

Installation guide

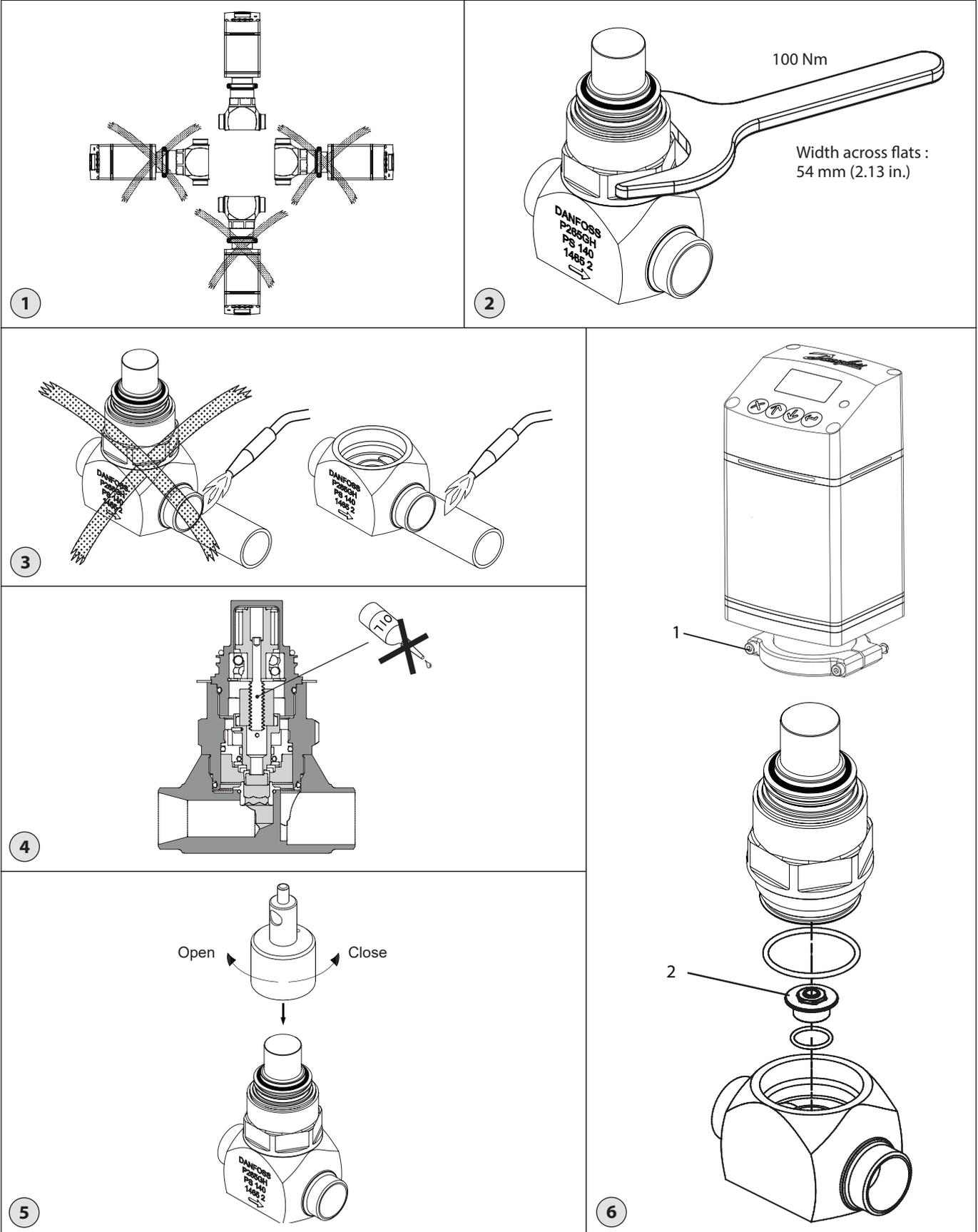
# Motor operated valve

Type ICMTS with actuator, type ICAD 600B-TS

089

027R9792

027R9792



Імпортер: ТОВ з іі "Данфосс ТОВ" 04080, Київ 80, п/с 168, Україна

Info for UK customers only : Danfoss Ltd., 22 Wycombe End, HP9 1NB, GB

## ENGLISH

### Installation

#### Refrigerants

The ICMS is specifically designed for high pressure R744 applications.

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 140 bar (2030 psig).

#### Technical data

ICMS is a balanced valve which remains in its position. The return function must be provided with the actuator used.

The ICMS can be used in suction, liquid, hot gas and liquid/vapour lines. The ICMS regulates the flow of the medium by modulation or the on/off function, depending on the control impulse to the actuator. Refer to the technical leaflet for details on design and regarding selections.

The ICMS valve is designed for use with the ICAD 600B-TS actuator from Danfoss. The ICAD 600B-TS actuator on the ICMS 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 600B-TS motor and, through a magnetic coupling, rotate the spindle in the ICMS to make the cone move vertically. A Danfoss EKC 326 or EKC 326A controller is typically used for high pressure applications.

#### Valve sizes

ICMS is available in sizes from ICMS 20A-33 ( $k_v$ : 0.2 m<sup>3</sup>/h) to ICMS 20-C ( $k_v$ : 4.6 m<sup>3</sup>/h).

#### Installation

ICMS + ICAD 600B-TS can be installed in horizontal pipelines with the actuator pointing upwards (fig. 1).

The motor can be mounted in any position before locking it with the 2 Allen screws (fig. 6, pos. 1).

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

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.

ICMS 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, such as the case with a welded-on end plate.

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#### Welding or soldering (fig. 3)

The top cover, complete with function module, should be removed before welding or soldering to prevent damage to O-rings and Teflon (PTFE) in the function module and to avoid getting welding debris in the module.

**Note:** Remove all parts from the valve body before welding or soldering (as shown in fig. 3). It is important to remove the seat (fig. 6, pos. 2) as the heat will damage the seat.

#### Reassemble and tighten of seat (fig. 6, pos. 2):

##### Tools:

ICMS 20-A/ICM 20-A33

Socket wrench:  
13 mm (0.51 in.)

ICMS 20-B/ICMS 20-C

Allen key(hexagon socket wrench):  
12 mm (0.47 in.)



The internal surfaces and weld connections of the enclosed ICMS 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 prior to commencing the welding / brazing process.

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 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.

#### Manual operation

A magnetic coupling 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. 5). 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. If the signal connections are wired to the actuator, it is possible to use the manual operation function built into the actuator electronics which allows the motor to step in 1% increments meaning that 100 steps will correspond to a fully open valve. Please refer to the separate instruction manual on ICAD to address the manual function.

#### Insulation

Insulating the valve and its actuator is only necessary if an energy consideration in the plant requires this. Regarding the function of the ICMS + ICAD 600B-TS, no insulation is necessary when kept inside temperature limits.

#### Surface treatment and identification

The ICMS valves are surface treated 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. After welding, the external surface around the connections of the valve body must be protected to prevent against corrosion with a suitable coating. When repainting the valve, it is recommended to protect the ID plate.

#### Assembly

Remove welding debris and any dirt from pipes and valve body before assembly. Check that the cone has been fully screwed back towards the top cover before it is mounted in the valve body. Use the manual magnetic tool (fig. 5) to achieve rotation through the top. A small amount of refrigeration oil on both O-rings can make the insert easier to install into the valve body.

#### Tightening

Tighten the top cover/function module with a torque wrench to the value indicated in (fig. 2).

### 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 the system carries.

The ICMS valves are easy to dismantle and all parts inside can be replaced by changing the function module.

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. 5) can be used to open the seat to equalise pressure internally before removing the top cover.

#### Replacement of the function module

- Remove the old module.
- Oil the O-rings on the new module with a small amount of refrigeration oil.



The spindle inside the valve must not be greased or oiled (fig. 4). Old o-rings cannot be reused.

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.

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