


KDSHY026

Description

The **KDS** units are monobloc units for installation in false ceilings, to be combined with radiant systems for moisture control.

Versions and product codes

Units

Product code	Dehumidification	Cooling integration	Technical communication ref.
KDSHY026	YES	NO	0932EN
KDSRHY026	YES	YES	0933EN
KDSRHY350	YES	YES	0934EN

Accessories

Product code	Description
KDSPLY003	Delivery plenum with 3 units Ø 125 mm for KDSHY026 and KDSRHY026
KDSPLY005	Delivery plenum with 5 units Ø 125 mm for KDSRHY350

Technical data

CONSTRUCTION CHARACTERISTICS	
Cooling compressor	Airtight, single-cylinder alternative
Refrigerant gas	R290 - 84 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 connections	2 x 1/2" F
Fan	Dual suction centrifuge with direct-coupled motor, 3 speeds
Air filter	With filtering material in synthetic fibre class G3 (EN 779:2002)
Nominal operating temperature range	15÷30 °C
Safety features	Inlet water temperature check, evaporator, condenser, alarm signal LED and relay

CHARACTERISTIC DATA

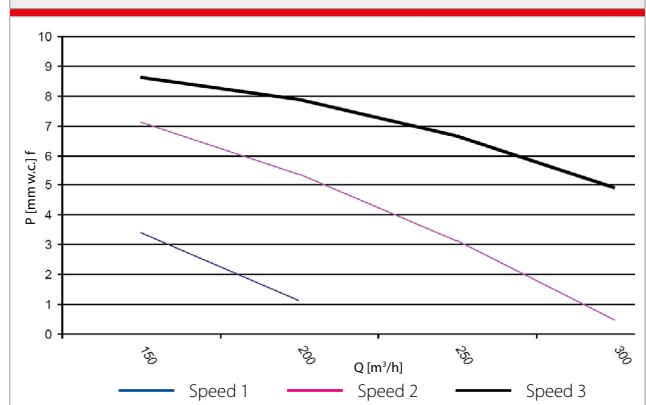
Air flow rate [m ³ /h]	200
Pressure available (factory configuration) [Pa]	15
Moisture removed (26 °C - 65% R.H. - inlet water 15 °C) [l/24h]	24,7
Max. absorbed electric power [W]	260
Electric power absorbed by fan [W]	30
Total water flow rate [l/h]	240
Water circuit loss of pressure [kPa]	11
Weight [kg]	29

NOISE DATA

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

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.

FAN AIR FLOW RATE



PERFORMANCE

Dehumidification - Air flow rate 200 m ³ /h [air conditions 24 °C - 55 % UR]						
T	A	B	C	D	E	
12	1439	481	16,6	688	237	
15 *	1297	412	14,2	631	249	
18	1179	363	12,5	584	251	
Dehumidification - Air flow rate 200 m ³ /h [air conditions 24 °C - 65 % UR]						
T	A	B	C	D	E	
12	1566	692	23,9	910	249	
15 *	1372	577	19,9	799	252	
18	1259	516	17,8	739	253	
Dehumidification - Air flow rate 200 m ³ /h [air conditions 26 °C - 55 % UR]						
T	A	B	C	D	E	
12	1626	609	21	828	249	
15 *	1424	490	16,9	711	251	
18	1304	438	15,1	662	254	
Dehumidification - Air flow rate 200 m ³ /h [air conditions 26 °C - 65 % UR]						
T	A	B	C	D	E	
12	1769	843	29,1	1065	252	
15 *	1559	715	24,7	393	254	
18	1354	587	20,3	814	257	

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

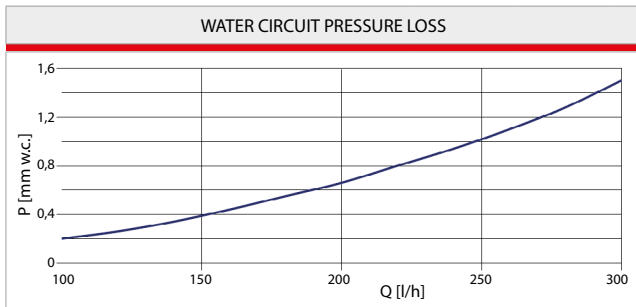
A: total cooling capacity [W]

B: latent cooling capacity [W]

C: dehumidification capacity [l/24h]

D: power required for the water cooler [W]

E: electric power absorbed [W]



Main components

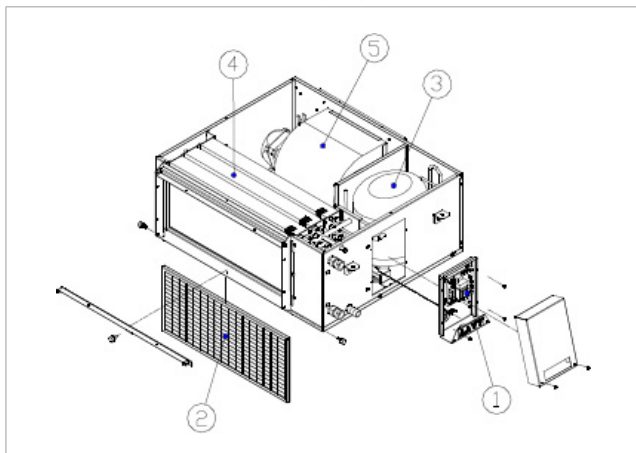
STRUCTURE: in galvanised metal panels entirely covered with a sound-absorbent coating in foam polyurethane with open cells.

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, alternative piston-operated cooling compressor - 10 cc; moisture filter.

HYDRAULIC CIRCUIT: in copper pipes, with finned aluminium coil and copper pipes for air pre-treatment and post-treatment. 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 3-speed motor; the operating speed is set by choosing the wires to be connected to the electricity supply.



Legend			
1	Electric command panel compartment	4	Finned coil
2	Suction air filter	5	Fan
3	Cooling compressor		

Figure 1 -Components

Operation

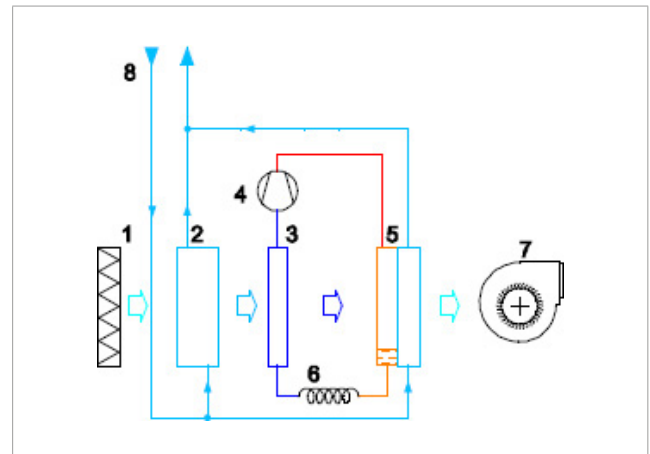


Figure 2 - Operating diagram with neutral air

The KDSHY026 dehumidifier is a cooling cycle unit designed as a system component. Cooling systems use cooled water at temperatures between 15 and 20 °C, which is sufficient to bring the rooms to the required temperature but not sufficient to dehumidify them. Dehumidification requires water at 7 °C, produced by the chiller at a notably lower flow rate than water at 15-20 °C. Water-chilled dehumidifiers with a cooling cycle keep the air humidity in the room at optimum values (55-65%), offering the following advantages compared with other systems:

- they use the cooled water from the radiant panel system;
- they allow the air to be treated without altering its temperature, so without any negative effect on the behaviour of the radiant panels and their adjustment system.

Fig.2 shows neutral air operation.

The air is filtered via the filtering section (1) and is pre-cooled via the cooled water exchanger (2) from the collector of the radiant system (8). 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 (5 - condenser) the post-heating operation uses the heat developed by the cooling circuit. The coil (5) has a second row, called "post-treatment", located just downstream from the cooling circuit condenser. Its job is to reduce the temperature of the air expelled from the unit so the value is no higher than the inlet temperature.

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

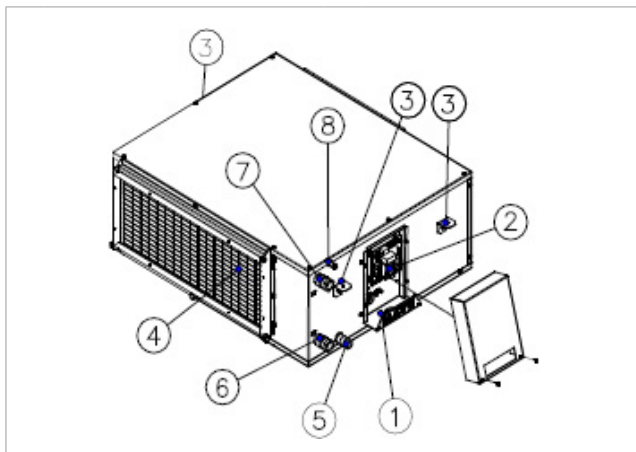
Yellow LED ALARM1	Red LED ALARM2	Diagnosis	Permanency
○	○	No alarm	
◐	○	Room temperature too high, or empty circuit	Permanent alarm
●	○	Room temperature too low	Permanent alarm
○	◐	Maximum cooling pressure lockout	Permanent alarm
○	●	Delivery water temperature higher than 30 °C	It resets by itself, if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

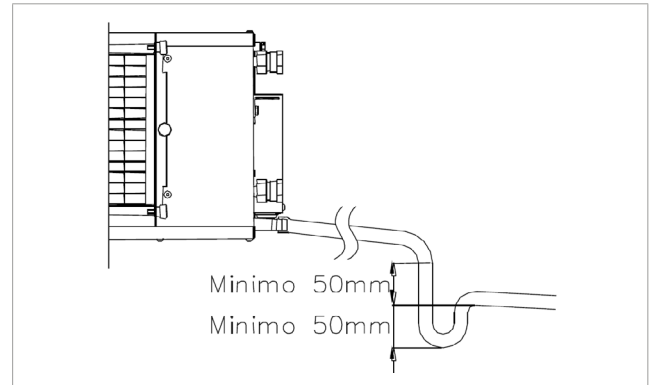


Legend			
1	Access to electrical connections	5	Condensate drainage (Ø 14 mm)
2	Electric command panel	6	Water inlet (1/2" F)
3	Coupling bracket (hole Ø 6 mm)	7	Water outlet (1/2" F)
4	Suction air filter	8	Vent

Figure 3 - Connections

Condensate drain:

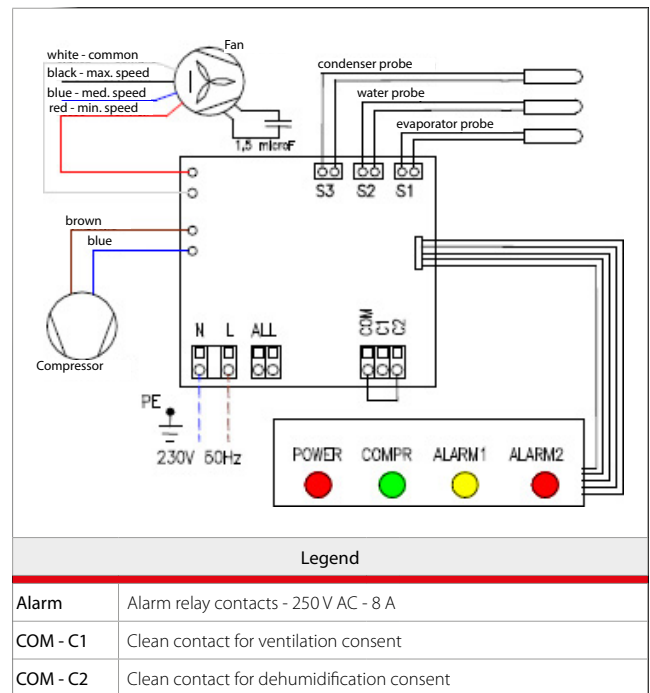
- The condensate drain must have a slope adapted to the size and length of the tube;
 - It is necessary to provide a siphon, and only one, to prevent suck back of air from the drain pipe.



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 mm², L + N + E. For operating consent: the cable must have a minimum section of 0,5 mm².



Legend	
Alarm	Alarm relay contacts - 250 V AC - 8 A
COM - C1	Clean contact for ventilation consent
COM - C2	Clean contact for dehumidification consent

Figure 4 - Electric connections

The unit is supplied with the fan connection at its minimum speed (red wire). Depending on the type of system and the losses of pressure in the pipes, you can increase the fan speed by connecting the blue wire (average speed) or the black wire (maximum speed) in place of the red one. The white wire must never be disconnected. The condenser (1,5 microF) is next to the motor on the fan.

Operating consent

The unit 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 unit interrupts operation when the contact between the two terminals opens.

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.

Accessories

There is a delivery plenum, code **KDSPLY026**, insulated and with knockout holes on which you can fix the collars (Ø 125 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.

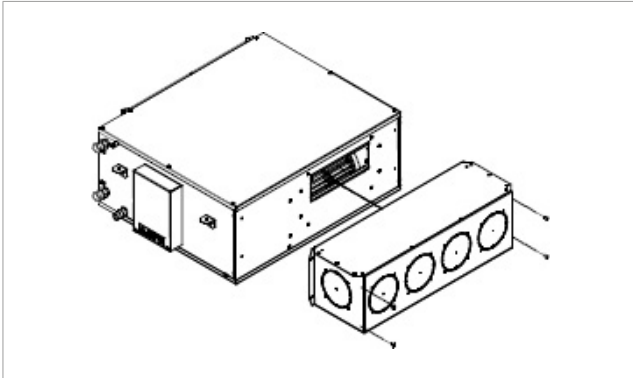


Figure 5 - KDSPLY003 plenum

Dimensions

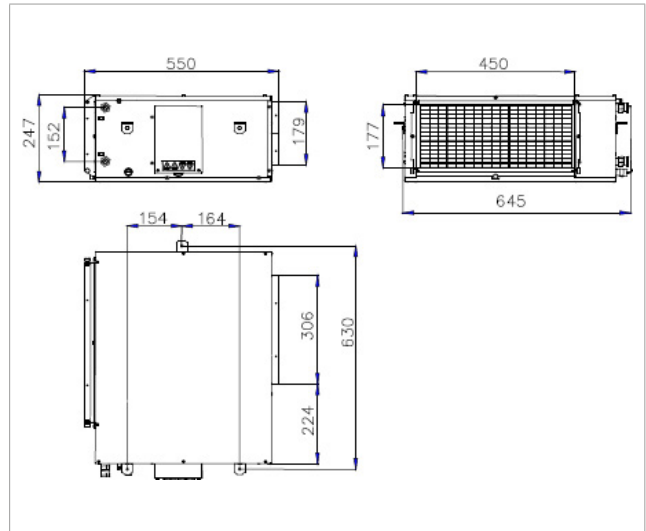


Figure 6 - Dimensions in mm



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

KDSHY026

Monobloc duct-type unit for dehumidification, 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 m³/h. Nominal temperature working range 15±30 °C. Water connections 2x1/2" 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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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
KDSRH026	YES	YES	0933EN
KDSRH350	YES	YES	0934EN

Accessories

Product code	Description
KDSPLY003	Delivery plenum with 3 units Ø 125 mm for KDSHY026 and KDSRH026
KDSPLY005	Delivery plenum with 5 units Ø 125 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	E	F
12	1439	958	481	16,6	688	237	1602	1172	430	14,9	1824	259
15 *	1297	885	412	14,2	631	249	1423	1071	352	12,2	1647	261
18	1179	816	363	12,5	584	251	1263	981	282	9,7	1489	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	E	F
12	1566	874	692	23,9	910	249	1643	1009	634	21,9	1869	263
15 *	1372	795	577	19,9	799	252	1747	948	526	18,2	1701	264
18	1259	743	516	17,8	739	253	1293	852	441	15,2	1522	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	E	F
12	1626	1017	609	21,0	828	249	1733	1210	523	18,1	1959	263
15 *	1424	934	490	16,9	711	251	1512	1115	397	13,7	1740	265
18	1304	866	438	15,1	662	254	1424	1052	372	12,9	1653	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	E	F
12	1769	926	843	29,1	1065	252	1944	1096	848	29,3	2172	265
15 *	1559	844	715	24,7	839	254	1700	1011	689	23,8	1930	267
18	1354	767	587	20,3	814	257	1454	919	535	18,5	1686	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

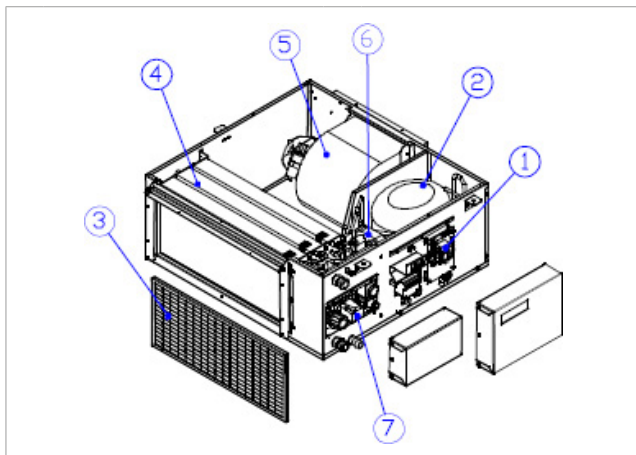
STRUCTURE: in galvanised metal panels entirely covered with a sound-absorbent coating in foam polyurethane with open cells.

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

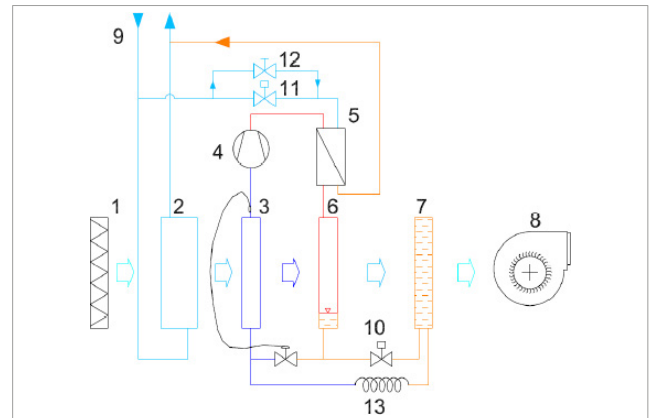


Figure 2 - Operating diagram with neutral air

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

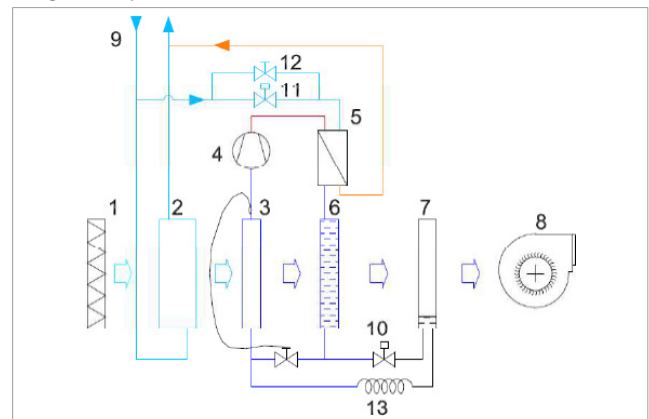


Figure 3 - Operating diagram in integration mode

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

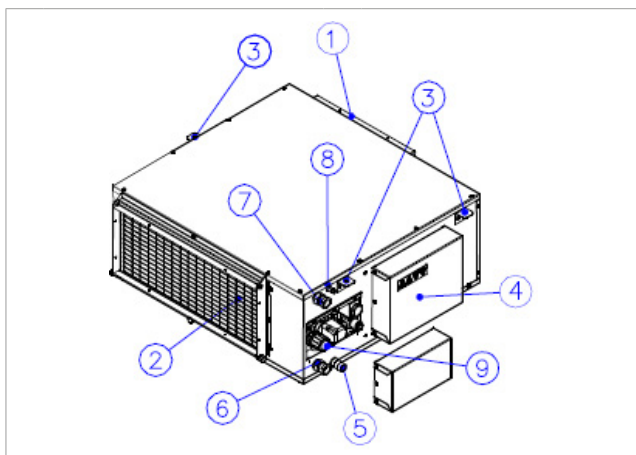
○ = LED off ● = LED on ◐ = LED flashing

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

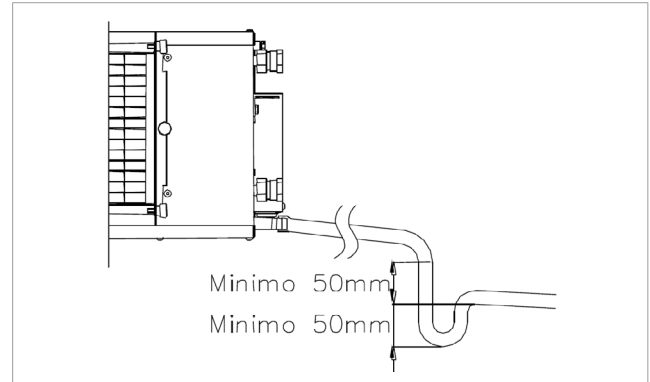


Legend			
1	Dehumidified air outlet	6	Water inlet (1/2" F)
2	Filter for air inlet	7	Water outlet (1/2" F)
3	Coupling bracket (hole Ø 6 mm)	8	Vent
4	Electric command panel	9	Water bypass valve
5	Condensate drainage (Ø 19 mm)		

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 mm², L + N + E.
 For operating consent: the cable must have a minimum section of 0,5 mm²

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.

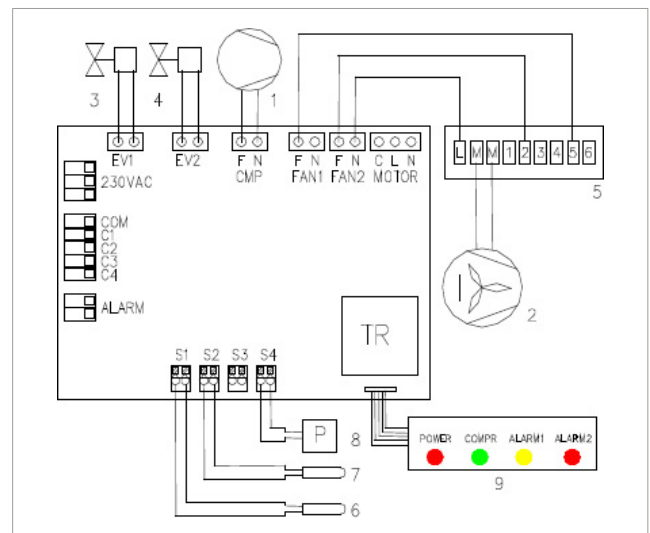


Figure 5 - Electric connections

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.

Accessories

There is a delivery plenum, code **KDSPLY003**, insulated and with knockout holes on which you can fix the collars (Ø 125 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.

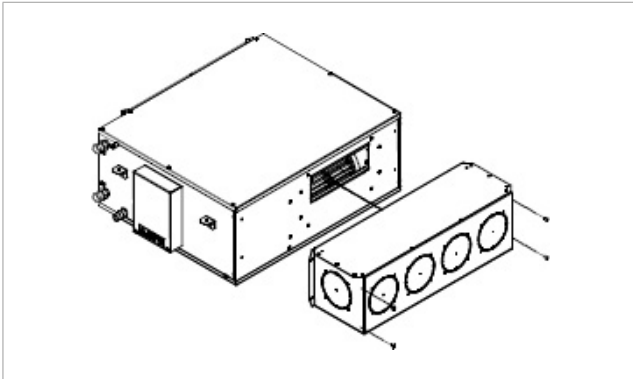


Figure 5 - KDSPLY003 plenum

Dimensions

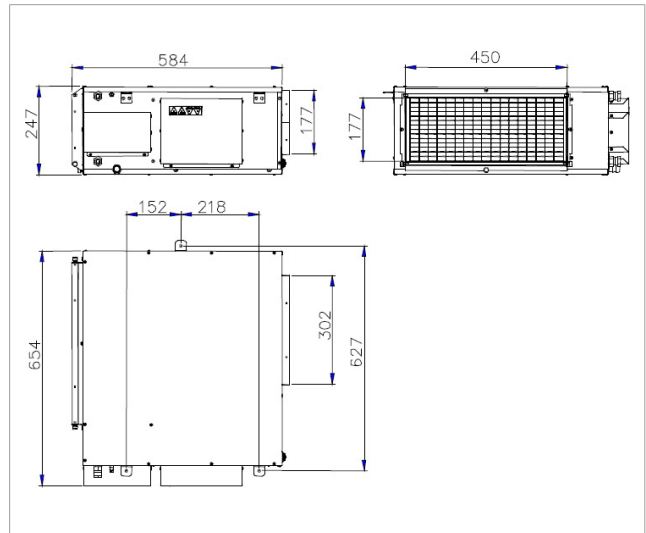


Figure 6 - Dimensions in mm



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.

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 m³/h in dehumidification mode and 300 m³/h in integration mode. Nominal operating temperature range 15÷30 °C. Water connections 2x1/2" 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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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
KDSPLY003	Delivery plenum with 3 units Ø 125 mm for KDSHY026 and KDSRHY026
KDSPLY005	Delivery plenum with 5 units Ø 125 mm for KDSRHY350

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

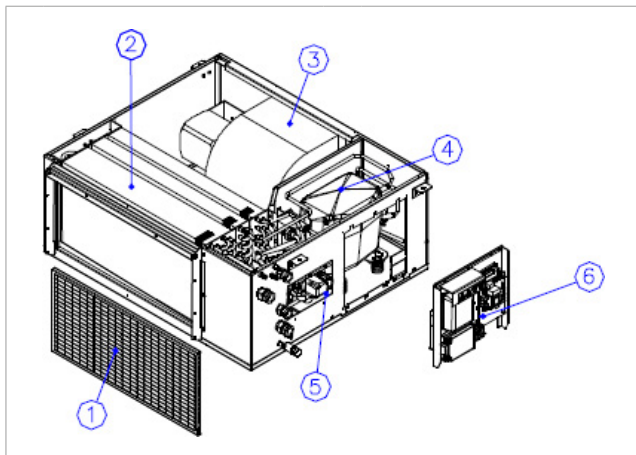
STRUCTURE: in galvanised metal panels entirely covered with a sound-absorbent coating in foam polyurethane with open cells.

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.



Legend			
1	Suction air filter	4	Cooling compressor
2	Finned coil	5	Valve unit
3	Fan	6	Electric command panel compartment

Figure 1 -Components

Operation

Operation with neutral air (dehumidification without cooling)

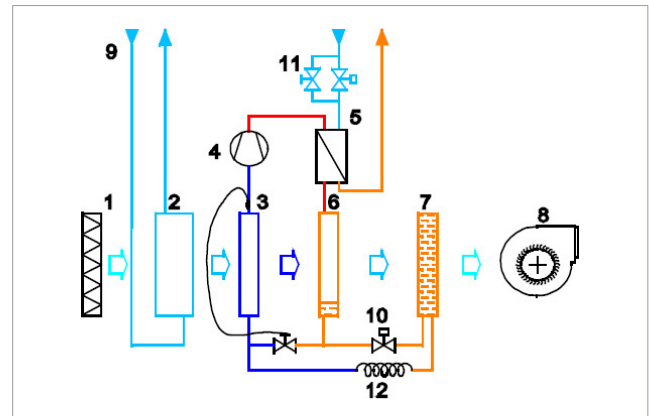


Figure 2 - Operating diagram with neutral air

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)

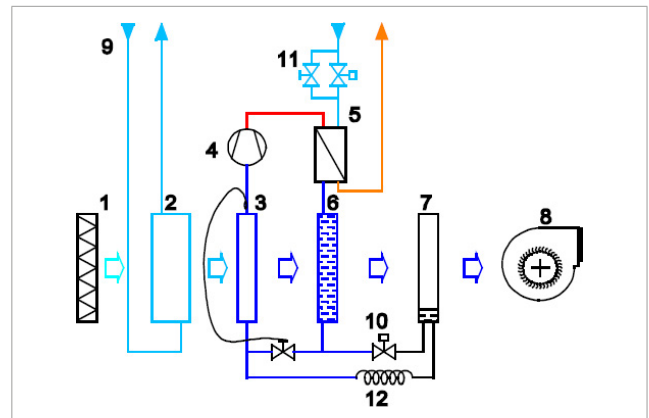


Figure 3 - Operating diagram in integration mode

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.

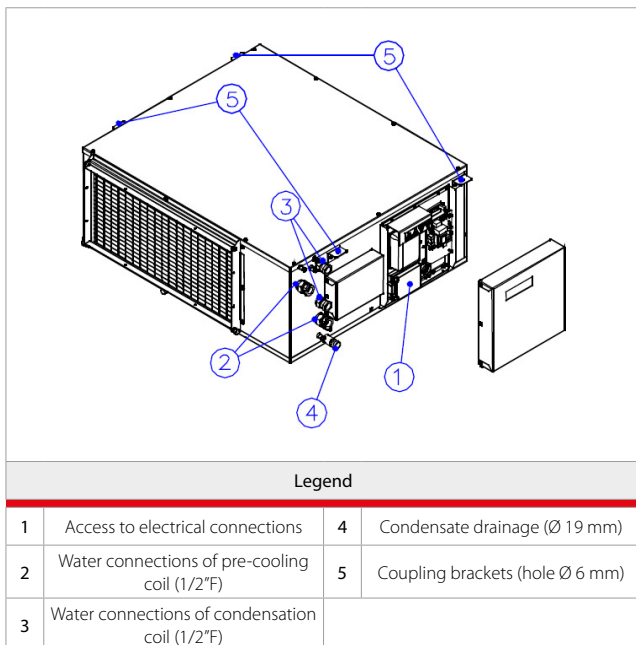
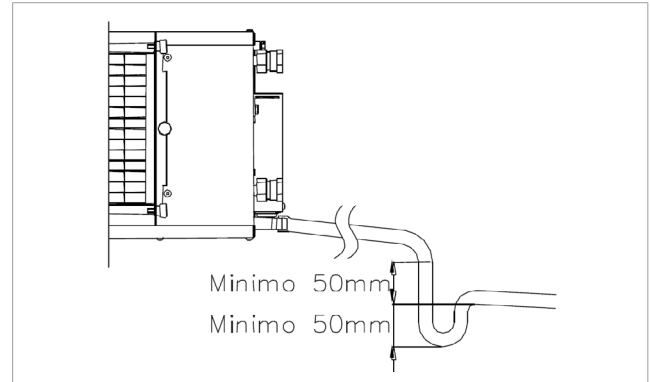


Figure 4 - Connections

Condensataion 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.

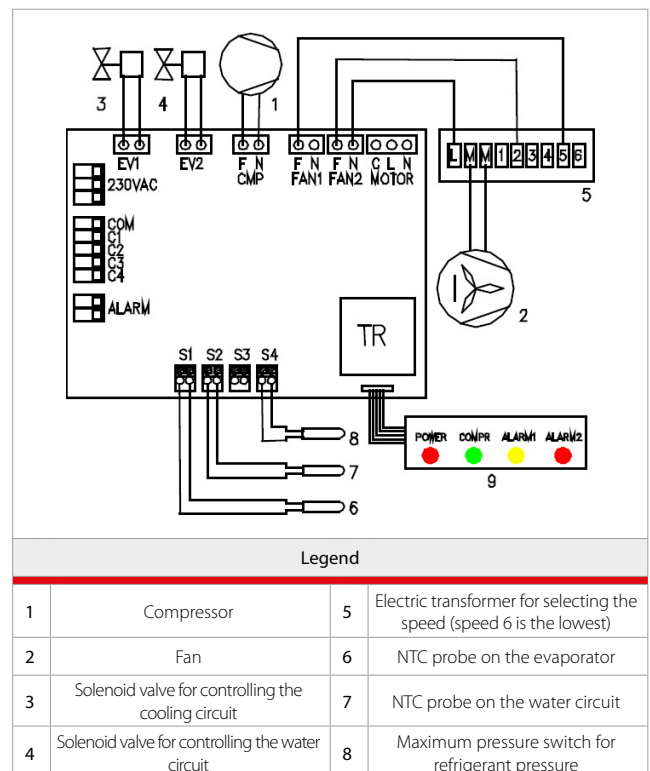


Figure 5 - Electric connections

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

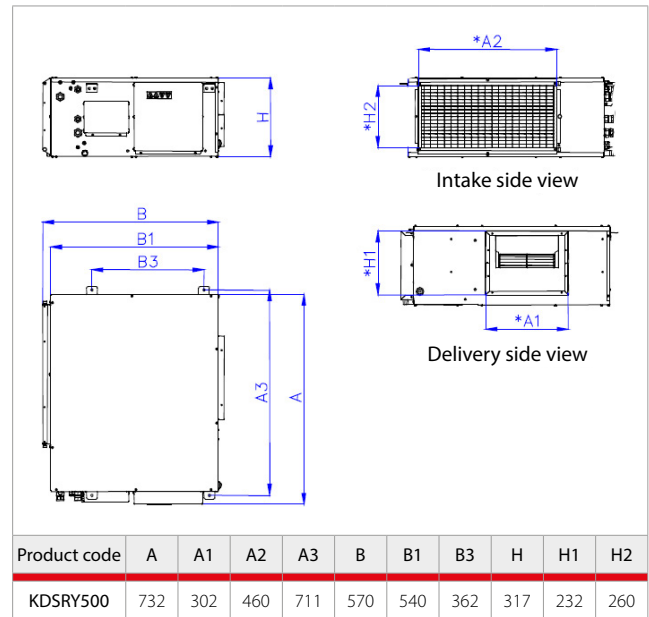


Figure 6 - Dimensions in mm

* = 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

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