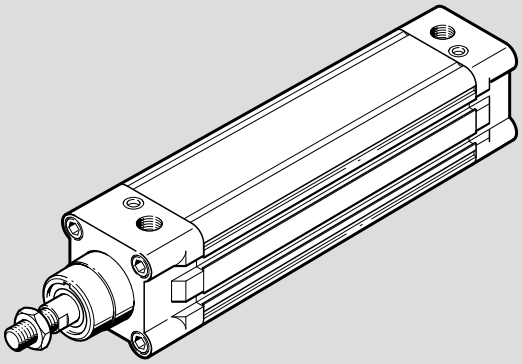
DNC
Standards-based cylinder



FESTO

Operating instruction

8189597

8189597
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[8189599]

Translation of the original instructions

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1 Applicable documents

All available documents for the product ➔ www.festo.com/sp.

2 Safety

2.1 Safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Observe the identifications on the product.
- Take into account the ambient conditions at the location of use.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.
- Before working on the product, switch off the compressed air supply and lock it to prevent it from being switched on again.

2.2 Intended use

The standards-based cylinder moves masses and transmits forces. The product is intended for use in industrial environments.

2.3 Training of qualified personnel

Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers. The qualified personnel have knowledge and experience in pneumatics.

3 Additional information

- Contact the regional Festo contact if you have technical problems ➔ www.festo.com.
- Accessories and spare parts ➔ www.festo.com/catalogue.

4 Product overview

4.1 Product design

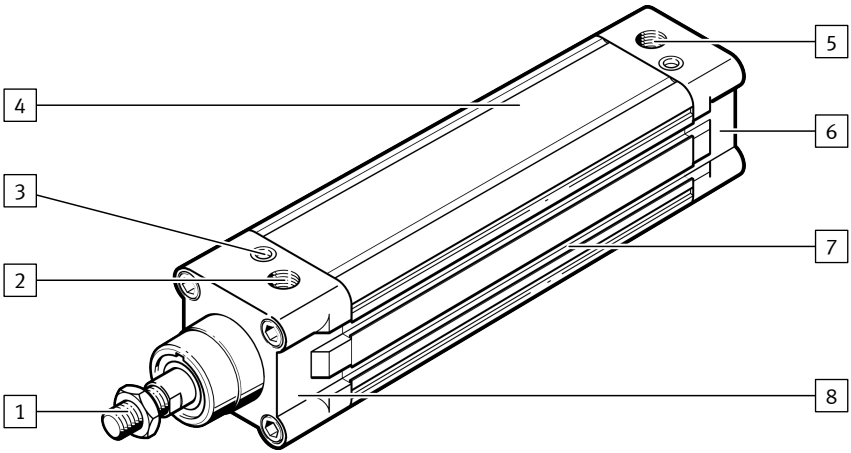

Fig. 1: Standards-based cylinder DNC

1 Thread for mounting the payload

2 Pneumatic port 1

3 For DNC-...-PPV:
Adjustable end-position cushioning (2x)

4 Cylinder barrel

5 Pneumatic port 2

6 End cap,
with mounting option,
female thread

7 Slot for proximity switch (6x)

8 Bearing cap,
with mounting option,
female thread

4.2 Function

When the cylinder chamber is pressurised at pneumatic port 1 or 2, the piston rod moves outwards or inwards. The cylinder force varies during advance and retraction. The position of the piston can be queried by proximity switches.

5 Assembly

5.1 Mounting standards-based cylinder

Requirement:

– The product is installed without tension.

A rigid coupling will reduce the service life and adversely affect the function of the cylinder.

DNC		-32	-40	-50	-63
Thread		M6		M8	
Screw-in depth	[mm]	11 ... 16			

DNC		-32	-40	-50	-63
Screw strength		≥ A*-70			
Flange thickness Aluminium, steel	[mm]	≥ 5.5		≥ 6.5	
Tightening torque	[Nm]	5 ± 20 %		8 ± 20 %	

Tab. 1: Tightening torques, DNC-32 ... -63

DNC		-80	-100	-125
Thread		M10		M12
Screw-in depth	[mm]	7 ... 17		10 ... 20
Screw strength		≥ A*-70		
Flange thickness Aluminium, steel	[mm]	≥ 10		
Tightening torque	[Nm]	17 ± 20 %		45 ± 20 %

Tab. 2: Tightening torques, DNC-80 ... -125

1. Mount the standards-based cylinder with at least 4 screws. Observe the tightening torque.
2. Avoid mechanical misalignment between the piston rod, for example in connection with an external guide, with one of the following measures:
   - Precise alignment
   - Use of attachments with spherical bearings, e.g. rod eye, swivel flange.
   - Use of a self-aligning rod coupler
   - Use of a guide unit

5.2 Mounting the payload

Requirement:
- An adequately sized intercepting device is used for medium and large payloads or at high speeds.
- Suitable shock absorbers or external stops are fitted with maximum payload, maximum piston speed or when using quick exhaust valves.

DNC-...(-...-K5)		-32	-40	-50	-63
DNC					
Thread		M10x1.25	M12x1.25	M16x1.5	
Hex nut		ISO 8675-...-04			
		ISO 8675-...-035			
Max. tightening torque	[Nm]	20	35	85	

DNC-...(-...-K5)		**-32**	**-40**	**-50**	**-63**
DNC-...-K5					
Thread		M10	M12	M16	
Hex nut		ISO 4035-...-04			
		ISO 4035-...-035			
Max. tightening torque	[Nm]	20	35	85	

Tab. 3: Maximum tightening torque DNC-32 ... -63(-...-K5)

DNC-...(-...-K5)		**-80**	**-100**	**-125**
DNC				
Thread		M20x1.5		M27x2
Hex nut		ISO 8675-...-04		
		ISO 8675-...-035		ISO 8675-...-025
Max. tightening torque	[Nm]	170		310
DNC-...-K5				
Thread		M20		M27
Hex nut		ISO 4035-...-04		
		ISO 4035-...-035		ISO 4035-...-025
Max. tightening torque	[Nm]	170		310

Tab. 4: Maximum tightening torque DNC-80 ... -125(-...-K5)

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For DNC-...-S2/-S20: do not counter-rotate the through piston rod by the spanner flats. This may disconnect the piston rod connection from the piston.

DNC-...-S20		**-32**	**-40**	**-50**	**-63**
Thread		M10x1.25	M12x1.25	M16x1.5	
Hex nut		ISO 8675-...-04			
		ISO 8675-...-035			
Max. tightening torque	[Nm]	12	22	85	

Tab. 5: Maximum tightening torque DNC-32 ... -63-S20

DNC-...-S20		-80	-100	-125
Thread		M20x1.5		M27x2
Hex nut		ISO 8675-...-04		ISO 8675-...-04
		ISO 8675-...-035		ISO 8675-...-025
Max. tightening torque	[Nm]	150		260

Tab. 6: Maximum tightening torque DNC-80 ... -125-S20

DNC-...-K3		-32	-40	-50	-63
Thread		M6	M8	M10	
Screw-in depth	[mm]	7 ... 12		11 ... 16	
Max. tightening torque for screw in strength class ≥ 10.9	[Nm]	10		28	
Max. tightening torque for screw in strength class ≥ A*-70	[Nm]	6	8	25	

Tab. 7: Maximum tightening torque DNC-32 ... -63-K3

DNC-...-K3		-80	-100	-125
Thread		M12		M16
Screw-in depth	[mm]	13 ... 20		22 ... 32
Max. tightening torque for strength class ≥ 10.9	[Nm]	45		120
Max. tightening torque for strength class ≥ A*-70	[Nm]	35		100

Tab. 8: Maximum tightening torque DNC-80 ... -125-K3

- Mount the payload by the thread. Observe the maximum tightening torque.

5.3 Mounting accessories

1. To adjust the speed: screw the one-way flow control valves into the pneumatic ports.
2. With DNC-...-A: use proximity switches. Avoid external influence caused by magnetic or ferritic parts in the vicinity of the proximity switches. Minimum distance: 10 mm

6 Installation

- Connect tubing to the pneumatic ports.

7 Commissioning

1. Screw the one-way flow control valves all the way in on both sides, then back one revolution.
2. With DNC-...-PPV: screw in the adjustable end-position cushioning on both sides to fully closed, then unscrew by one turn.
3. Pressurise the cylinder simultaneously on both port sides.
   ↳ The piston rod slowly extends to the end position.
4. Exhaust the cylinder on one side.
   ↳ The piston rod moves to the end position.
5. Start the test run.
6. If necessary: adjust the speed at the one-way flow control valves and the adjustable end-position cushioning. The piston rod should reach the end stop without hard impact or rebounding.

8 Cleaning

- Clean the product with a clean, soft cloth and non-abrasive cleaning agents.

9 Fault clearance

Malfunction	Cause	Remedy
Irregular motion of the piston rod.	The one-way flow control valves throttle the exhaust air too much.	– Reduce exhaust air throttling.
	The adjustable end-position cushioning is set too high.	– Reduce the adjustable end-position cushioning.
	The piston rod is dirty.	– Clean the cylinder. – Relubricate after cleaning.
		– Install a covering.
	The supply air is insufficient.	– Keep the tubing short and select large cross sections.
		– Select the correct operating pressure.
		– Maintain a constant operating pressure.
	The pressure is too low.	– Connect a volume upstream. – Increase the pressure.
	The cylinder is damaged.	– Repair or replace the cylinder.
	Insufficient lubricant.	– Apply lubricant according to information leaflet ➔ www.festo.com/spareparts

Malfunction	Cause	Remedy
Irregular motion of the piston rod.	The guide is not parallel to the direction of stroke.	– Use a self-aligning rod coupler.
Hard stops by the cylinder at the end position	The speed is too high.	– Reduce the exhaust air flow control.
	The cushioning is too low.	– Increase the cushioning. – Use additional cushioning components.
The piston does not move to the end position.	The cylinder is damaged.	– Repair or replace the cylinder.
	The adjustable end-position cushioning is set too high.	– Reduce the adjustable end-position cushioning.
Malfunctions with the position sensing	The temperatures are too high or too low.	– Maintain the permissible temperature range.
	The proximity switches are defective.	– Replace the proximity switches.
	Incorrect proximity switch installed.	– Use suitable proximity switches.
	Magnetic or ferritic components near the proximity switches.	– Increase the distance from the components. – Remove the components.
	The cylinder is in DNC version, without position sensing	– Select the cylinder in DNC-...-A version, with position sensing

Tab. 9: Fault clearance

10 Technical data

10.1 Technical data, general

DNC	-32	-40	-50	-63
Mounting position	Any			
Pneumatic port	G 1/8	G 1/4		G 3/8
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]			
Information on the operating medium	Lubricated operation possible, in which case lubricated operation will always be required			

DNC		-32	-40	-50	-63
Max. torque on the piston rod					
DNC-...-Q	[Nm]	0.8	1.1	1.5	
Max. impact energy at the end positions					
DNC	[J]	0.1	0.2		0.5
DNC-...-K10/-S20	[J]	0.1	0.2	0.18	0.45
Cushioning					
DNC-...-P		Elastic cushioning rings/plates at both ends			
DNC-...-PPV		Pneumatically acting, adjustable end-position cushioning, at both ends			
Ambient temperature					
DNC	[°C]	–20 ... +80			
DNC-...-KP	[°C]	–10 ... +80			
DNC-...-S6	[°C]	0 ... +120			
DNC-...-S10/-S11	[°C]	0 ... +80			

Tab. 10: Technical data, general DNC-32 ... -63

DNC		-80	-100	-125
Mounting position		Any		
Pneumatic port		G 3/8	G 1/2	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Information on the operating medium		Lubricated operation possible, in which case lubricated operation will always be required		
Max. torque on the piston rod				
DNC-...-Q	[Nm]	3		–
Max. impact energy at the end positions				
DNC	[J]	0.9	1.2	5
DNC-...-K10/-S20	[J]	0.9	1.2	5
Cushioning				
DNC-...-P		Elastic cushioning rings/plates at both ends		
DNC-...-PPV		Pneumatically acting, adjustable end-position cushioning, at both ends		

DNC		-80	-100	-125
Ambient temperature				
DNC	[°C]	–20 ... +80		
DNC-...-KP	[°C]	–10 ... +80		
DNC-...-S6	[°C]	0 ... +120		
DNC-...-S10/-S11	[°C]	0 ... +80		

Tab. 11: Technical data, general DNC-80 ... -125

10.2 Technical data, pneumatic

DNC		-32	-40	-50	-63
Operating pressure					
DNC	[MPa]	0.06 ... 1.2			
	[bar]	0.6 ... 12			
	[psi]	8.7 ... 174			
DNC-...-KP	[MPa]	0.06 ... 1			
	[bar]	0.6 ... 10			
	[psi]	8.7 ... 145			
DNC-...-Q	[MPa]	0.1 ... 1.2			
	[bar]	1 ... 12			
	[psi]	14.5 ... 174			
DNC-...-Q-...-S6	[MPa]	0.1 ... 0.8			
	[bar]	1 ... 8			
	[psi]	14.5 ... 116			
DNC-...-R8	[MPa]	0.15 ... 1.2			
	[bar]	1.5 ... 12			
	[psi]	21.8 ... 174			
DNC-...-S11	[MPa]	0.03 ... 1.2		0.02 ... 1.2	
	[bar]	0.3 ... 12		0.2 ... 12	
	[psi]	4.35 ... 174		2.9 ... 174	

Tab. 12: Technical data, pneumatic DNC-32 ... -63

DNC		-80	-100	-125
Operating pressure				
DNC	[MPa]	0.06 ... 1.2		0.06 ... 1
	[bar]	0.6 ... 12		0.6 ... 10
	[psi]	8.7 ... 174		8.7 ... 145
DNC-...-KP	[MPa]	0.06 ... 1		
	[bar]	0.6 ... 10		
	[psi]	8.7 ... 145		
DNC-...-Q	[MPa]	0.1 ... 1.2		–
	[bar]	1 ... 12		–
	[psi]	14.5 ... 174		–
DNC-...-Q-...-S6	[MPa]	0.1 ... 0.8		–
	[bar]	1 ... 8		–
	[psi]	14.5 ... 116		–
DNC-...-R8	[MPa]	0.15 ... 1.5		0.15 ... 1
	[bar]	1.5 ... 12		1.5 ... 10
	[psi]	21.8 ... 174		21.8 ... 145
DNC-...-S11	[MPa]	0.01 ... 1.2		0.01 ... 1
	[bar]	0.1 ... 12		0.1 ... 10
	[psi]	1.45 ... 174		1.45 ... 145

Tab. 13: Technical data, pneumatic DNC-80 ... -125

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