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Mini slides SLT/SLS/SLF

FESTO



Mini slides SLT/SLS/SLF

Key features

General information

- Double-acting drives
- Precise and rigid guide
- Versatile air connections
- Sensors can be integrated
- Highly flexible thanks to versatile, direct assembly and connection options on:
  - Drive body
  - Slide
  - Yoke plate

Mini slides SLT



- Powerful
- Compact design through air connections at rear
- Two adjustable end-position cushioning systems:
  - Flexible cushioning elements
  - Hydraulic shock absorbers
- Extremely compact drive thanks to cushioning systems integrated in the profile section
- Versatile combination options include:
  - Drives
  - Grippers
- System product for handling and assembly technology

Mini slides SLS



- Slim design
- Integrated end-position cushioning:
  - Flexible cushioning elements

Mini slides SLF

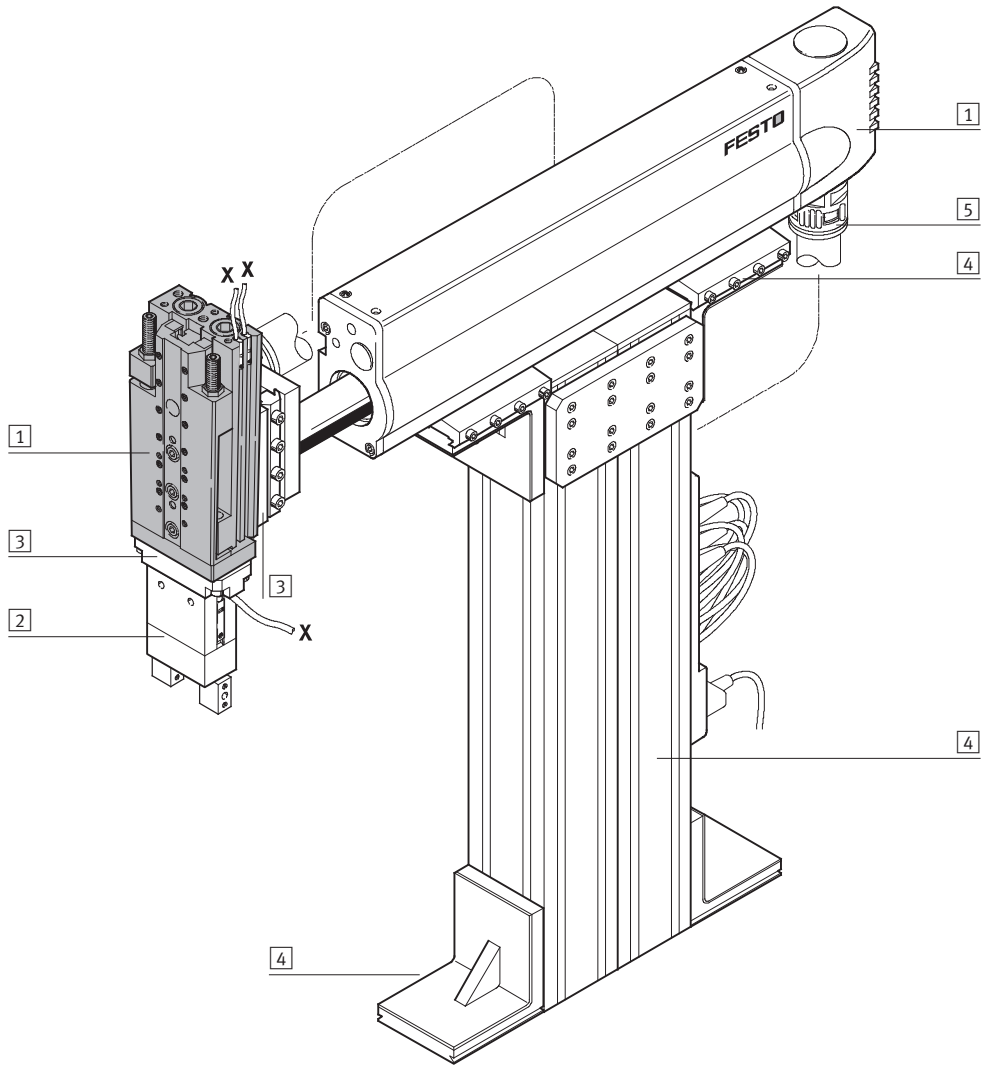


- Flat
- Adjustable end-position cushioning
  - Flexible cushioning elements
- Versatile combination options on:
  - Drives
- System product for handling and assembly technology

Mini slides SLT/SLS/SLF

System example

System product for handling and assembly technology



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

Mini slides SLT/SLS/SLF

Key features

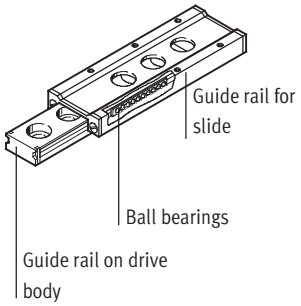
Drive

Mini slides SLT/SLS/SLF are driven with double-acting cylinders.
SLT: with two pistons
SLS/SLF: with one piston

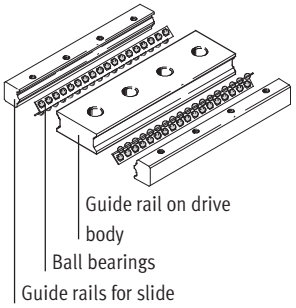
Guide

The slide moves on a pre-loaded, backlash-free precision ball bearing cage guide of high rigidity with high torque and load absorption.

SLT-/SLS-/SLF-6/-10/-16

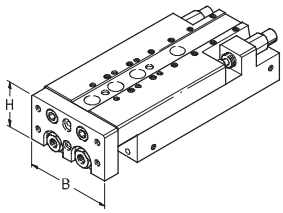


SLT-20/-25



The powerful mini slide

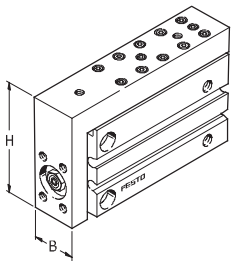
SLT



Piston ∅	Width (W)	x	Height (H)
2x 6 mm	35	x	20 mm
2x 10 mm	50	x	30 mm
2x 16 mm	66	x	40 mm
2x 20 mm	85	x	49 mm
2x 25 mm	104	x	60 mm

The super slim mini slide

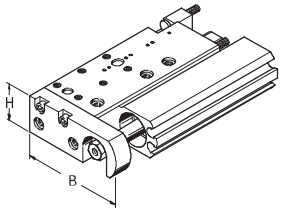
SLS



Piston ∅	**Width (W)**	x	Height (H)
6 mm	**16**	x	39 mm
10 mm	**20**	x	45 mm
16 mm	**24**	x	51 mm

The extremely flat mini slide

SLF



Piston ∅	Width (W)	x	**Height (H)**
6 mm	46	x	**11 mm**
10 mm	48	x	**15 mm**
16 mm	62	x	**21 mm**

Versatile

through

- Attachment
- Mounting
- Air connection
- End-position cushioning
- Sensors

1 Attachment:
The drive can be directly attached via through or threaded holes (with appropriate screws and centring sleeves ZBH).

2 Mounting surface:
Direct attachment of devices and loads is made possible with threaded holes in the slide and the yoke plate (using appropriate screws and centring sleeves ZBS/ZBH) (e.g. SLT: semi-rotary drives and grippers).

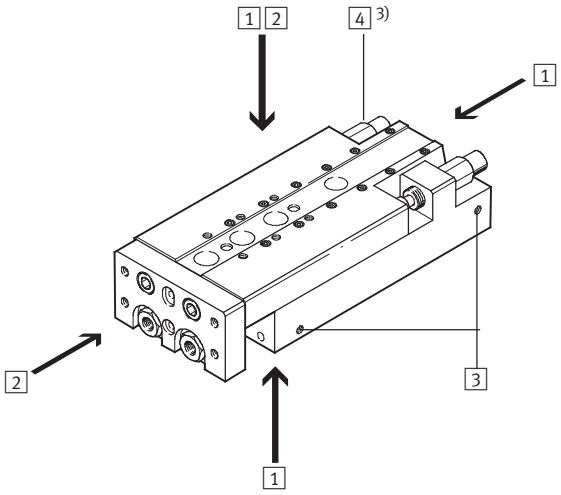
3 Versatile air connections

4 Adjustable end-position cushioning systems:
1) SLT-...-P-A/SLF-...-P-A
with flexible cushioning elements in the end positions
2) SLT-...-P-A with stop PF-...-SLT
allows precise, metallic positioning in the end positions
3) SLT-...-A-CC-B
with hydraulic shock absorbers YSRT on rear cover for optimum end-position adjustment

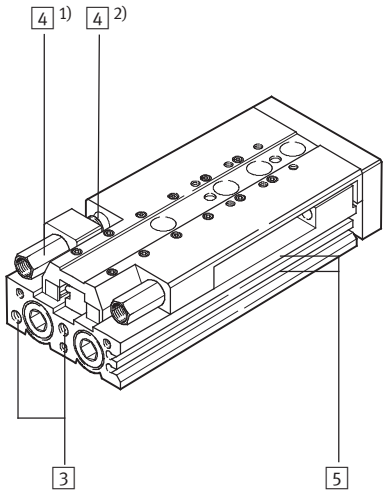
5 Sensors can be integrated
Sensor slots for one or more proximity sensors SME/SMT-10.
For space-saving, reliable sensing of piston positions.
Proximity sensors can be freely moved and clamped in their slots.

SLT

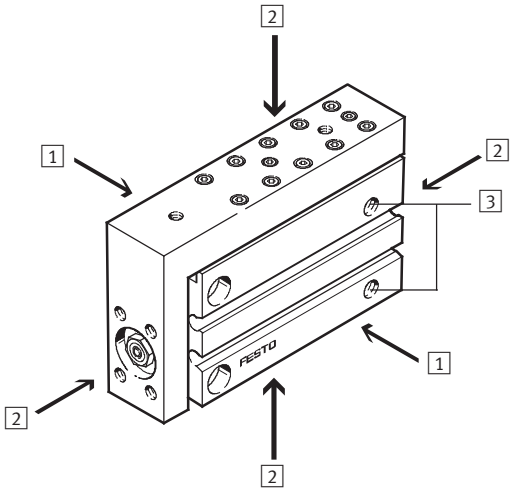
SLT-...-CC-B

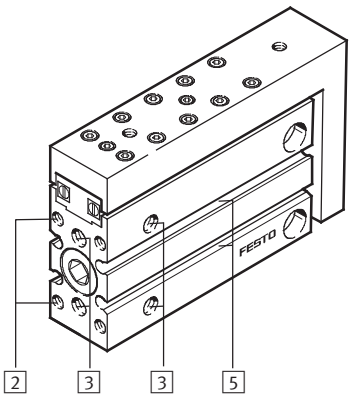


SLT-...-P-A

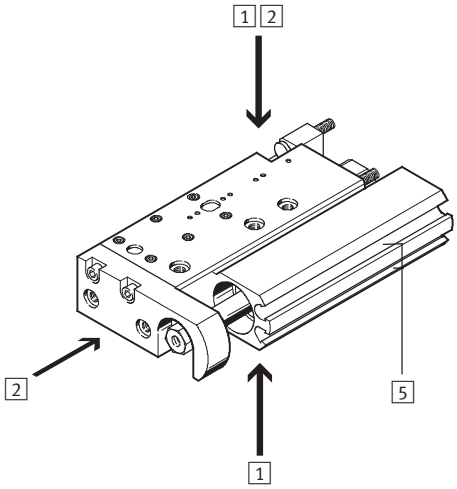


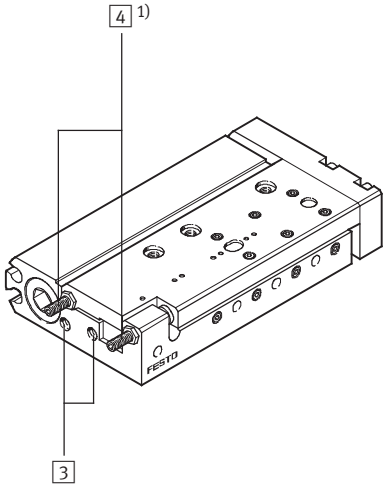
SLS





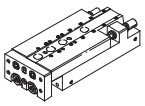
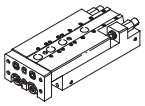
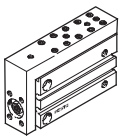
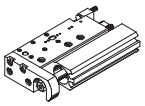
SLF





Mini slides SLT/SLS/SLF

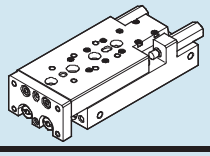
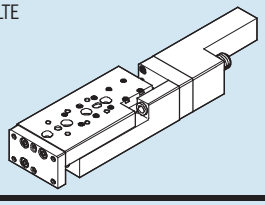
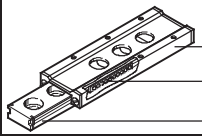
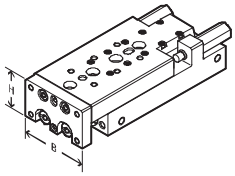
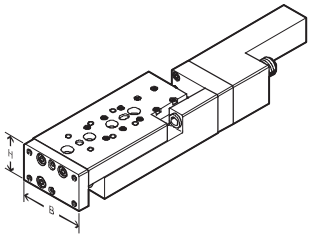
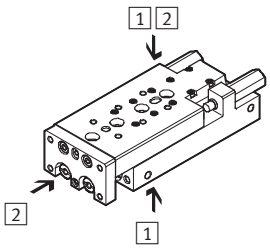
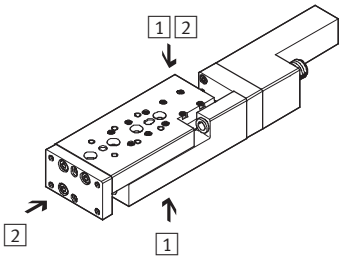
Product range overview

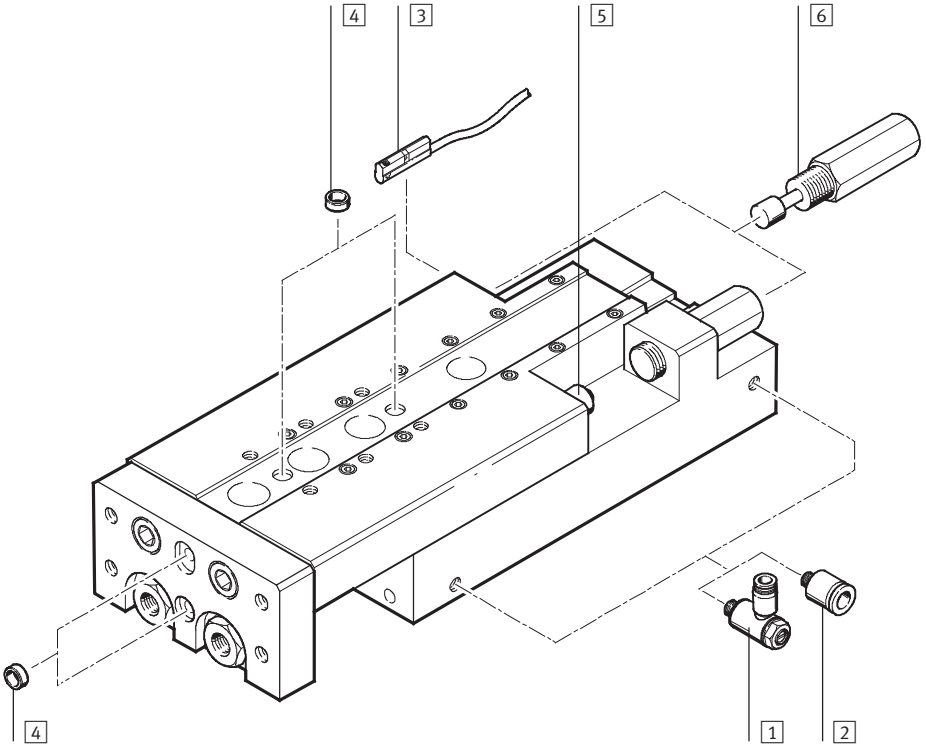
Function	Design	Piston ∅ [mm]	Stroke [mm]	Cushioning		Position sensing	➔ Page/ Internet
				flexible cushioning elements	hydraulic shock absorbers		
Double-acting	Powerful, SLT-...-P-A						
		6, 10, 16, 20, 25	10, 20, 30, 40, 50, 80, 100, 125, 150, 200	■	–	■	7
	Powerful, SLT-...-A-CC-B						
		10, 16, 20, 25	30, 40, 50, 80, 100, 125, 150, 200	–	■	■	7
	Slim, SLS-...-P-A						
		6, 10, 16	5, 10, 15, 20, 25, 30	■	–	■	21
	Flat, SLF-...-P-A						
		6, 10, 16	10, 20, 30, 40, 50, 80	■	–	■	29

Mini slides SLT

Key features

Comparison between pneumatic mini slide SLT and electric mini slide SLTE

	Pneumatic: SLT	Electric: SLTE
		
Advantages		
	• High feed force • High speed • Fast positioning time • Compact length	• Gentle starting and stopping • Constant and precise speed (2 ... 200 mm/s) • Flexible positioning without mechanical devices • Programmable drive profile
Guide		
• Preloaded, backlash-free, precise and rigid ball bearing cage guide • High torque and load absorption	 Guide rail for slide Ball bearings Guide rail on drive body	
Dimensions		
• Identical width and height dimensions Type Width (B) x Height (H) SLT(E)-10 50 x 30 mm SLT(E)-16 66 x 40 mm		
Interfaces		
• Identical mounting and attachment options 1 Mounting surfaces: Direct mounting using threaded holes and through-holes 2 Attachment surfaces: Direct mounting of loads and devices (e.g. SLT: semi-rotary drives and grippers) by means of threaded holes in slide and yoke plate		
Technical data		
Piston ∅ [mm]	6 ... 25	10, 16
Stroke [mm]	10 ... 200	50 ... 150
Max. speed [m/s]	0.8	0.2
Repetition accuracy at end positions [mm]	±0.02	±0.1
Intermediate positions	None	Any



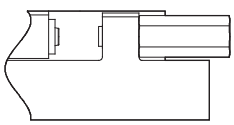
Note

End stops must not be removed.

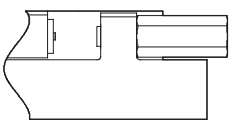
Accessories		
	Brief description	**➔ Page/Internet**
1 One-way flow control valve GRLA	For speed regulation	38
2 Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star
3 Proximity sensor SME/SMT-10	Sensor slots for one or more proximity sensors	39
4 Centring pin/sleeve ZBS/ZBH	For centring loads and attachments	38
5 Cushioning with stop PF	Precision metal stop for small loads at slow speed. At an operating pressure > 3 bar, the stop ensures precise, metal-to-metal contact. The stop can be retrofitted.	38
6 Cushioning with shock absorber YSRT	For large loads and high speed. Ensures precise, metal-to-metal contact after the cushioning.	ysrt
7 Cushioning P	Standard version with flexible cushioning elements. Low-cost, no metal-to-metal contact.	20

Cushioning variants

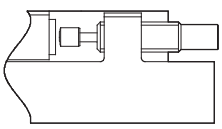
7 SLT-...-P-A
with cushioning P



5 SLT-...-P-A
with cushioning PF
(stop can be retrofitted)

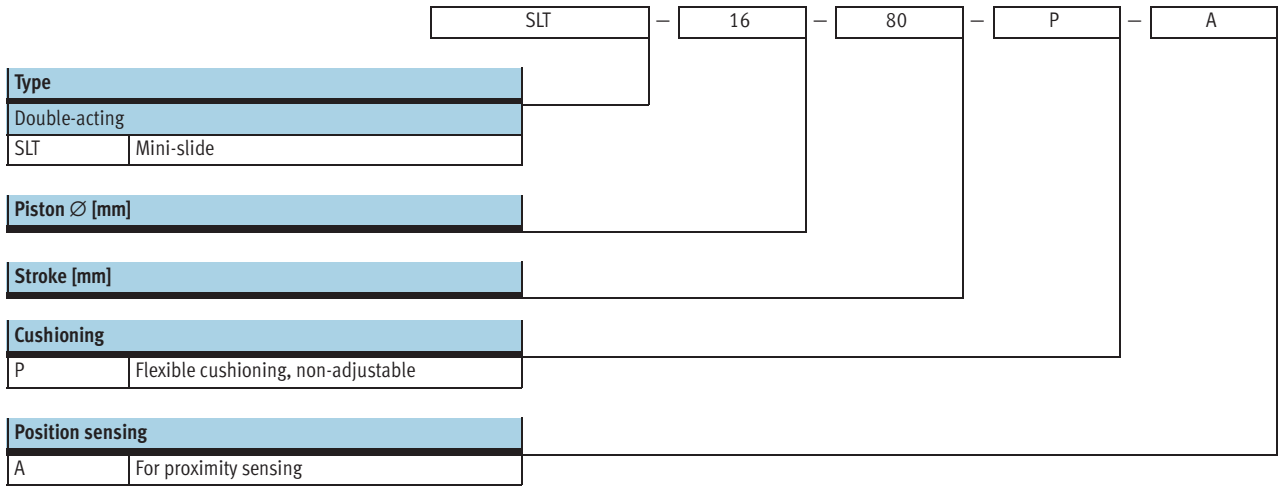


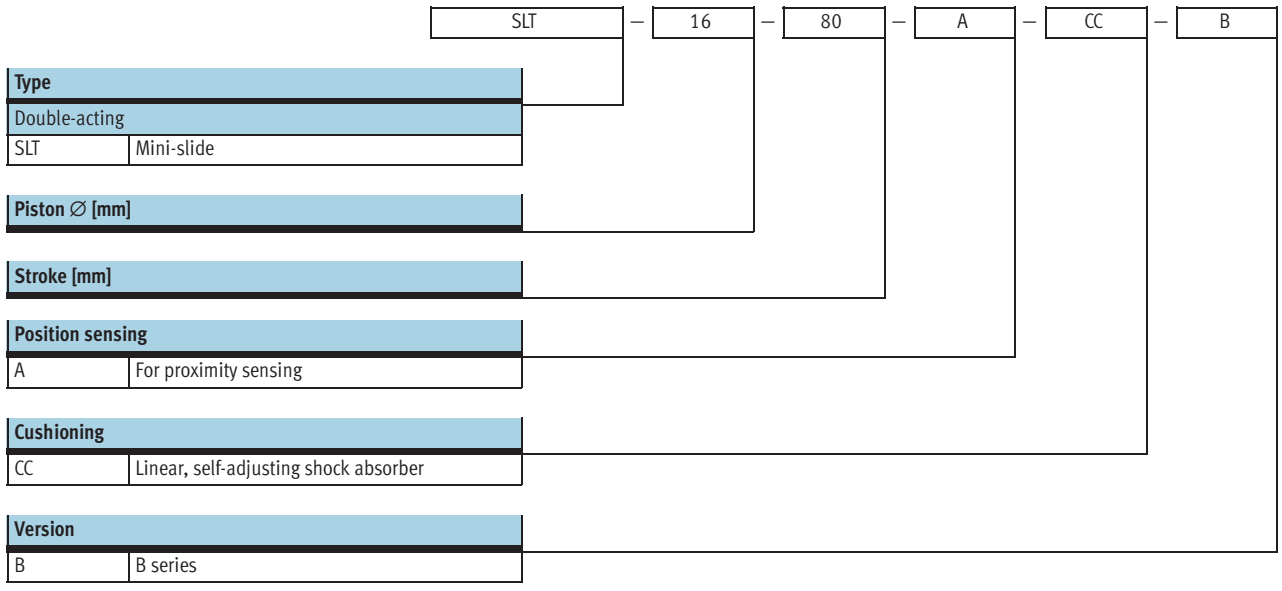
6 SLT-...-CC-B
with cushioning YSRT



Mini slides SLT

Type codes



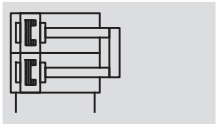


Mini slides SLT

Technical data

FESTO

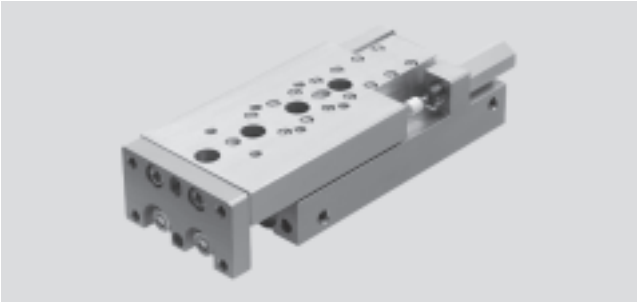
Function



- ⌀ - Diameter
  6 ... 25 mm

- | - Stroke length
  10 ... 200 mm

www.festo.com/en/Spare_parts_service



General technical data							
Piston ∅			6	10	16	20	25
Pneumatic connection			M5			G1⁄8	
Design			Kinematic yoke system				
Guide			Parallel piston rods, ball bearing guide				
Cushioning	Cushioning P		Non-adjustable at either end				
	Shock absorber		–	Self-adjusting at both ends			
Position sensing			For proximity sensing				
Type of mounting			Via through-holes				
			Via female thread				
Mounting position			Any				
Adjustable end-position range	Per end stop	[mm]	7	4	12		
	Per shock absorber	[mm]	–	4	5	12	
Cushioning length with shock absorbers		[mm]	–	5		8	12
Max. advancing speed		[m/s]	0.5[1)]	0.8			
Max. retracting speed		[m/s]	0.5[1)]	0.8			
Repetition accuracy	Stop PF	[mm]	0.02				
	Shock absorber	[mm]	–	0.02			

1) Must be throttled externally

Operating and environmental conditions							
Piston ∅			6	10	16	20	25
Operating medium			Compressed air in accordance with ISO 8573-1:2010 [7:4:4]				
Note on operating/pilot medium			Operation with lubricated medium possible (in which case lubricated operation will always be required)				
Operating pressure		[bar]	1.5 ... 10	1 ... 10			
Ambient temperature[1)]		[°C]	–20 ... +60				

1) Note operating range of proximity sensors

Forces [N] and impact energy [Nm]							
Piston ∅			6	10	16	20	25
Theoretical force at 6 bar, advancing			34	94	242	376	590
Theoretical force at 6 bar, retracting			25	79	218	317	495
Max. impact energy at the end positions[1)]	Stop PF[2)]		0.0005	0.007	0.015	0.030	0.060
	Cushioning P[2)]		0.016	0.1	0.3	0.4	0.5
	Shock absorber CC[2)]		–	1	2	3	10

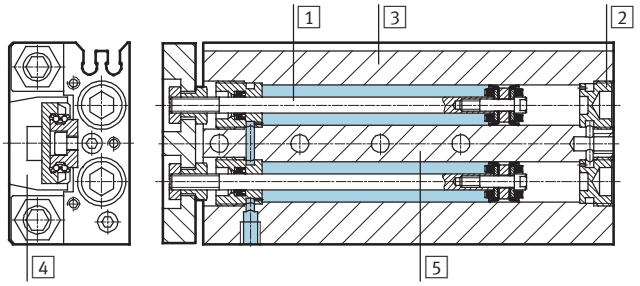
1) Loads moved by the slides must be taken into consideration for the calculation of end-position cushioning energy
2) Note also the graphs illustrating piston speed as a function of working load ➔ 11

Weights [g]

Piston ∅		6		10		16		20		25	
	Stroke	1	2	1	2	1	2	1	2	1	2
1 Product weight	10	128	42	304	125	588	255	1,132	533	1,866	920
2 Moving load	20	145	47	298	122	568	250	1,117	526	1,852	905
	30	161	53	334	141	617	265	1,112	518	1,835	891
	40	184	64	365	149	690	298	1,199	548	2,002	964
	50	223	85	427	179	762	327	1,347	608	2,152	1,036
	80	–	–	581	247	1,030	451	1,767	793	2,767	1,326
	100	–	–	–	–	1,247	543	2,088	924	3,209	1,516
	125	–	–	–	–	1,655	749	2,681	1,143	4,030	1,899
	150	–	–	–	–	1,802	797	2,923	1,253	4,549	2,087
	200	–	–	–	–	–	–	3,666	1,490	5,520	2,544

Materials

Sectional view



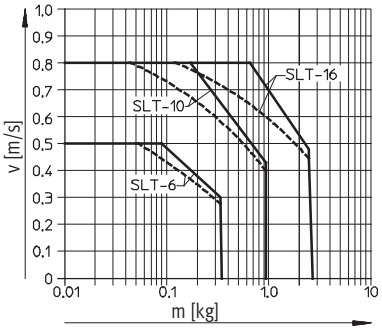
Mini slide	
1 Piston rod	High-alloy steel
2 Cap	Wrought aluminium alloy, anodised
3 Housing	Wrought aluminium alloy, anodised
4 Slide	Wrought aluminium alloy, anodised
5 Guide	Tempered steel
– Seals	Hydrogenated nitrile rubber
Note on materials	Free of copper, PTFE and silicone

Piston speed v as a function of working load m

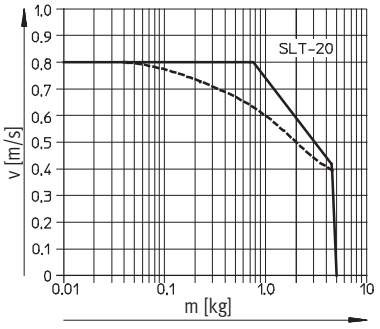
The piston speed as a function of working load may not be exceeded as the kinetic impact or residual energy in the end positions can result in damage to the drive.

For the mini slide SLT with shock absorbers, the speed should not be less than 0.1 m/s, as otherwise the service life of the shock absorber will be reduced.

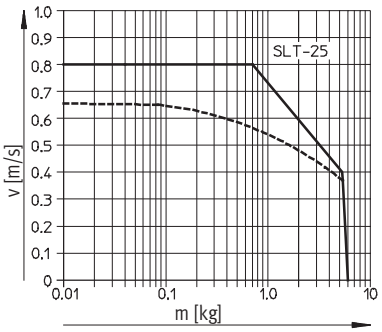
SLT-6/-10/-16-...-P-A



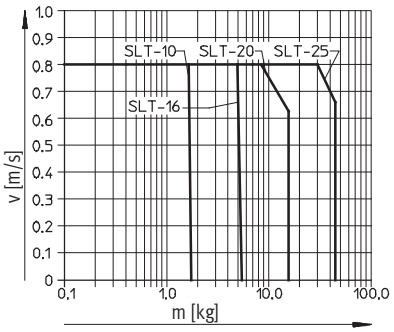
SLT-20-...-P-A



SLT-25-...-P-A



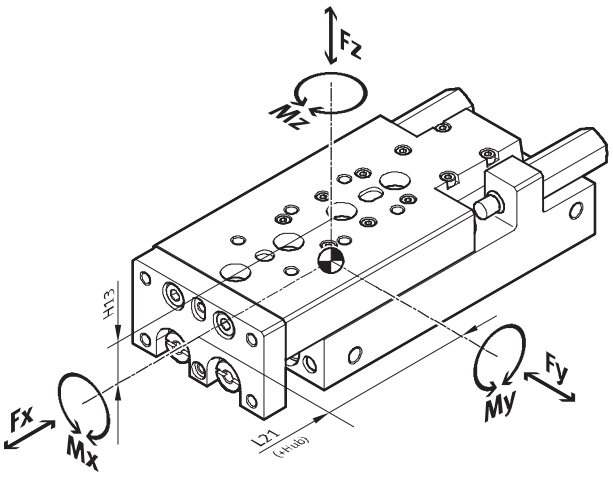
SLT-10/-16/-20/-25-...-A-CC-B



Min. stroke
Max. stroke

Dynamic characteristic load values

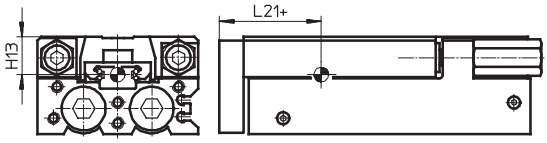
Torques are indicated with reference to the centre of the guide.
They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the drive is simultaneously subjected to several of the indicated forces and torques, the following equation must be satisfied in addition to the indicated maximum loads.

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|Mx|}{Mx_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}} \leq 1$$

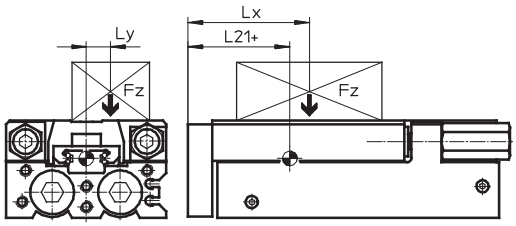
Position of guide centre



\+ plus stroke length

Calculation example

Given:



Mini slide	= SLT-10
Stroke length	= 80 mm
Lever arm L_x	= 50 mm
Lever arm L_y	= 30 mm
Mass F_z	= 0.8 kg
Acceleration a	= 0 m/s²

To be found:

F_y, F_z, Mx, My, Mz
and
verification of function with combined load

Solution:

L21 = 41 mm from table

F_y = 0 N

F_z = m x g
= 0.8 kg x 9.81 m/s² = 7.848 N

M_x = m x g x L_y
= 0.8 kg x 9.81 m/s² x 30 mm = 0.236 Nm

M_y = m x g x [(L21+stroke)-L_x]
= 0.8 kg x 9.81 m/s² [(41 mm + 80 mm) – 50 mm] = 0.557 Nm

M_z = 0 Nm

Combined load:

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|Mx|}{Mx_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}}$$

$$= 0 + \frac{7.848N}{410N} + \frac{0.2366Nm}{4.3Nm} + \frac{0.557Nm}{1.5Nm} + 0 = 0.445 \leq 1$$

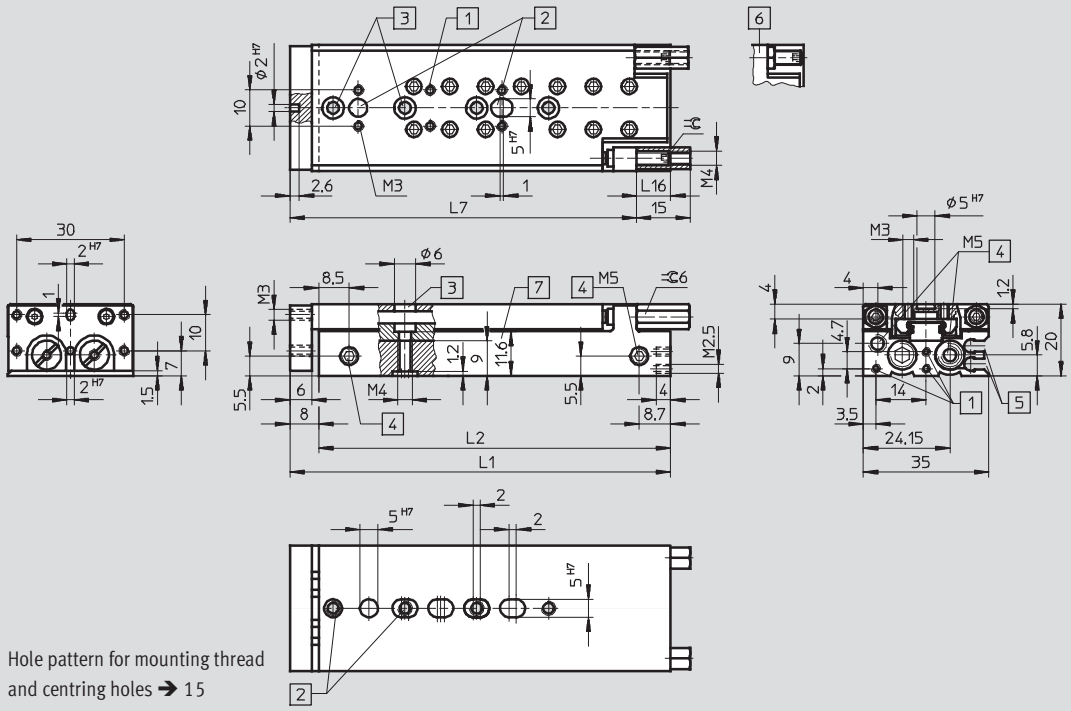
Mini slides SLT

Technical data

Permissible forces and torques						Geometric characteristics	
Piston ∅	Stroke	Fy_{max} [N]	Fz_{max} [N]	Mx_{max} [Nm]	My_{max}, Mz_{max} [Nm]	H13 [mm]	L21 [mm]
6							
	10	200	200	1.1	0.7	7	21.5
	20	160	160	1.1	0.7		21.5
	30	140	140	0.7	0.5		21.5
	40	150	150	0.9	0.5		25
	50	190	190	1.4	0.5		30.5
10							
	10	470	470	2.1	1.6	13	24.5
	20	370	370	1.7	1.4		24.5
	30	390	390	2.5	1.4		28.5
	40	350	350	2.2	1.3		28.5
	50	390	390	3.1	1.4		33.5
	80	410	410	4.3	1.5		41
16							
	10	820	820	6.1	4.2	16	33
	20	650	650	4.7	3.4		33
	30	530	530	4.2	3.0		31.5
	40	490	490	3.8	2.7		31.5
	50	510	510	4.6	2.8		35
	80	520	520	6.0	2.8		41.5
	100	600	600	9.1	3.2		51.5
	125	960	960	12.6	3.5		66.5
	150	660	660	12.6	3.5		66.5
20							
	10	1,600	1,600	16	18	16.5	38.5
	20	1,270	1,270	13	14		38.5
	30	1,110	1,110	11	12		38.5
	40	930	930	10	11		38.5
	50	1,080	1,080	9	10		41
	80	1,030	1,030	14	11		48.5
	100	1,160	1,160	18	11		58
	125	1,380	1,380	37	17		71
	150	1,300	1,300	47	17		79
	200	1,170	1,170	64	17		92.5
25							
	10	1,840	1,840	19	21	23.5	45.5
	20	1,460	1,460	16	16		45.5
	30	1,280	1,280	14	14		45.5
	40	1,310	1,310	13	12		45.5
	50	1,080	1,080	12	11		45.5
	80	1,030	1,030	14	11		50.5
	100	1,160	1,160	18	11		60
	125	1,380	1,380	37	17		72.5
	150	1,300	1,300	47	17		80.5
	200	1,170	1,170	64	17		94.5

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

∅ 6



Hole pattern for mounting thread and centring holes ➔ 15

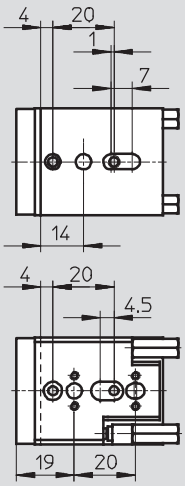
1 Mounting thread
2 Centring holes (centring sleeves included in scope of delivery)
3 Through-holes for mounting the drive
4 Supply ports
5 Sensor slots for proximity sensor SME/SMT-10
6 Slim lock nuts are supplied loose
7 Through-hole length for mounting screws

∅ [mm]	Stroke [mm]	L1	L2	L7	L16 1)	=C 1)
6	10	48	40	38	14	2
	20	58	50	48		
	30	68	60	58		
	40	85	77	75		
	50	106	98	96		

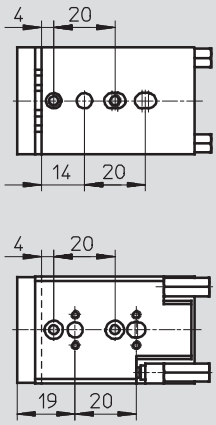
1) With flexible cushioning

Hole pattern for mounting thread and centring holes

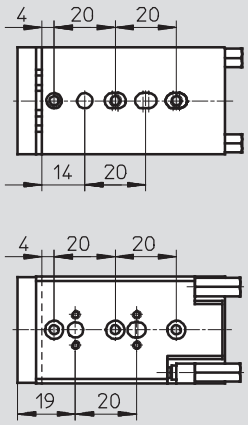
SLT-6-10



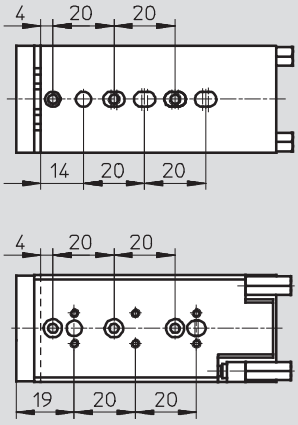
SLT-6-20



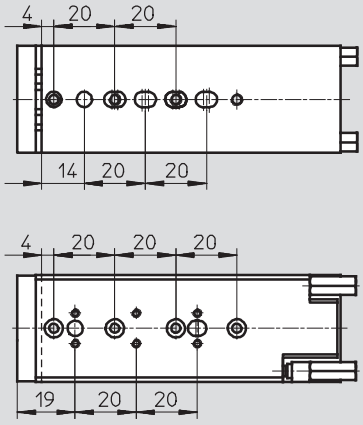
SLT-6-30



SLT-6-40

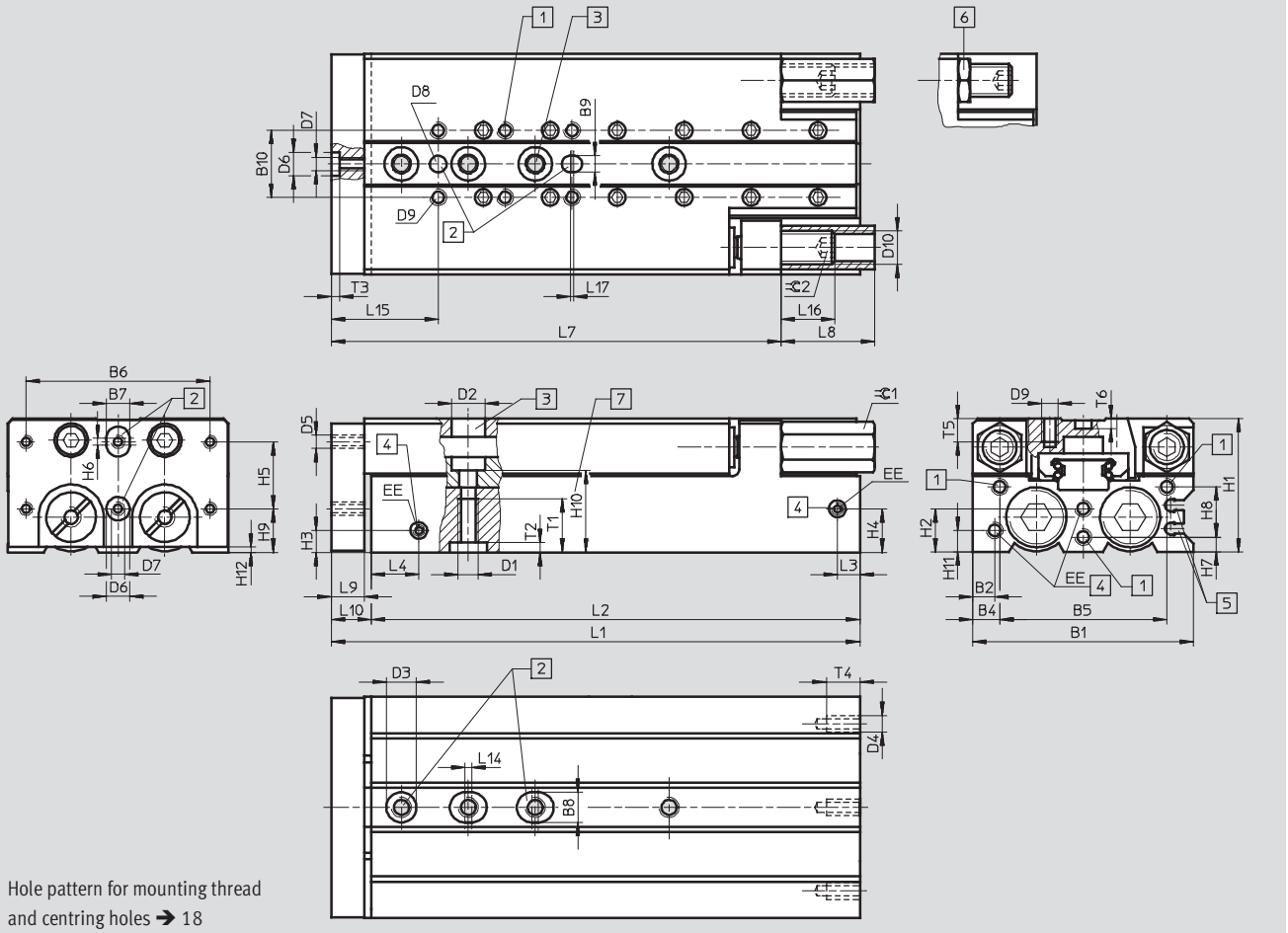


SLT-6-50



Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

∅ 10-...-25



Hole pattern for mounting thread and centring holes ➔ 18

1 Mounting thread
2 Centring holes (centring sleeves included in scope of delivery)
3 Through-holes for mounting the drive
4 Supply ports
5 Sensor slots for proximity sensor SME/SMT-10
6 Slim lock nuts are supplied loose
7 Through-hole length for mounting screws

∅ [mm]	B1	B2	B4	B5	B6	B7 H7	B8 H7	B9 H7	B10	D1	D2 ∅	D3 ∅ H7	D4	D5	D6 ∅ H7	D7
10	50	5.5	10	30	40	5	7	5	20	M5	8	7	M3	M4	5	M3
16	66	6.5	8	50	55	7	9			M6	10	9	M5	M5	7	M4
20	85	7	15	55	70	9	12	9	40	M8	11	12			9	M5
25	104	8	12	80	80	12		12					M6	M6	12	M6

∅ [mm]	D8 ∅ H7	D9	D10	EE	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
10	5	M4	M8x1	M5	30	9.4	5.5	11	20	2	4	10	5	15.15	5.5	1.5
16	5	M5	M10x1		40	13	6.5	13			4.5	15	13	20	6.5	1.5
20	9		M12x1	G⅛	49	19.5	9	19.7			6	19	16	30.5	9	2.5
25	12	M6	M16x1	G⅛	60	21	10	21	40		5	25	10	34.5	10	1.5

Mini slides SLT

Technical data

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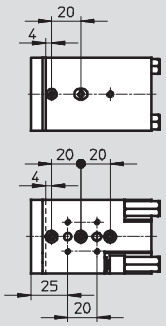
∅ [mm]	Stroke [mm]	L1	L2	L3	L4	L7	L8	L9	L10	L14 min.	L15
10	10	72	62	7	11.7	62.5	15	8	10	2	25
	20	72									
	30	82	72			72.5					
	40	92	82				25				
	50	112	102			92.5					
	80	162	152			140.5					
16	10	80	68	6.7	14.2	63.5	22	10	12	2	32
	20										
	30	87	75			70.5					
	40	97	85			80.5					
	50	112	100			90.5	28				
	80	158	146			134.5					
	100	199	187			176.5					
	125	257	245	8.2	16.6	233.5					
	150	282	270			258.5					
20	10	97	85	11.5	15.2	74	28	10	12	2	25
	20										
	30										
	40	107	95			84					
	50	122	110			92	37				
	80	167	155			135					
	100	203	191			171					
	125	262	250	10.3	17.5	208	59				
	150	302	290			249					
	200	377	365			323					
25	10	108	94	10.7	18.7	88.5	25	12	14	2	30
	20										
	30										
	40	118	104			92.5	34				
	50	131	117			102.5					
	80	177	163			132.5	51				
	100	210	196			159.5	57				
	125	264	250	10	21.5	212.5					
	150	304	290			252.5					
	200	379	365			328.5					

∅ [mm]	L16 1)	L16 2)	L17 min.	T1	T2	T3	T4	T5	T6	⫧ 1	⫧ 2 1)	⫧ 2 2)
10	21.7	8	1	12	1.5	1.3	7	8	1.2	10	2.5	4
16	23.5	16		16	2.1	1.6	10	7		13	3	5
20	34	17.5		20	2.6	2.1		10	2.1	15	4	6
25	49.5	18				2.6	12	11	2.6	19	5	8

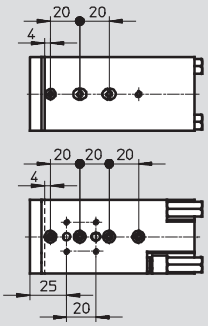
1) With hydraulic shock absorbers
2) With flexible cushioning

Hole pattern for mounting thread and centring holes

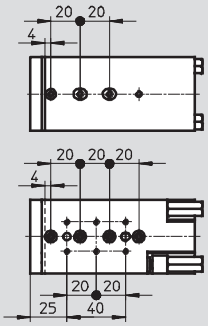
SLT-10-10 ... 30



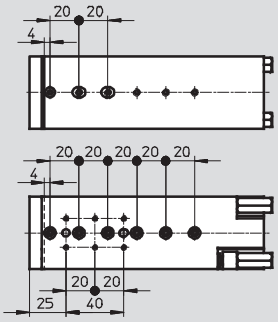
SLT-10-40



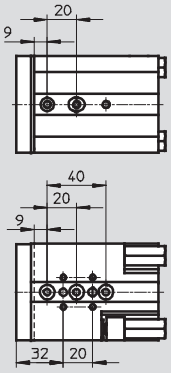
SLT-10-50



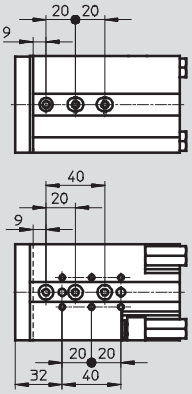
SLT-10-80



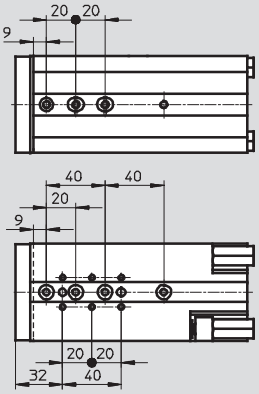
SLT-16-10 ... 40



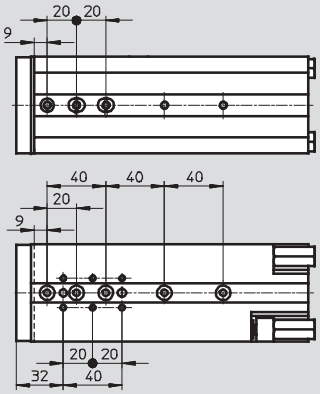
SLT-16-50



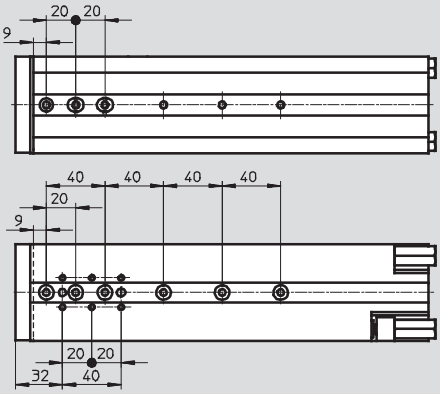
SLT-16-80



SLT-16-100

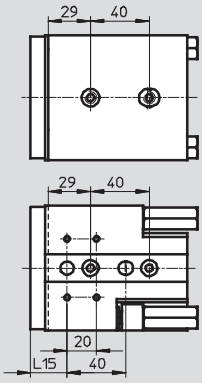


SLT-16-125/-150

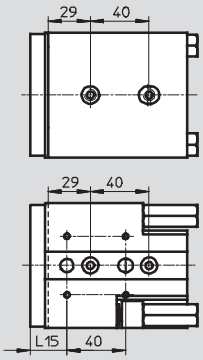


Hole pattern for mounting thread and centring holes

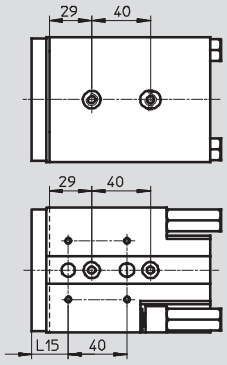
SLT-20-10 ... 40



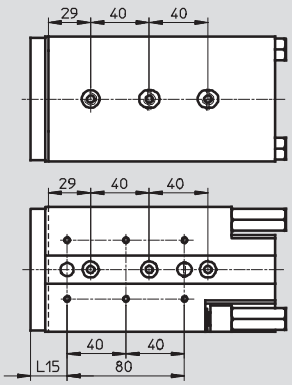
SLT-25-10 ... 40



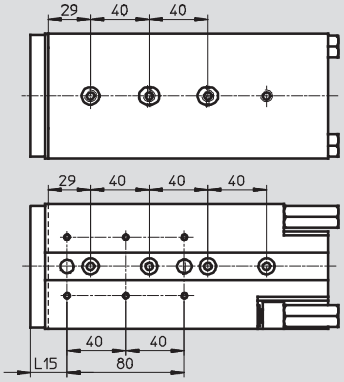
SLT-20/-25-50



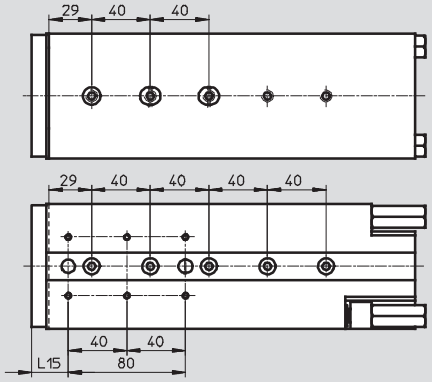
SLT-20/-25-80



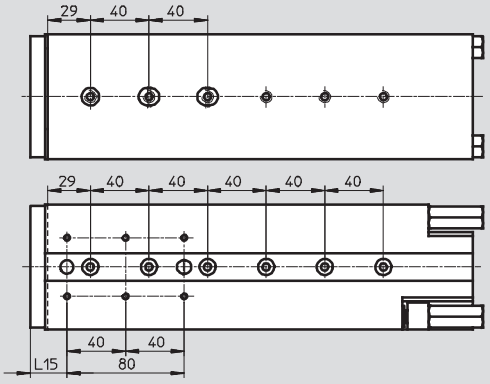
SLT-20/-25-100



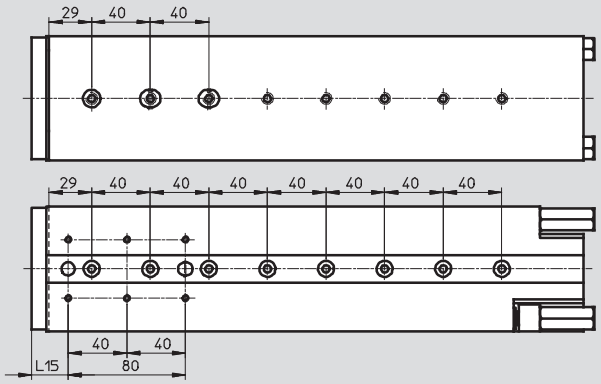
SLT-20/-25-125



SLT-20/-25-150



SLT-20/-25-200

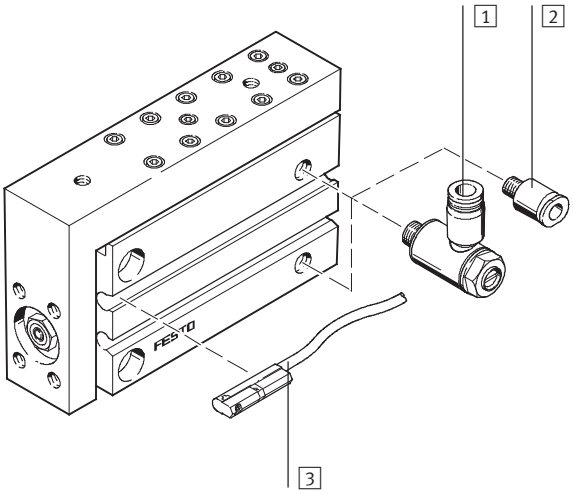


Ordering data					
∅	Stroke	SLT-...-P-A		SLT-...-A-CC-B	
[mm]	[mm]	Part No.	Type	Part No.	Type
6					
	10	**170 549**	**SLT-6-10-P-A**	–	
	20	**170 550**	**SLT-6-20-P-A**		
	30	**170 551**	**SLT-6-30-P-A**		
	40	**170 552**	**SLT-6-40-P-A**		
	50	**170 553**	**SLT-6-50-P-A**		
10					
	10	**170 554**	**SLT-10-10-P-A**	–	
	20	**170 555**	**SLT-10-20-P-A**		
	30	**170 556**	**SLT-10-30-P-A**	**197 891**	**SLT-10-30-A-CC-B**
	40	**170 557**	**SLT-10-40-P-A**	**197 892**	**SLT-10-40-A-CC-B**
	50	**170 558**	**SLT-10-50-P-A**	**197 893**	**SLT-10-50-A-CC-B**
	80	**170 559**	**SLT-10-80-P-A**	**197 894**	**SLT-10-80-A-CC-B**
16					
	10	**170 560**	**SLT-16-10-P-A**	–	
	20	**170 561**	**SLT-16-20-P-A**		
	30	**170 562**	**SLT-16-30-P-A**	**197 895**	**SLT-16-30-A-CC-B**
	40	**170 563**	**SLT-16-40-P-A**	**197 896**	**SLT-16-40-A-CC-B**
	50	**170 564**	**SLT-16-50-P-A**	**197 897**	**SLT-16-50-A-CC-B**
	80	**170 565**	**SLT-16-80-P-A**	**197 898**	**SLT-16-80-A-CC-B**
	100	**170 566**	**SLT-16-100-P-A**	**197 899**	**SLT-16-100-A-CC-B**
	125	**188 412**	**SLT-16-125-P-A**	**197 900**	**SLT-16-125-A-CC-B**
	150	**188 413**	**SLT-16-150-P-A**	**197 901**	**SLT-16-150-A-CC-B**
20					
	10	**170 567**	**SLT-20-10-P-A**	–	
	20	**170 568**	**SLT-20-20-P-A**		
	30	**170 569**	**SLT-20-30-P-A**	**197 902**	**SLT-20-30-A-CC-B**
	40	**170 570**	**SLT-20-40-P-A**	**197 903**	**SLT-20-40-A-CC-B**
	50	**170 571**	**SLT-20-50-P-A**	**197 904**	**SLT-20-50-A-CC-B**
	80	**170 572**	**SLT-20-80-P-A**	**197 905**	**SLT-20-80-A-CC-B**
	100	**170 573**	**SLT-20-100-P-A**	**197 906**	**SLT-20-100-A-CC-B**
	125	**188 416**	**SLT-20-125-P-A**	**197 907**	**SLT-20-125-A-CC-B**
	150	**188 417**	**SLT-20-150-P-A**	**197 908**	**SLT-20-150-A-CC-B**
	200	**188 418**	**SLT-20-200-P-A**	**197 909**	**SLT-20-200-A-CC-B**
25					
	10	**170 574**	**SLT-25-10-P-A**	–	
	20	**170 575**	**SLT-25-20-P-A**		
	30	**170 576**	**SLT-25-30-P-A**	**197910**	**SLT-25-30-A-CC-B**
	40	**170 577**	**SLT-25-40-P-A**	**197911**	**SLT-25-40-A-CC-B**
	50	**170 578**	**SLT-25-50-P-A**	**197912**	**SLT-25-50-A-CC-B**
	80	**170 579**	**SLT-25-80-P-A**	**197913**	**SLT-25-80-A-CC-B**
	100	**170 580**	**SLT-25-100-P-A**	**197914**	**SLT-25-100-A-CC-B**
	125	**188 422**	**SLT-25-125-P-A**	**197915**	**SLT-25-125-A-CC-B**
	150	**188 423**	**SLT-25-150-P-A**	**197916**	**SLT-25-150-A-CC-B**
	200	**188 424**	**SLT-25-200-P-A**	**197917**	**SLT-25-200-A-CC-B**

Mini slides SLS

Peripherals overview and type codes

Peripherals overview



Accessories

		Brief description	➔ Page/Internet
1	One-way flow control valve GRLA	For speed regulation	38
2	Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star
3	Proximity sensor SME/SMT-10	Sensor slots for one or more proximity sensors	39

Type codes

SLS – 16 – 10 – P – A

Type

Double-acting	
SLS	Mini slide

Piston ∅ [mm]

Stroke [mm]

Cushioning

P	Flexible cushioning, non-adjustable

Position sensing

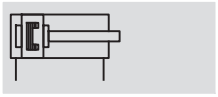
A	For proximity sensing

Mini slides SLS

Technical data

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Function



- ⌀ - Diameter
  6 ... 16 mm

- l - Stroke length
  5 ... 30 mm

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General technical data				
Piston ∅		6	10	16
Pneumatic connection		M5		
Design		Kinematic yoke system		
Guide		Via ball bearings		
Cushioning		Non-adjustable at either end		
Position sensing		For proximity sensing		
Type of mounting		Via through-holes		
		Via female thread		
Assembly position		Any		
Max. advancing speed	[m/s]	0.5[1)]	0.8	
Max. retracting speed	[m/s]	0.5[1)]	0.8	

1) Must be throttled externally

Operating and environmental conditions				
Piston ∅		6	10	16
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	1.5 ... 10	1 ... 10	
Ambient temperature[1)]	[°C]	–20 ... +60		

1) Note operating range of proximity sensors

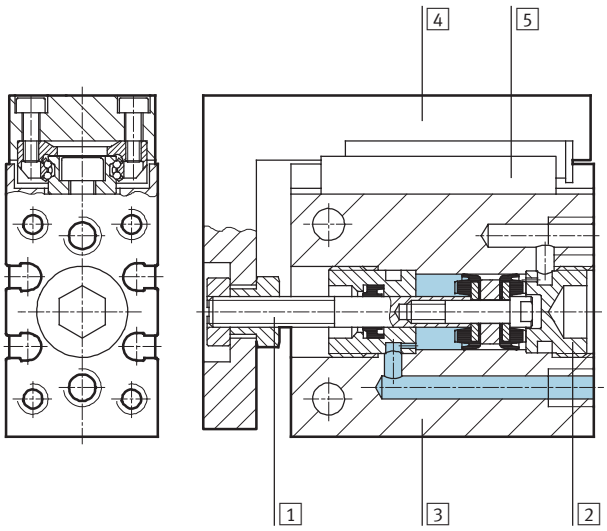
Forces [N] and impact energy [Nm]				
Piston ∅		6	10	16
Theoretical force at 6 bar, advancing		17	47	121
Theoretical force at 6 bar, retracting		13	39	104
Max. impact energy at the end positions[1)]	Cushioning P[2)]	0.008	0.05	0.15

1) Loads moved by the slides must be taken into consideration for the calculation of end-position cushioning energy
2) Note also the graph illustrating piston speed as a function of working load ➔ 24

Weights [g]				
Piston ∅	Stroke	6	10	16
Product weight	5	97	130	225
	10	104	139	226
	15	113	149	256
	20	120	164	257
	25	131	182	291
	30	141	191	301
Moving load	5	28	41	92
	10	28	44	92
	15	32	49	100
	20	33	51	101
	25	37	60	111
	30	38	62	115

Materials

Sectional view

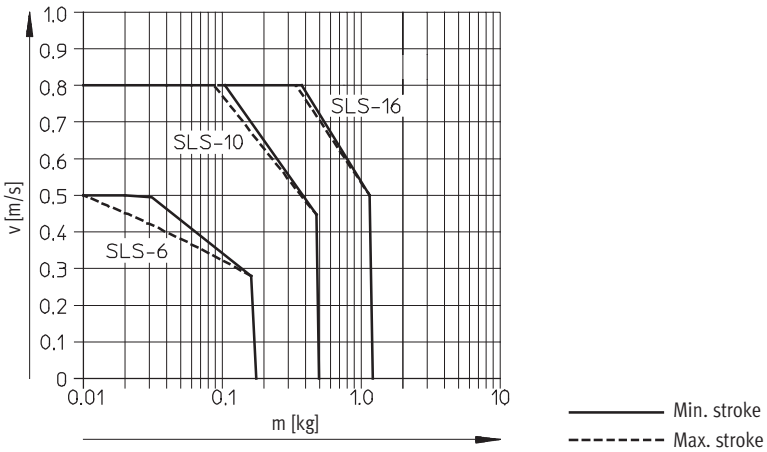


Mini slide		
1	Piston rod	High-alloy steel
2	Cap	Wrought aluminium alloy, anodised
3	Housing	Wrought aluminium alloy, anodised
4	Slide	Wrought aluminium alloy, anodised
5	Guide	Tempered steel
–	Seals	Thermoplastic rubber, hydrogenated nitrile rubber, nitrile rubber
	Note on materials	Free of copper, PTFE and silicone

Piston speed v as a function of working load m

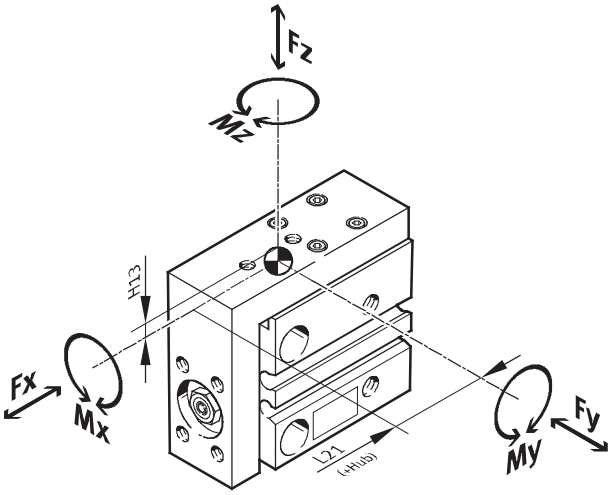
SLS-6/-10/-16-...-P-A

The piston speed as a function of working load illustrated in this graph may not be exceeded as the kinetic impact or residual energy in the end positions can result in damage to the drive.



Dynamic characteristic load values

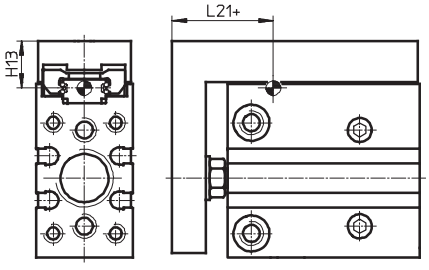
Torques are indicated with reference to the centre of the guide.
They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the drive is simultaneously subjected to several of the indicated forces and torques, the following equation must be satisfied in addition to the indicated maximum loads.

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|Mx|}{Mx_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}} \leq 1$$

Position of guide centre

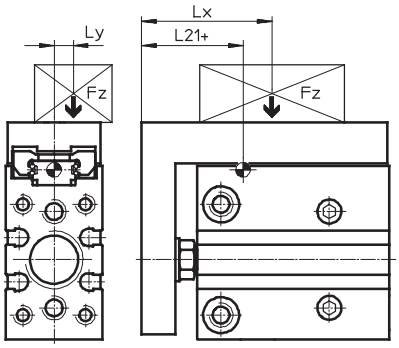


\+ plus stroke length

Permissible forces and torques						Geometric characteristics	
Piston ∅	Stroke	Fy_{max} [N]	Fz_{max} [N]	Mx_{max}, My_{max} [Nm]	Mz_{max} [Nm]	H13 [mm]	L21 [mm]
6							
	5	220	220	0.6	0.5	8.5	20.5
	10	170	170	0.6	0.5		20.5
	15	180	180	0.9	0.6		23
	20	160	160	0.9	0.6		23
	25	150	150	0.9	0.6		23
	30	140	140	0.9	0.6		23
10							
	5	220	220	0.6	0.5	10	27.5
	10	170	170	0.6	0.5		27.5
	15	170	170	1.1	0.7		36
	20	150	150	1.1	0.7		36
	25	140	140	1.1	0.7		36
	30	130	130	1.1	0.7		36
16							
	5	590	590	2.1	1.6	11	30.5
	10	470	470	2.1	1.6		30.5
	15	410	410	1.7	1.3		30.5
	20	370	370	1.7	1.3		30.5
	25	410	410	2.5	1.4		34
	30	390	390	2.5	1.4		34

Calculation example

Given:



Mini slide	= SLS-10
Stroke length	= 20 mm
Lever arm L_x	= 5 mm
Lever arm L_y	= 20 mm
Mass F_z	= 0.495 kg
Acceleration a	= 0 m/s²

To be found:

F_y, F_z, Mx, My, Mz
and
verification of function with combined load

Solution:

L21 = 36 mm from table

F_y = 0 N

F_z = m x g
= 0.495 kg x 9.81 m/s² = 4.856 N

M_x = m x g x L_y
= 0.495 kg x 9.81 m/s² x 20 mm = 0.097 Nm

M_y = m x g x [(L21+stroke)-L_x]
= 0.495 kg x 9.81 m/s² [(36 mm + 20 mm) – 5 mm] = 0.248 Nm

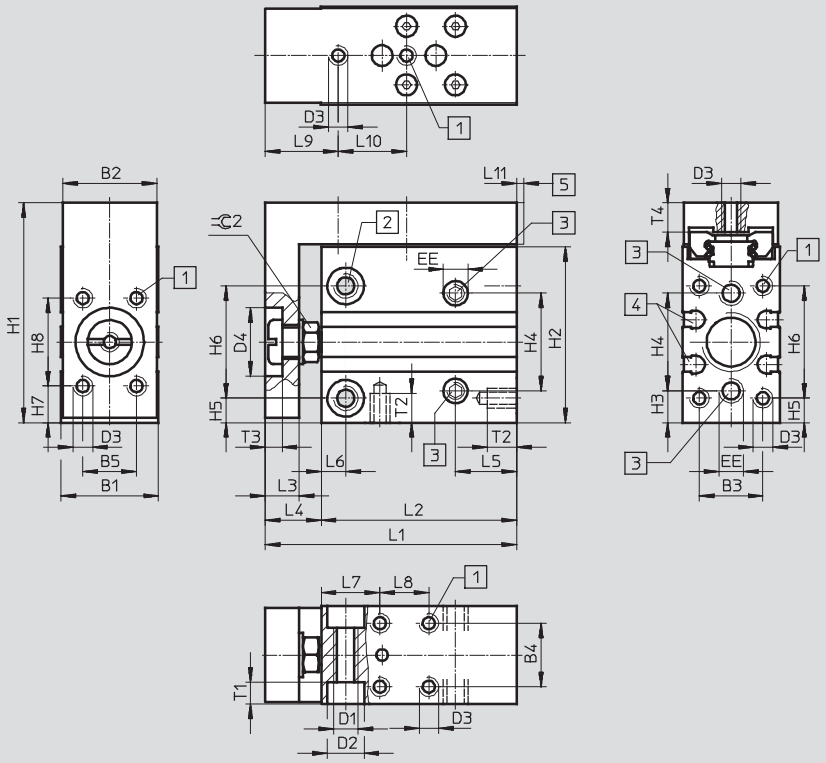
M_z = 0 Nm

Combined load:

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|Mx|}{Mx_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}}$$

$$= 0 + \frac{4.856N}{150N} + \frac{0.097Nm}{1.1Nm} + \frac{0.248Nm}{1.1Nm} + 0 = 0.345 \leq 1$$

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**



1 Mounting thread
2 Through and threaded holes for mounting the drive
3 Supply ports
4 Sensor slots for proximity sensor SME/SMT-10
5 Possible protrusion of the slide in relation to the edge of the housing

∅ [mm]	Stroke [mm]	B1	B2	B3	B4	B5	D1	D2 ∅	D3	D4 ∅ H11	EE	H1
6	5	16	15.3	10.5	10	9	M4	6	M3	12	M5	39
	10											
	15											
	20											
	25											
	30											
10	5	20	19.3	13	13	11	M5	7.5	M4	14	M5	45
	10											
	15											
	20											
	25											
	30											
16	5	24	23.3	17	17	16	M5	7.5	M4	19.5	M5	51
	10											
	15											
	20											
	25											
	30											

Mini slides SLS

Technical data

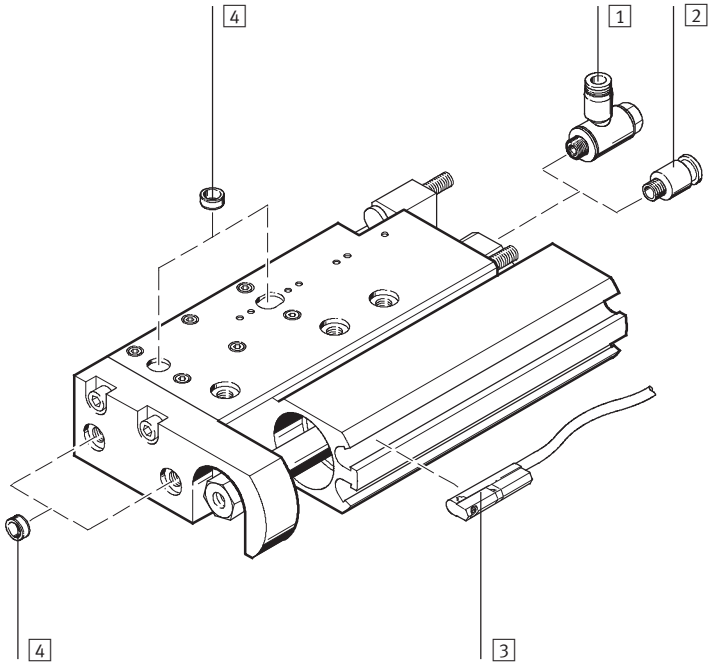
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∅ [mm]	Stroke [mm]	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3	L4	L5
6	5	31	6	17	5	19	7	15	46	37.5	6	8.5	10
	10								51	42.5			
	15								56	47.5			
	20								61	52.5			
	25								66	57.5			
	30								71	62.5			
10	5	36	6.5	20	5	23	7.5	18	51.5	40	7	11.5	12.5
	10								56.5	45			
	15								61.5	50			
	20								66.5	55			
	25								73.5	62			
	30								78.5	67			
16	5	41	6.5	25	5.5	27	6	26	66	52	10	14	12.5
	10												
	15								76	62			
	20												
	25								86	72			
	30								91	77			

∅ [mm]	Stroke [mm]	L6	L7	L8	L9	L10	L11	T1	T2	T3	T4	⫷ 2
6	5	4	10	10	13	20	–	3.3	4.8	3	5	7
	10			15								
	15			20		25						
	20			25		30						
	25			30		40						
	30			35								
10	5	5	12	10	15	14	Max. 0.75	4.4	6	3.5	6	8
	10			14		19						
	15			18		25						
	20			24		30						
	25			32		40						
	30			35		45						
16	5	5	12	20	18	24	Max. 0.75	4.4	6	5	6	13
	10			20		35						
	15			30		45						
	20					50						
	25			40								
	30			45		55						

Ordering data			
∅ [mm]	Stroke [mm]	Part No.	Type
6			
	5	**170 485**	**SLS-6-5-P-A**
	10	**170 486**	**SLS-6-10-P-A**
	15	**170 487**	**SLS-6-15-P-A**
	20	**170 488**	**SLS-6-20-P-A**
	25	**170 489**	**SLS-6-25-P-A**
	30	**170 490**	**SLS-6-30-P-A**
10			
	5	**170 491**	**SLS-10-5-P-A**
	10	**170 492**	**SLS-10-10-P-A**
	15	**170 493**	**SLS-10-15-P-A**
	20	**170 494**	**SLS-10-20-P-A**
	25	**170 495**	**SLS-10-25-P-A**
	30	**170 496**	**SLS-10-30-P-A**
16			
	5	**170 497**	**SLS-16-5-P-A**
	10	**170 498**	**SLS-16-10-P-A**
	15	**170 499**	**SLS-16-15-P-A**
	20	**170 500**	**SLS-16-20-P-A**
	25	**170 501**	**SLS-16-25-P-A**
	30	**170 502**	**SLS-16-30-P-A**

Peripherals overview



Note

End stops must not be removed.

Accessories

		Brief description	→ Page/Internet
1	One-way flow control valve GRLA	For speed regulation	38
2	Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star
3	Proximity sensor SME/SMT-10	Sensor slots for one or more proximity sensors	39
4	Centring pin/sleeve ZBS/ZBH	For centring loads and attachments	38

Type codes

SLF	–	16	–	20	–	P	–	A

Type

Double-acting	
SLF	Mini slide

Piston ∅ [mm]

Stroke [mm]

Cushioning

P	Flexible cushioning, non-adjustable

Position sensing

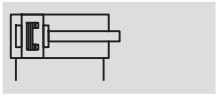
A	For proximity sensor

Mini slides SLF

Technical data

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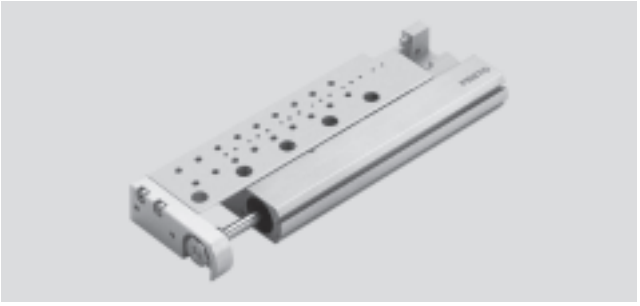
Function



- Ø - Diameter
  6 ... 16 mm

- l - Stroke length
  10 ... 80 mm

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General technical data				
Piston ∅		6	10	16
Pneumatic connection		M5		
Design		Kinematic yoke system		
Guide		Via ball bearings		
Cushioning		Non-adjustable at either end		
Position sensing		For proximity sensing		
Type of mounting		Via through-holes		
		Via female thread		
Assembly position		Any		
Adjustable end-position range	Per end stop [mm]	5		
Max. advancing speed	[m/s]	0.5[1)]	0.8	
Max. retracting speed	[m/s]	0.5[1)]	0.8	

1) Must be throttled externally

Operating and environmental conditions				
Piston ∅		6	10	16
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	1.5 ... 10	1 ... 10	
Ambient temperature[1)]	[°C]	–20 ... +60		

1) Note operating range of proximity sensors

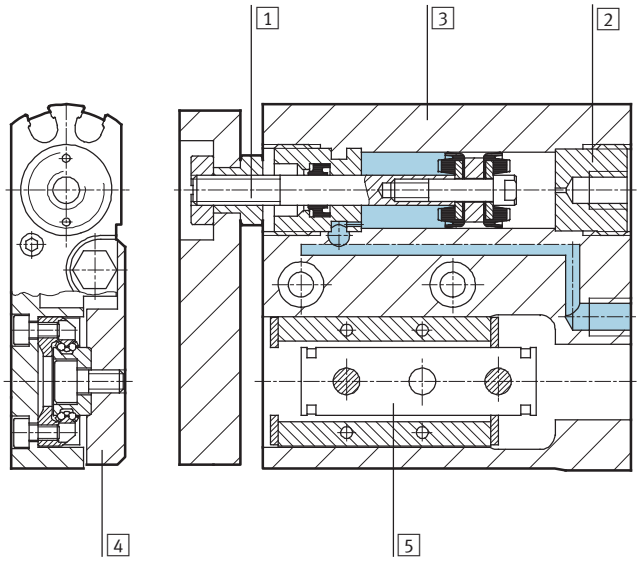
Forces [N] and impact energy [Nm]				
Piston ∅		6	10	16
Theoretical force at 6 bar, advancing		17	47	121
Theoretical force at 6 bar, retracting		13	40	104
Max. impact energy at the end positions[1)]	Cushioning P[2)]	0.016	0.05	0.1

1) Loads moved by the slides must be taken into consideration for the calculation of end-position cushioning energy
2) Note also the graph illustrating piston speed as a function of working load ➔ 32

Weights [g]				
Piston ∅		6	10	16
Product weight	10	108	135	257
	20	124	156	291
	30	138	171	319
	40	–	178	353
	50		227	407
	80		–	539
Moving load	10	32	41	99
	20	37	48	109
	30	48	58	122
	40	–	60	133
	50		79	153
	80		–	199

Materials

Sectional view

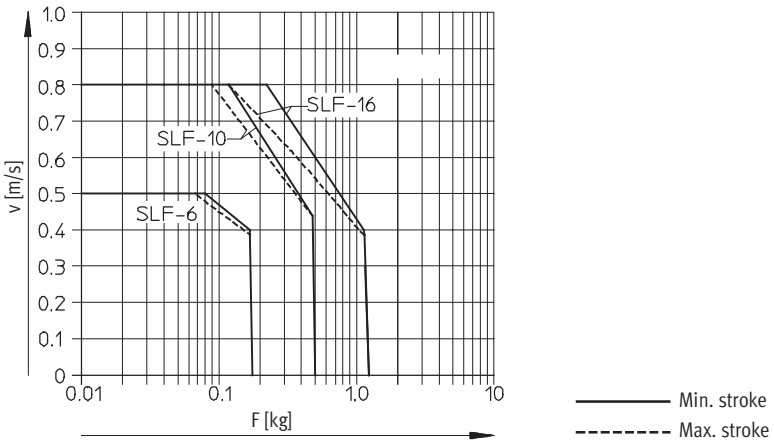


Mini slide		
1	Piston rod	High-alloy steel
2	Cap	Wrought aluminium alloy, anodised
3	Housing	Wrought aluminium alloy, anodised
4	Slide	Wrought aluminium alloy, anodised
5	Guide	Tempered steel
–	Seals	Thermoplastic rubber, hydrogenated nitrile rubber, nitrile rubber
	Note on materials	Free of copper, PTFE and silicone

Piston speed v as a function of working load m

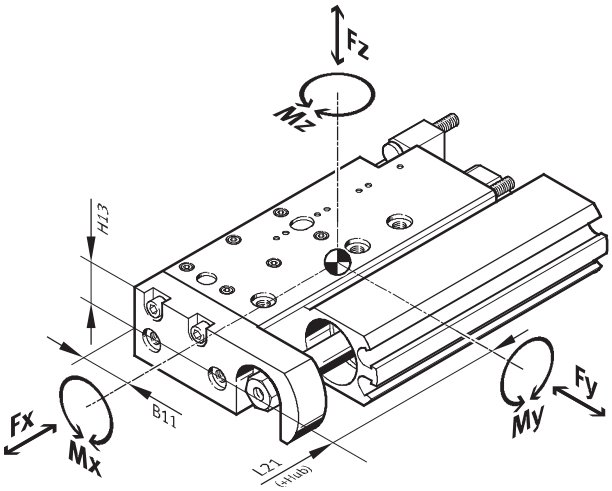
SLF-6/-10/-16-...-P-A

The piston speed as a function of working load illustrated in this graph may not be exceeded as the kinetic impact or residual energy in the end positions can result in damage to the drive.



Characteristic load values

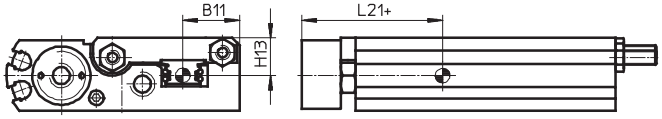
Torques are indicated with reference to the centre of the guide.
They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the drive is simultaneously subjected to several of the indicated forces and torques, the following equation must be satisfied in addition to the indicated maximum loads.

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|Mx|}{Mx_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}} \leq 1$$

Position of guide centre

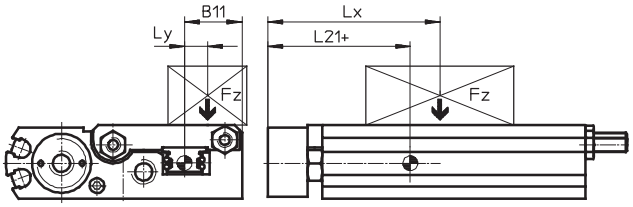


\+ plus stroke length

Permissible forces and torques						Geometric characteristics		
Piston ∅	Stroke	Fy_{max} [N]	Fz_{max} [N]	Mx_{max}, My_{max} [Nm]	Mz_{max} [Nm]	B11 [mm]	H13 [mm]	L21 [mm]
6								
	10	170	170	0.6	0.5	14	7	22
	20	150	150	1.1	0.7			21
	30	130	130	1.1	0.7			21
10								
	10	170	170	0.6	0.5	11.5	8	23
	20	150	150	1.1	0.7			25
	30	130	130	1.1	0.7			25
	40	150	150	0.9	0.5			29
	50	190	190	1.4	0.5			34.5
16								
	10	470	470	2.1	1.6	14	11.5	27.5
	20	370	370	1.7	1.3			27.5
	30	390	390	2.5	1.4			31.5
	40	350	350	2.2	1.3			31.5
	50	390	390	3.1	1.4			36
	80	410	410	4.3	1.5			43.5

Calculation example

Given:



Mini slide	= SLF-10
Stroke length	= 20 mm
Lever arm L_x	= 5 mm
Lever arm L_y	= 20 mm
Mass F_z	= 0.495 kg
Acceleration a	= 0 m/s²

To be found:

F_y, F_z, Mx, My, Mz
and
verification of function with combined load

Solution:

L21 = 25 mm from table

F_y = 0 N

F_z = m x g
= 0.495 kg x 9.81 m/s² = 4.856 N

M_x = m x g x L_y
= 0.495 kg x 9.81 m/s² x 20 mm = 0.097 Nm

M_y = m x g x [(L21+stroke)-L_x]
= 0.495 kg x 9.81 m/s² [(25 mm + 20 mm) – 5 mm] = 0.194 Nm

M_z = 0 Nm

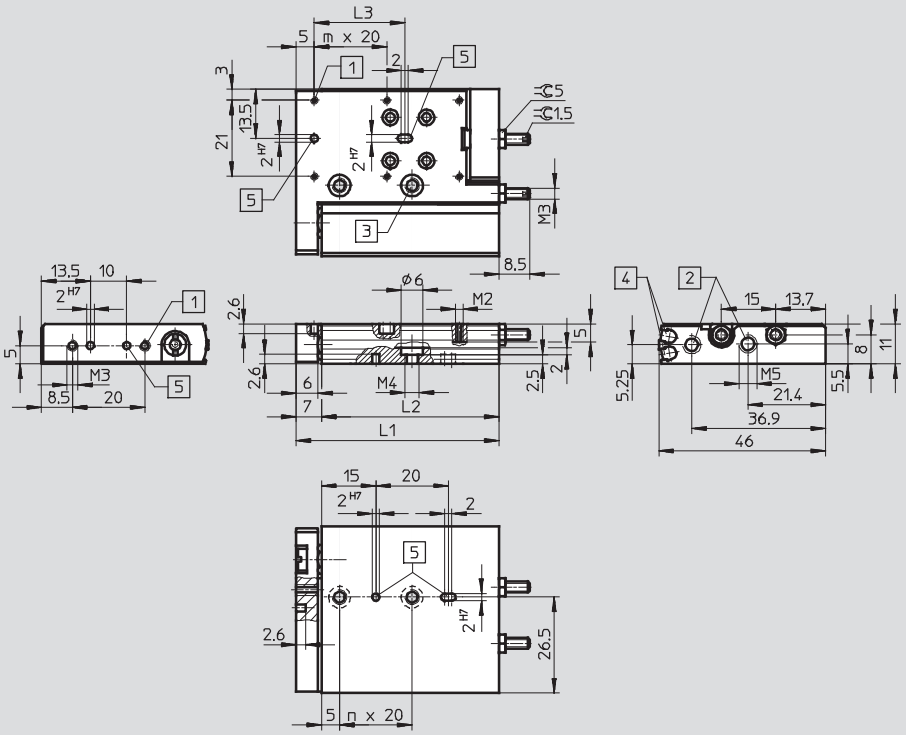
Combined load:

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|Mx|}{Mx_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}}$$

$$= 0 + \frac{4.856N}{150N} + \frac{0.097Nm}{1.1Nm} + \frac{0.194Nm}{1.1Nm} + 0 = 0.297 \leq 1$$

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

∅ 6

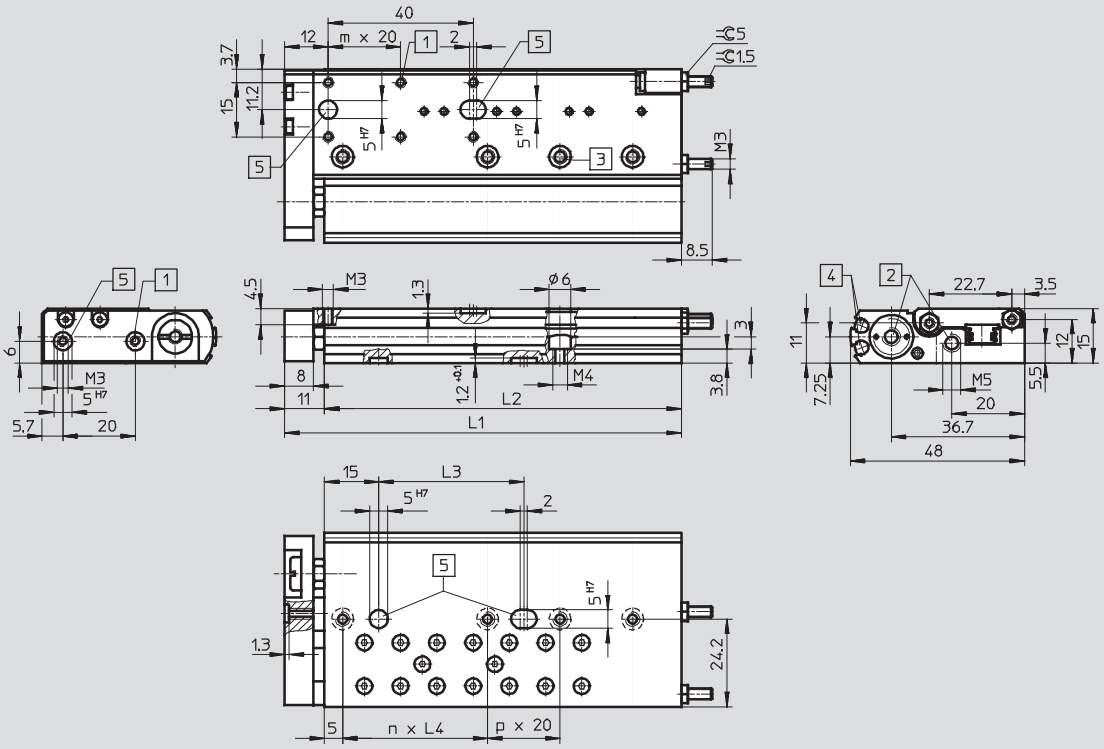


1 Mounting thread
2 Supply ports
3 Through-holes for mounting the drive
4 Sensor slots for proximity sensor SME/SMT-10
5 Centring holes (centring sleeves included in scope of delivery)

∅ [mm]	Stroke [mm]	L1	L2	L3	m	n
6	10	56	49	20	2	1
	20	66	59			2
	30	76	69	40	3	

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∅ 10

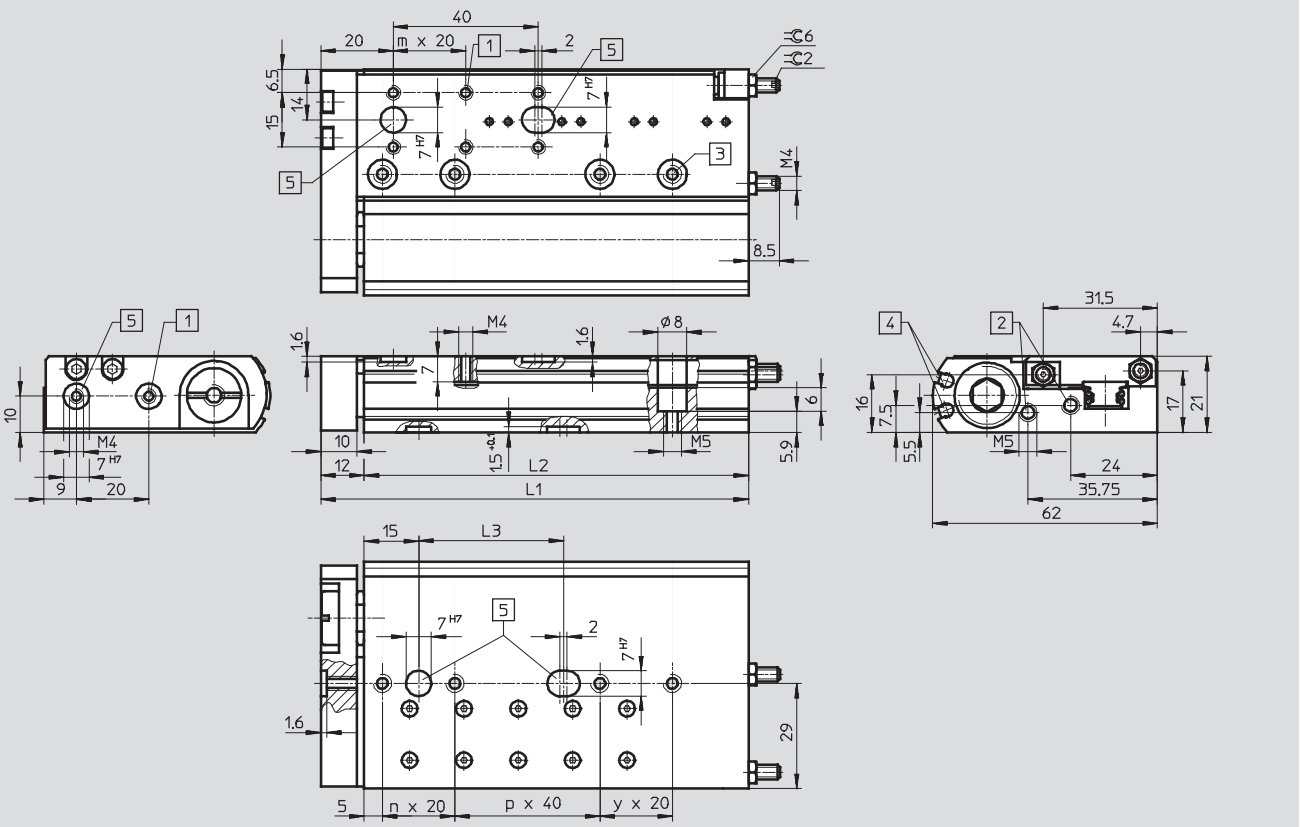


1 Mounting thread
2 Supply ports
3 Through-holes for mounting the drive
4 Sensor slots for proximity sensor SME/SMT-10
5 Centring holes (centring sleeves included in scope of delivery)

∅ [mm]	Stroke [mm]	L1	L2	L3	L4	m	n	p
10	10	59.5	48.5	20	20	1	1	–
	20	69.5	58.5					
	30	79.5	68.5			2	2	
	40	89.5	78.5	40			3	
	50	109.5	98.5		40		1	2

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

∅ 16



1 Mounting thread
2 Supply ports
3 Through-holes for mounting the drive
4 Sensor slots for proximity sensor SME/SMT-10
5 Centring holes (centring sleeves included in scope of delivery)

∅ [mm]	Stroke [mm]	L1	L2	L3	m	n	p	y
16	10	68	56	20	1	1	–	–
	20	78	66			2		
	30	88	76		2			
	40	98	86	40		3		
	50	118	106			1	1	1
	80	160	148				2	–

Ordering data			
∅ [mm]	Stroke [mm]	Part No.	Type
6			
	10	**170 503**	**SLF-6-10-P-A**
	20	**170 504**	**SLF-6-20-P-A**
	30	**170 505**	**SLF-6-30-P-A**
10			
	10	**170 506**	**SLF-10-10-P-A**
	20	**170 507**	**SLF-10-20-P-A**
	30	**170 508**	**SLF-10-30-P-A**
	40	**170 509**	**SLF-10-40-P-A**
	50	**170 510**	**SLF-10-50-P-A**
16			
	10	**170 511**	**SLF-16-10-P-A**
	20	**170 512**	**SLF-16-20-P-A**
	30	**170 513**	**SLF-16-30-P-A**
	40	**170 514**	**SLF-16-40-P-A**
	50	**170 515**	**SLF-16-50-P-A**
	80	**170 516**	**SLF-16-80-P-A**

Ordering data

		6 Part No.	6 Type	10 Part No.	10 Type	16 Part No.	16 Type	20 Part No.	20 Type	25 Part No.	25 Type
Centring pins/sleeves for SLT[1]										Technical data ➔ Internet: zbh	
	Housing	**189 652**	**ZBH-5**	**186 717**	**ZBH-7**	**150 927**	**ZBH-9**	**189 653**	**ZBH-12**	**189 653**	**ZBH-12**
	Slide	**189 652**	**ZBH-5**	**189 652**	**ZBH-5**	**189 652**	**ZBH-5**	**150 927**	**ZBH-9**	**189 653**	**ZBH-12**
	Yoke	**525 273**	**ZBS-02**	**189 652**	**ZBH-5**	**186 717**	**ZBH-7**	**150 927**	**ZBH-9**	**189 653**	**ZBH-12**
Centring pins/sleeves for SLF[1]										Technical data ➔ Internet: zbh	
	Housing	**525 273**	**ZBS-02**	**189 652**	**ZBH-5**	**186 717**	**ZBH-7**	–		–	
	Slide										
	Yoke										
Stop, metallic for SLT-...-P-A[2]											
	–	**539 278**	**PF-06-SLT**	**539 279**	**PF-10-SLT**	**539 280**	**PF-16-SLT**	**539 281**	**PF-20-SLT**	**539 282**	**PF-25-SLT**

1) Scope of delivery: 10 per pack
2) Scope of delivery: 2 per pack

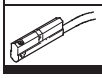
Ordering data – One-way flow control valves — Technical data ➔ Internet: grla

	Connection: Thread	Connection: For tubing O.D.	Material	Part No.	Type
	M5	3	Metal design	**193 137**	**GRLA-M5-QS-3-D**
		4		**193 138**	**GRLA-M5-QS-4-D**
	G1/8	4		**193 143**	**GRLA-1/8-QS-4-D**
		6		**193 144**	**GRLA-1/8-QS-6-D**

Ordering data – Proximity sensors for C-slot, magneto-resistive — Technical data ➔ Internet: smt

	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	PNP	Cable, 3-wire, in-line	2.5	**551 373**	**SMT-10M-PS-24V-E-2,5-L-OE**
			Plug M8x1, 3-pin, in-line	0.3	**551 375**	**SMT-10M-PS-24V-E-0,3-L-M8D**
			Plug M8x1, 3-pin, lateral	0.3	**551 376**	**SMT-10M-PS-24V-E-0,3-Q-M8D**

Ordering data – Proximity sensors for C-slot, magnetic reed — Technical data ➔ Internet: sme

	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	Contacting	Plug M8x1, 3-pin, in-line	0.3	**551 367**	**SME-10M-DS-24V-E-0,3-L-M8D**
			Cable, 3-wire, in-line	2.5	**551 365**	**SME-10M-DS-24V-E-2,5-L-OE**
			Cable, 2-wire, in-line	2.5	**551 369**	**SME-10M-ZS-24V-E-2,5-L-OE**
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	**173 212**	**SME-10-SL-LED-24**
			Cable, 3-wire, in-line	2.5	**173 210**	**SME-10-KL-LED-24**

Ordering data – Connecting cables — Technical data ➔ Internet: nebu

	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541 333**	**NEBU-M8G3-K-2.5-LE3**
			5	**541 334**	**NEBU-M8G3-K-5-LE3**
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	**541 338**	**NEBU-M8W3-K-2.5-LE3**
			5	**541 341**	**NEBU-M8W3-K-5-LE3**

Product Range and Company Overview

A Complete Suite of Automation Services

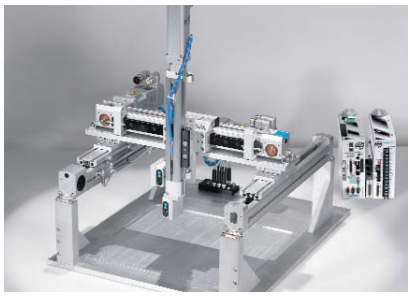
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