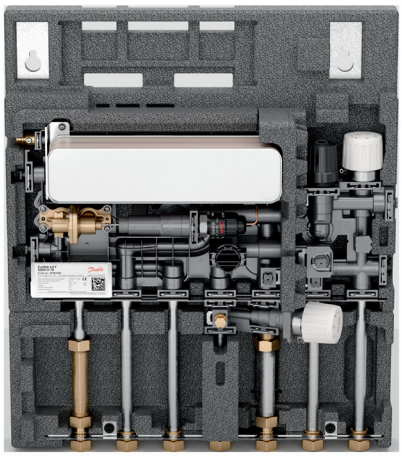
ENGINEERING TOMORROW

Data Sheet

EvoFlat 4.0 F

Domestic hot water and direct heating

Description



Product

Danfoss EvoFlat 4.0 station is particularly suitable for multi family buildings with central heat generation or district heating.

The innovative unit sets new standard. It consists of functional blocks made of a specially reinforced PPS composite material. This makes the station extremely lightweight and limits internal heat emission. The smooth surface reduces the risks of scaling and clogging.

All components are assembled with newly designed click-fit connections. Compared to conventionel substations with pipes and screw connections, this new connection technology does not require retightening during installation and commissioning.

Primary side (DH)

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

Heating (HE)

The flat station supplies the radiator heating circuits with the flow temperature provided by the supply. The differential pressure regulator integrated as standard creates optimal operating conditions for the heating. A zone valve is integrated in the return side. Time-dependent temperature control can be carried out using an optional actuator and room thermostat using an optional high-temperature connection set.

Domestic hot water (DHW)

Four sizes of heat exchanger are available to cover all requirements from 37 kW up to 70 kW. The Evoflat 4.0 M is equipped with an intelligent controller that regulates the supply side flow based on the domestic hot water temperature and the volume of water drawn. The station features an integrated differential pressure controller on the supply side of the domestic hot water heating system. This eliminates the need for hydraulic balancing of the station.

If necessary, the station can be expanded with a hot water circulation set.

Features & benefits

- Lightweight
- Easy installation, maintainance and operation
- Durable composit material
- Minimum space required for installation
- Minimal heat loss thanks to EPP insulation cover
- Prepared for build-in heat meter
- Prepared for build-in water meter
- Compatable with various heat sources, such as district heating, heat pumps, biomass etc.

Ordering

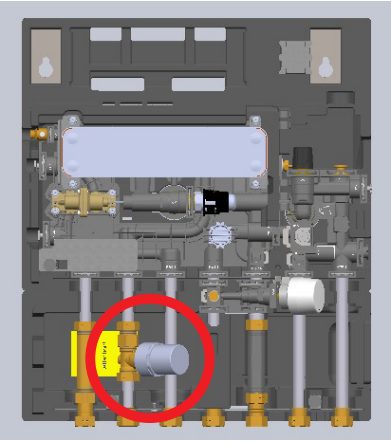
Product code numbers standard stations

Flat station	Brazing (HEX) copper	Brazing (HEX) Stainless steel
EvoFlat 4.0 F (HEX size 1)	183B1000	183B1500
EvoFlat 4.0 F (Hex size 2)	183B1001	183B1501
EvoFlat 4.0 F (HEX size 3)	183B1002	183B1502
EvoFlat 4.0 F (HEX size 4)	183B1003	183B1503

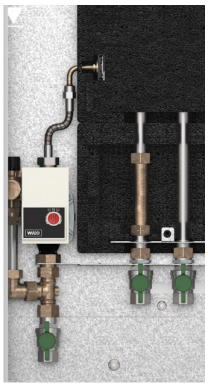
Product code numbers stations with water hammer arrestor

Flat station	Brazing (HEX) copper	Brazing (HEX) Stainless steel
EvoFlat 4.0 F WHA (HEX size 1)	183B1012	183B1512
EvoFlat 4.0 F WHA (Hex size 2)	183B1013	183B1513
EvoFlat 4.0 F WHA (HEX size 3)	183B1014	183B1514
EvoFlat 4.0 F WHA (HEX size 4)	183B1015	183B1515

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.



Domestic hot water circulation

If required a set with pump and safety valve (10 bar) can be ordered for easy connection to the flat station. This increases the width of the recess box to at least 690 mm.

Domestic hot water circulation

Code number	
183B0500	Circulation set EvoFlat 4.0
183B0547	Circulation set EvoFlat 4.0 with insulation shell for circulation pump

Accessories

Recess box

Is made of galvanized sheet steel metal, with frame and door powder-coated on both sides in RAL 9016.
Appropirate mounting bolts are provided on the rear wall for quick and easy installatiion of the flast station and distribution unit.
The box is closed all around, open at the bottom, and features mounting feet that are height-adjustable by up to 120 mm.
A mounting rail with seven ball valves (supplied loose) is included.
The box can be mounted in a wall or on a wall.

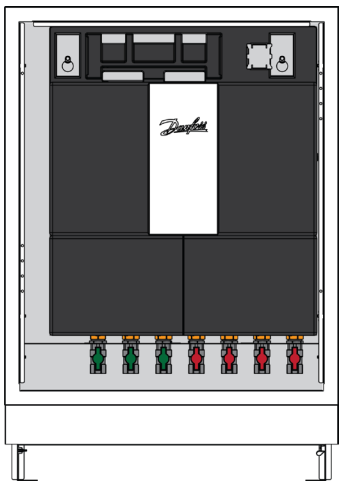
Reces boxes

Code number		Wide	Height	Depth
183U6028	Recess box w/mounting rail and loose ball valves	610	910	150
183U6029	Recess box w/mounting rail and loose ball valves	690	910	150
183U6033*	Feet set for recess box			
183L5142*	Ball valve set 3/4" 7 connections			

*Spare parts

On wall panels for recess boxes

Code number		Wide	High	Depth
183U6012	On wall panels	610	910	150
183U6014	On wall panels	690	910	150



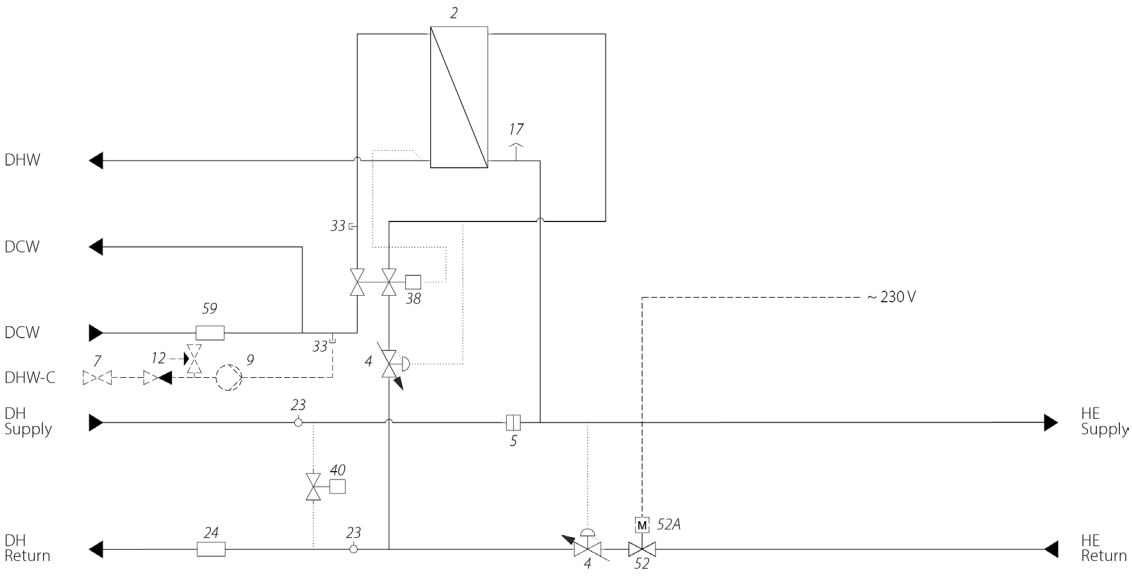
The distribution units fits on the back plate of the recess boxes but can also be mounted on the wall.

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

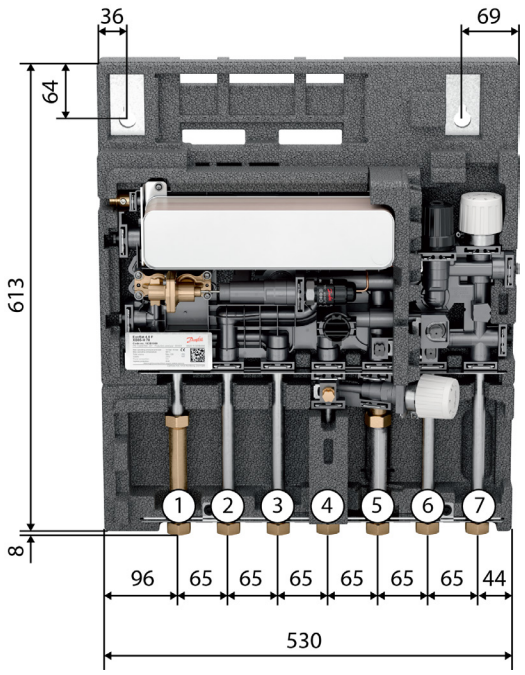
Standard station:
Recess box W 610 / H 910 / D 150 mm

Station with DHW circulation
Recess box W 690 / H 910 / D 150 mm

Circuit diagram



2 DHW plate heat exchanger
4 Differential pressure controller
5 Strainer
7 Ball valve*
9 DHW circulation pump*
12 Safety valve*
17 Air vent
23 Sensor pocket
24 Fitting piece for energy meter 3/4" x 110 mm
33 Connection DHW circulation
38 Hot water controller
40 Summer bypass
52 Zone valve*
52A TWA Q-NO 230V for zone valve*
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 Room heating (HE) supply
7 Room 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 bar
Brazing (HEX)	Copper or stainless steel
Weight excl. cover	7.7 - 9.3 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	9.7 kg
Weight without accessories - Type 2 HEX	10.1 kg
Weight without accessories - Type 3 HEX	10.6 kg
Weight without accessories - Type 4 HEX	11.4 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

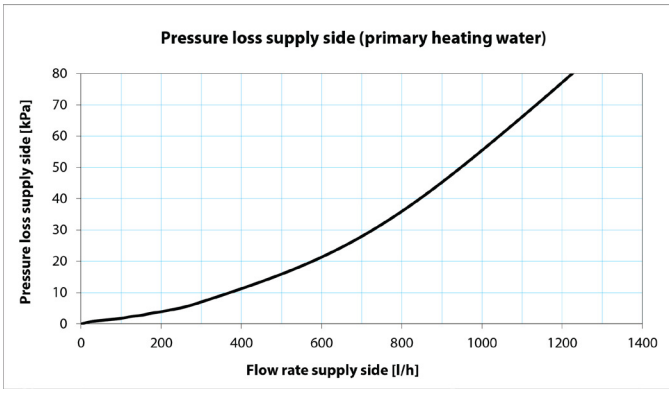
*Energy meter not included

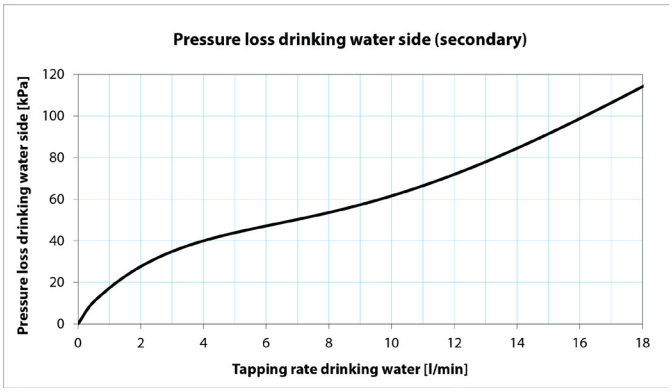
Heating capacity examples

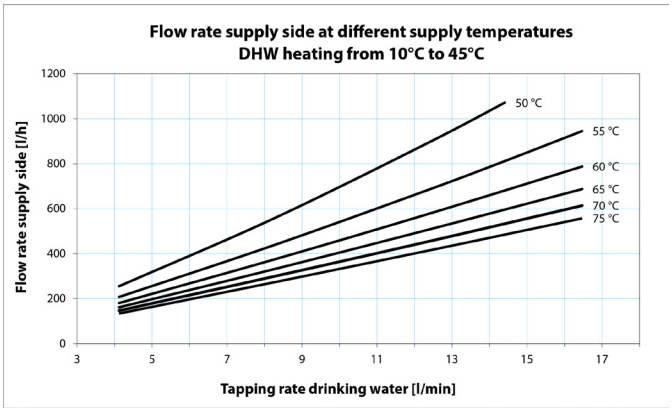
Heating capacity [kW]	Heating circuit ΔT [°C]	Total pressure loss primary* [kPa]	Flow rate supply [l/h]
10	20	12	430
10	25	8	344
10	30	6	287
10	35	5	246
10	40	4	215
17.5	30	20	500**

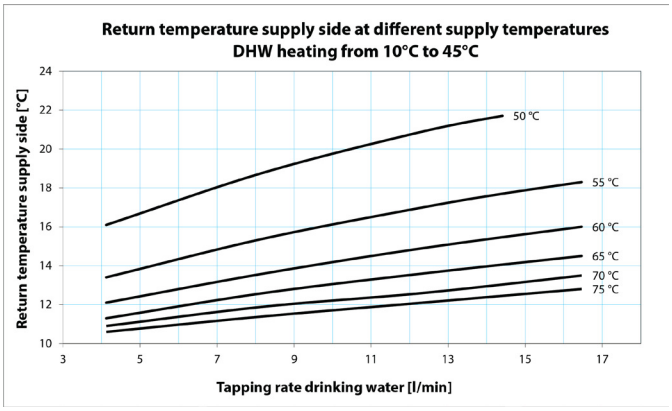
*Energy meter and DHW heating not included
**Max. flow

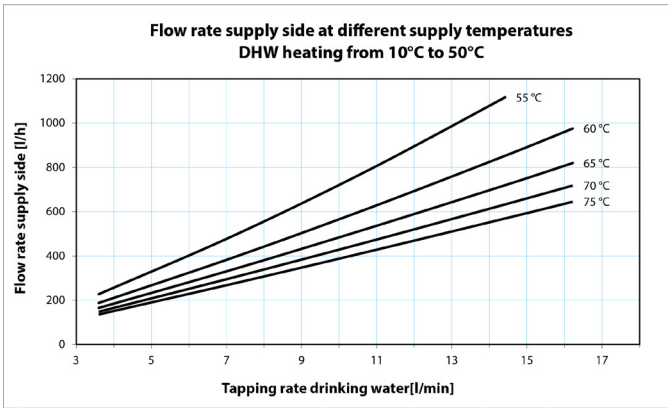
Flowrate type 1 HEX

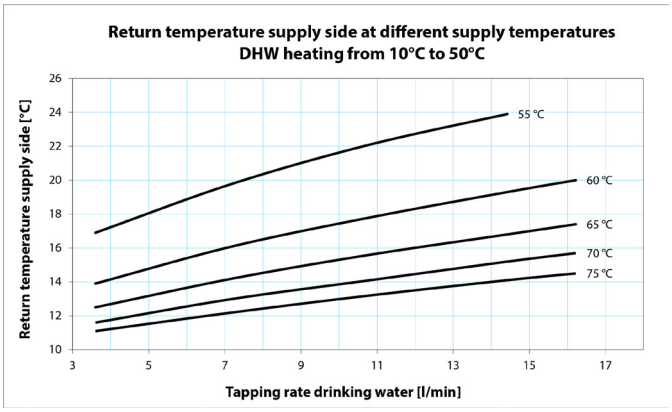


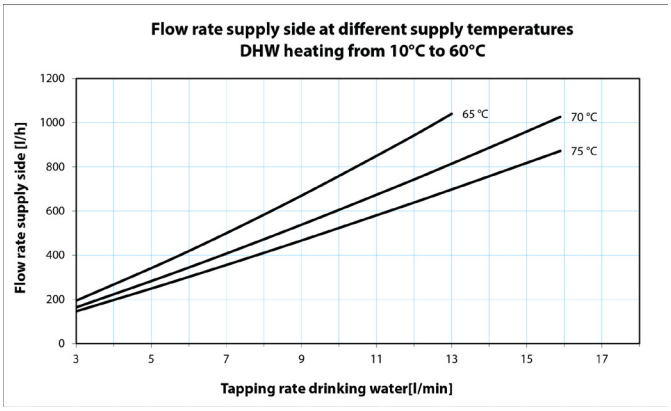


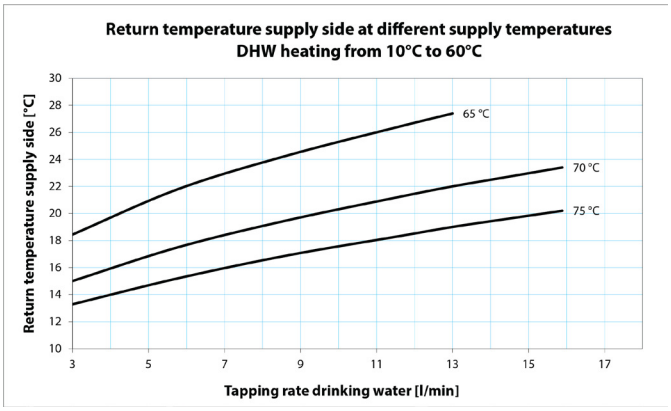




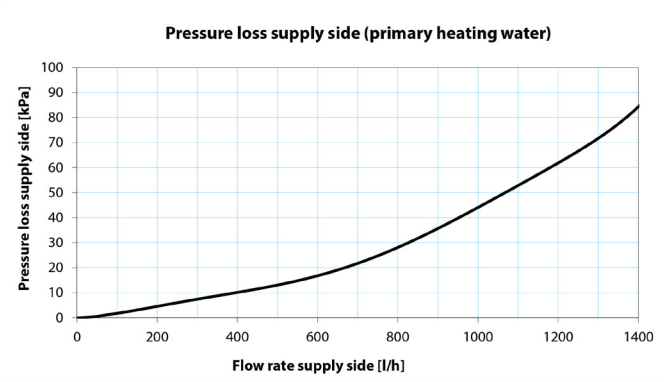


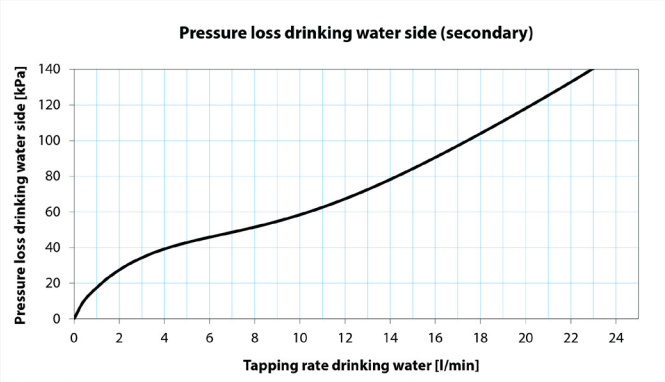


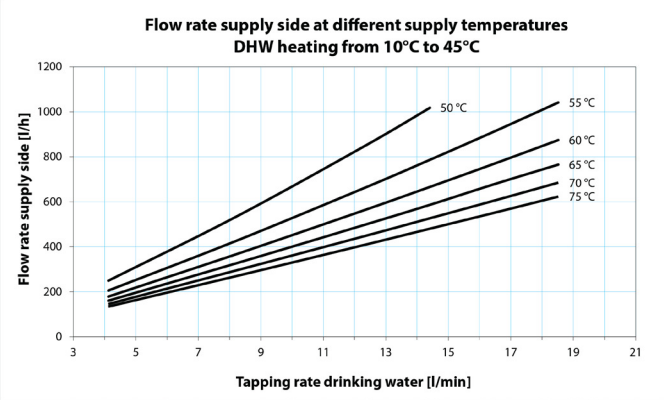


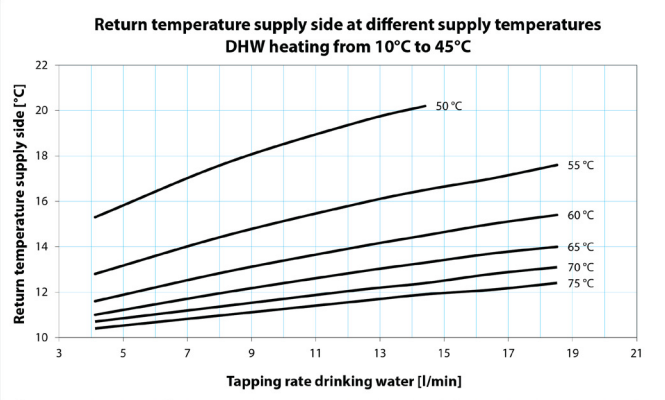


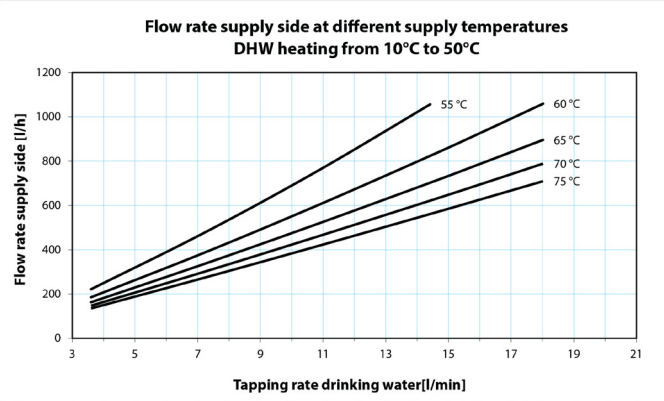
Flowrate type 2 HEX

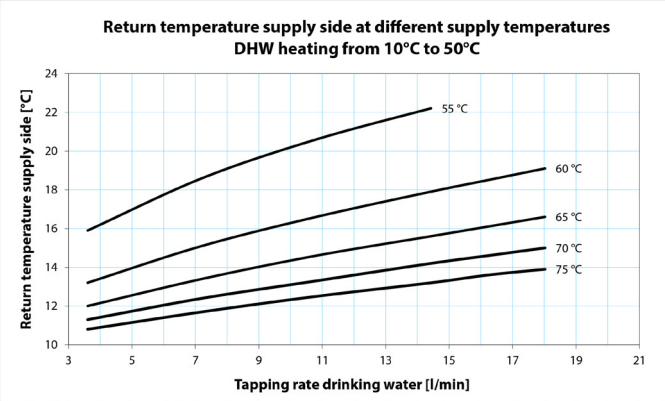


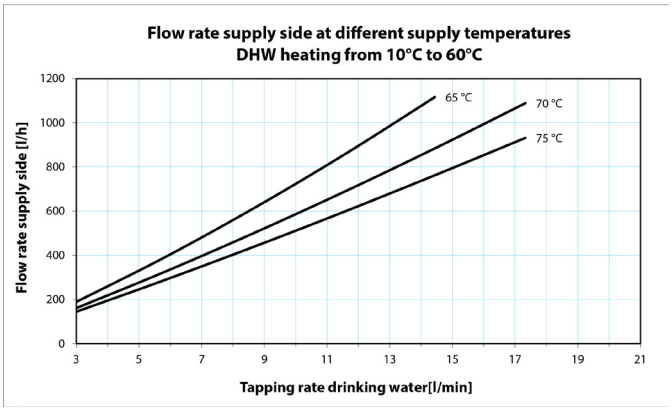


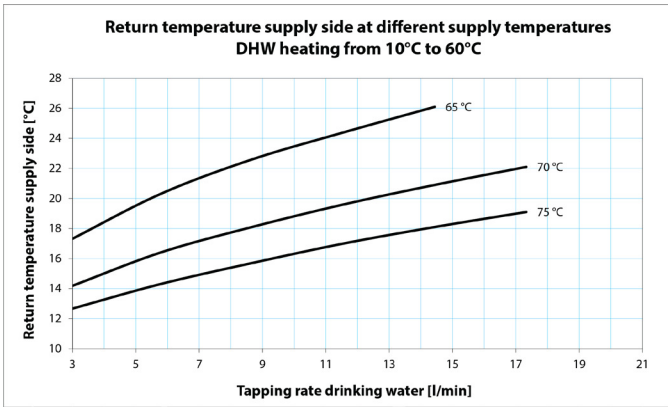




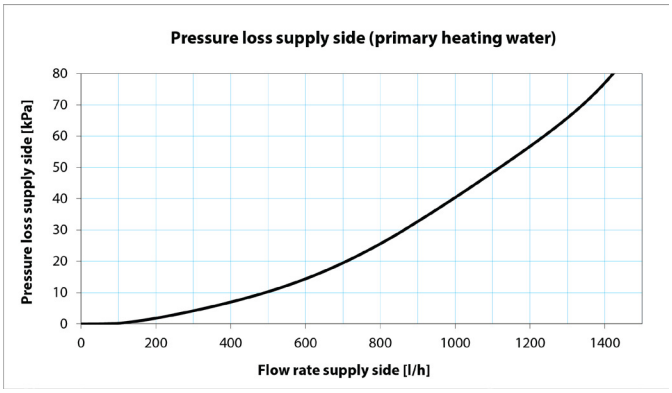


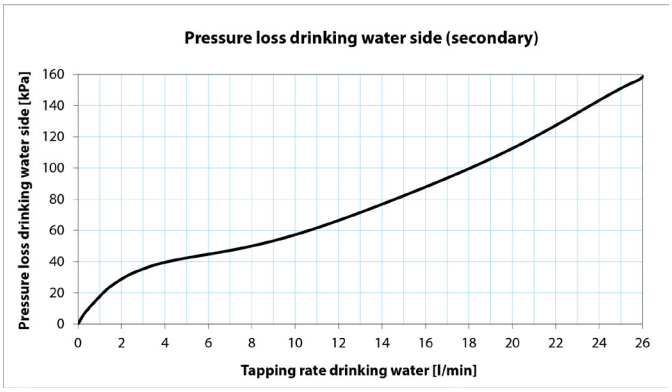


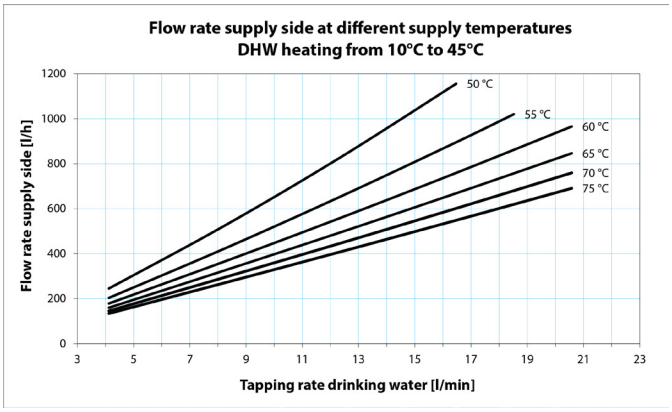


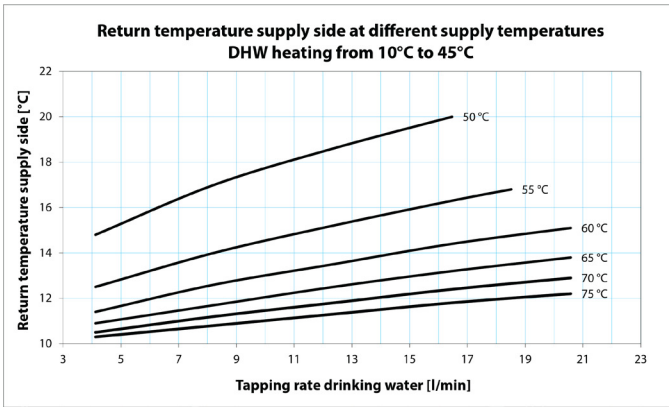


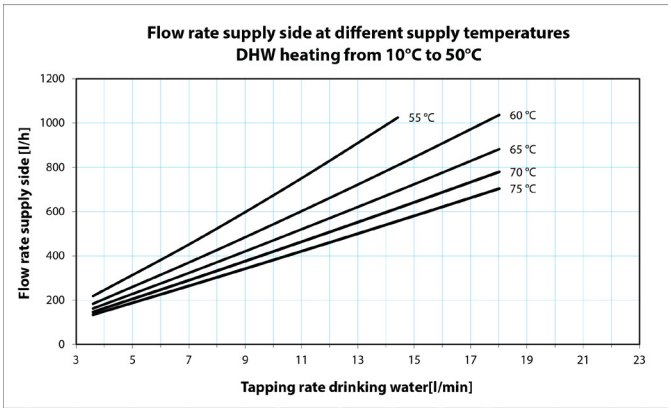
Flowrate type 3 HEX

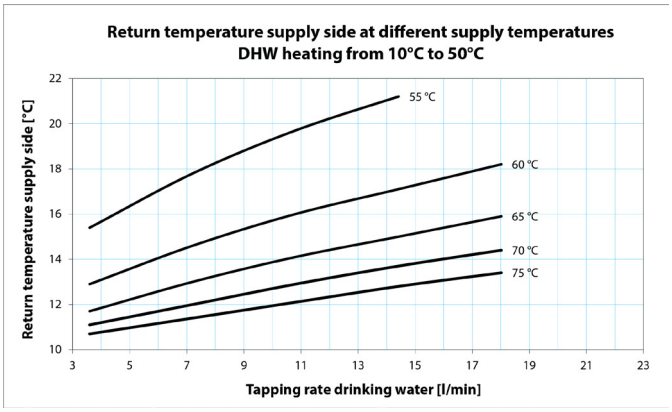


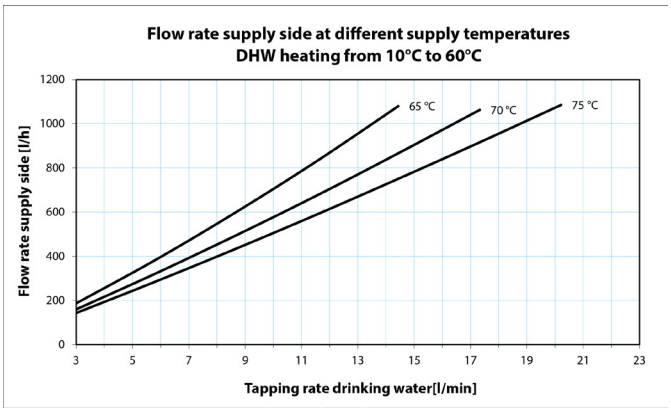


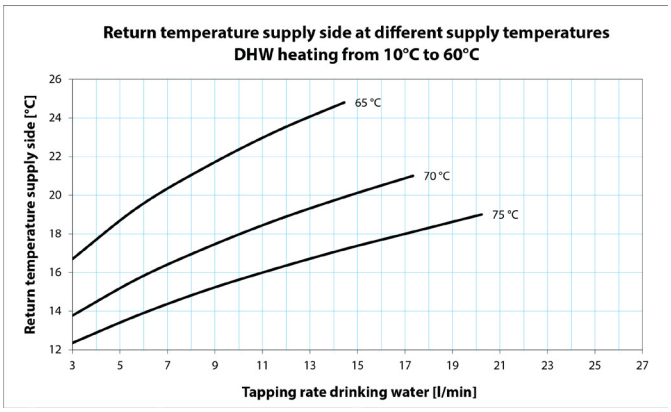




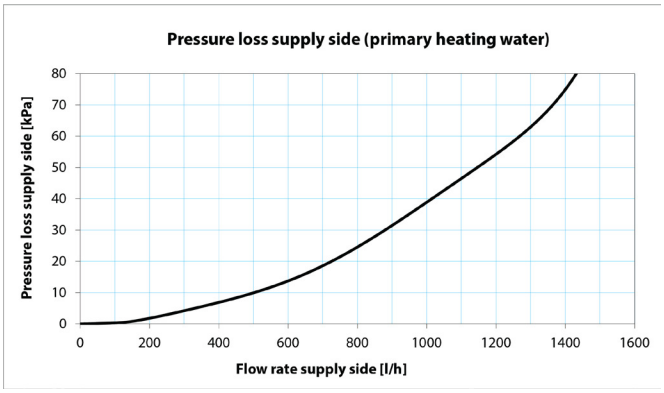


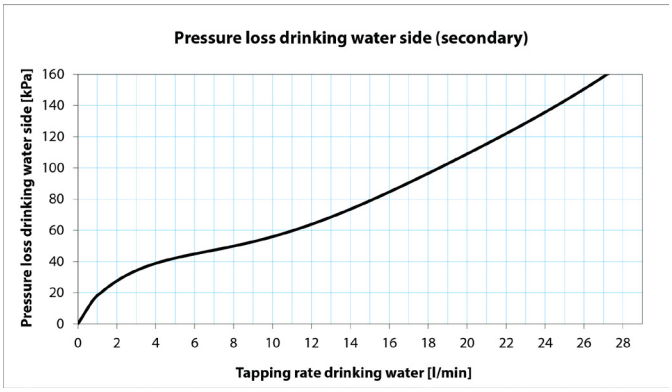


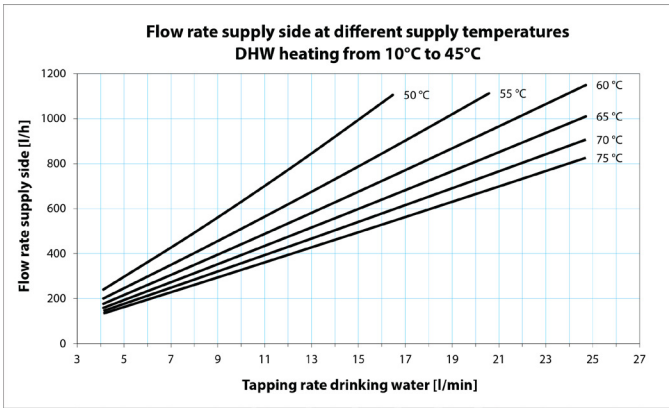


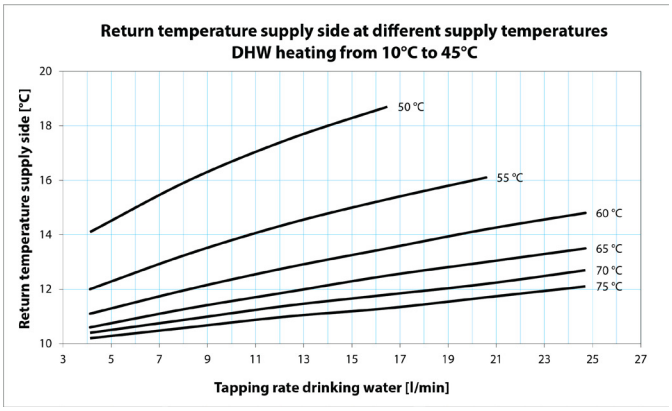


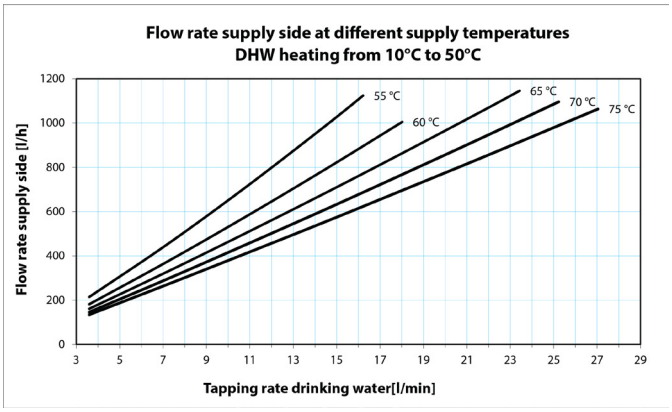
Flowrate type 4 HEX

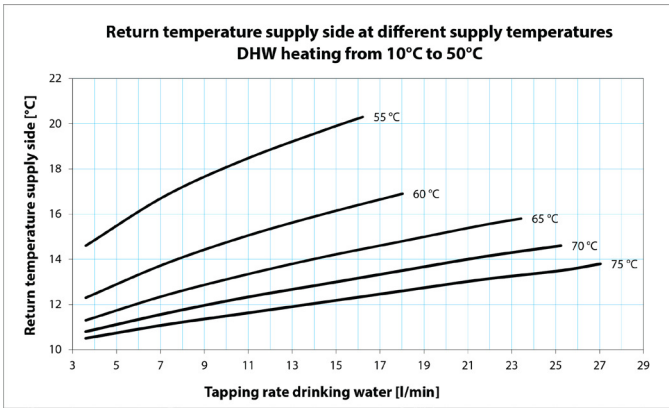


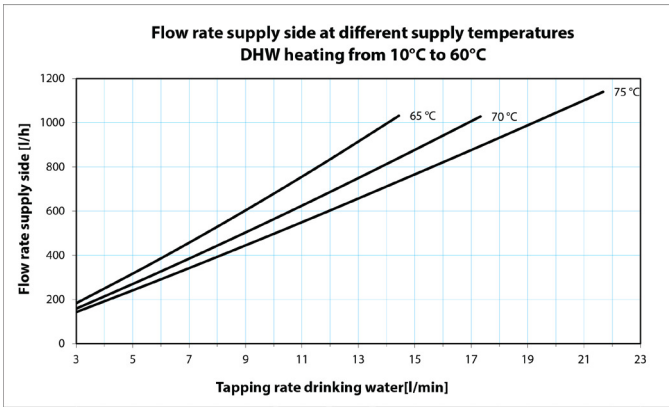


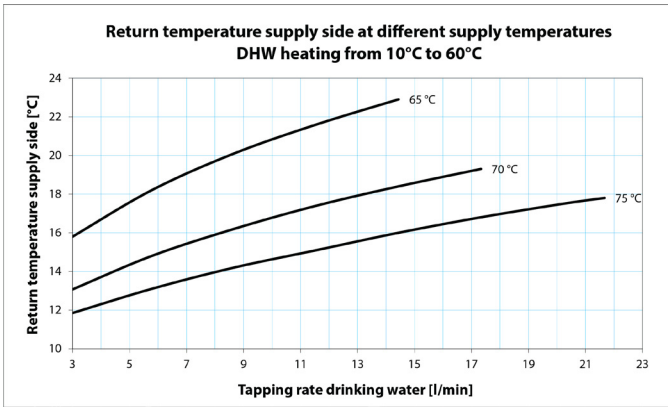




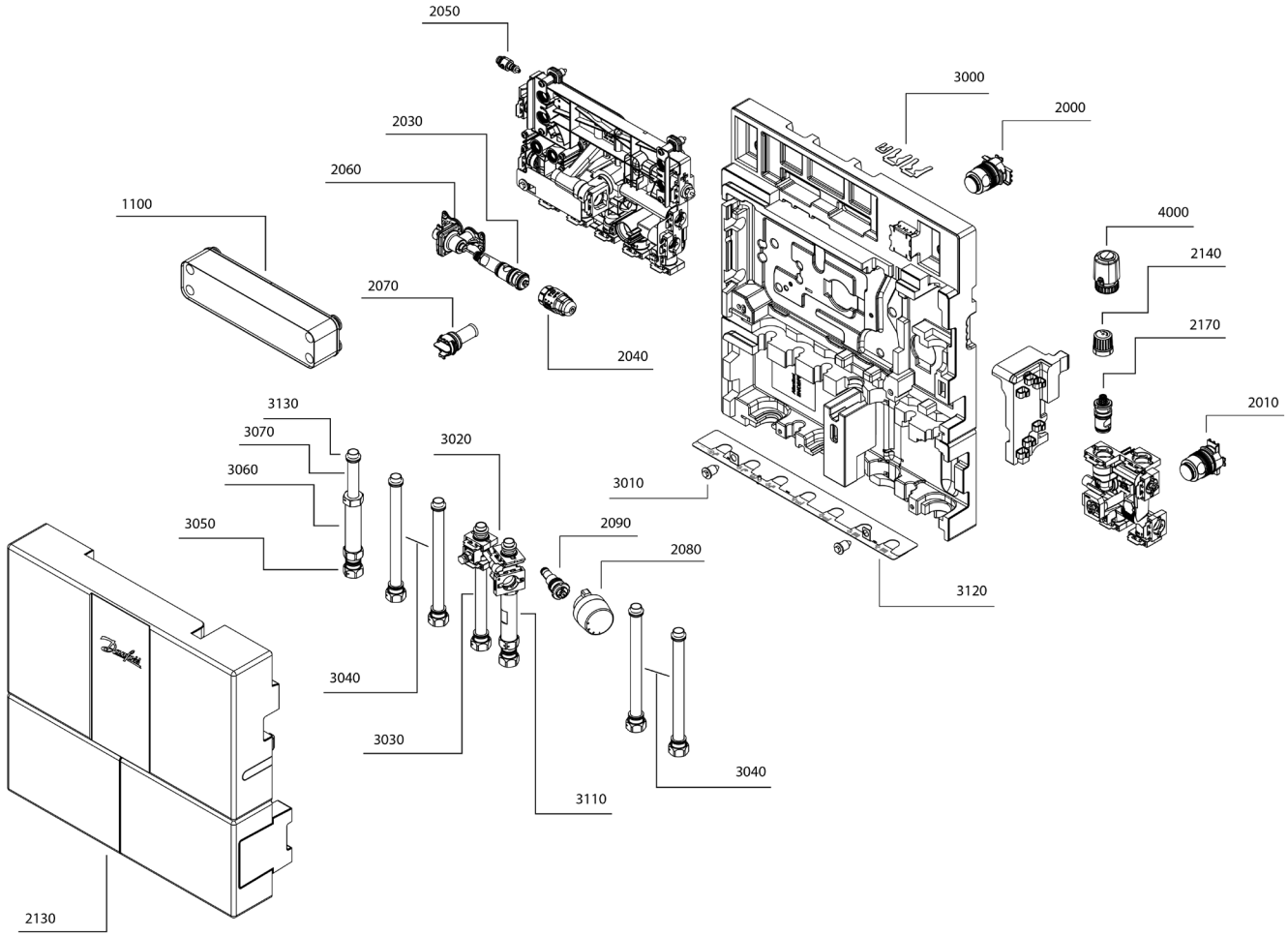








Spare parts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2090
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3120
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3110
2130

Spare parts

Pos.	Code number	Describpion
1100	183B0503	Service kit type 1 heat exchanger in copper
1100	183B0504	Service kit type 2 heat exchanger in copper
1100	183B0505	Service kit type 3 heat exchanger in copper
1100	183B0506	Service kit type 4 heat exchanger in copper
1100	183B0507	Service kit type 1 heat exchanger in stainless steel
1100	183B0508	Service kit type 2 heat exchanger in stainless steel
1100	183B0509	Service kit type 3 heat exchanger in stainless steel
1100	183B0510	Service kit type 4 heat exchanger in stainless steel
2000	183B0563	Dp regulator DHW EvoFlat 4.0 SAC
2010	183B0564	Dp regulator HE EvoFlat 4.0 SAC
2030	183B0511	DHW control valve set EvoFlat 4.0 SAC
2040	183B0512	DHW control thermostat set EvoFlat 4.0 SAC
2050	183B0513	Air vent set Danfoss EvoFlat 4.0
2060	183B0514	Flow activator with screws and gaskets
2070	183B0515	Strainer set EvoFlat 4.0
2080	183B0516	Bypass valve set manuel EvoFlat 4.0 SAC
2090	183B0517	Bypass valve set thermostatic EvoFlat 4.0 SAC
2130	183B0521	EPP cover set Danfoss EvoFlat 4.0
2170	183B5029	Zone valve set EvoFlat 4.0 SAC
3000	183B0552	Bracket kit for EvoFlat 4.0
3010	183B0553	Plast screw 15x25
3020	183B0554	Block for bypass EvoFlat 4.0
3030	183B0555	Pipe Ø18 - 171 mm
3040	183B0556	Pipe Ø18 - 223 mm
3050	183B0557	Bushing w/nuts 3/4" x 3/4" x 32 mm
3060	183B0558	Fitting piece 3/4" x 110 mm - DHW
3070	183B0559	Pipe Ø18 - 77 mm
3110	183B0565	Fitting piece 3/4" x 110 mm - HE
3120	183B0566	Mounting rail with symbols for EvoFlat 4.0
3130	183B0560	Clips, O-rings & washers for EvoFlat 4.0
4000	082F1601	Zone valve, TWA-Q-NO
	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.

			Plate	Brazing material		
Parameter	**Unit**	**Value or concentration**	**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	0	+	+	+
		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^{42}-)	mg/l	< 100	+	+	+	+
		100 - 300	+	o/-	o	+
		> 300	+	-	-	+
HCO_3- / SO_4^{2}-	mg/l	< 1.5	+	+	+	+
		> 1.5	+	0/-	0	+
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 ≤ 20°C	max 1000 mg/l
at T ≤ 50°C	max 400 mg/l
at T ≤ 80°C	max 200 mg/l
at T ≥ 100°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)

To enable programming of time-dependent temperature control, the station can optionally be equipped with an actuator (TWA Q-NO) for the zone valve integrated in the heating block as well as a room thermostat. The heating circuit is equipped with a second differential pressure controller.

Supply-side equipment

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

Mark: Danfoss

Fitting piece for heat meter G¾"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

Tap-water-side equipment

Fitting piece for cold water meter G¾"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:	G¾" (union, 7x)
Electrical connection:	230V AC
Dimensions H/W/D [mm]:	613/530/150
Weight [kg]:	*7.7 (Type 1 HEX)*
	8.1 (Type 2 HEX)
	8.8 (Type 3 HEX)
	9.3 (Type 4 HEX)

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.

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

Heating (HE)

To enable programming of time-dependent temperature control, the station can optionally be equipped with an actuator (TWA Q-NO) for the zone valve integrated in the heating block as well as a room thermostat. The heating circuit is equipped with a second differential pressure controller.

Supply-side equipment

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

Mark: Danfoss

Fitting piece for heat meter G¾”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

Tap-water-side equipment

Fitting piece for cold water meter G¾”x110mm (CW inlet)

Technical data

Heating

max. capacity [kW]:	17.5
at max. volume flow [m^3/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)*
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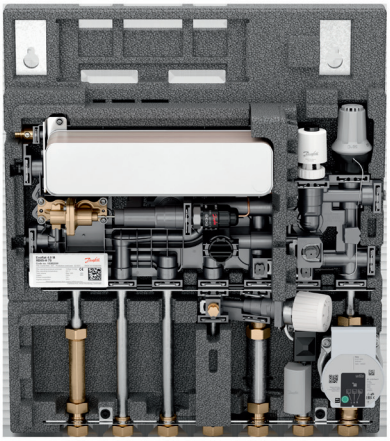
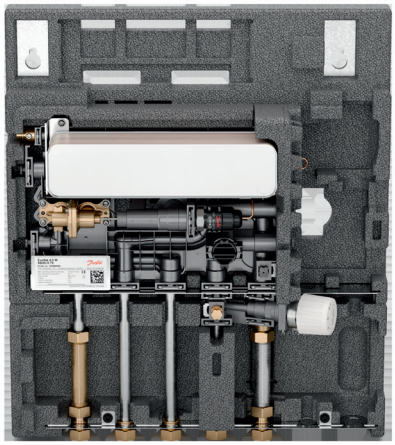
Other stations in this portfolio



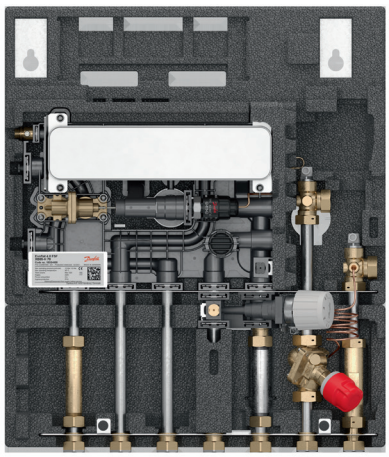
EvoFlat 4.0 M

Flat station for domestic hot water and floor 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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