

## Feed separators HPV

**FESTO**



# Feed separators HPV

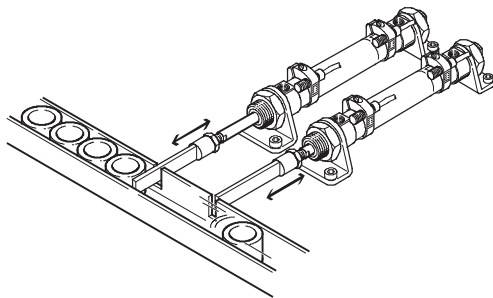
Key features at a glance

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## Separation of workpieces in the supply process

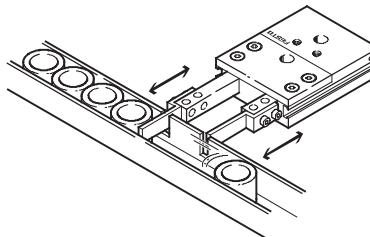
### Previously

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



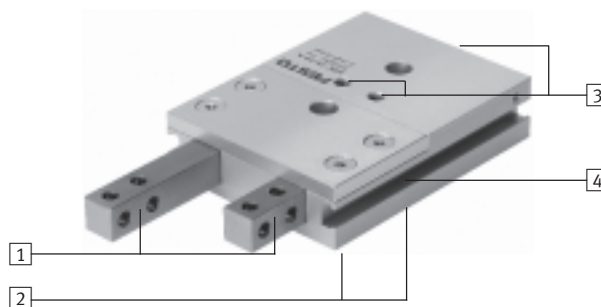
### Today

- 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)

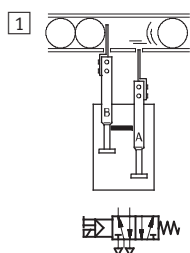


### Note

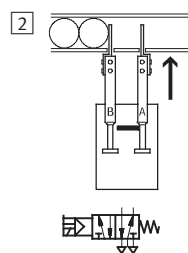
An integrated mechanical locking mechanism between the two plungers ensures that one piston cannot retract until the other has advanced. Both plungers are briefly extended upon changeover and the part to be separated is surrounded.

## Function principle

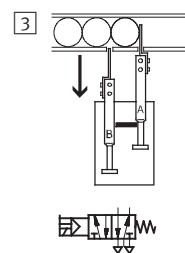
Plunger A is retracted. The locking mechanism locks plunger B.



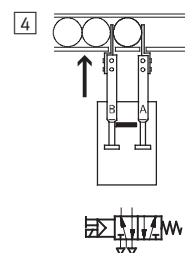
Plunger A advances.



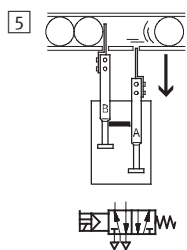
Plunger B cannot retract from the locking mechanism until plunger A is fully advanced.



Plunger B advances.



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

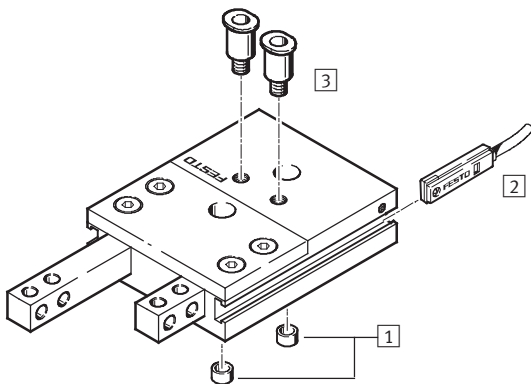


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Peripherals overview and type codes

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## Peripherals overview



Accessories		
	Brief description	→ Page/Internet
1	Centring sleeve, connecting sleeve	For centring when mounting
2	Proximity sensor	For position sensing, sensor is integrated in sensor slot
3	QS push-in fitting	For connecting compressed air tubing with standard external diameter
		quick star

## Type codes

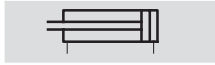
		HPV	–	14	–	20	–	A
<b>Type</b>								
Double-acting								
HPV	Feed separator							
<b>Size [mm]</b>								
<b>Stroke [mm]</b>								
<b>Position sensing</b>								
A	Via proximity sensor							

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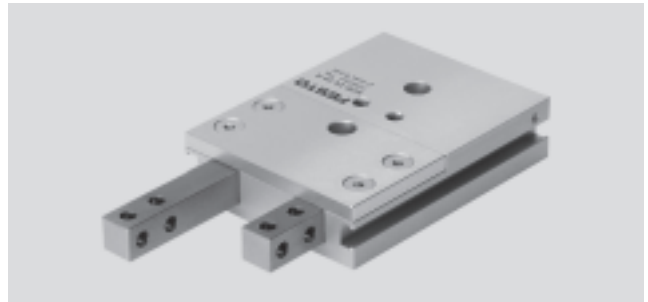
Technical data

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Function



- N- Size  
10 ... 22
- T- 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, filtered, lubricated or unlubricated		
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 <sup>1)</sup>	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

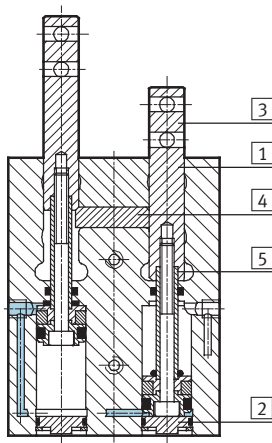
# Feed separators HPV

Technical data

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## 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, PTFE and silicone-free
		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.

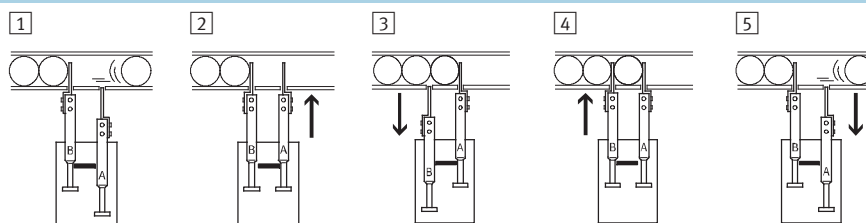
## Cycle times [ms] without add-on plunger separators at 6 bar (unrestricted)

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 <sup>1)</sup>	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 applied load [N] of the fingers

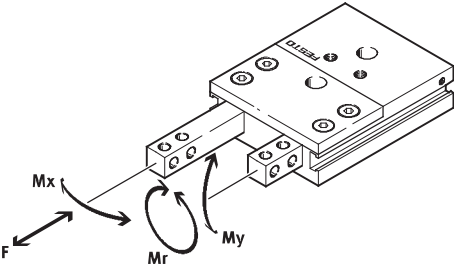
Size		10	14		22	
Stroke		10	20	40	30	60
Applied load	1 N	0.03	–	–	–	–
	2 N	0.04	0.03	0.05	–	–
	3 N	0.05	0.04	0.08	–	–
	4 N	0.06	0.05	0.11	0.24	0.48
	5 N	–	0.07	0.13	0.3	0.6
	6 N	–	–	–	0.36	0.72
	7 N	–	–	–	0.42	0.84
	8 N	–	–	–	0.48	0.96

# Feed separators HPV

Technical data

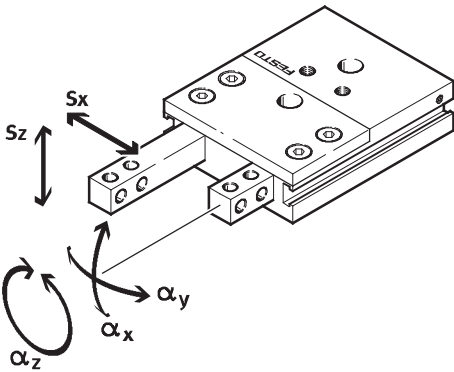
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## Permissible characteristic static load values at the plungers



Size	10	14	22
Force F [N]	75	100	180
Torque $M_x$ [Nm]	3	5	9
Torque $M_y$ [Nm]	3	5	9
Torque $M_r$ [Nm]	3	5	9

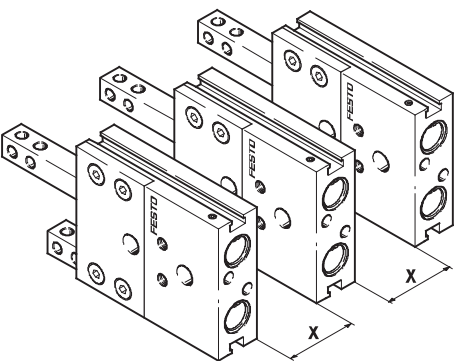
## Plunger backlash



Size	10	14	22
Stroke	10	20	30
$S_x$ [mm]	0.05	0.05	0.05
$S_z$ [mm]	0.03	0.03	0.03
$\alpha_x$ [°]	0.12	0.12	0.07
$\alpha_y$ [°]	0.2	0.2	0.11
$\alpha_z$ [°]	0.262	0.175	0.12

## Minimum clearances

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



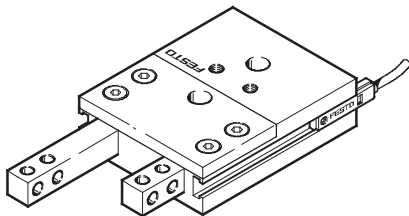
Size	10	14	22
For SME-8-... [mm]	60	59	73
For SMT-8-...-B [mm]	60	54	69

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Technical data

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## Projection of proximity sensors

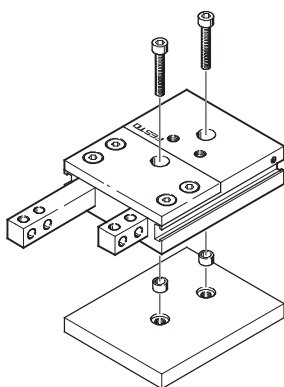


Size		10	14	22
For SME-8-...	[mm]	14		
For SMT-8-...	[mm]	22		

## Mounting options

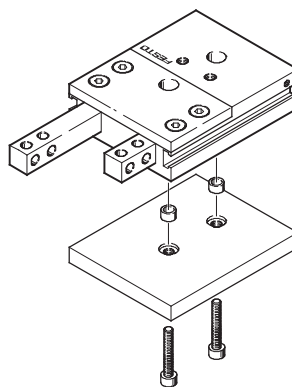
Only the mounting surface on the underside (opposite the supply ports) may be used.

### From above via through-holes



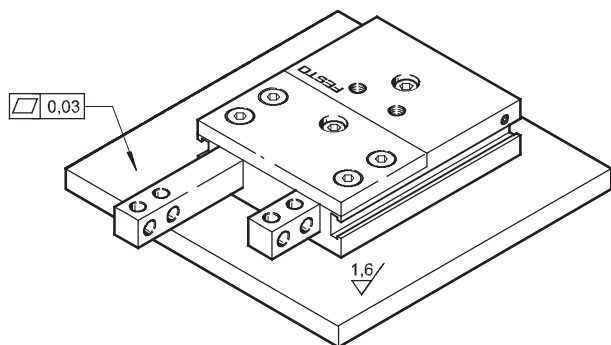
Size	10	14	22
Screw	M3	M4	M6
Permitted tightening torque [Nm]	1.2	2.9	9.9

### 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



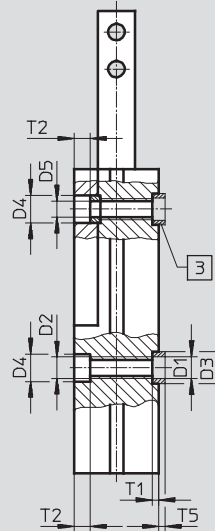
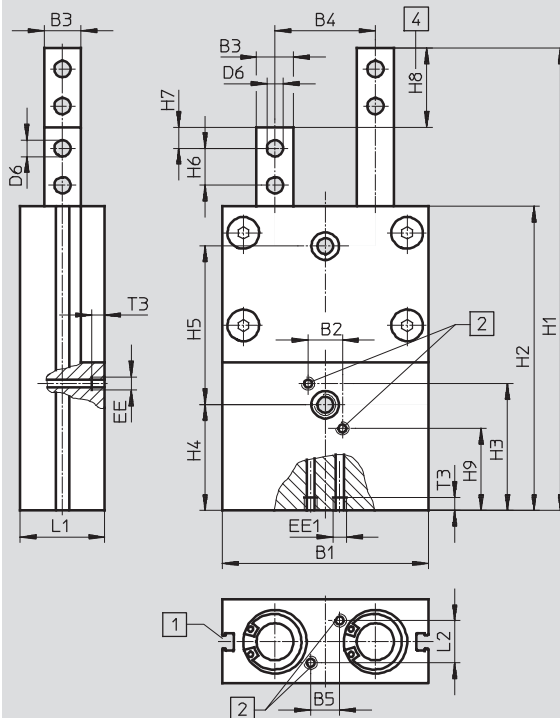
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Technical data

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## Dimensions

Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)



- 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 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 <sup>1)</sup>	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	550 908	HPV-10-10-A
14	20	529 351	HPV-14-20-A
	40	529 352	HPV-14-40-A
22	30	529 353	HPV-22-30-A
	60	529 354	HPV-22-60-A




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
Accessories



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Ordering data			Technical data ➔ Internet: zbh		
	For size	Part No.	Type	PU <sup>1)</sup>	
Centring sleeve ZBH					
	10, 14	186 717	ZBH-7	10	
	22	189 653	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 lengthwise, flush with the cylinder profile	PNP	Cable, 3-wire	2.5	175 436	SMT-8-PS-K-LED-24-B
			Plug M8x1, 3-pin	0.3	175 484	SMT-8-PS-S-LED-24-B

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	150 855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150 857	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	541 333	NEBU-M8G3-K-2.5-LE3
			5	541 334	NEBU-M8G3-K-5-LE3
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541 363	NEBU-M12G5-K-2.5-LE3
			5	541 364	NEBU-M12G5-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338	NEBU-M8W3-K-2.5-LE3
			5	541 341	NEBU-M8W3-K-5-LE3
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541 367	NEBU-M12W5-K-2.5-LE3
			5	541 370	NEBU-M12W5-K-5-LE3

Ordering data – Slot covers			
	Mounting	Length [m]	Part No. Type
	Inserted from above	2 x 0.5	151 680 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 Ø			
	M5	3	Metal design	193 137	GRLA-M5-QS-3-D
		4		193 138	GRLA-M5-QS-4-D
		6		193 139	GRLA-M5-QS-6-D

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