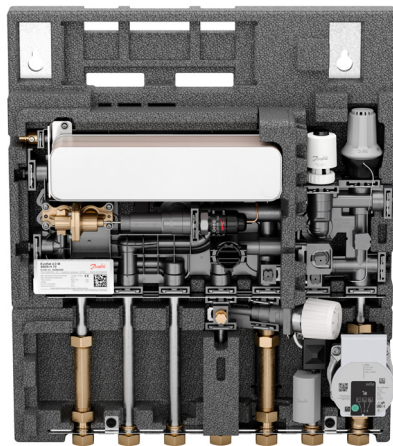


Data Sheet

EvoFlat 4.0 M

Domestic hot water and direct heating with mixing loop

Description



Product

Danfoss EvoFlat 4.0 is particularly suitable for multi family buildings with central heating.

The innovative unit sets a new standard. Its "body" is made from reinforced PPS composite. This makes the station lightweight and limits internal heat emission. The smooth surface reduces the risks of scaling and logging.

All components are mounted with click-fit connections. Compared to conventional stations with lots of pipes and screw connections, this technology does not require retightening during installation.

Primary side (DH)

The flat station is equipped with two differential pressure controller and a central strainer. A summer bypass keeps the supply line warm during standstill. This ensures a fast response time for DHW. The bypass can be operated thermostatically or manually.

Heating (HE)

The flat station supplies the floor heating with a regulated flow temperature, adjustable from 30 °C to 50 °C. The integrated temperature controller and the differential pressure controller create optimal operating conditions. A safety thermostat closes the flow at 55 °C. A highly efficient circulation pump is installed. The bathroom radiator or towel dryer can be connected using an optional high-temperature connection set.

Domestic hot water (DHW)

Four sizes of heat exchanger are available to cover every requirement from 37 kW up to 80 kW. A special built-in flow actuator allows primary and secondary side flow through the heat exchanger, only when hot water is tapped. It blocks the flow immediately after ending the tapping.

The EvoFlat 4.0 is characterized by an intelligent controller taking both flow volume and temperature into account. This self-acting thermostatic flow controller ensures accurate and stable water temperatures and optimized hydronic balance among all stations connected to the same heating source.

If necessary, it is possible to equip the station with an optional domestic hot water circulation set.

Features & benefits

- Low weight
- Easy to install, maintain and use
- Durable composite material
- Minimum space required for installation
- High insulation EPP cover
- Prepared for build-in heat meter
- Prepared for build-in water meter
- Compatible with several heat sources, such as district heating or heat pumps

Ordering

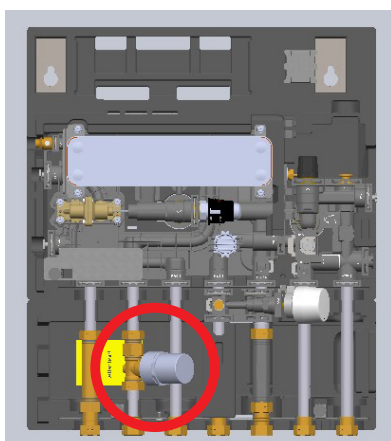
Product code numbers standard stations

Flat station	Brazing (HEX) copper	Brazing (HEX) Stainless steel
EvoFlat 4.0 M (HEX size 1)	183B2000	183B2500
EvoFlat 4.0 M (Hex size 2)	183B2001	183B2501
EvoFlat 4.0 M (HEX size 3)	183B2002	183B2502
EvoFlat 4.0 M (HEX size 4)	183B2003	183B2503

Product code numbers stations with water hammer arrestor

Flat station	Brazing (HEX) copper	Brazing (HEX) Stainless steel
EvoFlat 4.0 M WHA (HEX size 1)	183B2012	183B2512
EvoFlat 4.0 M WHA (Hex size 2)	183B2013	183B2513
EvoFlat 4.0 M WHA (HEX size 3)	183B2014	183B2514
EvoFlat 4.0 M WHA (HEX size 4)	183B2015	183B2515

Danfoss offers flat stations where water hammer arrestor is built in from the factory.



The water hammer resistor is placed at the domestic hot water supply.

Accessories



Recess box

Is made of galvanized steel with frame and door powder-coated on both sides in RAL9016. Brackets for mounting the flat station and distribution unit are prepared to make installation easy and fast.

The box is closed on all sides, open at the bottom with mounting feet, that can be adjusted in height by a maximum of 120 mm. A mounting rail including seven ball valves are included separately .

Can be installed in wall or on wall.

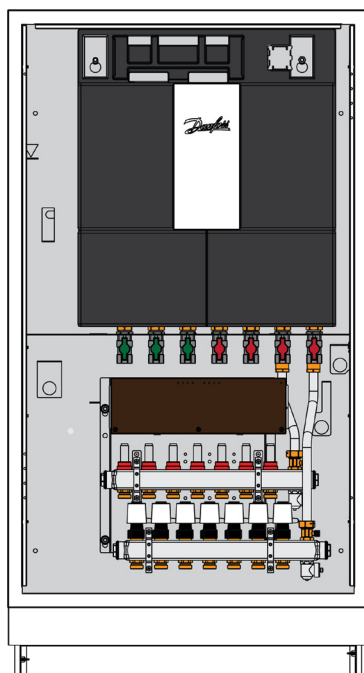
Reces boxes

Code number		Wide	Height	Depth
183U6030	Recess box w/mounting rail	610	1350	150
183U6031	Recess box w/mounting rail	690	1350	150
183U6032	Recess box w/mounting rail	850	1350	150
183U6033*	Feet set for recess box			
183L5142*	Ball valve set 3/4" 7 connections			

*Accessorie

On wall panels for recess boxes

Code number		Wide	High	Depth
183U6013	On wall panels	610	1350	150
183U6015	On wall panels	690	1350	150
183U6020	On wall panels	850	1350	150



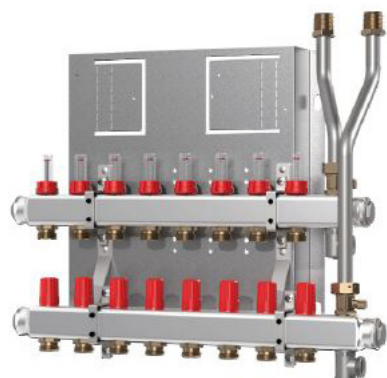
The distribution units fits on the back plate of the recess boxes but can also be mounted on the wall.

Recess boxes for built-in variants are available in three sizes:

2-9 circuits fits the:
Recess box W 610 / H 1350 / D 150 mm

10 circuits fits the:
Recess box W 690 / H 1350 / D 150 mm

11-12 circuits fits the:
Recess box W 850 / H 1350 / D 150 mm

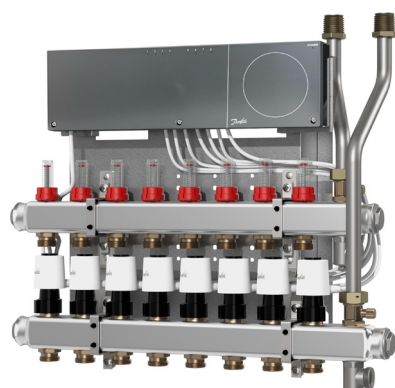


Distribution units SG

Plug and play for easy and quick installation. Finished manifold in stainless steel with connections especially suitable for Danfoss flat stations. The back plate is mounted with prepared screw holes directly into the recess box. SG variant can be used with or without any floor heating controller and actuators. It includes manual air-vents, drain valves and flow meters. Can be ordered with the connection of 2 to 12 floor heating loops.

Distribution unit SG

Code number	
145H0902	SG with 2 heating circuits
145H0903	SG with 3 heating circuits
145H0904	SG with 4 heating circuits
145H0905	SG with 5 heating circuits
145H0906	SG with 6 heating circuits
145H0907	SG with 7 heating circuits
145H0908	SG with 8 heating circuits
145H0909	SG with 9 heating circuits
145H0910	SG with 10 heating circuits
145H0911	SG with 11 heating circuits
145H0912	SG with 12 heating circuits

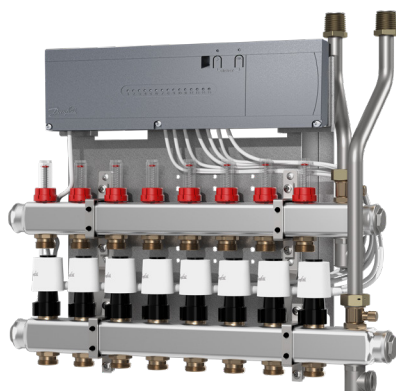


Distribution units SGC

Like SG but with Danfoss ICON Wiring Center. 230V thermoactuators TWA NC for control of the floor heating. Connected with wired room thermostats.

Distribution unit SGC

Code number	
145H0922	SGC with 2 heating circuits, ICON Wiring center 230V
145H0923	SGC with 3 heating circuits, ICON Wiring center 230V
145H0924	SGC with 4 heating circuits, ICON Wiring center 230V
145H0925	SGC with 5 heating circuits, ICON Wiring center 230V
145H0926	SGC with 6 heating circuits, ICON Wiring center 230V
145H0927	SGC with 7 heating circuits, ICON Wiring center 230V
145H0928	SGC with 8 heating circuits, ICON Wiring center 230V
145H0929	SGC with 9 heating circuits, ICON Wiring center 230V
145H0930	SGC with 10 heating circuits, ICON Wiring center 230V
145H0931	SGC with 11 heating circuits, ICON Wiring center 230V
145H0932	SGC with 12 heating circuits, ICON Wiring center 230V

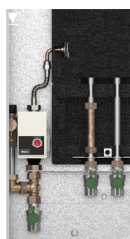


Distribution units SGCI

Like SG but with Danfoss ICON2 Advanced Master Controller.
 230V thermoactuators TWA NC for control of the floor heating, with automatic balancing. Connected with wireless and/or wired room thermostats and can be connected to Danfoss Ally™ via Ally Gateway, for enduser control. Easy commissioning via Danfoss ICON2 app, where the installer can generate a commissionings report.

Distribution unit SGCI

Code number	
145H1942	SGCI with 2 heating circuits, ICON 2, 230V
145H1943	SGCI with 3 heating circuits, ICON 2, 230V
145H1944	SGCI with 4 heating circuits, ICON 2, 230V
145H1945	SGCI with 5 heating circuits, ICON 2, 230V
145H1946	SGCI with 6 heating circuits, ICON 2, 230V
145H1947	SGCI with 7 heating circuits, ICON 2, 230V
145H1948	SGCI with 8 heating circuits, ICON 2, 230V
145H1949	SGCI with 9 heating circuits, ICON 2, 230V
145H1950	SGCI with 10 heating circuits, ICON 2, 230V
145H1951	SGCI with 11 heating circuits, ICON 2, 230V
145H1952	SGCI with 12 heating circuits, ICON 2, 230V



Domestic hot water circulation

If needed a set with pump and valve can be ordered for easy connection to the flat station.

Domestic hot water circulation

Code number	
183B0500	Circulation set EvoFlat SAC
183B0547	Circulation set EvoFlat SAC insulated



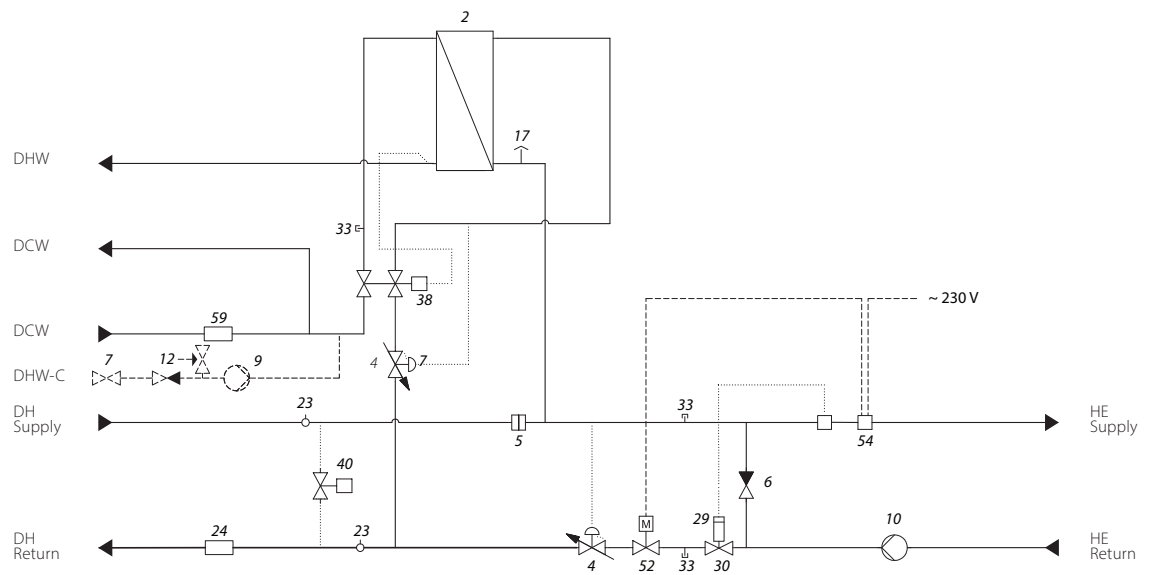
High temperature connection

In case of a towel dryer, HT-connection set can be installed.

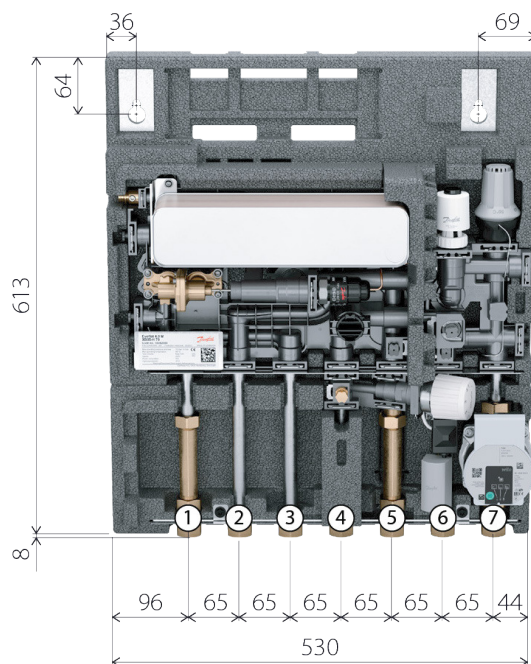
Domestic hot water circulation

Code number	
183B0501	HTC set EvoFlat 4.0
183B0539	HTC flex pipe set EvoFlat 4.0

Circuit diagram



- 2 DHW plate heat exchanger
 - 4 Differential pressure controller
 - 5 Strainer
 - 6 Check valve
 - 7 Ball valve*
 - 9 DHW circulation pump*
 - 10 Heating pump mixing circuit
 - 12 Safety valve*
 - 17 Air vent
 - 23 Sensor pocket
 - 24 Fitting piece for energy meter 3/4" x 110 mm
 - 29 Temperature sensor
 - 30 Valve HE
 - 33 Plug for high temperature circuit (HTC)
 - 38 Hot water controller
 - 40 Summer bypass
 - 52 Zone valve*
 - 54 Safety thermostat with TWA
 - 59 Fitting piece for water meter 3/4" x 110 mm
- *Optional



Connections:

- 1 Domestic cold water (DCW) inlet
- 2 Domestic hot water (DHW) supply
- 3 Domestic cold water (DCW) outlet
- 4 Heating source (DH) supply
- 5 Heating source (DH) return
- 6 Floor heating (HE) supply
- 7 Floor heating (HE) return

Technical data

Domestic hot water controller	TPC-M
Nominal pressure	PN10
Max. supply temperature (DH)	95 °C
DCW static cold water	$P_{min} = 1.5 \text{ bar}$
Brazing (HEX)	Copper or stainless steel
Weight excl. cover	9.2 - 10.8 kg
Insulation	EPP λ 0.039
Electrical supply	230V AC
Connection sizes	G 3/4" internal thread
Pressure nominal primary	10 bar
Pressure nominal secondary	10 bar
Weight without accessories - Type 1 HEX	12.2 kg
Weight without accessories - Type 2 HEX	13.3 kg
Weight without accessories - Type 3 HEX	13.8 kg
Weight without accessories - Type 4 HEX	14.6 kg

DHW capacity examples

Unit type HEX	DHW capacity [kW]	Temperature DHS/DHR [°C]	Flow rate primary [l/h]	Pressure loss Primary* [kPa]	Tap load 50 °C [l/min]
Type 1	37	65/15	637	25	13.3
	43	65/16	750	32	15.4
Type 2	45	65/15	770	29	16.2
	49	65/15	844	35	17.6
Type 3	55	65/15	943	40	19.8
	38	55/19	901	37	13.7
Type 4	60	65/14	1014	41	21.6
	70	65/14	1197	57	25.2
	49	55/19	1158	52	17.6

*Energy meter not included

Heating capacity examples

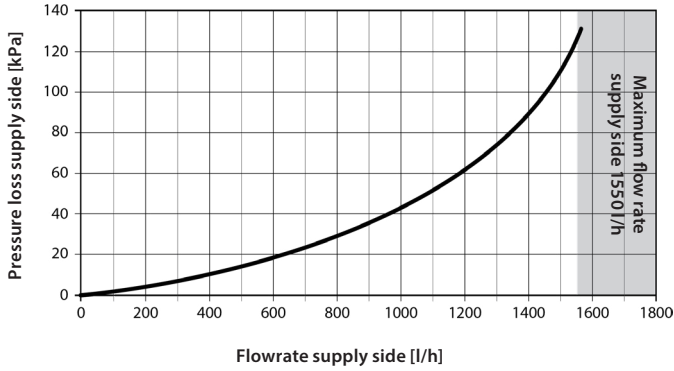
Heating capacity [kW]	Heating circuit ΔT [°C]	Total pressure loss primary* [kPa]	Flow rate supply [l/h]
10	20	12	430
10	25	8	344
10	30	6	287
10	35	5	246
10	40	4	215
17.5	30	20	500**

*Energy meter and DHW heating not included

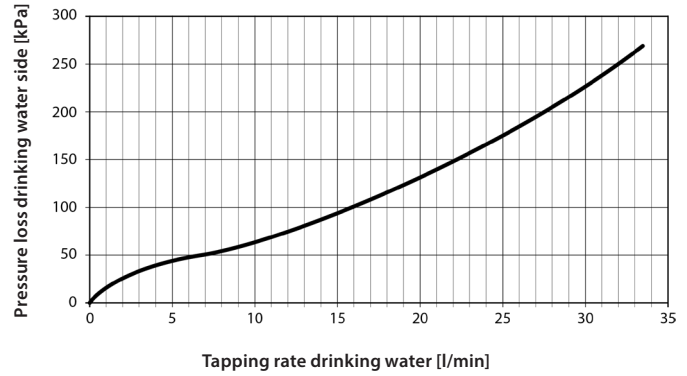
**Max. flow

Flowrate type 1 HEX

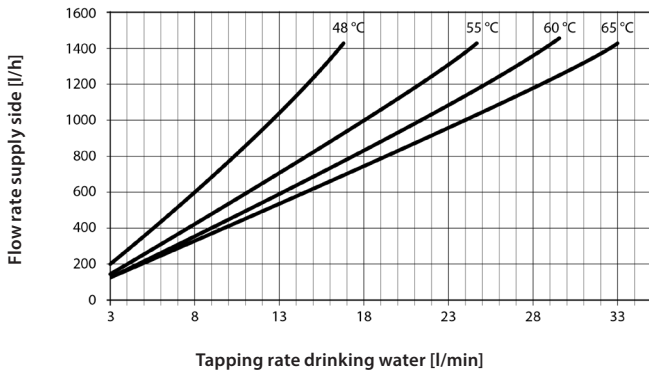
Pressure loss supply side (primary heating water)



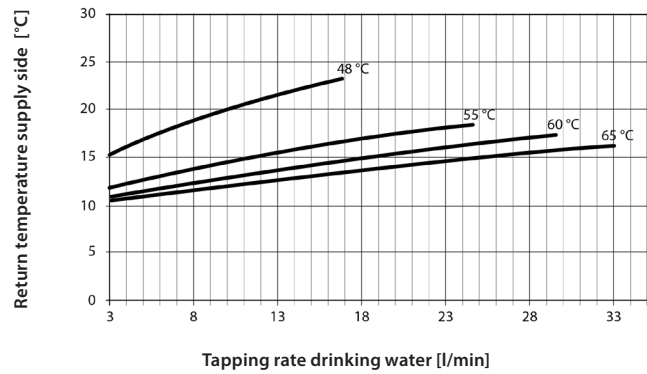
Pressure loss drinking waer side (secondary)



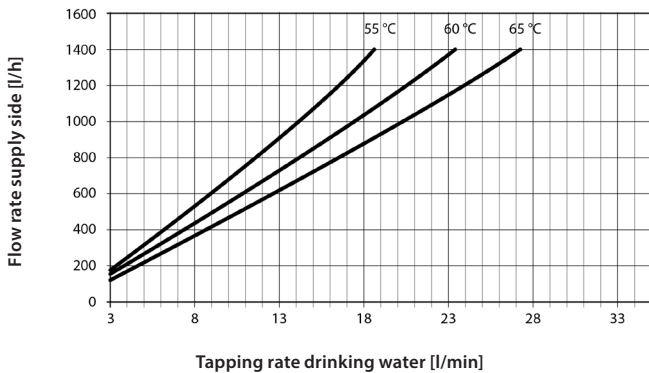
Flow rate supply side at different supply temperatures
DHW heating from 10 to 45 °C



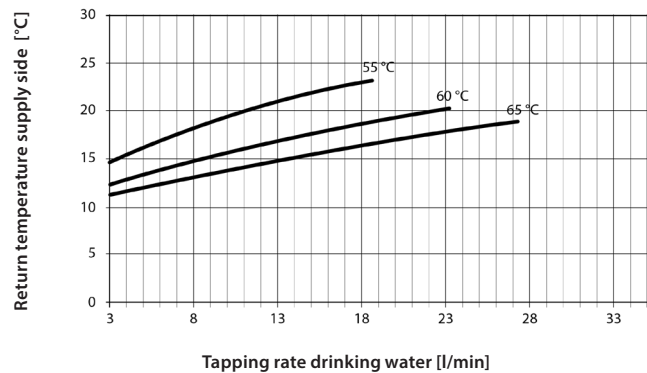
Return temperature supply side at different supply temperatures
DHW heating from 10 to 45 °C



Flow rate supply side at different supply temperatures
DHW heating from 10 to 55 °C

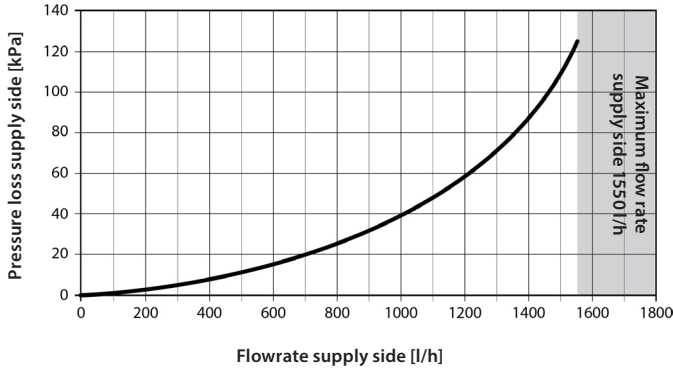


Return temperature supply side at different supply temperatures
DHW heating from 10 to 55 °C

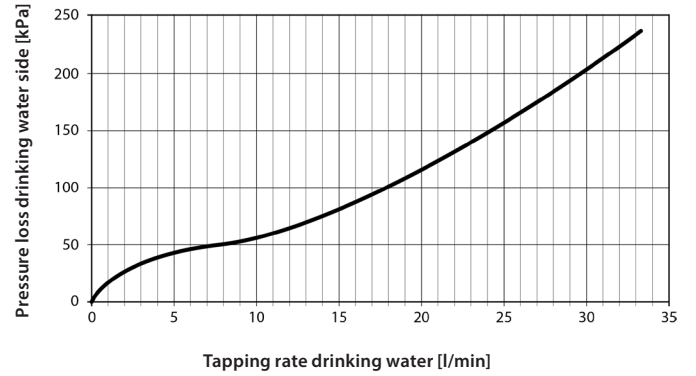


Flowrate type 2 HEX

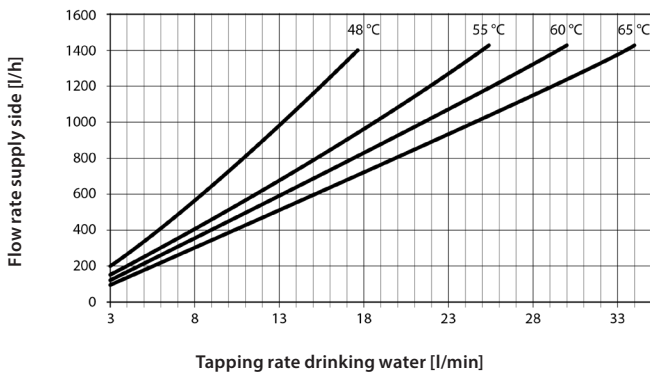
Pressure loss supply side (primary heating water)



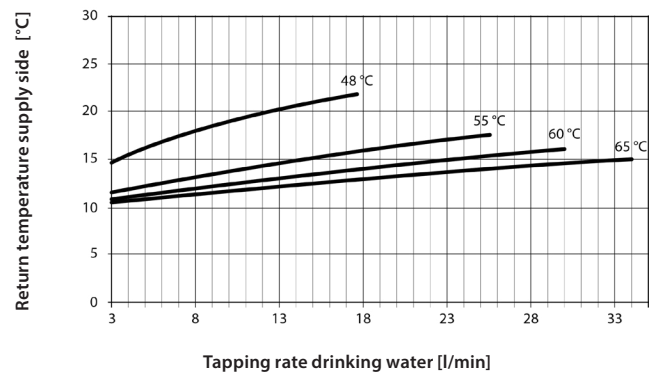
Pressure loss drinking waer side (secondary)



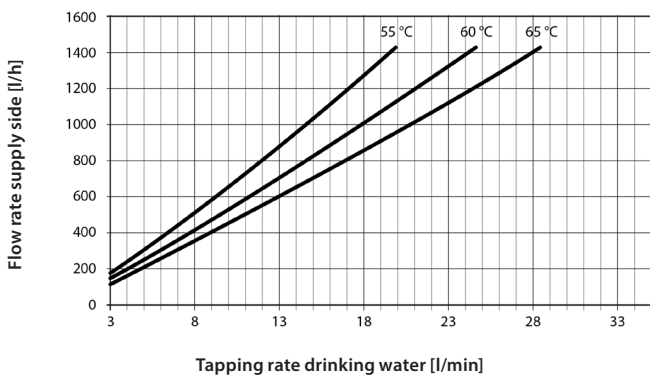
Flow rate supply side at different supply temperatures
DHW heating from 10 to 45 °C



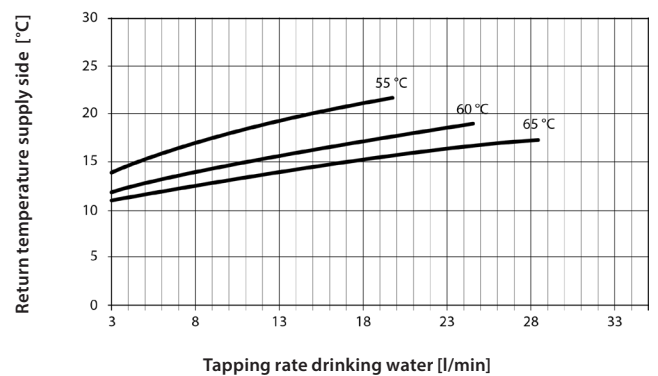
Return temperature supply side at different supply temperatures
DHW heating from 10 to 45 °C



Flow rate supply side at different supply temperatures
DHW heating from 10 to 55 °C

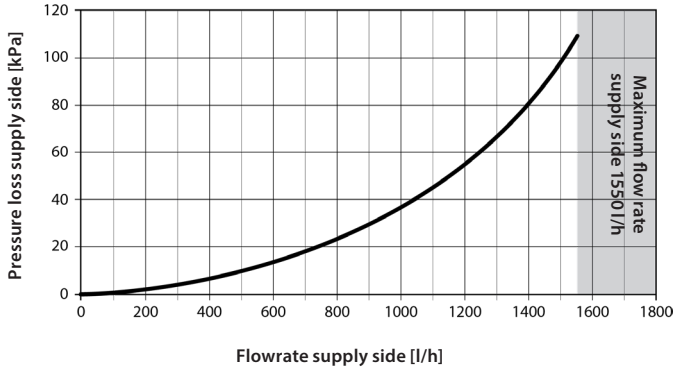


Return temperature supply side at different supply temperatures
DHW heating from 10 to 55 °C

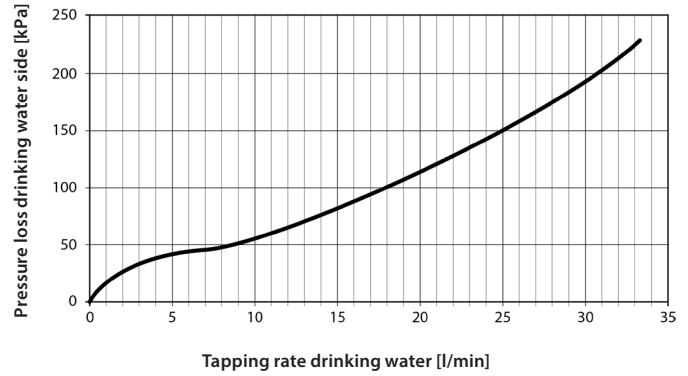


Flowrate type 3 HEX

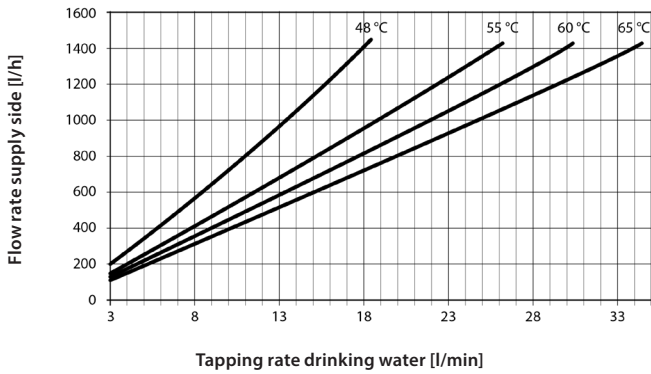
Pressure loss supply side (primary heating water)



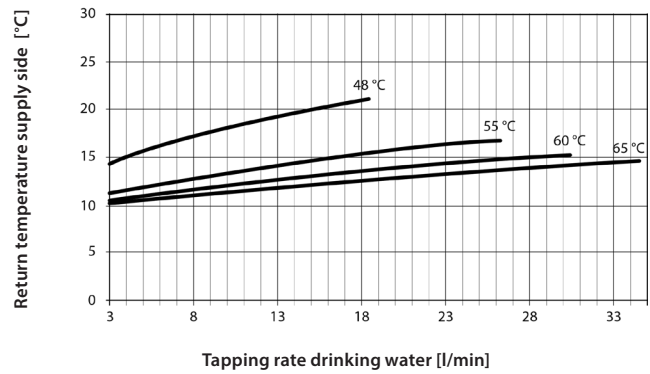
Pressure loss drinking waer side (secondary)



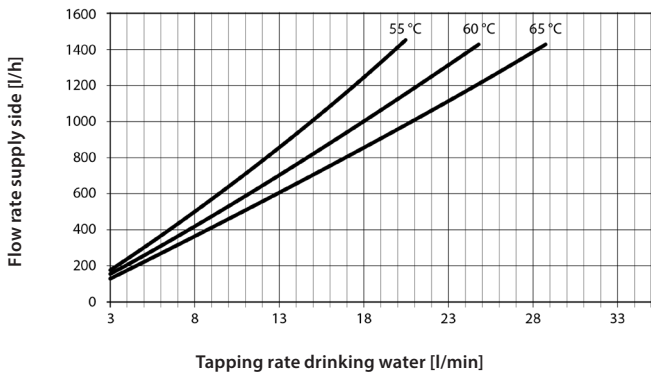
Flow rate supply side at different supply temperatures
DHW heating from 10 to 45 °C



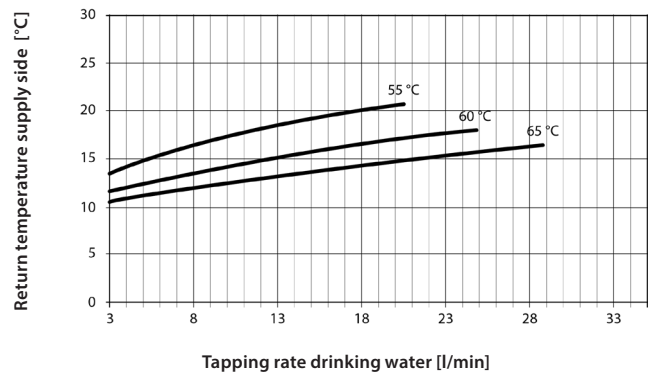
Return temperature supply side at different supply temperatures
DHW heating from 10 to 45 °C



Flow rate supply side at different supply temperatures
DHW heating from 10 to 55 °C

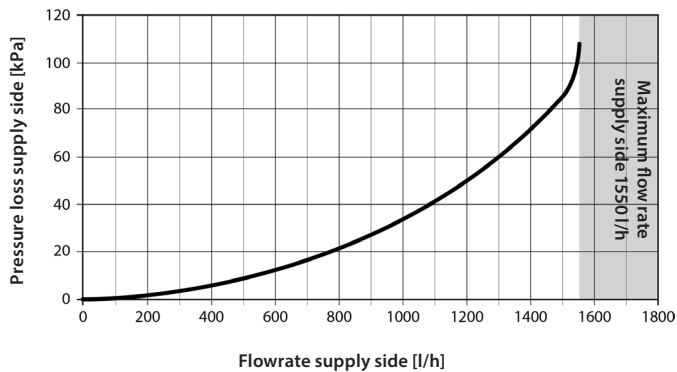


Return temperature supply side at different supply temperatures
DHW heating from 10 to 55 °C

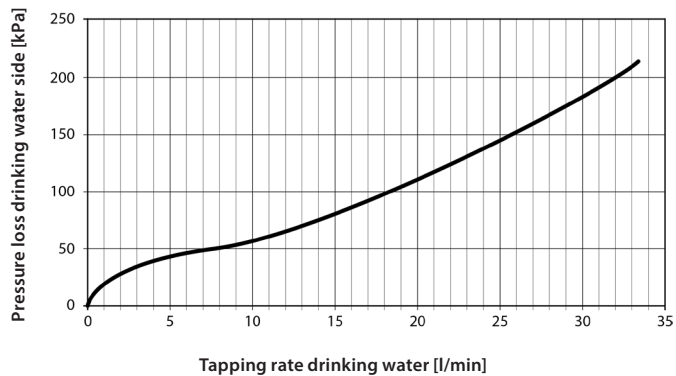


Flowrate type 4 HEX

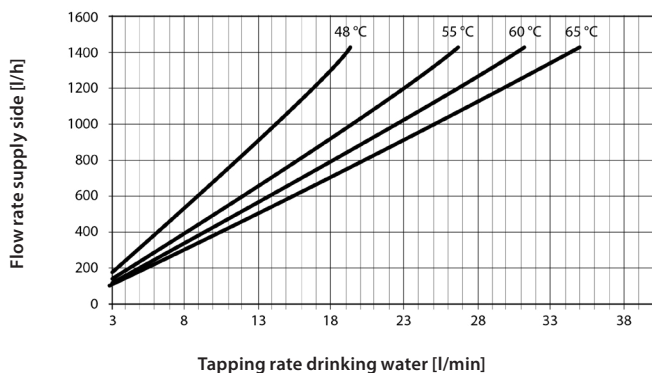
Pressure loss supply side (primary heating water)



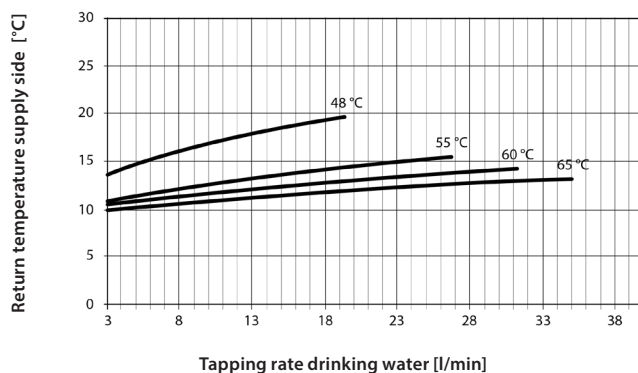
Pressure loss drinking water side (secondary)



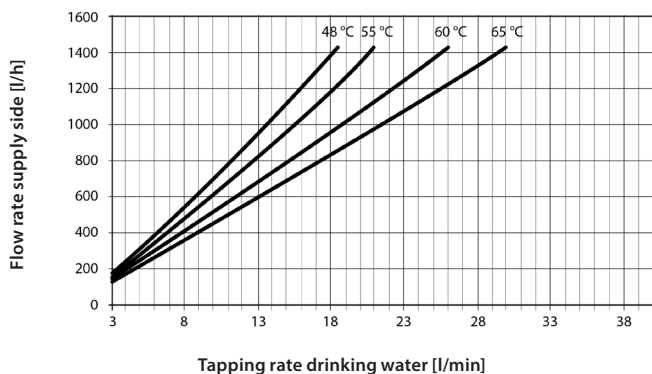
Flow rate supply side at different supply temperatures
DHW heating from 10 to 45 °C



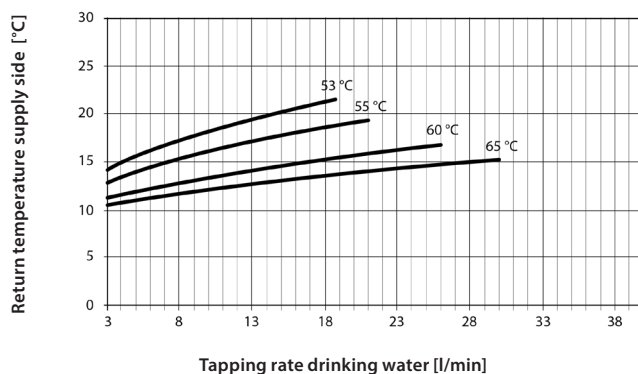
Return temperature supply side at different supply temperatures
DHW heating from 10 to 45 °C



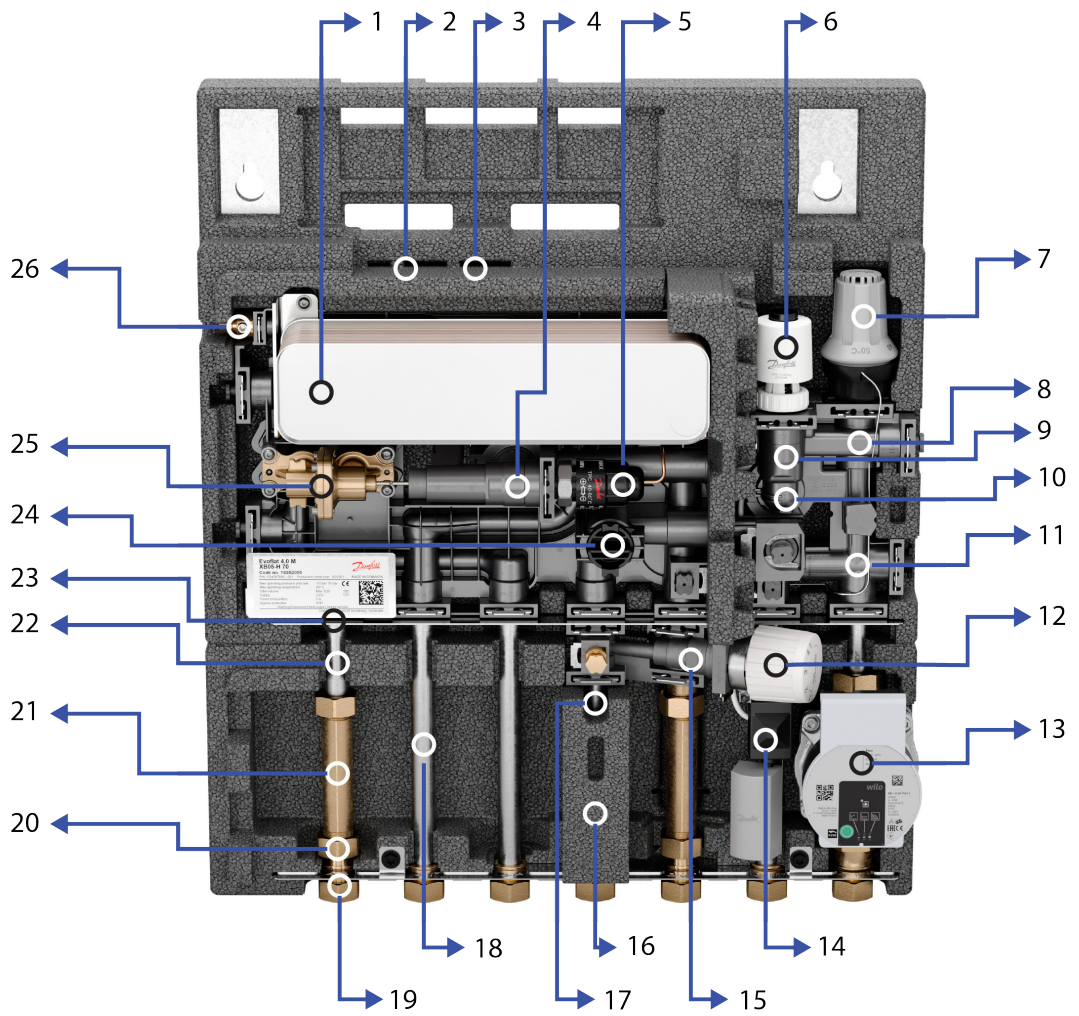
Flow rate supply side at different supply temperatures
DHW heating from 10 to 55 °C



Return temperature supply side at different supply temperatures
DHW heating from 10 to 55 °C



Spare parts



Spare parts

Pos.	Code number	Description
1	183B0503	Service kit type 1 heat exchanger in copper
1	183B0504	Service kit type 2 heat exchanger in copper
1	183B0505	Service kit type 3 heat exchanger in copper
1	183B0506	Service kit type 4 heat exchanger in copper
1	183B0507	Service kit type 1 heat exchanger in stainless steel
1	183B0508	Service kit type 2 heat exchanger in stainless steel
1	183B0509	Service kit type 3 heat exchanger in stainless steel
1	183B0510	Service kit type 4 heat exchanger in stainless steel
2	183U2104	Bracket kit for EvoFlat 4.0
3	145H3819	Plast screw 15x25
4	183B0511	DHW control valve set EvoFlat 4.0
5	183B512	DHW control thermostat set EvoFlat 4.0
6	183B0542	Temperature switch + TWA-Q-NO EvoFlat 4.0
7	013G5081	FTC Thermostat 15-50 °C
8	183B0527	HE valve set EvoFlat 4.0
9	183B0529	Zone valve set EvoFlat 4.0
10	003L3760	IFS dp regulator
11	183B0009	Cartridge for checkvalve IFS
12	183B0517	Bypass valve set thermostatic EvoFlat 4.0
13	145H4296	Wilo pump Yonos Para RS 15/6 1"
13	145H4074	Plug for Wilo Yonos Para 1.5m cable
14	183B0542	Safety temperature switch+TWA-Q-NO EvoFlat 4.0
15	183B0516	Bypass valve set manual EvoFlat 4.0
16	183B0003	Block for bypass IFS PPS 30GF
17	530Z388	Pipe Ø18 171 mm
18	830Z219	Pipe Ø18 223 mm
19	183N5020	Bushing w/nuts 3/4"x3/4"x32mm
20	145H3120	EPDM shore 3/4" udst. 24x17.5x3mm
21	144B2192	Insert 3/4"x110mm
22	830Z207	Pipe Ø18 77mm
23	183B0000	Washer Ø18.2xØ23.45x2mm
23	145.083	O-ring 17.50x3.50
24	183B0515	Strainer set EvoFlat 4.0
25	183B0514	Flow activator with screws and gaskets
26	183B0513	Air vent set Danfoss EvoFlat 4.0
	183B0521	EPP cover set Danfoss EvoFlat 4.0
	183B0518	Plug/O-ring/clips set 2 pc EvoFlat 4.0
	183B0519	Clips set 5 pcs./size EvoFlat 4.0
	183B0520	Gasket set EvoFlat 4.0
	183B0533	Flushing Tool EvoFlat 4.0 HEX

Guide lines for water quality

Danfoss has prepared this guideline for the water quality of tap water and district heating water used in plate heat exchangers of stainless steel (EN 1.4404 ~ AISI 316L) brazed with pure Copper (Cu), CoResist (Cn) or Stainless Steel (StS). It is important to point out that the water specification is not a guarantee against corrosion, but it must be considered as a tool to avoid the most critical water applications.

Parameter	Unit	Value or concentration	Plate	Brazing material		
			AISI 316L W. Nr. 1.4404	Cu	CoResist	StS
pH		< 0.6	o	-	-	o
		6.0 - 7.5	+	o/-	o	+
		7.5 - 10.5	+	+	+	+
		> 10.5	+	o	o	+
Conductivity	µS/cm	< 10	+	+	+	+
		10 - 500	+	+	+	+
		500 - 1000	+	o	+	+
		> 1000	+	-	o	+
Free Chlorine	mg/l	< 0.5	+	+	+	+
		0.5 - 1	o	+	+	+
		1 - 5	-	o	o	o
		> 5	-	-	-	-
Ammonia (NH ₃ , NH ₄ ⁺)	mg/l	< 2	+	+	+	+
		2 - 20	+	o	o	+
		> 20	+	-	-	+
Alkalinity (HCO ₃ ⁻)	mg/l	< 60	+	+	+	+
		60 - 300	+	+	+	+
		> 300	+	o	+	+
Sulphate (SO ₄ ²⁻)	mg/l	< 100	+	+	+	+
		100 - 300	+	o/-	o	+
		> 300	+	-	-	+
HCO ₃ ⁻ / SO ₄ ²⁻	mg/l	< 1.5	+	+	+	+
		> 1.5	+	o/-	o	+
Nitrate (NO ₃)	mg/l	< 100	+	+	+	+
		> 100	+	o	+	+
Manganese (Mn)	mg/l	< 0.1	+	+	+	+
		> 0.1	+	o	o	+
Iron (Fe)	mg/l	< 0.2	+	+	+	+
		> 0.2	+	o	+	+
* Hardness ratio [Ca ²⁺ , Mg ²⁺]/[HCO ₃ ⁻]		0 - 0.3	+	-	-	+
		0.3 - 0.5	+	o/-	+	+
		> 0.5	+	+	+	+

+	Good corrosion resistance
o	**Corrosion could happen when more parameters are evaluated with o
o/-	Risk of corrosion
-	Use is not recommended

* Hardness ration limits defined per experience and internal tests in Danfoss laboratory

** In case of three or more parameters evaluated with o consultancy is needed with Consultant for Corrosion & Microbiology or BU HHE Representative

Recommended Chloride concentration to avoid Stress Corrosion Cracking (SCC) in the stainless-steel plates:

Application temperature	Chloride concentration
at $T \leq 20^{\circ}\text{C}$	max 1000 mg/l
at $T \leq 50^{\circ}\text{C}$	max 400 mg/l
at $T \leq 80^{\circ}\text{C}$	max 200 mg/l
at $T \geq 100^{\circ}\text{C}$	max 100 mg/l

**Certificates,
declarations
and approvals**

CE	
EU RoHS	
EPD	

Tender text
Copper HEX**Design**

Danfoss EvoFlat™ flat station for direct heating and hygienic safe hot water provision with a control valve without auxiliary energy in the continuous flow system. Mounted on a heat-insulated base plate including EPP heat insulation hood, for flush or surface mounting.

Domestic hot water (DHW)

Tap water is heated by means of heat exchangers based on the continuous flow principle. The tap water temperature is regulated by the self-acting controller. These controllers ensure outstanding ease of use. The flow-controlled part allows primary and secondary flow through the heat exchanger only during hot water tapping. The flow is blocked immediately after completion of hot water tapping.

The thermostat part in turn regulates the hot water temperature.

Thanks to the fast-acting control valve, limescale deposits and bacteria growth are largely avoided.

The controller in combination with the differential pressure controller ensures a constant DHW temperature even with varying flow temperatures and differential pressures.

The primary line is kept warm by a thermostatically controlled bypass valve (summer bypass).

The flat station is equipped with a connection for domestic hot water circulation. The circulation kit is available as an option.

Heating (HE)

The mixing circuit for surface heating temperature control, consisting of a mechanical control group with a second integrated differential pressure controller for setting the FBH flow temperature, non-return valve and high-efficiency circulation pump (energy efficiency index $EEL \leq 0.20$). Safety device for flow temperature monitoring by Danfoss safety thermostat (55°C). If the temperature is too high, the integrated zone valve is closed by a servomotor.

The flat station is equipped with a connection for a second heating circuit on the high temperature circuit. The high temperature connection set is available as an option.

Supply-side equipment

Temperature and pressure regulators, two differential pressure regulators, zone valve, strainer and ventilation

Mark: Danfoss

Thermal actuator, 230V, normally open

Mark: Danfoss

Type: TWA-Q 230V NO

Fitting piece for heat meter G $\frac{3}{4}$ "x110mm in return flow, sensor holder as direct immersion sensor M10x1mm

Heat exchanger

Seal less stainless steel plate heat exchanger, copper brazed under vacuum to form a compact unit. New Micro Plate™ heat exchanger technology with unique plate structure for more effective heat transfer, lower pressure losses and longer service life. Corrosion resistant design.

Calculation and materials according to AD data sheets. Manufactured in accordance with DIN ISO 9001, CE tested in accordance with Pressure Equipment Directive 97/23/EC (PED).

Mark: Danfoss

Type: XB05H

Consumer-side equipment

Connection for static heating circuit (high temperature circuit) speed-controlled high-efficiency circulation pump:

Mark: Wilo

Type: Para 15-130/6

Non-return valve in bypass.

Fixed value controller without auxiliary energy

Mark: Danfoss FTC

Safety thermostat

Mark: Danfoss

Tap-water-side equipment

Fitting piece for cold water meter G $\frac{3}{4}$ "x110mm (CW inlet)

Technical data

Heating

max. capacity [kW]: 17.5

at max. volume flow [m³/h]: 0.5 (supply side) / 1.29 (consumer side)

Tap water heating

max. capacity [kW]: 45 @ VL65°C (Type 1 HEX)

at max. tapping capacity [l/min]: 13.2

max. capacity [kW]: 53 @ VL65°C (Type 2 HEX)

at max. tapping capacity [l/min]: 15.4

max. capacity [kW]: 60 @ VL65°C (Type 3 HEX)

at max. tapping capacity [l/min]: 17.4

max. capacity [kW]: 80 @ VL65°C (Type 4 HEX)

at max. tapping capacity [l/min]: 28.3

Pressure level (tap water side): PN10

Pressure level (supply side): PN10

DH network, max. differential pressure [bar]: 4

CW network, min. static pressure [bar]: 1.5

DH network, max. flow temperature [°C]: 95

Nominal connection size: G $\frac{3}{4}$ " (union, 7x)

Electrical connection: 230V AC

Dimensions H/W/D [mm]: 613/530/150

Weight [kg]: 9.2 (Type 1 HEX)

9.7 (Type 2 HEX)

10.3 (Type 3 HEX)

10.8 (Type 4 HEX)

Tender text
Stainless steel
HEX**Design**

Danfoss EvoFlat™ flat station for direct heating and hygienic safe hot water provision with a control valve without auxiliary energy in the continuous flow system. Mounted on a heat-insulated base plate including EPP heat insulation hood, for flush or surface mounting.

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Mark: Danfoss

Thermal actuator, 230V, normally open

Mark: Danfoss

Type: TWA-Q 230V NO

Fitting piece for heat meter G $\frac{3}{4}$ "x110mm in return flow, sensor holder as direct immersion sensor M10x1mm

Heat exchanger

Sealless stainless steel plate heat exchanger, brazed with stainless steel braze under vacuum to form a compact unit. New Micro Plate™ heat exchanger technology with unique plate structure for more effective heat transfer, lower pressure losses and longer service life. Corrosion resistant design.

Calculation and materials according to AD data sheets. Manufactured in accordance with DIN ISO 9001, CE tested in accordance with Pressure Equipment Directive 97/23/EC (PED).

Mark: Danfoss

Type: XB05H

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Mark: Wilo

Type: Para 15-130/6

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Fixed value controller without auxiliary energy

Mark: Danfoss FTC

Safety thermostat

Mark: Danfoss

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max. capacity [kW]: 60 @ VL65°C (Type 3 HEX)

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max. capacity [kW]: 80 @ VL65°C (Type 4 HEX)

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Electrical connection: 230V AC

Dimensions H/W/D [mm]: 613/530/150

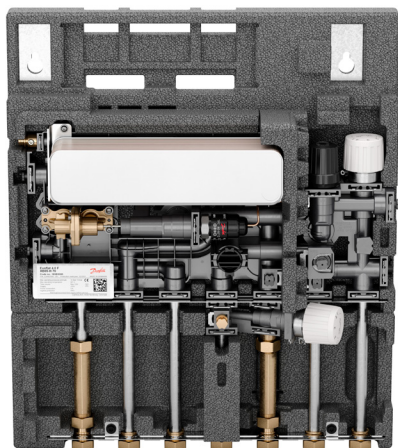
Weight [kg]: 9.2 (Type 1 HEX)

9.7 (Type 2 HEX)

10.3 (Type 3 HEX)

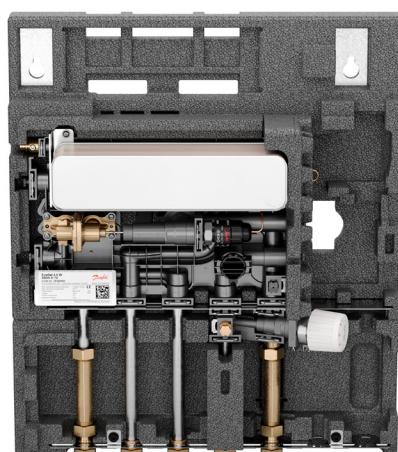
10.8 (Type 4 HEX)

Other stations in this portfolio



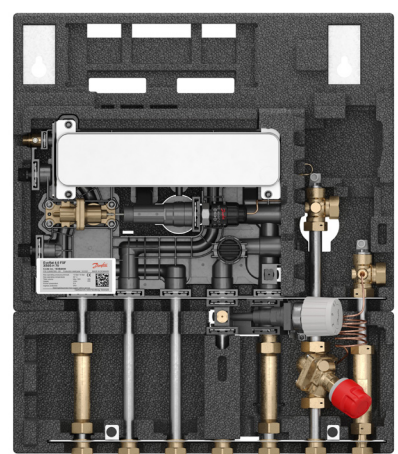
EvoFlat 4.0 F

Flat station for domestic hot water and radiator heating.



EvoFlat 4.0 W

Flat station for domestic hot water.



EvoFlat 4.0 Four pipe

Flat station for domestic hot water and floor heating. Especially made for heat pumps.

Danfoss A/S

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