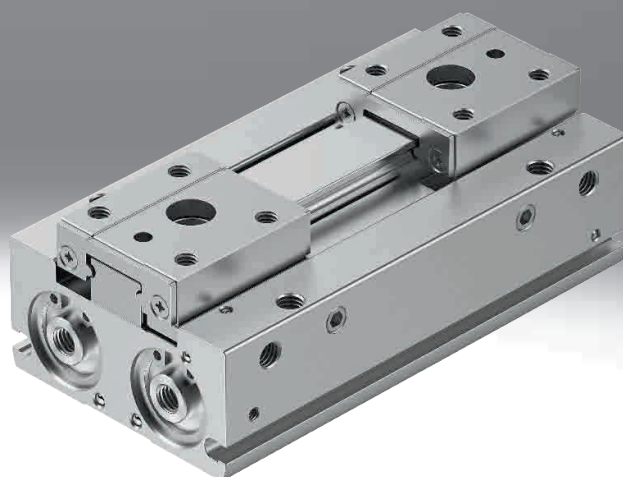


Parallel gripper HPPF

FESTO



Key features

At a glance

- Low height, ideal for applications with limited installation space
- Double-acting piston drive
- Optionally with adjustable stroke
- Resilient and precise ball guide
- High gripping forces with compact dimensions
- Wide range of mounting and connection options
- Mounting proximity switches via C-slot

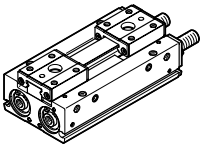
Position sensing

[A] Via proximity switch

The position sensing function uses proximity switches to sense any required positions.

Stroke variant

[S] Adjustable stroke



Allows the opening and closing stroke to be adjusted

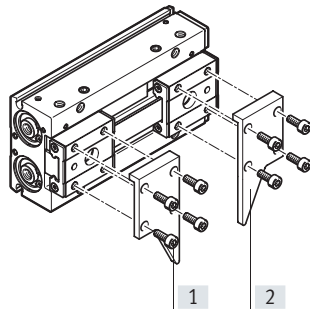
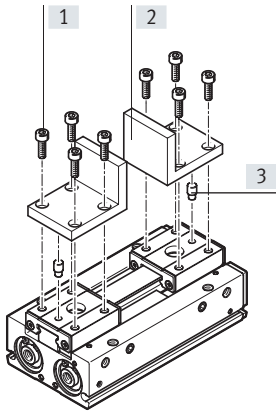
Note

Engineering software
Gripper selection
→ www.festo.com

Key features

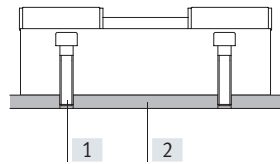
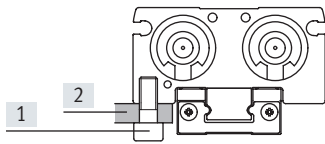
Mounting options

External gripper fingers

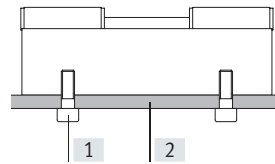


- [1] Screws
- [2] Gripper finger (produced in-house by the customer)
- [3] Centring pins (optional)

From above

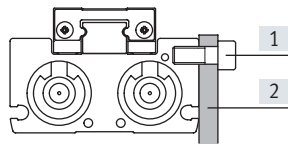
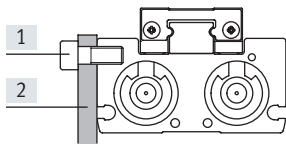


From underneath



- [1] Screws
- [2] Mounting plate (produced in-house by the customer)

On the side

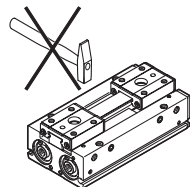


- [1] Screws
- [2] Mounting plate (produced in-house by the customer)

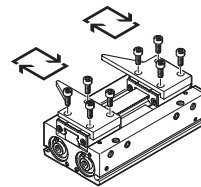
Note

When using a gripper, note the following:

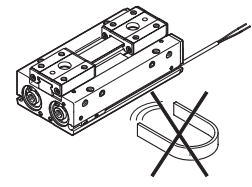
Further information
www.festo.com/sp → User documentation



- Protect against vibrations

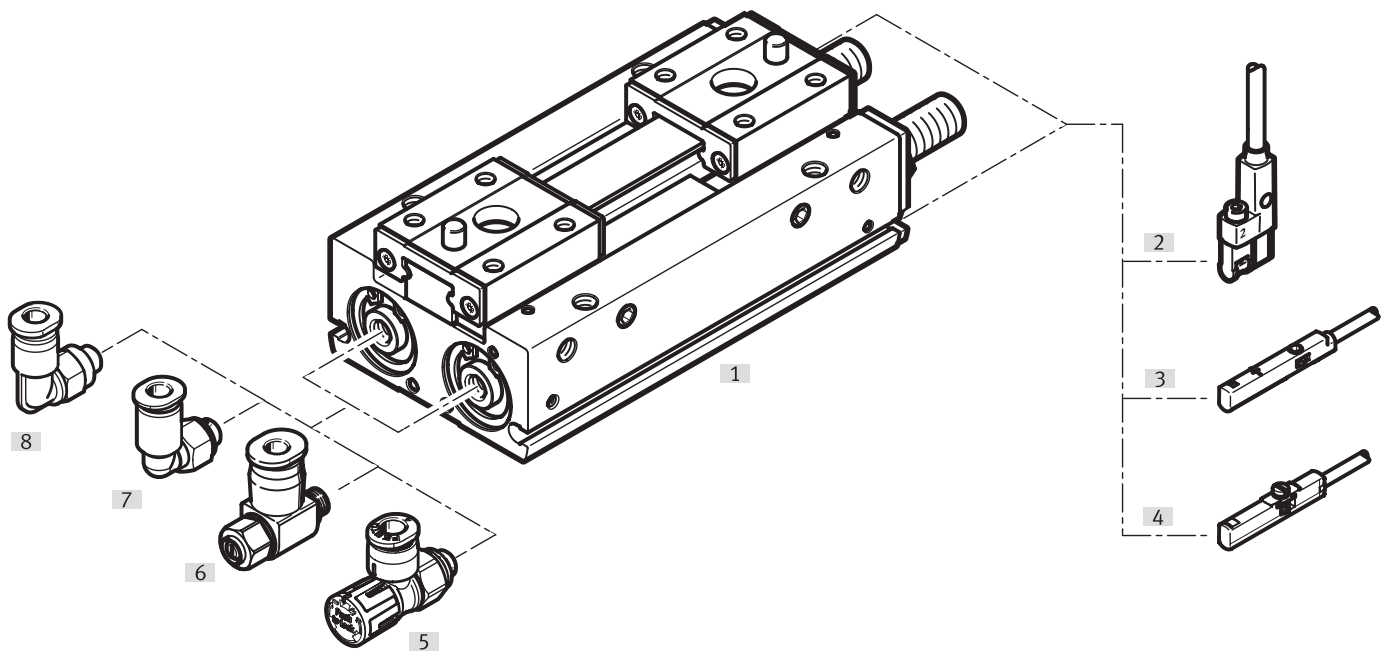


- Comply with torques



- Protect against magnetic fields

Peripherals overview



Accessories			
	Type/order code	Description	→ Page/Internet
[1]	Parallel gripper HPPF	Double-acting, with ball guide, optionally with adjustable stroke	6
[2]	Proximity switch SMT-10G	For sensing the piston position at the end positions	16
[3]	Proximity switch SMT-10M	For sensing the piston position at the end positions	16
[4]	Proximity switch SDBC-MSB	For sensing the piston position at the end positions	16
[5]	One-way flow control valve VFOE	For regulating speed	16
[6]	One-way flow control valve GRLA	For regulating speed	16
[7]	Push-in fitting QS	For connecting tubing with standard O.D.	qs
[8]	Push-in fitting NPQE	For connecting tubing with standard O.D.	npqe

Type codes

001	Size
HPPF	Parallel gripper

002	Size [mm]
8	8
12	12
16	16
20	20

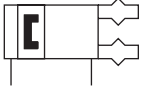
003	Complete stroke [mm]
8	8
12	12
16	16
20	20
24	24
32	32
40	40
48	48
64	64
80	80




004	Position sensing
A	For proximity sensor

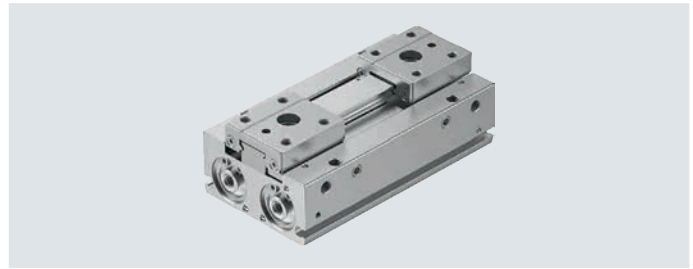
005	Stroke variant
	Without
S	Adjustable stroke

Datasheet

Function
Double-acting
HPPF-...A-...



-  - Size
8 ... 20 mm
-  - Total stroke
8 ... 80 mm
-  - www.festo.com



HPPF-...-A



HPPF-...-AS

General technical data

Size	8	12	16	20
Total stroke	8 16 32	12 24 48	16 32 64	20 40 80
Stroke per gripper jaw	4 8 16	6 12 24	8 16 32	10 20 40
Design	Flat mounting of gripper fingers, gear rack/pinion, force-guided motion sequence			
Mode of operation	Double-acting			
Guide	Ball guide			
Gripper function	Parallel			
Cushioning	Elastic cushioning rings/plates at both ends			
Number of gripper jaws	2			
Pneumatic connection	M3		M5	
Gripper repetition accuracy ¹⁾	≤0.03 mm		≤0.02 mm	
Max. operating frequency of gripper	2 Hz		1 Hz	
Position sensing	Gripping: Slot for proximity switch			
Type of mounting	Direct mounting via through-hole, direct mounting via thread			
Mounting position	Any			

¹⁾ 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	8	12	16	20
Operating pressure	0.15 ... 0.7 MPa		0.1 ... 0.7 MPa	
Operating pressure	21.75 ... 101.5 psi		14.5 ... 101.5 psi	
Operating pressure	1.5 ... 7 bar		1 ... 7 bar	
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]			
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)			
Ambient temperature ¹⁾	-10 ... 60°C			

¹⁾ Note operating range of proximity switches

Datasheet

Weights

Size	8						12					
Stroke variant	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke
Product weight	68 g	78 g	83 g	95 g	122 g	135 g	157 g	182 g	205 g	233 g	305 g	339 g

Weights

Size	16						20					
Stroke variant	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke	None	Adjustable stroke
Product weight	366 g	415 g	471 g	524 g	691 g	755 g	690 g	783 g	887 g	993 g	1326 g	1458 g

Materials

Size	8	12	16	20
Housing material	Anodised wrought aluminium alloy			
Cover material	Anodised wrought aluminium alloy			
Cover cap material	Anodised wrought aluminium alloy			
End plate material	High-alloy stainless steel			
Gripper jaw material	High-alloy steel			
Piston seal material	TPE-U(PU)			
Gear rack material	High-alloy stainless steel			
Material of screws	Coated steel			
Note on materials	RoHS-compliant			
O-ring material	NBR			
PWIS conformity	VDMA24364 zone III			

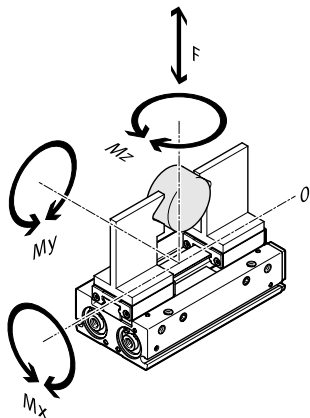
Measured gripping force

Size ¹⁾	8	12	16	20
Total gripping force at 0.6 MPa (6 bar, 87 psi), closing	60.32 N	135.72 N	241.28 N	377 N
Total gripping force at 0.6 MPa (6 bar, 87 psi), opening	60.32 N	135.72 N	241.28 N	377 N
Gripping force per gripper jaw at 0.6 MPa (6 bar, 87 psi) closing	30.16 N	67.86 N	120.64 N	188.5 N
Gripping force per gripper jaw at 0.6 MPa (6 bar, 87 psi) opening	30.16 N	67.86 N	120.64 N	188.5 N

1) Graphs relating to this are on the following pages.


Datasheet

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 weight forces caused by the workpiece or external gripper fingers, as well as forces which occur during movement. The zero coordinate line (gripper jaw guide) must be taken into consideration when calculating torques.

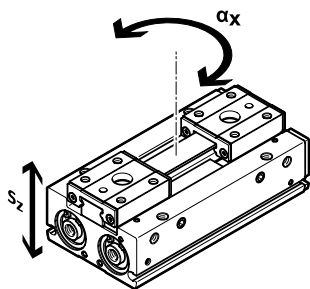
Size	8	12	16	20
Max. force on gripper jaw F_z , static	58 N	98 N	176 N	294 N
Max. torque M_x	0.6 Nm	1.4 Nm	2.8 Nm	4 Nm
Max. torque M_y	0.3 Nm	0.7 Nm	1.4 Nm	2 Nm
Max. torque M_z	0.3 Nm	0.7 Nm	1.4 Nm	2 Nm

 **Note**

Collisions of the slides must be avoided. In the event of a collision, the slides may be damaged.

Additional information
 → User documentation

Gripper jaw backlash



The gripper has a ball guide, which eliminates any possible 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.

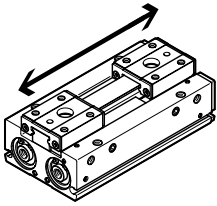
Size ¹⁾	8	12	16	20
Max. gripper jaw backlash S_z	0 mm			
Max. gripper jaw angular backlash α_x, α_y	0 deg			

¹⁾ The values apply only when the gripper is open.

Datasheet

Opening and closing times

Without external gripper fingers



The indicated opening and closing times [ms] were measured at room temperature with a horizontally mounted gripper without additional gripper fingers. The grippers must be throttled for larger masses [g]. Opening and closing times must then be adjusted accordingly.

Size ¹⁾	8		16		32		12		24		48		
	Total stroke	8	16	32	12	24	48	Without	Adjustable stroke	Without	Adjustable stroke	Without	Adjustable stroke
Min. opening time at 0.6 MPa (6 bar, 87 psi)	15 ms		32 ms		46 ms		44 ms		75 ms		121 ms		
Min. closing time at 0.6 MPa (6 bar, 87 psi)	12 ms		31 ms		44 ms		43 ms		73 ms		105 ms		

¹⁾ The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with a horizontally mounted gripper without additional gripper fingers. The grippers must be throttled for larger masses [g]. Opening and closing times must then be adjusted accordingly.

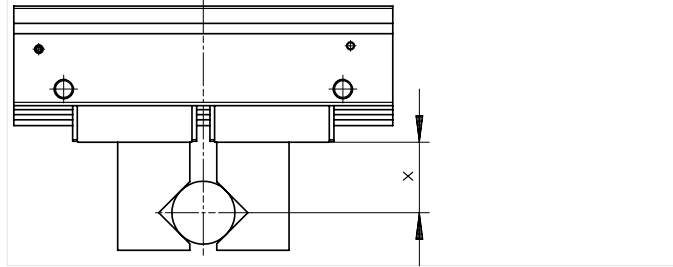
Size ¹⁾	16		32		64		20		40		80		
	Total stroke	16	32	64	20	40	80	Without	Adjustable stroke	Without	Adjustable stroke	Without	Adjustable stroke
Min. opening time at 0.6 MPa (6 bar, 87 psi)	55 ms		93 ms		189 ms		90 ms		120 ms		240 ms		
Min. closing time at 0.6 MPa (6 bar, 87 psi)	47 ms		91 ms		181 ms		70 ms		110 ms		225 ms		

¹⁾ The indicated opening and closing times [ms] were measured at room temperature at an operating pressure of 6 bar with a horizontally mounted gripper without additional gripper fingers. The grippers must be throttled for larger masses [g]. Opening and closing times must then be adjusted accordingly.

Datasheet

Gripping force F_{Gr} per gripper jaw as a function of the 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.



Note
 Engineering software
 Gripper selection
 → www.festo.com

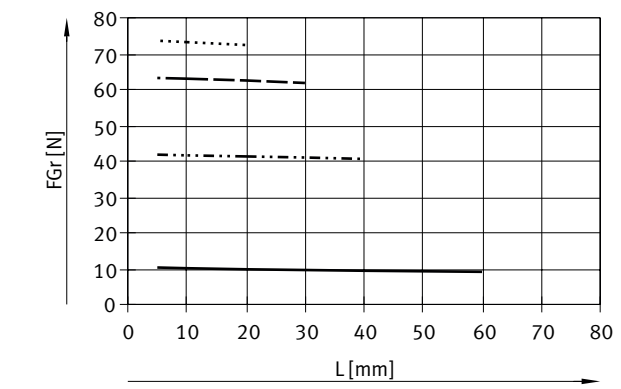
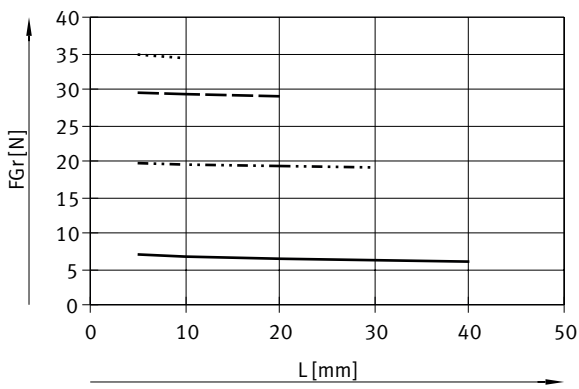
- 1 bar
- · - · - 4 bar
- - - - 6 bar
- · · · · 7 bar

External gripping (closing)

Double-acting

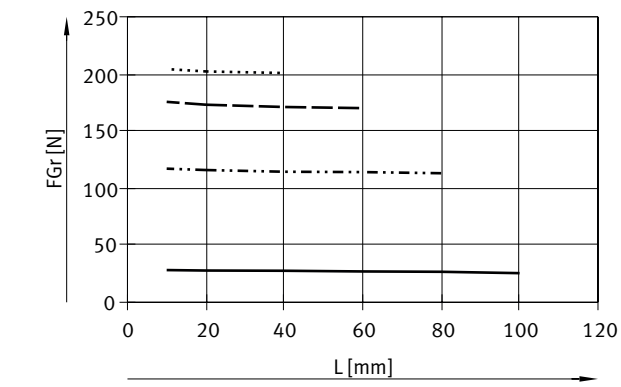
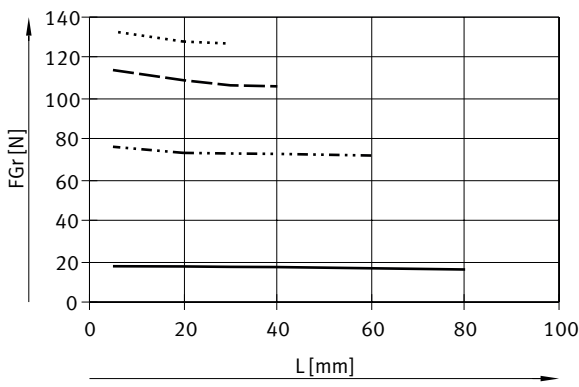
HPPF-8

HPPF-12



HPPF-16

HPPF-20



Datasheet

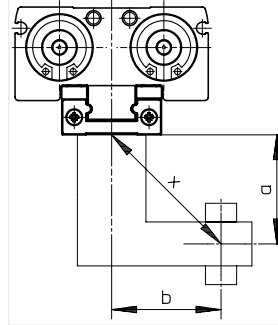
Gripping force F_{Gr} per gripper jaw at 0.6 MPa (6 bar, 87 psi) as a function of lever arm x and eccentricity a and b

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

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

can be read from the graphs

(→ page 10) using the calculated value x .



Calculation example

Assuming:

Distance $a = 20$ mm

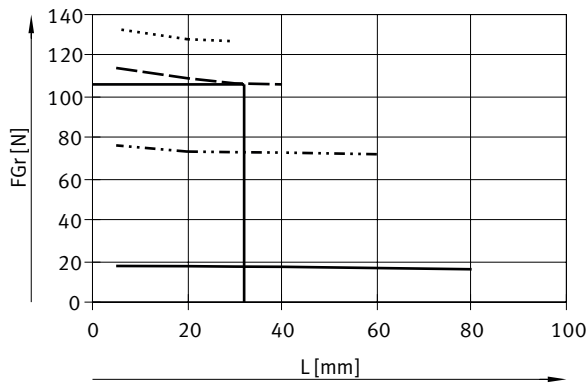
Distance $b = 25$ mm

To be determined:

The gripping force at 0.6 MPa (6 bar, 87 psi), with an HPPF-16, used as an external gripper

$$x = \sqrt{20^2 + 25^2}$$

The graph (→ page 10) gives a value of $F_{Gr} = 106$ N for the gripping force.

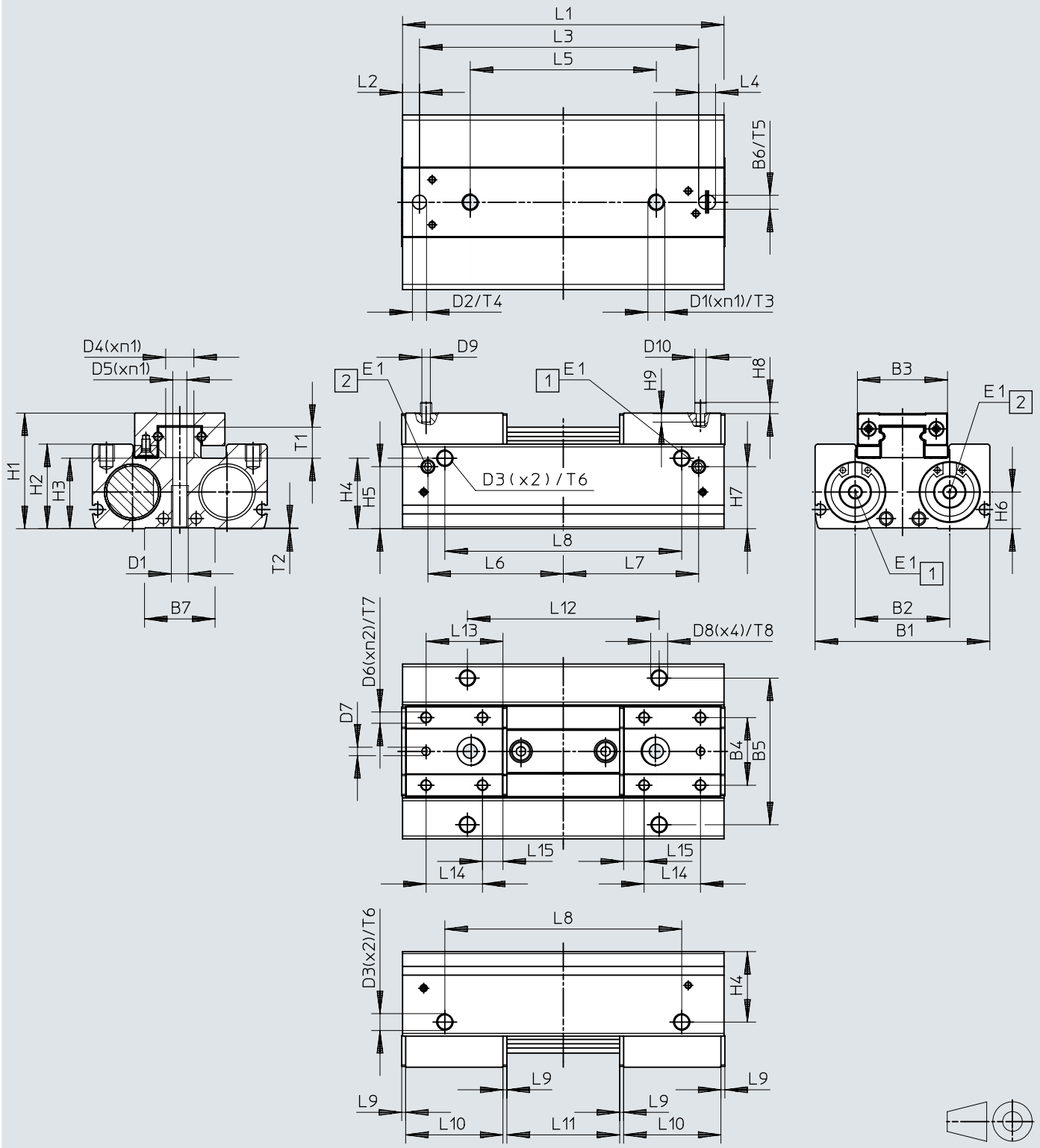


Datasheet

Dimensions

Download CAD data → www.festo.com

HPPF...-A



- [1] Pneumatic port, opening
- [2] Pneumatic port, closing

Datasheet

Size	Stroke	B1	B2	B3	B4	B5	B6	B7	D1	D2 ∅	D3	D4 ∅	D5 ∅	D6	D7	D8	D9 ∅	D10 ∅
[mm]	[mm]	-0.4		-0.1	±0.05	±0.1	H9			H9					H9			
8	8	32	15.7	17	12	26	2.5	16	M3	2.5	M3	4.4	2.5	M2.5	2	M3	2	2.5
	16																	
	32																	
12	12	40	20.3	20	15	33	3	16.6	M4	3	M4	5.5	3.5	M3	2.5	M4	2.5	3
	24																	
	48																	
16	16	50	24	27	20	43	4	15.6	M5	4	M5	8	4.2	M4	3	M5	3	4
	32																	
	64																	
20	20	62	33.5	32	24	52	5	25	M6	5	M6	10	5	M6	3	M6	3	4
	40																	
	80																	

Size	Stroke	E1	H1	H2	H3	H4	H5	H6	H7	H8	H9	L1	L2	L3	L4	L5	L6	L7
[mm]	[mm]		±0.1	±0.2	±0.05	±0.05						-0.1	±0.05	±0.05	±0.1	±0.1		
8	8	M3	19	14	11.2	11	7.6	5.9	7.6	2	2.5	38.5	3	31.1	3.4	16	13.8	13.5
	48											40.3		28		18.5	17.7	
	72											64.3		17		29.9	29.7	
12	12	M5	25	19	15.2	15	14.7	7.7	14.7	2.5	3	52	4	42	4	26	8.2	8.2
	69											58		42		16.7	16.7	
	104											94		26		34.2	34.2	
16	16	M5	33	25	21	20	20	10.5	20	3	4	72	6	60	5	38	11	11
	94											81		60		22	22	
	142											129.5		36		46	46	
20	20	M5	41	30	25.2	25	22	13	22	3	4	87	6	71	6	38	34.5	34.5
	114											99		66		48	48	
	174											159		42		78	78	

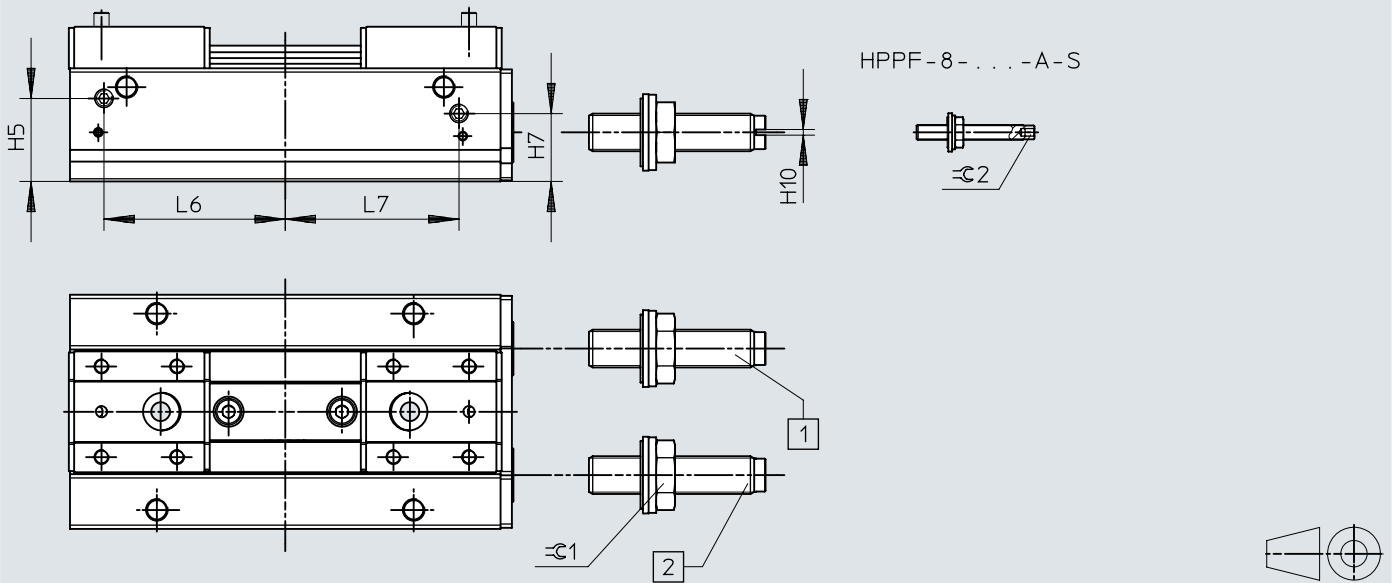
Size	Stroke	L8	L9	L10	L11	L12	L13	L14	L15	n1	n2	T1	T2	T3	T4	T5	T6	T7	T8
[mm]	[mm]	±0,1		-0.1	±1	±0.1	±0.05	±0.05											
8	8	22	0.9	12	8	14	10	0	6	2	2	5.2	0.2	4	2.5	2.5	4	3	4
	16	34		14	16	26	11		7										
	32	58		32	50	13	8		5										
12	12	38	1	18	12	28	14	0	9	2	2	6.6	10	3	3	5	4	5	
	24	54		20.5	24	44	16.3	12	4.3										
	48	90		27	48	80	22.5	18	4.5										
16	16	52	1.2	25	16	36	20	15	5	2	4	8.2	0.3	12	3	3	4	5.5	
	32	74		29	32	58	23.5	18	5.5										
	64	122		37	64	106	31.5	26											
20	20	56	1.4	31	20	40	23.5	16	7.5	2	4	10.8	15	4	4	6	4	6	
	40	84		34.5	40	68	27.3	20	7.3										
	80	144		44.5	80	128	37.3	30											

Datasheet

Dimensions

Download CAD data → www.festo.com

HPPF...-A-S



- [1] For adjusting the stroke, opening
- [2] For adjusting the stroke, closing

Size	Stroke	H5	H7	H10	L6	L7	≈C1	≈C2
[mm]	[mm]							
8	8	7.6	7.6	-	13.8	13.5	7	2
	16				18.5	17.7		
	32				29.9	29.7		
12	12	14.7	14.7	0.8	8.2	8.2	10	
	24				16.7	16.7		
	48				34.2	34.2		
16	16	20	20	1.5	11	11	13	-
	32				22	22		
	64				46	46		
20	20	22.5	18	1.5	35.5	32.5	16	
	40	22			48	46		
	80				78	76		


Datasheet

Ordering data			
Size	Total stroke	Part no.	Type
8	8 mm	8133724	HPPF-8-8-A
		8134368	HPPF-8-8-A-S
	16 mm	8133731	HPPF-8-16-A
		8134375	HPPF-8-16-A-S
		32 mm	8134364
8128415	HPPF-8-32-A		
12	12 mm	8139790	HPPF-12-12-A
		8141587	HPPF-12-12-A-S
	24 mm	8139791	HPPF-12-24-A
		8141588	HPPF-12-24-A-S
	48 mm	8139792	HPPF-12-48-A
		8141589	HPPF-12-48-A-S
16	16 mm	8105829	HPPF-16-16-A
		8143712	HPPF-16-16-A-S
	32 mm	8143713	HPPF-16-32-A-S
		8143243	HPPF-16-32-A
		64 mm	8143714
8143246	HPPF-16-64-A		
20	20 mm	8141226	HPPF-20-20-A
		8143425	HPPF-20-20-A-S
	40 mm	8143408	HPPF-20-40-A
		8143426	HPPF-20-40-A-S
	80 mm	8143409	HPPF-20-80-A
		8143427	HPPF-20-80-A-S


Accessories

Proximity switch


Ordering data – Proximity switches for C-slot, magneto-resistive Datasheets → Internet: smt

	Type of mounting	Electrical connection, outlet direction of connection	Switching output	Cable length [m]	Part no.	Type
N/O						
	Inserted in the slot from above	Cable, 3-wire, lengthwise	PNP	2.5	551373	SMT-10M-PS-24V-E-2.5-L-OE
		Plug M8x1, 3-pin, in-line		0.3	551375	SMT-10M-PS-24V-E-0.3-L-M8D
		Cable, 3-wire, crosswise	NPN	2.5	551374	SMT-10M-PS-24V-E-2.5-Q-OE
		Plug M8x1, 3-pin, crosswise		0.3	551376	SMT-10M-PS-24V-E-0.3-Q-M8D



Ordering data – Proximity switches for C-slot, magneto-resistive Datasheets → Internet: smt

	Type of mounting	Electrical connection, outlet direction of connection	Switching output	Cable length [m]	Part no.	Type
N/O						
	Inserted into the slot length-wise	Cable, 3-wire, crosswise	PNP	2.5	547862	SMT-10G-PS-24V-E-2.5Q-OE
		Plug M8x1, 3-pin, crosswise		0.3	547863	SMT-10G-PS-24V-E-0.3Q-M8D
		Cable, 3-wire, crosswise	NPN	2.5	8065030	SMT-10G-NS-24V-E-2.5Q-OE
		Plug M8x1, 3-pin, crosswise		0.3	8065029	SMT-10G-NS-24V-E-0.3Q-M8D


Ordering data – Proximity switches for C-slot, magneto-resistive Datasheets → Internet: sdbc

	Type of mounting	Electrical connection, outlet direction of connection	Switching output	Cable length [m]	Part no.	Type
N/O						
	Inserted in the slot from above	Cable, 3-wire, lengthwise	PNP	2	8139723	SDBC-MSB-1L-PU-K-2-LE
		Plug M8x1, 3-pin, in-line		0.3	8139726	SDBC-MSB-1L-PU-K-0.3-M8
		Cable, 3-wire, lengthwise	NPN	2	8139724	SDBC-MSB-1L-NU-K-2-LE
		Plug M8x1, 3-pin, in-line		0.3	8139727	SDBC-MSB-1L-NU-K-0.3-M8
		Cable, 2-wire, lengthwise	Non-contacting, 2-wire	2	8139725	SDBC-MSB-1L-ZU-K-2-LE


Ordering data – Connecting cables Datasheets → Internet: nebu

	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3
			5	541334	NEBU-M8G3-K-5-LE3
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541363	NEBU-M12G5-K-2.5-LE3
			5	541364	NEBU-M12G5-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
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541367	NEBU-M12W5-K-2.5-LE3
			5	541370	NEBU-M12W5-K-5-LE3

Ordering data – One-way flow control valves Datasheets → Internet: grla

	Connection		Material	Part no.	Type
	Thread	For tubing O.D.			
For exhaust air					
	M3	–	Metal design	175038	GRLA-M3
		3		175041	GRLA-M3-QS-3
		3		193137	GRLA-M5-QS-3-D
	M5	4		193138	GRLA-M5-QS-4-D
		6		193139	GRLA-M5-QS-6-D

Ordering data – One-way flow control valves Datasheets → Internet: u

	Connection	Material	Part no.	Type
	Thread			
For exhaust air				
	M5	4	8068723	VFOE-LE-T-M5-Q4
		4	8095432	VFOE-LE-T-M5-Q4-P50
		6	8068724	VFOE-LE-T-M5-Q6

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