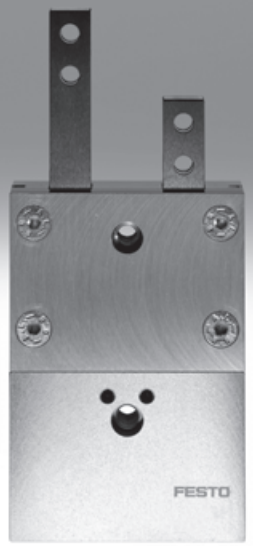
Feed separators HPV

FESTO



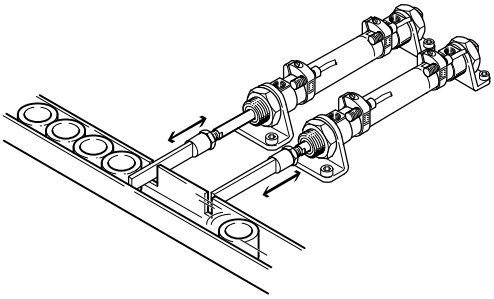
Feed separators HPV

Key features at a glance

Separation of workpieces in the supply process

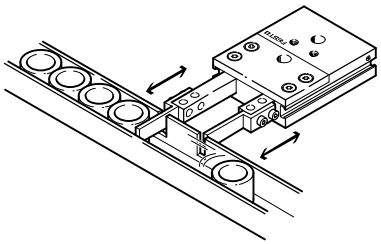
Previously

- Required at least 2 drives, 2 valves and 4 proximity sensors
- Extensive programming required



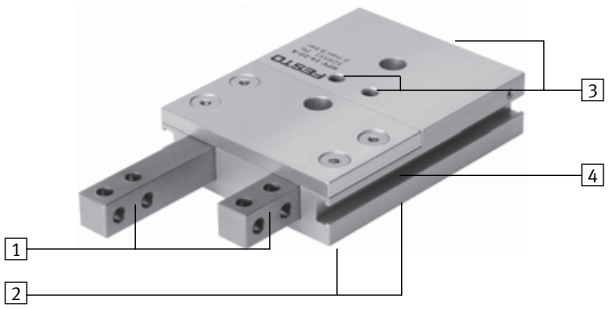
Today

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



High functionality

1. Corrosion-resistant thanks to stainless steel plungers
2. Optimum, accurate combination options with centring sleeves
3. Supply ports optionally at top or rear
4. Supports proximity sensors that can be integrated in the housing (SME/SMT-8)

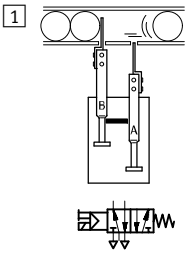


- Note

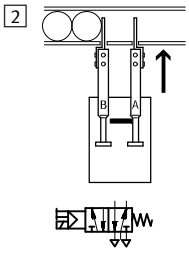
An integrated mechanical locking mechanism between the two plungers ensures that one piston cannot retract until the other has advanced.
Both plungers are briefly extended upon changeover and the part to be separated is surrounded.

Function principle

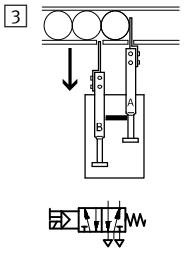
1 Plunger A is retracted. The locking mechanism locks plunger B.



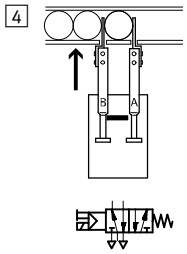
2 Plunger A advances.



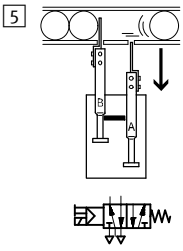
3 Plunger B cannot retract from the locking mechanism until plunger A is fully advanced.



4 Plunger B advances.



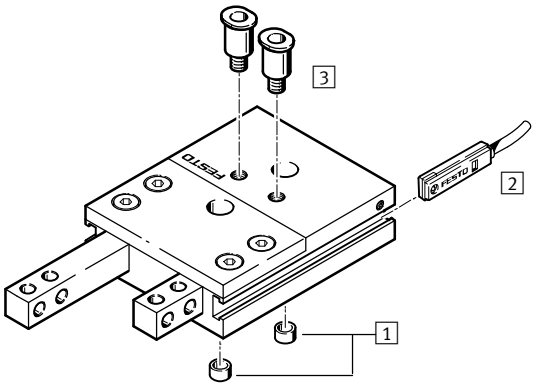
5 Plunger A cannot retract from the locking mechanism until plunger B is fully advanced.



Feed separators HPV

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, sensor is integrated in sensor slot	9
3	QS push-in fitting	For connecting compressed air tubing with standard external diameter	qs

Type codes

HPV	–	14	–	20	–	A

Type	
Double-acting	
HPV	Feed separator

Size [mm]

Stroke [mm]

Position sensing	
A	Via proximity sensor

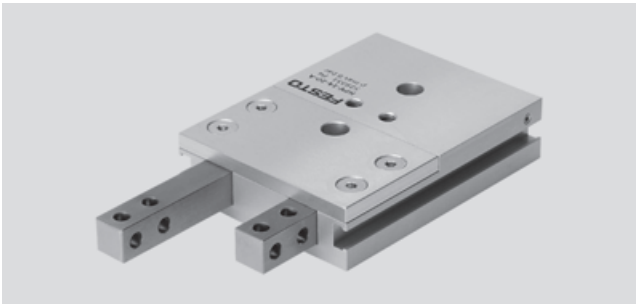
Feed separators HPV

Technical data

FESTO

Function

- 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 in accordance with ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)		
Design		Twin piston		
		Piston rod		
		Locking mechanism		
		Non-rotating		
Protection against torsion/guide		Square plungers		
Max. interchangeability	[mm]	0.3		
Cushioning		None		
Position sensing		Via proximity sensor		
Type of mounting		Via through-holes		
		Via female thread		
Mounting position		Any		

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

1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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

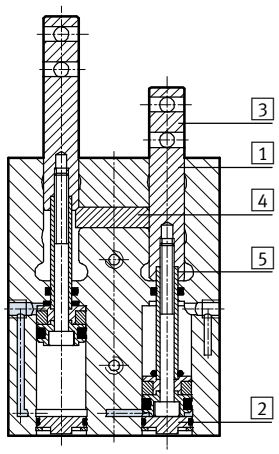
Weights [g]					
Size	10	14		22	
Stroke	10	20	40	30	60
Product weight	135	290	460	950	1,500

Feed separators HPV

Technical data

Materials

Sectional view



Feed separator		
1	Body	Wrought aluminium alloy (with CompCoat)
2	End cover	High-alloy steel
3	Plunger	High-alloy steel
4	Locking mechanism	Case-hardened steel
5	Piston rod	High-alloy steel
–	Seals	Nitrile rubber
	Note on materials	Copper and PTFE
		Conforms to RoHS

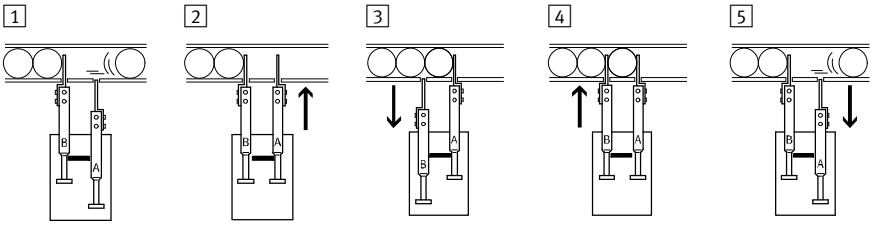
Note

The plunger slideways in the housing are determined by the appropriate fit selected and cannot be adjusted. The necessary basic lubrication is performed 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)

Half the cycle time:
Number 1 ... 3

Cycle time:
Number 1 ... 5



Size	10	14		22	
Stroke	10	20	40	30	60
Half the cycle time	26.5	111.5	234.2	152.4	398.1
Cycle time	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

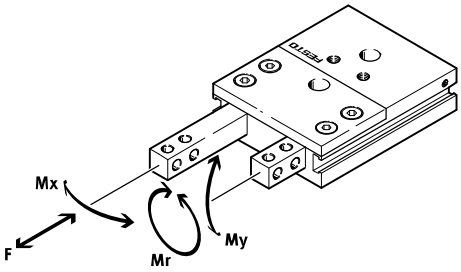
1) If the max. permissible weights of the add-on plunger separators are exceeded, the retracting and advancing times must be adapted in accordance with the table below using one-way flow control valves. Failure to do so may result in components of the feed separator being damaged.

Retracting and advancing times [s] with add-on plunger separators as a function of the load [g] of the fingers						
Size		10	14		22	
Stroke		10	20	40	30	60
Applied load	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

Feed separators HPV

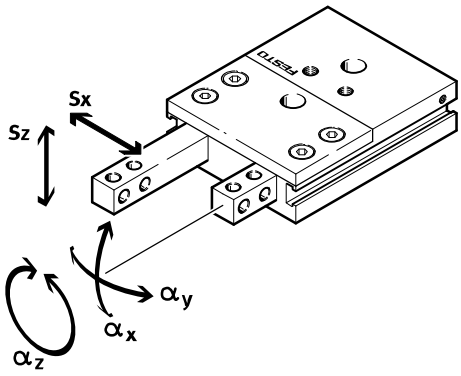
Technical data

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

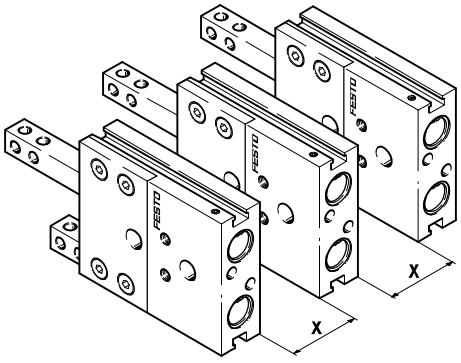
Plunger backlash



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.

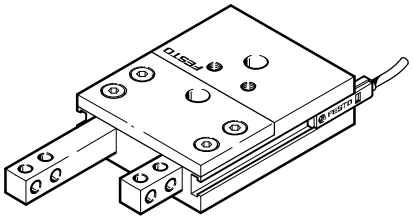


Size		10	14	22
For SME-8-...	[mm]	60	59	73
For SMT-8-...-B	[mm]	60	54	69

Feed separators HPV

Technical data

Projection of proximity sensors

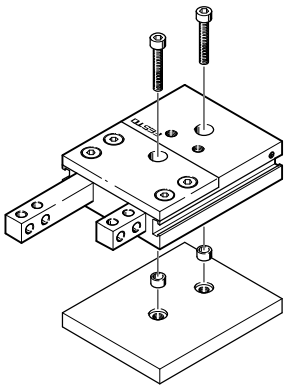


Size		10	14	22
For SME-8-...	[mm]	14		
For SMT-8-...	[mm]	22		

Mounting options

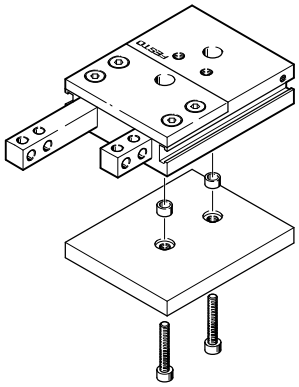
Only the mounting surface on the underside (opposite the supply ports) may be used.

From above via through-holes



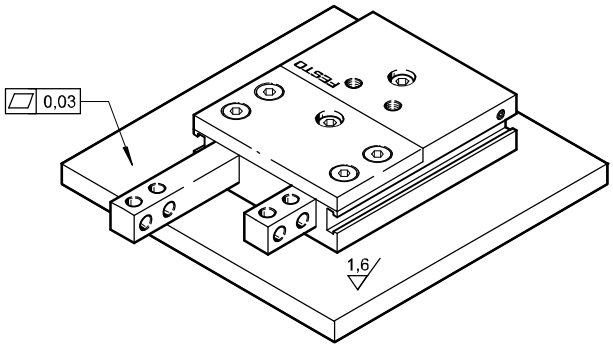
Size	10	14	22
Screw	M3	M4	M6
Permitted tightening torque [Nm]	1.2	2.9	9.9

From below via female threads



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

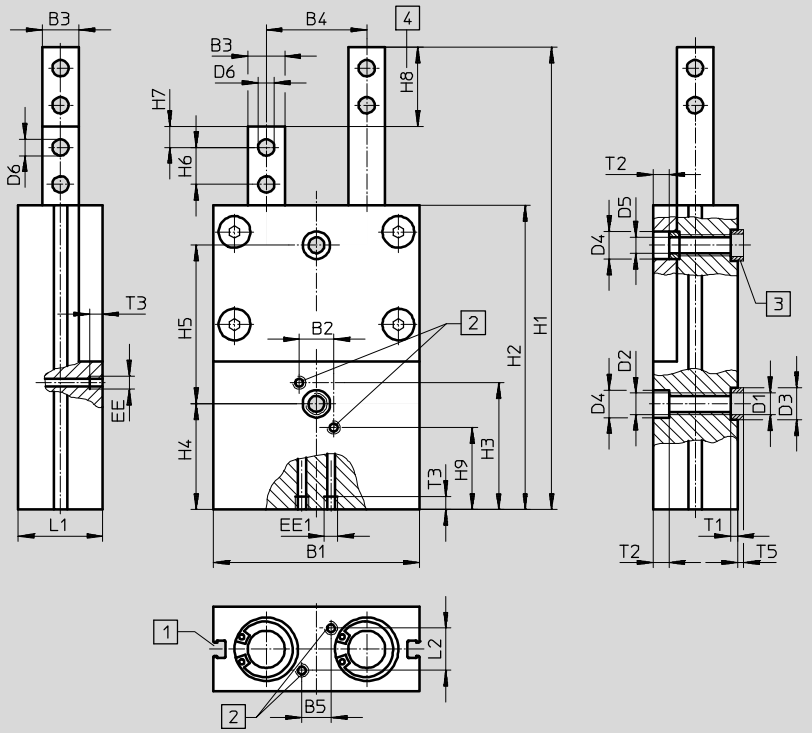
Surface finish and positional accuracy of bearing surface



Feed separators HPV

Technical data

Dimensions Download CAD data ➔ **www.festo.com**



1 Slot for proximity sensor
2 Compressed air connection (optional)
3 Centring sleeves (2 pieces included in scope of delivery)
4 Stroke

Type	B1	B2	B3 ±0.02	B4 ±0.05	B5	D1 ∅	D2	D3 H8/h7 ∅	D4 H13 ∅	D5 H13 ∅	D6 H13 ∅	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 threaded 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**

Ordering data				Technical data ➔ Internet: zbh
	For size	Part No.	Type	PU[1]
Centring sleeve ZBH				
	10, 14	**186717**	**ZBH-7**	10
	22	**189653**	**ZBH-12**	10

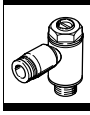
1) Packaging unit quantity

Ordering data – Proximity sensors for T-slot, magneto-resistive						Technical data ➔ Internet: smt
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with 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 sensors for T-slot, magnetic reed						Technical data ➔ Internet: sme
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Via contact	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					Technical data ➔ 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 covers				
	Mounting	Length [m]	Part No.	Type
	Inserted from above	2 x 0.5	**151680**	**ABP-5-S**

Ordering data – One-way flow control valves						Technical data ➔ Internet: grla-m5-qs
	Connection		Material	Part No.	Type	
	Thread	For tubing outer ∅				
	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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