

Standards-based cylinders DNC, ISO 15552

FESTO



Key features

At a glance



- Standards-based cylinders to ISO 15552 (corresponds to the withdrawn standards ISO 6431, DIN ISO 6431, VDMA 24562, NFE 49 003.1 and UNI 10290)
- The modern, consistent design saves up to 11% more space compared to ordinary standards-based cylinders, providing a significantly more compact system structure
- An extensive range of accessories enables the cylinder to be installed virtually anywhere
- The widest range of variants on the market offers the ideal cylinder DNC for any application

Cylinder with clamping units

DNC-KP



- Piston rod can be held or clamped in any position
- Piston rod can be held in position for long periods even with alternating loads, fluctuating operating pressure or leaks in the system

DNCKE



- Use in safety-related control systems observing the standards EN 954-1, EN 1050, EN 292 and EN 983
- Fail-safe
- Piston rod can be clamped in any position

Cylinder with end-position locking

DNC- ... -EL



- Mechanical locking when the end position is reached
- Locking is automatically released only when pressure is applied to the cylinder
- End-position locking at one or both ends

Cylinder/valve combination

DNC-V1 ... V6



- The cylinder/valve combination is assembled and fitted with tubing ready for connection
- Particularly suitable for decentralised use in large systems

Tandem cylinder

DNCT



- Series connection of 2 cylinders with the same piston diameter and stroke
- Twice the thrust and return force compared to a conventional cylinder

Longer service life with bellows kit DADB











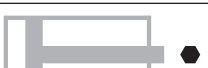







The bellows protects the piston rod, the seal and the bearing from the effects of a wide range of media, which has a positive impact on the service life of these components.

The bellows kit is a leak-free system. To prevent unwanted media from being drawn in, the supply and exhaust air for the kit must be ducted via a pressure compensation hole in the connection part [1].

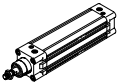
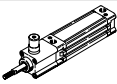
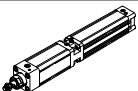
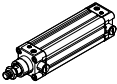
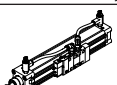
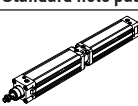
The kit protects the piston rod, seal and bearing against a wide variety of media, for example:

- Dust
- Chippings
- Oil
- Grease
- Fuel

Key features

Variants from the modular product system		
Symbol	Key features	Description
	S2 Through piston rod	The piston rod can be used for attachment at both ends of the cylinder
	S6 Heat-resistant seals	Temperature resistance up to max. 120°C
	S10 Constant motion (slow speed) at low piston speeds	<ul style="list-style-type: none"> • Break-away pressure: very low • Dynamic response: Suitable for very slow, constant and stick-slip-free movements Application example: Slow, constant feed motion
	S11 Low friction	<ul style="list-style-type: none"> • Break-away pressure: very low • Dynamic response: Especially suitable for slow movements with considerably reduced system friction • Application example: Slow applications where standstill is critical
	S20 Through, hollow piston rod	The piston rod can be used for attachment at both ends of the cylinder. The piston rod is hollow inside. This means it can be used to carry vacuum or compressed air
	K2 Extended male piston rod thread	–
	K3 Female piston rod thread	–
	K5 Custom piston rod thread	Metric standard thread to ISO
	K7 Piston rod with external hexagon	Special spanner flats
	K8 Extended piston rod	–
	K10 Smooth anodised aluminium piston rod	Ideal for use in welding environments: <ul style="list-style-type: none"> • Protection against welding spatter • Small working loads • Harder surface compared to steel • Long service life
	KP With clamping unit	Integrated clamping unit on the piston rod
	EL With end-position locking	Positive locking in the end position as a drop guard. If there is a drop in pressure, the cylinder is secured in its end position to prevent it from dropping
	Q Square piston rod	Protection against rotation. For correctly oriented feeding
	R3 High corrosion protection	All external cylinder surfaces comply with corrosion resistance class 3 to Festo standard 940070. The piston rod is made from corrosion- and acid-resistant steel
	R8 Dust protection with wiper seal	The cylinder has a hard-chrome-plated piston rod and a hard wiper seal, which protects against dry, dusty media

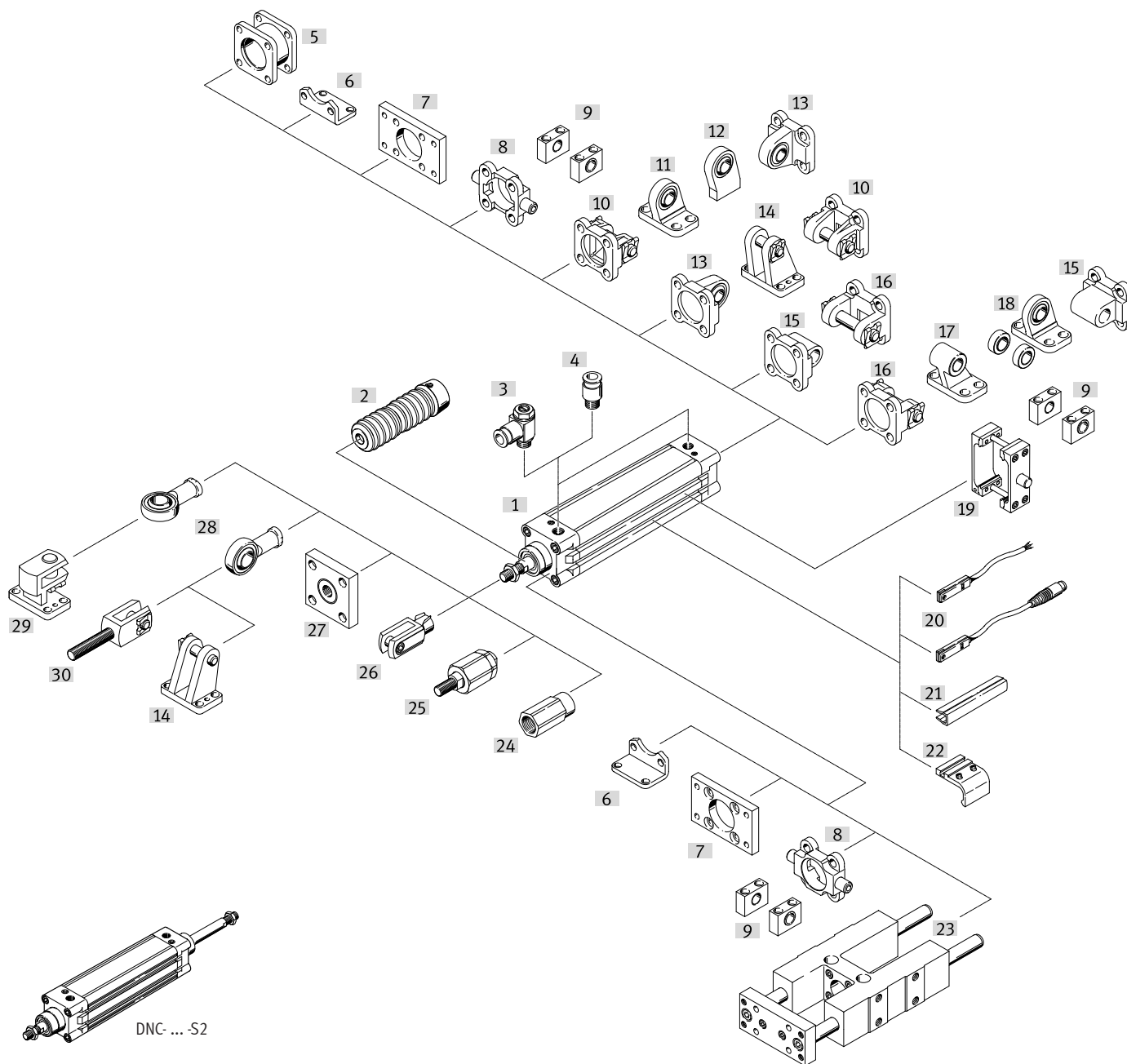
Product range overview

Function	Design	Type	Piston ø	Stroke	Position sensing	Protection against rotation	Through/hollow piston rod	Extended male piston rod thread	Female piston rod thread	Custom thread on the piston rod	
			[mm]	[mm]							A
Double-acting	Basic version										
		DNC	32, 40, 50, 63, 80, 100, 125	20, 25, 30, 40, 50, 60, 70, 80, 100, 125, 150, 160, 200, 250, 300, 320, 400, 500	10 ... 2000	■	■	■	■	■	■
	Standard hole pattern, with clamping unit										
		DNC-KP	32, 40, 50, 63, 80, 100, 125	–	10 ... 2000	■	■	■ S2	■	■	■
		DNC-KE	40, 63, 100	–	10 ... 2000	■	–	–	–	–	–
	Standard hole pattern, with end-position locking										
		DNC-...-EL	32, 40, 50, 63, 80, 100	–	10 ... 2000	■	–	■ S2	■	■	■
	Standard hole pattern, cylinder/valve combination										
		DNC-V1 ... V6	32, 40, 50, 63, 80, 100	–	100 ... 2000	■	■	■	■	■	■
	Standard hole pattern, tandem cylinder										
	DNCT	32, 40, 50, 63, 80, 100, 125	–	2 ... 500 3 ... 500	■	–	–	–	–	–	

Product range overview

Type	Special spanner flats	Extended piston rod	Smooth anodised piston rod	Heat-resistant seals max. 120°C	Slow speed (constant motion)	Low friction	High corrosion protection	Dust protection	Cylinder/valve combination	→ Page/Internet
	K7	K8	K10	S6	S10	S11	R3	R8	V1 ... V6	
Basic version										
DNC	■	■	■	■	■	■	■	■	-	9
Standard hole pattern, with clamping unit										
DNC-KP	■	■	-	-	-	-	-	-	■	25
DNCKE	-	-	-	-	-	-	-	-	-	2
Standard hole pattern, with end-position locking										
DNC-...-EL	-	■	-	-	-	-	-	-	-	33
Standard hole pattern, cylinder/valve combination										
DNC-V1 ... V6	■	■	■	-	■	■	-	■	■	40
Standard hole pattern, tandem cylinder										
DNCT	-	-	-	■	-	-	-	-	-	2

Peripherals overview



Mounting components and accessories		Description	DNC				→ Page/ Internet
			Basic version	KP	EL	V1 ... V6	
[1]	Standards-based cylinder DNC						
[2]	Bellows kit DADB	<ul style="list-style-type: none"> Protects the cylinder (piston rod, seal and bearings) against a wide range of media and thus prevents premature wear The kit can only be used in combination with an extended piston rod (K8) 	■	-	■	■	61
[3]	One-way flow control valve GRLA	For regulating speed	■	■	■	■	67
[4]	Push-in fitting QS	For connecting tubing with standard O.D.	■	■	■	■	qs

Peripherals overview

Mounting components and accessories		Description	DNC				→ Page/ Internet
			Basic version	KP	EL	V1 ... V6	
[5]	Multi-position kit DPNC	For connecting two cylinders with the same piston diameter to form a multi-position cylinder	■ ¹⁾	■	■	■ ¹⁾	49
[6]	Foot mounting HNC/CRHNC	For bearing or end caps	■	■	■	■	50
[7]	Flange mounting FNC/CRFNG	<ul style="list-style-type: none"> For bearing or end caps Cannot be used on the bearing cap in combination with bellows kit DADB 	■	■	■	■	51
[8]	Trunnion flange ZNC/CRZNG	<ul style="list-style-type: none"> For bearing or end caps Cannot be used on the bearing cap in combination with bellows kit DADB 	■	■	■	■	52
[9]	Trunnion support LNZG/CRLNZG	–	■	■	■	■	54
[10]	Swivel flange SNC	For end caps	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	55
[11]	Clevis foot LSNG	With spherical bearing	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	59
[12]	Clevis foot LSNSG	Weld-on, with spherical bearing	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	59
[13]	Swivel flange SNCS/CRSNCS/SNCS-...-R3	With spherical bearing for end caps	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	57
[14]	Clevis foot LBG/LBG-...-R3	–	■ ¹⁾	■	■	■ ¹⁾	59
[15]	Swivel flange SNCL	For end caps	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	58
[16]	Swivel flange SNCB/SNCB-...-R3	For end caps	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	56
[17]	Clevis foot LNG/CRLNG	–	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	59
[18]	Clevis foot LSN	With spherical bearing	■ ¹⁾	■ ¹⁾	■	■ ¹⁾	59
[19]	Trunnion flange kit DAMT	For mounting anywhere along the cylinder profile barrel	■	■	■	■	53
[20]	Proximity switch SME/SMT-8	Can be integrated in the cylinder profile barrel	■	■	■	■	66
[21]	Slot cover ABP-5-S	For protecting the sensor cables and the sensor slots from contamination	■	■	■	■	66
[22]	Mounting kit SMB-8-FENG	For attaching proximity switch SMT-8 to cylinders in combination with guide unit FENG	■ ²⁾	■ from Ø 50	■	–	65
[23]	Guide unit FENG	For protecting standards-based cylinders against rotation at high torques	■	■	–	–	65
[24]	Adapter AD	For mounting a suction cup on a hollow piston rod	■	–	–	■	60
[25]	Self-aligning rod coupler FK/CRFK	To compensate for radial and angular deviations	■	■	■	■	60
[26]	Rod clevis SG/CRSG	Permits a swivelling movement of the cylinder in one plane	■	■	■	■	60
[27]	Coupling piece KSG	To compensate for radial deviations	■	■	■	■	60
	Coupling piece KSZ	For cylinders with a non-rotating piston rod to compensate for radial deviations	■	■	■	■	60
[28]	Rod eye SGS/CRSGS	With spherical bearing	■	■	■	■	60
[29]	Right-angle clevis foot LQG	–	■	■	■	■	59
[30]	Rod clevis SGA	With male thread	■	■	■	■	60


1) Not with variant S2 or S20

2) For piston Ø 32, 40 mm only with variant R3

Type codes

001	Series	
DNC	Standards-based cylinder, double-acting, based on ISO 15552	
002	Piston diameter	
32	32	
40	40	
50	50	
63	63	
80	80	
100	100	
125	125	
003	Stroke	
...	2 ... 2000	
004	Cushioning	
P	Elastic cushioning rings/plates on both sides	
PPV	Pneumatic cushioning, adjustable at both ends	
005	Position sensing	
	None	
A	For proximity sensor	
006	Protection against rotation	
	None	
Q	With protection against rotation	
007	Piston rod type	
S2	Through piston rod	
S20	Through, hollow piston rod	
008	Piston rod thread extension [mm]	
009	Piston rod thread type	
	Male thread	
K3	Female thread	

010	Custom thread	
	Standard piston rod thread	
"M10"K5	M10	
"M12"K5	M12	
"M16"K5	M16	
"M20"K5	M20	
"M27"K5	M27	
011	Special spanner flats	
K7	Piston rod with external hexagon	
012	Piston rod extension	
	None	
...K8	1 ... 500 mm	
013	Improved running performance	
	None	
K10	Smooth aluminium anodised coated piston rod	
014	Improved running performance	
015	Temperature resistance	
S6	Heat-resistant seals max. 120 °C	
016	Temperature range	
017	Constant motion	
	None	
S10	Slow speed (constant motion at low piston speeds)	
018	Running characteristic	
S11	Low friction	
	None	
019	Corrosion protection	
	Standard	
R3	High corrosion protection	
020	Scraper	
R8	Dust protection	
	Standard	

 - Note

The standards-based cylinder DNC can be ordered either using a fixed part number and order reference or using the modular product system.

The type codes listed above represent the standards-based cylinders DNC with fixed part number and order reference only.

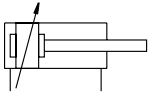
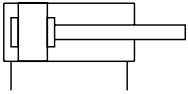
Variants can only be ordered using the modular product system.

Data sheet

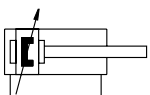
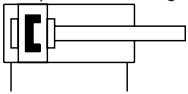
Function

DNC...

Without position sensing

**DNC...-A...**

With position sensing



⌀ - Diameter
32 ... 125 mm

— - Stroke length
10 ... 2000 mm

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Sets of wearing parts
→ Page 24



- Standards-based cylinders to ISO 15552 (corresponds to the withdrawn standards ISO 6431, DIN ISO 6431, VDMA 24562, NFE 49003.1 and UNI 10290)

**General technical data**

Piston Ø		32	40	50	63	80	100	125
Pneumatic connection		G1/8	G1/4	G1/4	G3/8	G3/8	G1/2	G1/2
Piston rod thread		M10x1.25	M12x1.25	M16x1.5	M16x1.5	M20x1.5	M20x1.5	M27x2
	K3	M6	M8	M10	M10	M12	M12	M16
	K5	M10	M12	M16	M16	M20	M20	M27
Design		Piston						
		Piston rod						
		Profile barrel						
Max. torsional backlash of piston rod [°]	Q	±0.65	±0.6	±0.45	±0.45	±0.45	±0.45	–
		Elastic cushioning rings/pads at both ends						
Cushioning		Pneumatic cushioning, adjustable at both ends						
	Cushioning length PPV [mm]	20	20	22	22	32	32	42
Position sensing		Via proximity switch						
Type of mounting		With female thread						
		Via accessories						
Mounting position		Any						

† Note: This product conforms to ISO 1179-1 and ISO 228-1.

Data sheet

Operating and environmental conditions		32	40	50	63	80	100	125
Piston ø								
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]						
Note on operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)						
Operating pressure [bar]		0.6 ... 12						0.6 ... 10
Operating pressure [bar]	Q	1 ... 12						-
	R8	1.5 ... 12						1.5 ... 10
	S11	After 10 strokes						
			0.16 ... 12	0.1 ... 12		0.06 ... 12		0.06 ... 10
	After 24 h							
		0.3 ... 12	0.2 ... 12		0.1 ... 12		0.1 ... 10	
Ambient temperature ¹⁾ [°C]		-20 ... +80						
Corrosion resistance class CRC ²⁾	S6	0 ... 120						
	R3	2						
ATEX		3						
CE marking (see declaration of conformity)		Selected types → www.festo.com						
UKCA marking (see declaration of conformity)		To EU Explosion Protection Directive (ATEX)						
		To UK EX instructions						

1) Note operating range of proximity switches

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Corrosion resistance class CRC 3 to Festo standard FN 940070

High corrosion stress. Outdoor exposure under moderate corrosive conditions. Externally visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment.

Forces [N] and impact energy [J]		32	40	50	63	80	100	125
Theoretical force at 6 bar, advancing		483	754	1178	1870	3016	4712	7363
	S2/S20	415	633	990	1682	2721	4418	6881
Theoretical force at 6 bar, retracting		415	633	990	1682	2721	4418	6881
	S2/S20	415	633	990	1682	2721	4418	6881
Max. impact energy at the end positions ¹⁾		0.1	0.2	0.2	0.5	0.9	1.2	5

1) With variant K10 and S20, the permissible impact energy is reduced by approx. 10%


Permissible impact velocity:

$$v = \sqrt{\frac{2 \cdot E}{m_1 + m_2}}$$

Maximum permissible mass:

$$m_2 = \frac{2 \cdot E}{v^2} - m_1$$

V Permissible impact velocity
E Max. impact energy
m1 Moving mass (drive)
m2 Moving payload

 **Note**
These specifications represent the maximum values that can be achieved. The maximum permissible impact energy must be observed.