Before starting the product installation, carefully read the manual.

Installation work must be carried out in accordance with national electrical installation standards and only by authorized personnel. This installation manual must be retained for future reference after being read carefully.

PL

User Manual
(Installation, Operation, and Maintenance)

Compact Air Handling and Ventilation Units

VENTUS PLATINIUM VVSA11c-VVSA56c

IOMM VENTUS PLATINIUM - ver. 6.0.5 (08.2025)

Content

1 GENERAL SAFETY RULES - OCCUPATIONAL HEALTH AND SAFETY (HSE)

Thorough review of this manual, as well as proper installation, commissioning, and operation of the air handling unit in accordance with the provided instructions and all applicable safety regulations, will lay a solid foundation for efficient, safe, and trouble-free operation of the device.
This document does not cover all possible configurations of these systems, nor does it provide exhaustive examples of installation or assembly. It also does not address every aspect of commissioning, operation, repair, or maintenance. When the equipment is used for its intended, design-specific purpose, both this documentation and all other materials provided with the unit are intended solely for qualified technical personnel.

		This symbol is displayed to indicate issues and operations that may pose a risk. Carefully read the section marked with this symbol and follow the instructions.
	**WARNING**	This means that failure to follow the instructions may result in minor injury or damage to the product.
	**DANGER**	This means that failure to follow instructions may result in serious injury or death.

INSTRUCTIONS GUIDELINES

- Failure to follow the recommendations provided in this manual may result in property damage and personal injury. The manufacturer assumes no responsibility for any damage, whether direct or indirect, resulting from non-compliance with these instructions.
- Depending on the selected configuration, the unit may be delivered with additional manuals for the supplied components. It is strongly recommended to review and comply with all safety requirements specified in those documents.
- The manual and unit documentation, as well as any additional instructions for used components (if available), should be kept in a safe and accessible place for operating and service personnel.

WARNING

INSTALLATION, SERVICE, AND OPERATION

- ! BEFORE PERFORMING ANY WORK, DISCONNECT AND SECURE THE POWER SUPPLY TO PREVENT UNINTENTIONAL START-UP OF THE UNIT. SERVICE WORK MUST BE CLEARLY ANNOUNCED AND MARKED.
- ! PERSONAL PROTECTIVE EQUIPMENT (PPE) MUST BE USED DURING ALL WORK ACTIVITIES.IN PARTICULAR:
  - ANTI-CUT GLOVES (EN 388) TO PROTECT HANDS FROM SHARP EDGES,
  - SAFETY HELMET (EN 397) WHEN WORKING OVERHEAD,
  - PROTECTIVE MASK TO PREVENT DUST AND DIRT PARTICLES FROM ENTERING THE LUNGS,
  - SAFETY GLASSES AND ANY OTHER PROTECTION REQUIRED BY REGULATIONS.

- ! ALL SERVICE OPERATIONS MUST BE CARRIED OUT WITH UTMOST CARE.
- ! THE INSTALLATION, COMMISSIONING, AND SERVICING OF AIR HANDLING UNITS AND THEIR COMPONENTS MAY INVOLVE SAFETY RISKS AND THEREFORE REQUIRE SPECIFIC KNOWLEDGE AND TRAINING.
- ! INSTALLATION, COMMISSIONING, AND OPERATION MUST BE PERFORMED BY PERSONNEL WITH APPROPRIATE QUALIFICATIONS IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- ! IT IS RECOMMENDED THAT A VTS-AUTHORIZED SERVICE TECHNICIAN PERFORMS INSTALLATION, COMMISSIONING, POST-WARRANTY REPAIRS, TECHNICAL INSPECTIONS, AND MAINTENANCE ACTIVITIES REQUIRED FOR THE AIR HANDLING UNITS.
- ! DEVICES THAT ARE INCORRECTLY INSTALLED, CONFIGURED, OR SERVICED BY UNQUALIFIED PERSONNEL MAY CAUSE SERIOUS INJURY OR EVEN DEATH. IN SUCH CASES, THE MANUFACTURER IS RELEASED FROM ANY RESPONSIBILITY OR LIABILITY UNDER WARRANTY OR GUARANTEE.
- ! THIS DEVICE IS NOT INTENDED FOR USE BY PERSONS (INCLUDING CHILDREN) WITH REDUCED PHYSICAL, SENSORY, OR MENTAL CAPABILITIES, OR WITHOUT EXPERIENCE AND KNOWLEDGE, UNLESS THEY ARE SUPERVISED OR INSTRUCTED BY A PERSON RESPONSIBLE FOR THEIR SAFETY.
- ! CHILDREN MUST BE SUPERVISED TO ENSURE THEY DO NOT PLAY WITH THE DEVICE.
- ! CLEANING AND MAINTENANCE BY THE USER MUST NOT BE PERFORMED BY CHILDREN WITHOUT SUPERVISION.
- ! THE UNIT MUST BE USED IN ACCORDANCE WITH ITS INTENDED PURPOSE AND WITHIN THE OPERATING PARAMETERS FOR WHICH IT WAS DESIGNED. THE MANUFACTURER SHALL NOT BE HELD LIABLE FOR ANY CONSEQUENCES RESULTING FROM IMPROPER USE.

DANGER

ELECTRICAL INSTALLATION

! ALL ELECTRICAL WORK MUST BE CARRIED OUT BY A LICENSED ELECTRICIAN HOLDING AT MINIMUM THE FOLLOWING QUALIFICATIONS:
- Certificate of Qualification for Operation of Devices, Installations, and Networks
- Certificate of Qualification for Supervision of Devices, Installations, and Networks

! IF THE UNIT IS EQUIPPED WITH COMPONENTS OR CONNECTED TO INSTALLATIONS REQUIRING E2 AND D2 QUALIFICATIONS, THE INSTALLER AND TECHNICAL SUPERVISOR MUST HOLD THESE QUALIFICATIONS.

! ALL CONNECTIONS MUST BE MADE IN ACCORDANCE WITH THE GUIDELINES PROVIDED IN THIS DOCUMENT.

! ENSURE THAT THE SUPPLY VOLTAGE MATCHES THE RATINGS INDICATED ON THE NAMEPLATES OF ELECTRICAL DEVICES. PERMISSIBLE DEVIATIONS ARE:
- SUPPLY VOLTAGE: ±5%,
- FREQUENCY: ±2%

! IT IS ALSO RECOMMENDED TO CHECK THAT ALL GROUNDING CONNECTIONS ARE SECURELY FASTENED.

! INSTALL A DEDICATED CIRCUIT WITH A MAIN DISCONNECT SWITCH EQUIPPED WITH A LOCKOUT DEVICE. BEFORE PERFORMING ANY SERVICE OR MAINTENANCE, SET THE MAIN DISCONNECT SWITCH TO THE “OFF” POSITION.

! INCORRECT WIRING OR INSTALLATION MAY RESULT IN FIRE OR ELECTRIC SHOCK.

! DO NOT USE DAMAGED OR IMPROPERLY SELECTED SWITCHES OR CABLES.

WARNING

WARNING! HOT SURFACES

! THE DEVICE CONTAINS COMPONENTS WITH POTENTIALLY HIGH SURFACE TEMPERATURES, SUCH AS HEAT EXCHANGERS, HEATING ELEMENTS, OR MOTOR HOUSINGS. DIRECT CONTACT WITH THESE PARTS MAY RESULT IN BURNS OR OTHER INJURIES. SPECIAL CARE MUST BE TAKEN – USE APPROPRIATE PROTECTIVE CLOTHING AND BEGIN SERVICE WORK ONLY AFTER THESE PARTS HAVE COOLED DOWN TO BELOW 40°C.

WARNING! SHARP EDGES

! THE UNIT CONTAINS SHARP EDGES, SUCH AS HEAT EXCHANGER FINS. CONTACT WITH THEM MAY CAUSE CUTS. EXERCISE EXTREME CAUTION AND WEAR PROTECTIVE CLOTHING WHEN PERFORMING ANY WORK.

!

WARNING! MOVING PARTS

! THE UNIT INCLUDES MOVING COMPONENTS, SUCH AS FAN IMPELLERS. CONTACT WITH THESE PARTS MAY LEAD TO INJURY OR SERIOUS HARM. SERVICE WORK MUST ONLY BE PERFORMED AFTER ALL MOVING PARTS HAVE COME TO A COMPLETE STOP.

! OPENING INSPECTION PANELS DURING UNIT OPERATION OR STARTING THE UNIT WITH OPEN PANELS IS STRICTLY PROHIBITED.

! BEFORE OPENING ANY INSPECTION PANELS, SWITCH OFF THE UNIT AND WAIT AT LEAST FOUR MINUTES TO ENSURE THAT ALL MOVING PARTS HAVE FULLY STOPPED.

WARNING

RESIDUAL RISK

DURING THE DESIGN AND MANUFACTURING PROCESS, EVERY EFFORT WAS MADE TO MINIMIZE RISKS TO PEOPLE AND PROPERTY. HOWEVER, A CERTAIN LEVEL OF RISK MAY STILL EXIST, WHICH IS BEYOND THE MANUFACTURER'S CONTROL.

- **HAZARDS RESULTING FROM IMPROPER INSTALLATION AND ASSEMBLY:**
  - INSTALLATION IN AREAS ACCESSIBLE TO UNAUTHORIZED PERSONS, POSING A THREAT TO HEALTH AND SAFETY,
  - INSTALLATION IN LOCATIONS WHERE MAINTENANCE WORK IS DIFFICULT OR DANGEROUS FOR HEALTH OR LIFE,
  - ACCUMULATION OR LEAKAGE OF CONDENSATE, WHICH MAY CAUSE PROPERTY DAMAGE, ELECTRICAL SHORT CIRCUITS, OR SLIPPERY SURFACES,
  - LEAKAGE OF REFRIGERANT OR HEATING MEDIUM FROM THE CIRCUIT, CREATING A HEALTH AND SAFETY HAZARD AND POTENTIALLY CAUSING PROPERTY DAMAGE,
  - COLLAPSE OF THE DEVICE DUE TO INSTALLATION ON AN IMPROPER SUPPORT STRUCTURE, POSING A RISK TO HEALTH, LIFE, AND PROPERTY

- HAZARDS RESULTING FROM IMPROPER TRANSPORT:
  - DROPPING OR TIPPING OVER OF THE DEVICE OR ITS COMPONENTS DURING TRANSPORT, POSING A DANGER TO BOTH HEALTH/LIFE AND PROPERTY

- HAZARDS RESULTING FROM IMPROPER STORAGE:
  - STORING THE UNIT IN CONDITIONS THAT LEAD TO DAMAGE, DEFORMATION, OR CHANGES IN THE PROPERTIES OF THE UNIT OR ITS COMPONENTS, WHICH MAY RESULT IN MALFUNCTION OR FAILURE TO MEET DECLARED SPECIFICATIONS

- HAZARDS RESULTING FROM INCORRECT ELECTRICAL INSTALLATION:
  - SHORT CIRCUITS, FIRES, AND RELEASE OF TOXIC FUMES, WHICH POSE A SERIOUS THREAT TO HEALTH AND LIFE, AS WELL AS POTENTIAL PROPERTY DAMAGE

- OPERATING THE DEVICE WITHOUT PROTECTIVE COVERS AND PANELS:
  - CONTACT WITH MOVING OR HOT PARTS MAY LEAD TO SERIOUS INJURY OR POSE A RISK TO HEALTH AND LIFE

WARNING

FAULTS, REPAIRS, MODIFICATIONS

- IN THE EVENT OF A MALFUNCTION OR IMPROPER OPERATION, THE UNIT MUST BE IMMEDIATELY SHUT DOWN AND AN AUTHORIZED SERVICE PROVIDER MUST BE CONTACTED.
- ALL REPAIRS MUST BE CARRIED OUT BY THE MANUFACTURER'S AUTHORIZED SERVICE CENTER USING GENUINE SPARE PARTS ONLY.
- ROUTINE INSPECTIONS PERFORMED BY QUALIFIED TECHNICAL PERSONNEL OR VTS-AUTHORIZED SERVICE TECHNICIANS ENSURE LONG-TERM, RELIABLE, AND TROUBLE-FREE OPERATION. OUR SERVICE TEAM IS ALWAYS AVAILABLE TO PROVIDE SUPPORT DURING COMMISSIONING, MAINTENANCE, OR IN CASE OF ANY EMERGENCIES RELATED TO UNIT OPERATION.
- VTS-AUTHORIZED SERVICE CENTERS PROVIDE SPARE PARTS AND ACCESSORIES FOR OUR AIR HANDLING UNITS. WHEN ORDERING SPARE PARTS, PLEASE PROVIDE THE UNIT TYPE, SIZE, AND SERIAL NUMBER.
- MORE INFORMATION ABOUT THE VTS SERVICE NETWORK CAN BE FOUND AT: WWW.VTSGROUP.COM.
- ANY UNAUTHORIZED MODIFICATIONS TO THE UNIT — WHETHER MECHANICAL OR ELECTRICAL — ARE STRICTLY PROHIBITED AND WILL VOID THE WARRANTY. THE MANUFACTURER ACCEPTS NO LIABILITY FOR THE CONSEQUENCES OF SUCH ACTIONS.

INFORMATION FOR USERS ON THE CORRECT HANDLING OF ELECTRICAL AND ELECTRONIC WASTE (WEEE).

IN ACCORDANCE WITH EUROPEAN UNION DIRECTIVE 2002/96/EC OF 27 JANUARY 2003 AND APPLICABLE NATIONAL LEGISLATION, PLEASE BE AWARE THAT:

- WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) MUST NOT BE DISPOSED OF AS MUNICIPAL WASTE AND MUST BE COLLECTED AND DISPOSED OF SEPARATELY.
- USE PUBLIC OR PRIVATE COLLECTION SYSTEMS AS SPECIFIED IN LOCAL REGULATIONS.
- THE EQUIPMENT MAY CONTAIN HAZARDOUS SUBSTANCES; IMPROPER USE OR DISPOSAL OF SUCH SUBSTANCES MAY HARM HUMAN HEALTH AND THE ENVIRONMENT.
- THE SYMBOL (CROSSED-OUT WHEELIE BIN) ON THE PRODUCT, PACKAGING OR TECHNICAL DOCUMENTATION INDICATES THAT THE EQUIPMENT WAS PLACED ON THE MARKET AFTER 13 AUGUST 2005 AND MUST BE DISPOSED OF SEPARATELY.
- BY SORTING AND DELIVERING WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT FOR PROCESSING, RECOVERY, RECYCLING AND DISPOSAL, YOU HELP TO PROTECT THE ENVIRONMENT FROM POLLUTION, REDUCE THE USE OF NATURAL RESOURCES, AND LOWER THE COST OF PRODUCING NEW DEVICES.
- ILLEGAL DISPOSAL OF ELECTRICAL AND ELECTRONIC WASTE IS SUBJECT TO PENALTIES SPECIFIED IN LOCAL WASTE MANAGEMENT LAWS.

DANGER

EMERGENCY SITUATIONS – FIRE

PROCEDURE IN THE EVENT OF A FIRE IN ELECTRICAL EQUIPMENT:

STAY CALM – DON'T PANIC, ASSESS THE SITUATION.

DISCONNECT POWER:

- IF POSSIBLE, TURN OFF THE POWER SUPPLY (E.G. BY TURNING OFF FUSES OR THE MAIN CIRCUIT BREAKER).
- DO NOT TOUCH THE DEVICE OR WIRES WITH BARE HANDS - THEY MAY STILL BE ELECTRIC.

CALL FOR HELP:

- CALL THE EMERGENCY NUMBER 112 OR 998.
- PROVIDE THE EXACT ADDRESS AND A BRIEF DESCRIPTION OF THE SITUATION.

FIRE FIGHTING:

- **DO NOT USE WATER!** – WATER CONDUCTS ELECTRICITY AND MAY CAUSE SHOCK.
- USE APPROPRIATE FIRE FIGHTING EQUIPMENT:
  - **CO_2 (CARBON DIOXIDE) FIRE EXTINGUISHER** – BEST FOR EXTINGUISHING FIRES ON ELECTRIC EQUIPMENT.
  - **ABC POWDER FIRE EXTINGUISHER** – CAN BE USED BUT MAY DAMAGE THE ELECTRONICS.

EVACUATION:

- IF THE FIRE IS SEVERE OR CANNOT BE EXTINGUISHED SAFELY, LEAVE THE ROOM AND CLOSE THE DOOR BEHIND YOU (TO RESTRICT THE SUPPLY OF OXYGEN).
- HELP OTHERS LEAVE THE BUILDING.
- DO NOT USE ELEVATORS.

! **IN THE EVENT OF FIRE, THERE IS A THREAT TO HEALTH AND LIFE DUE TO HIGH TEMPERATURE, HIGH SMOKE AND THE EMERGENCE OF HARMFUL GASES, INCLUDING: CARBON MONOXIDE, CARBON DIOXIDE, HYDROGEN CHLORIDE, HYDROGEN CYANIDE, DIOXINS.**

! **IT IS NECESSARY TO USE A RESPIRATORY PROTECTIVE APPARATUS (RESPIRATOR)!**

2 GENERAL INFORMATION

VENTUS PLATINIUM floor-standing ventilation and air conditioning units can be installed indoors or outdoors. The units are designed to work with air duct systems that supply and extract air from rooms, according to the ventilation design and parameters specified in the unit selection sheet. Connecting the ducts ensures that the rotating parts of the unit (the fan impeller) are not accessible. Nominal parameters and equipment are presented in the unit selection data sheet. Outdoor installation requires a roof and appropriate air intake and exhaust vents, as well as protection of the peripheral (field) control components from weather conditions.

The units can be used to treat air with a maximum dust concentration of 0.5 mg/m3 · The permissible temperature of the air supplied to the units is between -40°C and +40°C. The maximum absolute humidity of the air supplied to the unit at a maximum temperature of +30°C should not exceed 19 g/kg ps (70% relative humidity). During periods of low ambient temperatures, if the unit is left unused for a longer period, there is a risk of water vapor condensation inside the unit due to contact of warm air with the cold surface of the housing.

The device is equipped with a control system and can be equipped with a range of duct functions and accessories. The device functions and their parameters are provided in a selection card generated from the manufacturer's selection system according to design guidelines.

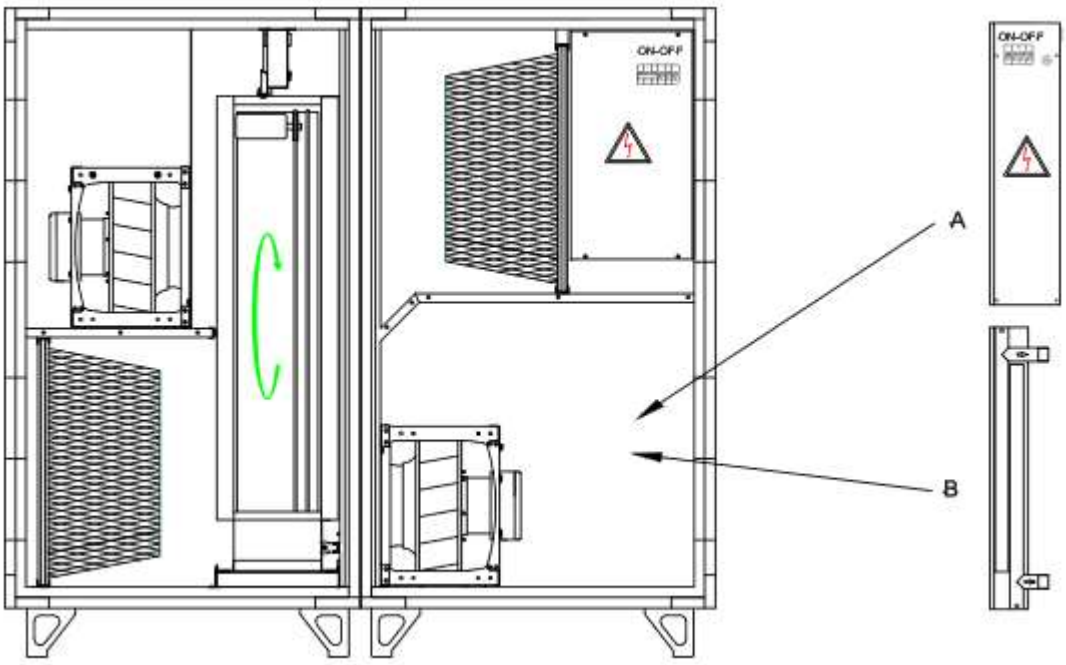
FUNCTION		FUNCTION VERSIONS			
F	Filter air	Filter air preliminary		Filter air secondary	
V	Fan				
H	Heater	Heater water		Heater electric	
C	Cooler	Cooler water		DX cooler	DX
P	PHE (recuperator)	Counterflow HEX exchanger			
R	RHE (regenerator)				
S	Noise suppressor				

OTHER MARKINGS AT THE UNITS

AD	Air Damper	
FLX.CON	Flexible connection	
IN	Inlet (supply e.g. medium)	
OUT	Outlet (return e.g. medium)	

The devices can be designed as right- or left-handed. The orientation of the device is determined by the direction of airflow in the supply air path (air outlet) relative to the side of the device where access to the power panel is located .

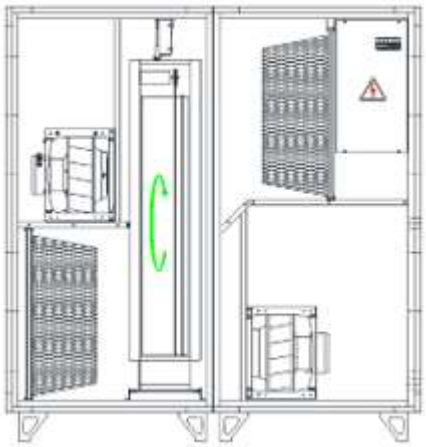
BASE SECTION WITH HEAT REGENERATOR (ROTARY EXCHANGER)



A – Optional electric heater, B – Optional water heater

MARKING OF AIR INLET AND OUTLET IN THE UNIT
VIEW FROM THE INSPECTION SIDE - RIGHT-HAND EXECUTION

EA
Air outlet for removing air from the room



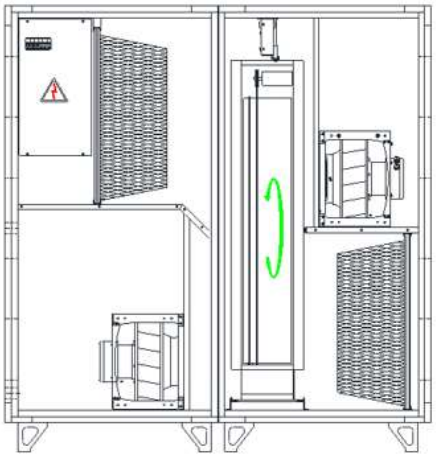
RA
Intake of air extracted from the room.

FA
Fresh air intake

RE
Outlet of the air supplied to the room

MARKING OF AIR INLET AND OUTLET IN THE UNIT
VIEW FROM THE INSPECTION SIDE - LEFT-HAND VERSION

RA
Intake of air extracted from the room.

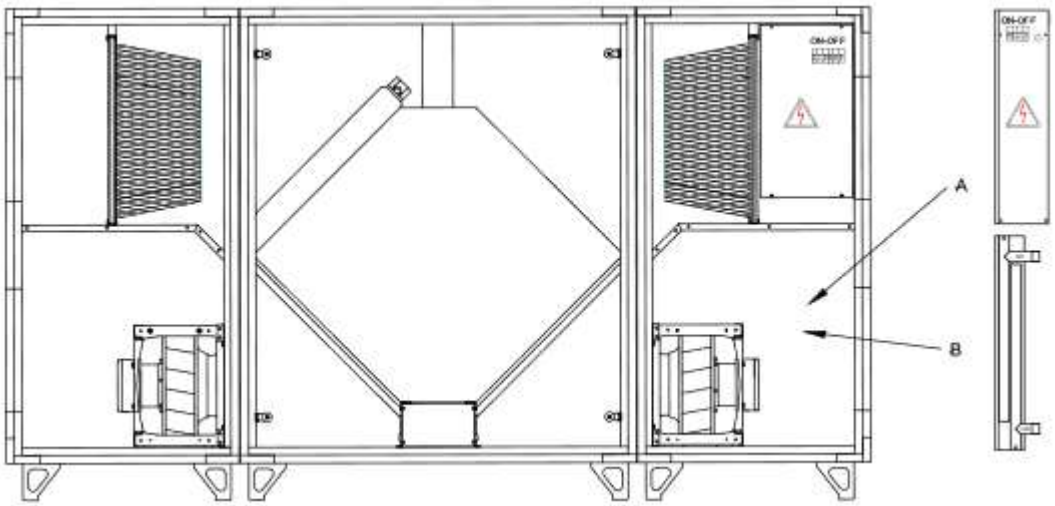


EA
Air outlet for removing air from the room

RE
Outlet of the air supplied to the room

FA
Fresh air intake

BASE SECTIONS WITH HEAT RECUPERATION (COUNTER-FLOW HEXAGONAL EXCHANGER)

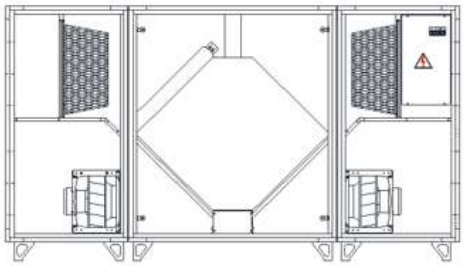


A – Optional electric heater, B – Optional water heater

MARKING OF AIR INLET AND OUTLET IN THE UNIT VIEW FROM THE INSPECTION SIDE - RIGHT-HAND EXECUTION

FA
Fresh air intake

RA
Intake of air extracted from the room.

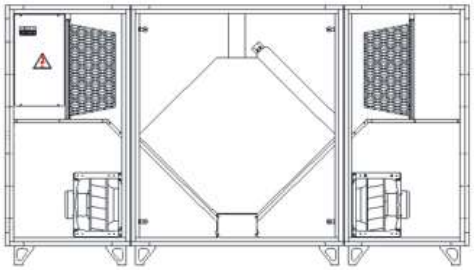


EA
Air outlet for removing air from the room

RE
Outlet of the air supplied to the room

MARKING OF AIR INLET AND OUTLET IN THE UNIT VIEW FROM THE INSPECTION SIDE - LEFT-HAND VERSION

RA
Intake of air extracted from the room.



FA
Fresh air intake

RE
Outlet of the air supplied to the room

EA
Exhaust of air removed from the room.

3 TRANSPORT AND STORAGE

Air handling units are packaged in a way that facilitates easy internal transport and storage at the installation site. Upon delivery, all components must be inspected for any potential transport damage. Detailed instructions can be found in the Delivery Inspection Checklist.

Immediately after receiving the shipment, the unit must be inspected for any transport-related damage, in accordance with the steps outlined in the checklist.

RECEIVING INSPECTION CHECKLIST	
1	Before accepting the delivery, all individual packages must be inspected. Check each package for visible damage and verify completeness against the delivery note (packing list).
2	If any item (package) appears to be damaged, it must be immediately inspected before accepting the entire shipment. Any damage should be clearly noted on the delivery note. Do not refuse the delivery.
3	The unit must be inspected immediately after delivery and before storage for any hidden damage. Hidden damage must be reported to the carrier within the time frame specified by the carrier's claims policy, counted from the delivery date. Check the carrier’s claim period.
4	Do not move a damaged unit from the location where it was delivered. The recipient is responsible for providing evidence that the hidden damage did not occur after delivery.
5	If a unit appears to be damaged, unpacking must be stopped immediately. All internal packaging materials, boxes, and crates must be preserved. If possible, take photo of the damage
6	The carrier must be notified immediately by phone and e-mail, in accordance with the claims procedure. A joint inspection of the damage should be requested with representatives of both the carrier and the shipment recipient.
7	Notify your VTS representative about any identified damage and begin preparing for repair. The carrier’s representative should inspect the damage before any repair work begins.
8	Finally, compare the electrical data on the unit’s nameplate with the data in the order confirmation and shipping documents to ensure that the correct unit has been delivered.

WARNING

- IMMEDIATELY UPON RECEIPT OF THE EQUIPMENT, CHECK THE CONDITION OF THE PACKAGING AND VERIFY THE COMPLETENESS OF THE DELIVERY BASED ON THE ATTACHED SPECIFICATIONS AND SHIPPING DOCUMENTS.
- A VISUAL INSPECTION MUST BE CARRIED OUT AFTER DELIVERY TO IDENTIFY ANY POTENTIAL DAMAGE.
- IN THE EVENT OF VISIBLE MECHANICAL DAMAGE TO ANY ITEM, A DAMAGE REPORT MUST BE COMPLETED IN THE PRESENCE OF THE CARRIER. THIS REPORT MUST BE ISSUED ON THE DAY OF DELIVERY AND CONSTITUTES THE BASIS FOR PROCESSING ANY CLAIM RELATED TO TRANSPORT DAMAGE.
- ANY DAMAGE RESULTING FROM IMPROPER TRANSPORT, UNLOADING, OR STORAGE IS NOT COVERED BY THE WARRANTY, AND ANY RELATED CLAIMS WILL NOT BE ACCEPTED BY VTS.
- VENTUS PLATINIUM UNITS ARE DELIVERED IN TRANSPORT BLOCKS (FOR LARGER UNITS) THAT REQUIRE ON-SITE ASSEMBLY.
- OWNERSHIP OF THE DELIVERED AHU AND ANY OPTIONAL EQUIPMENT IS TRANSFERRED TO THE CUSTOMER UPON SIGNING THE DELIVERY NOTE BY THE CUSTOMER'S REPRESENTATIVE.
- UNLOADING OF PACKAGES CONTAINING AHU COMPONENTS FROM THE TRANSPORT VEHICLE, TRANSPORTATION TO THE INSTALLATION SITE, AND POSITIONING OF THE UNITS OR BLOCKS AT THEIR FINAL LOCATION MUST BE CARRIED OUT USING SPECIALIZED EQUIPMENT (E.G. FORKLIFT, CRANE) AND BY APPROPRIATELY QUALIFIED PERSONNEL.

WARNING

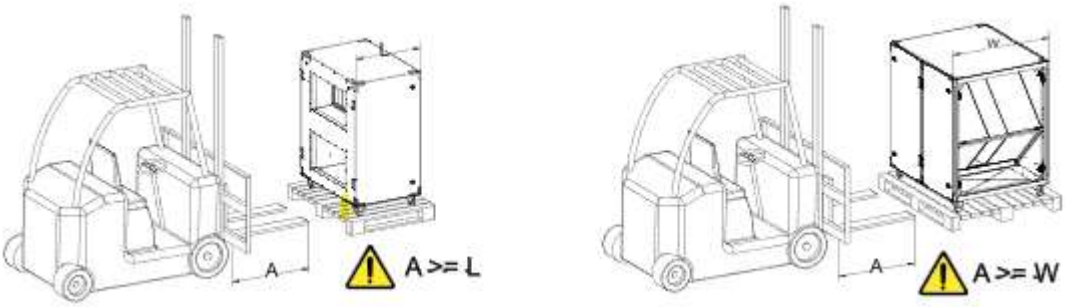
PACKAGING

- PACKAGING MATERIALS (SUCH AS PLASTIC FILMS, NAILS, ETC.) MAY POSE POTENTIAL HAZARDS AND SHOULD BE KEPT OUT OF REACH OF CHILDREN. AFTER USE, THEY MUST BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.

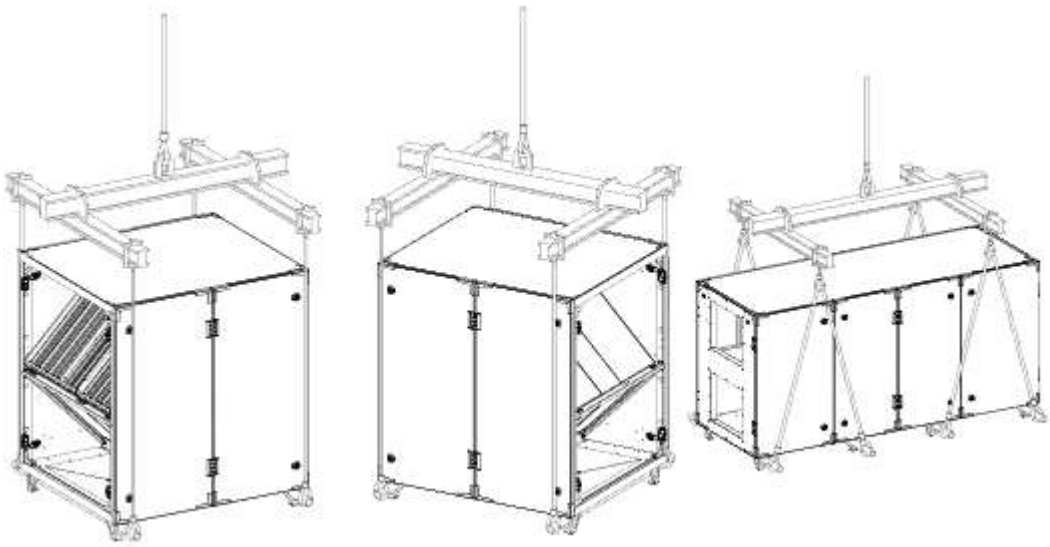
TRANSPORT GUIDELINES FOR AHU SECTIONS

Air handling units must be transported in the position and manner indicated on the original manufacturer's packaging. Any deviation from the designated orientation or handling instructions may result in mechanical damage, loss of warranty, or improper functioning of the device. Always refer to transport symbols and handling labels located on the packaging (e.g., "This Side Up", "Fragile", "Do Not Stack").

TRANSPORT BY FORKLIFT



TRANSPORT BY CRANE



NOTE: Lifting equipment is **not included** in the VTS delivery!

WARNING

- ! USE SPECIALIZED LIFTING EQUIPMENT TO LIFT THE UNIT.
- ! NEVER STAND UNDER A LIFTED UNIT.
- ! DESIGNATE AND MARK A HAZARD ZONE THAT MUST REMAIN CLEAR.
- ! TAKE THE UNIT'S WEIGHT INTO ACCOUNT DURING LIFTING OPERATIONS.
- ! ONLY LIFT TRANSPORT BLOCKS (BEFORE THEY ARE CONNECTED).
- ! USE CERTIFIED LIFTING STRAPS WITH APPROPRIATE STRENGTH (EN 12195-2).
- ! USE ANTI-SLIP BLOCKS.
- ! AVOID SLIDING THE BLOCKS ACROSS THE SURFACE.

WARNING

PACKAGING WITH DEVICES:

- ! MUST BE PLACED ON HARDENED, DRY SURFACES AND PROTECTED FROM PRECIPITATION.
- ! SHOULD BE LOCATED AND STORED AWAY FROM AREAS WITH ACTIVE MECHANICAL EQUIPMENT (VEHICLES, CRANES, AND OTHER CONSTRUCTION MACHINERY).
- ! SHOULD BE STORED IN LOCATIONS WHERE THEY ARE NOT EXPOSED TO ANY MECHANICAL DAMAGE, MOISTURE, EXCESSIVE HEAT, AGGRESSIVE CHEMICALS, LIQUIDS, DUST, OR ANY OTHER EXTERNAL FACTORS THAT COULD DETERIORATE THEIR TECHNICAL CONDITION AND FUNCTIONALITY.

VTS recommends keeping the air handling units and their accessories in their original transport packaging on pallets to ensure protection and to facilitate proper positioning during installation.

WARNING

THE EQUIPMENT AND ITS COMPONENTS MUST BE:

- STORED IN ROOMS THAT MEET THE FOLLOWING CONDITIONS:
  - RELATIVE HUMIDITY: Φ < 80% AT A TEMPERATURE OF T = (+20) °C,
  - AMBIENT TEMPERATURE: (-40) °C < T < (+60) °C
- PROTECTED FROM DIRECT SUNLIGHT AND ATMOSPHERIC PRECIPITATION.
- PROTECTED FROM DUST INGRESS INTO THE UNIT AND FROM DUST DEPOSITING ON THE CASING OR DEVICE COMPONENTS.
- PROTECTED FROM CONTACT WITH CORROSIVE DUSTS, GASES OR FUMES, AS WELL AS FROM ANY OTHER CHEMICAL SUBSTANCES THAT MAY HAVE A CORROSIVE EFFECT ON THE EQUIPMENT OR ITS COMPONENTS.

4 INSTALLING THE DEVICE

4.1 PREPARING FOR INSTALLATION

When choosing the installation location, make sure that after the device is installed there will be enough space to properly connect the technological and electrical installations to the device and to easily carry out maintenance of the device.

4.2 DEVICE LOCATION

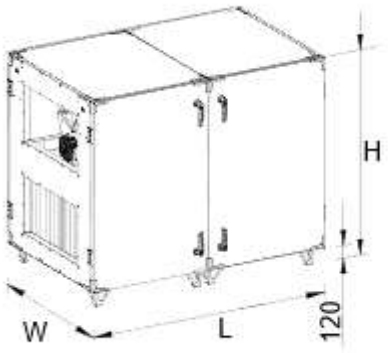
All pipes and ducts should be attached independently of the air handling unit.

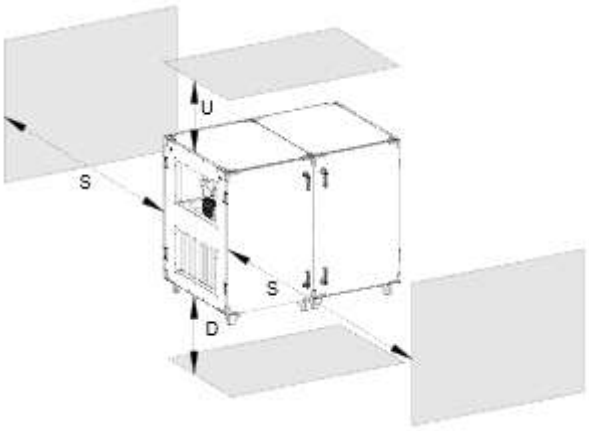
RECOMMENDATIONS FOR LOCATION OF THE DEVICE	
1	The weight of the device must be taken into account. Refer to the device weight on the nameplate. The weight on the nameplate does not include the weight of utilities, which should be taken into account when installing the device.
2	Sufficient space must be left to allow opening of inspection panels and casing plates for access to perform maintenance work.
3	The installer must provide lifting equipment to lift the control unit or heavier components of the control unit.
4	All devices must be mounted horizontally.
5	Coil and drain piping requirements and condensate drainage must be considered.

DANGER

- ! DO NOT INSTALL THE DEVICE IN AREAS WITH EXPLOSION HAZARD.
- ! DO NOT INSTALL THE DEVICE IN INSTALLATIONS OR ENVIRONMENTS WHERE THERE IS A RISK OF ACCUMULATION OF DUST OR TOXIC SUBSTANCES.
- ! DO NOT INSTALL THE DEVICE IN FOOD OR CHEMICAL INDUSTRY TECHNOLOGICAL INSTALLATIONS.
- ! THE DEVICES MAY NOT BE USED FOR STRUCTURAL FUNCTIONS OR AS PART OF A BUILDING ROOF.

DEVICE DIMENSIONS AND SERVICE SPACE						
	VVSA11c	**VVSA14c**	**VVSA22c**	**VVSA29c**	**VVSA40c**	**VVSA56c**
H	1082	1182	1295	1450	1598	1838
W (1)	750	865	947	1124	1284	1514
L (RRG)	2000	2000	2540	2811	2811	1752
L (Hex)	2000	2000	2540	2811	2811	-
Duct connection	Ø315	Ø 400	500x400	700x400	800x400	1000x500
	RRG/HEX	RRG/HEX	RRG/HEX	RRG/HEX	RRG/HEX	RRG/HEX
S Back	900/1205	900/1205	1007/907	1090/970	1090/970	1090/x
S Inspection	900/1205	900/1205	1247	1424	1584	1814
U	300/500	300/500	300/500	300/500	300/500	300/500
D	See: "Condensate Drainage"					





(1) - without door handles

4.3 DEVICE INSTALLATION

! **THE AIR HANDLING UNIT MUST BE POSITIONED ON:**
- A FOUNDATION SLAB,
- A STEEL FOUNDATION FRAME EMBEDDED IN THE FLOOR,
- A SPECIALLY PREPARED RIGID STEEL STRUCTURE.

! THE FOUNDATION, FRAME OR STEEL STRUCTURE MUST BE FLAT, LEVEL AND SUFFICIENTLY STRONG TO SUPPORT THE TOTAL WEIGHT OF THE UNIT ALONG WITH THE WEIGHT OF ALL MEDIA.

! DUCT SECTIONS THAT DO NOT HAVE SUPPORT FEET MUST BE SUPPORTED BY INDEPENDENT SUPPORT STRUCTURES (NOT SUPPLIED BY THE MANUFACTURER).

! DUCT SECTIONS WITHOUT THERMAL INSULATION MUST BE INSULATED ON SITE.

! THE HEIGHT OF THE FOUNDATION SLAB OR FRAME MUST ALLOW FOR INSTALLATION OF A SIPHON TO DRAIN CONDENSATE FROM THE DRIP TRAY. FOR DRIP TRAYS INSTALLED IN THE LOWER SECTIONS OF THE UNIT, THE UNIT SHOULD BE PLACED ON AN ADDITIONAL FOUNDATION OR A FLOOR RECESS SHOULD BE PREPARED DIRECTLY UNDER THE SIPHON. (SEE: CONDENSATE DRAINAGE)

! EACH SECTION MUST BE PROPERLY SUPPORTED.

! DIMENSIONS OF THE BASE BLOCK AND OPTIONAL FUNCTIONS ARE AVAILABLE IN THE DEVICE'S TECHNICAL DATA SHEET.

4.3.1 CONDENSATE DRAINAGE

Moisture from the air may condense on the surfaces of air coolers and heat recovery exchangers. Moisture condensed on the surfaces of the air cooler and heat recovery exchanger is collected in drip trays located below these components. To ensure proper condensate drainage:

- The **drip tray outlet** (Ø32 mm) must be connected to the **building's condensate drainage system**.
- A **siphon (trap)** must be installed on the condensate drain outlet to prevent air suction or odor backflow into the air handling unit.
- The **height of the siphon** must be calculated based on the total fan pressure head to ensure proper drainage and avoid overflow.

CONDENSATE DRAINAGE

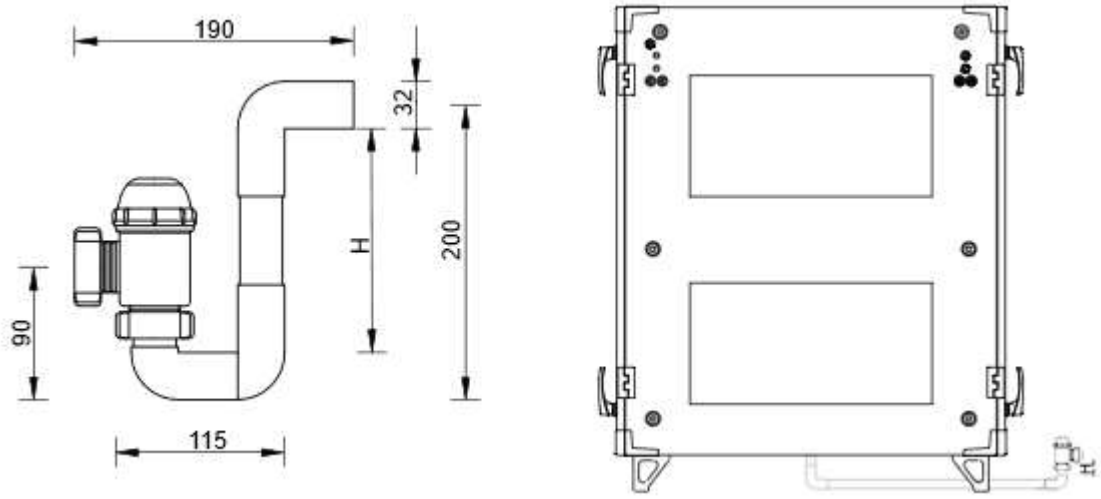
When planning the placement of the unit, provisions must be made for the drainage of condensate from the drip trays.

H [mm] = total fan pressure head in mm H_2O

H [mm] = Dp [Pa] × 0.1

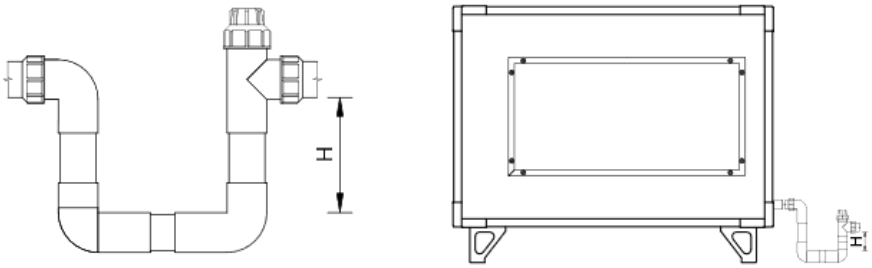
(where **Dp [Pa]** is the fan pressure head in pascals)

CONDENSATE DRAINAGE – CONNECTION OF SIPHON TO HEX BASE BLOCK



During heat recovery operation in winter, a siphon must be connected on the exhaust air path, while in summer operation, it must be connected on the supply air path. Any unused condensate drain outlet must be sealed using a dedicated cap provided for this purpose.

CONDENSATE DRAINAGE – SIPHON CONNECTION TO THE COOLING COIL SECTION

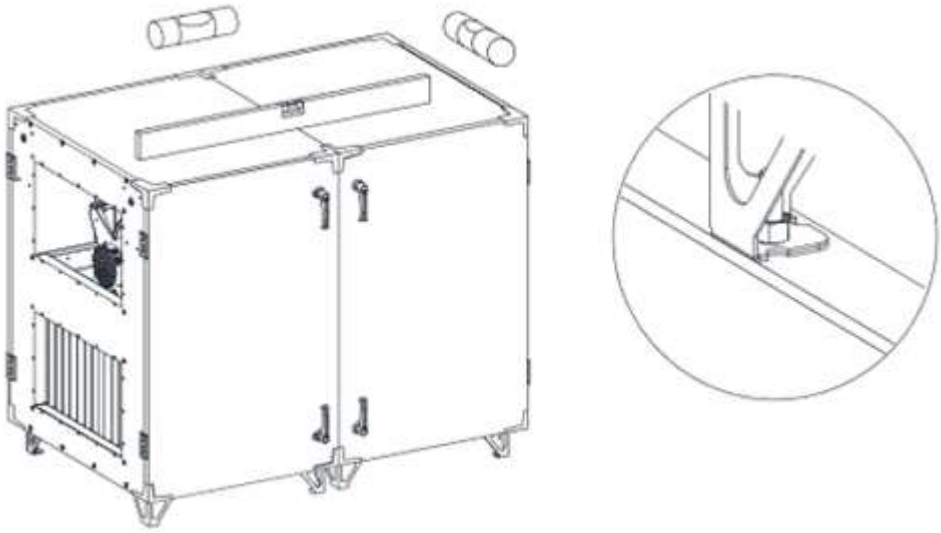


IMPORTANT CONDENSATE DRAINAGE REQUIREMENTS

- ! SIPHONS MUST BE INSTALLED ON DRIP TRAYS LOCATED ON THE SUCTION (NEGATIVE PRESSURE) SIDE OF THE FAN TO ENSURE PROPER OPERATION OF THE AIR HANDLING UNIT.
- ! IT IS RECOMMENDED TO INSTALL SIPHONS ALSO ON DRIP TRAYS LOCATED ON THE DISCHARGE (POSITIVE PRESSURE) SIDE OF THE FAN.
- ! BALL VALVES MUST NOT BE USED ON THE PRESSURE SIDE OF THE FAN.
- ! ALL SIPHONS MUST BE FILLED WITH WATER BEFORE STARTING THE UNIT.
- ! DO NOT CONNECT MULTIPLE CONDENSATE DRAINS TO A SINGLE SIPHON.
- ! BEFORE COMMISSIONING THE AIR HANDLING UNIT, ENSURE THE SIPHON IS PROPERLY FILLED WITH WATER.
- ! IN AREAS WHERE CONDENSATE FREEZING IS POSSIBLE, APPLY APPROPRIATE HEATING SYSTEMS AND THERMAL INSULATION FOR THE SIPHON AND DRAINAGE SYSTEM.

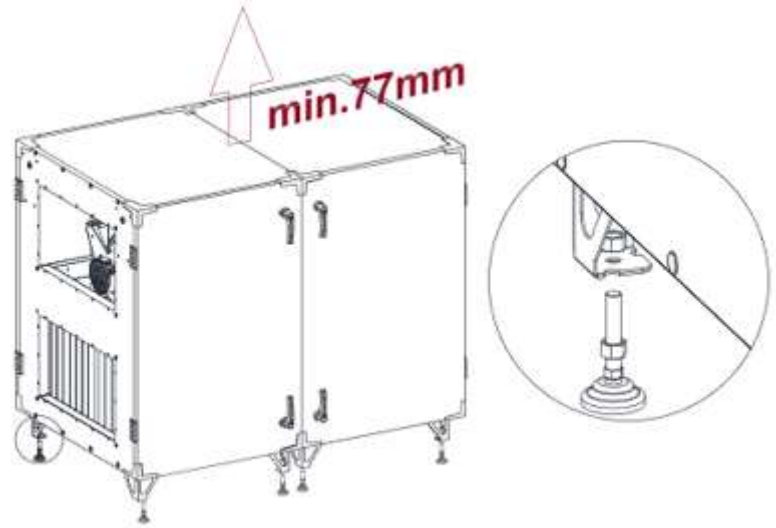
4.3.2 FIXING THE UNIT TO THE FOUNDATION

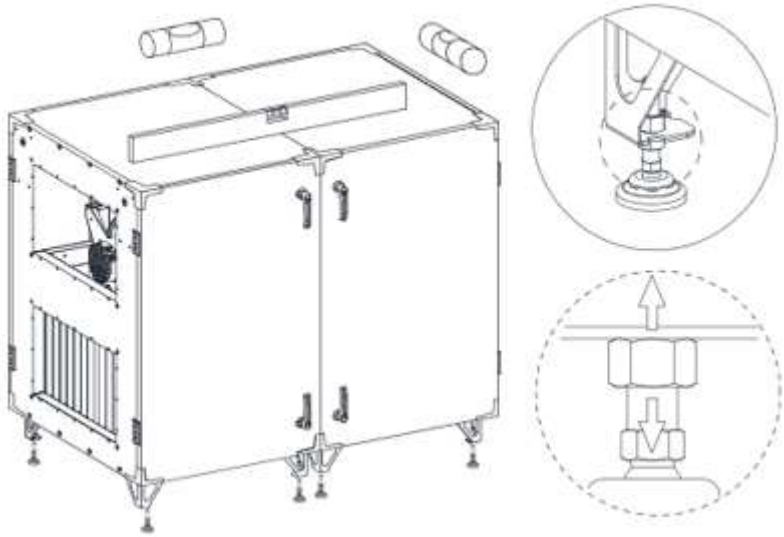
FIXING THE UNIT TO THE FOUNDATION



- ! The support feet must be fastened through the holes in the bottom part of each foot.
- ! All foot profiles of the air handling unit must be fully supported.
- ! Use M10 bolts or anchors to secure the frame to the foundation.
- ! The deflection of the mounting surface must not exceed 1 mm per 1 meter.

MOUNTING THE LEVELING FOOT





! Adjustable leveling feet are not permitted for outdoor installation.

! The leveling foot must be mounted using the designated holes located at the base of the foot.

! Ensure that the entire weight of the unit is evenly distributed across all installed leveling feet.

! The surface under the leveling foot must be flat, stable, and capable of bearing the weight of the unit.

! It is recommended to use anti-vibration pads or washers if specified in the design documentation.

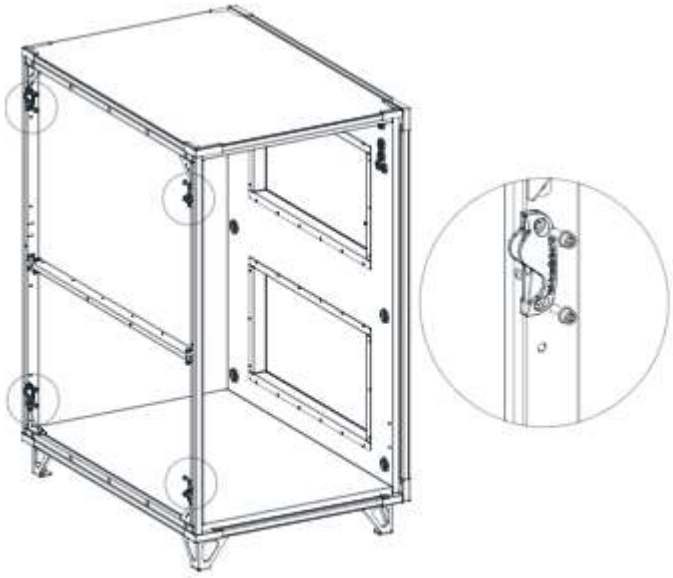
! After mounting, adjust the height to ensure the unit is perfectly leveled and properly aligned with connected ductwork or piping.

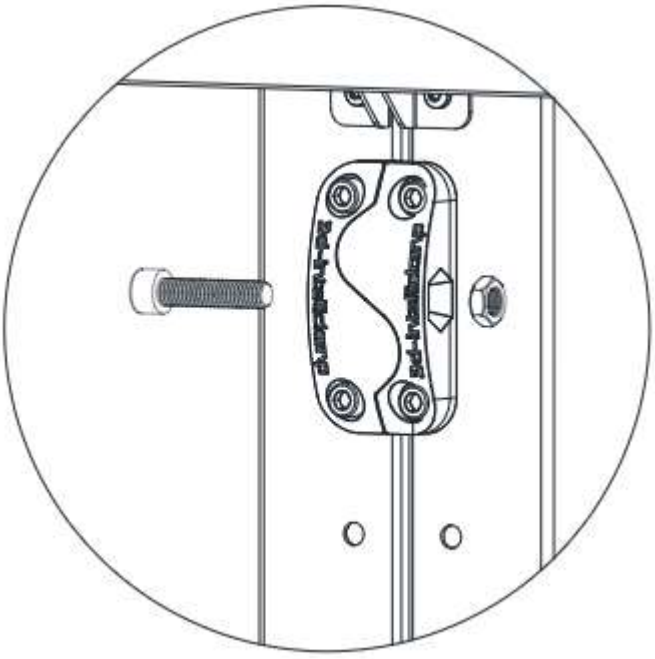
4.3.3 REQUIREMENTS FOR ON-SITE SECTION CONNECTIONS

SECTION CONNECTION DISCLAIMER AND INSTALLATION REQUIREMENTS	
1	Section connection is not included in the standard VTS offering. However, it is possible to purchase an additional option for section connection performed by the Authorized VTS Service.
2	Assembly should be carried out **within an ambient temperature range** that allows proper execution of all technical installation procedures, specifically from **(+5)°C to (+35)°C**.
3	If the installation is being done outdoors, it must be performed under weather conditions free of precipitation. Assembly may begin only when all safety requirements are met.
4	Installation must be carried out at the unit's final location. The preparation of the installation site (foundation frame, concrete base, etc.) is the responsibility of the customer. Please ensure all requirements specified in this manual are strictly followed.
5	**Requirements for the Installation Site:** To ensure proper installation of the unit, the following conditions must be met at the installation site: • Access to a 230V N~ power supply must be available. • Adequate lighting should be provided at the installation area. • The environment must ensure a safe working condition for the installation team. • All AHU components and pallets (including packaging) must be delivered to and available at the installation site of the specific air handling unit. • Transportation of AHU elements and blocks to the installation location must be ensured. • Immediate access to the installation area must be granted, allowing the service team to begin work upon arrival. • The warranty card and delivery documents for the specific air handling unit must be provided to the service team in order to carry out the installation.
6	When connecting sections, it is essential to ensure the proper placement of the gasket, which is part of the section assembly kit. Failure to use the provided gasket will result in insufficient casing tightness, and warranty claims related to this issue will not be accepted.

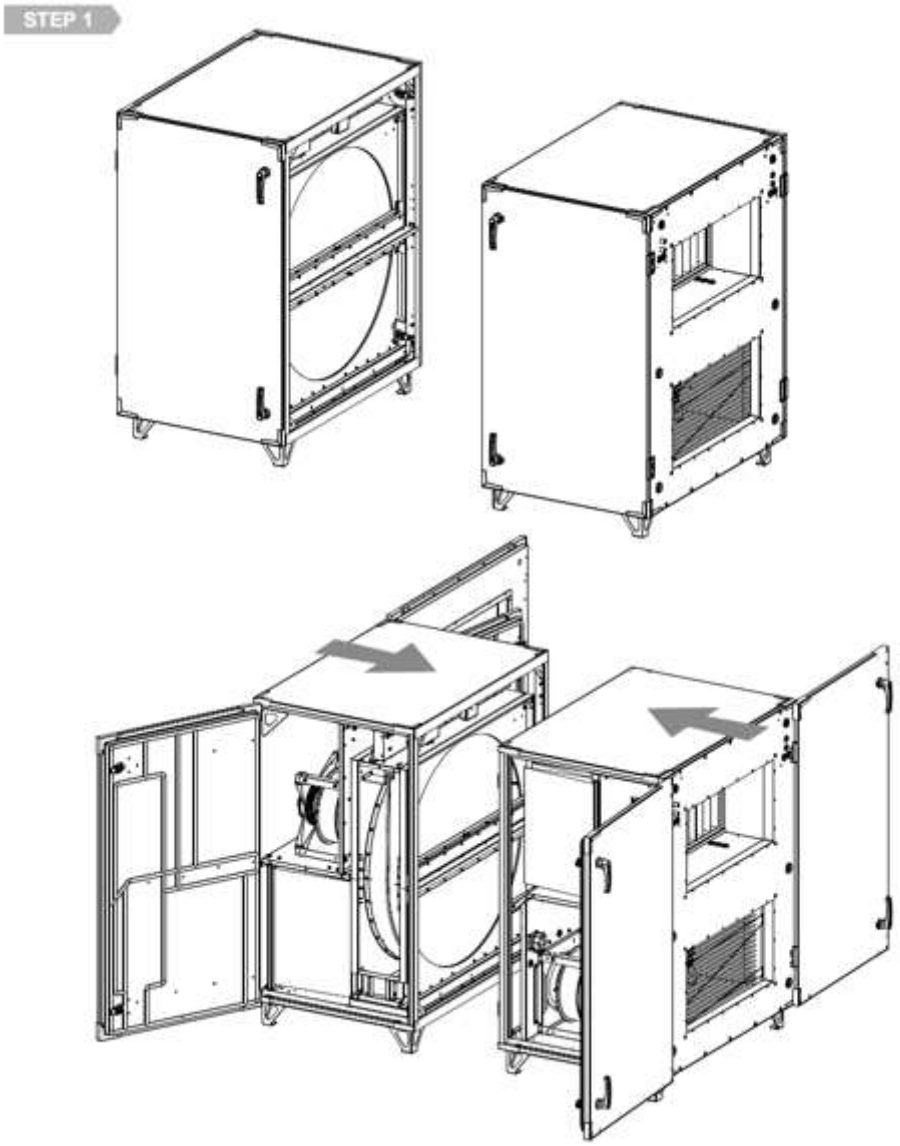
4.3.4 CONNECTION OF BASE BLOCK SECTIONS

POSITIONING CONNECTORS FOR BLOCKS IN SECTION VVSA29c–VVSA71c

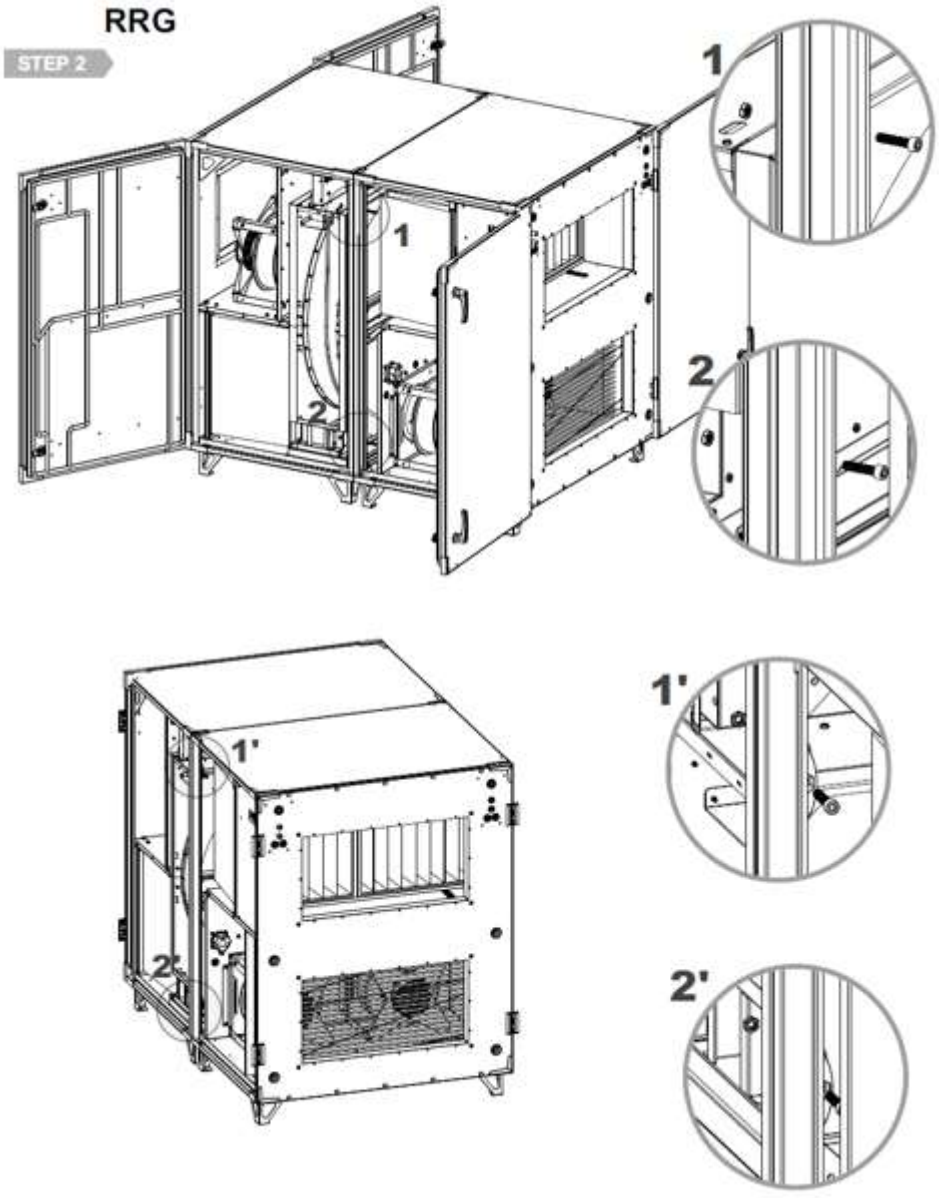




BASE BLOCK SECTION CONNECTION RRG VVSA29c–VVSA71c



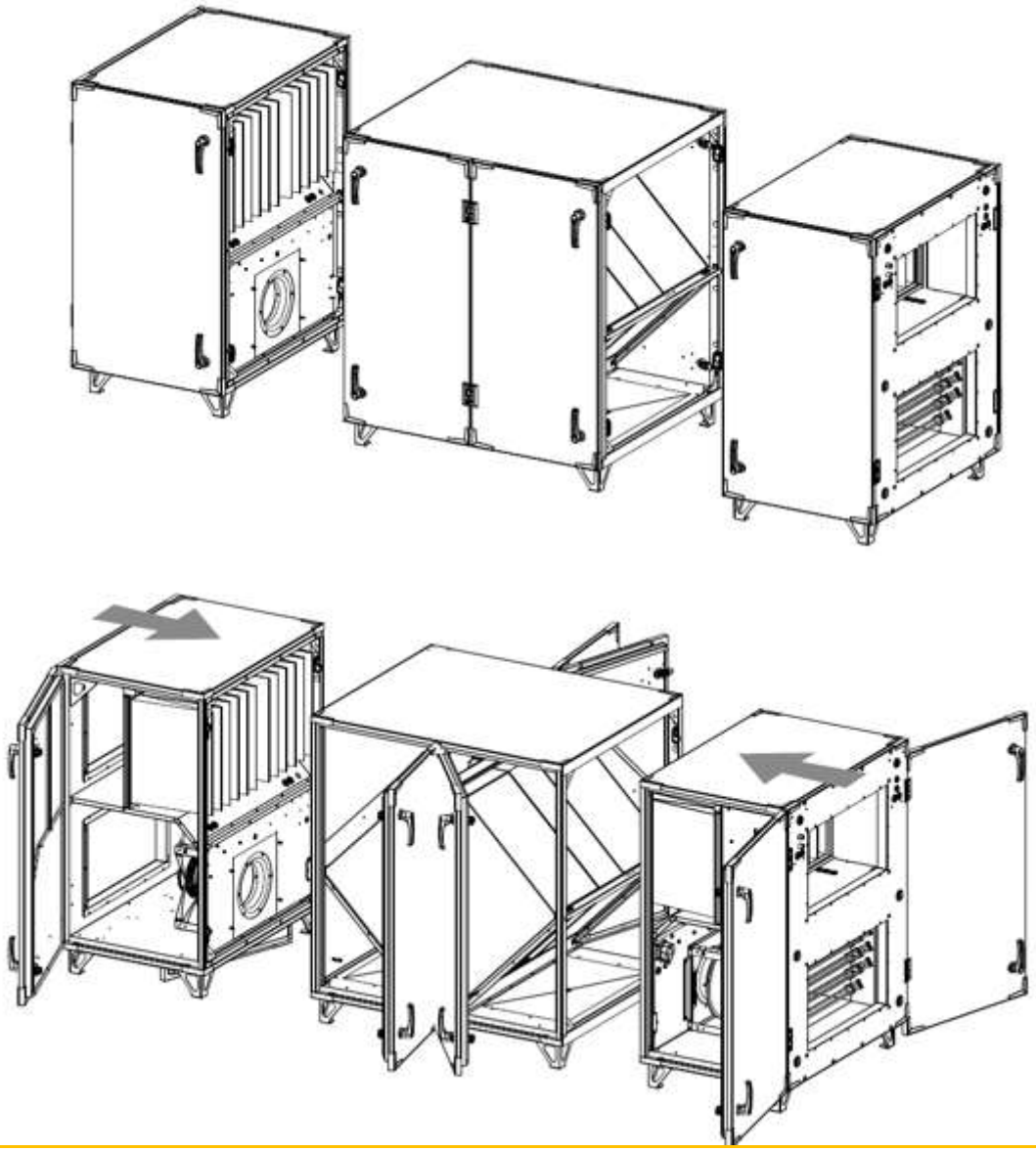
BASE BLOCK SECTION CONNECTION RRG VVSA29c–VVSA71c (cont.)



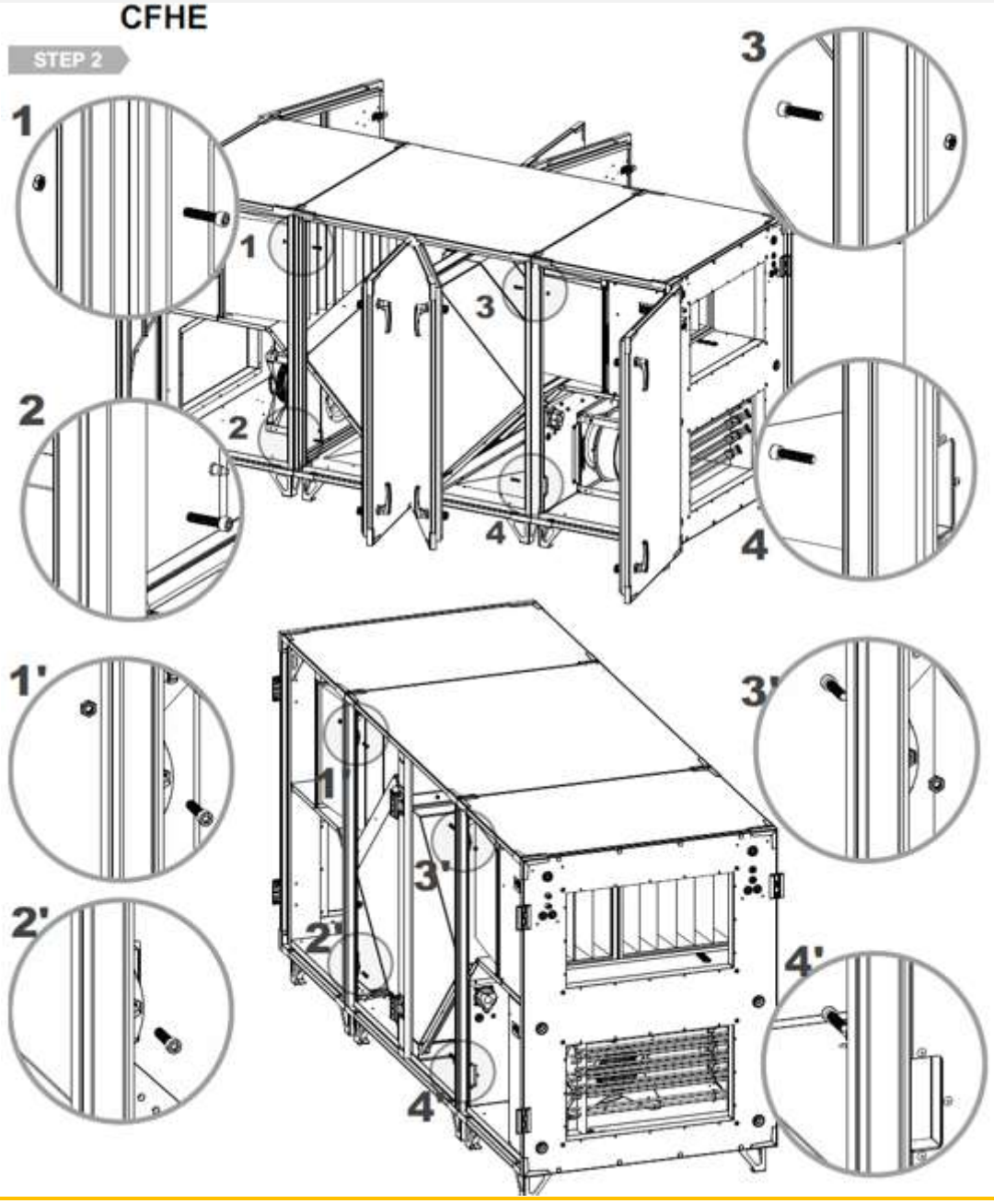
BASE BLOCK SECTION CONNECTION HEX VVSA29c–VVSA71c

CFHE

STEP 1

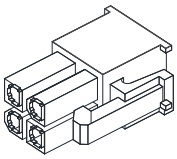
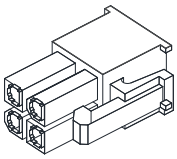
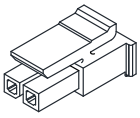
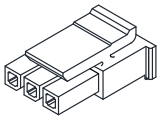


BASE BLOCK SECTION CONNECTION HEX VVSA29c–VVSA71c (cont)



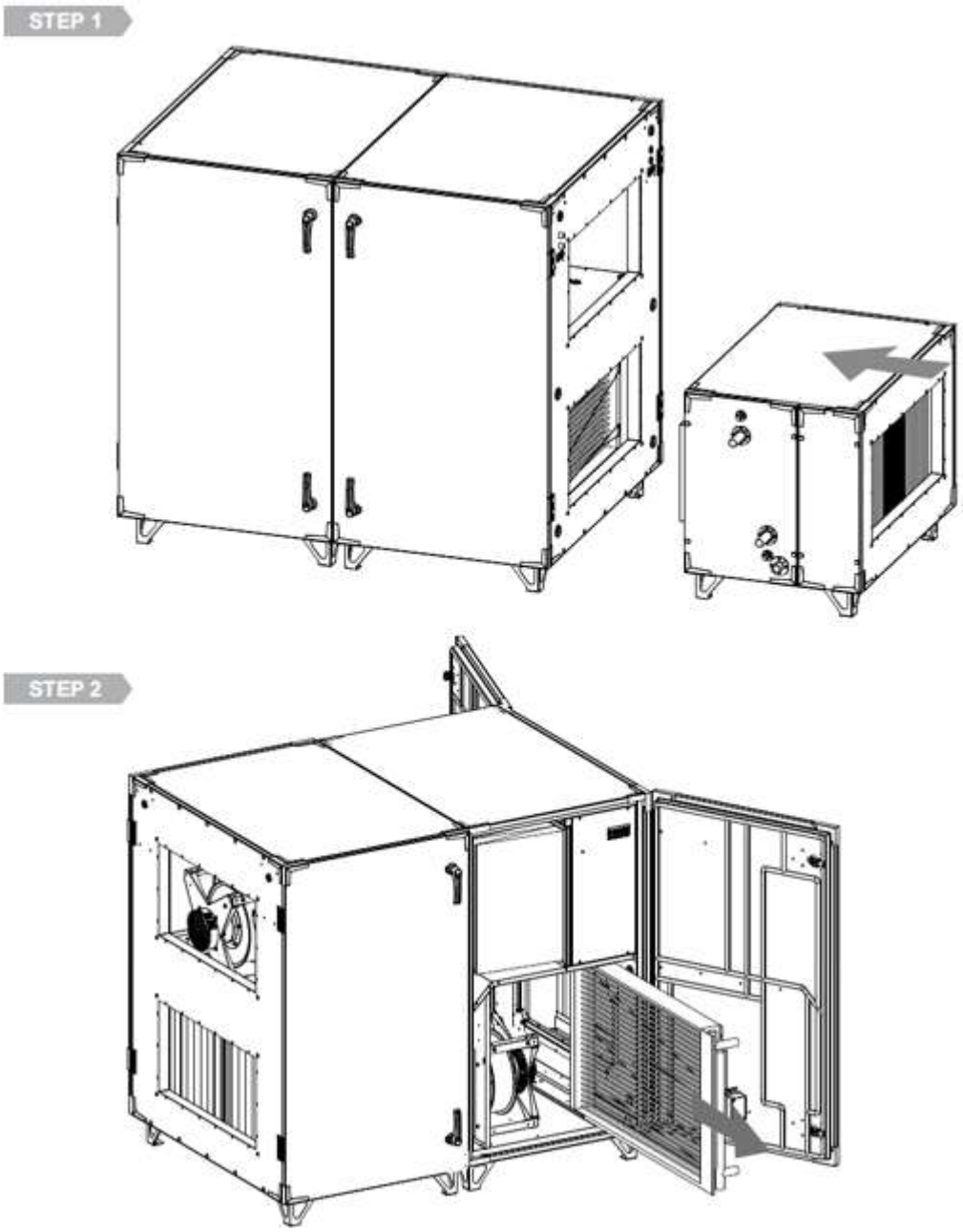
BASE BLOCK INSTALLATION CONNECTION

The base configuration of the VENTUS PLATINIUM with heat recovery is delivered as a factory-wired unit with a pre-connected and configured power supply and control system. In the case of base sections delivered in multiple transport modules, internal installations of the sections must be connected together after the modules are assembled.
To connect the installations, use the connectors located at the ends of the unit according to the markings.

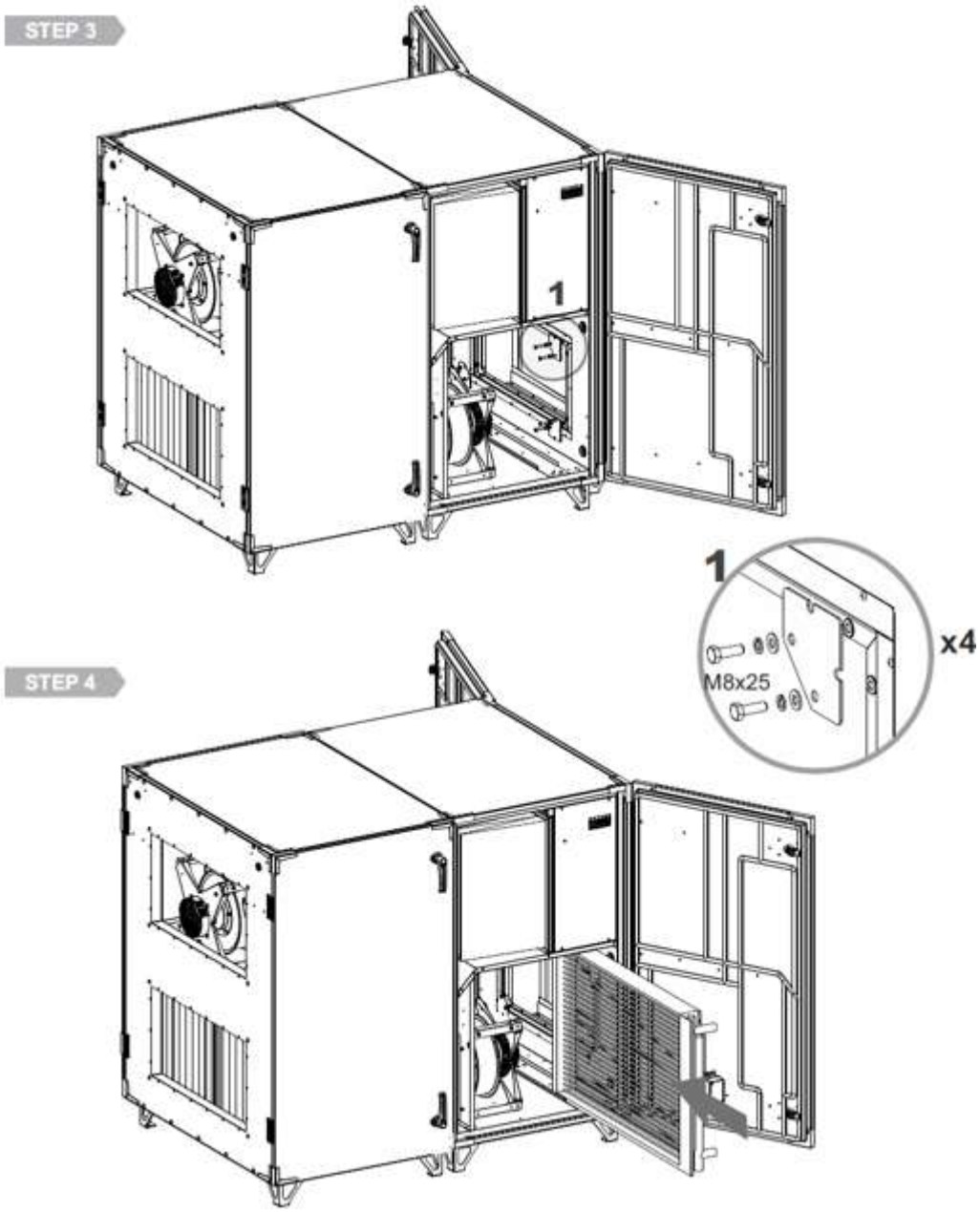
	Power Supply for Fans (white connector))		Pneumatic Tubes (Fan, Air Filters) Note: Connect pneumatic tubes according to the color and labeling on the tubes
	Motor Control Power Supply (grey connector)	 	Temperature Sensor Connectors Damper Actuator Connectors

4.3.5 CONNECTION OF THE COOLING COIL SECTION

CONNECTION OF THE COOLING COIL SECTION VVSA22c-VVSA71c



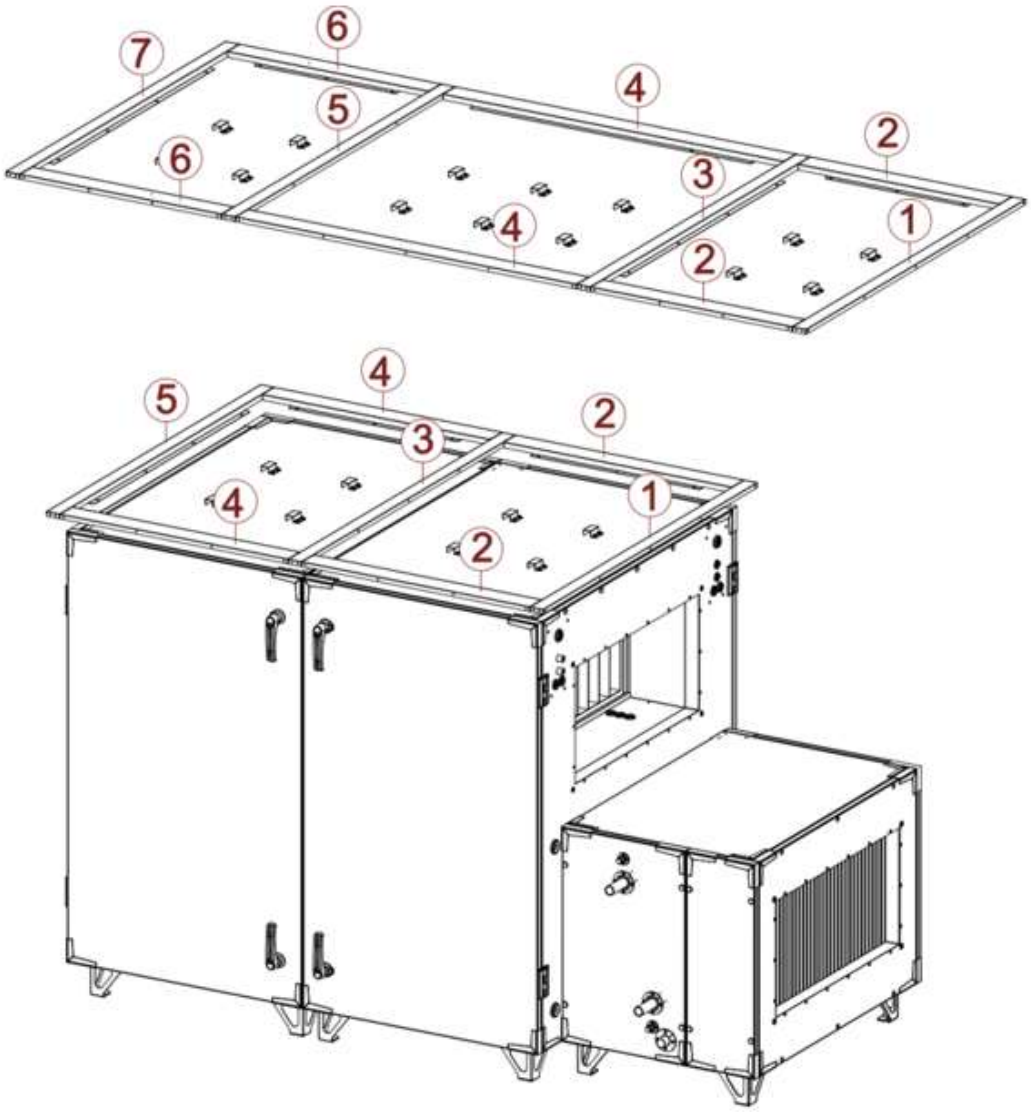
CONNECTION OF THE COOLING COIL SECTION VVSA22c-VVSA71c (cont.)



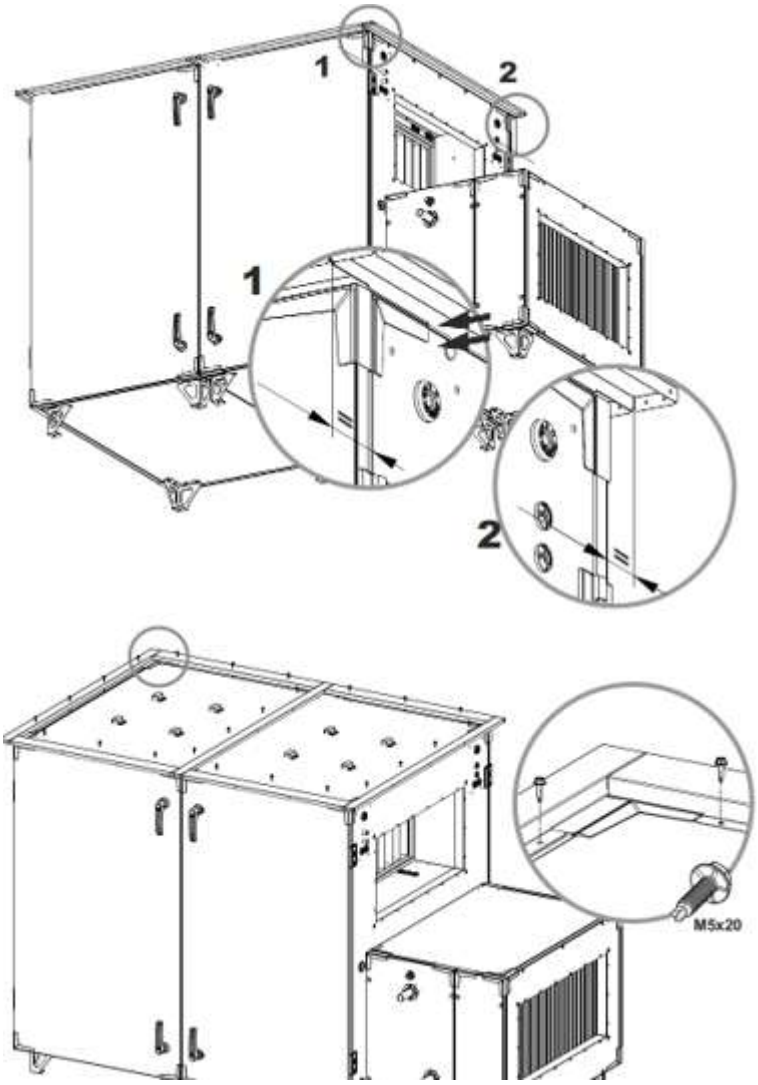
4.3.6 INSTALLATION OF THE UNIT ROOF

INSTALLATION OF THE UNIT ROOF

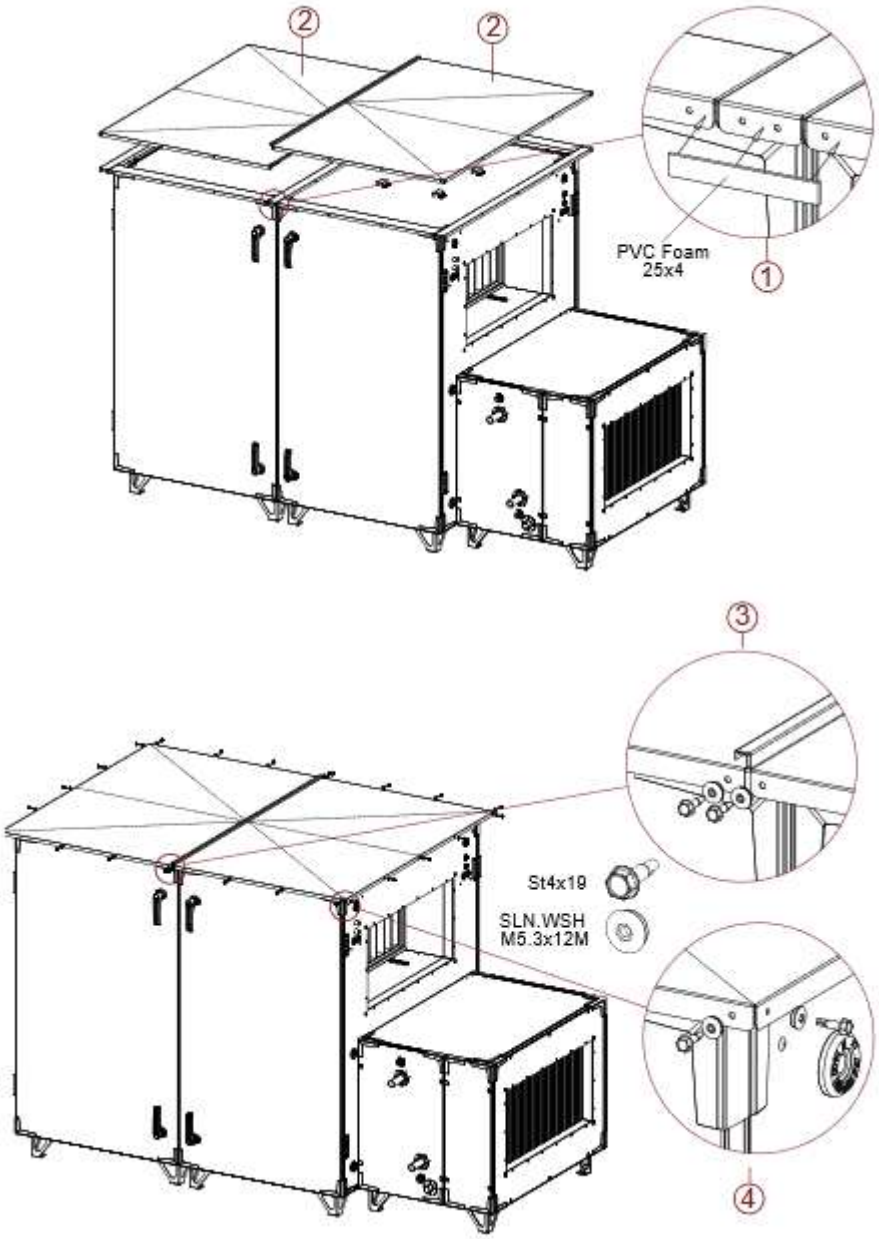
Assembly Sequence



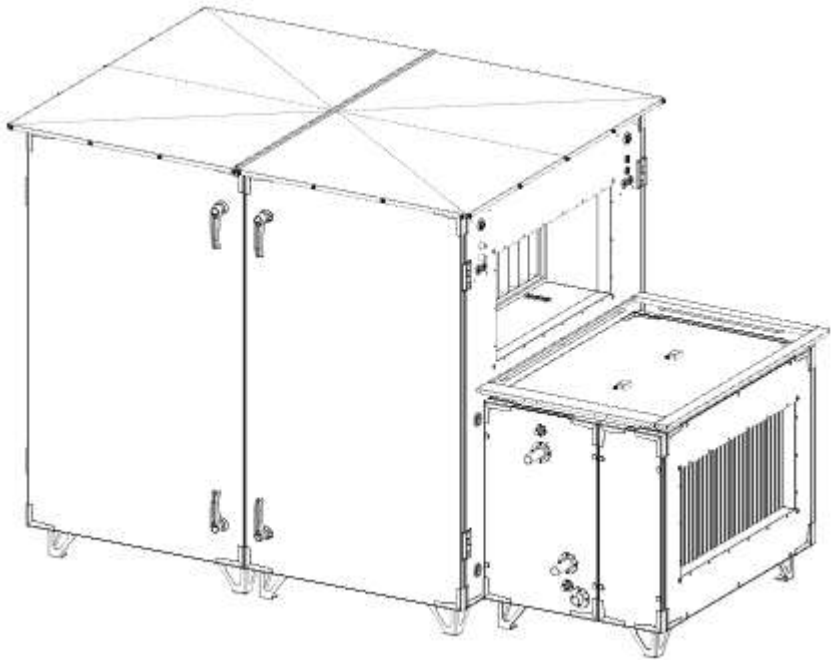
INSTALLATION OF THE UNIT ROOF



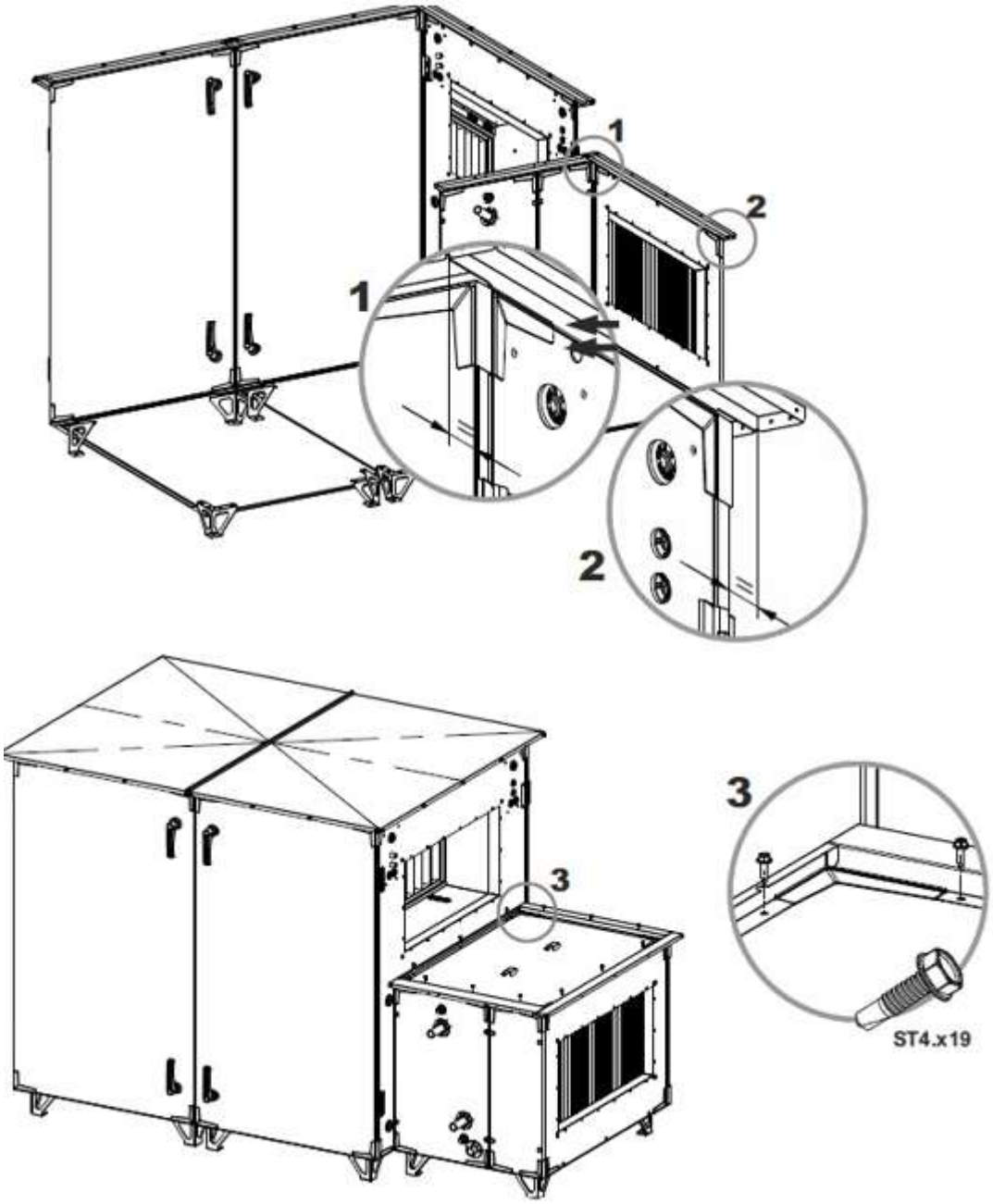
INSTALLATION OF THE UNIT ROOF



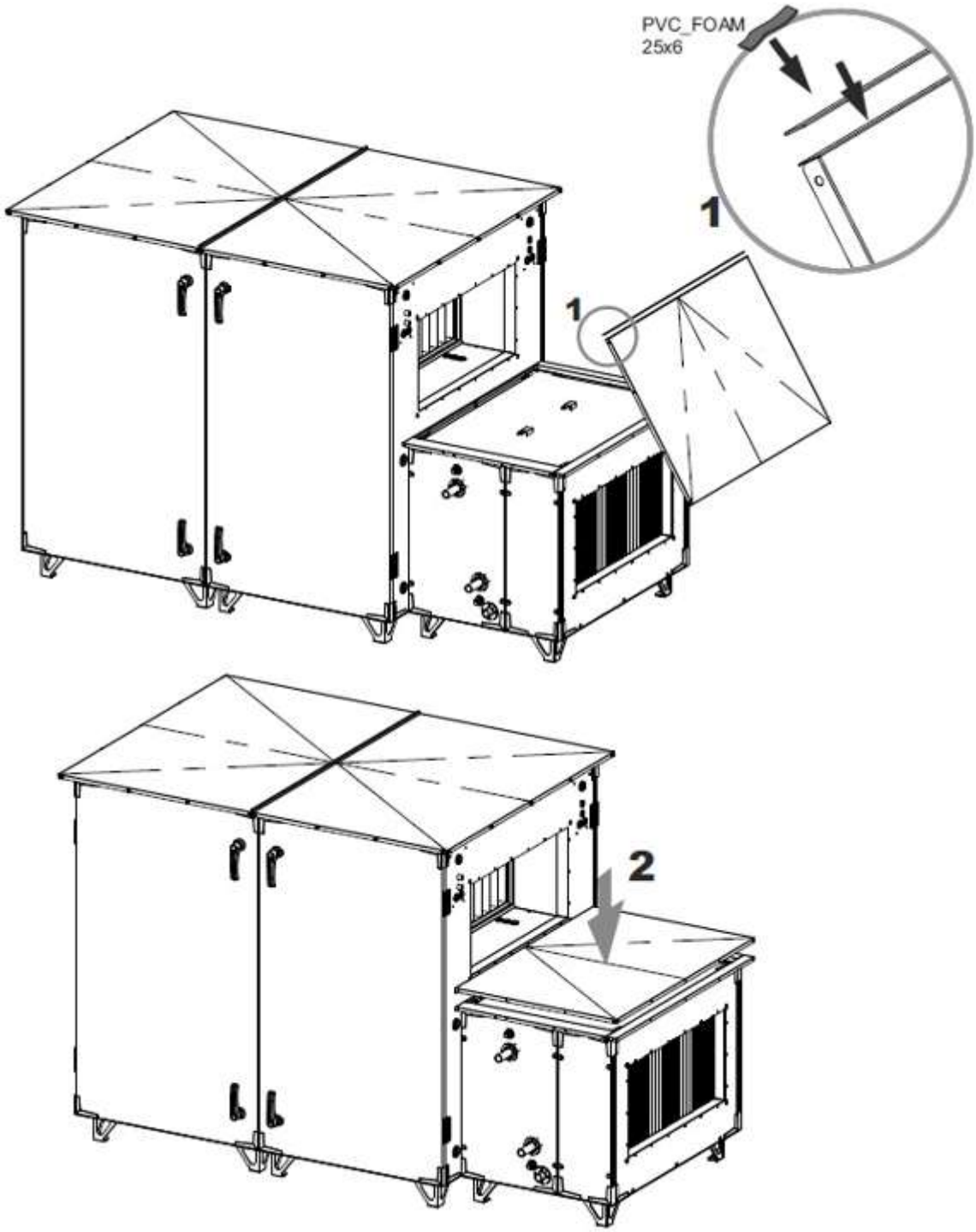
INSTALLATION OF THE UNIT ROOF – COOLING COIL SECTION



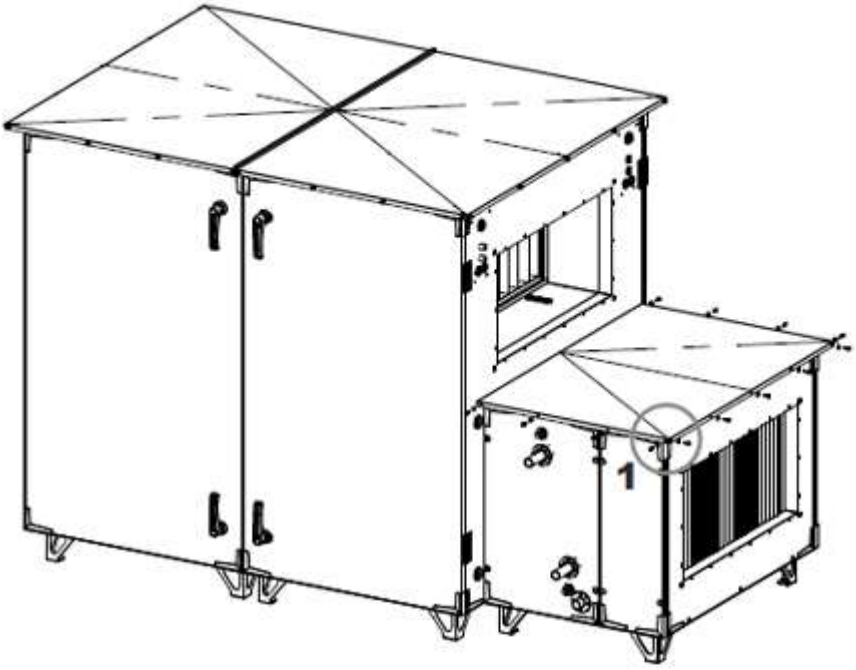
INSTALLATION OF THE UNIT ROOF – COOLING COIL SECTION (cont.)



INSTALLATION OF THE UNIT ROOF – COOLING COIL SECTION (cont.)



INSTALLATION OF THE UNIT ROOF – COOLING COIL SECTION (cont.)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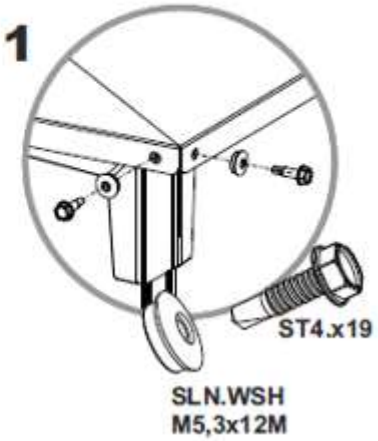
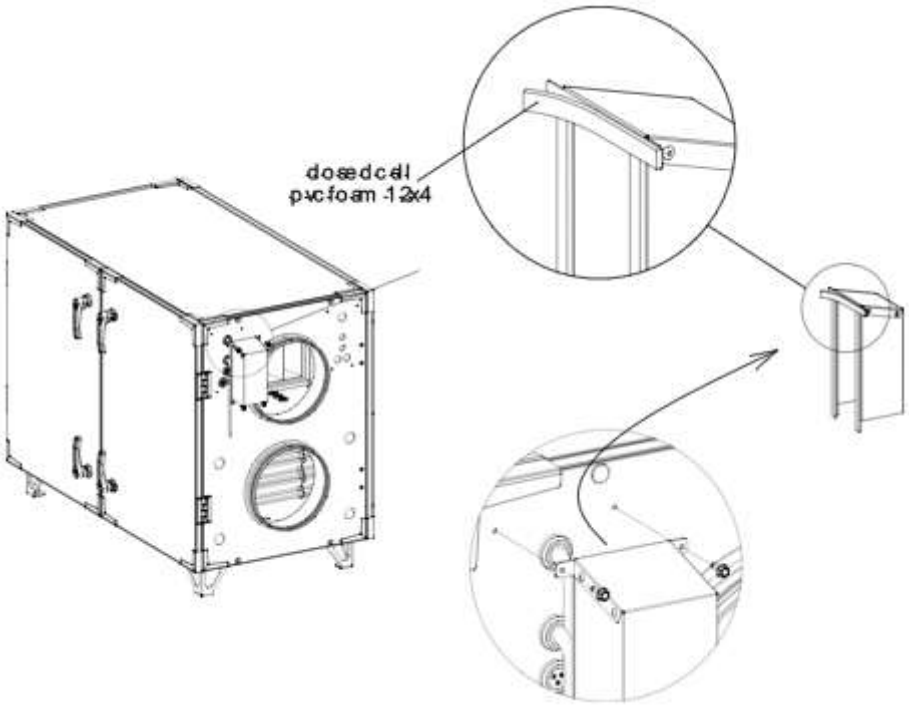
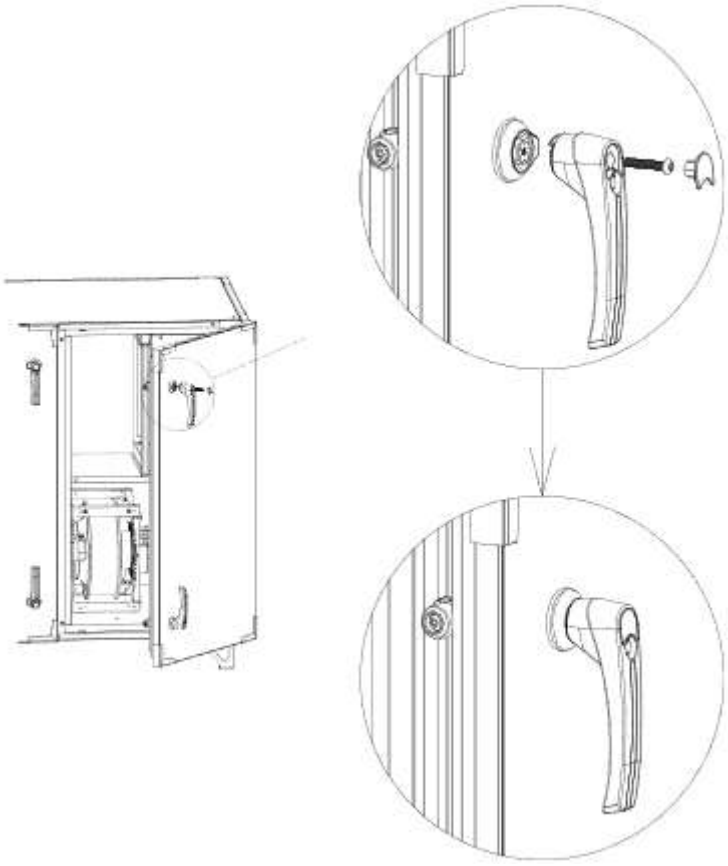

1
ST4.x19
SLN.WSH
M5,3x12M

4.3.7 CABLE ENCLOSURE INSTALLATION (OUTDOOR UNIT)

Screw the canopy in place using the holes in the enclosure.



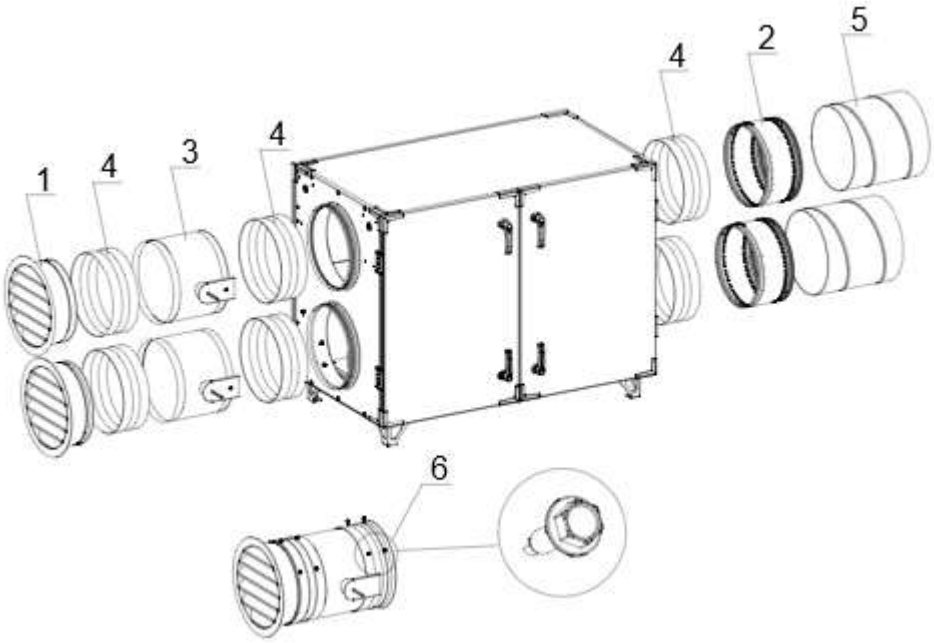
4.3.8 HANDLE INSTALLATION



4.3.9 CONNECTION OF VENTILATION DUCTS AND DUCT ACCESSORIES

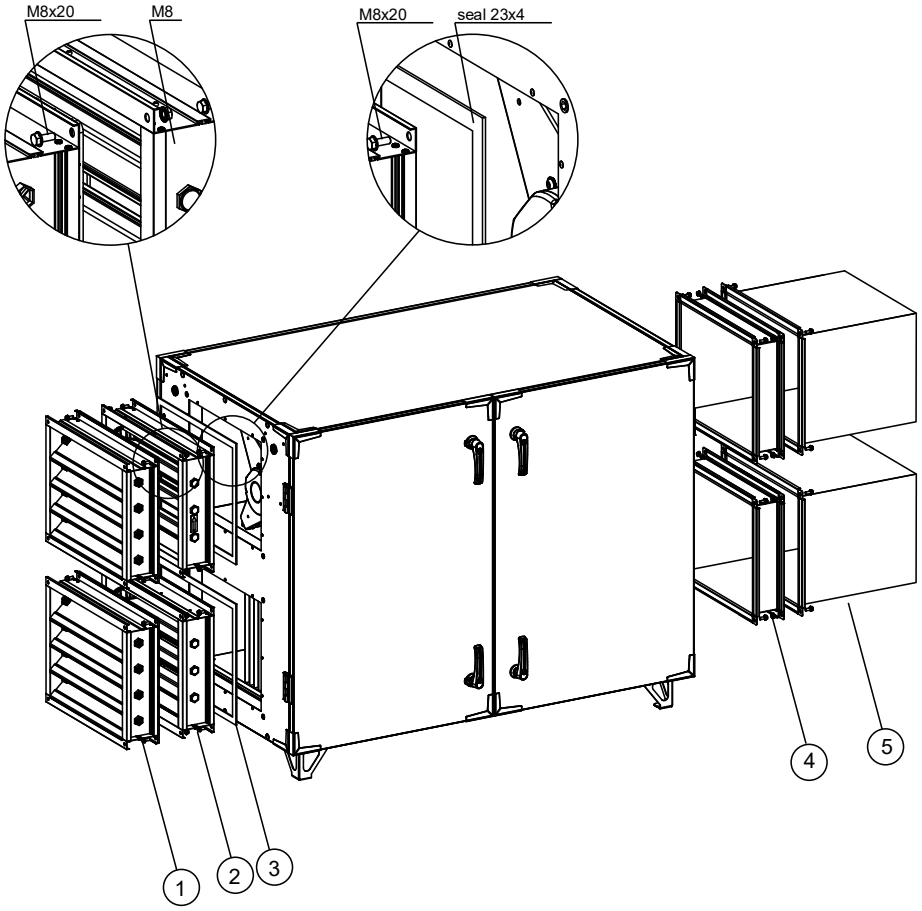
CONNECTION OF ROUND VENTILATION DUCTS

Ducts and accessories intended for round air ducts are connected using sleeve-type couplings.
It is recommended to seal individual duct connections with aluminum adhesive tape.



1	Fresh air intake/exhaust outlet	4	Sleeve
2	Flexible connection (for duct connections)	5	Air duct (spiro)
3	Air damper	6	Self-drilling screw

RECTANGULAR AIR DUCT CONNECTIONS



1	Louvered Air Inlet/Outlet	3	Gasket
2	Air Damper	4	Flexible Connection
		5	Air Duct

- ! Ventilation ducts should be connected to the air handling unit using flexible connectors (optional equipment), which help absorb vibrations from the unit and compensate for any misalignment between the duct outlets and the air handling unit.
- ! Flexible connectors are equipped with flanged joints with sealing.
- ! The flexible flanges should be connected to the ducts using self-tapping screws or additional clamping components.
- ! Duct connection components are not included in the standard scope of delivery.
- ! Air ducts must not rest their weight on the air handling unit.

5 ELECTRICAL AND FUNCTIONAL CONNECTIONS OF THE UNIT

5.1 HOT WATER HEATER AND CHILLED WATER COOLER CONNECTIONS

WARNING

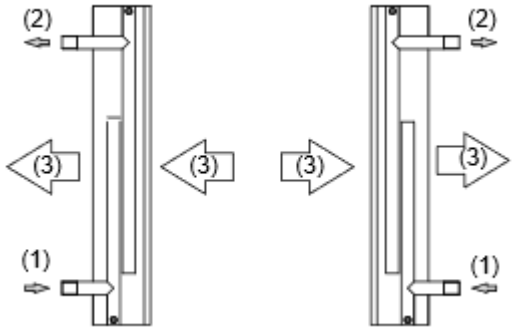
- ! THE OPERATION OF A WATER-BASED HEAT EXCHANGER REQUIRES CONNECTION TO THE PROCESS HEATING (OR COOLING) SYSTEM, DEPENDING ON THE INTENDED FUNCTION OF THE COIL.
- ! HEAT EXCHANGERS MUST BE PROTECTED AGAINST FREEZING IF THERE IS A RISK OF LOW AMBIENT TEMPERATURES.
- ! THE CONNECTION OF ADDITIONAL HEAT EXCHANGERS MUST BE CARRIED OUT IN A WAY THAT AVOIDS MECHANICAL STRESS, WHICH COULD LEAD TO DAMAGE OR LEAKS. THE WEIGHT OF THE PIPING AND ANY THERMAL EXPANSION FORCES MUST NOT BE TRANSFERRED TO THE COIL CONNECTIONS.
- ! SUPPLY PIPES SHOULD BE ROUTED TO AVOID COLLISIONS WITH OTHER AHU SECTIONS AND OTHER BUILDING SYSTEMS.
- ! IT MUST BE POSSIBLE TO EASILY DISCONNECT THE HEAT EXCHANGERS FROM THE PROCESS HEATING (OR COOLING) SYSTEM FOR MAINTENANCE AND SERVICING PURPOSES.
- ! EXPANSION COMPENSATION SHOULD BE APPLIED ON BOTH THE INLET AND OUTLET CONNECTIONS TO ALLOW FOR LINEAR PIPE EXPANSION.
- ! HYDRAULIC PIPES MUST NOT BE ROUTED ABOVE ELECTRICAL CABLES.
- ! USE CAUTION WHEN CONNECTING WATER PIPING – THERE IS A RISK OF DAMAGING THE COIL OR SURROUNDING COMPONENTS.

REQUIREMENTS FOR THE MEDIUM SUPPLYING THE WATER COILS

- Oil and grease content: < 1 mg/l
- pH at +25°C: 8–9
- Oxygen content: < 0.1 mg/l (as low as reasonably possible)
- Minimum cooler temperature: +3°C
- Maximum operating temperature: +130°C
- Maximum operating pressure: 16 bar
- If the return temperature of the medium may drop below 0°C, an antifreeze additive such as glycol must be used (up to 50% concentration in the mixture)
- Water hardness must not exceed:

Unit	Value
Normal concentration	4.101 mval/l (mval/dm³)
Molar concentration	2.051 mmol/l (mmol/dm³)
Calcium ion (Ca^{2+})	82.189 mg/l
As $CaCO_3$	205.25 mg/l (ppm)
French degrees (°f / °TH)	20.525
English degrees (°e)	14.400 (grain $CaCO_3$/UK gal)
US hardness (US)	11.990 (grain $CaCO_3$/US gal)
As CaO	115.000 mg/l
German degrees (°dH / °n)	11.500

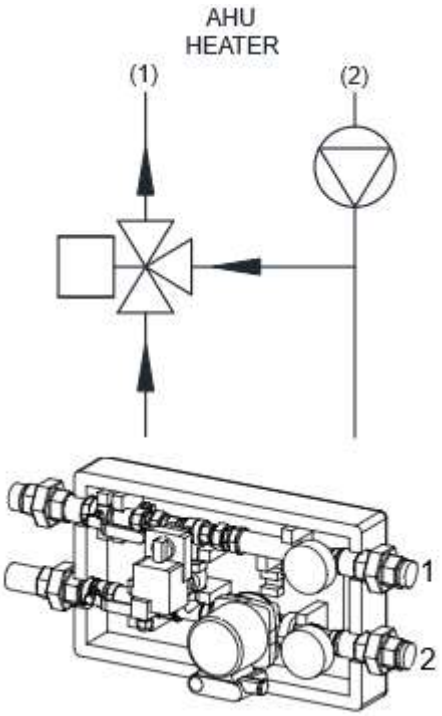
PRINCIPLE OF POWERING WATER EXCHANGERS - HEATER



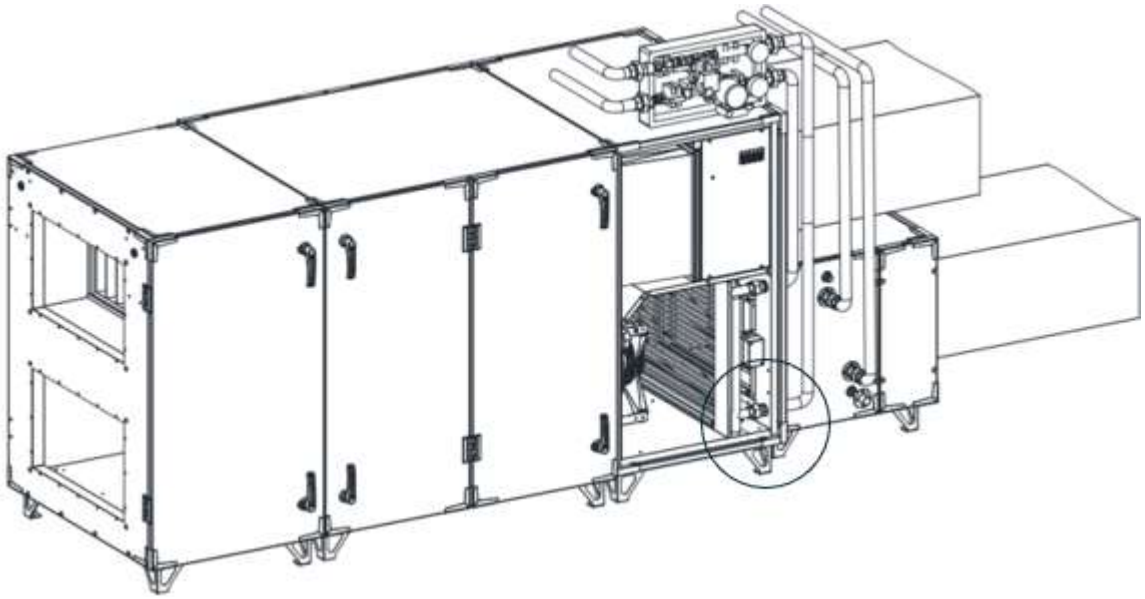
a) b)

a) Left-hand version
b) Right-hand execution
(1) Supplying the exchanger with the heating medium
(2) Return from the refrigerant exchanger
(3) Air flow direction in the unit

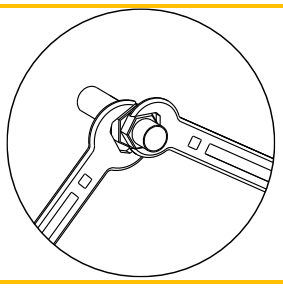
! **The supply and return connections to the coil should be configured to ensure counterflow operation.**
Co-current (parallel) flow results in a lower mean temperature difference, which negatively affects the coil's performance.



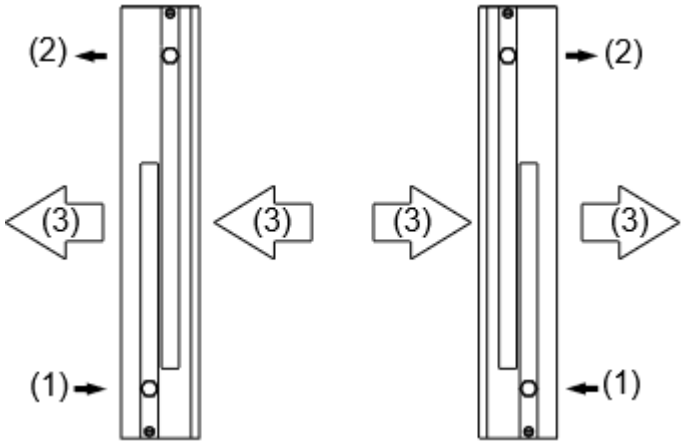
EXAMPLE OF WATER PIPING



When connecting exchangers equipped with screw connections, relieve the exchanger connector using an additional wrench.

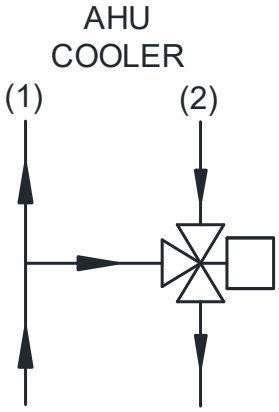


WATER EXCHANGER POWER SUPPLY PRINCIPLE - COOLER

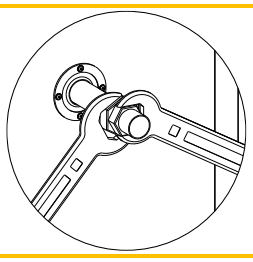


b) Left-hand version
c) Right-hand execution
(1) Supplying the exchanger with the heating medium
(2) Return from the refrigerant exchanger
(3) Air flow direction in the unit

! The supply and return connections to the coil must be configured to ensure counterflow operation. Parallel flow operation results in a lower mean temperature difference, which reduces the coil's overall efficiency.



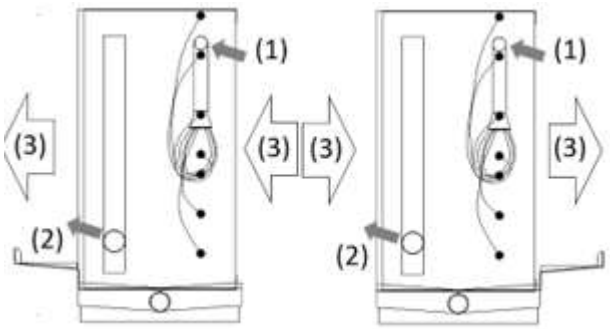
When connecting exchangers equipped with screw connections, relieve the exchanger connector using an additional wrench.



5.2 CONNECTION OF DX (DIRECT EXPANSION) COILS

- ! The DX coil must be connected by a qualified refrigeration system installer in accordance with applicable standards and regulations for fluorinated gas systems (F-gas certification required).
- ! The DX coil is designed to operate with refrigerant R410A or R32 (not included in the delivery) and requires an expansion valve.
- ! To ensure proper operation of DX cooling or heating coils, they must be connected to a DX system with a condensing/refrigeration unit in full compliance with all applicable regulations, standards, and best practices.
- ! Maximum operating pressure: 42 bar (for 5/16” coils).
- ! Operation or standstill in sub-zero temperatures requires appropriate protection and a defrosting system. The coil must be protected from frost accumulation on its surface.
- ! Freezing or complete frosting of the coil must not be allowed under any circumstances.
- ! For units equipped with a refrigerant circuit – prior to installation, check current legal requirements regarding the responsibilities of the installer and the owner/operator of the heat pump or DX system (see F-Gas Regulation).
- ! Refrigerant must not be released into the atmosphere! If refrigerant must be added or recovered, the service technician must follow all applicable local regulations.
- ! The owner of the heat pump or DX system is required to maintain a Product Logbook in which all inspections, repairs, and modifications to the unit must be recorded.

POWER SUPPLY PRINCIPLE OF DX EXCHANGERS (COOLERS, HEATERS)



a) b)

! DX exchangers have copper connectors suitable for brazing.

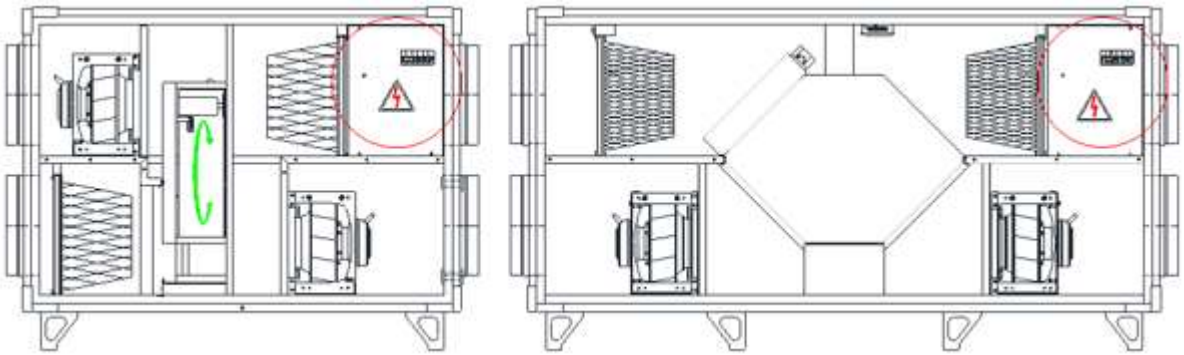
! DX heat exchangers have capillary connections. When brazing or welding pipes, avoid exposing pipe components to high temperatures when making capillary connections and protect the valve closest to the connection being made with a wet cloth.

a) Left-hand version
b) Right-hand execution
(1) Exchanger supply (liquid line - medium supply to the distributor)
(2) Suction line (steam line - refrigerant return to the compressor)
Air flow direction in the unit

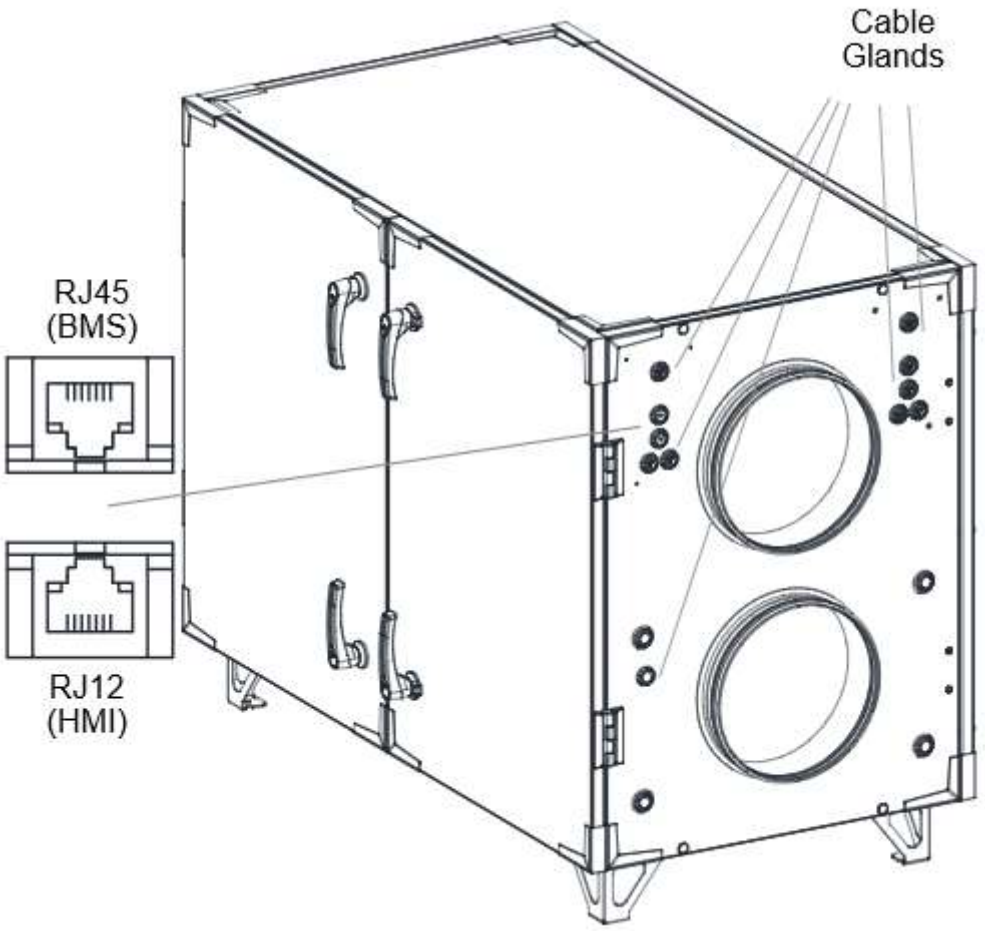
5.3 ELECTRICAL POWER CONNECTION

The VENTUS PLATINIUM base unit, equipped with heat recovery (using either a counterflow hexagonal heat exchanger or a rotary heat exchanger), fans, and air filters, is delivered as a prewired unit.
The power supply is connected to a designated connection point located inside the unit. Cable entry is provided through cable glands located on the front side of the unit. The unit housing is equipped with RJ12 ports for connecting the HMI Advanced panel and RJ45 ports for data transmission to the BMS (Building Management System).

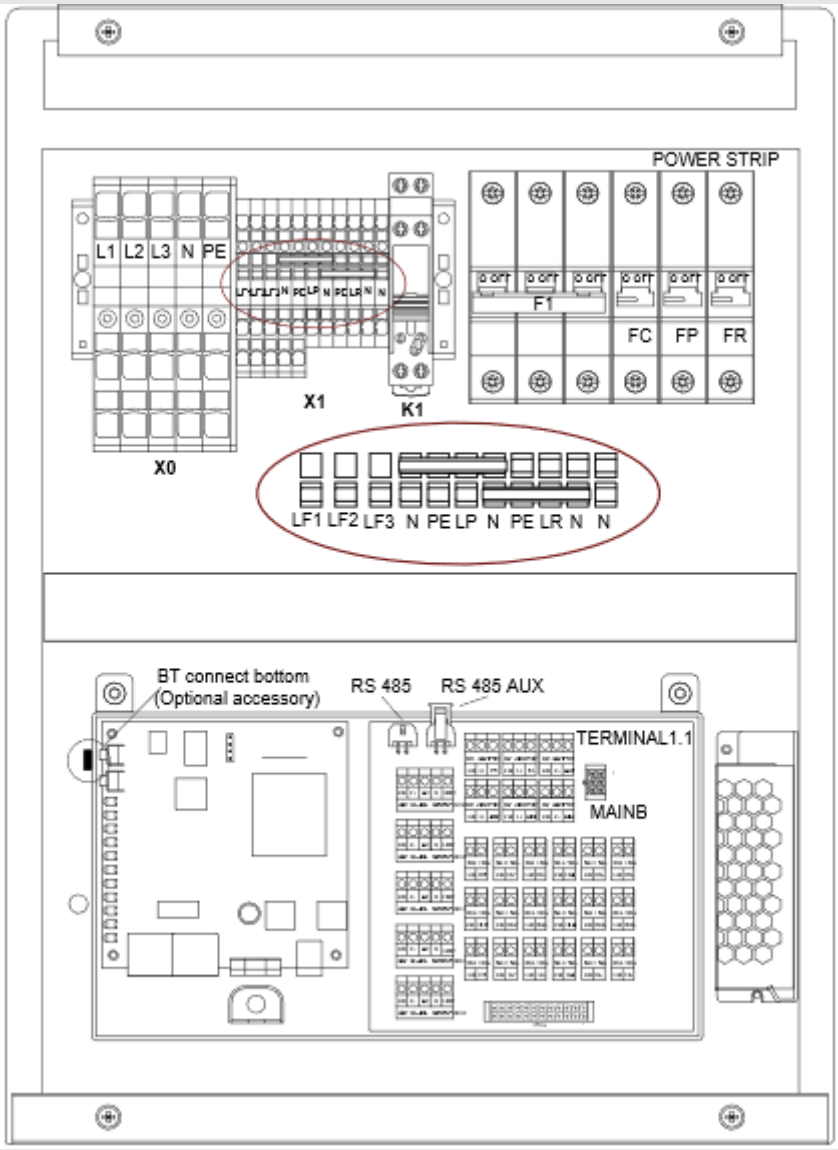
LOCATION OF THE POWER AND CONTROL SWITCHBOARD



CONTROL CABINET AND CABLE ENTRY SYSTEM



POWER AND CONTROL SWITCHBOARD



X0	Main power connection strip 380-415V 3N~ 50Hz
X1	Internal power connection strip
LFx	Internal fan power supply connection strip, x
LP	Heater circulation water pump connection strip (up to 250W 230V N~)
LR	Internal power supply connection strip for the rotary heat exchanger
K1	Connecting the power supply to the heater's circulating water pump (up to 250W 1~230V N~)
F1	Circuit breaker - fans
FC	Overcurrent circuit breaker - controller
FP	Overcurrent circuit breaker - heater water pump
FR	Overcurrent circuit breaker – rotary heat exchanger (if present)

CONNECTING THE POWER SUPPLY OF THE UNIT WITH A ROTARY HEAT EXCHANGER 380V-415V 3N~ 50Hz (3P+N+E)

Size devices	Heater . Electr.	Fan code	Quantity vent in section	FLA	MCA	MCB	MOP	Power cord
VVSA11c	0 kW	250|0.7kW|EC	1	6.0 A	8.3 A	16 A	16.0 A	5x1.5 mm ^{2}
	3 kW	250|0.7kW|EC	1	9.0 A	13.7 A	16 A	16,4 A	5x1,5 mm^2
	6 kW	250|0.7kW|EC	1	12,0 A	19,1 A	20 A	20,8 A	5x2,5 mm^2
VVSA14c	0 kW	250|0.7kW|EC	1	6,0 A	8,3 A	16 A	16,0 A	5x1,5 mm^2
	3 kW	250|0.7kW|EC	1	6,0 A	13,7 A	16 A	16,4 A	5x1,5 mm^2
	6 kW	250|0.7kW|EC	1	6.0 A	19.1 A	20 A	20.8 A	5x2.5 mm ^{2}
	0 kW	250|0.8kW|EC	1	5.1 A	7.1 A	16 A	16.0 A	5x1.5 mm ^{2}
	3 kW	250|0.8kW|EC	1	5.1 A	12.5 A	16 A	16.0 A	5x1.5 mm ^{2}
	6 kW	250|0.8kW|EC	1	5.1 A	18.0 A	16 A	18.7A	5x2.5mm ^{2}
	0 kW	250|1.1kW|EC	1	5.8A	8.0A	16 A	16.0A	5x1.5mm ^{2}
	3kW	250|1.1kW|EC	1	5.8A	13.4A	16 A	16.0A	5x1.5mm ^{2}
	6 kW	250|1.1kW|EC	1	5.8A	18.8A	16 A	16.0A	5x2.5mm ^{2}
VVSA22c	0 kW	315|1.5kW|EC	1	7,6 A	8,8 A	16 A	16,0 A	5x1,5 mm^2
	4,5 kW	315|1.5kW|EC	1	12,1 A	16,9 A	16 A	16,0 A	5x2,5 mm^2
	9 kW	315|1.5kW|EC	1	16,6 A	25,0 A	20 A	20,6 A	5x4,0 mm^2
	13,5 kW	315|1.5kW|EC	1	21,1 A	33,1 A	25 A	27.1 A	5x6.0 mm ^{2}
VVSA29c	0 kW	355|1.6kW|EC	1	7.0 A	9.5 A	16 A	16.0 A	5x1.5 mm ^{2}
	7.2 kW	355|1.6kW|EC	1	14.2 A	22.5 A	16 A	18.7 A	5x2.5 mm ^{2}
	14.4 kW	355|1.6kW|EC	1	21.4 A	35.5 A	25 A	29.1 A	5x6.0 mm ^{2}
	21.6 kW	355|1.6kW|EC	1	28,6 A	48,5 A	32 A	39,5 A	5x10 mm^2
VVSA40c	0 kW	400|2.5kW|EC	1	9,2 A	11,5 A	16 A	16,0 A	5x1,5 mm^2
	14,4 kW	400|2.5kW|EC	1	23,6 A	37,5 A	25 A	30,9 A	5x6,0 mm^2
	21,6 kW	400|2.5kW|EC	1	30,8 A	50,5 A	40 A	41.3 A	5x10 mm ^{2}
VVSA56c	0 kW	355 | 1.6kW | EC	2	13.0 A	16.3 A	16 A	16.0 A	5x2.5 mm ^{2}
	19.2 kW	355 | 1.6kW | EC	2	32.2 A	50.9 A	40 A	42.1 A	5x10.0 mm ^{2}

FLA (Full Load Ampers) – Current Rated .
MCA (Minimum Current Ampacity = 1.25% x FLA) - Minimum ampacity of the circuit.
MCB (Miniatur Circuit Breaker) – Overcurrent circuit breaker.
MOP (Maximum Overcurrent Protection) - Maximum overcurrent protection.

The cross-sections and types of cables (e.g. shielded cable) powering individual functional elements should be selected based on the rated current of the entire control panel and specific operating conditions (e.g. ambient temperature, cabling method, distance from the power source).

POWER CONNECTION OF THE UNIT WITH A COUNTER-FLOW (HEXAGONAL) HEAT EXCHANGER 380 V-415V 3N~ 50Hz (3P+N+E)

Size devices	Heater . Electr.	Fan code	Quantity vent in section	FLA	MCA	MCB	MOP	Power cord
VVSA11c	0 kW	250|0.7kW|EC	1	5.4 A	6.8 A	16 A	16.0 A	5x1.5 mm ^{2}
	3 kW	250|0.7kW|EC	1	8.4A	12.2A	16 A	16.0A	5x1.5mm2
	6 kW	250|0.7kW|EC	1	11.4A	17.6A	16 A	19.6A	5x2.5mm 2
VVSA14c	0 kW	250|0.7kW|EC	1	5.4A	6.8A	16 A	16.0A	5x1.5mm2
	3kW	250|0.7kW|EC	1	5.4A	12.2 A	16 A	16.0 A	5x1.5 mm ^{2}
	6 kW	250|0.7kW|EC	1	5.4 A	17.6 A	16 A	19.6 A	5x2.5 mm ^{2}
	0 kW	250|0.8kW|EC	1	4.5 A	5.6 A	16 A	16.0 A	5x1.5 mm ^{2}
	3 kW	250|0.8kW|EC	1	4.5 A	11.0 A	16 A	16.0 A	5x1.5mm2
	6 kW	250|0.8kW|EC	1	4.5A	16.5A	16 A	17.5A	5x2.5mm 2
	0 kW	250|1.1kW|EC	1	5.2A	6.5A	16 A	16.0A	5x1.5mm2
	3kW	250|1.1kW|EC	1	5.2A	11.9A	16 A	16.0A	5x1.5mm2
	6 kW	250|1.1kW|EC	1	5.2 A	17.3 A	16 A	16.0 A	5x2.5 mm ^{2}
VVSA22c	0 kW	315|1.5kW|EC	1	7.0 A	7.3 A	16 A	16.0 A	5x1.5 mm ^{2}
	4.5 kW	315|1.5kW|EC	1	11.5 A	15.4 A	16 A	16.0 A	5x1.5 mm ^{2}
	9 kW	315|1.5kW|EC	1	16,0 A	23,5 A	16 A	19,4 A	5x2,5 mm^2
	13,5 kW	315|1.5kW|EC	1	20,5 A	31,6 A	25 A	25,9 A	5x4,0 mm^2
VVSA29c	0 kW	355|1.6kW|EC	1	6,4 A	8,0 A	16 A	16,0 A	5x1,5 mm^2
	7,2 kW	355|1.6kW|EC	1	13,6 A	21,0 A	16 A	17,5 A	5x2,5 mm^2
	14,4 kW	355|1.6kW|EC	1	20,8 A	34,0 A	25 A	27,9 A	5x6,0 mm^2
	21,6 kW	355|1.6kW|EC	1	28,0 A	47,0 A	32 A	38,3 A	5x10 mm^2
VVSA40c	0 kW	400|2.5kW|EC	1	8,0 A	10,0 A	16 A	16,0 A	5x1,5 mm^2
	14,4 kW	400|2.5kW|EC	1	22,4 A	36,0 A	25 A	29,7 A	5x6,0 mm^2
	21,6 kW	400|2.5kW|EC	1	29,6 A	49,0 A	40 A	40,1 A	5x10 mm^2
VVSA56c	0 kW	355|1.6kW|EC	2	11,8 A	14,8 A	16 A	16,0 A	5x1,5 mm^2
	19.2 kW	355 | 1.6kW | EC	2	31.0 A	49.4 A	40 A	40.9 A	5x10 mm ^{2}

FLA (Full Load Ampers) – Current Rated .
MCA (Minimum Current Ampacity = 1.25% x FLA) - Minimum ampacity of the circuit.
MCB (Miniatur Circuit Breaker) – Overcurrent circuit breaker.
MOP (Maximum Overcurrent Protection) - Maximum overcurrent protection.

The cross-sections and types of cables (e.g. shielded cable) powering individual functional elements should be selected based on the rated current of the entire control panel and specific operating conditions (e.g. ambient temperature, cabling method, distance from the power source).

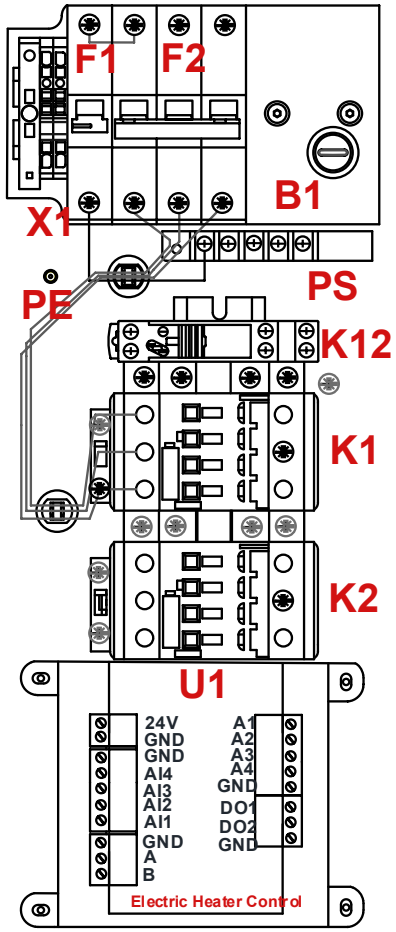
The units are equipped with modern, efficient fans with EC motors. The motors and controller have an IP rating of 44. The motors' internal electronics protect them against overload and failure.
Maximum ambient temperature 40°C.

6 ELECTRIC HEATER

6.1 GENERAL INFORMATION

The electric heater is an optional component of the air handling unit. If the unit is delivered with an electric heater, the heater is factory-wired to the power supply point of the unit and integrated into the unit's automation system. The electric heater consists of heating elements, a connection terminal, control automation (SCCR), and safety devices to prevent excessive temperature rise (thermal cut-off switch and differential air pressure switch).

ELECTRIC HEATER POWER AND CONTROL PANEL



F1 - Circuit breaker - heater control

F2 - Overcurrent circuit breaker - heater power supply

X1 – Terminal block

B1 - Thermal cut-off switch

PE - PE grounding terminal

PS - Power Supply

K12 – 2nd stage heating contactor

K1 - Heater contactor

K2 - Heater contactor

U1 - Heater controller

6.2 HEATER SAFETY – CUT-OFF THERMAL SWITCH

The thermal protection function is based on the properties of a bimetallic element – it opens the heater control circuit contacts when the air temperature near the cut-off thermal switch reaches 65°C. After an emergency shutdown, the heater is automatically reactivated when the air temperature drops by 20°C.

Following an intentional or emergency (overheating-related) power shutdown, the supply fan must continue to operate for a period of 0.5 to 5 minutes to allow the heater elements to cool down to a safe temperature.

The thermal switch is an integrated, factory-installed component of each heater segment and does not require any additional installation or electrical connection by the installer.

THERMAL SWITCH - FEATURES

THERMAL SWITCH	CONNECTION	COMMENTS
	Function	protecting the heater against overheating (temperature control of heating elements)
	Construction	• metal housing • two screw terminals • bimetallic element with NC contact function
	Rated operating voltage	30V DC
	Output signal type	voltage-free (switching contact)
	Activation temperature	(+65) °C
	Temperature hysteresis	17 °C

6.3 HEATER SAFETY - DIFFERENTIAL PRESSURE SWITCH

The differential pressure switch is an additional safety element, alongside the thermostat, that protects the heater from operating under improper conditions.

It prevents the heater from being activated when the pressure generated by the supply fan section of the air handling unit is insufficient to ensure the safe operation of the heating elements.

DIFFERENTIAL PRESSURE SWITCH - FEATURES		
DIFFERENTIAL PRESSURE SWITCH	**CONNECTION**	**COMMENTS**
	**Function**	protecting the heater against overheating (control of the pressure difference between the supply duct and atmospheric pressure)
	Construction	• plastic housing, • two screw terminals, • membrane connected to a mechanical module
	Rated operating voltage	30V DC
	Output signal type	voltage-free (switching contact)
	Measuring range	20-300 Pa

DANGER

! The switching threshold of the differential pressure switch is 20 Pa.

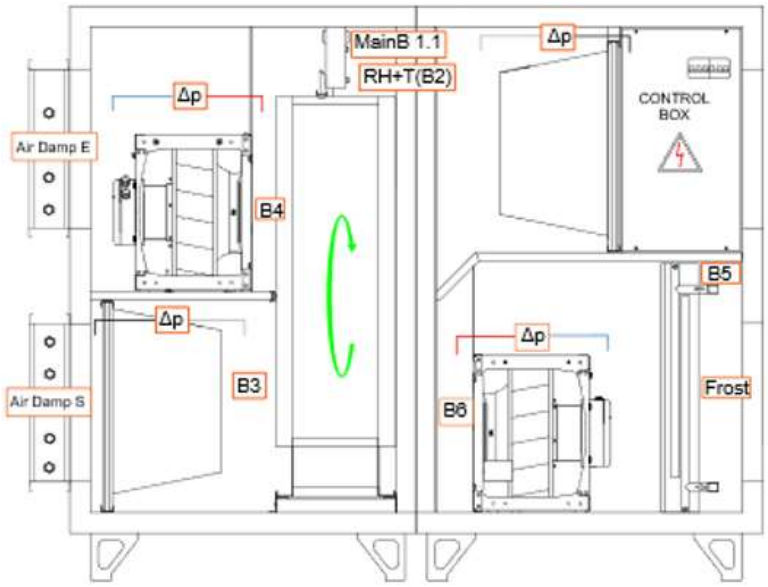
! If the pressure difference is detected at the current setpoint even when the unit is switched off (i.e. the heater is enabled despite the fans not operating), the setpoint must be gradually increased until correct operation is achieved. Correct operation is indicated by the heater remaining off despite the presence of control signals, in cases where the pressure switch does not detect a differential pressure between the measurement points – heater enable should only occur after the fans are running.

! After the pressure switch has been fully connected, a shutdown test of the electric heater must be performed. To do this, manually activate the heater (e.g. by issuing control signals from the controller), and simultaneously stop the fan operation. The pressure switch should prevent the electric heater from operating – this can be observed by the deactivation of the heater contactors in the control panel.

7 CONTROL SYSTEM

The base unit of **VENTUS PLATINIUM** with heat recovery (either with a counterflow hexagonal exchanger or a rotary heat exchanger) is delivered as a pre-wired unit with a connected and configured automation system. The control system is based on a factory-programmed and integrated **uPC3 controller**.
Peripheral (field) automation components that are designed to be mounted outside the base unit (such as room or duct-mounted sensors, actuators, valves) are supplied in separate packages. These components must be installed and connected on-site according to the relevant installation and connection instructions.

STANDARD CONTROL COMPONENTS INSTALLED IN THE UNIT

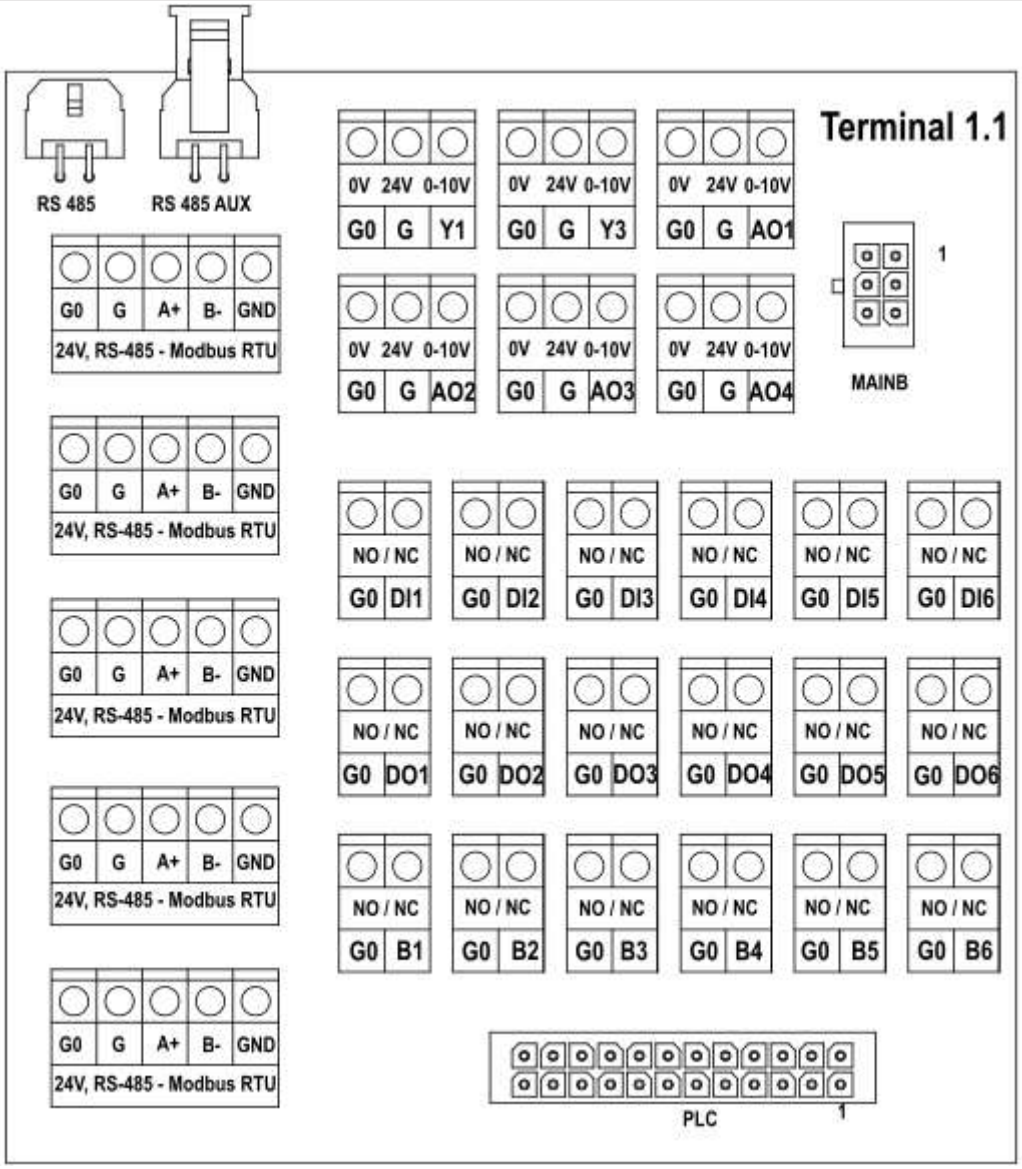


STANDARD CONTROL COMPONENTS – FACTORY ASSEMBLY		
Designation	Name	Location
Control Box	uPC3 controller	Power and control switchboard (see: "Wiring Diagram")
	Terminal 1.1 (T1.1)	Connection terminal for peripheral control elements
	Security	
B2	Temperature sensor	Return air from the room (exhaust before recovery: alternative reading from the sensor before the rotor, or the room sensor, the room sensor built into the HMI Basic)
H2 (RH+T)	Moisture transducer	Return air from the room (air before recovery)
B3	Temperature sensor	Outside air (before recovery)
B4	Temperature sensor	Removed air (exhaust after recovery)
B5	Temperature sensor	Heater medium return temperature.
B6	Temperature sensor	Supply air (after recovery)
	Differential pressure transducer	Measurement on the supply air filter
		Measurement on the supply air fan
		Measurement on the exhaust air filter
		Measurement on the exhaust air fan
	Air Damp S	Fresh air damper actuator
	Air Damp E	Exhaust air damper actuator
	Frost/Thermostat	Thermostat behind the heater.

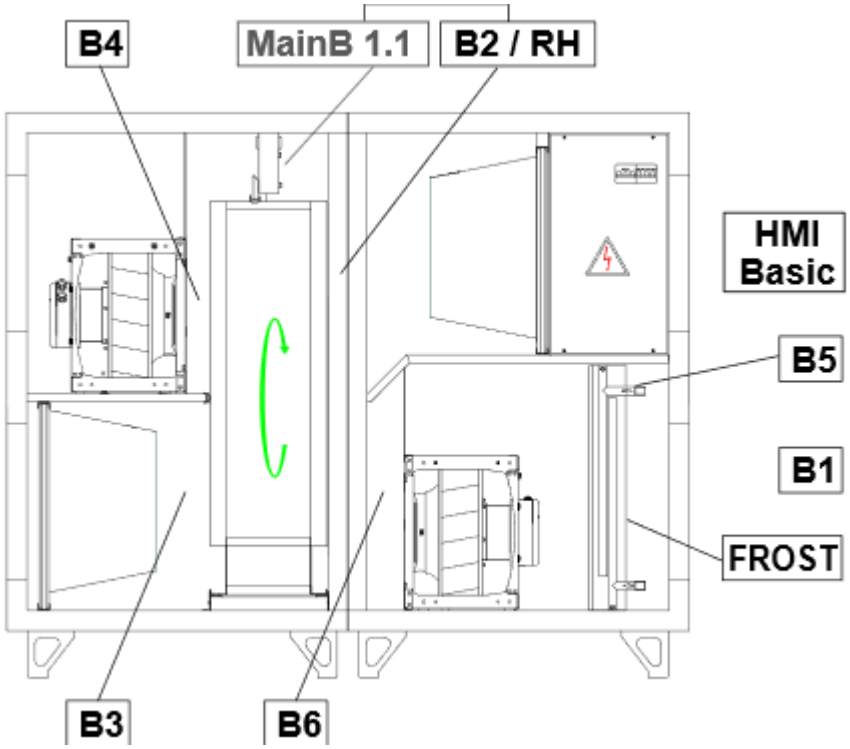
7.1 CONNECTION TERMINAL 1.1 (T1.1)

Terminal 1.1 (T1.1) is factory-connected to the uPC3 controller and it is a terminal dedicated to connecting field control components that are located outside the device's base unit and therefore could not be connected at the factory. Additional control components not offered by VTS can also be connected to Terminal 1.1 (T1.1). Terminal 1.1 is located in the control switchboard.

CONNECTION TERMINAL 1.1 (T1.1)

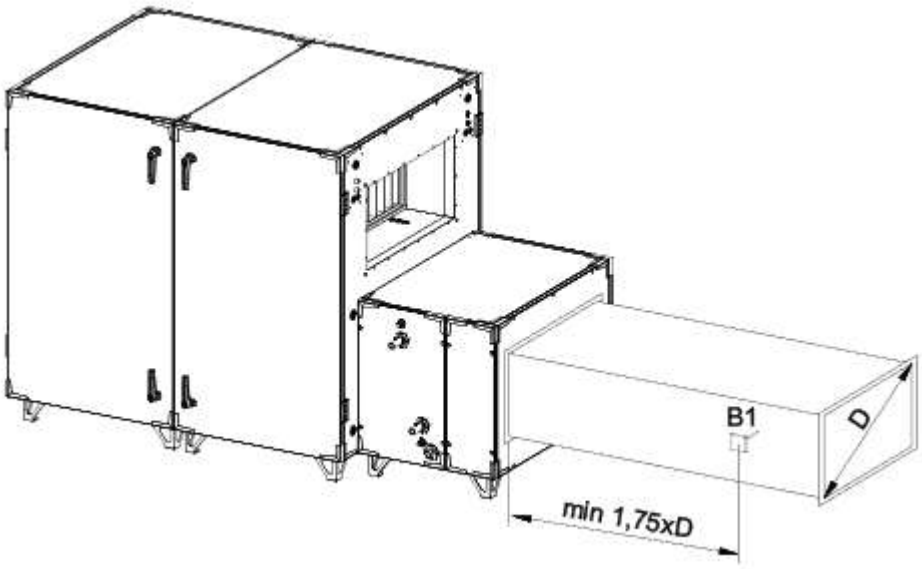


TEMPERATURE SENSORS



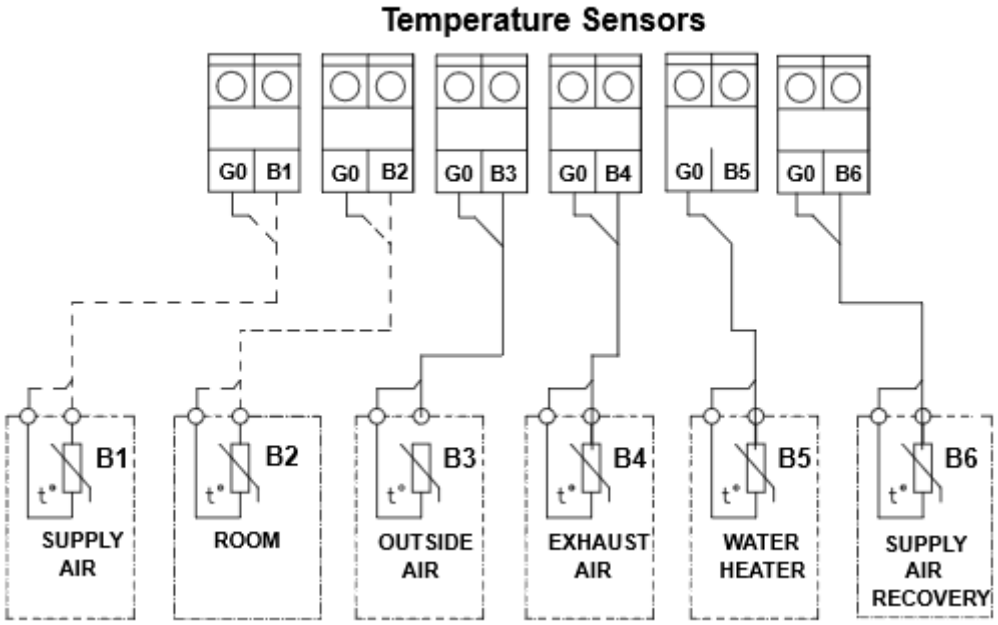
B1	Duct air temperature sensor – air supplied to the room. The sensor is mounted and connected on site. The B1 sensor should be placed in the air supply duct after the last section of the air handling unit, in a place representative for temperature measurement (in a homogeneous air stream with uniform temperature distribution). The minimum distance between the air outlet of the last section of the device and the sensor should not be less than the distance defined as 1.75 x the diagonal of the rectangular connection
B2	Exhaust air (room) temperature sensor factory-installed in heat recovery. If a room sensor is used as the primary sensor (other than HMI BASIC), this sensor must be connected to B2 on terminal T1.1
B3	Outside air temperature sensor.
B4	Exhaust air temperature sensor
B5	Contact temperature sensor for water heater. A contact-type water heater temperature sensor, assigned to only one heater (preheater or main). The preheater has priority. The sensor is mounted on the water outlet manifold.
B2/RH	Humidity transducer and temperature sensor.
HMI Basic	Optional panel with temperature sensor mounted on the object.

AIR SUPPLY DUCT TEMPERATURE SENSOR B1



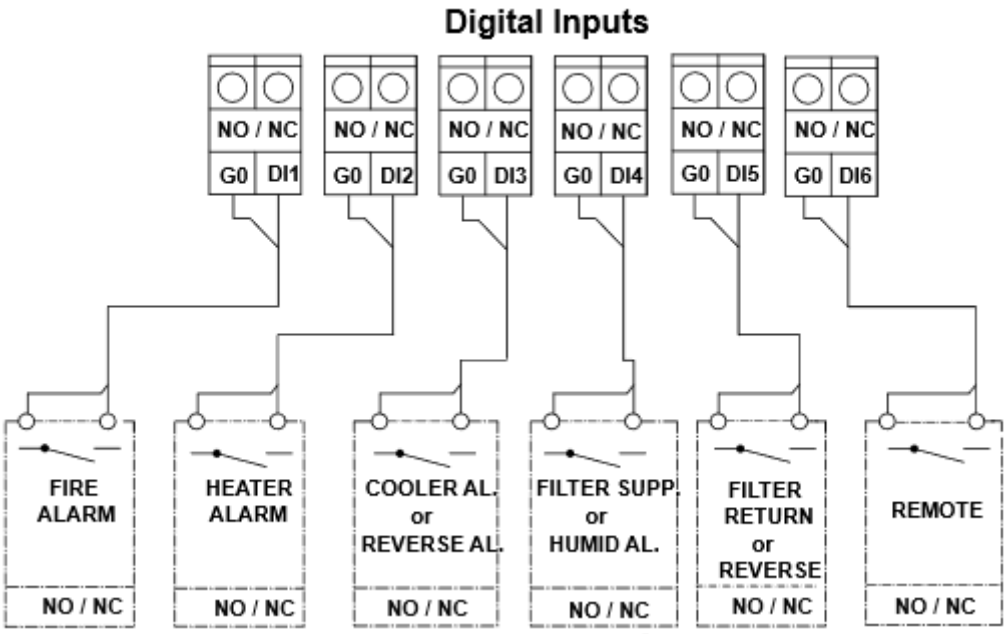
7.2 ANALOG INPUTS (NTC10K)

ANALOG INPUTS (NTC10K) – CONNECTION TO TERMINAL T1.1
SENSORS



7.3 DIGITAL INPUTS

DIGITAL INPUTS

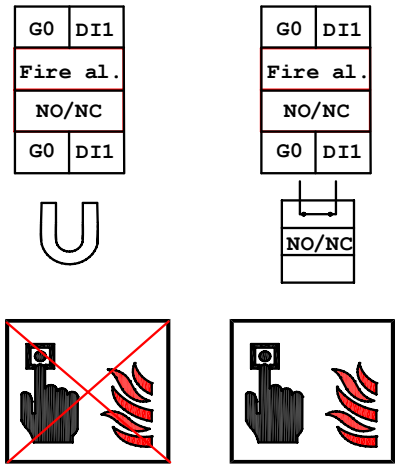


DI1	Fire alarm
DI2*	Heater alarm (freeze)
DI3	Radiator alarm
DI4	Humidifier alarm
DI5	Cooling source alarm
Remote	Programmable external input (permission to operate the control panel or forcing the selected operating mode.

DI2* - Heater alarm (freezing). In the absence of a water heater and the presence of an electric heater, the alarm signal is used to confirm the operation of the electric heater.

7.4 FIRE ALARM

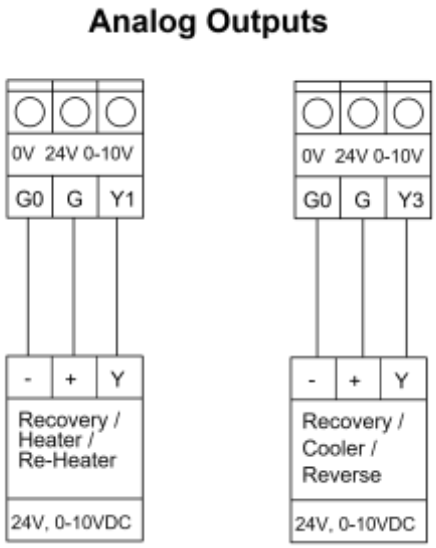
FIRE ALARM



If no fire alarm signal from an external source is connected, a jumper must be installed.

7.5 ANALOG OUTPUTS (0-10V DC)

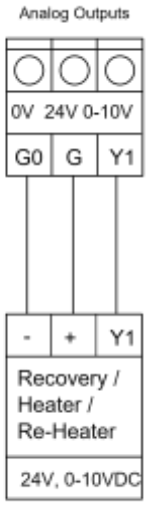
ANALOG OUTPUTS



AO1	Heat recovery. Factory connection outside of Terminal 1.1 (T1.1) MainBoard
AO2	Air mixing.
AO3	Humidification or post-heater.
AO4	Pre- or post-heater.
Y1	Main heater or secondary heater after DX-H or mixing chamber. Priority: 1. Main heater, 2. Secondary heater for heat pump (DX-H), 3 Mixing chamber.
Y3	Cooler or post-heater downstream of DX-H, or mixing chamber. Priority: 1. Radiator, 2. Secondary heater for heat pump (DX-H), 3 Mixing chamber,

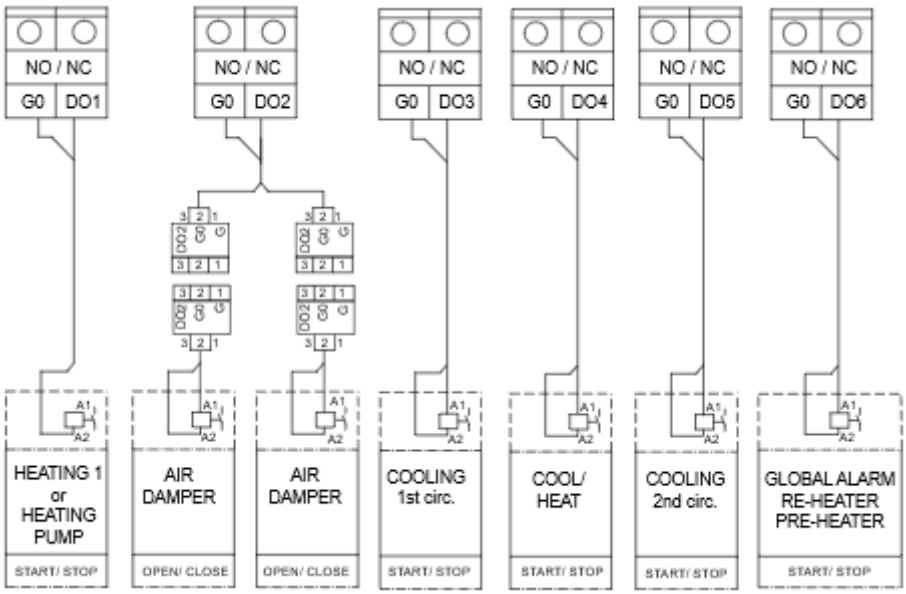
MAIN WATER HEATER VALVE ACTUATOR AND ELECTRIC MAIN HEATER CONTROL SIGNAL Y1

MAIN WATER HEATER VALVE ACTUATOR



7.6 OUTPUTS (24V DC)

DIGITAL OUTPUTS (24V DC)

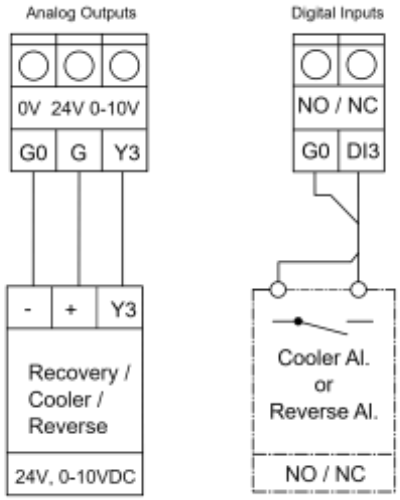


DO1	Main heater (or secondary heater if DX-H)
DO2	Air inlet and outlet dampers
DO3	Cooler Stage 1 or DX-H Signal
DO4	Cooling/heating switching signal
DO5	Cooler stage 2
DO6	Preheater or Postheater or General Alarm

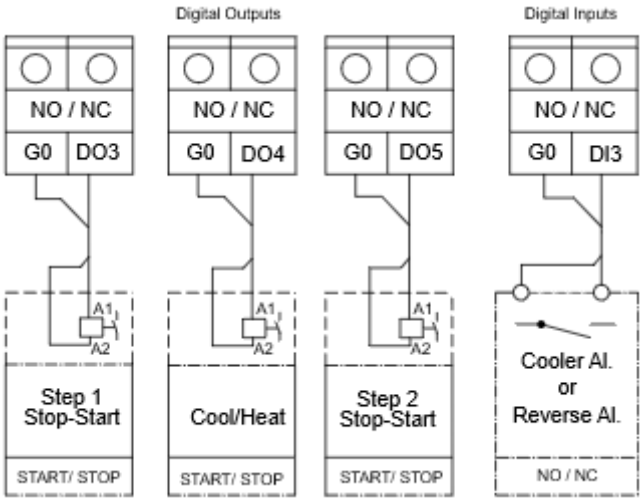
If it is necessary to use 230V AC voltage or potential-free contacts for the output signals, an isolation relay with a coil powered by 24V DC from the controller relay outputs should be used.

7.7 CONNECTING THE CONDENSING UNIT SIGNALS

DX EXCHANGER (0-10V CONTROL)

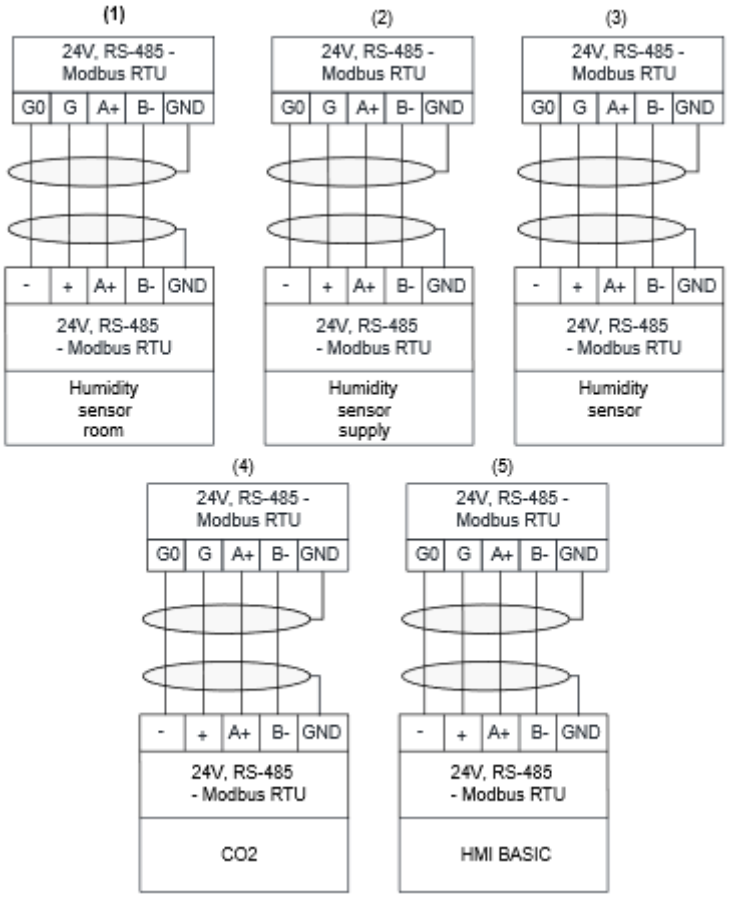


DX EXCHANGER (ON-OFF CONTROL)



7.8 MODBUS RTU RS485 COMMUNICATION

MODBUS RTU RS485 COMMUNICATION



(1) Air humidity sensor – room (exhaust – factory installed)

(2) Air humidity sensor - supply

(3) Air humidity sensor

(4) CO2 sensor

(5) HMI Basic Panel

8 COMMUNICATION WITH THE CONTROLLER

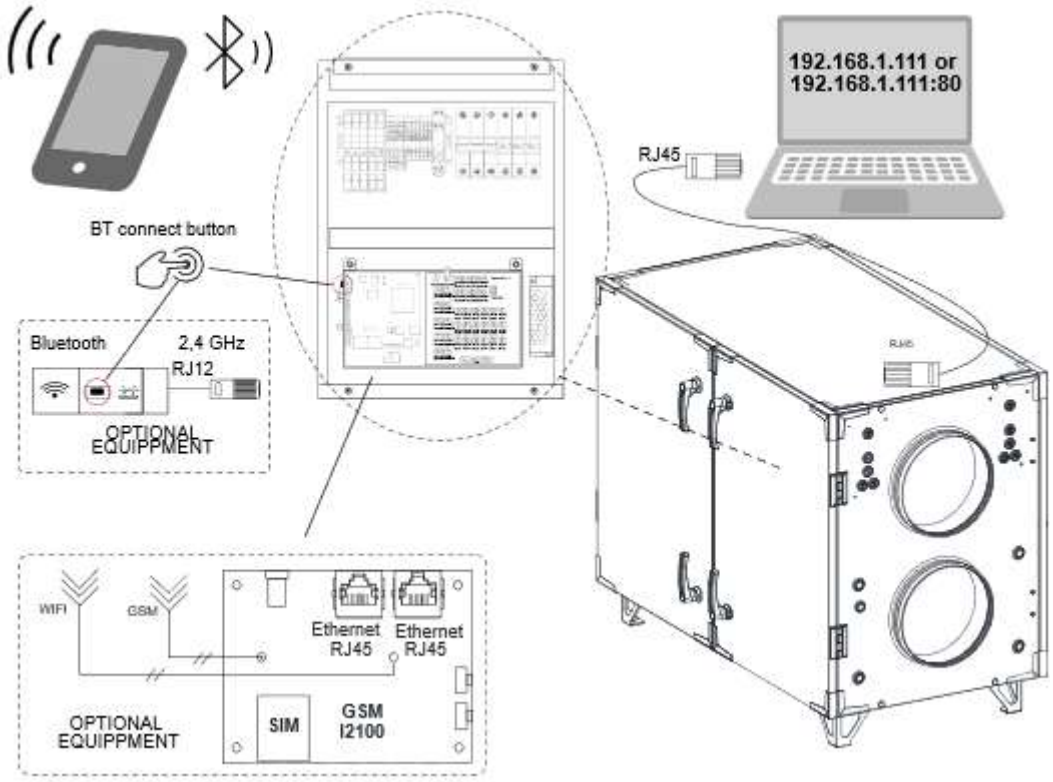
The user can communicate with the controller using:

- HMI Advanced (administration and service panel),
- HMI Basic,
- mHMI application (mobile HMI - Bluetooth),
- mHMI application (mobile HMI - GSM),
- via WIFI router (2.4 GHz),
- by connecting directly to the controller port - ModBus TCP/IP, optionally BacNet TCP/IP.

The possible communication methods depend on the automation option selected in the order.

8.1 WIRELESS COMMUNICATION WITH THE CONTROLLER

WIRELESS COMMUNICATION WITH THE AHU CONTROLLER



Available encrypts:

- None (no encryption)
- WEP
- WPA Personal
- WPA 2 Personal`
- mixed WPA/WPA2 Personal
- mixed WPA/WPA3 Personal

BLUETOOTH MODULE (BT)

The module transmits the RS485 serial communication signal [Modbus RTU] from the main controller to a mobile device via Bluetooth, eliminating the need for a communication cable. To control the air handling unit with VTS automation using the Bluetooth module, the dedicated mHMI application must be installed on the mobile device. Then, the mobile device must connect to the dedicated mHMI Bluetooth module, which is connected to the VTS automation control cabinet.

BT MODULE OPERATION

The device allows other devices to connect via a broadcast system. The default name of the module is the serial number of the air handling unit. For units with an unconfigured serial number, the module is identified as "AHU Bluetooth".

To configure the unit, a “Cloud Code” must be added — this code is located under the unit’s “QR Code”.

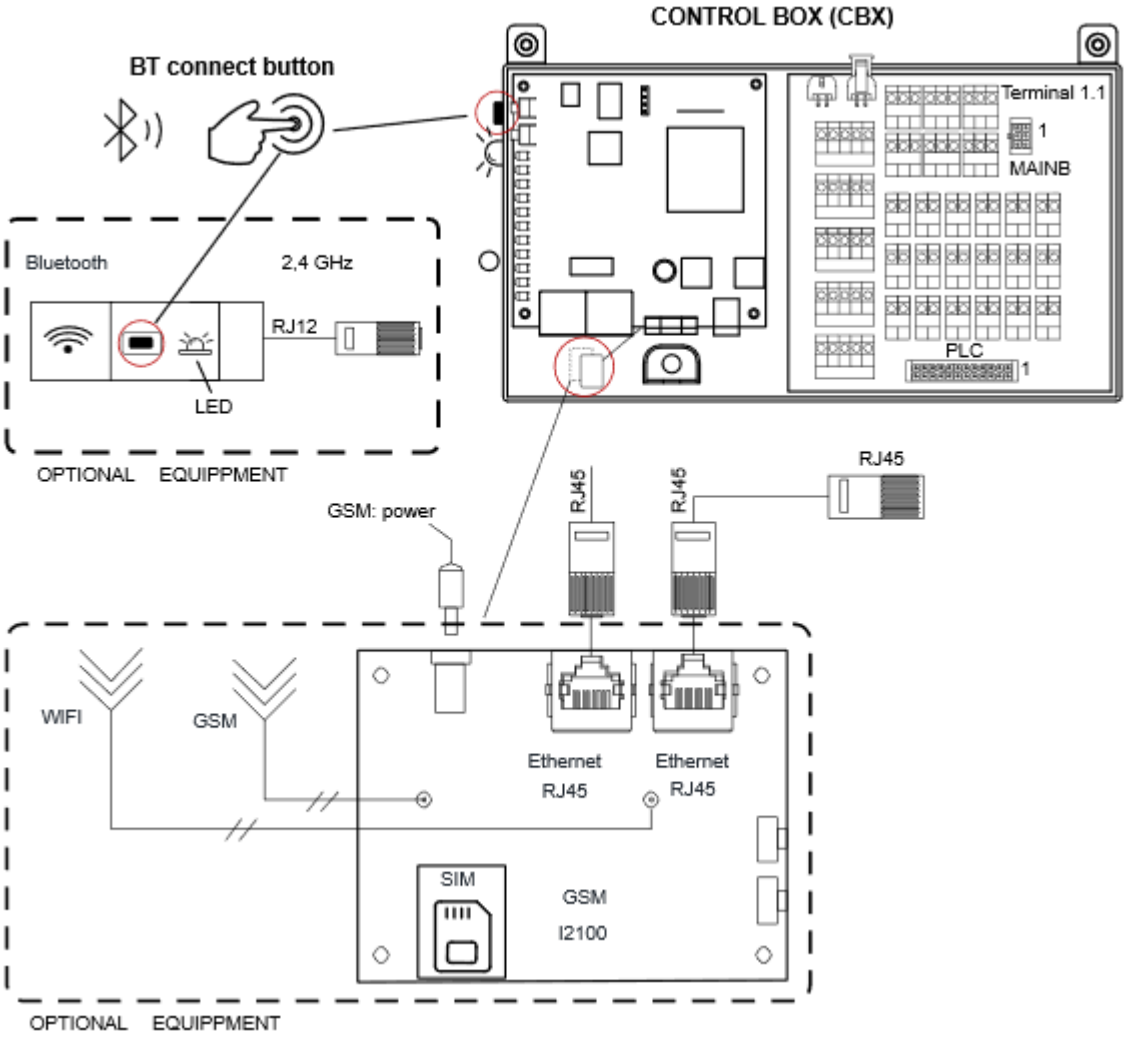
By default, the server allows connections only from previously paired devices. This state is indicated by the LED being off with a periodic pulse. To allow connections from all devices, press and hold the pairing button for approximately 3 seconds. The LED will then be on with a periodic pulse. The server can be connected to only one client device at a time. When the server is actively connected to a device, the LED remains constantly on.

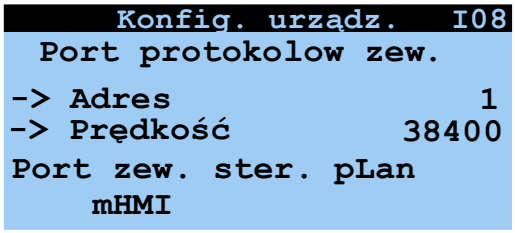
LED STATUS INDICATORS:

- Off – Offline mode / no power
- Off with pulse – Server mode with new device connections disabled
- On with pulse – Server mode with new device connections enabled
- On – Server mode with an active connection

STARTING THE BLUETOOTH MODULE

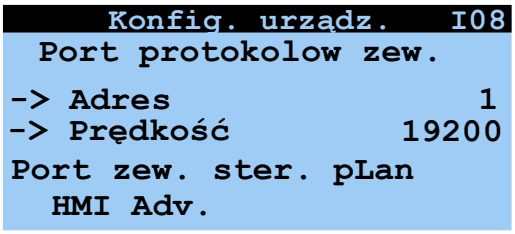
- Remove the cover of the unit's connection box.
- Locate the button on the Bluetooth (BT) module and press it until the LED starts flashing. This indicates that the BT module is in pairing mode.
- Next, open the application and pair the air handling unit with the app.
- The pairing mode remains active for 30 seconds.





- **"Address"** – the controller address used for communication using an external protocol
- **"Speed"** – speed (baudrate) of the external controller protocol
- **pLan controller external port "** – type of protocol used by the controller pLan port (RJ11 socket)

For mHMI , the pLan port parameter value should be set to " mHMMI "]



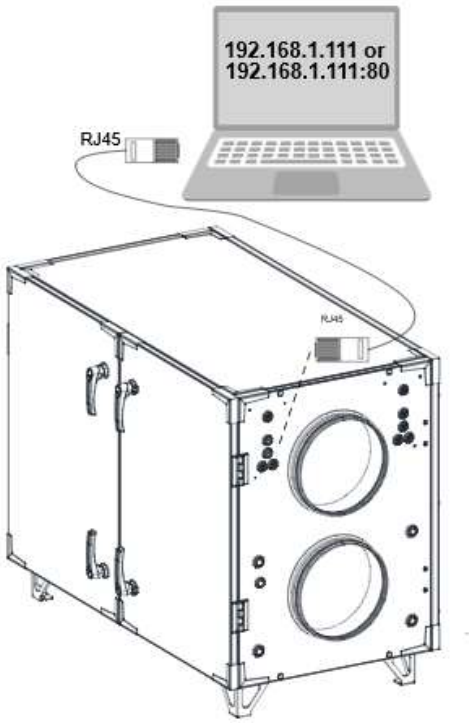
- **"Address"** – the controller address used for communication using an external protocol
- **"Speed"** – speed (baudrate) of the external controller protocol
- **"External port of the pLan controller "** – type of protocol used by the pLan port of the controller (RJ11 socket **)**

Depending on the selected HMI, the pLan port parameter value should be set to HMI Advanced.

- The device is equipped with a BlueTooth module as standard .
- Modification requires access to the standard service password. Parameters must be set as shown in the illustration.

8.2 WIRED COMMUNICATION WITH THE CONTROLLER

WIRED COMMUNICATION WITH THE AHU CONTROLLER



- Default address: 192.168.1.111/24.
- Please enter the address:
    - 192.168.1.111 or
    - 192.168.1.111:80
- After entering 192.168.1.111:80 (http) the service interface will appear (default Login: admin, Password: admin).

In the interface you can:

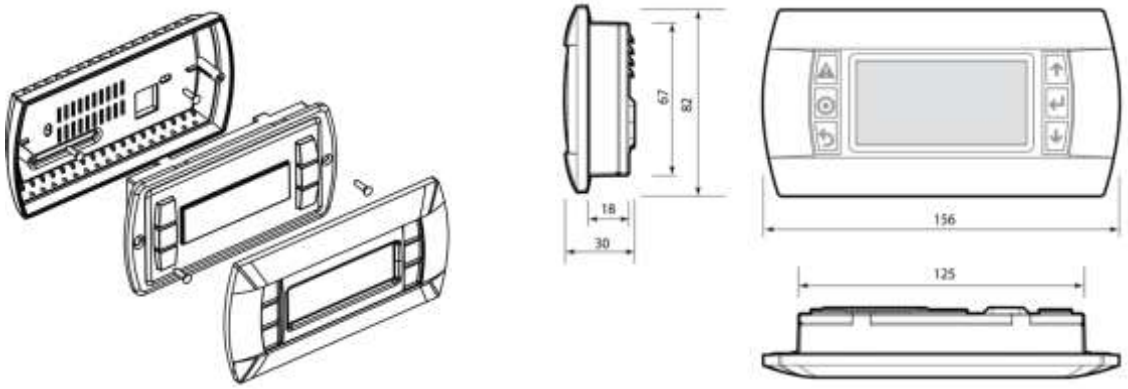
- change the network parameters of the port through which we connect to the control panel,
- connect to WIFI,
- change the interface access password,
- change the PIN code for the SIM card.

9 HMI PANELS

9.1 CONNECTING HMI PANELS

9.2 HMI ADVANCED

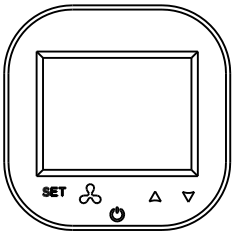
HMI ADVANCED (SERVICE AND ADMIN HUMAN MACHINE INTERFACE)

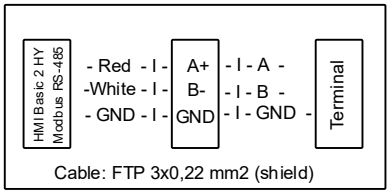


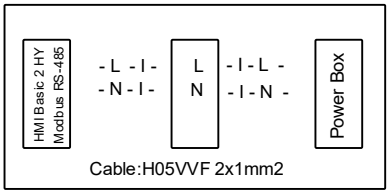
The electrical connection should be made using a 6-conductor telephone cable with RJ12 connectors on both ends. Using a different plug standard may damage the socket.

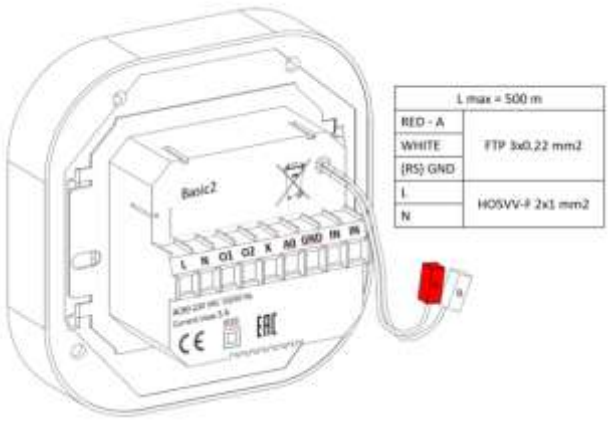
9.3 HMI BASIC (2HY)

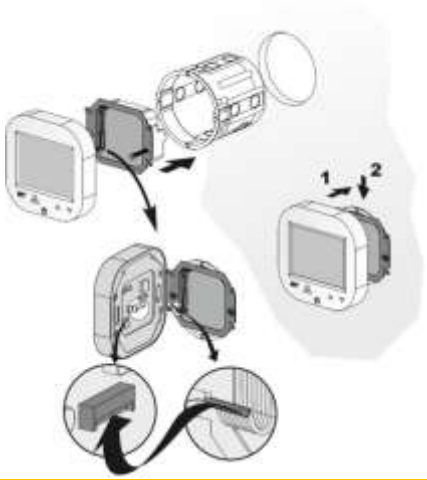
HMI BASIC 2HY











The HMI is powered by a 110-230V AC mains voltage. To ensure proper operation, separate power and control cables should be used, not exceeding the recommended length of 500m. The following cable types are recommended:

- power supply: H05VV-F 2x1 mm ^{2}
- communication: FTP 3x0.22 mm ^{2}

9.4 mHMI APPLICATION – DEVICE REGISTRATION

To pair your device with BT, see the section "WIRELESS COMMUNICATION"

mHMI APPLICATION

- Download the mHMI application from one of the Play App services Store or Apple App Store
- Create an account in the app
- Add device via Bluetooth

ADDING A DEVICE

If the device was ordered with a BT module, it already has a factory number programmed in the application.

10 FIRST START-UP OF THE UNIT

10.1 PREPARATION FOR FIRST START-UP

! BEFORE CARRYING OUT ANY PROCEDURES RELATED TO FIRST START-UP, MAKE SURE TO READ THE OPERATOR PANEL USER MANUAL.
! THE AIR HANDLING UNIT MAY ONLY OPERATE WITH FILTERS PROPERLY INSTALLED.
! AFTER THE INITIAL HOURS OF OPERATION, AIR FILTERS MUST BE REPLACED WITH CLEAN ONES.
! THIS MANUAL USES SCREEN GRAPHICS FROM THE HMI ADVANCED OPERATOR PANEL. SCREENS ON OTHER PANELS MAY VARY SLIGHTLY FROM THOSE SHOWN HERE.

CHECKING THE INSTALLATION CONDITION

PRE-START ACTIVITIES	
Correct use of the device	As part of the start-up procedure, it should be checked whether the air conditioning/ventilation/heating unit has been manufactured and installed in accordance with the construction/installation design and the manufacturer's guidelines.
Completeness of the installation	Verify the presence of all unit functions and accessories (filters, dampers, actuators, valves, heaters/coolers, etc.) based on the technical data sheet – a full list of unit components can be found in the unit's technical data sheet, as well as on the labels of individual delivery packages.
Connection to air ducts	Check whether all ventilation devices and their components have been mechanically installed and connected to the ductwork system
Condition of air ducts	Ensure that the ductwork is clean and that the regulation components within the duct system are pre-adjusted.
The quality of installation on site	Inspect the unit to confirm that no functional systems, device components, or control/automation elements were damaged during installation or related activities.
Connection of external sources of cooling and technological heat	Check whether the hydraulic systems and the refrigerant installation are complete and ready for operation and ensure that the appropriate amount of heating or cooling medium has been introduced into the system prior to commissioning the unit.

PRE-START ACTIVITIES (continued)	
Grounding installation	Check whether grounding cables are installed, including grounding for the ventilation ducts.
Condensate installation	Verify that siphons and condensate drainage systems from the condensate tray are properly installed.
Automation peripherals	Check the connections of peripheral devices (terminal T1.1), as optional unit components such as operator panels and certain temperature sensors may differ in connection method depending on the selected configuration. Special attention should be paid to the 24V power supply connection and the Modbus communication bus. ! Incorrect wiring may damage the entire communication bus of the unit.
Power supply of the device	Verify that the power supply is properly connected to the main switch – the distribution panel must be supplied with the appropriate voltage and power according to the wiring diagram provided in the relevant section of the unit's technical data sheet or User Manual (IOMM).
Electric heater	During AHU operation (and also before its first start-up), when the heater is inactive, dust may accumulate on the heating elements. If the heater is later switched on while heavily contaminated, it may generate a burning dust odor or even present a fire hazard. It is recommended to regularly, and especially before the first start-up or the beginning of the heating season, inspect the condition of electrical connections, heating elements, and their level of contamination. Any dirt should be removed using a vacuum cleaner with a soft nozzle or compressed air. It is also important to regularly check the functionality of overheating protection and airflow protection systems. The air velocity in the AHU during heater operation must not be lower than 1.5 m/s.
Closing inspection panels.	Ensure that all inspection panels are closed – rotating components of the unit may pose a serious risk to health and safety if protective covers are removed

10.2 FIRST START-UP

10.2.1 FACTORY PARAMETERS

A unit delivered in the Plug&Play standard comes with preconfigured control automation, set according to the parameters and criteria specified in the unit's selection sheet. To start the unit in factory default mode, **no additional on-site configuration is required**.(See section: *"Preparation for First Start-up"*.)

The VTS control system offers a wide range of parameters that allow the unit's operation to be tailored to the specifics of the installation. For improved user comfort, it is recommended to adjust these settings accordingly.

To perform basic commissioning of the unit, the following steps are sufficient:

- Connect all peripheral functions and automation components, depending on the optional accessories delivered with the unit.
- Connect the fan sections (connectors located on the fan wall for pressure measurement, control signal, and power supply).
- Connect the tubing for pneumatic differential pressure measurement of air filters
- Verify the correctness of all connections made on site.
- Check the accuracy of sensor readings and ensure proper operation of field-mounted components.

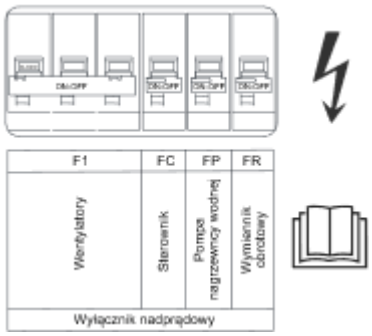
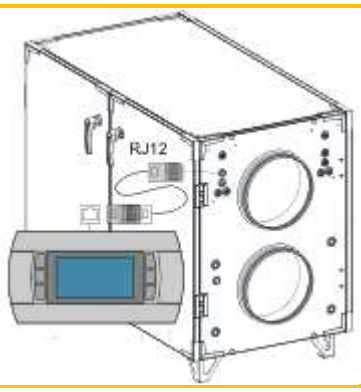
BASIC FACTORY CONFIGURATION

Application code configuration including:	Configuration and settings:	
• type and mode of operation of heat recovery, • type and parameters of the main heater, • type and parameters of the preheater, • type and parameters of the secondary heater, • type and parameters of the reversing system, • mixing chamber parameters, • humidifier operating parameters (controlling the moisture content in the air), • the occurrence of HMI Basic, HMI Basic2,	• leading sensor, • type of temperature control, • type of humidity control, • supply fan regulation type (CAV/VAV), • exhaust fan regulation type (CAV/VAV), • type of supply fan motor regulator (EC), • exhaust fan motor regulator type (EC), • PID fan controllers and other functions present in the application,	• number of supply fans, • number of exhaust fans, • airflow rotor size, • exhaust rotor size, • airflow efficiency, • exhaust efficiency, • available air supply pressure, • available exhaust pressure, • maximum speed for the supply fan motor, maximum speed for the exhaust fan motor, • activation of the water heater contact sensor, • Activation of the humidity transducer • Activation of the CO2 transducer,

BASIC FACTORY CONFIGURATION – WORKING PROFILES (MODE)					
PARAMETER			OPEARATION PROFILES		
			Comfort**	Economy	StandBy
Temperature	T	°C	22	22	22
Relative humidity - RH	RH*	%	50	50	50
Air quality - CO2 content	ppm	ppm	600	900	900
Airflow efficiency	V_S*	% m3/h	100	60***	60***
Exhaust efficiency	V_E*	% m3/h	100	60***	60***

- Work profiles: Comfort, Economic require setting the time and date of their validity in the calendar.
- StandBy work profile – requires setting parameters:
  - StandBy time, i.e. the minimum time for which the AHU is woken up in StandBy mode,
  - Wake-up time, i.e. the time defining the interval between automatic wake-ups of the AHU in StandBy mode.
- * - humidity control requires the unit to be equipped with humidification and dehumidification functions,
  otherwise the values are only read,
- ** - 100% means efficiency from the selection card.
- *** - It is recommended to adjust the object to the user's expectations.

10.2.2 UNIT COMMISSIONING

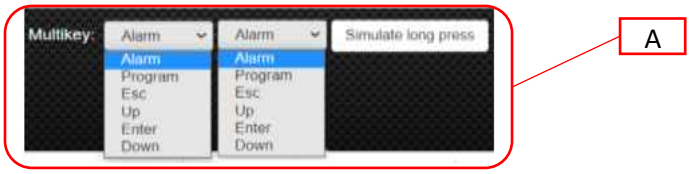
UNIT COMMISSIONING	
Turn on the power to the control panel	
Turn on HMI Advanced (virtual http:/192.168.1.111)	
Toggle OFF mode to any other mode (work profile) according to your preferences*	

		Changing the device status (operating mode)
OFF		The control panel is off (voltage is reaching the control panel)
HE	**ECO**	One of the user configuration profiles
	COMF	One of the user configuration profiles
StBy		The device is in a ready-to-use state. In the StBy state, the set room temperature is maintained. Fans are periodically activated to maintain the desired air temperature. This mode is best used at night, when the building's thermal occupancy is low or nonexistent.
CAR		Device operation according to schedule and calendar

- Unit start-up is strictly blocked by the following events: activation of the fire protection alarm, triggering of the fan motor thermal protection, three consecutive activations of the electric heater protection, or three consecutive activations of the antifreeze thermostat. Each of these events requires the cause of the alarm to be removed and the alarm to be cleared.
- Correct power supply and proper BIOS functionality are indicated by the illumination of the yellow and green LEDs on the controller's printed circuit board. The system is ready for operation approximately 30 seconds after power-up.
- - * Switching the operating mode from OFF to another mode is also available via the HMI Basic panel.

10.2.3 HMI ADVANCED

NAVIGATION IN THE HMI ADVANCED PANEL

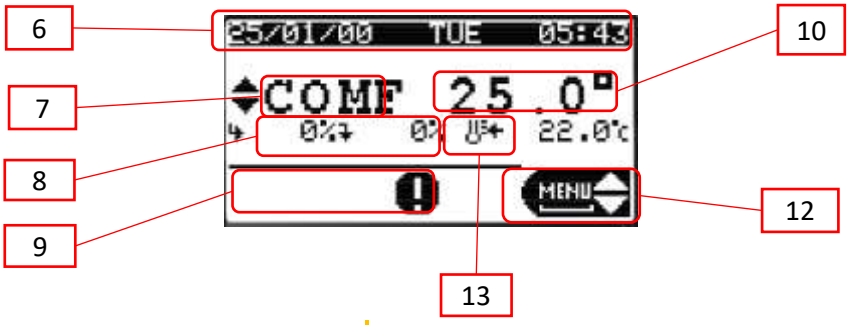


Simulation of simultaneous presses in WEB HMI

1	"Alarm" button (displays active and archived alarms, clears alarms). When an alarm is active, the button is highlighted in red.
2	Button to change operating modes (OFF/Auto/Low/Economy/Comfort). Confirm with ENTER
3	ESC button (return to previous field or screen)
4	Arrows to navigate up and down and to change the parameter value UP: • Move up through menu screens (when cursor remains in upper left corner) • Increasing the parameter value DOWN: • Move down through menu screens (when cursor remains in upper left corner) • Decreasing the value of a parameter
5	ENTER button. • selection of the parameter to be changed, • moving to another parameter, • confirming the selected value

! The parameters available in the LCD display window depend on the type of control unit and the automation system application. Therefore, for control units without a heater, options related to the heating section will not be visible.

HMI ADVANCED NAVIGATION cont.



6	Current date and time.
7	Current job profile
8	Current fan control
9	Status of the ventilation unit (fan operation/stop, heating/cooling, recovery activation)
10	Current value of the leading temperature
11	The set value of the leading temperature

12 **HMI Advanced work module** :

- **"Info" module** (view of the control panel's operating status – available without logging in),
- **"Set" module** (changing the settings of operating parameters: efficiency, temperature, humidity, CO2 and setting the timer – available without logging in),
- **"Menu" module** (allows you to make configuration changes to the control unit and its components as well as to program EC motors, available only after logging in

13 Working status icon:

Opening/closing throttles	Drainage
Fan operation	Active recovery
Warming	Detention on request
Cooling	Emergency stop
Moisturizing	Active calendar

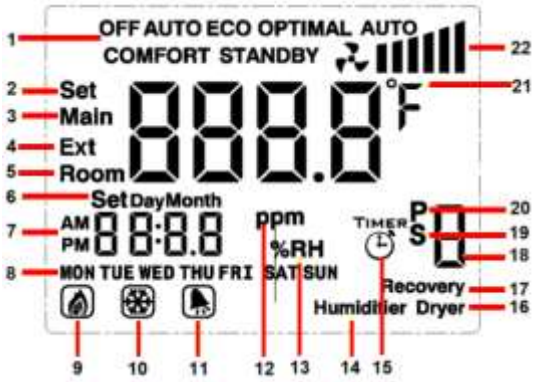
- The parameters available in the LCD display window depend on the type of control unit and the automation system application. Therefore, for control units without a heater, options related to the heating section will not be visible.

10.2.4 HMI BASIC 2HY

HMI BASIC 2 HY

The HMI Basic 2 HY is a basic control panel designed to operate VTS air handling units equipped with the uPC3 controller. It offers the following functions:

- starting and stopping the control panel,
- selection of operating mode,
- ability to view and change parameters of individual operating modes (temperature, humidity, CO2 level, supply and exhaust fan speeds),
- reading of the leading, external and room temperatures (built-in room temperature sensor),
- setting the AHU operation according to the schedule,
- alarm handling (viewing, deleting)



Current fan operating level control	
Symbol	Fan control
	0%
	0 <% ≤60
	60 <% ≤80
	80 <% ≤100

1	Current operating mode	**12**	Air quality
2	Setting temperature	**13**	Humidity
3	Temperature leading	**14**	Moisturizing
4	Outside temperature	**15**	Daily schedule
5	Room temperature	**16**	Drainage
6	Date setting	**17**	Recovery
7	Clock	**18**	Option number
8	Day of the week	**19**	Special schedule
9	Warming	**20**	Periodic schedule
10	Cooling	**21**	Temperature unit
11	Alarm	**22**	Fan operation level

BUTTON	FUNCTION
SET	change the operating mode / go to the settings menu / return to the previous menu
	confirming the selection / moving to the next setting parameters / returning to the general settings menu
	switching between displayed temperatures / exiting to the main screen / turning off the screen
	changing parameter values

- If there is no communication between the AHU controller and the HMI Basic 2 HY, only the room temperature will be displayed on the HMI screen and the controller will report an appropriate alarm (A1096).
- Activating the panel in the unit controller settings. The panel is designed for air handling units equipped with the uPC3 controller. To enable its operation, go to the service menu from the HMI Advanced level (either the physical controller connected to the pLAN port or the virtual one, which is part of the visualization application) and change the last digit of the application code to 7 on the I01 screen.
- The default Modbus address of the HMI Basic 2 HY is 16. It can be changed on the I05 HMI Advanced screen (HMI Basic 2 row).

STARTING THE CONTROL UNIT - CHANGING THE OFF MODE TO THE ON PROFILE (ECO / COMFORT)

On the main screen, hold down the button and SET then press again to select one of the modes **(Eco / Comfort)** and confirm your selection using .

TURNING THE PANEL ON AND OFF

To turn off the panel screen, hold down the ON/OFF button. To turn it on, briefly press the same button. Turning off the HMI panel does not turn off the unit – to turn off the AHU, select the Off mode.

The display backlight turns off automatically after a user-defined time. Pressing any key activates the backlight. Once illuminated, further operations can be performed using the panel.

CHANGING THE PARAMETERS OF INDIVIDUAL OPERATION MODES

On the main screen, hold down the button and SET then press repeatedly to select the mode you are interested in (StandBy / Eco / Comfort) and confirm your selection using .

We now have the ability to set the values of parameters associated with a given mode:

- set temperature,
- humidity,
- CO2 level ,

- supply fan speeds (S),
- exhaust fan speeds (E).

Access to individual settings depends on the configuration of the control panel and its actual components.

We make changes using △▽ approval with

Exit to the main screen occurs automatically after a moment of inactivity

or after pressing ⏻

SETTING THE CONTROL UNIT'S OPERATION SCHEDULE

The HMI Basic 2 HY panel allows you to set and modify the control panel's operating schedule. Changes made via the HMIS BASIC 2HY panel also affect the schedule available in HMI Advanced and visualization – it is not a separate calendar, but rather allows full access to the existing one.

On the main screen, hold down the SET button, then press again ∧∨to select the Auto submenu and confirm your selection with the button.

Now we select one of the schedules using and confirm it with the key:

- **Timer** – a daily schedule that allows you to program up to four mode changes each day at a selected time, separately for each day of the week. Select the day of the week, the activation (On/Off) of each action, the time at which it should be performed, and the mode to be set. Confirming subsequent parameters allows you to configure the next action (the numbers 1-4 displayed on the right indicate which action is currently being set).
- **P** – Periodic schedule, allowing you to select up to three periods per year in which the AHU will operate in a selected mode (this schedule type takes priority over the daily schedule). Select the activation (On/Off) for each period, its end date, start date, and the mode to be set. Confirming subsequent parameters allows you to set the next period (the numbers 1-3 displayed on the right indicate which one is currently being set).
- **S** – Special schedule, allowing you to select up to 6 special days per year for the AHU to operate in a specific mode (this schedule type takes priority over daily and periodic schedules). Select the activation (On/Off) for a specific special day, its date, and the mode to be set. Confirming subsequent parameters allows you to set the next special day (the numbers 1-6 displayed on the right indicate which one is currently being set).
- **T** - unused

- Access to individual settings depends on the control panel configuration and its actual components. "Exit" button.
- Exit to the home screen occurs automatically after a moment of inactivity or when pressed.

⏻

ALARM HANDLING

The MI Basic 2 HY allows you to view and clear active alarms. When an alarm is present, a bell symbol appears on the main screen, and the alarm number is displayed instead of the time.

To clear the alarm, after removing its causes, press and hold .

PROGRAMMING MODE

When the display is turned off by holding the button, hold the button to enter the programming mode (changing advanced parameters).

Press repeatedly SET to switch between parameters, and use ▲ ▼ to set their values. Exiting the menu occurs automatically after a moment of inactivity or by pressing .

Parameter	Range	Default value	Description
IP	1-255	16	Modbus-address
A1	2400/4800/9600	9600	Modbus – transmission speed
A2	0/1/2	0	Modbus – parity bit (0 = none, 1 = even, 2 = odd)
A3	12/24	24	Clock mode [h]
A4	00/01	00	Temperature units (00 = ºC, 01 = ºF)
A5	0-300	10	Screen backlight time [s]
A6	-9.9...9.9	0	Built-in temperature sensor correction [ºC]

SPECIFICATION

Device type	control panel; regulator
Temperature measurement	0ºC ... 70ºC, 10k NTC
Service	physical buttons of the membrane keyboard
Communication	Modbus RTU (2400 / 4800 / 9600 bps)
Power supply	110-230V AC
Power consumption	1.5 VA
Display	backlit, graphic LCD
Design	ABS + polyester
Dimensions (W x H x D)	86 x 86 x 17 mm
Permissible operating temperature	0ºC ... 50ºC
Destination	for indoor installation (IP20)
Installation	in a standard Ø60 installation box on a mounting bracket
Mass	150g

10.2.5 mHMI APPLICATION

AHU COMISSIONING

Select the paired device
Then, in the menu, choose one of the operating modes: **Eco**, **Comfort**, **Standby**, or **Auto** (under the **“On”** operating mode)
Save your selection
The application includes a tutorial for pairing and connecting the device.

10.2.6 OPERATING MODES OF THE EXCHANGE

OPERATING MODES OF THE EXCHANGE	
OFF	**Unit Off** – Fans are stopped, air dampers and control valves are closed. All sensors and measuring devices remain active to protect the unit from damage (e.g. fire alarm, antifreeze protection).
AUTO	Unit operation depends on the programmed calendar schedule.
ECON	**Eco Mode** – The fan speed and temperature control deadband are adjustable. The temperature control algorithm may use a narrower deadband, and the fans may be set to higher speeds to optimize energy usage. Factory default parameters are set based on the selection sheet. These settings can be modified by the user.
COMFORT	Factory default parameters are set based on the selection sheet. These settings can be modified by the user.
HMI BASIC	**Basic Mode** – External control signals (binary inputs), such as critical temperature values (e.g. too low temperature), will trigger the unit to start and immediately begin heating the space.

10.2.7 VERIFICATION OF OPERATION DURING FIRST START-UP

During the first start-up, it is recommended to perform the steps listed below.

CHECKING THE OPERATION OF THE FANS

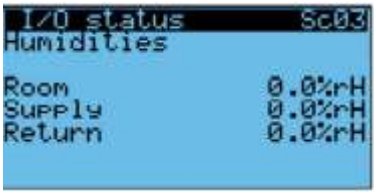
Check that the fans are not generating excessive noise. Ensure that the impeller is not rubbing against the inlet cone and that there are no foreign objects within the fan's operating range, which may have resulted from improper transport or storage conditions.

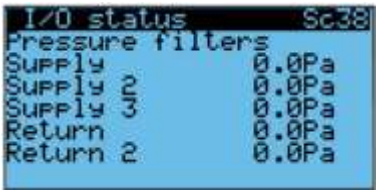
CHECKING THE OPERATION OF AIR DAMPERS ACTUATORS

- Check whether the dampers open and close fully and without resistance (this can be verified by observing their movement during unit start-up/shutdown or by pressing the manual release button on the actuator and manually moving the blades).
- Verify that the dampers open and close in the correct direction (during the start-up sequence, dampers should open; when the unit is turned off, they should close. Ensure they operate in the correct sequence. Actuators are equipped with a direction switch in case the operating direction is incorrect).
- For 0–10V actuators, check whether they operate correctly across the full control range.
- 0–10V actuators are typically used for passive heat recovery bypass dampers and mixing chamber dampers. In units with a mixing chamber, 0–10V actuators may also control the supply and exhaust dampers with proportional adjustment via voltage signal.
- This can be verified by observing the actuator operation during unit runtime or by manually applying the control signal via the appropriate screen of the mixing chamber or heat recovery controller (set D = ON and A to the desired percentage value).

CHECKING THE SENSOR READINGS

- Check whether the readings from temperature, pressure, CO_2, and humidity sensors are correct. Initially, when the air handling unit is powered but not yet running, temperature sensors should report values close to the ambient air temperature inside the unit.
  Other transmitters and sensors should indicate values typical for the surrounding environment — for example, CO_2 sensors should generally display values below 600 ppm for fresh air, and flow and pressure sensors should initially show zero or near-zero values before fan operation begins.
  Once the unit is running, these readings should change accordingly and fall within the expected operating ranges.





VERIFICATION OF WATER HEATING VALVE ACTUATOR FUNCTIONALITY

Check whether the water heater valve actuator responds to the control signal. Manually control the valve from the service menu of the controller and observe whether it opens and closes accordingly.
To perform this operation, set parameter D to ON and parameter A to the desired percentage value on the appropriate service menu screen, depending on the type of heater and its assigned function (screens A01, A03, A05, A06 – see “UPC3 Controller Screen Descriptions” instruction).

VERIFICATION OF WATER HEATING CIRCUIT PUMP FUNCTIONALITY

Check whether the water heater circulation pump responds to the control signal. Manually activate the pump from the controller’s service menu and observe whether it switches on and off accordingly.

! Please remember to restore the original settings of parameters D and A (Auto) after the test.

10.2.8 AIR QUANTITY MEASUREMENT

Airflow Measurement

Airflow measurement is a critical process in the following cases:

- During commissioning and technical acceptance of the air handling unit
- When the system does not operate according to specified requirements or user expectations
- For periodic performance checks of the air handling unit
- After replacing components of the fan assembly

Before performing any measurements or adjustments, ensure that all supply and exhaust grilles, dampers, or registers are set in accordance with the system design assumptions.

The determination of airflow rate is typically based on measuring the average air velocity in a test cross-section of the ventilation duct. One of the most common methods for determining average velocity is **cross-sectional probing using a Pitot tube**, with velocity calculated from the **measured dynamic pressure**.

Key factors affecting measurement accuracy include:

- the location of the measured cross-section in relation to elements that may distort the flow (e.g., bends, reducers, tees, dampers),
- the number and distribution of measurement points across the cross-section,
- q stable and uniform airflow during the measurement.

Measurements should be taken in a section of ductwork with parallel walls and straight runs, at least 6 hydraulic diameters upstream and 3 hydraulic diameters downstream of the measurement point. In practice, such long straight sections may be difficult to find. In such cases, select a cross-section with minimal expected flow disturbances and increase the number of measurement points to improve accuracy. The location of the test cross-section should be determined during the design stage of the ventilation system.

As a rule of thumb, a measurement is considered acceptable if it deviates no more than ±10% from the calculated design value.

If greater discrepancies occur, the result can be brought closer to the design value by:

- adjusting the duct network,
- modifying the setting of control dampers,
- changing the fan speed

10.3 THE MOST COMMON ADAPTATION CHANGES OF PARAMETERS TO THE NEEDS OF THE FACILITY

A full description of the uPC3 controller masks is available in the dedicated manual "AHU uPC3 Description of the upc3 Controller Masks"

FUNCTION	SCREEN	SCOPE OF CHANGES	WHEN TO CHANGE
MAIN HEATER	A07	PID	unstable temperature control
DXH MAIN	A11	compressor activation threshold settings	unstable temperature control
AFTERHEATER	A12	PID	unstable temperature control
PRE-HEATER	A16	PID, temperature settings after the heater, min/max power	unstable temperature control
MAIN RADIATOR	B03	PID, min/max power	unstable temperature control
DX MAIN	B05	compressor activation threshold settings	unstable temperature control
FANS	C16	PID	unstable temperature control
FANS	C16	setting the dependence of performance on temperature control	matching to object properties
RECOVERY DEVICE	D02	PID, min/max power	unstable temperature control during heat recovery
RECOVERY DEVICE	D03	PID	unstable temperature control during cooling recovery
MIXING CHAMBER	E02	PID in the heating direction	unstable temperature control with an inefficient heat source
MIXING CHAMBER	E03	PID towards cooling	unstable temperature control with an inefficient heat source
GENERAL	H01	supply temp. min/max, min/max temp. setpoint	matching to object properties
FANS	H02	PID performance dependence on temperature control	unstable performance regulation depending on temperature
GENERAL	H03	heating/cooling switching thresholds	unstable temperature control
GENERAL	H04	"StdBy" mode parameters	matching to object properties
GENERAL	I02	selection of the leading temperature	matching to object properties
N FANS	C07	PID	unstable performance regulation
FANS IN	C08	PID	unstable performance regulation
CO2			
FANS	C12	PID	unstable CO2 regulation by changing the output
FANS	C12	setting the efficiency dependence on CO2 regulation	matching to object properties
MIXING CHAMBER	E04	PID	unstable CO2 regulation by changing recirculation
MIXING CHAMBER	E06	parameters of the "fast heating" function	matching to object properties
HUMIDIFIER	F02	PID	unstable humidity control
BED HUMIDIFIER	F03	humidifier on/off threshold	unstable or imprecise humidity control
GENERAL	I02	selection of leading moisture	matching to object properties

HMI BASIC	I05	sensor activation in HMI Basic	adaptation to the needs of the facility
DXH MAIN	A10	compressor operating time settings	
DXH SECONDARY	A14	compressor operating time settings	
DXH PRELIMINARY	A18	compressor operating time settings	
CENTRAL	A21	next min supply temp and off delay	object sensitive to low airflow temperature

FUNCTION	SCREEN	SCOPE OF CHANGES	COMMENTS
PRE-HEATER	A29	support for supply air heating	object sensitive to low airflow temperature
CENTRAL	A21	next min supply temp and off delay	object sensitive to low airflow temperature
DX MAIN	B04	compressor operating time settings	
FANS	C11	fire protection settings	matching to object properties
RECOVERY DEVICE	D06	defrost method share settings	lack of power reserve of the heat source or the object is sensitive to reduced airflow efficiency
HUMIDIFIER	G08	humidifier alarm - logic	matching the properties of the humidifier
DIGITAL INPUTS	G07	fire entrance	matching the properties of the fire protection installation
DIGITAL INPUTS	G07	heating, cooling alarm	matching the properties of the external heating/cooling source
DIGITAL OUTPUT	G09	collective alarm logic	adaptation to the needs of the facility
MAIN ELECTRIC HEATER	A09	setting the heater power distribution	configuration setting
ELECTR. SECONDARY HEATER	A13	setting the heater power distribution	configuration setting
ELECTR. PREHEATING	A17	setting the heater power distribution	configuration setting
DXH	A22	scaling of the generator control signal	matching the properties of the cooling source
DXH	A23	set min. outside temp.	matching the properties of the cooling source
FANS	C05	fan type and nominal capacity settings	
FANS	C06	pressure settings for VAV controllers	adaptation to the needs of VAV regulators
RECOVERY DEVICE	D03	activation of cold recovery	
MIXING CHAMBER	E05	min/max operating range settings	min - the need for minimal air exchange in the facility, max - the installation of air intake and exhaust vents smaller than N and W
MIXING CHAMBER	E07	workflow settings for individual profiles	adaptation to the needs of the facility
STEAM HUMIDIFIER	F01	operation logic settings, correctness check	humidifier not included in the VTS range
DIGITAL INPUTS	G08	remote switching of the AHU profile (setting the profile type and NC/NO logic)	adaptation to the facility's requirements
DIGITAL INPUTS	G08	Input.External.Forcing summer/winter mode logic	adaptation to the facility's requirements
DIGITAL OUTPUT	G09	glycol recovery pump activation logic	matching the glycol pump control properties
DX, DXH	G10	output logic on I and II heating/cooling stages	matching the properties of the cooling source
HUMIDIFIER	G11	work permit output logic	matching the properties of the humidifier

FUNCTION	SCREEN	SCOPE OF CHANGES	COMMENTS
PREHEATERS	G11	work permit output logic	matching the heater properties
AFTERHEATER	G11	work permit output logic	matching the properties of the humidifier
REDUN. VENT. DAMP.	G11	work permit output logic	adjustment to throttle control properties.
FILTER PRESSURE CONVERTER	G18	activation of transducers	additional air filters
ADDITIONAL FILTERS	G20	type of filter	additional air filters
ADDITIONAL FILTERS	G21	maximum pressure drops	additional air filters
CONTROLLER	I02	program/run mode switch	AHU configuration change, first start-up???
FANS	I03	type of regulation CAV/VAV/none	matching the properties of the ventilation installation.
HMI BASIC	I05	alarm reset permission from HMI Basic	adaptation to user requirements
CONTROLLER	I11	export/import driver settings	parameterization of several identical AHUs, archiving of settings
HMI BASIC	J03	activation, address	
FILTERS	J09	type, max. pressure drop	changing the filter type, adapting to the needs of the object
FANS	J11, J12	external analog signal control settings	adaptation to the needs of the facility
HMI, PLC	I06	schedule source selection (Basic/uPC/none)	adapting to user needs
ACCESS LEVEL	K01	log out	end of setting change
AHU	Sa01	preview of current AHU utility parameters	
AHU	Sa03 to S07	changes to current parameter settings	current needs of the facility
HMI	Sa08	setting the real date and time	
HMI	Sa09 to Sa11	setting a work schedule	adapting to user needs
TEMP SENSORS	G05	B1 and B3 calibration	cable length > 5 m

11 MAINTENANCE AND SERVICING

DANGER

! !THE PERSONNEL RESPONSIBLE FOR THE OPERATION OF THE AIR HANDLING UNIT MUST READ THE DOCUMENTATION BEFORE CARRYING OUT ANY OPERATION OR MAINTENANCE ACTIVITIES. IF NO SUCH PERSONNEL WITH THE REQUIRED SKILLS AND COMPETENCIES ARE AVAILABLE, PERIODIC INSPECTIONS SHOULD BE CARRIED OUT BY VTS-AUTHORIZED SERVICE PROVIDERS.

11.1 SERVICE INSPECTION SCHEDULE

A full technical inspection of the device and installation is required at least once a year.
The frequency of inspections and maintenance of air handling units depends on:

- their installation locations,
- the conditions in which they work,
- purpose (e.g. residential, office, industrial),
- the intensity of their use,
- environmental conditions.

However, general recommendations are as follows:

BASIC AIR HANDLING UNIT MAINTENANCE – RECOMMENDED FREQUENCY	
Visual inspection of the unit	• Monthly
Air filters	• Immediate replacement is required whenever the maximum resistance drop across the filter is exceeded EU5 250 Pa, EU7 250 Pa and EU9 450 Pa • Filters and filter seals must be replaced at least: ○ apartments/single-family houses, every 6 months, ○ commercial/industrial facilities, every 3 months, (unless industry standards apply, then according to industry standards)
Inside the air handling unit	• At least once per year. • Every 3 months in conditions of high dust levels, high humidity, high temperatures, or when operating with dirty filters. • Inspect the condition of the internal surface coatings of the housing and unit components. • Clean the coatings; if damaged, repair or replace them. • Coatings must be free of damage, rust, discoloration, deformation, or scratches. • No foreign objects, deposits, dust, water, or other substances should be present inside the unit.
Inspection panels	• At least once a year. • Check the smooth operation of the hinges and locking system of the inspection panels. If necessary, clean, adjust, and maintain them. • Check the fit (tightness) — if needed, adjust hinges and locks or replace them.

	• Inspect the condition of the gaskets. • Gaskets must not show signs of aging or permanent deformation. They must adhere securely to the inspection panels. If non-compliant, replace the faulty panels. • Clean the inspection panels and gaskets. Maintain the gaskets as needed.

Casing of the air handling unit	Indoor Units – minimum once a year.
	Outdoor Units – minimum every 6 months.
	• Clean the casing. The Magnelis® coating must be kept clean.
	• Check the condition of the casing for any signs of damage.
	• If necessary, repair or replace it with a new one.
	• For outdoor units, perform a water-tightness test by spraying the closed casing from the outside with a water stream.
	• In case of leaks, inspect and adjust:
	  ○ the roof joints,
	  ○ the section connections (if the unit consists of at least two sections),
	  ○ the fit of vertical panels to the AHU casing.
	• If necessary, adjust or replace the elements.

Air fans	At least every 4 months
	• Checking the condition of fans, motors, and bearings. Checking:
	  ○ whether the fans are not beating,
	  ○ whether they have lost their balance,
	  ○ whether the bearings show any signs of wear.
	• Cleaning the fan impellers.

Water heater	At least every 4 months • Checking the general condition of the exchanger, • Check the condition of the fins (whether they are damaged or bent). If necessary, restore them to their factory condition. If repair is not possible, replace the heat exchanger with a new one. • Cleaning the exchanger, especially the space between the fins (gentle stream of water with detergent, compressed air). • Flushing the exchanger tubes – once a year
Water cooler	At least every 4 months • Checking the general condition of the exchanger, • Check the condition of the fins (whether they are damaged or bent). If necessary, restore them to their factory condition. If repair is not possible, replace the heat exchanger with a new one. • Cleaning the exchanger, especially the space between the fins (gentle stream of water with detergent, compressed air). • Flushing the exchanger tubes – once a year
DX cooler	At least every 4 months. • Checking the general condition of the exchanger, • Check the condition of the fins (whether they are damaged or bent). If necessary, restore them to their factory condition. If repair is not possible, replace the heat exchanger with a new one. • Cleaning the exchanger, especially the space between the fins (gentle stream of water with detergent, compressed air). Before servicing, collect the refrigerant in the system tank.
Electric heater	At least every 4 months (1 time preferably before the heating season). In industrial facilities or with intensive use – every 3–6 months (heating period). • Cleaning heating elements. • Checking the condition of wire insulation. • Checking the condition of the wire connections (if they are loose) • Checking and cleaning temperature sensors and thermostats. • Checking the operation of thermal protection. • Performance tests.

Counterflow heat recuperator	• At least every 4 months • Checking the general condition of the exchanger, • Check the condition of the fins (whether they are damaged or bent). If necessary, restore them to their factory condition. If repair is not possible, replace the heat exchanger with a new one. • Cleaning the exchanger, especially the space between the fins (gentle stream of water with detergent, compressed air).
Heat regenerator (rotary exchanger)	• At least every 4 months • Checking the general condition of the exchanger, • Check the condition of the fins (whether they are damaged or bent). If necessary, restore them to their factory condition. If repair is not possible, replace the heat exchanger with a new one. • Checking the condition and adjusting (or replacing) the drive belt • Cleaning the exchanger, especially the space between the fins (compressed air). • Exchanger drive inspection.
Condensate drain installation	• At least every 6 months. • Check the condensate drainage system for obstructions. If necessary, restore obstructions. • Check the condensate drainage system connections for leaks. If necessary, repair the condensate drainage system connections. • Checking the correct installation of siphons and adjusting them if necessary • Washing the condensate drainage system.

Air dampers	• At least every 6 months – under standard operating conditions.
	• Every 3 months – in dusty, high humidity or high temperature conditions.
	• After each failure/fault – full inspection.
	• Visual overview
	  ○ Checking the general technical condition of the throttle.
	  ○ Verification of the absence of mechanical damage (e.g. cracked wings, bent axles).
	  ○ Assessment of the condition of seals and thermal insulation (if applicable).
	• Cleaning
	  ○ Removing dust, dirt and deposits from the blades and housing.
	  ○ Cleaning of joint mechanisms, axles and bearings.
	• Lubrication
	  ○ Lubricate pivot points, hinges and bearings (e.g. silicone or lithium grease).
	• Operation control
	  ○ Checking the operation of the actuator and its connection to the throttle mechanism.
	  ○ Manually move the blades through their full range of motion (opening – closing) to check the smoothness of movement.
	  ○ Checking the correct operation of the automation (if the throttle is electrically or pneumatically controlled).
	• Regulation
	  ○ If necessary, adjust the end position of the blades.
	  ○ Calibration of the actuator and its limiters.
	• Leak test
	  ○ Performing a tightness test of the damper in the closed position (e.g. by measuring the pressure drop or smoke/vacuum test, depending on the application).

Airflow control	• At least once a year. • Checking the flow condition of: filters, heat exchangers and ventilation ducts, whether they are dirty or blocked.

Intakes, exhausts, ventilation ducts	• Cleaning of air intakes, exhaust vents, and ventilation ducts • Every 3–5 years (or more frequently in the case of polluted environments or dusty facilities). • In facilities requiring high cleanliness (e.g. hospitals, laboratories): more often – according to industry standards. • Cleaning of air intakes, exhaust vents, and ventilation ducts • Measure ventilation duct resistance annually. If there are any discrepancies with the design data, the duct resistance should be adjusted to achieve the unit's design operating parameters.
Electrical installation and control system	• Minimum once a year. INSPECTION OF ELECTRICAL INSTALLATION COMPONENTS: • Check the condition and fastening of power, control, and grounding cables. • Inspect screw connections for looseness and signs of overheating. • Inspect wire insulation for cracks, discoloration, or mechanical damage. • Check proper operation of switches, relays, and contactors. • Evaluate the function of electrical protections (circuit breakers, RCDs, fuses). • Measure wire insulation resistance (if required). • Measure grounding resistance. INSPECTION OF AUTOMATION AND CONTROL SYSTEMS: • Test the proper operation of the control system (e.g., BMS or local panel – HMI Advanced, HMI Basic). • Verify correct operation of sensors (temperature, humidity, pressure, airflow, etc.). • Check sensor calibration. • Test timers and alarms. • Verify correct operation of damper and valve actuators. MAINTENANCE: • Clean the control cabinet from dust and debris (e.g., with an antistatic vacuum cleaner). • Tighten electrical connections. • Replace any damaged components if necessary. • Update wire descriptions and labels in the control cabinet (if unreadable).

11.2 AIR FILTERS

WARNING

! A SIGNIFICANT AMOUNT OF FINE DUST OR PARTICULATE MATTER HARMFUL TO HEALTH MAY ACCUMULATE ON THE FILTERS. EXERCISE CAUTION WHEN REPLACING FILTERS.

! CONTAMINATED FILTERS CAUSE INCREASED POWER CONSUMPTION OF FAN MOTORS

! CONTAMINATED FILTERS MAY LEAD TO DAMAGE TO THE AIR HANDLING UNIT.

AIR FILTERS

- Under standard air handling unit operating conditions, filters should be replaced approximately twice a year. The need for filter replacement (in addition to visually visible contamination) is also indicated by pressure drop:
    - ePM10 40% (EU5) – 250 Pa,
    - ePM2.5 65% (EU7) – 250 Pa,
    - EU9 – 450 Pa
- If the final pressure difference exceeds the design value, the filter must be replaced. Filters are disposable.
- When replacing the filter, you should also clean the filtration section - with a vacuum cleaner or by dry cleaning.
- When ordering a new filter set from an authorized VTS office, please provide the filter type, filtration class, air handling unit size and, if necessary, filter size, according to the data in the technical data sheet or the "CONSUMABLES" section.
- Incorrect or dirty filters can cause increased power consumption of fan motors, leading to damage to the drive motors.

11.3 WATER HEATER

DANGER

! BE CAREFUL AROUND THE HOT SURFACE OF THE HEATER.
! BE CAREFUL WHEN CONNECTING THE WATER PIPELINE. THERE IS A RISK OF DAMAGE TO THE MATERIAL OR WATER HEATER.

WATER HEATER

- Active water heaters should be equipped with anti-freeze systems. Optionally, a non-freezing heating medium (e.g., glycol solution) can be used in winter. If the heating medium supply is cut off or the air handling unit is idle, and if the air temperature could drop below +5°C, the heater should be drained. To do this:
    - close the heating medium inlet and outlet valves (isolate the heater from the heating system),
    - remove the inspection panel,
    - unscrew the drain and remove the vent plug from the collectors,
    - connect the outlet hose to the drain, allowing the water from the emptied exchanger to drain out of the unit,
    - blow out the heater with compressed air introduced through the vent plug,
    - repeat this procedure several times at short intervals until the air escaping from the drain hose no longer shows any visible drops of water,
    - screw the drain plug and vent plug back in.
- Check the level of contamination on the heater fins. Dust accumulation on the heater surface reduces its heating capacity and leads to a drop in air pressure. Even if the air handling unit is equipped with filters, over time, dust blown in with the supplied air settles on the heater fins. If the fins become dirty, they should be cleaned in one of the following ways:
    - using a vacuum cleaner with a soft suction tip on the air inlet side,
    - by blowing a stream of compressed air in the direction opposite to the opearting air flow, directing the stream parallel to the plates,
    - washing with warm water and cleaning agents that do not cause corrosion of aluminum or copper elements.
- Before washing, protect adjacent sections of the air conditioning unit from contamination.
- To achieve maximum heating efficiency, the heater must be properly vented. Vent plugs located on the heater manifolds are designed for this purpose.
- During the AHU's shutdown, the flow of the heating medium should be limited to a minimum so that the temperature inside the AHU does not exceed +60°C. Exceeding this value could result in damage to certain components or subassemblies (engine, bearings, plastic parts, etc.) installed in adjacent sections.

11.4 ELECTRIC HEATER

WARNING

! BE CAREFUL AROUND THE HOT SURFACE OF THE HEATER
! WET CLEANING OF ELECTRIC HEATERS IS PROHIBITED

ELECTRIC HEATER

- During air handling unit operation, when the heater is turned off, dust may settle on the heating coils. When the heater is turned on again, heavy contamination of its surfaces can generate unpleasant odors of burning dust, even leading to an initial fire hazard.
- Regularly, and especially before the heating season, check all electrical connections, the condition of heating elements, and their level of contamination. Any debris should be removed with a soft-ended vacuum cleaner or compressed air.
- The operation of the overheating protection system should also be checked in the event of a lack of airflow. Airflow speed should not be lower than 1.5 m/s.

11.5 DX EXCHANGERS

DX HEATERS AND COOLERS (DIRECT EXPANSION COILS)

- Freon radiator maintenance involves the same steps as the heater and water cooler maintenance. Before washing the Freon radiator with warm water, the cooling system should be drained by draining the Freon into a container. Otherwise, there is a risk of uncontrolled pressure buildup in the Freon, causing damage to the cooling system.

11.6 ROTARY EXCHANGER

WARNING

! THE HEAT RECOVERY EXCHANGER IS HEAVY, BE CAREFUL WHEN MOVING THE EXCHANGER. THERE IS A RISK OF INJURY TO PERSONS OR DAMAGE TO THE HEAT RECOVERY EXCHANGER.

ROTARY EXCHANGER

- When performing maintenance on the rotary heat exchanger, check that:
  - The rotor rotates freely. Excessive resistance may be caused by the sealing brushes being too tight against the rotor edges. In this case, adjust the brushes accordingly. Worn seals should be replaced. If a previously removed seal is to be reinstalled, it should be installed so that its direction of rotation matches the rotor. After replacing or adjusting the sealing brushes, the exchanger should be operated for 30 minutes to allow the brushes to adapt to the rotor surface.
  - After this time, check:
    - motor current and compare it with the rated current to find out if the motor is overloaded.
    - Check that the drive belt is undamaged, clean, and not slipping on the cylindrical part of the rotor. If belt slippage persists despite the tensioning system being at maximum tension, the belt should be replaced or shortened.
    - that the air intake openings are free from dust or other obstructions. Any debris should be removed with a soft-ended vacuum cleaner or compressed air.
- The inspection should include both the technical condition and the level of contamination. Contamination in heat exchanger fins is often limited to the first 50 mm of the exchanger. Before cleaning, protect adjacent sections of the air handling unit from contamination.
- Necessary cleaning should be carried out as follows:
  - using vacuum cleaners with a soft suction tip,
  - by blowing the channels with an air stream in the direction opposite to the direction of normal air flow,
  - washing the air ducts along their entire length with water and cleaning agents that do not cause corrosion of aluminum,
  - In the case of very dirty exchangers, a pressurized water jet can be used to clean them.
- When cleaning the exchanger using mechanical means, pay maximum attention not to damage or deform the exchanger panels.
- When operating the exchanger at temperatures below zero, it must be thoroughly dried after washing before being put back into operation.
- Inspection and maintenance of the rotary heat exchanger drive must be carried out at the following intervals:
  - 12 hours after launch,
  - 1 week after launch,
  - then at least every 3 months

11.7 HEAT RECUPERATOR

WARNING

! THE HEAT RECOVERY EXCHANGER IS HEAVY, BE CAREFUL WHEN MOVING THE EXCHANGER.

! THERE IS A RISK OF INJURING PERSONS OR DAMAGE TO THE HEAT RECOVERY EXCHANGER.

HEAT RECUPERATOR (COUNTER-FLOW-HEXAGONAL)

Maintaining the heat exchanger involves checking its technical condition and the degree of contamination of the aluminum plates, once every four months. Dirt accumulation in heat exchangers is often limited to the first 50 mm of the exchanger. Before cleaning, adjacent sections should be protected.

Necessary cleaning should be performed by one of the following methods:

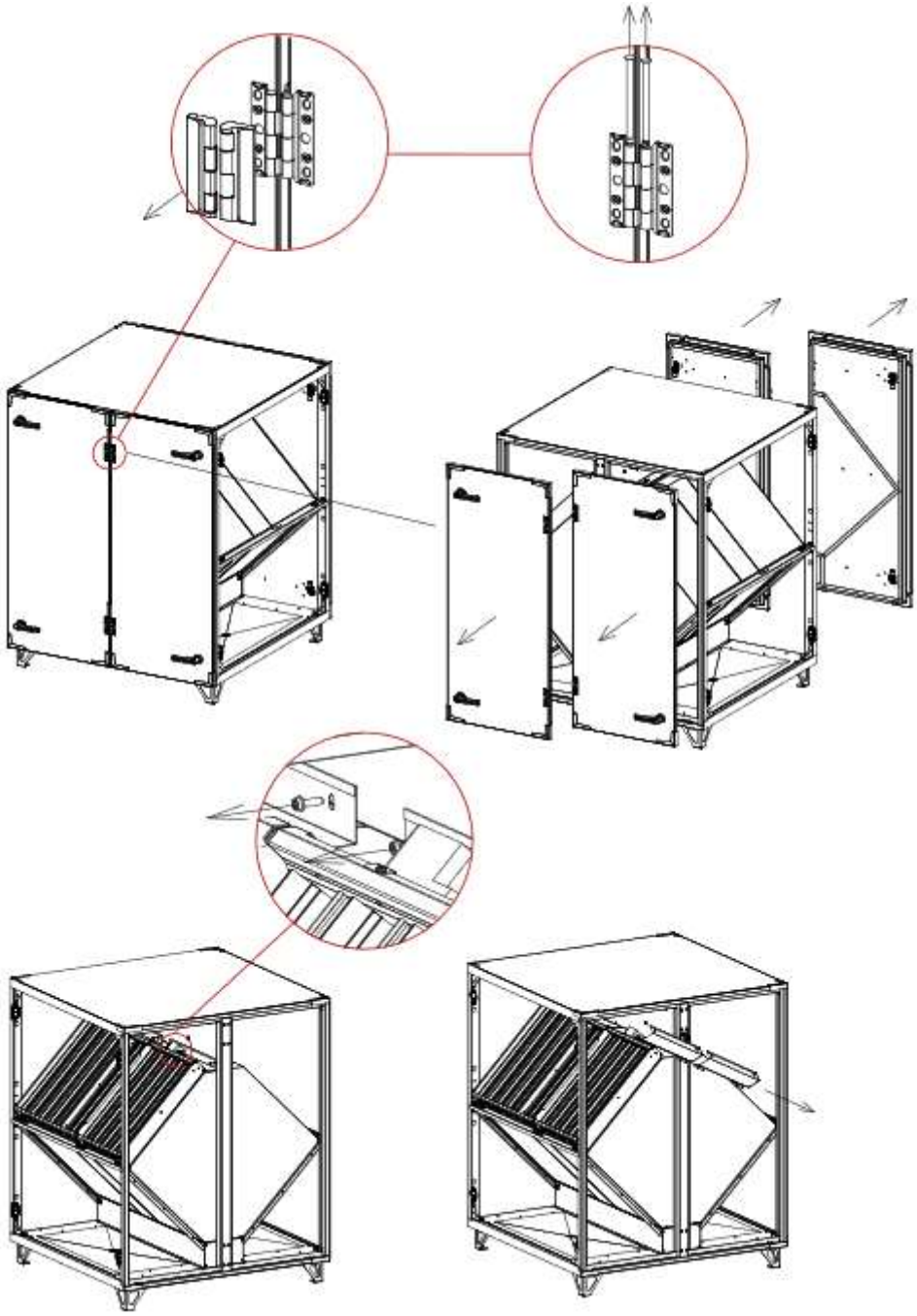
- vacuuming with a soft nozzle,
- blowing the channels with an air stream in the direction opposite to the normal air flow,
- washing the entire length of the air ducts with water and cleaning agents that do not cause corrosion of aluminum,
- In the case of more dirty exchangers, they can be cleaned by rinsing with a high-pressure water jet.

When cleaning with mechanical dirt removal agents, exercise extreme caution to avoid deforming or damaging the heat exchanger plates. When operating the heat exchanger in sub-zero temperatures, it must be thoroughly dried before restarting the unit.

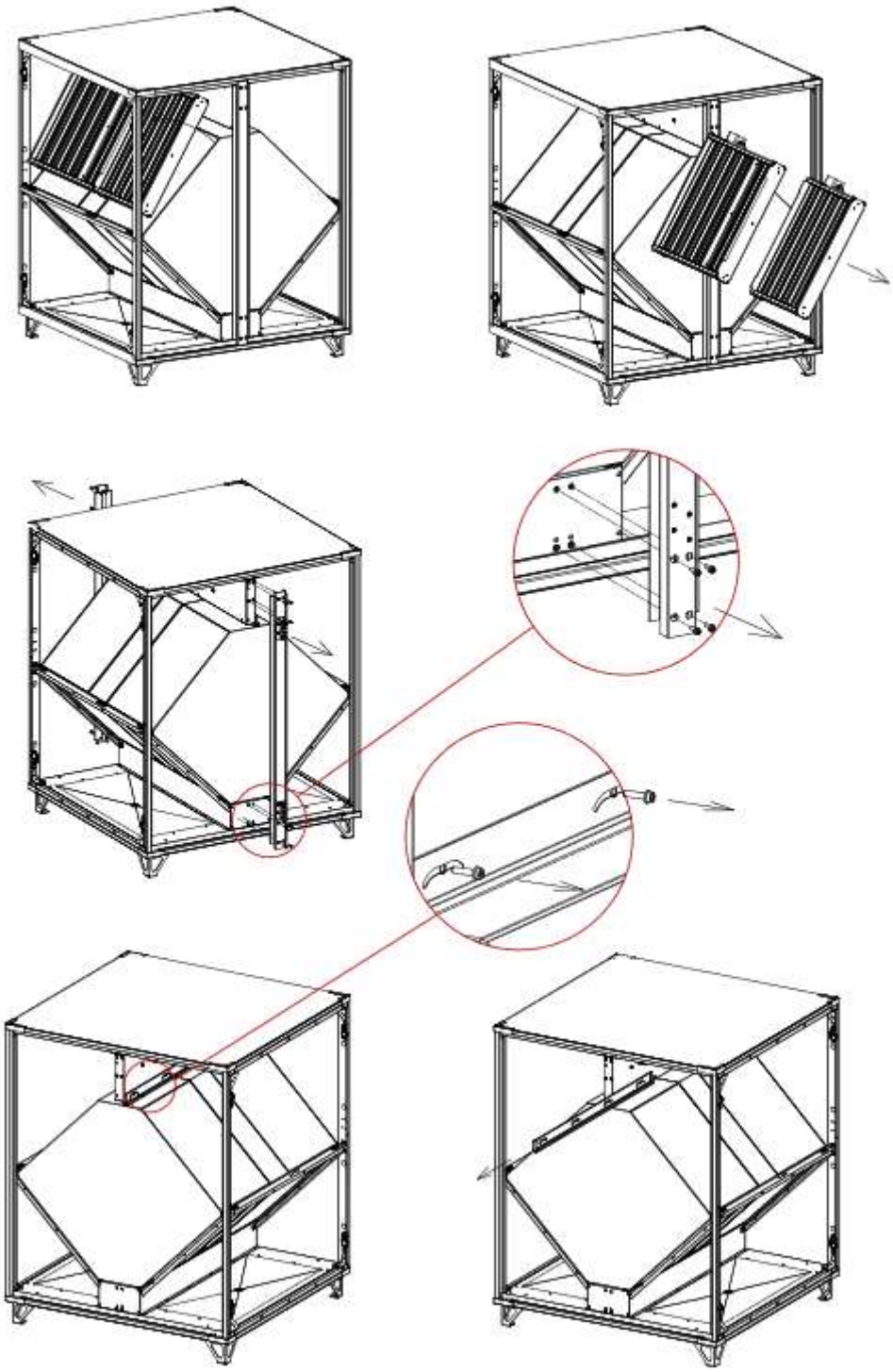
You should check:

- throttle operation,
- condenser condition,
- the state of the medium discharge from the tray,
- easy condensate drainage,
- before starting the unit, fill the siphon with water,
- antifreeze system (if present),

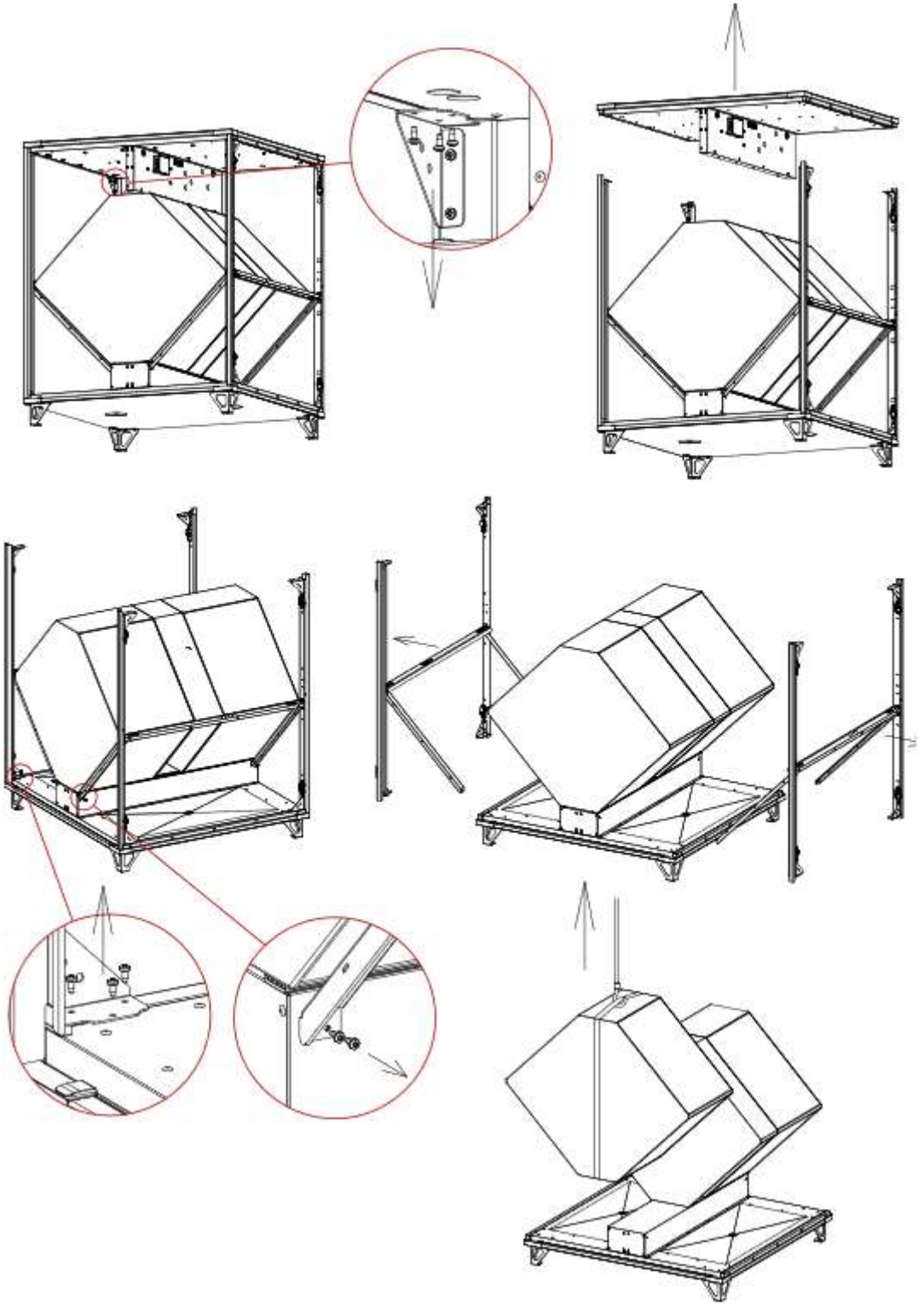
DISASSEMBLY OF THE HEXAGONAL EXCHANGER 1/4



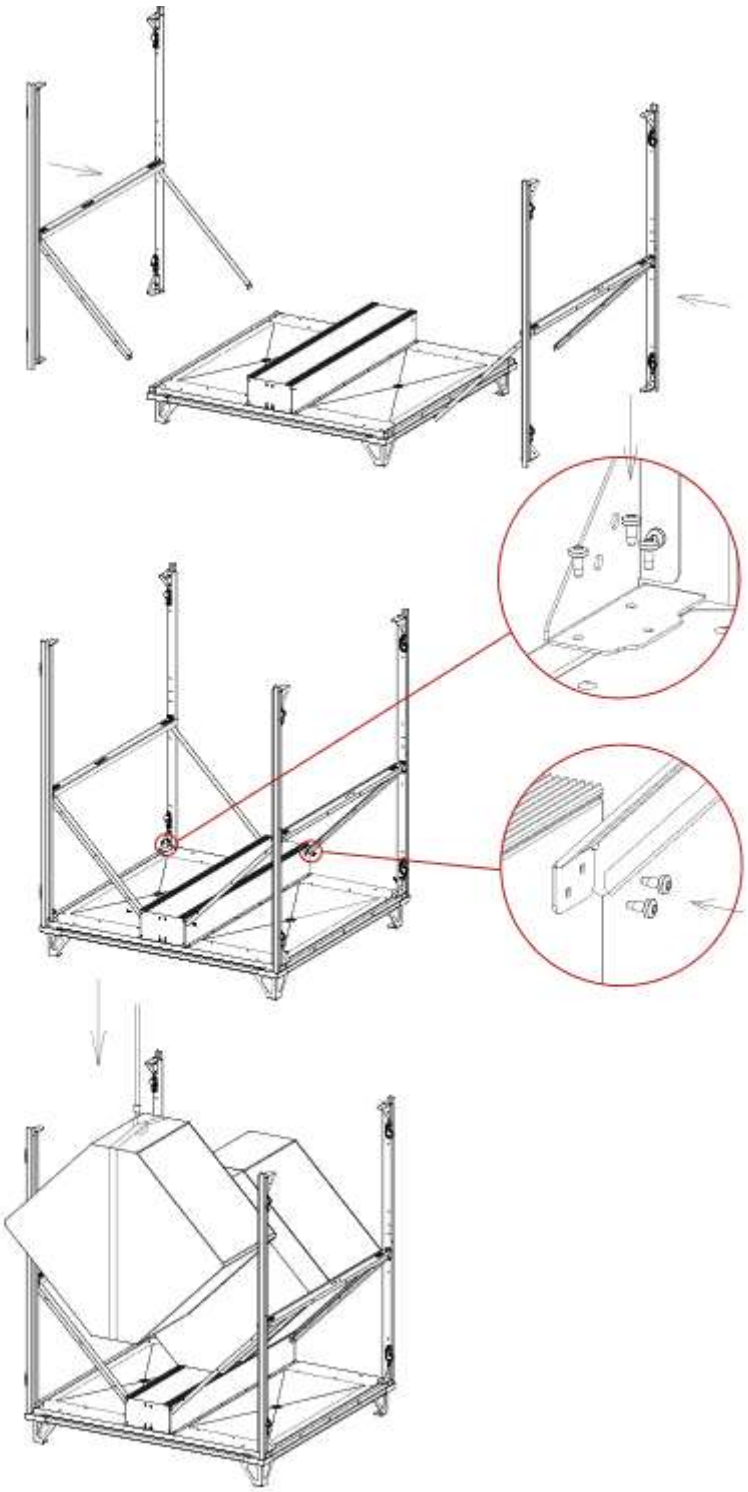
DISASSEMBLY OF THE 2/4 HEXAGONAL EXCHANGER



DISASSEMBLY OF THE 3/4 HEXAGONAL EXCHANGER



DISASSEMBLY OF THE 4/4 HEXAGONAL EXCHANGER



11.8 ATTENUATORS (BAFFLE-TYPE ATTENUATORS)

SOUND ATTENUATORS (BAFFLE-TYPE ATTENUATORS)

The muffler section is equipped with non-flammable mineral wool baffles that absorb acoustic energy. Maintenance procedures include checking the contamination levels of these baffles.

11.9 FAN ASSEMBLY

FAN ASSEMBLY

- Before starting any work (repair, maintenance, service) on the air handling unit, especially when opening the inspection panels in the fan section and when removing the covers over the drive system, make sure that:
  - the device has been properly disconnected from the power supply. This applies to both primary and secondary circuits,
  - the rotor does not rotate,
  - the fan surfaces are cool and temperature-safe to the touch,
  - the fan is protected against unintentional start-up.
- The fans are designed for dust-free or lightly dusty airflow. They are not designed for operation with aggressive gases, vapors, or in highly dusty environments. Operating the fans in unsuitable environments may result in bearing damage, corrosion, impeller imbalance, or vibration.
- The fan and motor of the unit are designed to meet specific requirements and operating characteristics. The fan speed is adjusted to ensure the airflow and overall rotor stress concentration are appropriate for the given ventilation system. A lower forced airflow causes operational disruptions and leads to an imbalance in the entire ventilation system.
- This may be caused by:
  - dust deposition on the fan impeller blades,
  - Incorrect fan rotation direction. If a radial fan rotates in the wrong direction, the airflow causes significantly harmful effects.
- When performing maintenance on the fan, check that:
  - the rotor rotates freely - the rotor is properly balanced,
  - the rotor is securely mounted on the journal,
  - did not change position in relation to the inlet cone,
  - all screws securing the fan structural components are tightened.
  - Rotor imbalance can be caused by:
  - dust deposition on the rotor blades,
  - detachment of additional balancing weights,
  - damage to rotor blades.
- Checking the level of contamination inside the housing, impeller and motor should be carried out every four months.
- Cleaning should be done using a vacuum cleaner or by wiping all surfaces with a damp cloth. For more serious stains, nylon brushes can be used:
  - clean the inside of the housing with a vacuum cleaner,
  - aluminum rotors clear:

        - vacuum cleaner or compressed air - ideal for removing dust and dirt without touching the surface,
        - using a microfiber cloth soaked in a solution of isopropyl alcohol (IPA) and distilled water (a 1:1 mixture of 70%-90% isopropyl alcohol and distilled water). The alcohol evaporates quickly, leaves no streaks, and does not damage aluminum,
        - using an antistatic brush - allows you to get into the nooks and crannies without the risk of scratching,
            - If the fan is very dirty, you can wash the blades with water and a mild detergent, such as dish soap. BE CAREFUL not to get the motor or electronics wet! After washing, dry thoroughly with a paper towel and allow to dry completely.
    - plastic rotors clean:
        - vacuum cleaner or compressed air - ideal for removing dust and dirt without touching the surface,
        - using a microfiber cloth soaked in a gentle cleaning agent such as:
            - **mild detergent solution** (e.g. dishwashing liquid diluted with water) – great for general cleaning.
            - **Isopropanol (IPA)** – effective for removing grease and industrial dirt, but does not leave residue.
            - **water with ethyl alcohol** (e.g. 70%) – also good for degreasing.

        DO NOT USE measures such as:
            - acetone and strong solvents (may damage the PA6 surface),
            - wire brushes or abrasive sponges (may scratch the surface and release the glass fiber),
            - High steam temperatures or too aggressive chemicals (may affect the structure of the material.

- For EC motors, use bearing type: 6202 ZZ C3E

11.10 ELECTRICAL INSTALLATION

ELECTRICAL INSTALLATION

INSTALLATION OVERVIEW.

It is recommended to check the condition of the electrical installation at least once a year, including:

- perform a visual inspection of the cables, plugs, terminal blocks and connections in the control cabinet.
- check the condition and mounting of power, control and grounding cables.
- check the condition of screw connections for looseness and signs of overheating.
- inspect the condition of the wire insulation (cracks, discoloration, mechanical damage).
- check the correct operation of switches, relays and contactors.
- check the operation of electrical protection devices (overcurrent circuit breakers, differential circuit breakers, fuses).
- measure the insulation resistance of cables and electrical components (in accordance with the PN-HD 60364-6 standard),
- perform an earth resistance measurement (check whether the earth resistance meets the requirements of the standards).

INSTALLATION MAINTENANCE SHOULD INCLUDE:

- cleaning the control cabinet of dust and dirt (e.g. with an antistatic vacuum cleaner),
- tightening loose electrical connections,
- replacement of damaged or worn components,
- updating the description of cables and markings in the control cabinet (if illegible).

11.11 CONTROL SYSTEM

It is recommended to check the condition of the automation system at least once a year, which includes:

- update the driver software,
- perform tests of the correct operation of the control system (e.g. BMS or local panel - HMI Advanced, HMI Basic),
- perform tests to check the correct operation of sensors (temperature, humidity, pressure, flow, etc.),
- check the calibration of the sensors,
- perform tests of time programs and alarms,
- check the correct operation of the damper and valve actuators.

11.12 MAINTENANCE OF THE UNIT CASING

MAGNELIS® COATING

The unit's casing is made of sandwich panels. The panels are made of 50 mm thick rock wool (mineral wool) insulation, covered on both sides with sheet metal. The sheet metal is coated with Magnelis®. Magnelis® is an advanced metallic coating composed primarily of zinc (Zn), aluminum (Al), and magnesium (Mg), which provides excellent anti-corrosion protection, superior to traditional zinc coatings. However, despite its high resistance, certain substances and conditions can negatively impact its durability or even damage it.

MATERIALS HARMFUL TO THE MAGNELIS® COATING:

- Strongly alkaline chemicals. High pH solutions (above 12), such as sodium hydroxide (NaOH), ammonia, and strong alkaline industrial detergents, can degrade the protective layer and cause localized corrosion.
- Strong acids – sulfuric acid, hydrochloric acid, nitric acid. These substances can react violently with the Magnelis® surface, destroying it faster than zinc.
- Chlorides and high-salt environments. Prolonged exposure to salt solutions (NaCl), such as near the sea or the use of large amounts of road salt, can lead to accelerated corrosion despite the general resistance of Magnelis®. In enclosed spaces where salt is not rinsed off, the corrosion effect may be accelerated.
- Mechanical damage. Mechanical damage to the surface (e.g., scratches, abrasions) followed by contact with aggressive environments (chemicals, moisture, alkalis, acids) can lead to localized corrosion.
- Prolonged contact with damp organic materials can cause localized corrosion due to natural acids. Examples include wood containing tannins, wet soil, and compost.
- Dust containing cement or lime.
    - Avoid prolonged contact and always remove deposits.
    - Prolonged contact may cause discoloration and local reactions, especially if the coating is damaged. In the case of lime, the presence of moisture may intensify the reaction.

CLEANING AND MAINTENANCE OF THE MAGNELIS® COATING

It is recommended that Magnelis®-coated components be maintained by regularly removing all contaminants, including sediment and vegetation. If the Magnelis® coating becomes damaged, it must be repaired. This process involves cleaning the damaged area by sandblasting, then removing the dust with a clean cloth, rinsing with clean water, and drying. After this, a suitable protective coating, such as a zinc-rich paint, should be applied.

Types of paints for Magnelis® coating:

- epoxy paints.
    - Advantages: Very good adhesion, high chemical and mechanical resistance.
    - Application: Mainly for priming layers (epoxy + polyurethane as a topcoat).
    - Note: Good surface treatment is required (e.g. degreasing and gentle sanding/matting).
- polyurethane paints.
    - Advantages: Good UV resistance, aesthetic finish.
    - Application: Most often as a topcoat after epoxy.
- Industrial acrylic paints.
    - Advantages: Easy application, quick drying, lower VOC emissions.
    - Application: Lighter structures or elements exposed to lower loads.

RECOMMENDED CLEANING PROCEDURE:

- Rinse the surface with lukewarm water (+30°C ÷ +40°C).
- Apply cleanser.:
    - mild detergent: e.g. diluted dishwashing liquid or,
    - cleaning agents for metal or stainless steel surfaces (but without chlorine and acids!) or,
    - non-corrosive metal cleaning products (sometimes available as "galvanized sheet cleaner" - check the label to see if they are compatible with ZnAlMg coatings, e.g. Zintek Cleaner).
- Clean with a soft sponge or microfiber cloth.
- Rinse thoroughly with clean water (preferably demineralized).
- Dry with a soft cloth to avoid streaks and smudges.

CLEANING AND MAINTENANCE OF PANEL GASKETS

- To clean the seals, use mild cleaning agents: soapy water or mild detergents (pH neutral).
- **Avoid using agents such as:** Acetone, gasoline, organic solvents, strong bases and acids may damage the structure of the gasket.
- **Periodically lubricate the seals** with silicone technical grease (e.g. silicone paste) or other specialized rubber care products (e.g. Gummi Pflege, Sonax, Klüber or similar). Apply a thin layer of the product with a soft cloth or sponge, and then wipe with a dry cloth (after a few minutes). For devices installed outdoors, use preparations with UV filters. In winter, it is worth protecting the seals from freezing (e.g. by using anti-freeze preparations).

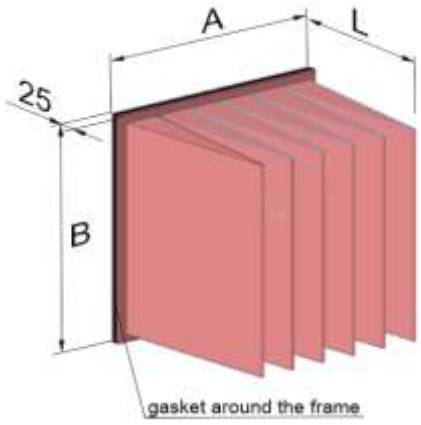
11.13 CONSUMABLE MATERIALS

! Spare parts are available in the manufacturer's online store and in the network of authorized service centers www.eshop.vtsgroup.com .

! Just enter the serial number

POCKET FILTERS (BAG) - ePM10 60% (EU5), ePM1 60% (EU7)

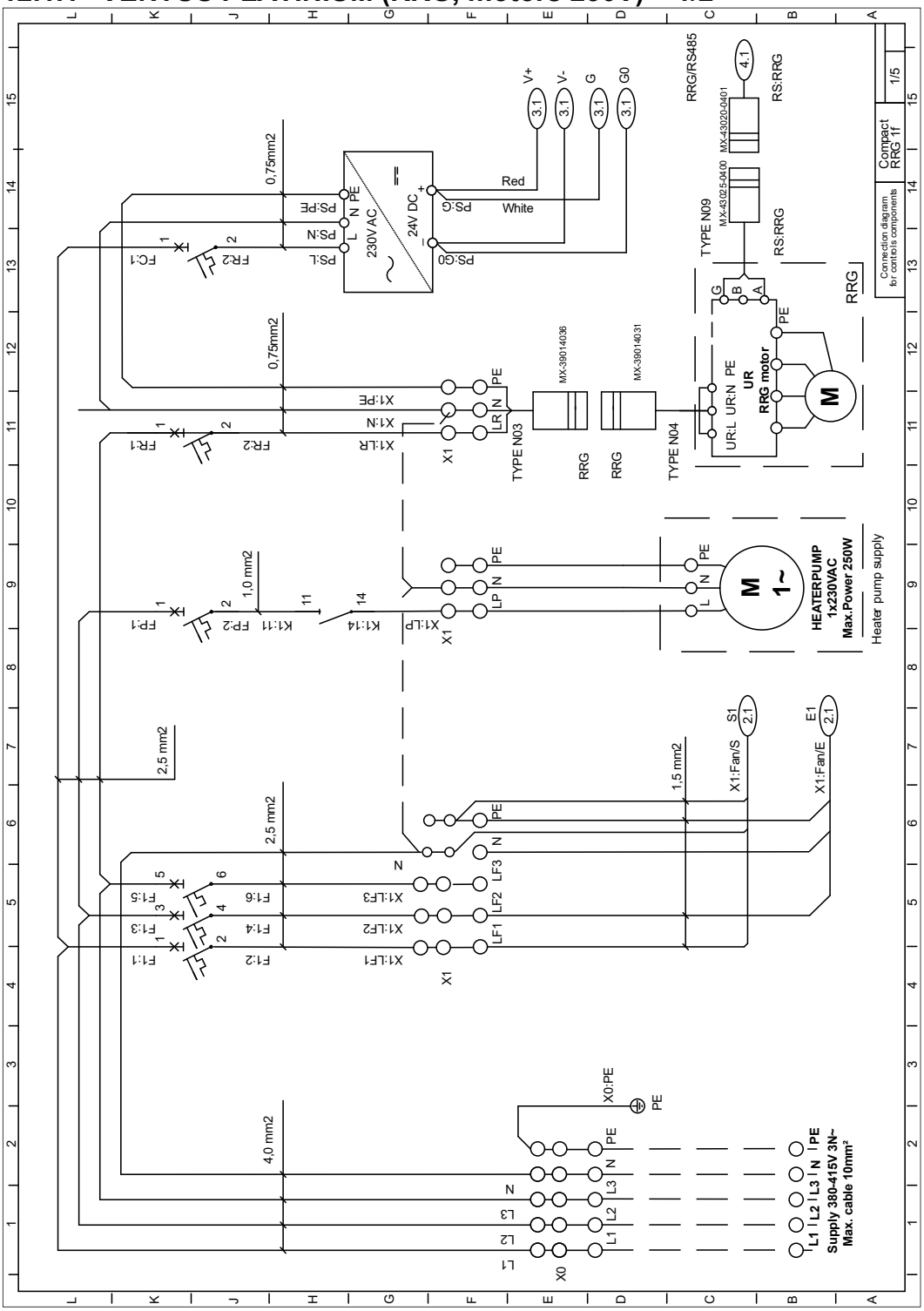
AHU	A x B x L [mm]	Pcs.
VVSA11c	634x372x250	1
VVSA14c	749x422x300	1
VVSA22c	831x479x350	1
VVSA29c	502x524x420	2
VVSA40c	582x603x420	2
VVSA56c	697x719x420	2



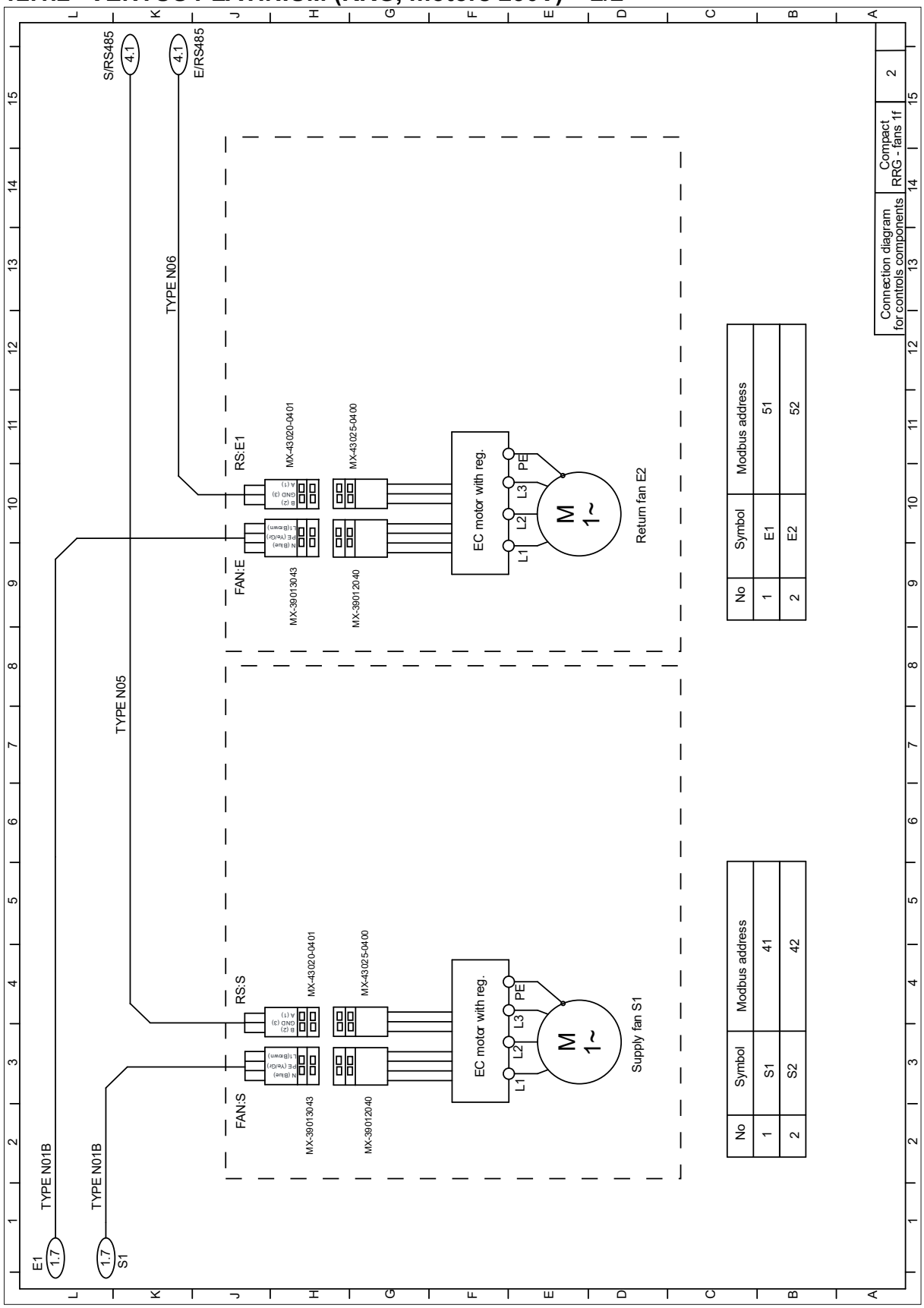
12 ELECTRIC DIAGRMAS

12.1 POWER SUPPLY DIAGRAM FOR VENTUS PLATINIUM WITH ROTARY HEAT EXCHANGER (230V AC MOTORS)

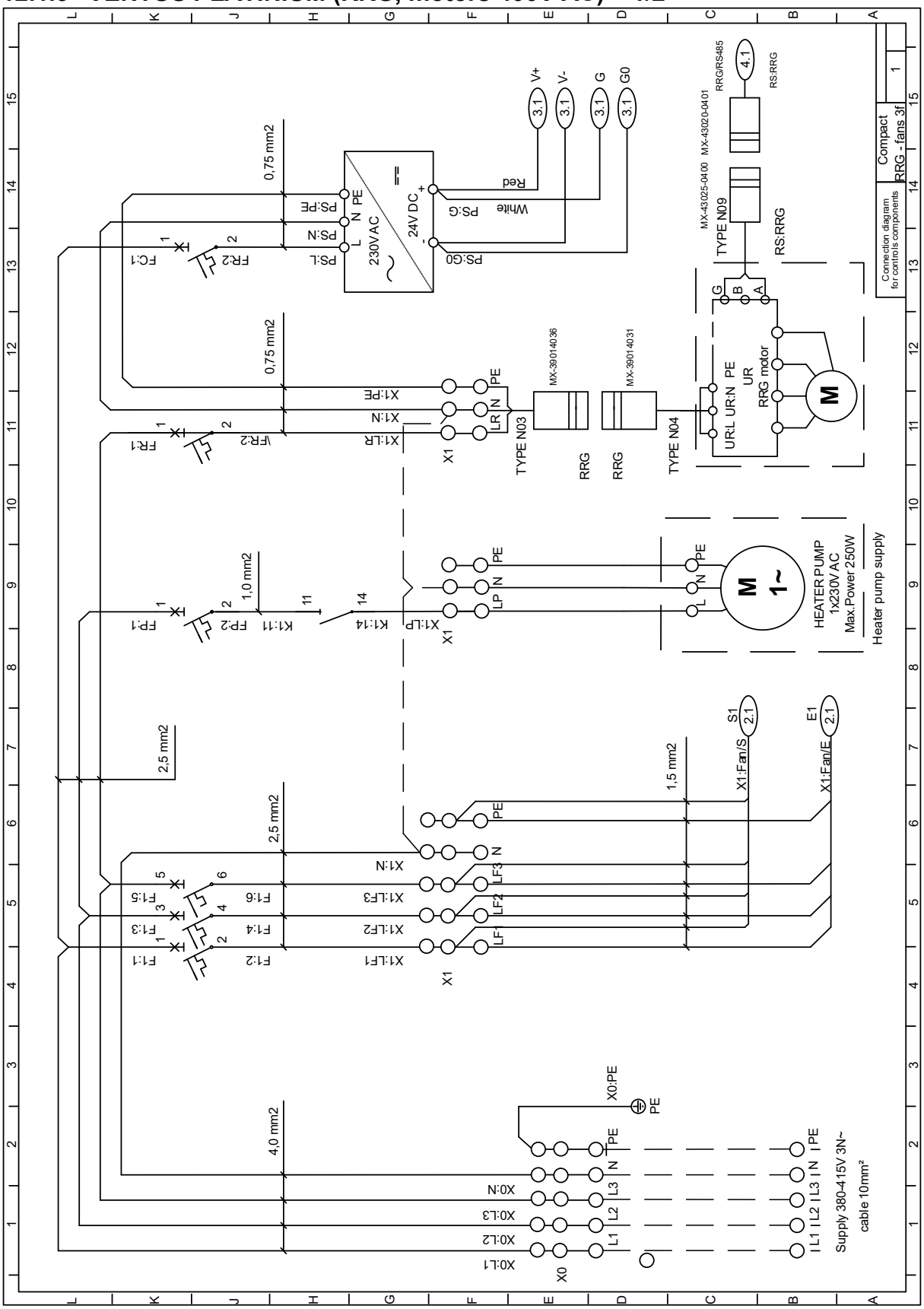
12.1.1 VENTUS PLATINIUM (RRG, motors 230V) – 1/2



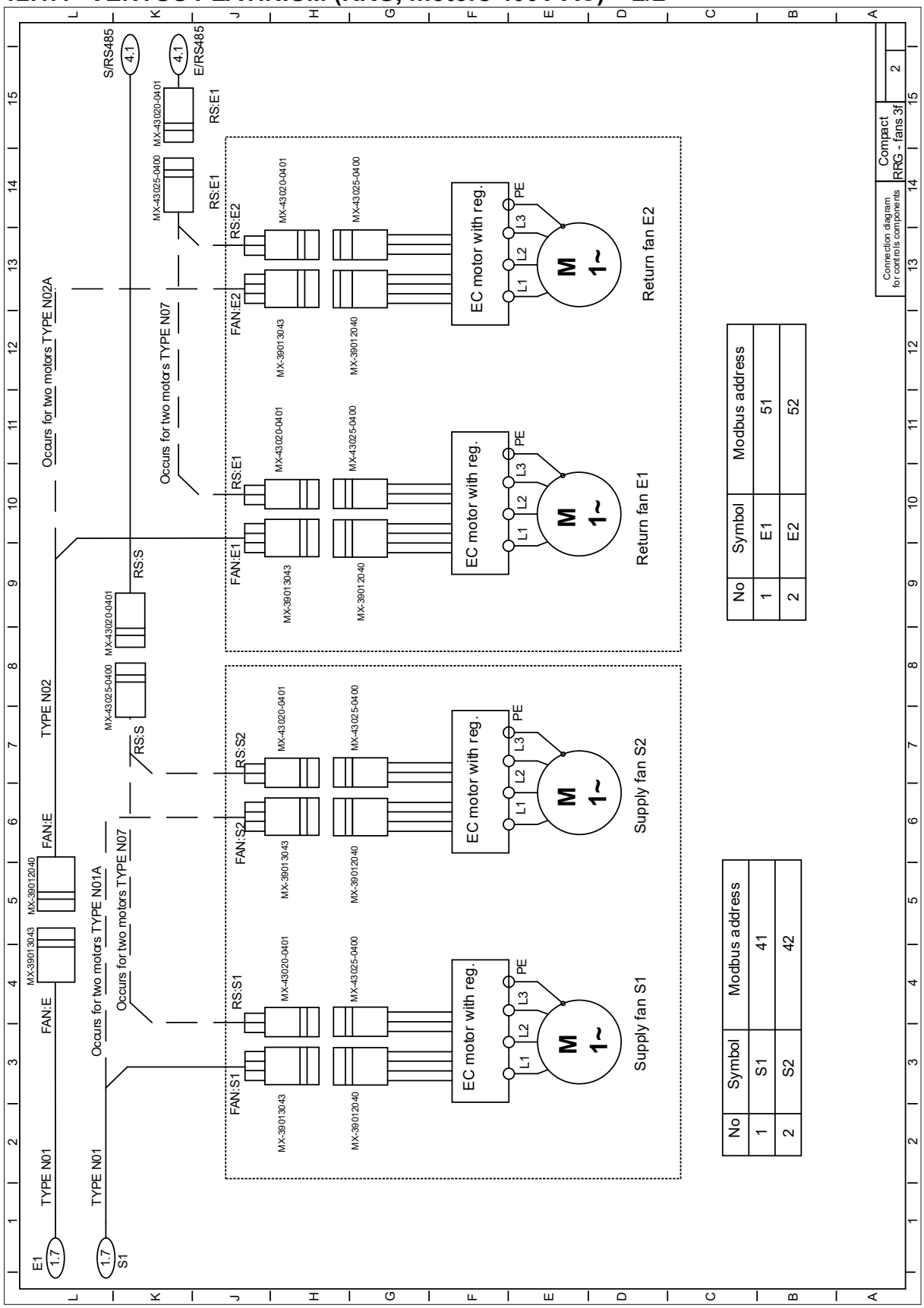
12.1.2 VENTUS PLATINIUM (RRG, motors 230V) – 2/2



12.1.3 VENTUS PLATINIUM (RRG, motors 400V AC) – 1/2

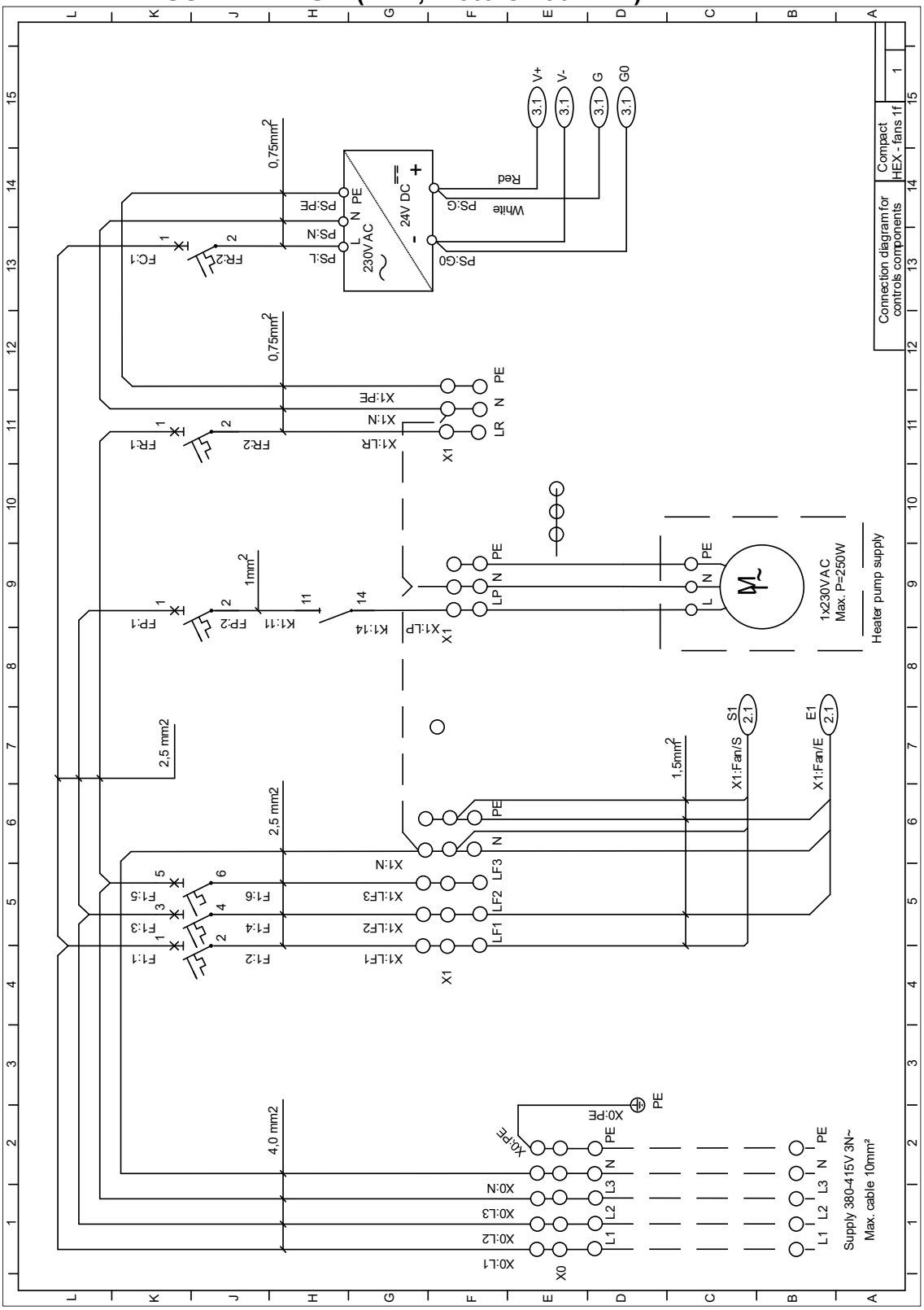


12.1.4 VENTUS PLATINIUM (RRG, motors 400V AC) – 2/2

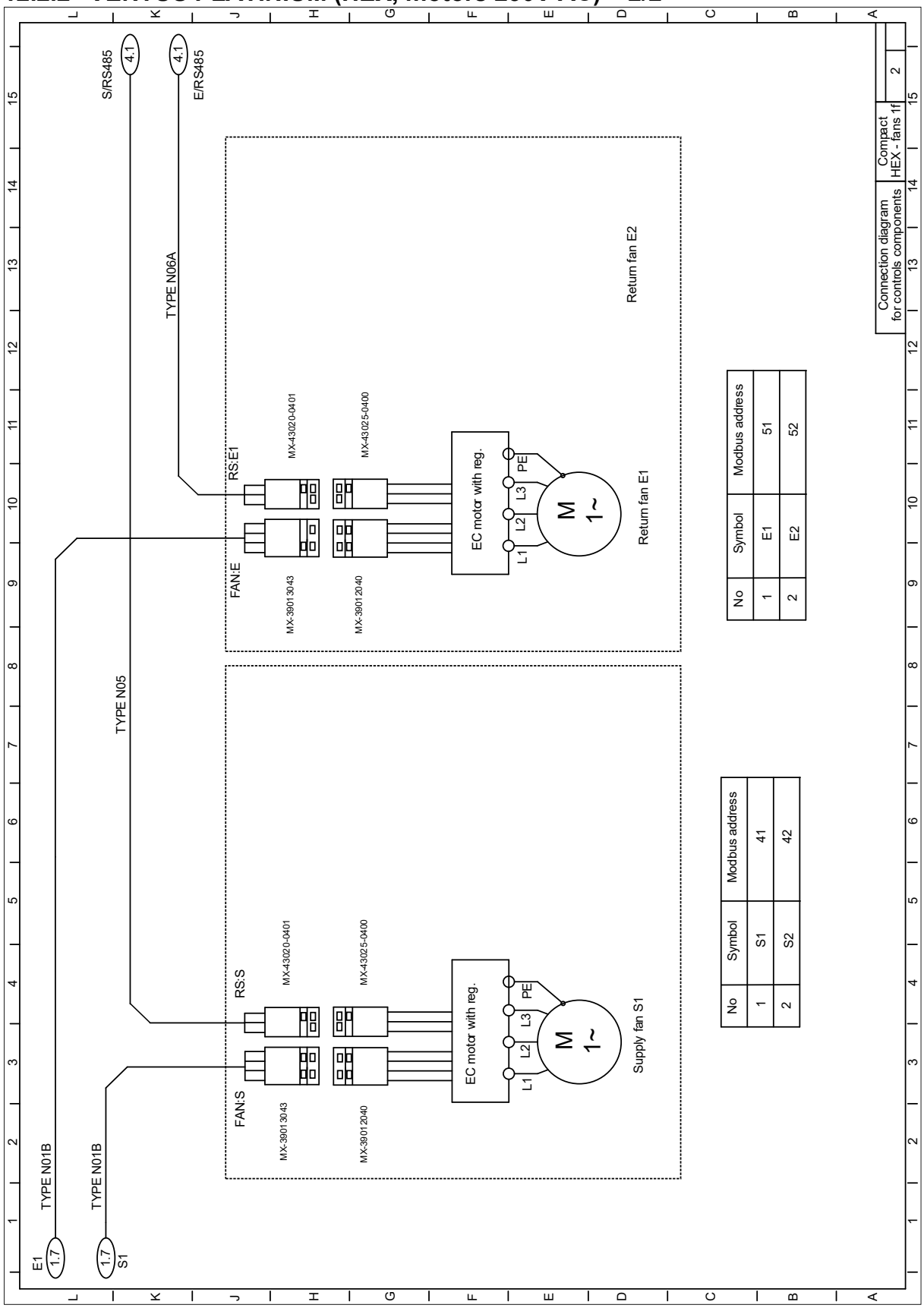


12.2 VENTUS PLATINIUM POWER SUPPLY DIAGRAM WITH HEX EXCHANGER

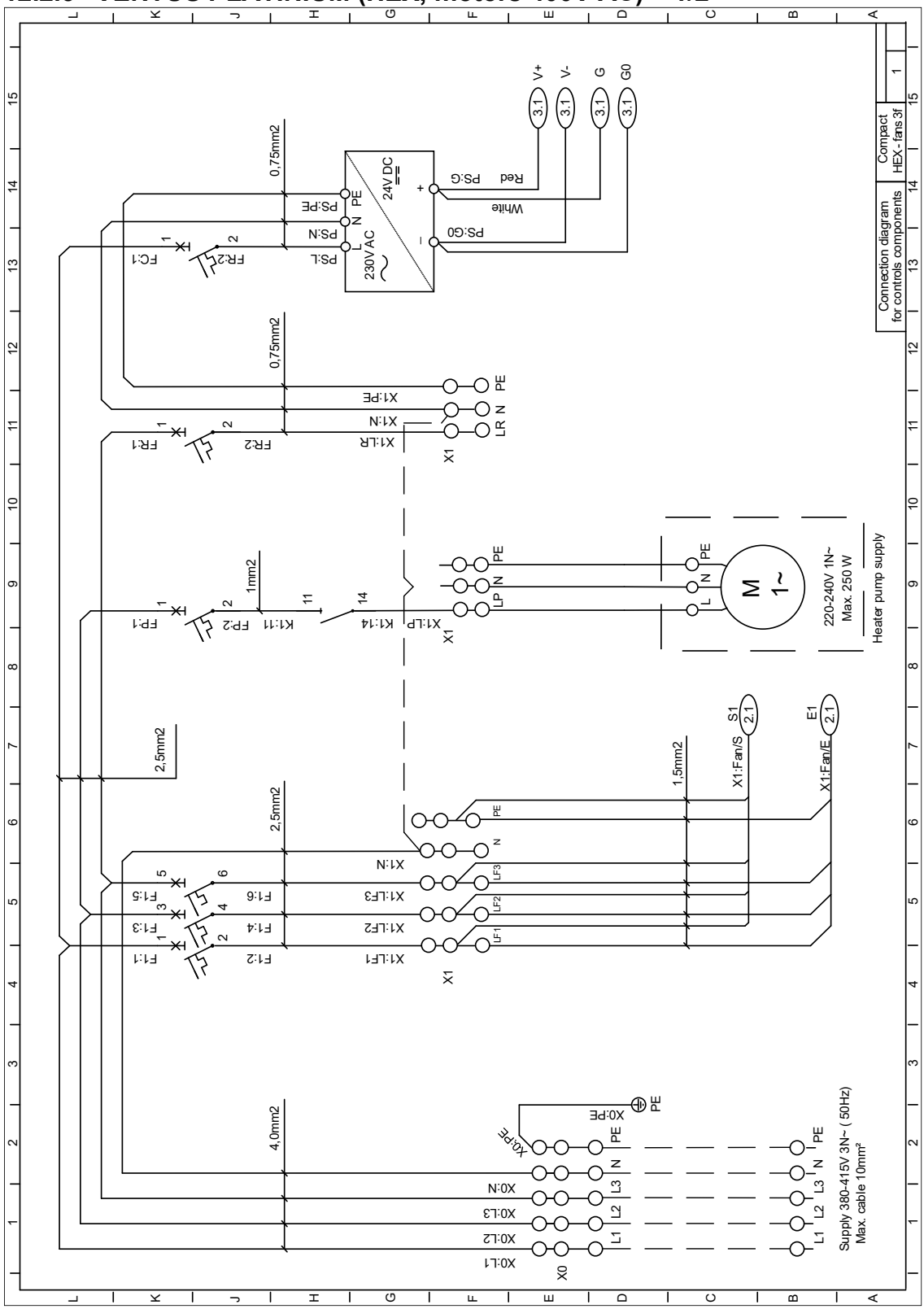
12.2.1 VENTUS PLATINIUM (HEX, motors 230V AC) – 1/2



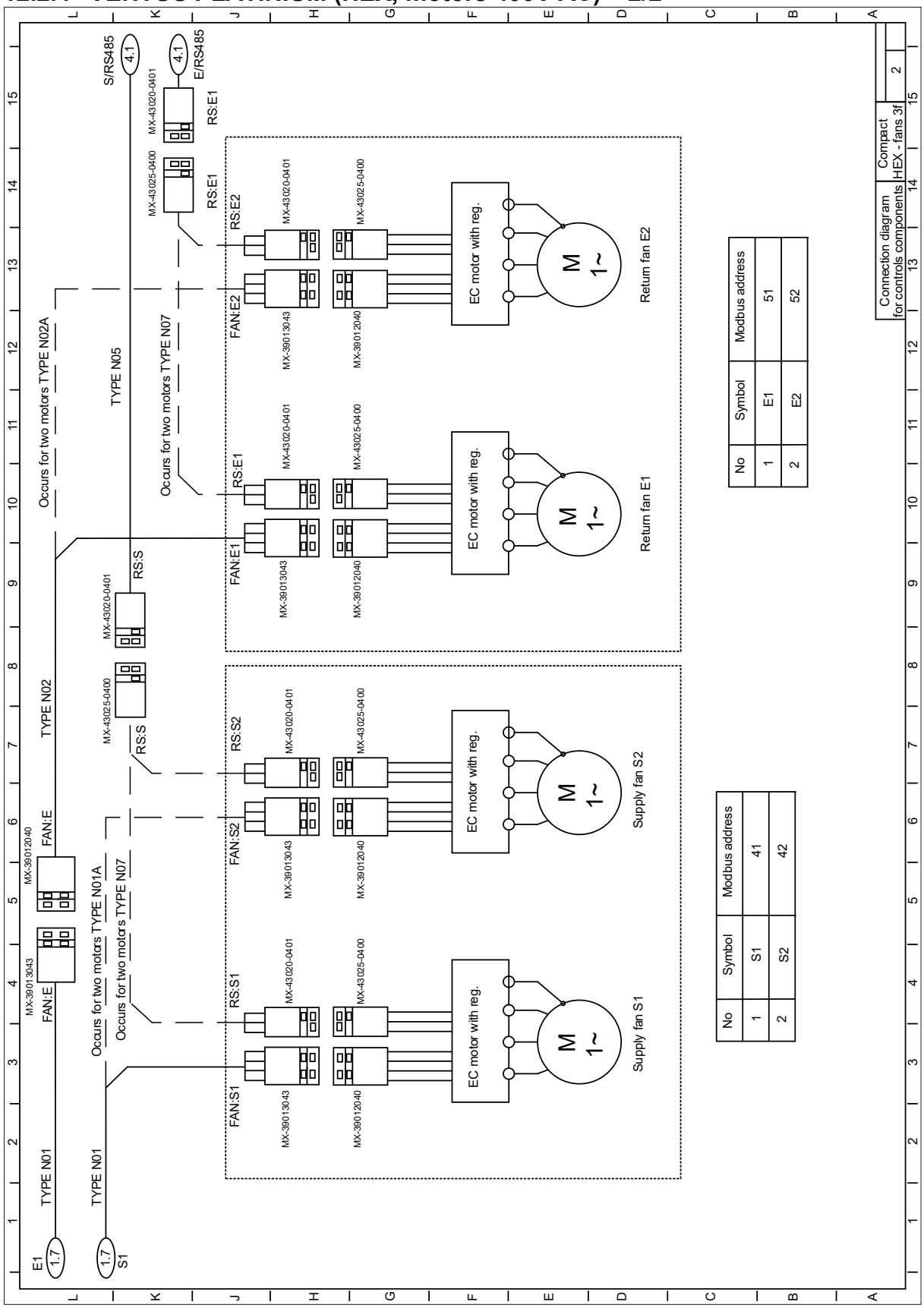
12.2.2 VENTUS PLATINIUM (HEX, motors 230V AC) – 2/2



12.2.3 VENTUS PLATINIUM (HEX, motors 400V AC) – 1/2

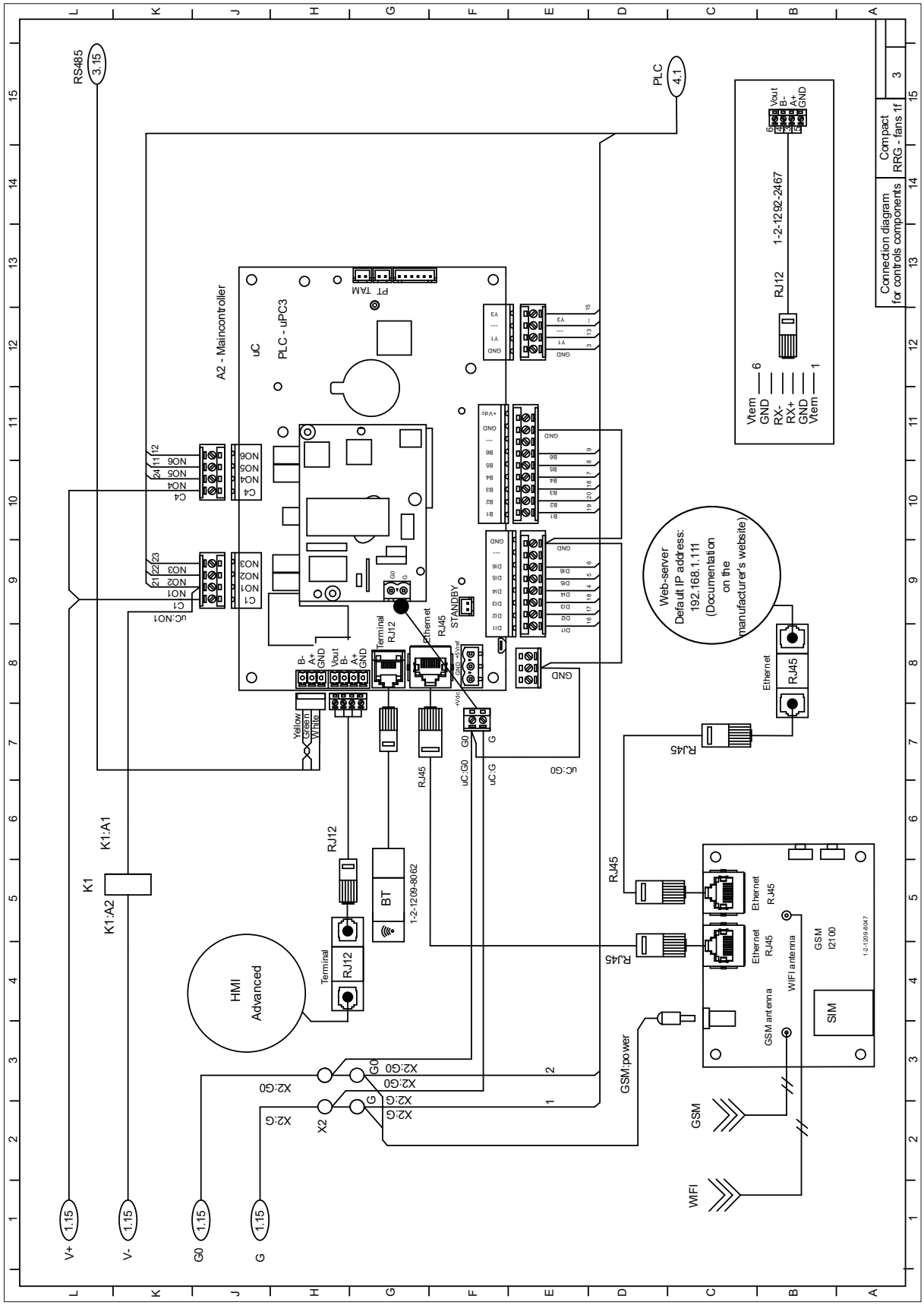


12.2.4 VENTUS PLATINIUM (HEX, motors 400V AC) – 2/2

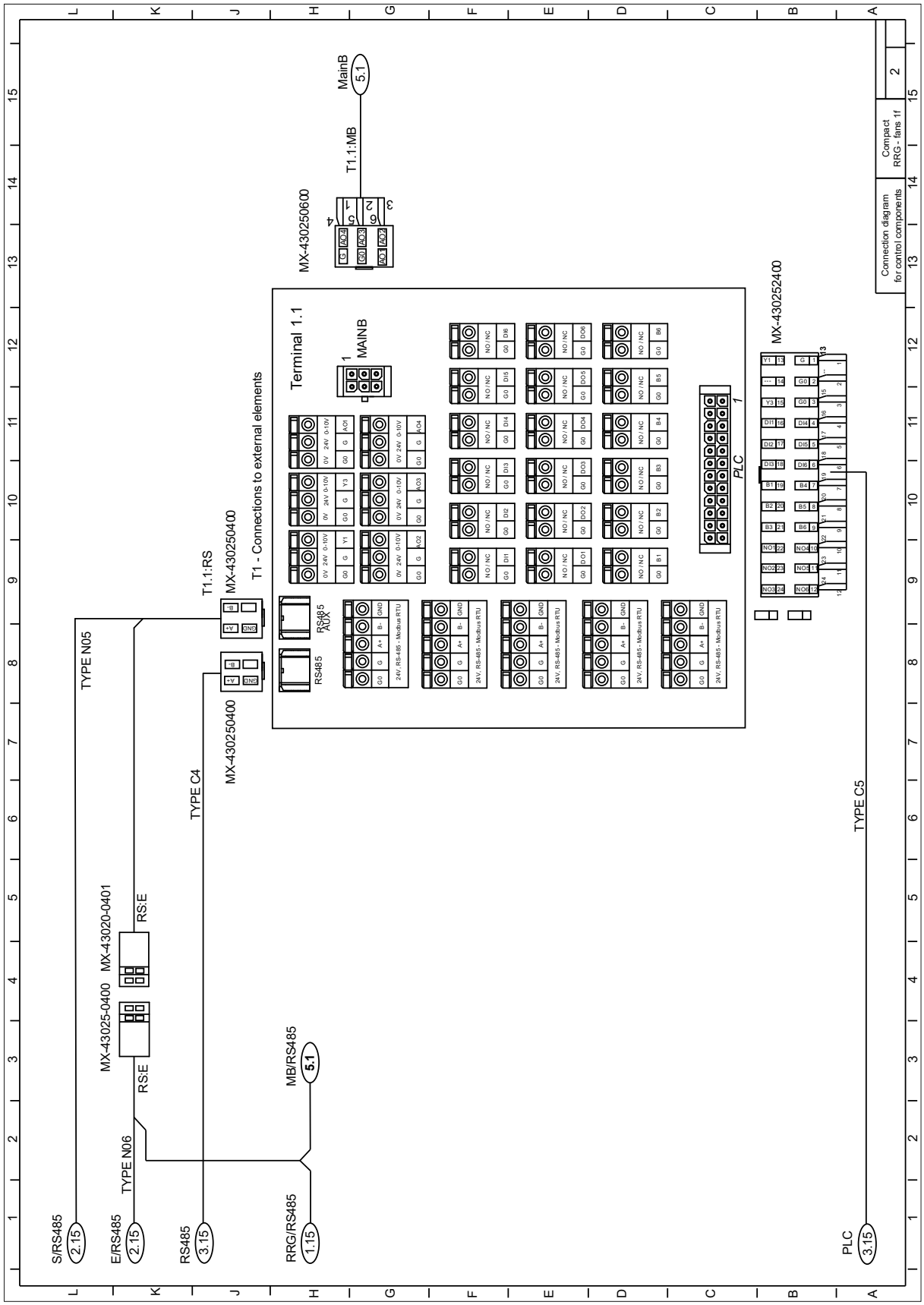


12.3 SCHEMAT UKŁADU AUTOMATYKI

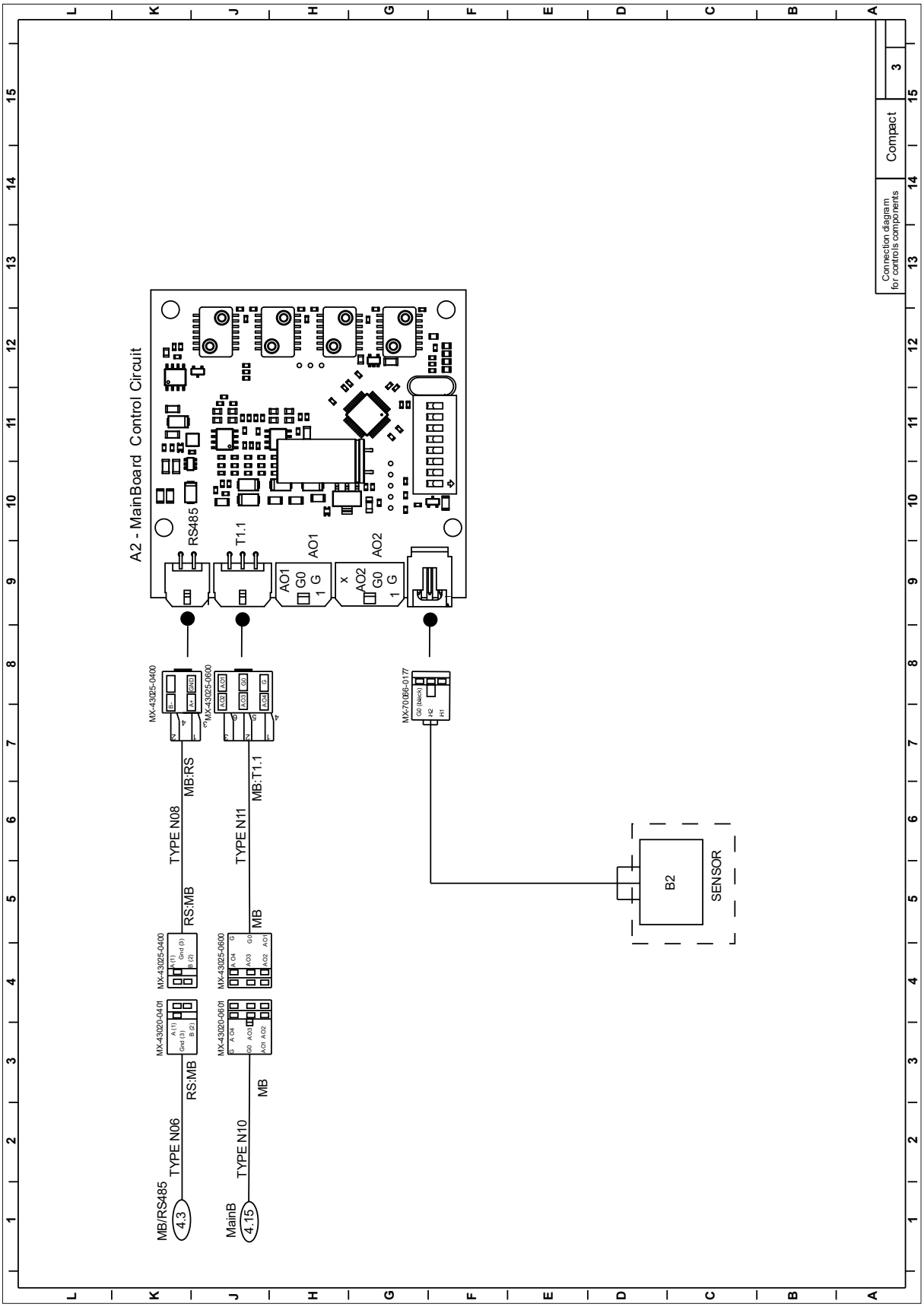
12.3.1 VENTUS PLATINIUM CONTROLS - 1/3



12.3.2 VENTUS PLATINIUM CONTROLS – 2/3

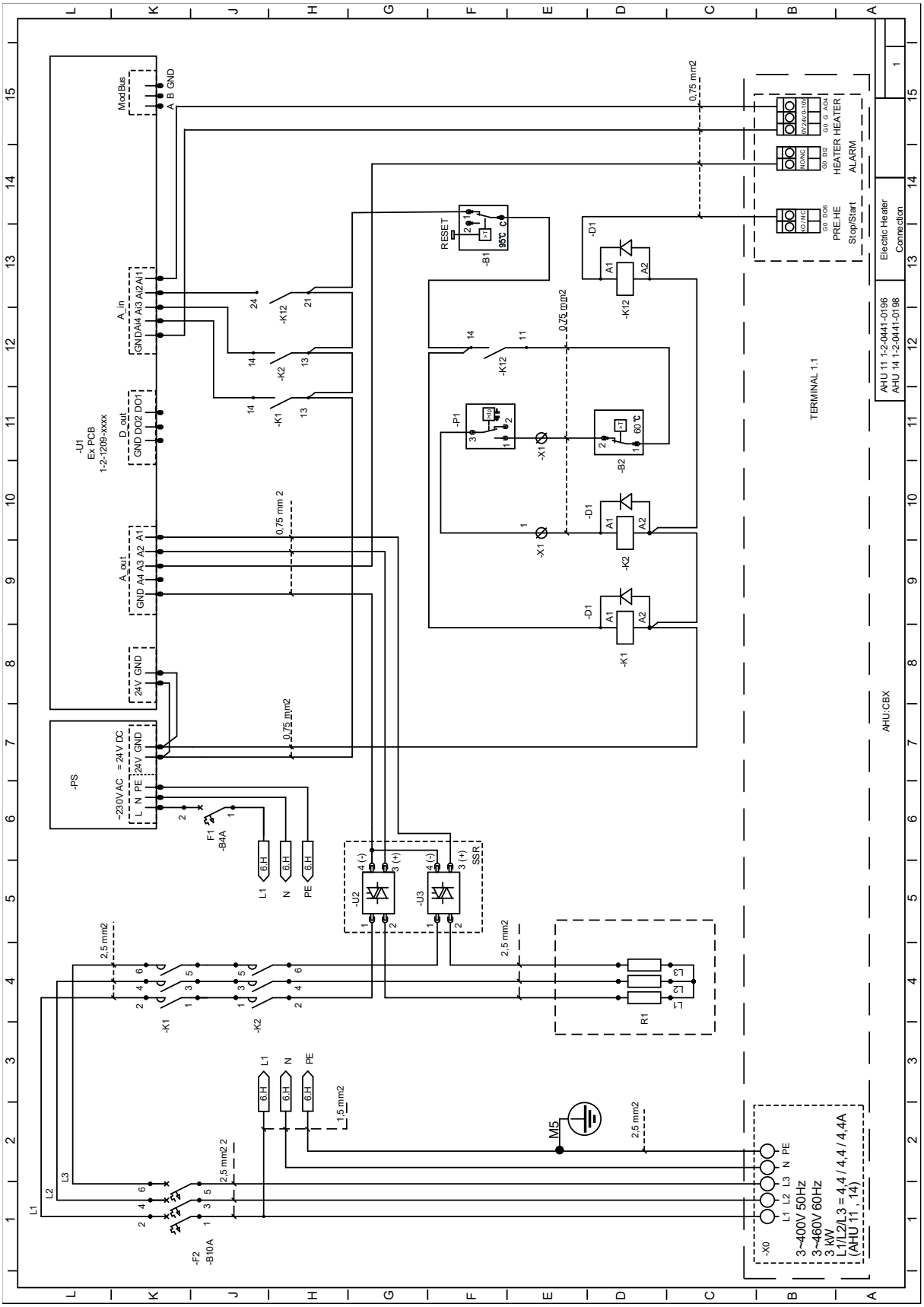


12.3.3 VENTUS PLATINIUM CONTROLS – 3/3

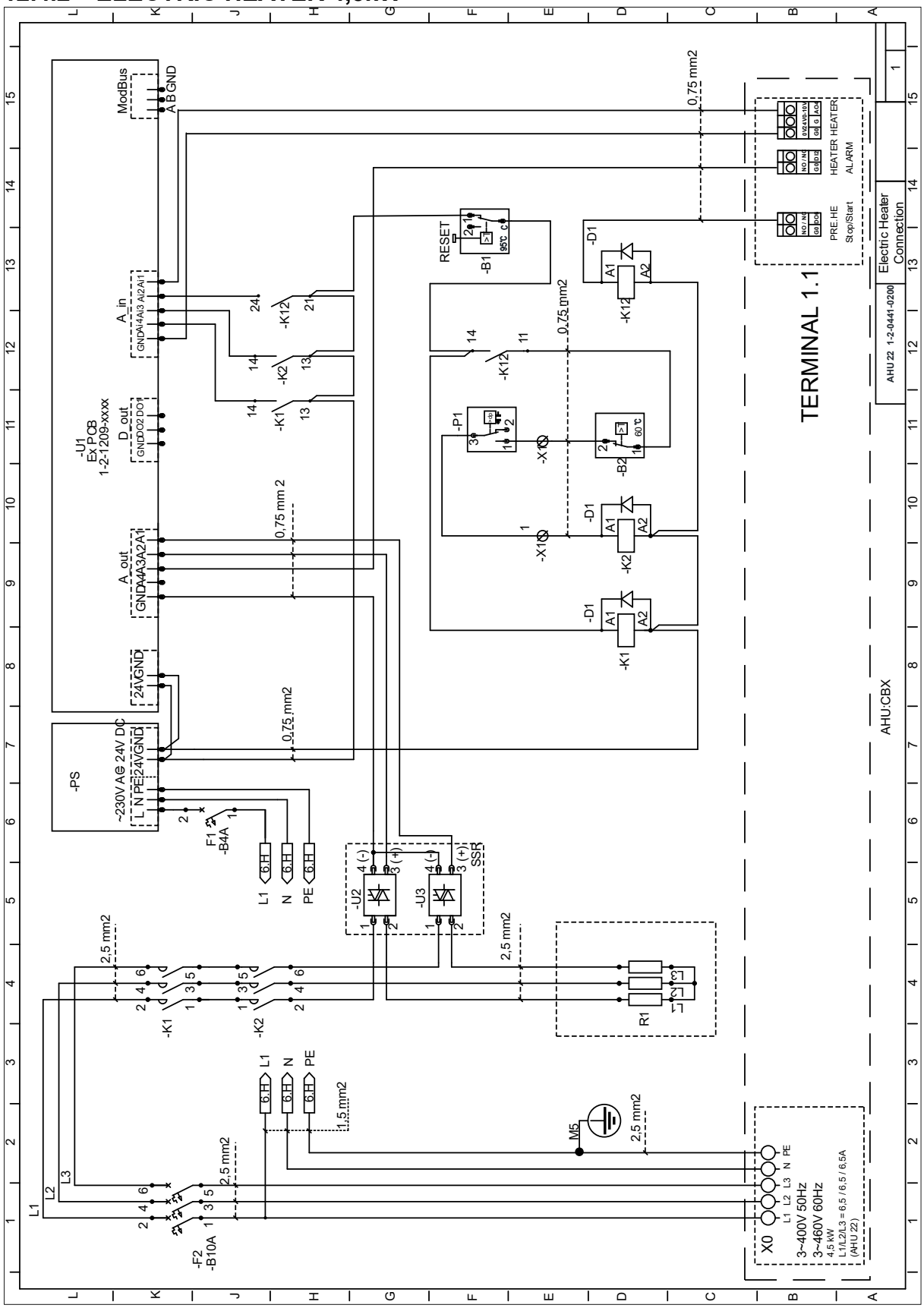


12.4 ELECTRIC HEATER WIRING DIAGRAM

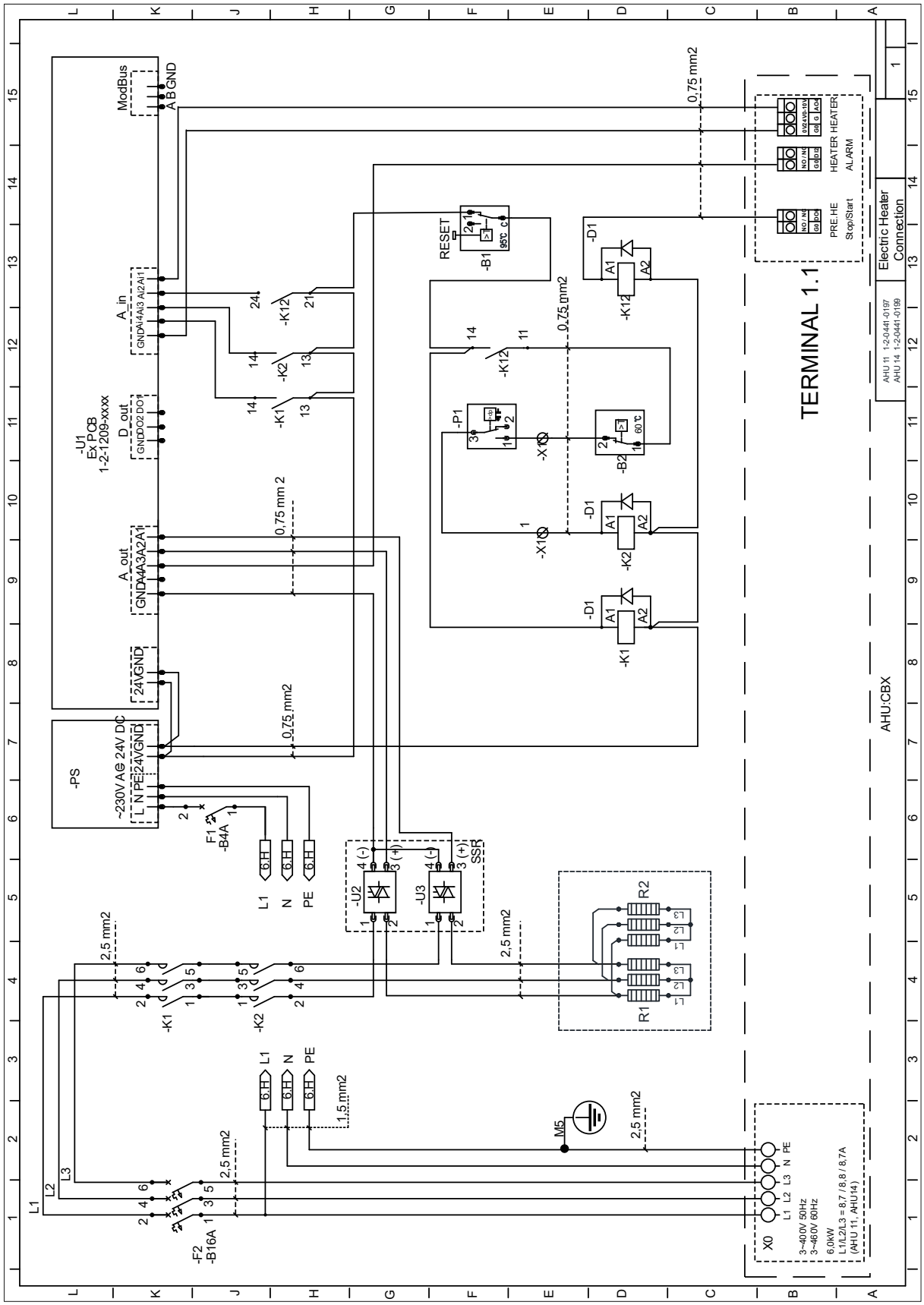
12.4.1 3kW ELECTRIC HEATER



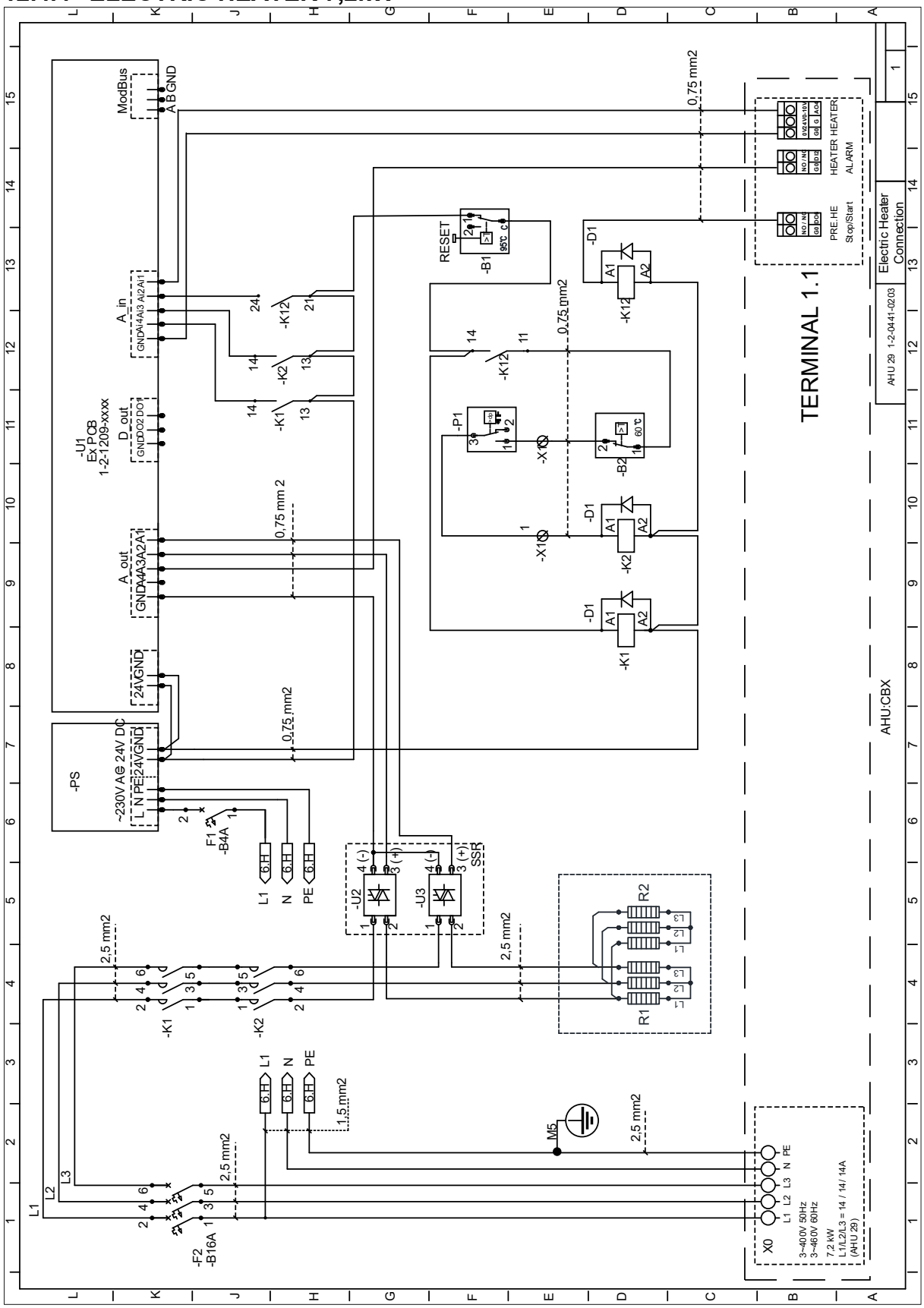
12.4.2 ELECTRIC HEATER 4,5kW



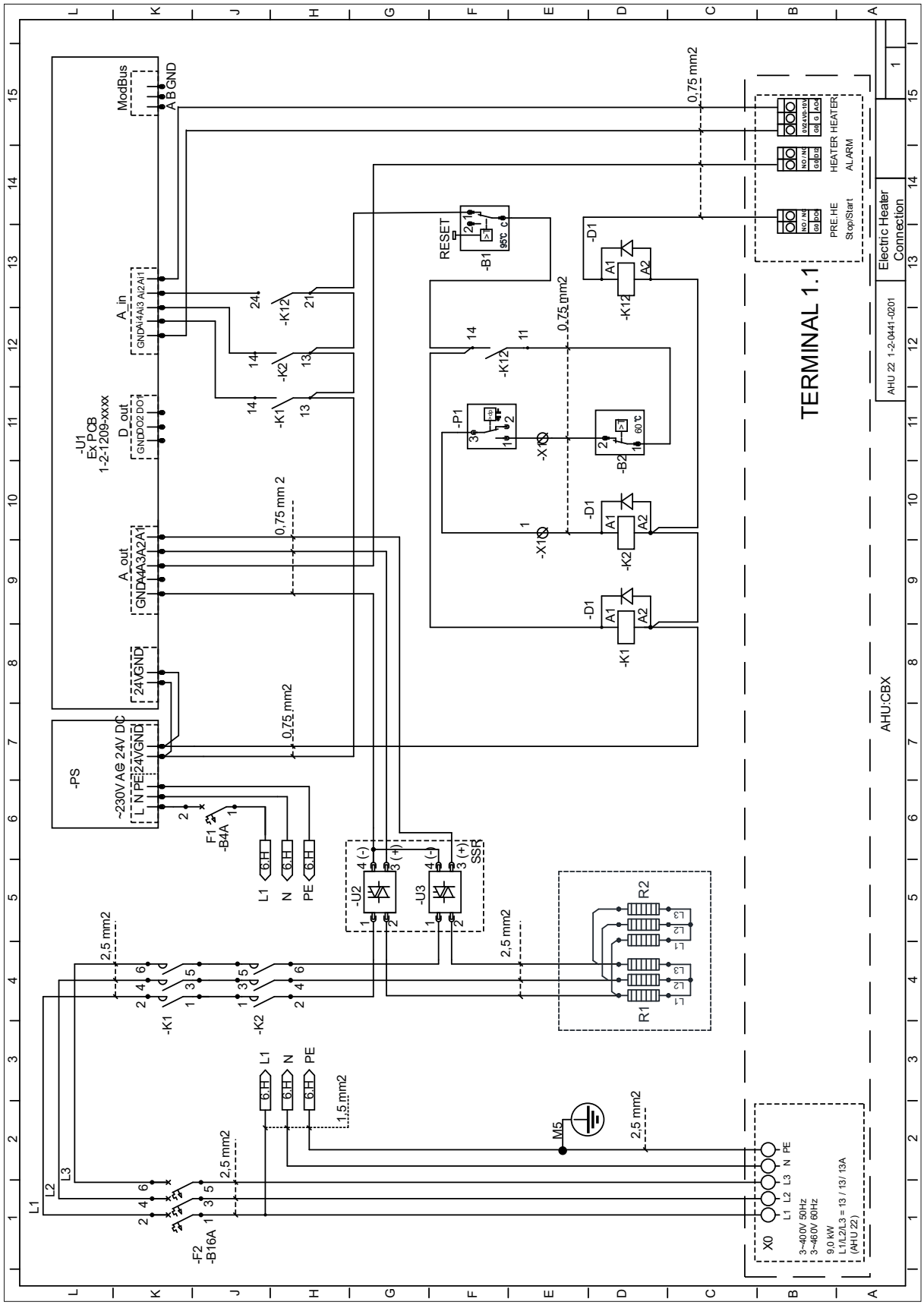
12.4.3 ELECTRIC HEATER 6kW



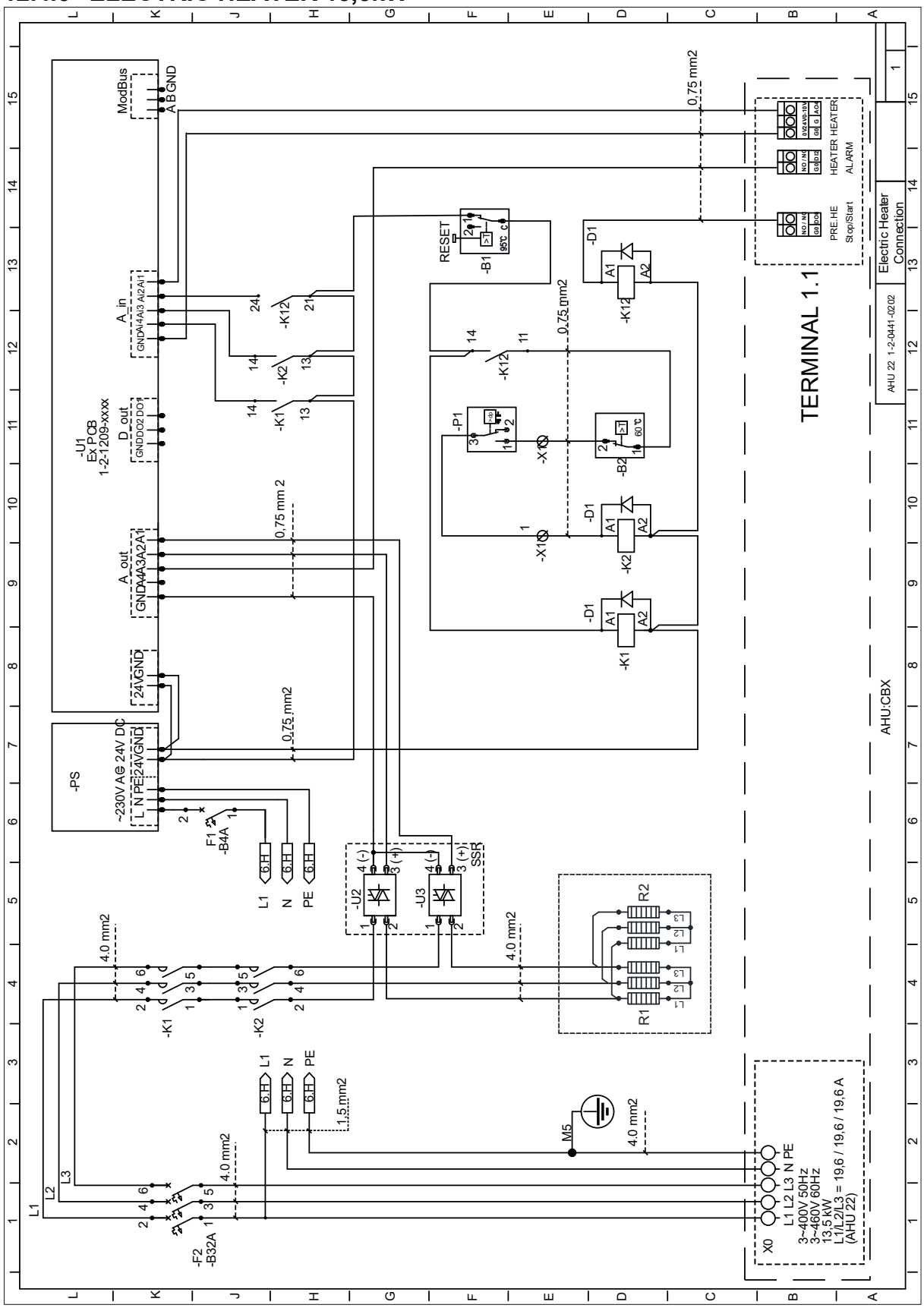
12.4.4 ELECTRIC HEATER 7,2kW



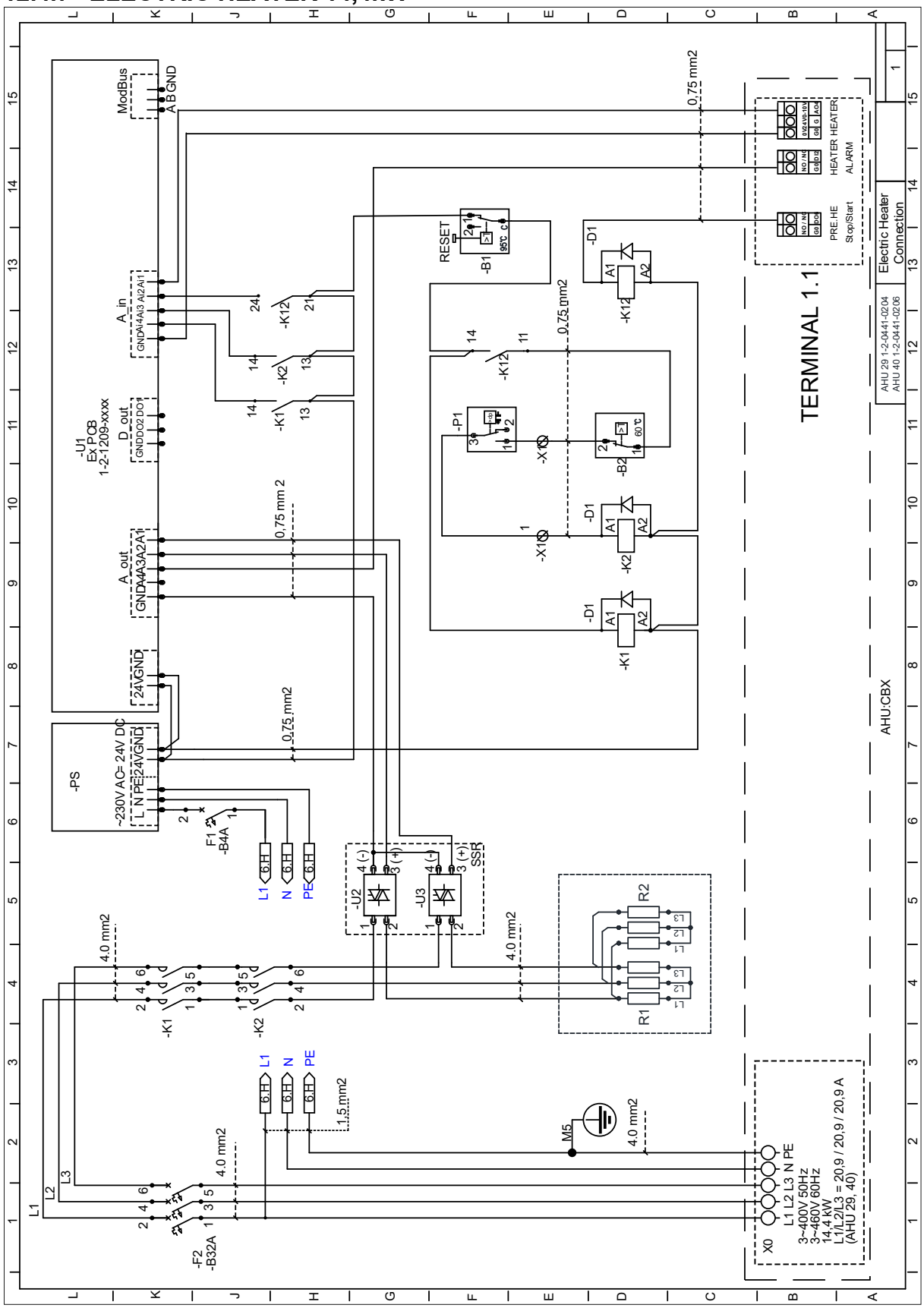
12.4.5 ELECTRIC HEATER 9kW



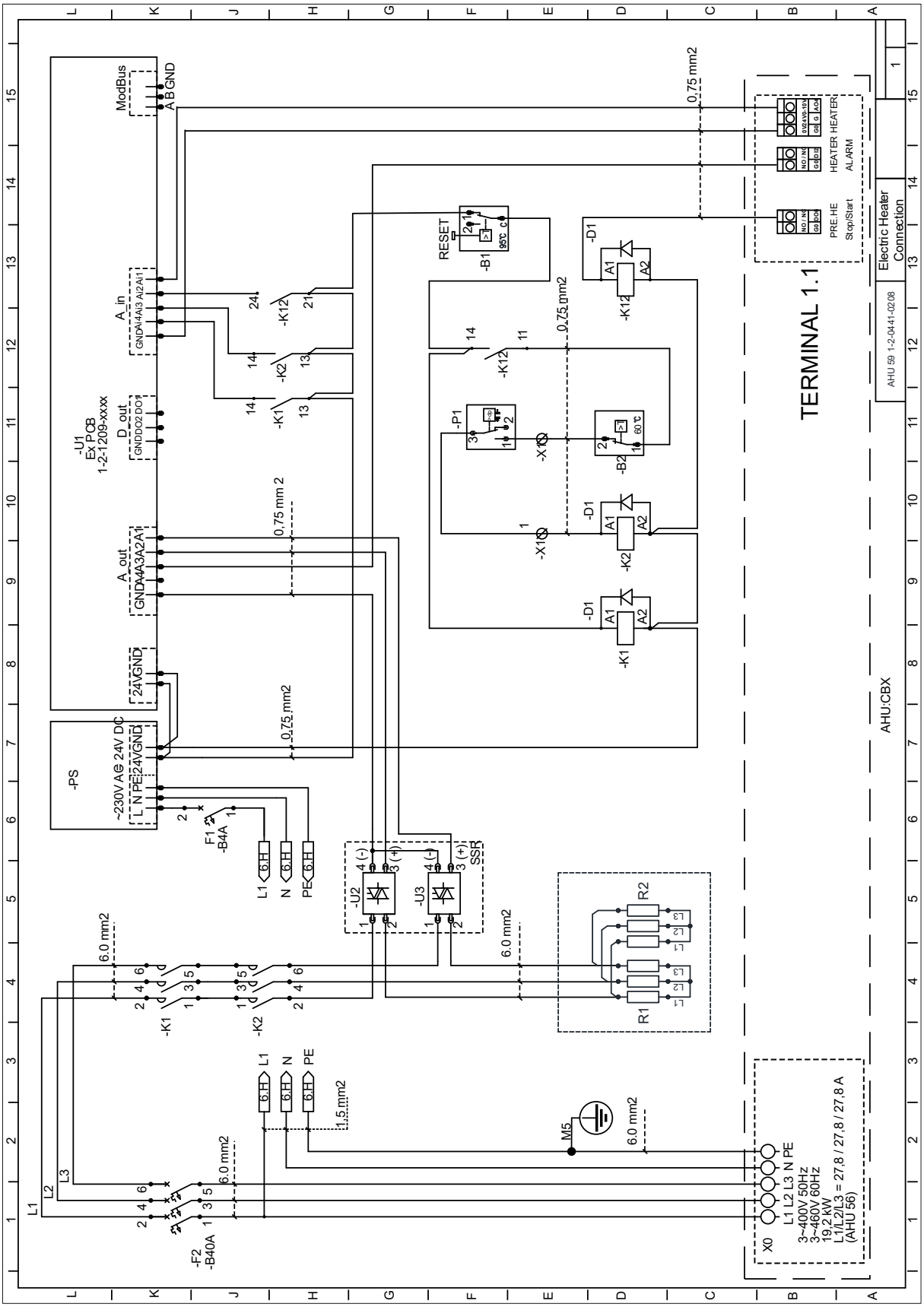
12.4.6 ELECTRIC HEATER 13,5kW



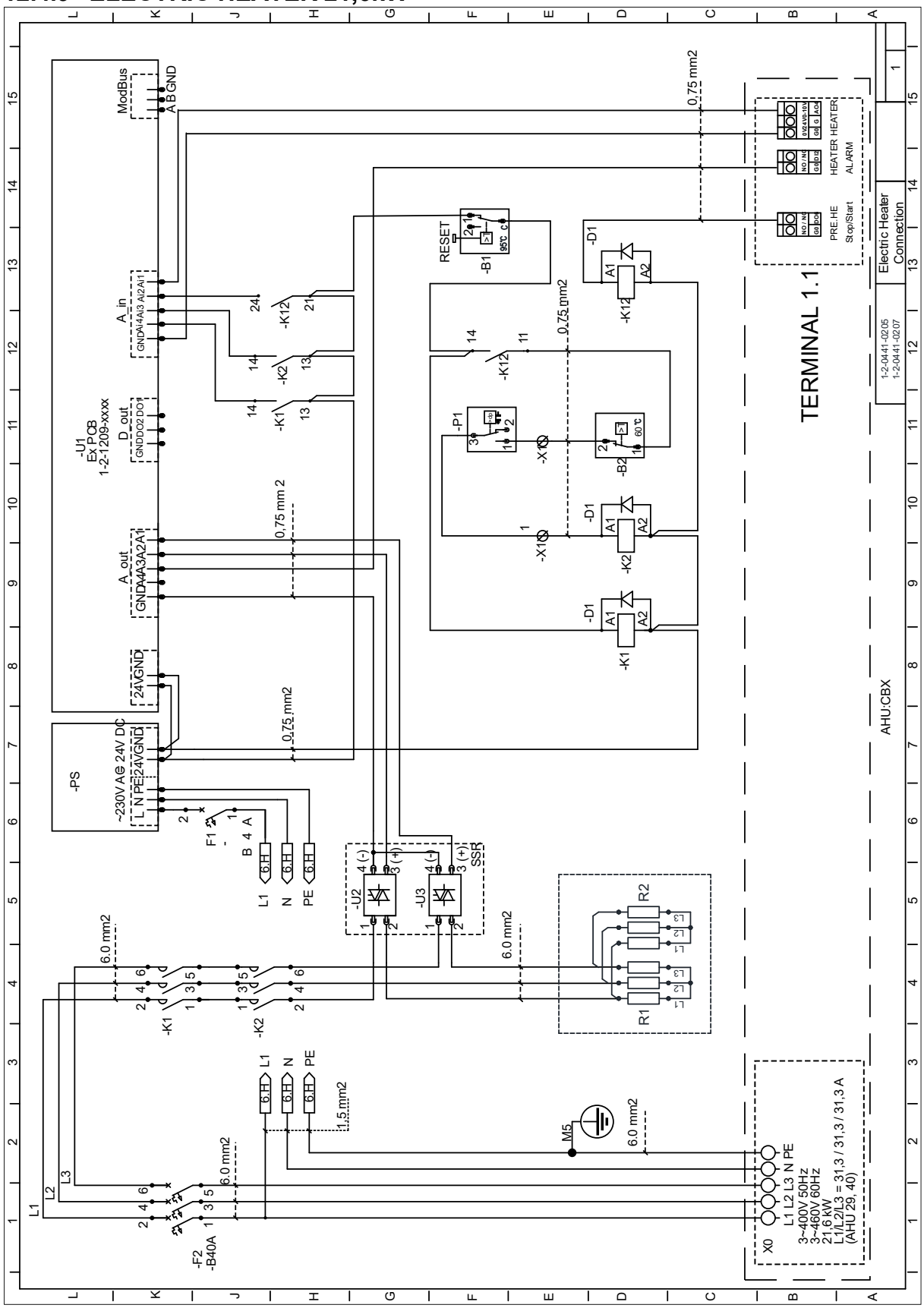
12.4.7 ELECTRIC HEATER 14,4kW



12.4.8 ELECTRIC HEATER 19,2kW



12.4.9 ELECTRIC HEATER 21,6kW



13 ADDITIONAL INFORMATION

13.1 TECHNICAL INFORMATION ACCORDING TO REGULATION (EU) No 327/2011 IMPLEMENTING DIRECTIVE 2009/125/EC

FANS TYPE SR-FS							
#8	#1	#4	#9-1	#9-2	#9-3	#10	#11
	[%]	[%]	[-]	[kW]	[m³/h]	[Pa]	[rpm]
SR-FS-P-250-EAOB75	61.0	74.1	58.9	0,712	1813	834	3 500
SR-FS-P-250-EAOB11	63.6	73.7	61.0	1,07	2039	1159	4000
SR-FS-P-315-1.5	70.0	72.0	64.8	1,754	3500	1170	3 235
SR-FS-A-355-1.6	68.0	71.1	64.35	2.525	4500	1300	3000
SR-FS-A-400-2.5	68.0	71.0	63.98	2,22	4650	1100	2400

(EU) 327/2011	VALUE
#2	A
#3	Static
#6	The year of production is printed on the product's nameplate.
#7	**Swiss Rotors Sp. z o.o.,** Tax ID: 586-001-73-79, Rumska 18, 81-198 Dębogórze, Poland
#8	YES
#12	Disposal must be carried out in an appropriate and environmentally friendly manner, in accordance with the legal regulations applicable in the respective country. "Materials are sorted and segregated in an environmentally responsible way." If necessary, they should be handed over to a specialized facility.
#13	For more detailed information, please refer to the relevant chapters of the dedicated manual, particularly those concerning maintenance: **www.swissrotors.com**
#14	N/A

13.2 RELATED MANUALS

It is necessary to familiarize yourself with the detailed manuals and perform all connections and configurations in accordance with the documentation available at **www.vtsgroup.com**, as well as the manuals provided with the equipment.

In particular, please refer to the following documents:

- Installation, Operation and Maintenance Manual – VENTUS Software – uPC3 Control / Ventilation unit software (Ventus – Application uPC3), uPC3 controller – connection diagram
- Installation, Operation and Maintenance Manual – VENTUS Heat Wheel Drive / Manual for the rotary heat exchanger drive
- Installation, Operation and Maintenance Manual – VTS EC Motor Drive / Technical requirements for VTS equipment with EC motor drives
- uPC3 controller display menu descriptions
- Other documents available at www.vtsgroup.com

13.3 DISMANTLING AND DISPOSAL

WARNING

! DISMANTLING OF THE UNIT OR ITS COMPONENTS MUST BE CARRIED OUT AND/OR SUPERVISED BY APPROPRIATELY QUALIFIED PERSONNEL WITH THE NECESSARY KNOWLEDGE AND CERTIFICATIONS.

! CONTACT A CERTIFIED WASTE DISPOSAL ORGANIZATION IN YOUR REGION TO CONFIRM HOW TO PREPARE AND SORT THE MATERIALS, ESPECIALLY HAZARDOUS MATERIALS THAT MAY HAVE BEEN USED IN THE CONSTRUCTION OF THE UNIT (E.G. BATTERIES). DETERMINE THE APPROPRIATE WASTE STORAGE LOCATION.

! COMPONENTS MUST BE SORTED FOR RECYCLING ACCORDING TO MATERIAL TYPE: IRON AND STEEL, ALUMINUM, COPPER, NON-FERROUS METALS (E.G. WINDINGS — WINDING INSULATION WILL BE BURNED OFF DURING COPPER RECYCLING), INSULATION MATERIALS, ELECTRICAL WIRING, ELECTRONIC WASTE, PLASTIC COMPONENTS, ETC. THE SAME APPLIES TO FABRICS AND CLEANING AGENTS USED DURING DISMANTLING. SEPARATION OF COMPONENTS SHOULD FOLLOW LOCAL REGULATIONS OR BE PERFORMED BY A SPECIALIZED RECYCLING COMPANY.

! THE UNIT SHOULD BE DISMANTLED FOLLOWING GENERAL PROCEDURES COMMONLY USED IN MECHANICAL ENGINEERING AND IN COMPLIANCE WITH LOCAL WASTE DISPOSAL AND ENVIRONMENTAL REGULATIONS.

! LOW-BOILING-POINT REFRIGERANT SYSTEMS (FREON-BASED) ARE CHARGED WITH REFRIGERANTS THAT MUST NOT BE RELEASED INTO THE ATMOSPHERE. THE REFRIGERANT MUST BE RECOVERED IN ACCORDANCE WITH APPLICABLE REGULATIONS — THIS OPERATION MUST BE PERFORMED BY CERTIFIED PERSONNEL.

GENERAL DISMANTLING PROCEDURE

- Disconnect all utilities (power supply, water, refrigerant lines, etc.).
- Remove heating and cooling media from the system.
- Dismantle inspection panels.
- Dismantle electrical and control systems.
- Remove all accessories and components from the air handling unit.
- Dismantle components according to the materials they are made of.
- Dismantle the unit casing.
- Separate insulation from sheet metal.
- Sort materials and components by material type.
- Transfer materials to an authorized waste disposal facility.

WARNING

! GENERAL SAFETY RULES MUST BE FOLLOWED.

! REFER TO “GENERAL SAFETY INSTRUCTIONS – OCCUPATIONAL HEALTH & SAFETY (OHS)”.

! PARTICULAR ATTENTION MUST BE PAID TO:

- THE WEIGHT OF THE UNIT AND ITS COMPONENTS. THE UNIT CONSISTS OF HEAVY PARTS. THESE PARTS MAY FALL DURING DISMANTLING, POSING A RISK OF DEATH, SERIOUS INJURY, OR MATERIAL DAMAGE.
- DISCONNECTION OF THE POWER SUPPLY, INCLUDING ALL RELATED CIRCUITS.
- PREVENTING ACCIDENTAL RE-ENERGIZATION OF THE SYSTEM.
- PRESENCE OF CONTROL OR ELECTRONIC COMPONENTS THAT MAY STORE RESIDUAL ELECTRICAL ENERGY.

13.4 NOTES

Routine inspections carried out by qualified technical personnel or service teams authorized by VTS ensure long-term, reliable, and trouble-free operation of the equipment.

Our **service staff is always available** to provide support during commissioning, maintenance, or in the event of any emergency related to unit operation.

VTS-authorized service centers supply spare parts and accessories for our air handling units. When ordering parts, please specify the **unit type, size, and serial number**.

More information about the VTS service network can be found at: www.vtsgroup.com

The nameplate of the unit includes the sound power level LWA (1 m), measured at a distance of 1 meter from the unit. To calculate the LWA value at distances of 3 meters and 5 meters, use the following formulas:

- **LWA (3 m) = LWA (1 m) – 9.54**
- **LWA (5 m) = LWA (1 m) – 13.98**

VTS reserves the right to make changes without prior notice.

14 EC DECLARATION

DEKLARACJA ZGODNOŚCI UE / EU DECLARATION OF CONFORMITY

My Producent:
The Manufacturer:

VTS Sp. z o.o.
ul. Aleja Grunwaldzka 472A
80-309 Gdańsk, Poland

CE

Strona internetowa:
Website:

www.vtsgroup.com

Deklarujemy z pełną odpowiedzialności, że wyroby:
We hereby declare that the following products:

Centrale wentylacyjne: *VENTUS*
Air handling units: VENTUS

Modele / *Models:*

VVS021, VVS030, VVS040, VVS055, VVS075, VVS100, VVS120, VVS150, VVS180, VVS230, VVS300, VVS400, VVS500, VVS650, VVS010s, VVS015s, VVS005s, VVS020s, VVS030s, VVS021c, VVS030c, VVS040c, VVS055c, VVS075c, VVS100c, VVS120c, VVS150c, VVSA11c, VVSA14c, VVSA22c, VVSA29c, VVSA40c, VVSA56c, VVSA70c, VVS023c, VVS033c, VVS043c.

Rok produkcji: / *Year of manufacture:* 2025

Numer seryjny: / *Serial number:* od 8-AXX-25-2VXXX-00001 do 8-AXX-25-2VXXX-99999
(Podano na tabliczce znamionowej/ Specified on the nameplate)

są zgodne w całości z postanowieniami następujących dyrektyw oraz z następującymi normami oraz standardami:
comply with the provisions of the following directives and with the following norms, standards, internal reports:

DYREKTYWY: ***DIRECTIVES:***	**STANDARDY I SPECYFIKACJE:** ***STANDARDS AND SPECIFICATIONS:***
2006/42/WE Dyrektywa maszynowa *2006/42/EC Machinery Directive*	EN ISO 12100:2010 | EN ISO 13857:2019 | EN 60204-1:2018 | EN 60335–1:2012 | EN 60335–2–40:2015 | EN 50106:2008 | EN 60529:2014
2009/125/WE Dyrektywa Ekoprojektu *2009/125/EC Ecodesign Directive*	327/2011 | 1253/2014 | EN 13053:2019
2014/30/UE Dyrektywa kompatybilności elektromagnetycznej *2014/30/EU EMC Directive*	EN 62233:2008 | EN 61000-6-2:2005 | EN 61000-6-3:2007
2011/65/UE, 2015/863/UE Dyrektywa RoHS *2011/65/EU, 2015/863/EU RoHS Directive*	EN IEC 63000:2018
2014/35/UE Dyrektywa niskonapięciowa *2014/35/EU Low Voltage Directive*	

Imię i nazwisko, stanowisko osoby upoważnionej:

Name and position of authorized person:

Przemysław Kamiński

Chief Technology Officer

VTS Sp. z o.o.
Al. Grunwaldzka 472 A, 80-309 Gdańsk
NIP 587-159-96-75, REGON 220079570
KRS: 0000239557

Miejsce i data:
Place and date

Gdańsk, 2025.08.04:

(podpis / signature)