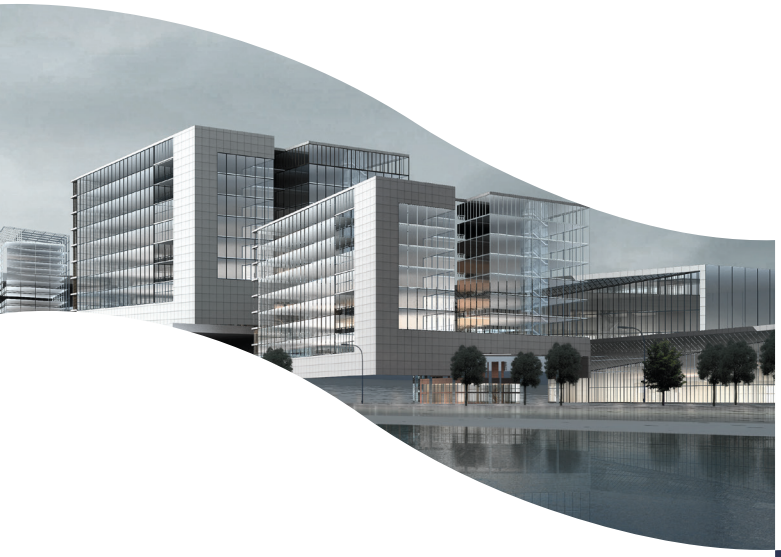
ÜNTES®

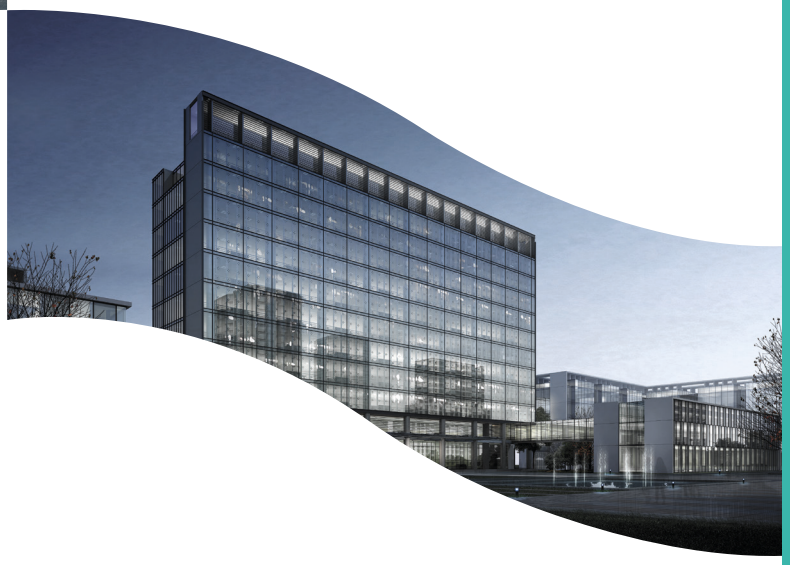
Building Trust since 1968

UTFP Series

{THERMOFRESH PLUS Units}

Technichal Catalogue





cold hot

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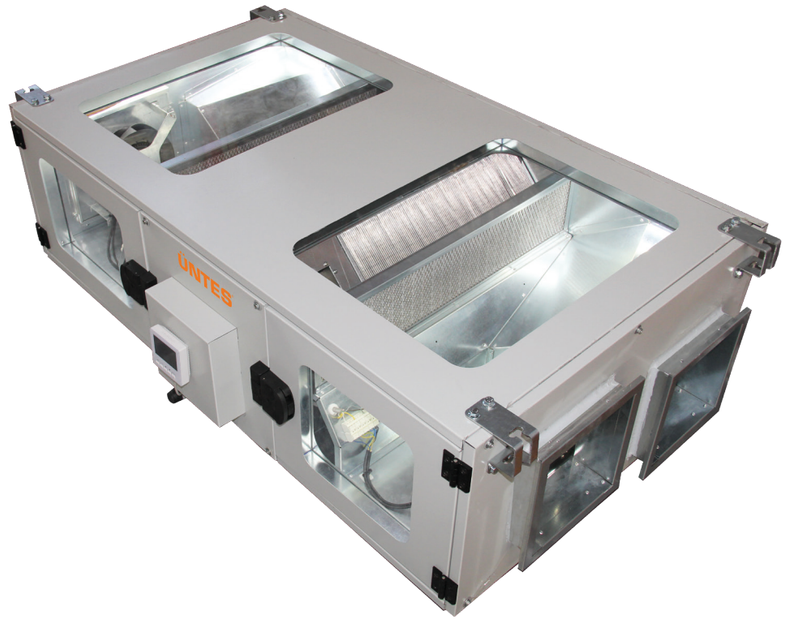
cold
hot

01 INTRODUCTION

1.1 THERMOFRESH PLUS Series

- Compatible with Latest Ecodesign Regulation Requirements
- Counter-Flow Heat Recovery System up to 90% Thermal Efficiency
- Proportional Flow Control Powered by Highly Efficient EC Plug Fans with Low Sound Level
- Minimum Thermal Leak Achieved by Double Skinned Casing Structure
- Air Tight Service Doors by Virtue of Balloon Gasket
- 8 Different Sizes up to 3600 m³/h Airflow Rate
- High Indoor Air Quality Resulted by Filtration Classes from ISO ePM10 ≥ 50% (M5) up to ISO ePM1 ≥ 80% (F9)
- Minimum Energy Consumption Thanks to Advanced Automation Control System
- Remote Access to Unit with Wi-Fi Technology and Unit Control by Mobile Application
- Flexible 7-Day Weekly Program
- User Friendly Room Control Unit



02 PRODUCT KEY

UTFP	040	BRCA	
UNIT CODE	MODEL	OPTIONS	
UTFP	040 060 080 100 150 205 260 330	**LPRH**	LOW CAPACITY ELECTRICAL Electrical Pre Heater
		HPRH	HIGH CAPACITY ELECTRICAL Electrical Pre Heater
		LPOH	LOW CAPACITY ELECTRICAL Electrical Post Heater
		MPOH	MEDIUM CAPACITY ELECTRICAL Electrical Post Heater
		HPOH	HIGH CAPACITY ELECTRICAL Electrical Post Heater
		CW3R	CHILLED WATER COIL 3-ROW
		CW4R	CHILLED WATER COIL 4-ROW
		CW5R	CHILLED WATER COIL 5-ROW
		CW6R	CHILLED WATER COIL 6-ROW
		DX3R	DIRECT EXPANSION COIL 3-ROW
		DX4R	DIRECT EXPANSION COIL 4-ROW
		DX5R	DIRECT EXPANSION COIL 5-ROW
		DX6R	DIRECT EXPANSION COIL 6-ROW
		HW1R	HOT WATER COIL 1-ROW
		HW2R	HOT WATER COIL 2-ROW
		C3H1	COLD/HOT WATER COIL 3-ROW/1-ROW
		C4H1	COLD/HOT WATER COIL 4-ROW/1-ROW
		C5H1	COLD/HOT WATER COIL 5-ROW/1-ROW
		CDCA	CIRCULAR DUCT CONNECTION ADAPTOR
		RAHS	RETURN AIR HUMIDITY SENSOR
		O2VH	ON/OFF HEATING CONTROL WITH 2-WAY VALVE SET
		O2VC	ON/OFF COOLING CONTROL WITH 2-WAY VALVE SET
		F7FS	ISO ePM1 50% (F7) FIRST STAGE SUPPLY FILTER
		F7SS	ISO ePM1 50% (F7) SECOND STAGE SUPPLY FILTER
		F9SS	ISO ePM1 80% (F9) SECOND STAGE SUPPLY FILTER
		MAXC	MAXI CONTROLLER ELECTRICAL PANEL
		SDFA	SMOKE DETECTOR/FIRE ALARM DIGITAL INPUT
		FADI	FIRE ALARM DIGITAL INPUT
		FAFD	FRESH AIR ON/OFF FLAP DAMPER
		EAFD	EXHAUST AIR ON/OFF FLAP DAMPER
		SATC	SUPPLY AIR TEMPERATURE CONTROL
		RATC	RETURN AIR TEMPERATURE CONTROL
		IAQC	INDOOR AIR QUALITY CONTROL
		RODI	REMOTE ON/OFF DIGITAL INPUT
		P2VH	PROPORTIONAL HEATING CONTROL WITH 2-WAY VALVE SET
		P3VH	PROPORTIONAL HEATING CONTROL WITH 3-WAY VALVE SET
		P2VC	PROPORTIONAL COOLING CONTROL WITH 2-WAY VALVE SET
		P3VC	PROPORTIONAL COOLING CONTROL WITH 3-WAY VALVE SET
		IP67	IP67 ELECTRİCAL PANEL
		WIFI	WIRELESS (Wi-Fi) CONTROL
		TRAF	24 VAC TRANSFORMER
		RLYC	RELAY CARD
		O3VH	ON/OFF HEATING CONTROL WITH 3-WAY VALVE SET
		O3VC	ON/OFF COOLING CONTROL WITH 3-WAY VALVE SET

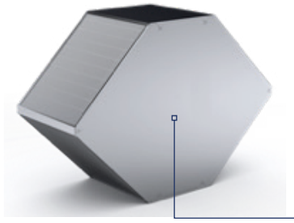
03 GENERAL FEATURES

3.0 Heat recovery units are used to increase the indoor air quality and save energy being lost in the process of ventilation. The units are ideal for ventilating small offices, houses and similar premises. In a house, the air from the toilet and kitchen is directed outward. The unit pulls in the fresh air with the help of ducts and collates it with the exhaust air inside a heat exchanger that can reach efficiencies of 83%. The exhaust air that has transferred its energy is given to the outside and fresh air is given to the living room.

04 COMPONENT FEATURES

4.1. STRUCTURE UTFP units outer skin is manufactured from corrosion resistant pre-painted galvanized sheet. Drainage pan is made from stainless steel and is fully covered by insulation. EPDM leak proof gaskets are used to provide full air tightness at the panels. Balloon type gaskets are placed on the service door to make them air tight as well. 40 mm thick A1 fire safety class rock wool is placed into the sandwich panels with the same thickness in order to reduce sound level and thermal leak.

4.2. PLATE HEAT EXCHANGER With the help of low pitched aluminum plated heat exchangers, the warm air leaving room transfers its energy to the cold air entering the room and as a result energy loss will be prevented. In cases where heat transfer is not required, the fresh air goes through the bypass damper omitting the heat exchanger and entering the room directly.

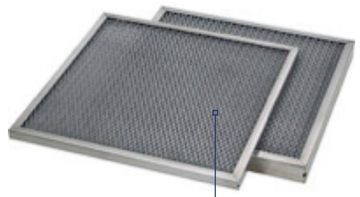


>> Plated Heat Exchanger

4.3. FANS The fans are located inside the unit and are used to lead the fresh air into the room and transfer the exhaust air from the room to the outside. It is designed to create variable pressure and airflow levels and can control its fan revolution according to the system needs. Thermofresh Plus units use 2 EC Centrifugal Fans.

>> Fans

4.4. FILTERS UTFP unit standard filters are ISO ePM10%50(M5). The filters are placed at the entry of the internal unit to improve the air quality and keep the equipment safe. It is important to do regular control and cleaning to the keep the system functional. Optionally ISO ePM1 50%(F7) is used as first and second stage filter or ISO ePM1 85%(F9) as first stage.



>> Filters

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

The safety equipment of the system in the panel mainly include automatic and glass fuses, motor protection switches and phase protection relay.
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. The microprocessor changes depending on the number of options.

>> Control Panel

4.6. COIL AND REFRIGERANT (R410A)

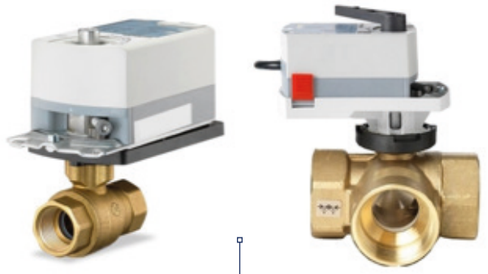
UTFP units have water and direct expansion coil as an option. Cold water coil are offered as 3/4/5/6 rows, direct expansion coils as 3/4/5/6/ rows and hot water coils as 1/2 rows.

The refrigerant used in UTFP 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.

>> Coil and Refrigerant (R410A)

4.7. PROPORTIONAL HEATING/COOLING VALVE KIT

Valve kits with actuators are used to operate the system more effectively and are given as an option when coils are selected. The cooling and heating processes are proportionally controlled with the help of actuators.



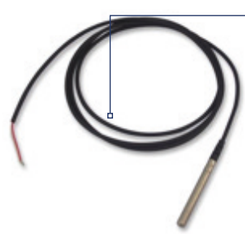
>> Proportional Heating/Cooling Valve Kit

4.8. 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.



>> Temperature Sensors

>> Dirt Filter Sensor

The optional air quality sensor(CO^2 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.

>> Smoke Detector

>> Air Quality Sensor

05 OPERATING LIMITS

Unit operating limits are given below. Operating within the limits is vital for the efficient operation of the device.

Cooling	External Air Temperature	
	DB [°C]	WB [°C]
Minimum	-24	-
Maximum	46	-

06 OPTIONS AND FEATURES

LPRH	LOW CAPACITY ELECTRICAL Electrical Pre Heater	**F7FS**	ISO ePM1 50% (F7) FIRST STAGE SUPPLY FILTER
HPRH	HIGH CAPACITY ELECTRICAL Electrical Pre Heater	**F7SS**	ISO ePM1 50% (F7) SECOND STAGE SUPPLY FILTER
LPOH	LOW CAPACITY ELECTRICAL Electrical Post Heater	**F9SS**	ISO ePM1 80% (F9) SECOND STAGE SUPPLY FILTER
MPOH	MEDIUM CAPACITY ELECTRICAL Electrical Post Heater	**MAXC**	MAXI CONTROLLER ELECTRICAL PANEL
HPOH	HIGH CAPACITY ELECTRICAL Electrical Post Heater	**SDFA**	SMOKE DETECTOR/FIRE ALARM DIGITAL INPUT
CW3R	CHILLED WATER COIL 3-ROW	**FADI**	FIRE ALARM DIGITAL INPUT
CW4R	CHILLED WATER COIL 4-ROW	**FAFD**	FRESH AIR ON/OFF FLAP DAMPER
CW5R	CHILLED WATER COIL 5-ROW	**EAFD**	EXHAUST AIR ON/OFF FLAP DAMPER
CW6R	CHILLED WATER COIL 6-ROW	**SATC**	SUPPLY AIR TEMPERATURE CONTROL
DX3R	DIRECT EXPANSION COIL 3-ROW	**RATC**	RETURN AIR TEMPERATURE CONTROL
DX4R	DIRECT EXPANSION COIL 4-ROW	**IAQC**	INDOOR AIR QUALITY CONTROL
DX5R	DIRECT EXPANSION COIL 5-ROW	**RODI**	REMOTE ON/OFF DIGITAL INPUT
DX6R	DIRECT EXPANSION COIL 6-ROW	**P2VH**	PROPORTIONAL HEATING CONTROL WITH 2-WAY VALVE SET
HW1R	HOT WATER COIL 1-ROW	**P3VH**	PROPORTIONAL HEATING CONTROL WITH 3-WAY VALVE SET
HW2R	HOT WATER COIL 2-ROW	**P2VC**	PROPORTIONAL COOLING CONTROL WITH 2-WAY VALVE SET
C3H1	COLD/HOT WATER COIL 3-ROW/1-ROW	**P3VC**	PROPORTIONAL COOLING CONTROL WITH 3-WAY VALVE SET
C4H1	COLD/HOT WATER COIL 4-ROW/1-ROW	**IP67**	IP67 ELECTRİCAL PANEL
C5H1	COLD/HOT WATER COIL 5-ROW/1-ROW	**WIFI**	WIRELESS (Wi-Fi) CONTROL
CDCA	CIRCULAR DUCT CONNECTION ADAPTOR	**TRAF**	24 VAC TRANSFORMER
RAHS	RETURN AIR HUMIDITY SENSOR	**RLYC**	RELAY CARD
O2VH	ON/OFF HEATING CONTROL WITH 2-WAY VALVE SET	**O3VH**	ON/OFF HEATING CONTROL WITH 3-WAY VALVE SET
O2VC	ON/OFF COOLING CONTROL WITH 2-WAY VALVE SET	**O3VC**	ON/OFF COOLING CONTROL WITH 3-WAY VALVE SET

6.1. ELECTRICAL PRE HEATER LOW/ HIGH CAPACITY – LPRH/H

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.

6.2. 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 Electrical Post Heater option has 3 stages.

6.3. 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 as an additional module to the unit are used to condition the air entering the room.

6.4. 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 as an additional module to the unit are used to condition the air entering the room.

6.5. HOT WATER COIL 1/2 ROW – HW1R/HW2R

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

6.6. 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 side as an additional module to 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.

6.7. FIRST/SECOND STAGE FINE FILTERS FOR SUPPLY – F7FS/ F7SS/F9SS

Optional filters are placed at the supply side to increase the quality of indoor air. ISO ePM1≥ 50%(F7) in case of single stage filter and ISO ePM10≥ 55%(M5) with ISO ePM1≥ 50% (F7) or ISO ePM1≥ 85%(F9) in case of second stage filter is used.

6.8. 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.

6.9. SMOKE DETECTOR/ FIRE ALARM DIGITAL INPUT – SDFA

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.

6.10. 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.

6.11. 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.

6.12. SUPPY 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.

6.13. INDOOR AIR QUALITY CONTROL – IAQC

Regulates indoor air quality by controlling the fresh air entering the room with the help of a CO_2 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.

6.14. REMOTE ON/OFF DIGITAL INPUT - RODI

Offers digital input for remote control possibilities on site.

6.15. PROPORTIONAL OR ON/OFF HEATING/COOLING CONTROL WITH 2/3-WAY VALVE SET – P2VH/P3VH/ P2VC/P3VC/O2VH/ O3VH/O2VC/O3VC

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

6.16. IP67 ELECTRICAL PANEL – IP67

Harsh outer environment resistant IP67 class panel.

6.17. WIRELESS (WI-FI) CONTROL – WIFI

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

6.18. CIRCULAR DUCT CONNECTION ADAPTOR - CDCA

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

6.19. 24 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.

6.20. RETURN AIR HUMIDITY SENSOR - RAHS

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

6.21. RELAY CARD - RLYC

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

cold
hot

07
CAPACITY TABLES

UTFP Series		040	060	080	100
Technical Specifications					
Nominal Airflow Rate	m³/h	400	600	800	1000
Nominal External Static Pressure	Pa	75	75	100	100
Power Supply	V/Ph/Hz	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50
Exhaust Fan Motor Absorbed Power [1]	W	59	98	125	164
Supply Fan Motor Absorbed Power [1]	W	57	96	119	158
SFPint [2]	W/(m³/s)	570	611,2	578,6	576,1
SFPint Limit [2]	W/(m³/s)	1190,3	1182	1116,7	1120,3
Fresh Air Filter Class	%	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)
Exhaust Air Filter Class	%	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)
Counter-Flow Heat Recovery					
Winter Efficiency [3]	%	88,5	88,5	87,4	87,6
Summer Efficiency [4]	%	82,8	82,8	80,9	81,3
Efficiency [5]	%	82,9	82,9	81	81,4
Sound					
Sound Pressure Level [6]	dB(A)	35	43	35	41
Dimensions					
Height	mm	397	397	479	479
Width	mm	1346	1346	1638	1638
Lenght	mm	721	845	915	965
Weight [7]	kg	92,3	104,2	137,3	144,5

1) Data is given at nominal airflow rate and external static pressure.
2) Data in accordance with EU 1253/2014 regulation at nominal airflow rate and nominal external static pressure.
3) Winter conditions: Outdoor air temperature -5ºC, 80% RH and indoor air temperature 22ºC, 50% RH.
4) Summer conditions: Outdoor air temperature 35ºC, 40% RH and indoor air temperature 24ºC, 50% RH.
5) Values are referred to EN 308 standard at balanced airflow rates.
6) Sound pressure level at 1 m distance in free field.
7) Weight of the unit without accessories.

UTFP Series		150	205	260	330
Technical Specifications					
Nominal Airflow Rate	m³/h	1500	2050	2600	3300
Nominal External Static Pressure	Pa	100	125	125	150
Power Supply	V/Ph/Hz	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50
Exhaust Fan Motor Absorbed Power [1]	W	345	341	476	691
Supply Fan Motor Absorbed Power [1]	W	336	331	466	677
SFPint [2]	W/(m³/s)	844,8	586,2	589,8	628,5
SFPint Limit [2]	W/(m³/s)	1162,5	1145,6	1140,7	1090,5
Fresh Air Filter Class	%	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)
Exhaust Air Filter Class	%	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)	ISO ePM10≥50% (M5)
Counter-Flow Heat Recovery					
Winter Efficiency [3]	%	88,6	88,7	89,2	88,6
Summer Efficiency [4]	%	83,4	83,6	84,2	83,5
Efficiency [5]	%	83,5	83,7	84,3	83,6
Sound					
Sound Pressure Level [6]	dB(A)	52	46	51	53
Dimensions					
Height	mm	618	618	618	759
Width	mm	1937	1937	1937	2219
Lenght	mm	1015	1290	1720	1780
Weight [7]	kg	193,9	233,1	291	368,3

1) Data is given at nominal airflow rate and external static pressure.
2) Data in accordance with EU 1253/2014 regulation at nominal airflow rate and nominal external static pressure.
3) Winter conditions: Outdoor air temperature -5ºC, 80% RH and indoor air temperature 22ºC, 50% RH.
4) Summer conditions: Outdoor air temperature 35ºC, 40% RH and indoor air temperature 24ºC, 50% RH.
5) Values are referred to EN 308 standard at balanced airflow rates.
6) Sound pressure level at 1 m distance in free field.
7) Weight of the unit without accessories.

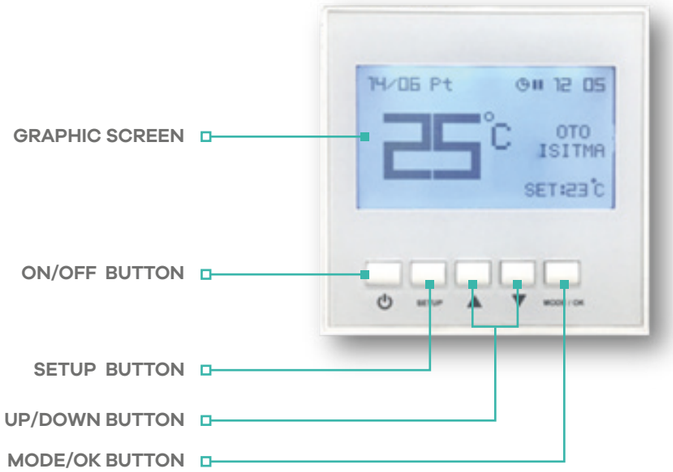
Electrical Heater and Coil Capacities	Inlet Air Conditions(°C)		UTFP 040	UTFP 060	UTFP 080	UTFP 100
Fresh Air Unit - Electrical Pre Heater - Low Capacity						
Total Heating Capacity		kW	0,80	1,20	1,65	2,10
Fresh Air Unit - Electrical Pre Heater - High Capacity						
Total Heating Capacity		kW	1,60	2,40	3,30	4,20
Fresh Air Unit - Electrical Post Heater - Low Capacity						
Total Heating Capacity		kW	0,80	1,20	1,65	2,10
Fresh Air Unit - Electrical Post Heater - Medium Capacity						
Total Heating Capacity		kW	1,60	2,40	3,30	4,20
Fresh Air Unit - Electrical Post Heater - High Capacity						
Total Heating Capacity		kW	2,40	3,60	4,95	6,30
Fresh Air Unit - 3 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	1,80	3,06	4,07	5,22
Fresh Air Unit - 4 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	2,37	3,87	5,15	6,19
Fresh Air Unit - 5 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	2,79	4,14	5,64	7,19
Fresh Air Unit - 6 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	3,10	4,62	6,27	7,68
Fresh Air Unit - 3 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	2,15	3,24	4,30	5,37
Total Heating Capacity	5 KT/80 % RH	kW	2,46	3,89	5,40	6,54
Fresh Air Unit - 4 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	2,60	3,82	5,23	6,46
Total Heating Capacity	5 DB/80 % RH	kW	2,99	4,63	6,23	7,62
Fresh Air Unit - 5 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	2,91	4,37	5,92	7,19
Total Heating Capacity	5 DB/80 % RH	kW	3,34	5,00	6,76	8,45
Fresh Air Unit - 6 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	3,13	4,72	6,36	7,70
Total Heating Capacity	5 DB/80 % RH	kW	3,58	5,36	7,22	9,00
Fresh Air Unit - 1 Row Hot Water Coil						
Total Heating Capacity	5 DB/80 % RH, 90/70 Fluid	kW	3,49	4,98	7,10	8,41
Fresh Air Unit - 2 Row Hot Water Coil						
Total Heating Capacity	5 DB/80 % RH, 90/70 Fluid	kW	5,82	8,68	11,82	14,43

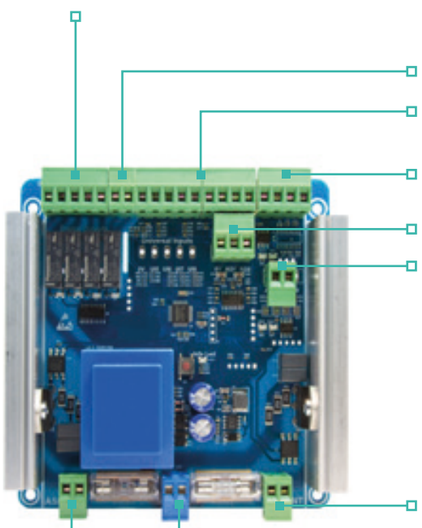
Electrical Heater and Coil Capacities	Inlet Air Conditions(°C)		UTFP 150	UTFP 205	UTFP 260	UTFP 330
Fresh Air Unit - Electrical Pre Heater - Low Capacity						
Total Heating Capacity		kW	3,00	4,50	6,00	6,75
Fresh Air Unit - Electrical Pre Heater - High Capacity						
Total Heating Capacity		kW	6,00	9,00	12,00	13,50
Fresh Air Unit - Electrical Post Heater - Low Capacity						
Total Heating Capacity		kW	3,00	4,50	6,00	6,75
Fresh Air Unit - Electrical Post Heater - Medium Capacity						
Total Heating Capacity		kW	6,00	9,00	12,00	13,50
Fresh Air Unit - Electrical Post Heater - High Capacity						
Total Heating Capacity		kW	9,00	13,50	18,00	20,25
Fresh Air Unit - 3 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	7,62	10,76	13,37	17,70
Fresh Air Unit - 4 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	9,29	12,76	16,11	20,96
Fresh Air Unit - 5 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	10,17	14,18	18,70	23,28
Fresh Air Unit - 6 Row Chilled Water Coil						
Total Cooling Capacity	27 DB/50 % RH, 7/12 Fluid	kW	10,85	15,81	20,13	25,59
Fresh Air Unit - 3 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	8,01	10,92	13,94	17,91
Total Heating Capacity	5 DB/80 % RH	kW	9,90	13,65	17,14	21,97
Fresh Air Unit - 4 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	9,59	13,20	16,76	21,40
Total Heating Capacity	5 DB/80 % RH	kW	11,58	15,84	20,13	25,66
Fresh Air Unit - 5 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	10,79	14,80	18,74	23,84
Total Heating Capacity	5 DB/80 % RH	kW	12,67	14,38	21,99	28,17
Fresh Air Unit - 6 Row Direct Expansion Coil						
Total Cooling Capacity	27 DB/50 % RH	kW	11,58	15,87	20,45	25,47
Total Heating Capacity	5 DB/80 % RH	kW	13,51	18,50	23,30	29,93
Fresh Air Unit - 1 Row Hot Water Coil						
Total Heating Capacity	5 DB/80 % RH, 90/70 Fluid	kW	12,42	17,77	21,66	27,12
Fresh Air Unit - 2 Row Hot Water Coil						
Total Heating Capacity	5 DB/80 % RH, 90/70 Fluid	kW	21,49	29,71	38,39	47,01

08
CONTROL UNIT

8.1. 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)





- Time Based Filter Dirt 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)

09
ELECTRICAL CONNECTION

9.1. ELECTRICAL CONNECTION

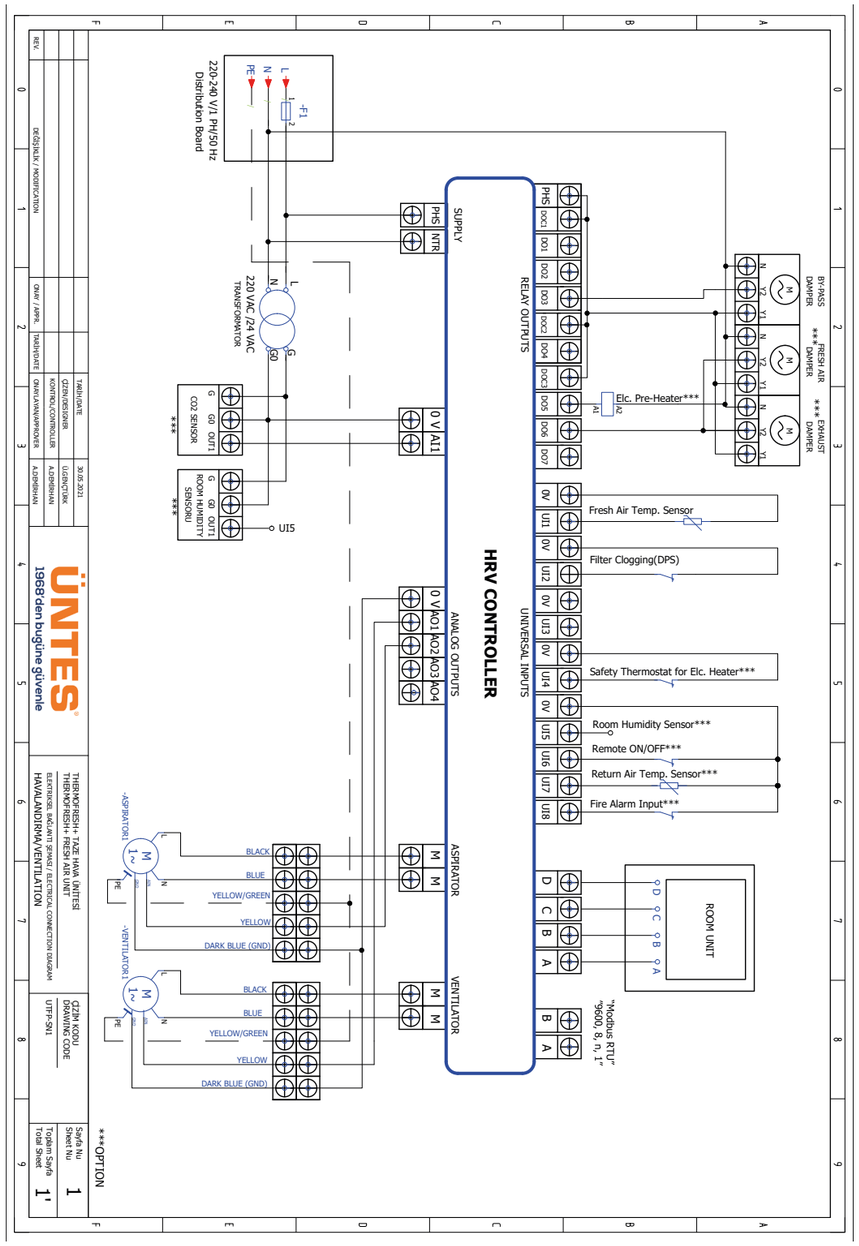
Electrical connection operations on the electric panel should be conducted by following the procedures below. These rules are not suggestions and should be followed to ensure the safety of user;

- 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.

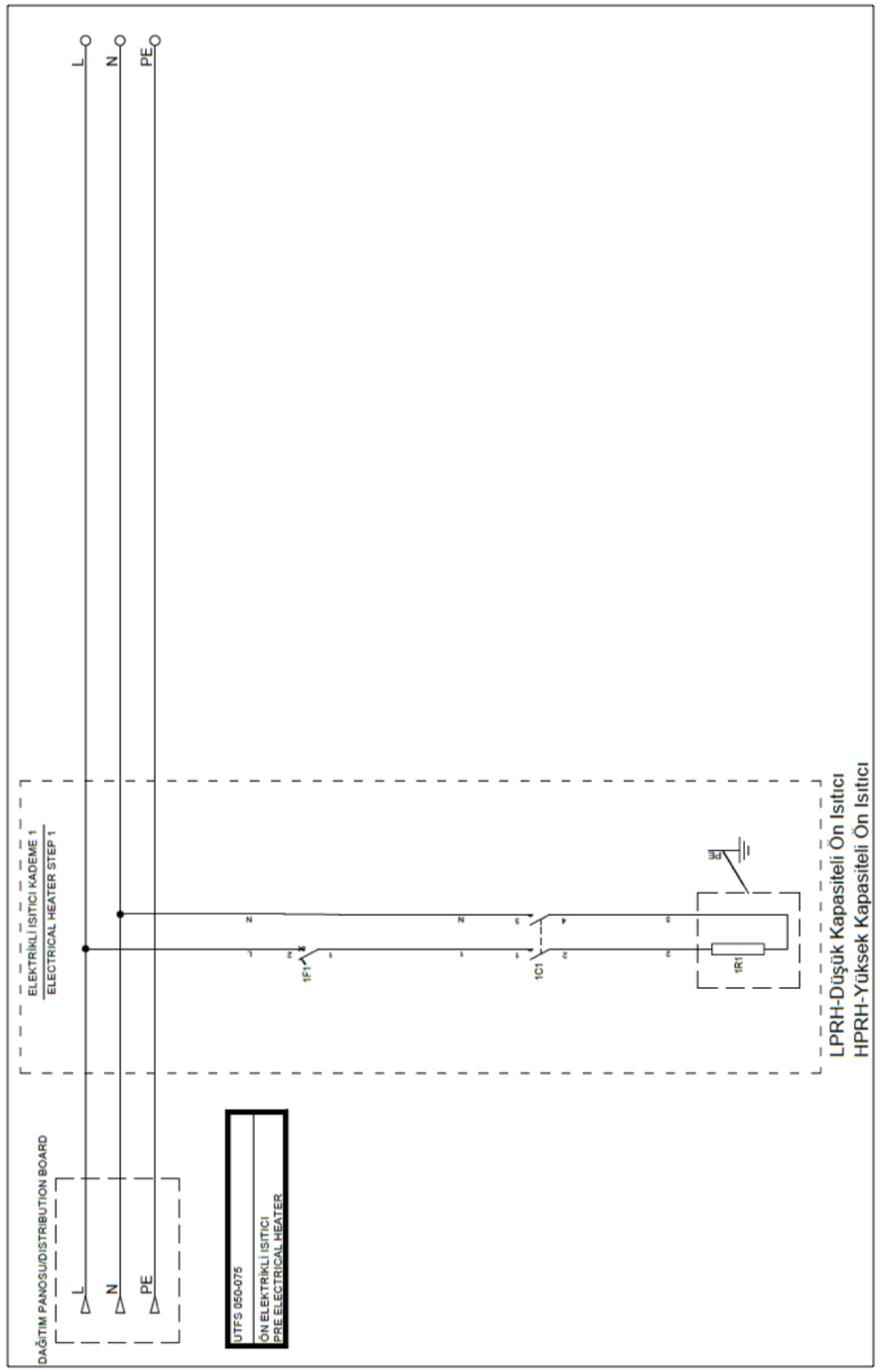
10
POWER INFORMATION

UTFP Model	Fan Motor Absorbed Current (A)	Electrical Pre Heater Absorbed Current (A)		Electrical Post Heater Absorbed Current (A)		
		Low Capacity	High Capacity	Low Capacity	Medium Capacity	High Capacity
040	0,75	3,48	6,96	3,48	6,96	10,43
060	0,9	5,22	10,43	5,22	10,43	15,65
080	1,4	2,38	4,75	2,38	4,75	7,13
100	1,4	3,02	6,05	3,02	6,05	9,07
150	3,1	4,32	8,64	4,32	8,64	12,96
205	3,1	6,48	12,96	6,48	12,96	19,44
260	2,2	8,64	17,28	8,64	17,28	25,92
330	3,2	9,72	19,44	9,72	19,44	29,16

11 ELECTRICAL WIRING SCHEMATIC

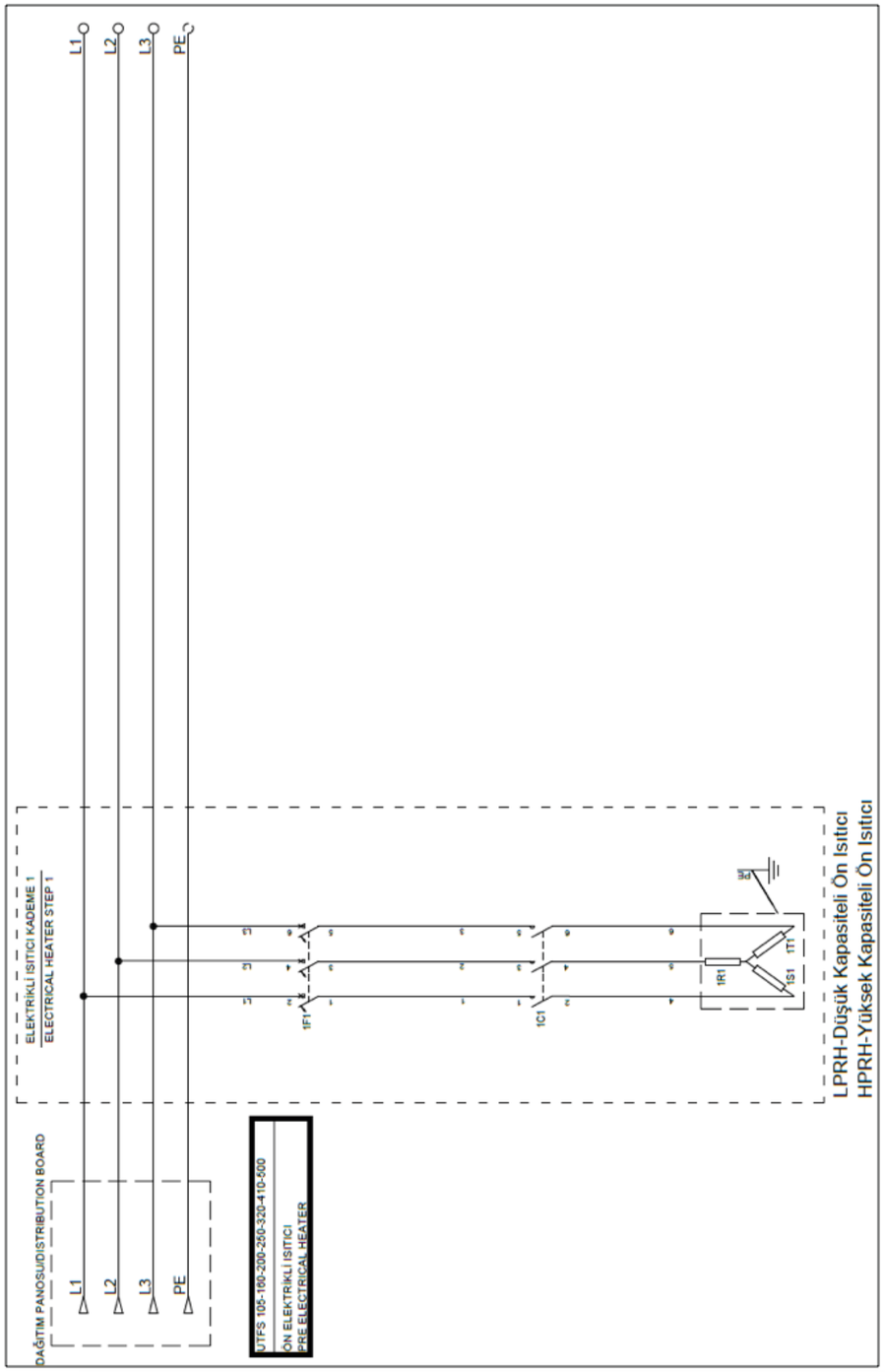


Electrical Pre Heater Schematic / 040-060

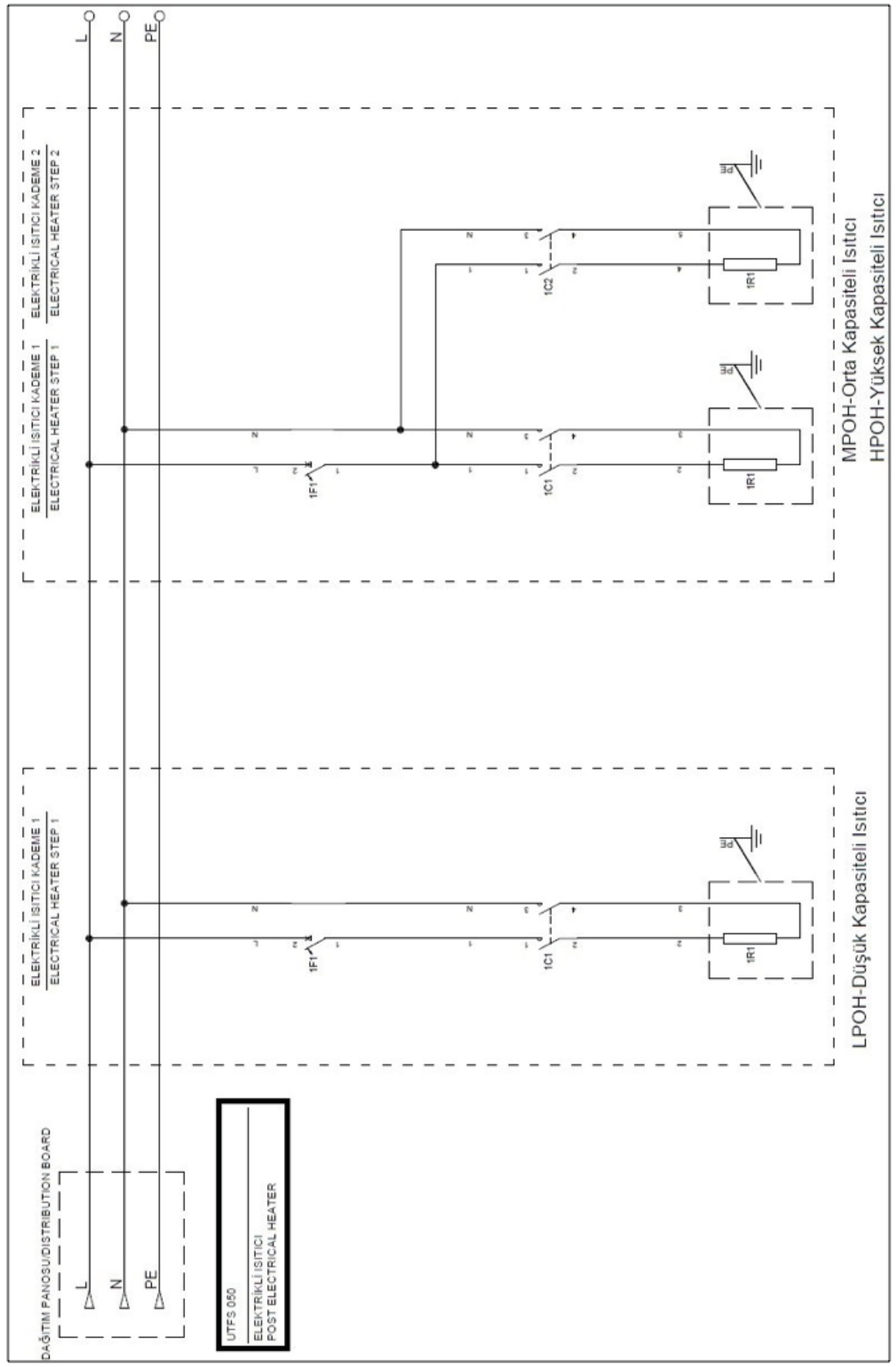


cold
hot

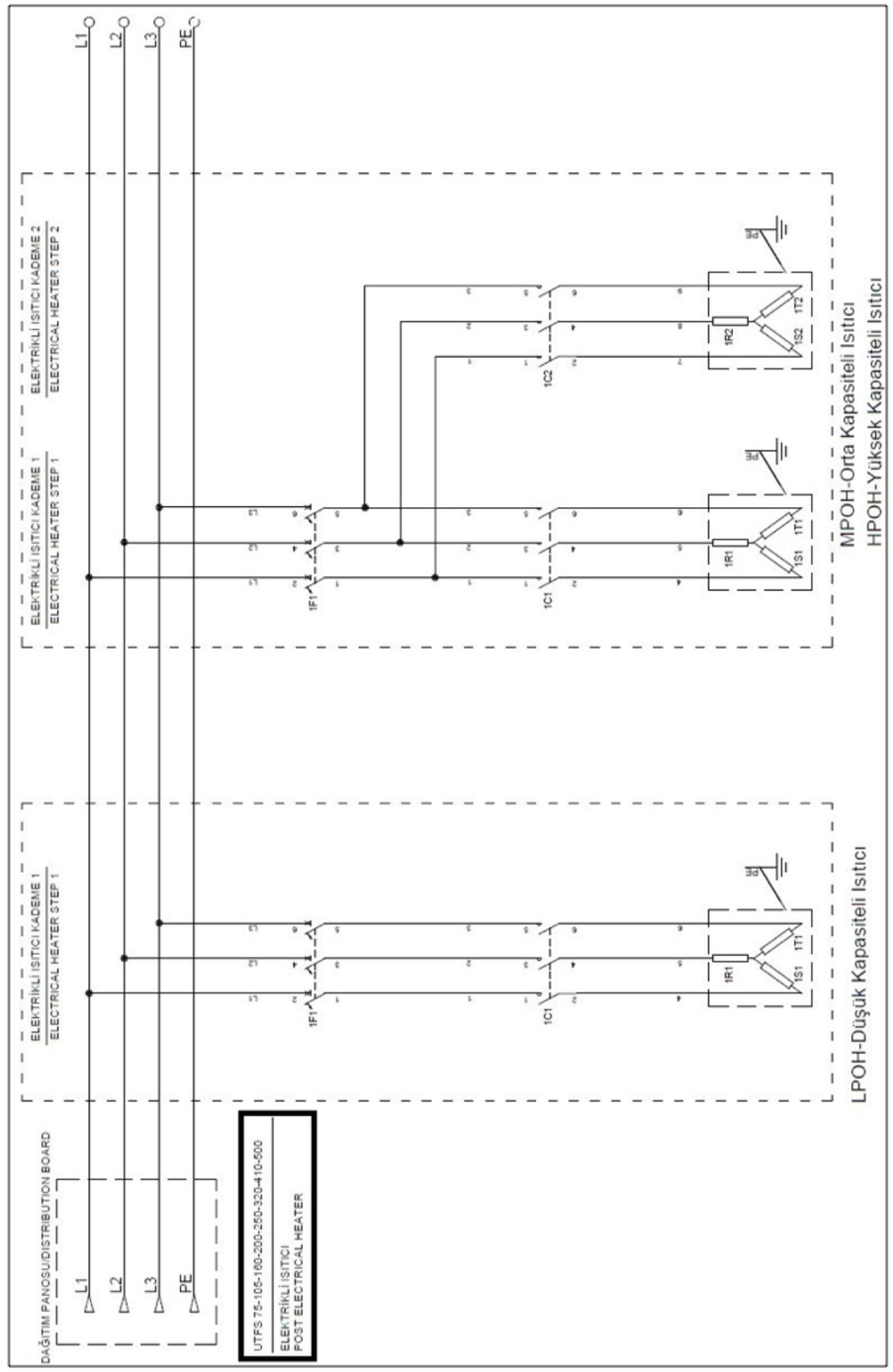
Electric Electrical Pre Heater Schematic / 080-100-150-205-260-330



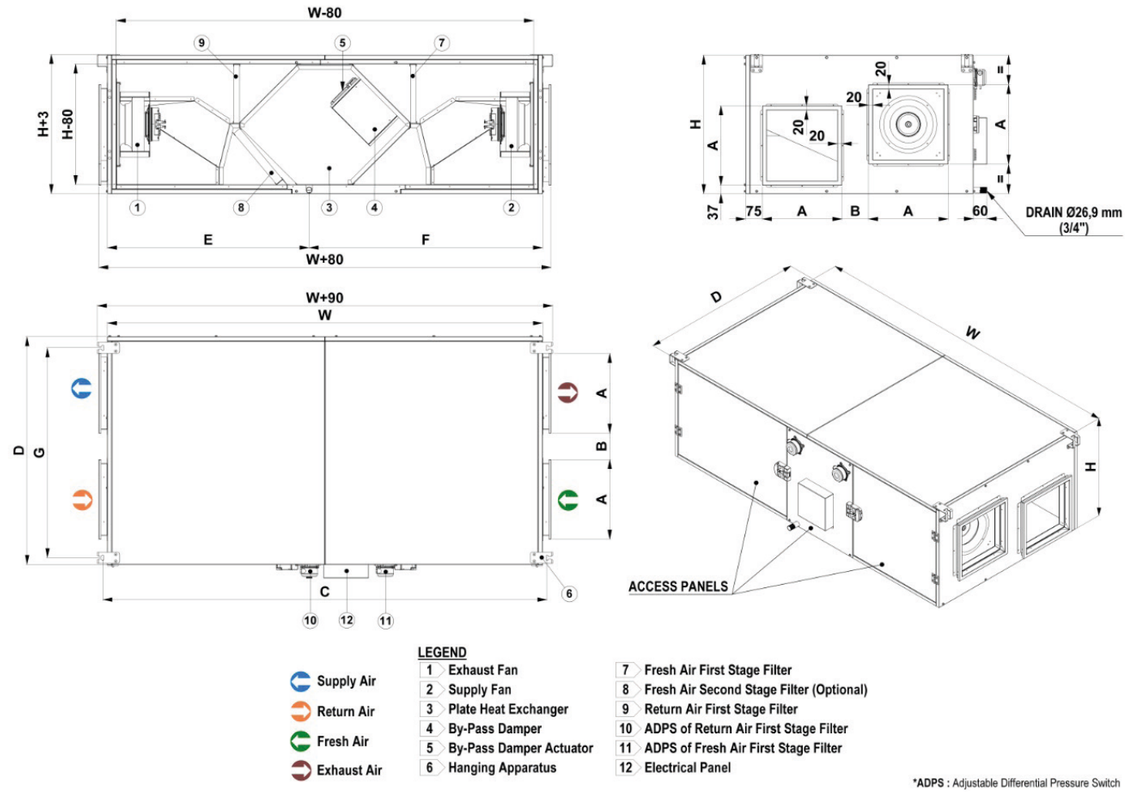
Main Electric Heater Schematic / 040-060



Main Electric Heater Schematic / 080-100-150-205-260-330

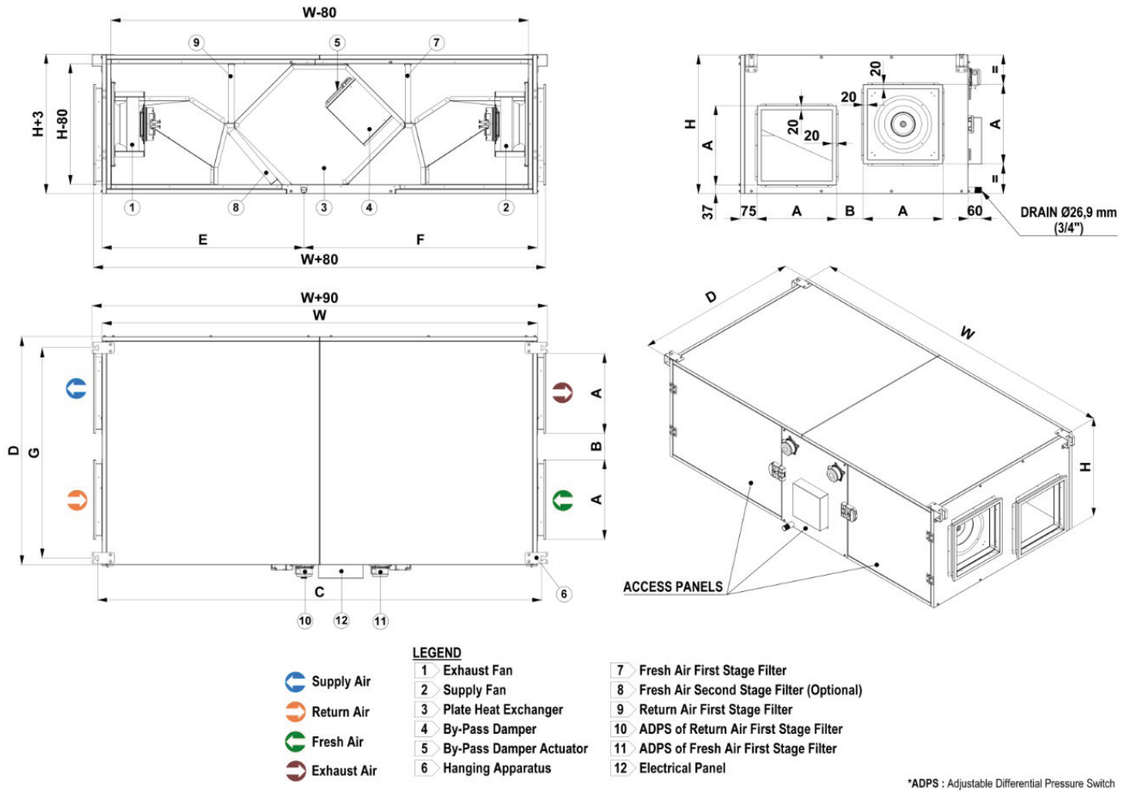


12
DIMENSIONS



*ADPS : Adjustable Differential Pressure Switch

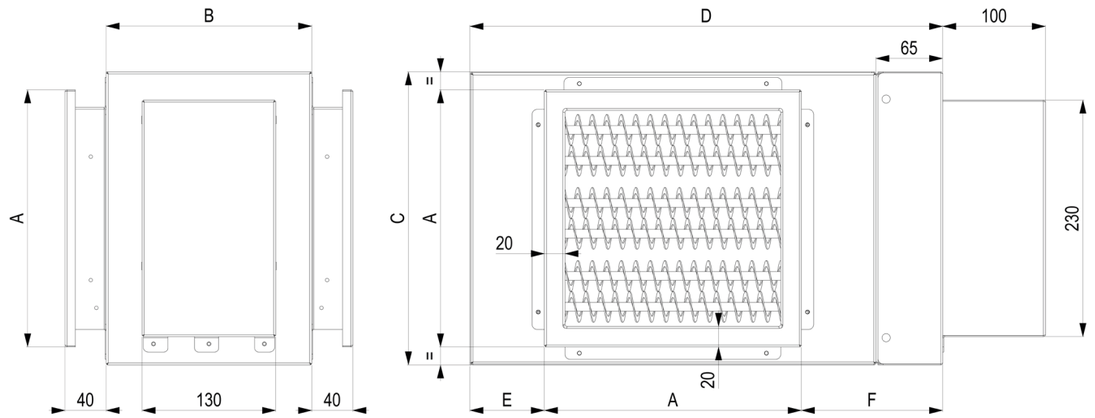
DIMENSIONS (mm)	MODELS			
	UTFP 040	UTFP 060	UTFP 080	UTFP 100
A	250	250	305	315
B	80,5	165	117,5	152,5
C	1386	1386	1678	1678
D	721	845	915	965
E	644	644	749	749
F	702	702	889	889
G	641	765	835	885
W	1346	1346	1638	1638
H	396,5	396,5	478,5	478,5



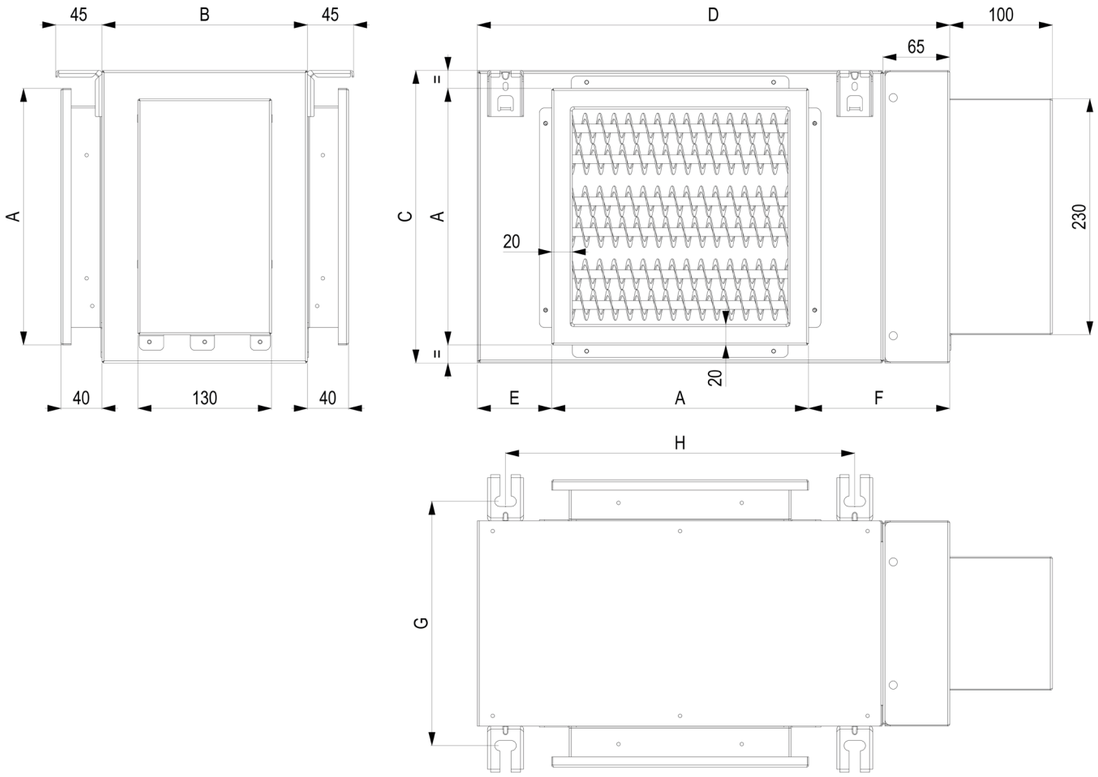
DIMENSIONS (mm)	MODELS			
	UTFP 150	UTFP 205	UTFP 260	UTFP 330
A	355	405	460	470
B	117,5	242,5	505	460
C	1977	1977	1977	2259
D	1015	1290	1720	1780
E	898	898	898	1059,5
F	1039	1039	1039	1159,5
G	935	1210	1640	1700
W	1937	1937	1937	2219
H	617,5	617,5	617,5	758,5

12.1. Electric Heater Module Dimensions

NO	MODEL	LPRH / HPRH / LPOH / MPOH / HPOH DIMENSIONS [mm]					
		A	B	C	D	E	F
1	UTFP 040	250	200	285	360	22,5	87,5
2	UTFP 060				460	72,5	137,5
3	UTFP 080	305		340	415	22,5	87,5
4	UTFP 100	315		350	425		
5	UTFP 150	355		390	465		



LPRH / HPRH / LPOH / MPOH / HPOH								
NO	MODEL	DIMENSIONS [mm]						
		A	B	C	D	E	F	G	H
6	UTFP 205	405	200	440	625	100	120	238	510
7	UTFP 260	460		520	720	97,5	162,5		600
8	UTFP 330	510	200	545	795	110	175		675

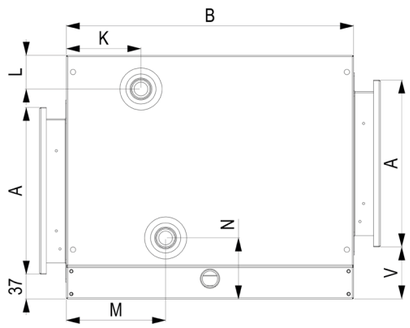


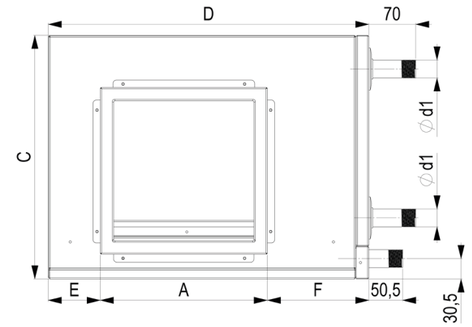
12.2. Coil Module Dimensions

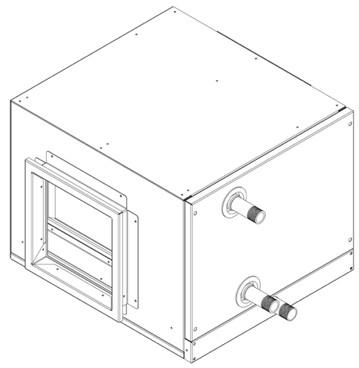
12.2.1.Water Coil Dimensions

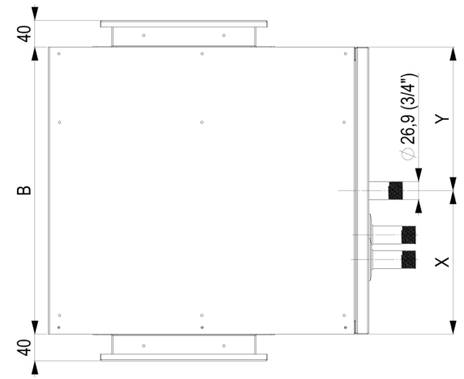
Water Cooling or Heating Coil - **CW3R/CW4R/CW5R/CW6R/HW1R/HW2R**

CW3R / CW4R / CW5R / CW6R / HW1R / HW2R																
NO	MODEL	COIL	DIMENSIONS [mm]													
			A	B	C	D	E	F	K	L	M	N	V	Ød1 [inch]	X	Y
1	UTFP 040	CW3R	250	430	365	375	25,5	99,5	90	50,5	127	91,5	78	3/4"	215	215
2		CW4R							101		138					
3		CW5R							112		149					
4		CW6R							122,5		159					
5		HW1R							95		132					
6		HW2R														
7	UTFP 060	CW3R	250	430	365	480	78	152	90	50,5	127	91,5	78	3/4"	215	215
8		CW4R							101		138					
9		CW5R							112		149					
10		CW6R							122,5		159					
11		HW1R							95		132					
12		HW2R														
13	UTFP 080	CW3R	305	470	465	480	50,5	124,5	115	50,5	152	91,5	100,5	3/4"	235	235
14		CW4R							126		163					
15		CW5R							137		174					
16		CW6R							147,5		184					
17		HW1R							120		157					
18		HW2R														
19	UTFP 100	CW3R	315	470	465	540	75,5	149,5	115	50,5	152	91,5	95,5	3/4"	235	235
20		CW4R							126		163					
21		CW5R							137		174					
22		CW6R							147,5		184					
23		HW1R							120		157					
24		HW2R														

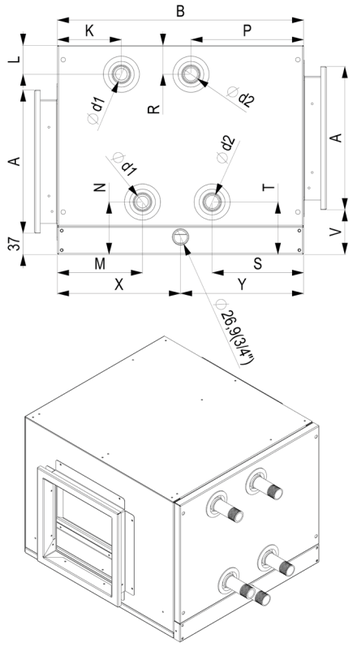


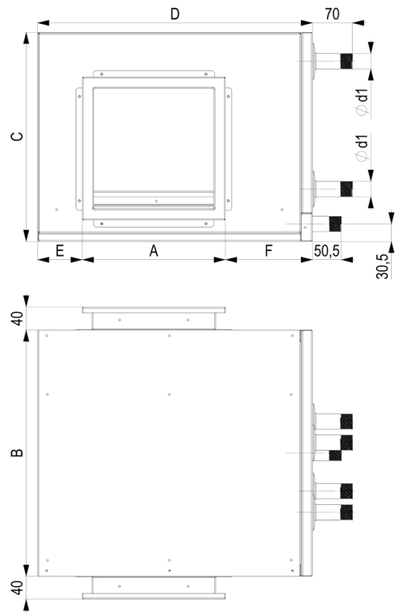






CW3R / CW4R / CW5R / CW6R / HW1R / HW2R																		
NO	MODEL	COIL	DIMENSIONS [mm]															
			A	B	C	D	E	F	G	H	K	L	M	N	V	Ød1 [inç]	X	Y
1	UTFP 150	CW3R	355	570	615	560	65,5	139,5	608	485	215	50,5	252	91,5	150,5	3/4"	363,5	206,5
2		CW4R									222,5	54	266	95		1"		
3		CW5R									233		277					
4		CW6R									244		288					
5		HW1R									220	50,5	257	91,5		3/4"		
6		HW2R																
7	UTFP 205	CW3R	405	520	615	730	115,5	209,5	558	655	162	54	205	95	125,5	1"	313,5	206,5
8		CW4R									168	58	220,5	99		1 1/4"		
9		CW5R									179		231					
10		CW6R									190		242					
11		HW1R									170	50,5	207	91,5		1"		
12		HW2R									172,5	54	216	95		3/4"		
13	UTFP 260	CW3R	460	470	615	870	158	252	508	795	118	58	170,5	99	98	1 1/4"	263,5	206,5
14		CW4R																
15		CW5R									129		181					
16		CW6R									140		192					
17		HW1R									120	50,5	157	91,5		3/4"		
18		HW2R									126	58	173	99		1 1/4"		
19	UTFP 330	CW3R	510	540	715	930	163	257	578	855	168	58	220,5	99	123	1 1/4"	323,5	216,5
20		CW4R																
21		CW5R									176	61	234	102		1 1/2"		
22		CW6R									187		245					
23		HW1R									172,5	54	216	95		1"		
24		HW2R									176	58	223	99		1 1/4"		

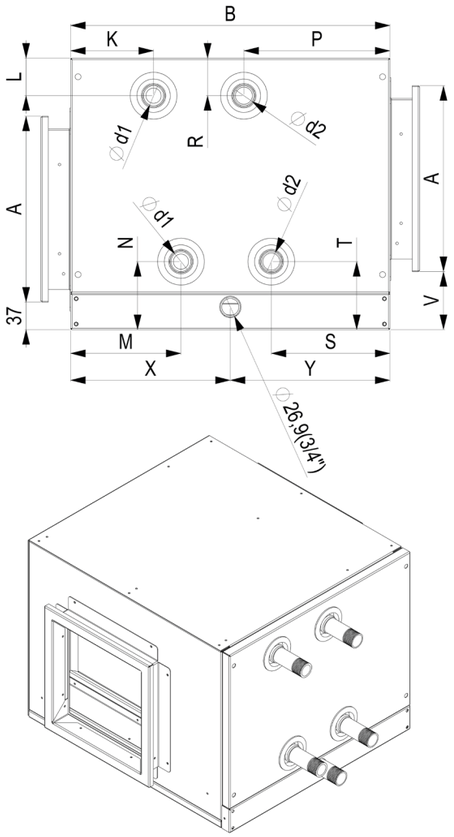


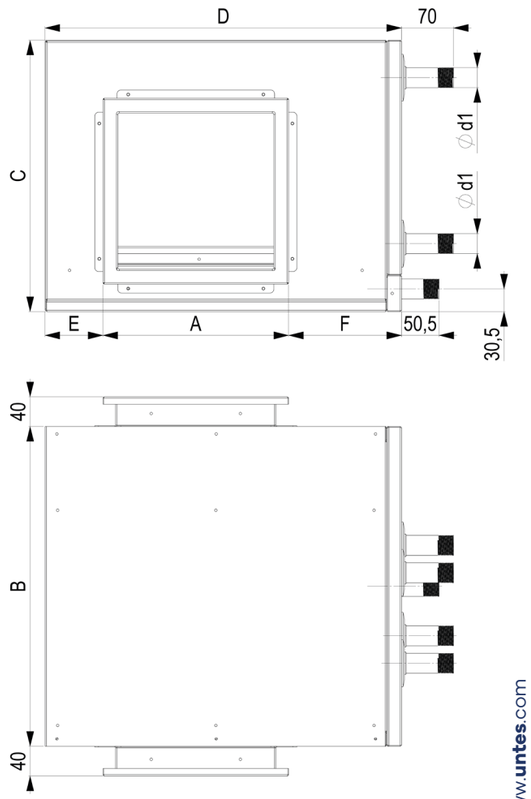


Water Heating and Cooling Coil - **C3H1 / C4H1 / C5H1**

CW3R / CW4R / CW5R / CW6R / HW1R / HW2R																						
NO	MODEL	COIL	DIMENSIONS [mm]																			
			A	B	C	D	E	F	K	L	M	N	P	R	S	T	V	Ød1 [inç]	Ød2 [inç]	X	Y
1	UTFP 040	C3H1	250	430	365	375	25,5	99,5	90	50,5	127	91,5	240	50,5	203	91,5	78	3/4"	3/4"	215	215
2		C4H1							101		138		218		181,5						
3		C5H1							112		149		197		160						
4	UTFP 060	C3H1	250	430	365	480	78	152	90	50,5	127	91,5	240	50,5	203	91,5	78	3/4"	3/4"	215	215
5		C4H1							101		138		218		181,5						
6		C5H1							112		149		197		160						
7	UTFP 080	C3H1	305	470	465	480	50,5	124,5	115	50,5	152	91,5	255	50,5	218	91,5	100,5	3/4"	3/4"	235	235
8		C4H1							126		163		233		196,5						
9		C5H1							137		174		212		175						
10	UTFP 100	C3H1	315	470	465	540	75,5	149,5	115	50,5	152	91,5	255	50,5	218	91,5	95,5	3/4"	3/4"	235	235
11		C4H1							126		163		233		196,5						
12		C5H1							137		174		212		175						

C3H1 / C4H1 / C5H1																						
NO	MODEL	COIL	DIMENSIONS [mm]																			
			A	B	C	D	E	F	G	H	K	L	M	N	P	R	S	T	V	Ød1 [inç]	Ød2 [inç]	X	Y
1	UTFP 150	C3H1	355	570	615	560	65,5	139,5	608	485	215	50,5	252	91,5	255	50,5	218	91,5	150,5	3/4"	3/4"	363,5	206,5
2		C4H1									222,5	54	266	95	233		196,5			1"			
3		C5H1									233		277		212		175						
4	UTFP 205	C3H1	405	520	615	730	115,5	209,5	558	655	162	54	205	95	255	50,5	218	91,5	125,5	1"	3/4"	313,5	206,5
5		C4H1									168	58	220,5	99	234		196,5			1 1/4"			
6		C5H1									179		231		212		175						
7	UTFP 260	C3H1	460	470	615	870	158	252	508	795	118	58	170,5	99	233	50,5	196,5	91,5	98	1 1/4"	3/4"	263,5	206,5
8		C4H1																					
9		C5H1									129		181		212		175						
10	UTFP 330	C3H1	510	540	715	930	163	257	578	855	168	58	220,5	99	251	54	207	95	123	1 1/4"	1"	323,5	216,5
11		C4H1																					
12		C5H1									176	61	234	102	229		186			1 1/2"			



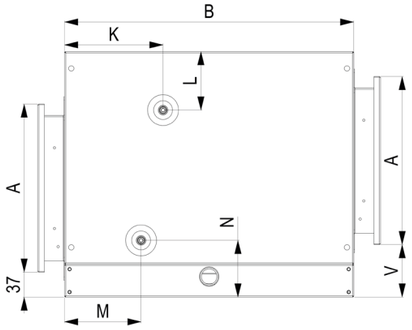


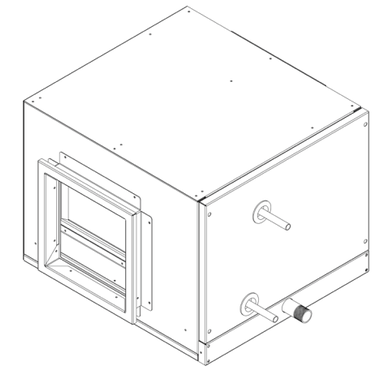
cold
hot

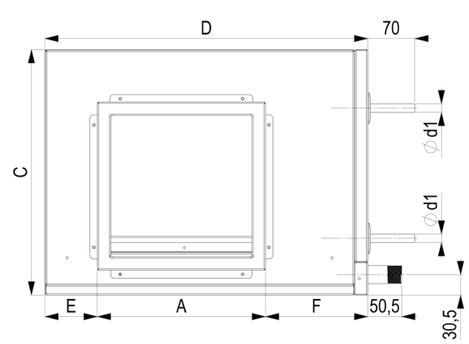
12.2.2. Direct Expansion Coil Dimensions

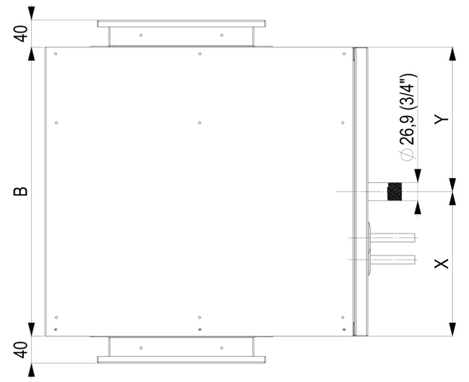
Direct Expansion Coil - **Dx3R/Dx4R/Dx5R/Dx6R**

Dx3R / Dx4R / Dx5R / Dx6R																
NO	MODEL	COIL	DIMENSIONS [mm]													
			A	B	C	D	E	F	K	L	M	N	V	Ød1 [inç]	X	Y
1	UTFP 040	DX3R	250	430	365	375	25,5	99,5	125	87	92	84	78	1/2"	215	215
2		DX4R							136		103					
3		DX5R							146,5		114					
4		DX6R							157		125					
5	UTFP 060	DX3R	250	430	365	480	78	152	125	87	92	84	78	1/2"	215	215
6		DX4R							136		103					
7		DX5R							146,5		114					
8		DX6R							157		125					
9	UTFP 080	DX3R	305	470	465	480	50,5	124,5	150	87	117	84	100,5	1/2"	235	235
10		DX4R							161		128					
11		DX5R							171,5		139					
12		DX6R							182		150					
13	UTFP 100	DX3R	315	470	465	540	75,5	149,5	150	87	117	84	95,5	1/2"	235	235
14		DX4R							161		128					
15		DX5R							173		137			5/8"		
16		DX6R							184		148					

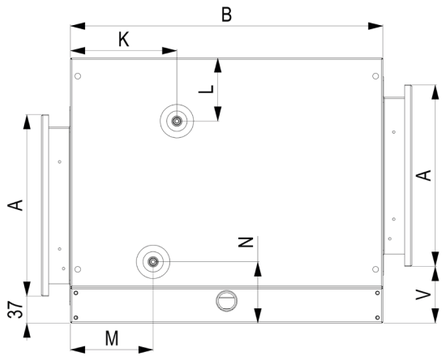


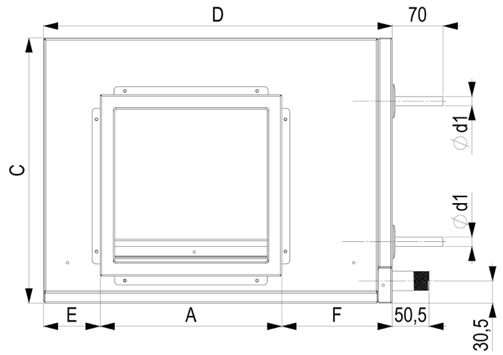


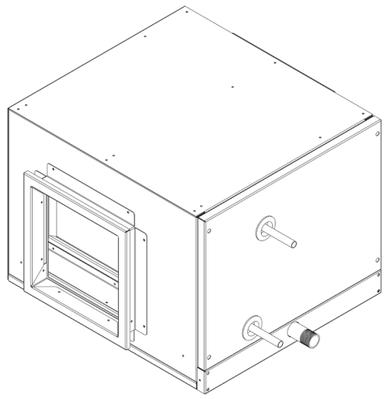


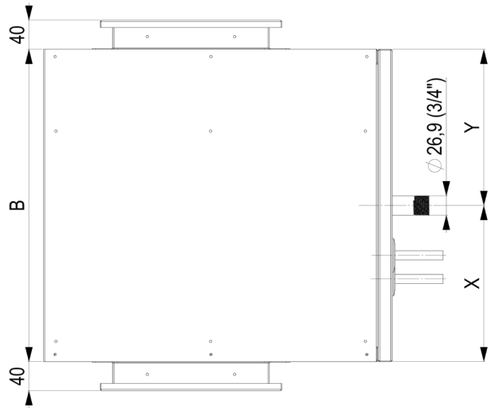


Dx3R / Dx4R / Dx5R / Dx6R																	
NO	MODEL	COIL	DIMENSIONS [mm]														
			A	B	C	D	E	F	G	H	K	L	M	N	V	Ød1 [inç]	X	Y
1	UTFP 150	DX3R	355	570	615	560	65,5	139,5	608	485	251	87	215,5	86	150,5	5/8"	363,5	206,5
2		DX4R									262		226					
3		DX5R									270		231	87,5		3/4"		
4		DX6R									290,5		241,5					
5	UTFP 205	DX3R	405	520	615	730	115,5	209,5	558	655	203	87	164	87,5	125,5	3/4"	313,5	206,5
6		DX4R									219		170					
7		DX5R									230		181					
8		DX6R									242		190	89		7/8"		
9	UTFP 260	DX3R	460	470	615	870	158	252	508	795	153	87	114	87,5	98	3/4"	263,5	206,5
10		DX4R									170		118			7/8"		
11		DX5R									181		129	89				
12		DX6R									192		140					
13	UTFP 330	DX3R	510	540	715	930	163	257	578	855	200	87	153	89	123	7/8"	323,5	216,5
14		DX4R									218		171					
15		DX5R									234		176	92		1 1/8"		
16		DX6R									245		187					



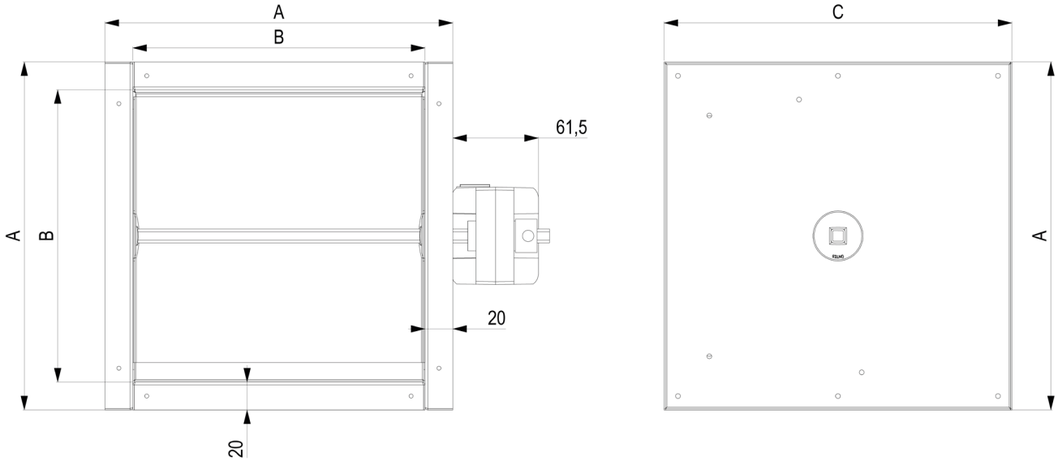


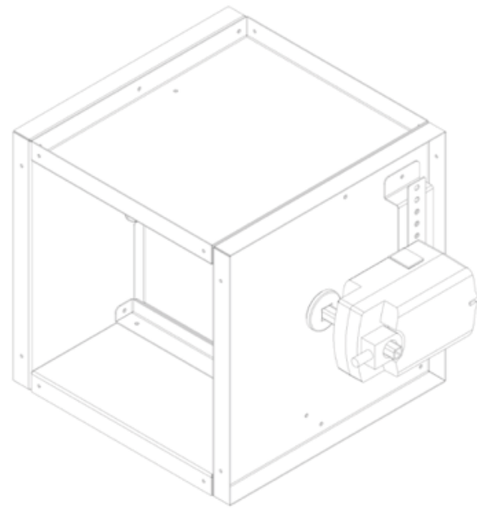




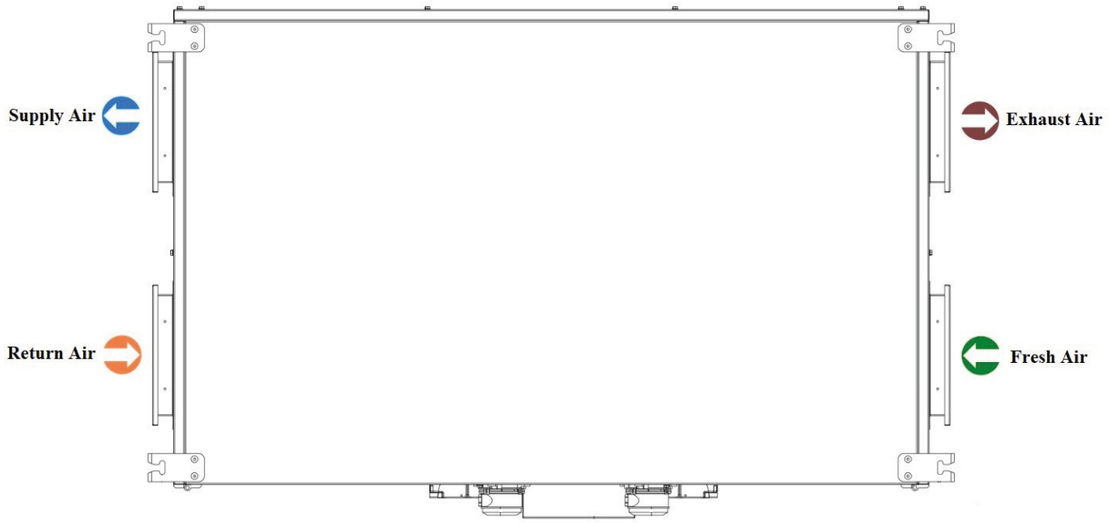
12.3. Damper Module Dimensions

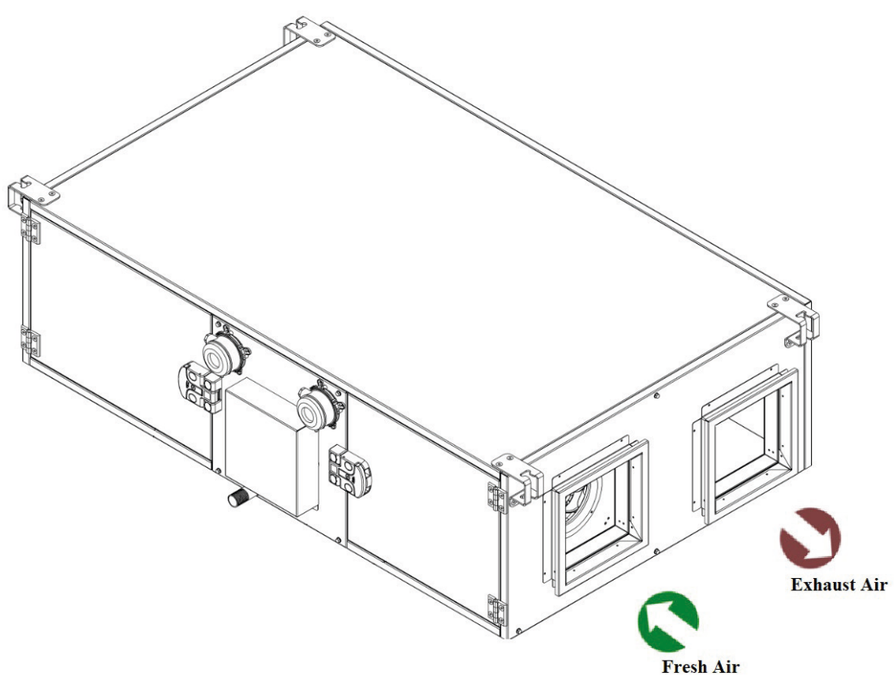
MODEL	DIMENSIONS [mm]		
	A	B	C
UTFP 040	250	210	250
UTFP 060		210	
UTFP 080	305	265	300
UTFP 100	315	275	
UTFP 150	355	315	340
UTFP 205	405	365	390
UTFP 260	460	420	450
UTFP 330	510	470	500





13 AIRFLOW DIRECTIONS





14 DEVICE OPERATING SCENARIOS

Scenario 1 (Only Ventilation)

In this scenario, 2 EC 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_2 sensors(Optional).

If the outer temperature falls below the limit, then the Electrical 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 ± 1K between indoor and outdoor environment and freecooling/freeheating.

Scenario 2 (Ventilation + 2 Step Electric Heating)

In this scenario, 2 EC 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_2 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 4 in the case heat exchanger frost protection, temperature difference of ± 1K between indoor and outdoor environment and freecooling/freeheating. If the outdoor air temperature falls below the limit, then the electric heater(Optional) will activate via Relay 5.

Scenario 3 (Ventilation + Water Heating)

In this scenario, 2 EC 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_2 sensors(Optional).

If the outer temperature falls below the limit, then the Electrical 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. Heating valve motor is controlled via AO3 proportional heating outlet.

Scenario 4 (Ventilation + Water Cooling)

In this scenario, 2 EC 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_2 sensors(Optional).

If the outer temperature falls below the limit, then the Electrical 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. Cooling valve motor is controlled via AO4 proportional cooling outlet.

Scenario 5 (Ventilation + Water Heating + Water Cooling)

In this scenario, 2 EC 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_2 sensors(Optional).

If the outer temperature falls below the limit, then the Electrical 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. Heating valve motor is controlled via AO3 proportional heating outlet and cooling valve motor via AO4 proportional cooling outlet.

Scenario 6 (Ventilation + Water Cooling + Electric Heating)

In this scenario, 2 EC 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_2 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. 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.

Scenario 8 (Ventilation + Dx Cooling)

In this scenario, 2 EC 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_2 sensors(Optional).

If the outer temperature falls below the limit, then the Electrical 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. Compressor opening and closing contactors are activated via Relay 4. Dx systems are controlled via AO4 proportional cooling outlet.

Scenario 9 (Ventilation + Dx Heatpump)

In this scenario, 2 EC 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_2 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. The damper motors are activated via Relay 5 when the device is started(Optional). If the outer temperature falls below the limit, then the Electrical Pre Heater is activated via Relay 6(Optional). Heating system is controlled via AO3 proportional heating outlet.

Scenario 10 (Ventilation + Dx Cooling + Electric Heating)

In this scenario, 2 EC 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_2 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. 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 Electrical 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.

Scenario 11 (Ventilation + Dx Cooling)

In this scenario, 2 EC 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_2 sensors(Optional).

The damper motors are activated via Relay 1 when the device is started(Optional). If the outer temperature falls below the limit, then the Electrical 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 ± 1K between indoor and outdoor environment and freecooling/freeheating. In cooling mode, the compressor opening-closing contactors are activated via Relay 4. VRF system is controlled via AO4 proportional cooling outlet.

Scenario 12 (Ventilation + Dx Heatpump)

In this scenario, 2 EC 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_2 sensors(Optional).

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 ± 1K between indoor and outdoor environment and freecooling/freeheating. The damper motors are activated via Relay 5 when the device is started(Optional). If the outer temperature falls below the limit, then the Electrical Pre Heater is activated via Relay 6(Optional). VRF heating and cooling system is controlled via AO3 proportional heating-cooling outlet.

Scenario 13 (Ventilation + Dx Cooling + Electric Heating)

In this scenario, 2 EC 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_2 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. The Bypass damper motor is activated via Relay 3 in the case heat exchanger frost protection, temperature difference of ± 1K between indoor and outdoor environment and freecooling/freeheating. 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 Electrical 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.

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