



Operation Instruction Manual Pneumatic Actuators

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1 Introduction

Once again you have shown your confidence in our products by selecting it for use in your plant.

The installation, operation and maintenance instructions contained in this manual are intended to be used for all piston type pneumatic actuators we supply from our standard product range. They may also apply to non-standard products, as long as the special additional instructions are followed as well; these can be made available upon request or can be found on our website: www.hpvalves.com

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2 Safety precautions



In terms of their hazard potential, in addition to being subject to these instructions, our products should also be dealt with according to general safe handling instructions and on a par with pressure vessels. Therefore the handling and use of our valves and products should only be entrusted to properly trained personnel.

Proper installation, operation and maintenance is essential to safe and reliable operation of all products supplied by HP Valves. The procedures described in this manual show effective methods for performing the aforementioned activities.

The installation, operation and maintenance of pneumatic actuators may involve proximity to fluids at extreme high pressure and/or high temperature. To minimize the risk of personal injury or damaging the pneumatic actuator, or render it unsafe, it is important to follow the described instructions.

Prior to working with pneumatic actuators or related products, personnel should become familiar with this manual and should be made aware of the hazards related to these procedures.

It is also important to note that the "safety messages" are not exhaustive. Due to the broad application of the products supplied, HP Valves cannot possibly complete a full risk

analysis related to the installation, operation and maintenance of its products.

The safety precautions listed here below are for customer information only. HP Valves Oldenzaal BV waives any responsibility related to any omissions in the precautions and instructions for installation, operation and/or maintenance.

Should anyone decide to install, operate or maintain HP Valves products deviating from the procedures described in this manual, he must make sure that this will not jeopardize personal safety, nor pneumatic actuator reliability.

Furthermore we point out that all personnel handling our products shall be trained professionals and are instructed properly prior to performing the required works.

If not satisfied or in case of any questions regarding tools or methods described, contact HP Valves through e-mail or by phone. Our contact details are shown on the cover page.

- I Prior to using the emergency handwheel (optional), ensure the pneumatic actuator is depressurised. After handwheel operation, return the handwheel position in its neutral position.
- II Do not attempt to disassemble the pneumatic actuator while being in pressurized.
- III During disassembly of the pneumatic actuator, special attention should be paid to the fact some actuators are spring loaded.
- IV No alteration or modification should be made to any pneumatic actuator or related product, except as sanctioned and/or authorized in writing by HP Valves.

3 Transport and Storage

Transport

When loading or unloading our products, ensure that they are handled with care and not subjected to sudden knocks. To ensure proper functioning of our products visually inspect all related products.

Heavy pneumatic actuators and/or related products shall be handled with a rope slung to the cylinder of the actuator its designated lifting eye. The use of chains is prohibited. Always make sure that the product is securely fixed and the ropes are aligned in such manner they cannot damage the product or any parts thereof.

Damaged coating should be touched-up as soon as possible in order to prevent corrosion!

If the products are to be shipped further after unloading, make sure that each individual product is properly secured against damage and properly packaged considering the means of shipment.

Receiving

Unless specified otherwise, products are packed in wooden cases fitted with tared paper on the inside and a layer of plywood between the layers of valves (if applicable). This kind of packing permits to satisfy normal transport needs, guaranteeing a good resistance against humidity.

All products have an adequate protection for storage in a closed environment, up to a maximum period of 3 months. This protection is (if not otherwise specified) any treatment against rust by means of coating i.e. paint and plugs in/on exposed openings such as pneumatic entries. If protection caps are taken out/off for inspection purposes, ensure to refit

them in order to maintain cleanliness. If caps are missing we suggest you to tape of the openings. In case foreign debris has entered the product, make sure to remove it immediately. When using a cleaning agent, ensure the proper solvent is used. Upon receipt of our products, ensure the following documents and labels are available for verification:

- Packing list
- Operation Instruction Manual
- TAG label

Storage

On site, the supplied products must be stored properly to protect them against mechanical damage, ingress of foreign objects, water and/or moisture and corrosion. Storage indoors at ambient temperature is preferred. Should it be unavoidable to store the supplied products outdoors, make sure to support products off the ground or pavement, protected by a watertight enclosure.

The protective packaging we provide must be left intact during storage and should only be removed prior to installation or commissioning. The supplied pneumatic actuators should be stored in their fail-safe position we supply them in.

Long term storage

The following recommendations are to be followed for preparing our products for long term storage. They are necessary to maintain the pneumatic actuators and related products in proper condition prior to installation and use. It is the purchaser's responsibility to take the necessary precautions for the protection of products in storage.

Upon receipt of the products at their destination, the supplied wooden cases shall be examined thoroughly for signs of mishandling or damage during shipment, exposure to rain and/or ocean spray or ingress of foreign debris.

In case the products are to be stored for more than 2 months, make sure that the storage facilities are in an enclosed weather tight building with a concrete floor provided with uniform heating; preferably at ambient temperature or at least 6°C / 43°F, maximum temperature variations and/or relative humidity shall not exceed 50%.



Long term outdoor storage is not permitted, unless specifically agreed upon with HP Valves otherwise!

During long term storage ensure to protect the products against mechanical damage, ingress of rain and/or foreign objects and/or corrosion. The protective packaging we provide must be left intact during storage and shall only be removed prior to installation or commissioning. The supplied pneumatic actuators should be stored in their fail-safe position we supply them in.

Furthermore we recommend to open the lid of the wooden cases ajar to allow air circulation; prevent condensation and corrosion (keep the cases covered to protect against ingress of foreign debris).

Our products are packed with protection caps on/in all openings; do not remove these protection caps unless necessary for inspection and installation. For storage longer than one year, it could be considered to remove the packing and apply an absorber, i.e. silica gel in the correct quantity.

Periodic inspections should be performed on all long term stored products. The frequency of these inspections should be determined based on the storage conditions available. At a minimum, all products should be inspected every 4-6 months. Inspect for dirt, moisture or any other type of contamination. If any is found, the product is to be thoroughly cleaned and dried.

When products are stored for a long period of time, it is recommended they are labelled as long-term storage items. When these products are ready for use, extra attention shall be paid to the condition of the products.

4 Installation Instructions

The designer, contractor or end user holds overall responsibility for positioning, installation and operation of the valve-unit in the piping system. Planning and installation errors can affect the proper operation of pneumatic actuators and may even constitute major hazard potential. So please take notice of the following instructions;

- Air connection (pipes and fittings) should be made of stainless steel or brass.
- The piston rod and moving parts of the valve should be accurately aligned to prevent torsion and excessive wear to both the pneumatic actuator and the valve.
- In case pneumatic actuators are installed horizontal or under an angle, be sure to provide sufficient support.
- Do not install the actuators in places where they are exposed to high, non-allowable temperatures.
- Install the actuators in such a manner that the piston rod cannot be damaged, since damage will result in heavy wear to the piston rod bearing and -seal.
- A proper air filter with water separator has to be mounted in front of the pneumatic actuator.
- Make sure the safety instructions attached on the pneumatic actuator are visible and remain intact.

Filters and / or lubricators may be mounted at some distance from the actuator, however not further away than 5 meters.

Before connecting the pneumatic actuator to its air supply, make sure the inside of all piping is thoroughly cleaned and dried. It must be absolutely free of dirt, moisture, rust, chips or any other contamination.

In case the pneumatic actuator is equipped with an emergency handwheel please take note of the following:

- The handwheel is supplied separate. Upon installation of the valve/actuator combination the handwheel can be installed to the actuator. Place the parallel key in the drivenut and install the handwheel over it, finally place the nut on top of the handwheel and tighten it.
- The handwheel position is in the neutral position during pneumatic operation. If the handwheel is not in the neutral position, the piston inside the actuator cannot travel correctly.
- When the emergency handwheel is operated, make sure the actuator is depressurized.

- When the handwheel is operated, first there will be some travel internally prior to opening / closing of the pneumatic actuator.

5 Product description

Our pneumatic actuators can be provided in the following configuration;

- Single-acting pneumatic actuators, completed with a spring to achieve fail-to-open or fail-to-close position.
- Single-acting tandem pneumatic actuators, completed with a spring(s) to achieve fail-to-open or fail-to-close position.
- Double-acting pneumatic actuators, completed with an optional airtank to achieve fail-to-open or fail-to-close position.

Pneumatic actuators can be provided with a wide range of optional extra's, i.e. equipped with an emergency handwheel, solenoid protection plate, quick exhaust, positioner, limit switches, junction box, etc. etc.

Additional information about these optional extras can be obtained by contacting your contact person within HP Valves.

6 Technical details

Working pressure;
max. 8 bar / 0.8 mPA / 116PSI

Operating temperature;
Min. -20 °C Max. 70 °C / Min. -4°F Max. 158°F

Medium;
Compressed air, dry and filtered to 50 µ.
Either non-lubricated or lubricated air.

7 Maintenance instructions

General

Caution

Before undertaking maintenance and assembly work, please read the general safety precautions and relevant safety rules of the plant. Opening the actuator can only be done in consultation with HP Valves BV. The high force generated by the spring in the actuator makes it necessary to apply special tools and it requires specific knowledge for a safe disassembly of the actuator.

The supplied piston type pneumatic actuators are suitable for operation under arduous conditions and are of such a design that maintenance can be kept to the minimum. The following parts are subject to normal wear and tear and should be inspected regularly;

- piston seal ring
- piston rod bearing
- piston rod seal
- piston rod scraper

Prior to performing any maintenance work, make sure the air supply is switched off and the pneumatic actuator is depressurised.

For replacement of the rod seal, scraper or piston rod bearing, take away the seal adaptor without further dismantling of the pneumatic actuator. Remove the four bolts and pull the seal adaptor from the actuator. Replace the seals and piston rod bearing when necessary. In case the seals are replaced, avoid the use of sharp tools and make sure no damage is done to the seals, especially the edges and lips should be free of any defects. During inspection, check the piston rod for damages as well. In case damages on the piston rod are observed, repair or replace the part prior to the assembly of the actuator.

Apply a sufficient amount of grease (i.e. Molykote BR-2) to the seals, before mounting the sealing cover into the actuator again. Assembly should be performed in the reverse order as described above. Retorque the bolting to 12Nm. For replacement of parts other than the mentioned seals, the actuator has to be fully disassembled by a trained professional.

Lubrication

Our pneumatic actuators are suitable for use with either non-lubricated or lubricated air. Be aware that since the oil mist washes out the initial grease from the actuator, oil mist lubrication has to be maintained once it has been used.

If oil mist lubrication is used, we recommend to use the following lubricating oils:

- FINA Purfiroc EP10
- Shell Tellus 15
- Gulf Gulfstone 46
- Texaco Randon HD10
- BP HLP22 / HLP15
- Esso Arox EP10
- Castrol AWH 15
- Bevrol Indula HV10
- Total Azolla ZS10 / ZS15

8 Spare parts and service

HP Valves maintenance staff is at your disposal to remedy defects and to perform the necessary maintenance to the actuators.

If upon inspection it becomes apparent parts require to be replaced, only original parts shall be used in order to be able to guarantee proper fit and operation after reassembly of the pneumatic actuator.

When ordering spare parts, specify the following:
Type of actuator (see name plate), year of manufacture, drawing number and (where possible) the Purchase Order number under which the actuator was first supplied.

Contact: P.O. Box 50040
7550 LA Hengelo (Ov)
The Netherlands
Telephone +31 (0)74 7820000
E-mail sales@hpvalves.com

9 Troubleshooting

In case the pneumatic actuator appears to be losing power, check the following points:

1. Check the air pressure on the pressure gauge at the pressure regulator. When the gauge does not show the correct pressure, adjust the pressure regulator until the correct pressure is reached. In case this is not effective, check the air pressure reading at the gauge on the compressor or air tank and check the piping for leaks and or defects.
2. When oil mist lubrication is used, check the lubricator. Check the oil level, top up if required using the appropriate oil as specified under "Lubrication". If the level is correct, check if oil drops into the feed air at regular intervals. If not, adjust the regulating screw on the lubricator or clean and repair the air lubricator.
3. Check the filter / regulator, in case this is full of water make sure to drain it by gently pushing on the drain pin located at the bottom of the bowl. Furthermore we advise to clean the filter element in case this is saturated with water or other foreign particles.
4. Check all connections on tightness. Tighten any loose or leaking connection.
5. Check all piping / tubing for sufficient air flow. In case air flow is compromised, replace the affected pipe or tubing section.
6. Check the actuator for leakage past the piston rod. In case leakage is detected, replace the piston rod seal and make sure to locate the cause of the defective seal. Prior to mounting a new seal, the cause for leakage has to be determined and eliminated. Special care should be applied to check the piston rod for any damages.
7. Check to see whether air is continuously flowing through the actuator air silencer, located to the actuator exhaust port. If this is the case, the piston seal must be checked and replaced if necessary.

In case the pneumatic actuator is operated through the emergency handwheel, take note of the following points:

1. The handwheel position is in the neutral position during pneumatic operation. If the handwheel is not in the neutral position, the piston inside the actuator cannot travel correctly.
2. When the emergency handwheel is operated, make sure the actuator is depressurized.
3. When the handwheel is operated, first there will be some travel internally prior to opening / closing of the pneumatic actuator.