ENGINEERING
TOMORROW

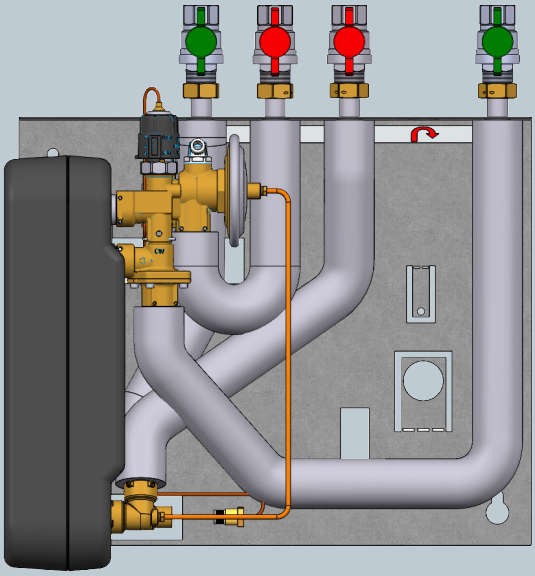
Mounting and Installation Guide

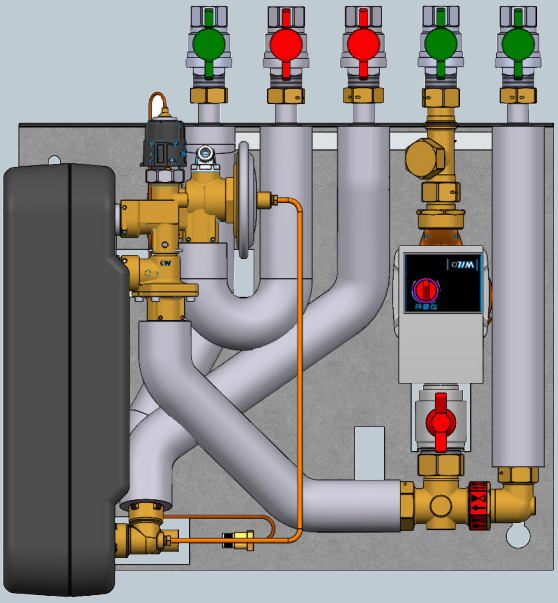
EvoFlat WSS for apartments, single- and multi-family houses

EvoFlat WSS AU3 TPC-M water heater for DHW heating, based on the flow principle.

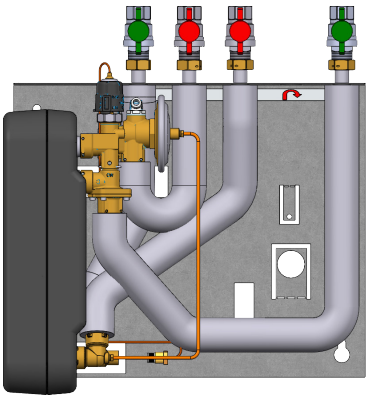
EvoFlat

Water Heater for apartments, single- and multi-family houses

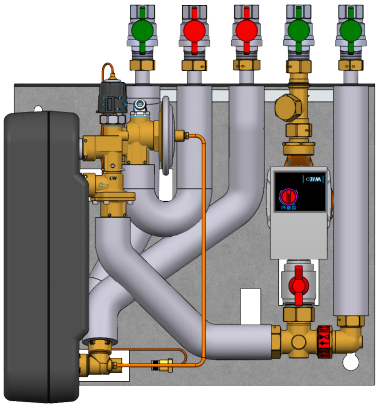




districtenergy.danfoss.com



EvoFlat WSS, Std.
145G0322



EvoFlat Circ.
145G0323

1. CONTENT

2. SAFETY NOTES

The following instructions refer to the standard design of the station.

This operating manual should be read carefully before installation and start-up of the flat station. The manufacturer accepts no liability for damage or faults that result from non-compliance with the operating manual. Please read and follow all the instructions carefully to prevent accidents, injury and damage to property.
Assembly, start-up and maintenance work must be performed by qualified and authorized personnel only.
Please comply with the instructions issued by the system manufacturer or system operator.

Corrosion protection
All pipes and components are made of stainless steel and brass.
The maximum chloride compounds of the flow medium should not be higher than 150 mg/l.
The risk of equipment corrosion increases considerably if the recommended level of permissible chloride compounds is exceeded.

Energy source
The substation is designed to be connected to decentralized heating installations with various energy sources, such as district heating, central boiler (gas, oil, biomass, etc.), solar, heat pump or a combination between them if the operating conditions allow it.

Application
The substation is designed only to operate with water 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**.**

Choise of materials
Only use materials that comply with local regulations.

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

Noise level.
≤ 35 dB.

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

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.

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 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.

Authorized personnel only
Assembly, start-up and maintenance work must be performed by qualified and authorized personnel only.

Please observe instructions carefully
To avoid injury to persons and damage to the device, it is absolutely necessary to read and observe these instructions carefully.

Warning of high pressure and temperature
Be aware of the installation's permissible system pressure and temperature.
The maximum temperature of the flow medium in the flat station is 95 °C. The maximum operating pressure of the flat station is 10 bar. The risk of persons being injured and equipment damaged increases considerably if the recommended permissible operating parameters are exceeded.
The flat station installation must be equipped with safety valves, however, always in accordance with local regulations.

Warning of hot surface
The flat station has got hot surfaces, which can cause skin burns.
Please be extremely cautious in close proximity to the flat station. Power failure can result in the motor valves being stuck in open position. The surfaces of the flat station can get hot, which can cause skin burns. The ball valves on district heating supply and return should be closed.

Handling
We recommend wearing suitable and safe footwear when handling and installing the district heating station.

Warning of transport damage
Before flat station installation, please make sure that the flat station has not been damaged during transport.

IMPORTANT - Tightening of connections
Due to vibrations during transport all flange connections, screw joints and electrical clamp and screw connections must be checked and tightened before water is added to the system.
After water has been added to the system and the system has been put into operation, re-tighten **ALL** connections.
Check that all hairpins in click connectionsare completely pushed in.

! Warning – for continued safety of this appliance it must be installed, operated and maintained in accordance with the manufacturer's instructions

Reach
All products of the EvoFlat series comply with the provisions of the REACH regulation.
We are therefore obliged to inform our customers about the presence of substances according to the SVHC candidate list, if they are present. We hereby inform you: This product contains brass parts containing lead (CAS 7439-92-1) in a concentration above 1% (w/w).

Potential equalization / grounding
Equipotential bonding is understood as all measures for eliminating electrical potential differences (contact voltages), which can occur between eg two pipelines. Equipotential bonding is an important measure for protection against electric shock. Equipotential bonding reduces corrosion in the heat exchanger, instantaneous water heaters, district heating stations and plumbing installations. ***Equipotential bonding should be in accordance with the provisions 60364-4-41: 2007 and IEC 60364-5-54: 2011.***
Binding point is marked with a grounding symbol on the bottom right corner of the mounting plate and there is a hole in the mounting plate and a label with grounding symbol.

Disposal
The station consists of materials that must not be disposed of with household waste. Disconnect the entire energy supply and disassemble the product for disassembly and dispose of it in accordance with local regulations.

Please notice
Interventions and reworking of our components lead to the loss of warranty.

3. MOUNTING

Installation must be in compliance with local standards and regulations. Heat Source (HS) - In the following sections, HS refers to the heat source which supplies the flat stations. A variety of energy sources, such as oil, gas or solar power, could be used as the primary supply to Danfoss substations. For the sake of simplicity, HS can be taken to mean the primary supply.

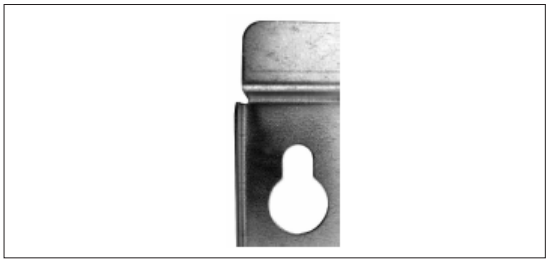
Authorized personnel only
Assembly, start-up and maintenance work must be performed by qualified and authorized personnel only.

Mounting:

Adequate space
Please allow adequate space around the flat station for mounting and maintenance purposes.

Orientation
The station must be mounted so that components, keyholes and labels are placed correctly. If you wish to mount the station differently please contact your supplier.

Drillings
Where substations are to be wall-mounted, drillings are provided in the back mounting plate.



Keyhole for mounting.

Labelling
Each connection on the substation is labelled.

Before installation:

Clean and rinse
Prior to installation, all substation pipes and connections should be cleaned and rinsed.

Thightening
Due to vibration during transport, all substation connections must be checked and tightened before installation. Check that all hairpins in click connections are completely pushed in.

Unused connections
Unused connections and shut-off valves must be sealed with a plug. Should the plugs require removal, this must only be done by an authorized service technician.

Installation:

Connections
Connection to the household installation and district heating pipes connections must be made using threaded, flanged or welded connections. The internal connections of the flat station is made by click-fit connections

4. START-UP

Start-up
The shut-off valves should be opened and the unit observed as it enters service. Visual checking should confirm temperatures, pressures, acceptable thermal expansion and absence of leakage.
If the heat exchanger operates in accordance with design, it can be put to regular use.
After water has been added to the system and the system has been put into operation, re-tighten ALL connections. Check that all hairpins in click connections are completely pushed in.

01. Fix the water heater on a solid wall with two strong bolts, screws, expansion plugs or the like.

02. Close all shut-off valves, before the water heater is connected to the household piping.

03. IMPORTANT! Tighten all connections, as vibrations during transport and handling may have caused leaks.

04. For systems with safety valve, a discharge outlet must be established in compliance with local regulations.

05. If the household plumbing system includes hot water recirculation the water heater must be connected to the hot water recirculation system. Remember always to mount safety valve on the DCW inlet. The pump must be connected to power supply, but do not switch on the pump.

06. Carefully open the ball valve on DH supply. Subsequently open the remaining ball valves.

07. Check the water heater and the household piping carefully for any leaks.

08. Perform pressure testing of the household installation in compliance with local regulations.

09. Switch on circulation pump (if any).

10. Finally adjust the water heater according to the enclosed installation instructions.

IMPORTANT! Heating and cooling of the system may cause leaks. Therefore tightening of all connections may be necessary after commencement of operation.

Re-tightening of connections
After water has been added to the system and the system has been put into operation, re-tighten **ALL** connections.

Pump
The pump must be switched off during system fill.

5. ELECTRICAL CONNECTIONS

Before making electrical connections, please note the following:

Safety notes
Please read the relevant parts of the safety notes.

230 V
The flat station must be connected to 230 V AC and earth.

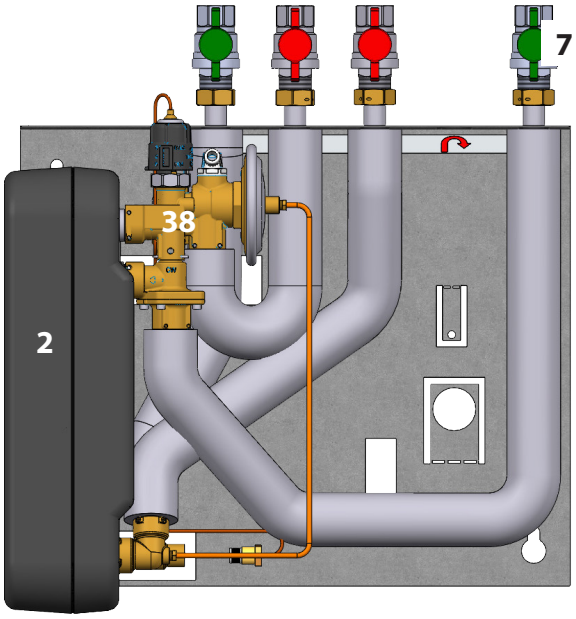
Disconnection
The substation must be electrically connected so that it can be disconnected for repairs.

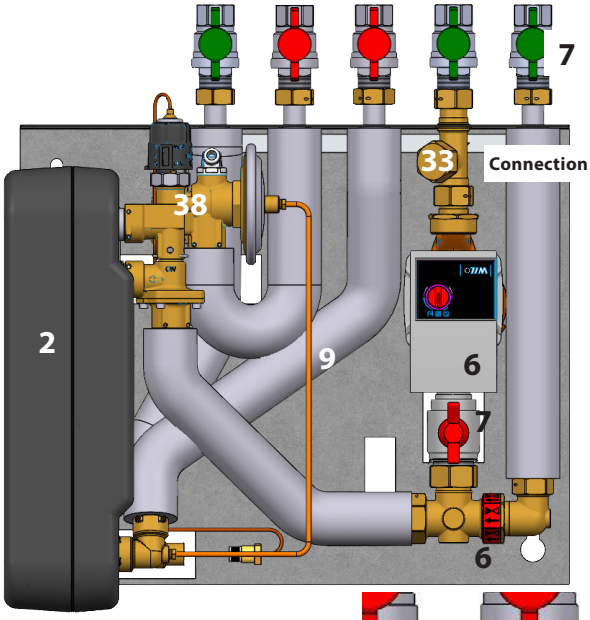
Grounding / potential compensation
The station should be connected to a grounding point on the right side of the station mounting rail.

Authorized electrician
Electrical connections must be made by an authorized electrician only.

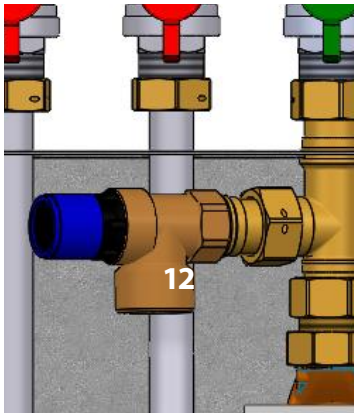
Local standards
Electrical connections must be made in accordance with current regulations and local standards.

6. MAIN COMPONENTS - EVOFLAT WSS, STD. / CIRC.





Your flat station might look different than the substation shown.



EvoFlat WSS Std.

2. Plate heat exchanger
7. Ball valve
38 DHW controller type TPM-C

EvoFlat WSS Circ.

2. Plate heat exchanger
6. Non-return valve
7. Ball valve
9. Circulation pump
12. Safety valve (supplied loose)
33 Plug
38 DHW controller type TPM-C

EvoFlat WSS Water heaters

EvoFlat WSS water heaters are newly developped compact and easy-to-use fresh water systems with high DHW performance.

EvoFlat WSS water heaters contain a multi-purpose controller TPC-M with integrated zone valve, air vent, differential pressure and DHW temperature controller.

On delivery, the station is prepared for connection upwards.

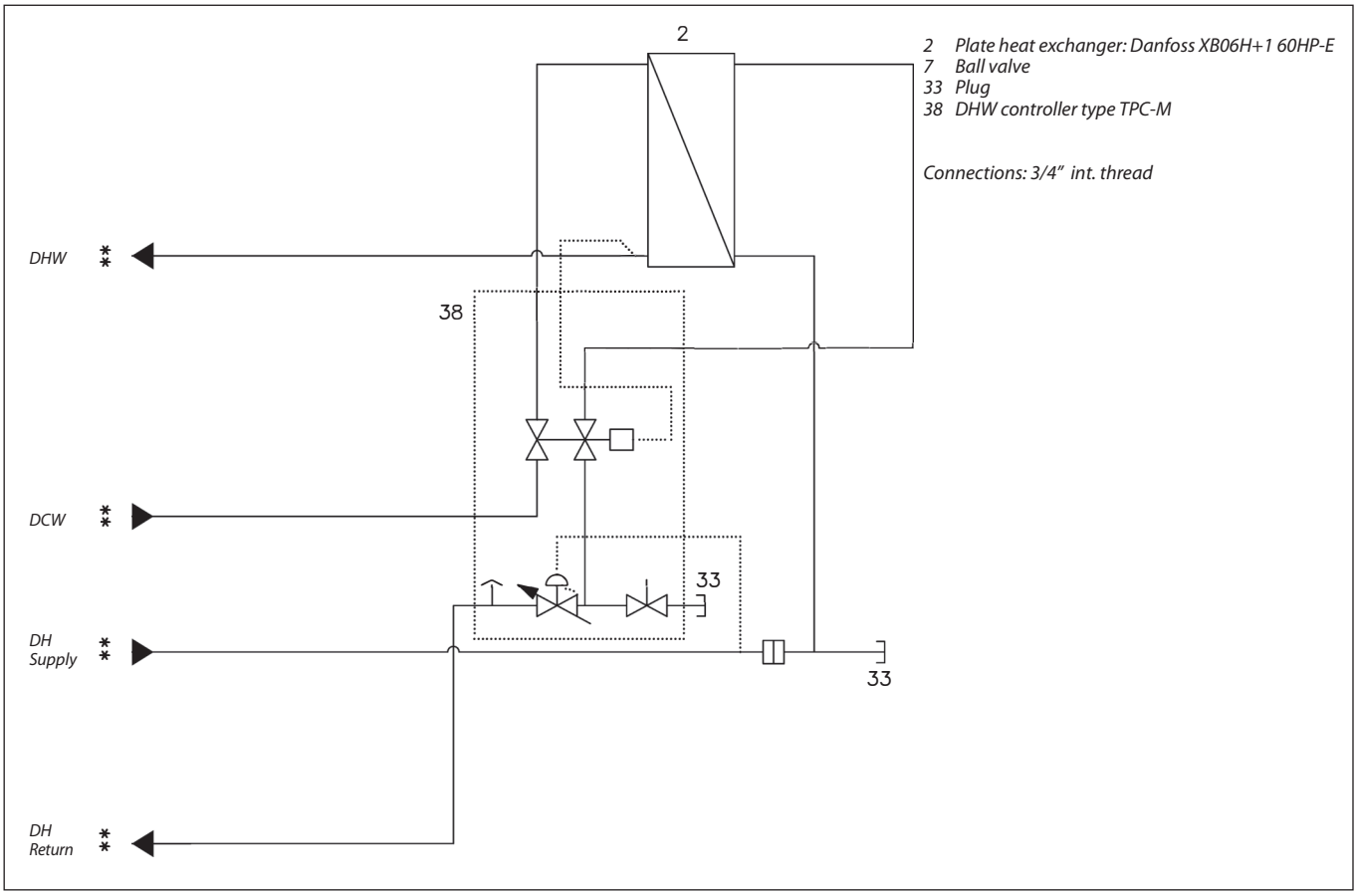
The EvoFlat WSS water heaters are available in two variants, - EvoFlat WSS water heaters Std. and EvoFlat WSS water heaters Circ. which is prepared for DHW circulation.

Please note that the EvoFlat WSS water heaters are supplied in a recess box, with pipe insulation and insulated heat exchanger.

The station is equipped with a symbol for the different connections. Connect the station to the house installation according to these and according to the instructions in this instruction manual.

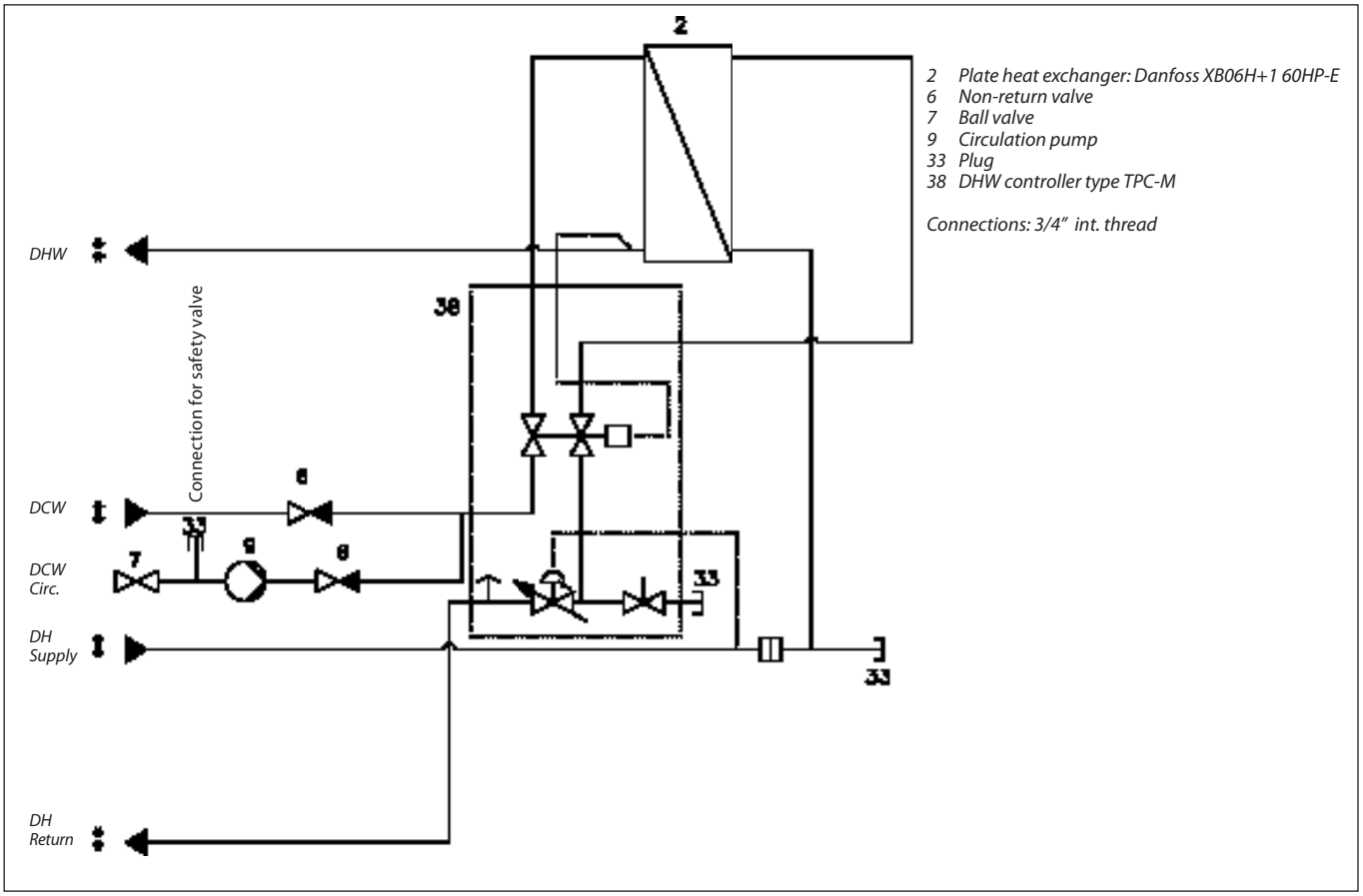
The EvoFlat WSS water heaters meet the demands of today for low energy consumption and energy efficiency and come with a highly efficient heat exchanger, which achieves a very high cooling of the heating water.

7. DIAGRAMS, EXAMPLES, EVOFLAT WSS



2 Plate heat exchanger: Danfoss XB06H+1 60HP-E
7 Ball valve
33 Plug
38 DHW controller type TPC-M

Connections: 3/4" int. thread

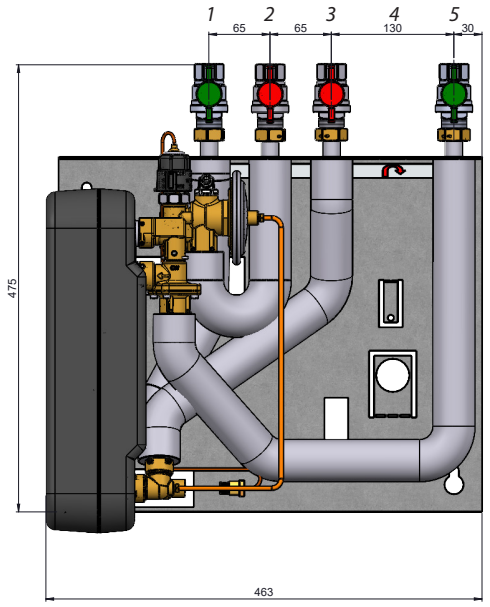


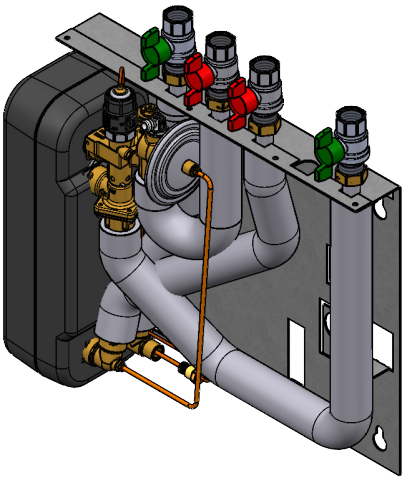
2 Plate heat exchanger: Danfoss XB06H+1 60HP-E
6 Non-return valve
7 Ball valve
9 Circulation pump
33 Plug
38 DHW controller type TPC-M

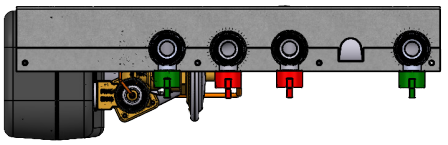
Connections: 3/4" int. thread

8. DIMENSIONAL SKETCH & CONNECTIONS, EXAMPLES

EvoFlat WSS, Std.

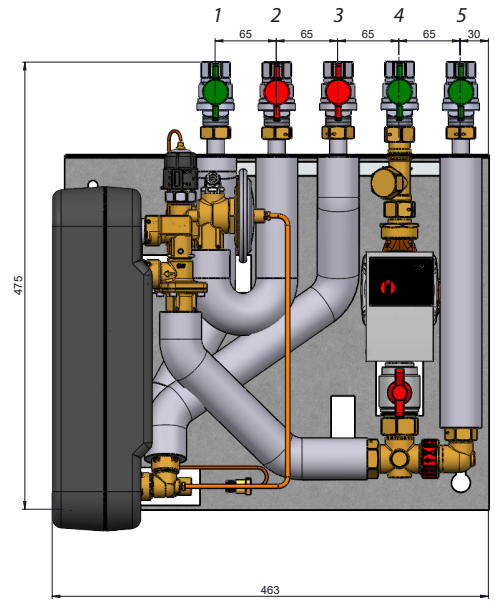


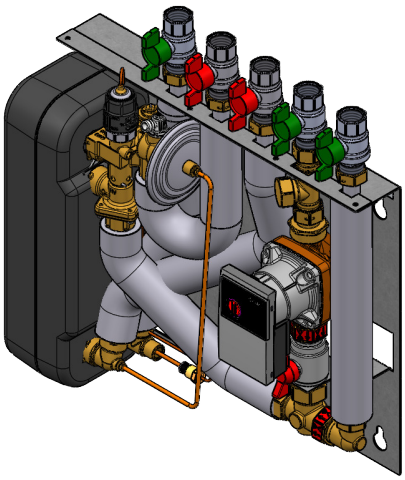


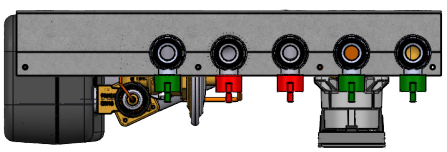


Connections:
1. Domestic hot water (DHW)
2. District heating (DH) return
3. District heating (DH) supply
4.
5. Domestic cold water (DCW)

EvoFlat WSS, Circ.

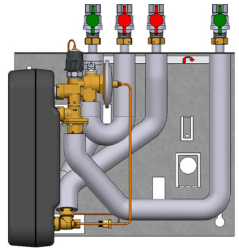
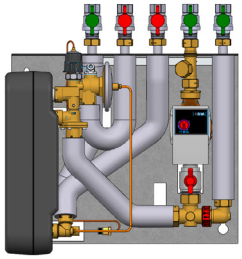






Connections:
1. Domestic hot water (DHW)
2. District heating (DH) return
3. District heating (DH) supply
4. Circ.
5. Domestic cold water (DCW)

9. ORDER DATA

Picture	Characteristics	Code No.
	**EvoFlat WSS, Std.**	145G0322
	**EvoFlat WSS, Circ.**	145G0323

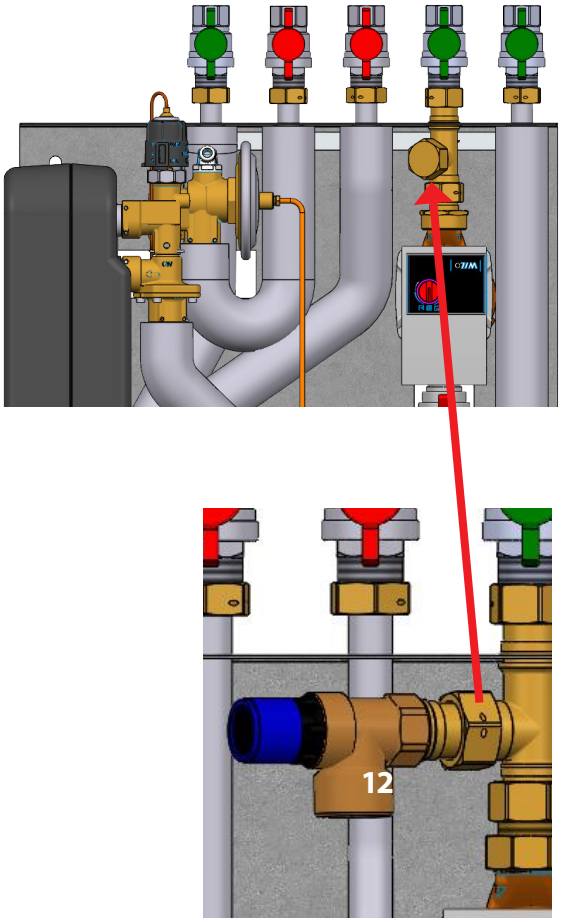
10. DHW RECIRCULATION

If the household plumbing system includes hot water recirculation the water heater must be connected to the hot water recirculation system.

Photo to the right shows the EvoFlat WSS Circ. water heater (145G0323), which is prepared for connection to the DHW recirculation system.

Remember to mount safety valve on the DCW inlet. -
Safety valve is supplied loose and must be mounted on site, as shown on photoes to the right.

Always establish a blow-off pipe from the safety valve. The blow-off pipe must be lead to a drain in accordance with applicable legislation.



11. CONTROLS

TPC-M multi-functional controller
Multi-functional controller with integrated zone valve, air vent, differential pressure and DHW temperature controller.

DHW temperature control
By turning the handle for temperature temperature in (+/MAX) direction the temperature is increased, by turning it in (-/MIN) direction the temperature is decreased.

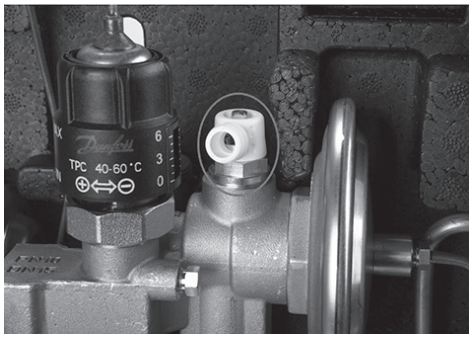
Setting range 40-60°C.

DHW temperature should be adjusted to 45-50 °C, as this provides optimal utilization of DH water. At DHW temperatures above 55 °C the possibility of lime scale deposits increases significantly.

Differential pressure controller
The differential pressure controller equalizes the high fluctuations in pressure arriving from the heat source, ensuring constant operating pressure

Zone valve
The TPC-M multi-functional controller contains a zone valve. The TWA-Q/NC actuator can be mounted on the zone valve. The transport protection on the TWA-QZ/NC actuator must be removed before use.

Air vent
The station should be vented during start up.



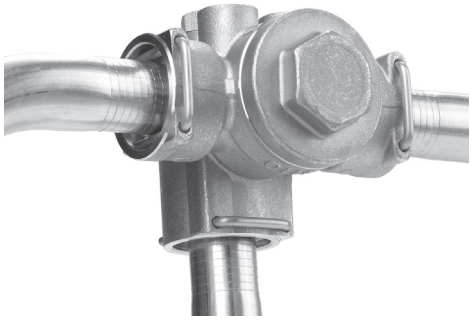
Safety valve
The purpose of the safety valve is to protect the flat station from excessive pressure.

The blow-off pipe from the safety valve must not be closed. The blow-off pipe outlet should be placed so that it discharges freely and it is possible to observe any dripping from the safety valve.

It is recommended to check the operation of safety valves at intervals of 6 months. This is done by turning the valve head in direction indicated.

11. CONTROLS

Click connection
The click connection can be dismantled during service.

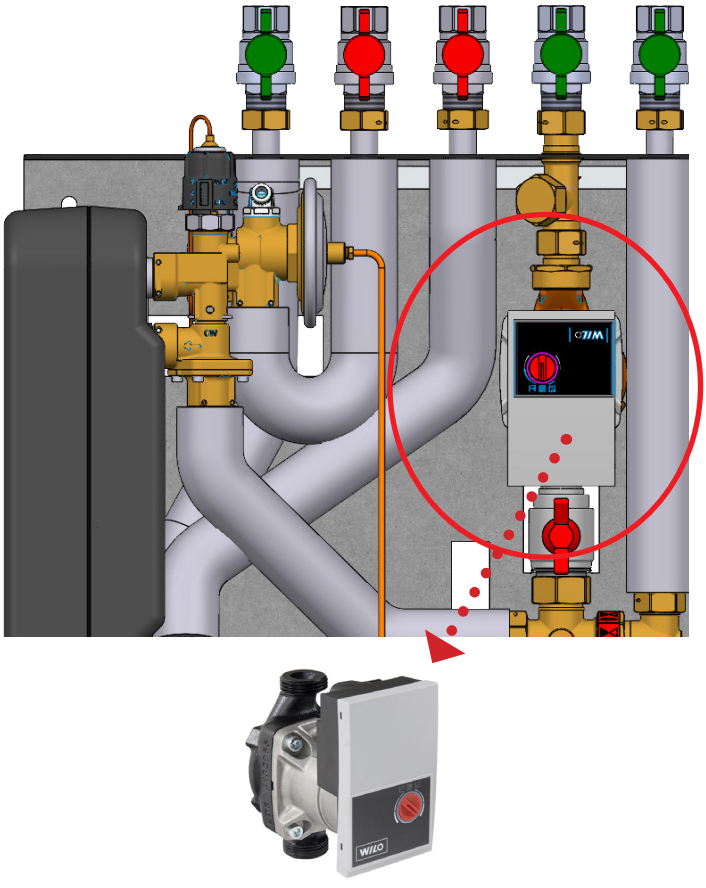


Circulation pump
Wilo Yonos Para Z15/7 RKC 130mm 1"

EvoFlat WSS, Circ. water heaters are factory fitted with a pump. 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.

For more information about bleeding the pump, etc. please see enclosed user manual:
WILO Yonos Para



Constant pressure
Max. pos.

Venting
Vertical pos.

Variable pressure
Max. pos.

12. MAINTENANCE

The substation requires little monitoring, apart from routine checks.

Regular inspections of the flat station according to this Instruction are recommended, which should include:

Strainers (if any)
Cleaning of strainers.

Temperatures
Checking of all temperatures, such as HS supply temperature and DHW temperature.

Connections
Checking all connections for leakages.

Safety valves
The operation of the safety valves should be checked by turning the valve head in the indicated direction.

Venting
Checking that the system is thoroughly vented.

Inspections should be carried out minimum every two years.

Spare parts can be ordered from Danfoss. Please ensure that any enquiry includes the flat station serial number.

Authorized personnel only
Assembly, start-up and maintenance work must be performed by qualified and authorized personnel only.

13. TROUBLESHOOTING GENERAL

In the event of operating disturbances, the following basic features should be checked before carrying out actual troubleshooting:

- the station is connected to electricity,
- the strainer (if any) on the HS supply pipe is clean,
- the supply temperature of the HS is at the normal level,
- the differential pressure is equal to or higher than the normal (local) differential pressure in the HS network – if in doubt, ask the HS plant supervisor.

Authorized personnel only
Assembly, start-up and maintenance work must be performed by qualified and authorized personnel only.

Problem	Possible cause	Solution
Too little or no DHW.	Strainer (if any) in supply or return line clogged.	Clean strainer(s).
	Defective or clogged non-return valve.	Replace – clean.
	No electricity. Only if station are with DHW circulation.	Check.
	Scaling of the plate heat exchanger.	Replace – rinse out.
	Defective temperature sensors.	Check – replace.
	Defective controller.	Check – replace.
Hot water in some taps but not in all.	DCW is being mixed with the DHW,	Check – replace.
	DHW circulation pump out of order or with too low setting. (Only if DHW circulation is installed)	Replace - clean
Tap temperature too high; DHW tap load too high.	Defective temperature sensors.	Check – replace.
Temperature drop during tapping.	Scaling of the plate heat exchanger.	Replace – rinse out.
	Larger DHW flow than the station has been designed for.	Reduce DHW flow.

14. EU DECLARATION OF CONFORMITY

Denmark
CVR nr.: 20 16 57 15

Telephone: +45 7488 2222
Fax: +45 7449 0949

EU DECLARATION OF CONFORMITY

Danfoss A/S
Danfoss Heating Segment – District Heating

Declares under our sole responsibility that the

Products: Substations in PED kat. 0 without electrical equipment

Type: Akva Vita, Akva Lux, Akva Les and Akva Therm waterheater,
Akva Vita II TD, Akva Lux TDP and Akva Vita II TDP-F,
Akva Lux II TD, Akva Lux II TDP, Akva Lux II TDP-F and Complete TDP-F,
Akva Les II TD,
EvoFlat FSS, EvoFlat Waterheater and EvoFlat Four Pipe
Distribution module SG
Metering station

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

Machinery Directive 2006/42/EC
DS/EN 60204-1/A1:2009. Safety of machinery – Part 1 – General Requirements.
DS/EN 12100:2011, Safety of machinery – Risk assessment.

Date	Issued by		Date	Approved	
6/4-17	Signature:			Signature:	
	Name:	Jan Bentzsen		Name:	Katja Brødegaard
	Title:	Engineering Expert		Title:	Quality Manager

Danfoss Redan A/S only vouches for the correctness of the English version of this declaration. In the event of the declaration being translated into any other language, the translator concerned shall be liable for the correctness of the translation

ID No: CHREUD01 Revision No: A Page 1 of 1

15. COMMISSIONING CERTIFICATE

The station is the direct link between the district heating supply and the house installation.
Before commissioning the home station, the rest of the system must be thoroughly rinsed and the tightness of the connections checked. Once the system has been filled with water, all pipe connections must be retightened before pressure testing for leaks. Clean the dirt traps and adjust according to the instructions in this manual.

When installing, comply with all local standards and regulations.

Installation and commissioning must only be carried out by qualified and authorized persons.

The station has been tested in the factory for leaks before delivery, but after transport, handling and heating of the system, all screw connections and connections must be checked and, if necessary, tightened. Please note that the connections can be made with EPDM rubber gaskets. Therefore, it is very important not to over-tighten the union nut, as this can lead to leaks. The manufacturer assumes no liability for leaks resulting from overvoltage.

To be completed by the installer

This plant has been redrawn, adapted and put into operation

date: _____ by installer: _____

ENGINEERING
TOMORROW

Danfoss Redan A/S
redan.dk • +45 8743 8943 • E-Mail: redan@danfoss.com