

Electric cylinders DNCE-LAS, with linear motor

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Electric cylinders DNCE-LAS, with linear motor

Key features

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At a glance

Characteristics

- 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
- Enables positioning with very high dynamic response. Accelerations of up to 125 m/s^2 are possible without load
- Mechanical interfaces are largely compatible with the standard cylinder DNC
- Together with the motor controller SFC-LACI and the associated cables, it is a quickly commissioned positioning system for small loads

Range of applications

- Positioning of small loads such as:
 - 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



CANopen

DeviceNet

Optional: Electric cylinder DNCE-LAS with clamping unit



The pneumatically actuated clamping unit can be used to hold loads in any stroke position and with the module installed in any position. Clamping in the end positions is not permitted. In the case of a pressure drop or pressure failure, the clamping unit acts like an EMERGENCY STOP device. The clamping unit can be released by means of the manual override.

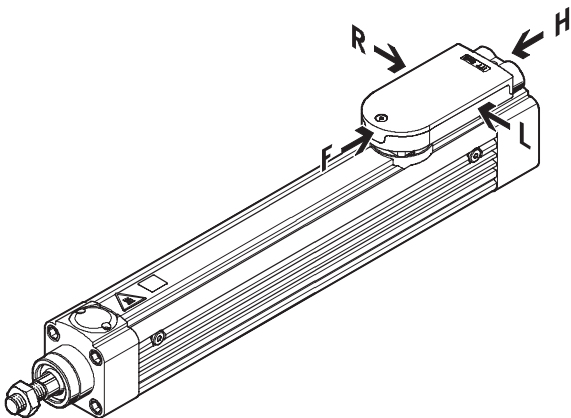
Electric cylinders DNCE-LAS, with linear motor

Type codes

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		DNCE	—	32	—	100	—	LAS	—	F	—	C	—	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													
Clamping unit														
C	Attached													
Protection class for electrics														
S1	IP65													

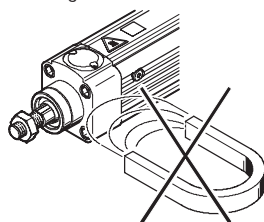
Cable outlet direction



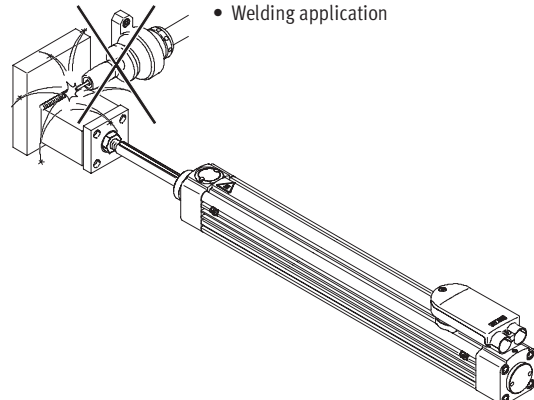
Instructions for use

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

- Magnetic field



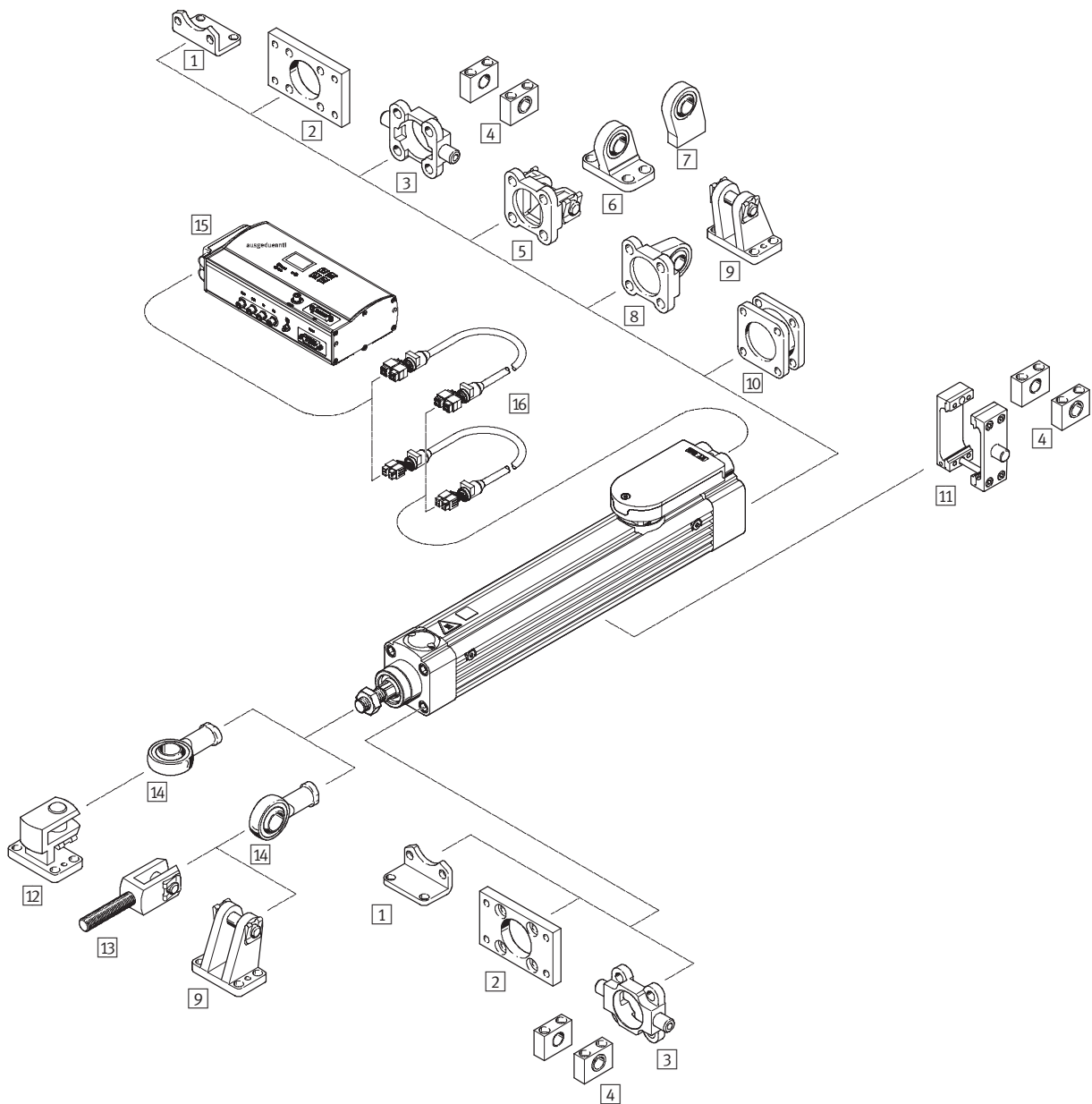
- Welding application



Electric cylinders DNCE-LAS, with linear motor

Peripherals overview

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Electric cylinders DNCE-LAS, with linear motor

Peripherals overview

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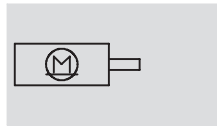
Mounting attachments and accessories		
	Brief description	→ Page/Internet
1 Foot mounting HNC/CRHNC	For bearing or end caps	17
2 Flange mounting FNC/CRFNG	For bearing or end caps	18
3 Trunnion flange ZNC/CRZNG	For bearing or end caps	19
4 Trunnion support LNZG/CRLNZG	For cylinders with trunnion mounting	20
5 Swivel flange SNC	For end caps	21
6 Clevis foot LSNG	With spherical bearing	22
7 Clevis foot LSNSG	Weld-on, with spherical bearing	22
8 Swivel flange SNCS	For end caps, with spherical bearing	21
9 Clevis foot LBG	With non-rotating pivot pin	22
10 Multi-position kit DPNC	For connecting two cylinders of the same size to form a multi-position cylinder	19
11 Trunnion mounting kit ZNCM	For mounting anywhere along the cylinder profile barrel	22
12 Right-angle clevis foot LQG	For rod eye SGS	22
13 Rod clevis SGA	For swivel attachment of cylinders	22
14 Rod eye SGS	With spherical bearing	22
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

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Function



-  Size
32, 40
-  Stroke length
100 ... 400 mm
-  www.festo.com



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).



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

Technical data – Clamping unit								
Size		32			40			
Stroke	[mm]	100	200	320	100	200	320	400
Design		Spring-loaded clamping profile						
Pneumatic connection		M5			G1/8			
Min. release pressure	[bar]	3						
Max. operating pressure		8						
Operating medium		Dried compressed air, lubricated or unlubricated.						
Max. static holding force		600			1,000			
Max. effective load (vertical operation)		1.5	1.5	1	1.5	1.5	1.5	1.5
Max. axial backlash with clamped piston rod without load	[mm]	0.5						

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Technical data

Operating and environmental conditions		
Ambient temperature ¹⁾	[°C]	0 ... +40
Max. motor temperature	[°C]	70 (warning at 70 °C, shut-off at 75 °C)
Standard temperature ²⁾	[°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 ³⁾		1

1) Note operating range of proximity sensors

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

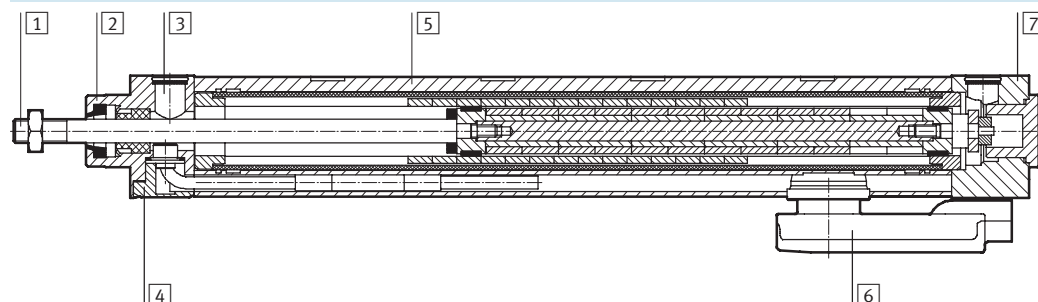
3) Corrosion resistance class 1 according to Festo standard 940 070

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



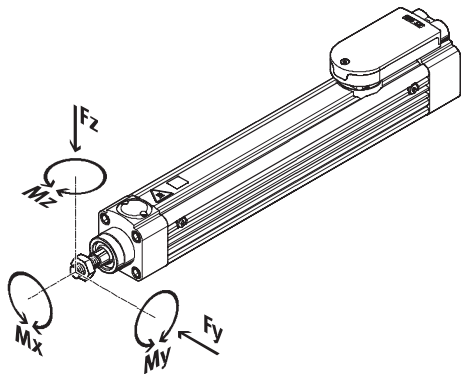
Electric cylinder		
1	Piston rod	High-alloy stainless steel
2	Bearing cap	Anodised wrought aluminium alloy
3	Filter disc	Sintered bronze
4	Distance piece	Anodised wrought aluminium alloy
5	Cylinder barrel	Anodised wrought aluminium alloy
6	Terminal strip	Die-cast zinc
7	End cap	Anodised wrought aluminium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

Electric cylinders DNCE-LAS, with linear motor

Technical data

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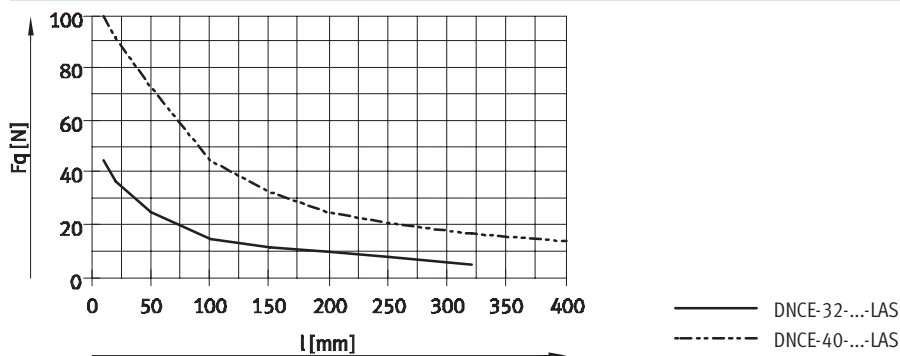
Maximum permissible loads on the piston rod



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

$$\frac{|F_x|}{F_{x\max.}} + \frac{|F_y|}{F_{y\max.}} + \frac{|F_z|}{F_{z\max.}} + \frac{|M_x|}{M_{x\max.}} + \frac{|M_y|}{M_{y\max.}} + \frac{|M_z|}{M_{z\max.}} \leq 1$$

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:

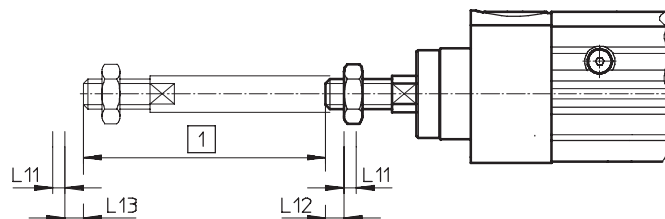
The recommended, available operating range

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



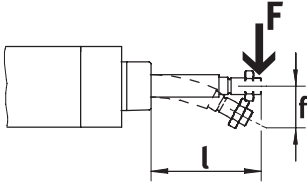
Size		Retracted		Advanced	
		L12	L11	L13	L11
32	[mm]	3.3	2	5.9	2
40	[mm]	3.1	2	3.7	2

Electric cylinders DNCE-LAS, with linear motor

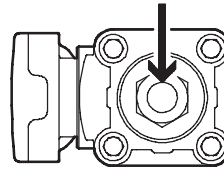
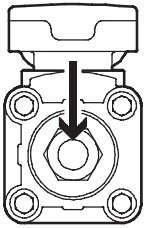
Technical data

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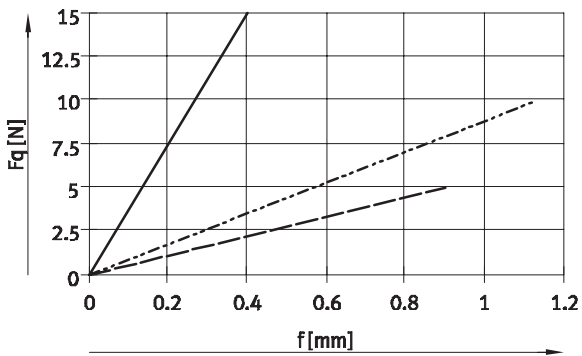
Piston rod displacement f , with fully advanced piston rod, as a function of lateral force F_q



Mounting position

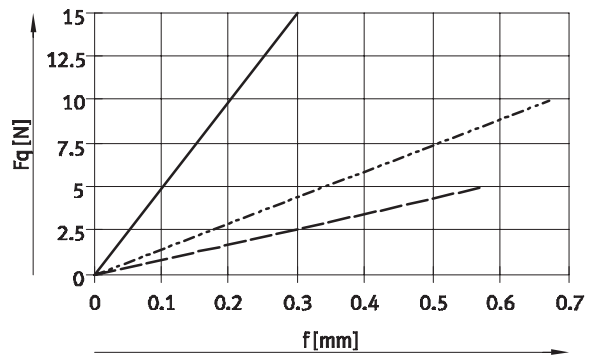


DNCE-32



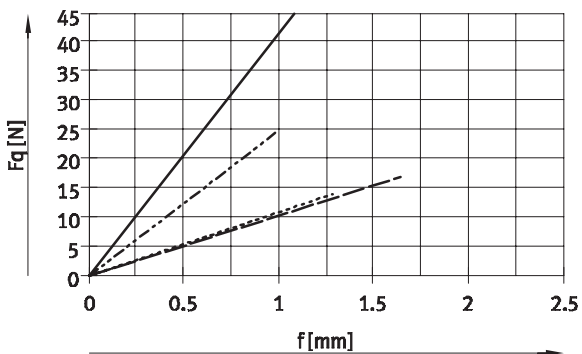
— DNCE-32-100-LAS
 - - - DNCE-32-200-LAS
 - · - DNCE-32-320-LAS

DNCE-32



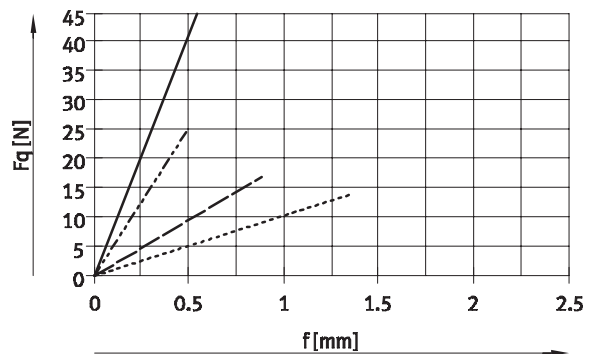
— DNCE-32-100-LAS
 - - - DNCE-32-200-LAS
 - · - DNCE-32-320-LAS

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

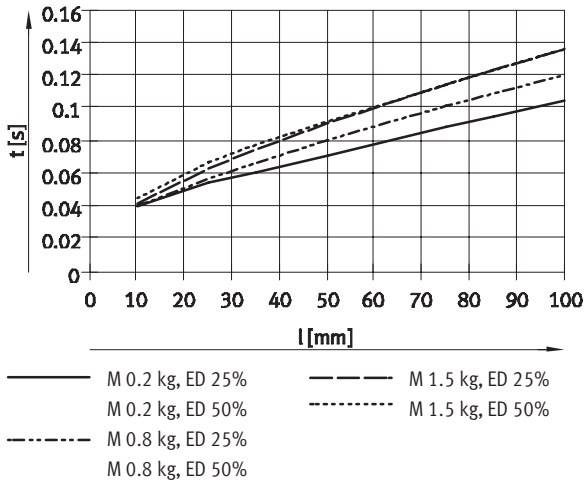
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Technical data

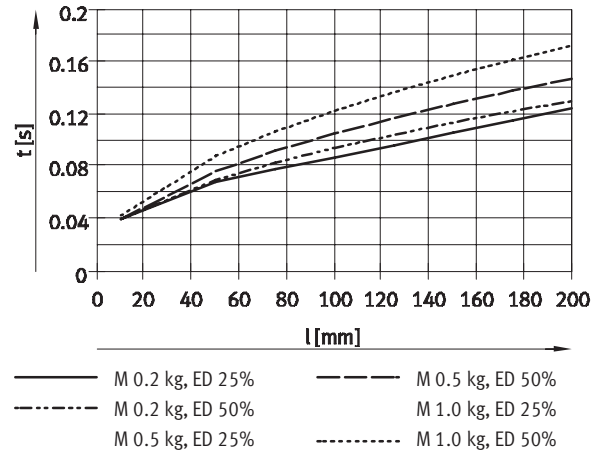
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Positioning time t as a function of stroke l , effective load M and duty cycle ED
For horizontal mounting position

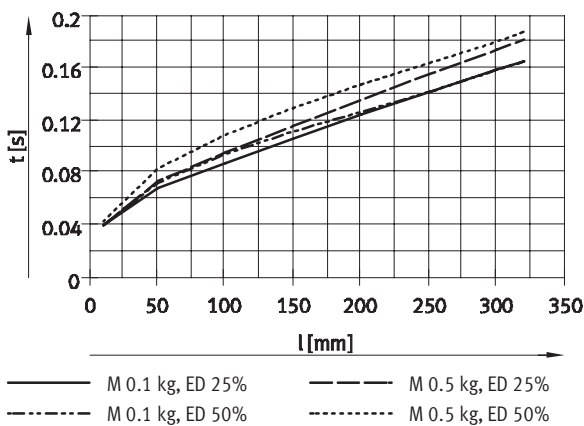
DNCE-32-100



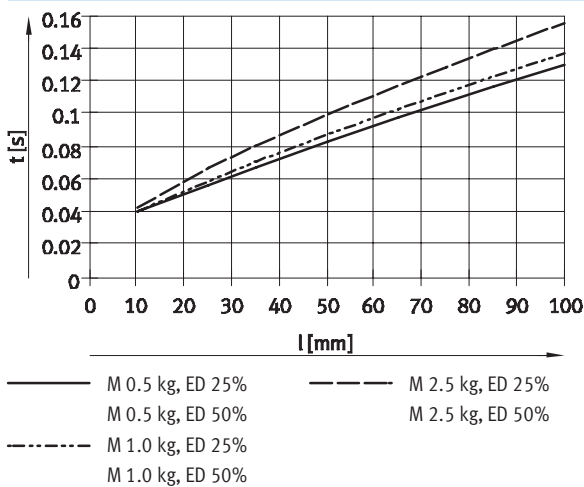
DNCE-32-200



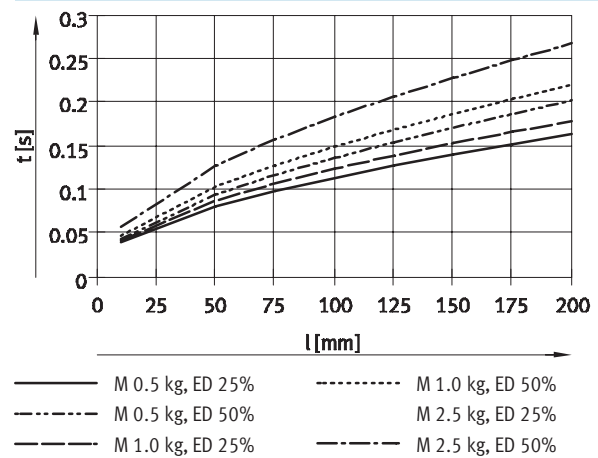
DNCE-32-320



DNCE-40-100



DNCE-40-200



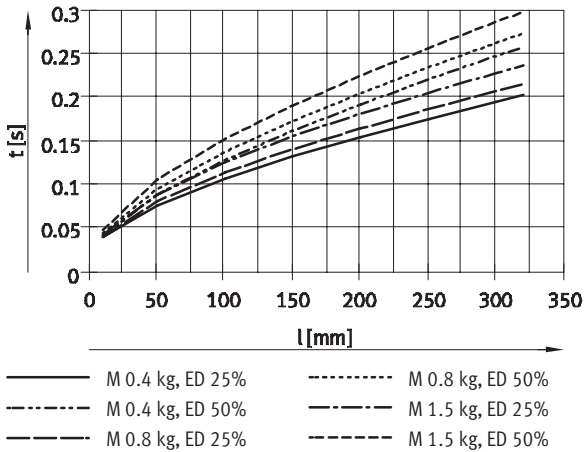
Electric cylinders DNCE-LAS, with linear motor

Technical data

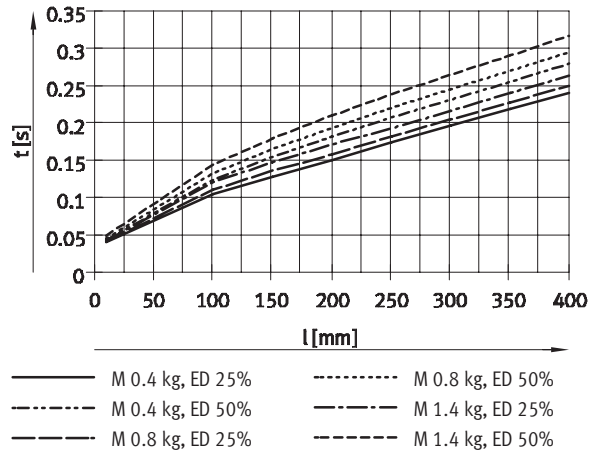
FESTO

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

DNCE-40-320



DNCE-40-400



Feed force F as a function of stroke l

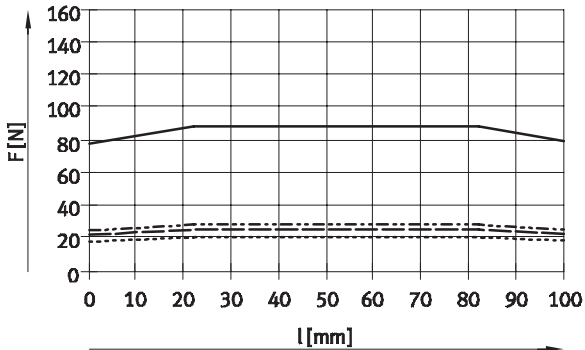
The graphs are based on practical values with friction taken into account.

Peak feed force

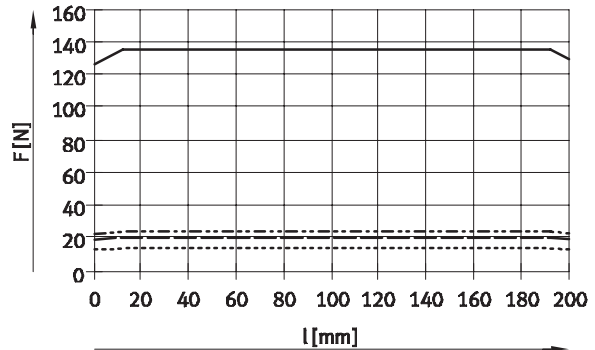
Continuous feed force at ambient temperature:

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

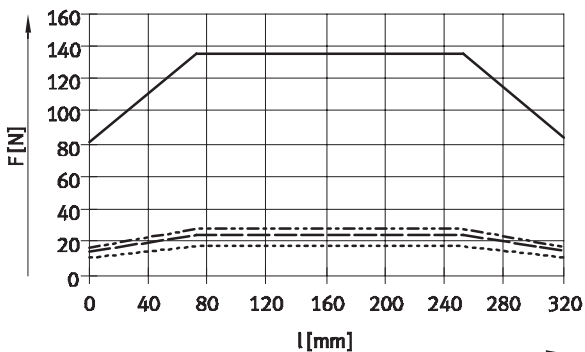
DNCE-32-100



DNCE-32-200



DNCE-32-320



Electric cylinders DNCE-LAS, with linear motor

Technical data

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Feed force F as a function of stroke l

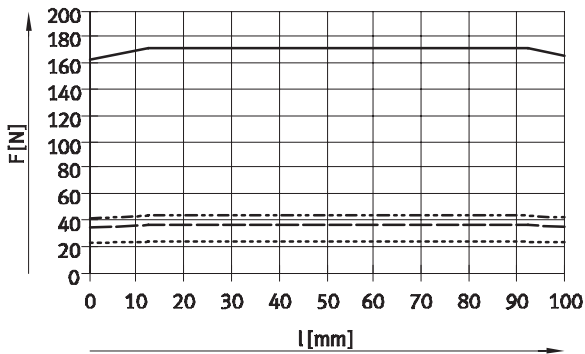
The graphs are based on practical values with friction taken into account.

Peak feed force

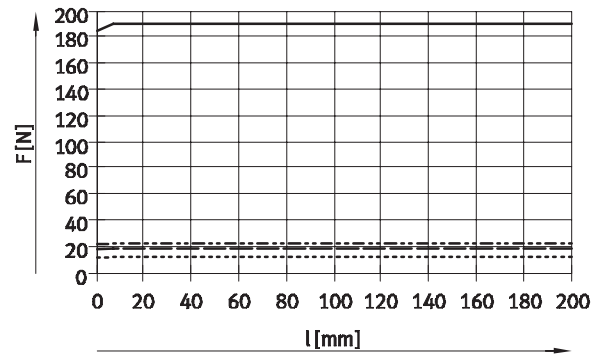
Continuous feed force at ambient temperature:

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

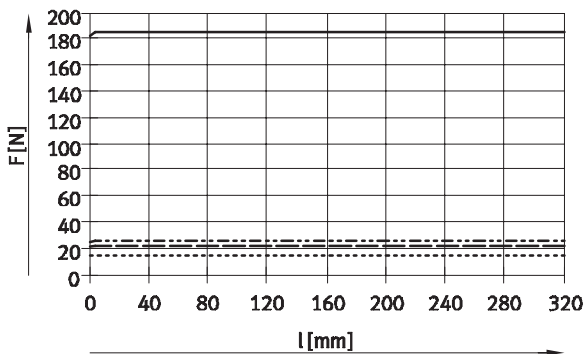
DNCE-40-100



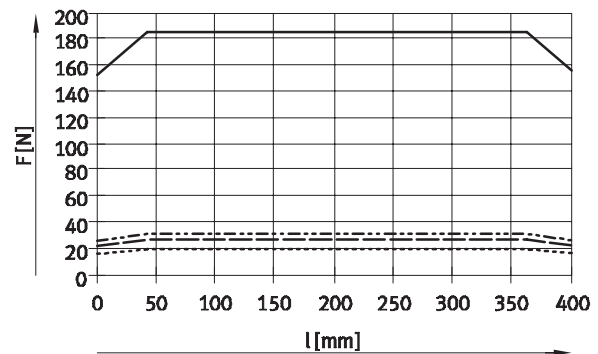
DNCE-40-200



DNCE-40-320



DNCE-40-400



Electric cylinders DNCE-LAS, with linear motor

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Technical data

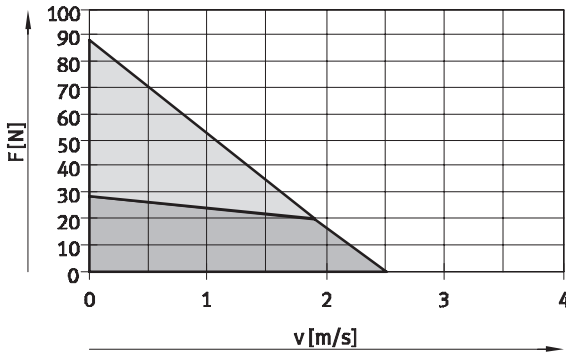
Feed force F as a function of speed v

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

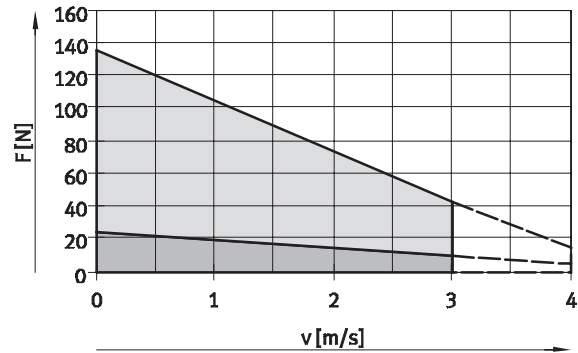
- Stroke centre of the electric cylinder
- Friction taken into account
- Standard temperature of 23 °C
- Max. motor temperature of 70 °C

-  Peak feed force
-  Continuous feed force
-  Non-permissible range

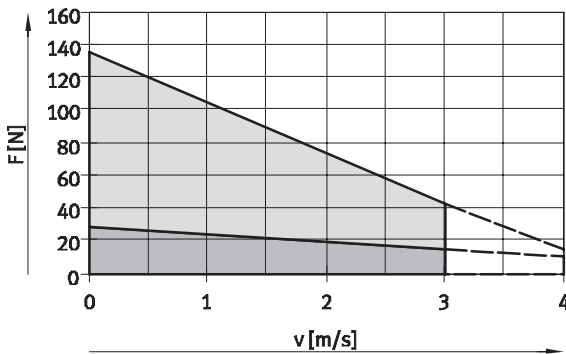
DNCE-32-100



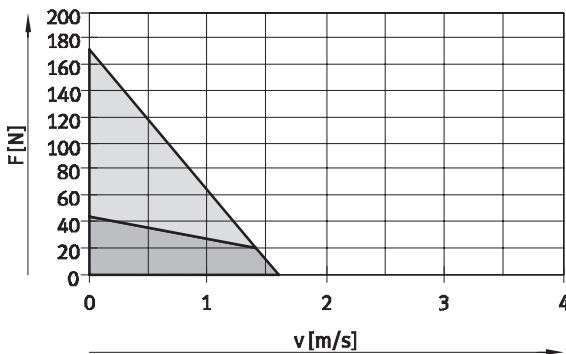
DNCE-32-200



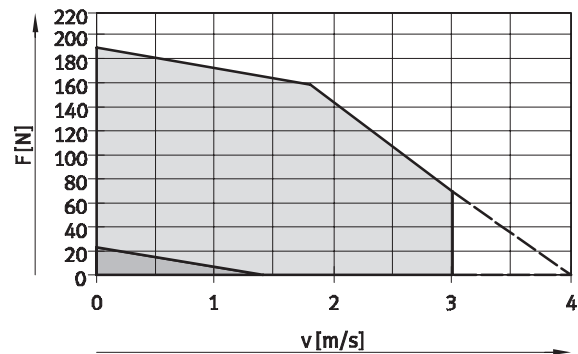
DNCE-32-320



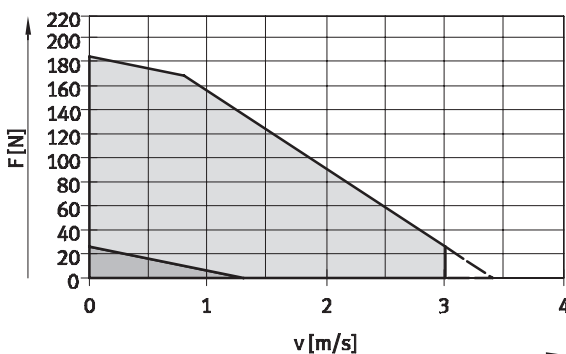
DNCE-40-100



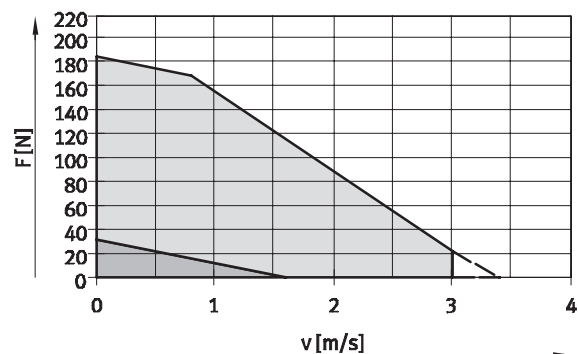
DNCE-40-200



DNCE-40-320



DNCE-40-400



Electric cylinders DNCE-LAS, with linear motor

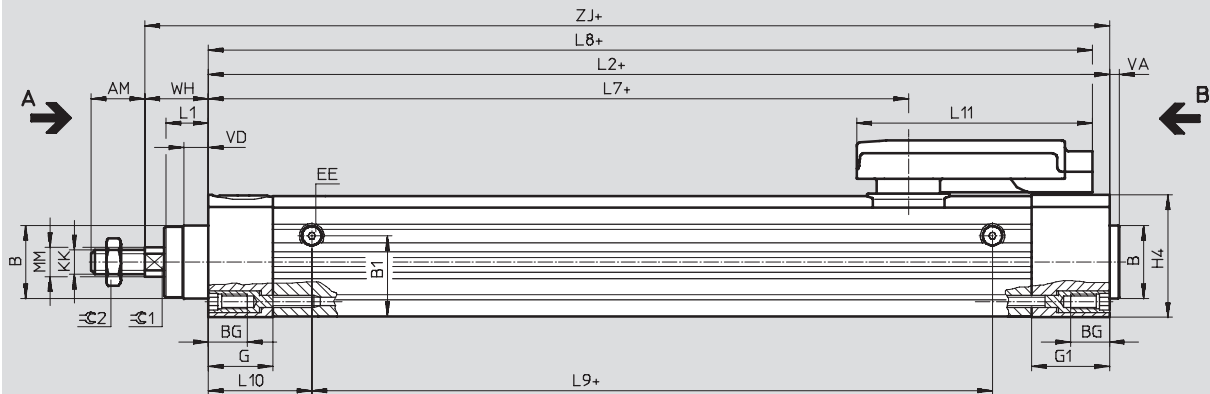
Technical data

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Dimensions

Download CAD data → www.festo.com

DNCE-...



Size	AM	B Ø d11	B1	B2	B3	BG	D1 Ø	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 Ø	RT	TG	VA	VD	WH	ZJ	∅1	∅2	∅3
32	96.8	12	M6	32.5	4	10	26	296	10	17	6
40	96.8	16	M6	38	4	10.3	30	371	13	19	6

Electric cylinders DNCE-LAS, with linear motor

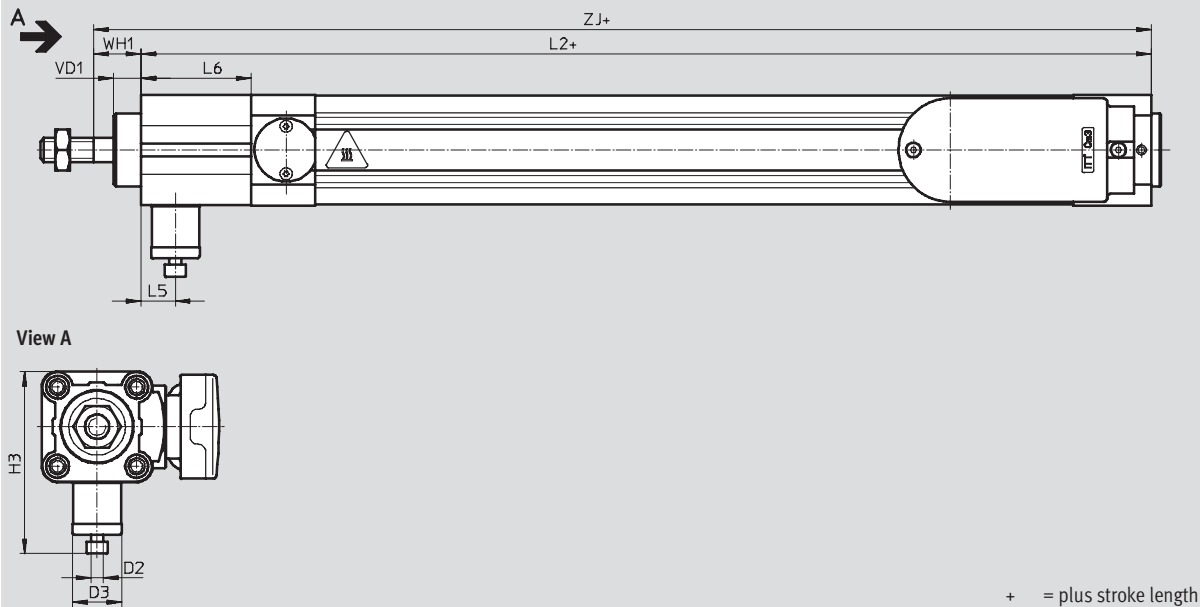
Technical data

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Dimensions

Download CAD data → www.festo.com

DNCE-...C – With clamping unit



Size	D2	D3 Ø	H3	L2	L5	L6	VD1	WH1	ZJ
32	M5	20	67.3	315	14	45	11.5	19.5	334.5
40	G1/8	24	88	394	16	53	11.5	20	414

Electric cylinders DNCE-LAS, with linear motor

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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] Clamping unit	Attached			-C	
Protection class for electrics	IP65			-S1	

Transfer order code

Electric cylinders DNCE-LAS, with linear motor

Accessories

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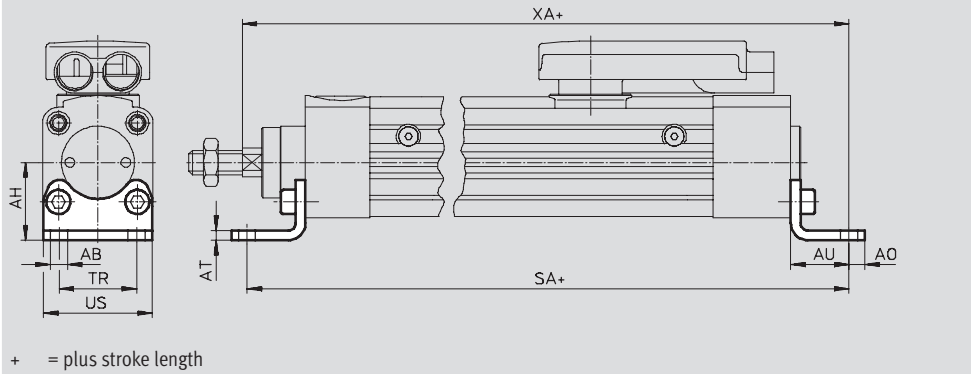
Foot mounting HNC/CRHNC

Material:

HNC: Galvanised steel

CRHNC: High-alloy steel

Free of copper, PTFE and silicone



Dimensions and ordering data											
For size	AB Ø	AH	AO	AT	AU	SA		TR	US	XA	
[mm]							-C				-C
32	7	32	6.5	4	24	318	363	32	45	320	358.5
40	10	36	9	4	28	397	450	36	54	399	442

For size [mm]	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
32	2	135	174369	HNC-32	4	135	176937	CRHNC-32
40	2	180	17470	HNC-40	4	180	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

FESTO

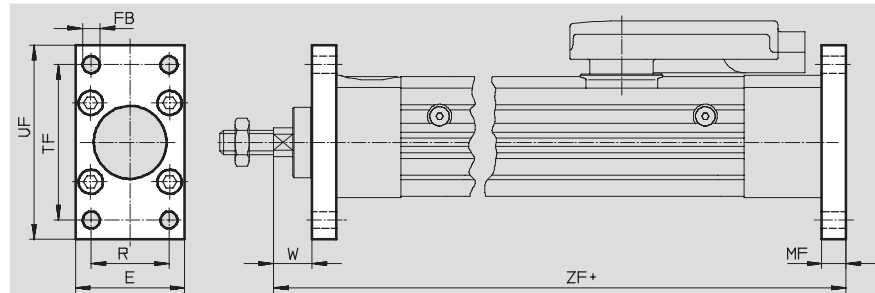
Flange mounting FNC/CRFNG

Material:

FNC: Galvanised steel

CRFNG: High-alloy steel

Free of copper, PTFE and silicone



+ = plus stroke length

Dimensions and ordering data										
For size	E	FB	MF	R	TF	UF	W		ZF	
[mm]		Ø H13						-C		-C
32	45	7	10	32	64	80	16	9.5	306	344.5
40	54	9	10	36	72	90	20	10	381	424

For size	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
[mm]								
32	2	240	174376	FNC-32	4	240	161846	CRFNG-32
40	2	280	174377	FNC-40	4	300	161847	CRFNG-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

Trunnion flange ZNCF/CRZNG

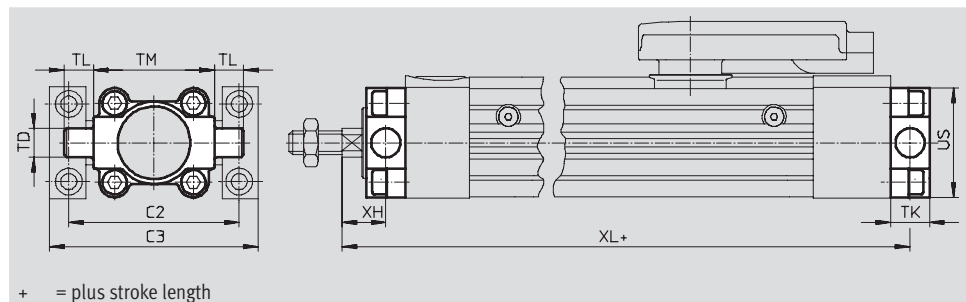
Material:

ZNCF: Stainless steel casting

CRZNG: Electropolished special steel

casting

Free of copper, PTFE and silicone



Dimensions and ordering data

For size	C2	C3	TD Ø e9	TK	TL	TM	US	XH		XL	
[mm]									-C		-C
32	71	86	12	16	12	50	45	18	11.5	304	342.5
40	87	105	16	20	16	63	54	20	10	381	424

For size [mm]	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
32	2	130	174411	ZNCF-32	4	150	161852	CRZNG-32
40	2	240	174412	ZNCF-40	4	260	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

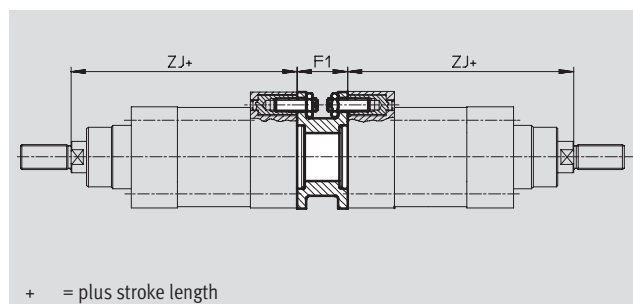
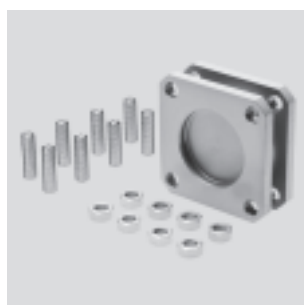
Multi-position kit DPNC

Material:

Flange: Wrought aluminium alloy

Threaded studs, hex nuts:

Galvanised steel



Dimensions and ordering data

For size [mm]	F1	ZJ		Weight [g]	Part No.	Type
			-C			
32	27	296	334.5	85	174418	DPNC-32
40	27	371	414	115	174419	DPNC-40

Electric cylinders DNCE-LAS, with linear motor

Accessories

FESTO

Trunnion support LN2G

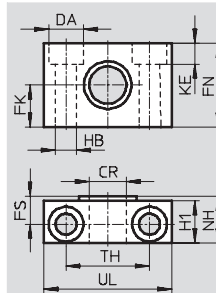
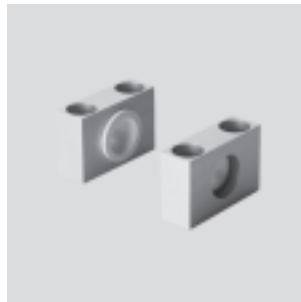
Material:

Trunnion support:

Anodised aluminium

Plain bearing: Plastic

Free of copper, PTFE and silicone



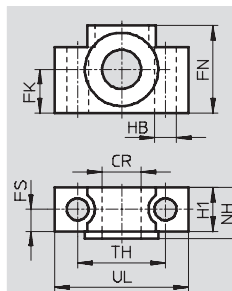
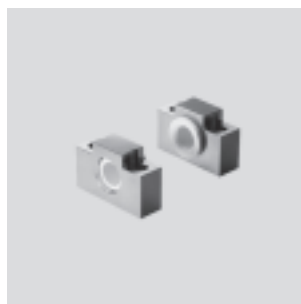
Dimensions and ordering data															
For size	CR	DA	FK	FN	FS	H1	HB	KE	NH	TH	UL	CRC ¹⁾	Weight	Part No.	Type
	Ø	Ø	Ø				Ø								
[mm]	D11	H13	±0.1				H13				±0.2		[g]		
32	12	11	15	30	10.5	15	6.6	6.8	18	32	46	2	125	32959	LNZG-32
40	16	15	18	36	12	18	9	9	21	36	55	2	400	32960	LNZG-40/50

Trunnion support CRLN2G

Material:

High-alloy steel

Free of copper, PTFE and silicone



Dimensions and ordering data													
For size	CR	FK	FN	FS	H1	HB	NH	TH	UL	CRC ¹⁾	Weight	Part No.	Type
[mm]	Ø	Ø				Ø							
	D11	±0.1				H13		±0.2			[g]		
32	12	15	30	10.5	15	6.6	18	32	46	4	200	161874	CRLNZG-32
40	16	18	36	12	18	9	21	36	55	4	330	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

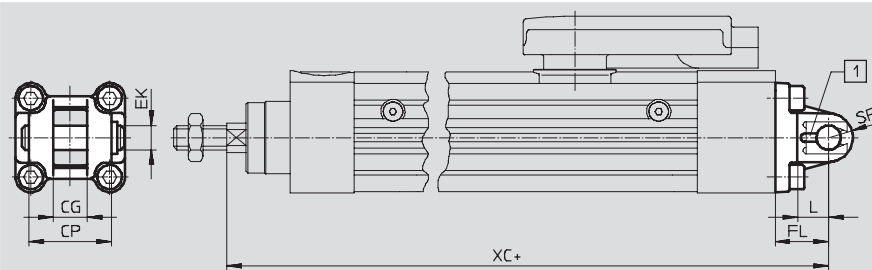
Swivel flange SNC



Material:

Die-cast aluminium

Free of copper, PTFE and silicone

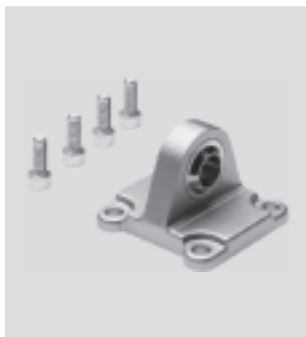


- 1 The king pin is protected against rotation with a dowel pin
+ = plus stroke length

Dimensions and ordering data

For size	CG	CP	EK	FL	L	SR	XC		CRC ¹⁾	Weight	Part No.	Type
[mm]	H14	h14	∅	±0.2				-C		[g]		
32	14	34	10	22	13	10	318	356.5	2	90	174383	SNC-32
40	16	40	12	25	16	12	396	439	2	120	174384	SNC-40

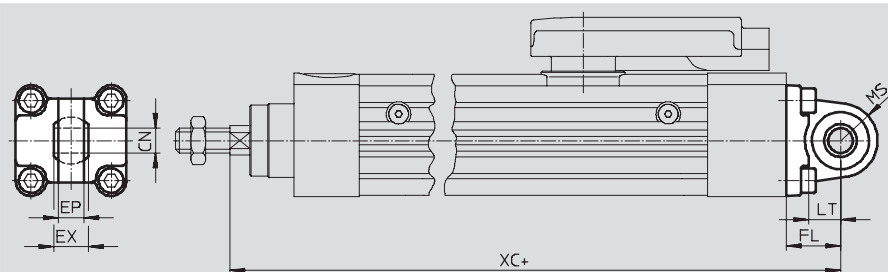
Swivel flange SNCS



Material:

Die-cast aluminium

Free of copper, PTFE and silicone



- + = plus stroke length

Dimensions and ordering data

For size	CN	EP	EX	FL	LT	MS	XC		CRC ¹⁾	Weight	Part No.	Type
[mm]	∅ H7	+0.2		±0.2				-C		[g]		
32	10	10.5	14	22	13	15	318	356.5	2	85	174397	SNCS-32
40	12	12	16	25	16	17	396	439	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

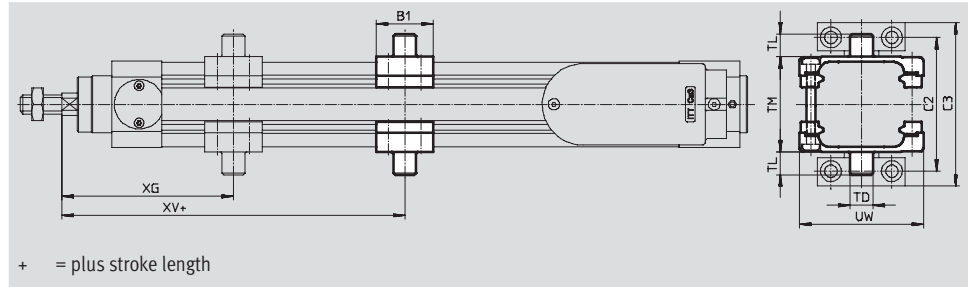
Electric cylinders DNCE-LAS, with linear motor

Accessories

FESTO

Trunnion mounting kit ZNCM

Material:
Tempered steel



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

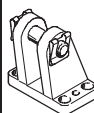
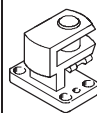
For size	B1	C2	C3	TD Ø e9	TL	TM	UW	XG	XV
[mm]									
32	30	71	86	12	12	50	65	90	80
40	32	87	105	16	16	63	75	100	150

For size	Max. tightening torque	CRC ¹⁾	Weight	Part No.	Type
[mm]	[Nm]		[g]		
32	4+1	2	210	163525	ZNCM-32
40	8+1	2	385	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

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

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