Brine/Water
Optiheat Inverta TWW

OH I 4esr TWW

Technical Manual

AC Cooling Heating

Table of contents

Technical data
Optiheat Inverta TWW 1/2

OH I 4esr TWW, water/water with Optiplus 3 controller

Heat pump type	**Optiheat Inverta OH I 4esr TWW**
Model	**All in One**
Controller Optiplus	**integrated**
WPZ-test number	**CH-HP-00611**

Standard performance data (as per EN 14511:2013, part load operation 60 Hz)			**W 35**	**W 45**	**W 55**
Heat output	at W10	kW	5.2	4.8	4.4
Power range	min/max.	kW	2.5 - 9.0	2.3 - 8.5	2.1 - 6.8
COP	at W10	-	6.3	4.6	3.5
El. power consumption	at W10	kW	0.8	1.1	1.3
Cooling output	at W10	kW	4.4	3.8	3.1

Standard performance data (as per EN 14511:2013, part load operation 40 Hz)			**W 35**	**W 45**	**W 55**
Heat output	at W10	kW	3.5	2.9	2.8
COP	at W10	-	6.4	4.5	3.4
El. power consumption	at W10	kW	0.6	0.7	0.8
Cooling output	at W10	kW	2.9	2.2	2.0

Standard performance data (as per EN 14511:2013, part load operation 50 Hz)			**W 35**	**W 45**	**W 55**
Heat output	at W10	kW	4.3	3.8	3.5
COP	at W10	-	6.4	4.5	3.4
El. power consumption	at W10	kW	0.7	0.8	1.0
Cooling output	at W10	kW	3.6	3.0	2.5

Perfomance data with intermediate circuit (heat source temperature inlet HP 7.5°C)			**W 35**	**W 45**	**W 55**
Heat output	at W7.5	kW	4.7	4.4	4.1
Power range	min/max.	kW	2.3 / 8.1	2.1 / 7.7	1.9 / 6.1
COP	at W7.5	-	5.9	4.3	3.3
El. power consumption	at W7.5	kW	0.8	1.0	1.3

Energy class / Performance data (average climatic conditions)

Energy efficiency class 35°C / 55°C		A+++/A+++
Rated thermal output Prated 35°C / 55°C	kW	9.5/8.1
Energy efficiency ηS 35°C / 55°C	%	277/182
SCOP (according to EN 14825) 35°C / 55°C		7.12/4.75

Sound (at W10/W55)

Sound power level [2]	Lwa	dB(A)	44
Sound pressure level in 1 m [3]	Lpa	dB(A)	29

Field of application/application limits

Heat source temperature	min/max.	°C	+6 / +20
Heat flow temperature	min/max.	°C	+25 / +62

Vaporiser, source side (at W10/W35)			**minimum**	**nominal**	**maximum**
Volume flow minimum / nominal (ΔT 3K EN 14511) / maximum		m³/h	0.47	1.25	2.30
Pressure drop via heat pump		kPa	1	7	9
Free compression [5]		kPa	71	62	55
Medium water		%	100		
Built-in source pump			UPM3 25-75		

1) Energy class for climate area medium / space heating low temperature application
2) As per EN9614-2 and EN12102
3) Sound pressure = free field value
4) For installation planning: see diagram
5) Free compression at highest pump rotation speed, pumps output-regulated

Observe local conditions and regulations

Technical data
Optiheat Inverta TWW

OH I 4esr TWW, water/water with Optiplus 3 controller

Condenser, heater side (at W10/W35)			**minimum**	**nominal**	**maximum**
Volume flow minimum / nominal (ΔT 5K EN 14511) / maximum		m³/h	0.35	0.64	0.89
Pressure drop via heat pump		kPa	2	6	11
Free compression [5]		kPa	72	69	64
Medium water		%	100		
Built-in heating pump			UPM3 25-75		

Dimensions/connections/miscellaneous

Dimensions	D x W x H	mm	700 x 600 x 1900
Total weight		kg	300
Heating circuit connection	AG	Inch	1"
Heat source connection	AG	Inch	1"
Cooling agent / filling quantity		-- / kg	R-410A / 1.35
GWP / CO_2e		--- / t	2090/2.8
Refrigeration oil filling quantity		l	0.4
Safety valve (source / heating)	p	bar	3.0

Domestic hot water tank

Net volume		l	220
Capacity as per EN16147 [6] (equiv. tap temperature 40°C)		l	310
Heat loss in stand-by mode as per EN12897 [6]		kWh/24h	1.15
Max. operating pressure storage tank		bar	6

Electrical data

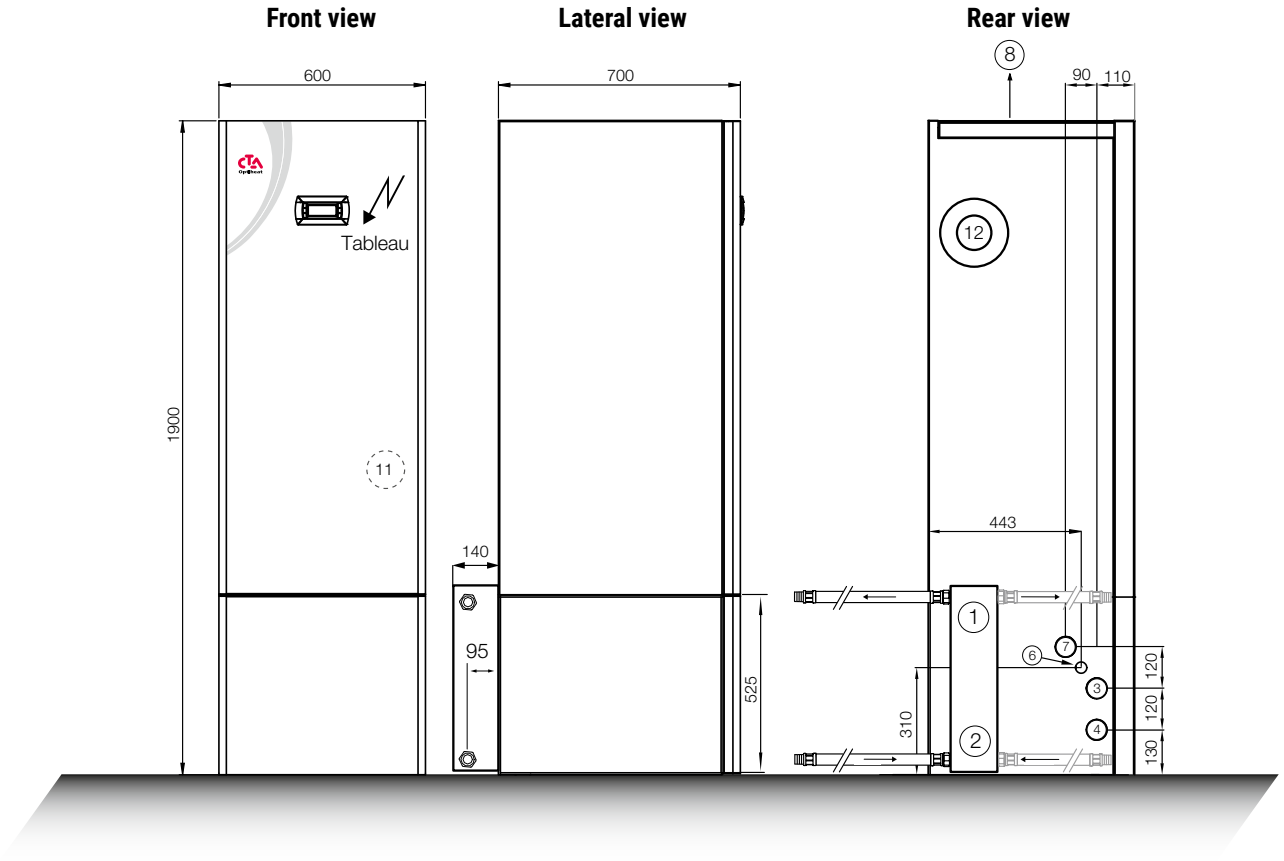
Operating voltage			1 / N / PE / 230 V / 50 Hz
External fuse protection unit		AT	13
Power el. emergency heating element 230 V		kW	2.5
Max. operating current unit / emergency heating element [7]		A	11.0 / 11.5
Starting current (soft start speed control)		A	7
Protection class		IP	20
Max. power consumption circulation pumps		kW	0.1
Max. power consumption total		kW	2.6

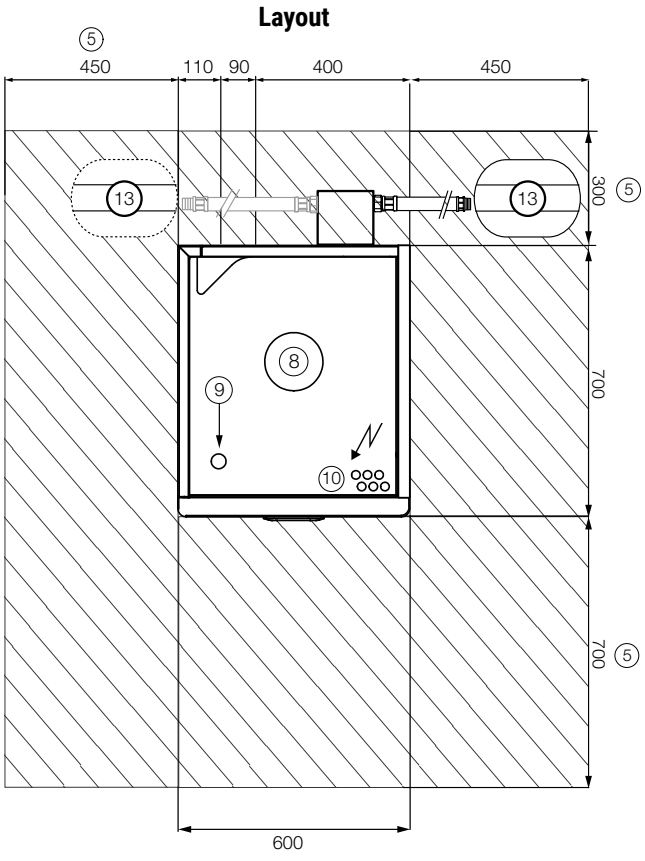
6) With DHW tank charged on 60°C
7) Heat pump operation and emergency heating element reciprocally locked

Observe local conditions and regulations

Dimension drawings
Optiheat Inverta TWW

OH I 4esr TWW





Legend

1 Heating water outlet
2 Heating water inlet
3 Heat source outlet
4 Heat source inlet
5 Minimum distances
6 Outlet safety valve heating
7 Cold water inlet
8 Hot water outlet 500 mm tube length from connection to rear side
9 Connection expansion vessel heating
10 Electrical and sensor connection
11 Inspection flange incl. magnesium anode
12 Expansion vessel intermediate circuit
13 Connection expansion vessel source

All dimensions are in mm

The external sensor and the documents are enclosed in the unit.

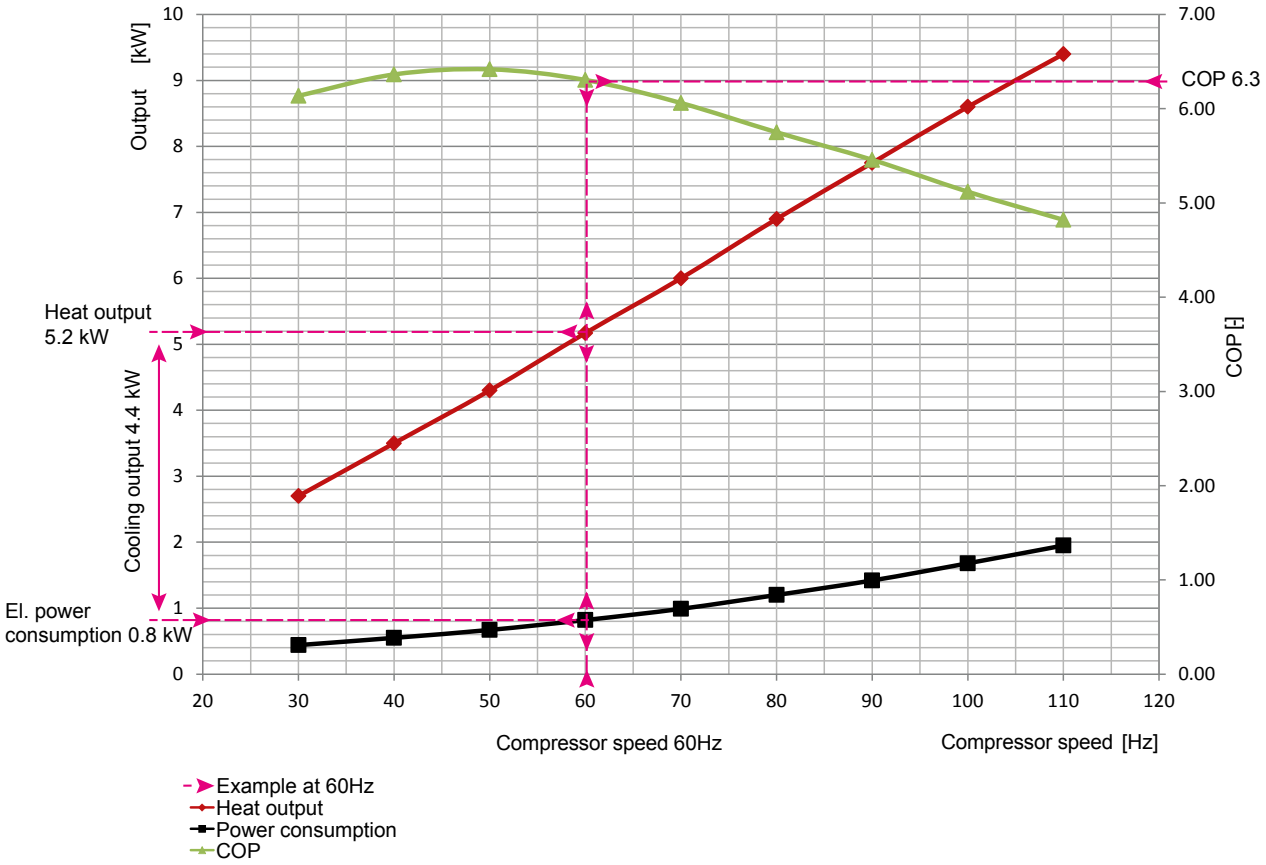
Power curves
Optiheat Inverta TWW

OH I 4esr TWW with Optiplus 3 controller

Volume flow source minimum / nominal (ΔT 3K EN 14511) / maximum	**0.47 / 1.25 / 2.30 m³/h**
Volume flow heater minimum / nominal (ΔT 5K EN 14511) / maximum	**0.35 / 0.89 / 1.70 m³/h**

Performance specifications as per EN 14511

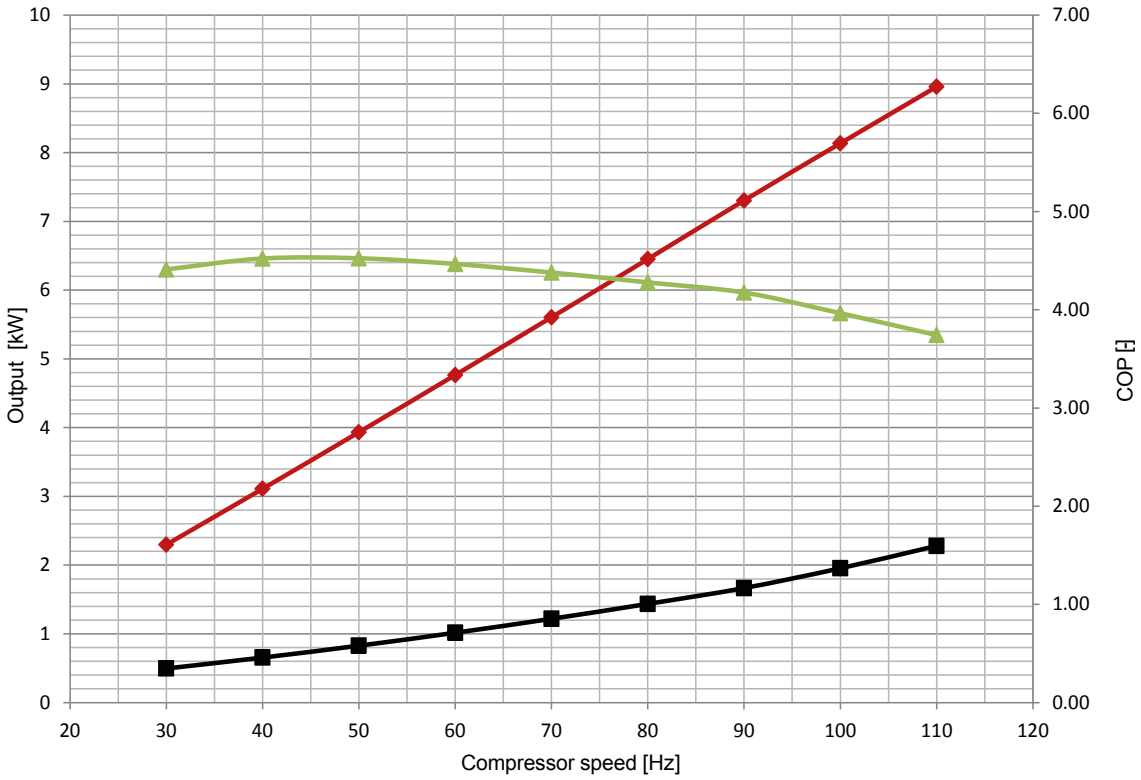
Heat output in kW



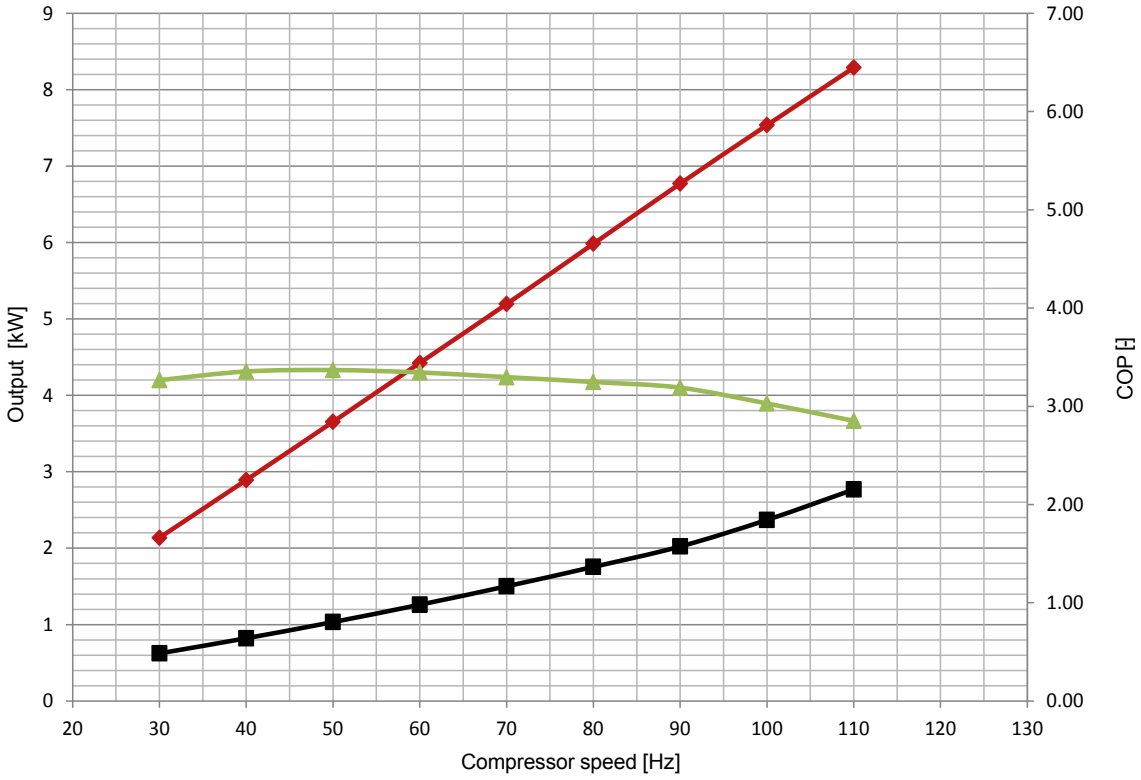
Power curves
Optiheat Inverta TWW

OH I 4esr TWW with Optiplus 3 controller

Heat output in kW at B0/W45



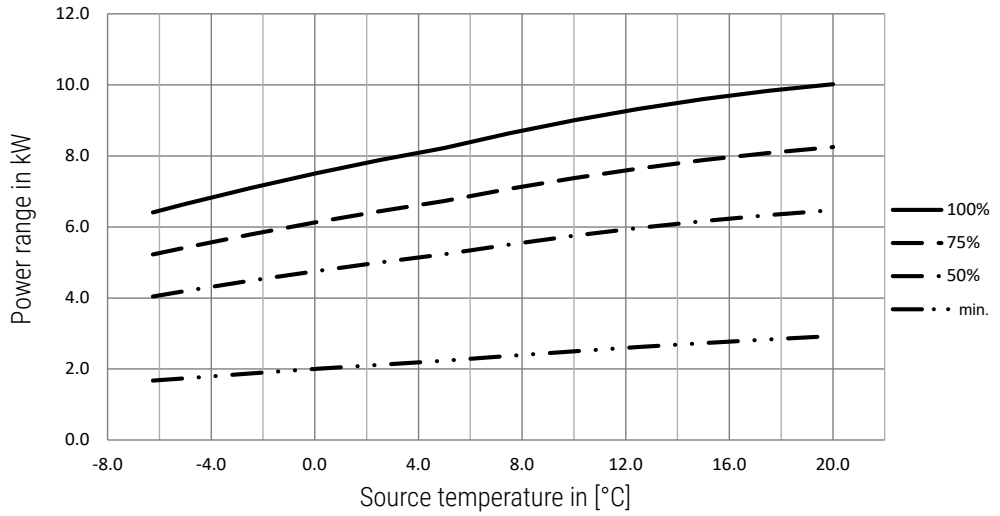
Heat output in kW at B0/W55



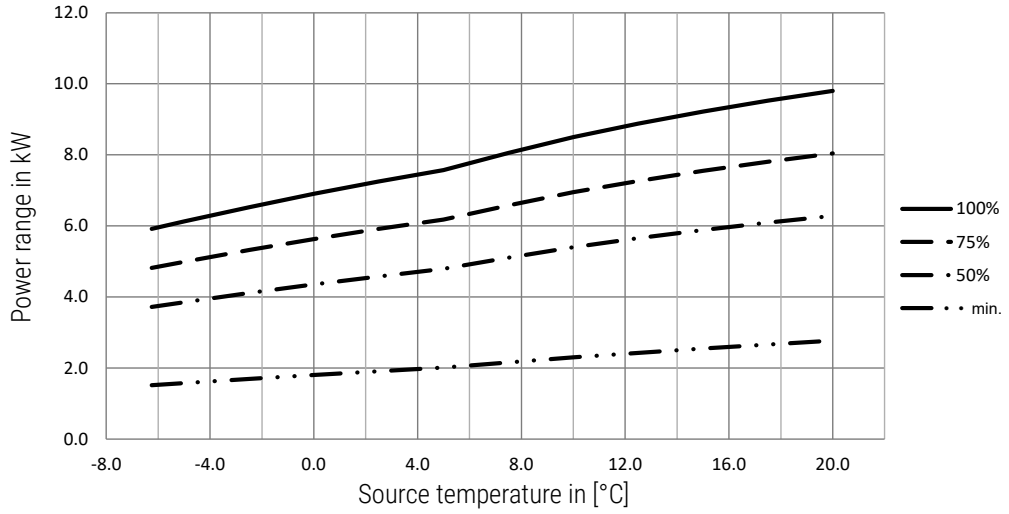
Heat output
Power consumption
COP

Heat output
Optiheat Inverta TWW OH I 4esr TWW

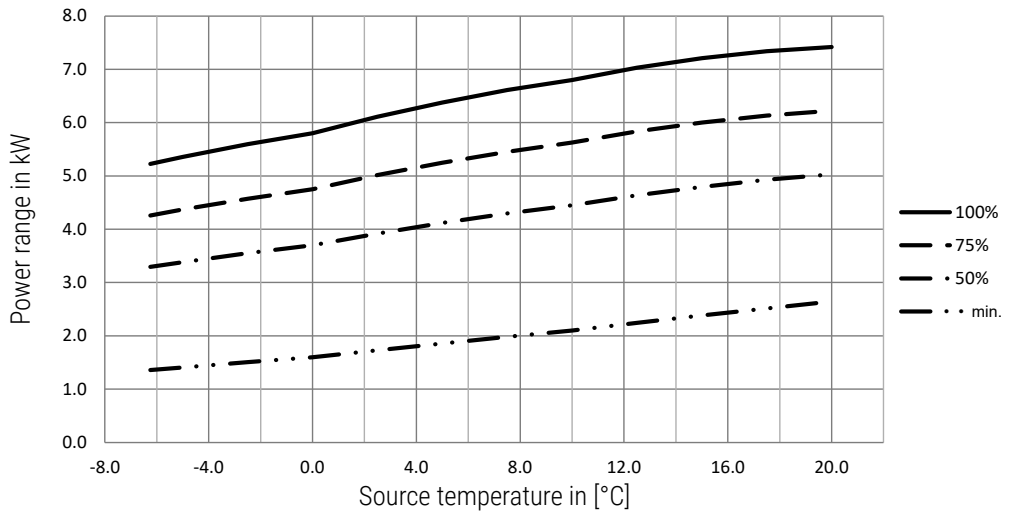
Heat output at flow temperature W35



Heat output at flow temperature W45

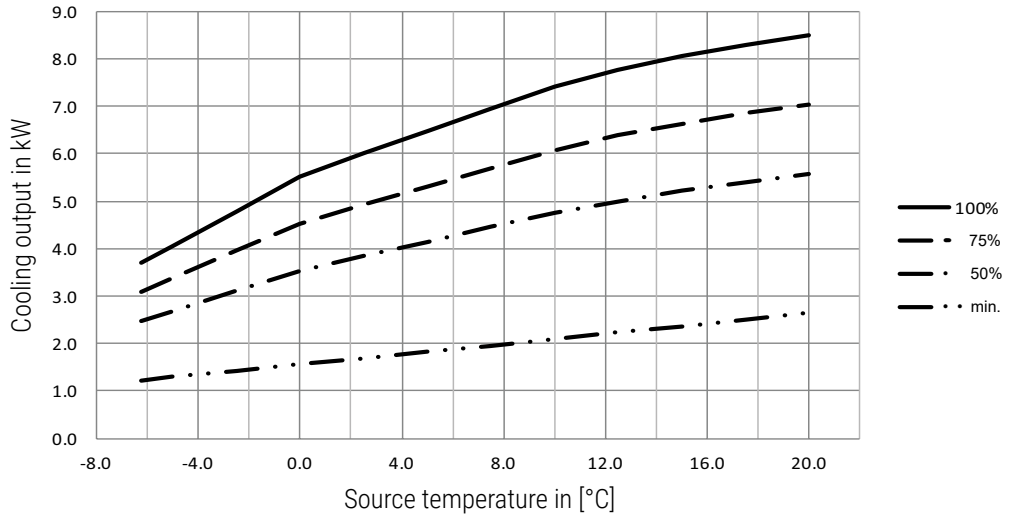


Heat output at flow temperature W55

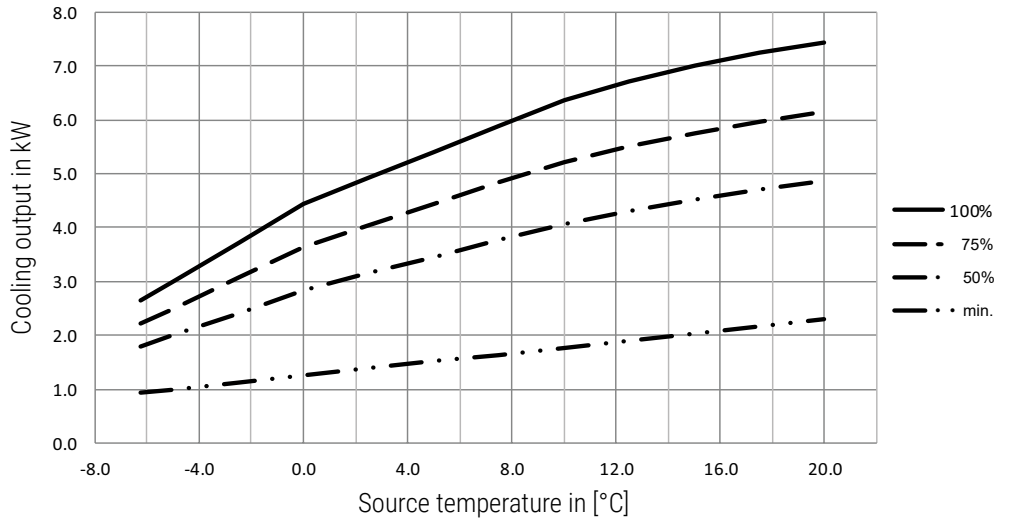


Cooling output
Optiheat Inverta TWW OH I 4esr TWW

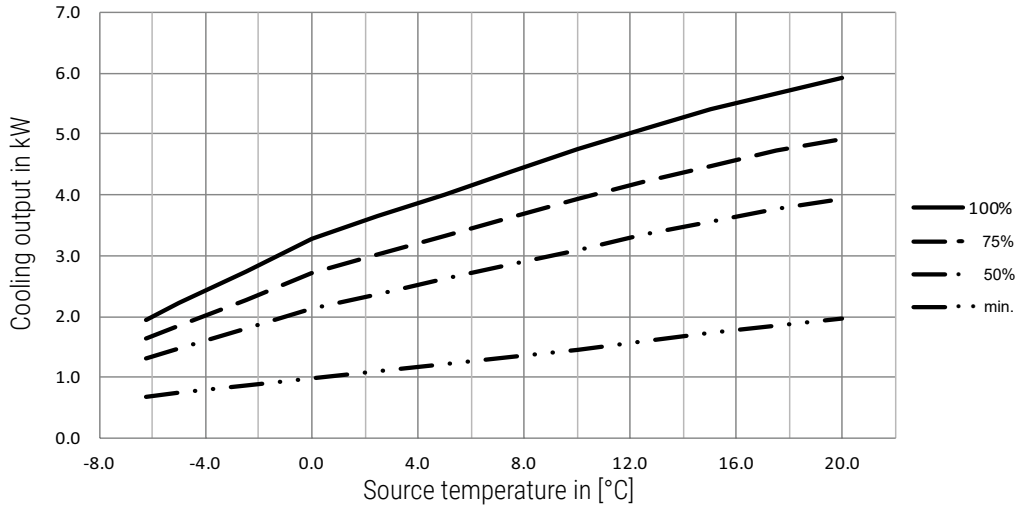
Cooling output at flow temperature W35



Cooling output at flow temperature W45

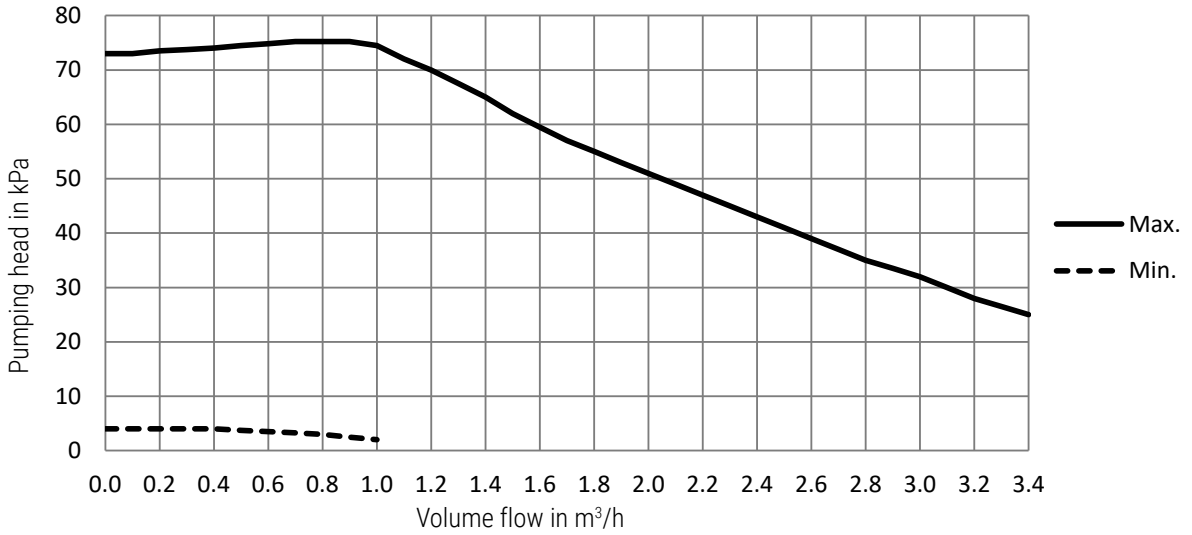


Cooling output at flow temperature W55

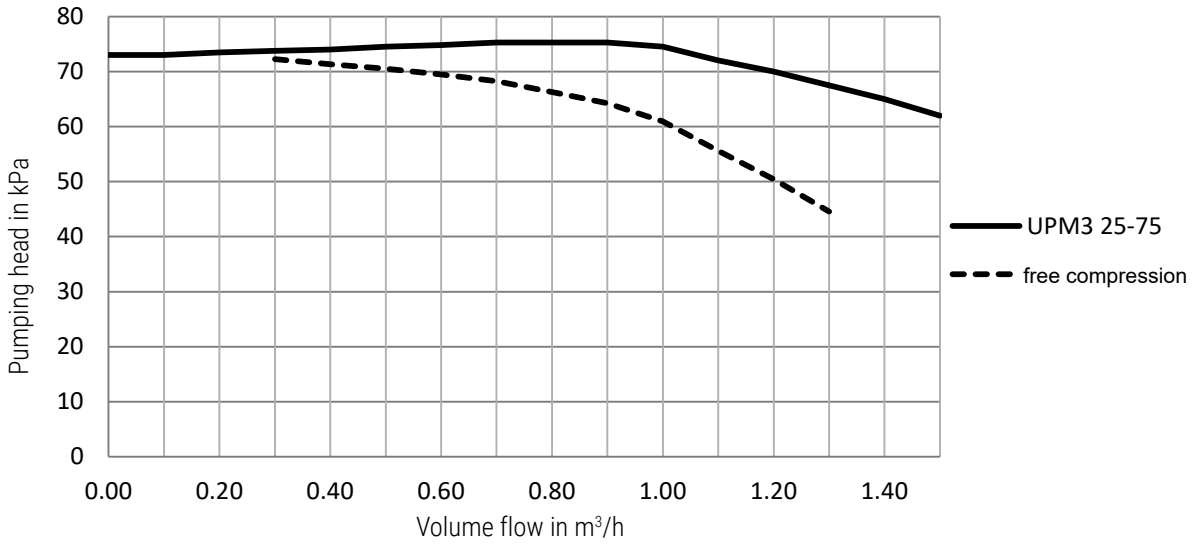


Volume flow and pressure loss circulation pump
Optiheat Inverta TWW OH I 4esr TWW

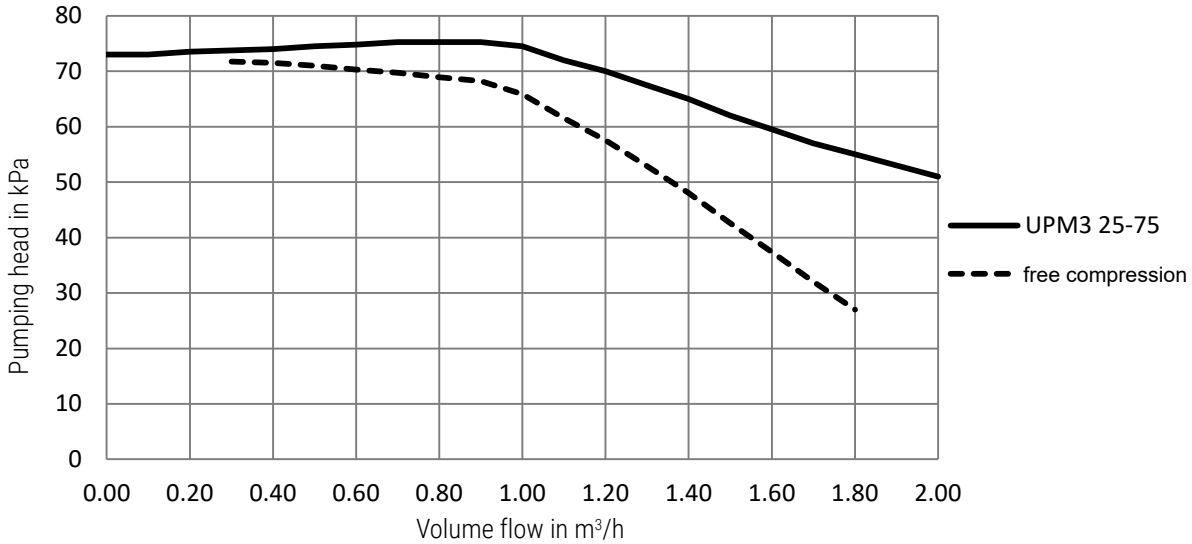
Pump curve UPM3 25-75



Heating side / condenser



Heat source / vaporiser



Additional sheet ground water connection indirect (standard) for Optiheat Inverta TWW with circuit separation

Design information

Heat source system
- Clarify space availability and accessibility for heavy tracked vehicles.
- Note existing utility lines.
- Obtain geological report on boring consent.
- Establish water and electric connection.
- Take out a liability insurance.
- Provide mud dump.

Lines for drawing and non-return wells
- Possibly select short line distance.
- Set trench depth below frost line.
- Drain trench floor.
- Embed lines in sand layer. (Risk of injury!)
- Cover only after pressure test.

External assembly
- Ensure accessibility to the wells.
- Insulate wall openings and seal against water.

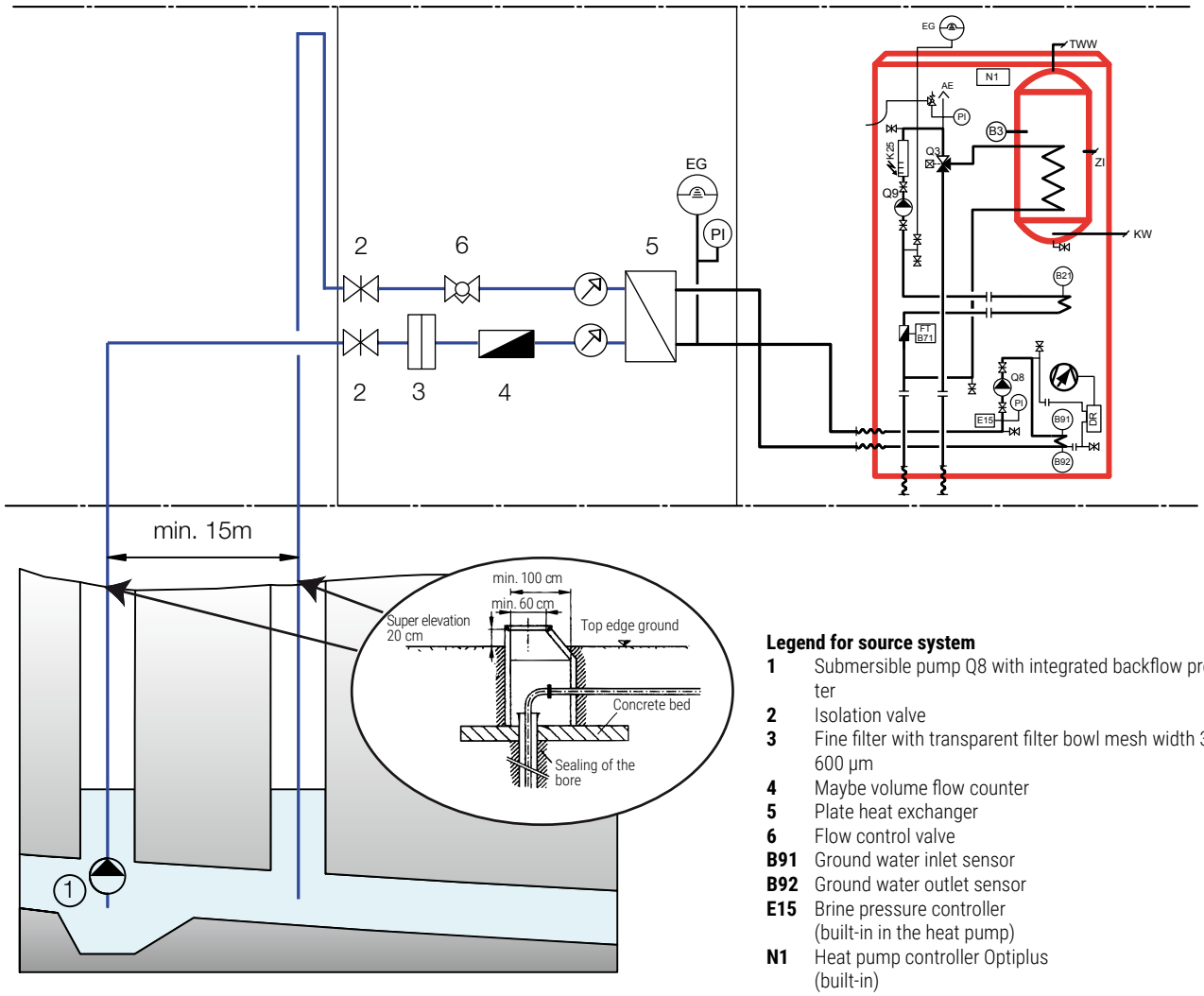
Internal assembly
- Protect all lines, pumps and armatures against corrosion.
- Also install drip tray.
- Prevent structure-borne noise.

Heat insulation
- Make it vapour diffusion-tight.
- Adequate insulation thickness for preventing condensation.

On-site work
- Coordination and design of line ditches, wall openings and well shafts.
- Filling the ditch and closing the wall openings after the installation.

Connections
- Drawing and non-return wells.
- Ditches and openings Delivery/assembly by installation company maybe foreman.

<u>Intermediate circuit (glycol 25%)</u>
- Hydraulic components outside of the heat pump.



Legend for source system

1	Submersible pump Q8 with integrated backflow preventer
2	Isolation valve
3	Fine filter with transparent filter bowl mesh width 300 - 600 µm
4	Maybe volume flow counter
5	Plate heat exchanger
6	Flow control valve
B91	Ground water inlet sensor
B92	Ground water outlet sensor
E15	Brine pressure controller (built-in in the heat pump)
N1	Heat pump controller Optiplus (built-in)
Q8	Brine pump in the intermediate circuit (built-in in the heat pump)

- Subject to technical changes.
- Installation of additional components as per local regulations and conditions.
- This presentation is used as planning aid for the responsible installer.

Function description

Heat pump

Start the heat pump via the external temperature sensor (B9). This works directly in the heating circulation.

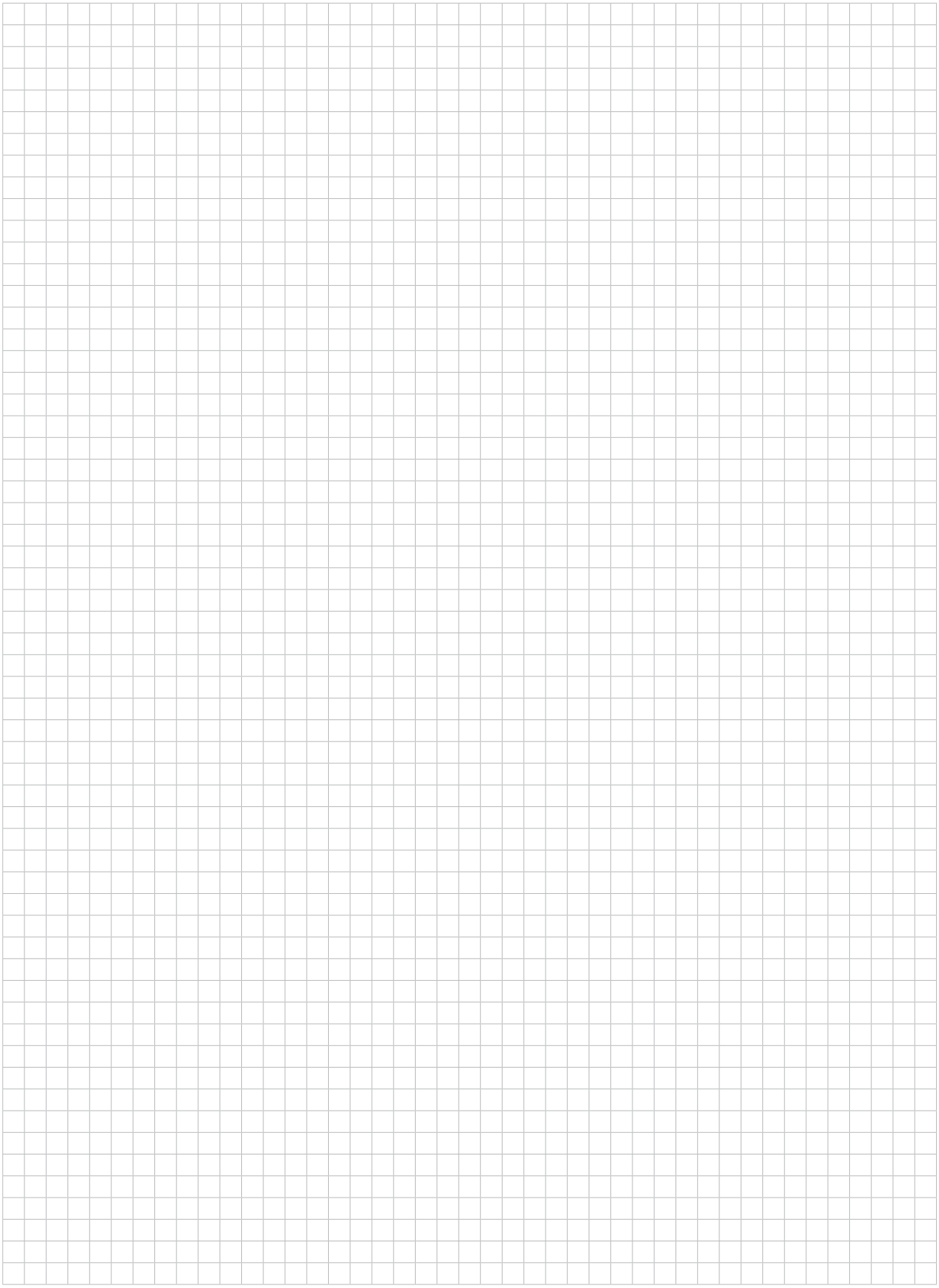
The heat pump is switched on and off via the return flow temperature (B71) depending on the external temperature. The machine has a starting delay in order to prevent wobbling. The integrated electrical heating element (K25) can be used as emergency heating.

The condenser pump (Q9) is in operating during the entire heating period, DHW is charged according to the time program via the temperature sensor (B3), the deflector valve (Q3) is thus switched. The electrical heating element (K6) in the DHW storage is controlled by the heat pump controller.

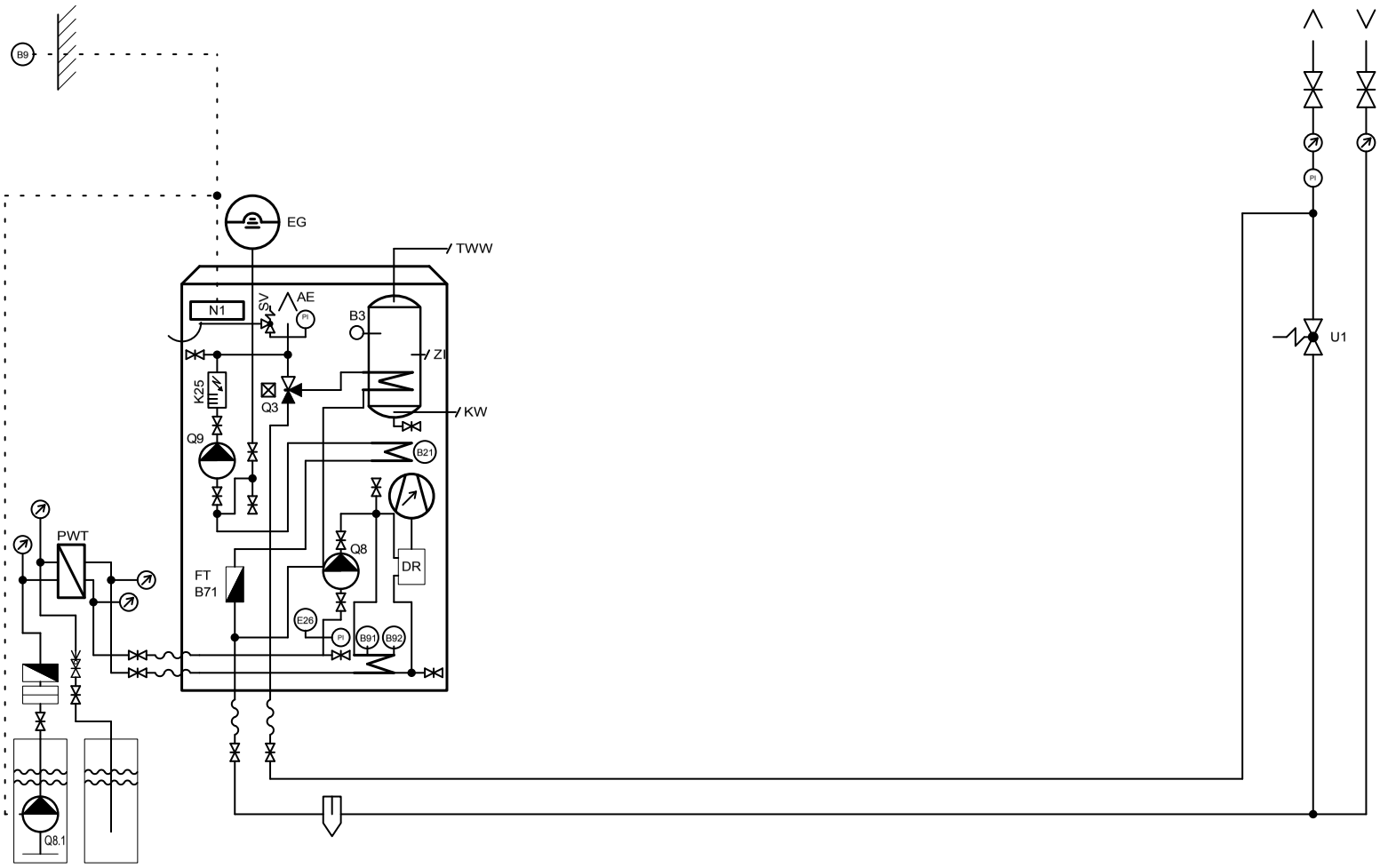
Free cooling

For passive cooling (free cooling), cooling is done without operating the cryogenic unit.
Heat is directly returned to the connected source (soil sensor or ground water). For cooling requirement, the source circuit is controlled by means of a deflector valve (Y28) via the plate heat exchanger (PWT).

The heat pump controller runs a cooling curve via the ambient temperature (B9), this is controlled with the connected mixer (Y1) and the flow temperature (B1). For available room thermostat valves, these must be adaptable for the cooling as well as the heating operation.



Ground water system | Heat pump | Consumer



Legend

AE	Automatic vent
B21	Flow temperature sensor heat pump
B3	Domestic hot water temperature sensor
B71	Return flow temperature sensor heat pump
B9	External temperature sensor
B91	Brine inlet temperature sensor
B92	Brine outlet temperature sensor
DR	Drive (output regulation)
E26	Brine pressure controller
EG	Expansion vessel
FT	Flow rate sensor
KW	Cold water
K25	Emergency heating element in flow
N11	Heat pump controller
PI	Pressure gauge
PWT	Plate heat exchanger (for cooling)
Q3	Deflector valve DHW
Q8.1	Submersible pump
Q8	Brine pump
Q9	Condenser pump
SV	Safety valve
TWW	Domestic hot water
U1	Overflow valve
ZI	Connection circulation DHW

				DATE	07/2016
				DESIGNER	KAF
				Proved	DG
RESPONSIBLE	CHANGE	DATE	DESIGNER	Standard	SIA 410

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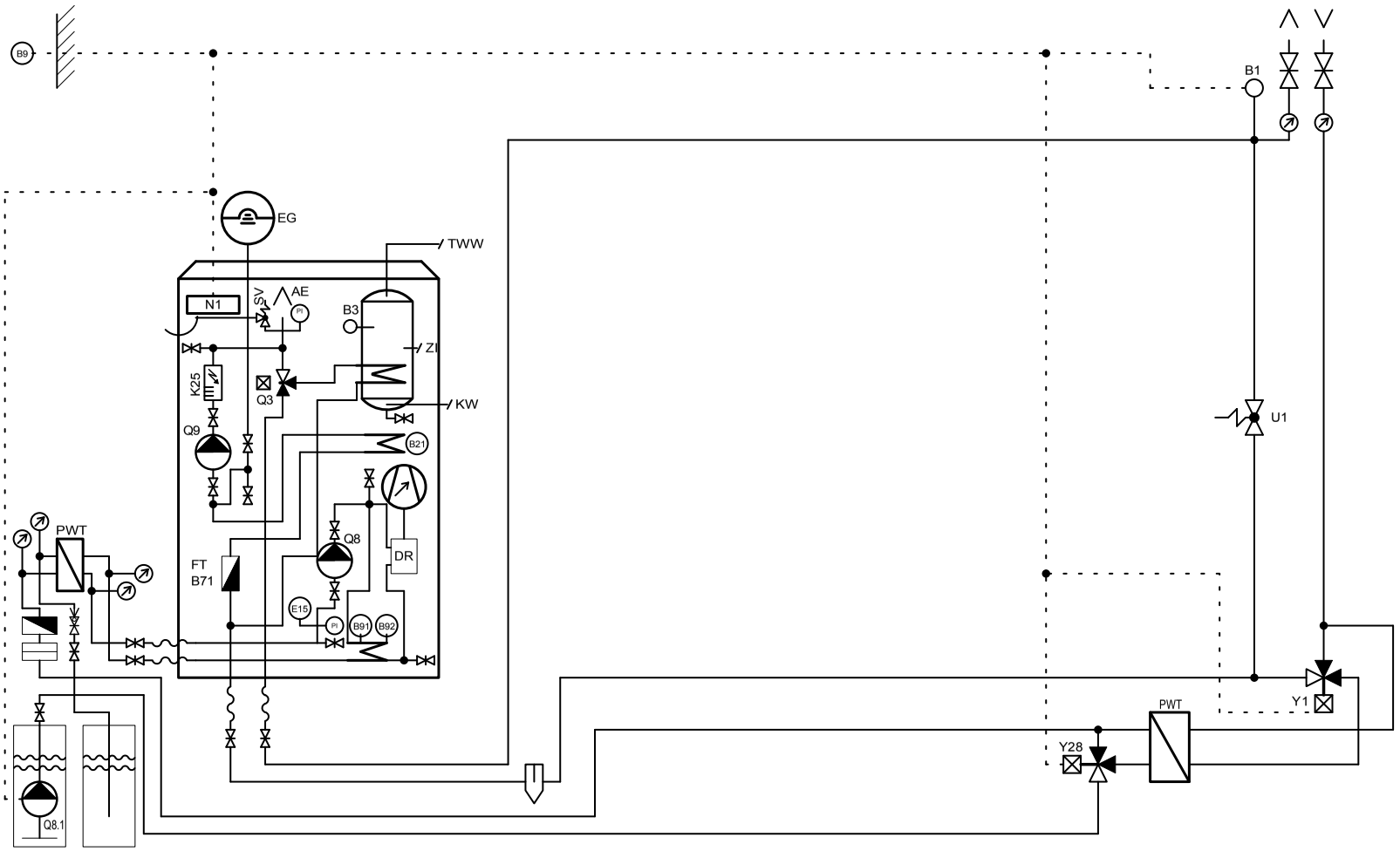
- This presentation is used as planning aid for the concerned installer.

PROJECTproject	STANDARD	Anlage / Funktion / Seite	5
NAME OF DRAWING	OHITWW	Project Manager	PM
		No. pgs.	6

Ground water system | Heat pump | Free cooling | Heating circuit 1



Legend

AE	Automatic vent	**KW**	Cold water	**Y1**	Mixer for cooling circuit 230 V
B1	Flow temperature sensor heating circuit	**K25**	Emergency heating element in flow	**Y28**	Deflector valve 230 V source side
B21	Flow temperature sensor heat pump	**N11**	Heat pump controller	**ZI**	Connection circulation DHW
B3	Domestic hot water temperature sensor	**PI**	Pressure gauge		
B71	Return flow temperature sensor heat pump	**PWT**	Plate heat exchanger (for cooling)		
B9	External temperature sensor	**Q3**	Deflector valve DHW		
B91	Brine inlet temperature sensor	**Q8**	Brine pump		
B92	Brine outlet temperature sensor	**Q8.1**	Submersible pump		
DR	Drive (output regulation)	**Q9**	Condenser pump		
E26	Brine pressure controller	**SV**	Safety valve		
EG	Expansion vessel	**TWW**	Domestic hot water		
FT	Flow rate sensor	**U1**	Overflow valve		

				DATE	01/2017
				DESIGNER	KAF
				Proved	DG
RESPONSIBLE	CHANGE	DATE	DESIGNER	Standard	SIA 410

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NAME OF DRAWING OHITWW

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