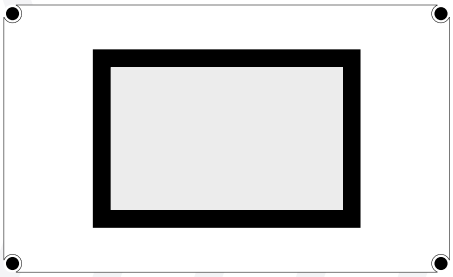
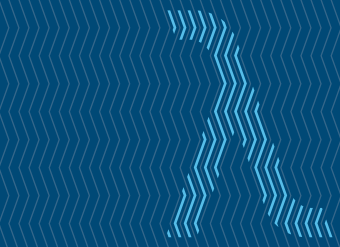
EN

LAMBDA WÄRMEPUMPEN



CONTROL SET **03** / 1.3



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CONTROL SET O3 Version 1.3

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1 Control set 03

1.1 Equipment

The control centre is located in the building and communicates with the refrigeration circuit controller (ARC) of the outdoor unit via a CAN bus connection. The control centre contains the hydraulic controller, a 7“ colour touch display.

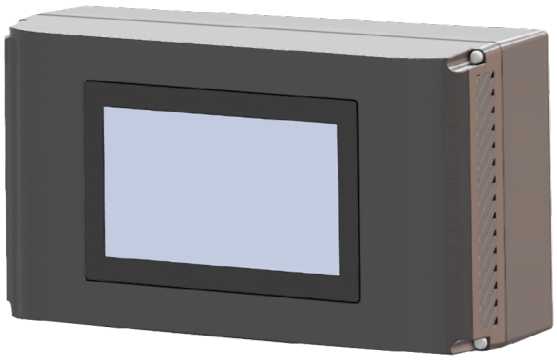


Fig. 1: Control centre consisting of display and hydraulic controller

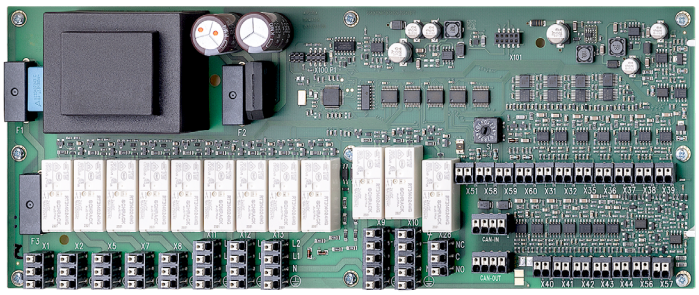


Fig. 2: AHC hydraulic control unit

1.2 Features

- 7“ colour touch display
- Local trend data storage
- Integrated remote maintenance option via VNC connection
- Modbus-RTU and Modbus-TCP connection to external devices (e.g. photovoltaics) supported
- SG-ready
- Electrical outputs are freely configurable; the following actuators and sensors can be operated as standard:
  → Auxiliary heating
  → 3x mixer group control (additional mixer group controls can be added)
  → Fresh water system
- Circulation pump
- Changeover valve for domestic hot water preparation
- Charging pump
- Speed control for fresh water pump and charging pump (PWM / 0-10V)
- 12x temperature inputs PT1000
- 24V digital inputs
  → External or PV
  → EVU block
  → Cooling
  → Fresh water flow switch
- Heat and electricity meters connection to control centre

2 Connecting the control centre

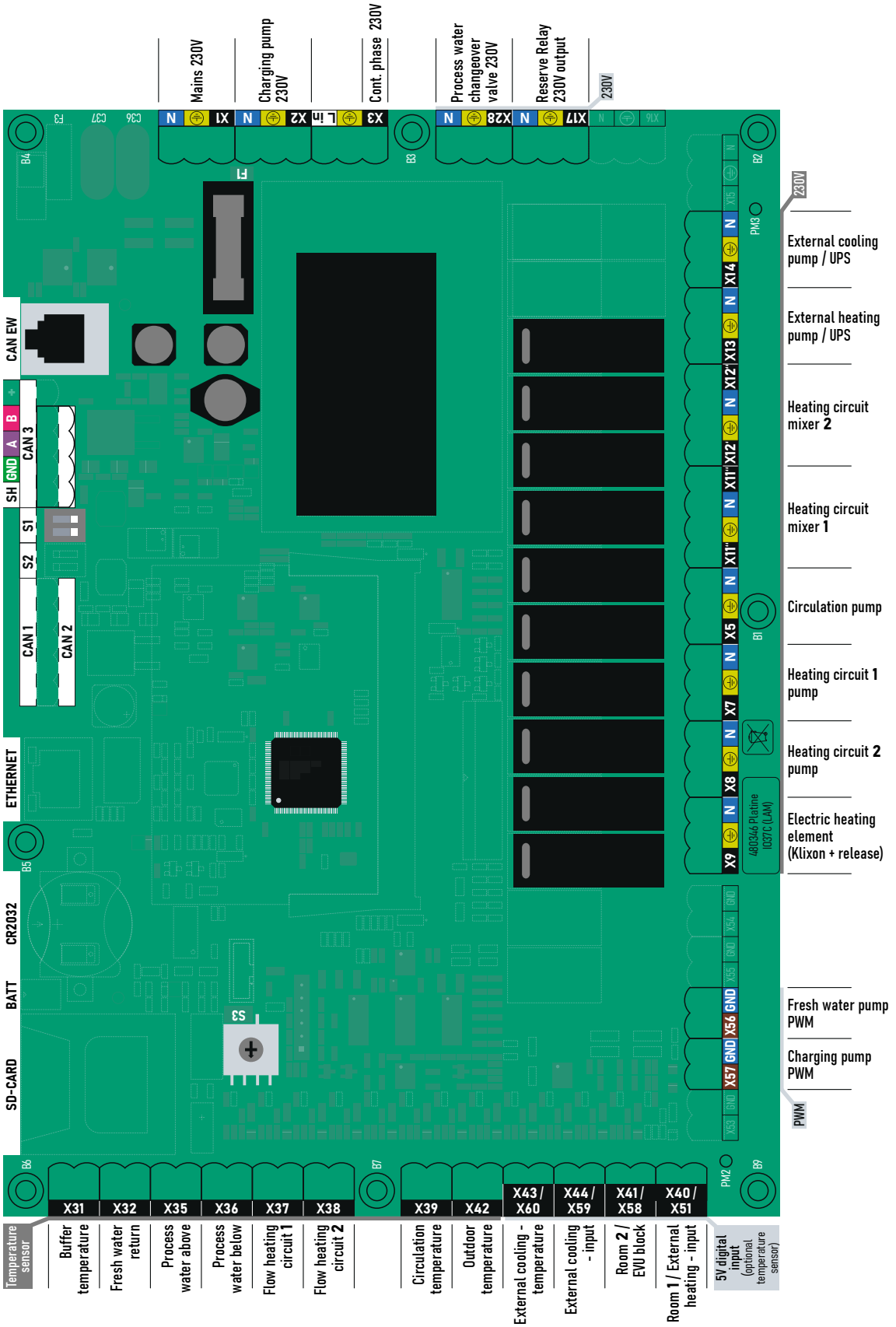
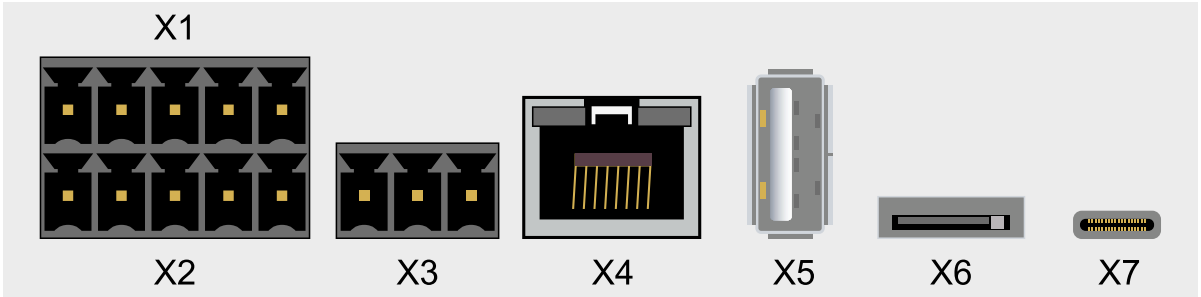


Fig. 3: Connection terminals AHC hydraulic controller

2.1 Pin assignment



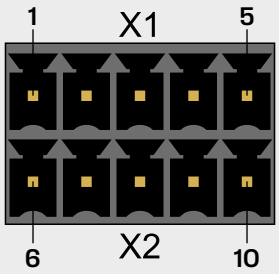
X1	**CAN-Bus**
X2	**Supply (10-pin Phoenix RM 3.5) X3: RS485**
X3	**RS485**
X4	**Ethernet 10/100 (RJ45)**
X5	**USB-Host 2.0 (type-A)**
X6	**microSD card**
X7	**USB 2.0, host (type C)**

Tab. 1: Connection terminals control centre display

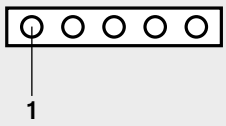
Designation	No.	Fuse rating
Primary transformer supply	F1	400mAT
Secondary transformer supply	F2	1AT
Fuse protection for 230V relay outputs	F3	6,3AT

Tab. 2: Miniature fuses HYD

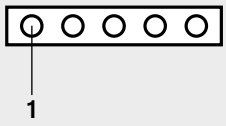
2.1.1 X1: CAN-Bus, X2: Supply (10-pol. Phoenix RM 3,5)



X1 Pin	Function
1	CAN A (LOW)
2	CAN B (HIGH)
3	CAN A (LOW)
4	CAN B (HIGH)
5	GND



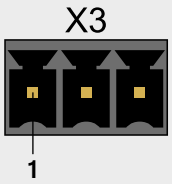
X2 Pin	Function
1	+24 V power supply
2	+24 V power supply
3	GND
4	GND
5	GND



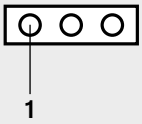
Tab. 3: X1 / X2 CAN-Bus power supply

i **CAN Bus Termination**
The resistor can be enabled or disabled via software.

2.1.2 X3: RS485 (3-pol. Phoenix RM 3,5)



X3 Pin	Function
1	RS485 A
2	RS485 B
3	GND



Tab. 4: X3 CAN-Bus power supply

i **RS485 Termination/Spreading**
The termination resistor and spacing can be enabled or disabled via software.

2.2 Inputs/outputs of the HYD control centre

The connection terminals can always be assigned to the respective actuator and sensor using software. In other words, if 230V actuators (pumps, mixers, changeover valves, etc.) are connected to terminals X5 - X28, temperature sensors to terminals X31 to X39, 0-10V or PWM signal to terminals X56 - X57 and switching inputs X51, X58 to X60, the respective device can be assigned via the software.

The following list describes the standardised terminal assignment.

X1: Mains 230V
230V connection

X2: Fresh water pump / charging pump
230V continuous voltage for supplying the charging pump (for the heat pump) and fresh water pump.

X5: Circulation pump 230V
Connection for a circulation pump, for circulating hot water.

X7: Heating circuit pump 1 230V
Connection for a pump in heating circuit 1. If no buffer is used (direct heating circuit), this connection is not used (the heating circuit is supplied via the charging pump).

X8: Heating circuit pump 2 230V
Connection for a pump in heating circuit 2. If no buffer is used (direct heating circuit), this connection is not used (the heating circuit is supplied via the charging pump).

X10: Process water valve supply
The supply for the process water valve is tapped on X10 (continuous phase (brown) -> connection 1 and neutral conductor (blue) → N).

X11: Mixer heating circuit 1: 230 V
Connection for a mixer in heating circuit 1. If no buffer is used (direct heating circuit), this connection is not used.

X12: Mixer heating circuit 2: 230 V
Connection for a mixer in heating circuit 2. If no buffer is used (direct heating circuit), this connection is not used.

X13 → L1: External heating (pump / valve): 230 V
Connection for a pump or valve for external heating requirements (e.g. swimming pool heating, high-temperature storage tank).

X13 → L2: External cooling (pump / valve): 230 V
Connection for a pump or valve for external cooling requirements (e.g. passive cooling, cooling buffer, direct cooling circuit).

X9: Electric heating element
Connection for an electric heating element. The first two connections are bridged and can be used for an external safety thermostat. Connection of the contactor for heating element on L and N.

X28: Process water valve
Switch contact connection for a 3-way valve for switching to process water heating. Switch (black) to NC.

X51: External heating or PV input: 24 V
Enabling of the heat pump due to PV surplus or an external heating requirement (swimming pool thermostat) via a potential-free relay.

X58: EVU block input: 24 V
Blocking the heat pump by interrupting the input. A „hard" EVU block (400V are switched off) is not permitted. If the energy supply company does not provide a block, the contact must be bridged.

X59: Cooling input: 24 V
Specification of an external cooling requirement (e.g. through external room control)

X60: Fresh water flow switch: 24 V
Connection of a flow switch that is closed when drinking water is tapped (for fresh water system).

X31: Buffer temperature: PT1000
Connection of the buffer temperature sensor. This should be installed in the upper third of the buffer in an immersion sleeve. If no buffer is used, the input is not connected.

X32: Fresh water return temperature: PT1000
Connection of the hot water temperature sensor. Only required for fresh water system. The sensor is installed at the outlet of the instantaneous water heater (plate heat exchanger) on the return side.

X35: Process water above: PT1000
Connection of the process water sensor in the upper third of the process water tank. This represents the switchon limit for the process water load.

X36: Process water temperature below: PT1000
Connection of the process water sensor in the lower third of the process water tank. This represents the switchoff limit for the process water load. Generally only required for boilers; for other storage tank types (hot water), the return temperature of the heat pump can be used as the switch-off temperature.

X37: Flow temperature heating circuit 1: PT1000
Temperature at the flow of heating circuit 1. The sensor is used for mixer control.

X38: Flow temperature heating circuit 2: PT1000
Temperature at the flow of heating circuit 1. The sensor is used for mixer control.

X39: Circulation temperature: PT1000
Temperature in the circulation pipe. Can only be used optionally when using a circulation pump.

X40: Room 1 temperature: PT1000
Connection for the room temperature sensor of heating circuit 1 (optional).

X41: Room 2 temperature: PT1000
Connection for the room temperature sensor of heating circuit 2 (optional).

X42: External temperature: PT1000
Connection for outdoor temperature sensor.

X43: Cooling temperature: PT1000
Connection for cooling temperature sensor in a cooling storage tank. If the heating buffer cylinder is used for cooling purposes, the buffer temperature is used.

X44: Cooling temperature: PT1000
Connection for temperature sensor for external cooling request.

X56: Fresh water pump: 0-10V / 10V PWM
For speed control of the fresh water pump when using a fresh water system. 0-10V or PWM output can be switched on the software side.

X57: Charging pump: 0-10V / 10V PWM
For regulating the speed of the charging pump. 0-10V or PWM output can be switched on the software side.

S1: CAN coding rotary knob
The coding rotary knob is set to 1 by default..

2.3 Practical tip

i Cover of the control housing can be easily fixed at the top edge for cable connection!

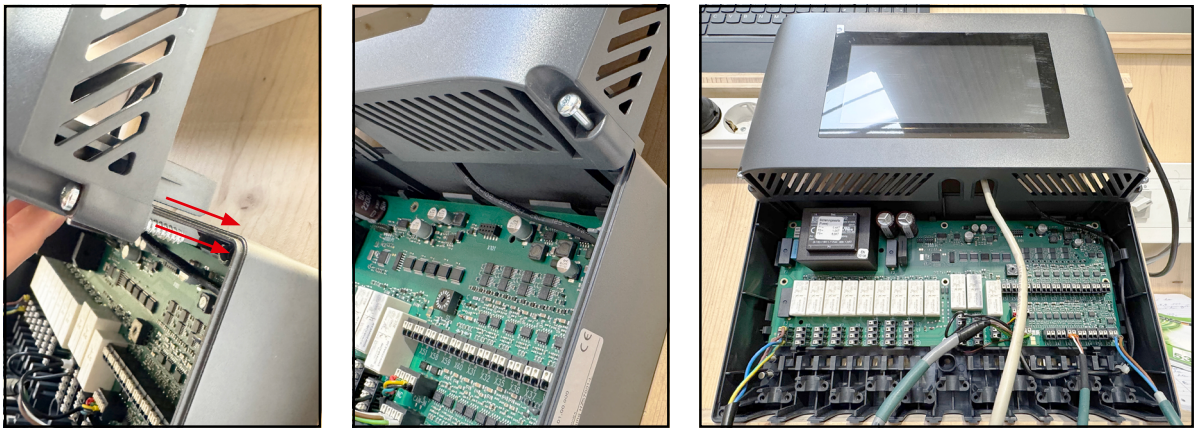


Fig. 4: Control centre 03

3 Overview of cabling

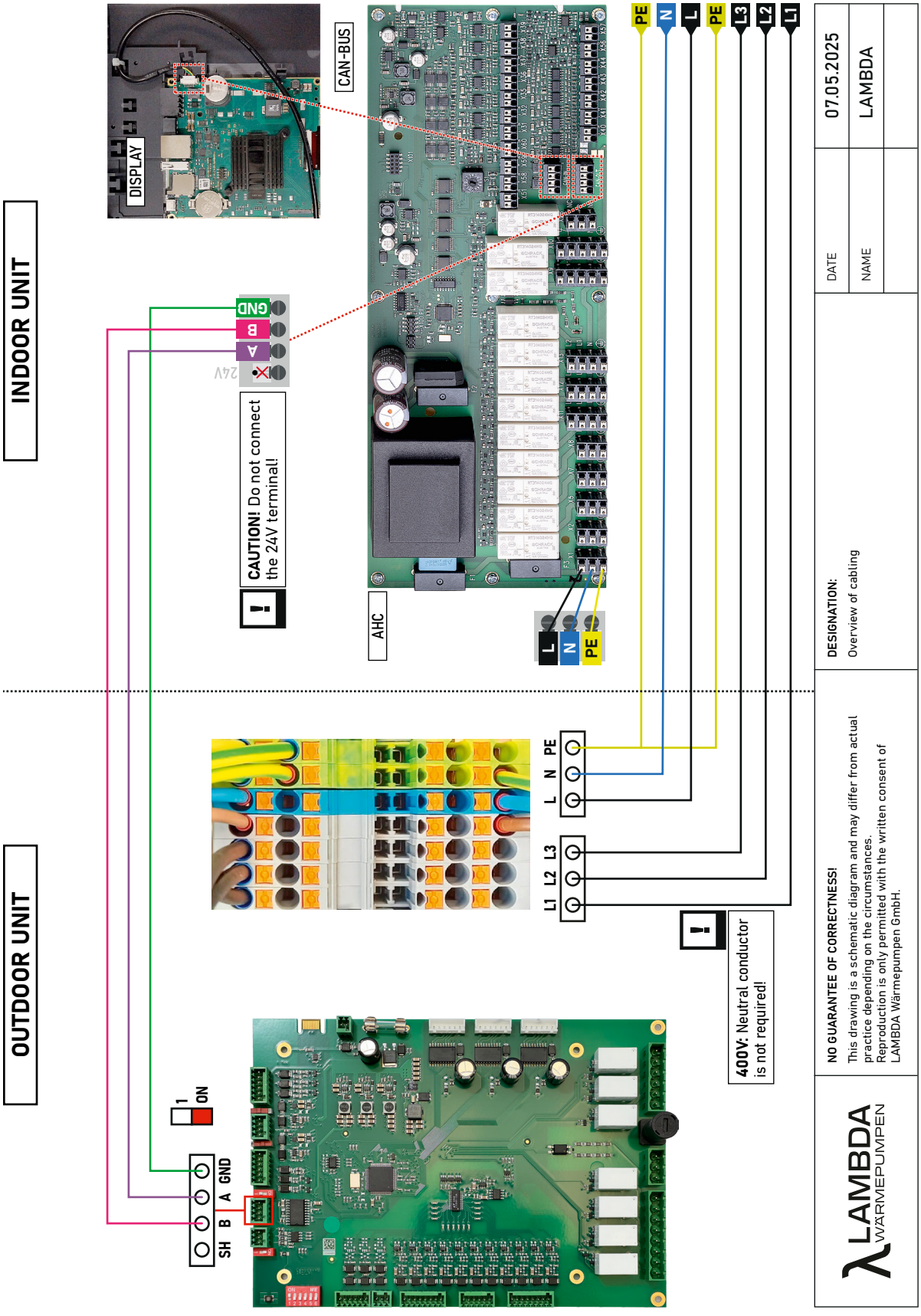


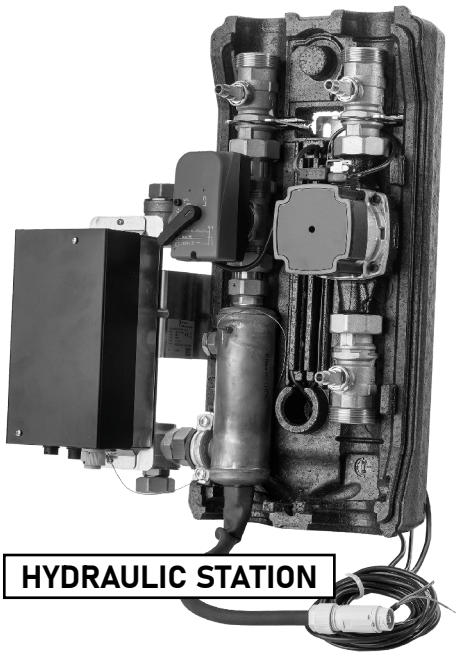
Fig. 5: Overview of cabling

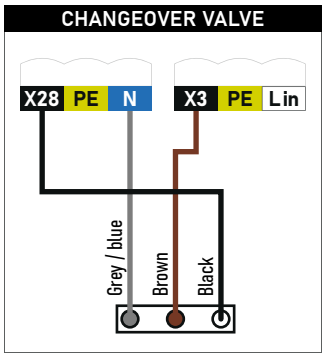
3.1 Cable list

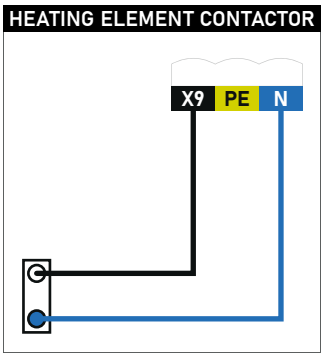
Designation	Type	Control centre terminal	Outdoor unit terminal
Mains connection			
		AHC (indoor)	Outdoor unit
Mains 400V	YMM 4x2.5mm² for EU10L-EU15L YMM 4x4mm² for EU20L	-	Terminal blocks (L1 L2 L3 PE)
Mains 230V	YMM 3x1.5mm²	X1	Terminal blocks (L N PE)
Hydraulic controller for outdoor unit			
		AHC (indoor)	ARC (outdoor)
CAN-Bus	LiYCY 2x2x0.5mm²	CAN IN	ARC X30
Hydraulic controller for display			
		AHC (indoor)	Display (indoor)
CAN-bus / 24V	LiYCY 2x2x0.5mm²	CAN OUT	X4 / X1
Control centre			
		AHC (indoor)	
230V outputs	YML 3x1.5mm²	X1 to X13 and X28	-
24V inputs	YML 2x0.75mm²	X51 to X60	-
Temperature sensors	YML 2x0.25mm²	X31 to X44	-
PWM / 0-10V lines	YML 2x0.25mm²	X56 and X57	-
CAN-Bus	LiYCY 2x2x0.5mm²	CAN OUT	CAN OUT
Internet connection	RJ45	LAN connector	
Control centre			
		Display	
CAN-Bus	LiYCY 2x2x0.5mm²	CAN plug	-
Internet connection	RJ45	X2	-
Modbus RTU	LiYCY 2x2x0.5mm²	X5	-

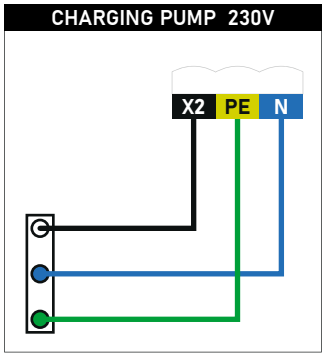
Tab. 5: Cable list

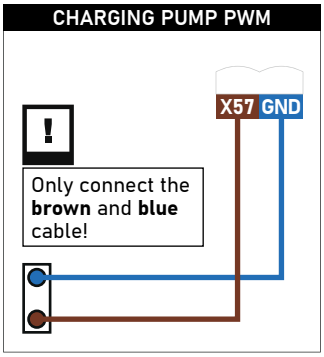
4 Connecting the hydraulic station











Further details on the hydraulic station connection can be found in the document **Anleitung Hydraulikstation 1/2/3/20** on our website in the download area.

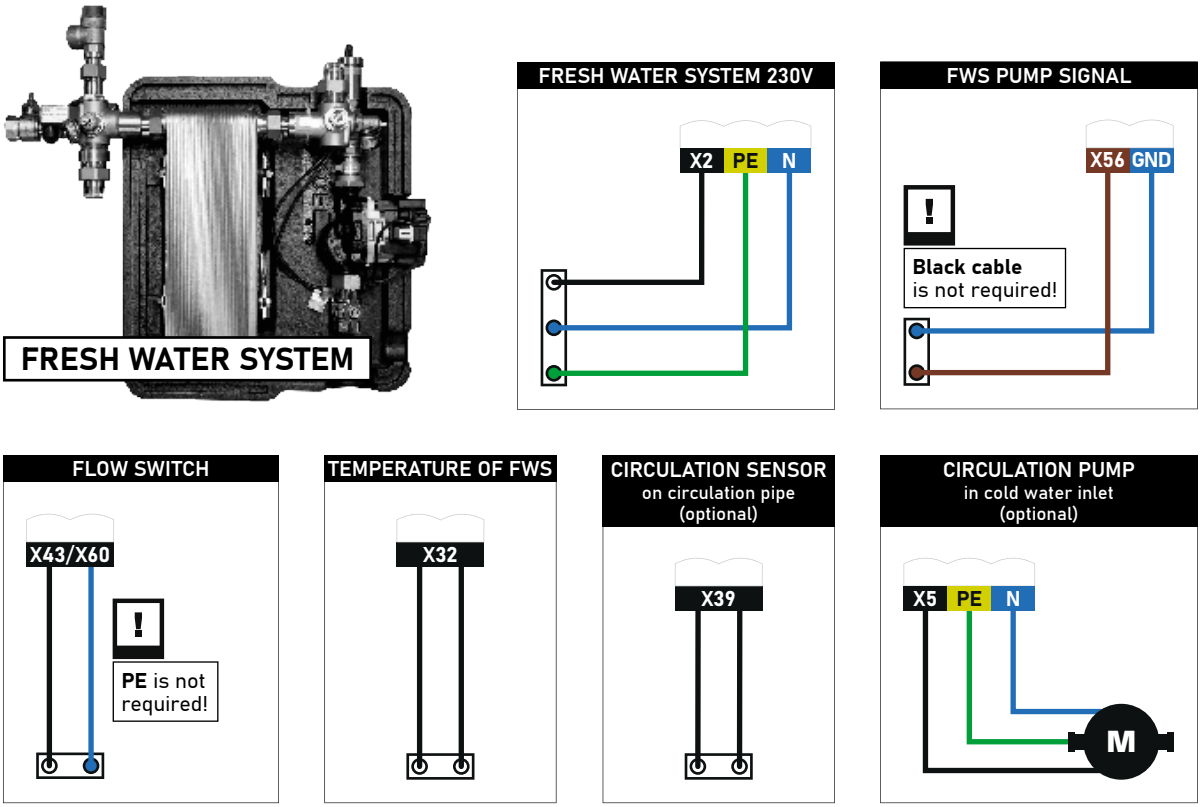
Fig. 6: Anschluss Hydraulikstation

5 Integrating the ECO hydraulic solution

Fig. 7: ECO hydraulic solution

X2	Charging pump (continuous voltage)
X57	Charging pump PWM
X9	Heating element
X28 / X10	Changeover valve / continuous phase
X31	Buffer tank sensor above
X35	Boiler sensor above
X36	Boiler sensor below

6 Connecting the fresh water system



Further details on connecting the FWS can be found in the document **Anleitung Frischwassersystem** on our website in the download area.

Fig. 8: Connecting the fresh water system

7 Integrating the smart meter

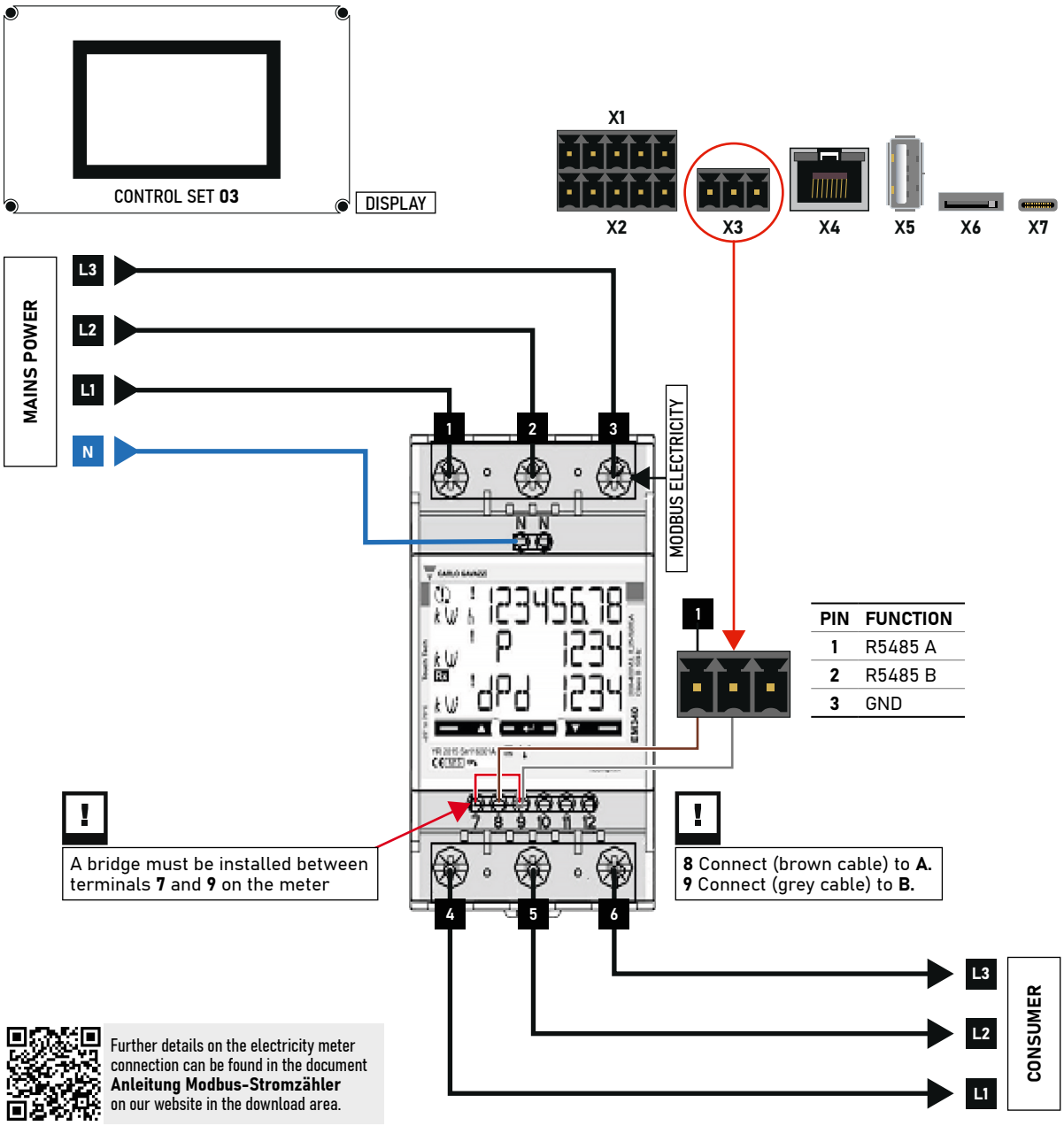
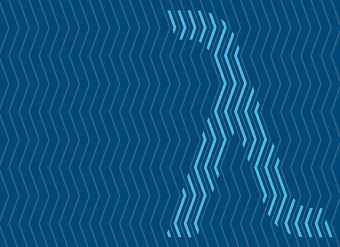


Fig. 9: Integrating the smart meter



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CONTROL SET O3 Version 1.3

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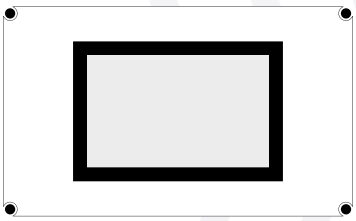

CONTROL SET **03** / 1.3

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