

Optipro

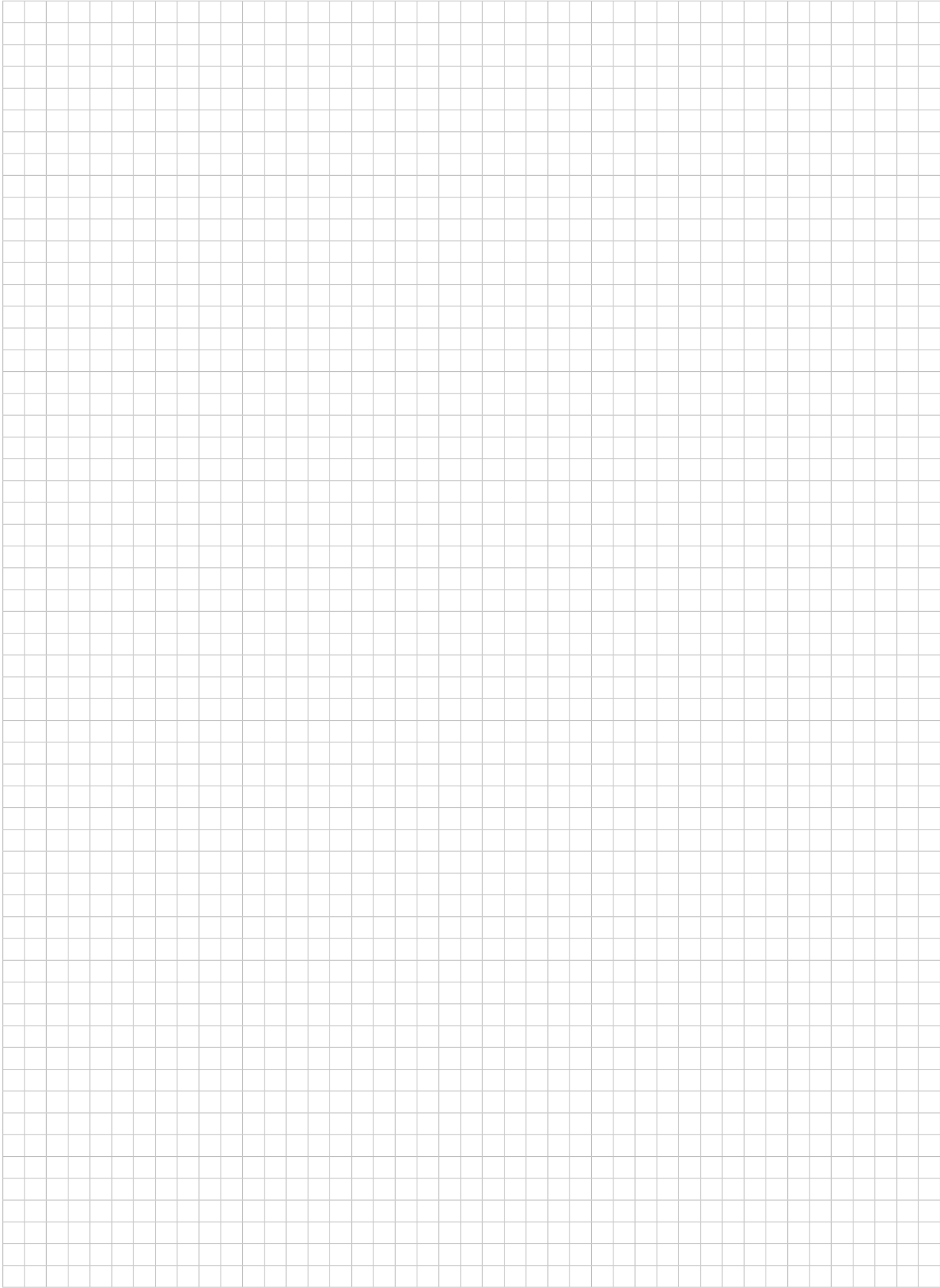
Brine/Water

OP 100ed to OP 230ed



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Technical data

Optipro OP 100ed to OP 140ed

OP 100ed to OP 140ed brine/water

Heat pump type	Optipro 100ed	Optipro 110ed	Optipro 130ed	Optipro 140ed
Model	dual circuit	dual circuit	dual circuit	dual circuit
Controller Optiplus	integrated	integrated	integrated	integrated
WPZ-test number	CH-HP-00956	CH-HP-00956	CH-HP-00956	CH-HP-00956

Standard performance data (as per EN 14511)			W 35	W 50	W 35	W 50	W 35	W 50	W 35	W 50
Heat output	at B0	kW	100	93	111	104	127	118	140	132
Performance data COP	at B0	(-)	4.7	3.2	4.6	3.2	4.6	3.2	4.6	3.2
Performance factor cos φ	at B0	(-)	0.72	0.80	0.76	0.84	0.75	0.84	0.76	0.85
El. power consumption	at B0	kW	21	28	23	32	27	36	30	41
Cooling output	at B0	kW	79	65	88	72	100	82	110	91

Energy class / Performance data (average climatic conditions)

Energy efficiency class 35°C / 55°C		A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
Rated thermal output Prated 35°C / 55°C	kW	100/91	111/102	127/116	140/130
Energy efficiency η _S 35°C / 55°C	%	192/152	189/150	188/151	189/150
SCOP (according to EN 14825) 35°C/55°C		5.0/4.0	4.9/4.0	4.9/4.0	4.9/4.0

Sound

Sound power level	L _{wa}	dB(A)	74	74	72	71
Sound pressure level in 1m ¹⁾	L _{pa}	dB(A)	59	59	57	56

Field of application / application limits

Heat source temperature	min/max	°C	- 5 to +20°C			
Heat flow temperature at > B3	min/max	°C	+25 to +60°C			
Heat flow temperature at B-5	min/max	°C	+25 to +56°C		+25 to +50°C	

Vaporiser, brine side (at B0/W35)

Volume flow, minimum/nominal/standard	m ³ /h	18.0/20.6/24.0	19.9/22.8/26.6	22.7/25.9/30.3	25.1/28.7/33.4
Pressure drop via heat pump	kPa	8.0/10.0/13.1	9.6/12.0/15.7	8.8/11.1/14.5	10.5/13.2/17.3
Medium water / ethylene glycol	%	75/25	75/25	75/25	75/25

Condenser, heater side (at B0/W35)

Volume flow, minimum/nominal/standard	m ³ /h	8.6/12.3/17.2	9.6/13.7/19.1	10.9/15.5/21.8	12.1/17.2/24.1
Pressure drop via heat pump	kPa	1.9/3.7/7.1	2.3/4.6/8.7	2.2/4.2/8.0	2.6/5.1/9.7
Medium water	%	100	100	100	100

Dimensions/connections/miscellaneous

Dimensions	D x W x H	mm	860 x 1260 x 1980			
Total weight		kg	830	900	975	1000
Heating circuit connection	IG	Inch	3"-Victaulic	3"-Victaulic	3"-Victaulic	3"-Victaulic
Heat source connection	IG	Inch	4"-Victaulic	4"-Victaulic	4"-Victaulic	4"-Victaulic
Cooling agent/filling quantity	-- / kg		R-410A / 16.8	R-410A / 17.6	R-410A / 20.4	R-410A / 20.9
GWP / CO ₂ e	--- / t		2088/35.1	2088/36.8	2088/42.6	2088/43.7
Refrigeration oil filling quantity	l		8.1	9.4	11.5	13.6

Electrical data

Operating voltage, supply			3P / N / PE / 400 V / 50 Hz			
External fuse protection	AT	125 "C"	125 "C"	160 "C"	160 "C"	
External fuse protection without circulation pumps	AT	100 "C"	100 "C"	125 "C"	160 "C"	
Max. machine current ²⁾	A	125	125	160	160	
Max. machine current without circulation pumps	A	100	100	125	160	
Starting current direct per compressor (LRA)	A	174/225	225/225	225/272	272/272	
Starting current with soft starter	A	99/113	113/113	113/136	136/136	
Protection class	IP	20	20	20	20	
Max. power consumption compressor	kW	39.7	45.2	50.2	55.2	
Max. power consumption circulation pumps	kW	3.5	3.5	4.4	5.0	
Max. power consumption total	kW	43.2	48.7	54.6	60.2	
Heating pump outputs ²⁾		3P/N/PE	3P/N/PE	3P/N/PE	3P/N/PE	
Source pump output ³⁾		3P/PE	3P/PE	3P/PE	3P/PE	

- 1) Reading averaged by the machine (free field)
- 2) Heating pumps 1 x 230 V (max. power consumption per pump output: 2 A) or 3 x 400 V.
- 3) Source pump 3 x 400 V

Observe local conditions and regulations.

Technical data

Optipro OP 160ed to OP 230ed

OP 160ed to OP 230ed brine/water

Heat pump type	Optipro 160ed	Optipro 180ed	Optipro 210ed	Optipro 230ed
Model	dual circuit	dual circuit	dual circuit	dual circuit
Controller Optiplus	integrated	integrated	integrated	integrated
WPZ-test number	CH-HP-00956	CH-HP-00956	CH-HP-00956	CH-HP-00956

Standard performance data (as per EN 14511)			W 35	W 50	W 35	W 50	W 35	W 50	W 35	W 50
Heat output	at B0	kW	161	151	180	169	206	193	230	215
Performance data COP	at B0	(-)	4.6	3.2	4.6	3.2	4.7	3.2	4.7	3.2
Performance factor cos φ	at B0	(-)	0.77	0.86	0.78	0.86	0.79	0.86	0.80	0.87
El. power consumption	at B0	kW	34	46	38	52	43	58	48	65
Cooling output	at B0	kW	127	105	142	117	163	135	182	150

Energy class / Performance data (average climatic conditions)

Energy efficiency class 35°C / 55°C		A+++/A+++	A+++/A+++	A+++/A+++	A+++/A+++
Rated thermal output Prated 35°C / 55°C	kW	161/149	1180/167	2206/190	230/213
Energy efficiency η _S 35°C / 55°C	%	189/150	185/145	1198/152	1187/147
SCOP (according to EN 14825) 35°C/55°C		4.9/4.0	4.8/3.9	44.9/4.0	4.8/4.0

Sound

Sound power level	L _{wa}	dB(A)	71	73	75	75
Sound pressure level in 1m ¹⁾	L _{pa}	dB(A)	56	58	60	60

Field of application / application limits

Heat source temperature	min/max	°C	- 5 to +20°C			
Heat flow temperature at > B3	min/max	°C	+25 to +60°C			
Heat flow temperature at B-5	min/max	°C	+25 to +50°C	+25 to +56°C		

Vaporiser, brine side (at B0/W35)

Volume flow, minimum/nominal/standard	m ³ /h	29.0/33.1/38.7	32.3/36.9/43.1	37.1/42.5/49.5	41.3/47.2/55.1
Pressure drop via heat pump	kPa	9.6/12.1/15.8	11.5/14.5/19.1	11.2/14.1/18.5	13.4/17.0/22.6
Medium water / ethylene glycol	%	75/25	75/25	75/25	75/25

Condenser, heater side (at B0/W35)

Volume flow, minimum/nominal/standard	m ³ /h	13.9/19.8/27.8	15.5/22.1/31.0	17.7/25.3/5.5	19.8/28.2/39.5
Pressure drop via heat pump	kPa	2.8/5.5/10.4	3.4/6.7/12.8	3.3/6.4/12.3	4.0/7.9/15.2
Medium water	%	100	100	100	100

Dimensions/connections/miscellaneous

Dimensions	D x W x H	mm	860 x 1260 x 1980			
Total weight		kg	1125	1145	1235	1250
Heating circuit connection	IG	Inch	3"-Victaulic	3"-Victaulic	3"-Victaulic	3"-Victaulic
Heat source connection	IG	Inch	4"-Victaulic	4"-Victaulic	4"-Victaulic	4"-Victaulic
Cooling agent/filling quantity	-- / kg		R-410A / 31	R-410A / 30.9	R-410A / 36.2	R-410A / 36.3
GWP / CO ₂ e	--- / t		2088/64.8	2088/64.6	2088/75.7	2088/75.9
Refrigeration oil filling quantity	l		13.1	12.6	12.6	12.6

Electrica data

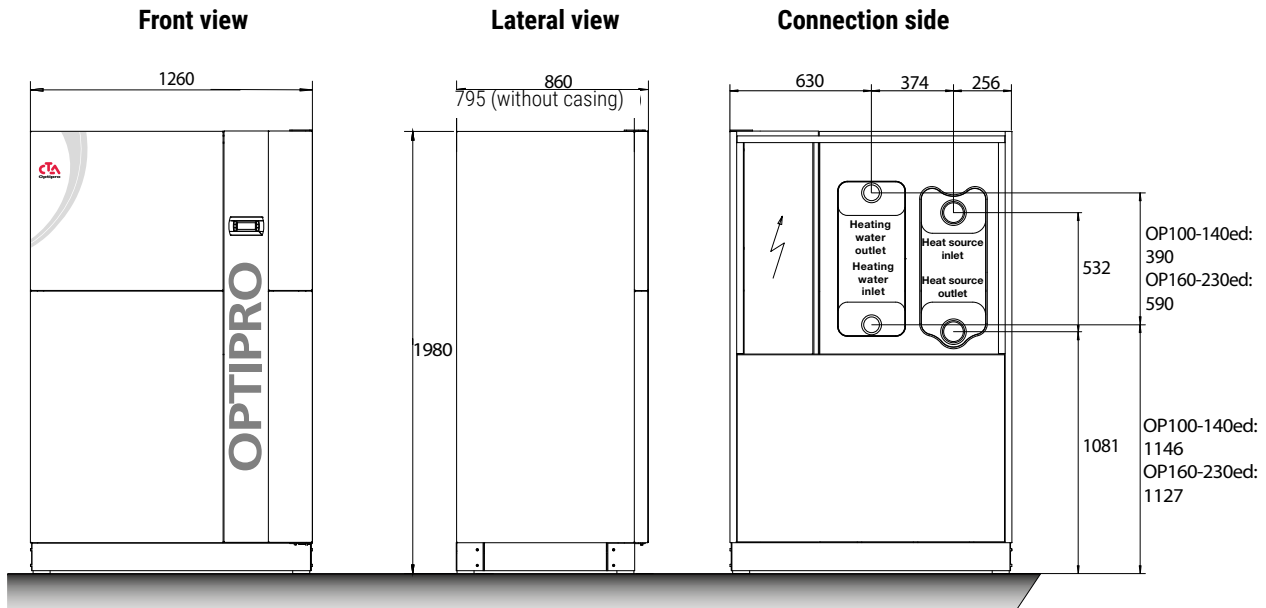
Operating voltage, supply			3P / N / PE / 400 V / 50 Hz			
External fuse protection	AT	200 "C"	200 "C"	200 "C"	200 "C"	200 "C"
External fuse protection without circulation pumps	AT	160 "C"	200 "C"	200 "C"	200 "C"	200 "C"
Max. machine current ^{2) 3)}	A	200	200	200	200	200
Max. machine current without circulation pumps	A	160	200	200	200	200
Starting current direct per compressor (LRA)	A	272/310	310/310	310/408	408/408	408/408
Starting current with soft starter	A	136/155	155/155	155/204	204/204	204/204
Protection class	IP	20	20	20	20	20
Max. power consumption compressor	kW	63.7	72.2	81.1	90.0	90.0
Max. power consumption circulation pumps	kW	5.0	5.0	8.8	8.8	8.8
Max. power consumption total	kW	68.7	77.2	89.9	98.8	98.8
Heating pump outputs ²⁾			3P/N/PE	3P/N/PE	3P/N/PE	3P/N/PE
Source pump output ³⁾			3P/PE	3P/PE	3P/PE	3P/PE

- 1) Reading averaged by the machine (free field)
- 2) Heating pumps 1 x 230 V (max. power consumption per pump output: 2 A) or 3 x 400 V
- 3) Source pump 3 x 400 V

Observe local conditions and regulations.

Dimension drawing Optipro OP 100ed to OP 230ed

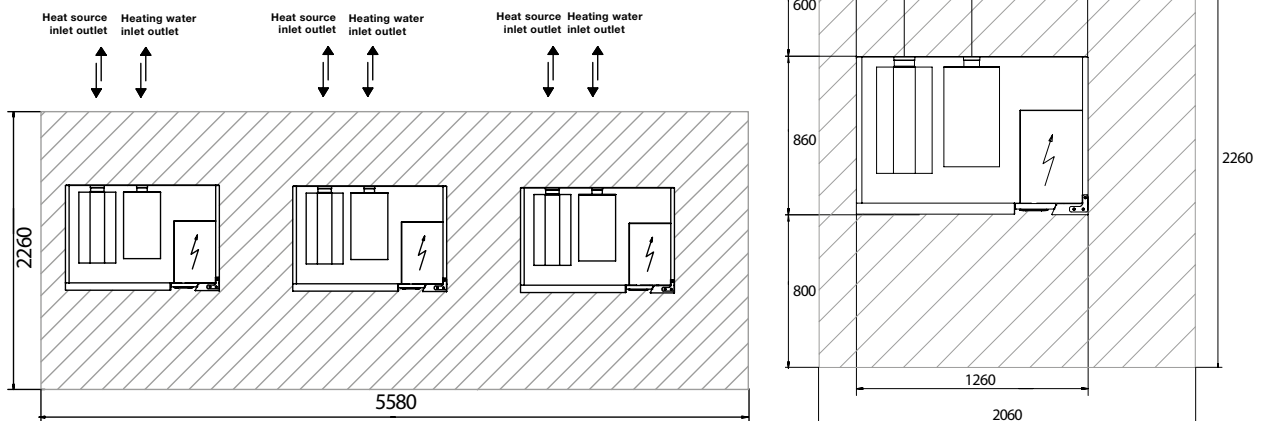
OP 100ed to OP 230ed brine/water



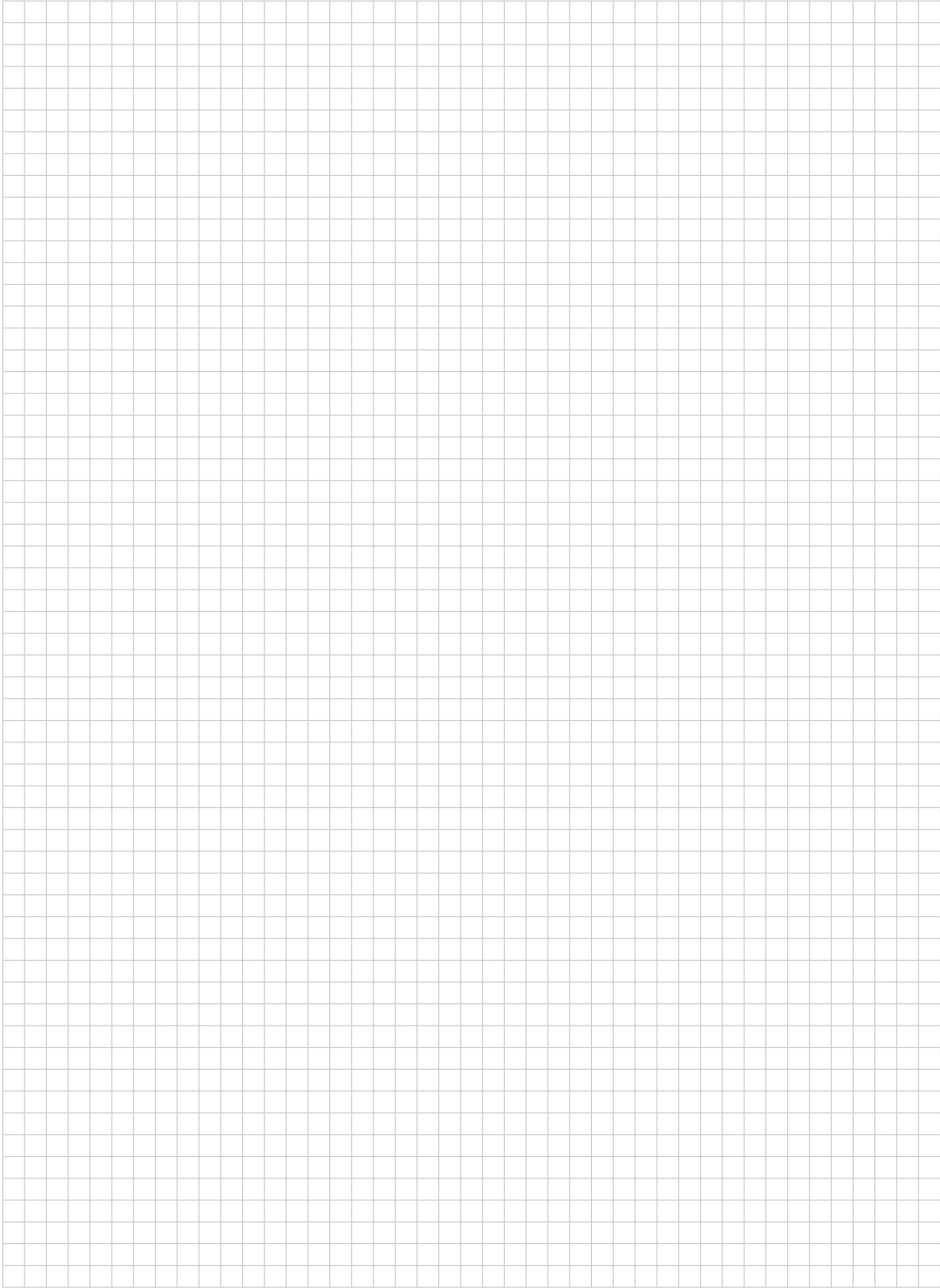
- Compensators for vibration absorption must be built in the hydraulic connection line directly after the heat pump.
- The dimensions of the hydraulic connections may vary slightly.
- Casing construction for bringing in with pallet rollers.
- We reserve the right to make design and specification changes without prior notice.

All dimensions are in mm

Alternative installation: cascade with 3 heat pumps



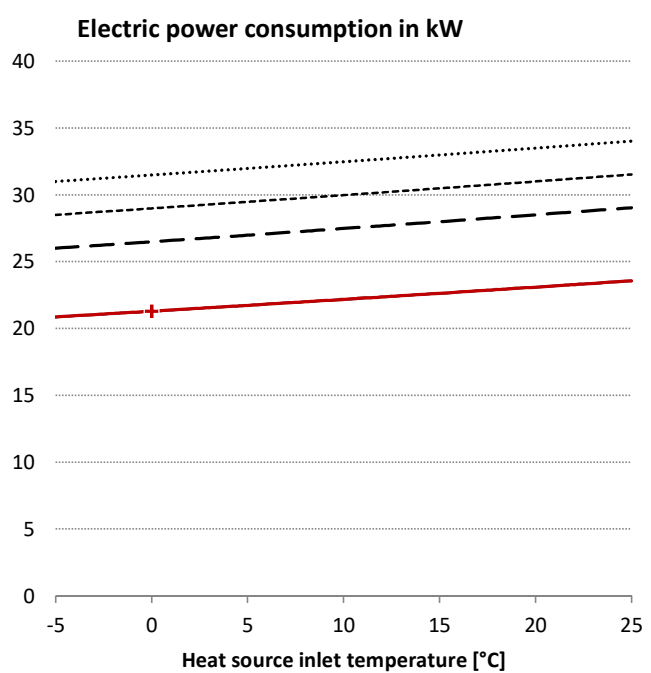
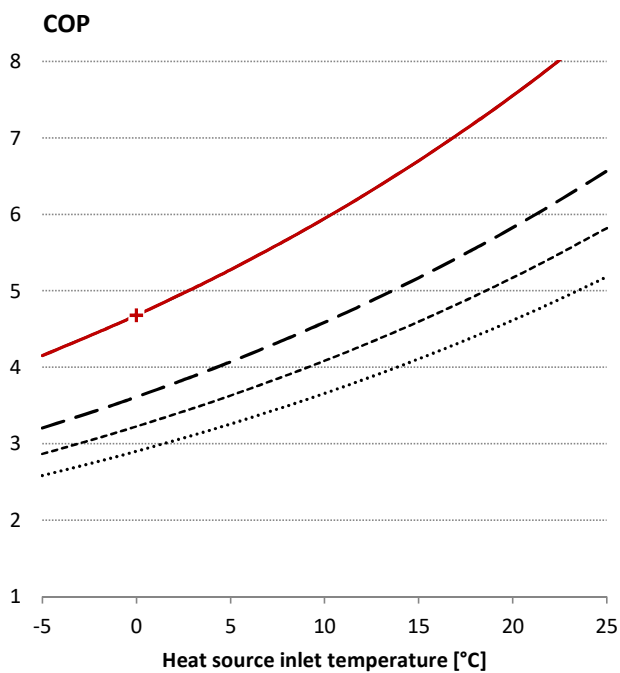
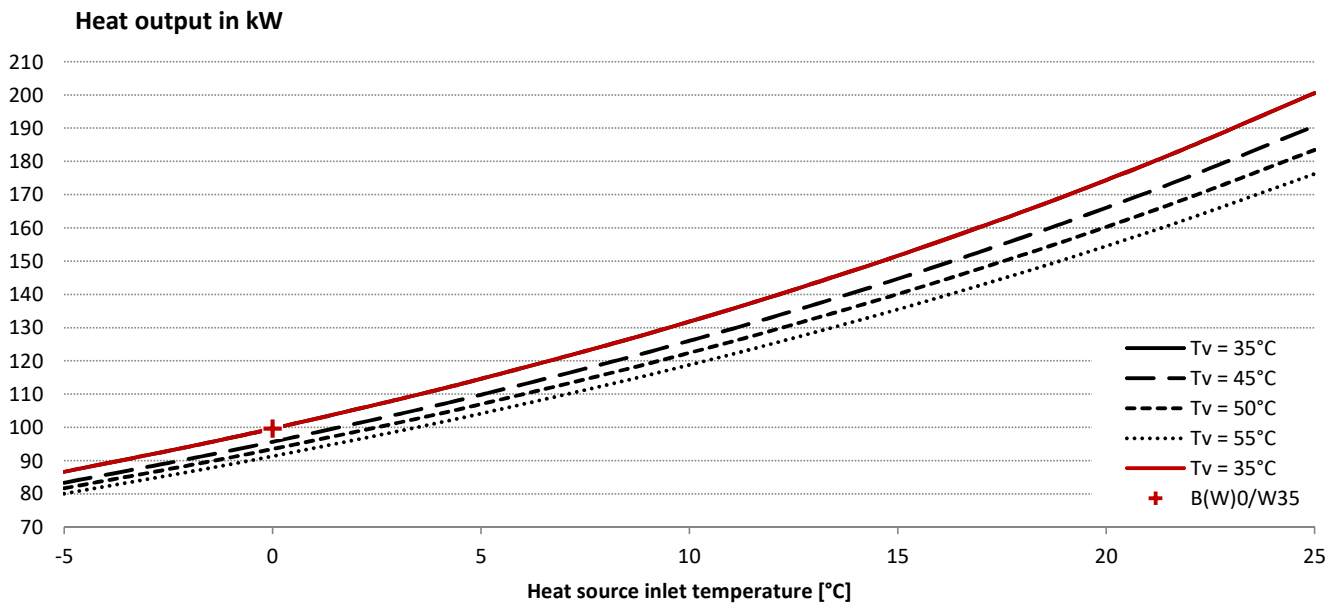
The external sensor and the documents are enclosed in the electric panel.



Power curves Optipro OP 100ed

Volume flow source minimum/nominal/standard 18.0 / 20.6 / 24.0 m³/h
 Volume flow heater minimum/nominal/standard 8.6 / 12.3 / 17.2 m³/h

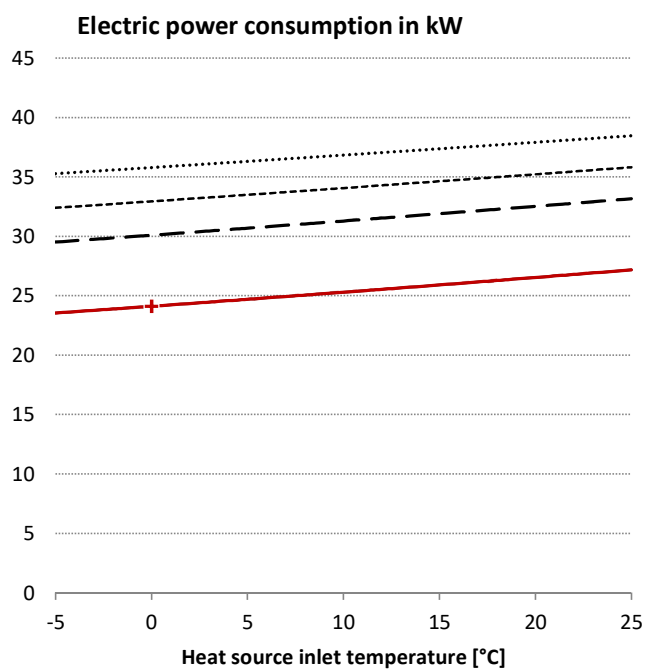
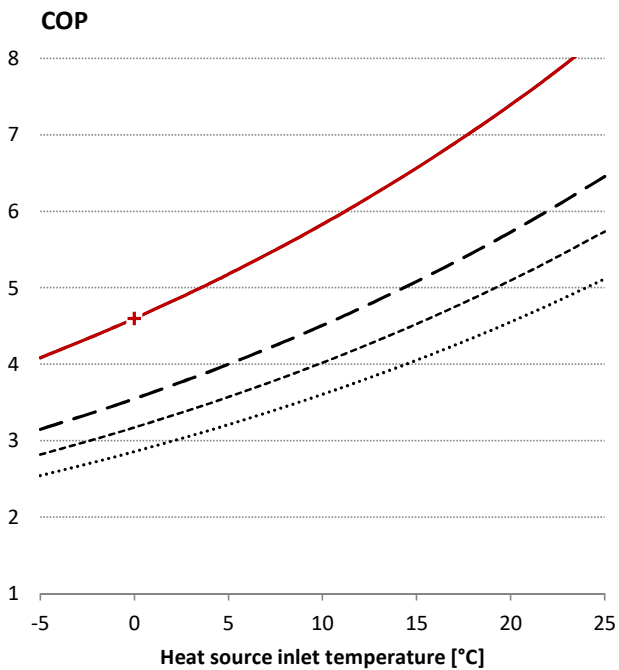
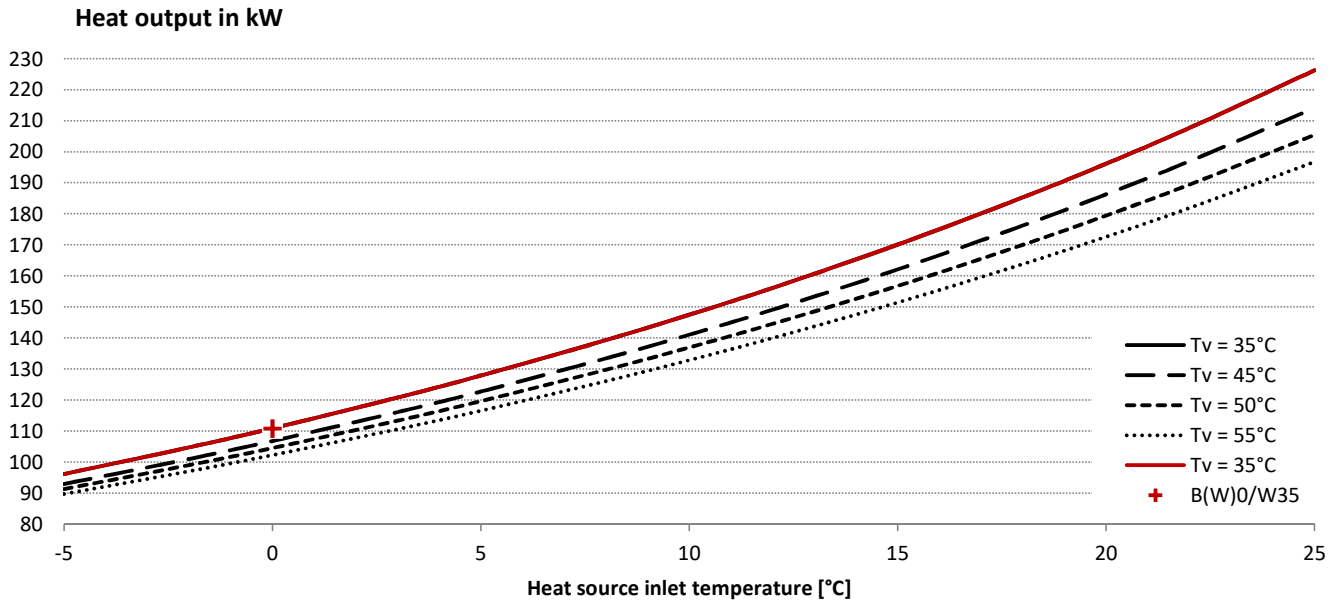
Performance data as per EN 14511, with 2 compressors in operation.



Power curves Optipro OP 110ed

Volume flow source minimum/nominal/standard 20.0 / 22.9 / 26.7 m³/h
 Volume flow heater minimum/nominal/standard 9.6 / 13.7 / 19.1m³/h

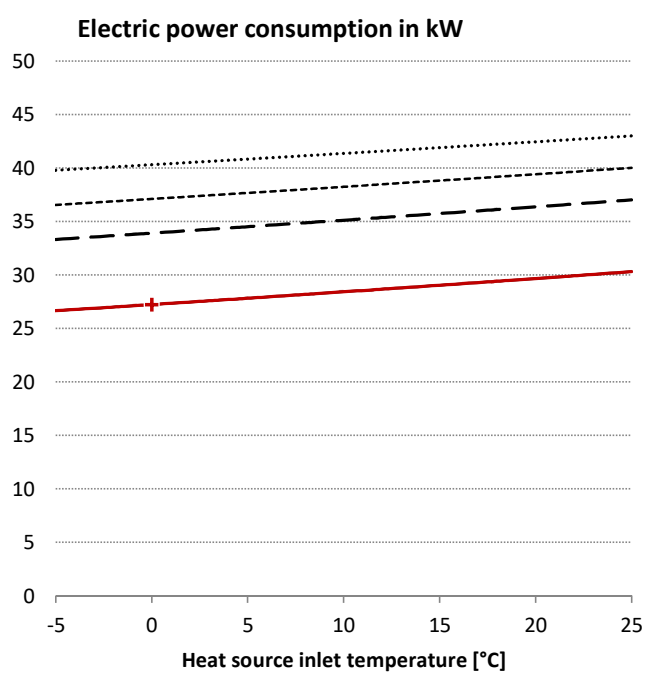
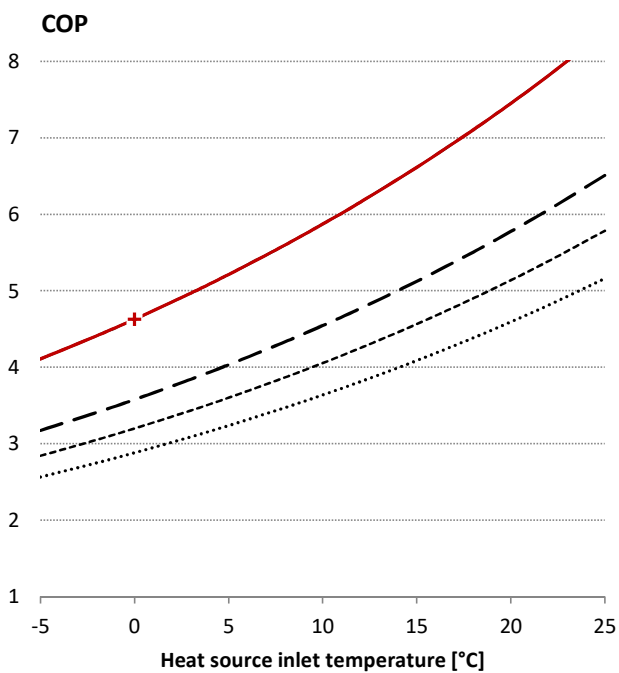
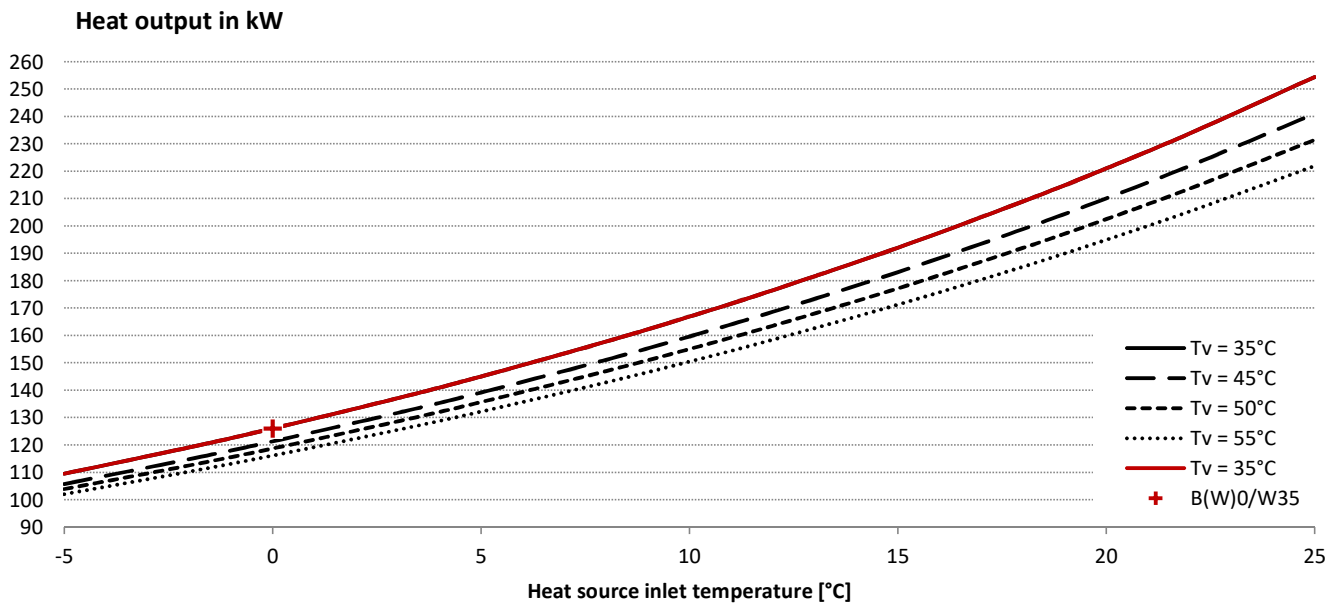
Performance data as per EN 14511, with 2 compressors in operation.



Power curves Optipro OP 130ed

Volume flow source minimum/nominal/standard 22.8 / 26.0 / 30.3 m³/h
 Volume flow heater minimum/nominal/standard 10.9 / 15.5 / 21.8 m³/h

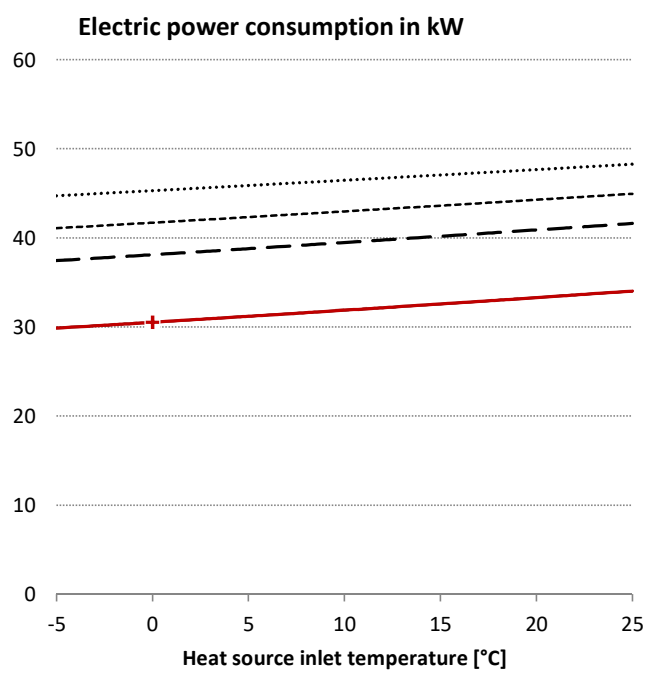
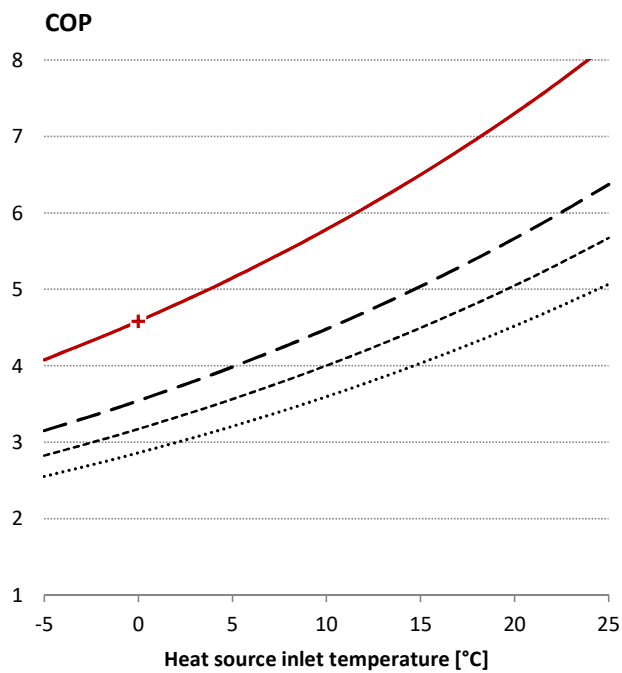
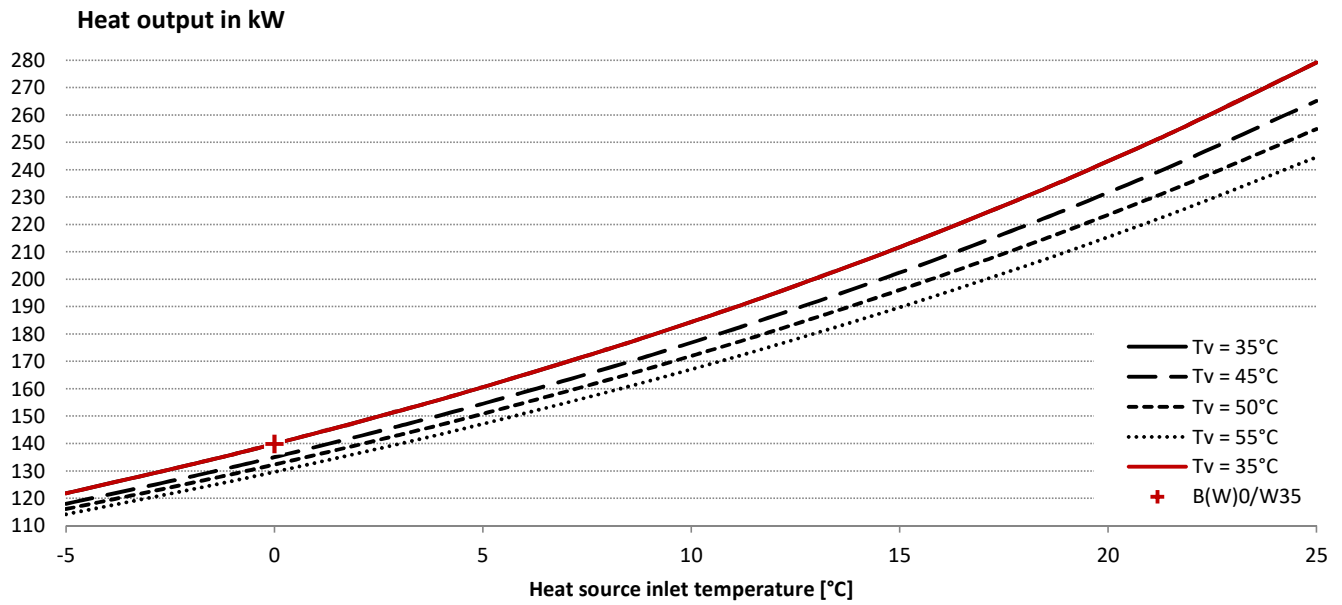
Performance data as per EN 14511, with 2 compressors in operation.



Power curves Optipro OP 140ed

Volume flow source minimum/nominal/standard 25.0 / 28.6 / 33.4 m³/h
 Volume flow heater minimum/nominal/standard 12.1 / 17.2 / 24.1 m³/h

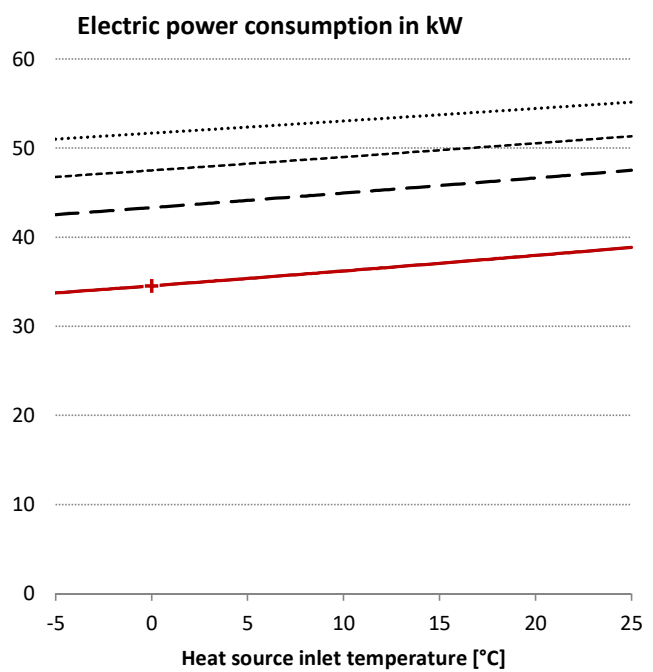
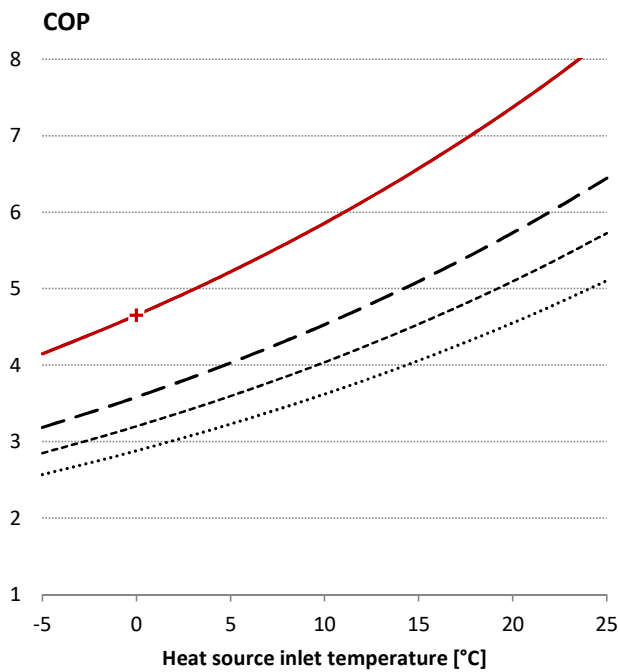
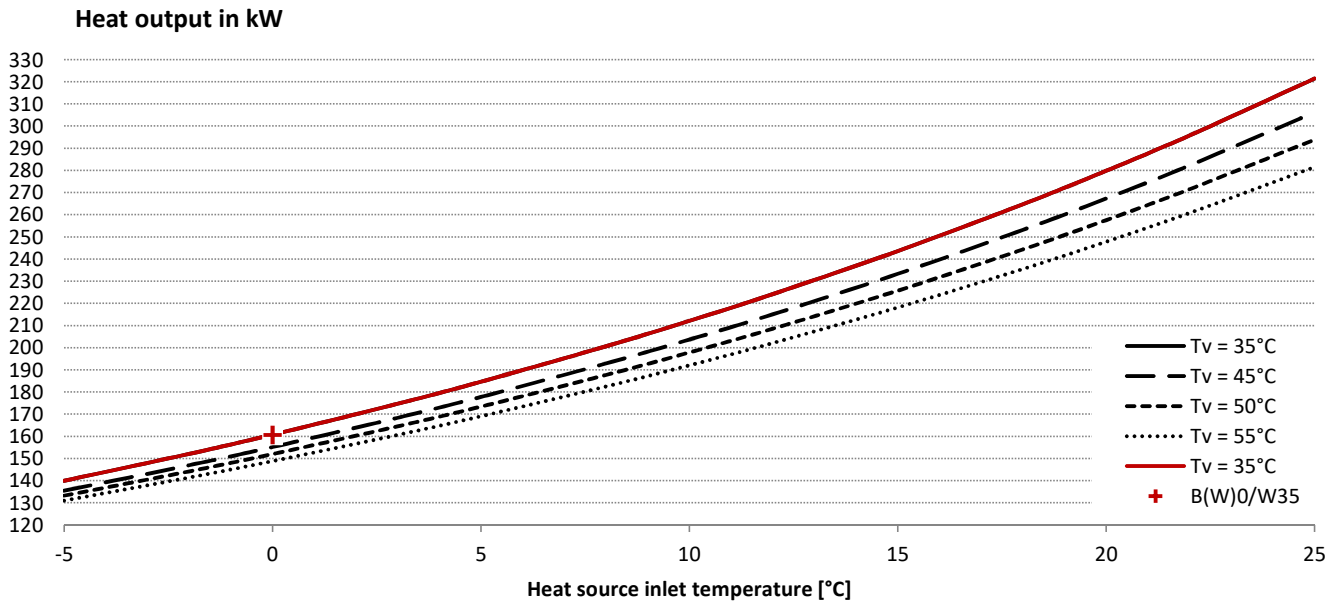
Performance data as per EN 14511, with 2 compressors in operation.



Power curves Optipro OP 160ed

Volume flow source minimum/nominal/standard 28.9 / 33.0 / 38.5 m³/h
 Volume flow heater minimum/nominal/standard 13.9 / 19.8 / 27.8 m³/h

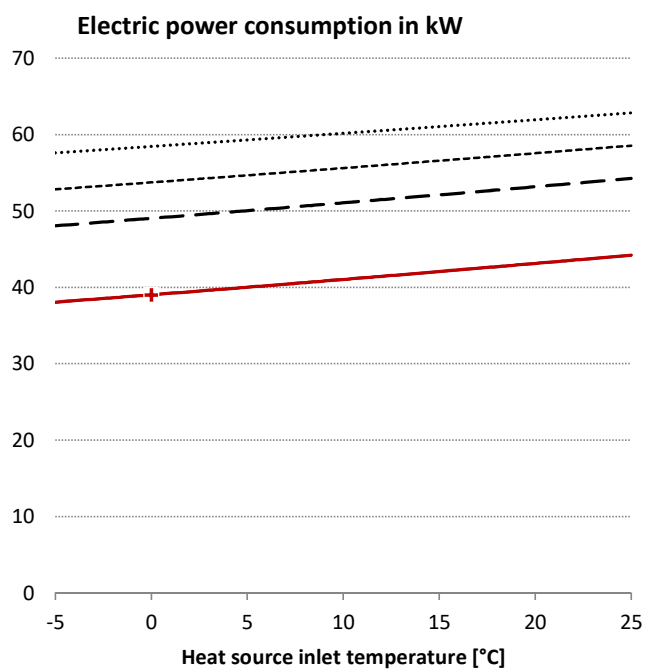
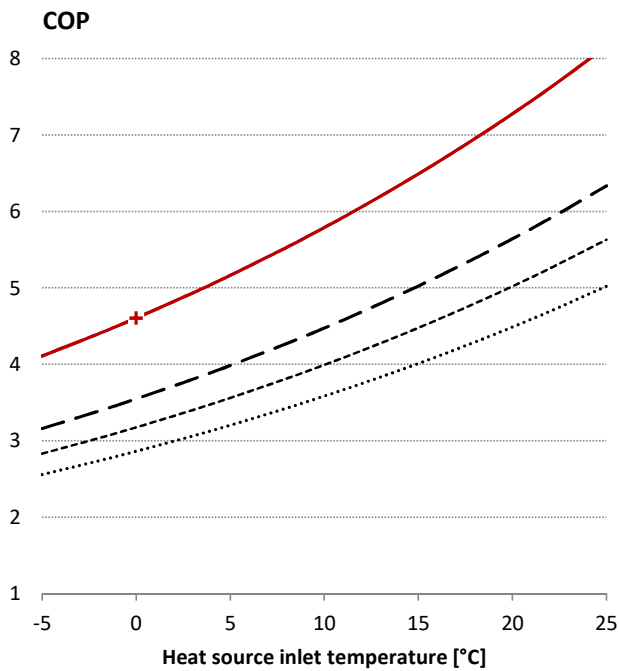
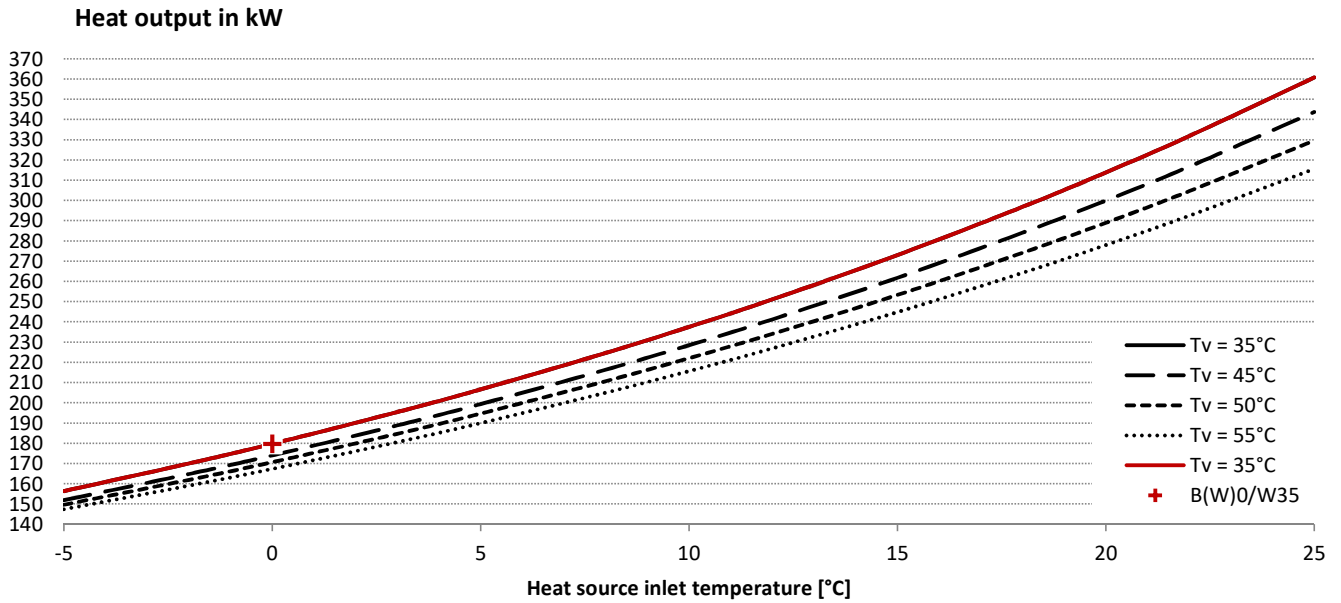
Performance data as per EN 14511, with 2 compressors in operation.



Power curves Optipro OP 180ed

Volume flow source minimum/nominal/standard 32.3 / 36.9 / 43.1 m³/h
 Volume flow heater minimum/nominal/standard 15.5 / 22.1 / 31.0 m³/h

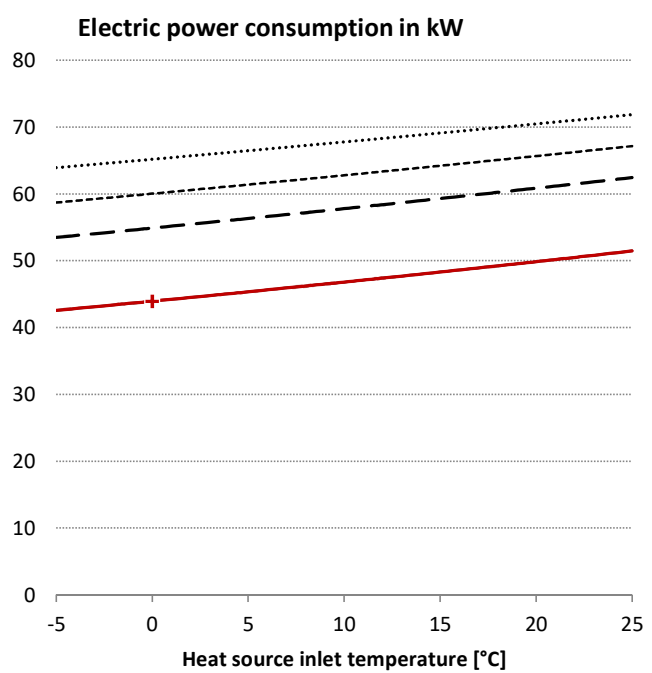
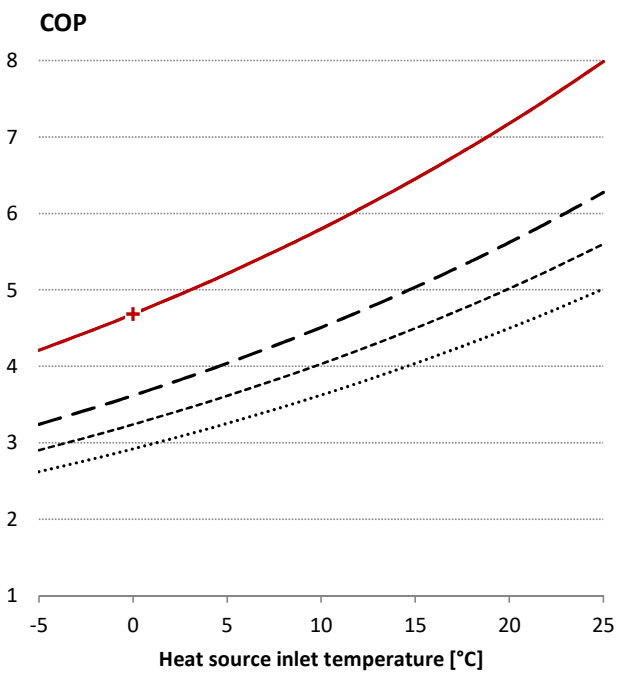
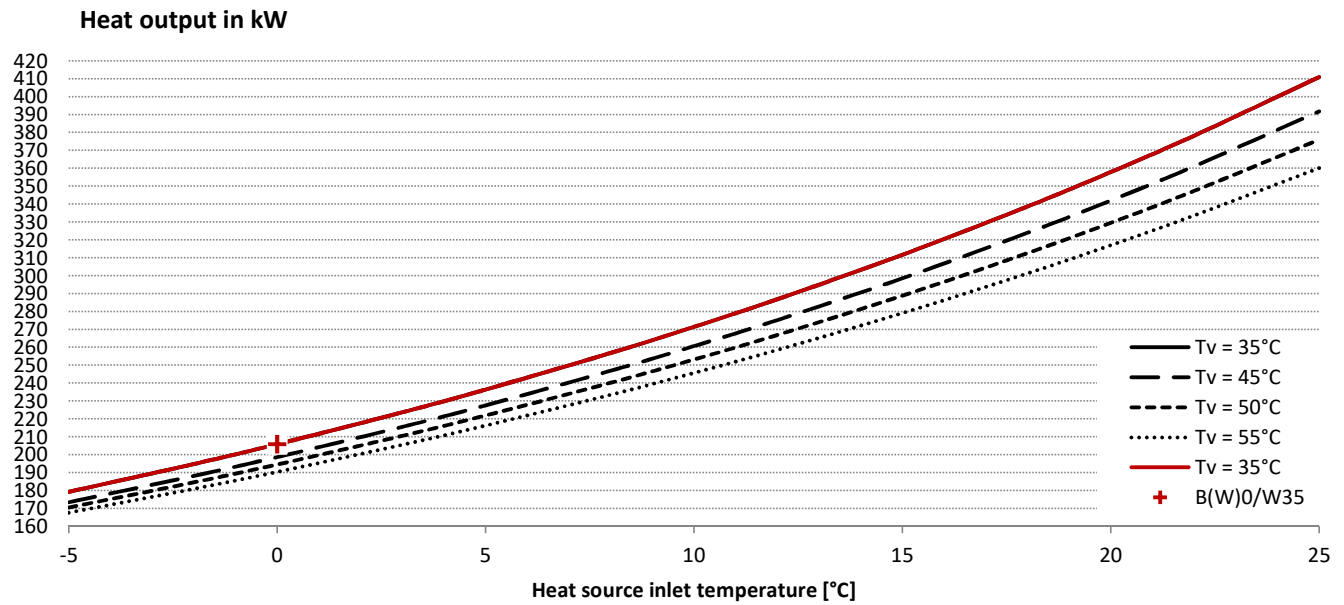
Performance data as per EN 14511, with 2 compressors in operation.



Power curves Optipro OP 210ed

Volume flow source minimum/nominal/standard 37.1 / 42.4 / 49.5 m³/h
 Volume flow heater minimum/nominal/standard 17.7 / 25.3 / 35.5 m³/h

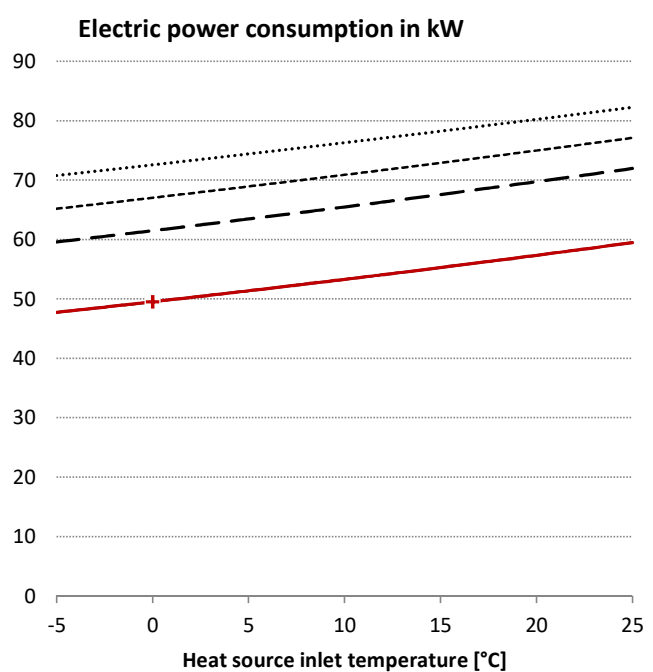
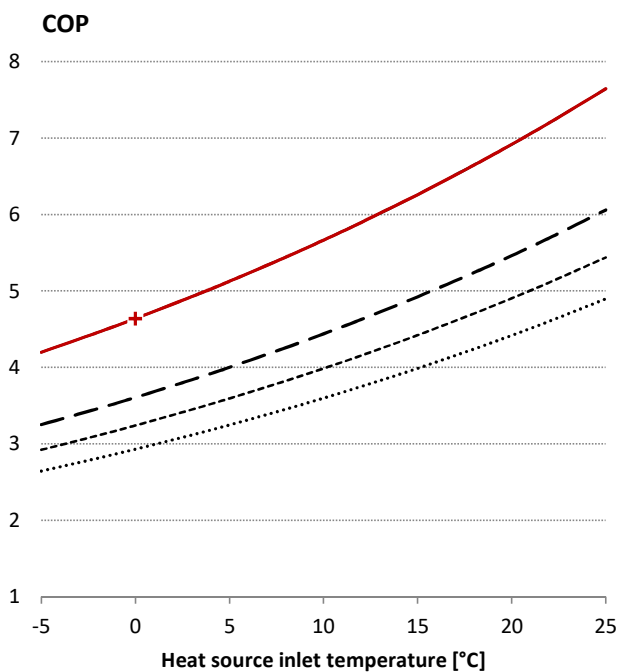
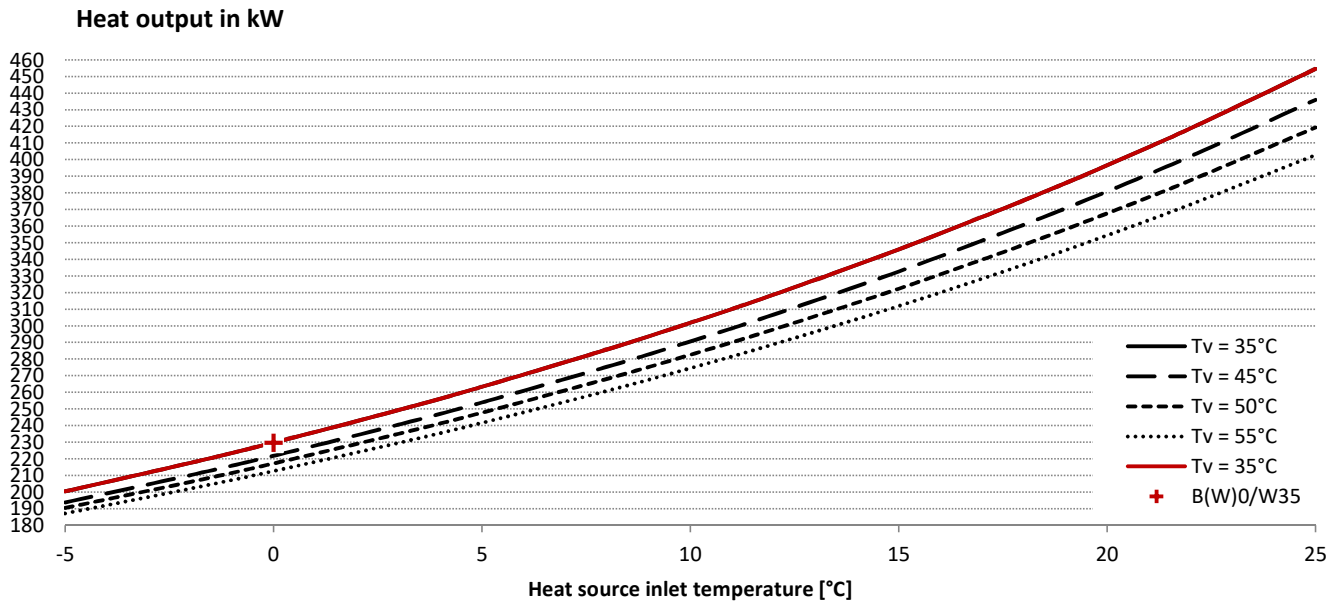
Performance data as per EN 14511, with 2 compressors in operation.



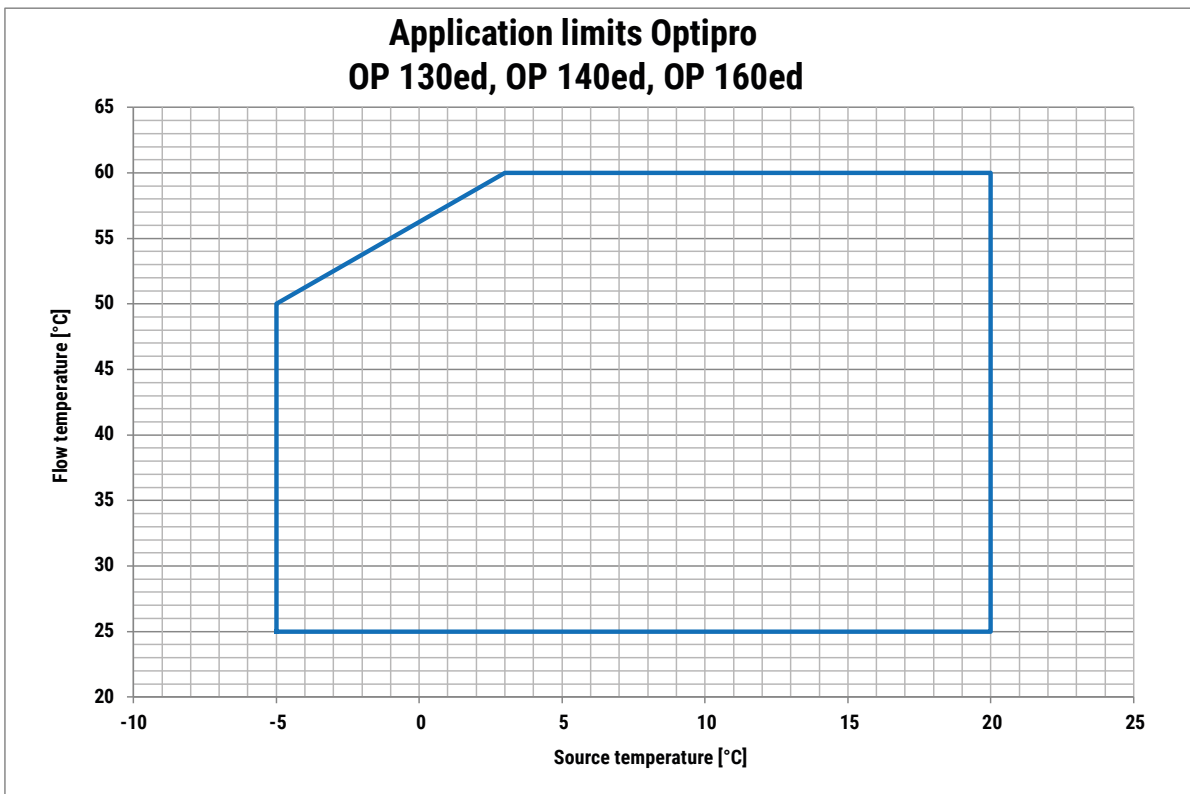
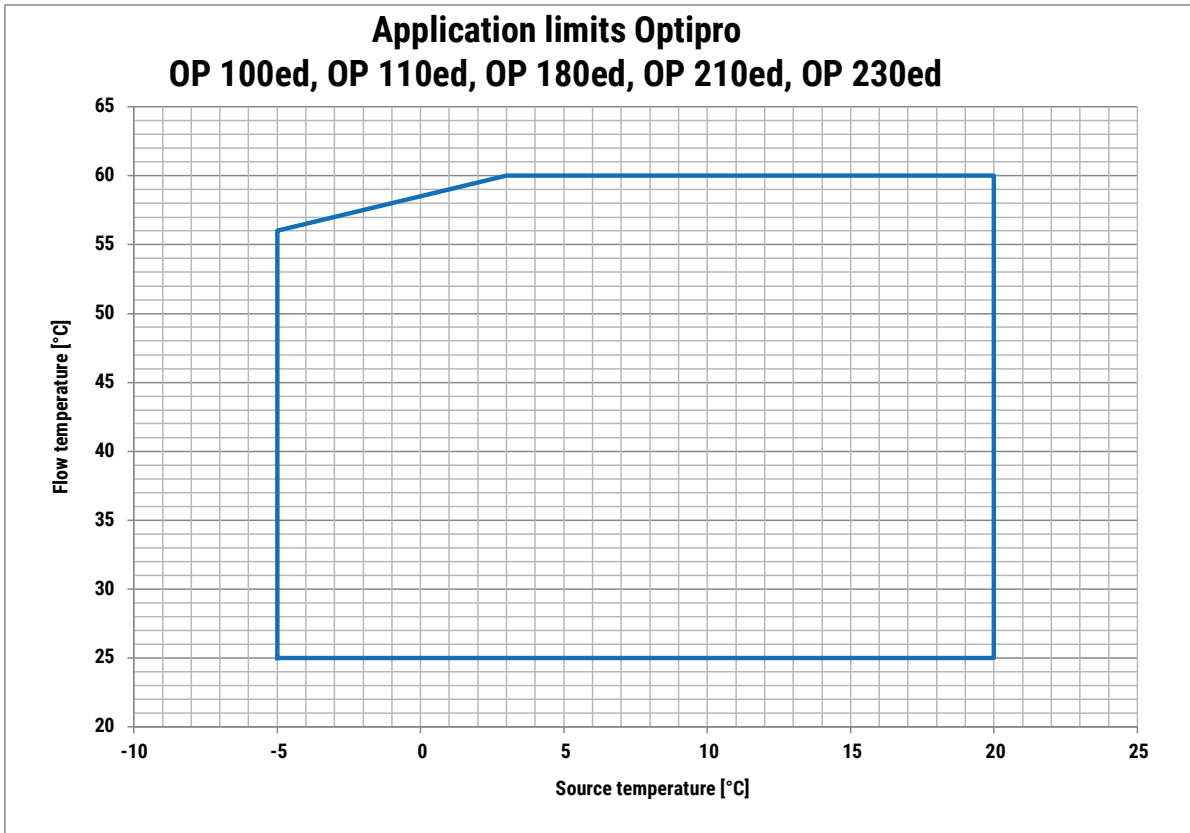
Power curves Optipro OP 230ed

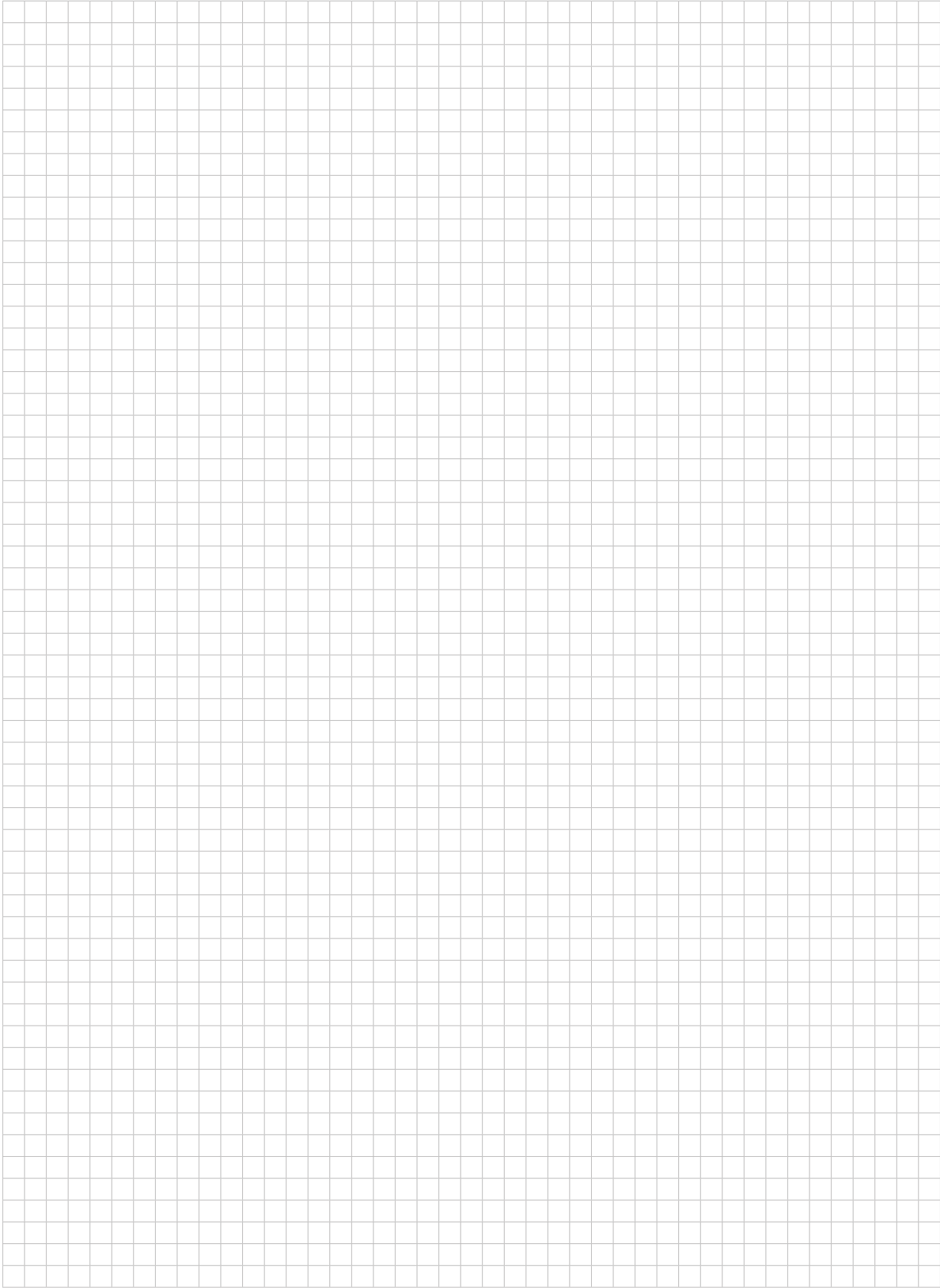
Volume flow source minimum/nominal/standard 41.4 / 47.3 / 55.2 m³/h
 Volume flow heater minimum/nominal/standard 19.8 / 28.2 / 39.5 m³/h

Performance data as per EN 14511, with 2 compressors in operation.



Application limits Optipro





Function description

Heat pump

Start the heat pump via the external temperature sensor B9. Depending on the hydraulic integration, this works directly on the buffer storage or directly in the heating circulation. Depending on the heat demand, the heat pump is switched on and off via the temperature sensors B4/B41 or B71.

The heat pump has a restart delay in order to prevent wobbling. In case of direct heat operation (e. g. underfloor heating), the condenser pump Q9 is in operation during the entire heating period.

DHW charging

DHW is charged according to the time program to the respective setpoint value. Charge is released via the temperature sensor B3, and the deflector valve Q3 is switched. The electrical heating element K6 in the DHW storage is released by the heat pump controller (further release necessary).

An external heat exchanger is used for DHW storage without internal register. Two additional temperature sensors B31 and B36 must be installed for controlling the intermediate circuit pump Q33.

Buffer storage

If a buffer storage is used in the hydraulic system, the heat generator side and consumer side are decoupled. The storage is used to bridge heat generator locks. The setpoint value of the storage is calculated by the maximum demand of the consumer groups.

Discharge control

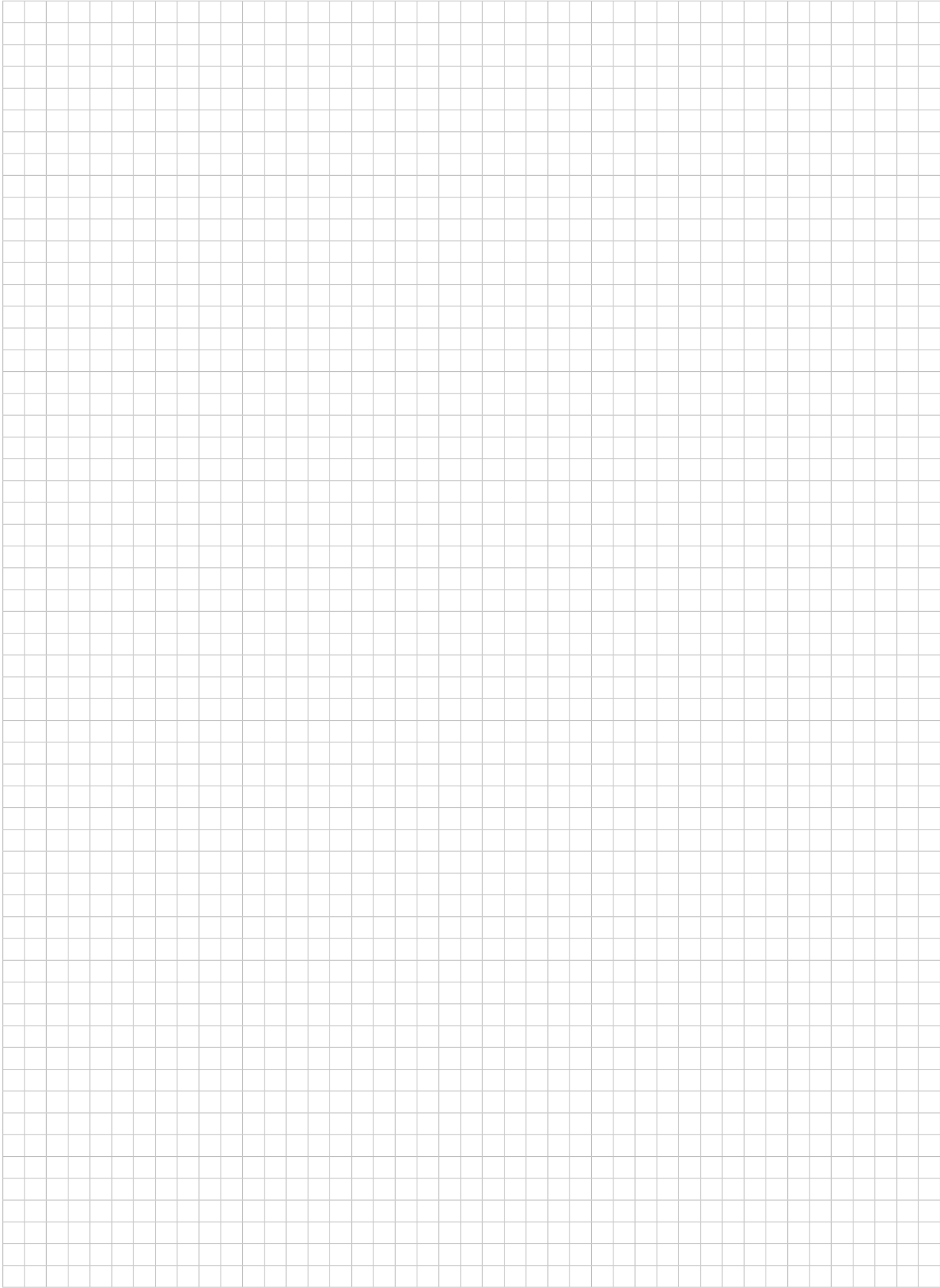
The setpoint value for the heating flow is calculated with the current outside temperature and the set heating curve. The discharge control adjusts the flow temperature B1 with the mixing valve Y1 to this setpoint value. The discharge pump Q2 is in operation during the entire heating period.

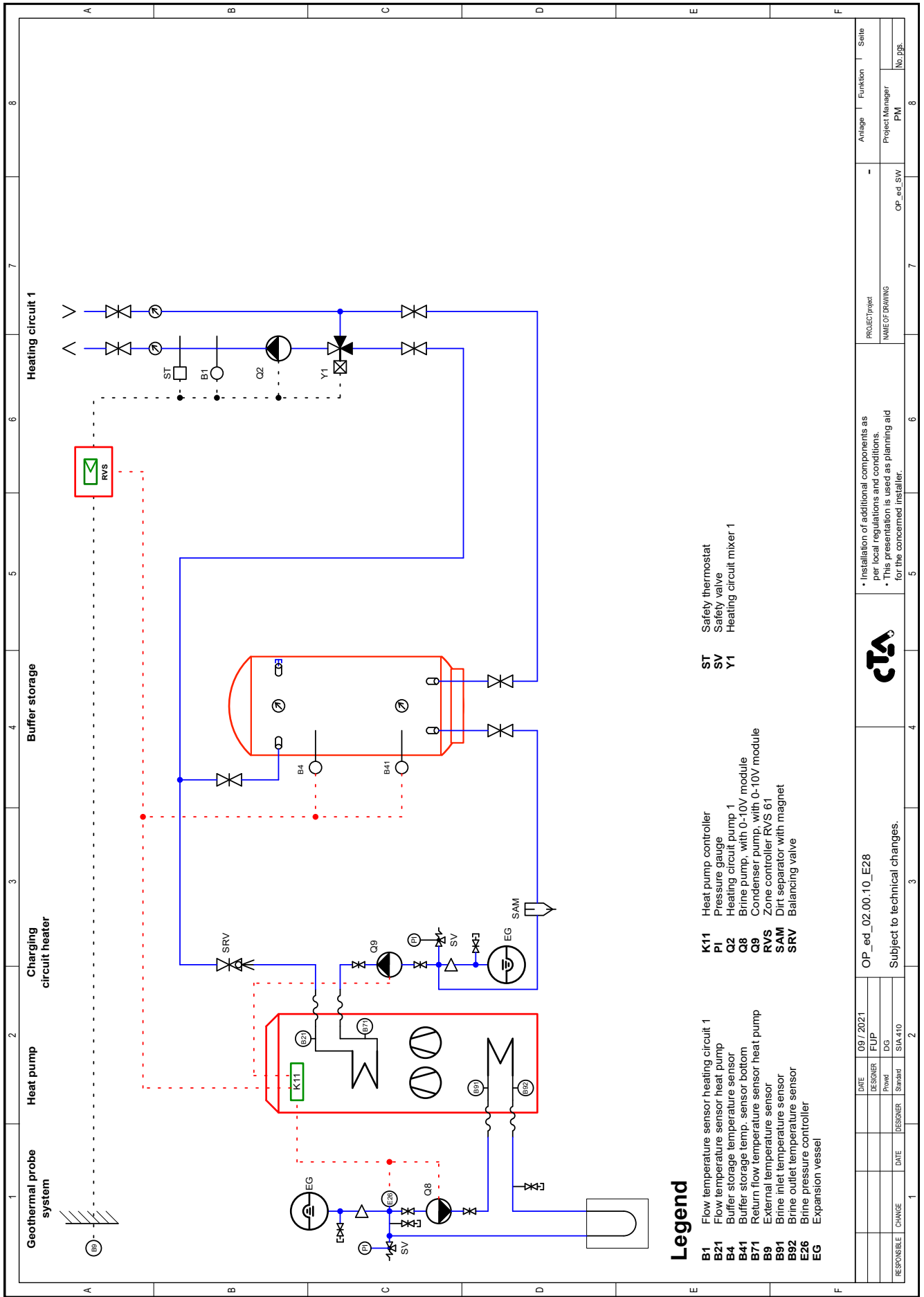
Free cooling

For passive cooling, cooling is done without operating a cooling generator. Heat is returned to the connected source (soil sensor or ground water).

For cooling requirement, the source circuit is controlled by means of the deflector valves Y28 and Y21 (in case of mixed discharge group) via the plate heat exchanger (PWT).

The heat pump controller runs a cooling curve via the external temperature B9, this is controlled with the 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.





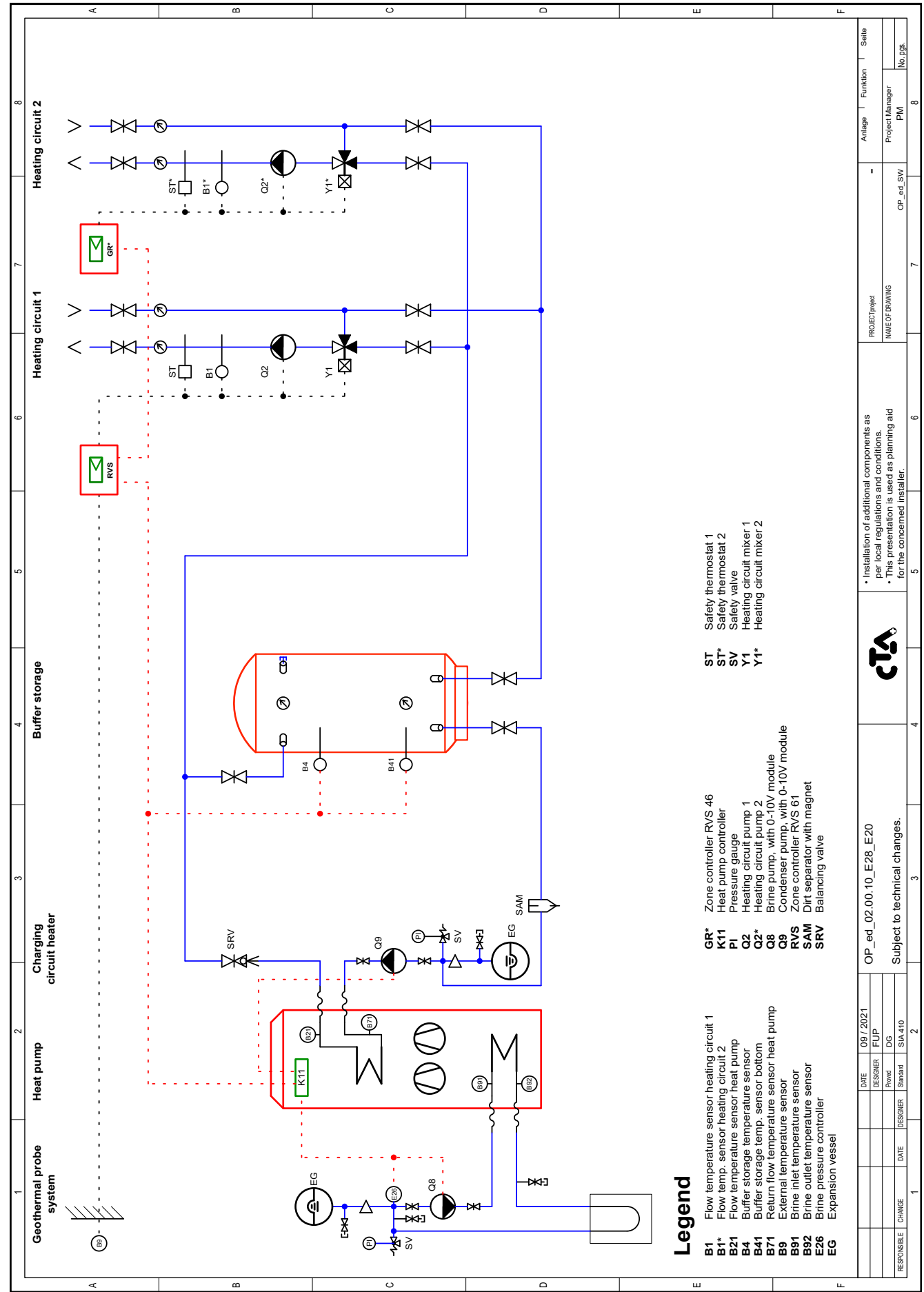
Legend

- B1 Flow temperature sensor heating circuit 1
- B21 Flow temperature sensor heat pump
- B4 Buffer storage temperature sensor
- B41 Buffer storage temp. sensor bottom
- B71 Return flow temperature sensor heat pump
- B9 External temperature sensor
- B91 Brine inlet temperature sensor
- B92 Brine outlet temperature sensor
- B26 Brine pressure controller
- EG Expansion vessel

- K11 Heat pump controller
- PI Pressure gauge
- Q2 Heating circuit pump 1
- Q8 Brine pump, with 0-10V module
- Q9 Condenser pump, with 0-10V module
- RVS Zone controller RVS 61
- SAM Dirt separator with magnet
- SRV Balancing valve

- ST Safety thermostat
- SV Safety valve
- Y1 Heating circuit mixer 1

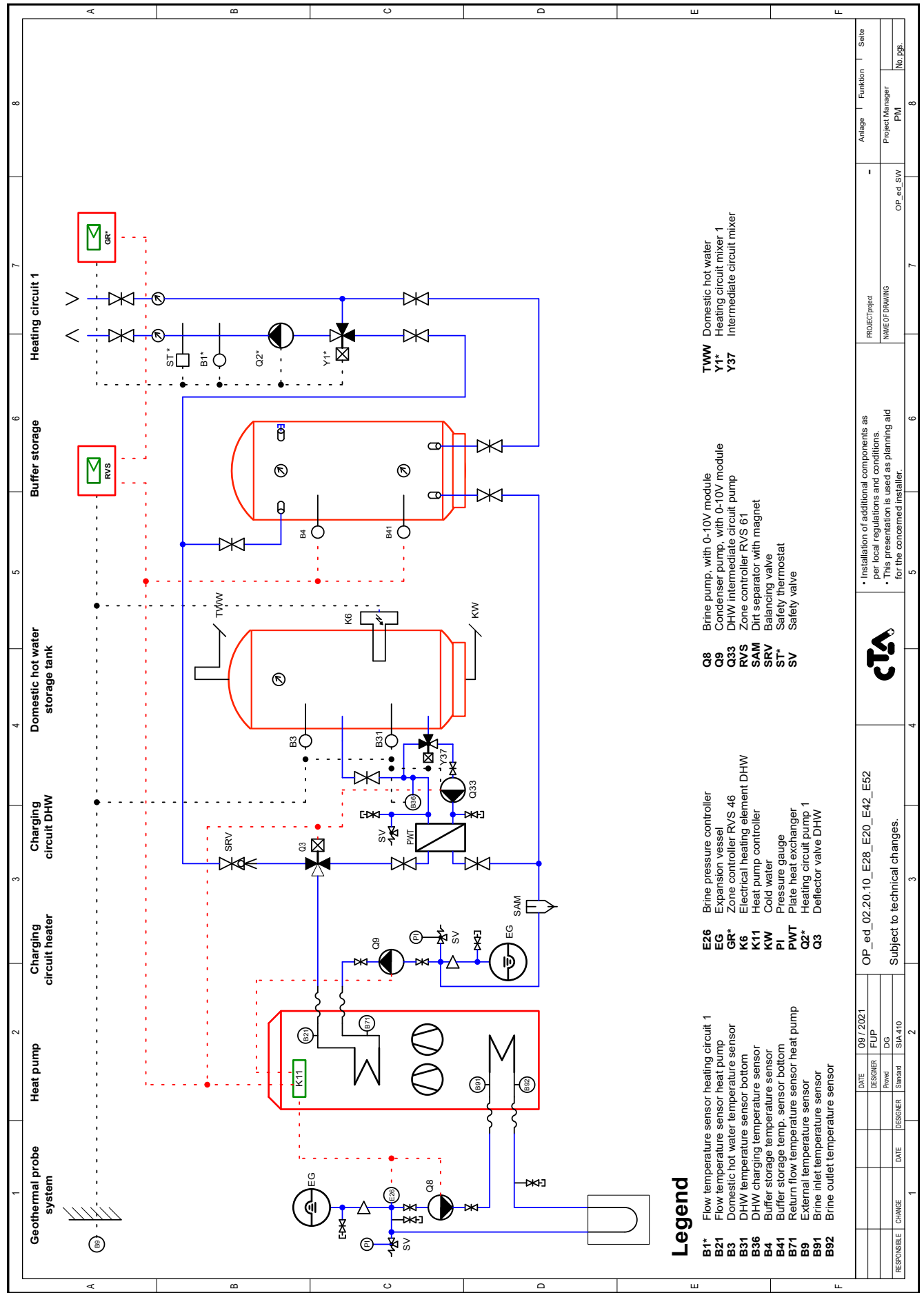
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																	NAME CP DRAWING	OP_ed_SW	Project Manager	PM	No. pgs.
																					8



Legend

- | | | | |
|------------|---|------------|-----------------------------------|
| B1 | Flow temperature sensor heating circuit 1 | GR* | Zone controller RVS 46 |
| B1* | Flow temp. sensor heating circuit 2 | K11 | Heat pump controller |
| B21 | Flow temperature sensor heat pump | P1 | Pressure gauge |
| B4 | Buffer storage temperature sensor | Q2 | Heating circuit pump 1 |
| B41 | Buffer storage temp. sensor bottom | Q2* | Heating circuit pump 2 |
| B71 | Return flow temperature sensor heat pump | Q8 | Brine pump, with 0-10V module |
| B9 | External temperature sensor | Q8 | Condenser pump, with 0-10V module |
| B91 | Brine inlet temperature sensor | RVS | Zone controller RVS 61 |
| B92 | Brine outlet temperature sensor | SAM | Dirt separator with magnet |
| E26 | Brine pressure controller | SRV | Balancing valve |
| EG | Expansion vessel | | |

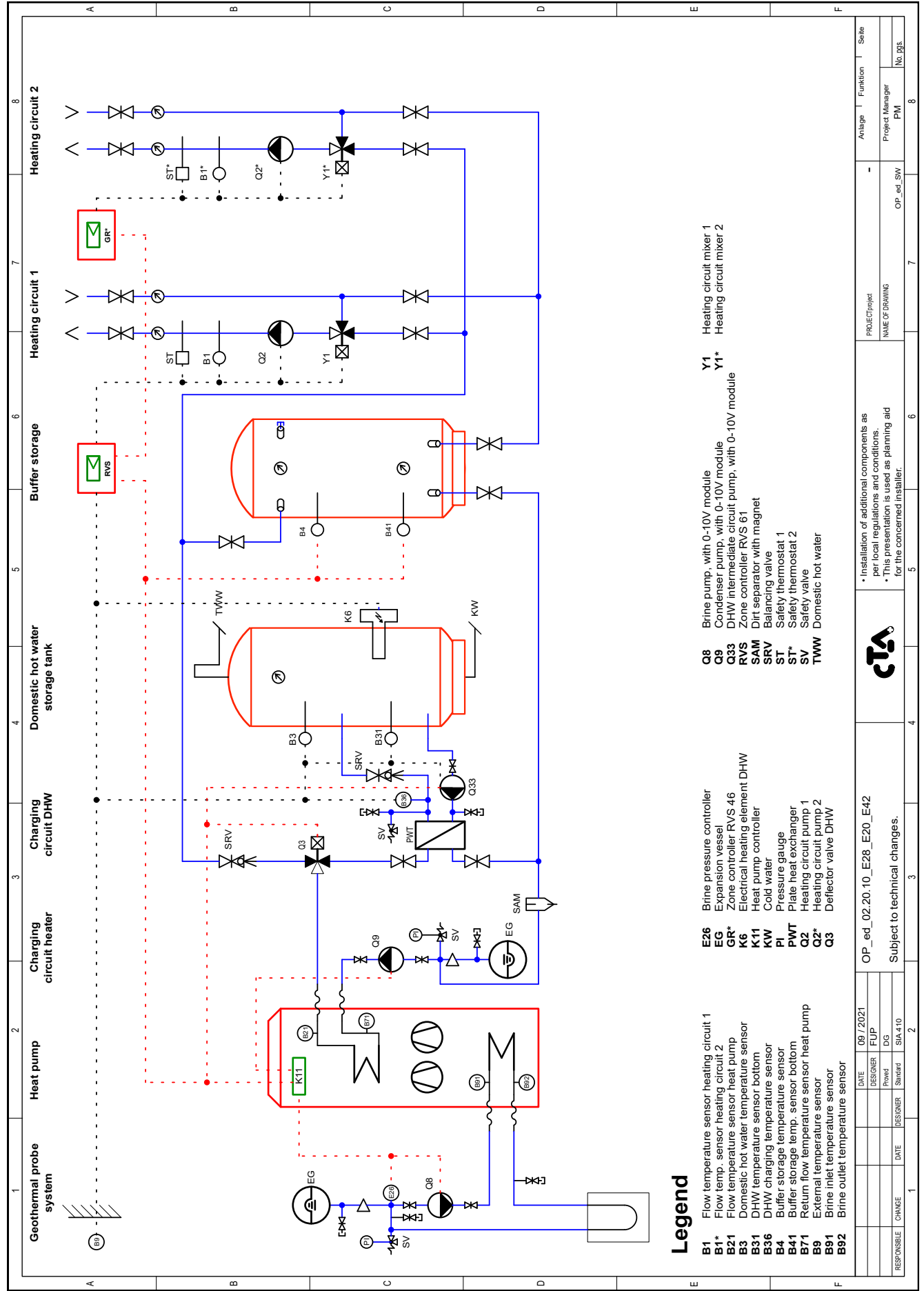
RESPONSIBLE		CHANGE	DATE	DESIGNER	Standard	DATE	DESIGNER	FUP	09/2021	OP_ed_02.00.10_E28_E20	Subject to technical changes.				* Installation of additional components as per local regulations and conditions. * This presentation is used as planning aid for the concerned installer.		PROJECT/Project	OP_ed/SW	Project Manager	PM	Antlage	Funkten	Selle		



Legend

- B1* Flow temperature sensor heating circuit 1
- B21 Flow temperature sensor heat pump
- B3 Domestic hot water temperature sensor
- B31 DHW temperature sensor bottom
- B36 DHW charging temperature sensor
- B4 Buffer storage temperature sensor
- B71 Return flow temperature sensor
- B9 External temperature sensor
- B91 Brine inlet temperature sensor
- B92 Brine outlet temperature sensor
- E26 Brine pressure controller
- EG Expansion vessel
- GR* Zone controller RVS 46
- K6 Electrical heating element DHW
- K11 Heat pump controller
- KW Cold water
- PI Pressure gauge
- PWT Plate heat exchanger
- Q2* Heating circuit pump 1
- Q3 Deflector valve DHW
- Q8 Brine pump, with 0-10V module
- Q33 Condenser pump, with 0-10V module
- RVS DHW intermediate circuit pump
- SAM Zone controller RVS 61
- SRV Dirt separator with magnet
- SV Balancing valve
- ST* Safety thermostat
- SV Safety valve
- TVWW Brine pump, with 0-10V module
- Y1* Heating circuit mixer 1
- Y37 Intermediate circuit mixer

DATE	09/2021	DESIGNER	FUP	PROJECT	OP_ed_20.10_E28_E20_E42_E52	ANLAGE	Function
DESIGNER	Swand	Projed	DG	NAME OF DRAWING	OP_ed_SW	Project Manager	PM
CHANGE		DESIGNER	SIA 410				No. pgs.
RESPONSIBLE							8



Legend

- B1 Flow temperature sensor heating circuit 1
- B1* Flow temp. sensor heating circuit 2
- B21 Flow temperature sensor heat pump
- B3 Domestic hot water temperature sensor
- B31 DHW charging temperature sensor
- B36 DHW charging temperature sensor
- B4 Buffer storage temperature sensor
- B41 Buffer storage temp. sensor bottom
- B71 Return flow temperature sensor heat pump
- B9 External temperature sensor
- B91 Brine inlet temperature sensor
- B92 Brine outlet temperature sensor
- E26 Brine pressure controller
- EG Expansion vessel
- GR* Zone controller RVS 46
- K6 Electrical heating element DHW
- K11 Heat pump controller
- KW Cold water
- PI Pressure gauge
- PWT Plate heat exchanger
- Q2 Heating circuit pump 1
- Q2* Heating circuit pump 2
- Q3 Deflector valve DHW
- Q8 Brine pump, with 0-10V module
- Q9 Condenser pump, with 0-10V module
- Q33 DHW intermediate circuit pump, with 0-10V module
- RVS Zone controller RVS 61
- SAM Dirt separator with magnet
- SRV Balancing valve
- ST Safety thermostat 1
- ST* Safety thermostat 2
- SV Safety valve
- TWW Domestic hot water
- Y1 Heating circuit mixer 1
- Y1* Heating circuit mixer 2

RESPONSIBLE		CHANGE	DATE	DESIGNER	STATUS	DATE	DESIGNER	STATUS	DATE	DESIGNER	STATUS
Subject to technical changes.											
OP_ed_02.20.10_E28_E20_E42											
CTA											
* Installation of additional components as per local regulations and conditions. * This presentation is used as planning aid for the concerned installer.											
PROJECT/Project											
NAME OF DRAWING											
Project Manager											
PN1											
OP_ed_SVW											
Anlage											
Funktion											
Seite											
No. pgs											

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