

Installation instructions for the TBXZ-4-42 pipework package GOLD SD 11-120/GOLD CX 100/120 SILVER C SD 11-120/SILVER C CX 35-120

1. General

The pipework package is used for circulating a mixture of water and glycol between two interconnected heat recovery coils in a closed system.

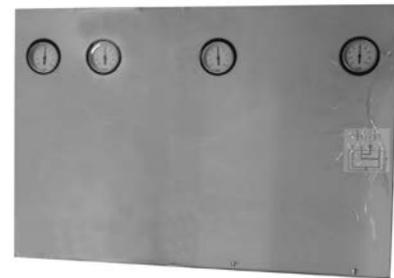
Parts shown in the basic circuit diagram below are included in the supply. The pipework package, pump and expansion vessel are supplied as separate units. Installation of the piping is not included.

GOLD:

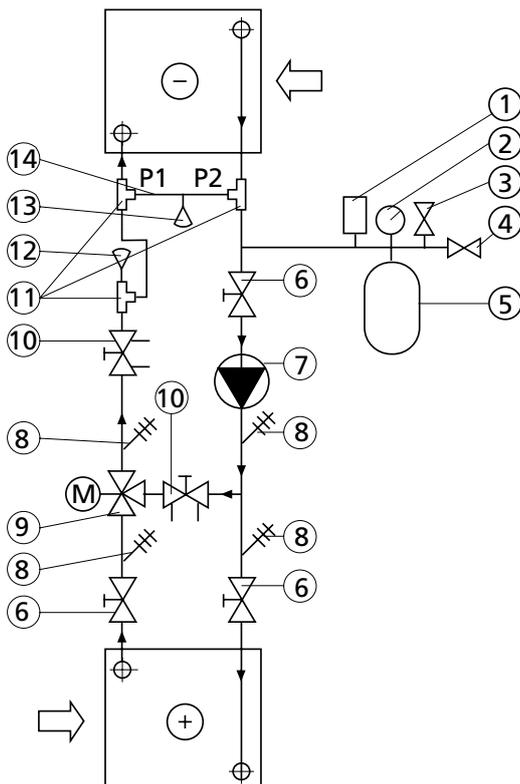
The control box is included in the supply from Swegon; see separate instructions.

SILVER C:

The control box and temperature sensor are not included in the supply from Swegon. Supplied by the controls supplier. Insertion-type temperature sensors are recommended.



Basic circuit diagram



- 1 Air purging valve
- 2 Manometer (Pressure switch)
- 3 Safety valve
- 4 Filling valve
- 5 Expansion vessel
- 6 Shut-off valve
- 7 Pump
- 8 Thermometer
- 9 Control valve with actuator
- 10 Commissioning valve
- 11 T-piece (3 pcs., not supplied by Swegon)
- 12 Temperature sensor
SILVER C: (not supplied by Swegon)
- 13 Differential pressure sensor
(SILVER C: Not used)
- 14 Pressure tube

2. Installation

2.1 Pipework package.

1. Install the pipework package at a suitable location in the fan room.

Wall mounting

Remove the wall mounting bracket from the pipework package and secure it to a suitable place on a wall. In order to reach and unfasten the wall mounting bracket, you must first dismantle the front panel of the sheet-metal casing.

Floor mounting

A stand for floor mounting, TBXZ-2-43, is available as an accessory, see illustration to the right. Secure the stand to a suitable spot on the floor. In order to reach the pipework package and secure it to the stand with screws, you must first dismantle the front panel of the sheet-metal casing.

2. Mount the pipework package onto the wall mounting bracket/floor stand. Refit the front panel.

3. Give careful attention to the direction of flow. See the label on the front of the pipework package and the illustration to the right. Install the pump vertically for horizontal flow.

4. Install the pump and shut-off valve with pipework at a suitable location in the fan room.

5. Install the expansion vessel with accessories at a suitable location in the fan room.

2.2 Control box (applies to the GOLD only)

The control box is designed for wall mounting should be installed at an appropriate location. Make sure that you position the safety isolating switch on the control unit 0.6 – 1.9 metres above floor level.

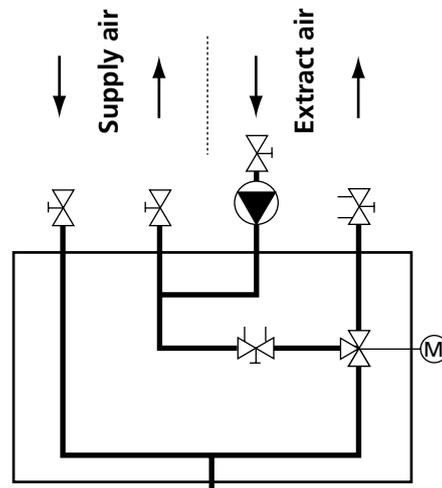
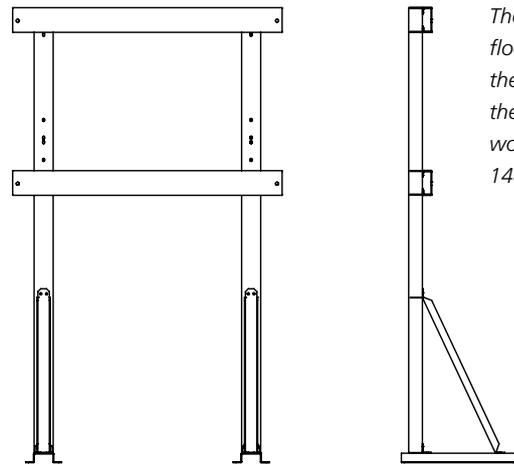
2.3 Installing the pipework

The pipework between the heat exchanger coils and the pipework package should be installed and insulated in a professional manner by a ventilation and sanitation fitter, according to customary trade standards and regulations.

Connect the heat exchanger coils for counter-flow circulation according to the arrows on the coil connection branches. Incorrect connection may cause a reduction in efficiency. Make sure that the pipework package and the connecting pipework do not block inspection of the other functional sections.

Check that the deadweight of the pipework and/or the expansion forces will not be applied to liquid connections. Use an appropriate sealing/jointing compound for sealing the threads on the heat exchanger connections.

Connect the safety valve, appropriately using a hose, to a collecting vessel (not supplied by Swegon).



2.4 Temperature sensor

GOLD:

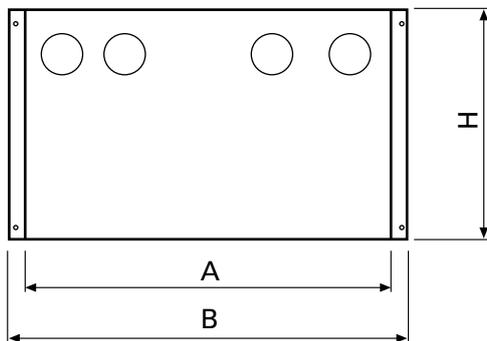
The temperature sensor supplied is an insertion-type sensor. Secure it as shown in the basic circuit diagram on page 1. Make sure that the end of the sensor, where the sensing element is, is positioned against the liquid flow. The sensor is used as a limiting sensor to counteract freezing.

Wire the temperature sensor according to separate installation instructions for the coil heat exchanger's control box.

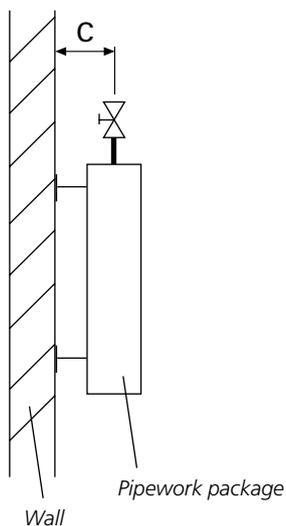
SILVER C:

The temperature sensor is not supplied by Swegon. The temperature sensor should be supplied by the control equipment supplier and must be an insertion-type sensor.

3. Dimensions and weights



GOLD/SILVER C Sizes	TBXZ-42 Size	A	B	H	Coil heat exch. connections	Pipework package connections	kg
11/12	12	601	669	415	DN25	DN25	16
14/20	20	601	669	415	DN32	DN32	19
25/30	30	772	839	530	DN32	DN32	25
35/40	40	772	839	530	DN 40	DN 40	26
50/60	60	772	839	530	DN 40	DN 40	27
70/80	80	772	839	530	DN 40	DN 40	27
100/120	120	937	1003	640	DN 50	DN 50	40



GOLD/SILVER C Sizes	TBXZ-42 Size	C
11 - 20	12, 20	130
25 - 80,	30, 40, 60, 80	128
100/120	120	141

4. Electrical connections

The electrical connections should be wired by a qualified electrician in accordance with local electrical safety regulations.

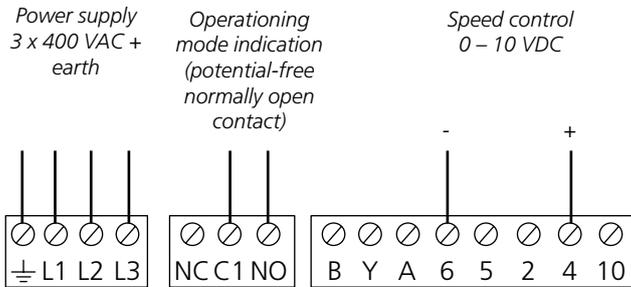
GOLD:

See separate instructions for control box, coil heat exchangers, part no. 809535.

SILVER C:

See below for details on how to connect the circulation pump, valve actuator and manometer/pressure switch

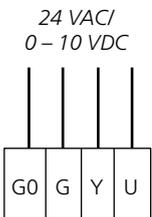
Circulation pump



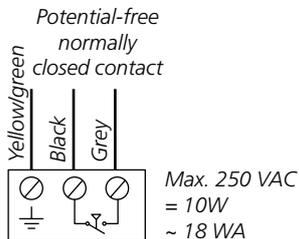
Recommended fuse protection

SILVER C	Fuse
SD 11-30, CX 35/40	3-pin conn., 6 A, C characteristic
SD 35-80, CX 50-80	3-pin conn., 10 A, C characteristic
SD 100/120, CX 100/120	3-pin conn., 16 A, C characteristic

Valve actuator



Manometer/ Pressure switch



5. Commissioning

1. The height of lift for the control valve is automatically calibrated the first time it is commissioned.
2. Check the pre-pressure by measuring the level difference from the centre of the expansion vessel to the highest point of the pipe connection system. Convert the level difference to bar (1 metre = 0.1 bar). Add another 0.3 bar (for the coil) to this figure to obtain the pre-pressure. The safety valve must be sized to withstand at least 1 bar above the pre-pressure. The safety valve supplied is sized to withstand 2.5 bar.

Example:

Measured level difference of 2 metres = 0.2 bar
 Pre-pressure = 0.2 bar + 0.3 bar (coil) = 0.5 bar
 Min. permissible safety valve pressure = 0.5 bar + 1 bar = 1.5 bar
 This figure is well below the max. limit of the safety valve supplied, which is 2.5 bar.

Equipped with the safety valve supplied, the pipe connection system will manage a level difference of 12 metres (= 1.2 bar).

If the level difference is more than 12 metres, you will either have to move the expansion vessel with accessories to a higher position or replace the safety valve. Since the expansion vessel manages max. 5 bar, a safety valve sized for a max permissible pressure of 5 bar must be used.

The expansion vessel is factory-rated for a pre-pressure of 0.5 bar, which also is the minimum limit. If the pre-pressure of the expansion vessel threatens to drop below 0.5 bar, fill more air through the nipple on the underside of the expansion vessel.

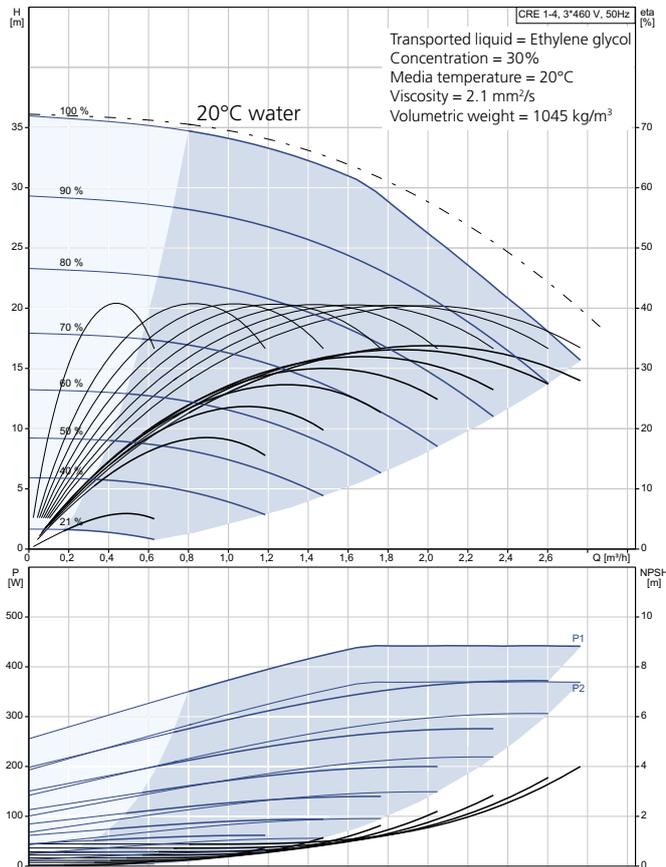
3. Preset the adjustable red pointer on the manometer, to the corrected pre-pressure in the expansion vessel.
4. Open the "cap" on the automatic air purging valve.
5. Fill the system with water (usually water mixed with glycol). Please note that if glycol is used, it must be meant for cooling medium systems, not motor vehicles. Fill the system slowly. Vent the liquid circuit at the air purging points as you fill it.
6. Adjust (fill / drain) the system so that the pressure in the system will conform to the corrected pre-pressure reading (see the red pointer on the manometer).
7. The system is now ready to be commissioned. Under normal operating conditions, the pressure in the system must not drop below the corrected pre-pressure preset on the manometer (see the red pointer on the manometer) or exceed the red mark.

6. Circulation pumps, wet motor

Sizing diagram

Grundfos CRE 1-4

For the GOLD/SILVER C SD, sizes 11/12



Electrical data

Frequency:	50 Hz
Rated voltage:	3 x 380-500 V
Capacity:	0.37 kW
Rated current:	1.05 – 1.00 A

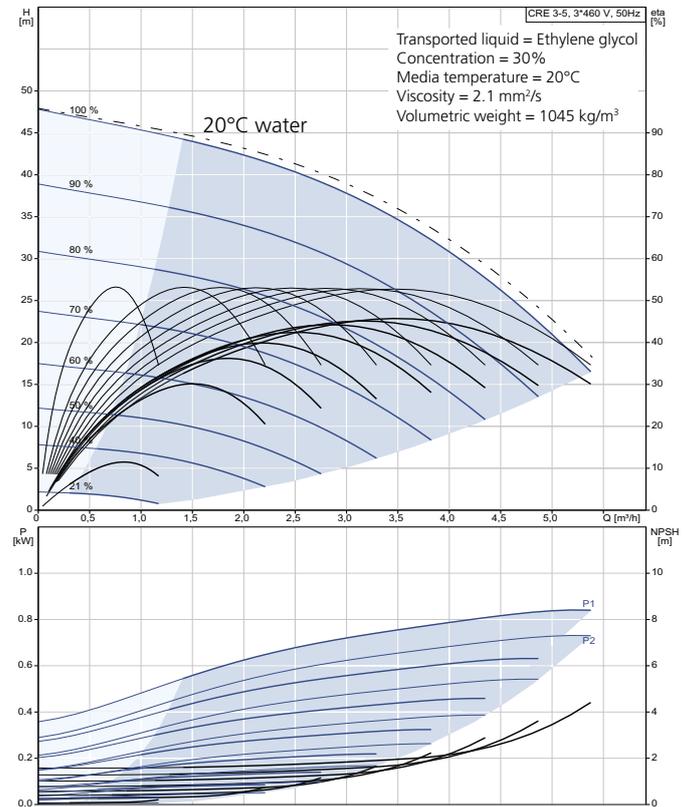
Survey – Pump data

Temperature range, liquid:	-20... 120°C
Max. permissible ambient temp.:	+50°C
Max. pressure at specified temp.:	25 bar/120°C 25 bar/-20°C
Flange standard:	DIN
Size of pipe connections:	DN25/DN32
Pressure stage:	PN16/PN25
Enclosure class:	IP55
Weight:	28 kg

Sizing diagram

Grundfos CRE 3-5

For the GOLD/SILVER C SD, sizes 14/20



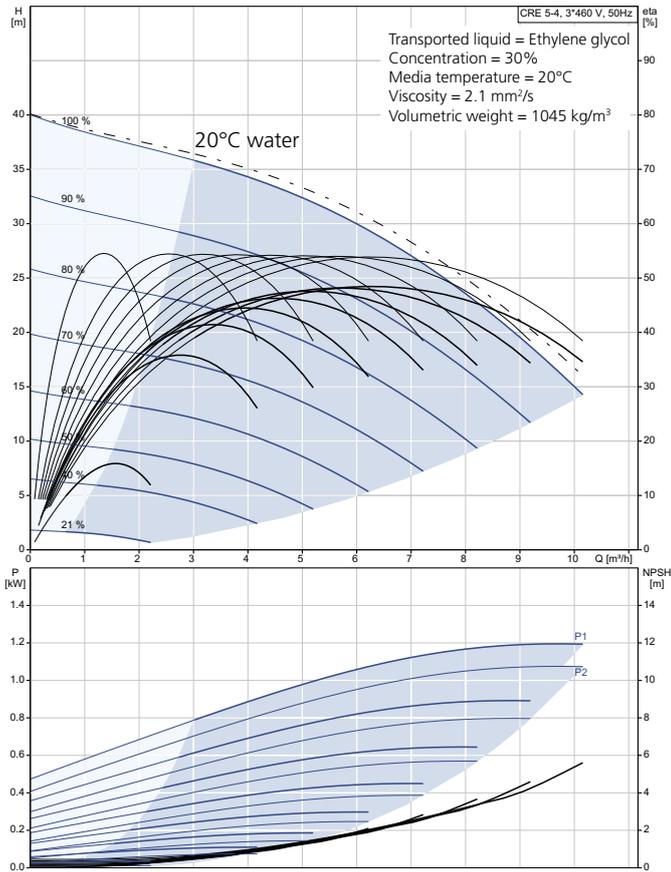
Electrical data

Frequency:	50 Hz
Rated voltage:	3 x 380-500 V
Capacity:	0.75 kW
Rated current:	1.70 – 1.60 A

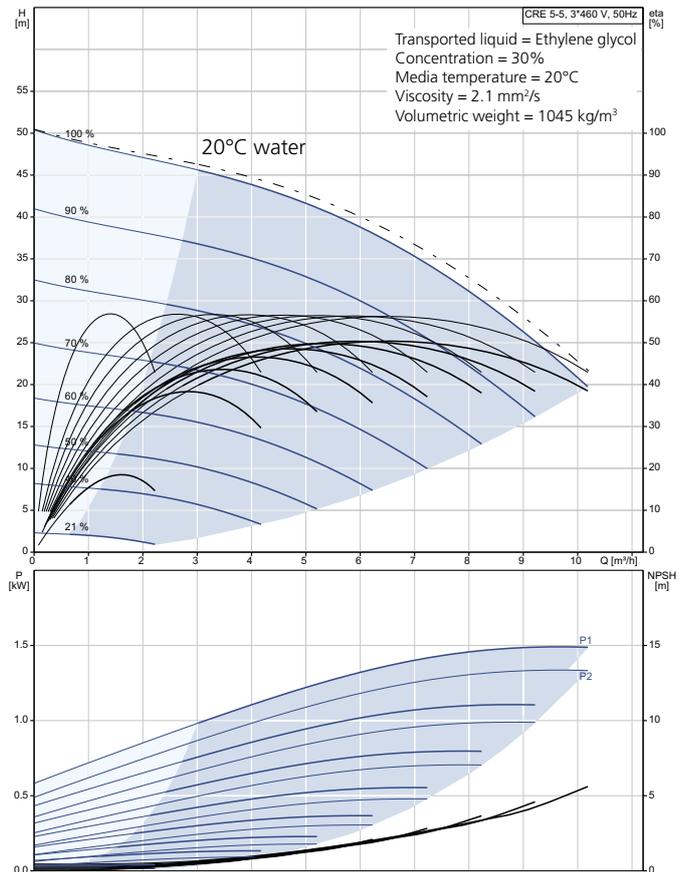
Survey – Pump data

Temperature range, liquid:	-20... 120°C
Max. permissible ambient temp.:	+50°C
Max. pressure at specified temp.:	25 bar/120°C 25 bar/-20°C
Flange standard:	DIN
Size of pipe connections:	DN25/DN32
Pressure stage:	PN16/PN25
Enclosure class:	IP55
Weight:	29 kg

**Sizing diagram
Grundfos CRE 5-4
For the GOLD/SILVER C SD, sizes 25/30
SILVER C CX, sizes 35/40**



**Sizing diagram
Grundfos CRE 5-5
For the GOLD/SILVER C SD, sizes 35/40
SILVER C CX, sizes 50/60**



Electrical data

Frequency: 50 Hz
 Rated voltage: 3 x 380-500 V
 Capacity: 1.1 kW
 Rated current: 2.20 – 1.90 A

Electrical data

Frequency: 50 Hz
 Rated voltage: 3 x 380-500 V
 Capacity: 1.5 kW
 Rated current: 2.90 – 2.40 A

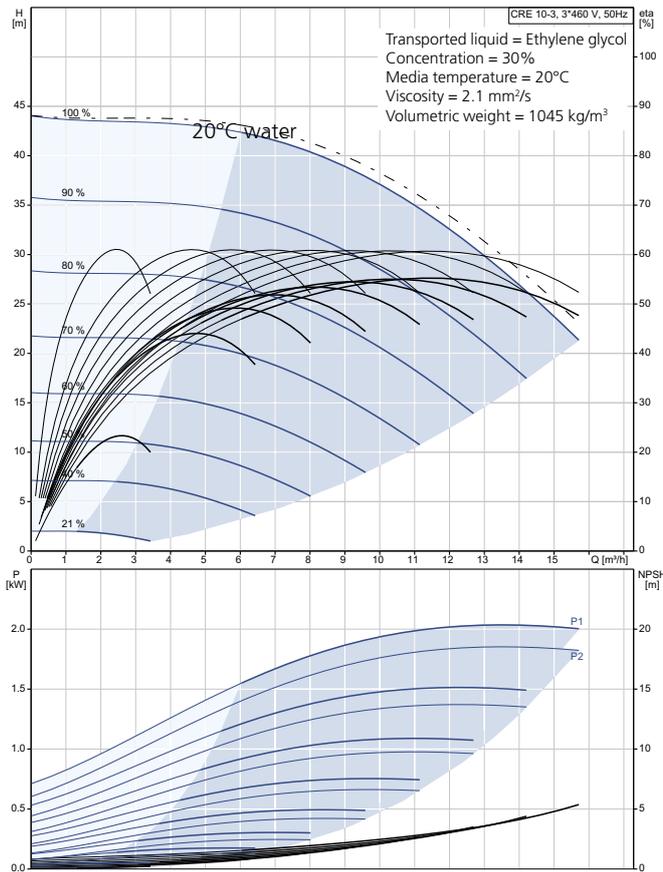
Survey – Pump data

Temperature range, liquid: -20...120°C
 Max. permissible ambient temp.: +50°C
 Max. pressure at specified temp.: 25 bar/120°C
 25 bar/-20°C
 Flange standard: DIN
 Size of pipe connections: DN25/DN32
 Pressure stage: PN16/PN25
 Enclosure class: IP55
 Weight: 38 kg

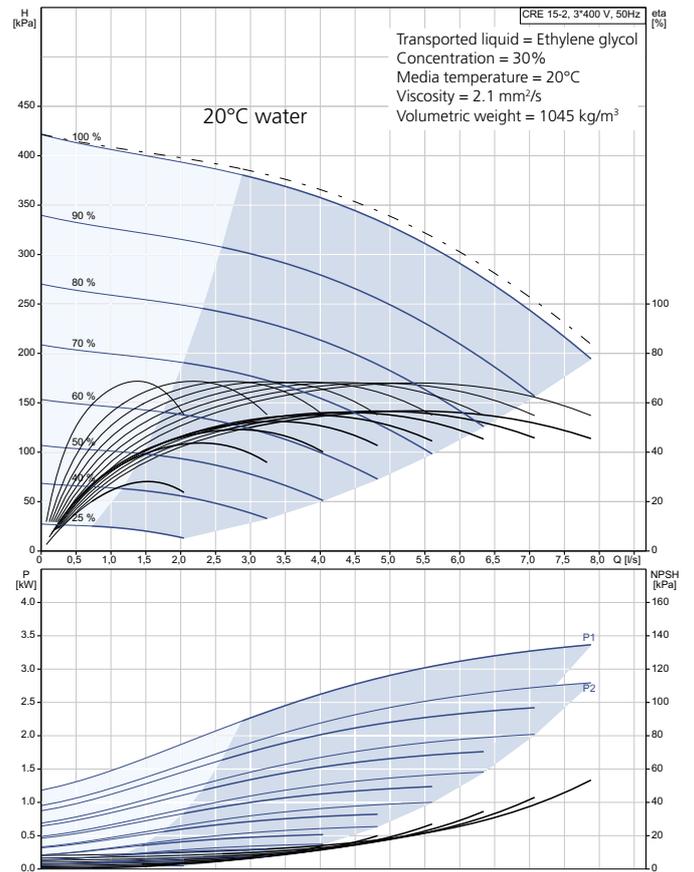
Survey – Pump data

Temperature range, liquid: -20...120°C
 Max. permissible ambient temp.: +50°C
 Max. pressure at specified temp.: 25 bar/120°C
 25 bar/-20°C
 Flange standard: DIN
 Size of pipe connections: DN25/DN32
 Pressure stage: PN16/PN25
 Enclosure class: IP55
 Weight: 41 kg

Sizing diagram
Grundfos CRE 10-3
 For the GOLD/SILVER C SD, sizes 50-80
 SILVER C CX, sizes 70-80



Sizing diagram
Grundfos CRE 15-2
 For the GOLD/SILVER C SD, sizes 100/120
 GOLD/SILVER C CX, sizes 100/120



Electrical data

Frequency: 50 Hz
 Rated voltage: 3 x 380-500 V
 Capacity: 2.2 kW
 Rated current: 4.15 – 3.40 A

Survey – Pump data

Temperature range, liquid: -20...120°C
 Max. permissible ambient temp.: +50°C
 Max. pressure at specified temp.: 16 bar/120°C
 16 bar/-20°C
 Flange standard: DIN
 Size of pipe connections: DN40
 Pressure stage: PN16
 Enclosure class: IP55
 Weight: 45 kg

Electrical data

Frequency: 50 Hz
 Rated voltage: 3 x 380-480 V
 Capacity: 3 kW
 Rated current: 6.20 – 5.00 A

Survey – Pump data

Temperature range, liquid: -20...120°C
 Max. permissible ambient temp.: +40°C
 Max. pressure at specified temp.: 16 bar/120°C
 16 bar/-20°C
 Flange standard: DIN
 Size of pipe connections: DN50
 Pressure stage: PN16
 Enclosure class: IP55
 Weight: 64 kg

7. Commissioning valve 9505

General

Draining

The valves without drain nipple have a cover sleeve. This cover sleeve can be exchanged for a set of drain fittings available as accessories.

Measurement tappings

The measurement tappings are self sealing. For measurements, remove the cover. Then insert the measurement needle through the self-sealing measurement tapping.

Technical description

Application area

Heating and cooling systems. Tap water installations.

Function

Commissioning, pressure drop and flow measurements, shut off and drainage.

The valve controls the flow by turning the handle and changes the setting. There are 40 different positions on the handle.

The valve can stop the flow and on a restart there is a memory function that returns the valve back to the previous setting.

The valve can be used for measuring the flow across the valve by measuring the pressure in the two measurement points.

Pressure class

PN 20. (PN 25 at max. permissible operating temperature, 100°C)

Temperature

Max. permissible operating temperature: 130°C.

Min. permissible working temperature: - 10°C.

Kv values

The values below or those in the diagram on the next page can be used for calculation of the pipe system.

Commissioning valve 9505

DN Turns	10	15	20	25	32	40	50
0.5	0.09	0.37	0.4	1.4	1.4	2.7	3.9
1	0.19	0.55	0.7	2	3.3	3.5	7.8
1.5	0.33	0.75	0.9	2.6	4.1	4.5	10.6
2	0.5	0.94	1.2	3.5	5.1	6.1	14.8
2.5	0.66	1.18	1.5	4.8	7.6	10	19.9
3	0.81	1.75	2.2	5.5	10.4	14.1	23.9
3.5	0.92	2.44	3.4	6	11.2	17.6	27.2
4	0.97	2.67	4.1	6.4	12	19.5	29.8

Presetting

The valve can be preset by means of the appropriate flow diagram for the relevant valve size. The presetting of the valve can be read in the "main" and "secondary" scale on the handle. Double zeros indicate that the valve is closed.

- The primary valve setting (main) is shown in the lower window, where the values move in a vertical direction. Each number indicates one whole turn.

- The secondary valve setting (secondary) is shown in the upper window, where the values move in a horizontal direction. Each number indicates one tenth of a turn.

To set a valve to a certain pressure drop setting that e.g. is equivalent to 2.3 turns in the diagram, proceed as follows:

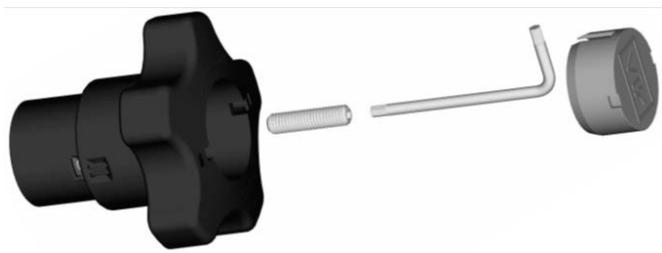
1. Close the valve completely.
2. Open the valve 2.3 turns.
3. The memory stop can be set as follows:

- Remove the plastic cover on the handle using a small tool:

- Insert the 3 mm Allen key supplied into the hole in the center. Make sure that the topset® is in its required position and tighten the inner screw clockwise until it stops. Do not tighten it too hard.

- Replace the plastic cover. You can prevent unauthorized persons from changing the setting by security sealing the cover of the handle's upper section. This can be done by using a special wire with a security seal that you insert through the existing grooves.

The valve can now be closed, and thus influence the flow at anytime. When the valve is opened again the memory stop will return to the previous setting.



4. The valve is now set.

To check the presetting, close the valve. The setting indicated should then be 0.0. After that, open it to stop. The presetting will then be indicated, in this case: 2.3.

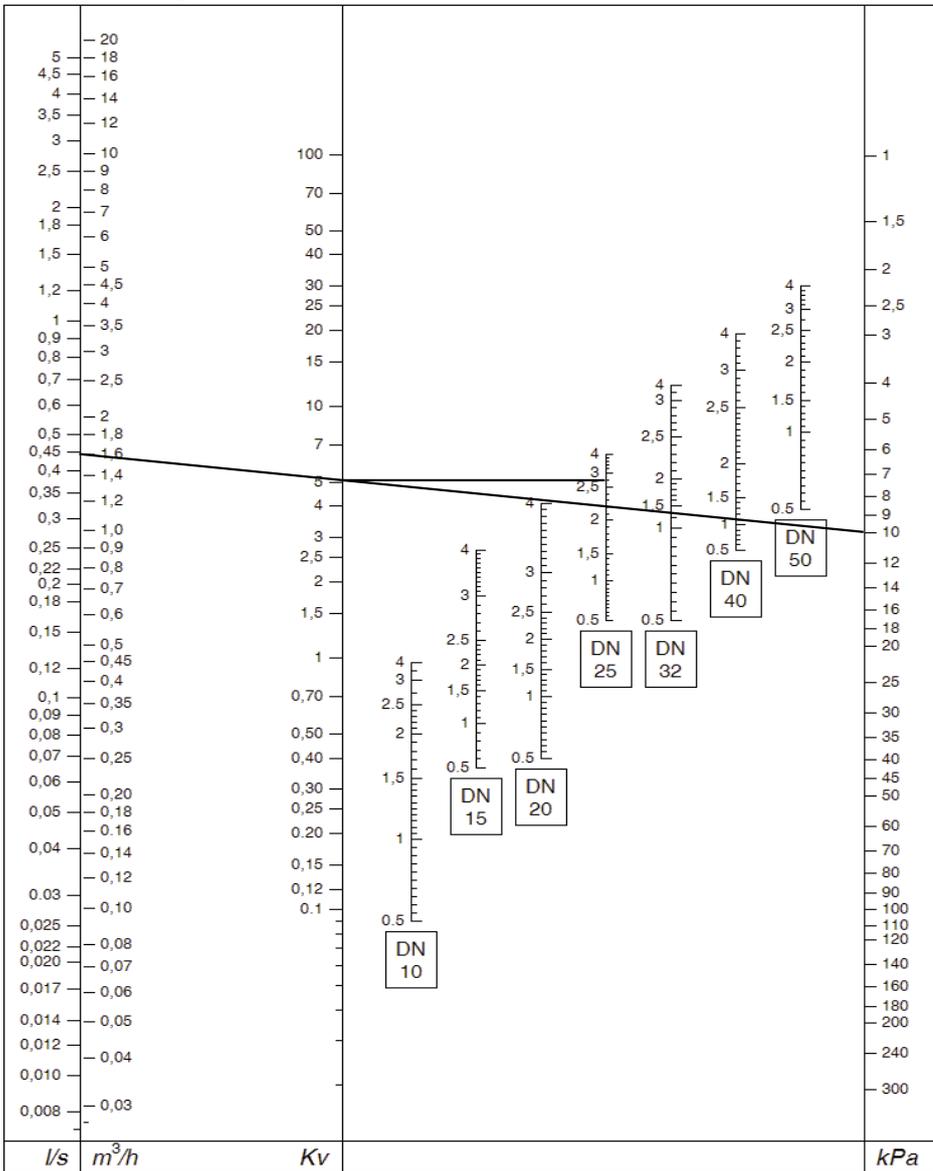
Diagrams that indicate the pressure drop at various settings and flows for each size of valve are provided for guidance in determining the correct valve size and presetting (pressure drop).

A fully open valve corresponds to 4 turns. Opening the valve additional turns will not increase its capacity.

8. Diagram

This diagram shows the pressure drop across the valve. A straight line that interconnects the scales for flow-Kv-pressure drop constitutes the relationship between the different readings.

The position for each valve size can be obtained by plotting a horizontal line from the value intersected on the Kv scale.



Example

Sought

Presetting for DN 25 and required 1.6 m^3/h and 10 kPa pressure drop.

Solution

Plot a line between 1.6 m^3/h and 10 kPa . This produces $Kv=5$. Then plot a horizontal line from Kv to the DN 25 scale where you read 2.75 turns.

NOTE!

If the flow is outside the diagram, it can be read as follows:

Proceed from the example above which produces 10 kPa , $Kv=5$ and flow 1.6 m^3/h . For 10 kPa and $Kv=0.5$ we obtain a flow of 0.16 m^3/h and for $Kv=50$ we obtain 16 m^3/h . Therefore for each given pressure drop, we can read 0.1 or 10 times flow and Kv .