



USER MANUAL

— Heating & Cooling Station
Automation

SHC-002

Version 2



Written by SMARTEH d.o.o.
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User Manual

Document Version: 2
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STANDARDS AND PROVISIONS: Standards, recommendations, regulations and provisions of the country in which the devices will operate, must be considered while planning and setting up electrical devices. Work on 100 .. 240 V AC network is allowed for authorized personnel only.

DANGER WARNINGS: Devices or modules must be protected from moisture, dirt and damage during transport, storing and operation.

WARRANTY CONDITIONS: For all SHC cabinets - if no modifications are performed upon and are correctly connected by authorized personnel - in consideration of maximum allowed connecting power, warranty of 24 months is valid from the date of sale to the end buyer, but not more than 36 months after delivery from Smarteh. In case of claims within warranty time, which are based on material malfunctions the producer offers free replacement. The method of return of malfunctioned module, together with description, can be arranged with our authorized representative. Warranty does not include damage due to transport or because of unconsidered corresponding regulations of the country, where the module is installed.

This device must be connected properly by the provided connection scheme in this manual. Misconnections may result in device damage, fire or personal injury.

Hazardous voltage in the device can cause electric shock and may result in personal injury or death.

NEVER SERVICE THIS PRODUCT YOURSELF!

This device must not be installed in the systems critical for life (e.g. medical devices, aircrafts, etc.).

If the device is used in a manner not specified by the manufacturer, the degree of protection provided by the equipment may be impaired.

Waste electrical and electronic equipment (WEEE) must be collected separately!

SHC cabinets complies to the following standards:

- EMC: EN 61000-6-3:2007 + A1:2011, EN 61000-6-1:2007, EN 61000-3-2:2006 + A1:2009 + A2: 2009, EN 61000-3-3:2013
- LVD: IEC 61010-1:2010 (3rd Ed.), IEC 61010-2-01:2013 (1st Ed.)

Smarteh d.o.o. operates a policy of continuous development. Therefore we reserve the right to make changes and improvements to any of the products described in this manual without any prior notice.

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1 ABBREVIATIONS

GUI	Graphical User Interface
SCADA	Supervisory Control And Data Acquisition
HMI	Human Machine Interface
MQTT	Message Queuing Telemetry Transport
PLC	Programmable Logic Controller
DC	Direct Current
AC	Alternating Current
I/O	Input/Output
AI	Analog Input
AO	Analog Output
DI	Digital Input
DO	Digital Output
NTC	Negative Temperature Coefficient
PWM	Pulse Width Modulation
DHWT	Domestic hot water tank
Temp	Temperature





2 DESCRIPTION

The SHC-002 Heating & Cooling Station Automation Cabinet is designed as a versatile solution for managing up to three heating and/or cooling circuits, whether in private homes or larger public buildings. SHC-002 cabinet is ideal for both new construction projects and retrofits, offering a compact and integrated automation system tailored to meet the specific requirements of any heating or cooling setup. With the SHC-002, installation, configuration, and startup are made simpler and quicker.

Unlike many automation systems that require the heating and cooling plant to adapt to a predefined layout, the SHC-002 can be adjusted to the unique hydraulic configuration of your plant. This adaptability ensures smooth integration into various environments.

For more detailed configurations of Smarteh Heating & Cooling Station Automation cabinets, please refer to the following table.

Table 1: Heating & Cooling Station Automation cabinet configuration

Cabinet	Heating sources	Heat storage	Domestic hot water tank	Divert module	Hydraulic separator	Heating & Cooling circuits
SHC-001	up to 2	up to 2	1	1	/	up to 2
SHC-002	up to 2	up to 2	1	1	1	up to 3
SHC-002 & 1 x SHC-E02	up to 4	up to 2	up to 2	1	1	up to 6
SHC-002 & 2 x SHC-E02	up to 6	up to 2	up to 3	1	1	up to 9
SHC-002 & 3 x SHC-E02	up to 6	up to 2	up to 3	1	1	up to 12

Table 2: Heating & Cooling Station Automation cabinet included temperature sensors

Cabinet	Heating circuits pipe surface PT1000-1CH	High temperature Heating sources Immersion, 6mm 180°C PT1000-1I	Domestic hot water tank & Hot water storage tank Immersion, 6mm 85°C PT1000-1C	Room PT1000-2	Outdoor PT1000-2E
SHC-001	1	2	2	/	1
SHC-002	2	2	2	1	1
SHC-E02	4	2	1	/	/

Table 3: Heating & Cooling Station Automation cabinet accessories

Item	Function
Temperature sensor PT1000-1CH	85°C, pipe surface temperature sensor
Temperature sensor PT1000-1I	180°C , 6mm diameter, immersion temperature sensor
Temperature sensor PT1000-1C	85°C , 6mm diameter, immersion temperature sensor
Temperature sensor PT1000-2	Room temperature sensor, wall mounted
Temperature sensor PT1000-2E	Outdoor temperature sensor, wall mounted
Touch panel 4,3" LPC-3.GOT.111	Room temperature panel, 4,3" touch panel, wall mounted



The cabinet was developed and is continuously upgraded to meet all requirements regarding the heating and cooling regulation algorithms, heating and cooling sources, valves, pumps, hot water storage tank, etc. The main part of the solution is the Smarteh PLC based color touch panel with local and remote possibility of automation algorithms and GUI uploading, system setting and system checking.

The system enables smart management of heat sources based on current energy prices, which can be configured through energy saving schedules. Additional features include storing energy within the building when energy prices are lower. The entire system's operation can be monitored via a web browser on the local network or remotely via an Internet connection, where all real-time system data is displayed.

SHC-002 is supporting Modbus Ethernet TCP/IP for connectivity to the supervision systems SCADA/HMI and MQTT protocol for connectivity to the Cloud. The cabinet also supports connection to a range of Smarteh wireless Bluetooth Mesh products like radiator/floor heating valve actuators, window/door contacts, light actuators, shades actuators, sensors, etc.

Actuator override commands are possible by using integrated switches in case of installed actuator failure. Fuses, the main power switch and all predefined wiring terminals are integrated and mandatory temperature sensors are included in the package.

The SHC-002 Heating & Cooling Station Automation cabinet has the possibility to program the functioning of up to 2 additional digital outputs. For example for switching OFF/ON the re-heater, pump or valve based on the set temperature threshold and measuring the actual temperature of the specific heating/cooling point.

Please check other Smarteh Heating & Cooling Station Automation cabinets like SHC-001 cabinet for up to 2 heating and/or cooling circuits automation and SHC-E02 Heating & Cooling Station Automation extension cabinet for up to 6, 9 or up to 12 heating and/or cooling circuits automation on our web site: www.smarteh.com under *PRODUCTS > BUILDING AUTOMATION PRODUCT LINE > CONTROL CABINETS > HEATING & COOLING STATION AUTOMATION* section. Smarteh Bluetooth Mesh products can be explored on our website: www.smarteh.com under *PRODUCTS > BUILDING AUTOMATION PRODUCT LINE > LBT-1 BLUETOOTH PRODUCTS*.





To put the SHC-002 Heating & Cooling Station Automation cabinet into operation authorized person needs to perform a few following tasks:

1. Choose the corresponding Smarteh Heating & Cooling Station Automation cabinet to support a needed number of heating and/or cooling circuits on our website. For example, SHC-002 cabinet for 3 heating and/or cooling circuits.
2. Mount the selected cabinet to the appropriate place in the domestic hot water tank room.
3. Switch OFF main power supply and connect the cabinet to the main power supply according to the connection scheme from this document.
4. Switch ON the main power supply and the cabinet MAIN switch. After powering up the touch panel, set up the system that directly corresponds to the heating and cooling plant hydraulic layout. Please follow the document *SHC-002 Integration Manual* on our website: www.smarteh.com under *DOWNLOADS & SUPPORT* section for system configuration setup.
5. Switch OFF the MAIN switch and the main power supply. Wire and connect heating and cooling sources, regulating and ON/OFF valves, pumps, hot water storage tank, sensors, etc. to the installed cabinet terminals. Set cabinet jumpers on the PLC modules and set integrated switches as required. Please provide the settings mentioned based on the touch panel configuration you performed and the connection scheme example inside this document.
6. Switch ON the main power supply and the cabinet MAIN switch and test the functionality.
7. For local Ethernet or/and remote Internet connection use integrated Ethernet or WiFi possibility. You will find this and information regarding the connectivity to the SCADA/HMI and/or Smarteh Cloud on our web site: www.smarteh.com under *DOWNLOADS & SUPPORT* section.
8. Handing over the SHC-002 cabinet Operator Manual which you can find on our website: www.smarteh.com under *DOWNLOADS & SUPPORT* section and instructions for system operation to the end user.





3 FEATURES



Figure 1: SHC-002

Table 4: Features

A ready-made solution for the automation of heating and cooling stations

Supports up to 3 heating & cooling circuits

Easy and fast integration

Quick and simple upgrade for up to 12 heating & cooling circuits

Adaptation to specific hydraulic layout

Increased energy efficiency

Intuitive 7-inch touch screen with remote access

Smart connectivity to supervision systems HMI, SCADA and Cloud

Heat source and pump operation mode selection switches





4 OPERATION

4.1 Operation description

For the SHC-002 Heating & Cooling Station Automation cabinet system operation instructions, please refer to the the documents *SHC-002 cabinet Operator Manual*.

For the SHC-002 Heating & Cooling Station Automation cabinet system configuration setup, please refer to the the documents *SHC-002 cabinet Integration Manual*.

Both manuals are available on our website: www.smarteh.com under *DOWNLOADS & SUPPORT* section.





5 INSTALLATION

5.1 Connection scheme

Connection scheme of the SHC-002 Heating & Cooling Station Automation Cabinet can be found in document *SHC-002 connection scheme*. This document is available on our website: www.smarteh.com under *DOWNLOADS & SUPPORT* section.



Figure 2: SHC-002 schematic example of device connections

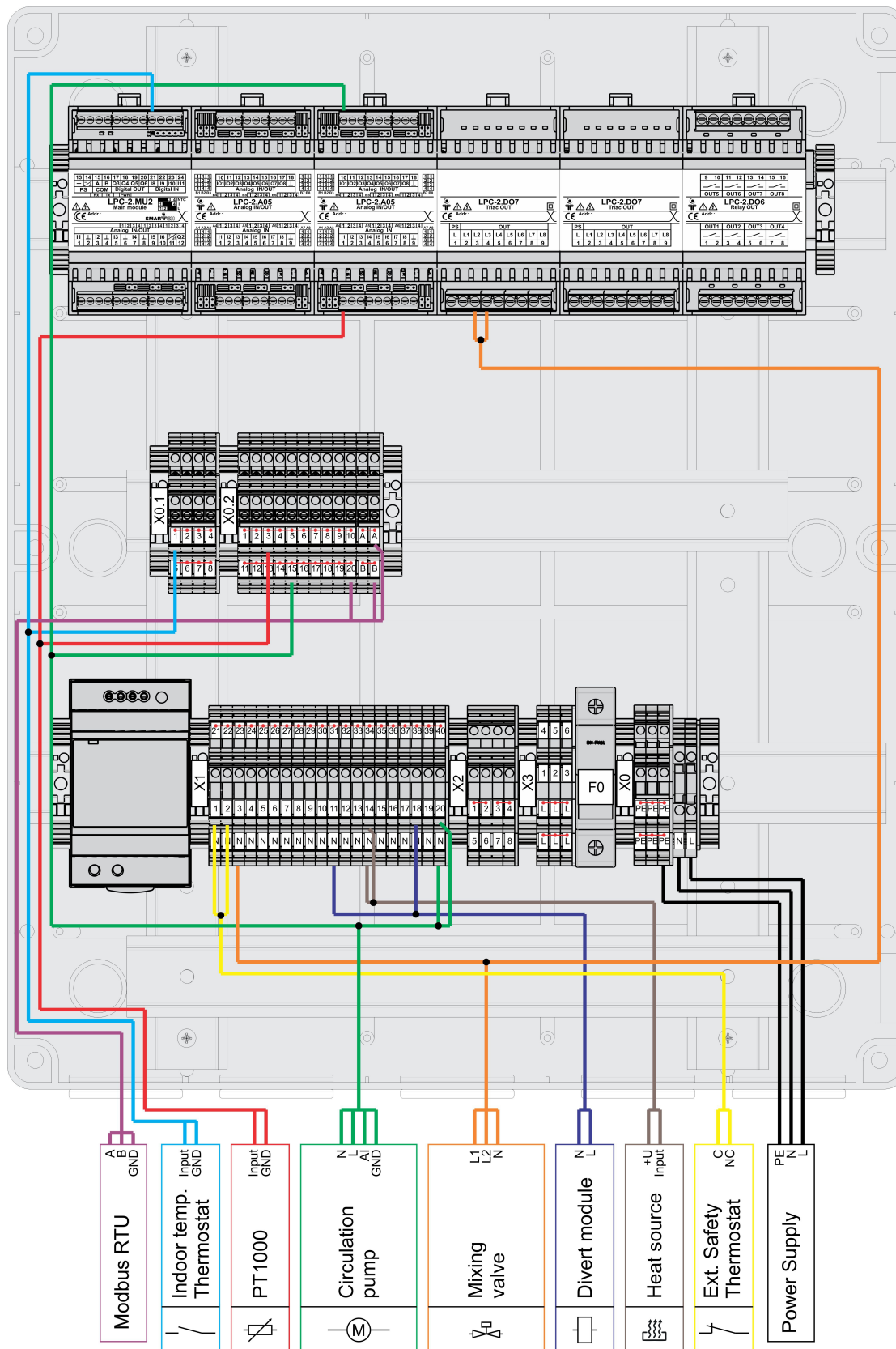




Figure 3: SHC-002

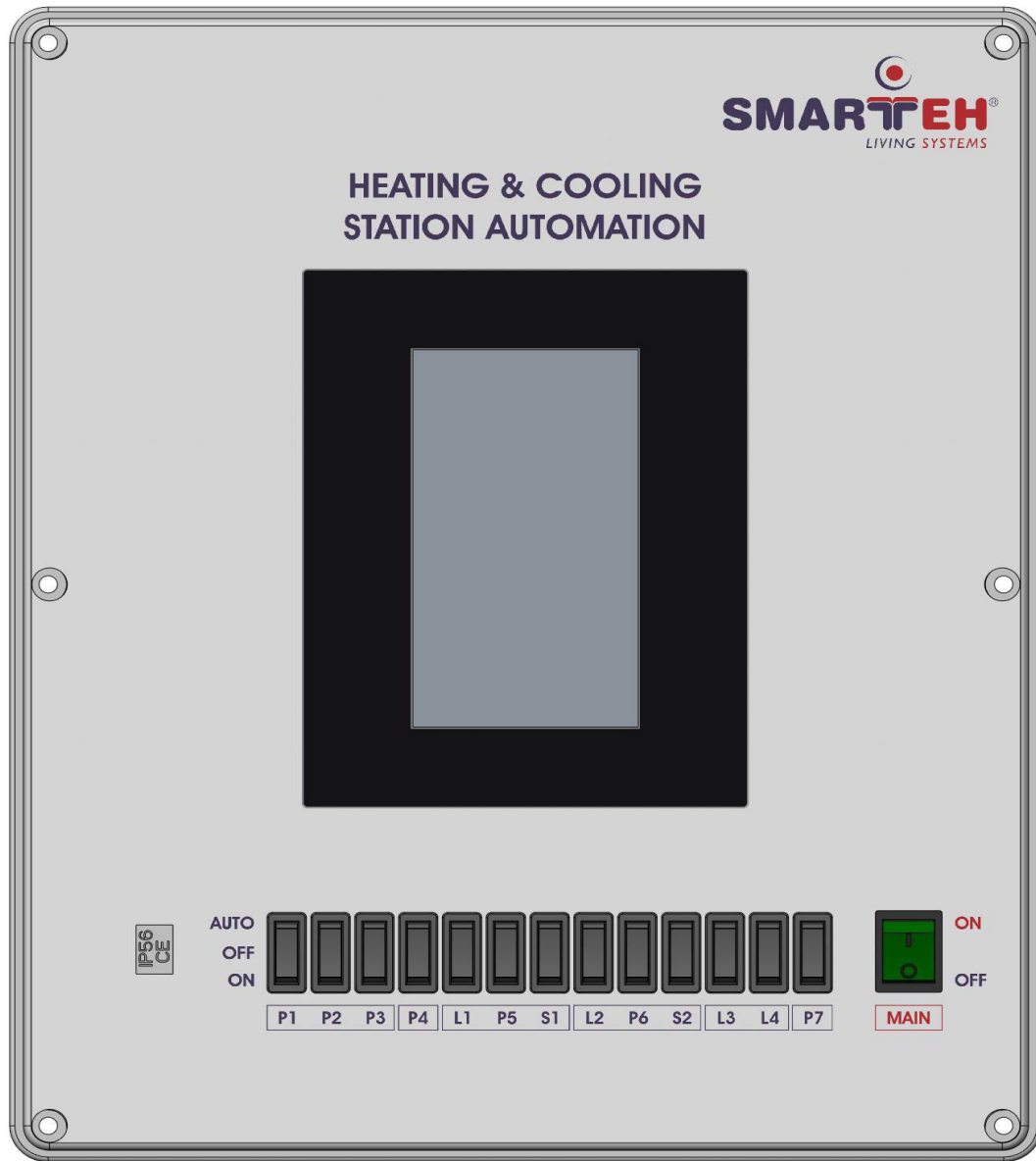


Table 5: Switches

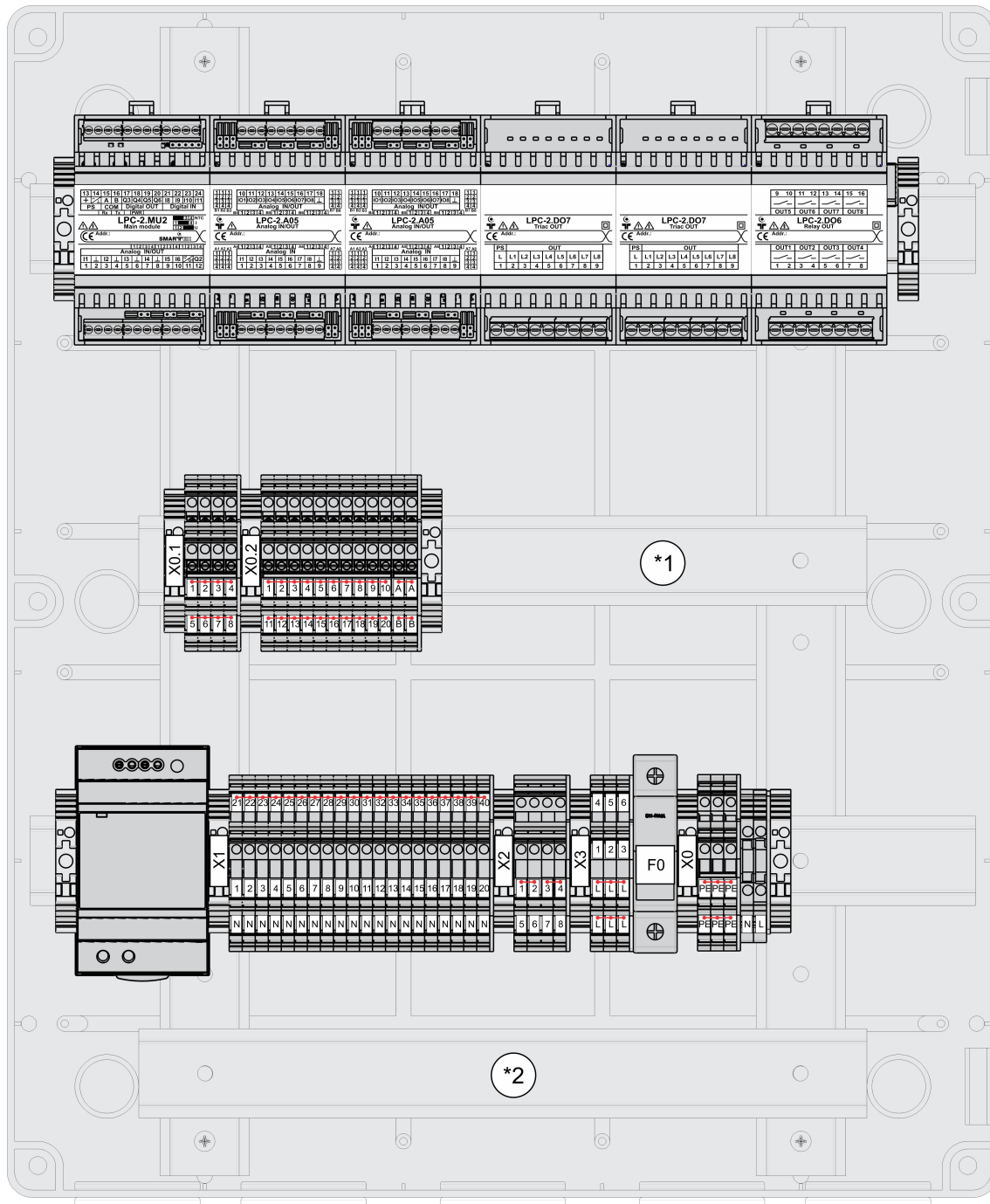
Designation	Functionality	Description
P1	Circulation pump 1	Switch for setting the operation mode of the pump for heating and cooling circuit 1
P2	Circulation pump 2	Switch for setting the operation mode of the pump for heating and cooling circuit 2
P3	Circulation pump 3	Switch for setting the operation mode of the pump for heating and cooling circuit 3
P4	Circulation pump 4	Switch for setting the operation mode of the pump for hydraulic separator
L1	Heat source 1	Switch for setting the operation mode of heat source 1
P5	Circulation pump 5	Switch for setting the operation mode of the pump for heat source 1
S1	Special function	Switch for setting the operation mode of heat source 1, dry contacts
L2	Heat source 2	Switch for setting the operation mode of heat source 2
P6	Circulation pump 6	Switch for setting the operation mode of the pump for heat source 2
S2	Special function	Switch for setting the operation mode of heat source 2, dry contacts
L3	Divert module 1	Switch for setting the operation mode of divert module 1
L4	Divert module 2	Switch for setting the operation mode of divert module 2
P7	Circulation pump 7	Switch for setting the operation mode of the pump for domestic hot water tank
MAIN	Main switch	Switch to turn ON the station and power for all connected devices

Operation mode description:

- AUTO: The device works in automatic mode and is controlled by the controller
- ON: The device works in manual mode and is turned ON
- OFF: The device works in manual mode and is turned OFF



Figure 4: SHC-002 inside



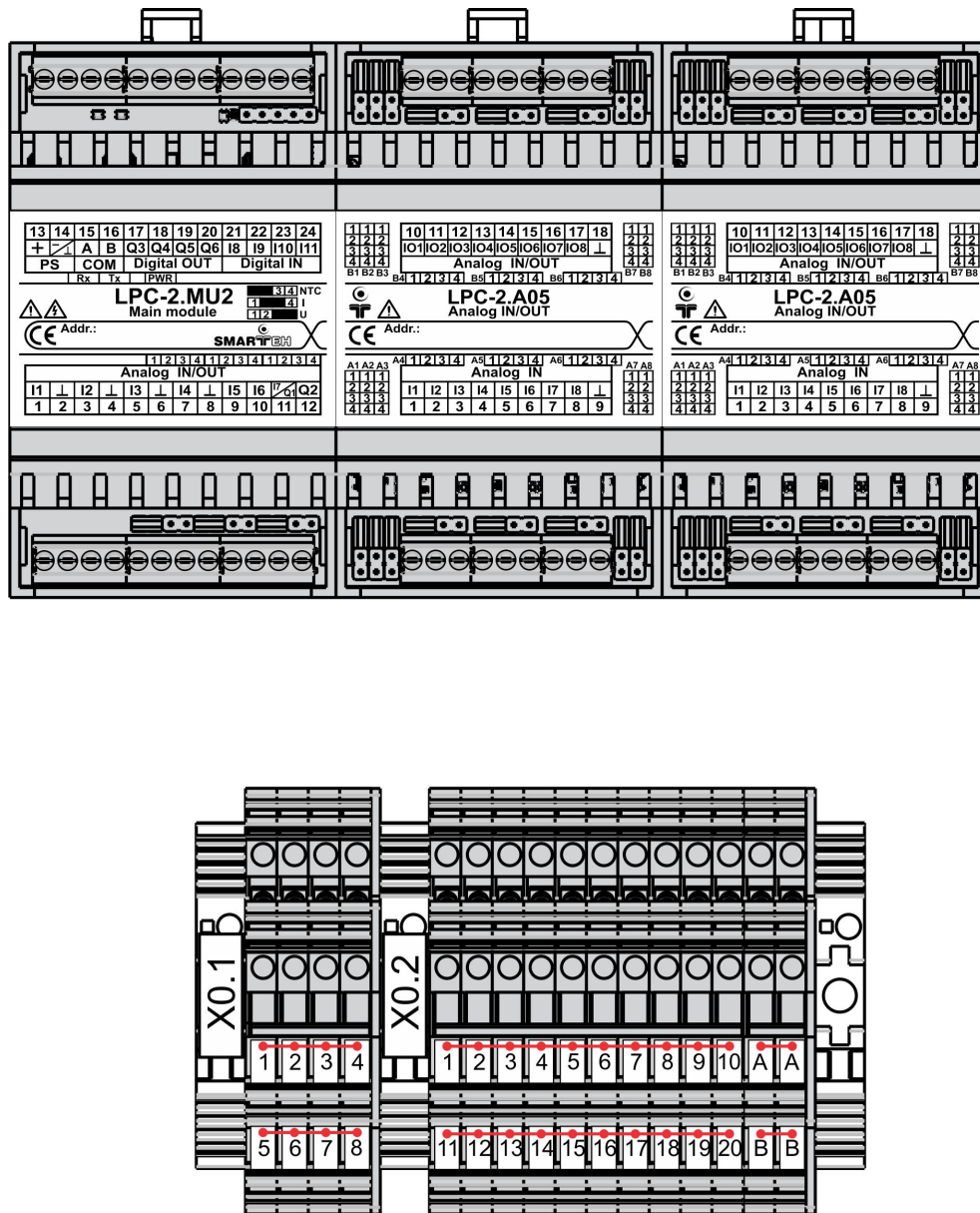
NOTE:

- The place marked with “*1” is intended for adding additional user modules and equipment.
- The place marked with “*2” is intended for fixing cables or wires of external units.





Figure 5: SHC-002 inside, low voltage section



The LPC-2.MU2 module has various analog and digital inputs and outputs. Some of these are used for the operation of the SHC-002 cabinet. Analog inputs I1 and I2 function as dry contact input recognition. Digital inputs I8, I9, and I10 are digital inputs for the digital room thermostat.

Table 6: LPC-2.MU2

	Input type	Input device type	Input description
I1 └┘	Dry contact	Heat source error signal	Heat source #1 - DI1
I2 └┘	Dry contact	Heat source error signal	Heat source #2 - DI2
I8	Digital input 0 .. 24 V DC	Room thermostat	Indoor temp #1 - DI8
I9	Digital input 0 .. 24 V DC	Room thermostat	Indoor temp #2 - DI9
I10	Digital input 0 .. 24 V DC	Room thermostat	Indoor temp #3 - DI10

The LPC-2.A05 module uses individual jumpers to configure the input/output functionality of each channel. Jumper positions and labels are clearly indicated on the module. The lower *Analog IN* inputs can be switched between analog voltage input, analog current input, or PT1000 input modes. Similarly, the upper *Analog IN/OUT* inputs/outputs can function as either analog voltage output, analog current output and PWM output, or as PT1000 inputs. Consult the LPC-2.A05 user manual for specific configuration details.

Table 7: LPC-2.A05 #1 Analog IN

	Jumper	Jumper position	Input type	Input device designation	Input description
I1	A1	3 4	Pt1000	T1	Heating & Cooling circuit #1 PT1000 inflow
I2	A2	3 4	Pt1000	T2	Heating & Cooling circuit #1 PT1000 outflow
I3	A3	3 4	Pt1000	T3	Heating & Cooling circuit #2 PT1000 inflow
I4	A4	3 4	Pt1000	T4	Heating & Cooling circuit #2 PT1000 outflow
I5	A5	3 4	Pt1000	T5	Heating & Cooling circuit #3 PT1000 inflow
I6	A6	3 4	Pt1000	T6	Heating & Cooling circuit #3 PT1000 outflow
I7	A7	3 4	Pt1000	T7	Hydraulic separator PT1000 inflow
I8	A8	3 4	Pt1000	T8	Hydraulic separator PT1000 outflow



Table 8: LPC-2.A05 #1 Analog IN/OUT control signals

Jumper		I/O type according to jumper position		I/O device designation	I/O description
		1 4	3 4		
IO1	B1	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P1	Heating & Cooling circuit #1 Circulation pump
IO2	B2	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	V1	Heating & Cooling circuit #1 Mixing valve
IO3	B3	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P2	Heating & Cooling circuit #2 Circulation pump
IO4	B4	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	V2	Heating & Cooling circuit #2 Mixing valve
IO5	B5	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P3	Heating & Cooling circuit #3 Circulation pump
IO6	B6	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	V3	Heating & Cooling circuit #3 Mixing valve
IO7	B7	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P4	Hydraulic separator Circulation pump
IO8	B8	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P5	Heat source #1 Circulation pump



Table 9: LPC-2.A05 #2 Analog IN

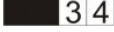
	Jumper	Jumper position	Input type	Input device designation	Input description
I1	A1		Pt1000	T9	Hot water storage tank PT1000 - Temp #1
I2	A2		Pt1000	T10	Hot water storage tank PT1000 - Temp #2
I3	A3		Pt1000	T11	Hot water storage tank PT1000 - Temp #3
I4	A4		Pt1000	T12	Hot water storage tank PT1000 - Temp #4
I5	A5		Pt1000	T13	Heat source #1 PT1000 - Temp #1
I6	A6		Pt1000	T14	Heat source #2 PT1000 - Temp #1
I7	A7		Pt1000	T15	Domestic hot water tank PT1000 - Temp #1
I8	A8		Pt1000	T16	Domestic hot water tank PT1000 - Temp #2

Table 10: LPC-2.A05 #2 Analog IN/OUT 1..4 control signals

	Jumper	I/O type according to jumper position		I/O device designation	I/O description
					
IO1	B1	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P6	Heat source #2 Circulation pump
IO2	B2	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	P7	Domestic hot water tank Circulation pump
IO3	B3	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	/	Spare
IO4	B4	Voltage analog output 0 .. 10 V	Current analog output 0 .. 20 mA or PWM output	/	Spare

Table 11: LPC-2.A05 #2 Analog IN/OUT 5..8

	Jumper	Jumper position	I/O type	I/O device designation	I/O description
IO5	B5		Pt1000	T17	Outdoor temp - PT1000
IO6	B6		Pt1000	T18	Indoor temp #1 - PT1000
IO7	B7		Pt1000	T19	Indoor temp #2 - PT1000
IO8	B8		Pt1000	T20	Indoor temp #3 - PT1000



**Table 12: X0.1**

Terminal designation	Terminal type	I/O device designation	I/O description
X0.1:1	24 VDC	T#1_DI_24V	Indoor temp #1 - DI8
		Spare	Spare
X0.1:2	24 VDC	T#2_DI_24V	Indoor temp #2 - DI9
		Spare	Spare
X0.1:3	24 VDC	T#3_DI_24V	Indoor temp #3 - DI10
		Spare	Spare
X0.1:4	24 VDC	Spare	Spare
		/	/
X0.1:5	24 VDC	Spare	Spare
		/	/
X0.1:6	24 VDC	Spare	Spare
		/	/
X0.1:7	24 VDC	Spare	Spare
		/	/
X0.1:8	24 VDC	Spare	Spare
		/	/

Table 13: X0.2

Terminal designation	Terminal type	I/O device designation	I/O description
X0.2:1	GND reference point	T1	Heating & Cooling circuit #1 PT1000 inflow
		/	/
X0.2:2	GND reference point	T2	Heating & Cooling circuit #1 PT1000 outflow
		P1	Heating & Cooling circuit #1 Circulation pump
X0.2:3	GND reference point	T9	Hot water storage tank PT1000 - Temp #1
		V1	Heating & Cooling circuit #1 Mixing valve
X0.2:4	GND reference point	T10	Hot water storage tank PT1000 -Temp #2
		P2	Heating & Cooling circuit #2 Circulation pump
X0.2:5	GND reference point	T3	Heating & Cooling circuit #2 PT1000 inflow
		V2	Heating & Cooling circuit #2 Mixing valve



Table 13: X0.2

X0.2:6	GND reference point	T4	Heating & Cooling circuit #2 PT1000 outflow
		P3	Heating & Cooling circuit #3 Circulation pump
X0.2:7	GND reference point	T11	Hot water storage tank PT1000 - Temp #3
		V3	Heating & Cooling circuit #3 Mixing valve
X0.2:8	GND reference point	T12	Hot water storage tank PT1000 - Temp #4
		P4	Hydraulic separator Circulation pump
X0.2:9	GND reference point	T5	Heating & Cooling circuit #3 PT1000 inflow
		P5	Heat source #1 Circulation pump
X0.2:10	GND reference point	T6	Heating & Cooling circuit #3 PT1000 outflow
		/	/
X0.2:11	GND reference point	T13	Heat source #1 PT1000 - Temp #1
		/	/
X0.2:12	GND reference point	T14	Heat source #2 PT1000 - Temp #1
		/	/
X0.2:13	GND reference point	T7	Hydraulic separator PT1000 inflow
		/	/
X0.2:14	GND reference point	T8	Hydraulic separator PT1000 outflow
		P6	Heat source #2 Circulation pump
X0.2:15	GND reference point	T15	Domestic hot water tank PT1000 - Temp #1
		P7	Domestic hot water tank Circulation pump
X0.2:16	GND reference point	T16	Domestic hot water tank PT1000 - Temp #2
		Spare	Spare
X0.2:17	GND reference point	T17	Outdoor temp PT1000
		Spare	Spare
X0.2:18	GND reference point	T18	Indoor temp #1 PT1000
		/	/



**Table 13: X0.2**

X0.2:19	GND reference point	T19	Indoor temp #2 PT1000
		/	/
X0.2:20	GND reference point	T20	Indoor temp #3 PT1000
		/	/
X0.2:A	RS-485 A Modbus RTU	Spare	Modbus RTU slave device SHC extension cabinet
X0.2:B	RS-485 B Modbus RTU	Spare	Modbus RTU slave device SHC extension cabinet



Figure 6: SHC-002 inside, power section

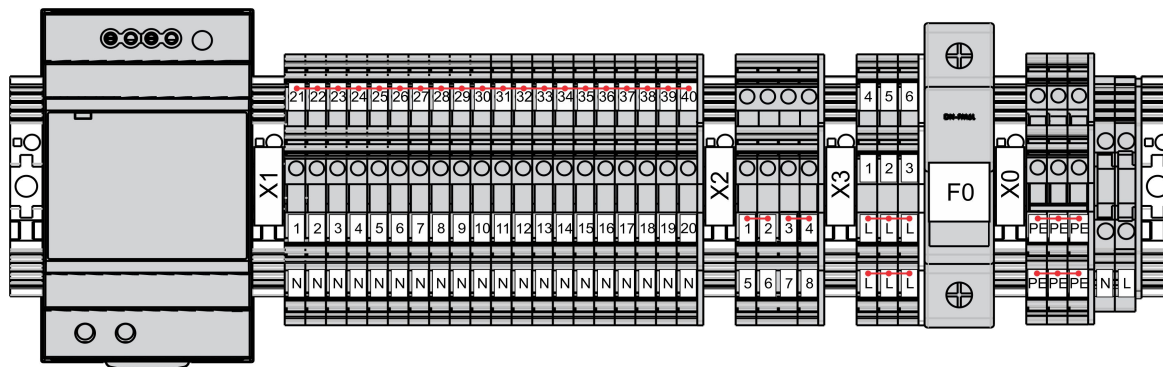


Table 14: X1

Terminal designation	Terminal type	I/O device designation	I/O description
X1:1	0..230 V AC - Line	P1	Heating & Cooling circuit #1 Circulation pump Optionally - External safety thermostat
X1:2	0..230 V AC - Line	P1	Heating & Cooling circuit #1 Circulation pump Optionally - External safety thermostat
X1:3	0..230 V AC - Line	V1 - L1	Heating & Cooling circuit #1 Mixing valve
X1:4	0..230 V AC - Line	V1 - L2	Heating & Cooling circuit #1 Mixing valve
X1:5	0..230 V AC - Line	P2	Heating & Cooling circuit #2 Circulation pump Optionally - External safety thermostat
X1:6	0..230 V AC - Line	P2	Heating & Cooling circuit #2 Circulation pump Optionally - External safety thermostat
X1:7	0..230 V AC - Line	V2 - L1	Heating & Cooling circuit #2 Mixing valve
X1:8	0..230 V AC - Line	V2 - L2	Heating & Cooling circuit #2 Mixing valve
X1:9	0..230 V AC - Line	P3	Heating & Cooling circuit #3 Circulation pump Optionally - External safety thermostat
X1:10	0..230 V AC - Line	P3	Heating & Cooling circuit #3 Circulation pump Optionally - External safety thermostat
X1:11	0..230 V AC - Line	V3 - L1	Heating & Cooling circuit #3 Mixing valve
X1:12	0..230 V AC - Line	V3 - L2	Heating & Cooling circuit #3 Mixing valve



Table 14: X1

X1:13	0..230 V AC - Line	P4	Hydraulic separator Circulation pump
X1:14	0..230 V AC - Line	L1	Heat source #1 Turning ON
X1:15	0..230 V AC - Line	P5	Heat source #1 Circulation pump
X1:16	0..230 V AC - Line	L2	Heat source #2 Turning ON/valve
X1:17	0..230 V AC - Line	P6	Heat source #2 Circulation pump
X1:18	0..230 V AC - Line	L3	Divert module #1
X1:19	0..230 V AC - Line	L4	Divert module #2
X1:20	0..230 V AC - Line	P7	Domestic hot water tank Circulation pump
X1:21	Neutral	P1	Heating & Cooling circuit #1 Circulation pump
X1:22	Neutral	/	Spare
X1:23	Neutral	V1	Heating & Cooling circuit #1 Mixing valve
X1:24	Neutral	/	Spare
X1:25	Neutral	P2	Heating & Cooling circuit #2 Circulation pump
X1:26	Neutral	/	Spare
X1:27	Neutral	V2	Heating & Cooling circuit #2 Mixing valve
X1:28	Neutral	/	Spare
X1:29	Neutral	P3	Heating & Cooling circuit #3 Circulation pump
X1:30	Neutral	/	Spare
X1:31	Neutral	V3	Heating & Cooling circuit #3 Mixing valve
X1:32	Neutral	/	Spare
X1:33	Neutral	P4	Hydraulic separator Circulation pump
X1:34	Neutral	L1	Heat source #1 Turning ON
X1:35	Neutral	P5	Heat source #1 Circulation pump
X1:36	Neutral	L2	Heat source #2 Turning ON/valve
X1:37	Neutral	P6	Heat source #2 Circulation pump
X1:38	Neutral	L3	Divert module #1
X1:39	Neutral	L4	Divert module #2



**Table 14: X1**

X1:40	Neutral	P7	Domestic hot water tank Circulation pump
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Table 15: X2

Terminal designation	Terminal type	I/O device designation	I/O description
X2:1	voltage free contacts	S1	Heat source #1 Turning ON
X2:2	voltage free contacts	S1	Heat source #1 Turning ON
X2:3	voltage free contacts	S2	Heat source #2 Turning ON
X2:4	voltage free contacts	S2	Heat source #2 Turning ON
X2:5	voltage free contacts	S1	Heat source #1 Turning ON
X2:7	voltage free contacts	S2	Heat source #2 Turning ON

Table 16: X3 - Power supply input

Terminal designation	Terminal type	Input description
L1	0 .. 230 VAC - Line fused	Spare
L2	0 .. 230 VAC - Line fused	Spare
L4	0 .. 230 VAC - Line fused	Spare
L5	0 .. 230 VAC - Line fused	Spare

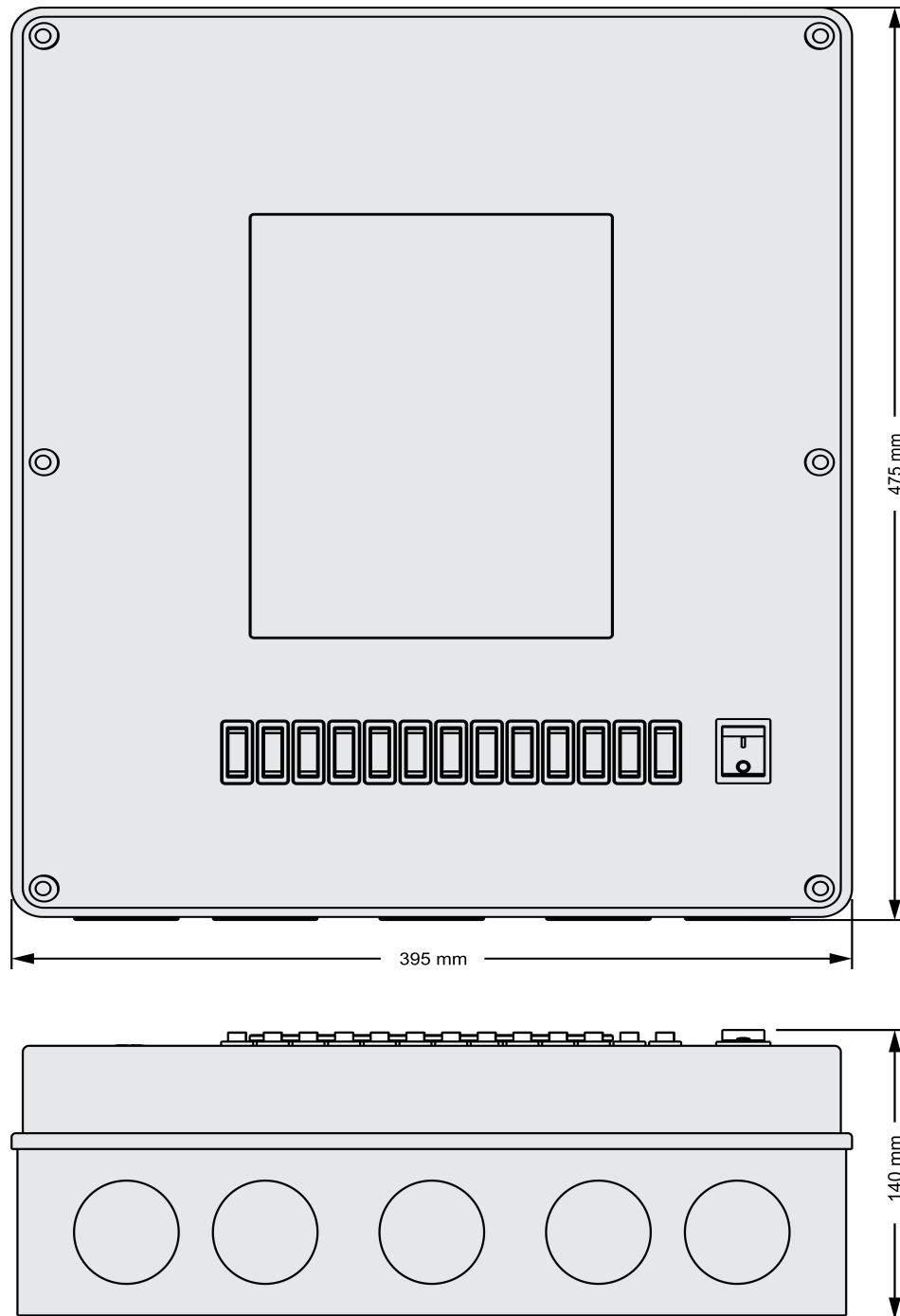
Table 17: X0 - Power supply input

Terminal designation	Terminal type	Input description
L	0 .. 230 VAC - Line	Power supply line
N	0 .. 230 VAC - Neutral	Power supply neutral
PE	Earth	Power supply earth



5.2 Mounting instructions

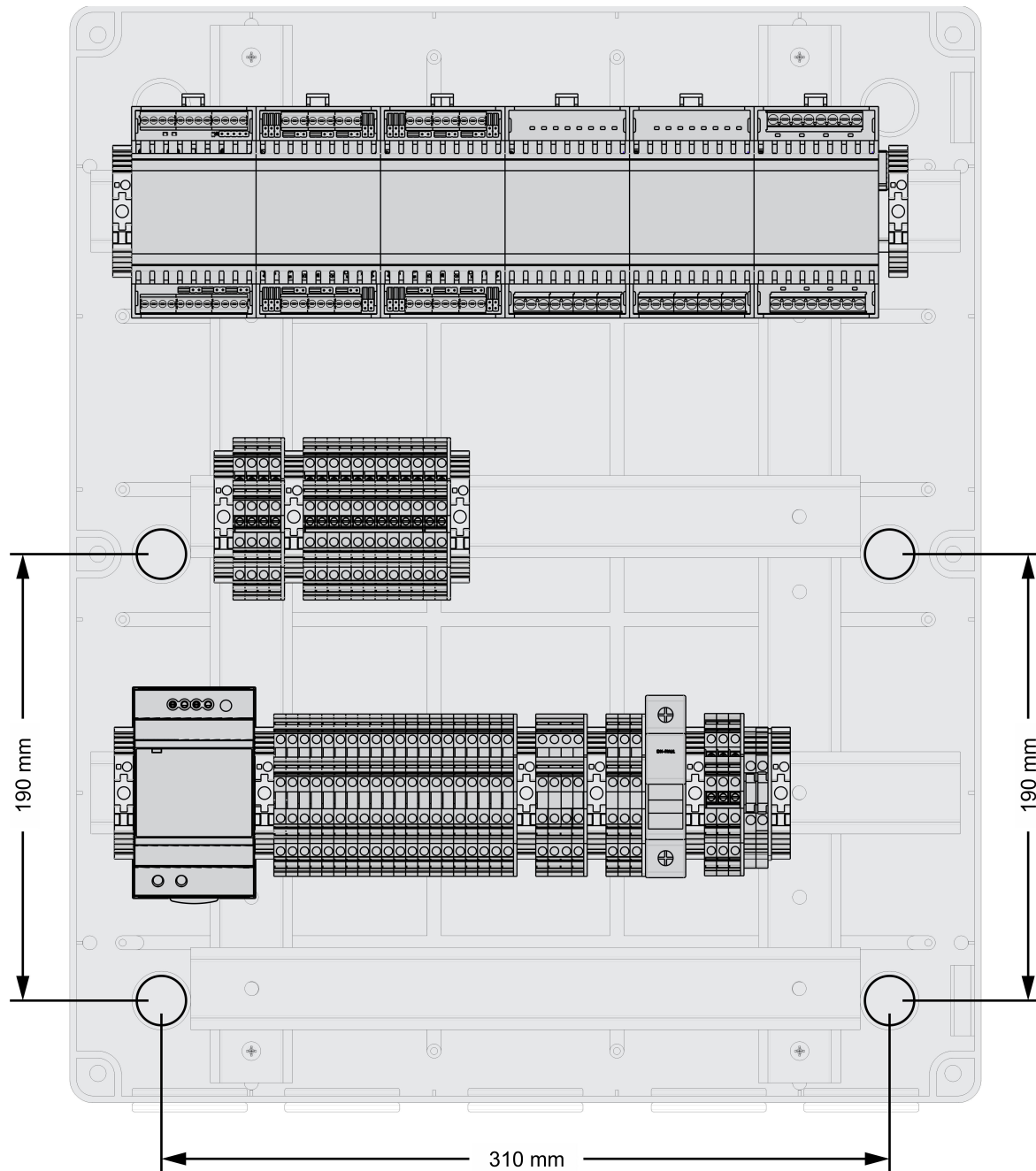
Figure 7: Housing dimensions



Dimensions in millimeters.



Figure 8: Mounting holes position



Dimensions in millimeters.





EXTERNAL SWITCH OR CIRCUIT-BREAKER AND EXTERNAL OVERCURRENT PROTECTION: The unit is allowed to be connected to installation with over current protection that has nominal value of 16 A or less.

RECOMMENDATION ON SWITCH OR CIRCUIT-BREAKER PROTECTION: There should be two poles main switch in the installation in order to switch off the unit. The switch should meet the requirements of standard IEC60947 and have a nominal value at least 16 A. The switch or circuit-breaker should be within easy reach of the operator. It should be marked as the disconnecting device for the equipment.

All connections, module attachments and assembling must be done while module is not connected to the main power supply.

Mounting instructions:

1. Switch OFF the main power supply.
2. Mount SHC-002 cabinet to the provided place.
3. Connect the cabinet main power supply.
4. Switch on the cabinet MAIN switch and after powering up the touch panel, set up the system that directly corresponds to the heating and cooling plant hydraulic layout.
5. Switch OFF the MAIN switch and the main power supply.
6. Wire and connect heating and cooling sources, regulating and ON/OFF valves, pumps, Hot water storage tank, sensors, etc. to the installed cabinet terminals.
7. Switch ON the main power supply and the MAIN switch.

NOTE: Signal wires must be installed separately from power and high voltage wires in accordance with general industry electrical installation standard.



6 TECHNICAL SPECIFICATIONS

Table 18: General technical specifications

Rated power supply	115/230 V AC, 50/60 Hz
Operational power supply	90 .. 264 V AC
Max. cabinet power consumption	30 W
Max. total power consumption	1300 W
Fuse	6 A, type C
Dimensions (L x W x H)	475 x 395 x 140 mm
Cabinet weight	6.2 kg
Ambient temperature	0 to 50 °C
Ambient humidity	max. 95 %, no condensation
Maximum altitude	2000 m
Mounting position	vertical
Transport and storage temperature	-20 to 60 °C
Pollution degree	2
Over-voltage category	II
Electrical equipment	Class II (double insulation)
Protection class	IP 30

Table 19: LPC-2.MU2 Technical specifications

Connection type	Screw type connector for max. wire cross section 1.5 mm ²
Digital input I8, I9, I10 threshold	ON: > 4 V OFF: < 1.5 V
Sensors input type I1, I2	Pt1000
Analog input I1, I2 measuring accuracy, Pt1000	± 1 °C
Analog input I1, I2 measuring temperature range	- 50 °C .. 300 °C

Table 20: LPC-2.A05 Technical specifications

Connection type	Screw type connector for max. wire cross section 1.5 mm ²
Pt1000 temperature measurement accuracy -20..250 °C	± 1 °C
Pt1000 temperature measurement accuracy on full range	± 2 °C
Max. output current per digital output	20 mA
Analog output accuracy of the full scale value	± 2 %



**Table 20: LPC-2.A05 Technical specifications**

Load resistance for analog outputs	$R > 500 \Omega$
Analog output range	0 .. 10 V
Max. transition time per channel	1 s

Table 21: X0 Technical specifications

Connection type	Screw type connector for max. wire cross section 2.5 mm ²
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Table 22: X1 Technical specifications

Connection type	Screw type connector for max. wire cross section 2.5 mm ²
Max. load per pump channel	200 W
Max. load per other channel (valve)	75 W

Table 23: X2 Technical specifications

Connection type	Screw type connector for max. wire cross section 2.5 mm ²
Type of output	relay make contacts (NO), non-protected
Max. current per channel	AC: 230 V, 3 A DC: 48 V, 1 A 30 V, 3 A
Min. permitted load per channel	100 mA at 5 V DC

Table 24: X3 Technical specifications

Connection type	Screw type connector for max. wire cross section 2.5 mm ²
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7 MODULE LABELING

Figure 9: Label

Label (sample):

XXX-N.ZZZ
P/N: AAABBBCCDDDEEE
S/N: SSS-RR-YYXXXXXXXXXX
D/C: WW/YY

Label description:

1. **XXX-N.ZZZ** - full product name.
 - **XXX-N** - Product family
 - **ZZZ** - product
2. **P/N: AAABBBCCDDDEEE** - part number.
 - **AAA** - general code for product family,
 - **BBB** - short product name,
 - **CCDDD** - sequence code,
 - **CC** - year of code opening,
 - **DDD** - derivation code,
 - **EEE** - version code (reserved for future HW and/or SW firmware upgrades).
3. **S/N: SSS-RR-YYXXXXXXXXXX** - serial number.
 - **SSS** - short product name,
 - **RR** - user code (test procedure, e.g. Smarteh person xxx),
 - **YY** - year,
 - **XXXXXXXXXX** - current stack number.
4. **D/C: WW/YY** - date code.
 - **WW** - week and
 - **YY** - year of production.

Optional

1. **MAC**
2. **Symbols**
3. **WAMP**
4. **Other**





8 SPARE PARTS

For ordering spare parts following part numbers should be used:

SHC-002 accessories and spare parts		
Item	Description	Part number
Temperature sensor PT1000-1CH	85°C, pipe surface temperature sensor	204PT1230CH001
Temperature sensor PT1000-1I	180°C , 6mm diameter, immersion temperature sensor	204PT12300I001
Temperature sensor PT1000-1C	85°C , 6mm diameter, immersion temperature sensor	204PT12300C001
Temperature sensor PT1000-2	Room temperature sensor, wall mounted	204PT223001001
Temperature sensor PT1000-2E	Outdoor temperature sensor, wall mounted	204PT22300E001
Touch panel 4,3" LPC-3.GOT.111	Room temperature panel, 4,3" touch panel, wall mounted, black	226GOT21111B04
Touch panel 4,3" LPC-3.GOT.111	Room temperature panel, 4,3" touch panel, wall mounted, white	226GOT21111W04





9 CHANGES

The following table describes all the changes to the document.

Date	V.	Description
05.11.2025	2	Figure 8 has been updated.
05.03.2025	1	The initial version, issued as <i>SHC-002 module UserManual</i> .





10 NOTES

