



General






Pneumatic cylinders are extremely robust working elements. Compared to hydraulic or electronic elements, pneumatic cylinders are characterized by low susceptibility to failure and a long service life. With the correct selection of type and the correct dimensions, high speeds are also possible. The prerequisites for failure-free operation of the system are the correct dimensioning, proper installation and careful maintenance.

1. Intended use

Pneumatic cylinders are designed exclusively for operation with purified compressed air. They are not suitable for operation with other media such as liquids or gases. Pneumatic cylinders are intended for use in enclosed spaces for the linear movement of tools, machine elements or connecting structures. Furthermore, the pneumatic cylinder serves to transmit forces.

2. Safety instructions

The safety and health protection signs listed below are labels which (in relation to a specific object) allow a specific activity or a specific situation - in each case by means of a safety sign - to make a safety and health protection statement.

Commandment sign	A command sign is a safety sign that prescribes a certain behaviour.		Follow instructions
			Use hand protection
			Use hearing protection
Warning sign	A warning sign is a safety sign that warns of a risk or danger.		Warning of obstacles on the ground
			Warning of crushing hazard

The safety instructions are intended to protect against dangerous situations and/or property damage and contains important information to protect users and third parties from injury and/or to prevent damage to the system.

- To ensure correct use of the product, read this instruction manual.
- Read the instructions for associated equipment before use.
- Keep these instruction manual in a safe place for future reference.
- To ensure the safety of personnel and equipment, the safety instructions in this instruction manual and other relevant safety practices must be followed.

3. Selection of cylinder

3.1 Piston diameter

The resulting cylinder forces result from the existing working pressure and the selection of the piston diameter. For this purpose, please refer to the "cylinder forces" shown in the RIEGLER main catalogue under „information/tables“.

3.2 Stroke

The stroke of the cylinder depends on the respective requirements of the application or design. In order to facilitate installation, the calculated stroke must have a reasonable clearance. Selecting standard strokes ensures faster and better availability and lower costs. Special strokes according to customer specifications are available on request.

3.3. Cylinder type

The cylinder type must be selected according to the specific requirements for the application and installation of the cylinder.

3.4. Considering whether a cushioning is necessary

Prevents hard approach to the front or rear end position. Elastic and manually adjustable cushioning are available. Using suitable tools on the cylinder head and cylinder cover, the manually adjustable cushioning must be adjusted in such a way that the piston reaches the end position safely but does not hit the end position with full force. For cylinders without cushioning, please ensure that the design of the system prevents the piston from hitting the end position, e.g. by incorporating external shock absorbers.

3.5. Position sensing – selection of proximity switches

For position sensing the cylinder can be equipped with proximity switches. The prerequisite is that the piston is equipped with a magnet. The selection of sensors depends on the external signal processing. The sensor's body should be matched to the sensor slots and sensor holders on the respective cylinders. For selection of available sensors please refer to our product range. The choice depends on the selected cylinder type.

3.6. Installation method

The installation method of the cylinder must be selected according to the application and installation requirements of the cylinder.

4. Storage

Pneumatic cylinders must be left in their original packaging until assembly to protect them from mechanical damage and moisture and dust.

5. Installation and application

The following points for the operation of pneumatic cylinders from RIEGLER & Co. KG must be checked and taken into account before installing the components.

All technical specifications regarding performance and operating conditions must be observed.



- During installation and use, it must be ensured that the movement does not cause any dangerous situations.
- Machines and systems operated by compressed air may only be operated by qualified personnel.
- Remove all transport, packaging and protective materials.
- Ensure pressureless installation, only pressurize the system slowly after complete assembly.
ATTENTION: If pressurization is too fast, uncontrolled rapid piston rod movements may occur.



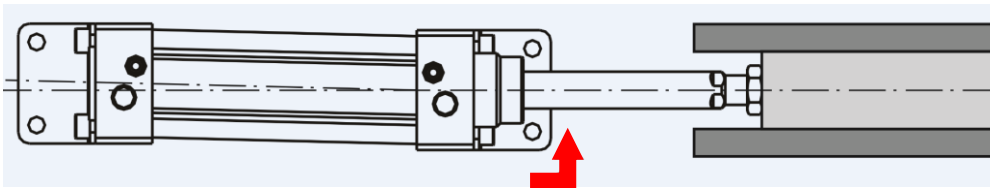
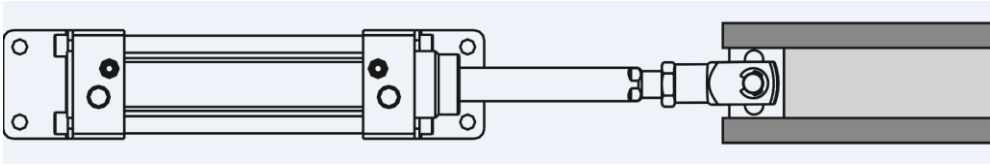
- The temperature at the installation site should be within the temperature range specified in the data sheet. Before carrying out any work on the pneumatic cylinder, allow it to cool down or heat up, or wear heat-resistant or cold-resistant protective gloves.
- Do not use the product in extremely dusty environments where there is a risk of dust entering the inside of the cylinder and drying out the grease. Where possible, suitable protective covers or bellows should be used.
- Do not use in damp environments or where corrosive gases, chemicals, salt water or steam are present.
- Do not mount by force, under tension or under excessive load.
- Check whether the type designation of the cylinder to be installed matches the required cylinder.
- Adjusting screws for end-position cushioning should always be accessible.



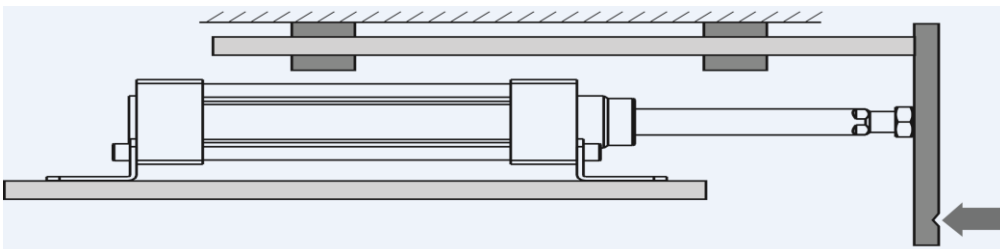
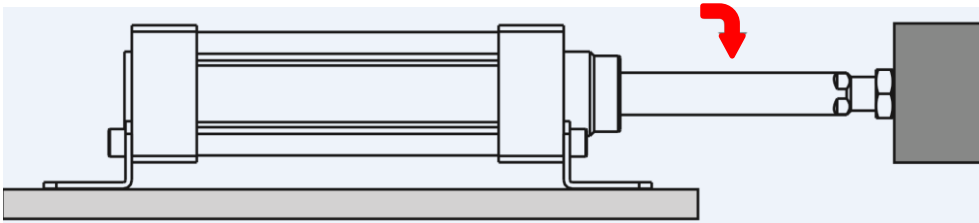
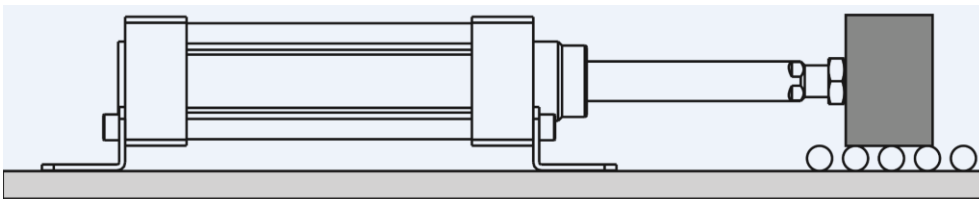
- Lay the compressed air supply/compressed air hoses in such a way that they do not pose a tripping hazard.
- Install the pneumatic cylinder in such a way that it is possible to discharge the electrostatic charge.
- Always ensure proper handling. Avoid damage to the piston rod, seals and cylinder tube. Function and service life are severely impaired by damage.
- Maintain the composition of the medium once selected over the entire product lifetime.
Alternative: If lubricated air is selected, lubrication must continue.

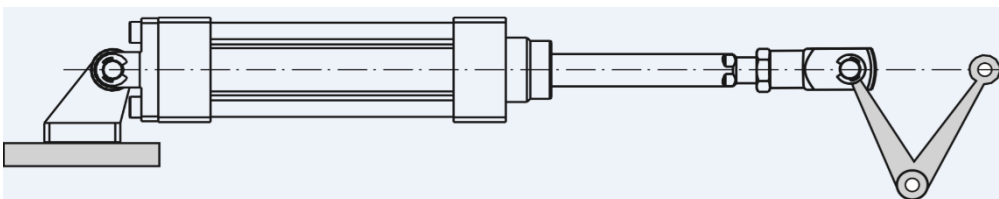
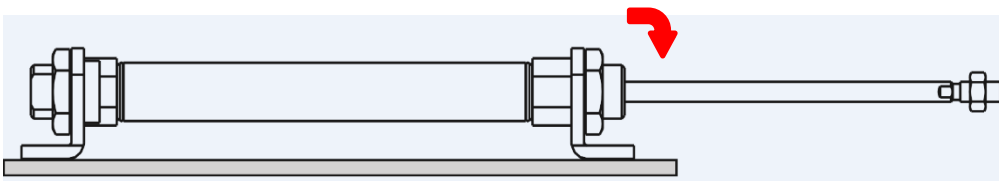
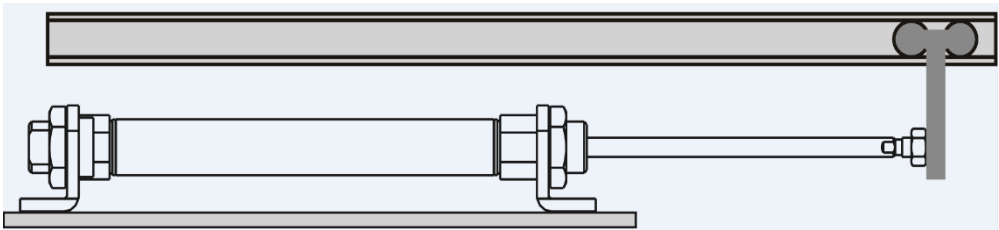
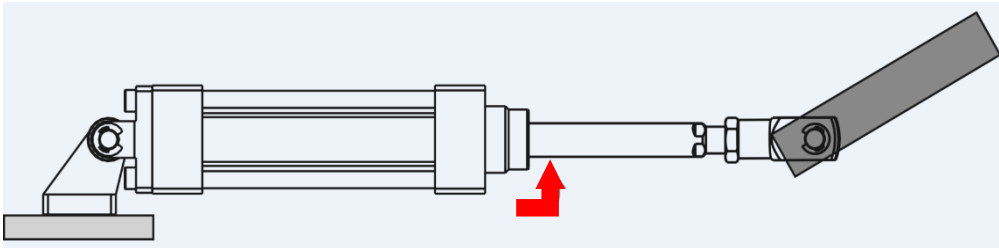
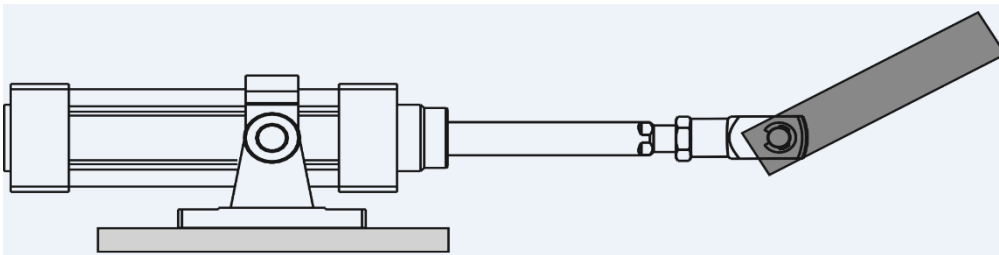
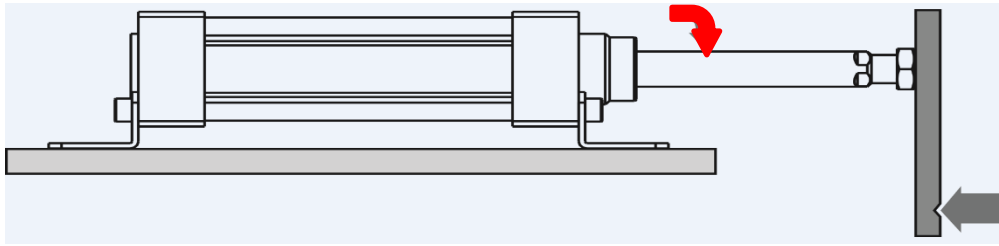


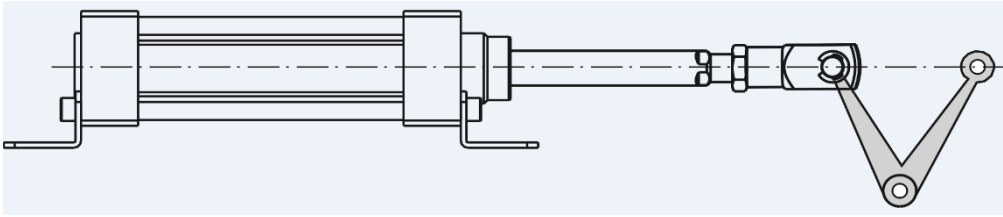
- Noise is generated by escaping air. Take measures to reduce noise, e.g. install silencers. Wear hearing protection when performing activities on the pneumatic cylinder.
- All legal regulations regarding safety must be taken into account.

5.1 The axes of the piston rod must correspond to the direction of movement of the load (coaxial)

5.2 Lateral loads on the piston rod

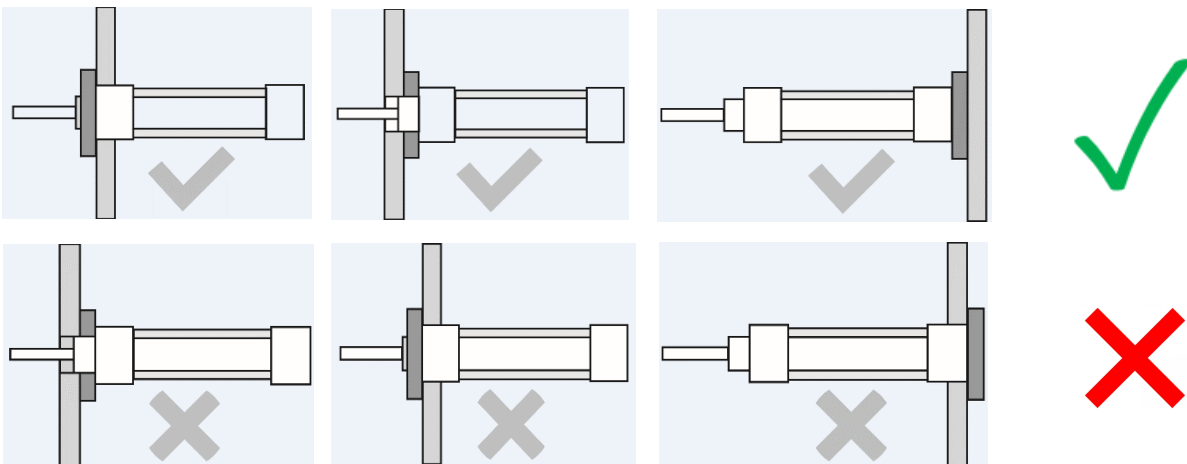
In order to ensure proper coaxial guidance, lateral loads on the piston rod must be compensated by suitable measures (see cylinder accessories in chapter "cylinders and control valves").





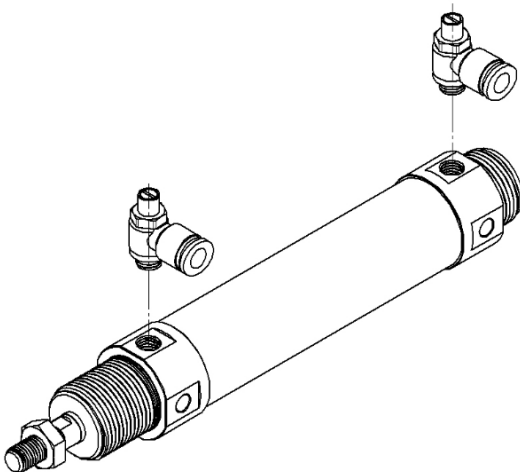


5.3 Proper installation must be carried out taking into account the direction of the load



5.4 Installation of compressed air connections and their thread sizes

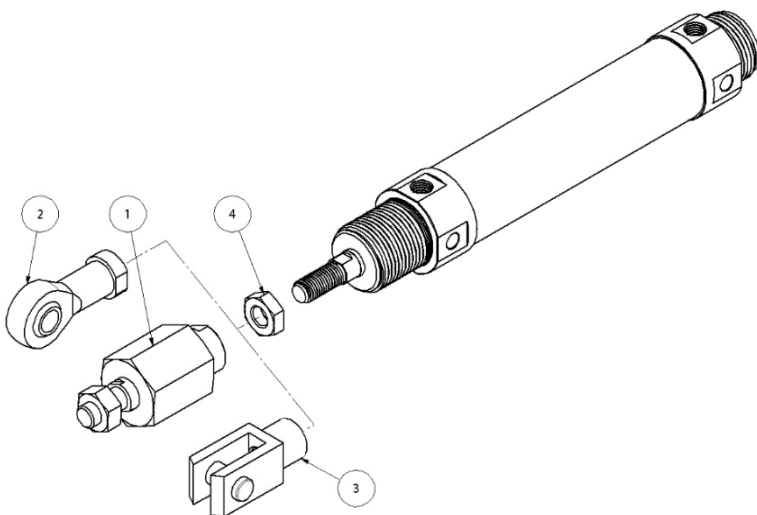
When connecting fittings or pipes, ensure that no sealing material gets inside the connection. When using sealing tape, leave 1.5 or two threads free at the end of the pipe or fitting.



Piston-Ø	Connection size
8	M5
10	M5
12	M5
16	M5
20	M5, G1/8
25	M5, G1/8
32	G1/8
40	G1/8, G1/4
50	G1/8, G1/4
63	G1/8, G1/4, G3/8
80	G1/8, G1/4, G3/8
100	G1/8, G3/8, G1/2
125	G1/4, G1/2

5.5 Installation of fastening elements

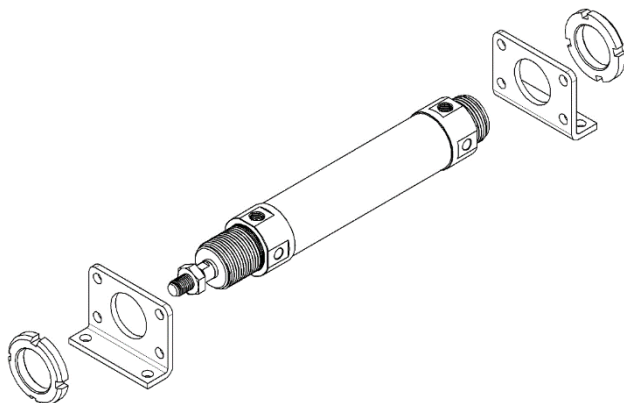
5.5.1 Piston rod accessories



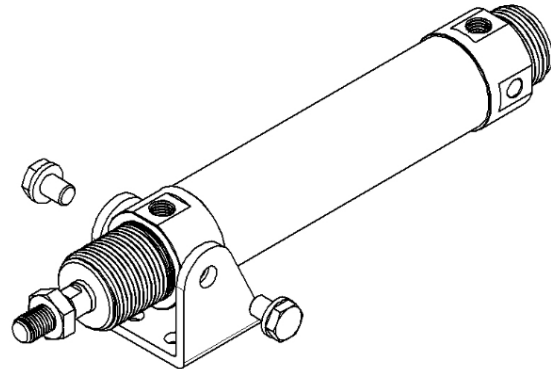
Number	Accessories
1	Self-aligning rod coupler
2	Joint head
3	Fork head
4	Piston rod nut

The nut (4) is screwed onto the piston rod thread. Then the fastening element (1, 2 or 3) is screwed onto the end of the piston rod. The fastening element is fixed by countering the nut.

5.5.2 Foot fastening



5.5.3 Pivoting bearing



6. Commissioning

6.1. Connection of directional control valves and adjustment of throttle valves

The directional control valves must be connected on both sides of the cylinder. When testing the cylinder, the throttle valve must be gradually opened from the closed state and the cylinder slowly vented and adjusted to the desired pressure.

6.2. Cylinder speeds

Throttle valves are used to regulate the speed of cylinders. Basically there are two types of throttling → 1. exhaust air throttling and 2. supply air throttling.

6.2.1 Exhaust air throttling

Exhaust air throttles are mostly used in compressed air systems or in pneumatics. In the case of exhaust air throttling, the supply air flows freely to the cylinder and the throttle in the discharge line puts up resistance to the outflowing air. The piston is clamped between two air cushions which are built up by the pressure of the supply air and by the resistance of the throttle for the exhaust air. This arrangement of the throttle check valves contributes significantly to the improvement of the feed behaviour.

6.2.2 Supply air throttling

With supply air throttling, the throttle check valves are installed in such a way that the air to the cylinder is throttled. The exhaust air can escape freely via the check valve on the discharge side. The smallest load fluctuations on the piston rod, such as when passing a limit switch, result in very large irregularities in the feed rate.

6.3. End-position cushioning

Our cylinders are supplied with or without adjustable end-position cushioning. End-position cushioning must be adjusted manually with a suitable tool on the cylinder head and cylinder cover so that the piston reaches the end position safely but does not hit the end position with full force. For cylinders without end-position cushioning, ensure that the design of the system prevents the piston from hitting the end position, e.g. by incorporating external shock absorbers. The cylinder speed can be regulated by additional use of throttle valves, throttle check valves as well as quick exhaust valves. **ATTENTION:** Quick exhaust valves can considerably reduce the function of end-position cushioning.

7. Maintenance, care and service

Failure to follow these instructions may cause malfunction of the product and damage to the device or equipment.

- Pneumatic cylinders must be subjected to regular visual and functional checks. Damaged cylinders must be replaced. Generally, damaged pneumatic cylinders, e.g. with a burr or crack, should no longer be used and should be replaced.
- Compressed air can be dangerous if not handled properly. Maintenance work on compressed air systems may only be carried out by appropriately trained personnel.
- Before carrying out maintenance work, it is essential to switch off the compressed air/power supply. Make sure that the air is vented to the atmosphere and that there is no more stored energy in the pneumatic circuit.
- After maintenance, connect the system to the operating pressure and power supply and perform the appropriate function and leakage tests to ensure that the equipment is installed correctly.
- To prevent leakage, the sliding parts of the cylinder and the piston rod must not be damaged.
- Do not make any changes to the product.



- Do not disassemble the product unless required by the instructions in the maintenance manual.
- All pneumatic cylinders are self-lubricating. Observe the following for maintenance: Remove dirt on the piston rod with soft, non-fibrous cloths. Permissible cleaning agents are all media that are gentle on the material. Frequent removal of the lubricating layer impairs the service life!

8. Malfunctions and their elimination / failure cause and trouble-shooting

MALFUNCTION	Possible cause	Elimination
1. Piston does not reach the end position	• End-position cushioning closed	• Operate adjusting screw
	• Damage to tube or piston rod	• Renew
	• Foreign body in the cylinder	• Disassemble and clean
2. Failure of the cylinder switches	• Cylinder without magnetic piston	• Change piston or complete cylinder
	• Wrong position of the switch	• Test switch at different positions on the tube
	• Temperature range is exceeded	• Comply to permissible temperature range
	• Cylinder switch is defective	• Replace cylinder switch
3. Jerky movement of the piston rod	• Flow control valves are incorrectly set or positioned	• Open valves. Recommendation: Use of throttle valves to regulate the exhaust air
	• Strong coating on the piston rod	• Clean the piston rod • External protection of the piston rod
	• Lubrication is missing	• Re-grease or check service unit/oiler
	• Seals defective	• Replace seals
	• Too little air	• Check throttle points
	• Pressure too low	• Check mains pressure • Select suitable diameters of the pipeline • Short pipelines

9. Recycling and disposal

When disposing of pneumatic cylinders and their transport, packaging and protective materials, the respective disposal regulations / environmental protection regulations must be observed and carried out via appropriate waste containers. Cylinders that cannot be repaired can be dismantled and fed into the recycling circuit in appropriate containers for used metals. In this case, attention must be paid to any residual toxic or corrosive media.