

## Handling modules HSW

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# Handling modules HSW

Key features at a glance

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## Range of applications

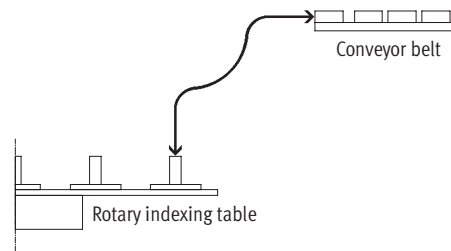
The handling module is a new generation of function modules for the automatic transfer, feed and removal of small parts in extremely confined spaces.

This is achieved by means of a guided swivel and linear motion sequence. A backlash-free guide with recirculating

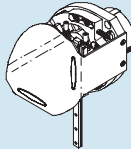
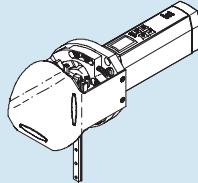
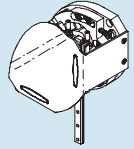
ball bearing elements ensures high precision and good rigidity. The combination of a semi-rotary drive and a slotted guide system produces a compact unit for a complete pick & place cycle at an operating angle of 90°.

## Special features

- Compact design
- Extremely short cycle times
- Cost optimised
- Simple commissioning
- For effective loads up to 1.6 kg
- Angle and stroke adjustment
- Wait positions possible
- No planning costs



## Product range overview – Two drive variants are available

|                                        |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                               |                    |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                                        | Pneumatic: HSW-...-AP,<br>with swivel module DSM                                                                                                                                | Electrical: HSW-...-AE,<br>with motor unit MTR-DCI                                                                                                                                                                                                                | Without drive: HSW-...-AS,<br>with drive shaft                                                                                                                                                                |                    |
|                                        |                                                                                               |                                                                                                                                                                                |                                                                                                                           |                    |
| Advantages                             |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                               |                    |
|                                        | <ul style="list-style-type: none"><li>• Fast</li><li>• Cost effective</li><li>• Ready to install</li><li>• No system planning required</li><li>• Simple commissioning</li></ul> | <ul style="list-style-type: none"><li>• Freely positionable</li><li>• Freely selectable speed</li><li>• Smooth motion sequence</li><li>• Ready to install</li><li>• No system planning required</li><li>• Simple commissioning using teach-in procedure</li></ul> | <ul style="list-style-type: none"><li>• Compact</li><li>• Universal applications</li><li>• Variable drive interface</li><li>• On request:<br/>Drive options in combination with servo motors MTR-AC</li></ul> |                    |
| Technical data                         |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                               |                    |
| Max. linear stroke at 90° swivel angle | [mm]                                                                                                                                                                            | 90 ... 175                                                                                                                                                                                                                                                        |                                                                                                                                                                                                               |                    |
| Working stroke                         | [mm]                                                                                                                                                                            | 9 ... 35                                                                                                                                                                                                                                                          |                                                                                                                                                                                                               |                    |
| Min. cycle time                        | [s]                                                                                                                                                                             | 0.6 ... 1.0                                                                                                                                                                                                                                                       | 0.8 ... 1.2                                                                                                                                                                                                   | Dependent on drive |
| Effective load                         | [g]                                                                                                                                                                             | 0 ... 1,600                                                                                                                                                                                                                                                       |                                                                                                                                                                                                               |                    |
| Repetition accuracy at end positions   | [mm]                                                                                                                                                                            | ±0.02                                                                                                                                                                                                                                                             | ±0.02                                                                                                                                                                                                         | ±0.02              |
| Wait positions                         |                                                                                                                                                                                 | Max. 2                                                                                                                                                                                                                                                            | Any                                                                                                                                                                                                           | Dependent on drive |
| Function of wait position              |                                                                                                                                                                                 | Pushing via actuating cylinder<br>(➔ 13)                                                                                                                                                                                                                          | Freely approachable<br>(➔ 29)                                                                                                                                                                                 | Dependent on drive |
| Repetition accuracy at wait positions  | [mm]                                                                                                                                                                            | < 1                                                                                                                                                                                                                                                               | < 2                                                                                                                                                                                                           | Dependent on drive |
| Technical data                         |                                                                                                                                                                                 | ➔ 9                                                                                                                                                                                                                                                               | ➔ 26                                                                                                                                                                                                          | ➔ 36               |

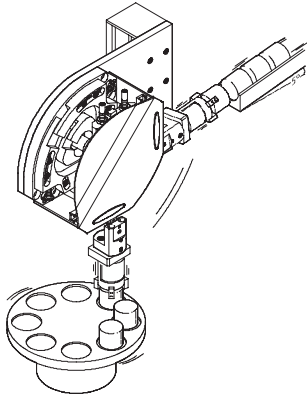
# Handling modules HSW

Application examples

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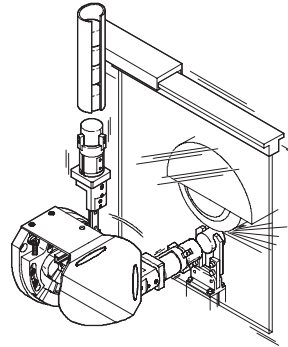
## HSW-...-AP, pneumatic / HSW-...-AE, electrical

Rotary indexing table



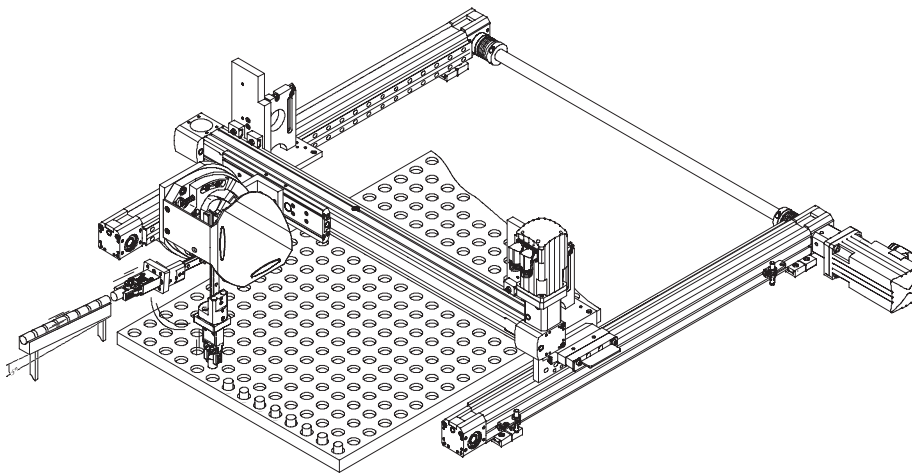
- Fast feed and removal at a linear transfer unit or rotary indexing table, for example

Machine equipment



- Loading and unloading of small parts on a grinding or injection moulding machine, for example

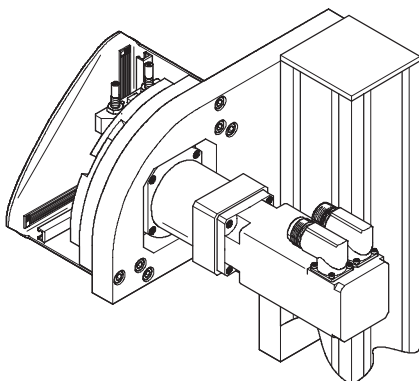
Planar surface gantry



- Fast equipping of pallets

## HSW-...-AS, without drive

Rotary indexing table, linear transfer



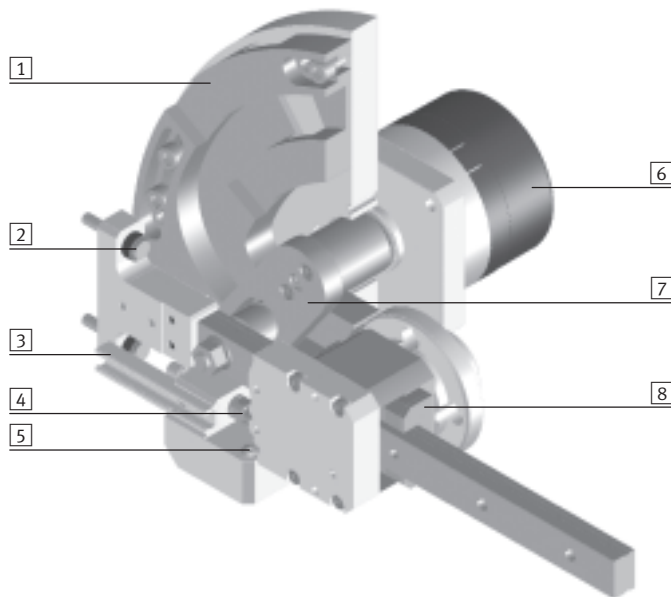
- Fast and flexible 90° pick & place unit with servo motor EMMS-AS
- Electrical variant using third-party motor

# Handling modules HSW

Key features at a glance

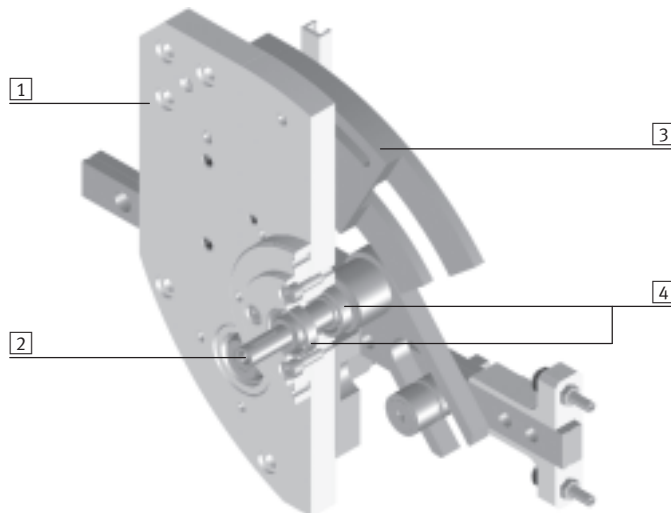
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## Design of HSW-...-AP – pneumatic variant with swivel module DSM



- 1 Slotted guide plate
- 2 Adjustable stop
- 3 Sensor rail
- 4 Shock absorber
- 5 Pressure piece
- 6 Swivel module DSM
- 7 Swivel lever
- 8 Guide with recirculating ball bearing element

## Design of HSW-...-AS – variant without drive (rear side)



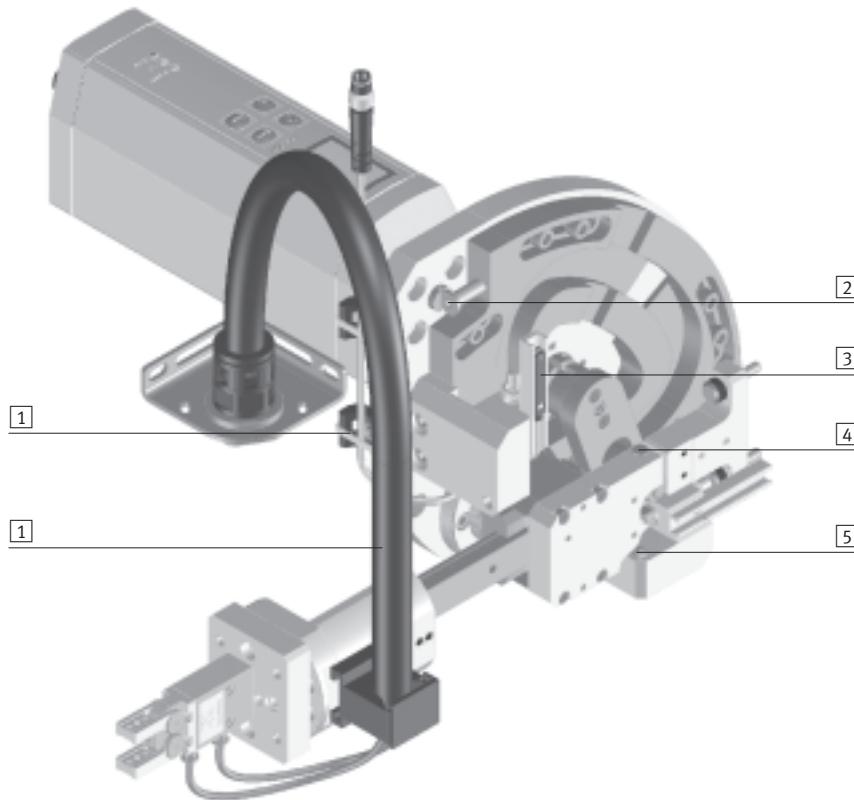
- 1 Base plate
- 2 Shaft with Woodruff key
- 3 Slotted guide plate
- 4 Ball bearings

# Handling modules HSW

Key features at a glance

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Design of HSW-...-AE – electrical variant with motor unit MTR-DCI-...-HM



## Cable binder holder and protective conduit



- 1 Holder and protective conduit facilitate the secure routing of tubing and cables.

## Stroke adjustment



- 2 The adjustable slotted guide plate permits precise adjustment of the swivel angle.

## Adjustment of proximity sensors



- 3 The sensor rail facilitates readily accessible and easy adjustment of the proximity sensors.

## Stop element and pressure piece

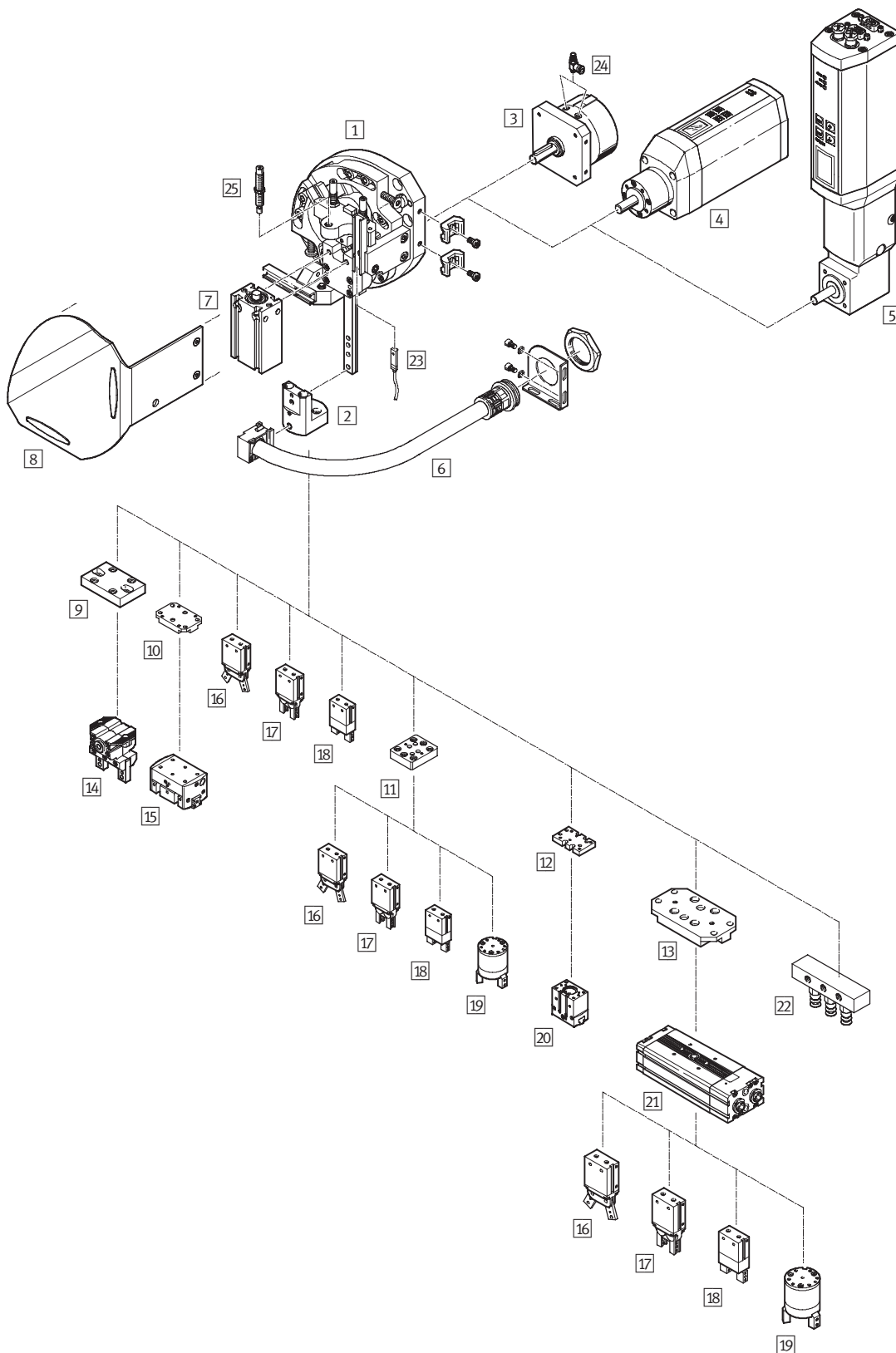


- 4+5 The stop element and pressure piece guarantee freedom from backlash and precision in the end positions and in the effective linear stroke.

# Handling modules HSW

Peripherals overview

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# Handling modules HSW

Peripherals overview

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| Accessories |                                           |                                                                                            |    |    |                 |             |
|-------------|-------------------------------------------|--------------------------------------------------------------------------------------------|----|----|-----------------|-------------|
|             | Brief description                         | 10                                                                                         | 12 | 16 | ➔ Page/Internet |             |
| 1           | Handling module<br>HSW                    | Standard module without accessories                                                        | ■  | ■  | ■               | 9           |
| 2           | Adapter kit<br>HAPG-...-B                 | Interface for grippers, semi-rotary drive, etc.                                            | ■  | ■  | ■               | 38          |
| 3           | Swivel module<br>DSM                      | Pneumatic drive, adapted to each size                                                      | ■  | ■  | ■               | dsm         |
| 4           | Motor unit<br>MTR-DCI-...-HM              | Servo motor with integrated power electronics                                              | ■  | ■  | ■               | 26          |
| 5           | Motor unit<br>MTR-DCI-...-HM              | Servo motor with right-angle gear unit and integrated power electronics                    | ■  | ■  | ■               | 26          |
| 6           | Installation kit<br>MKRP                  | Conduit to protect electrical cables and tubing                                            | ■  | ■  | ■               | 39          |
| 7           | Wait position module<br>BAW-HSW           | With pneumatic drive:<br>Pushes the swivel arm from the operating area                     | ■  | ■  | ■               | 39          |
| 8           | Cover kit<br>BSD-HSW                      | To protect against accidental contact                                                      | ■  | ■  | ■               | 39          |
| 9           | Adapter kit<br>HAPG                       | Interface between HSW and parallel gripper HGPC                                            | –  | ■  | ■               | 40          |
| 10          | Adapter kit<br>HAPG                       | Interface between HSW and parallel gripper HGPP                                            | –  | ■  | ■               | 40          |
| 11          | Adapter kit<br>HAPG                       | Interface between HSW and gripper                                                          | ■  | ■  | ■               | 40          |
| 12          | Adapter kit<br>HAPG                       | Interface between HSW and parallel gripper HGPT                                            | –  | ■  | ■               | 40          |
| 13          | Adapter kit<br>HAPS                       | Interface between HSW and semi-rotary drive DRQD                                           | –  | ■  | ■               | 40          |
| 14          | Parallel gripper<br>HGPC                  | Appropriate gripper for every application                                                  | –  | ■  | ■               | 40          |
| 15          | Parallel gripper<br>HGPP                  |                                                                                            | –  | ■  | ■               | 40          |
| 16          | Angle gripper<br>HGW                      |                                                                                            | ■  | ■  | ■               | 40          |
| 17          | Radial gripper<br>HGR                     |                                                                                            | ■  | ■  | ■               | 40          |
| 18          | Parallel gripper<br>HGP                   |                                                                                            | ■  | ■  | ■               | 40          |
| 19          | Three-point gripper<br>HGD                |                                                                                            | –  | –  | ■               | 40          |
| 20          | Parallel gripper<br>HGPT                  |                                                                                            | –  | ■  | ■               | 40          |
| 21          | Semi-rotary drive<br>DRQD                 | Semi-rotary drive for transferring parts                                                   | –  | ■  | ■               | drqd        |
| 22          | Suction cups                              | Appropriate suction cup for every application                                              | ■  | ■  | ■               | suction cup |
| 23          | Proximity sensor<br>SME-/SMT-8            | Sensing option for end positions                                                           | ■  | ■  | ■               | 42          |
| 24          | Non-return and flow control valve<br>GRLA | For setting the speed of pneumatic drives                                                  | ■  | ■  | ■               | grla        |
| 25          | Shock absorber<br>DYSW/YSRW               | • With path-controlled flow control function<br>• Slowly increasing cushioning force curve | ■  | ■  | ■               | 42          |

# Handling modules HSW, pneumatic



Type codes

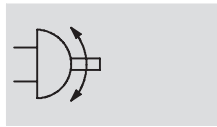
|          |                                |     |   |    |   |    |   |    |   |   |
|----------|--------------------------------|-----|---|----|---|----|---|----|---|---|
|          |                                | HSW | – | 10 | – | AP | – | SD | – | W |
| Type     |                                |     |   |    |   |    |   |    |   |   |
| HSW      | Handling module, double-acting |     |   |    |   |    |   |    |   |   |
| Size     |                                |     |   |    |   |    |   |    |   |   |
| Drive    |                                |     |   |    |   |    |   |    |   |   |
| AP       | Pneumatic drive                |     |   |    |   |    |   |    |   |   |
| Function |                                |     |   |    |   |    |   |    |   |   |
| SD       | Protective cover               |     |   |    |   |    |   |    |   |   |
| Function |                                |     |   |    |   |    |   |    |   |   |
| AW       | Wait position module           |     |   |    |   |    |   |    |   |   |

# Handling modules HSW, pneumatic

Technical data

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Function



-  Size  
10, 12 and 16
-  Swivel angle  
80 ... 100
-  Stroke range  
90 ... 175

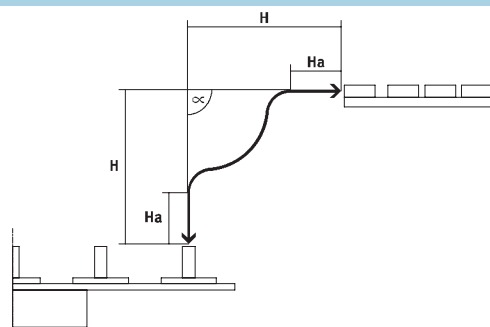
[www.festo.com/en/Spare\\_parts\\_service](http://www.festo.com/en/Spare_parts_service)



| General technical data |                                                        |    |    |
|------------------------|--------------------------------------------------------|----|----|
| Size                   | 10                                                     | 12 | 16 |
| Pneumatic connection   | M3                                                     | M5 |    |
| Mode of operation      | Double-acting                                          |    |    |
| Constructional design  | Swivel module                                          |    |    |
|                        | Linear guide plus ball bearing                         |    |    |
|                        | Force-guided motion sequence                           |    |    |
| Cushioning             | Shock absorber at both ends, soft characteristic curve |    |    |
| Position sensing       | Via proximity sensor                                   |    |    |
| Type of mounting       | Via through-holes                                      |    |    |
|                        | Via slot nuts                                          |    |    |
| Mounting position      | Any                                                    |    |    |

| Operating and environmental conditions |                                                     |
|----------------------------------------|-----------------------------------------------------|
| Type                                   | HSW-...-AP                                          |
| Operating medium                       | Filtered compressed air, lubricated or unlubricated |
| Operating pressure [bar]               | 4 ... 8                                             |
| Ambient temperature [°C]               | 0 ... +60                                           |

| Stroke [mm] and angle range [°] |          |            |           |           |
|---------------------------------|----------|------------|-----------|-----------|
| Size                            |          | 10         | 12        | 16        |
| Max. linear stroke at 90°       | H        | 90/90      | 142/142   | 175/175   |
| swivel angle                    |          |            |           |           |
| Working stroke                  | Ha       | 9 ... 15   | 15 ... 25 | 20 ... 35 |
| Angle range                     | $\alpha$ | 80 ... 100 |           |           |



| Forces [N]                                       |    |    |    |
|--------------------------------------------------|----|----|----|
| Size                                             | 10 | 12 | 16 |
| Along Y and Z axes (depending on lever position) |    |    |    |
| Effective force at 6 bar                         | 30 | 35 | 55 |
| Along Y axes                                     |    |    |    |
| Permissible process force <sup>1)</sup>          | 30 | 35 | 50 |

1) Due to the pretension force on the guide

# Handling modules HSW, pneumatic

Technical data

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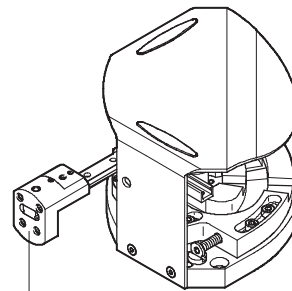
| Weight [g]       |       |       |       |
|------------------|-------|-------|-------|
| Size             | 10    | 12    | 16    |
| HSW-...-AP       | 1,300 | 3,000 | 5,100 |
| HSW-...-AP-SD    | 1,400 | 3,200 | 5,400 |
| HSW-...-AP-AW    | 1,370 | 3,200 | 5,500 |
| HSW-...-AP-SD-AW | 1,470 | 3,400 | 5,800 |

## Repetition accuracy [mm]

To ensure low-vibration operation, the effective load should be mounted as close as possible to the guide rail of the handling module.

Repetition accuracy is guaranteed by

mounting the effective load (adapter plate, semi-rotary drive and/or gripper, gripper finger, workpiece) within the mounting surface of the adapter kit HAPG/HAPG-...-B.



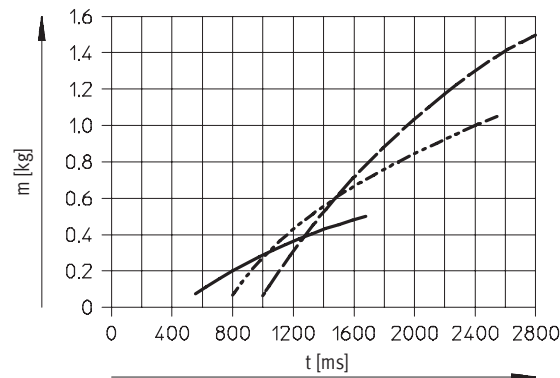
Mounting surface of HAPG

| Size                                 | 10    | 12 | 16 |
|--------------------------------------|-------|----|----|
| Repetition accuracy at end positions | ±0.02 |    |    |

## Travel times t as a function of effective load m with observance of repetition accuracy

The travel time t is the time taken for the handling module to move from one end position to the other and back again.

The effective load m is the load attached to the guide rail (e.g. adapter, gripper, semi-rotary drive and workpiece).



— HSW-10-AP  
- - - HSW-12-AP  
... HSW-16-AP

### Note

Higher speeds are possible at a constant load with restriction of the repetition accuracy.

## Cycle times [s]

The cycle time  $t_t$  comprises the travel time t and the dwell time  $t_e$  at the end positions.

$$t_t = \text{travel time } t + \text{dwell time } t_e$$

The value must not fall below the minimum cycle time.

| Size                                      | 10  | 12  | 16  |
|-------------------------------------------|-----|-----|-----|
| Min. cycle time                           | 0.6 | 0.8 | 1.0 |
| Min. cycle time with wait position module | 0.7 | 1.1 | 1.2 |

## Example for HSW-10-AP

Step 1:

The following values are assumed:

Effective load  $m = 0.2 \text{ kg}$

Dwell time  $t_e = 2 \times 350 \text{ ms}$

(350 ms per end position)

Step 2:

The travel time can be determined from the graph:

$t = 800 \text{ ms}$

Step 3:

This gives us a cycle time:

$t_t = 800 \text{ ms} + 700 \text{ ms}$

$= 1,500 \text{ ms}$

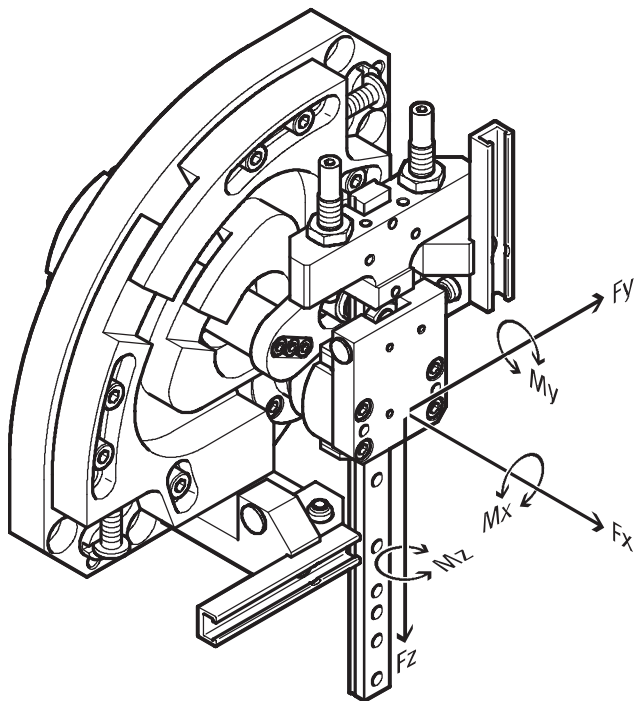
# Handling modules HSW, pneumatic

Technical data

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## Permissible static/dynamic characteristic load values

Linear guide and ball bearing



### Note

The torques apply to the centre of the vertical guide.

### Combined load

The following torque equation must be satisfied with combined load:

$$\frac{M_x}{M_{xperm.}} + \frac{M_y}{M_{yperm.}} + \frac{M_z}{M_{zperm.}} \leq 1$$

| Dynamic characteristic load values                        |     |     |     |
|-----------------------------------------------------------|-----|-----|-----|
| Size                                                      | 10  | 12  | 16  |
| Max. torques [Nm]<br>$M_{xperm.}, M_{yperm.}, M_{zperm.}$ | 0.6 | 1.5 | 2.5 |

# Handling modules HSW, pneumatic

Technical data

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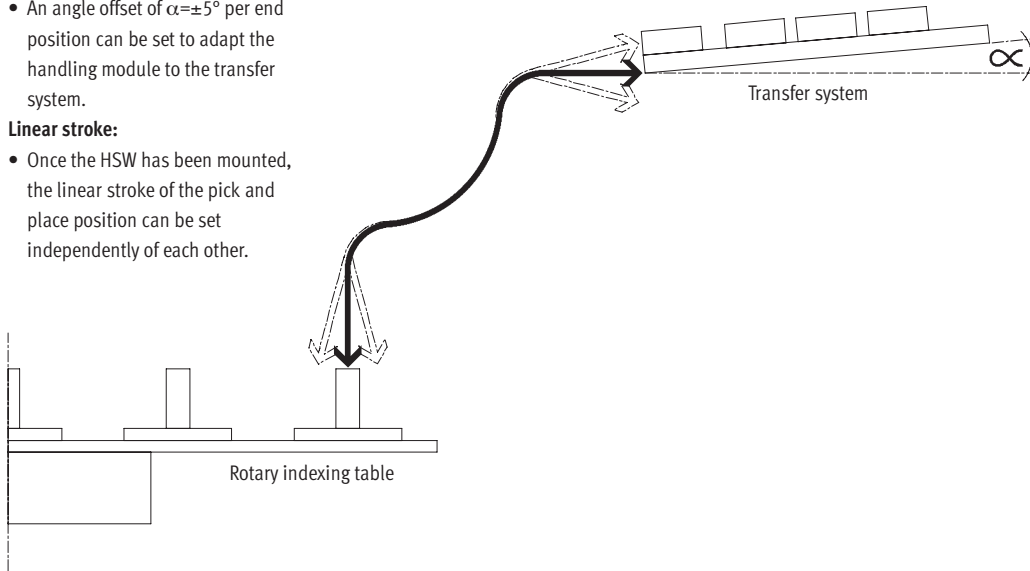
## Stroke adjustment

### Swivel angle:

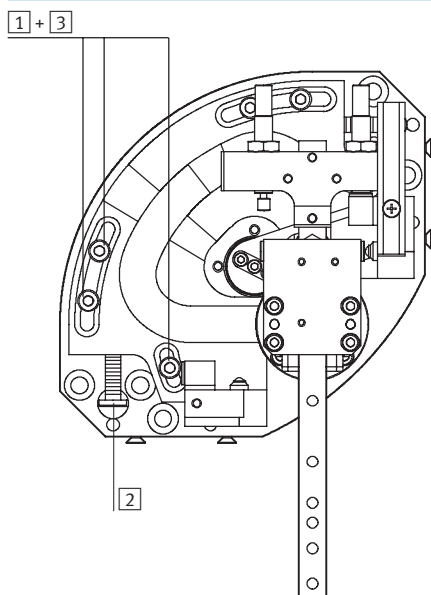
- An angle offset of  $\alpha = \pm 5^\circ$  per end position can be set to adapt the handling module to the transfer system.

### Linear stroke:

- Once the HSW has been mounted, the linear stroke of the pick and place position can be set independently of each other.



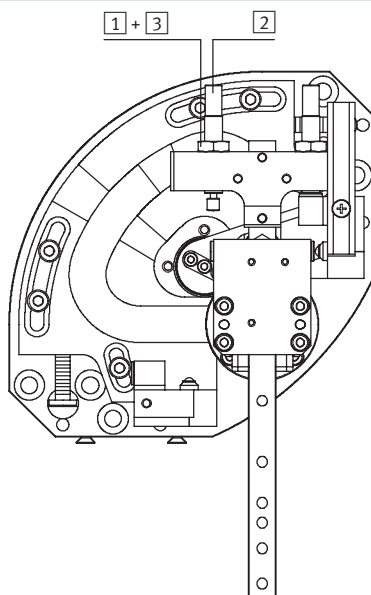
### Swivel angle



#### Procedure:

- 1 Loosen the screws
- 2 Adjust the slotted guide plate using the adjusting screw (the slotted guide plate must always make contact with the guide ring)
- 3 Tighten the screws

### Linear stroke



#### Procedure:

- 1 Loosen the lock nut
- 2 Set the desired linear stroke using the cushioning component/adjusting screw
- 3 Tighten the lock nut

# Handling modules HSW, pneumatic

Technical data

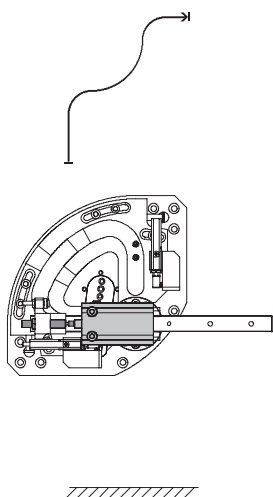
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## Wait position module

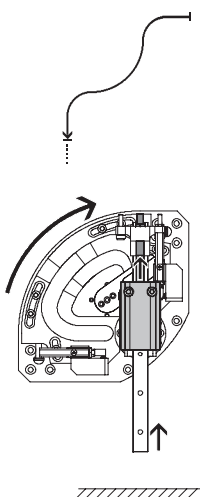
- Enables a movement to be paused before the end position, outside of the operating range (→ Step 2)
- The wait position module can be approached dynamically from the end position. This greatly reduces the cycle time
- Flexible adjustment within the adjustment range (working stroke) possible
- The wait position module may only be used with shock absorbers due to the high dynamic forces that occur
- The handling module HSW and actuating cylinder are actuated via a 5/2-way valve
- The valve for the wait position module should be activated with a time delay compared with the valve for the handling module

## Cycle sequence

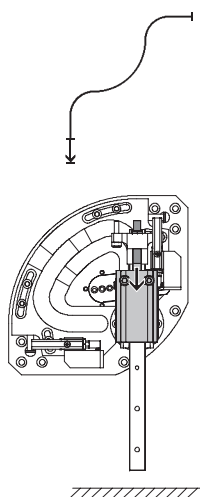
Step 1:  
Handling module is in the horizontal end position.  
Wait position module is retracted.



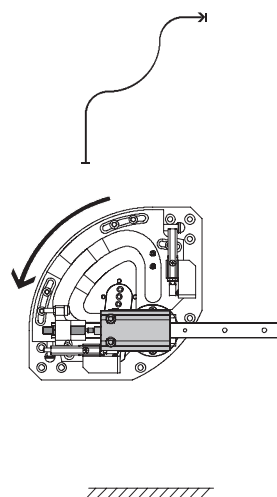
Step 2:  
Handling module moves to the vertical end position.  
Wait position module advances with time delay.  
Handling module pauses outside the operating range.



Step 3:  
Wait position module retracts.  
Handling module moves into the operating range.



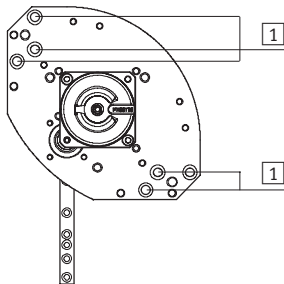
Step 4:  
Handling module moves to the horizontal end position.



|                                     |    |    |    |
|-------------------------------------|----|----|----|
| Size                                | 10 | 12 | 16 |
| Max. stroke of wait position module | 10 | 15 | 25 |

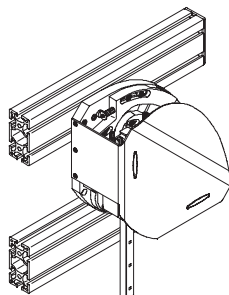
## Mounting options

Directly via through-holes

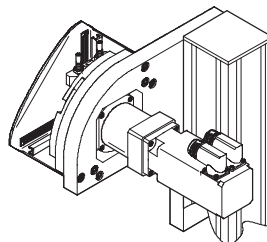


1 With or without centring rings

Via slot nuts on profile supports



User-specific



### Note

The handling module HSW-10 can also be attached with the adjusting unit HMX-1.

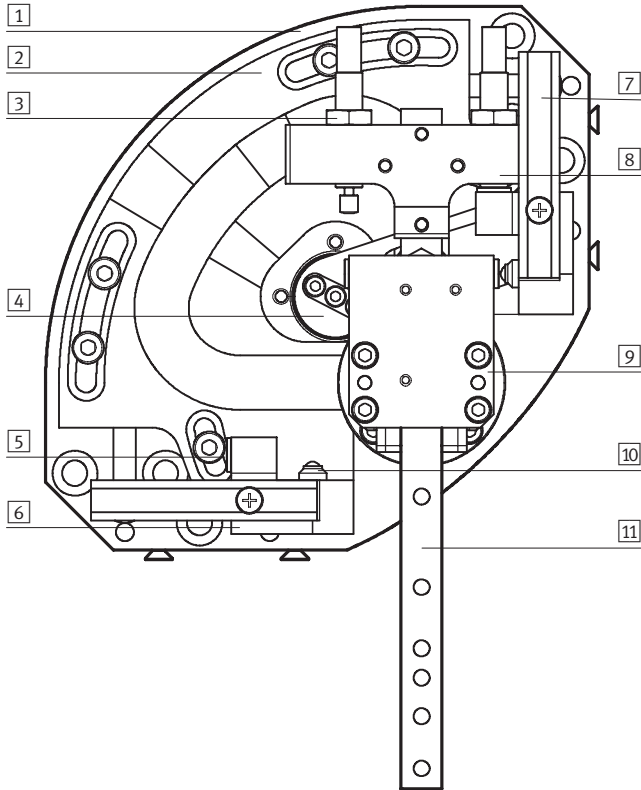
# Handling modules HSW, pneumatic

Technical data

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## Materials

Sectional view of handling module HSW



| Size                  | 10                                | 12               | 16 |
|-----------------------|-----------------------------------|------------------|----|
| 1 Back plate          | Wrought aluminium alloy, anodised |                  |    |
| 2 Slotted guide plate | Case-hardened steel               |                  |    |
| 3 Adjusting screw     | –                                 | High-alloy steel |    |
| 4 Swivel lever        | Case-hardened steel               |                  |    |
| 5 Stop sleeve         | High-alloy steel                  |                  |    |
| 6 Retainer            | Wrought aluminium alloy, anodised |                  |    |
| 7 Sensor rail         | Wrought aluminium alloy, anodised |                  |    |
| 8 Flange              | Wrought aluminium alloy, anodised |                  |    |
| 9 Top plate           | Wrought aluminium alloy, anodised |                  |    |
| 10 Pressure piece     | High-alloy steel                  |                  |    |
| 11 Guide              | Tempered steel                    |                  |    |
| – Housing             | Wrought aluminium alloy, anodised |                  |    |
| Note on materials     | Free of copper, PTFE and silicone |                  |    |

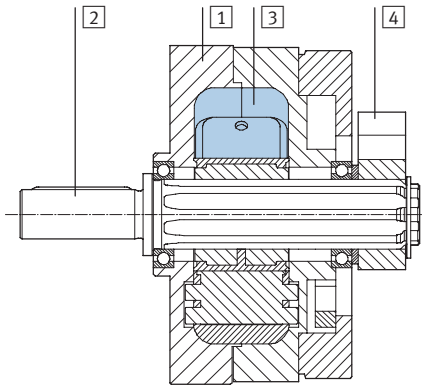
# Handling modules HSW, pneumatic

Technical data

FESTO

## Materials

Sectional view of swivel module DSM



| Swivel module |                   |                                   |
|---------------|-------------------|-----------------------------------|
| 1             | Housing           | Wrought aluminium alloy           |
| 2             | Shaft             | Steel with nickel-plated surface  |
| 3             | Rotary vane       | Fibreglass-reinforced plastic     |
| 4             | Stop lever        | Anodised aluminium                |
| –             | Cap               | Fibreglass-reinforced plastic     |
|               | Seals             | Polyurethane                      |
|               | Note on materials | Free of copper, PTFE and silicone |

# Handling modules HSW, pneumatic

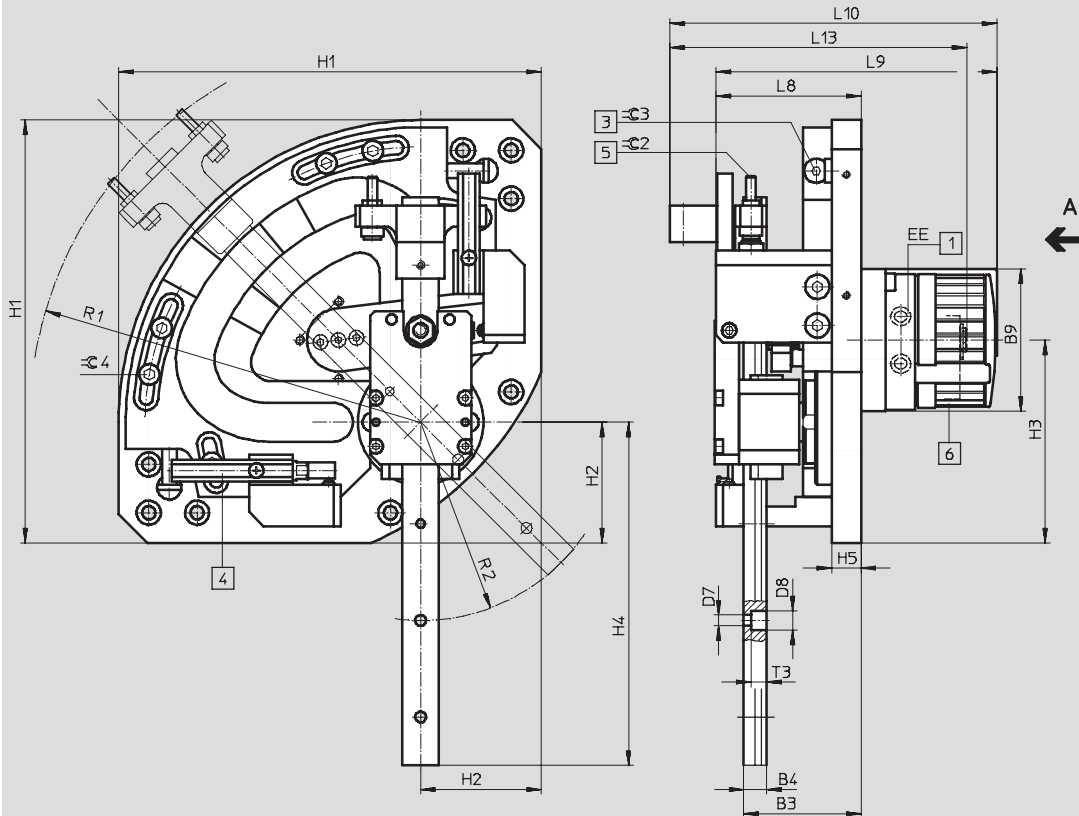
Technical data

FESTO

## Dimensions

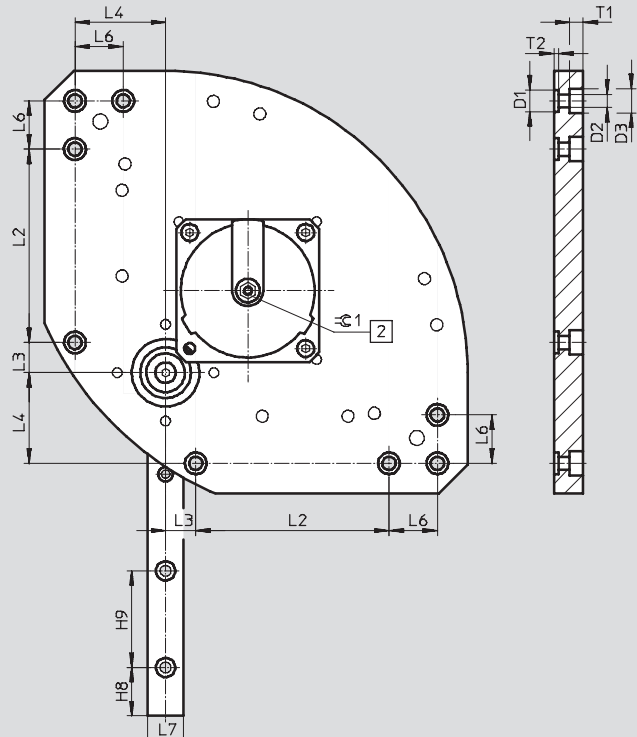
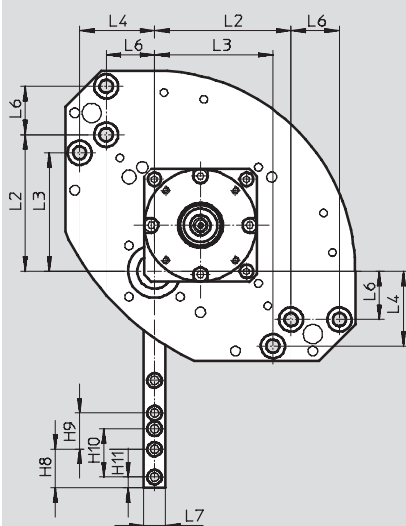
Download CAD Data → [www.festo.com/us/cad](http://www.festo.com/us/cad)

with swivel module DSM



View A  
HSW-10

HSW-12  
HSW-16



- 1 Compressed air connections
- 2 Manual override (internal hex)
- 3 Angle adjustment for slotted guide plate
- 4 Sensor slot for SME-/SMT-8
- 5 Stroke adjustment
- 6 HSW-10 without cover cap

# Handling modules HSW, pneumatic

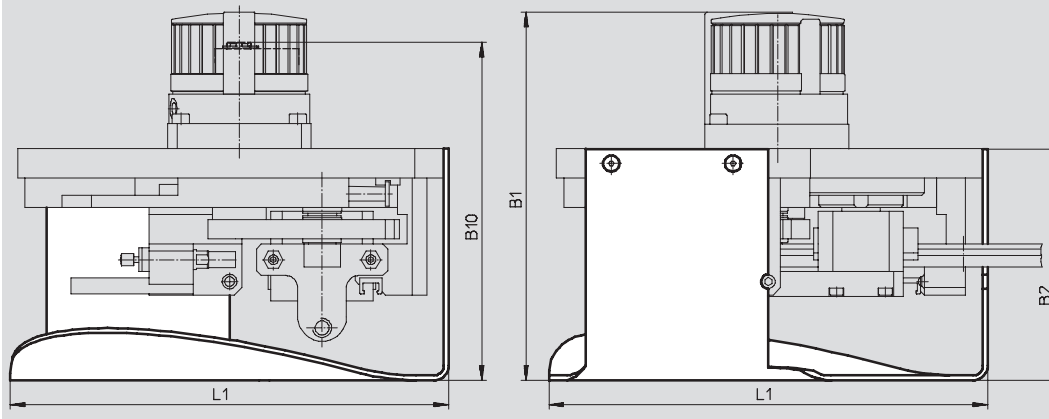
Technical data

**FESTO**

## Dimensions

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

with swivel module DSM and protective cover



| Size | B1  | B2  | B3   | B4   | B9 | B10 | D1<br>Ø | D2<br>Ø | D3<br>Ø | D7<br>Ø |
|------|-----|-----|------|------|----|-----|---------|---------|---------|---------|
|      | ±2  | ±1  | ±0.5 |      |    | ±2  | H7      |         |         |         |
| 10   | –   | 85  | 45   | 5.5  | 47 | 126 | 9       | 5.5     | 10      | 3.5     |
| 12   | 157 | 100 | 48.5 | 9.5  | 59 | 144 | 9       | 5.5     | 10      | 4.5     |
| 16   | 179 | 110 | 57   | 12.5 | 70 | 163 | 9       | 5.5     | 10      | 4.5     |

| Size | D8<br>Ø | EE | H1   | H2   | H3    | H4 <sup>1)</sup> | H5 | H8 | H9 | H10 |
|------|---------|----|------|------|-------|------------------|----|----|----|-----|
|      |         |    | ±0.3 | ±0.2 | ±0.5  | ±1               |    |    |    |     |
| 10   | 6       | M3 | 120  | 37   | 56    | 89.6             | 12 | 16 | 15 | 20  |
| 12   | 8       | M5 | 175  | 50   | 84    | 142              | 12 | 20 | 40 | –   |
| 16   | 7.5     | M5 | 215  | 58.5 | 103.5 | 174              | 12 | 15 | 40 | –   |

| Size | H11 | L1  | L2   | L3   | L4   | L6   | L7      | L8   | L9  | L10 |
|------|-----|-----|------|------|------|------|---------|------|-----|-----|
|      |     | ±2  | ±0.2 | ±0.2 |      | ±0.2 |         | ±2   | ±3  |     |
| 10   | 4.5 | 123 | 56.5 | 49   | 31   | 20   | 9–0.02  | 62   | –   | –   |
| 12   | –   | 180 | 80   | 12.5 | 37.5 | 20   | 15–0.02 | 60   | 117 | 136 |
| 16   | –   | 219 | 100  | 12   | 50   | 20   | 15±0.05 | 71.5 | 140 | 158 |

| Size | L13 | R1 <sup>1)</sup> |          | R2 <sup>1)</sup> | T3  | ≈C1 | ≈C2 | ≈C3 | ≈C4 |
|------|-----|------------------|----------|------------------|-----|-----|-----|-----|-----|
|      |     | ±3               | AW<br>±3 |                  |     |     |     |     |     |
| 10   | 113 | 113              | 116      | 55               | 3.3 | 4.5 | 2   | 3   | 3   |
| 12   | 123 | 162              | 177      | 82               | 6.5 | 6   | 2   | 3   | 4   |
| 16   | 143 | 200              | 206      | 100              | 5.3 | 8   | 2.5 | 4   | 4   |

1) Maximum stroke and 90° angle

# Handling modules HSW, pneumatic

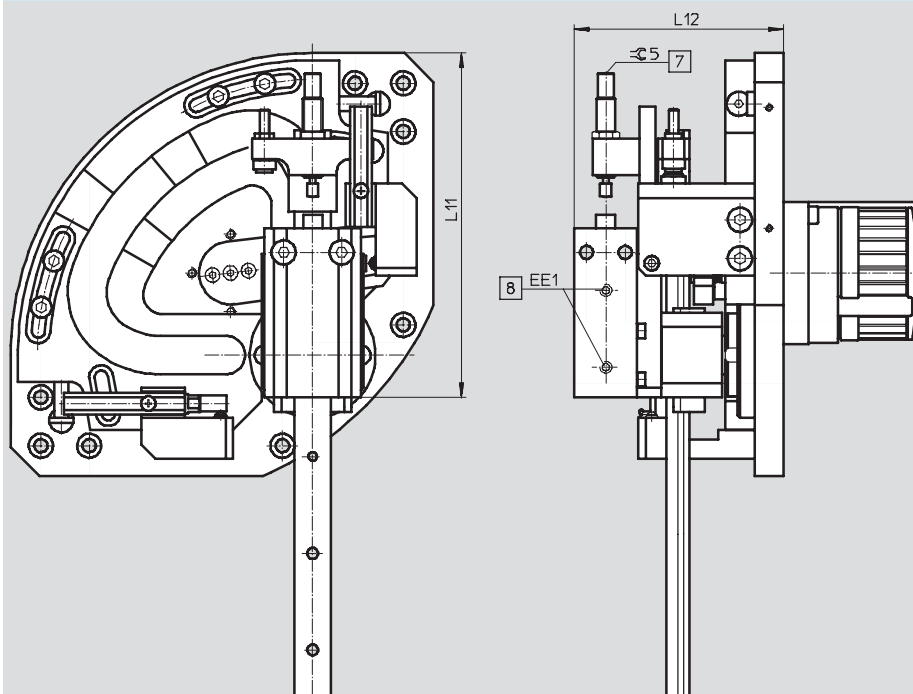
Technical data

FESTO

## Dimensions

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

with wait position module



- 7 Shock absorber for wait position module
- 8 Compressed air connections for wait position module

| Size | EE1 | L11   | L12  | 5   |
|------|-----|-------|------|-----|
|      |     | max.  | ±2   |     |
| 10   | M5  | 115   | 75.5 | 2   |
| 12   | M5  | 142.5 | 86.5 | 2.5 |
| 16   | M5  | 190.5 | 98   | 13  |

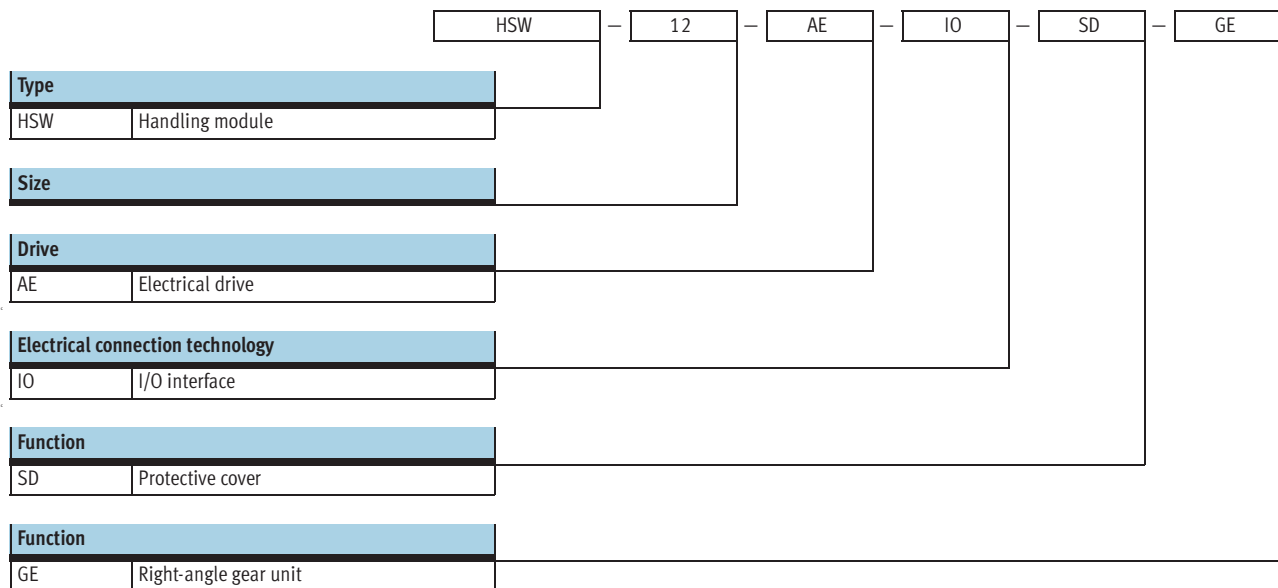
## Ordering data for HSW-...-AP

| Size                     | 10                     | 12                     | 16                     |
|--------------------------|------------------------|------------------------|------------------------|
|                          | Part No. Type          | Part No. Type          | Part No. Type          |
| Without protective cover |                        |                        |                        |
| –                        | 540222 HSW-10-AP       | 540228 HSW-12-AP       | 540234 HSW-16-AP       |
| Wait position module     | 562559 HSW-10-AP-AW    | 562560 HSW-12-AP-AW    | 562561 HSW-16-AP-AW    |
| With protective cover    |                        |                        |                        |
| –                        | 540223 HSW-10-AP-SD    | 540229 HSW-12-AP-SD    | 540235 HSW-16-AP-SD    |
| Wait position module     | 562562 HSW-10-AP-SD-AW | 562563 HSW-16-AP-SD-AW | 562564 HSW-16-AP-SD-AW |

## Handling modules HSW, electrical

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Type codes



# Handling modules HSW, electrical

Technical data

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Function

[www.festo.com/en/Spare\\_parts\\_service](http://www.festo.com/en/Spare_parts_service)



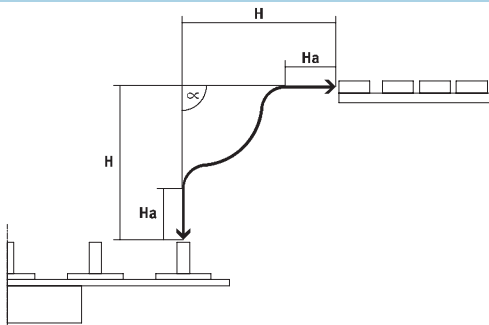
-  - Size  
10, 12 and 16
-  - Swivel angle  
80 ... 100
-  - Stroke range  
90 ... 175



| General technical data |                                |
|------------------------|--------------------------------|
| Type                   | HSW-...-AE                     |
| Constructional design  | Motor unit                     |
|                        | Linear guide plus ball bearing |
|                        | Force-guided motion sequence   |
| Cushioning             | Noise reduction via buffers    |
| Type of mounting       | Via through-holes              |
|                        | Via slot nuts                  |
| Mounting position      | Any                            |

| Operating and environmental conditions        |                                     |
|-----------------------------------------------|-------------------------------------|
| Type                                          | HSW-...-AE                          |
| Ambient temperature [°C]                      | 0 ... +50                           |
| Protection class of motor                     | IP54                                |
| CE marking<br>(see declaration of conformity) | In accordance with EU EMC directive |

| Stroke [mm] and angle range [°]        |          |            |           |           |
|----------------------------------------|----------|------------|-----------|-----------|
| Size                                   |          | 10         | 12        | 16        |
| Max. linear stroke at 90° swivel angle | H        | 90/90      | 142/142   | 175/175   |
| Working stroke                         | Ha       | 9 ... 15   | 15 ... 25 | 20 ... 35 |
| Angle range                            | $\alpha$ | 80 ... 100 |           |           |



| Forces [N]                                         |    |    |    |
|----------------------------------------------------|----|----|----|
| Size                                               | 10 | 12 | 16 |
| Along Y and Z axes (depending on lever position)   |    |    |    |
| Effective force at 80 % of the nominal motor force | 15 | 30 | 50 |
| Along Y axes                                       |    |    |    |
| Permissible process force <sup>1)</sup>            | 30 | 35 | 50 |

1) Due to the pretension force on the guide

# Handling modules HSW, electrical

Technical data

FESTO

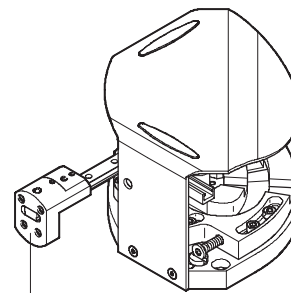
| Weight [g]       |       |       |        |
|------------------|-------|-------|--------|
| Size             | 10    | 12    | 16     |
| HSW-...-AE       | 2,000 | 4,500 | 8,900  |
| HSW-...-AE-SD    | 2,110 | 4,700 | 9,200  |
| HSW-...-AE-GE    | 2,410 | 5,000 | 10,000 |
| HSW-...-AE-SD-GE | 2,520 | 5,200 | 10,300 |

## Repetition accuracy [mm]

To ensure low-vibration operation, the effective load should be mounted as close as possible to the guide rail of the handling module.

Repetition accuracy is guaranteed by

mounting the effective load (adapter plate, semi-rotary drive and/or gripper, gripper finger, workpiece) within the mounting surface of the adapter kit HAPG/HAPG-...-B.



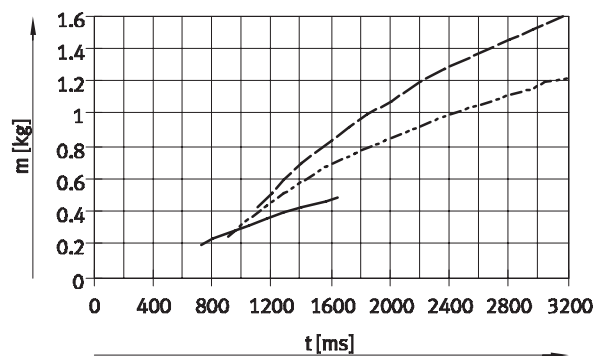
Mounting surface of HAPG

| Size                |                        | 10         | 12 | 16 |
|---------------------|------------------------|------------|----|----|
| Repetition accuracy | At end positions       | $\pm 0.02$ |    |    |
|                     | Intermediate positions | < 2        |    |    |

## Travel times t as a function of effective load m

The travel time t is the time taken for the handling module to move from one end position to the other and back again.

The effective load m is the load attached to the vertical guide rail (e.g. adapter, gripper, semi-rotary drive and workpiece)



— HSW-10-AE  
 - - - HSW-12-AE  
 . . . HSW-16-AE

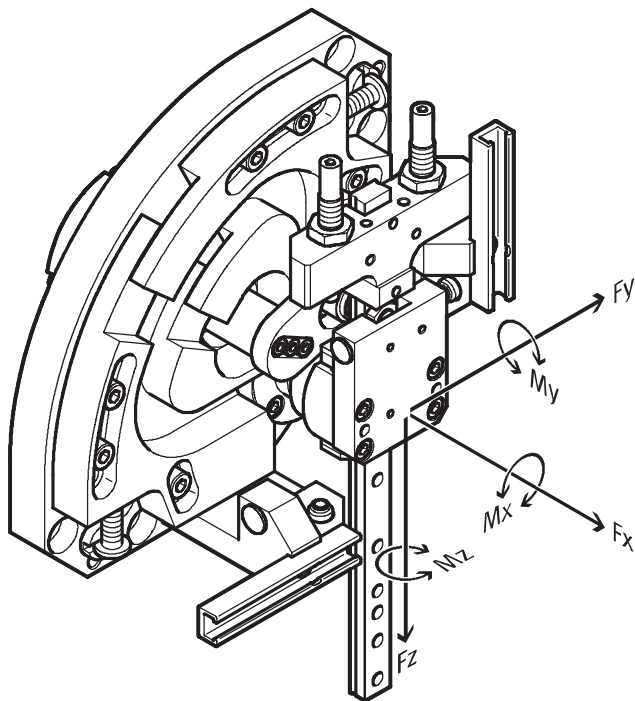
# Handling modules HSW, electrical

Technical data

FESTO

## Permissible static/dynamic characteristic load values

Cross-guide



### Note

The torques apply to the centre of the vertical guide.

### Combined load

The following torque equation must be satisfied with combined load:

$$\frac{M_x}{M_{xperm.}} + \frac{M_y}{M_{yperm.}} + \frac{M_z}{M_{zperm.}} \leq 1$$

| Dynamic characteristic load values   |     |     |     |
|--------------------------------------|-----|-----|-----|
| Size                                 | 10  | 12  | 16  |
| Max. torques [Nm]                    | 0.6 | 1.5 | 2.5 |
| $M_{xperm.}, M_{yperm.}, M_{zperm.}$ |     |     |     |

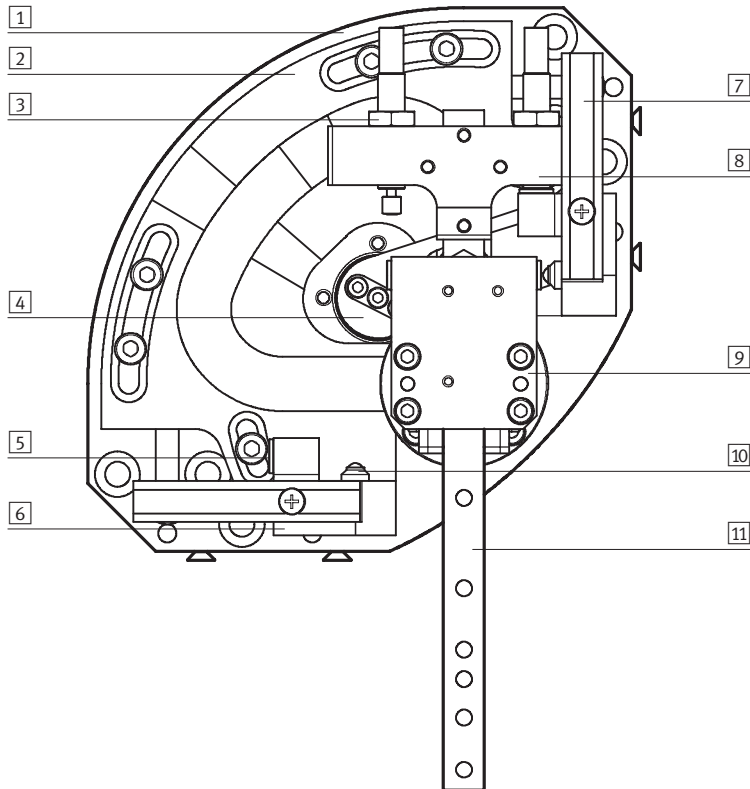
# Handling modules HSW, electrical

Technical data

**FESTO**

## Materials

Sectional view of handling module HSW



| Size                  | 10                                | 12                                | 16               |
|-----------------------|-----------------------------------|-----------------------------------|------------------|
| 1 Back plate          | Wrought aluminium alloy, anodised |                                   |                  |
| 2 Slotted guide plate | Case-hardened steel               |                                   |                  |
| 3 Adjusting screw     | –                                 |                                   | High-alloy steel |
| 4 Swivel lever        | Case-hardened steel               |                                   |                  |
| 5 Stop sleeve         | High-alloy steel                  |                                   |                  |
| 6 Retainer            | Wrought aluminium alloy, anodised |                                   |                  |
| 7 Sensor rail         | Wrought aluminium alloy, anodised |                                   |                  |
| 8 Flange              | Wrought aluminium alloy, anodised |                                   |                  |
| 9 Top plate           | Wrought aluminium alloy, anodised |                                   |                  |
| 10 Pressure piece     | High-alloy steel                  |                                   |                  |
| 11 Guide              | Tempered steel                    |                                   |                  |
| – Housing             | Wrought aluminium alloy, anodised |                                   |                  |
| Note on materials     |                                   | Free of copper, PTFE and silicone |                  |

# Handling modules HSW, electrical

Technical data

FESTO

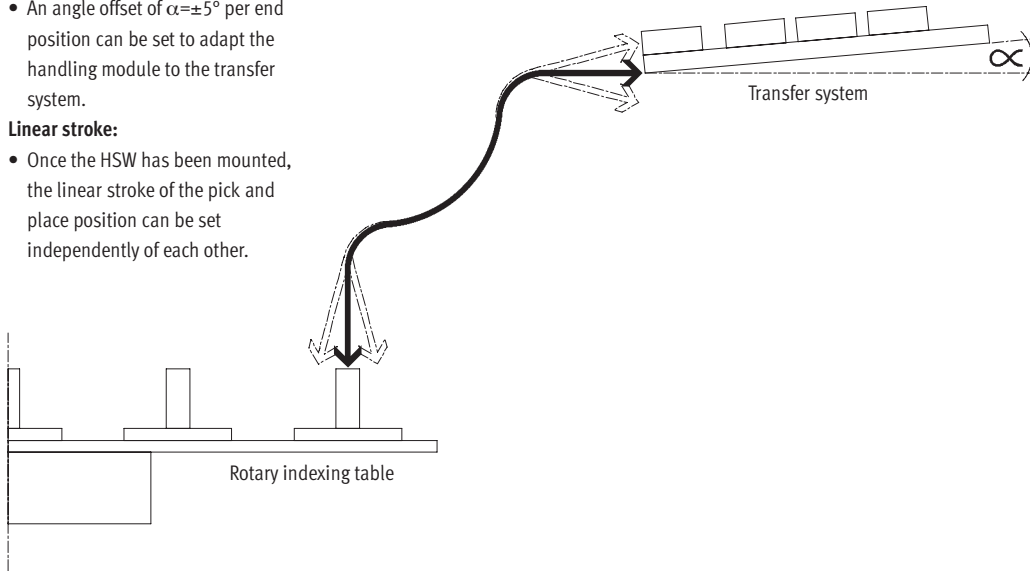
## Stroke adjustment

### Swivel angle:

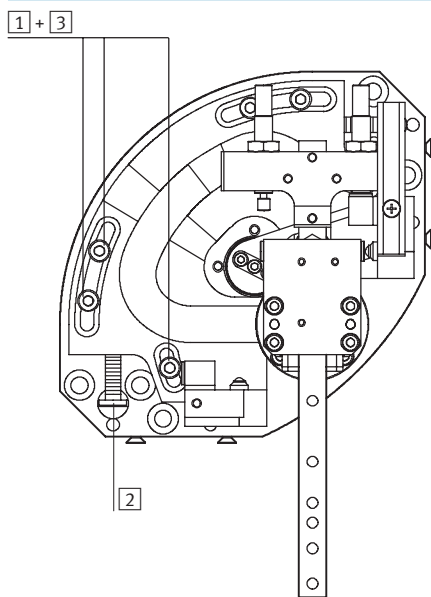
- An angle offset of  $\alpha = \pm 5^\circ$  per end position can be set to adapt the handling module to the transfer system.

### Linear stroke:

- Once the HSW has been mounted, the linear stroke of the pick and place position can be set independently of each other.



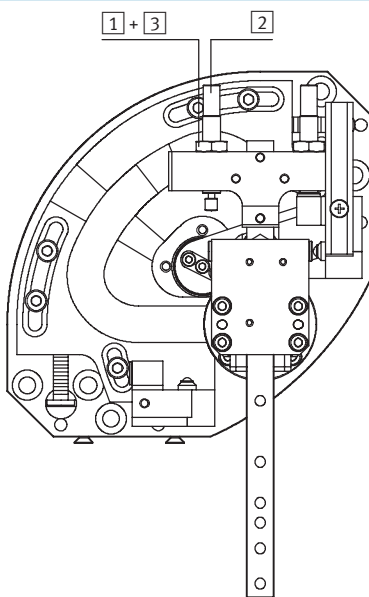
### Swivel angle



#### Procedure:

- 1 Loosen the screws
- 2 Adjust the slotted guide plate using the adjusting screw (the slotted guide plate must always make contact with the guide ring)
- 3 Tighten the screws

### Linear stroke



#### Procedure:

- 1 Loosen the lock nut
- 2 Set the desired linear stroke using the cushioning component/adjusting screw
- 3 Tighten the lock nut

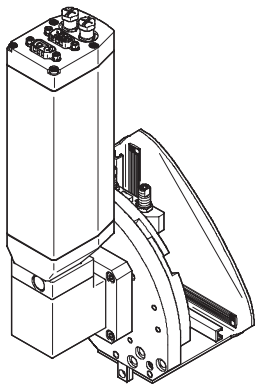
# Handling modules HSW, electrical

Technical data

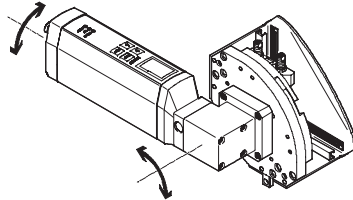
FESTO

## Motor mounting variants

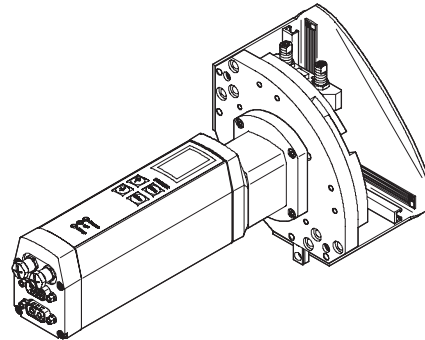
Motor pointing upwards/to side



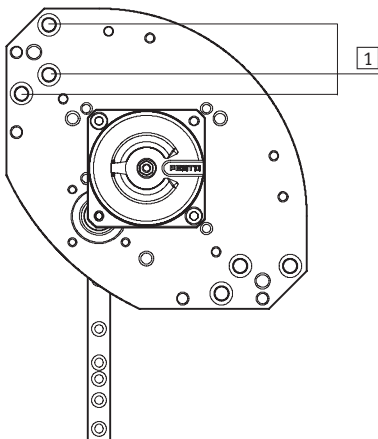
Control panel and access to the connections can be rotated according to space requirements.



Motor towards rear



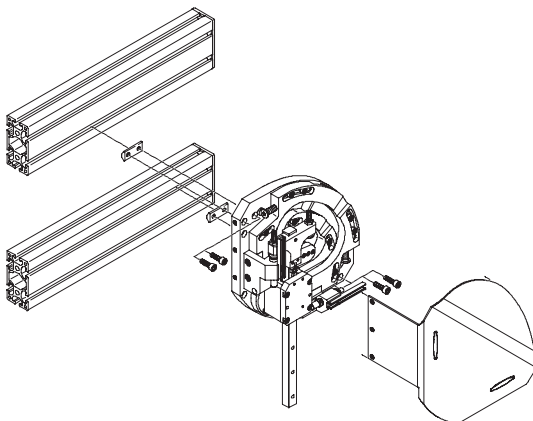
## Mounting options



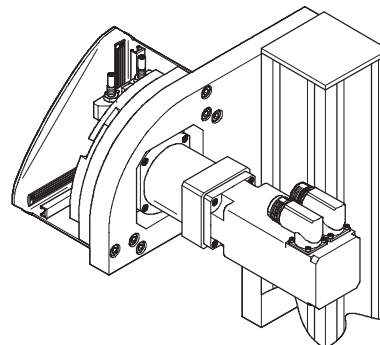
1 Directly via through-holes

Examples:

Via slot nuts on profile supports



User-specific



# Handling modules HSW, electrical

Technical data

**FESTO**

Motor unit MTR-DCI-...-HM



| General technical data <span style="float: right;">→ Internet: mtr-dci</span> |                                                                          |                   |                   |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------|-------------------|
| Type                                                                          | MTR-DCI-32-...-HM                                                        | MTR-DCI-42-...-HM | MTR-DCI-52-...-HM |
| For handling module                                                           | HSW-10-...-AE                                                            | HSW-12-...-AE     | HSW-16-...-AE     |
| Rotary position generator                                                     | Optical encoder                                                          |                   |                   |
| No. of increments/revolution                                                  | 300                                                                      | 500               |                   |
| Temperature monitoring                                                        | Silicon absolute temperature sensor, switches off at temperatures >80 °C |                   |                   |
| Display resolution                                                            | 128 x 64 pixels                                                          |                   |                   |
| Type of mounting                                                              | Can be bolted on or clamped to gear unit flange                          |                   |                   |
| Gear unit type                                                                | Planetary gearing                                                        |                   |                   |
| Gear unit ratio                                                               | 13.73 (14:1), 2-stage                                                    |                   |                   |

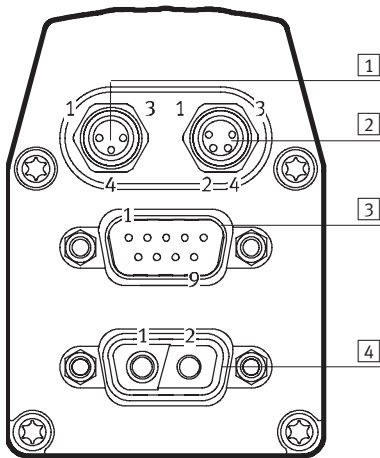
| Electrical data <span style="float: right;">→ Internet: mtr-dci</span> |                   |                   |                   |
|------------------------------------------------------------------------|-------------------|-------------------|-------------------|
| Type                                                                   | MTR-DCI-32-...-HM | MTR-DCI-42-...-HM | MTR-DCI-52-...-HM |
| For handling module                                                    | HSW-10-...-AE     | HSW-12-...-AE     | HSW-16-...-AE     |
| Nominal voltage [V DC]                                                 | 24 ±10%           |                   |                   |
| Nominal current (motor) [A]                                            | 0.73              | 2                 | 5.1               |
| Peak current [A]                                                       | 2.1               | 3.8               | 7.7               |
| Nominal power (motor) [W]                                              | 17.5              | 48                | 122.4             |
| Max. current (digital logic outputs) [mA]                              | 200               | 200               | 60                |
| No. of digital logic inputs (with I/O interface) –                     | 6                 |                   |                   |
| No. of digital logic outputs (with I/O interface) –                    | 2                 |                   |                   |
| Parameterisation interface                                             | RS232; 9,600 baud |                   |                   |

# Handling modules HSW, electrical

Technical data

FESTO

## Pin allocation



### 1 3-pin M8 socket

| Pin | Function |
|-----|----------|
| 1   | Unused   |
| 3   | Unused   |
| 4   | Unused   |
| –   |          |

### 2 RS232 interface, 4-pin M8 socket

| Pin | Function               |
|-----|------------------------|
| 1   | 0 V                    |
| 2   | Transmitted data (TxD) |
| 3   | Received data (RxD)    |
| 4   | –                      |

### 3 I/O interface, 9-pin SUB-D plug

| Pin | Function                        |
|-----|---------------------------------|
| 1   | Traversing record coding, bit 0 |
| 2   | Traversing record coding, bit 1 |
| 3   | Traversing record coding, bit 2 |
| 4   | Traversing record coding, bit 3 |
| 5   | Start bit                       |
| 6   | Enable bit                      |
| 7   | Ready signal output             |
| 8   | MC signal output                |
| 9   | 0 V                             |

### 4 Power supply, 2-pin plug

| Pin | Function |
|-----|----------|
| 1   | 24 V DC  |
| 2   | 0 V      |
| –   |          |
| –   |          |
| –   |          |
| –   |          |
| –   |          |
| –   |          |

# Handling modules HSW, electrical

Technical data

**FESTO**

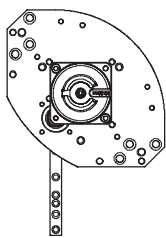
## Simple solution for your application

Advantages of the handling module HSW-...-AE for installation and commissioning

- Handling module is supplied with motor already attached.
- Less wiring required thanks to integration of controller concept.
- Motor with gear unit, controller and power electronics are all fitted in one housing. This means that only one unit has to be taken into consideration when planning the system.
- Only one voltage supply of 24 V is required for commissioning.
- Commissioning via:
  - Control panel on handling module.
  - PC using FESTO Configuration Tool (FCT) software.

## Installation and commissioning

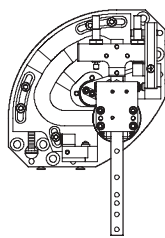
### Step 1: Mount the handling module



- Wide choice of mounting options

→ 25

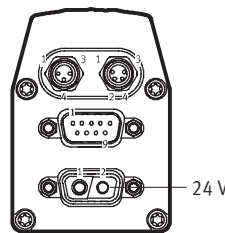
### Step 2: Mechanically adjust the end positions



- Set the desired linear stroke using the cushioning component and adjusting screw

→ 24

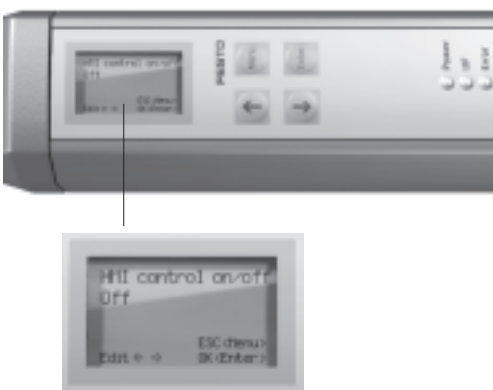
### Step 3: Connect the 24 V voltage supply



- Plug and work: Connect the voltage – HSW is ready for operation

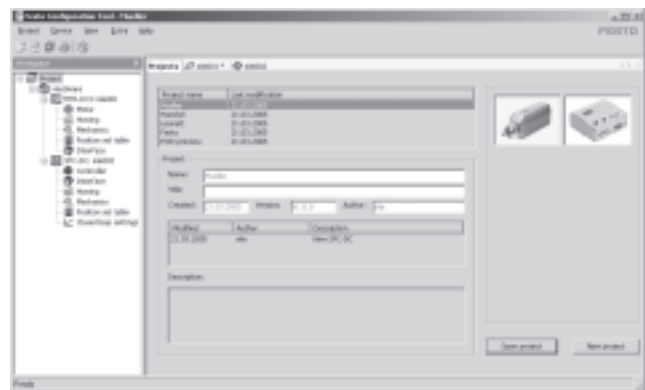
→ 26

### Step 4: Parameterisation either via control panel on motor or using FCT software



- Clearly arranged LCD display
- All data is entered and saved using 4 keys:
  - Menu key
  - Arrow keys for changing parameter values or traversing records
  - Key for confirming the entered actions

### FCT software – Festo Configuration Tool



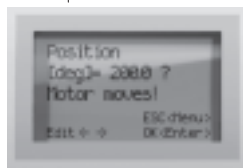
- All the drives in a system can be managed and archived in a common project
- Project and data management for all supported device types
- Simple to use thanks to graphically supported parameter entry
- Universal mode of operation for all drives
- Working offline at your desk or online at the machine

# Handling modules HSW, electrical

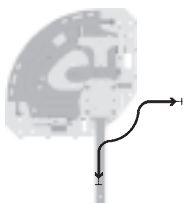
Technical data

FESTO

Step 5: Selection of predefined motion sequences (HSW mode) via the control panel or using the FCT software

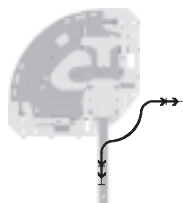


HSW mode 1



- Precise travel to the mechanical end position

HSW mode 2



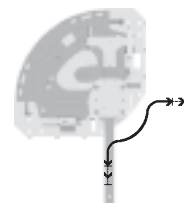
- Additional adjustable wait position module directly above workpiece/workpiece carrier
- Handling of parts with different heights
- Insertion procedures at different speeds

HSW mode 3



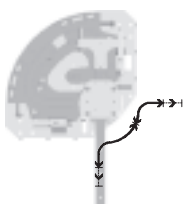
- Additional ejector station for reject parts or quality inspection
- Precise travel to end position via setup position

HSW mode 4



- Insertion procedures with defined force
- Continued travel from wait position with adjustable torque

HSW mode 5



- Insertion procedures with defined force and additional intermediate position
- Continued travel from wait position with adjustable torque

Step 6: Fine adjustment

- Adjustment of preset positions, speeds and torques
- Addition of new traversing records (where necessary)

# Handling modules HSW, electrical

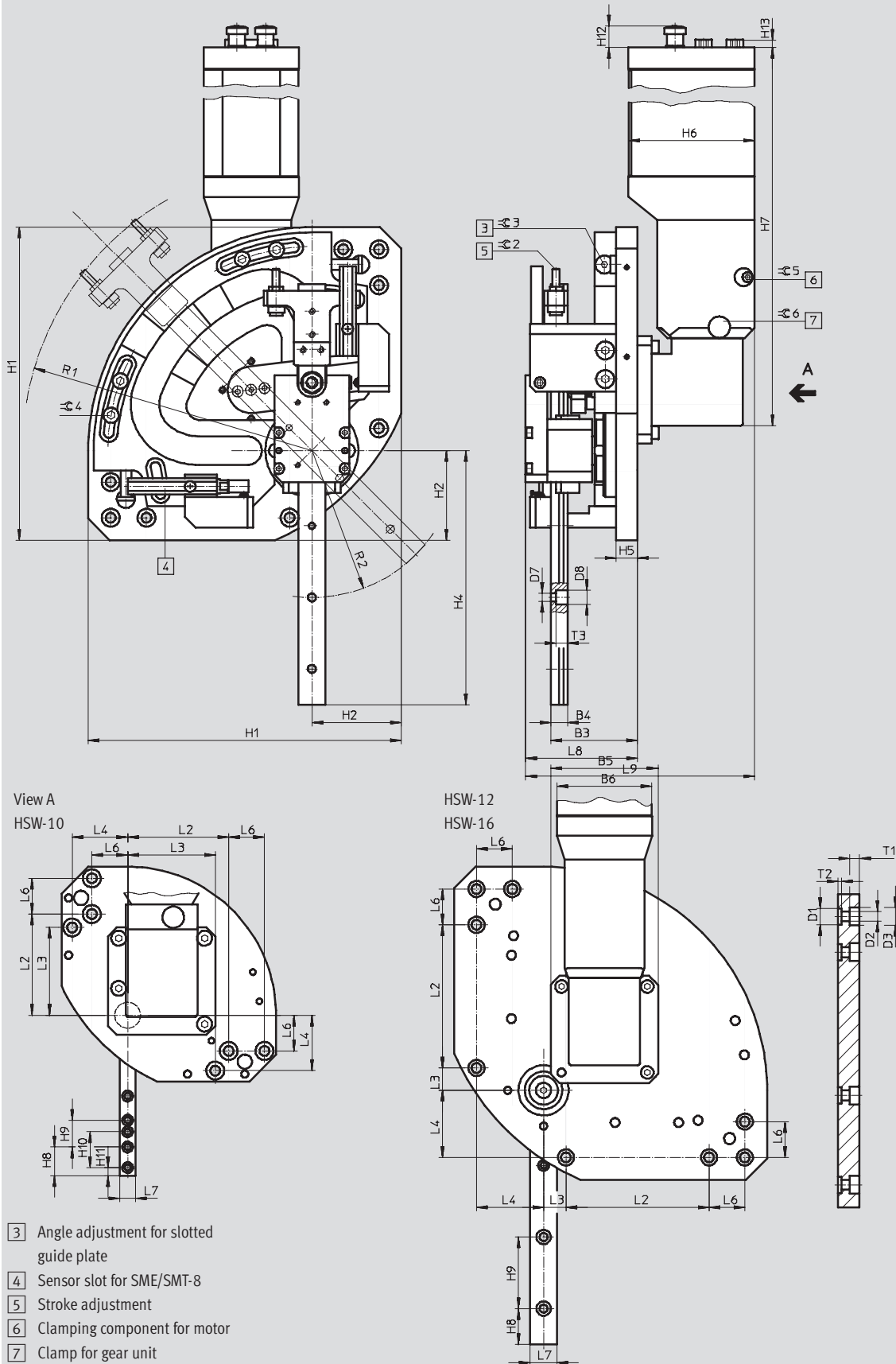
Technical data

FESTO

## Dimensions

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

with motor unit pointing upwards



# Handling modules HSW, electrical

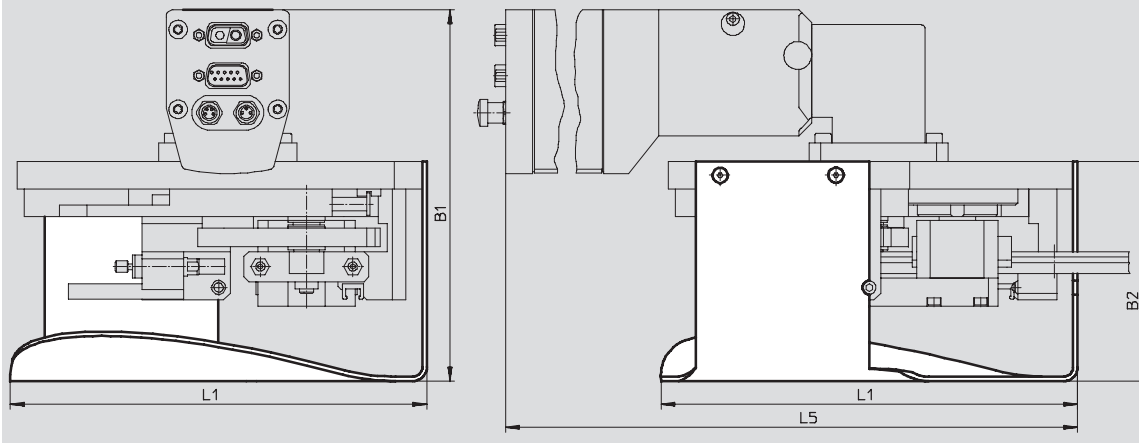
Technical data

**FESTO**

## Dimensions

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

with motor unit pointing upwards and protective cover



| Size | B1<br>±3 | B2<br>±1 | B3<br>±0.5 | B4   | B5  | B6   | D1<br>Ø<br>H7 | D2<br>Ø | D3<br>Ø | D7<br>Ø | D8<br>Ø |
|------|----------|----------|------------|------|-----|------|---------------|---------|---------|---------|---------|
| 10   | 153      | 85       | 45         | 5.5  | 60  | 46   | 9             | 5.5     | 10      | 3.5     | 6       |
| 12   | 165.5    | 100      | 48.5       | 9.5  | 60  | 53.3 | 9             | 5.5     | 10      | 4.5     | 8       |
| 16   | 198      | 110      | 57         | 12.5 | 100 | 69.5 | 9             | 5.5     | 10      | 4.5     | 7.5     |

| Size | H1<br>±0.3 | H2<br>±0.2 | H4 <sup>1)</sup><br>±1 | H5 | H6<br>±0.4 | H7<br>±3 | H8 | H9 | H10 | H11 | H12 |
|------|------------|------------|------------------------|----|------------|----------|----|----|-----|-----|-----|
| 10   | 120        | 37         | 89.6                   | 12 | 66         | 239      | 16 | 15 | 20  | 4.5 | 12  |
| 12   | 175        | 50         | 142                    | 12 | 70.8       | 291      | 20 | 40 | –   | –   | 12  |
| 16   | 215        | 58.5       | 174                    | 12 | 94.8       | 344.5    | 15 | 40 | –   | –   | 12  |

| Size | H13 | L1<br>±2 | L2<br>±0.2 | L3<br>±0.2 | L4<br>±0.2 | L5<br>±3 | L6<br>±0.05 | L7                  | L8<br>±2 | L9<br>±3 |
|------|-----|----------|------------|------------|------------|----------|-------------|---------------------|----------|----------|
| 10   | 5   | 123      | 56.5       | 49         | 31         | 276      | 20          | 9 <sub>-0.02</sub>  | 62       | 121      |
| 12   | 5   | 180      | 80         | 12.5       | 37.5       | 357      | 20          | 15 <sub>-0.02</sub> | 60       | 128      |
| 16   | 5   | 219      | 100        | 12         | 50         | 420      | 20          | 15 <sub>±0.05</sub> | 71.5     | 156      |

| Size | R1 <sup>1)</sup><br>±3 | R2 <sup>1)</sup><br>±3 | T1  | T2<br>+0.1 | T3  | ≈C2 | ≈C3 | ≈C4 | ≈C5 | ≈C6 |
|------|------------------------|------------------------|-----|------------|-----|-----|-----|-----|-----|-----|
| 10   | 113                    | 55                     | 5.5 | 2          | 3.3 | 2   | 3   | 3   | 2.5 | 2.5 |
| 12   | 162                    | 82                     | 5.5 | 2          | 6.5 | 2   | 3   | 4   | 2.5 | 2.5 |
| 16   | 200                    | 100                    | 5.5 | 2          | 5.3 | 2.5 | 4   | 4   | 5   | 3   |

1) Maximum stroke and 90° angle

# Handling modules HSW, electrical

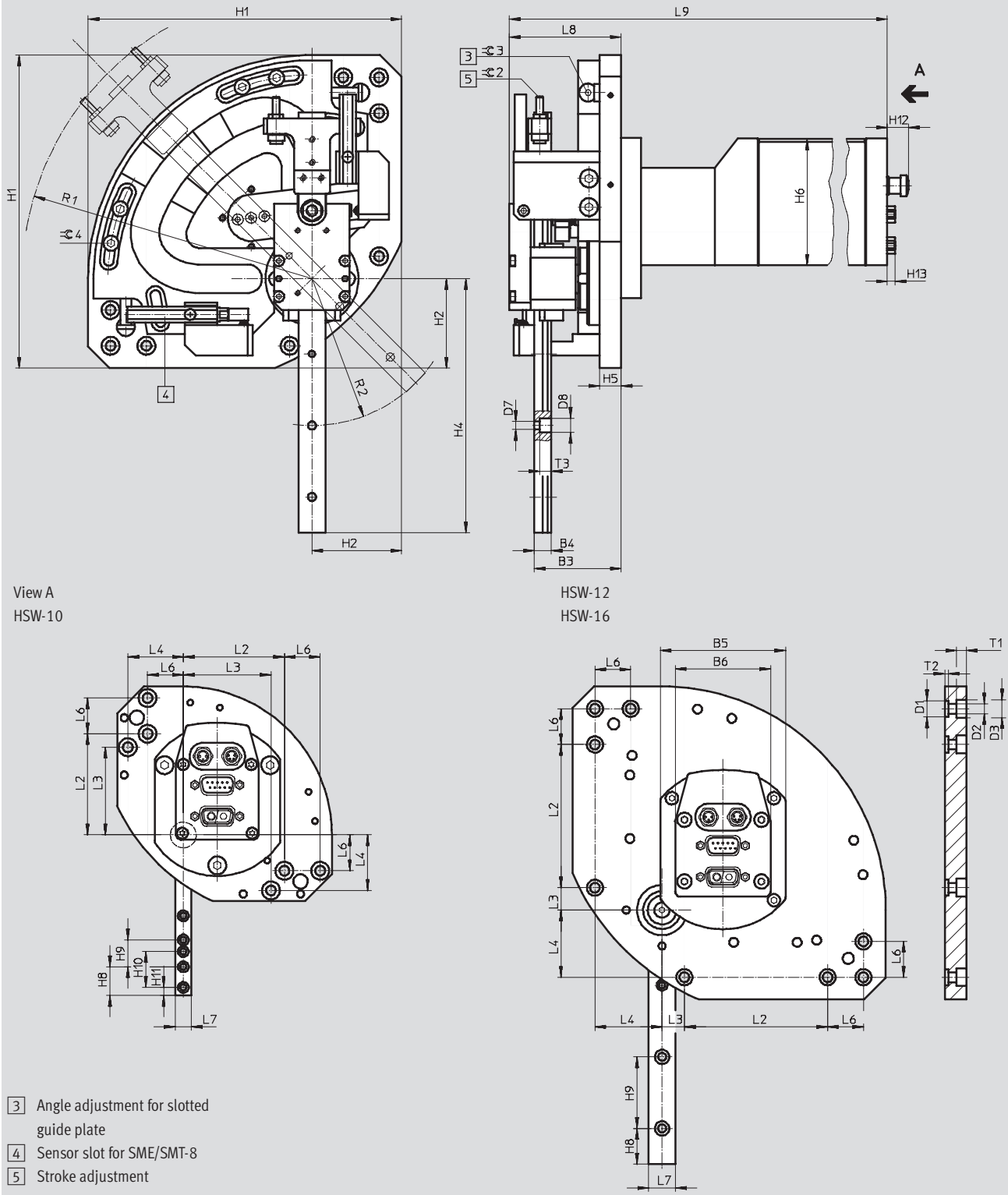
Technical data

FESTO

## Dimensions

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

with motor unit towards the rear



# Handling modules HSW, electrical

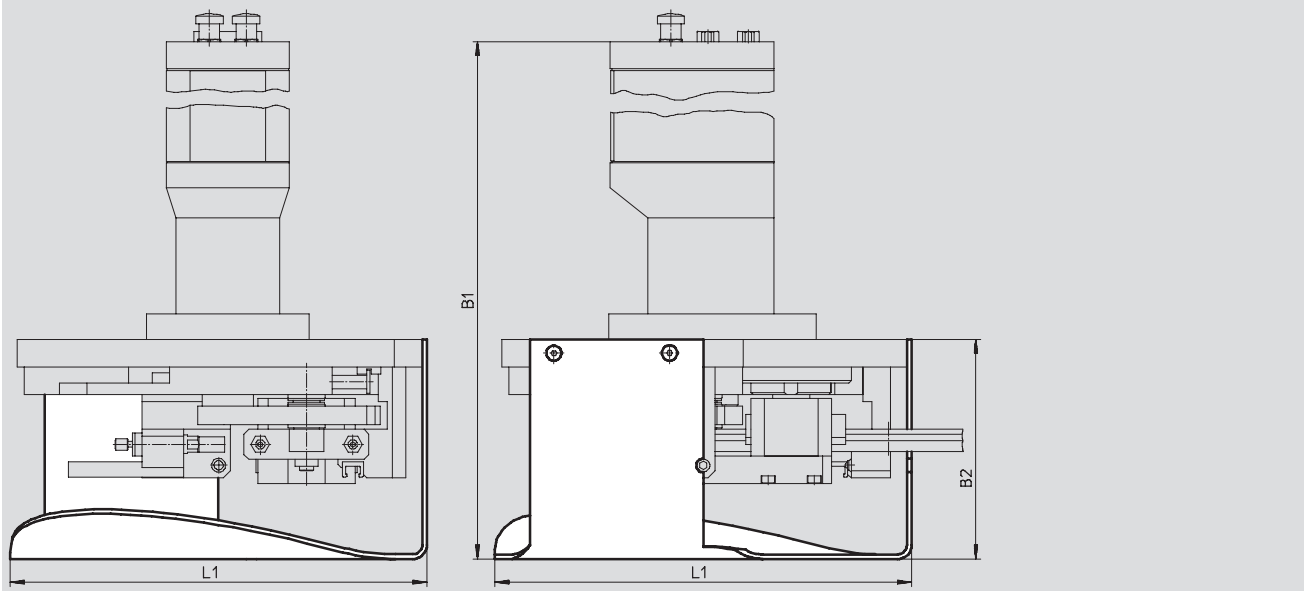
Technical data

**FESTO**

## Dimensions

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

with motor unit towards the rear and protective cover



| Size | B1  | B2  | B3   | B4   | B5 | B6   | D1<br>Ø<br>H7 | D2<br>Ø | D3<br>Ø | D7<br>Ø |
|------|-----|-----|------|------|----|------|---------------|---------|---------|---------|
| 10   | ±3  | ±1  | ±0.5 |      |    |      |               |         |         |         |
| 10   | 268 | 85  | 45   | 5.5  | 70 | 46   | 9             | 5.5     | 10      | 3.5     |
| 12   | 328 | 100 | 48.5 | 9.5  | 70 | 53.3 | 9             | 5.5     | 10      | 4.5     |
| 16   | 368 | 110 | 57   | 12.5 | 70 | 69.5 | 9             | 5.5     | 10      | 4.5     |

| Size | D8<br>Ø | H1<br>±0.3 | H2<br>±0.2 | H4 <sup>1)</sup><br>±1 | H5 | H6<br>±0.4 | H8 | H9 | H10 | H11 | H12 | H13 |
|------|---------|------------|------------|------------------------|----|------------|----|----|-----|-----|-----|-----|
| 10   | 6       | 120        | 37         | 89.6                   | 12 | 66         | 16 | 15 | 20  | 4.5 | 12  | 5   |
| 12   | 8       | 175        | 50         | 142                    | 12 | 70.8       | 20 | 40 | –   | –   | 12  | 5   |
| 16   | 7.5     | 215        | 58.5       | 174                    | 12 | 94.8       | 15 | 40 | –   | –   | 12  | 5   |

| Size | L1<br>±2 | L2<br>±0.2 | L3<br>±0.2 | L4<br>±0.2 | L6<br>±0.05 | L7                  | L8<br>±2 | L9<br>±3 |
|------|----------|------------|------------|------------|-------------|---------------------|----------|----------|
| 10   | 123      | 56.5       | 49         | 31         | 20          | 9 <sub>-0.02</sub>  | 62       | 245      |
| 12   | 180      | 80         | 12.5       | 37.5       | 20          | 15 <sub>-0.02</sub> | 60       | 290      |
| 16   | 219      | 100        | 12         | 50         | 20          | 15 <sub>±0.05</sub> | 71.5     | 328.5    |

| Size | R1 <sup>1)</sup><br>±3 | R2 <sup>1)</sup><br>±3 | T1  | T2<br>±0.1 | T3  | ≈C2 | ≈C3 | ≈C4 |
|------|------------------------|------------------------|-----|------------|-----|-----|-----|-----|
| 10   | 113                    | 55                     | 5.5 | 2          | 3.3 | 2   | 3   | 3   |
| 12   | 162                    | 82                     | 5.5 | 2          | 6.5 | 2   | 3   | 4   |
| 16   | 200                    | 100                    | 5.5 | 2          | 5.3 | 2.5 | 4   | 4   |

1) Maximum stroke and 90° angle

# Handling modules HSW, electrical

Technical data

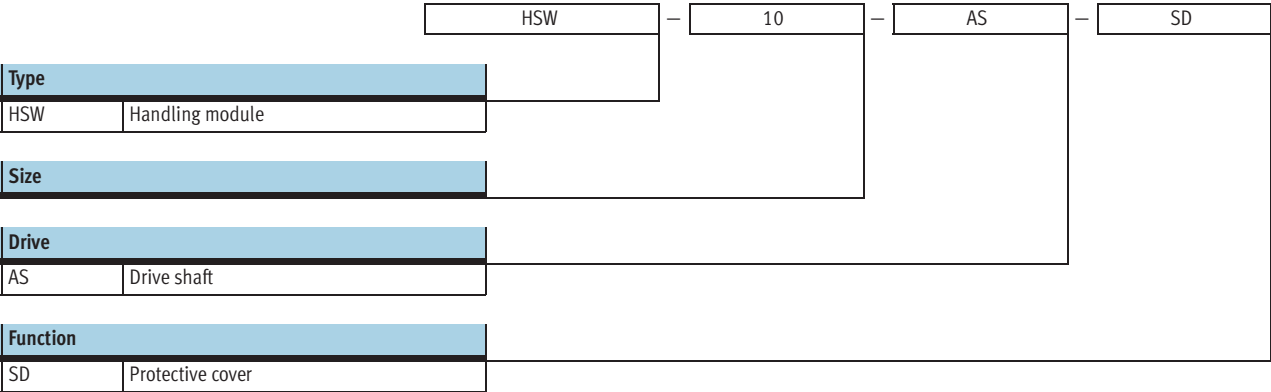
**FESTO**

| Ordering data for HSW-...-AE |          |                    |          |                    |          |                    |
|------------------------------|----------|--------------------|----------|--------------------|----------|--------------------|
| Size                         | 10       |                    | 12       |                    | 16       |                    |
|                              | Part No. | Type               | Part No. | Type               | Part No. | Type               |
| I/O interface                |          |                    |          |                    |          |                    |
| without gear unit            |          |                    |          |                    |          |                    |
| without protective cover     | 540250   | HSW-10-AE-IO       | 540266   | HSW-12-AE-IO       | 540282   | HSW-16-AE-IO       |
| with protective cover        | 540252   | HSW-10-AE-IO-SD    | 540268   | HSW-12-AE-IO-SD    | 540284   | HSW-16-AE-IO-SD    |
| with right-angle gear unit   |          |                    |          |                    |          |                    |
| without protective cover     | 540251   | HSW-10-AE-IO-GE    | 540267   | HSW-12-AE-IO-GE    | 540283   | HSW-16-AE-IO-GE    |
| with protective cover        | 540253   | HSW-10-AE-IO-SD-GE | 540269   | HSW-12-AE-IO-SD-GE | 540285   | HSW-16-AE-IO-SD-GE |

# Handling modules HSW, without drive



Type codes



# Handling modules HSW, without drive

Technical data

FESTO

Function

[www.festo.com/en/Spare\\_parts\\_service](http://www.festo.com/en/Spare_parts_service)



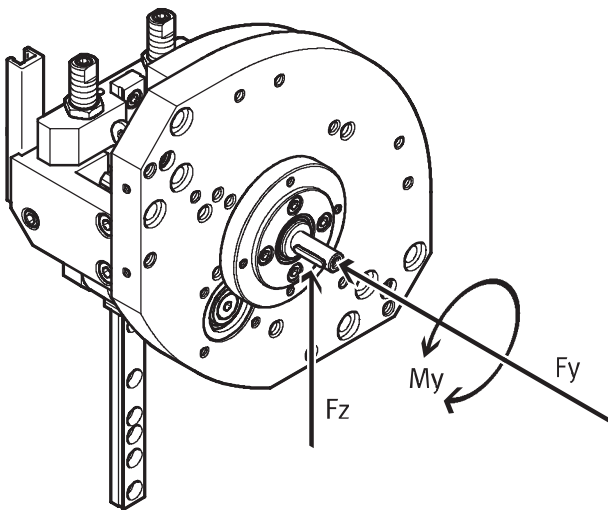
-  Size  
10, 12 and 16
-  Swivel angle  
80 ... 100
-  Stroke range  
90 ... 175



| General technical data |                                |
|------------------------|--------------------------------|
| Type                   | HSW-...-AS                     |
| Constructional design  | Drive shaft                    |
|                        | Linear guide plus ball bearing |
|                        | Force-guided motion sequence   |
| Cushioning             | Noise reduction via buffers    |
| Type of mounting       | Via through-holes              |
|                        | Via centring sleeves           |
| Mounting position      | Any                            |

| Weight [g]    |       |       |       |
|---------------|-------|-------|-------|
| Size          | 10    | 12    | 16    |
| HSW-...-AS    | 1,200 | 2,800 | 5,200 |
| HSW-...-AS-SD | 1,300 | 3,000 | 5,500 |

## Permissible static/dynamic characteristic load values



### Note

Technical data for mechanical components → 11.

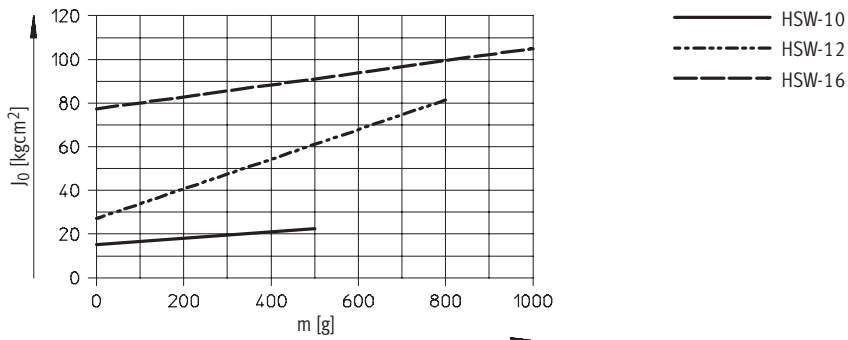
| Characteristic load values     |      |      |      |     |
|--------------------------------|------|------|------|-----|
| Size                           |      | 10   | 12   | 16  |
| Max. axial force $F_{Yperm.}$  | [Nm] | 10   | 18   | 30  |
| Max. radial force $F_{Zperm.}$ | [Nm] | 30   | 45   | 75  |
| Max. drive torque $M_{Yperm.}$ | [Nm] | 0.85 | 1.25 | 2.5 |

# Handling modules HSW, without drive

Technical data

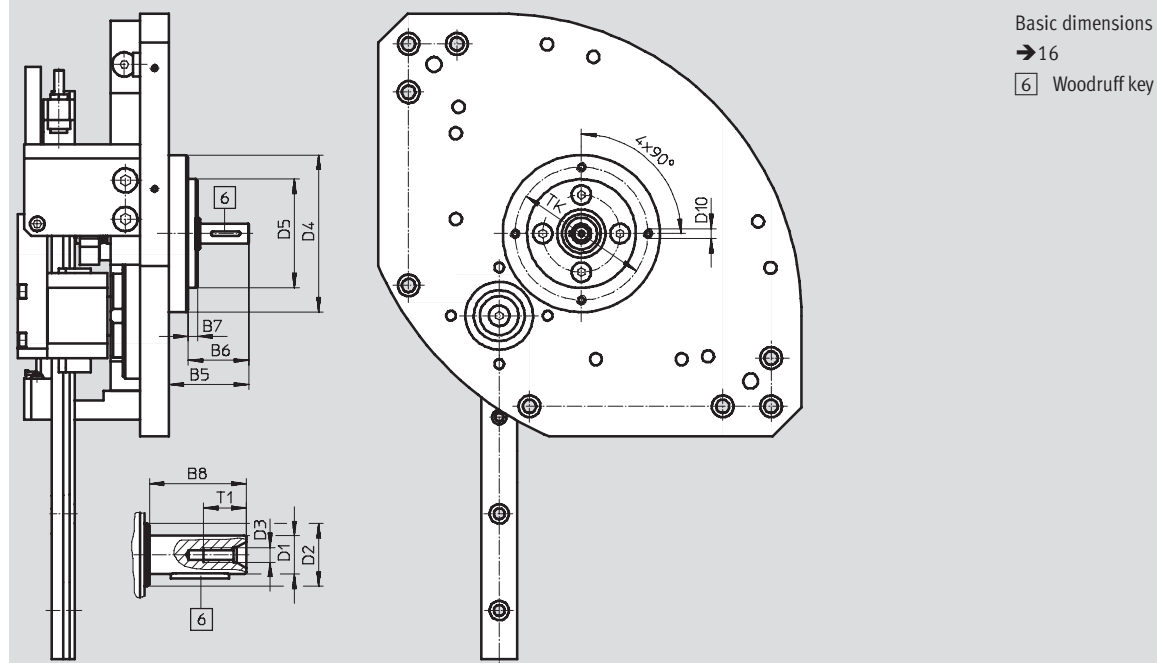
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Mass moment of inertia  $J_0$  as a function of effective load  $m$  (for sizing drive)



## Dimensions

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



| Size | B5   | B6   | B7 | B8 | D1<br>Ø<br>g7 | D2<br>Ø | D3   | D4<br>Ø | D5<br>Ø<br>f8 | D10 | T1   | TK<br>±0.1 |
|------|------|------|----|----|---------------|---------|------|---------|---------------|-----|------|------------|
| 10   | 25   | 19   | 2  | 16 | 6             | 12      | M2.5 | 46      | 32            | M3  | 6.8  | 39         |
| 12   | 33   | 25   | 4  | 20 | 8             | 13      | M3   | 65      | 45            | M4  | 8.8  | 55         |
| 16   | 36.5 | 28.5 | 4  | 23 | 10            | 16      | M3   | 70      | 50            | M4  | 10.6 | 60         |

## Ordering data for HSW-...-AS

| Size                     | 10<br>Part No. | Type         | 12<br>Part No. | Type         | 16<br>Part No. | Type         |
|--------------------------|----------------|--------------|----------------|--------------|----------------|--------------|
| without protective cover | 540226         | HSW-10-AS    | 540232         | HSW-12-AS    | 540238         | HSW-16-AS    |
| with protective cover    | 540227         | HSW-10-AS-SD | 540233         | HSW-12-AS-SD | 540239         | HSW-16-AS-SD |

# Handling modules HSW

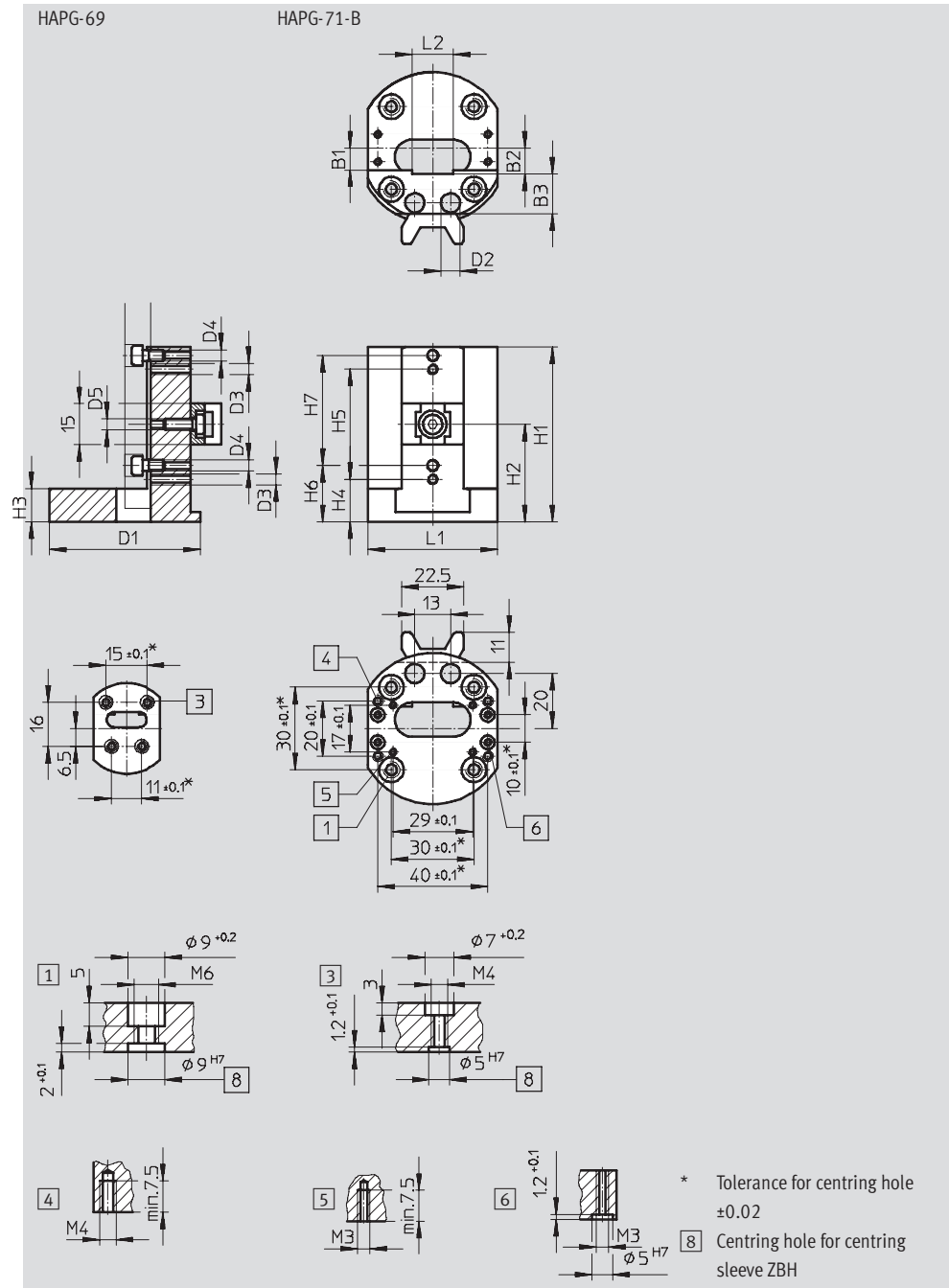
Accessories

FESTO

## Adapter kit HAPG/HAPG-B

Material:

Wrought aluminium alloy, anodised



| Dimensions and ordering data |    |           |      |               |               |    |    |    |      |      |
|------------------------------|----|-----------|------|---------------|---------------|----|----|----|------|------|
| For size                     | B1 | B2        | B3   | D1            | D2            | D3 | D4 | D5 | H1   | H2   |
|                              |    | $\pm 0.2$ |      | $\varnothing$ | $\varnothing$ |    |    |    |      |      |
| 10                           | 5  | 6         | 8    | 33            | –             | M4 | M3 | –  | 34   | –    |
| 12, 16                       | 8  | 9.5       | 14.5 | 56            | 7             | M4 | M4 | M4 | 63.5 | 35.5 |

| For size | H3 | H4        | H5        | H6        | H7        | L1 | L2        | Weight | Part No. | Type      |
|----------|----|-----------|-----------|-----------|-----------|----|-----------|--------|----------|-----------|
|          |    | $\pm 0.2$ | $\pm 0.2$ | $\pm 0.2$ | $\pm 0.2$ |    | $\pm 0.1$ | [g]    |          |           |
| 10       | 10 | 5         | 20.5      | 16.5      | 15        | 24 | 9         | 25     | 540249   | HAPG-69   |
| 12, 16   | 12 | 15.5      | 40        | 20.5      | 40        | 47 | 15        | 110    | 540882   | HAPG-71-B |

# Handling modules HSW

Accessories

**FESTO**

## Installation kit MKRP

Material:

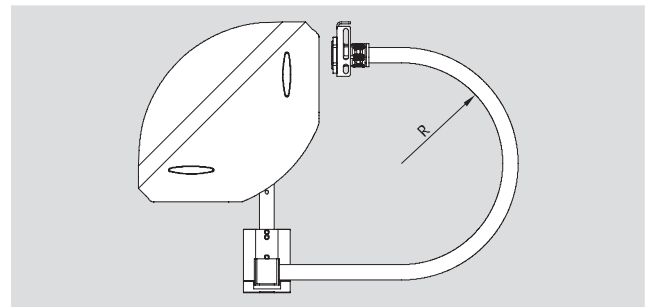
Conduit/fitting: Polyamide

Reducer/lock nut:

Nickel-plated brass

Adapter plate/bracket:

Powder-coated steel



| Ordering data |                                                         |                     |               |          |        |
|---------------|---------------------------------------------------------|---------------------|---------------|----------|--------|
| For size      | Max. bending radius for conduit <sup>1)</sup><br>R [mm] | Tubing I.D.<br>[mm] | Weight<br>[g] | Part No. | Type   |
| 10, 12        | 55                                                      | 12                  | 140           | 540247   | MKRP-5 |
| 12, 16        | 75                                                      | 16.5                | 150           | 540248   | MKRP-6 |

1) The conduit must not be filled beyond 70%

## Cover kit BSD-HSW

Material:

Wrought aluminium alloy, anodised



Dimensions → 17

| Ordering data |               |          |            |
|---------------|---------------|----------|------------|
| For size      | Weight<br>[g] | Part No. | Type       |
| 10            | 100           | 540240   | BSD-HSW-10 |
| 12            | 200           | 540241   | BSD-HSW-12 |
| 16            | 300           | 540242   | BSD-HSW-16 |

## Wait position module BAW-HSW for HSW-...-AP

Material:

Wrought aluminium alloy, anodised



Dimensions → 17

| Ordering data |               |          |            |
|---------------|---------------|----------|------------|
| For size      | Weight<br>[g] | Part No. | Type       |
| 10            | 110           | 562589   | BAW-HSW-10 |
| 12            | 220           | 562590   | BAW-HSW-12 |
| 16            | 400           | 562591   | BAW-HSW-16 |

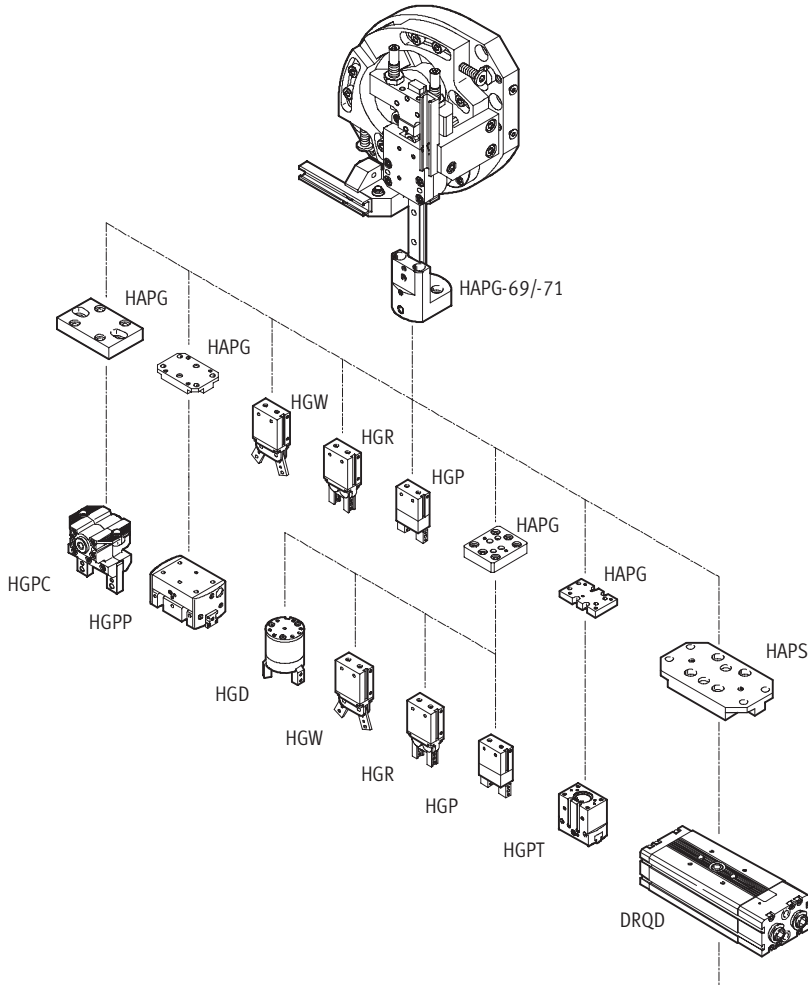
# Handling modules HSW

Accessories

FESTO

## Adapter kits for grippers

For combining HSW with grippers HG-... or semi-rotary drive DRQD



| Gripper                   |                           | Adapter kit                 |      | Required mounting attachments | B1 | D1 | D2 | H1 | L1 |      |    |    |      |
|---------------------------|---------------------------|-----------------------------|------|-------------------------------|----|----|----|----|----|------|----|----|------|
| Part No.                  | Type                      | Part No.                    | Type |                               |    |    |    |    |    |      |    |    |      |
| HSW-10-... with HAPG-69   |                           |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 174815                    | HGP-06-A                  | –                           |      | M3 x 14 (2x)                  | –  |    |    |    |    |      |    |    |      |
| 174817                    | HGR-10-A                  |                             |      | M3 x 16 (2x)                  |    |    |    |    |    |      |    |    |      |
| 174818                    | HGW-10-A                  |                             |      | M3 x 16 (2x)                  |    |    |    |    |    |      |    |    |      |
|                           |                           |                             |      |                               |    |    |    |    |    |      |    |    |      |
| HSW-12-... with HAPG-71-B |                           |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 174815                    | HGP-06-A                  | 192706 HAPG-37-S1           |      | –                             | 12 | M3 | M5 | 42 | 50 |      |    |    |      |
| 174817                    | HGR-10-A                  |                             |      |                               | 8  | M4 | M4 | 28 | 48 |      |    |    |      |
| 174818                    | HGW-10-A                  |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 1)<br>1)                  | DRQD-8-...<br>DRQD-12-... | 178448 HAPS-2 <sup>2)</sup> |      |                               | 12 | M3 | M5 | 42 | 50 |      |    |    |      |
| 197542                    | HGP-10-A-B                |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 161829                    | HGR-16-A                  |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 161833                    | HGW-16-A                  |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 525658                    | HGPP-10-A                 | 529017 HAPG-57              |      |                               |    |    |    |    |    |      |    |    |      |
| 539269                    | HGPC-16-A                 |                             |      |                               |    |    |    |    |    |      |    |    |      |
| 535858                    | HGPT-16-A                 |                             |      |                               |    |    |    |    |    |      |    |    |      |
|                           |                           | 191901 HAPG-55              |      | 10                            |    |    |    |    |    | M3   | M5 | 40 | 62   |
|                           |                           | 537169 HAPG-75              |      | 8                             |    |    |    |    |    | M2.5 | M3 | 27 | 49.6 |

1) The semi-rotary drive DRQD is a modular product; for information on configuration and ordering visit [www.festo.com](http://www.festo.com)

2) The centring sleeves for attaching to the adapter kit HAPG-71-B are not required

# Handling modules HSW

Accessories

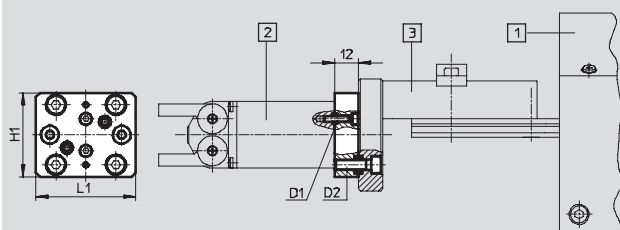
**FESTO**

| Gripper                   |             | Adapter kit |                       | Required<br>mounting attachments | B1 | D1   | D2 | H1 | L1   |
|---------------------------|-------------|-------------|-----------------------|----------------------------------|----|------|----|----|------|
| Part No.                  | Type        | Part No.    | Type                  |                                  |    |      |    |    |      |
| HSW-16-... with HAPG-71-B |             |             |                       |                                  |    |      |    |    |      |
| 174815                    | HGP-06-A    | 192706      | HAPG-37-S1            | -                                | 12 | M3   | M5 | 42 | 50   |
| 174817                    | HGR-10-A    |             |                       |                                  |    |      |    |    |      |
| 174818                    | HGW-10-A    |             |                       |                                  |    |      |    |    |      |
| 1)                        | DRQD-8-...  | 178448      | HAPS-2 <sup>2)</sup>  |                                  | 8  | M4   | M4 | 28 | 48   |
| 1)                        | DRQD-12-... |             |                       |                                  |    |      |    |    |      |
| 197542                    | HGP-10-A-B  | 192705      | HAPG-36-S1            |                                  | 12 | M3   | M5 | 42 | 50   |
| 161829                    | HGR-16-A    |             |                       |                                  |    |      |    |    |      |
| 161833                    | HGW-16-A    |             |                       |                                  |    |      |    |    |      |
| 174819                    | HGD-16-A    |             |                       |                                  |    |      |    |    |      |
| 525658                    | HGPP-10-A   |             |                       |                                  |    |      |    |    |      |
| 187867                    | HGPP-12-A   | 529017      | HAPG-57 <sup>2)</sup> |                                  | 8  | M3   | M4 | 33 | 49.6 |
| 187870                    | HGPP-16-A   | 191900      | HAPG-54               |                                  | 12 | M3   | M5 | 44 | 52   |
| 539269                    | HGPC-16-A   | 191901      | HAPG-55               |                                  | 10 | M3   | M5 | 40 | 62   |
| 535858                    | HGPT-16-A   | 537169      | HAPG-75               |                                  | 8  | M2.5 | M3 | 27 | 49.6 |
| 535861                    | HGPT-20-A   |             |                       |                                  |    |      |    |    |      |

1) The semi-rotary drive DRQD is a modular product; for information on configuration and ordering visit [www.festo.com](http://www.festo.com)

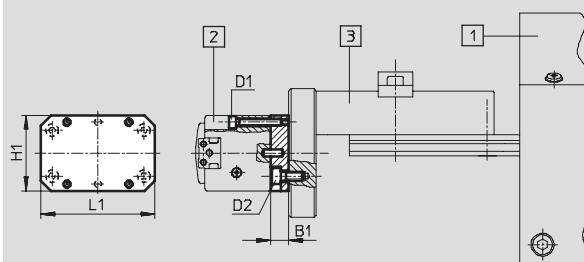
2) The centring sleeves for attaching to the adapter kit HAPG-71-B are not required

Adapter kit HAPG-36/-37



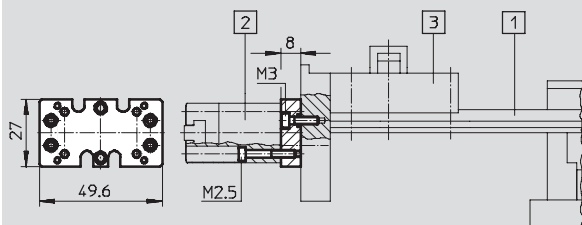
- 1 Handling module HSW
- 2 Gripper HG...
- 3 Adapter kit HAPG

Adapter kit HAPG-54/-55/-57



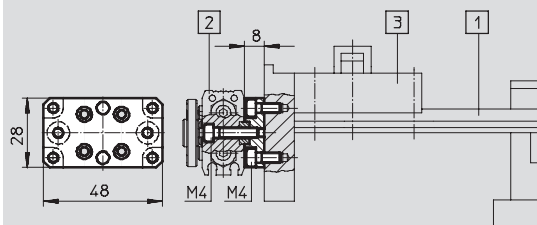
- 1 Handling module HSW
- 2 Parallel gripper HGP...
- 3 Adapter kit HAPG

Adapter kit HAPG-75



- 1 Handling module HSW
- 2 Parallel gripper HGPT
- 3 Adapter kit HAPG

Adapter kit HAPS-2



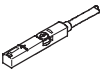
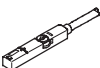
- 1 Handling module HSW
- 2 Semi-rotary drive DRQD
- 3 Adapter kit HAPG

## Handling modules HSW

Accessories

**FESTO**

| Ordering data – Shock absorber                                                    |          |            |          | Technical data → Internet: dysw; ysrw |  |
|-----------------------------------------------------------------------------------|----------|------------|----------|---------------------------------------|--|
|                                                                                   | For size | Weight [g] | Part No. | Type                                  |  |
|  | 10       | 6          | 548070   | DYSW-4-6-Y1F                          |  |
|                                                                                   | 12       | 11         | 548071   | DYSW-5-8-Y1F                          |  |
|                                                                                   | 16       | 18         | 191193   | YSRW-7-10                             |  |

| Ordering data – Proximity sensors for T-slot, magneto-resistive                    |                                                                    |               |                       |                  | Technical data → Internet: <a href="#">smt</a> |                         |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|-----------------------|------------------|------------------------------------------------|-------------------------|
|                                                                                    | 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              | 543867                                         | SMT-8M-PS-24V-K-2,5-OE  |
|                                                                                    |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 543866                                         | SMT-8M-PS-24V-K-0,3-M8D |
|                                                                                    |                                                                    |               | Plug M12x1, 3-pin     | 0.3              | 543869                                         | SMT-8M-PS-24V-K-0,3-M12 |
|                                                                                    |                                                                    | NPN           | Cable, 3-wire         | 2.5              | 543870                                         | SMT-8M-NS-24V-K-2,5-OE  |
|                                                                                    |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 543871                                         | SMT-8M-NS-24V-K-0,3-M8D |
|   | Insertable in the slot lengthwise, flush with the cylinder profile | PNP           | Cable, 3-wire         | 2.5              | 175436                                         | SMT-8-PS-K-LED-24-B     |
|                                                                                    |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 175484                                         | 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              | 543873                                         | SMT-8M-PO-24V-K7,5-OE   |

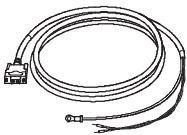
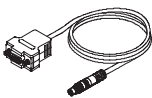
| Ordering data – Proximity sensors for T-slot, magnetic reed                         |                                                                    |               |                       |                  | Technical data → Internet: sme |                         |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------|-----------------------|------------------|--------------------------------|-------------------------|
|                                                                                     | 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              | 543862                         | SME-8M-DS-24V-K-2,5-OE  |
|                                                                                     |                                                                    |               |                       | 5.0              | 543863                         | SME-8M-DS-24V-K-5,0-OE  |
|                                                                                     |                                                                    |               | Cable, 3-wire         | 2.5              | 543872                         | SME-8M-ZS-24V-K-2,5-OE  |
|                                                                                     |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 543861                         | SME-8M-DS-24V-K-0,3-M8D |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting    | Cable, 3-wire         | 2.5              | 150855                         | SME-8-K-LED-24          |
|                                                                                     |                                                                    |               | Plug M8x1, 3-pin      | 0.3              | 150857                         | SME-8-S-LED-24          |
|                                                                                     |                                                                    |               |                       |                  |                                |                         |
| N/C contact                                                                         |                                                                    |               |                       |                  |                                |                         |
|  | Insertable in the slot lengthwise, flush with the cylinder profile | Contacting    | Cable, 3-wire         | 7.5              | 160251                         | SME-8-O-K-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              | 541333                          | NEBU-M8G3-K-2.5-LE3  |
|                                                                                     |                               |                              | 5                | 541334                          | NEBU-M8G3-K-5-LE3    |
|                                                                                     | Straight socket, M12x1, 5-pin | Cable, open end, 3-wire      | 2.5              | 541363                          | NEBU-M12G5-K-2.5-LE3 |
|                                                                                     |                               |                              | 5                | 541364                          | NEBU-M12G5-K-5-LE3   |
|  | Angled socket, M8x1, 3-pin    | Cable, open end, 3-wire      | 2.5              | 541338                          | NEBU-M8W3-K-2.5-LE3  |
|                                                                                     |                               |                              | 5                | 541341                          | NEBU-M8W3-K-5-LE3    |
|                                                                                     | Angled socket, M12x1, 5-pin   | Cable, open end, 3-wire      | 2.5              | 541367                          | NEBU-M12W5-K-2.5-LE3 |
|                                                                                     |                               |                              | 5                | 541370                          | NEBU-M12W5-K-5-LE3   |

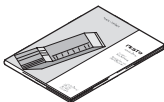
# Handling modules HSW

Accessories

**FESTO**

| Ordering data – Cables for HSW-AE                                                 |                                                        |              |          |                       |
|-----------------------------------------------------------------------------------|--------------------------------------------------------|--------------|----------|-----------------------|
|                                                                                   | Brief description                                      | Cable length | Part No. | Type                  |
|  | Supply cable                                           | 2.5 m        | 537931   | KPWR-MC-1-SUB-9HC-2,5 |
|                                                                                   |                                                        | 5 m          | 537932   | KPWR-MC-1-SUB-9HC-5   |
|                                                                                   |                                                        | 10 m         | 537933   | KPWR-MC-1-SUB-9HC-10  |
|                                                                                   |                                                        |              |          |                       |
|  | Control cable for I/O connection to any PLC controller | 2.5 m        | 537923   | KES-MC-1-SUB-9-2,5    |
|                                                                                   |                                                        | 5 m          | 537924   | KES-MC-1-SUB-9-5      |
|                                                                                   |                                                        | 10 m         | 537925   | KES-MC-1-SUB-9-10     |
|                                                                                   |                                                        |              |          |                       |
|  | Programming cable                                      | 2.5 m        | 537926   | KDI-MC-M8-SUB-9-2,5   |
|                                                                                   |                                                        |              |          |                       |

| Ordering data – Software for HSW-AE                                                |                                                                                                                                                                                                                                                                                                                              |          |                 |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|
|                                                                                    | Brief description                                                                                                                                                                                                                                                                                                            | Part No. | Type            |
|  | <p>The operator's package:</p> <ul style="list-style-type: none"> <li>– CD-ROM</li> <li>– With user's manual in the languages DE, EN, ES, FR, IT, SV</li> <li>– With configuration package FCT (Festo Configuration Tool)</li> <li>– Brief description</li> </ul> <p>The operator's package is included in the delivery.</p> | 541951   | P.BP-HSP_HSW-AE |

| Ordering data – Documentation for HSW-AE                                            |                                                                                                 |          |          |                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------|----------|-------------------|
|                                                                                     | Brief description                                                                               | Language | Part No. | Type              |
|  | <p>Description</p> <p>User's manual in paper form is not included in the scope of delivery.</p> | DE       | 553133   | P.BE-HSW-AE-IO-DE |
|                                                                                     |                                                                                                 | EN       | 553134   | P.BE-HSW-AE-IO-EN |
|                                                                                     |                                                                                                 | ES       | 553135   | P.BE-HSW-AE-IO-ES |
|                                                                                     |                                                                                                 | FR       | 553136   | P.BE-HSW-AE-IO-FR |
|                                                                                     |                                                                                                 | IT       | 553137   | P.BE-HSW-AE-IO-IT |
|                                                                                     |                                                                                                 | SV       | 553138   | P.BE-HSW-AE-IO-SV |

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