



Heat pump



TBW 54 EVI

WAMAK TBW 54 EVI

Product description

Heat pump with two power stages for heating and domestic hot water with the possibility of passive cooling control. One short closed refrigerant circuit with a pair of quiet Scroll compressors and robust stainless steel plate heat exchangers. Through the connection kit, the circulation pumps can be easily and quickly connected while externally controlling their variable speed.

Use for multi-family dwellings, suburban mixed-use buildings or commercial operations. The Urban range is based on a robust construction quality steel for all parts. High quality, long proven heat pump circuit components extend the life of the heat pump.

As a primary source, the thermal energy of the sun accumulated in the ground through a horizontal collector or geothermal energy through a deep borehole is used. In the collector or borehole, an antifreeze flows which takes the energy of the earth at a low temperature and the heat pump raises this temperature to a temperature usable for heating or hot water.

The EVI (Enhanced Vapour Injection) technology allows the heat pump to achieve higher header flow temperatures even at lower source temperatures. EVI also has a positive impact on the compressor lifespan and overall system stability because the discharge gas temperature from the compressor is lower.

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

Product features

- Scroll compressor
- EVI technology
- Asymmetric plate heat exchanger
- Multi-stage capacity control
- High pressure switch
- Low pressure sensor - analogue
- Flow sensor consumer - analogue - (with accessory)
- Mixed heating/cooling circuit control
- DHW switching control
- Outdoor temperature sensor - (with accessory)
- Buffer temperature sensor - (with accessory)
- Modbus connection - (with accessory)
- Sylomer pads under compressor unit
- 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)
- Direct heating/cooling circuit control
- DHW circulation control
- DHW temperature sensor - (with accessory)
- Cascade control - (with accessory)
- Solid frame structure

Basic performance data - WAMAK TBW 54 EVI

Heating - EN 14511		
Heating capacity [kW]	B0 / W35 (max)	55.5 (27.8 / 55.5)
	B0 / W35 (min)	27.8 (27.8 / 55.5)
	B0 / W34	55.5 (27.8 / 55.5)
Electrical power input [kW]	B0 / W35 (max)	12.2 (6.0 / 12.2)
	B0 / W35 (min)	6.0 (6.0 / 12.2)
	B0 / W34	11.9 (5.9 / 11.9)
Heating efficiency faktor [COP]	B0 / W35 (max)	4.56
	B0 / W35 (min)	4.62
	B0 / W34	4.67
Seasonal space heating energy efficiency - SCOP EN 14825		
Average Climate / Low Temperature [35°C]	SCOP	5.22
	η [%]	208.9
	Label	A+++
	Qhe [kWh]	21909.0
	Pdesignh [kW]	55.5
	Tbivalent [°C]	-10
Cooling		
Cooling capacity - [kW]	A35 / W23-18	56.8
	A25 / W23-18	60.0
	A35 / W12-7	56.8
	A25 / W12-7	56.8
Seasonal space cooling energy efficiency - SEER EN 14825		
[W 23 / 18°C]	SEER	5.44
	Qce [kWh]	5813.5
	η_c [%]	217.4
Sound EN 12102		
Acoustic power - Lw	dB(A)	58.5
Acoustic pressure - Lp	1 m dB(A)	50.5
	5 m dB(A)	36.5
	10 m dB(A)	30.5
Mechanical and operational information		
Compressor type (3~ 400/50)	SCROLL / 2 /	On/Off
Refrigerant	R410A (GWP - 2088)	6.8 kg
Operating limit temperatures heating - (min / max) [°C]		25 / 65
Operating limit temperatures source - (min / max) [°C]		-10 (7) / 30
Weight		420 kg

Main technical data - WAMAK TBW 54 EVI

Enclosure type			VN1100			Heat energy rejection side data					
Basic dimensions	Height [mm]	1270	Operating limit temperatures heating	MAX [°C]	65	for more see operating limits diagram	Condenser	Port size	VIC 2.1/2 "		
	Width [mm]	1100		MIN [°C]	25			Type	BPHE		
	Length [mm]	750		Count	1			Material	AISI 316		
Weight [kg]	420		Maximal operating pressure - refrigerant [bar]	50		for more see operating limits diagram	Maximal operating pressure - Water [bar]	6			
Colour	Gray		Testing pressure [bar]	70				Heat transfer medium	Water		
Enclosure IP Class	IP20		Heat transfer medium	Water					Volume flow @ dT 5K (nom) - Water [m3/h]	4.81 ~ 9.61	
Refrigeration cycle			Internal pressure drop - Water [kPa]	20		Temperature difference	@ 35°C (nom) 5 K				
Compressor	Type	Scroll	@ 55°C	8 K			@ 65°C	10 K			
	Number of stages	2	Renewable energy extraction side data				Operating limit temperatures source	MIN [°C]	-10 (7)		
	On/Off		MAX [°C]	30		for more see operating limits diagram		Evaporator	Port size	VIC 2.1/2 "	
	Power factor Cosφ	0.69	Refrigerant	R410A			Type		BPHE	Count	1
	Winding resistance	1.24 Ohm		Volme	6.8 kg		Material		AISI 316		
Refrigerant		GWP		2088		Maximal operating pressure - refrigerant [bar]	29				
Refrigeration oil type	POE RL32-3MAF		Safety class	A1		Heat transfer medium	Ethylenglykol				
Maximal pressure - refrigerant [bar]	50		Refrigeration oil type	POE RL32-3MAF		Brine proportion [%]	29				
	PED class	2	Oil volume	2 x 3.38 L		Antifreeze to [°C]	-15				
EVI - vapour injection with economizer			Maximal pressure - refrigerant [bar]	50		Maximal operating pressure - Ethylenglykol [bar]	6				
Electrical connection data			PED class	2		Volume flow - Ethylenglykol [m3/h]	4.94 ~ 9.88				
Line voltage [#~ V/Hz]	3~ 400/50		EVI - vapour injection with economizer			Internal pressure drop - Ethylenglykol [kPa]	20				
	Current	nominal [A]	24.46		Control System	Temperature difference - Ethylenglykol	4 K				
		maximal [A]	42.00			Main controller	SIEMENS RVS 61				
starting [A]		36.42		Extension module		AVS75.3xx AVS75.3xx AVS75.372					
Softstart	-		Bus Clip-In	Modbus OCI352		Main controller					
Main safety	C80		Online connection	Web server OZW672 ToSyMo		Extension module					
Control System			Superheat controller	SEC61		Bus Clip-In					
Main controller	SIEMENS RVS 61		Superheat controller			SEC61		Online connection			
Extension module	AVS75.3xx AVS75.3xx AVS75.372		*** with accessory								
Bus Clip-In	Modbus OCI352										
Online connection	Web server OZW672 ToSyMo										
Superheat controller	SEC61										

*** with accessory

WAMAK TBW 54 EVI

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

Model	TBW 54 EVI
Air-to-water heat pump	no
Brine-to-water heat pump	yes
Water-to-water heat pump	no
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	55.5	kW	Seasonal space heating energy efficiency	η_s	208.9	%
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	55.5	kW	Tj = -7 °C	COPd	4.67	-
Tj = +2 °C	Pdh	55.4	kW	Tj = +2 °C	COPd	5.1	-
Tj = +7 °C	Pdh	55.3	kW	Tj = +7 °C	COPd	5.6	-
Tj = +12 °C	Pdh	55.2	kW	Tj = +12 °C	COPd	6.0	-
Tj = bivalent temperature	Pdh	55.5	kW	Tj = bivalent temperature	COPd	4.6	-
Tj = operation limit temperature	Pdh	---	kW	Tj = operation limit temperature	COPd	---	-
Bivalent temperature	Tbiv	-10	°C	Tj = operation limit temperature	TOL	---	°C
Power consumption in modes other than active mode				Heating water operating limit temperature	WTOL	65	°C
Off mode	Poff	0.010	kW	Supplementary heater			
Thermostat-off mode	Pto	0.010	kW	Rated heat output	Psup	10.6	kW
Standby mode	Psb	0.010	kW	Type of energy input	electricity		
Crankcase heater mode	Pck	0.000	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	-	4.94 ~ 9.88	m ³ /h
indoors	Lwa	59	dB				
outdoors	Lwa	---	dB				
Annual energy consumption	Q _{HE}	21909.0	kWh				

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Model	TBW 54 EVI
Air-to-water heat pump	no
Brine-to-water heat pump	yes
Water-to-water heat pump	no
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	56.2	kW	Seasonal space heating energy efficiency	η_s	163.0	%
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	56.6	kW	Tj = -7 °C	COPd	3.26	-
Tj = +2 °C	Pdh	57.0	kW	Tj = +2 °C	COPd	4.2	-
Tj = +7 °C	Pdh	56.2	kW	Tj = +7 °C	COPd	4.7	-
Tj = +12 °C	Pdh	56.1	kW	Tj = +12 °C	COPd	5.2	-
Tj = bivalent temperature	Pdh	56.2	kW	Tj = bivalent temperature	COPd	2.8	-
Tj = operation limit temperature	Pdh	---	kW	Tj = operation limit temperature	COPd	---	-
Bivalent temperature	Tbiv	-10	°C	Tj = operation limit temperature	TOL	---	°C
Power consumption in modes other than active mode				Heating water operating limit temperature	WTOL	65	°C
Off mode	Poff	0.010	kW	Supplementary heater			
Thermostat-off mode	Pto	0.010	kW	Rated heat output	Psup	10.6	kW
Standby mode	Psb	0.010	kW	Type of energy input	electricity		
Crankcase heater mode	Pck	0.000	kW				
Other items							
Capacity control	multi-stage			For air-to-water heat pumps: Rated air flow rate, outdoors	-	---	m ³ /h
Sound power level							
indoors	Lwa	59	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	4.94 ~ 9.88	m ³ /h
outdoors	Lwa	---	dB				
Annual energy consumption	Q _{HE}	28447.1	kWh				

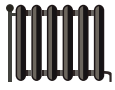
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WAMAK

TBW 54 EVI



55 °C

35 °C



A+++ **A+++** **A+++**

59 dB

--- dB

■ 60	■ 57
■ 57	■ 56
■ 56	■ 53
kW	kW

2019

811/2013

TBW 54 EVI

ErP Data

	55 °C	35 °C
Energy class	A+++	A+++
η [%]	163.0	208.9
P_{rated} [kW]	57	56
Q_{HE} [kWh/y]	28448	21909
SCOP [-]	4.08	5.22
$T_{bivalent}$ [°C]	-10	-10

CONTROLLER



+ QAA55/75 class VII 3.5% ↓
 - QAA55/75 class III 1.5% ↓

Heating performance data

Version: v2024.010-BW-WW

Source - Brine [0°C] / Low Temperature [35°C]

ZHI27K1P-TFD_R410A_2_BWW

Operating conditions	Qh	P	COP
1 B0 / W30-35	55.5	12.2	4.56
2 B0 / W30-35 (MIN)	27.8	6.0	4.62
A B0 / Wxx-34	55.5	11.9	4.67
B B0 / Wxx-30	55.4	10.8	5.13
C B0 / Wxx-27	27.7	5.0	5.58
D B0 / Wxx-24	27.6	4.6	6.00
E B0 / Wxx-35	55.5	12.2	4.56
F B0 / Wxx-35	55.5	12.2	4.56

SCOP DATA EN 14825:2018	
Source - Brine [0°C] / Low Temperature [35°C]	
SCOPon	5.23
SCOPnet	5.23
SCOP	5.22
η [%]	208.94
Label	A+++
Qh [kWh]	21909
Pdesignh [kW]	55.5
Tbivalent [°C]	-10

Source - Brine [0°C] / Medium Temperature [55°C]

Operating conditions	Qh	P	COP
1 B0 / W47-55	56.2	20.0	2.82
2 B0 / W47-55 (MIN)	28.1	9.7	2.86
A B0 / Wxx-52	56.6	18.0	3.26
B B0 / Wxx-42	57.0	13.7	4.21
C B0 / Wxx-36	28.1	5.9	4.74
D B0 / Wxx-30	28.1	5.3	5.27
E B0 / Wxx-55	56.2	20.0	2.82
F B0 / Wxx-54	56.7	18.5	3.07

SCOP DATA EN 14825:2018	
Source - Brine [0°C] / Medium Temperature [55°C]	
SCOPon	4.08
SCOPnet	4.08
SCOP	4.08
η [%]	163.01
Label	A+++
Qh [kWh]	28447
Pdesignh [kW]	56.2
Tbivalent [°C]	-10

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

Operating conditions	Qh	P	COP
1 W10 / W30-35	70.3	11.6	6.04
2 W10 / W30-35 (MIN)	35.2	5.7	6.12
A W10 / Wxx-34	70.3	11.3	6.21
B W10 / Wxx-30	70.3	10.1	6.95
C W10 / Wxx-27	70.2	9.3	7.69
D W10 / Wxx-24	70.0	8.4	8.44
E W10 / Wxx-35	70.3	11.6	6.04
F W10 / Wxx-35	70.3	11.6	6.04

SCOP DATA EN 14825:2018	
Source - Water [10°C] / Low Temperature [35°C]	
SCOPon	7.12
SCOPnet	7.12
SCOP	7.10
η [%]	284.18
Label	A+++
Qh [kWh]	20401
Pdesignh [kW]	70.3
Tbivalent [°C]	-10.00

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

	Operating conditions	Qh	P	COP
1	W10 / W47-55	70.1	19.8	3.55
2	W10 / W47-55 (MIN)	35.0	9.7	3.60
A	W10 / Wxx-52	70.8	17.8	3.99
B	W10 / Wxx-42	71.1	13.3	5.35
C	W10 / Wxx-36	71.1	11.4	6.30
D	W10 / Wxx-30	71.1	10.1	7.16
E	W10 / Wxx-55	70.1	19.8	3.55
F	W10 / Wxx-55	70.1	19.8	3.55

SCOP DATA EN 14825:2018	
Source - Water [10°C] / Medium Temperature [55°C]	
SCOPon	5.22
SCOPnet	5.22
SCOP	5.22
η [%]	208.65
Label	A+++
Qh [kWh]	27721
Pdesignh [kW]	70.1
Tbivalent [°C]	-10.00

Low temperature cooling W 12 / 7°C

	Operating conditions	Qc	P	EER
A	W30-35 / W12-7	43.4	13.1	3.31
B	W26-xx / W12-7	44.4	11.9	3.73
C	W22-xx / W12-7	45.3	10.8	4.19
D	W18-xx / W12-7	45.8	10.3	4.44

SEER DATA EN 14825:2018 [W 12 / 7°C]	
SEERon	4.05
SEER	4.05
Qc [kWh]	25140
η [%]	161.91

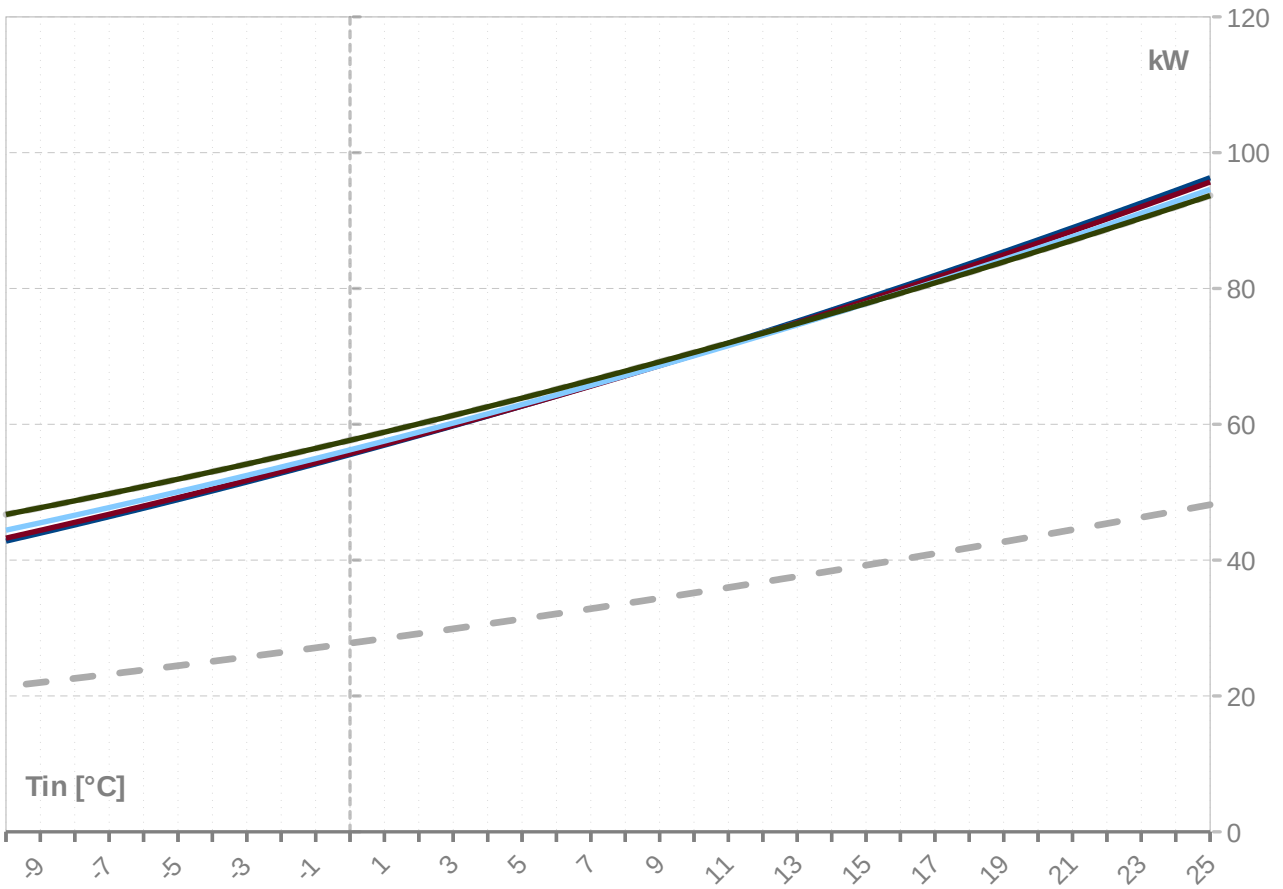
Radiant cooling W 23 / 18°C

	Operating conditions	Qc	P	EER
A	W50-xx / W23-18	50.2	21.6	2.33
B	W40-xx / W23-18	54.8	16.7	3.28
C	W30-35 / W23-18	58.5	13.1	4.47
D	W26-xx / W23-18	59.8	11.9	5.02

SEER DATA EN 14825:2018 [W 23 / 18°C]	
SEERon	5.44
SEER	5.44
Qc [kWh]	25140
η [%]	217.40

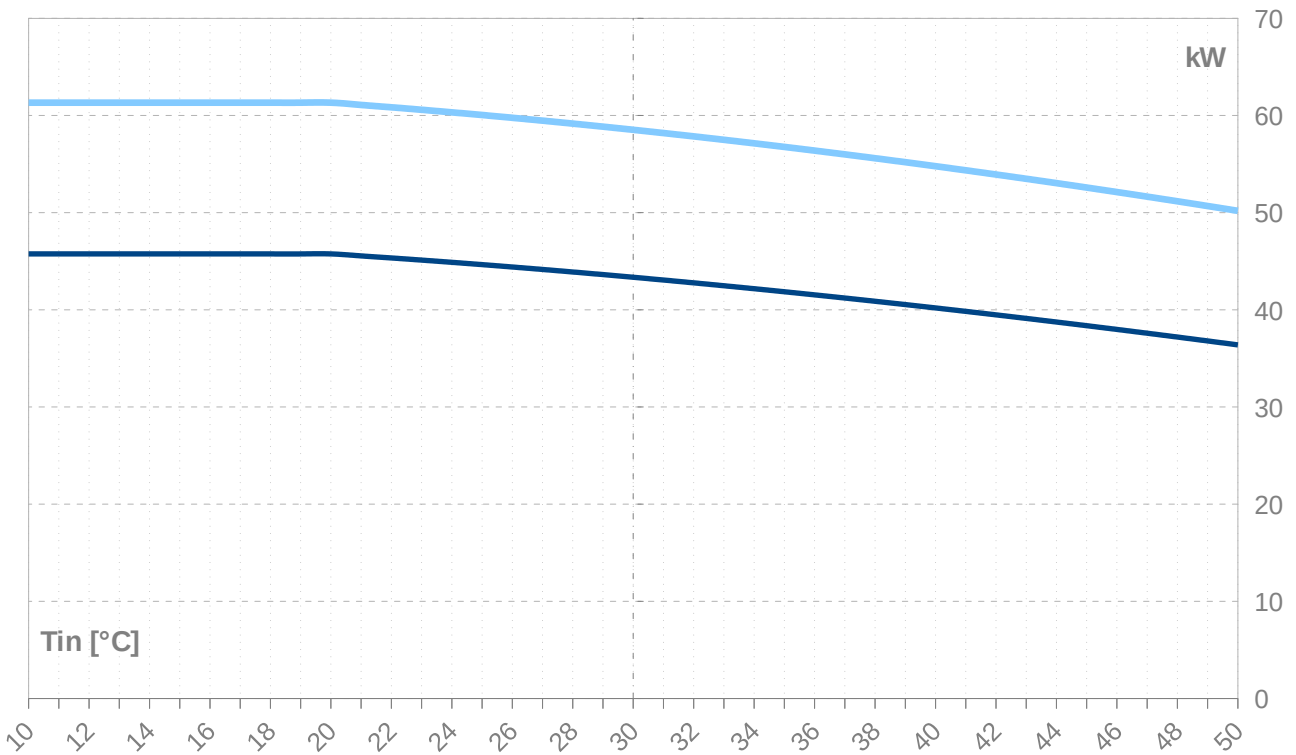
Performance lines - heating

— Qh-nom-35
 - - - Qh-min-35
 - - - Qh-max-65
 — Qh-nom-45
 — Qh-nom-55
— Qh-nom-65



Performance lines - cooling

— Qc-nom-12-7
 — Qc-nom-23-18



Th -OU	35										
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]	Qc max [kW]	I nom [A]
25	96.3	48.2	96.3	9.6	4.7	9.6	10.07	87.4	43.7	87.4	22.5
24	94.4	47.2	94.4	9.8	4.8	9.8	9.68	85.3	42.7	85.3	22.6
23	92.6	46.3	92.6	9.9	4.9	9.9	9.31	83.3	41.6	83.3	22.7
22	90.8	45.4	90.8	10.1	5.0	10.1	8.96	81.3	40.7	81.3	22.9
21	88.9	44.5	88.9	10.3	5.1	10.3	8.64	79.3	39.7	79.3	23.0
20	87.2	43.6	87.2	10.5	5.2	10.5	8.33	77.4	38.7	77.4	23.1
19	85.4	42.7	85.4	10.6	5.2	10.6	8.05	75.5	37.7	75.5	23.2
18	83.6	41.8	83.6	10.8	5.3	10.8	7.77	73.6	36.8	73.6	23.3
17	81.9	41.0	81.9	10.9	5.4	10.9	7.52	71.7	35.9	71.7	23.5
16	80.2	40.1	80.2	11.0	5.4	11.0	7.27	69.9	34.9	69.9	23.6
15	78.5	39.3	78.5	11.1	5.5	11.1	7.04	68.1	34.0	68.1	23.7
14	76.8	38.4	76.8	11.3	5.6	11.3	6.82	66.3	33.2	66.3	23.8
13	75.2	37.6	75.2	11.4	5.6	11.4	6.61	64.6	32.3	64.6	23.8
12	73.5	36.8	73.5	11.5	5.7	11.5	6.41	62.8	31.4	62.8	23.9
11	71.9	36.0	71.9	11.6	5.7	11.6	6.22	61.1	30.6	61.1	24.0
10	70.3	35.2	70.3	11.6	5.7	11.6	6.04	59.5	29.7	59.5	24.1
9	68.8	34.4	68.8	11.7	5.8	11.7	5.87	57.8	28.9	57.8	24.2
8	67.2	33.6	67.2	11.8	5.8	11.8	5.70	56.2	28.1	56.2	24.3
7	65.7	32.8	65.7	11.9	5.9	11.9	5.54	54.6	27.3	54.6	24.3
6	64.2	32.1	64.2	11.9	5.9	11.9	5.38	53.0	26.5	53.0	24.4
5	62.7	31.3	62.7	12.0	5.9	12.0	5.23	51.5	25.7	51.5	24.5
4	61.2	30.6	61.2	12.0	5.9	12.0	5.09	50.0	25.0	50.0	24.5
3	59.8	29.9	59.8	12.1	6.0	12.1	4.95	48.5	24.2	48.5	24.6
2	58.3	29.2	58.3	12.1	6.0	12.1	4.81	47.0	23.5	47.0	24.6
1	56.9	28.5	56.9	12.2	6.0	12.2	4.68	45.6	22.8	45.6	24.7
0	55.5	27.8	55.5	12.2	6.0	12.2	4.56	44.2	22.1	44.2	24.7
-1	54.2	27.1	54.2	12.2	6.0	12.2	4.44	42.8	21.4	42.8	24.7
-2	52.8	26.4	52.8	12.2	6.0	12.2	4.32	41.4	20.7	41.4	24.8
-3	51.5	25.7	51.5	12.3	6.0	12.3	4.20	40.1	20.0	40.1	24.8
-4	50.2	25.1	50.2	12.3	6.1	12.3	4.09	38.7	19.4	38.7	24.8
-5	48.9	24.5	48.9	12.3	6.1	12.3	3.98	37.4	18.7	37.4	24.9
-6	47.6	23.8	47.6	12.3	6.1	12.3	3.88	36.2	18.1	36.2	24.9
-7	46.4	23.2	46.4	12.3	6.1	12.3	3.77	34.9	17.5	34.9	24.9
-8	45.2	22.6	45.2	12.3	6.1	12.3	3.67	33.7	16.8	33.7	24.9
-9	44.0	22.0	44.0	12.3	6.1	12.3	3.58	32.5	16.2	32.5	24.9
-10	42.8	21.4	42.8	12.3	6.1	12.3	3.48	31.3	15.7	31.3	24.9
-11	41.6	20.8	41.6	12.3	6.1	12.3	3.39	30.2	15.1	30.2	24.9
-12	40.5	20.2	40.5	12.3	6.1	12.3	3.30	29.0	14.5	29.0	24.9
-13	39.4	19.7	39.4	12.3	6.1	12.3	3.21	27.9	14.0	27.9	24.9
-14	38.3	19.1	38.3	12.3	6.1	12.3	3.12	26.8	13.4	26.8	24.9
-15	37.2	18.6	37.2	12.3	6.0	12.3	3.04	25.8	12.9	25.8	24.9

-- attention: operating limits not reflected in performance table

ZHI27K1P-TFD_R410A_2_BWW

Th -OU	45										
[°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]	Qc max [kW]	I nom [A]
25	95.7	47.8	95.7	13.4	6.6	13.4	7.12	83.1	41.6	83.1	26.1
24	93.8	46.9	93.8	13.6	6.7	13.6	6.90	81.1	40.6	81.1	26.3
23	92.0	46.0	92.0	13.7	6.8	13.7	6.70	79.2	39.6	79.2	26.4
22	90.2	45.1	90.2	13.9	6.8	13.9	6.50	77.3	38.6	77.3	26.6
21	88.5	44.2	88.5	14.0	6.9	14.0	6.31	75.4	37.7	75.4	26.7
20	86.7	43.3	86.7	14.1	7.0	14.1	6.13	73.5	36.7	73.5	26.8
19	85.0	42.5	85.0	14.3	7.0	14.3	5.96	71.6	35.8	71.6	26.9
18	83.2	41.6	83.2	14.4	7.1	14.4	5.80	69.8	34.9	69.8	27.0
17	81.5	40.8	81.5	14.5	7.1	14.5	5.64	68.0	34.0	68.0	27.1
16	79.9	39.9	79.9	14.6	7.2	14.6	5.49	66.3	33.1	66.3	27.3
15	78.2	39.1	78.2	14.6	7.2	14.6	5.34	64.5	32.3	64.5	27.4
14	76.6	38.3	76.6	14.7	7.3	14.7	5.20	62.8	31.4	62.8	27.4
13	74.9	37.5	74.9	14.8	7.3	14.8	5.06	61.1	30.6	61.1	27.5
12	73.3	36.7	73.3	14.9	7.3	14.9	4.93	59.4	29.7	59.4	27.6
11	71.8	35.9	71.8	14.9	7.4	14.9	4.81	57.8	28.9	57.8	27.7
10	70.2	35.1	70.2	15.0	7.4	15.0	4.68	56.2	28.1	56.2	27.8
9	68.7	34.3	68.7	15.0	7.4	15.0	4.56	54.6	27.3	54.6	27.9
8	67.1	33.6	67.1	15.1	7.4	15.1	4.45	53.0	26.5	53.0	27.9
7	65.6	32.8	65.6	15.1	7.5	15.1	4.34	51.5	25.7	51.5	28.0
6	64.1	32.1	64.1	15.2	7.5	15.2	4.23	50.0	25.0	50.0	28.0
5	62.7	31.3	62.7	15.2	7.5	15.2	4.12	48.5	24.2	48.5	28.1
4	61.2	30.6	61.2	15.2	7.5	15.2	4.02	47.0	23.5	47.0	28.2
3	59.8	29.9	59.8	15.3	7.5	15.3	3.92	45.6	22.8	45.6	28.2
2	58.4	29.2	58.4	15.3	7.5	15.3	3.82	44.1	22.1	44.1	28.2
1	57.0	28.5	57.0	15.3	7.5	15.3	3.73	42.8	21.4	42.8	28.3
0	55.7	27.8	55.7	15.3	7.6	15.3	3.63	41.4	20.7	41.4	28.3
-1	54.3	27.2	54.3	15.3	7.6	15.3	3.54	40.0	20.0	40.0	28.3
-2	53.0	26.5	53.0	15.3	7.6	15.3	3.46	38.7	19.4	38.7	28.4
-3	51.7	25.9	51.7	15.3	7.6	15.3	3.37	37.4	18.7	37.4	28.4
-4	50.5	25.2	50.5	15.4	7.6	15.4	3.29	36.1	18.1	36.1	28.4
-5	49.2	24.6	49.2	15.4	7.6	15.4	3.20	34.9	17.4	34.9	28.4
-6	48.0	24.0	48.0	15.4	7.6	15.4	3.12	33.6	16.8	33.6	28.4
-7	46.7	23.4	46.7	15.4	7.6	15.4	3.05	32.4	16.2	32.4	28.4
-8	45.6	22.8	45.6	15.3	7.6	15.3	2.97	31.2	15.6	31.2	28.4
-9	44.4	22.2	44.4	15.3	7.6	15.3	2.89	30.1	15.0	30.1	28.4
-10	43.2	21.6	43.2	15.3	7.6	15.3	2.82	28.9	14.5	28.9	28.4
-11	42.1	21.1	42.1	15.3	7.6	15.3	2.75	27.8	13.9	27.8	28.4
-12	41.0	20.5	41.0	15.3	7.6	15.3	2.68	26.7	13.3	26.7	28.4
-13	39.9	20.0	39.9	15.3	7.6	15.3	2.61	25.6	12.8	25.6	28.4
-14	38.8	19.4	38.8	15.3	7.5	15.3	2.54	24.6	12.3	24.6	28.3
-15	37.8	18.9	37.8	15.3	7.5	15.3	2.47	23.5	11.8	23.5	28.3

-- attention: operating limits not reflected in performance table

Th -OU		55										
Ts -IN	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]	
25	94.6	47.3	94.6	18.6	9.2	18.6	5.08	77.2	38.6	77.2	32.1	
24	92.8	46.4	92.8	18.7	9.2	18.7	4.95	75.3	37.7	75.3	32.2	
23	91.1	45.5	91.1	18.9	9.3	18.9	4.83	73.5	36.7	73.5	32.4	
22	89.3	44.7	89.3	19.0	9.4	19.0	4.71	71.6	35.8	71.6	32.5	
21	87.6	43.8	87.6	19.1	9.4	19.1	4.60	69.8	34.9	69.8	32.6	
20	85.9	43.0	85.9	19.1	9.4	19.1	4.49	68.1	34.0	68.1	32.7	
19	84.3	42.1	84.3	19.2	9.5	19.2	4.38	66.3	33.2	66.3	32.9	
18	82.6	41.3	82.6	19.3	9.5	19.3	4.28	64.6	32.3	64.6	33.0	
17	81.0	40.5	81.0	19.4	9.6	19.4	4.18	62.9	31.4	62.9	33.1	
16	79.4	39.7	79.4	19.5	9.6	19.5	4.08	61.2	30.6	61.2	33.2	
15	77.8	38.9	77.8	19.5	9.6	19.5	3.99	59.5	29.8	59.5	33.3	
14	76.2	38.1	76.2	19.6	9.7	19.6	3.89	57.9	29.0	57.9	33.4	
13	74.6	37.3	74.6	19.6	9.7	19.6	3.80	56.3	28.2	56.3	33.4	
12	73.1	36.6	73.1	19.7	9.7	19.7	3.72	54.7	27.4	54.7	33.5	
11	71.6	35.8	71.6	19.7	9.7	19.7	3.63	53.2	26.6	53.2	33.6	
10	70.1	35.0	70.1	19.8	9.7	19.8	3.55	51.6	25.8	51.6	33.7	
9	68.6	34.3	68.6	19.8	9.8	19.8	3.47	50.1	25.1	50.1	33.7	
8	67.2	33.6	67.2	19.8	9.8	19.8	3.39	48.7	24.3	48.7	33.8	
7	65.7	32.9	65.7	19.8	9.8	19.8	3.31	47.2	23.6	47.2	33.8	
6	64.3	32.2	64.3	19.9	9.8	19.9	3.24	45.8	22.9	45.8	33.9	
5	62.9	31.5	62.9	19.9	9.8	19.9	3.16	44.3	22.2	44.3	33.9	
4	61.5	30.8	61.5	19.9	9.8	19.9	3.09	42.9	21.5	42.9	34.0	
3	60.2	30.1	60.2	19.9	9.8	19.9	3.02	41.6	20.8	41.6	34.0	
2	58.8	29.4	58.8	19.9	9.8	19.9	2.95	40.2	20.1	40.2	34.0	
1	57.5	28.8	57.5	19.9	9.8	19.9	2.88	38.9	19.4	38.9	34.0	
0	56.2	28.1	56.2	20.0	9.8	20.0	2.82	37.6	18.8	37.6	34.1	
-1	55.0	27.5	55.0	20.0	9.8	20.0	2.75	36.3	18.2	36.3	34.1	
-2	53.7	26.9	53.7	20.0	9.8	20.0	2.69	35.1	17.5	35.1	34.1	
-3	52.5	26.2	52.5	20.0	9.8	20.0	2.63	33.8	16.9	33.8	34.1	
-4	51.3	25.6	51.3	20.0	9.9	20.0	2.57	32.6	16.3	32.6	34.1	
-5	50.1	25.0	50.1	20.0	9.9	20.0	2.51	31.4	15.7	31.4	34.1	
-6	48.9	24.4	48.9	20.0	9.9	20.0	2.45	30.2	15.1	30.2	34.1	
-7	47.7	23.9	47.7	20.0	9.9	20.0	2.39	29.1	14.5	29.1	34.1	
-8	46.6	23.3	46.6	20.0	9.9	20.0	2.33	28.0	14.0	28.0	34.0	
-9	45.5	22.7	45.5	20.0	9.9	20.0	2.28	26.8	13.4	26.8	34.0	
-10	44.4	22.2	44.4	20.0	9.9	20.0	2.22	25.8	12.9	25.8	34.0	
-11	43.3	21.7	43.3	20.0	9.9	20.0	2.17	24.7	12.3	24.7	33.9	
-12	42.3	21.1	42.3	20.0	9.9	20.0	2.12	23.6	11.8	23.6	33.9	
-13	41.3	20.6	41.3	20.0	9.9	20.0	2.07	22.6	11.3	22.6	33.9	
-14	40.3	20.1	40.3	20.0	9.9	20.0	2.02	21.6	10.8	21.6	33.8	
-15	39.3	19.6	39.3	20.0	9.9	20.0	1.97	20.6	10.3	20.6	33.8	

-- attention: operating limits not reflected in performance table

Th -OU	[°C]	65 (T-max)									
		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]
25	93.7	46.8	93.7	24.9	12.3	24.9	3.77	70.4	35.2	70.4	39.9
24	92.0	46.0	92.0	25.0	12.3	25.0	3.68	68.7	34.3	68.7	40.1
23	90.3	45.2	90.3	25.1	12.4	25.1	3.61	66.9	33.5	66.9	40.2
22	88.7	44.4	88.7	25.1	12.4	25.1	3.53	65.2	32.6	65.2	40.3
21	87.1	43.5	87.1	25.2	12.4	25.2	3.45	63.5	31.8	63.5	40.5
20	85.5	42.7	85.5	25.3	12.5	25.3	3.38	61.9	30.9	61.9	40.6
19	83.9	42.0	83.9	25.3	12.5	25.3	3.31	60.2	30.1	60.2	40.7
18	82.4	41.2	82.4	25.4	12.5	25.4	3.24	58.6	29.3	58.6	40.8
17	80.8	40.4	80.8	25.5	12.6	25.5	3.17	57.0	28.5	57.0	40.9
16	79.3	39.6	79.3	25.5	12.6	25.5	3.11	55.5	27.7	55.5	41.0
15	77.8	38.9	77.8	25.6	12.6	25.6	3.04	53.9	27.0	53.9	41.1
14	76.3	38.2	76.3	25.6	12.6	25.6	2.98	52.4	26.2	52.4	41.1
13	74.8	37.4	74.8	25.6	12.7	25.6	2.92	50.9	25.4	50.9	41.2
12	73.4	36.7	73.4	25.7	12.7	25.7	2.86	49.4	24.7	49.4	41.3
11	72.0	36.0	72.0	25.7	12.7	25.7	2.80	48.0	24.0	48.0	41.3
10	70.6	35.3	70.6	25.8	12.7	25.8	2.74	46.5	23.3	46.5	41.4
9	69.2	34.6	69.2	25.8	12.7	25.8	2.68	45.1	22.6	45.1	41.4
8	67.8	33.9	67.8	25.8	12.7	25.8	2.63	43.7	21.9	43.7	41.5
7	66.5	33.2	66.5	25.8	12.7	25.8	2.57	42.4	21.2	42.4	41.5
6	65.2	32.6	65.2	25.9	12.7	25.9	2.52	41.0	20.5	41.0	41.6
5	63.9	31.9	63.9	25.9	12.8	25.9	2.47	39.7	19.8	39.7	41.6
4	62.6	31.3	62.6	25.9	12.8	25.9	2.42	38.4	19.2	38.4	41.6
3	61.3	30.7	61.3	25.9	12.8	25.9	2.37	37.1	18.6	37.1	41.6
2	60.1	30.0	60.1	25.9	12.8	25.9	2.32	35.9	17.9	35.9	41.6
1	58.8	29.4	58.8	25.9	12.8	25.9	2.27	34.6	17.3	34.6	41.6
0	57.6	28.8	57.6	25.9	12.8	25.9	2.22	33.4	16.7	33.4	41.6
-1	56.4	28.2	56.4	26.0	12.8	26.0	2.17	32.2	16.1	32.2	41.6
-2	55.3	27.6	55.3	26.0	12.8	26.0	2.13	31.0	15.5	31.0	41.6
-3	54.1	27.1	54.1	26.0	12.8	26.0	2.08	29.9	14.9	29.9	41.6
-4	53.0	26.5	53.0	26.0	12.8	26.0	2.04	28.7	14.4	28.7	41.6
-5	51.9	26.0	51.9	26.0	12.8	26.0	2.00	27.6	13.8	27.6	41.5
-6	50.8	25.4	50.8	26.0	12.8	26.0	1.95	26.5	13.3	26.5	41.5
-7	49.8	24.9	49.8	26.0	12.8	26.0	1.91	25.5	12.7	25.5	41.5
-8	48.7	24.4	48.7	26.0	12.8	26.0	1.87	24.4	12.2	24.4	41.4
-9	47.7	23.9	47.7	26.1	12.9	26.1	1.83	23.4	11.7	23.4	41.4
-10	46.7	23.4	46.7	26.1	12.9	26.1	1.79	22.4	11.2	22.4	41.3
-11	45.7	22.9	45.7	26.1	12.9	26.1	1.75	21.4	10.7	21.4	41.3
-12	44.8	22.4	44.8	26.1	12.9	26.1	1.71	20.4	10.2	20.4	41.2
-13	43.8	21.9	43.8	26.1	12.9	26.1	1.68	19.4	9.7	19.4	41.1
-14	42.9	21.5	42.9	26.2	12.9	26.2	1.64	18.5	9.2	18.5	41.1
-15	42.0	21.0	42.0	26.2	12.9	26.2	1.61	17.6	8.8	17.6	41.0

-- attention: operating limits not reflected in performance table

Tc -OU		W 12 / 7 °C										
Ts -IN	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	40.2	20.1	40.2	16.7	8.2	16.7	2.41	55.8	27.9	55.8	30.0	
39	40.5	20.3	40.5	16.3	8.0	16.3	2.49	55.8	27.9	55.8	29.5	
38	40.9	20.4	40.9	15.9	7.8	15.9	2.57	55.7	27.9	55.7	29.0	
37	41.2	20.6	41.2	15.5	7.6	15.5	2.66	55.7	27.8	55.7	28.5	
36	41.5	20.8	41.5	15.1	7.5	15.1	2.75	55.7	27.8	55.7	28.1	
35	41.9	20.9	41.9	14.8	7.3	14.8	2.83	55.7	27.8	55.7	27.6	
34	42.2	21.1	42.2	14.4	7.1	14.4	2.93	55.6	27.8	55.6	27.2	
33	42.5	21.2	42.5	14.1	6.9	14.1	3.02	55.6	27.8	55.6	26.8	
32	42.8	21.4	42.8	13.7	6.8	13.7	3.11	55.6	27.8	55.6	26.4	
31	43.1	21.5	43.1	13.4	6.6	13.4	3.21	55.6	27.8	55.6	26.1	
30	43.4	21.7	43.4	13.1	6.5	13.1	3.31	55.6	27.8	55.6	25.7	
29	43.6	21.8	43.6	12.8	6.3	12.8	3.41	55.6	27.8	55.6	25.4	
28	43.9	21.9	43.9	12.5	6.2	12.5	3.52	55.5	27.8	55.5	25.0	
27	44.2	22.1	44.2	12.2	6.0	12.2	3.62	55.5	27.8	55.5	24.7	
26	44.4	22.2	44.4	11.9	5.9	11.9	3.73	55.5	27.8	55.5	24.4	
25	44.7	22.3	44.7	11.6	5.7	11.6	3.84	55.5	27.8	55.5	24.1	
24	44.9	22.4	44.9	11.3	5.6	11.3	3.96	55.5	27.7	55.5	23.8	
23	45.1	22.6	45.1	11.1	5.5	11.1	4.07	55.5	27.7	55.5	23.6	
22	45.3	22.7	45.3	10.8	5.3	10.8	4.19	55.4	27.7	55.4	23.3	
21	45.6	22.8	45.6	10.6	5.2	10.6	4.32	55.4	27.7	55.4	23.1	
20	45.8	22.9	45.8	10.3	5.1	10.3	4.44	55.4	27.7	55.4	22.8	

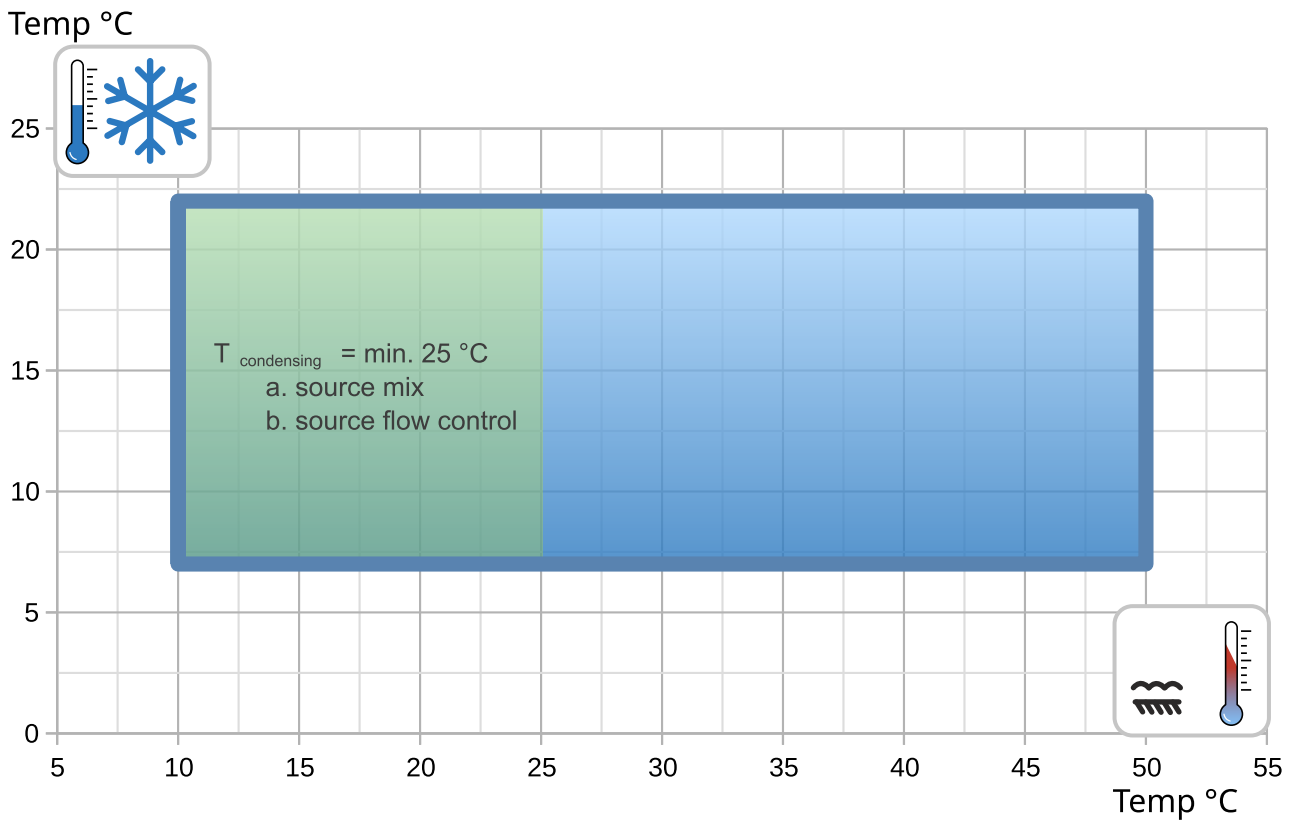
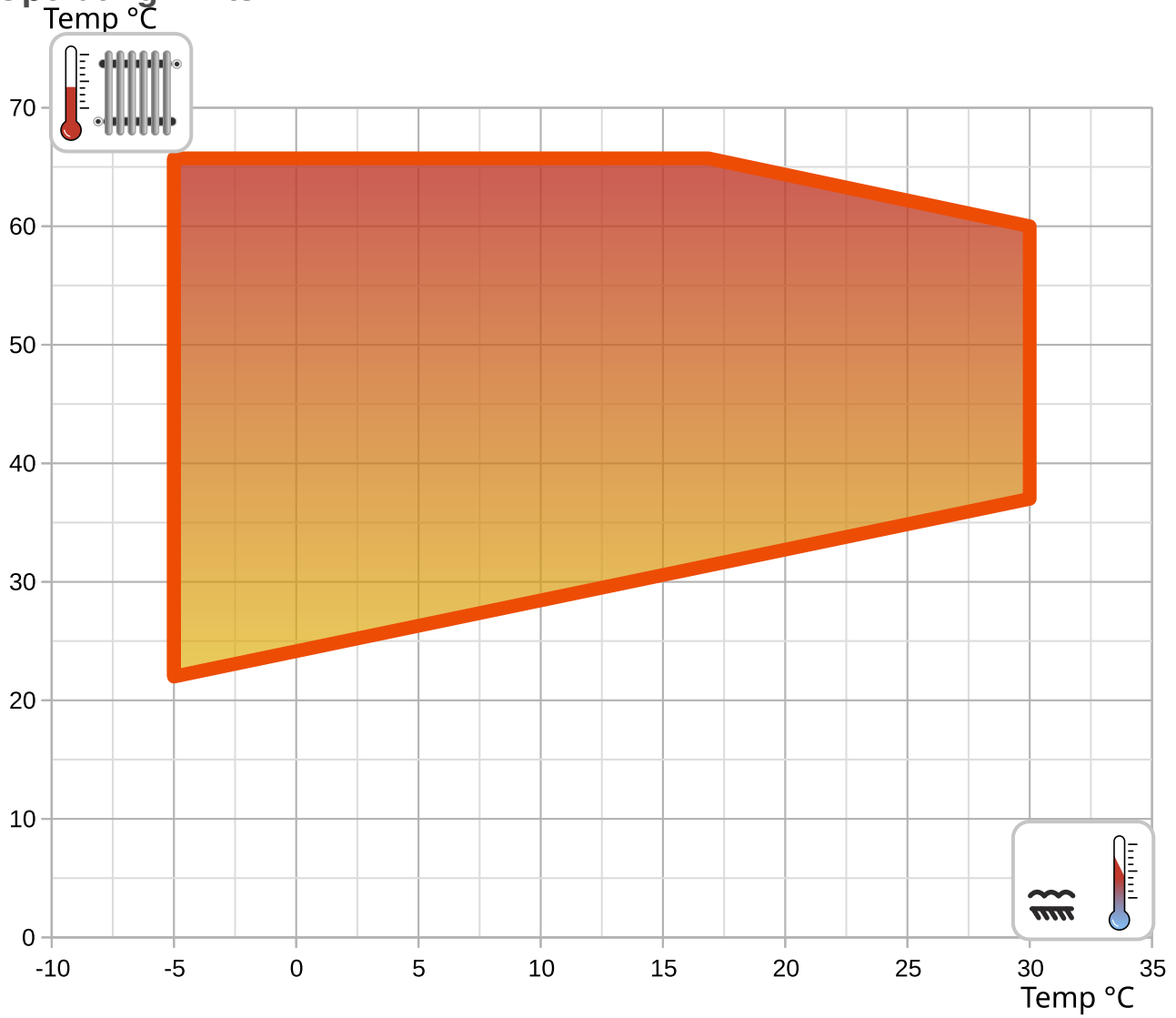
Tc [°C]		W 23 / 18 °C										
0	Qc nom	Qc min	Qc max	Pin nom	Pin min	Pin max	EER	Qh nom	Qh min	Qh max	I nom	
[°C]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	kW / kW	[kW]	[kW]	[kW]	[A]	
40	54.8	27.4	54.8	16.7	8.2	16.7	3.28	70.1	35.1	70.2	29.5	
39	55.2	27.6	55.2	16.3	8.0	16.3	3.39	70.1	35.1	70.1	29.0	
38	55.6	27.8	55.6	15.9	7.8	15.9	3.50	70.2	35.1	70.1	28.5	
37	56.0	28.0	56.0	15.5	7.6	15.5	3.61	70.2	35.1	70.1	28.0	
36	56.4	28.2	56.4	15.1	7.5	15.1	3.73	70.2	35.1	70.1	27.6	
35	56.8	28.4	56.8	14.8	7.3	14.8	3.84	70.2	35.1	70.1	27.1	
34	57.1	28.6	57.1	14.4	7.1	14.4	3.96	70.2	35.1	70.1	26.7	
33	57.5	28.7	57.5	14.1	6.9	14.1	4.09	70.3	35.1	70.1	26.3	
32	57.8	28.9	57.8	13.7	6.8	13.7	4.21	70.3	35.1	70.1	25.9	
31	58.2	29.1	58.2	13.4	6.6	13.4	4.34	70.3	35.2	70.1	25.5	
30	58.5	29.3	58.5	13.1	6.5	13.1	4.47	70.3	35.2	70.1	25.1	
29	58.8	29.4	58.8	12.8	6.3	12.8	4.60	70.3	35.2	70.1	24.8	
28	59.2	29.6	59.2	12.5	6.2	12.5	4.74	70.3	35.2	70.2	24.4	
27	59.5	29.7	59.5	12.2	6.0	12.2	4.88	70.3	35.2	70.2	24.1	
26	59.8	29.9	59.8	11.9	5.9	11.9	5.02	70.3	35.2	70.2	23.8	
25	60.0	30.0	60.0	11.6	5.7	11.6	5.17	70.3	35.2	70.2	23.5	
24	60.3	30.2	60.3	11.3	5.6	11.3	5.32	70.3	35.2	70.2	23.2	
23	60.6	30.3	60.6	11.1	5.5	11.1	5.47	70.3	35.2	70.3	22.9	
22	60.8	30.4	60.8	10.8	5.3	10.8	5.63	70.3	35.1	70.3	22.7	
21	61.1	30.5	61.1	10.6	5.2	10.6	5.79	70.3	35.1	70.3	22.4	
20	61.3	30.7	61.3	10.3	5.1	10.3	5.95	70.2	35.1	70.3	22.2	

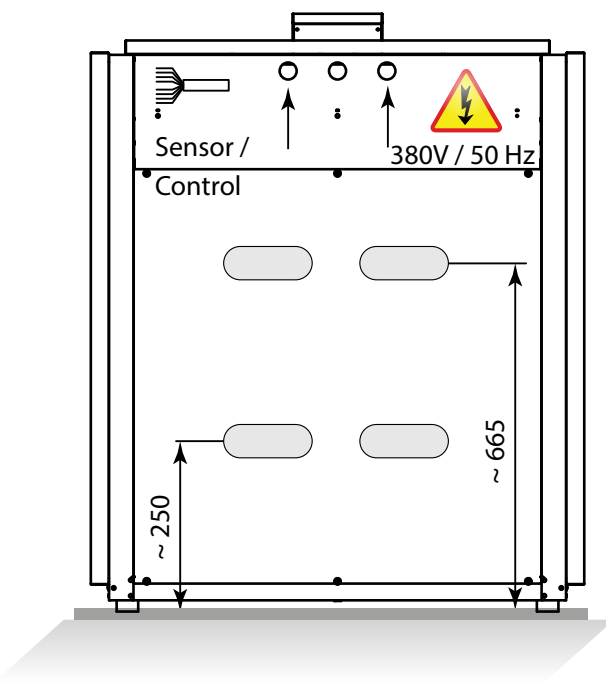
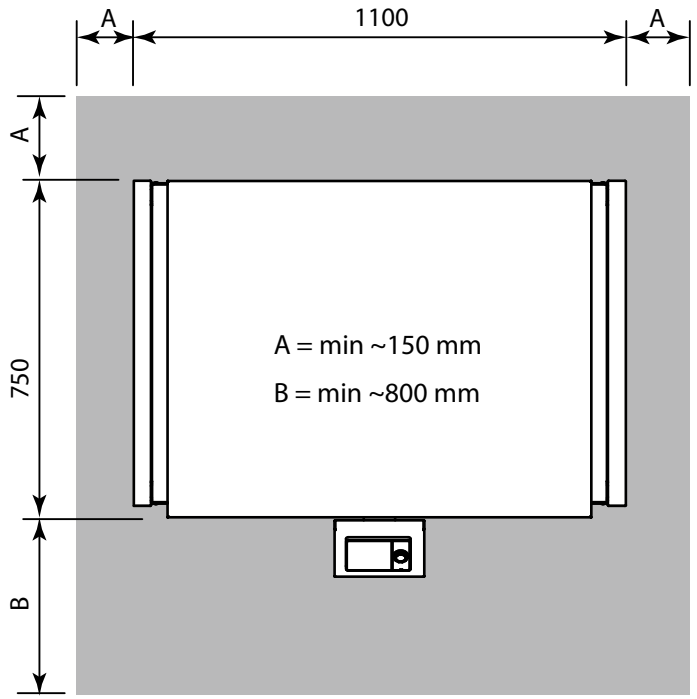
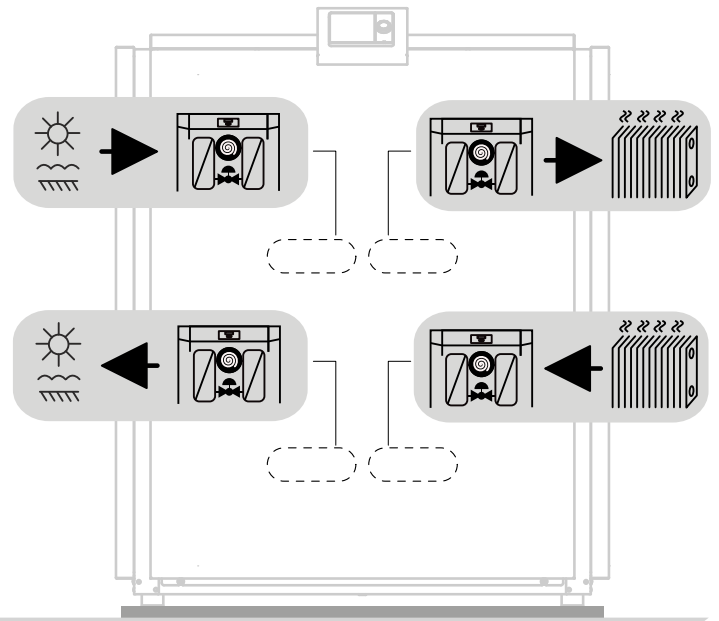
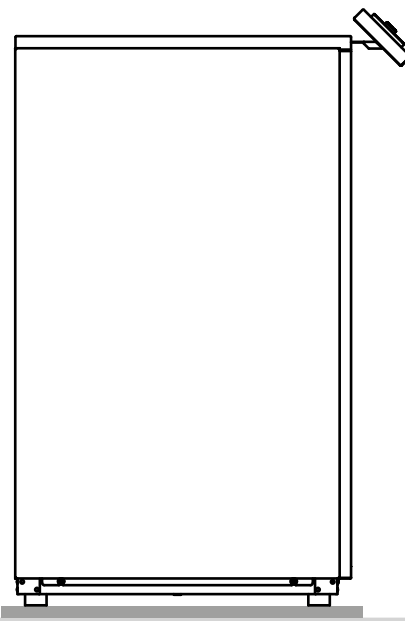
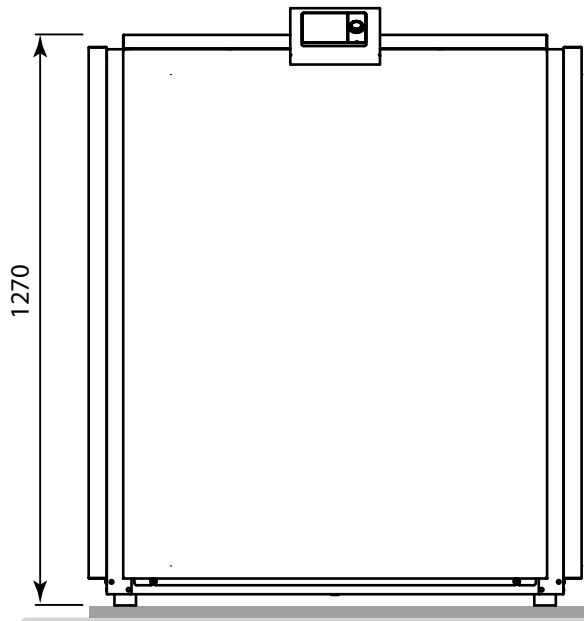
-- attention: operating limits not reflected in performance table

LEGEND:

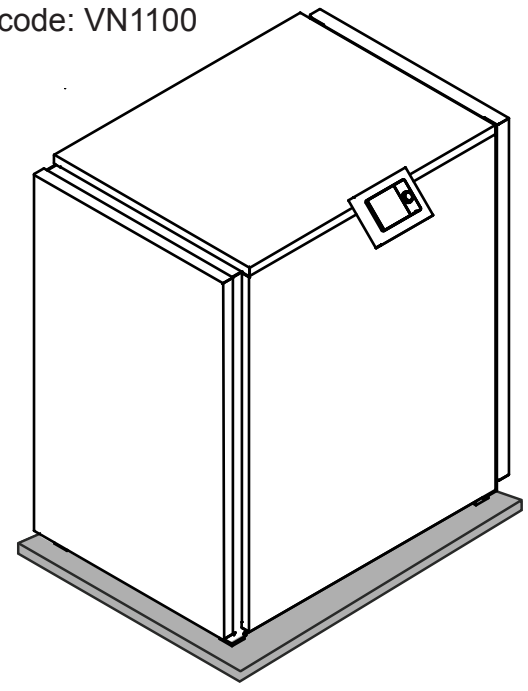
Ts-IN: Temperature renewable source - inlet [°C]
Th-OU: Temperature heating - outlet (flow) [°C]
Tc-OU: Temperature cooling - outlet (flow) [°C]
Qh nom: Heating capacity nominal
Qh min: Heating capacity minimal
Qh max: Heating capacity maximal
Pin nom: Power input at nominal heating capacity
Pin min: 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

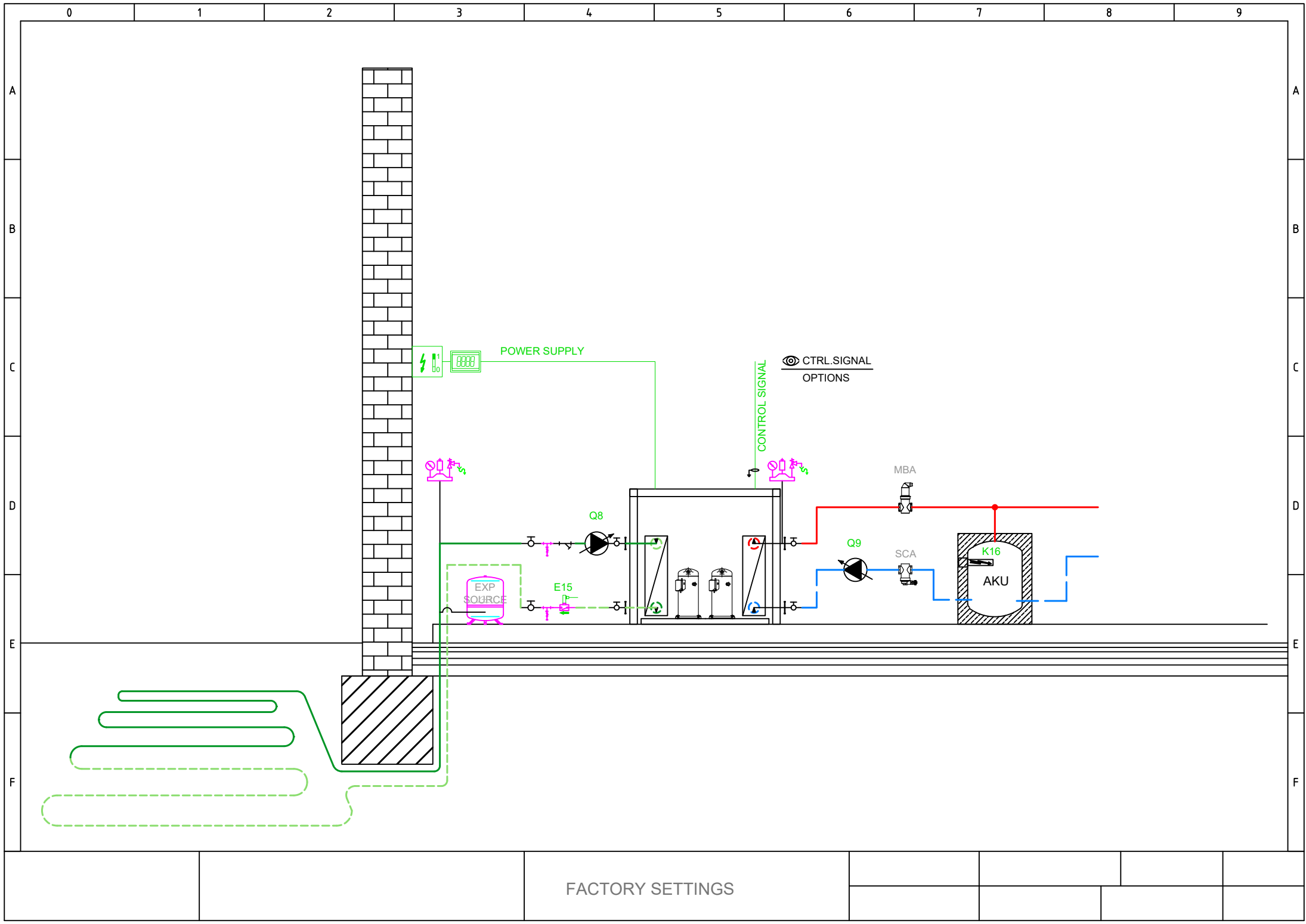
Operating limits

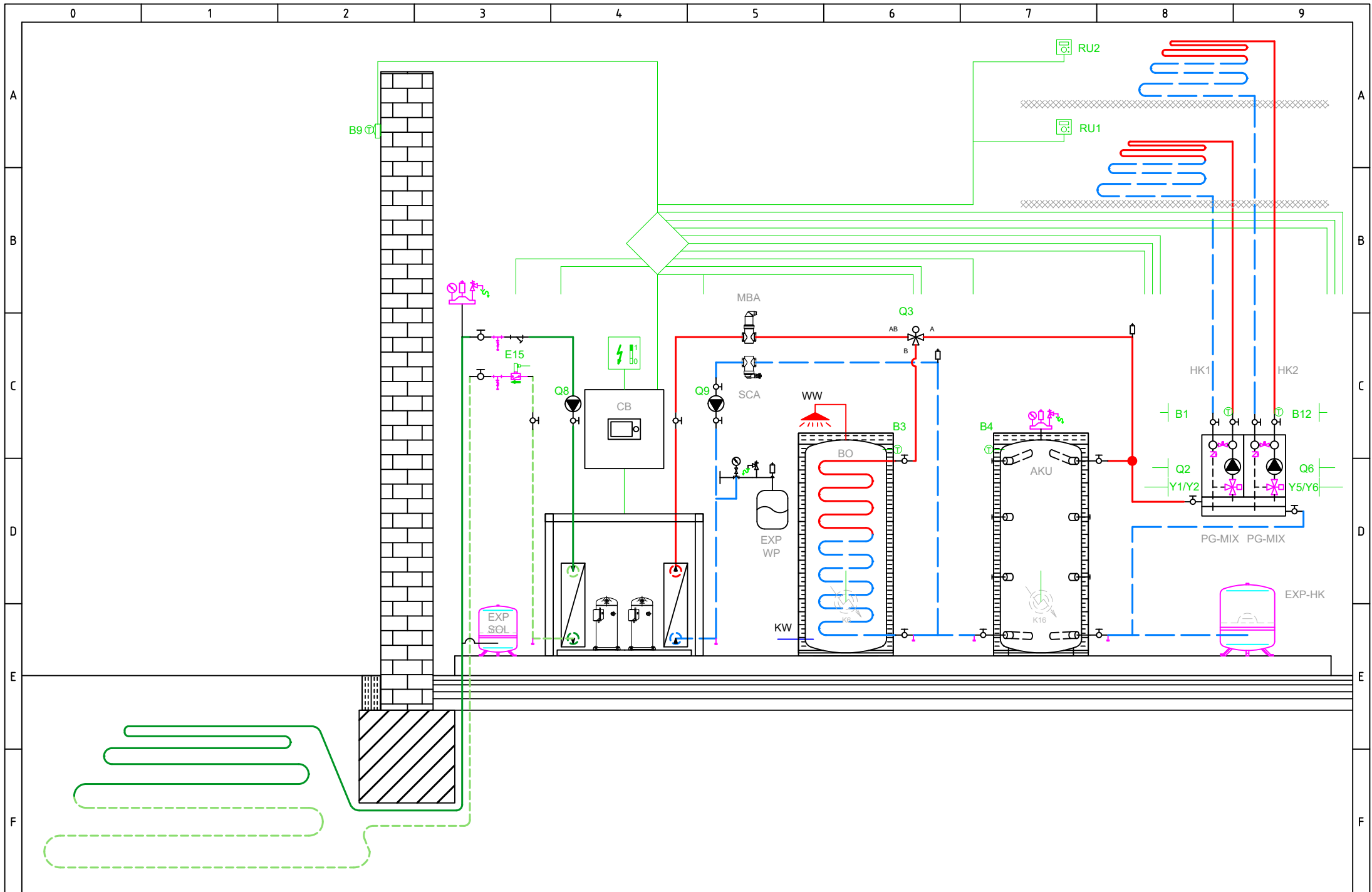




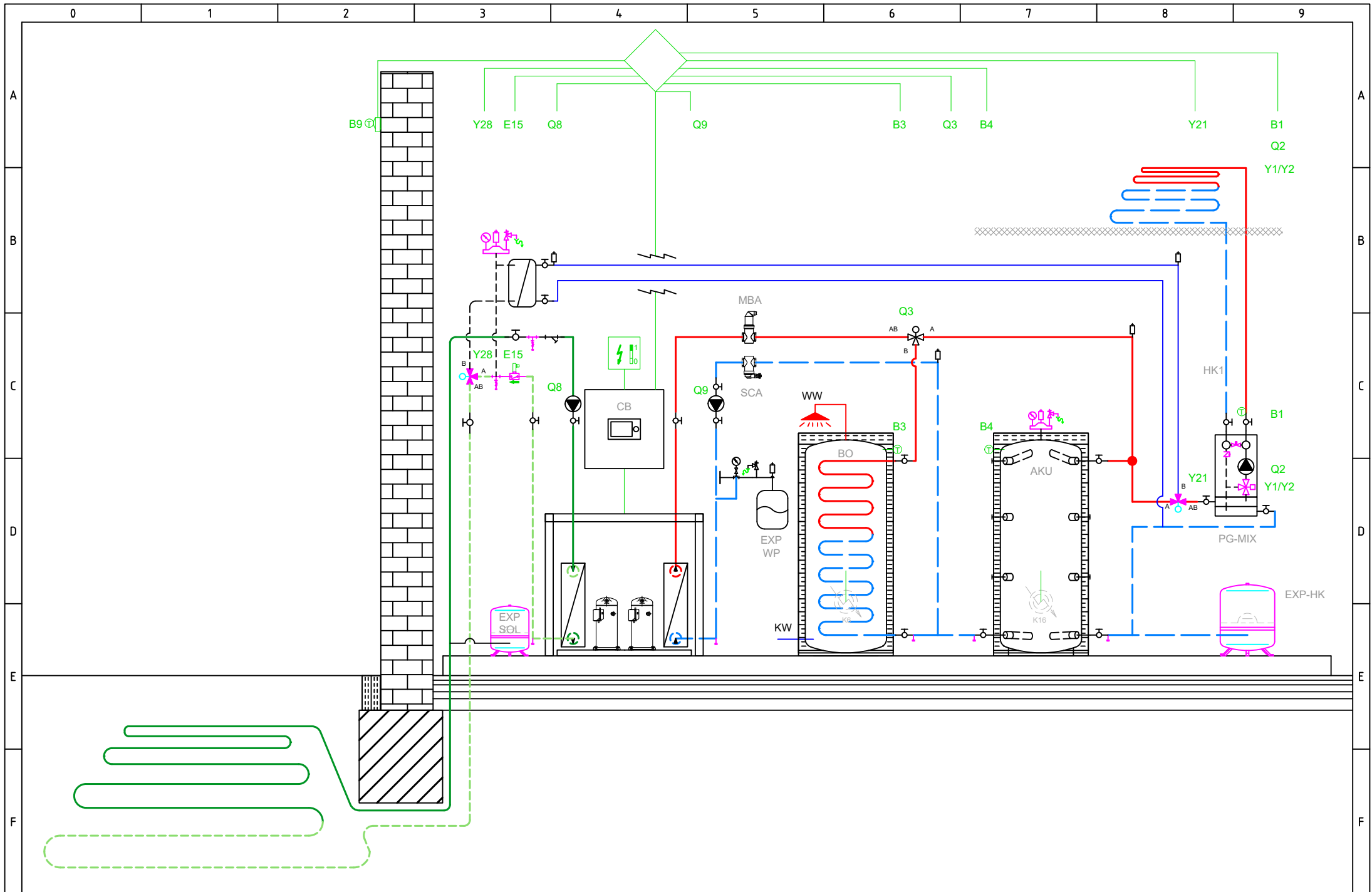
int. code: VN1100







BASIC APPLICATION



OPTIONAL APPLICATION

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

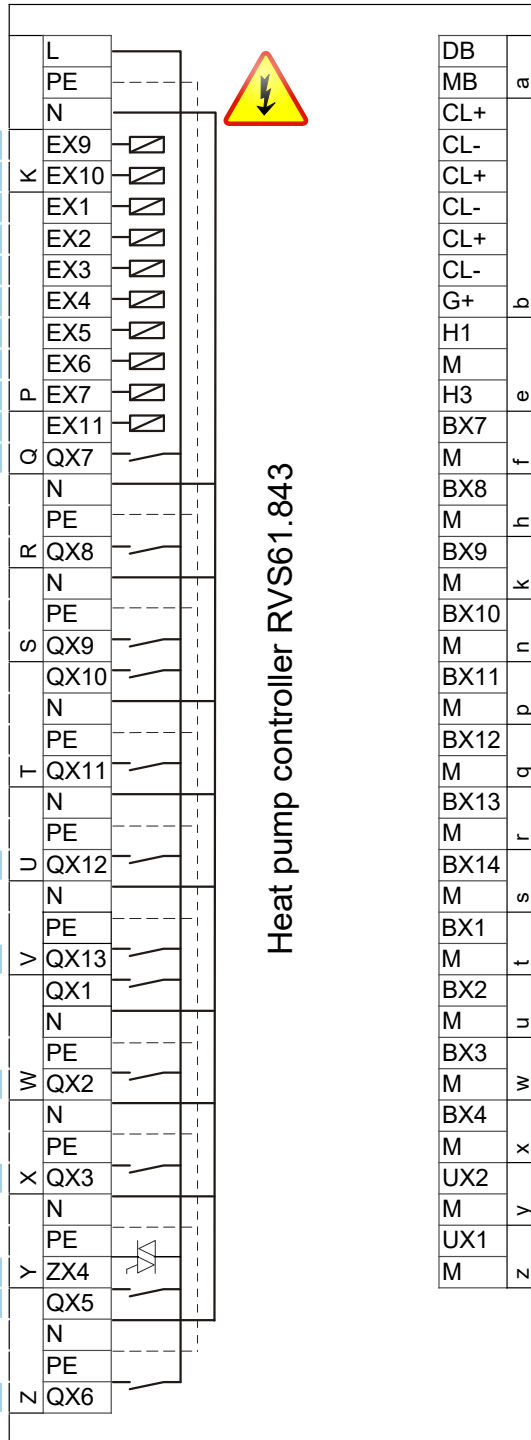
K10 Alarm output K10

K40 Crankcase heater K40

K81 Valve evaporator K81

K82 Valve EVI K82

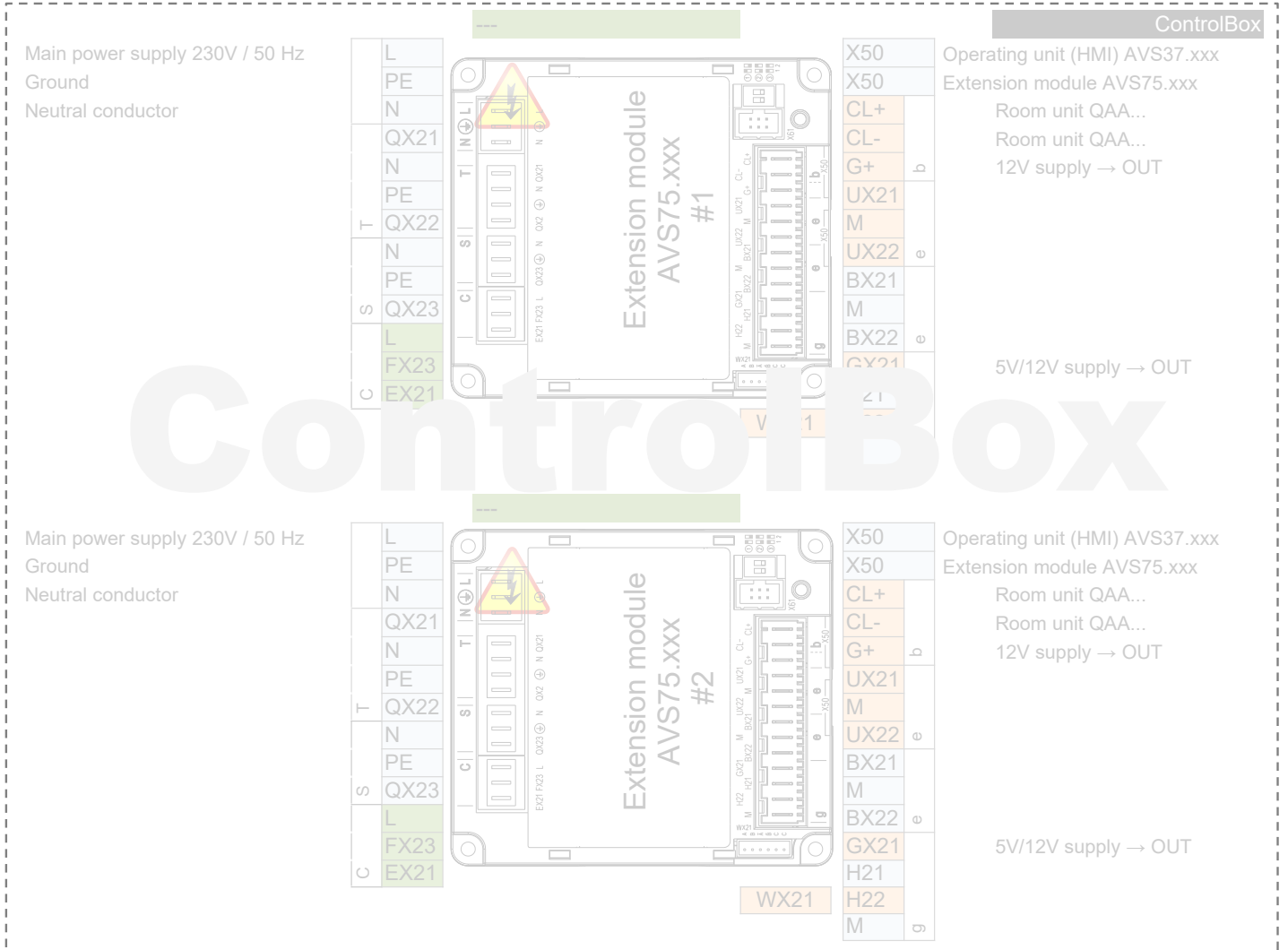
K2 Compressor stage 2 K2



- 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

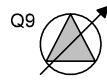
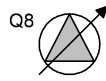


- AVS75.390
- AVS75.391
- AVS75.370



HEAT PUMP

EXTERNAL
INTERNAL



K1

K2

K82

K81

K40

K10

Q8 UX1

Q9 UX2

E11
KRW1
F1K
E11

E12
KRW2
F2K
E12

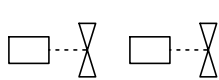
E6

E24
Q9.ERR
F1S
E24

E15
Q8.ERR
F1Z
E15

E10

E9



230V,50Hz
max 6A

0...10V



DO



0...10V



DO



0...10V



DO



0...10V



DO



0...10V



DO



0...10V



DO



0...10V



DO



0...10V



DO



0...10V



DO



0...10V



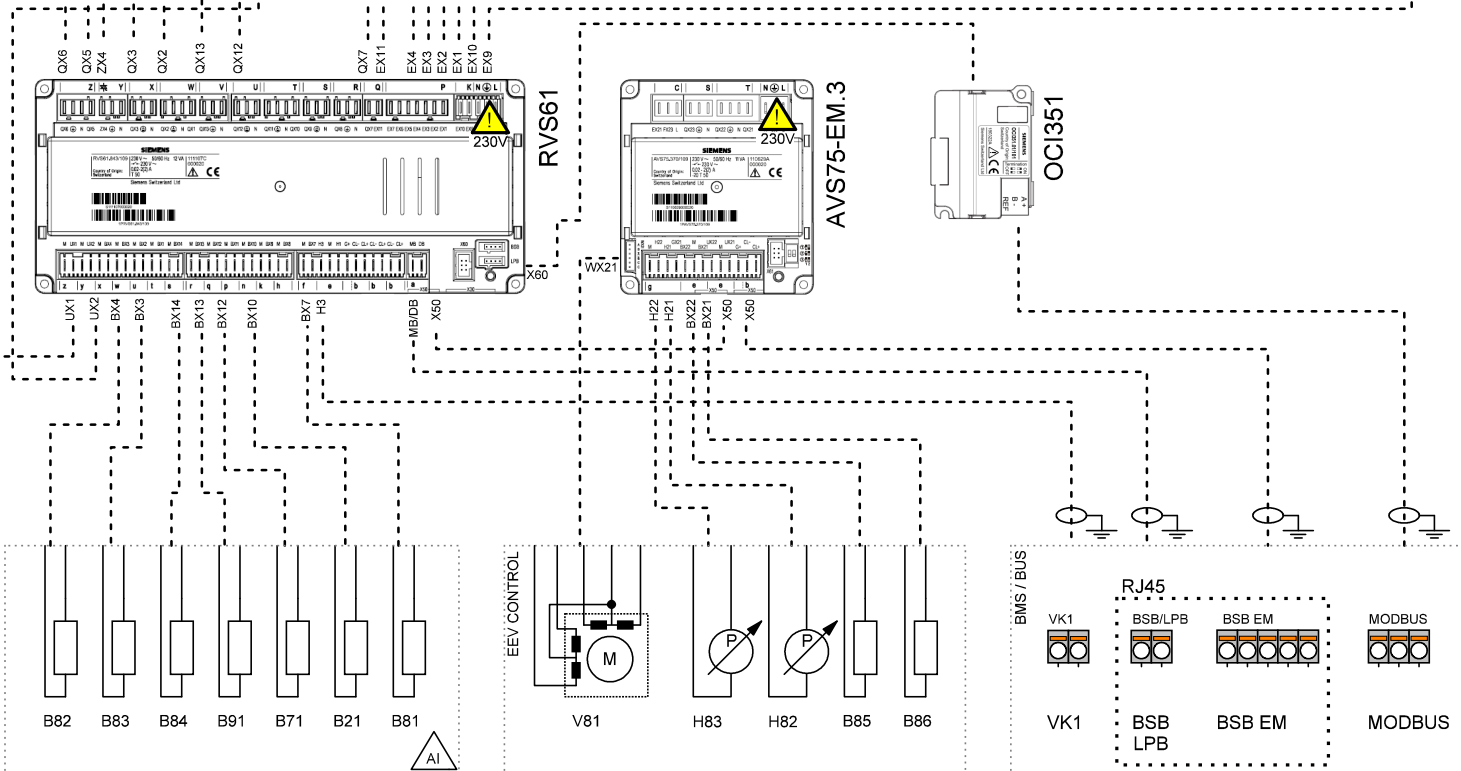
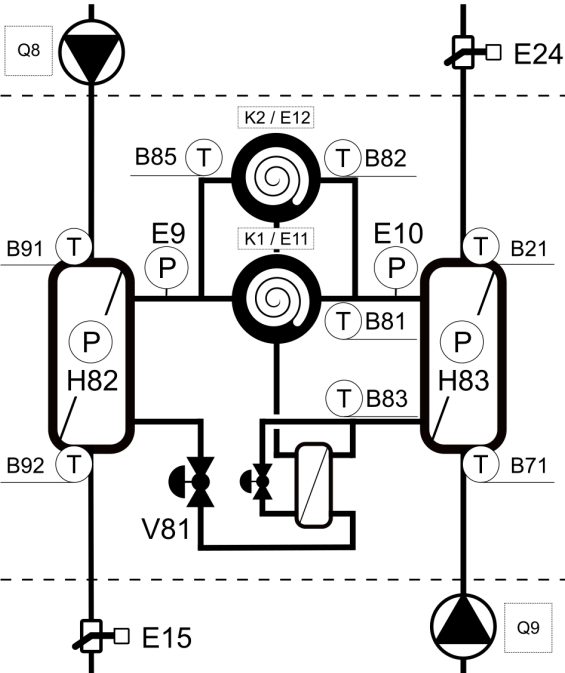
DO



0...10V

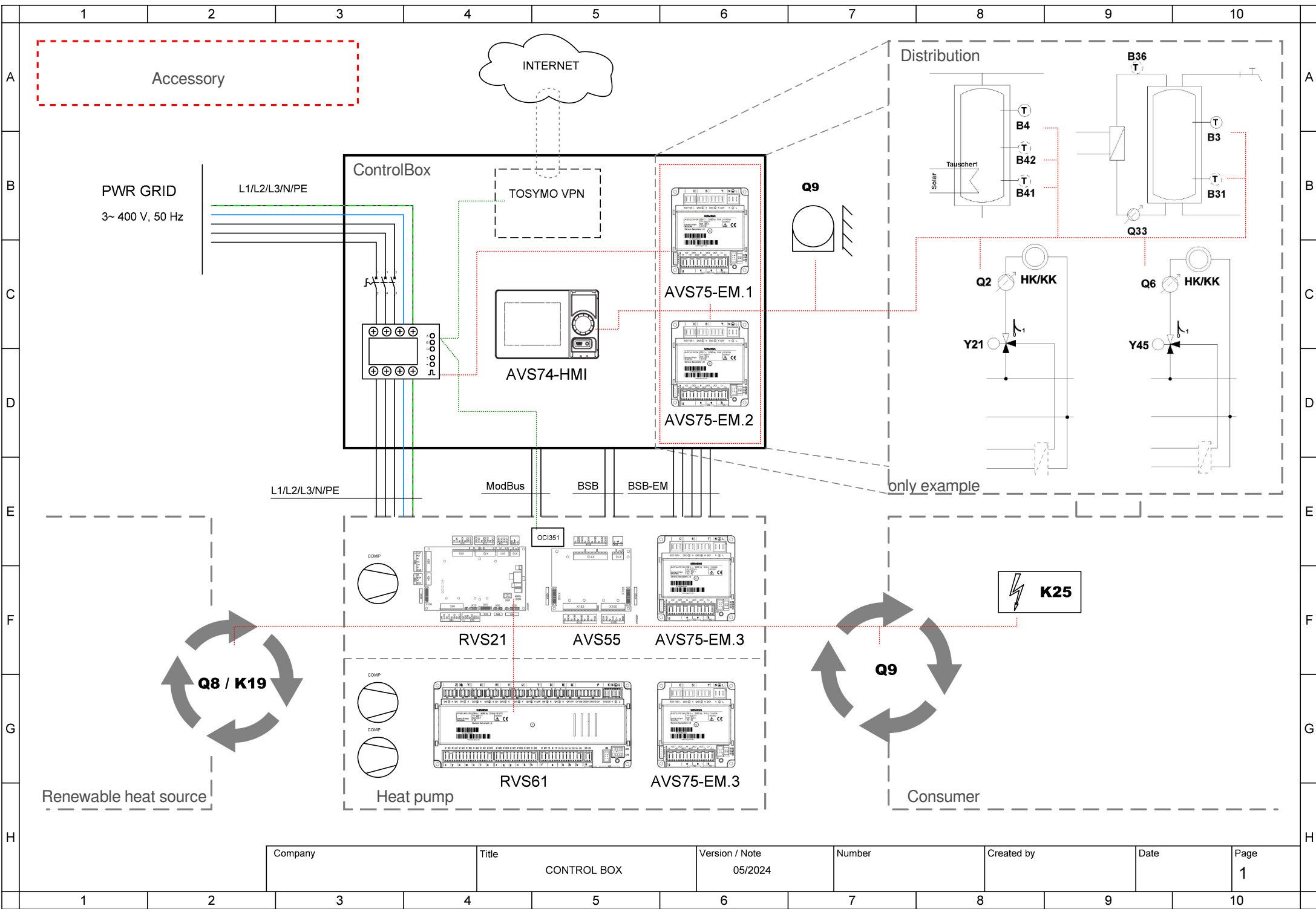


DO

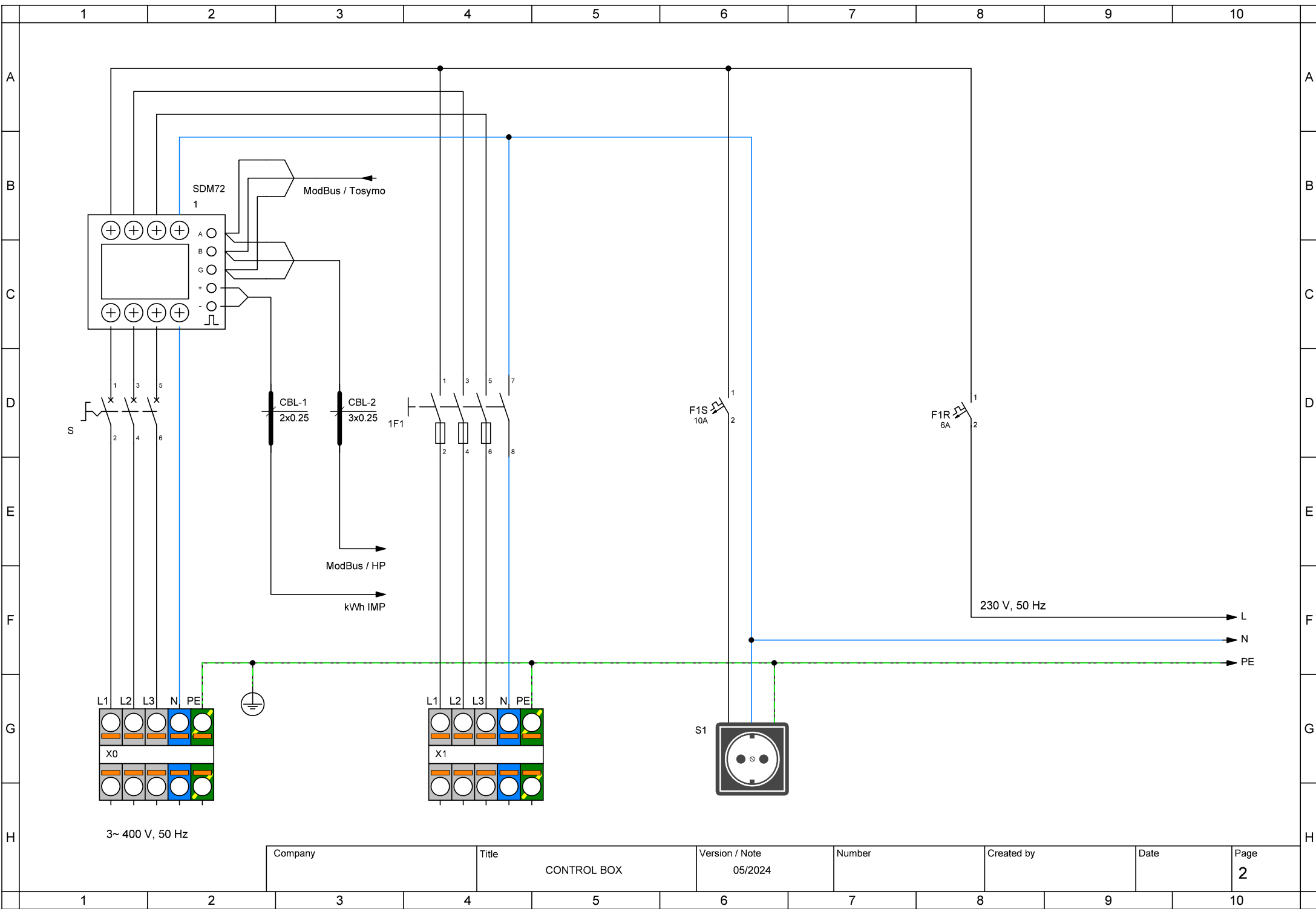


PWR SPLY: 3~ 400V, 50 Hz
CTRL: 1~ 230V, 50 HZ

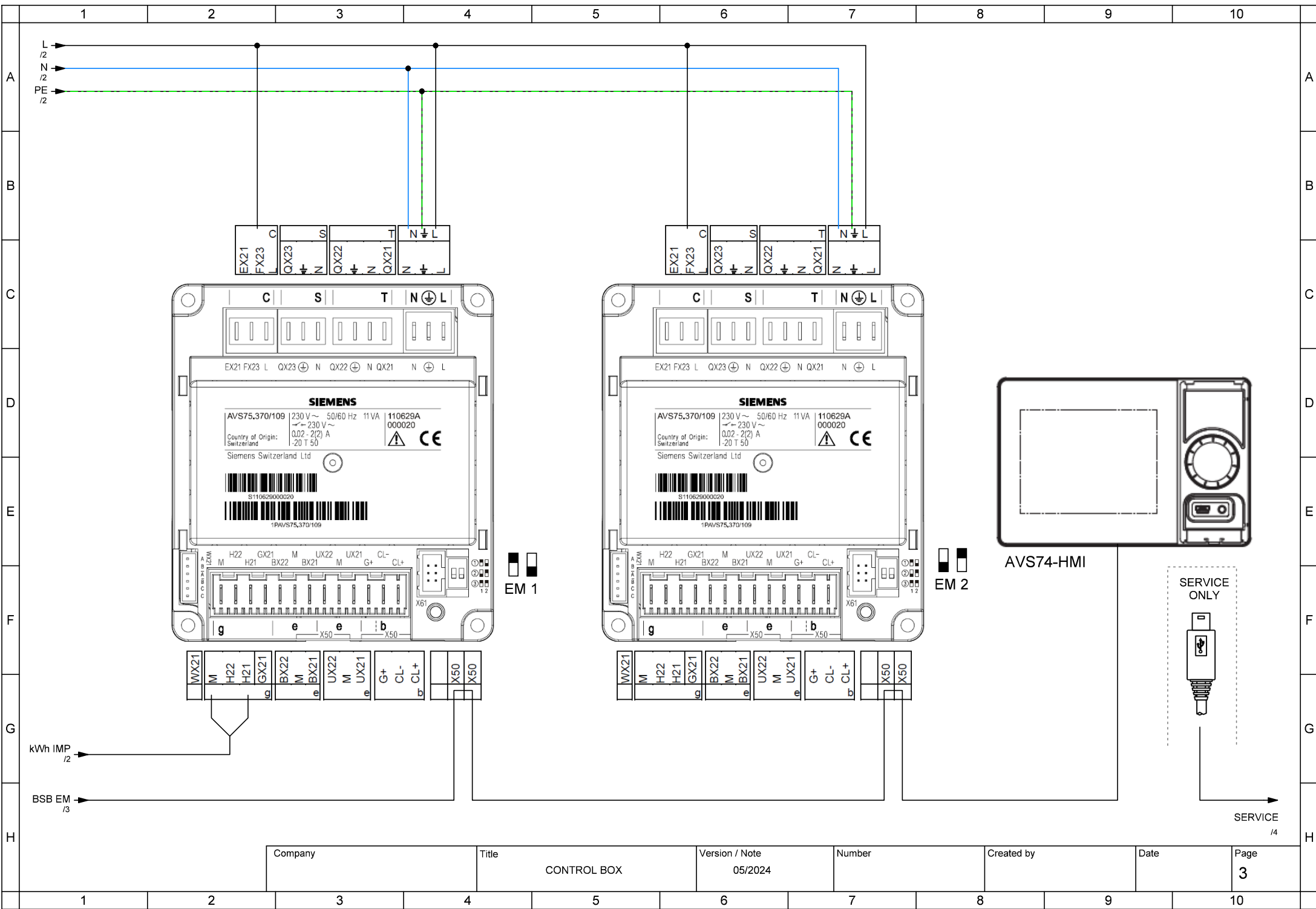
Company	Title	Version / Note	Number	Created by	Date	Page
	TBW-TWW	05/2024				1



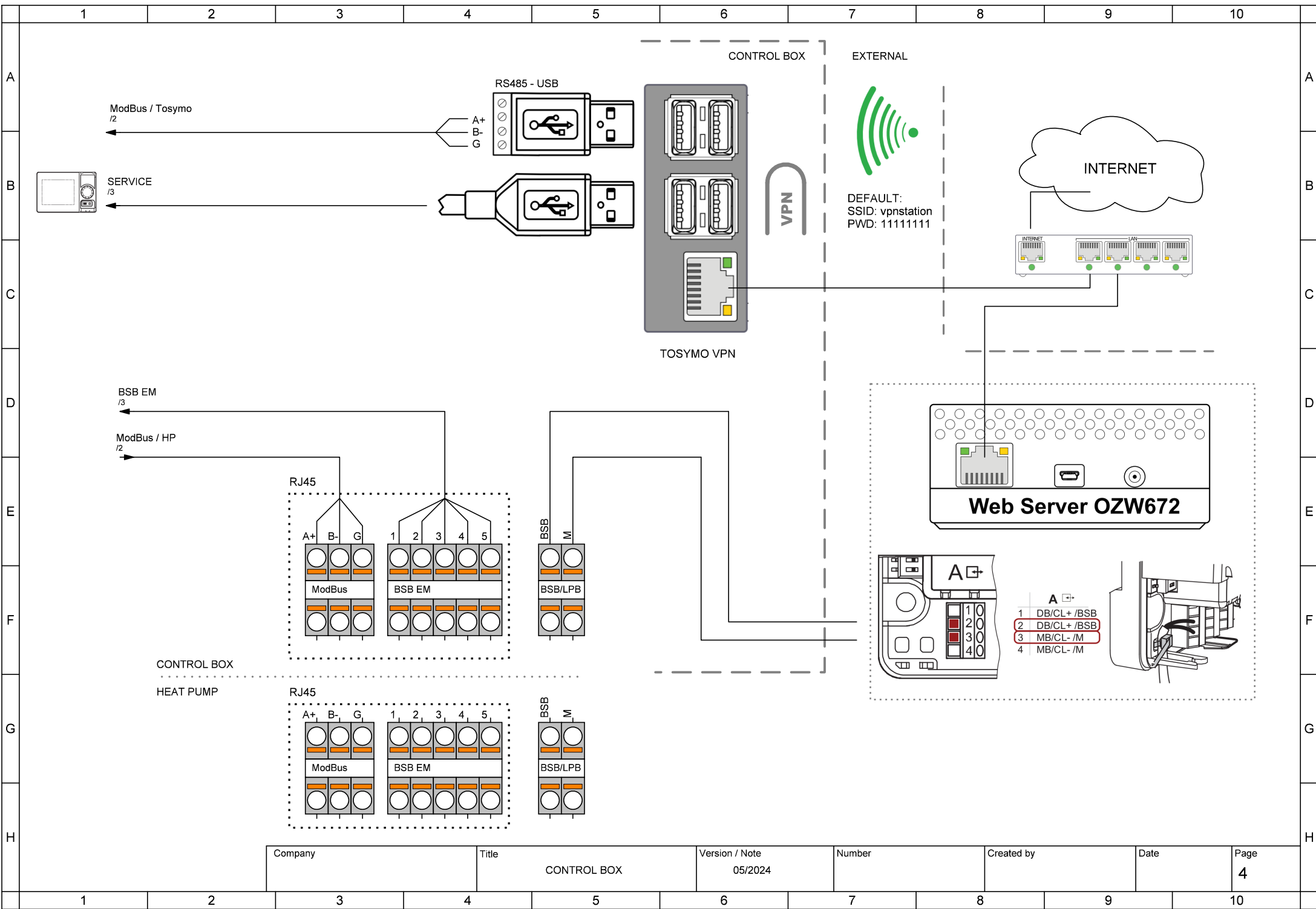
Company	Title	Version / Note	Number	Created by	Date	Page
	CONTROL BOX	05/2024				1



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

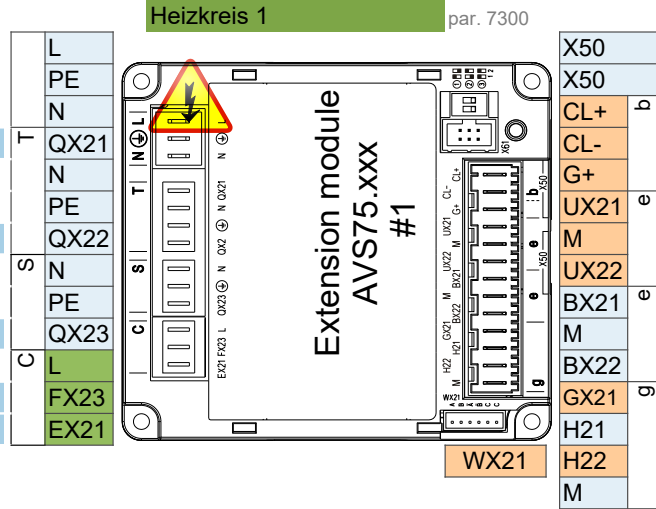
- AVS75.390
- AVS75.391
- AVS75.370

- 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

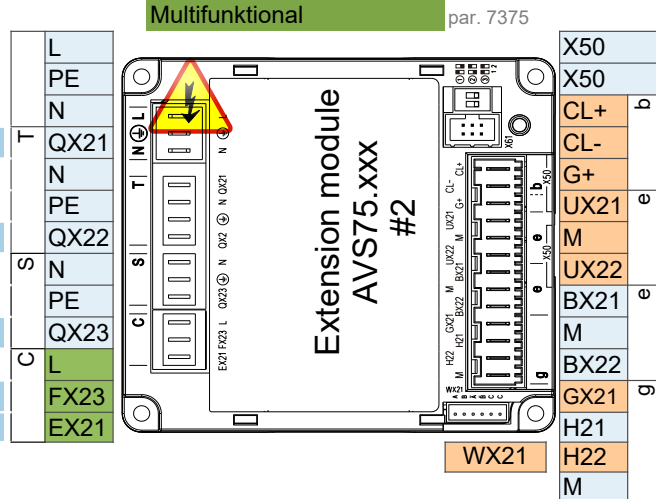
 Pulse count

- 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

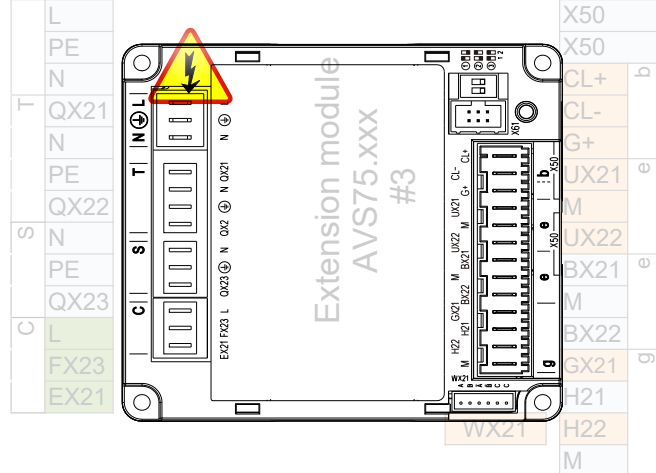


- Operating unit (HMI) AVS37.xxx
 Extension module AVS75.xxx
 Room unit QAA...
 Room unit QAA...

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