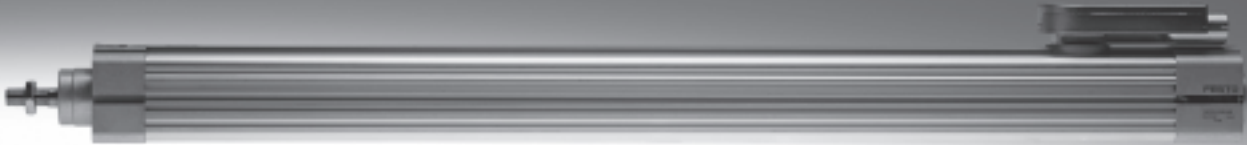


Electric cylinders DNCE-LAS, with linear motor



Electric cylinders DNCE-LAS, with linear motor

Key features

At a glance		
Characteristics		Range of applications
<ul style="list-style-type: none"> Linear motor axis with piston rod The electric cylinder consists of a freely positionable linear motor, integrated displacement encoder with magnetic strip, reference switch and plain bearings 	<ul style="list-style-type: none"> Enables positioning with very high dynamic response. Accelerations of up to 125 m/s² are possible without load Mechanical interfaces are largely compatible with the standard cylinder DNC 	<ul style="list-style-type: none"> Together with the motor controller SFC-LACI and the associated cables, it is a quickly commissioned positioning system for small loads
		<ul style="list-style-type: none"> Positioning of small loads such as: <ul style="list-style-type: none"> – placing small parts into and removing small parts from magazines – sorting parts quickly – for equipping and assembly processes

Everything from a single source

Electric cylinder DNCE-LAS

→ 3



Motor controller SFC-LACI

→ Internet: sfc-laci

The electric cylinder DNCE-LAS and motor controller SFC-LACI form one unit.

- Thanks to protection class IP54, the SFC can be mounted close to the DNCE, either:
 - via central supports or
 - via H-rail
 - Just two cables are required between the electric cylinder DNCE and motor controller SFC (motor and encoder cable)
 - The motor controller SFC is available with or without control panel
 - Up to 31 positioning records
- Parameterisation via:
- Control panel:
 - suitable for simple position sequences

Parameterisation via:

- FCT (Festo Configuration Tool) configuration package:
 - via RS 232 interface
 - Windows-based PC user interface, Festo Configuration Tool
- Easy actuation via:
 - I/O interface
 - Profibus
 - CANopen, incl. “interpolated position mode”
 - DeviceNet

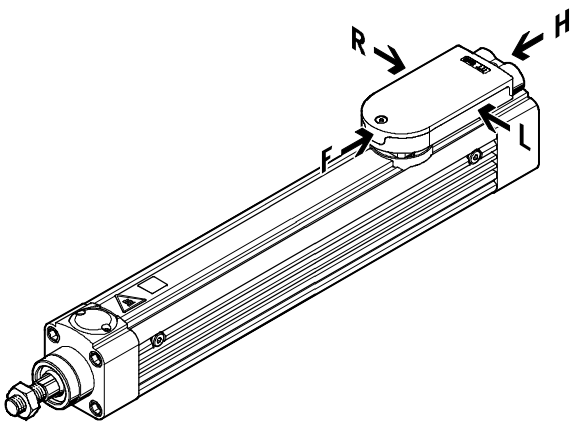


Electric cylinders DNCE-LAS, with linear motor

Type codes

		DNCE	–	32	–	100	–	LAS	–	F	–	S1
Type												
DNCE	Electric cylinder											
Size												
Stroke [mm]												
Drive type/motor technology												
LAS	Linear motor, AC synchronous											
Cable outlet direction												
H	To the rear											
F	To the front											
L	To the left											
R	To the right											
Protection class for electrics												
S1	IP65											

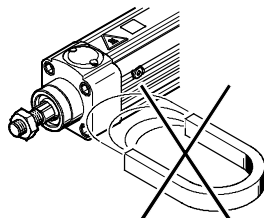
Cable outlet direction



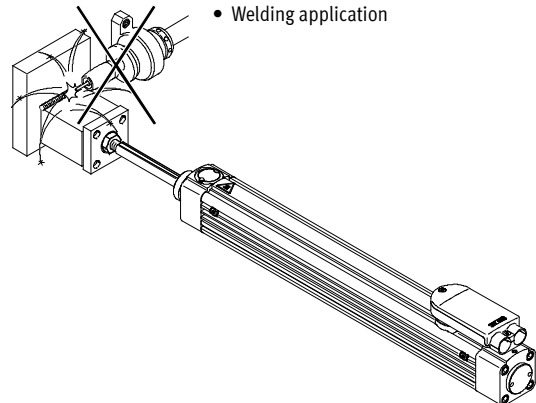
Instructions for use

The electric cylinder with linear motor is not designed for the following sample applications:

- Magnetic field



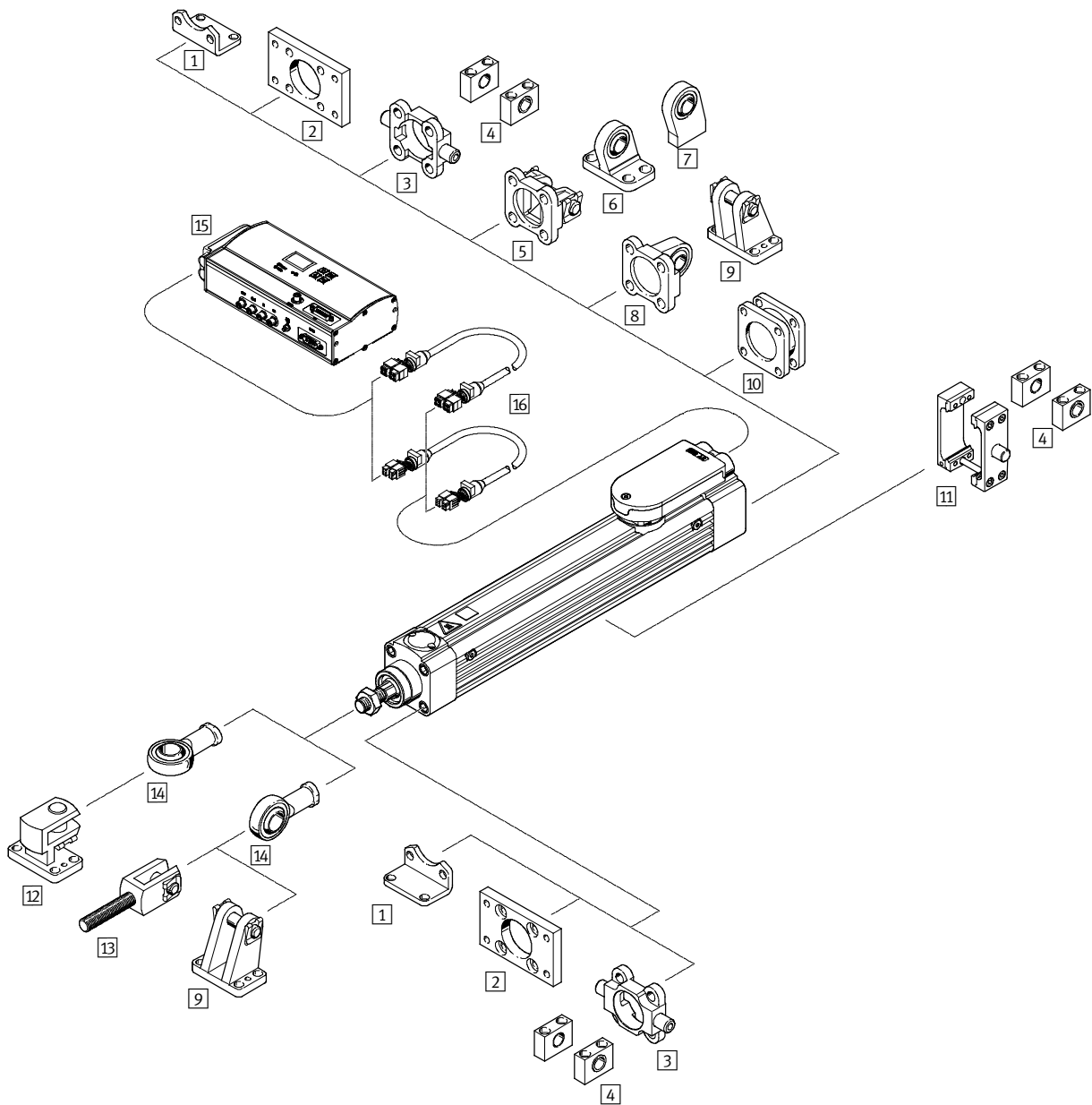
- Welding application



Electric cylinders DNCE-LAS, with linear motor

Peripherals overview

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Electric cylinders DNCE-LAS, with linear motor

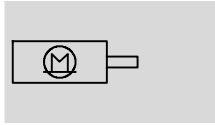
Peripherals overview

Mounting attachments and accessories		
	Brief description	→ Page/Internet
1	Foot mounting HNC/CRHNC	For bearing or end caps 16
2	Flange mounting FNC/CRFNG	For bearing or end caps 17
3	Trunnion flange ZNC/CRZNG	For bearing or end caps 18
4	Trunnion support LNZG/CRLNZG	For cylinders with trunnion mounting 19
5	Swivel flange SNC	For end caps 20
6	Clevis foot LSNG	With spherical bearing 21
7	Clevis foot LSNSG	Weld-on, with spherical bearing 21
8	Swivel flange SNCS	For end caps, with spherical bearing 20
9	Clevis foot LBG	With non-rotating pivot pin 21
10	Multi-position kit DPNC	For connecting two cylinders of the same size to form a multi-position cylinder 18
11	Trunnion mounting kit ZNCM/DAMT	For mounting anywhere along the cylinder profile barrel 21
12	Right-angle clevis foot LQG	For rod eye SGS 21
13	Rod clevis SGA	For swivel attachment of cylinders 21
14	Rod eye SGS	With spherical bearing 21
15	Motor controller SFC-LACI	For parameterising and positioning the electric cylinder sfc-laci
16	Motor/encoder cable NEBM	For connecting the motor and controller sfc-laci

Electric cylinders DNCE-LAS, with linear motor

Technical data

Function



Size
32, 40

Stroke length
100 ... 400 mm

Note

All values are based on a standard temperature of 23 °C. Dynamic response and accuracy are dependent on the mounting (rigidity) and temperature stresses (heat concentration).

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General technical data								
Size		32			40			
Stroke	[mm]	100	200	320	100	200	320	400
Mechanical								
Design		Electric linear direct drive						
Drive unit operating mode		Piston rod						
Type of mounting		Via female thread						
		Via accessories						
Mounting position		Any						
Continuous feed force ¹⁾	[N]	33.7	29.4	33.8	55.3	33.8	42.1	47.9
Peak feed force ¹⁾	[N]	93.7	141	141	183	202	202	202
Max. effective load without external guide (horizontal operation)	[kg]	1.5	1	0.5	2.5	2.5	1.5	1.4
Max. effective load with external guide (horizontal operation)	[kg]	2.8	6	4	3.4	6	6	6
Max. effective load without external guide (vertical operation)	[kg]	3	3	2	3	3	3	3
Max. speed	[m/s]	2	3	3	2	3	3	3
Repetition accuracy	[mm]	±0.02						
Electric								
Type of motor		Linear AC servo motor						
Displacement encoder		Relative measurement, magnetic, incremental, contactless						
Peak motor current	[A]	5.9	16.2	16.2	7.65	22.5	22.5	22.5
Nominal motor current	[A]	2.1	3.3	3.9	2.25	3.7	4.6	5.2
Rated motor output	[W]	101	88	101	166	101	126	144
Homing		Integrated reference sensor						

1) Disregarding friction

Electric cylinders DNCE-LAS, with linear motor

Technical data

Operating and environmental conditions	
Ambient temperature [°C]	0 ... +40
Max. motor temperature [°C]	70 (warning at 70 °C, shut-off at 75 °C)
Standard temperature ¹⁾ [°C]	23
Temperature monitoring	Shuts off if motor overheats
Protection class (mechanical system)	IP40
Protection class (electrical connection)	IP40 (with DNCE-...-S1: IP65)
CE marking (see declaration of conformity)	To EU EMC Directive
Corrosion resistance class CRC ²⁾	1

1) Unless otherwise stated, all values are based on standard temperature

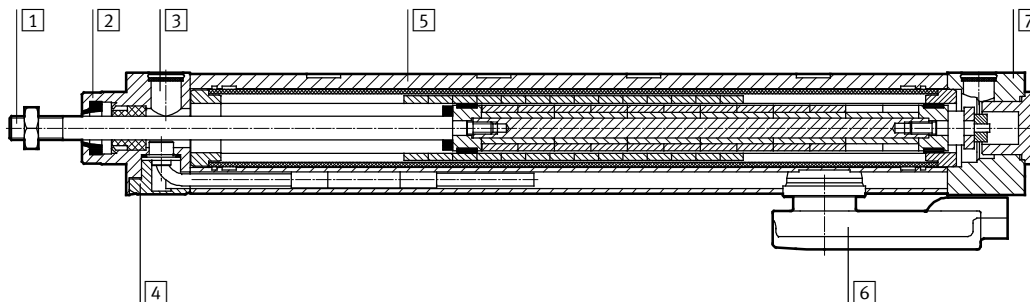
2) Corrosion resistance class 1 according to Festo standard 940 070

Components subject to low corrosion stress. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers

Weight [g]							
Size	32			40			
Stroke [mm]	100	200	320	100	200	320	400
Product weight	2,570	3,170	3,750	4,560	5,420	6,420	7,000
Moving load	530	610	710	1,340	1,470	1,630	1,750

Materials

Sectional view

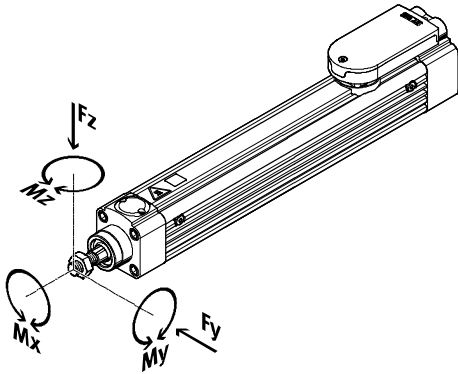


Electric cylinder	
1	Piston rod High-alloy stainless steel
2	Bearing cap Anodised wrought aluminium alloy
3	Filter disc Sintered bronze
4	Distance piece Anodised wrought aluminium alloy
5	Cylinder barrel Anodised wrought aluminium alloy
6	Terminal strip Die-cast zinc
7	End cap Anodised wrought aluminium alloy
-	Screws Galvanised steel
Note on materials Contains PWIS (paint-wetting impairment substances) RoHS-compliant	

Electric cylinders DNCE-LAS, with linear motor

Technical data

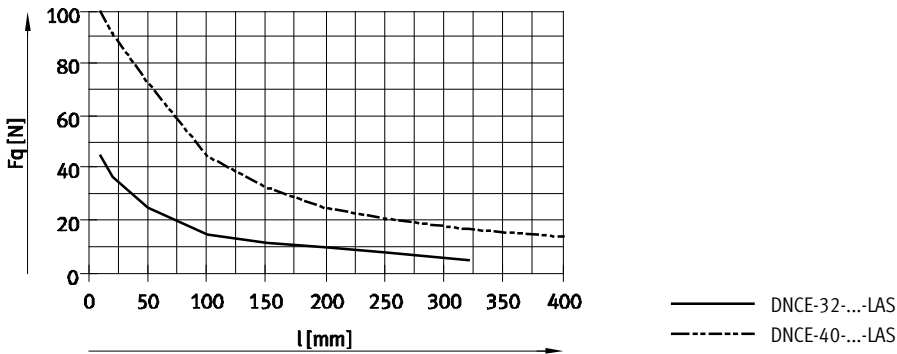
Maximum permissible loads on the piston rod



If there are two or more forces and torques simultaneously acting upon the piston rod, the following equations must be satisfied:

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

Maximum permissible lateral forces $F_{y_{max}}$ and $F_{z_{max}}$ as a function of stroke l (limited by the plain bearing)



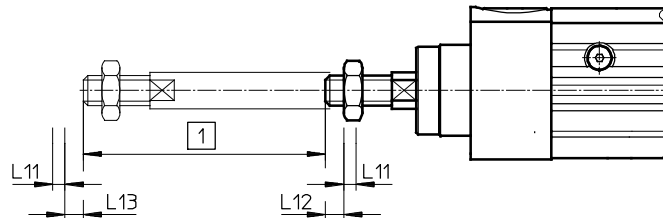
Maximum permissible forces and torques

Size	32	40
$M_{x_{max}}$ [Nm]	No torques are permitted	
$M_{y_{max}}, M_{z_{max}}$ [Nm]	2	5

- - Note
PositioningDrives
sizing software
→ www.festo.com

Stroke reserve and cushioning length

1 Working stroke:
The recommended, available operating range
L12, L13 Stroke reserve:
The distance from the end positions of the working stroke to the buffers
L11 Cushioning length:
The distance from the buffer surface to the mechanical end position

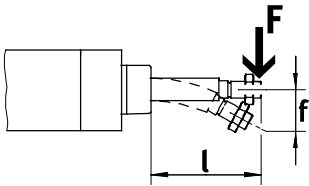


Size	Retracted		Advanced	
	L12	L11	L13	L11
32 [mm]	3.3	2	5.9	2
40 [mm]	3.1	2	3.7	2

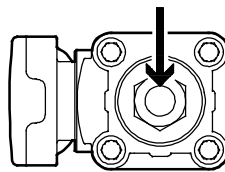
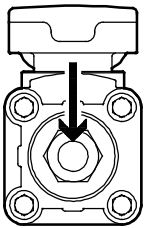
Electric cylinders DNCE-LAS, with linear motor

Technical data

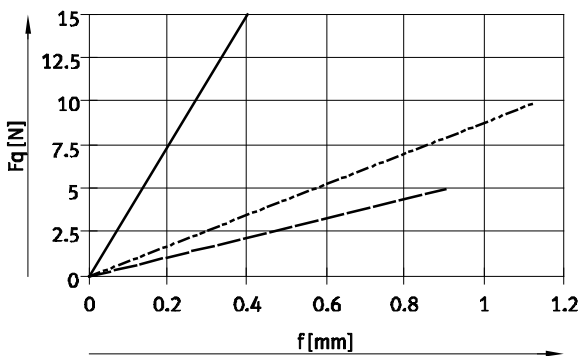
Piston rod displacement f , with fully advanced piston rod, as a function of lateral force F_q



Mounting position

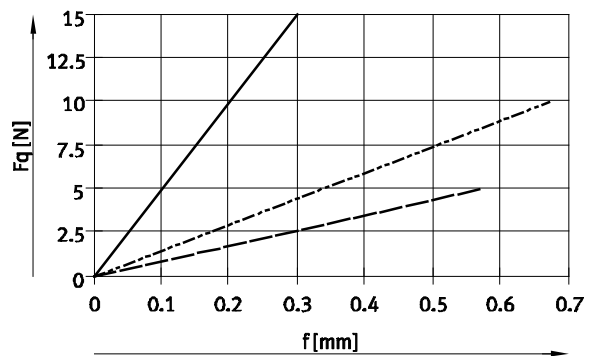


DNCE-32



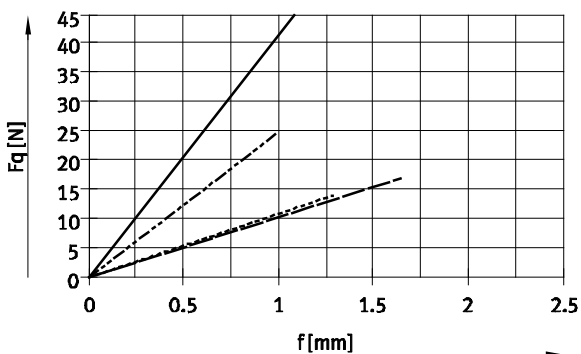
- DNCE-32-100-LAS
- - - DNCE-32-200-LAS
- · - DNCE-32-320-LAS

DNCE-32



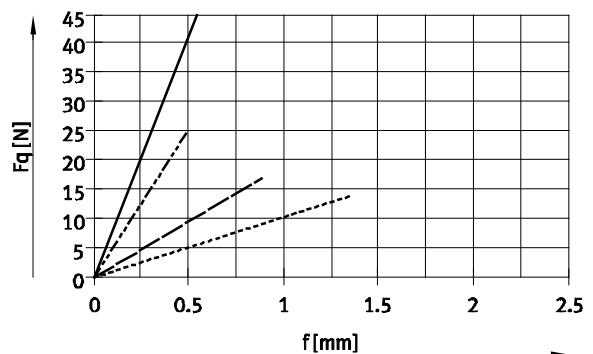
- DNCE-32-100-LAS
- - - DNCE-32-200-LAS
- · - DNCE-32-320-LAS

DNCE-40



- DNCE-40-100-LAS
- - - DNCE-40-200-LAS
- · - DNCE-40-320-LAS
- · · DNCE-40-400-LAS

DNCE-40



- DNCE-40-100-LAS
- - - DNCE-40-200-LAS
- · - DNCE-40-320-LAS
- · · DNCE-40-400-LAS

Electric cylinders DNCE-LAS, with linear motor

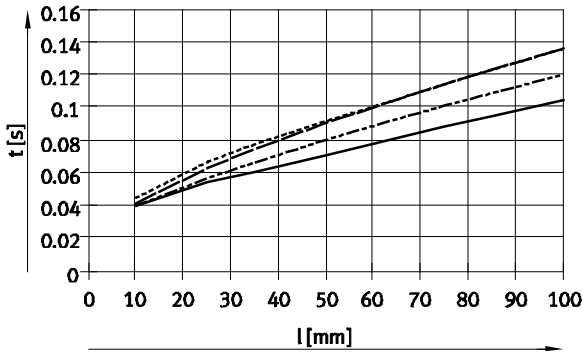
Technical data

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Positioning time t as a function of stroke l , effective load M and duty cycle ED

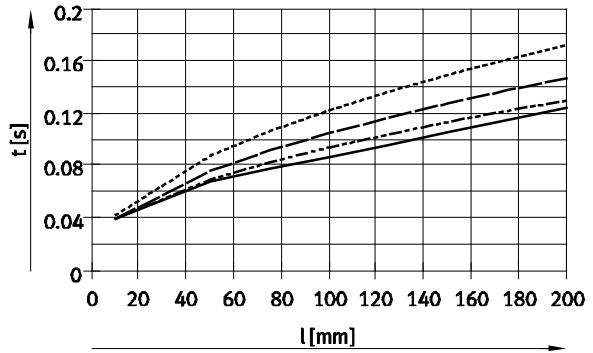
For horizontal mounting position

DNCE-32-100



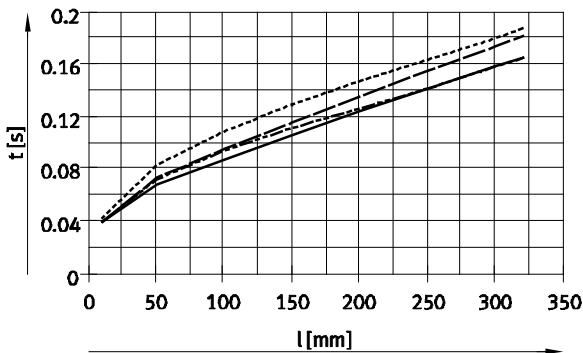
— M 0.2 kg, ED 25% - - - M 1.5 kg, ED 25%
 - - - M 0.2 kg, ED 50% ····· M 1.5 kg, ED 50%
 - · - M 0.8 kg, ED 25%
 ····· M 0.8 kg, ED 50%

DNCE-32-200



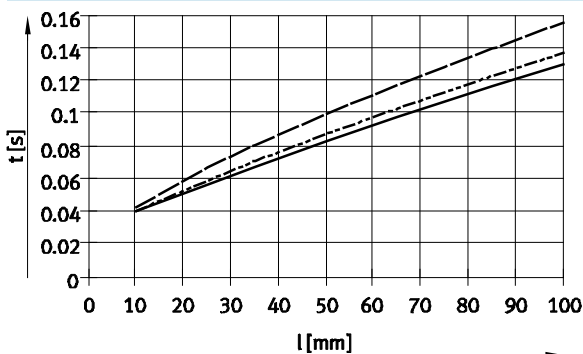
— M 0.2 kg, ED 25% - - - M 0.5 kg, ED 50%
 - - - M 0.2 kg, ED 50% ····· M 1.0 kg, ED 25%
 - · - M 0.5 kg, ED 25% ····· M 1.0 kg, ED 50%

DNCE-32-320



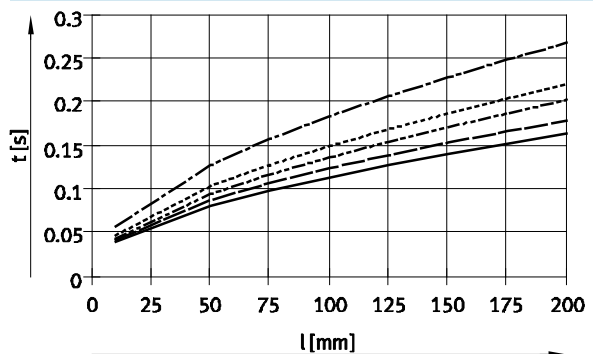
— M 0.1 kg, ED 25% - - - M 0.5 kg, ED 25%
 - - - M 0.1 kg, ED 50% ····· M 0.5 kg, ED 50%

DNCE-40-100



— M 0.5 kg, ED 25% - - - M 2.5 kg, ED 25%
 - - - M 0.5 kg, ED 50% ····· M 2.5 kg, ED 50%
 - · - M 1.0 kg, ED 25%
 ····· M 1.0 kg, ED 50%

DNCE-40-200



— M 0.5 kg, ED 25% - - - M 1.0 kg, ED 50%
 - - - M 0.5 kg, ED 50% ····· M 2.5 kg, ED 25%
 - · - M 1.0 kg, ED 25% ····· M 2.5 kg, ED 50%

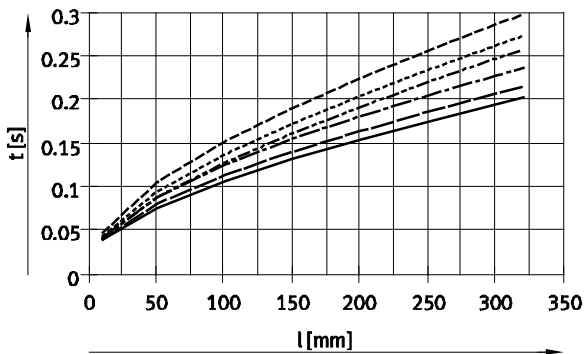
Electric cylinders DNCE-LAS, with linear motor

Technical data

Positioning time t as a function of stroke l , effective load M and duty cycle ED

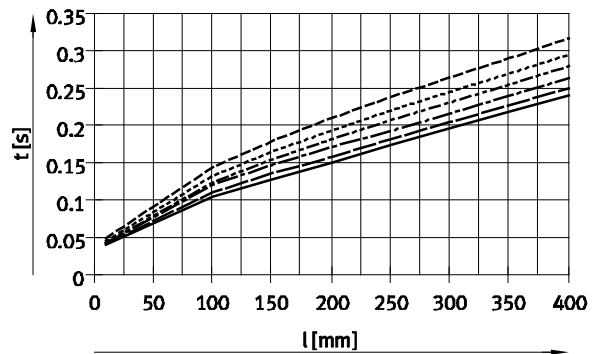
For horizontal mounting position

DNCE-40-320



- M 0.4 kg, ED 25%
- M 0.4 kg, ED 50%
- M 0.8 kg, ED 25%
- M 0.8 kg, ED 50%
- - - M 0.8 kg, ED 50%
- - - M 1.5 kg, ED 25%
- - - M 1.5 kg, ED 50%

DNCE-40-400



- M 0.4 kg, ED 25%
- M 0.4 kg, ED 50%
- M 0.8 kg, ED 25%
- M 0.8 kg, ED 50%
- - - M 0.8 kg, ED 50%
- - - M 1.4 kg, ED 25%
- - - M 1.4 kg, ED 50%

Feed force F as a function of stroke l

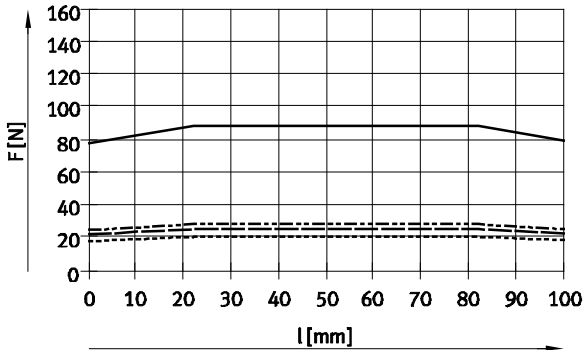
The graphs are based on practical values with friction taken into account.

Peak feed force

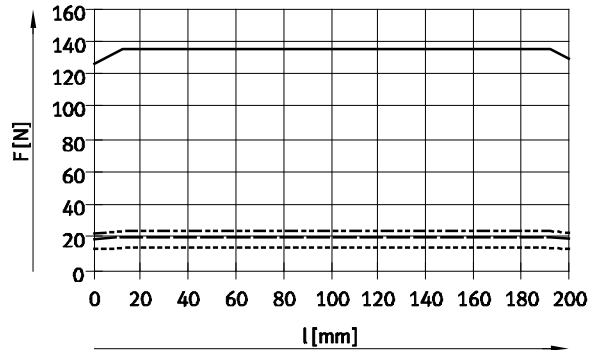
Continuous feed force at ambient temperature:

- - - from 23 °C
- - - from 30 °C
- - - from 40 °C

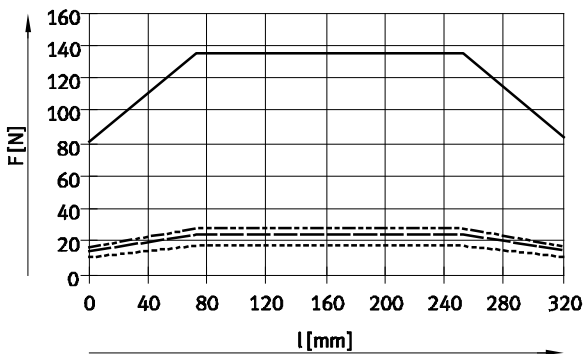
DNCE-32-100



DNCE-32-200



DNCE-32-320



Electric cylinders DNCE-LAS, with linear motor

Technical data

Feed force F as a function of stroke l

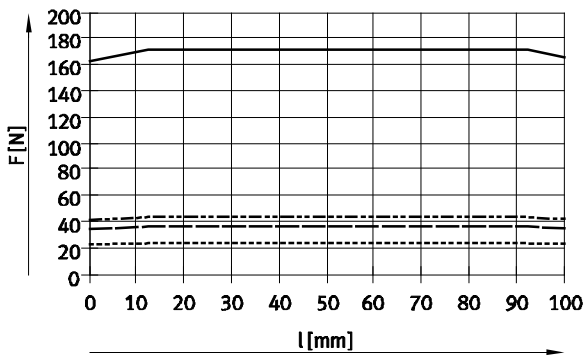
The graphs are based on practical values with friction taken into account.

Peak feed force

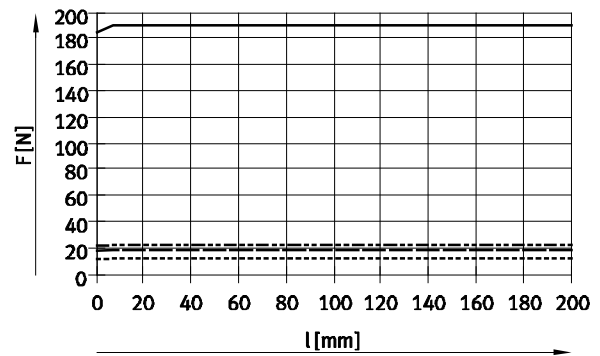
Continuous feed force at ambient temperature:

- from 23 °C
- from 30 °C
- from 40 °C

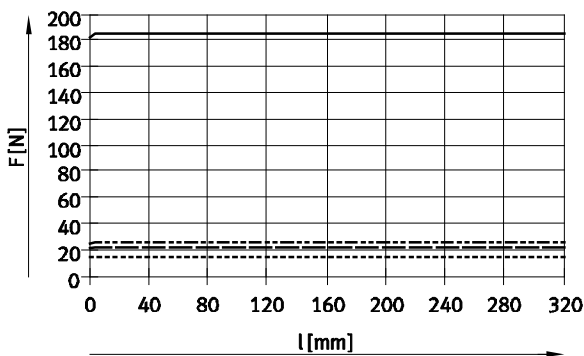
DNCE-40-100



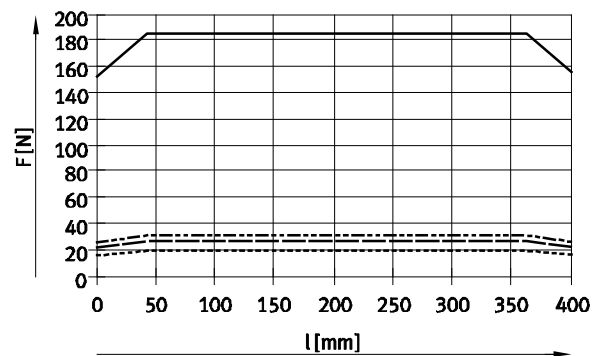
DNCE-40-200



DNCE-40-320



DNCE-40-400



Electric cylinders DNCE-LAS, with linear motor

Technical data

Feed force F as a function of speed v

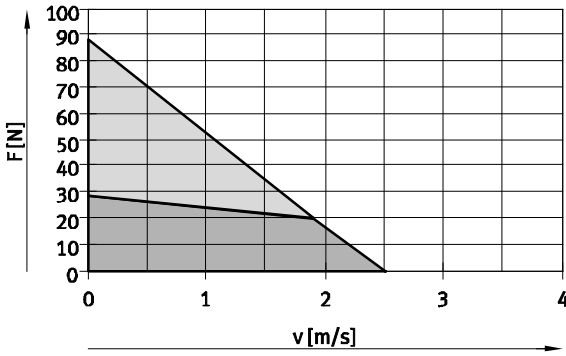
The graphs are based on practical values under the following conditions:

- Stroke centre of the electric cylinder
- Friction taken into account
- Standard temperature of 23 °C
- Max. motor temperature of 70 °C

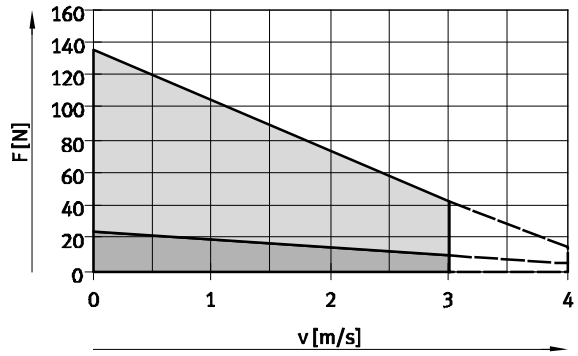
Legend:

- Peak feed force (light grey shaded area)
- Continuous feed force (dark grey shaded area)
- Non-permissible range (dashed line)

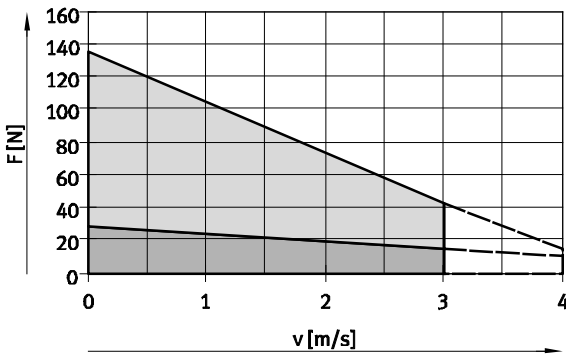
DNCE-32-100



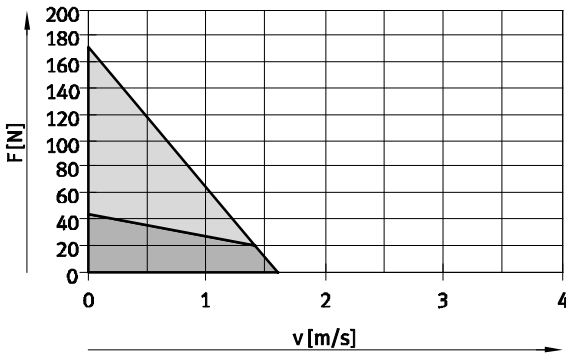
DNCE-32-200



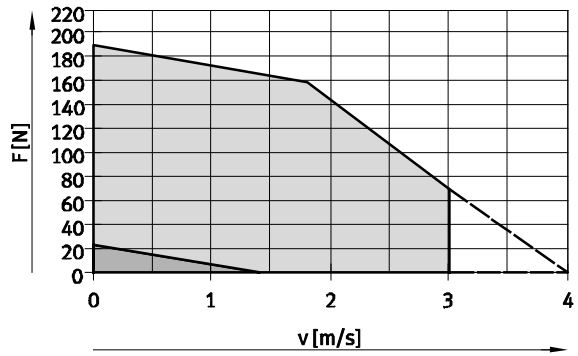
DNCE-32-320



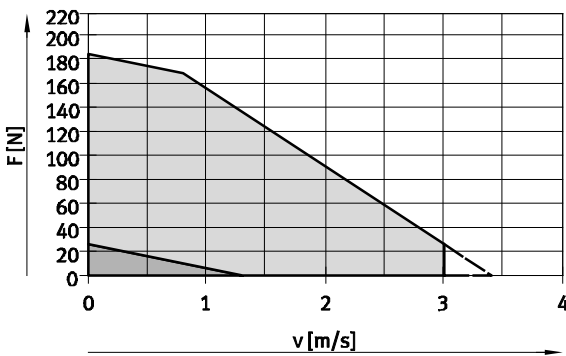
DNCE-40-100



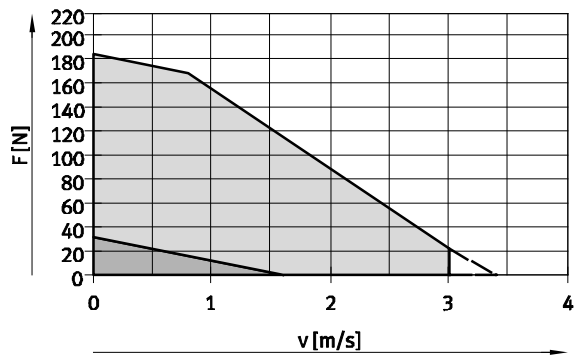
DNCE-40-200



DNCE-40-320



DNCE-40-400



Electric cylinders DNCE-LAS, with linear motor

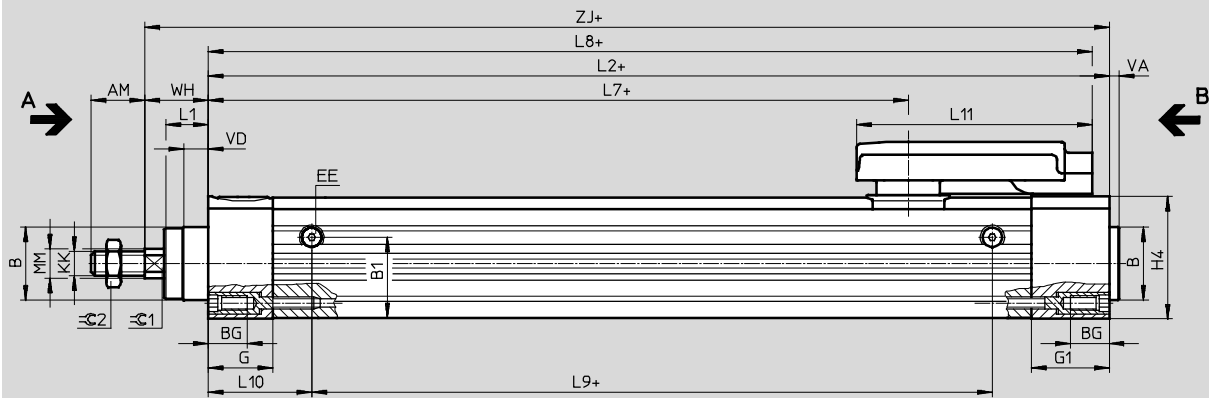
Technical data



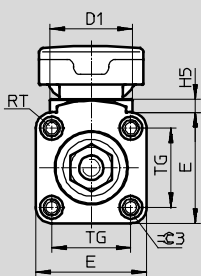
Dimensions

Download CAD data → www.festo.com

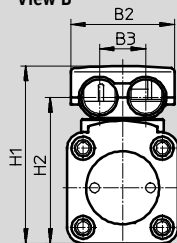
DNCE-...



View A



View B



+ = plus stroke length

Size	AM	B ∅ d11	B1	B2	B3	BG	D1 ∅	E	EE	G	G1
32	22	30	33	42.6	19	16	34	45.5	M5	26.5	32
40	24	35	38	42.6	19	16	34	54	M5	26.5	32

Size	H1	H2	H4	H5	KK	L1	L2	L7	L8	L9	L10
32	72.8	59.8	50.3	5.5	M10X1.25	18	270	187.5	263	179.5	42.5
40	81.3	68.3	58.7	5.5	M12X1.25	21.3	341	258.5	334	240.5	47.5

Size	L11	MM ∅	RT	TG	VA	VD	WH	ZJ	∅C1	∅C2	∅C3
32	96.8	12	M6	32.5	4	10	26 _{-3.3}	296 _{-3.3}	10	17	6
40	96.8	16	M6	38	4	10.3	30 _{-3.1}	371 _{-3.1}	13	19	6

Electric cylinders DNCE-LAS, with linear motor

Ordering data – Modular products

Ordering table					
Size	32	40	Condi- tions	Code	Enter code
M Module No.	562830	562831			
Function	Electric cylinder			DNCE	DNCE
Size	32	40		-...	
Stroke [mm]	100	100		-...	
	200	200			
	320	320			
	-	400			
Drive type	Linear motor			-L	-L
Motor technology	AC synchronous			AS	AS
Cable outlet direction	To the rear			-H	
	To the front			-F	
	To the left			-L	
	To the right			-R	
O Protection class for electrics	IP65			-S1	

Transfer order code

Electric cylinders DNCE-LAS, with linear motor

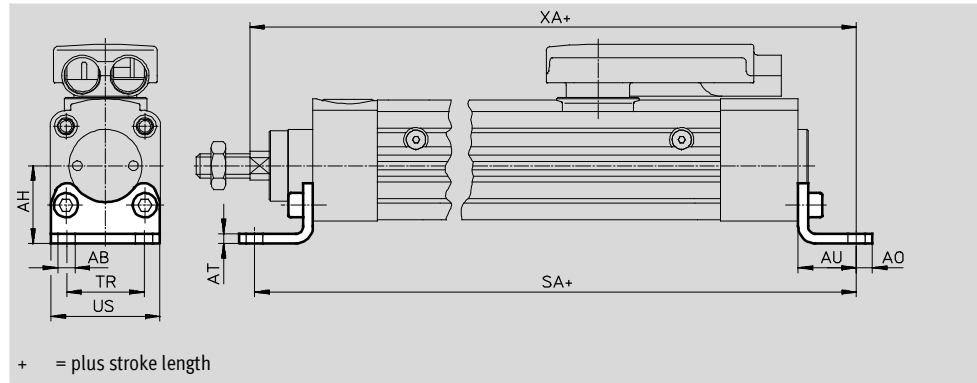
Accessories

Foot mounting HNC/CRHNC

Material:

HNC: Galvanised steel
CRHNC: High-alloy steel

Free of copper and PTFE



Dimensions and ordering data									
For size	AB ∅	AH	AO	AT	AU	SA	TR	US	XA
[mm]									
32	7	32	6.5	4	24	318	32	45	320
40	10	36	9	4	28	397	36	54	399

For size [mm]	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
32	2	144	174369	HNC-32	4	139	176937	CRHNC-32
40	2	193	174370	HNC-40	4	188	176938	CRHNC-40

1) Corrosion resistance class 2 according to Festo standard 940 070
 Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents
 Corrosion resistance class 4 according to Festo standard 940 070
 Components subject to particularly high corrosion stress. Parts used with aggressive media, e.g. in the food or chemical industry. These applications should be supported with special tests with the media if required

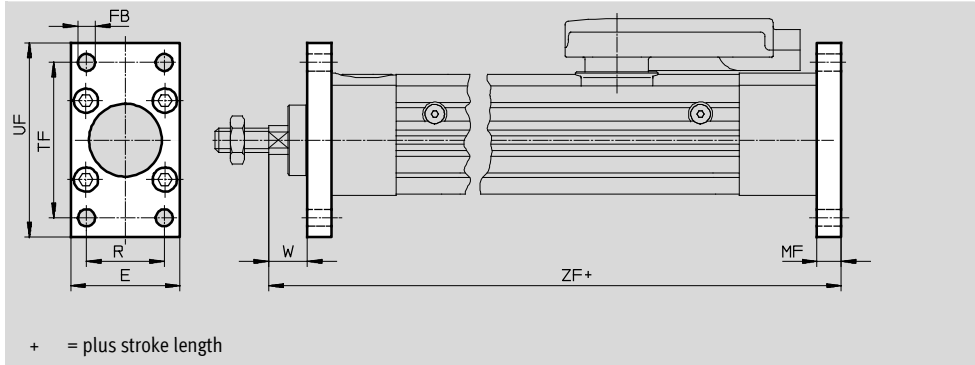
Electric cylinders DNCE-LAS, with linear motor

Accessories

Flange mounting FNC/CRFNG

Material:
 FNC: Galvanised steel
 CRFNG: High-alloy steel

Free of copper and PTFE
 RoHS-compliant



Dimensions and ordering data								
For size	E	FB	MF	R	TF	UF	W	ZF
[mm]		∅ H13						
32	45	7	10	32	64	80	16	306
40	54	9	10	36	72	90	20	381

For size	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
32	1	221	174376	FNC-32	4	225	161846	CRFNG-32
40	1	291	174377	FNC-40	4	300	161847	CRFNG-40

1) Corrosion resistance class 1 according to Festo standard 940 070
 Components with light corrosion exposure. Protection for transport and storage. Components without significant decorative function or surface, e.g. installed out of sight internally or behind covers.
 Corrosion resistance class 4 according to Festo standard 940 070
 Components subject to particularly high corrosion stress. Parts used with aggressive media, e.g. in the food or chemical industry. These applications should be supported with special tests with the media if required

Electric cylinders DNCE-LAS, with linear motor

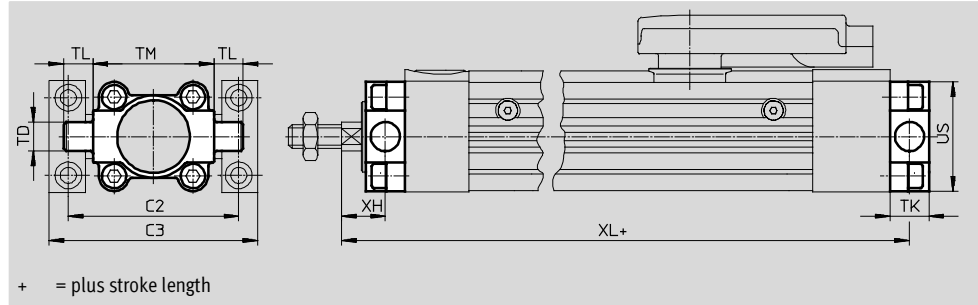
Accessories



Trunnion flange ZNCF/CRZNG

Material:
 ZNCF: Stainless steel casting
 CRZNG: Electropolished special steel casting

Free of copper and PTFE
 RoHS-compliant



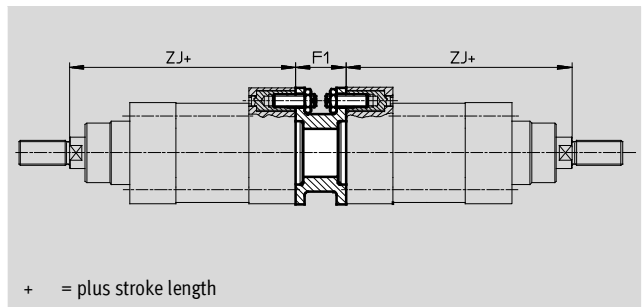
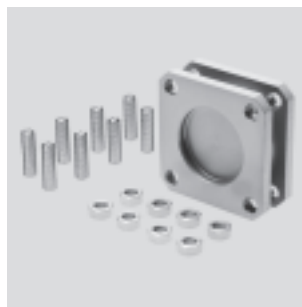
Dimensions and ordering data									
For size	C2	C3	TD	TK	TL	TM	US	XH	XL
[mm]			∅ e9						
32	71	86	12	16	12	50	45	18	304
40	87	105	16	20	16	63	54	20	381

For size	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
[mm]								
32	2	150	174411	ZNCF-32	4	150	161852	CRZNG-32
40	2	285	174412	ZNCF-40	4	285	161853	CRZNG-40

1) Corrosion resistance class 2 according to Festo standard 940 070
 Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents
 Corrosion resistance class 4 according to Festo standard 940 070
 Components subject to particularly high corrosion stress. Parts used with aggressive media, e.g. in the food or chemical industry. These applications should be supported with special tests with the media if required

Multi-position kit DPNC

Material:
 Flange: Wrought aluminium alloy
 Threaded studs, hex nuts:
 Galvanised steel
 Free of copper and PTFE
 RoHS-compliant



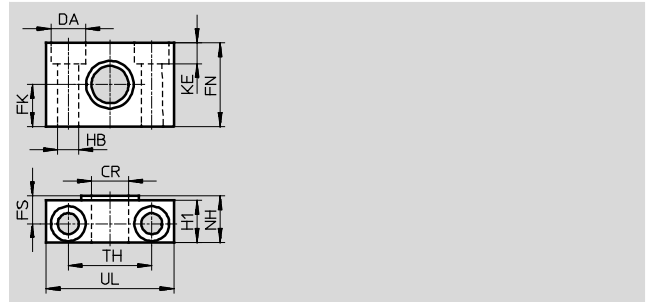
Dimensions and ordering data					
For size	F1	ZJ	Weight	Part No.	Type
[mm]			[g]		
32	27	296	85	174418	DPNC-32
40	27	371	115	174419	DPNC-40

Electric cylinders DNCE-LAS, with linear motor

Accessories

Trunnion support LNZG

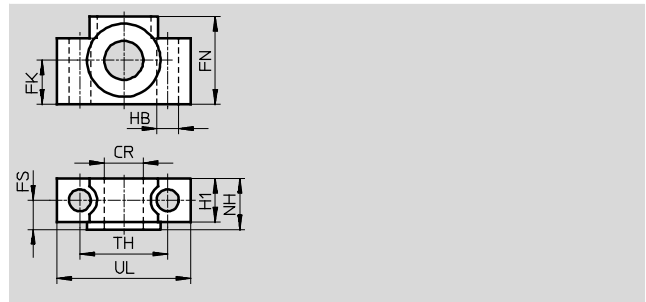
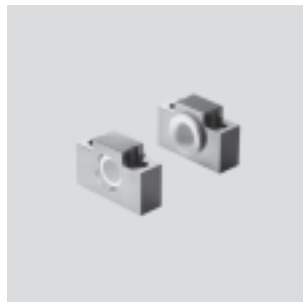
Material:
 Trunnion support:
 Anodised aluminium
 Plain bearing: Plastic
 Free of copper and PTFE
 RoHS-compliant



Dimensions and ordering data														Weight	Part No.	Type
For size	CR	DA	FK	FN	FS	H1	HB	KE	NH	TH	UL	CRC ¹⁾	Weight	Part No.	Type	
[mm]	∅	∅	∅				∅			±0.2			[g]			
32	12	11	15	30	10.5	15	6.6	6.8	18	32	46	2	83	32959	LNZG-32	
40	16	15	18	36	12	18	9	9	21	36	55	2	129	32960	LNZG-40/50	

Trunnion support CRLNZG

Material:
 High-alloy steel
 Free of copper and PTFE
 RoHS-compliant



Dimensions and ordering data														Weight	Part No.	Type
For size	CR	FK	FN	FS	H1	HB	NH	TH	UL	CRC ¹⁾	Weight	Part No.	Type			
[mm]	∅	∅				∅		±0.2			[g]					
32	12	15	30	10.5	15	6.6	18	32	46	4	205	161874	CRLNZG-32			
40	16	18	36	12	18	9	21	36	55	4	323	161875	CRLNZG-40/50			

1) Corrosion resistance class 2 according to Festo standard 940 070
 Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents
 Corrosion resistance class 4 according to Festo standard 940 070
 Components subject to particularly high corrosion stress. Parts used with aggressive media, e.g. in the food or chemical industry. These applications should be supported with special tests with the media if required

Electric cylinders DNCE-LAS, with linear motor

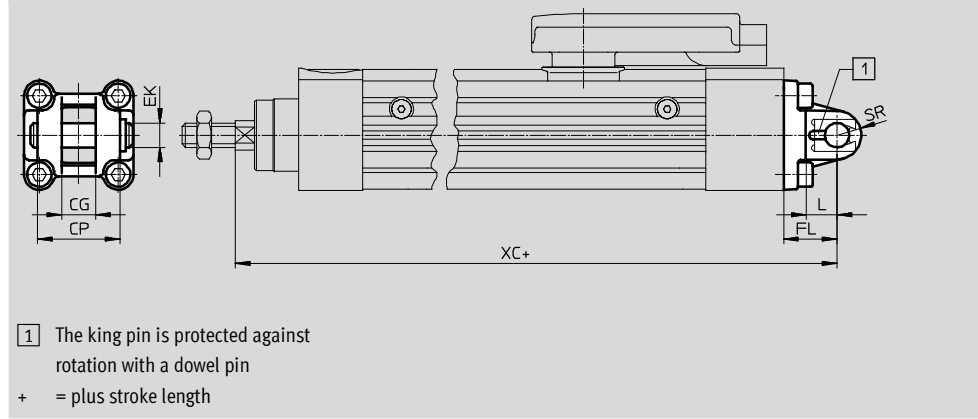


Accessories

Swivel flange SNC

Material:
Die-cast aluminium

Free of copper and PTFE
RoHS-compliant

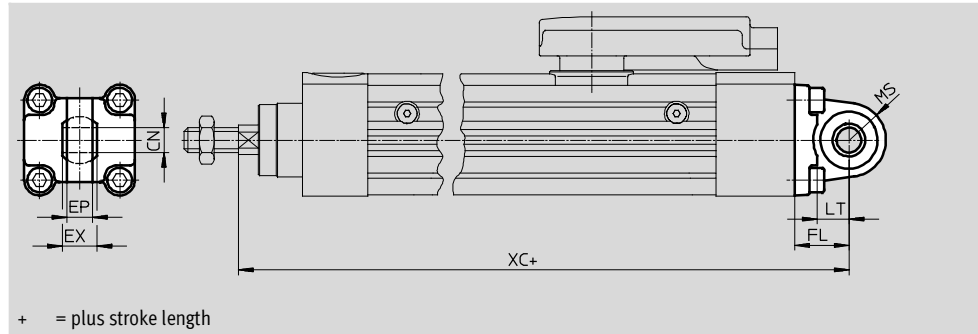
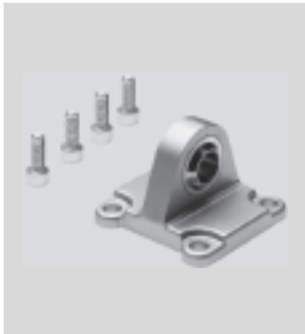


Dimensions and ordering data											
For size	CG	CP	EK	FL	L	SR	XC	CRC ¹⁾	Weight	Part No.	Type
[mm]	H14	h14	∅	±0.2					[g]		
32	14	34	10	22	13	10	318	2	90	174383	SNC-32
40	16	40	12	25	16	12	396	2	120	174384	SNC-40

Swivel flange SNCS

Material:
Die-cast aluminium

Free of copper and PTFE
RoHS-compliant



Dimensions and ordering data											
For size	CN	EP	EX	FL	LT	MS	XC	CRC ¹⁾	Weight	Part No.	Type
[mm]	∅	H7		±0.2					[g]		
32	10	10.5	14	22	13	15	318	2	85	174397	SNCS-32
40	12	12	16	25	16	17	396	2	125	174398	SNCS-40

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

Electric cylinders DNCE-LAS, with linear motor

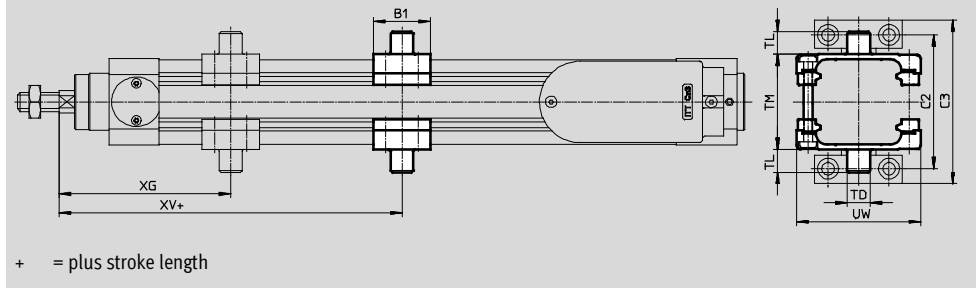
Accessories



Trunnion mounting kit ZNCM/DAMT

Material:
Galvanised steel

Free of copper and PTFE



+ = plus stroke length

- Note
The kit can be mounted axially anywhere on the cylinder barrel between the positions XG and XV+stroke.
The kit can only be mounted as shown in the drawing and not turned by 90°. The bolt on the top side must be removed for attachment.

Dimensions and ordering data									
For size	B1	C2	C3	TD	TL	TM	UW	XG	XV
[mm]				∅ e9					
32	30	71	86	12	12	50	65	90	80
40	32	87	105	16	16	63	75	100	150

For size	Max. tightening torque	CRC ¹⁾	Weight	Part No.	Type
[mm]	[Nm]		[g]		
32	4+1	2	224	2213233	DAMT-V1-32-A
40	8+1	2	396	163526	ZNCM-40

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

Ordering data – Mounting attachments				Technical data → Internet: clevis foot			
Designation	For size	Part No.	Type	Designation	For size	Part No.	Type
Clevis foot LSNG				Clevis foot LSNSG			
	32	31740	LSNG-32		32	31747	LSNSG-32
	40	31741	LSNG-40		40	31748	LSNSG-40
Clevis foot LBG				Right-angle clevis foot LQG			
	32	31761	LBG-32		32	31768	LQG-32
	40	31762	LBG-40		40	31769	LQG-40

Ordering data – Piston rod attachments				Technical data → Internet: piston rod attachments			
Designation	For size	Part No.	Type	Designation	For size	Part No.	Type
Rod eye SGS				Rod clevis SGA			
	32	9261	SGS-M10x1,25		32	32954	SGA-M10x1,25
	40	9262	SGS-M12x1,25		40	10767	SGA-M12x1,25