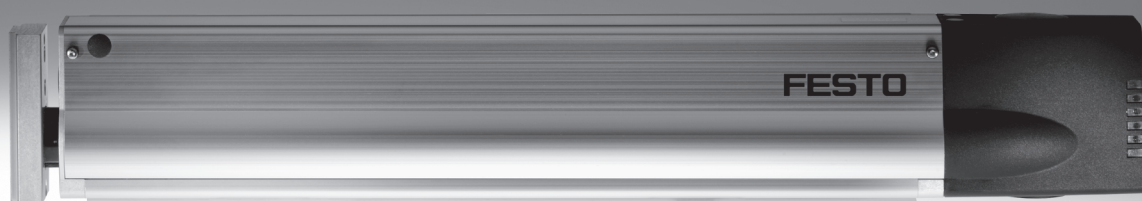


## Linear modules HMP

**FESTO**



# Linear modules HMP

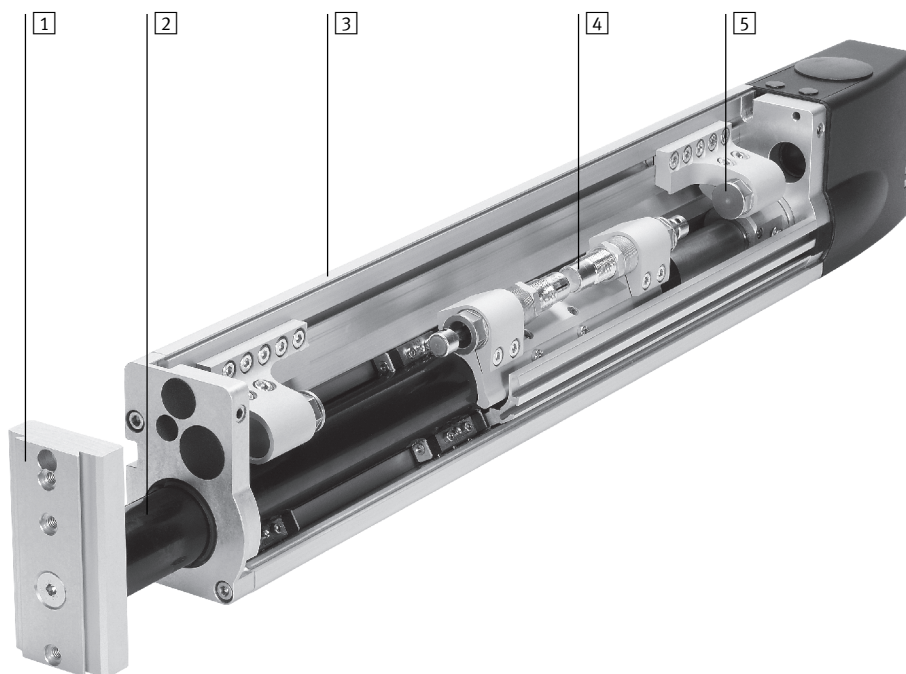
Key features

FESTO

## At a glance

 New

- Sturdier
- Optimised end stop system
- Optimised intermediate position module
- Minimised susceptibility to wear
- One-way flow control valves that can be externally adjusted
- Integrated sensor strip
- Diameters of 16 ... 32 mm
- Stroke lengths of 50 ... 400 mm
- Extremely rigid basic profile
- Infinitely adjustable end stops
- Rotatable yoke plate
- Integrated clamping unit
- Precision backlash-free guide system
- Freely adjustable intermediate position
- Adjustable end-position cushioning
- Integrated sensors:
  - Sensor strip for proximity sensors for end-position sensing
  - Mounting slot for proximity sensors for position sensing
- Functional end cap:
  - Pneumatic interface
  - Electrical interface
- Highly flexible thanks to various mounting and assembly options:
  - Basic profile
  - Yoke plate
- Large selection of adapters for:
  - Drives
  - Grippers
- Innovative and user-friendly installation system



- 1 Yoke plate**  
Can be turned to any angle from 0 to 360°. The yoke plate cannot be turned if combined with the clamping unit. Drives and grippers can be mounted on the yoke plate by means of adapter kits (direct mounting or dovetail connections).
- 2 Guide system**  
Extremely high rigidity thanks to the hardened steel guide barrel which is supported in pre-loaded and backlash-free recirculating ball bearing guides guaranteeing the utmost precision.
- 3 Basic profile**  
Drives and basic components can be attached to the rigid light alloy profile using adapter, connector and component kits.
- 4 End-position cushioning**  
Extremely dynamic operation thanks to hydraulic shock absorbers which cushion the piston sleeve at the end positions.
- 5 End stop**  
Any desired intermediate position can be set between minimum and maximum stroke (plus the strokes of the shock absorbers).

# Linear modules HMP

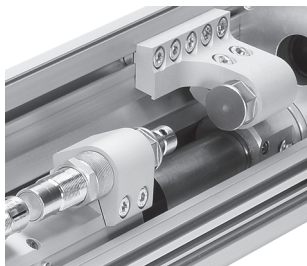
Key features

FESTO

## Wide choice of variants

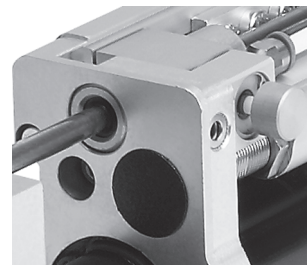
### End stop

The optimised end stop system is practically wear-free. Rough adjustment is performed by moving the stop into the profile groove. Fine adjustment is performed using compressed air via a rotatable sleeve.



### Clamping unit

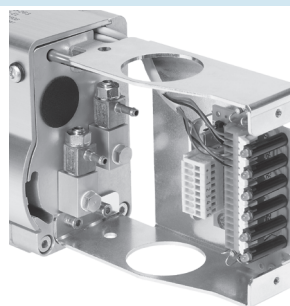
The pneumatically-powered clamping unit can be used to hold loads at any end position and with the module installed at any angle. In the case of a pressure drop or pressure failure, the clamping unit acts like an EMERGENCY STOP device. The clamping unit can be released by means of the manual override.



### End cap

Connections can be made on the top and bottom of the end cap. Pneumatic tubing and electrical cables can be bundled and routed through the end cap via conduits.

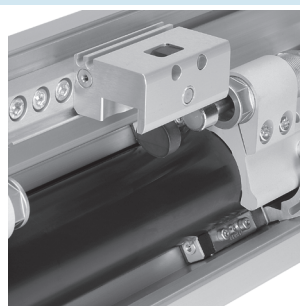
Max. 6 proximity sensors can be connected to the integral terminal strip. The switching states of the proximity sensors are indicated via a display window in the end cap.



### Intermediate position module

The intermediate position module permits advancing to an additional position between the two end positions. This is done by swivelling a lever into the traversing range of the moving stop on the guide tube.

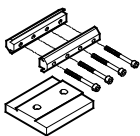
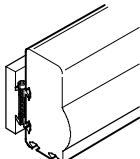
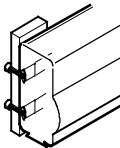
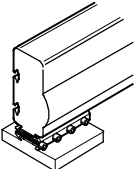
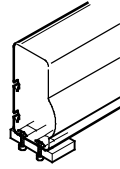
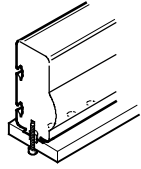
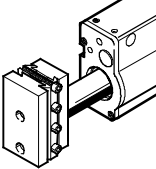
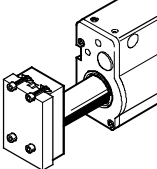
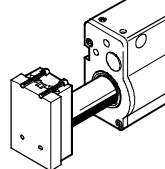
The intermediate position can be activated during the advancing stroke or retracting stroke, depending on the type of design. Multiple intermediate position modules can be installed on request.



# Linear modules HMP

Key features

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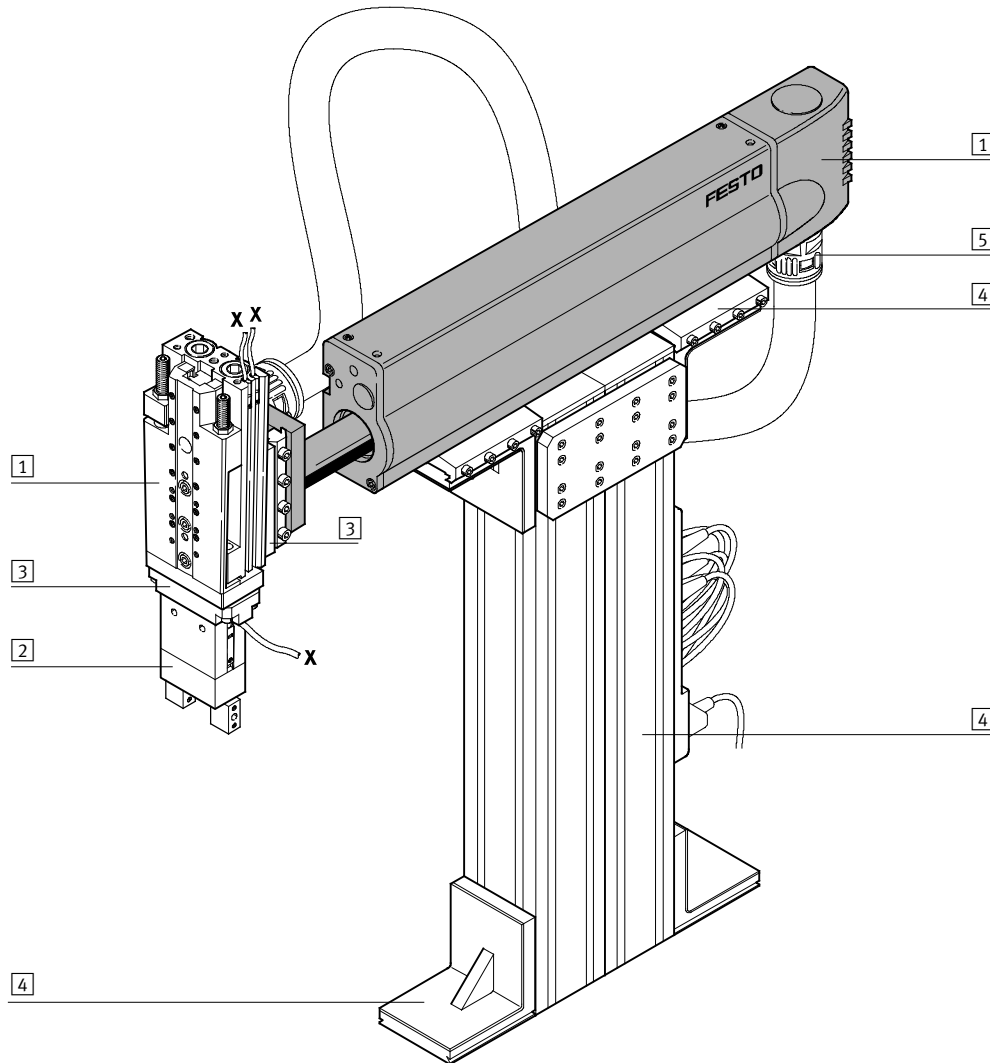
| Mounting and assembly options            |                                                                                                                                  |                                                                                                                                     |                                                                                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Mounting options                         |                                                                                                                                  |                                                                                                                                     |                                                                                                                                              |
|                                          | Dovetail mounting<br>using connecting kit HAVB  | Direct mounting<br>using screws and slot nuts NST  | Direct mounting<br>using screws and centring sleeves ZBH  |
| Mounting surfaces                        |                                                                                                                                  |                                                                                                                                     |                                                                                                                                              |
| On the side<br>of the basic profile      | HMP-16/-20/-25/-32                              | HMP-16/-20/-25/-32                                 |                                                                                                                                              |
| On the underside<br>of the basic profile | HMP-16/-20/-25/-32                             | HMP-25/-32                                        | HMP-16/-20                                               |
| On the yoke plate                        | HMP-16/-20/-25/-32                            | HMP-25/-32                                       | HMP-16/-20/-25/-32                                      |

# Linear modules HMP

System example

**FESTO**

System product for handling and assembly technology



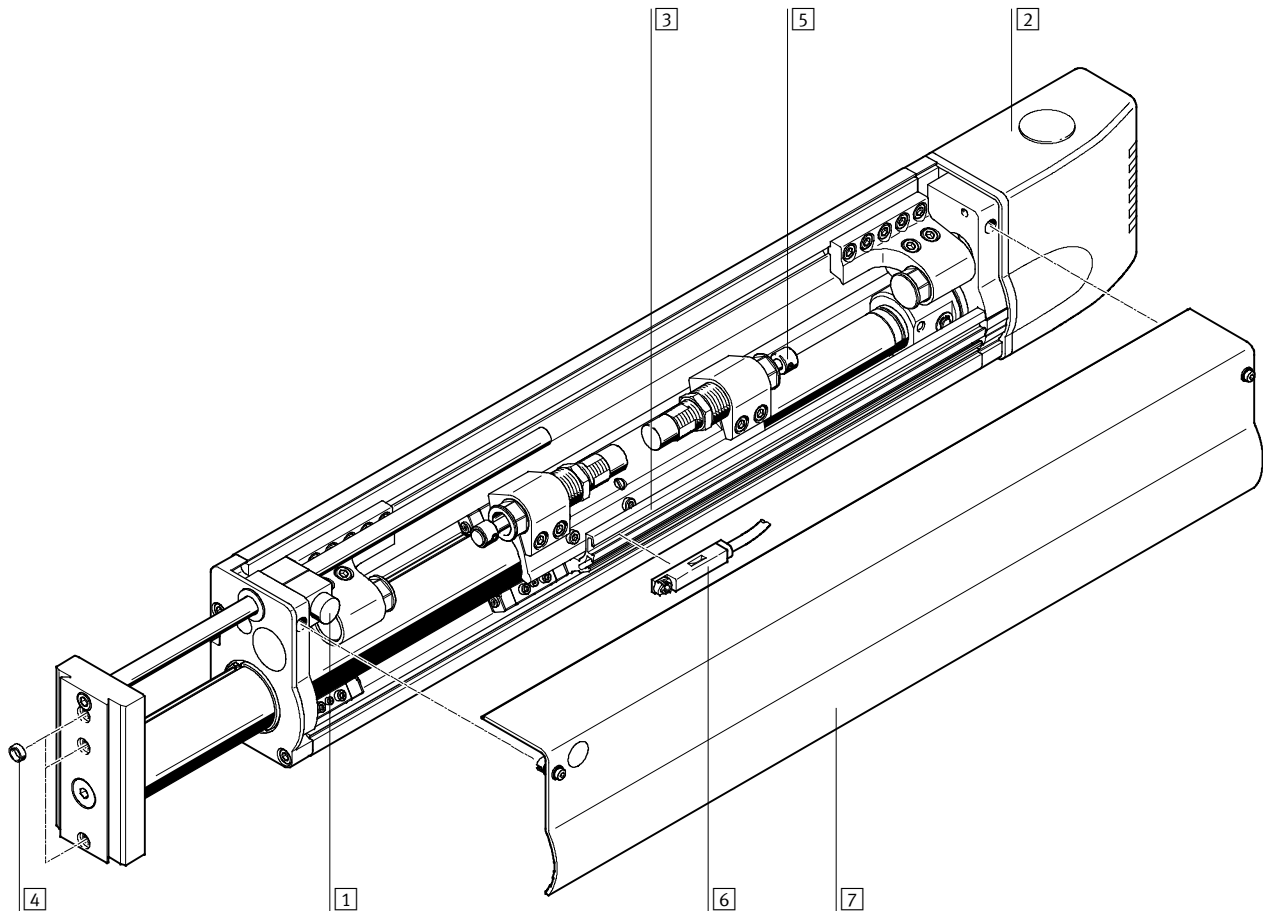
| System elements and accessories |                                                                           |                        |
|---------------------------------|---------------------------------------------------------------------------|------------------------|
|                                 | Brief description                                                         | → Page/Internet        |
| 1 Drives                        | Wide range of combination options within handling and assembly technology | drive                  |
| 2 Grippers                      | Wide range of optional variants within handling and assembly technology   | gripper                |
| 3 Adapters                      | For drive/drive and drive/gripper combinations                            | adapter kit            |
| 4 Basic components              | Profiles and profile combinations as well as profile/drive combinations   | basic component        |
| 5 Installation components       | For achieving a clear-cut, safe layout of electrical cables and tubing    | installation component |
| – Axes                          | Wide range of combination options within handling and assembly technology | axes                   |
| – Motors                        | Servo and stepper motors, with or without gearing                         | motor                  |

# Linear modules HMP

Peripherals overview

FESTO

With clamping unit KP



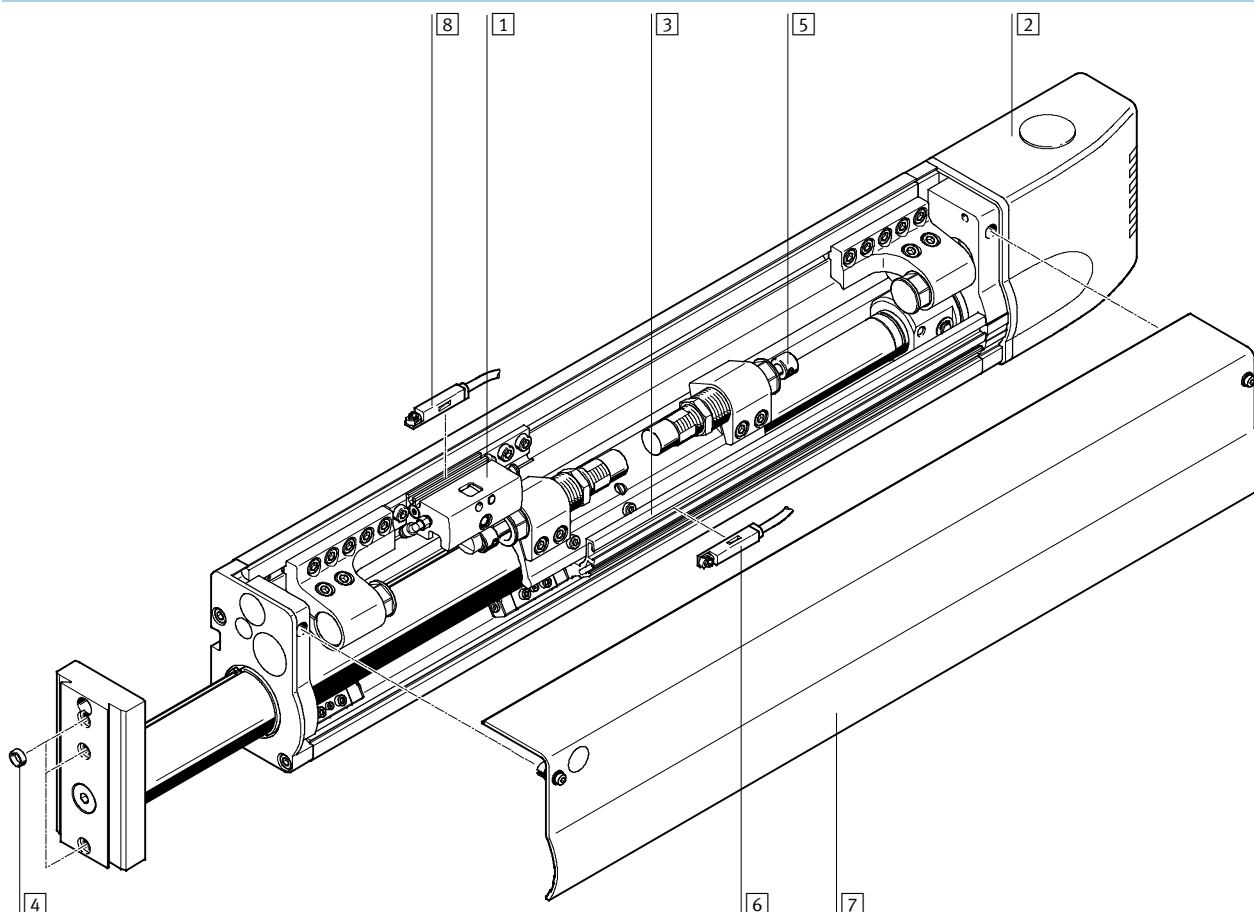
| Accessories             |                                                                                                                                           |                 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|                         | Brief description                                                                                                                         | → Page/Internet |
| 1 Clamping unit KP      | For holding loads in all mounting and end positions in the event of a drop in pressure                                                    | 24              |
| 2 End cap AD/EL         | The end cap (EL) houses an integrated electrical interface                                                                                | 24              |
| 3 Sensor strip SL       | For mounting proximity sensors and flexible sensing of any desired end positions. Included in the scope of delivery of the linear module. | 24              |
| 4 Centring sleeve Z     | For centring loads and attachments on the yoke plate                                                                                      | 26              |
| 5 Shock absorber        | Included in the scope of delivery of the linear module                                                                                    | 26              |
| 6 Proximity sensor A... | For position sensing via the sensor strip                                                                                                 | 27              |
| 7 Housing cover         | Included in the scope of delivery of the linear module                                                                                    | –               |
| – Cable with socket V   | For proximity sensor                                                                                                                      | 27              |
| – Slot cover A          | For protecting the proximity sensor cable                                                                                                 | 26              |

# Linear modules HMP

Peripherals overview

FESTO

## With intermediate position module Z1A



| Accessories |                                  |                                                                                                                                                                                 |    |
|-------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|             | Brief description                | ➔ Page/Internet                                                                                                                                                                 |    |
| 1           | Intermediate position module Z1A | For approaching an intermediate position during the advance stroke. The intermediate position module Z1E is used to approach an intermediate position during the return stroke. | 18 |
| 2           | End cap AD/EL                    | The end cap (EL) houses an integrated electrical interface                                                                                                                      | 24 |
| 3           | Sensor strip SL                  | For mounting proximity sensors and flexible sensing of any desired end positions. Included in the scope of delivery of the linear module.                                       | 24 |
| 4           | Centring sleeve Z                | For centring loads and attachments on the yoke plate                                                                                                                            | 26 |
| 5           | Shock absorber                   | Included in the scope of delivery of the linear module                                                                                                                          | 26 |
| 6           | Proximity sensor A...            | For position sensing via the sensor strip                                                                                                                                       | 27 |
| 7           | Housing cover                    | Included in the scope of delivery of the linear module                                                                                                                          | –  |
| 8           | Proximity sensor A...            | For sensing the position of the lever at the intermediate position module (intermediate position active/not active)                                                             | 28 |
| –           | Cable with socket V              | For proximity sensor                                                                                                                                                            | 27 |
| –           | Slot cover A                     | For protecting the proximity sensor cable                                                                                                                                       | 26 |

# Linear modules HMP

Type codes

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|     |  |   |    |   |     |   |   |   |    |   |     |   |    |   |  |   |    |   |    |   |   |
|-----|--|---|----|---|-----|---|---|---|----|---|-----|---|----|---|--|---|----|---|----|---|---|
| HMP |  | - | 16 | - | 150 | - | B | - | SL | - | 2G3 | - | KP | - |  | - | EL | - | A1 | - | E |
|-----|--|---|----|---|-----|---|---|---|----|---|-----|---|----|---|--|---|----|---|----|---|---|

| Type |               |
|------|---------------|
| HMP  | Linear module |

| Piston Ø [mm] |  |
|---------------|--|
|               |  |

| Stroke [mm] |  |
|-------------|--|
|             |  |

| Generation |          |
|------------|----------|
| B          | B series |

| Sensing |              |
|---------|--------------|
| SL      | Sensor strip |

| Pneumatic connection |                      |
|----------------------|----------------------|
| 2G3                  | For 3 mm I.D. tubing |
| 2G4                  | For 4 mm I.D. tubing |
| 2G6                  | For 6 mm I.D. tubing |

| Clamping unit |          |
|---------------|----------|
| KP            | Attached |

| Intermediate position module |                    |
|------------------------------|--------------------|
| Z1A                          | For advance stroke |
| Z1E                          | For return stroke  |

| Interface |                                   |
|-----------|-----------------------------------|
| AD        | End cap                           |
| EL        | End cap with electrical interface |

| Proximity sensor |                                    |
|------------------|------------------------------------|
| A1               | With cable, 2.5 m                  |
| A2               | Contactless with cable, 2.5 m, NPN |
| A3               | Contactless with cable, 2.5 m, PNP |
| A4               | With plug                          |
| A5               | Contactless with plug, NPN         |
| A6               | Contactless with plug, PNP         |

| User documentation |                                                               |
|--------------------|---------------------------------------------------------------|
| E                  | English                                                       |
| S                  | Spanish                                                       |
| F                  | French                                                        |
| I                  | Italian                                                       |
| V                  | Swedish                                                       |
| B                  | Express waiver – no manual to be included (already available) |

# Linear modules HMP

Type codes



→

+ ZUB

-

A

Z

|             |                            |
|-------------|----------------------------|
| Accessories |                            |
| ZUB         | Accessories supplied loose |

|                   |       |
|-------------------|-------|
| Cable with socket |       |
| ...V              | 2.5 m |

|            |            |
|------------|------------|
| Slot cover |            |
| A          | Slot cover |

|                 |                |
|-----------------|----------------|
| Centring sleeve |                |
| ...Z            | For yoke plate |

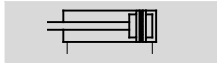
# Linear modules HMP

Technical data

FESTO

Function

Standard version



with clamping unit



-  - Piston Ø  
16 ... 32 mm

-  - Stroke length  
50 ... 400 mm

-  - [www.festo.com](http://www.festo.com)



| General technical data                               |                       |                 |                 |                 |
|------------------------------------------------------|-----------------------|-----------------|-----------------|-----------------|
| Piston Ø                                             | 16                    | 20              | 25              | 32              |
| System mode                                          | Yoke                  |                 |                 |                 |
| Mode of operation                                    | Double-acting         |                 |                 |                 |
| Protection against torsion                           | Guide                 |                 |                 |                 |
| Connection type                                      | Female thread         |                 |                 |                 |
| Pneumatic connection, linear module                  | M5                    | G $\frac{1}{8}$ | G $\frac{1}{8}$ | G $\frac{1}{4}$ |
| Pneumatic connection, intermediate position module   | M3                    |                 |                 |                 |
| Assembly position                                    | Any                   |                 |                 |                 |
| Effective stroke [mm]                                | 16 ... 320            | 24 ... 400      | 24 ... 400      | 40 ... 400      |
| Position sensing                                     | For proximity sensing |                 |                 |                 |
| Max. repetition accuracy <sup>1)</sup> [mm]          | 0.01                  |                 |                 |                 |
| Max. speed                                           | advancing [m/s]       | 0.8             | 1.1             | 1.2             |
|                                                      | returning [m/s]       | 0.8             | 1.1             | 1.1             |
| Swivel time of lever at intermediate position module | advancing [s]         | 0.04            | 0.04            | 0.072           |
|                                                      | returning [s]         | 0.04            | 0.036           | 0.065           |

1) Variation of end position and intermediate position for 100 successive strokes under constant operating conditions

| Operating and environmental conditions       |                                                                                                           |    |    |    |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------|----|----|----|
| Piston Ø                                     | 16                                                                                                        | 20 | 25 | 32 |
| Operating pressure [bar]                     | 4 ... 8                                                                                                   |    |    |    |
| Operating medium                             | Compressed air in accordance with ISO 8573-1:2010 [7:4:4]                                                 |    |    |    |
| Note on operating/pilot medium               | Operation with lubricated medium possible<br>(in which case lubricated operation will always be required) |    |    |    |
| Ambient temperature <sup>1)</sup> [°C]       | 0 ... +60                                                                                                 |    |    |    |
| Protection class to EN 60 529                | IP 40                                                                                                     |    |    |    |
| Noise level F <sub>LEQ</sub> [dB(A)]         | 62                                                                                                        | 65 | 68 | 69 |
| Corrosion resistance class CRC <sup>2)</sup> | 2                                                                                                         |    |    |    |

1) Note operating range of proximity sensors

2) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. 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]                                          |     |     |     |     |
|-----------------------------------------------------|-----|-----|-----|-----|
| Piston Ø                                            | 16  | 20  | 25  | 32  |
| Theoretical force at 6 bar, advancing <sup>1)</sup> | 121 | 188 | 295 | 483 |
| Theoretical force at 6 bar, returning <sup>1)</sup> | 104 | 158 | 247 | 415 |

1) Theoretical values, please note: Degree of efficiency: approx. 90%

# Linear modules HMP

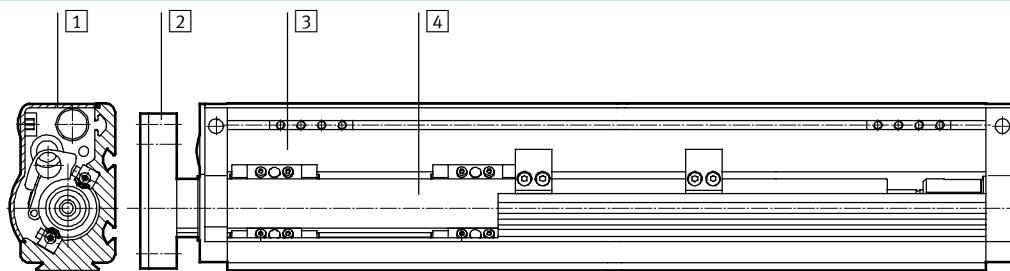
Technical data

**FESTO**

| Weight [g]                                       |                  | 16   | 20   | 25   | 32    |
|--------------------------------------------------|------------------|------|------|------|-------|
| Piston Ø                                         |                  |      |      |      |       |
| Product weight                                   | with 0 mm stroke | 2100 | 4700 | 6300 | 10900 |
|                                                  | per 10 mm stroke | 88   | 110  | 150  | 200   |
| Moving load                                      | with 0 mm stroke | 900  | 1500 | 2300 | 4000  |
|                                                  | per 10 mm stroke | 28   | 37   | 55   | 74    |
| End cap                                          | HMP-...-AD       | 180  | 270  | 300  | 400   |
|                                                  | HMP-...-EL       | 210  | 300  | 330  | 430   |
| Clamping unit HMP-...-KP<br>for effective stroke | 50 mm            | 109  | 114  | –    | –     |
|                                                  | 100 mm           | 120  | 125  | –    | –     |
|                                                  | 150 mm           | 131  | 136  | –    | –     |
|                                                  | 200 mm           | 142  | 147  | –    | –     |
|                                                  | 250 mm           | 153  | 158  | –    | –     |
|                                                  | 320 mm           | 168  | 173  | –    | –     |
|                                                  | 400 mm           | –    | 191  | –    | –     |
| Intermediate position module                     | HMP-...-Z1A/Z1E  | 165  | 206  | 227  | 321   |

## Materials

Sectional view



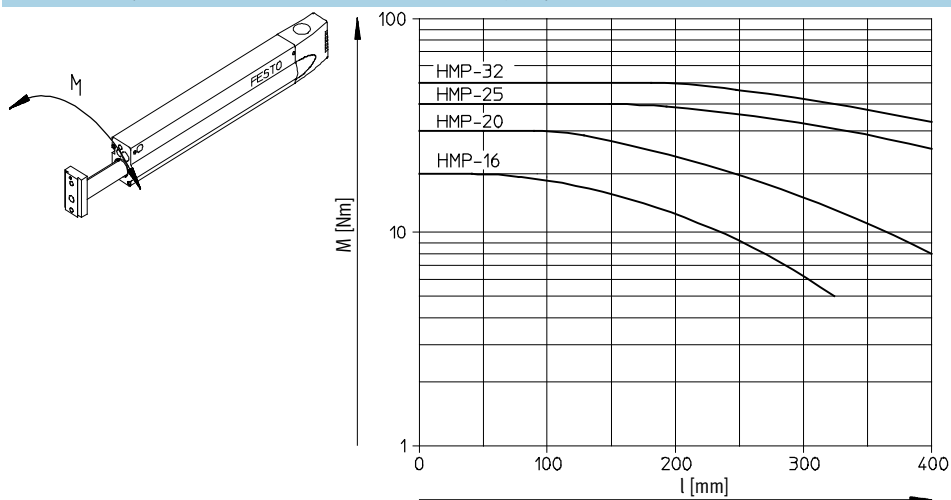
| Linear module |               |                              |
|---------------|---------------|------------------------------|
| 1             | Housing cover | Anodised aluminium           |
| 2             | Yoke plate    | Anodised aluminium           |
| 3             | Profile       | Anodised aluminium           |
| 4             | Guide barrel  | Tool steel                   |
| –             | Seals         | Nitrile rubber, polyurethane |

# Linear modules HMP

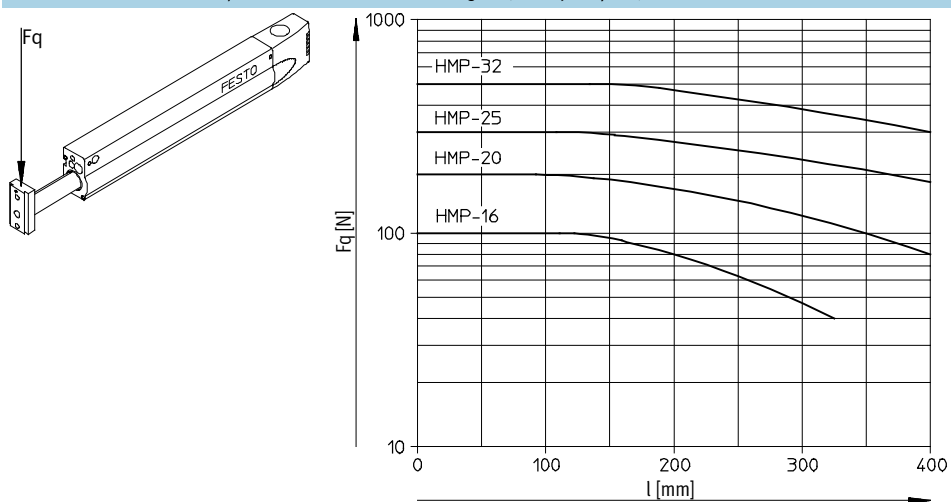
Technical data

FESTO

Permissible torque M as a function of the stroke length l (at the yoke plate)



Permissible effective load Fq as a function of the stroke length l (at the yoke plate)

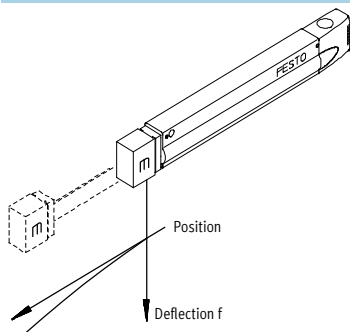


# Linear modules HMP

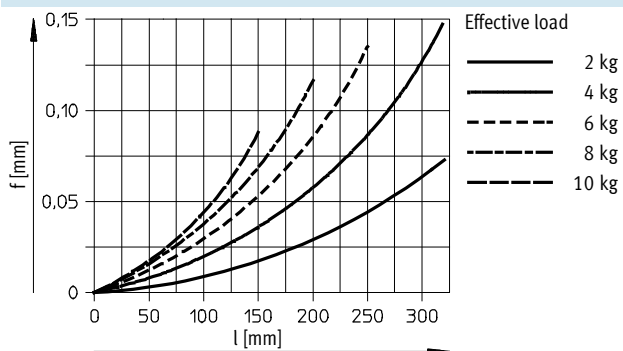
Technical data

FESTO

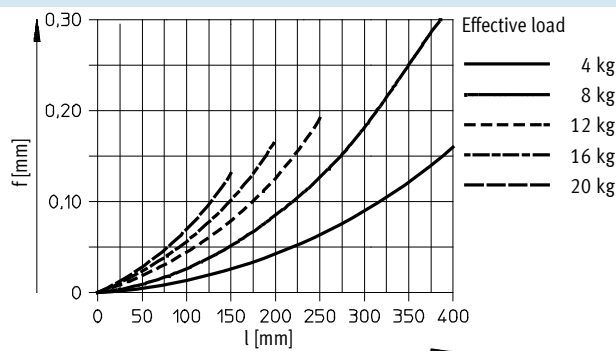
Deflection/deformation  $f$  as a function of the effective load  $m$  and the position  $l$  (stroke)



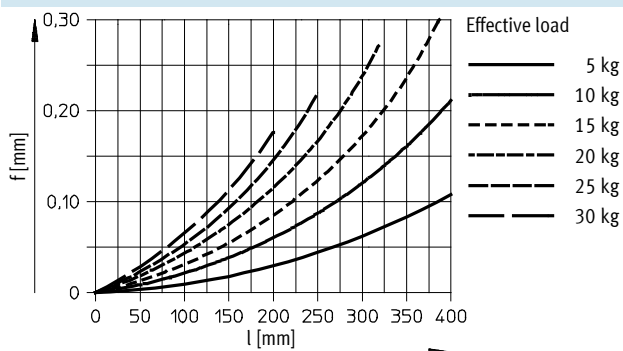
HMP-16



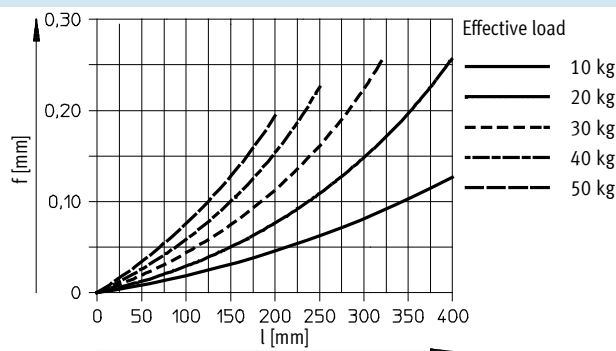
HMP-20



HMP-25



HMP-32



# Linear modules HMP

Technical data

FESTO

Max. permissible horizontal effective load at 6 bar

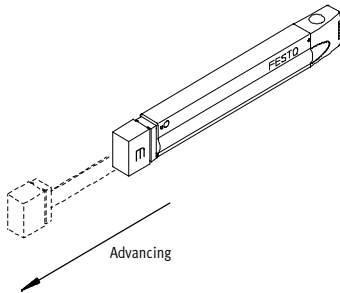
HMP-16: 10 kg

HMP-20: 20 kg

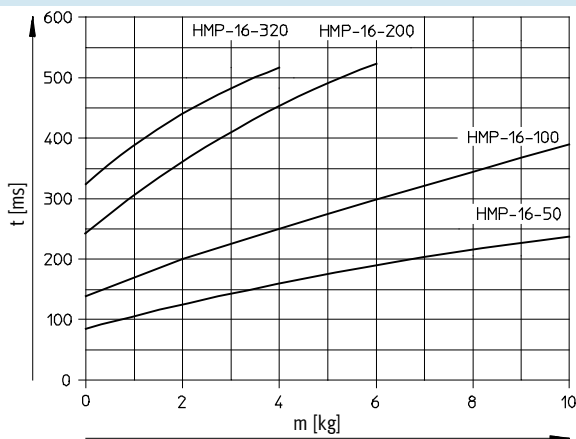
HMP-25: 30 kg

HMP-32: 50 kg

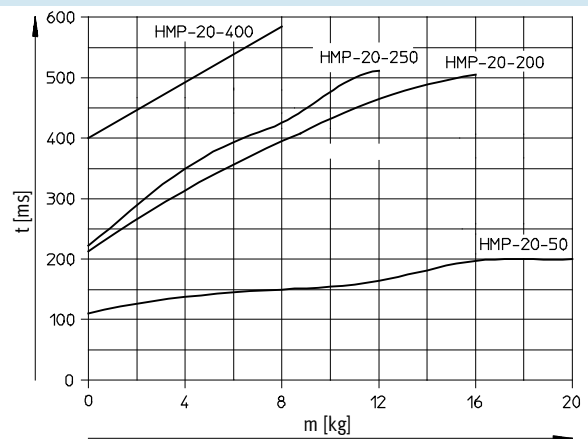
Permissible horizontal advancing time  $t$  as a function of the stroke length and the effective load  $m$  with optimum shock absorber stroke



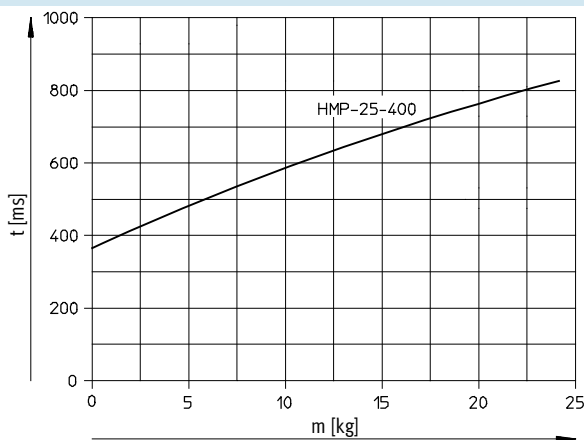
HMP-16<sup>1)</sup>



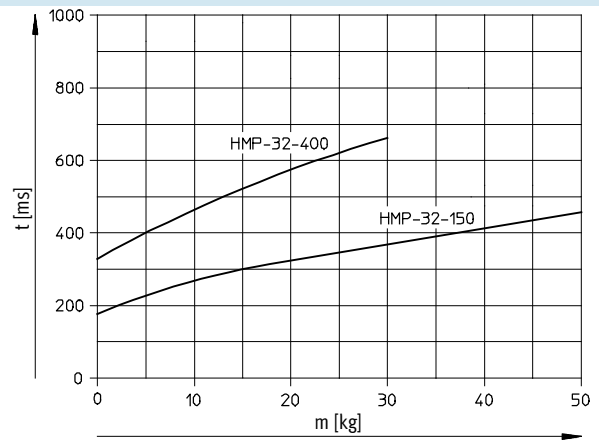
HMP-20<sup>1)</sup>



HMP-25<sup>1)</sup>



HMP-32<sup>1)</sup>



1) Further nominal strokes in preparation

# Linear modules HMP

Technical data

FESTO

Max. permissible horizontal effective load at 6 bar

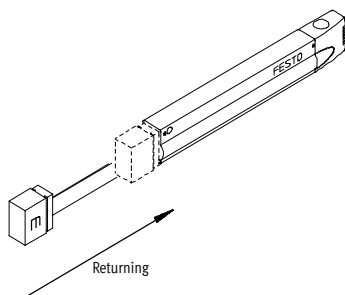
HMP-16: 10 kg

HMP-20: 20 kg

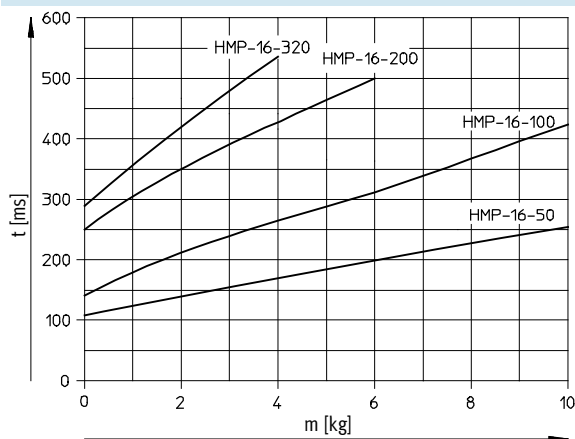
HMP-25: 30 kg

HMP-32: 50 kg

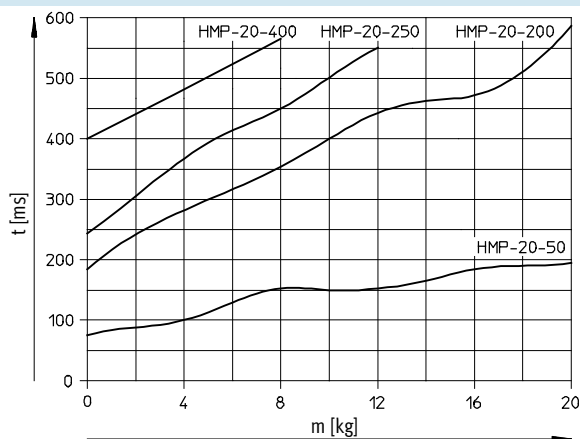
Permissible horizontal returning time  $t$  as a function of the stroke length and the effective load  $m$  with optimum shock absorber stroke



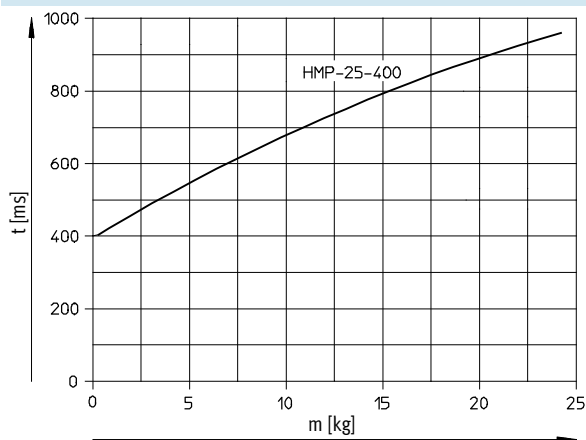
HMP-16<sup>1)</sup>



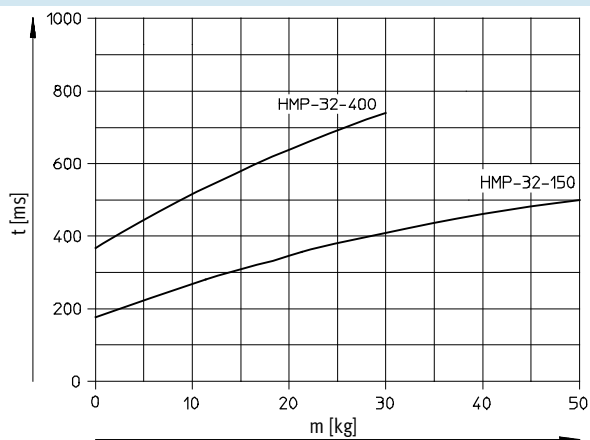
HMP-20<sup>1)</sup>



HMP-25<sup>1)</sup>



HMP-32<sup>1)</sup>



1) Further nominal strokes in preparation

# Linear modules HMP

Technical data

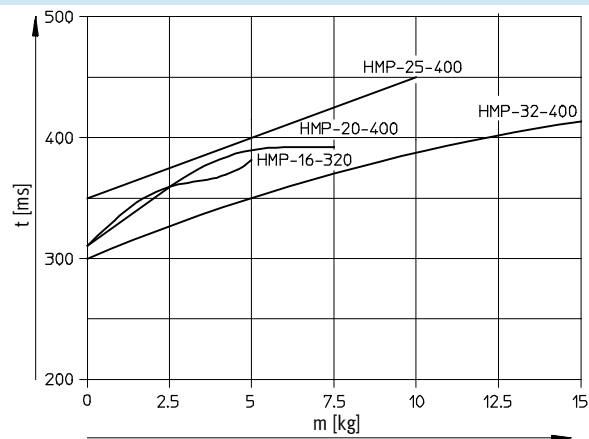
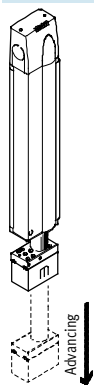
FESTO

## Max. permissible vertical effective load at 6 bar

| without clamping cartridge | with clamping cartridge |
|----------------------------|-------------------------|
| HMP-16: 5 kg               | HMP-16: 4 kg            |
| HMP-20: 10 kg              | HMP-20: 7.5 kg          |
| HMP-25: 15 kg              |                         |
| HMP-32: 25 kg              |                         |

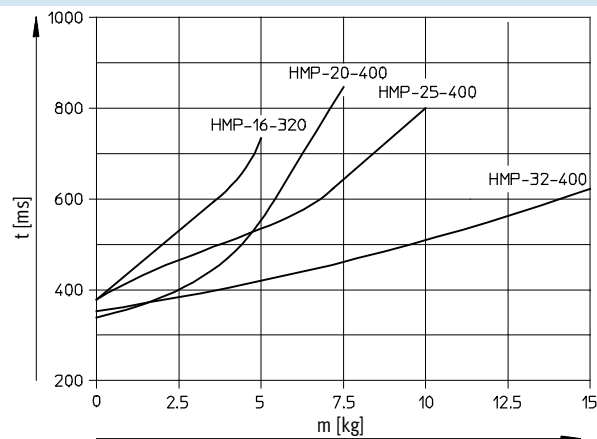
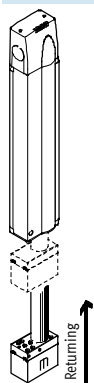
## Permissible vertical advancing time $t$ as a function of the stroke length and the effective load $m$ with optimum shock absorber stroke

HMP-16/-20/-25/-32<sup>1)</sup>



## Permissible vertical returning time $t$ as a function of the stroke length and the effective load $m$ with optimum shock absorber stroke

HMP-16/-20/-25/-32<sup>1)</sup>



1) Further nominal strokes in preparation

# Linear modules HMP

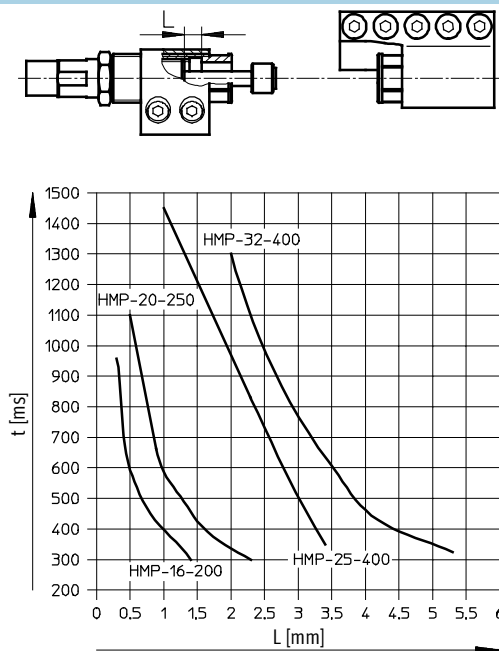
Technical data

FESTO

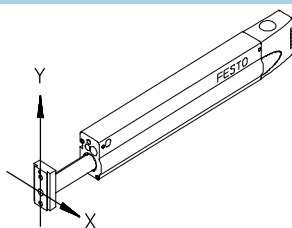
## Advancing/returning time $t$ as a function of the optimum length $L$ to which the shock absorber should be screwed out

In order to obtain the shortest possible travel time with a linear module HMP, it is essential to adjust the shock absorbers to match the advancing/returning time  $t$ .

The optimum length  $L$  to which the shock absorbers should be screwed out is shown in the adjacent graph.

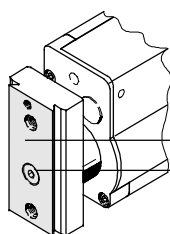


## Determining the permissible effective load



As long as the centre of gravity of the effective load on the yoke plate lies within the outline of this plate, it is impossible to overload the linear module.

Centre of gravity



When dovetail mounting components are used, the centre of gravity should be within this area.

Recommended position of centre of gravity for low-vibration operation.

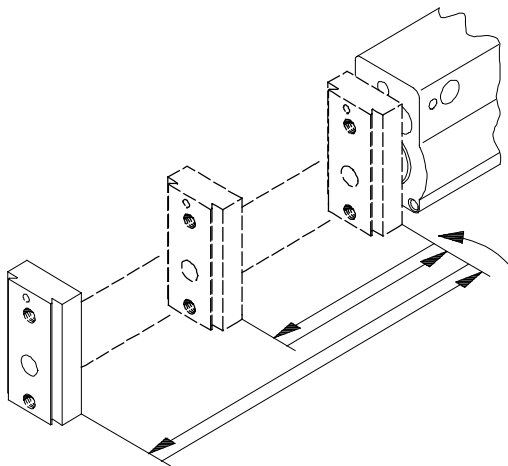
# Linear modules HMP

Technical data

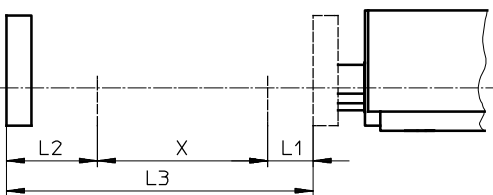
FESTO

## Intermediate position module Z1A/Z1E

Intermediate position with advancing with Z1A



### Range for possible intermediate positions when advancing



L1 = Rear non-operational zone  
L2 = Front non-operational zone  
L3 = Effective stroke

X = Zone for possible intermediate positions  
X =  $L3 - L1 - L2$

### Non-operational zones [mm]

| Piston Ø | 16 | 20   | 25   | 32   |
|----------|----|------|------|------|
| L1       | 33 | 42   | 42   | 55.5 |
| L2       | 66 | 68.5 | 54.5 | 56   |

### Calculation example

Given:  
Linear module  
HMP-16-200-...-Z1A-...

To be found:  
In which zone of the effective stroke  
are intermediate positions possible?

Calculation:  
The piston Ø of the linear module  
(16 mm) determines the following  
non-operational zones which do not  
permit intermediate positions:  
L1 = 33 mm  
L2 = 66 mm

$$X = L3 - L1 - L2 = 101 \text{ mm}$$

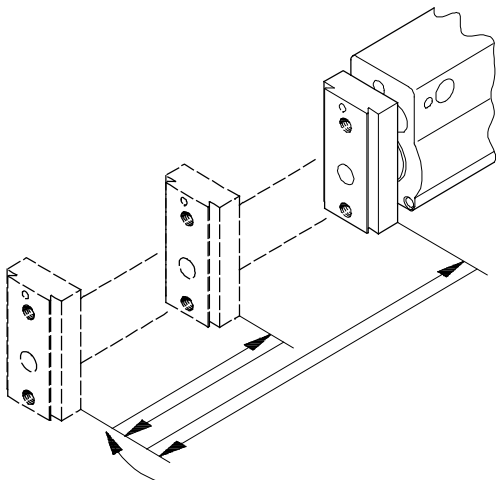
This means:  
The lower limit of the effective stroke  
range for permissible intermediate  
positions is:  
L1 = 33 mm  
  
The upper limit of the effective stroke  
range for permissible intermediate  
positions is:  
L1 + X = 134 mm

# Linear modules HMP

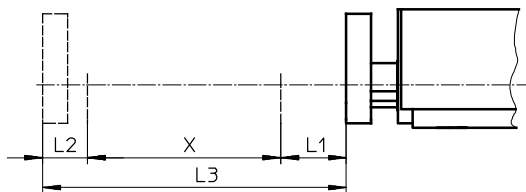
Technical data

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## Intermediate position when returning with Z1E



## Range for possible intermediate positions when returning



L1 = Rear non-operational zone  
L2 = Front non-operational zone  
L3 = Effective stroke

X = Zone for possible intermediate positions  
X =  $L3 - L1 - L2$

| Non-operational zones [mm] |      |    |      |      |
|----------------------------|------|----|------|------|
| Piston Ø                   | 16   | 20 | 25   | 32   |
| L1                         | 47.5 | 62 | 54.5 | 56   |
| L2                         | 33   | 42 | 42   | 55.5 |

## Calculation example

Given:  
Linear module  
HMP-16-200-...-Z1E-...

To be found:  
In which zone of the effective stroke  
are intermediate positions possible?

Calculation:  
The piston Ø of the linear module  
(16 mm) determines the following  
non-operational zones which do not  
permit intermediate positions:  
L1 = 47.5 mm  
L2 = 33 mm  
X =  $L3 - L1 - L2 = 119.5$  mm

This means:  
The lower limit of the effective stroke  
range for permissible intermediate  
positions is:  
L1 = 47.5 mm  
  
The upper limit of the effective stroke  
range for permissible intermediate  
positions is:  
L1 + X = 167 mm

# Linear modules HMP

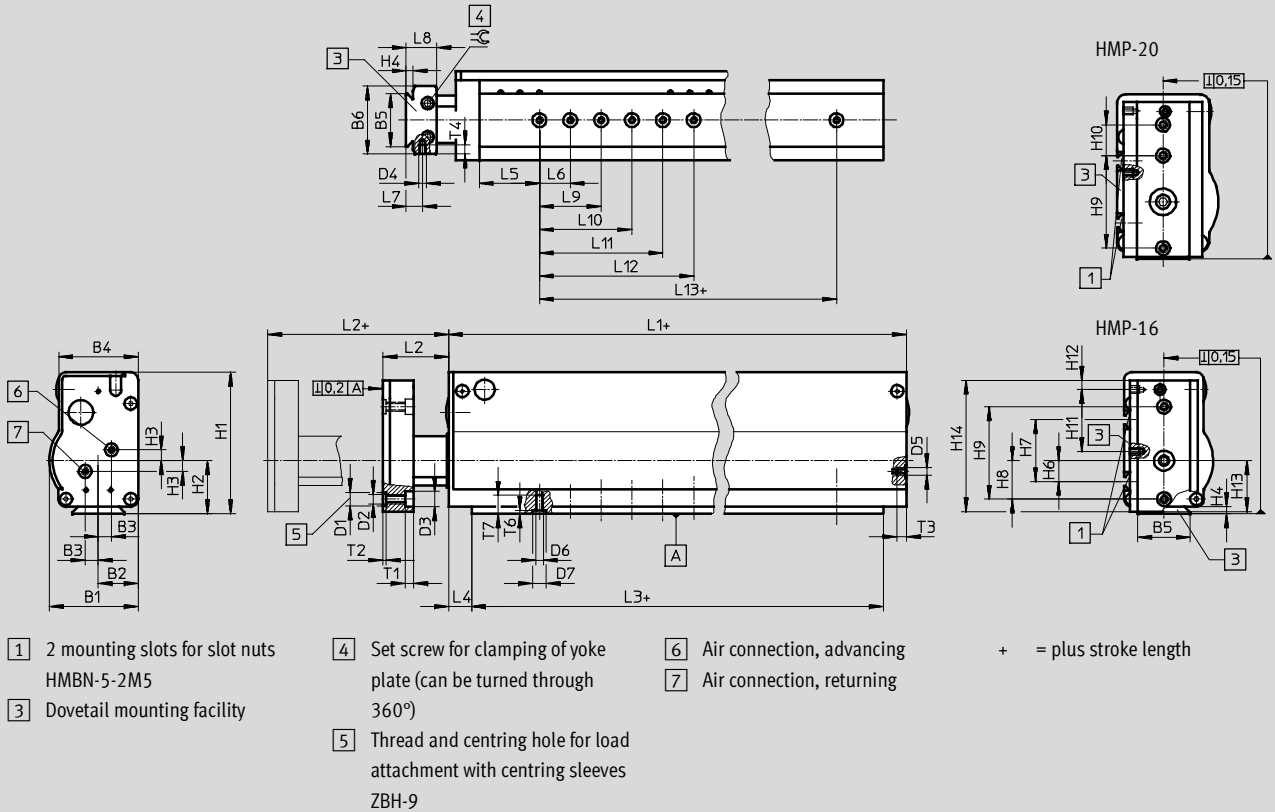
Technical data

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## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Piston Ø 16/20 mm



| Type   | B1   | B2 | B3  | B4   | B5 | B6 | D1<br>Ø<br>H7 | D2 | D3<br>Ø<br>H13 | D4 | D5   | D6 | D7<br>Ø<br>H7 | H1  | H2   | H3<br>±0.1 |
|--------|------|----|-----|------|----|----|---------------|----|----------------|----|------|----|---------------|-----|------|------------|
| HMP-16 | 57.8 | 26 | 8.5 | 51.7 | 34 | 44 | 9             | M6 | 10             | M5 | M5   | M5 | 9             | 92  | 34.5 | 7          |
| HMP-20 | 65.8 | 30 | 10  | 59.8 |    | 51 |               |    |                |    | G1/8 |    |               | 107 | 37   |            |

| Type   | H4  | H6   | H7 | H8 | H9<br>±0.03 <sup>1)</sup> | H10<br>±0.03 <sup>1)</sup> | H11 | H12 | H13  | H14   | H17 | L1  | L2 | L3  | L4<br>+0.2 |
|--------|-----|------|----|----|---------------------------|----------------------------|-----|-----|------|-------|-----|-----|----|-----|------------|
| HMP-16 | 4.5 | 13.5 | 40 | 25 | 60                        | —                          | 40  | 6   | 33   | 85    | 38  | 247 | 23 | 217 | 15         |
| HMP-20 |     |      |    | 30 |                           | 20                         |     |     | 35.5 | 100.4 | 40  |     |    | 290 |            |

| Type   | L5 | L6    | L7    | L8   | L9    | L10   | L11   | L12   | L13   | T1  | T2   | T3  | T4 | T6   | T7 | ≅ |
|--------|----|-------|-------|------|-------|-------|-------|-------|-------|-----|------|-----|----|------|----|---|
|        |    | ±0.03 |       | +0.2 | ±0.03 | ±0.03 | ±0.03 | ±0.03 | ±0.03 |     | +0.1 |     |    | +0.1 |    |   |
| HMP-16 | 39 | 20    | 10.75 | 20   | 40    | 60    | 80    | 100   | 140   | 5.7 | 2.1  | 6.4 | 6  | 2.1  | 12 | 4 |
| HMP-20 | 45 |       |       |      |       |       |       |       | 200   |     |      | 9   |    |      |    |   |

1) Tolerance specification applies to countersink D1; tolerance for thread D2: ±0.2

# Linear modules HMP

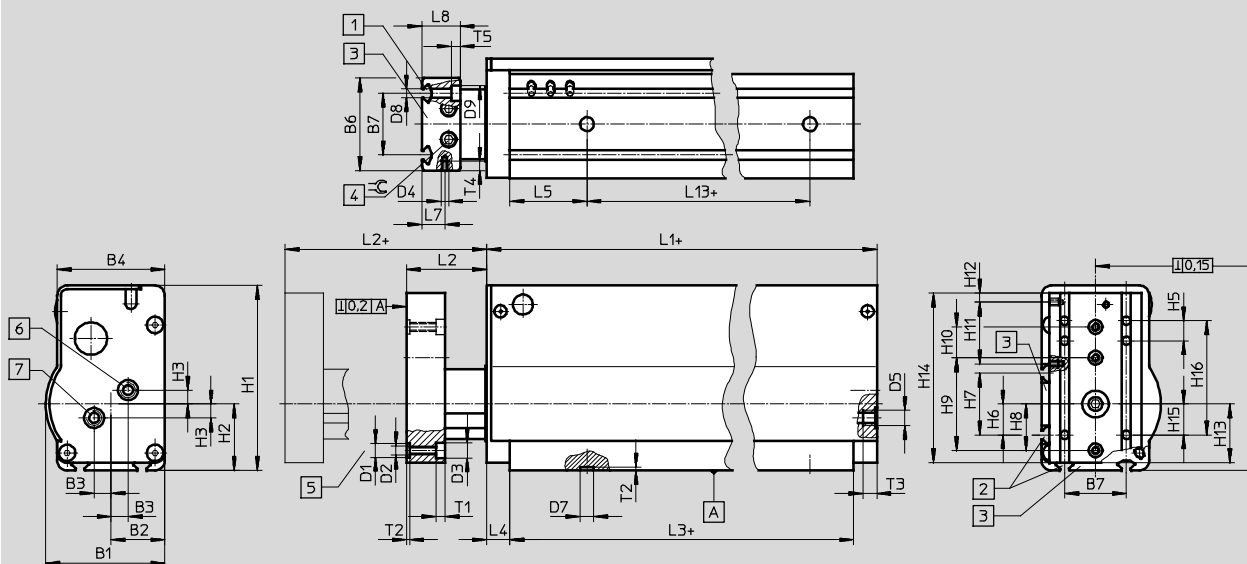
Technical data

FESTO

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Piston Ø 25/32 mm



- |   |                                              |   |                                                                                |   |                           |                        |
|---|----------------------------------------------|---|--------------------------------------------------------------------------------|---|---------------------------|------------------------|
| 1 | 2 mounting slots for slot nuts<br>HMBN-5-2M5 | 4 | Set screw for clamping of yoke<br>plate (can be turned<br>through 360°)        | 6 | Air connection, advancing | + = plus stroke length |
| 2 | 4 mounting slots for slot nuts<br>HMBN-5-2M5 | 5 | Thread and centring hole for load<br>attachment with centring sleeves<br>ZBH-9 | 7 | Air connection, returning |                        |
| 3 | Dovetail mounting facility                   |   |                                                                                |   |                           |                        |

| Type   | B1   | B2 | B3 | B4   | B6 | B7 | D1<br>Ø<br>H7 | D2 | D3<br>Ø<br>H13 | D4 | D5                            | D7<br>Ø<br>H7 | D8<br>Ø<br>H13 | D9<br>Ø |
|--------|------|----|----|------|----|----|---------------|----|----------------|----|-------------------------------|---------------|----------------|---------|
| HMP-25 | 77.3 | 35 | 11 | 69.8 | 60 | 40 | 9             | M6 | 10             | M5 | G <sup>1</sup> / <sub>8</sub> | 9             | 5.5            | 10      |
| HMP-32 | 90.8 | 40 |    | 79.8 | 70 |    |               |    |                |    | G <sup>1</sup> / <sub>4</sub> |               |                |         |

| Type   | H1  | H2 | H3   | H5 | H6 | H7 | H8 | H9                  | H10                 | H11 | H12 | H13 | H14 | H15 | H16 |
|--------|-----|----|------|----|----|----|----|---------------------|---------------------|-----|-----|-----|-----|-----|-----|
|        |     |    | ±0.1 |    |    |    |    | ±0.03 <sup>1)</sup> | ±0.03 <sup>1)</sup> |     |     |     |     |     |     |
| HMP-25 | 120 | 43 | 9    | 13 | 20 | 40 | 30 | 60                  | 20                  | 40  | 6   | 38  | 110 | 20  | 74  |
| HMP-32 | 143 | 53 |      |    | 30 |    | 40 | 80                  |                     |     |     | 48  | 133 |     |     |

| Type   | H17 | L1  | L2 | L3  | L4   | L5 | L7 | L8   | L13   | T1  | T2   | T3 | T4 | T5  | ≈ |
|--------|-----|-----|----|-----|------|----|----|------|-------|-----|------|----|----|-----|---|
|        |     |     |    |     | +0.2 |    |    | ±0.2 | ±0.03 |     | +0.1 |    |    |     |   |
| HMP-25 | 40  | 320 | 28 | 290 | 15   | 50 | 15 | 25   | 190   | 5.7 | 2.1  | 9  | 6  | 5.7 | 5 |
| HMP-32 |     | 427 |    | 392 |      |    |    |      | 290   |     |      | 12 |    |     |   |

1) Tolerance specification applies to countersink D1; tolerance for thread D2: ±0.2

# Linear modules HMP

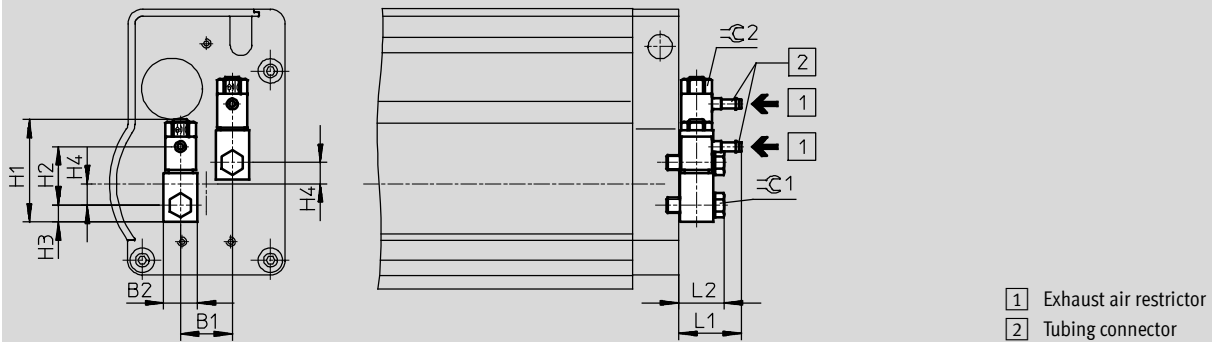
Technical data

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## Dimensions – Pneumatic connections

Download CAD data → [www.festo.com](http://www.festo.com)

(code 2G3/2G4/2G6)

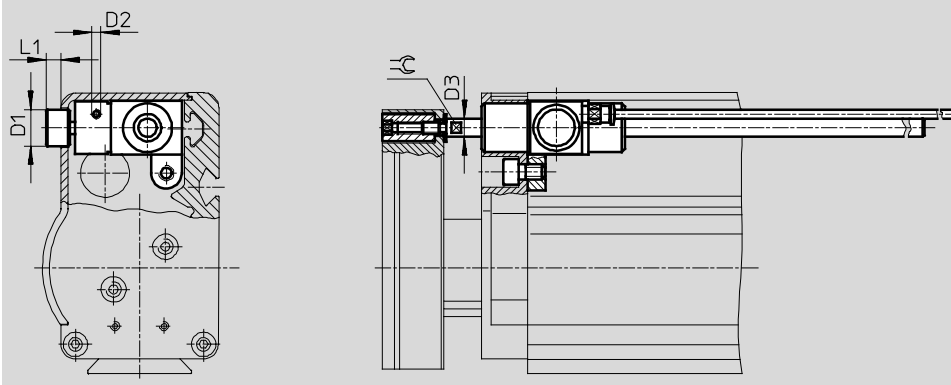


| Type           | B1   | B2 | H1   | H2   | H3  | H4   | L1   | L2   | ≡C1 | ≡C2 |      |
|----------------|------|----|------|------|-----|------|------|------|-----|-----|------|
| HMP-16-...-2G3 | 17   | 11 | 33.6 | 19   | 5.5 | 7    | 20.6 | 15   | 7   | 9   |      |
| HMP-16-...-2G4 |      |    |      |      |     |      | 22.6 |      |     |     |      |
| HMP-20-...-2G4 | 20   | 16 | 48.7 | 28.9 | 8   |      | 31.3 | 22.2 | 13  | 14  |      |
| HMP-20-...-2G6 |      |    |      | 27.5 |     |      |      |      |     |     | 31.4 |
| HMP-25-...-2G4 | 22   |    |      | 28.9 |     | 27.5 | 9    |      |     |     | 31.3 |
| HMP-25-...-2G6 |      |    |      |      |     |      |      |      |     |     | 31.4 |
| HMP-32-...-2G4 |      | 20 | 61.8 | 37.9 | 10  | 35.8 |      | 28.2 | 17  | 17  |      |
| HMP-32-...-2G6 | 38.2 |    |      | 35.9 |     |      |      |      |     |     |      |

## Dimensions – Clamping unit

Download CAD data → [www.festo.com](http://www.festo.com)

(code KP)



| Type   | D1<br>Ø | D2<br>1) | D3<br>Ø | L1  | ⌀C | Holding force<br>[N] | Effective load     |                  |
|--------|---------|----------|---------|-----|----|----------------------|--------------------|------------------|
|        |         |          |         |     |    |                      | horizontal<br>[kg] | vertical<br>[kg] |
| HMP-16 | 11.4    | M3       | 6       | 5   | 5  | 100                  | 10                 | 4                |
| HMP-20 |         |          |         | 3.8 |    |                      | 20                 | 7.5              |

1) Air connection is supplied ready-fitted with QS connector QSM-M3-4

## Note

The clamping unit must only be operated when the rod is stationary (end position). Dynamic braking operations can result in severe damage to the clamping device.

Precision positioning cannot be guaranteed with the clamping unit since slippage of approx. 1 – 2 mm can occur.

When using the linear module HMP-20 together with the clamping unit, the max. possible stroke is reduced by 12.5 mm.

# Linear modules HMP

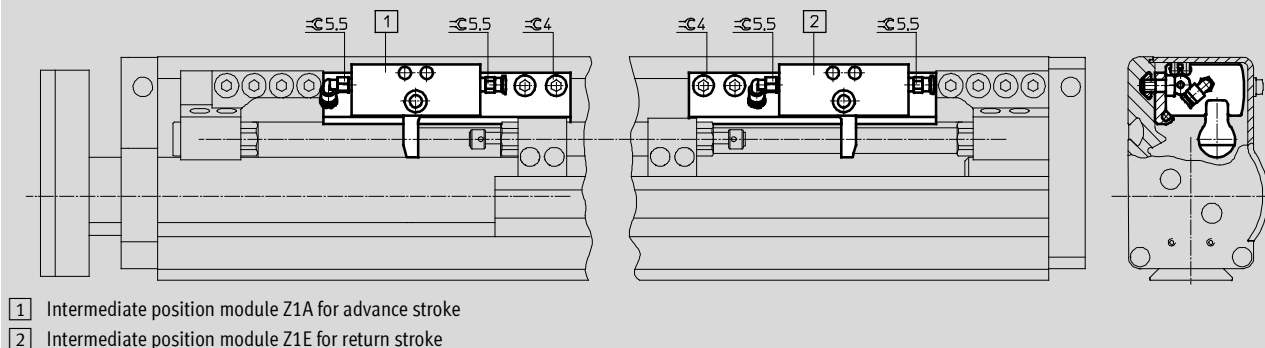
Technical data

**FESTO**

## Dimensions – Intermediate position modules

Download CAD data → [www.festo.com](http://www.festo.com)

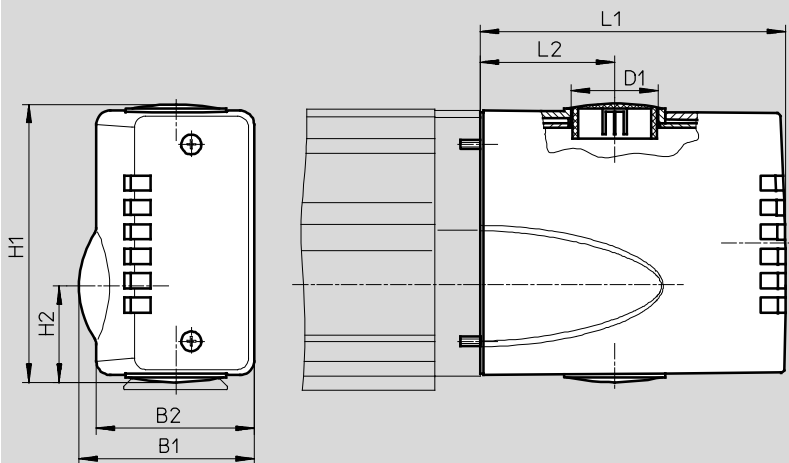
(code Z1A/Z1E)



## Dimensions – End cap

Download CAD data → [www.festo.com](http://www.festo.com)

(code AD/EL)



| Type   | B1   | B2   | D1<br>Ø      | H1    | H2   | L1  | L2 |
|--------|------|------|--------------|-------|------|-----|----|
| HMP-16 | 57.4 | 51.2 | 28.5 (PG 21) | 91.3  | 31.5 | 100 | 44 |
| HMP-20 | 65.4 | 59.2 | 37.2 (PG 29) | 106.3 | 34.4 | 120 | 55 |
| HMP-25 | 76.9 | 69.2 |              | 119   | 40.1 |     |    |
| HMP-32 | 90.4 | 79.2 |              | 141.6 | 49.9 |     |    |

# Linear modules HMP

Ordering data – Modular products

FESTO

## Mandatory data →

| Module No.              | Function | Piston Ø | Stroke | Generation | Position sensing | Pneumatic connection |
|-------------------------|----------|----------|--------|------------|------------------|----------------------|
| 537 940                 | HMP      | 16       | 50     | B          | SL               | 2G3                  |
| 537 941                 |          | 20       | 100    |            |                  | 2G4                  |
| 537 942                 |          | 25       | 150    |            |                  | 2G6                  |
| 537 943                 |          | 32       | 200    |            |                  |                      |
|                         |          |          | 250    |            |                  |                      |
|                         |          |          | 320    |            |                  |                      |
|                         |          |          | 400    |            |                  |                      |
| <b>Ordering example</b> |          |          |        |            |                  |                      |
| 537 940                 | HMP      | 16       | 150    | B          | SL               | 2G3                  |

| Ordering table       |                                                   |                                                   |         |         |                 |      |               |  |
|----------------------|---------------------------------------------------|---------------------------------------------------|---------|---------|-----------------|------|---------------|--|
| Size                 | 16                                                | 20                                                | 25      | 32      | Condi-<br>tions | Code | Enter<br>code |  |
| M Module No.         | 537 940                                           | 537 941                                           | 537 942 | 537 943 |                 |      |               |  |
| Function             | Linear module with ball bearing guide             |                                                   |         |         |                 | HMP  | HMP           |  |
| Piston Ø [mm]        | 16                                                | 20                                                | 25      | 32      |                 | -... |               |  |
| Stroke [mm]          | 50                                                | 50                                                | -       | -       |                 | -50  |               |  |
|                      | 100                                               | 100                                               | 100     | 100     |                 | -100 |               |  |
|                      | 150                                               | 150                                               | 150     | 150     |                 | -150 |               |  |
|                      | 200                                               | 200                                               | 200     | 200     |                 | -200 |               |  |
|                      | 250                                               | 250                                               | 250     | 250     |                 | -250 |               |  |
|                      | 320                                               | 320                                               | 320     | 320     |                 | -320 |               |  |
|                      | -                                                 | 400                                               | 400     | 400     |                 | -400 |               |  |
| Generation           | B series                                          |                                                   |         |         |                 | -B   | -B            |  |
| Position sensing     | Sensor strip                                      |                                                   |         |         |                 | -SL  | -SL           |  |
| Pneumatic connection | One-way flow control valve, 3 mm barbed connector | -                                                 | -       | -       |                 | -2G3 |               |  |
|                      | One-way flow control valve, 4 mm barbed connector |                                                   |         |         |                 | -2G4 |               |  |
|                      | -                                                 | One-way flow control valve, 6 mm barbed connector |         |         |                 | -2G6 |               |  |

Transfer order code

|  |     |   |  |   |  |   |   |   |    |   |  |
|--|-----|---|--|---|--|---|---|---|----|---|--|
|  | HMP | - |  | - |  | - | B | - | SL | - |  |
|--|-----|---|--|---|--|---|---|---|----|---|--|

# Linear modules HMP

Ordering data – Modular products

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| Options       |                       |           |                                  |                            |             |                   |            |                  |
|---------------|-----------------------|-----------|----------------------------------|----------------------------|-------------|-------------------|------------|------------------|
| Clamping unit | Intermediate position | Interface | Proximity sensor set             | User documentation         | Accessories | Cable with socket | Slot cover | Centring sleeves |
| KP            | Z1A<br>Z1E            | AD<br>EL  | A1<br>A2<br>A3<br>A4<br>A5<br>A6 | E<br>S<br>F<br>I<br>V<br>B | ZUB         | ...V              | A          | ...Z             |
| -             | - Z1A                 | - EL      | - A1                             | - B                        | ZUB         | - 2V              |            |                  |

| Ordering table                                                 |                                                               |    |    |    |                 |      |  |               |
|----------------------------------------------------------------|---------------------------------------------------------------|----|----|----|-----------------|------|--|---------------|
| Size                                                           | 16                                                            | 20 | 25 | 32 | Condi-<br>tions | Code |  | Enter<br>code |
| Clamping unit                                                  | Attached                                                      |    |    |    | 1               | -KP  |  |               |
| Intermediate position                                          | 1 intermediate position, advancing                            |    |    |    | 2               | -Z1A |  |               |
|                                                                | 1 intermediate position, returning                            |    |    |    | 2               | -Z1E |  |               |
| Interface                                                      | End cap                                                       |    |    |    |                 | -AD  |  |               |
|                                                                | End cap with electrical interface                             |    |    |    |                 | -EL  |  |               |
| Proximity sensor, assembled                                    | Proximity sensor with cable, 2.5 m                            |    |    |    |                 | -A1  |  |               |
|                                                                | Proximity sensor, contactless, NPN with cable, 2.5 m          |    |    |    |                 | -A2  |  |               |
|                                                                | Proximity sensor, contactless, PNP with cable, 2.5 m          |    |    |    |                 | -A3  |  |               |
|                                                                | Proximity sensor with plug M8                                 |    |    |    | 3               | -A4  |  |               |
|                                                                | Proximity sensor, contactless, NPN with plug M8               |    |    |    | 3               | -A5  |  |               |
|                                                                | Proximity sensor, contactless, PNP with plug M8               |    |    |    | 3               | -A6  |  |               |
|                                                                |                                                               |    |    |    |                 |      |  |               |
| Alternative user documentation<br>(standard is German/English) | User documentation, English                                   |    |    |    |                 | -E   |  |               |
|                                                                | User documentation, Spanish                                   |    |    |    |                 | -S   |  |               |
|                                                                | User documentation, French                                    |    |    |    |                 | -F   |  |               |
|                                                                | User documentation, Italian                                   |    |    |    |                 | -I   |  |               |
|                                                                | User documentation, Swedish                                   |    |    |    |                 | -V   |  |               |
|                                                                | Express waiver - no manual to be included (already available) |    |    |    |                 | -B   |  |               |
| Accessories                                                    | Supplied separately                                           |    |    |    |                 | ZUB- |  | ZUB-          |
| Cable with socket, 2.5 m                                       | 1 ... 10                                                      |    |    |    |                 | ...V |  |               |
| Slot cover                                                     | Slot cover                                                    |    |    |    |                 | A    |  |               |
| Centring sleeves (pack of 10)                                  | 10, 20, 30, 40, 50, 60, 70, 80, 90                            |    |    |    |                 | ...Z |  |               |

1 KP Not with intermediate position Z1A, Z1E.

2 Z1A, Z1E Min. stroke: 150 mm.

3 A4, A5, A6 Not with interface EL

Max. stroke: Piston Ø 16, 20, 25 mm: 200 mm

Piston Ø 32 mm: 150 mm

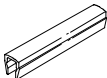
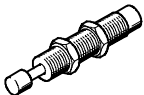
Transfer order code

- - - - - ZUB - - -

# Linear modules HMP

Accessories

**FESTO**

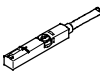
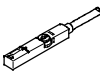
| Ordering data                                                                          |                      |                                 |            |          |            |                  |
|----------------------------------------------------------------------------------------|----------------------|---------------------------------|------------|----------|------------|------------------|
|                                                                                        | For piston Ø<br>[mm] | Remarks                         | Order code | Part No. | Type       | PU <sup>1)</sup> |
| Centring sleeve ZBH <span style="float: right;">Technical data → Internet: zbh</span>  |                      |                                 |            |          |            |                  |
|       | 16 ... 32            | For yoke plate                  | Z          | 150 927  | ZBH-9      | 10               |
| Slot cover ABP                                                                         |                      |                                 |            |          |            |                  |
|       | 16 ... 32            | For sensor strip<br>every 0.5 m | A          | 151 681  | ABP-5      | 2                |
| Shock absorber YSRW <span style="float: right;">Technical data → Internet: ysrw</span> |                      |                                 |            |          |            |                  |
|       | 16                   | –                               | –          | 191 194  | YSRW-8-14  | 1                |
|                                                                                        | 20                   |                                 |            | 191 196  | YSRW-12-20 |                  |
|                                                                                        | 25                   |                                 |            | 191 196  | YSRW-12-20 |                  |
|                                                                                        | 32                   |                                 |            | 191 197  | YSRW-16-26 |                  |

1) Packaging unit quantity

# Linear modules HMP

Accessories

**FESTO**

| 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     | PNP           | Cable, 3-wire         | 2.5              | 543 867                        | SMT-8M-PS-24V-K-2,5-OE  |
|                                                                                   |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 543 866                        | SMT-8M-PS-24V-K-0,3-M8D |
|                                                                                   |                                                                    |               | Plug M12x1, 3-pin     | 0.3              | 543 869                        | SMT-8M-PS-24V-K-0,3-M12 |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | PNP           | Cable, 3-wire         | 2.5              | 543 870                        | SMT-8M-NS-24V-K-2,5-OE  |
|                                                                                   |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 543 871                        | SMT-8M-NS-24V-K-0,3-M8D |
|                                                                                   |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 175 436                        | SMT-8-PS-K-LED-24-B     |
|                                                                                   |                                                                    |               |                       |                  | 175 484                        | SMT-8-PS-S-LED-24-B     |
| N/C contact                                                                       |                                                                    |               |                       |                  |                                |                         |
|  | Insertable in the slot from above, flush with cylinder profile     | PNP           | Cable, 3-wire         | 7.5              | 543 873                        | SMT-8M-PO-24V-K7,5-OE   |

| 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 from above, flush with cylinder profile     | Contacting    | Cable, 3-wire         | 2.5              | 543 862                        | SME-8M-DS-24V-K-2,5-OE  |
|                                                                                     |                                                                    |               |                       | 5.0              | 543 863                        | SME-8M-DS-24V-K-5,0-OE  |
|                                                                                     |                                                                    |               | Cable, 2-wire         | 2.5              | 543 872                        | SME-8M-ZS-24V-K-2,5-OE  |
|                                                                                     |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 543 861                        | SME-8M-DS-24V-K-0,3-M8D |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting    | 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          |
|                                                                                     |                                                                    |               |                       |                  |                                |                         |
| N/C contact                                                                         |                                                                    |               |                       |                  |                                |                         |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting    | Cable, 3-wire         | 7.5              | 160 251                        | SME-8-O-K-LED-24        |

## Linear modules HMP

Accessories

**FESTO**

| Ordering data – Proximity sensors for C-slot, magneto-resistive                   |                                   |               |                                             |                  | Technical data → Internet: smt |                            |
|-----------------------------------------------------------------------------------|-----------------------------------|---------------|---------------------------------------------|------------------|--------------------------------|----------------------------|
|                                                                                   | Type of mounting                  | Switch output | Electrical connection, connection direction | Cable length [m] | Part No.                       | Type                       |
| N/O contact                                                                       |                                   |               |                                             |                  |                                |                            |
|  | Insertable in the slot from above | PNP           | Cable, 3-wire, in-line                      | 2.5              | 551 373                        | SMT-10M-PS-24V-E-2,5-L-OE  |
|                                                                                   |                                   |               | Plug M8x1, 3-pin, in-line                   | 0.3              | 551 375                        | SMT-10M-PS-24V-E-0,3-L-M8D |
|                                                                                   |                                   |               | Plug M8x1, 3-pin, lateral                   | 0.3              | 551 376                        | SMT-10M-PS-24V-E-0,3-Q-M8D |

| Ordering data – Proximity sensors for C-slot, magnetic reed                       |                                   |               |                                             |                  | Technical data → Internet: sme |                            |
|-----------------------------------------------------------------------------------|-----------------------------------|---------------|---------------------------------------------|------------------|--------------------------------|----------------------------|
|                                                                                   | Type of mounting                  | Switch output | Electrical connection, connection direction | Cable length [m] | Part No.                       | Type                       |
| N/O contact                                                                       |                                   |               |                                             |                  |                                |                            |
|  | Insertable in the slot from above | Contacting    | Plug M8x1, 3-pin, in-line                   | 0.3              | 551 367                        | SME-10M-DS-24V-E-0,3-L-M8D |
|                                                                                   |                                   |               | Cable, 3-wire, in-line                      | 2.5              | 551 365                        | SME-10M-DS-24V-E-2,5-L-OE  |
|                                                                                   |                                   |               | Cable, 2-wire, in-line                      | 2.5              | 551 369                        | SME-10M-ZS-24V-E-2,5-L-OE  |
|  | Insertable in the slot lengthwise | Contacting    | Plug M8x1, 3-pin, in-line                   | 0.3              | 173 212                        | SME-10-SL-LED-24           |
|                                                                                   |                                   |               | Cable, 3-wire, in-line                      | 2.5              | 173 210                        | SME-10-KL-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   |