Mini-slide SLTE, electric

FESTO

- Precise and rigid guide
- High flexibility
- Adjustable end-position cushioning

New

Mini-slide SLTE, electric

Key features

Field of application

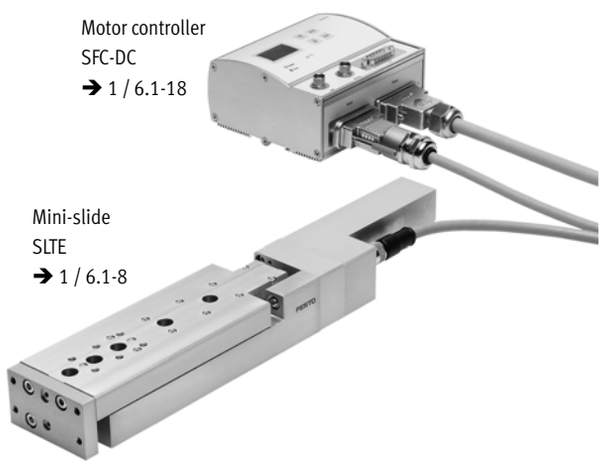
The electric mini-slide SLTE is ideal for use in automation applications where controlled end-position cushioning (gentle stopping), constant travel speed and positioning capability are important factors.

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
- Integrable sensors
- Gentle starting and stopping
- Working loads up to 4 kg
- Constant travel speeds of 2 ... 200 mm/s

Everything from a single source



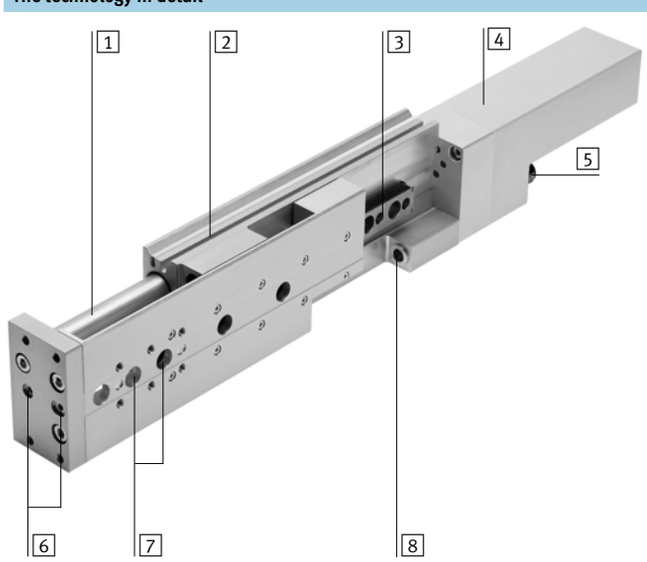
The mini-slide SLTE and motor controller SFC form one unit.

- Thanks to the protection class IP54, the SFC can be mounted close to the SLTE, either:
  - on central supports
  - on a top-hat rail
- Only one cable required between SLTE and SFC
- Motor controller SFC available with or without control panel
- Max. 31 traversing records
- Simple control via digital I/Os

Parameterisation possible via:

- Control panel:
  - suitable for simple positioning cycles
- 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 Ball 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-slide SLTE, electric

Key features

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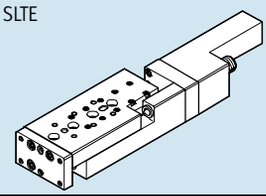
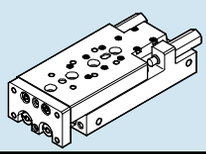
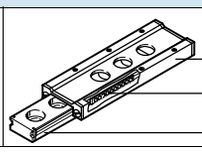
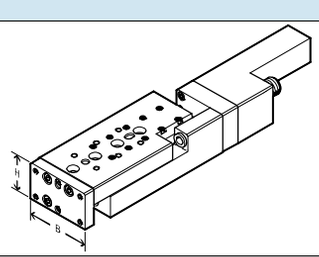
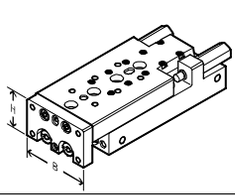
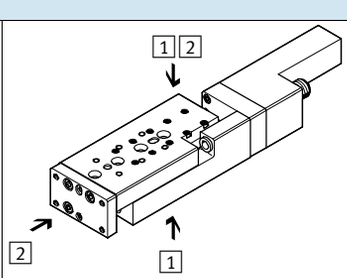
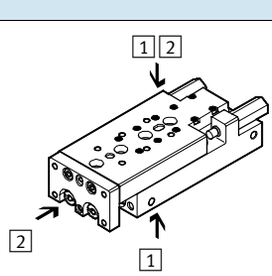
Comparison between electrical mini-slide SLTE and pneumatic mini-slide SLT

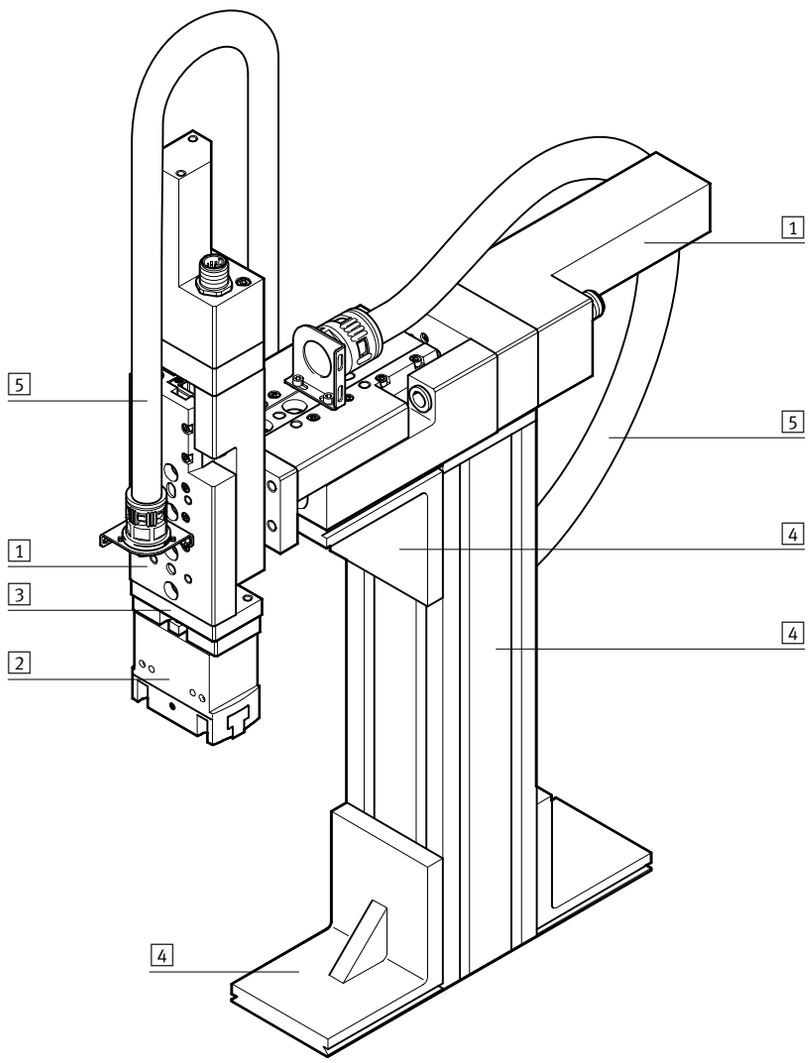
	Electric: SLTE	Pneumatic: SLT
		
Advantages		
	■ Gentle starting and stopping ■ Constant and precise speed (2 … 200 mm/s) ■ Flexible positioning without mechanical devices ■ Programmable drive profile	■ High feed force ■ High speed ■ Fast positioning time ■ Compact length
Guide		
■ Preloaded, backlash-free, precise and rigid ball bearing cage guide ■ High torque and load absorption	 Guide rail for slide Ball bearings Guide rail on drive body	
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 Mounting surfaces: Direct mounting using threaded holes and through-holes 2 Attachment surfaces: Direct mounting of loads and devices (e.g. SLT: rotary drives and grippers) by means of threaded holes in slide and yoke plate	 	
Technical data		
Piston diameter [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

New

Mini-slide SLTE, electric

Key features

System product for handling and assembly technology



System elements and accessories

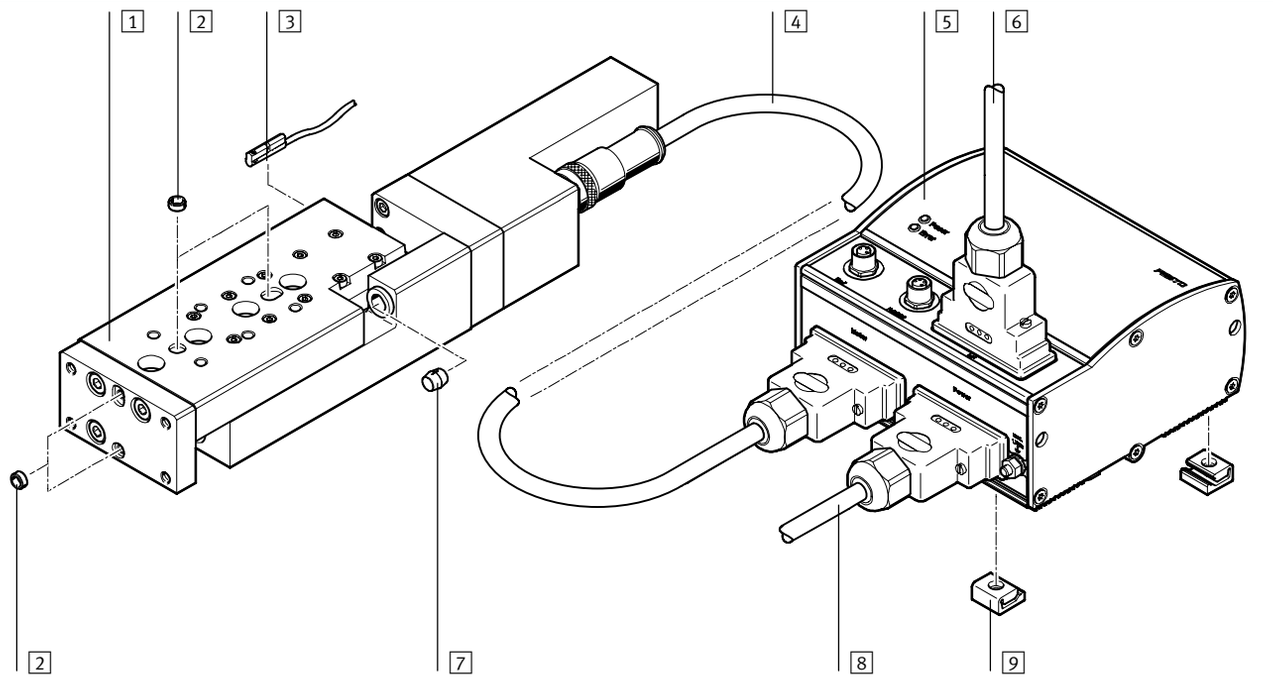
		Brief description	➔ Page
1	Axes	Wide range of combination options within handling and assembly technology	Volume 5 www.festo.com Volume 1
2	Gripper	Wide range of variation options within handling and assembly technology	Volume 1 www.festo.com Volume 2
3	Adapter	For drive/drive and drive/gripper combinations	Volume 5 www.festo.com Volume 2
4	Basic components	Profiles and profile combinations as well as profile/drive combinations	Volume 5 www.festo.com Volume 1
5	Installation components	For achieving a clear-cut, safe layout for electrical cables and tubing	Volume 5 www.festo.com Volume 1

–	Drives	Wide range of combination options within handling and assembly technology	Volume 1 www.festo.com Volume 1

Mini-slide SLTE, electric

Overview of peripherals

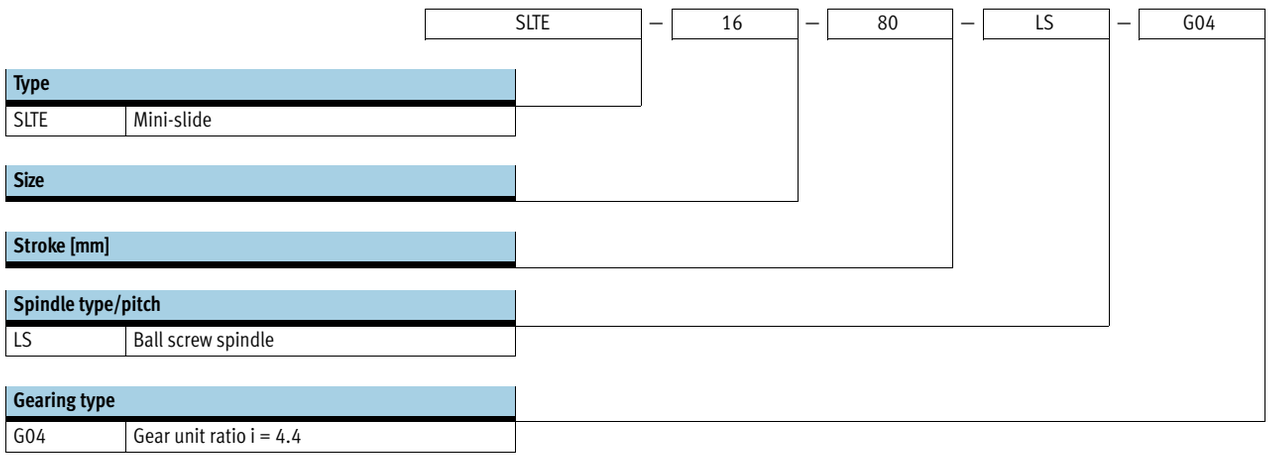
Size 10/16



Accessories			
		Brief description	**➔ Page**
1	Mini-slide SLTE	Electromechanical linear axis with ball screw spindle	1 / 6.1-8
2	Centring pin/sleeve ZBS/ZBH	– For centring loads and attachments – Centring sleeves included in scope of delivery	1 / 6.1-16
3	Proximity sensor SME-/SMT-10	For referencing mini-slide or for sensing slide position	1 / 6.1-16
4	Motor cable KMTR	Connecting cable between motor and motor controller	1 / 6.1-22
5	Motor controller SFC	For parameterising and positioning mini-slide	1 / 6.1-18
6	Control cable KES	Cable for I/O connection to any controller	1 / 6.1-22
7	Buffer	Buffer included in scope of delivery	–
8	Supply cable KPWR	Power supply cable; load and logic power supplies are isolated	1 / 6.1-22
9	Central support MUP	– For mounting motor controller – Motor controller can also be mounted on top-hat rail	1 / 6.1-22

Mini-slide SLTE, electric

Type code



Mini-slide SLTE, electric

Data sheet

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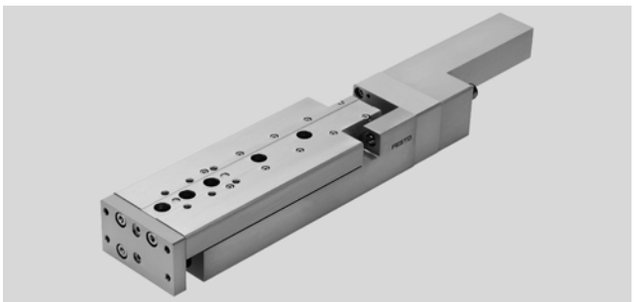
Size
10 and 16

Stroke length
50 ... 150 mm



General technical data				
Size			10	16
Constructional design			Electromechanical linear axis with ball screw spindle	
Guide			With ball bearings	
Type of mounting			With through-holes	
			With female thread	
			With 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
Mounting position			Any	
Spindle pitch		[mm]	5	7.5
Min. travel speed		[mm/s]	2	
Max. acceleration		[m/s^2]	2.5	
Repetition accuracy		[mm]	< 0.1	< 0.055
Reversing backlash		[mm]	< 0.1	

Electrical data for motor			
Size		10	16
System resolution of encoder		512 (pulses per rotation)	1000 (pulses per rotation)
Nominal operating voltage	[V DC]	24	
Power	[W]	4.5	18

Operating and environmental conditions			
Size		10	16
Ambient temperature	[°C]	0 ... +40	
Protection class		IP40	
Interference immunity		To EN61000-6-2 (industry)	
Interference emission		To EN61000-6-4 (industry)	
Fast transients		To EN61000-4-4	
Max. noise level[1)]	[dB A]	< 50	< 55
CE symbol		89/336/EEC (EMC)	

1) At maximum permissible speed.

Mini-slide SLTE, electric

Data sheet

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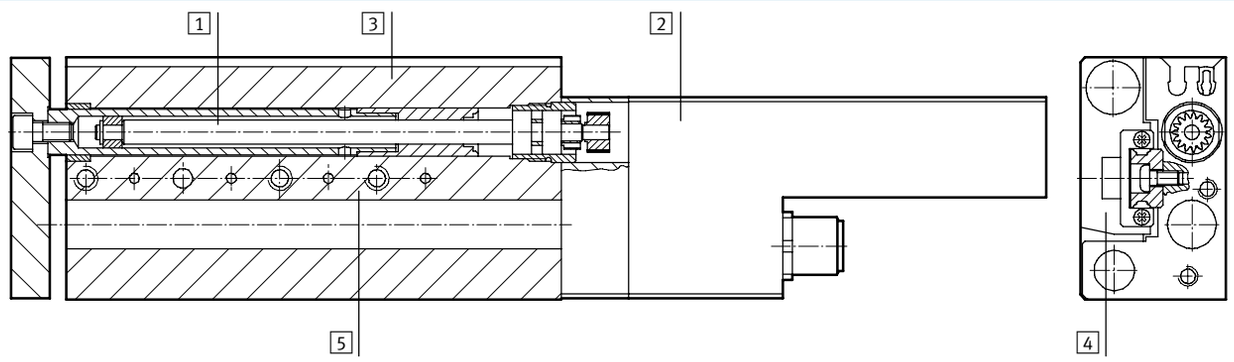
Weight [g]						
Size	10		16			
Stroke	50	80	50	80	100	150
Product weight	574	737	1,185	1,465	1,714	2,196
Moving load	163	235	296	415	519	729

Materials

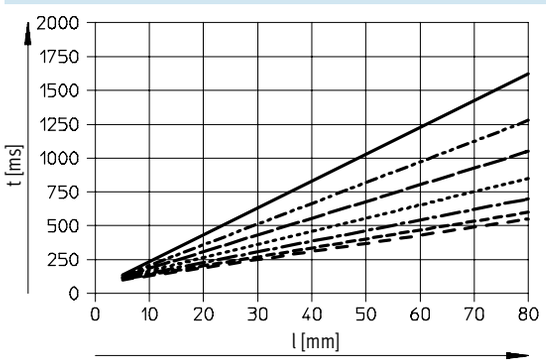
Sectional view



Mini-slide		
1	Spindle	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

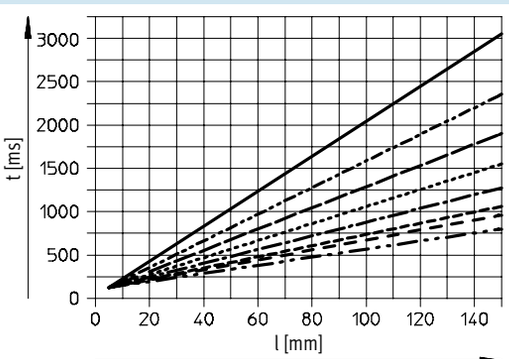
Positioning time t as a function of stroke l

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

Mini-slide SLTE, electric

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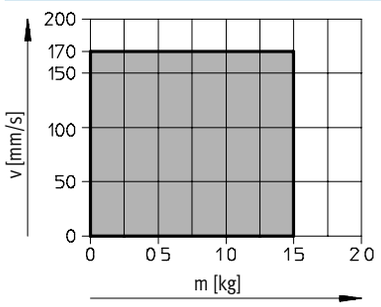
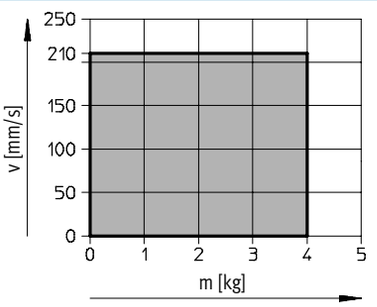
Travel speed v as a function of applied load m

Horizontal mounting position

SLTE-10

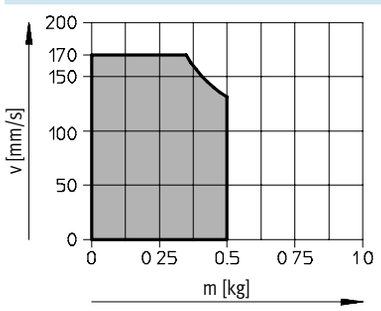


SLTE-16

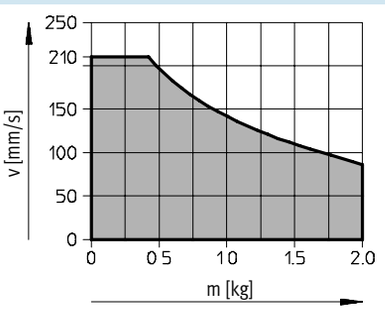


Vertical mounting position

SLTE-10



SLTE-16

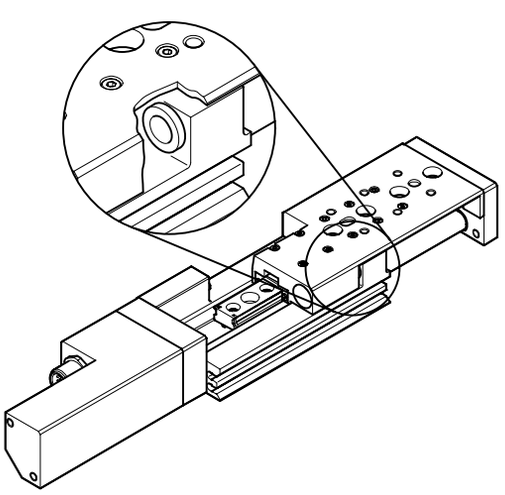


Permissible operating range

Reference travel

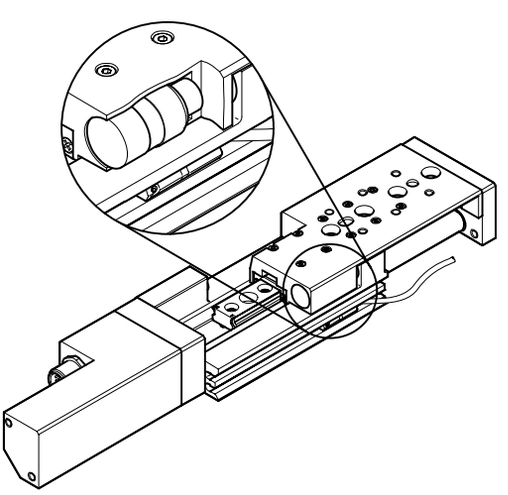
to fixed stop

- to front stop bush (extended)
- to rear stop bush (retracted)



to proximity sensor

- to proximity sensor (position freely selectable)



Mini-slide SLTE, electric

Data sheet

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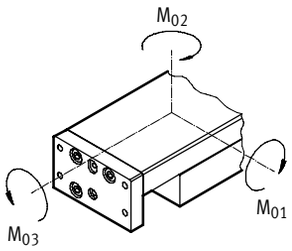
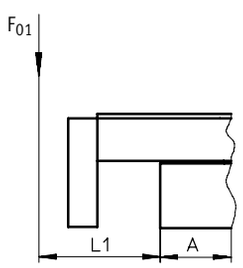
Permissible loads

static/dynamic

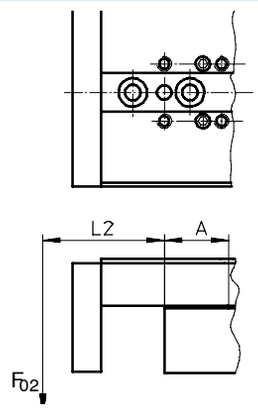


Longitudinal torque



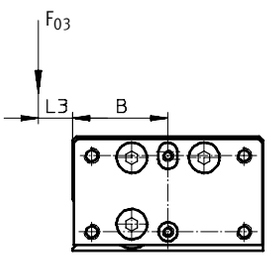
$$F_{01} \leq \frac{M_{01perm.}}{L_1 + A}$$

Lateral torque



$$F_{02} \leq \frac{M_{02perm.}}{L_2 + A}$$

Transversal torque

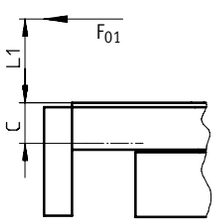


$$F_{03} \leq \frac{M_{03perm.}}{L_3 + B}$$

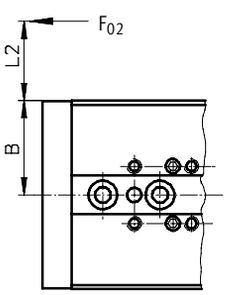
Combined load

The following torque equation must be satisfied with combined load:

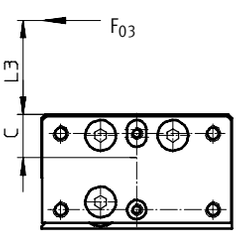
$$\frac{M_1}{M_{1perm.}} + \frac{M_2}{M_{2perm.}} + \frac{M_3}{M_{3perm.}} \leq 1$$



$$F_{01} \leq \frac{M_{01perm.}}{L_1 + C}$$



$$F_{02} \leq \frac{M_{02perm.}}{L_2 + B}$$



$$F_{03} \leq \frac{M_{03perm.}}{L_3 + C}$$

Mini-slide SLTE, electric

Data sheet

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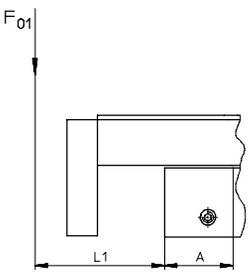
Calculation example

Static load



Given:

Mini-slide	= SLTE-16
Stroke length	= 50 mm
Lever arm L_1	= 0.040 m
Torque $M_{01perm.}$	= 21 Nm
Correction factor A	= 24 mm
	= 0.024 m

To be found:

$$F_{01} \leq \frac{M_{01perm.}}{L_1 + A}$$

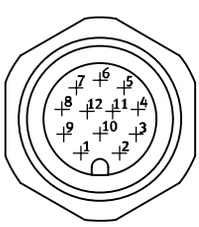
Calculation:

$$F_{01} \leq \frac{21\ Nm}{0.040\ m + 0.024\ m}$$

$$F_{01} \leq 328.13\ N$$

Permissible loads								Correction factors		
Size	Stroke	Static			Dynamic					
		M_{01}	M_{02}	M_{03}	M_{01}	M_{02}	M_{03}	A	B	C
	[mm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[Nm]	[mm]	[mm]	[mm]
10										
	50	16	16	13	3.1	3.1	1.4	24.2	25	11.8
	80	27	27	17	4.3	4.3	1.5	31.7		
16										
	50	21	21	20	4.6	4.6	2.8	24	33	15.3
	80	34	34	27	6	6		31		
	100	60	60	36	9.1	9.1	3.2	41		
	150	109	109	49	12.6	12.6	3.5	54		

Pin allocation of connection plug



M12 plug		
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-slide SLTE, electric

Data sheet

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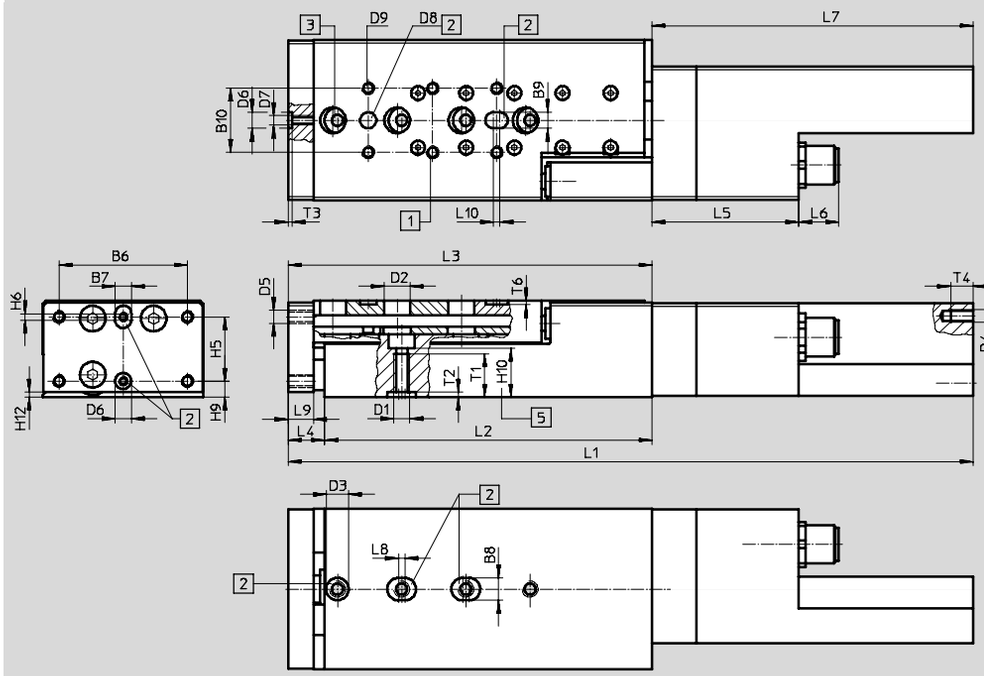
Dimensions Download CAD data ➔ **www.festo.com/en/engineering**



1 Mounting thread
2 Centring hole (centring sleeve included in scope of delivery)
3 Through-holes for mounting slide
4 Sensor slot for proximity sensor
5 Through-hole length for mounting screws

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

Mini-slide SLTE, electric

Data sheet

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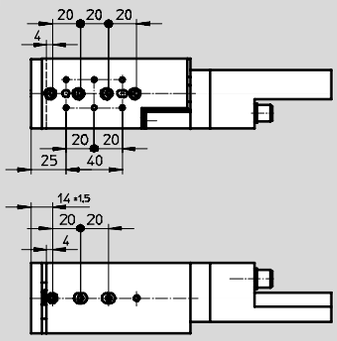
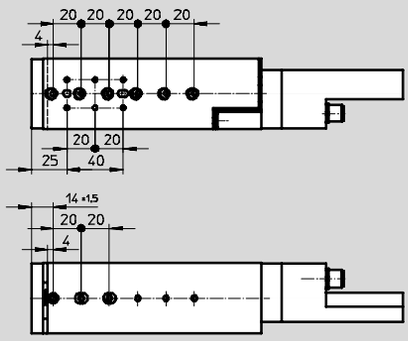
Hole pattern for mounting thread and centring holes

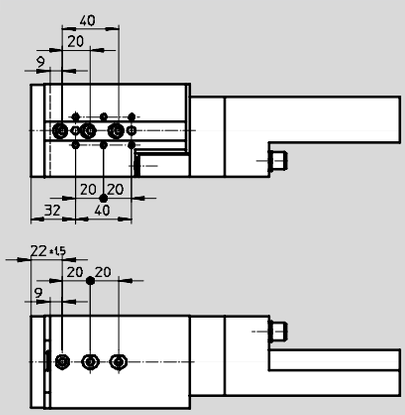
SLTE-10-50



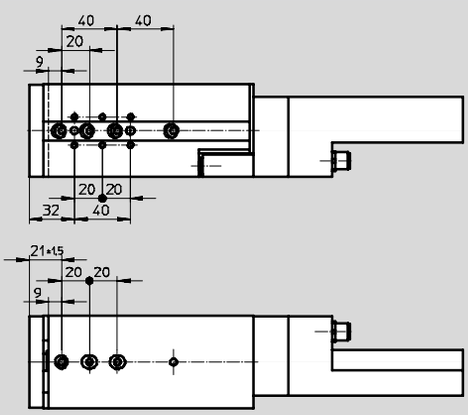
SLTE-10-80



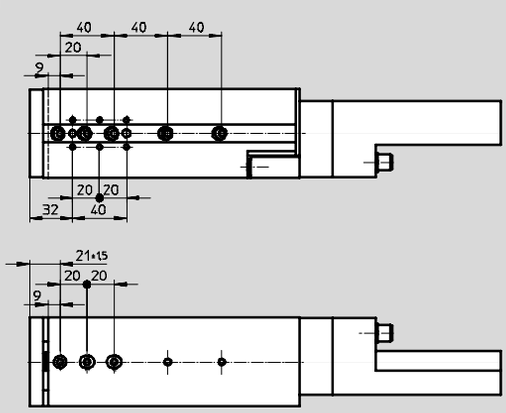
SLTE-16-50



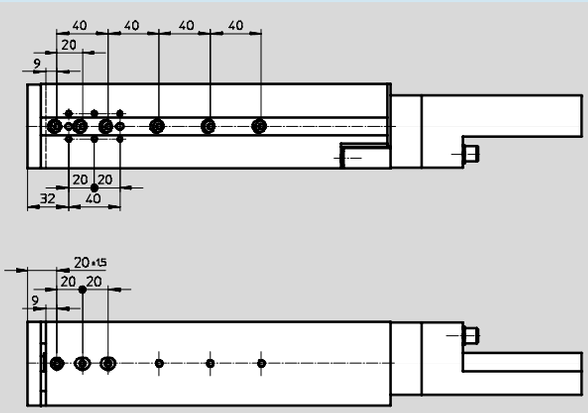
SLTE-16-80



SLTE-16-100



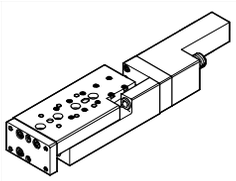
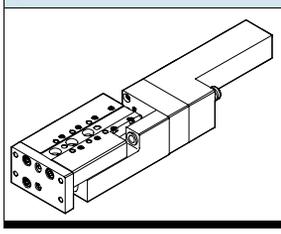
SLTE-16-150



Mini-slide SLTE, electric

Data sheet

FESTO

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**

Mini-slide SLTE, electric

Accessories

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Ordering data – Centring sleeves[1]				Datenblätter ➔ NO TAG Data sheets ➔ www.festo.com	
Piston diameter		10		16	
		Part No.	Type	Part No.	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 slot type 10, magneto-resistive							Data sheets ➔ NO TAG Data sheets ➔ www.festo.com	
	Mounting	Switch output	Electrical connection		Cable length [m]	Connection direction	Part No.	Type
			Cable	M8 plug				
NO contact								
	Insertable from above	PNP	3-core	–	2.5	In-line	**525 915**	**SMT-10F-PS-24V-K2,5L-OE**
			–	3-pin	0.3	In-line	**525 916**	**SMT-10F-PS-24V-K0,3L-M8D**
						Lateral	**526 675**	**SMT-10F-PS-24V-K0,3Q-M8D**
	Insertable from end	PNP	–	3-pin	0.3	In-line	**173 220**	**SMT-10-PS-SL-LED-24**
			3-core	–	2.5		**173 218**	**SMT-10-PS-KL-LED-24**

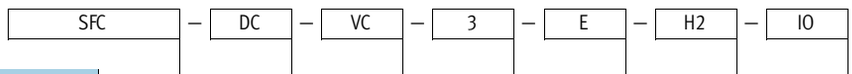
Ordering data – Proximity sensors for slot type 10, magnetic reed						Data sheets ➔ NO TAG Data sheets ➔ www.festo.com	
	Mounting	Electrical connection		Cable length [m]	Connection direction	Part No.	Type
		Cable	M8 plug				
NO contact							
	Insertable from above	–	3-pin	0.3	In-line	**525 914**	**SME-10F-DS-24V-K0,3L-M8D**
		3-core	–	2.5	In-line	**525 913**	**SME-10F-DS-24V-K2,5L-OE**
		2-core				**526 672**	**SME-10F-ZS-24V-K2,5L-OE**
	Insertable from end	–	3-pin	0.3	In-line	**173 212**	**SME-10-SL-LED-24**
		3-core	–	2.5		**173 210**	**SME-10-KL-LED-24**

Ordering data – Plug sockets						Data sheets ➔ NO TAG Data sheets ➔ www.festo.com	
	Mounting	Switch output		Connection	Cable length [m]	Part No.	Type
		PNP	NPN				
Straight socket							
	Union nut M8	■	■	3-pin	2.5	**159 420**	**SIM-M8-3GD-2,5-PU**
					5	**159 421**	**SIM-M8-3GD-5-PU**
Angled socket							
	Union nut M8	■	■	3-pin	2.5	**159 422**	**SIM-M8-3WD-2,5-PU**
					5	**159 423**	**SIM-M8-3WD-5-PU**

Core Range

Motor controller SFC-DC

Type code



Type	
SFC	Motor controller

Motor type	
DC	Direct-current motor

Voltage	
VC	Voltage, 24 V

Nominal current	
3	Nominal current, 3 A

Encoder	
E	Encoder

Control panel	
H0	Without control panel
H2	Integrated control panel with RS232

Parameterisation interface	
IO	I/O connection

Motor controller SFC-DC

Data sheet

FESTO

General technical data			
Type		SFC-...	
Operating mode		Cascade controller with – P current regulator	– PI speed controller – P position controller
Position sensor		Encoder	
Encoder input		RS485/RS422, A/B signal with index pulse	
Process interfacing		I/O interface for 31 traversing records and reference travel	
Display		Four-key interface with full-text display via graphic LCD display (124 x 64 pixels)	
Number of digital logic inputs		8	
Number of digital logic outputs		4	
Type of mounting		Top-hat rail, wall or surface bracket	
Product weight	[g]	600	

Electrical data		
Type		SFC-...
General		
Nominal power	[W]	75
Parameterisation interface		RS232; 9 600 baud; optionally with control panel
Load supply		
Nominal voltage	[V DC]	24 ±10%
Nominal current	[A]	3
Peak current	[A]	5
Logic supply		
Nominal voltage	[V DC]	24 ±10%
Nominal current	[A]	0.1
Peak current	[A]	0.8
Max. current per output (digital logic outputs)	[A]	0.5

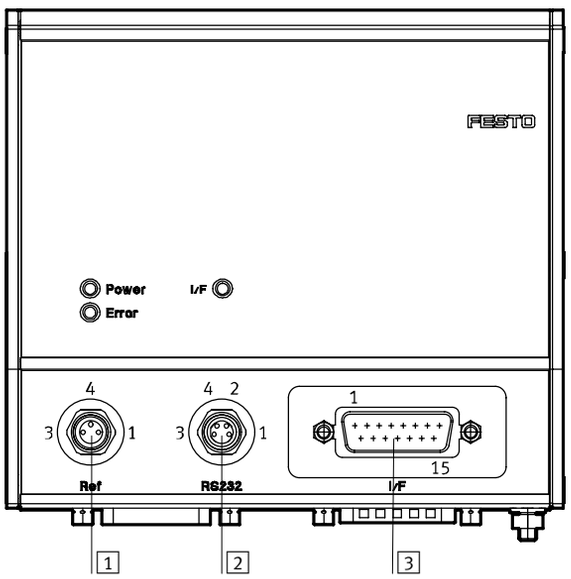
Operating and environmental conditions			
Type		SFC-...	
Digital logic outputs		Electrically isolated	
Operating range of logic input		IEC 61131	
Protection class		IP54	
Interference immunity		To EN 61000-6-2 (industry)	
Interference emission		To EN 61000-6-4 (industry)	
Vibration and shock resistance		To FN 942017-4 and -5, severity level 1	
Protective function		– I^2t monitoring – Current monitoring – Voltage failure detection	– Drag fault monitoring – Software end-position detection
CE symbol		89/336/EEC (EMC)	
Ambient temperature	[°C]	0 ... +40	
Relative air humidity	[%]	0 ... 95 (non-condensing)	

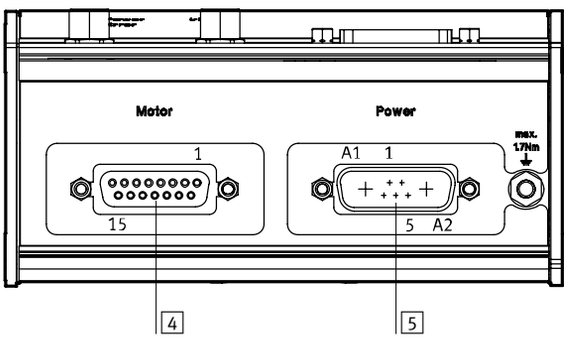
Motor controller SFC-DC

Data sheet

FESTO

Pin allocation of plugs/sockets





1 Reference switch, 3-pin M8 socket	
Pin	Function
1	24 V
4	Reference input
3	0 V
–	

2 RS 232 interface, 4-pin M8 socket	
Pin	Function
1	0 V
2	Transmitted Data (TxD)
3	Received Data (RxD)
4	–

3 I/O interface, 15-pin SUB-D plug	
Pin	Function
1	24 V (supply for output)
2	Traversing record coding, bit 1
3	Traversing record coding, bit 2
4	Traversing record coding, bit 3
5	Traversing record coding, bit 4
6	Traversing record coding, bit 5
7	Stop bit
8	0 V
9	Enable bit
10	Start bit
11	MC
12	Ready
13	Acknowledge
14	Error
15	0 V

4 Motor interface, 15-pin SUB-D plug	
Pin	Function
1	VCC logic
2	Encoder channel A
3	Encoder channel A/
4	Encoder channel B
5	Encoder channel B/
6	Encoder channel C
7	Encoder channel C/
8	Logic 0 V
9	0 V
10	0 V
11	0 V
12	Motor +
13	Motor –
14	0 V
15	0 V

5 Power supply, 2-pin plug	
Pin	Function
A1	24 V (load)
A2	0 V (load)
1	24 V (logic)
2	0 V (logic)
3	–
4	PE
5	–

Motor controller SFC-DC

Data sheet

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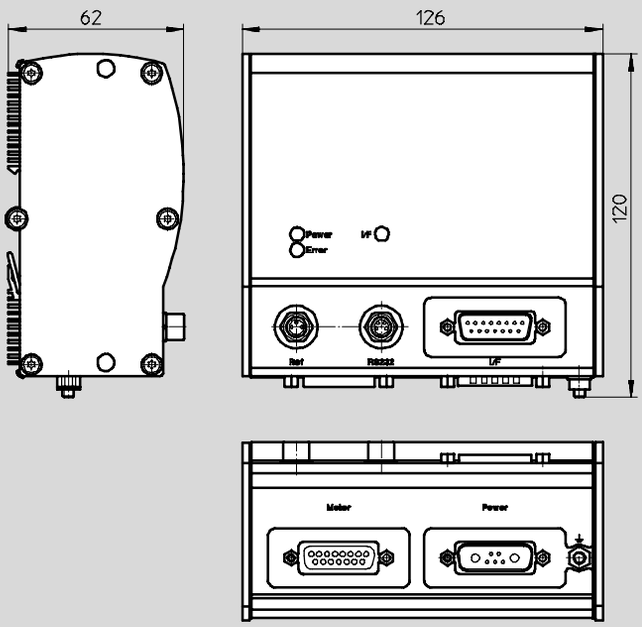
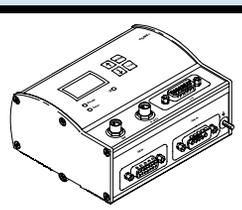
Dimensions Download CAD data ➔ **www.festo.com/en/engineering**



Ordering data

	Brief description	Part No.	Type
	Motor controller	**538 912**	**SFC-DC-VC-3-E-H0-IO**
		538 913	**SFC-DC-VC-3-E-H2-IO**

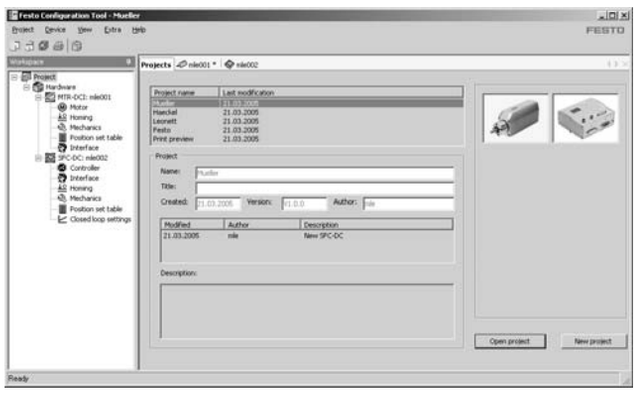
Motor controller SFC-DC

Data sheet

FESTO

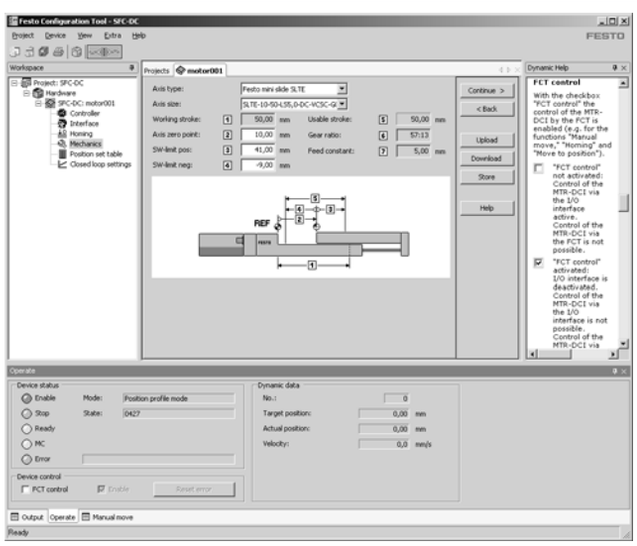
FCT software – Festo Configuration Tool

Software platform for electrical drives from Festo



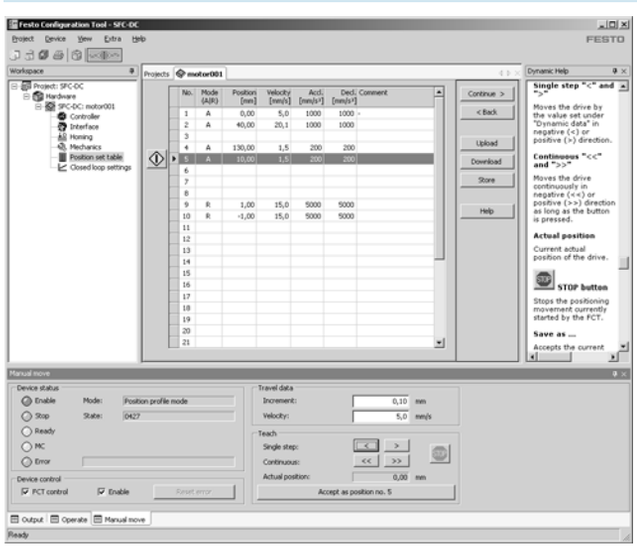
- All the drives in a system can be managed and archived in a common project
- Project and data management for all supported device types
- Simple to use thanks to graphically supported parameter entry
- Universal mode of operation for all drives
- Working offline at your desk or online at the machine

Mechanical reference positions and limit positions



- Reference positions can be either edited or taught in
- Flexible adaptation to installation conditions
- Settings are displayed clearly

Traversing record table



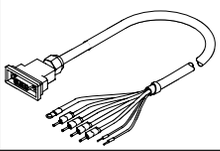
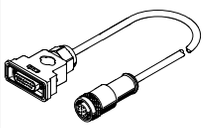
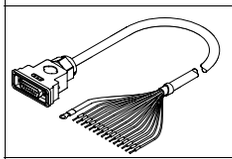
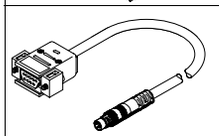
- 31 traversing records ensure positioning flexibility
- Absolute or relative positioning values can be used
- The following parameters can be set flexibly for each application:
  - Position
  - Speed
  - Acceleration
  - Braking ramps
- Complete function test

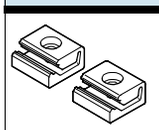
New

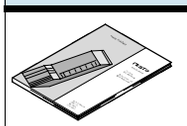
Motor controller SFC-DC

Accessories

FESTO

Ordering data – Cables				
	Brief description	Cable length [m]	Part No.	Type
	Supply cable, for connecting load and logic supply	2.5	**538 914**	**KPWR-MC-1-SUB-15HC-2,5**
		5	**538 915**	**KPWR-MC-1-SUB-15HC-5**
		10	**538 916**	**KPWR-MC-1-SUB-15HC-10**
	Motor cable, for connecting motor and controller	2.5	**538 917**	**KMTR-DC-SUB-15-M12-2,5**
		5	**538 918**	**KMTR-DC-SUB-15-M12-5**
		10	**539 316**	**KMTR-DC-SUB-15-M12-10**
	Control cable, for I/O connection to any controller	2.5	**538 919**	**KES-MC-1-SUB-15-2,5**
		5	**538 920**	**KES-MC-1-SUB-15-5**
		10	**538 921**	**KES-MC-1-SUB-15-10**
	Programming cable, for connecting controller and PC	2.5	**537 926**	**KDI-MC-M8-SUB-9-2,5**

Ordering data – Central support			
	Brief description	Part No.	Type
	For mounting controller	**160 909**	**MUP-8/12**

Ordering data – Documentation				
	Brief description	Language	Part No.	Type
	Description User documentation in paper form is not included in the scope of delivery.	DE	**540 417**	**P.BE-SFC-DC-IO-DE**
		EN	**540 418**	**P.BE-SFC-DC-IO-EN**
		ES	**540 419**	**P.BE-SFC-DC-IO-ES**
		FR	**540 420**	**P.BE-SFC-DC-IO-FR**
		IT	**540 421**	**P.BE-SFC-DC-IO-IT**
		SV	**540 422**	**P.BE-SFC-DC-IO-SV**
	Documentation package User documentation on CD-ROM, in the languages DE, EN, ES, FR, IT, SV, is included in the scope of delivery.		**542 003**	**P.BE-SFC-DC-UDOK**
	Configuration package The configuration package FCT (Festo Configuration Tool) on CD-ROM is included in the scope of delivery.		**539 622**	**P.SW-FCT**