

## Mini Slides SLTE, Electric

**FESTO**



# Mini Slides SLTE, Electric

Key features

## Range of applications

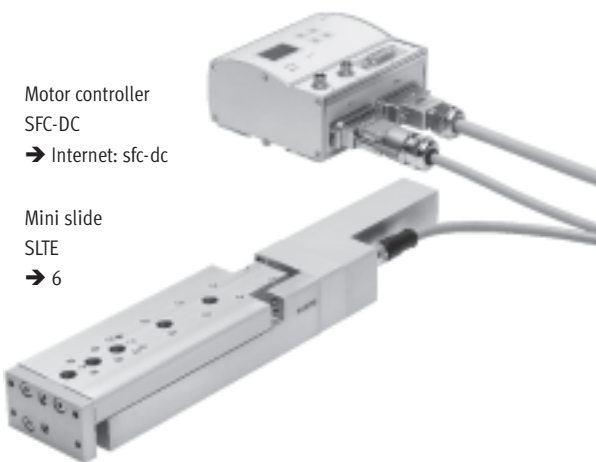
The electric mini slide SLTE is ideal for use in automation applications where controlled end-position cushioning (gentle stopping), constant travel speed and positioning capability are important factors.

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  
→ 6

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

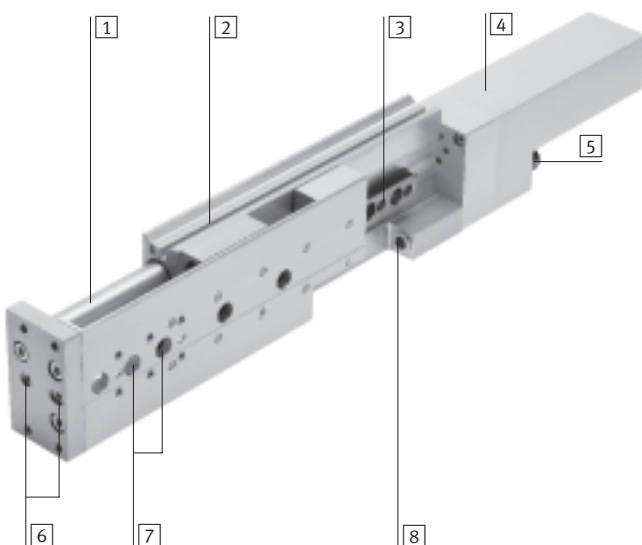
- Thanks to the protection class IP54, the SFC can be mounted close to the SLTE, either:
  - with centre supports
  - on an H-rail
- Only one cable required between SLTE and SFC
- Motor controller SFC available with or without control panel
- Easy control with
  - I/O interface
  - Profibus
  - CANopen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



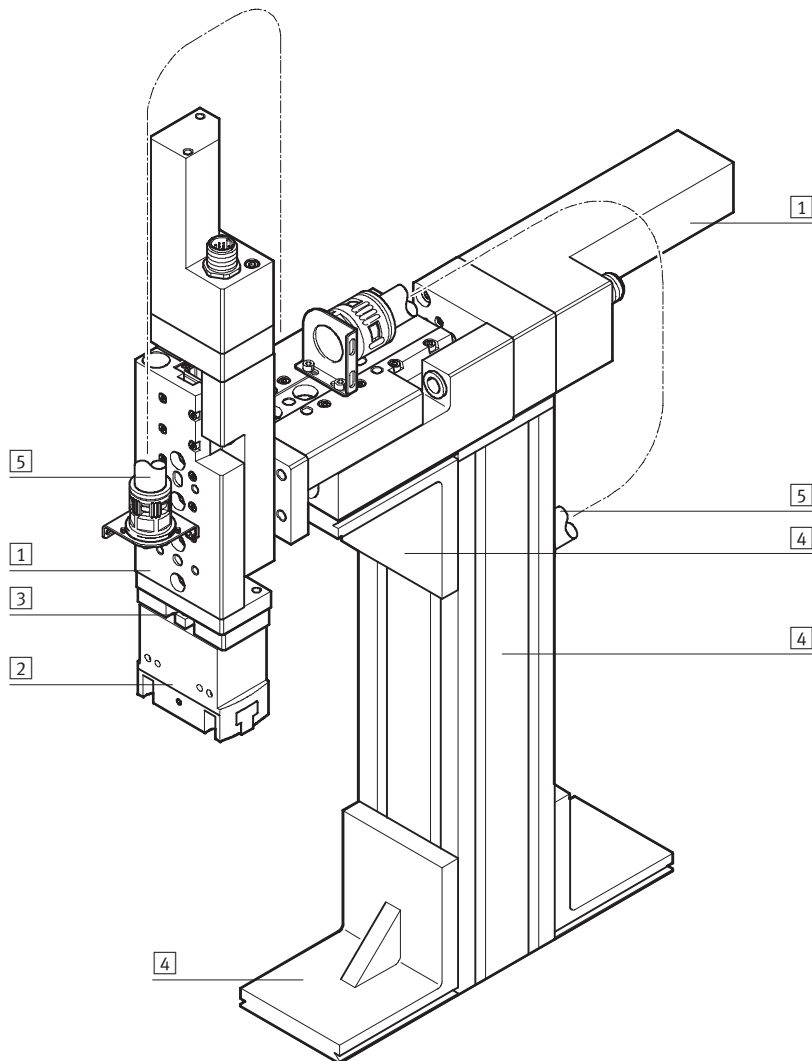
## Comparison between electric mini slide SLTE and pneumatic mini slide SLT

	Electrical: SLTE	Pneumatic: SLT												
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Gentle starting and stopping</li> <li>Constant and precise speed (2 ... 200 mm/s)</li> <li>Flexible positioning without mechanical devices</li> <li>Programmable drive profile</li> </ul>	<ul style="list-style-type: none"> <li>High feed force</li> <li>High speed</li> <li>Fast positioning time</li> <li>Compact length</li> </ul>												
<b>Guide</b>	<ul style="list-style-type: none"> <li>Preloaded, backlash-free, precise and rigid ball bearing cage guide</li> <li>High torque and load absorption</li> </ul>	<p>Guide rail for slide Ball bearing Guide rail on drive body</p>												
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>Identical width and height dimensions</li> </ul> <table border="1"> <thead> <tr> <th>Type</th> <th>Width (W)</th> <th>x</th> <th>Height (H)</th> </tr> </thead> <tbody> <tr> <td>SLT(E)-10</td> <td>50</td> <td>x</td> <td>30 mm</td> </tr> <tr> <td>SLT(E)-16</td> <td>66</td> <td>x</td> <td>40 mm</td> </tr> </tbody> </table>	Type	Width (W)	x	Height (H)	SLT(E)-10	50	x	30 mm	SLT(E)-16	66	x	40 mm	
Type	Width (W)	x	Height (H)											
SLT(E)-10	50	x	30 mm											
SLT(E)-16	66	x	40 mm											
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>Identical mounting and attachment options</li> </ul> <p><b>1</b> Attachment surfaces: Direct mounting using threaded holes and through-holes</p> <p><b>2</b> 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</p>													
<b>Technical data</b>														
Piston $\varnothing$	[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]	$\pm 0.1$	$\pm 0.02$											
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

# Mini Slides SLTE, Electric

Type codes



**Type**

SLTE	Mini slide
------	------------

**Size**

**Stroke [mm]**

**Drive spindle/pitch**

LS	Lead screw
----	------------

**Gearing type**

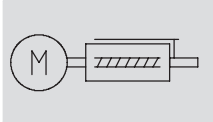
G04	Gear unit ratio $i = 4.4$
-----	---------------------------

# Mini Slides SLTE, Electric

Technical data



Function



Sizes 10 and 16

Stroke lengths 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 <sup>2</sup> ]	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 <sup>1)</sup>	[dB A]	< 50	< 55
CE symbol (declaration of conformity)	In accordance with EU EMC directive		

1) At maximum permissible speed

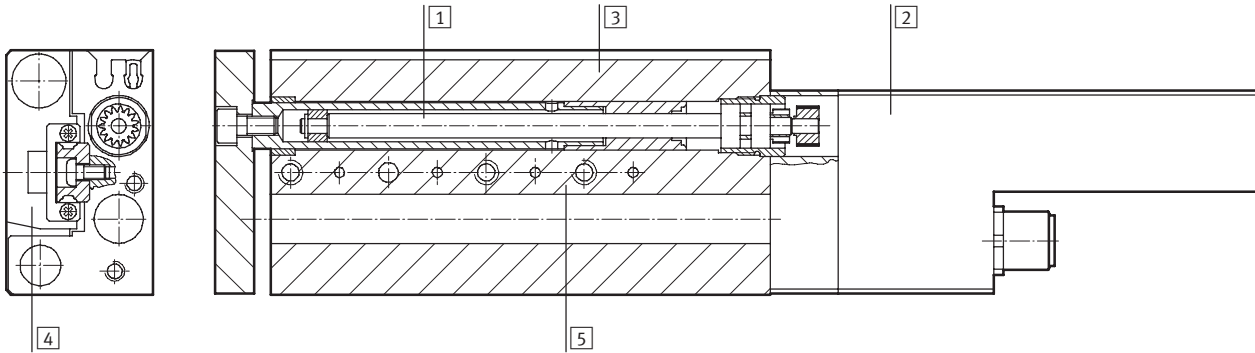
Weight [g]							
Size	10			16			
	Stroke	50	80	50	80	100	150
Product weight		574	737	1,185	1,465	1,714	2,196
Moving load		163	235	296	415	519	729

# Mini Slides SLTE, Electric

Technical data

## Materials

Sectional view



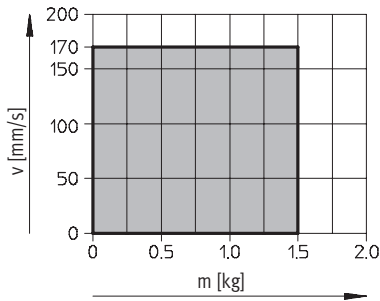
## Mini slide

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

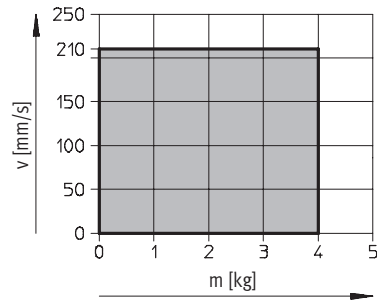
## Travel speed $v$ as a function of applied load $m$

Horizontal mounting position

SLTE-10

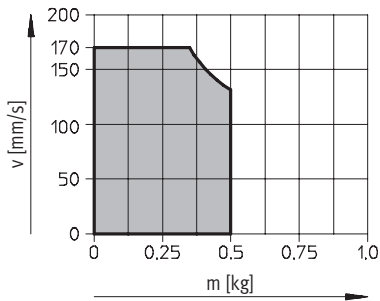


SLTE-16

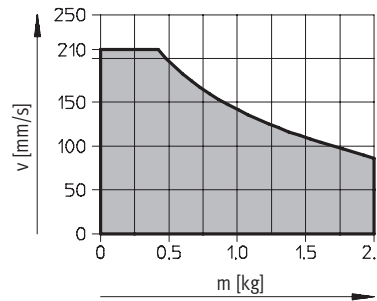


Vertical mounting position

SLTE-10



SLTE-16



Permissible operating range

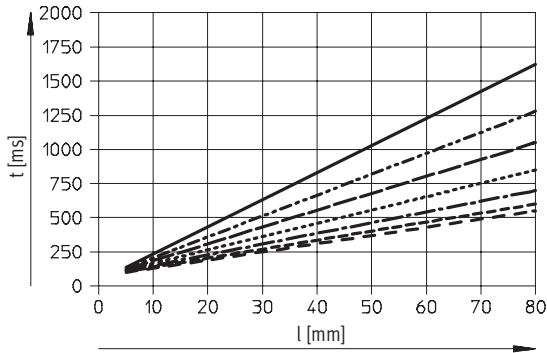
# Mini Slides SLTE, Electric

Technical data



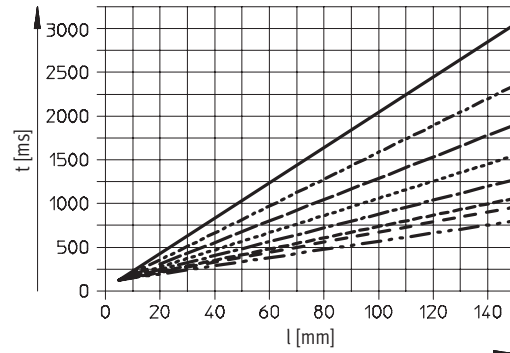
## Positioning time $t$ as a function of stroke $l$

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

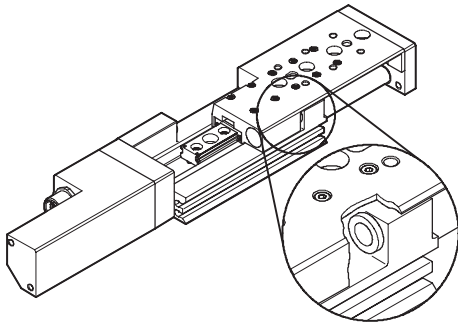


- $v = 50$  mm/s
- - -  $v = 65$  mm/s
- · -  $v = 80$  mm/s
- · ·  $v = 100$  mm/s
- - -  $v = 125$  mm/s
- · -  $v = 150$  mm/s
- · ·  $v = 170$  mm/s
- · -  $v = 210$  mm/s

## Reference travel

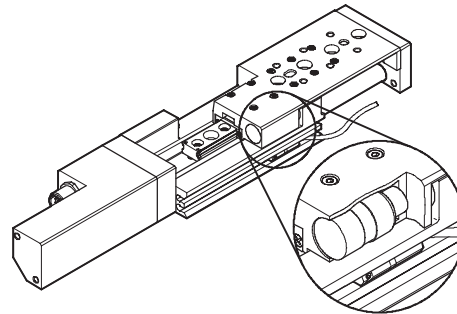
to fixed stop

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



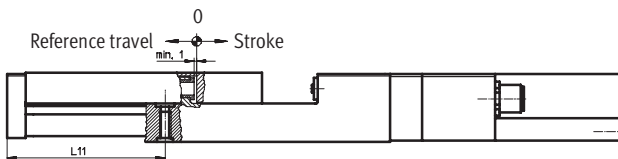
to proximity sensor

- Position freely selectable

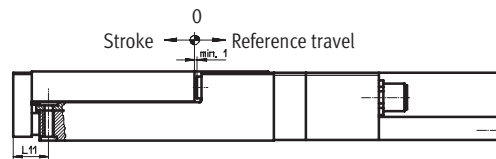


## The following applies for reference travel to a fixed stop:

Positive fixed stop



Negative fixed stop



Size	Stroke	L11	
		Positive fixed stop	Negative fixed stop
10	50	67.4 <sup>+1.1</sup>	15.6 <sub>-1.1</sub>
	80	97.0 <sup>+1.1</sup>	15.2 <sub>-1.1</sub>
16	50	74.9 <sup>+1.1</sup>	23.1 <sub>-1.1</sub>
	80	104.1 <sup>+1.1</sup>	22.3 <sub>-1.1</sub>
	100	124.6 <sup>+1.1</sup>	22.8 <sub>-1.1</sub>
	150	173.3 <sup>+1.1</sup>	21.5 <sub>-1.1</sub>

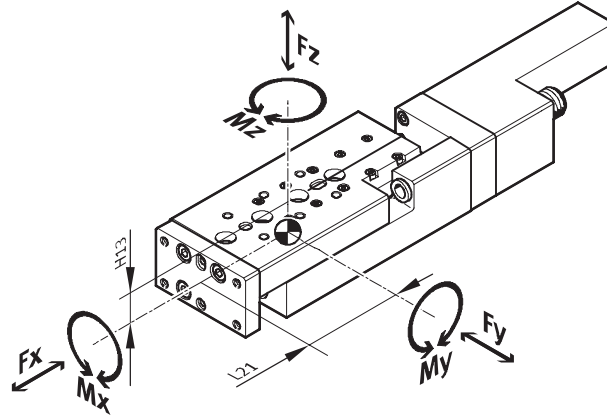


# Mini Slides SLTE, Electric

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:

$$\frac{|F_{y1}|}{F_{y_{max}}} + \frac{|F_{z1}|}{F_{z_{max}}} + \frac{|M_{x1}|}{M_{x_{max}}} + \frac{|M_{y1}|}{M_{y_{max}}} + \frac{|M_{z1}|}{M_{z_{max}}} \leq 1$$

## Position of the guide centre



+ plus stroke length

Permissible forces and torques						Geometric characteristics	
Size	Stroke	F <sub>y</sub> <sub>max</sub> [N]	F <sub>z</sub> <sub>max</sub> [N]	M <sub>x</sub> <sub>max</sub> , M <sub>y</sub> <sub>max</sub> [Nm]	M <sub>z</sub> <sub>max</sub> [Nm]	H13 [mm]	L21 [mm]
<b>10</b>							
	50	390	390	3.1	1.4	13	33.5
	80	410	410	4.3	1.5		41
<b>16</b>							
	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

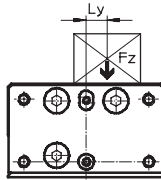
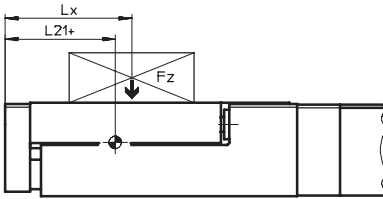
Sizing software  
PositioningDrives  
→ [www.festo.com](http://www.festo.com)

# Mini Slides SLTE, Electric

Technical data

## 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<sup>2</sup>

To be found:

$F_y, F_z, M_x, M_y, M_z$   
 and verification of function with  
 combined load

## Solution:

$L_{21} = 41$  mm from table

$F_y = 0$  N

$F_z = m \times g$   
 $= 0.8 \text{ kg} \times 9.81 \text{ m/s}^2 = 7.848$  N

$M_x = m \times g \times L_y$   
 $= 0.8 \text{ kg} \times 9.81 \text{ m/s}^2 \times 30 \text{ mm} = 0.236$  Nm

$M_y = m \times g \times [(L_{21} + \text{stroke}) - L_x]$   
 $= 0.8 \text{ kg} \times 9.81 \text{ m/s}^2 [(41 \text{ mm} + 80 \text{ mm}) - 50 \text{ mm}] = 0.557$  Nm

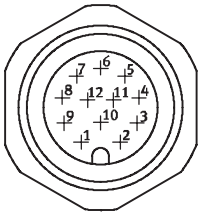
$M_z = 0$  Nm

Combined load:

$$\frac{|F_y|}{F_{y_{\max}}} + \frac{|F_z|}{F_{z_{\max}}} + \frac{|M_x|}{M_{x_{\max}}} + \frac{|M_y|}{M_{y_{\max}}} + \frac{|M_z|}{M_{z_{\max}}}$$

$$= 0 + \frac{7.848\text{N}}{41\text{N}} + \frac{0.2366\text{Nm}}{4.3\text{Nm}} + \frac{0.557\text{Nm}}{1.5\text{Nm}} + 0 = 0.445 \leq 1$$

## Pin allocation of connection plug



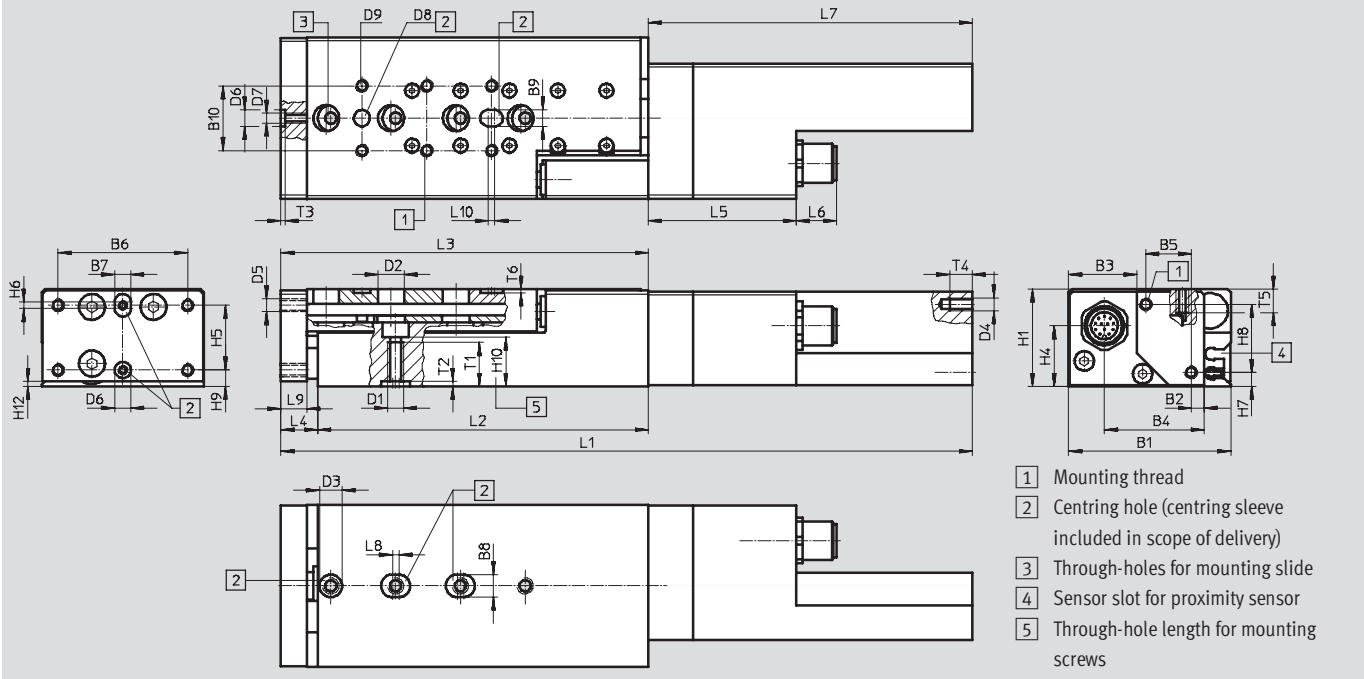
Plug M12		
Pin	Connection	Function
1	Motor +	Motor conductor
2	Motor -	Motor conductor
3	A	Encoder signal RS 485
4	A/	Encoder signal RS 485
5	B	Encoder signal RS 485
6	B/	Encoder signal RS 485
7	I	Encoder signal RS 485
8	I/	Encoder signal RS 485
9	+5 V DC	Signal supply
10	0 V	Signal ground
11	-	-
12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

# Mini Slides SLTE, Electric

Technical data



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



Size	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	D1	D2	D3	D4
		±0.3	±0.3				H7	H7	H7			∅	∅	
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	D7	D8	D9	H1	H4	H5	H6	H7	H8	H9	H10	H12
		∅ H7		∅ H7										
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 [mm]	L1 ±1.5		L2	L3 ±1		L4 ±1	
		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	L6	L7	L8	L9	L10	T1	T2	T3	T4	T5	T6
	±0.5											
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

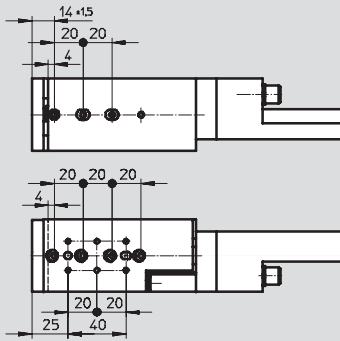
# Mini Slides SLTE, Electric

Technical data

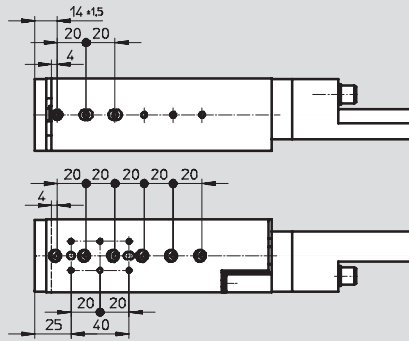


## Hole pattern for mounting thread and centring holes

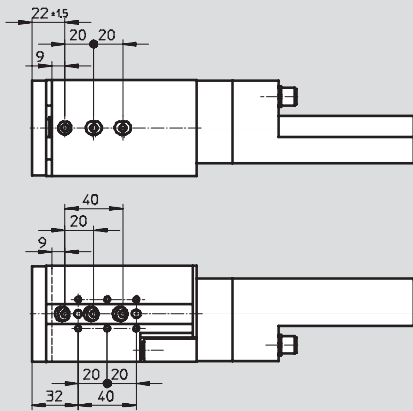
SLTE-10-50



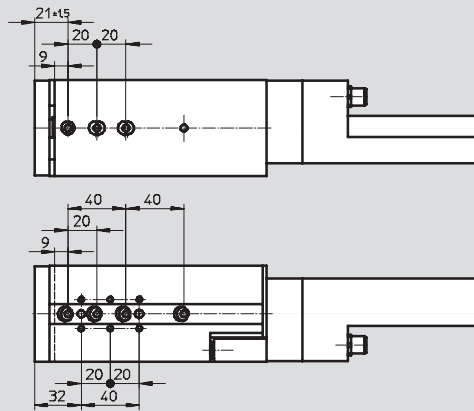
SLTE-10-80



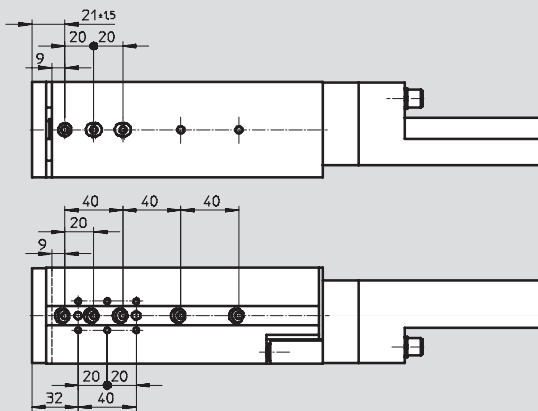
SLTE-16-50



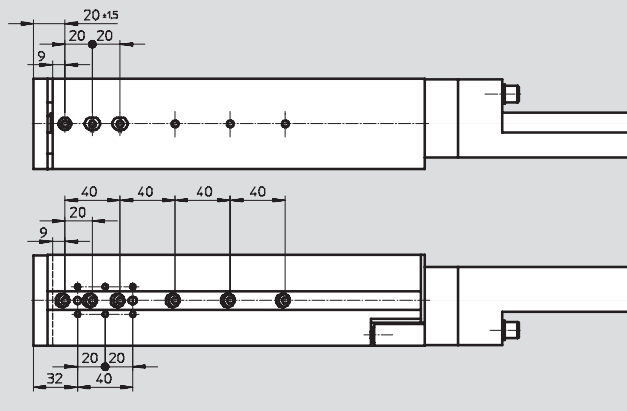
SLTE-16-80



SLTE-16-100



SLTE-16-150



### Ordering data

	Size	Part No.	Type
	10	537447	SLTE-10-50-LS-G04
		537449	SLTE-10-80-LS-G04

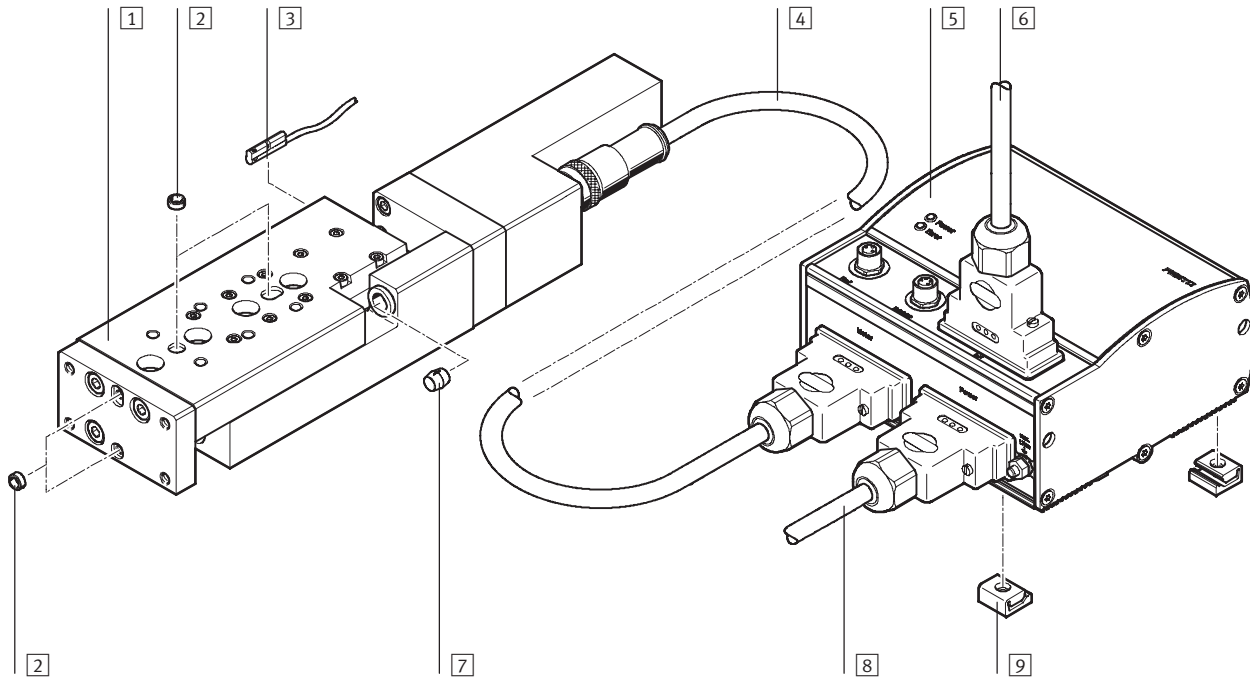
### Ordering data

	Size	Part No.	Type
	16	537459	SLTE-16-50-LS-G04
		537461	SLTE-16-80-LS-G04
		537463	SLTE-16-100-LS-G04
		537465	SLTE-16-150-LS-G04

# Mini Slides SLTE, Electric

Peripherals overview

Size 10/16




Accessories			
	Brief description	→ Page/Internet	
1	Mini slide SLTE	Electromechanical linear axis with lead screw spindle	6
2	Centring pin/sleeve ZBS/ZBH	– For centring loads and attachment components – Centring sleeves included in scope of delivery	14
3	Proximity sensor SME/SMT-10	For referencing mini slide or for sensing slide position	14
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



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

Accessories



FESTO

Ordering data – Centring sleeves <sup>1)</sup>				Technical data → Internet: zbh	
Size		10		16	
		Part No.	Type	Part No.	Type
	Housing	186717	ZBH-7	150927	ZBH-9
	Slide	189652	ZBH-5	189652	ZBH-5
	Yoke	189652	ZBH-5	186717	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	525915	SMT-10F-PS-24V-K2,5L-OE
			Plug M8x1, 3-pin, in-line	0.3	525916	SMT-10F-PS-24V-K0,3L-M8D
			Plug M8x1, 3-pin, lateral	0.3	526675	SMT-10F-PS-24V-K0,3Q-M8D
	Insertable in the slot lengthwise	PNP	Plug M8x1, 3-pin, in-line	0.3	173220	SMT-10-PS-SL-LED-24
			Cable, 3-wire, in-line	2.5	173218	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	525914	SME-10F-DS-24V-K0,3L-M8D
			Cable, 3-wire, in-line	2.5	525913	SME-10F-DS-24V-K2,5L-OE
			Cable, 2-wire, in-line	2.5	526672	SME-10F-ZS-24V-K2,5L-OE
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	173212	SME-10-SL-LED-24
			Cable, 3-wire, in-line	2.5	173210	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	541333	NEBU-M8G3-K-2.5-LE3
			5	541334	NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5	541341	NEBU-M8W3-K-5-LE3

# Product Range and Company Overview

## A Complete Suite of Automation Services

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



**Custom Automation Components**  
Complete custom engineered solutions



**Custom Control Cabinets**  
Comprehensive engineering support and on-site services



**Complete Systems**  
Shipment, stocking and storage services

## The Broadest Range of Automation Components

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



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Electromechanical actuators, motors, controllers & drives



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



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

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

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

## Quality Assurance, ISO 9001 and ISO 14001 Certifications

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

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



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# Festo North America

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