ENGINEERING
TOMORROW

Data sheet

ThermoDual®- CM (Charging module)

General Description / Use

Domestic hot water provision by storage charging principle is an efficient solution that fulfils all hygienic requirements. Hot water is stored at temperatures that kill or prevent the growth of pathogens. Favourable habitats for the proliferation of bacteria such as legionella do not exist, provided the system is operated in accordance with the instructions. Ideally this requires an integrated circulation management. When combined with optimally hygienic stainless steel water tanks from our SE/SES series, these systems are the ideal solution where security of supply is of the essence, particularly at peak load.

The system's essential benefits are:
- hygienically safe
- efficient cooling of the primary medium
- optimum use of energy
- free choice from a wide range of energy sources
- at all times sufficient hot water temperature to meet hygienic requirements
- constant hot water temperature

Maximum operating parameters

Primary		
Maximum permissible supply temperature, primary	90°C / 150°C (without/with safety function)	
Maximum permissible operating pressure, primary	10 / 20 bar(g)	Pumps and 3-way valve variant / 2-way valve variant
Rated pressure, primary	PN10 / PN25	
Maximum permissible pressure differential, primary	only 2-way valve variant: 25 bar (up to 210kW) /16 bar	
Secondary		
Maximum permissible temperature, secondary	90°C	
Maximum permissible operating pressure, secondary	10 bar(g)	
Minimum required pressure (static), water supply	1.0 bar(g)	
Rated pressure, secondary	PN10	
Mains power supply / maximum power consumption	230V AC / 4.0 A	

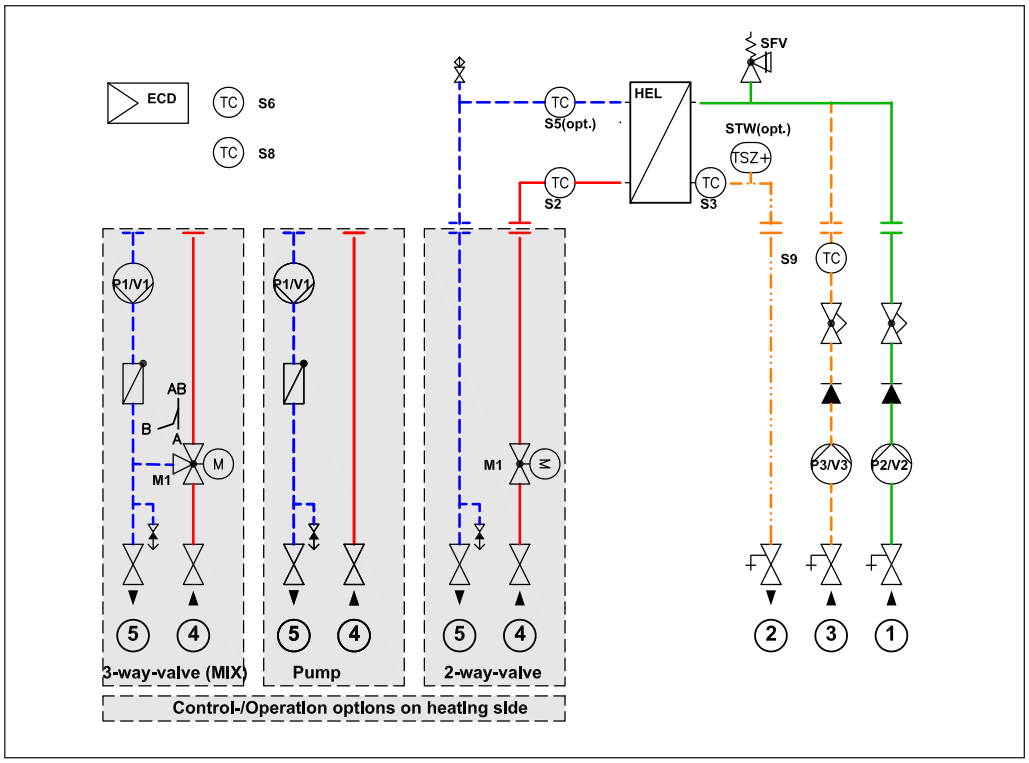
Materials

Pipes, fittings, flanges, valves (domestic side)	1.4571, bronze or brass as per DIN EN 1982, also considering DIN 50930-06 and UBA guidelines
ditto (heating side)	P235GH-TC1, CuSn5Pb5Zn5-C (RG-5), ST37.0, EN-JL 1040 (GG25)
Heat exchanger	1.4404 with Cu solder
Insulation	Hardcover PU hard foam λ=0.029 W/mK (100%ENEV)

Code numbers

Capacity [kW]	Code no.			
	Pump + 3-way mixing valve	Pump control (PWM control signal)	2-way valve (without safety function)	2-way valve (with safety function)
140	004X1695	004X1689	004X1677	004X1683
210	004X1781	004X1776	004X1766	004X1771
280	004X1782	004X1777	004X1767	004X1772
350	004X1783	004X1778	004X1768	004X1773
420	004X1784	004X1779	004X1769	004X1774
455	004X1785	004X1780	004X1770	004X1775

Circuit diagram



- Shut-off valve
- Non-return valve
- Check valve
- Balancing valve
- Air vent
- Drain
- Dain sampling valve (optional)

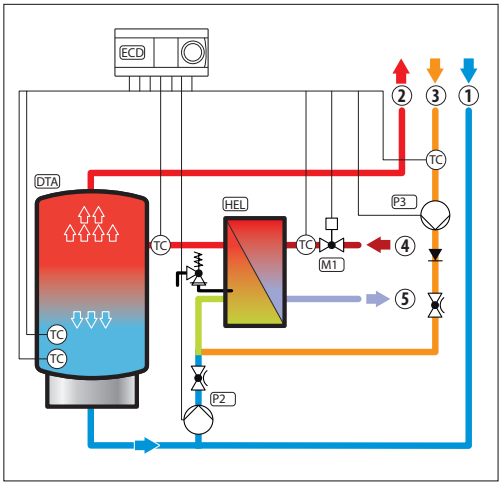
HEL	Heat exchanger, charging
P2	Charging pump
P1	Heating pump
P3	Circulation pump
SFV	Safety valve
M1	Motorized control valve (2/3-way)
ECD	Electronic domestic hot water controller (ECL 310 / P318.1)
STW	Safety thermostat (optional)
DTA	Domestic hot water storage tank (installed by customer)
(1)	Domestic water (cold/charging)
(2)	Domestic hot water (hot/charging network)
(3)	Circulation (inlet)
(4)	Heating supply
(5)	Heating return
(TC)	Sensors (general: direct , immersion, surface) "S2": with designation as for controller

Technical data

Type ThermoDual®	Capacity [kW]	FR_P (70->25°C) [m³/h]	Pump dpr [kPa]	2-way dp [kPa]	3-way dpr [kPa]	FR_{TW} (10->60°C) [m³/h]	DW dpr [kPa]	FR_C* (55->60°C) [m³/h]	C dpr** [kPa]
CM 140	140	2.4	52	21	38	2.4	41	1.0 / 2.4	80 / 43
CM 210	210	3.8	95	30	81	3.6	89	1.5 / 2.4	70 / 43
CM 280	280	5.1	86	29	76	4.8	88	2.0 / 2.4	57 / 43
CM 350	350	6.3	74	30	59	6.0	71	2.5 / 3.4	51 / 30
CM 420	420	7.8	53	30	54	7.2	55	3.0 / 3.4	38 / 30
CM 455	455	8.0	59	22	54	7.8	52	3.3 / 3.4	34 / 31

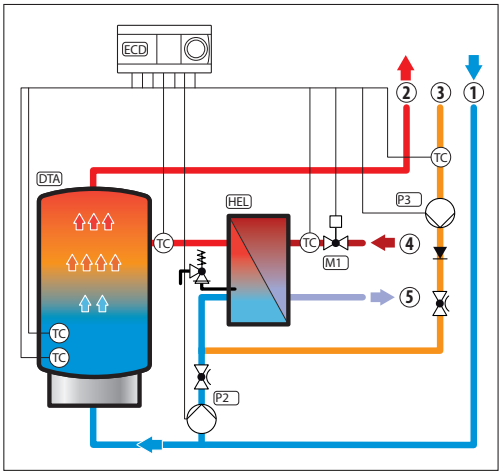
FR: Flow rate p: primary dpr: Remaining pump head dp: Pressure loss DW: Domestic water C: Circulation
* flow rate: standard setup / maximal possible
** remaining pump head for: standard setup / maximal possible

Function



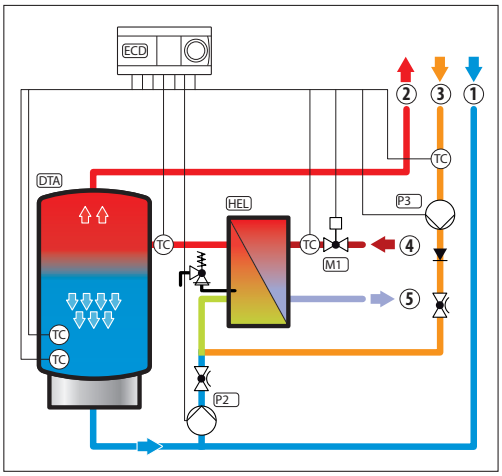
Low load operation (with circulation)

In low-load operation, all the cold water passes over the instantaneous water heater (HEL). If the tap load is less then the flow pre-set at the balancing valve, a portion of the water (tap volume) flows trough the top of the tank (DTA) as bypass to the taps. The remaining volume is drawn from the bottom of the tank so that the tank (DTA) continues to be charged. The total tap load is covered by the heat exchanger (HEL), while the storage tank (DTA) is not being discharged.



Peak load operation

In peak-load operation, the pre-set flow of cold water passes through the instantaneous water heater (HEL) and the remainder flows through the tank (DTA) from bottom to top. The tap load is covered from the instantaneous water heater (HEL) and the storage tank (DTA) is simultaneously discharged. Once tap operation ceases, the storage tank (DTA) is charged as described below.



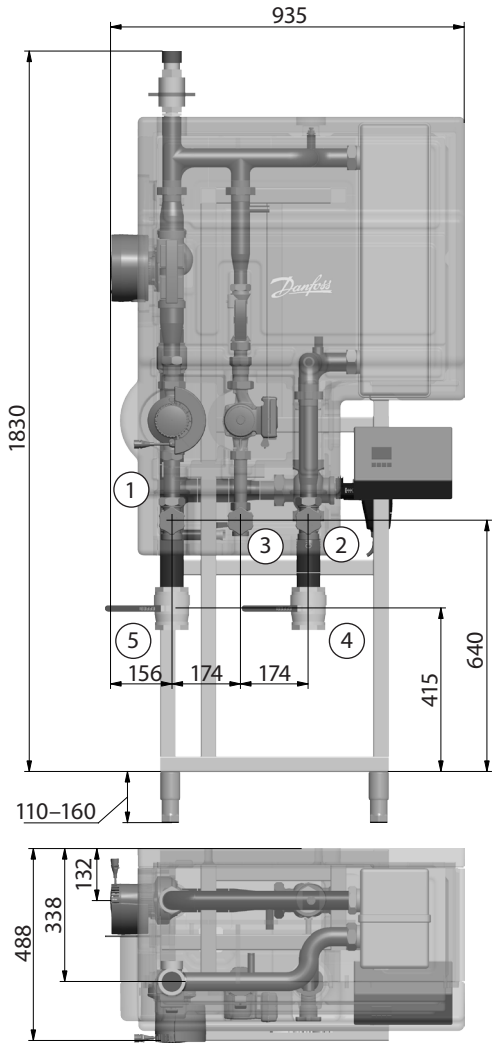
Charging operation (no tap load / circulation)

If there is no consumption the storage tank (DTA) is being charged. The total charging flow is drawn from the bottom of the tank (DTA) and passed via the instantaneous water heater (HEL) to the top of the tank (DTA).

Data sheet **ThermoDual®-CM (Charging module)**

Dimensions

Type ThermoDual®	Connections:				Weight [kg]		
	DW C/H	Circ.	HTG (DN) SL, RL	HTG (DN) SL, RL	Pump + 3-way v.	Pump control (PWM)	2-way v.
	1/2 G ISO	3 G ISO	4/5 PN10 Rp	4/5 PN25 WELD			
CM 140	1 ¼"A	1 ¼"A	1 ¼"	42.4	97	94	103
CM 210	1 ¼"A	1 ¼"A	1 ¼"	42.4	104	100	107
CM 280	1 ½"A	1 ¼"A	1 ½"	48.3	110	106	115
CM 350	1 ½"A	1 ¼"A	1 ½"	48.3	115	110	119
CM 420	1 ¾"A	1 ¼"A	2"	60.3	124	115	129
CM 455	1 ¾"A	1 ¼"A	2"	60.3	130	121	135



Correlation of connections

1. Domestic cold water
2. Domestic hot water
3. Circulation (inlet)
4. Heating supply line
5. Heating return line