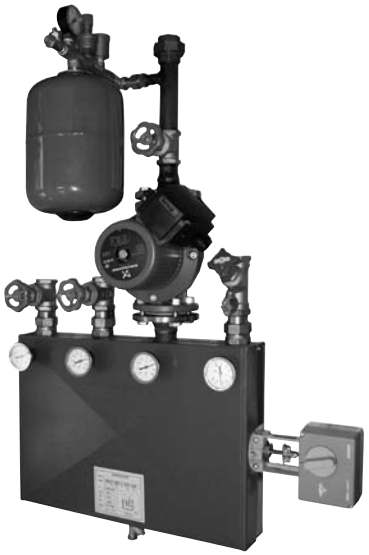
Installation Instructions for the TBXZ-2-42 Pipework Package, GOLD SD/GOLD CX 100/120

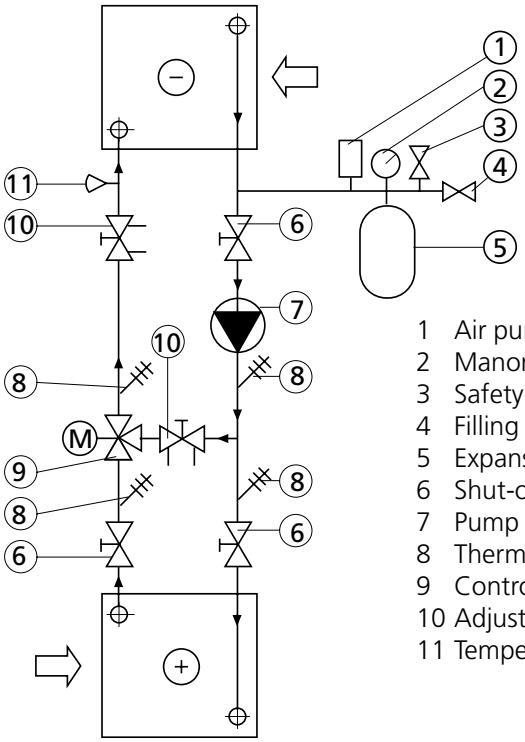
1. General

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

The supply includes the following: The pipework package is supplied complete with insulated sheet-metal casing, pump, control valve with actuator, expansion vessel, safety valve, manometer and shut-off cocks, thermometers, filling valve and air purging valve.



Basic circuit diagram



1 Air purging valve
2 Manometer
3 Safety valve
4 Filling valve
5 Expansion vessel
6 Shut-off valve
7 Pump
8 Thermometer
9 Control valve with actuator
10 Adjustment valve
11 Temperature sensor

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.

Floor mounting

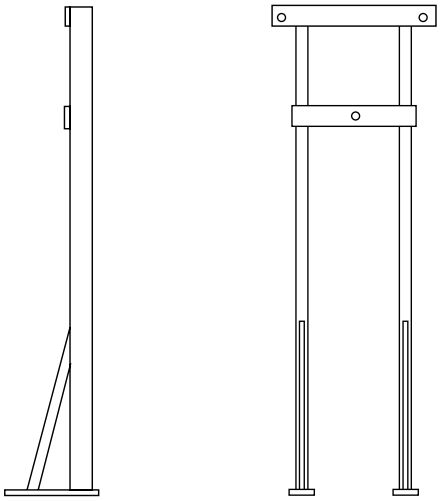
A stand for floor mounting, TBXZ-1-43, is available as an accessory, see illustration to the right. Secure the stand to a suitable spot on the floor.

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

3. Fit the pump to the pipework package. Give careful attention to the direction of flow. See the label on the front of the pipework package and the illustration to the right. It may be necessary to dismantle the drive side of the pump and turn it so that the electrical terminal box will be positioned upward. This can be done after removing four socket head cap screws.

4. Mount the shut-off valve + pipes onto the pump.

5. Mount the pressure expansion vessel and accessories.



The height from floor level to the thermometers on the installed pipework package is 1480 mm.

2.2 Control unit.

The control unit is designed for wall mounting should be mounted 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.

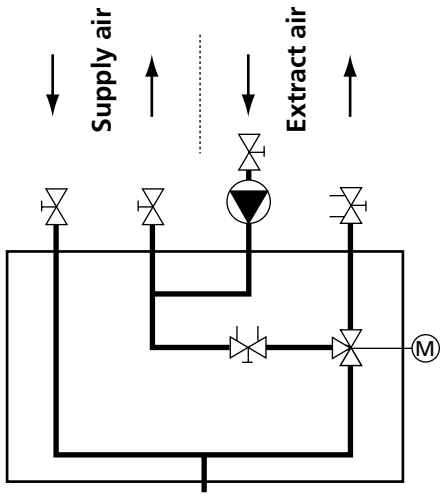
2.3 Installing the pipework

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).

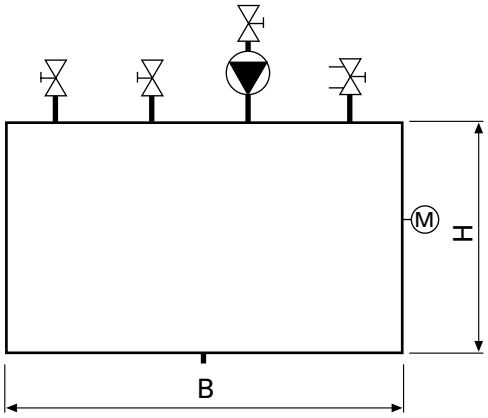


2.4 Temperature sensor

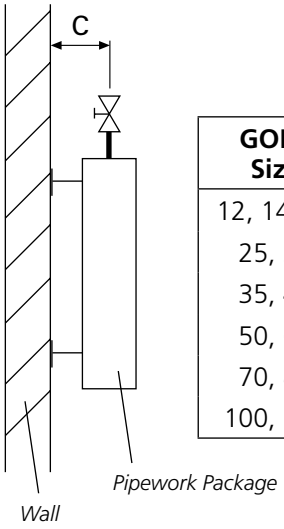
A type strap-on temperature sensor is supplied with the pipework package. Secure the sensor onto the return pipe, as shown in the basic circuit diagram on page 1, for instance by means of a bundling strap. The sensor is used as a limiting sensor to counteract freezing.

Wire the temperature sensor leads to terminals 107-108 in the control unit of the pipework package.

3. Dimensions



GOLD Size	TBXZ-42 Size	B	H
12, 14, 20	20	600	415
25, 30	30	770	530
35, 40	40	770	530
50, 60	60	770	530
70, 80	80	770	530
100, 120	120	935	640

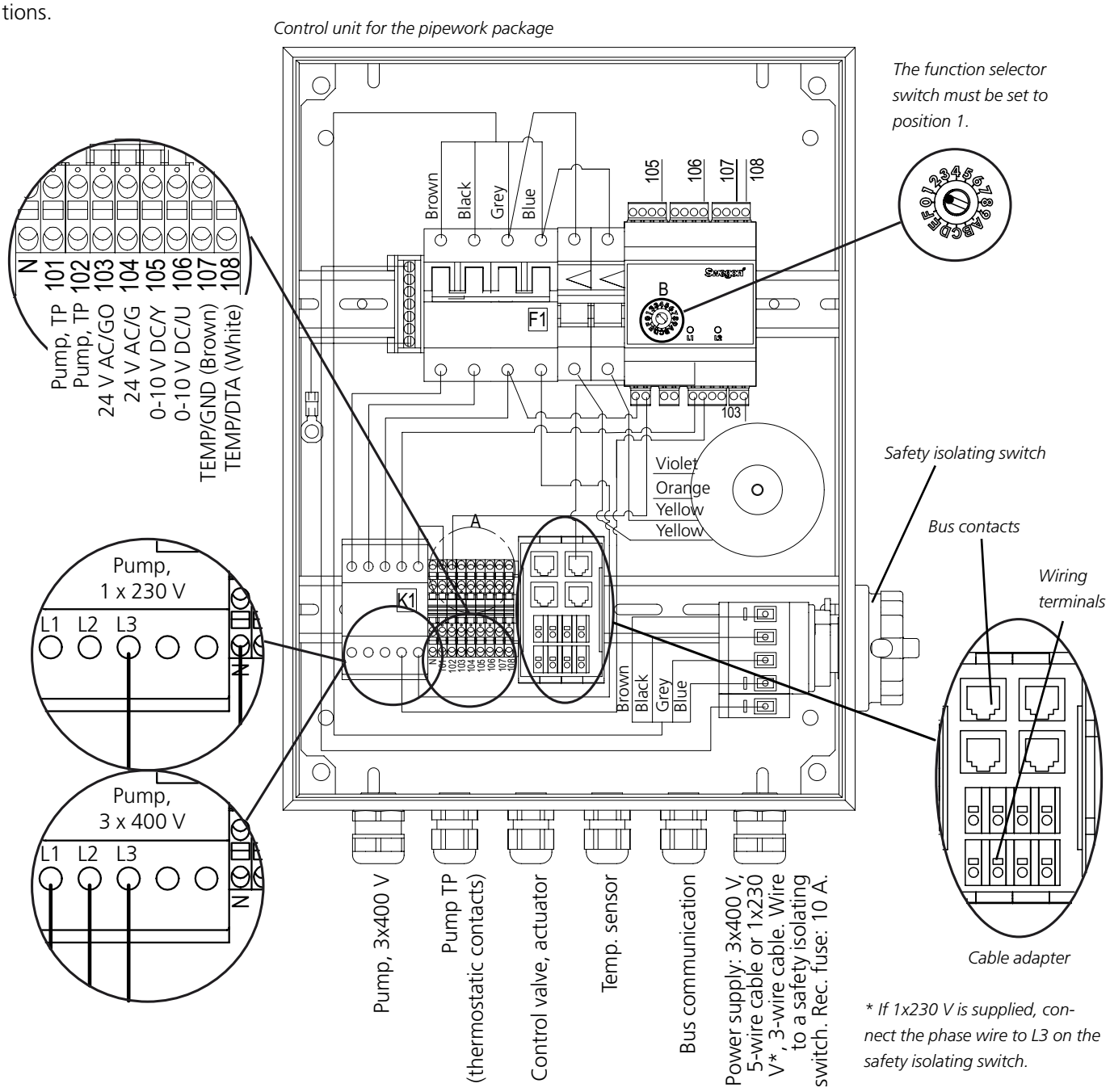


GOLD Size	TBXZ-42 Size	C
12, 14, 20	20	100
25, 30	30	120
35, 40	40	120
50, 60	60	120
70, 80	80	120
100, 120	120	185

GOLD Size	TBXZ-42 Size	Coil heat exchanger connections	Pipework package connections
12, 14, 20	20	DN 32	DN 32
25, 30	30	DN 40	DN 40
35, 40	40	DN 40	DN 50
50, 60	60	DN 40	DN 50
70, 80	80	DN 50	DN 50
100, 120	120	DN 65	DN 65

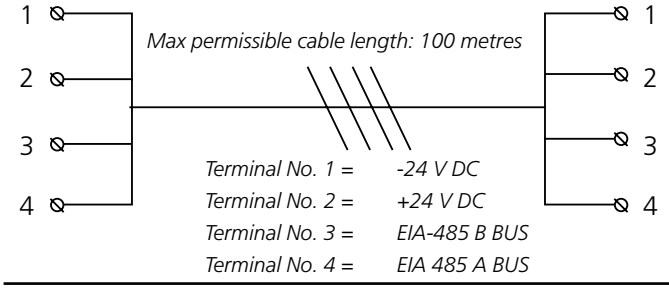
3. Electrical Connections

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



Terminals – Cable adapter, GOLD air handling unit.
GOLD SD: Cable adapter in the supply air or extract air handling unit.
GOLD CX 100/120: Cable adapter marked EIA-485 in the upper electrical equipment cubicle.

Terminals, Cable adapter - Control unit for the pipework package



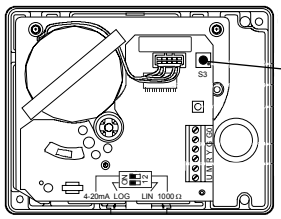
Connect the cable between the GOLD unit and the control unit for the pipework package from terminal to terminal, i.e. from Terminal No. 1 in the GOLD unit to Terminal No. 1 in the control unit for the pipework package. See the fig. to the left.

The cable between units is not included in the supply.

Twisted-pair cables are recommended. Use one cable pair for 24 V and the other cable pair for bus communication.

4. Commissioning

1. Calibrate the lifting height for the control valve the first time it is commissioned. To do this, press the calibration button - accessible only after you have removed the cover from the enclosure. See the illustration below.



Calibration button

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.

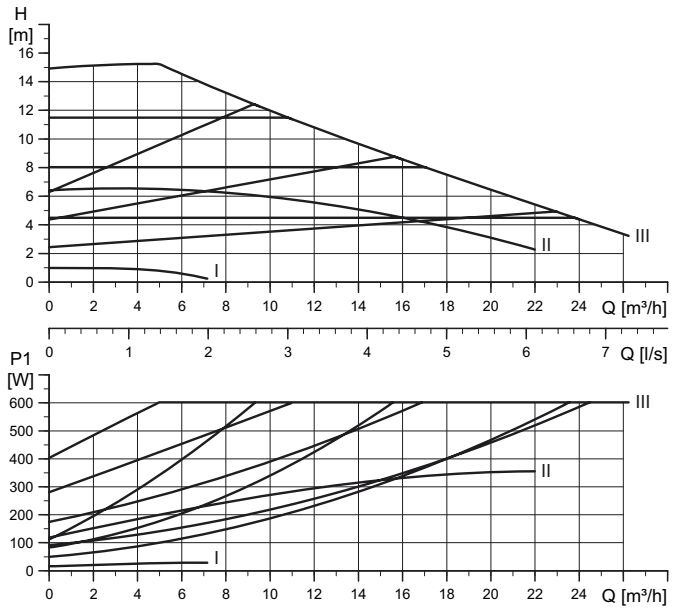
5. Fill the system with water (usually water mixed with glycol). Please note that if glycol is used, it must be meant for cooling medium systems, not motor vehicles. Fill the system slowly. Vent the liquid circuit at the air purging points as you fill it.

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.

5. Circulation pumps, wet motor

Sizing diagram, Magna1 40-150 F For the GOLD SD, sizes 12-40



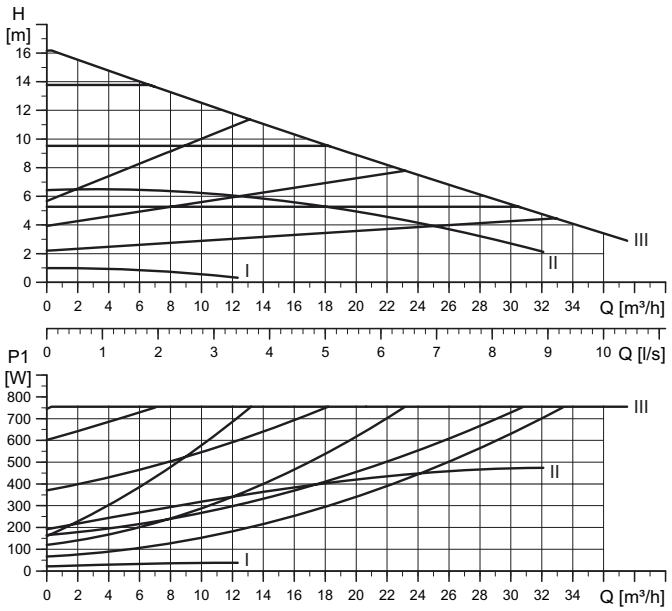
Electrical data

Frequency:	50/60 Hz
Rated voltage:	1 x 230 V
Current:	0.18 – 2.71 A
Power consumption:	16 - 615 W
Protective motor switch:	Integrated

Survey – Pump Data

Temperature range:	-10°C – +110°C
Max. perm. operating pressure:	10 bar
Size of pipe connections:	1.5"
Max. permissible static pressure:	PN 10
Enclosure class:	IPx4D
Insulation class:	F
Weight:	16 kg

Sizing diagram, Magna1 50-180 F For the GOLD SD, sizes 50-60



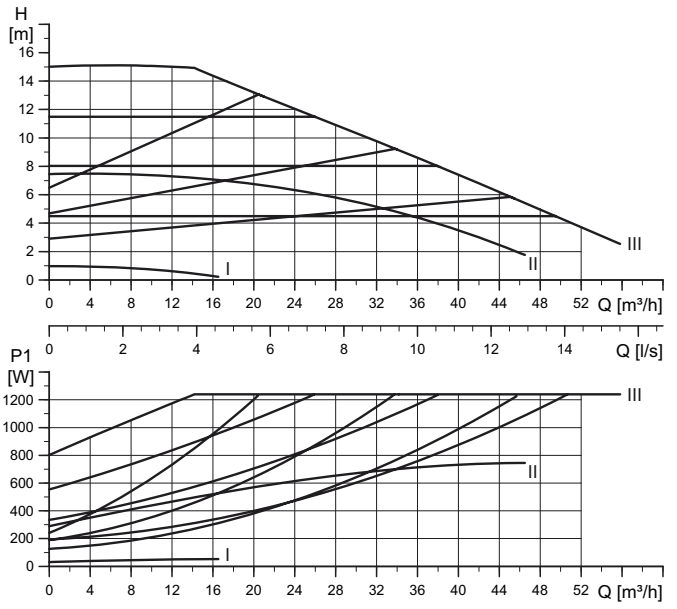
Electrical data

Frequency:	50/60 Hz
Rated voltage:	1 x 230 V
Current:	0.24 – 3.40 A
Power consumption:	22.1 - 769 W
Protective motor switch:	Integrated

Survey – Pump Data

Temperature range:	-10°C – +110°C
Max. perm. operating pressure:	10 bar
Size of pipe connections:	2"
Max. permissible static pressure:	PN 10
Enclosure class:	IPx4D
Insulation class:	F
Weight:	19 kg

Sizing diagram, Magna1 65-150 F For the GOLD SD, sizes 70-120, GOLD CX sizes 100/120



Electrical data

Frequency:	50/60 Hz
Rated voltage:	1 x 230 V
Current:	0.31 – 5.53 A
Power consumption:	30.7 - 1263 W
Protective motor switch:	Integrated

Survey – Pump Data

Temperature range:	-10°C – +110°C
Max. perm. operating pressure:	10 bar
Size of pipe connections:	2.5"
Max. permissible static pressure:	PN 10
Enclosure class:	IPx4D
Insulation class:	F
Weight:	24 kg

6. Adjustment valve, STAD/STAF

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

Range of Application

Heating and cooling systems. Tap water installations.

Function

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

Pressure class

PN 20 (STAD), PN 25 (STAF).

Temperature

Max. permissible working temperature: 120°C.
Min. permissible working temperature: - 20°C.

Kv values

The values or chart on the next page can be used for calculating the pipe system.

Adjustment valve STAD

Turns \ DN	10/09	15/14	20	25	32	40	50
0.5	-	0.127	0.511	0.60	1.14	1.75	2.56
1	0.090	0.212	0.757	1.03	1.90	3.30	4.20
1.5	0.137	0.314	1.19	2.10	3.10	4.60	7.20
2	0.260	0.571	1.90	3.62	4.66	6.10	11.7
2.5	0.480	0.877	2.80	5.30	7.10	8.80	16.2
3	0.826	1.38	3.87	6.90	9.50	12.6	21.5
3.5	1.26	1.98	4.75	8.00	11.8	16.0	26.5
4	1.47	2.52	5.70	8.70	14.2	19.2	33.0

Adjustment valve STAF

Turns \ DN	65
0,5	1,8
1	3,4
1,5	4,9
2	6,5
2,5	9,3
3	16,3
3,5	25,6
4	35,3
4,5	44,5
5	52
5,5	60,5
6	68
6,5	73
7	77
7,5	80,5
8	85

Presetting

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 (Fig. a).
2. Open the valve 2.3 turns (Fig. b).
3. Use an Allen wrench (3 mm) to screw the inner spindle clockwise to the stop position.
4. The valve is now set.

To check the presetting, close the valve. Digits 0,0 should then be visible in the windows. After that, open the valve to stop. The preliminary setting will then be indicated, in this case: 2,3 (Fig. b).

Charts 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 preliminary setting (pressure drop).

Fully open valve is equivalent to 4 turns (STAD) or 8 turns (STAF) (Fig. c). Opening the valve additional turns will not increase its capacity.

Fig. a
Closed valve

Fig. b
Closed to 2,3 turns

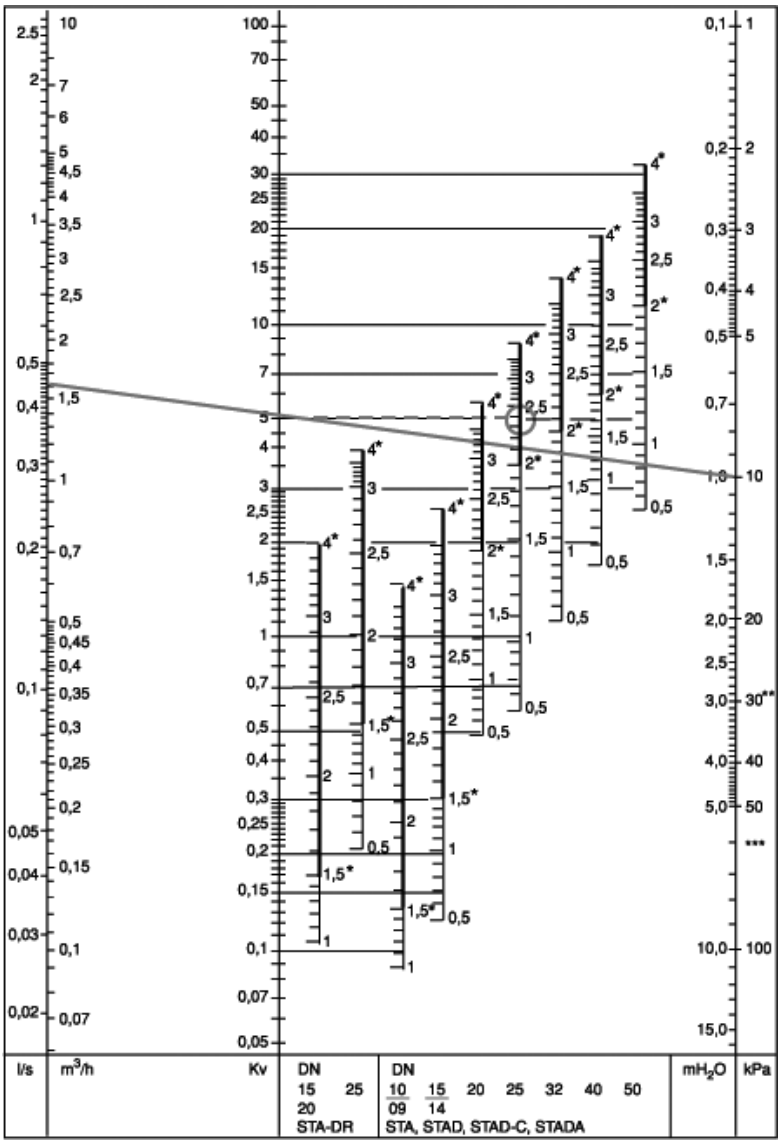
Fig. c
Fully open valve (STAD)

7. Chart

7.1 DN 32 – 50 (GOLD SD 12-80)

This chart shows the pressure drop across the valve. A straight line that interconnects the scales for flow – Kv - pressure drop constitute 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 flow ^{3}/h and pressure drop of 10 kPa.

Solution

Plot a line between 1.6 m^3/h and 10 kPa. This intersects the Kv scale at KV=5. Then plot a horizontal line from Kv 5 to the DN 25 scale where you read 2.35 turns.

Important!

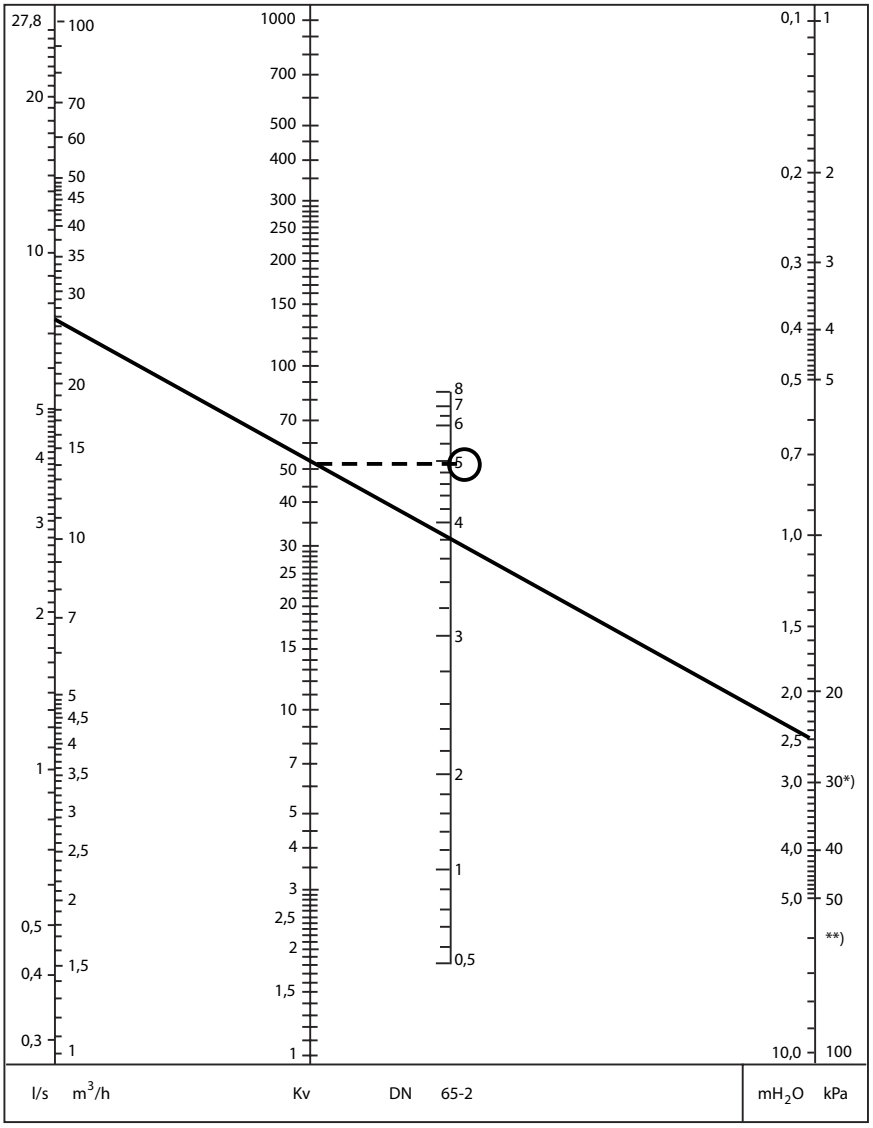
If the flow is outside the chart, it can be read as follows:

Assume the example above that reads 10 kPa, Kv=5 and a flow of 1.6 m^3/h. For 10 kPa and Kv=0.5 you read a flow of 0.16 m^3/h and for Kv=50 you read 16 m^3/h. Therefore, for every given pressure drop you can read 0.1 or 10 times the flow and Kv.

7.2 DN 65 (GOLD SD 100/120, GOLD CX 100/120)

This chart shows the pressure drop across the valve. A straight line that interconnects the scales for flow – Kv - pressure drop constitute 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 65 and required 27 m flow ³/h and pressure drop of 25 kPa.

Solution

Plot a line between 27 m³/h and 25 kPa. This intersects the Kv scale at KV=53. Then plot a horizontal line from Kv 53 to the DN 65 scale where you read 5 turns.

Important!

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

Assume the example above that reads 25 kPa, Kv=53 and a flow of 27 m³/h. For 25 kPa and Kv=5,3 you read a flow of 2,7 m³/h and for Kv=53 you read 270 m³/h. Therefore, for every given pressure drop you can read 0.1 or 10 times the flow and Kv.