

# Installation, commissioning and maintenance of proportional valves

**RE 07800/07.05**  
Replaces: 12.02

1/4

## 1. General

Before commissioning proportional valves, observe the notes in the following data sheets:

- Associated data sheet
- German standard DIN 24346
- ISO standard ISO 4413

## 2. System flushing

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

The hydraulic fluid volume contained in the system should be flushed at least 150 to 300 times through the filter.

This results in the following flushing time guideline:

$$t \approx \frac{V}{q_v} \times 2.5 \text{ to } 5$$

Where:

$t$  = flushing time in hours

$V$  = tank capacity in litres

$q_v$  = pump flow in l/min

The decisive factor for the flushing time is the degree of contamination of the hydraulic fluid according to section 4.3. The hydraulic system must be flushed until the required minimum cleanliness is achieved. This is only possible with permanent monitoring with the help of a particle counter.

When changing over to special fluids, which are not compatible or miscible with the hydraulic fluid used so far, considerably longer flushing times may be required.

During flushing, check all filters at short intervals and change the filter elements as required.

Continued on page 2

### 3. Installation

#### 3.1 Rules for the installation

Before installing the valve in the system, compare the type designation of the valve with the ordering data.

– Cleanliness:

- Ensure cleanliness of both, the surroundings and the proportional valve when installing the component
- The tank must be sealed against external contamination
- Clean pipes and tanks from dirt, scale, sand, chips, etc. before installing the valve
- Hot-bent or welded pipes must be pickled, flushed and oiled
- Use only lint-free cloth or special paper for cleaning

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

– In the interest of obtaining high stiffness, hoses between valves and the actuators should be avoided.

– Use seamless precision steel pipes to DIN 2391/ parts 1 and 2 for the pipework.

– The connecting pipes between the actuator and the valve should be as short as possible; we recommend the installation of the hydraulic valve as close as possible to the actuator. The mounting face must feature a surface quality of  $R_{t\max} \leq 4 \mu\text{m}$  and a flatness of  $\leq 0.01 \text{ mm}/100 \text{ mm}$  length.

– Fixing screws must be of the dimensions and strength class specified in the data sheet and be tightened to the prescribed tightening torque.

– As a filler/breather filter we recommend a filter with the same mesh width as the filters used in the hydraulic system!

#### 3.2. Valve mounting

When mounting the valve, take care that the base of the valve and the subplates are dry and free from oil. If mounting without the presence of oil is impossible, the fixing screws must generally be tightened manually and not with the aid of power tools. In the case of more than 4 fixing screws, care should be taken to tighten the central screws first.

This ensures that the seal rings seal correctly on the valve mounting face.

#### 3.3. Installation orientation

Preferably horizontal; however, if the proportional valve is to be mounted onto an actuator, see to it that the valve spool is not arranged in parallel to the direction of acceleration of the actuator.

#### 3.4. Electrical connection

For the electrical connection, please refer to the relevant data sheet.

Special types of protection require special measures that are described in the relevant data sheet.

### 4. Commissioning

#### 4.1. Hydraulic fluid

Observe the recommendations given in the data sheet!

Observe pressure and temperature ranges!

In general, the following fluids can be used:

– Mineral oil to DIN 51524 (HL; HLP) <sup>1)</sup>

Fast bio-degradable hydraulic fluids to VDMA 24568 (see also RE 90221)

– HETG (rape seed oils) <sup>1)</sup>

– HEPG (polyglycols) <sup>2)</sup>

– HEES (synthetic esters) <sup>2)</sup>

Other hydraulic fluids on enquiry!

<sup>1)</sup> Suitable for NBR and FKM seals

<sup>2)</sup> Suitable only for FKM seals

Whenever possible, the maximum temperatures recommended by the manufacturer should not be exceeded in order to spare the hydraulic fluid. To ensure stable response characteristics of the system, it is recommended that the hydraulic fluid temperature be kept constant ( $\pm 5 \text{ }^\circ\text{C}$ ).

#### 4.2. Are the seal materials used compatible?

For hydraulic fluids (e.g. HEPG and HEES) and in the case of temperatures  $> 80 \text{ }^\circ\text{C}$  FKM seals **must** be used (identified with "V" in the type code).

#### 4.3. Filtration

– Reliable supply filtration (10  $\mu\text{m}$  absolute) prolongs the service life of the pilot control.

Please take also note of the recommendations for the max. permissible degree of contamination of the hydraulic fluid to ISO 4406 (c) in our data sheet.

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

– We recommend filters with clogging indicators.

– Observe strictest cleanliness when changing filters.

Contamination on the outlet side of the filters is flushed into the system and cause malfunction.

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

#### 4.4. Operating pressure for the pilot valve

– For pilot operated proportional directional valve type WRZ:

The pilot pressure must not be less than 30 bar. If the pilot pressure exceeds 100 bar, a sandwich plate pressure reducing valve must be installed in the supply line. Pressure surges from the tank line can be avoided with the help of a check valve.

– For other pilot operated proportional directional valves:

The pilot pressure for other proportional directional valves can be found in our data sheet.

#### 4.5 Solenoid bleeding

To ensure proper functioning, the valve must be bled at the highest point during commissioning. Depending on the installation situation, draining of the tank line must be prevented by installing a preload valve.

### 5. Maintenance

#### 5.1. Return of the valve for repair purposes

When returning a defective valve, the base of the valve must be protected against contamination.

Careful packaging is recommended to prevent any further damage in transit.

### 6. Storage

Requirements for the storage room:

- Dry, dust-free room, free from etching agents and vapours

For storage periods longer than 3 months:

- Fill the housing with preservative oil and close the valve

## Notes

---