Mini slides SLTE, electric

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Mini slides SLTE, electric

Key features

Range of applications

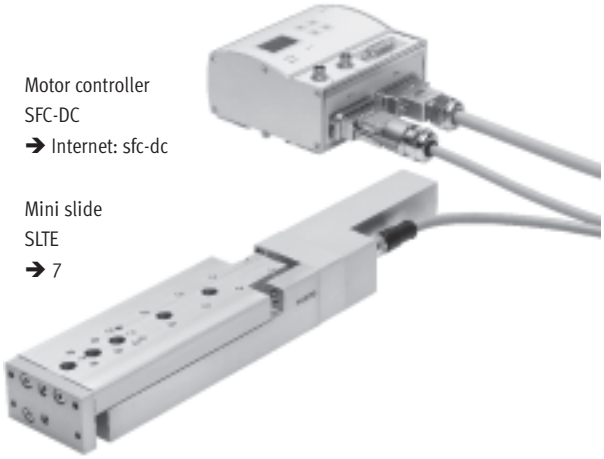
The electric mini slide SLTE is ideal for use in automation applications where controlled end-position cushioning (gentle stopping), constant travel speed and positioning capability are important factors.

The SLTE has the same interfaces on the yoke, slide and underneath the housing as the pneumatic SLT. It is also fully compatible with the modular handling and assembly system and SLT adapter kits.

Special features

- Precise and rigid guide
- Freely positionable
- Fast positioning times
- Through-holes from above and below
- Sensors can be integrated
- Gentle starting and stopping
- Working loads up to 4 kg
- Constant travel speeds of 2 ... 200 mm/s

Everything from a single source



Motor controller
SFC-DC
➔ Internet: sfc-dc

Mini slide
SLTE
➔ 7

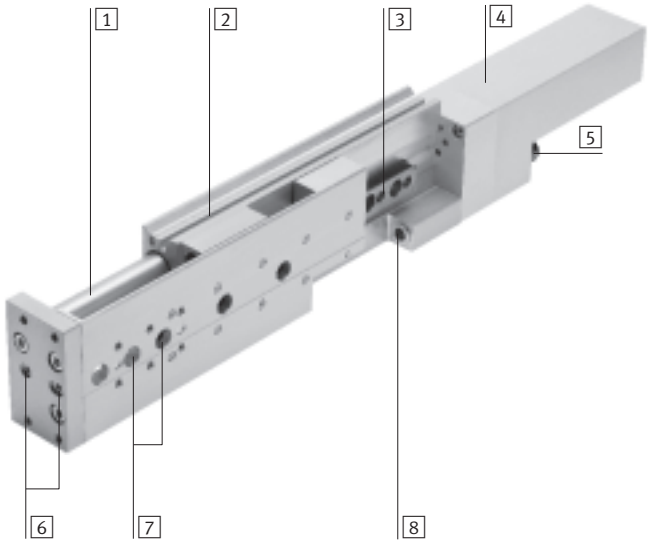
The mini slide SLTE and motor controller SFC form one unit.

- Thanks to the protection class IP54, the SFC can be mounted close to the SLTE, either:
  - with centre supports
  - on an H-rail
- Only one cable required between SLTE and SFC
- Motor controller SFC available with or without control panel
- Easy control with
  - I/O interface
  - Profibus
  - CANopen
  - DeviceNet

Parameterisation possible via

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

The technology in detail

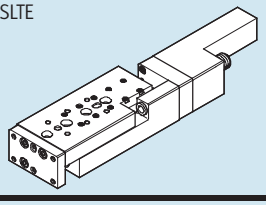
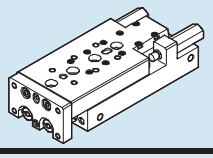
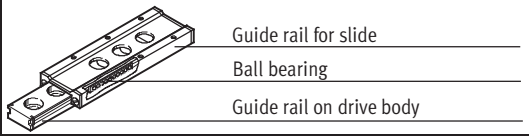
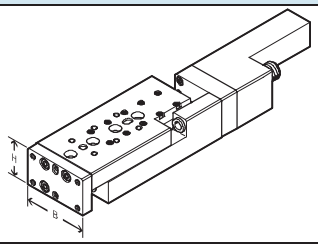
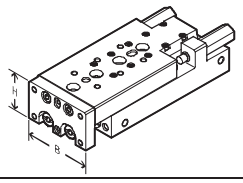
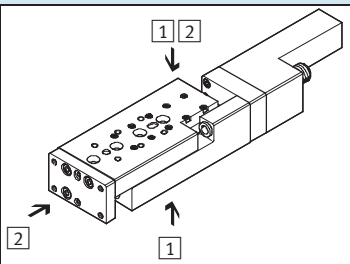
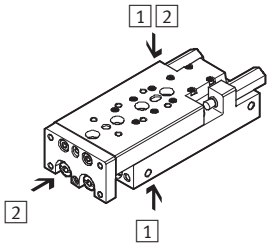


1 Drive rod
2 Slot for reference switch
3 Roller bearing guide
4 Drive assembly consisting of DC motor with displacement encoder
5 Electrical connection
6 Threaded holes and through-holes with centring hole for attaching the working load
7 Threaded holes and through-holes with centring hole for attaching the SLTE
8 Fixed stop with integrated rubber buffer

Mini slides SLTE, electric

Key features

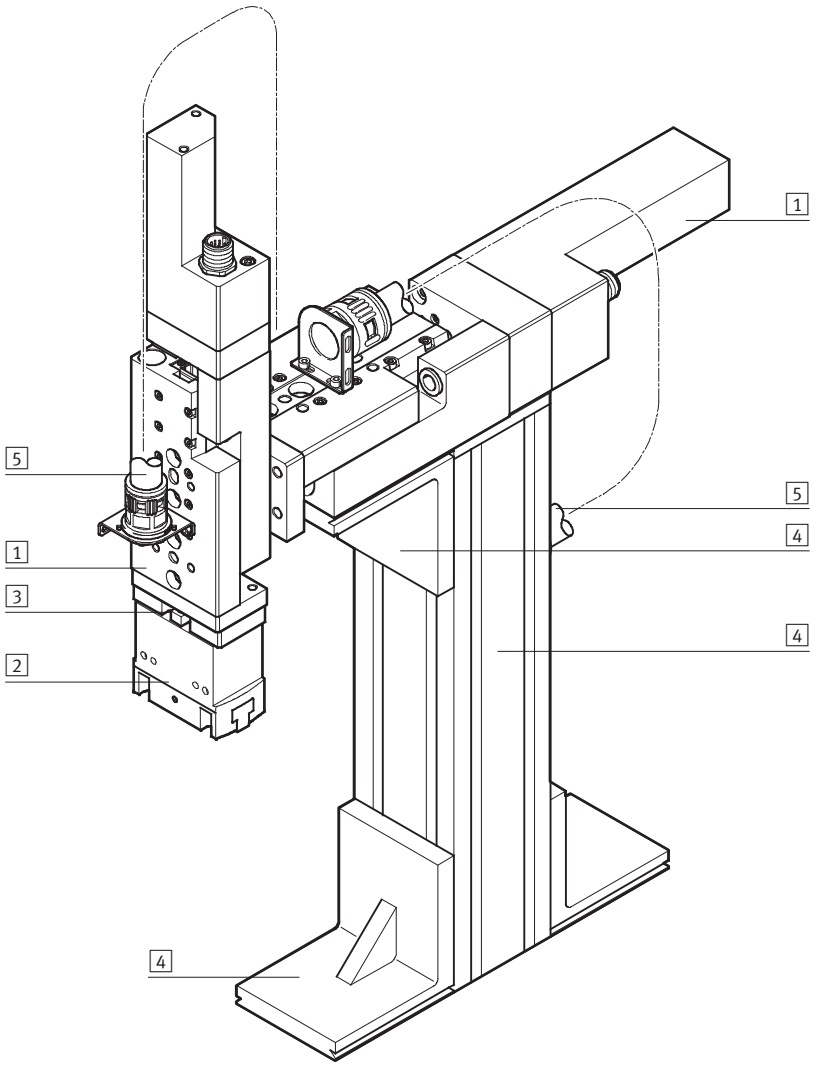
Comparison between electric mini slide SLTE and pneumatic mini slide SLT

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

Mini slides SLTE, electric

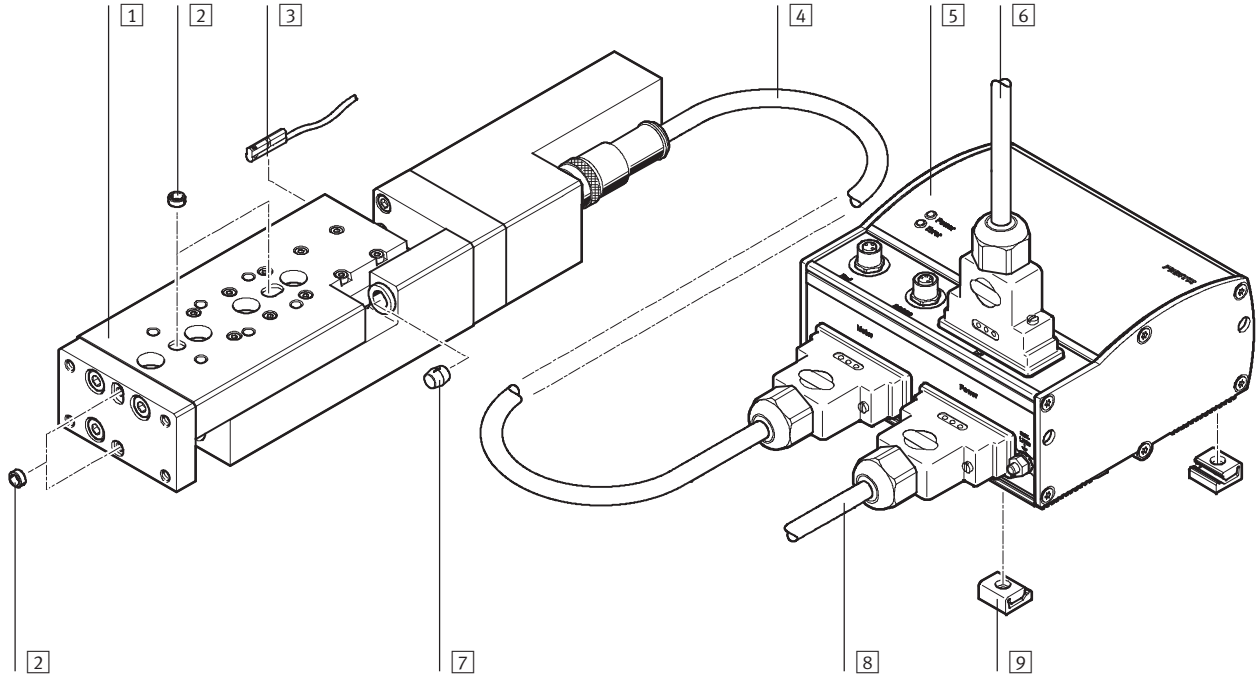
Key features

System product for handling and assembly technology



System elements and accessories			
		Brief description	**➔ Page/Internet**
1	Axes	Wide range of combinations possible within handling and assembly technology	axes
2	Grippers	Wide range of variations possible within handling and assembly technology	gripper
3	Adapters	For drive/drive and drive/gripper combinations	adapter kit
4	Basic mounting components	Profiles and profile connectors as well as profile/drive connectors	basic component
5	Installation components	For manageable and secure guidance of electrical cables and tubing	installation component
–	Drive units	Wide range of combinations possible within handling and assembly technology	drive

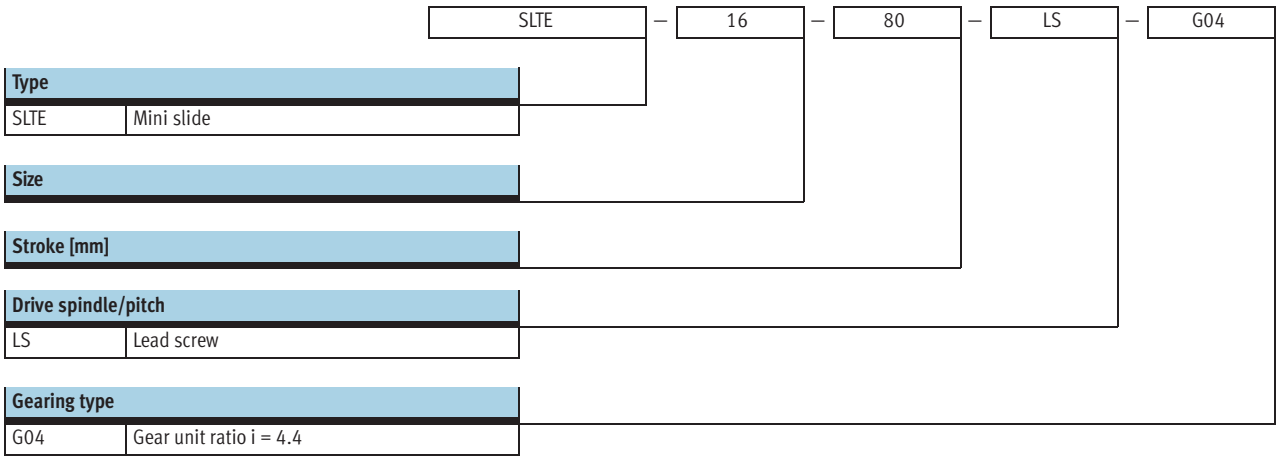
Size 10/16



Accessories			
		Brief description	**➔ Page/Internet**
1	Mini slide SLTE	Electromechanical linear axis with lead screw spindle	7
2	Centring pin/sleeve ZBS/ZBH	– For centring loads and attachment components – Centring sleeves included in scope of delivery	15
3	Proximity sensor SME/SMT-10	For referencing mini slide or for sensing slide position	15
4	Motor cable KMTR	Connecting cable between motor and motor controller	kmtr
5	Motor controller SFC	For parameterising and positioning mini slide	sfc-dc
6	Control cable KES	For I/O connection to any controller	kes
6	Plug FBS, FBA	For fieldbus interface	plug
7	Buffer	Buffer included in scope of delivery	–
8	Supply cable KPWR	Power supply cable; load and logic power supplies are isolated	kpwr
9	Centre supports MUP	– For mounting motor controller – Motor controller can also be mounted on H-rail	mup

Mini slides SLTE, electric

Type codes



Mini slides SLTE, electric

Technical data

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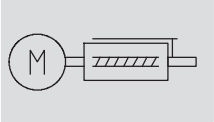
Function



- Ø - Size
10 and 16

- | - Stroke length
50 ... 150 mm

General technical data				
Size			10	16
Constructional design			Electromechanical linear axis with lead screw	
Guide			With ball bearings	
Type of mounting			Via through-holes	
			Via female thread	
			Via female thread and centring sleeve	
Stroke		[mm]	50, 80	50, 80, 100, 150
Stroke reserve per end position	with rubber buffer at both ends	[mm]	0.5	0.6
	with rubber buffer at one end	[mm]	1.2	1.25
Assembly position			Any	
Lead screw pitch		[mm]	5	7.5
Min. travel speed		[mm/s]	2	
Max. acceleration		[m/s^2]	2.5	
Repetition accuracy		[mm]	±0.1	
Reversing backlash		[mm]	< 0.1	

Electrical data for motor			
Size		10	16
System resolution of encoder		512 (pulses per rotation)	1,000 (pulses per rotation)
Nominal operating voltage	[V DC]	24	
Output	[W]	4.5	18

Operating and environmental conditions			
Size		10	16
Ambient temperature	[°C]	0 ... +40	
Protection class		IP40	
Fast transients		To EN61000-4-4	
Max. noise level[1)]	[dB A]	< 50	< 55
CE symbol (declaration of conformity)		In accordance with EU EMC directive	
Certification		C-Tick	

1) At maximum permissible speed

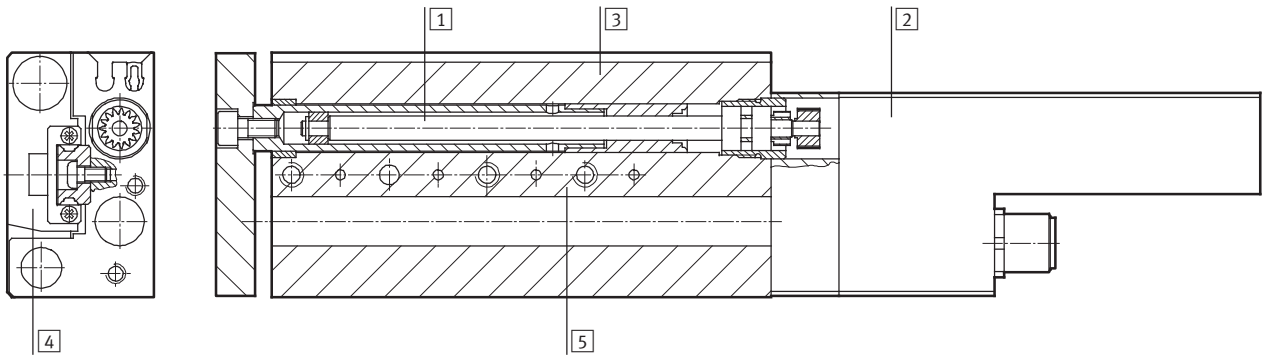
Weight [g]						
Size	10		16			
Stroke	50	80	50	80	100	150
Product weight	574	737	1,185	1,465	1,714	2,196
Moving load	163	235	296	415	519	729

Mini slides SLTE, electric

Technical data

Materials

Sectional view

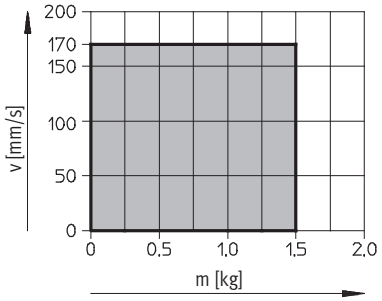


Mini slide		
1	Lead screw	High-alloy steel
2	Motor housing	Wrought aluminium alloy, anodised
3	Housing	Wrought aluminium alloy, anodised
4	Slide	Wrought aluminium alloy, anodised
5	Guide	Tempered steel
–	Seals	Thermoplastic rubber, nitrile rubber

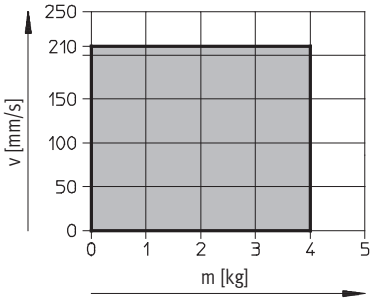
Travel speed v as a function of applied load m

Horizontal mounting position

SLTE-10

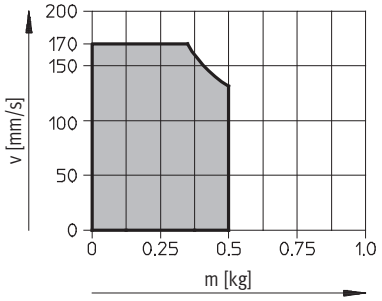


SLTE-16

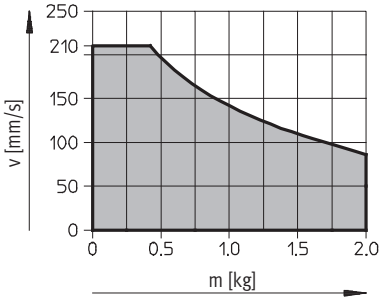


Vertical mounting position

SLTE-10



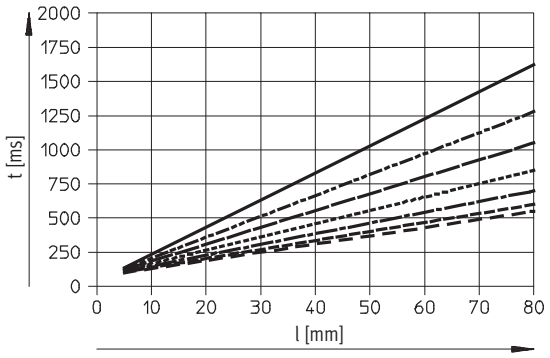
SLTE-16



Permissible operating range

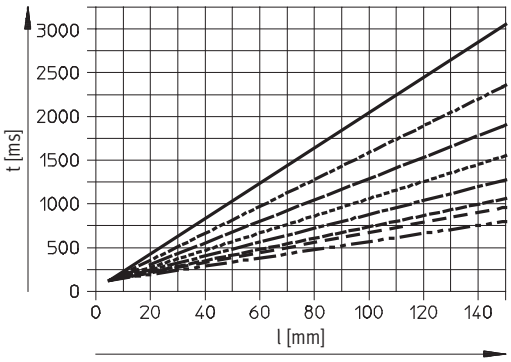
Positioning time t as a function of stroke l

SLTE-10



- v = 50 mm/s
- v = 65 mm/s
- v = 80 mm/s
- v = 100 mm/s
- v = 125 mm/s
- v = 150 mm/s
- v = 170 mm/s

SLTE-16

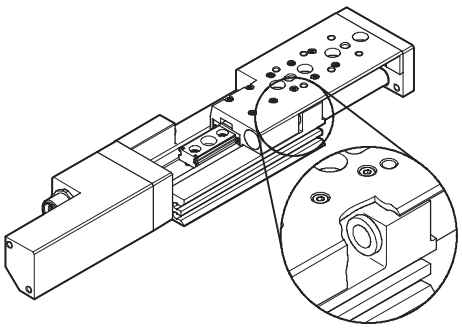


- v = 50 mm/s
- v = 65 mm/s
- v = 80 mm/s
- v = 100 mm/s
- v = 125 mm/s
- v = 150 mm/s
- v = 170 mm/s
- v = 210 mm/s

Reference travel

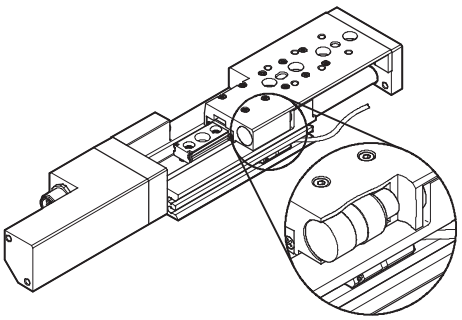
to fixed stop

- Positive fixed stop
  - To front stop bush (extended)
- Negative fixed stop
  - To rear stop bush (retracted)



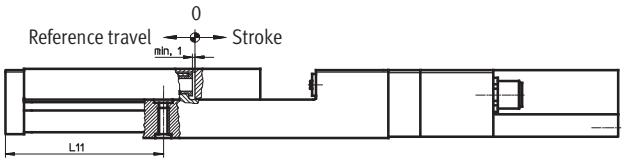
to proximity sensor

- Position freely selectable

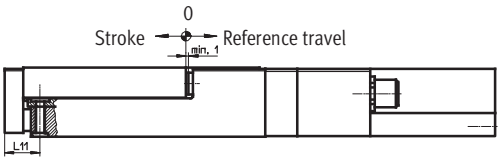


The following applies for reference travel to a fixed stop:

Positive fixed stop



Negative fixed stop



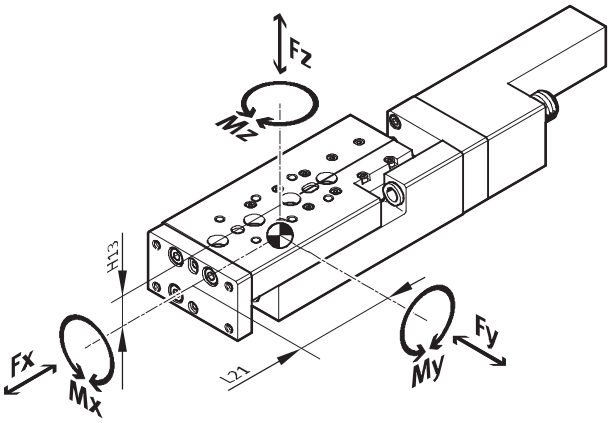
Size	Stroke	L11	
		Positive fixed stop	Negative fixed stop
10	50	$67.4^{+1.1}$	$15.6_{-1.1}$
	80	$97.0^{+1.1}$	$15.2_{-1.1}$
16	50	$74.9^{+1.1}$	$23.1_{-1.1}$
	80	$104.1^{+1.1}$	$22.3_{-1.1}$
	100	$124.6^{+1.1}$	$22.8_{-1.1}$
	150	$173.3^{+1.1}$	$21.5_{-1.1}$

Mini slides SLTE, electric

Technical data

Dynamic characteristic load values

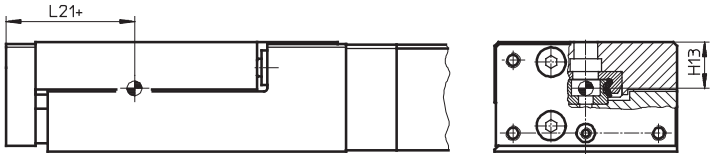
Torques are indicated with reference to the centre of the guide.
They must not be exceeded in the dynamic range. Special attention must be paid to the cushioning phase.



If the drive is subjected to more than two of the indicated forces and torques simultaneously, 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 the guide centre



\+ plus stroke length

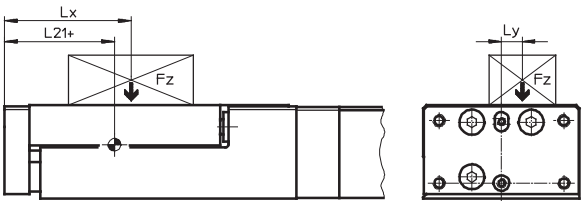
Permissible forces and torques						Geometric characteristics	
Size	Stroke	Fy_{max} [N]	Fz_{max} [N]	Mx_{max}, My_{max} [Nm]	Mz_{max} [Nm]	H13 [mm]	L21 [mm]
10							
	50	390	390	3.1	1.4	13	33.5
	80	410	410	4.3	1.5		41
16							
	50	510	510	4.6	2.8	16	35
	80	520	520	6.0	2.8		41.5
	100	600	600	9.1	3.2		51.5
	150	660	960	12.6	3.5		66.5

Note

Sizing software
PositioningDrives
➔www.festo.com

Calculation example

Given



Mini slide	= SLTE-10
Stroke length	= 80 mm
Lever arm L_x	= 50 mm
Lever arm L_y	= 30 mm
Weight F_z	= 0.8 kg
Acceleration a	= 0 m/s^2

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/s^2 = 7.848 N

M_x = m x g x L_y
= 0.8 kg x 9.81 m/s^2 x 30 mm = 0.236 Nm

M_y = m x g x [(L21+stroke)-L_x]
= 0.8 kg x 9.81 m/s^2 [(41 mm + 80 mm) – 50 mm] = 0.557 Nm

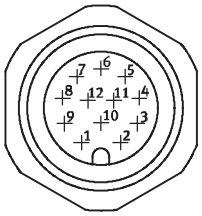
M_z = 0 Nm

Combined load:

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

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

Pin allocation of connection plug



Plug M12		
Pin	Connection	Function
1	Motor +	Motor conductor
2	Motor –	Motor conductor
3	A	Encoder signal RS 485
4	A/	Encoder signal RS 485
5	B	Encoder signal RS 485
6	B/	Encoder signal RS 485
7	I	Encoder signal RS 485
8	I/	Encoder signal RS 485
9	+5 V DC	Signal supply
10	0 V	Signal ground
11	–	–
12	–	–

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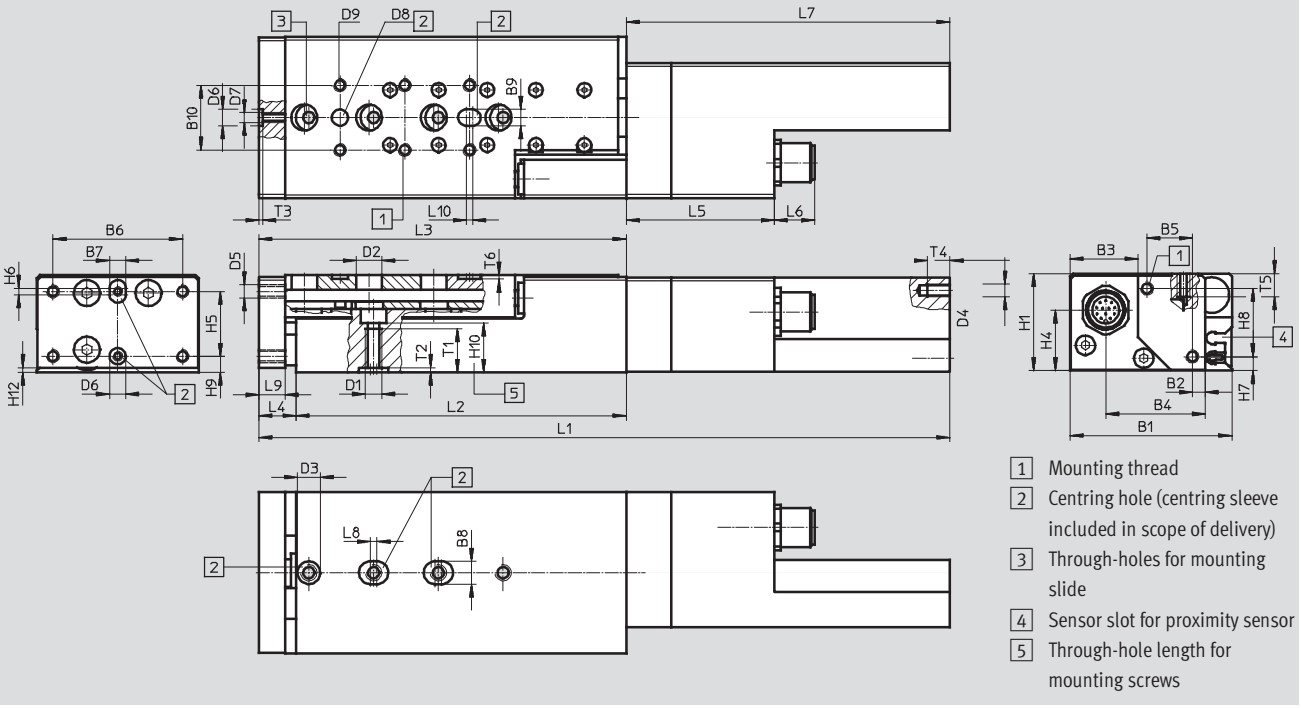
Technical data

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



Size	B1	B2 ±0.3	B3 ±0.3	B4	B5	B6	B7 H7	B8 H7	B9 H7	B10	D1	D2 ∅	D3 ∅ H7	D4
10	50	30.8	20.8	4	14	40	5	5	5	20	M5	8	7	M4
16	66	45.7	24.3	4.2	25	55	7	9	5	20	M6	10	9	M4

Size	D5	D6 ∅ H7	D7	D8 ∅ H7	D9	H1	H4	H5	H6	H7	H8	H9	H10	H12
10	M4	5	M3	5	M4	30	18.4	20	2	4	21	5	15	1.5
16	M5	7	M4	5	M5	40	25.8	20	2	4.5	30	13	20	1.5

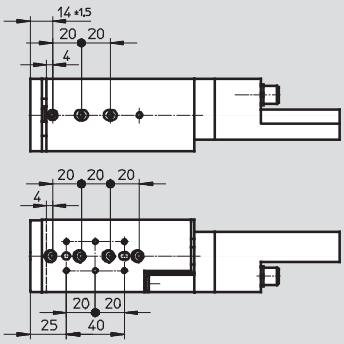
Size	Stroke	L1 ±1.5		L2	L3 ±1		L4 ±1	
	[mm]	1)	2)		1)	2)	1)	2)
10	50	212	213	102	112	113	10	11.1
	80	262	263	152	162	163	9.6	10.7
16	50	262.5	263.5	100	112.5	113.5	12.5	13.5
	80	307.5	308.5	146	158	159	11.7	12.7
	100	349	350	187	199.5	200.5	12.2	13.2
	150	430.5	431.5	270	281	282	11	12

Size	L5 ±0.5	L6	L7	L8	L9	L10	T1	T2	T3	T4	T5	T6
10	45.8	12.5	100	2	8	2	12	1.5	1.2	7	8	1.2
16	56.3	12.5	149.7	2	10	1	16	2.1	1.5	7	7	1.2

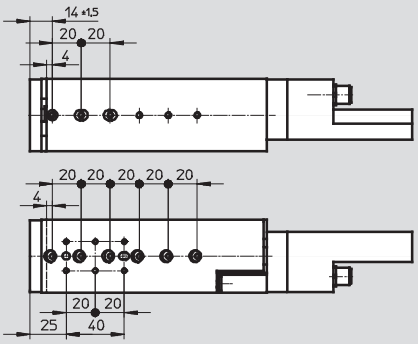
1) End position at fixed stop
2) End position at rubber buffer

Hole pattern for mounting thread and centring holes

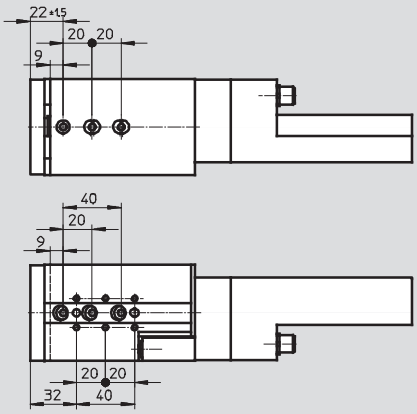
SLTE-10-50



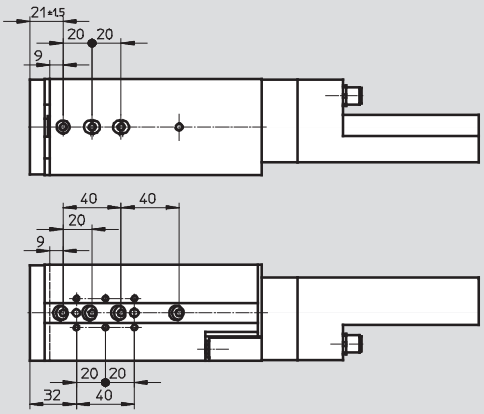
SLTE-10-80



SLTE-16-50



SLTE-16-80



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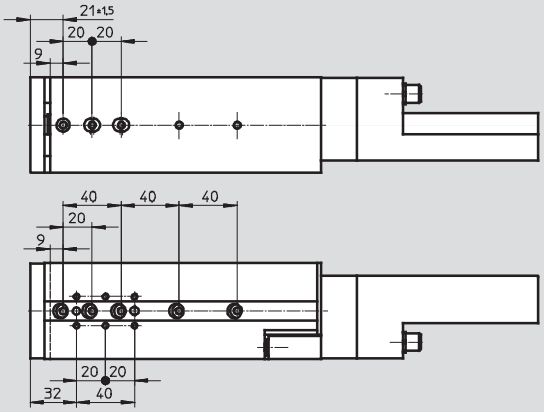
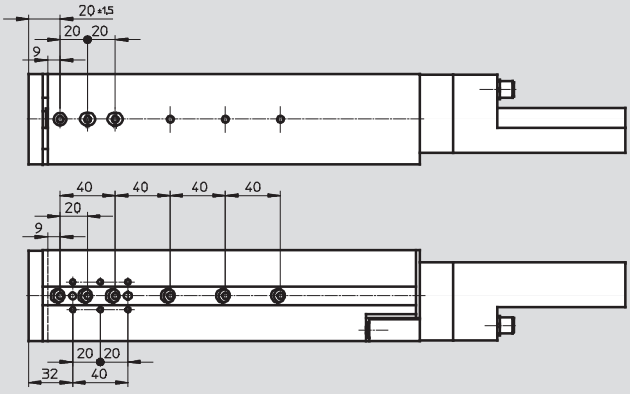
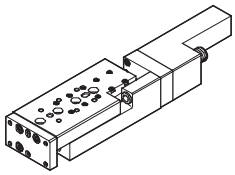
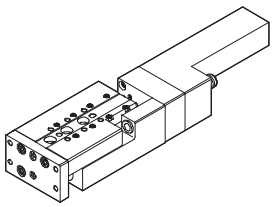


SLTE-16-150



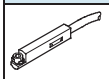
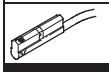
Ordering data			
Size	Brief description	Part No.	Type
10			
	Mini slide	**537 447**	**SLTE-10-50-LS-G04**
		537 449	**SLTE-10-80-LS-G04**
16			
	Mini slide	**537 459**	**SLTE-16-50-LS-G04**
		537 461	**SLTE-16-80-LS-G04**
		537 463	**SLTE-16-100-LS-G04**
		537 465	**SLTE-16-150-LS-G04**

Ordering data – Centring sleeves[1] — Technical data ➔ Internet: zbh

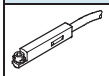
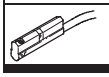
Size		10 Part No.	10 Type	16 Part No.	16 Type
	Housing	**186 717**	**ZBH-7**	**150 927**	**ZBH-9**
	Slide	**189 652**	**ZBH-5**	**189 652**	**ZBH-5**
	Yoke	**189 652**	**ZBH-5**	**186 717**	**ZBH-7**

1) Scope of delivery: 10 per pack

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, flush with cylinder profile	PNP	Cable, 3-wire, in-line	2.5	**525 915**	**SMT-10F-PS-24V-K2,5L-OE**
			Plug M8x1, 3-pin, in-line	0.3	**525 916**	**SMT-10F-PS-24V-K0,3L-M8D**
			Plug M8x1, 3-pin, lateral	0.3	**526 675**	**SMT-10F-PS-24V-K0,3Q-M8D**
	Insertable in the slot lengthwise	PNP	Plug M8x1, 3-pin, in-line	0.3	**173 220**	**SMT-10-PS-SL-LED-24**
			Cable, 3-wire, in-line	2.5	**173 218**	**SMT-10-PS-KL-LED-24**

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, flush with cylinder profile	Contacting	Plug M8x1, 3-pin, in-line	0.3	**525 914**	**SME-10F-DS-24V-K0,3L-M8D**
			Cable, 3-wire, in-line	2.5	**525 913**	**SME-10F-DS-24V-K2,5L-OE**
			Cable, 2-wire, in-line	2.5	**526 672**	**SME-10F-ZS-24V-K2,5L-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**

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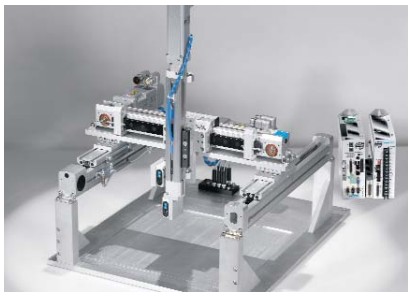

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