


**KDSRH026**

## Description

The **KDS** units 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

### Units

Product code	Dehumidification	Cooling integration	Technical communication ref.
KDSHY026	YES	NO	0932EN
<b>KDSRH026</b>	<b>YES</b>	<b>YES</b>	<b>0933EN</b>
KDSRH350	YES	YES	0934EN

### Accessories

Product code	Description
<b>KDSPLY026</b>	<b>Delivery plenum with 4 units Ø 100 mm for KDSHY026 and KDSRH026</b>
KDSPLY350	Delivery plenum with 6 units Ø 100 mm for KDSRH350

## Technical data

CONSTRUCTION CHARACTERISTICS	
Cooling compressor	Airtight, alternative
Refrigerant gas	R290 - 105 g
Electricity supply	230 V 50 hz
Pre-cooling coil	Copper pipes (2 rows) 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	AlSi 316 stainless steel brazed plate
Water connections	2 x 1/2" F
Fan	Dual suction centrifuge, 5 speeds
Air filter	With filtering material in synthetic fibre class G3 (EN 779:2002)
Nominal operating temperature range	15÷30 °C
Safety features	Maximum pressure switch, inlet water temperature control, alarm signal LED and relay

CHARACTERISTIC DATA	Dehumid.	Integration
Air flow rate [m³/h]	200	300
Pressure available (factory configuration) [Pa]	24	45
Moisture removed (26 °C - 65% R.H. - inlet water 15 °C) [l/24h]	24,7	23,8
Absorbed electric power [W]	260	270
Electric power absorbed by fan [W]	30	37
Pre-cooling water flow rate [l/h]	180	180
Total water flow rate [l/h]	220	280
Water circuit loss of pressure [kPa]	11	11
Weight [kg]	32	32

NOISE DATA				
Sound power level db (A) (ISO 3747)	Speed 5	Speed 3	Speed 2	Speed 1
Ventilation	39,6	41,4	46,2	50,4
Dehumidification / Integration	46	47,5	49,2	51,2

NB: the equivalent sound pressure level depends on the room where the unit is installed, and the presence or absence of ducts and/or plenums. Generally speaking, the value is 7-10 db (A) lower than the sound power level, and this value falls further when there are ducts and/or plenums.

PRESSURE AVAILABLE AT THE VARIOUS FAN SPEEDS		
Air flow rate [m³/h]	200	300
Speed 5 [Pa]	24	18
Speed 3 [Pa]	42	32
Speed 2 [Pa]	52	45
Speed 1 [Pa]	68	60

PERFORMANCE											
[air conditions 24 °C - 55 % UR]											
Dehumidification - Air flow rate 200 m³/h						Integration - Air flow rate 300 m³/h					
T	A	B	C	D	E	F	A	B	C	D	F
12	1439	958	481	16,6	688	237	1602	1172	430	14,9	259
15 *	1297	885	412	14,2	631	249	1423	1071	352	12,2	261
18	1179	816	363	12,5	584	251	1263	981	282	9,7	263

[air conditions 24 °C - 65 % UR]											
Dehumidification - Air flow rate 200 m³/h						Integration - Air flow rate 300 m³/h					
T	A	B	C	D	E	F	A	B	C	D	F
12	1566	874	692	23,9	910	249	1643	1009	634	21,9	263
15 *	1372	795	577	19,9	799	252	1747	948	526	18,2	264
18	1259	743	516	17,8	739	253	1293	852	441	15,2	266

[air conditions 26 °C - 55 % UR]											
Dehumidification - Air flow rate 200 m³/h						Integration - Air flow rate 300 m³/h					
T	A	B	C	D	E	F	A	B	C	D	F
12	1626	1017	609	21,0	828	249	1733	1210	523	18,1	263
15 *	1424	934	490	16,9	711	251	1512	1115	397	13,7	265
18	1304	866	438	15,1	662	254	1424	1052	372	12,9	266

[air conditions 26 °C - 65 % UR]											
Dehumidification - Air flow rate 200 m³/h						Integration - Air flow rate 300 m³/h					
T	A	B	C	D	E	F	A	B	C	D	F
12	1769	926	843	29,1	1065	252	1944	1096	848	29,3	265
15 *	1559	844	715	24,7	839	254	1700	1011	689	23,8	267
18	1354	767	587	20,3	814	257	1454	919	535	18,5	269

T: supply water temperature [°C] (\* Design temperature)

A: total cooling capacity [W]

B: sensible cooling capacity [W]

C: latent cooling capacity [W]

D: dehumidification capacity [l/24h]

E: power required for the water cooler [W]

F: electric power absorbed [W]

## Main components

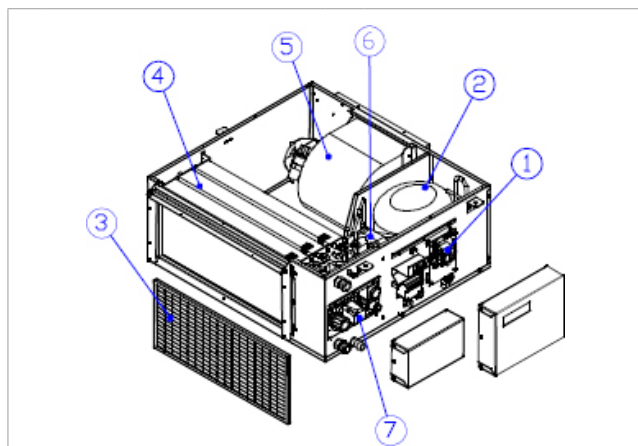
**STRUCTURE:** in galvanised metal panels entirely covered with a sound-absorbent coating in foam polyurethane with open cells.

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

**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 - 10 cc; 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 unit 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 4-speed motor; the operating speed is set by choosing the wires to be connected to the electricity supply.



Legend

1	Electric command panel compartment	5	Fan
2	Cooling compressor	6	Plate exchanger
3	Suction air filter	7	Valve compartment
4	Finned coil		

Figure 1 -Components

## Operation

### Operation with neutral air

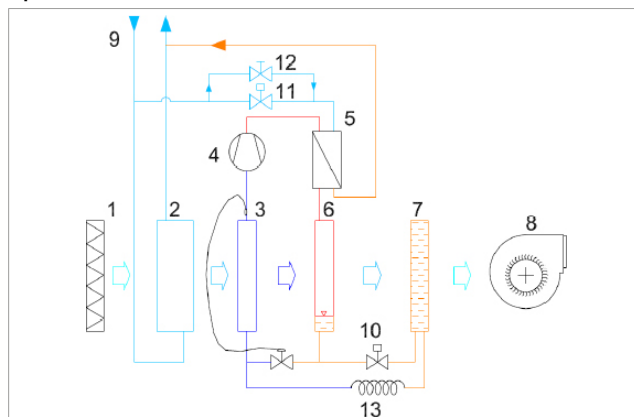


Figure 2 - Operating diagram with neutral air

The air is filtered via the filtering section (1) and is pre-cooled via the cooled water exchanger (2). The use of cooled water to pre-cool the air is fundamental for the efficiency of the process, as it minimises the use of electricity by the cooling compressor (4). 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 cooling circuit. The outlet air is neutral compared with the unit inlet temperature; this effect is obtained thanks to the transit of calibrated water in the plate exchanger (5) to remove the excess heat. The finned exchanger (7) acts as a cooling liquid accumulator and has a limited effect in this operating mode. The manual valve (12) has a partial opening and permits limited water transit to take out the excess heat compared with the neutral outlet air. The unit is able to function with this configuration 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

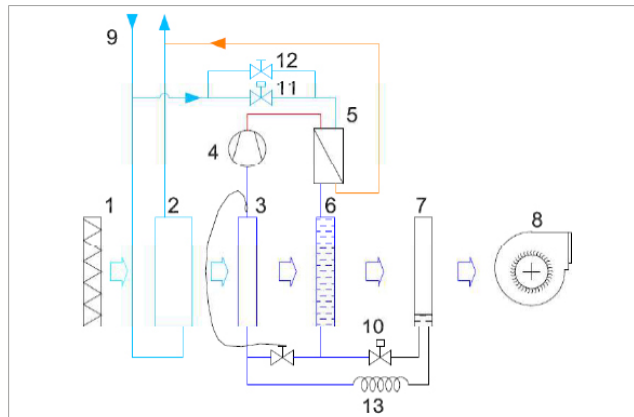


Figure 3 - Operating diagram in integration mode

In this mode, the solenoid valve (10) is closed and the solenoid valve (11) is opened; the accumulator (7) drains towards the capillary pipe (13) 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 freely flows via the open valve (11). In integration operation, there is also a switch to a higher fan speed, which is factory-set to provide 200 mc/h in dehumidification mode and 300 mc/h in integration mode. 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

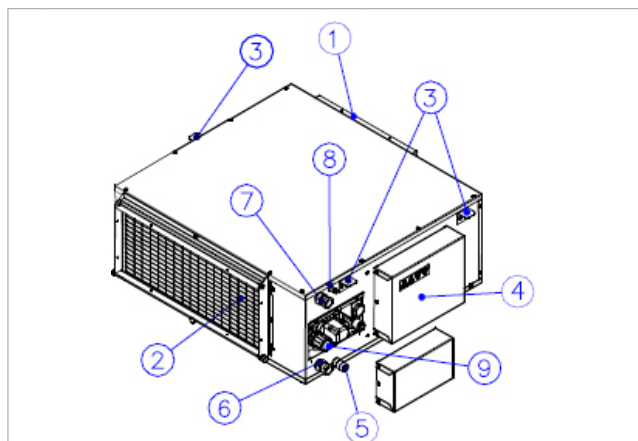
Yellow LED ALARM1	Red LED ALARM2	Diagnosis
fast flashing ◐		One of the probes is faulty: 1 flash: evaporator probe 2 flashes: water probe 3 flashes: condenser probe
	fast flashing ◐	One of the probes is disconnected: 1 flash: evaporator probe 2 flashes: water probe 3 flashes: condenser probe



#### 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



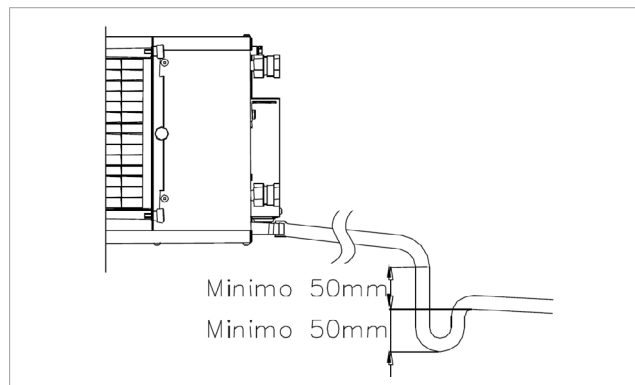
#### Legend

1	Dehumidified air outlet	6	Water inlet (1/2" F)
2	Filter for air inlet	7	Water outlet (1/2" F)
3	Coupling bracket (hole Ø 6 mm)	8	Vent
4	Electric command panel	9	Water bypass valve
5	Condensate drainage (Ø 19 mm)		

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 mm<sup>2</sup>, L + N + E.

For operating consent: the cable must have a minimum section of 0,5 mm<sup>2</sup>

#### ELECTRIC LAYOUT

The unit is usually supplied with the fan connection at its minimum speed, but the speeds for the dehumidifier or cooling dehumidifier can be set during the installation phase.

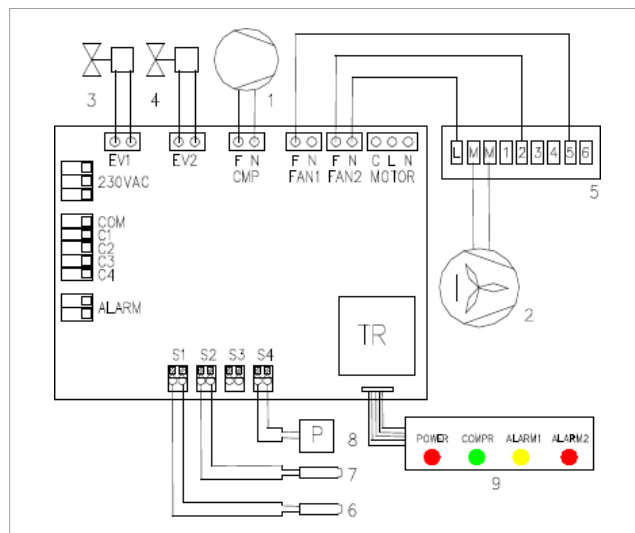


Figure 5 - Electric connections

#### OPERATING CONSENT

The unit operates by means of two digital inputs (clean contact) and a 220 V signal.

**Ventilation consent:** contact between the COM-C1 terminals. 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 unit interrupts operation when the contact between the two terminals opens.

**Integration consent:** contact between the COM-C3 terminals. The unit operates in cooling mode.

**Renewal consent:** contact between the COM-C4 terminals. This activates the renewal mode of the air recovery unit (if present).



## Water-free operation



### Warning.

The dehumidifier can operate without cooled water, but the suction air temperature must not be higher than 22 °C. The dehumidifying capacity of the unit will anyway be lower (reduced by up to 40%).

### Warning.

Do not circulate cooling water when the unit is not working for long periods, as condensate could form on the outer surface of the unit 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 unit's hydraulic circuit.

## Product specifications

### KDSRHY026

Monobloc duct-type unit 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), centrifuge fan with direct-coupled 3-speed motor, cooling circuit with R290 refrigerant gas, hydraulic circuit, treatment coils with copper pipe and aluminium fins, and 4-way delivery plenum with 100 mm diameter. Dehumidification capacity 24,7 l/24h, air flow rate 200 m<sup>3</sup>/h in dehumidification mode and 300 m<sup>3</sup>/h in integration mode. Nominal operating temperature range 15÷30 °C. Water connections 2x1/2" F. 230 V power supply.

## Accessories

There is a delivery plenum, code **KDSPLY026**, insulated and with knockout holes on which you can fix the collars (Ø 100 mm) supplied. The plenum should be connected to the unit, but in any case it can be fixed to the ceiling autonomously so as to sustain the weight of the ducts during dehumidifier maintenance work.

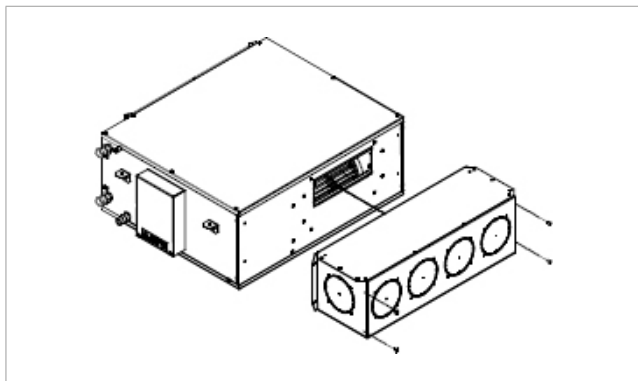


Figure 5 - KDSPLY026 plenum

## Dimensions

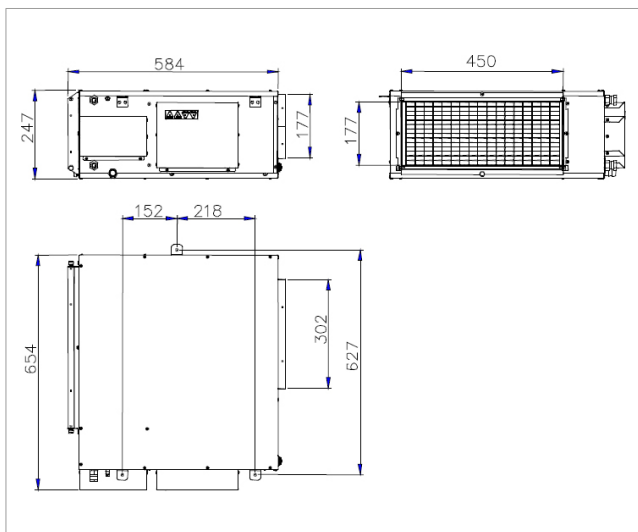


Figure 6 - Dimensions in mm



### Note.

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.

## Additional information

For additional information please check the website [www.giacomini.com](http://www.giacomini.com) or contact the technical service: ☎ +39 0322 923372 📠 +39 0322 923255 ✉ [consulenza.prodotto@giacomini.com](mailto:consulenza.prodotto@giacomini.com)  
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