

Installation guide / Operating instruction

# Safety relief valves

SFA 10, SFA 15

148R9527

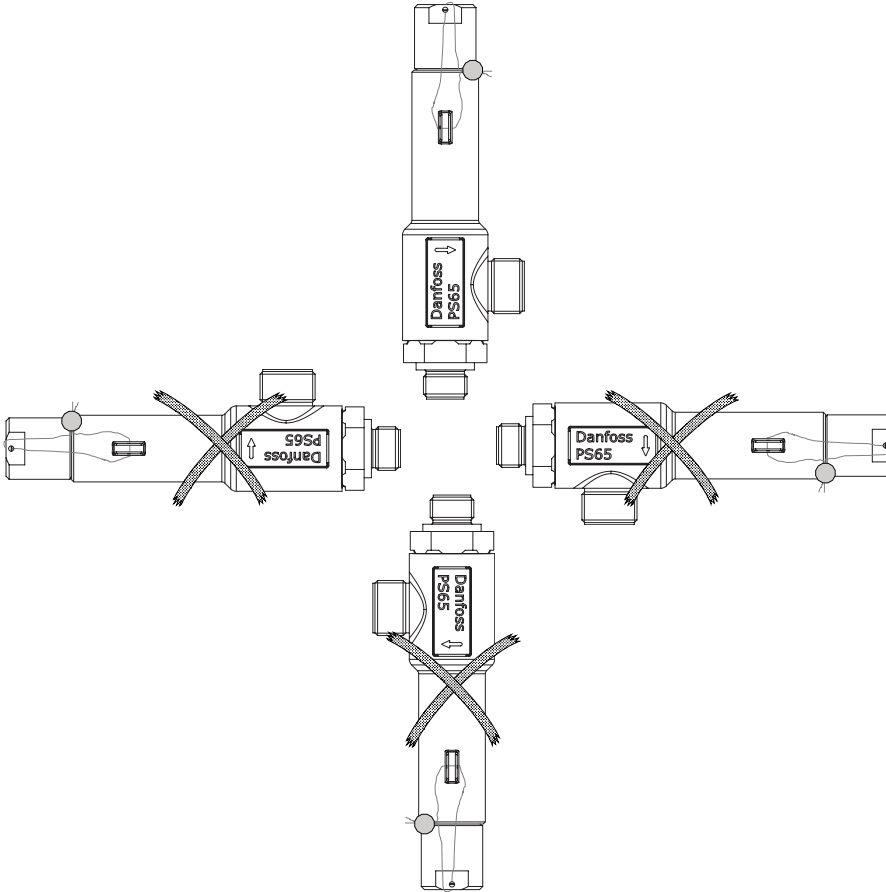


Fig. 1. Orientation

148R9527

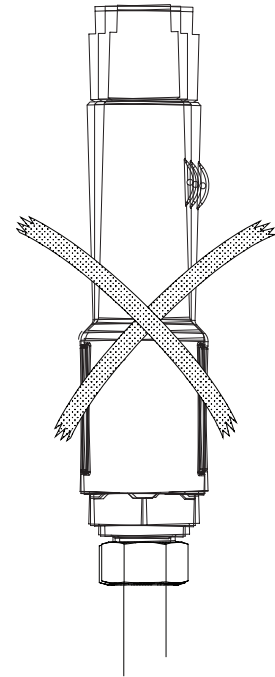


Fig. 2. Vibrations

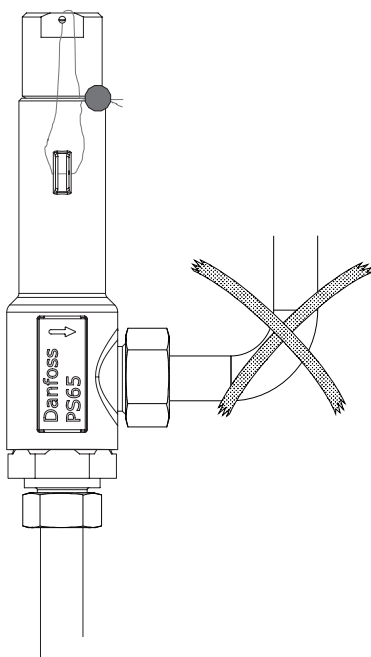


Fig. 3. Piping precautions

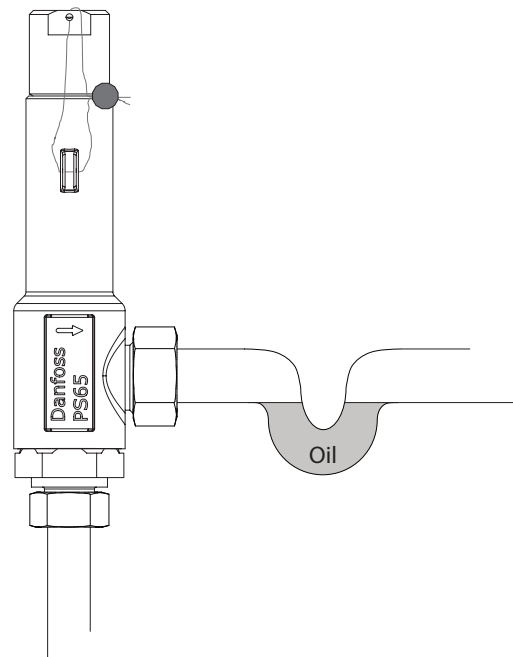
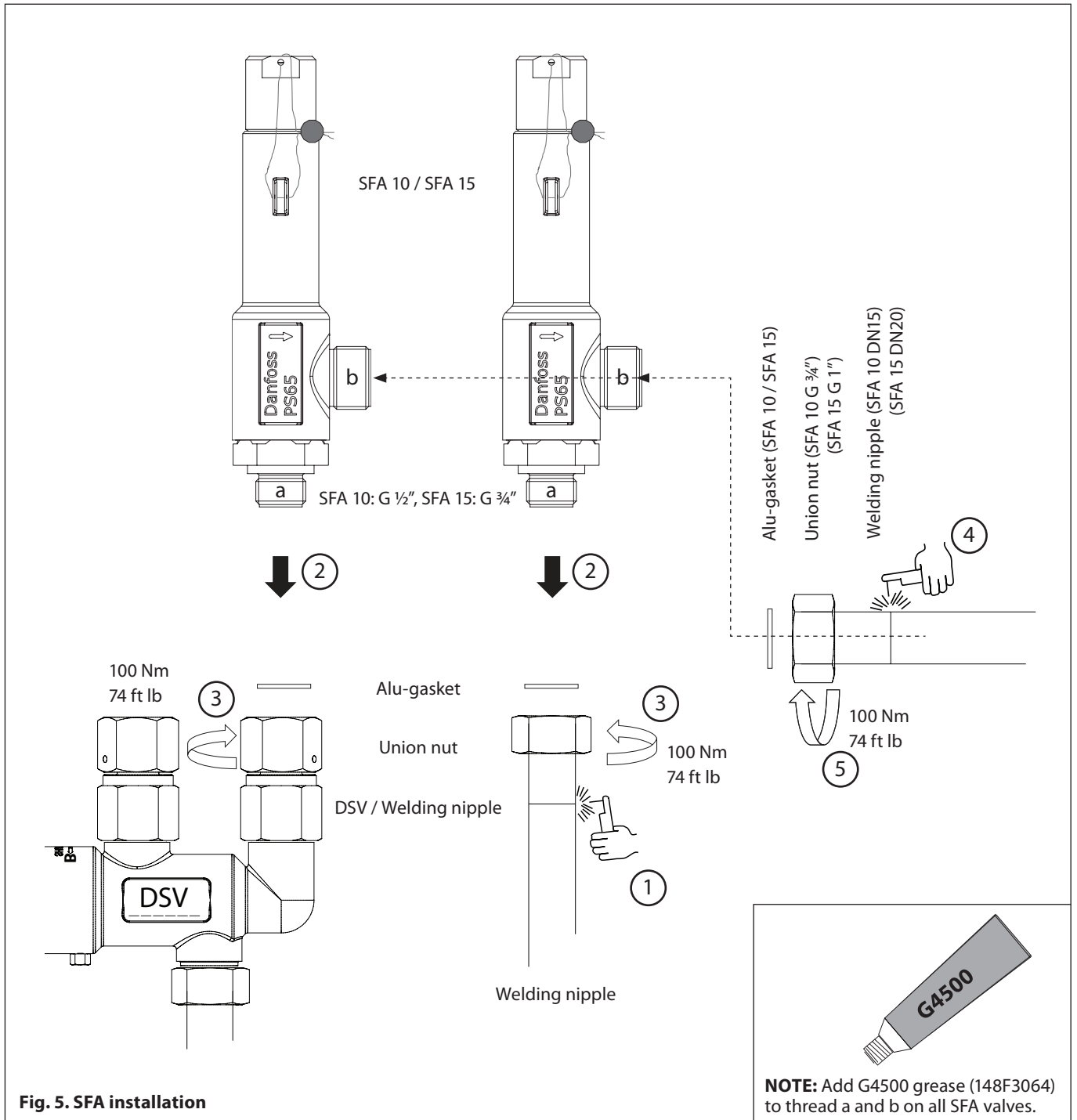


Fig. 4. Piping precautions



## Installation

### Refrigerants

Applicable to **R717, R744, HFC and HCFC**

### Temperature range

-50 °C to +100 °C (-58 °F to +212 °F), and a set pressure not lower than -30 °C (-22 °F) saturation temperature.

At static temperatures below -30 °C (-22 °F) the O-ring becomes harder and full tightness of the valve cannot be guaranteed. Above -30 °C (-22 °F) the O-ring will become soft and fully functional again.

Observe for R744 (CO<sub>2</sub>)! Due to above the min set pressure for correct functional valve in R744 (CO<sub>2</sub>) is 27 bar (392 psig), to ensure proper function of the valve in case of a sudden relief.

### Pressure range

The SFA valve is designed for a max. working pressure of  
SFA 10: 65 bar (944 psig).  
SFA 15: 40 bar (580 psig).

The safety valve is adjusted to a specific relief pressure stated on the ID plate. After setting the valve is sealed with wire and seal. To comply with EN13445-3, the SFA10/15 is limited for operation up to 500 full pressure cycles or equivalent set pressure cycles.

### Piping precautions

The valve is recommended for closed circuits only.

### Refrigerant purity

Danfoss cannot guarantee correct opening and closing of the valve if the pressure relieved refrigerant is polluted with dirt and particles.

### IMPORTANT:

**THE INLET/OUTLET PIPE DIMENSIONS MUST NOT BE SMALLER THAN THOSE OF THE WELDING NIPPLES.**

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.

During welding avoid welding debris and dirt in the threads of the connections and in the adjacent pipes. Before assembly clean all parts exposed to debris and dirt.

### Valve orientation (see fig. 1)

The valve should be installed with the spring housing pointing upwards.

### Vibrations (see fig. 2)

The SFA valve should never be exposed to thermic or dynamic stress from vibrations.

### Outlet pipe orientation (see fig. 3)

To avoid dirt and condensate entering and accumulating at the valve outlet avoid piping lay out in upwards slope.

### Oil trap (see fig. 4)

For SFA valves in applications with outlet to the ambient an oil filled U-pipe is an efficient protection against the entrance of water and dirt.

### Installation of SFA (see fig. 5)

The SFA valve can be installed either in the dedicated DSV change-over valve (SFA 10 only) or directly in the system piping via a threaded connection.

### Follow these steps:

1. (welding nipple only). Assemble the union nut and welding nipple and place the assembly on the system piping. Fully weld the welding nipple to the system piping and cool down
2. Add G4500 grease (148F3064) to thread a. Place the alu gasket inside the the union nut and install the SFA by turning the union nut clockwise
3. Tighten to torque 100 Nm ( 74 ft lb)
4. Prepare and weld the outlet welding nipple like described in step 1
5. Add G4500 grease (148F3064) to thread b and tighten the outlet connection to torque 100 Nm ( 74 ft lb)

### Corrosion protection

The DSV valves are factory painted with a red oxide primer. The external surface of the valve housing must be prevented against corrosion with a suitable protective coating after installation and assembly.

## Service/maintenance

When due for service or after the safety valve has been activated it is recommended to disassemble and clean the valve seat for dirt and particles.

The valve must not be disassembled while installed/in operation. Servicing of the valve is only allowed when valve is dismantled.

- All external sealings must be changed during service
- After valve dismantling, cone and spring can be removed e.g by using the special tool in the Danfoss repair kit (SFA 10 only). Other tools may damage the O-ring, cone or other parts influencing the valve function
- While tightening/loosening the valve inlet union use only the body hexagon as counterpart

### Corrosion

Dust, dirt, corrosion or sticky medias on moving and guiding parts may influence the valve function negatively.

If any part (including the spring) inside the valve are corroded, the valve should be fully replaced.

Dirt and particles must be fully removed.

In extreme environments it is recommended to use a valve with bellow instead. This will protect the valve from refrigerant contaminated with dirt and particles.

### Springs

Observe! When cleaning or replacing the spring, it is very important that the exact same spring type is being used.

The spring type can be identified by the color of first windings. Even though it may be possible to set the correct pressure **with a wrong spring**, the opening and closing characteristics may be compromised and may lead to

- Reduced lift, leading to lack of valve capacity and increased system pressure
- Increased blowdown, leading to extraordinary loss of charge

### Temperature ageing

The O-ring material ages when exposed to atmosphere and/or longterm high temperatures.

Max. temperature is 100 °C (212 °F) during activation. If this temperature is exceeded the valve may not reseat perfectly leading to loss of refrigerant.

At static temperatures above 60 °C (140 °F) the lifetime of the O-ring will be gradually reduced, and the valve should be serviced more frequently, using Danfoss SFA 10 repair kit.

### Recalibration and leak test

To verify the valve function after service or inspection following tests should be done by authorized personnel.

- Leak test to verify valve tightness at 90% of the set pressure
- Set pressure shall be verified by water bubble test at set pressure