

**ÜNTES®**



**CE**

**THERMOFRESH UNITS**  
**ASSEMBLY, START UP, MAINTENANCE AND USER MANUAL**



**Please read this manual first!**

Dear Customer,

Thank you for preferring UNTES. We hope that your product which has been manufactured in modern facilities and passed through a strict quality control procedure will give you the best results. Therefore, we advise you to read through this manual carefully before using your product and keep it for future reference.


- Please read the Operation Manual before installing and starting your machine
- Particularly follow the instructions related to safety.
- Keep this Operating Manual within easy reach. You may need it in the future.

Sincerely,

UNTES Heating Ventilating Air Conditioning Inc.

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## 1. Introduction and General Information

This manual was prepared according to the TS 11823/95 standard. Users are required to be aware of the instructions contained in this manual before the start-up. This manual is a reference guide, envisioned to be a guide the user through installation, commissioning, operation and maintenance of heat recovery unit (UTFS). The users must pay high attention to the information in this manual for their own safety and comfort.

### 1.1. General Warnings

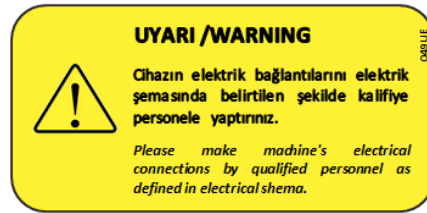
- Pay attention to the transport and storage conditions in the instruction manual.
- Comply fully with EN378 or ISO5149 standards for installation.
- After having received and before commissioning the unit, a damage control shall be performed. Make sure that refrigeration circuits are not damaged and have not been subject to any leakage. In case any damage is detected, you should definitely contact the technical service.
- If needed, the list of spare parts should be requested from the company.
- The packaging should not be removed until the unit reaches the installation site to avoid damages.
- Any staff who takes a role in operation the unit, must be
- Care must be taken to ensure that the drain pipe diameter is not smaller than that of the outlet of the condensation pan.
- The electrical connections made to the unit user panel from the outside must be compliant with the rules.
- The unit cannot be used in environments with explosion hazard.
- Never perform maintenance or repair on plugged in units.
- Make sure that the local electrical supply conditions are compatible with the electrical data given on the unit tag.
- The voltage must be kept within  $\pm 5\%$  tolerance of the tag value by using a voltmeter.
- While performing any maintenance on the unit, the electricity of the unit should be disconnected and a warning sign should be used indicating that the unit was under maintenance.
- Intervention by any unauthorized personnel should not be allowed on any electrical part of the unit.
- Do not touch the electrical equipment of the unit with bare hands without any protection.
- Do not operate the unit while exposing the electric and electronic equipment to the external environment conditions by opening the doors.
- Gas pipes should never be used in unit grounding.
- Do not touch the hot surfaces during the operation of the unit
- Correct operation of the cooling circuit equipment should be checked
- Global warming potential of R-410A gas in use is (GWP): 2088. According to European or local laws, periodic maintenance and controls need to be carried out for refrigerant leakages. These maintenance and controls should be performed according to the local laws.

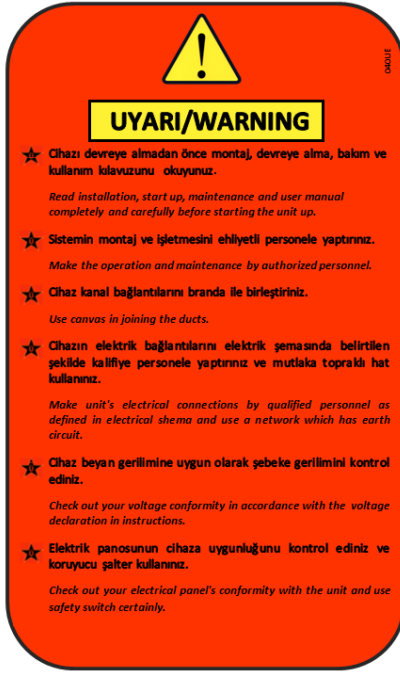
- NFE29-795 standad regulating the use and collection of halogenated hydrocarbons should absolutely be within the scope of knowledge.
- The conditions defined for refrigerant charge should be followed.
- Cihazda R-410A gazı çalışma basıncı ~40 bardır. Soğutma devresi üzerinde çalışırken mutlaka özel korunma ekipmanları kullanılmalıdır.
- R-410A gas contact with eyes and/or skin will cause irritation and should be avoided.
- The unit should not be operated next to sensitive devices due to electromagnetic effects.
- Room type combined temperature or humidity sensor should be installed at a minimum height of 1.5 m.
- Perform the precursory inspections before starting-up the unit.
- Bear in mind that wrong cleaning procedures may result in undesired damages to the unit and/or the operator.
- The dismantled dirty filters should be placed in a closed, isolated box and should be disposed in compliance with the solid waste procedures.
- Compressed air should be used for cleaning the fan. Air should not contain lubricant particles.

## 1.2. Marks and Tags Used on the Unit

Warning and Information related tags on the unit are as follows:

|   |  |
|---|--|
| <b>ÜNTEŞ</b>  |  |
| Merkez/Fabrika / Head Office/Factory<br>İstanbul Yolu 37. Km.<br>Kazan - ANKARA TURKEY<br>Tel : +90(0312) 818 63 00<br>Fax : +90(0312) 818 61 50<br>E-Mail : untes@untes.com.tr |  |
| <b>CE</b>   |  |
| Model   |  |
| Sipariş No / Order No.  |  |
| Seri No   |  |
| Nominal Isı Girişi (Qn)   |  |
| Hava Debişi / Air Flow Rate (m³/h)  |  |
| Soğutma Kapasitesi / Cooling Capacity (kW)  |  |
| Isıtma Kapasitesi / Heating Capacity (kW)   |  |
| Döğüşme Gücü / Burner Heating Cap. (kW)   |  |
| Kapasite Aralığı / Modulating Capacity Control (%)  |  |
| Kurulu Güç / Total Installed Power (kW)   |  |
| Cihaz Dış Basıncı / External Static Pressure (Pa)   |  |
| Soğutucu Akışkan / Refrigerant  |  |
| Volt / Frek./Faz/Volt./Freq./Phase  |  |
| Üretim Tarihi / Production Date   |  |





### 1.3. Operation Limits

The operational limits of the unit are given in the table below. Adherence to these data is very important for a healthy operation of the unit.

| Cooling | External Air Temperature |         |
|---------|--------------------------|---------|
|         | KT [°C]                  | YT [°C] |
| Minimum | -20                      | -       |
| Maximum | 42                       | -       |

## **1.4. List of Spare Parts**

The list of spare parts should be requested from the manufacturer in case of need. The spare parts list contains components that can be easily replaced on site but cannot be easily found in the market. On the other hand, materials that can be easily found anywhere such as the electrical motor, contactor, refrigerant fluid etc. are not included in this list.

Spare parts and technical service are provided for the product for a period of 10 years with change. Regular periodical maintenance performed by qualified technical staff increases the performance of the unit.

## **2. Equipment and Components Working Principles**

### **2.1. Electrical Panel and Microprocessor**

UTFS units have just one electrical panel. The electrical panel has a built-in power supply and accommodates the microprocessor that ensures the control of the components. UTFS units do not require any extra power or any additional electrical panels.

The safety equipment of the system in the panel mainly includes automatic and glass fuses, motor protection switches and phase protection relay. The door of the panel is locked and must not be intervened by any incompetent or unauthorized staff.

The electrical panel contains a microprocessor that processes the signal received from pressure, temperature and humidity sensors. This microprocessor is capable of performing the cooling and fan control operations of the unit. Furthermore, it is also possible to ensure the control of accessories other than the standard ones. The microprocessor changes depending on the number of options.

### **2.2. Fans**

These fans are located inside the unit and their purpose is to direct the fresh air needed by the user to the room and redirect the air back to the outside. The system is designed to create variable pressure and airflow rates. In order to do this, the fans are controlled meeting the system's needs.

### **2.3. Sensors**

There are various sensors depending on the options and accessories in the system. They provide the necessary operational information for the processor by converting the data they acquire and sending them to the microprocessor.

Fresh air temperature sensor plays a vital role in determining the optimal operating conditions of the heat recovery system by measuring the temperature of air coming into the room. The sensor is placed at the damper openings before the heat recovery unit entry.

Dirt filter sensors determine the decrease in filter set pressure values by measuring filter inlet and outlet pressure. It also provides the user with information about the change/cleaning requirements of the filters.



The supply temperature sensor given with the heating/cooling options provides information to the microprocessor by measuring the temperature that enters the room. The sensor helps the system keep the heating/cooling balance.

The optional air quality sensor(CO<sub>2</sub> sensors) provides the information to the control unit that regulates the fan stages by measuring the amount of carbondioxide in the room.

The optional return air temperature sensor measures the temperature of air leaving the room and provides the information to the microprocessor that uses the data to operate the heat recovery unit more efficiently.

The optional smoke detector provides the information to the control unit in the event of fire or beforehand through air property changes and stops the fans. If the unit has dampers, fans and dampers are closed.

#### **2.4. Filter**

ISO Coarse 60%(G4) filters are used as standard in UTFS units. The filters positioned at the inlet of the unit is used to protect the equipment inside and increases the air quality. Periodic maintenance and cleaning contributes to the overall efficiency of the systems. Optionally ISO ePM10 50%(M5) or ISO Course 40%(G2) are used.

#### **2.5. Refrigerant (R-410A)**

The refrigerant used in UTFS units is R-410A. This unit is designed to work with this particular gas and should not be used with other refrigerant s. R-410A has a GWP of 2088 and is considered a fluorinated greenhouse gas by the Kyoto protocol.

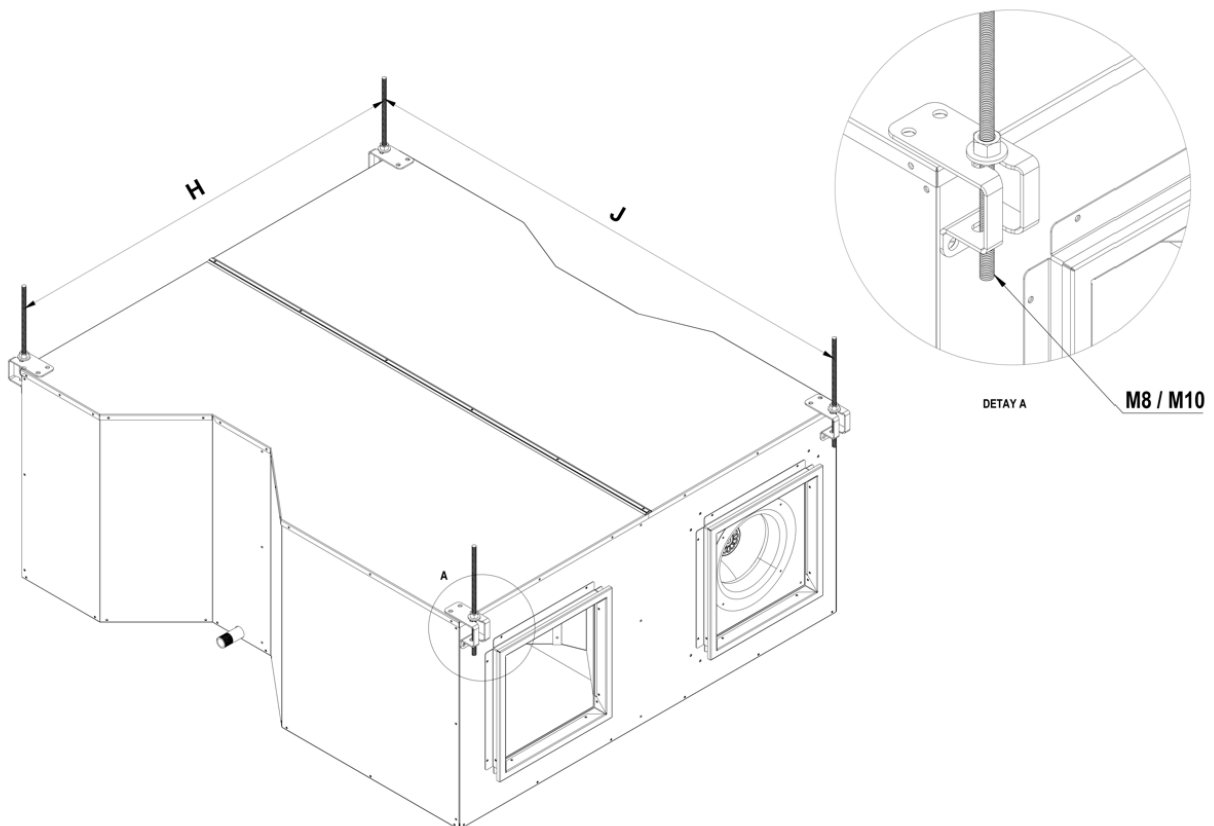
#### **2.6. Heat Recovery Unit**

Heat recovery unit is a heat exchanger that saves energy that would otherwise leave the room. The warm air leaving the room transfers the heat to the air entering room to save energy with the help of aluminium plate heat exchanger. The heat exchanger is an efficient unit consisting of low-pitched aluminium fins. In case where heat transfer is not necessary, fresh air travels through the bypass damper avoiding the heat exchanger completely(Optionally).

## 3. Installation

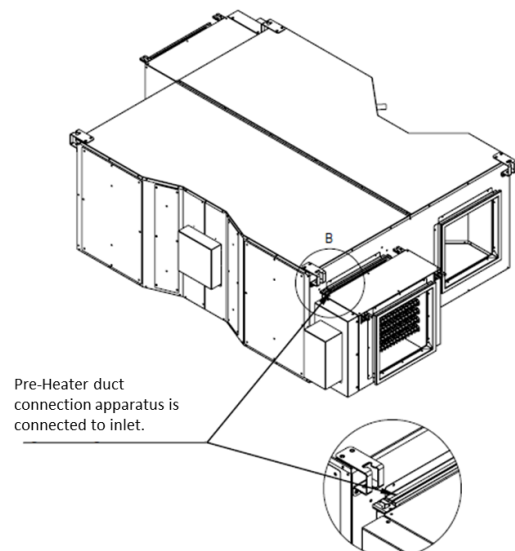
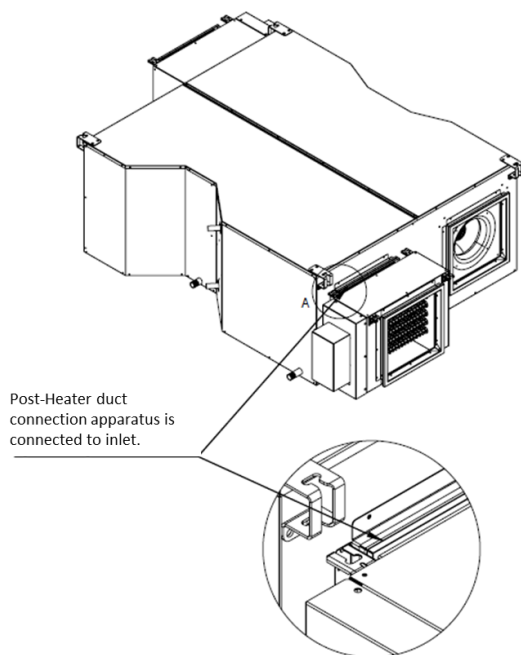
### 3.1. Transportation and Storage

- Units should not be removed from their packaging until they reach their installation site, impact and fall damage should be prevented.
- Units should be carried and stored horizontally. In the case of stowing, place Styrofoam inbetween units to prevent damages to the unit.
- Dragging the unit by placing it on top of sledges should be avoided.
- Forklift and similar vehicles should be used to carry the unit to the installation location. For larger units use appropriate lifting setup and do not stay under the unit in the process of lifting.
- Units that are not installed should be should be stored packaged and indoors.
- Placing weight on the unit that would cause deformation should be avoided.
- Dust, gas, vapor and chemicals that would cause abrasion should not come into contact with the unit or its parts.
- The dampers should be in a closed state when the unit is not working.
- Installation and use of the unit in environments with over 80% relative humidity, temperatures lower than -20°C or over 40°C should not be considered.

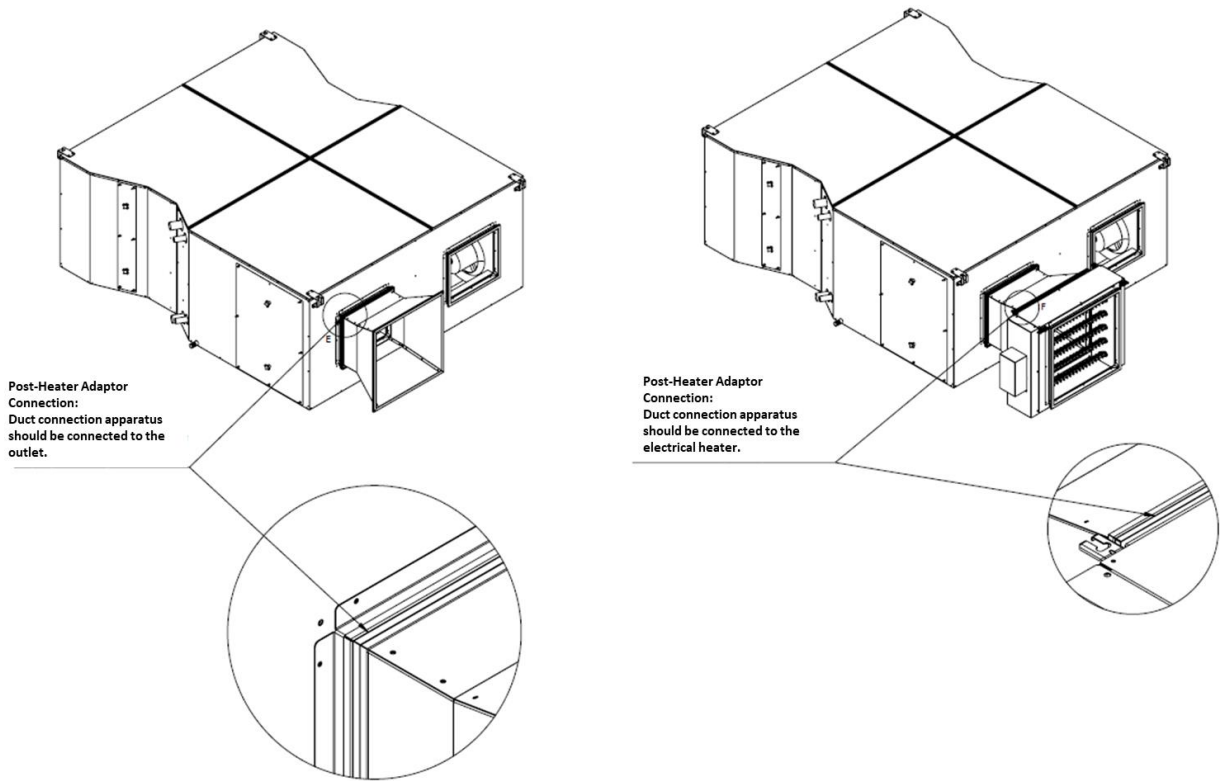


### 3.2. Considerations While Placing the Unit

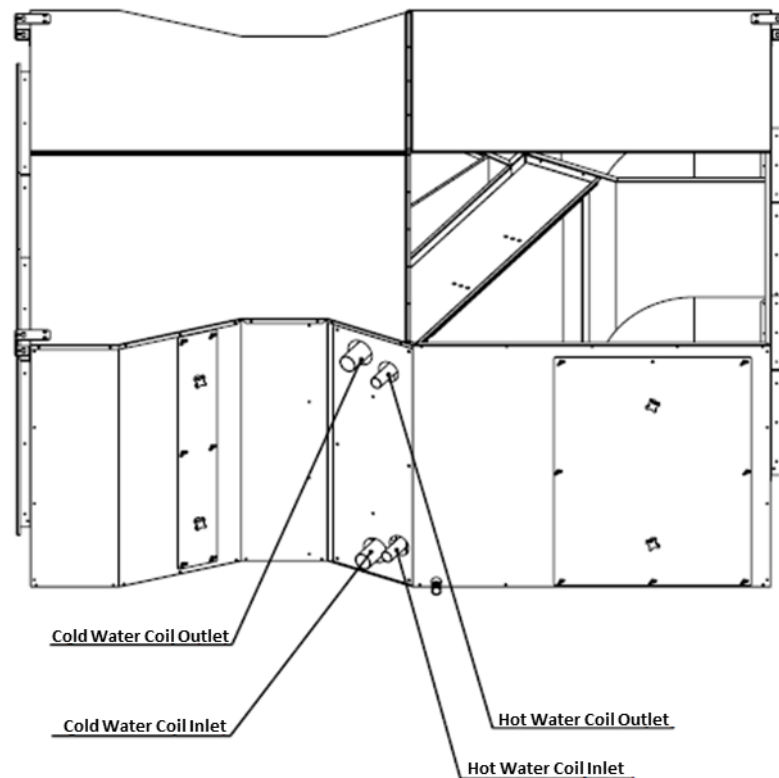
- The unit should be installed after checking the service and operating directions.
- Install the unit using the appropriate lifting methods.
- Install the system by using the hanging apparatus on the unit or mounting the unit on a support frame that was prepared beforehand.
- A minimum of M8 threaded rod and appropriate connection equipment should be used to hang the unit from the ceiling.
- A minimum of 25 mm thick vibration insulator should be used to dampen the vibration in installations where the unit is mounted on a support.
- In the case of direct duct installation to the unit, make sure the ducts are continuing alongside the supply direction for a few more meters before making a turn.
- Install the unit horizontally and make sure the unit is balanced by using a carpenters level.
- If the unit installation is carried out by an external team, make sure they are following the right installation procedures to prevent damages to the unit.
- Use gaskets between the unit and its accessories to prevent air leaks.
- Sloped condensate drain pans are used to lead the condensated water out of the system. During installation additional downslope of 1/100 towards the drainage pipe should be given.
- Electric pre and post heater connections are shown in the following drawings.

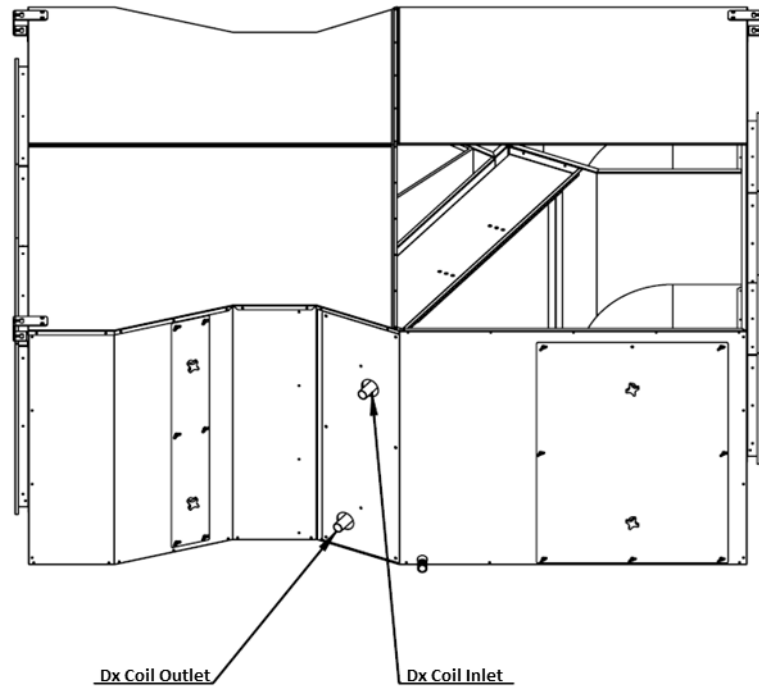


- Electric post-heater connection in larger models is shown in the following drawings.

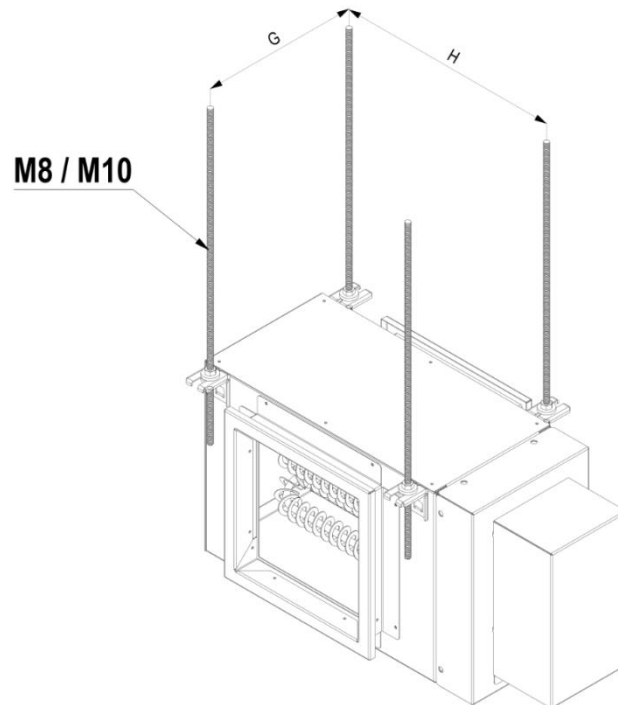


- Coil connections are shown in the following drawings.

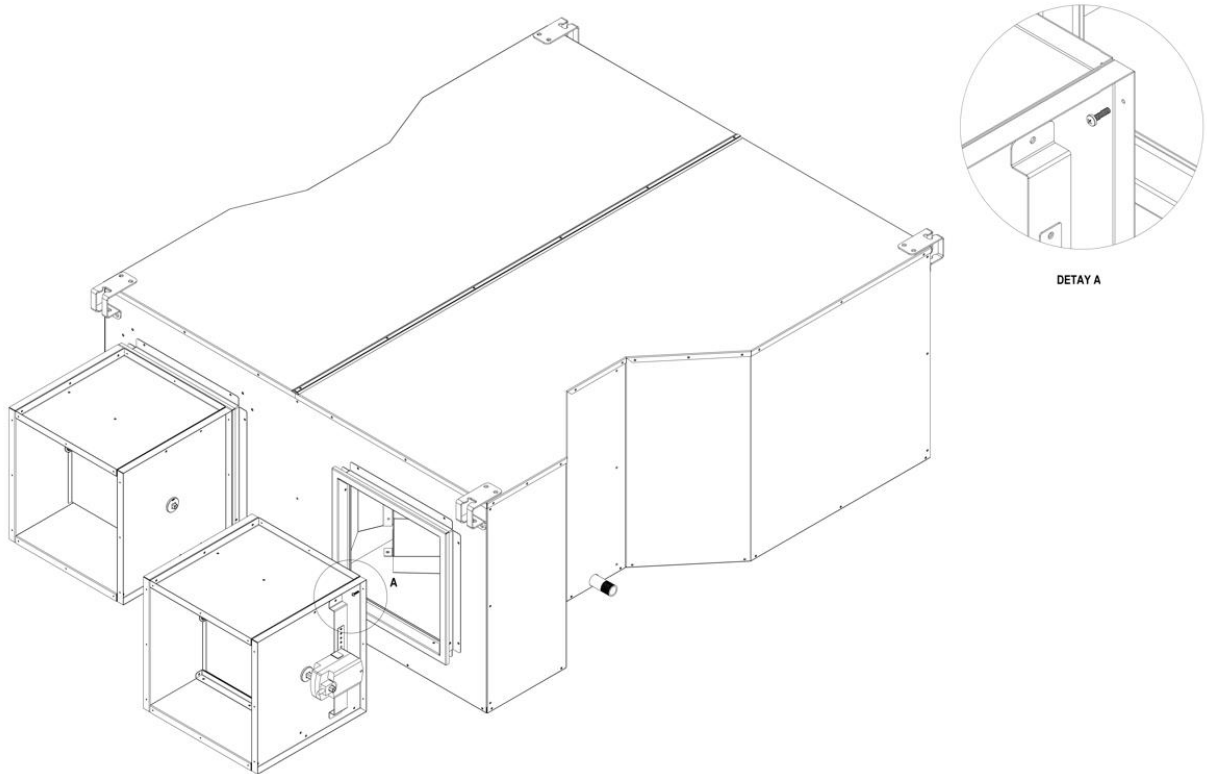




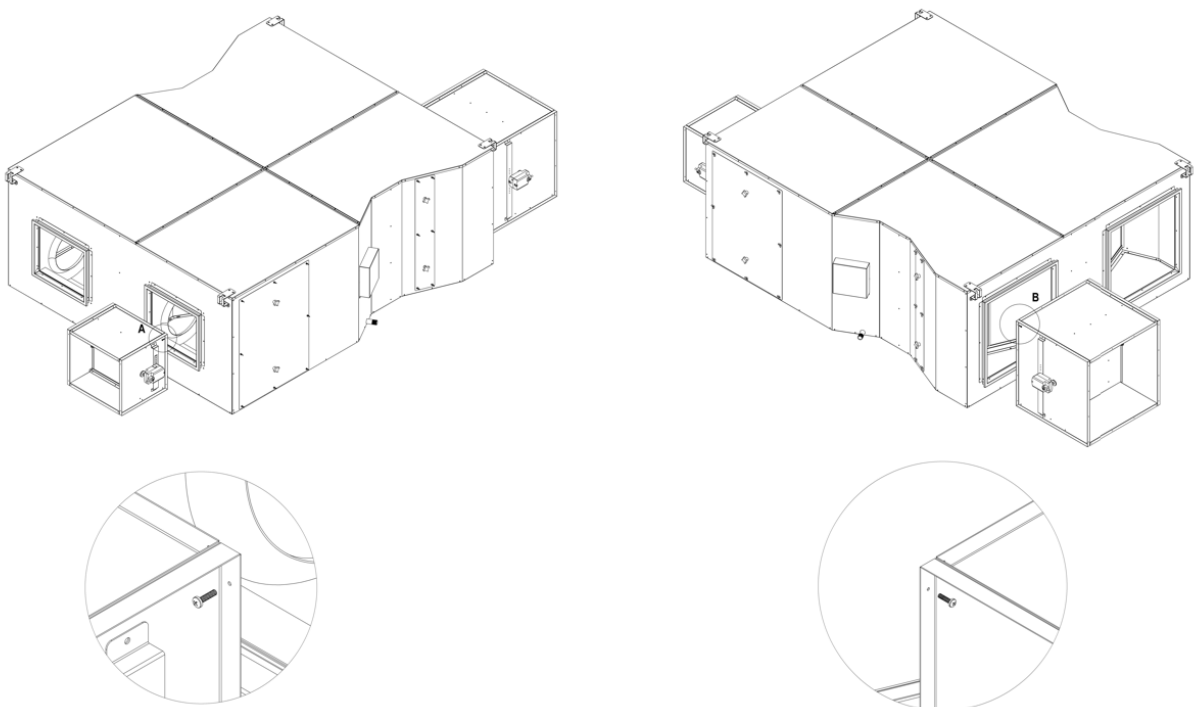
- A minimum of M8/M10 threaded rod and appropriate connection equipment should be used to hang the coil and electric-heater module from the ceiling.



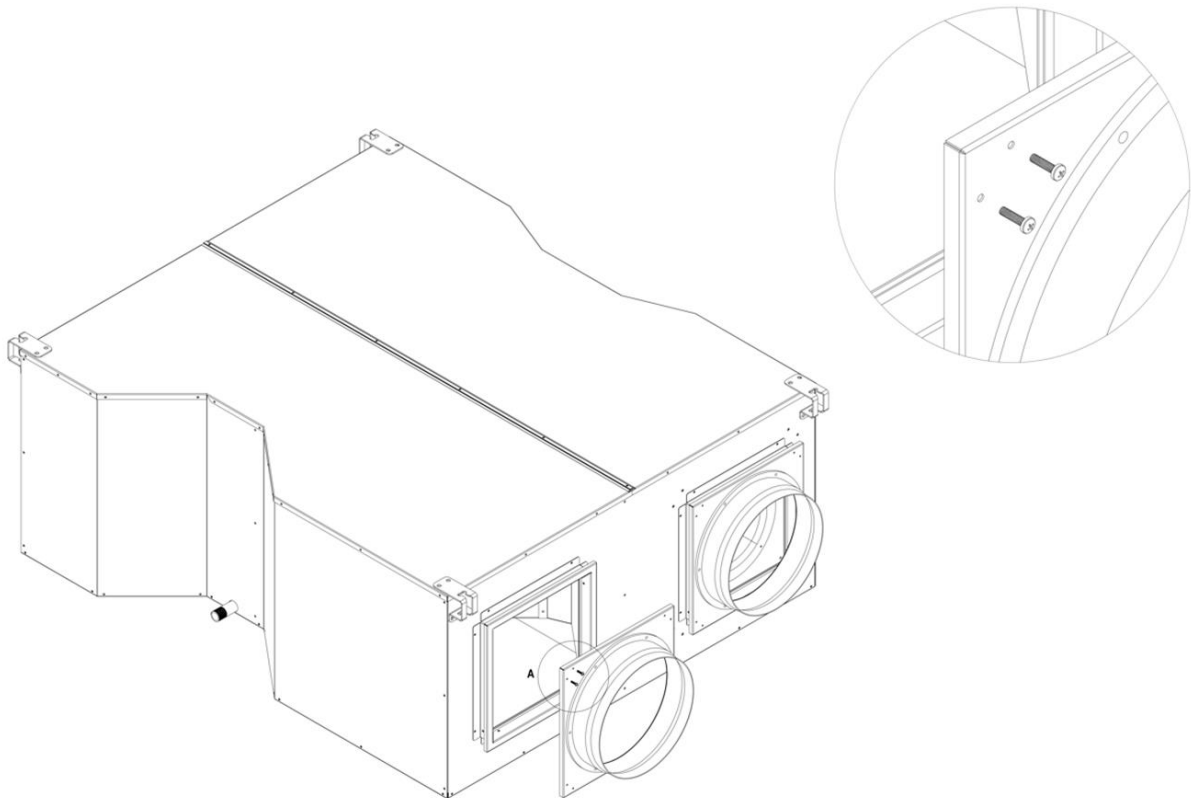
- Fresh air and exhaust dampers are shown in the following drawings.



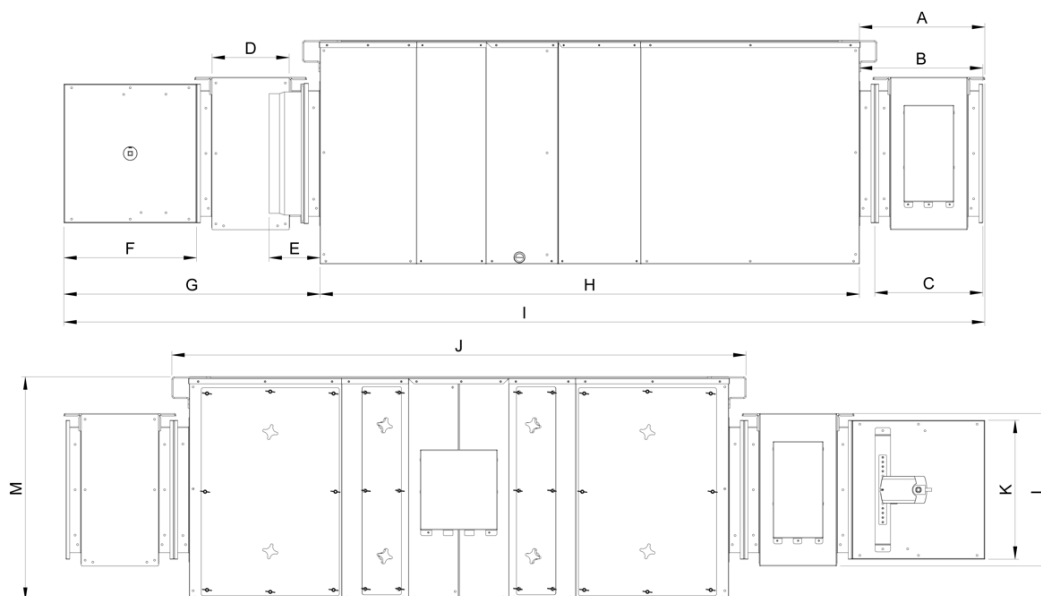
- Fresh air and exhaust dampers for larger models are shown in the following drawings.



- Circular duct connection apparatus installation is shown in the following drawing.

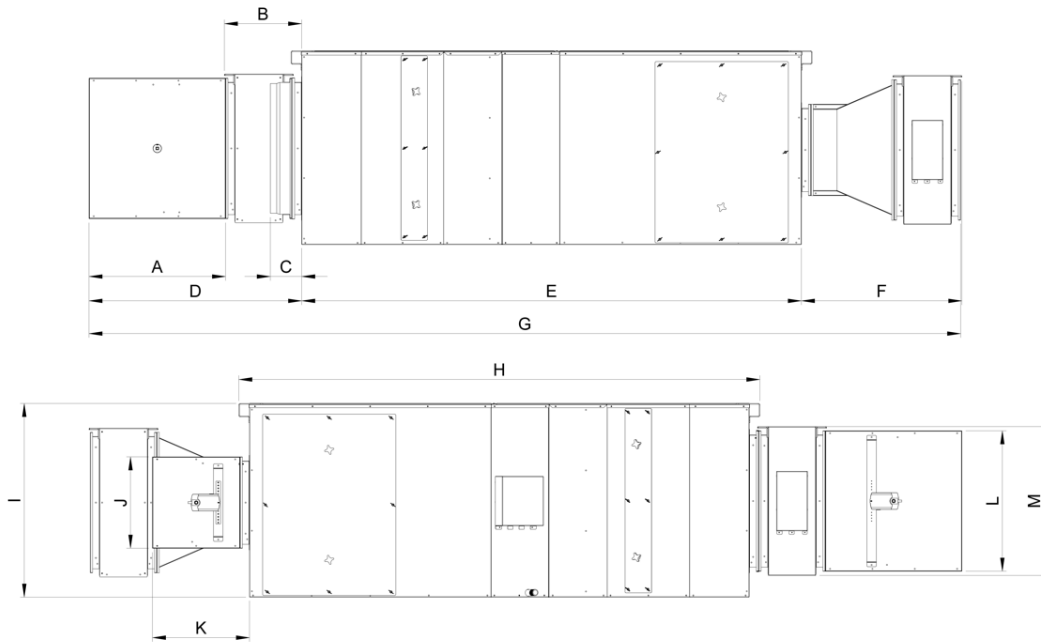


- Connection of multiple options used at once is shown in the drawings below.



| MODEL    | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | H [mm] | I [mm] | J [mm] | K [mm] | L [mm] | M [mm] |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| UTFS 050 | -      | 320    | 280    | 200    | 132    | 275    | 595    | 1017   | 1932   | 1107   | 290    | 329    | 426    |
| UTFS 075 | -      |        |        |        |        | 280    | 600    | 1103.5 | 2023.5 | 1193.5 | 295    | 329    | 432    |
| UTFS 105 | -      |        |        |        |        | 300    | 620    | 1243.5 | 2183.5 | 1333.5 | 315    | 349    | 480    |
| UTFS 160 | -      |        |        |        |        | 344    | 664    | 1366.5 | 2350.5 | 1456.5 | 360    | 395    | 534    |
| UTFS 200 | 325    |        |        |        |        | 1398.5 | 2387.5 | 1488.5 | 579    |        |        |        |        |

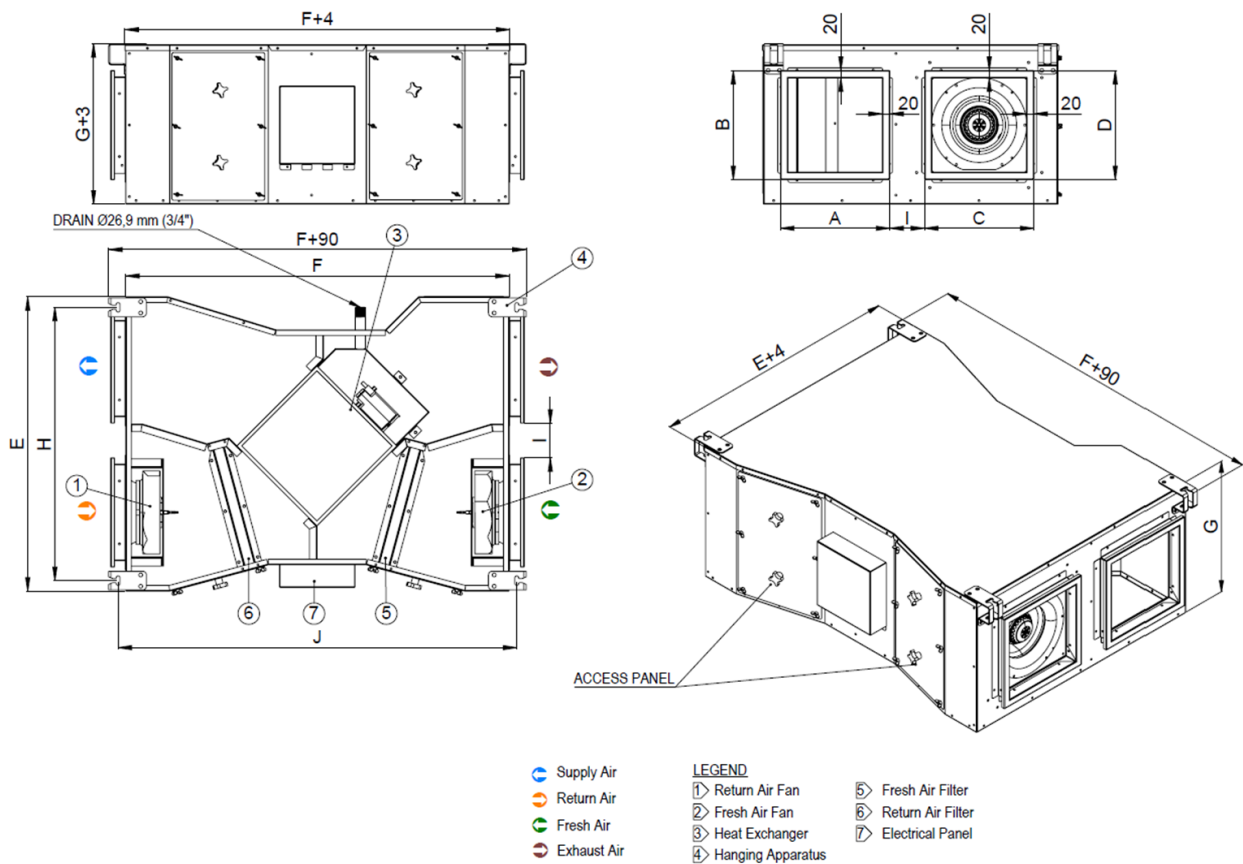
- Connection of multiple options used at once for larger models is shown in the drawings below.



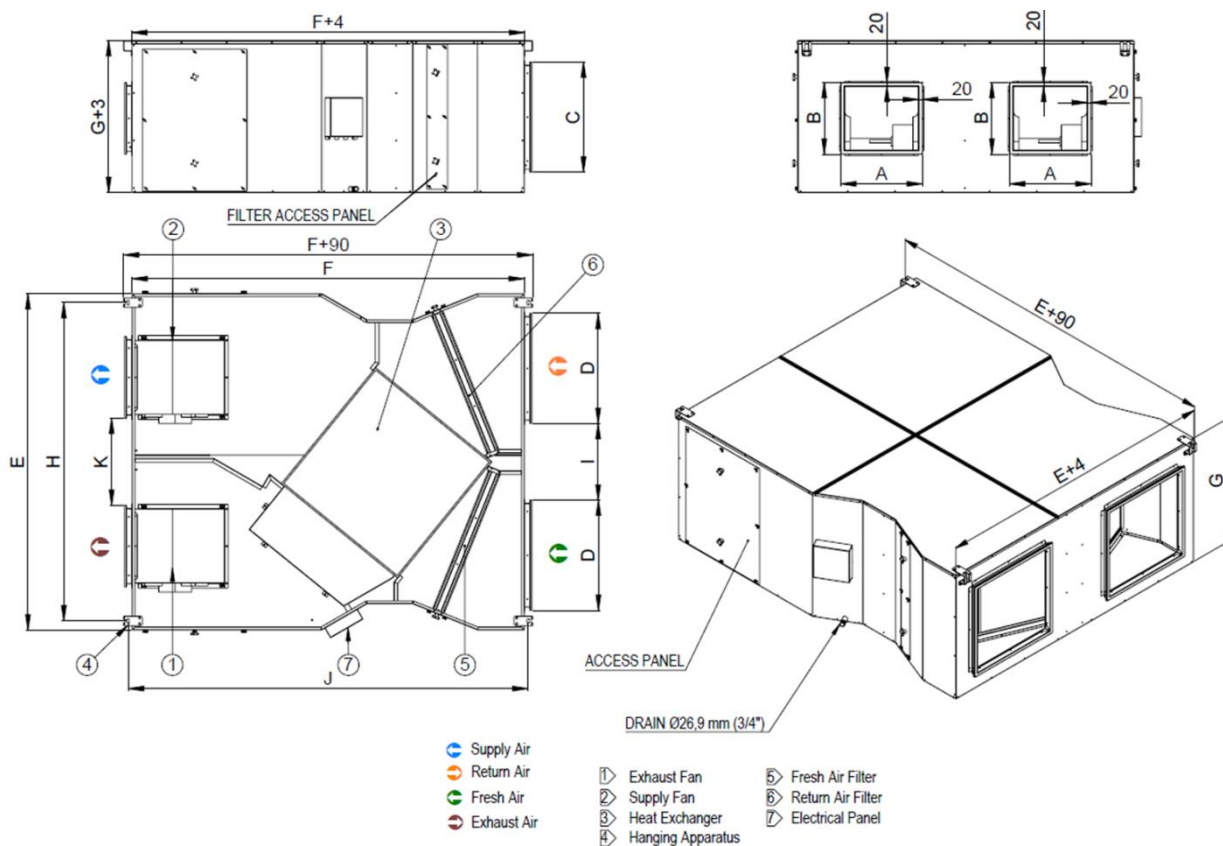
| MODEL    | A [mm] | B [mm] | C [mm] | D [mm] | E [mm] | F [mm] | G [mm] | H [mm] | I [mm] | J [mm] | K [mm] | L [mm] | M [mm] |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| UTFS 250 | 444    | 325    | 132    | 764    | 1600   | 600    | 2964   | 1690   | 684    | 302    | 326    | 460    | 495    |
| UTFS 320 | 474    |        |        | 794    | 1700   |        | 3094   | 1790   | 714    | 330    | 354    | 490    |        |
| UTFS 410 | 524    |        |        | 844    | 1850   | 645    | 3339   | 1940   | 764    | 336    | 360    | 540    | 625    |
| UTFS 500 | 574    |        |        | 894    | 2100   | 675    | 3664   | 2190   | 814    | 384    | 408    | 590    |        |



## 4. Dimensions

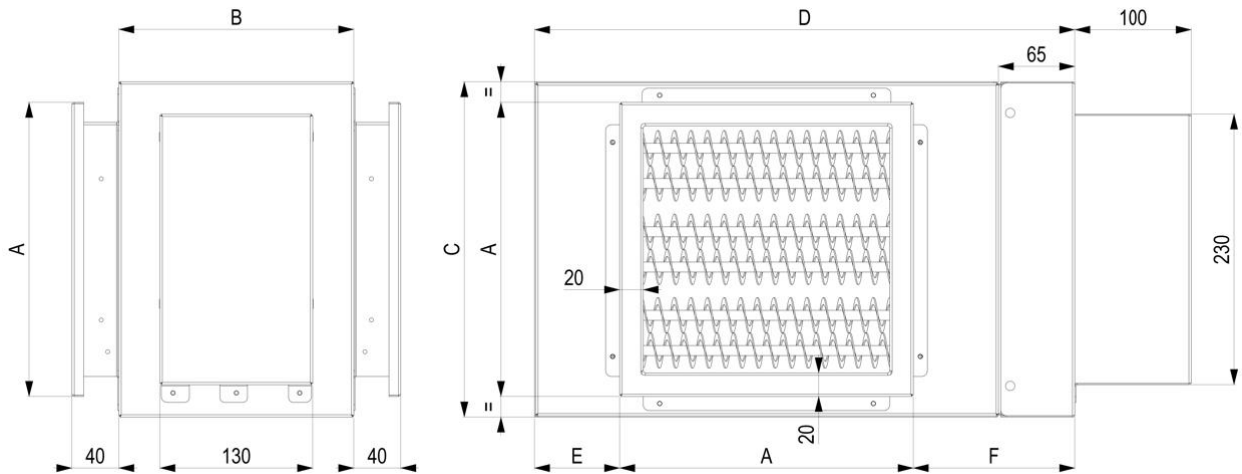


| Dimensions | Models   |          |          |          |          |
|------------|----------|----------|----------|----------|----------|
|            | UTFS 050 | UTFS 075 | UTFS 105 | UTFS 160 | UTFS 200 |
| A          | 290      | 295      | 315      | 360      | 360      |
| B          | 290      | 295      | 315      | 360      | 360      |
| C          | 290      | 295      | 315      | 360      | 360      |
| D          | 290      | 295      | 315      | 360      | 360      |
| E          | 781,5    | 891      | 1005     | 1177     | 1207     |
| F          | 1017     | 1103,5   | 1243,5   | 1366,5   | 1398,5   |
| G          | 423      | 429      | 477      | 531      | 576      |
| H          | 725,5    | 835      | 949      | 1121     | 1151     |
| I          | 92       | 169      | 204      | 284      | 314      |
| J          | 1057     | 1143,5   | 1283,5   | 1406,5   | 1438,5   |

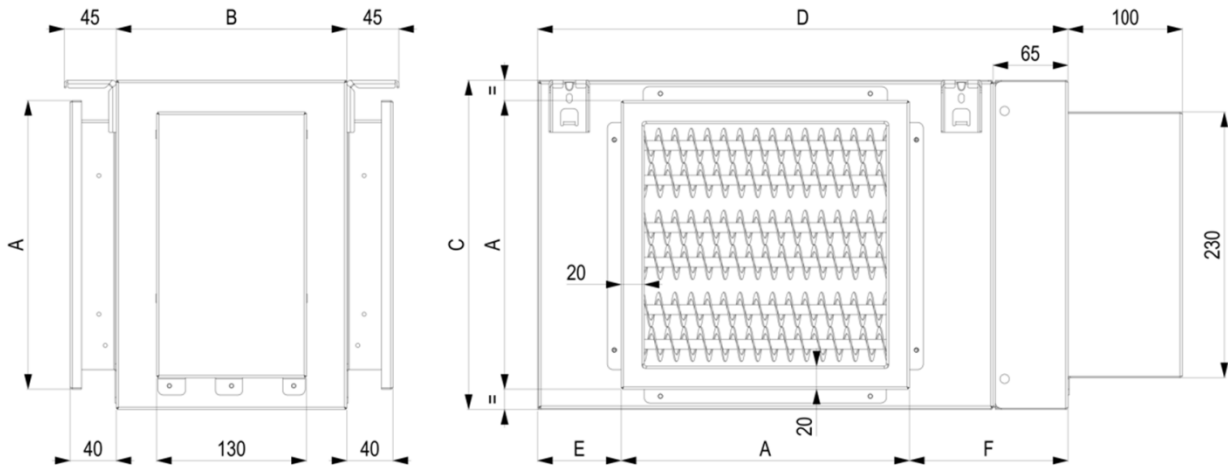


| Dimensions | Models   |          |          |          |
|------------|----------|----------|----------|----------|
|            | UTFS 250 | UTFS 320 | UTFS 410 | UTFS 500 |
| A          | 344      | 373      | 373      | 437      |
| B          | 308      | 336      | 336      | 384      |
| C          | 460      | 490      | 540      | 590      |
| D          | 460      | 490      | 540      | 590      |
| E          | 1353     | 1428     | 1550     | 1800     |
| F          | 1600     | 1700     | 1850     | 2100     |
| G          | 681      | 711      | 761      | 811      |
| H          | 1257     | 1332     | 1454     | 1704     |
| I          | 193,5    | 238,5    | 210,5    | 410,5    |
| J          | 1640     | 1740     | 1890     | 2140     |
| K          | 344      | 439      | 544      | 466      |

### 4.1. Electric Heater Module Dimensions



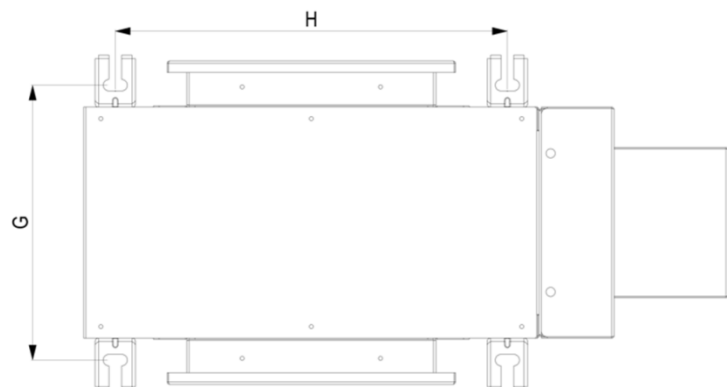
| LPRH / HPRH / LPOH / MPOH / HPOH |          |                 |     |     |     |      |      |
|----------------------------------|----------|-----------------|-----|-----|-----|------|------|
| NO                               | MODEL    | DIMENSIONS [mm] |     |     |     |      |      |
|                                  |          | A               | B   | C   | D   | F    |      |
| 1                                | UTFS 050 | 290             | 200 | 329 | 394 | 19,5 | 84,5 |
| 2                                | UTFS 075 | 295             |     | 349 | 414 | 17   | 82   |
| 3                                | UTFS 105 | 315             |     | 394 | 459 |      |      |
| 4                                | UTFS 160 | 360             |     |     |     |      |      |



| LPRH / HPRH / LPOH / MPOH / HPOH |          |                 |     |     |     |
|----------------------------------|----------|-----------------|-----|-----|-----|
| NO                               | MODEL    | DIMENSIONS [mm] |     |     |     |
|                                  |          | A               | B   | D   |     |
| 5                                | UTFS 200 | 360             | 200 | 395 | 559 |
| 6                                | UTFS 250 | 460             |     | 495 | 659 |
| 7                                | UTFS 320 | 490             |     | 625 | 689 |
| 8                                | UTFS 410 | 540             |     | 625 | 739 |
| 9                                | UTFS 500 | 590             |     | 625 | 789 |

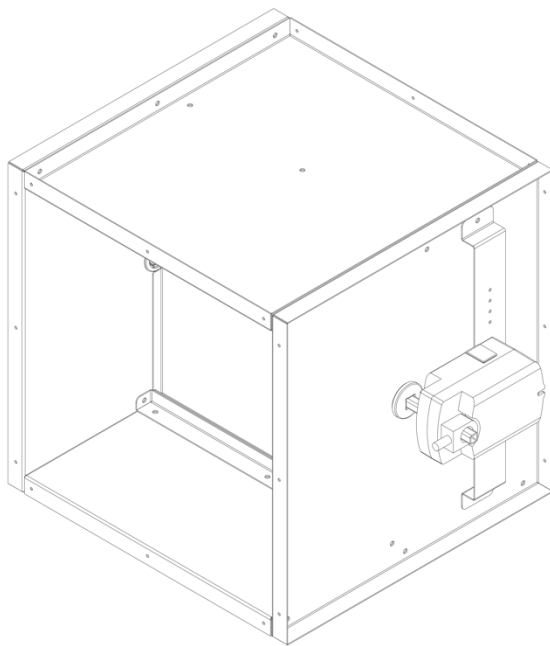
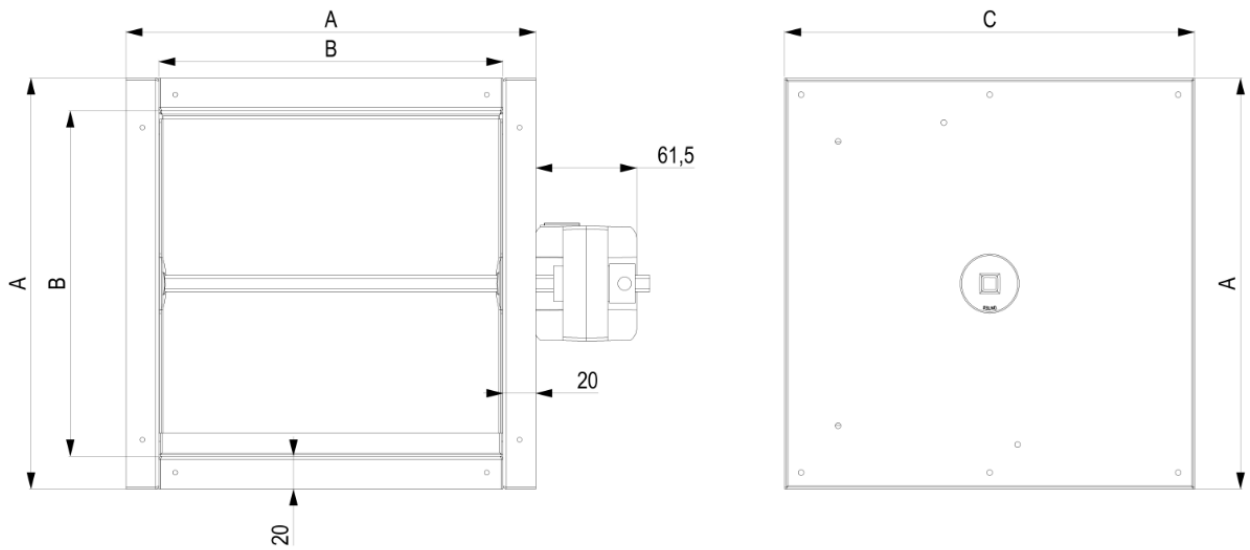
  

| NO | MODEL    | DIMENSIONS [mm] |     |     |     |
|----|----------|-----------------|-----|-----|-----|
|    |          | E               | F   | H   |     |
| 5  | UTFS 200 | 67              | 132 | 238 | 439 |
| 6  | UTFS 250 |                 |     | 539 |     |
| 7  | UTFS 320 |                 |     | 549 |     |
| 8  | UTFS 410 |                 |     | 619 |     |
| 9  | UTFS 500 |                 |     | 669 |     |



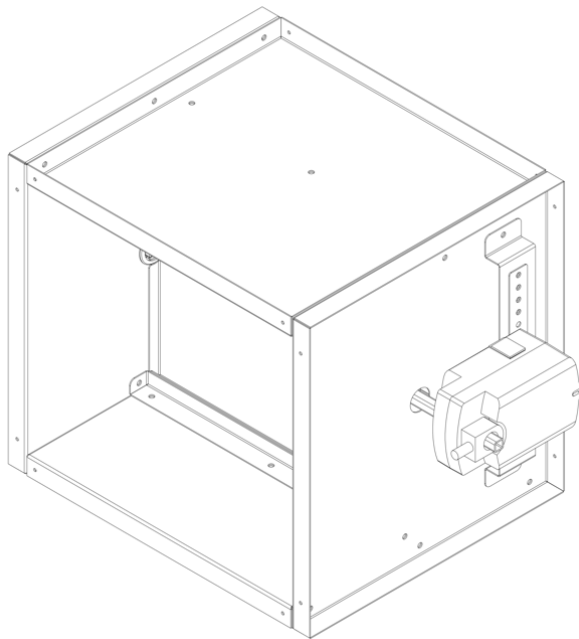
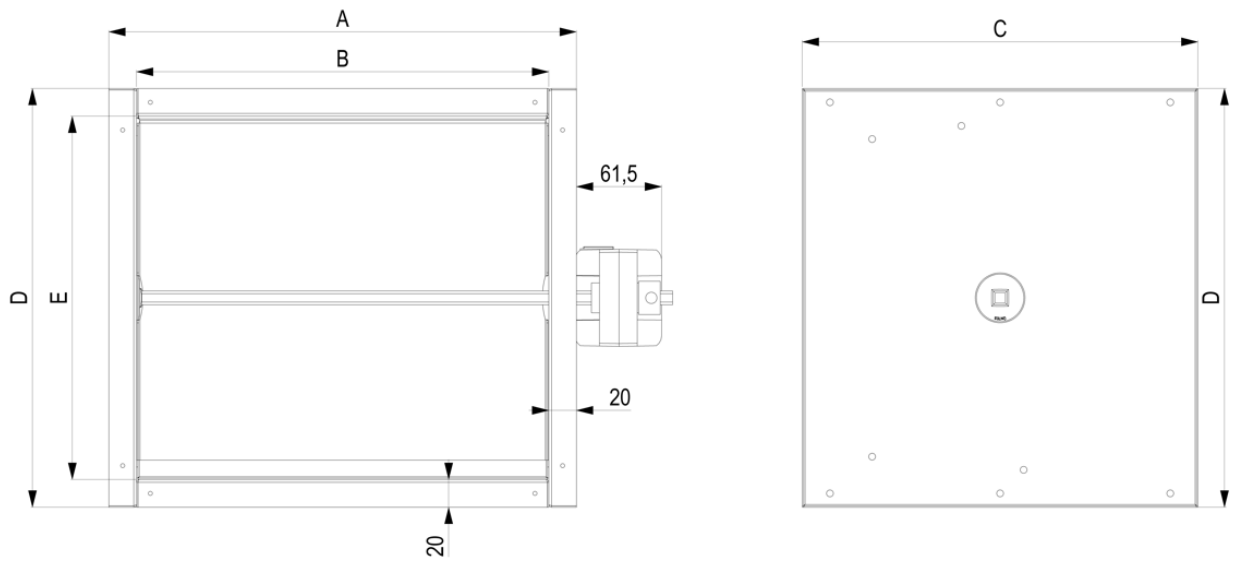
## 4.2. Damper Module Dimensions

Fresh Air On/Off Damper



| FAFD |          |                 |     |     |
|------|----------|-----------------|-----|-----|
| NO   | MODEL    | DIMENSIONS [mm] |     |     |
|      |          | A               | B   | C   |
| 1    | UTFS 050 | 290             | 250 | 275 |
| 2    | UTFS 075 | 295             | 255 | 280 |
| 3    | UTFS 105 | 315             | 275 | 300 |
| 4    | UTFS 160 | 360             | 320 | 344 |
| 5    | UTFS 200 | 360             | 320 | 344 |
| 6    | UTFS 250 | 460             | 420 | 444 |
| 7    | UTFS 320 | 490             | 450 | 474 |
| 8    | UTFS 410 | 540             | 500 | 524 |
| 9    | UTFS 500 | 590             | 550 | 574 |

## Exhaust Air On/Off Damper



| EAFD |          |                 |       |     |
|------|----------|-----------------|-------|-----|
| NO   | MODEL    | DIMENSIONS [mm] |       |     |
|      |          | A               | B     | C   |
| 1    | UTFS 050 | 290             | 250   | 275 |
| 2    | UTFS 075 | 295             | 255   | 280 |
| 3    | UTFS 105 | 315             | 275   | 300 |
| 4    | UTFS 160 | 360             | 320   | 344 |
| 5    | UTFS 200 | 360             | 320   | 344 |
| 6    | UTFS 250 | 338             | 298   | 286 |
| 7    | UTFS 320 | 371             | 331   | 314 |
| 8    | UTFS 410 | 373             | 333   | 320 |
| 9    | UTFS 500 | 437             | 397   | 368 |
| NO   | MODEL    | DIMENSIONS [mm] |       |     |
|      |          | D               | E     |     |
| 1    | UTFS 050 | —               | —     |     |
| 2    | UTFS 075 |                 |       |     |
| 3    | UTFS 105 |                 |       |     |
| 4    | UTFS 160 |                 |       |     |
| 5    | UTFS 200 |                 |       |     |
| 6    | UTFS 250 | 302             | 262   |     |
| 7    | UTFS 320 | 329,6           | 289,6 |     |
| 8    | UTFS 410 | 335.6           | 295.6 |     |
| 9    | UTFS 500 | 384             | 344   |     |

## 5. Technical and Capacity Information

### 5.1. Unit Tables

| UTFS Series   |  | 050                 | 075          | 105          | 160          | 200          |
|---|--|---------------------|--------------|--------------|--------------|--------------|
| <b>Technical Specifications</b>                       |  |                     |              |              |              |              |
| Nominal Airflow Rate                                  | m <sup>3</sup> /h                          | 500                 | 750          | 1050         | 1600         | 2000         |
| Maximum External Static Pressure                      | Pa   | 220                 | 210          | 235          | 317          | 204          |
| Power Supply  | V/Ph/Hz                                    | 220-240/1/50        | 220-240/1/50 | 220-240/1/50 | 220-240/1/50 | 220-240/1/50 |
| Exhaust Fan Nominal Motor Power                       | W  | 58                  | 91           | 145          | 310          | 310          |
| Supply Fan Nominal Motor Power                        | W  | 58                  | 91           | 145          | 310          | 310          |
| Fan Model   | Backward Curved Direct Coupled AC Plug Fan |                     |              |              |              |              |
| Fresh Air Filter Class                                | %  | ISO Coarse≥60% (G4) |              |              |              |              |
| Exhaust Air Filter Class                              | %  | ISO Coarse≥60% (G4) |              |              |              |              |
| <b>Sound</b>  |  |                     |              |              |              |              |
| Sound Pressure Level ❶                                | dB(A)                                      | 40                  | 50           | 53           | 53           | 59           |
| <b>Dimensions</b>                                     |  |                     |              |              |              |              |
| Height  | mm   | 423                 | 429          | 477          | 531          | 531          |
| Width   | mm   | 781                 | 891          | 1005         | 1181         | 1382         |
| Lenght  | mm   | 1017                | 1103,5       | 1243,5       | 1466,5       | 1498,5       |
| Weight ❷  | kg   | 57                  | 65           | 83           | 112          | 130          |
| ❶ Sound pressure level at 1 m distance in free field. |  |                     |              |              |              |              |
| ❷ Weight of the unit without accessories.             |  |                     |              |              |              |              |

| UTFS Series   |  | 250                 | 320          | 410          | 500          |
|---|--|---------------------|--------------|--------------|--------------|
| <b>Technical Specifications</b>                       |  |                     |              |              |              |
| Nominal Airflow Rate                                  | m <sup>3</sup> /h                                | 2500                | 3200         | 4100         | 5000         |
| Maximum External Static Pressure                      | Pa   | 180                 | 232          | 234          | 150          |
| Power Supply  | V/Ph/Hz  | 220-240/1/50        | 220-240/1/50 | 220-240/1/50 | 220-240/1/50 |
| Exhaust Fan Nominal Motor Power                       | W  | 373                 | 550          | 750          | 1100         |
| Supply Fan Nominal Motor Power                        | W  | 373                 | 550          | 750          | 1100         |
| Fan Model   | Forward Curved Direct Coupled AC Centrifugal Fan |                     |              |              |              |
| Fresh Air Filter Class                                | %  | ISO Coarse≥60% (G4) |              |              |              |
| Exhaust Air Filter Class                              | %  | ISO Coarse≥60% (G4) |              |              |              |
| <b>Sound</b>  |  |                     |              |              |              |
| Sound Pressure Level ❶                                | dB(A)  | 54                  | 54           | 58           | 56           |
| <b>Dimensions</b>                                     |  |                     |              |              |              |
| Height  | mm   | 611                 | 711          | 711          | 811          |
| Width   | mm   | 1478                | 1578         | 1749         | 1800         |
| Lenght  | mm   | 1900                | 2000         | 2200         | 2250         |
| Weight ❷  | kg   | 175                 | 202          | 251          | 299          |
| ❶ Sound pressure level at 1 m distance in free field. |  |                     |              |              |              |
| ❷ Weight of the unit without accessories.             |  |                     |              |              |              |

## 6. Electrical Information

### 6.1. Electricity Connection

Electrical connection operations on the electric panel should be conducted by following the procedures below. These rules are not suggestions and should be followed to ensure the safety of user;

- Equipment and cables to be used in electricity connection should be chosen according to the maximum current values given in the tables and figures. Figures can also be found on the electrical panel door.
- Connections, over current protections and magnetic switches must comply with CEI EN 60204 European norms. If a stray current relay will be used in addition to the magnetic protection, this relay must have 30–300 mA block. This will also protect the operator against the isolator defects.
- Grounding cable sections should by no means be under the values given in the diagrams.
- The route of the electrical supply cables must not obstruct the service covers of the unit.

**These operations must be completed by the customer before commissioning!**

### 6.2. Heater Information

| UTFS  | Pre-Heater Total Capacity[kW] |               | Pre-Heater Total Absorbed Current |               | Pre-Heater Temperature Difference[K] |               |
|-------|-------------------------------|---------------|-----------------------------------|---------------|--------------------------------------|---------------|
| Model | Low Capacity                  | High Capacity | Low Capacity                      | High Capacity | Low Capacity                         | High Capacity |
| 050   | 1,02                          | 2,04          | 4,43                              | 8,87          | 6,09                                 | 12,18         |
| 075   | 1,54                          | 3,08          | 6,7                               | 13,39         | 6,13                                 | 12,26         |
| 105   | 2,16                          | 4,32          | 3,11                              | 6,22          | 6,14                                 | 12,29         |
| 160   | 3,27                          | 6,54          | 4,71                              | 9,42          | 6,1                                  | 12,21         |
| 200   | 4,11                          | 8,22          | 5,92                              | 11,84         | 6,14                                 | 12,27         |
| 250   | 5,1                           | 10,2          | 7,34                              | 14,69         | 6,09                                 | 12,18         |
| 320   | 6,54                          | 13,08         | 9,42                              | 18,84         | 6,1                                  | 12,21         |
| 410   | 8,4                           | 16,8          | 12,1                              | 24,19         | 6,12                                 | 12,24         |
| 500   | 10,14                         | 20,28         | 14,6                              | 29,2          | 6,06                                 | 12,11         |

| UTFS  | Post-Heater Total Capacity[kW]        |                 |               | Post-Heater Total Absorbed Current |                 |               |
|-------|---------------------------------------|-----------------|---------------|------------------------------------|-----------------|---------------|
| Model | Low Capacity                          | Medium Capacity | High Capacity | Low Capacity                       | Medium Capacity | High Capacity |
| 050   | 1,02                                  | 2,04            | 3,06          | 4,43                               | 8,87            | 13,3          |
| 075   | 1,54                                  | 3,08            | 3,85          | 6,7                                | 13,39           | 16,74         |
| 105   | 2,16                                  | 4,32            | 6,48          | 3,11                               | 6,22            | 9,33          |
| 160   | 3,27                                  | 6,54            | 9,81          | 4,71                               | 9,42            | 14,13         |
| 200   | 4,11                                  | 8,22            | 12,33         | 5,92                               | 11,84           | 17,76         |
| 250   | 5,1                                   | 10,2            | 15,3          | 7,34                               | 14,69           | 22,03         |
| 320   | 6,54                                  | 13,08           | 19,62         | 9,42                               | 18,84           | 28,25         |
| 410   | 8,4                                   | 16,8            | 25,2          | 12,1                               | 24,19           | 36,29         |
| 500   | 10,14                                 | 20,28           | 30,42         | 14,6                               | 29,2            | 43,8          |
| UTFS  | Post-Heater Temperature Difference[K] |                 |               |                                    |                 |               |
| Model | Low Capacity                          | Medium Capacity | High Capacity |                                    |                 |               |
| 050   | 6,09                                  | 12,18           | 18,28         |                                    |                 |               |
| 075   | 6,13                                  | 12,26           | 15,33         |                                    |                 |               |
| 105   | 6,14                                  | 12,29           | 18,43         |                                    |                 |               |
| 160   | 6,1                                   | 12,21           | 18,31         |                                    |                 |               |
| 200   | 6,14                                  | 12,27           | 18,41         |                                    |                 |               |
| 250   | 6,09                                  | 12,18           | 18,28         |                                    |                 |               |
| 320   | 6,1                                   | 12,21           | 18,31         |                                    |                 |               |
| 410   | 6,12                                  | 12,24           | 18,35         |                                    |                 |               |
| 500   | 6,06                                  | 12,11           | 18,17         |                                    |                 |               |

| <b>UTFS</b>  | <b>Power Supply</b> | <b>Power Supply</b> |
|--------------|---------------------|---------------------|
| <b>Model</b> | <b>Pre-Heater</b>   | <b>Post-Heater</b>  |
| <b>050</b>   | 220-240V/1Ph/50Hz   | 220-240V/1Ph/50Hz   |
| <b>075</b>   | 220-240V/1Ph/50Hz   | 220-240V/1Ph/50Hz   |
| <b>105</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |
| <b>160</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |
| <b>200</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |
| <b>250</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |
| <b>320</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |
| <b>410</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |
| <b>500</b>   | 380-420V/3Ph/50Hz   | 380-420V/3Ph/50Hz   |

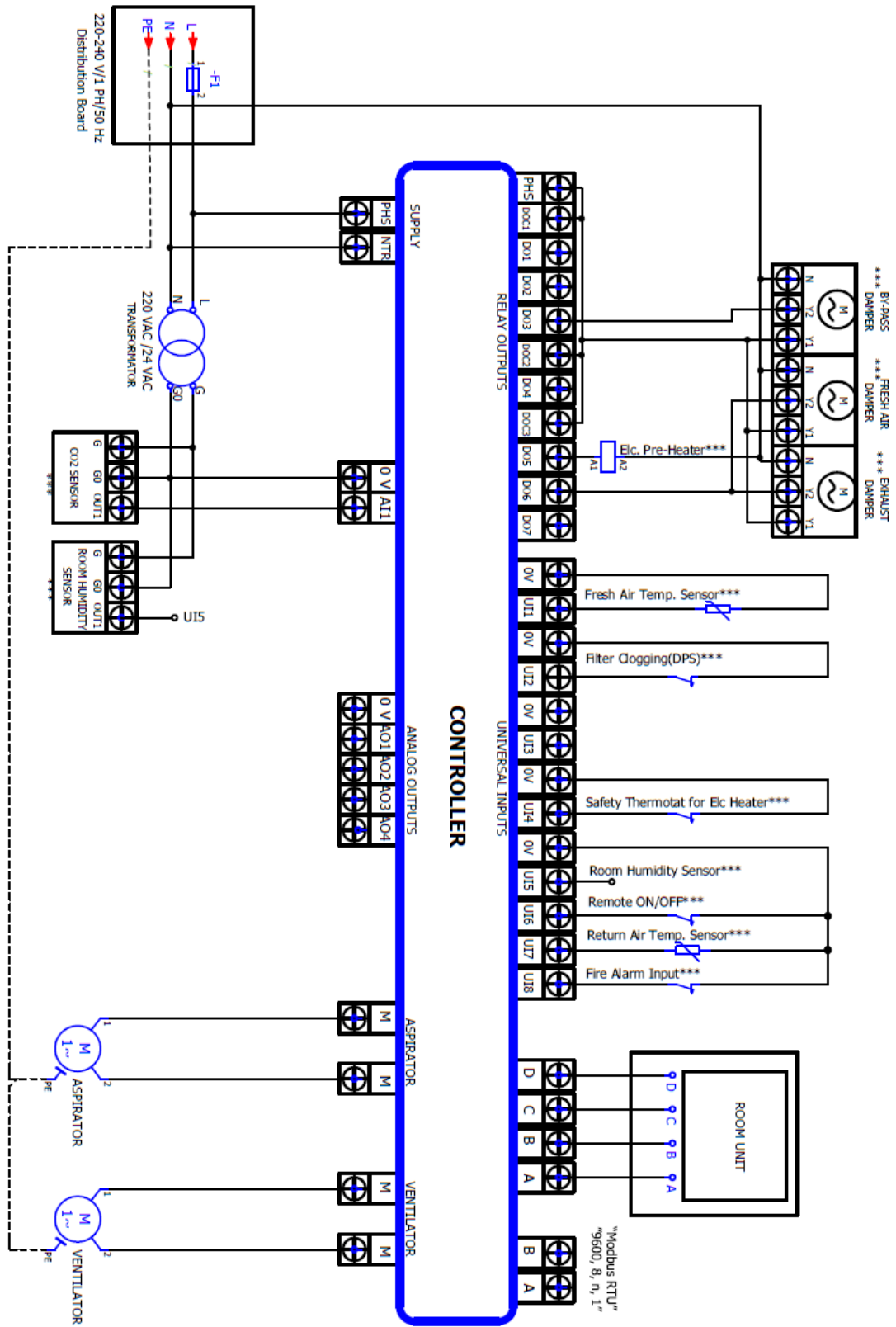
### **6.3. Wiring for Site Control**

Please consult Untes Aftersales Services Department for site control cabling.



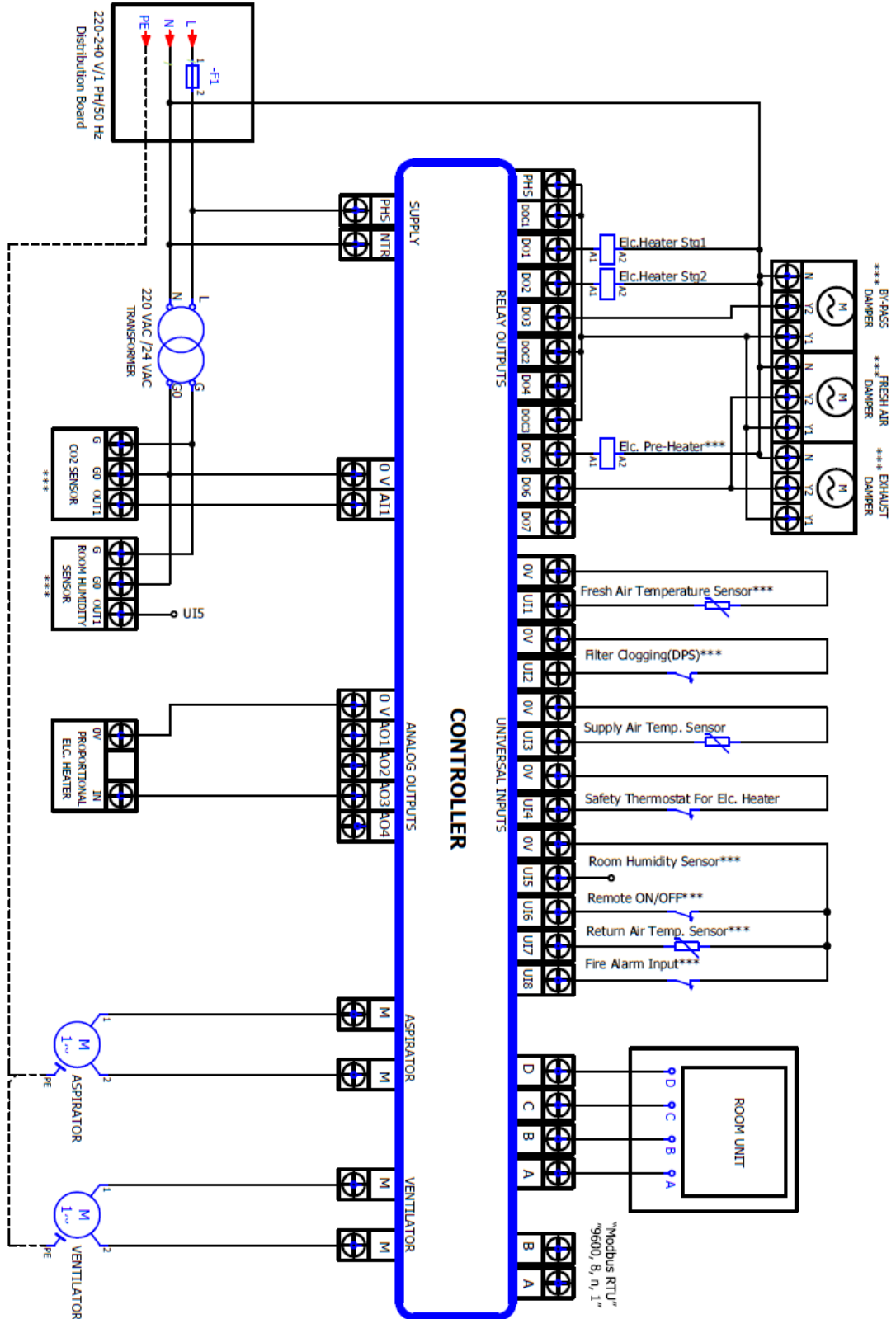
6.4. Electrical Wiring Schematic

Scenario 1 – Ventilation



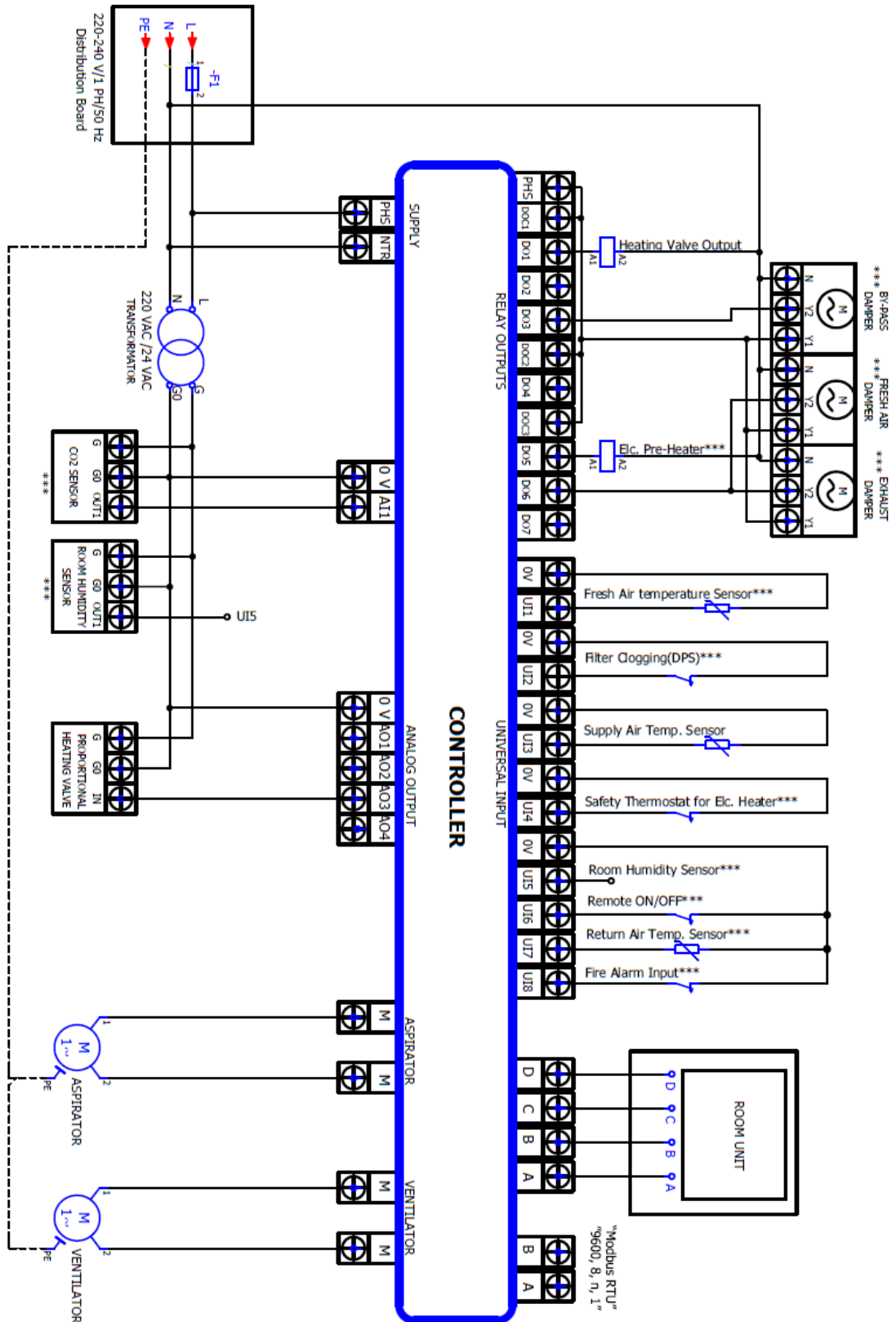
\*\*\*OPTION

## Scenario 2 – Electric Heating



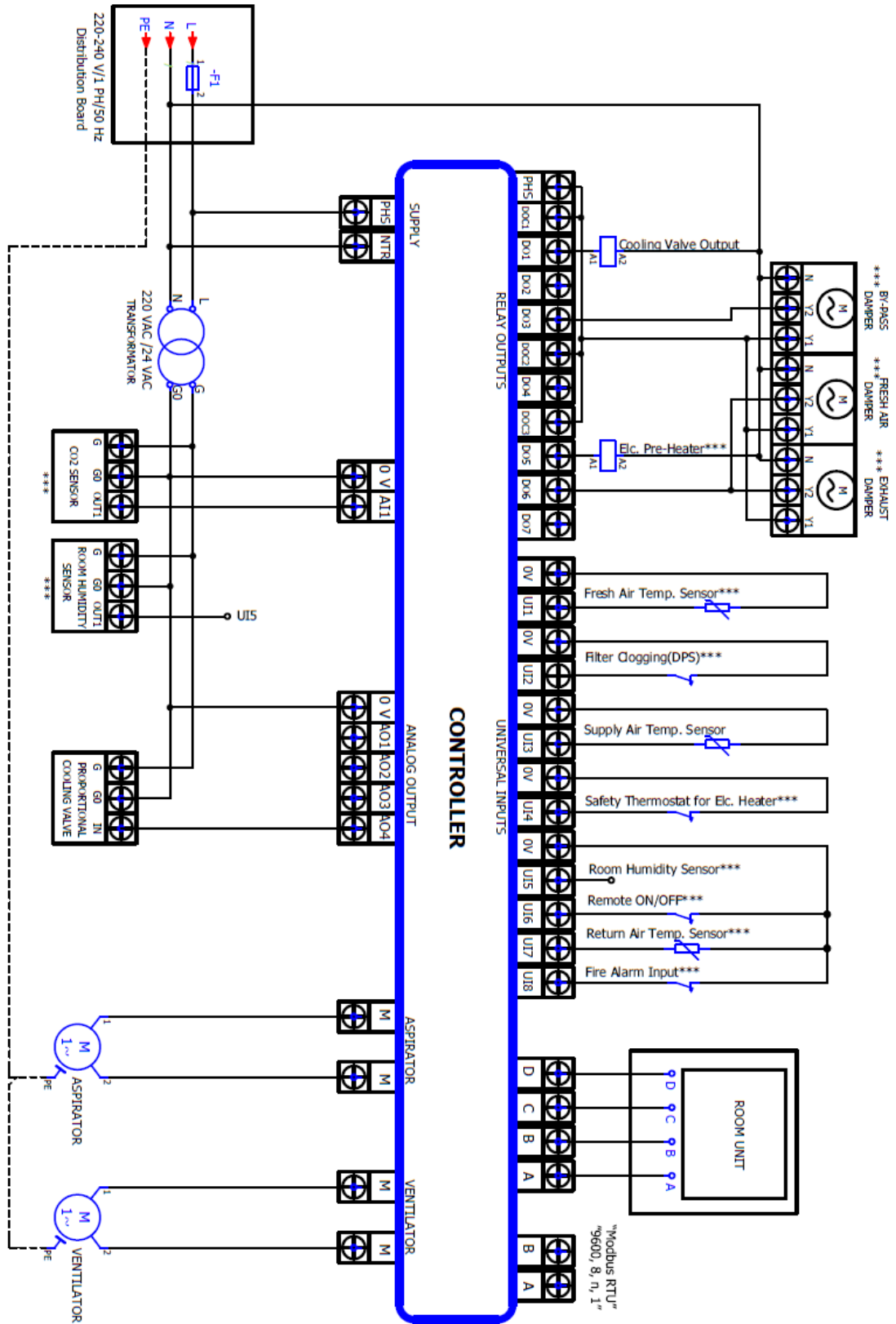
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## Scenario 3 – Water Heating



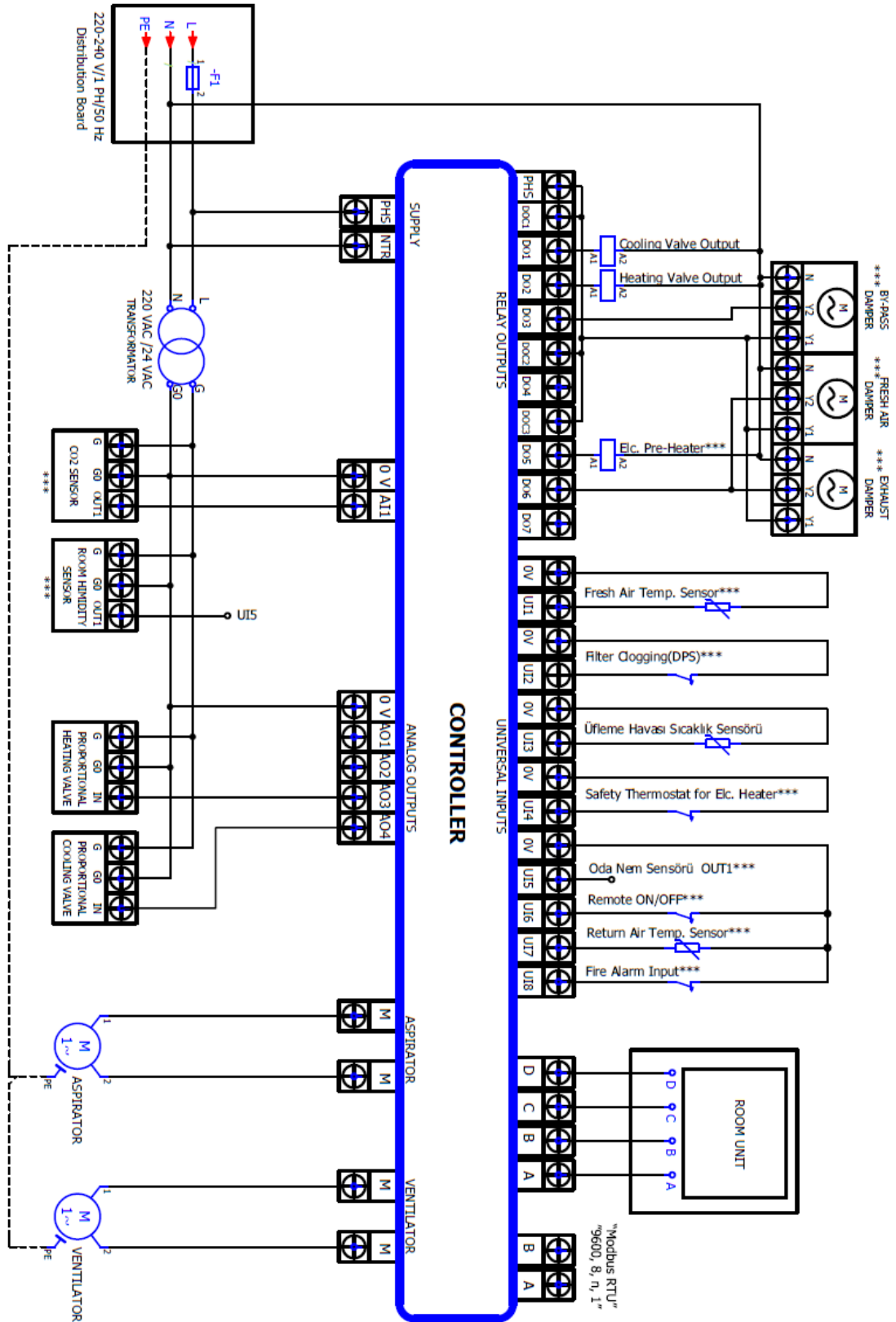
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## Scenario 4 – Water Cooling



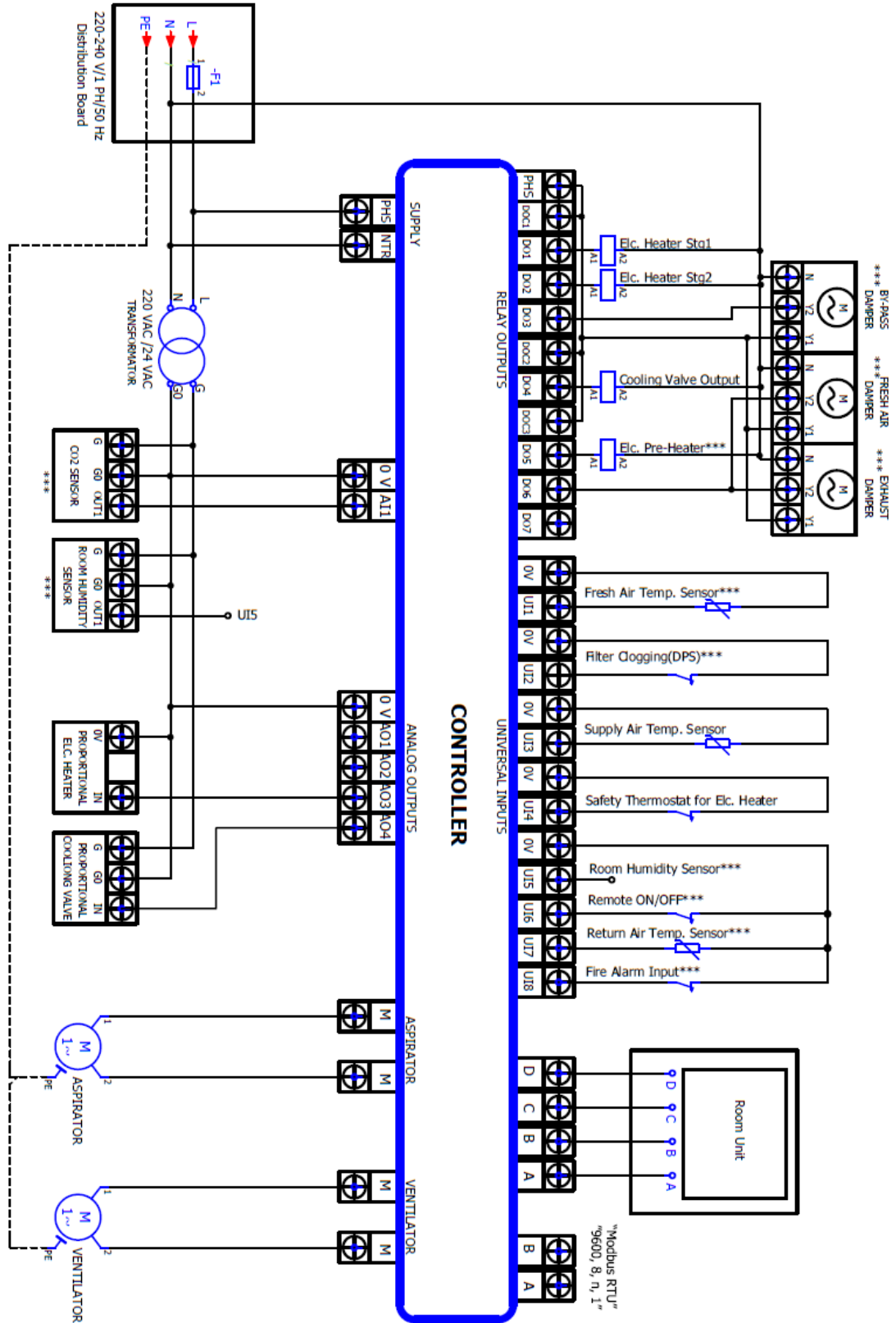
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## Scenario 5 – Water Heating + Water Cooling



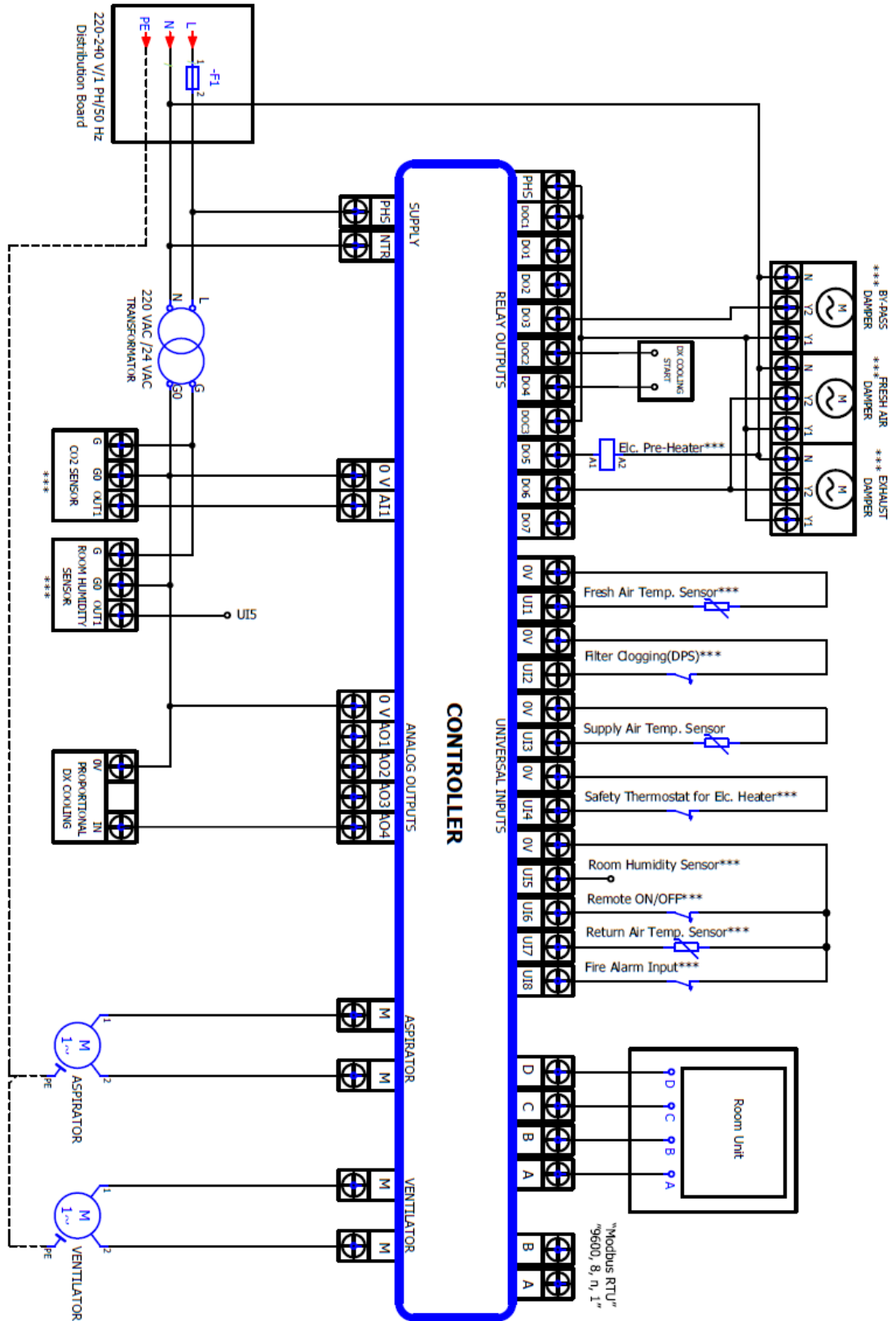
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## Scenario 6 - Water Cooling + Electric Heater



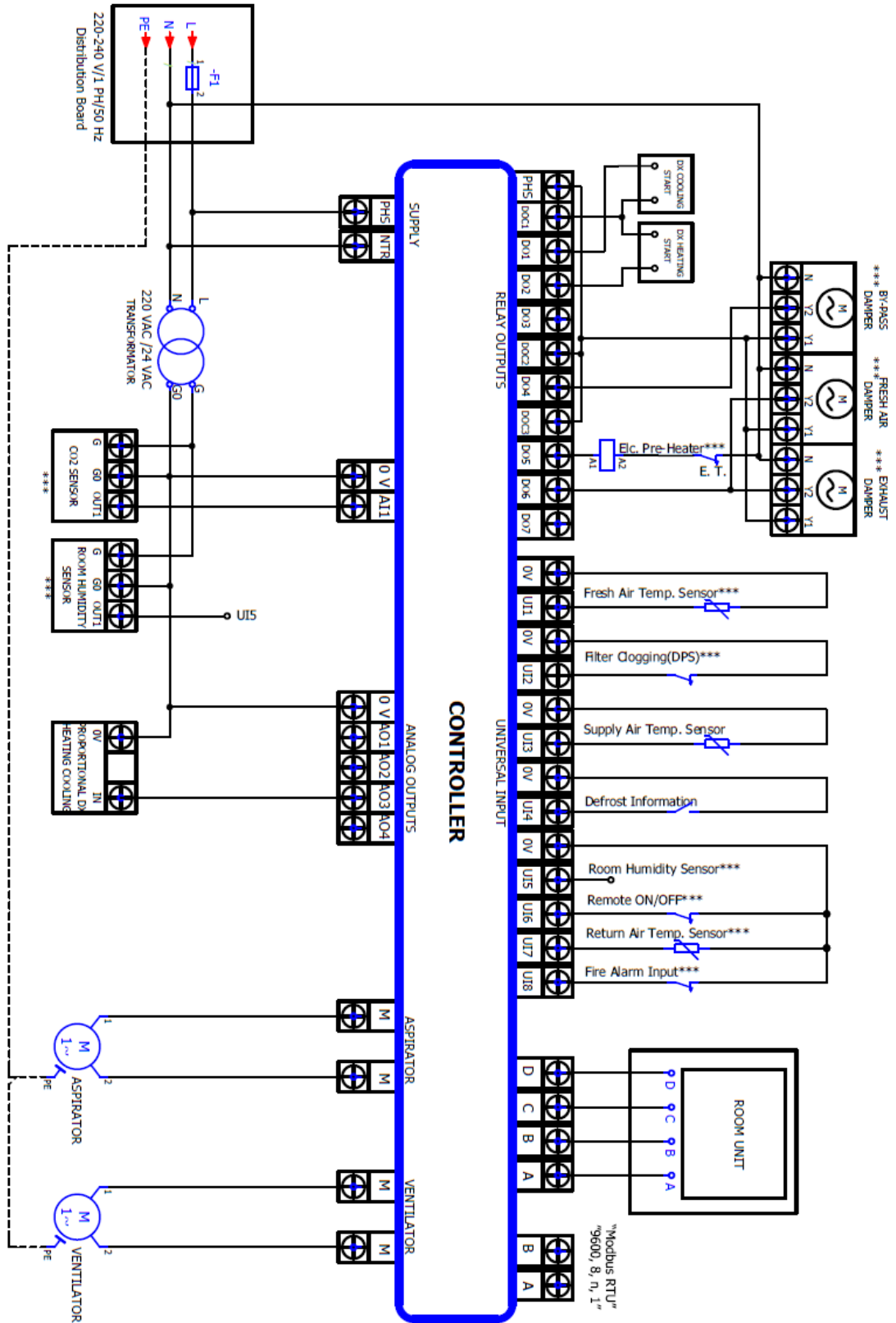
\*\*\*OPTION

Scenario 8 – DX Cooling



\*\*\*OPTION

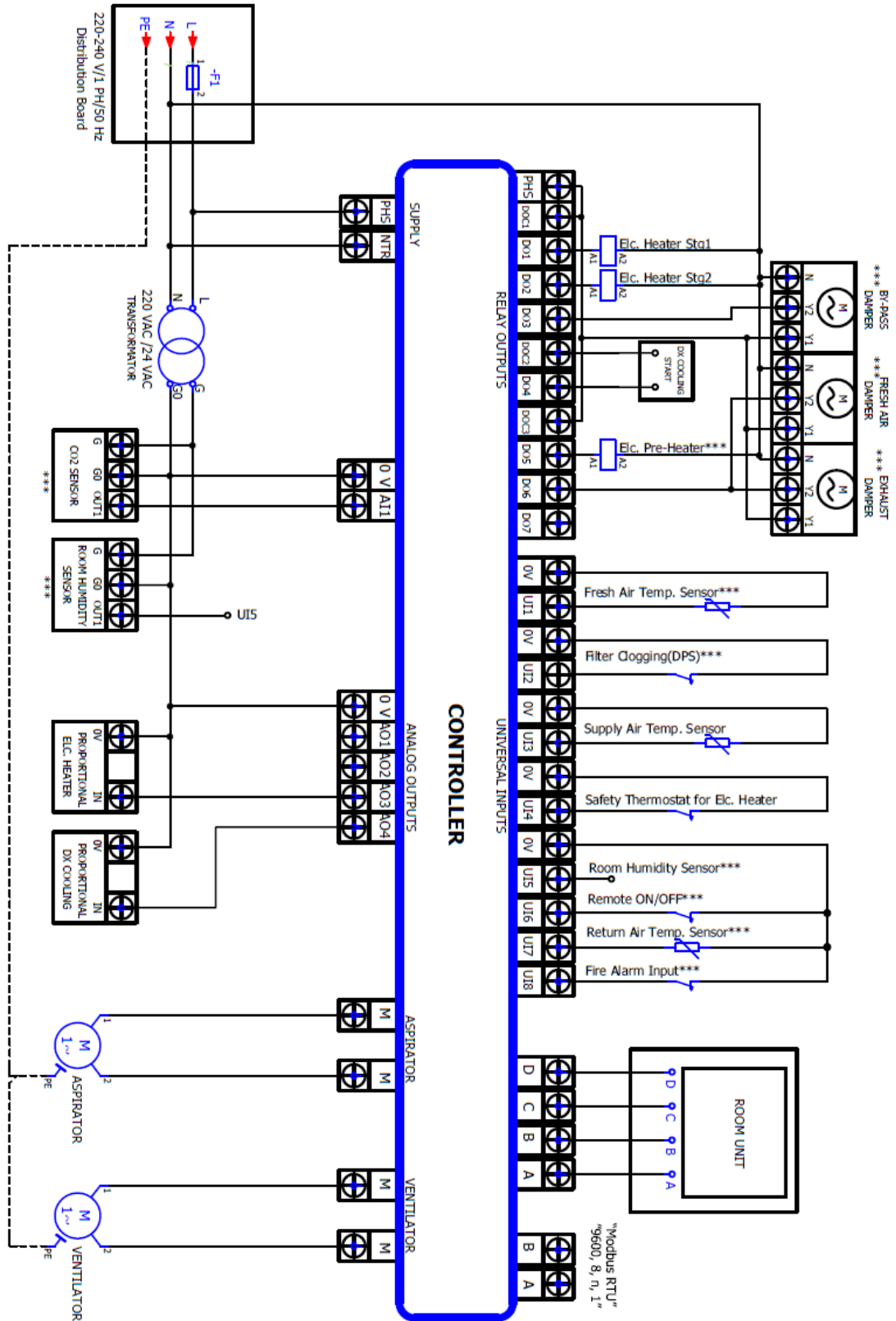
## Scenario 9 – DX Heatpump



\*\*\*OPTION

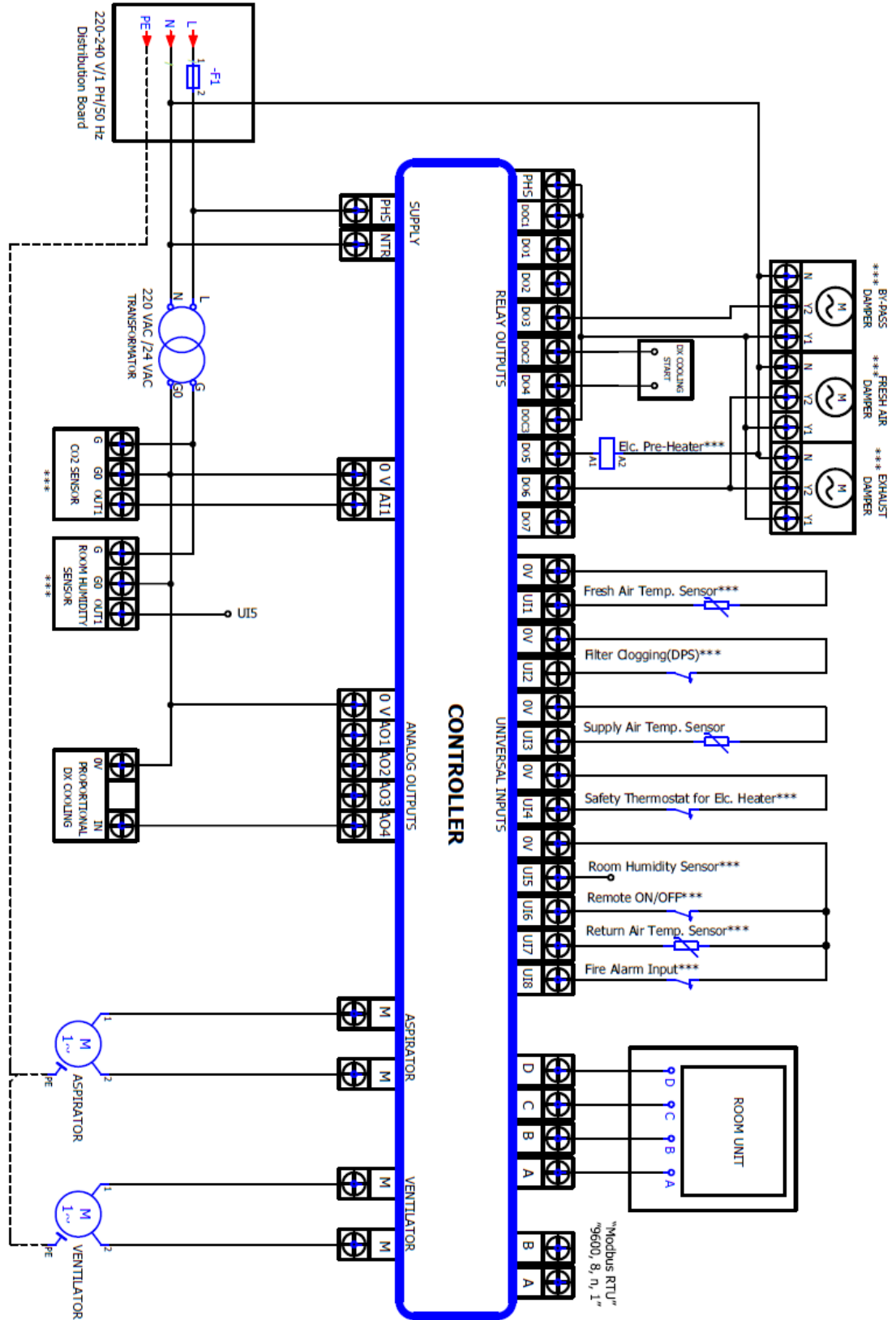


## Scenario 10 – DX Cooling + Electric Heating



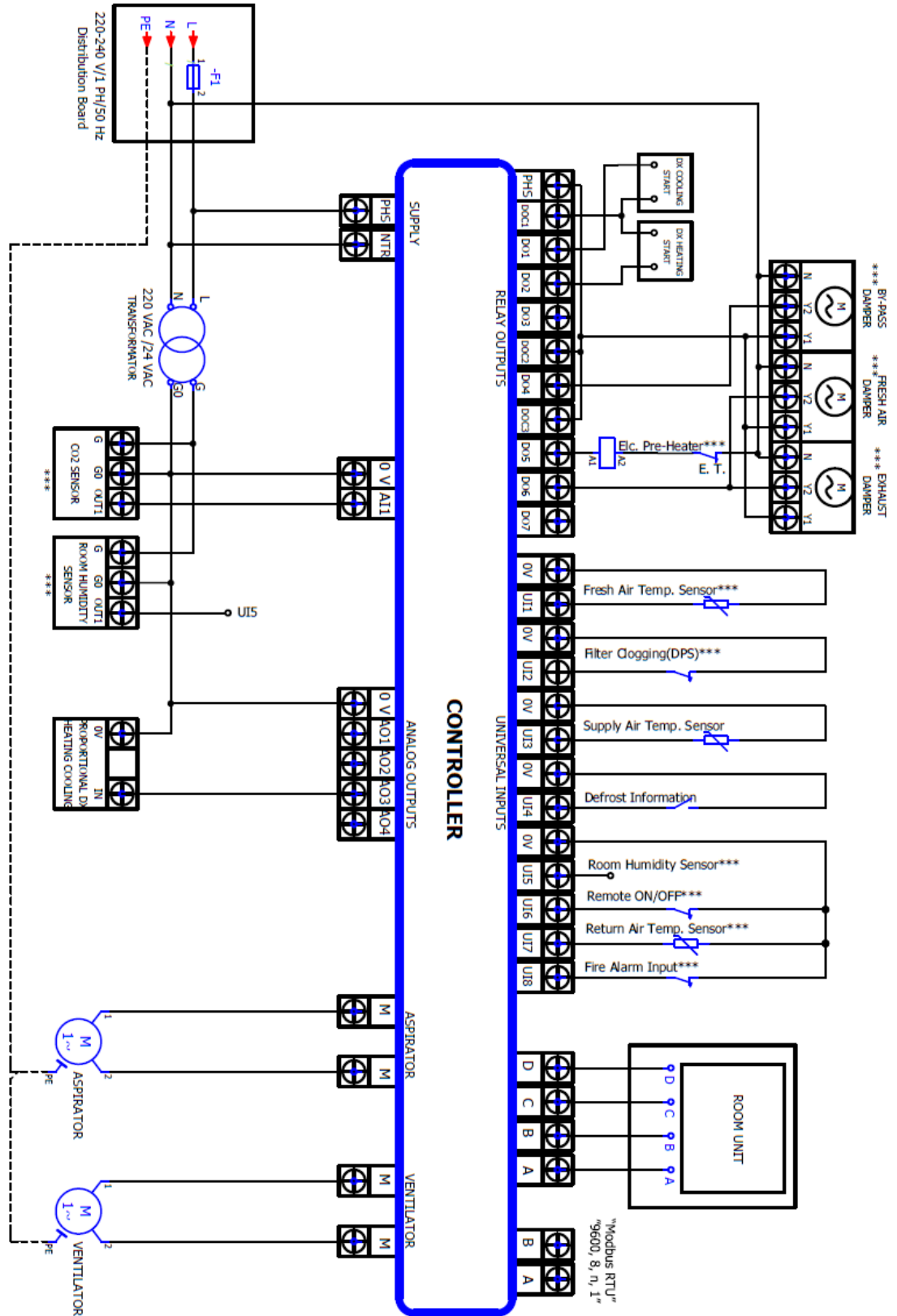
\*\*\*OPTION

## Scenario 11 – DX Soğutma(Hisense)



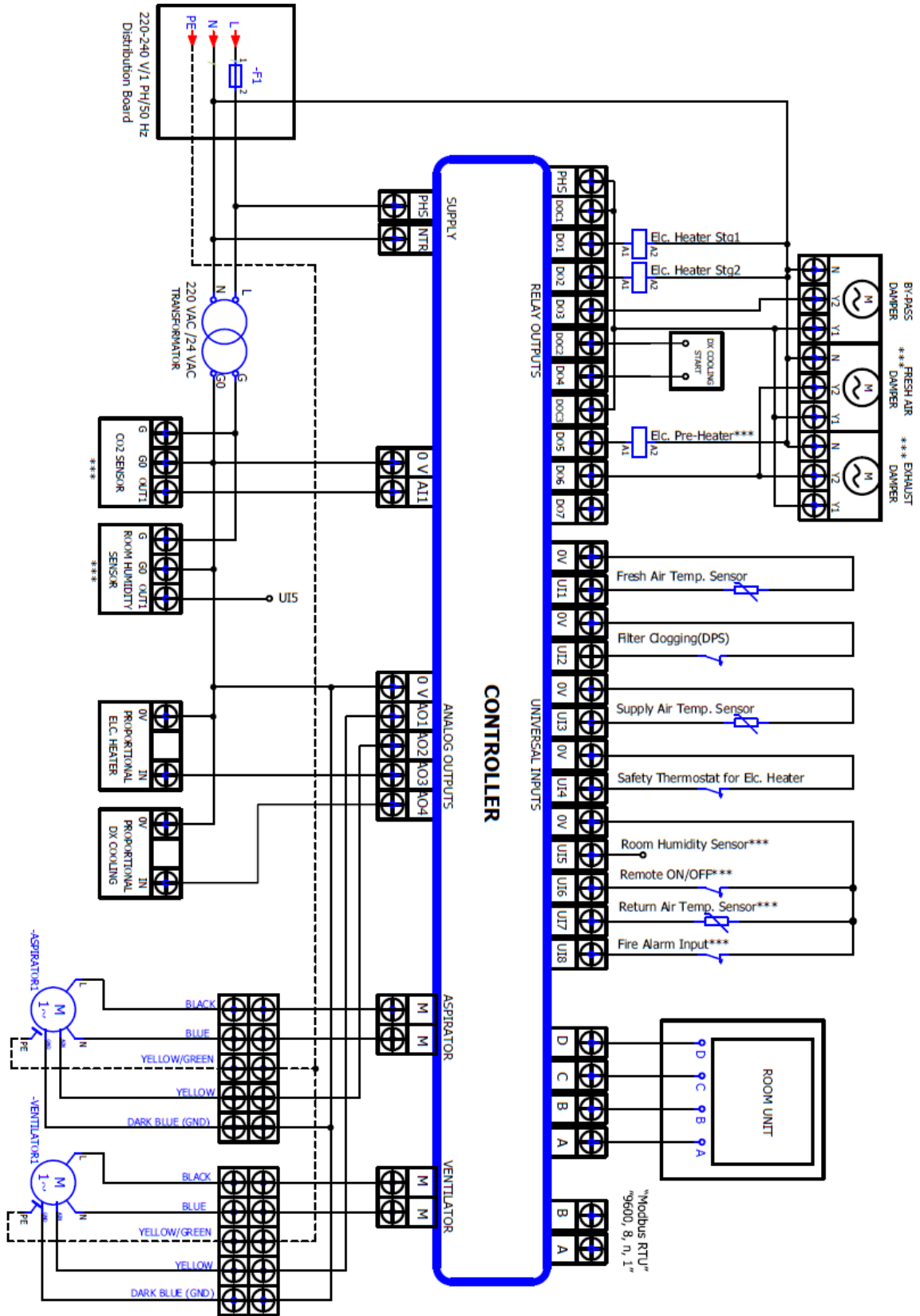
\*\*\*OPTION

## Scenario 12 – DX Heatpump(Hisense)



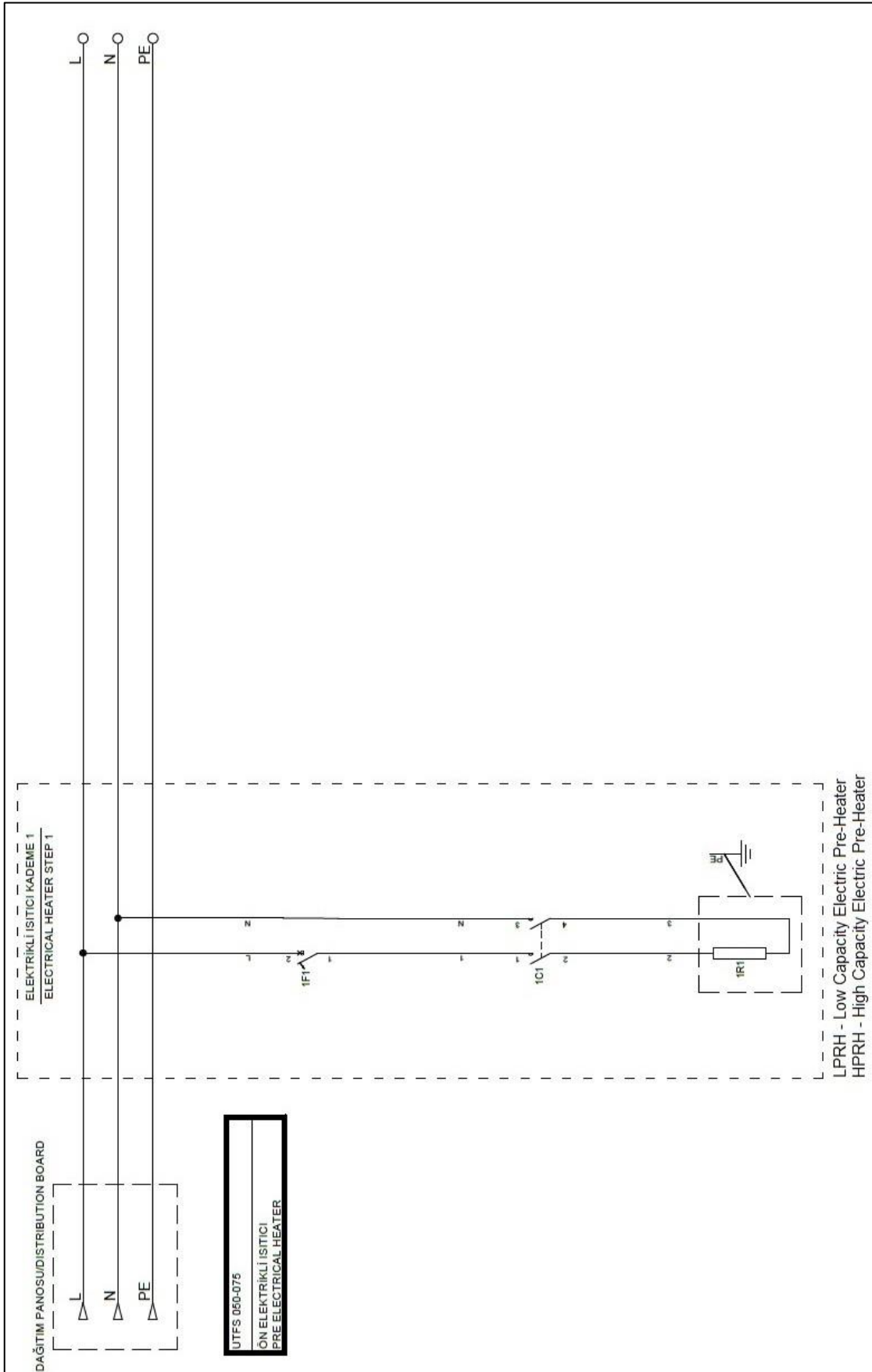
\*\*\*OPTION

## Scenario 13 – DX Cooling(Hisense) + Electric Heating

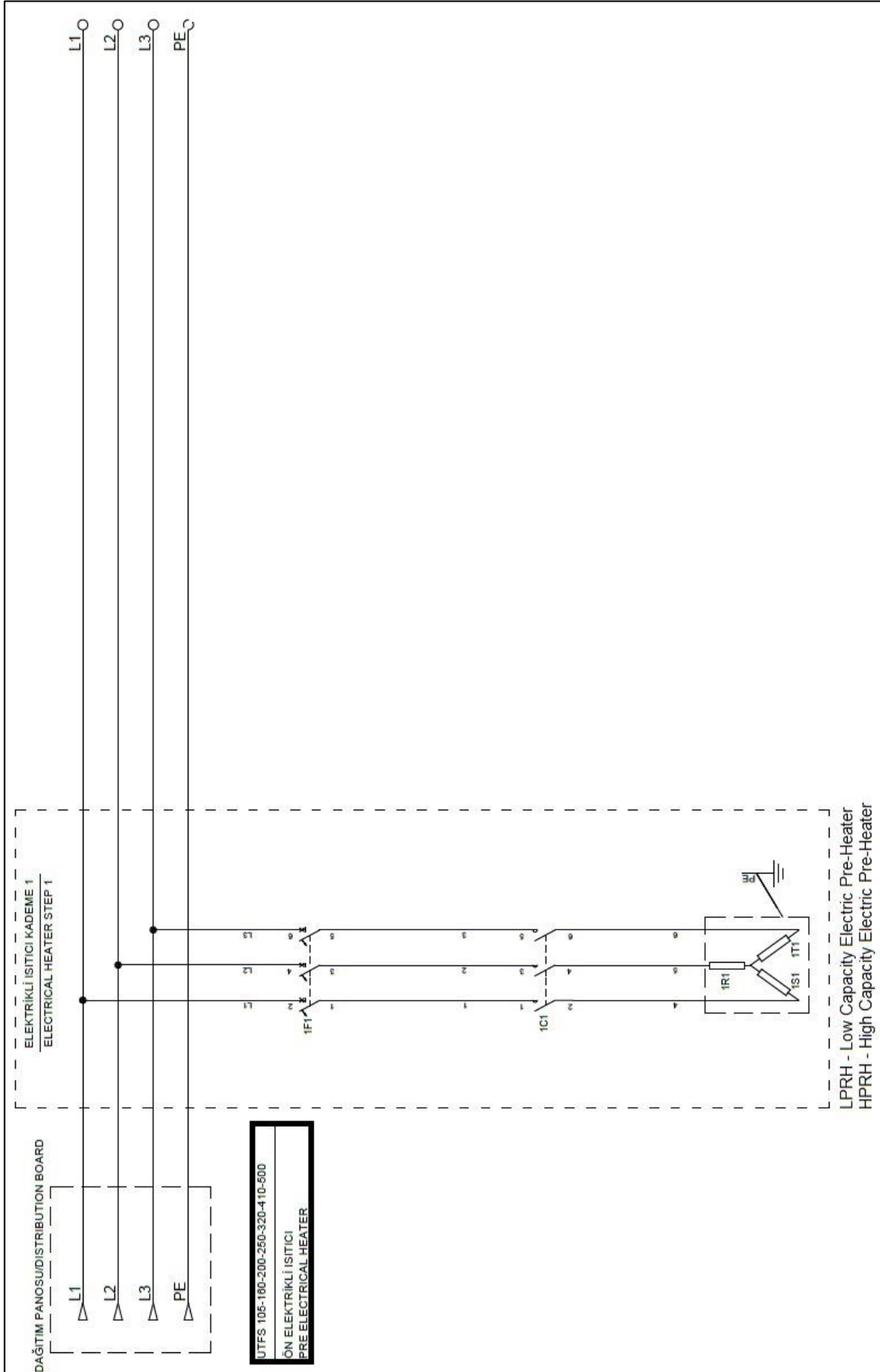


\*\*\*OPTION

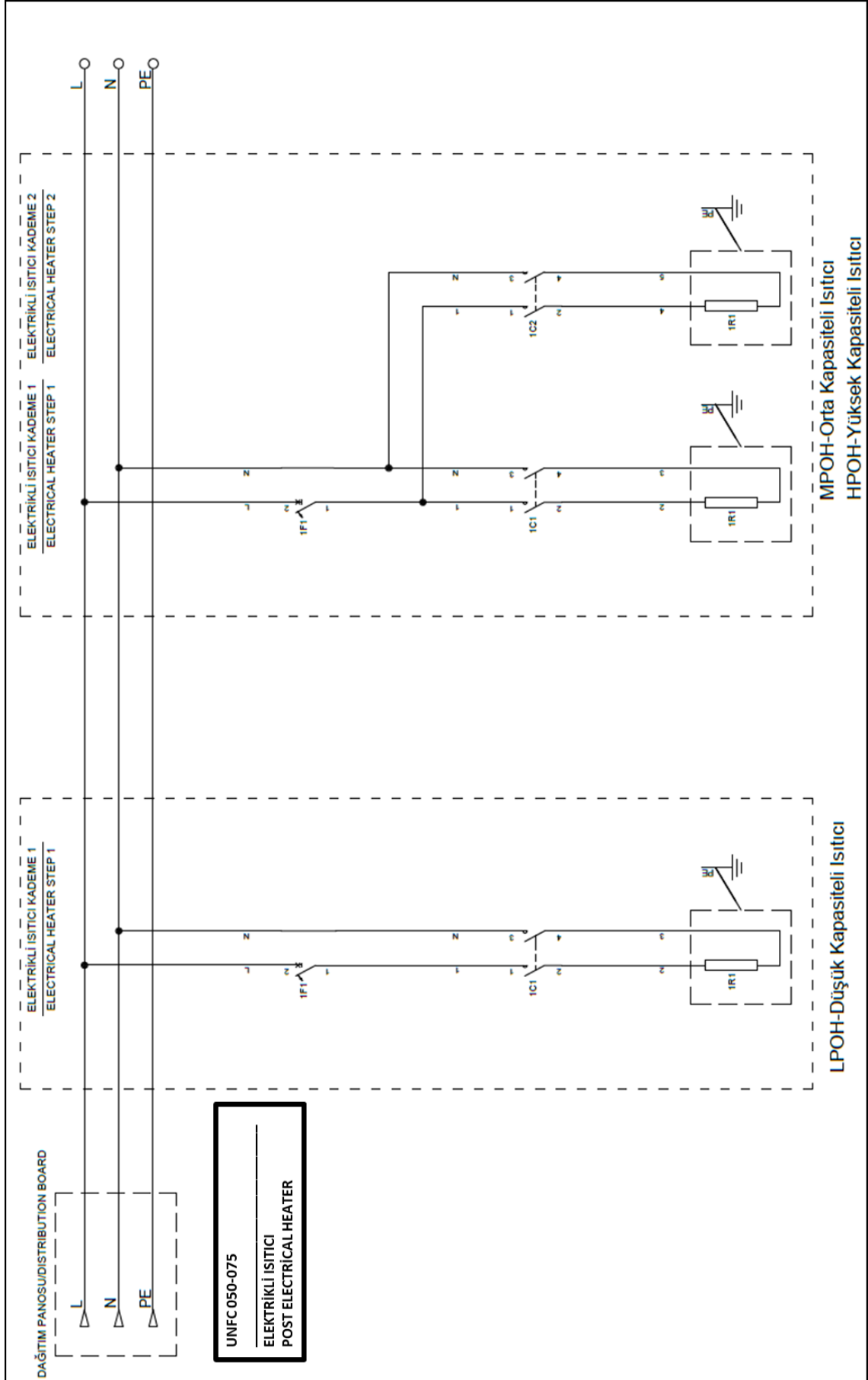
Electric Pre-Heater Schematic 050-075



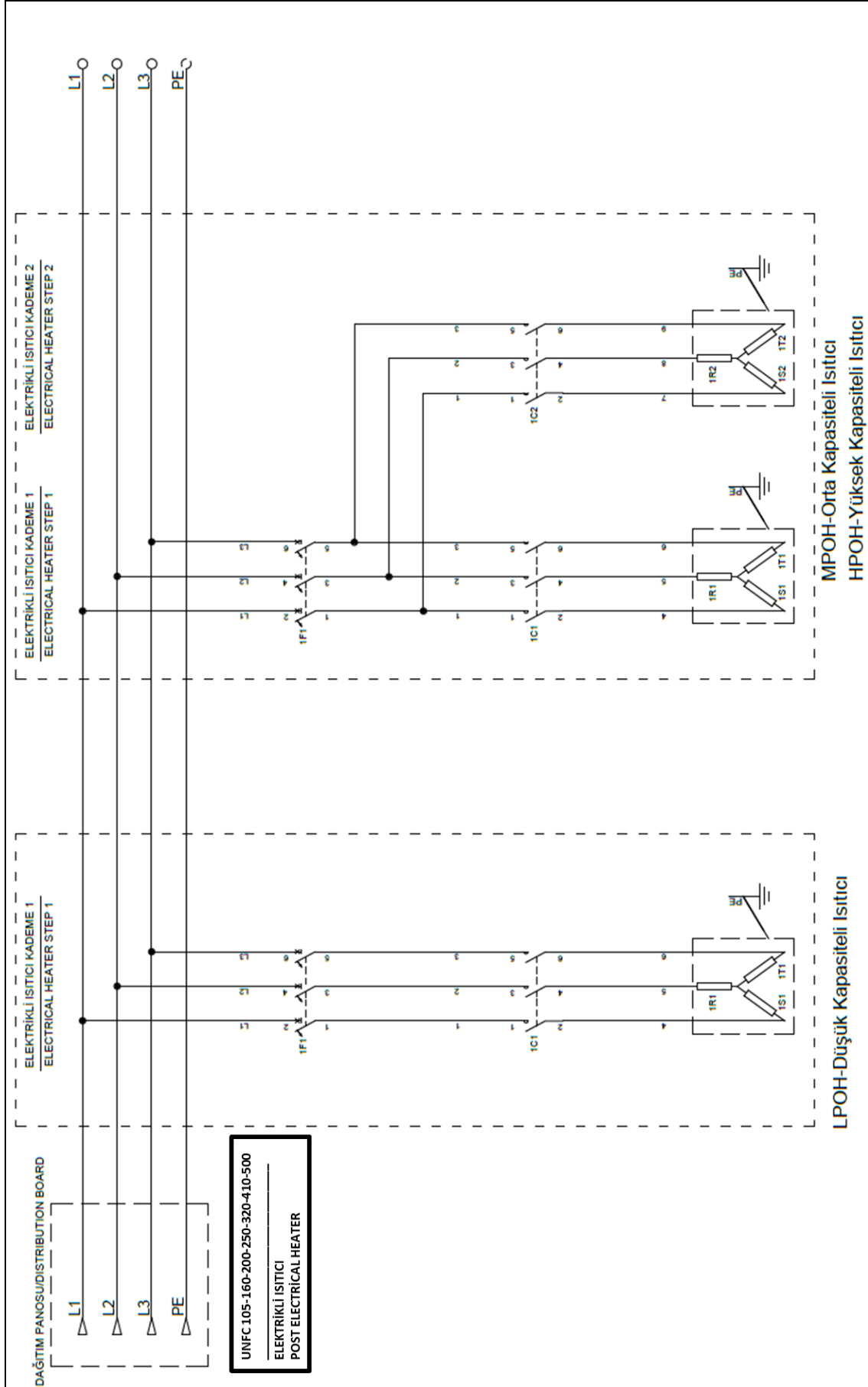
## Electric Pre-Heater Schematic / 105-160-200-250-320-410-500



Main Electrical Heater Schematic / 050-075



## Main Electrical Heater Schematic / 105-160-200-250-320-410-500





## **7. Options**

The options that can be used for UTFS unit are as follows.

### **7.1. Electrical Pre-Heater Low/High Capacity – LPRH/HPRH**

Heats the fresh air before entering the heat recovery unit to increase the efficiency of the overall heat recovery system. It has the capability of heating the cold outdoor air and regulating the humidity of air entering the heat recovery system.

### **7.2. Electrical Post-Heater Low/Medium/High Capacity– LPOH/MPOH/HPOH**

Provides heating to the air entering the room if the temperature needs to be raise further, mostly used when the room is partially or fully conditioned by the outer units. High capacity post-heater option has 3 stages.

### **7.3. Chilled Water Coil 3/4/5/6 Row – CW3R/CW4R/CW5R/CW6R**

Sectional cooling compatible chilled water coils, that are installed at the supply side of the unit are used to condition the air entering the room.

### **7.4. Direct Expansion Coil 3/4/5/6 Row – DX3R/DX4R/DX5R/DX6R**

Sectional cooling compatible direct expansion coils, that are installed at the supply side of the unit are used to condition the air entering the room.

### **7.5. Hot Water Coil 1/2 Row – HW1R/HW2R**

Sectional cooling compatible hot water coils, that are installed at the supply side of the unit are used to condition the air entering the room.

### **7.6. Cold and Hot Water Coil 3/4/5-1 Row – C3H1/C4H1/C5H1**

Sectional cooling compatible hot and cold water coils, that are installed at the supply of the unit are used to condition the air entering the room. The option should be selected when heating or cooling is required on the same unit.

### **7.7. First Stage Supply and Exhaust Filter – M5FS/G2FS/G2FR**

Optional filters are placed at the supply and exhaust side to increase the quality of indoor air. Filters used in the first stage are ISO ePM10 $\geq$  %50(M5) in the case of fine filter and ISO Coarse $\geq$  %40(G2) in the case of metal 1. stage filter.

## **7.8. Maxi Controller Electrical Panel - MAXC**

A controller that offers advanced automation possibilities for complex applications. Maxi controller needs to be installed when selecting the following options: Smoke detector/Fire Alarm Digital Input, Return Air Temperature Control and Remote On/Off.

## **7.9. Smoke Detector/Fire Alarm Digital Input – SDFI**

In the case of fire, the detector informs the controller of the incident and consequently the controller shuts the unit down while giving alarm information to the input. Likewise, the detector provides the controller with the information from the fire alarm system on site and consequently the controller shuts the unit down.

## **7.10. Fire Alarm Digital Input - FADI**

The digital input provides the controller the information of a incident with the help of the fire alarm system on site.

## **7.11. Fresh Air and Exhaust Air ON/OFF Damper - FAFD/EAFD**

Regulates the amount of fresh air entering the room and the amount of exhaust air leaving the room to increase the overall efficiency of the unit. The airflow rate is regulated with the servomotor controlled dampers.

## **7.12. By-Pass On/Off Damper - BPDF**

Optionally, the fresh air omits the heat exchangers and is given directly to the room in the case where heat transfer is not necessary with the help of a by-pass damper.

## **7.13. Supply and Return Air Temperature Control – SATC/RATC**

Measures the fresh air temperature entering the room and exhaust air leaving the room. The information obtained is provided to the necessary control components, which operates the unit more efficiently.

## **7.14. Filter Clogging Alarm – FCAL**

The filter clogging sensor monitors the pressure at the inlet and outlet of filters, determines that the filter values are below the set limit and informs the user that the filters require cleaning/replacement.

## **7.15. Indoor Air Quality Control – IAQC**

Regulates indoor air quality by controlling the fresh air entering the room with the help of a CO<sub>2</sub> sensor situated at the exhaust fan suction duct. The controller provides the necessary fresh air by using the data taken off the sensors and regulates fan stages with this information.

**7.16. Remote ON/OFF Digital Input - RODI**

Offers digital input for remote control possibilities on site.

**7.17. Proportional Heating/Cooling Control with 2/3-way Valve Kit – P2VH/P3VH  
P2VC/P3VC**

Valve kits are used in cycles with hot and cold water coils to make the system more efficient.

**7.18. IP67 Electrical Panel – IP67**

Harsh outer environment resistant IP67 class panel.

**7.19. Wireless (Wi-Fi) Control – WIFI**

Remote access to the unit thanks to Wi-Fi technology and unit control with mobile application.

**7.20. Circular Duct Connection Adaptor - CDCA**

The adaptor is used to connect the inlet and outlet connection to circular ducts.

**7.21. Low/High Capacity Electrical Pre-Heater + By-Pass ON/OFF Damper –  
LPHB/HPHB**

Heats the fresh air before entering the heat recovery unit to increase the efficiency of the overall heat recovery system. It has the capability of heating the cold outdoor air and regulating the humidity of air entering the heat recovery system. Optionally, the fresh air omits the heat exchangers and is given directly to the room in the case where heat transfer is not necessary with the help of a by-pass damper.

**7.22. VAC Transformer – TRAF**

When indoor air quality, proportional controlled valves and return air humidity sensor are selected, the transformer needs to be installed as well.

**7.23. Return Air Humidity Sensor - RAHS**

Should be selected when the indoor humidity value needs to be read.

**7.24. Relay Card - RLYC**

When Pre-Heaters and On/Off dampers are selected, the relay card needs to be installed as well.

## 8. Control Unit

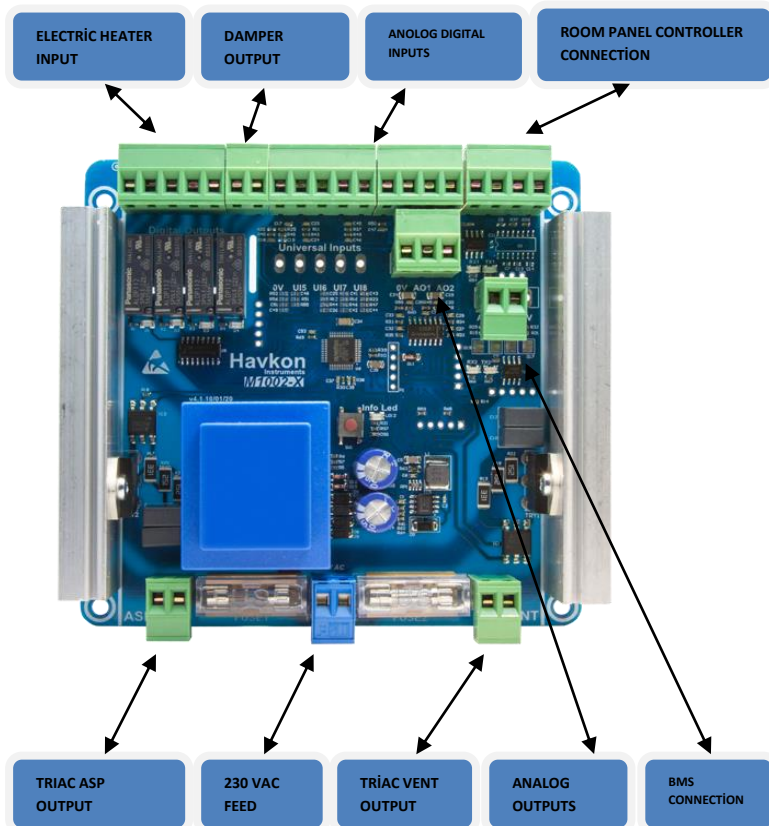
Heat recovery unit electronics consists of 2 parts, namely the control panel and power unit.



The control unit can do the following operations;

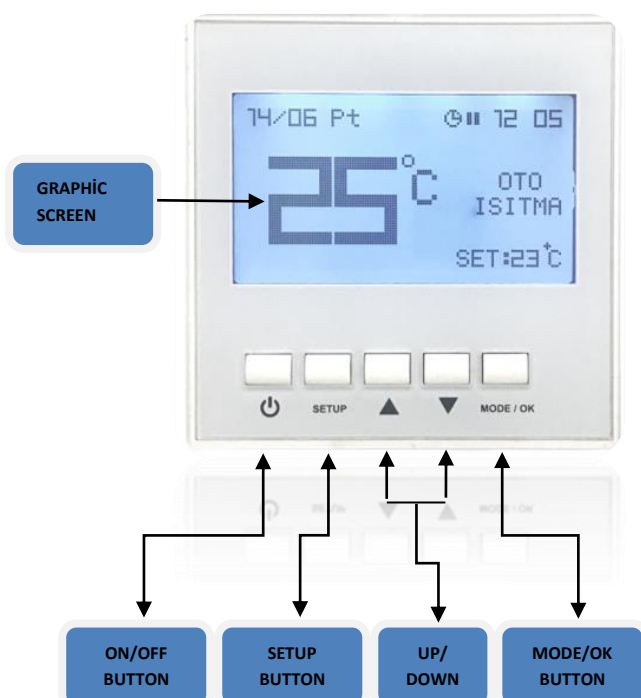
- Set value changes on the room control panel, mode changes, fan speed configuration changes
- Room temperature measurement with the help of a sensor installed on the control panel
- Digital inputs that can be allocated as alarm and temperature inputs
- 230 VAC triac, 0-10Vdc proportional and 230 VAC 6 step fan speed control capabilities
- Heater step control
- Automatic fan rpm control connected to CO<sub>2</sub> or air quality rates
- Heating/Cooling control functions
- Weekly time programming
- Building automation system integration through Modbus RTU with RS485 connection

## 8.1. Power Control Unit



- Time Based Dirty Filter Control (Adjustable Service Duration)
- Ready Application Selection on the Screen
- Adjustable Mode Selection (Auto Heating, Auto Cooling, Man Heating, Man Cooling, Fan Mode)
- Resumable After Power Outage
- Connection to Building Management System (Modbus-RTU)
- Weekly Program (Each day separately)

## 8.2. Control Panel



- 3.1" Graphic Screen
- Aspirator, Ventilator 6 Step Speed Control
- Automatic/Manual Operation
- Heating/Cooling/Fan Modes
- Language Options Selection (Turkish/English)
- Internal Room Temperature Sensor
- User Friendly Design
- Minimum and Maximum Set Temperature Limit
- Weekly Program (Each day Separately)

**230V AC Triac Output:** Input voltage minimum 50V and output voltage equal to the maximum input voltage.

**Temperature Sensor Inputs:** Supply, Return, Outer Air, Room Temperature are recognized and NTC10K type temperature sensors can be connected.

**Active Sensor Inputs:** Air quality sensors and carbondioxyde sensors can be connected. These sensors increase the fan speed resulting in higher air circulation when the fans are taken in automatic mode and when air quality levels drop.

**Control Panel:** 4x0.75 mm<sup>2</sup> shielded and stranded cables up to 100 meters can be used between the room control panel and the unit. Cable strands need to be grounded one sided. Otherwise communication errors will occur between the control panel and the unit. The wiring between thermostat and controller should be done according to the diagrams.

**BMS:** Allows all parameters going into BMS.

**Filter Dirt Measurement:** 2 filter alarm are defined in the system.

**Outer Environment Temperature Sensor:** A sensor that is situated inside the unit, that measures the outer air temperature. NTC10K is used as a sensor.

**Time-Date:** Open-Closing times can be configured. Configuration can be made for each day of the week.

## 8.2.1. Weekly Program Configuration



- Firstly, a time module needs to be installed
- While the unit is open, click on the **SETUP** button for 2 seconds.
- While weekly program is selected, click on **MODE/OK** button.
- Select the starting and finishing hours of each day on the weekly program screen by using the **UP/DOWN** and proceed by using the **MODE/OK** button.
- In order to go back at anytime press the **ON/OFF** button.

**Note1** : If the starting hours are after the finishing hours, the unit will stay closed for the selected day.

**Note2** : If the starting and finishing hours are the same, the weekly program will not work for the selected day.

**Note3** : If the unit is the weekly programmed for the current day and also within the programmed working hours, then a clock logo will appear on the screen.

**Note4** : If the unit is the weekly programmed for the current day and also within the programmed working hours, then a stop clock logo will appear on the screen.

## 8.2.2. Date and Time Configuration



- While the unit is open, click on the **SETUP** button for 2 seconds.
- While Time and Date is selected, click on **MODE/OK** button and proceed.
- Select the Hour/Minutes configuration with the **UP/DOWN** buttons and click on **MODE/OK** to proceed.
- Select the Day/Month configuration with the **UP/DOWN** buttons and click on **MODE/OK** to proceed.
- Select the Year with **UP/DOWN** buttons and click on **MODE/OK** to proceed.
- Select the Day with **UP/DOWN** buttons and click on **MODE/OK** to proceed.

## 8.2.3. Device Mode Configuration



- While the device is open, click on **MODE/OK** button to selected the mode option.
- If the device is on manuel heating, manuel cooling or fan mode, click **MODE/OK** to select fan steps and set temperature. While in set temperature mode, clicking on **MODE/OK** button will take you to the next mode.
- If the device is on automatic mode, click **MODE/OK** to get to the next mode.

## 8.2.4. Set Temperature Configuration



- While the device is open and in automatic mode, clicking on the **UP** or **DOWN** buttons will highlight the set temperature and configuration of the temperature can be done with the same buttons afterward.
- While the device is open and in manual mode, click **MODE/ON** to highlight the set temperature and use the same button to configure the temperature.

## 8.2.5. Malfunction Reset



- If the malfunction code is flashing on the upper corner of the screen and the defect has been fixed, then press the **SETUP** and **UP** buttons at the same time to reset the malfunction.

## 8.2.6. Filter Dirt Time Reset



- If the filter dirt code is flashing on the upper corner of the screen and the filters are cleaned, then press the **SETUP** and **MODE/OK** button at the same time to reset the filter dirt timer.

**Note:** Filter dirt limit timer can be changed by hours using the 177 Parameter. Instantaneous filter timer can be observed with the 115 Parameter.



## 8.2.7. Service Menu Usage

In order to enter the service menu:



- While the device is open, use the **UP** and **DOWN** button at the same time.
- Use the **UP** and **DOWN** button to enter the service menu password and press **MODE/OK** button.
- Note: Service menu password: **“58”**
- If the password is entered correctly, use the **UP** and **DOWN** buttons to navigate to the desired parameter and click on the **MODE/OK** button.
- Use the **UP** and **DOWN** buttons to change the desired parameters and click **MODE/OK** to finalize the configuration.
- Use the **ON/OFF** button to exit the service menu



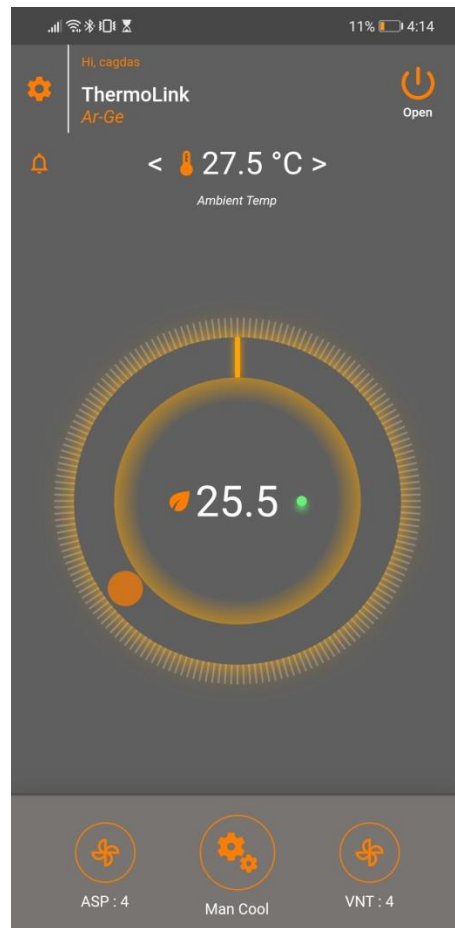
**Beware, the service configuration menu changes should be made by technical personnel. Any malfunction resulting from the configuration will be the responsibility of the user that changed the device parameters.**

## 8.3. Wi-Fi Control

- Wi-Fi control is offered optionally in UTFS and UTFP units.
- Communication between the room thermostat and unit control is executed through the mobile application. The app can be downloaded through the Google Play Store or the App Store.
- Unit control through Wi-Fi connection can be established between the room thermostat and a modem with a strong signal.
- The unit can be reached through the mobile app as long as there is stable modem internet.

Mobile application controller features:

- Open/Close
- Mode switching
- Fan speed step switching
- Set value changing
- Activate or deactivate room unit lock
- Alarm listing and resetting
- Room temperature set value monitoring
- Multiple unit grouping



## 8.3.1. Wi-Fi Connection

- In order to use UTFS and UTFP units through Wi-Fi, the room thermostat needs to be matched with the modem inside the building.
- The thermostat and modem matching can be done with a phone or a PC. A Wi-Fi scan with a phone or PC should be performed and a connection to the passwordless room thermostat established.
- Afterwards the password and SSID of the modem that is connected to the 192.168.4.1 IP will be entered and the room thermostat will be connected.
- Wi-Fi icon will appear on the screen when the thermostat is connected to the modem.
- When the thermolink application recognizes the room thermostat and the unit is connected to the server, the icon ‘‘C’’ will appear next to the Wi-Fi icon.



## ThermoLink

### WiFiManager

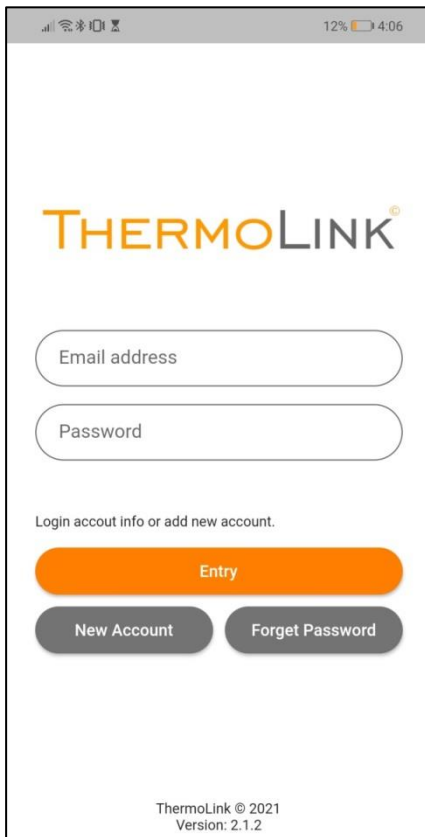
Configure WiFi

Configure WiFi (No Scan)

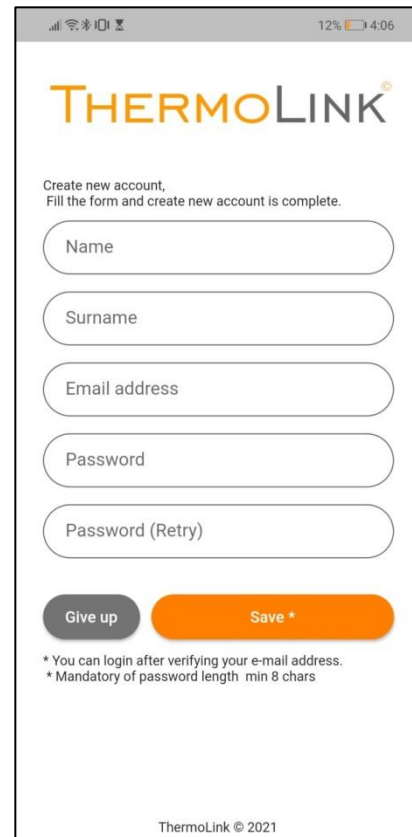
Info

Reset

### 8.3.2. Thermolink Application: Register



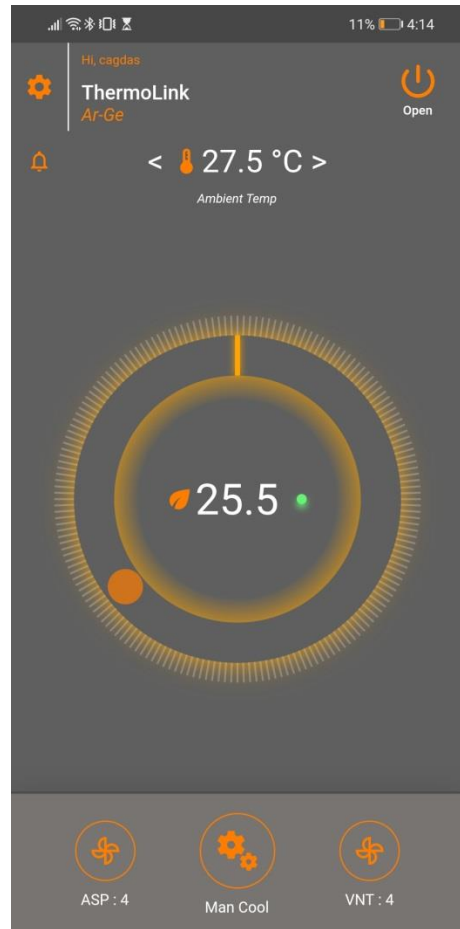
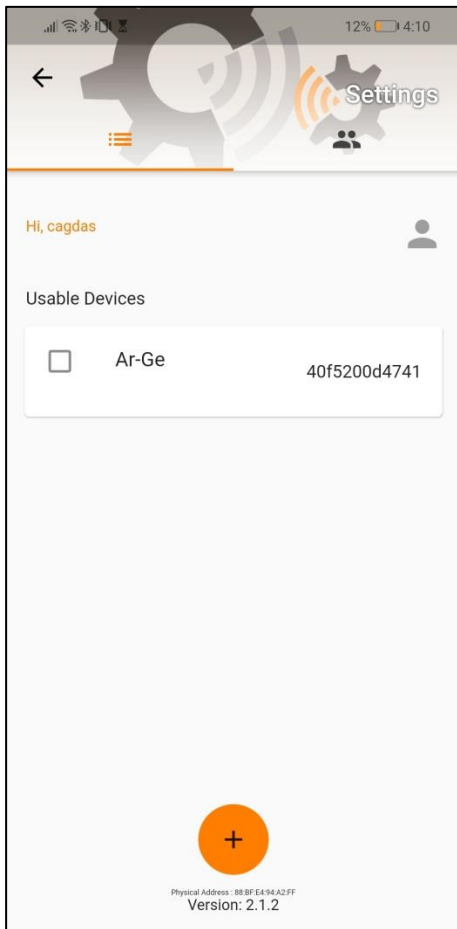
Thermolink © 2021  
Version: 2.1.2



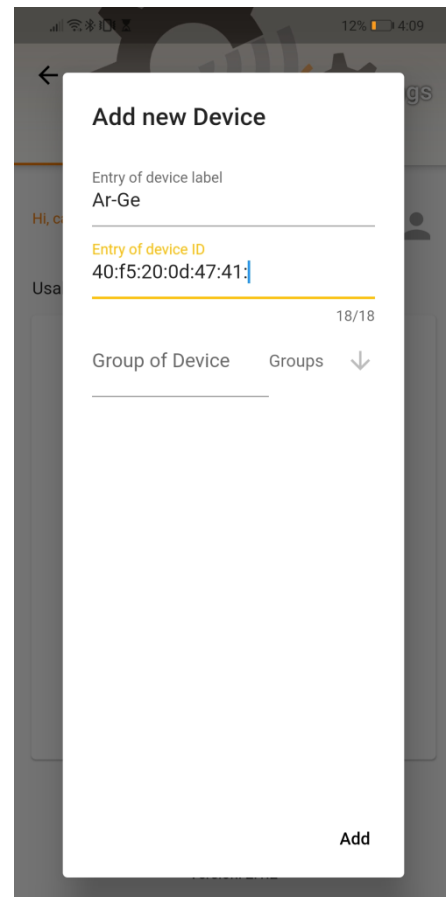
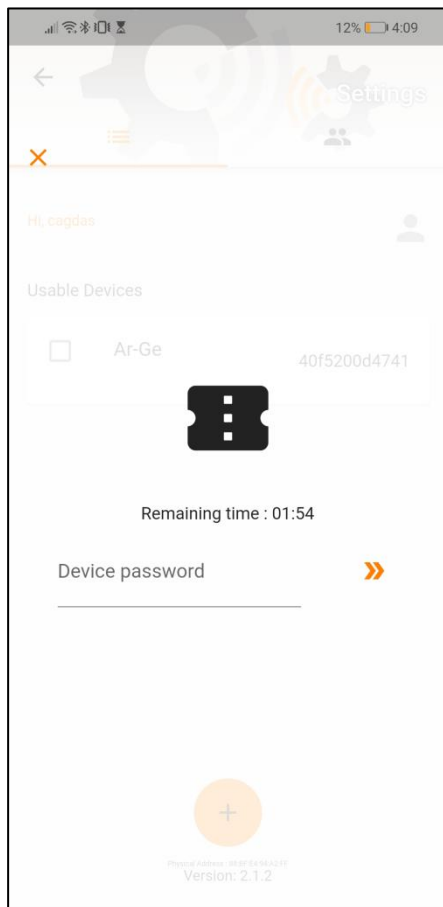
Thermolink © 2021

- Thermolink application requires and Email and password entry. If you dont have a Thermolink account, click on New Account and create an account by filling the required section. Verification should be done with the mail that is delivered to the entered Email adress.
- After the email account and password are entered, the application can be used. Email and passworld query will only happen once.

## 8.3.3. Thermolink Application: New Unit

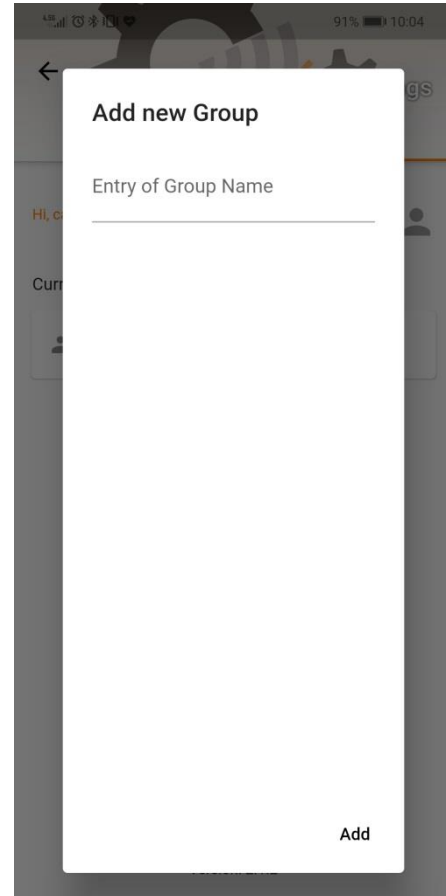
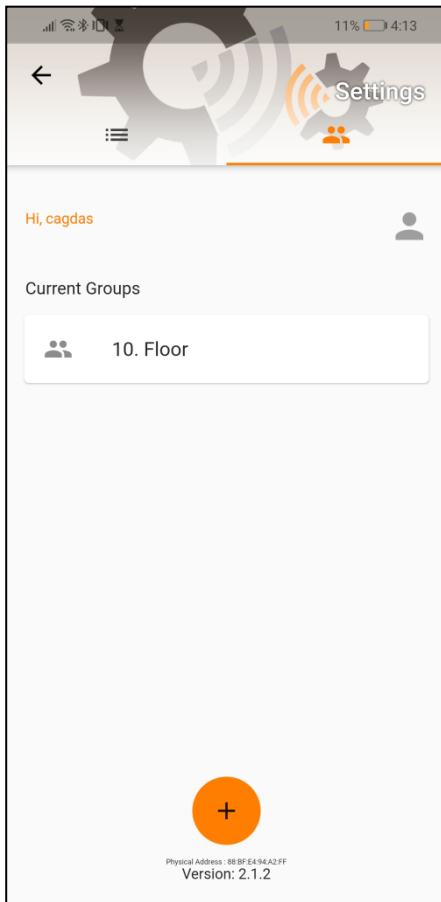


- Thermolink application main screen can be seen in the picture.
- In order to enter a new unit to the application press the settings button on the screen and enter the settings menu.
- Afterwards click on the “+” button on the screen. Enter the unit name and ID.
- Note: Unit ID will appear on the Digital Panel screen when **SETUP+UP+DOWN** buttons are clicked for 5 seconds. While this screen is visible, click on the ADD button to enter the room panel password screen.
- The unit and application will be paired when the password from the room panel is entered in the application.



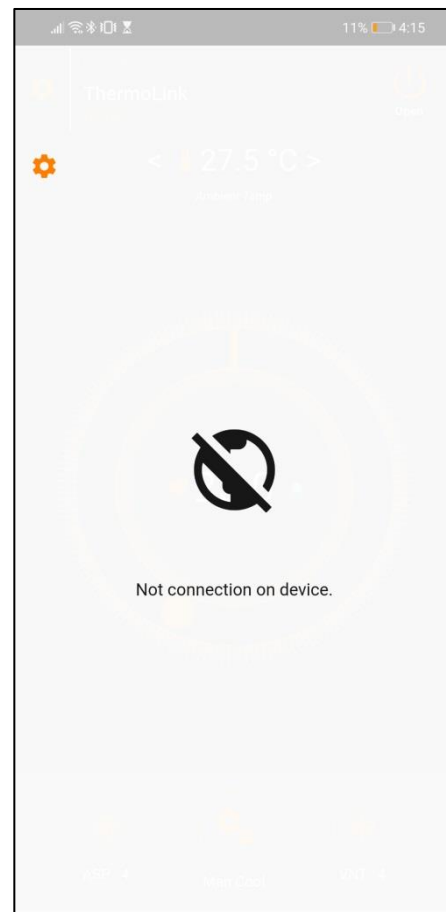
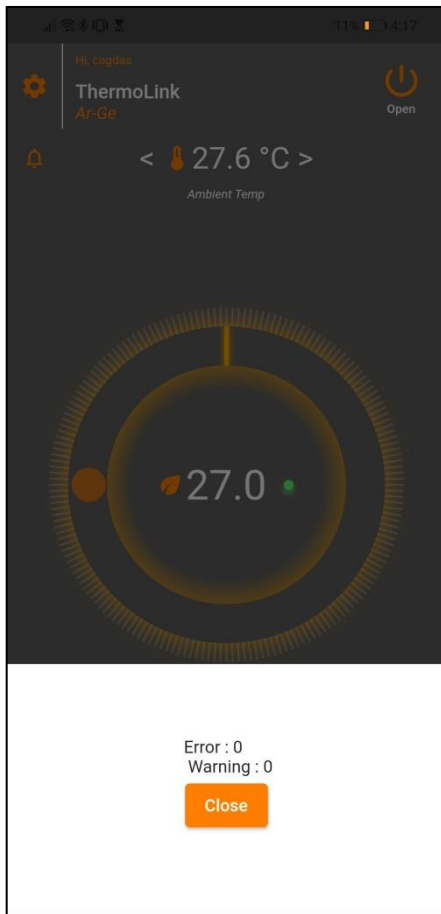
- In order to enter a new unit to the application press the settings button on the screen and enter the settings menu.
- Afterwards click on the “+” button on the screen. Enter the unit name and ID.
- Note: Unit ID will appear on the Digital Panel screen when **SETUP+UP+DOWN** buttons are clicked for 5 seconds. While this screen is visible, click on the ADD button to enter the room panel password screen.
- The unit and application will be paired when the password from the room panel is entered in the application.

## 8.3.4. Thermkolink Application: Grouping



- Several of our unit can be grouped with the help of the Thermolink application. For example: every heat recovery unit on the 10th floor can be grouped and each configuration made on the main screen can be applied simultaneously to all units.
- The groups can be managed in the setting section. New groups can be created or newly created groups can be added/removed.

### 8.3.5. Wi-Fi Connection Errors



- If there is no connection between the unit and application, the warning depicted will appear. Causes for non-communication:
  - No internet on the modem
  - Wi-Fi communication break off between thermostat and modem
  - Connection error between thermostat and main server
- If the application won't open, then the mobile phone is not connected to the internet.
- Unit alarms and warnings can be tracked with the Thermolink application.

## 8.4. Modbus Parameters

| PLC Register   | ID | PARAMETER NAME                                 | MIN/MAX            | VALUE  |
|--|----|--|--------------------|--|
| <b>Device General Control Values</b>                 |    |  |                    |  |
| 40001  | 0  | Device On/Off Variable                         | 0:Kapalı<br>1:Açık |  |
| 40002  | 1  | Device Set Temperature                         | 0...999            | 28°C is shown as 280.  |
| 40003  | 2  | Device Air Conditioning Mode                   | 0...4              | 0: Man. Heating<br>1: Man. Cooling<br>2: Auto Heating<br>3: Auto Cooling<br>4: Full Automatic Mode |
| 40004  | 3  | Aspirator Fan Manuel Velocity Value            | 0...6              |  |
| 40005  | 4  | Ventilator Fan Manuel Velocity Value           | 0...6              |  |
| <b>Device Temperature Register</b>                   |    |  |                    |  |
| 40006  | 5  | Application Temperature                        | -400...999         | 28°C is shown as 280.  |
| 40007  | 6  | Panel Environment Temperature Value            | -400...999         | Temperature Value on the Panel.  |
| 40008  | 7  | Device Return Air Temperature Value            | -400...999         | The Temperature of Air Taken From the Room.  |
| 40009  | 8  | Device Supply Air Temperature Value            | -400...999         | If there is no current temperature value on the device, the value will shown as "32767".           |
| 40010  | 9  | Outer Air Temperature Value                    | -400...999         |  |
| 40011  | 10 | Water Coild Temperature Value                  | -400...999         |  |
| 40012  | 11 | Evaporator Temperature Value                   | -400...999         |  |
| 40013  | 12 | Condenser Temperature Value                    | -400...999         |  |
| 40014  | 13 | Can be Heat Exchanger Temperature Value        | -400...999         |  |
| <b>Current Device Input State Indicator Register</b> |    |  |                    |  |
| 40015  | 14 | Bms Input                                      | 0...1              | 0: Device Works Normally.<br>1: Device Is Closed.  |
| 40016  | 15 | Boost Input                                    | 0...1              | 0: Works Normally.<br>1: Fans Are Fully Working.   |
| 40017  | 16 | Aspirator Fan Airflow Information              | 0...1              | Aspirator Fan Airflow Switch Information.  |
| 40018  | 17 | Ventilator Fan Airflow Information             | 0...1              | Ventilator Fan Airflow Switch Information.   |
| 40019  | 18 | Filter 1 Dirt Information                      | 0...1              | Filter 1 DPS Information   |
| 40020  | 19 | Filter 2 Dirt Information                      | 0...1              | Filter 2 DPS Information   |
| 40021  | 20 | E. Heater Safety Thermostat Information        | 0...1              | Safety Thermostat Information  |
| 40022  | 21 | Aspirator Fan Thermal Malfunction Information  | 0...1              | Aspirator Fan Malfunction Information  |
| 40023  | 22 | Ventilator Fan Thermal Malfunction Information | 0...1              | Ventilator Fan Malfunction   |



|   |    |  |          | Information  |
|---|----|--|----------|--|
| 40024   | 23 | Emergency Stop Button Information          | 0...1    | Emergency Stop Button Information  |
| 40025   | 24 | Low Pressure Input Information             | 0...1    | Low Pressure Input   |
| 40026   | 25 | High Pressure Input Information            | 0...1    | High Pressure Input  |
| 40027   | 26 | Fire Information                           | 0...1    | Fire Information   |
| 40028   | 27 | Frost Thermostat Information               | 0...1    | Frost Thermostat Information (In Water Coil Applications, Valves Will Open Completely and Fans Will Stop Working). |
| 40029   | 28 | Compressor Thermal Malfunction Information | 0...1    | Compressor Malfunction Information (If There Is a Compressor, it will shut down).                                  |
| 40030   | 29 | Phase Malfunction Information              | 0...1    | Phase Malfunction Information (Device Will Shutdown Completely.)   |
| 40031   | 30 | Heat Exchanger Frost Thermostat            | 0...1    |  |
| 40032   | 31 | VRF Malfunction                            | 0...1    |  |
| 40033   | 32 | VRF Defrost                                | 0...1    |  |
| <b>Device Analog Input Register</b>             |    |  |          |  |
| 40034   | 33 | Humidity Value                             | 0...1000 | These values are configured between 321 and 340 analog input calibration parameters.                               |
| 40035   | 34 | Air Quality Value                          | 0...1000 |  |
| 40036   | 35 | CO2 Value                                  | 0...1000 |  |
| 40037   | 36 | Return Pressure Value                      | 0...1000 |  |
| 40038   | 37 | Supply Pressure Value                      | 0...1000 |  |
| 40039   | 38 | Analog 1 Set Value                         |          |  |
| 40040   | 39 | Analog 2 Set Value                         |          |  |
| 40041   | 40 | Analog 3 Set Value                         |          |  |
| <b>Mixture Damper Register</b>                  |    |  |          |  |
| 40042   | 41 | Mixture Damper Mode                        | 0...1    |  |
| 40043   | 42 | Mixture Damper Manual Value                |          |  |
| <b>Momentary Digital Output Status Register</b> |    |  |          |  |
| 40044   | 43 | Fresh/Return Air Damper Motor              | 0...1    | 0:Off 1:On   |
| 40045   | 44 | Bypass Damper Motor                        | 0...1    | 0:Off 1:On   |
| 40046   | 45 | Heating/Cooling Coil Valve Outlet          | 0...1    | 0:Off 1:On   |
| 40047   | 46 | Heating Coil On/Off Outlet                 | 0...1    | 0:Off 1:On   |
| 40048   | 47 | Cooling Coil On/Off Outlet                 | 0...1    | 0:Off 1:On   |
| 40049   | 48 | Compressor Outlet                          | 0...1    | 0:Off 1:On   |
| 40050   | 49 | Compressor 4-Way Valve Outlet              | 0...1    | 0:Off 1:On   |
| 40051   | 50 | Device Working Status Information Outlet   | 0...1    | 0:Off 1:On   |
| 40052   | 51 | Device Malfunction Information Outlet      | 0...1    | 0:Off 1:On   |
| 40053   | 52 | Device Warning Information Outlet          | 0...1    | 0:Off 1:On   |
| 40054   | 53 | Run Aspirator Fan Outlet                   | 0...1    | 0:Off 1:On   |
| 40055   | 54 | Run Ventilator Fan Outlet                  | 0...1    | 0:Off 1:On   |
| 40056   | 55 | VRF On/Off Outlet                          | 0...1    | 0:Off 1:On   |
| 40057   | 56 | VRF Heating Outlet                         | 0...1    | 0:Off 1:On   |
| 40058   | 57 | VRF Cooling Outlet                         | 0...1    | 0:Off 1:On   |
| 40059   | 58 | Rotary Outlet                              | 0...1    | 0:Off 1:On   |
| 40060   | 59 | Humidifier Outlet                          | 0...1    | 0:Off 1:On   |

|   |    |   |          |  |
|---|----|---|----------|--|
| 40061   | 60 | Momentary Aspirator Fan Outlet Value            | 0...6    | Momentary Step Values of Fans and Electric Heaters   |
| 40062   | 61 | Momentary Ventilator Fan Outlet Value           | 0...6    |  |
| 40063   | 62 | Momentary Electric Post-Heater                  | 0...3    |  |
| 40064   | 63 | Momentary Electric Pre-Heater                   | 0...3    |  |
| <b>Momentary Device Equipment Status Indicator Register</b> |    |   |          |  |
| 40065   | 64 | Aspirator Fan Analog Outlet Value               | 0...100  | Proportional Outlet Values Are Shown.  |
| 40066   | 65 | Ventilator Fan Analog Outlet Value              | 0...100  |  |
| 40067   | 66 | Proportional Heating Valve Outlet Value         | 0...100  |  |
| 40068   | 67 | Proportional Cooling Valve Outlet Value         | 0...100  |  |
| 40069   | 68 | Proportional Heating/Cooling Valve Outlet Value | 0...100  |  |
| 40070   | 69 | Proportional Bypass Damper Outlet Value         | 0...100  |  |
| 40071   | 70 | Mixture Damper Outlet Value                     | 0...100  |  |
| 40072   | 71 | VRF Outlet Value                                | 0...100  |  |
| <b>Weekly Program Time Configuration Parameter Register</b> |    |   |          |  |
| 40073   | 72 | Sunday Starting Hour: Minute                    | 0...2359 | <p>Device operates between the given starting and finishing time in a given day and stop working outside of the appointed hours.</p> <p>If the starting and finishing hours are the same, then the device operates throughout the the day.</p> <p>If the starting hour later then the finishing hour, then the device will not work at the given day.</p> <p><b>Configured parameter 1210 → Hour: Minute Information is configured as 12:10.</b></p> |
| 40074   | 73 | Sunday Finishing Hour: Minute                   | 0...2359 |  |
| 40075   | 74 | Monday Starting Hour: Minute                    | 0...2359 |  |
| 40076   | 75 | Monday Finishing Hour: Minute                   | 0...2359 |  |
| 40077   | 76 | Tuesday Starting Hour: Minute                   | 0...2359 |  |
| 40078   | 77 | Tuesday Finishing Hour: Minute                  | 0...2359 |  |
| 40079   | 78 | Wednesday Starting Hour: Minute                 | 0...2359 |  |
| 40080   | 79 | Wednesday Finishing Hour: Minute                | 0...2359 |  |
| 40081   | 80 | Thursday Starting Hour: Minute                  | 0...2359 |  |
| 40082   | 81 | Thursday Finishing Hour: Minute                 | 0...2359 |  |
| 40083   | 82 | Friday Starting Hour: Minute                    | 0...2359 |  |
| 40084   | 83 | Friday Finishing Hour: Minute                   | 0...2359 |  |
| 40085   | 84 | Saturday Starting Hour: Minute                  | 0...2359 |  |
| 40086   | 85 | Saturday Finishing Hour: Minute                 | 0...2359 |  |
| 40087   | 86 | Momentary Day                                   | 1...31   |  |
| 40088   | 87 | Momentary Month                                 | 1...12   |  |
| 40089   | 88 | Momentary Year                                  | 0...99   |  |
| 40090   | 89 | Momentary Hour                                  | 0...23   |  |
| 40091   | 90 | Momentary Minute                                | 0...59   |  |
| 40092   | 91 | Momentary Second                                | 0...59   |  |
| 40093   | 92 | Momentary Weekly Day                            | 1...7    | 1:Sunday 2:Monday<br>3:Tuesday<br>4:Wednesday<br>5:Thursday 6:Friday<br>7:Saturday   |
| 40094   | 93 | Momentary Weekly Program Status                 | 0...2    | 0:No Weekly Program<br>1:Weekly Program Is Installed and Device Is Working<br>2:Weekly Program Is  |

|  |     |                                    |              |   |
|--|-----|------------------------------------|--------------|---|
|  |     |                                    |              | Installed and Device Is Not Working.  |
| 40095  | 94  | RTC Module Status                  | 0...1        | 0: No Module<br>1: Has Module   |
| 40096  | 95  | Alarm Value                        | 0...99       |   |
| 40097  | 96  | Warning Value                      | 0...99       |   |
| <b>Menu Configuration Parameter</b>              |     |                                    |              |   |
| 40098  | 97  | Show Fan Mode Menu                 | 0...1        | While the Device Is On, Select the Desired Display Options as 1.  |
| 40099  | 98  | Show Manual Heating Menu           | 0...1        |   |
| 40100  | 99  | Show Manual Cooling Menu           | 0...1        |   |
| 40101  | 100 | Show Auto Heating Menu             | 0...1        |   |
| 40102  | 101 | Show Auto Cooling Menu             | 0...1        |   |
| 40103  | 102 | Show Full Automatic Menu           | 0...1        |   |
| <b>Key Lock</b>                                  |     |                                    |              |   |
| 40104  | 103 | Key Lock                           | 0...1        | 0: Key Lock Closed<br>1: Key Lock Open  |
| <b>Malfunction Parameter</b>                     |     |                                    |              |   |
| 40105  | 104 | Big Malfunction Information        | 0...1        | 0: No Malfunction<br>1: Malfunction that resulted in complete shutdown of the device.                             |
| 40106  | 105 | Compressor Malfunction Information | 0...1        | 0: No Malfunction at the Compressor<br>1: Malfunction that resulted in shutdowns of the compressor.               |
| <b>Set Temperature Parameters</b>                |     |                                    |              |   |
| 40107  | 106 | Set Temperature Min. Value         | 0...999      | The Value of 280 Is Equal to 28°C.  |
| 40108  | 107 | Set Temperature Max. Value         | 0...999      | The Value of 280 Is Equal to 28°C.  |
| <b>Fan Configuration Parameters</b>              |     |                                    |              |   |
| 40109  | 108 | Number of Fans                     | 1...2        | 1: Single Fan<br>2: Double Fan  |
| 40110  | 109 | Fan Step Values                    | 1...6        |   |
| <b>Password Parameters</b>                       |     |                                    |              |   |
| 40111  | 110 | Service Configuration Password     | 0...9999     | Configuration Of Parameters With Higher Numbers Than 120 Require a Password. The Password for V1.07 Card is "58". |
| <b>Building Automation Modbus-RTU Parameters</b> |     |                                    |              |   |
| 40112  | 111 | Modbus ID                          | 1...254      |   |
| 40113  | 112 | Modbus Baud Rate                   | 0...7        |   |
| <b>Filter Time Counter</b>                       |     |                                    |              |   |
| 40116  | 115 | Filter Time Counter                | 0-9999 Hours | This Counter Will Increase In Terms Of Hours As Long As The Ventilator Fan Is                                     |

|  |     |                                       |        |  |
|--|-----|---------------------------------------|--------|--|
|  |     |                                       |        | In Operation.  |
| 40117  | 116 | Device Working Mode Information       | 0-100  | 0:Device Closed<br>1:Opening Damper<br>2:Starting Fan<br>3:Main Cycle<br>4:Closing Valve<br>5:Closing Fan<br>6:Frost Case<br>7:Defrost Case<br>99:Malfunction Case<br>(Awaiting Reset) |
| <b>Boost Mod Set/Configuration Registers</b> |     |                                       |        |  |
| 40118  | 117 | Activate Boost                        | 0-1    | 0:Deactive<br>1:Active   |
| <b>Temperature Type Control Selection</b>    |     |                                       |        |  |
| 40119  | 118 | Temperature Type Control              | 0-3    | 0:Panel Temperature<br>1:According To The Device Return Air Temperature<br>2:According To The Supply Air Temperature<br>3:According To The Outside Air Temperature                     |
| 40120  | 119 | Exhaust/Fresh Air Damper Opening Time | 0-999s | The Device Opens The Damper and Waits This Amount of Time To Start The Fans and Other Equipment  |

| • MALFUNCTION LIST |      |                     |  |
|--------------------|------|---------------------|--|
| Value              |      | Binary              | Definition                                 |
| E                  | 1    | 0000.0000.0000.0001 | Aspirator Fan Malfunction                  |
| E                  | 2    | 0000.0000.0000.0010 | Ventilator Fan Malfunction                 |
| E                  | 4    | 0000.0000.0000.0100 | Electric Heater Malfunction                |
| E                  | 8    | 0000.0000.0000.1000 | Aspirator Airflow Malfunction              |
| E                  | 16   | 0000.0000.0001.0000 | Ventilator Airflow Malfunction             |
| E                  | 32   | 0000.0000.0010.0000 | Compressor Malfunction                     |
| E                  | 64   | 0000.0000.0100.0000 | Low Pressure Malfunction                   |
| E                  | 128  | 0000.0000.1000.0000 | High Pressure Malfunction                  |
| E                  | 256  | 0000.0001.0000.0000 | Fire Malfunction                           |
| E                  | 512  | 0000.0010.0000.0000 | Phase Malfunction                          |
| E                  | 1024 | 0000.0100.0000.0000 | VRF Malfunction                            |
| • WARNING LIST     |      |                     |  |
| Değer              |      | Binary              | Definition                                 |
| W                  | 1    | 0000.0000.0000.0001 | Closed Through The Build Automation System |
| W                  | 2    | 0000.0000.0000.0010 | Boost Mode                                 |
| W                  | 4    | 0000.0000.0000.0100 | Filter 1 Dirty                             |
| W                  | 8    | 0000.0000.0000.1000 | Filter 2 Dirty                             |
| W                  | 16   | 0000.0000.0001.0000 | Defrost Mode                               |
| W                  | 32   | 0000.0000.0010.0000 | Frost Thermostat                           |
| W                  | 64   | 0000.0000.0100.0000 | Emergency State                            |

**Note:** For further parameter, please contact our technical service department.

## 9. Device Operation Scenarios

| <b>Scenario 1 (Only Ventilation)</b>   |
|--|
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).</p> <p>If the outer temperature falls below the limit, then the pre-heater is activated via Relay 1(Optional). The damper motors are activated via Relay 2 when the device is started(Optional). The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional).</p> <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p>  |
| <b>Scenario 2 (Ventilation + 2 Step Electric Heating)</b>  |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).</p> <p>If the set temperature is higher than the room temperature in heating, then the electric heater will activate via Relay 1, Relay 2 and in 3.step via Relay 1+Relay 2. In proportional heating(Optional), no relay is used as outlet. The Bypass damper motor is activated via Relay 4 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional). If the outdoor air temperature falls below the limit, then the electric heater(Optional) will activate via Relay 5.</p> <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p> |
| <b>Scenario 3 (Ventilation + Water Heating)</b>  |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).</p> <p>If the outer temperature falls below the limit, then the pre-heater is activated via Relay 1(Optional). The damper motors are activated via Relay 2 when the device is started(Optional). The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating. Heating valve motor is controlled via AO3 proportional heating outlet(Optional).</p> <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p>   |
| <b>Scenario 4 (Ventilation + Water Cooling)</b>  |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).</p> <p>If the outer temperature falls below the limit, then the pre-heater is activated via Relay 1(Optional). The damper motors are activated via Relay 2 when the device is started(Optional). The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional). Cooling valve motor is controlled via AO4 proportional cooling outlet.</p> <p>In the instructions;</p>  |

HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.

### Scenario 5 (Ventilation + Water Heating + Water Cooling)

In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).

If the outer temperature falls below the limit, then the pre-heater is activated via Relay 1(Optional). The damper motors are activated via Relay 2 when the device is started(Optional). The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of  $\pm 1K$  between indoor and outdoor environment and freecooling/freeheating(Optional). Heating valve motor is controlled via AO3 proportional heating outlet and cooling valve motor via AO4 proportional cooling outlet

In the instructions;

HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.

### Scenario 6 (Ventilation + Water Cooling + Electric Heating)

In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).

If the set temperature is higher than the room temperature in heating, then the electric heater will activate via Relay 1, Relay 2 and in 3.step via Relay 1+Relay 2. In proportional heating(Optional), no relay is used as outlet. The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of  $\pm 1K$  between indoor and outdoor environment and freecooling/freeheating(Optional). The damper motors are activated via Relay 4 when the device is started(Optional). Heaters are controlled via AO3 proportional heating outlet(Optional) and cooling valve motor via AO4 proportional cooling outlet.

In the instructions;

HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.

### Scenario 8 (Ventilation + Dx Cooling)

In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).

If the outer temperature falls below the limit, then the pre-heater is activated via Relay 1(Optional). The damper motors are activated via Relay 2 when the device is started(Optional). The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of  $\pm 1K$  between indoor and outdoor environment and freecooling/freeheating(Optional). Compressor opening and closing contactors are activated via Relay 4. Dx systems are controlled via AO4 proportional cooling outlet.

In the instructions;

HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.

### Scenario 9 (Ventilation + Dx Heatpump)

In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).

In cooling mode, the compressor opening-closing contactors are activated via Relay 1 and in heating mode via Relay 2. The Bypass damper motor is activated via Relay 4 in the case heat exchanger frost protection, temperature difference of  $\pm 1K$  between indoor and outdoor environment and freecooling/freeheating(Optional). The damper motors are activated via Relay 5 when the device is started(Optional). If the outer temperature falls below the limit, then the pre-heater is activated via Relay 6(Optional). Heating system is controlled via AO3 proportional heating outlet.

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| <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p>  |
| <p><b>Scenario 10 (Ventilation + Dx Cooling + Electric Heating)</b></p>   |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).<br/>If the set temperature is higher than the room temperature in heating, then the electric heater will activate via Relay 1, Relay 2 and in 3.step via Relay 1+Relay 2. In proportional heating(Optional), no relay is used as outlet. The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional). In cooling mode, the compressor opening-closing contactors are activated via Relay 4. The damper motors are activated via Relay 5 when the device is started(Optional). If the outer temperature falls below the limit, then the pre-heater is activated via Relay 6(Optional). Heating system is controlled via AO3 proportional heating outlet and Dx system via AO4 proportional cooling outlet.</p> <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p> |
| <p><b>Scenario 11 (Ventilation + Dx Cooling-Hisense VRF)</b></p>  |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).<br/>The damper motors are activated via Relay 1 when the device is started(Optional). If the outer temperature falls below the limit, then the pre-heater is activated via Relay 2(Optional). The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional). In cooling mode, the compressor opening-closing contactors are activated via Relay 4. VRF system is controlled via AO4 proportional cooling outlet.</p> <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p>  |
| <p><b>Scenario 12 (Ventilation + Dx Heatpump-Hisense VRF)</b></p>   |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).<br/>In heating mode, the opening-closing contactors are activated via Relay 1 and Relay 2. In cooling mode, the compressor opening-closing contactors are activated via Relay 1. Bypass damper motor is activated via Relay 4 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional). The damper motors are activated via Relay 5 when the device is started(Optional). If the outer temperature falls below the limit, then the pre-heater is activated via Relay 6(Optional). VRF heating and cooling system is controlled via AO3 proportional heating-cooling outlet.</p> <p>In the instructions;<br/>HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.</p>   |
| <p><b>Scenario 13 (Ventilation + Dx Cooling-Hisense VRF + Electric Heating)</b></p>   |
| <p>In this scenario, 2 AC fan motors connected to triac outlets operate at different speed steps according to the required load determined by the thermostat input temperature or the information obtained by the CO<sub>2</sub> sensors(Optional).<br/>If the set temperature is higher than the room temperature in heating, then the electric heater will activate via Relay 1, Relay 2 and in 3.step via Relay 1+Relay 2. The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of <math>\pm 1K</math> between indoor and outdoor environment and freecooling/freeheating(Optional). In cooling mode, the compressor opening-closing contactors are activated via Relay 4. The damper motors</p>   |

are activated via Relay 5 when the device is started(Optional). If the outer temperature falls below the limit, then the pre-heater is activated via Relay 6(Optional). Heaters are controlled via AO3 proportional heating outlet(Optional) and VRF system via AO4 proportional cooling outlet.

In the instructions;

HCP6 Digital Room Control Panel will be called as thermostat and M1002-X card as device.

## 10. Maintenance

- The device maintenance should be conducted by qualified personel.
- The device should be cleaned periodically every 6 months.
- The electric connection should be severed before doing maintenance and cleaning.
- Filters should be cleaned once every 3 months. If the cleaning process does not result into an affective solution, then the filters needs to be changed. Dirty filters will prevent the system to work efficiently.
- Device inlet and outlet opening cleaning should be done once every 3 months and controls in months fall-winter seasons should be increased. In outer environments, the device inlet and outlet openings should be controlled for obstacles that would confine them.
- Cleaning of heat exchangers should be done once every 6 months. Dust and dirt that is attached to heat exchangers reduces the efficiency of the overall system.
- Drainage connections control and cleaning should be done every 6 months.
- Fans are designed to be used with lubricants. Fan maintenance consists of fan cleanliness control and should be done once every 2 months. Accumulated dust and dirt on the fan blades should be vacuumed.
- Cleaning of the inner surface should be done once every year.
- Taking yearly technical service is advised. This services provides you with a check-up of the first six maintenance stages mentioned above and general operating performance of the device.
- After maintenance, the device should be started to check on balance, vibration or unforeseen sounds that might occure.
- After the start-up of the device the current values should be measured and verified to be within the motor limit intervals.

## 11. Warnings



- Heat recovery unit is used for heating/cooling and ventilation. This device should not be used for any other purpose.
- The installation and commissioning processes varies in different countries.
- Utilization of national standards is the responsibility of the user.
- Any kind of alteration on the device is strictly forbidden. Problems that arise from this type of alteration will not be covered by the warranty.
- The device should be run only by authorized personel.



## 12. Information Regarding Misusage

- During maintenance and repair, the personnel should cut the power through the main power switch.
- Rain and snow should not enter the suction and exhaust openings.
- Drainage pipes should be connected directly to the city sewers.
- Fans create another potential threat by drawing in various free standing objects. Object that are getting in contact with a spinning fan are launched in different direction with high speed and cause danger to everything around it.
- If the fan covering is to be removed, then the power connecting needs to be cut and locked.
- Doors on the device and channels should not opened while the fans are operation or close to a halt.
- Power should be cut before entering the fan and channel sections.

This warranty given by Üntes is out of scope, if the unit is used outside of its purpose and in the following cases:

1. Damages and malfunction caused by incorrect usage.
2. Damages and malfunction caused by loading, unloading and transportation after the product has been delivered.
3. Damages and malfunction caused by low or high voltage, faulty electrical installation, operation at voltages different than the recommended values in the manual.
4. Damages and malfunction caused by fire or lightning.
5. Malfunction caused by usage in ways not mentioned in the product manual.
6. Malfunction caused by unauthorized service personal intervention on a faulty product.

The mentioned defects can be repaired by charging the cost to you and product warranty starts from date of invoice.

**ÜNTEŞ**

**Factory - Headquarter**

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