

Handling modules HSW

FESTO



Handling modules HSW

Key features at a glance

FESTO

Range of applications

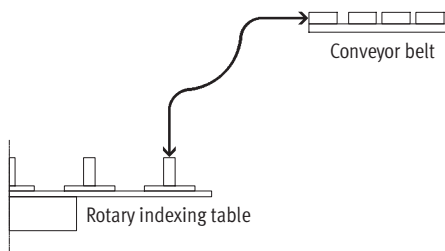
The handling module is a new generation of function modules for the automatic transfer, feed and removal of small parts in extremely confined spaces.

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

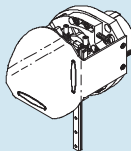
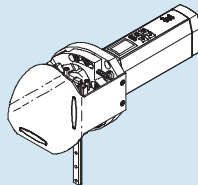
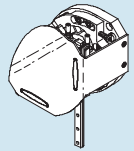
ball bearing elements ensures high precision and good rigidity. The combination of a semi-rotary drive and a slotted guide system produces a compact unit for a complete pick and place cycle at an operating angle of 90°.

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, with swivel module DSM	Electrical: HSW-...-AE, with motor unit MTR-DCI	Without drive: HSW-...-AS, with drive shaft
			
Advantages			
	• Fast • Cost effective • Ready to install • No system planning required • Simple commissioning	• Freely positionable • Freely selectable speed • Smooth motion sequence • Ready to install • No system planning required • Simple commissioning using teach-in procedure	• Compact • Universal applications • Variable drive interface • On request: Drive options in combination with servo motors MTR-AC
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
Effective load	[g]	0 ... 1,600	
Repetition accuracy at end positions	[mm]	±0.02	±0.02
Wait positions		Max. 2	Any
Function of wait position		Pushing via actuating cylinder (→ 13)	Freely approachable (→ 29)
Repetition accuracy at wait positions	[mm]	< 1	< 2
Technical data	→ 9	→ 26	→ 36

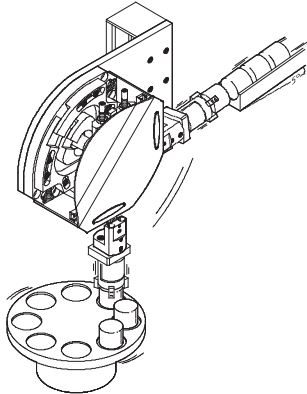
Handling modules HSW

Application examples

FESTO

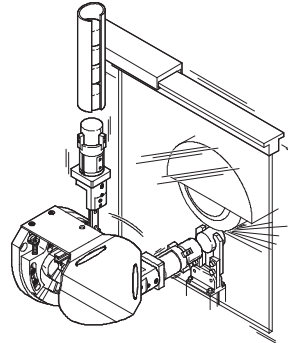
HSW-...-AP, pneumatic / HSW-...-AE, electrical

Rotary indexing table



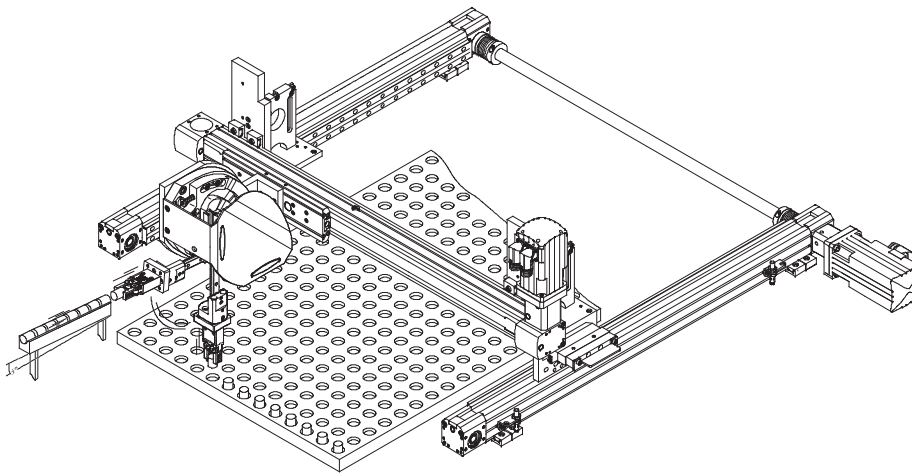
- Fast feed and removal at a linear transfer unit or rotary indexing table, for example

Machine equipment



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

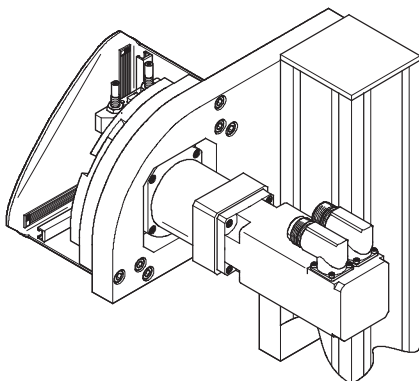
Planar surface gantry



- Fast equipping of pallets

HSW-...-AS, without drive

Rotary indexing table, linear transfer



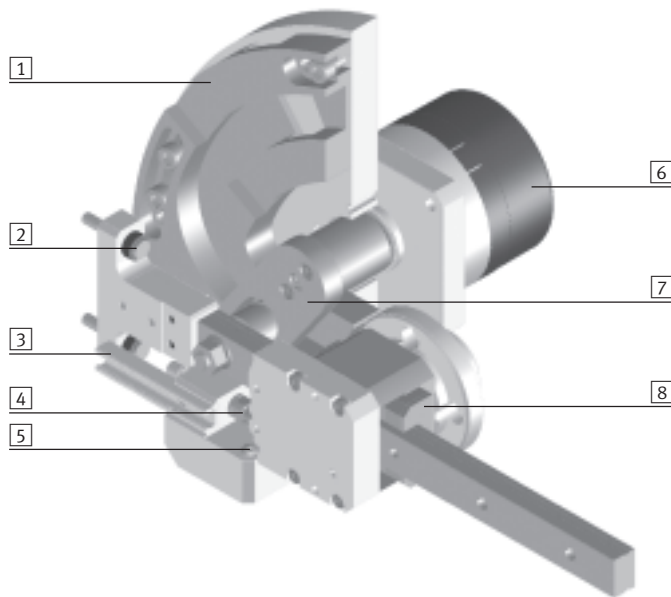
- Fast and flexible 90° pick and place unit with servo motor EMMS-AS
- Electrical variant using third-party motor

Handling modules HSW

Key features at a glance

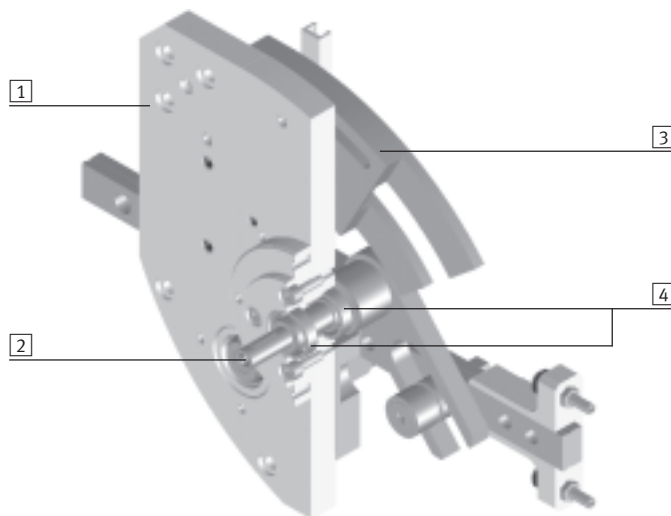
FESTO

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)



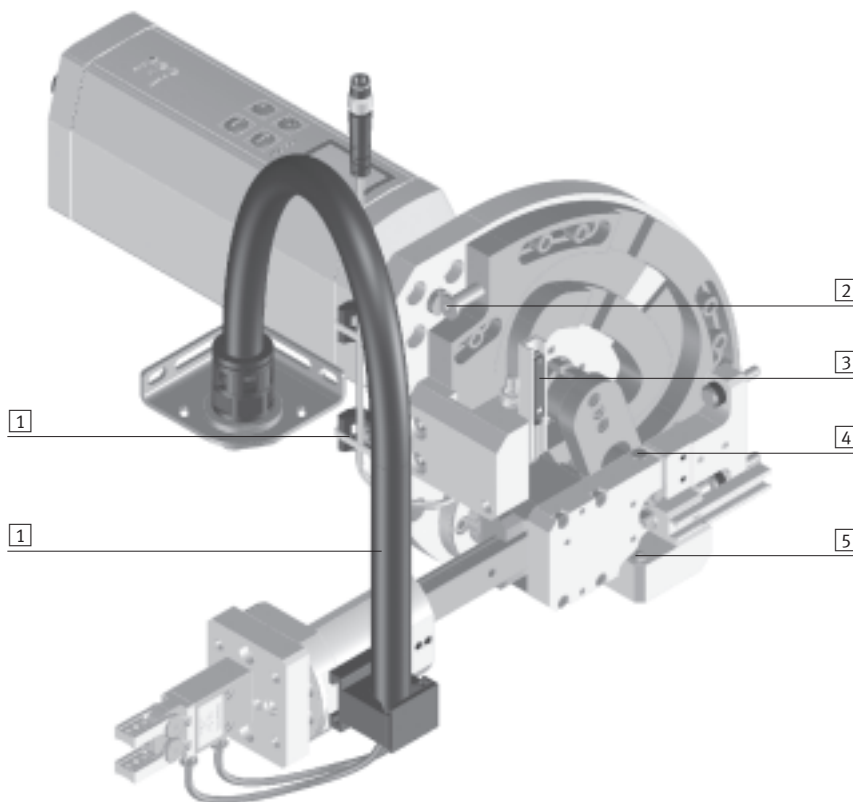
- 1 Base plate
- 2 Shaft with Woodruff key
- 3 Slotted guide plate
- 4 Ball bearings

Handling modules HSW

Key features at a glance

FESTO

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

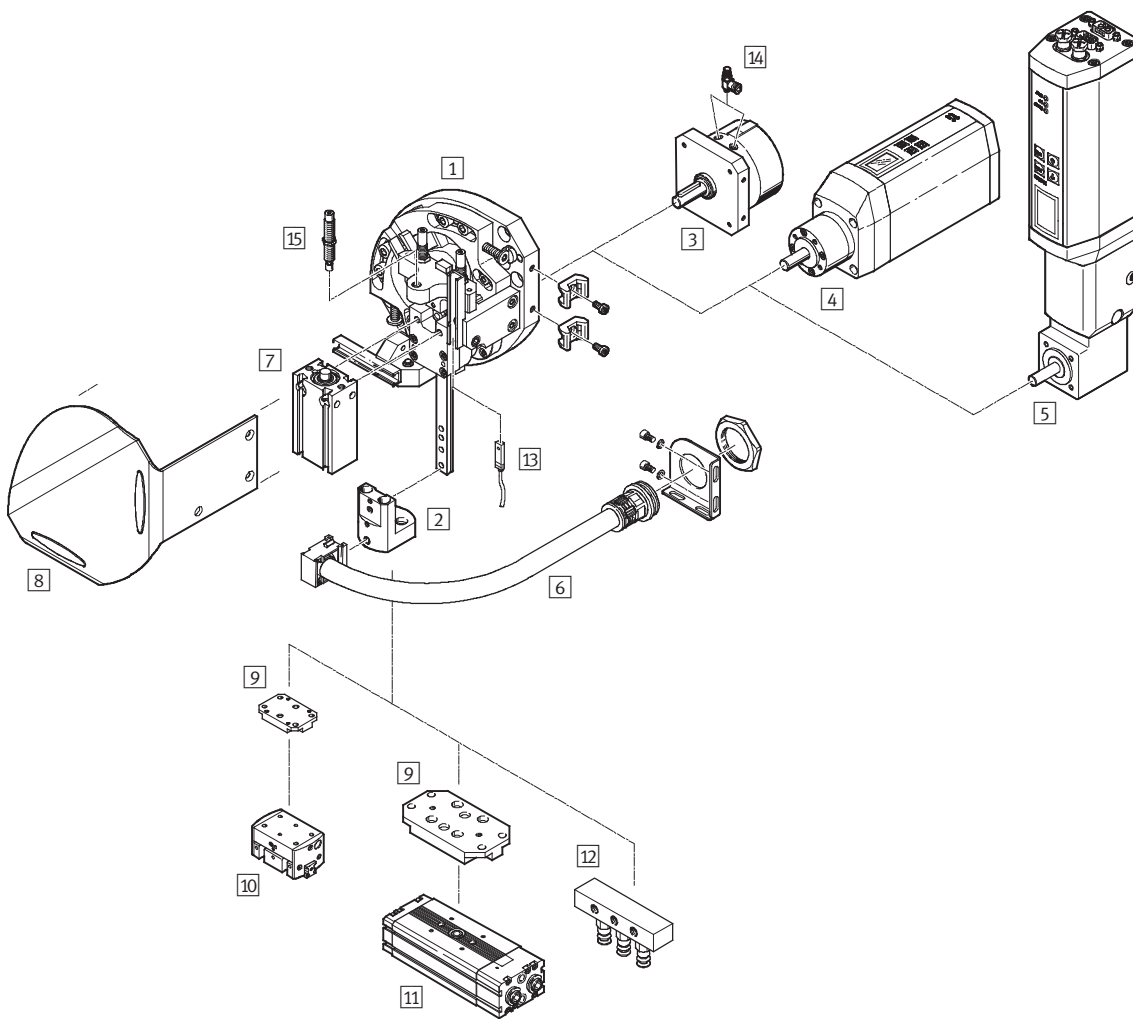


- 4+5 The stop element and pressure piece guarantee freedom from backlash and precision in the end positions and in the effective linear stroke.

550.Handling modules HSW

Peripherals overview

FESTO



551.Handling modules HSW

Peripherals overview

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

Handling modules HSW, pneumatic



Type codes

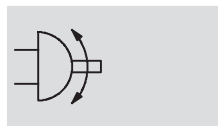
		HSW	–	10	–	AP	–	SD	–	W
Type										
HSW	Handling module, double-acting									
Size										
Drive										
AP	Pneumatic drive									
Function										
SD	Protective cover									
Function										
AW	Wait position module									

Handling modules HSW, pneumatic

Technical data

FESTO

Function



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

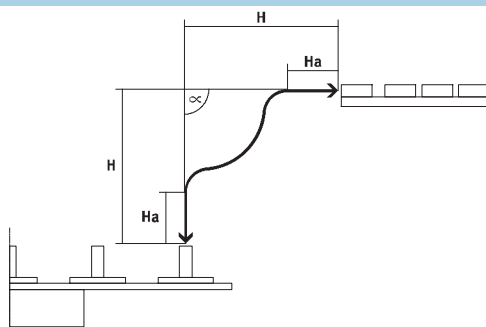
www.festo.com/en/
Spare_parts_service



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	Compressed air in accordance with ISO 8573-1:2010 [7:-:-]
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)
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	α	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 ¹⁾	30	35	50

1) Due to the pretension force on the guide

Handling modules HSW, pneumatic

Technical data

FESTO

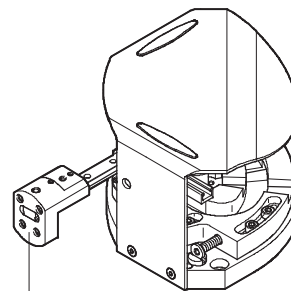
Weight [g]			
Size	10	12	16
HSW-...-AP	1,300	3,000	5,100
HSW-...-AP-SD	1,400	3,200	5,400
HSW-...-AP-AW	1,370	3,200	5,500
HSW-...-AP-SD-AW	1,470	3,400	5,800

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.



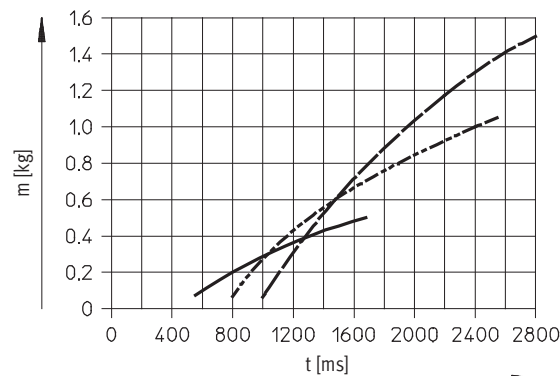
Mounting surface of HAPG

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:

$$t_t = 800 \text{ ms} + 700 \text{ ms} = 1,500 \text{ ms}$$

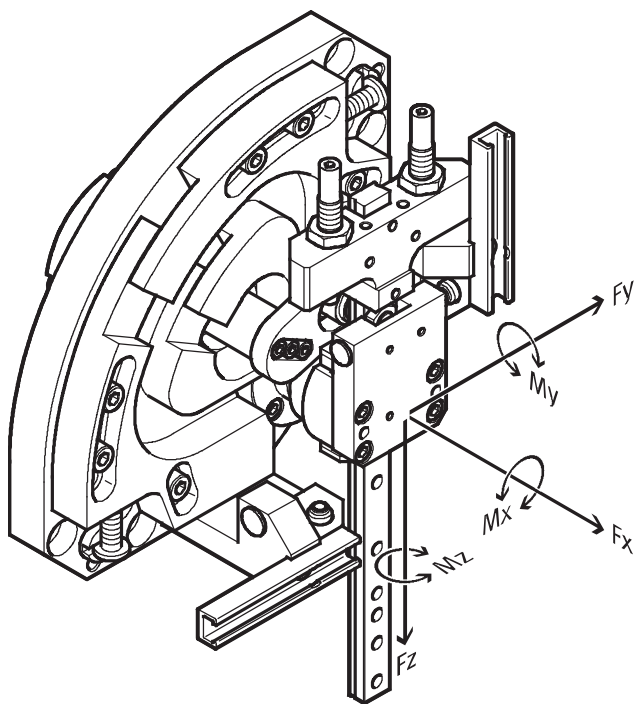
Handling modules HSW, pneumatic

Technical data

FESTO

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] $M_{xperm.}, M_{yperm.}, M_{zperm.}$	0.6	1.5	2.5

Handling modules HSW, pneumatic

Technical data

FESTO

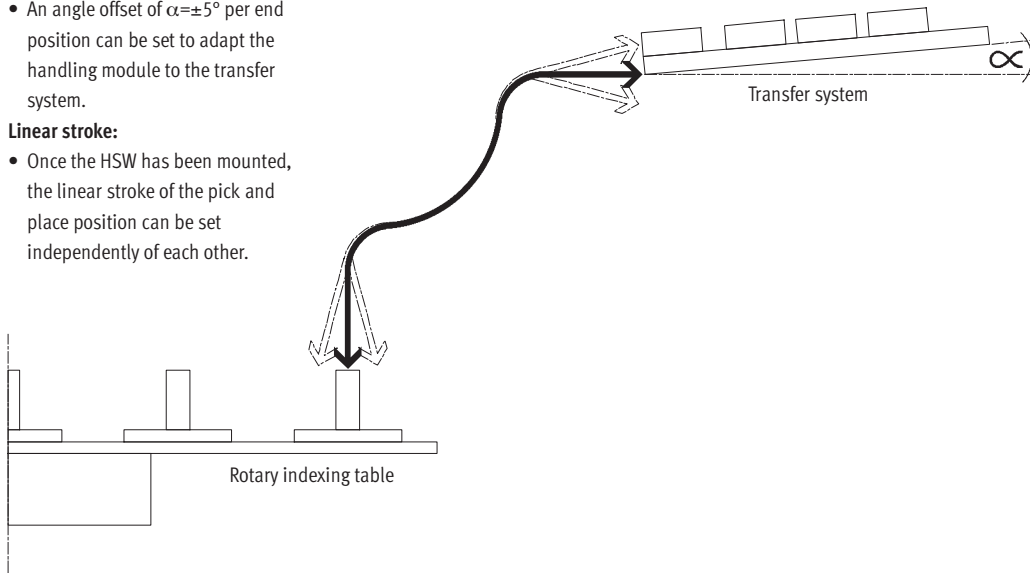
Stroke adjustment

Swivel angle:

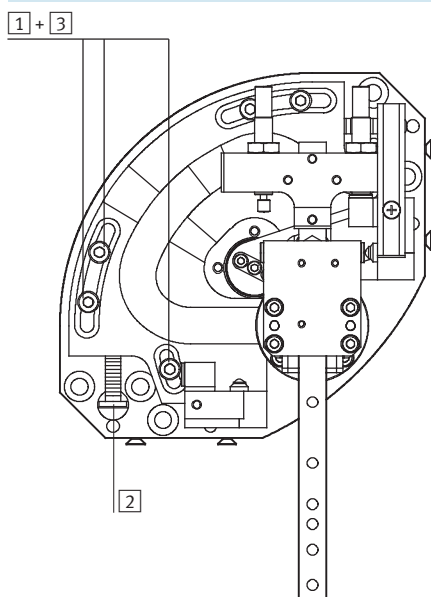
- An angle offset of $\alpha = \pm 5^\circ$ per end position can be set to adapt the handling module to the transfer system.

Linear stroke:

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



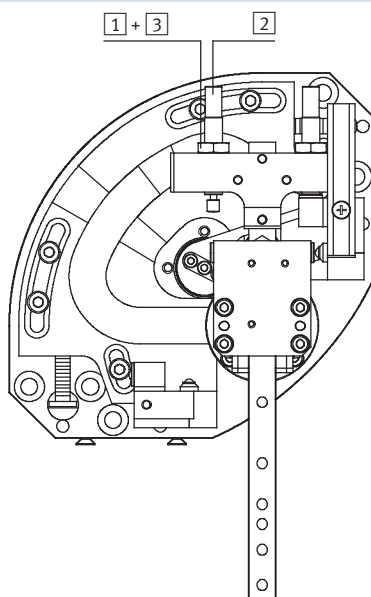
Swivel angle



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, pneumatic

Technical data

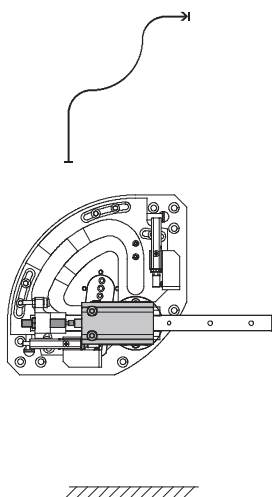
FESTO

Wait position module

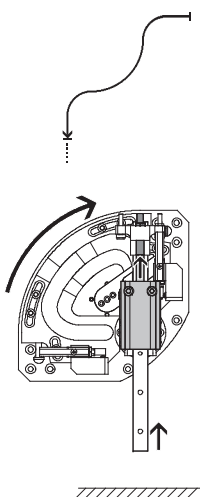
- Enables a movement to be paused before the end position, outside of the operating range (→ Step 2)
- The wait position module can be approached dynamically from the end position. This greatly reduces the cycle time
- Flexible adjustment within the adjustment range (working stroke) possible
- The wait 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

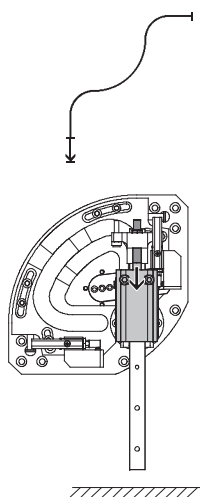
Step 1:
Handling module is in the horizontal end position.
Wait position module is retracted.



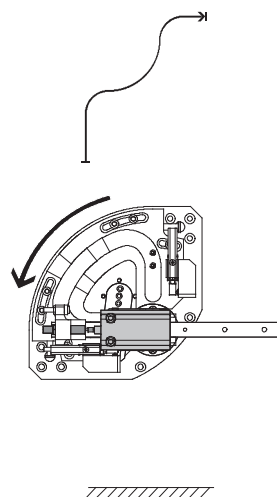
Step 2:
Handling module moves to the vertical end position.
Wait position module advances with time delay.
Handling module pauses outside the operating range.



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



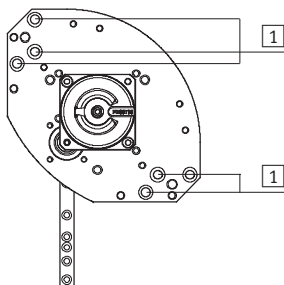
Step 4:
Handling module moves to the horizontal end position.



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

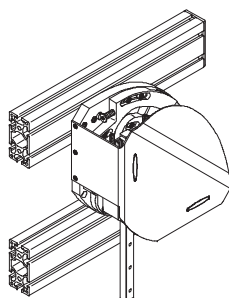
Mounting options

Directly via through-holes

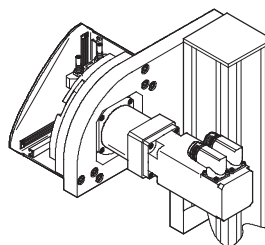


1 With or without centring rings

Via slot nuts on profile supports



User-specific



Note

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

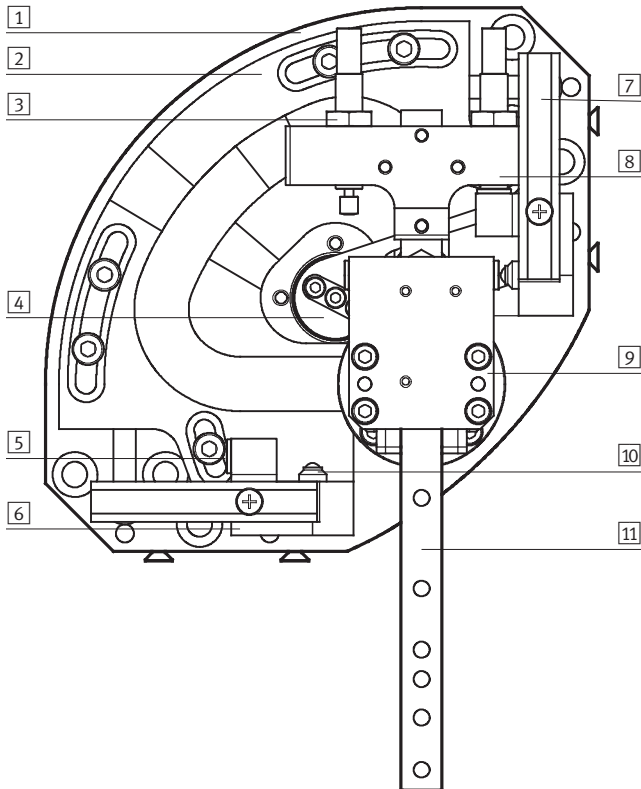
Handling modules HSW, pneumatic

Technical data

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		

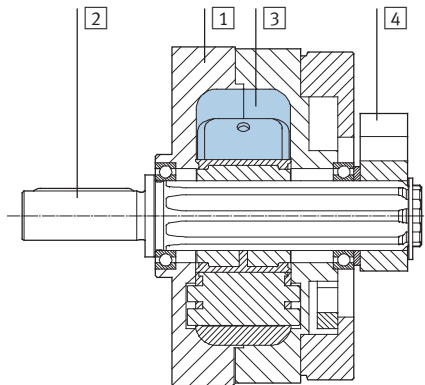
Handling modules HSW, pneumatic

Technical data

FESTO

Materials

Sectional view of swivel module DSM



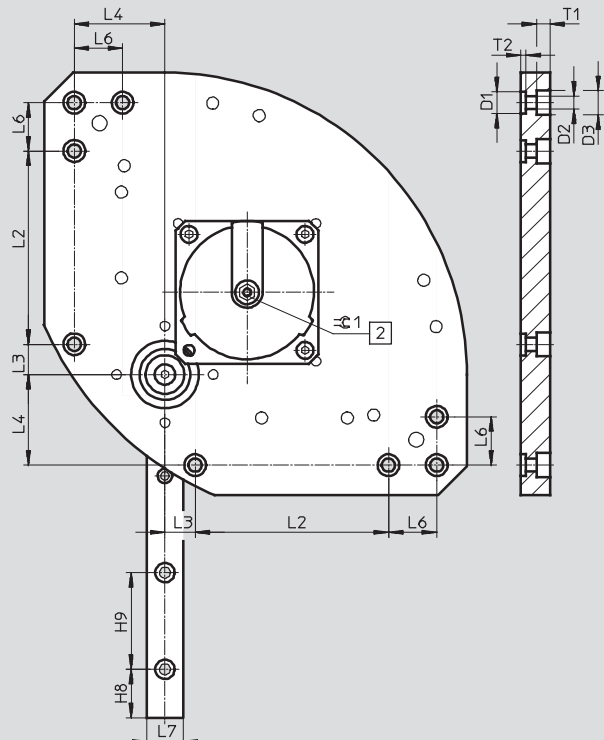
Swivel module		
1	Housing	Wrought aluminium alloy
2	Shaft	Steel with nickel-plated surface
3	Rotary vane	Fibreglass-reinforced plastic
4	Stop lever	Anodised aluminium
–	Cap	Fibreglass-reinforced plastic
	Seals	Polyurethane
	Note on materials	Free of copper, PTFE and silicone

Technical data

with swivel module DSM



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

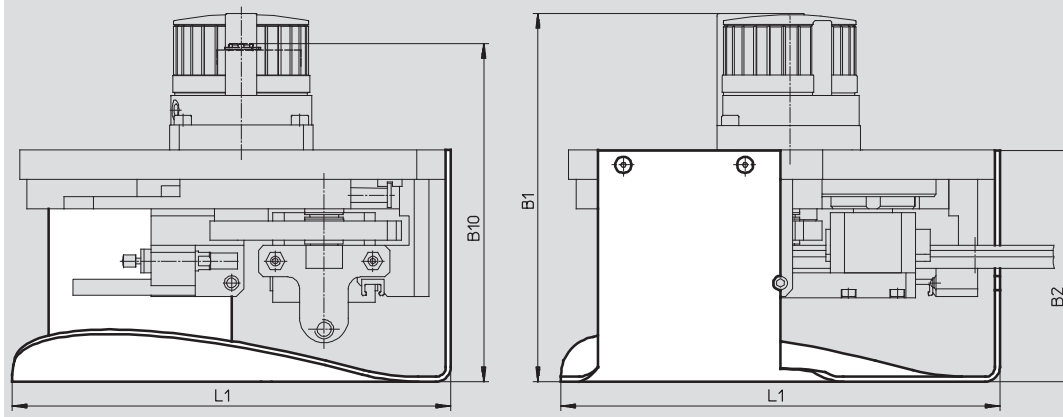
Technical data

FESTO

Dimensions

Download CAD Data → www.festo.com/us/cad

with swivel module DSM and protective cover



Size	B1	B2	B3	B4	B9	B10	D1 Ø	D2 Ø	D3 Ø	D7 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 Ø	EE	H1	H2	H3	H4 ¹⁾	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 ¹⁾		R2 ¹⁾	T3	≈C1	≈C2	≈C3	≈C4
		±3	AW ±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

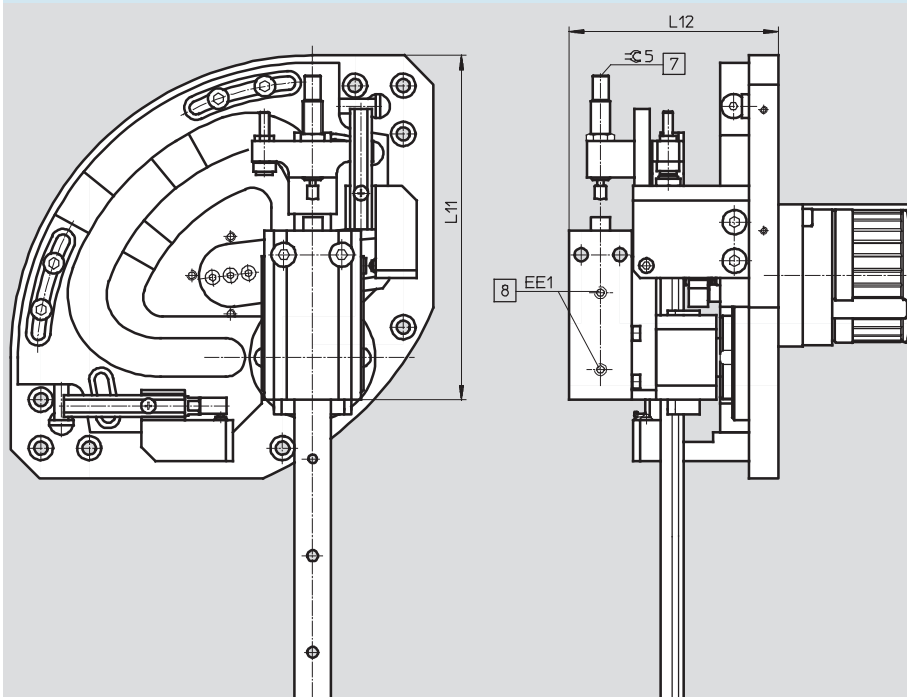
Technical data

FESTO

Dimensions

Download CAD Data → www.festo.com/us/cad

with wait position module



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

Size	EE1	L11 max.	L12 ±2	5
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 Part No.	Type	12 Part No.	Type	16 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-12-AP-SD-AW	562564	HSW-16-AP-SD-AW

Type codes



Handling modules HSW, electrical

Technical data

FESTO

Function

[www.festo.com/en/
Spare_parts_service](http://www.festo.com/en/Spare_parts_service)



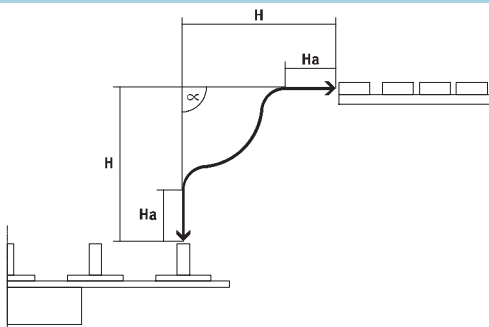
- N- Size
10, 12 and 16
- Y- Swivel angle
80 ... 100
- T- Stroke range
90 ... 175



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 (see declaration of conformity)	In accordance with EU EMC directive

Stroke [mm] and angle range [°]				
Size		10	12	16
Max. linear stroke at 90°	H	90/90	142/142	175/175
Working stroke	Ha	9 ... 15	15 ... 25	20 ... 35
Angle range	α	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 ¹⁾	30	35	50

1) Due to the pretension force on the guide

Handling modules HSW, electrical

Technical data

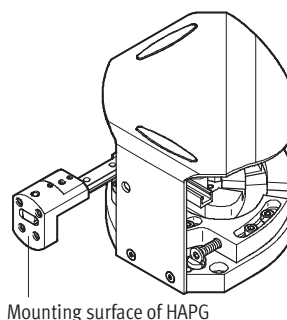
Weight [g]			
Size	10	12	16
HSW-...-AE	2,000	4,500	8,900
HSW-...-AE-SD	2,110	4,700	9,200
HSW-...-AE-GE	2,410	5,000	10,000
HSW-...-AE-SD-GE	2,520	5,200	10,300

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.

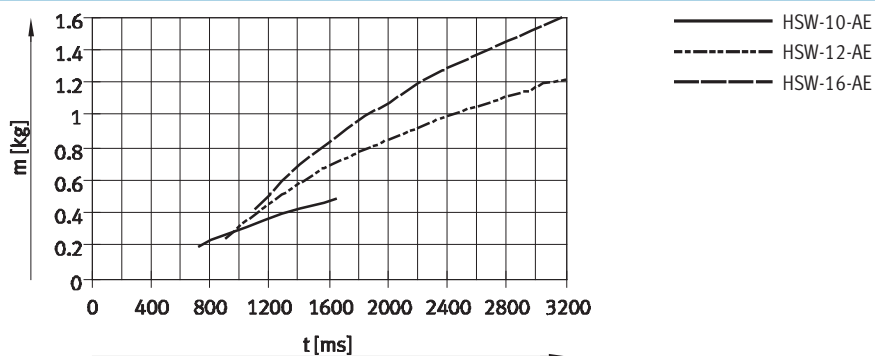


Size		10	12	16
Repetition accuracy	At end positions	± 0.02		
	Intermediate positions	< 2		

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)



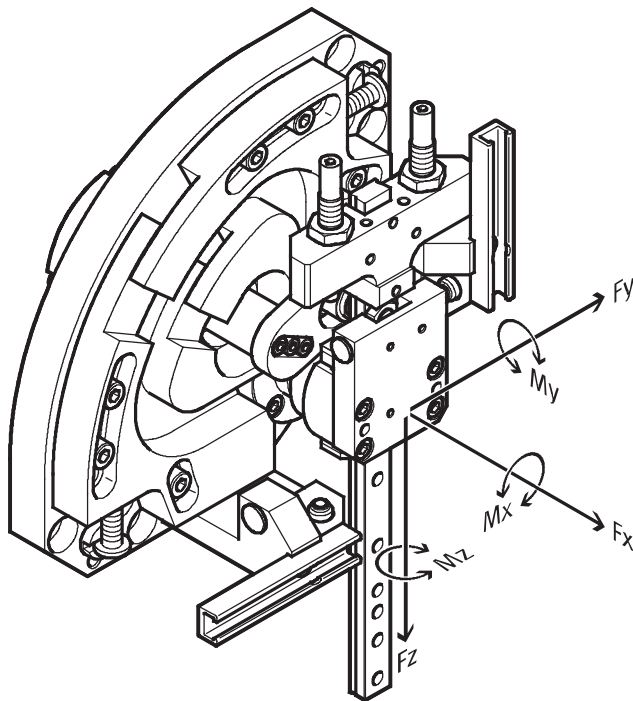
Handling modules HSW, electrical

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
$M_{xperm.}, M_{yperm.}, M_{zperm.}$			

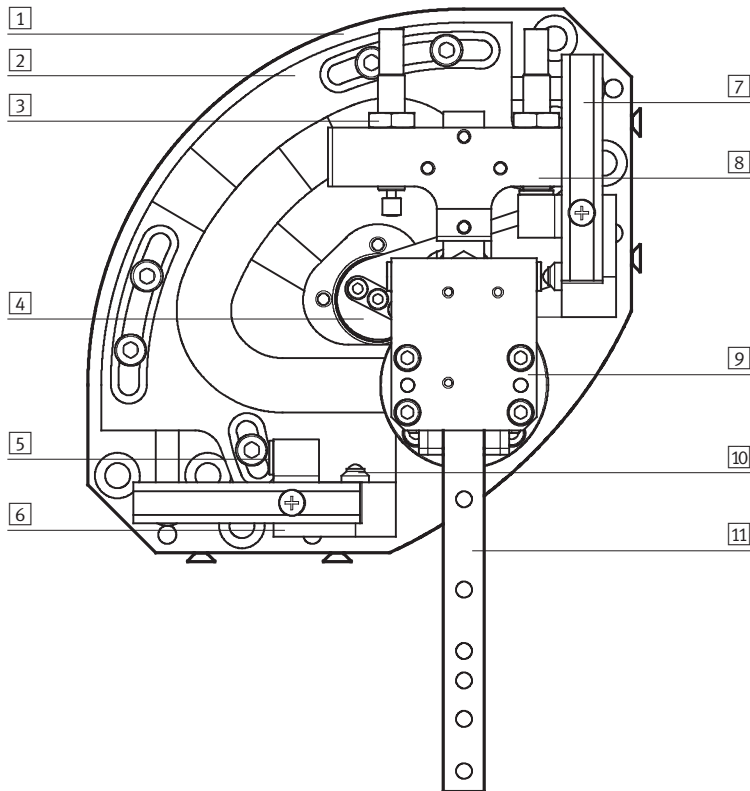
Handling modules HSW, electrical

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

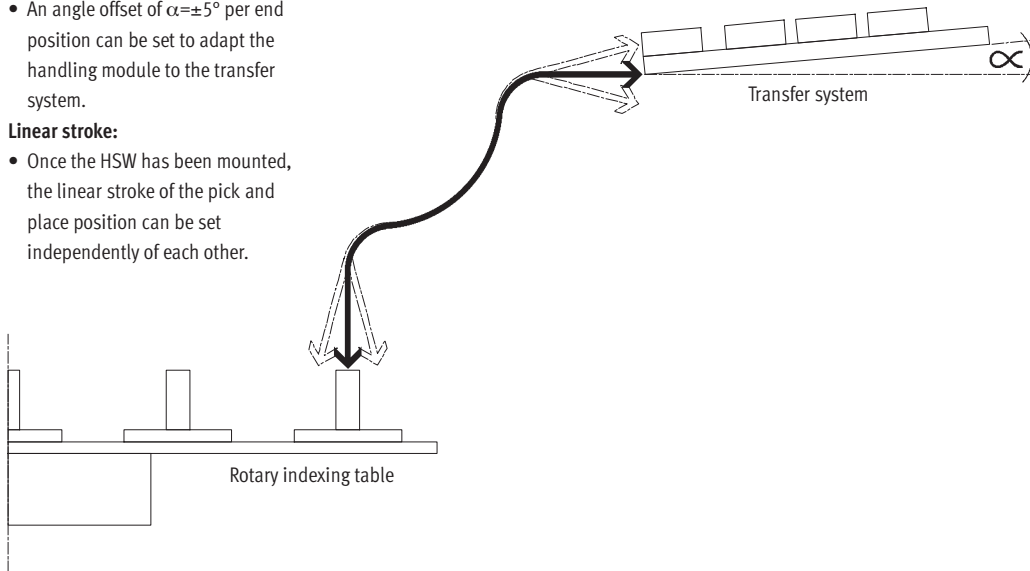
Stroke adjustment

Swivel angle:

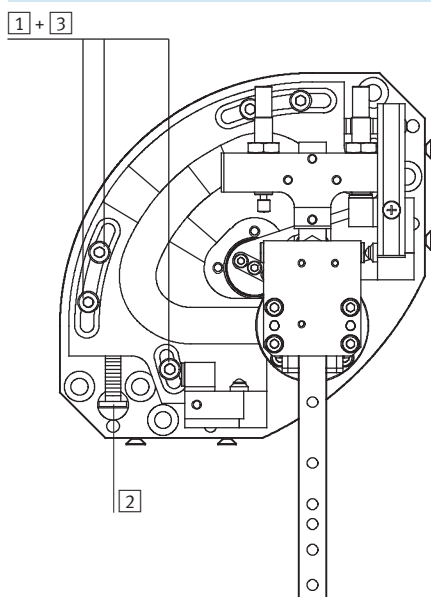
- An angle offset of $\alpha = \pm 5^\circ$ per end position can be set to adapt the handling module to the transfer system.

Linear stroke:

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



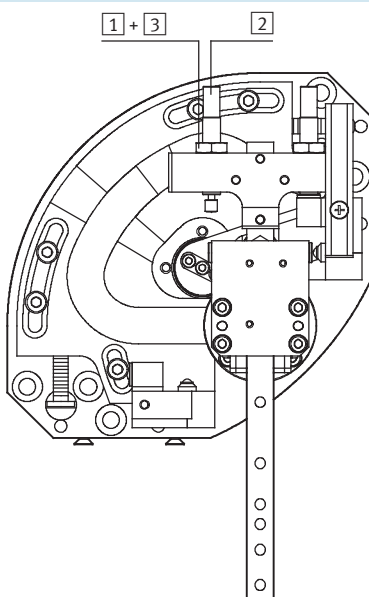
Swivel angle



Procedure:

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

Linear stroke



Procedure:

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

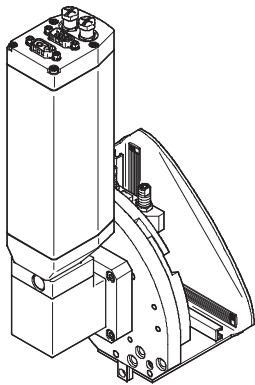
Handling modules HSW, electrical

Technical data

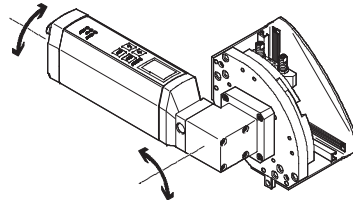
FESTO

Motor mounting variants

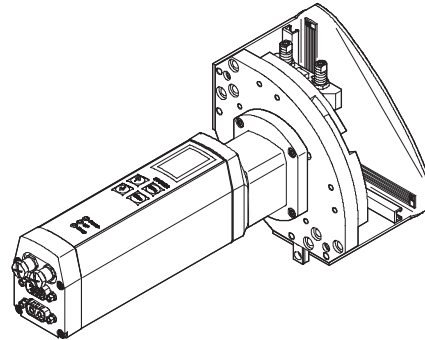
Motor pointing upwards/to side



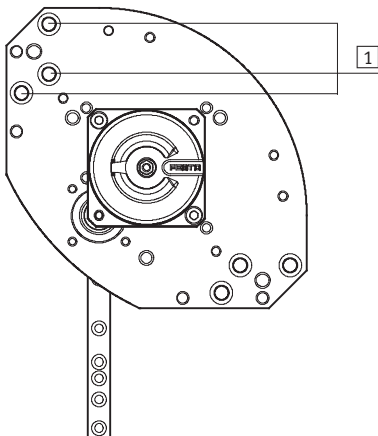
Control panel and access to the connections can be rotated according to space requirements.



Motor towards rear



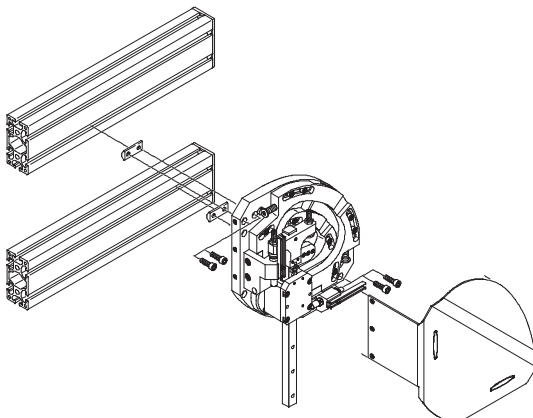
Mounting options



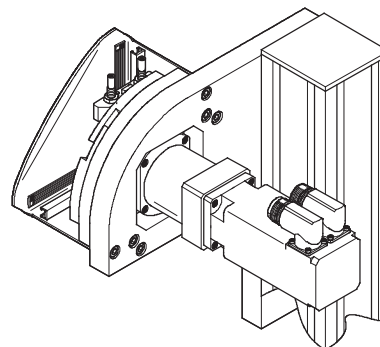
1 Directly via through-holes

Examples:

Via slot nuts on profile supports



User-specific



Handling modules HSW, electrical

Technical data

FESTO

Motor unit MTR-DCI-...-HM



General technical data			
➔ Internet: mtr-dci			
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		

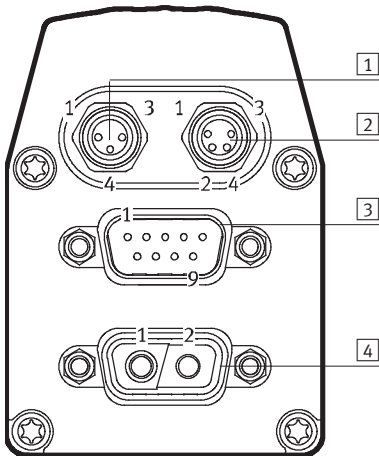
Electrical data			
➔ Internet: mtr-dci			
Type	MTR-DCI-32-...-HM	MTR-DCI-42-...-HM	MTR-DCI-52-...-HM
For handling module	HSW-10-...-AE	HSW-12-...-AE	HSW-16-...-AE
Nominal voltage	[V DC]	24 ±10%	
Nominal current (motor)	[A]	0.73	2
Peak current	[A]	2.1	3.8
Nominal power (motor)	[W]	17.5	48
Max. current (digital logic outputs)	[mA]	200	200
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

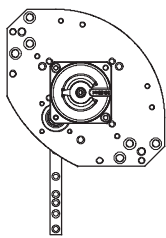
Simple solution for your application

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

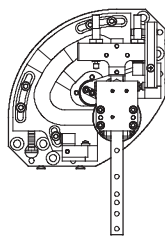
Step 1: Mount the handling module



- Wide choice of mounting options

→ 25

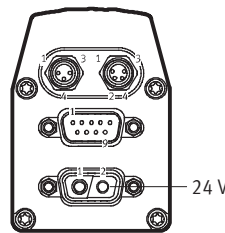
Step 2: Mechanically adjust the end positions



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

→ 24

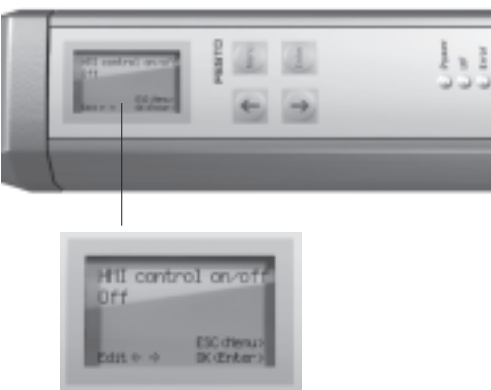
Step 3: Connect the 24 V voltage supply



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

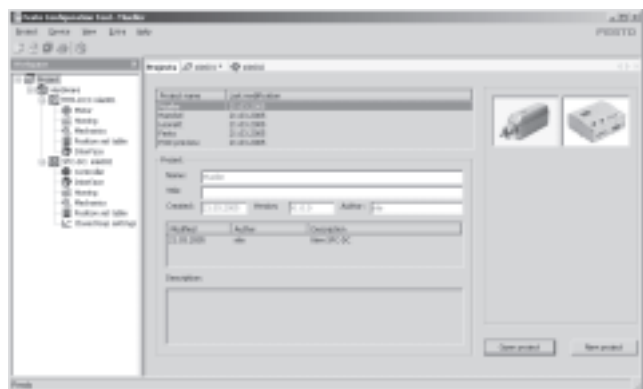
→ 26

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



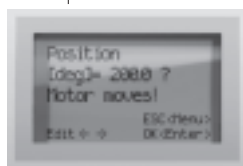
- All the drives in a system can be managed and archived in a common project
- Project and data management for all supported device types
- Simple to use thanks to graphically supported parameter entry
- Universal mode of operation for all drives
- Working offline at your desk or online at the machine

Handling modules HSW, electrical

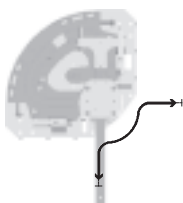
Technical data

FESTO

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

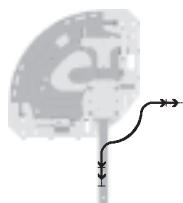


HSW mode 1



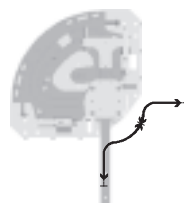
- Precise travel to the mechanical end position

HSW mode 2



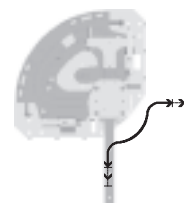
- Additional adjustable wait position module directly above workpiece/workpiece carrier
- Handling of parts with different heights
- Insertion procedures at different speeds

HSW mode 3



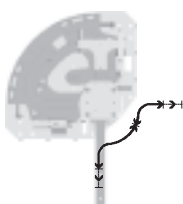
- Additional ejector station for reject parts or quality inspection
- Precise travel to end position via setup position

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)

Technical data

with motor unit pointing upwards



Handling modules HSW, electrical

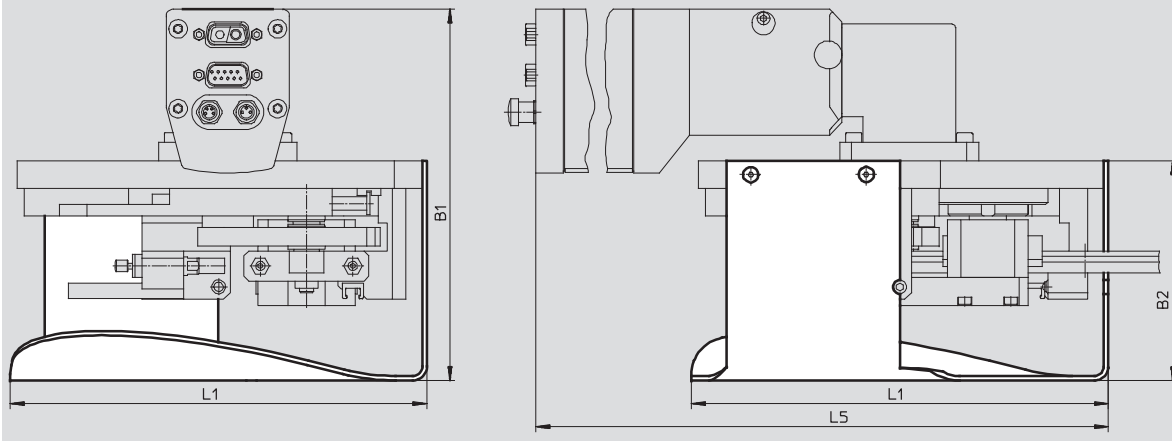
Technical data

FESTO

Dimensions

Download CAD Data → www.festo.com/us/cad

with motor unit pointing upwards and protective cover



Size	B1 ±3	B2 ±1	B3 ±0.5	B4	B5	B6	D1 Ø H7	D2 Ø	D3 Ø	D7 Ø	D8 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 ±0.3	H2 ±0.2	H4 ¹⁾ ±1	H5	H6 ±0.4	H7 ±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 ±2	L2 ±0.2	L3 ±0.2	L4 ±0.2	L5 ±3	L6 ±0.05	L7	L8 ±2	L9 ±3
10	5	123	56.5	49	31	276	20	9 _{-0.02}	62	121
12	5	180	80	12.5	37.5	357	20	15 _{-0.02}	60	128
16	5	219	100	12	50	420	20	15 _{±0.05}	71.5	156

Size	R1 ¹⁾ ±3	R2 ¹⁾ ±3	T1	T2 +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

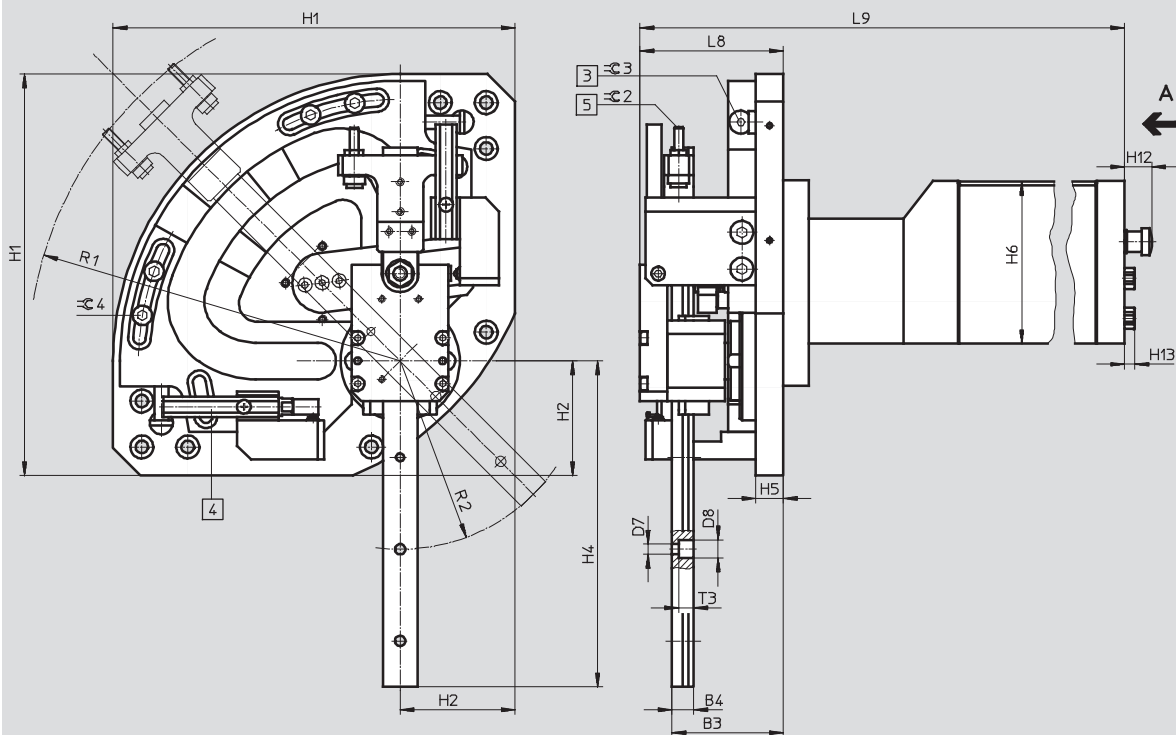
1) Maximum stroke and 90° angle

Technical data

FESTO

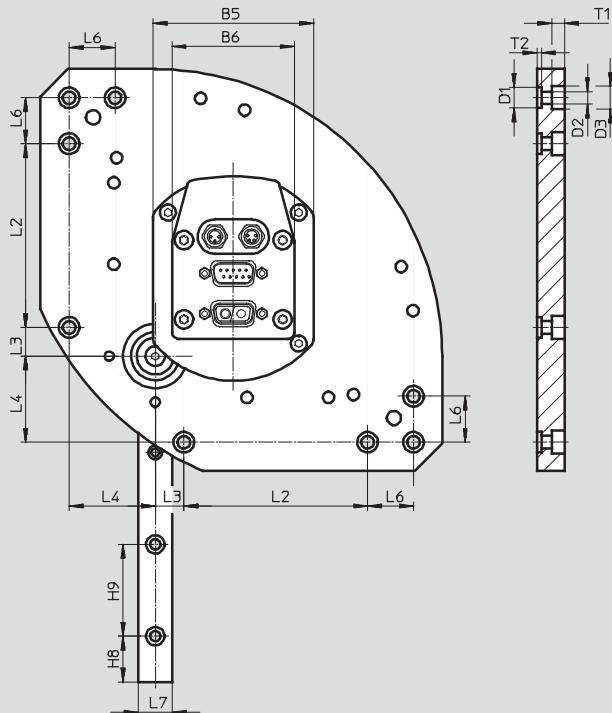
Download CAD Data → www.festo.com/us/cad

Download CAD Data → www.festo.com/us/cad



HSW-12

HSW-16



- 3 Angle adjustment for slotted guide plate
- 4 Sensor slot for SME/SMT-8
- 5 Stroke adjustment

Handling modules HSW, electrical

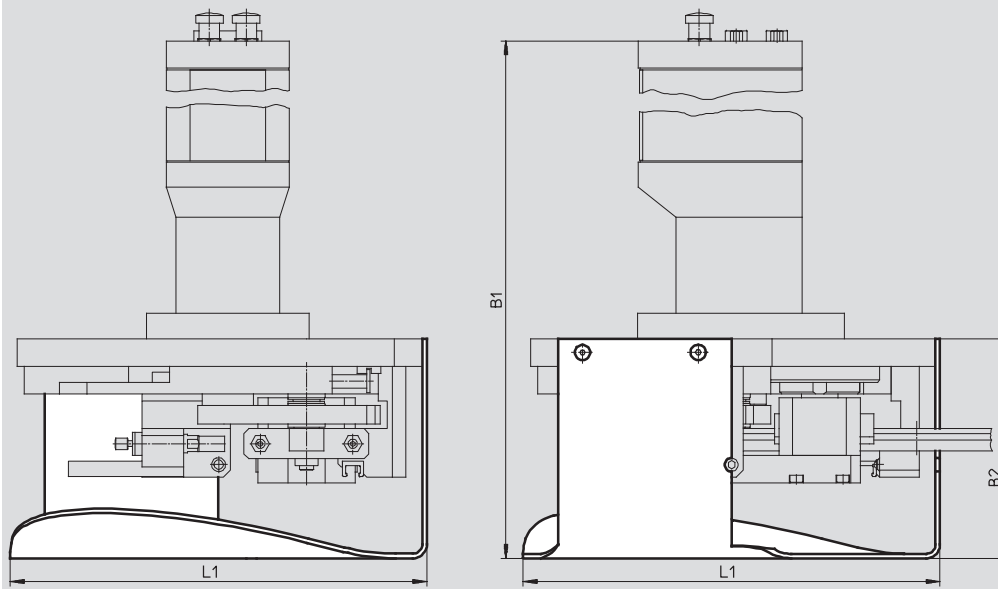
Technical data

FESTO

Dimensions

Download CAD Data → www.festo.com/us/cad

with motor unit towards the rear and protective cover



Size	B1 ±3	B2 ±1	B3 ±0.5	B4	B5	B6	D1 Ø H7	D2 Ø	D3 Ø	D7 Ø
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 Ø	H1 ±0.3	H2 ±0.2	H4 ¹⁾ ±1	H5	H6 ±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 ±2	L2 ±0.2	L3 ±0.2	L4 ±0.2	L6 ±0.05	L7	L8 ±2	L9 ±3
10	123	56.5	49	31	20	9 _{-0.02}	62	245
12	180	80	12.5	37.5	20	15 _{-0.02}	60	290
16	219	100	12	50	20	15 _{±0.05}	71.5	328.5

Size	R1 ¹⁾ ±3	R2 ¹⁾ ±3	T1	T2 ±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

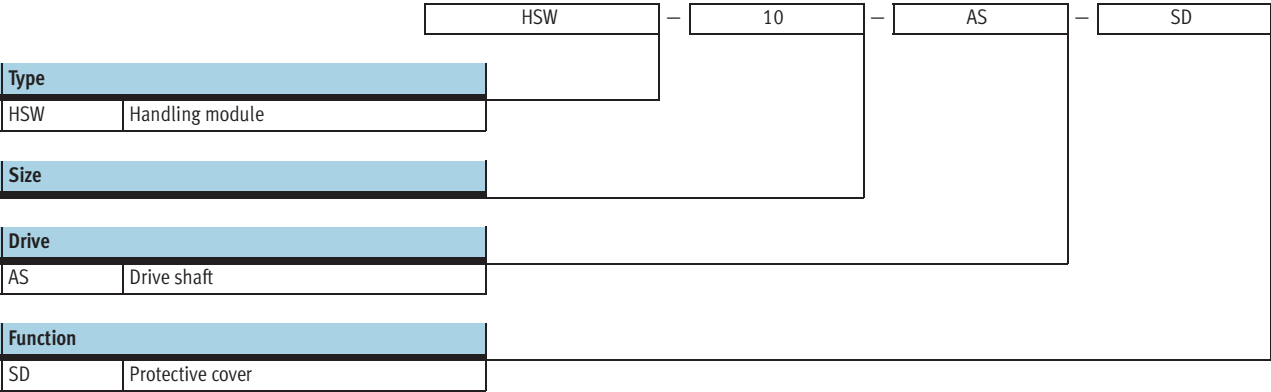
FESTO

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

FESTO

Technical data

Function

[www.festo.com/en/
Spare_parts_service](http://www.festo.com/en/Spare_parts_service)



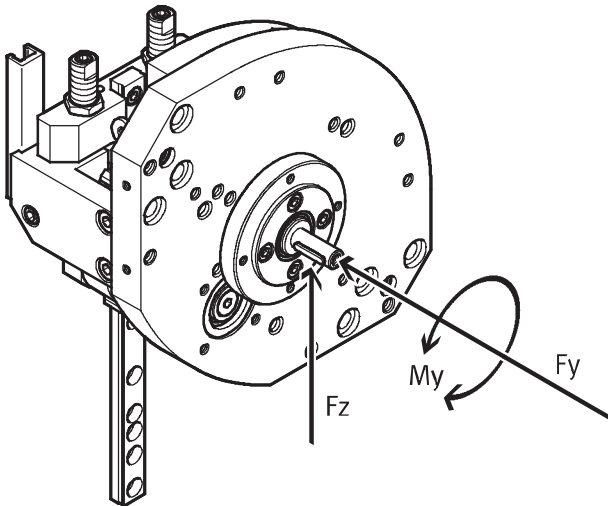
- N- Size
10, 12 and 16
- Y- Swivel angle
80 ... 100
- T- Stroke range
90 ... 175



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.

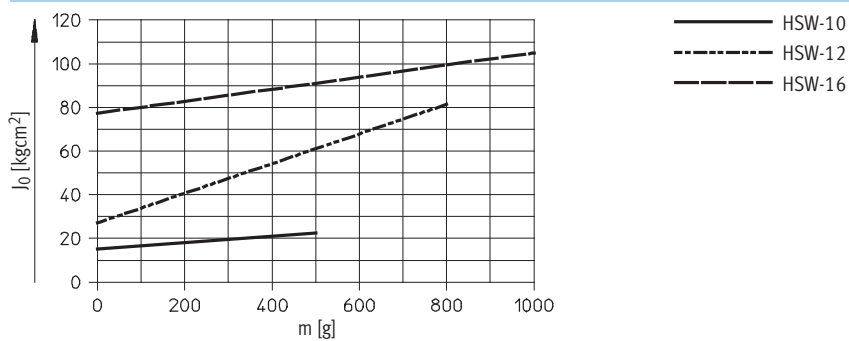
Characteristic load values			
Size	10	12	16
Max. axial force $F_{Yperm.}$ [Nm]	10	18	30
Max. radial force $F_{Zperm.}$ [Nm]	30	45	75
Max. drive torque $M_{Yperm.}$ [Nm]	0.85	1.25	2.5

Handling modules HSW, without drive

Technical data

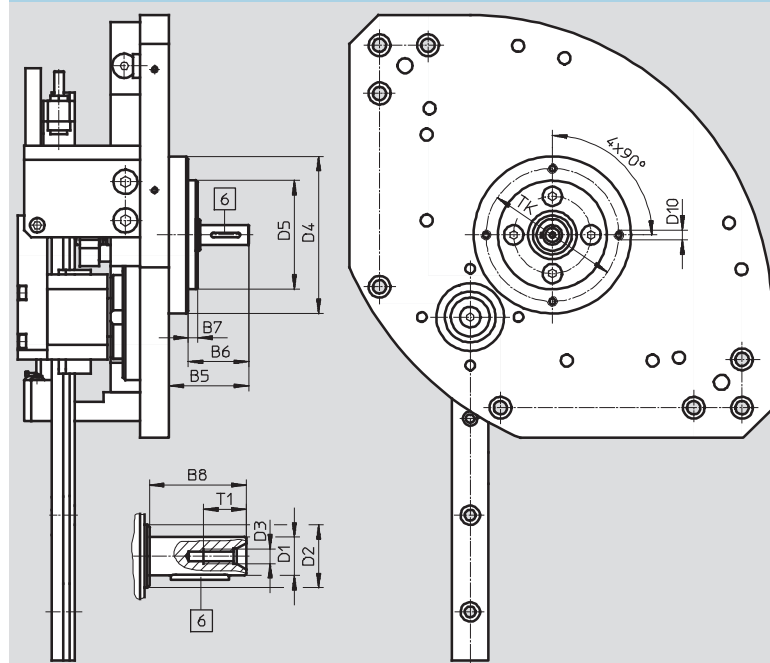
FESTO

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



Basic dimensions

→ 16

6 Woodruff key

Size	B5	B6	B7	B8	D1 Ø g7	D2 Ø	D3	D4 Ø	D5 Ø f8	D10	T1	TK ±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 Part No.	Type	12 Part No.	Type	16 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

584.Handling modules HSW

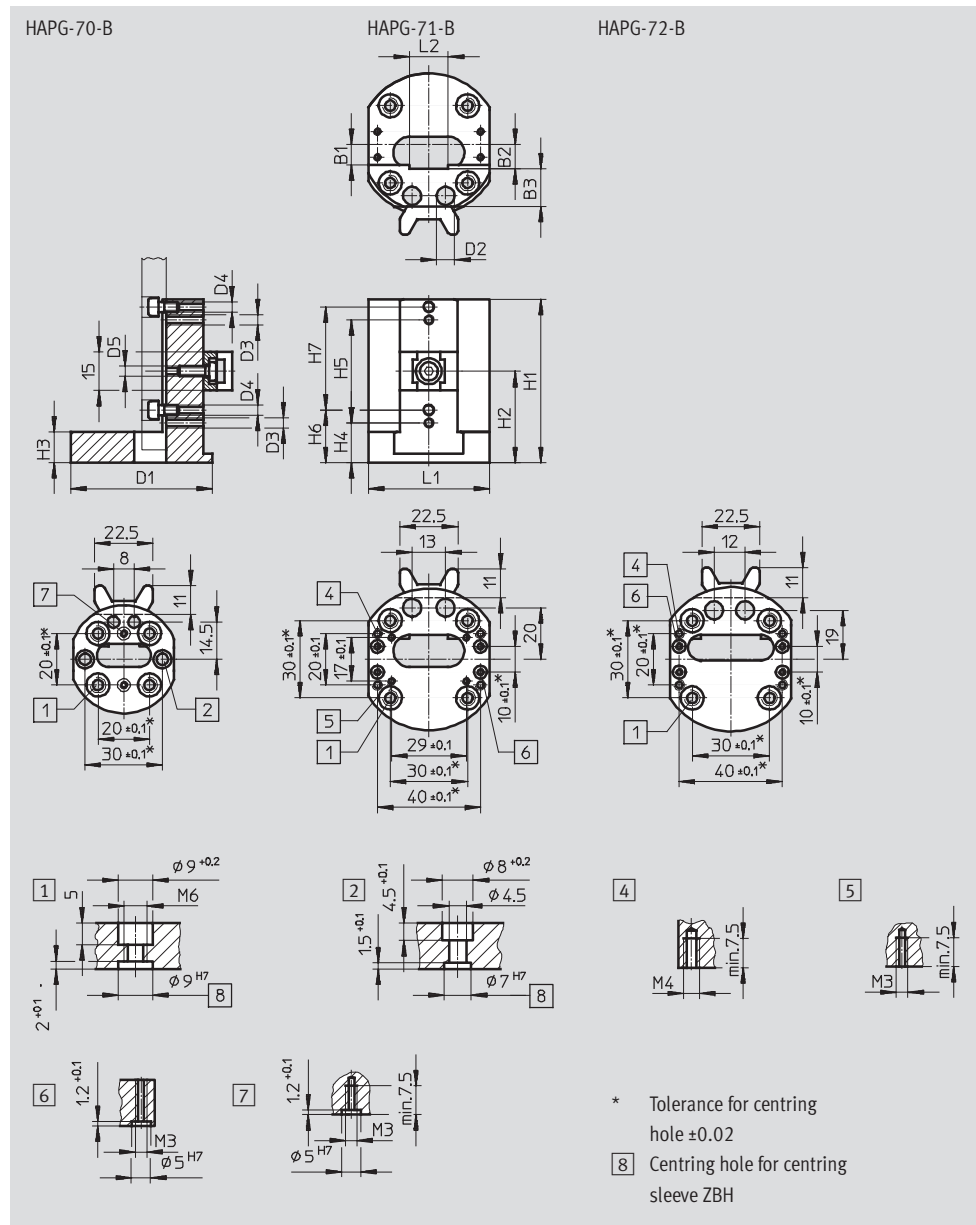
Accessories

FESTO

585.Adapter kit HAPG-B

Material:

Wrought aluminium alloy, anodised



Dimensions and ordering data										
For size	B1	B2	B3	D1	D2	D3	D4	D5	H1	H2
		± 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
		$+0.2$	± 0.2	$+0.2$	± 0.2		$+0.1$	[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

586.Handling modules HSW

FESTO

Accessories

587.Installation kit MKRP

Material:

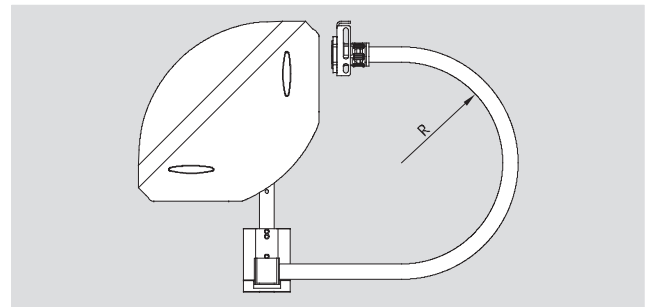
Conduit/fitting: Polyamide

Reducer/lock nut:

Nickel-plated brass

Adapter plate/bracket:

Powder-coated steel



Ordering data					
For size	Max. bending radius for conduit ¹⁾ R [mm]	Tubing I.D. [mm]	Weight [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%

588.Cover kit BSD-HSW

Material:

Wrought aluminium alloy, anodised



Dimensions → 17

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

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

Material:

Wrought aluminium alloy, anodised



Dimensions → 17

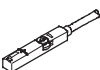
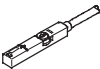
Ordering data			
For size	Weight [g]	Part No.	Type
10	110	562589	BAW-HSW-10
12	220	562590	BAW-HSW-12
16	400	562591	BAW-HSW-16

590.Handling modules HSW

Accessories

FESTO

591.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	

592.Ordering data – Proximity sensors for T-slot, magneto-resistive					Technical data ➔ Internet: smt	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	2.5	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

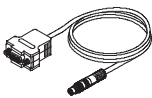
593.Ordering data – Proximity sensors for T-slot, magnetic reed						Technical data → Internet: sme	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, flush with cylinder profile	Contacting	Cable, 3-wire	2.5	543862	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	

594.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	

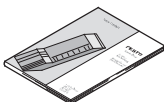
595.Handling modules HSW

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
	The operator's package: – CD-ROM – With user's manual in the languages DE, EN, ES, FR, IT, SV – With configuration package FCT (Festo Configuration Tool) – Brief description The operator's package is included in the delivery.	541951	P.BP-HSP_HSW-AE

Ordering data – Documentation for HSW-AE				
	Brief description	Language	Part No.	Type
	Description User's manual in paper form is not included in the scope of delivery.	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

Product Range and Company Overview

A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



Custom Automation Components
Complete custom engineered solutions



Custom Control Cabinets
Comprehensive engineering support and on-site services



Complete Systems
Shipment, stocking and storage services

The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



Electromechanical
Electromechanical actuators, motors, controllers & drives



Pneumatics
Pneumatic linear and rotary actuators, valves, and air supply



PLCs and I/O Devices
PLC's, operator interfaces, sensors and I/O devices

Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

Quality Assurance, ISO 9001 and ISO 14001 Certifications

Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.



© Copyright 2008, Festo Corporation. While every effort is made to ensure that all dimensions and specifications are correct, Festo cannot guarantee that publications are completely free of any error, in particular typing or printing errors. Accordingly, Festo cannot be held responsible for the same. For Liability and Warranty conditions, refer to our "Terms and Conditions of Sale", available from your local Festo office. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of Festo. All technical data subject to change according to technical update.



Printed on recycled paper at New Horizon Graphic, Inc., FSC certified as an environmentally friendly printing plant.

Festo North America

Festo Regional Contact Center

5300 Explorer Drive
Mississauga, Ontario L4W 5G4
Canada

USA Customers:

For ordering assistance,

Call: 1.800.99.FESTO (1.800.993.3786)

Fax: 1.800.96.FESTO (1.800.963.3786)

Email: customer.service@us.festo.com

For technical support,

Call: 1.866.GO.FESTO (1.866.463.3786)

Fax: 1.800.96.FESTO (1.800.963.3786)

Email: product.support@us.festo.com

Canadian Customers:

Call: 1.877.GO.FESTO (1.877.463.3786)

Fax: 1.877.FX.FESTO (1.877.393.3786)

Email: festo.canada@ca.festo.com

USA Headquarters

Festo Corporation
395 Moreland Road
P.O. Box 18023
Hauppauge, NY 11788, USA
www.festo.com/us

USA Sales Offices

Appleton

North 922 Tower View Drive, Suite N
Greenville, WI 54942, USA

Boston

120 Presidential Way, Suite 330
Woburn, MA 01801, USA

Chicago

1441 East Business Center Drive
Mt. Prospect, IL 60056, USA

Dallas

1825 Lakeway Drive, Suite 600
Lewisville, TX 75057, USA

Detroit – Automotive Engineering Center

2601 Cambridge Court, Suite 320
Auburn Hills, MI 48326, USA

New York

395 Moreland Road
Hauppauge, NY 11788, USA

Silicon Valley

4935 Southfront Road, Suite F
Livermore, CA 94550, USA

United States



USA Headquarters, East: Festo Corp., 395 Moreland Road, Hauppauge, NY 11788

Phone: 1.631.435.0800; Fax: 1.631.435.8026;

Email: info@festo-usa.com

www.festo.com/us

Canada



Headquarters: Festo Inc., 5300 Explorer Drive, Mississauga, Ontario L4W 5G4

Phone: 1.905.624.9000; Fax: 1.905.624.9001;

Email: festo.canada@ca.festo.com

www.festo.ca

Mexico



Headquarters: Festo Pneumatic, S.A., Av. Ceylán 3, Col. Tequesquahuac,
54020 Tlalneapantla, Edo. de México

Phone: 011 52 [55] 53 21 66 00; Fax: 011 52 [55] 53 21 66 65;

Email: festo.mexico@mx.festo.com

www.festo.com/mx

Central USA

Festo Corporation
1441 East Business
Center Drive
Mt. Prospect, IL 60056, USA
Phone: 1.847.759.2600
Fax: 1.847.768.9480



Western USA

Festo Corporation
4935 Southfront Road,
Suite F
Livermore, CA 94550, USA
Phone: 1.925.371.1099
Fax: 1.925.245.1286



Festo Worldwide

Argentina Australia Austria Belarus Belgium Brazil Bulgaria Canada Chile China Colombia Croatia Czech Republic Denmark
Estonia Finland France Germany Great Britain Greece Hong Kong Hungary India Indonesia Iran Ireland Israel Italy Japan Latvia
Lithuania Malaysia Mexico Netherlands New Zealand Norway Peru Philippines Poland Romania Russia Serbia Singapore
Slovakia Slovenia South Africa South Korea Spain Sweden Switzerland Taiwan Thailand Turkey Ukraine United States Venezuela

www.festo.com