MAKING MODERN LIVING POSSIBLE

# Collection of Instructions

## Instructions for Danfoss
## Refrigeration & Air conditioning Controls

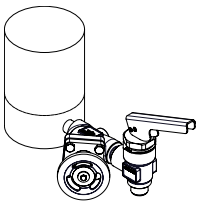
REFRIGERATION &
AIR CONDITIONING DIVISION

Catalogue

**Stop and regulating valves**

# Instructions

## QDV - SVA valve train



148R9542

148R9542

*QDV - SVA valve train*

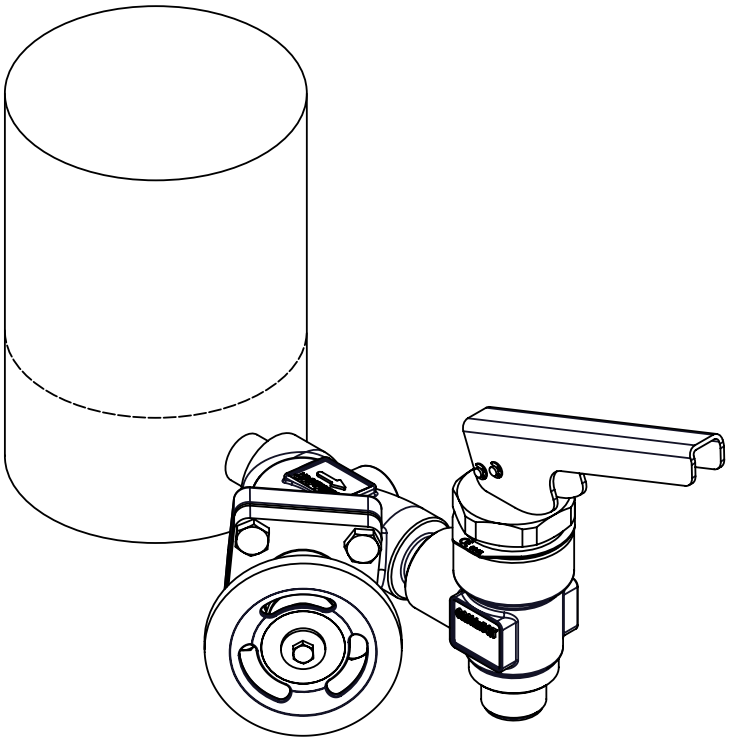


*Fig. 1*

*QDV 15*

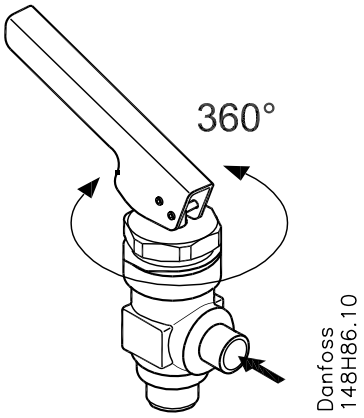



*Fig. 2*

*QDV 15*

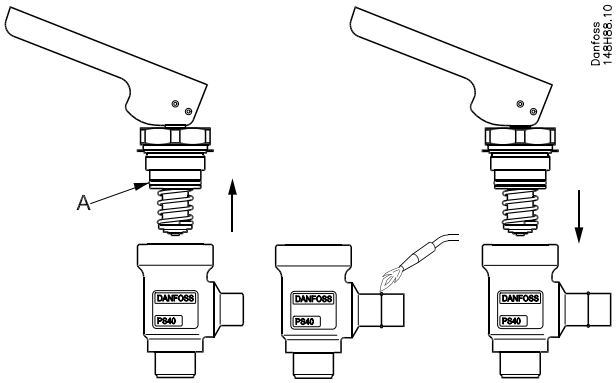
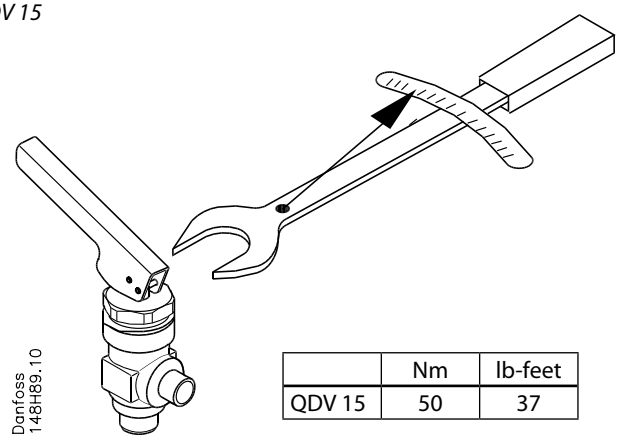



*Fig. 3*

*QDV 15*




| | Nm | lb-feet |
|---|---|---|
| QDV 15 | 50 | 37 |

*Fig. 4*

*QDV 15*

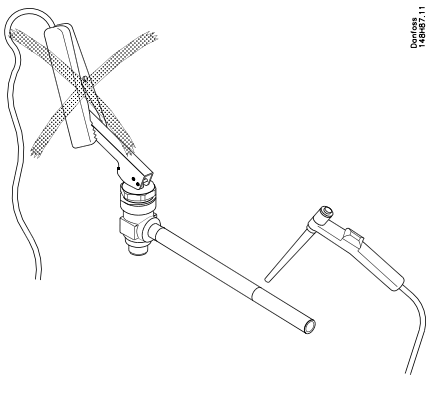



*Fig. 5*

*SVA-ST 15*

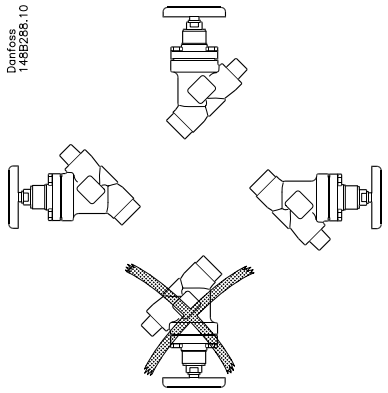



*Fig. 6*

*SVA-ST 15*

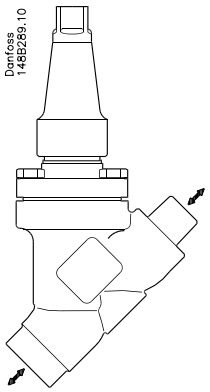



*Fig. 7*

*SVA-ST 15*

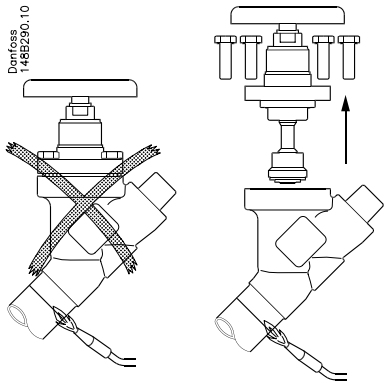
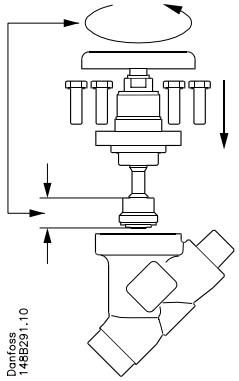
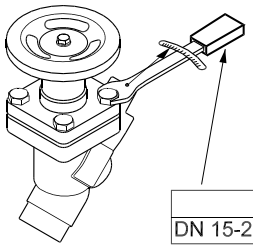



*Fig. 8*

*SVA-ST 15*



| | Nm | LB-feet |
|---|---|---|
| DN 15-20 | 22 | 16 |

*Fig. 9*

*SVA-ST 15*

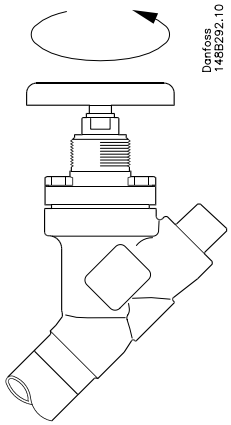



*Fig. 10*

*SVA-ST 15*

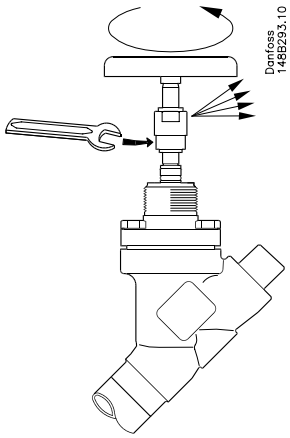



*Fig. 11*

*SVA-ST 15*

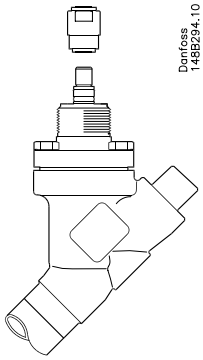



*Fig. 12*

*SVA-ST 15*

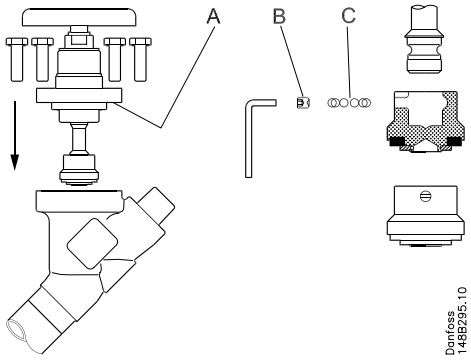
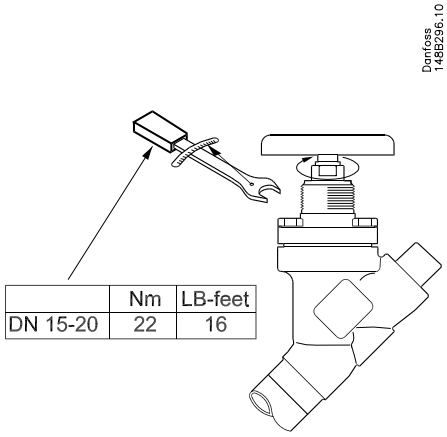



*Fig. 13*

*SVA-ST 15*




| | Nm | LB-feet |
|---|---|---|
| DN 15-20 | 22 | 16 |

*Fig. 14*

## Installation

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

**Temperature range**
SVA-ST: –50/+150°C (–58/+302°F)
QDV 15: –50/+150°C (–58/+302°F)

**Pressure**
The valves are designed for a max. working pressure of 40 bar g (580 psi g).
In order to prevent hydraulic pressure building up between the stop valve and the QDV an integral relief device is included opening the valve slowly if the pressure exceeds 20 bar g (290 psi g).

**Installation**
QDV must be installed with the spindle vertically upwards and SVA with the spindle in horizontal position (fig. 6).
Valves should be opened by hand without the use of tools or other devices.
The valves are 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.

**If any tube or hose is mounted on the outlet of the QDV it has to be calculated to prevent backpressure building up when relieving**. Blocking the outlet of the QDV will cause danger (hydraulic pressure building up).
QDV handle can be turned 360° for optimizing operation position (fig. 2).
An outlet hose of the same size as the outlet connection of the QDV valve must be used.

**Recommended flow direction**
The valve must be installed with flow direction from the side branch (fig. 2 and 7).

**Welding**
The bonnet should be removed before welding (fig. 8) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

**Removing the bonnet can be omitted provided that:**
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.
Be careful not to damage the teflon cone ring.
The valve housing must be free from stresses (external loads) after installation.
Stop 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.

**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 bonnet before it is replaced in the valve body (fig. 9).

SVA and QDV valves are assembled by means of FPT (self tightening) thread. For better tightness a Teflon tape could be applied. QDV valve is screwed on SVA valve with the torque min 80 Nm, and than QDV valve is aligned to vertical position.

**Note!**
**it is not allowed to turn QDV in anti-clockwise direction, after tightening it to the required torque.**

**Fig. 5**
**Never use QDV or any other Danfoss product to get an earth connection for welding as it might cause damage to the product.**

**Tightening**
Thighten the bonnet with a torque wrench, to the values indicated in the table (fig. 9).

**Colours and identification**
QDV and SVA valves are painted with a red oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

# SVA

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 10)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 11)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland (fig. 12)**
Handwheel and packing gland can now be removed.

**Dismantling the valve (fig. 13)**
Do not remove the bonnet while the valve is still under pressure.
- Check that the O-ring (pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone (fig. 13)**
Unscrew the cone screw (pos. B) with an Allen key.
SVA 15 .....2.0 mm A/F
(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the balls (pos. C).
Number of balls in pos. C:
SVA 15 .....10 pcs.
The cone can then be removed. Place the new cone on the spindle and replace the balls. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 9).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 9).
Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 14).

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.

# QDV

**Dismantling the valve (fig. 8):**
Do not remove the bonnet while the valve is still under pressure. Always close the stop valve before the QDV. Then proceed with activation of the QDV valve to make sure that it is not under pressure.
- Check that the O-ring (pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- Check that the Teflon cone ring is without marks or scratches.

**Replacement of the O-ring between the bonnet and the valve body (fig. 3):**
The QDV 15 is delivered with an extra Oring.
Remove the damaged O-ring (pos. A) from the bonnet and carefully install the new O-ring.

**Assembly:**
Remove any dirt from the body before the valve is assembled.
Check that the O-ring between the valve body and bonnet, as well as the Teflon gasket in the valve seat is without marks or scratches.

**Tightening:**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4).

Use only original Danfoss parts for replacement. New parts must be made of certified materials applicable for the refrigerant used.

In cases of doubt, please contact Danfoss.

*Danfoss accepts no responsibility for errors and omissions.*
*Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.*

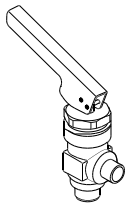
A possible issue with our quick oil drain valves type QDV which may not fully close off during an oil draining process.

This may present itself when a drainage pipe is installed on the outlet of the valve which generates a back pressure to the valve such that the valve is unable to fully close. This will not present itself if there is no drainage pipe installed on the valve outlet. Max. back pressure 10 bar.

In applications where a QDV valve is installed in a system and is normally operating with an outlet pipe, please ensure that full safety precautions are taken when draining oil and make sure the inlet to the vessel is isolated during the oil draining process.

# Instructions

## Quick closing oil drain valve type QDV 15



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148R9540

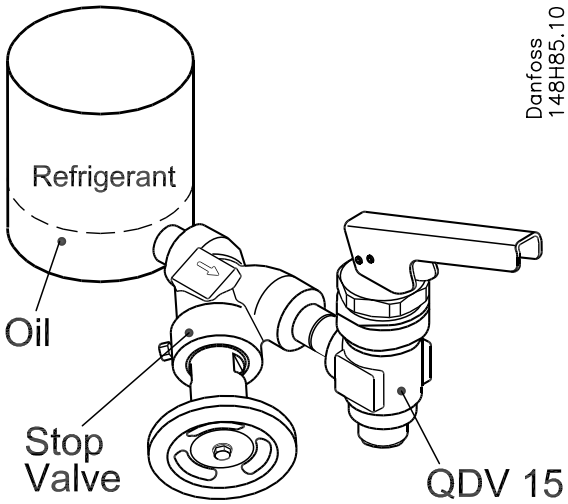



*Fig. 1*

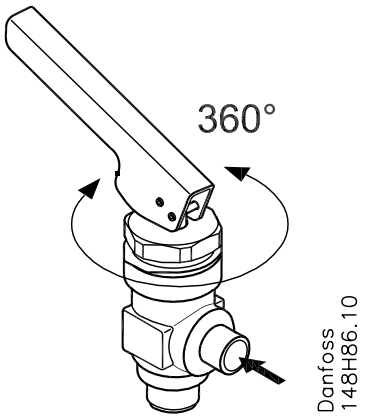



*Fig. 2*

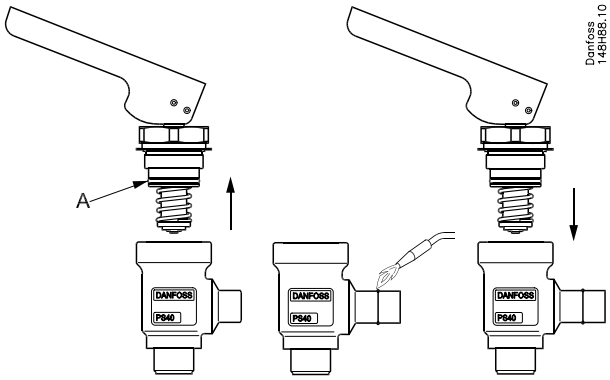
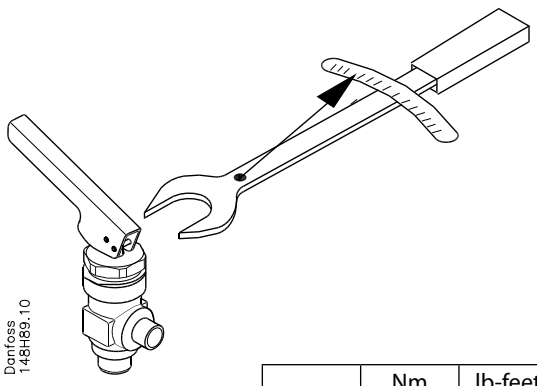



*Fig. 3*




| | Nm | lb-feet |
|---|---|---|
| QDV 15 | 50 | 37 |

*Fig. 4*

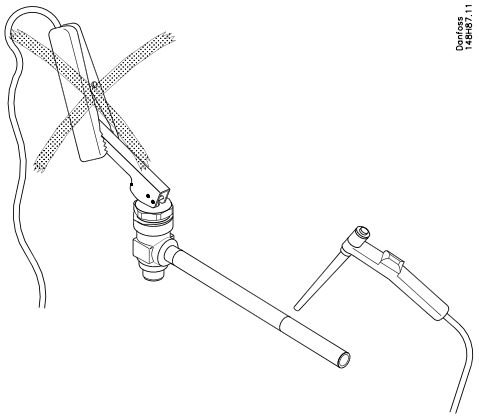



*Fig. 5*

**Refrigerants:**
Applicable to all common non-flammable refrigerants, including R717 and non corrosive gases/liquids depending on sealing material compatibility.

Flammable hydrocarbons are not recommended. QDV is a backpressure dependent valve. The valve is only recommended for use in open circuits. For further information please contact Danfoss.

**Temperature range:**
QDV 15: –50/+150°C (–58/+302°F)

**Pressure range:**
The valves are designed for a max. working pressure of 40 bar g (580 psi g). In order to prevent hydraulic pressure building up between the stop valve and the QDV an integral relief device is included opening the valve slowly if the pressure exceeds 20 bar g (290 psi g).

**Installation:**
The valve must be installed after a stop valve with the spindle vertically upwards and with flow direction from the side branch (fig. 1).

If any tube or hose is mounted on the outlet of the QDV it has to be calculated to prevent backpressure building up when relieving. Blocking the outlet of the QDV will cause danger (hydraulic pressure building up).
An outlet hose of the same size as the outlet connection of the QDV valve must be used.

The handle can be turned 360° for optimizing operation position (fig. 2).
Valves should only be operated by hand without the use of tools or other devices.
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.

**Recommended flow direction:**
The valve must be installed with flow direction from the side branch (fig. 2).

**Welding:**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-ring between the valve body and bonnet, as well as the Teflon cone ring in the valve seat.
Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing.
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 threads of the housing and the bonnet.
Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F.
This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.
Be careful not to damage the Teflon cone ring. The valve housing must be free from stresses (external loads) after installation.

**Fig. 5**
**Never use QDV or any other Danfoss product to get an earth connection for welding as it might cause damage to the product.**

**Assembly:**
Remove welding debris and any dirt from pipes and valve body before assembly.
Check that the O-ring between the valve body and bonnet, as well as the Teflon cone ring in the valve seat is without marks or scratches.

**Tightening:**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4).

**Colors and identification:**
The QDV 15 valves are painted with a red oxide primer in the factory.
Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body.
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 ring when repainting the valve is recommended.

## Maintenance

**Dismantling the valve (fig. 3):**
Do not remove the bonnet while the valve is still under pressure. Always close the stop valve before the QDV. Then proceed with activation of the QDV valve to make sure that it is not under pressure.
- Check that the O-ring (pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- Check that the Teflon cone ring is without marks or scratches.

**Replacement of the O-ring between the bonnet and the valve body (fig. 4):**
The QDV 15 is delivered with an extra O-ring. Remove the damaged O-ring (pos. A) from the bonnet and carefully install the new O-ring.

**Assembly:**
Remove any dirt from the body before the valve is assembled.
Check that the O-ring between the valve body and bonnet, as well as the Teflon gasket in the valve seat is without marks or scratches.

**Tightening:**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4).

Use only original Danfoss parts for replacement.
New parts must be made of certified materials applicable for the refrigerant used.

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A possible issue with our quick oil drain valves type QDV which may not fully close off during an oil draining process.

This may present itself when a drainage pipe is installed on the outlet of the valve which generates a back pressure to the valve such that the valve is unable to fully close. This will not present itself if there is no drainage pipe installed on the valve outlet. Max. back pressure 10 bar.

In applications where a QDV valve is installed in a system and is normally operating with an outlet pipe, please ensure that full safety precautions are taken when draining oil and make sure the inlet to the vessel is isolated during the oil draining process.

# Instructions

## REG 15 - 65,
## REG-SS 15 - 40

148R9516

**Installation**

148R9516

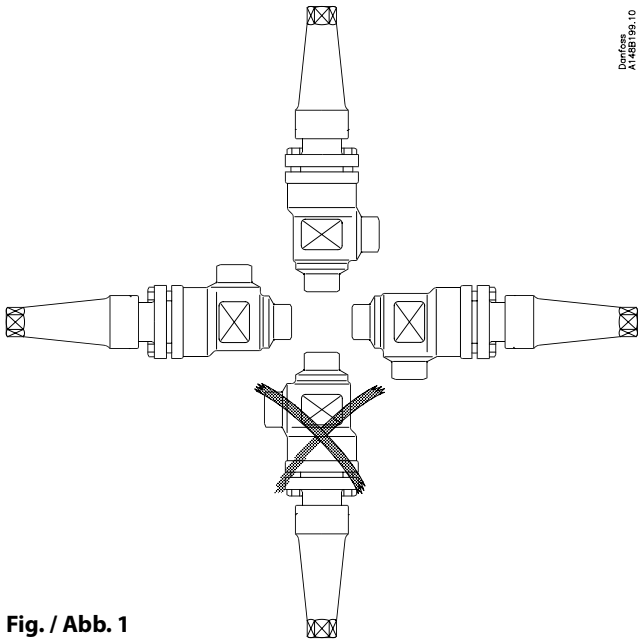



**Fig. / Abb. 1**

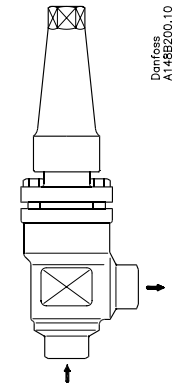



**Fig. / Abb. 2**

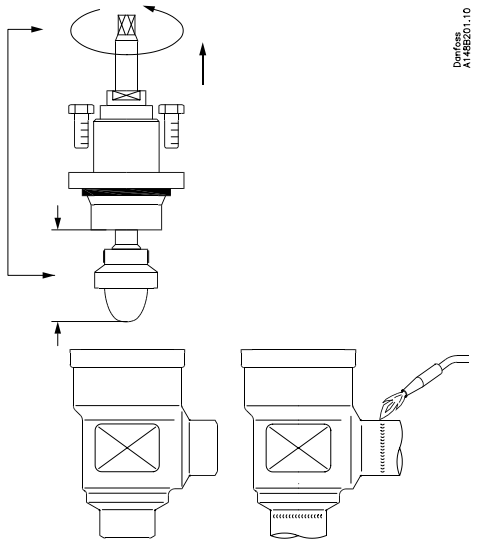
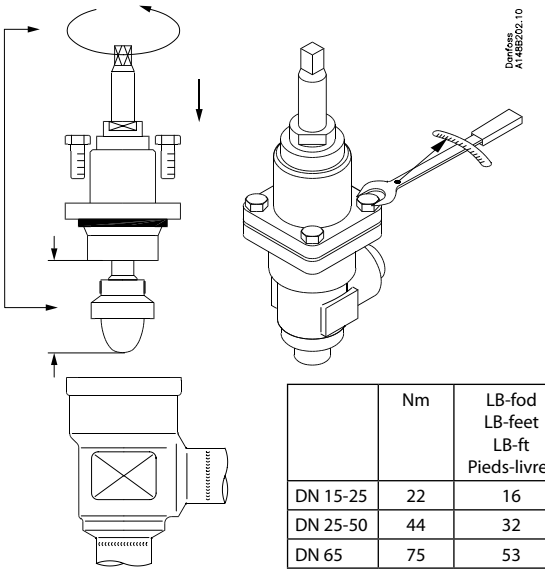



**Fig. / Abb. 3**




| | Nm | LB-fod<br>LB-feet<br>LB-ft<br>Pieds-livres |
|---|---|---|
| DN 15-25 | 22 | 16 |
| DN 25-50 | 44 | 32 |
| DN 65 | 75 | 53 |

**Fig. / Abb. 4**

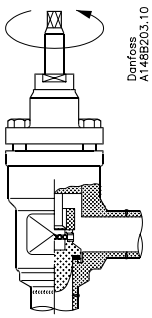



**Fig. / Abb. 5**

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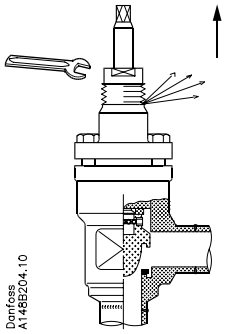



**Fig. / Abb. 6**

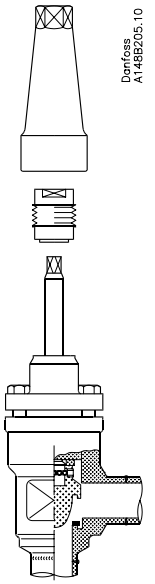
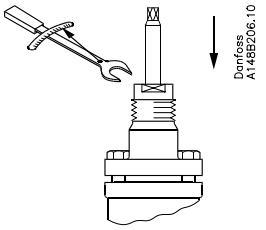



**Fig. / Abb. 7**




| | Nm | LB-fod<br>LB-feet<br>LB-ft<br>Pieds-livres |
|---|---|---|
| DN 15-25 | 50 | 37 |
| DN 25-40 | 70 | 52 |
| DN 50-65 | 60 | 45 |

**Fig. / Abb. 8**

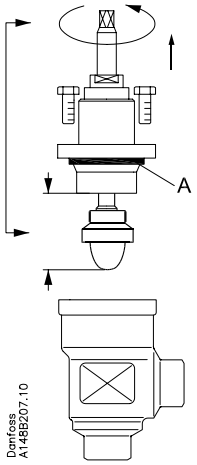



**Fig. / Abb. 9**

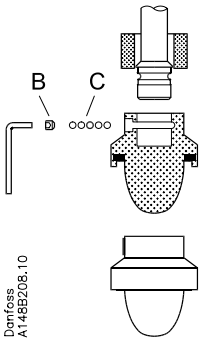



**Fig. / Abb. 10**

 ~~RI1GB302~~ → DKRCI.PI.KM0.A1.52 / 520H1539

## Installation

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

**Temperature range**
REG: –50/+150°C (–58/+302°F)
REG-SS: –60/+150°C (–76/+302°F)

**Pressure range**
The valves are designed for a max. working pressure of 40 bar g (580 psi g).

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand according to the guidelines in the datasheet. 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.

**Recommended flow direction**
Direct the flow towards the cone as indicated by the arrow placed on the valve housing (fig. 2). The force used to open and close the valve must not exceed the force of an ordinary handwheel.

**Welding**
The bonnet should be removed before welding (fig. 3) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

REG 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.

**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 bonnet before it is replaced in the valve body (fig. 4).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4).

**Colours and identification**
The REG valves are painted with a red oxide primer in the factory. Stainless steel valves are not painted. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 5)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 6)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland (fig. 7)**
Cap and packing gland can now be removed.

**Dismantling the valve**
Do not remove the bonnet while the valve is still under pressure.
- Check that the O-ring (fig. 9, pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone (fig. 10)**
Unscrew the cone screw (pos. B) with an Allen key.

| | |
|---|---|
| REG 15-40 | 2.0 mm A/F |
| REG 50-65 | 2.5 mm A/F |

(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the balls (pos. C).

Number of balls in fig. 10, pos. C:
REG with cone no. 4-5-6-7..... 10 pcs.
REG with cone no. 8-9-10-11-12..... 14 pcs.

The cone can then be removed. Place the new cone on the spindle and replace the balls. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 4).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4). Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 8).

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.

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.

For further details / restrictions – see Installation Instruction

**Description of Pressure Equipment**

Refrigerant main regulating valves
Type **REG, REG-SS**

| | |
|---|---|
| Nominal bore | **DN ≤ 25 mm.** (1 in) |

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 07/01/2003

148B9716 - rev. 1

 ~~RI1GB302~~ → DKRCI.PI.KM0.A1.52 / 520H1539

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**
Refrigerant stop valve, with straight or angled bonnet arrangement

**Type REG**

| | | |
|---|---|---|
| Nominal bore | **DN 27-40 mm**. ($1^1/_8$ in. - $2^1/_2$ in.) | |
| Classified for | **Fluid Group I** (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. | |
| Temperature range maximum allowable working pressure | REG | PS 40 bar (580 psi) at –50°C/+150°C (–58°F/+302°F) |
| | REG-SS | PS40 bar (580 psi) at –60°C/+150°C (–76°F/+302°F) |

**Conformity and Assessment Procedure Followed**

| | |
|---|---|
| Category | **II** |
| Module | **D1** |
| Certificate ID | *D1: 07 202 0511 Z 0009/1/H-0002* |

**Name and Address of the Notified Body which carried out the Inspection**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

CE
(0045)

**Name and Address of the Notified Body monitoring the Manufacturer's Quality Assurance System**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

**References of Harmonised Standards used**
EN 10028-3 EN 10222-4

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 10/03/2003

148B9717 - rev. 2

# Instructions

REG 15 - 65 (PS 52 bar / 754 psi)
REG-SS 15-40

148R9531

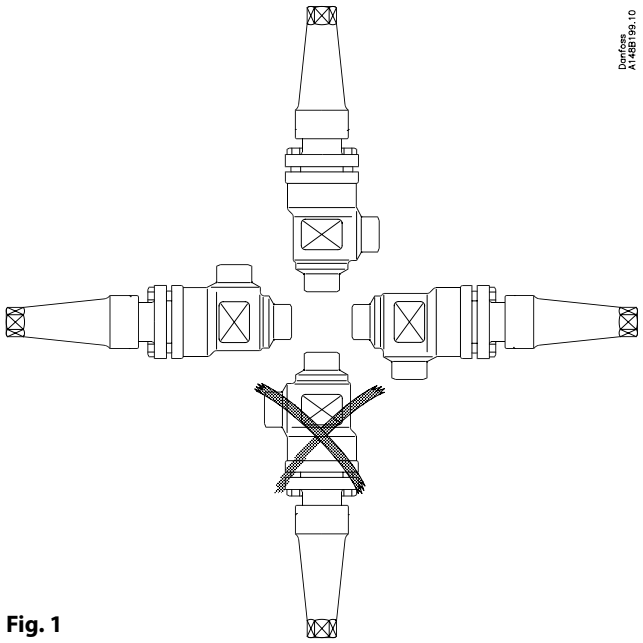



**Fig. 1**

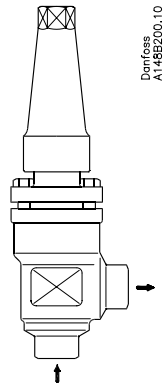



**Fig. 2**

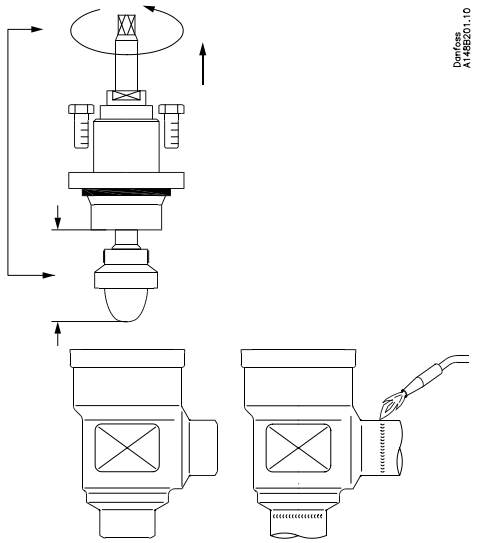
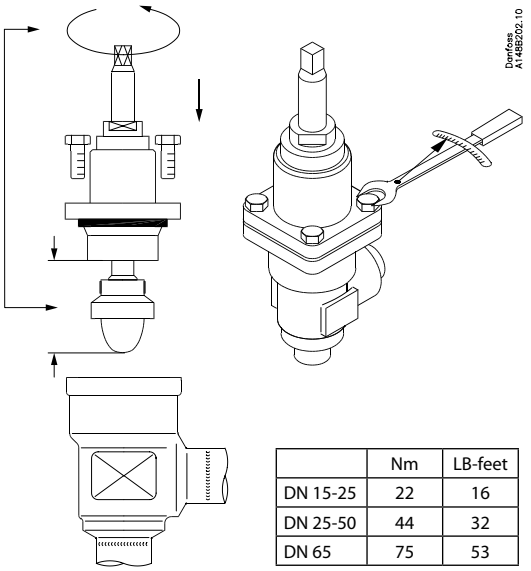



**Fig. 3**




| | Nm | LB-feet |
|---|---|---|
| DN 15-25 | 22 | 16 |
| DN 25-50 | 44 | 32 |
| DN 65 | 75 | 53 |

**Fig. 4**

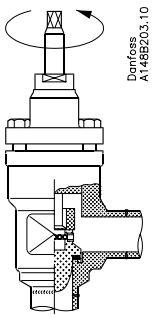



**Fig. 5**

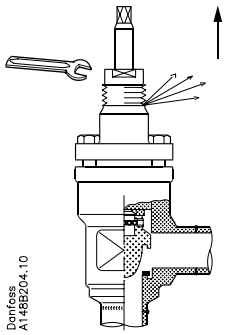



**Fig. 6**

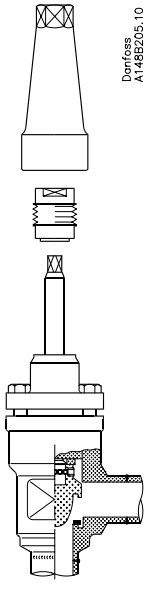
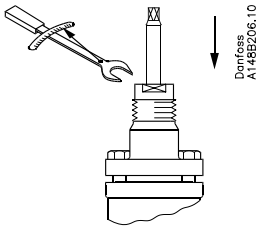



**Fig. 7**




| | Nm | LB-feet |
|---|---|---|
| DN 15-25 | 50 | 37 |
| DN 25-40 | 70 | 52 |
| DN 50-65 | 60 | 45 |

**Fig. 8**

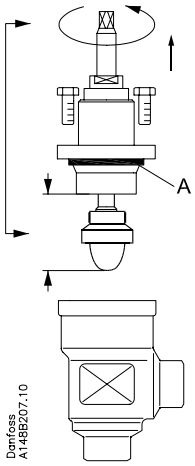



**Fig. 9**

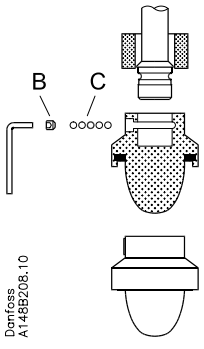



**Fig. 10**

ENGLISH

## Installation

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

**Temperature range**
REG: –50/+150°C (–58/+302°F)
REG-SS: –60/+150°C (–76/+302°F)

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

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand according to the guidelines in the datasheet. 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.

**Recommended flow direction**
Direct the flow towards the cone as indicated by the arrow placed on the valve housing (fig. 2). The force used to open and close the valve must not exceed the force of an ordinary handwheel.

**Welding**
The bonnet should be removed before welding (fig. 3) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

REG 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.

**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 bonnet before it is replaced in the valve body (fig. 4).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4).

**Colours and identification**
The REG valves are painted with a red oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 5)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 6)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland (fig. 7)**
Cap and packing gland can now be removed.

**Dismantling the valve**
Do not remove the bonnet while the valve is still under pressure.

- Check that the O-ring (fig. 9, pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone (fig. 10)**
Unscrew the cone screw (pos. B) with an Allen key.

| | |
|---|---|
| REG 15-40 | 2.0 mm A/F |
| REG 50-65 | 2.5 mm A/F |

(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the balls (pos. C).

Number of balls in fig. 10, pos. C:
REG with cone no. 4-5-6-7..... 10 pcs.
REG with cone no. 8-9-10-11-12..... 14 pcs.

The cone can then be removed. Place the new cone on the spindle and replace the balls. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 4).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4). Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 8).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.

For further details / restrictions – see Installation Instruction

**Description of Pressure Equipment**

Refrigerant main regulating valves
Type **REG and REG-SS**

| | |
|---|---|
| Nominal bore | **DN ≤ 25 mm.** (1 in) |

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 11/05/2004

148B9716 - rev. 2

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**
Refrigerant stop valve, with straight or angled bonnet arrangement

**Type REG and REG-SS**

| | | |
|---|---|---|
| Nominal bore | **REG DN 32-65 mm** (1¼ in. - 2 in.); **REG-SS DN 32-40 mm** (1¼ in. - 1½ in.) | |
| Classified for | **Fluid Group I** (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. | |
| Temperature range | REG<br>REG-SS | –50°C/+150°C (–58°F/+302°F)<br>–60°C/+150°C (–76°F/+302°F) |
| Maximum allowable working pressure | Standard applications<br>High pressure applications | PS 40 bar (580 psi)<br>PS 52 bar (754 psi) |

**Conformity and Assessment Procedure Followed**

| | | |
|---|---|---|
| Category | | **II** |
| Module | | **D1** |
| Certificate ID | | *D1: 07 202 0511 Z 0009/1/H-0002* |
| Nominal bore | Standard applications | DN 32-65 mm (1¼ - 2 in.) |

**Name and Address of the Notified Body which carried out the Inspection**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

CE
(0045)

**Name and Address of the Notified Body monitoring the Manufacturer's Quality Assurance System**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

**References of Harmonised Standards used**
EN 10028-3 EN 10213-3 EN 10222-4

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 11/05/2004

148B9717 - rev. 3

# Instructions

REG 3-40

148R9507

148R9507

**Installation**

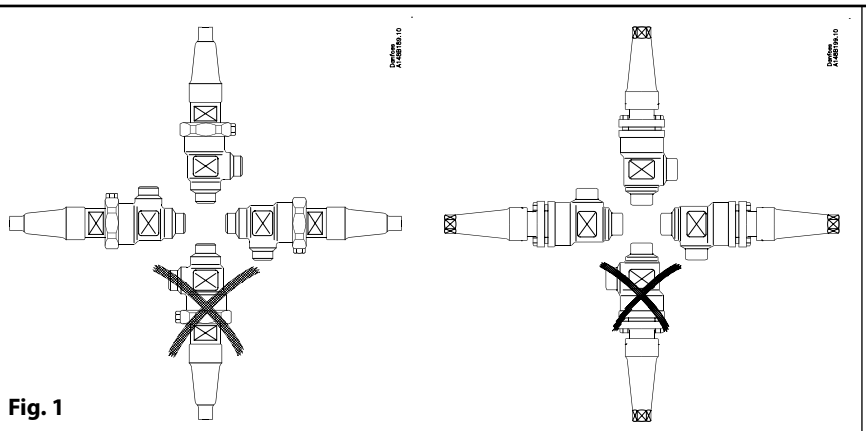


**Fig. 1**

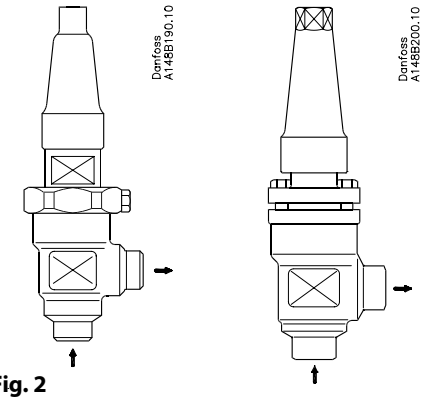


**Fig. 2**

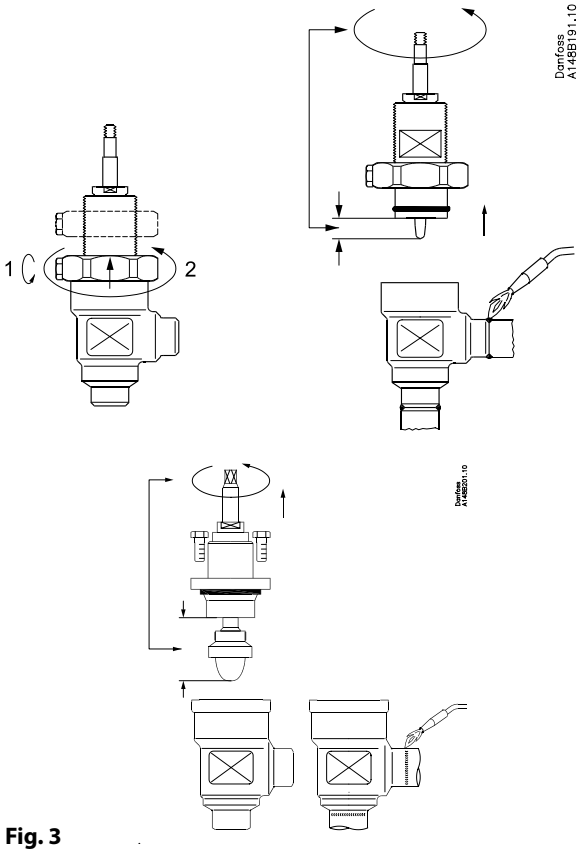
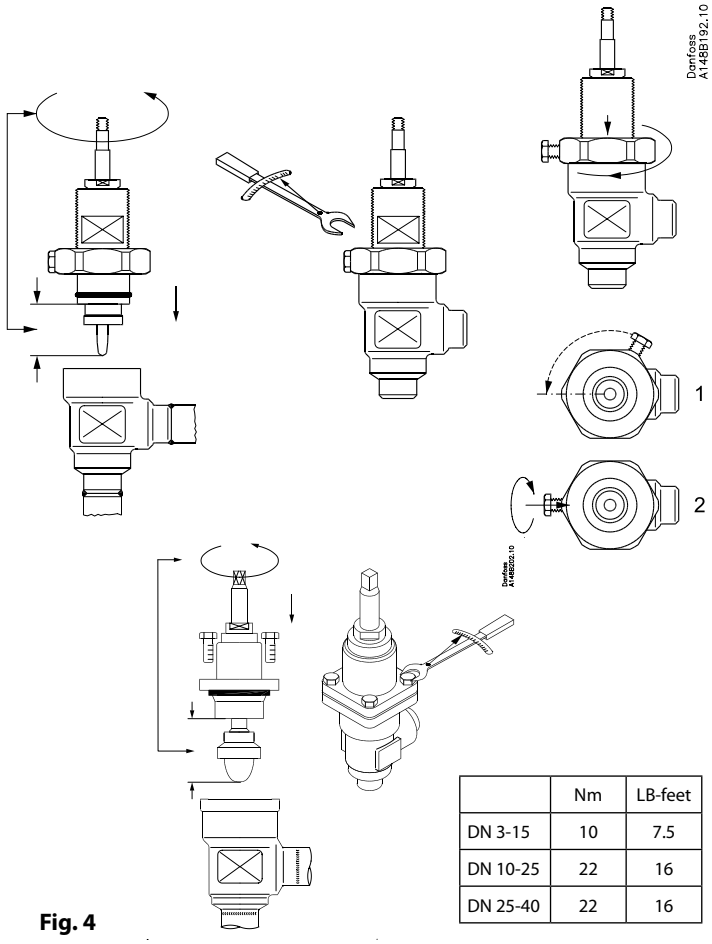


**Fig. 3**



| | Nm | LB-feet |
|---|---|---|
| DN 3-15 | 10 | 7.5 |
| DN 10-25 | 22 | 16 |
| DN 25-40 | 22 | 16 |

**Fig. 4**

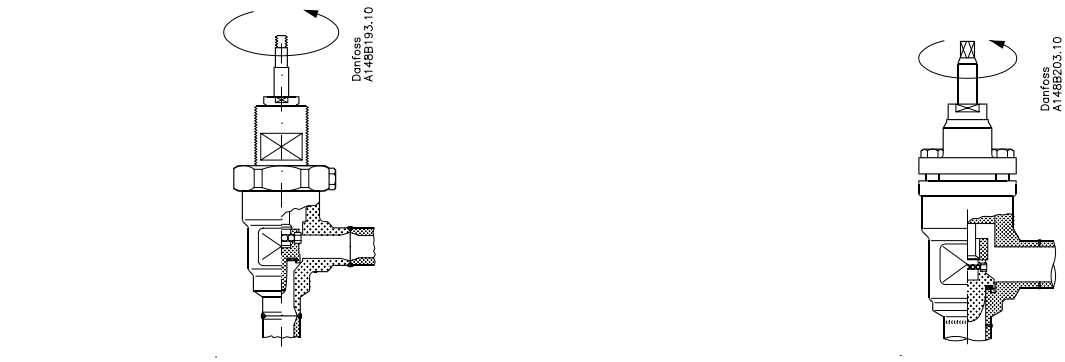


**Fig. 5**

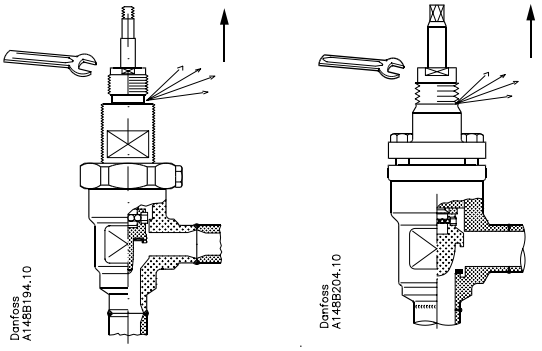



**Fig. 6**

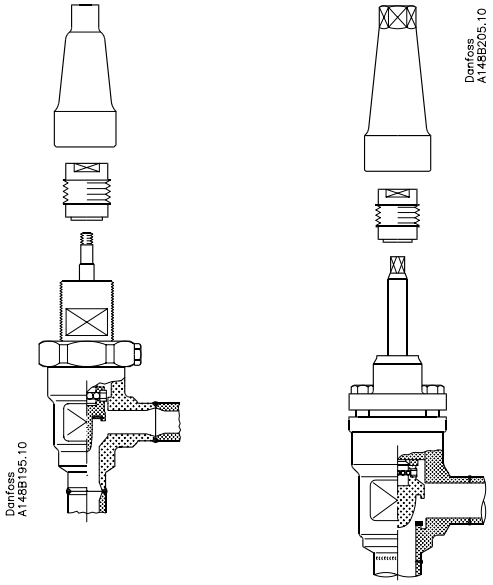
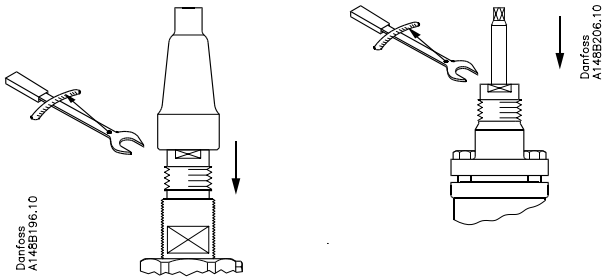



**Fig. 7**




| | Nm | LB-feet |
|---|---|---|
| DN 3-15 | 30 | 22 |
| DN 10-25 | 50 | 37 |
| DN 25-40 | 70 | 52 |

**Fig. 8**

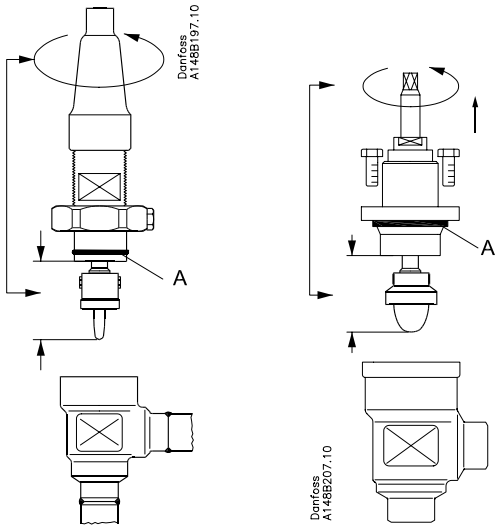



**Fig. 9**

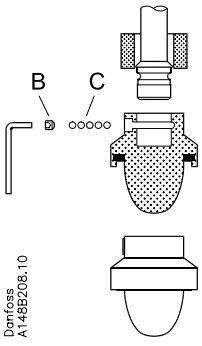



**Fig. 10**

ENGLISH

## Installation

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

**Temperature range**
–50/+150°C (–58/+302°F)

**Pressure range**
The valves are designed for a max. working pressure of 25 bar g (363 psi g).

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand according to the guidelines in the datasheet. 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.

**Recommended flow direction**
Direct the flow towards the cone as indicated by the arrow placed on the valve housing (fig. 2). The force used to open and close the valve must not exceed the force of an ordinary handwheel.

**Welding**
The bonnet should be removed before welding (fig. 3) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

REG 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.

**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 bonnet before it is replaced in the valve body (fig. 4).

**Tightening**
Thighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4).

**Colours and identification**
The REG valves are painted with a red oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating** (fig. 5)
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization** (fig. 6)
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland** (fig. 7)
Cap and packing gland can now be removed.

**Dismantling the valve**
Do not remove the bonnet while the valve is still under pressure.

- Check that the O-ring (Fig. 9, pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone** (fig. 10)
Unscrew the cone screw (pos. B) with an Allen key.

| | |
|---|---|
| REG 3-40 | 2.0 mm A/F |

(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the balls (pos. C).

Number of balls in fig. 10, pos. C:

| | |
|---|---|
| REG 3-10 | 6 pcs. |
| REG 15-20 | 10 pcs. |
| REG 25-40 | 14 pcs. |

The cone can then be removed. Place the new cone on the spindle and replace the balls. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 4).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 4). Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 8).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.

For further details / restrictions – see Installation Instruction

**Description of Pressure Equipment**
Refrigerant main regulating valves
Type **REG**

Nominal bore **DN ≤ 25 mm.** (1 in)

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 18/01/2002

148B9716 - rev. 0

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**

High pressure float valve
**Type REG**

| | | |
|---|---|---|
| Nominal bore | **DN 27-40 mm**. ($1^1/_8$ in. - $1^1/_2$ in.) | |
| Classified for | **Fluid Group I** (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. | |
| Temperature range | REG | –50°C/+150°C (–58°F/+302°F) |
| maximum allowable working pressure | REG | **25 bar** (365 psi) |

**Conformity and Assessment Procedure Followed**

| | |
|---|---|
| Category | **I** |
| Module | **A** |

**References of Harmonised Standards used**

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

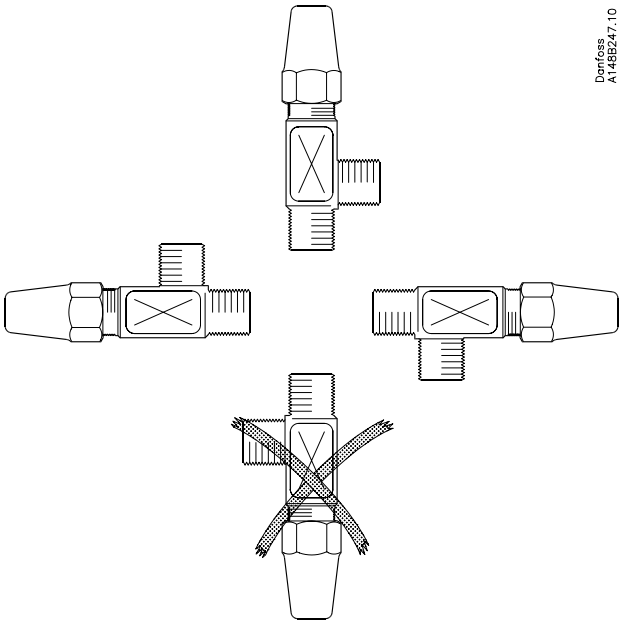
**Signature:** Morten Steen Hansen **Date:** 01/11/2001

148B9717 - rev. 0

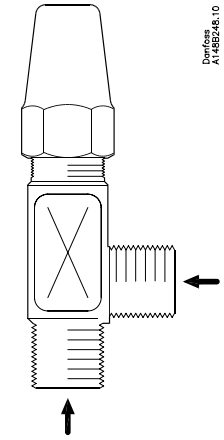
# Instruction

## SNV-ST, SNV-SS

148R9517




1




2

148R9517

**ENGLISH**

### Installation

**Refrigerants**
Applicable to all common refrigerants, including R717, $H_2S$ and non-corrosive gases/liquids dependent on sealing material compatability.
The valve is only recommended for use in closed circuits. For further information please contact Danfoss.

**Temperature range**
SNV: –60/+150°C (–76/+302°F)

**Pressure range**
SNV: The valves are designed for a max. working pressure of 52 bar g (754 psig).

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand according to sound engineering practice only by use of small spanners. 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.

**Recommended flow direction**
Flow direction as indicated by the arrow (fig. 2). The force used to open and close the valve must not exceed the force of an ordinary handwheel.

The valve housing must be free from stresses (external loads) after installation.

SNV 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.

**Identification**
Precise identification of the valve is made via the stamping on the valve body.

**Surface Treatment**
SNV-ST is externally zinc-chromated and SNV-SS is made of stainless steel. The external surface of the valve housing can be further prevented against corrosion with a suitable protective coating.

### Maintenance

SNV valves are assembled without the possibility to be disassembled. The spindle can in no way be unscrewed. This will protect the system from tampering.

**Packing gland**
If the packing gland is found to be leaking, there is a possibility to tighten it by carefully screwing with a wrench. Make sure not to apply very high force and we recommend turning the packing gland in steps and to check the leaking in between.

In cases of doubt, please contact Danfoss.

# DECLARATION OF CONFORMITY
The Pressure Equipment Directive 97/23/EC

**Name and Address of Manufacturer's Representative within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are Classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.
For further details / restrictions - see Installation Instruction

**Description of Pressure Equipment**
Refrigerant stop valve, with angled bonnet arrangement
Type **SNV-ST** and **SNV-SS**

| | |
|---|---|
| Nominal bore | **DN ≤ 25 mm (1 in.)** |

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer's Representative within the European Community**

Name: Morten Steen Hansen Title: Production Manager

Signature: Morten Steen Hansen Date: 14/01/2003

148B9740 – rev. 0

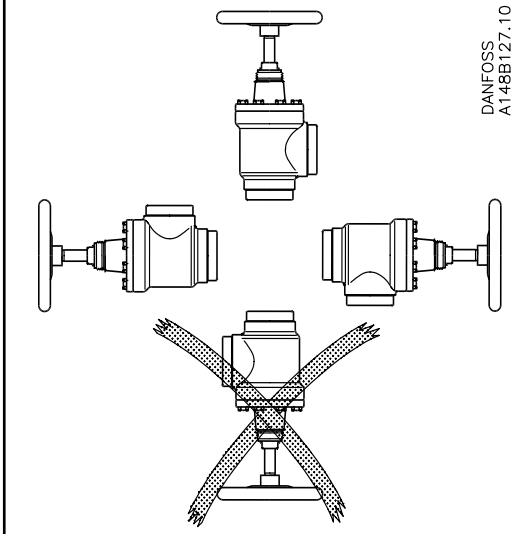
# Instruction

STC 15 - 150 (½ - 6 in.)

148R9534

148R9534

**Installation**

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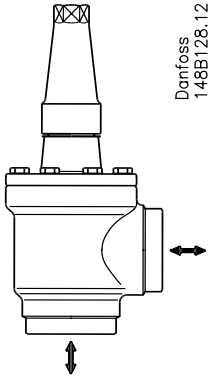


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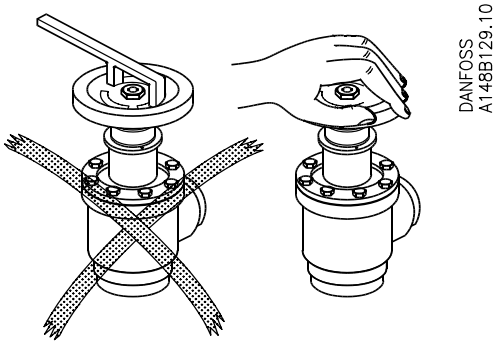
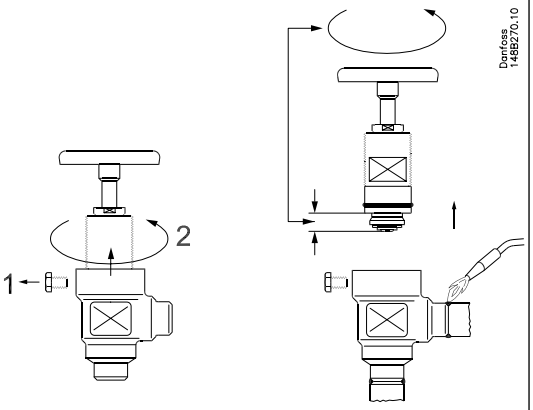


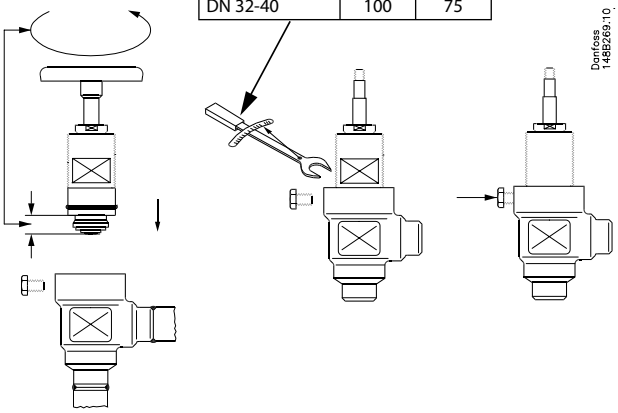

*3*

**STC 15-40**

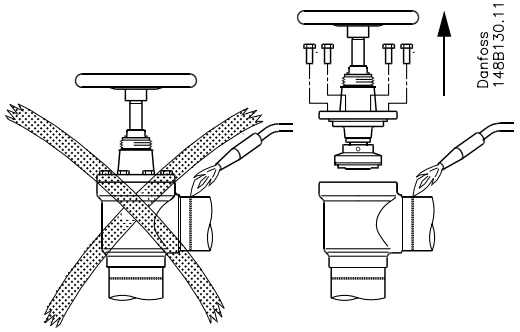



**STC 15-40**

| | Nm | LB-feet |
|---|---|---|
| DN 15-25 | 80 | 60 |
| DN 32-40 | 100 | 75 |

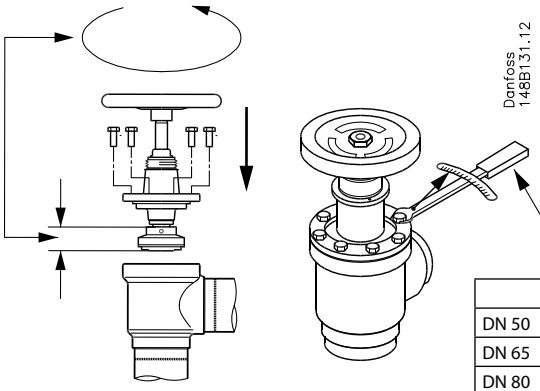



**STC 50-150**



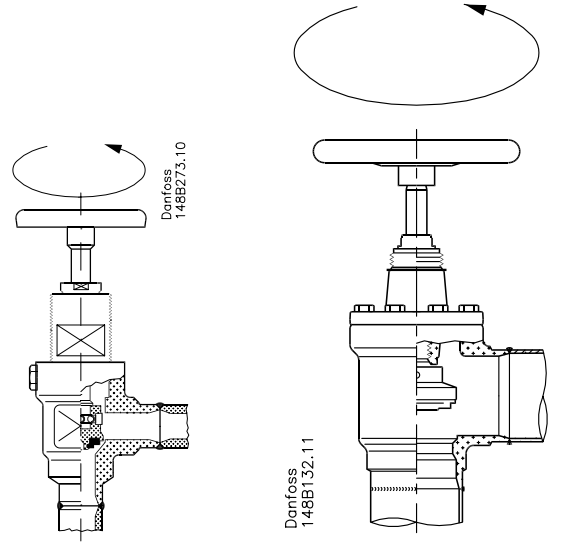

*4*

**STC 50-150**



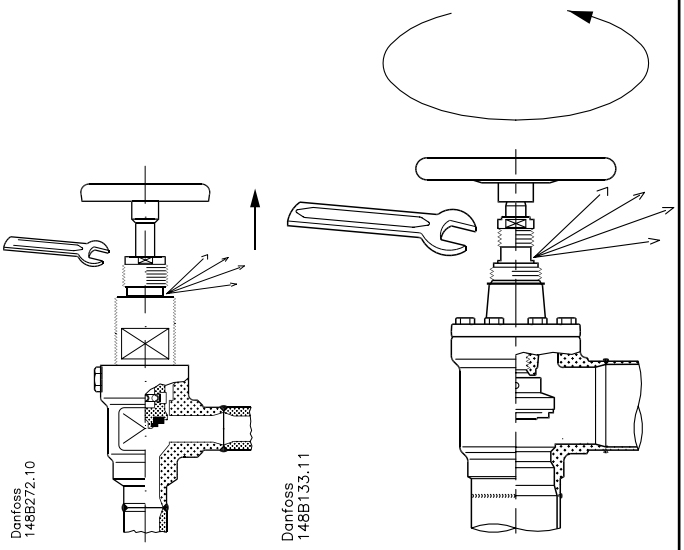

| | Nm | LB-feet |
|---|---|---|
| DN 50 | 36 | 26 |
| DN 65 | 62 | 45 |
| DN 80 | 36 | 26 |
| DN 100 | 62 | 45 |
| DN 125-150 | 130 | 95 |

*5*



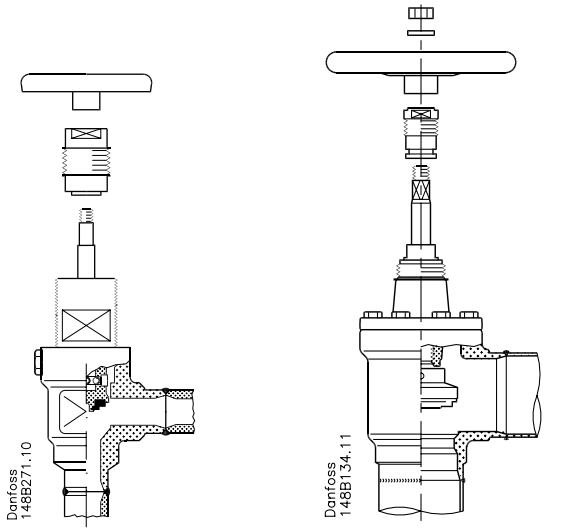

**STC 15-40** **STC 50-150**

***6***



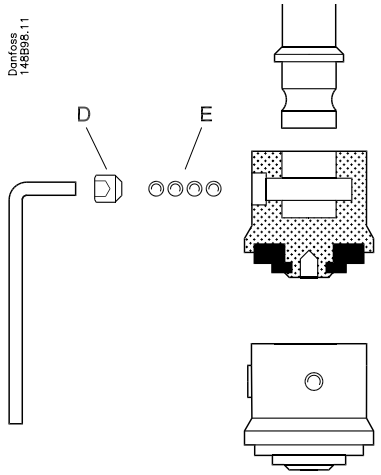

**STC 15-40** **STC 50-150**

***7***




**STC 15-40** **STC 50-150**

***8***

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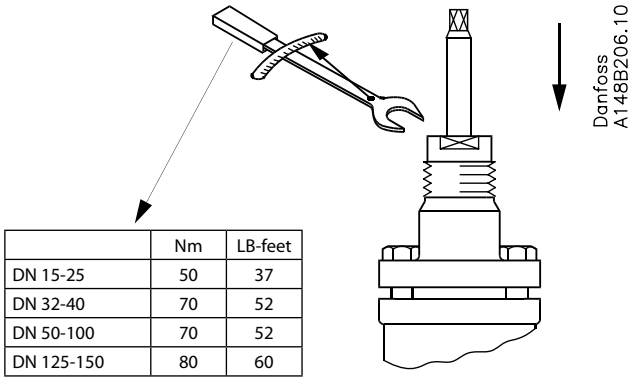


| | Nm | LB-feet |
|---|---|---|
| DN 15-25 | 50 | 37 |
| DN 32-40 | 70 | 52 |
| DN 50-100 | 70 | 52 |
| DN 125-150 | 80 | 60 |

***10***

# Instructions

SVA-DH, SVA-DL 250-300

148R9510

148R9510

**Installation**

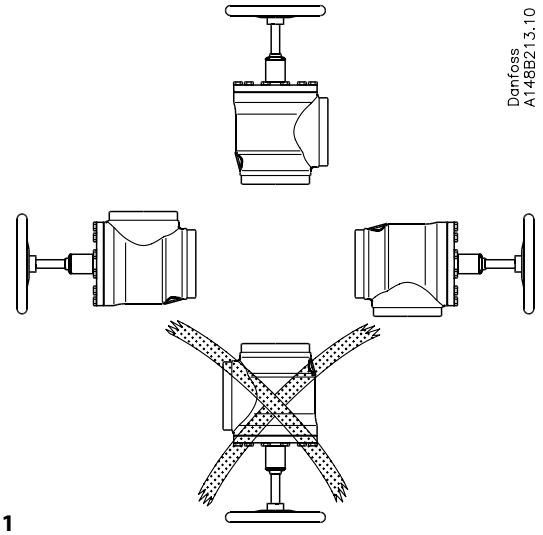


**Fig. 1**

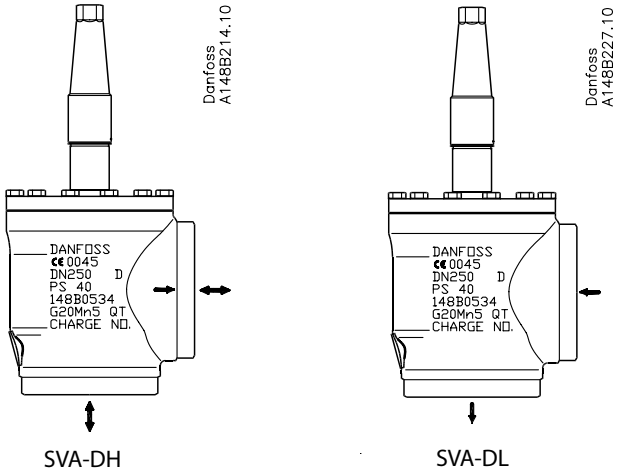


**Fig. 2**

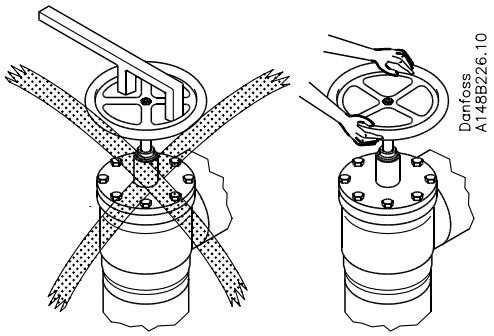


**Fig. 3**

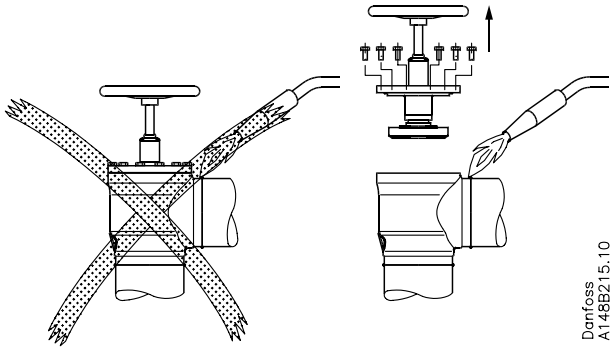


**Fig. 4**

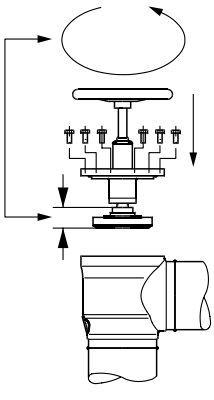

**Fig. 5a**

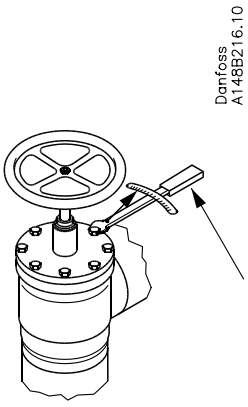


**Fig. 5b**

| | Nm | LB-feet |
|---|---|---|
| DN 250-300 | 370 | 272 |

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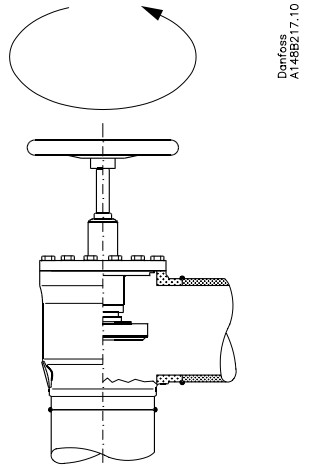



**Fig. 6**

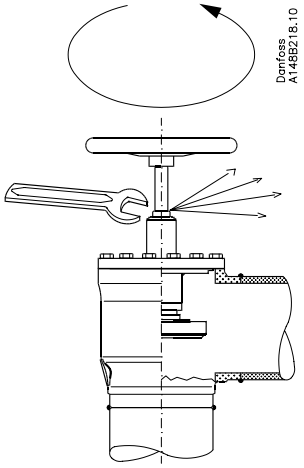



**Fig. 7**

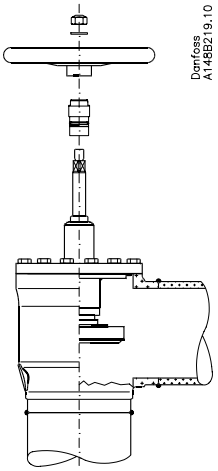
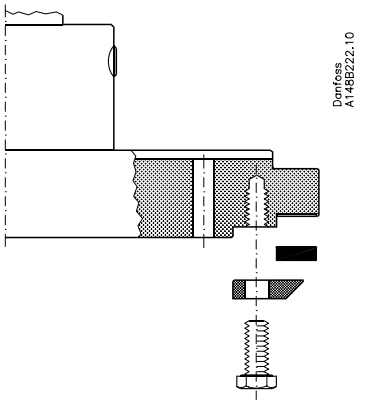


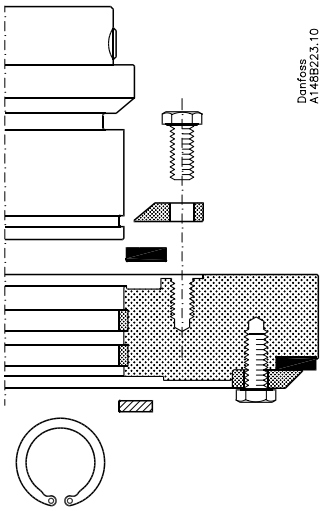

**Fig. 8**




SVA-DL, SVA-DH

| **Pos. C** | Nm | LB-feet |
|---|---|---|
| DN 250-300 | 25 | 18 |

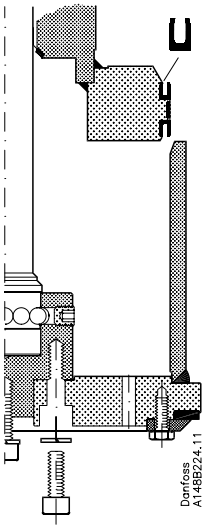
**Fig. 9a**




SVA-DL

| **Pos. A** | Nm | LB-feet |
|---|---|---|
| DN 250-300 | 25 | 18 |

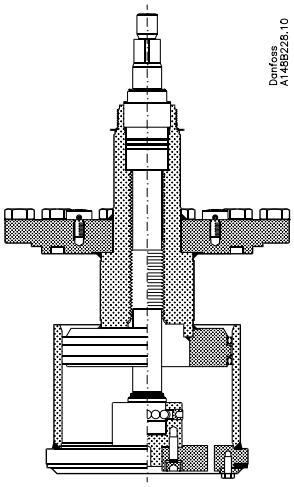
**Fig. 9b**




SVA-DH

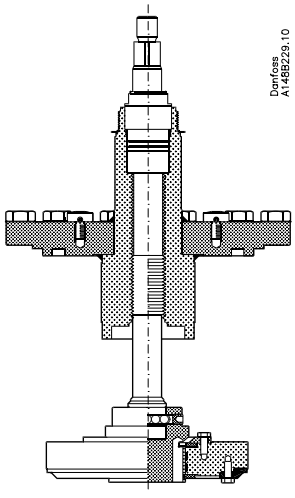
| **Pos. B** | Nm | LB-feet |
|---|---|---|
| DN 250-300 | 49 | 36 |

**Fig. 9c**

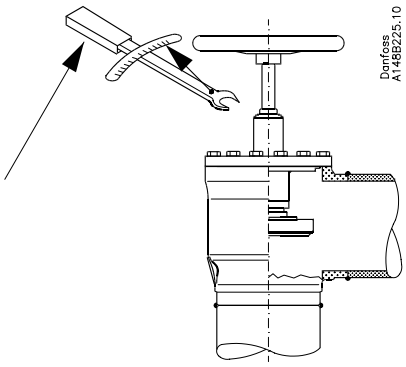



SVA-DH

**Fig. 10**




SVA-DL




| | Nm | LB-feet |
|---|---|---|
| DN 250-300 | 80 | 60 |

**Fig. 11**

ENGLISH

## Installation

**Refrigerants**
Applicable to all common non-flammable refrigerants, including R717, $H_2S$ and non-corrosive gases/liquids dependent on sealing material compatability. Flammable hydrocarbons are not recommended. The valve is only recommended for use in closed circuits. For further information please contact Danfoss.

**Temperature range**
SVA-DL: –60/+150°C (–76/+302°F)
SVA-DH: –60/+150°C (–76/+302°F)

**Pressure range**
SVA-DL, SVA-DH:
40 bar (580 psi) at -60°C to +60°C (-76°F to +140°F)
36 bar (522 psi) at +60°C to +80°C (+140°F to +176°F)
32 bar (464 psi) at +80°C to +120°C (+176°F to +248°F)
28 bar (406 psi) at +120°C to +150°C (+248°F to +302°F)

The valves are designed for a max. working pressure of 40 bar g (580 psi g).

**Installation (fig. 1)**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand without the use of tools or other devices (fig. 3). 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.

**Recommended flow direction (fig. 2)**
To achieve optimum flow conditions, the valve should be installed with the flow as indicated by the arrow (fig. 2) for SVA-DH. Flow in the opposite direction is also acceptable, but slightly reduces the $k_v$- / $C_v$ value.

For SVA-DL, flow direction can only be from the side in order for the pressure relief to function.

**Welding (fig. 4)**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

Stop 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.

**Assembly (fig. 5a)**
Remove welding debris and any dirt from pipes and valve body before assembly. Check that the cone has been fully screwed back towards the bonnet before it is replaced in the valve body (fig. 5a).

**Tightening (fig. 5b)**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b).

Tightening of the bonnet should be performed according to sound mechanical practice.

**Colours and identification**
The SVA valves are painted with a red oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 6)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 7)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland**
Handwheel and packing gland can now be removed.

**Dismantling the valve**
Do not remove the bonnet while the valve is still under pressure.

- Check that the top gasket has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the cone assembly must be disassembled and the teflon renewed.

Replacement of the teflon seat (fig. 9a)
The Teflon seat can be renewed as shown in fig. 9a. The bolts, pos. C, are unscrewed and the tension ring can be removed. If the Teflon seat is moderately damaged, it can be turned around to use the fresh side (check).
If the Teflon ring is deformed or has very deep marks (> 1mm) it must be replaced for strength. When remounting the bolts on the tension ring, please refer to the torque table.

**Replacement of pressure relief seat on SVA-DL (fig. 9b)**
If the the SVA-DL has a leak over the pressure relief seat, this can be changed:
- Remove the retaining ring (Seeger circlip ring), pos. D, by using suitable tool.
- Pull the seat assembly off the spindle
- Remove bolts, pos. A
- Remove tension ring, pos. B.

Again the Teflon ring can be turned around if damages are moderate (moderate deforming or pressure marks < 0.8 mm). Otherwise the Teflon ring must be replaced.
- Put tension ring and bolts back in place and tighten bolts (pos. A) to the torque indicated.
- Check that the wear rings, pos. E, are intact and oil the rings before slowly and lightly placing the seat assembly on the spindle again.
- Refit the retaining ring, pos. D, in the spindle groove and check that the cone assembly refits on the spindle.

**Replace U-sleeve seals or balls in SVA-DH (fig. 9c)**
If the two U-sleeve seals are damaged or access is needed for the balls in the valve spindle - valve seat bearing:
- Rotate the spindle clockwise all the way down as for fully open
- Unscrew all the bolts in pos. B.
- Carefully remove the seat with the welded on cylinder.

Now there is access to the two U-sleeve seals (pos. C), the wear ring (pos. D), and the balls behind the lock nut (pos. E).

The U-sleeve seals must be replaced by bending them slightly into an oval shape and carefully pull them off in an angle and pushing the new one from an angle. The wear ring, pos. D, must be undamaged, otherwise replace.

- Oil the U-sleeve seals, pos. C, and wear ring, pos. D
- Carefully refit the cone with cylinder and at the same time place one of the bolts in pos. A to control the position of the remaining six bolt holes.
- Rotate the cone ot get the holes aligned
- Refit also the center bolt and tighten.
- Check that the U-sleeve seals are in place and the wear ring is positioned before slowly moving the spindle upwards checking that the seals move into place over the bevel.

**Replacement of backseat seal (fig. 10)**
The valve backseat is a special teflon ring. If this is damaged, it must be replaced. Screw the spindle out of the bonnet. Carefully remove the original backseat seal and mount a new one in the angled contact surface directly inside the opening in the bonnet. Avoid folding and damage to the teflon ring, or damage to the contact surface at the top of the valve during assembly.

**Assembly**
Remove any dirt from the body before the valve is assembled. Resposition the valve cone on the SVA-DH bonnet as described above with consideration to the U-sleeve seal. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 5a).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b). Tightening of the bonnet should be performed according to sound mechanical practice.

Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 11).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**

Refrigerant stop valve, with straight or angled bonnet arrangement
**Type SVA-DL (Δ Low) and SVA-DH (Δ High)**

| | |
|---|---|
| Nominal bore | **DN 250-300 mm**. (10-12 in.) |
| Classified for | **Fluid Group I** (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. |
| Temperature range maximum allowable working pressure | **PS40** bar (580 psi) at –60°C/+60°C (–76°F/+140°F)<br>**PS36** bar (522 psi) at +60°C/+80°C (+140°F/+176°F)<br>**PS32** bar (464 psi) at +80°C/+120°C (+176°F/+248°F)<br>**PS28** bar (406 psi) at +120°C/+150°C (+248°F/+302°F) |

**Conformity and Assessment Procedure Followed**

| Category | III | IV |
|---|---|---|
| Module | **B1 + D** | **B + D** |
| Certificate ID | *B1: 07 202 0124 Z 0248/2/0001*<br>*D: 07 202 0511 Z 0009/1/H-0001* | *B: 07 202 7833 Z 0226/2/H*<br>*D: 07 202 0511 Z 0009/1/H-0001* |
| Nominel bore | DN 250 mm. (10 in.) | DN 300 mm. (12 in.) |

**Name and Address of the Notified Body which carried out the Inspection**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

CE
(0045)

**Name and Address of the Notified Body monitoring the Manufacturer's Quality Assurance System**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

**References of Harmonised Standards used**
EN 10028-3 EN 10213-3

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 03/07/2002

148B9702 - rev. 0

# Instructions

SVA-HS 15-200 (1/2-8") (PS 40bar/580 psi)
SVA-HS 15-65 (1/2-2") (PS 52 bar/754 psi) high pressure version
SVA-HS 80-200 (3-8") (PS 50 bar/725 psi) high pressure version

**Installation**

148R9502

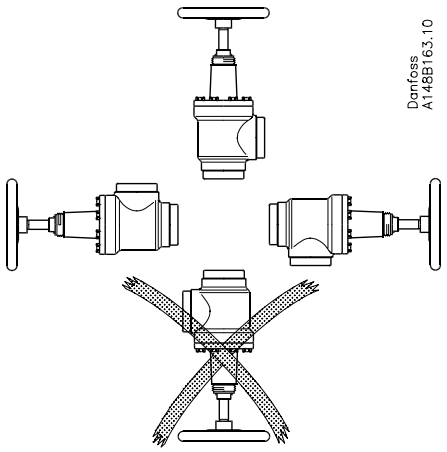



**Fig. 1**

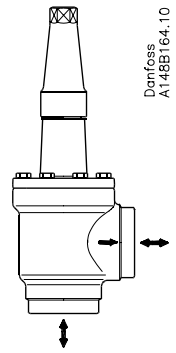



**Fig. 2**

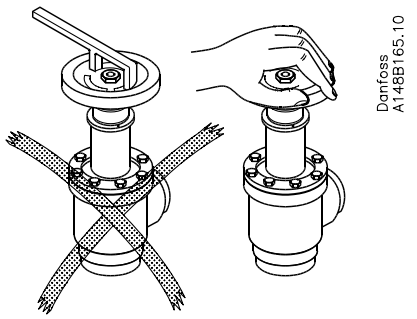



**Fig. 3**

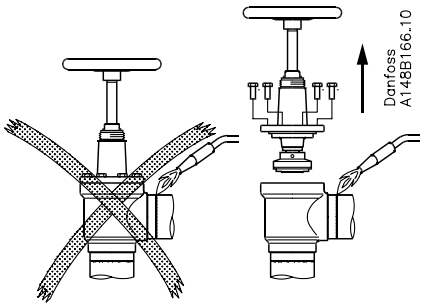



**Fig. 4**

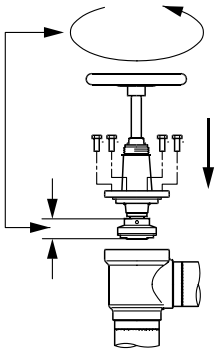


**Fig. 5a**

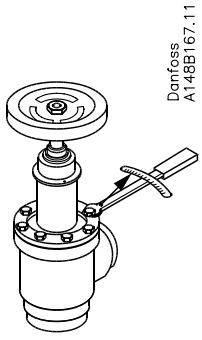



**Fig. 5b**

| | Nm | LB-feet |
|---|---|---|
| DN 15 - 20 | 22 | 16 |
| DN 25 - 50 | 44 | 32 |
| DN 65 | 74 | 53 |
| DN 80 | 44 | 32 |
| DN 100 | 74 | 53 |
| DN 125 - 150 | 183 | 135 |
| DN 200 | 370 | 272 |

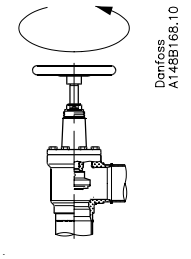



**Fig. 6**

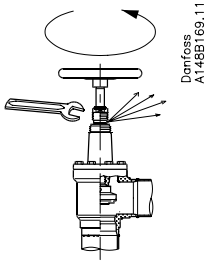



**Fig. 7**

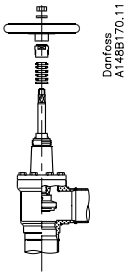



**Fig. 8**

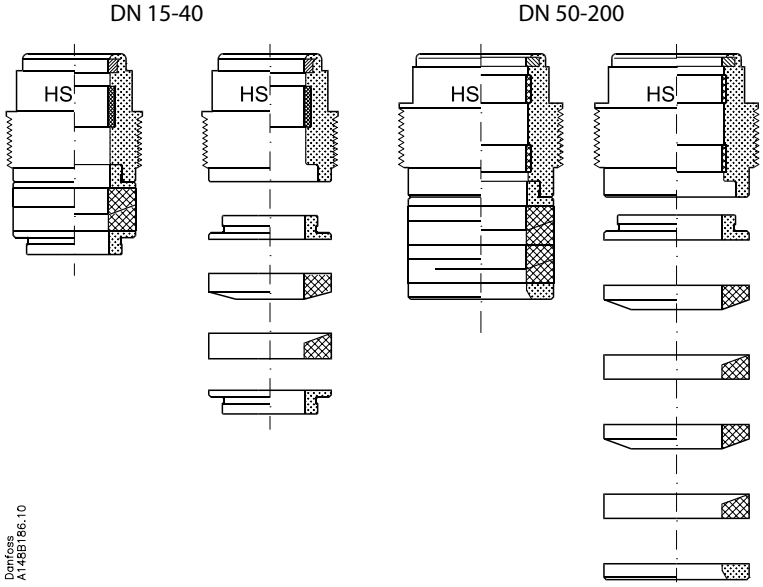



**Fig. 9**

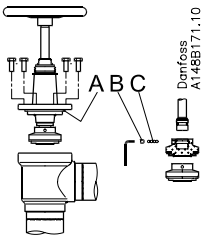



**Fig. 10**

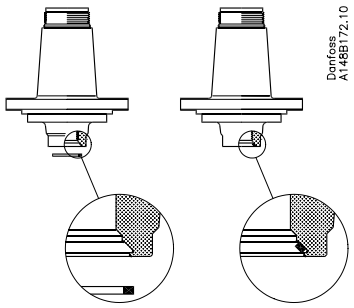



**Fig. 11**

| | Nm | LB-feet |
|---|---|---|
| DN 15 - 20 | 40 | 30 |
| DN 25 - 40 | 60 | 45 |
| DN 50 - 65 | 60 | 45 |
| DN 80 - 100 | 100 | 73 |
| DN 125 - 150 | 100 | 73 |
| DN 200 | 150 | 110 |

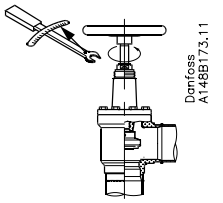



**Fig. 12**

ENGLISH

**Introduction**
The SVA-HS valve is designed for use in industrial refrigeration systems.
The following installation and service instructions should be carefully read and fully understood before using the product or servicing it. Only trained and qualified personnel should be responsible for installation, operation, and service.

## Installation

**Refrigerants**
The valve can be used for all refrigerants, including $H_2S$ and flammable hydrocarbons and non-corrosive gases or liquids, with due consideration given to valve materials.

**Flammable hydrocarbons**
If one of the following refrigerants is used: Propane (R 290), Propylene (R1270), Butane (R600), Iso-Butane (R600a), and Ethan (R170) or mixtures of the mentioned refrigerants, please require additional information from Danfoss.

**Temperature range**
–60/+150°C (–76/+302°F)

**Pressure range**
The valves are designed for a maximum working pressure of 40 bar g (580 psi g) throughout the temperature range.
High pressure version valves are designed for a maximum working pressure of 52 bar g (754 psi) for DN 15-65 (½-2 ½") and 50 bar g (725 psi) for DN 80-200 (3-8") in temperature range -60/+50 deg. C.

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be operated by hand without the use of tools or other devices (fig. 3). 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.

**Recommended direction of flow**
To achieve optimum flow conditions, the valve should be installed with the flow towards the valve cone as indicated by the arrow on the side of the valve body (fig. 2). Flow in the opposite direction is also acceptable (fig. 2), but slightly reduces the $k_v$ - / $C_v$ value.

**Operation**
Avoid overloading the spindle by the inappropriate use of tools (Fig. 3).

**Welding**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

> Removing the bonnet can be omitted provided that:
> The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

Stop 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.

**Assembly**
Remove welding debris and any dirt from pipes and valve body before assembly.

During assembly, check:
- that the seal between valve body and top section (pos. A) is undamaged.
- that the valve spindle is unscratched and has not been damaged by impact.
- that the Teflon gasket on the valve cone is undamaged.

Ensure also that the valve cone is screwed back to the top section before refitting the top section in the body (Fig. 5a).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b).

Tightening of the bonnet should be performed according to sound mechanical practice.

**Colour and identification**
The SVA-HS valves are painted with a black oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body.
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 ring when repainting the valve is recommended.

## Maintenance

**Dismantling the valve**
The top section must not be removed while the valve is subject to pressure.
Replacing the spindle seal
During service and maintenance the complete spindle seal can be replaced. Seals can be supplied as spare parts. Normally, the valve should not be subject to pressure when the seal is removed. However, the seal can be removed while there is pressure in the valve if the following precautions are taken:

**Reverse sealing (Fig. 6)**
The valve is reverse-sealed by turning the spindle anticlockwise until the valve is completely open.

**Pressure equalisation (Fig. 7)**
Under certain conditions, pressure can build up behind the spindle seal. This pressure can be equalised by slowly unscrewing the seal. During this operation, it is recommended that a handwheel or other adjusting tool be fitted to the end of the spindle in order to maintain the torque for reverse sealing.

**Removing the spindle seal (Fig. 8)**
The handwheel and other spindle seal components can now be removed.

> **Note!** Teflon gaskets should not be re-used after removing the spindle seal.

**Fitting a replacement spindle seal (Fig. 9)**
Great care should be taken when fitting a new spindle seal and damage to Teflon gaskets must be avoided.

During fitting, the individual components in the spindle seal should be placed in order and positioned as shown (Fig. 9).

**Replacing the cone (Fig. 10)**
Remove the screw (Pos. B) from the cone with a hexagon key.

| | |
|---|---|
| SVA-HS 15-40 (½-1½") | 2 mm a/flats |
| SVA-HS 50-65 (2-2½") | 2.5 mm a/flats |
| SVA-HS 80-100 (3-4") | 4 mm a/flats |
| SVA-HS 125-150 (5-6") | 5 mm a/flats |
| SVA-HS 200 (8") | 6 mm a/flats |

Hexagonal keys are enclosed in the gasket sets "Complete Cone" and "Complete Repair Kit" from Danfoss Industrial Refrigeration.

The balls (Pos. C) can then be taken out and the cone subsequently removed.

| | |
|---|---|
| SVA-HS 15-20 (½-¾") | 10 pcs. |
| SVA-HS 25-65 (1½-2½") | 14 pcs. |
| SVA-HS 80-200 (3-8") | 13 pcs. |

A new cone can now be mounted on the spindle and the balls replaced. Refit the screw and tighten it. If the cone and spindle are detached several times, it may

be necessary to use a strong adhesive (e.g. Loctite no. 648) to ensure screw fixing.

**Replacing the reverse sealing, DN 80-200 (3-8") (Fig. 11)**
The reverse sealing of the valve is in the form of a special Teflon ring DN 80-200 (3-8"). This Teflon ring should be replaced if it becomes damaged. Screw the spindle out of the top section. Carefully remove the original Teflon ring and fit a replacement on the sloping contact surface just inside the opening in the top section.

Avoid folding or damaging the Teflon ring during fitting. In addition, be careful not to damage the contact surface for the ring in the top section.

**Assembly (Fig. 5a)**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body.

During assembly, check:
- that the seal between the valve body and top section (pos. A) is undamaged.
- that the valve spindle is unscratched and has not been damaged by impact.
- that the Teflon gasket on the valve cone is undamaged.

Ensure also that the valve cone is screwed back to the top section before refitting the top section in the body (Fig. 5a).

**Tightening (Fig. 12)**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b). Tightening of the bonnet should be performed according to sound mechanical practice.

Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 12).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# Instructions

SVA-HS 15 - 65 (½ - 2½") (PS 52 bar version)

148R9535

148R9535

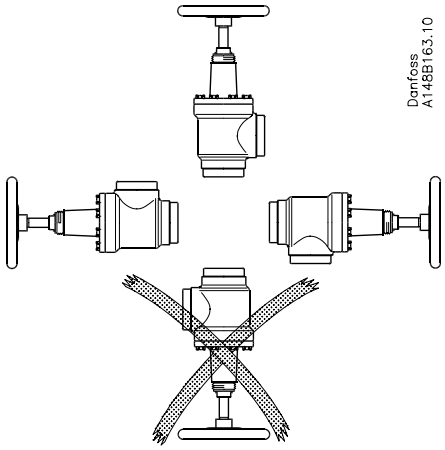



**Fig. 1**

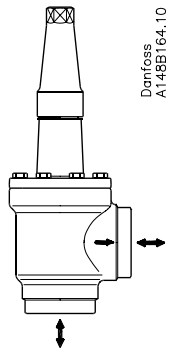



**Fig. 2**

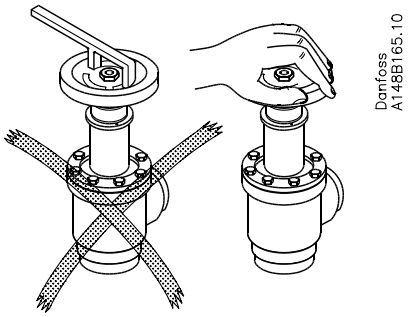



**Fig. 3**

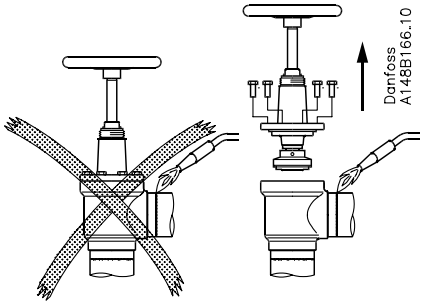



**Fig. 4**

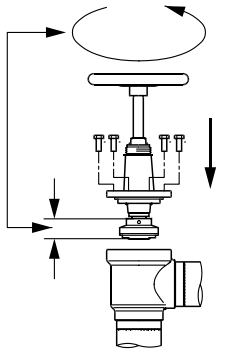


**Fig. 5a**

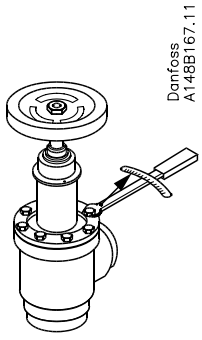



**Fig. 5b**

| | Nm | LB-feet |
|---|---|---|
| DN 15 - 20 | 22 | 16 |
| DN 25 - 50 | 44 | 32 |
| DN 65 | 74 | 53 |

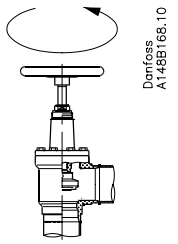



**Fig. 6**

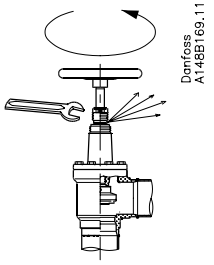



**Fig. 7**

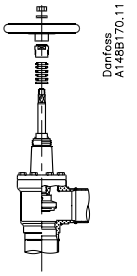



**Fig. 8**

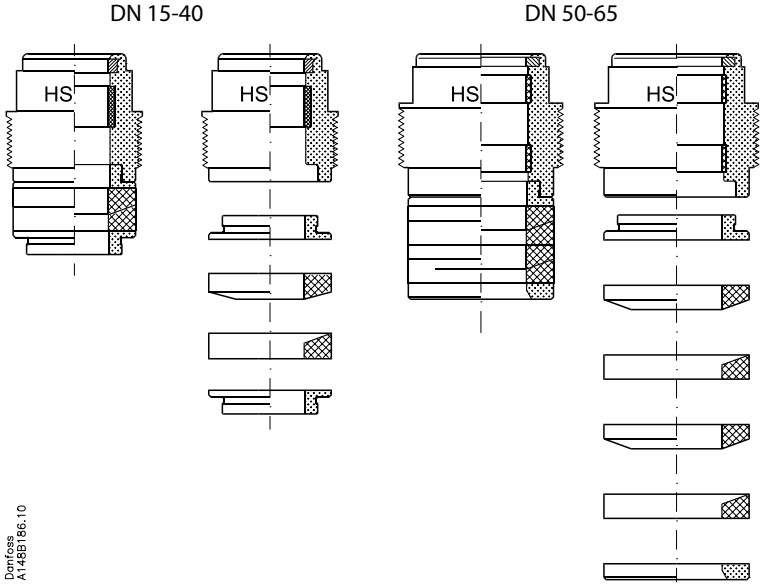



**Fig. 9**

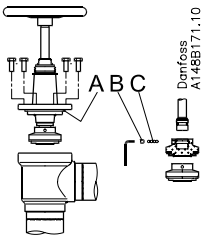



**Fig. 10**

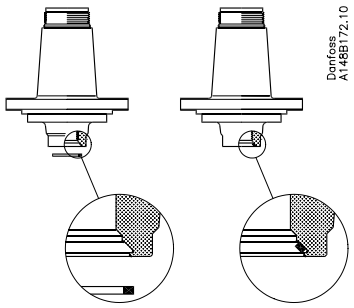



**Fig. 11**

| | Nm | LB-feet |
|---|---|---|
| DN 15 - 20 | 40 | 30 |
| DN 25 - 40 | 60 | 45 |
| DN 50 - 65 | 60 | 45 |

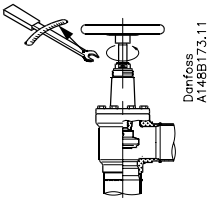



**Fig. 12**

**ENGLISH**

**Introduction**
The SVA-HS valve is designed for use in industrial refrigeration systems.
The following installation and service instructions should be carefully read and fully understood before using the product or servicing it. Only trained and qualified personnel should be responsible for installation, operation, and service.

## Installation

**Refrigerants**
The valve can be used for all refrigerants, including flammable hydrocarbons and non-corrosive gases or liquids, with due consideration given to valve materials.

**Flammable hydrocarbons**
If one of the following refrigerants is used: Propane (R290), Propylene (R1270), Butane (R600), Iso-Butane (R600a), and Ethan (R170) or mixtures of the mentioned refrigerants, please require additional information from Danfoss.

**Temperature range**
–60/+150°C (–76/+302°F)

**Pressure range**
The valves are designed for a maximum working pressure of 52 bar g (754 psi g) throughout the temperature range.

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be operated by hand without the use of tools or other devices (fig. 3). 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.

**Recommended direction of flow**
To achieve optimum flow conditions, the valve should be installed with the flow towards the valve cone as indicated by the arrow on the side of the valve body (fig. 2). Flow in the opposite direction is also acceptable (fig. 2), but slightly reduces the $k_v$ - / $C_v$ value.

**Operation**
Avoid overloading the spindle by the inappropriate use of tools (fig. 3).

**Welding**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

> Removing the bonnet can be omitted provided that:
> The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself (cooling can be ensured by, for example, wrapping a wet cloth around the valve body). Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

Stop 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.

**Assembly**
Remove welding debris and any dirt from pipes and valve body before assembly.

During assembly, check:
- that the seal between valve body and top section (pos. A) is undamaged.
- that the valve spindle is unscratched and has not been damaged by impact.
- that the Teflon gasket on the valve cone is undamaged.

Ensure also that the valve cone is screwed back to the top section before refitting the top section in the body (fig. 5a).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b).

Tightening of the bonnet should be performed according to sound mechanical practice.

**Colour and identification**
The SVA-HS valves are painted with a black oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

**Dismantling the valve**
The top section must not be removed while the valve is subject to pressure.

**Replacing the spindle seal**
During service and maintenance the complete spindle seal can be replaced. Seals can be supplied as spare parts. Normally, the valve should not be subject to pressure when the seal is removed. However, the seal can be removed while there is pressure in the valve if the following precautions are taken:

**Reverse sealing (fig. 6)**
The valve is reverse-sealed by turning the spindle anticlockwise until the valve is completely open.

**Pressure equalisation (fig. 7)**
Under certain conditions, pressure can build up behind the spindle seal. This pressure can be equalised by slowly unscrewing the seal. During this operation, it is recommended that a handwheel or other adjusting tool be fitted to the end of the spindle in order to maintain the torque for reverse sealing.

**Removing the spindle seal (fig. 8)**
The handwheel and other spindle seal components can now be removed.

> **Note!** Teflon gaskets should not be re-used after removing the spindle seal.

**Fitting a replacement spindle seal (Fig. 9)**
Great care should be taken when fitting a new spindle seal and damage to Teflon gaskets must be avoided.

During fitting, the individual components in the spindle seal should be placed in order and positioned as shown (Fig. 9).

**Replacing the cone (fig. 10)**
Remove the screw (pos. B) from the cone with a hexagon key.

| | |
|---|---|
| SVA-HS 15-40 (½-1½") | 2 mm a/flats |
| SVA-HS 50-65 (2-2½") | 2.5 mm a/flats |

Hexagonal keys are enclosed in the gasket sets "Complete Cone" and "Complete Repair Kit" from Danfoss Industrial Refrigeration.

The balls (pos. C) can then be taken out and the cone subsequently removed.

| | |
|---|---|
| SVA-HS 15-20 (½-¾") | 10 pcs. |
| SVA-HS 25-65 (1½-2½") | 14 pcs. |

A new cone can now be mounted on the spindle and the balls replaced. Refit the screw and tighten it. If the cone and spindle are detached several times, it may be necessary to use a strong adhesive (e.g. Loctite no. 648) to ensure screw fixing.

**Assembly (fig. 5a)**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body.

During assembly, check:
- that the seal between the valve body and top section (pos. A) is undamaged.
- that the valve spindle is unscratched and has not been damaged by impact.
- that the Teflon gasket on the valve cone is undamaged.

Ensure also that the valve cone is screwed back to the top section before refitting the top section in the body (fig. 5a).

**Tightening (fig. 12)**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b). Tightening of the bonnet should be performed according to sound mechanical practice.

Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 12).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.

For further details / restrictions – see Installation Instruction

**Description of Pressure Equipment**

Refrigerant stop valve, with straight or angled bonnet arrangement
**Type SVA-ST, SVA-LT, SVA-HS and SVA-SS**

Nominal bore **DN ≤ 25 mm** (1 in.)

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 11/05/2004

148B9735 - rev. 1

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**

Refrigerant stop valve, with straight or angled bonnet arrangement
**Type SVA-HS**

| | | |
|---|---|---|
| Nominal bore | **DN 32-200 mm**. ($1^1/_4$-8 in.) | |
| Classified for | **Fluid Group I** (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. | |
| Temperature range | SVA-HS | **–60°C/+150°C** (–76°F/+302°F) |
| Maximum allowable working pressure | Standard applications<br>High pressure applications | 40 bar (580 psi)<br>52 bar (754 psi) |

**Conformity and Assessment Procedure Followed**

| | | | |
|---|---|---|---|
| Category | | **II** | **III** |
| Module | | **D1** | **B1 + D** |
| Certificate ID | | *D1: 07 202 0511 Z 0009/1/H-0002* | *B1: 07 202 0511 Z 0110/1/H*<br>*D: 07 202 0511 Z 0009/1/H-0001* |
| Nominal bore | Standard applications | DN 32-80 mm ($1^1/_4$ - 3 in.) | DN 100-200 mm (4 - 8 in.) |

**Name and Address of the Notified Body which carried out the Inspection**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

CE
(0045)

**Name and Address of the Notified Body monitoring the Manufacturer's Quality Assurance System**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

**References of Harmonised Standards used**
EN 10028-3 EN 10213-3 EN 10222-4

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 11/05/2004

148B9710 - rev. 1

# Instructions

SVA-HS, SVA-ST 200,
SVA-X1 200, SVA-DH 250-300,
SVA-DL 250-300, FIA 200-300

148R9538

148R9538

**PLEASE NOTE!**

To protect the top gasket the bolts are not tightened to the full torque from factory.

A new gasket has been inserted after pressure testing in the factory and the bolts are only partly tightened.

No matter which method of mounting is used the bolts **must** be retightened to the full torque indicated in the instruction before plant pressure test or commissioning.

**BEMÆRK!**

For at beskytte top pakningen er boltene ikke tilspændt med det endelige moment fra fabrikken.

Efter trykprøvning i fabrikken er en ny pakning isat og boltene kun delvist spændt.

Uanset monteringsmetode **skal** boltene spændes til det i instruktionen angivne moment inden trykprøvning eller ibrugtagning af anlægget.



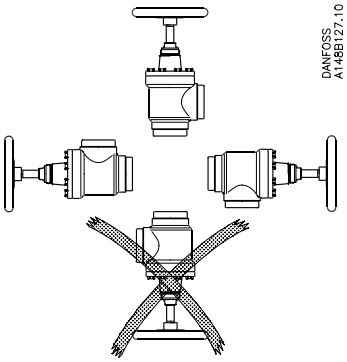
DKRCI.PI.K00.B1.85 / 520H1534

# Instruction

SVA-ST 10-65 (PS 52 bar / 754 psi)
SVA-SS 15-200 (PS 50 bar / 725 psi)
SVA-ST 80-200 (PS 50 bar / 725 psi)
SVA-SS 80-200 (PS 50 bar/ 725 psi)

148R9526

148R9526

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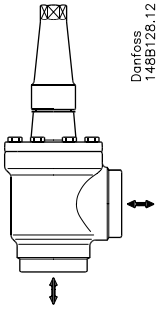


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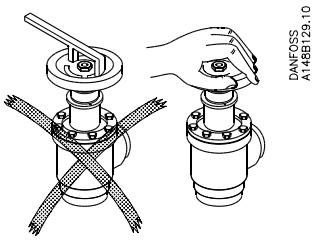


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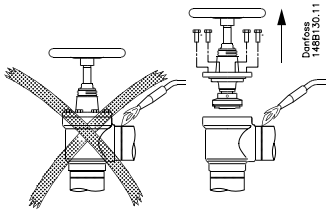
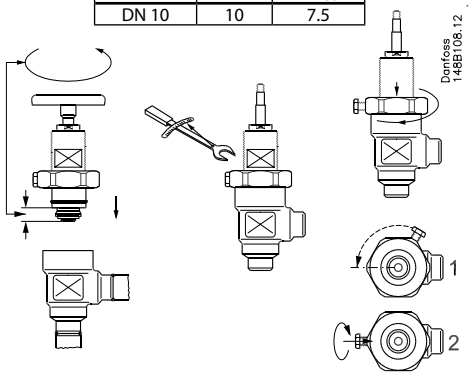



*4*

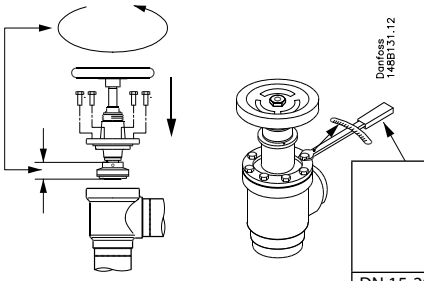
**DN 10**

| | Nm | LB-fod<br>LB-feet<br>LB-ft<br>Pieds-<br>livres |
|---|---|---|
| DN 10 | 10 | 7.5 |



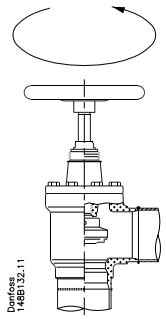

*5a* *5b* *5c*

**DN 15 - 200**

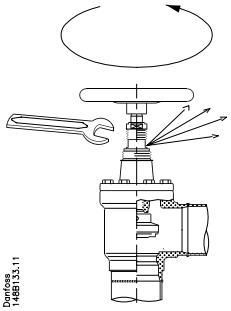



| | Nm | LB-fod<br>LB-feet<br>LB-ft<br>Pieds-<br>livres |
|---|---|---|
| DN 15-20 | 22 | 16 |
| DN 25-32-40-50 | 44 | 32 |
| DN 65 | 75 | 53 |
| DN 80 | 44 | 32 |
| DN 100 | 75 | 53 |
| DN 125-150 | 183 | 135 |
| DN 200 | 370 | 272 |

*5a* *5b*




*6*

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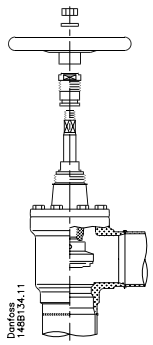


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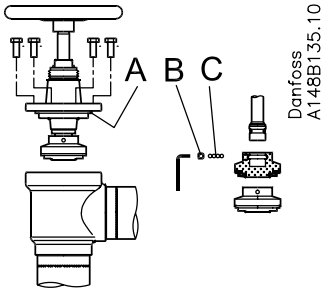
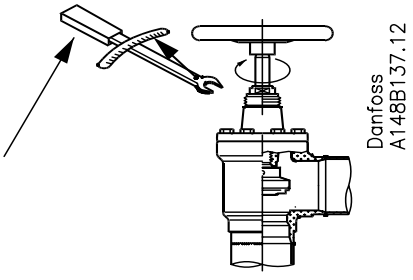



*9*

| | Nm | LB-fod<br>LB-feet<br>LB-ft<br>Pieds-<br>livres |
|---|---|---|
| DN 15-20 | 50 | 37 |
| DN 25-40 | 70 | 52 |
| DN 50-65-80-100 | 60 | 45 |
| DN 125-150-200 | 80 | 60 |




*10*

## Installation

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

**Temperature range**
SVA-ST: –50/+150°C (–58/+302°F)
SVA-SS: –60/+150°C (–76/+302°F)

**Pressure**
SVA 10-65: The valves are designed for a max. working pressure of 52 bar g (754 psi g).
SVA 80-200: The valves are designed for a max. working pressure of 50 bar g (725 psi g).

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand without the use of tools or other devices (fig. 3). 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.

**Attention!**
SVA are shut off valves and must always be either fully closed or fully open. Half open positions are not allowed. In case the valve is installed close to compressor (economizer lines, oil lines etc.) or on other lines subjected to high vibrations and pulsations, it is necessary to install special lock washers on the valve. Please refer to the catalogue for additional information.

**Recommended flow direction**
To achieve optimum flow conditions, the valve should be installed with the flow towards the valve cone as indicated by the arrow on the side of the valve body (fig. 2). Flow in the opposite direction is also acceptable (fig. 2), but slightly reduces the $k_v$- / $C_v$ value.

**Welding**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

Stop 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.

**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 bonnet before it is replaced in the valve body (fig. 5a).

**Tightening**
Thighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b).

**Colours and identification**
The SVA valves are painted with a red oxide primer in the factory. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.
SVA-SS valves are not painted and do not require any protective coating.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 6)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 7)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland (fig. 8)**
Handwheel and packing gland can now be removed.

**Dismantling the valve (fig. 9)**
Do not remove the bonnet while the valve is still under pressure.
- Check that the O-ring (pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone (fig. 9)**
Unscrew the cone screw (pos. B) with an Allen key.

| | |
|---|---|
| SVA 10 | 2.0 mm A/F |
| SVA 15-40 | 2.0 mm A/F |
| SVA 50-65 | 2.5 mm A/F |
| SVA 80-100 | 4 mm A/F |
| SVA 125-150 | 5 mm A/F |
| SVA 200 | 6 mm A/F |

(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the bolts (pos. C).

Number of bolts in pos. C:

| | |
|---|---|
| SVA 10 | 6 pcs. |
| SVA 10-20 | 10 pcs. |
| SVA 25-65 | 14 pcs. |
| SVA 80-200 | 13 pcs. |

The cone can then be removed. Place the new cone on the spindle and replace the bolts. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 5a).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b). Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 10).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
The Pressure Equipment Directive 97/23/EC

**Name and Address of Manufacturer's Representative within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are Classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.
For further details / restrictions - see Installation Instruction

**Description of Pressure Equipment**
Refrigerant stop valve, with straight or angled bonnet arrangement
Type **SVA-ST, SVA-HS** and **SVA-SS**

| | |
|---|---|
| Nominal bore | **DN ≤ 25 mm (1 in.)** |

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer's Representative within the European Community**

Name: Michael Breumsø Title: Plant Director

Signature:  Date: 07/03/2006

148B9735 – rev. 1

 DKRCI.PI.KD0.B3.52 / 520H1293

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**

Refrigerant stop valve, with straight or angled bonnet arrangement
**Type SVA-ST, SVA-SS**

| | | |
|---|---|---|
| Nominal bore | **SVA-ST, DN 32-200 mm** (1¼ - 8 in.); **SVA-SS DN 32-200 mm** (1¼ - 8 in.) | |
| Classified for | Fluid Group I (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. | |
| Temperature range | **SVA-ST**<br>**SVA-SS** | –50°C/+150°C (–58°F/+302°F)<br>–60°C/+150°C (–76°F/+302°F) |
| Maximum allowable working pressure | Standard applications<br>High pressure applications<br>High pressure applications | **40 bar** (580 psi)<br>**50 bar** (725 psi)<br>**52 bar** (754 psi) |

**Conformity and Assessment Procedure Followed**

| Category | | II | III |
|---|---|---|---|
| Module | | **D1** | **B1 + D** |
| Certificate ID | | *D1: 07 202 0511 Z 0009/1/H-0002* | *B1: 07 202 0511 Z 0058/1/H-0001*<br>*D: 07 202 0511 Z 0009/1/H-0001* |
| Nominal bore | Standard applications | DN 32-80 mm (1¼ - 3 in.) | DN 100-200 mm (4-8 in.) |

**Name and Address of the Notified Body which carried out the Inspection**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

CE
(0045)

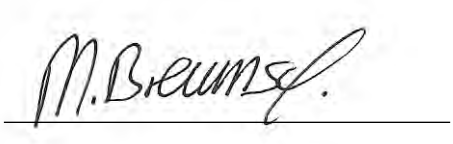
**Name and Address of the Notified Body monitoring the Manufacturer's Quality Assurance System**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

**References of Harmonised Standards used**
EN 10028-3 EN 10213-3 EN 10222-4

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer within the European Community**

**Name:** Michael Breumsø **Title:** Plant Director

**Signature:**  **Date:** 07/03/2006

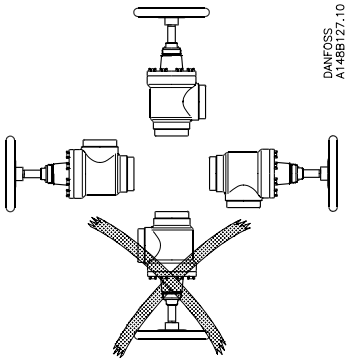
148B9701 - rev. 2

# Instructions
SVA-ST/SVA-SS 15 - 200

148R9504

148R9504

**Installation**

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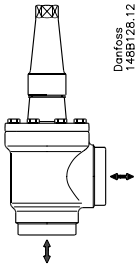


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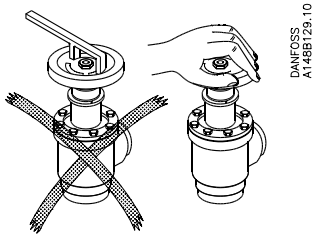


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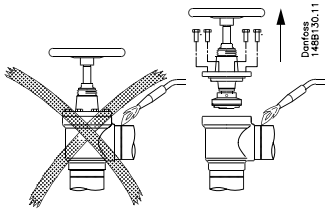


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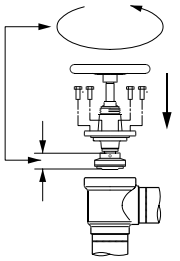

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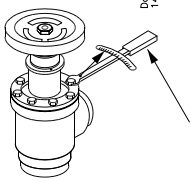
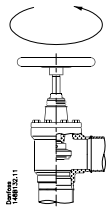



*5b*

| | Nm | LB-feet |
|---|---|---|
| DN 15-20 | 22 | 16 |
| DN 25-32-40-50 | 44 | 32 |
| DN 65 | 75 | 53 |
| DN 80 | 44 | 32 |
| DN 100 | 75 | 53 |
| DN 125-150 | 183 | 135 |
| DN 200 | 370 | 272 |

**Vedligeholdelse, Maintenance, Wartung, Entretien**



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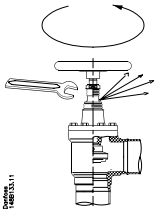

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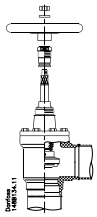

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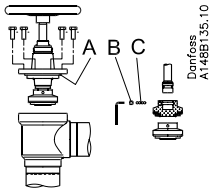
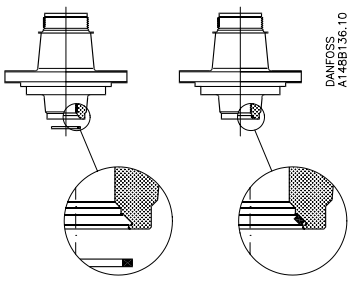


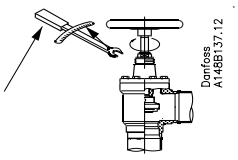

*9*

Kun DN 80 - 200
Only DN 80 - 200
Nur DN 80 - 200
Uniquement DN 80 - 200




*10*

| | Nm | LB-feet |
|---|---|---|
| DN 15-20 | 50 | 37 |
| DN 25-40 | 70 | 52 |
| DN 50-65-80-100 | 60 | 45 |
| DN 125-150-200 | 80 | 60 |




*11*

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ENGLISH

## Installation

**Refrigerants**
Applicable to all common non-flammable refrigerants, including R717, $H_2S$ and non-corrosive gases/liquids dependent on sealing material compatability. Flammable hydrocarbons are not recommended. The valve is only recommended for use in closed circuits. For further information please contact Danfoss.

**Temperature range**
SVA-ST: –50/+150°C (–58/+302°F)
SVA-LT: –60/+150°C (–76/+302°F)
SVA-SS: –60/+150°C (–76/+302°F)

**Pressure range**
The valves are designed for a max. working pressure of 40 bar g (580 psi g), for both standard (SVA-ST) and low temperature versions (SVA-LT, SVA-SS).

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand without the use of tools or other devices (fig. 3). 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.

**Attention!**
SVA are shut off valves and must always be either fully closed or fully open. Half open positions are not allowed. In case the valve is installed close to compressor (economizer lines, oil lines etc.) or on other lines subjected to high vibrations and pulsations, it is necessary to install special lock washers on the valve. Please refer to the catalogue for additional information.

**Recommended flow direction**
To achieve optimum flow conditions, the valve should be installed with the flow towards the valve cone as indicated by the arrow on the side of the valve body (fig. 2). Flow in the opposite direction is also acceptable (fig. 2), but slightly reduces the $k_v$ - / $C_v$ value.

**Welding**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:

The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

Stop 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.

**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 bonnet before it is replaced in the valve body (fig. 5a).
**vTightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b).

**Colours and identification**
The SVA valves are painted with a red oxide primer in the factory. Stainless steel valves are not painted. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. The external surface of the valve housing must be guarded against corrosion with a suitable protective coating after installation and assembly.

Protection of the ID ring when repainting the valve is recommended.
SVA-SS valves are not painted and do not require any protective coating.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 6)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 7)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equal-ized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland (fig. 8)**
Handwheel and packing gland can now be removed.

**Dismantling the valve (fig. 9)**
Do not remove the bonnet while the valve is still under pressure.

- Check that the O-ring (pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone (fig. 9)**
Unscrew the cone screw (pos. B) with an Allen key.
SVA-ST/LT/SS 15-40..... 2.0 mm A/F
SVA-ST/LT 50-65 ..... 2.5 mm A/F
SVA-ST/LT 80-100.....4 mm A/F
SVA-ST/LT 125-150 .....5 mm A/F
SVA-ST/LT 200.....6 mm A/F

(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the balls (pos. C).

Number of balls in pos. C:
SVA-ST/LT/SS 10-20.....10 pcs.
SVA-ST/LT/SS 25-65.....14 pcs.
SVA-ST/LT 80-200 .....13 pcs.

The cone can then be removed. Place the new cone on the spindle and replace the balls. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Replacement of backseat seal (fig. 10)**
For sizes DN 80-200 only:
The valve backseat is a special teflon ring. If this is damaged, it must be replaced. Screw the spindle out of the bonnet. Carefully remove the original backseat seal and mount a new one in the angled contact surface directly inside the opening in the bonnet. Avoid folding and damage to the teflon ring, or damage to the contact surface at the top of the valve during assembly.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 5a).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5b). Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 11).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
The Pressure Equipment Directive 97/23/EC

**Name and Address of Manufacturer's Representative within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are Classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.
For further details / restrictions - see Installation Instruction

**Description of Pressure Equipment**
Refrigerant stop valve, with straight or angled bonnet arrangement
Type **SVA-ST, SVA-HS** and **SVA-SS**

| | |
|---|---|
| Nominal bore | **DN ≤ 25 mm (1 in.)** |

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer's Representative within the European Community**

Name: Michael Breumsø Title: Plant Director

Signature: M. Breumsø Date: 07/03/2006

148B9735 – rev. 1

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Description of Pressure Equipment**

Refrigerant stop valve, with straight or angled bonnet arrangement
**Type SVA-ST, SVA-SS**

| | | |
|---|---|---|
| Nominal bore | **SVA-ST, DN 32-200 mm** (1¼ - 8 in.); **SVA-SS DN 32-200 mm** (1¼ - 8 in.) | |
| Classified for | Fluid Group I (all refrigerants (toxic, nontoxic, flammable and nonflammable)).<br>For further details / restrictions - see Installation Instruction. | |
| Temperature range | **SVA-ST**<br>**SVA-SS** | –50°C/+150°C (–58°F/+302°F)<br>–60°C/+150°C (–76°F/+302°F) |
| Maximum allowable working pressure | Standard applications<br>High pressure applications<br>High pressure applications | **40 bar** (580 psi)<br>**50 bar** (725 psi)<br>**52 bar** (754 psi) |

**Conformity and Assessment Procedure Followed**

| | | | |
|---|---|---|---|
| Category | | **II** | **III** |
| Module | | **D1** | **B1 + D** |
| Certificate ID | | *D1: 07 202 0511 Z 0009/1/H-0002* | *B1: 07 202 0511 Z 0058/1/H-0001*<br>*D: 07 202 0511 Z 0009/1/H-0001* |
| Nominal bore | Standard applications | DN 32-80 mm (1¼ - 3 in.) | DN 100-200 mm (4-8 in.) |

**Name and Address of the Notified Body which carried out the Inspection**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

CE
(0045)

**Name and Address of the Notified Body monitoring the Manufacturer's Quality Assurance System**
TÜV-Nord e.V.
Grosse Bahnstrasse 31
22525 Hamburg, Germany

**References of Harmonised Standards used**
EN 10028-3 EN 10213-3 EN 10222-4

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter 2000

**Authorised Person for the Manufacturer within the European Community**

**Name:** Michael Breumsø **Title:** Plant Director

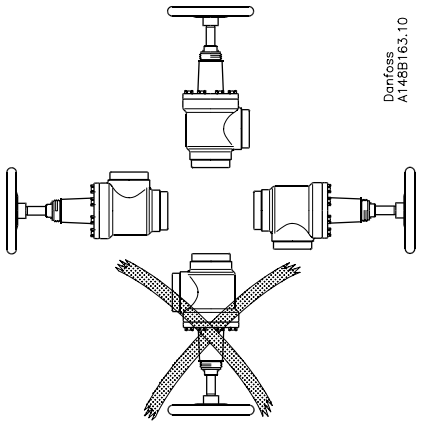
**Signature:** M. Breumsø **Date:** 07/03/2006

148B9701 - rev. 2

# Instruction
## SVA-X1 15-200 (½-8")

148R9518

Installation

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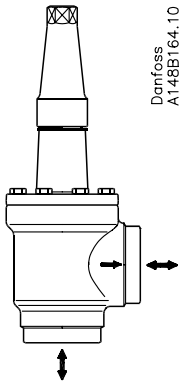


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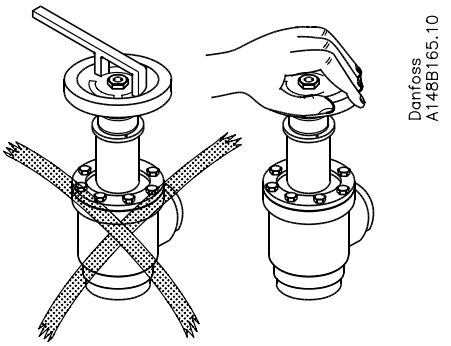


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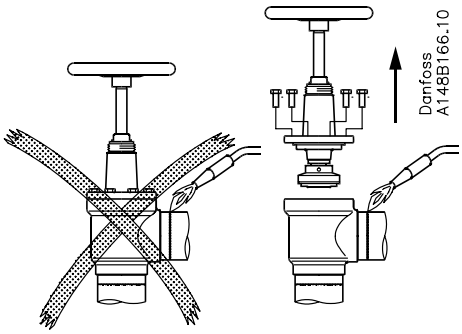


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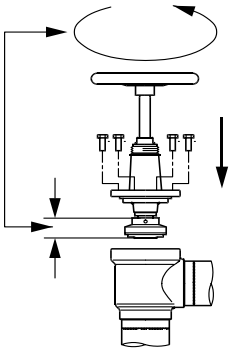

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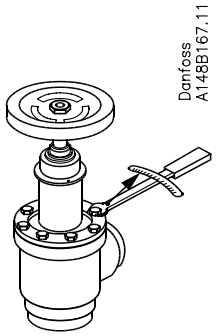
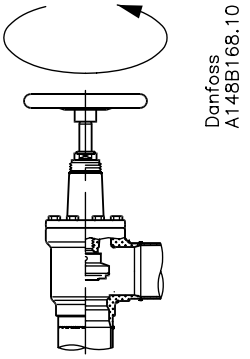



*5b*

| | Nm | LB-feet |
|---|---|---|
| DN 15 - 20 | 22 | 16 |
| DN 25 - 50 | 44 | 32 |
| DN 65 | 74 | 53 |
| DN 80 | 44 | 32 |
| DN 100 | 74 | 53 |
| DN 125 - 150 | 183 | 135 |
| DN 200 | 370 | 272 |

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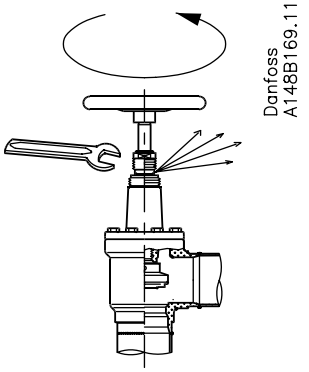


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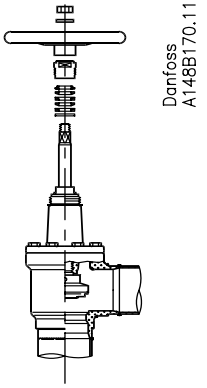


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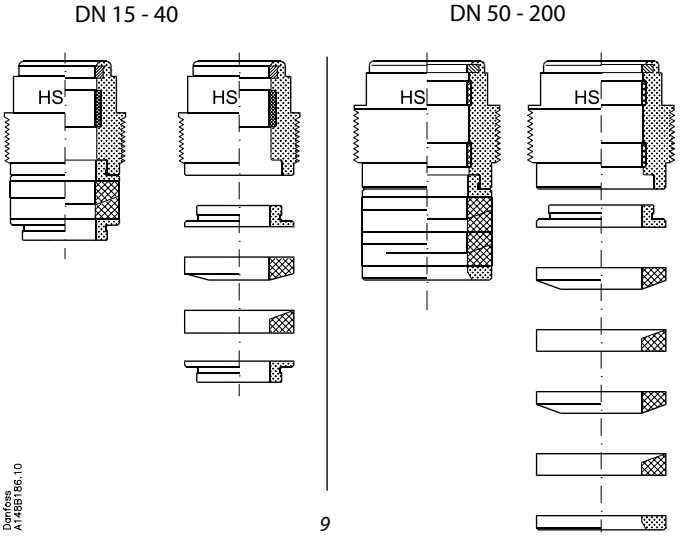


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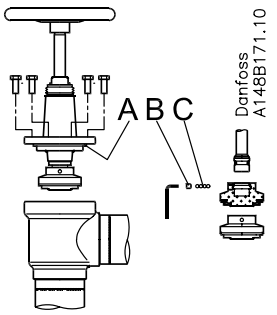


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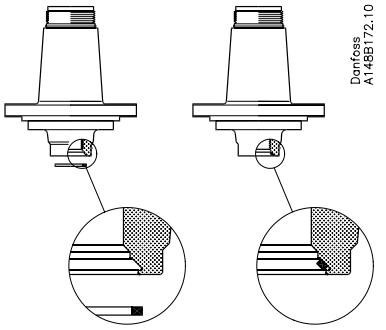
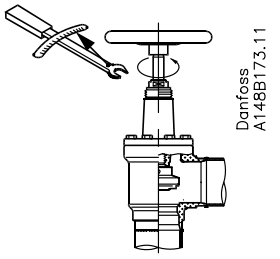



11

| | Nm | LB-feet |
|---|---|---|
| DN 15 - 20 | 40 | 30 |
| DN 25 - 40 | 60 | 45 |
| DN 50 - 65 | 60 | 45 |
| DN 80 - 100 | 80 | 60 |
| DN 125 - 150 | 80 | 60 |
| DN 200 | 120 | 90 |




12

ENGLISH

**Introduction**
The SVA-X1 valve is designed for use in industrial refrigeration systems. The following installation and service instructions should be carefully read and fully understood before using the product or servicing it. Only trained and qualified personnel should be responsible for installation, operation, and service.

## Installation

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

**Temperature range**
–60/+150°C (–76/+302°F)

**Pressure range**
The valves are designed for a maximum working pressure of 40 bar g (580 psi g) throughout the temperature range.

**Installation**
The valve must be installed with the spindle upwards or in a horizontal position (fig. 1).

Although the valve is designed to resist high internal pressure, piping should be installed in such a way as to avoid liquid confinement and the resulting risk of hydraulic pressure.

Stop valves must not be installed in systems where the valve outlet is open to the atmosphere. The valve outlet must always be connected to the system unless it is securely blanked off, e.g. with a welded-on end plate.

**Recommended direction of flow**
In order to achieve optimum $k_v$ and $C_v$ values, the direction of flow should be towards the valve cone, as shown by the arrow on the valve body (fig. 2). Flow in the opposite direction is also acceptable.

**Operation**
Avoid overloading the spindle by the inappropriate use of tools (fig. 3).

**Welding**
Before welding in (fig. 4), the top section with the valve insert must be removed in order to ensure that the Teflon gasket in the valve seat and the sealing material in the spindle seal and between the valve body and the top section are not damaged by heat during welding. After welding, the inside of the valve should be cleaned before refitting the top section.

Dismantling can be omitted if the temperature in the area between the valve body and the top section does not exceed +150°C / +302°F during welding. This temperature depends on the welding method and on any cooling of the valve body during welding (cooling can for example be achieved by wrapping a damp cloth around the valve body). In order to protect the spindle and valve cone, the valve should be fully open during welding in, and dirt, weld spatter or other matter must be prevented from entering the valve during welding.

**Assembly**
Weld spatter and dirt must be removed from the piping and the valve body before the valve is assembled.

During assembly, check:
- that the seal between valve body and top section (pos. A) is undamaged.
- that the valve spindle is unscratched and has not been damaged by impact.
- that the Teflon gasket on the valve cone is undamaged.

Ensure also that the valve cone is screwed back to the top section before refitting the top section in the body (fig. 5a).

**Tightening**
Tighten the top section using a torque wrench in accordance with the table (fig. 5b).

**Colour and identification**
SVA-X1 valves are supplied from the factory painted with a primer. The valve can be identified precisely by the ID ring uppermost on the top section and by markings embossed on the valve body. It is recommended that the ID ring should be protected during painting in order that the information it contains remains legible.

## Maintenance

**Dismantling the valve**
The top section must not be removed while the valve is subject to pressure.

**Replacing the spindle seal**
During service and maintenance the complete spindle seal can be replaced. Seals can be supplied as spare parts. Normally, the valve should not be subject to pressure when the seal is removed. However, the seal can be removed while there is pressure in the valve if the following precautions are taken:

**Reverse sealing (fig. 6)**
The valve is reverse-sealed by turning the spindle anticlockwise until the valve is completely open.

**Pressure equalisation (fig. 7)**
Under certain conditions, pressure can build up behind the spindle seal. This pressure can be equalised by slowly unscrewing the seal. During this operation, it is recommended that a handwheel or other adjusting tool be fitted to the end of the spindle in order to maintain the torque for reverse sealing.

**Removing the spindle seal (fig. 8)**
The handwheel and other spindle seal components can now be removed.

**Note!** Teflon gaskets should not be re-used after removing the spindle seal.

**Fitting a replacement spindle seal**
Great care should be taken when fitting a new spindle seal and damage to Teflon gaskets must be avoided.
During fitting, the individual components in the spindle seal should be placed in order and positioned as shown (fig. 9).

**Replacing the cone (fig. 10)**
Remove the screw (pos. B) from the cone with a hexagon key.

| | |
|---|---|
| SVA-X1 15-40 (½-1½") | 2 mm a/flats |
| SVA-X1 50-65 (2-2½") | 2.5 mm a/flats |
| SVA-X1 80-100 (3-4") | 4 mm a/flats |
| SVA-X1 125-150 (5-6") | 5 mm a/flats |
| SVA-X1 200 (8") | 6 mm a/flats |

Hexagonal keys are enclosed in the gasket sets "Complete Cone" and "Complete Repair Kit" from Danfoss Industrial Refrigeration.

The balls (pos. C) can then be taken out and the cone subsequently removed.

| | |
|---|---|
| SVA-X1 15-20 (½-¾") | 10 pcs. |
| SVA-X1 25-65 (1½-2½") | 14 pcs. |
| SVA-X1 80-200 (3-8") | 13 pcs. |

A new cone can now be mounted on the spindle and the balls replaced. Refit the screw and tighten it. If the cone and spindle are detached several times, it may be necessary to use a strong adhesive (e.g. Loctite no. 648) to ensure screw fixing.

**Replacing the reverse sealing, DN 80-200 (3-8") (fig. 11)**
The reverse sealing of the valve is in the form of a special Teflon ring DN 80-200 (3-8"). This Teflon ring should be replaced if it becomes damaged. Screw the spindle out of the top section. Carefully remove the original Teflon ring and fit a replacement on the sloping contact surface just inside the opening in the top section.

Avoid folding or damaging the Teflon ring during fitting. In addition, be careful not to damage the contact surface for the ring in the top section.

**Assembly (fig. 12)**
Any dirt must be removed before assembling the valve.

During assembly, check:
- that the seal between the valve body and top section (pos. A) is undamaged.
- that the valve spindle is unscratched and has not been damaged by impact.
- that the Teflon gasket on the valve cone is undamaged.

Ensure also that the valve cone is screwed back to the top section before refitting the top section in the body (fig. 5a).

**Tightening**
Tighten the top section using a torque wrench in accordance with the table (fig. 5b).

The spindle seal should be tightened in accordance with the table (fig. 12).

In case of doubt, contact Danfoss.

Danfoss accepts no responsibility for errors and omissions in printed matter.
Danfoss Industrial Refrigeration reserves the right to modify products and specifications without prior notice.

# Instructions

## SVA / REG 6-10

2516+261

Installation

2516+261

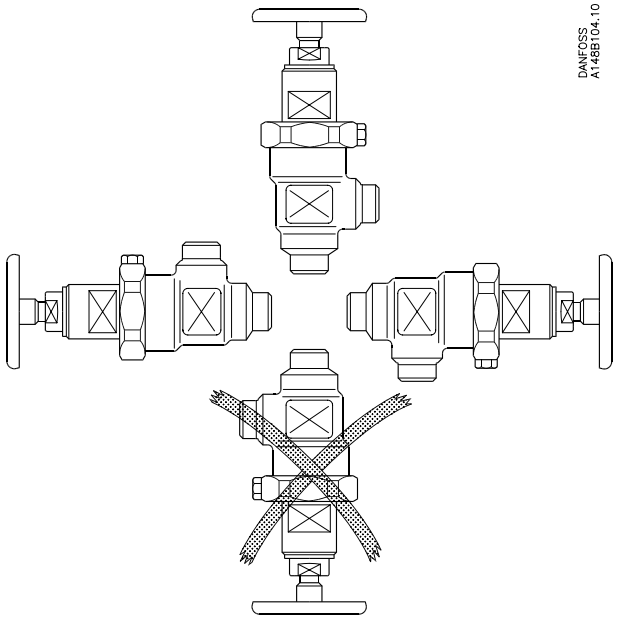



*Fig. 1*

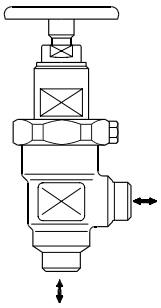


*Fig. 2a*

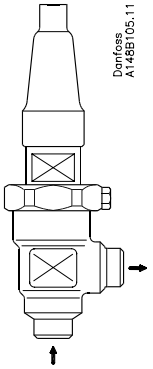



*Fig. 2b*

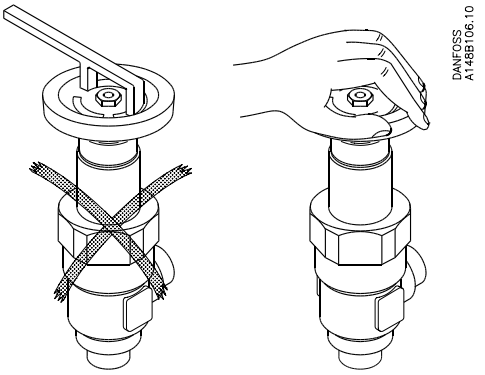



*Fig. 3*

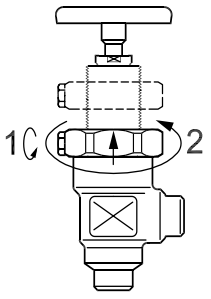



*Fig. 4a*

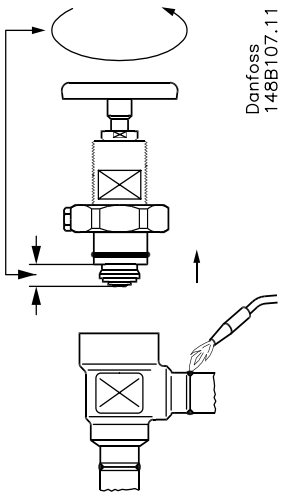



*Fig. 4b*

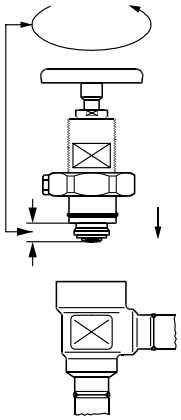


*Fig. 5a*

| | Nm | LB-feet |
|---|---|---|
| Max. | 10 | 7.5 |

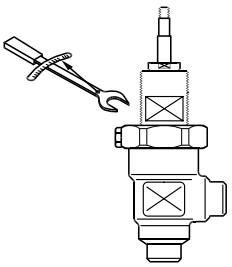


*Fig. 5b*

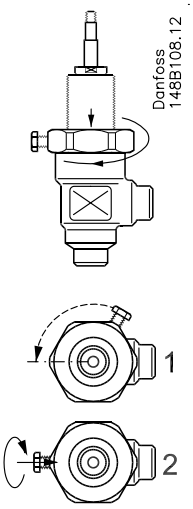



*Fig. 5c*

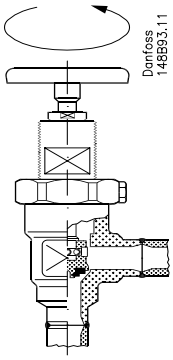



*Fig. 6*

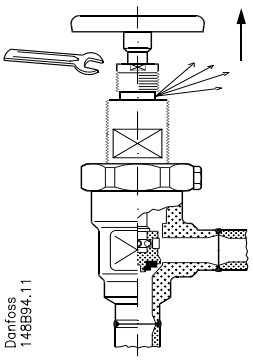



*Fig. 7*

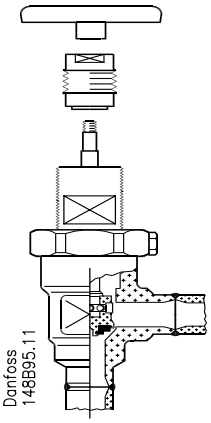



*Fig. 8*

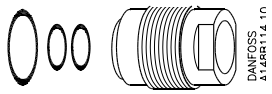



*Fig. 9*

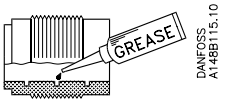



*Fig. 10*

| Nm | LB-feet |
|---|---|
| 30 | 22 |

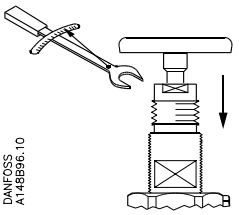



*Fig. 11*

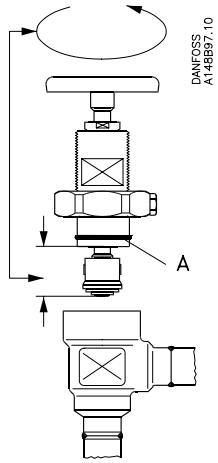



*Fig. 12*

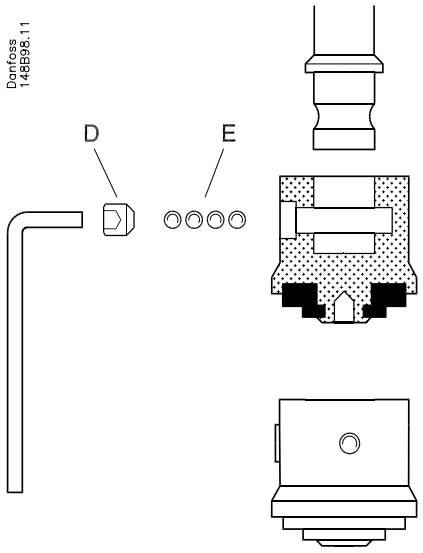



*Fig. 13*

ENGLISH

## Installation

**Refrigerants**
Applicable to all common non-flammable refrigerants, including R717, $H_2S$ and non-corrosive gases/liquids dependent on sealing material compatability.
Flammable hydrocarbons are not recommended. The valve is only recommended for use in closed circuits. For further information please contact Danfoss.

**Temperature range**
SVA: –50/+150°C (–58/+302°F)
REG: –50/+150°C (–58/+302°F)

**Pressure range**
The valves are designed for a max. working pressure of 40 bar g (580 psi g).

**Installation**
The valve must be installed with the spindle vertically upwards or in horizontal position (fig. 1). Valves should be opened by hand (fig. 3) according to the guidelines in the datasheet. 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.

**Recommended flow direction**
Direct the flow towards the cone as indicated by the arrow placed on the valve housing (fig. 2). The force used to open and close the valve must not exceed the force of an ordinary handwheel.

**Welding**
The bonnet should be removed before welding (fig. 4) to prevent damage to the O-rings in the packing gland and between the valve body and bonnet, as well as the teflon gasket in the valve seat. Only materials and welding methods, compatible with the valve housing material, must be welded to the valve housing. 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 threads of the housing and the bonnet.

Removing the bonnet can be omitted provided that:
The temperature in the area between the valve body and bonnet during welding does not exceed +150°C/+302°F. This temperature depends on the welding method as well as on any cooling of the valve body during the welding itself. (Cooling can be ensured by, for example, wrapping a wet cloth around the valve body.) Make sure that no dirt, welding debris etc. get into the valve during the welding procedure.

Be careful not to damage the teflon cone ring.

The valve housing must be free from stresses (external loads) after installation.

SVA/REG 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.

**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 bonnet before it is replaced in the valve body (fig. 5).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5).

**Colours and identification**
The SVA valves are painted with a red oxide primer in the factory and the REG valves with a green oxide primer. Precise identification of the valve is made via the ID ring at the top of the bonnet, as well as by the stamping on the valve body. 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 ring when repainting the valve is recommended.

## Maintenance

**Packing gland**
When performing service and maintenance, replace the complete packing gland only, which is available as a spare part. As a general rule, the packing gland must not be removed if there is internal pressure in the valve. However, if the following precautionary measures are taken, the packing gland can be removed with the valve still under pressure:

**Backseating (fig. 6)**
To backseat the valve, turn the spindle counter-clockwise until the valve is fully open.

**Pressure equalization (fig. 7)**
In some cases, pressure forms behind the packing gland. Hence a handwheel or similar should be fastened on top of the spindle while the pressure is equalized. The pressure can be equalized by slowly screwing out the gland.

**Removal of packing gland (fig. 8)**
Cap and packing gland can now be removed.
**Dismantling the valve**
Do not remove the bonnet while the valve is still under pressure.

- Check that the O-ring (Fig. 12, pos. A) has not been damaged.
- Check that the spindle is free of scratches and impact marks.
- If the teflon cone ring has been damaged, the whole cone assembly must be replaced.

**Replacement of the cone (fig. 13)**
Unscrew the cone screw (pos. D) with an Allen key.
SVA/REG 6-10 2.0 mm A/F

(An Allen key is included in the Danfoss Industrial Refrigeration gasket set).
Remove the balls (pos. E).

Number of balls in fig. 13, pos. E:
SVA/REG 6-10 .....6 pcs.

The cone can then be removed. Place the new cone on the spindle and replace the balls. Refit the cone screw in again using Loctite No. 648. to ensure that the screw is properly fastened.

**Assembly**
Remove any dirt from the body before the valve is assembled. Check that the cone has been screwed back towards the bonnet before it is replaced in the valve body (fig. 5).

**Tightening**
Tighten the bonnet with a torque wrench, to the values indicated in the table (fig. 5).
Tighten the packing gland with a torque wrench, to the values indicated in the table (fig. 11).

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. Danfoss accepts no responsibility for errors and omissions. Danfoss Industrial Refrigeration reserves the right to make changes to products and specifications without prior notice.

# DECLARATION OF CONFORMITY
**The Pressure Equipment Directive 97/23/EC**

**Name and Address of Manufacturer within the European Community**
Danfoss Industrial Refrigeration A/S
Stormosevej 10
PO Box 60
DK-8361 Hasselager
Denmark

**Declaration**
We hereby declare that below-mentioned equipment are Classified for Fluid Group I (all refrigerants (toxic, non-toxic, flammable and non-flammable)), and that all are covered by Article 3, paragraph 3.

For further details / restrictions - see Installation Instruction

**Description of Pressure Equipment**

Refrigerant regulating valve, with straight or angled bonnet arrangement
Type **SVA/REG 6-10**

Nominal bore **DN** ≤ **25 mm.** (1 in.)

**References of other Technical Standards and Specifications used**
prEN 12284 DIN 3158
AD-Merkblätter

**Authorised Person for the Manufacturer within the European Community**

**Name:** Morten Steen Hansen **Title:** Production Manager

**Signature:** Morten Steen Hansen **Date:** 18/11/2002

148B9734 - rev. 0

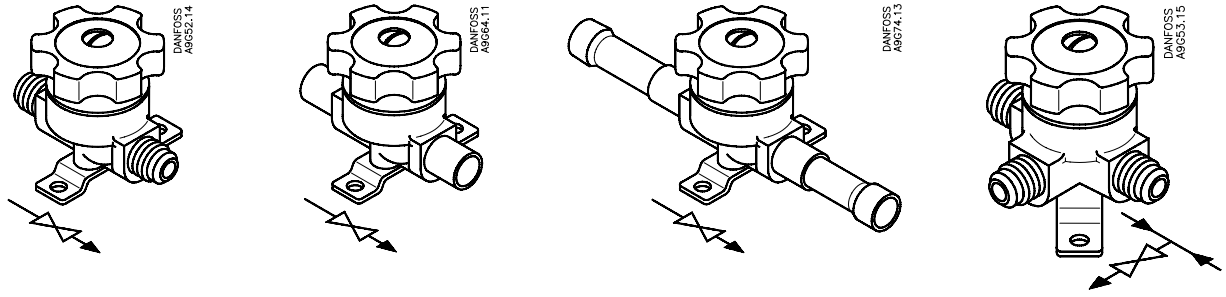
# INSTRUCTIONS

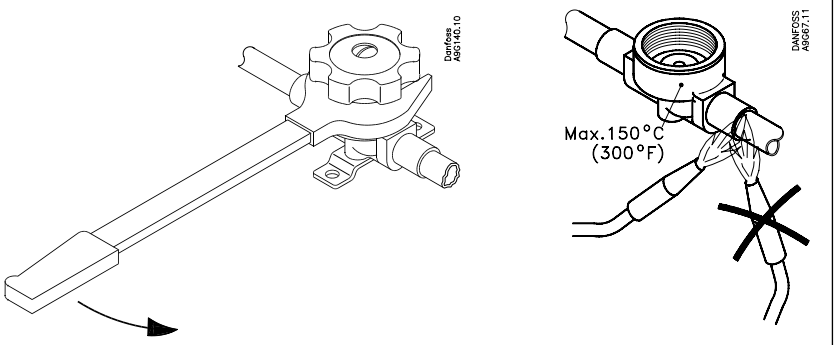
## BM

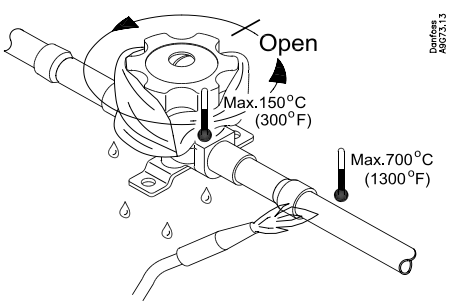
009R9663

HFC, HCFC, CFC
–55 → +100°C / –70 → +212°F

–1→ 21 bar / 30 in.Hg → 305 psig
PB = 28 bar / MWP = 400 psig

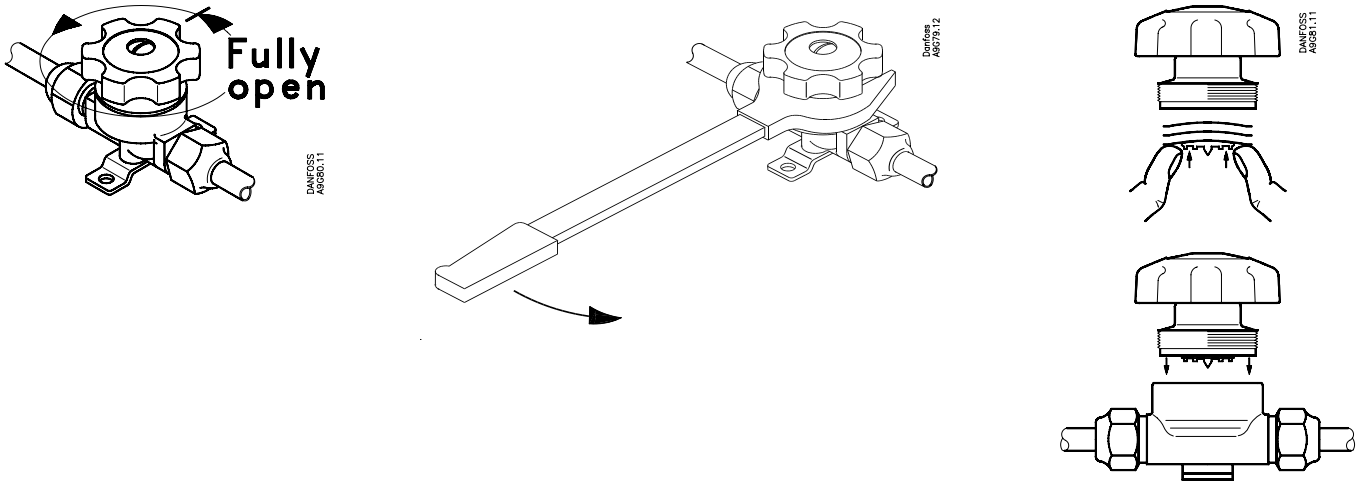


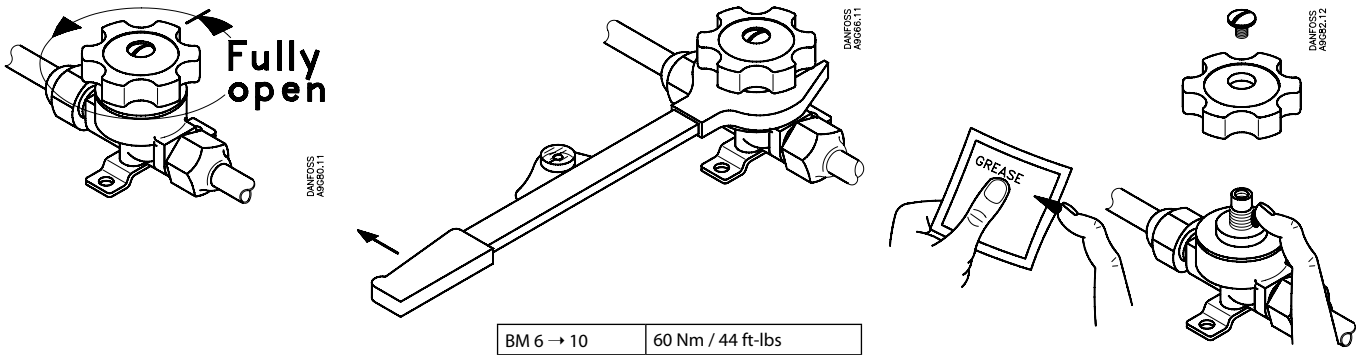






RI6EA500



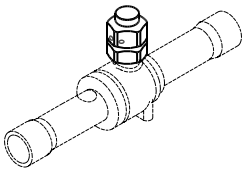

| | |
|---|---|
| BM 6 → 10 | 60 Nm / 44 ft-lbs |
| BM 12 | 90 Nm / 66 ft-lbs |
| BM 16 → 22 | 140 Nm / 103 ft-lbs |

RI6EA500

# Instructions

009R9510

## GBC Service Kit

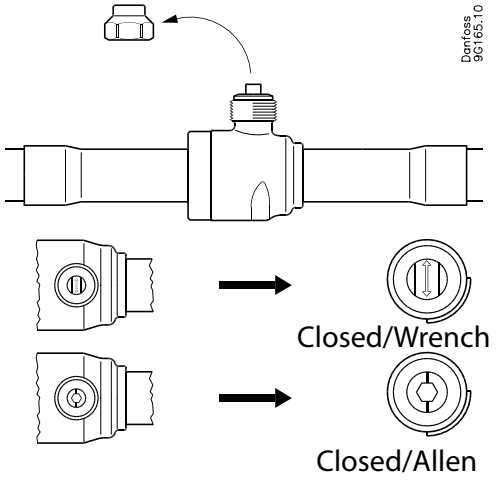


009R9510

**1.** Choose the right Service Kit according to the valve size and the spindle type.

| Spindle type \ GBC size | 6-22s | 28-35s | 42-79s |
|---|---|---|---|
| Allen key | 009G7011 | 009G7013 | 009G7015 |
| Wrench | 009G7012 | 009G7014 | 009G7016 |

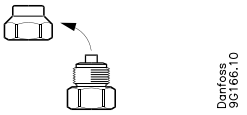
**2.** Remove cap and close the valve immediately




**3.** Identify* the Service Kit and remove its cap.


(For Wrench spindle)


(for Allen spindle)

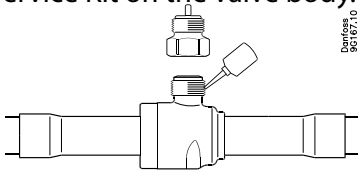



* The large Service Kit (42-79s) contains two sizes of allen spindles (6 mm and 8 mm). The size of the original spindle should be identified before fixing it. Choose the right spindle (6 mm or 8 mm). Both spindles are included in **009G7015**.

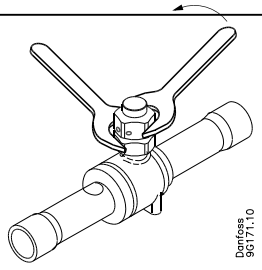
**Note: Since the kit will be permanently locked onto the valve body by *Loctite* glue, please must check it before the installation:**

- **The black gasket is in position and has no burrs on it ;**
- **Compulsorily keep the Service Kit internally clean, no dirt/dust;**
- **Do not separate the spindle from the Service Kit when assembling.**

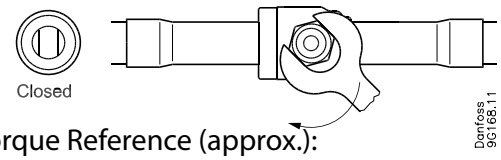
**4.** Drip a bit of ***Loctite*** glue onto the thread of valve body and fit the Service Kit on the valve body.




**NOTE:** When removing the cap of the Service Kit, please **FIX** its body with one spanner and untighten the cap with the other one.

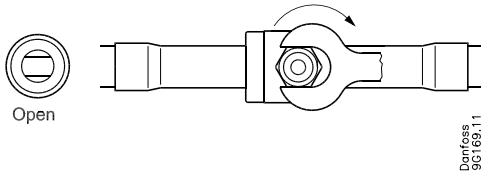



**5.** Before tightening the Service Kit, adjust the new spindle direction: let it fit into the old spindle and finally it shows closed.



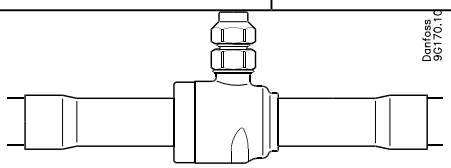

Torque Reference (approx.):
15 Nm for 009G7011, 009G7012
20 Nm for 009G7013, 009G7014
32 Nm for 009G7015, 009G7016
Detect the leakage, thighten again if necessary

**6.** Open the valve, then apply the new cap and tighten it.

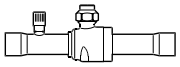



Torque Reference (approx.):
15 Nm for 009G7011, 009G7012
20 Nm for 009G7013, 009G7014
32 Nm for 009G7015, 009G7016

**Final view**



# Instruction
## GBC Ball Valve
## Brazing Instructions

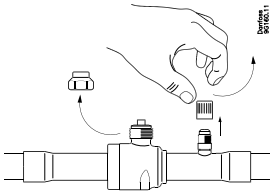


009R9508

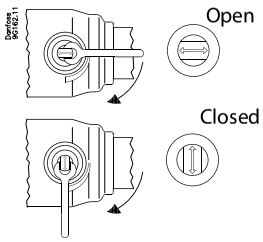
Temperature range:
–40°C → 150°C
(–40°F → 300°F)

Bi-flow

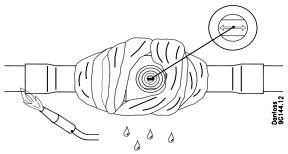
PS/MWP = 45 bar (650 psig)



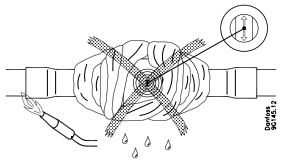
Remove cap and access cap (if present)



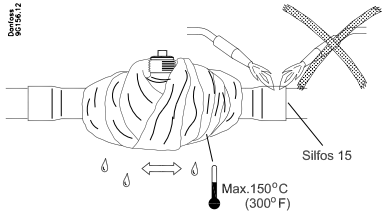

Change stem direction to open position

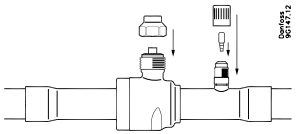


Fully soaked
OPEN position

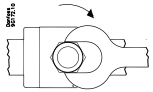


CLOSED position



Install Schraeder valve
and cap (if present)



Tighten

Tighten the cap with approx. torque

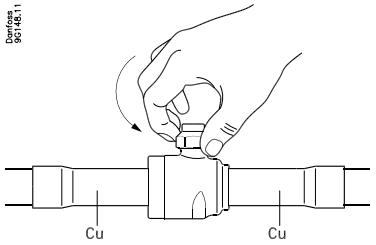
| Valve size | 6 ~ 22s | 25 ~ 35s | 42 ~ 79s |
|---|---|---|---|
| Torque | 15 Nm | 20 Nm | 32 Nm |

1. Brazing should be operated by qualified skilled technician.
2. The most important is to prevent overheating valve body when brazing, otherwise **the heat may damage the O-ring and cause leak.** The process should be finished within 1 min. or a few seconds.
3. Never keep the flame towards the valve body.
4. We recommend Apply $N_2$ in the tube when brazing
5. De-pressurize the system before operation. (May result in bodily injury).
6. After finishing brazing, cover another soaked cloth to the joint to cool it down.
7. Final leakage check.

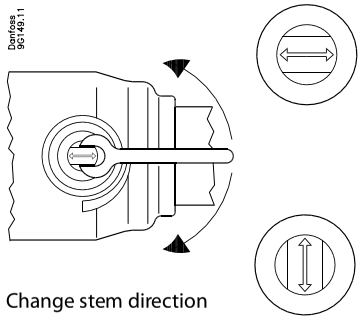


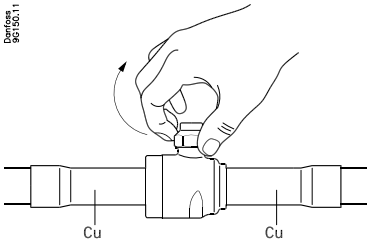
## Open / close valves



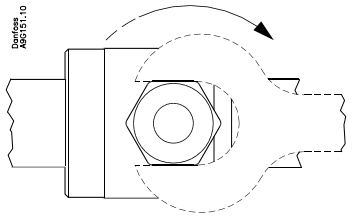

Remove cap



Change stem direction

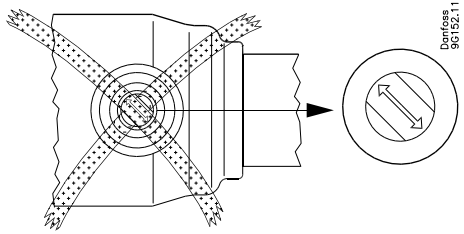



Hand tighten cap



Tighten

Tighten the cap with a torque which should be increased time to time to ensure a good seal.



**Ball valve must always be in either**
**FULLY OPEN or**
**FULLY CLOSED position**