


KDSRY500

Description

The KDS machines are monobloc units for installation in false ceilings, to be combined with radiant systems for moisture control with possible integration of sensible available power.

Versions and product codes

Machines

Product code	Dehumidification	Cooling integration	Technical communication ref.
KDSY026	YES	NO	0551IT
KDSRY026	YES	YES	0552IT
KDSRY350	YES	YES	0553IT
KDSRY500	YES	YES	0554IT

Accessories

Product code	Description
KDSPLY026	Delivery plenum with 4 units Ø 100 mm for KDSY026 and KDSRY026
KDSPLY350	Delivery plenum with 6 units Ø 100 mm for KDSRY350

Technical data

CONSTRUCTION CHARACTERISTICS	
Cooling compressor	Airtight, single-cylinder alternative
Refrigerant gas	R134a
Electricity supply	230 V 50 hz
Pre-cooling coil	Copper pipes and aluminium fins with hydrophilic treatment
Evaporator coil	Copper pipes and aluminium fins with hydrophilic treatment
Post-heating coil	Copper pipes and aluminium fins
Water condenser	With braze-welded plates in AISI 316 stainless steel
Hydraulic connections for pre-cooling coil	2 x 1/2"F
Hydraulic connections for condensation coil	2 x 1/2"F
Air filter	Filtering material in synthetic fibre class G3 (EN 779:2002)

CHARACTERISTIC DATA	
Air flow rate [m³/h]	500
Available pressure [Pa]	60
Moisture removed (26 °C - 65% R.H. - inlet water 15 °C) [l/24h]	60,1
Nominal electric power [W]	650
Nominal current [A]	3
Maximum power absorbed by fan [W]	100
R134a refrigerant load [g]	680
Pre-cooling water flow rate [l/h]	500
Loss of pressure in pre-cooling water [kPa]	16
Suction air temperature [°C]	15÷32
Water temperature working range [°C]	12÷22

PERFORMANCE (water at 15 °C)						
Inlet air conditions [°C - R.H. %]	Total cooling capacity [W]	Sensible cooling capacity [W]	Latent cooling capacity [W - l/24h]	Sensible cooling capacity (ambient) [W]	Latent cooling capacity (ambient) [W - l/24h]	Minimum delivery air temp. [°C]
26 - 55	3350	2260	1090 - 37,6	-	- -	13,1
26 - 65	3810	2070	1740 - 60,1	-	- -	14,1
30,5 - 64,4	5320	2500	2820 - 97,4	1742	622 - 21,5	16,4
35 - 50	5940	3208	2732 - 94,4	1693	514 - 17,7	16,8

Notes

- a) the first two input air conditions refer to recirculation mode; the third refers to the situation where all the external air is treated in a heat recovery unit with 50% efficiency compared to sensible; the fourth refers to the mode where all the external air has the characteristics traditionally taken as project conditions for locations in southern Italy.
- b) in the operating mode where the air entering the machine is different from the ambient air, the cooling capacity of the latter is also shown (assumed to be 26 °C with 65% R.H.)

Main components

STRUCTURE: in galvanised metal panels entirely covered with a sound-absorbent coating in foam polyurethane with open cells.

FILTERING SECTION: filtering structure in galvanised metal, with G3 filter that can be removed from every side of the machine.

COOLING CIRCUIT: in copper pipes; finned aluminium coils with copper pipes, water-freon heat exchanger in braze-welded stainless steel plates. Alternative piston-operated cooling compressor; moisture filter, thermostatic thermal expansion valve, on-off valve on the circuit for changing the operating mode.

HYDRAULIC CIRCUIT: in copper pipes, with finned aluminium coil and copper pipes for air pre-treatment; plate exchanger for refrigerant cooling; on-off valve for operating mode change. The galvanised metal machine frame contains the finned coils for air treatment, the cooling circuit for dehumidification, the suction air filter, the condensate collection basin, the delivery fan, and the electric command panel.

FAN: dual suction centrifuge with forward blades, with direct-coupled 6-speed motor; the operating speed is set by choosing the wires to be connected to the electricity supply.

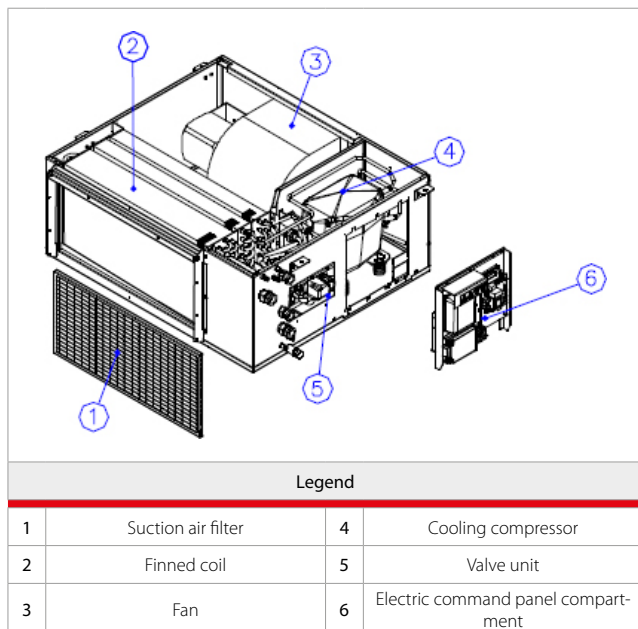


Figure 1 -Components

Operation

Operation with neutral air (dehumidification without cooling)

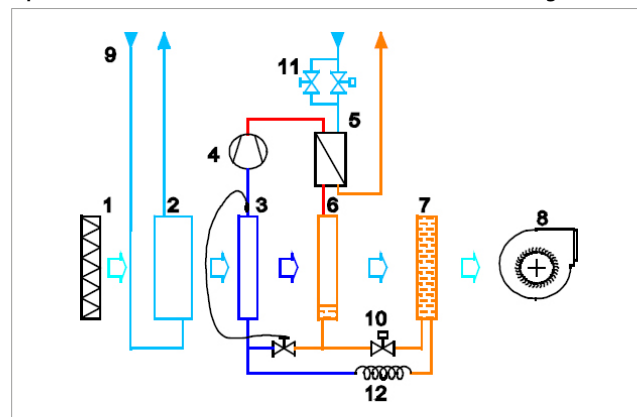


Figure 2 - Operating diagram with neutral air

The air is filtered via the filtering section (1) and is pre-cooled via the cooled water exchanger (2). The air is then dehumidified by passing through the finned coils of a cooling circuit: the actual dehumidification takes place in the first coil (3 - evaporator), while in the second (6 - condenser) the post-heating operation uses the heat developed by the compressor. The outlet air is neutral compared with the machine inlet temperature; this effect is obtained by using the manual valve (11) (factory-calibrated) to set the minimum water flow rate in the plate exchanger (5) that removes the excess heat. The finned exchanger (7) acts as a cooling liquid accumulator and has a limited effect in this operating mode. The machine is able to function in this mode even without water; with no pre-cooling or heat dispersal however, the outlet air temperature will be higher than that of the inlet air.

Integration operation (dehumidification with cooling)

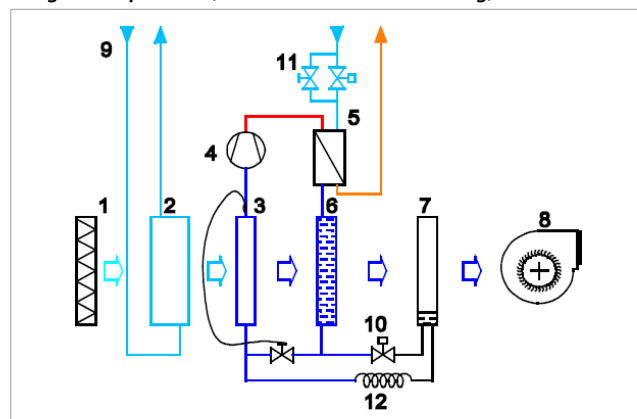


Figure 3 - Operating diagram in integration mode

In this mode, the solenoid valve (10) is closed and a thermo-activated valve is opened to ensure the maximum flow rate to the plate condenser (5); the accumulator (7) drains towards the capillary pipe (12) and the freed liquid accumulates in the condenser (6). When the condenser is completely full of liquid, heat dispersal is inhibited and takes place almost entirely in the plate exchanger (5) where the cooled water flows freely; the outlet air is dehumidified and cooled. Integration operation is only possible with a cooled water supply.

LED display diagnostics

Red "POWER" LED: a fixed light indicates that the power supply is enabled.

Green "COMPR" LED: indicates dehumidification consent. A fixed light indicates that the compressor is working. A flashing light indicates that the compressor is in standby following start-up or a fault.

Alarm LEDs 3 and 4: see the table below

○ = LED off ● = LED on ◐ = LED flashing

Yellow LED ALARM1	Red LED ALARM2	Diagnosis	Permanency
○	○	No alarm	
◐	○	Room temperature too high, or empty circuit	Permanent alarm
●	○	Room temperature too low	Permanent alarm
○	◐	Maximum cooling pressure lockout	Permanent alarm
○	●	Delivery water temperature higher than 30 °C	It resets by itself, if the temperature falls

Yellow LED ALARM1	Red LED ALARM2	Diagnosis
fast flashing ◐		One of the probes is faulty: 1 flash: evaporator probe 2 flashes: water probe 3 flashes: condenser probe
	fast flashing ◐	One of the probes is disconnected: 1 flash: evaporator probe 2 flashes: water probe 3 flashes: condenser probe



Nota.

In the event of a permanent alarm, the compressor stops and does not restart. To reset the alarm, disconnect the electricity supply to the electronic card and then reconnect it again.

Connections

All the machine connections (apart from the suction and air expulsion ducts) are on the left side. The machine has four brackets for fixing it to the ceiling; the centre distances are shown in the dimensions table.

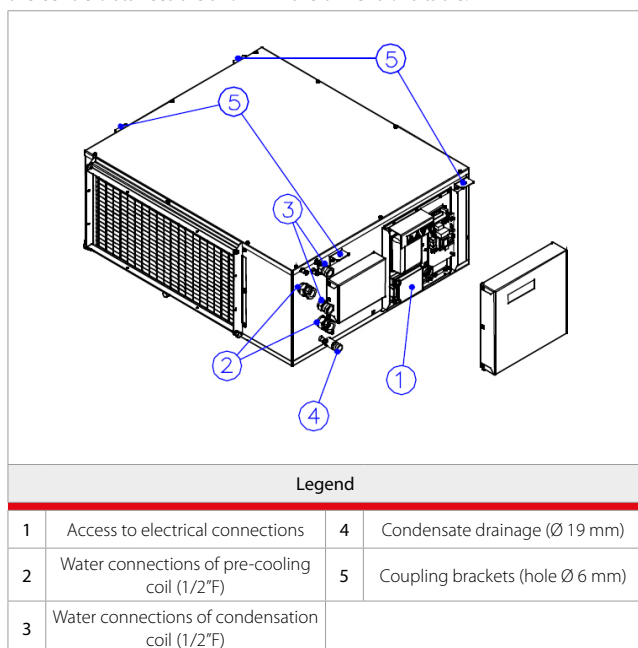
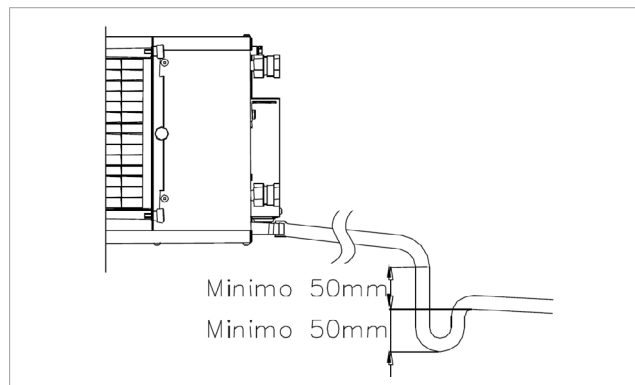


Figure 4 - Connections

Condensate drain:

- The condensate drain must have a slope adapted to the size and length of the tube;

- It is necessary to provide a siphon, and only one, to prevent suck back of air from the drain pipe.



Electric connections

WIRE SECTION

The electricity supply line and the disconnection devices must be determined by qualified electricity design experts; in any case, the cable section must be at least 3x1,5 sq.mm., L + N + E.

For operating consent: the cable must have a minimum section of 0,5 sq.mm. The fan is fitted with an auto-transformer that has 6 positions so you can choose the most suitable one on the basis of the losses of pressure in the circuit.

NB: the controller changes the fan speed during the switch to integration operation, to ensure a greater air flow rate. The two speeds (normal and integration) are set in the factory but, depending on the type of system and the losses of pressure in the pipes, you can modify the speeds by connecting the "FASTON" type terminals of the electronic card output wires in a different position. Position no.1 on the auto-transformer corresponds to the maximum speed; position no.6 corresponds to the minimum speed.

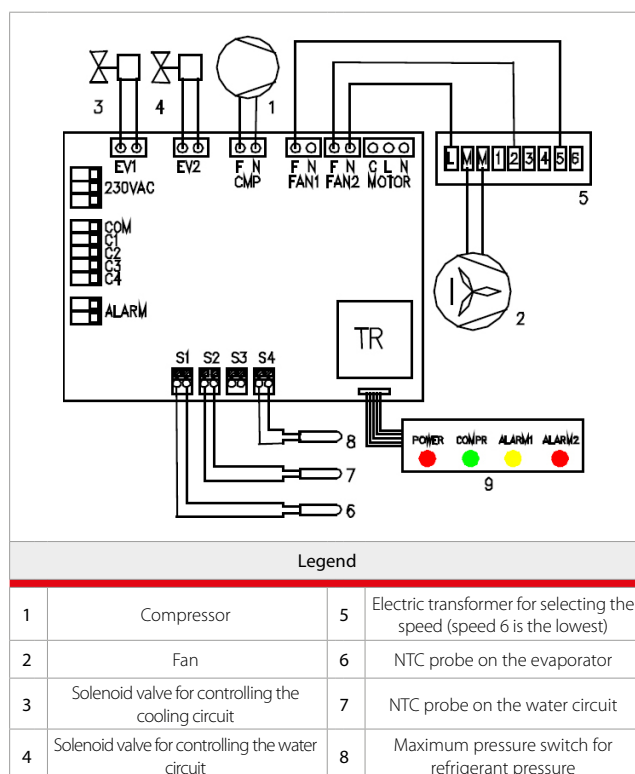


Figure 5 - Electric connections

OPERATING CONSENT

The machine operates by means of two digital inputs (clean contact).

Ventilation consent: contact between the COM-C1 terminals. Not usually used, but by closing the contact you can activate the fan only (to force the movement of the air).

Dehumidification consent: contact between the COM-C2 terminals. Usually jumpered if there is no room humidity adjustment system. The machine interrupts operation when the contact between the two terminals opens.

Integration consent: contact between the COM-C3 terminals to obtain integration operation.

Water-free operation



Warning.

The dehumidifier can operate without cooled water, but the suction air temperature must not be higher than 21 °C. The dehumidifying capacity of the machine will anyway be lower compared with envisaged summer conditions. Integration operation is not possible if there is no cooled water circulation, so the machine will go into alarm mode due to the high refrigerant pressure.

Warning.

Do not circulate cooling water when the machine is not working for long periods, as condensate could form on the outer surface of the machine itself.

Warning.

After filling the system with water, you are advised to carefully check the seal not only of the connections but also of the machine's hydraulic circuit.

Dimensions

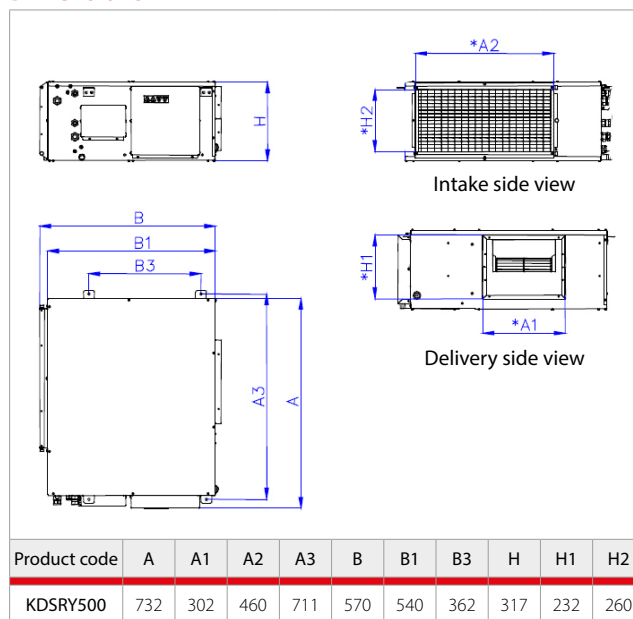


Figure 6 - Dimensions in mm

* = internal measurements



Nota.

it is important to leave a gap of at least 60 cm on the side of the hydraulic and electric connections, ensuring easy access for any future maintenance and repair work.

Product specifications

KDSRY500

Monobloc duct-type conditioner for dehumidification and integration of sensible available power, for installation in false ceilings, to be combined with radiant cooling systems. Complete with removable filtering section in synthetic material, class G3 (EN779:2002), pre-cooling coil, centrifuge fan with direct-coupled 3-speed motor, cooling circuit with R134a refrigerant gas, hydraulic circuit, treatment coils with copper pipe and aluminium fins. Dehumidification capacity 60,1 l/24h, air flow rate 600 m³/h. Nominal temperature working range 15÷32 °C. Water temperature working range 12÷22 °C. Pre-calibration pressure 60 Pa. Water connections 4x1/2" F. 230 V power supply.

Additional information

For additional information please check the website www.giacomini.com or contact the technical service: ☎ +39 0322 923372 📠 +39 0322 923255 ✉ consulenza.prodotti@giacomini.com
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