Instruction

Motor operated valve ICM 100 - 150

027R9794

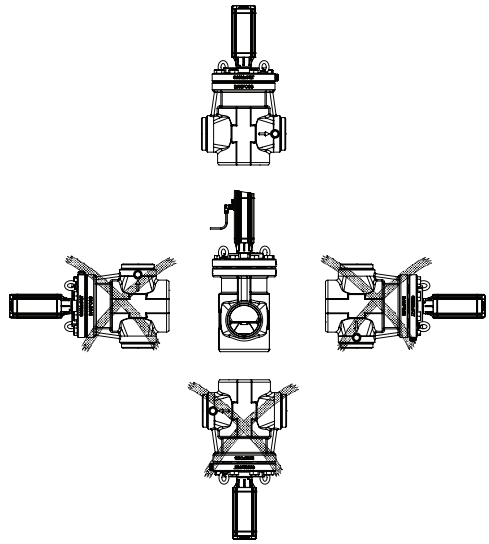


Fig. 1

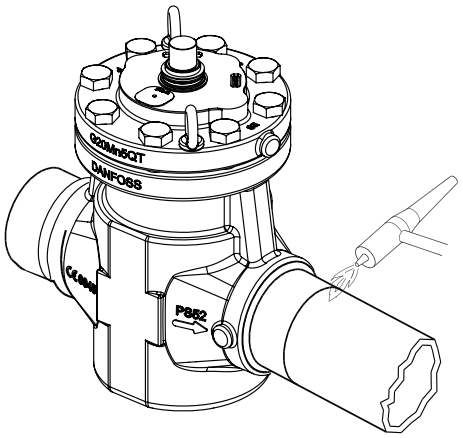
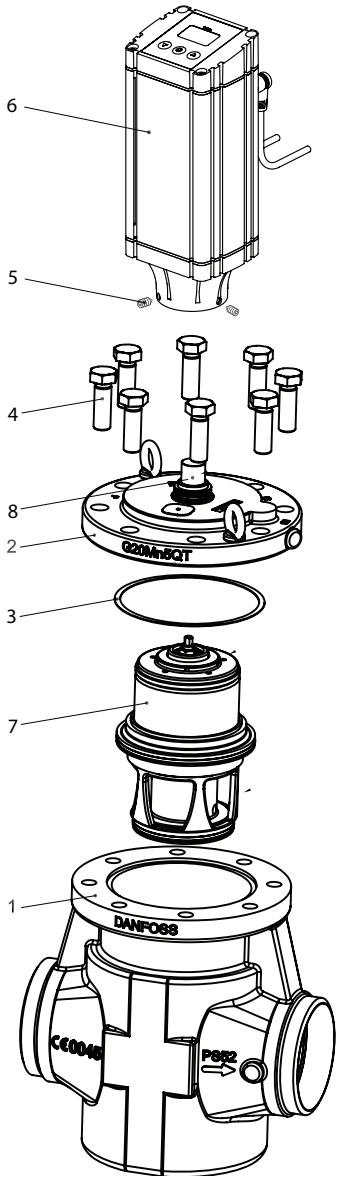


Fig. 2



1 Housing
2 Top cover
3 Gasket
4 Bolts
5 Allan screws
6 Actuator
7 Insert
8 Magnetic coupling

Fig. 3

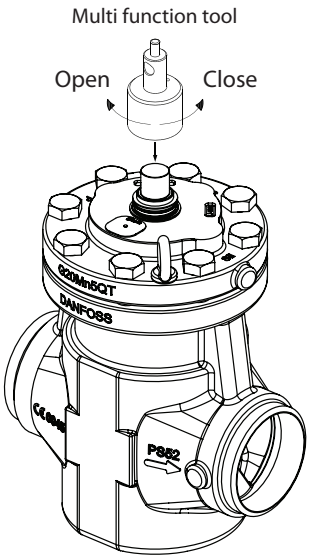


Fig. 4

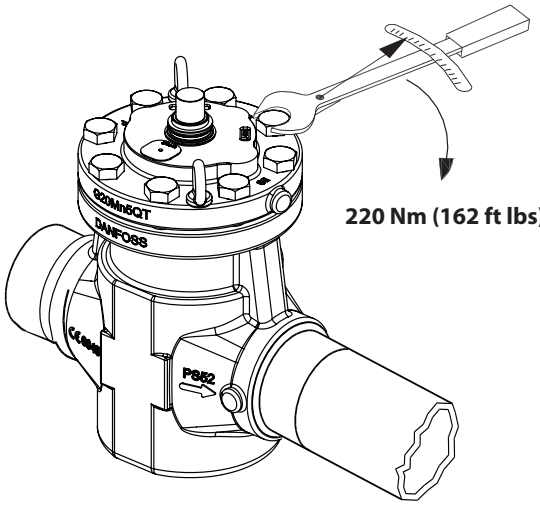


Fig. 5

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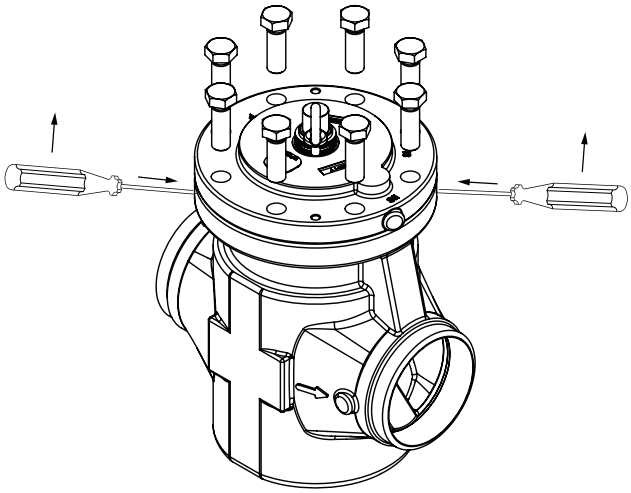
Maintenance



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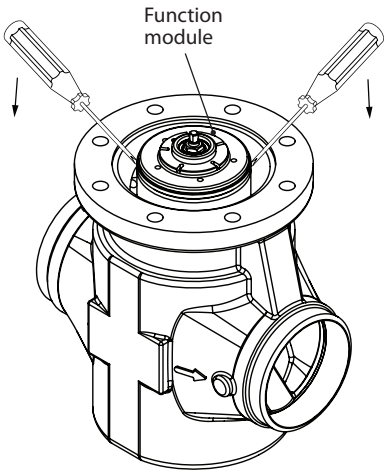

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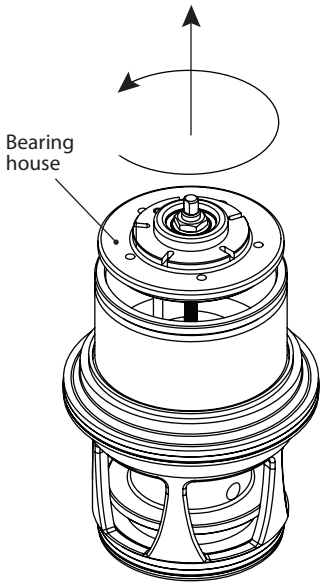

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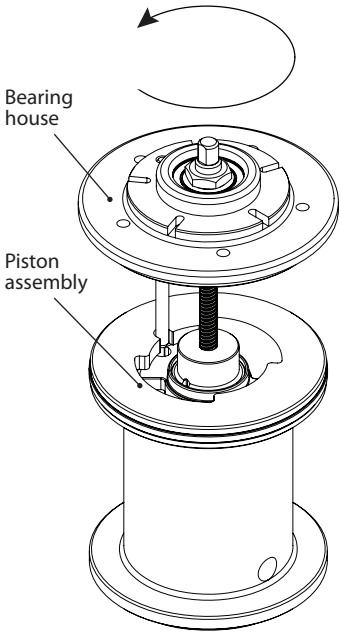

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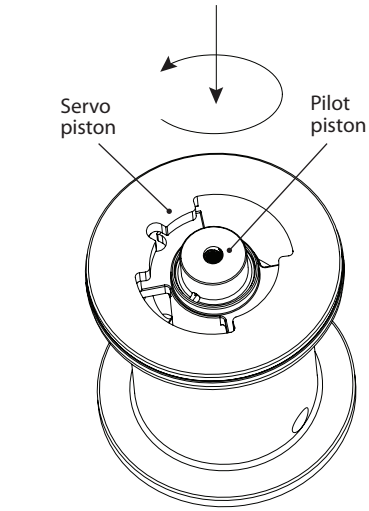

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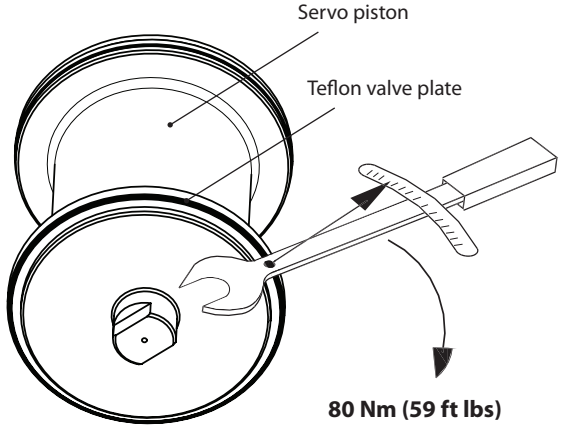

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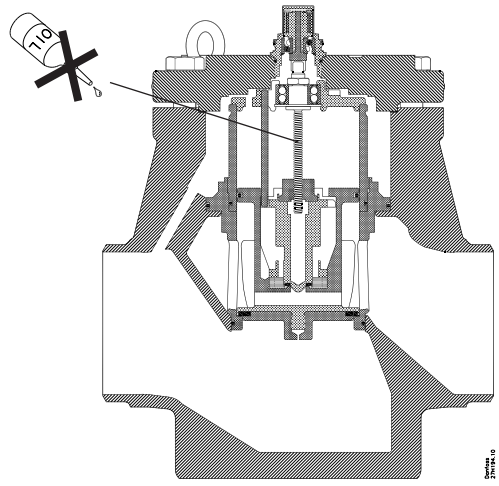

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ENGLISH

Installation

Refrigerants
Applicable to R717. For other refrigerants please contact Danfoss.
Flammable hydrocarbons are not recommended. The valve is only recommended for use in closed circuits. For further information please contact Danfoss.

Temperature range
Media: –60/+120°C (–76/+248°F)
Ambient: –30/+50°C (–22/+122°F)

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

Technical data
The ICM can be used in suction, liquid and hot gas lines. The ICM regulates the flow of the medium by modulation or on/off function, depending on the control impulse to the actuator. Refer to the technical leaflet for for design and selection information.

The ICM 100-150 valves are designed for use with the ICAD 1200 actuator from Danfoss. The ICAD actuator on the ICM ensures compatibility with the regulators provided by Danfoss plus a range of other controllers, especially PLC controllers. A control signal from a Danfoss controller or PLC will activate the ICAD motor and through a magnetic coupling rotate the spindle in the ICM to make the valve open or close.

Regulation performance
The V-shaped opening in the insert provides optimum regulation accuracy.

Valve sizes
ICM is available in sizes from ICM 100-B (k_v: 142 m³/h) to ICM 150-B (k_v: 370 m³/h)

Service friendly valve design
The ICM 100-150 is delivered as a complete valve. For service needs different spare part kits are available.

Installation
ICM + ICAD is installed in horizontal pipelines with the actuator pointing upwards (fig. 1).

The top cover can be rotated in any given direction without any influence on the valve function. The motor can be mounted in any position before locking it with the 3 Allen screws (fig. 3, pos.5).

The ICM valve must be installed with the arrow in the direction of flow.
When installing an ICM, refrigerant must not be allowed to escape and dirt ingress must be prevented.
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.

ICM valves must not be mounted in systems where the outlet side of the valve is open to 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.

Welding (fig. 2)
The valve can remain assembled during the welding process provided that the welding method is controlled and ensuring no welding debris.

The internal surfaces and weld connections of the enclosed ICS/ ICM valve have been applied with an anti-corrosion treatment.

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 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. Welding with open flame is not allowed.

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.

Manual operation
A multi function tool (fig. 4) can be used to rotate the spindle manually if the actuator has been removed. To make use of the manual operation, a multi-function tool (optional) is used (see fig. 4). The code number for the multi function tool is **027H0181**.

Manual operation is also possible with the actuator mounted on the valve and the power supply connected to the actuator. Irrespective if the signal connections are wired to the actuator it will be possible to use the manual operation function built into the actuator electronics allowing the motor to step in 1% increments meaning that 100% will correspond to a fully open valve. Please refer to the ICAD instruction sheet for further information regarding manual operation via the ICAD actuator.

Insulation
Insulating the valve and its actuator is only necessary if an energy consideration in the plant requires this. Regarding the function of the ICM + ICAD no insulation is necessary when kept inside temperature limits.

Surface treatment and identification
The ICM valves are Zinc-Chromated from factory. If further corrosion protection is required, the valves can be painted.

Note: Magnet coupling must be protected.

Precise identification of the valve is made via the ID plate on the top cover. After welding, the external surface around the connections of the valve body must be protected to prevent against corrosion with a suitable coating.
Protection of the ID plate when repainting the valve is recommended.

Assembly
Remove welding debris and any dirt from pipes and valve body before assembly. When installing the insert into the valve house a small amount of refrigerant oil on both O-rings will ease the installation. Use the magnetic tool when mounting the top cover.

Tightening
Tighten the top cover/function module with a torque wrench, to the values indicated in fig. 5.

Maintenance

Service
A precise service schedule cannot be given for the valve as service intervals will depend on operating conditions, i.e. how often the valve operates and the amount of impurities and dirt within the system.

The ICM 100-150 valves are easy to dismantle and spare part kits are available for servicing the valves.
Do not open the valve while the valve is still under pressure.

Be aware that the valve can be under pressure from both sides and that the manual magnet tool (fig. 4) can be used to open the seat and thus equalize pressure internally before removing the top cover.

If the teflon valve plate has been damaged this should be replaced as shown in (fig. 11). When reassembling the servo piston after replacement of the Teflon valve plate, Danfoss recommends to use Loctite 586 or similar on the thread of the servo piston.

Dismantling the valve
Do not remove the top cover while the valve is still under pressure.
- (1) Remove the 8 to 10 bolts from the top cover (fig. 6).
- (2) Push two screwdrivers in between the top cover and the valve body (fig. 6).
- (3) Pull the screwdriver upwards to remove the top cover (fig. 6).
- (4) Use the same two screwdrivers to remove the insert from the valve body. Place the end of the screwdrivers in the machined groove on the outside of the insert (fig. 7) and pull the screwdrivers downwards to release the function module and its o-rings from the valve body.

Servicing and replacing the function module
The function module can easily be serviced or replaced.
- (1) Remove the 8 to 10 bolts from the top cover (fig. 6).
- (2) Push two screwdrivers in between the top cover and the valve body (fig. 6).
- (3) Pull the screwdriver upwards to remove the top cover (fig. 6).
- (4) Use the same two screwdrivers to remove the insert from the valve body. Place the end of the screwdrivers in the machined groove on the outside of the insert (fig. 7) and pull the screwdrivers downwards to release the function module and its o-rings from the valve body.
- (5) Screw the spindle 4 times counter clockwise to lift the bearing house from the insert (fig. 8).
- (6) By pulling up on the bearing house the piston assembly can be withdrawn from the insert (fig. 8).
- (7) Unscrew the spindle and bearing house from the piston assembly (fig. 9).
- (8) By pushing down and turning on the pilot piston the piston assembly can easily be dismantled (fig. 10).
- (9) Replace wear parts according to the sparepart kits and reassemble the valve.

Oil the new o-rings on the insert with a small amount of refrigerant oil when reassembling the valve.

The spindle inside the valve must not be greased or oiled (fig. 12).

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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