

Operating instructions for pilot operated solenoid valves

It is essential to follow these installation and operating instructions. To ensure perfect functioning and long service life, the limit values for pressures and temperatures must be observed, as must the information contained in the data sheet and delivery note. You must also comply with national regulations when in use in safety areas. Failure to follow these instructions will exempt us from all liability and will invalidate the warranty on equipment and accessories.

► Function:

The standard pilot operated valve is always closed when de-energised (NC). In the de-energised position, the plunger closes the pilot orifice by means of spring force. The medium reaches the upper control chamber via the build-up orifice and supports the closing process. The diaphragm or piston then seal the valve seat, assisted by the pressure of the medium. If the solenoid is energised by applying a voltage, the plunger lifts opening the pilot orifice and the pressure in the control chamber falls. The higher pressure below then lifts the diaphragm or piston off the valve seat. The valve opens.

► Important for smooth valve functioning: Observe the specified pressure difference between connection "P" and connection "A". Please note: If the follow-up flow rate is too small in relation to the nominal diameter, then Δp may also be too small.

► Storage and transportation:

The valves must be properly protected and stored in a clean, dry area. For the handling of heavy valves, only use the eye bolts provided for this purpose and/or suitable certified slings on the valve body. Never use the actuator as a carrying handle or lever!!!

► Installation:

When installing, the direction of the medium which flows through the valve, must be taken into consideration. The valve is designed to function in a specific direction only, and its function is defined. If the valve is not correctly installed, it will not function. To prevent the risk of this happening, the valve is engraved with permanent legible markings on the connections. P for input, A for output and R for return flow or, in the case of 3/2-way valves, for the second output. The installation direction of the standard type valve up to DN50 (G2) is optional. With the combination of added options, only after consultation with GSR. As for DN65 and above, it is only permitted to install the valve with the actuator in the vertical position with the medium flowing horizontally. Always take into consideration the direction of the arrows or the connection markings (P, A, R) on the housing, in respect to the flow of the medium.

Before installation, rinse through pipes with pressure intervals. In accordance with DIN 3394 and DIN EN 161, a strainer must be fitted upstream of every shut-off valve so as to ensure smooth functioning with neutral media. Dirt may cause blockage of small orifices such as the pilot or reduction orifice, and may restrict or prevent functions such as closing/opening the valve.

If a valve is installed with a sleeve connection, please do not use the coil as a lever. Connection flanges, inclusive of sealing materials and connection elements, conform to the standards of pipeline manufacturing and are the responsibility of the system engineer.

► Putting into operation:

Depending on the area of use, surface temperatures higher or lower than the ambient temperatures may occur on the valve housing. In system engineering, pipes with large temperature differences relative to the ambient temperature are usually insulated accordingly to save energy. This insulation should also include the housing of the industrial valve. The solenoid must not be insulated both for thermal reasons (heat build-up) and also to permit easy maintenance. Insulating the housing excludes the possible risk of burns. The decision regarding insulation is taken by the system engineer and is thus his responsibility. Finally, there is a small residual risk caused by high temperature on the solenoid, which depends on the frequency of operation. Caution: Surface temperature can exceed 100°C!

Some valves are equipped with adjustable closing regulation, which is set at the factory for reliable valve functioning with regard to closing time at a viscosity of the medium of up to 22 mm²/s. The setting is made using a locked adjustment screw and can, if required, be changed and readjusted by the customer to suit the particular system. This entails the risk that, if handled incorrectly, the adjustment screw might be removed completely and the medium would be able to escape to the outside through the control orifice.

Furthermore, the closing time is set at the factory so that up to the stated viscosity of the medium no, or only minimal, pressure surges occur in the pipe system. Adjustment by the customer/system operator may, however, be necessary (depending on the viscosity of the medium). For this reason, the adjustment screw must not be fixed. It is therefore the responsibility of the system operator to have the adjustment made by expert staff when the system is put into operation and thereby prevent the risk of the adjustment screw being removed completely.

When operating the industrial valve within a system, electrostatic charges may occur due to the flow of the medium. These charges are normally discharged to earth via a cable connection or via the electrically conductive pipe system. The industrial valve has a threaded hole in the housing to permit connection of a cable.

► Electrical connection:

The solenoid systems in the standard range have either a plug-in connection or a terminal box on the solenoid.

Before connecting the power supply, check the specified type of current and voltage on the rating plate and delivery note.

Voltage tolerance +5%/-10%. The valves are designed for continuous duty. The operating time is the function in which the solenoid remains energised until the load temperature is reached. Protect electrical connections against continuous moisture.

If installed outdoors, provide adequate covering. IP 65 enclosure protection means that the unit is only designed for short exposure to moisture. Electrical connections must only be made by qualified staff. In the case of solenoids that only operate with accompanying rectifier or switching electronics, it is obligatory for these to be connected.

► Possible malfunctions:

Check the direction of flow, voltage, place of use and operating pressure!

- Valve does not close
 - no, or inadequate, Δp or flow rate is present
 - dirt in the control orifices
 - plunger is sticking
 - rated voltage is not present
 - incorrect installation position
 - direction of the arrows or markings (P, A, R) are not identical with direction of flow

- Valve does not open
 - diaphragm or plunger is defective
 - load relief orifice is blocked (inspect the seal or screw connection)
 - plunger does not rise (audible knocking "clicking")
 - connection voltage has been interrupted or is insufficient
 - solenoid or rectifier is defective
 - plunger is sticking in a blocked tube. (When the plunger does not reach the stroke end position, this causes the solenoid to fail (thermal overload) after a short time if the alternating current solenoid is energised)
 - rated voltage and coil voltage are different

► Action

Action must only be taken by qualified staff and using suitable tools. If the valve is still under warranty, you must consult GSR before taking any action, failure to do this will result in the termination of the warranty. When added options are present and the valve differs from the standard, due to the different possibilities and/or of the valves special functions, please follow the technical data as shown in the delivery note or preceding offer. In this case these operating instructions only apply with limitations.

► Information about the Pressure Equipment Directive:

All valves are designed and manufactured in accordance with the EU Directive 97/23/EC (Pressure Equipment Directive). Equipment that has no CE mark on the housing comes under Article 3 Paragraph 3 of the Directive. They are designed and manufactured on the basis of "good engineering practice" and are not allowed to carry a CE mark.