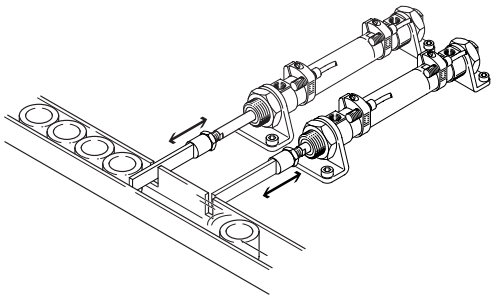
Feed separators HPV

Key features

Separation of workpieces in the feed process

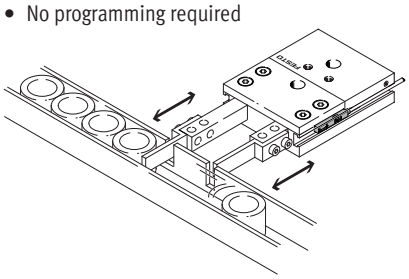
Previously

- At least 2 drives, 2 valves and 4 proximity sensors
- Extensive programming

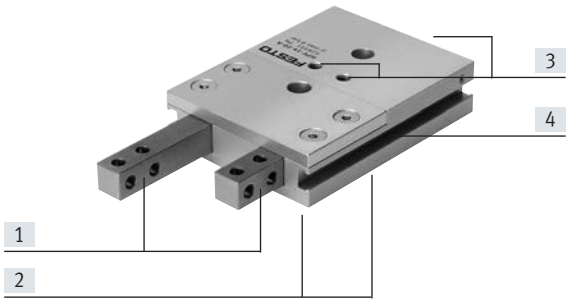


Now

- One unit (1 drive, 1 valve and 2 proximity sensors)
- Cheaper
- Reliable
- No programming required



High functionality



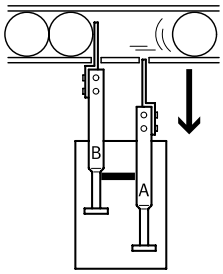
[1] Corrosion-resistant thanks to stainless steel plungers
[2] Optimum and precise adaptation options using centring sleeves
[3] Supply ports optionally at top or rear
[4] Proximity sensors suitable for integration in the housing can be used (type SME/SMT-8)

Note

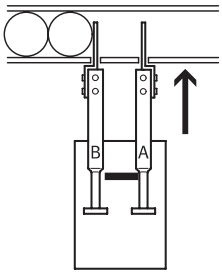
An integrated mechanical interlock between the two plungers ensures that one plunger cannot retract until the other has advanced.
Both plungers are briefly extended during switching and the part to be separated is enclosed.

Operating principle

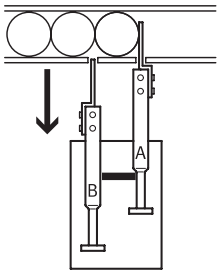
Plunger A is retracted. The locking mechanism locks plunger B.



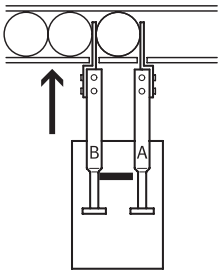
Plunger A advances.



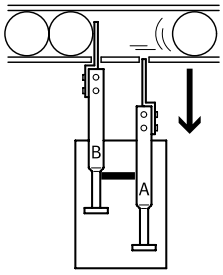
The locking mechanism prevents plunger B from retracting until plunger A is fully advanced.



Plunger B advances.

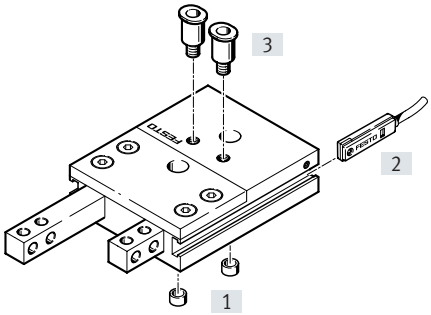


The locking mechanism prevents plunger A from retracting until plunger B is fully advanced.



Peripherals overview and type codes

Peripherals overview



Accessories

		Description	→ Page/Internet
[1]	Centring sleeve, connecting sleeve	For centring when mounting	9
[2]	Proximity sensor	For position sensing, integrated in sensor slot	9
[3]	QS push-in fitting	For connecting compressed air tubing with standard O.D.	qs

Type codes

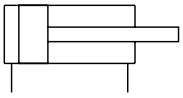
001	Series	
HPV	Separator, double-acting	

002	Size	
10	10	
14	14	
22	22	

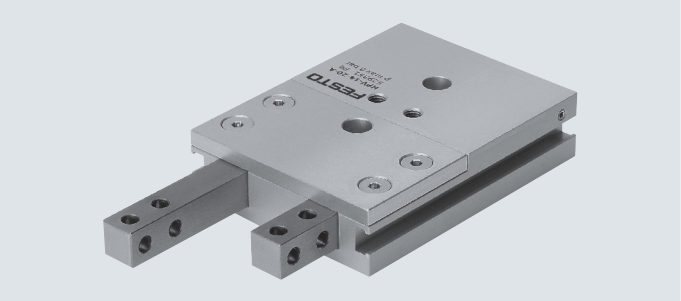
003	Stroke	
10	10	
20	20	
30	30	
40	40	
60	60	

004	Position sensing	
A	For proximity sensor	

Data sheet



- Ø - Size
  10 ... 22
- | - Stroke length
  20 ... 60 mm



General technical data				
Size		10	14	22
Pneumatic connection		M5/M3	M5/M5	
Mode of operation		Double-acting		
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)		
Design		Double piston		
		Piston rod		
		Locking mechanism		
		Non-rotating		
Protection against rotation/guide		Square		
Max. interchangeability	[mm]	0.3		
Cushioning		None		
Position sensing		Via proximity sensor		
Type of mounting		With through-hole		
		Via female thread		
Mounting position		Any		

Operating and environmental conditions		
Operating pressure	[bar]	3 ... 8
Ambient temperature	[°C]	+5 ... +60
Degree of protection		IP40
Corrosion resistance class CRC[1)]		2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

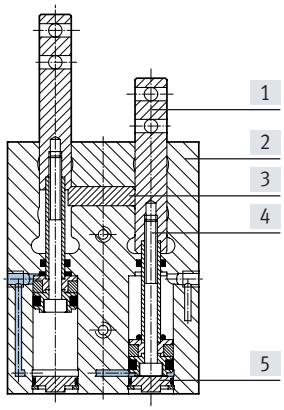
Forces [N]			
Size	10	14	22
Theoretical force at 6 bar Advancing	45	90	225
Theoretical force at 6 bar Retracting	35	75	180

Weight [g]					
Size	10	14		22	
Stroke	10	20	40	30	60
Product weight	135	290	460	950	1 500

Data sheet

Materials

Sectional view



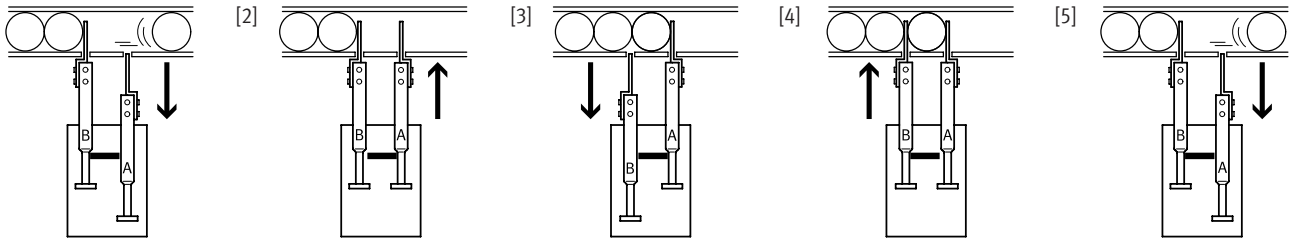
Feed separator		
[1]	Plunger	High-alloy steel
[2]	Housing	Wrought aluminium alloy (with CompCoat)
[3]	Locking mechanism	Case-hardened steel
[4]	Piston rod	High-alloy steel
[5]	End cap	High-alloy steel
–	Seals	Nitrile rubber
	Note on materials	Copper/PTFE-free
		RoHS-compliant

Note

The plunger slideways in the housing are determined by choosing the appropriate fit, and cannot be adjusted. The necessary basic lubrication is applied during assembly. We recommend that the feed separator be re-lubricated after 2 million cycles.

Cycle times [ms] without add-on plunger separators at 6 bar (unrestricted)

[1] [2] [3] [4] [5]



Size	10	14		22	
Stroke	10	20	40	30	60
Half cycle time (number [1] ... [3])	26.5	111.5	234.2	152.4	398.1
Cycle time (number [1] ... [5])	52.5	223	468.4	304.8	796.1

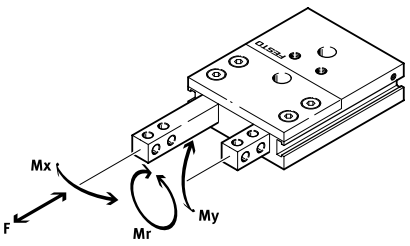
Max. permissible weight [g] of add-on plunger separators for unrestricted operation			
Size	10	14	22
Add-on plunger separators[1)]	56	150	395

1) If the max. permissible weights of the add-on plunger separators are exceeded, the retracting and advancing times must be adapted in accordance with the table below using one-way flow control valves. Failure to do so may result in components of the feed separator being damaged.

Retracting and advancing times [s] with add-on plunger separators as a function of the mass [g] of the plunger separators						
Size		10	14		22	
Stroke		10	20	40	30	60
Weight force	100 g	0.03	–	–	–	–
	200 g	0.04	0.03	0.05	–	–
	300 g	0.05	0.04	0.08	–	–
	400 g	0.06	0.05	0.11	0.24	0.48
	500 g	–	0.07	0.13	0.3	0.6
	600 g	–	–	–	0.36	0.72
	700 g	–	–	–	0.42	0.84
	800 g	–	–	–	0.48	0.96

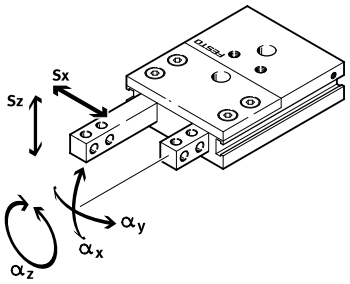
Data sheet

Permissible characteristic static load values at the plungers



Size		10	14	22
Force F	[N]	75	100	180
Torque Mx	[Nm]	3	5	9
Torque My	[Nm]	3	5	9
Torque Mr	[Nm]	3	5	9

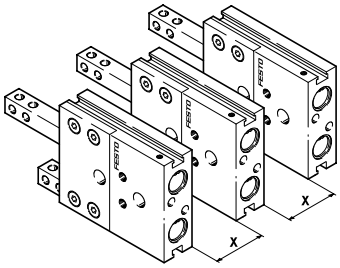
Plunger backlash



Size		10	14		22	
Stroke		10	20	40	30	60
S_x	[mm]	0.05	0.05	0.05	0.05	0.05
S_z	[mm]	0.03	0.03	0.03	0.03	0.03
α_x	[°]	0.12	0.12	0.07	0.06	0.04
α_y	[°]	0.2	0.2	0.12	0.11	0.07
α_z	[°]	0.262	0.175	0.175	0.12	0.12

Minimum clearances

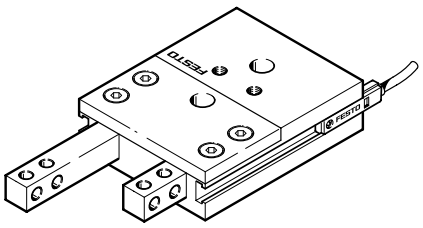
To prevent malfunctioning of the proximity sensors, the feed separators must comply with the minimum clearances specified in the table.



Size		10	14	22
For SME-8-...	[mm]	60	59	73
For SMT-8-...-B	[mm]	60	54	69

Data sheet

Projection of proximity sensors



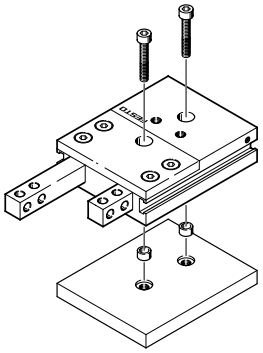
Size		10	14	22
For SME-8-...	[mm]	max. 14[1)]		
For SMT-8-...	[mm]	max. 22[1)]		

1) Depending on mounting position

Mounting options

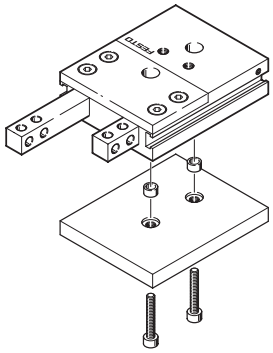
Only the underside (opposite the supply ports) may be used as a mounting surface.

From above via through-hole



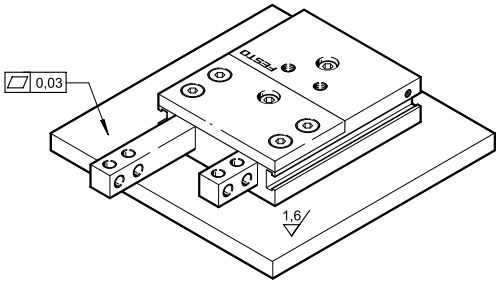
Size	10	14	22
Screw	M3	M4	M6
Permitted tightening torque [Nm]	1.2	2.9	9.9

From below via female thread



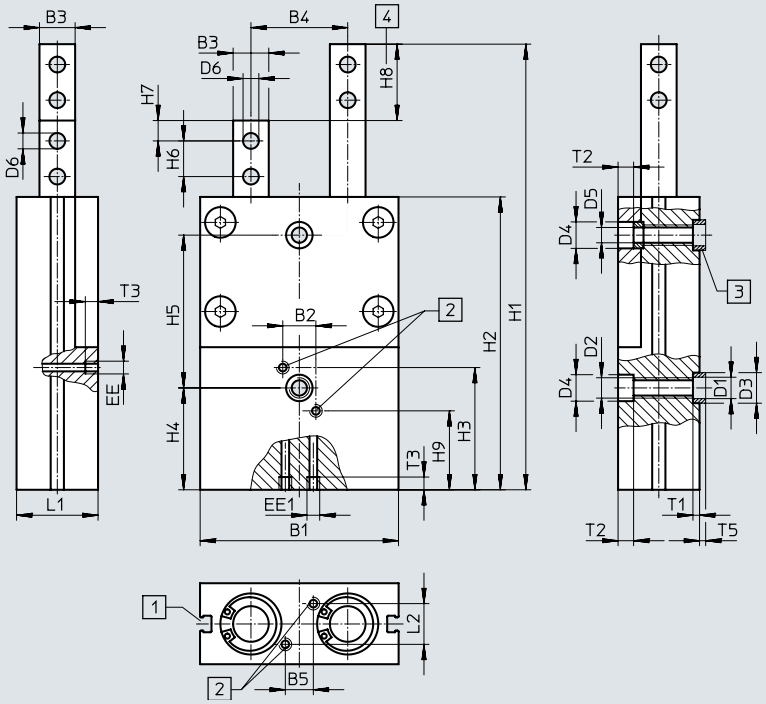
Size	10	14	22
Screw	M4	M5	M8
Permitted tightening torque [Nm]	2.9	5.9	24

Surface finish and positional accuracy of bearing surface



Data sheet

Dimensions Download CAD data ➔ www.festo.com



[1] Sensor slot for proximity sensor
[2] Choice of supply port
[3] Centring sleeves (2 included in scope of delivery)
[4] Stroke

Type	B1	B2	B3 ±0.02	B4 ±0.05	B5	D1 Ø	D2	D3 H8/h7 Ø	D4 H13 Ø	D5 H13 Ø	D6 H13 Ø	EE	EE1	H1
HPV-10-10-A	47	6	7	20	7	5.3	M4	7	6	–	3.2	M5	M3	78
HPV-14-20-A	60	12	10	30	10	5.3	M5	7	7.4	–	4.2	M5	M5	119
HPV-14-40-A	60	12	10	30	10	5.3	M5	7	7.4	–	4.2	M5	M5	189
HPV-22-30-A	78	13	14	38	11	8.4	M8	12	10.4	6.2	6.2	M5	M5	175
HPV-22-60-A	78	13	14	38	11	8.4	M8	12	10.4	6.2	6.2	M5	M5	280

Type	H2	H3	H4 ±0.1	H5[1]	H6 ±0.2	H7 ±0.1	H8 ±0.5	H9	L1	L2	T1 +0.1	T2	T3 min.	T5 –0.3
HPV-10-10-A	53	24.5	16	30	7	4	10	7.5	18	9	1.6	3.1	4	1.4
HPV-14-20-A	79	36	20	30	10	5	20	36	19	7	1.6	4.6	5	1.4
HPV-14-40-A	129	56	20	60	10	5	40	56	19	7	1.6	4.6	5	1.4
HPV-22-30-A	115	48	40	60	14	8	30	48	32	16	2.6	6.1	5	2.4
HPV-22-60-A	190	78	40	120	14	8	60	78	32	16	2.6	6.1	5	2.4

1) Tolerance for centring hole ±0.02
Tolerance for thread and through-hole ±0.1

Ordering data

Size	Stroke [mm]	Part no.	Type
10	10	**550908**	**HPV-10-10-A**
14	20	**529351**	**HPV-14-20-A**
	40	**529352**	**HPV-14-40-A**
22	30	**529353**	**HPV-22-30-A**
	60	**529354**	**HPV-22-60-A**

Accessories

Ordering data — Data sheets → Internet: zbh

	For size	Part no.	Type	PU[1]
Centring sleeve ZBH				
	10, 14	**8146544**	**ZBH-7-B**	10
	22	**189653**	**ZBH-12**	10

1) Packaging unit

Ordering data – Proximity sensor for T-slot, magneto-resistive — Data sheets → Internet: smt

	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Inserted in the slot from above, flush with the cylinder profile, 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**

Ordering data – Proximity sensor for T-slot, magnetic reed — Data sheets → Internet: sme

	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Inserted in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	**150855**	**SME-8-K-LED-24**
			Plug M8x1, 3-pin	0.3	**150857**	**SME-8-S-LED-24**

Ordering data – Connecting cables — Data sheets → 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 – Slot cover

	Mounting	Length [m]	Part no.	Type
	Inserted from above	2 x 0.5	**151680**	**ABP-5-S**

Ordering data – One-way flow control valves — Data sheets → Internet: grla-m5-qs

	Connection Thread	For tubing O.D.	Material	Part no.	Type
	M5	3	Metal design	**193137**	**GRLA-M5-QS-3-D**
		4		**193138**	**GRLA-M5-QS-4-D**
		6		**193139**	**GRLA-M5-QS-6-D**

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