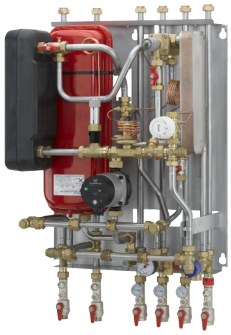
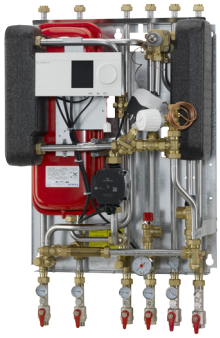


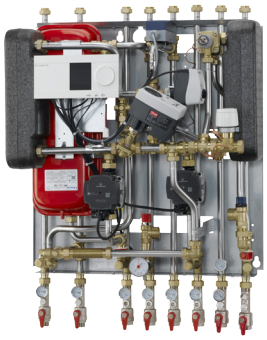
Akva Lux II VX thermostatic control

Akva Lux II VX thermostatic control, and optional junction box + zone valve

Akva Lux II VX (ECL 110)



Akva Lux II VX HWP (ECL210)

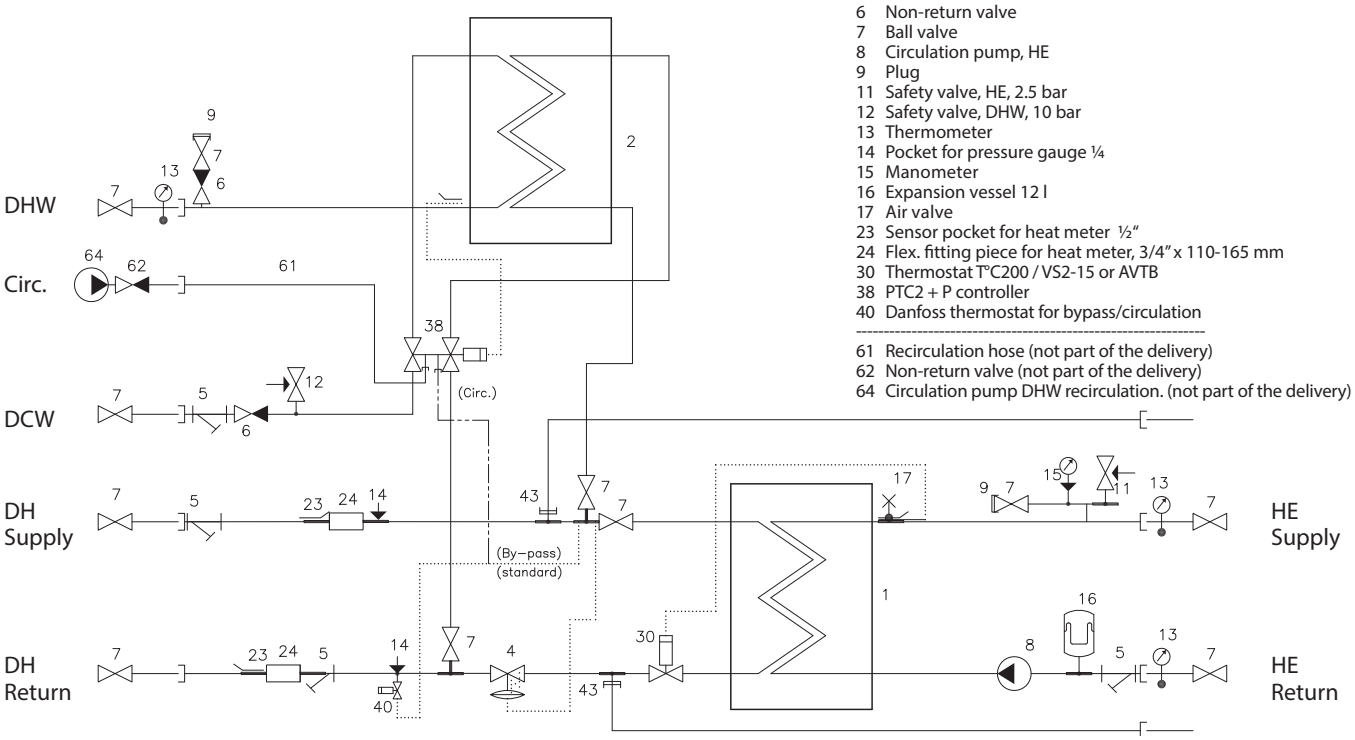


Akva Lux II VX H2WP (ECL 210)

1. Contents

2.0 Product introduction

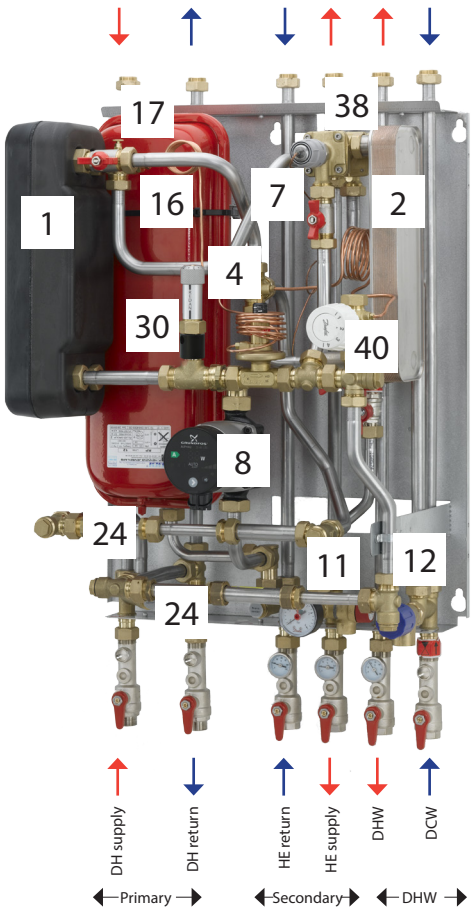
2.1 Akva Lux II VX (thermostatic control) - 1 HE circuit and instantaneous domestic hot water heater



1 Plate heat exchanger, HE, insulated
2 Plate heat exchanger, DHW
4 Differential pressure controller AVPL
5 Dirt strainer
6 Non-return valve
7 Ball valve
8 Circulation pump, HE
9 Plug
11 Safety valve, HE, 2.5 bar
12 Safety valve, DHW, 10 bar
13 Thermometer
14 Pocket for pressure gauge ¼
15 Manometer
16 Expansion vessel 12 l
17 Air valve
23 Sensor pocket for heat meter ½"
24 Flex. fitting piece for heat meter, 3/4" x 110-165 mm
30 Thermostat T°C200 / VS2-15 or AVTB
38 PTC2 + P controller
40 Danfoss thermostat for bypass/circulation

61 Recirculation hose (not part of the delivery)
62 Non-return valve (not part of the delivery)
64 Circulation pump DHW recirculation. (not part of the delivery)

Principal components
1 Plate heat exchanger HE
2 Plate heat exchanger DHW
4 Differential pressure controller
7 Ball valve (fill valve)
8 Circulation pump, HE
11 Safety valve, HE
12 Safety valve, DHW
16 Expansion vessel
17 Air valve
24 Fitting piece for heat meter
30 Thermostat T°C 200 / VS2
38 PTC2+P controller
40 Thermostat for bypass/circulation



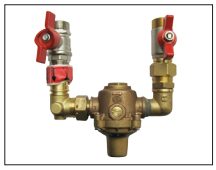
The substation offers variable connection possibilities, as connection of pipes can be established both in the top or in the bottom of the substation. Please note that the ball valves are supplied loose with the substation, - for mounting on site.

Accessories available as extra equipment (mounting on site)
Recirculation pipe set - Div.736 - Code No. 004U8404
For systems that feature domestic hot water recirculation.

Refill line - Div.770 - Code No. 004U8668
To secure a constant pressure on the secondary side.
(Applicable on some markets, if in accordance with all local regulations, - please check with your heating supplier).

Recirculation pipe set

Refill line

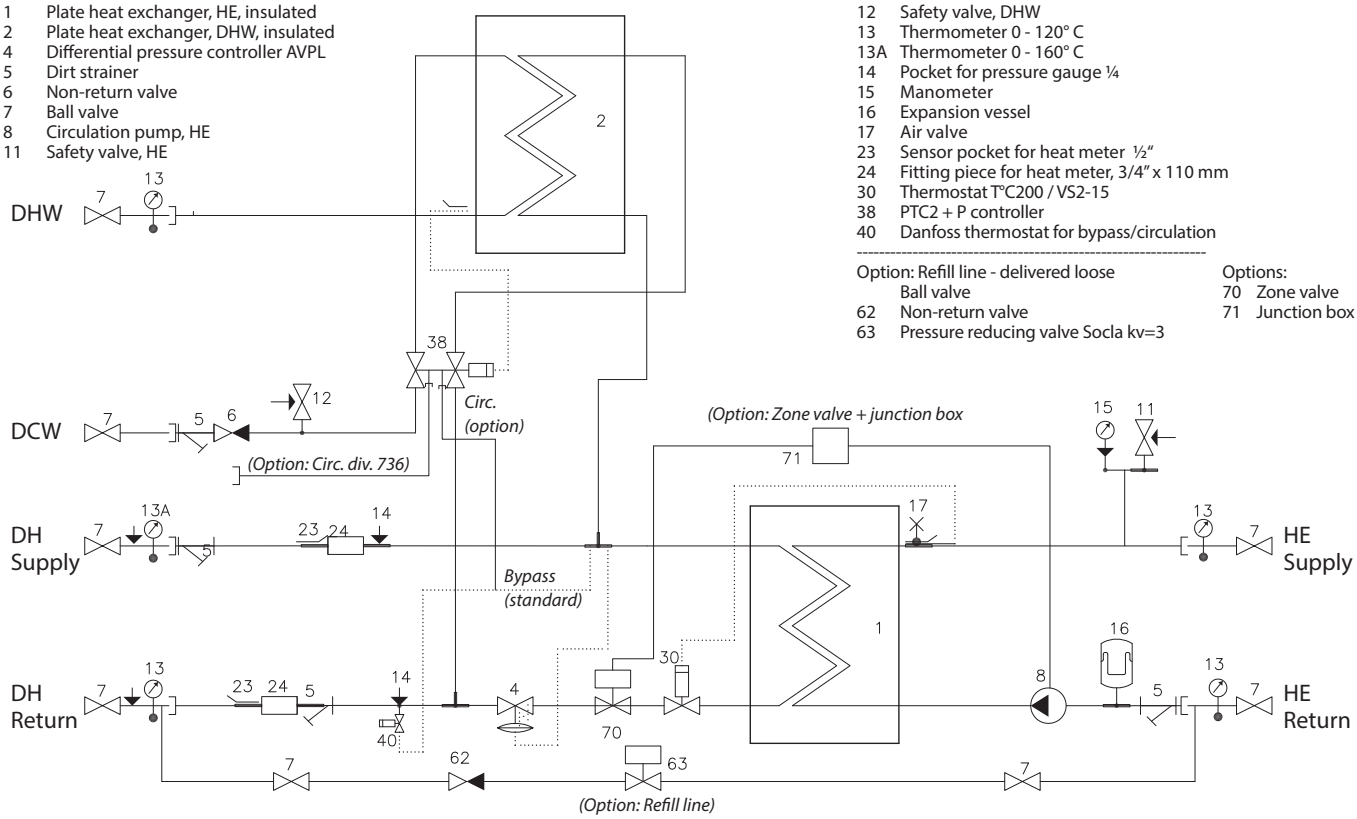


2.2 Akva Lux II VX (thermostatic control and optional junction box + zone valve) - 1 HE circuit and instantaneous DHW heater

1 Plate heat exchanger, HE, insulated
2 Plate heat exchanger, DHW, insulated
4 Differential pressure controller AVPL
5 Dirt strainer
6 Non-return valve
7 Ball valve
8 Circulation pump, HE
11 Safety valve, HE
12 Safety valve, DHW
13 Thermometer 0 - 120° C
13A Thermometer 0 - 160° C
14 Pocket for pressure gauge ¼
15 Manometer
16 Expansion vessel
17 Air valve
23 Sensor pocket for heat meter ½"
24 Fitting piece for heat meter, 3/4" x 110 mm
30 Thermostat T°C200 / VS2-15
38 PTC2 + P controller
40 Danfoss thermostat for bypass/circulation

Option: Refill line - delivered loose
Ball valve
62 Non-return valve
63 Pressure reducing valve Socla kv=3

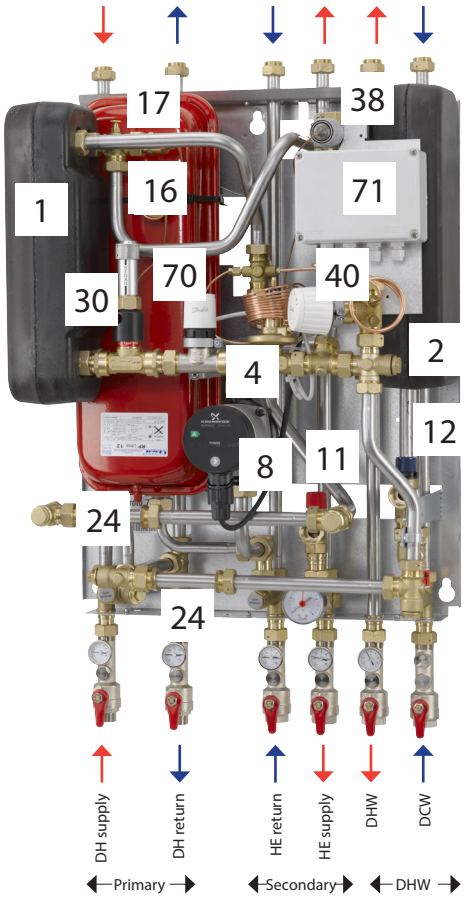
Options:
70 Zone valve
71 Junction box



Principal components

1 Plate heat exchanger HE
2 Plate heat exchanger DHW
4 Differential pressure controller
8 Circulation pump, HE
11 Safety valve HE
12 Safety valve DHW
16 Expansion vessel
17 Air valve
24 Fitting piece for heat meter
30 Thermostat T°C 200 / VS2
38 PTC2+P controller
40 Thermostat for bypass/circulation
70 Zone valve (Option)
71 Junction box (Option)

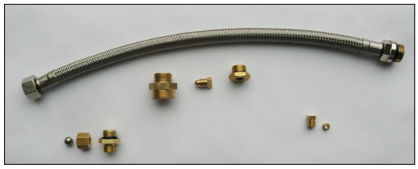
The substation offers variable connection possibilities, as connection of pipes can be established both in the top or in the bottom of the substation. Please note that the ball valves are supplied loose with the substation, - for mounting on site.



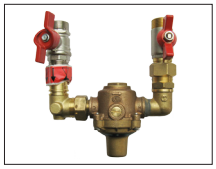
Accessories available as extra equipment (mounting on site)
Recirculation pipe set - Div.736 - Code No. 004U8404
For systems that feature domestic hot water recirculation.

Refill line - Div.770 - Code No. 004U8668
To secure a constant pressure on the secondary side.
(Applicable on some markets, if in accordance with all local regulations, - please check with your heating supplier).

Recirculation pipe set



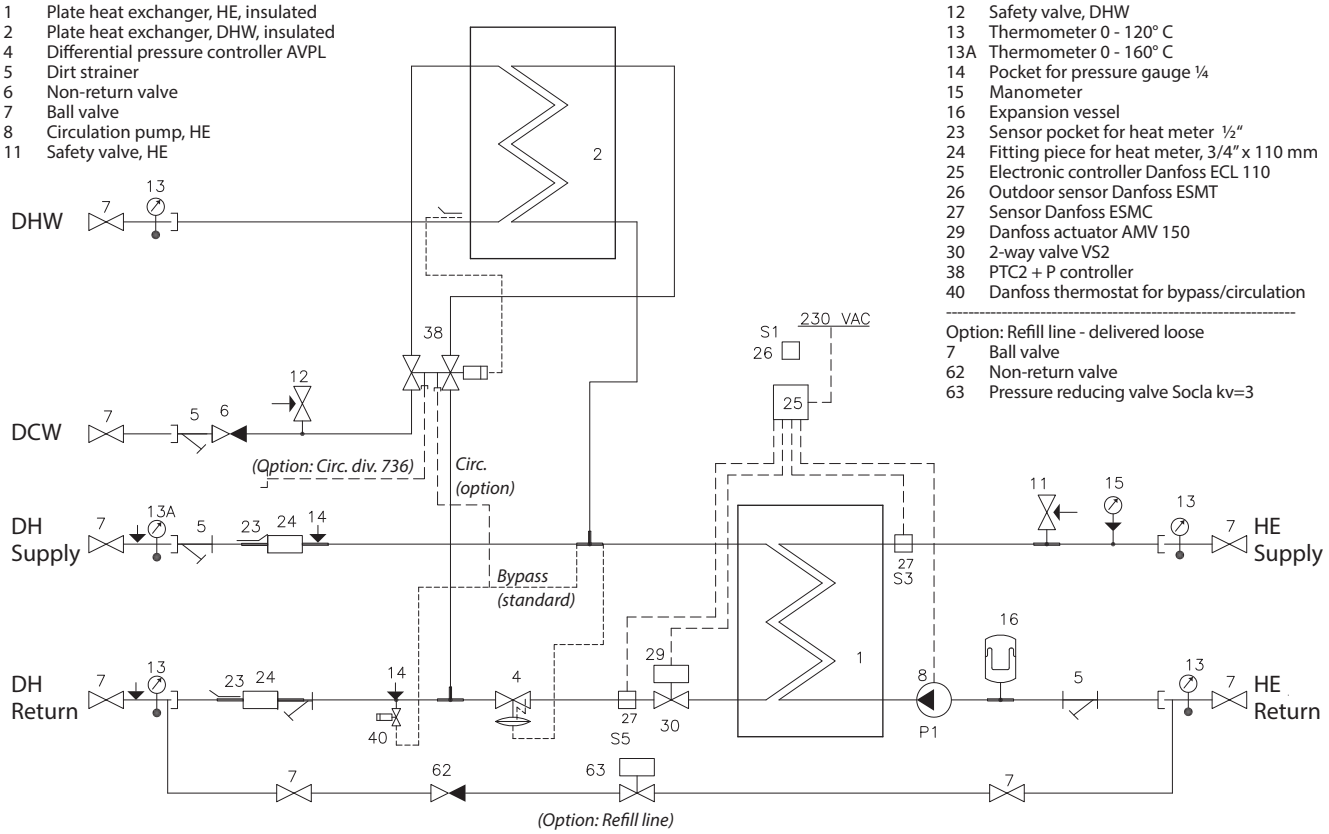
Refill line



2.3 Akva Lux II VX (ECL 110) - 1 HE circuit and instantaneous domestic hot water heater

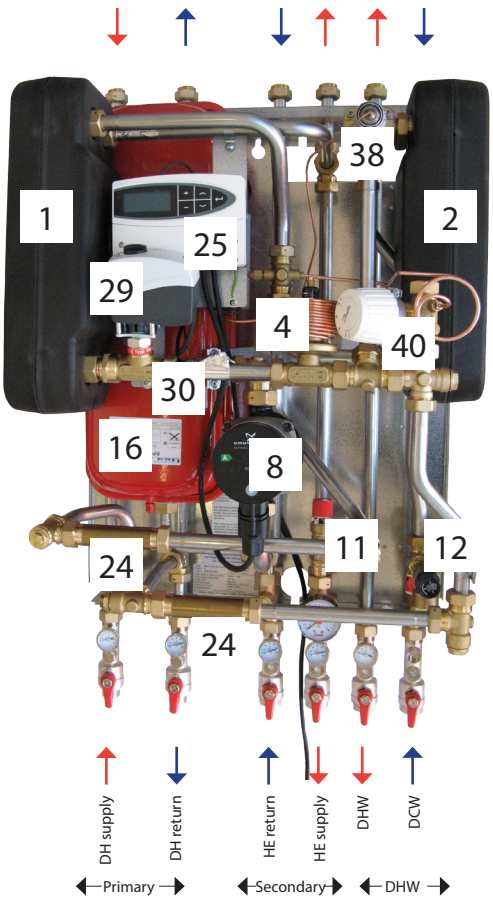
1 Plate heat exchanger, HE, insulated
2 Plate heat exchanger, DHW, insulated
4 Differential pressure controller AVPL
5 Dirt strainer
6 Non-return valve
7 Ball valve
8 Circulation pump, HE
11 Safety valve, HE
12 Safety valve, DHW
13 Thermometer 0 - 120° C
13A Thermometer 0 - 160° C
14 Pocket for pressure gauge ¼
15 Manometer
16 Expansion vessel
23 Sensor pocket for heat meter ½"
24 Fitting piece for heat meter, 3/4" x 110 mm
25 Electronic controller Danfoss ECL 110
26 Outdoor sensor Danfoss ESMT
27 Sensor Danfoss ESMC
29 Danfoss actuator AMV 150
30 2-way valve VS2
38 PTC2 + P controller
40 Danfoss thermostat for bypass/circulation

Option: Refill line - delivered loose
7 Ball valve
62 Non-return valve
63 Pressure reducing valve Socla kv=3



Principal components
1 Plate heat exchanger HE
2 Plate heat exchanger DHW
4 Differential pressure controller
8 Circulation pump, HE
11 Safety valve, HE
12 Safety valve, DHW
16 Expansion vessel
24 Fitting piece for heat meter
25 Electronic controller
29 Actuator AMV 150
30 2-way valve VS2
38 PTC2+P controller
40 Thermostat for bypass/circulation

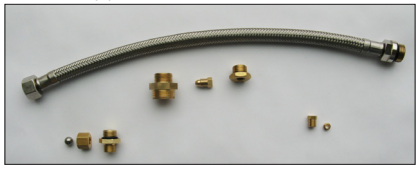
The substation offers variable connection possibilities, as connection of pipes can be established both in the top or in the bottom of the substation. Please note that the ball valves are supplied loose with the substation, - for mounting on site.



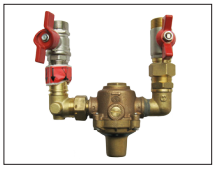
Accessories available as extra equipment (mounting on site)
Recirculation pipe set - Div.736 - Code No. 004U8404
For systems that feature domestic hot water recirculation.

Refill line - Div.770 - Code No. 004U8668
To secure a constant pressure on the secondary side.
(Applicable on some markets, if in accordance with all local regulations, - please check with your heating supplier).

Recirculation pipe set



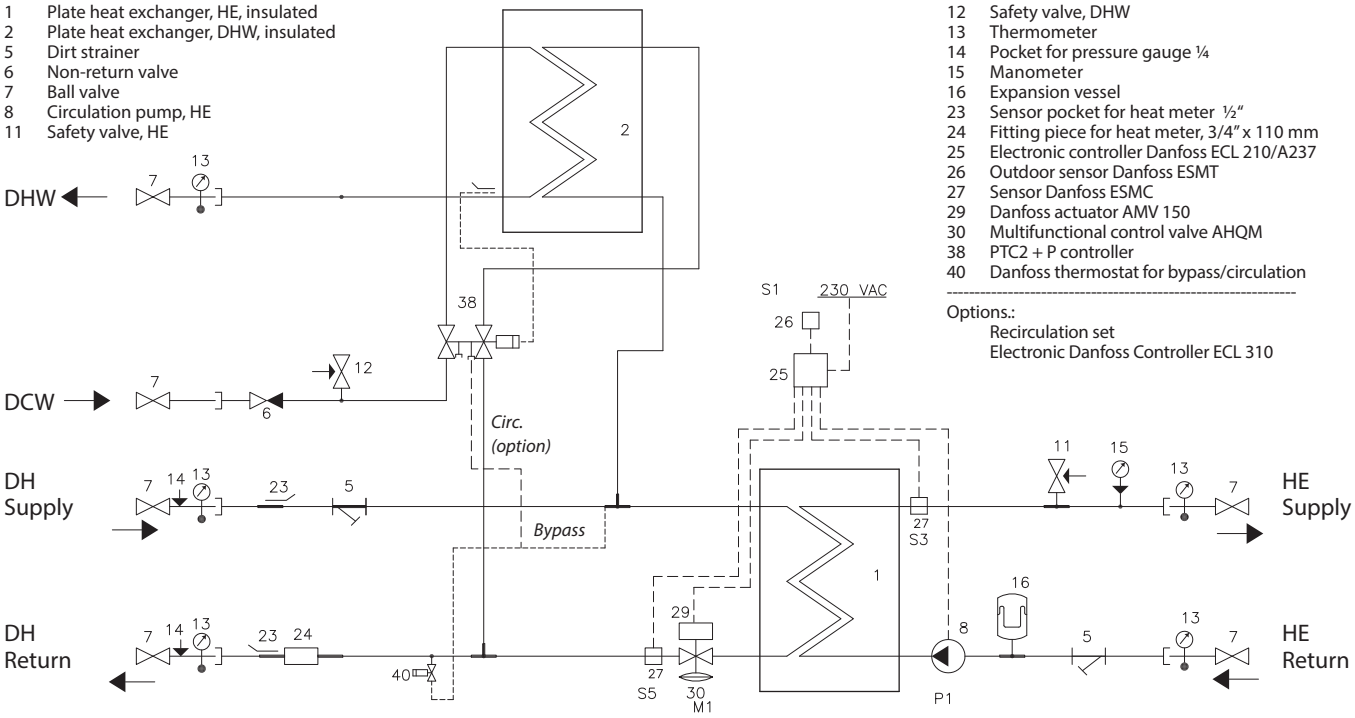
Refill line



2.3 Akva Lux II VX HWP (ECL 210/A237) - 1 HE circuit and instantaneous domestic hot water heater

1 Plate heat exchanger, HE, insulated
2 Plate heat exchanger, DHW, insulated
5 Dirt strainer
6 Non-return valve
7 Ball valve
8 Circulation pump, HE
11 Safety valve, HE
12 Safety valve, DHW
13 Thermometer
14 Pocket for pressure gauge ¼
15 Manometer
16 Expansion vessel
23 Sensor pocket for heat meter ½"
24 Fitting piece for heat meter, 3/4" x 110 mm
25 Electronic controller Danfoss ECL 210/A237
26 Outdoor sensor Danfoss ESMT
27 Sensor Danfoss ESMC
29 Danfoss actuator AMV 150
30 Multifunctional control valve AHQM
38 PTC2 + P controller
40 Danfoss thermostat for bypass/circulation

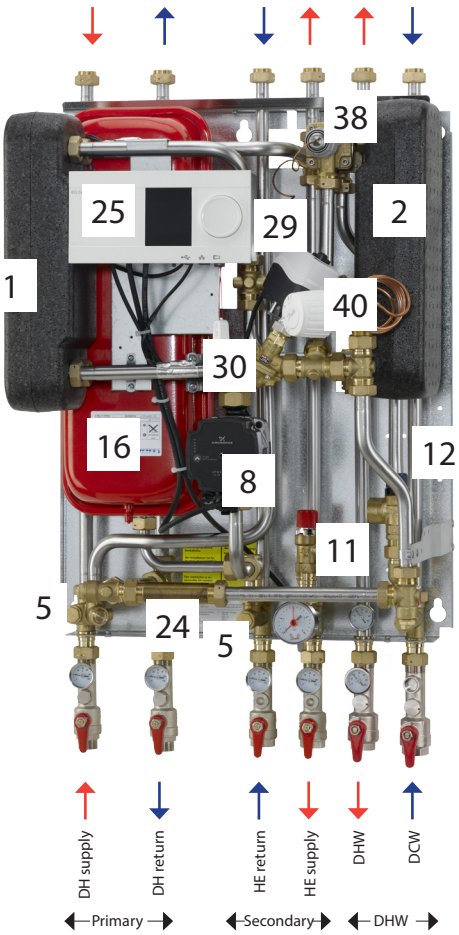
Options.:
Recirculation set
Electronic Danfoss Controller ECL 310



Principal components

1 Plate heat exchanger HE
2 Plate heat exchanger DHW
5 Strainer
8 Circulation pump, HE
11 Safety valve, HE
12 Safety valve, DHW
16 Expansion vessel
24 Fitting piece for heat meter
25 Electronic controller ECL 210/A237
29 Actuator AMV 150
30 Multifunctional control valve AHQM
38 PTC2+P controller
40 Thermostat for bypass/circulation

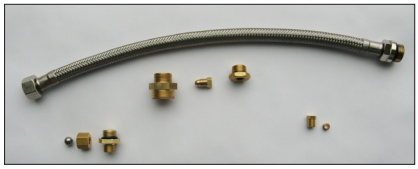
The substation offers variable connection possibilities, as connection of pipes can be established both in the top or in the bottom of the substation. Please note that the ball valves are supplied loose with the substation, - for mounting on site.



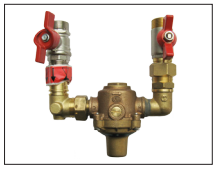
Accessories available as extra equipment (mounting on site)
Recirculation pipe set - Div.736 - Code No. 004U8404
For systems that feature domestic hot water recirculation.

Refill line - Div.770 - Code No. 004U8668
To secure a constant pressure on the secondary side.
(Applicable on some markets, if in accordance with all local regulations, - please check with your heating supplier).

Recirculation pipe set

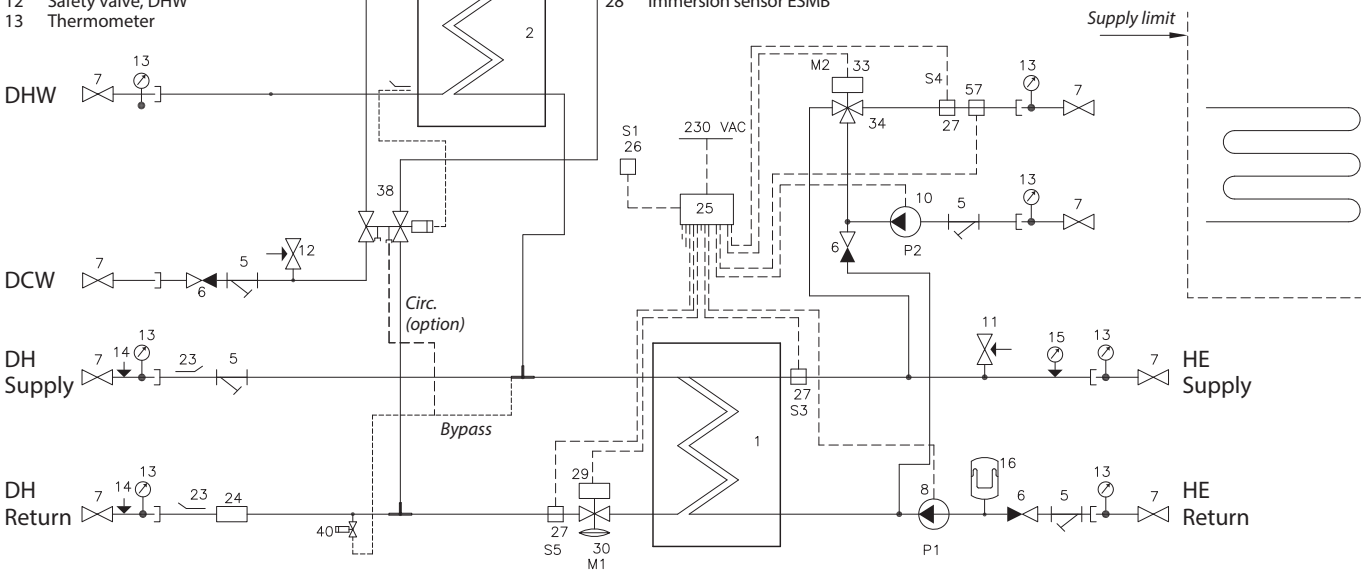


Refill line



2.4 Akva Lux II VX H2WP (ECL 210/A260) - 2 HE circuits and instantaneous domestic hot water heater

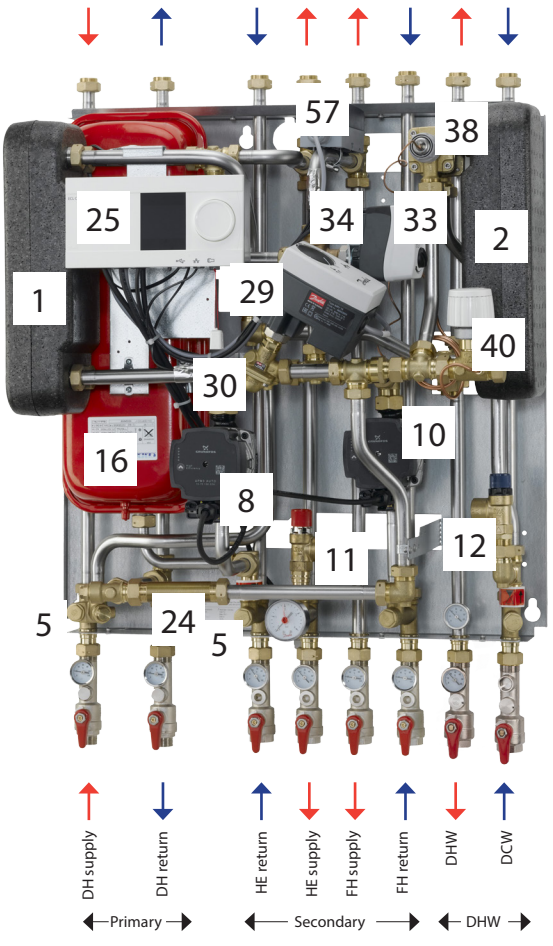
1 Plate heat exchanger, HE, insulated
2 Plate heat exchanger, DHW, insulated
5 Dirt strainer
6 Non-return valve
7 Ball valve
8 Circulation pump, HE
10 Circulation pump, FH
11 Safety valve, HE
12 Safety valve, DHW
13 Thermometer
14 Pocket for pressure gauge ¼
15 Manometer
16 Expansion vessel
23 Sensor pocket for heat meter ½"
24 Fitting piece for heat meter, 3/4" x 110 mm
25 Electronic controller Danfoss ECL 210/A260
26 Outdoor sensor Danfoss ESMT
27 Sensor Danfoss ESMC
28 Immersion sensor ESMB
29 Danfoss actuator AMV
30 Multifunctional control valve AHQM
33 Danfoss actuator AMV
34 Three-way valve VMV
38 PTC2 + P controller
40 Danfoss thermostat for bypass/circulation
29 Danfoss actuator AMV, HE
57 Safety thermostat



Principal components

1 Plate heat exchanger HE
2 Plate heat exchanger DHW
5 Dirt strainer
8 Circulation pump, HE
10 Circulation pump, FH
11 Safety valve, HE
12 Safety valve, DHW
16 Expansion vessel
24 Fitting piece for heat meter
25 Electronic controller
29 Actuator AMV 13
30 Multifunctional control valve AHQM
33 Actuator AMV 150
34 3-way valve VMV
38 PTC2+P controller
40 Thermostat for bypass/circulation
57 Safety thermostat

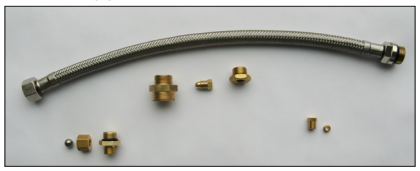
The substation offers variable connection possibilities, as connection of pipes can be established both in the top or in the bottom of the substation. Please note that the ball valves are supplied loose with the substation, - for mounting on site.



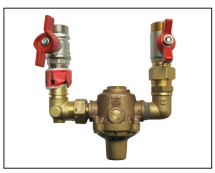
Accessories available as extra equipment (mounting on site)
Recirculation pipe set - Div.736 - Code No. 004U8404
For systems that feature domestic hot water recirculation.

Refill line - Div.770 - Code No. 004U8668
To secure a constant pressure on the secondary side.
(Applicable on some markets, if in accordance with all local regulations, - please check with your heating supplier).

Recirculation pipe set



Refill line



3.0 Dimensional sketches / connections

Dimensions mm:
Without cover:
H 860 x W min. 510 / max. 553* x D 365

With cover:
H 861 x W 550 x D 365
H 861 x W 600 ** x D 381

* Units with insulated plate heat exchanger type XB06H-1 40 for both HE and DHW circuits.

** Width of cover for units with insulated plate heat exchanger type XB06H-1 40 for both HE and DHW circuits.

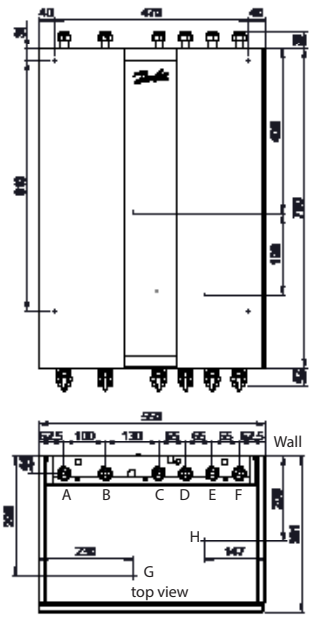
Connections sizes:

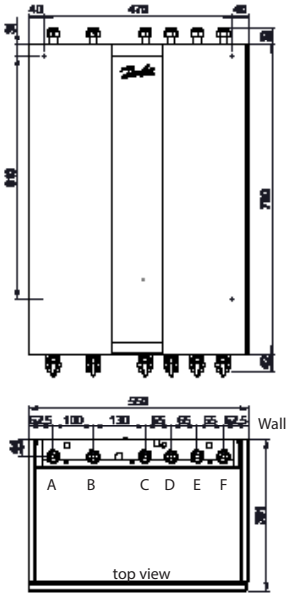
Akva Lux II VX (thermostatic control)
DH + DCW + DHW + HE: G ¾" (int. thread)
Connections, Circ.: R ½" (int. thread)

** Substations with XB 06L-24 heat exchanger for floor heating are supplied with connection pipes for radiators for direct connection.*

Akva Lux II VX (thermostatic control and optional junction box + zone valve) +
Akva Lux II VX (electronic control)
DH: G¾" (ET)
DCW, DHW, HE: G¾" (IT)
Circ. R½" (ET)

Akva Lux II VX - 1 HE circuit + domestic hot water





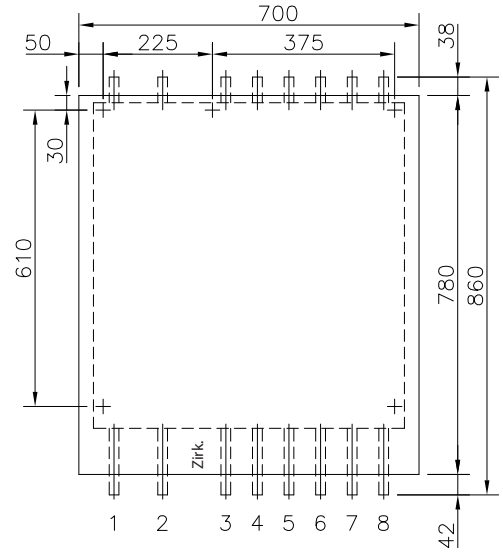
Connections:
Order:
A. District heating (DH) supply
B. District heating (DH) return
C. Heating (HE) return
D. Heating (HE) supply
E. Domestic hot water (DHW
F. Domestic cold water (DCW)
G. Connection return *
H. Connection supply *

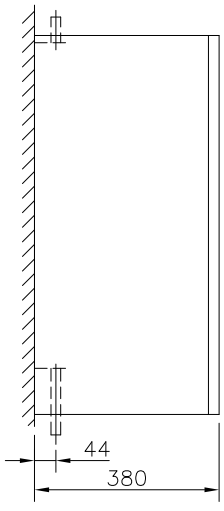
Connections:
Order:
A District heating (DH) supply
B District heating (DH) return
C Heating (HE) return
D Heating (HE) supply
E DHW
F DCW

Akva Lux II VX - 2 HE circuits + domestic hot water

Dimensions mm:
Without cover:
H 861 x W 650 x D 365

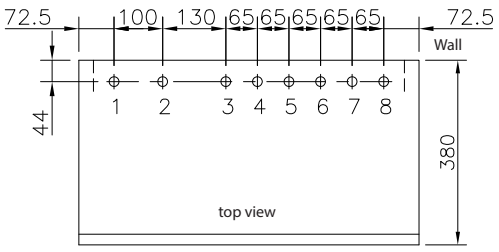
With cover:
H 861 x W 700 x D 380





Connections:
Order:
1 District heating (DH) supply
2 District heating (DH) return
3 Heating (HE) return
4 Heating (HE) supply
5 Floor heating (FH) supply
6 Floor heating (FH) return
7 DHW
8 DCW

Connections size:
DH: G¾" (ET)
DCW, DHW, HE, FH: G¾" (IT)
Circ. R½" (ET)



4.0 Enduser instructions, General

Instructions
Please read these instructions carefully before installing and commissioning this substation. The manufacturer accepts no liability for loss or damage resulting from failure to comply with these instructions for use. Read and follow these instructions carefully to prevent the risk of physical injury and/or damage to property. Exceeding the recommended operating parameters appreciably increases the risk of personal injury and/or damage to property.

Installation, commissioning and maintenance must be carried out by qualified and authorised personnel (both plumbing and electrical work).
Once the station has been installed and is operating, there is *normally* no need to alter the settings or other functions. The district heating substation is very reliable and easy to operate.

If necessary, you can change the temperature settings as described on page 10. For more detailed information about the substation, see the sections concerning installation and commissioning.

Description
These instructions apply to substation types Akva Lux II VX, which are district heating substations for indirect heating for single-family houses, semi-detatched and terraced houses as well as flats. With one or two heating circuits for radiator and/or floor heating and with instantaneous water heater for domestic hot water heating. For wall-mounting and with variable connection possibilities.

The HE supply temperature is controlled either by a self-acting thermostat T°C 200 or AVTB or by a Danfoss ECL controller in combination with an electronic actuator. The ECL controller acts as the brain of the heating system. It lets you easily control and optimize system performance and operation.

We recommend regular inspections of the substation - ideally in connection with readings of the district heating meter.
Pay special attention to any leaks and an excessively high return temperature in the district heating circuit (poor cooling of the district heating water). Cooling – i.e. the difference between the supply and return temperature of the district heating water – has a significant effect on the overall energy economy. Therefore, it is important to focus on the supply and return temperature in the heating system.
The difference should typically be 30–35°C in systems that operate with radiators. In systems that feature floor heating, the difference is typically 5–10°C. In floor heating systems, the supply temperature should not exceed 35°C.

Cooling from the water heater alone:
During tapping, the level of cooling will typically be 30–35°C. When domestic hot water is not being tapped, it is completely normal for the return temperature from the water heater to rise slightly. In this situation, the district heating meter will register very modest consumption as the volume of water is very small.
On substations with recirculation, the calorie meter registers the heat loss in the recirculation pipe.

Irregularities
When reading the meters, check all joints and connections for leaks.
If you identify any irregularities/leaks, contact your professional provider for assistance.
Check the troubleshooting section before contacting your professional provider.

Warning! Hot surfaces
Parts of the substation may be very hot and can cause burn injuries. Be very careful when you are in the immediate vicinity of the unit.

Warnings about high pressure and high temperature
The maximum supply temperature in the district heating network can be up to 120°C (130° C*) and the operating pressure can be up to 16 bar. This may result in a risk of scalding from touching the substation and from outflow of the medium (water/steam). Exceeding the substation design data and operating parameters for pressure and temperature carries an appreciable risk of personal injury and/or damage to property.

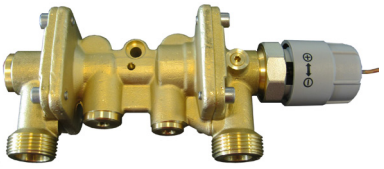
Emergencies
In the event of fire, leaks or other hazards, immediately shut off all sources of energy to the substation, if possible, and call for appropriate assistance.
If the domestic hot water is discoloured or malodorous, shut off all ball valves on the substation notify all users and call for professional assistance without delay.

*the substations can work temporarily at 130° C

5.0 Enduser instructions, Initial adjustment and Setting

Domestic hot water control
Danfoss PTC2+P controller (Fig. 1) for domestic hot water. Set the DHW temperature by moving the adjuster lever towards "+" (hotter) or "-" (colder).
Start by turning the lever **clockwise** – until it stops/until you cannot turn it any further. Then turn the lever **counter-clockwise** until the temperature of the tap water is approx. 48°C during normal tapping flow (7–8 litres per min.). The temperature must never exceed 55°C to prevent limescale deposits building up in the water heater.

Fig. 1



Option: Alternatively the VX substations may be fitted with a Danfoss PM2+P controller (Fig. 2) for domestic hot water. Set the DHW temperature by turning the adjuster lever towards red (hotter) or blue (colder). Start by turning the lever **clockwise** – until the pin is opposite the blue dot. Then turn the lever **counter-clockwise** until the temperature of the tap water is approx. 48°C during normal tapping flow (7–8 litres per min.). The temperature must never exceed 55°C to prevent limescale deposits building up in the water heater.

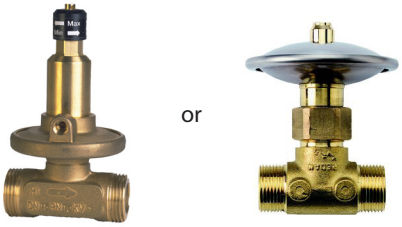
Fig. 2

Bypass or circulation thermostat
Thermostat (Fig. 3) that keeps the branch pipe warm in the summer or regulates the circulation temperature if domestic hot water recirculation has been established in the hot water system (see pages 20-21 and page 37 for more information).
The thermostat should initially be set to position 3.

Fig. 3

Heating circuit, Differential Pressure Controller
The differential pressure controller (Fig. 1) reduces the high, fluctuating pressure in the district heating network to a constant operating pressure.
The **AVPL** differential pressure controller is initially set by the plumber in connection with the commissioning of the substation. If disruptions to the operation occur: noise in the radiator thermostats or poor regulation capacity, it may be necessary to reset the differential pressure controller to a lower or higher operating pressure. We suggest that you contact your local plumber for assistance.
The **TD200** differential pressure controller is preset from factory and should not be adjusted afterwards.

Fig. 4



Heating circuit, Temperature control
Thermostatic control
The supply temperature to the substation can be set by adjusting the thermostat TC (Fig. 5), which controls the temperature for the heating circuit. The thermostat will be set by the installer in connection with the commissioning, but it may be necessary to adjust it subsequently depending on the outdoor temperature.

Fig. 5A

Approximate thermostat scale settings:

Pos. 2 = 30°C
3 = 40°C for range 25-70° C
4 = 50°C
5 = 60°C

or

Pos. 2 = 45°C
3 = 55°C for range 35-85° C
4 = 65°C
5 = 75°C

Please note that a label on the TC thermostat will indicate the temperature range (fig. 6).

Fig. 6

The setting values may vary depending on the operating conditions. It is important to set the supply temperature to the radiators as low as possible. Use the radiator thermostats to regulate the room temperature.

NB! For houses that are heated exclusively with floor heating.
The supply temperature should typically be set to approx. 30–35°C.
ALWAYS refer to the instructions from the floor supplier.

Alternatively the HE temperature is controlled by a self-acting temperature controller Danfoss AVTB (Fig. 5B). The controller has a control valve, thermostatic actuator and handle for temperature setting. The thermostat will be set by the installer in connection with the commissioning, but it may be necessary to adjust it subsequently depending on the outdoor temperature.
Approximate thermostat scale settings:
1.0 = 35 °C
1.5 = 45 °C
2.0 = 55 °C
2.5 = 65 °C
3.0 = 75 °C

Other variations with other types of thermostatic valves for control of the heating circuit may occur.

Fig. 5B

AVTB

Electronic control
The temperature for the heating circuit can be controlled electronically by a Danfoss ECL 110, a Danfoss ECL 210 or a Danfoss ECL 310 controller (Fig. 6). The supply temperature ist calculated by the controller on basis of the outdoor temperature.
See the enclosed documentation for same.

Fig. 6

or

ECL 110 ECL 210 / ECL 310

Pump.
Akva Lux II VX substations are factory fitted with a pump (Fig. 7). The pump setting is established in connection with the commissioning. Generally speaking, this setting is not to be altered. If it should nevertheless be necessary to change the pump setting, see the section concerning pumps in the installation and commissioning sections regarding the individual products.
In the summer, you can switch off the power to the pump at the mains if you want to save electricity by not heating your home.
Start-up and venting – see the installation and commissioning sections, if necessary.

Fig. 7

UPM3 AUTO L UPM3 AUTO

6.0 Installation instructions, Safety and Handling

Instructions
Please read these instructions carefully before installing and comissioning this substation. The manufacturer accepts no liability for loss or damage resulting from failure to comply with these instructions for use. Read and follow these instructions carefully to prevent the risk of physical injury and/or damage to peroperty. Exceeding the recommended operating parameters considerably increases the risk of personal injury and/or damage to property.
Installation, commissioning and maintenance must be carried out by qualified and authorized personnel in compliance with the local safety regulations.

Once the station has been installed and is operating, there is *normally* no need to alter the settings or other functions. The district heating substation is very reliable and easy to operate.

Energy source
The substation is primarily designed for connection to district heating. Alternative energy sources can be used if the operating conditions are equivalent to district heating at all times.

Application
The substation is designed only to operate with water or a water-glycol mixture (up to 40%), and other heating media may not be used.
The substation is to be connected to the household piping in a frost-free room, where the temperature does not exceed 50 °C and the relative humidity is not higher than 80%. The substation must no be covered, bricked in or otherwise cut off from access.

Choice of materials
Only use materials, that comply with local regulations.

Corrosion
The maximum chloride compounds of the medium must not be higher than 300 mg/l. The risk of corrosion increases considerably if the recommended chloride content is exceeded.

Safety valve(s)
Installation of safety valve(s) must always be in compliance with local regulations.

Noise level.
≤ 55 dB.

PTC2+P controller for domestic hot water
The controller is preset from factory and sealed with a red sticker. This sealing must not been broken.
The warranty becomes void if the sealing is broken.

Storage
Before installation, the units must be stored in a dry, heated (i.e. frost-free) room.
(Relative humidity max. 80% and storage temperature 5-70 °C).
The units must not be stacked higher than the limit at the factory (max. 8 layers) Units supplied in cardboard packaging must be lifted using the handles incorporated in the packaging. Units must be placed on pallets for transport/moving across large distances.
As far as possible, do not lift the substation by the pipes. Lifting by the pipes may cause leaks. REMEMBER to retighten.

Disposal
Dispose of the packaging in accordance with the local regulations for disposal of used packaging materials.
The substation is made of materials that cannot be disposed of together with household waste.
Close all energy sources and disconnect all connection pipes. Disconnect and dismantle the product for disposal in accordance with the applicable local regulations for the disposal of the individual components.

Connection
It must be possible to cut off all energy sources to the unit - including electrical connections - at all times.

Potential equalization/grounding
Potential equalization is an electrical equalizer connection to secure against user contact with dangerous voltage, which may occur for example between two piping systems. Potential equalization reduces corrosion in heat exchangers, water heaters, district heating units and plumbing installations. Equalization of potentials should be effected according to local regulations.

Warning! Hot surfaces
Parts of the substation may be very hot and can cause burn injuries. Be very careful when you are in the immediate vicinity of the substation.

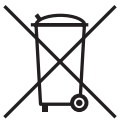
Warning of high pressure and high temperature
The maximum supply temperature in the district heating network can be up to 120°C (130°C*) and the operating pressure can be up to 16 bar. This may result in a risk of scalding from touching the substation and from outflow of the medium (water/steam). Exceeding the substation design data and operating parameters for pressure and temperature carries an appreciable risk of personal injury and/or damage to property.
* the substation can work temporarily at130°C.

Emergencies
In the event of fire, leaks or other hazards, immediately shut off all sources of energy to the substation, if possible and call for appropriate assistance.
If the domestic hot water is discoloured or malodorous, shut off all ball valves on the substation, notify all users and call for professional assistance immediately.

Warning of damage during transport
On reception of the substation, and before installing it, check for any evidence of damage during transport.
The substation must be handled and moved with the greatest care and attention.

NB! - Tightening of connections
Before mounting of the substation, ALL pipe connections MUST be retightened, as vibrations during transport may have caused leaks. Once the substation has been put into operation ALL pipe connections MUST be pressure tested for leaks and retightened once more if necessary.
DO NOT OVERTIGHTEN THE PIPE CONNECTIONS – see page 14, “Test & connections”.

Handling
We recommend that you wear suitable safety footwear while handling and installing the substation.



7.0 Installation instructions - Getting started

Connect the substation to the household piping in accordance with the labelling at the bottom and/or in accordance with the instructions in this manual.

If the system features DHW recirculation, a recirculation connection must be established on the substation. **The circulation set is optional equipment, which must be ordered separately and mounted on site.**

We recommend establishing recirculation BEFORE mounting the substation on the wall.

For instructions about recirculation connection, see page 20-21.

Commissioning

Please note that from factory the substation is prepared for connection in bottom of the substation.

1. The ball valves, which are supplied loose with the substation, can be mounted either on the top connections or bottom connections. For connection in top, demount the plugs from the top connections and mount them on the bottom connections.
   (Please see instruction on page 14 for further information)

2. **For connection in TOP for DCW and DHW please note that this includes relocation of the built-in blind plates BEFORE mounting the substation on the wall. (Please see instruction on page 15 for further information).**

3. If the household piping system features domestic hot water recirculation, the substation must be connected to the recirculation system. See pages 20-21 for further information about DHW recirculation.

4. The substation is prepared for wall mounting. Mount the substation on a solid wall using two sturdy bolts, screws, expansion bolts or similar.

5. Close all shut-off valves in the substation before connecting it/them to the household piping.

6. Mount the district heating meter (see page 16).

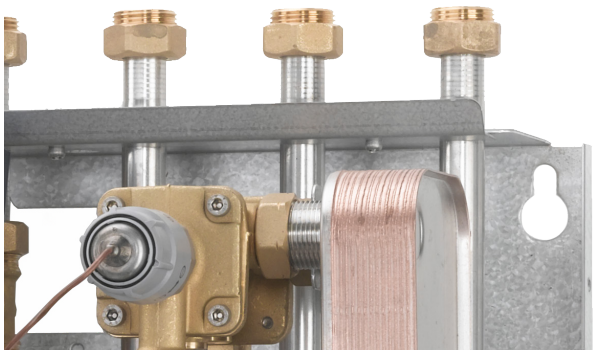
7. IMPORTANT! Tighten all pipe connections, as they may have loosened during transport and handling.

8. On systems that feature a safety valve, establish a drain connection in compliance with the applicable legislation.

9. Fill the heat exchanger / the system with water according to the instructions on pages 18 and 19 until the manometer shows a working pressure, which corresponds to the system height + approx. 5 m (approx. 1.2 - 1.5 bar).

10. Finally open the ball valve for the DH supply and return flow and heat up the system.

11. Check the substation and the household piping thoroughly for leaks.



12. Pressure test the entire system for leaks in accordance with the applicable regulations.

13. Connect pump and automatic components, if any, to the electricity supply, **but do not** switch on the power**.**

14. Heat the system and vent the radiator circuit/heating side thoroughly on the radiators and the air valve, if any.

15. For substations, which include zone valve, remember to remove the red split on the position indicator of the zone valve.

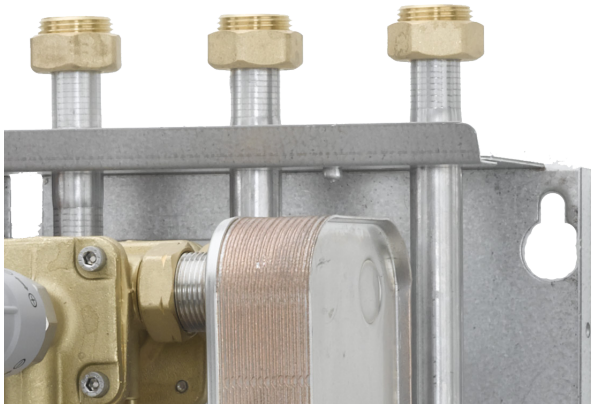
16. Now switch on the pump and automatic components, if any.

17. Finish by adjusting the substation in accordance with the instruction manuals.

Heating and cooling the substation may cause leaks. Therefore it may be necessary to retighten the connections in the period after commissioning.

8.0 Installation instructions, general

The installation, connection and maintenance of the substation must be performed by qualified and authorised personnel.
Installation must always be performed in accordance with the applicable legislation and in compliance with these instructions.
The substation must be installed so that it is freely accessible and can be maintained without unnecessary disruption. Lift the substation by its mounting plate and secure it to a solid wall using 2 sturdy bolts, screws or expansion bolts positioned in the two keyholes in the mounting plate.
Before commissioning, rinse all the pipes in the household piping system thoroughly to remove any impurities, and check and clean the dirt strainers in the substation.
Connect the substation to the household piping in accordance with the labelling at the bottom and/or in accordance with the instructions in this manual.



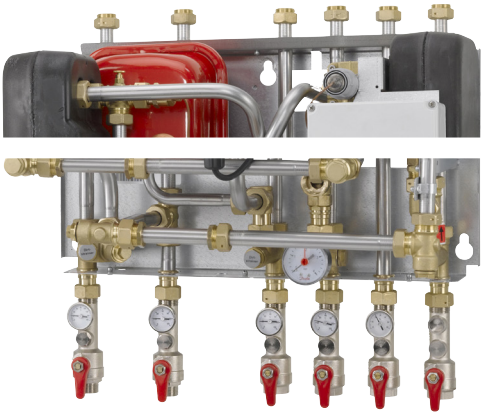
Test and connections
Before filling the system with water, retighten all the pipe connections because vibrations and shocks during transport and handling may have caused leaks. Once the system has been filled with water, tighten all the pipe connections once more before performing pressure test for leaks. After heating of the system, check all the connections and retighten if necessary.
Please note that the connections feature EPDM rubber gaskets!
Therefore, it is important that you DO NOT OVERTIGHTEN the union nuts. Over-tightening may result in leaks. Leaks caused by over-tightening or failure to retighten connections are not covered by the warranty.

Variable connections possibilities

The Akva Lux II VX substations offer variable connection possibilities, as connections of pipes can be established in the top or in the bottom of the substation. - Upon delivery the substation is prepared for connction in bottom of the substation. **Please note that the ball valves are supplied loose and must be mounted on site.**

For change of connection from bottom to top, demount plugs on connection pipes in top of substation and ball valves on connection pipes in bottom of substation, and mount plugs in connection pipes in bottom of substation and ball valves on connection pipes in top of substation.

These variable connection possibilities makes it possible to establish some of the connections in the top and others in the bottom of the substation. This may be desirable in some cases.



PLEASE NOTE!
Remember to use gaskets when establishing connection in top of unit.

DCW
If there is a need for a domestic cold water outlet in top of the unit, **remove** the blind plate in pos. A and demount the plug in top of the unit.

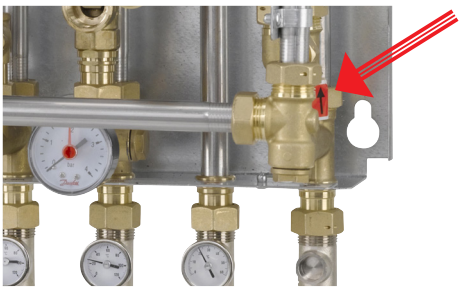
For DCW inlet in top of the unit**,** remove the plug in top of the unit and the blind place in pos. A. Mount the ball valve in top and use the plug for plugging in the bottom (remember gaskets).

DHW
For DHW outlet in top of the unit, remove the blind plate and gasket from Pos. B and relocate to Pos. C - see photos to the right.
The blind plate should be installed in Pos. C to prevent a pocket of standing water that at worst can produce dangerous bacteria. Therefore, it is extremely important to install the blind plate as shown.
Also move the plug from the top connection to the DHW outlet in the bottom of the unit and mount the ball valve in top (remember gaskets).

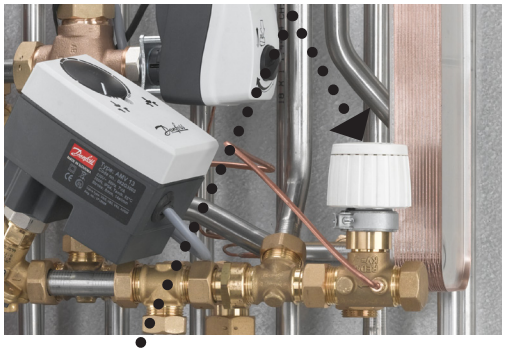
DHW both up and down
The unit can be connected with piping both up and down for the domestic hot water. Remove blind plate in pos. B and plug in top of unit.

Heating (HE)
The unit can be connected with piping both up and down on the heating side. Remove the plugs in top of unit, and establish connection upwards.

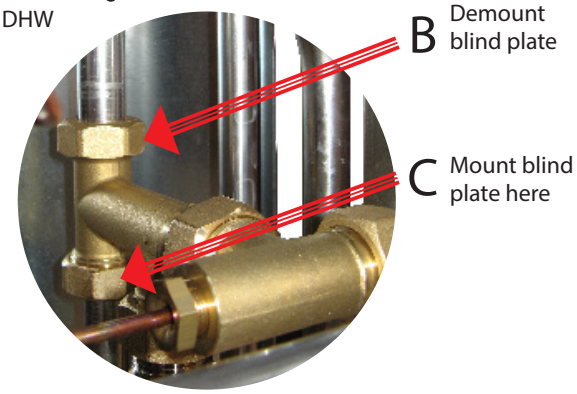
DCW



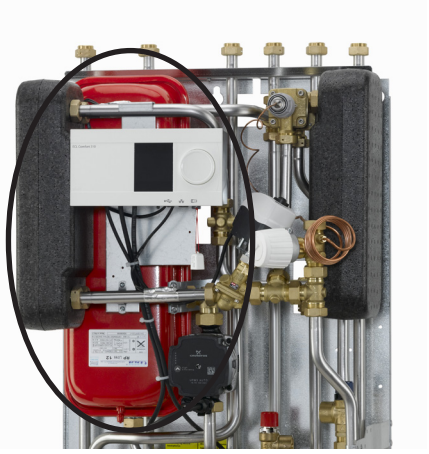
DHW



DHW



Expansion vessel
The Akva Lux II VX substations are equipped with an expansion vessel, which is factory set to 0,5 bar.



Fitting piece(s) for heat meter(s).

The Akva Lux II VX substations are equipped with fitting piece(s) for heat meter in both DH supply and return (leak detection) or only in DH return.

The fitting piece(s) can be either flexible size 3/4 x 110 - 165 mm or fixed size 3/4" x 110 mm.

Variations with other dimensions may occur.

Fitting of heat meter in substation with flexible fitting piece size 3/4 x 110 - 165 mm

Fitting of heat meter in DH return - (Fig. 1)
The heat meter can easily be fitted on site as follows:
- Close the ball valves on the district heating and the heating lines.
- Loosen the union nuts at both ends of the nipple pipe 24^1. remove nipple pipe 24^1 and insert heat meter and tighten - do not forget gaskets.
- For heat meters with an overall length of more than110 mm the flexible fitting pipe 24^2 must be loosened and displaced, so that it corresponds to the size of the heat meter.
- Tighten union nut/locknut.
- After mounting of heat meter remember to check and tighten all pipe connections before commissioning the heat meter.

For fitting of heat meter in DH supply (Fig. 2) please follow the above instructions.

For fitting of heat meter in both DH supply and return, please follow the above instructions.

Fitting of heat meter(s) in substation with fixed fitting piece size 3/4 x 110 mm

Fitting of heat meter(s) - (Fig. 3)
The heat meter can easily be fitted on site as follows:
- Close the ball valves on the district heating and the heating lines.
- Loosen the union nuts at both ends of the fitting piece13b and remove it.
- Fit the heat meter, - remember to insert gaskets.
- After mounting of heat meter remember to check and tighten all pipe connections before commissioning the heat meter.

Mounting of temperature sensor
As standard the heat meter is supplied with temperature sensors for measuring the supply and return flow temperatures.

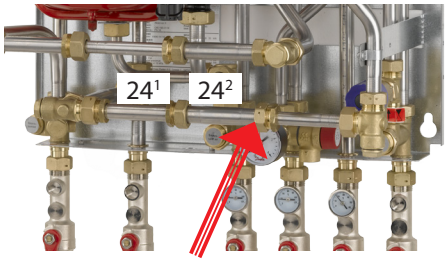
The Akva Lux II VX substations are prepared for mounting of temperature sensors with M10x1 connection (see photo to the right).

The supply flow sensor is mounted in the sensor pocket on DH supply (pos. A)
- demount M10 plug (pos. A)
- insert one temperature sensor in the sensor pocket
- tighten temperature sensor union nut

Mount the return flow sensor in the heat meter housing (pos. C) or in the sensor pocket on DH return (pos. B).

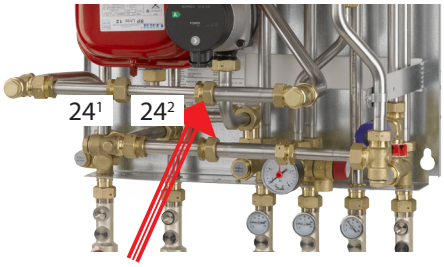
Please note:
Some variant are supplied with ½" plug.

Fig. 1



Loosen union nut/locknut and the flexible pipe 24^2 is adjustable from 110 to 165 mm.

Fig. 2



Loosen union nut/locknut and the flexible pipe 24^2 is adjustable from 110 to 165 mm.

Fig. 3

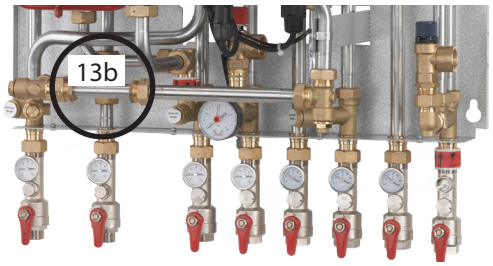
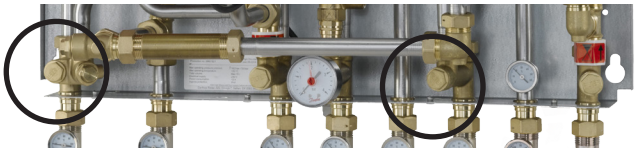


Fig. 4

Pipe bushing ½"/M10x1 incl. plug M10



Electrical connection
The station is wired and tested in the factory.
Electrical connections between the controller, pump(s), sensor and actuator(s) are made.

The electrical connection of the substation must be performed by a qualified and authorised electrician in compliance with all applicable rules and regulations.

The station should be connected to a 230 V AC power supply.

The power supply / connection must be carried out in accordance with the applicable regulations and instructions.

The station must be wired and connected to an external main switch so that it can be disconnected during maintenance, cleaning and repairs or in the event of an emergency.

Controller ECL 110/210/310

Supply voltage:	230 V a.c. - 50 Hz
Voltage range:	207 to 244 V a.c. (IEC 60038)
Power consumption:	5 VA
Load on relay outputs:	4(2) A - 230 V a.c
Load on triac outputs:	0,2 A - 230 V a.c.

Actuator AMV13 / AMV 150

Supply voltage	230 V a.c. - 50 Hz
Power consumption	2 / 7 VA

For further information please refer to the enclosed instructions.

Pumps (UPM3 AUTO L & UPM3 AUTO)

Supply voltage:	230 V a.c. - 50 Hz
Protection class:	IP44
Power consumption:	Max. 52 Watt

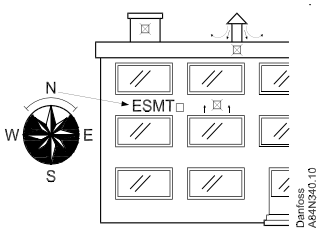
For further information please refer to the enclosed instructions for the circulation pumps.

Mounting of outdoor temperature sensor
The outdoor temperature sensor is delivered separately and must be mounted on site according to the enclosed illustrations.

The outdoor sensor is always to be mounted on the coldest side of the property (normally the north side of the property).
The sensor must not be exposed to the morning sun, and should not be mounted above windows, doors, air vents or other heat sources, and not under balconies and roof eaves.

Mounting height approx. 2.5 m above ground.

Temperature range: -50 to 50° C.

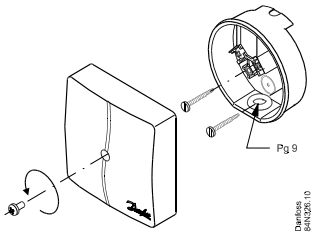


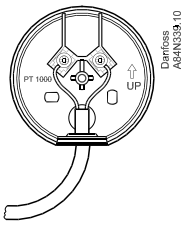
Electrical connections
Two wire non polarized (can be crossed).
Sensor cable: 2 x 0.4 - 1.5 mm^2.

For ECL 110:
Connect the cable ends to ECL controller in terminal 1 and 2.

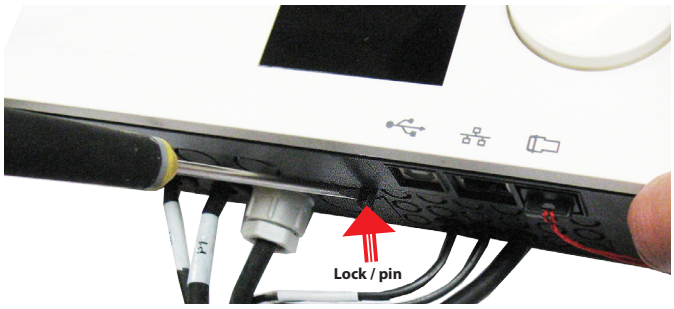
For ECL 210:
Connect the cable ends to ECL controller in common ground terminal and in terminal 29.

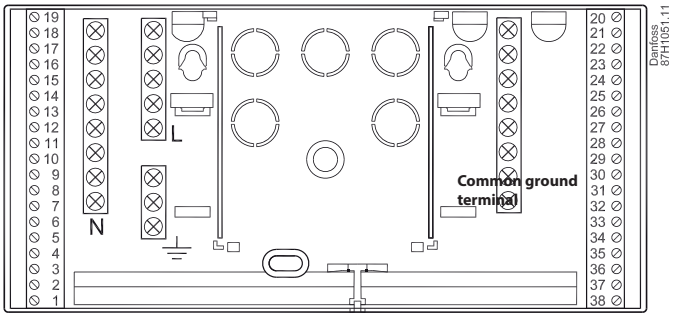
For ECL 310:
Connect the cable ends to ECL controller in common ground terminal and in terminal 29.





Access to ECL base part
Access to the base part for connection of outdoor sensor or the like is obtained by pulling the lock (pin) down with a screwdriver until a yellow line is visible on the lock. Then, the front piece can easily be removed. Lock by pressing the lock (pin) up.





ECL Comfort 210 base part

Filling, start-up
Prior to the Akva Lux II VX installation all its pipes and connections should be cleaned and rinsed. After that the dirt strainers should be cleaned. Due to vibrations during transport all connections must be checked and tightened before filling and start-up.

Before starting-up, check if:
- pipes are connected according to the circuit diagram,
- expansion vessel is connected,
- heat meter is mounted,
- shut-off valves are closed,
- threaded and flanged connections are tightened,
- recirculation, if any, has been established.

Fill the heat exchanger / the system with water:

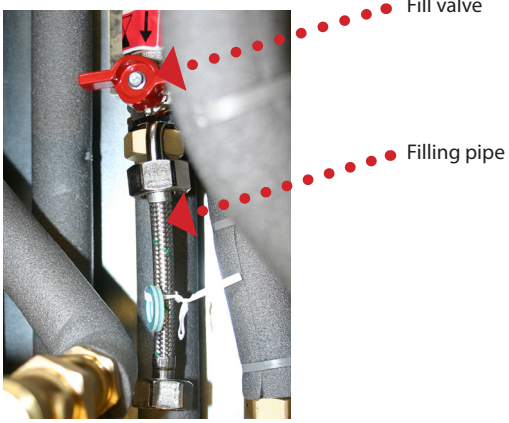
Akva Lux II VX with fill valve
(placed on the DHW pipe (see product introduction page 3), built-in from factory (photo 1)).

This type of substation does not include a permanent water filling pipe, but is supplied with a flexible water filling pipe, which is supplied loose (may be attached to the fill valve as shown on enclosed photo 1), and which must be mounted on site as shown on photo 3.

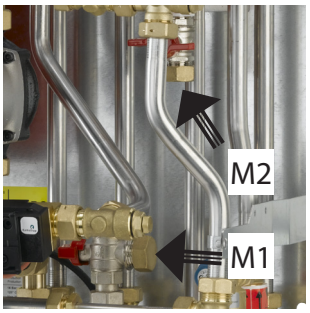
The pump must be switched off when filling the system with water.

- Demount the plugs M1 and M2 on HE supply and DHW (photo 2) and mounting the flexible pipe as shown on photo 3).
- Mount the flexible water filling pipe and open the ball valves for the HE supply and return flow as well as the ball valve for DCW.
- Carefully open the fill valves V1 and V2 and fill the system with water and at the same time vent the system.
- Fill the heat exchanger / the system with water* until the manometer shows a working pressure, which corresponds to the system height + approx. 5 m (approx. 1.2 - 1.5 bar).
- Close the fill valves, demount the pipe and remount the plugs M1 and M2 (remember gaskets).
- Finally open the remaining ball valves and heat up the system.
- After filling and heat-up of the system it should be vented by means of the air vents on the substation, if any and on the radiators.
- For substations, which include zone valve, remember to remove the red split on the position indicator of the zone valve.
- Then switch on the pump.

1



2



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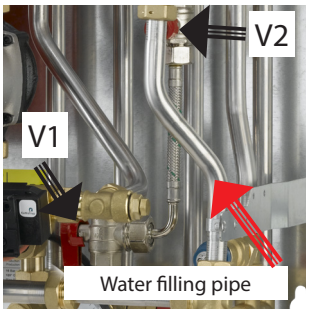
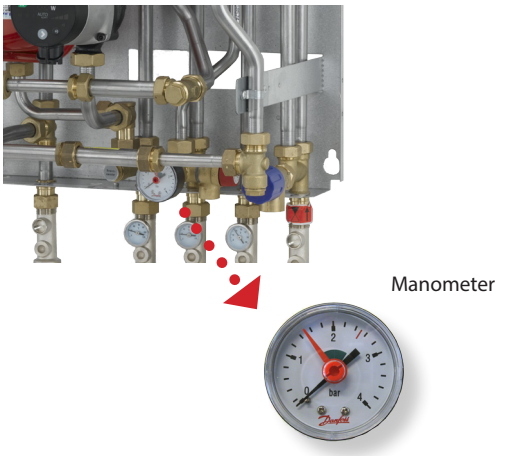


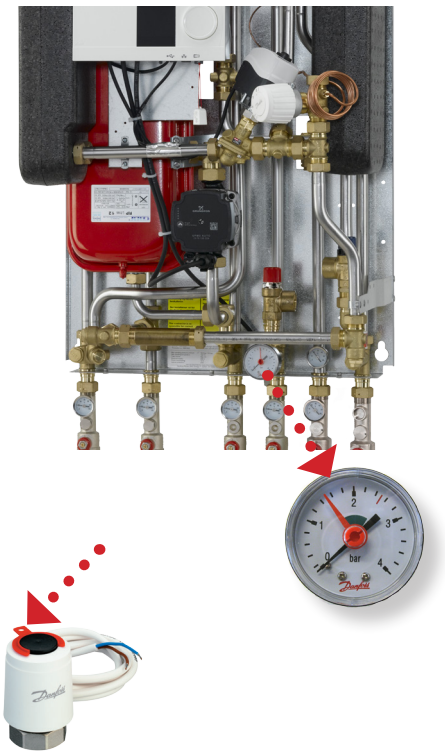


Akva Lux II VX without fill valve

Filling of water to the heating system must be done outside the substation, typically by connection to a cold water supply in the household installation.

The pump must be switched off when filling the system with water.

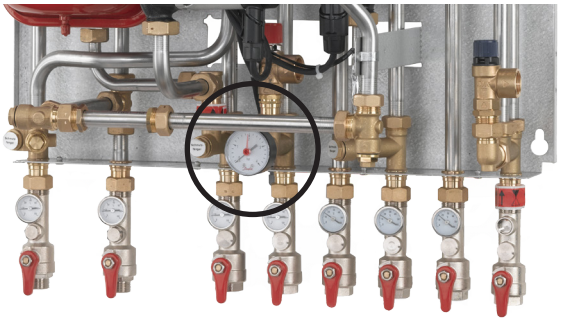
- Open the ball valves for the HE supply and return flow and fill the system with water and at the same time venting the system.
- Fill the heat exchanger / the system with water until the manometer shows a working pressure, which corresponds to the system height + approx. 5 m (approx. 1.2 - 1.5 bar).
- Finally open the remaining ball valves and heat up the system.
- After filling and heat-up of the system it should be vented by means of the air vents on the substation, if any and on the radiators.
- For substations, which include zone valve, remember to remove the red split on the position indicator of the zone valve.
- Then switch on the pump.



Manometer and filling
If the pressure drops below 1 bar, water must be added to the system. The operating pressure should never exceed 1.5 bar.

(The safety valve opens at 3 bar)

If system pressure drops dramatically within a short time, heating system should be examined for leakage, - this includes checking the factory set pressure of the expansion vessel.

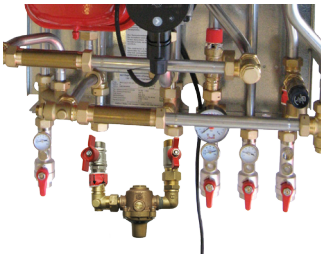


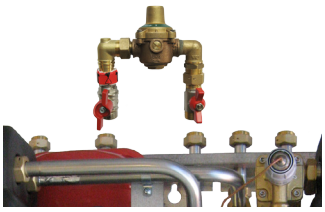
Refill line (option)
If water needs to be added to the system a refill line is applicable on some markets, if in accordance with all local regulations, - please check with your heating supplier.

The refill line includes a pressure reducing valve type 11 BIS, which will open, when the flow/pressure on the secondary side drops.

The pressure adjusting valve is adjustable and is supplied pre-set at 3 bar.

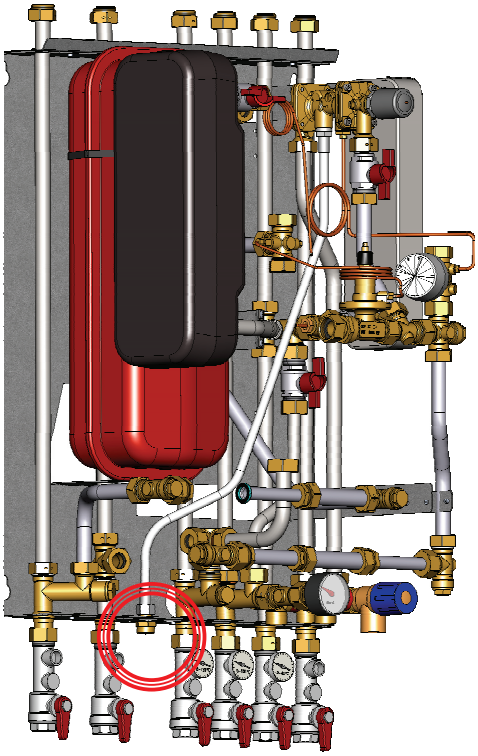
The refill line with pressure reducing valve can be mounted in top or bottom of the substation.
- Mount the refill line
- Open the ball valves





9.0 Recirculation connection

If the household piping system features domestic hot water recirculation, the substation must be connected to the recirculation system. The circulation set for recirculation connection is not standard equipment. The set must be purchased as extra equipment.
We recommend establishing recirculation BEFORE mounting the substation on the wall.



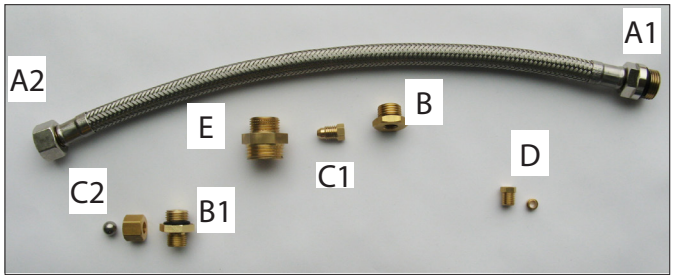
Connect the recirculation pipe from the fixed household piping to the hexagon nipple at the bottom of the substation, - see photo to your right .

You must always fit a pump and a non-return valve to the recirculation pipe, with flow direction towards the substation.
(This is not part of the delivery and must be mounted on site).

If a time-controlled pump is used, we recommend setting of the circulation water temperature to approx. 35°C.
Please note that if the circulation pump (outside the substation) is stopped for a protracted period, we recommend that the bypass thermostat is shut off for the same period.

The circulation set and and control change from bypass to DHW recirculation will be described thoroughly on page 21.

9.1 Installation instructions - recirculation



Please note that this circulation set applies to substations with 4 as well as 6 mm capillary tube.
Therefore excess components may occur and we ask you please to ignore these.

You must always fit a pump and a non-return valve to the recirculation pipe, with flow direction towards the susbstation. (This is not part of the delivery and must be mounted on site).

Fig. 1+ 2
In substations, equipped with ECL controller, it may be necessary to remove the actuator in order to prepare the substation for connection to the recirculation system.

Disassemble in points 1, 2 and 3, and move actuator and pipe section to the left (fig. 1).
If it is necessary to create additional space loosen nut 4 (fig. 2) by the bypass valve, allowing it to be turned to right.
(Please note that the above instructions serve as guideline only, as substation execution may vary and therefore variants with another component placement may be supplied).

Then follow below instructions and finish by mounting the actuator and pipe section and possibly bypass valve again. Remember gaskets!

Fig. 3
Demount nipples/plugs (6 mm Allen Key) from controller.

Fig. 4
Mount circulation hose end A1 and nipple B in controller (for substatios with 6 mm capillary tube nipple B1 is to be mounted.

Fig. 5
Demount capillary tube from T-piece (Pos C).

Fig. 6
Plug the hole in pos. C with 4 mm screw plug C1 (substation with 4 mm capillary tube) or with union nut and ball plug C2 (substations with 6 mm capillary tube).

Fig. 7
Fit the capillary tube end from pos. C in nipple B (alternatively B1 for 6 mm capillary tube) in DHW controller by means of union nut and cutting ring.

Fig. 8
Fix circulation hose end A2 and hexagon nipple E in mounting plate as shown.

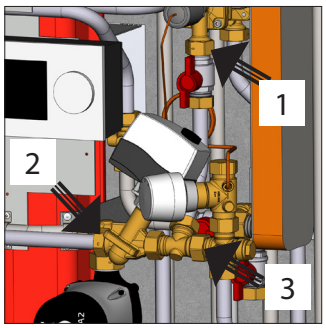


Fig. 1

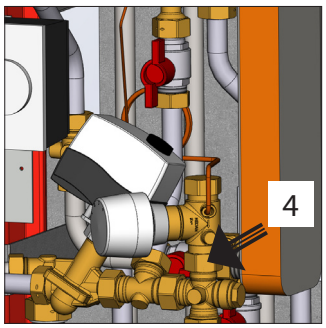


Fig. 2

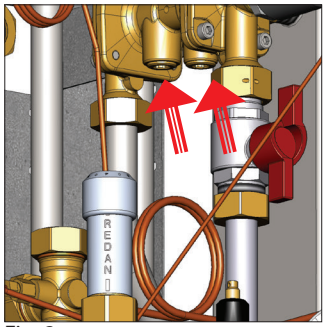


Fig. 3

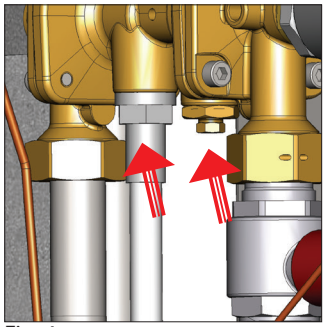


Fig. 4

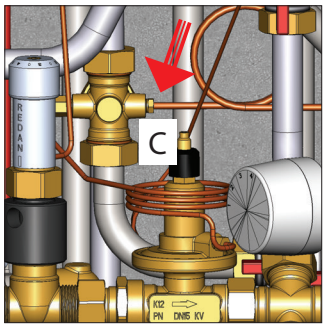


Fig. 5

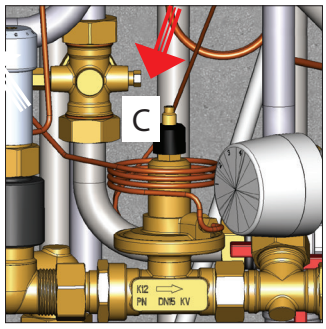


Fig. 6

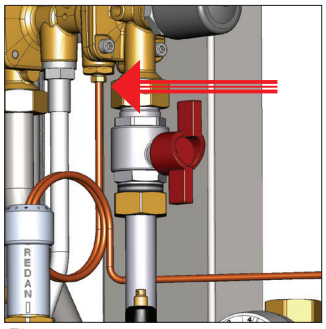


Fig. 7

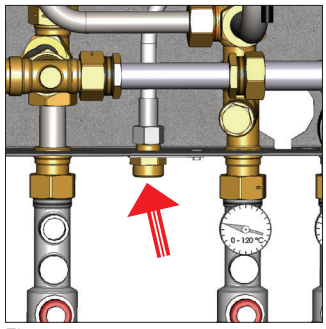
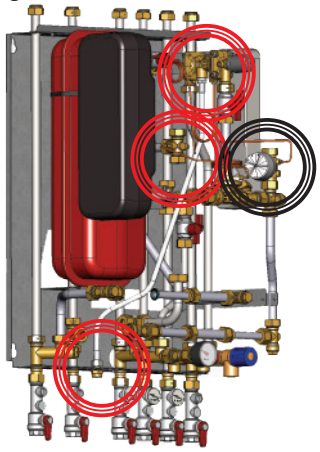


Fig. 8



10.0 Description of the Akva Lux II VX variants

10.1 Akva Lux II VX (thermostatic control) - 1 HE circuit and instantaneous domestic hot water heater

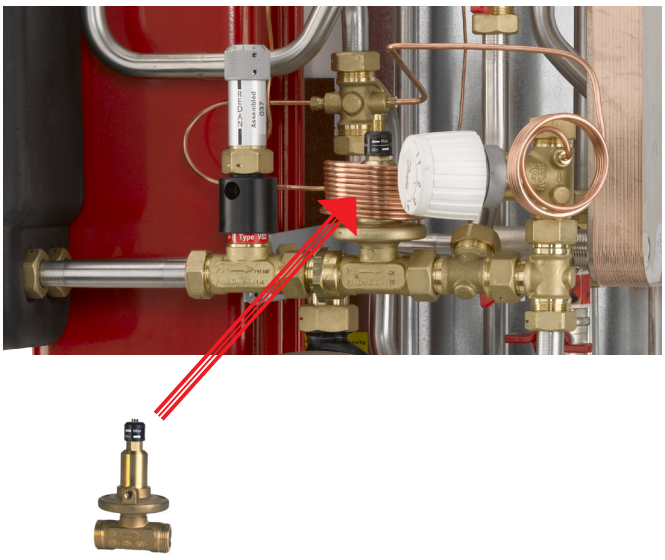
Substation for indirect heating for single-family, semi-detatched and terraced houses as well as flats. With one heating circuit for radiator or floor heating and with instantaneous water heater for domestic hot water heating. For wall-mounting and with variable connection possibilities.

The HE supply temperature is controlled by a self-acting thermostat thermostat T°C 200.

Please note:
Your substation may look different than the substation shown, as variants with other components may be supplied.
Instructions for the fitted components will be supplied together with the substation.

Differential pressure controller

(Standard on systems with self-acting thermostat).
The differential pressure controller reduces the high flunctuations in pressure in the district heating network, ensuring constant operating pressure across the substation and thereby ensures the best possible operating conditions for radiator thermostats, which enables individual control of the room temperature.

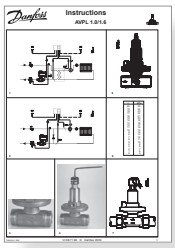


Differential pressure controller AVPL

AVPL is a self-acting differential pressure controller for PN 16 with adjustable differential pressure setting. Der AVPL keeps a constant differential pressure even with a variable system resistance.
The AVPL can be set at any differential pressure between 0,05 bar and 0,25 bar. The preset factory setting of the controller is 0,1 bar.
To alter the differential pressure, use an Allen Key NV 3.
1 full turn is equivalent to approx. 0.01 bar. The arrow on the controller top shows that the setting of the differential pressure is increased when it is turned clockwise and reduced when turned counter-clockwise. The controller settings can be changed in accordance with the enclosed producer instructions.

Differential pressure controller (PN 16) AVPL
Return mounting, adjustable setting.

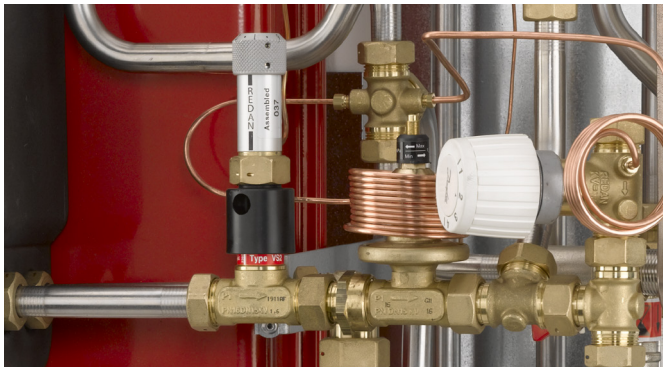
AVPL



Alternative differential pressure controller TD200

Alternatively a diffferential pressure controller type TD200 can be mounted in the substation.
This type of differential pressure controller is preset from factory and should not be adjusted afterwards.

Control of heating circuit
The temperature for the heating circuit is controlled by a thermostatic valve T°C 200.
Approximate thermostat scale setting for range 25-70° C:
Pos. 2 = 30°C
3 = 40°C
4 = 50°C
5 = 60°C
6 = 70°C



Please note that the values are intended as a guide and may vary according to the district heating operating conditions.
Approximate supply temperatures at:
10 °C outdoor temperature approx. 40°C
0 °C outdoor temperature approx. 55°C
-10 °C outdoor temperature approx. 65°C

Please note that a label on the thermostatic valve will indicate the temperature range.

It is important to keep the supply temperature to the radiators as low as possible (the temperature is indicated by thermometer mounted in HE return). The room temperature is controlled by radiator thermostats.

Floor heating (substation with heat exchanger for floor heating)
It is important to keep the supply temperature to the floor heating system as low as possible, approx. 30-35° (the temperature is indicated by thermometer mounted in HE return),

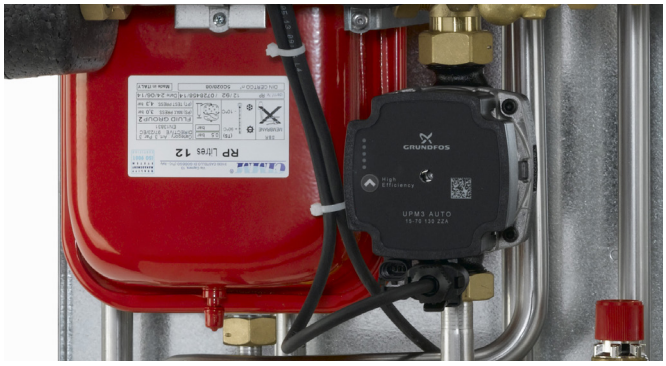
The T°C is typically set in pos. 2-2.5 (intended as a guide). The supply temperature should not exceed 40°C
(ALWAYS refer to the instructions of the floor supplier)

Alternatively the HE temperature is controlled by a self-acting temperature controller Danfoss AVTB. The controller has a control valve, thermostatic actuator and handle for temperature setting. The thermostatic actuator consists of a bellows, capillary tube and sensor.
The AVTB closes on rising temperature.
The thermostat will be set by the installer in connection with the commissioning, but it may be necessary to adjust it subsequently depending on the outdoor temperature.
Approximate thermostat scale settings:
1.0 = 35 °C
1.5 = 45 °C
2.0 = 55 °C
2.5 = 65 °C
3.0 = 75 °C

AVTB

Other variations with other types of thermostatic valves for control of the heating circuit may occur.

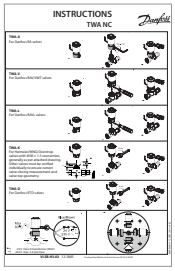
Circulation pump, heating circuit
See item 11 on page 37 for more information about circulation pump.

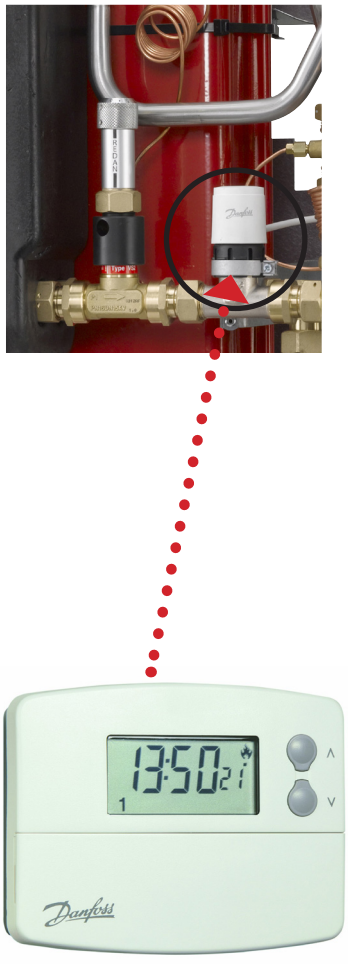


Electronic programmable room thermostat (option)
As an option the Akva Lux II VX with thermostatic control can be delivered with a zone valve, which enables connection to an **electronic programmable room thermostat.**

The thermal actuator of the zone valve is switched on by an external contact from the room thermostat, and starts to open or close the valve. The actuating movement is achieved by means of an electrically heated expansion element. When the heating current is switched off, the actuator shuts or opens the valve.

The actuator is equipped with a visual position indicator to show the open or closed position of the valve.





If the substation is connected to a room thermostat the temperature is controlled by the room thermostat and radiator thermostats. Please note that the room thermostat keeps the temperature at a constant level in the whole apartment according to the set room parameters.

Consult additional maintenance instructions for room thermostat for further information. It is recommended to avoid fully opened thermostats on some radiators and fully shut-off on others. Higher temperature at the top and lower temperature at the bottom part of radiators means that the system operation is correct. To keep correct temperature and friendly microclimate for human beings in the apartment, it is recommended to ensure regular airing in rooms.

Refill line (option)
A district heating refill line is applicable on some markets.

See page 19 for more detailed description.

10.2 Akva Lux II VX (thermostatic control and optional juntion box + zone valve) - 1 HE circuit and instantaneous DHW heater

Substation for indirect heating for single-family, semi-detatched and terraced houses as well as flats. With one heating circuit for radiator or floor heating and with instantaneous water heater for domestic hot water heating. For wall-mounting and with variable connection possibilities.

The HE supply temperature is controlled by a self-acting thermostat thermostat T°C 200.

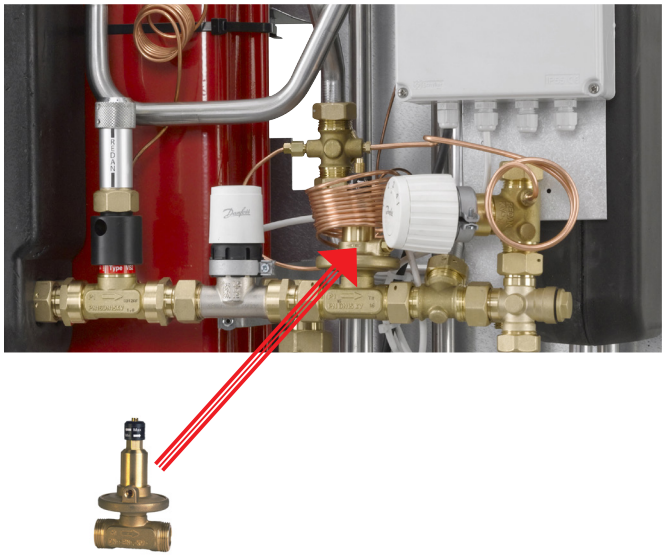
Please note:
Your substation may look different than the substation shown, as variants with other components may be supplied.
Supplier instructions for the fitted components will be supplied together with the substation.

Differential pressure controller

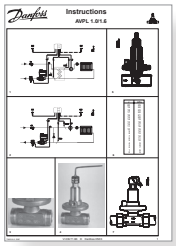
(Standard on systems with self-acting thermostat).
The differential pressure controller reduces the high flunctuations in pressure in the district heating network, ensuring constant operating pressure across the substation and thereby ensures the best possible operating conditions for radiator thermostats, which enables individual control of the room temperature.

Differential pressure controller AVPL

AVPL is a self-acting differential pressure controller for PN 16 with adjustable differential pressure setting. Der AVPL keeps a constant differential pressure even with a variable system resistance.
The AVPL can be set at any differential pressure between 0,05 bar and 0,25 bar. The preset factory setting of the controller is 0,1 bar.
To alter the differential pressure, use an Allen Key NV 3.
1 full turn is equivalent to approx. 0.01 bar. The arrow on the controller top shows that the setting of the differential pressure is increased when it is turned clockwise and reduced when turned counter-clockwise. The controller settings can be changed in accordance with the enclosed producer instructions.
Differential pressure controller (PN 16) AVPL
Return mounting, adjustable setting.



AVPL



Alternative differential pressure controller TD200

Alternatively a diffferential pressure controller type TD200 can be mounted in the substation.
This type of differential pressure controller is preset from factory and should not be adjusted afterwards.

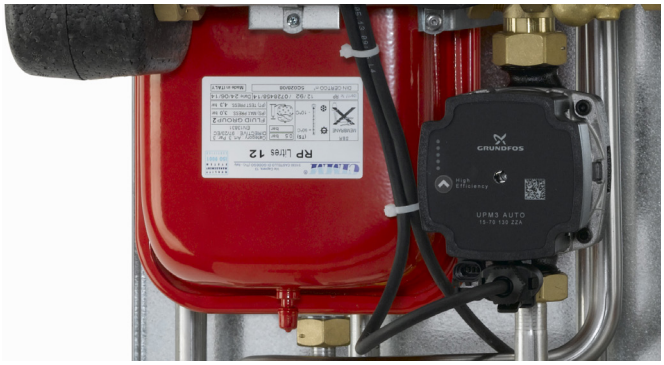
Control of heating circuit
The temperature for the heating circuit is controlled by a thermostatic valve T°C 200.
Approximate thermostat scale setting for temperature range 35-85°C:
Pos. 2 = 45°C
3 = 55°C
4 = 65°C
5 = 75°C

Please note that the values are intended as a guide and may vary according to the district heating operating conditions.

It is important to keep the supply temperature to the radiators as low as possible (the temperature is indicated by thermometer mounted in HE return). The room temperature is controlled by radiator thermostats.

Please note that a label on the thermostatic valve will indicate the temperature range.

Circulation pump, heating circuit
See item 11 on page 36 for more information about circulation pump.



Electronic programmable room thermostat (option)
As option the Akva lux II with thermostatic control can be delivered with a zone valve and junction box, as shown in the photo on page 24. This enables connection to an **electronic programmable room thermostat**.

The thermal actuator of the zone valve is switched on by an external contact from the room thermostat, and starts to open or close the valve. The actuating movement is achieved by means of an electrically heated expansion element. When the heating current is switched off, the actuator shuts or opens the valve.

The actuator is equipped with a visual position indicator to show the open or closed position of the valve.

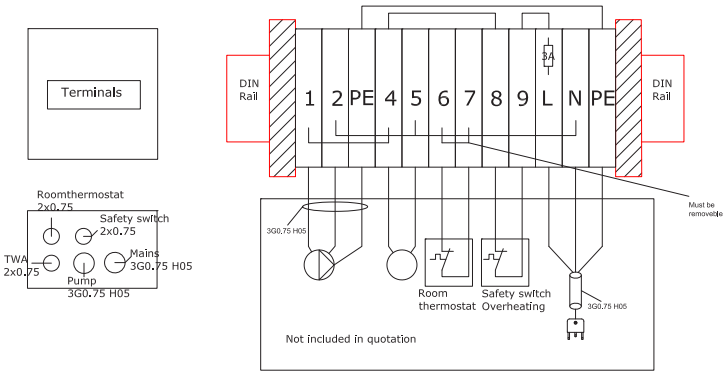
If the substation is connected to a room thermostat the temperature is controlled by the room thermostat and radiator thermostats. Please note that the room thermostat keeps the temperature at a constant level in the whole apartment according to the set room parameters.
Consult additional maintenance instructions for room thermostat for further information. It is recommended to avoid fully opened thermostats on some radiators and fully shut-off on others. Higher temperature at the top and lower temperature at the bottom part of radiators means that the system operation is correct. To keep correct temperature and friendly microclimate for human beings in the apartment, it is recommended to ensure regular airing in rooms.

Electrical junction box
The electrical junction box houses the internal electrical connections of the substation and allows the wiring in the substation to interface with the main power supply provided by a local utility.

For the Akv Lux II VX with junction box, the pump and zone valve are pre-wired to the junction box, and the junction box is also prepared for connection of a room thermostat.

In case of floor heating a safety switch is also connected in the junction box, securing that zone valve and pump will close in case of overheating.

See enclosed wiring diagram for more information.



Refill line (option)
A district heating refill line is applicable on some markets.

See page 19 for more detailed description.

10.3 Akva Lux II VX (ECL110) - 1 HE circuit and instantaneous DHW heater

Substation for indirect heating for single-family, semi-detatched and terraced houses as well as flats. With one heating circuit for radiator or floor heating and with instantaneous water heater for domestic hot water heating. For wall-mounting and with variable connection possibilities.

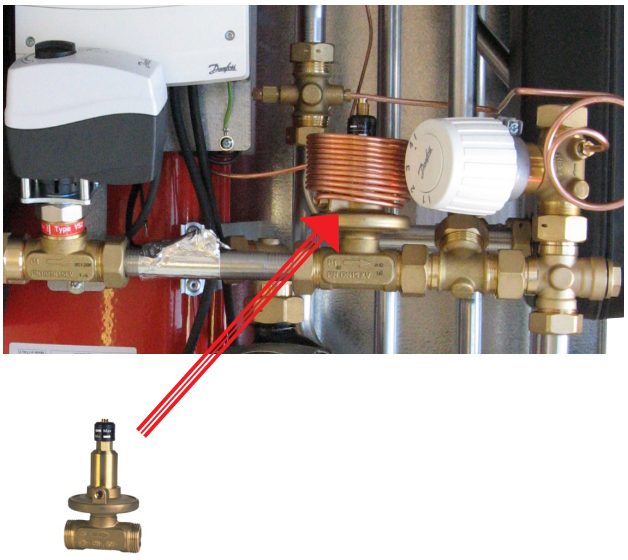
The temperature for the heating circuit is controlled by a Danfoss ECL controller in combination with an electronic actuator. The ECL controller acts as the brain of the heating system. It lets you easily control and optimise system performance and operation.

Please note:
Your substation may look different than the substation shown, as variants with other components may be supplied.
Supplier instructions for the fitted components will be supplied together with the substation.

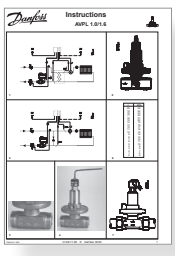
Heating circuit
The temperature for the heating circuit is controlled by the Danfoss ECL controller. The supply temperature is calculated by the controller on basis of the outdoor temperature.
The factory-setting of the controller ensures that heating is automatically switched off in the summer period.
In periods with higher heat demand the controller settings can be changed in accordance with the enclosed producer instructions for the mounted controller.

Installation & Maintenance
Danfoss ECL Comfort 110

Differential pressure controller AVPL
AVPL is a self-acting differential pressure controller for PN 16 with adjustable differential pressure setting. Der AVPL keeps a constant differential pressure even with a variable system resistance.
The AVPL can be set at any differential pressure between 0,05 bar and 0,25 bar. The preset factory setting of the controller is 0,1 bar.
To alter the differential pressure, use an Allen Key NV 3.
1 full turn is equivalent to approx. 0.01 bar. The arrow on the controller top shows that the setting of the differential pressure is increased when it is turned clockwise and reduced when turned counter-clockwise. The controller settings can be changed in accordance with the enclosed producer instructions.



Differential pressure controller (PN 16) AVPL
Return mounting, adjustable setting.

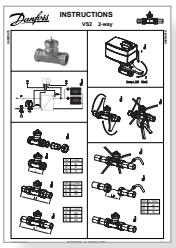


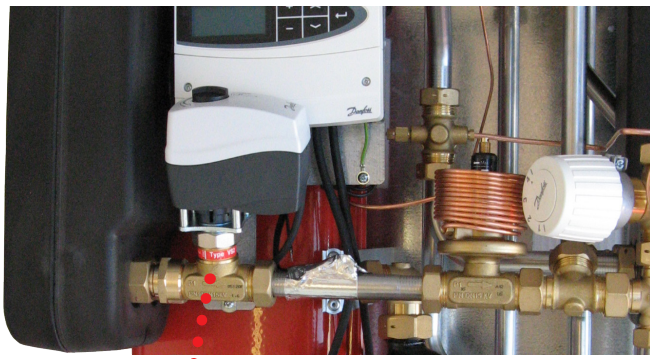
AVPL

Control of heating circuit
For control of the heating circuit the Akva Lux II VX (ECL 110) is supplied with a 2-way valve VS 2 and an electrical actuator AMV 150, which in combination with the ECL controller controls the heating circuit.

The electrical actuator has undergone a functional test from factory. In case of operating disturbances the actuator can be closed by turning the manual operation knob on top of actuator counter-clockwise.

Please see enclosed instructions,
Electrical actuator AMV 150
2-way valve VS 2





Manual operation (AMV 150)

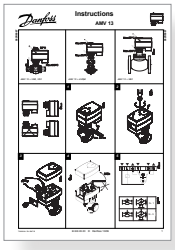
VS2

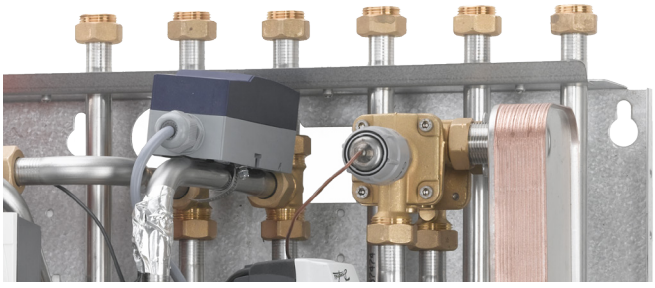
Press and hold the button (on the bottom side of the actuator) during manual operation.

Option
As alternative to the AVPL differential pressure controller and the 2-vay valve VS 2 the Akva Lux II VX (ECL 110) can be supplied with a self-acting flow controller with integrated control valve Danfoss AHQM, for control of the heating circuit.
In this case instructions for the AHQM will be enclosed.

AHQM

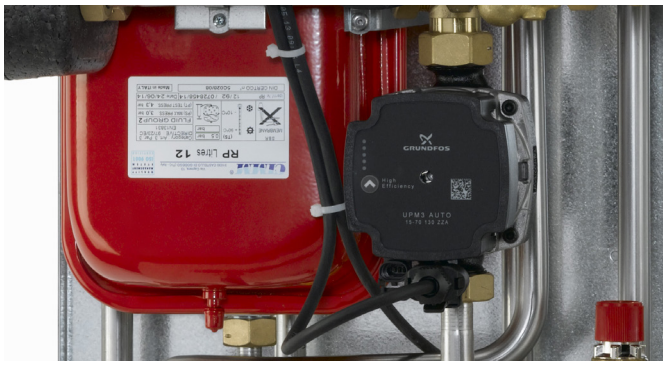
Safety function (option)
In case of floor heating the floor heating circuit can as an option be supplied with a safety thermostat Jumo AT and an electrical actuator AMV 13 instead of AMV 150 for protection against overheating.





AMV 13

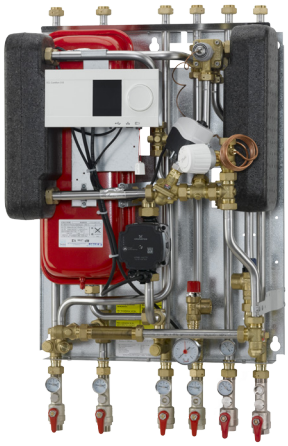
Circulation pump, heating circuit
See item 11 on page 36 for more information about circulation pump.



Refill line (option)
A district heating refill line is applicable on some markets.

See page 19 for more detailed description.

10.4 Akva Lux II VX HWP (ECL 210/A237)



Substation for indirect heating for single-family, semi-detatched and terraced houses as well as flats. With one heating circuit for radiator or floor heating and with instantaneous water heater for domestic hot water heating. For wall-mounting and with variable connection possibilities.

The temperature for the heating circuit is controlled by a Danfoss ECL controller in combination with an electronic actuator. The ECL controller acts as the brain of the heating system. It lets you easily control and optimise system performance and operation.

Please note:
Your substation may look different than the substation shown, as variants with other components may be supplied.
Supplier instructions for the fitted components will be supplied together with the substation.

Heating circuit
The temperature for the heating circuit is controlled electronically by the Danfoss ECL controller. The supply temperature ist calculated by the controller on basis of the outdoor temperature.
The ECL Comfort 210 controller is loaded with a selected application by means of an ECL Application Key (Plug-&-Play). The Application Key contains information about application, languages and factory settings.
Various applications can be loaded by means of the ECL Application Key, and it is possible to update the controller with new application software.

The controller is factory preset to turn off the heating automatically in the summer period.

The controller settings can be changed in accordance with the enclosed producer instructions for the mounted controller.

See ECL Application Key Box with ECL Comfort 210/310 user guide and mounting guide, for further information.

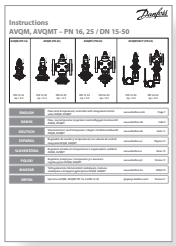
ECL application key

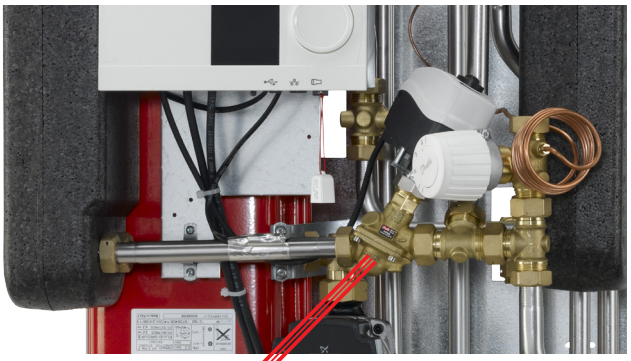
We also refer to Danfoss Installation Guide für ECL Comfort 210, application A230, which can be found on www.heating.danfoss.com

Control of heating circuit
For controlling the heating circuit the Akva Lux II VX HWP is supplied with a self-acting flow controller with integrated control valve Danfoss AHQM and an electrical actuator AMV 150, which in combination with the ECL controller controls the heating circuit.
The controller closes when set max. flow is exceeded.
The flow-controller is equipped with excess pressure safety valve, which protects the actuator from too high differential pressure.

The electrical actuator has undergone a functional test from factory. In case of operating disturbances the actuator can be closed manually turning the manual operation knob on top of actuator counter-clockwise.

Please see enclosed instructions,
Electrical actuator AMV 150
Flow-controller with integrated control valve AHQM





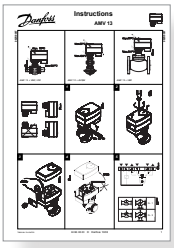
Manual operation (AMV 150)

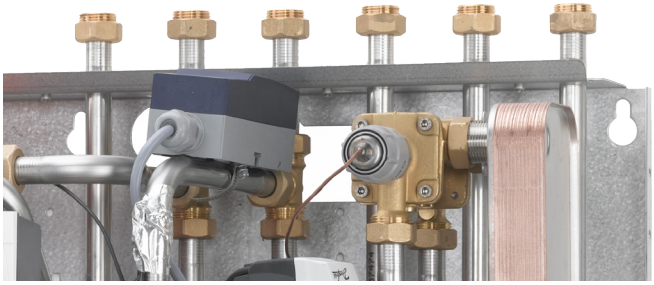
AHQM

Press and hold the button (on the bottom side of the actuator) during manual operation.

Circulation pump, heating circuit
See item 11 on page 36 for more information about circulation pump.

Safety function (option)
In case of floor heating the floor heating circuit can as an option be supplied with a safety thermostat Jumo AT and an electrical actuator AMV 13 instead of AMV 150, for protection against overheating.





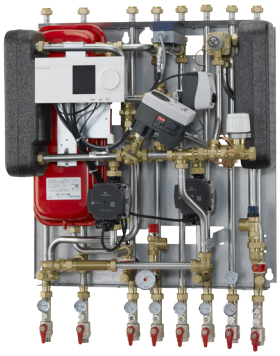
AMV 13

Refill line (option)
A district heating refill line is applicable on some markets.

See page 19 for more detailed description.

10.5 Akva Lux II VX H2WP (ECL 210/A260) - 2 HE circuits + instantaneous DHW heater

Substation for indirect heating for single-family, semi-detatched and terraced houses as well as flats. With two heating circuits for radiator and floor heating and with instantaneous water heater for domestic hot water heating. For wall-mounting and with variable connection possibilities.



The temperature for the heating circuit is controlled by a Danfoss ECL controller in combination with an electronic actuator. The ECL controller acts as the brain of the heating system. It lets you easily control and optimise system performance and operation.

Please note:
Your substation may look different than the substation shown, as variants with other components may be supplied.
Supplier instructions for the fitted components will be supplied together with the substation.

Heating circuit
The temperature for the heating circuit is controlled electronically by the Danfoss ECL controller. The supply temperature ist calculated by the controller on basis of the outdoor temperature.
The ECL Comfort 210 controller is loaded with a selected application by means of an ECL Application Key (Plug-&-Play). The Application Key contains information about application, languages and factory settings.
Various applications can be loaded by means of the ECL Application Key, and it is possible to update the controller with new application software.

The controller is factory preset to turn off the heating automatically in the summer period.

The controller settings can be changed in accordance with the enclosed producer instructions for the mounted controller.

See ECL Application Key Box with ECL Comfort 210/310 user guide and mounting guide, for further information.

We also refer to Danfoss Installation Guide für ECL Comfort 210, application A260, which can be found on www.heating.danfoss.com

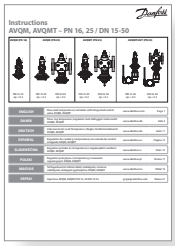
ECL application key

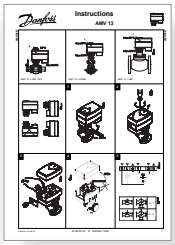
Control of heating circuits

For controlling the heating circuit the Akva Lux II VX H2WP is supplied with a self-acting flow controller with integrated control valve Danfoss AHQM and an electrical actuator AMV 13, which in combination with the ECL controller controls the heating circuit.
The controller closes when set max. flow is exceeded.
The flow-controller is equipped with excess pressure safety valve, which protects the actuator from too high differential pressure.

The electrical actuator has undergone a functional test from factory.

Please see enclosed instructions,
Electrical actuator AMV 13
Flow-controller with integrated control valve AHQM





AHQM

AMV 13

Circulation pump, heating circuit

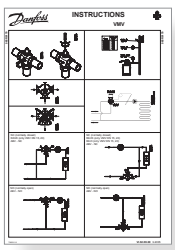
See item 11 on page 36 for more information about circulation pump.

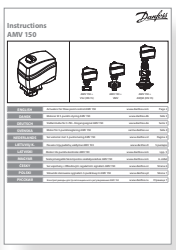
Control of floor heating circuit

For controlling the floor heating circuit the Akva Lux II VX H2WP is supplied with a 3-way valve VMV and an electrical actuator AMV 150, which in combination with the ECL controller controls the floor heating circuit.

The electrical actuator has undergone a functional test from factory. In case of operating disturbances the actuator can be closed manually turning the manual operation knob on top of actuator counter-clockwise.

Please see enclosed instructions,
Electrical actuator AMV 150
3-way seated mixing valve VMV



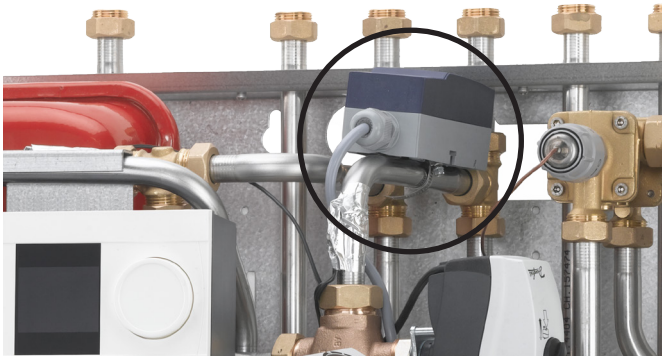


Manual operation (AMV 150)

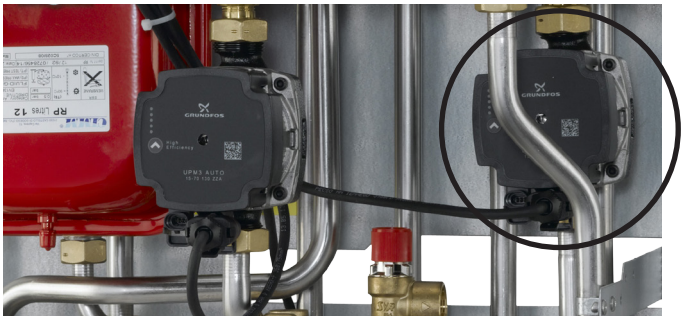
VMV

Press and hold the button (on the bottom side of the actuator) during manual operation.

Safety temperature monitor
The heating circuits can be supplied with a safety thermostat for protection against overheating.
Please see enclosed operating instructions
Jumo AT



Circulation pump, floor heating circuit
The floor heating circuit comprises a circulation pump.
See item 11 on page 36 for more information about circulation pump.



Refill line (option)
A district heating refill line is applicable on some markets.

See page 19 for more detailed description.

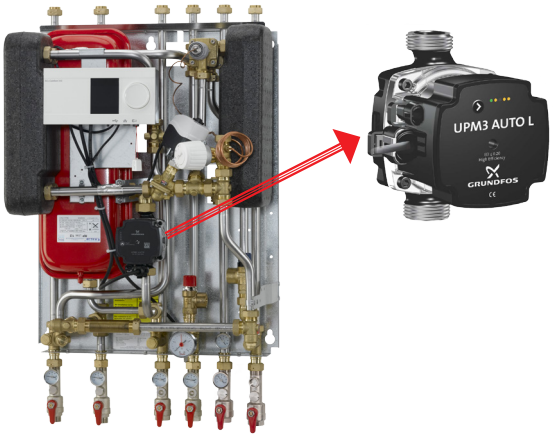
11.0 Circulation pump for HE

Grundfos Pump UPM3 Auto L

Grundfos UPM3 Auto L has 10 optional settings, which can be selected with the push-botton. **See fig. 1 - User interface.**

The user interface is designed with a single push button, one red/ green LED and four yellow LEDs.

The pump is set from factory to Proportional pressure curve 3.



The user interface shows:
* performance view (during operation)
  - operation status
  - alarm status
* settings view (after pressing the button)

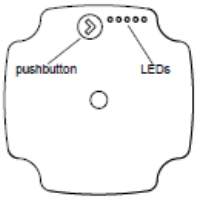
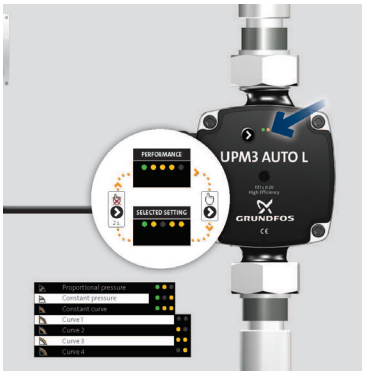


Fig. 1. User interface.



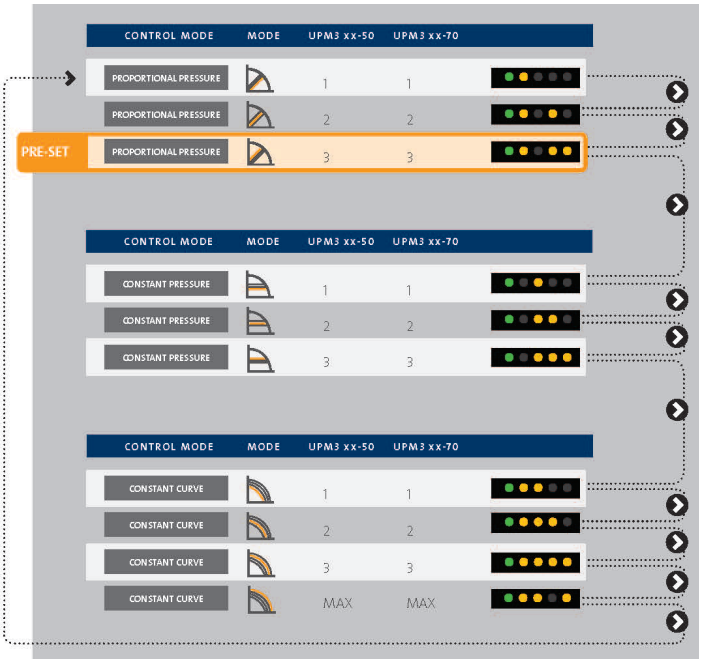
The LEDs show the power consumption for the pump. When the pump is running, LED 1 is green. The four yellow LEDs indicate the current power consumption (P1). **See fig. 2 - Performance view**.

Fig. 2. Performance view.

Display	Indication	Performance in % of P1 MAX
One green LED (flashing)	Standby (only externally controlled)	0
One green LED + one yellow LED	Low performance	0-25
One green LED + two yellow LED	Medium low performance	25-50
One green LED + three yellow LED	Medium high performance	50-75
One green LED + four yellow LED	High performance	75-100

Check the pump setting by pressing the button once. The LEDs will briefly show the pump setting before changing back to showing the power consumption. **See fig. 3 - Pump settings.**

Fig. 3. Pump settings



If the pump setting does not give the desired distribution of heat in the rooms of the house, change the pump setting. **See fig. 4 - Recommended pump settings.**

To change the pump setting, choose the setting you want **(see fig 3),** press the button down for more than 2 seconds (less than 10) and the LEDs will flash. Then press the button until the LEDs shows the desired setting. The LEDs flash and when they stop the new setting is saved. The LEDs return to show power cunstumption. Please note that if the LEDs do not flash after 2 seconds, possibly the pump setting is locked. To unlock, press the button down for more than 10 seconds. LEDs will flash and the pump is unlocked. To lock the pump, repeat the procedure.

For more information, see enclosed Grundfos instructions.

Fig. 4. Recommended pump settings

UMP3 15-70 AUTO L	
Application	**Recommended pump mode**
Radiator two-pipe system	1. Proportional pressure mode
Radiator one-pipe system	1. Constant curve mode, speed 1-2-3-4 2. Constant pressure mode
Floor heating	1. Constant pressure mode
Ventilation	1. Constant curve mode, speed 1-2-3-4 2. Constant pressure mode
Domestic hot water*	1. Constant curve mode, speed 1-2-3-4

* Bronze or stainless steel pump housing

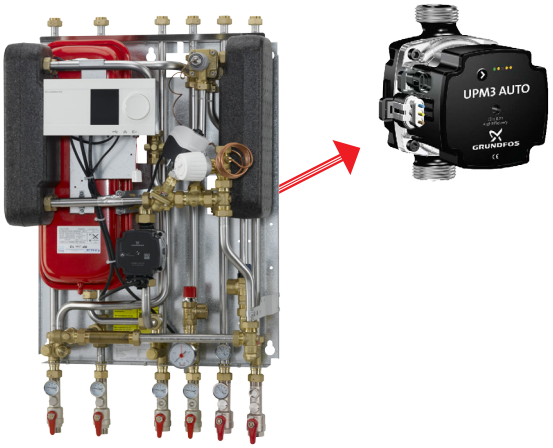
In case the 1st LED is red the pump has detected one or more alarms. **See fig. 5 - Alarm status**. When there is no active alarm anymore the user interface switches back to operation mode shortly and then showing power consumption.

Fig. 5. Alarm status

Grundfos Pump UPM3 Auto

Grundfos UPM3 Auto has 12 optional settings, which can be selected with the push-botton. **See fig. 1 - User interface.**

The pump is set from factory to Autoadapt maximum curve proportional pressure.



The user interface shows:
* performance view (during operation)
  - operation status
  - alarm status
* settings view (after pressing the button)

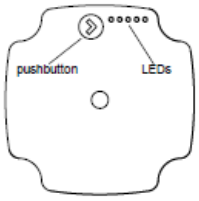
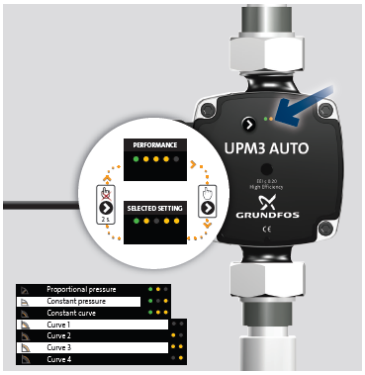


Fig. 1. User interface.



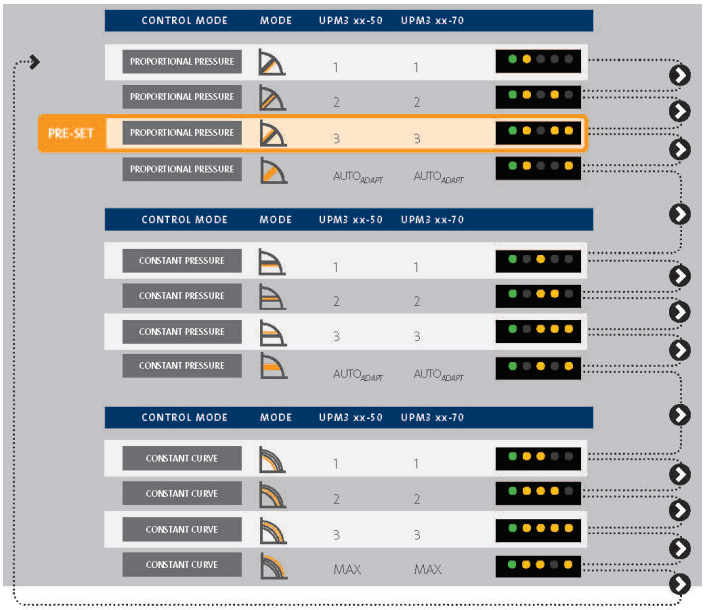
The LEDs show the power consumption for the pump. When the pump is running, LED 1 is green. The four yellow LEDs indicate the current power consumption (P1). **See fig. 2 - Performance view**.

Fig. 2. Performance view.

Display	Indication	Performance in % of P1 MAX	
One green LED (flashing)	Standby (only externally controlled)	0	
One green LED + one yellow LED	Low performance	0-25	
One green LED + two yellow LED	Medium low performance	25-50	
One green LED + three yellow LED	Medium high performance	50-75	
One green LED + four yellow LED	High performance	75-100	

Check the pump setting by pressing the button once. The LEDs will briefly show the pump setting before changing back to showing the power consumption. **See fig. 3 - Pump settings.**

Fig. 3. Pump settings



If the pump setting does not give the desired distribution of heat in the rooms of the house, change the pump setting. **See fig. 4 - Recommended pump settings.**

To change the pump setting, choose the setting you want **(see fig 3)**, press the button down for more than 2 seconds (less than 10) and the LEDs will flash. Then press the button until the LEDs shows the desired setting. The LEDs flash and when they stop the new setting is saved. The LEDs return to show power cunstumption. Please note that if the LEDs do not flash after 2 seconds, possibly the pump setting is locked. To unlock, press the button down for more than 10 seconds. LEDs will flash and the pump is unlocked. To lock the pump, repeat the procedure.

For more information, see enclosed Grundfos instructions.

Fig. 4. Recommended pump settings

UMP3 15-70 AUTO	
Application	**Recommended pump mode**
Radiator two-pipe system	1. Auto adapt proportional pressure mode 2. Proportional pressure mode **
Radiator one-pipe system	1. Constant curve mode, speed 1-2-3-4 2. Constant pressure mode **
Floor heating	1. Auto adapt, Constant pressure mode
Ventilation	1. Constant curve mode, speed 1-2-3-4 2. Constant pressure mode **
Domestic hot water	1. Constant curve mode, speed 1-2-3-4

** factory setting

In case the 1st LED is red the pump has detected one or more alarms. **See fig. 5 - Alarm status**. When there is no active alarm anymore the user interface switches back to operation mode shortly and then showing power consumption.

Fig. 5. Alarm status

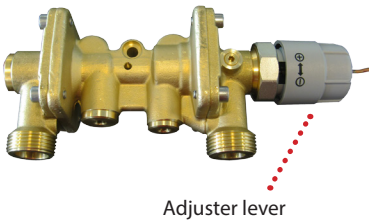
12.0 Domestic hot water (DHW)

Description
The domestic hot water is prepared in the heat exchanger based on the flow principle and the temperature is controlled by a combined hydraulic and thermostatic self-acting controller **PTC2+P** with integrated differential pressure controller, which blocks the flow of primary and secondary side flow through the heat exchanger immediately after completion of the tapping process.

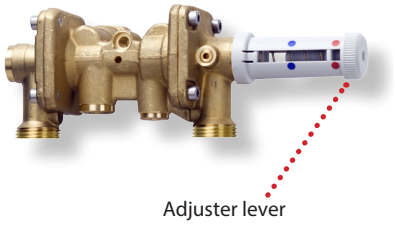
12.1 Regulation of the domestic hot water temperature

PTC2 controller for domestic hot water (Fig. 1).
Danfoss PTC2 controller for domestic hot water. Adjust the hot water temperature by moving the adjuster lever towards "+" (hotter) or "-" (colder). Start by turning the lever **clockwise** – until it stops/ until you cannot turn it any further. Then turn the lever **counter-clockwise** until the temperature of the tap water is approx. 48°C during normal tapping flow (7–8 litres per min.). The temperature must never exceed 55°C to prevent limescale deposits building up in the water heater.

1



Alternative controller PM2+P
As alternative the temperature can be controlled by a the pressure-controlled self-acting controller PM2+P with integrated differential pressure controller. Set the DHW temperature by turning the adjuster lever towards red (hotter) or blue (colder). Start by turning the lever clockwise - until the pin is opposite the blue dot. Then turn the lever counter-clockwise until the temperature of the tap water is approx. 48°C during normal tapping flow (7–8 litres per min.). The temperature must never exceed 55°C to prevent limescale deposits building up in the water heater. NB! The pin must be positioned between the blue and red dot, otherwise the controller will shut down.



12.2 Bypass or circulation thermostat (Fig. 2)

Bypass thermostat (default)
As a standard the substation is equipped with a bypass thermostat, Danfoss FJVR, so that when water is tapped, the water heater immediately starts to produce hot water. We recommend setting of the thermostat in pos.3. If you have to wait a long time (i.e. more than 20 sec.) for hot water, it may be necessary to set the thermostat at a higher value.

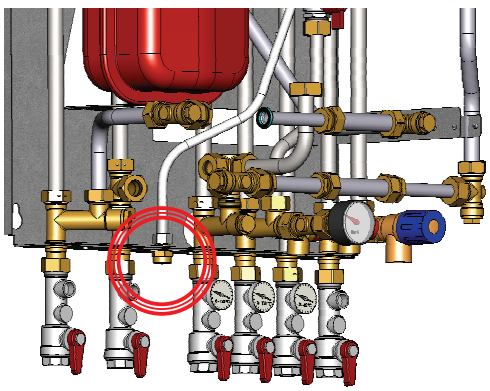
2

Scale setting (indicative)
Pos. 2 = 30°C
3 = 40°C
4 = 45°C

If you want to avoid waiting time altogether, you will need to set up domestic hot water recirculation to the tapping points.

Circulation thermostat / conversion to recirculation
If the household piping system features domestic hot water recirculation, the substation must be connected to the recirculation system.

Conversion to recirculation requires only an additional circulation set. (this is not part of the delivery and must be purchased as extra equipment, - see photo on page 21).



Connect the recirculation pipe from the fixed household piping system to the hexagon nipple, at the bottom of the substationtion (please see pages 20 -21 for instructions about how to make recirculation connection).

If a time-controlled pump is used, we recommend setting the circulation water temperature to approx. 35 °C.

Please note! If the circulation pump (outside the station) is stopped for a protracted period, we recommend that the bypass thermostat is shut off for the same period.

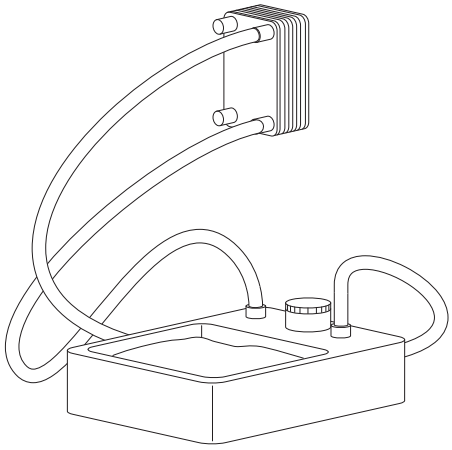
13.0 Maintenance

Maintenance work
Is only to be carried out by qualified and authorised personnel.

Inspection
The water heater should be checked regularly by authorised personnel. Any necessary maintenance must be performed in accordance with the instructions in this manual and other sets of instructions. During service the dirt strainers are to be cleaned – including the filter on the controller, all pipe connections must be tightened and the safety valve must be function tested by turning the lever.

Rinsing/cleaning of plate heat exchanger
To clean the plate heat exchanger, rinse it by running clean water through the exchanger at high speed and in the opposite direction to the normal flow. This will remove any dirt deposits that may have built up in the exchanger. If rinsing with clean water is not sufficient, the exchanger can also be cleaned by circulating a cleaning agent approved by Danfoss (e.g. Kaloxi or Radiner FI cleaning fluid) through the exchanger. Both these cleaning fluids are environmentally friendly and can be disposed off through the standard sewer system. After use of a cleaning fluid, the plate heat exchanger must be rinsed thoroughly with clean water.

Acid cleaning of plate heat exchanger
Deposits of limescale may build up in plate heat exchangers for domestic hot water on account of the large temperature fluctuations, and because aerated water is used on the secondary side. If it becomes necessary to clean the exchanger with acid, this can be done as shown on the drawing to the right. Brazed plate heat exchangers can withstand rinsing with a dilute acid solution - e.g. 5% formic, acetic or phosphoric acid).



Measures after maintenance work
After maintenance work and before commissioning:
- Check that all screwed connections are tight.
- Check that all safety features, covers, that were removed, have been replaced properly.
- Clean the working area and remove any spilled materials.
- Clear all tools, materials and other equipment from the working area.
- Connect to energy supply and check for leaks.
- Vent the system.
- Carry out any necessary adjustment again.
- Make sure that all safety features on the device and the system work properly.

Meter reading
The caretaker/owner must perform visual checking and reading of the district heating meter at short, regular intervals. (The meter is not a part of the delivery from Danfoss).
Service procedures must only be performed by trained, authorised personnel.
NB! Excessive consumption for whatever reason is not covered by the Danfoss warranty.

Cooling / Return temperature reading
Cooling – i.e. the difference between the supply and return temperature of the district heating water – has a significant effect on overall energy economy. Therefore, it is important to focus on the supply and return temperature in the heating system. The difference should typically be 30–35°C. Please note that a low district heating return temperature is directly related to the return temperature from the heating circuit and the return temperature of the circulation water.
It is therefore important to focus on these return temperatures.

Cooling from the water heater alone:
During tapping, the level of cooling will typically be 30–35°C. When hot water is not being tapped, it is completely normal for the return temperature from the water heater to rise slightly. In this situation, the district heating meter will register very modest consumption as the volume of water is very small.
On water heaters with recirculation, the calorie meter registers the heat loss in the circulation pipe.

13.1 Maintenance schedule (recommendations)

Interval	Maintenance work	Comments
At least once a year	Check all connections for leaks	If you identify a leak, replace the gaskets and retighten the pipe connections
	Check that the safety valve on the cold water supply is functioning correctly.	Check the functionality by turning the lever on the safety valves
	Check that all components are intact and functioning as intended	In the event of irregularities, lack of functionality or visible faults and defects in a component, replace the component in questionn
	Clean all dirt filters/strainers in the substation	Replace any filters that are not intact
	Check that any electrical cables are in serviceable condition and that it is possible to disconnect the electrical power supply to the substation	Visual check. Check whether it is possible to disconnect the current to the substation.
	Check the pipes and exchanger for signs of corrosion	Visual check
	Check that the temperature regulators are set in accordance with the instructions in this manual	Follow the instructions in the present manual
	Check the functions of all shut-off valves	Check that the ball valves open and close as they should

Service and maintenance procedures must only be performed by trained, authorised personnel.
Please note that after dismantling, the gaskets MUST be replaced.
Once the system has been filled with water, retighten all the pipe connections once more before performing pressure test for leaks.
After heating of the system, check all the connections and retighten if necessary.
Please note that the connections may feature EPDM gaskets! Therefore, it is important that you DO NOT OVERTIGHTEN the pipe connections. Over-tightening may result in leaks. Leaks caused by over-tightening or failure to retighten connections are not covered by the warranty.

14.0 Troubleshooting

If operating disturbances occur, the following basic features should be checked before carrying out acual troubleshooting:
- the substation is correctly connected,
- the district heating supply temperature is at the normal level (summer at least 60 °C, winter at least 70 °C),
- the differential pressure is higher than or equal to the normal (local) differential pessure in the district heating network. - If in doubt, ask the district heating plant,
- the substation is connected to electricity (pump and automatic components).
- the dirt strainer in the district heating supply pipe is clean,
- air pockets in the system.

14.1 Troubleshooting - Heating

Problem	Possible cause	Solution
No heat	Dirt strainer clogged on DH og HE side (radiator circuit).	Clean dirt strainer.
	Filter in district heating meter clogged.	Clean the filter (after consulting the district heating plant).
	Defective differential pressure controller.	Check the functions of the differential pressure controller - clean valve seat if required.
	Defective sensor	Replace sensor.
	Defektive actuator.	Check the functioning of the actuator.
	Defective motor valve - or possibly dirt in the valve housing.	Check the functions of the motor valve - clean valve housing if required.
	Automatic controls wrongly set or defective - possibly power failure.	Check if the setting of the controller is correct - see separate instructions. Check the power supply. Temporary setting of actuator to "manual" control - see instruction on heating circuit, manual control.
	Pump out of operation.	Check that the pump is receiving power and that it runs. Control that there is no air in the pump housing - see pump manual.
	The pump is set at too low speed of rotation.	Set the pump at higher speed of rotation - see instructions on heating circuit.
	Air pockets in the system.	Vent the installation thoroughly.
Uneven heat distribution	Air pockets in the system.	Vent the installation thoroughly.
Supply temperature too high	Wrong setting of automatic controls.	Adjust automatic controls, see instructions for automatic controls.
	Defective sensor.	Replace sensor.
	Defective controller. The controller does not react as it is should in accordance with the instructions.	Call in automatic controls manufacturer or replace controller.

Problem	Possible cause	Solution
Supply temperature too low	Wrong setting of automatic controls.	Adjust automatic controls, see instructions for automatic controls.
	Defective controller. The controller does not react as it is should in accordance with the instructions.	Call in automatic controls manufacturer or replace controller.
	Outdoor sensor mounted or placed incorrectly.	Mount/place outdoor sensor correctly.
Poor cooling	Dirt strainer clogged.	Clean dirt strainer.
	Too small heating surface/ too small radiators compared to the total heating requirement of the building.	Increase total heating surface.
	Poor utilization of existing heating surface.	Make sure that the heat is distributed evenly across the full heating surface - open all radiators and keep the radiator in the system from heating up at the bottom. Higher temperature at the top and lower temperature at the bottom part of the radiators means that the system operation is correct.
	The system is single-pipe.	It is extremely important to keep the supply temperature to the radiators as low as ever possible, while maintaining a reasonable level of comfort.
	Self-acting thermostat on DH defective (does not apply to all variants)	Replace thermostat - alternatively only the sensor.

14.2 Troubleshooting - Domestic hot water

Problem	Possible cause	Solution
Variations in temperature	Non-return valve on the circulation line defective (leads to mixing - and the circulation water pipes become cold du-	Replace non-return valve.
Low temperature / variations in temperature at the draining points	Non-return valve in thermostatic mixer tap in the bathroom defective - leads to mixing of cold and hot water-. Note that variations in temperature may occur at other draining points/water taps in the household piping! REMEMBER, to check all the mixer taps in the house!	Replace mixer tap, or non-return valve only.
Not enough pressure on the hot water	Dirt strainer in cold water meter or in the cold water supply line clogged.	Clean dirt strainer (cold water meter possibly in consulation with the water supply company).
Long waiting time	Circulation pump out of operation - (not part of the dly).	Check whether the pump is running - whether the pump is receiving power. Control that there is no air in the pump housing - see pump manual.
No domestic hot water	Dirt strainer on DH supply clogged.	Clean dirt strainer.
DHW temperature too low	See above. Non-return valve on the circulation line defective (leads to mixing - and the circulation water pipes become cold during tapping).	See above. Replace non-return valve.
DHW temperature too high	Defective DHW controller.	Check the functions of the controller, and replace if required.
Declining temperature during tapping	Air in capillary tubes. Califfied heat exchanger. Short-circuiting of / defective heat exchanger.	Air and rinse capillary tubes. Clean heat exchanger with acid solution or replace heat exchanger. Replace heat exchanger.
Poor cooling	Califfied heat exchanger.	Clean heat exchanger with acid solution or replace heat exchanger.
Discoloured water (during a protracted period)	Plate heat exchanger short-circuited.	Replace the plate heat exchanger.
Lack of hot water pressure	Califfied plate heat exchanger.	Replace the plate heat exchanger or clean it with acid.

15.0 EU Declaration of Conformity

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EC-DECLARATION OF CONFORMITY

For CE marking in EU (European Union)

Danfoss Redan A/S District Energy

DK-8382 Hinnerup

Declares under our sole responsibility that below products including all available power and control options:

Akva Lux II VX

Main components: See instruction manual.

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the products are used in accordance with our instructions.

EU Directives:

EMC Directive 2004/108/EEC

EN 61000-6-1 2007 Electromagnetic compatibility- Generic standard: Immunity for residential, commercial and light industry.

EN 61000-6-2 2007 Electromagnetic compatibility- Generic standard: Immunity industry.

EN 61000-6-3 2007 Electromagnetic compatibility- Generic standard: Emission for residential, commercial and light industry.

EN 61000-6-4 2007 Electromagnetic compatibility- Generic standard: Emission industry.

Machinery Directive 2006/42/EEC

EN ISO 14121-1 Safety of machinery -- Risk assessment

EN 60204-1-Safety of machinery - Electrical equipment of machines — Part 1: General requirements

PED Directive 97/23/EEC

Conformity assessment procedure followed: Module A - Internal control of production

All substations that falls under Article 3 §3 and category 1 shall not be CE-marked according to this directive

CE marked affixed year 2010

Approved by:

Place and date of issue: Hinnerup, Aug. 22nd, 2013

Name: Katja Brødegaard

Title: Quality & HSE Manager

16.0 Commissioning Certificate

Commissioning certificate
The substation is the direct link between the district heating supply network and the household piping system. All supply pipes and the pipes in the household piping system must be checked and rinsed before commissioning. Once the system has been filled with water, all pipe connections must be retightened before performing pressure test for leaks. The dirt strainers must be cleaned and the substation must be adjusted in accordance with the instructions in this manual.

It is important to comply with all technical regulations and the applicable legislation in every respect.

Installation and commissioning must only be performed by trained, authorised personnel.

The substation is checked in the factory for leaks before delivery. Leaks are however possible due to vibrations caused by transport, handling and heating of the system and therefore it is important to check all connections and to retighten if necessarys before commissioning. Please note that the connections may feature EPDM gaskets! **Therefore it is important that you DO NOT OVER-TIGHTEN the connections.** Over-tightening may result in leaks. Leaks caused by overtightening or failure to retighten connections are not covered by the warranty.

To be filled-out by the installer.

This substation has been retightened, adjusted and commissioned

on the: _____ by installer: _____

Date/Year Company name (stamp)

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