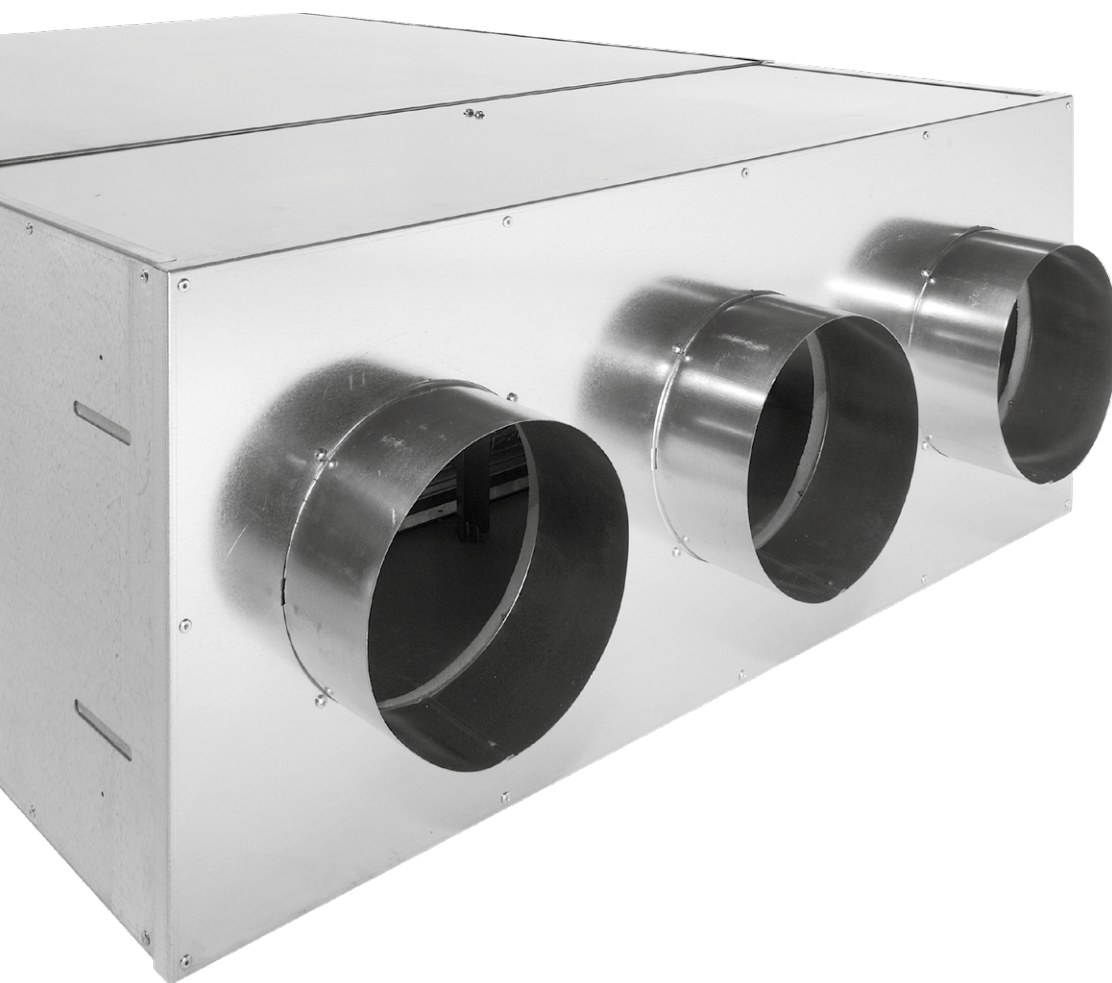


TECHNICAL MANUAL



HIGH PRESSURE UNIT ESTEBH

EUROPO

INTEGRATED
COMFORT
SYSTEMS

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1. GENERAL INFORMATION

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1.1 APPLICATIONS

ESTEBH high pressure ducted fan coils with energy saving motors, are specifically designed for ducted installations, with external static pressure up to 300 Pa.

Their high pressure fan decks permit to satisfy every request of heating and cooling application in big environments.

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1.2 OPERATION

The effectiveness of a fan coil is due to the large surface area of the finned heat exchanger (coil) where the air drawn from the room by the fan passes through.

Heating operation: the hot water circulating in the finned coil supplies heat to the air passing through the heat exchanger.

Cooling operation: the chilled water circulating in the finned coil removes heat from the air passing through the heat exchanger.

The air is also dehumidified and the condensed water vapor must be discharged from the unit: suitable drains must therefore be provided to drain the condensed water that collects in the condensate tray.

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1.3 PERFORMANCES

The performance of a fan coil can vary greatly with changes in the temperature and in the amount of water circulating through the coil, as well as with changes in the temperature and in the amount of air circulating through the coil.

The air volume is determined by selecting the proper fan speed through continuous regulation (0-100%) by using electronic or digital (OMNIBUS 360) regulators (also for BMS system) while the water flow rate is determined by the specifications of the system and of the pump.

Thermal performances of the unit can be optimized by controlling the inlet flow rate of the water with proper regulating valves (ON/OFF or modulating), which can be supplied as accessories and which are necessary in case of cooling operation.

For each model, thermal performances in heating and cooling depend on the number of rows of the coil installed, which gives the opportunity to make the air treatment suit every condition required.

In cooling function, under the same operating conditions, the more rows the heat exchanger has, the more it will dehumidify.

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1.4 PRODUCT RANGE

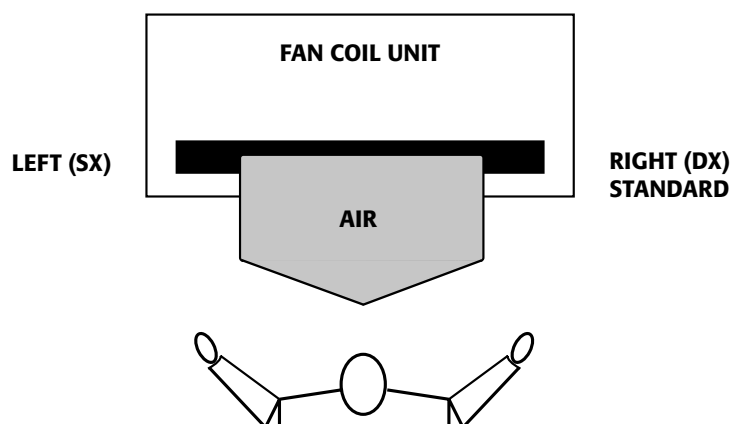
The ESTEBH high pressure fan coil units are available in 5 sizes (020, 030, 040, 050 and 060) for concealed horizontal installation, in 2 and 4 pipe systems.

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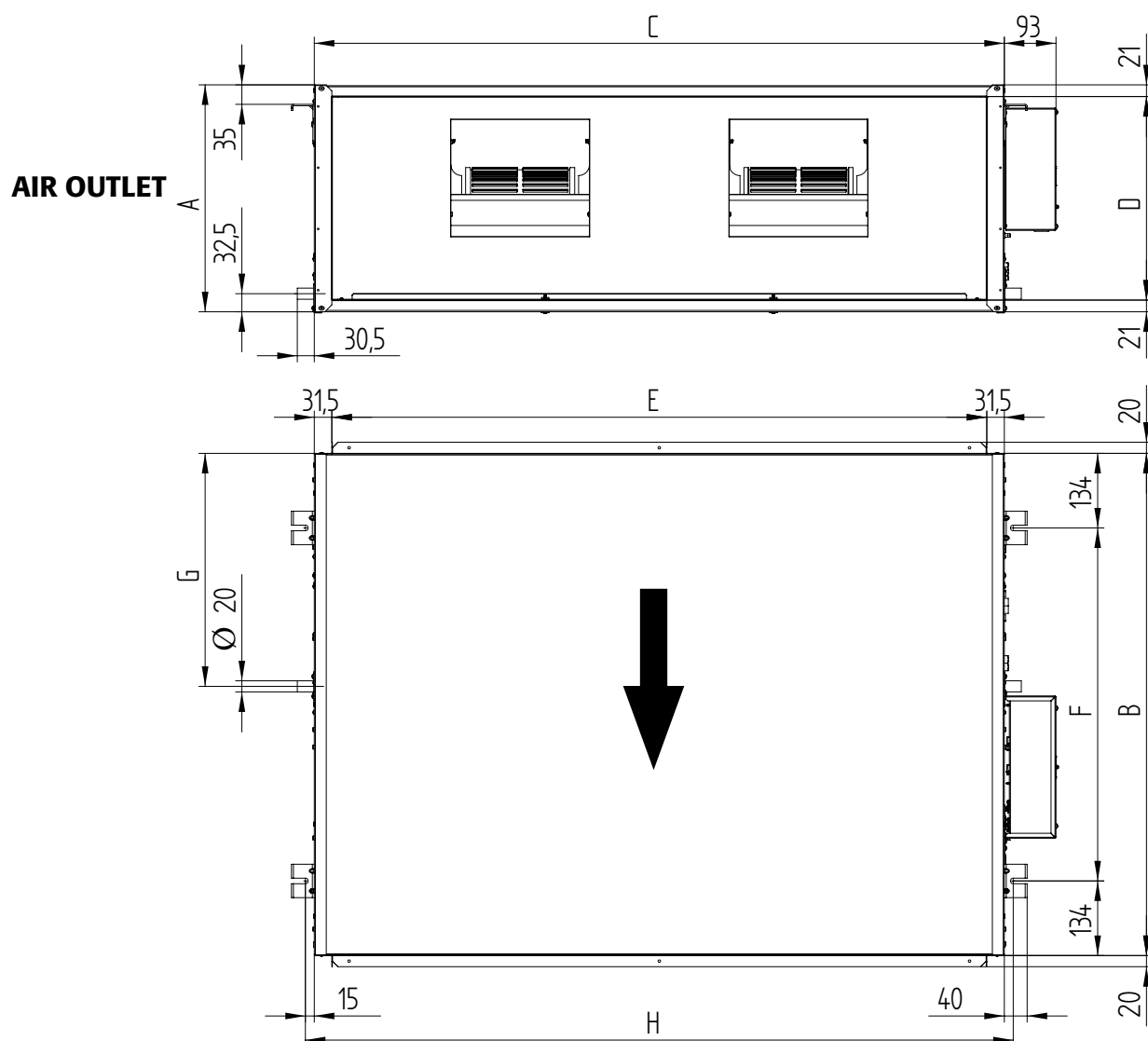
1.5 SELECTION SOFTWARE

To facilitate choosing the correct size of a fan coil for any operating condition (including those differing from the standard ones), EURAPO offers a dedicated computer program available at the following address: <http://www.geniusplan.it>.

1.6 WATER CONNECTIONS



2. DIMENSIONS AND WEIGHTS



		020	030	040	050	060
A	[mm]	407,6	407,6	407,6	407,6	517,6
B	[mm]	902	902	902	902	1160
C	[mm]	989,6	989,6	1239,6	1239,6	1634,6
D	[mm]	365,6	365,6	365,6	365,6	475,6
E	[mm]	926,6	926,6	1176,6	1176,6	1571,6
F	[mm]	634	634	634	634	892
G	[mm]	418,5	418,5	418,5	418,5	446,5
H	[mm]	1019,6	1019,6	1269,6	1269,6	1664,6
Weight (3R - 3 rows)	[kg]	64,3	64,3	79,3	79,3	126,0
		(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4-5 rows)
Weight of the coil	[kg]	4,8-5,8-7,6	4,8-5,8-7,6	5,6-7,4-9,6	5,6-7,4-9,6	9,4-12,8-17,4-21,5
Water connection		G1/2" F	G1/2" F	G1/2" F	G1/2" F	G1" M
		(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4 rows)	(2-3-4-5rows)
Water content	[l]	1,5-2,2-2,9	1,4-2,2-2,9	1,9-2,8-3,8	1,9-2,8-3,8	3,4-5,0-6,7-8,4

3. COMPONENTS

3.1 STRUCTURE

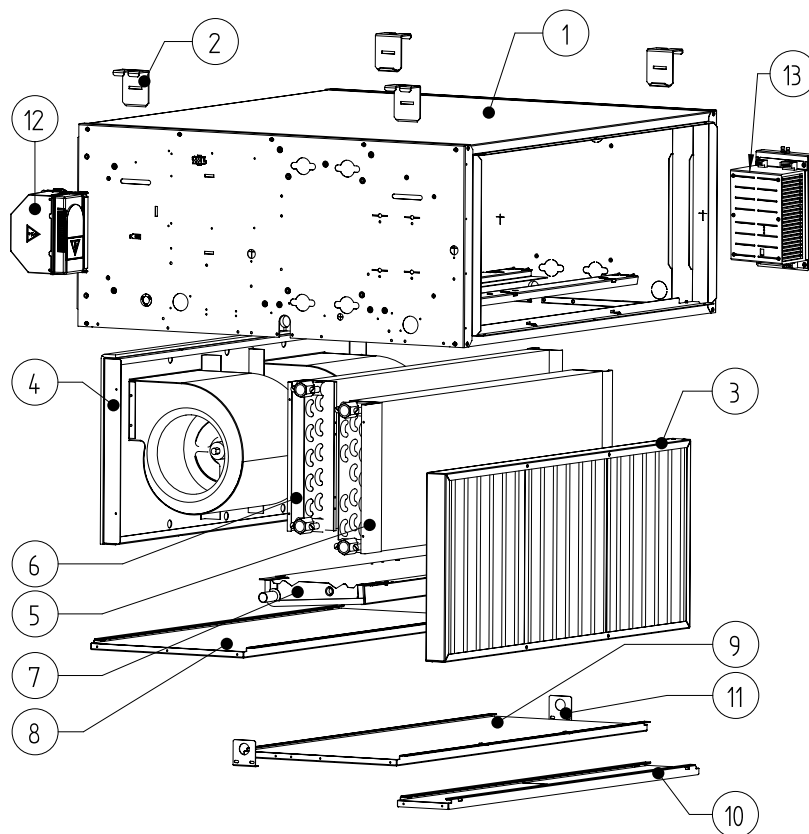
The structure is made of galvanized steel. A particular manufacturing process gives stiffness to the structure: in this way all risks of vibration (which causes unpleasant noise) are strongly reduced. All the inner elements that could be cooled are completely lined with insulating material based on polyolefins, chemically reticulated and closed cell foam, which is not only a thermal insulation material but also a good sound attenuator. Self-extinguishing grade in accordance to norms: Class 1 - Italy, Class M1 - France, UNI 8457 and UNI 9174.

In order to facilitate all maintenance operations, the structure is divided in 3 separate and independent sections:

- Fan deck
- Condensate tray
- Filter

The air intake and outlet are provided with a 21 mm flange for an easy connection to the air duct.

The ESTEBH fan coils can be installed on the ceiling by using the four fixing brackets always supplied with every unit.



LEGEND

1.	Structure
2.	Fixing support
3.	Filter
4.	Fan deck
5.	Standard coil
6.	Heat exchangers (2 or 3 rows)
7.	Condensate tray
8.	Access panel to fan deck
9.	Access panel to condensate tray
10.	Access panel to filter
11.	Water discharge fixing supports
12.	Electric box
13.	Inverter

3.2 COILS

For each unit size there are 2, 3 and 4 row coils available; for 4 pipe systems it is possible to install a 2 or 3 row coil. It is therefore possible to have a combination of maximum 7 rows (4 row cooling + 3 row heating). For models 060 are also 5 row coils available, which can be combined with additional 2 or 3 row coils. All coils consist of 3/8" external diameter copper pipes mechanically expanded to the aluminum fin packs, provided with copper headers and brass soldering connections. Max. operating pressure 1,6 MPa, testing pressure 2,8 MPa.

For the sizes 020, 030, 040 e 050 each header is provided with a very handy air valve, to allow air venting or water drainage from the coil. The air valve can be easily reached from the outside of the unit.

For the sizes 060 the air vent valve are not present, therefore it is necessary to provide in the pipe connection a system for the water discharge and air venting of the coil.

ESTEBH units are also available for **District Cooling** applications: the water coils (4 rows for size 020–050 and 5 rows for size 060) are designed with a reduced number of circuits, suitable for functioning with high water temperature difference.

ESTEBH units can be ordered with right (standard) or left water connections, so defined when facing the air outlet. If necessary, however the coils can be easily removed and reversed on site. Water connections are 1/2" F (female threaded) for sizes 020, 030, 040, 050 1" M (male threaded) for size 060.



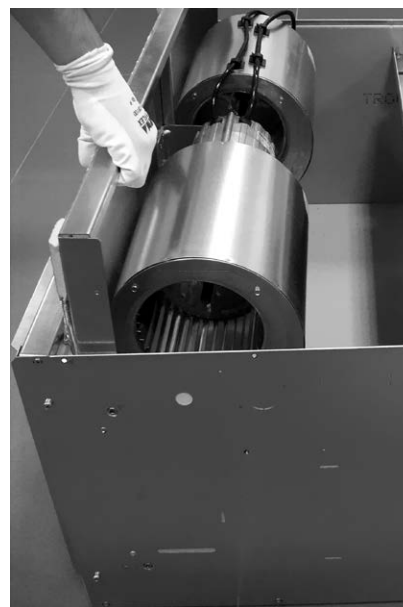
MAXIMUM OPERATING PRESSURE WITH VALVES: 16 BAR.

3.3 FAN DECK

The fan deck is composed by a motor and 2 centrifugal galvanized steel scrolls. The brushless motor is a component of the EST technology (Energy Saving Technology) applied to the Eurapo product range.

It is combined to a dedicated electronic device (inverter), which is provided with Dip-Switch that can be set on site accordingly to the pressure drop in the system. The inverter can be managed by specific regulators (Omnibus 360, for example) which use a modulating signal with 0-10 Vdc tension in order to regulate the fan speed. OMNIBUS regulators give the possibility to fully control the fan speed (0-100%) and/or to manually select three fan steps (high, med or low speed): it is actually possible to set in every moment and very easily the three different levels of motor's rotation, in order to fulfil specific thermal or acoustical requirements. The motor and the scrolls are fixed on a rigid galvanized steel 1,5 mm thick basement: the motor is located in a proper cradle and fixed with elastic ribbon supports. All motors operate at 50/60Hz and for all sizes the power supply is 230V±10%. Motor protection degree is IP20, class F.

Each fan assembly is dynamically balanced, to reduce noise and wear of the components to minimum levels; it can easily be removed for maintenance operation.



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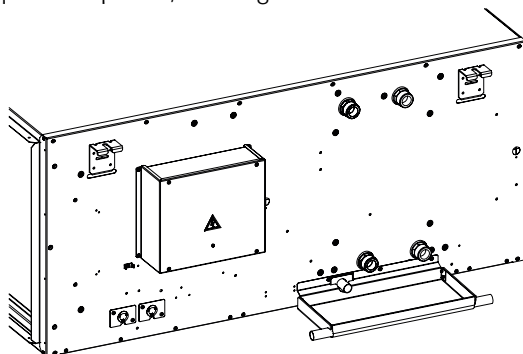
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3.4 CONDENSATE TRAY

The condensate tray is made of galvanized steel and it is completely insulated by a 12 mm thick closed cell polyurethane foam layer. The condensed water is discharged from both sides (left or right) through a 20 mm diameter header. Stainless Steel (AISI 316) condensate tray is also available upon request. The auxiliary drain pan to be mounted under the valves (VH) are available, upon request as optional, also in galvanized steel or in stainless steel (AISI 316).

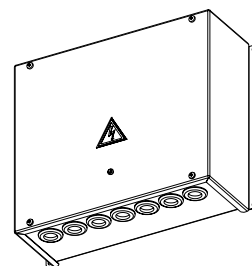
KVH auxiliary drain pan in Stainless Steel



3.5 STANDARD ELECTRICAL PANEL IP30

The standard electrical panel (ESTQET00) consists of a galvanized sheet metal box, in which there is a 12-pole electrical terminal board and the clamp for the connection of the ground protection. The electric box is fixed on the same side of the water connection.

Every ESTEBH model is supplied with an electric wiring diagram showing all the electrical components, accessories factory fitted and/or remote controllers ordered together with the unit. Everything must be correctly wired in accordance to the diagram, to obtain the requested working conditions of the unit.



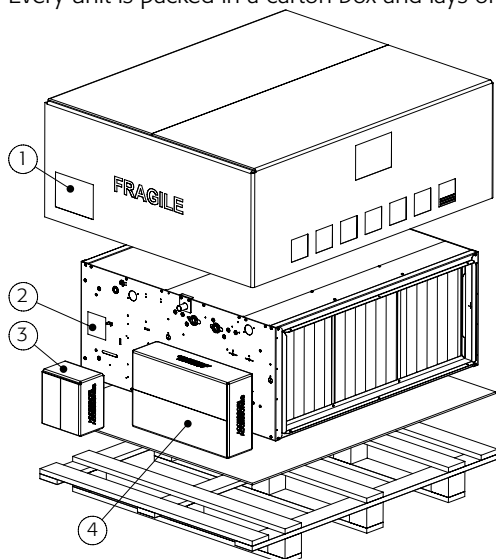
Standard electrical panel ESTQET00

3.5.1 OPTIONAL ELECTRICAL PANEL IP44 (ESTGW00)

Electrical panel composed by a terminal board with screw terminals contained in a high protection box (IP44). Available on request.

3.6 PACKING

Every unit is packed in a carton box and lays on a wooden pallet. Available fumigated (SPM15-IPPC) pallets as optional.



LEGEND

1. Label on packing
2. Label on internal structure
3. Box with fixing brackets and accessories
4. Valve Kit (optional)

3.7 AIR FILTER

The air filter consists of a polyester acrylic fiber, filtration class G3. A filter with higher filtering grade (F5) is also available upon request for each model.

The particular pleated shape of the filter, protected by a metal frame, allows having a big filtering surface with only 45 mm thickness. The filter section can be easily removed for cleaning and maintenance operation. Filters are not washable.

4. ELECTRICAL ACCESSORIES

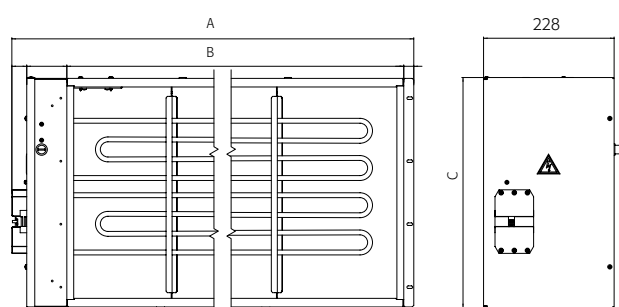
4.1 ELECTRIC BOX QET10

The QET10 electrical panel consists of a galvanized sheet metal box, in which there is a 12-pole electrical terminal board and a double insulated transformer (230/24 V~10 VA), for the electrical connection of the modulating valves. It can be used in combination to EDCR and Omnibus 360 controls (ORBTxx).

4.2 ELECTRICAL HEATER - KREL 1 E KREL 2

Additional module for electrical heater supplied with 2 safety thermostats, one with automatic resetting (intervention temperature 75 °C) and the other one with manual resetting (intervention temperature 85 °C), a power relay card and a terminal board for the electrical connection. The electric heater has two or three-stage electrical resistance to allow part-load operation. The table shows the power of the electric heater for each unit size.

KREL 1			KREL 2			DIMENSIONS		
ESTEBH	P [kW]	Power supply [V-ph-Hz]	ESTEBH	P [kW]	Power supply [V-ph-Hz]	A	B	C
020 030	3,0	230-1-50/60	020 030	1,5	230-1-50/60	1068,1	954,6	402,1
040 050	6,0	380-3-50/60	040 050	2,0/4,0	230-1-50/60	1318,1	1204,6	
060	9,0	380-3-50/60	060	3,0/6,0	230-1-50/60	1713,1	1599,6	512,1



4.3 AS - AS - AIR SENSOR

1 or 3 m long NTC sensor fixed on the air inlet of the ducted unit. It is optional, on request, with the following regulators: EDCR and OPower card ORBTxx (OMNIBUS 360).

4.4 CS - CHECK SENSOR

1 m long NTC sensor, to be installed on the air outlet of the ducted unit. In combination with OPower card ORBTxx, it allows highlighting any faults in the functioning of the ducted unit, by reporting an alarm signal.

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4.5 WS - WATER SENSOR

3 m long NTC sensor (10K, 25°C), requested for the automatic S/W switch when a ducted unit is controlled by a regulator with microprocessor or OMNIBUS 360, in a 2 pipe system, for both heating and cooling operation. The Summer/Winter changeover works as follows:

WS combined to EDCR

- Summer: water temperature $< 18\text{ }^{\circ}\text{C} \pm 1\text{K}$ = cooling on
- water temperature $> 20\text{ }^{\circ}\text{C} \pm 1\text{K}$ = cooling off
- Winter: water temperature $> 36\text{ }^{\circ}\text{C}$ = heating on
- water temperature $< 34\text{ }^{\circ}\text{C}$ = heating off



WS

The water sensor is not compatible with 2 way valves (J2B2 or J2C2, for example).

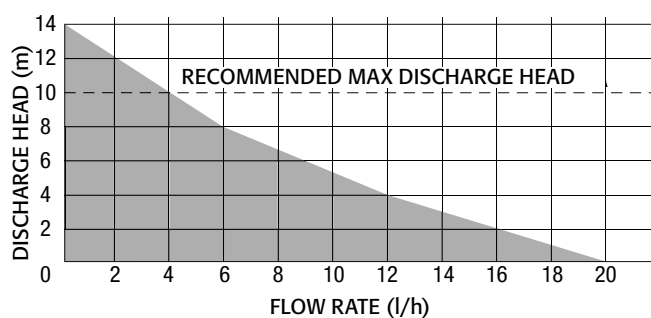
4.6 PC - CONDENSATE PUMP

The condensate pump is necessary when the traditional water discharge is not allowed. It is supplied already mounted on the unit and is complete with non-return valve on the delivery side. The power of the pump is different for the different models where it has to be installed. **It is not possible to install an auxiliary drain pan (VH) together with this accessory.**

Functions:

- forced evacuation of the condensed water.

Max flow rate	20 l/h
Max suction head	3 m
Max discharge head	10 m (flow= 4 l/h)
Electric power	14 W
Electric voltage	230 V~ 50/60 Hz
Alarm contact	NC 8 A resistive - 250 V
Detection levels in mm	ON: 16, OFF: 11, Alarm: 19
Sound level at 1 m	20 dBA
Thermal protection (overheating)	115 °C
Safety standards	CE
RhOS and WEEE directives	Complies



4.7 EDCR - ELECTRONIC REGULATOR

Microprocessor control designed for water terminal units equipped with brushless motors (EST Inverter Technology). It permits to control the type of ventilation (fan thermostated or fan continuously running), the fan speeds (0-10V or Auto), SUMMER/WINTER changeover and room temperature thermostat.



EDCR

For more information please refer to the TECHNICAL MANUAL FOR EDCR CONTROLLERS.

EDCR CONTROLS FUNCTIONS TABLE

Functions	EDCR
Ventilation mode (Thermostated - Continuous)	•
Manual (0-10V) or Auto speed selector	•
Automatic S/W changeover (2 pipe system, with WS)	•
Automatic (with dead band) or external (centralized) S/W changeover	•
Room temperature thermostat setting	•
De-stratification function	•
Economy/occupancy contact*	•
Window contact*	•
Frost protection (only with heating valve)	•
Operating mode LED (Summer - Winter)	•
Dirty filter alarm LED	•

* not optoinsulated from 230 V~ power supply net

EDCR CONTROL COMPATIBILITY TABLE

Compatibility	Rif. EUROPO	EDCR
2 and 4 pipe system		•
ON/OFF 230V cooling and heating valve, 2/4 pipe system	J3B2-J3C2	•
Modulating 24V cooling and heating valve, 2/4 pipe system	J3BM-J3CM	•
NTC water sensor for automatic S/W (2 pipe system) and min. water temp. thermostat	WS	•
Electric heater (in alternative to the heating valve)	KREL	•

4.8 OMNIBUS 360 DIGITAL CONTROL

The digital control OMNIBUS 360 permits a complete and integrated management of a water terminal unit. It is designed either for a stand-alone operating mode, or to be integrated, at different levels, to a centralized Building Automation System, with a serial communication protocol RS-485 (Modbus RTU). The digital regulator can control many units at the same time (Master/Slave solution), which are connected together by two twisted wires (AWG 22/24).

4.8.1 OPOWER CARD FOR BMS - ORBT10

The OPower card mounted on the unit is designed to fully regulate (directly or via Modbus) the water terminal units with brushless motor.

Output/Input management:

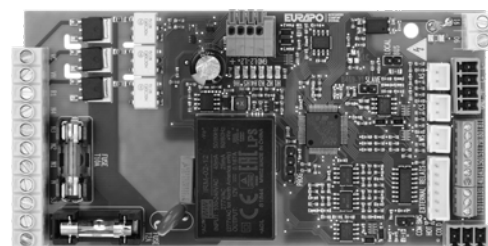
- 230V ON/OFF VALVES: no. 2 230V outputs for the management of the Hot water valve and Cold water valve.
- MODULATING VALVES: no. 2 analogue 0/10V outputs for the management of Hot water modulating valve and Cold water modulating valve.
- BRUSHLESS FAN: Analogue 0/10V output for the management of the brushless motor and relative input for the management of any alarms.
- ELECTRIC HEATER: 230V signal for the control of the electric heater.
- ROOM TEMPERATURE: Analogue input for the connection of a NTC water sensor (WS)
- AIR OUTLET TEMPERATURE: Analogue input for the connection of an air outlet temperature sensor (CS).
- WINDOW CONTACT INPUT: Digital input configurable for the management of the window contact.
- MULTIFUNCTION INPUT: Configurable input for the management of differential pressure switch, STANDBY forcing, Season changeover, Motor alarm, Forcing ventilation, Economy mode, External temperature sensor.
- PUMP ALARM/DIFFERENTIAL PRESSURE SWITCH INPUT: Configurable input for the management of the condensate pumps alarm or the differential pressure switch alarm.

Serial Ports of communication:

- MODBUS LOCAL BUS: Communication port 485 with Modbus protocol for the MASTER/SLAVE connection of the units.
- MODBUS BUS CONSOLE: Communication port 485 with Modbus protocol for the connection of the LOCAL CONSOLE.
- MODBUS BMS BUS: Communication port 485 with Modbus protocol for the connection of the BMS supervisor.

Additional multifunction card:

- MULTITASK CARD CONNECTION: The multitask expansion board provides contacts for the control of 24V ON/OFF valves, alarm contact, fan contact or card status via some relays.



ORBT10

4.8.2 ROUND TOUCH CONSOLE - ORC4xx

The console is connected to the OPower card installed on the water terminal unit with a double-insulated 3-conductor cable for information exchange of the RS-485 Console Bus network. The 230V mains power supply is supplied separately.

It is equipped with a 4.3" backlit capacitive TFT touch screen and a buzzer for confirming the command selection.

The console can manage the following functions:

- Status: OFF-Comfort-Economy
- Fan: Min, Med, Max, Auto
- Functioning mode: Cooling-Heating-Fan
- Room temperature setting (set-point)
- Weekly program
- Alarms management and visualization
- Parameters management
- Visualization of Input/Output status



ORC436

For a correct operation of the console a NTC air sensor must be mounted on the combined fan coil unit.

4.8.3 ROUND DISPLAY CONSOLE - ORC2xx

The console is connected to the OPower card installed on the water terminal unit with a double-insulated 4-conductor cable for power supply and information exchange of the RS-485 Console Bus network; it is equipped with a LCD backlit screen and four **touch** buttons for the parameters and operation mode settings of the fan coil unit:

- Status: OFF-Comfort-Economy
- Fan: Min, Med, Max, and Auto
- Functioning mode: Cooling-Heating-Fan
- Room temperature setting (set-point)



ORC236

The console is equipped with a NTC sensor for the detection of the room temperature.

The Round Display console can also be used as **Service Tool** (diagnostic tool), allowing:

- Identification by code of any alarm states.
- Modbus address assignment or change and I/O status verification.

4.8.4 ROUND ANALOG CONSOLE - ORC3xx

The console is connected to the OPower card with 4 wires for power supply and information exchange of the RS-485 Console Bus network. The console is composed by:

- 1 knob for the room temperature setting and the deactivation of the water terminal unit;
- 2 buttons for the fan speed selection (Min, Med, Max, Auto) and the operating mode setting (Summer/Winter);
- 1 LED that indicates the operating mode;
- 4 LED for the visualization of the fan speed and any warning status
- 1 NTC integrated air sensor for the detection of the room temperature.



ORC236

4.8.5 ROUND CABIN CONSOLE - ORC6xx

The console is connected to the OPower card with 4 wires for power supply and information exchange of the RS-485 Console Bus network. The console is composed by:

- 1 KNOB for the room temperature setting and the operating mode;
- 1 LED that indicates the operating mode (Cooling or Heating) or any alarm or warning;
- 1 NTC integrated air sensor for the detection of the room temperature.



ORC636

4.8.6 ROUND IR CONSOLE (ORC5xx) AND REMOTE CONTROL (OIR30)

The console is connected to the OPower card with 4 wires for power supply and information exchange of the RS-485 Local Bus network. It can be mounted integrated in the housing of the fancoil (ORC 514) or on the wall (ORC 516).

The console is composed by: 1 NTC integrated air sensor for the detection of the room temperature and 1 LED that indicates the operating mode (Cooling or Heating) or any alarm or warning.



ORC516



OIR30

The console Round IR must be paired to the remote control (OIR 30).

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4.9 OMNIBUS 360 SUPERVISION

4.9.1 ROUND MANAGER - ORS7xx (up to 16 units)

It is a supervisor for small system and is composed by 4.3" capacitive TFT touch screen. It allows the centralization of the operating mode of the **OPower** cards, up to a maximum of 16 cards connected to the network. Each single OPower card can be independently managed by using one of the available OConsoles. The provisioning of a Wi-Fi connection allows the connection to a server Cloud and the remote management by the dedicated app **ROUND CLIMA**.

- MODBUS/RTU protocol
- Parameters set-up
- INPUT/OUTPUT status visualization
- Alarms management
- Daily and weekly programming of all units connected to the same network
- Multilanguage



ROUND MANAGER - ORS736

4.9.2 ROUND MASTER SUPERVISOR - ORS810 (UP TO 100 UNITS)

Round Master is a supervisor for medium-size systems with a 7-inch screen and capacitive touch. It allows managing up to **100 OPower** cards connected to the network via the MODBUS RTU serial bus.

Each single OPower card can be independently managed by using one of the available OConsoles.

With Round Master it is possible to configure complex scenarios and set up seasonal system programming. The supervisor can manage by one control panel the operation of fan coil units and to integrate and interact with other devices of the HVAC system at the same time:

- cooling and heating unit (chiller/boiler);
- circulating pumps of the HVAC system;
- modulating valves (for radiant systems);
- thermal zone valves;
- hydronic terminal units.



ROUND MASTER - ORS810

The main features are:

- Wi-Fi connection allows the connection to a server Cloud and the remote management by the dedicated app **ROUND CLIMA PLUS**
- Ethernet connection
- MODBUS/RTU protocol
- Different access level (administrator/super/user)
- Centralized operation
- Set-up parameters configuration
- INPUT/OUTPUT status monitoring
- Daily, weekly and special events program
- Alarms management
- Boost function for a period set by the user
- Remote management via Internet
- USB port for backup and restore of the system

Round Master supervisor is designed to be installed on the wall or to be placed on a table and has an external 230V/24vdc power supply supplied in the installation kit.

4.9.3 ROUND NET - ORS940 (UP TO 250 UNITS)

Round Net Web server is an embedded system complete with web server, designed to allow terminal units to be connected and managed via the MODBUS network, ensuring a very high level of control.

Thanks to a latest generation processor and high performance components, it is possible to achieve high computing power. Round Net offers the same functions as the Round Master supervisor, but allows you to manage larger networks, controlling **up to 250 OPower cards**.



OCB50

Thanks to the Wi-Fi antenna, it is possible to connect to Round Net via the internet, using a common web browser. It can also connect to a Cloud server and be managed remotely via the **ROUND CLIMA PLUS app**.

Round Net is designed for remote wall installation, typically positioned in technical rooms or **thermal power plants** thanks to the presence on the body of useful air intakes.

Round Net has an external 230V/24Vdc power supply supplied in the installation kit.

4.9.4 APP ROUND CLIMA AND ROUND CLIMA PLUS

With the **Round Clima** and **Round Clima Plus** mobile applications it is possible to remotely manage the system functions via smartphone and tablet.

The application is compatible with both Android and iOS operating systems.

They are only available paired with Round Manager, Round Master and Round Net devices.



ROUND CLIMA and **ROUND CLIMA PLUS** are available in the following app stores:



5. HYDRAULIC ACCESSORIES

5.1 J3B2 – ON/OFF 3-WAY VALVES WITH 4 WATER CONNECTIONS, 3/4", FOR 2 OR 4 PIPE SYSTEMS, 230V

The ON/OFF 3-way regulating valves with bypass are provided with thermoelectric actuator and connection tubes. The direct water flow is closed by not supplying power to the actuator. They are suitable for fan coils size 020÷050 and available also with 24V. They are always supplied loose together with their proper insulating shell.

5.2 J3C2 – ON/OFF 3-WAY VALVES WITH 4 WATER CONNECTIONS, 1", FOR 2 OR 4 PIPE SYSTEMS, 230V

The ON/OFF 3-way regulating valves with bypass are provided with thermoelectric actuator and connection tubes. The direct water flow is closed by not supplying power to the actuator. They are suitable for fan coils size 060 and available also with 24V. They are always supplied loose together with their proper insulating shell.

5.3 J3BM – MODULATING (24V) 3-WAY VALVES WITH 4 WATER CONNECTIONS, 3/4", FOR 2 OR 4 PIPE SYSTEMS

The modulating 3-way regulating valves with bypass are provided with modulating actuator and connection tubes. The direct water flow is closed by not supplying power to the actuator. They are suitable for fan coils size 020÷050. They are always supplied loose together with their proper insulating shell.

5.4 J3CM – MODULATING (24V) 3-WAY VALVES WITH 4 WATER CONNECTIONS, 1", FOR 2 OR 4 PIPE SYSTEMS

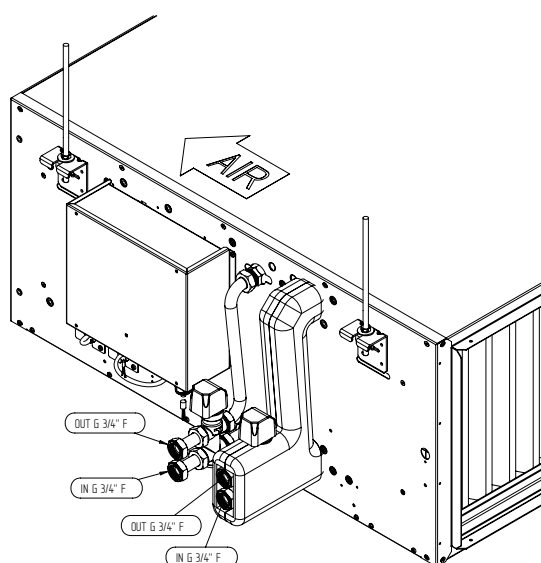
The modulating 3-way regulating valves with bypass are provided with modulating actuator and connection tubes. The direct water flow is closed by not supplying power to the actuator. They are suitable for fan coils size 060. They are always supplied loose together with their proper insulating shell.

5.5 J2B2 – ON/OFF 2-WAY VALVES, 3/4", FOR 2 OR 4 PIPE SYSTEMS, 230V

The ON/OFF 2-way regulating valves with bypass are provided with thermoelectric actuator and connection tubes. They are suitable for fan coils size 020÷050. Available also with 24V (J2B0) or modulating with 24V (J2BM). They are always supplied loose, and must be insulated on site as they are not provided with insulating shell.

5.6 J2C2 – ON/OFF 2-WAY VALVES, 1", FOR 2 OR 4 PIPE SYSTEMS, 230V

The ON/OFF 2-way regulating valves with bypass are provided with thermoelectric actuator and connection tubes. They are suitable for fan coils size 060. Available also modulating with 24V (J2CM). They are always supplied loose, and must be insulated on site as they are not provided with insulating shell.



ESTEBH with J3B2 (020÷050)

TECHNICAL FEATURES OF THE VALVES

Nominal pressure	PN16	Cod.: J3B2, J3BM, J3C2, J3CM, J2B2, J2C2, J2BM, J2CM, J2B0
Fluid	Hot or cold water for HVAC system, according to VDI standard quality or equivalent	Cod.: J3B2, J3BM, J3C2, J3CM, J2B2, J2C2, J2BM, J2CM, J2B0
Hydraulic connection	1" GM* 3/4" GM*	Cod.: J3C2, J3CM, J2C2, J2CM Cod.: J3B2, J3BM, J2B2, J2BM, J2B0
Max close-off pressure	100 kPa 200 kPa	Cod.: J2C2, J3C2, J2CM, J3CM Cod.: J2BM, J3B2, J3BM, J2B2, J2B0
Kvs	2,5 6,3	Cod.: J3B2, J3BM, J2B2, J2BM, J2B0 Cod.: J2C2, J3C2, J2CM, J3CM
Material	Brass	Cod.: J3B2, J3BM, J3C2, J3CM, J2B2, J2C2, J2BM, J2CM, J2B0
Flow temperature limit	2÷110 °C	Cod.: J3B2, J3BM, J3C2, J3CM, J2B2, J2C2, J2BM, J2CM, J2B0
Room temperature limit	2÷50 °C	Cod.: J3B2, J3BM, J3C2, J3CM, J2B2, J2C2, J2BM, J2CM, J2B0
Actuator	On/Off Modulating	Cod.: J3B2, J3C2, J2B2, J2C2, J2B0 Cod.: J3CM, J3BM, J2CM, J2BM
Voltage supply	230 VAC ±10% 24 VAC/DC ±15% 24 VAC/DC +20%...- 10%	Cod.: J3B2, J2B2, J2C2, J3C2 Cod.: J3CM, J3BM, J2BM, J2CM Cod.: J2B0
Control signal	0÷10 Vcc	Cod.: J3CM, J3BM, J2CM, J2BM
Assorbimento	1 W 1,5 W	Cod.: J3B2, J3C2, J2B2, J2C2, J2B0 Cod.: J3CM, J3BM, J2CM, J2BM
Opening and closing time	~ 4 min 4,5 min	Cod.: J3B2, J3C2, J2B2, J2C2 Cod.: J2B0
Protection grade	IP54 IP43	Cod.: J3B2, J2B2, J2C2, J3C2, J2B0 Cod.: J2CM, J3CM, J2BM, J3BM

*** VALVES KIT ENDS WITH A HYDRAULIC CONNECTION 3/4" GF (020÷050) AND 1" GF (060)**

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GRAPHIC PRESSURE DROP VALVES

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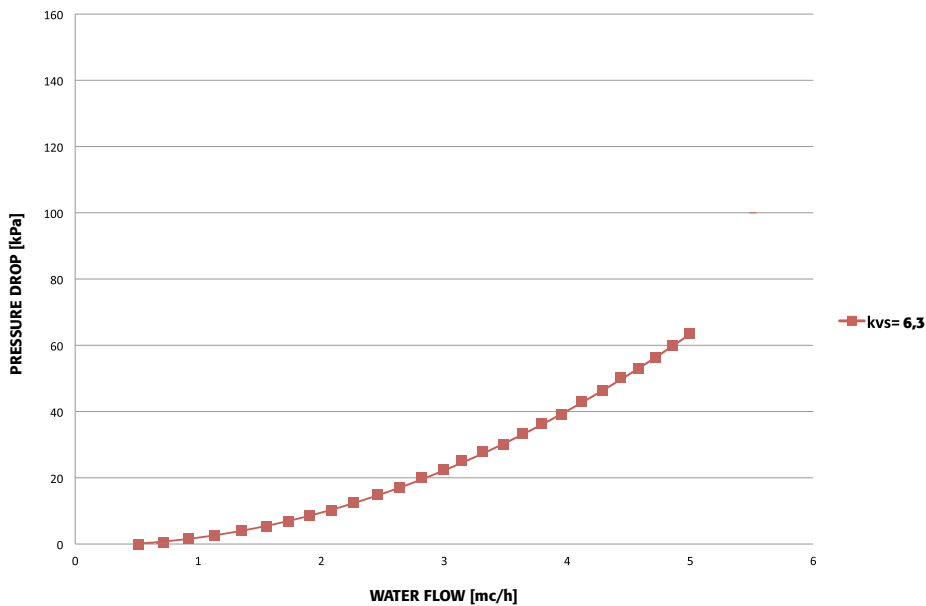
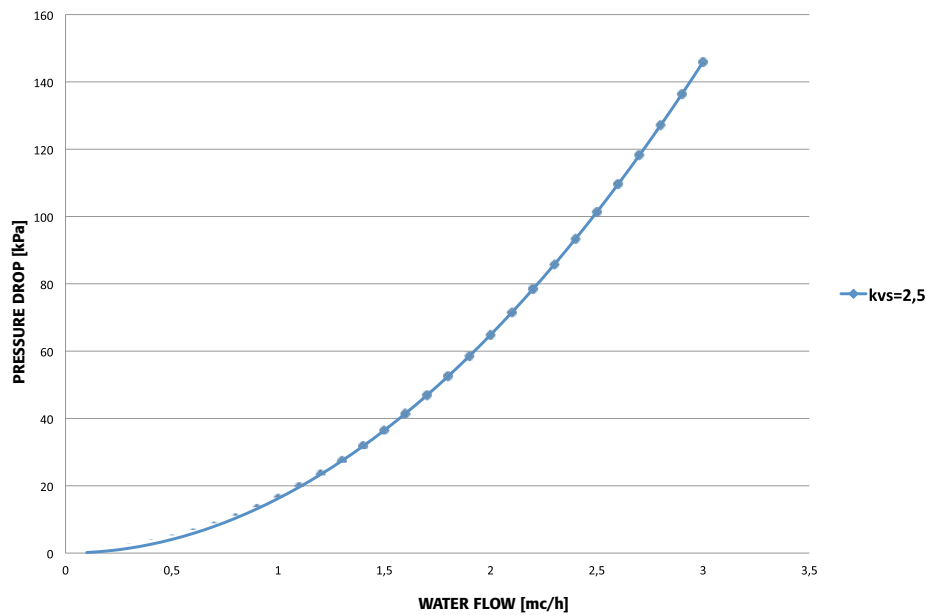
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In order to choose the correct type of valve it is necessary to know the system's technical specifications; for this reason the consultant should take full responsibility for this choice.



MAXIMUM OPERATING PRESSURE WITH VALVES: 16 BAR.

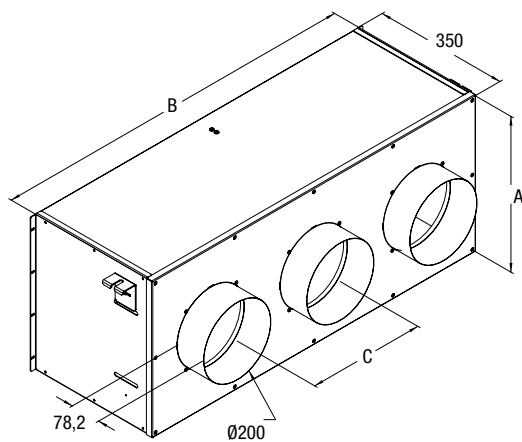
6. OTHER ACCESSORIES

6.1 PM – AIR DELIVERY PLENUM

The air delivery plenum is made of galvanized steel sheet, insulated inside with polyurethane foam, 12 mm thick, provided with spigots for the connection to the air ducts and with fixing supports. It must be installed on the air outlet of the unit.

6.2 PA – AIR INTAKE PLENUM

The air intake plenum is made of galvanized steel sheet, insulated inside with polyurethane foam, 12 mm thick, provided with spigots for the connection to the air ducts and with fixing supports. It must be installed on the air inlet of the unit.



PM-PA					
Size	020	030	040	050	060
N. Collars	3	3	4	4	5
A	403,6		403,6		513,6
B	962,6		1212,6		1607,6
C	306,5		300		311



Filter F5 (on request)

6.3 FILTER F5

High filtering grade air filter consisting of a polyester acrylic fiber foam, filtration class F5.

6.4 RAL PAINTING

The complete structure of the unit can be painted with oven dried epoxy powders. The standard colour is white (RAL 9001) but the full range of RAL colours is available upon request, with possible delays in the delivery time.

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7. TECHNICAL DATA

7.1 AIR VOLUMES [m³/h] AT DIFFERENT EXTERNAL STATIC PRESSURES [Pa]*

The air volume refers to standard fan coils, with clean air filter, 20 °C room temperature, at sea level and without plenum.

Nominal values (m³/h)

		24 Pa	50 Pa	85 Pa
Size 020	5 V	549	-	-
	7 V	-	796	-
	9 V	-	-	1040
		36 Pa	50 Pa	86 Pa
Size 030	6 V	1241	-	-
	7 V	-	1471	-
	9 V	-	-	1948
		24 Pa	50 Pa	85 Pa
Size 040	5 V	1484	-	-
	7 V	-	2160	-
	9 V	-	-	2848
		37 Pa	50 Pa	63 Pa
Size 050	7 V	2442	-	-
	8 V	-	2834	-
	9 V	-	-	3217
		30 Pa	50 Pa	75 Pa
Size 060**	7 V	2972	2999	3336
	8 V	3224	3599	3996
	9 V	-	4337	4521

*as certified by Eurovent

**out of scope Eurovent.

7.2 COOLING CAPACITIES, 4 ROWS, AT DIFFERENT EXTERNAL STATIC PRESSURES [Pa]*



ROOM TEMPERATURE: 27 °C d.b. - 47% r.h. - TEMPERATURE WATER: 7/12 °C

Speed			020	030	040	050	060
MIN	Total cooling capacity	kW	4,23	7,11	8,43	11,90	18,79
	Sensible cooling capacity	kW	3,16	5,47	6,46	9,56	14,49
	Water flow	l/h	728	1224	1451	2048	3224
	Pressure drop	kPa	6,8	18,8	17,7	34,7	20,5
MED	Total cooling capacity	kW	5,62	8,13	11,22	13,25	20,32
	Sensible cooling capacity	kW	4,30	6,34	10,82	10,82	15,78
	Water flow	l/h	812	1399	1931	2281	3488
	Pressure drop	kPa	11,6	24,0	30,6	42,9	23,4
MAX	Total cooling capacity	kW	6,75	9,94	13,64	14,40	23,82
	Sensible cooling capacity	kW	5,27	7,98	11,17	11,94	18,76
	Water flow	l/h	1162	1711	2348	2478	4088
	Pressure drop	kPa	16,5	35,4	45,0	50,9	30,8

MIN-MED-MAX: 020 and 040=5V-7V-9V; 030=6V-7V-9V; 050 and 060=7V-8V-9V

* as certified by Eurovent

7.3 HEATING CAPACITIES, 4 ROWS, AT DIFFERENT EXTERNAL STATIC PRESSURES [Pa]*



ROOM TEMPERATURE: 20 °C d.b. - 50% r.h. - Water temperature: 45/40 °C

Velocità			020	030	040	050	060
MIN	Heating capacity [kW]	kW	4,11	7,81	9,35	14,37	21,23
	Water flow [l/h]	l/h	707	1344	1609	2473	3689
	Pressure drop [kPa]	kPa	5,8	19,3	19,3	43,1	19,8
MED	Heating capacity [kW]	kW	5,65	9,07	12,87	16,25	23,25
	Water flow [l/h]	l/h	972	1561	2215	2797	4041
	Pressure drop [kPa]	kPa	10,4	25,4	34,8	54	23,2
MAX	Heating capacity [kW]	kW	7,07	11,52	16,24	18,07	28,00
	Water flow [l/h]	l/h	1217	1983	2795	3110	4866
	Pressure drop [kPa]	kPa	15,4	39,1	53,2	65,7	32,1

MIN-MED-MAX: 020 and 040=5V-7V-9V; 030=6V-7V-9V; 050 and 060=7V-8V-9V

*as certified by Eurovent

7.4 ELECTRICAL DATA

Electrical data refer to standard fan coils with clean filter and at different external static pressure (Eurovent). A dirty filter or an external air pressure drop will lower the absorbed power level. The installation of electric accessories increases the absorbed power level.

Speed	Absorbed current [A]			Power input [kW]			Power supply [V ph-Hz]
	MIN	MED	MAX	MIN	MED	MAX	
020	0,29	0,58	1,08	0,036	0,075	0,161	230-1-50/60*
030	0,53	0,68	1,12	0,091	0,132	0,261	230-1-50/60*
040	0,53	0,97	1,85	0,082	0,196	0,405	230-1-50/60*
050	1,12	1,59	2,17	0,234	0,341	0,478	230-1-50/60*
060**	2,02	2,67	4,16	0,386	0,541	0,926	230-1-50/60*

MIN-MED-MAX: 020 and 040=5V-7V-9V; 030=6V-7V-9V; 050 and 060=7V-8V-9V

* For a correct selection at 60 Hz of the units, pls use the EURAPO software for selection.

**out of scope Eurovent.

7.5 WORKING OPERATION LIMITS

Each high pressure ducted unit can work properly only if the operating limits listed below are respected:

- Max. operating pressure (water side): 1,6 Mpa
- Min. inlet cold water temperature: 5 °C
- Max. inlet cold water temperature: 20 °C
- Min. inlet hot water temperature: 35 °C
- Max. inlet hot water temperature: 75 °C



In order to select the ESTEBH ducted fancoil with calculating conditions differing from the standard ones or with DISTRICT COOLING coils, please use the EURAPO software for selection.



Note. Some units can present the risk of condensing water sprays if selected under particular calculating conditions in water temperature and relative humidity. In this case it is necessary to modify the calculating parameters or select a different ESTEBH model.



Unit size 060 can be used only with external static pressure >30Pa. For a correct selection of the units, pls use the EURAPO software for selection.

8. NOISE LEVELS



8.1 SOUND POWER

The acoustic emission characteristics of any noise source is defined as its **«sound power»** (SWL). This typical measurement indicates the total radiated energy which does not vary for a given noise source; that is, it does not depend on the observer, location, distance or any other factor which is not part of the source. Following please find the values of the sound power level.

8.2 SOUND PRESSURE IN A CLOSED ENVIRONMENT

The perceived noise radiated from a sound source is something quite different: noise perception is indicated by its **«sound pressure»** (SPL). Even though it is caused by the emission of a sound energy, it greatly depends on the environment through which the sound travels, on the distance from the source and on all other circumstances that are not directly related to the primary noise source.

Besides the distance from the source, the most important factor that influences the **«sound pressure»** (and, as a result, the perceived noise) in a closed environment is the amount of sound energy reflected off surfaces that have a greater or lesser reflection capacity: it depends, therefore, on the re-transmission of sound energy (power) acting upon reflecting surfaces.

Covering the walls with sound absorbing material (i.e. material with a low sound reflecting capacity) is the most effective way to reduce the noise level in a closed environment.

The following values indicate the sound pressure emitted by high pressure unit, calculated in open field at 1 meter distance. By using the EURAPO software for selection it is possible to calculate the new sound pressure level obtained by changing the parameters: room volume, distance from the noise source and reverberation time.

The reverberation time measures the sound characteristics of a room: it increases as the room dimensions increase and decreases as the sound absorption capacity of the structure increases.

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The following sound levels are referred to ESTEBH units with air delivery plenum with spigots, at different Pa of external static pressure.

MOD	SPEED	EXT. STATIC PRESSURE (Pa)	Lw	Lp
			DB(A)	DB(A)
020	min	Outlet inlet + structure 24 Pa	49	38
			47	36
	med	Outlet inlet + structure 50 Pa	58	47
			56	45
	max	Outlet inlet + structure 85 Pa	65	54
			63	52
030	min	Outlet inlet + structure 36 Pa	57	46
			54	43
	med	Outlet inlet + structure 50 Pa	61	50
			57	46
	max	Outlet inlet + structure 86 Pa	68	57
			63	52
040	min	Outlet inlet + structure 24 Pa	57	46
			55	44
	med	Outlet inlet + structure 50 Pa	66	55
			63	52
	max	Outlet inlet + structure 85 Pa	71	60
			68	57
050	min	Outlet inlet + structure 37 Pa	69	58
			66	55
	med	Outlet inlet + structure 50 Pa	72	61
			69	58
	max	Outlet inlet + structure 63 Pa	75	64
			71	60
060*	min	Outlet inlet + structure 30 Pa	74	63
			70	59
	med	Outlet inlet + structure 50 Pa	77	66
			72	61
	max	Outlet inlet + structure 75 Pa	81	70
			76	65

*Out of scope Eurovent FCP

Lw= Total sound power level

Lp= Total sound pressure level in open field at 1 m from the source

dB(A)= Sound level, weighted

9. ELECTRICAL CONNECTIONS

Most frequently used wiring diagrams:

LEGEND (for all the electric diagrams)

M Fan motor

N Neutral

L Phase

PE Earth

PR Power Relay card

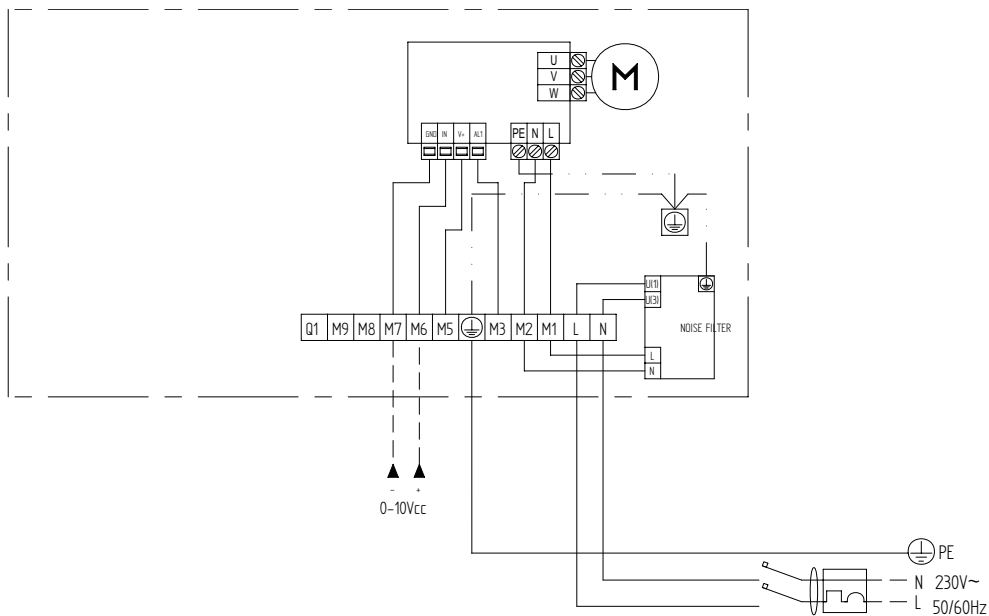
X Terminal board

EV Regulating valve: EVC for cooling;
EVH for heating

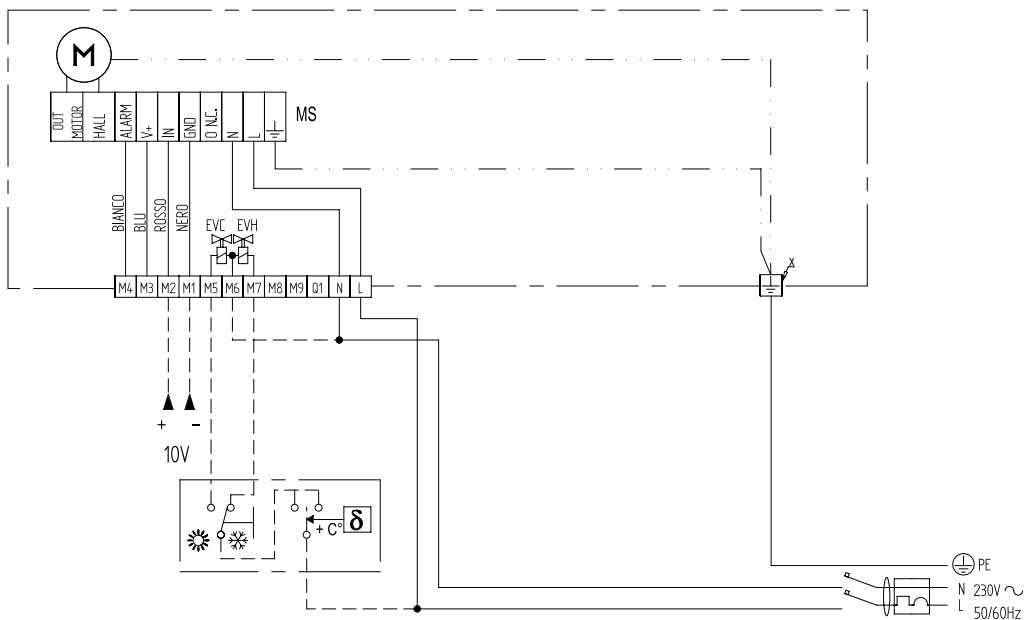
PC Condensate pump

☀ ☄ Summer/Winter switch

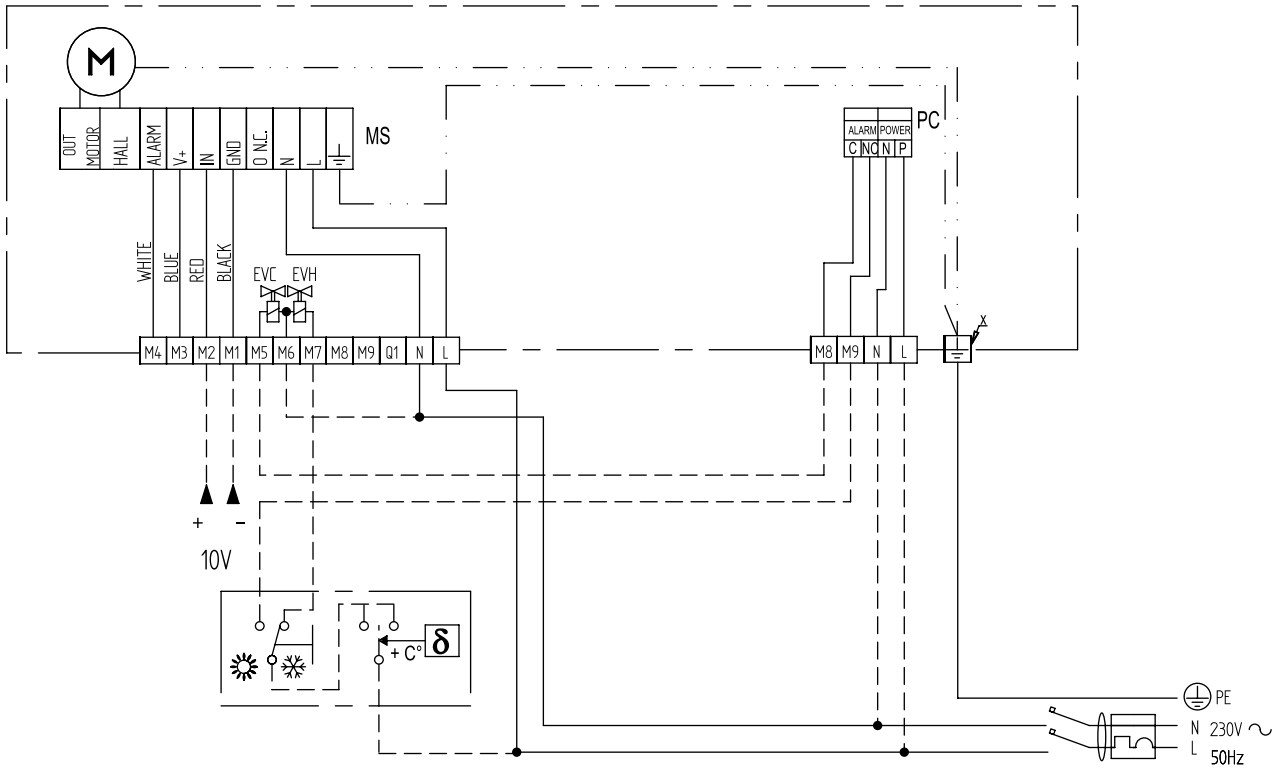
EST - QET00



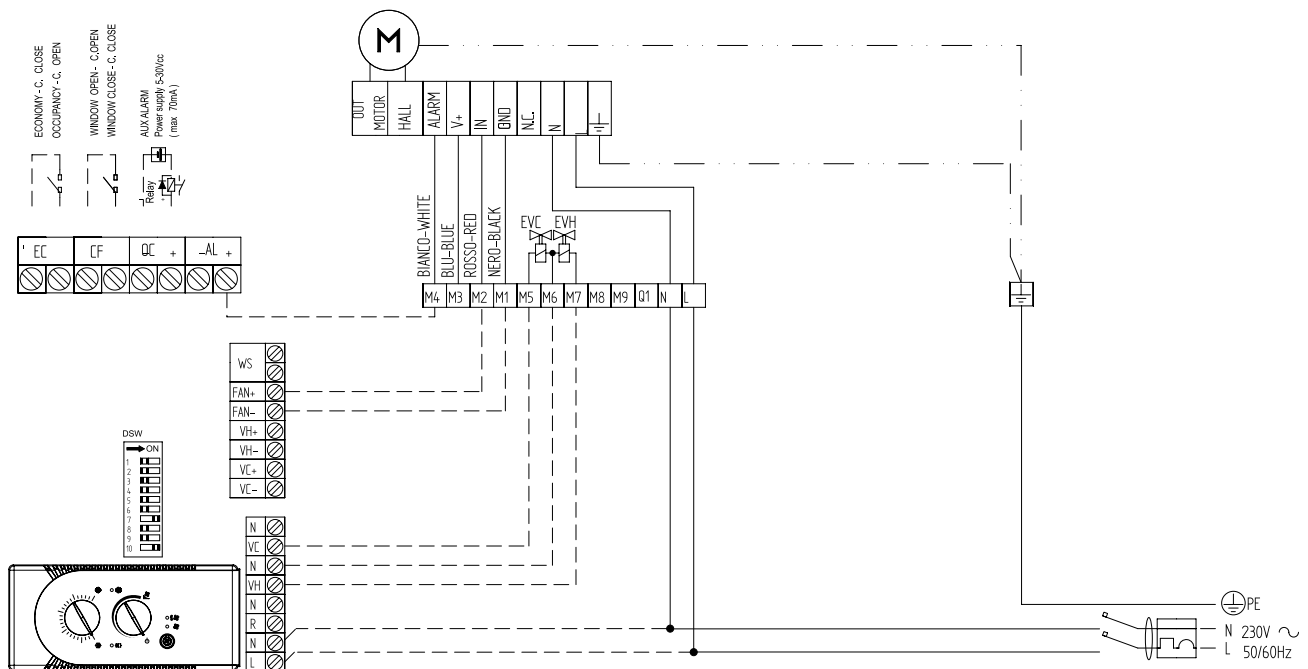
EST - QET00 - EVC- EVH



EST - QET00 - EVC - EVH - PC



EDCR - EST - QET00 - EVC - EVH

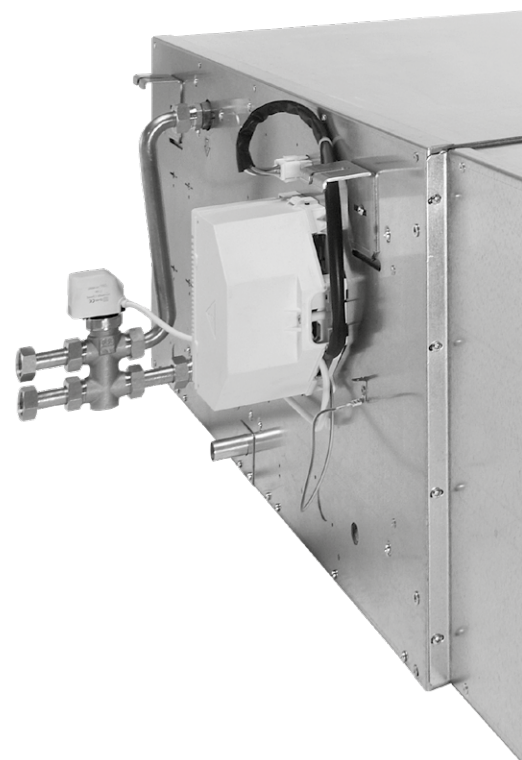


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CE



www.eurovent-certification.com
www.certiflash.com

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