Linear modules HMP

FESTO

- Precision backlash-free guide system
- Infinitely adjustable end stops
- Adjustable end-position cushioning

Linear modules HMP

Key features

At a glance

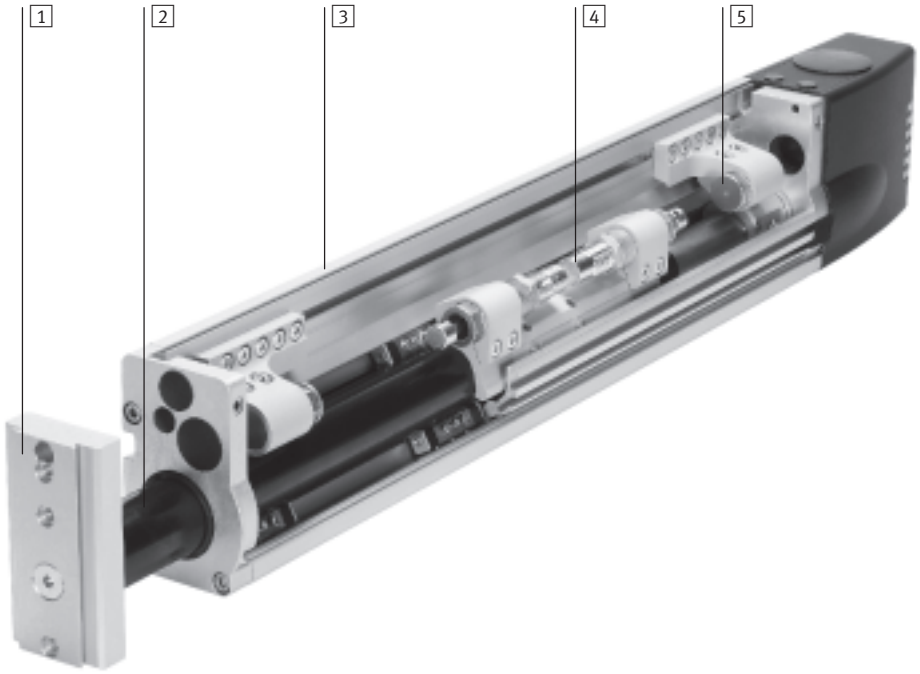
New

- Sturdier
- Optimised end stop system
- Optimised intermediate position module
- Minimised susceptibility to wear
- One-way flow control valves that can be externally adjusted
- Integrated sensor strip

- Diameters of 16 ... 32 mm
- Stroke lengths of 50 ... 400 mm
- Extremely rigid basic profile
- Infinitely adjustable end stops
- Rotatable yoke plate
- Integrated clamping unit
- Precision backlash-free guide system
- Freely adjustable intermediate position
- Adjustable end-position cushioning

- Integrated sensors:
  - Sensor strip for proximity sensors for end-position sensing
  - Mounting slot for proximity sensors for position sensing
- Functional end cap:
  - Pneumatic interface
  - Electrical interface

- Highly flexible thanks to various mounting and assembly options:
  - Basic profile
  - Yoke plate
- Large selection of adapters for:
  - Drives
  - Grippers
- Innovative and user-friendly installation system



1 Yoke plate
Can be turned to any angle from 0 to 360°. The yoke plate cannot be turned if combined with the clamping unit. Drives and grippers can be mounted on the yoke plate by means of adapter kits (direct mounting or dovetail connections).

2 Guide system
Extremely high rigidity thanks to the hardened steel guide barrel which is supported in pre-loaded and backlash-free recirculating ball bearing guides guaranteeing the utmost precision.

3 Basic profile
Drives and basic components can be attached to the rigid light alloy profile using adapter, connector and component kits.

4 End-position cushioning.
Extremely dynamic operation thanks to hydraulic shock absorbers which cushion the piston sleeve at the end positions.

5 End stop
Any desired intermediate position can be set between minimum and maximum stroke (plus the strokes of the shock absorbers).

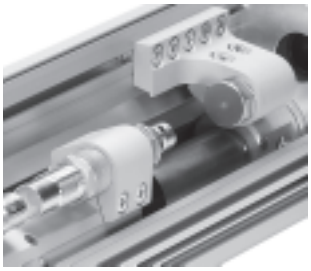
Linear modules HMP

Key features

Wide choice of variants

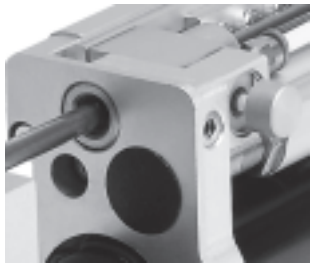
End stop

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



Clamping unit

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



End cap

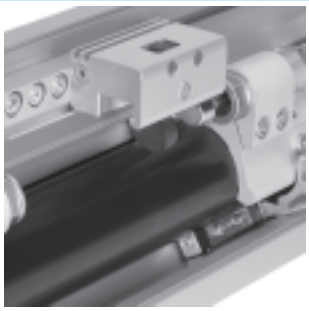
Connections can be made on the top and bottom of the end cap. Pneumatic tubing and electrical cables can be bundled and routed through the end cap via conduits.

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

Intermediate position module

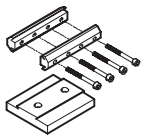
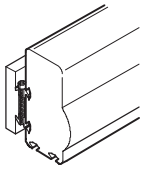
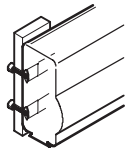
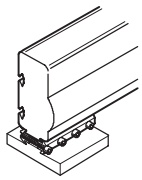
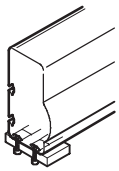
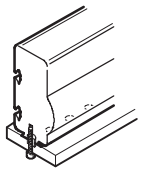
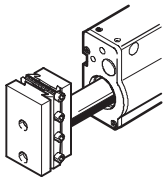
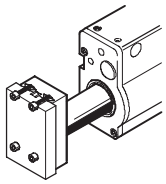
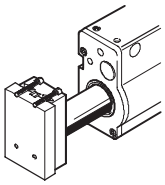
The intermediate position module permits advancing to an additional position between the two end positions. This is done by swivelling a lever into the traversing range of the moving stop on the guide tube.

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



Linear modules HMP

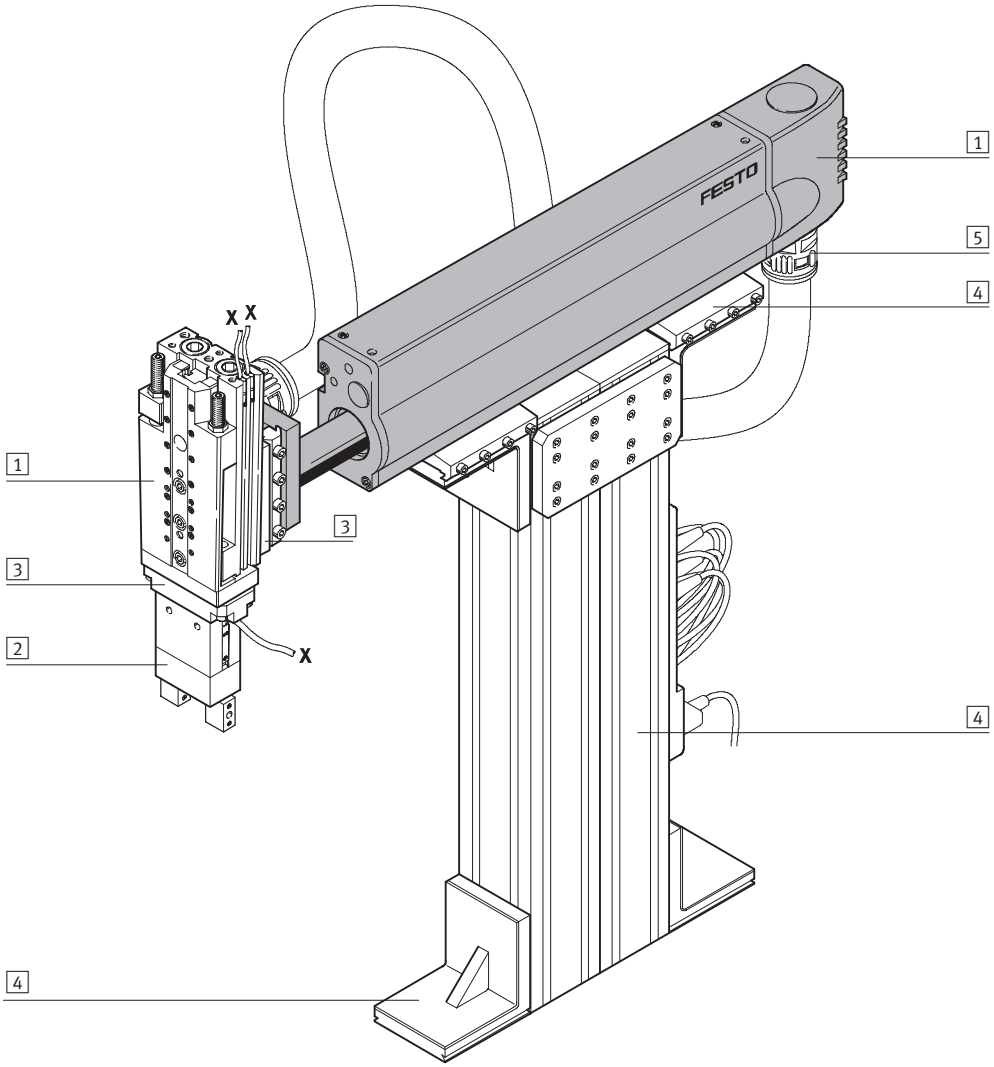
Key features

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

Linear modules HMP

System example

System product for handling and assembly technology



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

Linear modules HMP

Peripherals overview

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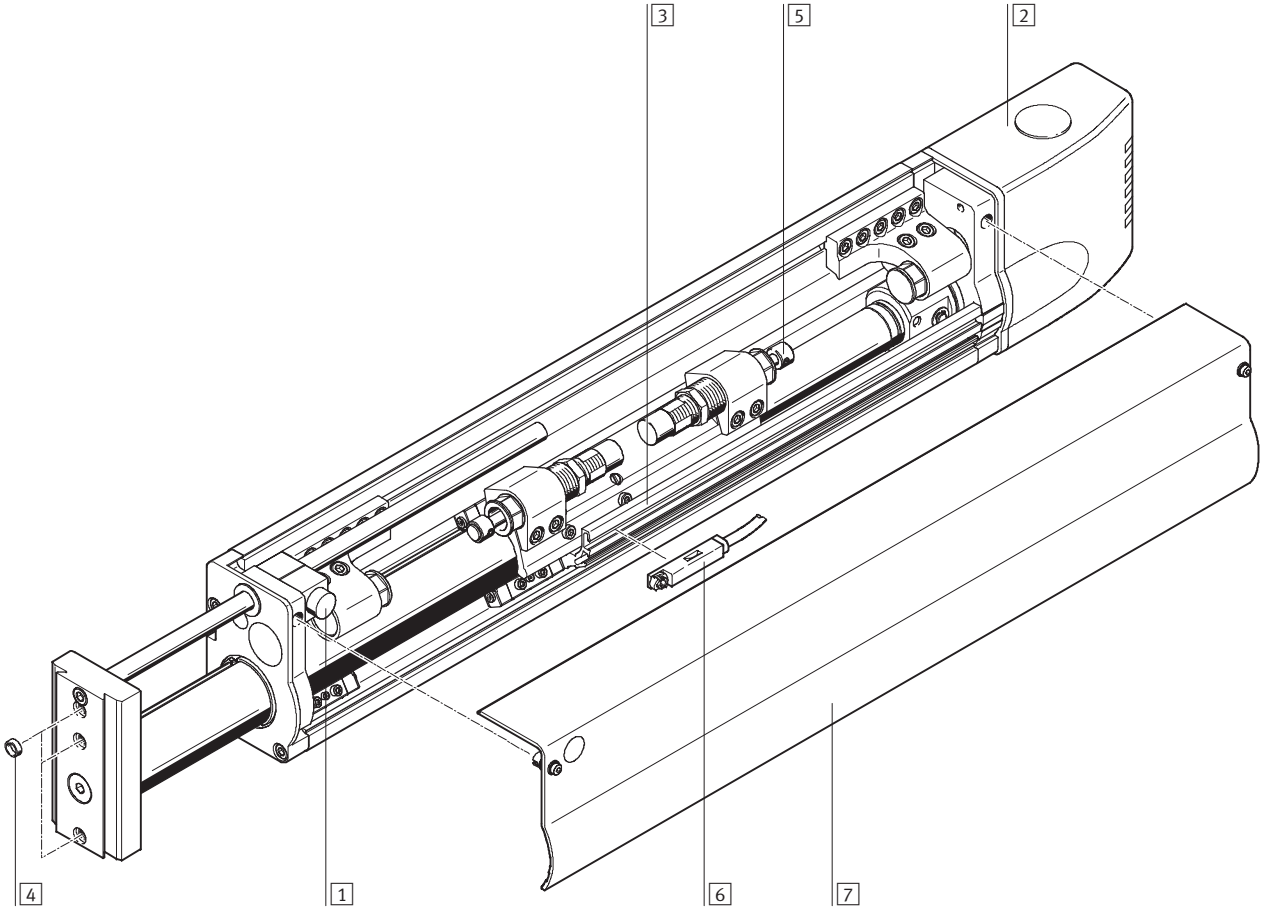
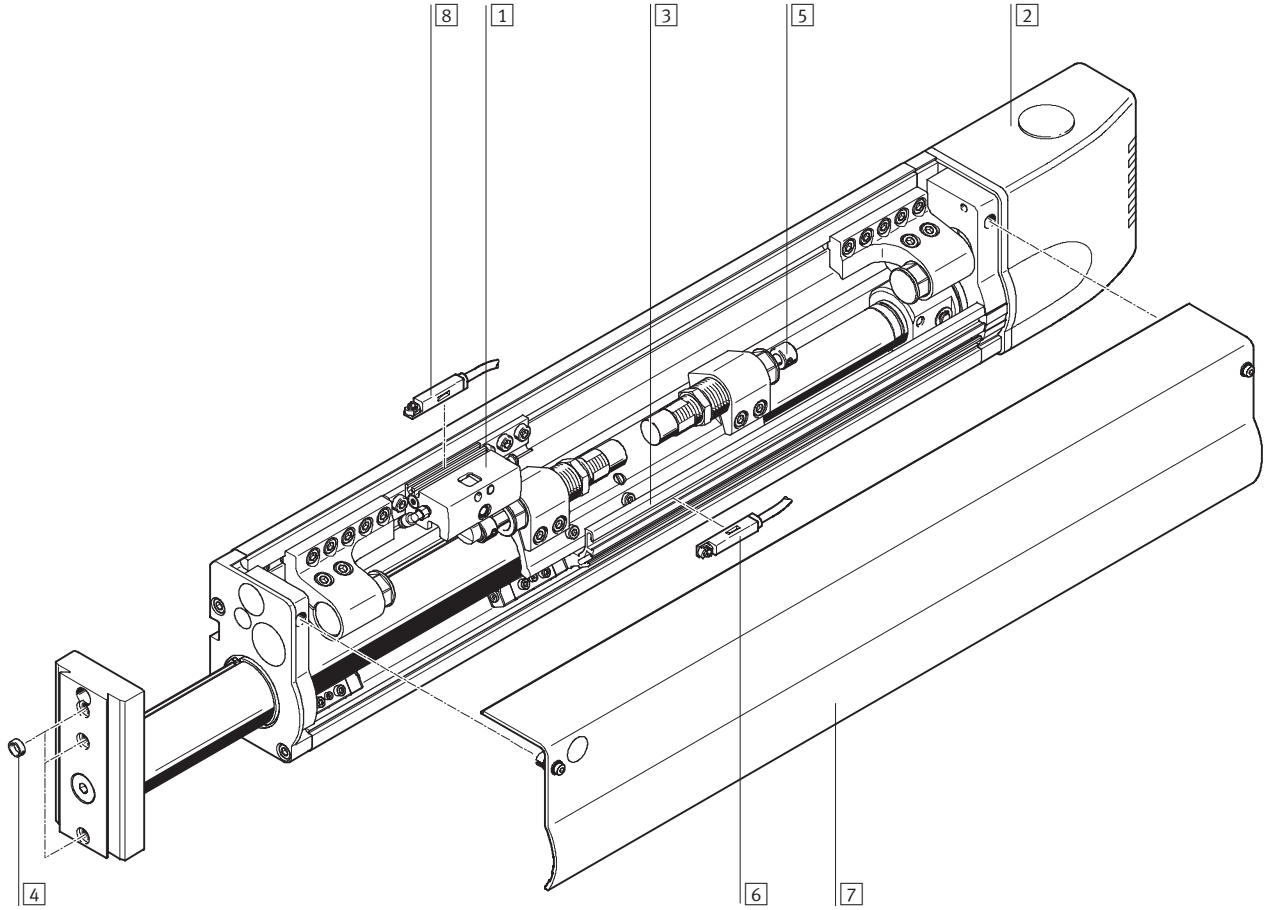
With clamping unit KP



Accessories			
		Brief description	**➔ Page**
1	Clamping unit KP	For holding loads in all mounting and end positions in the event of a drop in pressure	1 / 7.1-24
2	End cap AD/EL	The end cap (EL) houses an integrated electrical interface	1 / 7.1-24
3	Sensor strip SL	For mounting proximity sensors and flexible sensing of any desired end positions. Included in the scope of delivery of the linear module.	1 / 7.1-24
4	Centring sleeve Z	For centring loads and attachments on the yoke plate	1 / 7.1-26
5	Shock absorber	Included in the scope of delivery of the linear module	1 / 7.1-26
6	Proximity sensor A...	For position sensing via the sensor strip	1 / 7.1-27
7	Housing cover	Included in the scope of delivery of the linear module	–
–	Plug socket with cable V	For proximity sensor	1 / 7.1-27
–	Slot cover A	For protecting the proximity sensor cable	1 / 7.1-26

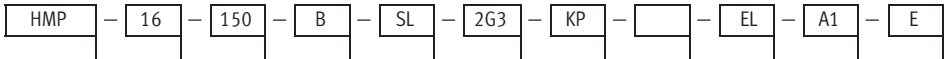
With intermediate position module Z1A



Accessories			
		Brief description	**→ Page**
1	Intermediate position module Z1A	For approaching an intermediate position during the advance stroke. The intermediate position module Z1E is used to approach an intermediate position during the return stroke.	1 / 7.1-18
2	End cap AD/EL	The end cap (EL) houses an integrated electrical interface	1 / 7.1-24
3	Sensor strip SL	For mounting proximity sensors and flexible sensing of any desired end positions. Included in the scope of delivery of the linear module.	1 / 7.1-24
4	Centring sleeve Z	For centring loads and attachments on the yoke plate	1 / 7.1-26
5	Shock absorber	Included in the scope of delivery of the linear module	1 / 7.1-26
6	Proximity sensor A...	For position sensing via the sensor strip	1 / 7.1-27
7	Housing cover	Included in the scope of delivery of the linear module	–
8	Proximity sensor A...	For sensing the position of the lever at the intermediate position module (intermediate position active/not active)	1 / 7.1-28
–	Plug socket with cable V	For proximity sensor	1 / 7.1-27
–	Slot cover A	For protecting the proximity sensor cable	1 / 7.1-26

Linear modules HMP

Type codes



Type	
HMP	Linear module

Piston ∅ [mm]	

Stroke [mm]	

Generation	
B	B series

Sensing	
SL	Sensor strip

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

Clamping unit	
KP	Clamping cartridge

Intermediate position module	
Z1A	For advance stroke
Z1E	For return stroke

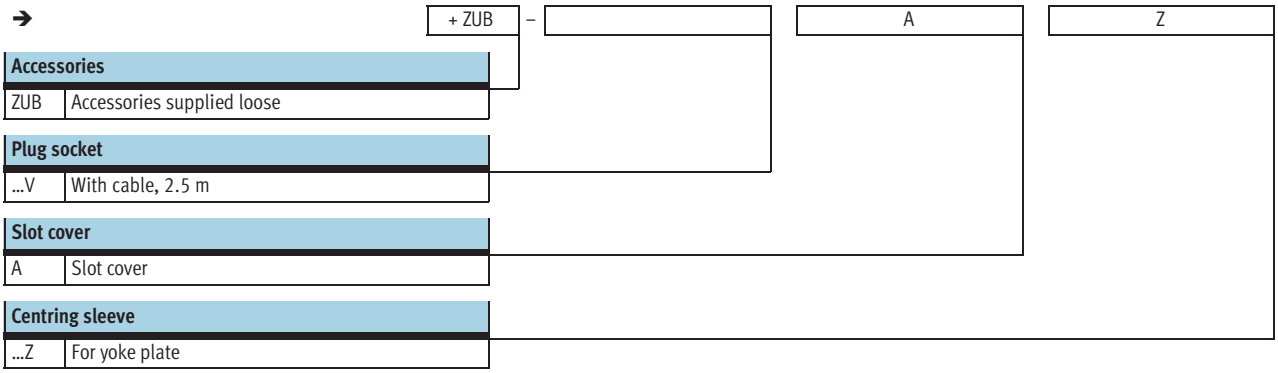
Interface	
AD	End cap
EL	End cap with electrical interface

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

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

Linear modules HMP

Type codes



Linear modules HMP

Technical data

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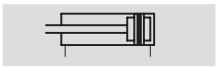
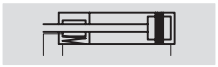
Function

Standard version



with clamping unit



Piston ∅
16 ... 32 mm

Stroke length
50 ... 400 mm

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Spare_parts_service

General technical data						
Piston ∅			16	20	25	32
System mode			Yoke			
Mode of operation			Double-acting			
Protection against torsion			Guide			
Connection type			Female thread			
Pneumatic connection, linear module			M5	G1⁄8	G1⁄8	G1⁄4
Pneumatic connection, intermediate position module			M3			
Assembly position			Any			
Effective stroke		[mm]	16 ... 320	24 ... 400	24 ... 400	40 ... 400
Position sensing			For proximity sensing			
Max. repetition accuracy[1]		[mm]	0.01			
Max. speed	advancing	[m/s]	0.8	1.1	1.1	1.2
	returning	[m/s]	0.8	1.1	1.1	1.1
Swivel time of lever at intermediate position module	advancing	[s]	0.04	0.04	0.04	0.072
	returning	[s]	0.04	0.036	0.034	0.065

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

Operating and environmental conditions					
Piston ∅		16	20	25	32
Operating pressure	[bar]	4 ... 8			
Operating medium		Dried compressed air, lubricated or unlubricated			
Ambient temperature[1]	[°C]	0 ... +60			
Protection class to EN 60 529		IP 40			
Noise level F_{LEQ}	[dB(A)]	62	65	68	69
Corrosion resistance class CRC[2]		2			

1) Note operating range of proximity sensors
2) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Forces [N]				
Piston ∅	16	20	25	32
Theoretical force at 6 bar, advancing[1]	121	188	295	483
Theoretical force at 6 bar, returning[1]	104	158	247	415

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

Linear modules HMP

Technical data

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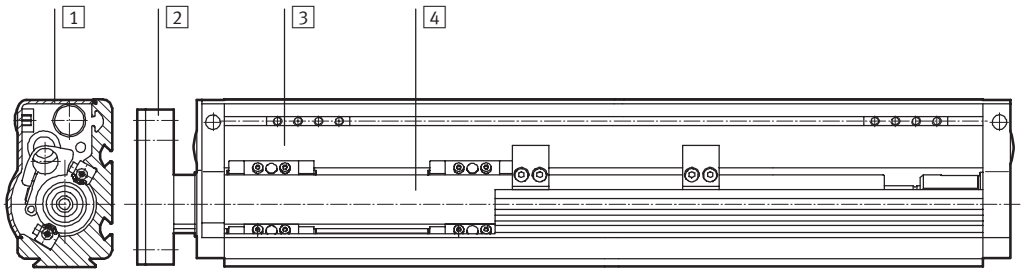
Weight [g]					
Piston ∅		16	20	25	32
Product weight	with 0 mm stroke	2100	4700	6300	10900
	per 10 mm stroke	88	110	150	200
Moving load	with 0 mm stroke	900	1500	2300	4000
	per 10 mm stroke	28	37	55	74
End cap	HMP-...-AD	180	270	300	400
	HMP-...-EL	210	300	330	430
Clamping unit HMP-...-KP for effective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

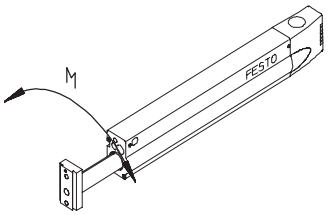
Materials

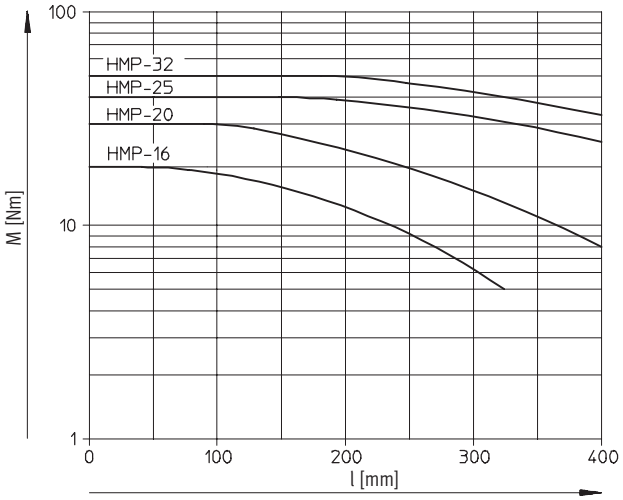
Sectional view



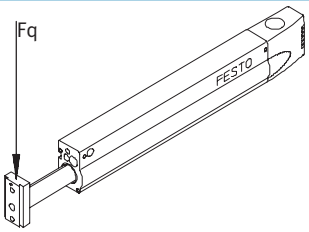
Linear module		
1	Housing cover	Anodised aluminium
2	Yoke plate	Anodised aluminium
3	Profile	Anodised aluminium
4	Guide barrel	Tool steel
–	Seals	Nitrile rubber, polyurethane

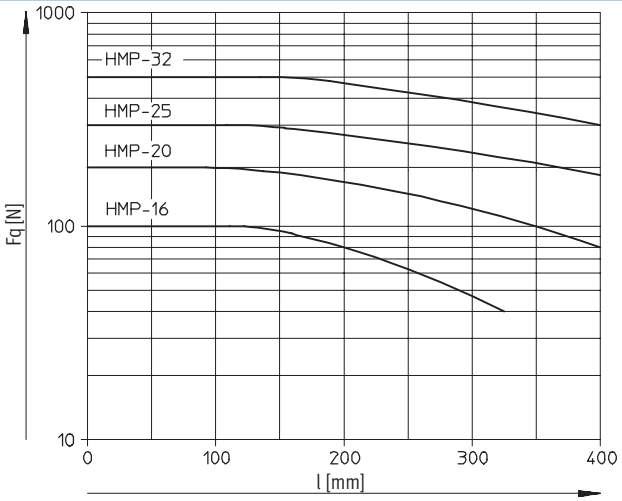
Permissible torque M as a function of the stroke length l (at the yoke plate)



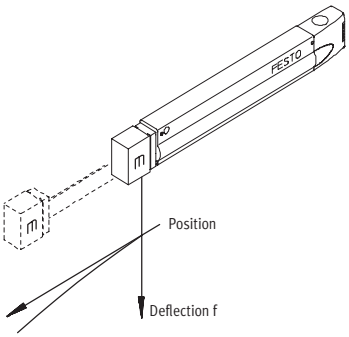


Permissible effective load Fq as a function of the stroke length l (at the yoke plate)

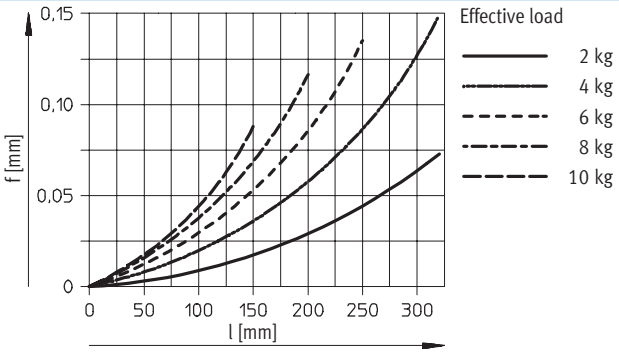




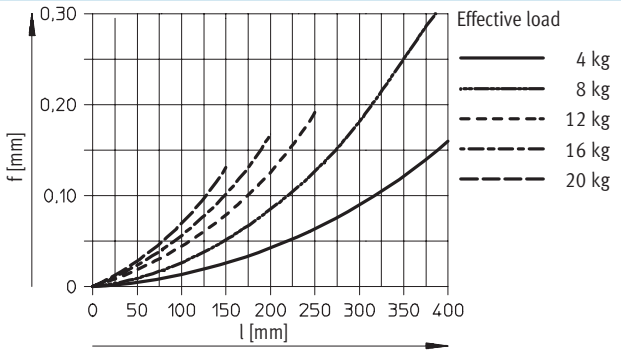
Deflection/deformation f as a function of the effective load m and the position l (stroke)



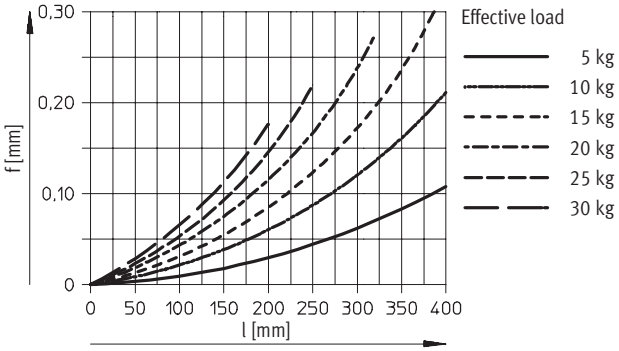
HMP-16



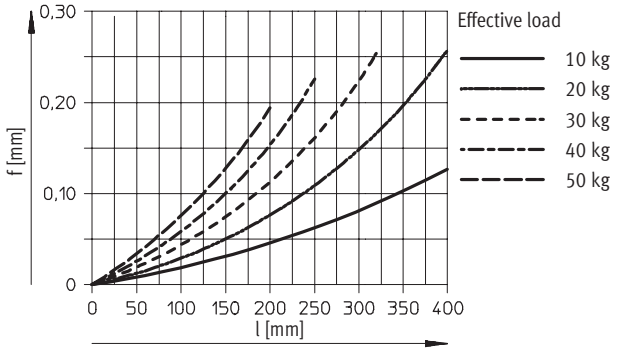
HMP-20



HMP-25



HMP-32



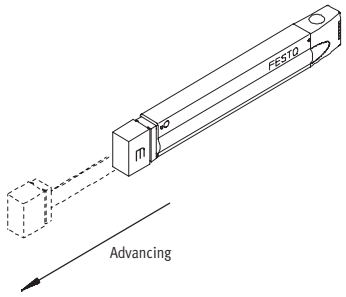
Linear modules HMP

Technical data

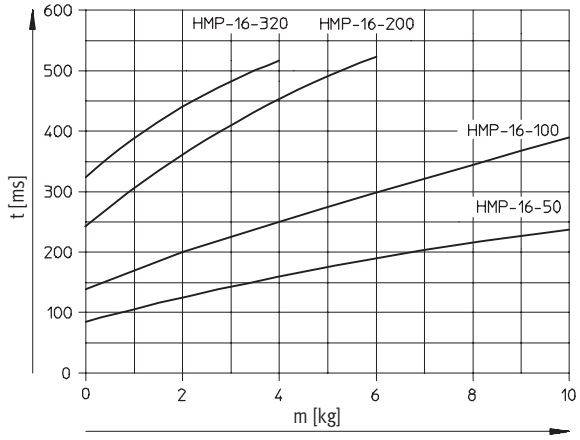
Max. permissible horizontal effective load at 6 bar

HMP-16: 10 kg
HMP-20: 20 kg
HMP-25: 30 kg
HMP-32: 50 kg

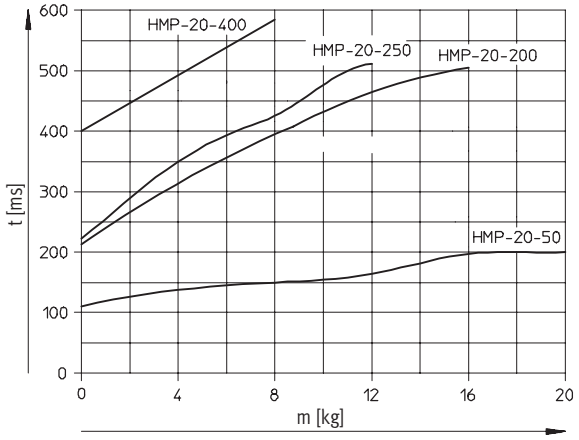
Permissible horizontal advancing time t as a function of the stroke length and the effective load m with optimum shock absorber stroke



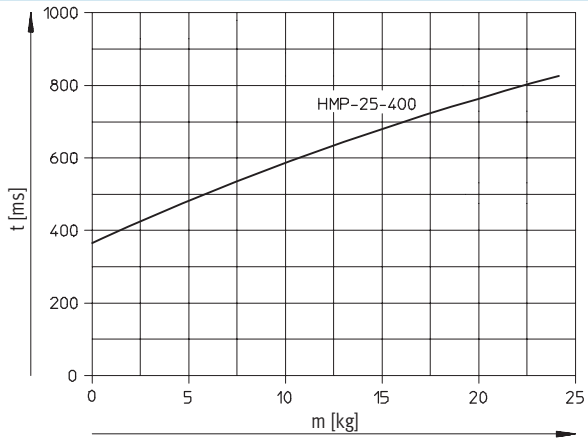
HMP-16[1)]



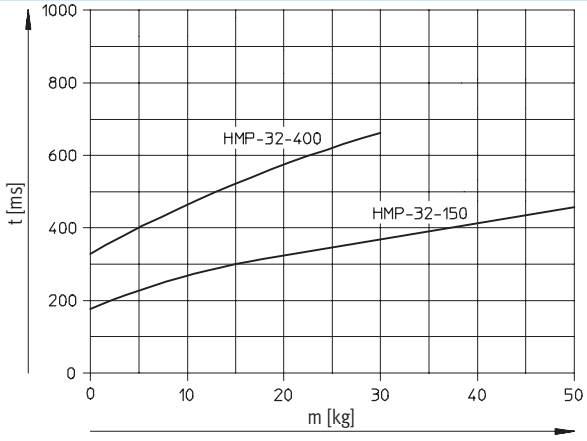
HMP-20[1)]



HMP-25[1)]



HMP-32[1)]



1) Further nominal strokes in preparation

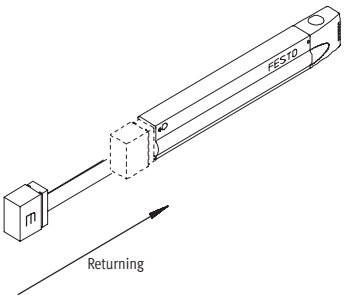
Linear modules HMP

Technical data

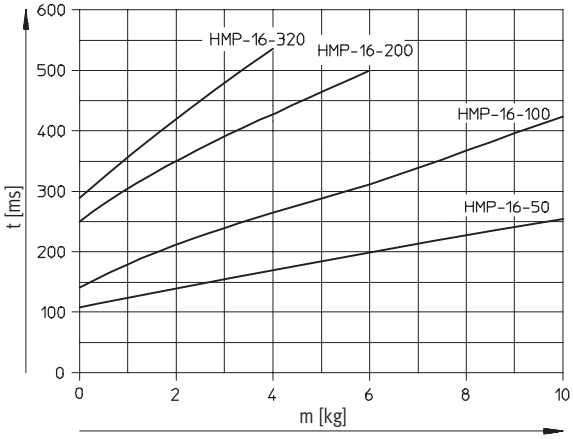
Max. permissible horizontal effective load at 6 bar

HMP-16: 10 kg
HMP-20: 20 kg
HMP-25: 30 kg
HMP-32: 50 kg

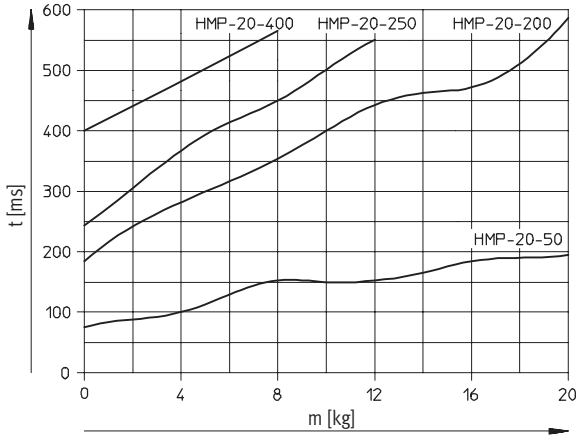
Permissible horizontal returning time t as a function of the stroke length and the effective load m with optimum shock absorber stroke



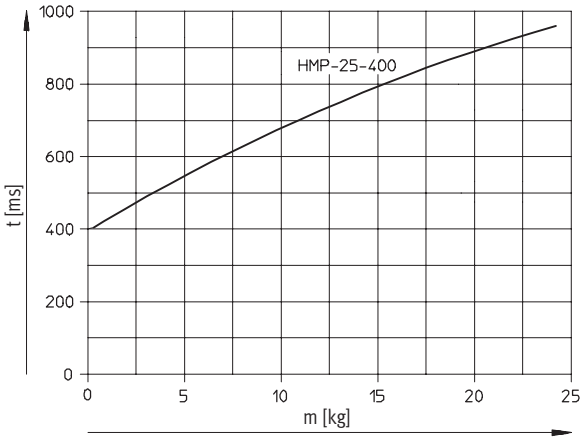
HMP-16[1)]



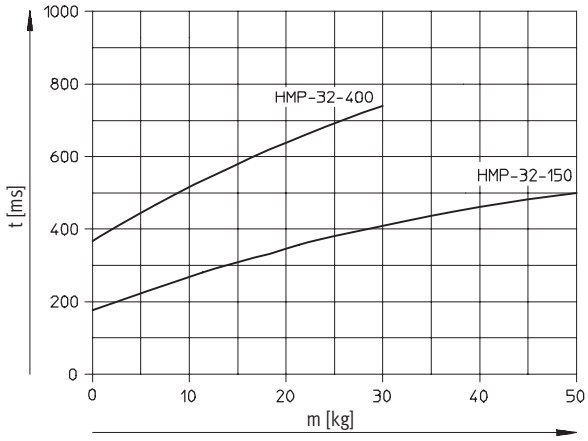
HMP-20[1)]



HMP-25[1)]



HMP-32[1)]



1) Further nominal strokes in preparation

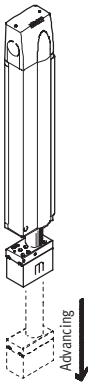
Linear modules HMP

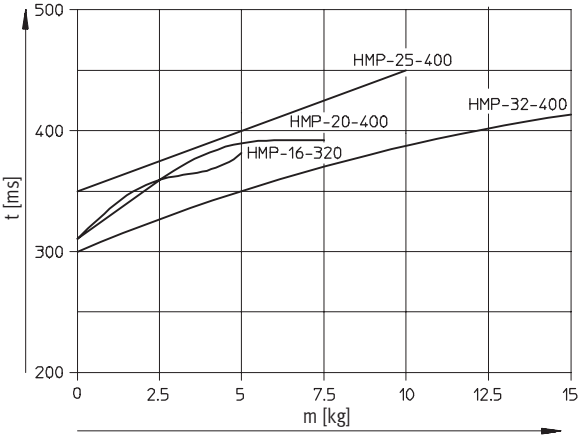
Technical data

Max. permissible vertical effective load at 6 bar	
without clamping cartridge	with clamping cartridge
HMP-16: 5 kg	HMP-16: 4 kg
HMP-20: 10 kg	HMP-20: 7.5 kg
HMP-25: 15 kg	
HMP-32: 25 kg	

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

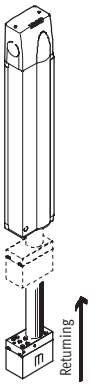
HMP-16/-20/-25/-32[1)]

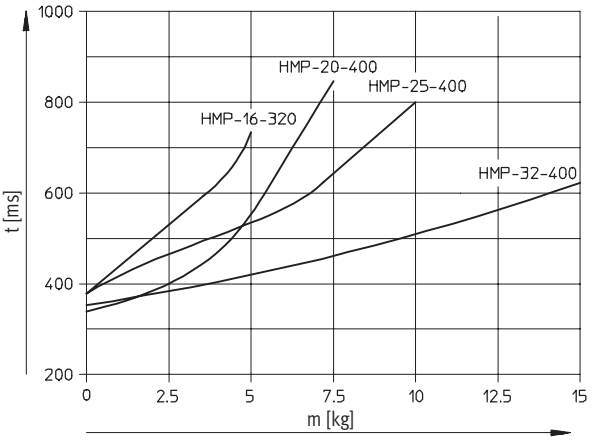




Permissible vertical returning time t as a function of the stroke length and the effective load m with optimum shock absorber stroke

HMP-16/-20/-25/-32[1)]



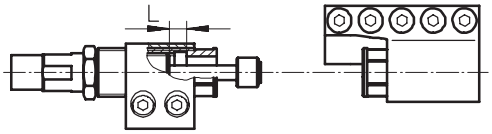


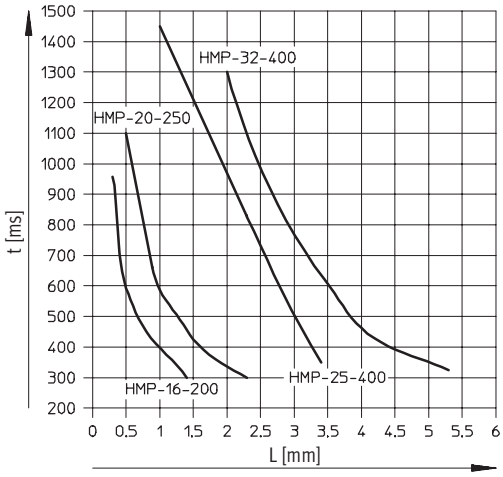
1) Further nominal strokes in preparation

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

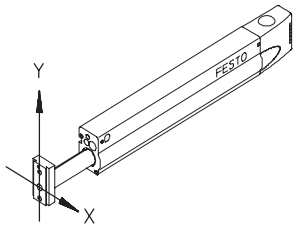
In order to obtain the shortest possible travel time with a linear module HMP, it is essential to adjust the shock absorbers to match the advancing/returning time t.

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



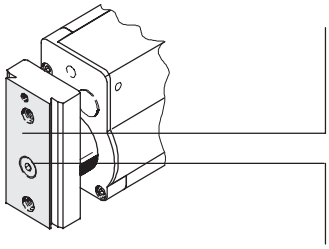


Determining the permissible effective load



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

Centre of gravity



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

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

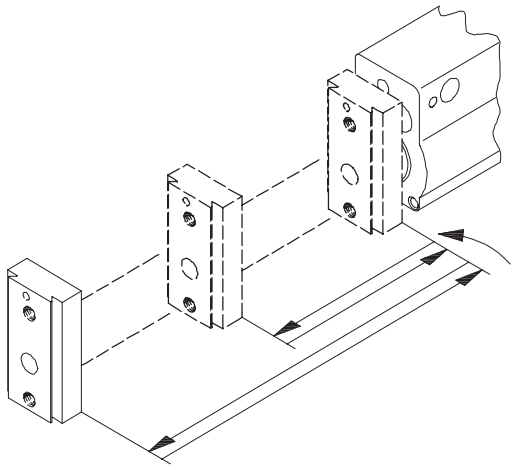
Linear modules HMP

Technical data

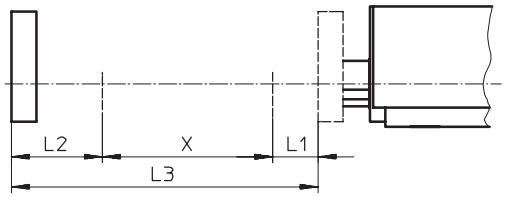
FESTO

Intermediate position module Z1A/Z1E

Intermediate position with advancing with Z1A



Range for possible intermediate positions when advancing



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

X = Zone for possible intermediate positions
X = L3 – L1 – L2

Non-operational zones [mm]				
Piston ∅	16	20	25	32
L1	33	42	42	55.5
L2	66	68.5	54.5	56

Calculation example

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

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

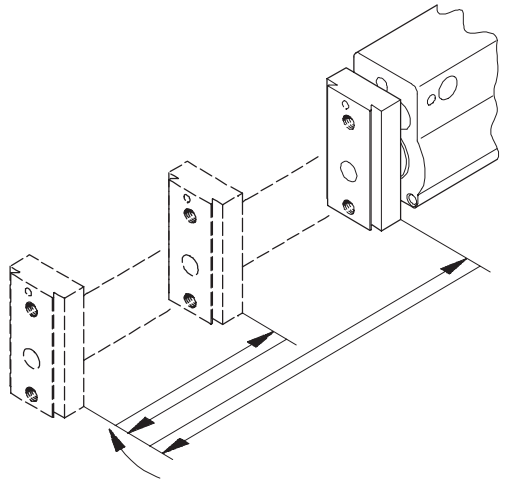
Calculation:
The piston ∅ of the linear module (16 mm) determines the following non-operational zones which do not permit intermediate positions:
L1 = 33 mm
L2 = 66 mm

X = L3 – L1 – L2 = 101 mm

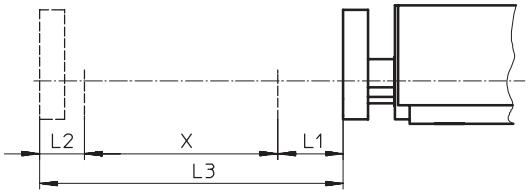
This means:
The lower limit of the effective stroke range for permissible intermediate positions is:
L1 = 33 mm

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

Intermediate position when returning with Z1E



Range for possible intermediate positions when returning



L1 = Rear non-operational zone
L2 = Front non-operational zone
L3 = Effective stroke
X = Zone for possible intermediate positions
X = L3 – L1 – L2

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

Calculation example

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

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

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

X = L3 – L1 – L2 = 119.5 mm

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

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

Linear modules HMP

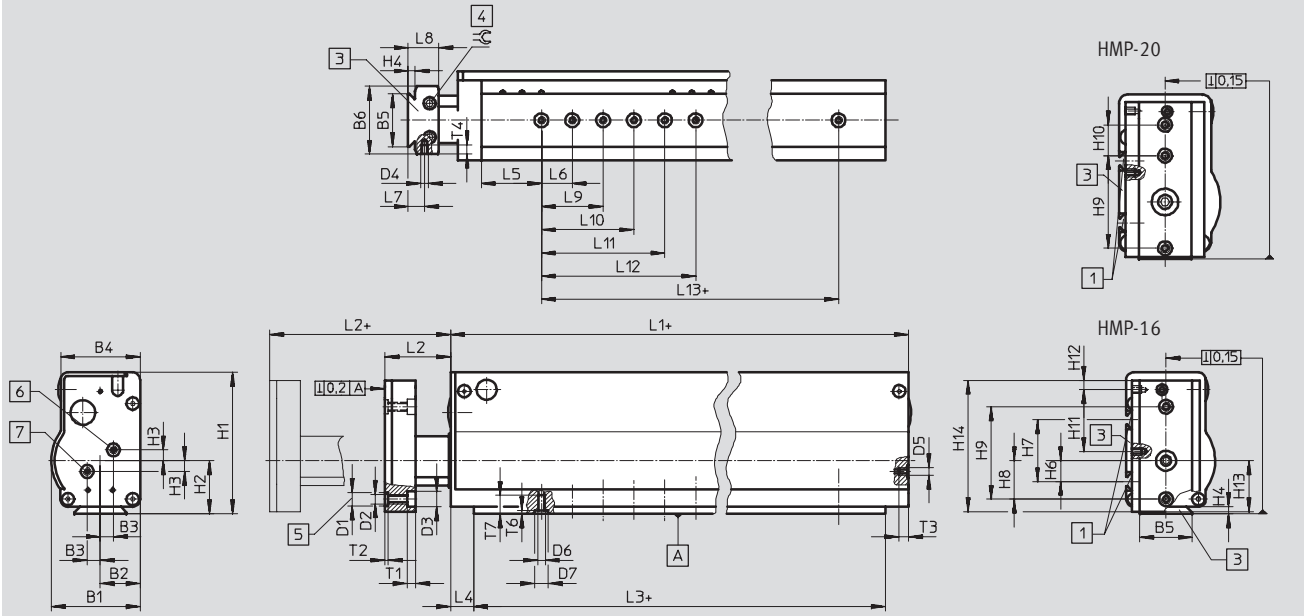
Technical data

FESTO

Dimensions

Download CAD data ➔ **www.festo.com/en/engineering**

Piston ∅ 16/20 mm



1 2 mounting slots for slot nuts HMBN-5-2M5

3 Dovetail mounting facility

4 Set screw for clamping of yoke plate (can be turned through 360°)

5 Thread and centring hole for load attachment with centring sleeves ZBH-9

6 Air connection, advancing

7 Air connection, returning

\+ = plus stroke length

Type	B1	B2	B3 ±0.1	B4	B5	B6	D1 ∅ H7	D2	D3 ∅ H13	D4	D5	D6	D7 ∅ H7	H1	H2	H3 ±0.1
HMP-16	57.8	26	8.5	51.7	34	44	9	M6	10	M5	M5	M5	9	92	34.5	7
HMP-20	65.8	30	10	59.8		51					G⅛			107	37	

Type	H4	H6	H7	H8	H9 ±0.03[1]	H10 ±0.03[1]	H11	H12	H13	H14	H17	L1	L2	L3	L4 +0.2
HMP-16	4.5	13.5	40	25	60	–	40	6	33	85	38	247	23	217	15
HMP-20				30		20			45.5	100.4	40	320		290	

Type	L5	L6 ±0.03	L7	L8 +0.2	L9 ±0.03	L10 ±0.03	L11 ±0.03	L12 ±0.03	L13 ±0.03	T1	T2 +0.1	T3	T4	T6 +0.1	T7	⫷
HMP-16	39	20	10.75	20	40	60	80	100	140	5.7	2.1	6.4	6	2.1	12	4
HMP-25	45								200			9				

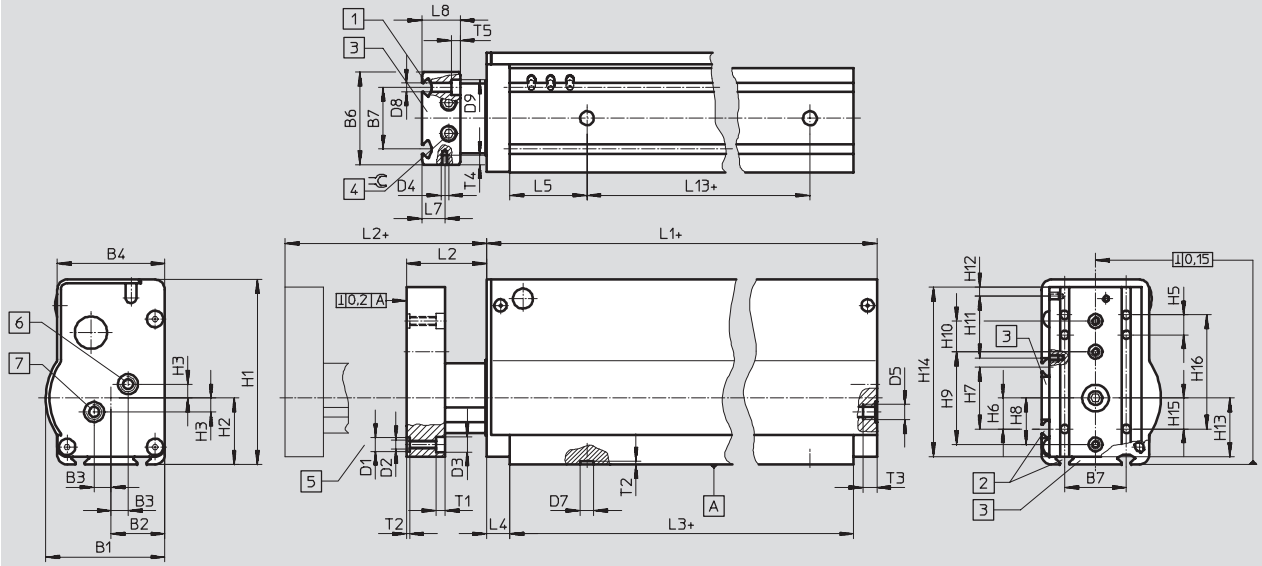
1) Tolerance specification applies to countersink D1; tolerance for thread D2: ±0.2

Linear modules HMP

Technical data

Dimensions Download CAD data ➔ **www.festo.com/en/engineering**

Piston ∅ 25/32 mm



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

Type	B1	B2	B3 ±0.1	B4	B6	B7	D1 ∅ H7	D2	D3 ∅ H13	D4	D5	D7 ∅ H7	D8 ∅ H13	D9 ∅
HMP-25	77.3	35	11	69.8	60	40	9	M6	10	M5	G1⁄8	9	5.5	10
HMP-32	90.8	40		79.8	70						G1⁄4			

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

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

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

Linear modules HMP

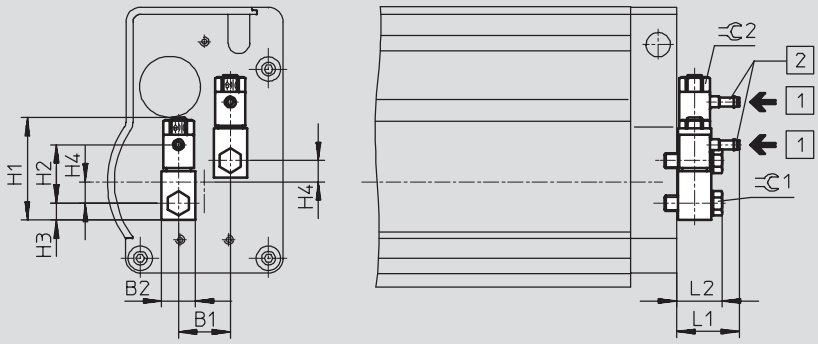
Technical data

FESTO

Dimensions – Pneumatic connections

Download CAD data ➔ **www.festo.com/en/engineering**

(code 2G3/2G4/2G6)



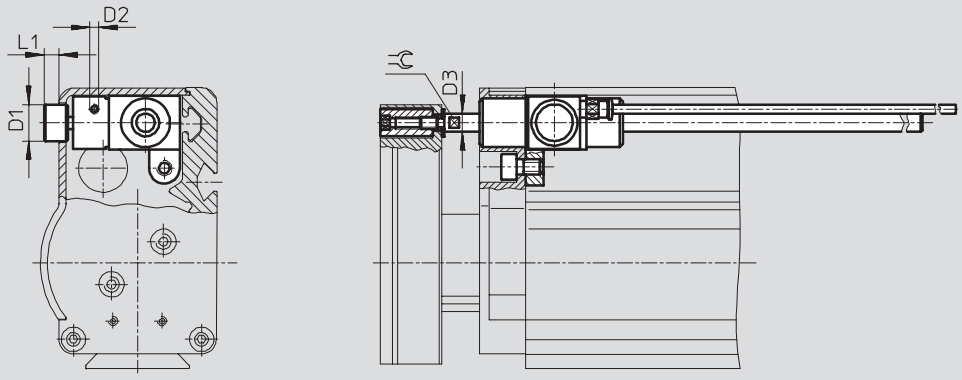
1 Exhaust air restrictor
2 Tubing connector

Type	B1	B2	H1	H2	H3	H4	L1	L2	⊂1	⊂2
HMP-16-...-2G3	17	11	33.6	19	5.5	7	20.6	15	7	9
HMP-16-...-2G4							22.6			
HMP-20-...-2G4	20	16	48.7	28.9	8		31.3	22.2	13	14
HMP-20-...-2G6				27.5			31.4			
HMP-25-...-2G4	22			28.9		9	31.3			
HMP-25-...-2G6				27.5			31.4			
HMP-32-...-2G4		20	61.8	37.9	10		35.8	28.2	17	17
HMP-32-...-2G6				38.2			35.9			

Dimensions – Clamping unit

Download CAD data ➔ **www.festo.com/en/engineering**

(code KP)



Type	D1 ∅	D2 1)	D3 ∅	L1	⊂	Holding force [N]	Effective load horizontal [kg]	Effective load vertical [kg]
HMP-16	11.4	M3	6	5	5	100	10	4
HMP-20				3.8			20	7.5

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

- Note

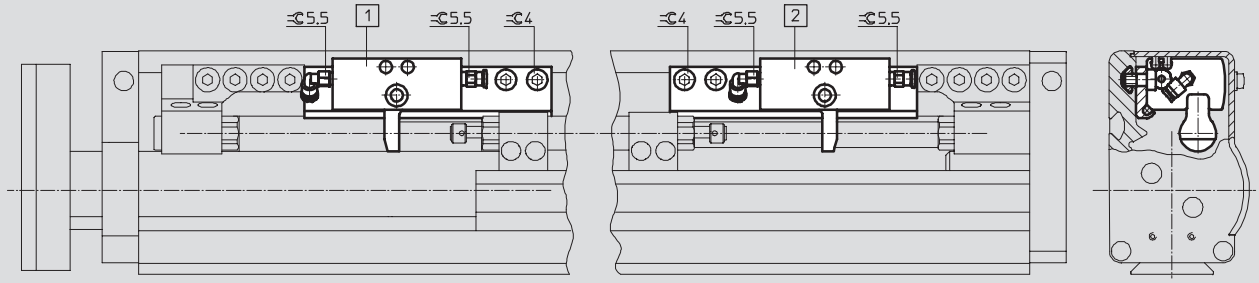
The clamping unit must only be operated when the rod is stationary (end position). Dynamic braking operations can result in severe damage to the clamping device.

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

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

Dimensions – Intermediate position modules Download CAD data ➔ **www.festo.com/com/engineering**

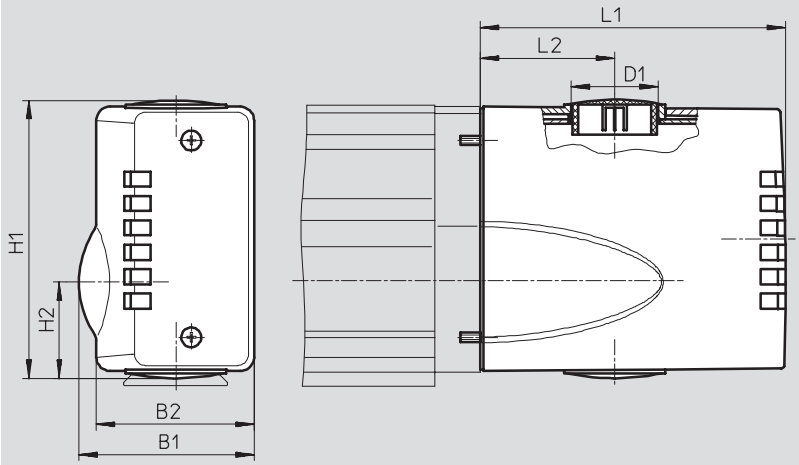
(code Z1A/Z1E)



1 Intermediate position module Z1A for advance stroke
2 Intermediate position module Z1E for return stroke

Dimensions – End cap Download CAD data ➔ **www.festo.com/en/engineering**

(code AD/EL)



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

Linear modules HMP

Ordering data – Modular products

FESTO

M Mandatory data

Module No.	Function	Piston ∅	Stroke	Generation	Position sensing	Pneumatic connection
537 940 537 941 537 942 537 943	HMP	16 20 25 32	50 100 150 200 250 320 400	B	SL	2G3 2G4 2G6
Ordering example						
537 940	**HMP** –	**16** –	**150** –	**B** –	**SL** –	**2G3**

Ordering table

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

Transfer order code

	HMP	–		–		–	**B**	–	**SL**	–	

Linear modules HMP

Ordering data – Modular products

FESTO

0 Options

	Clamping unit		Intermediate position		Interface		Proximity sensor set		User documentation		Accessories		Plug socket		Slot cover		Centring sleeves
	KP		Z1A Z1E		AD EL		A1 A2 A3 A4 A5 A6		E S F I V B		ZUB		...V		A		...Z
–		–	**Z1A**	–	**EL**	–	**A1**	–	**B**	–	**ZUB**	–	**2V**				

Ordering table

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

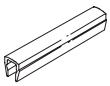
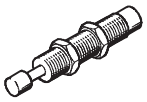
1 **KP** Not with intermediate position Z1A, Z1E.

2 **Z1A, Z1E** Min. stroke: 150 mm.

3 **A4, A5, A6** Not with interface EL
Max. stroke: Piston ∅ 16, 20, 25 mm: 200 mm
Piston ∅ 32 mm: 150 mm

Transfer order code

–		–		–		–		–	**ZUB**	–		

Ordering data						
	For piston ∅ [mm]	Remarks	Order code	Part No.	Type	PU[1]
Centring sleeve ZBH						Technical data➔ 1 / 10.1-18
	16 ... 32	For yoke plate	Z	**150 927**	**ZBH-9**	10
Slot cover ABP						
	16 ... 32	For sensor strip every 0.5 m	A	**151 681**	**ABP-5**	2
Shock absorber YSRW						Technical data➔ 1 / 9.1-12
	16	–	–	**191 194**	**YSRW-8-14**	1
	20			**191 196**	**YSRW-12-20**	
	25			**191 196**	**YSRW-12-20**	
	32			**191 197**	**YSRW-16-26**	

1) Packaging unit quantity

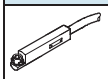
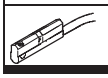
Ordering data – Proximity sensors for T-slot, magneto-resistive — Technical data ➔ 1 / 10.2-13

	Assembly	Switch output	Electrical connection			Cable length [m]	Part No.	Type
			Cable	Plug M8	Plug M12			
NO contact								
	Insertable from above	PNP	3-core	–	–	2.5	**525 898**	**SMT-8F-PS-24V-K2,5-OE**
		NPN					**525 909**	**SMT-8F-NS-24V-K2,5-OE**
		–	2-core	–	–	2.5	**525 908**	**SMT-8F-ZS-24V-K2,5-OE**
		PNP	–	3-pin	–	0.3	**525 899**	**SMT-8F-PS-24V-K0,3-M8D**
		NPN					**525 910**	**SMT-8F-NS-24V-K0,3-M8D**
		PNP	–	–	3-pin	0.3	**525 900**	**SMT-8F-PS-24V-K0,3-M12**
	Insertable from end, flush with the cylinder profile	PNP	3-core	–	–	2.5	**175 436**	**SMT-8-PS-K-LED-24-B**
			–	3-pin	–	0.3	**175 484**	**SMT-8-PS-S-LED-24-B**
NC contact								
	Insertable from above	PNP	3-core	–	–	7.5	**525 911**	**SMT-8F-PO-24V-K7,5-OE**

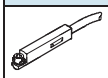
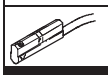
Ordering data – Proximity sensors for T-slot, magnetic reed — Technical data ➔ 1 / 10.2-18

	Assembly	Electrical connection		Cable length [m]	Part No.	Type
		Cable	Plug M8			
NO contact						
	Insertable from above	3-core	–	2.5	**525 895**	**SME-8F-DS-24V-K2,5-OE**
				5.0	**525 897**	**SME-8F-DS-24V-K5,0-OE**
		2-core	–	2.5	**525 907**	**SME-8F-ZS-24V-K2,5-OE**
		–	3-pin	0.3	**525 896**	**SME-8F-DS-24V-K0,3-M8D**
	Insertable from end, flush with the cylinder profile	3-core	–	2.5	**150 855**	**SME-8-K-LED-24**
		–	3-pin	0.3	**150 857**	**SME-8-S-LED-24**
NC contact						
	Insertable from end, flush with the cylinder profile	3-wire	–	7.5	**160 251**	**SME-8-O-K-LED-24**

Ordering data – Proximity sensors for C-slot, magneto-resistive — Technical data ➔ 1 / 10.2-57

	Assembly	Switch output	Electrical connection		Cable length	Connection direction	Part No.	Type
			Cable	Plug M8	[m]			
NO contact								
	Insertable from above	PNP	3-core	–	2.5	In-line	**525 915**	**SMT-10F-PS-24V-K2,5L-OE**
			–	3-pin	0.3	In-line	**525 916**	**SMT-10F-PS-24V-K0,3L-M8D**
						Lateral	**526 675**	**SMT-10F-PS-24V-K0,3Q-M8D**
	Insertable from end	PNP	–	3-pin	0.3	In-line	**173 220**	**SMT-10-PS-SL-LED-24**
			3-core	–	2.5		**173 218**	**SMT-10-PS-KL-LED-24**

Ordering data – Proximity sensors for C-slot, magnetic reed — Technical data ➔ 1 / 10.2-60

	Assembly	Electrical connection		Cable length	Connection direction	Part No.	Type
		Cable	Plug M8	[m]			
NO contact							
	Insertable from above	–	3-pin	0.3	In-line	**525 914**	**SME-10F-DS-24V-K0,3L-M8D**
		3-core	–	2.5	In-line	**525 913**	**SME-10F-DS-24V-K2,5L-OE**
		2-core				**526 672**	**SME-10F-ZS-24V-K2,5L-OE**
	Insertable from end	–	3-pin	0.3	In-line	**173 212**	**SME-10-SL-LED-24**
		3-core	–	2.5		**173 210**	**SME-10-KL-LED-24**

Ordering data – Plug sockets with cable — Technical data ➔ 1 / 10.2-114

	Assembly	Switch output		Connection	Cable length	Part No.	Type
		PNP	NPN		[m]		
Straight socket							
	Union nut M8	■	■	3-pin	2.5	**159 420**	**SIM-M8-3GD-2,5-PU**
					5	**159 421**	**SIM-M8-3GD-5-PU**
	Union nut M12	■	■	3-pin	2.5	**159 428**	**SIM-M12-3GD-2,5-PU**
					5	**159 429**	**SIM-M12-3GD-5-PU**
Angled socket							
	Union nut M8	■	■	3-pin	2.5	**159 422**	**SIM-M8-3WD-2,5-PU**
					5	**159 423**	**SIM-M8-3WD-5-PU**
	Union nut M12	■	■	3-pin	2.5	**159 430**	**SIM-M12-3WD-2,5-PU**
					5	**159 431**	**SIM-M12-3WD-5-PU**