

## Electrical linear modules HME

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- Precise, backlash-free guidance
- Freely programmable position, speed and acceleration
- Great flexibility

## Electric linear modules HME

Key features

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### Range of applications

The electric linear module HME is ideal for use in automation applications where controlled end-position cushioning (gentle stopping), constant travel speed and positioning capability are important factors.

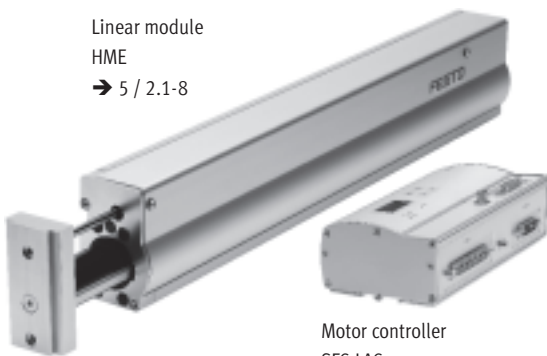
The linear module HME has the same interfaces on the yoke and basic profile as the pneumatic linear module HMP, and is fully compatible with modular handling and assembly systems including HMP adapter kits.

### Special features

- With integrated linear motor
- Freely positionable
- Fast positioning times
- Extremely rigid basic profile
- Precise, backlash-free guidance
- Controlled starting and stopping (programmable ramp)
- Working loads up to 25 kg
- Freely programmable travel speeds up to 3 m/s
- High dynamic response and accuracy thanks to rotationally symmetrical linear motor
- No external magnetic fields
- Fixed-position long-coil system without moving energy supply with short magnetic rotor

### Everything from a single source

Linear module  
HME  
→ 5 / 2.1-8



Motor controller  
SFC-LAC  
→ 5 / 2.1-23

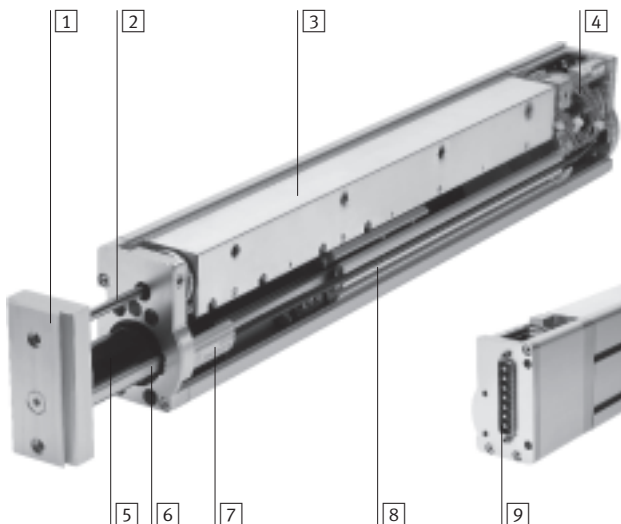
The linear module HME and motor controller SFC form one unit.

- Thanks to the protection class IP54, the SFC can be mounted close to the HME, either:
  - with centre supports
  - on an H-rail
- Only one cable is required between linear module HME and motor controller SFC
- Motor controller SFC available with or without control panel
- Up to 31 position sets
- Simple control via digital I/Os

Parameter assignment via:

- Control panel:
  - suitable for simple position sequences
- Configuration package FCT (Festo configuration tool):
  - with RS 232 interface
  - Windows-based PC user interface (Festo configuration tool)

### The technology in detail

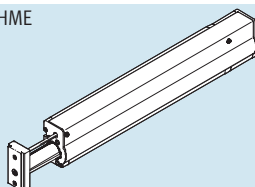
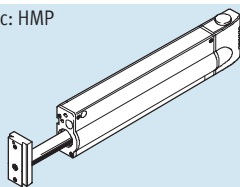
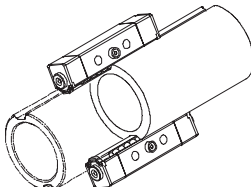
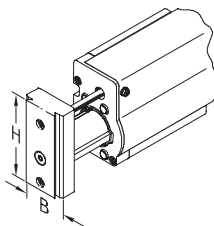
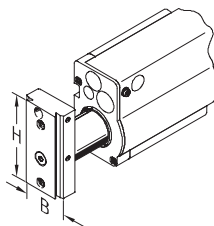
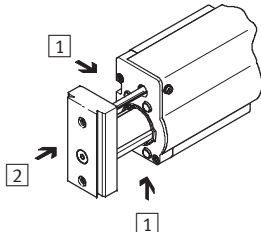
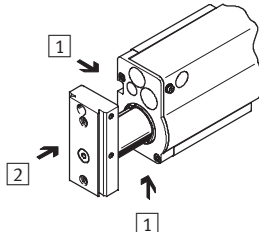


- 1 Yoke plate
- 2 Drive rod
- 3 Linear motor in aluminium housing
- 4 Electrical interface
- 5 Guide
- 6 Contactless displacement encoder
- 7 Measuring head
- 8 Integrated reference switch
- 9 Electrical interface

# Electric linear modules HME

Key features

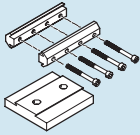
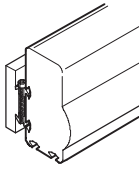
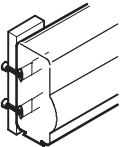
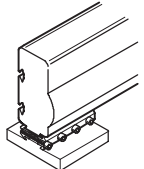
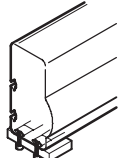
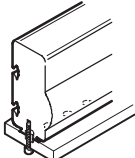
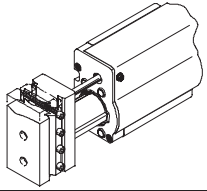
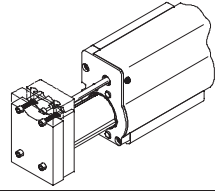
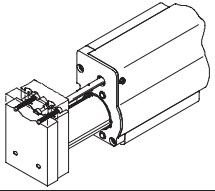
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| Comparison between electric linear module HME and pneumatic linear module HMP                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------|------------|-------------|----|---|-------|-------------|----|---|--------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--|
|                                                                                                                                                                                                                                                                                                                                                               | Electric: HME                                                                                                                                                                                                                         | Pneumatic: HMP                                                                        |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
|                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                      |    |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Advantages                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
|                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"><li>• Controlled starting and stopping</li><li>• Constant and precise speed up to 3 m/s</li><li>• Flexible positioning without mechanical aids</li><li>• Programmable positioning profile</li></ul> | <ul style="list-style-type: none"><li>• High feed force</li></ul>                     |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Guide                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| <ul style="list-style-type: none"><li>• Preloaded, backlash-free, precise and rigid recirculating ball bearing guide</li><li>• High load capacity (forces and torques)</li></ul>                                                                                                                                                                              |                                                                                                                                                    |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Dimensions                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| <ul style="list-style-type: none"><li>• Identical width and height dimensions</li></ul>                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| <table><tr><td>Type</td><td>Width (W)</td><td>x</td><td>Height (H)</td></tr><tr><td>HME/HMP-16:</td><td>34</td><td>x</td><td>85 mm</td></tr><tr><td>HME/HMP-25:</td><td>40</td><td>x</td><td>110 mm</td></tr></table>                                                                                                                                         | Type                                                                                                                                                                                                                                  | Width (W)                                                                             | x                                             | Height (H) | HME/HMP-16: | 34 | x | 85 mm | HME/HMP-25: | 40 | x | 110 mm |  |  |  |
| Type                                                                                                                                                                                                                                                                                                                                                          | Width (W)                                                                                                                                                                                                                             | x                                                                                     | Height (H)                                    |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| HME/HMP-16:                                                                                                                                                                                                                                                                                                                                                   | 34                                                                                                                                                                                                                                    | x                                                                                     | 85 mm                                         |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| HME/HMP-25:                                                                                                                                                                                                                                                                                                                                                   | 40                                                                                                                                                                                                                                    | x                                                                                     | 110 mm                                        |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Interfaces                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| <ul style="list-style-type: none"><li>• Identical mounting and attachment options</li></ul> <div><div>1</div>Attachment surfaces:<br/>Attached using slot nuts or dovetail connections</div> <div><div>2</div>Mounting surfaces:<br/>Direct attachment of loads and devices via threaded holes in the yoke plate, dovetail connections or through-holes</div> |                                                                                                                                                    |  |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Technical data                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                       |                                                                                       |                                               |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Size                                                                                                                                                                                                                                                                                                                                                          | [mm]                                                                                                                                                                                                                                  | 16, 25                                                                                | 16, 20, 25, 32                                |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Stroke                                                                                                                                                                                                                                                                                                                                                        | [mm]                                                                                                                                                                                                                                  | 100 ... 400                                                                           | 50 ... 400                                    |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Max. speed                                                                                                                                                                                                                                                                                                                                                    | [m/s]                                                                                                                                                                                                                                 | 3                                                                                     | 1.2                                           |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Repetition accuracy at end positions                                                                                                                                                                                                                                                                                                                          | [mm]                                                                                                                                                                                                                                  | ±0.015                                                                                | 0.01                                          |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |
| Intermediate positions                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                       | Any                                                                                   | With mid-position module, up to two positions |            |             |    |   |       |             |    |   |        |                                                                                     |                                                                                       |  |

## Electric linear modules HME

Key features

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

 Note

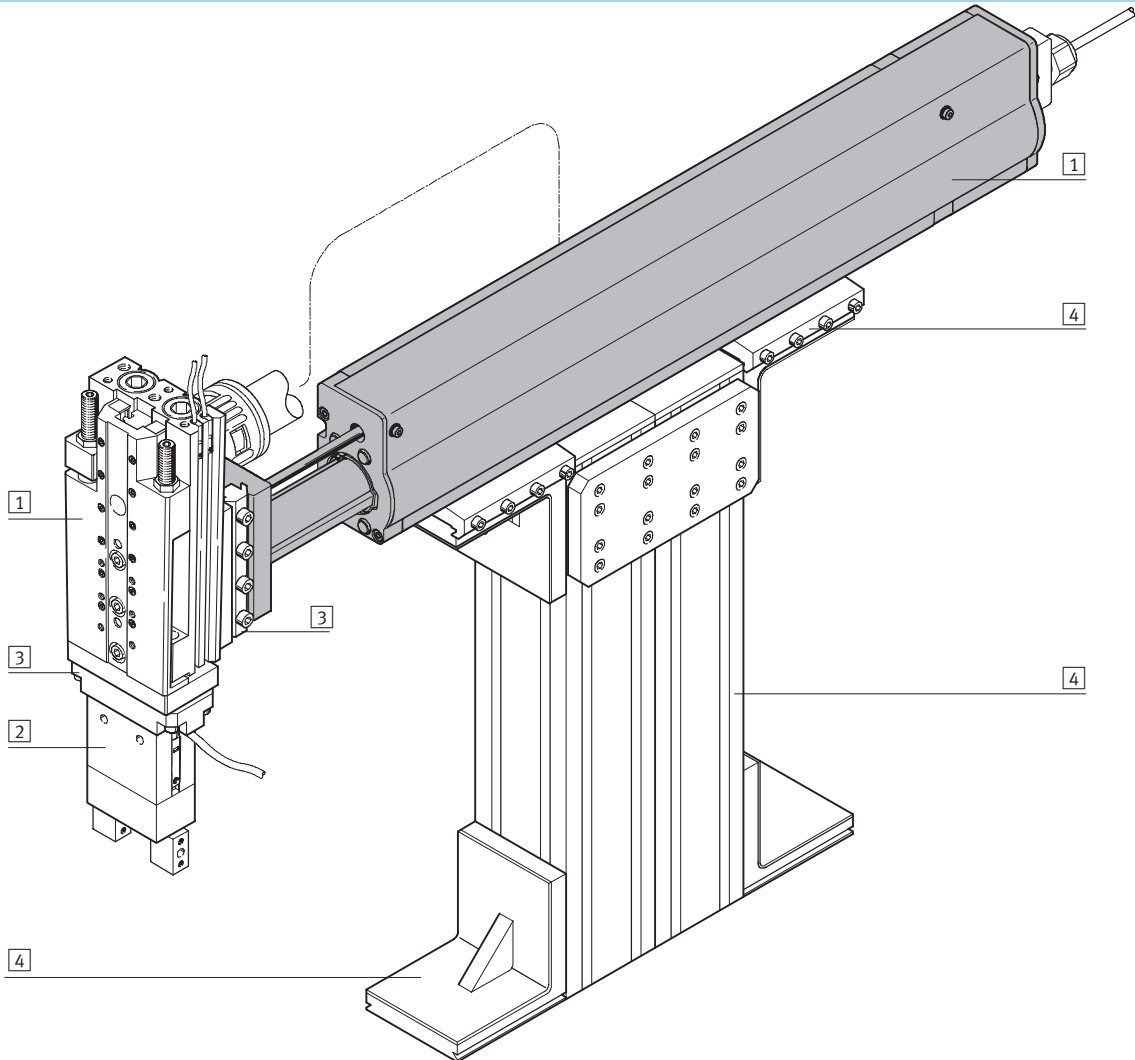
The dynamic response and accuracy of the linear module HME depends on the mounting (rigidity) and temperature stresses (heat concentration).

# Electric linear modules HME

System example

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System product for handling and assembly technology



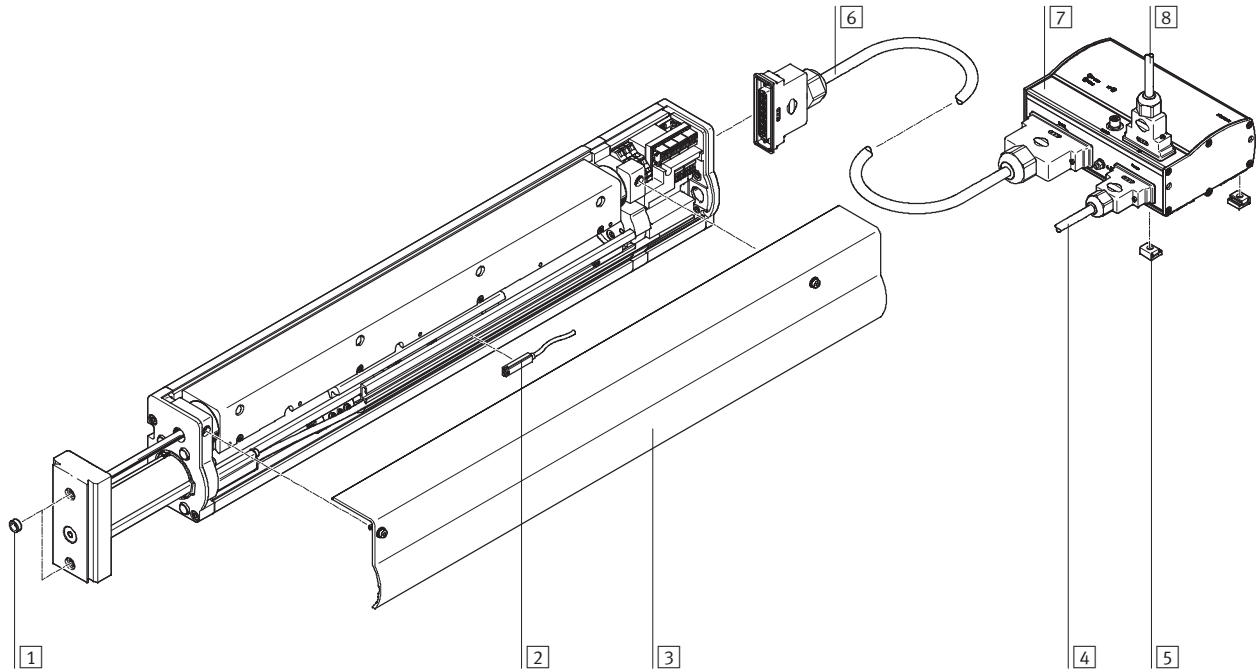
| System elements and accessories |                                                                             |          |
|---------------------------------|-----------------------------------------------------------------------------|----------|
|                                 | Brief description                                                           | → Page   |
| 1 Drives and axes               | Wide range of combinations possible within handling and assembly technology | Volume 1 |
| 2 Gripper                       | Wide range of variations possible within handling and assembly technology   | Volume 1 |
| 3 Adapter                       | For drive/driver and drive/gripper combinations                             | Volume 5 |
| 4 Basic mounting components     | Profiles and profile connectors as well as profile/driver connectors        | Volume 5 |
| – Installation components       | For manageable and secure guidance of electrical cables and tubing          | Volume 5 |
| – Motors                        | Servo and stepper motors, with or without gearing                           | Volume 5 |

## Electric linear modules HME

Peripherals overview

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Size 16/25



| Accessories |                           |                                                                                                                            |
|-------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------|
|             | Brief description         | → Page                                                                                                                     |
| 1           | Centring sleeve<br>ZBH    | – For centring loads and attachment components<br>5 / 2.1-21                                                               |
| 2           | Proximity sensor<br>SME-8 | – For referencing the linear module. (The proximity sensor is fitted and adjusted upon delivery of the linear module)<br>– |
| 3           | Housing cover             | – With cover: protection class IP40<br>– Easy to remove for maintenance<br>–                                               |
| 4           | Supply cable<br>KPWR      | Power supply cable for load and logic supply<br>5 / 2.1-27                                                                 |
| 5           | Centre supports<br>MUP    | – For mounting motor controller<br>– Motor controller can also be mounted on H-rail<br>5 / 2.1-27                          |
| 6           | Motor cable<br>KMTR       | Connecting cable between motor and motor controller<br>5 / 2.1-27                                                          |
| 7           | Motor controller<br>SFC   | For parameterising and positioning the linear module<br>5 / 2.1-23                                                         |
| 8           | Control cable<br>KES      | Cable for I/O connection to any controller<br>5 / 2.1-27                                                                   |

## Electric linear modules HME

Type code

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|                              |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
|------------------------------|-------------------------------|-----|---|----|---|-----|---|-----|---|------|---|----|---|-----|---|-----|
|                              |                               | HME | – | 16 | – | 200 | – | LAC | – | R010 | – | SC | + | ZUB | – | 10Z |
| <b>Type</b>                  |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| HME                          | Linear module                 |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Size</b>                  |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Stroke [mm]</b>           |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Type of motor</b>         |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| LAC                          | Linear AC servo motor         |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Displacement encoder</b>  |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| R010                         | Relative displacement encoder |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Electrical connection</b> |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| SC                           | Straight plug                 |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Accessories</b>           |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| ZUB                          | Supplied separately           |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| <b>Centring sleeve</b>       |                               |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |
| –...Z                        | Centring sleeves              |     |   |    |   |     |   |     |   |      |   |    |   |     |   |     |

## Electric linear modules HME

Technical data

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 Size  
16 and 25

 Stroke length  
100 ... 400 mm

 Note

All values are based on a normal temperature of 23 °C.  
Dynamic response and accuracy depend on the mounting (rigidity) and temperature stresses (heat concentration).



| General technical data                                   |                                           |                                        |      |      |      |      |      |      |
|----------------------------------------------------------|-------------------------------------------|----------------------------------------|------|------|------|------|------|------|
| Size                                                     | 16                                        |                                        |      |      | 25   |      |      |      |
| Stroke                                                   | 100                                       | 200                                    | 320  | 100  | 200  | 320  | 400  |      |
| Mechanical                                               |                                           |                                        |      |      |      |      |      |      |
| Drive unit operating mode                                | Yoke                                      |                                        |      |      |      |      |      |      |
| Guide                                                    | Recirculating ball bearing guide          |                                        |      |      |      |      |      |      |
| Constructional design                                    | Handling module with guide                |                                        |      |      |      |      |      |      |
| Mode of operation                                        | Electrical linear direct drive            |                                        |      |      |      |      |      |      |
| Type of mounting                                         | Linear module                             | With female thread and centring sleeve |      |      |      |      |      |      |
|                                                          |                                           | With dovetail connection               |      |      |      |      |      |      |
|                                                          |                                           | With slot nut strip                    |      |      |      |      |      |      |
| Type of mounting                                         | Attachments on yoke plate                 | With female thread and centring sleeve |      |      |      |      |      |      |
|                                                          |                                           | With dovetail connection               |      |      |      |      |      |      |
|                                                          |                                           | With through-hole and centring sleeve  |      |      |      |      |      |      |
|                                                          |                                           | Size 25 via slot nut strip             |      |      |      |      |      |      |
| Mounting position                                        | Horizontal (vertical on request)          |                                        |      |      |      |      |      |      |
| Stroke                                                   | [mm]                                      | 100                                    | 200  | 320  | 100  | 200  | 320  | 400  |
| Max. effective load (horizontal operation) <sup>1)</sup> | [kg]                                      | 10                                     | 8    | 4    | 25   | 25   | 22   | 19   |
| Max. speed                                               | [m/s]                                     | 3                                      |      |      |      |      |      |      |
| Repetition accuracy                                      | [mm]                                      | ±0.015                                 |      |      |      |      |      |      |
|                                                          |                                           |                                        |      |      |      |      |      |      |
| Electric                                                 |                                           |                                        |      |      |      |      |      |      |
| Type of motor                                            | Linear AC servo motor                     |                                        |      |      |      |      |      |      |
| Displacement encoder                                     | Relative measuring, magnetic, incremental |                                        |      |      |      |      |      |      |
| Link voltage                                             | [V]                                       | 48                                     |      |      |      |      |      |      |
| Peak feed force <sup>2)</sup>                            | [N]                                       | 248                                    | 179  | 179  | 257  | 257  | 257  | 257  |
| Continuous feed force <sup>2)</sup>                      | [N]                                       | 42                                     | 42   | 45   | 57   | 73   | 69   | 74   |
| Peak motor current                                       | [A]                                       | 28.5                                   | 20.5 | 20.5 | 28.5 | 28.5 | 28.5 | 28.5 |
| Nominal motor current                                    | [A]                                       | 4.8                                    | 4.8  | 5.2  | 6.3  | 8.1  | 7.6  | 8.2  |
| Nominal motor power <sup>2)</sup>                        | [W]                                       | 127                                    | 127  | 134  | 171  | 221  | 209  | 223  |
| Magnetic radiation                                       | None                                      |                                        |      |      |      |      |      |      |

1) With use of maximum stroke. Higher loads on request

2) Disregarding friction

# Electric linear modules HME

Technical data

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| Operating and environmental conditions       |      |                                     |
|----------------------------------------------|------|-------------------------------------|
| Ambient temperature <sup>1)</sup>            | [°C] | 0 ... +40                           |
| Max. motor temperature                       | [°C] | 70                                  |
| Normal temperature <sup>2)</sup>             | [°C] | 23                                  |
| Temperature monitoring                       |      | Shuts down if motor overheats       |
| Protection class                             |      | IP40                                |
| CE symbol (see conformity declaration)       |      | In accordance with EU EMC directive |
| Relubrication intervals of guide components  | [km] | 2,500                               |
| Corrosion resistance class CRC <sup>3)</sup> |      | 2                                   |

1) Note operating range of proximity sensors

2) Unless otherwise stated, all values are based on normal temperature

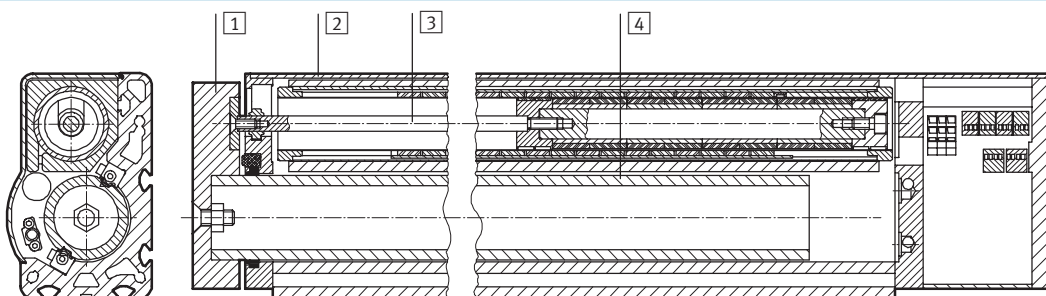
3) Corrosion resistance class 2 to Festo standard 940 070

Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

| Weights [g]       |       |       |       |       |        |        |        |
|-------------------|-------|-------|-------|-------|--------|--------|--------|
| Size              | 16    |       |       | 25    |        |        |        |
| Stroke            | 100   | 200   | 320   | 100   | 200    | 320    | 400    |
| Product weight    | 4,700 | 6,000 | 7,300 | 9,600 | 11,500 | 13,800 | 15,300 |
| Moved dead weight | 1,400 | 1,700 | 2,100 | 3,400 | 3,900  | 4,600  | 5,000  |

## Materials

Sectional view



| Linear module |              |                                   |
|---------------|--------------|-----------------------------------|
| 1             | Yoke plate   | Wrought aluminium alloy, anodised |
| 2             | Housing      | Wrought aluminium alloy, anodised |
| 3             | Drive rod    | High-alloy stainless steel        |
| 4             | Guide barrel | Coated rolled steel               |

## Electric linear modules HME

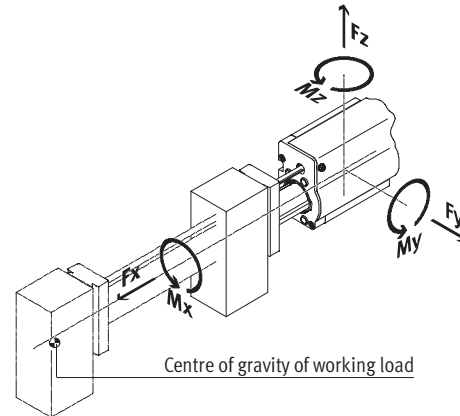
Technical data

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### Dynamic characteristic load values of the bearing guide

The stated forces and torques are for a horizontal and vertical mounting position (see illustration). In many cases the maximum loads occur on braking and with extended axis.

The calculated loads must be used in the following equation. The equation must be satisfied statically and dynamically, in any operating situation. The effective direction of the torques and forces must be observed. The torques and force directions shown are positive.



$$\frac{| - 0.5 * F_y + 0.5 * \sqrt{3} * F_z |}{F_{u_{max}}} + \frac{| 0.5 * \sqrt{3} * F_y + 0.5 * F_z |}{F_{v_{max}}} + \frac{| M_x |}{M_{x_{max}}} + \frac{| - 0.5 * M_y + 0.5 * \sqrt{3} * M_z |}{M_{u_{max}}} + \frac{| 0.5 * \sqrt{3} * M_y + 0.5 * M_z |}{M_{v_{max}}} \leq 1$$

#### 1 Loads resulting from the application: forces $F_y$ , $F_z$ and torques $M_x$ , $M_y$ , $M_z$

The forces and torques to be used in the above equation, caused by the load of the application, comprise the following:

Composition of forces:  
 $F_y = F_{y5}$   
 $F_z = F_{z2} + F_{z3} + F_{z5}$

Composition of torques:  
 $M_x = M_{x3} + M_{x5}$   
 $M_y = M_{y1} + M_{y2} + M_{y3} + M_{y4} + M_{y5}$   
 $M_z = M_{z1} + M_{z4} + M_{z5}$

#### 1.1 Torques acting on the bearing guide due to maximum feed force

The stated values are maximum values resulting from the peak feed force.

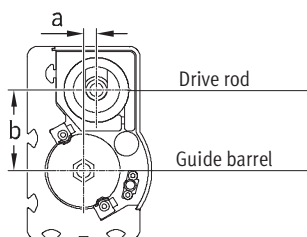
They are independent of:

- stroke position
- inertia

and dependent on:

- direction of movement
- mounting position

|                 | Extending – Accelerating /<br>Retracting – Braking |               | Retracting – Accelerating /<br>Extending – Braking |               |
|-----------------|----------------------------------------------------|---------------|----------------------------------------------------|---------------|
|                 | $M_{y1}$ [Nm]                                      | $M_{z1}$ [Nm] | $M_{y1}$ [Nm]                                      | $M_{z1}$ [Nm] |
| HME-16-100      | 9.2                                                | –1.3          | –9.2                                               | 1.3           |
| HME-16-200/-320 | 6.7                                                | –1            | –6.7                                               | 1             |
| HME-25          | 13                                                 | –2.1          | –13                                                | 2.1           |



| Dimensions | a [mm] | b [mm] |
|------------|--------|--------|
| HME-16     | 5.4    | 37.2   |
| HME-25     | 8      | 50.2   |

#### 1.2 Forces and torques acting on the bearing guide due to dead weight

The stated values are maximum values in the extended condition.

They are independent of:

- inertia of the dead weight

and dependent on:

- stroke position
- mounting position

|            | $M_{y2}$ [Nm] | $F_{z2}$ [N] |
|------------|---------------|--------------|
| HME-16-100 | 0.6           | –9.8         |
| HME-16-200 | 1.4           | –12.5        |
| HME-16-320 | 2.7           | –15.7        |
| HME-25-100 | 1.3           | –22.1        |
| HME-25-200 | 3.0           | –26.9        |
| HME-25-320 | 5.6           | –32.7        |
| HME-25-400 | 7.7           | –36.6        |

## Electric linear modules HME

Technical data

**FESTO**

### 1.3 Forces and torques acting on the bearing guide due to the weight of the working load

Values to be determined:

Formulae for calculating forces and torques:

Distances:

– X2, Y2 and Z2

Forces and torques due to weight:

– Fz3

– Mx3, My3

Due to inertia:

– My4, Mz4

$$Fz3 = m \times g$$

$$Fy3 = 0$$

$$Mx3 = Y2 \times Fz3$$

$$My3 = (X1 + Hub + X2) \times Fz3$$

$$Mz3 = 0$$

$$Mx4 = 0$$

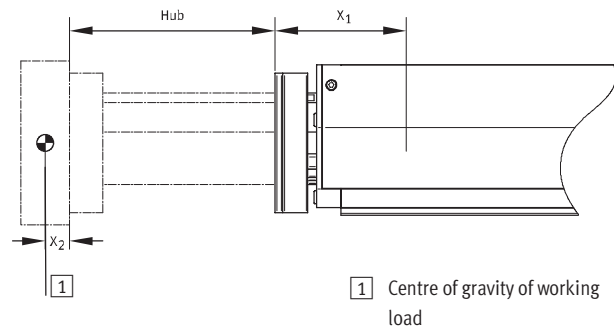
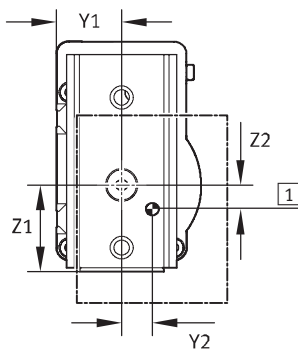
$$My4 = Z2 \times m \times a$$

$$Mz4 = Y2 \times m \times a$$

m = Mass of working load

a = Acceleration

g = Acceleration due to gravity  
(9.81 m/s<sup>2</sup>)



|        | Y1 [mm] | Z1 [mm] |
|--------|---------|---------|
| HME-16 | 26      | 34.5    |
| HME-25 | 35      | 43      |

|        | X1 [mm] |
|--------|---------|
| HME-16 | 119.3   |
| HME-25 | 154     |

### 1.4 Forces and torques acting on the bearing guide due to forces from the application (other drives)

For example:

– Mounting forces

– Forces from attached rotary drives

Fy5 = Mounting force acts at right angles to working load

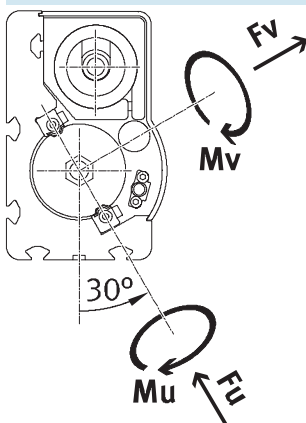
Fz5 = Mounting force presses additionally on working load

Mx5 = Attached rotary drive causes torque on the bearing guide

My5 = Torques due to Fz5

Mz5 = Torques due to Fy5

### 2 Maximum permitted load capacity of bearing guide<sup>1)</sup>



| Size                    | 16    | 25    |
|-------------------------|-------|-------|
| Fu <sub>max.</sub> [N]  | 2,456 | 2,456 |
| Fv <sub>max.</sub> [N]  |       |       |
| Mx <sub>max.</sub> [Nm] | 42    | 60    |
| Mu <sub>max.</sub> [Nm] | 123   | 220   |
| Mv <sub>max.</sub> [Nm] | 123   | 220   |

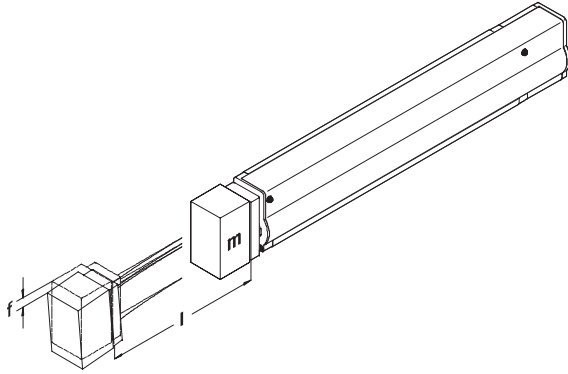
1) After 5,000 km

## Electric linear modules HME

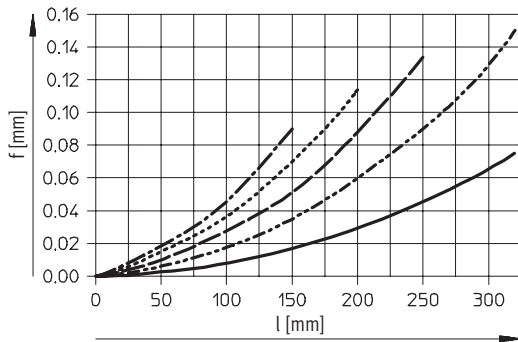
Technical data

**FESTO**

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

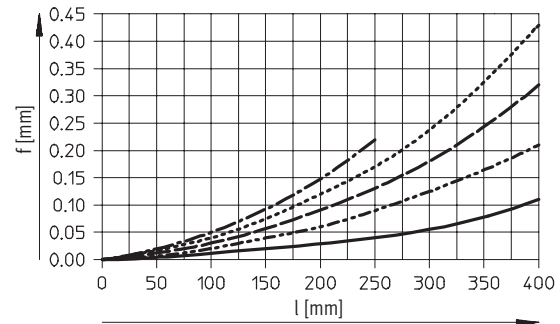


Size 16



- 2 kg
- - - 4 kg
- - - 6 kg
- - - 8 kg
- - - 10 kg

Size 25



- 5 kg
- - - 10 kg
- - - 15 kg
- - - 20 kg
- - - 25 kg

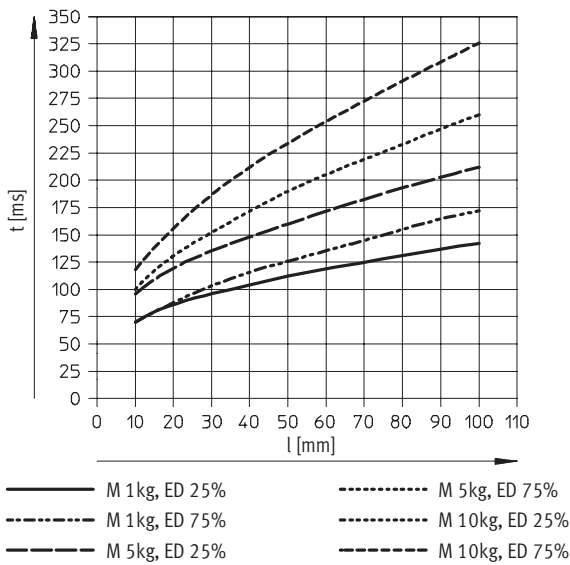
# Electric linear modules HME

Technical data

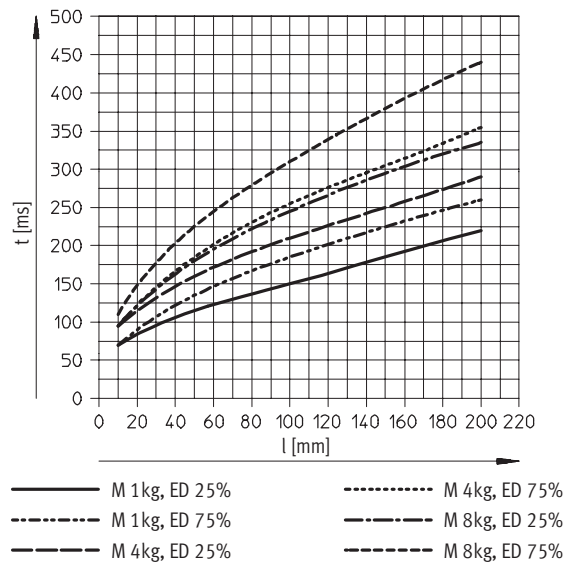
FESTO

## Positioning time $t$ as a function of stroke $l$ , working load $M$ and duty cycle ED

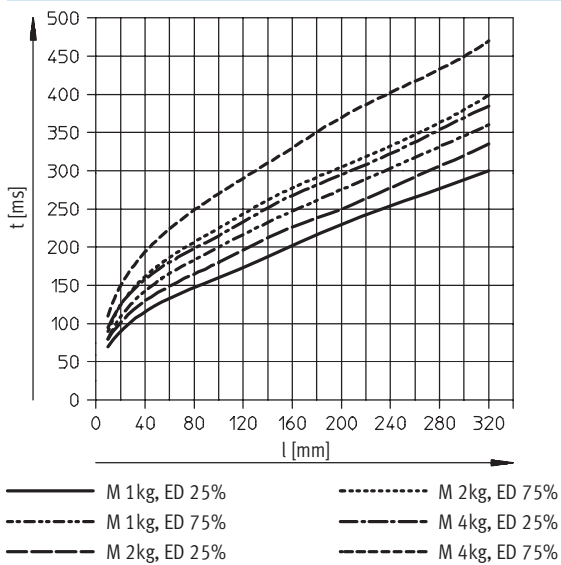
HME-16-100



HME-16-200



HME-16-320



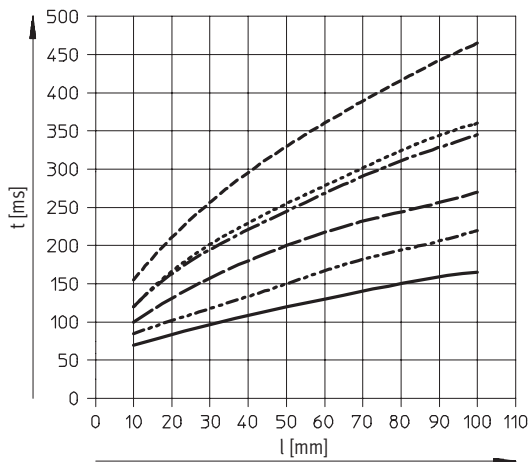
# Electric linear modules HME

Technical data

**FESTO**

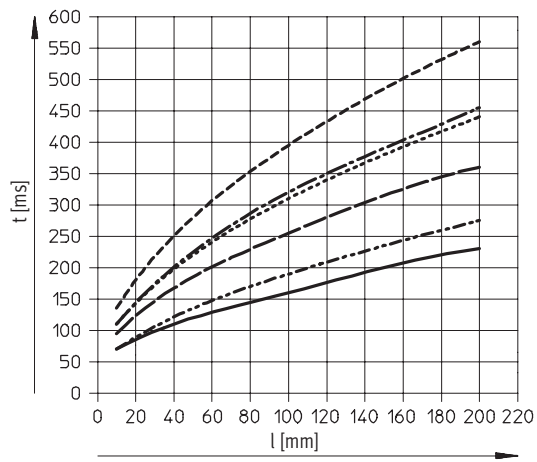
Positioning time  $t$  as a function of stroke  $l$ , working load  $M$  and duty cycle ED

HME-25-100



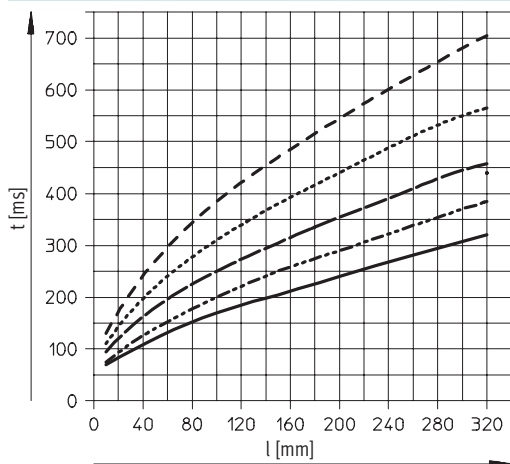
— M 1kg, ED 25%      - - - - - M 12.5kg, ED 75%  
 - - - - - M 1kg, ED 75%      - - - - - M 25kg, ED 25%  
 - - - - - M 12.5kg, ED 25%      - - - - - M 25kg, ED 75%

HME-25-200



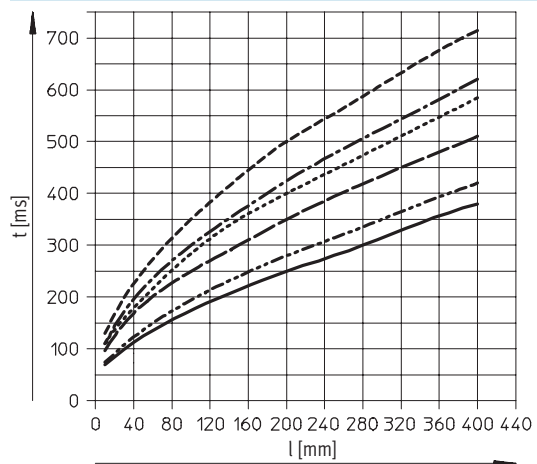
— M 1kg, ED 25%      - - - - - M 12.5kg, ED 75%  
 - - - - - M 1kg, ED 75%      - - - - - M 25kg, ED 25%  
 - - - - - M 12.5kg, ED 25%      - - - - - M 25kg, ED 75%

HME-25-320



— M 1kg, ED 25%      - - - - - M 11kg, ED 75%  
 - - - - - M 1kg, ED 75%      - - - - - M 22kg, ED 25%  
 - - - - - M 11kg, ED 25%      - - - - - M 22kg, ED 75%

HME-25-400



— M 1kg, ED 25%      - - - - - M 9.5kg, ED 75%  
 - - - - - M 1kg, ED 75%      - - - - - M 19kg, ED 25%  
 - - - - - M 9.5kg, ED 25%      - - - - - M 19kg, ED 75%

# Electric linear modules HME

Technical data

## Feed force F as a function of stroke l

The graphs are based on theoretically determined values, without friction.

Peak feed force

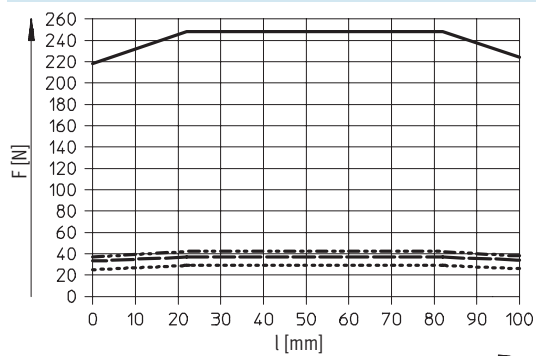
Continuous feed force at ambient temperature:

----- of 23 °C

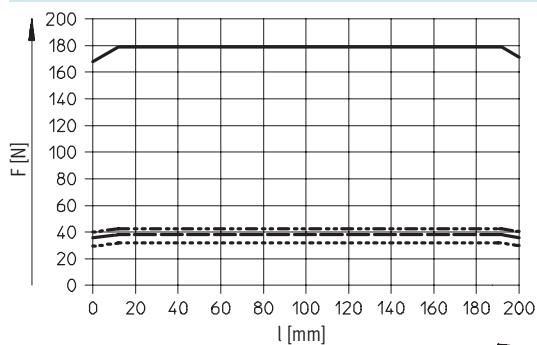
----- of 30 °C

----- of 40 °C

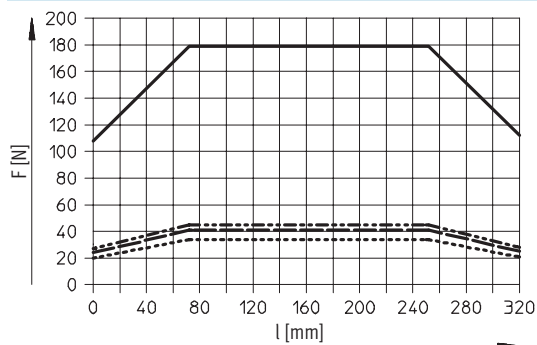
HME-16-100



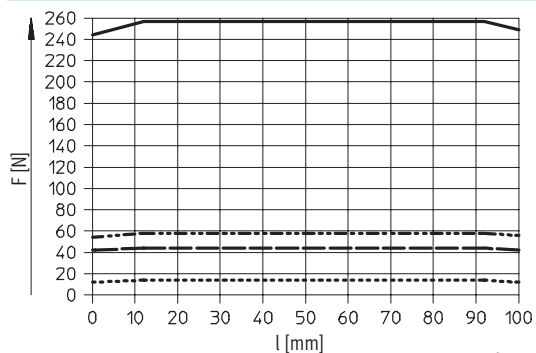
HME-16-200



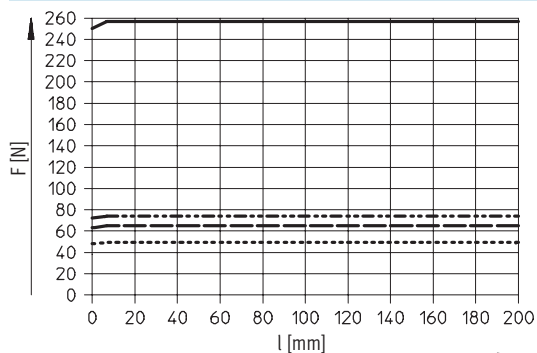
HME-16-320



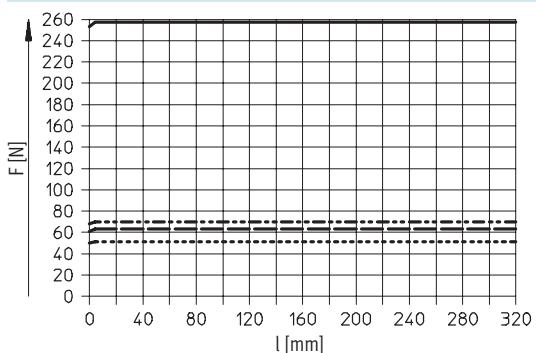
HME-25-100



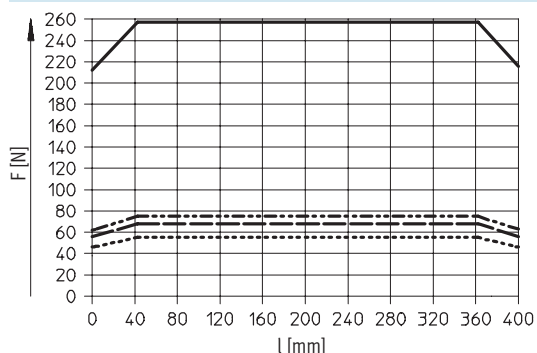
HME-25-200



HME-25-320



HME-25-400



# Electric linear modules HME

Technical data

**FESTO**

## Feed force $F$ as a function of speed $v$

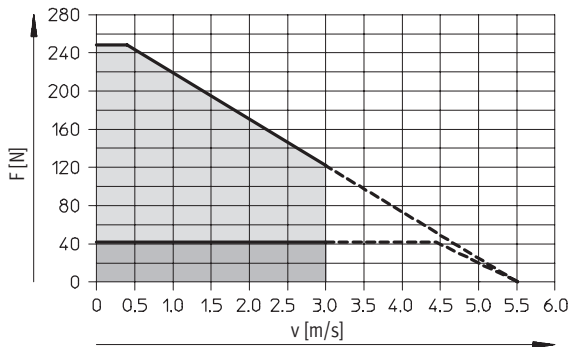
The graphs are based on theoretically determined values under the following conditions:

- Stroke centre of the linear module
- Friction disregarded

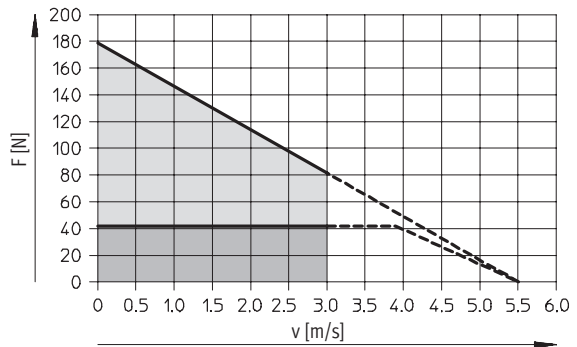
- Normal temperature of 23 °C
- Max. motor temperature of 70 °C

-  Peak feed force
-  Continuous feed force
-  Non-permissible range

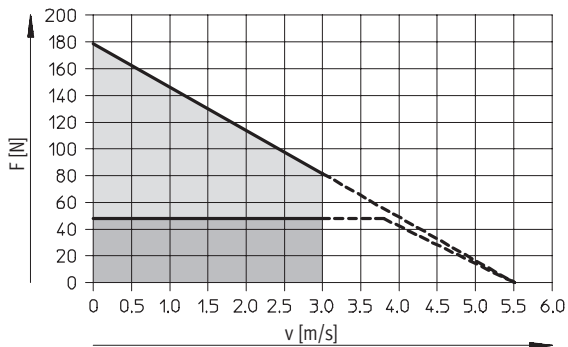
HME-16-100



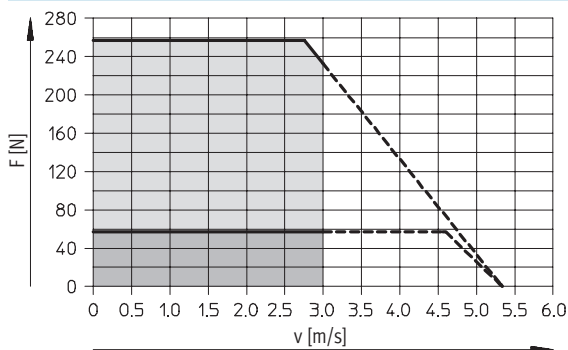
HME-16-200



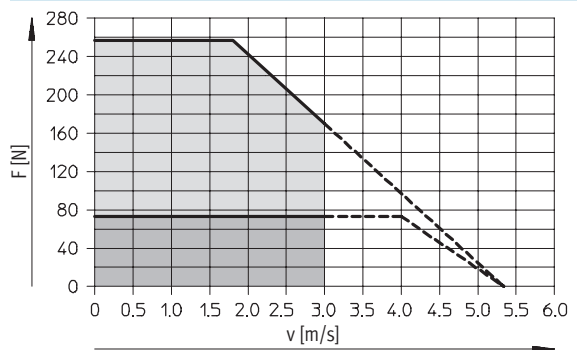
HME-16-320



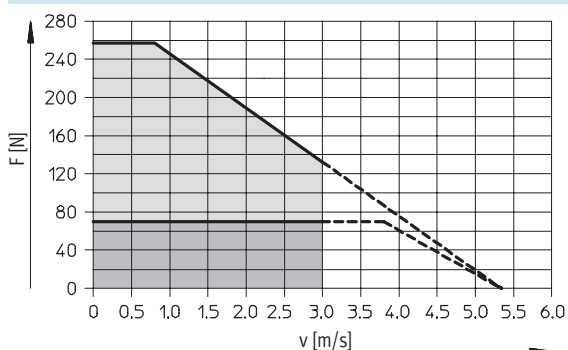
HME-25-100



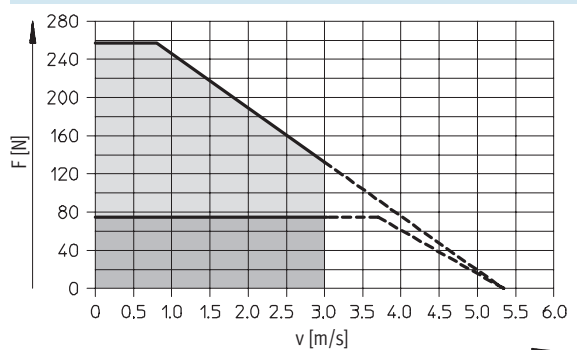
HME-25-200



HME-25-320



HME-25-400



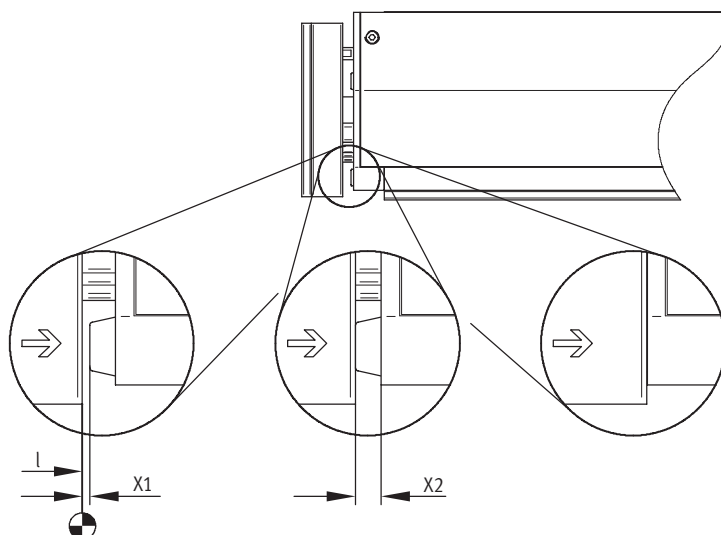
# Electric linear modules HME

Technical data

## Stroke reserve and cushioning length

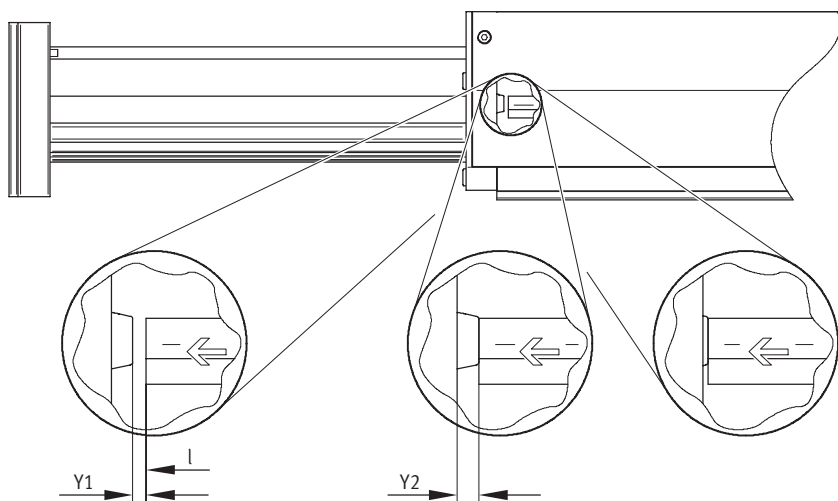
| Working stroke:                            | Stroke reserve:                                                          | Cushioning length:                                      |
|--------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------|
| The recommended, available operating range | The distance from the end positions of the working stroke to the buffers | Distance from buffer surface to mechanical end position |

### Linear module retracted



l = Working stroke  
X1 = Stroke reserve  
X2 = Cushioning length

### Linear module extended



l = Working stroke  
Y1 = Stroke reserve  
Y2 = Cushioning length

| Size | Retracted |        | Extended |        |
|------|-----------|--------|----------|--------|
|      | X1        | X2     | Y1       | Y2     |
| 16   | 1 mm      | 1.8 mm | 1 mm     | 3.5 mm |
| 25   | 0.7 mm    | 1.8 mm | 0.7 mm   | 4 mm   |

# Electric linear modules HME

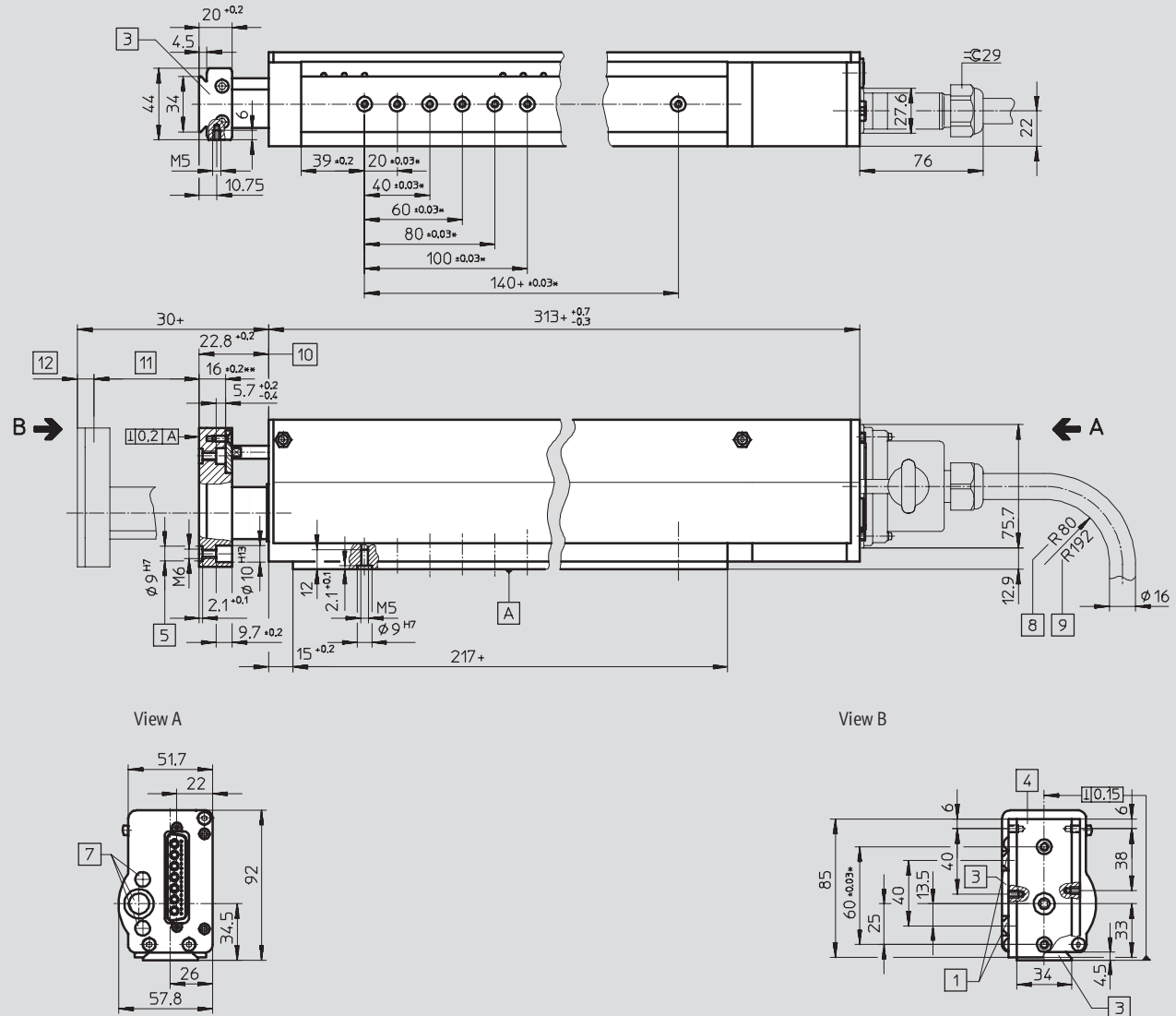
Technical data

**FESTO**

## Dimensions

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

Size 16



- 1 2 mounting slots for slot nuts HMBN-5-2M5
- 3 Dovetail mounting option
- 4 The yoke plate must not be turned

- 5 Thread and centring hole for load attachment with centring sleeves ZBH-9. The adapter plate must be detached from the yoke plate in order to mount the working load

- 7 Cover
- 8 Static radius
- 9 Dynamic radius
- 10 Start working stroke (zero point)
- 11 Working stroke
- 12 Stroke reserve Y1 + Cushioning length Y2

→ 5 / 2.1-17

- \* Tolerance for countersink  $\varnothing 9 \text{ H7}$ , for threaded hole  $\pm 0.2$
- \*\* Max. screw-in depth
- + = plus stroke length

# Electric linear modules HME

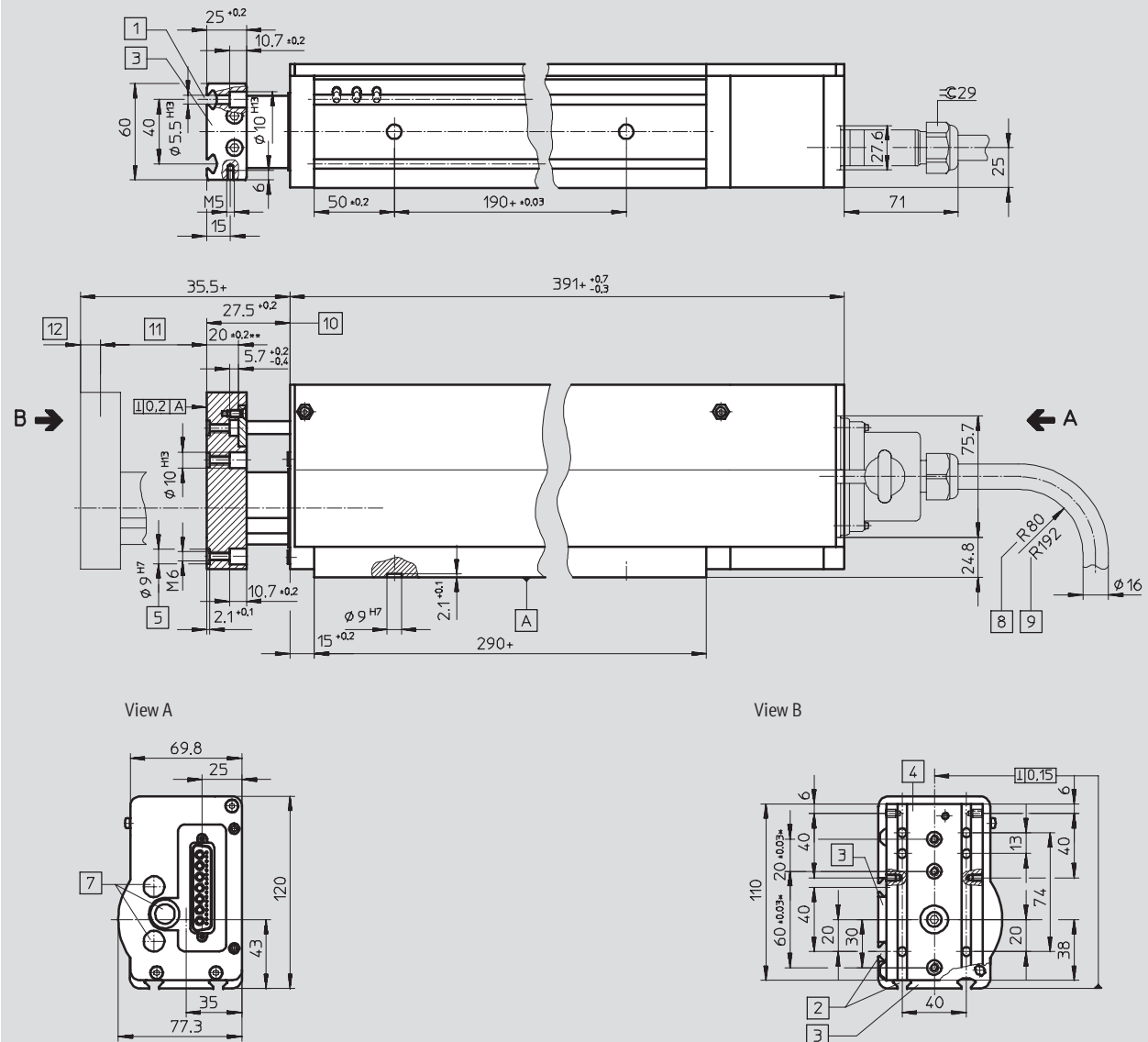
Technical data

**FESTO**

## Dimensions

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

Size 25



- |                                                                                                                                                                                    |                                                                                                                                                                              |                                                                                                                                                                                                           |                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>1 2 mounting slots for slot nuts HMBN-5-2M5</p> <p>2 4 mounting slots for slot nuts HMBN-5-2M5</p> <p>3 Dovetail mounting option</p> <p>4 The yoke plate must not be turned</p> | <p>5 Thread and centring hole for load attachment with centring sleeves ZBH-9. The adapter plate must be detached from the yoke plate in order to mount the working load</p> | <p>7 Cover</p> <p>8 Static radius</p> <p>9 Dynamic radius</p> <p>10 Start working stroke (zero point)</p> <p>11 Working stroke</p> <p>12 Stroke reserve Y1 + Cushioning length Y2</p> <p>→ 5 / 2.1-17</p> | <p>* Tolerance for countersink<br/>Ø 9 H7, for threaded hole ±0.2</p> <p>** Max. screw-in depth</p> <p>+ = plus stroke length</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|

## Electric linear modules HME

Ordering data – Modular products

**FESTO**

| M Mandatory data        |                |      |        |               |                      |                       | O Options   |                  |
|-------------------------|----------------|------|--------|---------------|----------------------|-----------------------|-------------|------------------|
| Module No.              | Drive function | Size | Stroke | Type of motor | Displacement encoder | Electrical connection | Accessories | Centring sleeves |
| 539 981                 | HME            | 16   | 100    | LAC           | R010                 | SC                    |             | ...Z             |
| 539 982                 |                | 25   | 200    |               |                      |                       |             |                  |
|                         |                |      | 320    |               |                      |                       |             |                  |
|                         |                |      | 400    |               |                      |                       |             |                  |
| <b>Ordering example</b> |                |      |        |               |                      |                       |             |                  |
| 539 982                 | HME            | - 25 | - 400  | - LAC         | - R010               | - SC                  | ZUB         | - 10Z            |

| Ordering table        |                               |         |                 |       |               |       |
|-----------------------|-------------------------------|---------|-----------------|-------|---------------|-------|
| Size                  | 16                            | 25      | Condi-<br>tions | Code  | Enter<br>code |       |
| M Module No.          | 539 981                       | 539 982 |                 |       |               |       |
| Drive function        | Electric linear module        |         |                 | HME   |               | HME   |
| Size                  | 16                            | 25      |                 | ...   |               |       |
| Stroke [mm]           | 100                           | 100     |                 | -100  |               |       |
|                       | 200                           | 200     |                 | -200  |               |       |
|                       | 320                           | 320     |                 | -320  |               |       |
|                       | -                             | 400     |                 | -400  |               |       |
| Type of motor         | Linear AC servo motor         |         |                 | -LAC  |               | -LAC  |
| Displacement encoder  | Relative displacement encoder |         |                 | -R010 |               | -R010 |
| Electrical connection | Straight plug                 |         |                 | -SC   |               | -SC   |
| O Accessories         | Supplied separately           |         |                 | ZUB-  |               | ZUB-  |
| Centring sleeves      | 10, 20 ... 90                 |         |                 | ...Z  |               |       |

Transfer order code

|  |     |   |  |   |  |   |     |   |      |   |    |  |     |   |  |
|--|-----|---|--|---|--|---|-----|---|------|---|----|--|-----|---|--|
|  | HME | - |  | - |  | - | LAC | - | R010 | - | SC |  | ZUB | - |  |
|--|-----|---|--|---|--|---|-----|---|------|---|----|--|-----|---|--|

## Electric linear modules HME

Accessories

**FESTO**

| Ordering data                                                                     |                  |                |            |                              |              |                  |
|-----------------------------------------------------------------------------------|------------------|----------------|------------|------------------------------|--------------|------------------|
|                                                                                   | For size<br>[mm] | Remarks        | Order code | Part No.                     | Type         | PU <sup>1)</sup> |
| Centring sleeve ZBH                                                               |                  |                |            | Technical data → 1 / 10.1-18 |              |                  |
|  | 16, 25           | For yoke plate | Z          | <b>150 927</b>               | <b>ZBH-9</b> | 10               |

1) Packaging unit quantity

## Motor controllers SFC-LAC

Type code

**FESTO**

|                          |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
|--------------------------|------------------------|-----|---|-----|---|----|---|----|---|---|---|----|---|----|
|                          |                        | SFC | – | LAC | – | VD | – | 10 | – | E | – | H2 | – | IO |
| <b>Type</b>              |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| SFC                      | Motor controller       |     |   |     |   |    |   |    |   |   |   |    |   |    |
| <b>Motor type</b>        |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| LAC                      | Linear direct drive    |     |   |     |   |    |   |    |   |   |   |    |   |    |
| <b>Voltage</b>           |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| VD                       | Voltage, 48 V          |     |   |     |   |    |   |    |   |   |   |    |   |    |
| <b>Nominal current</b>   |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| 10                       | Nominal current, 10 A  |     |   |     |   |    |   |    |   |   |   |    |   |    |
| <b>Encoder</b>           |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| E                        | Encoder                |     |   |     |   |    |   |    |   |   |   |    |   |    |
| <b>Control panel</b>     |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| H0                       | Without control panel  |     |   |     |   |    |   |    |   |   |   |    |   |    |
| H2                       | Built-in control panel |     |   |     |   |    |   |    |   |   |   |    |   |    |
| <b>Control interface</b> |                        |     |   |     |   |    |   |    |   |   |   |    |   |    |
| IO                       | I/O connection         |     |   |     |   |    |   |    |   |   |   |    |   |    |

# Motor controllers SFC-LAC

Technical data



| General technical data          |                                               |                                                             |
|---------------------------------|-----------------------------------------------|-------------------------------------------------------------|
| Type                            | SFC-...-H0-IO                                 | SFC-...-H2-IO                                               |
| Operating mode                  | Adaptive status controller                    |                                                             |
| Position sensor                 | Encoder                                       |                                                             |
| Encoder input                   | CAN bus                                       |                                                             |
| Display                         | –                                             | Full text display via graphic LCD display (128 x 64 pixels) |
| Control elements                | –                                             | 4 keys                                                      |
| Process interfacing             | I/O interface for 31 position sets and homing |                                                             |
| Number of digital logic inputs  | 8                                             |                                                             |
| Number of digital logic outputs | 4                                             |                                                             |
| Mains filter                    | Integrated                                    |                                                             |
| Type of mounting                | H-rail, wall or surface bracket               |                                                             |
| Product weight [g]              | 1,200                                         |                                                             |

| Electrical data                                    |        |                    |
|----------------------------------------------------|--------|--------------------|
| General                                            |        |                    |
| Rated output                                       | [VA]   | 480                |
| Parameterisation interface                         |        | RS232; 38 400 Baud |
| Max. link voltage                                  | [V DC] | 48                 |
| Peak power                                         | [VA]   | 960                |
| Peak current per phase, effective                  | [A]    | 15                 |
|                                                    |        |                    |
| Load supply                                        |        |                    |
| Nominal voltage                                    | [V DC] | 48 +5/−10%         |
| Nominal current                                    | [A]    | 10                 |
| Peak current                                       | [A]    | 20                 |
|                                                    |        |                    |
| Logic supply                                       |        |                    |
| Nominal voltage                                    | [V DC] | 24 ±10%            |
| Nominal current                                    | [A]    | 0.5                |
| Peak current                                       | [A]    | 0.8                |
| Max. current per output<br>(digital logic outputs) | [A]    | 0.5                |

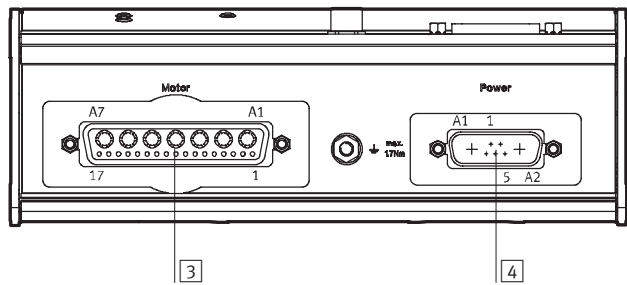
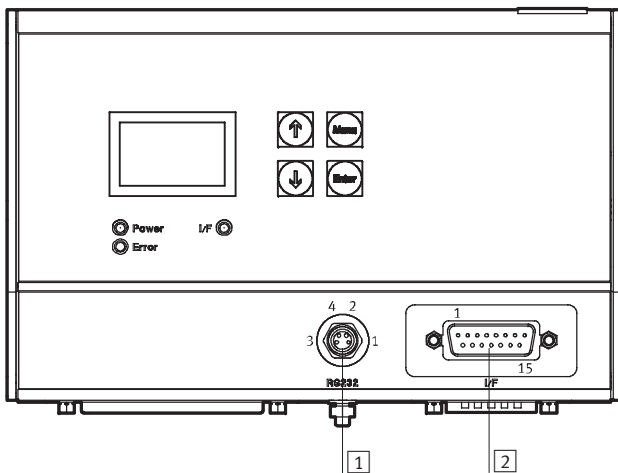
## Motor controllers SFC-LAC

Technical data

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| Operating and environmental conditions |                                     |
|----------------------------------------|-------------------------------------|
| Digital logic outputs                  | Electrically isolated               |
| Logic inputs                           | Electrically isolated               |
| Specification, logic input             | IEC 61131                           |
| Protection class                       | IP54                                |
| Vibration resistance                   | to DIN EN 60068-2-6                 |
| Shock resistance                       | to DIN EN 60068-2-27                |
| Protective function                    | I <sup>2</sup> t monitoring         |
|                                        | Current monitoring                  |
|                                        | Voltage failure detection           |
|                                        | Lag error monitoring                |
|                                        | Software end-position detection     |
|                                        | Temperature monitoring              |
|                                        |                                     |
|                                        |                                     |
|                                        |                                     |
|                                        |                                     |
| Ambient temperature [°C]               | 0 ... +40                           |
| CE symbol (see conformity declaration) | In accordance with EU EMC directive |
| Relative air humidity [%]              | 0 ... 95 (non-condensing)           |

### Pin allocation



| 1 RS 232 interface, 4-pin M8 socket |                        |
|-------------------------------------|------------------------|
| Pin                                 | Function               |
| 1                                   | 0 V                    |
| 2                                   | Transmitted Data (TxD) |
| 3                                   | Received Data (RxD)    |
| 4                                   | —                      |

| 2 I/O interface, 15-pin Sub-D plug |                            |
|------------------------------------|----------------------------|
| Pin                                | Function                   |
| 1                                  | 24 V (supply for output)   |
| 2                                  | Position set coding, bit 1 |
| 3                                  | Position set coding, bit 2 |
| 4                                  | Position set coding, bit 3 |
| 5                                  | Position set coding, bit 4 |
| 6                                  | Position set coding, bit 5 |
| 7                                  | Stop bit                   |
| 8                                  | 0 V                        |
| 9                                  | Enable bit                 |
| 10                                 | Start bit                  |
| 11                                 | MC                         |
| 12                                 | Ready                      |
| 13                                 | Acknowledge                |
| 14                                 | Error                      |
| 15                                 | 0 V                        |

## Motor controllers SFC-LAC

Technical data

| 3 Motor interface, 24-pin plug |            |
|--------------------------------|------------|
| Pin                            | Function   |
| A1                             | String 1+  |
| A2                             | String 1–  |
| A3                             | String 2+  |
| A4                             | 0 V        |
| A5                             | String 2–  |
| A6                             | String 3+  |
| A7                             | String 3–  |
| 1                              | 24 V       |
| 2                              | –          |
| 3                              | –          |
| 4                              | CAN-H line |
| 5                              | CAN-L line |
| 6                              | CAN ground |
| 7                              | –          |
| 8                              | –          |
| 9                              | –          |
| 10                             | –          |
| 11                             | –          |
| 12                             | –          |
| 13                             | –          |
| 14                             | –          |
| 15                             | –          |
| 16                             | 0 V        |
| 17                             | –          |

| 4 Power supply, 7-pin plug |              |
|----------------------------|--------------|
| Pin                        | Function     |
| A1                         | 48 V (load)  |
| A2                         | 0 V (load)   |
| 1                          | 24 V (logic) |
| 2                          | 0 V (logic)  |
| 3                          | –            |
| 4                          | PE           |
| 5                          | –            |

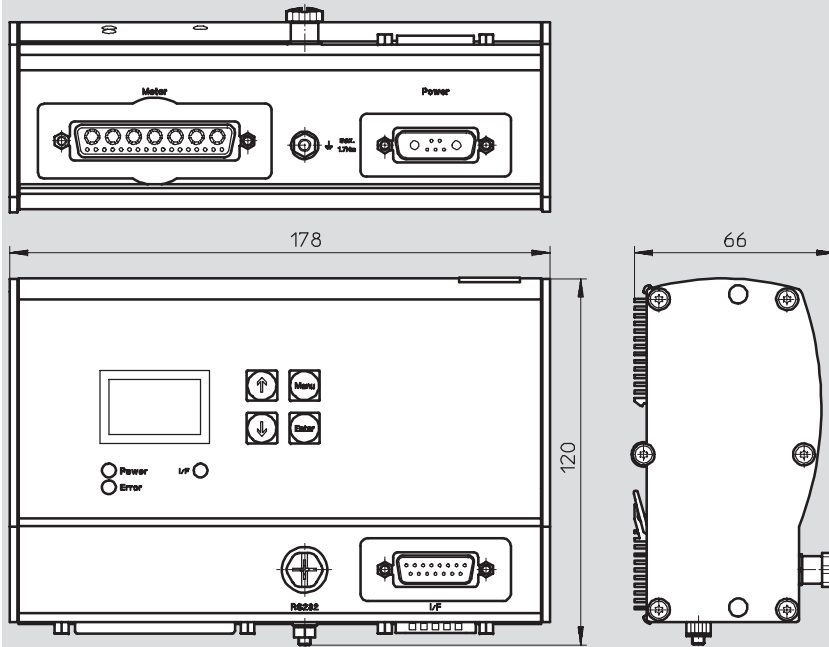
## Motor controllers SFC-LAC

Technical data

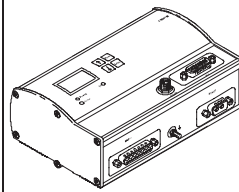
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### Dimensions

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



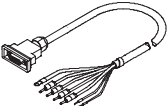
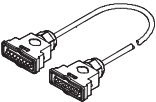
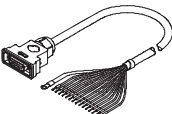
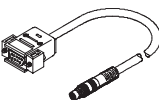
### Ordering data

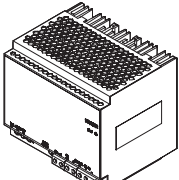
|                                                                                     | Brief description                    | Part No. | Type                  |
|-------------------------------------------------------------------------------------|--------------------------------------|----------|-----------------------|
|                                                                                     |                                      |          |                       |
|  | Motor controller with I/O connection |          |                       |
|                                                                                     | Without control panel                | 540 038  | SFC-LAC-VD-10-E-H0-IO |
|                                                                                     | With control panel                   | 540 039  | SFC-LAC-VD-10-E-H2-IO |

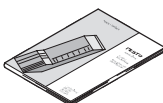
## Motor controllers SFC-LAC

Accessories

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| Ordering data                                                                       |                                                                                                        |                  |          |                          |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------|----------|--------------------------|
|                                                                                     | Brief description                                                                                      | Cable length [m] | Part No. | Type                     |
| Cable                                                                               |                                                                                                        |                  |          |                          |
|    | Supply cable,<br>for connecting load and logic supply                                                  | 2.5              | 538 914  | KPWR-MC-1-SUB-15HC-2,5   |
|                                                                                     |                                                                                                        | 5                | 538 915  | KPWR-MC-1-SUB-15HC-5     |
|                                                                                     |                                                                                                        | 10               | 538 916  | KPWR-MC-1-SUB-15HC-10    |
|    | Motor cable,<br>for connecting motor and controller                                                    | 2.5              | 539 489  | KMTR-LAC-S50HC-S50HC-2,5 |
|                                                                                     |                                                                                                        | 5                | 539 490  | KMTR-LAC-S50HC-S50HC-5   |
|                                                                                     |                                                                                                        | 10               | 539 491  | KMTR-LAC-S50HC-S50HC-10  |
|    | Control cable,<br>for I/O connection to any controller                                                 | 2.5              | 538 919  | KES-MC-1-SUB-15-2,5      |
|                                                                                     |                                                                                                        | 5                | 538 920  | KES-MC-1-SUB-15-5        |
|                                                                                     |                                                                                                        | 10               | 538 921  | KES-MC-1-SUB-15-10       |
|    | Programming cable,<br>for parameterisation and commissioning via RS232<br>interface using FCT software | 2.5              | 537 926  | KDI-MC-M8-SUB-9-2,5      |
| Centre supports                                                                     |                                                                                                        |                  |          |                          |
|  | For mounting controller                                                                                |                  | 160 909  | MUP-8/12                 |

| Ordering data                                                                       |                                      |                            |                               |                            |          |                        |
|-------------------------------------------------------------------------------------|--------------------------------------|----------------------------|-------------------------------|----------------------------|----------|------------------------|
|                                                                                     | Brief description                    | Input voltage range [V AC] | Nominal output voltage [V DC] | Nominal output current [A] | Part No. | Type                   |
| Power supply unit                                                                   |                                      |                            |                               |                            |          |                        |
|  | Power supply for<br>motor controller | 100 ... 240                | 48                            | 5                          | 542 403  | SVG-1/230VAC-48VDC-5A  |
|                                                                                     |                                      | 100 ... 240                | 48                            | 10                         | 542 404  | SVG-1/230VAC-48VDC-10A |
|                                                                                     |                                      | 400 ... 500                | 48                            | 20                         | 542 405  | SVG-3/400VAC-48VDC-20A |

| Ordering data – Documentation and software                                          |                                                                                                                                                                                                  |                        |          |                    |  |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------|--------------------|--|
|                                                                                     | Brief description                                                                                                                                                                                | Language               | Part No. | Type               |  |
|  | Documentation package is included with the motor controller.<br>The package comprises:<br>– User documentation<br>– Configuration package FCT (Festo configuration tool) in the languages DE, EN | DE, EN, ES, FR, IT, SV | 542 004  | P.BP-SFC-LAC       |  |
|  | Description of SFC-LAC with I/O interface.<br>User documentation in paper form is not included in the scope of delivery for the motor controller.                                                | DE                     | 540 547  | P.BE-SFC-LAC-IO-DE |  |
|                                                                                     |                                                                                                                                                                                                  | EN                     | 540 548  | P.BE-SFC-LAC-IO-EN |  |
|                                                                                     |                                                                                                                                                                                                  | ES                     | 540 549  | P.BE-SFC-LAC-IO-ES |  |
|                                                                                     |                                                                                                                                                                                                  | FR                     | 540 550  | P.BE-SFC-LAC-IO-FR |  |
|                                                                                     |                                                                                                                                                                                                  | IT                     | 540 551  | P.BE-SFC-LAC-IO-IT |  |
|                                                                                     |                                                                                                                                                                                                  | SV                     | 540 552  | P.BE-SFC-LAC-IO-SV |  |

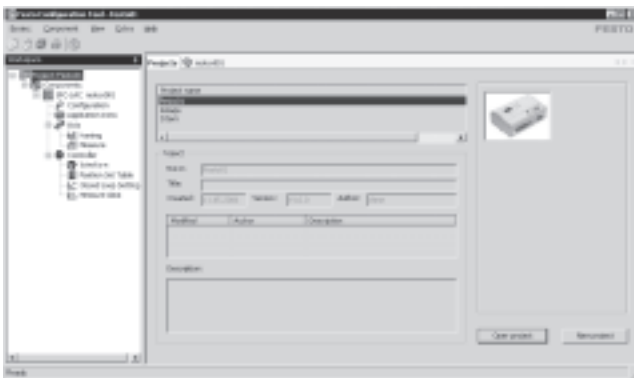
## Motor controllers SFC-LAC

Technical data

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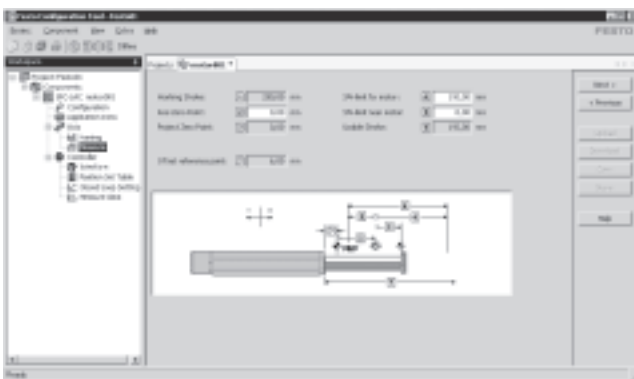
### FCT software – Festo configuration tool

Software platform for electrical drives from Festo



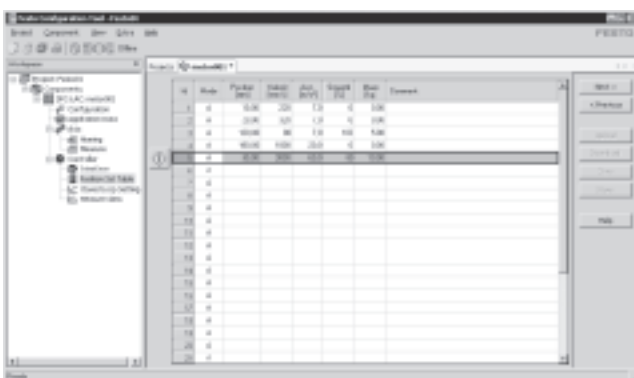
- All the drives in a system can be managed and archived in a common project
- Project and data management for all supported device types
- Simple to use thanks to graphically supported parameter entry
- Universal mode of operation for all drives
- Working offline at your desk or online at the machine

### Mechanical reference positions and limit positions



- Reference positions can be either edited or taught in
- Flexible adaptation to installation conditions
- Settings are displayed clearly

### Position set table



- 31 position sets ensure flexibility in positioning
- Absolute or relative positioning values can be used
- The following parameters can be set flexibly for each application:
  - Position
  - Speed
  - Acceleration
  - Braking ramps
- Complete function test