

**KDVRWY300**

Description

The KDV machines are integrated units for ceiling installation to be used in combination with radiant systems for air treatment, with ventilation duct option, dehumidification and sensitive power integration.

When connected to a radiant panel system, the KDVRWY300 unit is able to carry out air treatment operations according to the different needs relating to the seasons and to environmental wellbeing, through the following functions:

- air renewal, both in summer and winter, with heat recovery of 90%;
- air renewal without heat recovery (with external accessory);
- dehumidification in summer with temperature control of the air delivered into the environment;
- summer cooling without dehumidification through the radiant plant water;
- heating of the air in winter through the hot water in the radiant system.

The machine is made from a zinc-plated sheet structure that collects: a direct expansion refrigeration circuit and an alternative refrigeration compressor, a coil with fins fed from the hydraulic circuit of the radiant system, a high-efficiency air/air heat recovery, two dampers (one optional) to regulate the aerulic flows and two electronically controlled EC fans.

Thanks to the particular fans used, the machine's electronic controller allows the user to set the air flow rate in the various functions: the unit will achieve these flow rates regardless of the pressure drop of the air ducts, provided these do not exceed the maximum pressure available.

Versions and product codes

Product code	Dehumidification	Cooling integration	Ventilation	Ref. technical communication
KDVRWY300	YES	YES	YES	0573EN
KDVRAY300	YES	YES	YES	0574EN

Technical data

TECHNICAL DATA	
Water	condensation
Electricity supply	230 V 50 hz
Weight	71 Kg
Total dehumidification flow rate	44,9 l/24 h 1083 W
Effective dehumidification flow rate (relative to recirculation)	25,9 l/24 h 625 W
Effective refrigeration flow rate (relative to recirculation)	1050 W
Electric power absorbed by compressor	460 W
Required water flow rate	400 l/h
Water circuit pressure drop	8 kPa
Power absorbed by delivery fan	min 30 W max 70 W
Delivery fan flow rate	min 200 m ³ /h max 300 m ³ /h
Delivery fan effective pressure	200 Pa
Power absorbed by discharge fan	min 15 W max 30 W
Discharge fan flow rate	min 200 m ³ /h max 300 m ³ /h
Discharge fan effective pressure	100 Pa
Energy recovery when set to winter function (20 °C - 50% RH inside, -5 °C - 50% RH outside)	Flow rate 80 m ³ /h - efficiency 95 % Flow rate 160 m ³ /h - efficiency 91 %
Energy recovery when set to summer function (26 °C - 65% RH inside, 35 °C - 50% RH outside)	Flow rate 80 m ³ /h - efficiency 93 % Flow rate 160 m ³ /h - efficiency 86 %
Sound pressure level (in free field conditions, 1 m distance)	39 dB(A)

Main components

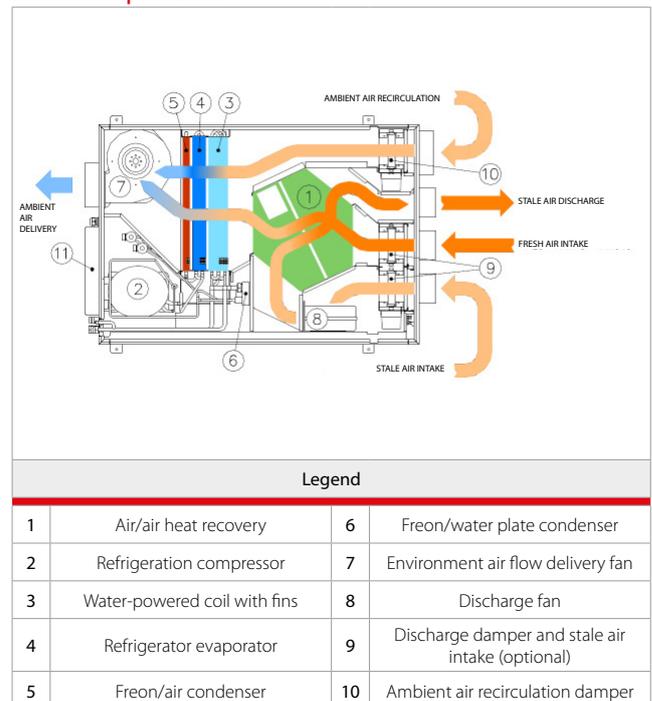


Figure 1 -Components

Aeraulic function

The air flow rate treated by the machine can be set through the control panel, the fans automatically revert to the speed required to overcome the losses of pressure in the ducts.

Two air flows are possible within the machine: air renewal without heat recovery, via the counter-current flow air/air recuperator (1), and the ambient air recirculation.

Renewal and recirculation flows can be combined or not, depending on the flow rate and the type of treatment to be performed on the air entering the system.

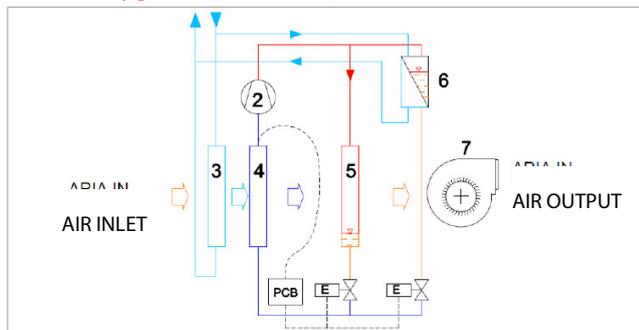
The following air treatment operations can be performed:

- air renewal with optional winter heating or summer cooling;
- recirculation of air with winter heating, summer cooling, summer dehumidification, and summer cooling and dehumidification combined;
- recirculation of air with partial renewal, along with all treatments provided for in the recirculation setting.

The flow rates of air can take on the following values:

- air introduced into the environment, with variable recirculation rate: flow rate can be set from 200 m³/h up to 300 m³/h;
- Fresh air: flow rate can be set from 80 to 160 m³/h.

Thermo-hygrometric function



LEGEND

2	Refrigeration compressor	6	Freon/water plate condenser
3	Water-powered coil with fins	7	Environment air flow delivery fan
4	Refrigerator evaporator	PCB	Electronic control board
5	Freon/air condenser	E	Electronic expansion valve

Figure 2 - Thermo hygrometric function

COOLING: The coil with fins (3), connected to the hydraulic radiant system, allows for cooling in the summer and heating in the winter; the output temperature can be adjusted by the machine itself, with the addition of an external mixing valve (supplied as an accessory) or with the mixing valve and adjustment of the radiant system.

DEHUMIDIFICATION AND COOLING: the air is pre-cooled by the water coil (3) which is powered by the radiant system; the refrigerator evaporator (4) carries out the cooling and consequent dehumidification of the air.

The refrigerator circuit of two condensers connected in parallel: in addition to the air-cooled condenser (5) a second plate condenser (6) disposes of the condensation heat in the water.

The two electronic expansion valves allow the distribution of the condensation heat between air and water, in the desired proportions; in this way, the air exiting the system can be adjusted to the desired temperature between the coldest and neutral.

The output air temperature values that can be set are:

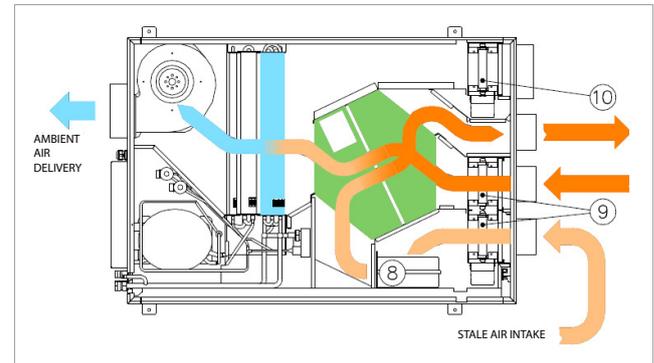
- neutral summer temperature;
- summer integration temperature;
- neutral winter temperature;
- winter integration temperature;



Note.
The refrigerator circuit cannot be launched in the winter or when set to pure renewal.

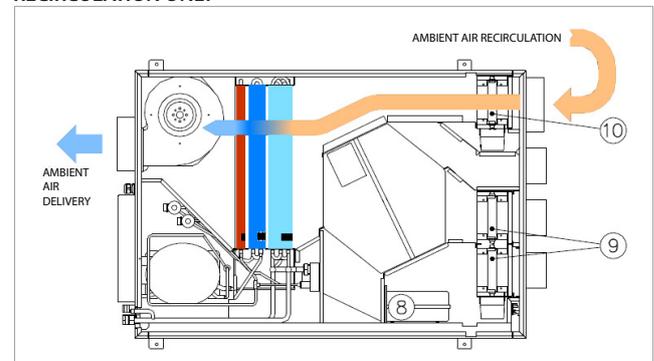
Summer function setting

RENEWAL ONLY



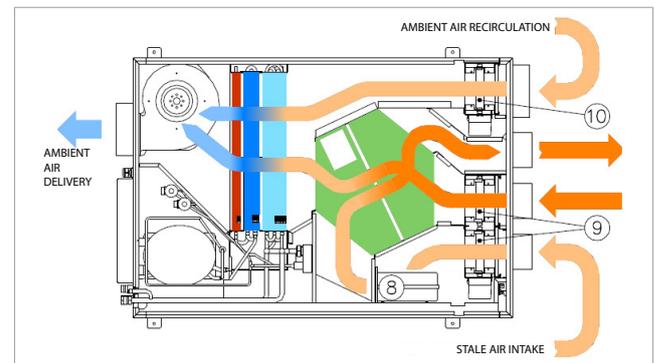
- Damper 9 is open (if present), damper 10 is closed;
- air flow rate can be set from 80 to 160 m³/h;
- the delivery air temperature can be corrected through the water coil.

RECIRCULATION ONLY



- Damper 9 is closed (if present), damper 10 is open;
 - air flow rate can be set from 200 to 300 m³/h;
 - the delivery air temperature can be corrected through the water coil, and if the dehumidification or (cold) integration functions are activated, the refrigerator circuit.
- In this last case, maximum air cooling can be achieved.

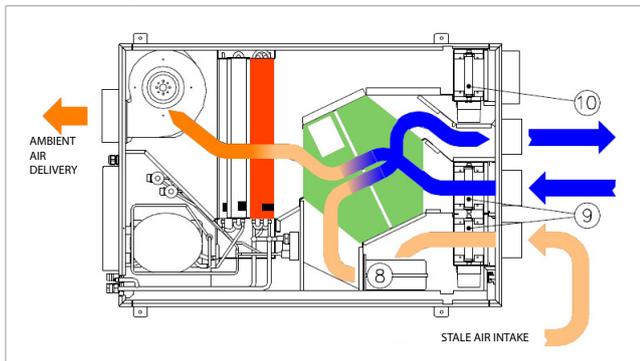
RENEWAL AND RECIRCULATION



- Damper 9 is open (if present); a dedicated differential pressure sensor guides the partial opening of damper 10 in order to ensure correct distribution of the flow rate;
 - renewed air flow rate can be set from 80 to 160 m³/h;
 - delivery air flow rate can be set from 200 to 300 m³/h;
 - the delivery air temperature can be corrected through the water coil, and if the dehumidification or (cold) integration functions are activated, the refrigerator circuit.
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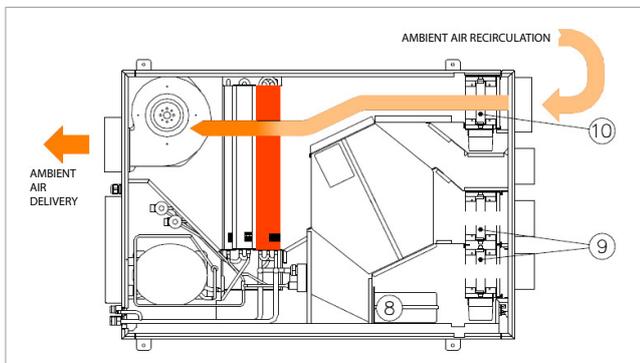
Winter function setting

RENEWAL ONLY



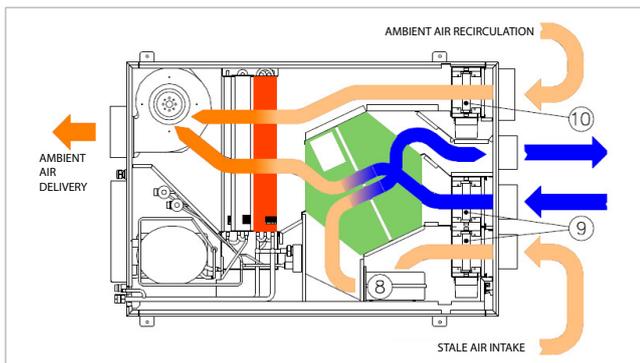
- Damper 9 is open (if present), damper 10 is closed;
- air flow rate can be set from 80 to 160 m³/h;
- the delivery air temperature can be corrected through the water coil.

RECIRCULATION ONLY



- Damper 9 is closed (if present), damper 10 is open;
- air flow rate can be set from 200 to 300 m³/h;
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RENEWAL AND RECIRCULATION



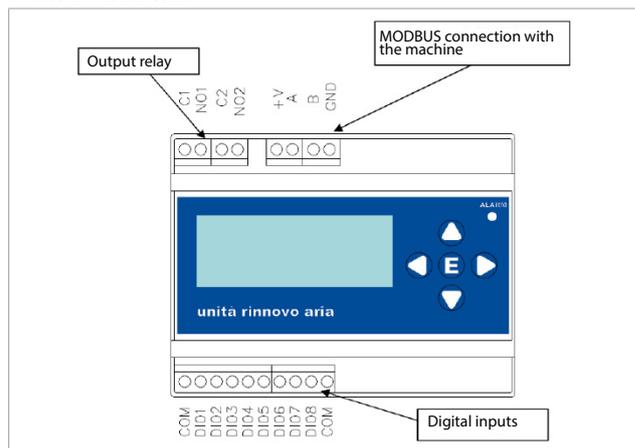
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- renewed air flow rate can be set from 80 to 160 m³/h;
- delivery air flow rate can be set from 200 to 300 m³/h;
- the delivery air temperature can be corrected through the water coil.

Control panel

The machine is equipped with a remote control panel to be mounted on a DIN rail in a wall-mounted electrical cabinet.

The control panel is equipped with 3 terminal boards, with the following connections:

- the connection to the machine, through the four wires that supply power to the panel (24 V) and the serial communication with the electronics board;
- the digital activators for the various functions;
- the two digital relay outputs which activate a circulation pump and an alarm in case of malfunction.



MODBUS connection

The connection is carried out with 4 wires; at the ends of A and B, insert the terminating resistor supplied. The V+ wire supplies 24 V of power to the panel. If the connection is longer than 25 metres, use a shielded cable.

Output relay

- C01-NO1: 250 V AC – 5 A relay activated when water circulation is required, useful for controlling a pump.
- C01-NO2: 250 V AC – 5 A relay activated in the presence of an alarm, useful for providing a remote alarm signal.

Digital inputs

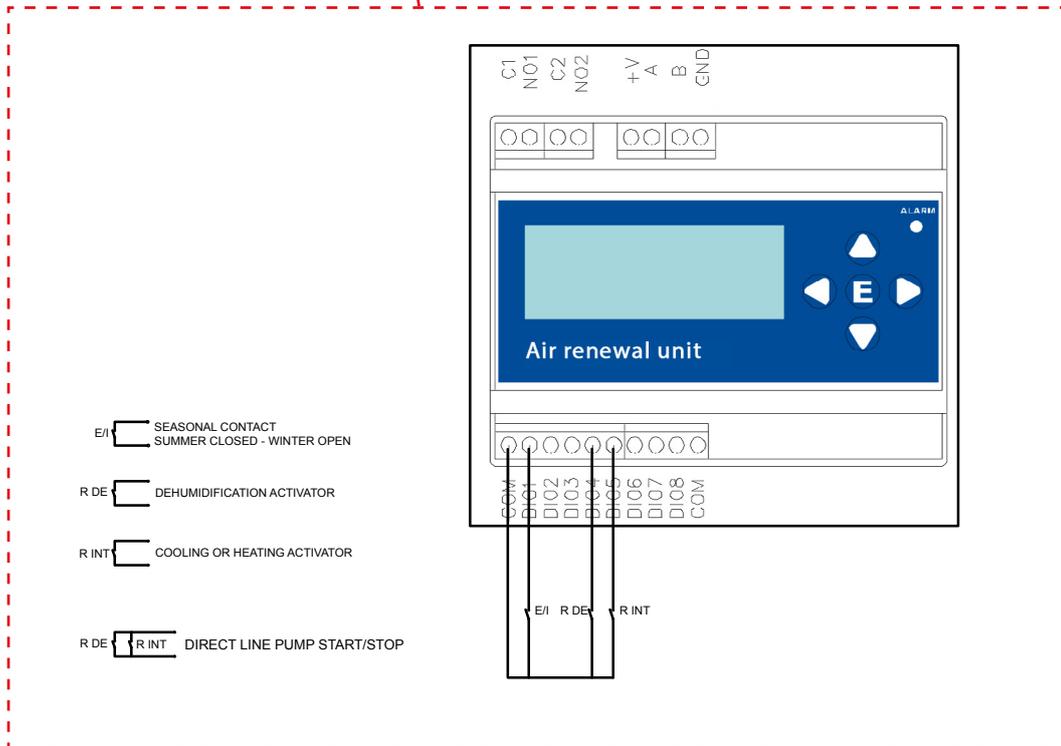
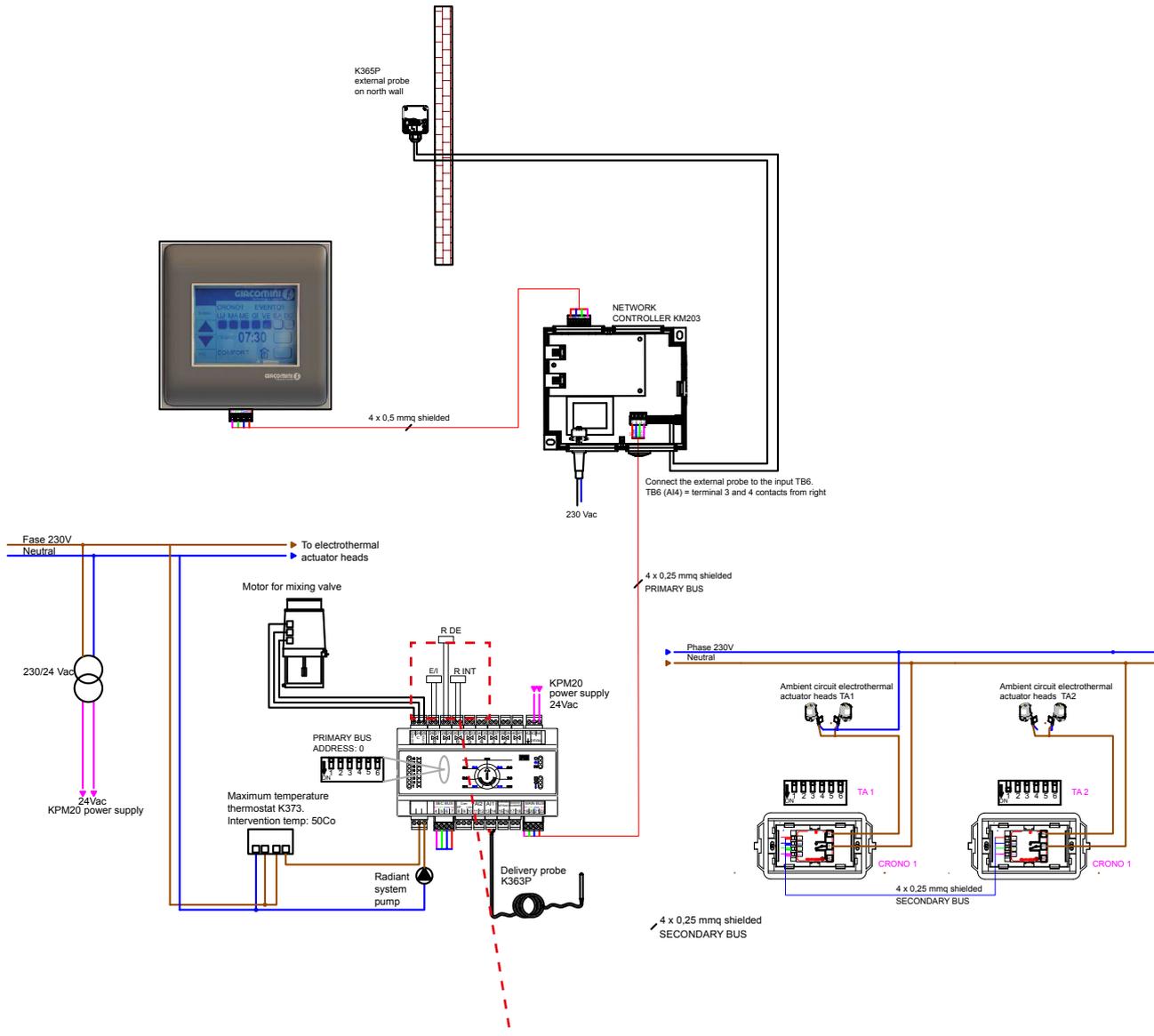
- COM: Common terminal for all inputs;
- DI01: season indicator, 1 = summer, 0 = winter, if the season is set from digital input instead of from the keyboard;
- DI02: environment fan activator; this is not a function mode, but keeps the air moving in a given environment;
- DI03: renewal activator;
- DI04: dehumidification activator;
- DI05: cooling activator if the season is set to SUMMER, or heating if the season is WINTER;
- DI06: renewal blocker, allows users to block a renewal set with DI03 or with hour bands. This input, if connected in conjunction with the DI03 to a 3-position selector of 0-1-2 type, allows users to activate a function with three possibilities: renewal ON, renewal OFF, AUTOMATIC renewal; through time bands.
- DI07: not available
- DI08: flow rate attenuation activator.

AVAILABLE SETTINGS ON THE KEYBOARD

- activation of functions (alternative to digital activators);
- clock, season (alternative to digital activators);
- air delivery and renewal flow rate;
- normal delivery temperature and integration temperature for each season;
- automatic renewal hour bands (maximum 4);
- flow rate attenuation hour bands (maximum 4).

Furthermore, the machine is equipped with temperature sensor values which can be read here, useful when testing or verifying proper function.

Example of connection with Giacomini bus system



Connections

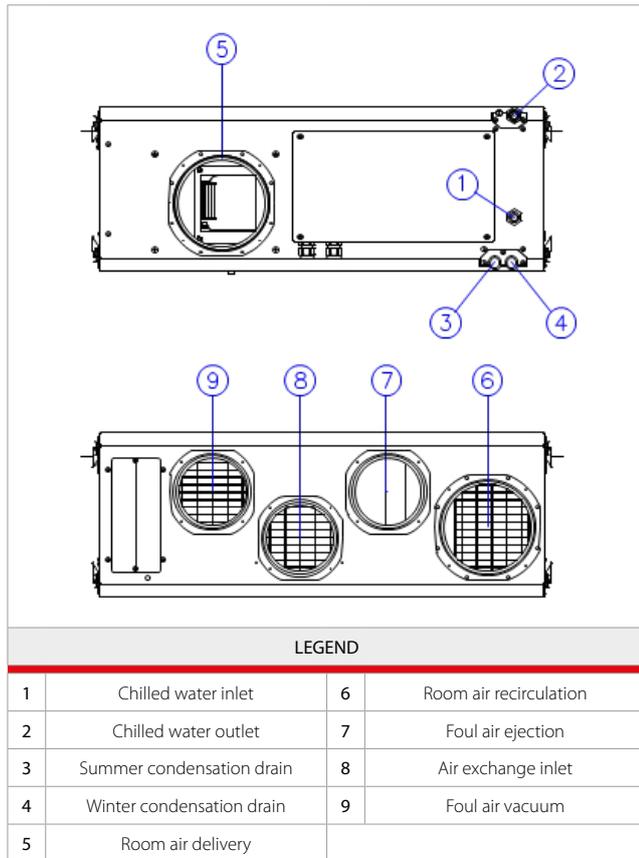


Fig. 3 - Connections

Electric connection: 3x1,5 mm²

Control panel connection 4x0,5 mm², shielded if L > 25 m

Hydraulic connections: 1/2" F

Aeraulic connections: delivery and recirculation Ø 160
renewal, discharge and recovery Ø 125



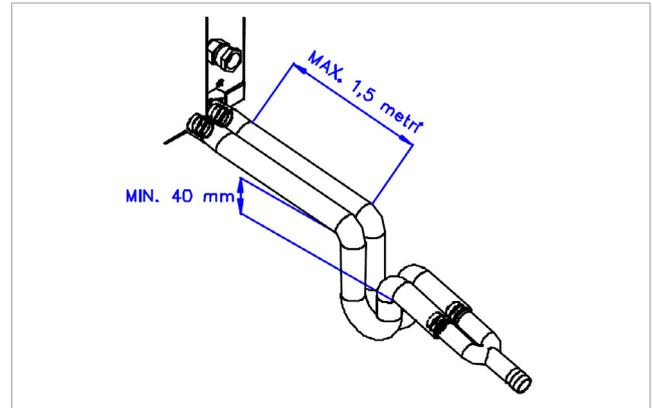
Note.

The condensation drain must have 2 independent siphons with a minimum height of 50 mm, which can only be assembled downstream.

Siphons for the discharge of the condensate

The drains of the condensates are two, one for the summer condensation and one for winter condensation.

They are indispensable to prevent suck back of air can prevent proper drainage of the condensate possibly formed; they must be independent, with a difference of a minimum height of 40 mm and installed near the exhaust ducts of the machine.



Dimensions

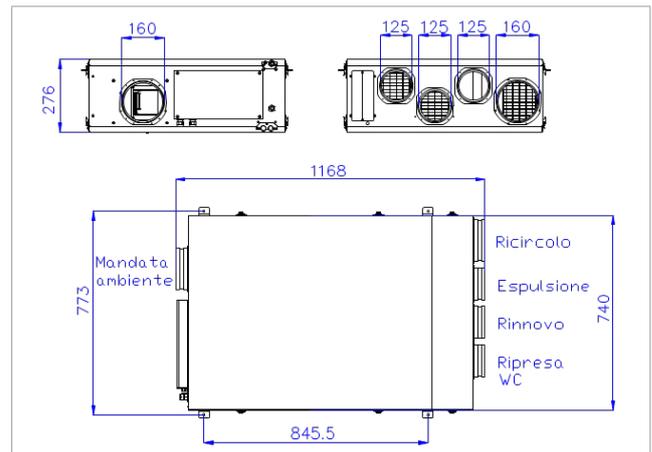


Figure 4 - Dimensions in mm

Product specifications

KDVRWY300

Integrated air treatment unit with ventilation duct option, dehumidification and sensitive power integration for false ceiling installation, to be used alongside radiant cooling systems complete with high-efficiency heat recovery air counter-current (efficiency > 86%), removable filter section in class G3 synthetic material (EN779:2002), 2 "brushless" centrifugal fans with direct coupled 3-speed motor, 5 motorized dampers, refrigeration circuit with R134a refrigerant gas, hydraulic circuit, treatment batteries with copper pipe and aluminium fins and 5 delivery units, recirculation, extraction, external socket, 125 mm diameter discharge. Total flow rate 260÷300 m³/h. External air flow rate 80÷160 m³/h. Dehumidification flow rate 25,9 l/24 h (depending on internal environment). Ambient temperature working range 15÷32 °C. Pre-calibration pressure 40 Pa. Water connections 4x1/2" F. 230 V power supply.

Additional information

For more information, go to www.giacomini.com or contact our technical assistance service: ☎ +39 0322 923372 📠 +39 0322 923255 ✉ consulenza.prodotti@giacomini.com

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