

Danfoss
**ICS 25 - 65 Pilot
Operated Servo
Valve**



Danfoss ICS 25 – 65 Pilot Operated Servo Valve Installation Guide

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Danfoss ICS 25 – 65 Pilot Operated Servo Valve



Specifications

- **Product Name:** Servo Operated Valve ICS 25 – 65
- **Model Number:** 027R9775
- **Body Size:** 25, 32, 40, 50, 65
- **Torque Range:** 18 Nm – 110 Nm (13.3 ft-lb – 81.1 ft-lb)

Product Usage Instructions

Installation

1. Ensure the valve is protected against back pressure by installing a check valve upstream if needed.
2. Cover welding connections and consider painting for additional corrosion protection.
3. Use the ID plate on the top cover for precise valve identification.
4. Protect the external surface of the valve housing with a suitable top coating post-installation.

Maintenance

1. Regular maintenance is essential for optimal valve performance.
2. Check for any signs of corrosion and apply suitable corrosion protection measures.
3. Inspect and replace gaskets if necessary to prevent leaks.
4. Keep the manual operating spindle clean and lubricated for smooth operation.

FAQ

Q: How can I ensure the correct position of the piston ring?

A: Install a check valve upstream of the ICS to protect against back pressure, which can affect the piston ring's position.

Q: How do I identify the valve precisely?

A: Use the ID plate located on the top cover for accurate valve identification.

Q: What should I do for further corrosion protection?

A: Consider painting the valves after installation involving welding and assembly, and protect the ID plate during painting.

Installation**Refrigerants**

- Applicable to all common non-flammable refrigerants, including R717 and noncorrosive gases/liquids dependent on sealing material compatibility.
- Flammable hydrocarbons are not recommended.
- The valve is only recommended for use in closed circuits. For further information please contact Danfoss.

Temperature range

- $-60/+120^{\circ}\text{C}$ ($-76/+248^{\circ}\text{F}$)

Pressure range

- The valves are designed for a max. working pressure of 52 bar g (754 psi g).

Technical data

- The ICS can be used in suction, liquid, hot gas, and liquid/vapor lines. The ICS regulates the flow of the medium by modulation or on/off function, depending on the control impulse from the screwed-on pilot valve or valves.

Regulating range

- Dependent on the chosen type and combination of pilot valves.

Opening differential pressure (p)

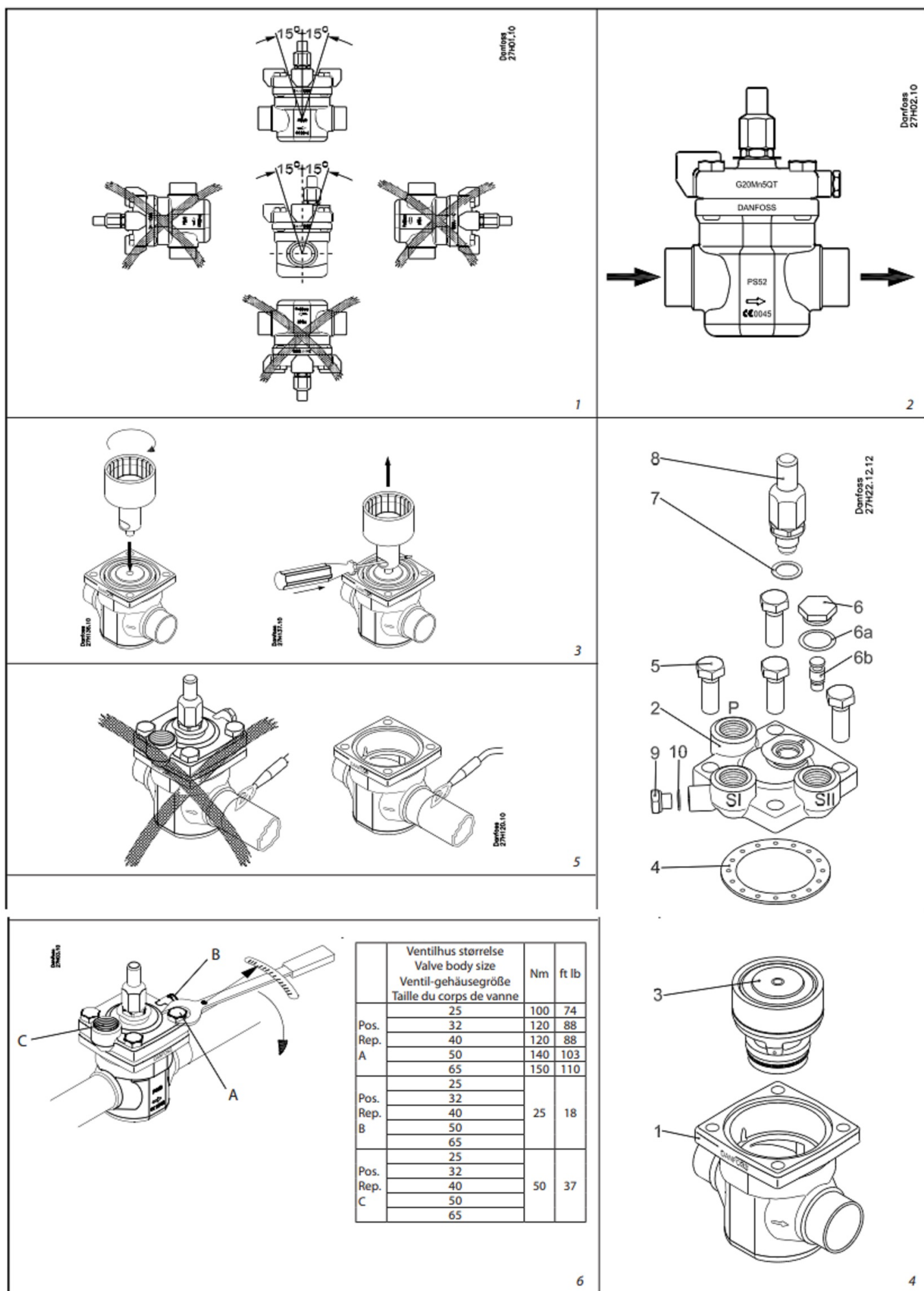
- The ICS main valve requires a minimum opening differential pressure of 0.07 bar (1 psi) to begin to open and 0.2 bar (3 psi) to be completely open.
- The valve must be protected against back pressure. A check valve should be installed upstream of the ICS in installations where there is a risk of back pressure. Back pressure can affect the correct position of the piston ring.

Design (fig. 4)

1. Body
2. Top cover
3. Function module

4. Gasket
5. Bolts
6. Plug
7. Gasket
8. Manual operating spindle
9. Plug
10. Gasket

Installation



- The valve must be installed with the spindle in a vertically upward position (fig. 1). 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° concerning 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 ICS 1 is to be used as a solenoid valve in a liquid line, external control pressure cannot be recommended because it can cause a liquid hammer.
- The valve is designed to withstand 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 (fig. 3, 4 and 5)

- The top cover (fig. 4, pos. 2) and function module (fig. 4, pos. 3), must be removed before welding to prevent damage to o-rings and teflon (PTFE) in the function module and to avoid getting welding debris in the module.
- The function module can be lifted out using a bolt size M6 or multi-function tool screwed into the threaded hole of the piston on the function module (fig. 3). Debris blocking the bolt hole will need cleaning.
- **Note:** Remove all parts from the valve body before welding (as shown in fig. 5).
- The internal surfaces and weld connections of the enclosed ICS/ ICM valve have been applied with an anti-corrosion treatment.
- In order to maintain the effectiveness of this anti-corrosion treatment, it is important to ensure that the valve is disassembled just before the welding / brazing process is undertaken.
- In the event that the function modules are to be left disassembled for any length of time, please ensure that the function modules are further protected by placing them in a polyethylene bag or by applying a rust protection agent (e.g. refrigeration oil or BRANOROL) on the surfaces.
- Only materials and welding methods, compatible with the valve body material, must be welded to the valve body. The valve should be cleaned internally to remove welding debris on completion of welding and before the valve is reassembled.
- Avoid welding debris and dirt in the valve body and the function module. The valve body must be free from stresses (external loads) after installation.
- The 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.

Assembly

- Remove welding debris and any dirt from pipes and valve bodies before assembly.
- Check that the o-rings are intact before replacing the function module. If possible, apply some refrigeration oil to ease the insertion and to protect the o-rings. Check that the top gasket has not been damaged.
- If the surface has been damaged or the gasket has been bent, it must be replaced.

Tightening (fig. 6)

- Tighten the top cover with a torque wrench, to the values indicated in the table.

Colours and identification

- The ICS valves are Zinc-Chromated from the factory. The Zinc-Chromatization does not cover the welding connections. 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 protected against corrosion with a suitable top coating after installation involving welding and consequent assembly.
- Protection of the ID plate when painting the valve is recommended.

Maintenance

Service

- The ICS valves are easy to dismantle.
- Do not open the valve while the valve is still under pressure.
- Pressure relief can be done by carefully opening the manual operating spindle. Small grooves along the thread will release refrigerant into the open air. This operation must only be done after providing the correct countermeasures under local legislation.
- The function module can be lifted out using a bolt size M6 screwed into the threaded hole of the piston on the function module (fig. 3). Debris blocking the bolt hole will need cleaning.

Upon opening and removal of the function module:

- Check that the o-rings on the function module have not been damaged. A valve with a damaged o-ring might not modulate according to the specification.
- Check that the piston and cylinder are free of scratches and look for wear marks. If the wear is excessive the function module should be replaced to prevent a false pilot signal around the piston ring.
- Check that the movement of the cylinder and valve seat is free and with low friction.
- If the teflon valve plate has been damaged, the function module 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 by particles or similar.
- If possible, apply some refrigeration oil to ease the insertion and protect the rings.

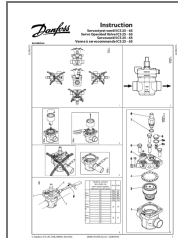
Tightening (fig. 6)

- Tighten the top cover with a torque wrench, to the values indicated in the table.
- Use only original Danfoss parts, including O-rings and gaskets for replacement.
- Materials of new parts are certified for the relevant refrigerant.
- In cases of doubt, please contact Danfoss.
- Drawings are only for illustration, not for dimensioning or construction.
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ICS 25, ICS 32, ICS 40, ICS 50, ICS 65, ICS 25 - 65 Pilot Operated Servo Valve, ICS 25 - 65, Pilot Operated Servo Valve, Operated Servo Valve, Servo Valve, Valve

References

- [User Manual](#)

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