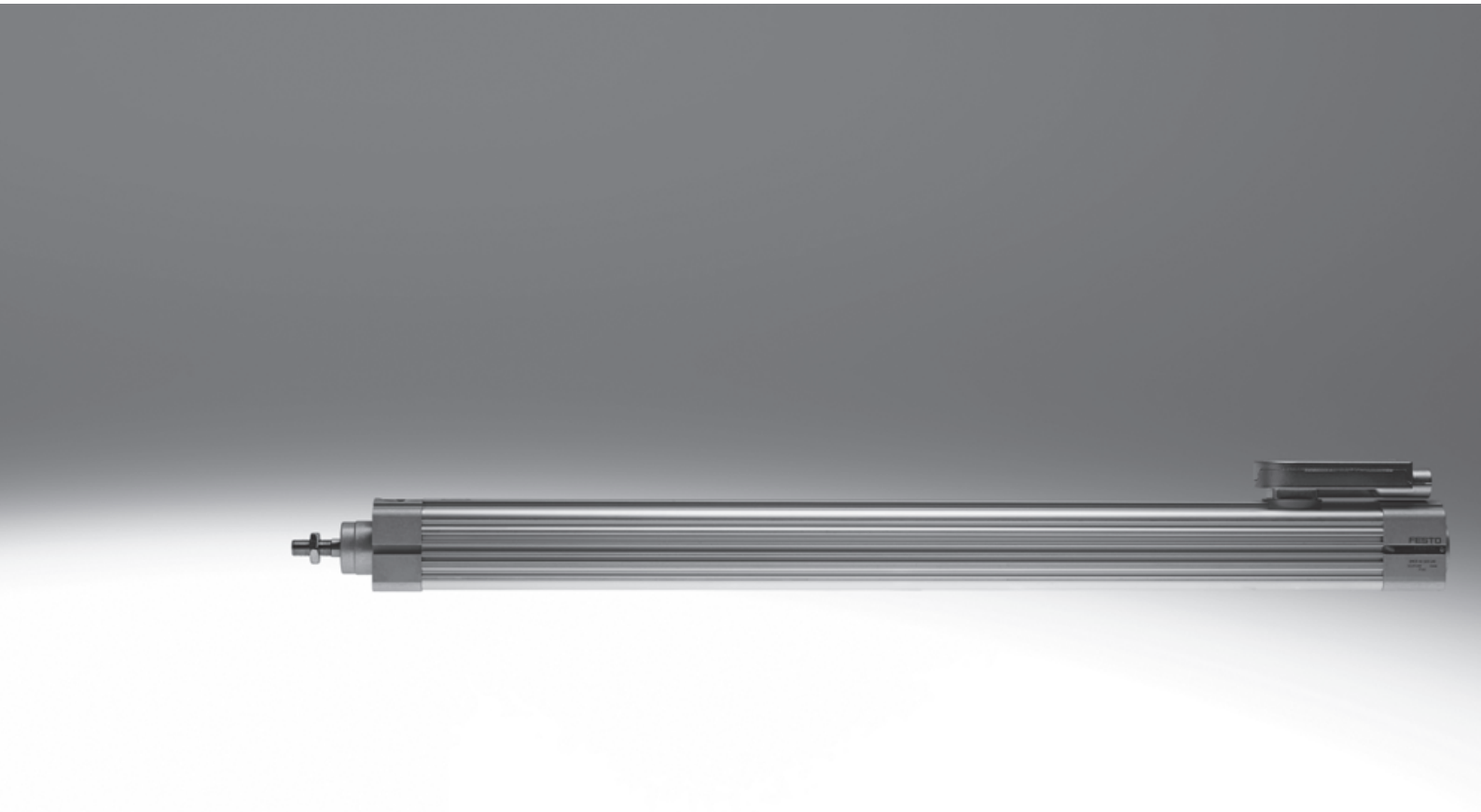
Electric cylinders DNCE-LAS, with linear motor

FESTO



Electric cylinders DNCE-LAS, with linear motor

Key features

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

PROFIBUS®, DeviceNet®, CANopen® is a registered trademark of its respective trademark holder in certain countries.

Electric cylinders DNCE-LAS, with linear motor

Type codes

DNCE	–	32	–	100	–	LAS	–	F	–	S1

Type	
DNCE	Electric cylinder

Size

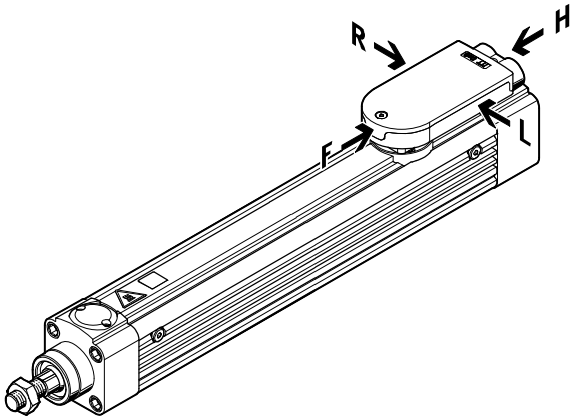
Stroke [mm]

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

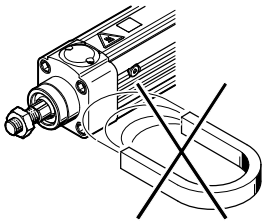
Cable outlet direction



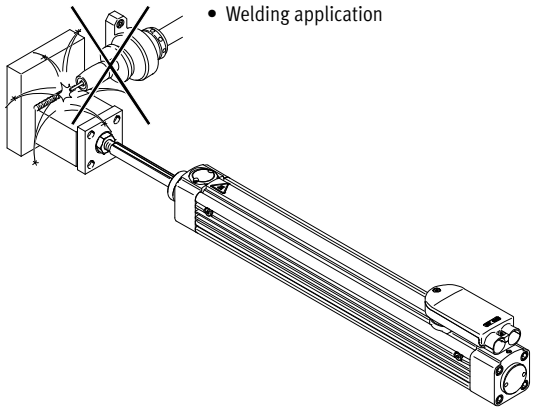
Instructions for use

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

- Magnetic field

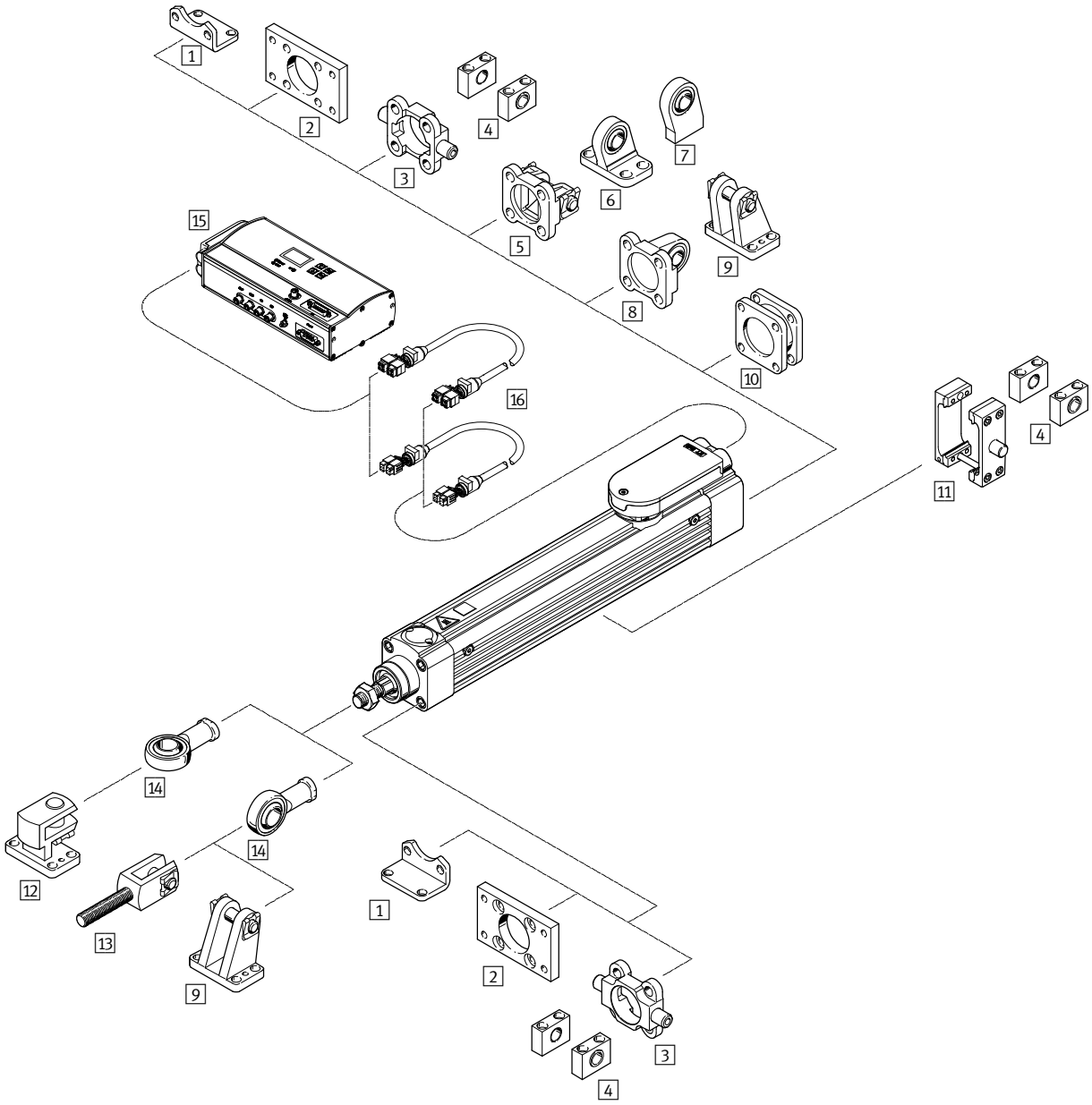


- Welding application



Electric cylinders DNCE-LAS, with linear motor

Peripherals overview



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 ZNCF/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	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

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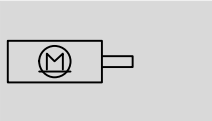
Function

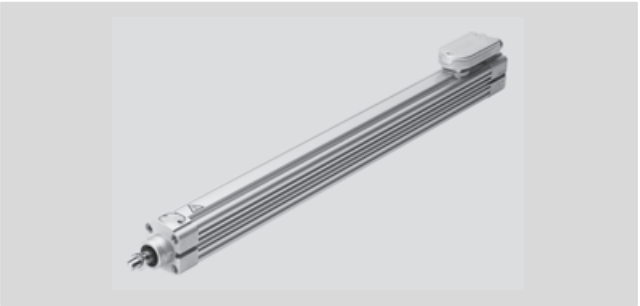


-N- Size
32, 40
-T- Stroke length
100 ... 400 mm

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).

www.festo.com/en/Spare_parts_service



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

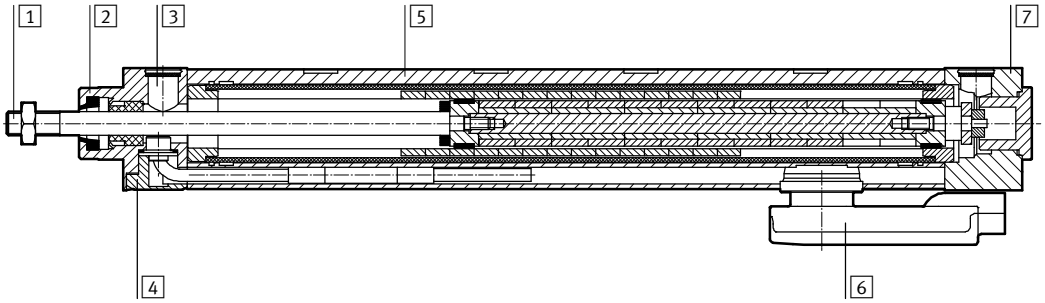
Operating and environmental conditions		
Ambient temperature	[°C]	0 ... +40
Max. motor temperature	[°C]	70 (warning at 70 °C, shut-off at 75 °C)
Standard temperature[1)]	[°C]	23
Temperature monitoring		Shuts off if motor overheats
Protection class (mechanical system)		IP40
Protection class (electrical 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

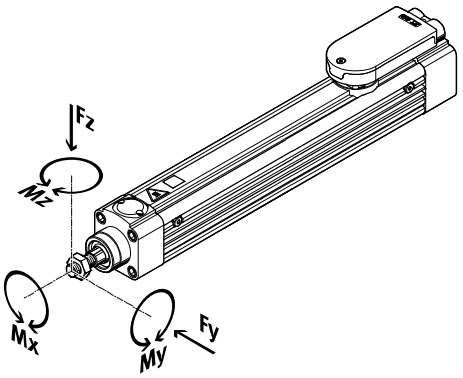
Materials

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

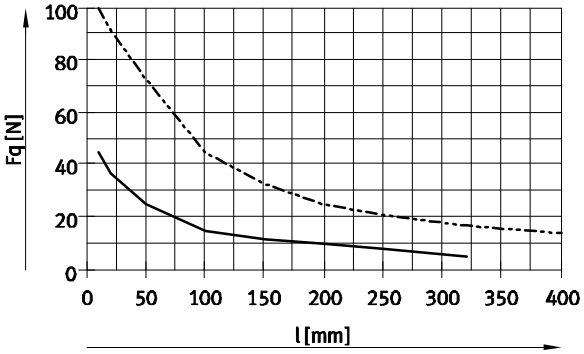
Maximum permissible loads on the piston rod



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

$$\frac{|Fy|}{Fy_{max.}} + \frac{|Fz|}{Fz_{max.}} + \frac{|My|}{My_{max.}} + \frac{|Mz|}{Mz_{max.}} \leq 1$$

Maximum permissible lateral forces Fy_{max} and Fz_{max} as a function of stroke l (limited by the plain bearing)



Maximum permissible forces and torques

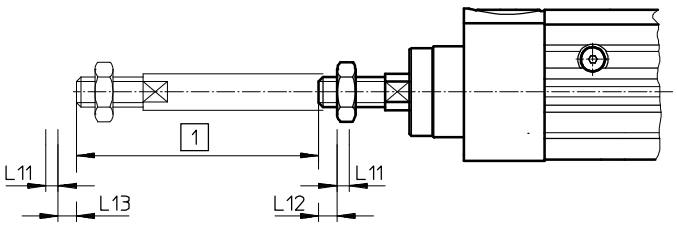
Size		32	40
Mx_{max}	[Nm]	No torques are permitted	
My_{max}, Mz_{max}	[Nm]	2	5

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

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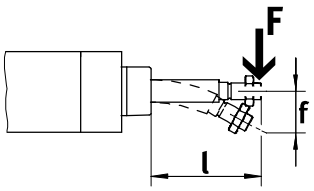
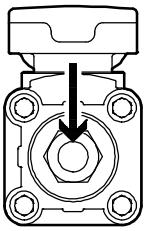
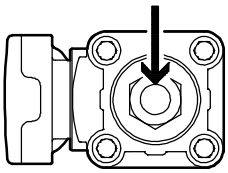
Technical data

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

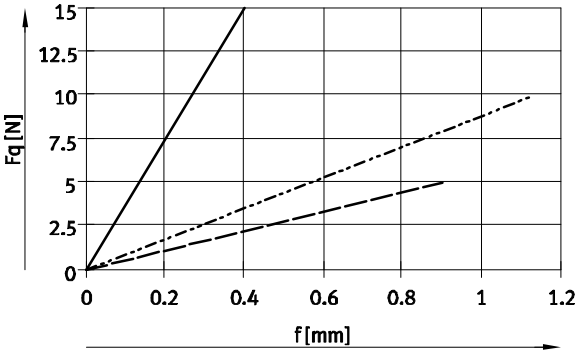


Mounting position



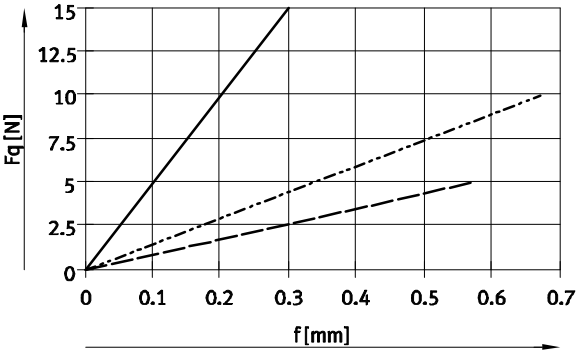


DNCE-32



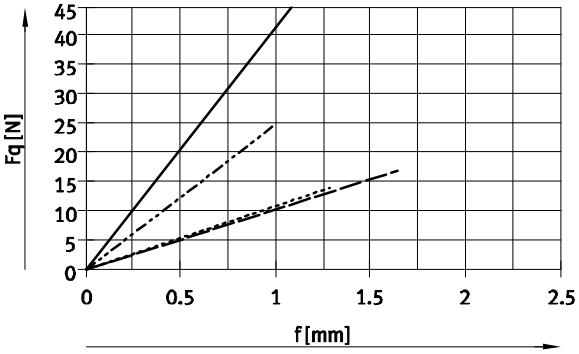
DNCE-32-100-LAS
DNCE-32-200-LAS
DNCE-32-320-LAS

DNCE-32



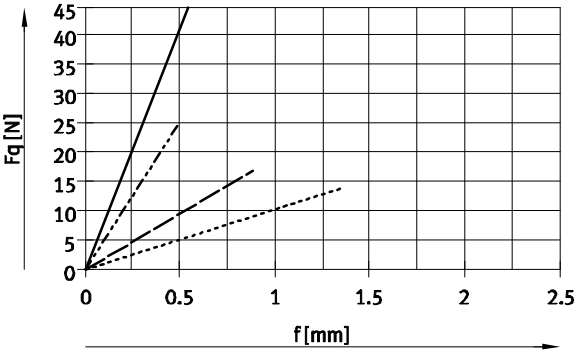
DNCE-32-100-LAS
DNCE-32-200-LAS
DNCE-32-320-LAS

DNCE-40



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

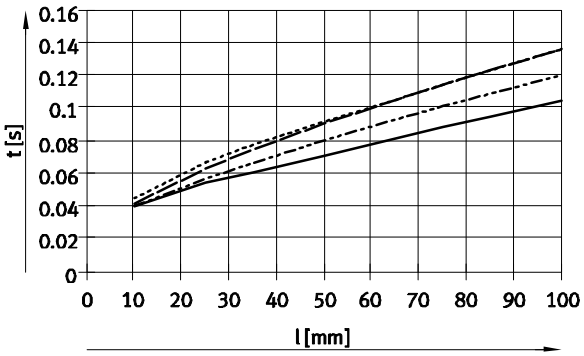
DNCE-40



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

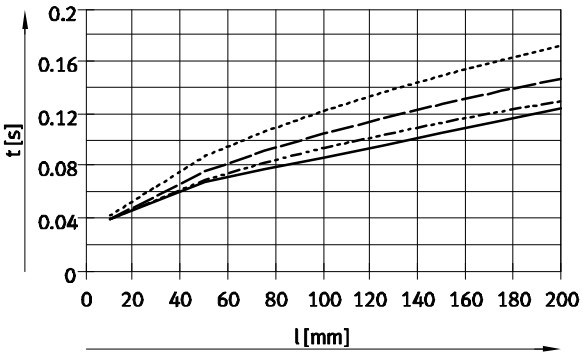
Positioning time t as a function of stroke l, effective load M and duty cycle ED
For horizontal mounting position

DNCE-32-100



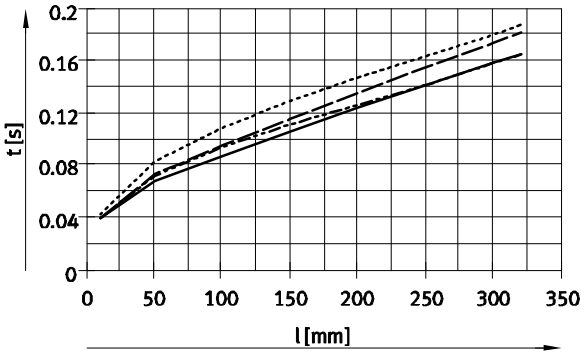
M 0.2 kg, ED 25%
M 0.2 kg, ED 50%
M 0.8 kg, ED 25%
M 0.8 kg, ED 50%
M 1.5 kg, ED 25%
M 1.5 kg, ED 50%

DNCE-32-200



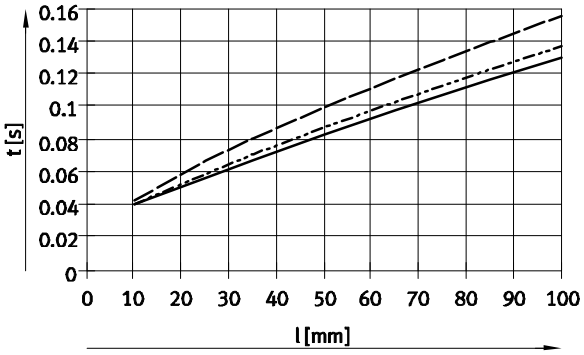
M 0.2 kg, ED 25%
M 0.2 kg, ED 50%
M 0.5 kg, ED 25%
M 0.5 kg, ED 50%
M 1.0 kg, ED 25%
M 1.0 kg, ED 50%

DNCE-32-320



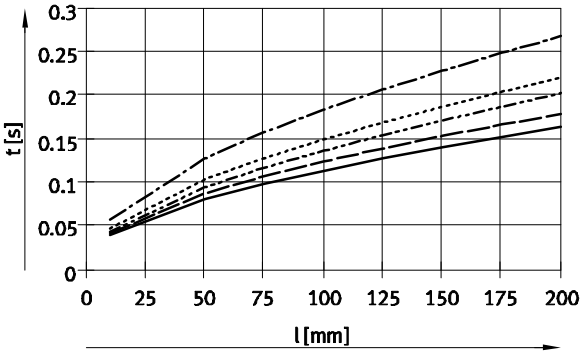
M 0.1 kg, ED 25%
M 0.1 kg, ED 50%
M 0.5 kg, ED 25%
M 0.5 kg, ED 50%

DNCE-40-100



M 0.5 kg, ED 25%
M 0.5 kg, ED 50%
M 1.0 kg, ED 25%
M 1.0 kg, ED 50%
M 2.5 kg, ED 25%
M 2.5 kg, ED 50%

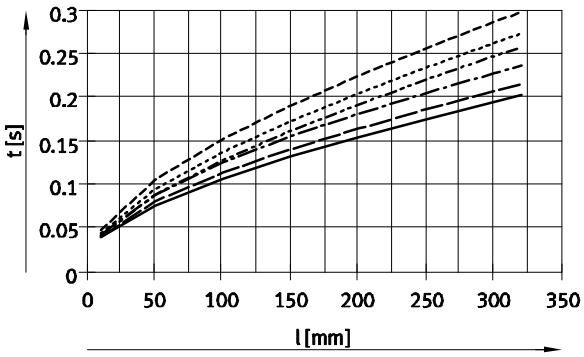
DNCE-40-200



M 0.5 kg, ED 25%
M 0.5 kg, ED 50%
M 1.0 kg, ED 25%
M 1.0 kg, ED 50%
M 2.5 kg, ED 25%
M 2.5 kg, ED 50%

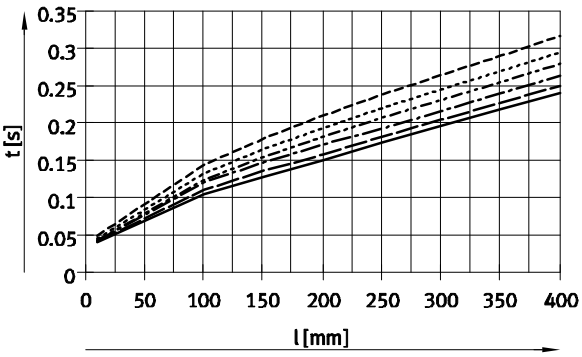
Positioning time t as a function of stroke l, effective load M and duty cycle ED
For horizontal mounting position

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 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 1.4 kg, ED 25%
M 1.4 kg, ED 50%

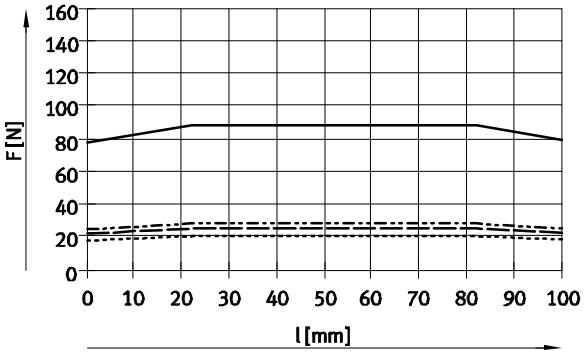
Feed force F as a function of stroke l

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

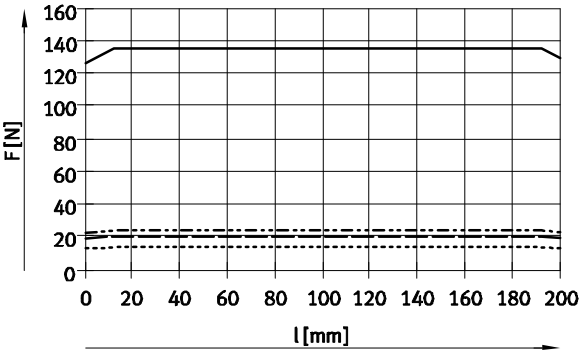
Peak feed force

Continuous feed force at ambient temperature:
- from 23 °C
- from 30 °C
- from 40 °C

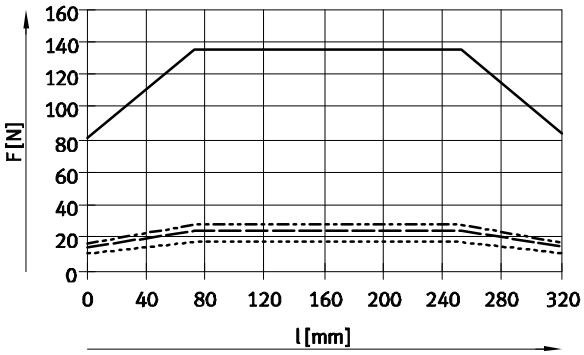
DNCE-32-100



DNCE-32-200



DNCE-32-320



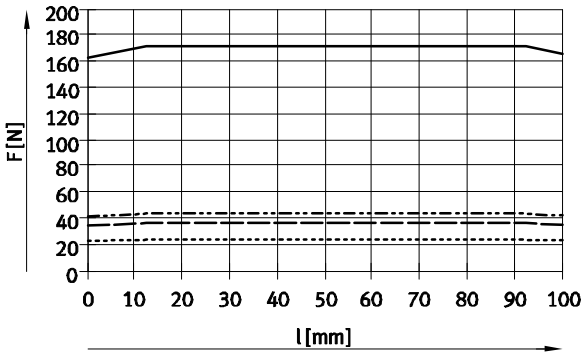
Feed force F as a function of stroke l

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

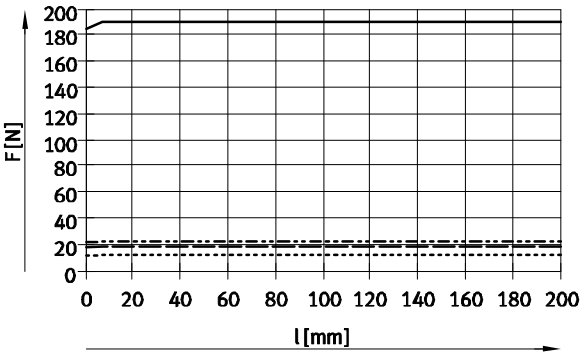
Peak feed force

Continuous feed force at ambient temperature:
- from 23 °C
- from 30 °C
- from 40 °C

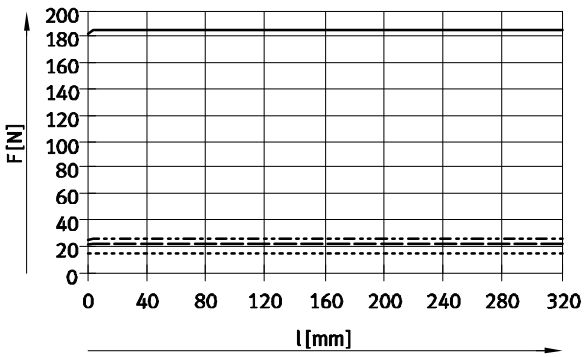
DNCE-40-100



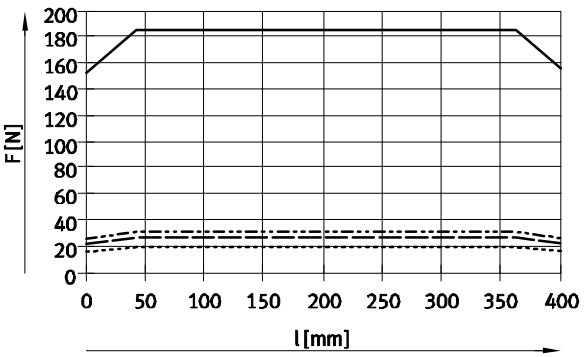
DNCE-40-200



DNCE-40-320



DNCE-40-400

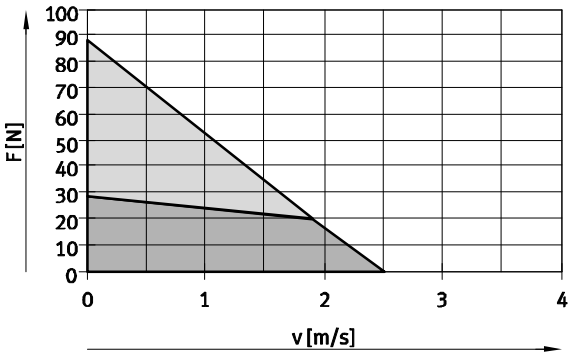


Feed force F as a function of speed v

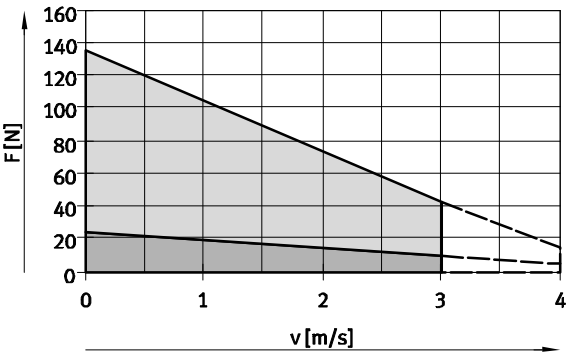
The graphs are based on practical values under the following conditions:
- Stroke centre of the electric cylinder
- Friction taken into account
- Standard temperature of 23 °C
- Max. motor temperature of 70 °C

Peak feed force
Continuous feed force
Non-permissible range

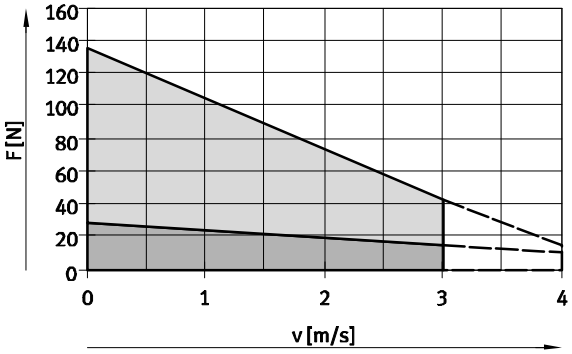
DNCE-32-100



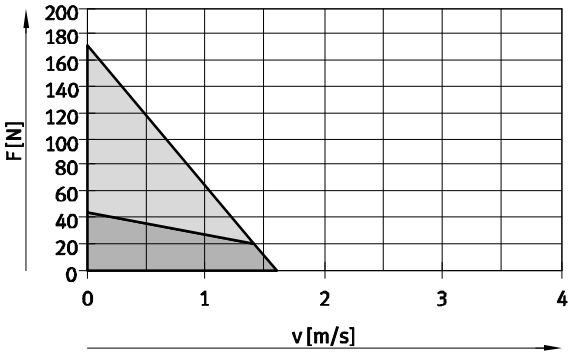
DNCE-32-200



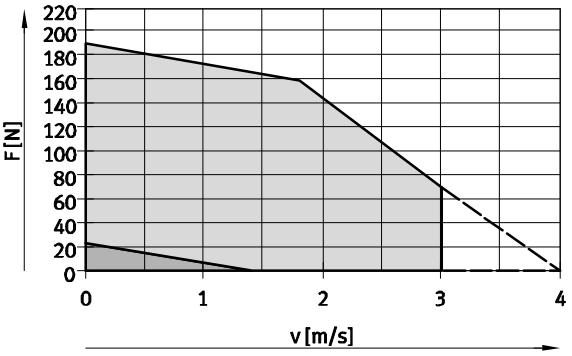
DNCE-32-320



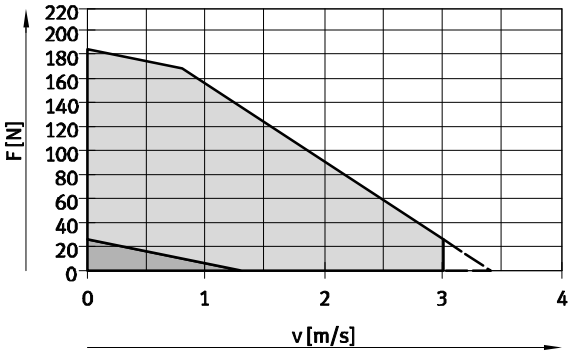
DNCE-40-100



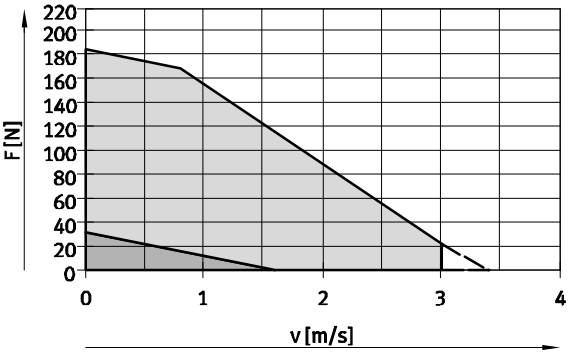
DNCE-40-200



DNCE-40-320

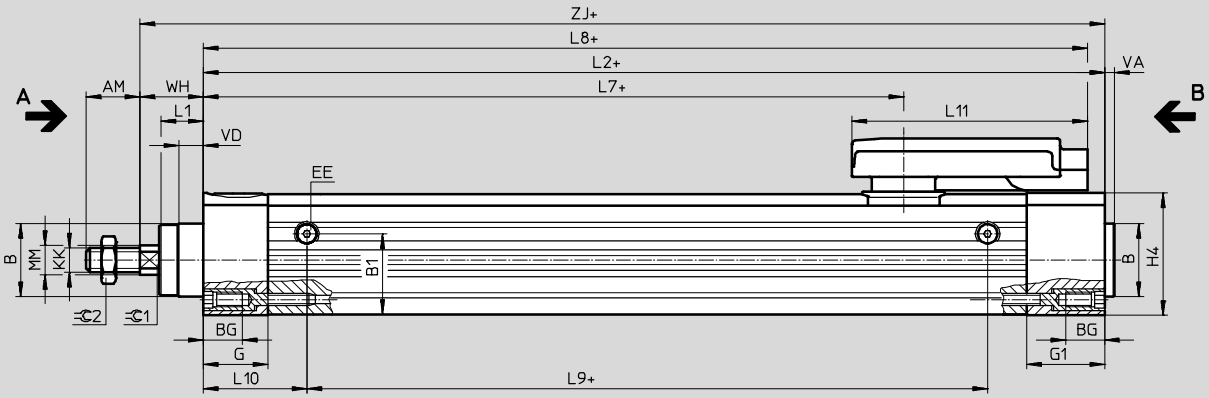


DNCE-40-400

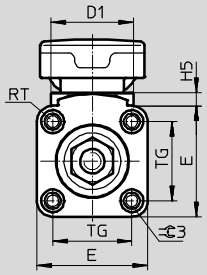


Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

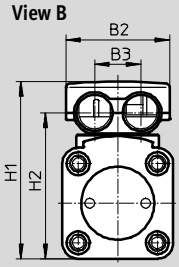
DNCE-...



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

FESTO

Ordering table							
Size		32	40	Conditions	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**		

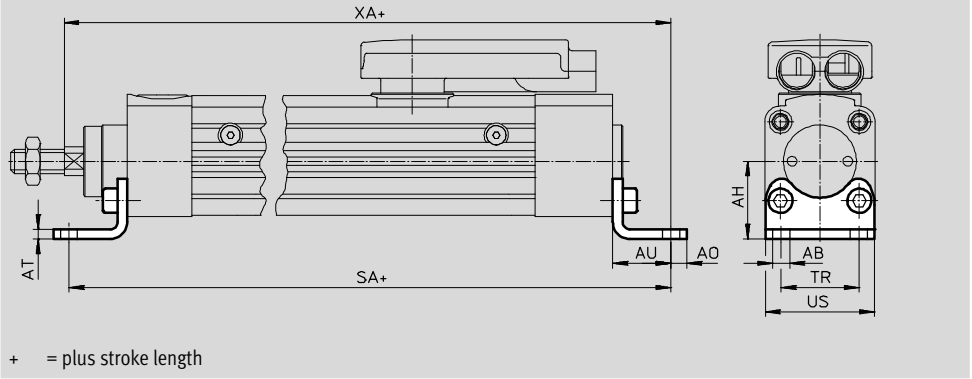
Transfer order code

	DNCE	–		–		–	L	AS	–		–	

Foot mounting HNC/CRHNC

Material:
HNC: Galvanised steel
CRHNC: High-alloy steel

Free of copper and PTFE



\+ = plus stroke length

Dimensions and ordering data

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

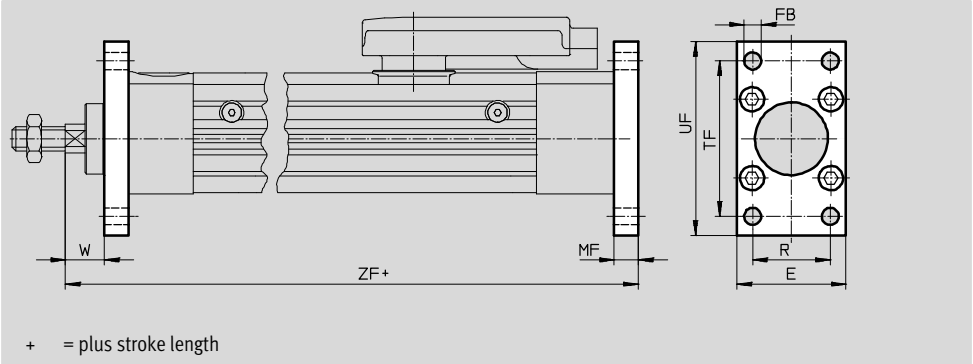
For size [mm]	Basic version				High corrosion protection			
	CRC[1)]	Weight [g]	Part No.	Type	CRC[1)]	Weight [g]	Part No.	Type
32	2	144	**174369**	**HNC-32**	4	139	**176937**	**CRHNC-32**
40	2	193	**174370**	**HNC-40**	4	188	**176938**	**CRHNC-40**

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

Flange mounting FNC/CRFNG

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

Free of copper and PTFE
RoHS-compliant



\+ = plus stroke length

Dimensions and ordering data

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

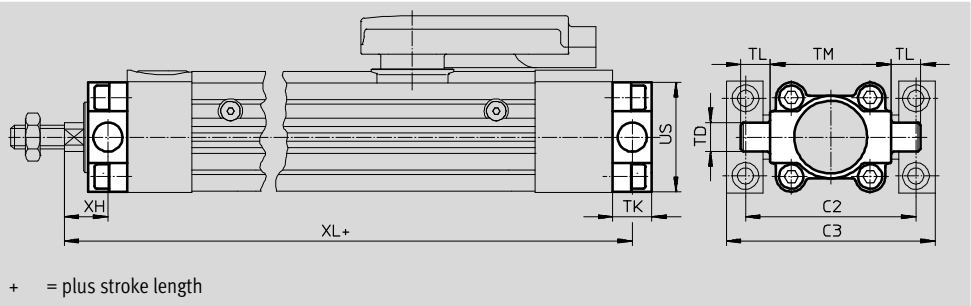
For size	Basic version				High corrosion protection			
[mm]	CRC[1)]	Weight [g]	Part No.	Type	CRC[1)]	Weight [g]	Part No.	Type
32	1	221	**174376**	**FNC-32**	4	225	**161846**	**CRFNG-32**
40	1	291	**174377**	**FNC-40**	4	300	**161847**	**CRFNG-40**

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

Trunnion flange ZNCF/CRZNG

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

Free of copper and PTFE
RoHS-compliant



\+ = plus stroke length

Dimensions and ordering data

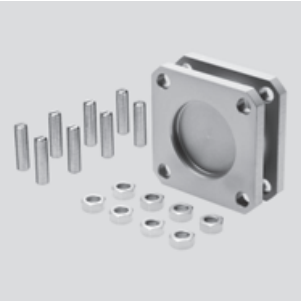
For size [mm]	C2	C3	TD ∅ e9	TK	TL	TM	US	XH	XL
32	71	86	12	16	12	50	45	18	304
40	87	105	16	20	16	63	54	20	381

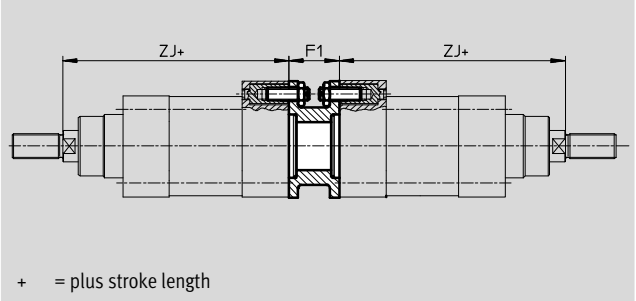
For size	Basic version				High corrosion protection			
	CRC[1)]	Weight	Part No.	Type	CRC[1)]	Weight	Part No.	Type
[mm]		[g]				[g]		
32	2	150	**174411**	**ZNCF-32**	4	150	**161852**	**CRZNG-32**
40	2	285	**174412**	**ZNCF-40**	4	285	**161853**	**CRZNG-40**

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





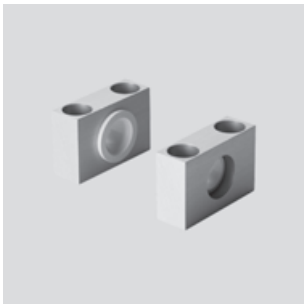
\+ = plus stroke length

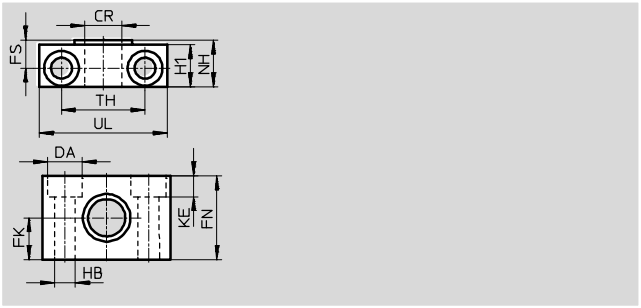
Dimensions and ordering data

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

Trunnion support LNZG

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



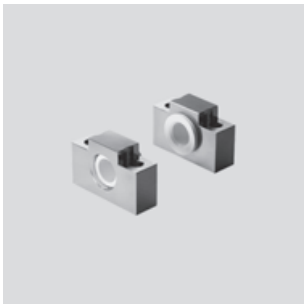


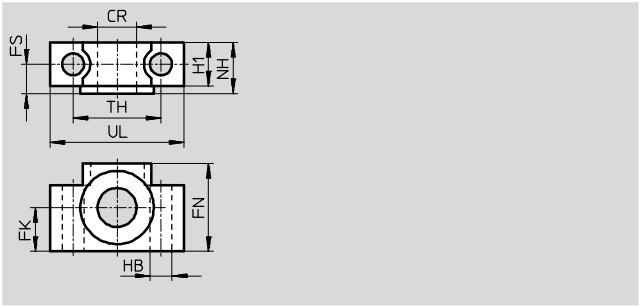
Dimensions and ordering data

For size	CR ∅	DA ∅	FK ∅	FN	FS	H1	HB ∅	KE	NH	TH	UL	CRC[1]	Weight	Part No.	Type
[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	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

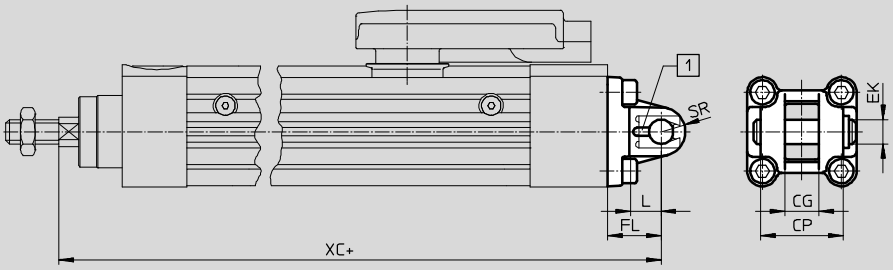
For size	CR ∅	FK ∅	FN	FS	H1	HB ∅	NH	TH	UL	CRC[1]	Weight	Part No.	Type
[mm]	D11	±0.1				H13		±0.2			[g]		
32	12	15	30	10.5	15	6.6	18	32	46	4	205	**161874**	**CRLNZG-32**
40	16	18	36	12	18	9	21	36	55	4	323	**161875**	**CRLNZG-40/50**

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

Swivel flange SNC

Material:
Die-cast aluminium

Free of copper and PTFE
RoHS-compliant



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

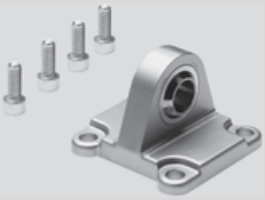
Dimensions and ordering data

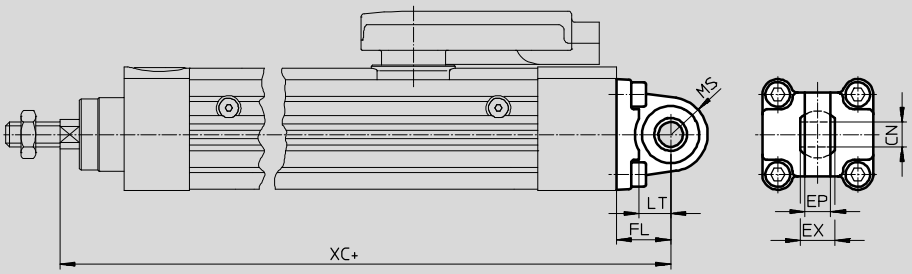
For size [mm]	CG H14	CP h14	EK ∅	FL ±0.2	L	SR	XC	CRC[1]	Weight [g]	Part No.	Type
32	14	34	10	22	13	10	318	2	90	**174383**	**SNC-32**
40	16	40	12	25	16	12	396	2	120	**174384**	**SNC-40**

Swivel flange SNCS

Material:
Die-cast aluminium

Free of copper and PTFE
RoHS-compliant





\+ = plus stroke length

Dimensions and ordering data

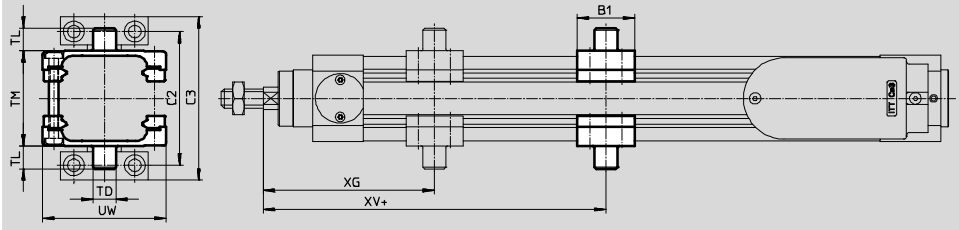
For size [mm]	CN ∅ H7	EP +0.2	EX	FL ±0.2	LT	MS	XC	CRC[1]	Weight [g]	Part No.	Type
32	10	10.5	14	22	13	15	318	2	85	**174397**	**SNCS-32**
40	12	12	16	25	16	17	396	2	125	**174398**	**SNCS-40**

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

Trunnion mounting kit ZNCM

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.

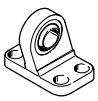
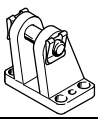
Dimensions and ordering data

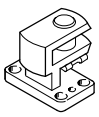
For size [mm]	B1	C2	C3	TD ∅ e9	TL	TM	UW	XG	XV
32	30	71	86	12	12	50	65	90	80
40	32	87	105	16	16	63	75	100	150

For size [mm]	Max. tightening torque [Nm]	CRC[1)]	Weight [g]	Part No.	Type
32	4+1	2	224	**163525**	**ZNCM-32**
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

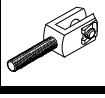
Ordering data – Mounting attachments Technical data ➔ Internet: clevis foot

Designation	For size	Part No.	Type
Clevis foot LSNG			
	32	**31740**	**LSNG-32**
	40	**31741**	**LSNG-40**
Clevis foot LBG			
	32	**31761**	**LBG-32**
	40	**31762**	**LBG-40**

Designation	For size	Part No.	Type
Clevis foot LSNSG			
	32	**31747**	**LSNSG-32**
	40	**31748**	**LSNSG-40**
Right-angle clevis foot LQG			
	32	**31768**	**LQG-32**
	40	**31769**	**LQG-40**

Ordering data – Piston rod attachments Technical data ➔ Internet: piston rod attachments

Designation	For size	Part No.	Type
Rod eye SGS			
	32	**9261**	**SGS-M10x1,25**
	40	**9262**	**SGS-M12x1,25**

Designation	For size	Part No.	Type
Rod clevis SGA			
	32	**32954**	**SGA-M10x1,25**
	40	**10767**	**SGA-M12x1,25**

Product Range and Company Overview

A Complete Suite and Company Overview

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

Custom Automation Components
Complete custom engineered solutions

Custom Control Cabinets
Comprehensive engineering support and on-site services

Complete Systems
Shipment, stocking and storage services

The Broadest Range of Automation Components

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

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Electromechanical actuators, motors, controllers & drivers

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

PLCs and I/O Devices
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Supporting Advanced Automation... As No One Else Can!
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Quality Assurance, ISO 9001 and ISO 14001 Certifications
Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

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

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ISO 9001
ISO 14001
DNV
Certified Company
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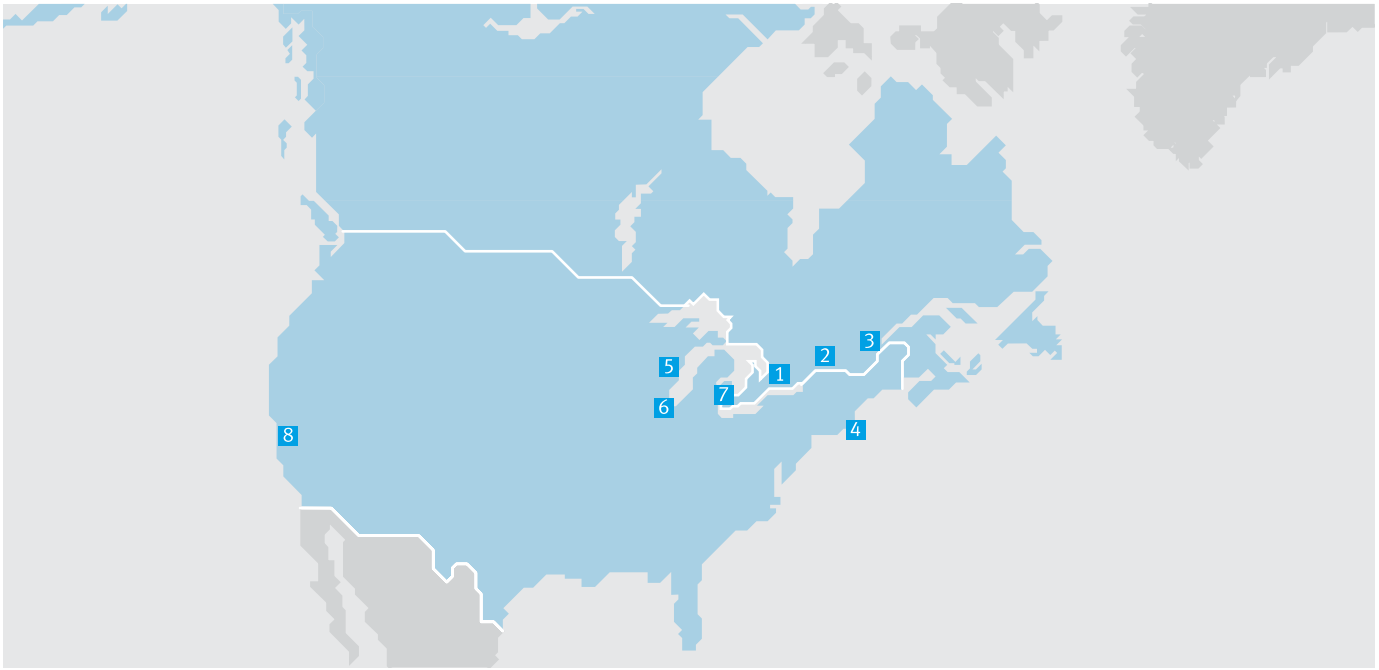

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