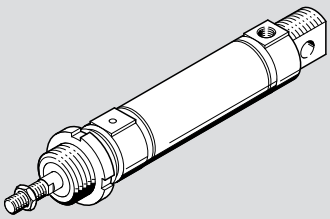
ESNU
Round cylinder



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Operating instructions

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Translation of the original instructions

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.
- Take into account the ambient conditions at the location of use.
- Observe the identifications on the product.
- 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 product is intended for the transport of loads.

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. Personnel must have the relevant mechanical training.

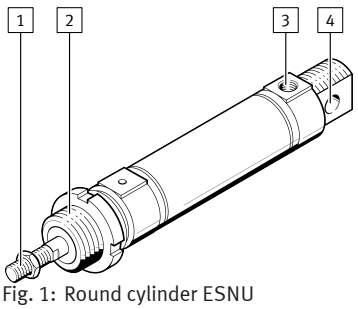
3 Additional information

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

4 Function

The piston rod moves outwards when the cylinder chamber is pressurised.
With single-acting cylinders the extended piston rod is retracted by an integrated return spring.
With a single-ended piston rod the cylinder force is different in forward and reverse.
The position of the piston can be queried by proximity switches.

5 Product design



1 Male thread on the piston rod
2 Male thread on the bearing cap
3 Pneumatic port
4 Cross hole for mounting

Fig. 1: Round cylinder ESNU

6 Transport

NOTICE

Unexpected and unbraked movement of components

- Secure moving components for transport.

1. Take product weight into account ➔ 12 Technical data.
2. Maintain the support clearance of ≤ 300 mm when attaching transportation equipment.

7 Mounting

1. Handle the cylinder so as to avoid any damage to the cylinder barrel and the piston rod.
2. Note the following points:
   - Parallel mounting when using external guides
   - Mounting without distortion
   - Compliance with the permissible loads ➔ www.festo.com/catalogue
3. Observe the maximum tightening torque of the counter nut on the male thread on the bearing cap [2].

ESNU		-8	-10	-12	-16	-20
Maximum tightening torque on the bearing cap	[Nm]	10		20		40

ESNU		-25	-32	-40	-50	-63
Maximum tightening torque on the bearing cap	[Nm]	40	60	80	100	

4. Avoid a mechanical alignment inaccuracy between the piston rod and an external guide with one of the following measures:
   - absolutely precise alignment
   - use of a self-aligning rod coupler FK
   - use of a guide unit FEN with compensating coupling

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

8 Mounting accessories

In the case of a large payload, high piston speed or when using quick exhaust valves:

- Use suitable shock absorbers or external stops.

To prevent the payload from sliding down suddenly in the event of an air supply failure in a horizontal or sloping mounting position:

- Use piloted check valves.

To set the velocity:

- Use one-way flow control valves in the following supply ports:
  - for single-acting cylinders: GRLZ (supply air)

The one-way flow control valves are screwed directly into the supply ports. Use of other accessories with a screw-in depth that is too long will damage the cushioning piston.
For position sensing with proximity switches:

- Use proximity switches with mounting kit.
  Avoid external influence caused by magnetic or ferritic parts in the vicinity of the proximity switches. Distance ≥ 10 mm.

9 Pneumatic installation

- Connect the tubing to the pneumatic port [3].

10 Commissioning

1. Pressurise the complete system. A soft start valve is used for the slow switch-on pressurisation ➔ www.festo.com/catalogue.
2. With medium or large payloads or at high velocities:
   - Use an arrester fixture with sufficient sizing ➔ www.festo.com/catalogue.

NOTICE

Risk of collision due to payloads that project into the setup region of the product.

- Only turn adjusting screws while the product is stationary.

3. Close the one-way flow control valve completely, then open it again by one revolution.
4. Pressurise the cylinder at the pneumatic port [3].
   ↳ The piston rod advances to the end position.
5. Exhaust the cylinder.
   ↳ The piston rod is retracted to the end position by the spring return.
6. Start the test run.
7. If necessary: correct the velocity at the one-way flow control valve. The piston rod should reach the end stop without hard impact or rebounding.

11 Fault clearance

Fault description	Cause	Remedy
Irregular movement of the piston rod, cylinder jolts.	Lack of lubricant	Apply lubricant in accordance with wearing parts sheet ➔ www.festo.com/spareparts.
	The one-way flow control valves restrict the supply air.	Restrict the exhaust air flow if possible, not the supply air.
	The piston rod is dirty.	Clean the cylinder.
		Provide covering.
		Relubricate after intensive cleaning.
	The supply air is insufficient (stick slip).	Keep the tubing lines short and select suitable cross-sections.
		Select the correct pressure.
		Keep the pressure constant.
	The pressure is too low.	Connect volume upstream.
	The guide is not parallel to the direction of stroke.	Use self-aligning rod coupler as in accessories ➔ www.festo.com/catalogue.
The piston does not move to the end position.	The cylinder barrel is damaged.	Replace the cylinder.
	The setting screw for end-position cushioning is completely closed.	Loosen the setting screw.
	Foreign matter in the cylinder.	Filter the compressed air.
	The cylinder travels to an external end stop.	Readjust the end stop.
False triggering during position sensing.	The temperatures are too high or too low.	Comply with the permissible temperature range of the proximity switches.
	Error in the proximity switch	Operating instructions of the proximity switch ➔ www.festo.com/sp.

Tab. 1: Fault clearance

12 Technical data

ESNU		-8	-10	-12	-16	-20
Pneumatic port		M5				G 1/8
Cushioning ESNU-...-P		elastic end-position cushioning, both ends				
Mounting position		any				
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				
Operating pressure	[MPa]	0.15 ... 1			0.12 ... 1	
	[bar]	1.5 ... 10			1.2 ... 10	
	[psi]	21.8 ... 145			17.4 ... 145	
Ambient temperature	[°C]	–20 ... +80				
Theoretical force at 0.6 MPa (6 bar; 87 psi), advance	[N]	24.8	41.7	60.9	107.3	169.2
Theoretical force exerted by spring return force, return	[N]	5.4		7	13.3	19.3
Basic weight	[g]	34.6	37.3	75	89.9	186.8
Added weight per 10 mm stroke	[g]	2.4	2.7	4	4.6	7.2

Tab. 2: Technical data ESNU-8 ... 20

ESNU		-25	-32	-40	-50	-63
Pneumatic port		G 1/8	G 1/8	G 1/4		G 3/8
Cushioning ESNU-...-P		elastic end-position cushioning, both ends				
Mounting position		any				
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				
Operating pressure	[MPa]	0.12 ... 1				
	[bar]	1.2 ... 10				
	[psi]	17.4 ... 145				
Ambient temperature	[°C]	–20 ... +80				
Theoretical force at 0.6 MPa (6 bar; 87 psi), advance	[N]	270.7	442.4	687.6	1071	1763
Theoretical force exerted by spring return force, return	[N]	23.8	40.3	66.3	107	
Basic weight	[g]	238	370.5	661	1087	1445
Added weight per 10 mm stroke	[g]	11	15.5	24	40	44

Tab. 3: Technical data ESNU-25 ... 63