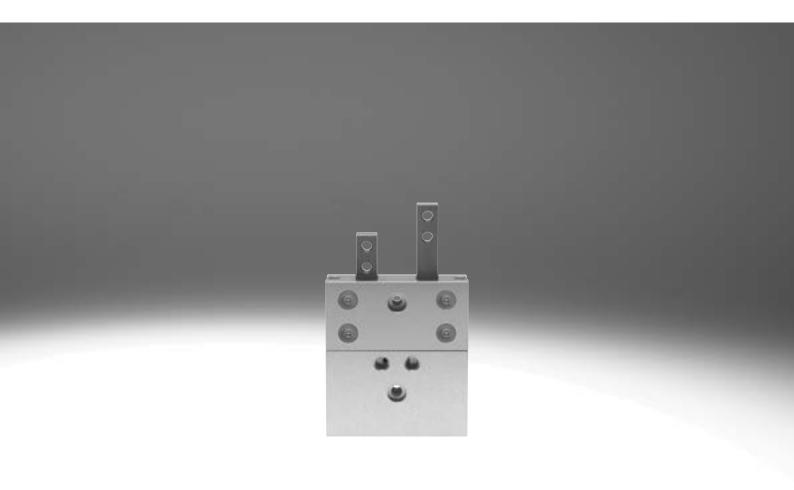
## Feed separators HPV

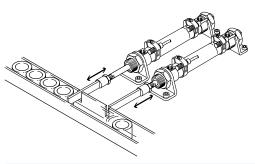
# **FESTO**



## Key features

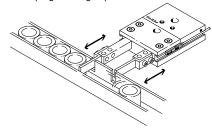
#### Separation of workpieces in the feed process Previously

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

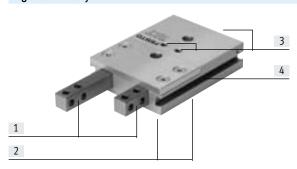


#### Now

- 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
- 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)

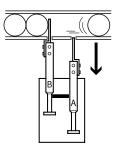
## Note

An integrated mechanical interlock between the two plungers ensures that one plunger cannot retract until the other has advanced. Both plungers are briefly extended

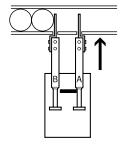
during switching and the part to be separated is enclosed.

#### Operating principle

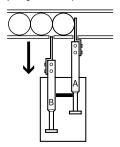
Plunger A is retracted. The locking mechanism locks plunger B.



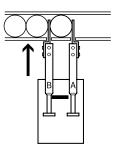
Plunger A advances.



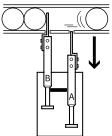
The locking mechanism prevents plunger B from retracting until plunger A is fully advanced.



Plunger B advances.

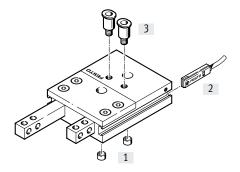


The locking mechanism prevents plunger A from retracting until plunger B is fully advanced.



## Peripherals overview and type codes

## Peripherals overview



Acce	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	
Α	For proximity sensor	

## Feed separators HPV

## Data sheet

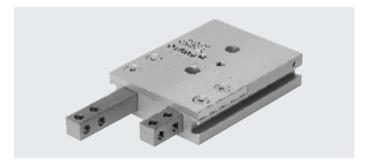


- **Ø** - Size

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 8573-1:20	010 [7:4:4]			
Note on the operating/pilot medium	Lubricated operation possible (in	which case lubricated operation	will always be required)		
Design	Double piston	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	perating and environmental conditions					
Operating pressure	[bar]	38				
Ambient temperature	[°C]	+5+60				
Degree of protection		IP40				
Corrosion resistance class CRC <sup>1)</sup>		2				

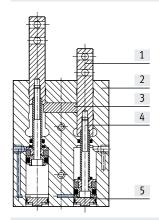
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

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

#### Materials

Sectional view

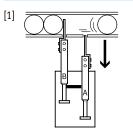


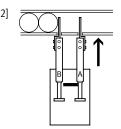
Feed	Feed separator				
[1]	Plunger	High-alloy steel			
[2]	Housing	Wrought aluminium alloy (with CompCoat)			
[3]	Locking mechanism	Case-hardened steel			
[4]	Piston rod	High-alloy steel			
[5]	End cap	High-alloy steel			
-	Seals	Nitrile rubber			
	Note on materials	Copper/PTFE-free			
		RoHS-compliant			

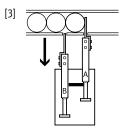


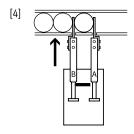
The plunger slideways in the housing are determined by choosing the appropriate fit, and cannot be adjusted. The necessary basic lubrication is applied during assembly. We recommend that the feed separator be re-lubricated after 2 million cycles.

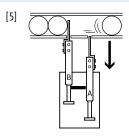
#### Cycle times [ms] without add-on plunger separators at 6 bar (unrestricted)











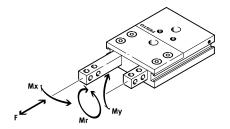
Size	10	14		22	
Stroke	10	20	40	30	60
Half cycle time (number [1] [3])	26.5	111.5	234.2	152.4	398.1
Cycle time (number [1] [5])	52.5	223	468.4	304.8	796.1

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

<sup>1)</sup> 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.

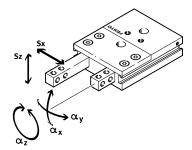
Retracting and advancing times [s] with add-on plunger separators as a function of the mass [g] of the plunger separators								
Size		10	14		22			
Stroke		10	20	40	30	60		
Weight force	100 g	0.03	=	-	-	-		
	200 g	0.04	0.03	0.05	-	-		
	300 g	0.05	0.04	0.08	-	-		
	400 g	0.06	0.05	0.11	0.24	0.48		
	500 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		

#### 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

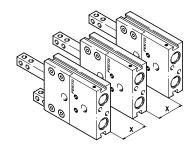
#### Plunger backlash



Size		10	14		22	
Stroke		10	20	40	30	60
S <sub>x</sub>	[mm]	0.05	0.05	0.05	0.05	0.05
S <sub>z</sub>	[mm]	0.03	0.03	0.03	0.03	0.03
$\alpha_{x}$	[°]	0.12	0.12	0.07	0.06	0.04
$\alpha_{y}$	[°]	0.2	0.2	0.12	0.11	0.07
$\alpha_{z}$	[°]	0.262	0.175	0.175	0.12	0.12

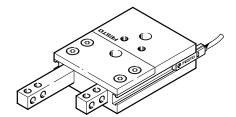
#### Minimum clearances

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-8B	[mm]	60	54	69

#### Projection of proximity sensors



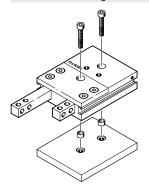
Size		10	14	22	
For SME-8	[mm]	max. 14 <sup>1)</sup>			
For SMT-8	[mm]	max. 22 <sup>1)</sup>			

<sup>1)</sup> Depending on mounting position

#### **Mounting options**

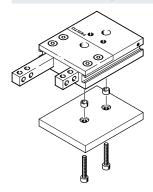
Only the underside (opposite the supply ports) may be used as a mounting surface.

From above via through-hole



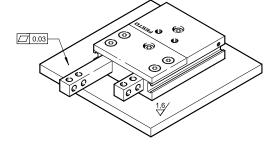
Size		10	14	22
Screw		M3	M4	M6
Permitted tightening	[Nm]	1.2	2.9	9.9
torque				

#### From below via female thread



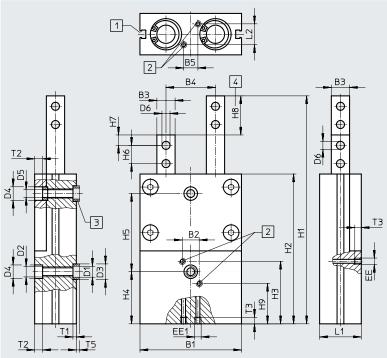
Size		10	14	22
Screw		M4	M5	M8
Permitted tightening	[Nm]	2.9	5.9	24
torque				

#### Surface finish and positional accuracy of bearing surface





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

Туре	B1	B2	B3	B4	B5	D1	D2	D3 H8/h7	D4 H13	D5 H13	D6 H13	EE	EE1	H1
			±0.02	±0.05		Ø		Ø	Ø	Ø	Ø			
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
Туре	H2	Н3	H4	H5 <sup>1)</sup>	H6	H7	H8	Н9	L1	L2	T1	T2	T3	T5
			±0.1		±0.2	±0.1	±0.5				+0.1		min.	-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
		<del>                                     </del>												
HPV-14-20-A	79	36	20	30	10	5	20	36	19	7	1.6	4.6	5	1.4
HPV-14-20-A HPV-14-40-A	79 129	36 56	20	30 60	10	5	20 40	36 56	19 19	7	1.6 1.6	4.6 4.6	5	1.4
										· '				

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

Ordering data			
Size	Stroke		
	[mm]	Part no.	Туре
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	1						Data sheets	s → Internet: zbh
	For size					Part no.	Туре	PU <sup>1)</sup>
Centring sleev	re ZBH							
	10, 14					186717	ZBH-7	10
	22					189653	ZBH-12	10
) Packaging uni	it							
Ordering data	a – Proximity sensor for T-slot, magneto-resistive	!					Data sheets	s → Internet: smt
	Type of mounting	Switching output	Electrical con	nnection	Cable length [m]	Part no.	Туре	
N/O contact		<u>'</u>	<u>'</u>		•		•	
~	Inserted in the slot from above, flush with the	PNP	Cable, 3-wire	<u> </u>	2.5	574335	SMT-8M-A-PS-24V-E-2	2.5-0E
	cylinder profile, short design		Plug M8x1, 3		0.3	574334	SMT-8M-A-PS-24V-E-0	
0-1	Desiration of Tales are setting							
Ordering data	a – Proximity sensor for T-slot, magnetic reed	lanı	1		المالية المالية	La .	1	→ Internet: sme
	Type of mounting	Switching output	Electrical con	inection	Cable length [m]	Part no.	Туре	
N/O contact			_		<u> </u>	<u>'</u>	-	
	Inserted in the slot lengthwise, flush with the	Contacting	Cable, 3-wire	•	2.5	150855	SME-8-K-LED-24	
<b>6 9 1</b>	cylinder profile		Plug M8x1, 3-pin			150857	SME-8-S-LED-24	
Ordering data	a – Connecting cables	1			1	I =	The second secon	→ Internet: nebu
	Electrical connection, left	Electrical connection, right Cable le		Cable length [m]	Part no.	Туре		
		Cable, open end, 3-wire 2.5						
~//	Straight socket, M8x1, 3-pin	Cable, open e	end, 3-wire		2.5	541333	NEBU-M8G3-K-2.5-LE	3
	Straight socket, M8x1, 3-pin	Cable, open e	end, 3-wire		2.5	541333 541334	NEBU-M8G3-K-2.5-LE3	3
	Straight socket, M8x1, 3-pin  Straight socket, M12x1, 5-pin	Cable, open e						
					5	541334	NEBU-M8G3-K-5-LE3	E3
			end, 3-wire		5 2.5	541334 541363	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L	E3
	Straight socket, M12x1, 5-pin	Cable, open e	end, 3-wire		5 2.5 5	541334 541363 541364	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3	E3
	Straight socket, M12x1, 5-pin	Cable, open e	end, 3-wire		5 2.5 5 2.5	541334 541363 541364 541338	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE	E3
	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin	Cable, open e	end, 3-wire		5 2.5 5 2.5 5	541334 541363 541364 541338 541341	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3	E3 3
Ordering data	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin	Cable, open e	end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L	E3 3
Ordering data	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin	Cable, open e	end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3	E3 3
Ordering data	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin	Cable, open e	end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L	E3 3
Ordering data	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin	Cable, open e  Cable, open e  Cable, open e	end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3	E3 3
Ordering data	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin  - Slot cover  Mounting	Cable, open e  Cable, open e  Cable, open e	end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370 Part no.	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3	E3 3
	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin  a – Slot cover  Mounting  Inserted from above	Cable, open e  Cable, open e  Cable, open e	end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370 Part no.	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3 Type  ABP-5-S	E3 3 E3 B
	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin  a – Slot cover  Mounting  Inserted from above	Cable, open e  Cable, open e  Cable, open e	end, 3-wire end, 3-wire end, 3-wire	<i>N</i> aterial	5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370 Part no.	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3  Type  ABP-5-S  Data sheets → Int	E3 3 E3 B
	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin  a – Slot cover  Mounting  Inserted from above	Cable, open e  Cable, open e  Cable, open e  Length [m]  2 x 0.5	end, 3-wire end, 3-wire end, 3-wire	Material	5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370 Part no.	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3 Type  ABP-5-S	E3 3 E3 B
	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin  A - Slot cover  Mounting  Inserted from above  A - One-way flow control valves  Connection	Cable, open e  Cable, open e  Cable, open e  Length [m]  2 x 0.5	end, 3-wire end, 3-wire end, 3-wire	Material Metal design	5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370 Part no.	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-L NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-5-LE3 NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3  Type  ABP-5-S  Data sheets → Int	E3 3 E3 B
	Straight socket, M12x1, 5-pin  Angled socket, M8x1, 3-pin  Angled socket, M12x1, 5-pin  A Slot cover  Mounting  Inserted from above  A - One-way flow control valves  Connection Thread  For tub	Cable, open e  Cable, open e  Cable, open e  Length [m]  2 x 0.5	end, 3-wire end, 3-wire end, 3-wire		5 2.5 5 2.5 5 2.5 5	541334 541363 541364 541338 541341 541367 541370 Part no.	NEBU-M8G3-K-5-LE3 NEBU-M12G5-K-2.5-LE NEBU-M12G5-K-5-LE3 NEBU-M8W3-K-2.5-LE NEBU-M8W3-K-2.5-LE NEBU-M12W5-K-2.5-L NEBU-M12W5-K-5-LE3  Type  ABP-5-S  Data sheets → Int Type	E3 3 E3 B