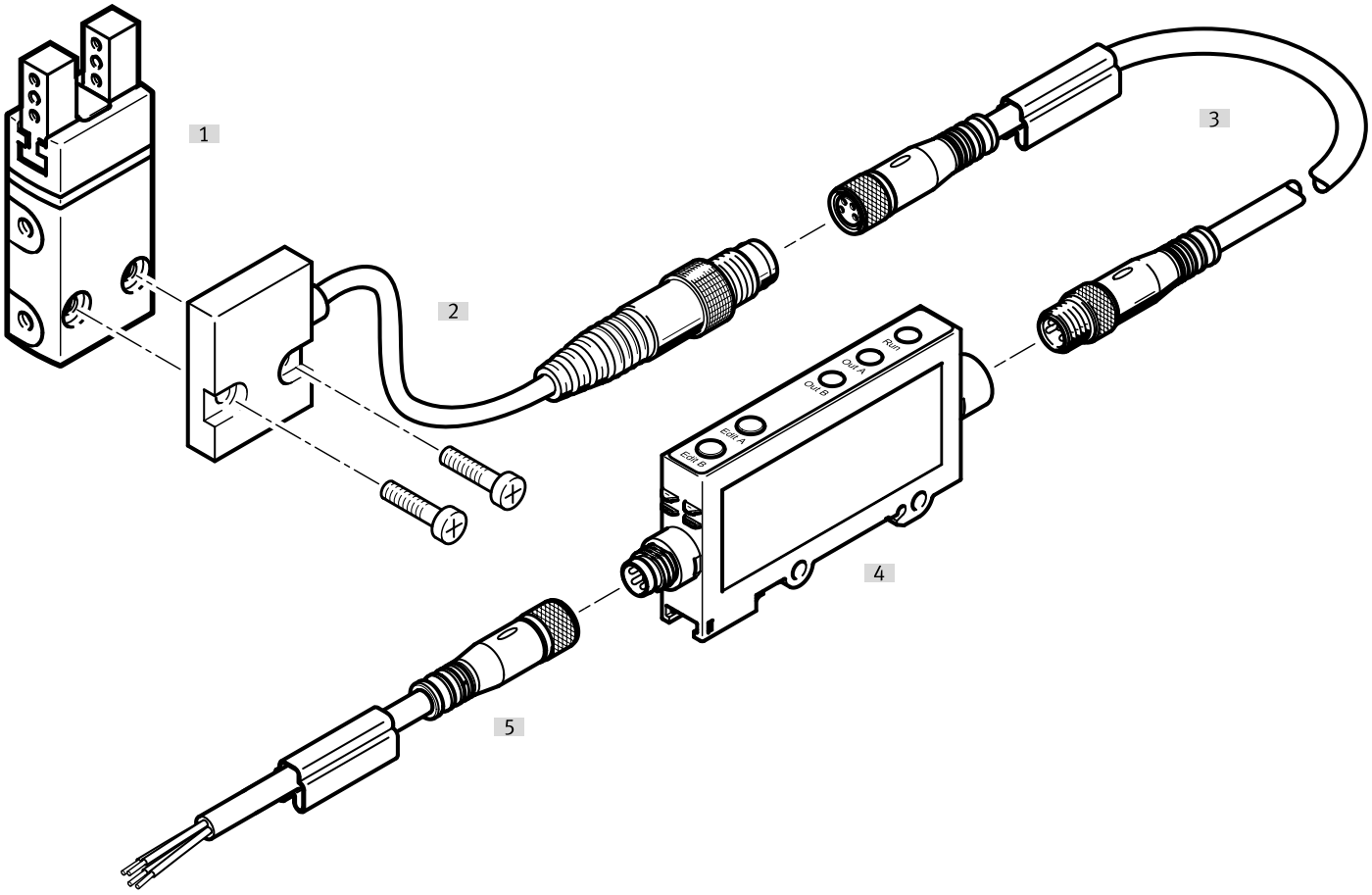
	Size	Stroke per gripper jaws	Product weight	Part no.	Type
	10	3 mm	68 g	1254041	DHPS-10-A-NO
	16	5 mm	188 g	1254044	DHPS-16-A-NO
	20	6.5 mm	387 g	1254047	DHPS-20-A-NO
	25	7.5 mm	713 g	1254050	DHPS-25-A-NO
	35	12.5 mm	1,345 g	1254053	DHPS-35-A-NO

Single-acting or with closing gripping force retention

	Size	Stroke per gripper jaws	Product weight	Part no.	Type
	10	3 mm	68 g	1254042	DHPS-10-A-NC
	16	5 mm	188 g	1254045	DHPS-16-A-NC
	20	6.5 mm	387 g	1254048	DHPS-20-A-NC
	25	7.5 mm	713 g	1254051	DHPS-25-A-NC
	35	12.5 mm	1,345 g	1254054	DHPS-35-A-NC

Peripherals

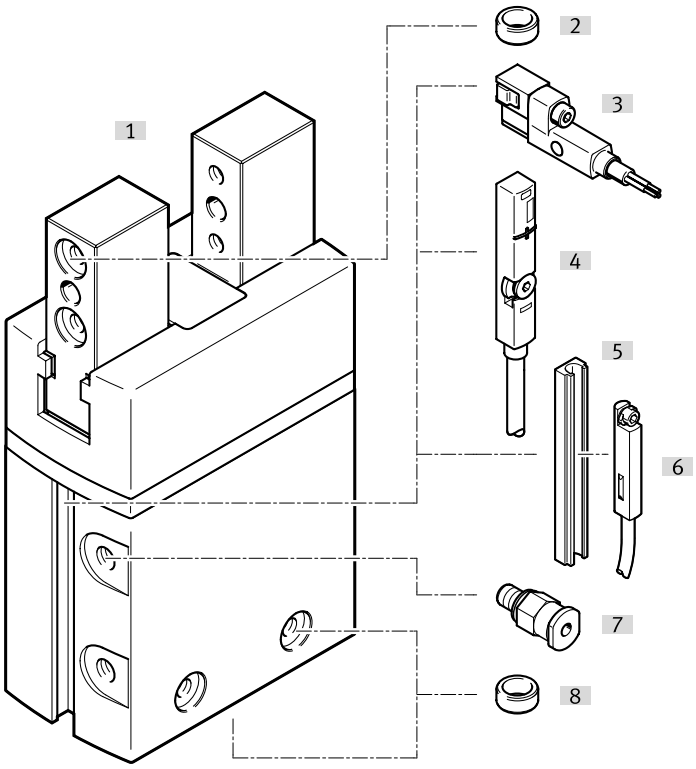
DHPS-6



Accessories			→ Page/Internet
	Type/order code	Description	
[1]	Parallel gripper DHPS	Double-acting	dhps
[2]	Position sensor SMH-S1	Adaptable and integrable sensors for sensing the piston position	23
[3]	Connecting cable NEBU	Connection between position sensor and signal converter	24
[4]	Signal converter SVE4	For evaluating signals for position sensor SMH-S1	24
[5]	Connecting cable NEBU	Connection between signal converter and controller	26
[6]	Adapter kit DHAA, HAPG	Connecting plate between drive and gripper	adapter
[7]	Proportional-pressure regulator VPPM	For stepless adjustment of the gripping force	vppm

Peripherals

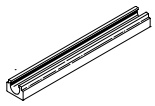
DHPS-10 ... 35



Accessories			→ Page/Internet
	Type/order code	Description	
[1]	Parallel gripper DHPS	Double-acting	dhps
[2]	Centring sleeve ZBH	- For centring the gripper fingers on the gripper jaws - 4 centring sleeves are included in the scope of delivery of the gripper from size 10 onward	23
[3]	Proximity switch SMT-8G	- For sensing the piston position - Proximity switch does not protrude underneath the housing	24
[4]	Position transmitter SMAT-8M	Continuously detects the position of the piston. It has an analogue output with an output signal that is proportional to the piston position	25
[4]	Position transmitter SDAT	Continuously detects the position of the piston. It has an analogue output with an output signal proportional to the piston position	25
[5]	Glue-in sensor rail HGP-SL	Enables the use of proximity switches SME/SMT-10	23
[6]	Proximity switch SMT-10G	- For sensing the piston position - Proximity switch does not protrude underneath the housing - With sensor rail HGP-SL10-...	25
[7]	Push-in fitting QS	For connecting tubing with standard O.D.	qs
[8]	Centring sleeve ZBH	- For centring the gripper when mounting - 2 centring sleeves are included in the scope of delivery of the gripper	23
[9]	Adapter kit DHAA, HAPG	Connecting plate between drive and gripper	adapter
[10]	Proportional-pressure regulator VPPM	For stepless adjustment of the gripping force	vppm

Accessories

Sensor rail HGP-SL

	Description	Material adhesive	Part no.	Type
	For size 10	Construction adhesive	**535582**	**HGP-SL10-10**
	For size 16		**535583**	**HGP-SL10-16**
	For size 20		**535584**	**HGP-SL10-20**
	For size 25		**535585**	**HGP-SL10-25**
	For size 35		**535586**	**HGP-SL10-35**

Centring sleeve ZBH-5

	Description	Material sleeve	Size of pack	Product weight	Part no.	Type
	For sizes 6, 10	Steel	10	1 g	**8146543**	**ZBH-5-B**

Centring sleeve ZBH-7

	Description	Material sleeve	Size of pack	Product weight	Part no.	Type
	For sizes 16, 20	Steel	10	1 g	**8146544**	**ZBH-7-B**

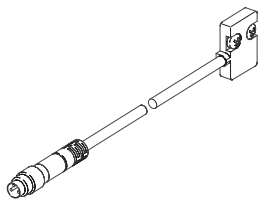
Centring sleeve ZBH-9

	Description	Material sleeve	Size of pack	Product weight	Part no.	Type
	For sizes 25, 35	Steel	10	2 g	**8137184**	**ZBH-9-B**

Centring sleeve ZBH-12

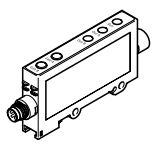
	Description	Material sleeve	Size of pack	Product weight	Part no.	Type
	For size 35	Steel	10	1 g	**8137185**	**ZBH-12-B**

Position sensor SMH-S1 for direct mounting, magnetic Hall – for size 6 **Further information → smh**

	Type of mounting [1]	Output signal	Electrical connection	Cable length	Part no.	Type
	Screwed to gripper	Analogue	Plug M8, A-coded	0.5 m	**175710**	**SMH-S1-HGP06**

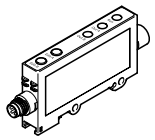
1) Installation note: To ensure the functionality of the position sensor, the cable outlet and the outlet of the compressed air tube must point in the same direction during installation.

Signal converter SVE4 – for size 6 **Further information → sve**

	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**

Accessories

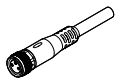
Signal converter SVE4 – for size 6 — **Further information → sve**

	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	2xPNP	**544216**	**SVE4-HS-R-HM8-2P-M8**

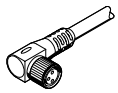
Connecting cables NEBU, straight – connection between position sensor and signal converter

	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**

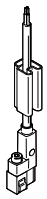
Connecting cables NEBU, straight – connection between signal converter and controller

	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**

Connecting cables NEBU, angled – connection between signal converter and controller

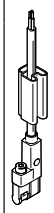
	Electrical connection 1, connector system	Electrical connection 2, connector system	Electrical connection 2, number of connections/ cores	Cable length	Part no.	Type
	M8x1, A-coded, to EN 61076-2-104	Open end	4	2.5 m	**541344**	**NEBU-M8W4-K-2.5-LE4**
				5 m	**541345**	**NEBU-M8W4-K-5-LE4**

Proximity switch SMT-8G for T-slot, magneto-resistive – for sizes 10 ... 35 — **Further information → smt**

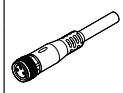
	Type of mounting	Switching output	Electrical connection	Cable length	Part no.	Type
	Clamped in T-slot, Insertable in the slot lengthwise	3-wire NPN N/O contact	Open end	2.5 m	**8065028**	**SMT-8G-NS-24V-E-2,5Q-OE**
			Plug M8, A-coded	0.3 m	**8065027**	**SMT-8G-NS-24V-E-0,3Q-M8D**
		3-wire PNP N/O contact	Open end	2.5 m	**547859**	**SMT-8G-PS-24V-E-2,5Q-OE**
			Plug M8, A-coded	0.3 m	**547860**	**SMT-8G-PS-24V-E-0,3Q-M8D**

Accessories

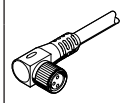
Proximity switch SMT-10G for round slot, magneto-resistive – For sizes 10 ... 35, with sensor rail HGP-SL10-... **Further information → smt**

	Type of mounting	Switching output	Electrical connection	Cable length	Part no.	Type
	Clamped in C-slot, Insertable in the slot lengthwise	3-wire NPN N/O contact	Open end	2.5 m	**8065030**	**SMT-10G-NS-24V-E-2,5Q-OE**
			Plug M8, A-coded	0.3 m	**8065029**	**SMT-10G-NS-24V-E-0,3Q-M8D**
		3-wire PNP N/O contact	Open end	2.5 m	**547862**	**SMT-10G-PS-24V-E-2,5Q-OE**
			Plug M8, A-coded	0.3 m	**547863**	**SMT-10G-PS-24V-E-0,3Q-M8D**

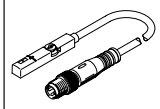
Connecting cable NEBU, straight

	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	3	2.5 m	**541333**	**NEBU-M8G3-K-2.5-LE3**
				5 m	**541334**	**NEBU-M8G3-K-5-LE3**

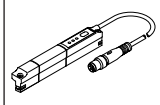
Connecting cable NEBU, angled

	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	3	2.5 m	**541338**	**NEBU-M8W3-K-2.5-LE3**
				5 m	**541341**	**NEBU-M8W3-K-5-LE3**

Position transmitter SMAT-8M for T-slot, plug M8, A-coded – for size 10 ... 35 **Further information → smat**

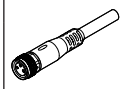
	Sensing range	Analogue output	Electrical connection 1, number of connections/ cores	Cable length	Part no.	Type
	52 mm	0 - 10 V	4	0.3 m	**553744**	**SMAT-8M-U-E-0,3-M8D**

Position transmitter SDAT for T-slot, M8 plug, A-coded – For size 35 **Further information → sdat**

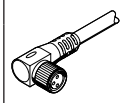
	Sensing range	Analogue output	Electrical connection 1, number of connections/ cores	Cable length	Part no.	Type
	0 ... 50.000 mm	4 - 20 mA	4	0.3 m	**1531265**	**SDAT-MHS-M50-1L-SA-E-0.3-M8**

Accessories

Connecting cables NEBU, straight

	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**

Connecting cables NEBU, angled

	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**