SMARTY R V

EN MOUNTING AND INSTALLATION INSTRUCTION

SALDA

www.salda.it

1. CONTENTS

2. SYMBOLS AND MARKING

Stick the auxiliary label on the unit (on an easily accessible place) or on the dashed place of a technical manual in order to keep the important information about the unit.

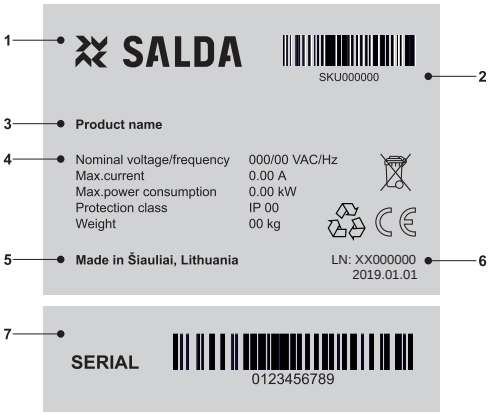


Figure 2.1 - Technical label

1 - Logo; 2 - Product code (SKU); 3 - Product name; 4 - Technical data; 5 - Production place; 6 - Batch number and production date; 7 - Serial number.

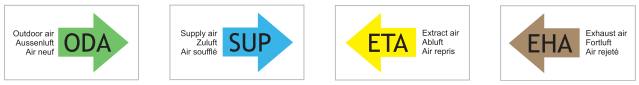


Figure 2.2 - Indication for duct connection.

Figure 2.3 - indication of kitchen hood

ODA - outdoor air; SUP - supply air; ETA - extract air; EHA - exhaust air.

3. SAFETY INSTRUCTIONS AND PRECAUTIONS

Read this instruction very carefully before installing and using this equipment. Installation, connection and maintenance should be carried out by a qualifed technician and in accordance with the local rules and legal acts.
The company shall take no responsibility for the injuries suffered by the people or for the damaged property, if the safety requirements are not followed or the device is modifed without the permission of the manufacturer.

⚠	**Warning – pay attention**
ℹ	**Additional information**

Main safety rules

Danger
- Before performing any electricity or maintenance tasks make sure, that the device is disconnected from the mains, that all moving parts of the device have stopped.
- Make sure that the fans can not be entered through air ducts or branch openings.
- If you notice liquids on electric parts or connections that bear voltage, stop the operation of the appliance.
- Do not plug the device into the mains, that differs from the one indicated on the label or on the housing.
- Voltage of the mains should comply with the electrotechnical parameters indicated on the label.
- The device should be earthed in accordance with the rules of installation of electric appliances. It is forbidden to turn on and use un-earthed device. Follow the requirements of the device's labels that indicate *Danger*.

Warnings
- Connection of electricity and maintenance of the device should be performed only by a qualified personnel, in accordance with the manufacturer's instructions and valid safety requirements.
- In order to reduce the risk during installation and maintenance, suitable protective clothes should be worn.
- Beware of sharp angles while performing installation and maintenance tasks.
- Do not touch heating elements until they haven't cooled down.
- Some devices are heavy, thus one should be very careful while transporting and installing. Use suitable lifting equipment.
- While connecting electricity to the mains a circuit breaker of suitable size is necessary.

Warning!
- If the device is installed in a cold environment, make sure that all connections and tubes are properly isolated. Intake and discharge air ducts should be isolated in all cases.
- Openings of the ducts should be covered during transportation and installation.
- Make sure not to damage the heater when connecting the piping of the water heater. For tightening up, use a wrench/spanner.

Before starting the equipment
- make sure, that there are no strange objects inside;
- manually check whether fans are not stuck or blocked;
- if rotary heat exchanger is installed in the device, make sure that it is not stuck or blocked;
- check the grounding;
- make sure that all components and accessories are connected in accordance with the project or provided instructions.

Danger: Fumes

Salda Antifrost system uses dis-balancing of the air flow and it may cause negative pressure in premises. Great care should be taken when using at the same time in premises as another heating appliance what depend on the air in premises. Such appliances include gas, oil, wood or coal-fired boilers and heaters, fireplaces, continuous flow or other water heaters, gas hobs, cookers or ovens which draw air in from the room and duct exhaust gases out through a chimney or extraction ducting. The heating appliance can be starved of oxygen, impairing combustion. In exceptional cases harmful gases could be drawn out of the chimney or extraction ducting back into the room. In this case we strictly recommend to turn off *Salda Antifrost* and use an external preheater for heat exchanger anti-frost protection (see *Salda Antifrost* function on the Remote controller manual).

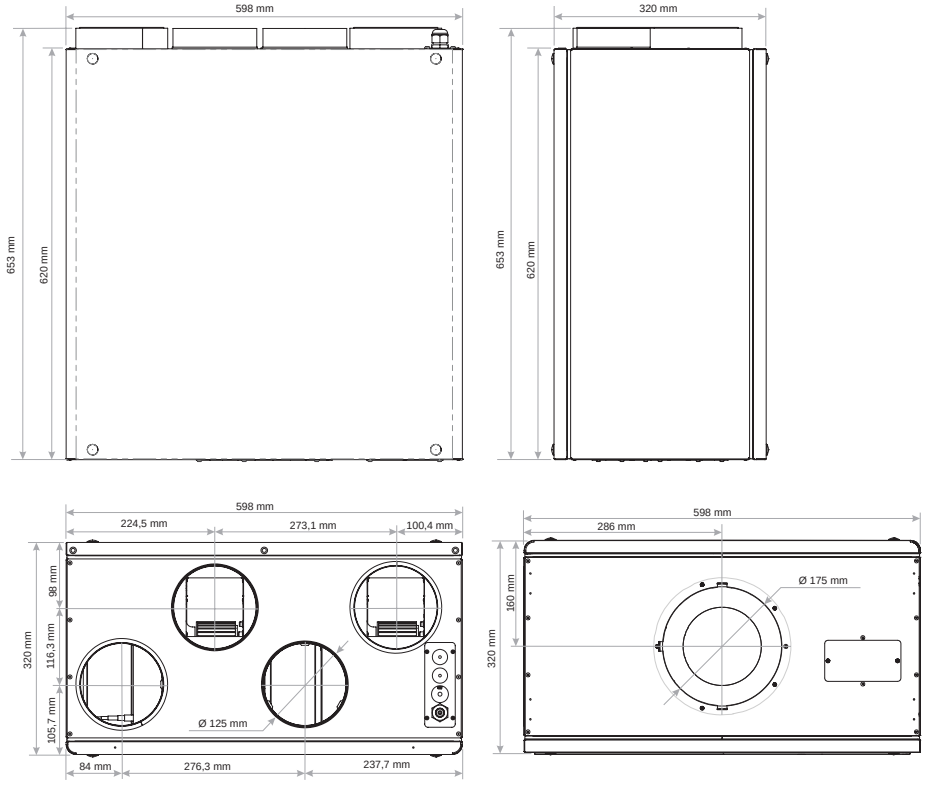
4. INFORMATION ABOUT THE PRODUCT

4.1. DESCRIPTION

HRU Residential is a residential air handling unit with a high efficiency (up to 75 %) rotor heat exchanger with integrated electrical heater. The unit provides ventilation in the home and takes the heat from the exhausted air. AHU complies with ErP 2018 requirements. The unit is operated by a separate remote control panel or though separate MB-Gateway by PC. Remote control panel and MB-Gateway are optional and not included in standard package.
HRU Residential operates within the limits of the airflow diagrams and is suitable for indoor operation only. Required ambient temperatures must be from -20 °C to +40 °C. For the cold climate zones (air temperatures below -20 °C), optional pre-heater is required.

Unsuitable for operation in pools, saunas and other similar premises.

4.2. DIMENSIONS AND WEIGHT



SMARTY		2R VER	2R VER PLUS
m	[kg]	36	36

4.3. TECHNICAL DATA

SMARTY		2R VER	2R VER PLUS
Heat exchange			
- phase/voltage	[f/VAC/Hz]	~1/230/50	~1/230/50

- power/current	[kW/A]	0,006/0,1	0,006/0,02
-thermal efficiency up to		75%	75%
Heater			
- power/current	[kW/A]	0,6/2,61	0,6/2,61
Exhaust air fan			
- phase/voltage	[f/VAC/Hz]	~1/230/50	~1/230/50
- power/current	[kW/A]	0,07/0,6	0,084/0,75
- speed	[min^{-1}]	1380	3200
- protection class		IP44	IP54
- control imput	[VDC]	0-10	0-10
Supply air fan			
- phase/voltage	[f/VAC/Hz]	~1/230/50	~1/230/50
- power/current	[kW/A]	0,07/0,6	0,084/0,75
- speed	[min^{-1}]	1380	3200
- protection class		IP44	IP54
- control imput	[VDC]	0-10	0-10
Total			
- power/current	[kW/A]	0,75/3,91	0,77/4,13
Automatic control integrated		+	+
Insulation of walls	[mm]	20	20
Weight	[kg]	36	36
Exhaust air filter			
class class		ePM10 55%	ePM10 65%
width	[mm]	270	270
height	[mm]	86	85
depth	[mm]	46	173
model		MPL	FMK
Supply air filter			
class		ePM10 55%	ePM10 65%
width	[mm]	270	270
height	[mm]	86	85
depth	[mm]	46	173
model		MPL	FMK

SMARTY 2R VER	**LWA TOTAL, DB(A)**	**LWA, DB(A)**							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Outdoor	62	22	54	61	48	41	27	20	14
Supply	70	29	61	68	59	60	55	49	43
Extract	62	22	54	61	49	36	28	19	14
Exhaust	69	28	60	67	58	58	52	48	41
Surrounding	49	10	40	48	36	31	30	30	29
Measured at 140 m^3/h, 50 Pa									

SMARTY 2R VER PLUS	**LWA TOTAL, DB(A)**	**LWA, DB(A)**							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Outdoor	60	18	50	58	55	44	28	16	12
Supply	66	23	55	63	61	56	55	48	40
Extract	60	19	50	58	54	40	35	24	17
Exhaust	66	23	55	62	60	56	53	46	36
Surrounding	48	3	34	44	45	32	31	30	29
Measured at 180 m^3/h, 50 Pa									

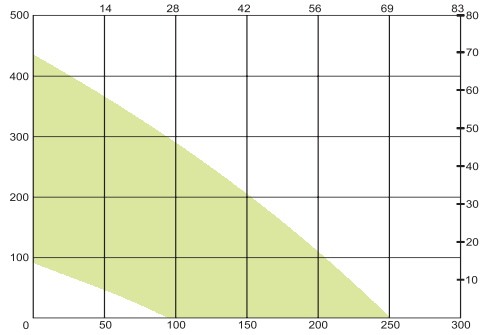
NOTE. Subject to technical modification

4.3.1. AIR FLOW DIAGRAMS

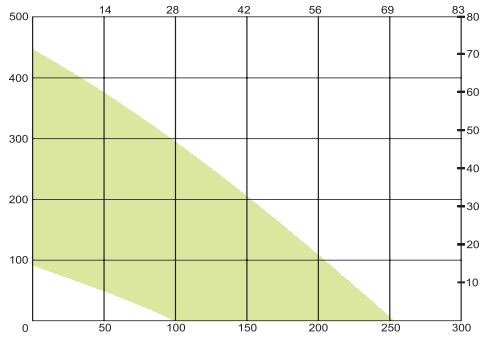
——— Performance
— — Power consumption

SMARTY 2R VER

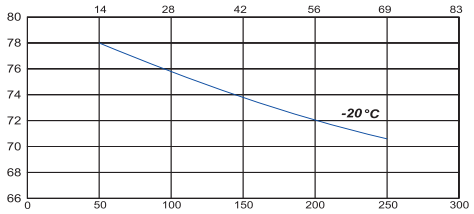
Supply air



Exhaust air

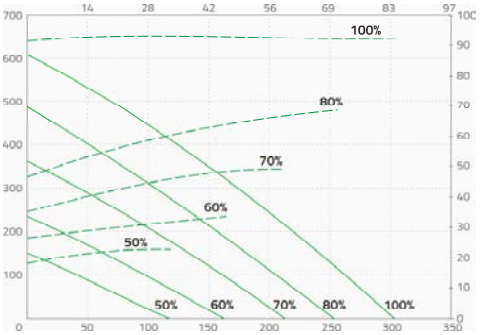


Temperature efficiency

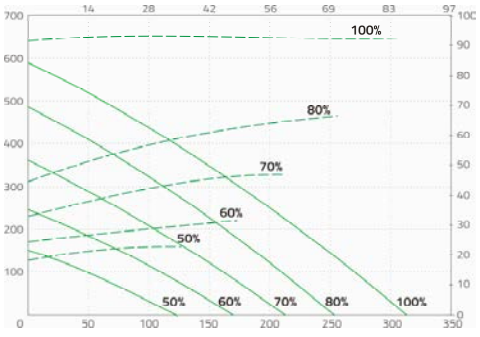


SMARTY 2R VER PLUS

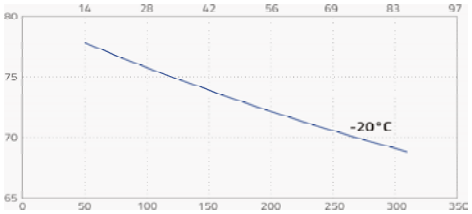
Supply air



Exhaust air



Temperature efficiency



Temperature efficiency (balanced mass flow):
Extract air = - 20 °C / 90 % RH

4.4. OPERATING CONDITIONS

- Unit is designed to operate only indoors.
- It is forbidden to use the unit in potentially explosive environment.
- Unit is designed to supply/extract only clean air (free of chemical compounds causing metal corrosion, of substances aggressive to zinc, plastic and rubber, and of particles of solid, adhesive and fibred materials).

OUTDOOR AIR			EXTRACT AIR		
- temperature min./max.*	[°C]	-23 / +40	- temperature min./max.*	[°C]	+15 / +40
- humidity	[%]	90	- max. humidity	[%]	60

*** Can be used at temperatures below -23 °C with pre-heater, the power of which is over 600W.**

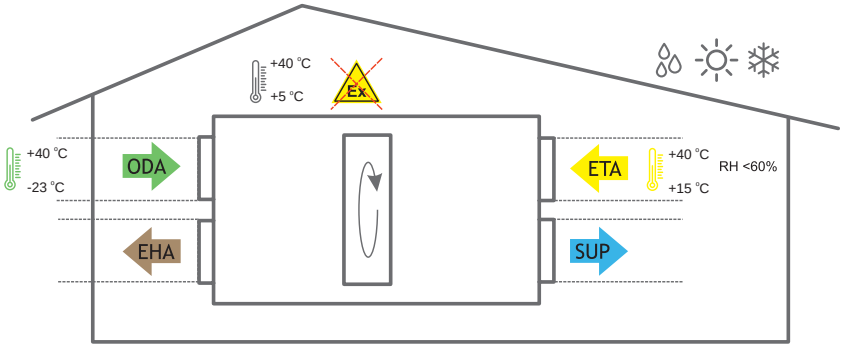


Figure 5.4.1 - operating conditions

4.5. STANDARD PACKAGE OF COMPONENTS

Standard package (without optional accessories) includes:

- Mounting brackets (mural and unit parts), Rubber seal for vibration damping.
- Screws M5x25 DIN7985 CT for mounting brackets - 3 pcs.; 5. Spring washers DIN127 5 - 3 pcs.
- Bushing caps - 8 pcs.
- Antivibration stick - 2 pcs.
- Key - 1 pcs.

4.6. DESCRIPTION OF COMPONENTS

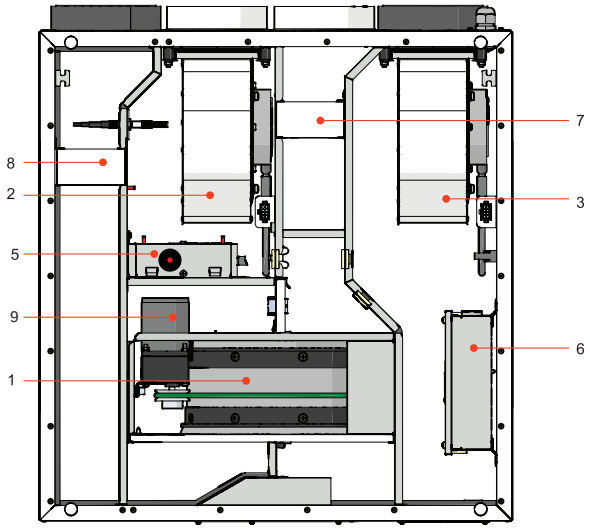


Figure 5.3.1 - Smarty 2R VER construction

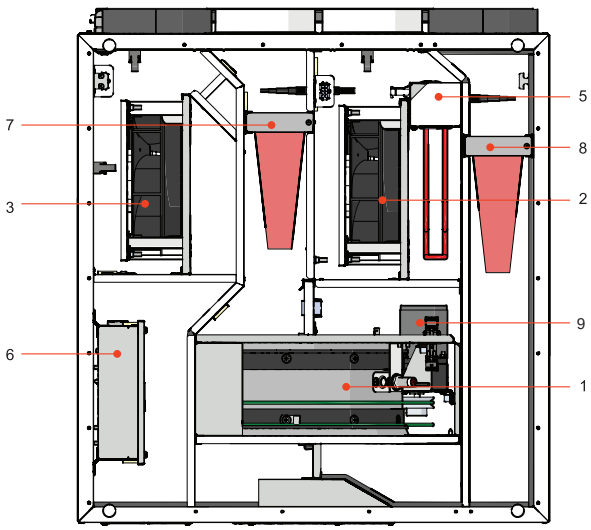


Figure 5.3.2 - Smarty 2R VER plus construction

1 - Plate/rotor heat exchanger; 2 - Supply fan; 3 - Exhaust fan; 4 - By-pass damper*; 5 - Electrical/water heater/pre-heater; 6 - Control board; 7 - Extract air filters (panel/pocket); 8 - Supply air filter (panel/pocket); 9 - Rotor motor.*

4.7. SPARE PARTS

Rotor belt

Door

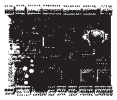
Rotor motor

Fan

Fan

Rotor box

TJ



MCB

Hall H1A-D12P24-1

SRR 0,6-1f EC-1k

SRR V-0,6-1f

TL/TA

Rotor box belt	**Rotor belt**	GNG00062
Smarty 2R VE door	**Door**	GNG00061
Rotor box motor	**Rotor motor**	ZVAR0133
Fan supply/exhaust	**Fan** (Smarty 2R VER)	GPUVRA009
	Fan (Smarty 2R VER plus)	GVESMARTY001
Rotor box	**Rotor box**	GPURSD085_330
Temperature sensor 3 m	**TJ**	PJUT0063
Temperature sensor 1,5 m	**TL/TA**	PJUT0062
Controler	**MCB V1.0**	ZED00985
Hall sensor	**Hall H1A-D12P24-1**	PJUT0006
Electrical heater	**SRR 0,6-1f EC-1k** (Smarty 2R VER)	ZESSRR028
	SRR V-0,6-1f (Smarty 2R VER plus)	ZESSRR032

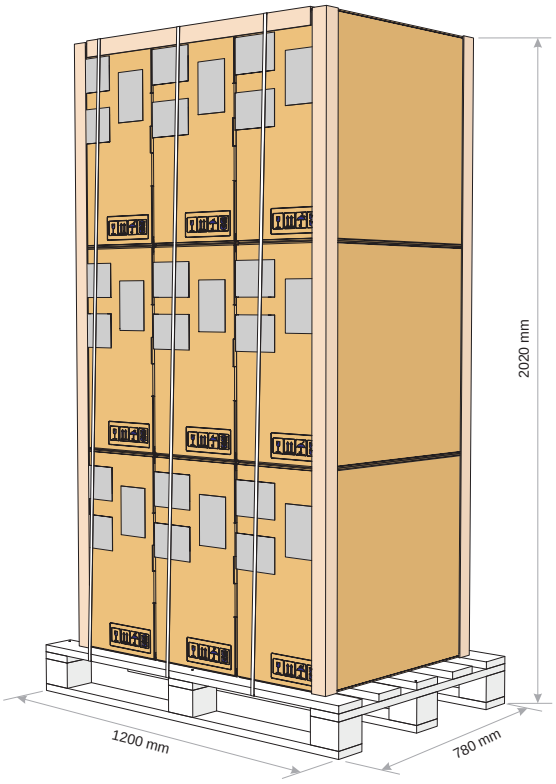
5. INSTALATION

5.1. RECEPTION OF GOODS

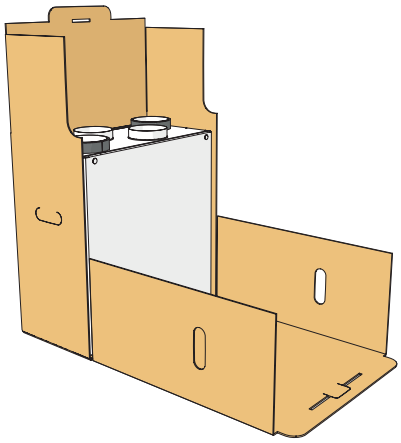
Each device is thoroughly checked before transportation. When receiving goods it is recommended to check whether devices were damaged during transportation. If damage to the device is identified, immediately inform the representatives of a transport company. Please inform a representative of the manufacturer, if any deviation from the order is noticed.

5.2. TRANSPORTATION AND STORAGE

- All units are packed in the factory to withstand regular conditions of transportation.
- Upon unpacking, check the unit for any damages caused during transportation. It is forbidden to install damaged units!!!
- **The package is only for protection purpose!**
- While unloading and storing the units, use suitable lifting equipment to avoid damages and injuries. Do not lift units by holding on power supply cables, connection boxes, air extract or exhaust flanges. Avoid hits and shock overloads. Before installation units must be stored in a dry room with the relative air humidity not exceeding 70% (at +20 °C) and with the average ambient temperature ranging between +5 °C and +30 °C. The place of storage must be protected against dirt and water.
- The units must be transported to the storage or installation site using forklifts.
- The storage is not recommended for a period longer than one year. In case of storage longer than one year, before the installation it is necessary to verify whether the bearings of fans and motor rotate easily (turn the impeller by hand) and if the electric circuit insulation is not damaged or the moisture is accumulated.



5.3. UNPACKING



5.4. MOUNTING DIAGRAM

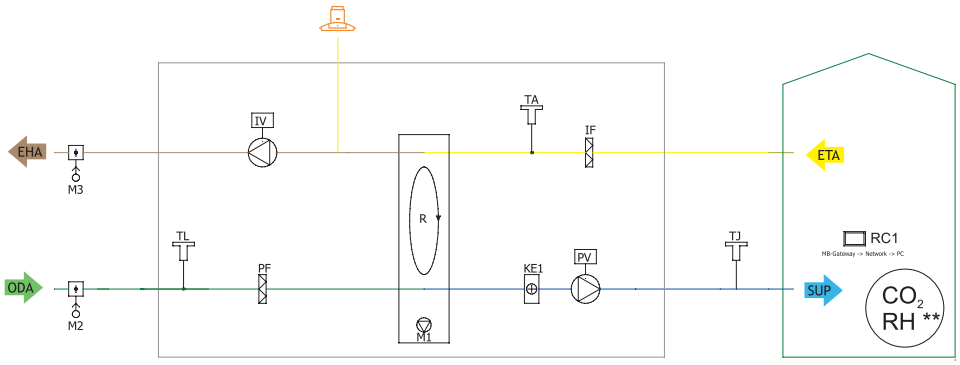


*Figure 5.4.1 - Smarty RV (** Only one sensor can be used at a time)*

Figure 5.4.2 - Indication for duct connection.

Figure 5.4.3 - Ventilated premises

Figure 5.4.4 - Air from cooing hood

LIST OF COMPONENTS

C	Plate heat exchanger	**A1**	Fire alarm damper actuator I
PV	Supply air fan	**A2**	Fire alarm damper actuator II
IF	Extract air filter	**TJ**	Supply air temperature sensor
PF	Supply air filter	**TL**	Outdoor air temperature sensor
IV	Exhaust fan	**TE**	Exhaust air temperature sensor
KE1	Electric heater	**DTJ**	Extract air temperature and RH sensor
PE1	Electric pre-heater	**T2**	Cooler changeover thermostat
KV2	Water pre-heater	**TV2**	Water preheater temperature sensor
KV3	Water cooler	**TV3**	Water cooler temperature sensor
DX	DX cooler	**U3**	PV pressure transmitter
M1	By-pass damper	**U4**	IV pressure transmitter
M2	Outdoor air damper actuator	**CO_2**	CO_2 sensor*
M3	Exhaust air damper actuator	**RH**	RH sensor*
M5	Water cooler valve motor	**PC**	Computer
M12	Water pre-heater valve actuator	**RC1**	Stouch or SA-Control remote control panel
M14	Water cooler circulation pump	**RC2**	Stouch, Flex or SA-Control remote control panel
M15	DX cooler valve actuator	**MB-Gateway**	Network module
M16	Water pre-heater circulation pump	**NET**	Network
R	Rotor heat exchanger		

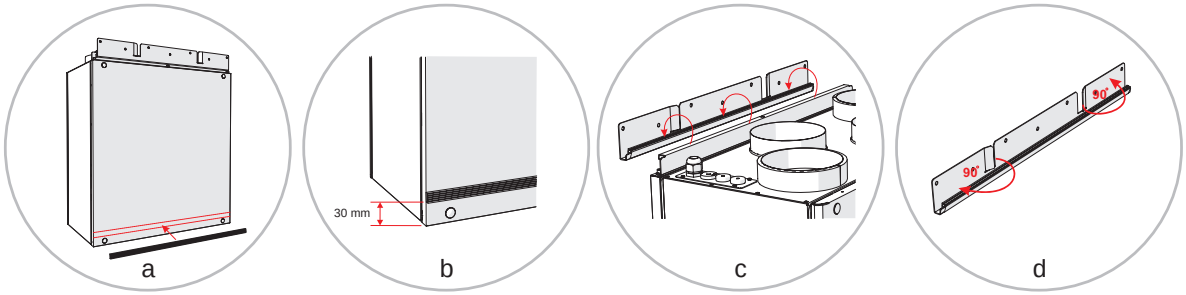
POSSIBLE PCB INPUTS/OUTPUTS			
FA	Fire alarm	**H1**	Working indication output
FPP	Fireplace protection	**H2**	Alarm indication output
System mode switch (START/STOP)		Fans speed switch (BOOST)	

* Compone

5.5. MOUNTING

- Installation should only be performed by qualified and trained staff.
- When connecting air ducts, consider the notices indicated on the casing of the unit.
- Before connecting to the air duct system, the connection openings of ventilation unit should be closed.
- Do not connect the bends close to connection flanges of the unit. The minimum distance of the straight air duct between the unit and the first branch of the air duct in the supply air duct must be 1xD, in air exhaust duct 3xD, where D is diameter of the air duct.
- It is recommended to use the accessories-holders. This will reduce vibration transmitted by the unit to the air duct system and environment.
- Enough space must be left for opening of the maintenance door and filter covers.
- If the installed ventilation unit is adherent to the wall, it may transmit noise vibrations to the premises. Though the level of noise caused by the fans is admissible, it is recommended to mount the unit at the distance of 400 mm from the nearest wall. If it is not possible, the mounting of the unit is recommended on the wall of the room where the level of noise is not important.
- Ducts are connected to the unit in such way that they could be easily disassembled and the heater could be removed from the unit when performing service or repair works.

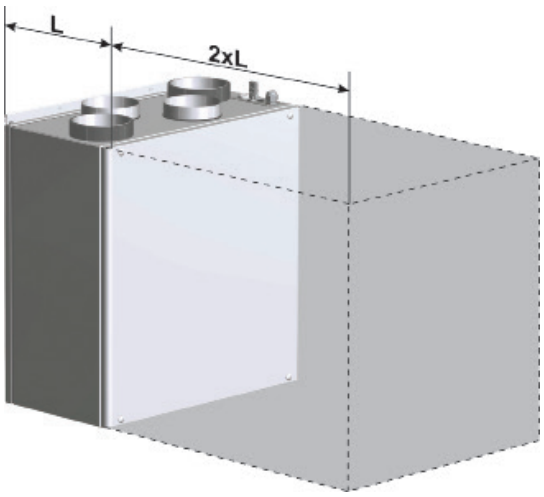
5.5.1. MOUNTING ON THE WALL



Mounting on the wall:
a) To reduce the vibration stick the insulating tape on the unit's casing side which touches the wall before mounting the unit on the wall.
b) The unit has to be mounted on the mounting brackets.
c) AHU mounting drawing.
d) After the unit is mounted two wall bracket tabs has to be folded to 90° angle by pliers to avoid the accident fall of the unit.

5.5.2. PLACE REQUIREMENTS FOR THE EQUIPMENT AND MOUNTING POSITIONS

1. The installation position only in the horizontal direction.
2. Install the supporting legs.
3. AmberAir Compact are assembled from separate sections.
4. They must be adjusted without a gradient.
5. Leave space in the front (2xL) that it would be sufficient to open the doors and to remove or install a required component.

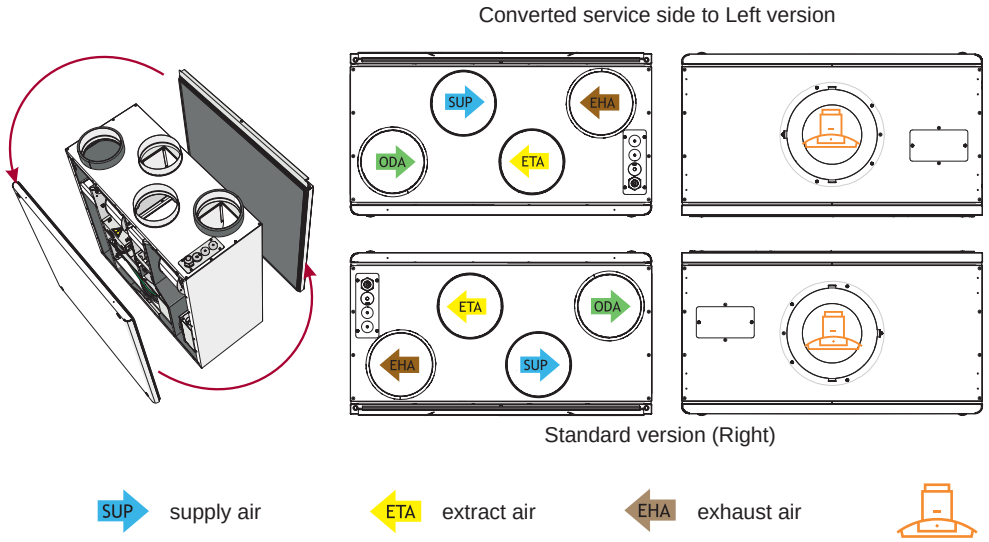


5.5.3. CONNECTION OF AIR DUCTS

• Connected air ducts must be straight and have their own fixing.
• Make sure that the fans can not be accessed through air duct heads. If it is possible to access the fan, protective grid should be installed. You can choose it in our website.
• Do not reduce the diameter of the piping near air inlet or exhaust ducts. If you want to reduce the speed of air in the system, drop of pressure and noise level, you can increase the diameter.
• In order to reduce the level of the noise in the air supply system, install silencers (see chapter on their installation).
• In order to reduce air loss in the system, the air ducts and profile parts should be of class C and higher. Their catalog can be found in our website.
• If air handling unit is installed in heated premises, outdoor and exhaust air ducts must be insulated in order to avoid heat loses and condensing. If AHU is installed outdoors, it's recommended to insulate all the air ducts.
• It is recommended to maintain a distance of up to 8 meters between air intake and air exhaust ducts. Air supplying system should be installed further from potential air pollution sources.
• Use holders while installing air ducts next to the ventilation equipment. They suppress vibration and ensure a firm installation of various system parts.
• Necessary holders can be found in our catalog or website.
• A common mistake is that air ducts are attached to improper airflow connection. On the ventilation equipment there are signs, indicating the air duct to be connected. Before starting the system carefully check whether the work was performed properly.

5.5.4. AIR FLOW

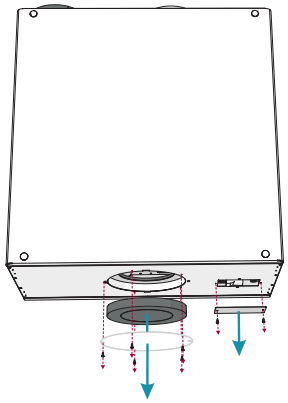
The maintenance side can be changed for the ventilation unit, i.e. it can be mounted with the left ambient air inlet or the right ambient air inlet. That can be implemented by switching over the back door and the front door. The default version of the ventilation unit is right.



ODA outdoor air SUP supply air ETA extract air EHA exhaust air kitchen hood

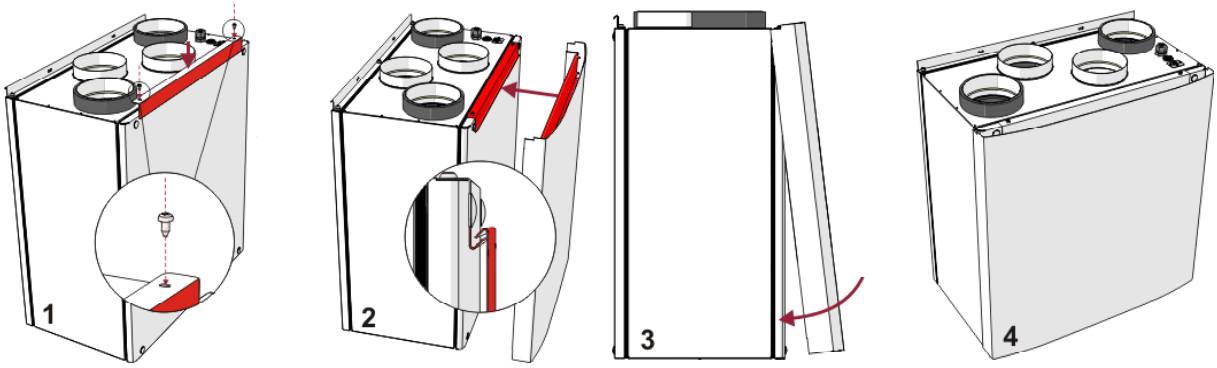
5.5.5. CONNECTION OF THE KITCHEN HOOD

- Installation works must be performed only by trained and qualified personnel.
- If you have any questions regarding the save installation and use of the product, please contact the manufacturer or the representative.
- Before installing the unit, unscrew the lid a covering the opening for connection of the kitchen hood and remove the middle part of the insulating ring.
- Cut the connecting opening as indicated on the insulation material.
- Carefully remove the lid, which covers the electric connection for the connection of the electrical part of the kitchen hood to the ventilation unit.
- Mount the hood to the ventilation unit. Fasten with self-tapping screws to the designated connection points.
- It is necessary to ensure the tight and reliable connection of the air ducts of the kitchen hood to the ventilation unit and the electrical contact of the control circuit.
- The subsequent installation of the device is performed according the description in chapter "Mechanic installation".
- Properties, assembly, control, use and maintenance of the kitchen hood are described in its instalation manual.



Use cooker hood supplied by our company only. Equipment is not tested with other cooker hoods and company holds no responsibility for malfunction or failures of the equipment in this case.

5.5.6. SHIELD INSTALLATION



5.6. CONNECTION OF THE UNIT TO ELECTRIC NETWORK

- Supply voltage to the unit must be connected by a qualified specialist following the manufacturer's instructions and effective safety instructions.
- The unit's power network voltage must correspond to electrotechnical parameters of the unit indicated in the technical decal.
- The unit's voltage, power and other technical parameters are provided in the unit's technical decal (on the unit casing). The unit must be connected to the voltage plug socket of the grounded power network in compliance with the effective requirements.
- The unit must be earthed according to the rules on installing electrical equipment.
- It is prohibited to use extension wires (cables) and power network plug socket distribution devices.
- Prior to carrying out any ventilation unit installation and connection activities (until its hand-over to the customer), the unit must be disconnected from the power network.
- After installation of the ventilation unit, the power network plug socket must be accessible at any time and disconnection from the power network is performed through the two-pole circuit breaker (by disconnecting phase pole and neutral).
- The unit must be thoroughly checked against damages (execution, control, measurement nodes) during transportation before it is connected to the power network.
- The power cable can be replaced only by a qualified specialist upon the evaluation of the rated power and current.

The manufacturer does not assume any liability for personal injuries and property damage due to non-conformance with the provided instructions.

5.7. START-UP RECOMMENDATIONS

5.7.1. SYSTEM PROTECTION

Control system of the unit has an integrated protection against short-circuit for these functional components. The controllers have the following protections:

MCB

F1, F2 - 1A(5x20) MCB protection

To ensure safe maintenance of the unit, it is necessary to remove the plug from the power network.

5.7.2. PRE-STARTUP RECOMENDATIONS OF THE UNIT (IN THE PRESENCE OF THE ENDUSER)

Prior to start-up the system must be thoroughly cleaned. Check whether:
- operation systems and unit elements as well as automation and automation devices were not damaged during installation,
- all consumers are connected to power supply and fit for service,
- all necessary automation elements are installed and connected to power supply and MCB terminal blocks,
- cable connection to MCB terminal blocks comply with the existing power connection diagrams,
- all electrical equipment protection elements are properly connected (if they are additionally used),
- cables and wires correspond to all applicable safety and functional requirements, diameters, etc.,
- earthing and protection systems are properly installed,
- condition of all seals and sealing surfaces is proper.

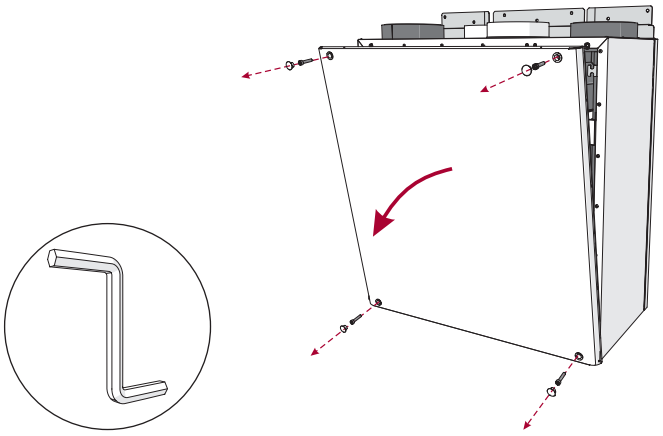
6. MAINTENANCE

⚠ **Unplug unit from mains before opening the door (disconnect the power plug from the outlet or if there is a two-pole automatic circuit breaker installed – disconnect it as well. It is necessary to ensure that it won't be turned on by third parties) and wait until the full stop of the fans (for about 2 min.).**

6.1. SAFETY INSTRUCTION

- Do not use the unit for purposes other than its' intended.
- Do not disassemble or modify the unit in any way which may lead to mechanical failure or injury.
- Use special clothing and be careful while performing maintenance and repair jobs – the unit's and its components' edges may be sharp and cutting.
- Do not wear loose clothing that could be entangled in to operating unit.
- If a outside object enters the unit, immediately disconnect power source. Before removing object, make sure that any mechanical motion has stopped, the heater has cooled down and the restart is not possible.
- Do not connect to any other power source than indicated on the model label.
- Do not place or operate unit on unsteady surfaces and mounting frames.
- Mount the unit firmly to ensure safe operating.
- Never use this unit in the environment containing any explosive or aggressive elements.
- Do not use the unit if external connections are broken or damaged. If there are any defects, stop operating the unit and replace the damaged parts immediately. That can be performed only by qualified electrician.
- Do not use water or another liquid to clean electrical parts or connections.
- If you notice condensat on electrical parts or connections, stop operating the unit.

6.2. COVER OPENING



6.3. FILTERS MAINTENANCE

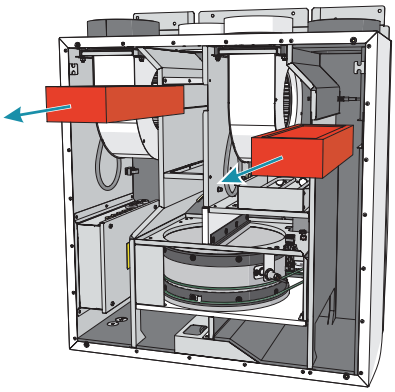


Figure 6.3.1 - Smarty 2R VER

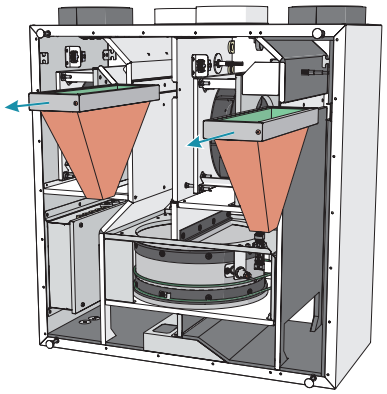


Figure 6.3.2 - Smarty 2R VER plus

Dirt increases air resistance in the filter, therefore less air is supplied into the premises.

Taking off the filters:

- Open cover.
- Remove the filter.

Changing filters, filters reload timer control. Description of remote control panel functions is provided in the remote control panel technical documentation or on the website www.salda.lt.
Allowed to operate the unit without filters!

It is recommended to change the filters every 3-4 months, or in accordance to filter timer.

6.4. FANS MAINTENANCE

- Maintenance should be performed only by experienced and trained staff.
- The fan should be inspected and cleaned at least once a year.
- Be sure the fan is disconnected from power source before performing any maintenance or repair.
- Proceed to maintenance and repair after any rotation in the fan is stopped.
- Observe staff safety regulations during maintenance and repair.
- The motor is of heavy duty ball bearing construction. The motor is completely sealed and requires no lubrication for the life of the motor.
- Detach fan from the unit.
- Impeller should be specially checked for buil-up material or dirt which may cause an imbalance. Excessive imbalance can lead to accelerated wear on motor bearings and noise, vibration.
- Clean impeller and inner housing with mild detergent, water and damp, soft cloth.
- Do not use high pressure cleaner, abrasives, sharp instruments or caustic solvents that may scratch or damage housing and impeller.
- Do not plunge the motor into any fluid while cleaning impeller.
- Make sure, that impeller's balance weights are not moved.
- Make sure the impeller is not hindered.
- Mount the fan back into the unit. Connect the fan to power supply source.
- If after maintenance the fan does not start or stop itself, contact the producer. Malfunction of the fan can be identified according to the pressure in the system (when pressure switches are connected). When there is a fault in fans' motor, any separate notice is shown on the control panel.

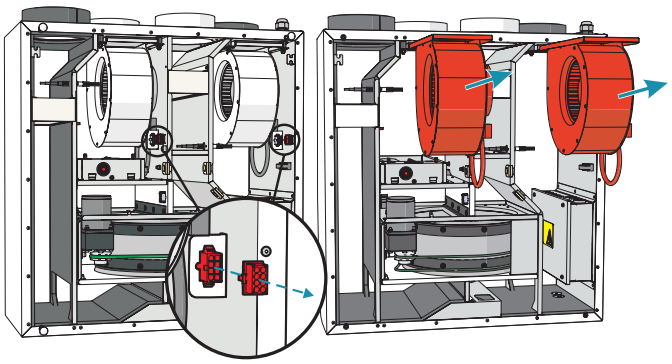


Figure 6.4.1 - Smarty 2R VER

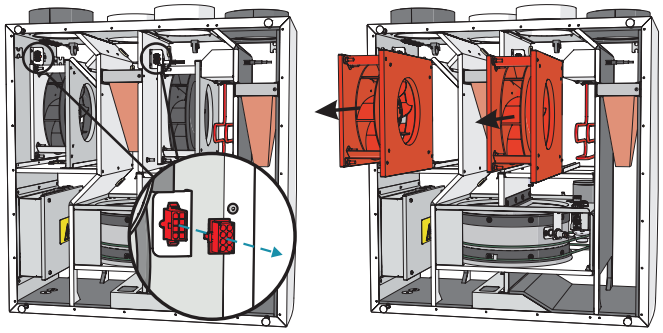


Figure 6.4.2 - Smarty 2R VER plus

Be sure the unit is disconnected from power source before performing any maintenance or repair.

6.5. HEATER MAINTENANCE

- Electrical heater does not need to be serviced additionally. It is compulsory to change fi lters as described above.
- Heaters have 2 thermal protections: automatically self-resetting, which activates at +50°C and the manually restored, which activates at +100°C.
- After the activation of the manually restored protection, the unit must be disconnected from the power supply. Wait until the heating elements cool down and the fans stop rotating. After identifying and removing the reason of failure, to start the unit, press the “reset” button. The failure can be identified only by a qualified professional.
- If necessary, the electric heater can be removed. Disconnect the electrical connector from the heater and remove the heater.

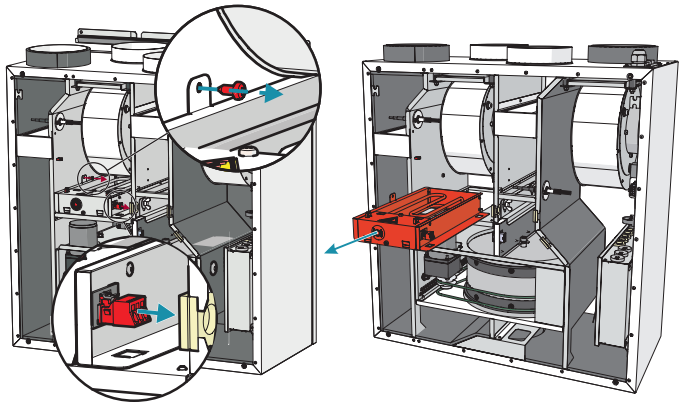


Figure 6.5.1 - Smarty 2R VER

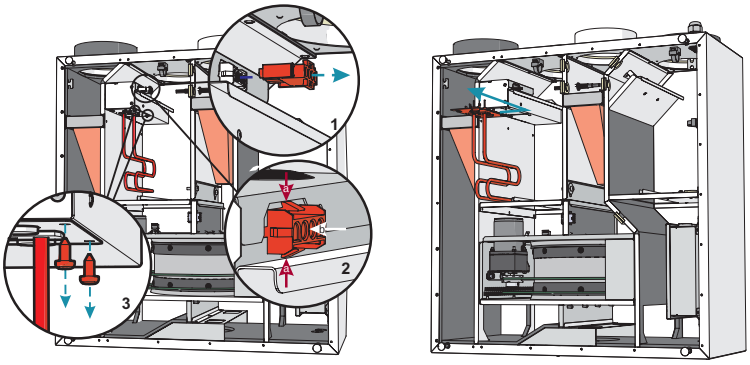
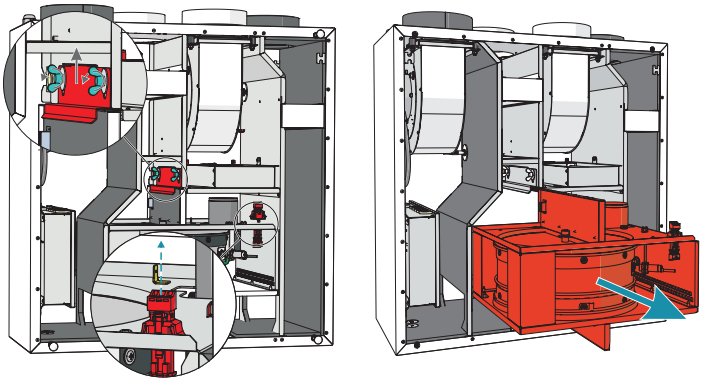


Figure 6.5.2 - Smarty 2R VER plus

6.6. ROTOR MAINTENANCE

- Rotor heat exchanger must be serviced once a year.
- Ensure that the gaps of the heat exchanger are clean, the brushes are not worn, the belt drive is not worn and the clamping nodes of the rotor heat exchanger are tight.
- Rotor heat exchanger can be easily removed from the unit. The power cord of the motor of the heat exchanger is disconnected. The clamp of rotor heat exchanger section is released and raised and the heat exchanger is removed.
- The heat exchanger is cleaned using the solution of warm water and non-corrosive toward aluminum alkaline agent or the air stream. It is not recommended to apply direct stream of liquid as it can harm the device.

- While cleaning, protect the motor of heat exchanger from entry of moisture and fluids.
- After reinstalling the heat exchanger, fasten the heat exchanger section with the clamp. Connect the heat exchanger motor.



CAUTION: the heat exchanger can not be used when the filters are removed!

7. CONTROL

7.1. DEVICE CONTROL

Ventilation unit can be controlled using a remote control, web interface via MB-Gateway and building management system. More information about the possibilities of controlling is provided in the table below.

MB-Gateway + WIFI + SALDA AIR app	Stouch	FLEX MCB	SA-Control	MB-Gateway	BMS
+	+	+	+	+	Modbus RTU

7.2. MEANING OF THE SYMBOLS USED IN THE INSTRUCTIONS AND ON THE DEVICE

ODA outdoor air SUP supply air ETA extract air EHA exhaust air kitchen hood

7.3. DESCRIPTIONS OF THE FUNCTIONS

Functions	MCB	
	Smarty 2R VER	Smarty 2R VER plus
	E	E
Date and time settings	●	●
System modes for easy and-user friedly control (*Stand-by, Building protection, Economy, Comfort*)	●	●
BOOST function (Fans operate at highst speed)	●	●
Comfortable air temperature function	●	●
Cold/heat recovery	●	●
Heating season (from a selected date, 3-day temperature average or manually)	●	●
Dryness protection	○	○
Weekly/holiday schedule	●	●
User and service control levels	●	●
Manual air flow balancing	●	●
CO_2 level indication and reduction function	○	○
Night cooling function	●	●
Relative humidity (RH) level indication and reduction function	○	○
Software and configuration update possibility	●	●
Supply air temperature control according to the extract air sensor	●	●
Monitoring function (all sensors and I/O) Mode switch (start/stop)	●	●
Manual components control	●	●

Switching the speed of the fans	●	●
Functional units		
Fans		
Soft start and stop	●	●
Protection by RPM	●	●
Speed synchronous/asynchronous 0-10V control	●	●
Electrical heater		
On/off control	●	●
Overheat protection (additional protection software)	●	●
Filter pollution minitoring		
By filter timer	●	●
Rotor		
On/off control	●	●
Motor belt levers protection	●	●
Rotation speed indication	●	●
Service timer	●	●
Air temperature sensors		
temperature sensor failure protection (with emergency mode)	●	●
Supply air temperature sensor	●	●
Outdoor air temperature sensor	●	●
Extract air temperature sensor	●	●
Dampers		
open/close	○	○
Emergency signals and inputs/outputs		
Fire protection input	●	●
Configurable digital inputs	●	●
Remote controllers		
Stouch	○	○
SA-Control	○	○
MB Gateway	○	○

● standard feature
○ for the feature to function an accessory is needed
- it is not possible to use the feature

7.4. DESCRIPTION OF THE UNITS FUNCTIONS

All functions indicated in this section are installed in the software of the control board. However, operation and control of the device depends on the following:

1. Selected control panel. Full functionality and configuration possibility can be assured only by MB-Gateway web interface SA-Control, SALDA AIR app.
2. Connected external devices: external heaters, dampers, sensors and etc. (see the description of the acquired air handling system).
3. Internal components of the device: type of heat exchanger (plate or rotor), integrated dampers, sensors and etc. (see components of the chosen device).
4. Control board type.

Air Handling Unit uses MCB board.

The unit can be configured only with SA-Control remote control panel, MB-Gateway web application or SALDA AIR app. The following control board functions can be fully controlled only with SA-Control remote control panel, MB-Gateway web application or SALDA AIR app. In case of Stouch remote control panel use the description of remote control panel functions for MCB control board.

7.4.1. SYSTEM MODES

- Stand-by;
- Building protection;
- Economy;
- Comfort.

In Stand-by mode the system is shut down for a permissible period (based on the Stand-by mode blocking function settings).

The Building protection mode is designed to protect premises against moisture accumulation. The system operates at speed 1. Based on manufacturer's parameters (by default) this mode controls the temperature (the desirable one is indicated), but, if necessary, it can be switched off, i.e. to activate the energy saving mode. Also, if necessary, full recirculation function is activated. (ADJUSTER › USER SETTINGS › BUILDING PROTECTION MODE TEMPERATURE or USER › MENU › SETTINGS › BUILDING PROTECTION).
After activating the energy saving mode, temperature is maintained only by the heat exchanger. It will seek to maintain the current temperature in the room; however, if the supply air temperature falls below the minimal supply air temperature level, heaters will be activated and they will maintain a temperature one degree above the minimum. Also, if the supply air temperature rises above the maximal supply air temperature level, coolers will be activated and they will maintain a temperature one degree below the maximum.

Economy mode is designed to save energy when people are absent from the premises. The system operates at speed 2. Based on manufacturer's parameters this mode controls the temperature maintaining (the desirable one is indicated), but, if necessary, it can be switched off, i.e. to activate the energy saving mode. Also full recirculation function is activated. (ADJUSTER › USER SETTINGS › ECONOMY MODE TEMPERATURE or USER › MENU › SETTINGS › ECONOMY MODE).

Comfort mode is running when people are present in the premises. The system operates at speed 3. In this mode the temperature is always maintained – it is set in the main window (ADJUSTER › VENTILATION CONTROL or USER › SET POINT).

7.4.2. SYSTEM CONTROL

System modes are changed by the following functions (indicated in a sequential order):
- Weekly Schedule;
- Switching on is activated from an external contactor;
- Manual mode selection;
- Holiday Schedule;
- Stand-by mode blocking.

Based on the Weekly Schedule the system decides in what mode it will be operating; however, the user may change it manually. The system informs when the next mode change is scheduled. After power loss the mode is selected based on the Weekly Schedule; however, if it is not set, the mode that was set before the power loss will be activated.
The user may change modes even when the switching on is activated from an external contactor. The only case when it is not possible – active period of Holiday Schedule of which the system informs and which must be changed to avoid blocking.
Stand-by mode can be blocked by selected parameters. If at least one of the above functions changes its mode into Stand-by mode, it must be checked whether this mode is not currently blocked. If it is blocked, the previous mode shall be activated.

The function order is provided below.

Start

› Reading of input data;

› Weekly Schedule;

› Mode external switch;

› User entered data;

› Holiday Schedule;

› Stand-by mode schedule;

› Stand-by mode blocking;

› Protection against Dryness;

› Boost ventilation;

› Air handling unit operating algorithm;

› Protection;

› Blocking of air handling unit operating algorithm;

› Manual Control of Components;

› Data entering into outputs and user environment.

End

7.4.3. SYSTEM STATES

This field informs a user about the existing system state. It is displayed in the main window ADJUSTER › VENTILATION CONTROL or the main window of the user environment. The table below shows possible system states.

SYSTEM STATE	DESCRIPTION
Stand-by mode	System operates in Stand-by mode
Building protection mode	System operates in Building protection mode
Economy mode	System operates in Economy mode
Comfort mode	System operates in comfort mode
Emergency run	System operates in emergency mode (for details refer to alarms section)
Preparing	System is preparing for operation (pre-heating of water heaters, etc.)
Opening dampers	Dampers are opened
BOOST function activated	BOOST function is active
Cooling heaters	Electric heaters are cooled down prior to shutdown of fans
Closing dampers	Dampers are closed
Critical alarm	Critical failure, system is shut down (for details refer to alarms section)
Fire alarm	Fire protection from an external contactor is activated
Heat exchanger frost protection activated	Heat exchanger frost protection is activated
Change filters	Warning about clogged filters (pressure switches are activated or filter timer is activated)
Room RH 3 days average is lower than 30%. Limiting speed.	Reduced airflow because of too low exhaust air moisture
DX cooler defrosting	Dissolving the DX cooler / heater
Fire damper testing	Checking fire dampers

7.4.4. SETTING DATE AND TIME

For smooth execution of schedules, event log and winter/summer function, it is necessary to set proper date and time in section ADJUSTER › USER SETTINGS › DATE AND TIME SET and click a button DATE AND TIME SET. It can also be indicated in user environment USER › MENU › SETTINGS › DATE AND TIME. Fast synchronization with the computer time is possible in user and adjuster environment.

7.4.5. SUPPLY AIR TEMPERATURE CONTROL AND COMPENSATION

Temperature for supply air or premises temperature may be indicated. In the service environment section SERVICE › MAIN › SUPPLY AIR TEMPERATURE CONTROL you can control it based on supply or exhaust air temperature. If control by premises temperature is selected, then it is calculated what kind of air is to be supplied so that the proper room temperature is maintained. It is limited by allowable limits of supply air temperature.
The air handling unit is not designed to heat premises, therefore it is not necessary to use full capacity for low temperature differences – the compensation in percentage is provided for this purpose. This parameter indicates a percentage of the temperature difference (between the set temperature and premises temperature) to be compensated for by this function. E.g. set point is 20 °C, temperature in the premises is 16 °C, compensation is 50 %, difference between the indicated and existing temperatures is 20-16=4 °C. Since 50 % is compensated, then 4*50 %=2 °C. When the received value is added to the set temperature we get the required supply air temperature – 2+20=22 °C. This temperature is not limited as it is within the supply air temperature protection limits. In this case the system maintains the supply air temperature at 22 °C. The closer the premises temperature is to the set temperature (20 °C), the faster the supply air temperature reaches 20 °C.
It may be too hot in the premises, therefore this function both heats and cools. Preferred (compensated) temperature is displayed in the window MONITORING (REQUIRED SUPPLY). If the displayed temperature is 0 °C, it means that temperature maintaining of supply air is switched off.

The temperature of supply air is maintained by the following components (indicated in a sequential order):
- Fans (operate slower, if it is too hot);
- Recirculation valve (if the ambient air temperature is favourable);
- Water cooler;
- DX cooler;
- Recirculation damper and CO_2 (in case of favorable outdoor temperature);
- Bypass damper or rotor (in case of favorable outdoor temperature);
- Recirculation damper and CO_2 (in case of favorable outdoor temperature);
- DX heater;
- Water heater;
- Water cooler/heater;
- Electrical heater;
- Fans (operate slower, if it is too cold).

Firstly the system tries to maintain the supply air temperature by means of a heat exchanger. In case of a plate heat exchanger, the bypass damper is controlled, and in case of a rotary heat exchanger, the rotor rotating speed or interval is changed. The heat exchanger can both heat and cool – it depends on outdoor and room air temperatures. It is controlled by a PID controller whose coefficients are indicated in the adjuster environment section ADJUSTER › PID CONTROLLERS ADJUSTING › HEAT EXCHANGER CONTROL BY SUPPLY AIR TEMPERATURE.
When the heat exchanger operates at full capacity and preferred temperature is not reached, the recirculation damper, then the heater or cooler etc. is activated (if necessary). Only the components configured for temperature maintaining are activated. It takes 10 s for the system to switch

between the elements.

7.4.6. FAN CONTROL

The preferred air-flow can be indicated in percentage or in 4 fixed speeds where each of them is dedicated to a relevant system mode:
- Building protection;
- Economy;
- Comfort;
- Maximum power.

Fan speed can be controlled by:
- Percentage - speed in percentage is indicated in the adjuster environment window ADJUSTER › AIR FLOWS ADJUSTING: 0 % corresponds to 0, and 100 % – 10 V control signal voltage;
- Pressure - the maximum system pressure is indicated, which based on speed settings in the adjuster environment ADJUSTER › AIR FLOWS ADJUSTING means 100 % air-flow;
- Air-flow (m^3/h) - K factors of supply and exhaust air and the maximum system air-flow (m^3/h) are displayed, which based on speed settings in the adjuster environment ADJUSTER › AIR FLOWS ADJUSTING means 100 %.

Fans based on air-flow and pressure are controlled by PID controller and its coefficients are indicated in the adjuster environment section ADJUSTER › PID CONTROLLERS ADJUSTING › FANS SPEED CONTROL BY AIR FLOW OR PRESSURE. Each fan is controlled individually.
In the service environment window SERVICE › FANS › FANS SPEED CONTROL you can limit the minimum and maximum fan control signal voltage. Based on manufacturer set parameters, the minimum 2V voltage is indicated, which means that 0V voltage signal is sent when fans are off, and 2V voltage signal is immediately switched on when rotation is required.
It is possible to specify the nominal flows of supply and exhaust air. Then, the maximal air flow is calculated automatically.

7.4.7. “BOOST“ FUNCTION

Boost ventilation function is used for fast ventilation of premises. It activates the maximum air-flow (speed 4). Boost ventilation has be temporary, i.e. it must be a final condition (e.g. CO_2 limit, time). The reason for this limitation – protection against dryness. High air flow reduces humidity, and dry air is harmful for health.
The function is activated by pressing ON and deactivated by pressing OFF button in the BOOST section, or by means of an external contactor (FANS SPEED SWITCH), which is configured in the service environment (SERVICE › MAIN › FANS SPEED SWITCH) section.
The function is inactive when Stand-by mode is on. Time limit is indicated (ADJUSTER › USER SETTINGS › BOOST TIMER or USER › MENU › SETTINGS › BOOST TIMER). Once the function is activated, the time is set by the timer and the time is counted till its deactivation. It may be adjusted in real-time, i.e. when the function is on, in ADJUSTER › VENTILATION CONTROL or in the user environment main window.

7.4.8. WEEKLY SCHEDULE

A weekly schedule consists of 10 weekly events. They can be added, deleted, activated and deactivated. One event indicates time, mode/BOOST function, days of the week. Also it is possible to indicate the change of settable mode temperature.
The system changes modes according to the Weekly Schedule only at the indicated times, therefore a user can always change the existing mode manually. This schedule notifies of the upcoming mode change by indicating the time remaining till the next event.
The schedule is edited in user environment USER › MENU › SCHEDULE.

7.4.9. HOLIDAY SCHEDULE

This schedule is used when the unit has to operate in uniform mode during holidays. The user interface shows when the schedule period is active as nobody can change the mode activated by this function (except for protection). In order to control the system in a normal manner, the Holiday Schedule period must be deactivated, i. e. zero values must be indicated or dates must be changed. Up to five holiday periods can be set.
The schedule is edited in the user environment USER › MENU › HOLIDAY.

7.4.10. WINTER/SUMMER MODE

The winter/summer function is set during the cold periods, because some parts of the system have to be protected against cold outdoor air. During winter it is recommended to leave the unit switched on, therefore it is possible to set blocking of switch-off. Water heaters must always be switched on during the entire winter.

The winter mode may be indicated
- Manually;
- By date;
- Based on 3-day mean outdoor temperature, to be calculated only when the fresh air (outdoor) pre-heater is off.

7.4.11. DRYNESS PROTECTION

This function is designed to protect premises against dryness. If the function is active, it calculates the 3-day mean humidity of extract air from the premises. If the mean drops below set limit (30%), fans start operating in speed 2 in comfort mode. A user is notified of the activated protection and limited air flow.
If the humidity mean exceeds set limit (30%) or the function is switched off manually, fans start operating in speed 3 in comfort mode.
The function is switched on/off in the section ADJUSTER › USER SETTINGS › DRYNESS PROTECTION or in the window USER › MENU › SETTINGS › OTHER.

7.4.12. NIGHT COOLING FUNCTION

This function is designed to save energy in the morning, when a fresh night air is used to cool down the building. The function is active only in summer. If it is switched on but not active yet, activation conditions are checked:
- System time from function start to the end (hours/minutes);
- Time is exactly every hour from the start;
- If STAND-BY mode is set, the unit operates in BUILDING PROTECTION mode for 5 minutes so that the actual temperature data is available. The temperature is checked after purging. If it is not suitable, the unit returns to STAND-BY mode;
- Outdoor temperature is higher than the set outdoor temperature;
- Exhaust air temperature is higher than the set temperature;
- Exhaust air temperature is higher than the outdoor temperature by at least 2 °C;
- Summer.

If all conditions are met the unit starts operating in COMFORT mode (without temperature maintaining). The main window shows that the Night cooling function is active. When it is active continuously, the deactivation conditions are checked:
- Time does not correspond to the start/end interval;
- Exhaust air temperature drops below the set temperature;
- Outdoor temperature drops below the set temperature;
- Mode other than COMFORT was switched or the unit has been shut down.

If at least one condition is met, the unit switches off the Night cooling function and it switches to the mode that was on prior to activating the function.
The function is configured in the section ADJUSTER › USER SETTINGS › NIGHT COOLING FUNCTION or in the window USER › MENU › SETTINGS › NIGHT COOLINGS.

7.4.13. CO_2 REDUCTION FUNCTION

This function is designed to maintain a proper quality of room air. To activate it the exhaust air CO_2 sensor must be connected and properly configured in the service environment window SERVICE › SENSORS. When completed, the exhaust air CO_2 value is displayed in the section MONITORING.
In the service environment window SERVICE › MAIN › CO_2 REDUCTION FUNCTION you can switch on/off the function, indicate preferred CO_2 level and allowable limit; when it is exceeded (CO_2 set + allowable excess) CO_2 is reduced, information is displayed and air-flow is increased. When CO_2 reaches the set point, reduction is switched off.
CO_2 protection is inactive in the stand-by and building protection modes.

7.4.14. FILTER PROTECTIONS

Filter Timer Settings

The filter timer limit is set in the service environment window SERVICE › MAIN › AIR FILTERS PROTECTIONS. The maximum setting is 1 year.

7.4.15. SYSTEM MODE COMMUNICATION WITH EXTERNAL CONTACTOR

This function activates the preferred system switching on by means of external contactor; it indicates what signal will be sent to input. Possible types of signals:
- Not used;
- Upon pressing a button the selected system mode is activated. After receipt of the first impulse the function is activated, and after second impulse – deactivated;
- On/off; selected system mode is activated. The mode is active while the contactor is on;
- PIR sensor. When the sensor is activated, the selected system mode is activated. If the signal is not received for 30 minutes, the mode is activated.

Function is set in the service environment section SERVICE › MAIN › SYSTEM MODE SWITCH.

7.4.16. FAN SPEEDS FROM AN EXTERNAL SYSTEM CONTACTOR

This function is designed to activate/deactivate the boost ventilation function or preferred combination of fan speeds by means of an external contactor.

The function indicates a type of a signal to be sent to the input and components controlled by it. Possible combinations of signal types and functions:
- *Not used*;
- *On/off* – selected fan speed combination is activated. Function is on when contactor is on;
- Button click – selected fan speed combination is activated. Function is activated when it receives an impulse. It is deactivated when it receives the impulse again;
- *On/off* – Boost ventilation function is controlled. Function is on when contactor is on. If the boost ventilation function is not terminated by means of this function within the boost ventilation time limit, force shutdown is used after the time expires;
- Button click – Boost ventilation function is controlled. Function is activated when it receives an impulse. It is deactivated when it receives the impulse again;
- If the boost ventilation function is not terminated by means of this function within the boost ventilation time limit, force shutdown is used after the time expires.

It is also indicated whether boost ventilation will be activated or combination of fan speeds is preferred, i.e. it is possible to indicate preferred supply and extract air fan speeds individually.

7.4.17. HEAT EXCHANGER CONTROL

Cold - Heat Recuperation

Cold-heat recovery function is designed to control a heat exchanger. Its power is controlled by:
- Using plate heat exchanger - bypass damper. When it is closed, the heat exchanger is operating at full capacity. Its power is reduced by opening the damper.
- Rotary heat exchanger power is controlled by changing its rotating speed or interval. When the rotor rotates at full speed, the heat exchanger is used at full capacity. The power is reduced by slowing down the rotating speed or increasing the interval.

The heat exchanger can both heat and cool – it depends on air temperature. If it is colder outside than in the premises, the heat exchanger preheats the outdoor air by using the room heat. If it is colder in the premises than outside, the heat exchanger cools down the outdoor air temperature by room air. Its power is reduced to the minimum when the target supply air temperature is the same as outdoor one. The higher the difference between the preferred and supply air temperatures, the higher heat exchanger power is used. When it is operating at maximum capacity, it is allowed to activate other heating/cooling components.
For this function suitable heat exchanger type is indicated in the window SERVICE › HEAT EXCHANGER and PID controller coefficients – in the window ADJUSTER › PID CONTROLLERS ADJUSTING.

PID controller output limits are set for rotor or bypass damper, at which their operation starts.
- If rotor is controlled by 0..10 V signal, at low voltages it does not rotate, the motor heats up, thus the minimum control signal output is limited. If On/Off rotary heat exchanger is used, PID percentage for activating the rotor is indicated in the window SERVICE › HEAT EXCHANGER.
- If the bypass damper opens only a few percent, noise can occur, thus minimum opening is limited, which also applies when coming to the full opening. If the plate heat exchanger with a 3-way bypass damper is used, the opening time of the bypass damper is indicated in the window SERVICE › HEAT EXCHANGER.
- If a plate heat exchanger with segment valves is controlled by an external controller is used, then the type of the bypass damper "REMOTE CONTROLLER" is shown in the window "SERVICE › HEAT EXCHANGER".
- If a plate heat exchanger with segment valves connected to a controller is used, then the type of the bypass damper is shown in the window "SERVICE › HEAT EXCHANGER" as either "2 SEGMENTS" or "3 SEGMENTS". In the case of heat recovery control, segments are closed in sequence, i.e. if heat recovery is not required, then all the segments are closed and the bypass damper is opened.

When the fans are switched on during the heating season, the heat exchanger runs for 10 minutes at full power, until the system stabilizes.

7.4.18. SYSTEM MONITORING

The service and adjuster environment have the window MONITORING where you can monitor operation of the entire system, i.e. see controller input and output, CO_2 values, versions of connected modules, date and time, speed of fans, temperatures, pressure, etc. The amount of information depends on the system configuration. This tool is designed for preventive maintenance of the system.

7.4.19. STAND-BY MODE BLOCKING

This function is designed to protect the system against the impermissible unit shutdown and it is recommended to limit the unit shutdown up to 1 hour within 12 hours during the winter season. Possible function modes:
- Always allow shutdown;
- Block shutdown;
- Block shutdown in winter;
- Block shutdown in summer.

It must be indicated for how long the shutdown is permissible within 12 hours. If it is blocked and the system is shut down, the system counts and informs the user on the remaining time. This function is configured in the service environment (SERVICE › MAIN › SYSTEM BLOCKING).
If the time has expired and Stand-by mode is blocked, the user is informed by the function indication.

7.4.20. AIR FLOW ADJUSTMENT

Air-flows are adjusted in the adjuster environment window ADJUSTER › AIR FLOWS ADJUSTING. There are 4 of them in the system and they are dedicated to specific modes:
- Building protection;
- Economy;
- Comfort;
- Maximum power (BOOST function).

Air-flows are arranged in an ascending order, i.e. upon setting lower air-flow in COMFORT mode then in ECONOMY mode, the air-flow of the latter is reduced automatically. With respect to the system configuration, air-flows are indicated in percentage, pressure or amounts of air. 100 % value of air-flow is indicated in service environment window SERVICE › FANS › FAN SPEED CONTROL.

7.4.21. MANUAL CONTROL OF COMPONENTS

This function manually activates/deactivates the components controlled by digital and analogue outputs. The latter ones are controlled in percentage, and digital ones – by ON/OFF. Based on manufacturer's parameters (by default) the status of all components is AUTO, which means that control is based on air handling unit operating algorithm. Components are displayed by the system configuration. Settings must be saved so they remain active after power loss.
The lowest power consumption is when the Stand-by mode is on, and position of components – AUTO.
Prior to using the manual control function, it is recommended to activate the force shutdown function, which blocks the air handling unit operating algorithm.

This can be useful, if you need to check if everything is properly connected. Moreover, in the event of failure, certain components can be activated so that the unit operates irrespective of sensors and protections. Of course, this method should be applied in exceptional cases until the failure is rectified.
If the service environment window SERVICE › SENSORS displays an external (REMOTE) type of a temperature sensor, its temperature may be indicated manually. The values may be indicated via the Modbus interface.

7.4.22. CHANGING PASSWORDS

In the service environment section SERVICE › MAIN › PASSWORD › PASSWORD CHANGING MODE › ON you can change login passwords. For this it is necessary to activate the change and after entering a preferred password (4 digits), click a button SET. To review and change the parameters without a password, just set 0.

7.4.23. RESTORING FACTORY DEFAULTS

If set parameters result in incorrect operation of the system, you can always restore the factory defaults in the service environment window SERVICE › MAIN › FACTORY SETTINGS.

7.4.24. INDICATIONS OF FUNCTIONS, ALARMS AND WARNINGS

User about active functions, warnings or alarms is notified in the window ADJUSTER › ALARMS or USER › ALERT. Functions are displayed in the main window ADJUSTER › VENTILATION CONTROL or in the user environment window. The table below provides indications and their descriptions.

	FUNCTIONS	DESCRIPTION
	Working indication output	Working indication output is activated
	Alarm indication output	Failure indication output is activated
	System mode switch	Switching on from an external contactor is activated
	Custom fans speed switch	Selected fans speed from an external contactor is activated
	Winter	Winter mode is active
	Stand-by mode blocking activated	Stand-by mode blocking is activated
	Slowing down fans	Fans are slowed down
	Slowing down fans by temperature	Fans are slowed down depending on supply air temperature
	Night cooling function activated	Night cooling function is activated
	Hydronic pump exercise activated	Preventive maintenance of circulation pumps is activated
	Service stop function	Blocking of air handling unit operating algorithm; Service activities are carried out
	Holidays	Holiday Schedule interval is active. System mode can be changed only upon changing the Holiday Schedule interval
	Reducing CO_2 level	CO_2 reduction function is activated
	Full recirculation	Full recirculation function is activated

7.4.25. DISPLAY AND CONCELLATION OF ALARMS AND WARNINGS

The system notifies the user about the system failures by warnings that are canceled automatically and by alarms that have to be canceled manually. The latter are recommended to be canceled by a specialist prior to finding out the causes of the alarm. Information on alarms and warnings is also displayed
in the main window ADJUSTER › VENTILATION CONTROL. If at least one alarm is active, the system is shut down and external failure indication is activated. Alarms and warnings can be reviewed and canceled in the window ADJUSTER › ALARMS or USER › ALERT. All possible alarms and warnings are provided in

the table below.

INDICATION	ALARMS LIST	INDICATION	ALARMS LIST
W.01	Warning! Rotor broken belt alarm	A.31	Alarm! Controller cabinet temperature sensor failure. System stopped
A.02	Alarm! Fireplace protection activated	W.32	Fire damper test OK
W.03	Warning! Dryness protection activated	W.33	Warning! Fire damper test failed
W.04	Warning! Plate heat exchanger frost protection activated	A.34	Alarm! Heater manual protection. System stopped!
A.05	Alarm! Plate heat exchanger frost protection system stopped	W.35	Warning! Heater automatic protection
W.06	Warning! Plate heat exchanger frost protection (pressure relay)	A.36	Alarm! Pre-heater manual protection. System stopped!
A.07	Alarm! Hydronic heater frost protection. System stopped	W.37	Warning! Pre-heater automatic protection
W.08	Warning! Too low supply temperature	A.38	Alarm! Supply fan failure
W.09	Warning! Too high supply temperature	A.39	Alarm! Extract fan failure
A. 10	Alarm! Too low supply temperature. System stopped	W.40	Warning! DX cooler failure
A. 11	Alarm! Too high supply temperature. System stopped	A.41	Alarm! Fire
W. 12	Warning! Change supply air filter (pressure relay)	A.42	Alarm! Supply fan pressure protection. System stopped
W. 13	Warning! Change extract air filter (pressure relay)	A.43	Alarm! Extract fan pressure protection. System stopped.
W. 14	Warning! Change supply and extract filters (timeout)	A.44	Alarm! Internal system error.
A. 15	Alarm! Power supply failure. Please, check F1 fuse	A.45	Alarm! Heater manual protection. Boosting.
W. 16	Warning! Supply air temperature sensor failure. Emergency run	A.46	Alarm! Pre-heater manual protection. Boosting.
W. 17	Warning! Extract air temperature sensor failure. Emergency run	A.47	Alarm! Internal communication error
W. 18	Warning! Exhaust air temperature sensor failure. Emergency run	W.48	Warning! DX cooler defrosting
W. 19	Warning! Outdoor air temperature sensor failure. Emergency run	W.49	Warning! Too high 3 days extract humidity. Increasing air flow.
W.20	Warning! Hydronic heater water temperature sensor failure. Emergency run	W.50	Warning! Too high extract humidity. Boosting.
W.21	Warning! Hydronic pre-heater water temperature sensor failure. Emergency run	A.51	Alarm! Rotor broken belt alarm. System stopped.
W.22	Warning! Hydronic cooler water temperature sensor failure. Emergency run	W.52	Warning! Gas heater failure
W.23	Warning! Controller cabinet temperature sensor failure. Emergency run	W.53	Warning! Gas pre-heater failure
A.24	Alarm! Supply air temperature sensor failure. System stopped	W.54	Warning! Too high condensation level
A.25	Alarm! Extract air temperature sensor failure. System stopped	W.55	Warning! Supply fan failure. Emergency run
A.26	Alarm! Exhaust air temperature sensor failure. System stopped	W.56	Warning! Extract fan failure. Emergency run
A.27	Alarm! Outdoor air temperature sensor failure. System stopped	W.57	Warning! Too low supply air flow for DX cooler
A.28	Alarm! Hydronic heater water temperature sensor failure. System stopped	A_58	Alarm! Bypass damper failure. System stopped.
A.29	Alarm! Hydronic pre-heater water temperature sensor failure. System stopped	A_59	Alarm! Hydronic heater/pre-heater circ. pump failute. System stopped.
A.30	Alarm! Hydronic cooler water temperature sensor failure. System stopped	W_60	Warning! Hydronic heater/pre-heater circ. pump failute.

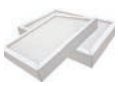
7.4.26. EVENT LOG (HISTORY)

The system records 50 recent events (failures, alarms, fire damper testing results, etc.).
The log stores the description of events and time.
The event log may be reviewed in the window ADJUSTER › HISTORY or USER › MENU › HISTORY.

7.4.27. SYSTEM VERSIONS AND RUNNING TIME

In the section ADJUSTER › USER SETTINGS › ABOUT you may see software and configuration versions that are saved in the production line namely to every unit. Next to them the running time since the unit has been manufactured is also displayed. It is calculated when the fans are rotating.

8. ACCESSORIES



Filters panel

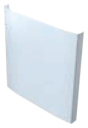
Filters pocket

Heater electrical circular

Damper circular

Cooker hood

Silencer circular



Front cover

Bracket

Stouch

SA-Control

MB Gate-way

CM24-F-L

S-KCO2

S-KFF-U

S-RFF-U-D-F2

S-RCO2-F2

Coupling without sealing

Clamp

TL-WR802N

IR24

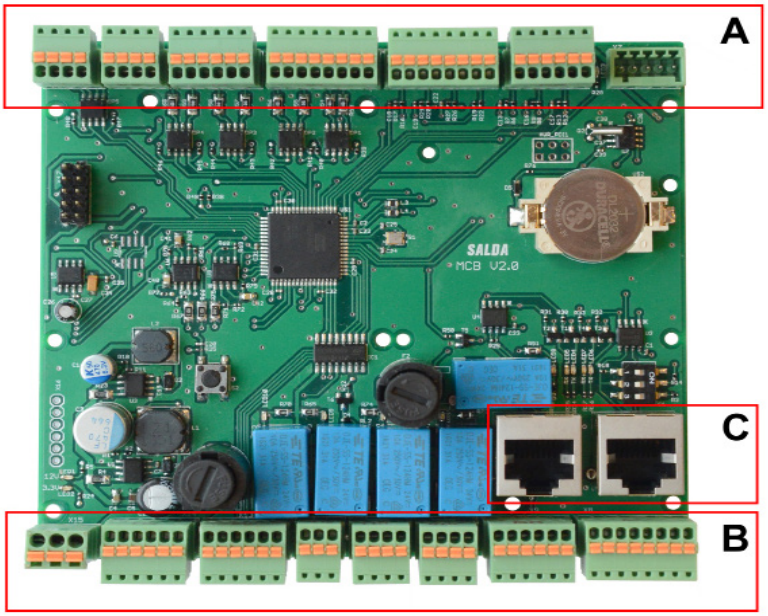
PA-TROL_701

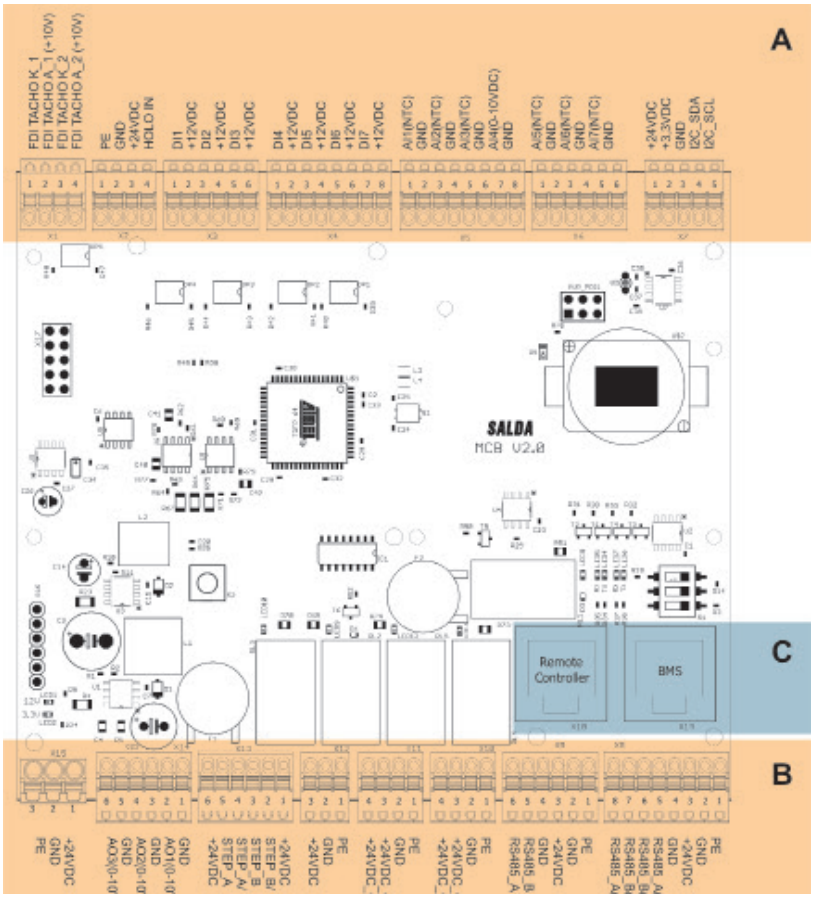
AL

Panel filter	**MPL (M5/M5)** (Smarty 2R V)	GKOFIL0015
	MPL (F7/F7) (Smarty 2R V)	GKOFIL0016
Pocket filters	**FMK (M5/M5)** (Smarty 2R V plus)	GFIRIRS3002
Electrict pre-heater	**EKA NV 125-0,6-1f PH** (Smarty 2R V)	PSIEKANVPH1250.6_1
	EKA NV 125-0,9-1f PH (Smarty 2R V plus)	PSIEKANVPH1250.9_1
Humidity sensor	**S-RFF-U-D-F2**	ZAKKT0050
	S-KFF-U	ZAKKT0051
CO_2 sensor	**S-RCO2-F2**	ZAKKT0048
	S-KCO2	ZAKKT0049
Cooker hood for stainless steel	**Cooker hood**	ZPGKT0042
Cooker hood for white	**Cooker hood**	ZPGKT0041
Front coover mounting bracket	**Mounting bracket**	GNGKRON17
Front cover white	**Front cover**	GNGGAUBT022
Front cover stainless steel	**Front cover**	GNGGAUBTSS1
Silencer	**Silencer, 350 mm**	GSORIRS168_152
	Silencer, 750 mm	GSORIRS168_324
Remote control	**Stouch**	PRGPU51
	SA-Control	PRGPU051
Net module	**MB Gateway**	PRGPU082
Actuator for damper	**CM24-F-L**	ZAKP0029
Damper	**SKG-A 125**	GSKSKG028

8.1. CONNECTION FO ACCESSORIES

8.1.1. SCHEMATIC OF CONTROLLER CONNECTIONS IN MCB





MCB

Connector	Contact No.	Contact name	Ductional block name
		A	
X1	1	MCB FDI TACHO K_1(GND)	Supply fan speed (RPM)
	2	MCB FDI TACHO A_1(+10V)	
	3	MCB FDI TACHO K_2(GND)	Extract fan speed (RPM)
	4	MCB FDI TACHO A_2(+10V)	

X2	1	PE	Rotor speed (RPM)/
	2	GND	Too high condensation (NO)
	3	+24VDC	
	4	MCB HOLO	
X3	1	MCB DI1	Supply air electrical heater automatic protection (NC)/
			Supply air Hydronic cooler heating/cooling changeover thermo-stat (NC/NO)/Water heater circulation pump fail
	2	+12VDC	
	3	MCB DI2	Supply air electrical heater manual protection/
	4	+12VDC	Water heater protection (thermostat) (NC)
	5	MCB DI3	Supply air fan protection (NC)
	6	+12VDC	
X4	1	MCB DI4	Fire protection input (NC)
	2	+12VDC	
	3	MCB DI5	By-pass closed input (NC)
	4	+12VDC	
	5	MCB DI6	Rotor alarm (NC)/
	6	+12VDC	Heat exchanger pressure relay (NC)
	7	MCB DI7	Extract air fan failure (NC)
	8	+12VDC	
X5	1	MCB AI1 (NTC)	Supply air temperature sensor
	2	GND	
	3	MCB AI2 (NTC)	Fresh air temperature sensor
	4	GND	
	5	MCB AI3 (NTC)	Exhaust air temperature sensor
	6	GND	
	7	MCB AI4 (0-10V)	Heat exchanger pressure transmitter
	8	GND	
X6	1	MCB AI5 (NTC)	Extract air temperature sensor
	2	GND	
	3	MCB AI6 (NTC)	Reserved
	4	GND	
	5	MCB AI7 (NTC)	Hydraulic heater ret. fluid temperature sensor
	6	GND	
X7	1	+24VDC	Connection with EX2-X47
	2	+3,3VDC	
	3	GND	
	4	I2C_SDA	
	5	I2C_SCL	
		B	
X8	1	PE	BMS connection (RS485)
	2	GND	
	3	+24VDC	
	4	GND	
	5	RS485 A (D+)	
	6	RS485 B (D-)	
	7	RS485 B (D-)	
	8	RS485 A (D+)	
X9	1	PE	Remote Control connection (RS485)
	2	GND	
	3	+24VDC	
	4	GND	
	5	RS485_B	
	6	RS485_A	

X10	1	MCB PE	Recirculation damper control 3P
	2	MCB GND	
	3	MCB RECIRC_+24VDC_OPEN (DO4)	
	4	MCB RECIRC_+24VDC_CLOSE (DO5)	
X11	1	MCB PE	By-pass damper control 3P
	2	MCB GND	
	3	MCB BYPASS_+24VDC_OPEN (DO2)	
	4	MCB BYPASS_+24VDC_CLOSE (DO3)	
X12	1	PE	24VDC Power supply for water heater actuator
	2	GND	
	3	+24VDC	
X13	1	+24VDC	By-pass step motor control
	2	STEP_B/	
	3	STEP_B	
	4	STEP_A/	
	5	STEP_A	
	6	+24VDC	
X14	1	GND	Supply air fan control output (0-10VDC)
	2	MCB AO1(0-10VDC)	
	3	GND	Extract air fan control output (0-10VDC)
	4	MCB AO2(0-10VDC)	
	5	GND	Supply air heater control output (0-10VDC)
	6	MCB AO3(0-10VDC)	
X15	1	+24VDC	MCB Power supply 24VDC
	2	GND	
	3	PE	
		C	
X18			Remote Control connection (RS485)
X19			BMS connection (RS485, configurable via SL1)

8.1.2. CO_2 SENSOR OR CONNECTION OF HUMIDITY SENSOR RH

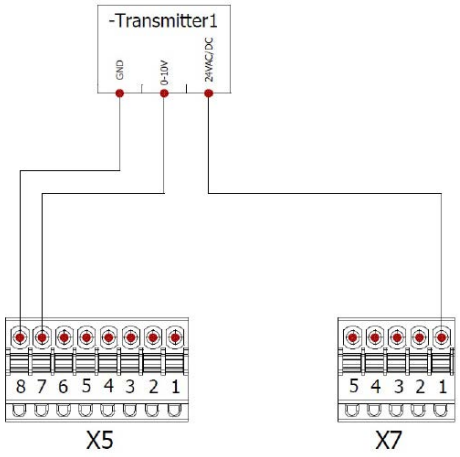
Settings:
CO_2 converter (S-KCO2 or S-RCO2-F2)

1. Set that next to 0.10 V input an extracted air CO_2 converter is connected "SERVICE › SENSORS › 0-10 VDC SENSORS › AIR QUALITY SENSOR 1" (choose "Extract CO_2")
2. Indicate:
   - "Air quality sensor MIN": 0
   - "Air quality sensor MAX": 2000
3. CO_2 reduction function is activated "SERVICE › MAIN › CO_2 REDUCTION FUNCTION" (controlled recirculation damper and fans)
4. To see the CO_2 level: "ADJUSTER › MONITORING › EXTRACT AIR CO_2"

Humidity RH converter (S-KFF-U) or room RH converter (S-RFF-U-D-F2)

1. Set that next to 0.10 V input an extracted air RH converter is connected "SERVICE › SENSORS › 0-10 VDC SENSORS › AIR QUALITY SENSOR 2" (choose "Extract RH")
2. Indicate:
   - "Air quality sensor MIN": 0 (0*0.1=0.0 %)
   - "Air quality sensor MAX": 1000 (1000*0.1=90.0 %)
3. You can see the level of extracted air RH in: "ADJUSTER › MONITORING › EXTRACT AIR RH"

Electric installation:



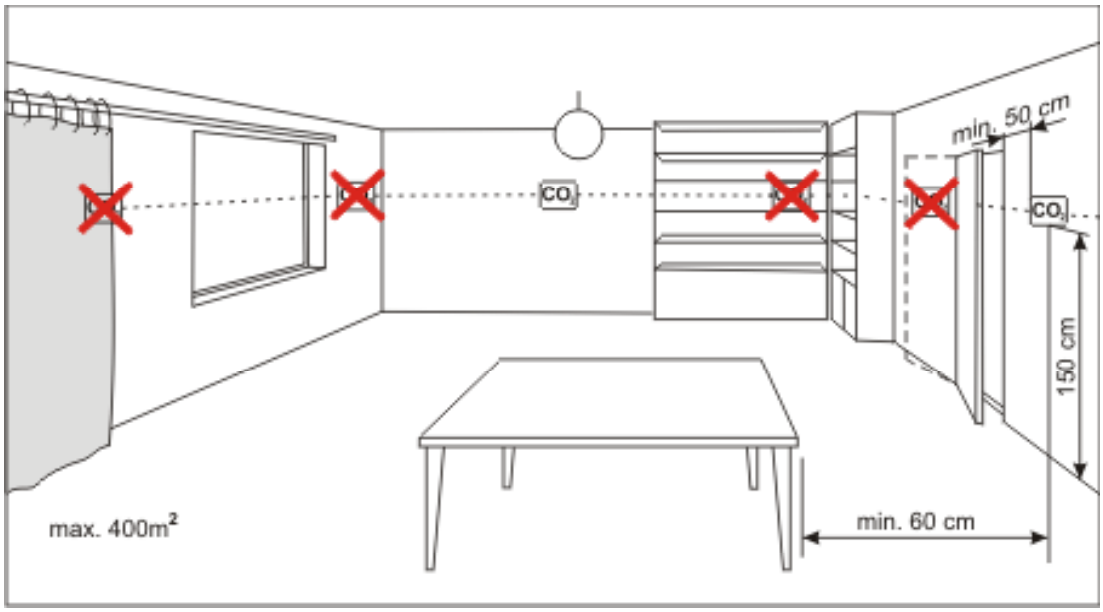
RH sensor of the extracted air is used to calculate the freezing point

In order to reduce the CO_2 concentration in the premise (-s), it is necessary to connect CO_2 converter (canal or installed in the premises).

Purpose of the connectors contacts:

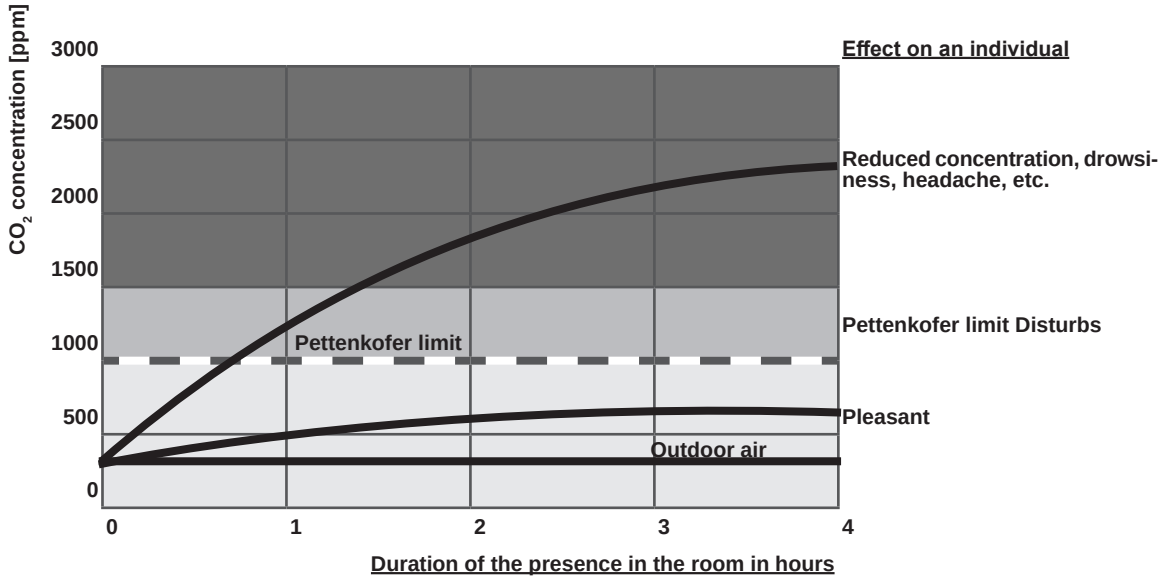
MCB:
X7:1 – power supply of the converter +24 V DC
X5:7 – analogue input 0–10 V DC
X5:8 – general GND

8.1.3. ROOM CO_2 TRANSMITTER INSTALLATION RECOMMENDATION



Where the channel CO_2 transmitter is used: it must be installed in the extract air duct. Tool for drilling holes are required for its installation.

8.1.4. CO_2 CONCENTRATION ACCORDING TO PETTENKOFER LIMIT

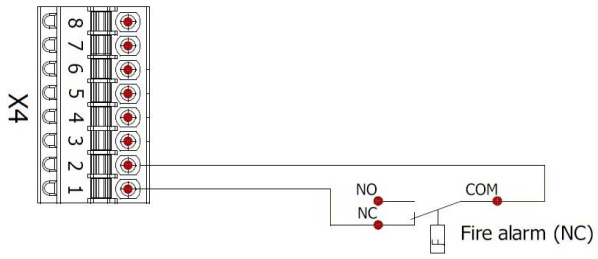


8.1.5. FIRE PROTECTION INPUT (NC)

Fire protection signal input has to be normally closed, until the fire protection system is not connected. In factory the short-circuiter is applied. KEFA KF2EDGKD-2.5/8P X4 connector 1 and 2 contacts.

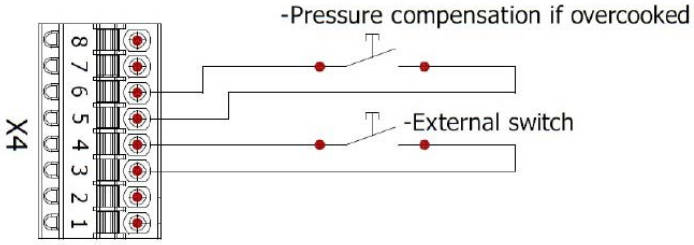
Fire protection signal:

MCB:
X4: 1, 2

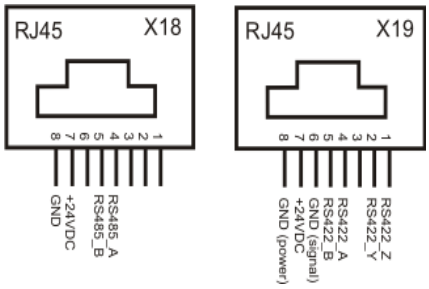


8.1.6. EXTERNAL SWITCHES

Functions are activated using external switches.
- Pressure compensation after steam extraction – KEFA KF2EDGKD-2.5/8P X4 connector 5 and 6 contacts;
- External switch – KEFA KF2EDGKD-2.5/8P X4 connector 3 and 4 contacts.

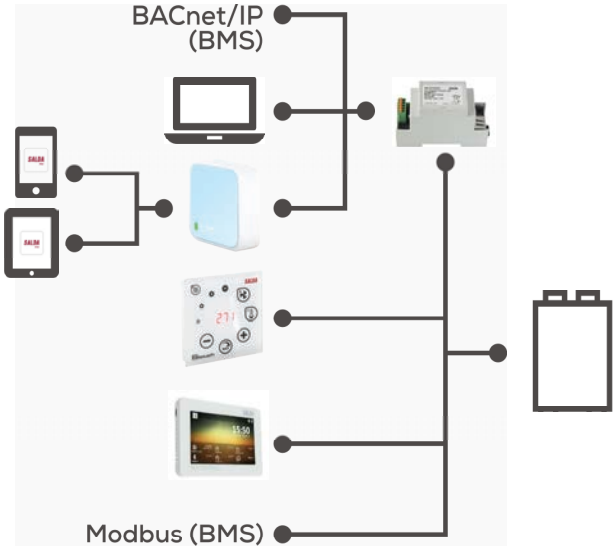


8.1.7. CONNECTION OF REMOTE CONTROL PANEL OR MODBUS



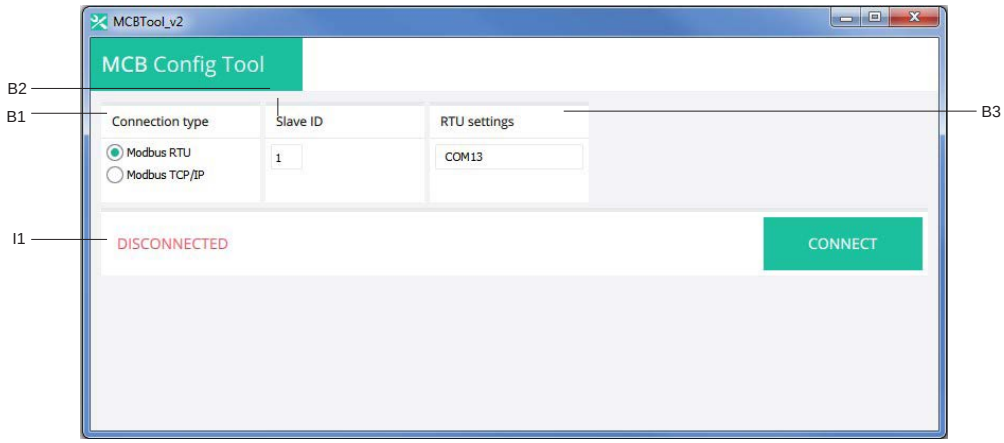
SL1 DIP switch	1	2	3	4	5
Purpose (ON position)	A+Y (RS422->RS485)	B+Z (RS422->RS485)	120R line termination resistor	1kR connection line pull-up resistor	1kR connection line pull-down resistor

8.1.8. “MCB TOOL” PROGRAM DESCRIPTION



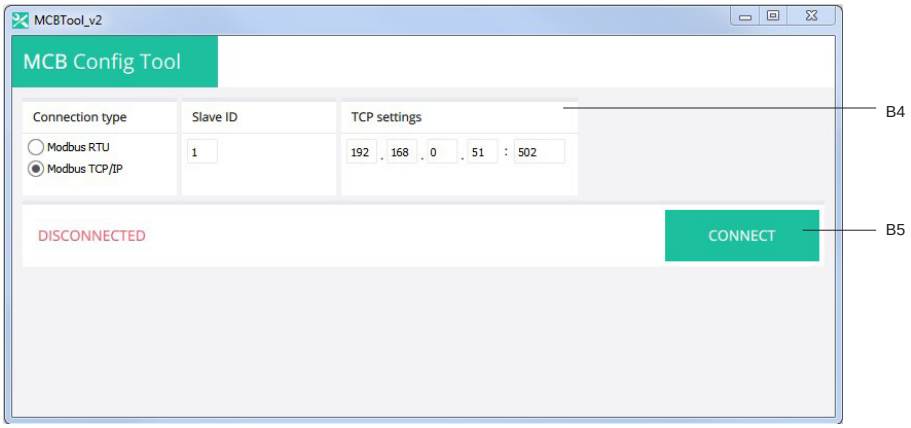
The app ‘MCB tool’ is for importing control board MCB settings from MCB to the media in a computer, and to export MCB settings from the media in a computer to MCB. Download the app from *http://www.salda.lt/en/products/category/download_page/*.

1. Choose connection type
   a. Modbus RTU (connect with RS485 converter)



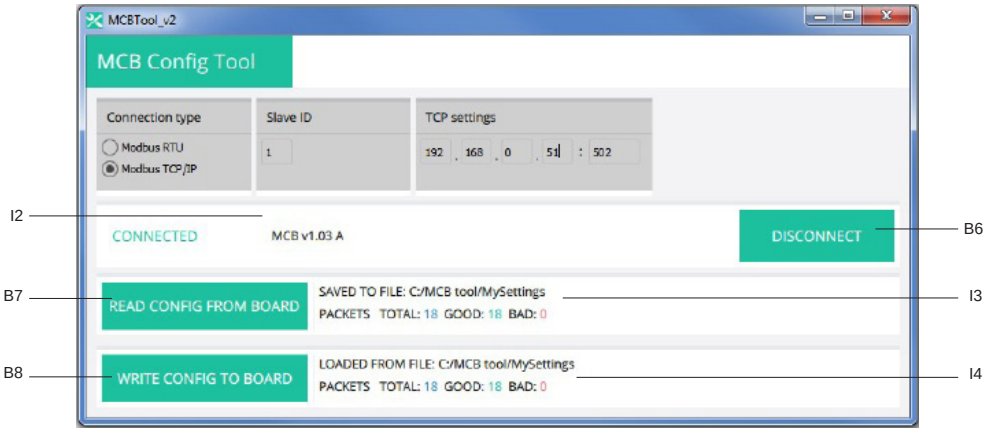
I1	Connection status
B1	Select connection type
B2	Set Modbus slave ID
B3	Select COM port of RS485 converter

b. Modbus TCP/IP (connect with TCP/IP Modbus gateway (MB-GATEWAY))



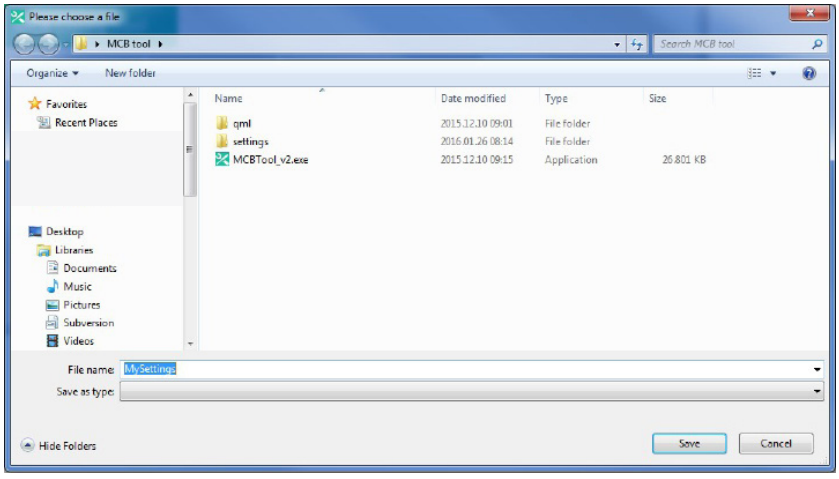
B4	Set IP of TCP/IP Modbus gateway (MB-GATEWAY)
B5	Press to connect

2. Connect to device (press “CONNECT” button)

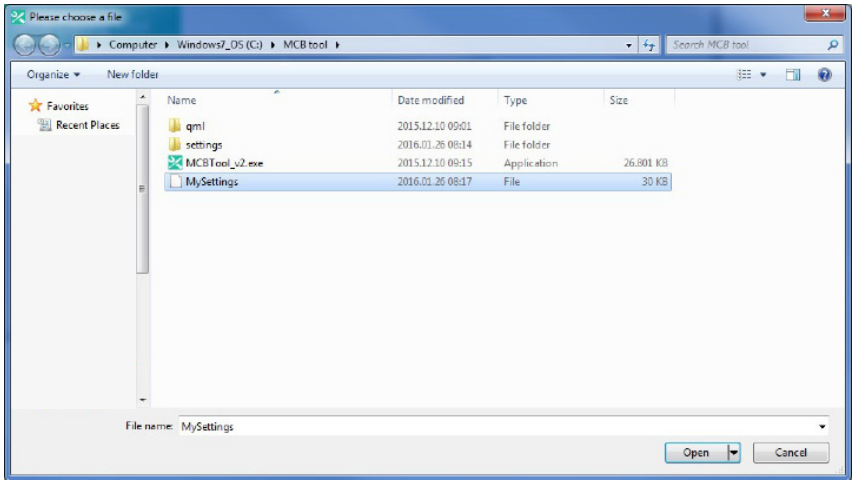


I2	Device software version
I3	Configuration read status
I4	Configuration write status
B6	Press to disconnect from device
B7	Press to read configuration from device
B8	Press to write configuration to device

3. Read configuration from device and save to your computer (press “READ CONFIG FROM BOARD” button and write configuration file name)



4. Write configuration to device from your computer (press “WRITE CONFIG TO BOARD” button and select configuration file)



8.2. THE PRINCIPAL CONNECTION SCHEME OF INTERNAL AND EXTERNAL COMPONENTS

Figure 8.2.1 - SP46

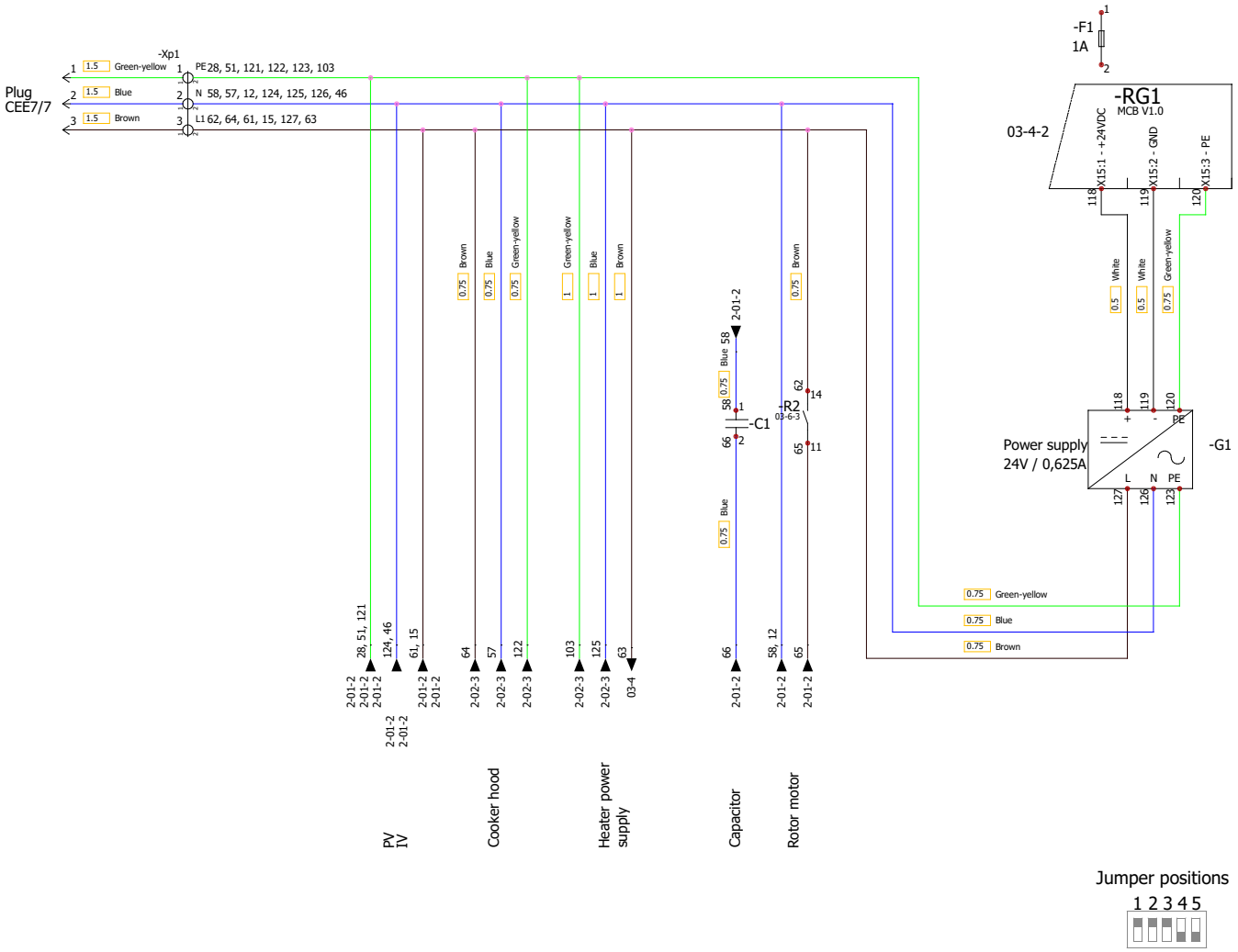


Figure 8.2.2 - 219.0161.0.1.1-PS-4k

Punktyrine linija pažymėtus komponentus ir kabelius pajungia SALDA arba vartotojas.
Components and cables marked with the dash line connected by SALDA or customer.

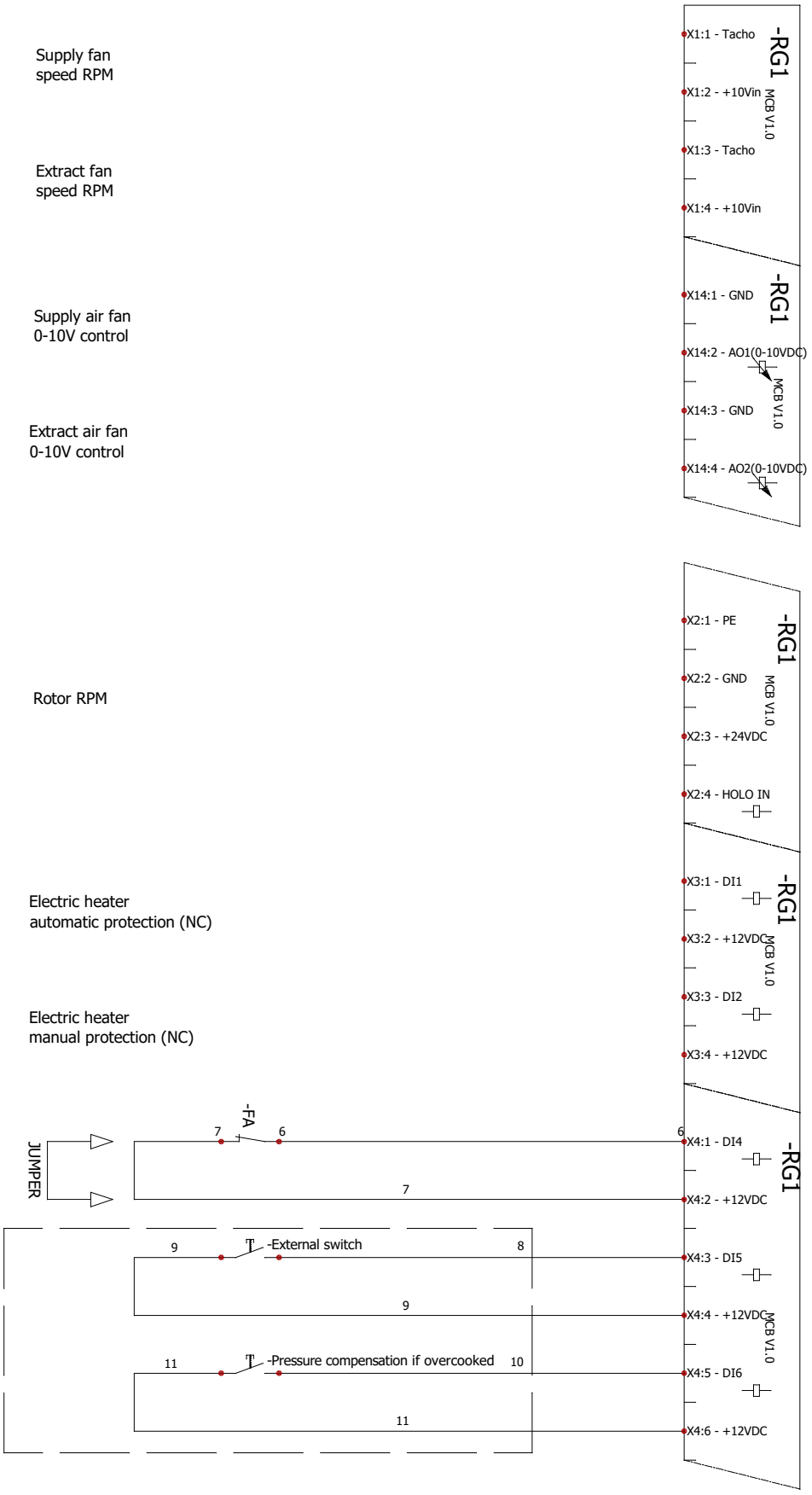


Figure 8.2.3 - 219.0161.0.1.2-PS-4k

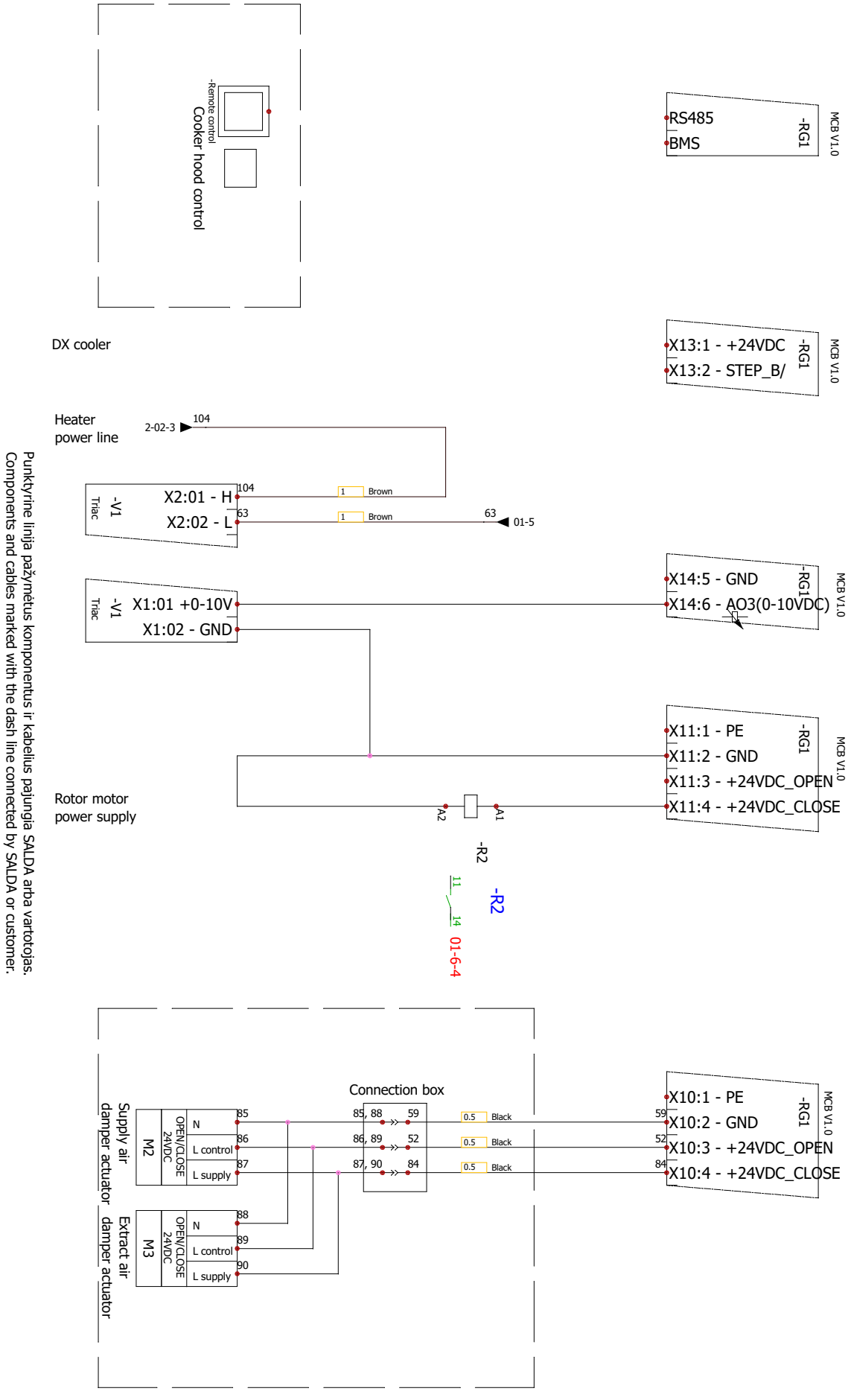


Figure 8.2.4 - 219.0161.0.1.3-PS-4k

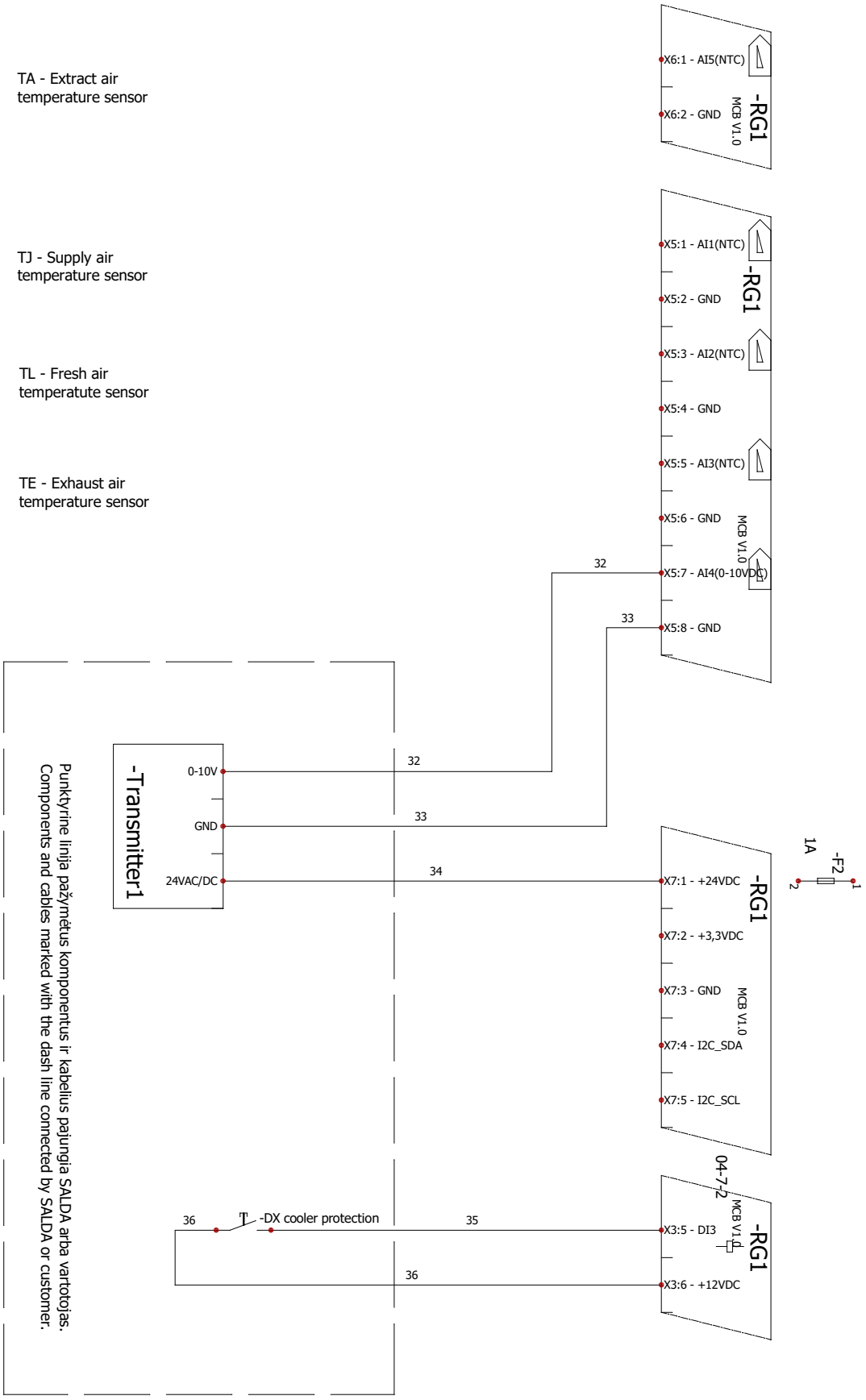


Figure 8.2.5 - 219.0161.0.1.4-PS-4k

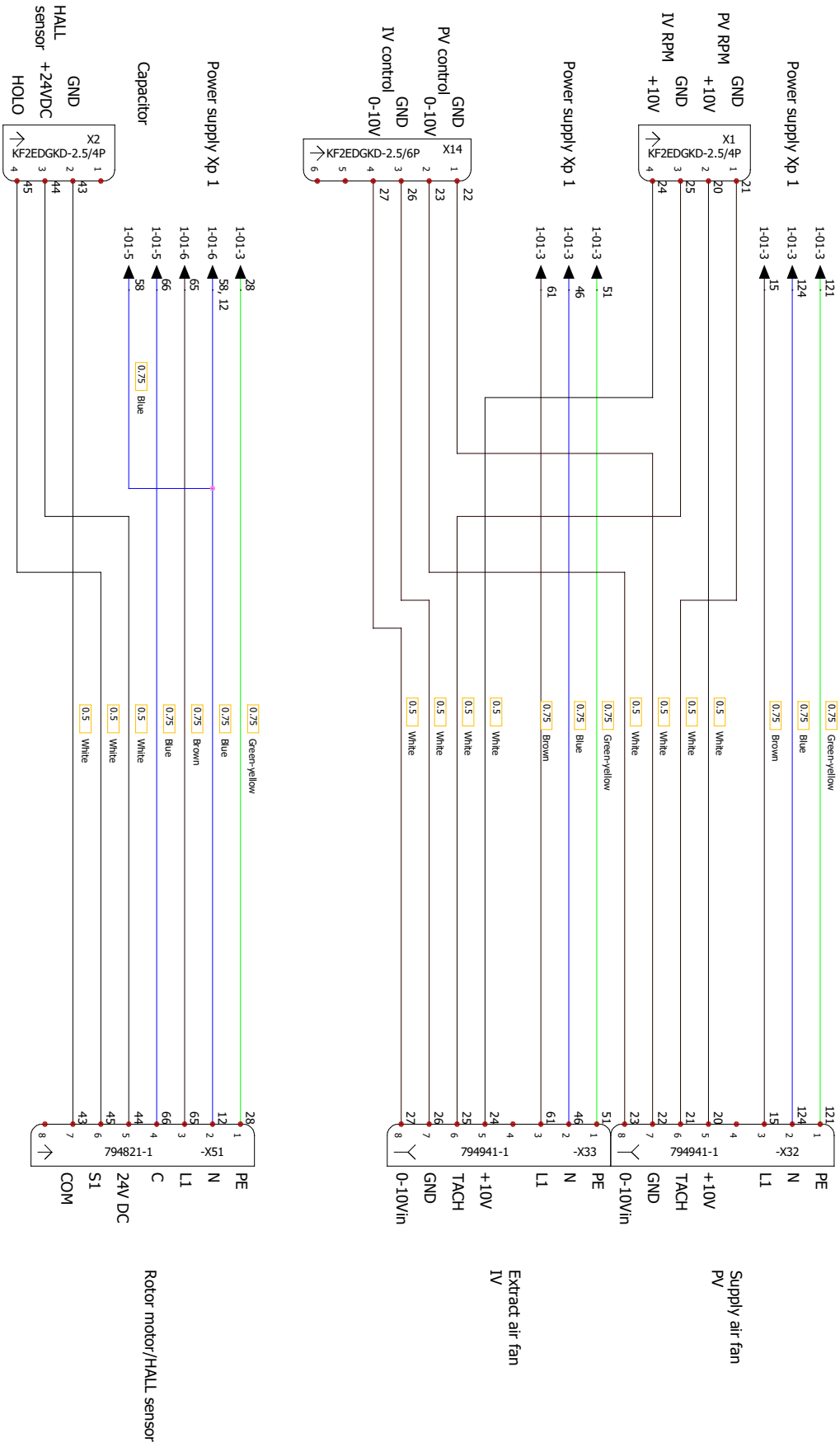


Figure 8.2.6 - 21.0205.0.1.1-PS-8k

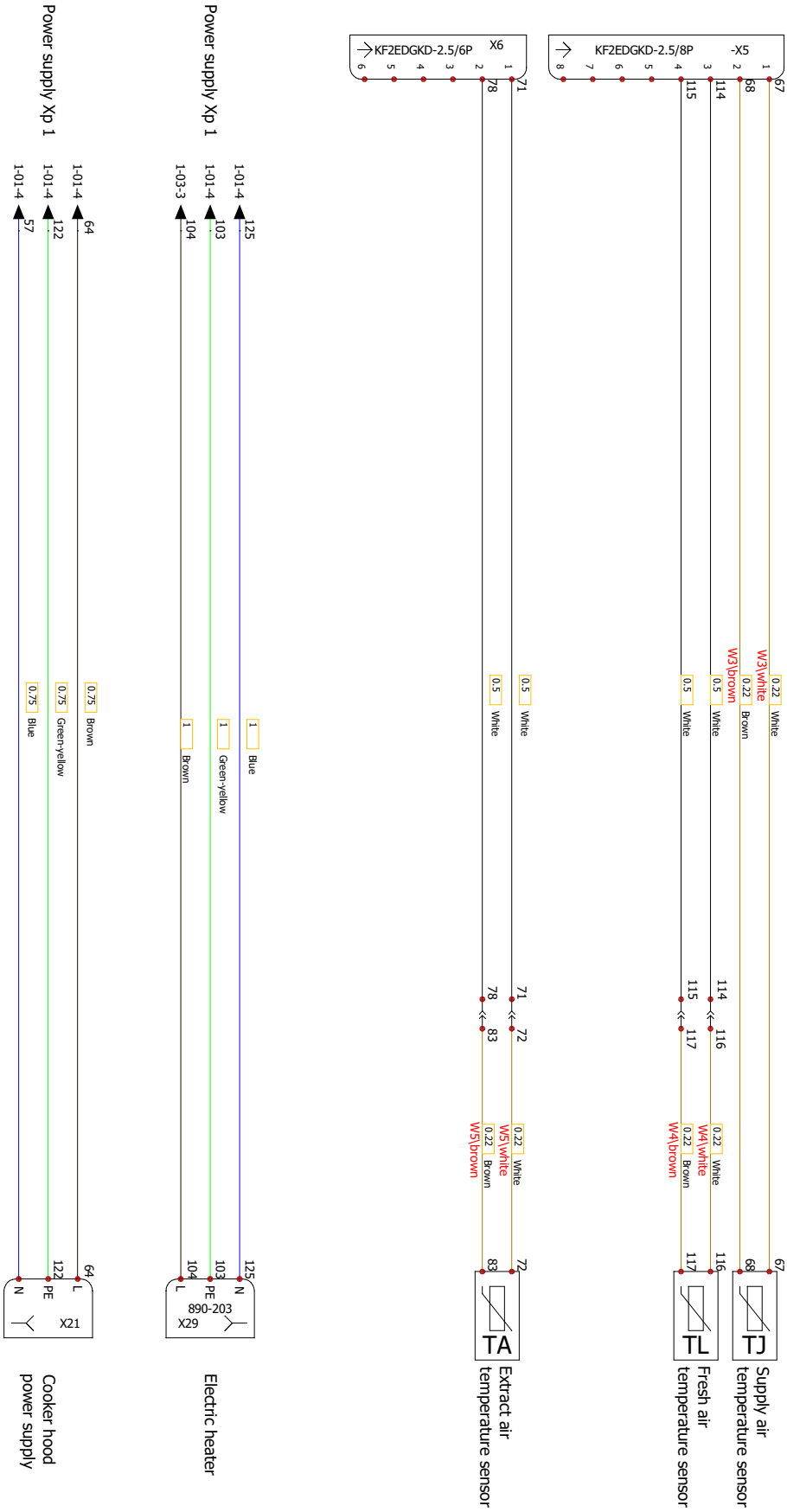


Figure 8.2.7 - 221.0205.0.1.2-PS-8k

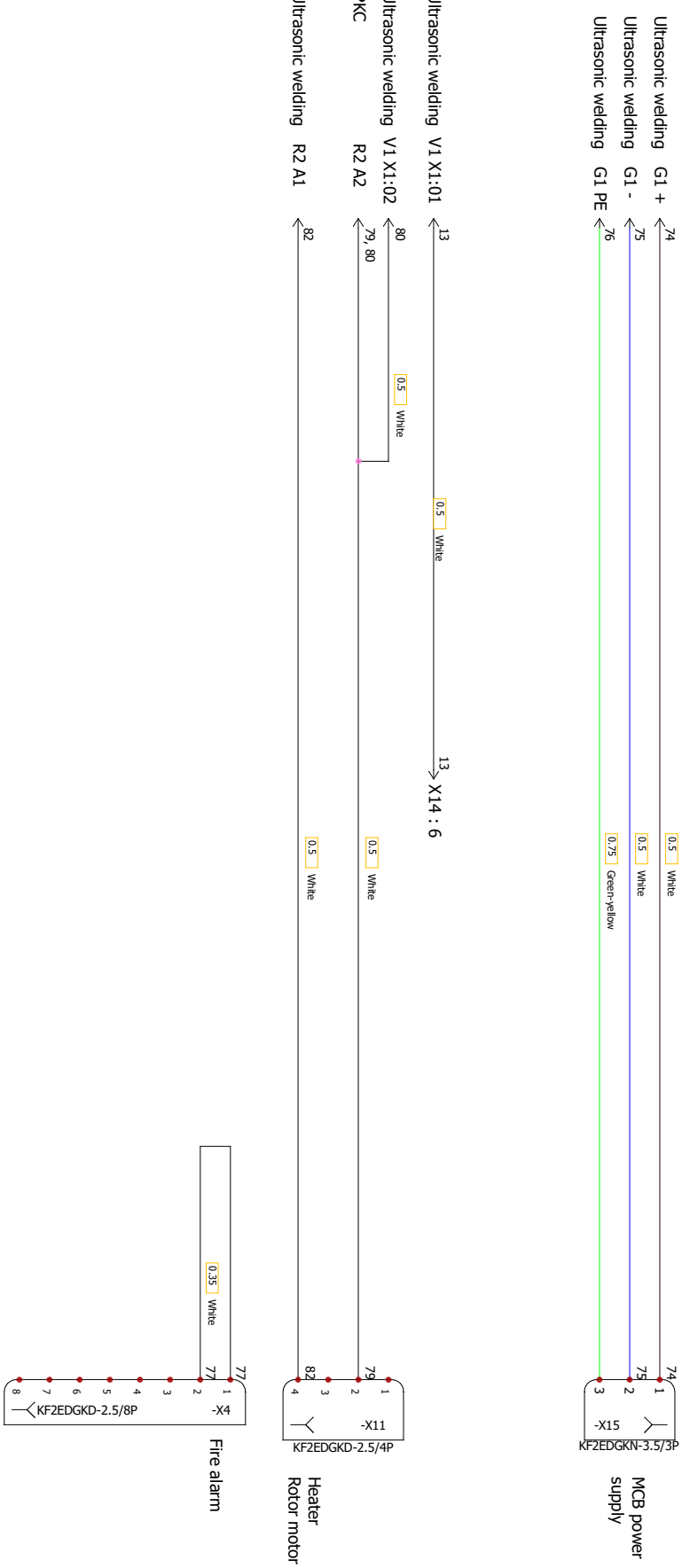


Figure 8.2.8 - 221.0206.0.1.0-PS-5k

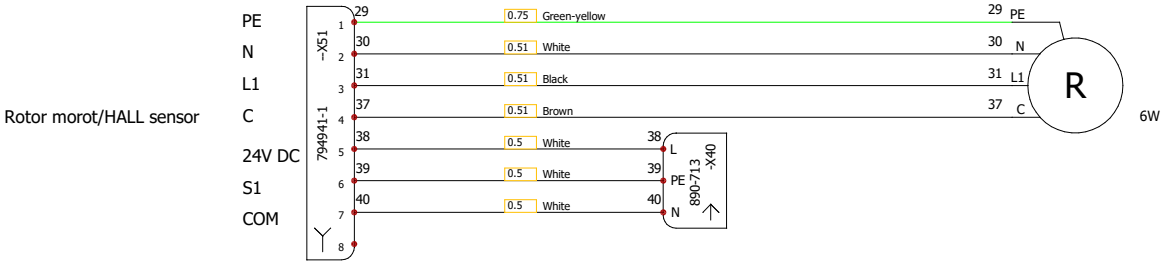


Figure 8.2.9 - 5.0013.0.1.0-PS-4k

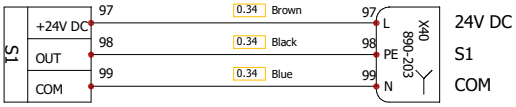
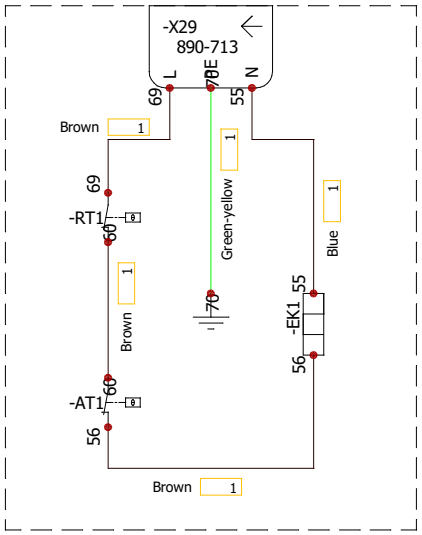


Figure 8.2.10 - 5.0014.0.1.0-PS-2k



EK - heating element
AT1 - automating overheat protection
RT1 - manual overheat protection

Figure 8.2.11 - 1.680.200.5.0-PS-1k

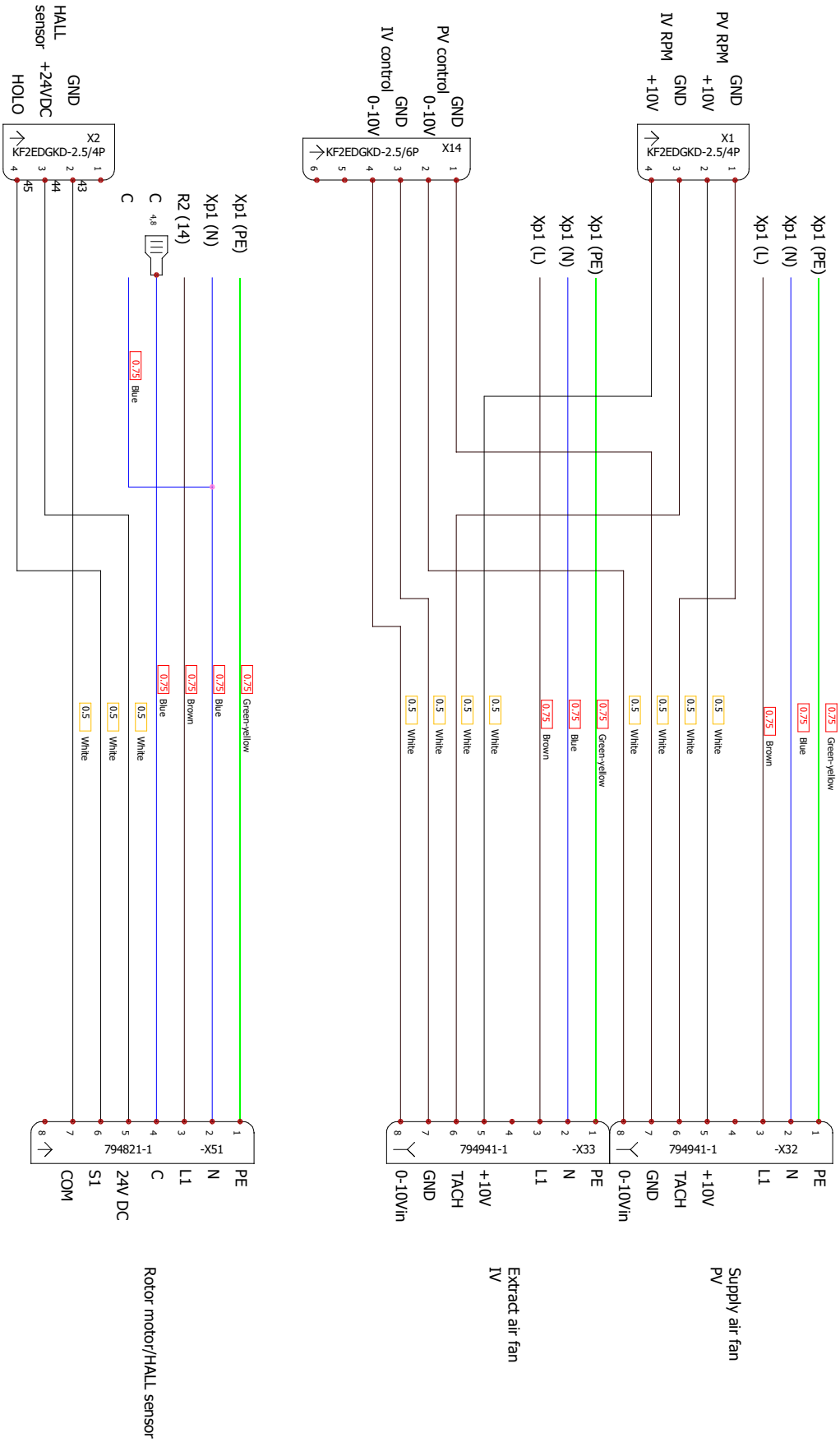


Figure 8.2.12 - 221.0216.0.1.1-PS-4k

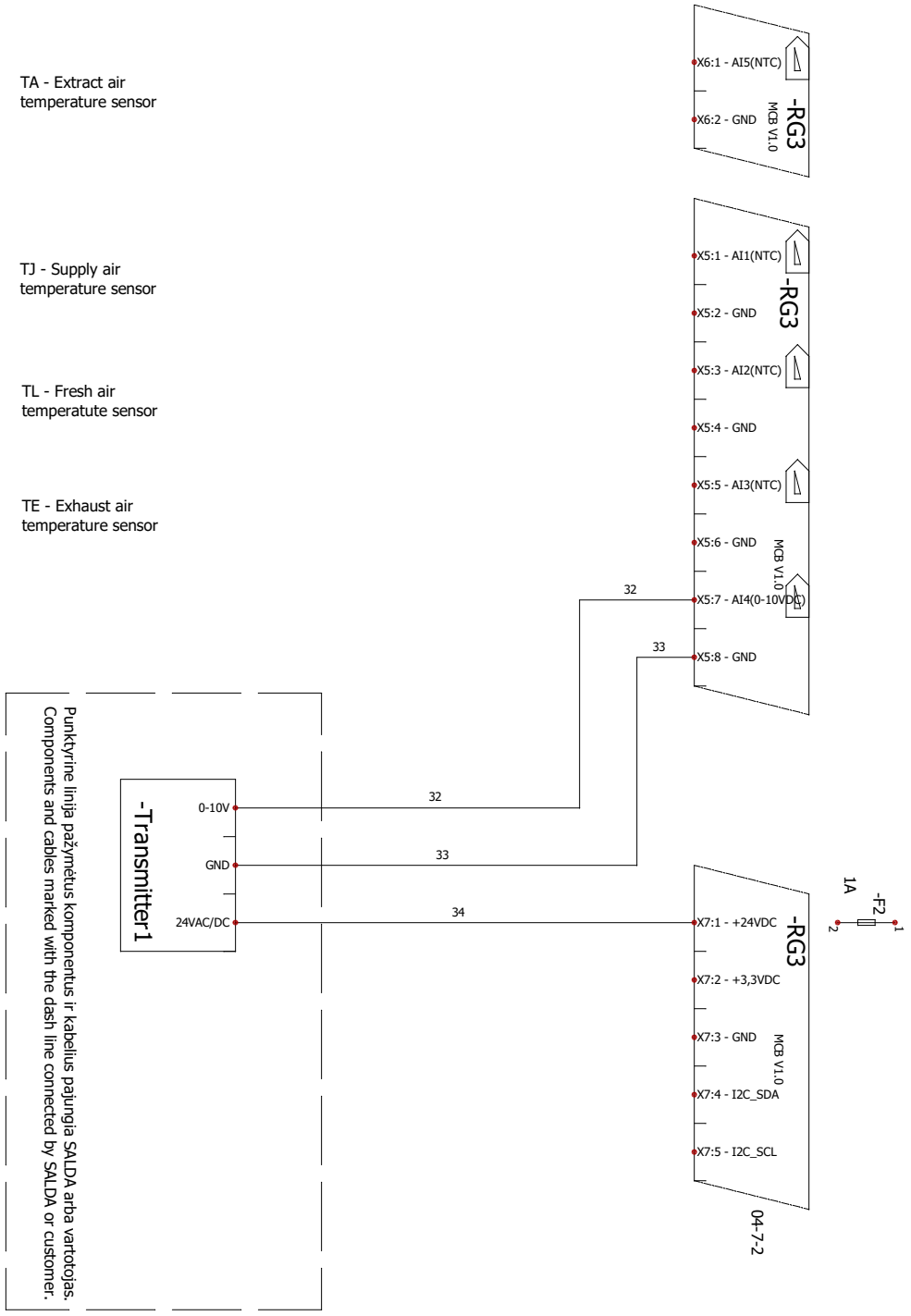
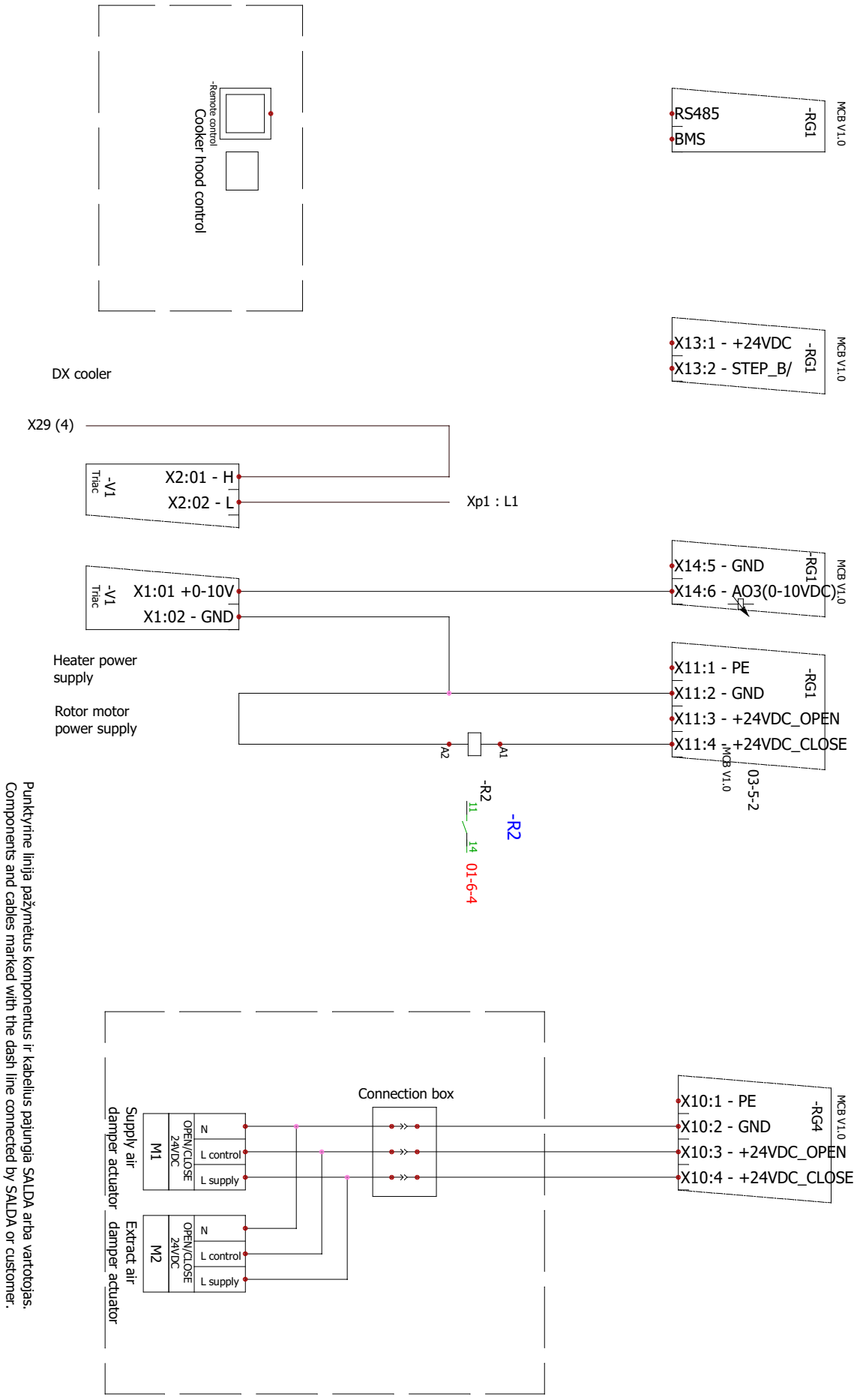


Figure 8.2.13 - 219.0172.0.1.4-PS-3k



Punktyrine linija pažymėtus komponentus ir kabelius pajungia SALDA arba vartotojas.
Components and cables marked with the dash line connected by SALDA or customer.

Figure 8.2.14 - 219.0172.0.1.3-PS-3k

Punktyrine linija pažymėtus komponentus ir kabelius pajungia SALDA arba vartotojas.
Components and cables marked with the dash line connected by SALDA or customer.

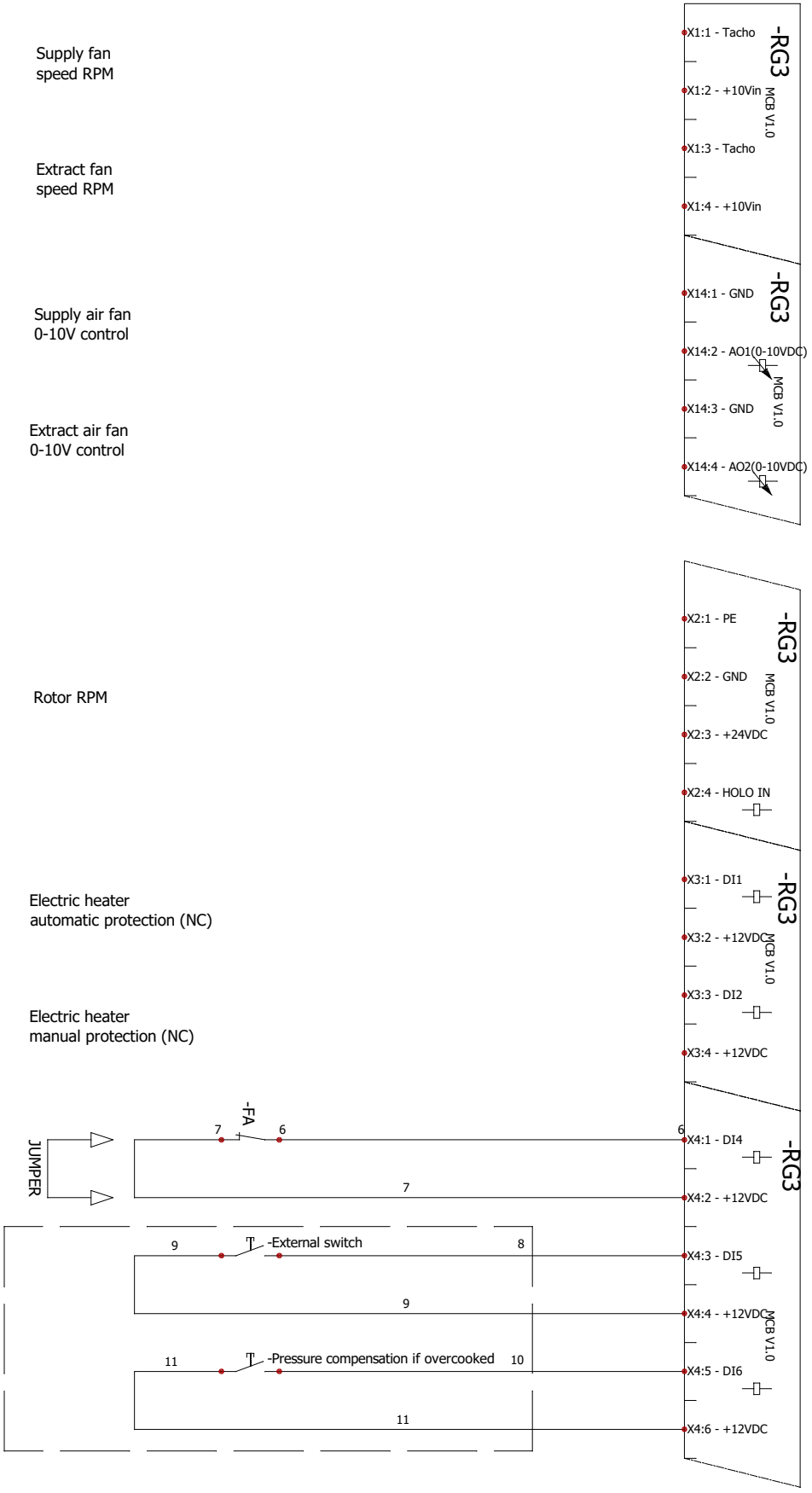


Figure 8.2.15 - 219.0172.0.1.2-PS-3kk

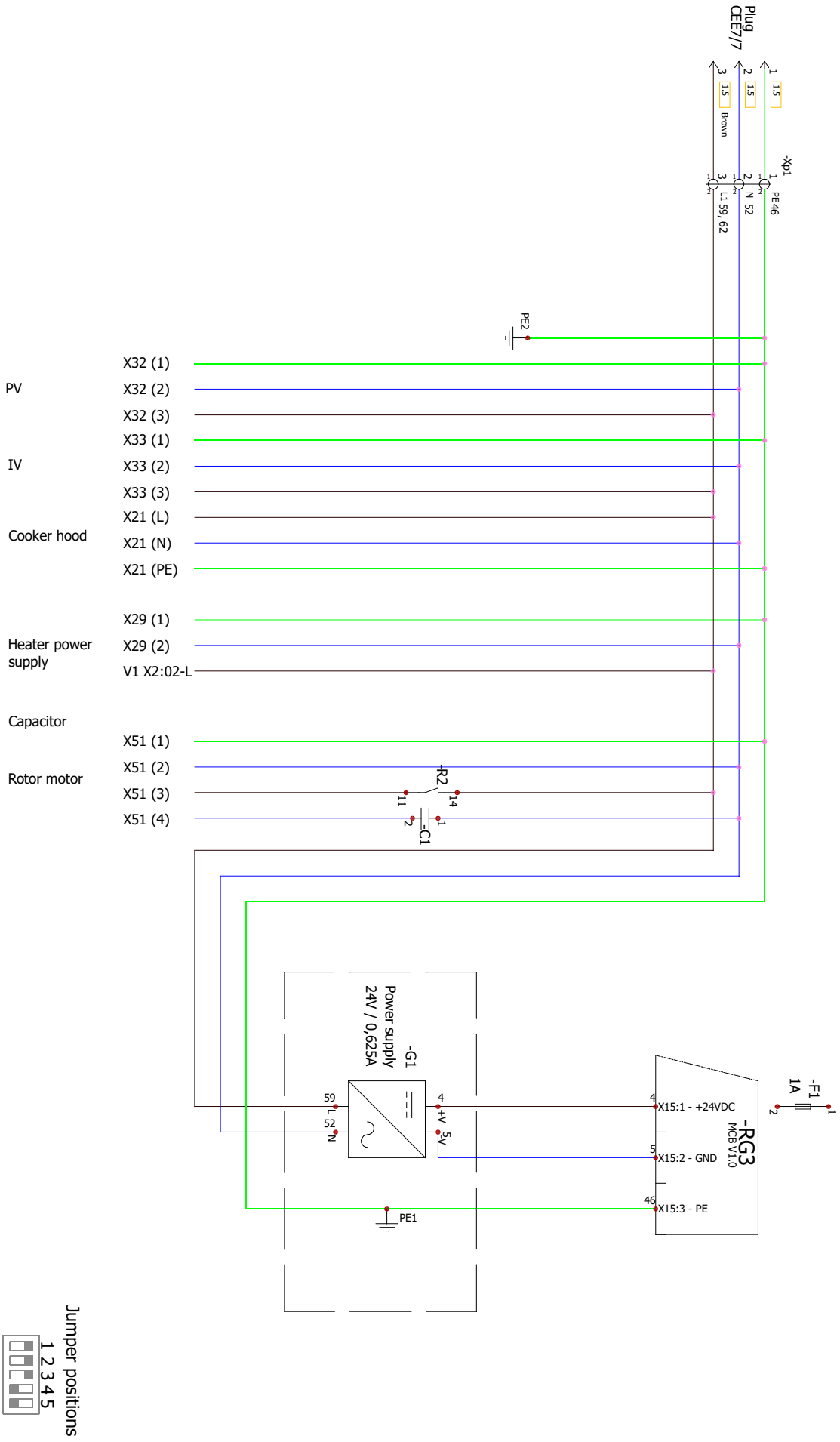


Figure 8.2.16 - 219.0172.0.1.1-PS-3k

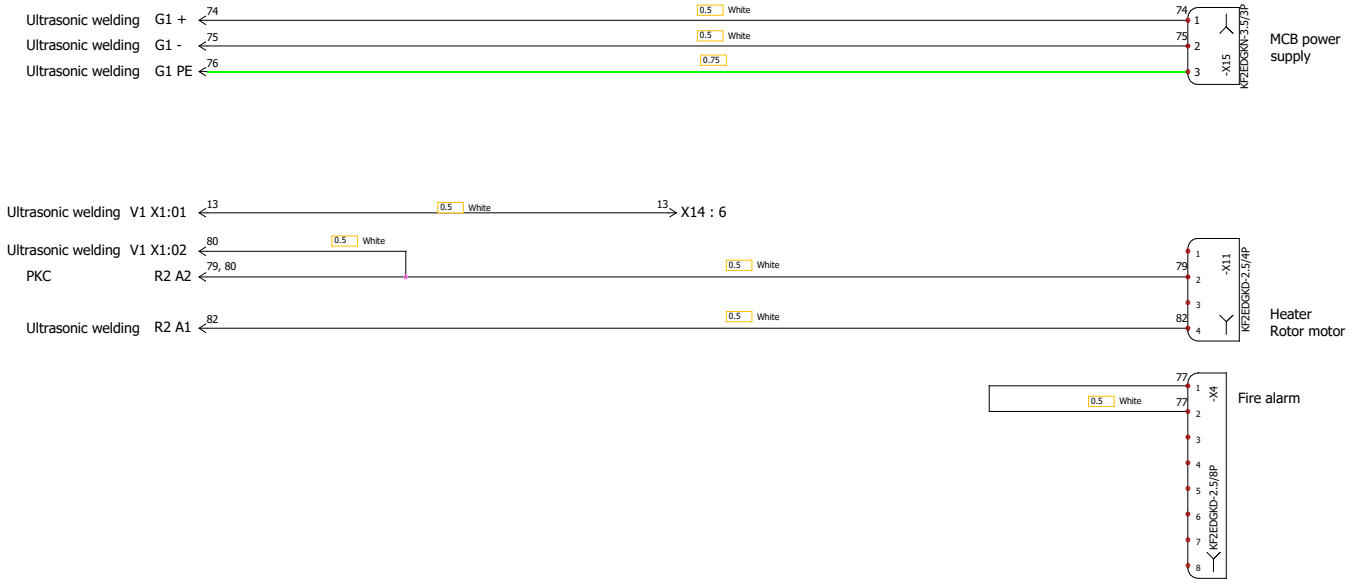


Figure 8.2.17 - 221.0206.0.1.0-PS-5k

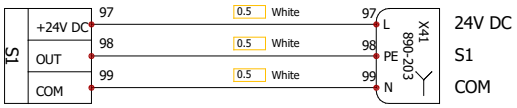


Figure 8.2.18 - 5.0014.0.1.0-PS-3k

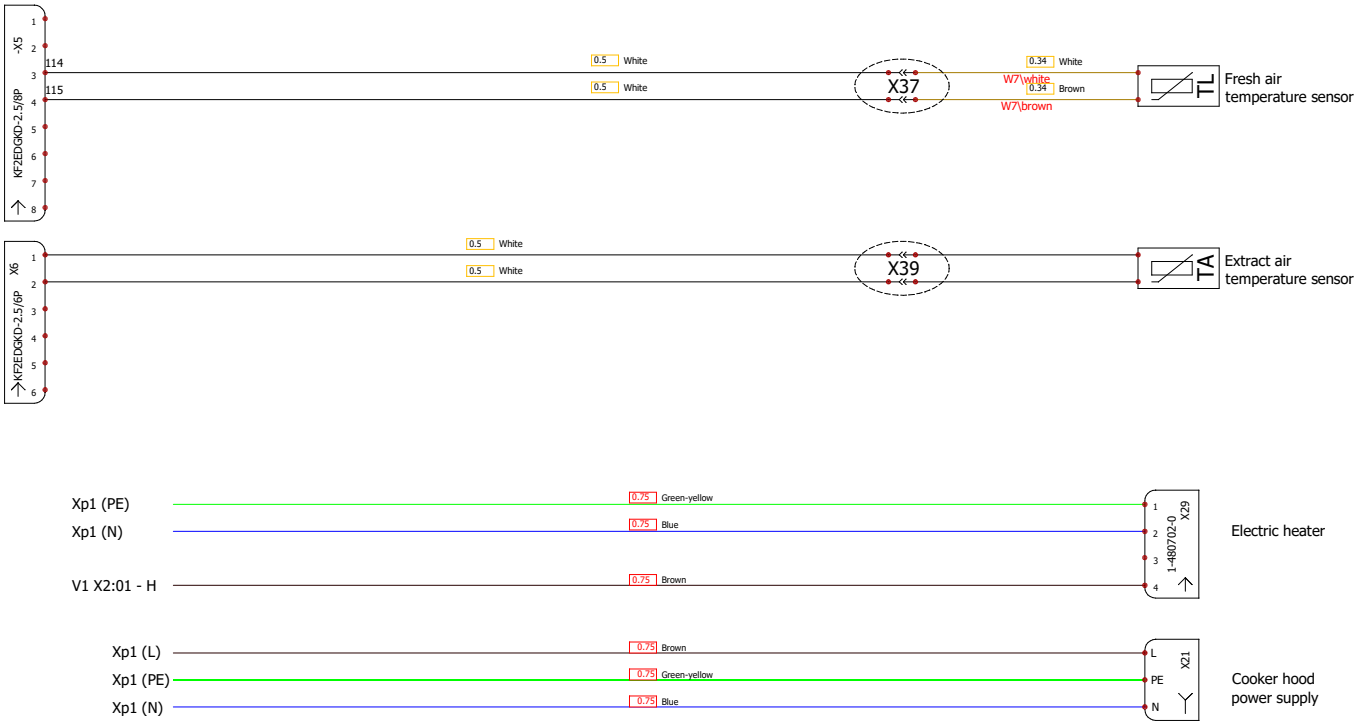


Figure 8.2.19 - 221.0216.0.1.2-PS-4k

8.3. ELECTRICAL CONNECTION OF THE UNITS

- Electrical connection can only be implemented by the qualified electrician in accordance with the applicable international and national electrical safety requirements and requirements for installation of electrical devices.

- Use only power source which meets the requirements specified on the device label.
- Power supply cable should be selected based on the electrical specification of the device. If the device power supply line is far from the unit, the distance and voltage drop should be considered.
- Device must be earthed.
- Install the control panel at the designated place.
- Install the supplied connection cablebetween the control panel and the HVAC unit. It is recommended to install the control panel separately from the power cables.

NOTE: If cable is used together with other power cables, shielded control panel cable with earthed shield should be used.
NOTE: The remote control panel can be connected and (or) disconnected only after disconnecting the power supply for the HVAC unit.

- Select the desired fan rotation speed and the supply air temperature using the remote controller.

9. POSSIBLE FAULTS AND TROUBLESHOOTING

FAILURE	CAUSE	EXPLANATION / CORRECTIVE ACTIONS
Unit is not operating	No supply voltages	Check whether the device is connected to the plug socket
	Two-pole protection device is off or a current leakage relay is active (if installed by the installer)	Switch on only if the unit condition has been evaluated by a qualified electrician. If the system failed, the failure MUST BE rectified prior to switching it on.
Air supply heater or heater is not operating or malfunctioning (if installed)	Too low air flow in air ducts activates automatic protection	Check if air filters are not clogged Check if fans are rotating
	Manual protection is activated	Possible heater or unit failure. MUST address the servicing staff for failure detection and its elimination.
Too low air flow at rated fan speed	Clogged supply and/or extract air filter(s)	Filter replacement needed
Filters are clogged and no message is shown on the remote control	Wrong time in filter timers	Shorten filter timer time till the message of clogged filters

10. SENSORS AND THEIR TECHNICAL INFORMATION

The controller is used with NTC sensors.
Default sensor NTC
10 kΩ β (25/85) 3977
Limits for temperature measurement -30 ...105 °C.
Accuracy - ± 0,2 %
Safety class – IP-54

11. INSPECTION OF THE VENTILATION SYSTEM

For the ventilation unit to work properly, perform the inspection of the entire ventilation system once a year. Check if the air inlet grating and room air supply devices are clean. Check if the air duct system is not dirty. If necessary, clean or replace these devices.

12. ECODESIGN DATA TABLE

SMARTY		2R VER	2R VER PLUS
Specific energy consumption (SEC) cold	[kWh/m²a]	-68.7	-67.5
Specific energy consumption (SEC) average	[kWh/m²a]	-28.6	-27.6
Specific energy consumption (SEC) warm	[kWh/m²a]	-5.7	-4.8
Declared typology		bidirectional	bidirectional
Type of drive installed (fan)		Variable	Variable
Type of heat recovery system		regenerative	regenerative
Thermal efficiency of heat recovery	[%]	76.6	75.9
Maximum flow rate	[m³/h]	201	256
Electric power input of the fan drive at maximum flow rate	[W]	126	170
Sound power level (Lwa)	[dB(A)]	49	48
Reference flow	m³/s]	0,039	0,05
Reference pressure difference	[Pa]	50	50
SPI	[W/(m³/h)]	0,47	0,47
Control factor and control typology		0,95	0,95
Declared maximum internal leakage rates	[%]	3	3
Declared maximum external leakage rates	[%]	2	2
Possition and description of visual filter warning for RVU's		Timer	Timer
AEC average	[kWh]	531	563
AEC cold	[kWh]	531	563
AEC warm	[kWh]	531	563
AHS Average	[kWh/a]	4192	4170
AHS Cold	[kWh/a]	8201	8157
AHS Warm	[kWh/a]	1896	1885
ErP Compliance		2018	2018
Internet address for disassembly instructions			www.salda.lt

13. DECLARATION OF CONFOMITY

Manufacturer

SALDA, UAB
Ragainės g. 100
LT-78109 Šiauliai, Lithuania
Tel.: +370 41 540415
www.salda.lt

Hereby confirms that the following products - Air handling units:

Smarty*

(where by "*" indicates possible unit installation type and modification)

Provided it was delivered and installed in the facility in accordance with the included installation instructions, comply with all applicable requirements in the following directives:

Machinery Directive 2006/42/EC
EMC Directive 2014/30/EU
Ecodesign Directive 2009/125/EC

The following harmonized standards are applied in applicable parts:

LST EN ISO 12100:2011 - Safety of machinery - General principles for design - Risk assessment and risk reduction.
LST EN 60204-1:2006 - Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
LST EN 60335-1:2012 - Household and similar electrical appliances. Safety. Part 1: General requirements.
LST EN 60529:1999 - Degrees of protection provided by enclosures (IP code).
LST EN 61000-6-2:2005 - Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments.
LST EN 61000-6-3:2007 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

Should any alterations be made in the products, this declaration will no longer apply.

Notified body: VšĮ Technikos priežiūros tarnyba, Naugarduko g. 41, LT – 03227 Vilnius, Lithuania, identification number 1399.

Quality: Salda UAB activities are in line with the international quality management system standard **ISO 9001:2015.**

Date 2019-02-01

Giedrius Taujenis
Director product development

14. WARRANTY

1. All equipment manufactured in our factory is checked in operating conditions and tested befor delivery. Test protocol is supplied together with the unit. The equipment is shipped in good working order and condition to the direct client. The unit is warrantied for the period of two years from the invoice date.
2. If equipment is found to have been damaged during transportation, a claim should be made against carrier, as we assume no responsibility for such damage.
3. This warranty does not apply:
   3.1. when transportation, storage, installation and maintenance instructions of the unit are violated;
   3.2. when the equipment is improperly maintained, mounted - inadequate maintenance;
   3.3. when the equipment without our knowledge and permission has been upgraded or unskilled repairs were made;
   3.4. when the unit was used not for its original purpose.
   3.5. Company SALDA UAB is not responsible for potential loss of property or personal injury in cases where AHU is manufactured without a control system and the control system will be installed by the client or third parties. The manufacturer's warranty does not cover devices that will be damaged by installing the control system.
4. This warranty does not apply at these malfunction cases:
   4.1. mechanical damage;
   4.2. damage caused by entering outside objects, materials, liquids;
   4.3. damage caused by natural disaster, accident (voltage change in the electricity network, lightning, etc..).
5. The company assumes no liability for its products either directly or indirectly damage, if the damage is caused by failure to comply with installation and mounting regulations, deliberate or careless users or third-party behavior.

These conditions are readily discernable when the equipment is returned to our factory for inspection.
If the direct client determines that equipment is found to be faulty, or a breakdown occurred, he should inform the manufacturer within five working days and deliver the equipment to manufacturer. Delivery costs should be covered by customer.

⚠ **Manufacturer reserves the right to change this technical passport any time without prior notice, if some typographic errors or inaccurate information is found, as well as after improving the apps and/or the devices. Such changes will be included in the new issues of the technical passport. All illustrations are just for information and thus may differ from the original device.**

14.1. LIMITED WARRANTY COUPON

Warranty term
24 months*

I received complete package and technical manual of the product ready for usage. I have read warranty terms and conditions and agree with them:

.....
Customer's signature

*refer to WARRANTY CONDITIONS

Dear User, we appreciate your choice and do hereby guarantee that all ventilation equipment manufactured by our Company is inspected and thoroughly tested. An operational and high-quality product is sold to the direct buyer and shipped from the territory of the factory. It is provided with a 24-month warranty since invoice issue date.
Your opinion is important to us, thus we always look forward to hearing your comments, feedback, or suggestions regarding technical and operational characteristics of the Products.
In order to avoid any misunderstandings, please read the instructions for installation and operation of the product as well as other technical documents of the product carefully. The number of the Limited Warranty Coupon and serial number of the product specified on the silver identification sticker attached to the housing must match.
The Limited Warranty Coupon shall be valid provided that the seller's stamps and records are clear. It is prohibited to change, delete, or rewrite the data specified on it in any manner – such a coupon shall be invalid.
With this Limited Warranty Coupon the manufacturer confirms one's obligations to implement the imperative requirements established by effective laws on protection of consumer rights in the event of identification of any defects of the products.
The manufacturer reserves the right to refuse provision of free warranty servicing in cases when the warranty conditions listed below are disregarded.

UNIT'S MAINTENANCE TABLE

Product name*

LOT number*

Instalation	Interval	Date
Fan cleaning	**Once a year****	
Heat exchanger cleaning	**Once a year****	
Filter replacement	**Every 3-4 months****	

* - Look at the product label.
** - At least.

NOTE. The purchaser is required to fill in the "Product maintenance table".

MAN000005

Ragainės g. 100
Šiauliai LT-78109, LITHUANIA

+370 41 540 415
office@salda.lt