



Heat pump



TWW 110

WHR

HeavyDuty 2L 1

WAMAK TWW 110 WHR HeavyDuty 2L1

Product description

High-efficiency heat pump consisting of multiple modules of separate heat pumps. Each module contains one short closed refrigerant circuit with a pair of quiet Scroll compressors and robust stainless steel plate heat exchangers. Applications range from heating, cooling and domestic hot water heating of office or multi-functional buildings, to cascading applications in industrial applications.

Use for demanding industrial applications. By combining the most suitable performance and application variants of heat pump modules, it is possible to tailor-make the complete system required. Each module is refrigeration, hydraulically and electrically isolated with a separate controller. The connection of the modules is cascaded, whereby each single controller can take over the function of the cascade master.

Thermal energy from various industrial or ancillary processes is used as a primary source. Usually in the temperature range between 20° and 50°C. Depending on the quality and chemical composition of the process medium, the heat is extracted either directly in the heat pump or via a pre-wired heat exchanger with intermediate circuit. The heat pump then raises this temperature with high efficiency to a usable temperature for heating or hot water.

The twin compressors give the system robustness and the ability to distribute the heat output according to the actual load.

Product features

- Scroll compressor
- Electronic expansion valve
- Two-stage capacity control
- Phase and rotation control
- High pressure sensor - analogue
- Flow switch consumer - on/off - (with accessory)
- Flow switch source - on/off - (with accessory)
- DHW temperature sensor - (with accessory)
- Cascade control
- Solid frame structure
- Sylomer pads under compressor unit
- Asymmetric plate heat exchanger
- Multi-stage capacity control
- High pressure switch
- Low pressure sensor - analogue
- Flow sensor consumer - analogue - (with accessory)
- Outdoor temperature sensor - (with accessory)
- Buffer temperature sensor - (with accessory)
- Modbus connection
- Two level frame

Basic performance data - WAMAK TWW 110 WHR HeavyDuty 2L1

Heating - EN 14511		
Heating capacity [kW]	W10 / W35 (max)	60.7 (30.4 / 60.7)
	W10 / W35 (min)	30.4 (30.4 / 60.7)
	W10 / W34	61.1 (30.5 / 61.1)
Electrical power input [kW]	W10 / W35 (max)	10.3 (5.1 / 10.3)
	W10 / W35 (min)	5.1 (5.1 / 10.3)
	W10 / W34	10.1 (5.0 / 10.1)
Heating efficiency faktor [COP]	W10 / W35 (max)	5.89
	W10 / W35 (min)	6.00
	W10 / W34	6.04
Seasonal space heating energy efficiency - SCOP EN 14825		
Average Climate / Low Temperature [35 °C]	SCOP	6.66
	η [%]	266.5
	Label	A+++
	Qhe [kWh]	18475.0
	Pdesignh [kW]	60.7
	Tbivalent [°C]	-7
Cooling		
Cooling capacity - [kW]	A35 / W23-18	46.0
	A25 / W23-18	51.7
	A35 / W12-7	29.9
	A25 / W12-7	29.9
Seasonal space cooling energy efficiency - SEER EN 14825		
[W 23 / 18 °C]	SEER	5.30
	Qce [kWh]	17940.0
	η_c [%]	212.1
Sound EN 12102		
Acoustic power - Lw	dB(A)	61.6
Acoustic pressure - Lp	1 m dB(A)	53.6
	5 m dB(A)	39.6
	10 m dB(A)	33.6
Mechanical and operational information		
Compressor type (3~ 400/50)	SCROLL / 2 /	On/Off
Refrigerant	R513A (GWP - 631)	11.2 kg
Operating limit temperatures heating - (min / max) [°C]		45 / 85
Operating limit temperatures source - (min / max) [°C]		-10 / 50
Weight		620 kg

Main technical data - WAMAK TWW 110 WHR HeavyDuty 2L1

Enclosure type		HD2L1		Heat energy rejection side data		
Basic dimensions	Height [mm]	2000		Operating limit temperatures heating	MAX [°C]	85
	Width [mm]	820			MIN [°C]	45
	Length [mm]	1200		for more see operating limits diagram		
Weight [kg]	620		Condenser	Port size	VIC 2.1/2 "	
Colour	Gray			Type	BPHE	
Enclosure IP Class	IP20			Count	1	
Refrigeration cycle				Material	AISI 316	
Compressor	Type	Scroll		Maximal operating pressure - refrigerant [bar]		
	Number of stages	2		Maximal operating pressure - Water [bar]		
	On/Off			Testing pressure [bar]		
	Power factor Cosφ	0.63		Heat transfer medium		
	Winding resistance	1.23 Ohm		Volume flow @ dT 5K (nom) - Water [m3/h]		
Refrigerant		R513A		Internal pressure drop - Water [kPa]		
	Volme	11.2 kg		Temperature difference	@ 35°C (nom)	5 K
	GWP	631			@ 55°C	8 K
	Safety class	A1			@ 65°C	10 K
Refrigeration oil type	POE RL32-3MAF		Renewable energy extraction side data			
	Oil volume	2 x 3.25 L		Operating limit temperatures source	MIN [°C]	-10
Maximal pressure - refrigerant [bar]	32		for more see operating limits diagram			
	PED class	2		Evaporator	MAX [°C]	50
EVI - vapour injection with economizer			Port size		VIC 2.1/2 "	
Electrical connection data			Type		BPHE	
Line voltage [#~ V/Hz]	3~ 400/50		Count	1		
Current	nominal [A]	34.44		Material	AISI 316	
	maximal [A]	44.60		Maximal operating pressure - refrigerant [bar]		
	starting [A]	12.9		Heat transfer medium		
Softstart	-		Maximal operating pressure - Water [bar]			
Main safety	C80		Volume flow - Water [m3/h]			
Control System			Internal pressure drop - Water [kPa]			
Main controller	SIEMENS	RVS 61	Temperature difference - Water			
Extension module	AVS75.3xx	AVS75.3xx	4 K			
Bus Clip-In			Modbus OCI352			
Online connection	Web server OZW672		ToSyMo			
Superheat controller			SEC61			

*** with accessory

WAMAK TWW 110 WHR HeavyDuty 2L1

ErP (EU) No 811/2013: Technical parameters for heat pump space heaters

Model	TWW 110 WHR HeavyDuty 2L1
Air-to-water heat pump	no
Brine-to-water heat pump	no
Water-to-water heat pump	yes
Low-temperature heat pump	no
Equipped with a supplementary heater	no
Heat pump combination heater	no
Temperature application	low (35°C - 30°C)
Climate conditions	average

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output at Tdesignh	Prated	60.7	kW	Seasonal space heating energy efficiency	η_s	266.5	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	61.1	kW	Tj = -7 °C	COPd	6.04	-
Tj = +2 °C	Pdh	62.6	kW	Tj = +2 °C	COPd	6.6	-
Tj = +7 °C	Pdh	63.6	kW	Tj = +7 °C	COPd	7.3	-
Tj = +12 °C	Pdh	64.6	kW	Tj = +12 °C	COPd	7.8	-
Tj = bivalent temperature	Pdh	60.7	kW	Tj = bivalent temperature	COPd	5.9	-
Tj = operation limit temperature	Pdh	---	kW	Tj = operation limit temperature	COPd	---	-
Bivalent temperature	Tbiv	-7	°C	Tj = operation limit temperature	TOL	---	°C
Power consumption in modes other than active mode				Heating water operating limit temperature	WTOL	85	°C
Off mode	Poff	0.040	kW	Supplementary heater			
Thermostat-off mode	Pto	0.010	kW	Rated heat output	Psup	11.5	kW
Standby mode	Psb	0.010	kW	Type of energy input	electricity		
Crankcase heater mode	Pck	0.050	kW				
Other items				For air-to-water heat pumps: Rated air flow rate, outdoors	-	---	m ³ /h
Capacity control	multi-stage			For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	6.84 ~ 13.69	m ³ /h
Sound power level							
indoors	Lwa	62	dB				
outdoors	Lwa	---	dB				
Annual energy consumption	Q _{HE}	18475.0	kWh				

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WAMAK TWW 110 WHR HeavyDuty 2L1

ErP (EU) No 811/2013: Technical parameters for heat pump space heaters

Model	TWW 110 WHR HeavyDuty 2L1
Air-to-water heat pump	no
Brine-to-water heat pump	no
Water-to-water heat pump	yes
Low-temperature heat pump	no
Equipped with a supplementary heater	no
Heat pump combination heater	no
Temperature application	middle (55°C - 47°C)
Climate conditions	average

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output at Tdesignh	Prated	53.0	kW	Seasonal space heating energy efficiency	η_s	201.0	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7 °C	Pdh	55.4	kW	Tj = -7 °C	COPd	3.97	-
Tj = +2 °C	Pdh	59.8	kW	Tj = +2 °C	COPd	5.3	-
Tj = +7 °C	Pdh	61.9	kW	Tj = +7 °C	COPd	6.2	-
Tj = +12 °C	Pdh	63.6	kW	Tj = +12 °C	COPd	6.9	-
Tj = bivalent temperature	Pdh	53.0	kW	Tj = bivalent temperature	COPd	3.5	-
Tj = operation limit temperature	Pdh	---	kW	Tj = operation limit temperature	COPd	---	-
Bivalent temperature	Tbiv	-7	°C	Tj = operation limit temperature	TOL	---	°C
Power consumption in modes other than active mode				Heating water operating limit temperature	WTOL	85	°C
Off mode	Poff	0.040	kW	Supplementary heater			
Thermostat-off mode	Pto	0.010	kW	Rated heat output	Psup	11.5	kW
Standby mode	Psb	0.010	kW	Type of energy input			electricity
Crankcase heater mode	Pck	0.050	kW				
Other items							
Capacity control		multi-stage		For air-to-water heat pumps: Rated air flow rate, outdoors	-	---	m ³ /h
Sound power level				For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	6.84 ~ 13.69	m ³ /h
indoors	Lwa	62	dB				
outdoors	Lwa	---	dB				
Annual energy consumption	Q _{HE}	21444.7	kWh				

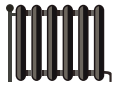
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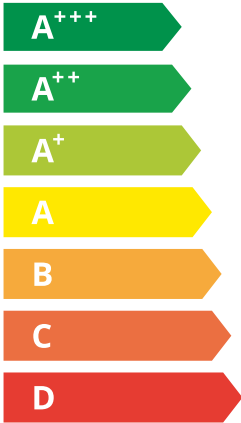


TWW 110 WHR
 HeavyDuty 2L1



55 °C

35 °C



A+++

A+++



62 dB



--- dB

■ 56
 ■ 53
 ■ 52
 kW

■ 62
 ■ 61
 ■ 58
 kW



2019

811/2013

TWW 110 WHR
 HeavyDuty 2L1

ErP Data

	55 °C	35 °C
Energy class	A+++	A+++
η [%]	201.0	266.5
P_{rated} [kW]	53	61
Q_{HE} [kWh/y]	21445	18475
SCOP [-]	5.03	6.66
$T_{bivalent}$ [°C]	-7	-7

CONTROLLER



+ QAA55/75
 - QAA55/75

class VII
 class III

3.5% ↓
 1.5% ↓

Heating performance data		Heat recovery		
Operating conditions		Qh	P	COP
W45 / W80		113.2	25.3	4.47
W30 / W70		84.1	20.8	4.04
W25 / W60		93.6	17.2	5.45

Normative data: water - water application

Source - Water [10°C] / Low Temperature [35°C]

Operating conditions		Qh	P	COP
1	W10 / W30-35	60.7	10.3	5.89
2	W10 / W30-35 (MIN)	30.4	5.1	6.00
A	W10 / Wxx-34	61.1	10.1	6.04
B	W10 / Wxx-30	62.6	9.4	6.65
C	W10 / Wxx-27	63.6	8.9	7.26
D	W10 / Wxx-24	64.6	8.4	7.79
E	W10 / Wxx-35	60.7	10.3	5.89
F	W10 / Wxx-35	60.7	10.3	5.89

SCOP DATA EN 14825:2018	
Source - Water [10°C] / Low Temperature [35°C]	
SCOPon	6.79
SCOPnet	6.79
SCOP	6.66
η [%]	266.54
Label	A+++
Qh [kWh]	18475
Pdesignh [kW]	60.7
Tbivalent [°C]	-7.00

Source - Water [10°C] / Medium Temperature [55°C]

Operating conditions		Qh	P	COP
1	W10 / W47-55	53.0	15.1	3.50
2	W10 / W47-55 (MIN)	26.5	7.4	3.56
A	W10 / Wxx-52	55.4	14.0	3.97
B	W10 / Wxx-42	59.8	11.3	5.29
C	W10 / Wxx-36	61.9	10.2	6.16
D	W10 / Wxx-30	63.6	9.4	6.87
E	W10 / Wxx-55	53.0	15.1	3.50
F	W10 / Wxx-55	53.0	15.1	3.50

SCOP DATA EN 14825:2018	
Source - Water [10°C] / Medium Temperature [55°C]	
SCOPon	5.11
SCOPnet	5.11
SCOP	5.03
η [%]	201.01
Label	A+++
Qh [kWh]	21445
Pdesignh [kW]	53.0
Tbivalent [°C]	-7.00

Low temperature cooling W 12 / 7°C

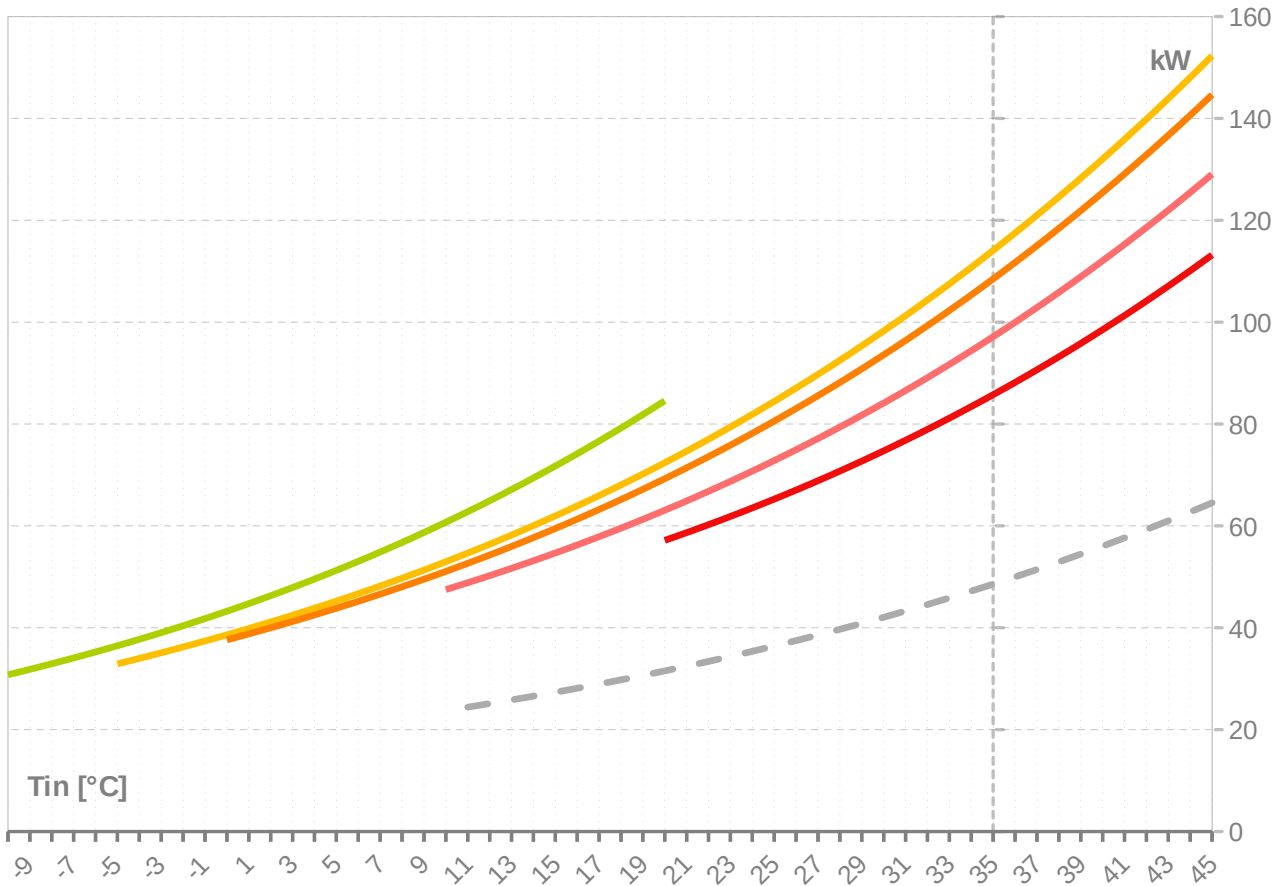
Operating conditions				Qc	P	EER	SEER DATA EN 14825:2018 [W 12 / 7°C]	
A	W30-35 / W12-7	32.2	10.9	2.95	SEERon	3.64		
B	W26-xx / W12-7	33.9	10.1	3.35	SEER	3.56		
C	W22-xx / W12-7	35.5	9.4	3.77	Qc [kWh]	17940		
D	W18-xx / W12-7	36.3	9.1	4.00	η [%]	142.41		

Radiant cooling W 23 / 18°C

Operating conditions				Qc	P	EER	SEER DATA EN 14825:2018 [W 23 / 18°C]	
A	W50-xx / W23-18	36.2	16.4	2.21	SEERon	5.48		
B	W40-xx / W23-18	42.9	13.3	3.23	SEER	5.30		
C	W30-35 / W23-18	48.9	10.9	4.49	Qc [kWh]	17940		
D	W26-xx / W23-18	51.2	10.1	5.06	η [%]	212.07		

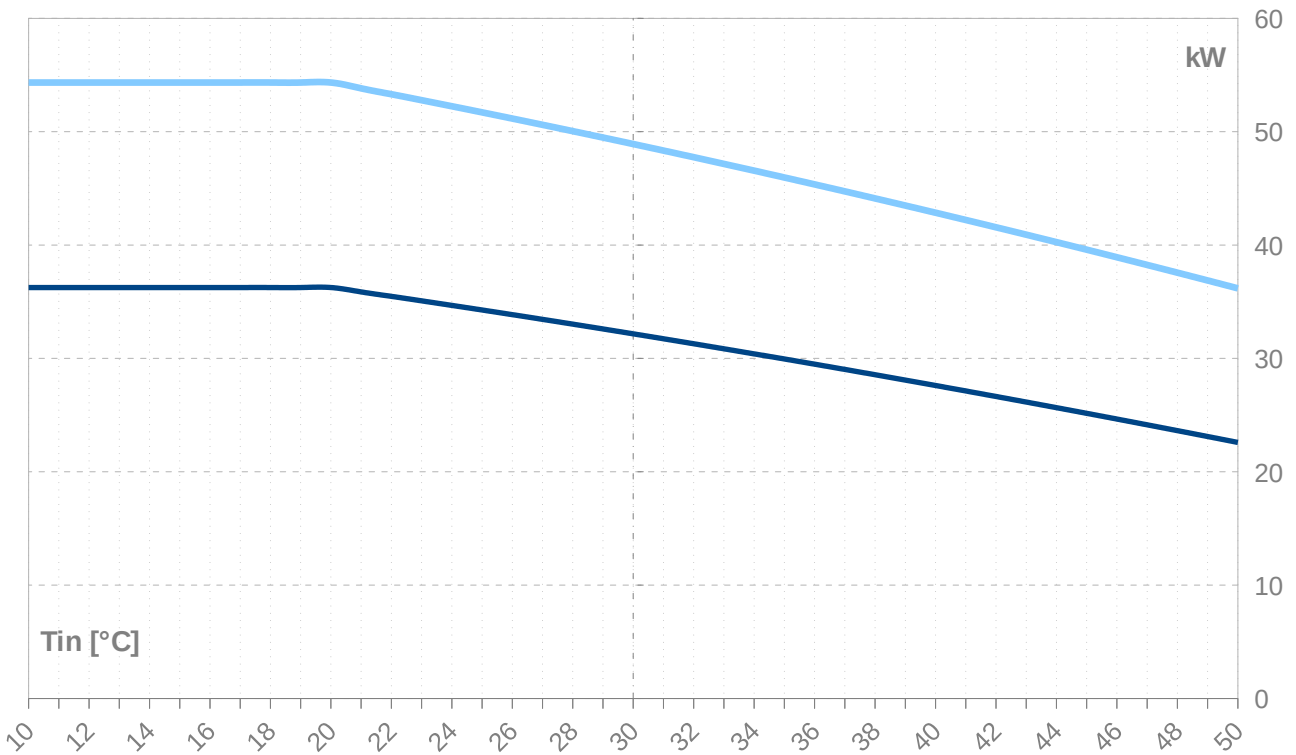
Performance lines - heating

- Qh-nom-35
- Qh-nom-55
- Qh-nom-60
- Qh-nom-70
- Qh-nom-80
- - - Qh-min-70



Performance lines - cooling

- Qc-nom-12-7
- Qc-nom-23-18



WAMAK TWW 110 WHR HeavyDuty 2L1

Th -OU	55										
[°C]	Qh nom	Qh min	Qh max	Pin nom	Pin min	Pin max	COP nom	Qc nom	Qc min	Qc max	I nom
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]
45	152.3	76.1	152.3	16.3	8.0	16.3	9.32	137.1	68.6	137.1	29.3
44	148.0	74.0	148.0	16.3	8.0	16.3	9.09	132.9	66.5	132.9	29.3
43	143.9	71.9	143.9	16.2	8.0	16.2	8.86	128.8	64.4	128.8	29.2
42	139.8	69.9	139.8	16.2	8.0	16.2	8.64	124.8	62.4	124.8	29.1
41	135.9	67.9	135.9	16.1	7.9	16.1	8.42	120.9	60.5	120.9	29.1
40	132.0	66.0	132.0	16.1	7.9	16.1	8.21	117.1	58.6	117.1	29.0
39	128.3	64.1	128.3	16.0	7.9	16.0	8.00	113.4	56.7	113.4	29.0
38	124.6	62.3	124.6	16.0	7.9	16.0	7.79	109.8	54.9	109.8	28.9
37	121.0	60.5	121.0	15.9	7.8	15.9	7.59	106.2	53.1	106.2	28.8
36	117.5	58.7	117.5	15.9	7.8	15.9	7.39	102.8	51.4	102.8	28.8
35	114.1	57.0	114.1	15.9	7.8	15.9	7.20	99.4	49.7	99.4	28.7
34	110.8	55.4	110.8	15.8	7.8	15.8	7.00	96.1	48.0	96.1	28.7
33	107.5	53.8	107.5	15.8	7.8	15.8	6.82	92.9	46.4	92.9	28.6
32	104.4	52.2	104.4	15.7	7.7	15.7	6.63	89.8	44.9	89.8	28.6
31	101.3	50.6	101.3	15.7	7.7	15.7	6.45	86.7	43.4	86.7	28.5
30	98.3	49.1	98.3	15.7	7.7	15.7	6.28	83.8	41.9	83.8	28.5
29	95.4	47.7	95.4	15.6	7.7	15.6	6.11	80.9	40.4	80.9	28.5
28	92.5	46.3	92.5	15.6	7.7	15.6	5.94	78.1	39.0	78.1	28.4
27	89.8	44.9	89.8	15.5	7.6	15.5	5.77	75.3	37.7	75.3	28.4
26	87.1	43.5	87.1	15.5	7.6	15.5	5.61	72.7	36.3	72.7	28.3
25	84.4	42.2	84.4	15.5	7.6	15.5	5.45	70.1	35.0	70.1	28.3
24	81.9	40.9	81.9	15.4	7.6	15.4	5.30	67.6	33.8	67.6	28.3
23	79.4	39.7	79.4	15.4	7.6	15.4	5.15	65.1	32.6	65.1	28.2
22	77.0	38.5	77.0	15.4	7.6	15.4	5.00	62.7	31.4	62.7	28.2
21	74.7	37.3	74.7	15.4	7.6	15.4	4.86	60.4	30.2	60.4	28.2
20	72.4	36.2	72.4	15.3	7.5	15.3	4.72	58.2	29.1	58.2	28.1
19	70.2	35.1	70.2	15.3	7.5	15.3	4.58	56.0	28.0	56.0	28.1
18	68.0	34.0	68.0	15.3	7.5	15.3	4.45	53.9	26.9	53.9	28.1
17	65.9	33.0	65.9	15.3	7.5	15.3	4.32	51.8	25.9	51.8	28.0
16	63.9	32.0	63.9	15.2	7.5	15.2	4.19	49.8	24.9	49.8	28.0
15	62.0	31.0	62.0	15.2	7.5	15.2	4.07	47.8	23.9	47.8	28.0
14	60.0	30.0	60.0	15.2	7.5	15.2	3.95	45.9	23.0	45.9	28.0
13	58.2	29.1	58.2	15.2	7.5	15.2	3.83	44.1	22.1	44.1	27.9
12	56.4	28.2	56.4	15.2	7.5	15.2	3.72	42.3	21.2	42.3	27.9
11	54.7	27.3	54.7	15.2	7.4	15.2	3.61	40.6	20.3	40.6	27.9
10	53.0	26.5	53.0	15.1	7.4	15.1	3.50	38.9	19.5	38.9	27.9
9	51.3	25.7	51.3	15.1	7.4	15.1	3.39	37.3	18.6	37.3	27.9
8	49.7	24.9	49.7	15.1	7.4	15.1	3.29	35.7	17.9	35.7	27.9
7	48.2	24.1	48.2	15.1	7.4	15.1	3.19	34.2	17.1	34.2	27.9
6	46.7	23.3	46.7	15.1	7.4	15.1	3.09	32.7	16.3	32.7	27.8
5	45.2	22.6	45.2	15.1	7.4	15.1	3.00	31.3	15.6	31.3	27.8
4	43.8	21.9	43.8	15.1	7.4	15.1	2.91	29.9	14.9	29.9	27.8
3	42.5	21.2	42.5	15.1	7.4	15.1	2.82	28.5	14.2	28.5	27.8
2	41.1	20.6	41.1	15.1	7.4	15.1	2.73	27.2	13.6	27.2	27.8
1	39.9	19.9	39.9	15.1	7.4	15.1	2.65	25.9	12.9	25.9	27.8
0	38.6	19.3	38.6	15.1	7.4	15.1	2.57	24.6	12.3	24.6	27.8
-1	37.4	18.7	37.4	15.0	7.4	15.0	2.48	23.4	11.7	23.4	27.8
-2	36.2	18.1	36.2	15.0	7.4	15.0	2.41	22.3	11.1	22.3	27.8
-3	35.1	17.5	35.1	15.0	7.4	15.0	2.33	21.1	10.6	21.1	27.8
-4	34.0	17.0	34.0	15.1	7.4	15.1	2.26	20.0	10.0	20.0	27.8
-5	32.9	16.4	32.9	15.1	7.4	15.1	2.19	18.9	9.5	18.9	27.8

-- attention: operating limits not reflected in performance table

ZR144KRE-TFD_R513A_2_WHR

WAMAK TWW 110 WHR HeavyDuty 2L1

Th -OU	[°C]	60									
		Ts -IN [°C]	Qh nom [kW]	Qh min [kW]	Qh max [kW]	Pin nom [kW]	Pin min [kW]	Pin max [kW]	COP nom kW / kW	Qc nom [kW]	Qc min [kW]
45	144.6	72.3	144.6	17.7	8.7	17.7	8.16	128.2	64.1	128.2	31.0
44	140.6	70.3	140.6	17.7	8.7	17.7	7.95	124.2	62.1	124.2	31.0
43	136.7	68.3	136.7	17.6	8.7	17.6	7.75	120.3	60.2	120.3	30.9
42	132.8	66.4	132.8	17.6	8.6	17.6	7.55	116.5	58.3	116.5	30.8
41	129.1	64.6	129.1	17.6	8.6	17.6	7.36	112.8	56.4	112.8	30.8
40	125.5	62.7	125.5	17.5	8.6	17.5	7.16	109.2	54.6	109.2	30.7
39	121.9	60.9	121.9	17.5	8.6	17.5	6.98	105.7	52.8	105.7	30.7
38	118.4	59.2	118.4	17.4	8.6	17.4	6.79	102.2	51.1	102.2	30.7
37	115.0	57.5	115.0	17.4	8.6	17.4	6.61	98.9	49.4	98.9	30.6
36	111.7	55.9	111.7	17.4	8.5	17.4	6.44	95.6	47.8	95.6	30.6
35	108.5	54.2	108.5	17.3	8.5	17.3	6.26	92.4	46.2	92.4	30.5
34	105.4	52.7	105.4	17.3	8.5	17.3	6.09	89.3	44.7	89.3	30.5
33	102.3	51.1	102.3	17.3	8.5	17.3	5.93	86.3	43.1	86.3	30.4
32	99.3	49.7	99.3	17.2	8.5	17.2	5.77	83.3	41.7	83.3	30.4
31	96.4	48.2	96.4	17.2	8.5	17.2	5.61	80.5	40.2	80.5	30.4
30	93.6	46.8	93.6	17.2	8.4	17.2	5.45	77.7	38.8	77.7	30.3
29	90.8	45.4	90.8	17.1	8.4	17.1	5.30	74.9	37.5	74.9	30.3
28	88.2	44.1	88.2	17.1	8.4	17.1	5.15	72.3	36.1	72.3	30.3
27	85.6	42.8	85.6	17.1	8.4	17.1	5.01	69.7	34.9	69.7	30.2
26	83.0	41.5	83.0	17.1	8.4	17.1	4.87	67.2	33.6	67.2	30.2
25	80.6	40.3	80.6	17.0	8.4	17.0	4.73	64.8	32.4	64.8	30.2
24	78.2	39.1	78.2	17.0	8.4	17.0	4.60	62.4	31.2	62.4	30.1
23	75.8	37.9	75.8	17.0	8.3	17.0	4.47	60.1	30.0	60.1	30.1
22	73.6	36.8	73.6	17.0	8.3	17.0	4.34	57.9	28.9	57.9	30.1
21	71.4	35.7	71.4	16.9	8.3	16.9	4.21	55.7	27.8	55.7	30.1
20	69.3	34.6	69.3	16.9	8.3	16.9	4.09	53.6	26.8	53.6	30.0
19	67.2	33.6	67.2	16.9	8.3	16.9	3.97	51.5	25.7	51.5	30.0
18	65.2	32.6	65.2	16.9	8.3	16.9	3.86	49.5	24.8	49.5	30.0
17	63.2	31.6	63.2	16.9	8.3	16.9	3.75	47.6	23.8	47.6	30.0
16	61.3	30.7	61.3	16.9	8.3	16.9	3.64	45.7	22.8	45.7	30.0
15	59.5	29.7	59.5	16.8	8.3	16.8	3.53	43.9	21.9	43.9	30.0
14	57.7	28.8	57.7	16.8	8.3	16.8	3.43	42.1	21.0	42.1	29.9
13	56.0	28.0	56.0	16.8	8.3	16.8	3.33	40.4	20.2	40.4	29.9
12	54.3	27.1	54.3	16.8	8.3	16.8	3.23	38.7	19.3	38.7	29.9
11	52.6	26.3	52.6	16.8	8.3	16.8	3.13	37.1	18.5	37.1	29.9
10	51.1	25.5	51.1	16.8	8.3	16.8	3.04	35.5	17.7	35.5	29.9
9	49.5	24.8	49.5	16.8	8.3	16.8	2.95	34.0	17.0	34.0	29.9
8	48.0	24.0	48.0	16.8	8.2	16.8	2.86	32.5	16.2	32.5	29.9
7	46.6	23.3	46.6	16.8	8.2	16.8	2.78	31.0	15.5	31.0	29.9
6	45.2	22.6	45.2	16.8	8.2	16.8	2.69	29.6	14.8	29.6	29.9
5	43.8	21.9	43.8	16.8	8.2	16.8	2.61	28.3	14.1	28.3	29.9
4	42.5	21.3	42.5	16.8	8.2	16.8	2.54	27.0	13.5	27.0	29.9
3	41.2	20.6	41.2	16.8	8.2	16.8	2.46	25.7	12.8	25.7	29.9
2	40.0	20.0	40.0	16.8	8.2	16.8	2.39	24.4	12.2	24.4	29.9
1	38.8	19.4	38.8	16.8	8.2	16.8	2.31	23.2	11.6	23.2	29.9
0	37.6	18.8	37.6	16.8	8.2	16.8	2.24	22.1	11.0	22.1	29.9
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-- attention: operating limits not reflected in performance table

WAMAK TWW 110 WHR HeavyDuty 2L1

Th -OU	[°C]	70									
		Ts -IN [°C]	Qh nom [kW]	Qh min [kW]	Qh max [kW]	Pin nom [kW]	Pin min [kW]	Pin max [kW]	COP nom kW / kW	Qc nom [kW]	Qc min [kW]
45	129.0	64.5	129.0	21.0	10.3	21.0	6.13	109.5	54.8	109.5	35.3
44	125.5	62.7	125.5	21.0	10.3	21.0	5.97	106.0	53.0	106.0	35.2
43	122.0	61.0	122.0	21.0	10.3	21.0	5.81	102.5	51.3	102.5	35.2
42	118.6	59.3	118.6	21.0	10.3	21.0	5.65	99.1	49.6	99.1	35.2
41	115.3	57.6	115.3	21.0	10.3	21.0	5.50	95.8	47.9	95.8	35.2
40	112.1	56.0	112.1	20.9	10.3	20.9	5.35	92.6	46.3	92.6	35.1
39	108.9	54.5	108.9	20.9	10.3	20.9	5.20	89.5	44.7	89.5	35.1
38	105.9	52.9	105.9	20.9	10.3	20.9	5.06	86.4	43.2	86.4	35.1
37	102.9	51.4	102.9	20.9	10.3	20.9	4.92	83.5	41.7	83.5	35.1
36	100.0	50.0	100.0	20.9	10.3	20.9	4.79	80.6	40.3	80.6	35.1
35	97.1	48.6	97.1	20.9	10.3	20.9	4.65	77.8	38.9	77.8	35.0
34	94.4	47.2	94.4	20.9	10.3	20.9	4.52	75.0	37.5	75.0	35.0
33	91.7	45.9	91.7	20.9	10.2	20.9	4.40	72.4	36.2	72.4	35.0
32	89.1	44.6	89.1	20.8	10.2	20.8	4.28	69.8	34.9	69.8	35.0
31	86.6	43.3	86.6	20.8	10.2	20.8	4.16	67.3	33.6	67.3	35.0
30	84.1	42.1	84.1	20.8	10.2	20.8	4.04	64.8	32.4	64.8	35.0
29	81.7	40.9	81.7	20.8	10.2	20.8	3.93	62.4	31.2	62.4	35.0
28	79.4	39.7	79.4	20.8	10.2	20.8	3.82	60.1	30.1	60.1	35.0
27	77.1	38.6	77.1	20.8	10.2	20.8	3.71	57.9	28.9	57.9	34.9
26	74.9	37.5	74.9	20.8	10.2	20.8	3.60	55.7	27.8	55.7	34.9
25	72.8	36.4	72.8	20.8	10.2	20.8	3.50	53.5	26.8	53.5	34.9
24	70.7	35.4	70.7	20.8	10.2	20.8	3.40	51.5	25.7	51.5	34.9
23	68.7	34.4	68.7	20.8	10.2	20.8	3.31	49.5	24.7	49.5	34.9
22	66.8	33.4	66.8	20.8	10.2	20.8	3.21	47.5	23.8	47.5	34.9
21	64.9	32.4	64.9	20.8	10.2	20.8	3.12	45.6	22.8	45.6	34.9
20	63.1	31.5	63.1	20.8	10.2	20.8	3.03	43.8	21.9	43.8	34.9
19	61.3	30.6	61.3	20.8	10.2	20.8	2.95	42.0	21.0	42.0	34.9
18	59.6	29.8	59.6	20.8	10.2	20.8	2.87	40.3	20.1	40.3	34.9
17	57.9	28.9	57.9	20.8	10.2	20.8	2.78	38.6	19.3	38.6	34.9
16	56.3	28.1	56.3	20.8	10.2	20.8	2.71	37.0	18.5	37.0	35.0
15	54.7	27.3	54.7	20.8	10.2	20.8	2.63	35.4	17.7	35.4	35.0
14	53.2	26.6	53.2	20.8	10.2	20.8	2.55	33.9	16.9	33.9	35.0
13	51.7	25.8	51.7	20.8	10.2	20.8	2.48	32.4	16.2	32.4	35.0
12	50.2	25.1	50.2	20.8	10.2	20.8	2.41	30.9	15.5	30.9	35.0
11	48.8	24.4	48.8	20.8	10.2	20.8	2.35	29.5	14.8	29.5	35.0
10	47.5	23.7	47.5	20.8	10.2	20.8	2.28	28.2	14.1	28.2	35.0
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-- attention: operating limits not reflected in performance table

WAMAK TWW 110 WHR HeavyDuty 2L1

Th -OU	80										
[°C]	Qh nom	Qh min	Qh max	Pin nom	Pin min	Pin max	COP nom	Qc nom	Qc min	Qc max	I nom
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]
45	113.2	56.6	113.2	25.3	12.4	25.3	4.47	89.7	44.9	89.7	41.0
44	110.1	55.1	110.1	25.3	12.4	25.3	4.35	86.6	43.3	86.6	41.0
43	107.1	53.5	107.1	25.3	12.4	25.3	4.23	83.6	41.8	83.6	41.0
42	104.2	52.1	104.2	25.3	12.5	25.3	4.11	80.7	40.3	80.7	41.0
41	101.3	50.7	101.3	25.3	12.5	25.3	4.00	77.8	38.9	77.8	41.0
40	98.5	49.3	98.5	25.4	12.5	25.4	3.89	75.0	37.5	75.0	41.0
39	95.8	47.9	95.8	25.4	12.5	25.4	3.78	72.3	36.2	72.3	41.1
38	93.2	46.6	93.2	25.4	12.5	25.4	3.67	69.7	34.8	69.7	41.1
37	90.6	45.3	90.6	25.4	12.5	25.4	3.57	67.1	33.6	67.1	41.1
36	88.2	44.1	88.2	25.4	12.5	25.4	3.47	64.6	32.3	64.6	41.1
35	85.8	42.9	85.8	25.4	12.5	25.4	3.37	62.2	31.1	62.2	41.1
34	83.4	41.7	83.4	25.4	12.5	25.4	3.28	59.8	29.9	59.8	41.1
33	81.1	40.6	81.1	25.4	12.5	25.4	3.19	57.5	28.8	57.5	41.2
32	78.9	39.5	78.9	25.5	12.5	25.5	3.10	55.3	27.7	55.3	41.2
31	76.8	38.4	76.8	25.5	12.5	25.5	3.01	53.2	26.6	53.2	41.2
30	74.7	37.4	74.7	25.5	12.5	25.5	2.93	51.1	25.5	51.1	41.2
29	72.7	36.4	72.7	25.5	12.5	25.5	2.85	49.0	24.5	49.0	41.2
28	70.8	35.4	70.8	25.5	12.6	25.5	2.77	47.1	23.5	47.1	41.3
27	68.9	34.4	68.9	25.6	12.6	25.6	2.69	45.2	22.6	45.2	41.3
26	67.0	33.5	67.0	25.6	12.6	25.6	2.62	43.3	21.7	43.3	41.3
25	65.2	32.6	65.2	25.6	12.6	25.6	2.55	41.5	20.8	41.5	41.3
24	63.5	31.8	63.5	25.6	12.6	25.6	2.48	39.8	19.9	39.8	41.4
23	61.9	30.9	61.9	25.6	12.6	25.6	2.41	38.1	19.0	38.1	41.4
22	60.2	30.1	60.2	25.7	12.6	25.7	2.35	36.4	18.2	36.4	41.4
21	58.7	29.3	58.7	25.7	12.6	25.7	2.28	34.8	17.4	34.8	41.5
20	57.2	28.6	57.2	25.7	12.6	25.7	2.22	33.3	16.6	33.3	41.5
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-- attention: operating limits not reflected in performance table

WAMAK TWW 110 WHR HeavyDuty 2L1

Tc -OU		W 12 / 7 °C										
[°C]	Qc nom	Qc min	Qc max	Pin nom	Pin min	Pin max	EER	Qh nom	Qh min	Qh max	I nom	
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]	
40	27.6	13.8	27.6	13.3	6.5	13.3	2.08	39.9	20.0	39.9	25.7	
39	28.1	14.0	28.1	13.0	6.4	13.0	2.16	40.1	20.1	40.1	25.4	
38	28.6	14.3	28.6	12.7	6.3	12.7	2.24	40.4	20.2	40.4	25.1	
37	29.0	14.5	29.0	12.5	6.1	12.5	2.32	40.6	20.3	40.6	24.9	
36	29.5	14.7	29.5	12.2	6.0	12.2	2.41	40.8	20.4	40.8	24.6	
35	29.9	15.0	29.9	12.0	5.9	12.0	2.49	41.1	20.5	41.1	24.3	
34	30.4	15.2	30.4	11.8	5.8	11.8	2.58	41.3	20.7	41.3	24.1	
33	30.8	15.4	30.8	11.5	5.7	11.5	2.67	41.6	20.8	41.6	23.8	
32	31.3	15.6	31.3	11.3	5.6	11.3	2.76	41.8	20.9	41.8	23.6	
31	31.7	15.9	31.7	11.1	5.5	11.1	2.86	42.0	21.0	42.0	23.4	
30	32.2	16.1	32.2	10.9	5.4	10.9	2.95	42.3	21.1	42.3	23.2	
29	32.6	16.3	32.6	10.7	5.3	10.7	3.05	42.5	21.3	42.5	23.0	
28	33.0	16.5	33.0	10.5	5.2	10.5	3.15	42.8	21.4	42.8	22.8	
27	33.4	16.7	33.4	10.3	5.1	10.3	3.25	43.0	21.5	43.0	22.6	
26	33.9	16.9	33.9	10.1	5.0	10.1	3.35	43.2	21.6	43.2	22.4	
25	34.3	17.1	34.3	9.9	4.9	9.9	3.45	43.5	21.7	43.5	22.2	
24	34.7	17.3	34.7	9.8	4.8	9.8	3.56	43.7	21.9	43.7	22.0	
23	35.1	17.5	35.1	9.6	4.7	9.6	3.66	44.0	22.0	44.0	21.9	
22	35.5	17.7	35.5	9.4	4.6	9.4	3.77	44.2	22.1	44.2	21.7	
21	35.9	17.9	35.9	9.2	4.5	9.2	3.88	44.4	22.2	44.4	21.6	
20	36.3	18.1	36.3	9.1	4.5	9.1	4.00	44.7	22.3	44.7	21.4	

Tc [°C]		W 23 / 18 °C										
0	Qc nom	Qc min	Qc max	Pin nom	Pin min	Pin max	EER	Qh nom	Qh min	Qh max	I nom	
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]	
40	42.9	21.4	42.9	13.3	6.5	13.3	3.23	55.3	27.6	51.4	25.9	
39	43.5	21.7	43.5	13.0	6.4	13.0	3.34	55.7	27.8	51.8	25.6	
38	44.1	22.1	44.1	12.7	6.3	12.7	3.46	56.1	28.0	52.2	25.3	
37	44.7	22.4	44.7	12.5	6.1	12.5	3.58	56.5	28.2	52.6	25.0	
36	45.4	22.7	45.4	12.2	6.0	12.2	3.70	56.9	28.4	53.0	24.8	
35	46.0	23.0	46.0	12.0	5.9	12.0	3.83	57.3	28.6	53.3	24.5	
34	46.6	23.3	46.6	11.8	5.8	11.8	3.95	57.6	28.8	53.7	24.3	
33	47.2	23.6	47.2	11.5	5.7	11.5	4.08	58.0	29.0	54.1	24.0	
32	47.7	23.9	47.7	11.3	5.6	11.3	4.22	58.4	29.2	54.5	23.8	
31	48.3	24.2	48.3	11.1	5.5	11.1	4.35	58.8	29.4	54.9	23.6	
30	48.9	24.5	48.9	10.9	5.4	10.9	4.49	59.2	29.6	55.3	23.4	
29	49.5	24.7	49.5	10.7	5.3	10.7	4.63	59.6	29.8	55.7	23.2	
28	50.0	25.0	50.0	10.5	5.2	10.5	4.77	60.0	30.0	56.1	23.0	
27	50.6	25.3	50.6	10.3	5.1	10.3	4.91	60.3	30.2	56.5	22.8	
26	51.2	25.6	51.2	10.1	5.0	10.1	5.06	60.7	30.4	56.9	22.6	
25	51.7	25.9	51.7	9.9	4.9	9.9	5.21	61.1	30.5	57.3	22.4	
24	52.2	26.1	52.2	9.8	4.8	9.8	5.36	61.5	30.7	57.6	22.2	
23	52.8	26.4	52.8	9.6	4.7	9.6	5.51	61.8	30.9	58.0	22.0	
22	53.3	26.7	53.3	9.4	4.6	9.4	5.67	62.2	31.1	58.4	21.9	
21	53.8	26.9	53.8	9.2	4.5	9.2	5.83	62.6	31.3	58.8	21.7	
20	54.3	27.2	54.3	9.1	4.5	9.1	5.99	62.9	31.5	59.2	21.6	

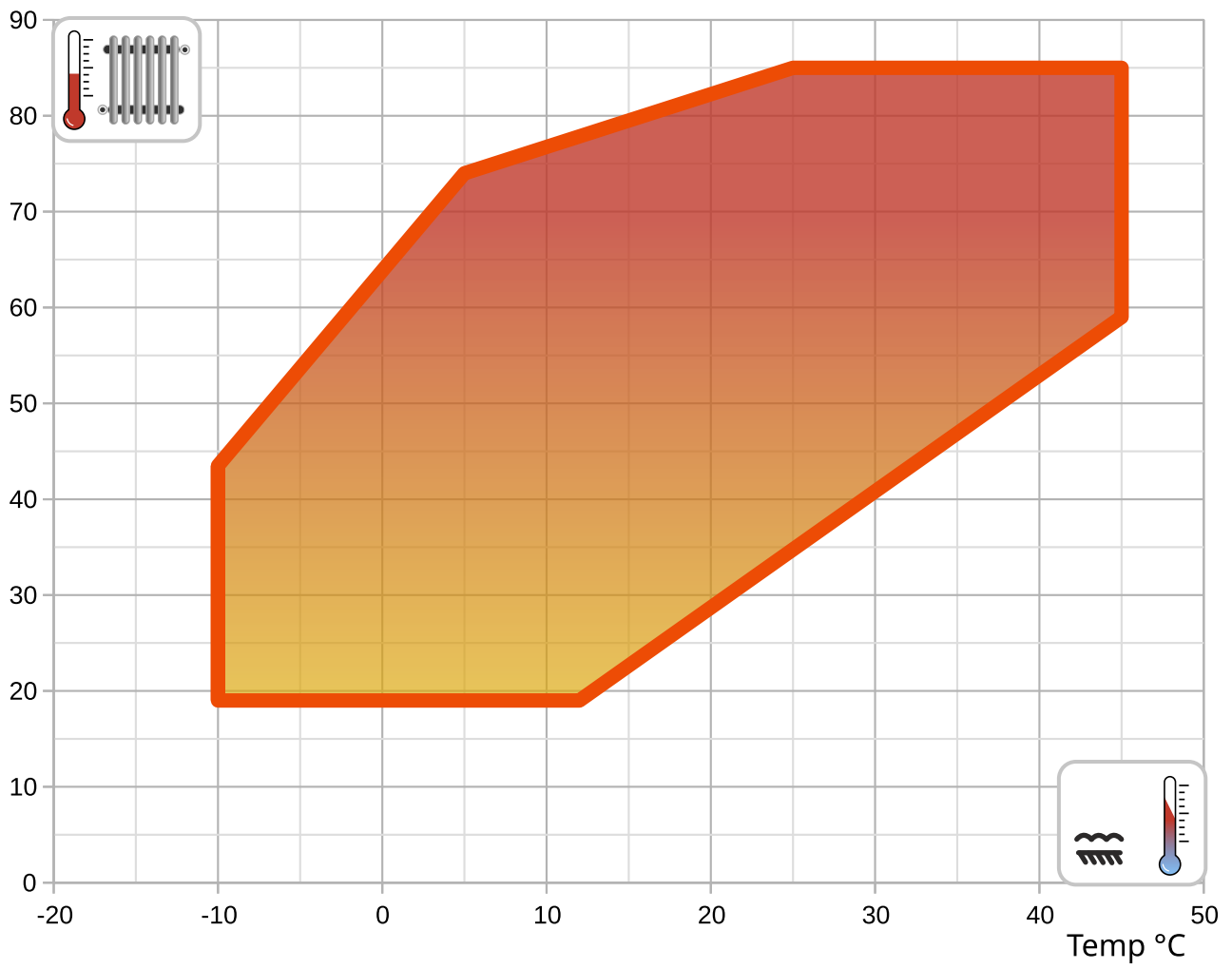
-- attention: operating limits not reflected in performance table

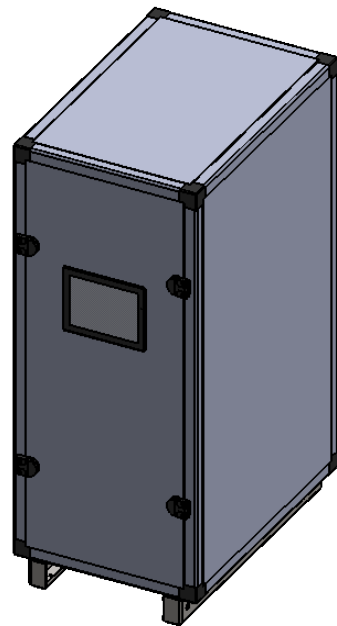
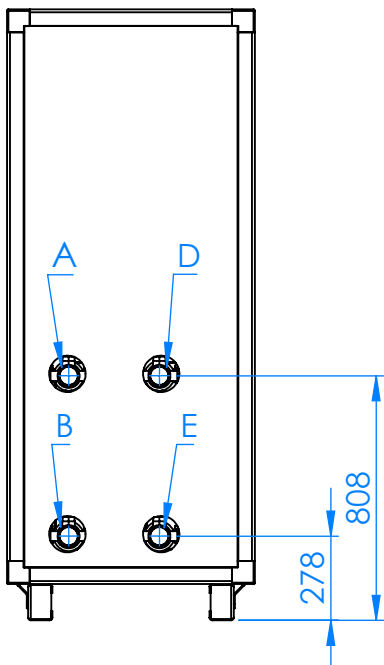
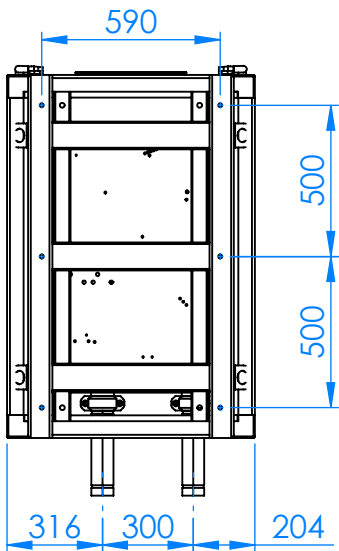
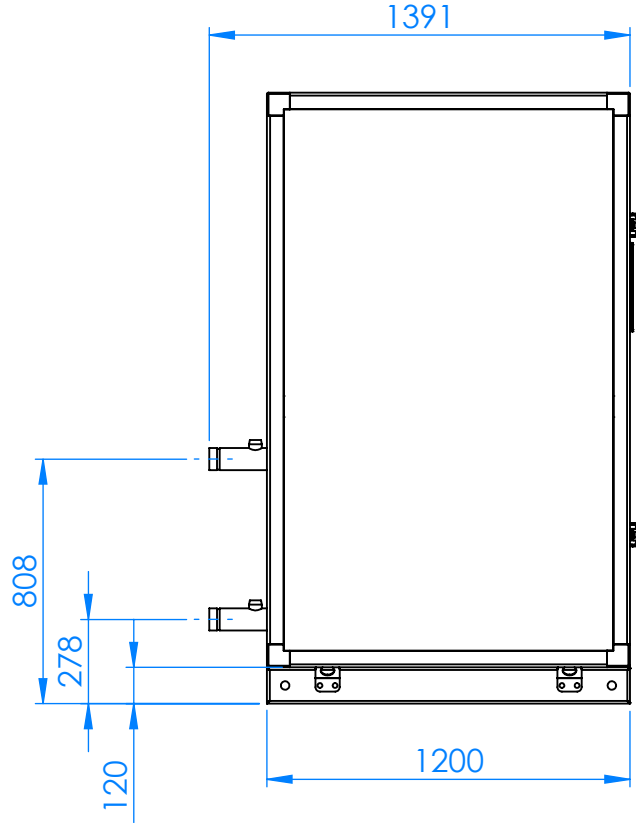
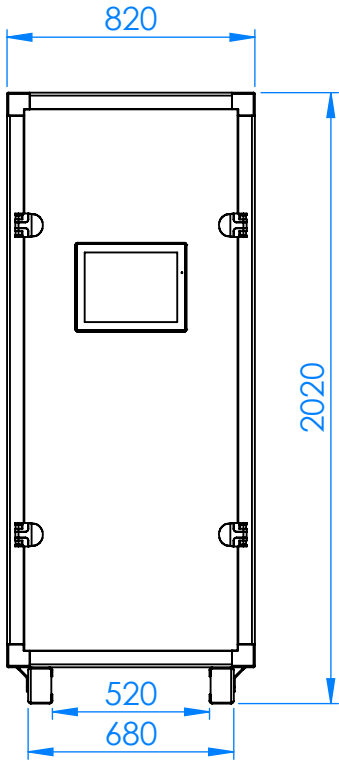
LEGEND:

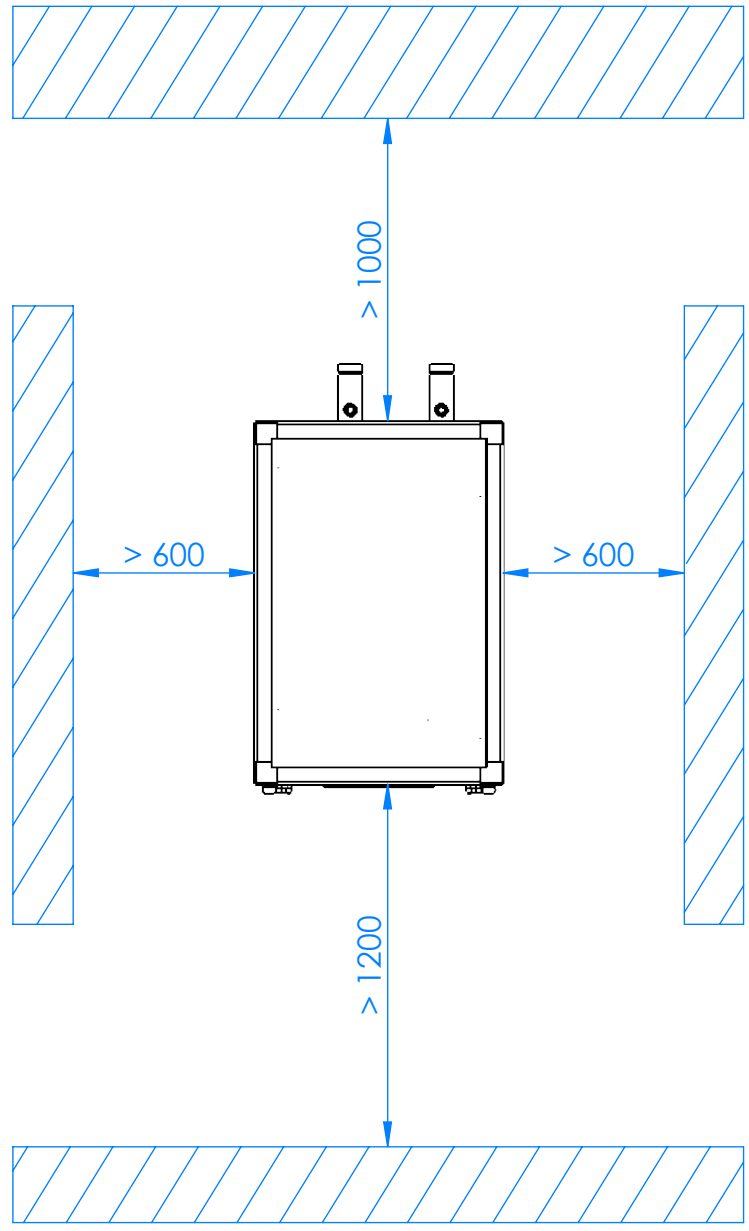
Ts-IN: Temperature renewable source - inlet [°C]
Th-OU: Temperature heating - outlet (flow) [°C]
Tc-OU: Temperature cooling - outlet (flow) [°C]
Qh nom: Heating capacity nominal
Qh min: Heating capacity minimal
Qh max: Heating capacity maximal
Pin nom: Power input at nominal heating capacity
Pin min: Power input at minimal heating capacity
Pin max: Power input at maximal heating capacity
COP nom: coefficient of performance at nominal heating capacity
Qc nom: cooling / heat extraction capacity at nominal heating capacity
Qc min: cooling / heat extraction at minimal heating capacity
Qc max: cooling / heat extraction at maximal heating capacity
I nom: Current at nominal heating capacity
EER: energy efficiency ratio at nominal cooling capacity

Operating limits

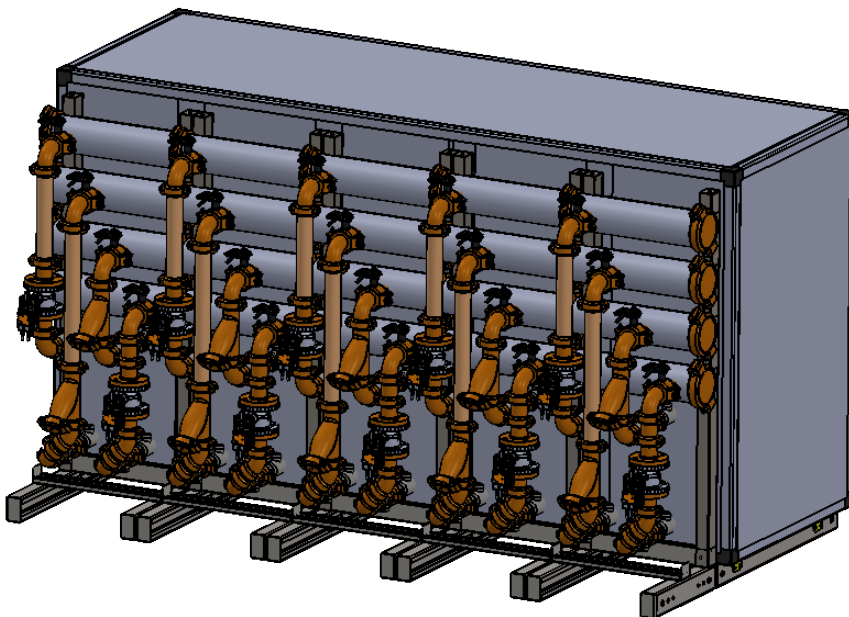
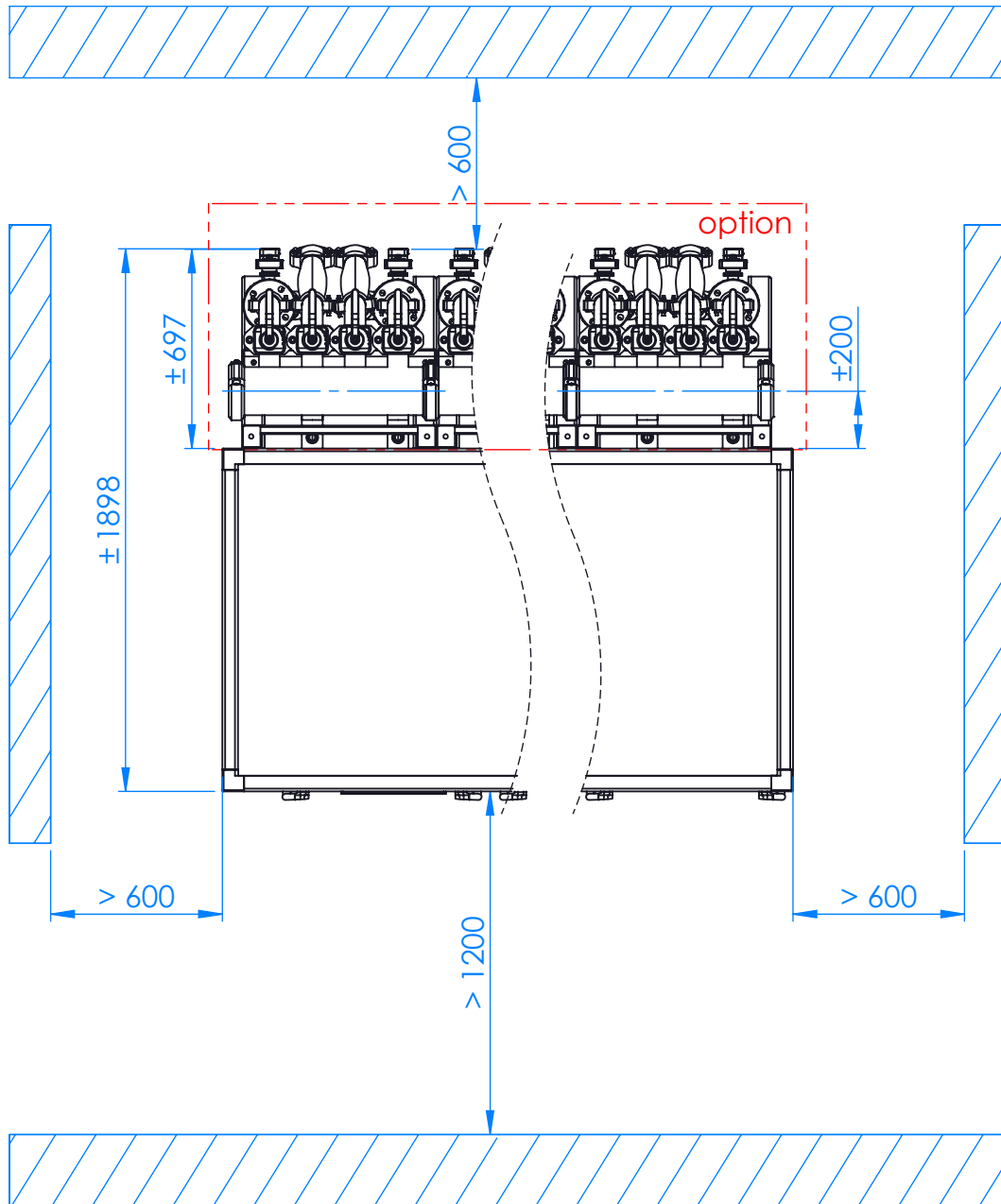
Temp °C

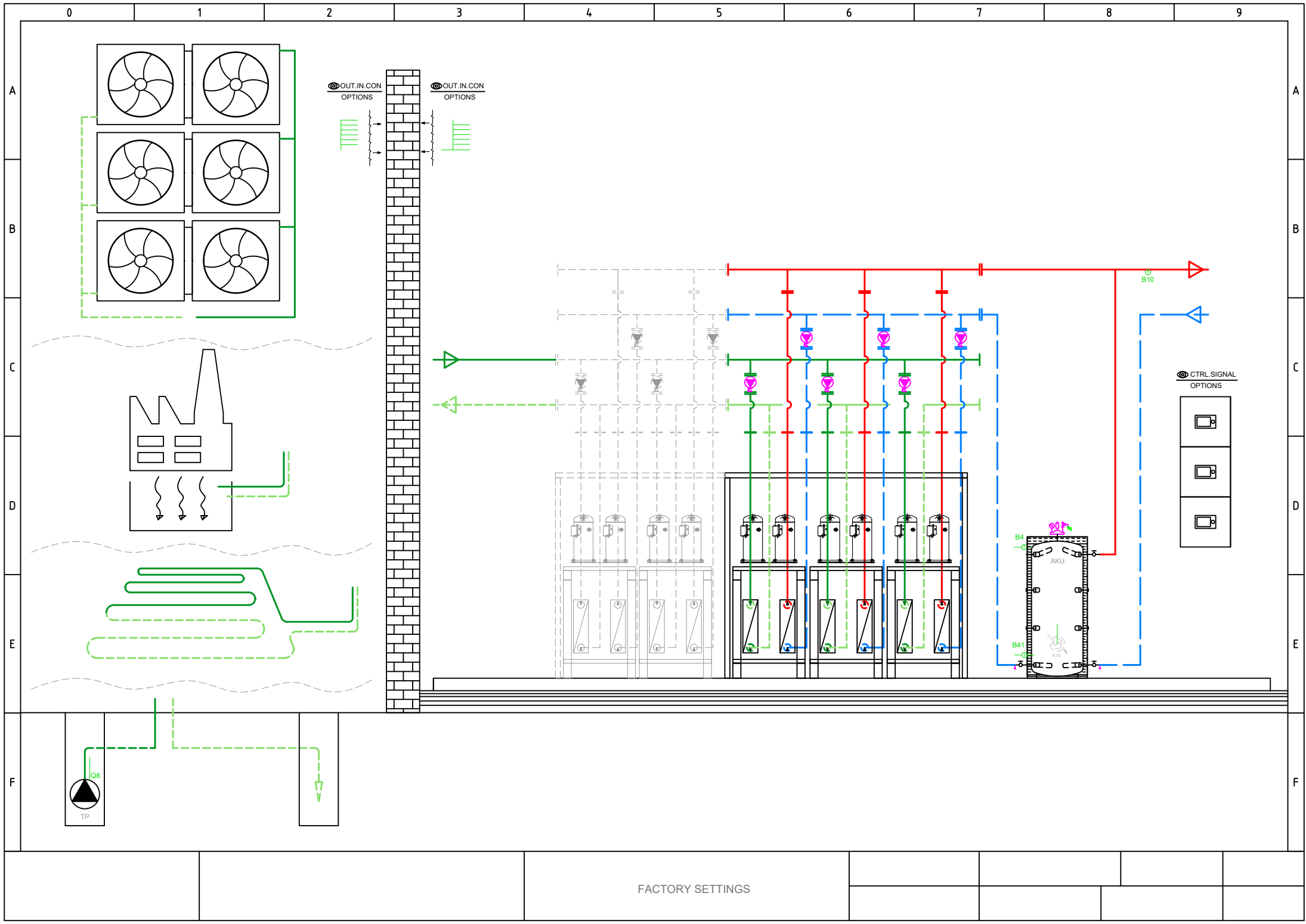






WAMAK TWW 110 WHR HeavyDuty 2L1





Total: max 6A
1 x QX...: max 2A

Main power supply 230V / 50 Hz
Ground
Neutral conductor

- E9 Low-pressure switch E9
- E10 High-pressure switch E10
- E15 Flow switch source E15
- E24 Flow switch consumers E24
- E6 Electrical utility lock E6
- E12 Overload compressor 2 E12
- E21 Mains supervision E21
- E22 Mains supervision E22
- E23 Mains supervision E23
- E11 Overload compressor 1 E11
- K1 Compressor stage 1 K1

Q8 Source pump Q8

Q9 Condenser pump Q9

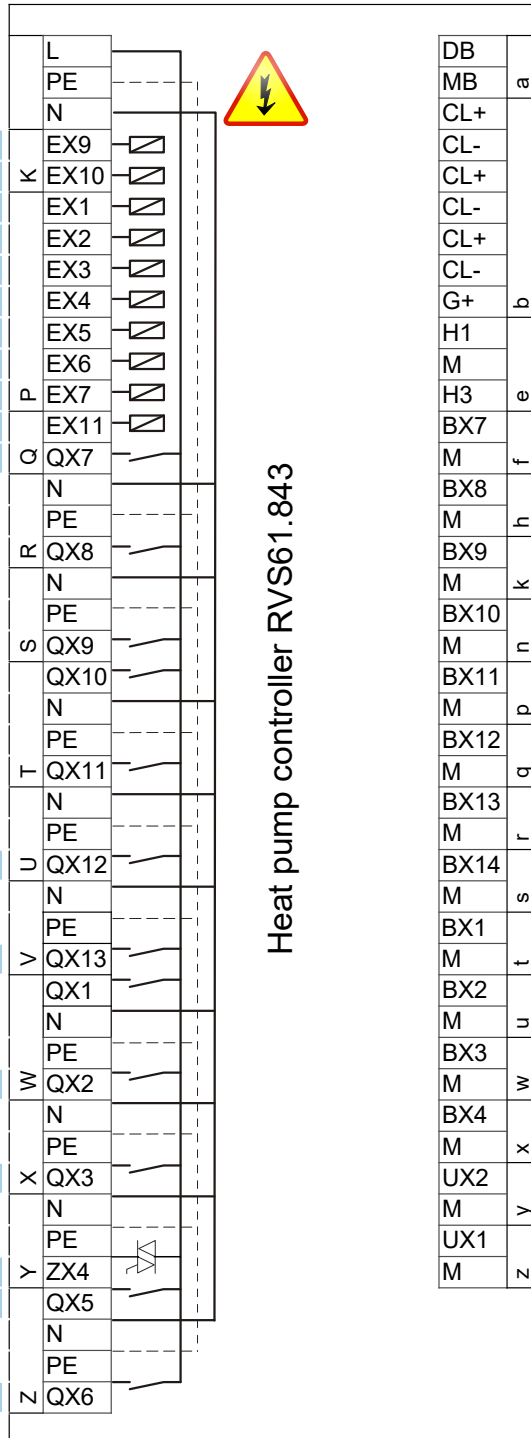
K10 Alarm output K10

K40 Crankcase heater K40

K81 Valve evaporator K81

K82 Valve EVI K82

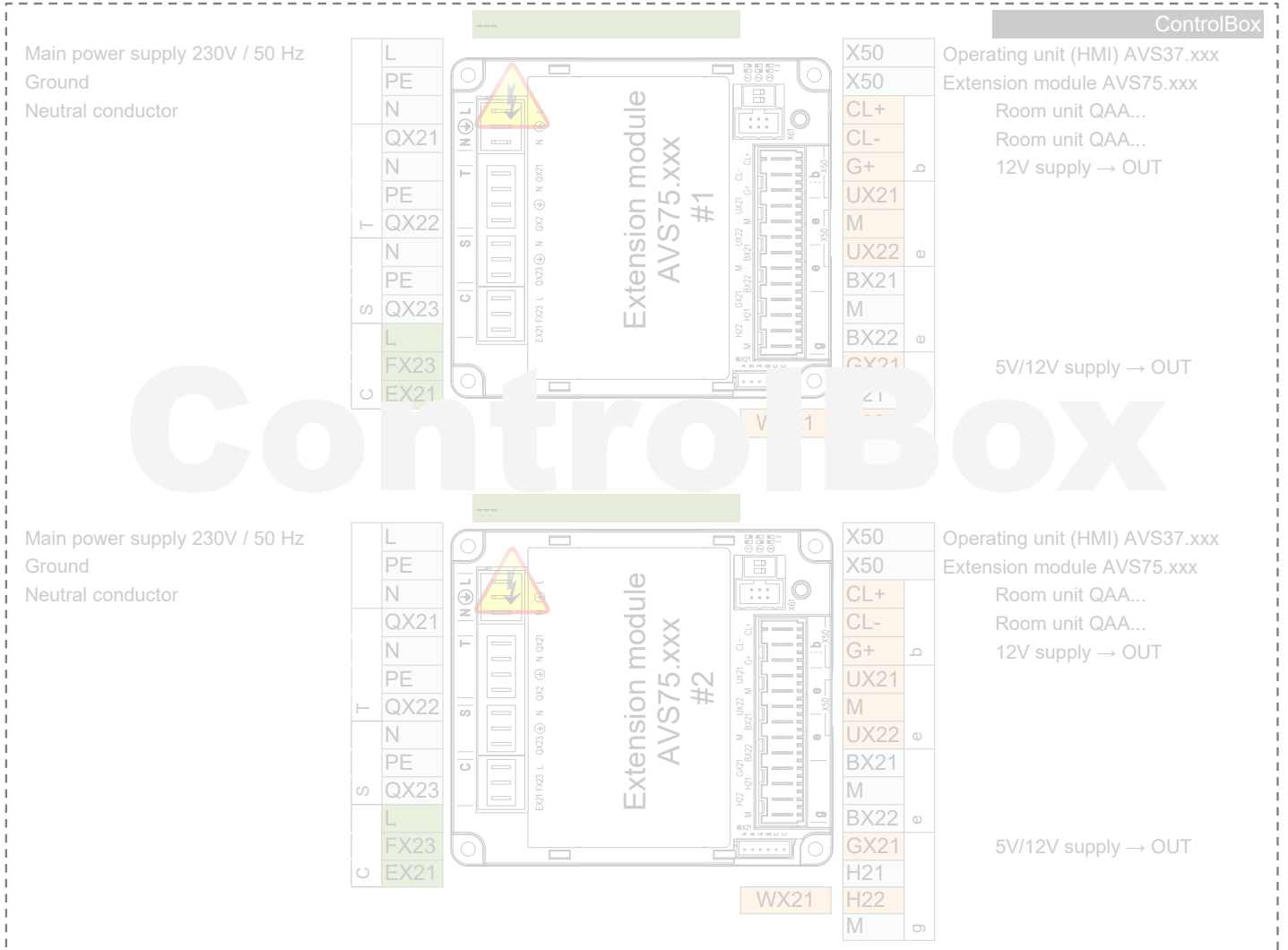
K2 Compressor stage 2 K2



- DB LPB Bus data
- MB LPB Bus GND
- CL+ Room unit QAA...
- CL- Room unit QAA...
- CL+ Room unit QAA... 2.
- CL- Room unit QAA... 2.
- CL+ Room unit QAA... 3.
- CL- Room unit QAA... 3.
- G+ 12V supply → OUT
- H1
- M
- H3 Consumer request VK1
- BX7 B81 Hot-gas sensor K1 B81
- M
- BX8
- M
- BX9
- M
- BX10 B21 HP flow sensor B21
- M
- BX11
- M
- BX12 B71 HP return sensor B71
- M
- BX13 B91 Source inlet sensor B91
- M
- BX14 B84 Source outl sens B92/B84
- M
- BX1
- M
- BX2
- M
- BX3 B83 Refrig sensor liquid B83
- M
- BX4 B82 Hot-gas sensor K2 B82
- M
- UX2 Condenser pump Q9
- M
- UX1 0..10 V Signal
- M
- Z 0..10 V Signal

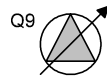
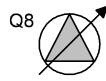


- AVS75.390
- AVS75.391
- AVS75.370



HEAT PUMP

EXTERNAL
INTERNAL



K1

K2

K82

K81

K40

K10

Q8 UX1

Q9 UX2

E11
KRW1
F1K
E11

E12
KRW2
F2K
E12

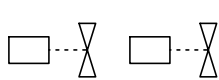
E6

E24
Q9 ERR
F1S
E24

E15
Q8.ERR
F1Z
E15

E10

E9



230V,50Hz
max 6A

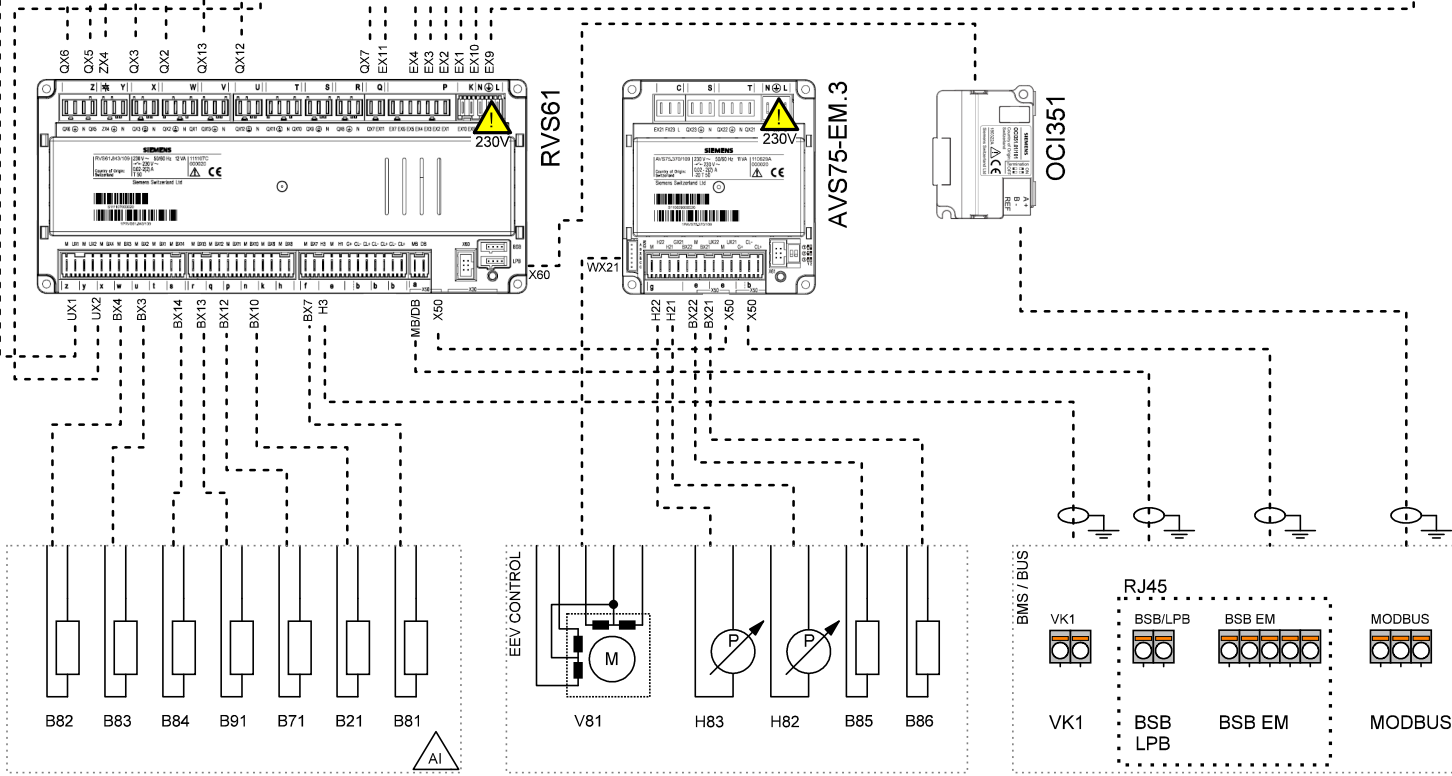
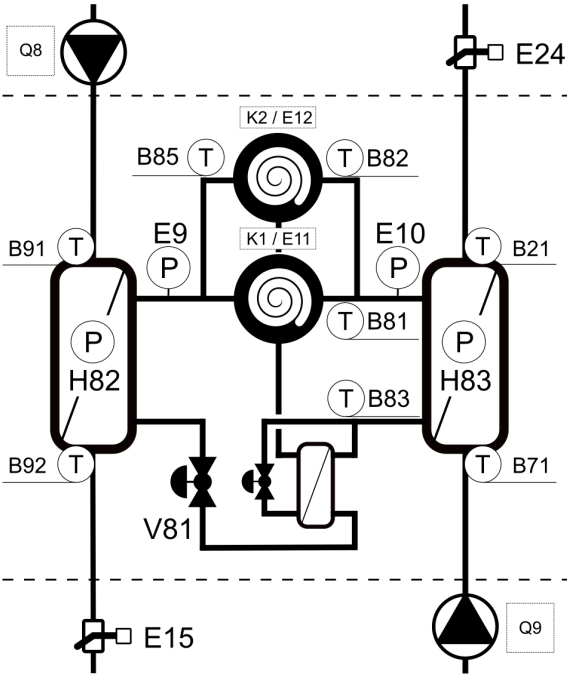
0...10V

230V,50Hz
max 6A

0...10V

DO

DI



PWR SPLY: 3~ 400V, 50 Hz
CTRL: 1~ 230V, 50 HZ

Company

Title

Version / Note

Number

Created by

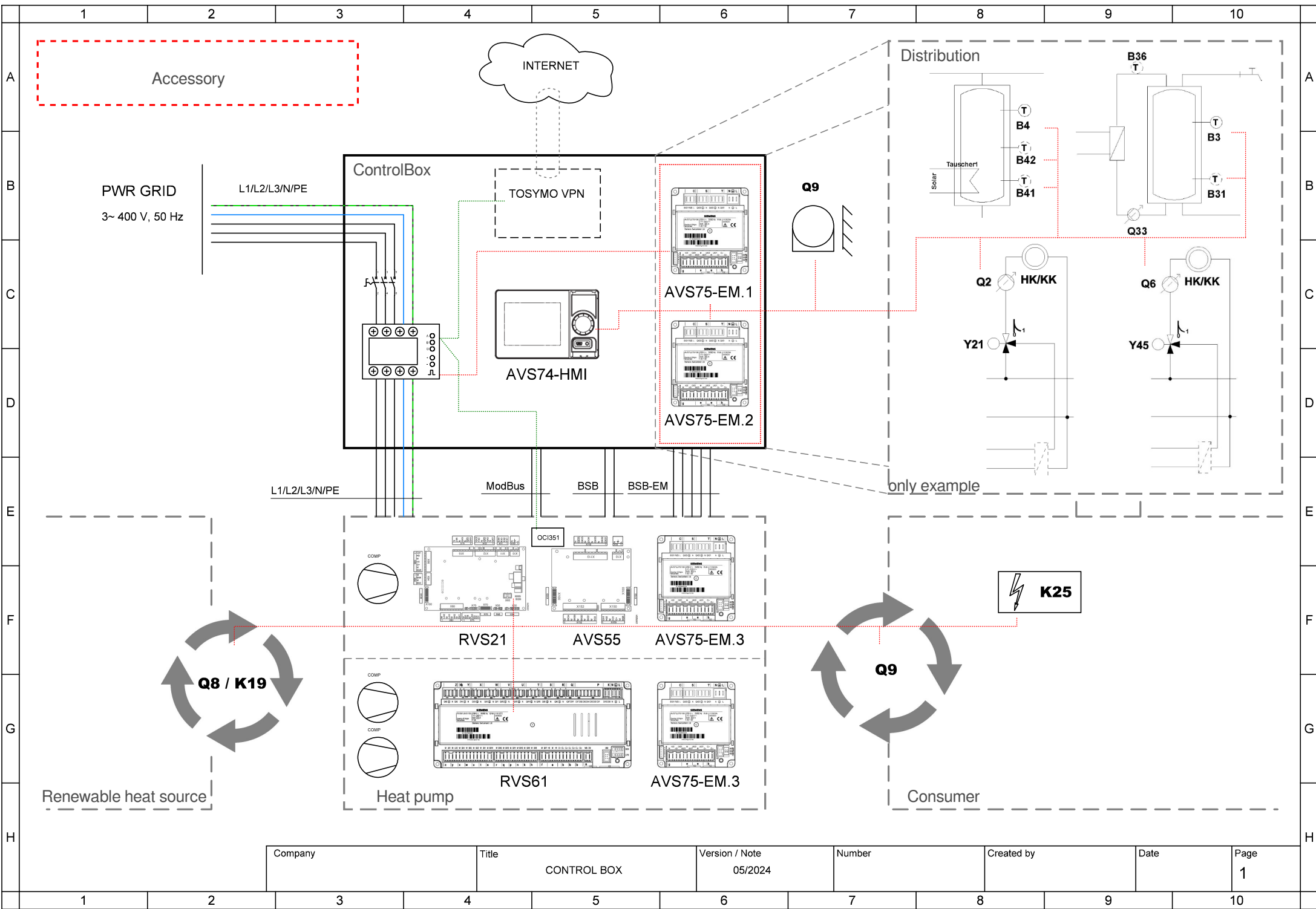
Date

Page

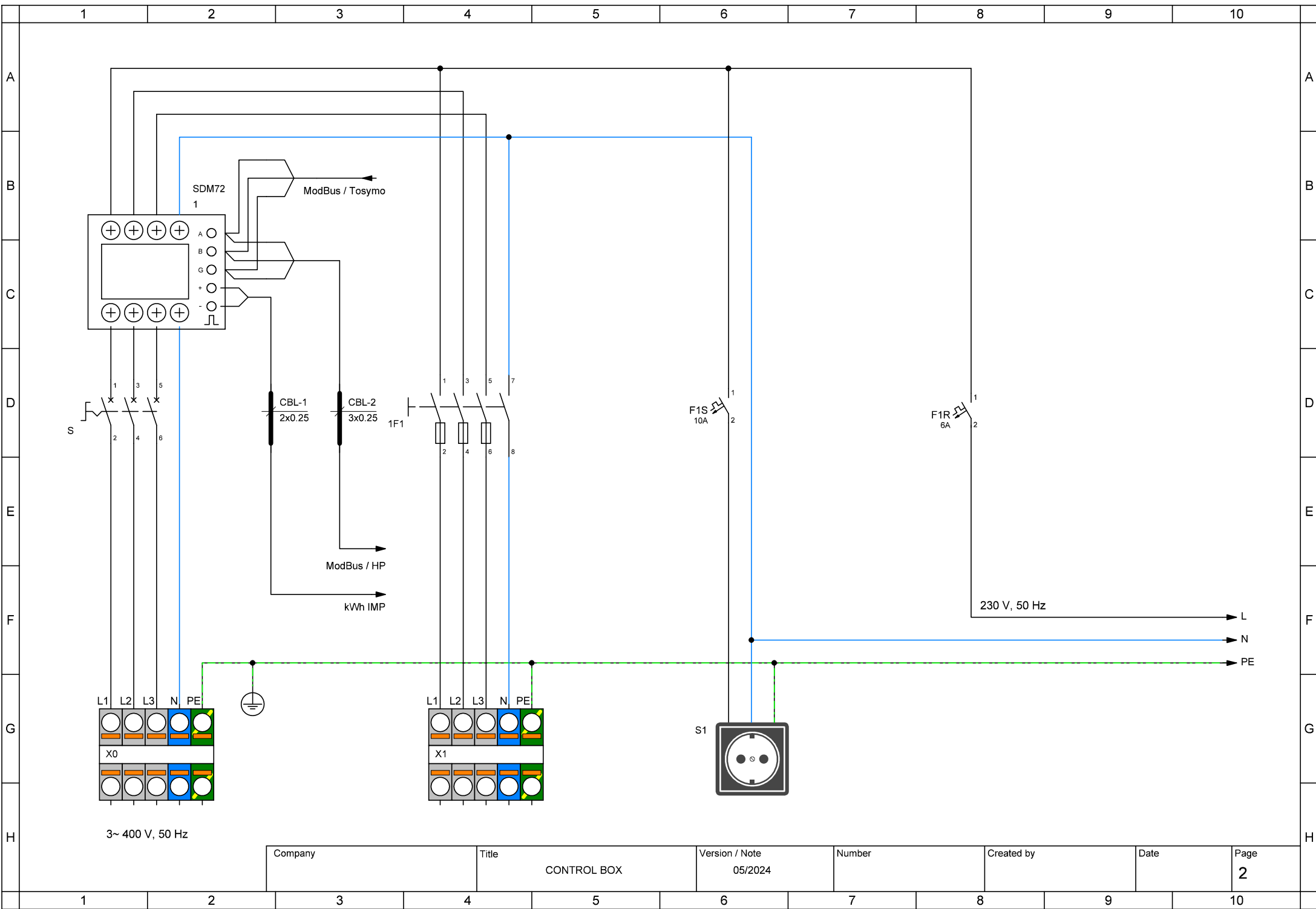
TBW-TWW

05/2024

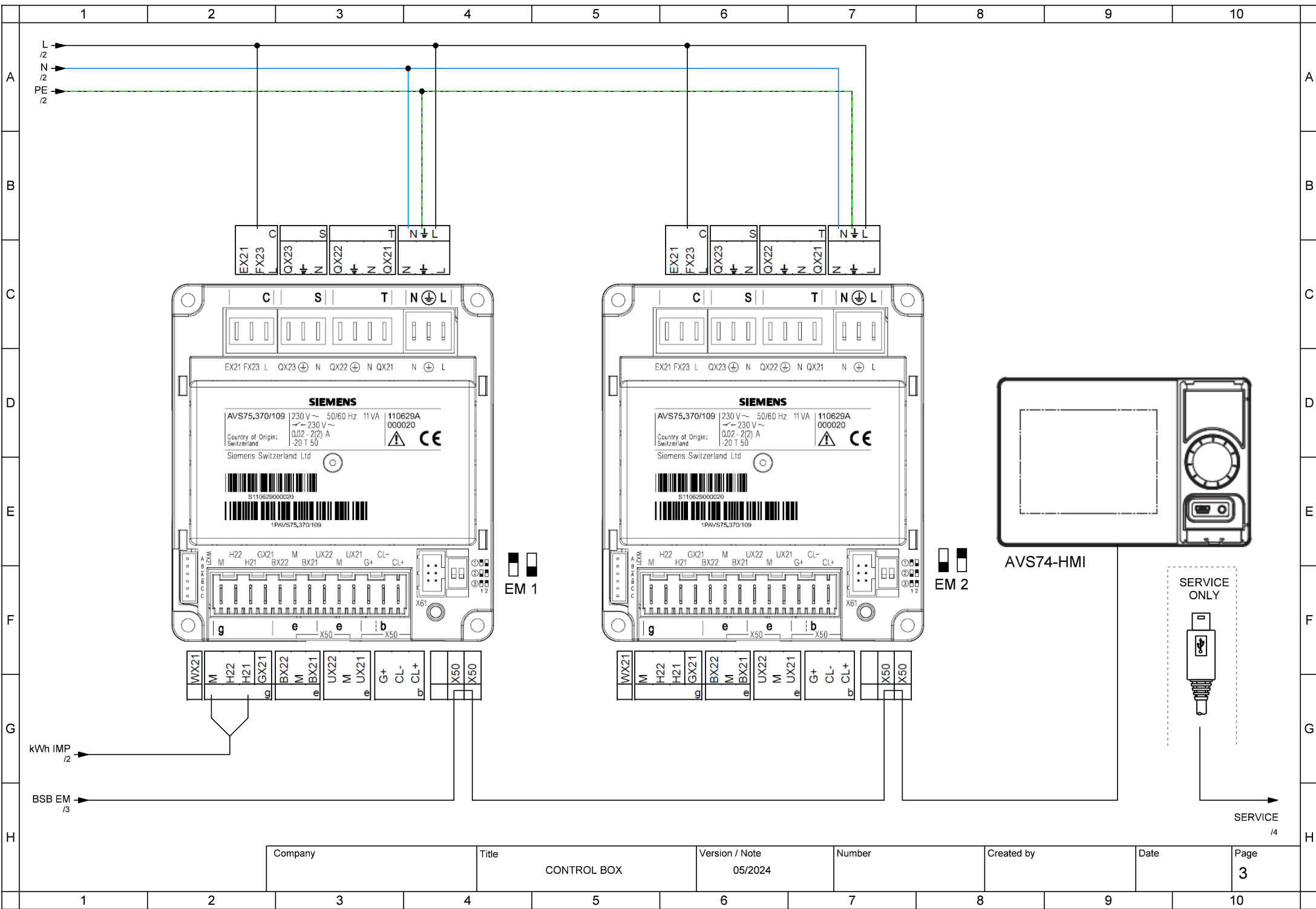
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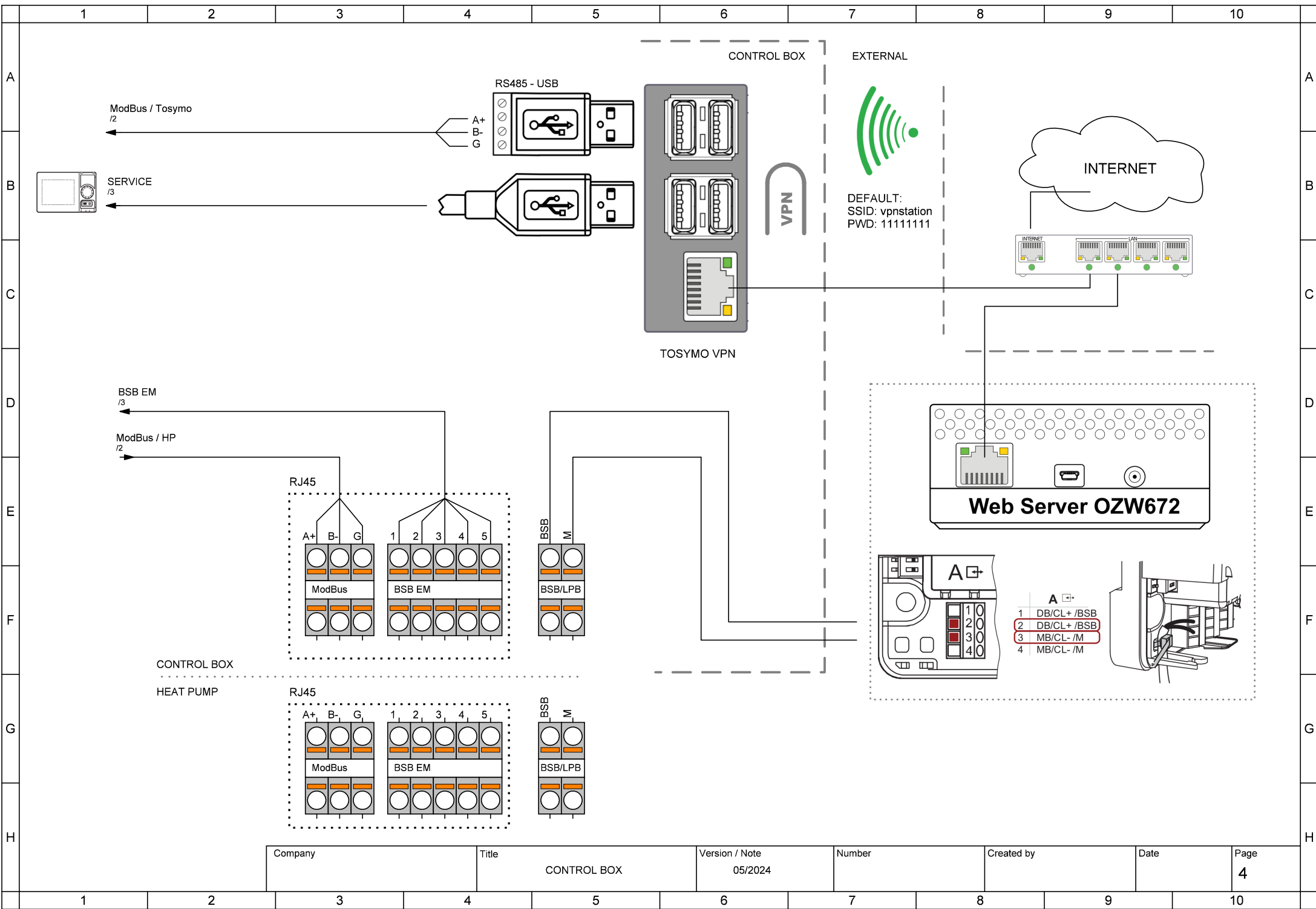
Company	Title	Version / Note	Number	Created by	Date	Page
	CONTROL BOX	05/2024				1



Company	Title	Version / Note	Number	Created by	Date	Page
	CONTROL BOX	05/2024				2



Company	Title	Version / Note	Number	Created by	Date	Page
	CONTROL BOX	05/2024				3



Company	Title	Version / Note	Number	Created by	Date	Page
	CONTROL BOX	05/2024				4

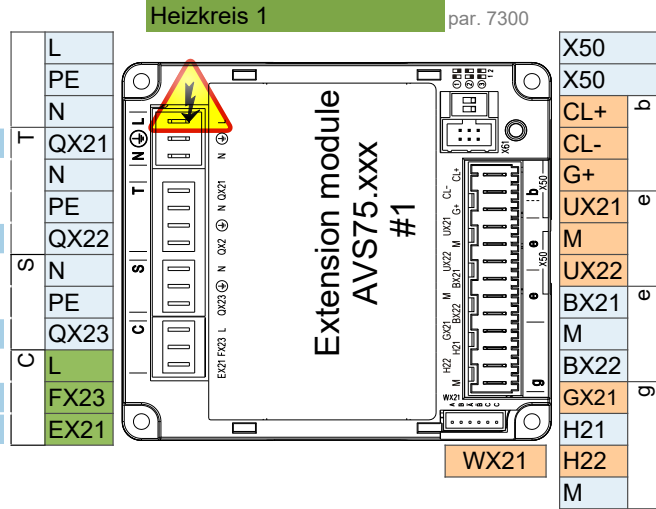
- AVS75.390
- AVS75.391
- AVS75.370

- AVS75.370**
 Main power supply 230V / 50 Hz
 Ground
 Neutral conductor
Y1 Mixing valve Open

Y2 Mixing valve Close

Q2 Heat circuit pump HC1 Q2

L Phase 230V
E61 Smart grid E61



- Extension module AVS75.xxx
 Room unit QAA...
 Room unit QAA...

B1 Flow sensor 1

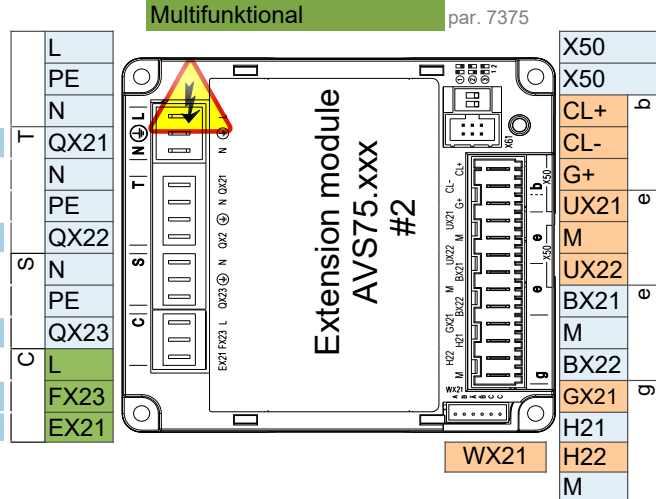
 Pulse count

- AVS75.370**
 Main power supply 230V / 50 Hz
 Ground
 Neutral conductor
Q3 DHW ctrl elem Q3

K6 El imm heater DHW K6

Q6 Heat circuit pump HC2 Q6

L Phase 230V
E62 Smart grid E62

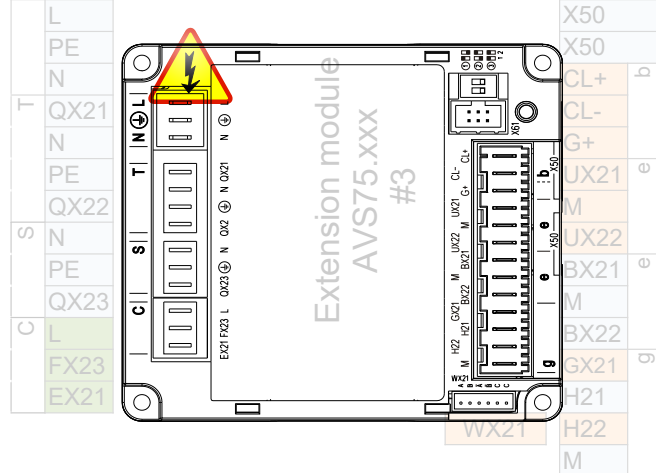


- Operating unit (HMI) AVS37.xxx
 Extension module AVS75.xxx
 Room unit QAA...
 Room unit QAA...

B3 DHW sensor B3

B4 Buffer sensor B4

- Main power supply 230V / 50 Hz
 Ground
 Neutral conductor



- Operating unit (HMI) AVS37.xxx
 Extension module AVS75.xxx
 Room unit QAA...
 Room unit QAA...

Attention: Extension module 3 is inside the heat pump

Control connection options

1 ControlBox

ControlBox, with two built-in extension modules, enables numerous options for application control on the consumer side behind the heat pump. For more, see the ControlBox schematic and the application diagrams sheet.

2 Fix flow temperature setpoint - On / Off dry (potential free) contact

2 wire shielded cable 2 x 0.5 mm² - Setpoint = 45°C (editable by param. 1859)

Connection terminal - see wiring diagram

3 Analog 0..10V flow temperature setpoint control

2 wire shielded cable 2 x 0.5 mm² - Setpoint: 0V = 16°C ~ 10V = 60°C (editable in parameter set)

Connection terminal - see wiring diagram

4 ModBus RTU communication command

3 wire shielded cable min. 3 x 0.25mm²

For ModBus mapping table contact technical support

5 MQTT IoT communication protocol

For more information contact technical support