



#### **FESTO**

#### 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<sup>2</sup> 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





Motor controller SFC-LACI

→ Internet: sfc-laci

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

- 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
- 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
- Easy actuation via:
  - I/O interface
  - Profibus
  - CANopen, incl. "interpolated position mode"
- DeviceNet







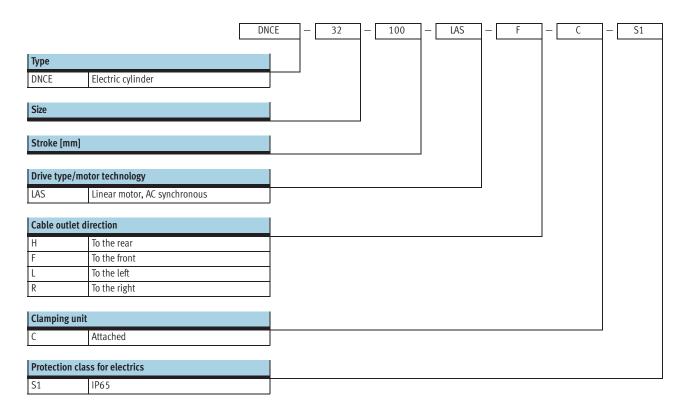
#### Optional: Electric cylinder DNCE-LAS with clamping unit



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.

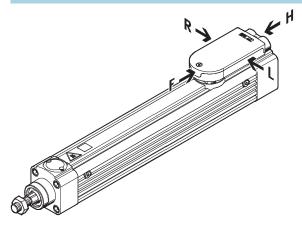
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Type codes

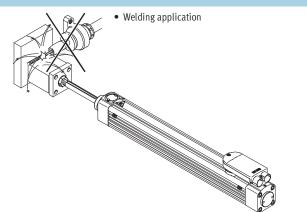


#### Cable outlet direction

Instructions for use

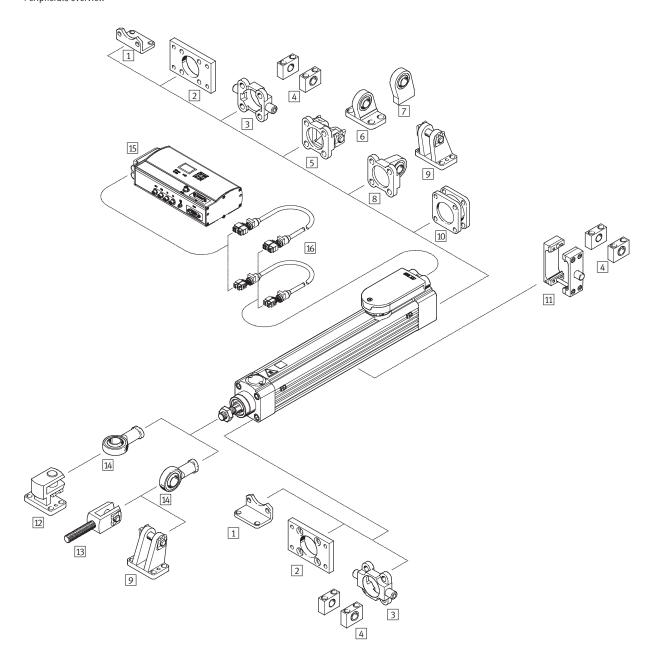


# The electric cylinder with linear motor is not designed for the following sample applications: • Magnetic field





# Electric cylinders DNCE-LAS, with linear motor Peripherals overview





# **Electric cylinders DNCE-LAS, with linear motor** Peripherals overview



Mou	nting attachments and acces	ssories	
		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 ZNCF/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



-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 d	lirect drive										
Drive unit operating mode		Piston rod	1.000										
Type of mounting	Type of mounting			Via female thread									
	Via accessories												
Mounting position		Any											
Continuous feed force <sup>1)</sup>	[N]	33.7	29.4	33.8	55.3	33.8	42.1	47.9					
Peak feed force <sup>1)</sup>	[N]	93.7	141	141	183	202	202	202					
Max. effective load without external	1.5	1	0.5	2.5	2.5	1.5	1.4						
guide (horizontal operation)													
Max. effective load with external	[kg]	2.8	6	4	3.4	6	6	6					
guide (horizontal operation)													
Max. effective load without external	[kg]	3	3	2	3	3	3	3					
guide (vertical operation)													
Max. speed	[m/s]	2	3	3	2	3	3	3					
Repetition accuracy	[mm]	±0.02											
Electric													
Type of motor		Linear AC servo											
Displacement encoder				c, incremental, co									
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 refer	ence sensor										

<sup>1)</sup> Disregarding friction

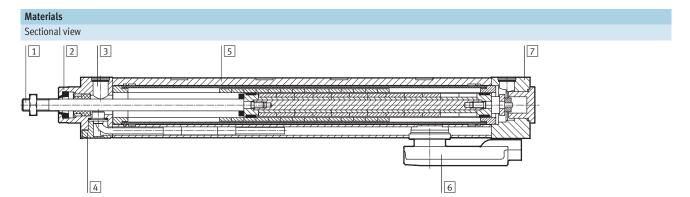
Technical data – Clamping unit										
Size		32			40					
Stroke	[mm]	100 200 320			100	200	320	400		
Design		Spring-loaded clamping profile								
Pneumatic connection		M5			G1/8					
Min. release pressure	[bar]	3								
Max. operating pressure	[bar]	8								
Operating medium		Dried compres	sed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



Operating and environmental conditions							
Ambient temperature [°C]	0 +40						
Max. motor temperature [°C]	0 (warning at 70 °C, shut-off at 75 °C)						
Standard temperature <sup>1)</sup> [°C]	3						
Temperature monitoring	Shuts off if motor overheats						
Protection class (mechanical system)	IP40						
Protection class (electrical connection)	IP40 (with DNCES1: IP65)						
CE marking	To EU EMC Directive						
(see declaration of conformity)							
Corrosion resistance class CRC <sup>2)</sup>	1						

- Unless otherwise stated, all values are based on standard temperature
   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	

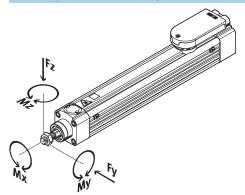


Elect	ric cylinder	
1	Piston rod	High-alloy stainless steel
2	Bearing cap	Anodised wrought aluminium alloy
3	Filter disc	Sintered bronze
4	Distance piece	Anodised wrought aluminium alloy
5	Cylinder barrel	Anodised wrought aluminium alloy
6	Terminal strip	Die-cast zinc
7	End cap	Anodised wrought aluminium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

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Technical data

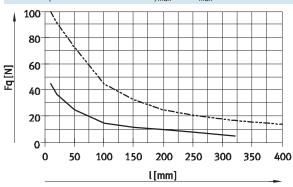
#### Maximum permissible loads on the piston rod



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

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

#### Maximum permissible lateral forces Fymax and Fzmax as a function of stroke l (limited by the plain bearing)



 DNCE-32-...-LAS ---- DNCE-40-...-LAS

#### Maximum permissible forces and torques

Size		32	40
Mx <sub>max</sub>	[Nm]	No torques are permitted	
My <sub>max</sub> , Mz <sub>max</sub>	[Nm]	2	5

#### Note

PositioningDrives sizing software

→ www.festo.com

#### Stroke reserve and cushioning length

1 Working stroke:

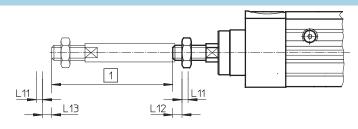
The recommended, available operating range

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



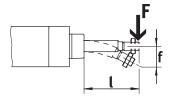
Size		Retracted		Advanced				
		L12	L11	L13	L11			
32	<i>i</i> mmi	3.3	2	5.9	2			
40	) [mm]	3.1	2	3.7	2			



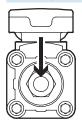
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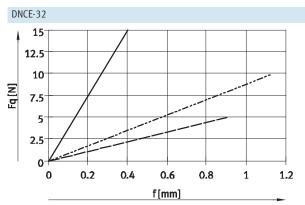
Technical data

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

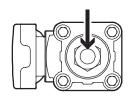


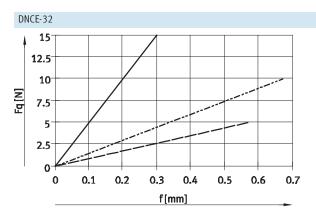
#### Mounting position



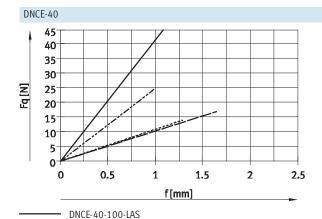


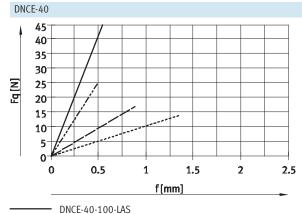
——— DNCE-32-100-LAS
———— DNCE-32-200-LAS
———— DNCE-32-320-LAS





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





---- DNCE-40-200-LAS

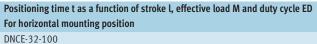
----- DNCE-40-400-LAS

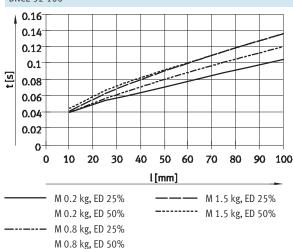
---- DNCE-40-320-LAS

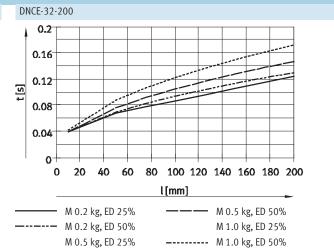


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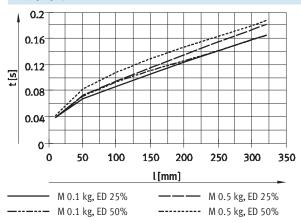
Technical data

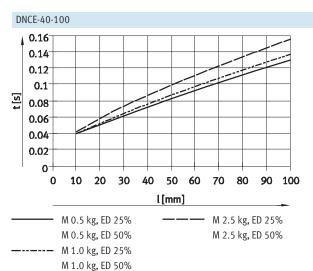


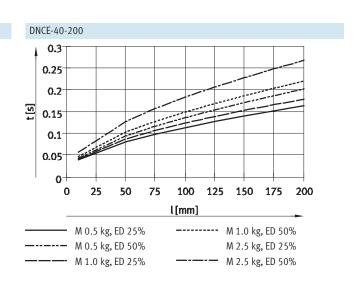




#### DNCE-32-320



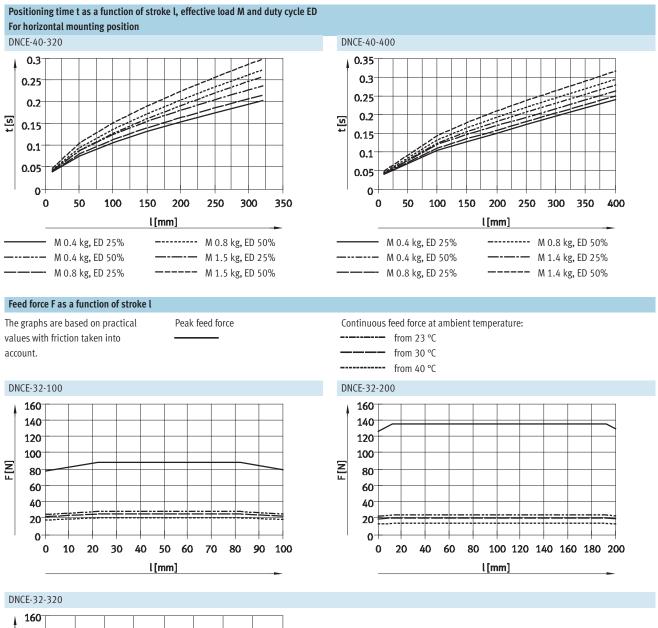






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Technical data

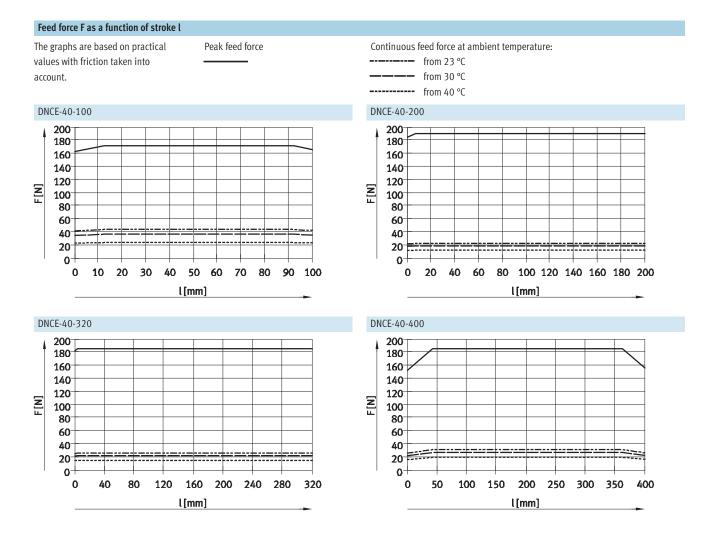


### 160 140 120 100 80 60 40 20 0 40 80 120 160 200 240 280 320 1[mm]



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Technical data





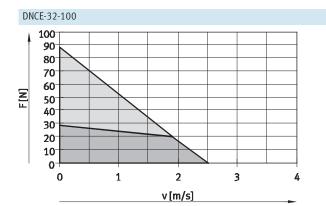
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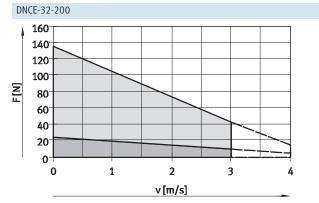
#### Feed force F as a function of speed v

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

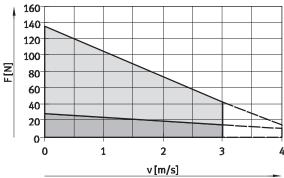
- Stroke centre of the electric cylinder
- Friction taken into account
- Standard temperature of 23  $^{\circ}\text{C}$
- Peak feed force  $-\,$  Max. motor temperature of 70 °C Continuous feed force

Non-permissible range

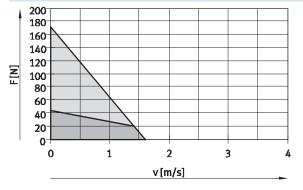




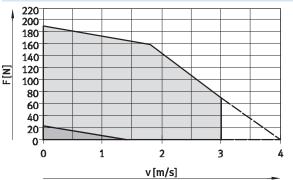
### DNCE-32-320



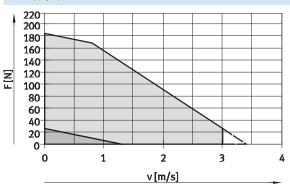
#### DNCE-40-100



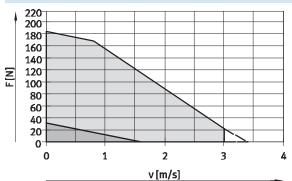
#### DNCE-40-200



### DNCE-40-320



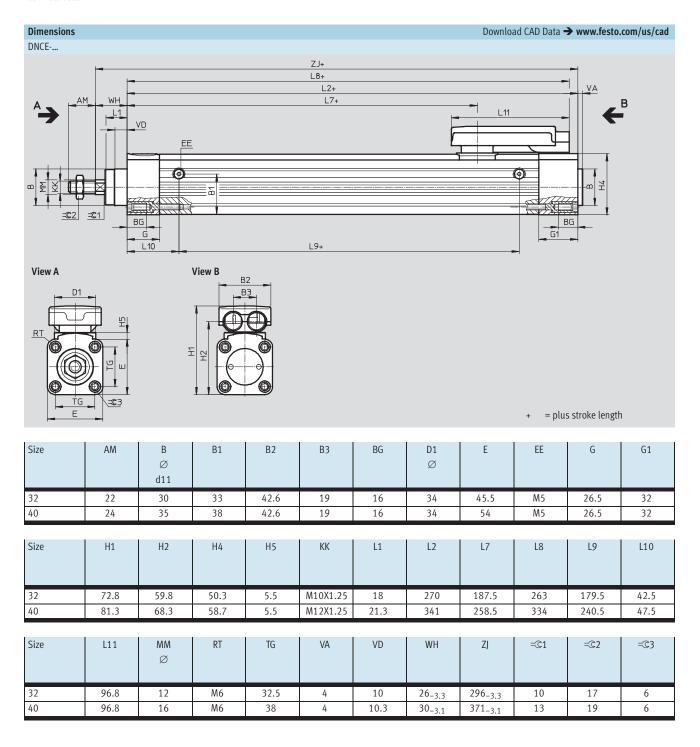
#### DNCE-40-400



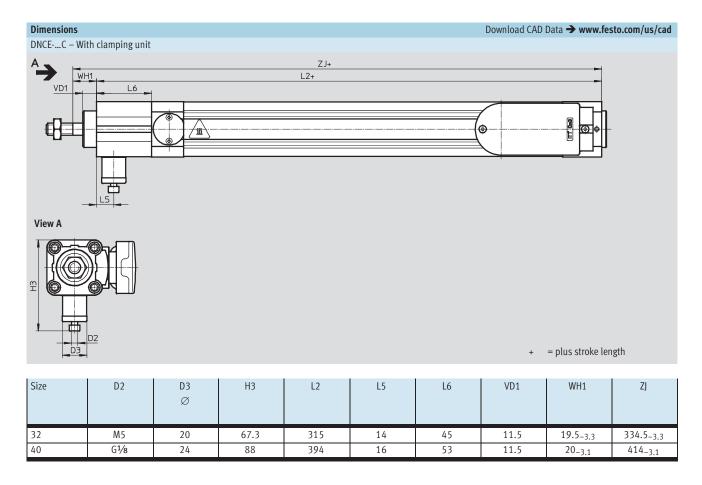


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Technical data



# **Electric cylinders DNCE-LAS, with linear motor**Technical data





# Electric cylinders DNCE-LAS, with linear motor Ordering data – Modular products

Ordering table					
Size	32	40	Conditio ns	Code	Enter code
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	

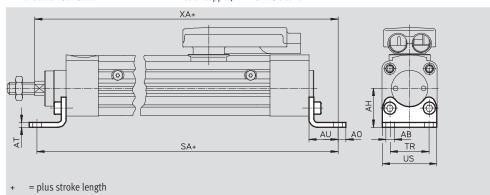
Transfer order	r order code															
		DNCE	-		-		-	L		AS	_		-		-	

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#### Foot mounting HNC/CRHNC



Material: CRHNC: High-alloy steel HNC: Galvanised steel Free of copper, PTFE and silicone



Dimensions and o	Dimensions and ordering data																						
For size	AB ∅	АН	AO	AT	AU	SA		SA		SA		SA		SA		SA		SA		TR	US	X	A
[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	or size Basic version						High corrosion protection					
	CRC <sup>1)</sup>	Weight	Part No. Type		CRC <sup>1)</sup>	Weight	Part No.	Туре				
[mm]		[g]				[g]						
32	2	144	174369	HNC-32	4	139	176937	CRHNC-32				
40	2	193	174370	HNC-40	4	188	176938	CRHNC-40				

<sup>1)</sup> 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

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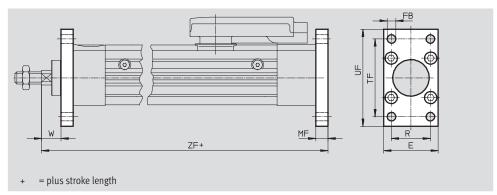
Accessories

Flange mounting FNC/CRFNG

Material:

FNC: Galvanised steel CRFNG: High-alloy steel Free of copper, PTFE and silicone





Dimensions and o	rdering data									
For size	E	FB	MF	R	TF	UF	V	I	Z	F
		Ø								
[mm]		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 versi	on			High corros	ion protection	on	
	CRC <sup>1)</sup>	Weight	Part No.	Туре	CRC <sup>1)</sup>	Weight	Part No.	Туре
[mm]		[g]				[g]		
32	1	221	174376	FNC-32	4	240	161846	CRFNG-32
40	1	291	174377	FNC-40	4	300	161847	CRFNG-40

<sup>1)</sup> CRC1: Corrosion resistance class to Festo standard 940070

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



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Accessories

Trunnion flange ZNCF/CRZNG

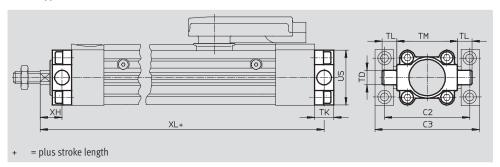
Material:

ZNCF: Stainless steel casting CRZNG: Electropolished special steel

casting

Free of copper, PTFE and silicone





Dimensions and o	Dimensions and ordering data												
For size	C2	C3	TD Ø	TK	TL	TM	US	XI	1	Х			
[mm]			e9						-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	Basic versi	on			High corros	sion protection	on	
	CRC <sup>1)</sup>	Weight	Part No.	Туре	CRC <sup>1)</sup>	Weight	Part No.	Туре
[mm]		[g]				[g]		
32	2	130	174411	ZNCF-32	4	150	161852	CRZNG-32
40	2	240	174412	ZNCF-40	4	260	161853	CRZNG-40

<sup>1)</sup> 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

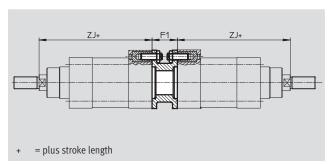
Components subject to particularly high corrosion stress. Parts used with aggressive media, e.g. in the food or chemical industry. These applications should be supported with special tests with the media if required

#### Multi-position kit DPNC

Material:

Flange: Wrought aluminium alloy Threaded studs, hex nuts: Galvanised steel





Dimensions and o	ordering data				
For size	F1	Z	IJ	Weight	Part No. Type
[mm]			-C	[g]	
32	27	296	334.5	85	174418 DPNC-32
40	27	371	414	115	174419 DPNC-40

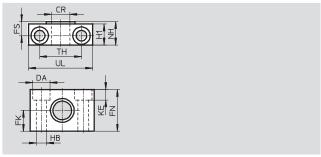


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#### Trunnion support LNZG

Material: Trunnion support: Anodised aluminium Plain bearing: Plastic Free of copper, PTFE and silicone



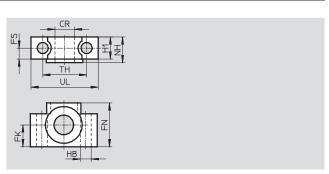


Dimensions and o	Dimensions and ordering data														
For size	CR	DA	FK	FN	FS	H1	HB	KE	NH	TH	UL	CRC <sup>1)</sup>	Weight	Part No.	Туре
	Ø	Ø	Ø				Ø								
[mm]	D11	H13	±0.1				H13			±0.2			[g]		
32	12	11	15	30	10.5	15	6.6	6.8	18	32	46	2	83	32959	LNZG-32
40	16	15	18	36	12	18	9	9	21	36	55	2	129	32960	LNZG-40/50

#### Trunnion support CRLNZG

Material: High-alloy steel Free of copper, PTFE and silicone





Dimensions and o	Dimensions and ordering data												
For size	CR	FK	FN	FS	H1	HB	NH	TH	UL	CRC <sup>1)</sup>	Weight	Part No.	Туре
	Ø	Ø				Ø							
[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

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

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Accessories

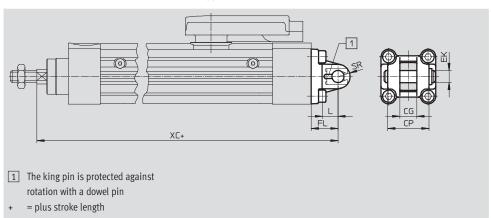
#### Swivel flange SNC

#### Material:

Die-cast aluminium

Free of copper, PTFE and silicone





Dimensions and o	Dimensions and ordering data												
For size	CG	СР	EK	FL	L	SR	Х	C	CRC <sup>1)</sup>	Weight	Part No.	Туре	
			Ø										
[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	

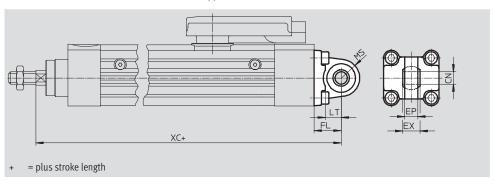
#### Swivel flange SNCS

#### Material:

Die-cast aluminium

Free of copper, PTFE and silicone





Dimensions and o	Dimensions and ordering data												
For size	CN	EP	EX	FL	LT	MS	Х	C	CRC <sup>1)</sup>	Weight	Part No.	Туре	
	Ø												
[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	

<sup>1)</sup> 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

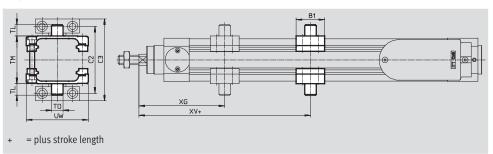


**FESTO** 

#### 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 o	Dimensions and ordering data												
For size	B1	C2	C3	TD	TL	TM	UW	XG	XV				
				Ø									
[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 <sup>1)</sup>	Weight	Part No.	Туре
[mm]	[Nm]		[g]		
32	4+1	2	224	163525	ZNCM-32
40	8+1	2	396	163526	ZNCM-40

<sup>1)</sup> 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 attachn	nents				Tech	nical data → Internet: clevis foot
Designation	For size	Part No.	Туре	Designation	For size	Part No.	Туре
Clevis foot LSN	G			Clevis foot LSNS	SG		
	32	31740	LSNG-32		32	31747	LSNSG-32
	40	31741	LSNG-40		40	31748	LSNSG-40
Clevis foot LBG				Right-angle clev	vis foot LQG		
Ø -	32	31761	LBG-32		32	31768	LQG-32
C.S.	40	31762	LBG-40	C.O.	40	31769	LQG-40

Ordering data – Piston rod attachments							Technical data → Internet: piston rod attachments		
Designation	For size	Part No.	Туре		Designation	For size	Part No.	Туре	
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	

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