RBM	**DEUCLIMATIZER DEU 26-S**	MI1999.B_07 ITA May 2022

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

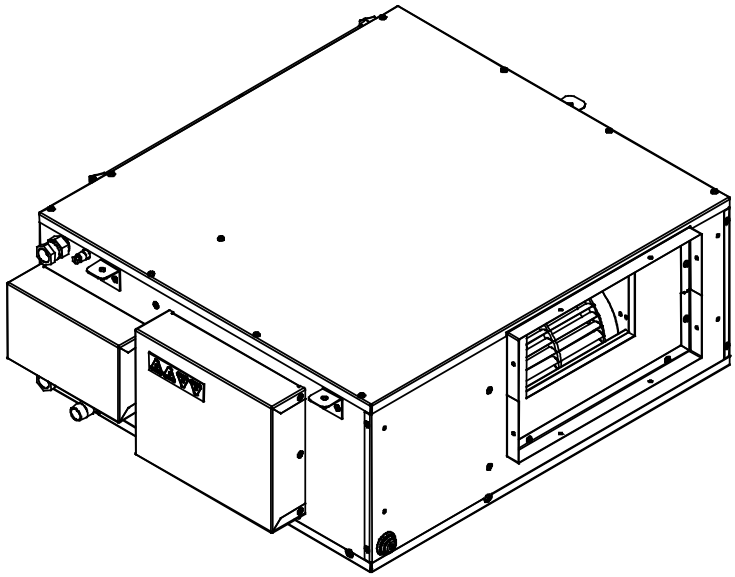
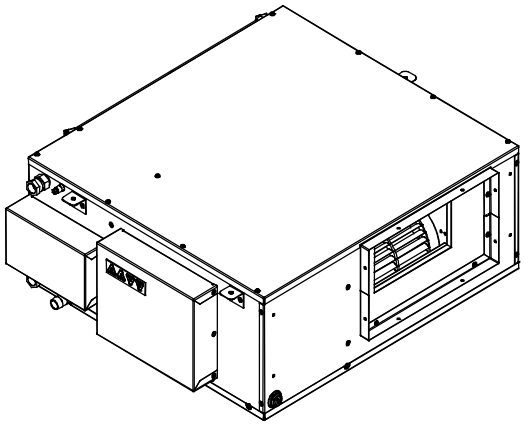


Fig. 1: Ducted ceiling-mounted deuclimatizer, code ***1999.26.22***

SUMMARY **page**

GENERAL INFORMATION



PACKAGE CONTENTS:

The dehumidifier is packed in cardboard box containing:

- 1 DEUCLIMA 26-S machine
- 1 operation and maintenance manual.

Package dimensions: 64x70x29h cm
Weight: Kg 36

TRANSPORT AND STORAGE

IMPORTANT: the package must be transported on pallets and handled by mechanical means; handling on the construction site must be done with means appropriate to the weight and volume of the package, avoiding dents and falls: a fall of the package from a few centimeters in height can damage its contents. The package must never be overturned or tipped over; if this happens, it must be returned to the correct horizontal position for at least 3 hours before installation.
Store packages horizontally and not upside down; up to 5 boxes can be stacked on top of each other.
Permissible environmental conditions: temperature -10°C ÷ 50°C, relative humidity less than 90%.

SAFETY NOTES

- The machine contains flammable refrigerant gas under pressure. In case of gas leakage from one or more machines ventilate the room.
- In case of fire, the gas contained in the machines may cause violent flames.
- Contact with the fan discharge port may cause injury.
- Electrical connections must be made by competent and licensed personnel in accordance with the law.
- Defects in piping, hydraulic connections and shut-off valves can give rise to dripping or splashing water resulting in property damage and dangerous situations when electricity is present.

PRODUCT DESCRIPTION

The DEUCLIMA 26-S unit is a machine capable of performing summer air treatment in conjunction with a radiant cooling system. It cools the intake air using both cold water from the system and an internal refrigeration circuit, so that the dehumidification process is carried out with maximum efficiency.
The machine also has the ability, by means of an electric control, to dissipate the heat developed by the refrigeration circuit directly into the chilled water, thus carrying out cooling of the outgoing air that complements the cooling of the radiant panels.
The air treatment process varies depending on whether neutral or cooled output air is to be obtained with respect to the intake temperature.

Operation with neutral air

Neutral air operation is schematized in Fig. 1.
The air, filtered through the filter section (1), undergoes precooling through the chilled water exchanger (2). The use of chilled water to precool the air is critical to the efficiency of the process, because in this way the electrical power commitment of the refrigeration compressor (6) can be made minimal.
The air is then dehumidified by passing sequentially through the finned coils of a refrigerant circuit: in the first coil (3) there is actual dehumidification, and in the second coil (5) there is postheating, carried out by the heat developed by the refrigerant circuit, with the solenoid valve (7) open.

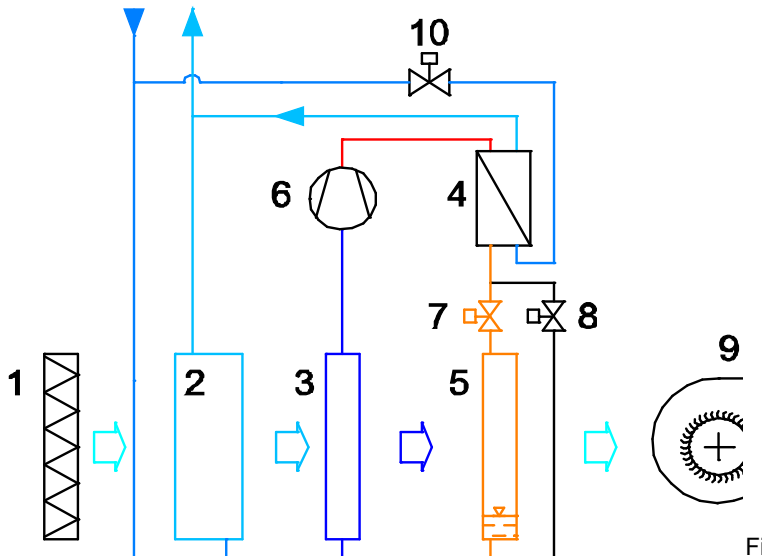


Fig. 1

The outgoing air is neutral with respect to the inlet temperature of the machine; this effect is achieved by a calibrated water passage in the plate heat exchanger (4), which removes excess heat, allows a limited water passage in order to remove excess heat with respect to the neutrality of the outgoing air.
The machine can operate with this configuration even in the absence of water; however, lacking both pre-cooling and heat removal, the air will exit at a higher temperature than the inlet temperature.

Integration operation

Integration operation is schematized in Figure 2.
In this mode, the solenoid valve (8) is opened and the solenoid valve (7) is closed; In this mode, heat disposal and takes place in the plate heat exchanger (4), in which chilled water flows freely through the open valve (10).
In integration operation there is also a change to a higher fan speed, which is factory set to give 200 mc/h in dehumidification and 300 mc/h in integration.

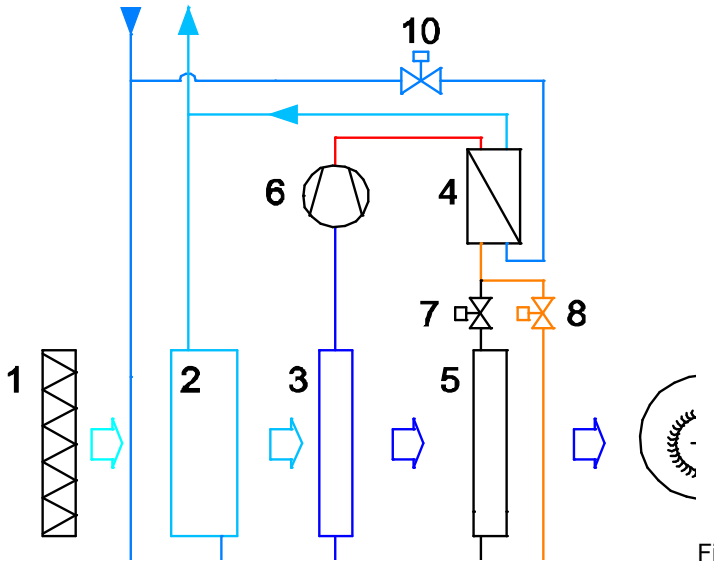


Fig. 2

Integration operation is possible only with chilled water supply.

MAIN COMPONENTS DESCRIPTION

STRUCTURE: in galvanized sheet metal panels, lined internally with sound-absorbing mat of open-cell polyurethane foam.
FILTER SECTION: galvanized sheet metal filter structure, filter type G3 removable from all sides of the machine.
REFRIGERANT CIRCUIT: in copper tubes, finned aluminum coils with copper tubes, water-freon heat exchanger in brazed stainless steel plates. Reciprocating 10 cc piston refrigeration compressor; moisture filter. thermostatic lamination valve, on-off valve on the circuit for mode change.
HYDRAULIC CIRCUIT: made of copper tubes, with aluminum finned coil and copper tubes for air pretreatment, plate heat exchanger for refrigerant cooling, on-off valve for change of operating mode;
The machine frame, made of galvanized sheet metal contains the finned coil assembly for air treatment, the refrigerant circuit for dehumidification
tion, intake air filter, condensate collecting tray, supply fan, and electrical control and management panel.
FAN: centrifugal with forward-facing blades, double suction with directly coupled motor, 4-speed; operating speed is configurable by choosing the wires to be connected to the power supply.

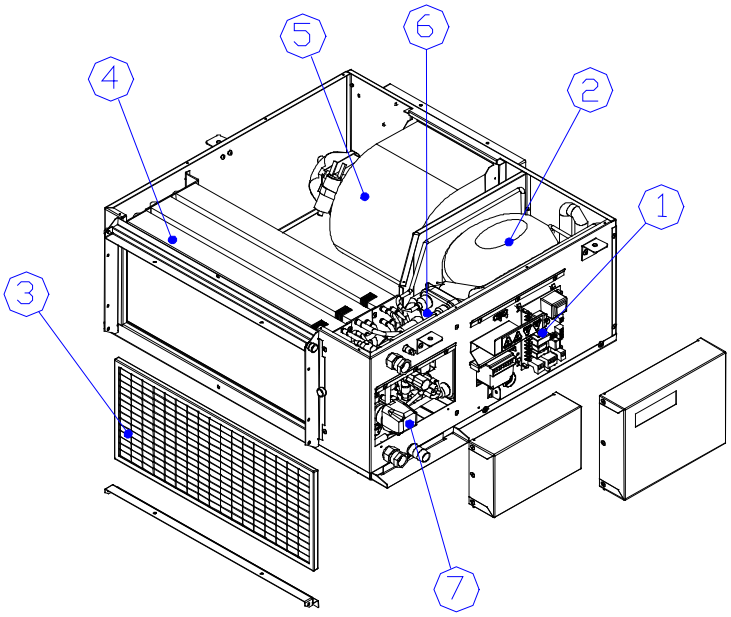


Fig. 3

1) electrical cabinet compartment;
2) refrigeration compressor;
3) air intake filter;
4) finned battery;
5) fan;
6) plate heat exchanger;
7) service compartment.

TECHNICAL DATA

Construction features

Refrigerant compressor	Hermetic, alternative
Refrigerant gas	R290 - 100g
Power supply	230/1/50 (V/ph/Hz)
Pre-cooling coil	Copper pipes (2 rows) and aluminum fins with "hydrophilic" treatment
Evaporating coil	Copper tubes and aluminum fins with "hydrophilic" treatment
Post-heating coil	Copper tubes and aluminum fins
Water condenser	Braze-welded plates made of AISI 316 stainless steel
Water connections	2 x ½" GAS female
Fan	Double suction, 5-speed centrifugal pump
Air filter	with synthetic fiber filter material - class G3 (EN 779:2002).
Operating range	15°C to 30°C
Security	Maximum pressure switch, inlet water temperature control, alarm signaling relay

Characteristic data	**U.M.**	**Dehumidif.**	**Integr.**
Air flow rate	m^3/h	200	300
Available head (factory configuration)	Pa	55	5
Maximum electrical power absorbed	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 pressure drop	kPa	11	11
Weight	Kg	32	

Available head at various fan speeds

Air flow rate	m^3/h	200	300
Speed 5	Pa	55	5
Speed 4	Pa	65	18
Speed 3	Pa	73	34
Speed 2	Pa	84	59
Speed 1	Pa	90	65

PERFORMANCES

	room: 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	978	461	15,9	709	237	1603	1198	405	14,0	1853	262
15	1296	904	392	13,5	651	249	1423	1094	329	11,4	1675	264
18	1178	834	344	11,9	604	251	1264	1002	262	9,1	1518	266

	ambient: 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	1567	899	668	23,1	932	249	1643	1037	606	20,9	1897	166
15	1371	817	554	19,1	819	252	1474	974	500	17,3	1729	267
18	1259	764	495	17,1	760	253	1293	875	418	14,4	1550	269

	ambient: 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	1042	584	20,2	849	249	1732	1240	492	17,0	1986	266
15	1424	598	466	16,1	732	251	1512	1142	370	12,8	1768	268
18	1304	888	416	14,4	683	254	1424	1078	346	12,0	1681	269

	ambient: 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	956	813	28,1	1086	252	1944	1131	813	28,1	2200	268
15	1558	871	687	23,7	959	254	1698	1042	656	22,7	1956	270
18	1354	792	562	19,4	835	257	1453	947	506	17,5	1713	272

t: supply water temperature °C (design temperature in gray)
a: total cooling power W
b: sensible cooling power W
c: latent cooling power W
d: dehumidification capacity l/day
e: required power to the water chiller W
f: electrical power input W

Acoustical data*

Sound power level db(A) according to 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

(*) Note: The equivalent sound pressure level depends on the room where the machine is installed, the presence or absence of duct and/or plenum. Generally the value is 7-10db(A) lower than the sound power and with duct and/or plenum it is reduced

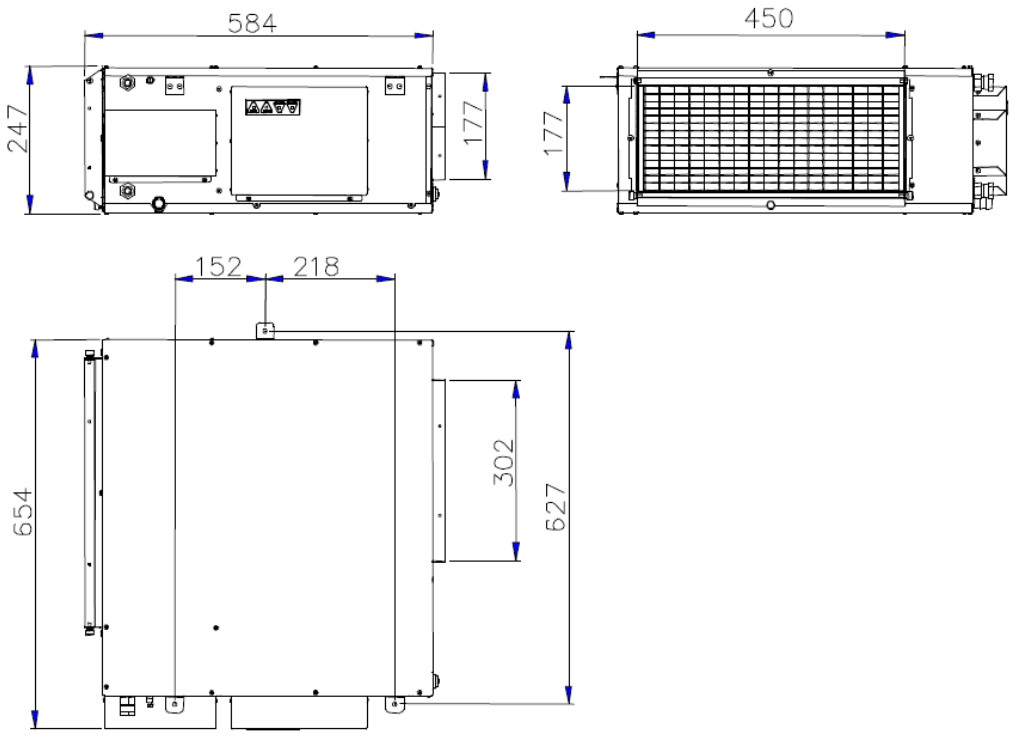


Fig. 4

INSTALLATION REQUIREMENTS:

Before installing the machine, it is necessary to prepare:

- the supply and return piping for cooling water with two shut-off valves for line disconnection;
- the drain for condensed water;
- the electrical cables for power supply, the PE protective conductor (earth conductor) and the wires for operating consents.

The machine should be installed in a horizontal position, either hanging by the appropriate brackets or resting on the lower hood. Installation should be carried out inside buildings.

⚠ **A clearance of at least 60 cm must be left on the side of the plumbing and electrical connections and accessibility must be preserved for future maintenance or repair.**

The unit must be protected from freezing.

For the proper installation of the unit, current standards, building codes and fire regulations should be observed.

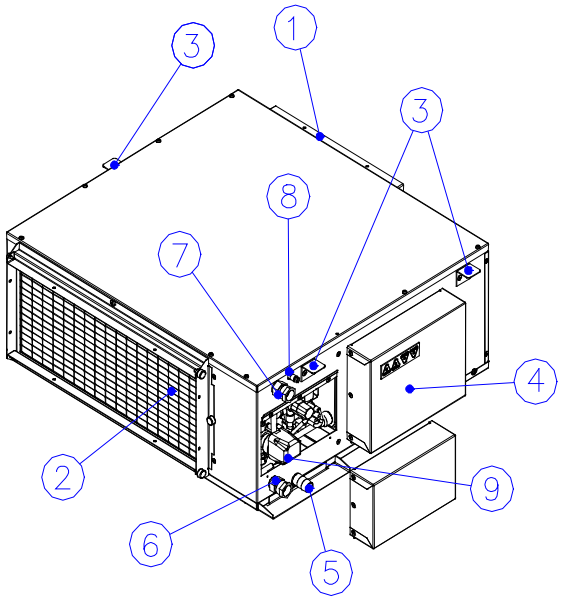


Fig. 5

1. Dehumidified air outlet
2. Intake air intake
3. Attachment bracket (D6mm hole)
4. Electrical panel board
5. Condensate drain (D=19mm)
6. Water inlet (1/2 "F)
7. Water outlet (1/2 "F)
8. Vent
9. Electrothermal water valve

Note for condensate drain:

- the condensate drain must have a slope appropriate to the size and length of the pipe;
- a siphon, and only one, should be provided to prevent the suction of air from the drain pipe.

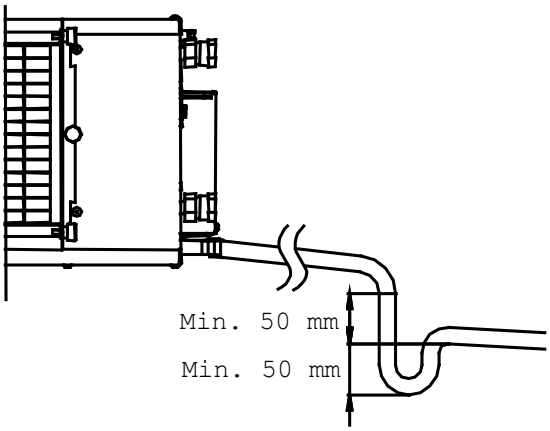


Fig. 6

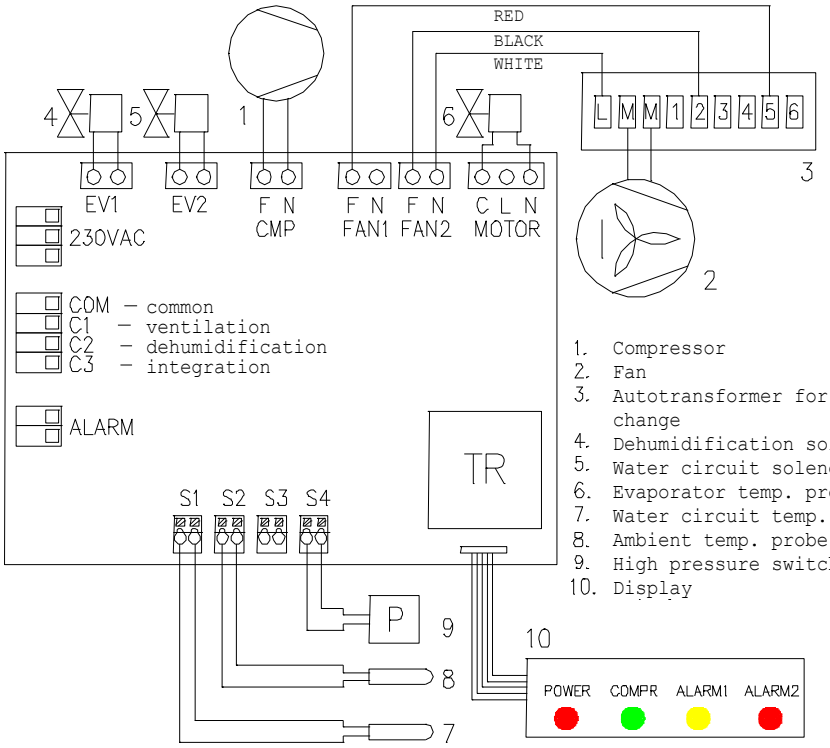
ELECTRICAL CONNECTIONS

CONDUCTOR SECTION

The electrical supply line and disconnecting devices must be determined by persons qualified in electrical design; however, the cable must have a minimum cross-section of 3x1.5mm^2, F + N+ PE.
For operating consents: the cable must have a minimum cross section of 0.5mm^2

WIRING DIAGRAM

The machine is normally supplied with the fan connection on minimum speed; speeds in dehumidifier or dehumidifier-cooling mode, however, can be set during installation



1. Compressor
2. Fan
3. Autotransformer for fan speed change
4. Dehumidification solenoid valve
5. Water circuit solenoid valve
6. Evaporator temp. probe
7. Water circuit temp. probe
8. Ambient temp. probe
9. High pressure switch
10. Display

Fig. 7

Fan speed

In dehumidification or ventilation mode, the fan will run at the speed corresponding to the connection coming out of the FAN1 position on the board.
In integraizone mode, the fan will run at the speed corresponding to the connection coming out of the FAN2 position on the board.
Fan speed adjustments: move the "faston" connectors to the various positions on the autotransformer. The positions that can be used are: 1(max), 2, 3, 4, 5(min).

Operating consents

Machine operation is via two digital inputs (dry contact) and a 220V signal.
Ventilation consent: contact between terminals COM-C1, by closing the contact only the fan can be operated to force air movement.
Dehumidification consent: contact between terminals COM-C2, normally bridged in the absence of a room humidity control system. The machine stops its operation when the contact between the two terminals opens.
Integration consent: contact between terminals COM-C3, the machine operates in cooling mode.

Temperature-resistance conversion table for NTC temperature probes

To check the reliability of the probes, the table below describes the correspondence between the temperature and the Ohm value of resistance

°C	Ohm	°C	Ohm
-50	329500	15	14690
-45	247700	20	12090
-40	188500	25	10000
-35	144100	30	8313
-30	111300	35	6940
-25	86430	40	5827
-20	67770	45	4911
-15	53410	50	4160
-10	42470	55	3536
-5	33900	60	3020
0	27280	65	2588
5	22050	70	2226
10	17960	75	1924

OPERATION CONSENTS

Machine operation is via three digital inputs (dry contact).

Ventilation consent: contact between terminals COM-C1, closing the contact allows only the fan to be operated to force air movement.
Dehumidification consent: contact between terminals COM-C2, normally bridged in the absence of a room humidity control system. The machine stops its operation when the contact between the two terminals opens.
Integration consent: contact between terminals COM-C3, the machine operates as with dehumidification consent and in addition the integration function.

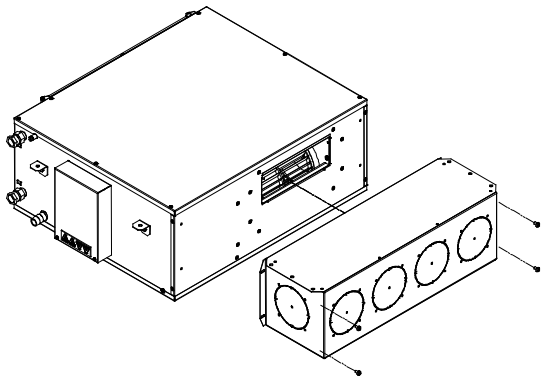
WORKING RANGE

The dehumidifier is designed to operate at a room temperature between 15°C and 32°C. If the room air sucked in, or the water in the cooling circuit has conditions other than those expected, it may happen that the evaporator of the refrigeration circuit is outside the allowed temperature limits; in this case, the compressor stops and the display indicates an abnormality.
The refrigeration compressor turns on after 2' from the dehumidification consent.
In case of frost formation on the evaporator refrigeration compressor pauses allow the melting of the frost formed on the evaporator (defrosting). In this case the green led on the compressor flashes until the correct temperature conditions are present.

ACCESSORIES

As optional accessories are available:

- supply plenum **(code 2291.26.02)**, insulated, equipped with 6 pre-drilled holes (4 front and 1 on each side) to which the appropriate collars for connection with a DN100 pipeline can be attached. Included with the plenum are 4 connection collars. The plenum can be attached to the ceiling independently, so it can support the weight of the ducts in case of maintenance to the dehumidifier.



- supply plenum **(code 2292.26.02)**, insulated, equipped with pre-drilled holes (3 front and 1 on each side) to which the appropriate collars can be attached for connection with a DN125 pipe. Included with the plenum are 3 connection collars. The plenum can be attached to the ceiling independently, so it can support the weight of the ducts in case of maintenance to the dehumidifier.

FIRST START-UP

Check the tightness of the hydraulic circuit and the absence of drips from the machine.
The testing of the dehumidifier should be done at the same time as the testing of the panel system in summer operation;
The machine is in operation when the power supply is energized and the dehumidification consent is closed. At each start-up, the fan is started first and after 2 minutes the compressor is started.

OPERATION WITHOUT WATER

The dehumidifier can operate without chilled water only under the following conditions:

- the temperature of the intake air must not exceed 22°C;
- dehumidification operation should be set.

However, the dehumidifying performance of the machine will be lower, with decreases of up to 40%.

CAUTION: Do not circulate chilled water with the machine stopped for long periods, as condensation may form on the outer surface of the machine.

The main check to be made concerns the cooling water flow rate, which should not be less than 4l/min.
In case the water flow rate cannot be measured, calibration can be carried out in the following way:

- open the chilled water circulation completely;
- start the dehumidifier and wait 15 minutes;
- if one is within the operating limits, the air will come out cooled; it will be possible to raise the air temperature by slowly reducing the chilled water flow rate, until the desired conditions are reached.

Based on the connected ducting, select the most suitable fan speed for the flow rate required for proper machine operation (200m^3/h).
NOTE: After filling the system with water, it is recommended to carefully check the tightness of not only the hydraulic circuit connections.

LED DISPLAY DIAGNOSTICS

Led "POWER" red: if voltage is present, it is on steady;
Led "COMPR" green: indicates consent for dehumidification, if it is on steady, it indicates the compressor is running, if it is on flashing, it indicates the compressor is stopped for pause, waiting after startup or abnormality;
Alarm led 3 and 4 : see the following table.

◯ = led off;

◐ = led on flashing;

● = led on steady.

led ALARM1 yellow	led ALARM2 red	diagnosis	permanence
◯	◯	No alarm	
◐	◯	Ambient temperature too high or circuit discharged	Permanent alarm
●	◯	Ambient temperature too low	Permanent alarm
◯	◐	Maximum refrigerant pressure lockout	Permanent alarm
◯	●	Discharge water temperature higher than 30°C	Unlocks itself if temperature drops

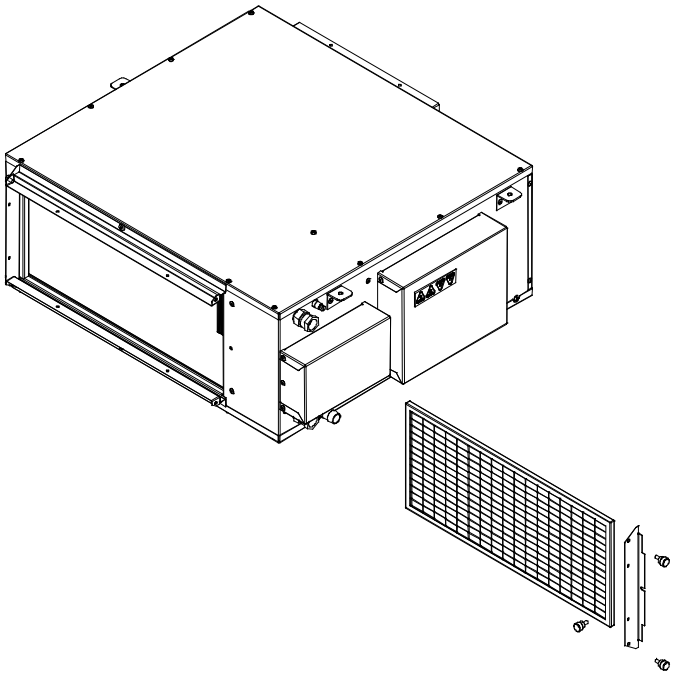
led ALARM1 yellow	led ALARM2 red	diagnosis
Blinking fast ◐		One of the probes is faulty: - 1 blink: evaporator probe; - 2 flashes water probe; - 3 flashes condenser probe;
	Blinking fast ◐	One of the probes is faulty: - 1 blink: evaporator probe; - 2 flashes water probe; - 3 flashes condenser probe;

⚠ **Note**: in case of a permanent alarm, the compressor stops and does not restart; to reset the alarm, it is necessary to remove and restore power to the electronic board.

MAINTENANCE

The only periodic operation to be done is to clean the filter, which should be done at a variable frequency depending on the environment in which the machine is operating.
The filter is removable by removing the side of the frame, which in turn is secured with special knobs that can be unscrewed by hand.
The filter holder frame allows you to choose the extraction side of the filter; if the already arranged extraction side does not satisfy, simply swap the fixing screws of the desired side with the knobs.

CAUTION: provide the necessary space for the extraction of the filter.



WARNINGS FOR THE PROPER DISPOSAL OF THE PRODUCT

This product falls under the scope of Directive 2012/19/EU on the management of waste electrical and electronic equipment (WEEE).
The appliance should not be disposed of with household waste as it is composed of different materials that can be recycled at the appropriate facilities. Inquire through the municipal authority about the location of ecological platforms suitable to receive the product for disposal. Upon purchase of equivalent appliance, the distributor is required to take back the product for disposal free of charge.

The product is not potentially hazardous to human health and the environment, but if abandoned in the environment it will negatively impact the ecosystem.
Read the instructions carefully before using the appliance for the first time.
The crossed-out bin symbol on the label on the appliance indicates that it complies with the regulations on waste electrical and electronic equipment. Abandoning the equipment in the environment or disposing of it improperly is punishable by law.

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RBM Spa - Via S.Giuseppe, 1 - 25075 Nave (Brescia) Italy - Tel. 030-2537211 Fax 030-2531798 - info@rbm.eu www.rbm.eu
@rbmspa RBM S.p.A. rbm_spa_ Rbm Italia