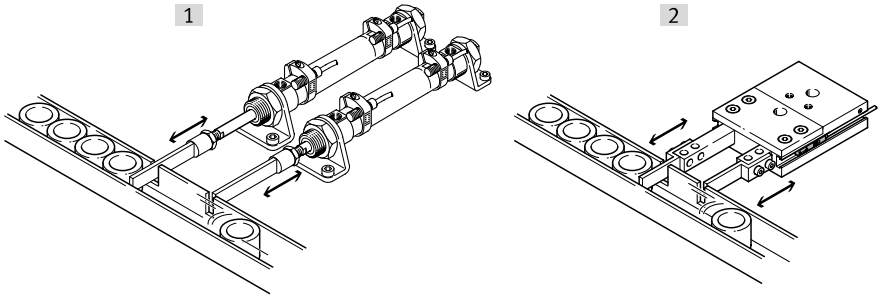
# Feed separator HPV

FESTO

# Characteristics

## At a glance

Link hpv




Separating workpieces in the feeding process:

[1] Previously:
- At least 2 drives, 2 valves and 4 proximity switches
- Extensive programming

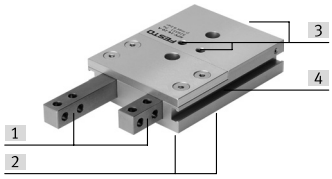
[2] Nowadays:
- One unit (1 drive, 1 valve and 2 proximity switches)
- More cost-efficient
- Process-reliable
- No programming required

## Position sensing

| | |
|---|---|
| [A] | For proximity sensor |

By using proximity switches, any position can be detected.

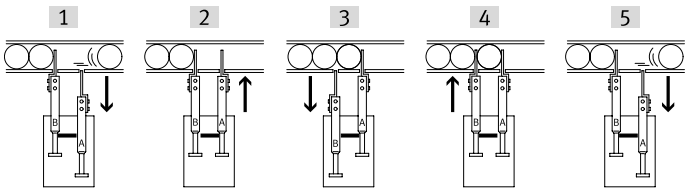
## Overview




High functionality:
[1] Corrosion-resistant thanks to stainless steel fingers
[2] Optimum and precise adaptation options using centring sleeves
[3] Compressed air connections optionally at the top or rear
[4] Proximity switches can be integrated in the housing

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

## Application example




Functional principle:
[1] Plunger A is retracted. The locking mechanism locks plunger B.
[2] Plunger A advances.
[3] The locking mechanism prevents plunger B from retracting until plunger A is fully advanced.
[4] Plunger B advances.
[5] The locking mechanism prevents plunger A can from retracting until plunger B is fully advanced.

# Type code

| 001 | Series | |
|---|---|---|
| **HPV** | Separator, double-acting | |

| 002 | Size [mm] | |
|---|---|---|
| **10** | 10 | |
| **14** | 14 | |
| **22** | 22 | |

| 003 | Stroke [mm] | |
|---|---|---|
| **10** | 10 | |
| **20** | 20 | |
| **30** | 30 | |
| **40** | 40 | |
| **60** | 60 | |

| 004 | Position sensing | |
|---|---|---|
| **A** | For proximity sensor | |

# Datasheet

| General technical data | | | | | |
|---|---|---|---|---|---|
| Size [mm] | 10 mm | 14 mm | | 22 mm | |
| Stroke | 10 mm | 20 mm | 40 mm | 30 mm | 60 mm |
| Pneumatic connection | M5 | | | | |
| alternative connections | M3 | M5 | | | |
| Mode of operation | Double-acting | | | | |
| Design | Twin piston<br>Piston rod<br>Locking mechanism<br>Non-rotating | | | | |
| Protection against torque/ guide | Square guide | | | | |
| Max. replacement accuracy | 0.3 mm | | | | |
| Cushioning | No cushioning | | | | |
| Position detection | Via proximity switch | | | | |
| Type of mounting [1] | With through-hole for M3 screw and centring sleeve<br>With female thread M4 and centring sleeve | With through-hole for M4 screw and centring sleeve<br>With female thread M5 and centring sleeve | | With through-hole for M6 screw and centring sleeve<br>With female thread M8 and centring sleeve | |
| Max. tightening torque | 1.2 Nm for M3<br>2.9 Nm for M4 | 2.9 Nm for M4<br>5.9 Nm for M5 | | 24 Nm for M8<br>9.9 Nm for M6 | |
| Mounting of external fingers | Through-hole | | | | |
| Mounting position | optional | | | | |

1) Only the underside (opposite the compressed air connections) may be used as the mounting surface.

| Operating and environmental conditions | | | |
|---|---|---|---|
| Size [mm] | 10 mm | 14 mm | 22 mm |
| Operating medium | Compressed air to ISO 8573-1:2010 [7:4:4] | | |
| Note on operating and pilot medium | Lubricated operation possible (in which case lubricated operation will always be required) | | |
| Operating pressure | 3 ... 8 bar | | |
| Ambient temperature | 5 ... 60°C | | |
| Degree of protection | IP40 | | |
| Corrosion resistance class CRC [1] | 2 - Moderate corrosion stress | | |

1) More information www.festo.com/catalogue/kbk

| Forces | | | |
|---|---|---|---|
| Size [mm] | 10 mm | 14 mm | 22 mm |
| Theoretical force at 0.6 MPa (6 bar, 87 psi), advance stroke | 45 N | 90 N | 225 N |
| Theoretical force at 0.6 MPa (6 bar, 87 psi), return stroke | 35 N | 75 N | 180 N |

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

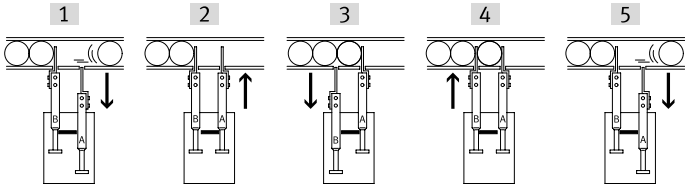
# Datasheet

## Materials

Note: The plain-bearing guide of the plungers in the housing is determined by choosing a suitable fit and cannot be adjusted. The necessary basic lubrication is carried out during the mounting process. Maintenance-free up to 10 million cycles. At higher ambient temperatures, we recommend relubrication after 5 millions of cycles.

| | |
|---|---|
| Material housing | Smooth-anodised wrought aluminium alloy |
| Material cover | High-alloy steel |
| Material piston rod | High-alloy steel |
| Plunger material | High-alloy steel |
| Material gate valve | Case-hardened steel |
| Material seals | NBR |
| Note on materials | RoHS-compliant |
| LABS (PWIS) conformity | VDMA24364-B2-L |

## Cycle times without adapter jaws at 0.6 MPa (6 bar, 87 psi), unthrottled




[1] ... [3] Half cycle
[1] ... [5] Cycle time

| Size [mm] | 10 mm | 14 mm | | 22 mm | |
|---|---|---|---|---|---|
| Stroke | 10 mm | 20 mm | 40 mm | 30 mm | 60 mm |
| Half pulse | 26.5 ms | 111.5 ms | 234.2 ms | 152.4 ms | 398.1 ms |
| Cycle time | 52.5 ms | 223 ms | 468.4 ms | 304.8 ms | 796.1 ms |

## Max. permissible weight of the adapter jaws for unthrottled operation

| Size [mm] | 10 mm | 14 mm | 22 mm |
|---|---|---|---|
| Max. mass per external gripper finger [1] | 56 g | 150 g | 395 g |

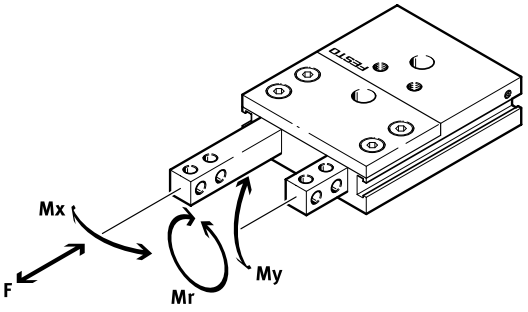
1) If the max. permissible weights of the add-on plunger separators are exceeded, the retracting and advancing times must be adapted in accordance with the table below using one-way flow control valves. Otherwise, parts of the feed separator may be destroyed.

## Retracting and advancing times

| Size [mm] | 10 mm | 14 mm | | 22 mm | |
|---|---|---|---|---|---|
| Stroke | 10 mm | 20 mm | 40 mm | 30 mm | 60 mm |
| Return-stroke time [1] | 0.03 ... 0.06 ms | 0.03 ... 0.07 ms | 0.05 ... 0.13 ms | 0.24 ... 0.48 ms | 0.48 ... 0.96 ms |
| Advance time [2] | 0.03 ... 0.06 ms | 0.03 ... 0.07 ms | 0.05 ... 0.13 ms | 0.24 ... 0.48 ms | 0.48 ... 0.96 ms |

1) Depending on the mass of the external adapter jaws used.
2) Depending on the mass of the external adapter jaws used.

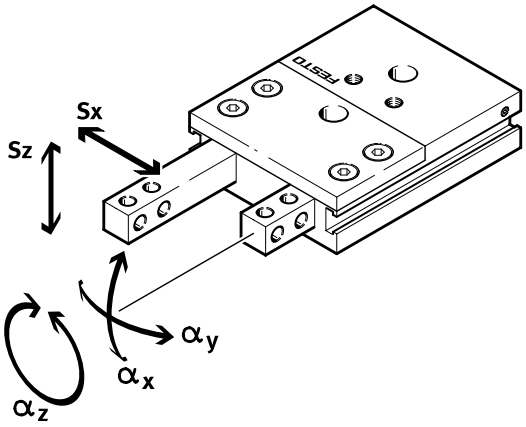
## Characteristic load values on the plungers




| Size [mm] | 10 mm | 14 mm | 22 mm |
|---|---|---|---|
| Max. force on finger Fz static | 75 N | 100 N | 180 N |
| Max. torque at finger Mx static | 3 Nm | 5 Nm | 9 Nm |
| Max. torque at finger My static | 3 Nm | 5 Nm | 9 Nm |
| Max. torque Mr at finger, static | 3 Nm | 5 Nm | 9 Nm |

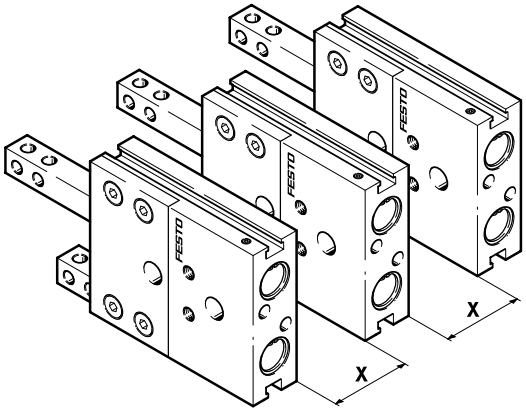
# Datasheet

## Plunger clearance




| Size [mm] | 10 mm | 14 mm | | 22 mm | |
|---|---|---|---|---|---|
| Stroke | 10 mm | 20 mm | 40 mm | 30 mm | 60 mm |
| Max. stem backlash Sx | 0.05 mm | | | | |
| Max. stem backlash Sz | 0.03 mm | | | | |
| Max. angular gripper jaw backlash ax | 0.12 deg | | 0.07 deg | 0.06 deg | 0.04 deg |
| Max. angular gripper jaw backlash ay | 0.2 deg | | 0.12 deg | 0.11 deg | 0.07 deg |
| Max. angular gripper jaw backlash az | 0.262 deg | 0.175 deg | | 0.12 deg | |

## Minimum clearances



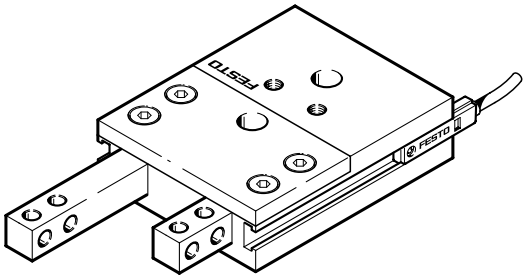

To prevent the proximity switches from malfunctioning, the feed separators must comply with the minimum clearances specified.

| Size [mm] | 10 mm | 14 mm | 22 mm |
|---|---|---|---|
| Minimum product distance due to proximity switches[1)] | 60 mm | 54 ... 59 mm | 69 ... 73 mm |

1) Min. values apply with proximity switches SMT-8 / max. values apply with proximity switches SME-8

# Datasheet

## Proximity switch protrusion

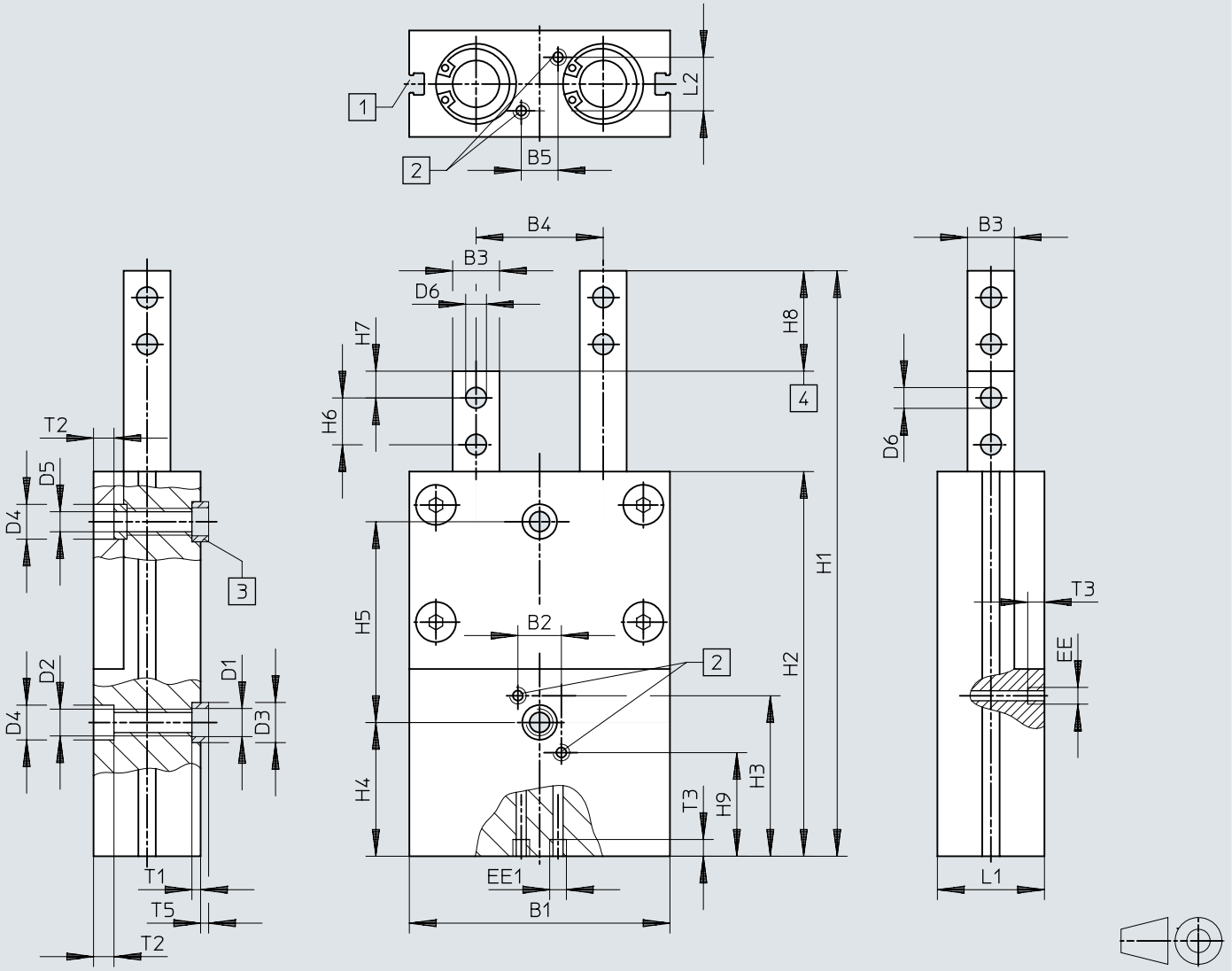



| Size [mm] | 10 mm | 14 mm | 22 mm |
|---|---|---|---|
| Proximity switch protrusion[1)] | 14 ... 22 mm | | |

1) Min. values apply with proximity switches SMT-8 / max. values apply with proximity switches SME-8

# Dimensions

**Dimensions – Feed separator HPV** Download CAD data www.festo.com




[1] Sensor slot for proximity switch
[2] Choice of compressed air connection
[3] Centring sleeves ZBH (2 included in the scope of delivery)
[4] Stroke

## Dimensions

| | B1 | B2 | B3<br>±0,02 | B4<br>±0,05 | B5 | D1<br>ø | D2 | D3<br>H8/h7<br>ø | D4<br>H13<br>ø | D5<br>H13<br>ø | D6<br>H13<br>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 |

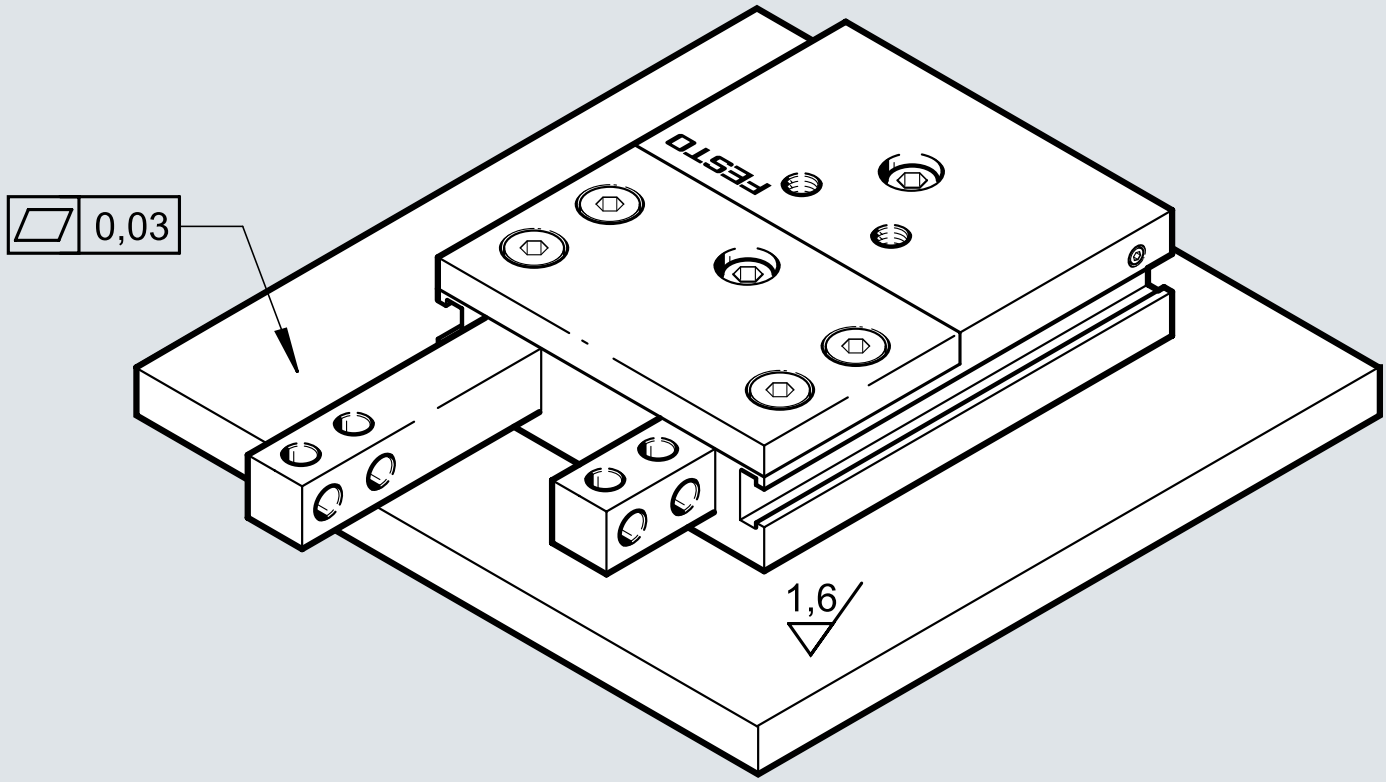
| | H2 | H3 | H4<br>±0,1 | H5[1)] | H6<br>±0,2 | H7<br>±0,1 | H8<br>±0,5 | H9 | L1 | L2 | T1<br>+0,1 | T2 | T3<br>min | T5<br>–0,3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPV-10-10-A | 53 | 24,5 | 16 | 30 | 7 | 4 | 10 | 7,5 | 18 | 9 | 1,6 | 3,1 | 4 | 1,4 |
| HPV-14-20-A | 79 | 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

## Dimensions

**Dimensions – Feed separator HPV – shape and position accuracy of the contact surface**

Download CAD data www.festo.com



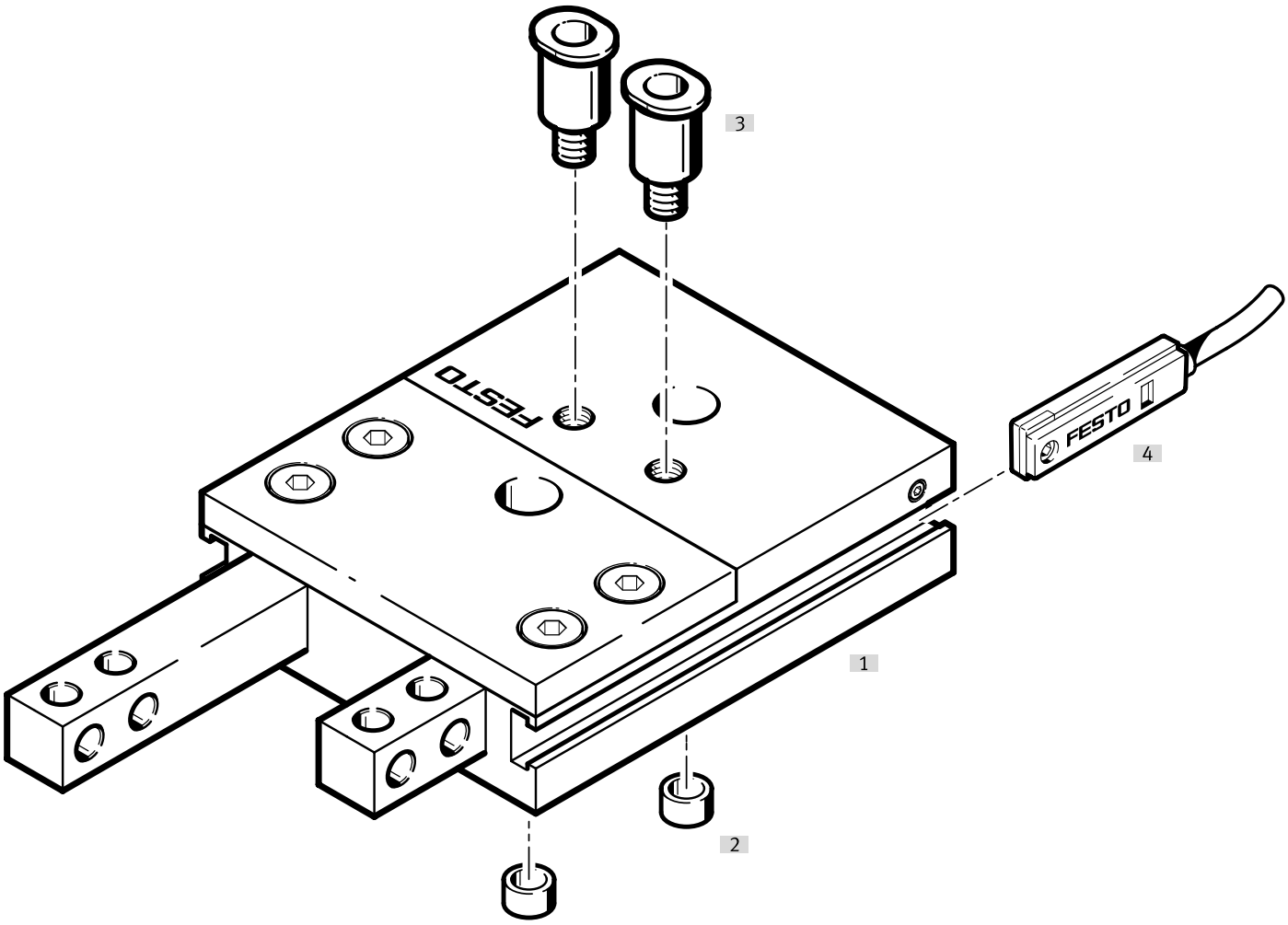
# Ordering data

**Feed separator HPV**

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

# Peripherals

**Feed separator HPV**




| Accessories | | | → Link |
|---|---|---|---|
| | Type/order code | Description | |
| [1] | Feed separator HPV | Double-acting | hpv |
| [2] | Centring sleeve ZBH | For centring when mounting | 13 |
| [3] | Push-in fitting QS | For connecting compressed air tubing with standard O.D. | qs |
| [4] | Proximity switch SMT/SME | • For position sensing<br>• Can be integrated in the sensor slot | 13 |

# Accessories

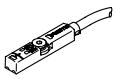
**Centring sleeve ZBH-7**

| | Description | Material sleeve | Size of pack | Product weight | Part no. | Type |
|---|---|---|---|---|---|---|
|  | for size 14, For size 10 | Steel | 10 | 1 g | **8146544** | **ZBH-7-B** |

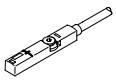
**Centring sleeve ZBH-12**

| | Description | Material sleeve | Size of pack | Product weight | Part no. | Type |
|---|---|---|---|---|---|---|
|  | For size 22 | Steel | 10 | 1 g | **8137185** | **ZBH-12-B** |

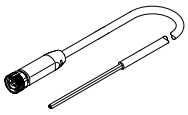
**Proximity switch SMT-8 for T-slot, magneto-resistive** — Link smt

| | Type of mounting | Switching output | Electrical connection | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | Screw-clamped, Insertable in the slot from above | 3-wire PNP N/O contact | Open end | 2.5 m | **574335** | **SMT-8M-A-PS-24V-E-2,5-OE** |
| | | | Plug M8, A-coded | 0.3 m | **574334** | **SMT-8M-A-PS-24V-E-0,3-M8D** |

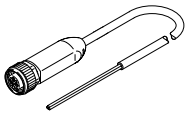
**Proximity switch SME-8 for T-slot, magnetic reed** — Link sme

| | Type of mounting | Switching output | Electrical connection | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | Clamped in T-slot, Insertable in the slot lengthwise | None | Open end | 2.5 m | **150855** | **SME-8-K-LED-24** |
| | | | Plug M8, A-coded | 0.3 m | **150857** | **SME-8-S-LED-24** |

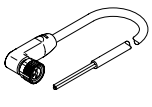
**Connecting cables NEBA, straight, M8 connection**

| | Electrical connection 1, connector system | Electrical connection 2, connector system | Electrical connection 2, number of connections/ cores | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | M8x1, A-coded, to EN 61076-2-104 | Open end | 3 | 2.5 m | **8078223** | **NEBA-M8G3-U-2.5-N-LE3** |
| | | | | 5 m | **8078224** | **NEBA-M8G3-U-5-N-LE3** |

**Connecting cables NEBU, straight, M12 connection**

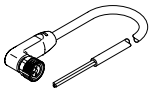
| | Electrical connection 1, connector system | Electrical connection 2, connector system | Electrical connection 2, number of connections/ cores | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | M12x1, A-coded to EN 61076-2-101 | Open end | 3 | 2.5 m | **8078236** | **NEBA-M12G5-U-2.5-N-LE3** |
| | | | | 5 m | **8078237** | **NEBA-M12G5-U-5-N-LE3** |

**Connecting cables NEBA, angled, M8 connection**

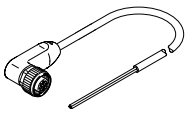
| | Electrical connection 1, connector system | Electrical connection 2, connector system | Electrical connection 2, number of connections/ cores | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | M8x1, A-coded, to EN 61076-2-104 | Open end | 3 | 2.5 m | **8078230** | **NEBA-M8W3-U-2.5-N-LE3** |

# Accessories

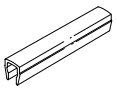
**Connecting cables NEBA, angled, M8 connection**

| | Electrical connection 1, connector system | Electrical connection 2, connector system | Electrical connection 2, number of connections/ cores | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | M8x1, A-coded, to EN 61076-2-104 | Open end | 3 | 5 m | **8078231** | **NEBA-M8W3-U-5-N-LE3** |

**Connecting cables NEBA, angled, M12 connection**

| | Electrical connection 1, connector system | Electrical connection 2, connector system | Electrical connection 2, number of connections/ cores | Cable length | Part no. | Type |
|---|---|---|---|---|---|---|
|  | M12x1, A-coded to EN 61076-2-101 | Open end | 3 | 2.5 m | **8078245** | **NEBA-M12W5-U-2.5-N-LE3** |
| | | | | 5 m | **8078246** | **NEBA-M12W5-U-5-N-LE3** |

**Slot cover ABP for T-slot**

| | Material housing | Packaging quantity [pieces] | Part no. | Type |
|---|---|---|---|---|
|  | ABS | 2 | **151680** | **ABP-5-S** |

**One-way flow control valves GRLA – for exhaust air**

| | Pneumatic connection 1 | Pneumatic connection, port 2 | Part no. | Type |
|---|---|---|---|---|
|  | Push-in connector 3 mm | M5 | **193137** | **GRLA-M5-QS-3-D** |
| | Push-in connector 4 mm | | **193138** | **GRLA-M5-QS-4-D** |
| | Push-in connector 6 mm | | **193139** | **GRLA-M5-QS-6-D** |