

General

The double piston pressure multiplier or booster is a device that automatically compresses the compressed air and increases the output pressure up to twice the input pressure. The pressure booster is normally used to increase the input pressure of one or more actuators. The purely pneumatic design makes it suitable for applications that exclude the use of electrical components. Pressure boosters can be equipped with or without a pressure regulator. Check valves are provided to secure the outlet pressure even if the pressure supply is switched off and the pressure booster is vented. They are not intended for continuous operation. If necessary, the duty cycle must be clarified with the sales engineering department of RIEGLER & Co. KG. To prevent pressure fluctuations at the outlet pressure, it is recommended to connect a compressed air tank downstream of the pressure booster. Compressed air tanks up to a volume of 12 litres can be found in the RIEGLER main catalogue or in the online shop. Compressed air tanks with higher volumes are available on request.

1. Intended use

This product is intended for the following applications:

- If certain system parts require a higher pressure than the system's mains pressure.
- If a small cylinder size is desired, while ensuring sufficient strength so that a compact drive unit can be achieved.
- For increasing the pressure of remote or inaccessible system parts by using the air-operated version.
- For quick filling of a compressed air tank under atmospheric pressure.

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 crushing hazard
Prohibition sign	A prohibition sign is a safety sign that prohibits behaviour that may cause a hazard.	 Climbing forbidden

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.

Machines, systems and components may only be operated by appropriately trained personnel.

- The product described here can be dangerous if handled improperly. Assembly, commissioning and maintenance work on machines and systems may only be carried out by appropriately trained and experienced personnel.

Maintenance work on machines and systems or the removal of individual components may only be carried out when safety is guaranteed.



- Inspection and maintenance work on machinery and equipment must not be carried out until all measures have been checked to prevent the driven object from falling or moving unexpectedly.
- If parts or components are to be removed, the above mentioned safety instructions must be observed and any compressed air/power supply must be interrupted. Carefully read product-specific safety instructions of all relevant devices.
- Before restarting the equipment, take measures to prevent unforeseen movements of the equipment or malfunctions.

Ensure that all relevant safety laws and standards are met. All electrical work must be carried out by a qualified person in a safe manner and in compliance with national regulations.

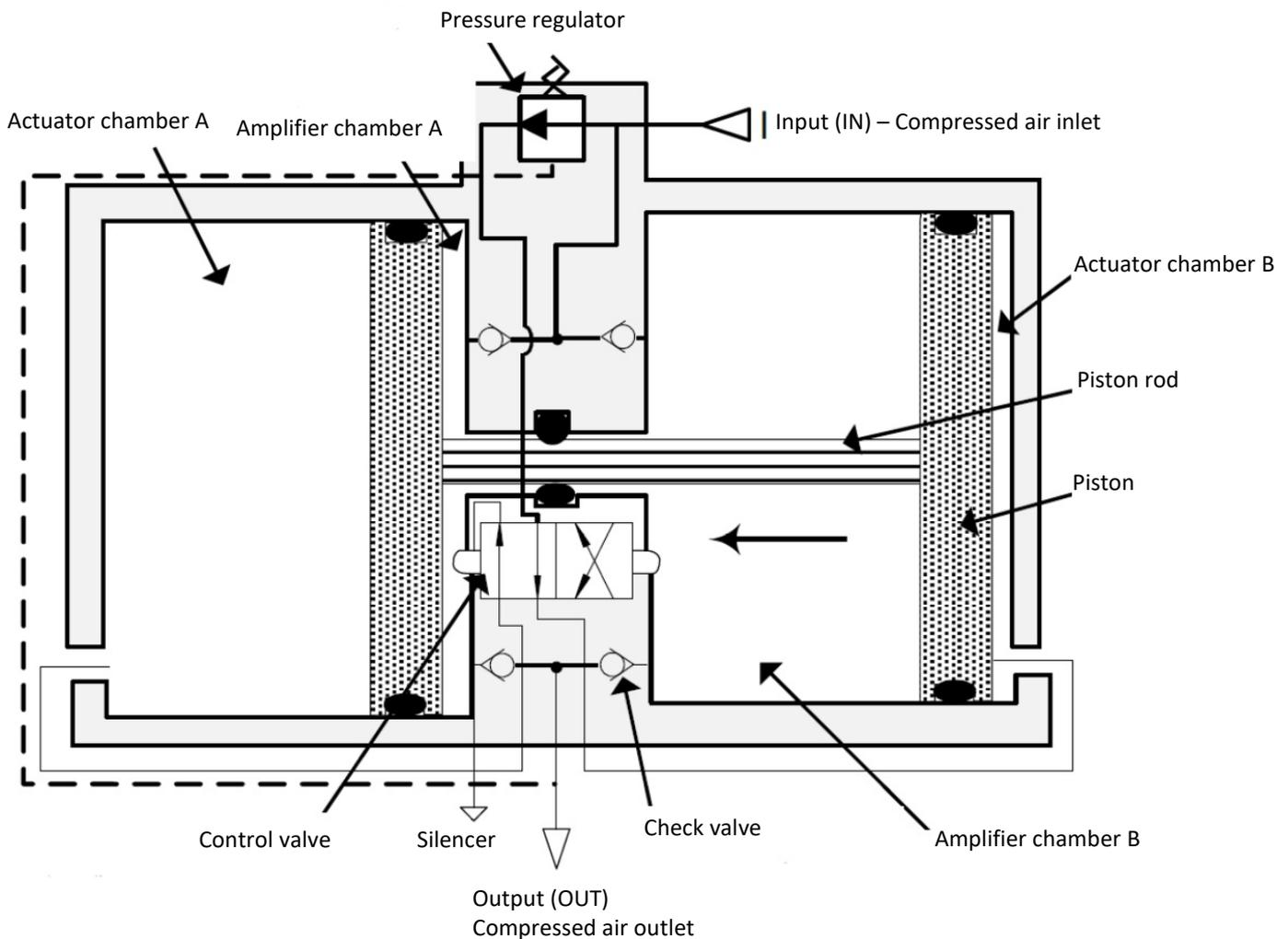
3. Storage

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

4. Functional principle & design

The compressed air from the plant network flows through check valves into the amplifier chambers A and B and through the pressure regulator and the control valves into the actuator chamber B. With the air pressure in amplifier chamber A and actuator chamber B, the double piston moves, compressing the compressed air in amplifier chamber B which is already under prepressure. The compressed air exiting via a check valve can be a maximum of two times higher than the inlet pressure. During this process, the air from actuator chamber A can escape into the atmosphere via a silencer. When the piston has reached the end of stroke, the control valve switches over, the compressed air from the actuator chamber B is vented to the atmosphere, the amplifier chamber A, the actuator chamber A and the amplifier chamber B are pressurized with the inlet pressure and the compressed air from the amplifier chamber A can be compressed higher. This working process is repeated continuously. The compressed air exiting actuator chamber A and B into the atmosphere is the only power loss in this unit.

The outlet pressure is set at the inlet-side pressure regulator. The pressure fluctuations are minimal, which means that the output pressure is kept almost constant. The pressure booster only operates when the set output pressure, which drops due to application operation, is undershot.



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.

- Pressure boosters may only be operated by qualified personnel.
- Remove all transport, packaging and protective materials.
- Check the type designation to see if the desired product is present.
- Hold the pressure booster with both hands during transport. Never hold only by the black knob protruding from the center of the device, as it could detach from the housing, cause the device to fall to the floor, and thus be damaged.
- Before installation, carefully blow through the compressed air line to remove rust particles, scale particles and other dirt from the line. When screwing in fittings or pipes with threads, make sure that no chips or other particles resulting from thread cutting are present on the external thread. Completely remove Teflon residues from fittings that have already been used.
- The installation position is arbitrary.



- Ensure pressureless installation, only pressurize the system slowly after complete assembly.
- Do not mount by force, under tension or under excessive load.
- Since vibrations are transmitted due to the cyclic piston movements, mounting screws should be used for assembly, which are tightened to the specified torque.
- If it is necessary to avoid the transmission of vibrations, rubber buffers should be mounted between the booster and the mounting surface.
- The compressed air to be compressed can be oily or oil-free → oiling of the compressed air is not required.
- Dirt particles, water and oil in the line impair proper functioning and increase wear. For this reason, it is recommended that a standard filter be installed upstream of the pressure booster and, in the case of heavily contaminated compressor intake air, an additional fine filter with a pore size of less than 10 µm.
- The compressed air connection on the input side IN must be elastic.
- If the pressure booster is operated without a tank, an elastic connection is also required on the compressed air output side.



- Noise is generated by escaping air. Wear hearing protection when performing activities on the pressure booster.
- All legal regulations regarding safety must be taken into account.

5.1 Environmental conditions

To avoid errors, the pressure booster must not be used in the following environments:

- Places where contact with corrosive gases, organic solvents, chemicals, salt water, water and water vapor are likely → do not operate the pressure booster when it is immersed in liquids. This can penetrate the inside of the product through the openings and cause malfunctions.
- Environments with direct sunlight where UV rays cause damage to the plastic or the plastic overheats.
- Environments with strong shock and vibration and near heat sources with poor ventilation → shield heat sources with insulating material.



The temperature at the installation site should be within the temperature range specified in the data sheet. Before carrying out any work on the pressure booster, allow it to cool down or heat up, or wear heat-resistant or cold-resistant protective gloves.

Avoid use with extremely dry compressed air and do not use in extremely dusty environments where there is a risk of dust entering the product interior, causing the grease to dry out and thus significantly affecting the reliability and service life of the product.

6. Commissioning

The pressure booster is delivered ready for operation. After the piping has been connected, the pressure booster can be put into operation. The desired or required operating pressure is set on the pressure regulator located on the suction side. When setting the pressure regulator knob or switching on the control pressure, the maximum permissible set pressure must not be exceeded. When the inlet pressure is increased, the outlet pressure is also increased so that the maximum permissible set pressure can be exceeded. The pressure booster then operates according to the compressed air consumption.

7. Maintenance

Failure to follow these instructions may cause malfunction of the product and damage to the device or equipment. 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 sufficient free space in the product environment.

- After completing the maintenance work, turn on the operating pressure and power supply for the equipment and check for proper operation and possible air leakage. In case of faulty operation, check the setting parameters of the product.
- Do not make any changes to the product.



- Do not disassemble the product unless required by the instructions in the maintenance manual.



- Do not climb on the device or place heavy objects on it, as the device may become deformed or damaged.

7.1 Removal of the device

When removing the pressure booster, the following work steps must be followed and observed:



- Switch off the compressed air supply and vent the system.
- For the manually operated version, the compressed air supply must be switched off and the compressed air in the control lines must be released.
- The expected service life of the pressure booster varies depending on the compressed air quality and the operating conditions. Constant blowing off of air in the area of the adjustment button as well as venting noises every ten to 20 seconds despite the absence of air extraction at the output of the pressure booster indicate that the end of the service life will soon be reached. In these cases, the planned maintenance work must be carried out earlier.

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

MALFUNCTION	Possible cause	Elimination
1. No flow	<ul style="list-style-type: none"> • Connections IN – OUT inverted 	Correct connections IN: Input page (mains pressure) OUT: Output page (increased pressure)
2. No pressure increase	<ul style="list-style-type: none"> • Pressure regulator not adjusted 	<ul style="list-style-type: none"> • Adjusting the outlet pressure
	<ul style="list-style-type: none"> • Air consumption on output side too high 	<ul style="list-style-type: none"> • Determine air consumption • Available volume flow must be greater
	<ul style="list-style-type: none"> • Malfunction of control valve due to ingress of foreign particles 	<ul style="list-style-type: none"> • Close vent connection until pressure increase is noticeable, then open abruptly • Vent input IN and output OUT, pressurize input IN immediately afterwards
3. Leakage at the pressure regulator	<ul style="list-style-type: none"> • O-ring / seals defective 	<ul style="list-style-type: none"> • Replace O-ring / seals
	<ul style="list-style-type: none"> • Valve body seat dirty 	<ul style="list-style-type: none"> • Clean or renew valve body seat
4. Performance acc. to techn. data sheet is not reached	<ul style="list-style-type: none"> • Silencer clogged • Pipeline cross section too small 	<ul style="list-style-type: none"> • Replace silencer • Use hose with larger inner-\varnothing

9. Recycling and disposal

When disposing of pressure boosters and their transport, packaging and protective materials, the respective disposal regulations / environmental protection regulations must be observed and carried out via appropriate waste containers. Pressure boosters 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.