Danfoss PME 5-65 Pilot Operated Servo Valve Installation Guide

Contents

Danfoss PME 5-65 Pilot Operated Servo Valve

Specifications

- Product Name: Pilot-operated servo valve PME 5-65
- Working Pressure: Max. 28 bar g (406 psi g)
- Refrigerants: Applicable to HCFC, HFC, and R717 (Ammonia)
- Function: Regulates flow by modulation or on/off function based on control impulse
- Main Valve Opening Differential Pressure: 0.07 bar (1 psi) to start opening, 0.2 bar (2.8 psi) to be fully open

Product Usage Instructions

Installation:

1. Ensure the O-ring is not damaged and replace parts if the Teflon valve plate is damaged.
2. Install the valve with the arrow indicating the direction of flow and the top cover facing upwards.
3. If using an external pilot valve, connect the pilot line to the upper side of the main line to prevent dirt and oil contamination.
4. Avoid liquid traps and hydraulic pressure risks caused by thermal expansion in the piping system.

Usage Recommendations:

1. The valve is suitable for use in closed circuits only.
2. Not recommended for use with flammable hydrocarbons.
3. Ensure proper pressure differentials for optimal valve performance.

Maintenance:

1. Regularly check for any damage to the O-ring and Teflon valve plate.
2. Clean the strainer periodically to prevent clogging.

Installation

Design
See Fig. 1

- 1. Valve body 1a and 1b. Channels in the valve body (1)
- 10. Valve spindle
- 11. Throttle cone
- 12. Valve seat
- 21a. Equalizing hole in servo piston (24)
- 22. Locking ring
- 24. Servo piston
- 24a. Gasket
- 30. Bottom cover
- 33. Strainer
- 36. Bottom plug
- 40. Cover 40a, b, c, and d. Channels in cover (40)
- 44. Pressure gauge connection
- 60. Manual operating spindle
- S I, S II, and P. Pilot valve connections

Refrigerants
Applicable to HCFC, HFC, and R717 (Ammonia).
Flammable hydrocarbons are not recommended. The valve is only recommended for use in closed circuits. For further information, please contact Danfoss.

Temperature range
PME: –60/+120°C (–76/+248°F)

Pressure range
PME: The valves are designed for a max. Working pressure of 28 bar g (406 psi g).

Technical data

- The PME 1 can be used in suction, liquid, hot-gas, and liquid/vapour lines.
- The PME 1 regulates the flow of the medium by modulation or on/off function, depending on the control impulse from the screwed on pilot valves.
- The PME 3 has three connections for pilot valves: two in series, marked “S I” and “S II”, and one in parallel with these two, marked “P”, figs. 3 and 4.
- If only two pilot valves are necessary for the function required, the third pilot connection must be sealed with a blanking plug (see fig. 4). A blanking plug is supplied with the valve.

Opening differential pressure (Δp)

The PME main valve requires a minimum opening differential pressure of 0.07 bar (1 psi) to begin to open and 0.2 bar (2.8 psi) to be completely open.

Note: The valve opens when differential pressure against the direction of flow occurs.

Installation

- The flange set for the PME is delivered separately. The valve must be installed with the arrow in the direction of the flow and the top cover upwards (fig. 2). The top cover can be rotated 4 X 90° about the valve body.
- The valve is fitted with a spindle for manual opening.
- If an external pilot valve is used, the pilot line must be connected to the upper side of the main line so that any dirt and oil from the plant will not find its way into the pilot line.
- If the PME 1 is to be used as a solenoid valve in a liquid line, external control pressure cannot be recommended because it can cause liquid hammer.
- The valve is designed to withstand a high internal pressure. However, the piping system should be designed to avoid liquid traps and reduce the risk of hydraulic pressure caused by thermal expansion. It must be ensured that the valve is protected from pressure transients like “liquid hammer” in the system.

Welding

- If using welding flanges, only materials and welding methods compatible with the flange material must be welded to the flanges.
- The flanges should be cleaned internally to remove welding debris on completion of welding and before the valve is inserted.
- The valve housing and flanges must be free from stresses (external loads) after installation.
- PME valves must not be mounted in systems where the outlet side of the valve is open to the atmosphere. The outlet side of the valve must always be connected to the system or properly capped off, for example, with a welded-on end plate.

Colours and identification

- The PME valves are chromated in the factory. If further corrosion protection is required, the valves can be painted.
- Precise identification of the valve is made via the ID plate on the top cover.
- The external surface of the valve housing must be prevented against corrosion with a suitable protective coating after installation and assembly.
- Protection of the ID plate when repainting the valve is recommended.

Maintenance

Service
The PME valves are easy to dismantle and most of its parts are replaceable. When the bottom cover is removed, the strainer can be taken out for cleaning.

- Do not open the valve while the valve is still under pressure.
- Check that the O-ring has not been damaged.

- Check that the spindle is free of scratches and impact marks.
- If the Teflon ring has been damaged, the parts must be replaced.

Assembly

Remove any dirt from the body before the valve is assembled. Check that all channels in the valve are not blocked with articles or similar.

Tightening (fig. 7)
Tightening torques See table I.

Use only original Danfoss parts, including packing glands, O-rings, and gaskets for replacement. Materials of new parts are certified for the relevant refrigerant.
In cases of doubt, please contact Danfoss.

Note:
Always pay attention to the spindle during operation of the manual opener (see Fig. 6)

1. Make sure that the C-clip (C) is positioned on the spindle (B) and is intact. A new C-clip is available in the inspection kit for the valve.
2. Pay attention to the C-clip reaching the top nut of the packing gland when turning the manual stem clockwise for opening the valve. Never use excessive torque, and stop turning when the C- clip gets in contact with the top nut.
3. When turning the spindle (B) anticlockwise, for deactivation of the manual opener, to the top point, tighten the spindle further anticlockwise to 8 Nm (5.9 lb/ft) torque.
4. Remount the cap (A) and tighten it clockwise to 8 Nm (5.9 lb/ft) torque.

Drawings are only for illustration, not for dimensioning or construction.
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FAQs

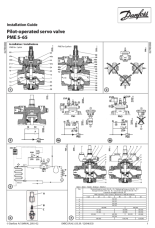
- **Q: What refrigerants is the valve applicable to?**
  A: The valve applies to HCFC, HFC, and R717 (Ammonia).

- **Q: What is the maximum working pressure for the valve?**

  A: The valve is designed for a maximum working pressure of 28 bar g (406 psi g).
- **Q: How many pilot connections does PME 3 have?**

  A: PME 3 has three connections for pilot valves: two in series (S I and S II) and one in parallel (P).

Documents / Resources

	Danfoss PME 5-65 Pilot Operated Servo Valve [pdf] Installation Guide 027R9900, DKRCI.PI.HL1.X3.59, 520H6333, PME 5-65 Pilot Operated Servo Valve, PME 5-65, Pilot Operated Servo Valve, Operated Servo Valve, Servo Valve

References

- User Manual