

**Operation and
Maintenance
Manual**

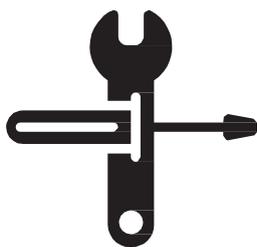
EVO-MODULAR
AIR HANDLING UNITS



Contents

1. General Information	1
1.1 Introduction.....	1
1.2 Purpose of User Manual.....	1
1.3 Warning and Safety Instructions	1
1.4 Warranty.....	2
1.5 Components	5
1.6 Transport and Storage	8
2. Assembly	11
2.1 Assembly Area.....	11
2.2 Module Labeling	12
2.3 Installation of Weather Protection Sheets.....	14
2.4 Ball Siphon Assembly	14
2.5 Removing of the Fan Fixing Parts.....	15
2.6 Duct Mounting	16
2.7 Connection of Run Around Heat Recovery System	18
2.8 Coil Connections.....	18
2.9 Humidifiers.....	20
2.9.1 Steam Humidifiers	20
2.9.2 Direct Injection Humidifier	20
2.9.3 Evaporative Humidifiers.....	20
2.10 Electrical Heater.....	20
2.11 External Sensors.....	21
2.12 Electrical Connections.....	21
2.12.1 Air Handling Unit with Automation Equipment.....	21
2.12.1.1 Type of Units	22
2.12.1.2 Pressure Differential Transmitter (PDT) Connection	24
2.12.1.3 Two Way Valve Electrical Connection.....	25
2.12.1.4 Damper Motor Electrical Connection.....	27
2.12.1.5 Rotor Control Unit Connections.....	29
2.12.2 Control Panel and BMS Connection.....	31
2.12.3 Modbus Addresses and Variables	32
2.12.4 Air Handling Unit without Automation Equipment.....	33
2.12.4.1 Panel Assembly.....	33
2.12.4.2 3 Phase AC Motor Connections.....	33
2.12.4.3 3 Phase EC Ziehl-Abegg Motor Connections.....	35
2.12.4.4 3 Phase EC EBMpapst EC Fan Connections	37
2.12.4.5 Rotor Control Unit Connections.....	39
2.12.4.6 Motor Voltage Unbalance	40
2.12.4.7 Control Panel and Terminal Connection.....	40

3.	Commissioning	41
3.1	Starting Device	42
3.1.1	Display Control	42
3.1.2	Change Parameters.....	43
3.2	Running Mode	44
3.3	Temperature	46
3.4	Air Control.....	47
3.5	Time Settings.....	48
3.6	Access Rights.....	50
4.	Service and Maintenance	51
4.1	Service Maintenance Information.....	51
4.2	Maintenance Plan.....	51
4.3	Component Maintenance	52
4.3.1	Filter maintenance	53
4.3.2	Heat Exchanger Maintenance and Cleaning.....	54
4.3.2.1	Rotary Heat Recovery Systems	54
4.3.2.2	Plate Heat Exchanger Heat Recovery Systems.....	55
4.3.2.3	Run Around (With Coil) and Heat Pipe Heat Recovery Systems Maintenance and Cleaning.....	55
4.3.3	Fan Maintenance and Cleaning	55
4.3.4	Coil Maintenance and Cleaning	56
4.3.5	Electric Heater Maintenance and Cleaning.....	57
4.3.6	Moisturizer Maintenance and Cleaning	57
4.3.7	Silencer Maintenance and Cleaning.....	57
4.3.8	Condensation Pan Maintenance and Cleaning.....	57
4.3.9	Damper Maintenance and Cleaning.....	57
4.3.10	Body Cleaning	58
4.4	Alarms	58
4.5	Problems & Solutions.....	62
4.6	Spare Parts.....	67
4.7	After-Sales Services & Service Form.....	67



1. General Information

1.1 Introduction

Thank you for choosing AERA Air Handling Units.

This manual applies to Evo Modular air handling units. Before operating Evo Modular series air handling units, please carefully review and keep the user manual. Do not use any module of the units as a workbench or storage place. Evo Modular units can only be operated under conditions that meet their design purpose and specification.

Repairs and modifications to be made on the product can be made by AERA Technical service personnel or expert personnel approved by AERA, unless they are marked as the user in the maintenance plans. In case of need for spare parts, please contact the after-sales service department at aftersales@aera.com.tr. Any damage that may occur after the use of spare parts not provided by AERA is not covered by the warranty.

The unit should be visually inspected at the time of delivery. AERA units are shipped complete and connected to all equipment, suitably packaged. If apparent damage is detected during transport, write it on the waybill and have it signed by the driver. Photograph the damage and share it with AERA logistics department.

AERA reserves the right to make design changes without prior notice. Images in this user manual may

differ from actual devices!

1.2 Purpose of User Manual

This instruction manual has been created to provide general information. The product line has many variants. The user is entirely responsible for following the instructions as required. If you have any questions regarding the content of this manual or if any information is out of scope, contact AERA technical service at aftersales@aera.com.tr

1.3 Warning and Safety Instructions

The instructions given in the manual have been created for technical personnel, trained persons, qualified electricians or air conditioning technicians. These people should read and fully understand the manual before starting any work. Safety rules must be followed and observed.

Warning and information labels are placed on the unit. (Figure.1)

DANGER ⚠ Failure to adhere to the warning labels can result in serious accidents.



DANGER

Death / serious irreversible injury

Indicates an extremely dangerous situation that will result in death or serious irreversible injury if the safety instructions are not followed.

WARNING

Death / Serious injury

Indicates an extremely dangerous situation that will result in death or serious irreversible injury if the safety instructions are not followed.

CAUTION

Minor or moderate injury

Indicates a dangerous situation which may result in minor or moderate injury if the safety instructions are not followed.

ATTENTION

Environmental or material damage

indicates actions that could cause damage to equipment or property.

Occupational health and safety local regulations and general safety regulations for the field of application of the air handling unit also apply.

1.4 Warranty

Warranty conditions applicable to products of AERA

1. General warranty conditions

- 1.1. AERA (the "Manufacturer") does hereby provide the Buyer with a 24-month warranty for quality of the purchased products (here in after referred to as the "Products") manufactured by the Manufacturer to be calculated from the issue date of the Manufacturer's invoice for the Product.
- 1.2. Extended warranty may be provided according to separate agreement between Manufacturer and Buyer, according to rules set in Paragraph 6.
- 1.3. The Buyer shall carry out all repairs and replacements provided in the warranty conditions. The Manufacturer shall supply the Buyer with the items or parts needed to replace defective items or parts under the warranty conditions. Other repair costs are covered by Buyer itself, if otherwise it is not set in the agreement between Parties. If the case doesn't comply warranty conditions, the Buyer will be charged to cover the costs of the supplied parts or items.
- 1.4. Provision of a warranty service shall not change, i.e. shall not renew and/ or extend, calculation of the warranty period of the Product, and the warranty period applicable to individual parts of the Product shall expire along with expiry of the warranty period applicable to the initial Product.
- 1.5. The Manufacturer shall not take any responsibility for damages directly or indirectly caused by the Products resulting from failure to comply with the Product Operation Rules as well as conditions and/ or requirements established in the Technical Documentation of the Product, as well as deliberate or negligent behavior of the users of the Product or the third parties. The Manufacturer shall not be liable for any direct or indirect losses incurred by the Buyer or the user of the Product caused by defects of the Product either, except for cases when such limitation of liability is prohibited by legislations.
- 1.6. The Buyer selling the Product to the end user (consumer) shall make sure that the end user of the Product is properly familiarized with the conditions of this Warranty as well as all other Technical Documents of the Product and has confirmed his/ her obligation to comply with the requirements established by them as well as all conditions of the Warranty. If the Buyer violates this requirement, the Manufacturer shall be entitled to refuse application of the warranty and/ or apply it with reservations established under the Manufacturer's discretion. In addition to this, in such a case all costs incurred in relation to implementation of the Warranty conditions shall be borne by the Buyer.
- 1.7. Buyer shall keep claim records during the warranty period.

2. Claim procedure

- 2.1. Upon noticing a shortcoming or a defect of the Product, the end user of the Product shall contact the Buyer but no later than within 7 days from the time when he/ she noticed or was supposed to notice the defect
- 2.2. In order to make sure that the submitted claim is subject to registration and evaluation by the Manufacturer, the Buyer must send an email address aftersales@aera.com.tr. It no later than within 14 days from the receipt date of a respective claim of the end user of the Product. It is compulsory to specify the production order No. When controller-related failure occurs, it is useful to indicate also the control board's unique number. Product malfunction notification form is provided in the annex.
- 2.3. The Buyer, to the extent possible, sends back to the Manufacturer the defective unit, components or material (further "defective parts"). This kind of return must take place at least once every month, or by agreement. All the returned defective parts should be accompanied by the Warranty Claim Form (registered previously, when the malfunction occurred) to allow the 14. St. Number:13 Pancar OSB, 35865 Torbalı - Izmir, TURKEY Phone:+90 232 799 0 111 traceability. After the Manufacturer's service department having controlled the parts and if the factory defect is confirmed – the credit note for the invoice is issued. If the defective parts are not returned to the Manufacturer, the Buyer must pay for the components in normal payment conditions.
- 2.4. Returned parts shall be properly packed on a pallet with a list of parts (part name, warranty claim number and quantity) in respect of which application of the warranty is requested attached to it. The list of defective parts shall be attached to the pallet in a manner enabling to get acquainted with it without damaging the packaging of the parts. Liability for delivery of the object shall be borne by the Buyer. The defective parts shall be delivered in the factory or other packaging, which would ensure protection of the Product from mechanical, electrostatic and/ or other damages during transportation. The Manufacturer shall not accept the parts delivered without observing the requirements.
- 2.5. The Buyer shall perform the work of replacement of the parts subject to warranty as well as all other work needed for implementation of the warranty at one's own cost, in compliance with the requirements established in the Technical Documentation of the Product.
- 2.6. In certain cases, Manufacturer has right to send its service team to repair Products at it owns discretion. In this case Buyer will be not entitled to any compensation for claim management or any other expenses occurring from this claim.
- 2.7. The end user of the Product may raise claims regarding any defects of the Product only to the Buyer. In no case claims may be raised directly to the Manufacturer.

3. Claim consideration procedures

- 3.1. The Manufacturer shall undertake to resolve the filed claims related to application of warranty as soon as possible.
- 3.2. Upon recognition of the validity of claims regarding the quality of the Product, the Manufacturer, at one's discretion, may cover price of the replacement parts Buyer (is otherwise is not set in the contract)
- 3.3. The Manufacturer shall reserve the right to extend the deadline for resolution of claims, if the claim could not be considered by the end of the main time period because of the formed special circumstances.
- 3.4. The aforementioned rules shall be applicable in case of repeatedly raised claims regarding defects of the same Product or inadequate repair thereof as well.
- 3.5. Claims regarding the warranty for the quality of the Products shall be considered and resolved by the Manufacturer's servicing division.

4. Warranty costs to be covered by the buyer

- 4.1. In the event of determination that the claims have been raised unreasonably within the course of consideration of the claim, the Manufacturer shall be entitled to claim compensation of costs incurred
- 4.2. Buyer must cover price of parts and other Manufacturer expenses if the defect occurred due to fault or negligence of the end user

5. Cases when warranty shall not apply

- 5.1. If the defects of the Products were reported to the Manufacturer later than after 7 days from the time when the end user noticed or was supposed to notice respective defects of the Product.

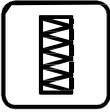
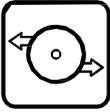
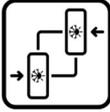
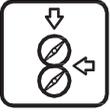
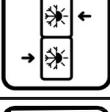
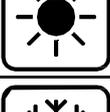
- 5.2. If the Buyer fails to comply with the requirements established in Paragraphs 2, 3, and/ or 6 of these Warranty Conditions.
- 5.3. To naturally worn off parts of the Product, consumables, i.e. filters, V-belts, fuses, bearings, rotor belts, brushes as well as disposable parts (batteries, accumulators, etc.).
- 5.4. To defects developed during unconventional use of the Product, including, but not limited to, transportation of the Products, loading / unloading them to/ from a vehicle, installation of the Products, maintenances etc.
- 5.5. If the Products are used not for the intended purpose there of;
- 5.6. To consequences resulting from normal wear and tear; 14. St. Number:13 Pancar OSB, 35865 Torbalı - Izmir, TURKEY Phone:+90 232 799 0 111
- 5.7. To defects, which developed during installation, use, maintenance, and operation of the Products, as well as performing any other actions with the Goods without observing the Manufacturer's instructions as well as the requirements and conditions determined in the Technical Documents of the Product (e.g., requirements for humidity, temperature, etc.), and in the event no such requirements have been specified, then the requirements and the good practice rules typically applicable to this type or similar Products; as well as when registration (monitoring) of operation and parameters of the ventilation system, where the Product is used, is not performed in due time and under the established procedure;
- 5.8. If identification stickers have been damaged, removed, re-attached and/ or tampered with in any other manner
- 5.9. If the Products have been changed, added or modified in any manner and/ or they have been repaired and/ or their maintenance has been performed by entities, who have not been properly authorized by the Manufacturer, and/ or not genuine Manufacturer's parts or parts not approved by the latter or other inadequate materials and/ or materials not specified by the Manufacturer have been used for repairs
- 5.10. If the Product servicing log was not being filled in under the established procedure
- 5.11. If the defects of the Products were caused by a natural disaster, failure (e.g., changes in voltage in the electricity grid, lightning, etc.), accident and/ or any other circumstances, which have been out of the Manufacturer's control or will, including force majeure circumstances; 5.1.12. To Products installed outdoors, which have not been protected from exposure to the environmental factors as recommended by the Manufacturer
- 5.12. If the ventilation system where the Product is used has been installed without observing the requirements established by regulations, the Technical Documents of the Product, or the good practice rules.
- 5.13. If electrical devices or accessories, e.g., sensors, heaters, by-pass drives and/ or others not manufactured by the Manufacturer, have been connected to the Products
- 5.14. To accessories purchased together with the Products or separately from them, which are not an integral part of the Products and/ or which have not been manufactured by the Manufacturer
- 5.15. If the requirements specified in these Warranty Conditions are disregarded

6. Extended warranty conditions

- 6.1. The Buyer can purchase extended warranty to the products specified separately. However, the Manufacturer has the right to refuse to sell extended warranty.
- 6.2. The Extended warranty shall be provided only if these conditions are met:
 - 6.2.1. Product has serial number for the identification;
 - 6.2.2. Standard warranty period (2 years – Article 1.1) has not ended
 - 6.2.3. Maintenance of the Product is performed in accordance with the Manufacturer's instructions and the Technical Documentation of the Product, by observing the servicing schedule established by the Manufacturer
 - 6.2.4. Products has been operated and repaired by using only genuine Manufacturer's parts
- 6.3. During extended warranty period Manufacturer will send replacement part for the defective parts as set in Paragraph 2.

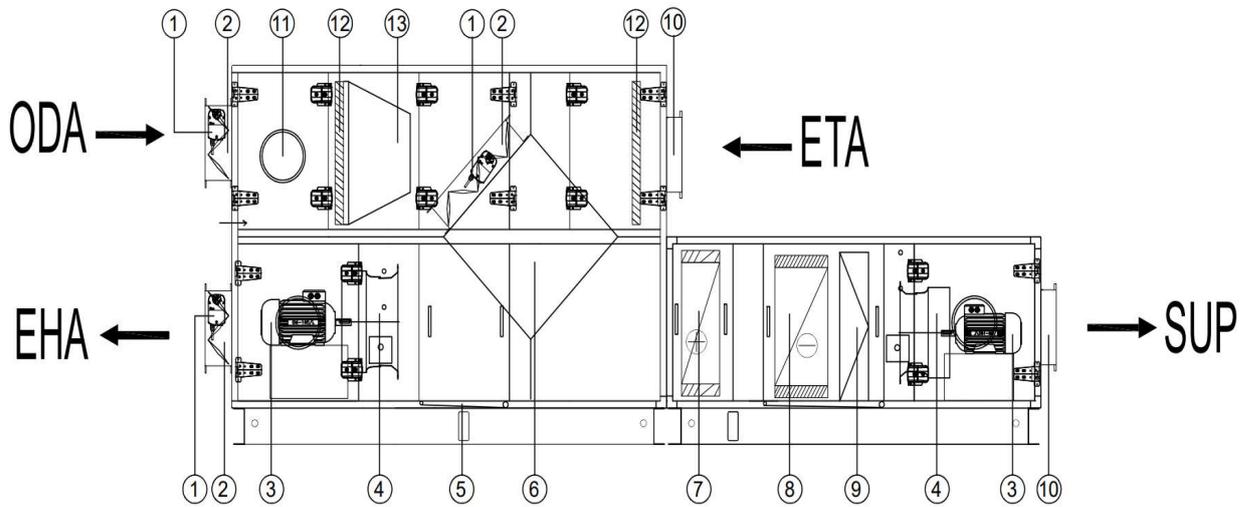
1.5 Components

Evo-M series air handling units modules are marked with the following icons according to their features.

	Filter Module		DX Coil Module
	Fan Module		Steam Coil Module
	Plate Type Heat Exchanger Module		Electrical Heater Module
	Rotary Heat Exchanger Module		Humidifier Module
	Run Around Heat Exchanger Module		Mixing Damper Module
	Heat Pipe Heat Exchanger Module		Damper Module
	Water Heating Coil Module		Silencer Module
	Water Cooling Coil Module		Compressor Module

This user manual, which is sent with the device, is placed in the fan module or filter module with additional shipping group materials such as siphon. Please check it out!

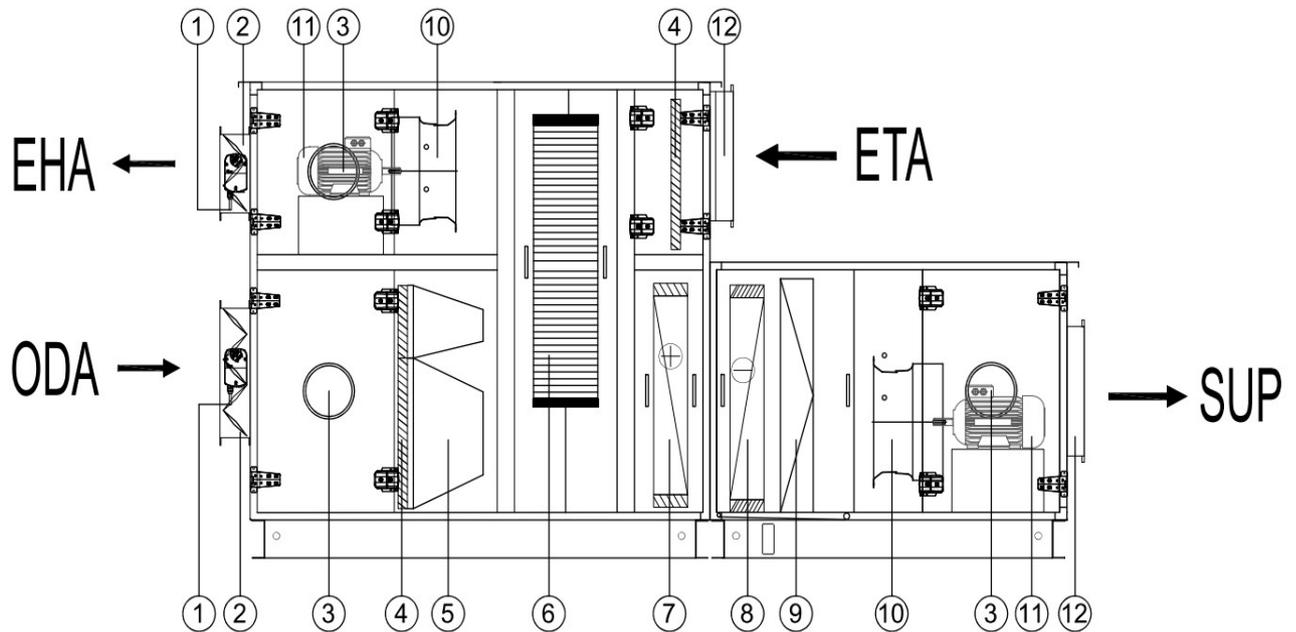
EVO MODULAR WITH PLATE EXCHANGER SAMPLE LAYOUT



- 1-) Damper Motor
- 2-) Damper
- 3-) Fan Motor
- 4-) Fan Impeller
- 5-) Condensate Tray
- 6-) Heat Exchanger
- 7-) Heater Coil
- 8-) Cooler Coil
- 9-) Drop Eliminator
- 10-) Duct
- 11-) Observation Glass
- 12-) Filter
- 13-) Bag Filter

NOTE: Product line has many variants. Depending on the project variation, the air handling unit may have different component selections. Your unit's whole shape and components may differ from this figure.

EVO MODULAR WITH ROTARY EXCHANGER SAMPLE LAYOUT



- 1-) Damper Motor
- 2-) Damper
- 3-) Observation Glass
- 4-) Filter
- 5-) Bag Filter
- 6-) Rotor
- 7-) Heater Coil
- 8-) Cooler Coil
- 9-) Drip Eliminator
- 10-) Fan Impeller
- 11-) Fan Motor
- 12-) Duct
- 13-) Outdoor Air

NOTE: Product line has many variants. Depending on the project variation, the air handling unit may have different component selections. Your unit's whole shape and components may differ from this figure.

1.6 Transport and Storage

DANGER ⚠

Do not stand under/near suspended loads while transporting air handling unit modules.

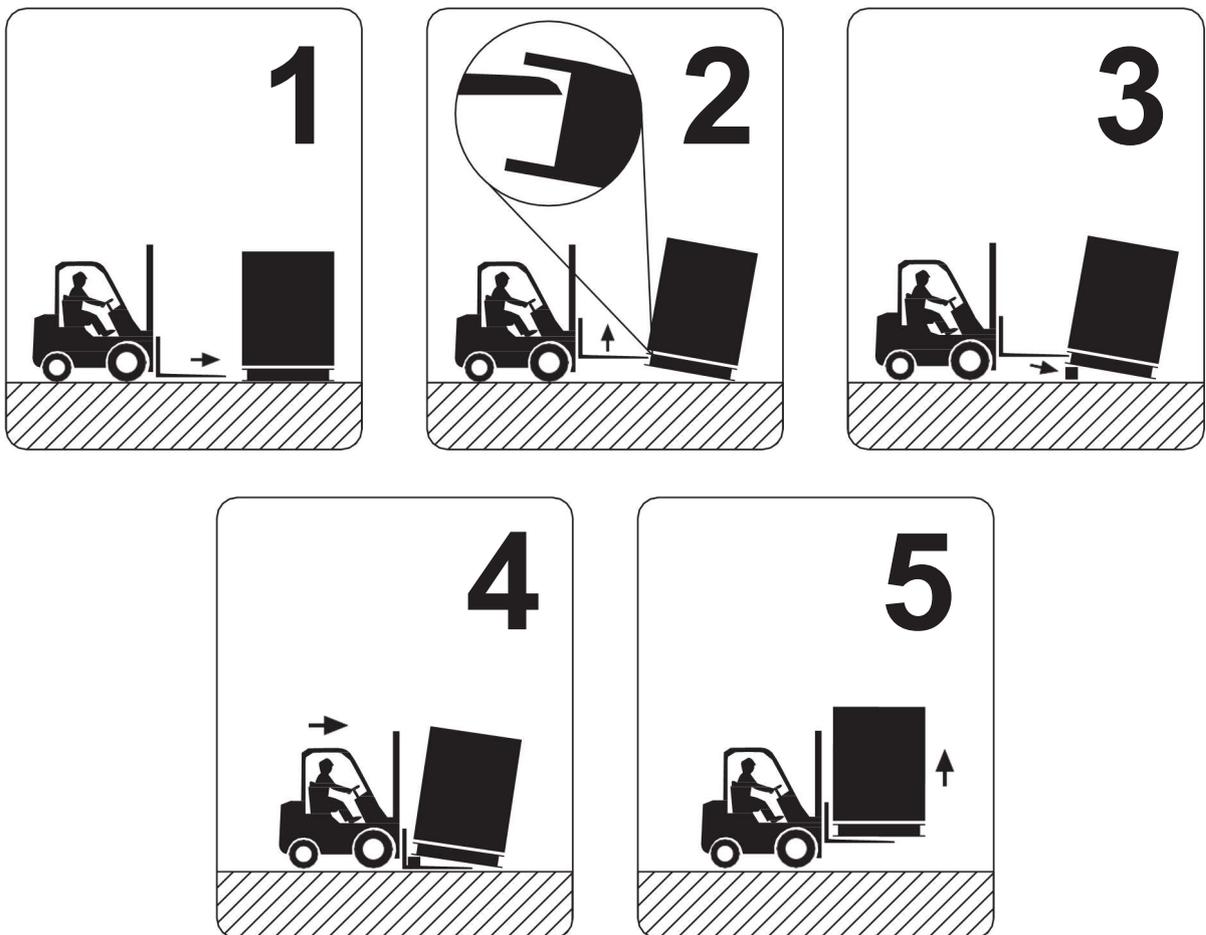
ATTENTION ⚠

The unit must never be lifted, pulled or pushed using any protruding parts other than the main frame, such as coils, dampers.

ATTENTION ⚠

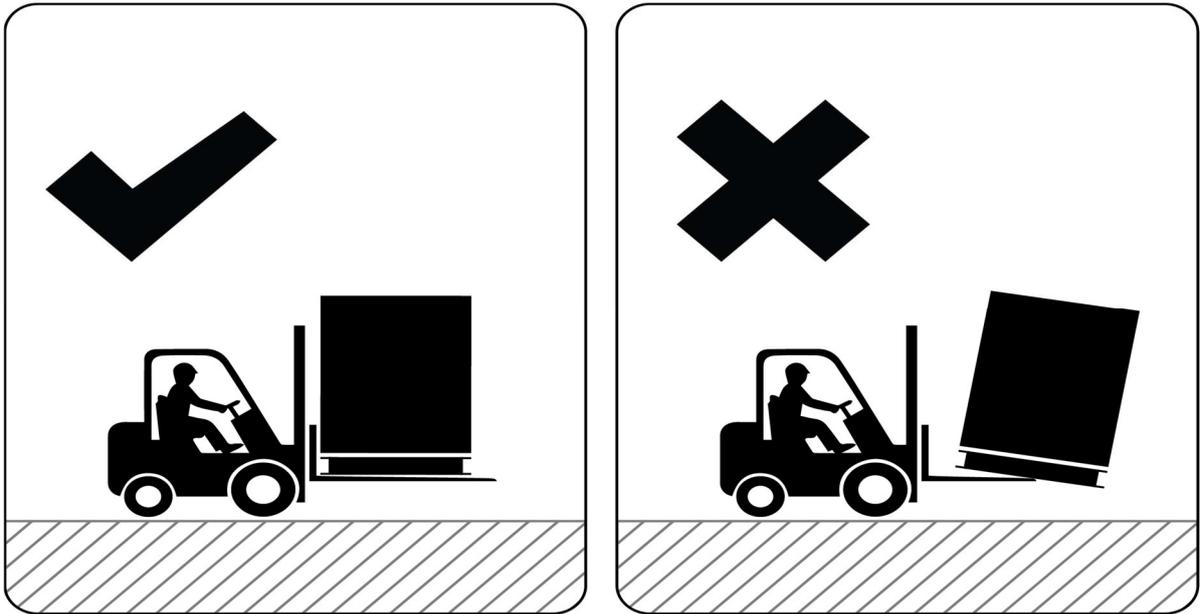
The unit must not be tilted during transport or lifting.

While the units are unloaded from the vehicle, the units should be taken to the forklift by placing wedges under the pedestal as described in the pictures below.

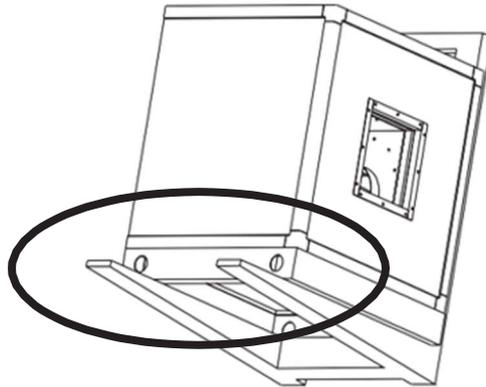


ATTENTION 

If a forklift is used during transportation, make sure that the forklift blades pass through the bottom of the units. Otherwise, it may damage the panels at the bottom of the units.

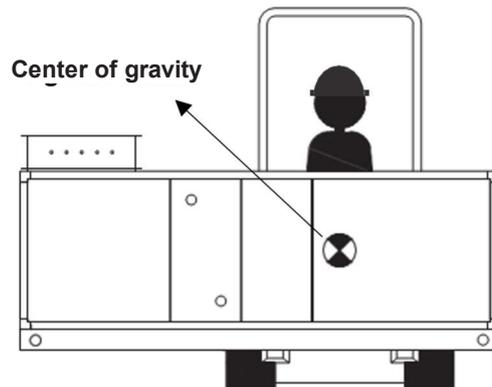


Forklift blades must be long enough to pass through the module completely!



ATTENTION 

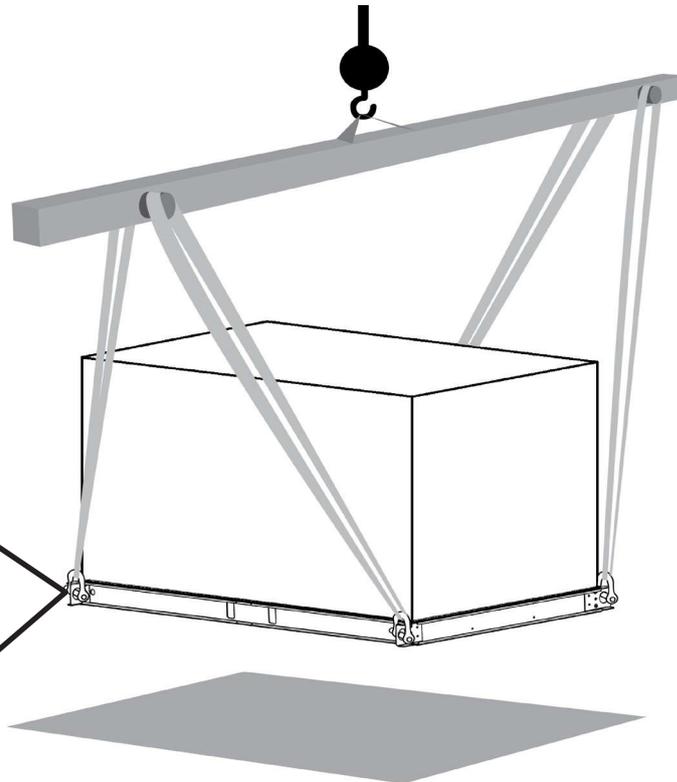
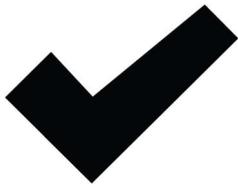
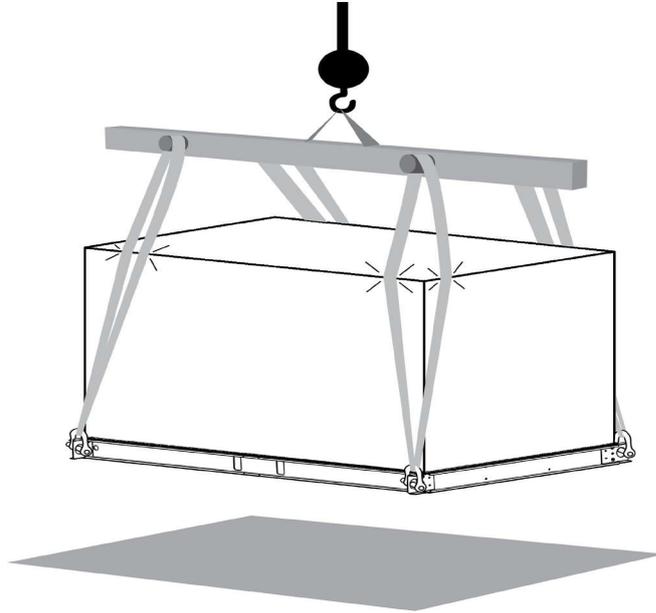
If the units are lifted with a forklift, the lifting operation should be carried out by considering the center of gravity of the module and making sure that the load is evenly distributed on the forklift forks. Be careful that the blades do not hit the panels and drain pan outlets.



ATTENTION 

If the module is to be moved with a crane, the lifting parts can be connected to the unit through a shaft that will pass through 30mm (standard) or 60mm (optional part) diameter holes on both sides of the pedestal. In crane operations, the connection details shown below should be considered and applied completely. AERA is not responsible for any damage that may occur otherwise.

Sample Application for Lifting from Pedestal



If air handling units will storage at construction sites or warehouses, warnings below should be taken into account.

- In order to avoid pollution, all gaps in the air handling unit must be covered. If stored in a wet environment, sufficient ventilation should be provided. Store components of air handling units in a dry and non-condensing place.
- Ensure that the air temperature is between -10°C and 40°C and the storage area is away from water.
- Nothing must be placed on the units. The units must not be walked on, and the materials that may damage the units must not stand on the units.
- Protruding parts of the units, such as coil connections and dampers etc, must be protected from damage.
- The product will be out of warranty if it is not stored in appropriate environments and conditions.

2. Assembly

Before starting the installation, the checklist in chapter 3 must be checked!

2.1 Assembly Area

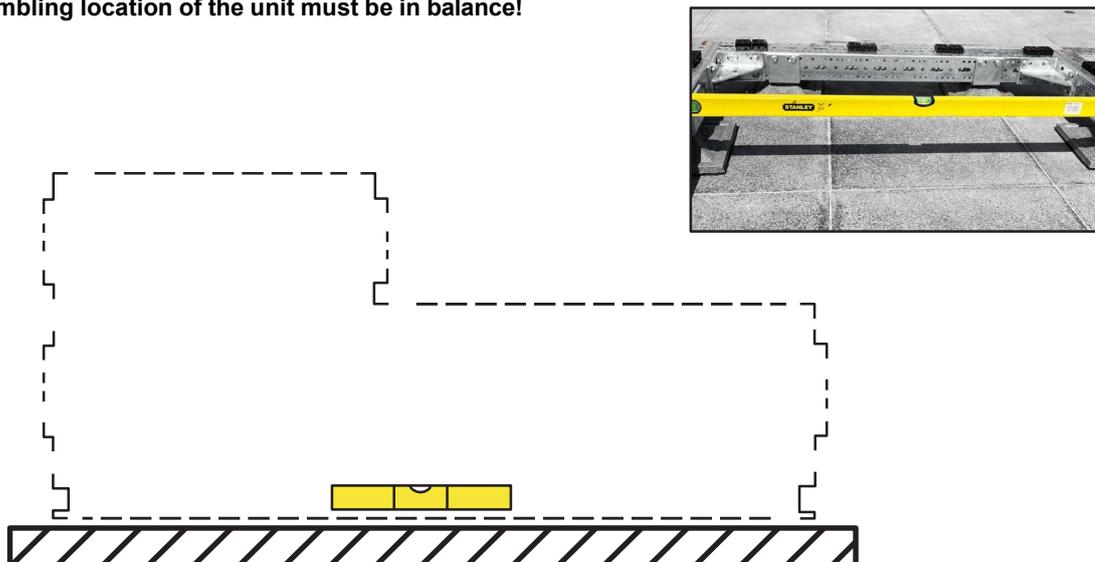
ATTENTION  Errors that occur when installing and assembling air handling units can potentially lead to fatal situations and cause serious physical damage. There is also a risk that the air handling unit may not function properly.

The installation place of the unit must be flat and balanced. If the floor is not stable, the air handling unit must be balanced with appropriate balancing elements. In the absence of suitable balancing elements, it is recommended to prepare the floor at least 10 cm above the ground as it will protect the device from rain and floods.

ATTENTION  As a result of assembling the air handling unit with imbalance, the air handling unit may not function properly. In this case, damages that may occur in the unit are not covered by the warranty.

Adjustable feet can be installed under the base of the unit in order to be able to adjust the balance of the unit more easily against planar irregularities that may occur at the installation place. Feet are supplied as accessories. If the unit is supplied with these feet, the balance of the unit can be adjusted with the 2 nuts on the feet.

The assembling location of the unit must be in balance!



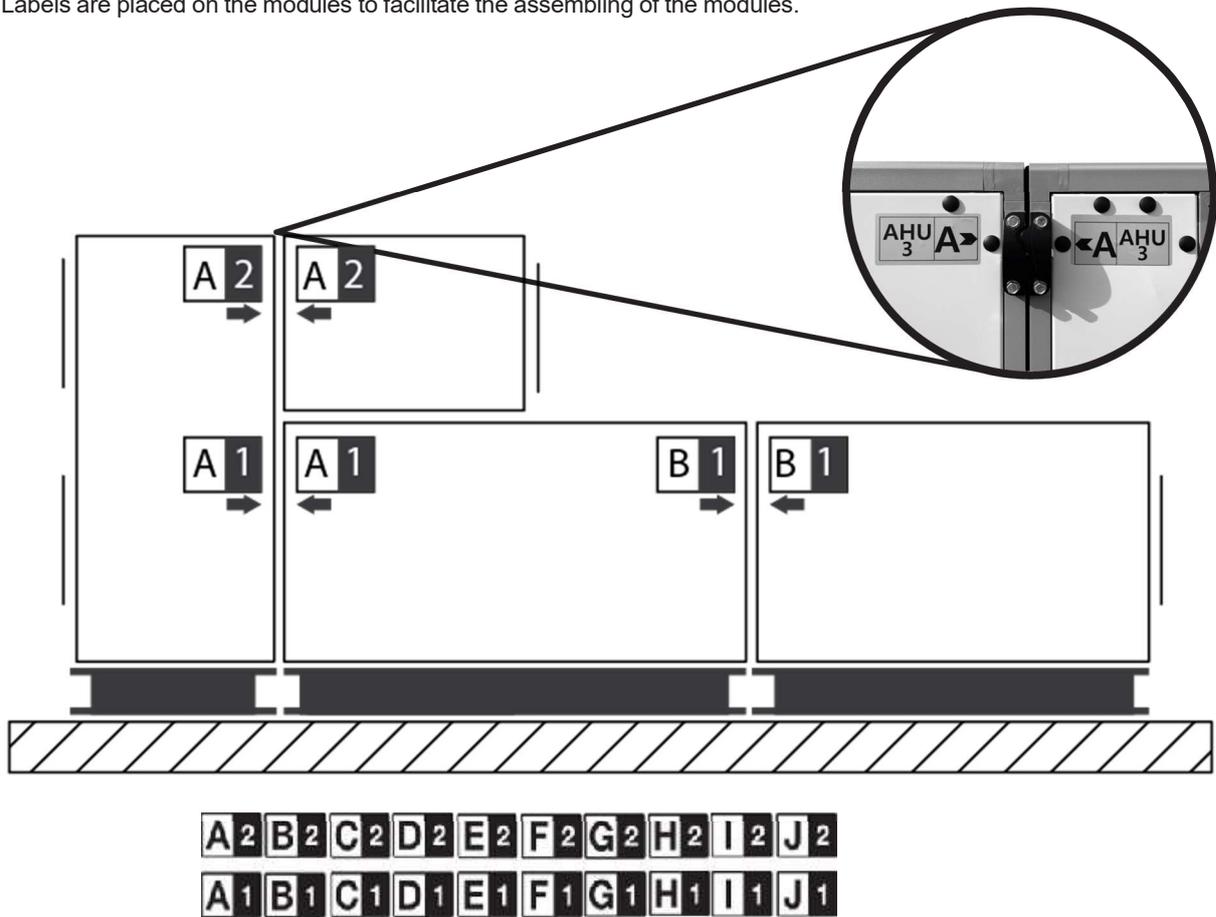
There should be enough space for the height of the siphon in the modules where the condensation pan is located. Check the "Siphon installation" chapter for further information.

In order to take out the components for reasons such as cleaning, maintenance and replacement, While locating the unit, gaps of appropriate sizes should be left around the unit. This space should be on the service side of the unit and at least 1.2 times the width of the unit.

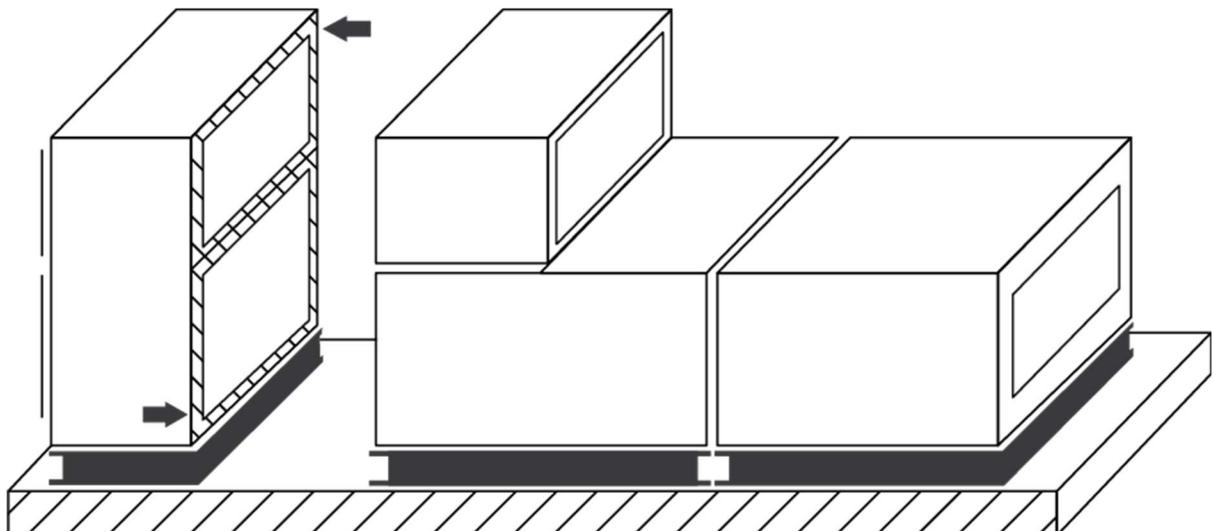
ATTENTION ⚠ If the units are to be operated in an outdoor application, they should be specified before the project selection and should be produced in accordance with the outdoor application. (weather protection sheet, high protection class component selection etc.). Otherwise, the unit should not be operated outside.

2.2 Module Labeling

Labels are placed on the modules to facilitate the assembling of the modules.

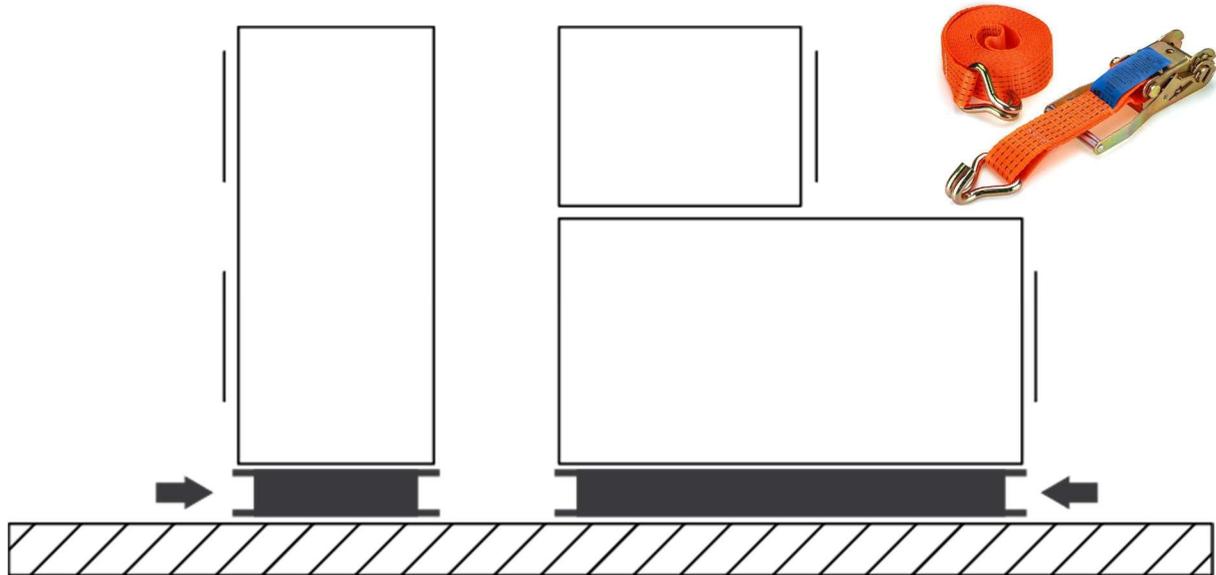


Sealing gaskets are applied between the modules of air handling units. Before the modules are combined, the gaskets should be checked and if there is any damage, replaced with new ones.



ATTENTION

The pedestal under the modules must be used to bring the modules close enough to each other! Fix a suitable tensioning strap to the pedestal and tighten the tensioning strap for this task. Make sure the modules get close enough with the base.

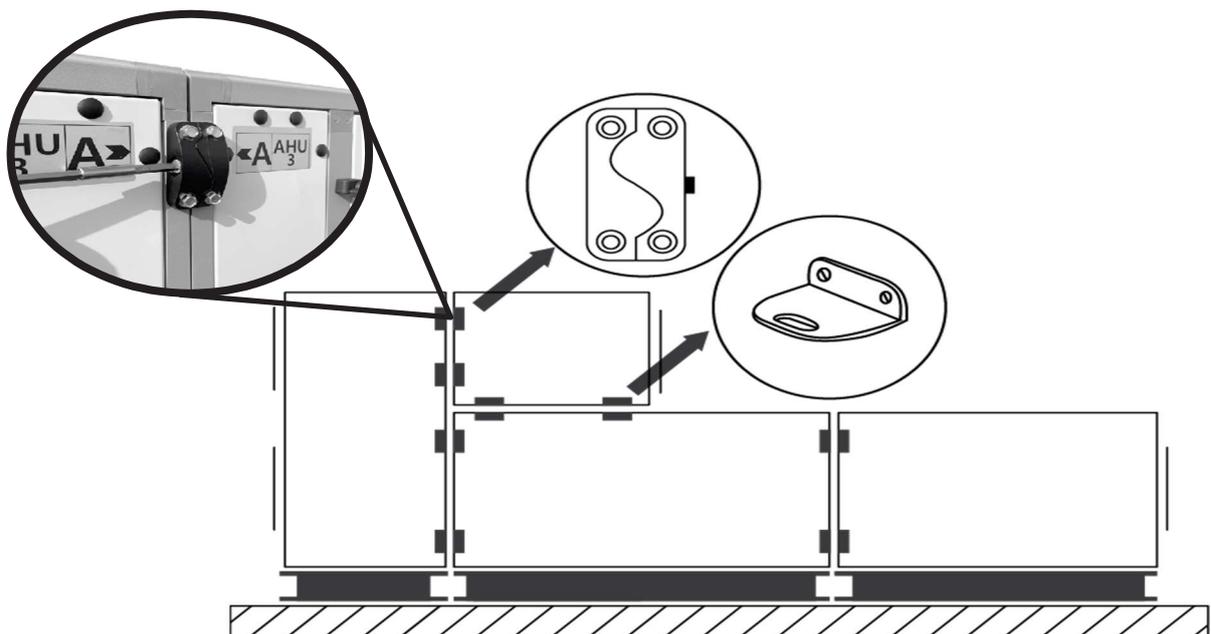


ATTENTION

Assembling with the tensioning strap should be done using only pedestal. Any protruding parts of the units (coil pipes, drainpipes, door handles, etc.) should not be used to move the modules. Otherwise, it may cause accidents and damage the air handling unit. If the units damaged during the assembly process on the panel, they will be out of warranty.

ATTENTION

There are cell combination elements on the modules. The allen-head bolts, on the side of the connection elements of modules shown with arrows in the picture, must be tightened sufficiently with a suitable hand tool.



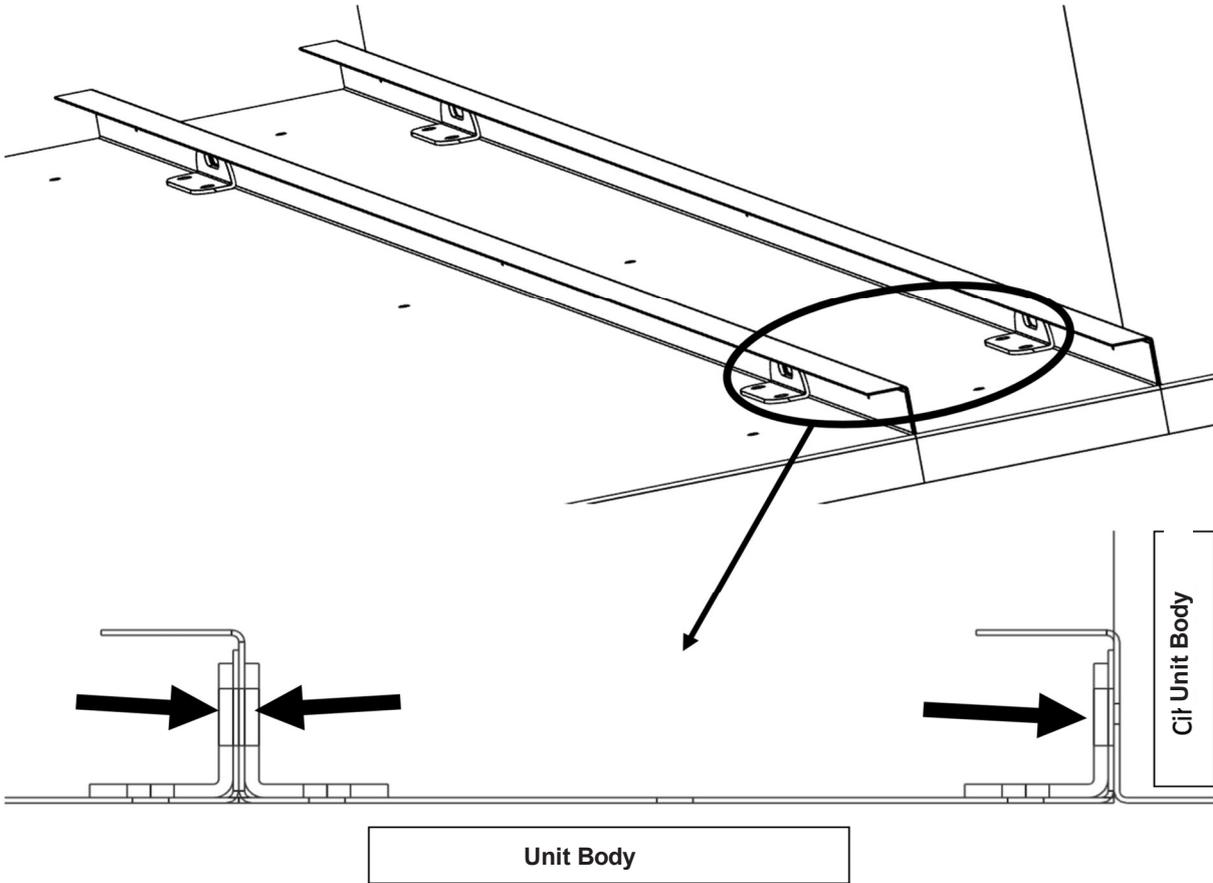
ATTENTION ⚠ Connecting elements of modules should only be used in order to tighten gaskets between modules after modules are brought close enough to each other.

ATTENTION ⚠ In air handling units produced as double-check, the connections between the floors should be made with connection sheets.

ATTENTION ⚠ Connection elements of modules should not be used before the modules are balanced and brought close enough to each other.

2.3 Installation of Weather Protection Sheets

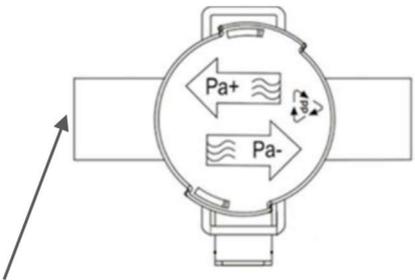
In air handling units that are specially demanded outdoor application, weather protection sheets are shipped as mounted on the unit. After the module combination process, these sheets should be fixed by using the sheets sent with air handling units.



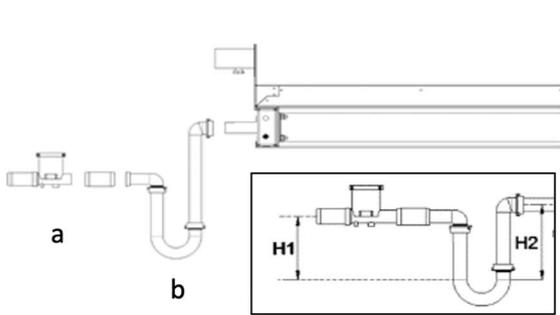
2.4 Ball Siphon Assembly

It is recommended to use a collective siphon in order to prevent undesirable substances such as dirt, sewage water, odors, etc. from entering the unit through the drain pan. There is a collective siphon in the additional shipping group of the air handling unit.

ATTENTION ⚠ Correct installation of the siphon is the responsibility of the client / contractor. AERA is not responsible for damages that may arise due to incorrect connection.

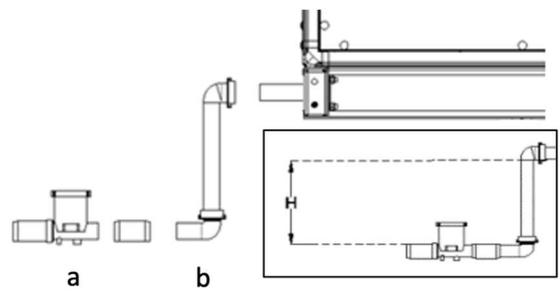


The side connected to the drain pan outlet.



Siphon Connection in Positive Pressure

- a. Siphon
- b. Elbow / S (Required if pressure is more than 600Pa)



Siphon Connection in Negative Pressure

- a. Siphon
- b. Elbow / S (Required if the pressure is less than -600Pa.)

System Pressure	H1	H2
1500 Pa	150 mm	110 mm
1400 Pa	140 mm	100 mm
1300 Pa	130 mm	90 mm
1200 Pa	120 mm	80 mm
1100 Pa	110 mm	70 mm
1000 Pa	100 mm	60 mm
800 Pa	80 mm	40 mm
600 Pa	60 mm	20 mm

System Pressure	Elbow Height (H)
1500 Pa	110 mm
1400 Pa	100 mm
1300 Pa	90 mm
1200 Pa	80 mm
1100 Pa	70 mm
1000 Pa	60 mm
800 Pa	40 mm
600 Pa	20 mm
< 600 Pa	-

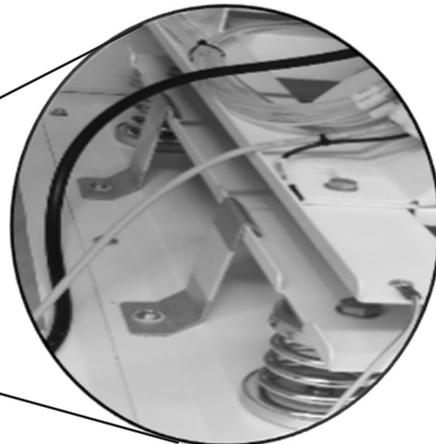
2.5 Removing of the Fan Fixing Parts

Fan bases are fixed to the unit frame with spring vibration insulators to prevent noise and vibration. Since this situation may cause damage to the unit by undesirable vibrations during shipment, the fan bases are fixed to the unit frame via a fixing sheet at the factory. The sheets must be removed before the fans are operated.

ATTENTION



The units may be damaged if operated without the fixing sheet of fan Insulators removed. AERA is not responsible for any damages that may occur due to the failure to remove the sheets.



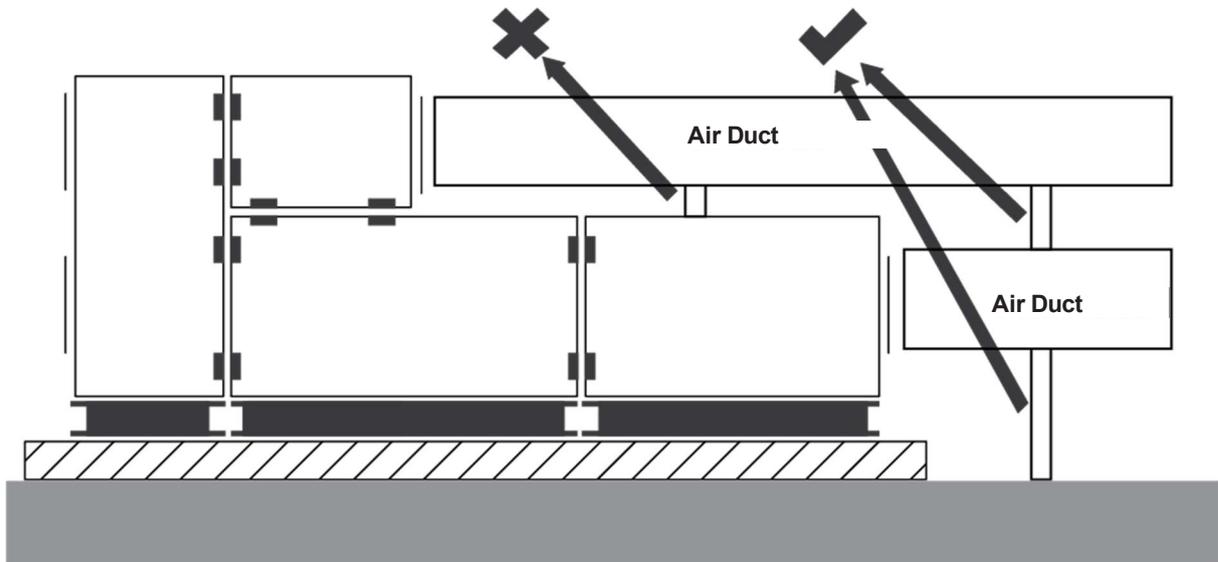
2.6 Duct Mounting

Air suction and blow nozzles on the unit should be connected to air ducts with flexible duct elements. While installing flexible duct elements, make sure that the flanges on the unit and the connection flanges of the air duct are on the same axis.

The length of the assembled flexible connector should be approximately 75% of the stretched length.

ATTENTION ⚠ Weights of ducts should never be carried to dampers and flanges. Instead, fixed headstock supports should be placed on the ceiling or the floor and carried to these holders. Otherwise, the dampers may not work properly and the unit may be damaged.

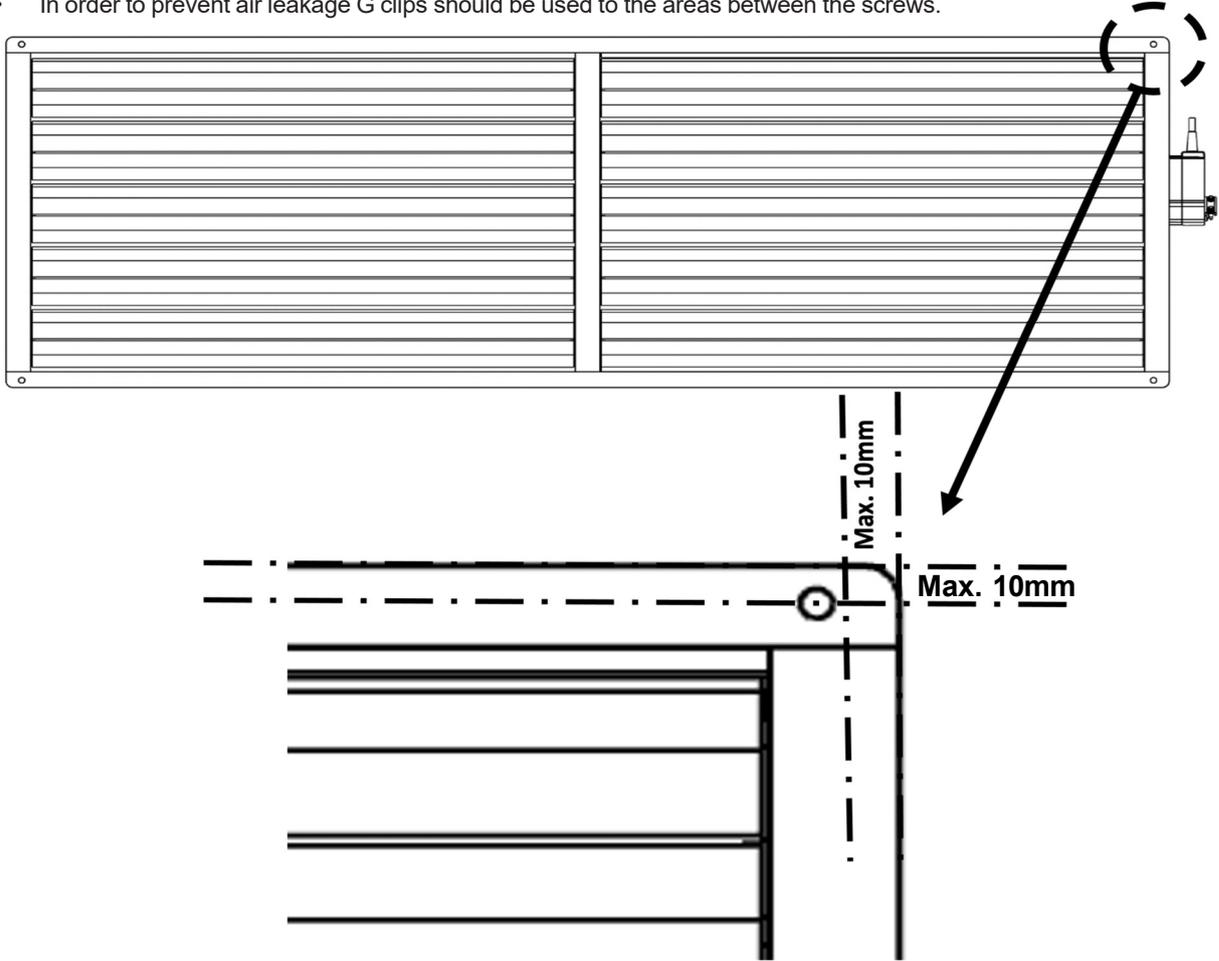
ATTENTION ⚠ Duct connection supports should not be connected to the unit frame. Using the unit frame as support equipment may cause panel damage! AERA is not responsible for any damages that may occur in such cases.



ATTENTION

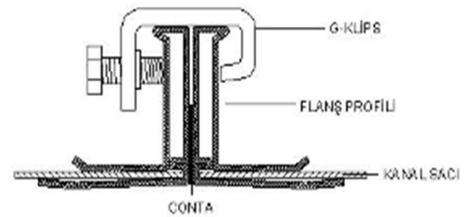
Care should be taken when connecting ducts to the dampers in the openings of the device to the outside. If the screws get stuck in the gear of the damper mechanism, the damper will not work. Therefore, the following points should be considered in the duct mounting to be made on dampers.

- The duct connection of the dampers should be made via the bolt holes in the corners.
- Gaskets must be applied between dampers and duct connections.
- In places other than these holes, the screws should be tightened in a way that they are a maximum of 10mm inside from the edge.
- In order to prevent air leakage G clips should be used to the areas between the screws.



ATTENTION

Gaskets must be used between the duct and damper and flange connection surfaces. In order to tighten the gaskets properly, G-Clips should be placed on the connections at a maximum of 25 cm intervals.

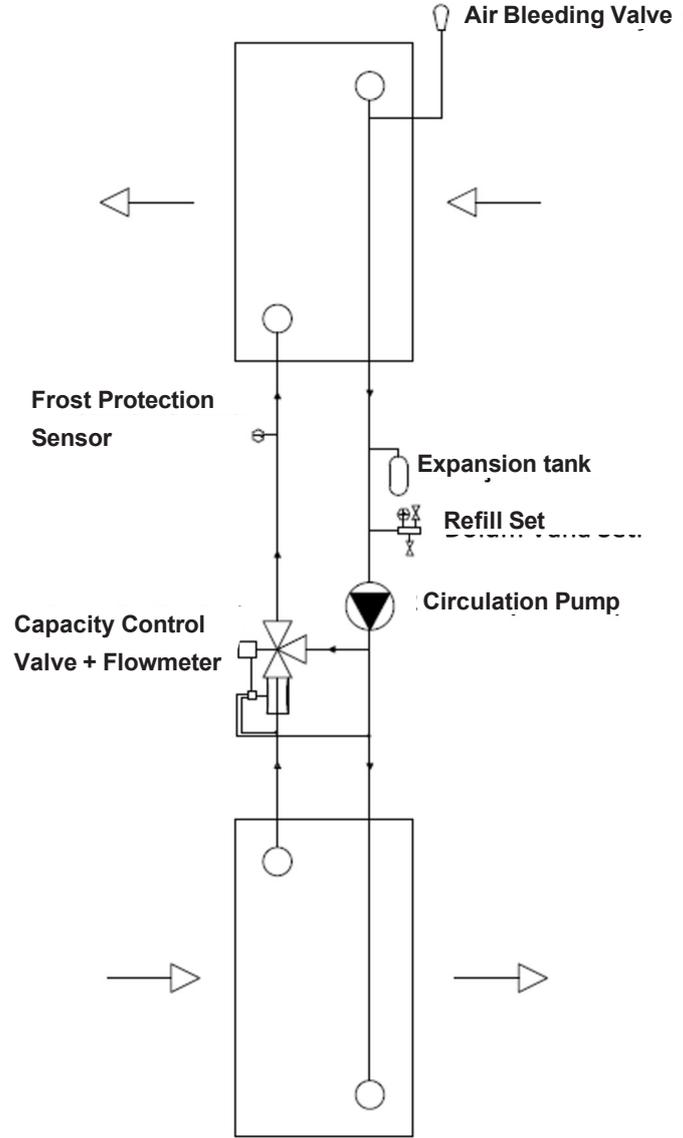


Duct connections on the unit are indicated with the labels below. While making the connection, make sure that the correct duct is connected to the right place.



2.7 Connection of Run Around Heat Recovery System

In air handling units with a coil heat recovery system, the connection between the coils should be made in the construction site and in accordance with the diagram below.



2.8 Coil Connections

DANGER ⚠

Coils may contain extremely hot water. Care must be taken before pumping water into the system and during air removal.

Depending on the project selection, the air handling unit may have water heating and / or water-cooling coil.

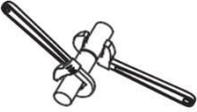
The water inlet and outlet lines of the heater and cooler are labeled in such a way that the water inlet is on the air outlet side. The assembly should be made as per these marks. Incorrect connection causes loss of capacity in the heat exchanger.



- The coil should be carefully unpacked and cleaned if necessary.
- Before installation, caps and/or other protectors on the pipe nozzle must be removed. After this process, the product should not be exposed to open air to prevent water ingress into the pipe, as this may cause oxidation or freezing explosion.
- Inlet and outlet connections should not be fixed in a way not to allow expansion, appropriate expansion opportunities should be allowed to prevent damages caused by thermal expansion.
- When the coil is empty and cold, the hot fluid should not be suddenly given to the coil.
- During filling, the vent nozzle of the coil should be opened and ensured that the fluid is filled into the coil.
- After that, the air relief valve should be closed and the coil should be brought to operating temperature gradually.
- The coil should be pressurized gradually and watch out for leaks or other problems. At the first sign of such problems, the filling process should be stopped immediately and the unit turned off.
- The system installer is responsible for the execution of the installation process and safety precautions in accordance with current, valid standards and instructions.
- Assembly and installation should only be made by experts in one's field.
- Care should be taken not to damage the pipes and connections during the installation of the coils.
- The mounting position of the heat exchanger should be in accordance with its design.

ATTENTION 

While tightening the coil connections, it must be tightened by making contra, since there is a risk of rotation/torsion of the inner part of the pipe. Torsions that will occur if it is not tightened by making contra may make the coil unusable! AERA is not responsible for any damage that may occur as a result of non-contra connections!



All pipes of installation and coil connection must be insulated.

ATTENTION 

A particle filter must be used when pumping water into the installation. In case of pumping water without this filter, blockages may occur in the coil.

ATTENTION 

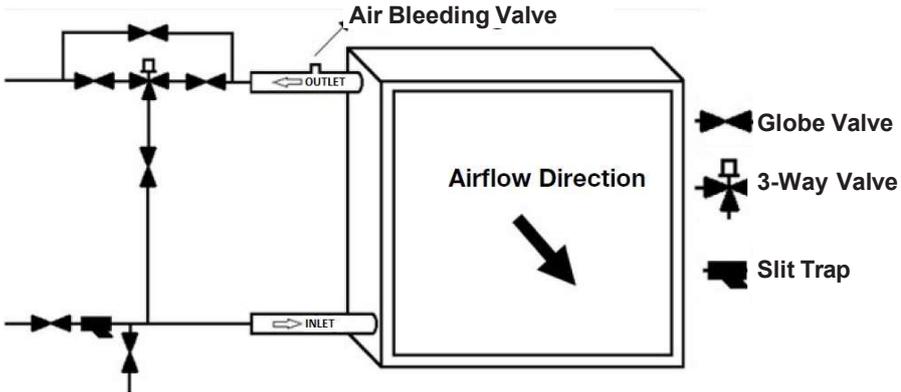
Since the coils that contain water are at risk of freezing during the winter months, precautions must be taken. Even if the water is drained, it may not be enough just water discharge, as some water may remain in the heating and cooling coils. Based on this;

- The amount of antifreeze (glycol) recommended in the mechanical installation calculations can be added to the system,
- Circulation pumps can be operated continuously,
- It can be ensured that the water is completely drained.

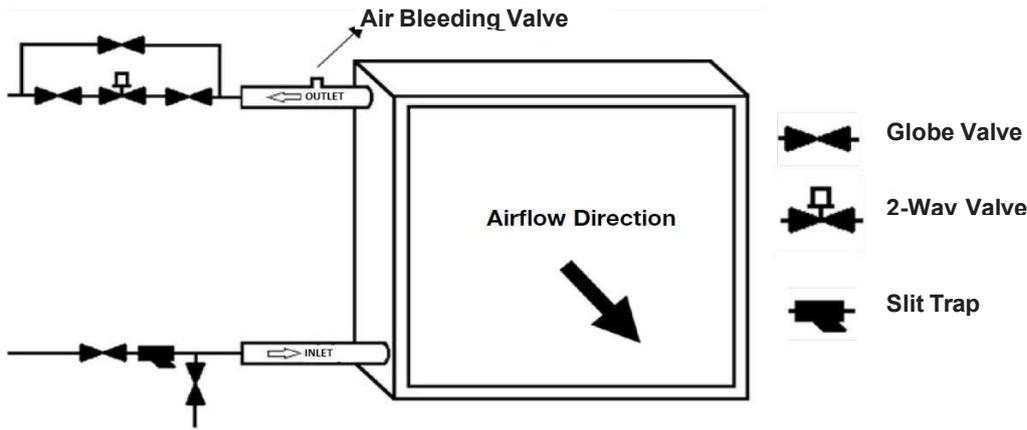
ATTENTION 

The weight of the supply water installation pipes must be carried in such a way that they do not affect the pipes of coils. Otherwise, leakages may occur at the coil pipe connections.

3-Way Valve Connection



2-Way Valve Connection



The refrigerant inlet and outlet lines of the direct expansion coil are labelled on the unit, it is important to pay attention to these labels during assembly.

Connection of DX coil with AHUKIT and VRF outdoor unit should be made by AERA technical service or authorized personal.

2.9 Humidifiers

2.9.1 Steam Humidifiers

Steam diffusers of steam humidifiers are shipped as mounted inside the air handling unit. However, steam generating units are sent together with the air handling unit as a package. The installation of these units should be carried out by the customer in a weather-protected area!

ATTENTION

Humidifier installation and usage instructions are sent with the humidifier. These usage and installation manuals that come out of the humidifier box must be strictly followed.

2.9.2 Direct Injection Humidifier

For direct injection humidifiers, atomizers are mounted inside the air handling unit. However, the pump group is sent together with the air handling unit. The connection between the pump group and the atomizers is the responsibility of the client.

ATTENTION

Humidifier installation and usage instructions are sent with the humidifier. These usage and installation manuals that come out of the humidifier box must be strictly followed.

2.9.3 Evaporative Humidifiers

The units are sent with the humidifiers assembled. The connection between the pump group and the humidification unit is the responsibility of the customer.

ATTENTION

Instructions for installation and use of the humidifier are available in the user manual that comes with the humidifier. This installation manual, which comes out of the humidifier box, must be strictly followed.

2.10 Electrical Heater

Electric heaters are delivered to you as mounted inside the unit and with all internal electrical connections made. Electrical supply must be ensured in accordance with the electrical schemes sent to the automation panel of units.

DANGER ⚠

The electrical connection of the unit should only be made by qualified electricians.

DANGER ⚠

Before all electrical assembly operations, the main supply panel must be de-energized and it must be ensured that it will not be energized accidentally.

2.11 External Sensors

If sensors such as humidity, air quality, smoke etc. are requested specifically for the project, those that will be mounted inside air handling units are assembled at the factory. However, sensors placed in the duct or air-conditioned areas are sent with the air handling unit as an additional shipping group. In this case, it is the customer's responsibility to connect the sensor to the empty terminals on the panel in accordance with the automation schemes in the unit automation panel.

DANGER ⚠

Before making the sensor connections, the power should be cut off from the main supply panel and it should be ensured that it will not be energized accidentally.

2.12 Electrical Connections

2.12.1 Air Handling Unit with Automation Equipment

CAUTION ⚠

Ground the unit and be sure to install a ground fault circuit breaker. Fault circuit and grounding resistance should be according to local laws and regulations. Failure to install a ground fault circuit breaker may cause electric shocks and fire. Incomplete grounding may cause electric shocks.

CAUTION ⚠

The electrical connection should only be made by an authorized electrician according to the wiring diagrams below.

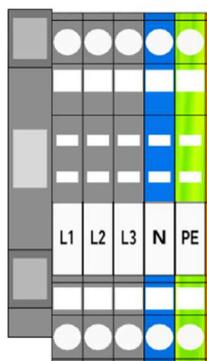
CAUTION ⚠

The unit must be completely isolated from the mains power supply before any maintenance and installation or before opening the device!

CAUTION ⚠

The electrical connection must be completely isolated from the mains power supply till the installation is complete!

The unit is equipped with a main switch, which can be secured against unauthorized switching with a padlock. Relevant standards of local electricity supply companies, safety regulations and technical connection conditions must be complied.



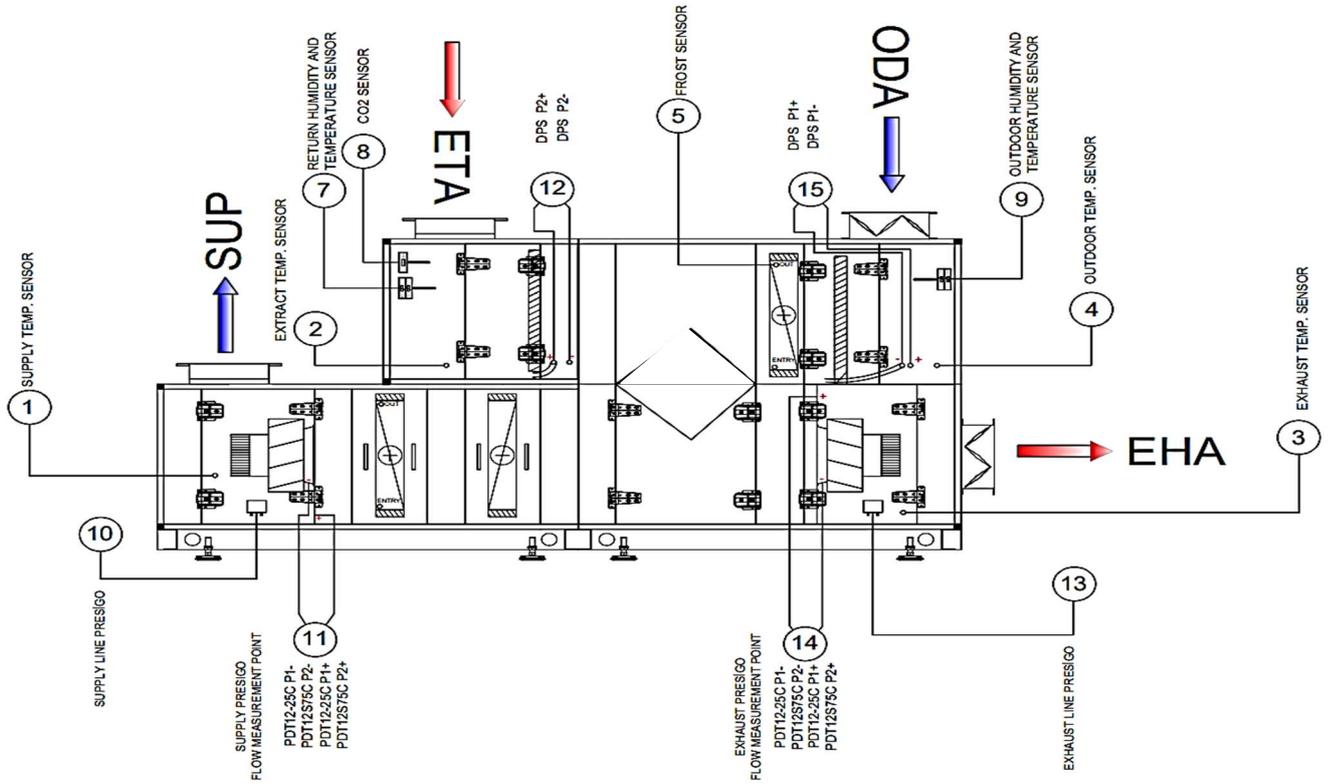
Automation Panel

- Open the cover of the panel box on the top of the unit.
- Plug your power cable into the terminal shown above.
- Turn the switch to the right so that the energy can be supplied to the system.

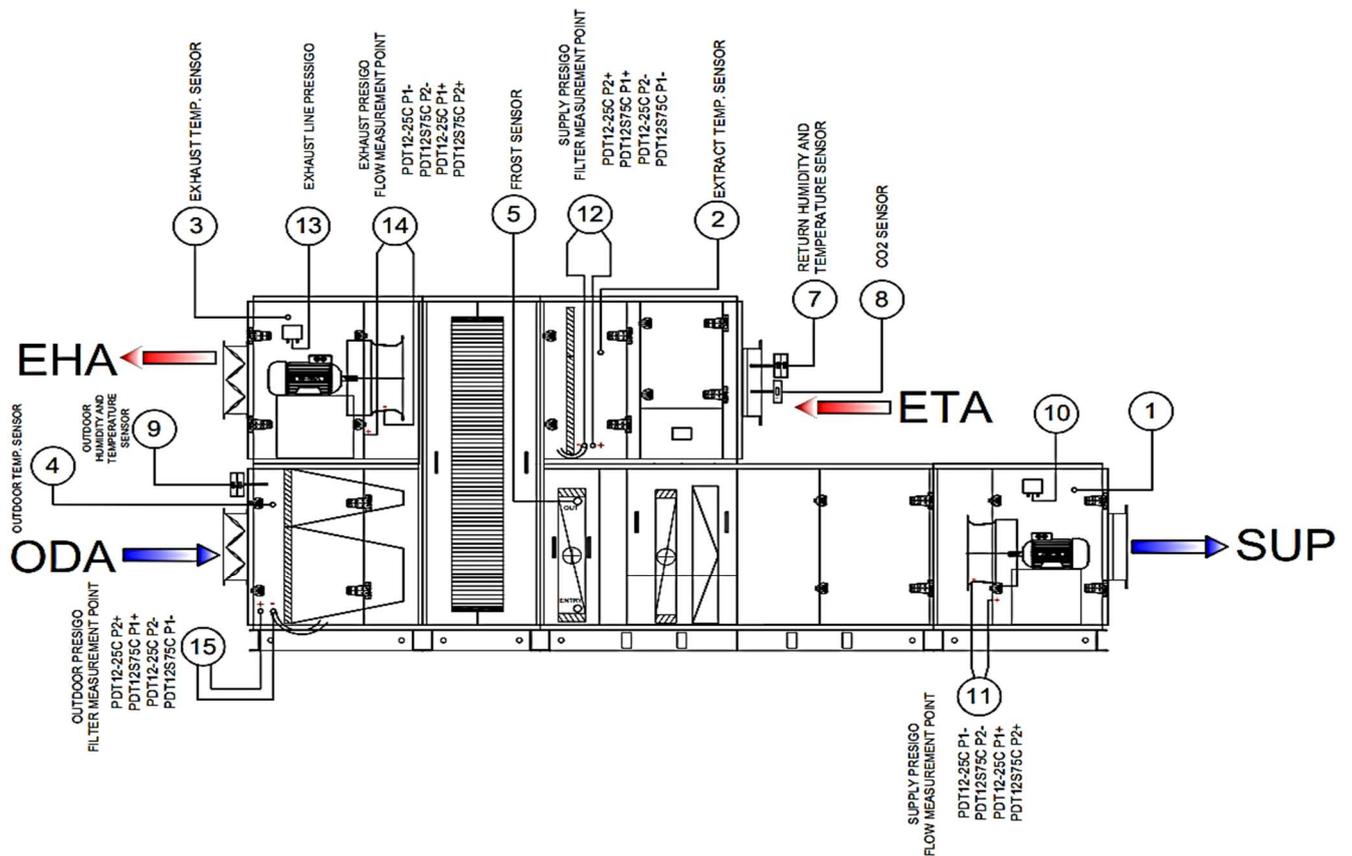
2.12.1.1 Type of Units

NOTE: Product line has many variants. Depending on the project variation, the air handling unit may have different component selections. Your unit's whole shape and components may differ from this figure.

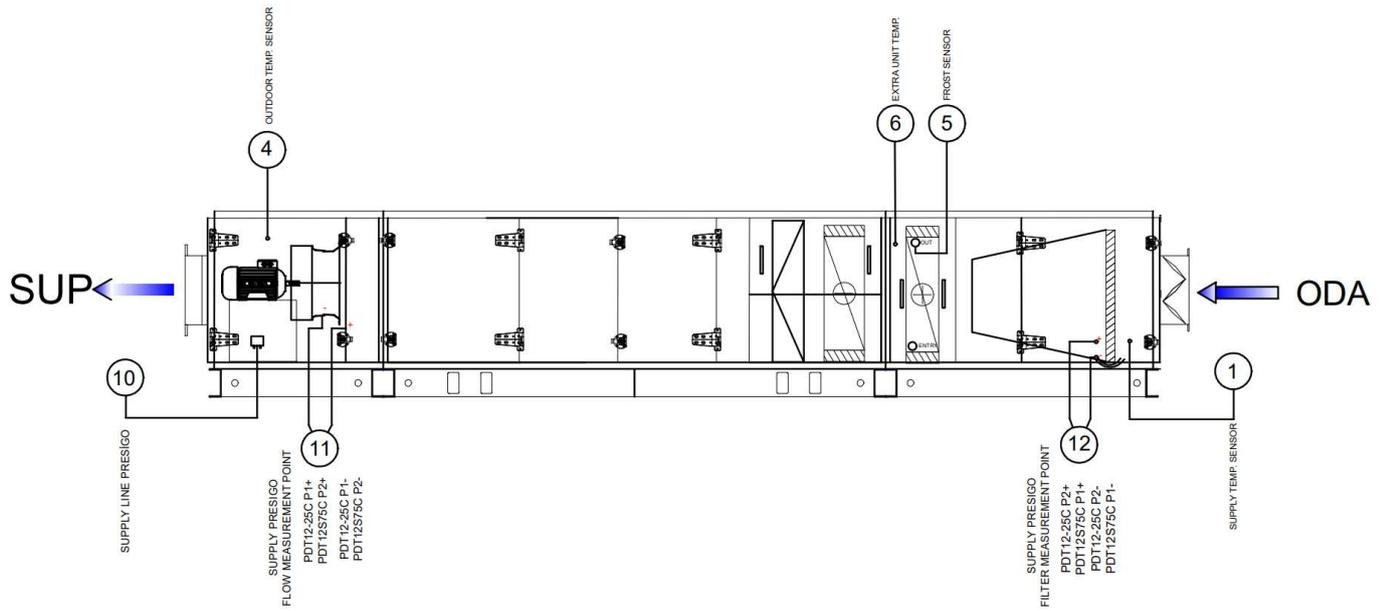
Crossflow Plate Heat Exchanger



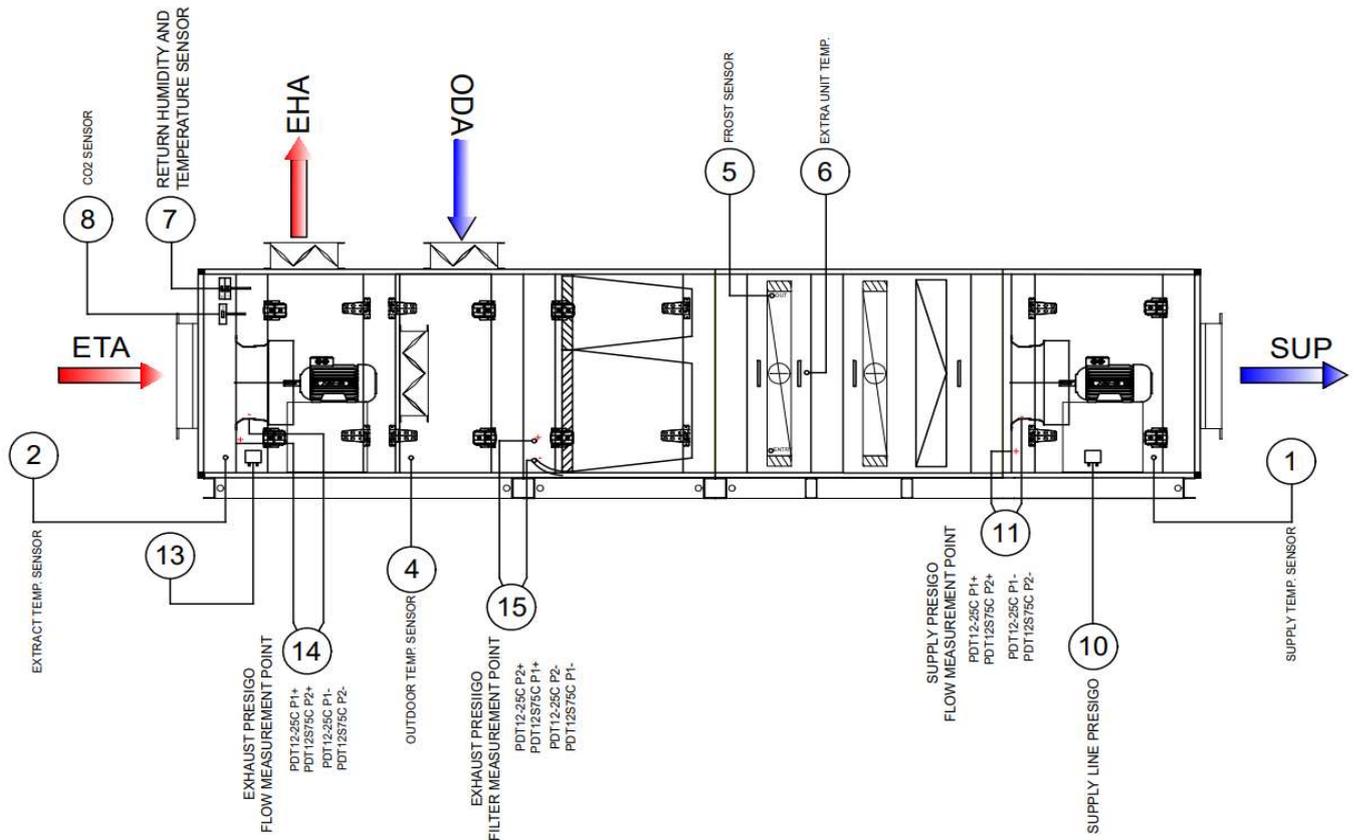
Rotary Heat Exchanger



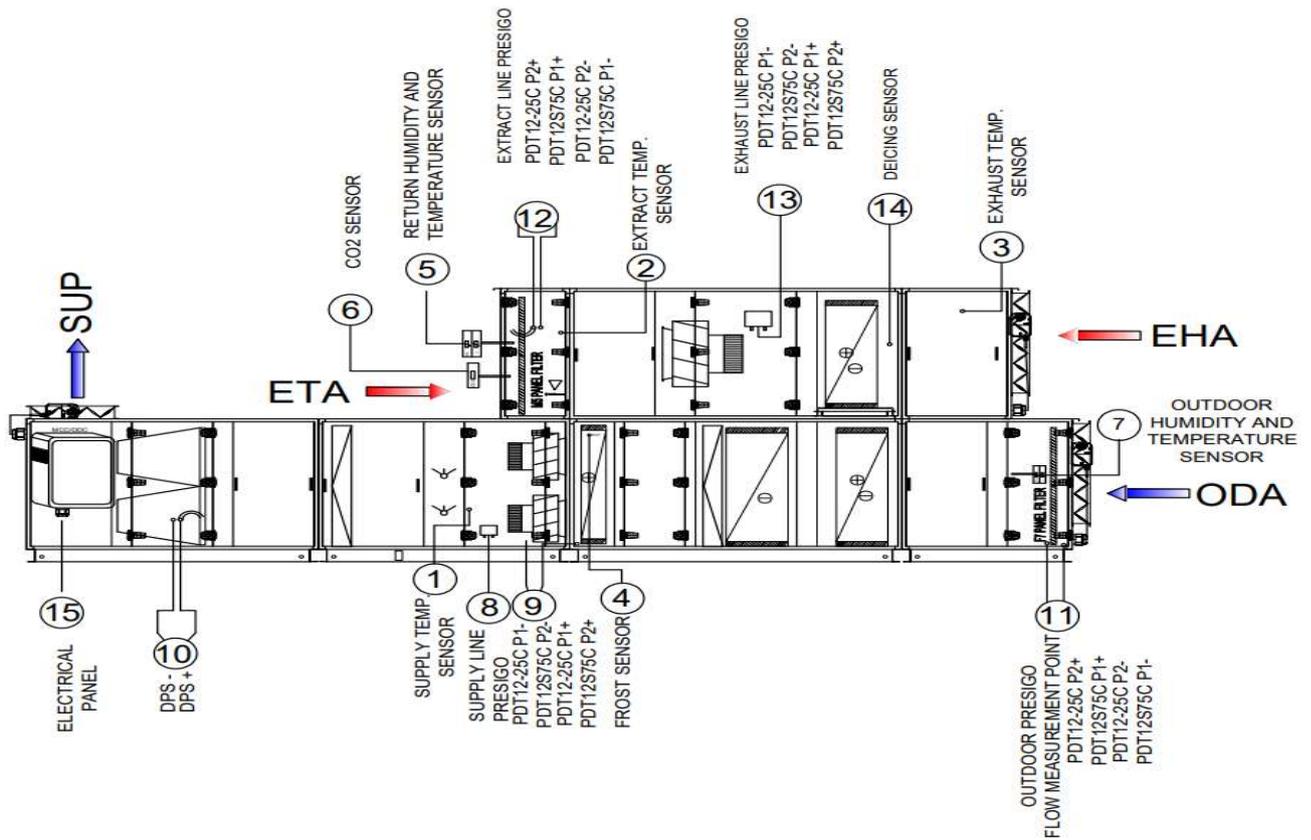
%100 Fresh Air Units



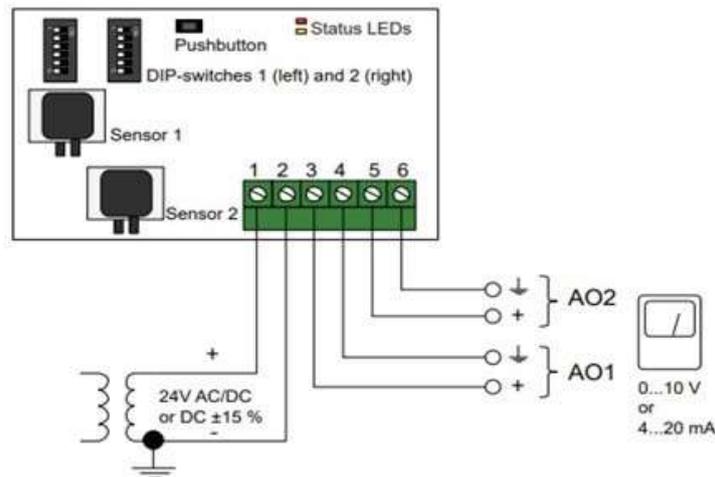
Fresh Air With Mixing Damper Units



Run Around Coil Units



2.12.1.2 Pressure Differential Transmitter (PDT) Connection



Wiring for models with two sensors

Pushbutton

Quick press: Zero-set pressure sensors.

Disconnect the pressure ports before zeroing. Let the unit warm up for 10 minutes before attempting the procedure. Zeroing usually takes a few seconds. The yellow LED will light up while the zeroing operation is in progress.

If the yellow LED starts blinking during the zeroing procedure, the unit has failed to zero-set properly. If so, ensure that the pressure ports are open and unobstructed and then power-cycle the unit and try again.

If the procedure still fails, a sensor error is present and the unit must then be replaced.

Long press (10 s): Reset to factory settings. (**DON'T IF YOUR DEVICE INCLUDES MORE THAN 2 PDT !**)
 The red and yellow LEDs will flash alternating for the duration of the operation. The unit will then reset and restart.

Status LED

The red status LED will light up at power-on and go out shortly thereafter when the on-board sensory circuitry is ready for operation.
 Blinking red LED after power-up: The unit has lost important system settings and must be taken back to the factory for reprogramming.
 Steady red LED during normal operation: The unit is damaged and should be returned or discarded.

DIP-switches

The transmitter features one or two groups of DIP-switches for setting up suitable pressure range, output function and damping time factor. If the DIP-switch settings are changed, all changes will take place immediately. If a factory reset is performed, the pressure sensors will be reset to the factory calibration.

2.12.1.3 Two Way Valve Electrical Connection

Proportional Control

CAUTION ⚠ The electrical connection must be completely isolated from the mains power supply till the installation is complete!

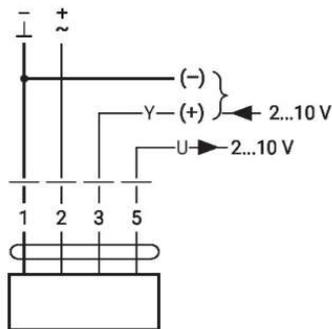
CAUTION ⚠ The electrical connection should only be made by an authorized electrician according to the wiring diagram above.*

Wire colours:

- 1 = black
- 2 = red
- 3 = white
- 5 = orange

Wiring diagrams

AC/DC 24 V, modulating



1	2	3 (a)	3 (b)	
				A - AB = 100%
				A - AB = 0%
			2 V	A - AB = 0%
			10 V	A - AB = 100%

- Black is negative.
- Red is 24V positive.
- White cable is 2-10V for proportional control.**

** Check the AERA Unit electrical panel for the terminal connection diagram.

ATTENTION ⚠ *Valve actuator model and electrical connections may vary and depends on your product.

ON / OFF Control

CAUTION



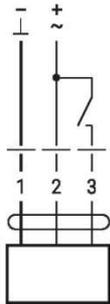
The electrical connection must be completely isolated from the mains power supply till the installation is complete!

Wire colours:

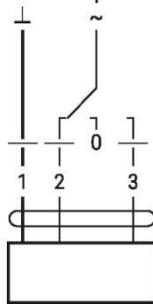
- 1 = black
- 2 = red
- 3 = white

Wiring diagrams

AC/DC 24 V, open/close



AC/DC 24 V, 3-point



1	2	3	
			A - AB = 0%
			A - AB = 100%
			stop
			A - AB = 100%

CAUTION



The electrical connection should only be made by an authorized electrician according to the wiring diagram above.*

- Black is negative.
- Red is 24V positive.
- White cable is 24V for ON-OFF control.**

** Check the AERA Unit electrical panel for the terminal connection diagram.

ATTENTION



*Valve actuator model and electrical connections may vary and depends on your product.

You can contact AERA Technical Service at aftersales@aera.com.tr for any questions and information needed.

2.12.1.4 Damper Motor Electrical Connection

Proportional Control

CAUTION



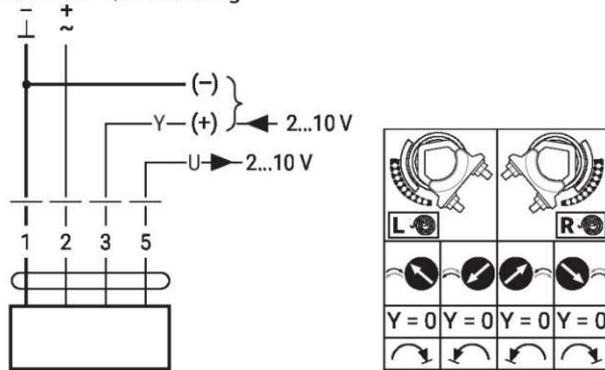
The electrical connection must be completely isolated from the mains power supply till the installation is complete!

Wire colours:

- 1 = black
- 2 = red
- 3 = white
- 5 = orange

Wiring diagrams

AC/DC 24 V, modulating



CAUTION



The electrical connection should only be made by an authorized electrician according to the wiring diagram above.*

- Black is negative.
- Red is 24V positive.
- White cable is 2-10V for proportional control.**

** Check the AERA Unit electrical panel for the terminal connection diagram.

ATTENTION



*Damper motor model and electrical connections may vary and depends on your product.

ON / OFF Control

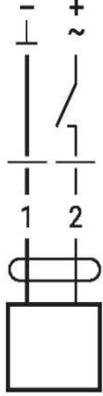
CAUTION



The electrical connection must be completely isolated from the mains power supply till the installation is complete!

Wiring diagrams

AC/DC 24 V, open/close



CAUTION



The electrical connection should only be made by an authorized electrician according to the wiring diagram above.*

- Black is negative.
- Red is 24V positive for ON-OFF control.**

** Check the AERA Unit electrical panel for the terminal connection diagram.

ATTENTION



*Damper motor model and electrical connections may vary and depends on your product.

You can contact AERA Technical Service at aftersales@aera.com.tr for any questions and information needed.

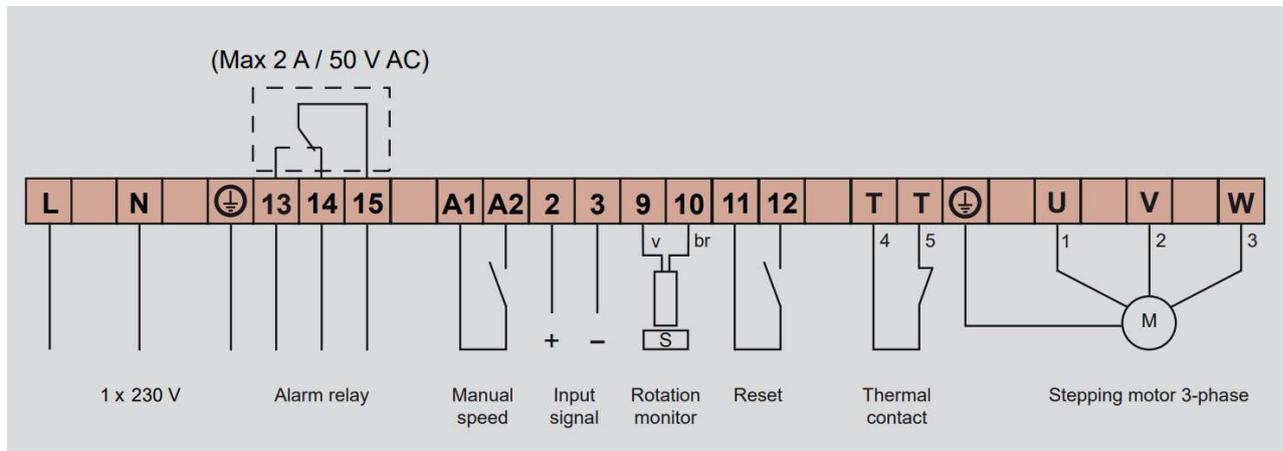
2.12.1.5 Rotor Control Unit Connections

DANGER ⚠

The electrical connection of the unit should only be made by qualified electricians.

DANGER ⚠

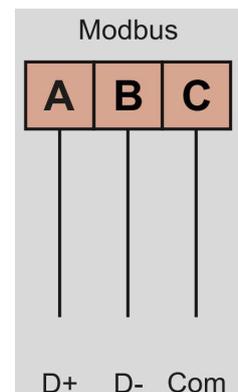
Before all electrical assembly operations, the main supply panel must be de-energized and it must be ensured that it cannot be energized accidentally.



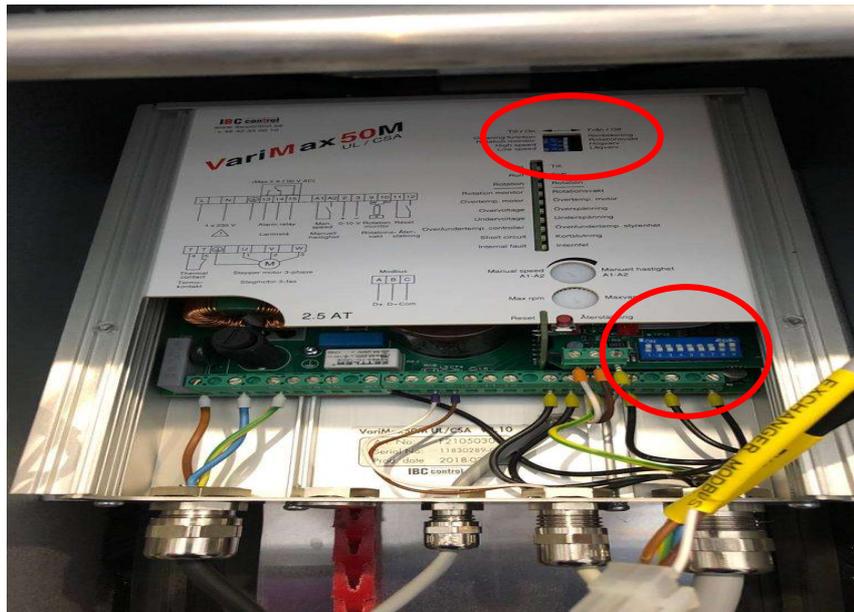
Power Supply	L	Black	Phase
	N	Blue	Neutral
	PE	Yellow – Green	Protective Earth
Control	A	Brown	RS485 A, Positive channel
	B	White	RS485 B, Negative channel
	C	Yellow	Common, Earth
Motor	U	Black	Motor Phase 1
	V	Brown	Motor Phase 2
	W	Gray	Motor Phase 3
	PE	Yellow – Green	Protective Earth
Relay	13	White	Normally Closed
	14	White	Normally Open
	15	White	Common

Varimax rotor control units are controlled through the Modbus RS485 or input signal. Your unit may differ.

Modbus Data	Data Rate	9600(default) – 19200 – 38400 – 56000
	Bit Format	8 Databits, 1 stop bit, even parity 8 Databits, 1 stop bit, no parity 8 Databits, 2 stop bit, no parity 8 Databits, 1 stop bit, odd parity
	Address	8 unique addresses
	Termination	120 Ω Optional embedded terminal resistance
	Inputs	Sensor A (D+), Sensor B (D-), C = Common



Modbus Control



CAUTION

The electrical connection should only be made by an authorized electrician according to the wiring diagram above.

- L1 phase and N neutral should be connected to power supply and PE earth should be connected to ground.
- Motor phases U, V and W should be connected to correct terminals.
- Connect the Thermal Contacts (NC).
- Put the Cleaning Function and Rotation Monitoring switches to ON position.
- Put the 1, 8 and 9 number switches to ON position for Modbus control activation.
- When the connections are correct and unit has power, rotary exchanger is ready to start with Modbus command.

*Contact AERA for Modbus registers.

0-10V Analog Control

CAUTION

The electrical connection should only be made by an authorized electrician according to the wiring diagram above.

- L1 phase and N neutral should be connected to power supply and PE earth should be connected to ground.
- Motor phases U, V and W should be connected to correct terminals.
- Connect the Thermal Contacts (NC).
- Connect the 2 and 3 to 0-10V Analog signal.
- Put the Cleaning Function and Rotation Monitoring switches to ON position.
- Put the 1 number switch to OFF position for deactivation of Modbus control.
- When the connections are correct and unit has power, rotary exchanger is ready to start with 0-10V variable control.

* Check the connection diagram for wiring.

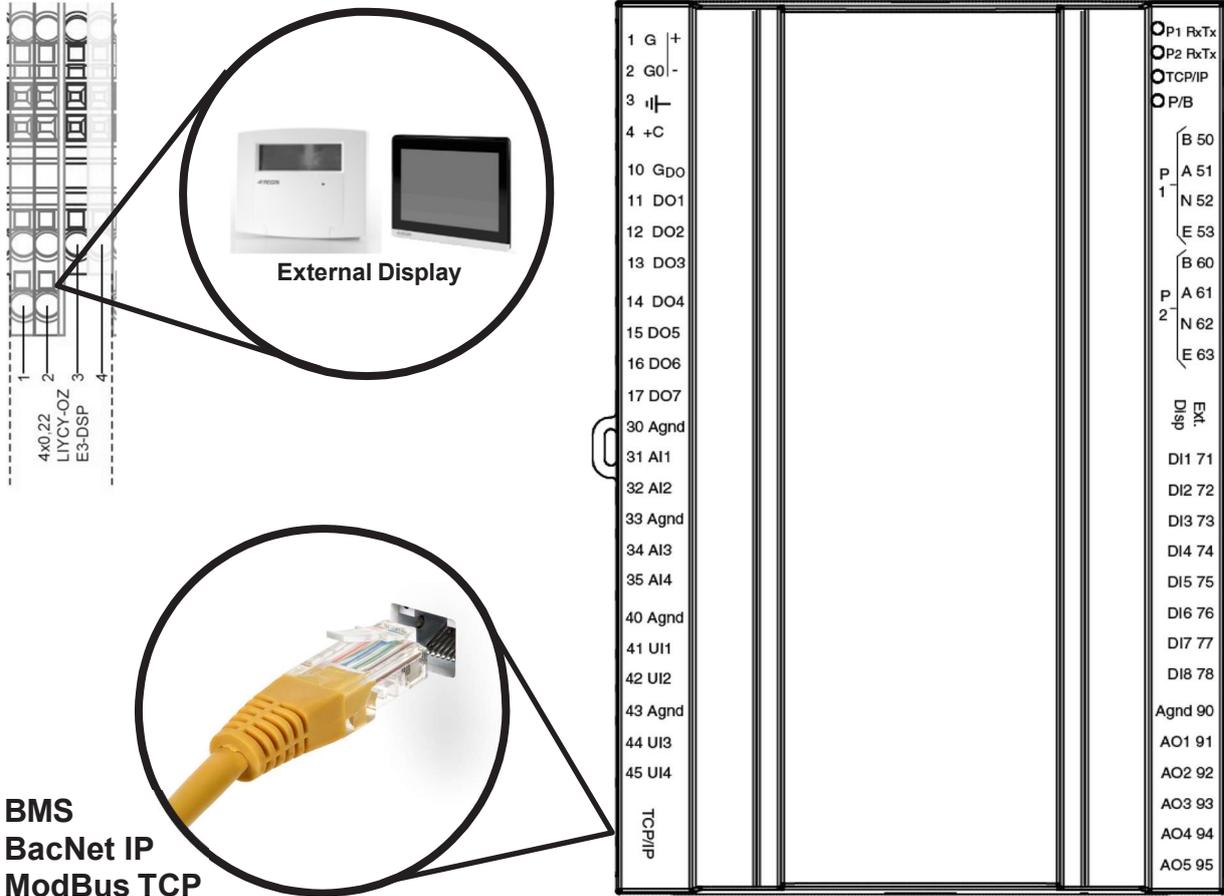
CAUTION 

Documents containing the electrical and automation details of the air handling unit are attached to the automation panel or the module with the accessories. All electrical connections must be made according to this document.



2.12.2 Control Panel and BMS Connection

Air handling units that are requested with automation equipment can be integrated with the building automation system via Modbus TCP-IP / Bacnet protocols and can be monitored with these protocols. Ethernet (RJ45) port on the controller located in the unit automation panel should be used for BMS connection.



Terminals are reserved on the automation panel for external display connections (E3-DSP/ED-T7). Screen connections must be made with 4x0.50 shielded cable. The maximum wiring distance for touch panel (ED-T7) and standard display (E3-DSP) is 100 m.

2.12.3 Modbus Addresses and Variables

This document describes some of main controller signals that are accessible via Modbus. It does not describe how to create or set up building management system. Signals with **default value** can be changed!

MODBUS TYPE

The Modbus type of signals:

- 1 = Coil Status Register (Modbus Function = 1, 5 and 15)
- 2 = Input Status Register (Modbus Function = 2)
- 3 = Holding Register (Modbus Function = 3, 6 = 16)
- 4 = Input Register (Modbus Function = 4)

NOTE: In this part of manual, the term "Exhaust air" is used to describe the air extracted from inside of a building. The term "Extract air" is used to describe the air leaving a ventilation system.

Signal Name	EXOL Type	Modbus Address	Default Value	Function	Description
VentSettings.Cor_SupplySetpoint	R	40001	18	Supply, Extract and Room Temperatures	Setpoint Supply air temp when constant supply air temp function
VentSettings.Cor_ExhaustSetpoint	R	40018	21	Supply, Extract and Room Temperatures	Setpoint Extract air temp if extract air temp control function
VentSettings.Cor_RoomSetpoint	R	40019	21	Supply, Extract and Room Temperatures	Room setpoint if room temp control function
VentSettings.Cor_SAFFu llspeedAirFlow	R	40028	2000	SAF/EAF Pressure and Flow	Setpoint full speed supply air fan flow. Scale factor = 1
VentSettings.Cor_EAFFu llspeedAirFlow	R	40030	2000	SAF/EAF Pressure and Flow	Setpoint full speed extract air fan flow. Scale factor = 1
VentActual.Cor_Outdoortemp(0)	R	30001		Actual/Setpoint	Outdoor temperature (read-only)
VentSettings.Cor_AirUnitAutoMode	X	40368	3	Manual/Auto	Running mode air unit: Modbus: 0=Manual off 1=Manual reduced speed 2=Manual normal speed 3=Auto
VentActual.Cor_RunMode	X	30003		Actual/Setpoint	Modbus: 0=Stopped 1=Starting up 2=Starting reduced speed 3=Starting full speed 4=Starting normal run 5=Normal run 6=Support control heating 7=Support control cooling 8=CO2 run 9=Night cooling 10=Full speed stop 11=Stopping fan
VentActual.Cor_SupplyAirTemp	R	30007		Supply, Extract and Room Temperatures	Supply air temperature
VentActual.Cor_ExhaustAirTemp	R	30009		Supply, Extract and Room Temperatures	Extract air temperature
VentActual.Cor_SAFAirFlow	R	30015		SAF/EAF Pressure and Flow	Supply air flow (m3/h). Scale factor = 1
VentActual.Cor_EAFAirFlow	R	30016		SAF/EAF Pressure and Flow	Extract air flow (m3/h) Scale factor = 1
VentActual.Cor_CO2Sensor	R	30017		CO2	CO2 (ppm)
VentActual.Cor_ExtractAirTemp	R	30020		Exhaust air temp	Exhaust air temperature
VentActual.Cor_RoomTemp	R	30135		Supply, Extract and Room Temperatures	Room temperature 1 and 2

2.12.4 Air Handling Unit without Automation Equipment

DANGER ⚠

The electrical connection of the unit should only be made by qualified electricians.

DANGER ⚠

Before all electrical assembly operations, the main supply panel must be de-energized and it must be ensured that it cannot be energized accidentally.

Your air handling unit can be manufactured specifically for the project with or without the automation panel. The wiring diagrams placed inside the unit must be examined against the different variations of the unit.

Depending on the project variation, the air handling unit may have different component selections. In units where there is no automation panel, electrical connections have been moved to junction boxes placed outside the device.

In order to reduce the starting current in motors above 4kW, "star-delta" motor connection is made.

2.12.4.1 Panel Assembly

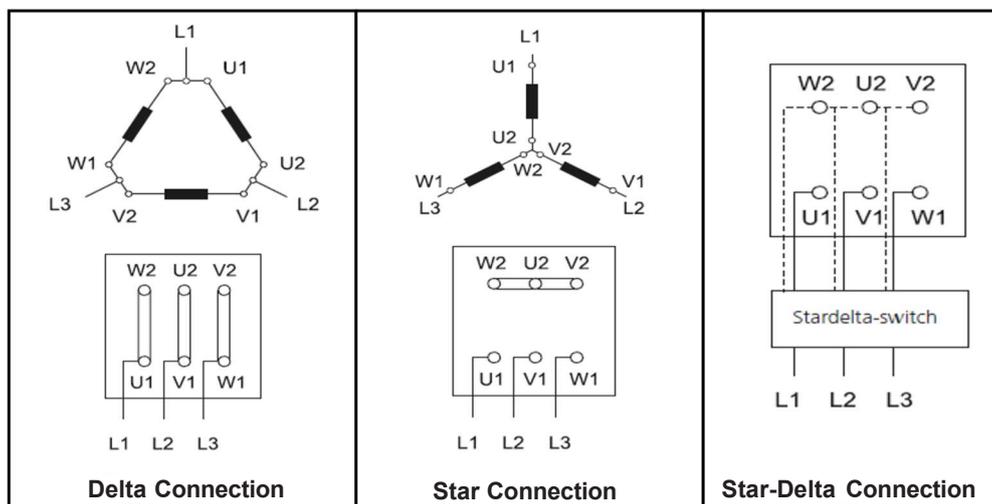
In air handling units ordered with automation, the panel may not be mounted on the device by special request. In this case, the automation panel can be fixed on a suitable wall around the air handling unit or an external frame. The distance between the device and the panel should be kept as short as possible (max. 3 m).

CAUTION ⚠

If the device will be located outdoors, the panel should be protected from weather conditions as much as possible.

2.12.4.2 3 Phase AC Motor Connections

WIRING DATA AND CONNECTIONS DEPENDING ON MOTOR POWER				
Motor Power (kW)	Current (A)	Cable Cross-section (mm ²)	Cable Type	Connection style
1,1	3	4x1,5	TTR	Star (unless otherwise specified)
1,5	4	4x1,5	TTR	Star (unless otherwise specified)
2,2	6	4x1,5	TTR	Star (unless otherwise specified)
3	10	4x1,5	TTR	Star (unless otherwise specified)
4	10	4x1,5	TTR	Star (unless otherwise specified)
5,5	16	4x2,5	TTR	Star/Delta
7,5	20	4x2,5	TTR	Star/Delta
11	25	4x4	TTR	Star/Delta
15	40	4x10	TTR	Star/Delta
18	40	4x10	TTR	Star/Delta
22	50	4x16	TTR	Star/Delta
30	80	4x25	TTR	Star/Delta



Terminal Connection of AC Fans to Frequency Inverter

DANGER ⚠

The electrical connection of the unit should only be made by qualified electricians.

DANGER ⚠

Before all electrical assembly operations, the main supply panel must be de-energized and it must be ensured that it cannot be energized accidentally.

CAUTION ⚠

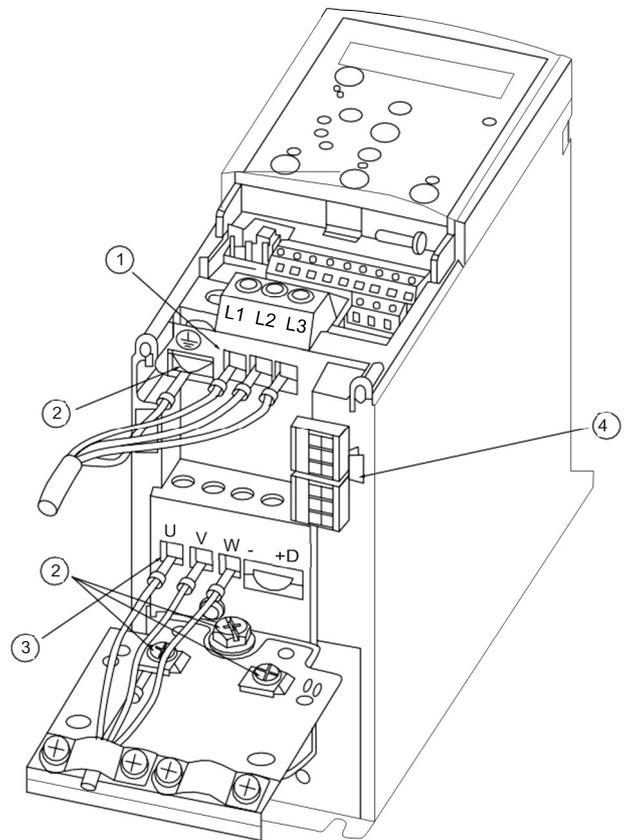
If the device will be located outdoors, the panel should be protected from weather conditions as much as possible.

This manual only shows electrical connection of frequency inverter. It doesn't explain how to set parameters to frequency inverter. Please ask your supplier or aftersales@aera.com.tr for further information.

To ensure connections are correct, manual should've fully read and understand before assembly.

This figure shows Danfoss frequency inverter sample. Your component may differ related to project.

Power Supply	L1	Phase	(1)
	L2	Phase	
	L3	Phase	
Control	PE	Protective Earth	(2)
	PE	Protective Earth	
	U	Motor Phase 1	
Relay	V	Motor Phase 2	(3)
	W	Motor Phase 3	
	COM	Common	
Relay	NC	Normally Closed	(4)
	NO	Normally Open	

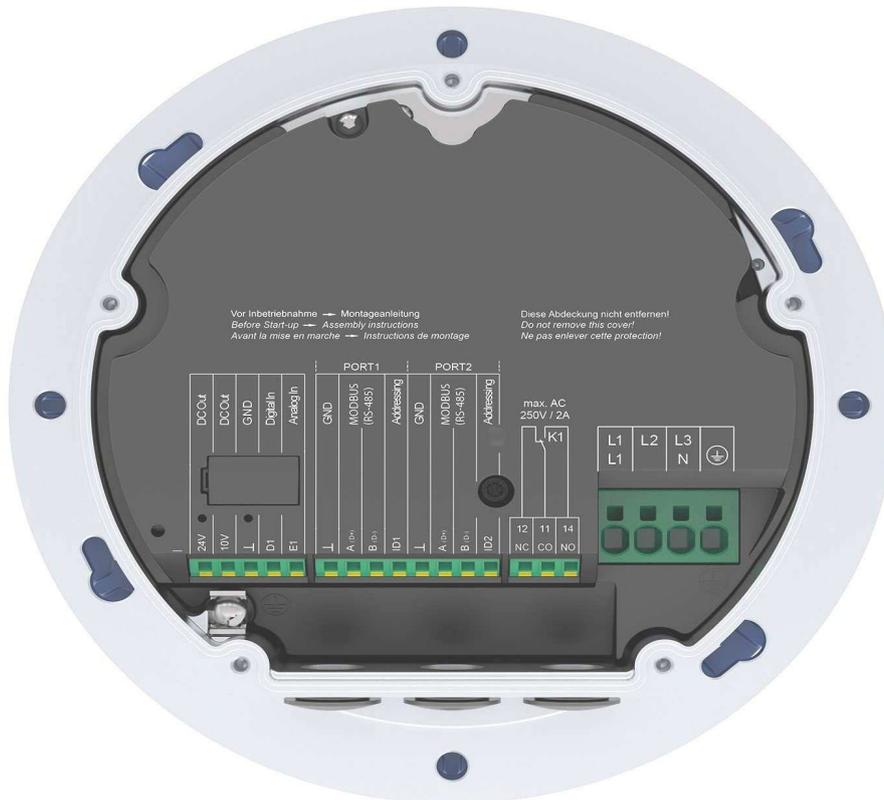


WARNING ⚠

Please check and make sure that you are using correct cables with the proper diameters needed for the connections. Thin cables can't handle the heat and may cause fire.

- Power Supply PE should be connected to ground before any connection.
- L1, L2, L3 phases should be connected to power supply Number 1 as shown in the figure.
- Motor PE should be connected to ground.
- U, V, W should be connected to Number 3 as shown in the figure.

2.12.4.3 3 Phase EC Ziehl-Abegg Motor Connections



*Sample of Ziehl-Abegg fan ports.

Assembly Instructions

DANGER ⚠

The electrical connection of the unit should only be made by qualified electricians.

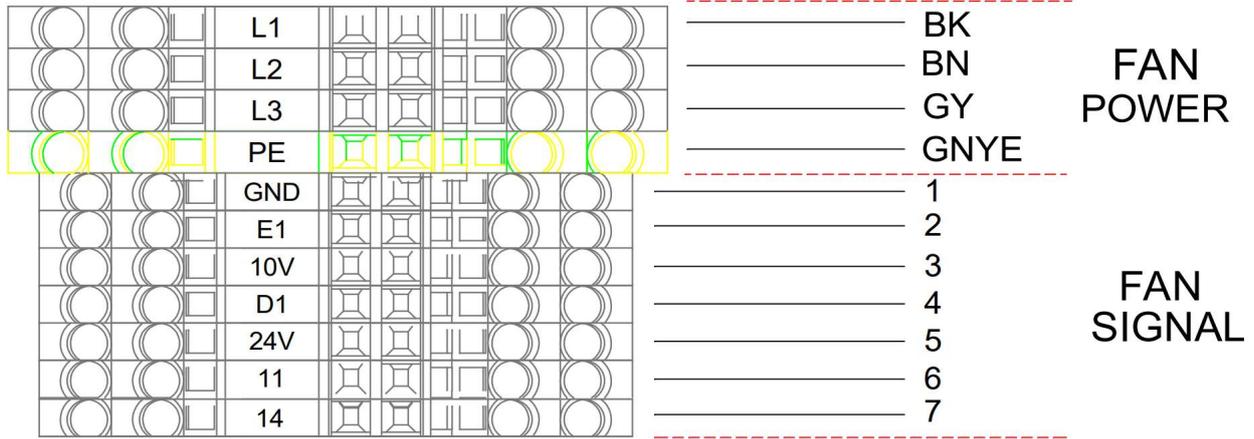
DANGER ⚠

Before all electrical assembly operations, the main supply panel and the motor must be de-energized or separated from power supply and it must be ensured that it cannot be energized accidentally.

Power Supply	L1	Black	Phase
	L2	Brown	Phase
	L3	Grey	Phase
	PE	Yellow-Green	Protective Earth
Control	24V	Red	Fixed Digital Output 24V DC
	10V	Yellow	Fixed Analog Output 10V DC
	GND	Yellow-Green	Reference ground for control
	D1	Red	Digital Input Max. 24V DC
	E1	Yellow	Analog Input Max. 10V DC / 20mA
Communication	GND	Yellow-Green	Protective Earth
	A (D+)	Yellow	Modbus RS485 A
	B (D-)	Brown	Modbus RS485 B
	ID1	White	Address
Relay	12	White	Normally Closed
	11	White	Common
	14	White	Normally Open

* Colors may differ.

Terminal Connection of Ziehl-Abegg Fans



Power Supply	L1	Black	Phase
	L2	Brown	Phase
	L3	Grey	Phase
	PE	Yellow - Green	Protective Earth
Control	GND	Yellow – Green-1	Reference ground for control
	E1	White-2	Analog Input 0-10V DC / 20mA
	10V	White-3	Fixed Analog Output 10V DC
	D1	White-4	Digital Input Max. 24V DC
	24V	White-5	Fixed Digital Output 24V DC
Relay	COM	White-6	Common
	NO	White-7	Normally Open

WARNING

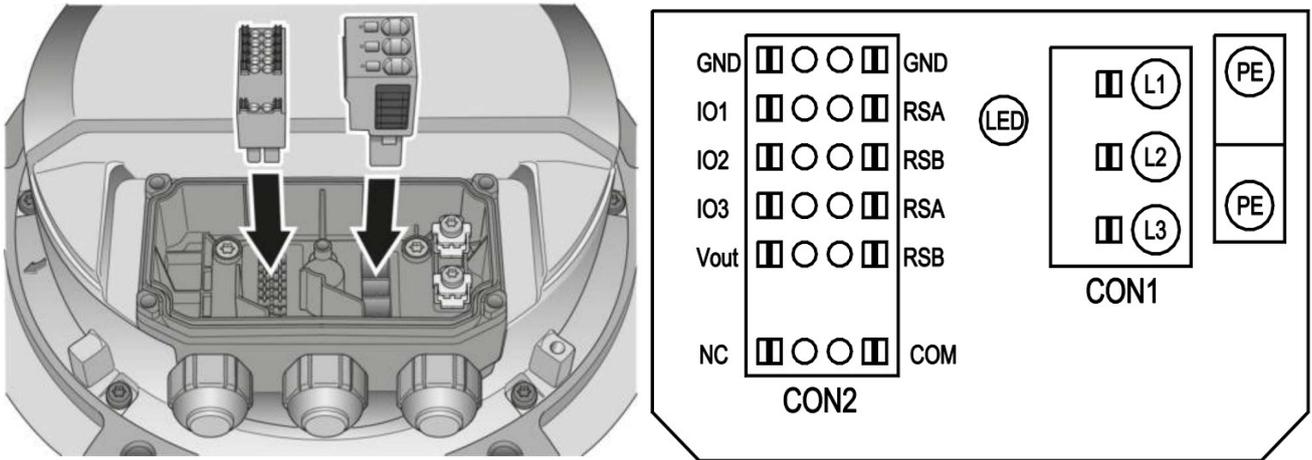
Please check and make sure that you are using correct cables with the proper diameters needed for the connections.

- L1, L2, L3 phases should be connected to power supply and PE earth should be connected to ground.
- GND should be connected to ground.
- D1 Digital Input must be energized with 24V DC to fan start working. This can be supplied from 24V DC output from terminal easily.
- A bridge between COM and NO can be used. This bypasses alarm relay if alarm is not supposed to be seen. If alarm needs to be seen, COM and NO can be connected to automation system.
- E1 Analog Input can be used with variable DC voltage 0 to 10V DC. It can be controlled by automation system or directly from the 10V output from terminal. Keep in mind that if E1 is energized by the 10V from terminal, fans will be run at %100 speed. Example;
 - 1V = %10 speed
 - 5V = %50 speed
 - 10V = %100 speed

* If there is an alarm persists, the relays 11-12 switches are connected.

**When the motor runs up and no alarm exists the relays 11-14 switches are connected.

2.12.4.4 3 Phase EC EBMpapst EC Fan Connections



*Sample of EBMpapst EC fan ports.

Assembly Instructions

DANGER ⚠

The electrical connection of the unit should only be made by qualified electricians.

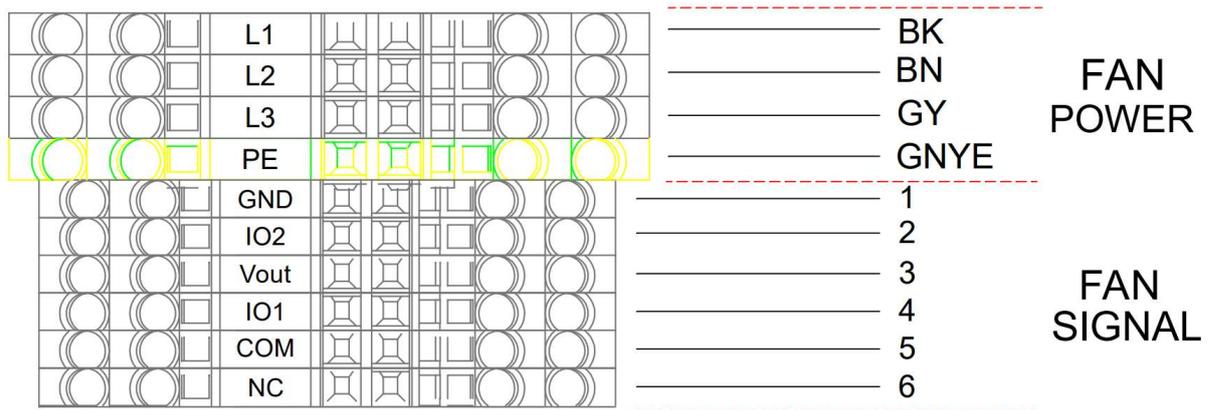
DANGER ⚠

Before all electrical assembly operations, the main supply panel and the motor must be de-energized or separated from power supply and it must be ensured that it cannot be energized accidentally.

Power Supply	L1	Black	Phase
	L2	Brown	Phase
	L3	Grey	Phase
	PE	Yellow - Green	Protective Earth
Control	GND	Yellow - Green	Reference ground for control
	IO1	White	Digital Input 24V DC / 20mA
	IO2	White	Analog Input 0-10V DC / 20mA
	Vout	White	Digital Output Max. 24V DC
Communication	GND	Yellow - Green	Reference ground for control
	RSA	White	Modbus RS485 A
	RSB	Brown	Modbus RS485 B
Relay	NC	White	Normally Closed
	COM	White	Common

*Relay contacts (COM-NC) disconnects when alarm comes up.

Terminal Connections



*Sample terminal of Ziehl-Abegg un-automated units

Power Supply	L1	Black	Phase
	L2	Brown	Phase
	L3	Grey	Phase
	PE	Yellow - Green	Protective Earth
Control	GND	Yellow – Green-1	Reference ground for control
	IO2	White-2	Analog Input 0-10V DC / 20mA
	Vout	White-3	Fixed Digital Output 10V DC
	IO1	White-4	Digital Input Max. 24V DC
Relay	COM	White-5	Common
	NC	White-6	Normally Closed

WARNING

Please check and make sure that you are using correct cables with the proper diameters needed for the connections.

- L1, L2, L3 phases should be connected to power supply and PE earth should be connected to ground.
- GND should be connected to ground.
- IO1 Digital Input must be energized with 24V DC to fan start working. This can be supplied from Vout output from terminal easily.
- A bridge between COM and NC can be used. This bypasses alarm relay if alarm is not supposed to be seen.
- IO2 Analog Input can be used with variable DC voltage 0 to 10V DC. It can be controlled by automation system or directly from the 10V output from terminal. Keep in mind that if IO2 is energized by the 10V from terminal, fans will be run at %100 speed. Example;
 - 1V = %10 speed
 - 5V = %50 speed
 - 10V = %100 speed

* Relay contacts (COM-NC) disconnected when alarm comes up.

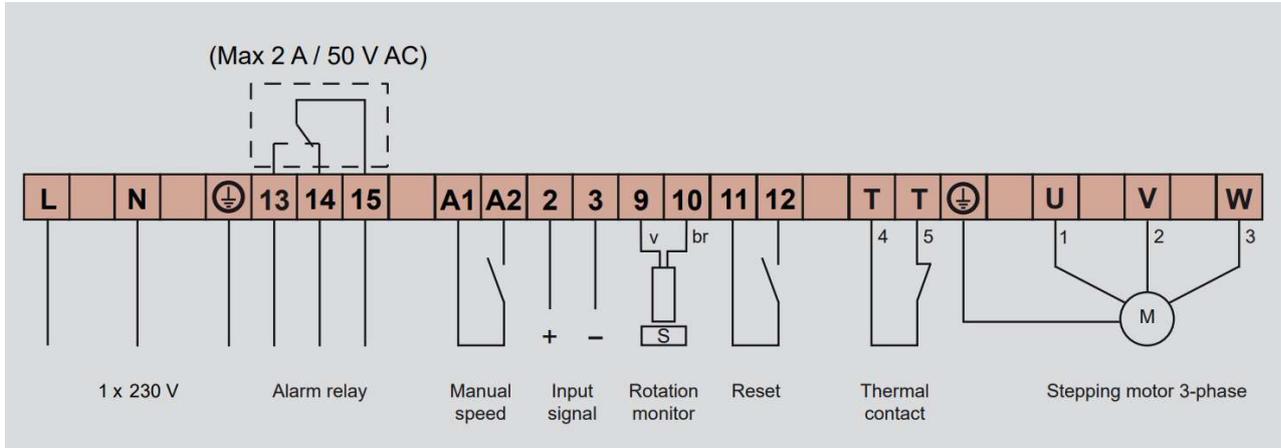
2.12.4.5 Rotor Control Unit Connections

DANGER ⚠

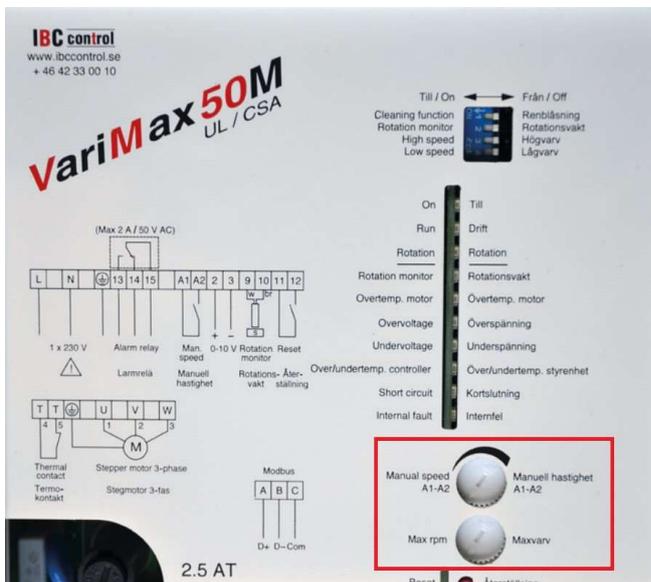
The electrical connection of the unit should only be made by qualified electricians.

DANGER ⚠

Before all electrical assembly operations, the main supply panel must be de-energized and it must be ensured that it cannot be energized accidentally.



Power Supply	L	Black	Phase
	N	Blue	Neutral
	PE	Yellow – Green	Protective Earth
Control	A1	Red	Digital Output
	A2	Red	Digital Input
Motor	U	Black	Motor Phase 1
	V	Brown	Motor Phase 2
	W	Gray	Motor Phase 3
	PE	Yellow - Green	Protective Earth



- L1 phase and N neutral should be connected to power supply and PE earth should be connected to ground.

- Motor phases U, V and W should be connected to correct terminals.

- A1 and A2 should be bridged.

- Put the Cleaning Function and Rotation Monitoring switches to ON position.

- Connect the Thermal Contacts (NC).

- When the connections are correct and unit has power, rotary exchanger will start rotating.

- Rotation speed and max rpm can be adjusted by the rotary buttons in the red box.

- Please check the figure on the left.

2.12.4.6 Motor Voltage Unbalance

CAUTION 

For the supply voltage in the proper operation of the motor, measure all phase-to-phase voltage after installation, the voltage unbalance should not exceed 2%.

For voltage unbalance;

Voltage balance = $100A/2V_{ort}$

For example, if the measured voltages are 221,230 and 227, the average voltage will be 226V.

$$A = (226-221) + (230-226) + (227-226)$$

CAUTION 

The electrical connections of the air handling unit are carried out of the device with materials such as junction boxes, coupling, etc. Unless there is special instruction, holes, slots, etc. should not be drilled into the air handling unit. Otherwise, it may adversely affect the operating performance of the device.

ATTENTION 

Ensure that the grounding circuit is suitable for its function.

ATTENTION 

The cross-section of the supply cables should be determined by taking into account the voltage drops depending on the distance.

CAUTION 

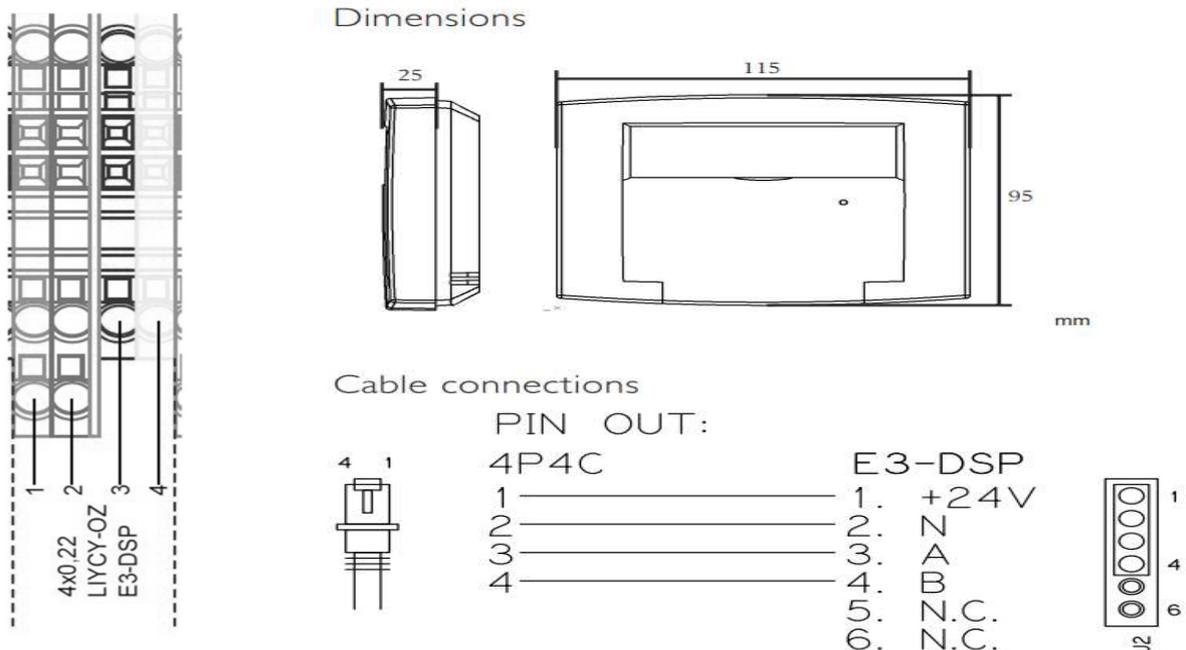
In case of short circuit, overload or double phase, it is recommended to put a thermal phase protection relay, fuse, etc. in the electrical circuit.

Make sure that the main power supply character meets the EN 60204-1 regulation.

2.12.4.7 Control Panel and Terminal Connection

Air handling units that are requested with automation equipment can be integrated with the building automation system via Modbus TCP-IP / Bacnet protocols and can be monitored with these protocols. Ethernet (RJ45) port on the controller located in the unit automation panel should be used for BMS connection.

There are 4 terminals to connect E3-DSP to communicate with the controller. These four cables end with RJ11 plug. E3-DSP cable connections and order for RJ11 plug is showing below.



3. Commissioning

EVO-M series air handling units are set at the desired values in the project at the factory and shipped to the user as plug and play. However, before the air handling unit is commissioned, the list below should be filled in and in case of a problem, please contact AERA Technical Service at aftersales@aera.com.tr.

PRE-COMMISSIONING CHECKLIST				
NO	Control Point	NONE	YES	NO
1.	The personnel will commission the device is qualified			
2.	Unit's user manual has been read / understood			
3.	The unit is assembled in accordance with the user manual			
4.	Unit module number and type is correct			
5.	There is not any visible defect / damage on the device			
6.	Unit mounted properly and stabilized			
7.	Unit modules combined correctly			
8.	Unit's doors close properly			
9.	Roof sheet installed correctly (If available)			
10.	The siphon connections of the device in accordance with the user manual (If available)			
11.	Drain pan is clean and able to drain water (If available)			
12.	The fan insulator sheets are removed (If available)			
13.	Fan connection equipment undamaged			
14.	Fans can rotate freely			
15.	Duct connections of the unit is correct			
16.	There is not any damage seen at the batteries of the unit (If available)			
17.	Battery connections of the unit is correct (If available)			
18.	The internal mixing damper is closed (If available)			
19.	There are not any damage seen at the internal silencers (If available)			
20.	The humidifier connections of the unit is correct (If available)			
21.	External sensors of the device connected correctly (If available)			
22.	Electrical connections between modules made correctly			
23.	The remote control panel is connected			
24.	BMS (Building Management System) has connected (If available)			
25.	Unit's filter type, airflow direction is correct and the filters are clean? (If available)			
26.	There is not any damage seen at the heat recovery exchanger (If available)			
27.	Unit's heat exchanger bypass damper is closed (If available)			
28.	The power supply specifications are proper to the unit			
29.	There is not any tools or objects inside the unit			
30.	Inside of the unit has been cleaned after assembly			
31.	There is water in the batteries of the unit (If available)			
If there is a problem with even one of the above items, the unit should not be operated!				
If the error cannot be resolved by the user, AERA Technical Service should be contacted!				

If all the items in the list above are suitable, the device can be powered for the first time. The items to be checked after the first run are as follows.

POST COMMISSIONING CHECKLIST

NO	Control Points	None	Yes	No
1.	Fan rotation is correct for both fans			
2.	There is not any leak in the unit			
3.	Dampers opened during the relevant operation (If available)			
4.	There is no water leakage from the coils or its connections (If available)			
5.	There is no air leak from the water heater / cooler coils or its connections			
6.	Rotor is rotating at the number of revolution as it should have (If available)			
7.	Bag filters are swollen when unit is running and air passing through (If available)			
8.	Unit provides the desired flow rate			
9.	Power and current values drawn by the device matches the unit label (+ - 5%)?			

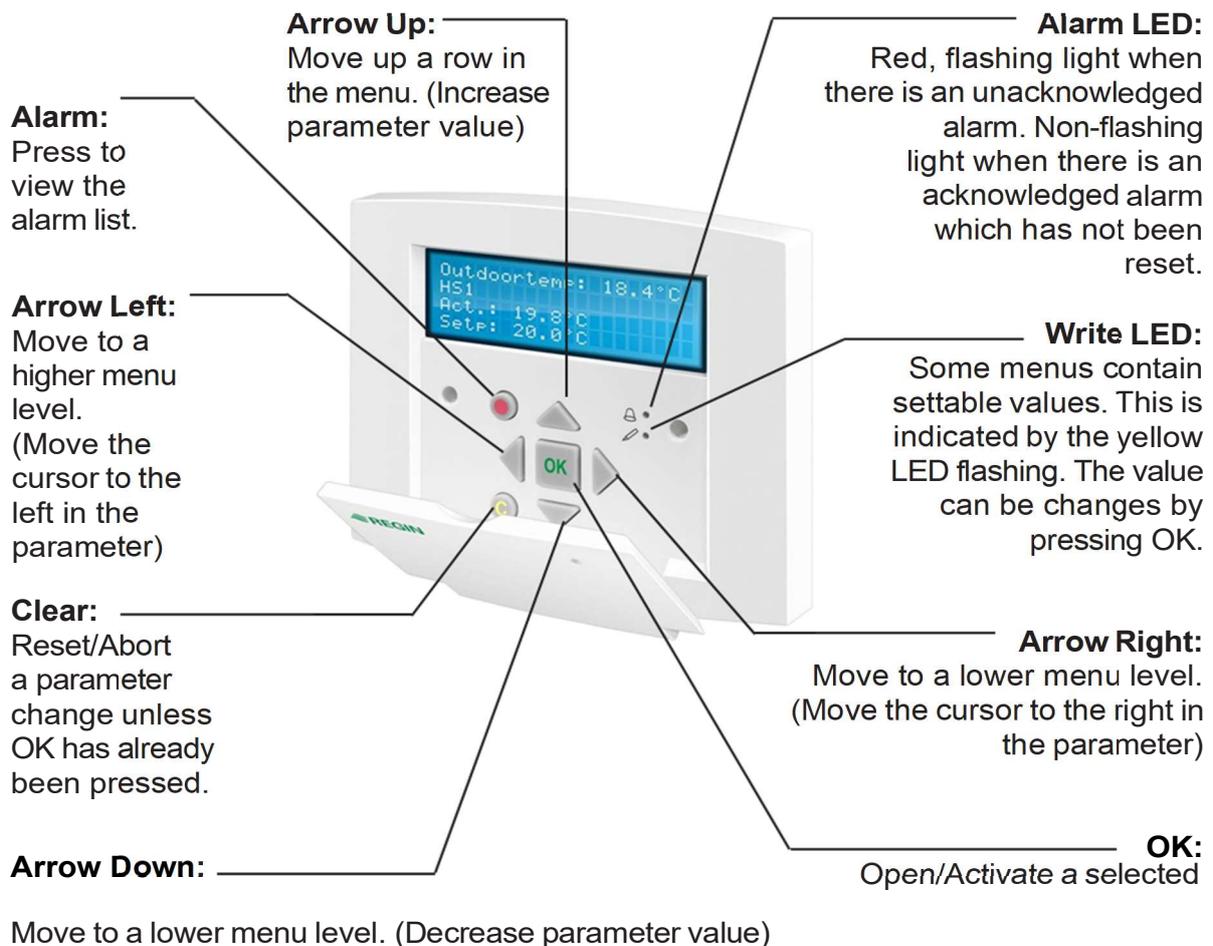
If there is a problem in even one of the above items, the power plant should be stopped immediately and AERA Technical Service should be contacted!

3.1 Starting Device

3.1.1 Display Control

The display has 4 rows and 20 characters. It has background illumination. The illumination is normally off but is activated as soon as a button is pressed. The illumination will be turned off again after a period of inactivity.

The meanings of the keys that appear on the screen are shown below.



Display Icons Meanings

Display Icons Meanings

	ARROW UP: Move up a row in the menu. (Increase parameter value)		ALARM: Press to view the alarm list.
	ARROW DOWN: Move down a row in the menu. (Decrease parameter value)		CLEAR: Reset/Abort a parameter change unless OK has already been pressed.
	ARROW RIGHT: Move to a lower menu level. (Move the cursor to the right in the parameter)		ALARM LED: Red, flashing light when there is an unacknowledged alarm. Non-flashing light when there is an acknowledged alarm which has not been reset.
	ARROW LEFT: Move to a higher menu level. (Move the cursor to the left in the parameter)		WRITE LED: Some menus contain settable values. This is indicated by the yellow LED flashing. The value can be changed by pressing OK.
	OK: Open/Activate a selected menu/setting. (Confirm a parameter value)		

3.1.2 Change Parameters

In some menus there are parameters that can be set. This is indicated by the yellow LED with flashing.

A quick blinking (2 times/s) indicates that the parameter can be changed using the present user access. A slower blinking (1 time/s) indicates that a higher user access is required to change the parameter.

To change a parameter, first press the  button. If you need a higher user access than you have to change the parameter, a log on menu will be displayed, see below. Otherwise, a cursor will appear at the first settable value. If you wish to change the value, do so by pressing the  and  buttons.

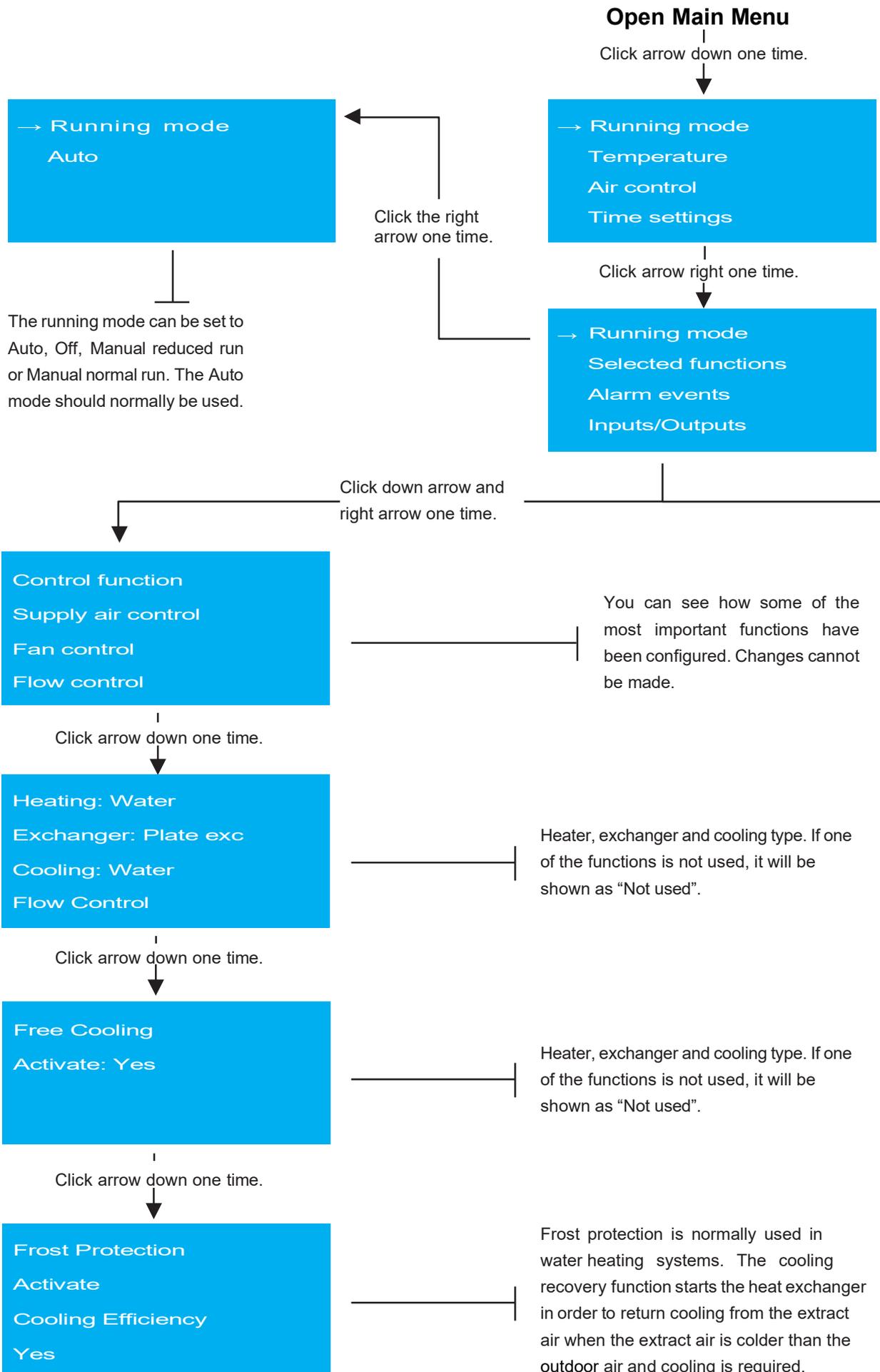
In numbers containing several digits you can move between the digits using   buttons. If there are further settable values displayed the cursor will automatically move to the next one.

To pass a value without changing it, press 

To abort a change and return to the initial setting, press, and hold the  button until the cursor disappears.

Collected here are several menus showing running mode, selected functions, alarm events and status of inputs and outputs.

3.2 Running Mode



Click arrow down three times and right arrow one time.



Select AI and click right arrow one time.

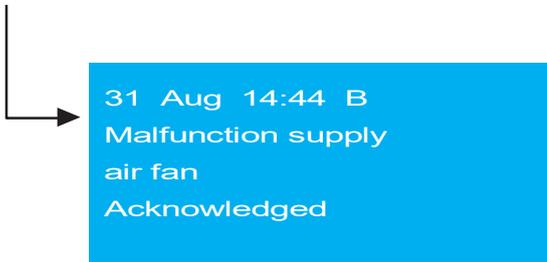
Select DO and click right arrow one time.



The current values for the analogue inputs and outputs are shown here.

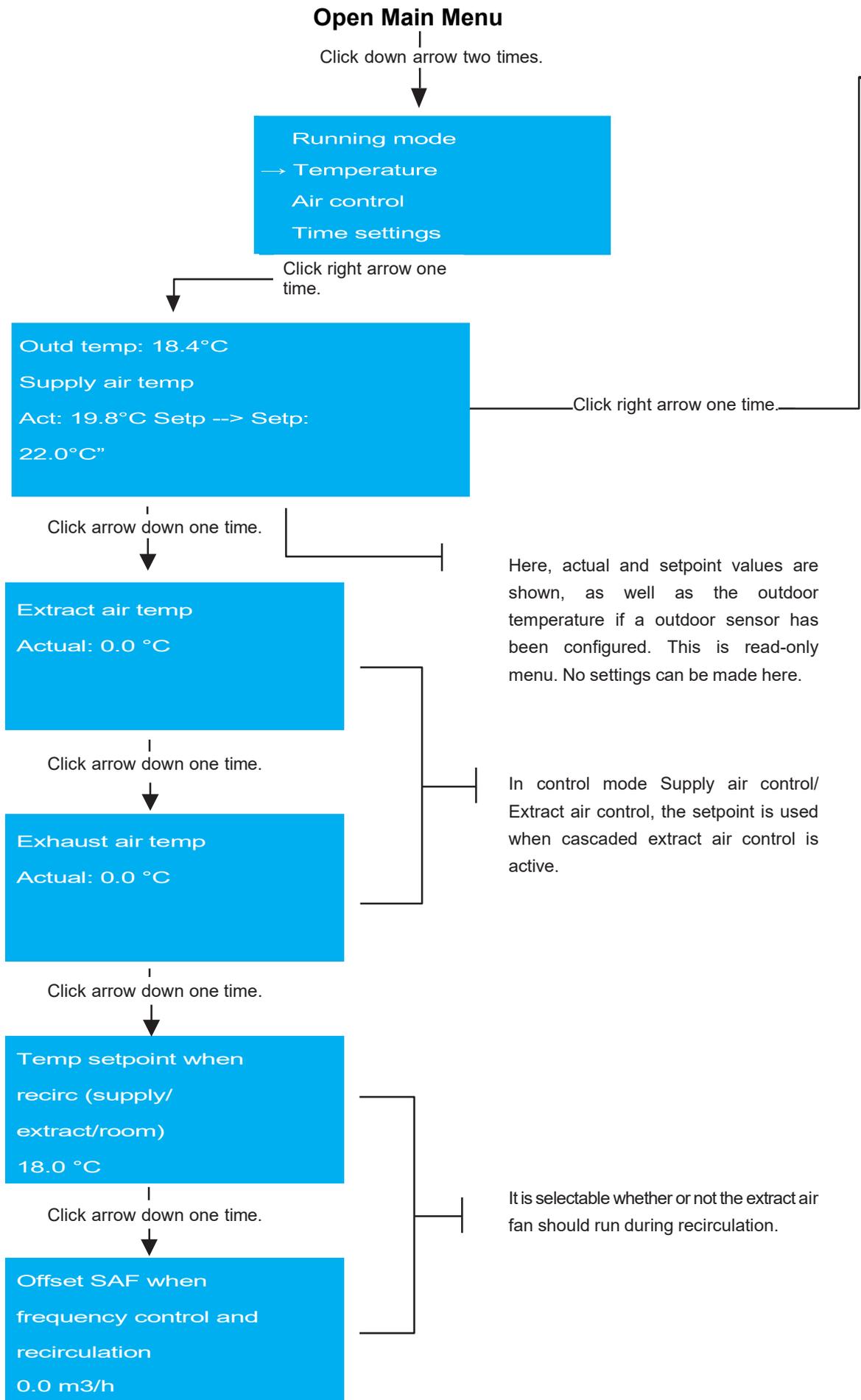
This menu shows if the digital inputs and outputs are On or Off.

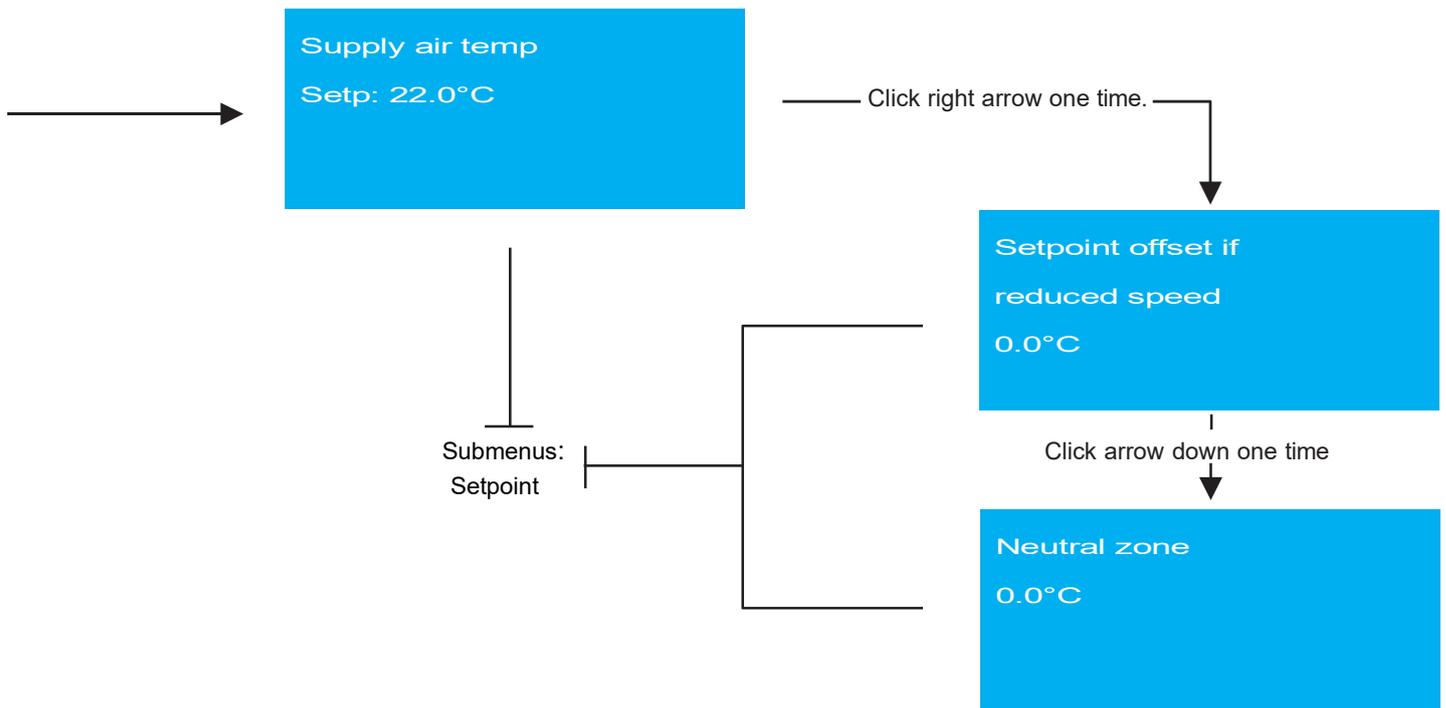
Click arrow down two times and arrow right one time.



Alarm log, containing the 40 latest alarm events. The most recent event is listed first. The alarm log can only be used for viewing the alarm history. Alarms are handled in a special area, see the section Alarm handling.

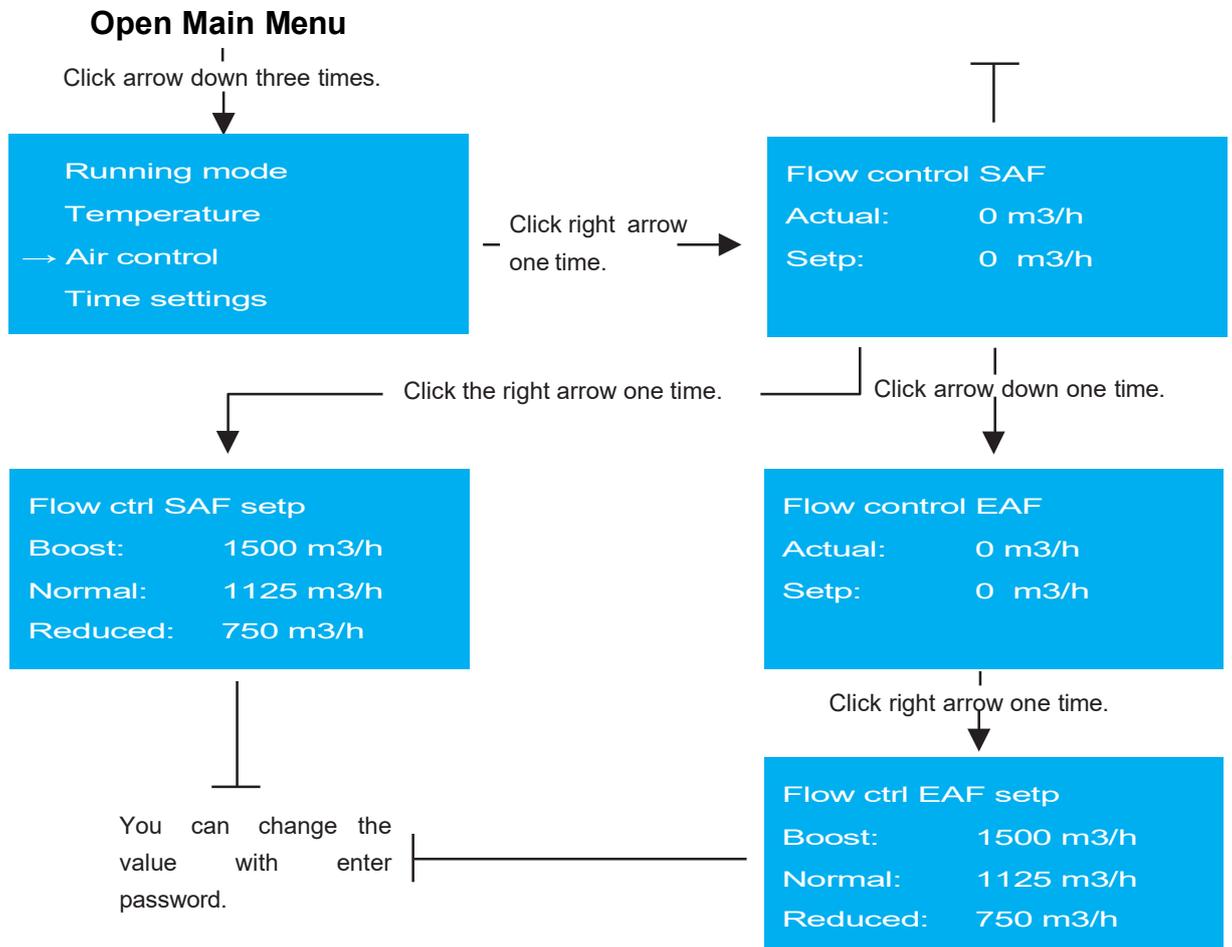
3.3 Temperature



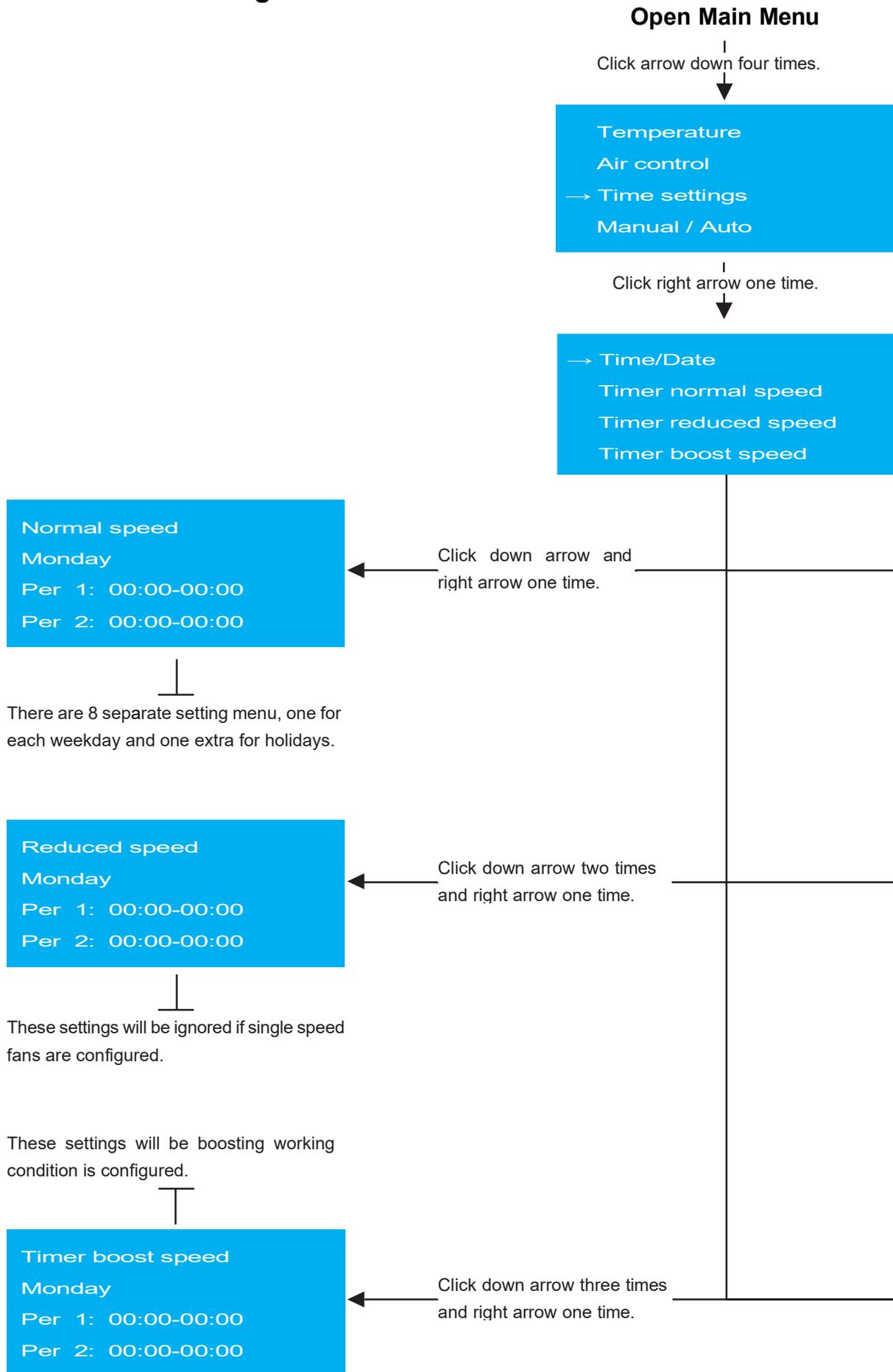


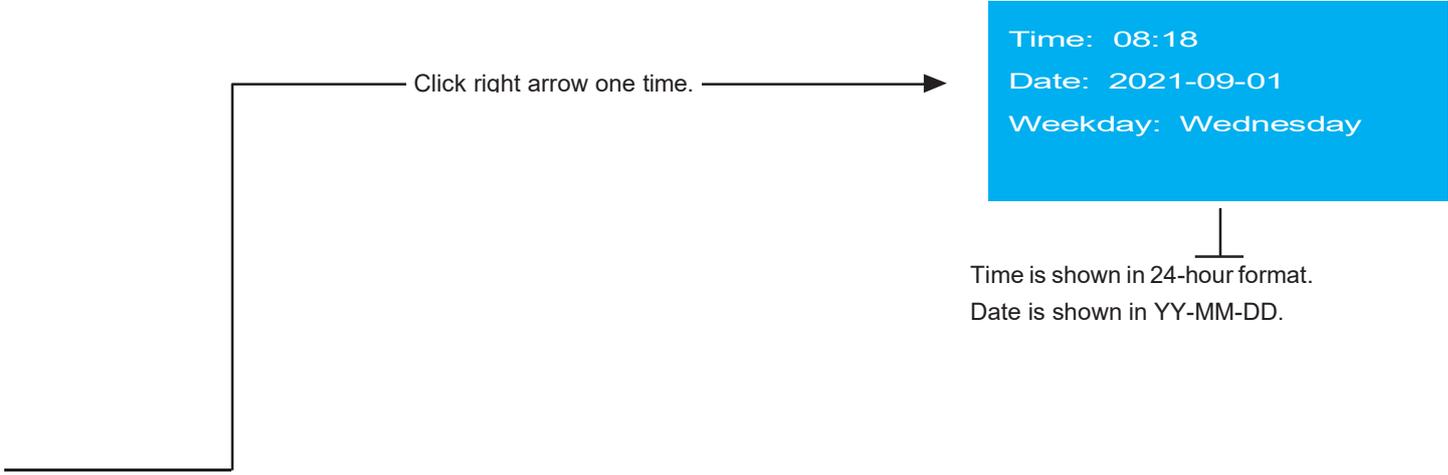
3.4 Air Control

Flow control adjust point. The real points can be visible with the set points in the screen. This menu cannot be changeable just for observation.

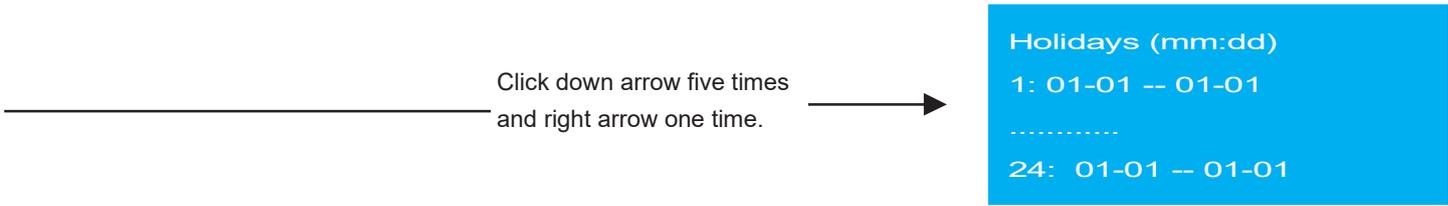


3.5 Time Settings

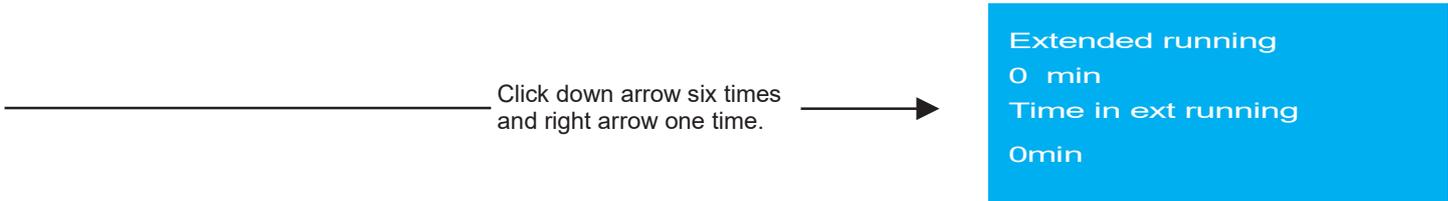




Time is shown in 24-hour format.
Date is shown in YY-MM-DD.

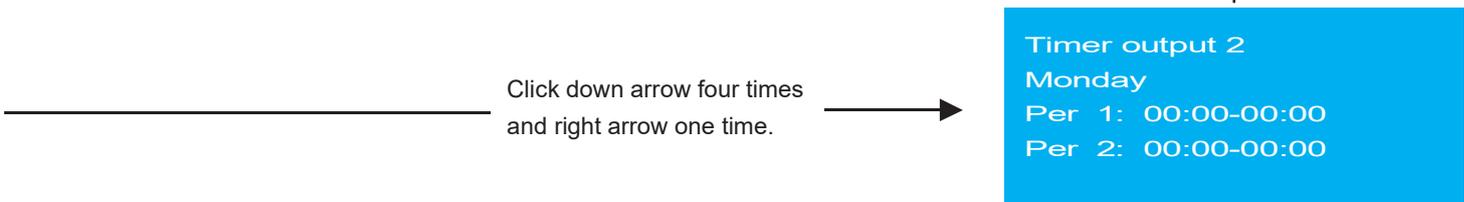


Up to 24 separate holiday periods for a full year can be set.



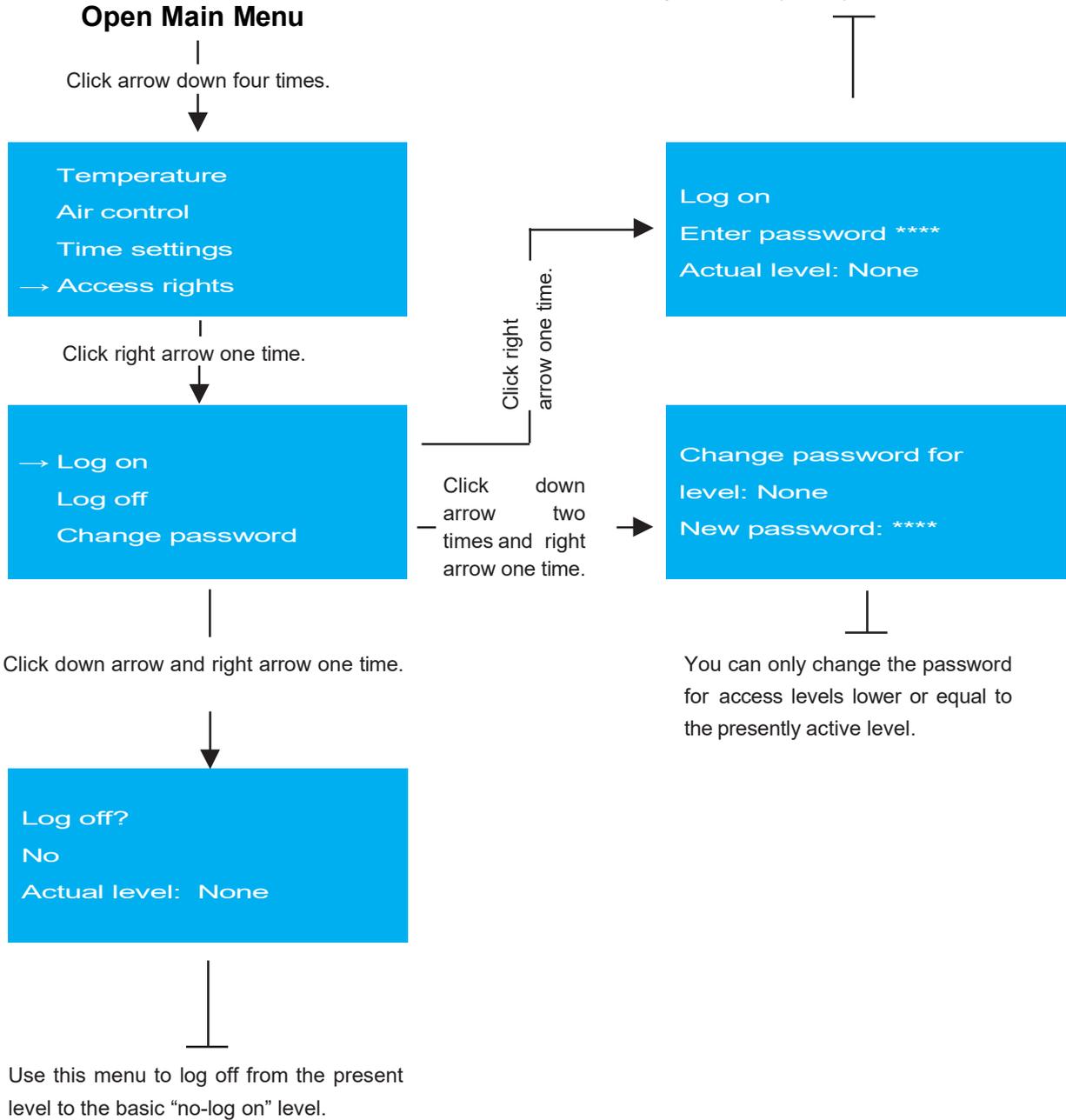
Digital inputs can be used to force the unit to start although the timer says the running mode should be "Off".

Each timer output has 8 separate settings menus, one for each weekday and one extra for holidays. Holiday schedules take precedence over other schedules.



3.6 Access Rights

In this menu it is possible to log on to any access level by entering the appropriate 4-digit code. The log on menu will also be displayed should you try to gain access to a menu or try to do an operation requiring higher authority than you have.



4. Service and Maintenance

4.1 Service Maintenance Information

Before contacting the technical service, make sure that you have the following information at and so that any errors that may occur can be rectified as soon as possible:

- 4.1.1 Unit delivery date
- 4.1.2 AERA order number
- 4.1.3 Product name and label information or picture if possible
- 4.1.4 Brief description of the error
- 4.1.5 Pre-commissioning form
- 4.1.6 Product Malfunction Information Form

4.2 Maintenance Plan

The air handling unit should be checked periodically within the times specified in the plan below, and the necessary actions should be taken.

Components	Control Points	Actions	Period		
			3 Month	6 Month	12 Month
Duct Mount	Becoming dirty	Cleaning and maintenance		x	
	Damage and corrosion				x
	Air Leak	Repair		x	
Filter	Filter Pollution	Replace if it is dirty,	x		
	Sealing Elements Check	If it is damaged, it should be repaired / replaced.	x		
Fan	Cleaning			x	
	Check the motor and fan	If it is damaged, it should be repaired / replaced.			x
	Check vibration pads	If it is damaged, it should be repaired / replaced.			x
	Check Flexible fastener	If it is damaged, it should be repaired / replaced.			x
Exchanger	Cleaning			x	
	Damage and Corrosion	If it is damaged, it should be repaired / replaced.			x
	Sealing Elements Check	If it is damaged, it should be repaired / replaced.			x
	Check Bypass	If it is damaged, it should be repaired / replaced.			x

Heater / Cooler Coil	Cleaning			x	
	Damage and Corrosion	If it is damaged, it should be repaired / replaced.			x
	Plumbing damage / corrosion	If it is damaged, it should be repaired / replaced.			x
Electric heater	Cleaning			x	
	Damage and Corrosion	If it is damaged, it should be repaired / replaced.		x	
Humidity	Cleaning			x	
	Damage and Corrosion	If it is damaged, it should be repaired / replaced.			x
	Plumbing damage / corrosion	If it is damaged, it should be repaired / replaced.			x
Suppressor	Cleaning			x	
	Damage and Corrosion	If it is damaged, it should be repaired / replaced.			x
Condensation Pan	Cleaning		x		
	Damage / corrosion	If it is damaged, it should be repaired / replaced.	x		
Damper	Cleaning			x	
	Damage and Corrosion	If it is damaged, it should be repaired / replaced.			x

4.3 Component Maintenance

Before performing component maintenance, it is necessary to open the doors on the unit or remove the removable panels in order to reach these components. Dismantling procedure for doors and removable panels should be as follow

Doors: The doors of EVO-M series units are protected against external interference by means of special locks. For this reason, in order to open the doors, special lock keys sent with the device are needed.



4.3.1 Filter maintenance

DANGER ⚠

Before any maintenance and installation work or opening the enclosure, the unit must be completely isolated from the main power supply!

Filter fixing systems in EVO-M series units are offered to users in 2 types.

Replacement of Slide Filters:

- Disconnect the electricity with the switch on the device panel.
- Open the door of the filter module to be replaced with the module key.
- If there is a clamping mechanism, first loosen the mechanism.
- Hold the filter on both sides and gently pull it out.
- Remove the filters in all cross sections.
- Check the filter dimensions, air flow direction and mount the new filters.
- Drive new filters back while paying attention to air flow direction and size.



Replacement of Compressed Filters:

- Stop the device and disconnect it from the electricity with the switch on the panel.
- Open the door of the filter module to be replaced with the module key.
- Loosen the clamping wires at the corners of the filter case.
- Gently pull the used filter out of the case and remove it.
- Place the new filters in the case paying attention to the air flow direction and size.
- Compress the filter by using the clamping wires in the filter case completely.



CAUTION

After the clamping wires are loosened, the filters may fall out of their casing. The last wire should be loosened by supporting the filters.

ATTENTION

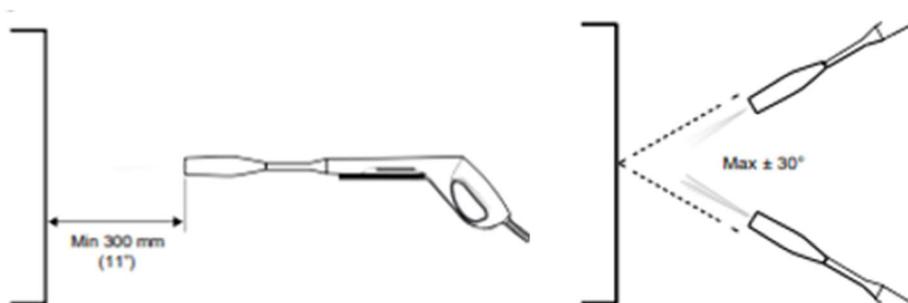
After the filters are removed, the sealing elements on the filter fixing mechanism should be checked. If there are any damaged ones, they should be replaced with new ones.

4.3.2 Heat Exchanger Maintenance and Cleaning

4.3.2.1 Rotary Heat Recovery Systems

The spray machine to be used for heat exchanger cleaning should be at low pressure. Cleaning with high pressure machines can damage the fins and make the heat exchanger unusable.

- Loosen wing fasteners and remove service panel.
- The heat exchanger is cleaned of dust and other contaminants with clean water and low-pressure spray.
- The cleaning of the rotary heat exchangers is done with Fairy branded dishwashing detergent with a cleaning liquid to be prepared with a maximum of 75% water-25% detergent.
- This prepared solution is filled into the low-pressure washing machine and sprayed to the heat exchanger at a maximum angle of 30 degrees and a minimum distance of 30 cm.
- The same process should be repeated until the detergent between the coverslips and clean water is completely cleared.



ATTENTION

Cleaning should be done at a maximum angle of 30 degrees. Otherwise, the coverslips may be damaged!

ATTENTION

Cleaning should be done from both sides of the heat exchanger. After the process is over, it should not be placed in the unit until it is completely dry!

ATTENTION

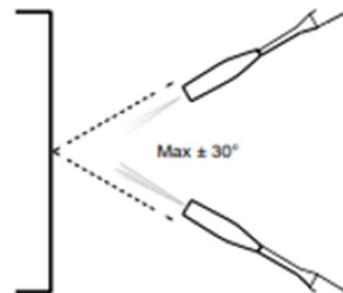
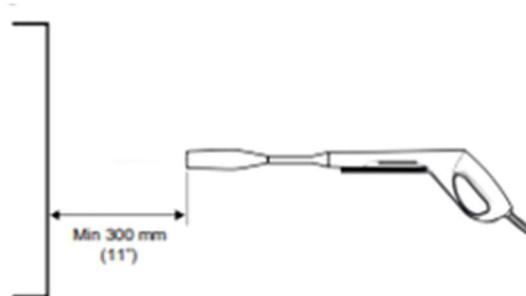
Rotary heat recovery systems are motor-driven moving systems. Make sure that no liquid gets into the rotor motor and driver during cleaning!

4.3.2.2 Plate Heat Exchanger Heat Recovery Systems

ATTENTION

The spray machine to be used for heat exchanger cleaning should be at low pressure. Cleaning with high pressure machines can damage the fins and make the heat exchanger unusable.

- Loosen wing fasteners and remove service panel.
- The heat exchanger is cleaned of dust and other contaminants with clean water and low-pressure spray.
- The cleaning of the rotary heat exchangers is done with Fairy branded dishwashing detergent with a cleaning liquid to be prepared with a maximum of 75% water-25% detergent.
- This prepared solution is filled into the low-pressure washing machine and sprayed to the heat exchanger at a maximum angle of 30 degrees and a minimum distance of 30 cm.
- The same process should be repeated until the detergent between the coverslips and clean water is completely cleared.



ATTENTION

Cleaning should be done at a maximum angle of 30 degrees. Otherwise, the may be damaged!

Cleaning should be done from all 4 sides of the heat exchanger. After the process is over, it should not be placed in the unit until it is completely dry!

4.3.2.3 Run Around (With Coil) and Heat Pipe Heat Recovery Systems Maintenance and Cleaning

Run Around and the heat pipe systems include coils basically. You can find the cleaning information in the coil cleaning and maintenance section!

4.3.3 Fan Maintenance and Cleaning

DANGER

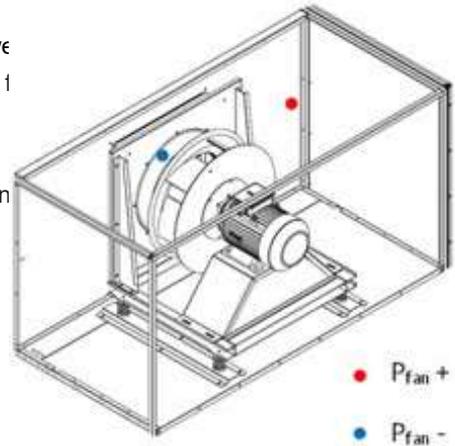
Before any maintenance and installation work or opening the enclosure, the unit must be completely isolated from the mains power supply!

DANGER ⚠

If there is even the slightest movement on the fan, never open the fan door!

Fans are components that cannot be taken out of the unit due to their nature (Except for units with sliding fan structure produced on special request). For this reason, no intervention should be made by the user, except for general controls about the service.

- Make sure power is disconnected
- Check the fans if they are running
- Turn the fan wheel by hand and check for any mechanical friction, knocking or clicking noise.
- Check the tightness of the fan wheel
- If it is Plug Fan, check the vibration wedges for any damage or loosening.
- If it is a plug fan, check if there is any laceration in the flexible connections.
- Check the hose connections at the pressure measurement points and make sure hoses are not bend.

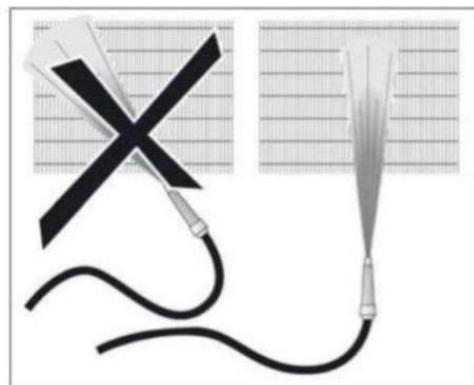


4.3.4 Coil Maintenance and Cleaning

- Because the working pressure of the heat exchanger is higher than atmospheric pressure, care should be taken against any operation that may affect the sealing or cause structural damage (Damages that are generally found at high temperatures and pressures and may cause internal fluid leakage or emission that could harm people / the product).
- All maintenance should be done when the heat exchanger is not operating. Internal fluid must be completely drained, connections that will impair the tightness must not be loosened until the internal pressure reaches atmospheric pressure. The temperature of the product components should not be higher than 35 ° C or ambient temperature.
- Before starting the system, make sure that gaskets are placed on all heat exchanger connections.
- The system should be vented regularly to prevent air from remaining in the cycle.
- When the heat exchanger is disassembled for any reason, new gaskets must be used. This process will prevent leaks from seals that become brittle over time due to dehydration.
- The heat exchanger should never be left filled with fluid while it is not operating to avoid freezing problems.
- Anti-freezing thermostats should be used.
- It should be ensured that all parts of the system are clean and in the most suitable condition for working conditions.

Cleaning

- Heat exchangers should be free of dirt and dust. Dirt/dust accumulating on the surface will cause a loss of capacity by forming a layer that will affect the heat transfer.
- The surface of the heat exchanger should be checked for dirt and dust and if necessary, cleaned with a soft brush, compressed air, pressurized hot water, or a similar method.
- Maintenance should be taken that the high air/water pressure value used during cleaning does not cause damage / bending on the coverslips.
- The washing process should be done parallel to the coverslip surface. Chemicals that can react with the materials used in the product should be avoided. When necessary, suitable chemicals that will not react with the material can be used.



4.3.5 Electric Heater Maintenance and Cleaning

DANGER ⚠ The unit must be completely isolated from the mains power supply before any maintenance and installation work or opening the enclosure!

WARNING ⚠ Do not wash the unit. This may cause electric shocks or fire. The appliance must be installed in accordance with national wiring regulations. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

CAUTION ⚠ Electric heater components can still be hot when the power plant is stopped! It should not be intervened before it is completely cooled!

CAUTION ⚠ The electric heater should not be operated before it is completely dry after cleaning!

Cleaning:

- The heating elements and body of the electric heater should be wiped with a damp cloth.
- The area with electrical and electronic components should be cleaned using only compressed air!

NOT: There are thermal protections on the electric heaters that SUPPLY at temperatures of 70 degrees and 90 degrees. Of these protections, it is 70 degrees with automatic reset. However, the 90 degrees must be reset manually. After the electricity is cut off, the 90-degree thermostat must be reset through the hole on the electric heater body!

4.3.6 Moisturizer Maintenance and Cleaning

Maintenance and cleaning of humidification systems should be done in accordance with the user manuals included in the humidifier.

For cleaning the stainless-steel condensation pans under the humidifiers, see section 5.3.8 “Condensation Pan Care and Cleaning”.

4.3.7 Silencer Maintenance and Cleaning

In EVO-M series air handling units, silencers are fixed to the body of the unit with trapezoidal screws. In case of need for service, the silencers can be taken out by removing these screws. Silencers should be checked for damage and lacerations at the intervals specified in the maintenance plan.

Cleaning of the silencers should be done by wiping with a slightly damp cloth. Compressed air/pressure washers should not be used during cleaning. These units may cause the silencer lining to laceration and the silencer to become unusable!

If there is a damaged silencer, AERA Technical Service should be contacted for spare parts.

4.3.8 Condensation Pan Maintenance and Cleaning

Condensation pans are maintenance-free materials. Pans should be wiped with a damp cloth for cleaning. Light cleaning materials such as FAIRY used in heat exchanger cleaning can be used for pan cleaning.

Siphons connected to the condensation pan should be checked in the periods specified in the maintenance plan. If there is no water in it, it should be completed.

4.3.9 Damper Maintenance and Cleaning

CAUTION ⚠ During damper checks, the unit must be completely turned off, its electrical connection must be disconnected, and if damper motors are connected, they must be disassembled.

Dampers should be checked on the following issues in the periods specified in the maintenance plan. If problems are encountered after the control, the Problem-Solving section should be examined. If the problem could not be solved despite this, AERA Technical Team should be contacted.

- Can the dampers open and close smoothly?
- Is there any wear/laceration/detachment on damper seals?
- Are there any crooked/broken/cracking/crushing of damper blades?

4.3.10 Body Cleaning

The interior and exterior surfaces of the switchboard should be checked within the period specified in the maintenance plan. Regarding the negativities detected because of the control, the “Problem Solving” section should be examined first, and if the problem cannot be solved, the AERA Technical Team should be contacted. Control points are as follows.

- Are there any knocks / dents / splitting in the body of the unit?
- Is water leaking from the appliance?
- Is there any visible corrosion or wear on the outside of the unit?
- Are the doors dropping?

Use a damp cloth for body cleaning.

4.4 Alarms

CAUTION

This section should be reviewed by a person with sufficient knowledge of electricity. Appropriate precautions must be taken before any intervention.

	ALARM	PRIORITY	STOP	THINGS TO DO
1	SAF Failure	B	X	The ventilator fan needs to be checked.
2	EAF Failure	B	X	The extractor fan needs to be checked.
3	P1 HEATER FAILURE	B		Heater pump failure. Check if the unit has a pump outlet. Check the pump.
4	P1 COOLER FAILURE	B		Cooler pump failure. Check if the unit has a pump outlet. Check the pump.
5	P1 EXCHANGER FAILURE	B	X	Heat exchanger pump failure. Check the pump.
6	FILTER ALARM 1	B		Check if the filter on the supply side is dirty.
7	FIRE ALARM	A		Check the fire status information connections.
8	EXTERNAL SWITCHING	C		External start warning.
9	EXTERNAL ALARM	B	X	External alarm warning.
10	SUPPLY AIR CONTROL ERROR	B		It is an alarm indicating that the difference between the supply temperature set value and the reading air temperature is too high. Whether there is hot water in the system, the valve motor opened, the status of the bypass valve, etc. do checks.
11	HIGH SUPPLY TEMPERATURE ERROR	B		The supply air is above the specified limit. Check the heating actuator or electric heater.
12	LOW SUPPLY TEMPERATURE ERROR	B		The supply air is below the specified limit. Check cooling valve or DX Unit.
13	HIGH ROOM TEMPERATURE	B		Room temperature is above the specified limit. Check the temperature control equipment. Heater valve, DX Unit, etc.
14	LOW ROOM TEMPERATURE	B		Room temperature is below the specified limit. Check refrigeration control equipment. Refrigerant valve, DX Unit, etc.

15	ELECTRIC HEATER HIGH TEMPERATURE	A		Electric heater high-temperature failure. Check if there is air flow. Check heater wiring connections. Cut off the power and check the heater.
16	FREEZING RISK	B		Freeze alert.
17	LOW FREEZING TEMPERATURE	A		The value from the freezing temperature sensor is below the specified limit.
18	LOW EFFICIENCY	B	X	Check the switchboard parameters.
19	OUTDOOR TEMPERATURE SENSOR ERROR	B		Check the outdoor sensor.
20	VENTILATION MANUAL MODE	C		The unit was operated in manual mode warning.
21	MANUAL SUPPLY AIR CONTROL ERROR	C		The supply air warning in manual mode.
22	MANUAL SUPPLY FAN MODE ERROR	C		The supply fan warning in manual mode.
23	MANUAL SUPPLYING FREQUENCY CONTROL	C		The frequency converter warning in manual mode.
24	MANUAL EXCHANGER FREQUENCY CONTROL	C		The heat exchanger warning in manual mode.
25	MANUAL HEATER CONTROL ERROR	C		The heater warning in manual mode.
26	MANUAL EXCHANGER CONTROL ERROR	C		The heat exchanger warning in manual mode.
27	MANUAL COOLER CONTROL ERROR	C		The cooler warning in manual mode.
28	MANUAL P1 HEATER	C		P1 heater pump warning in manual mode.
29	MANUAL P1 HEAT EXCHANGER	C		P1 heat exchanger warning in manual mode.
30	MANUAL P1 COOLER	C		P1 cooler pump warning in manual mode.
31	SUPPLY TEMPERATURE SENSOR ERROR	B		Check the relevant sensor connections.
32	HEAT EXCHANGER SENSOR ERROR	B	X	Check the relevant sensor connections.
33	ROOM TEMPERATURE 1 SENSOR ERROR	B		Check the relevant sensor connections.
34	ROOM TEMPERATURE 2 SENSOR ERROR	B		Check the relevant sensor connections.
35	EXTERNAL AIR TEMPERATURE SENSOR ERROR	B		Check the relevant sensor connections.
36	EXTRA SENSOR 1 SENSOR FAILURE	B		Check the relevant sensor connections.
37	SAF PRESSURE SENSOR ERROR	B		Check the relevant sensor connections.
38	EAF PRESSURE SENSOR ERROR	B		Check the relevant sensor connections.
39	FROST PROTECT TEMPERATURE SENSOR ERROR	B	X	Check the relevant sensor connections.
40	FROST PROTECTION SENSOR ERROR	B	X	Check the relevant sensor connections.

41	CO2 SENSOR ERROR	B		Check the relevant sensor connections.
42	ROOM HUMIDITY SENSOR ERROR	B		Check the relevant sensor connections.
43	MOISTURE PIPES SENSOR ERROR	B		Check the relevant sensor connections.
44	EXTRA UNIT TEMPERATURE SENSOR ERROR	B		Check the relevant sensor connections.
45	EXTERNAL CONTROL SAF SENSOR FAILURE	B		Check the relevant sensor connections.
46	EXTERNAL CONTROL EAF SENSOR FAILURE	B		Check the relevant sensor connections.
47	SAF PRESSURE 2 SENSOR ERROR	B		Check the relevant sensor connections.
48	OUTDOOR HUMIDITY SENSOR FAILURE	B		Check the relevant sensor connections.
49	INPUT TEMPERATURE SENSOR ERROR	B		Check the relevant sensor connections.
50	EXTRA SENSOR 2 SENSOR ERROR	B		Check the relevant sensor connections.
51	EXTRA SENSOR 3 SENSOR ERROR	B		Check the relevant sensor connections.
52	EXTRA SENSOR 4 SENSOR ERROR	B		Check the relevant sensor connections.
53	EXTRA SENSOR 5 SENSOR ERROR	B		Check the relevant sensor connections.
54	SAF EXTRA PRESSURE SENSOR ERROR	B		Check the relevant sensor connections.
55	EAF EXTRA PRESSURE SENSOR ERROR	B		Check the relevant sensor connections.
56	SAF FREQUENCY CONVERTER ERROR	C	X	Check the frequency converter, then check the motor.
57	EAF FREQUENCY CONVERTER ERROR	C	X	Check the frequency converter, then check the motor.
58	SAF FREQUENCY COMMUNICATION ERROR	C	X	Check the communication cables.
59	EAF FREQUENCY COMMUNICATION ERROR	C	X	Check the communication cables.
60	EXPANSION UNIT 1 COMMUNICATION ERROR	C	X	Check the communication cables.
61	EXPANSION UNIT 2 COMMUNICATION ERROR	C	X	Check the communication cables.
62	SAF FREQUENCY CONVERTER WARNING	C		Check the frequency converter.
63	EAF FREQUENCY CONVERTER WARNING	C		Check the frequency converter.
64	SERVICE TIME	C		Service control of the unit should be provided.
65	Y4 EXTRA SEQUENCE CONTROL MANUAL	B		Manual Y4 control warning.
66	Y5 EXTRA SEQUENCE CONTROL MANUAL	C		Manual Y5 control warning.

67	FILTER PROTECTION 2 ERROR	B		Check if the filter on the return side is dirty.
68	EXTRA SENSOR HIGH TEMPERATURE 1	-		Check the place where the extra sensor is located.
69	EXTRA SENSOR LOW TEMPERATURE 1	-		Check the place where the extra sensor is located.
70	EXTRA SENSOR HIGH TEMPERATURE 2	-		Check the place where the extra sensor is located.
71	EXTRA SENSOR LOW TEMPERATURE 2	-		Check the place where the extra sensor is located.
72	EXTRA SENSOR HIGH TEMPERATURE 3	-		Check the place where the extra sensor is located.
73	EXTRA SENSOR LOW TEMPERATURE 3	-		Check the place where the extra sensor is located.
74	EXTRA SENSOR HIGH TEMPERATURE4	-		Check the place where the extra sensor is located.
75	EXTRA SENSOR LOW TEMPERATURE4	-		Check the place where the extra sensor is located.
76	EXTRA SENSOR HIGH TEMPERATURE 5	-		Check the place where the extra sensor is located.
77	EXTRA SENSOR LOW TEMPERATURE 5	-		Check the place where the extra sensor is located.
78	EXTRA ALARM 1	-		Check the extra alarm set designated as DI.
79	EXTRA ALARM 2	-		Check the extra alarm set designated as DI.
80	EXTRA ALARM 3	-		Check the extra alarm set designated as DI.
81	EXTRA ALARM 4	-		Check the extra alarm set designated as DI.
82	EXTRA ALARM 5	-		Check the extra alarm set designated as DI.
83	EXTRA ALARM 6	-		Check the extra alarm set designated as DI.
84	EXTRA ALARM 7	-		Check the extra alarm set designated as DI.
85	EXTRA ALARM 8	-		Check the extra alarm set designated as DI.
86	EXTRA ALARM 9	-		Check the extra alarm set designated as DI.
87	EXTRA ALARM 10	-		Check the extra alarm set designated as DI.
88	EXTRA UNIT MANUAL MODE ERROR	-		The function determined as an extra warning in the manual mode.
89	EXPANSION UNIT 3 COMMUNICATION ERROR	-		Check the communication cables.
90	EXPANSION UNIT 4 COMMUNICATION ERROR	-		Check the communication cables.
91	LOW OUTDOOR TEMPERATURE	-		Check the outdoor sensor.
92	HIGH OUTDOOR AIR TEMPERATURE	-		Check the outdoor sensor.
93	EXPANSION UNIT 5 COMMUNICATION ERROR	-		Check the communication cables.
94	EXPANSION UNIT 6 COMMUNICATION ERROR	-		Check the communication cables.

*Full of terminal and connection diagram attached to electrical panel. Also you can find device layout which is showing where the sensors, fans, filters, exchanger and coils. If you need a help about anything you can feel free to contact aftersales@aera.com.tr

4.5 Problems & Solutions

FAULT	CONDITION	POSSIBLE CAUSE	SOLUTION
The air handling unit is noisy.	High air velocity	Air flow too high	Check if the airflow appropriate to the project value. If not, set it to the appropriate value.
		Duct sections, small for the application	Check the duct size and revise if necessary.
		Fan too small for the application	Contact the AERA Technical Team.
		Serpentine with the insufficient front surface	Contact the AERA Technical Team.
		Small vents for application	Check if the airflow appropriate to the project value. If not, set it to the appropriate value.
	Fan-Motor Noise	Worn or damaged fan wheel	Replace the fan wheel.
		Damaged suction funnel	Remove and straighten the funnel, replace if necessary.
		Bush loose	Tighten the bushing, replace if necessary.
		Worn or damaged fan wheel	Replace the fan wheel.
		Unbalanced (Balanced) fan wheel	Contact the AERA Technical Team.
		Motor bearing damage/failure	Contact the AERA Technical Team.
		Motor cooler damage/failure	Contact the AERA Technical Team.
		The foreign item inside the unit or in the fan	Clean the inside of the unit and fan.
	Vibration	Vibrating ducts	Fasten up the ducts.
		Vibrating body parts	Fasten up or properly isolate parts that cause vibration.
		A vibration isolator is not placed between the vibrating parts and the building.	Put vibration isolator under the switchboard.
		Fan spring insulators loose / damaged	Check insulators, replace if necessary.
	Whistling	Clogging in dampers, vents	Check dampers and vents, correct/clean if necessary.
		General leakage	Check the leak section.
		Sharp elbows	Remove sharp elbows install elbows of appropriate diameter and directional blades.
There is a sudden widening or narrowing of the duct		Replace the expansion/contraction chambers with the appropriate angle expansion/contraction chambers.	

FAULT	SYMPTOM	POSSIBLE CAUSE	SOLUTION
In the air handling units, no airflow/motor not running	There is no power supply to the motor	Power be off	Check the electrical supply line. Troubleshoot the fault.
			Check motor connections, correct if necessary.
			Check terminals and contactors, correct if necessary.
		Thermal burnout	Contact the AERA Technical Team.
		Control panel error	System connections are checked.
		Main switch off	Turn on the main switch.
	There is power supply to the motor	Incorrect connection to terminals	Fix the connections.
		Motor oils	Contact the AERA Technical Team.
		Motor burned out	Contact the AERA Technical Team.
		Damper/flaps may be closed	Check dampers and flaps, correct if necessary.
In the air handling units, no airflow/motor running	The fan wheel not turning	Fan wheel and motor shaft connection loose	Tighten the bushing, replace if necessary.
	The fan wheel is spinning	Clogging in ducts	Check/remove congestion in the duct.
		Fan rotation direction is not correct	Correct the fan rotation direction.
		Damper closed in suction or blowing	Check the damper positions, if it is closed, open it.
Low airflow in air handling units	Low airflow	Filters are dirty or clogged	Change or clean filters.
		Coils dirty or clogged	Clean the coils.
		External pressure loss higher than the rated value	Check duct pressure losses and duct design.
		Fan rotation direction is not correct	Correct the fan rotation direction.
		There is a leak in the unit	Check the leak section.
		Dampers do not clear enough	Check and correct damper positions.
		High fan k factor value (in automation units)	Correct the K-factor value (in automation units)
	Excessive leakage on the pressure side of the system	Doors do not close properly/fallen	Check the door gaskets and replace them if necessary. Check the door hinges, adjust if necessary.
		Duct connections are not isolated	Make duct connections sealed.
		The fire damper may be closed.	Check and open if necessary.
		VAVs may be turned off, out of adjustment, or incorrectly selected.	Contact the mechanical installers.
		The duct outlet may be closed or clogged.	Check and remove clogging if necessary

FAULT	SYMPTOM	POSSIBLE CAUSE	SOLUTION
In air handling units, high airflow	High Airflow	Low fan k factor value (in automation units)	Correct the K-factor value (in automation units)
		External pressure loss less than the design value	Lower the fan speed.
	Excessive leakage on the suction side of the system	Doors do not close properly/ fallen	Check the door gaskets and replace if necessary.
			Check the door hinges, adjust if necessary.
	Excessive motor current	The supply voltage is low.	The voltage of the supply to the motor must be corrected.
		Doorways are not installed.	Install the doorways.
		Filters are not installed.	Install the filters.
The filters are clean, so the initial pressure difference is low.		The operating frequency settings of the motor are made. VAV, CAV, and fire dampers are checked.	
No heating/cooling in air handling units	No airflow.	See the "No airflow" section.	See the "No airflow" section.
	Incorrect temperature setting.	Heating/cooling set temperature low/high	Bring the set temperature to the project level.
	Serpentine Heater/refrigerant pipe is clogged	There is air in the system.	Bleed the serpentines.
		Two-way or three-way valves are closed/faulty.	Check valves and actuators, replace if necessary.
		The hot/cold water system is faulty.	Check the hot/cold water system, correct if necessary.
		Serpentine frozen (heating serpentine only)	Add glycol to the system.
			Determine damage, replace if necessary.
		Mechanical regulated valves are closed.	Open the valves.
		Pipe connections leaking water.	Check the pipe connections. Replace if necessary.
		Coil damaged / defective / burst	Determine damage, replace if necessary.
Heating/cooling coil cold/hot	Boiler/chiller temperature is insufficient	Check the set setting. If it does not change, adjust the boiler/chiller temperature.	
Insufficient / excessive heating / cooling in air handling units	Airflow high / low	See section high / low airflow	See section high / low airflow
	Heater / refrigerant flow high / low	Two-way or three-way valves closed / faulty	Check valves and actuators, replace if necessary.
		Pump power	Check pump power. Replace the pump if necessary.
		Pipe dimensions	Check the pipe dimensions. Replace if necessary.
		Serpentine is clogged.	Clean the strainers, replace them if necessary.
Strainers are full	Clean the strainers, replace them if necessary.		

FAULT	SYMPTOM	POSSIBLE CAUSE	SOLUTION
Electric heater - No heating	There is no power in the controller.	No electricity	Locate and repair the error.
		Contactor is faulty	Contact the AERA Technical Team.
		The safety thermostat shut down the system.	Check the safety thermostat, make sure there is airflow. Reset the thermostat.
	There is power in the controller.	The resistor is faulty	Contact the AERA Technical Team.
		Heater disconnected/wiring incorrect/low voltage	Check connections, correct if necessary.
		Temperature set point too low	Adjust the temperature set.
Electric heater - under / over Heating	Heating Element is defective	There is a leak in the element, it is grounding.	Contact the AERA Technical Team.
	Air flow high / low	See section high / low airflow	See section high / low airflow
	Set value too low	Temperature set point too low	Adjust the temperature set.
Steam humidifier - no humidification	There is no energy.	Fuse capacity low/defective	Check the fuse, remove, or replace if necessary.
		Supply connections wrong / missing	Fix the connections.
	Heater is faulty	Electrodes are defective.	Contact the AERA Technical Team.
		There is no water in the boiler.	
		The solenoid valve is faulty.	
	The humidity sensor is faulty.	Humidity sensor oxidized / damaged / cable broken / disconnected	Check the cables, replace them if necessary.
	There is no water in the cylinder.	Humidifier solenoid valve defective.	Contact the AERA Technical Team.
		Strainers full / valve closed	Check valve and strainers, replace if necessary.

FAULT	SYMPTOM	POSSIBLE CAUSE	SOLUTION
There is a water leak from the air handling unit.	The drain pan is full.	The drain pan inside the air handling unit is clogged.	Check the pan and pipe, clean if necessary.
		There may be water leakage in the water coils inside the air handling unit.	Turn off the water connections, check the coil. Contact AERA Technical Team in case of damage detection.
		The siphon is not working.	Check the siphon, clean, or replace if necessary.
		The drainage pipe outside the switchboard may be clogged.	Contact your plumber.
	Coil connections are dripping/ leaking.	The unions are loose / cracked or leaking from the welds.	Contact your plumber.
	The heating coil is dripping/ leaking.	The heating coil damaged/ burst.	Contact the AERA Technical Team.
	There are water drops after the cooling coil.	Drip tray installed incorrectly / broken	Check the drip tray, correct if necessary or request a new one.
	Water accumulation in the unit	Storage shortage	The unit may have gotten water while it was waiting at the construction site. Check all cables and connectors against corrosion.
		The unit is not installed correctly.	Check, install according to the manual.
		The unit is damaged	Contact the AERA Technical Team.
		Weather protection assembly does not correct	Check, install according to the manual.
		Positioning the indoor unit outdoors	Attach the appropriate weather protection to the unit.

FAULT	SYMPTOM	POSSIBLE CAUSE	SOLUTION
There is an air leak in the air handling unit.	Whistling sound from module combinations	The unit is not equilibrium.	Balance the unit.
		Module fasteners are not tightened completely.	Tighten the module joints.
		Module joint gaskets damaged/missing	Check gaskets, replace them if necessary.
	Whistling sound at panel joints.	There is no silicone between the panels inside the unit/damaged.	Check all joints, apply silicone if necessary.
		Panel screws are loose.	Tighten the panel screws.
	Whistling from door frames.	Door locks do not crush the gasket.	Check the locks, tighten them if necessary.
		The door has sagged/fallen	Adjust the doors and gaskets.
		Door gaskets missing / damaged	Check gaskets, replace them if necessary.
	Whistling in duct connections.	Duct connection gaskets damaged/wrecked	Check duct connection gaskets, replace them if necessary.
		Duct connections are loose.	Tighten duct connections, replace them if necessary.
		Duct connections are not enough.	Tighten duct connections with G-clips.
	Leak location cannot be determined	Drain pan outlets open	Check that the drain pans have siphons, or plug them in.
		Coil collectors damaged	Contact the AERA Technical Support.
There is insulation material in the duct.	Silencer damage	The silencer is torn	Contact the AERA Technical Support.

4.6 Spare Parts

- I. Emergency Stop Button
- II. Door Switches
- III. Dampers and Damper Motors
- IV. Filters
- V. Coils
- VI. Electric Motors
- VII. Fans
- VIII. Door Lock and Door Handles
- IX. Detachable Panels and Doors
- X. Sensors
- XI. Main Controller and Remote Controller
- XII. Belt Pulleys

4.7 After-Sales Services & Service Form

All the AERA EVO-M air handling units, there is no part replacement or repair work to be done by the user, except for cleaning and eye control. Users should contact the AERA company for any malfunctions detected during commissioning or maintenance. Contact the address given below for your service needs and problems. Please fill the "Product Malfunction Notification Form" and forward it to aftersales@aera.com.tr.

FACTORY

3. Cadde No:13 Pancar OSB, Torbalı - İzmir
TEL +90 232 799 0 111 FAKS +90 232 799 01 14

FACTORY II

14. Cadde No: 13 Pancar OSB, Torbalı İZMİR TÜRKİYE
Aftersales@aera.com.tr



PRODUCT MALFUNCTION NOTIFICATION FORM

DATE:

COMPANY NAME:	END USER:
COMPANY CONTACT:	END USER CONTACT:
ADDRESS:	ADDRESS:
TELEPHONE NUMBER:	TELEPHONE NUMBER:
E-MAIL:	E-MAIL:
UNIT MODEL:	INSTALLATION DATE:
INVOICE OR DELIVERY NOTE NUMBER:	MALFUNCTION DATE:
SERIAL NUMBER:	PRODUCT NUMBER:
REMOTE ACCESS: YES / NO	

*End user contact information is not mandatory.

CAUSE OF FAILURE, MARK IF KNOWN:

- | | | |
|-----------------------------|---------------------------------|--------------------------|
| 1.Assembly Fault | 5.User Fault | 9.Short Circuit |
| 2.Configuration Fault | 6.Packaging or Shipping Failure | 10.Commissioning Failure |
| 3.Deficient User Manual | 7.Part/Product Failure | |
| 4.Missing Parts / Equipment | 8.Product Life Cycle | |

DESCRIPTION OF THE PROBLEM:

NOTES:

- 1) A separate Product Malfunction Notification Form will be filled out for each product.
- 2) Forms without a problem description will not be accepted.
- 3) Products sent for testing or Remote access requests fee depends on unit model. Please get confirmation from Aftersales team.

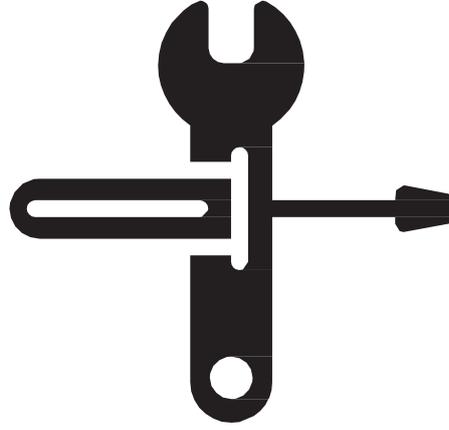
* The parts replaced by our service are covered by a 12-month warranty.

** Units or parts not received within 90 calendar days, our service is not responsible.

**Operation and
Maintenance
Manual**

EVO-MODULAR
AIR HANDLING UNITS

KA.TA.001 • 22.11.2021 • REV/02



AERA İKLİMLENDİRME TEKNOLOJİLERİ SAN. VE TİC. AŞ

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