

1. General

Before commissioning proportional valves the guidelines stated in the following data sheets should be taken into account:

- The relevant data sheet
- VDI guidelines VDI 3027
- German standard DIN 24 346
- ISO standard ISO 4413

2. System flushing

With external pilot oil supply, it must be ensured that this connection is also flushed.

The oil volume contained within the system should be flushed through the filter 150 to 300 times.

As a guide the flushing time can be calculated as follows:

$$t \approx \frac{V}{q_v} \times 2,5 \text{ to } 5$$

With:

t = Flushing time in hours

V = Reservoir capacity in Litres

q_v = Pump flow in L/min

A decisive factor which affects the flushing time is the fluid contamination grade, see point 4.3. To achieve the minimum level the hydraulic system has to be flushed until this level has been achieved. This can only be achieved by continuously monitoring the particule count with a monitoring unit.

When changing over to special fluids which are **not** compatible or which do not mix with the fluid which has been used in the system, considerably longer flushing times can be necessary.

During the flushing operation all of the filters must be checked at short intervals and the filter elements changed as required.

3. Installation

3.1. Installation guidelines

Before the valve is assembled onto the system, the designation of the valve should be compared with the order data.

– Cleanliness:

- When installing proportional valves the valve and the area to which it is to be fitted must be clean
- The reservoir must be sealed against external contamination
- Piping and reservoir must be cleaned of dirt, scale, sand, swarf, etc.
- Welded or hot formed pipes are to be pickled, flushed and finally oiled
- For cleaning only use lint free cloths or special paper

– Sealing materials such as hemp, putty or sealing tape are not permissible

– In the interest of obtaining a high stiffness hoses between the valve and actuator should be avoided.

– For pipe work seamless steel pipes to DIN 2391/part 1 and 2 are to be used.

– Piping between the actuator and valve should be as short as possible; we recommend that the proportional valve should be installed as close as possible to the actuator. The mounting surface must have a surface finish of $R_{tmax} \leq 4 \mu\text{m}$ and a flatness of $\leq 0,01 \text{ mm}/100 \text{ mm}$.

– Fixing screws must be to the dimensions and tensile strength as stated in the catalogue sheets, they must also be tightened to the correct torque.

– As a filler/breather we recommend that a filter with the same rating as the filters in the hydraulic system is used!

3.2. Installation position

A horizontal position is preferred, if however the proportional valve is fitted to the actuator, a position where the spool is parallel to the acceleration direction is to be avoided.

3.3. Electrical connections

The electrical connection details can be obtained from the data sheet.

Special types of protection, require special measures to be taken, these are stated within the relevant data sheets.

4. Commissioning

4.1. Pressure fluid

The recommendations stated in the data sheets are to be taken into account!

Pressure and temperature ranges are to be observed.

Generally the following fluids can be used:

– Mineral oil to DIN 51 524 (HL; HLP)¹⁾

Fast bio-degradable pressure fluids to VDMA 24 568 (also see RE 90 221)

– HETG (rape seed oil)¹⁾

– HEPG (polyglycol)²⁾

– HEES (synthetic ester)²⁾

(other fluids on request)

¹⁾ suitable for NBR **and** FPM seals

²⁾ **only** suitable for FPM seals

In order to protect the pressure fluid the manufacturer's recommendations concerning maximum temperatures should be observed. In order to obtain constant response characteristics from the system, it is recommended that the fluid temperature should be held constant ($\pm 5 \text{ }^\circ\text{C}$).

4.2. Are the sealing materials used suitable?

For pressure fluids (e.g. HEPG and HEES) as well as temperatures > 80 °C FPM seals must be used (defined in the type code with "V").

4.3. Filtration

– A reliable supply filtration (10 µm absolute) increases the service life of the pilot controls.

Please take note of the maximum permissible NAS 1638 cleanliness grade for the pressure fluid which is stated in our catalogue sheet.

– The maximum permissible filter element pressure differential must not be exceeded.

– We recommend that filters are fitted with clogging indicators.

– Great care with regard to cleanliness should be taken when changing filter elements.

Contamination on the outlet side of the pressure filter can be flushed into the systems and cause malfunctions.

Contamination on the inlet side reduces the service life of the filter element.

4.4. Pilot valve operating pressure

– For pilot operated proportional directional control valves type WRZ:

The pilot pressure must not fall below 30 bar. If the pilot pressure exceeds 100 bar a sandwich plate type pressure reducing valve must be installed in the supply line. Pressure shocks from the tank line can be minimised by fitting a check valve.

– For other pilot operated proportional valves:

The pilot pressure for other pilot operated valves can be obtained from the relevant data sheet.

4.5. Solenoid bleeding

In order to ensure correct function it is necessary during commissioning to bleed the valve at its highest point. Depending on the installation the emptying of the tank line can be avoided by fitting a backpressure valve.

5. Maintenance**5.1. Return of the valve for maintenance**

When returning a defective valve it is necessary to protect the base of the valve against contamination.

Careful packing is recommended to avoid any damage during transport.

6. Storage

Storage requirements:

– A dry, dust-free room, free of corrosive substances and vapors

When storing for periods exceeding 3 months:

– Fill the housing with preservative oil and seal the valve.



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