

airv

INSTALLATION AND MAINTENANCE MANUAL

CASSETTE

BALI



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To get all the air flow and acoustic performances, refer to the general catalogue and/or the BALI datasheet (available on www.aircalo.fr)

1. GENERALITES

CAUTION: before any intervention on the system and before handling any intern component, cut the power of the main circuit-breaker.

Read attentively this manual before starting the installation

- The unit is in conformity with the Low Voltage Directive (CEE/73/23) and electromagnetic compatibility (CEE/89/336).
- Confide the installation to a qualified installer.
- The maintenance must be made only by qualified personnel.
- Respect safety requirements of national standards. In particular, check that you dispose of a connection on the ground with an adequate size.
- Check that the tension and the frequency of the power supply is like the ones necessary at the unit which will be installed.
Eventually, take into account of others devices connected up at the same electric circuit.
Make sure that the safety requirements of national standards have been respected over the power supply circuit
- Use this unit only as a part of registered applications: they do not have to be used in a laundry room or any other local with steam ironing.
It should be avoiding the use of Cassettes in an atmosphere that contains oil vapors or corrosive.
- It is recommended to disinfect once by year, condensate drain pan to avoid the development and spreading of legionella.
- Operating limits (EN1397: 2011) for ambient air temperatures: min. 5 ° C / max. 32 ° C.
- Do not install or use damaged devices.
- The manufacturer declines any responsibility for damage caused by the modification or mistake in electric connections or hydraulic connections.
- Failing to follow the electric security rules can cause a risk of fire in the case of an electric short.
- In case of an unusual functioning, turn off the unit, remove the electricity supply and contact specialized personnel.
- Unless particular conditions, Aircalo gives one year parts warranty against defects in conception or production. Are excluded defects of installation and use and also wearing parts and environment condition which damage the smooth functioning of the device that would have not be specified in the order.
- Failing to follow the manufacturer instructions concerning the installation or the use of the unit in conditions that exceed functioning limits indicated in this manual can lead to the loss of the unit warranty.

2. PRESENTATION

Bali cassettes are equipped with EC fans. They are available in section:

- 600 x 600 mm
- 900 x 900 mm

3. INSTALLATION

Choice of the place

Avoid the following locations:

- Exposure to sunbeam
- Areas near sources of heat.
- Humid locations and places where water may penetrate into the unit.
- Places where curtains or furniture can disturb a good circulation of the air.

Location advised:

- A place without obstacle that can cause an unequal distribution or return of the air.
- Consider a location where the installation will be easier.
- Allow required clearances.
- Look for a place into the room that will guarantee a good distribution of the air.
- It could be easier to connect condensate drain pipe through the appropriated pipework.

Implantation

- It is recommended to position the unit in the center of the room to ensure a good air distribution.
- Caution: the power capacity of installed units must be defined following the thermal balance and the acoustic of the locals.
- Check that the panels from the false ceiling can be dismantled in order to get enough space for maintenance. All of the hydraulic and electric arrangements are put on a same lateral face.
- Do not put the Cassettes on false ceilings which are not horizontals (because it caused water runoff).

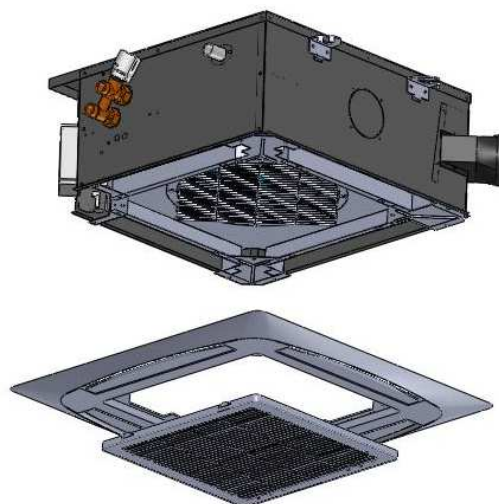
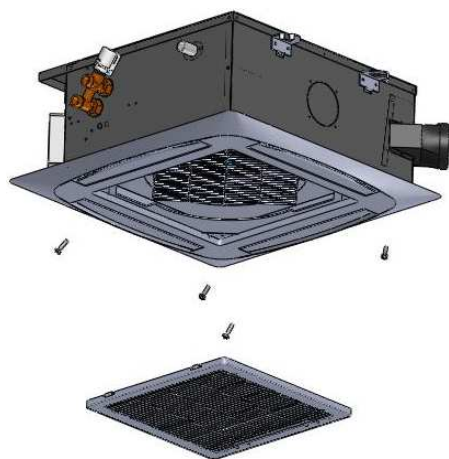
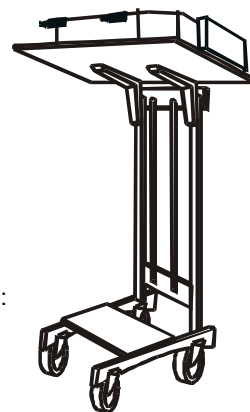
Reception - Storage

- Check the conformity of goods delivered according to the order. Read and control the instructions given by the identification plate.
- In the case of lack or damages, it must be done reserves on the delivery bill to the carrier. Then, confirm this with a registered letter over 48 hours.
- Storage the equipment in a clean, dry place, protected from shocks, vibration and temperature fluctuation and at a relative humidity level of less than 90%. The period of storage should not exceed 1 year.
- Proceed with the unpacking of the device using the protections of accident prevention which are required. Recycle packaging in accordance with local laws regarding waste.
- It is recommended to bring the unit as close as possible to its definitive location before to unpack it.

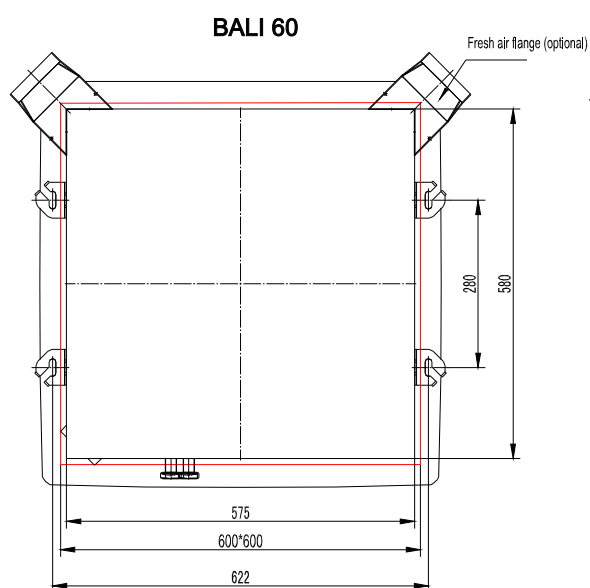
Fitting

Standard units

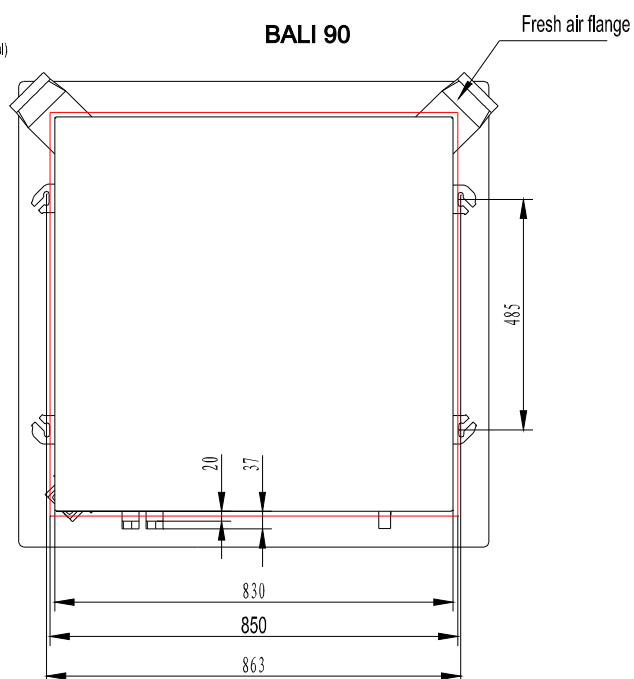
- Use a lift truck to facilitate the installation of the ceiling unit.
- To avoid damaging the slab, disassemble and store waiting for the end of the installation:
 - Remove the intake grille.
 - Remove the screws of the slab.
 - Remove the panel of the unit.



- Fit the 4 tie rods (recommended diameter M8) ceiling following the spacings of the cassette mounting ears to rise. (The ears are formed with oblong holes to permit a final adjustment.)



280 x 622: Suspension Bolts
600 x 600 : Dimensions for opening

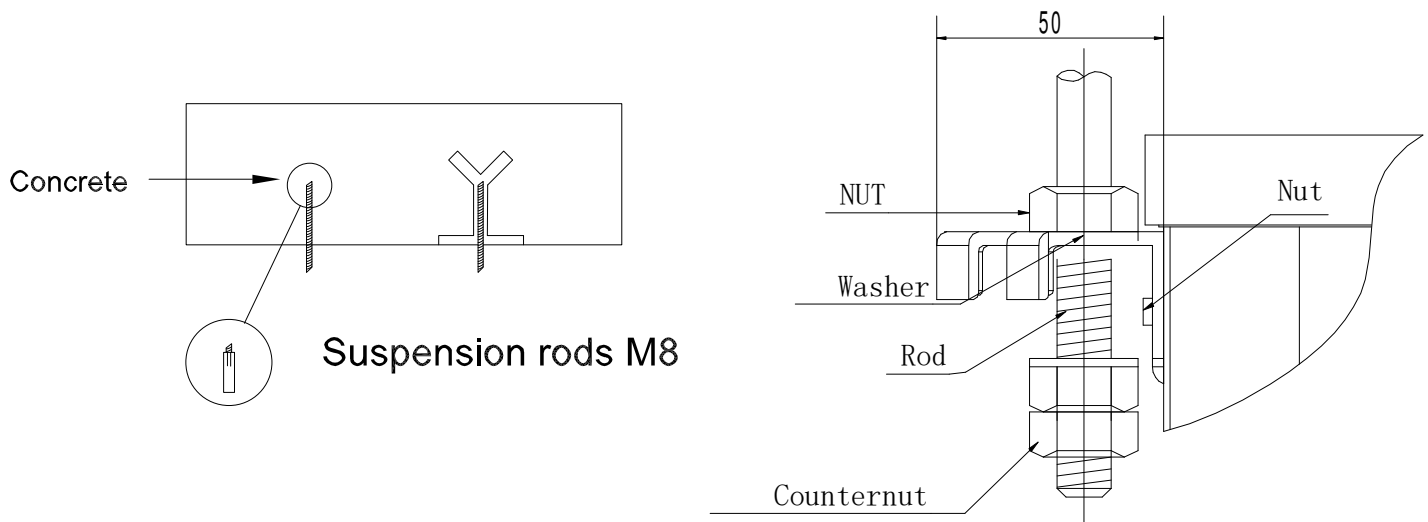


485x 863: Suspension Bolts
850x 850: Dimensions for opening

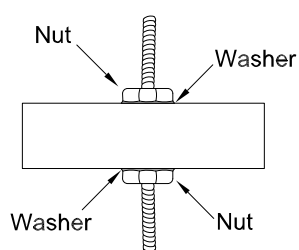
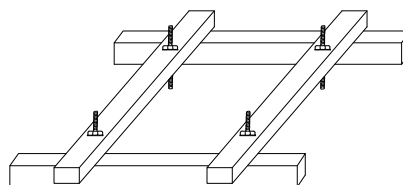
Suspension Structure

- Mark the position of the suspension rods, water lines, condensate drain pipe, power supply cables and remote control cable.
- Supporting rods can be fixed, depending on the type of ceiling.
- Fit suspension brackets supplied with the unit to the threaded rods.
- Do not tighten nuts and counter nuts; this should only be done after the final leveling of the unit when all the connections have been completed.
- Ensure the ceiling is horizontally level, otherwise the condensate water cannot drain away.
- The casing is fixed to the slab with 4 drop rods. The rods should have two nuts and washers to lock the unit in position. The cassette brackets will then hook over the washers.
- Take care when lifting the cassette into position. Don't lift the unit by the drip tray.

Fixing on cement ceiling

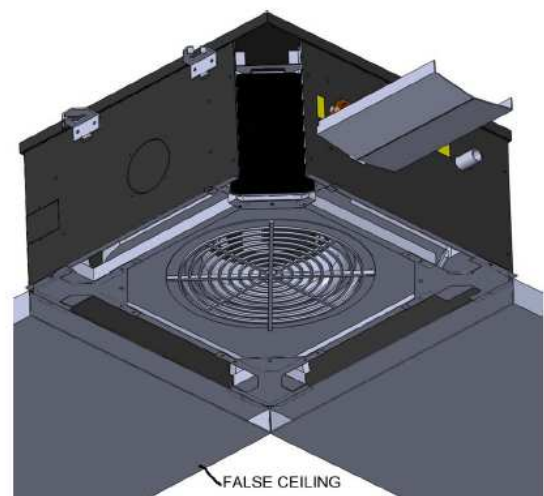
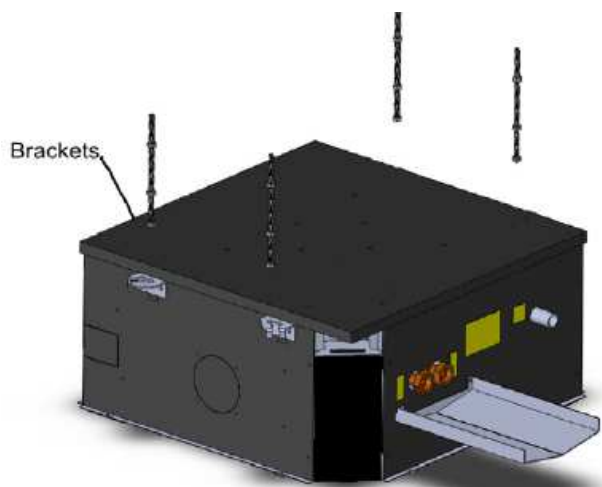
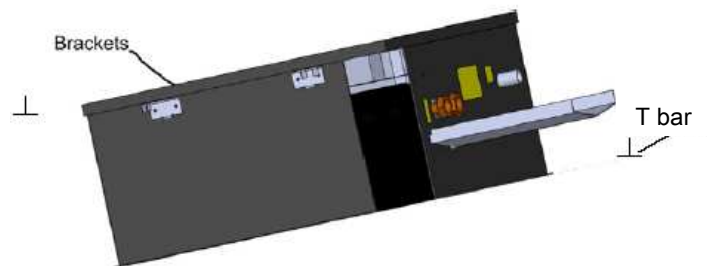
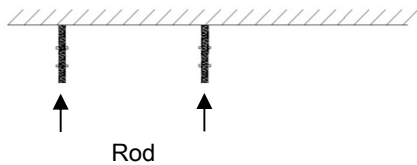


Example of wooden frame

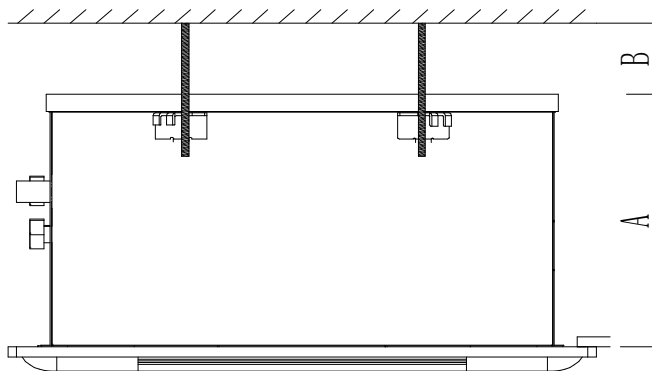


Installation Procedure

- Ensure there is sufficient space around the unit to service it.
- Lift unit (without the air panel) with care by its four corners only. Do not lift unit by the condensate drain discharge pipe or by the piping connections.
- Incline the unit and insert it into the false ceiling. Insert the rods into the bracket slot. It might be necessary to remove some T bars of the false ceiling temporarily to ensure there is enough clearance.
- Using a level guide, line up the unit with a spirit level to ensure an even distance between the body of the unit and the lower part of the false ceiling (see figure next).
- Line up the unit to the supporting bars of the false ceiling, tightening the nuts and counter nuts of the threaded rods.
- After connecting of the condensate drain piping and piping connections, check again that the unit is level.
- The spaces between the unit and ceiling can now be adjusted. Use the drop rods to make the adjustment.
- Check to ensure the unit is level.
- Tighten the nuts on the suspended rods.
- Replace the profile "T" previously removed (false ceiling rails).

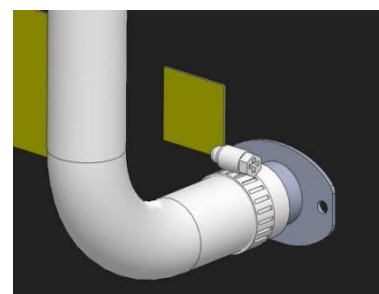
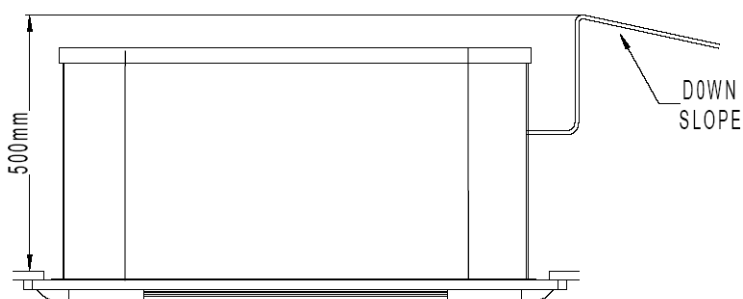


(mm)	A	B
Bali 60/90	290	10 ou plus



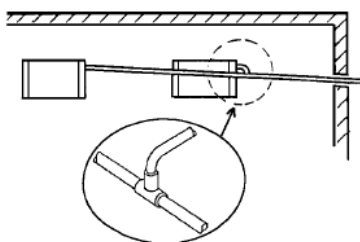
Condensate drain

- The drain pipe has to be covered with an insulating material such as Polyurethane, Protylène or Neoprene, with a thickness of 5 to 10 mm.
- The unit is fitted with a condensate pump with a 500 mm. lift.
- The unit is provided with 25.4mm drainage head made of ABS.
- Before connecting polyvinyl tube with an inner diameter of 26 mm, check if the drainage head is in good condition.
- Fit drainage head into polyvinyl tube with a hose clip.
- The drain must be installed with a downward slope.



reform:

The condensate drain pipe must be installed with a minimum continuous slope of 2%. Connection to the mains drainage must be sized with a siphon depending on the discharge pressure of the unit to allow for sufficient water drainage and continuous.

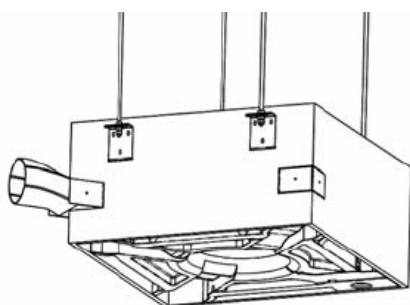
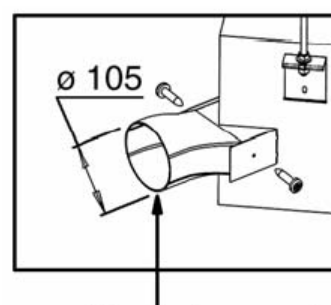
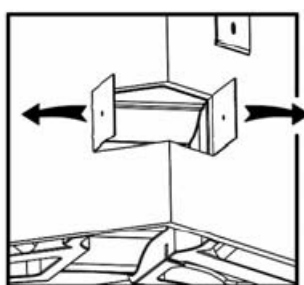
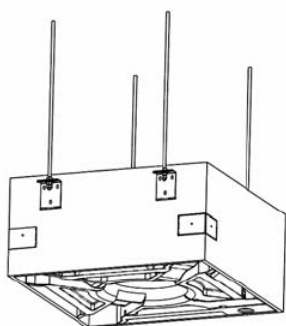
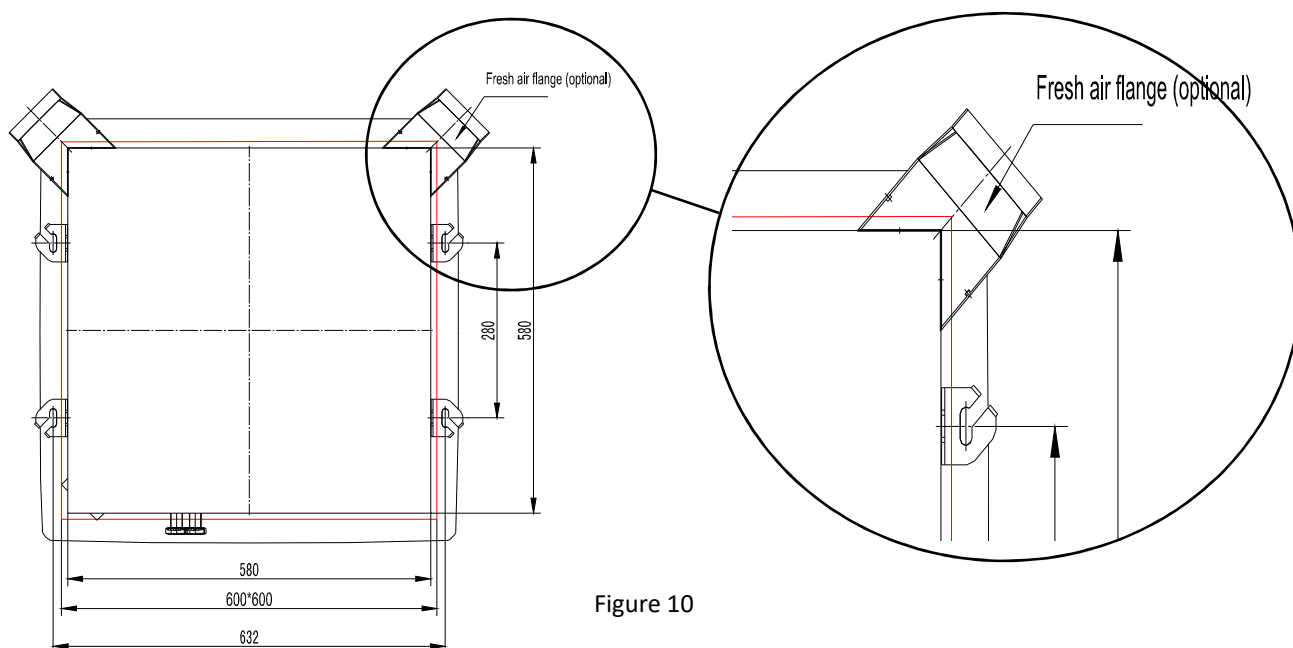


After installation, put water into the auxiliary condensate tray to check leaks.

4. FRESH AIR CONNECTION

The fresh air system for cassette units allows up to 15% of unit airflow to be fresh air intake (per connection). Maximum 2 fresh air connections per unit are allowed.

- The corners of the cassette allow separate ductwork to be installed for outside air intake (Figure 10)
- Cut and remove thermal insulating material.
- Open the mounting plate (Figure 11 and Figure 12)
- Install the flanges to casing and attach with 2 screws. The flange is a rectangular duct with the dimensions of 110 x 55mm.
- It is necessary to control the fresh air supply >70 Pa.



5. HYDRAULIC CONNECTIONS

Instructions

Size	BALI 60	BALI 90
Principal coil	3/4" Female gas	3/4" Female gas
Auxiliary coil 1 row	3/4" Female gas	3/4" Female gas

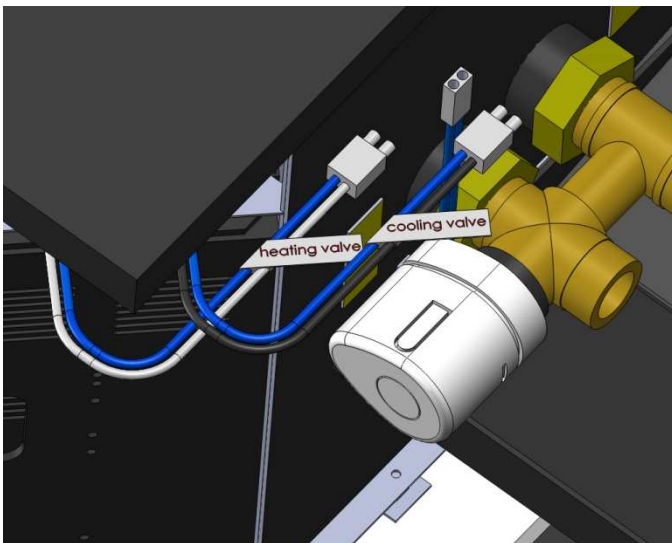
- Operating limit:
Maximum allowable pressure 140 MCE
Min ambient air temperature 5 °C, max 32 °C
Minimum water temperature 2 °C, max 80 °C
Temperature blowing max 60 °C
- Respect the inlet and outlet water coil as shown on the labels on the unit.
- For cassettes 4 pipes be sure to connect the chilled water circuit to the coil specified "cooling" and the hot water circuit to the coil mentioned "heating".
- The tightening torque to be used for water connections is 25 Nm. It is advisable to tighten with a wrench.
- Fully drain the coil, using traps accessible by removing the filter panel.
- To make draining the unit if necessary, cut the electrical supply and the water supply to the unit. Loosen the bleed screw to release pressure in the coil. Partially unscrew the lower manifold piping or valve. The water flow can be exhausted via the auxiliary drain pan if it has been installed correctly and its operation has been tested beforehand.
- Note that the coil is partially drainable; for a complete discharge, it is necessary to blow air under pressure into the coil.
- It is recommended to do the connections to the coil with insulated flexible pipes. For connection with steel pipes ensure they are aligned and suspended to not make mechanical stress on the unit.
- When the connections are completed, it is necessary to surround the valves and piping with insulating materials such as polyethylene foam having a thickness of 5 to 10 mm.
- Check all joints of the fittings when the system is filled with water.
The manufacturer can not guarantee the quality of the seals provided by the installer.
It assumes no responsibility for any dysfunction of the sets and damage that would result from leaks.



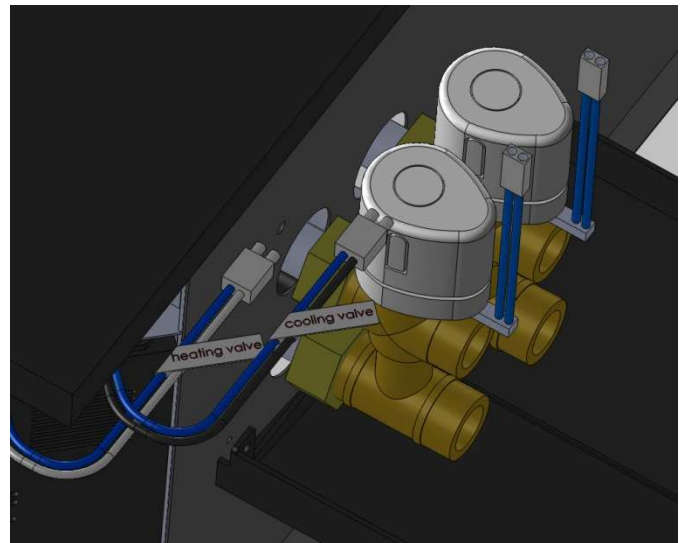
Control valves

- Standard valves are mounted by the installer. Mounting the motorized control valves can be part of our optional supply. Actuated valves are intended to be supplied with 230 V, average consumption 5 VA. The valves are of the type 2-way or 3-way with bypass.
- The valves must close the water inlet when there is no power.
- Before connecting, check the position of the electro valve: Normally closed on the coil side and Open on bypass side.
- When the ambient temperature does not satisfy the thermostat, electrical resistance causes the heating of a thermostatic heating element which determines the descent of the piston; the valve gradually opens to circulate the water in the coil.
- When the room temperature reaches the level required by the thermostat or when the power is off, the valve is gradually closed from the coil side and open on the bypass side.
- Insulate carefully pipes, valve assembly, coil connections (cold side) to prevent condensation that may form dripping onto the ceiling.
- It is recommended to organize the regulation so that valves can not open if the fan motor is not working.

2-Pipe systems:



4-Pipe systems:



- Once valves are fitted, make the electrical connection with the connectors. For 4-pipes wire marked "valve heating" must be connected to the valve motor of the heating coil and the wire marked "cooling valve" must be connected to the valve motor of the cold coil.

External Drain Pan

Instructions:

- Align the two screw holes in the fixing plate to the two holes in the external drain pan. (Figure 8)
- Make sure the drain pan is horizontal.
- Tighten the two screws while making sure the external drain pan is installed evenly against the fixing plate. (Figure 9)

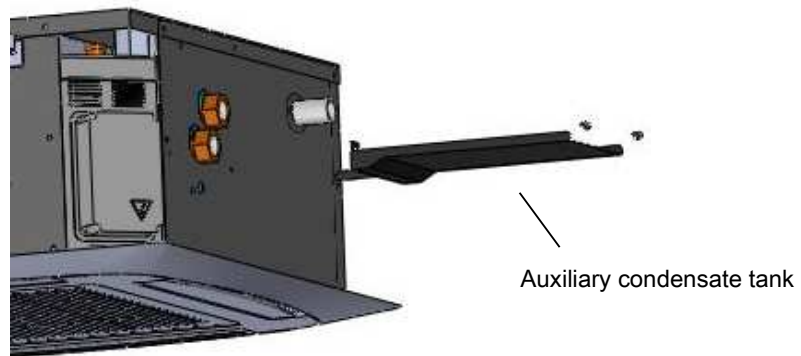


Figure 8

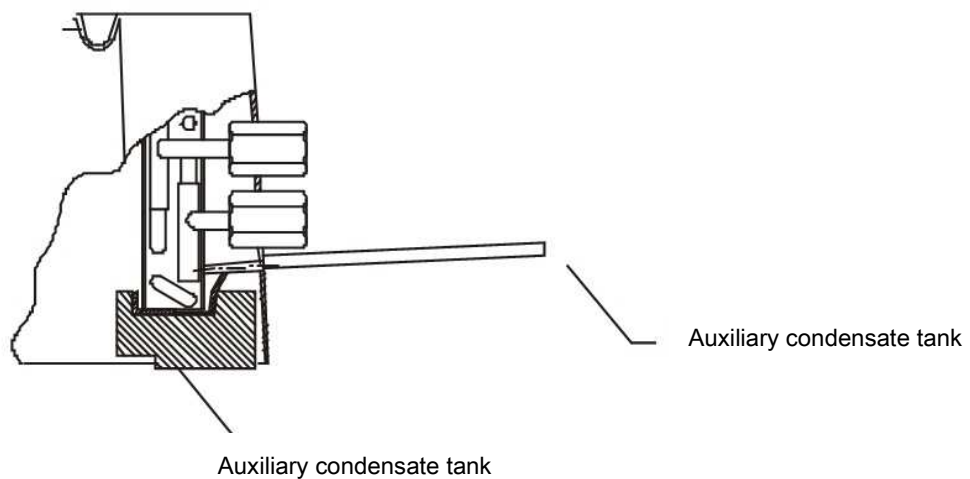


Figure 9

6. ELECTRIC CONNECTIONS

- The electrical installation of a device must comply with the installation rules in force and carried out by qualified personnel according to the diagrams attached end of document.
- The supply voltage is 230 V single-phase + earth (operation mini 198 V ; Max: 264 V).
- Make the connection of earth before any other connection.
- Check that the power supply is done through a switch that disconnects all poles, keeping a distance of at least 3 mm between the contacts.

Caution : Electrical regulation requires that any installation of rotating equipment should have an effective protection from all points of view. In this context, the guarantees issued by the Union of Electrical Construction does not apply to motors whose winding is "burnt".

The warranty is void in case of changes in wiring and factory settings.

- All electrical connections should be made on the terminal block on the same side as easements of the unit.
- An electrical box must control each device. In the case of multiple devices controlled by a single thermostat, it is necessary to provide an electrical relay system.
- We recommend the use of electric supply cable from the unit HO7 RN-F type. The section of the wire connections must be defined in terms of power absorbed (below) and cable lengths to put depending of the geometry of the premises.

Motor power

	BALI 60	BALI 90
Input power (W)	80	362
Intensity (A)	0.35	1.57

Electric power auxiliary heating resistors

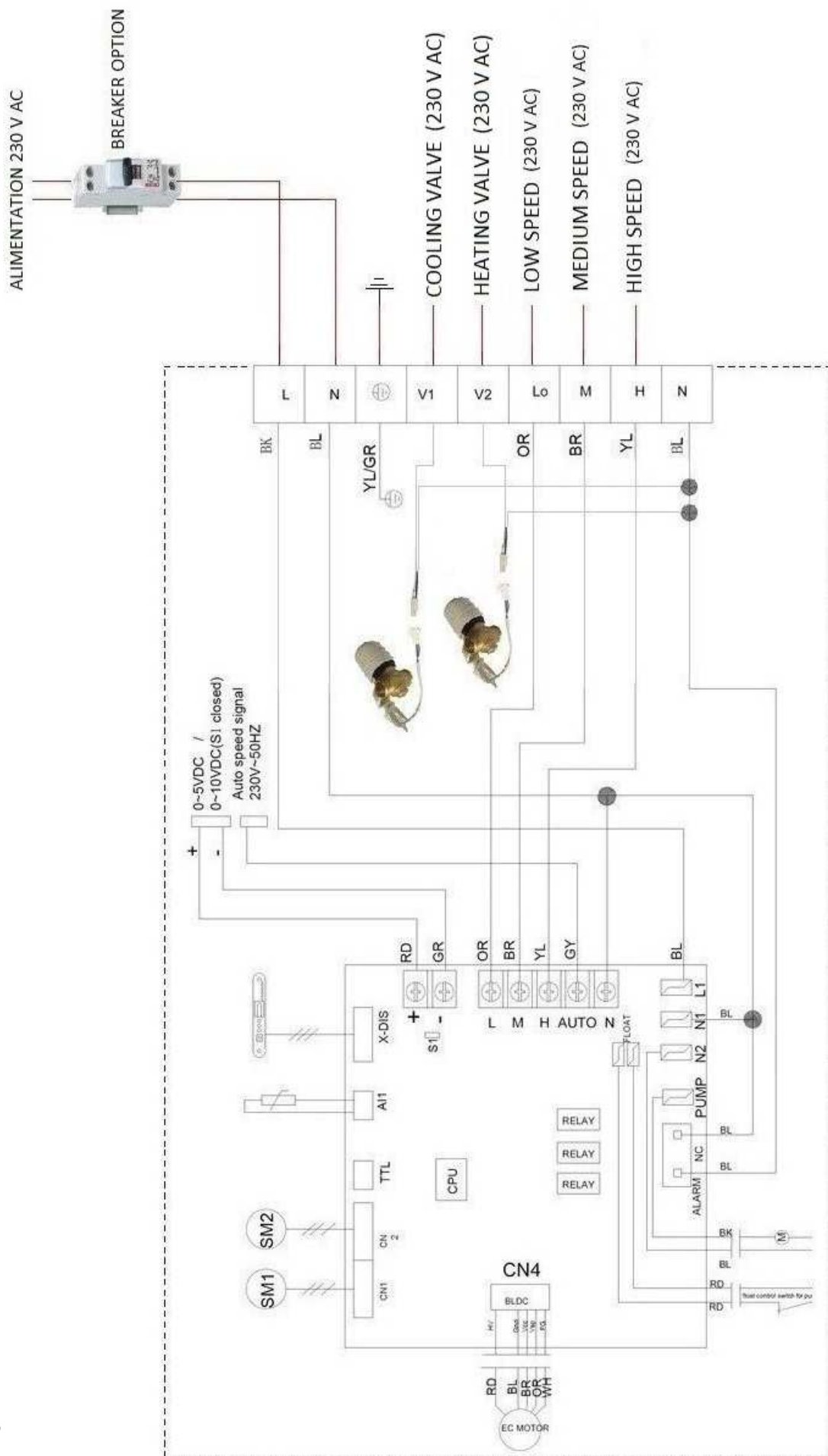
Power	BALI 60	BALI 90
2000 W	4.40 (A)	-
4000 W	-	8.80 (A)

Note : A reset safety thermostat is integrated into the control box.

Caution :

- Post-ventilation: It is necessary to provide a delay of forced operation of the fan motor after stopping the electric coil to ensure dissipation of residual energy on resistance. Post-ventilation time 45 seconds.
- Non-observance of this control can result in damage to the unit or the environment.
- During operation of the electric coil, a power cut can cause tripping of the safety thermostat.
- The operation of electrical heaters is prohibited when the main battery is supplied with hot water.
- If the airflow is not sufficient, the electrical coil will not start. The minimum speed for continuous operation of the electrical resistances is 300 RPM.

Electrical connection – type 3 fan speeds – 4 Pipes
 (for auto-speed 0 – 10V – refer to regulator technical leaflet).



(for auto-speed 0 – 10V – refer to regulator technical leaflet).



7. BOX CONTROL

Description

- Condensate management with valve protection and NC alarm contact.
- Integrated fan relays for zone control applications.
- ON/OFF thermostat input and low-voltage modulating fan speed input flexibility.
- Simple error diagnostic and LED error display.

I/O Port Definitions

I/O		Code	2-Pipe	4-Pipe
Analogue input	Coil temperature sensor	AI1	Cooling / heating coil sensor (Ti1)	Analogue input
Voltage input	High fan speed	H	230VAC input signals from wired thermostat	
	Medium fan speed	M		
	Low fan speed	L		
	Phase	L	External 230VAC power supply connection to the PCB. Max length: 5 m.	
	Neutral	N		
	Earth	GND		
	Auto ON/OFF	AUTO	230VAC input signal from wired thermostat, activates modulating control mode	
Signal Input	Modulating signal	+/-	Low voltage modulating signal input (standard 0~10VDC; optional 0~5VDC)	
Digital input	Programming interface	TTL	Low voltage digital signal input for board programming	
	Float switch	Float	Voltage-free (NC)	
Voltage output	Water pump	WP	Voltage output (L)	
	EC motor	CN4	5-wire connection with 230VAC power supply to EC motor and 0~10VDC modulating signal output	
	Stepping motor	CN1-2	Low-voltage output	
Digital output	LED display	X-DIS	Low-voltage output	
Voltage-free output	Alarm		Voltage-free alarm contact: (a) Standard configuration is (NC).	

Onboard Configuration

The PCB can be configured for different modulating signal inputs. Refer to jumper configuration table below.

Code	State	Description
S1	Open	PCB configured for 0~5VDC modulating signal input.
S1	Closed	PCB configured for 0~10VDC modulating signal input (standard)
S3	N/A	Reserved
S4	N/A	Reserved

Control Logic

Unit Power ON/OFF

- The unit is turned ON when:
 - One of the fan speed inputs (H/M/L) is ON
 - ON/OFF signal input is ON.
- The unit is turned OFF only if all of the fan speed inputs (H/M/L) are OFF AND Auto ON/OFF signal input is OFF.

Alarm Protection and Error Display

- If the float switch is open for 5 minutes, then the (NC) voltage-free alarm contact shall be open and the (NO) voltage free alarm contact shall be closed.
- If the float switch is open for 10 minutes, the LED display reports a condensate management failure (see table on the next page).

Drain-Pump Run Management

- When the unit turns ON:
 - If $Ti1 < 15\text{ }^{\circ}\text{C}$, the drain pump turns ON.
 - If $Ti1 \geq 15\text{ }^{\circ}\text{C}$, the drain pump turns OFF.

When the unit turns OFF and the drain pump is ON: the drain pump will remain ON for 5 minutes, before the drain pump turns OFF.

- At any time:
 - If the float switch is OPEN, the drain pump will turn ON.
 - If the float switch is OPEN and then CLOSES, the drain pump will remain ON for 5 minutes, and then turn OFF.

Swing and Louver Control

- When the unit is OFF, the louvers are closed (angle at 100° against vertical).
- When the unit turns ON, the louvers open (angle at 87° against the horizontal).
- When the unit turns OFF, the louvers returns to a closed position (100° against the vertical).

Modulating Signal Input

- When the "Auto ON/OFF" 230VAC input is ON, the fan motor rpm speed shall be modulated by the "+/-" low voltage modulating signal input.
- The standard configuration is for 0~10VDC modulating signal input.
- The optional configuration is for 0~5VDC modulating signal. To set the PCB to the optional configuration, the S1 jumper must be closed.

8. LED INDICATION AND ERROR DESCRIPTION



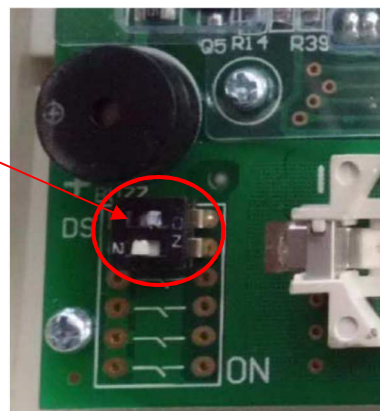
SK-NCGH-002/003-ECM		
Fan speed setting	LED indication	Condition
High speed	RED LED ON	Normal
Medium speed	YELLOW LED ON	Normal
Low speed	GREEN LED ON	Normal

For all units - Green LED blinks			
Item	Item	Item	Item
Indoor coil sensor 1 failure	Green LED blinks 4 times, stops for 3s	Ti1 sensor unplugged or damaged.	<ol style="list-style-type: none"> 1. Check if Ti1 plug is connected or not. 2. Check if sensor's resistance is correct or not.
Water pump failure	Green LED blinks 7 times, stops for 3s	Float switch is opened.	<ol style="list-style-type: none"> 1. Check if the condensate water pipe is connected or not. 2. Check if the pump is functioning or not.
EC motor failure	Green LED blinks 9 times, stops for 3s	No EC motor feedback	<ol style="list-style-type: none"> 1. Check DIPB-SW5 and SW6 setting. 2. Check the EC motor.

9. SPEED CONTROL BOX

Bali cassettes come with 3 fan speeds (Low / Medium / High) factory set. With the speed control box (accessory optional) it is possible to change the fan speed ventilation, especially if the sound level is estimated excessive by the user. Procedure:

- 1) Turn OFF the unit.
- 2) Open speed control box's back cover, where two DIP switches can be seen.
- 3) Turn the DIP switch 1 to "ON" position.



- 4) Wired speed control box LCD will display the following;
- 5) The box shows :



This is the speed level setting.
d0 means low speed
d1 means medium speed
d2 means high speed
Press PARAMETER + / - button to select.

This is the motor RPM setting.
Press TEMP. + / - button to increase the RPM setting by 10RPM step.

Table for RPM setting for EC fans:

Model	High	Medium	Low
BALI 60	800	560	250
BALI 90	930	650	400

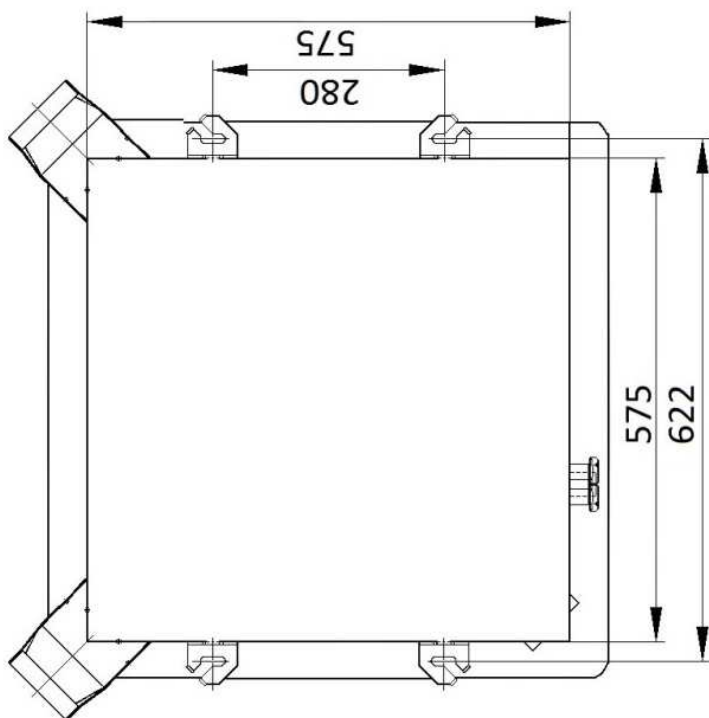
Air flow/Voltage for EC fans

BALI 60			
Air flow (m³/h)	Voltage (V)	Power abs. (W)	Speed RPM
160	2.97	6.6	
210	3.96	10.0	
255	4.81	14.4	
340	6.31	28.4	
375	6.91	36.9	

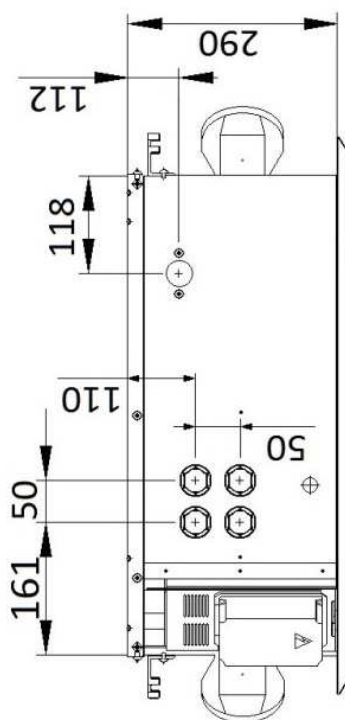
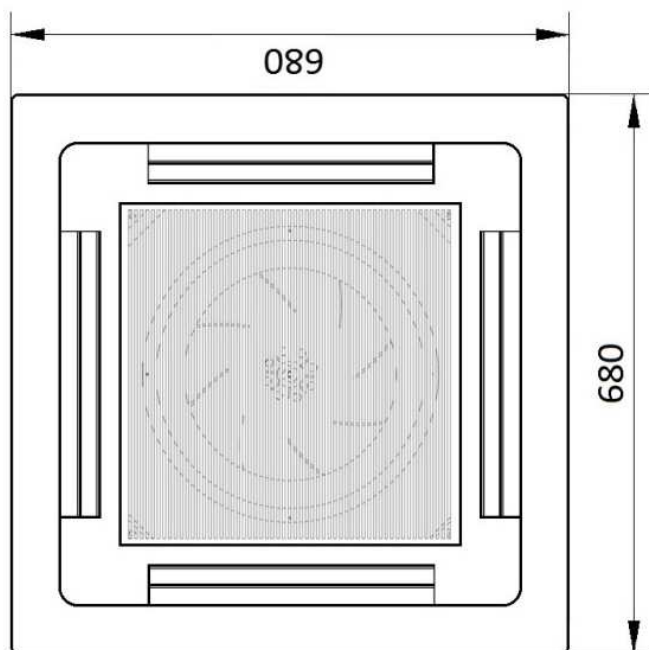
BALI 90			
Air flow (m³/h)	Voltage (V)	Power abs. (W)	Speed RPM
180	1.55	7.6	
240	2.08	10.7	
440	3.81	23.0	
580	5.0	39.2	
705	6.07	63.7	

10. DIMENSIONS AND WEIGHT

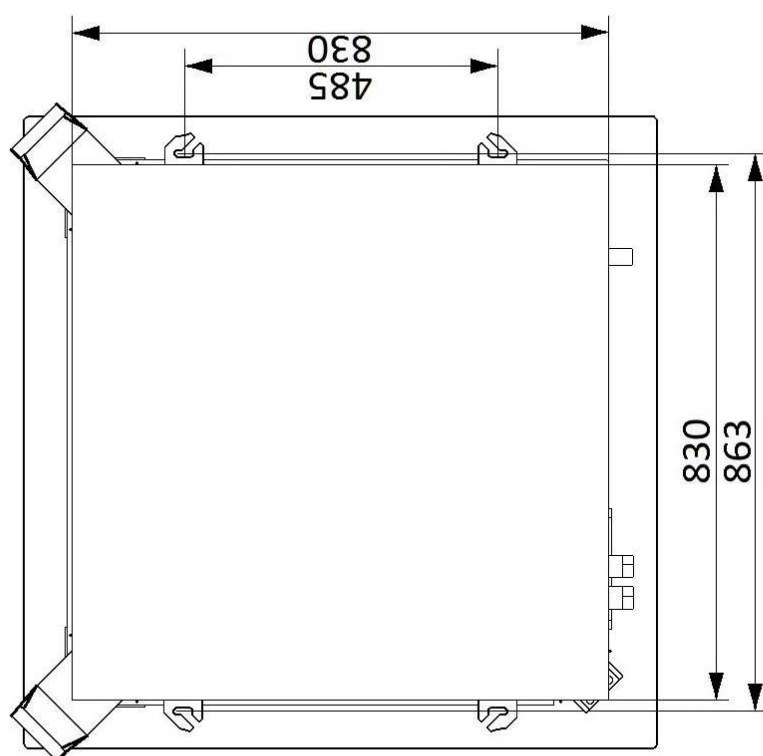
BALI 60



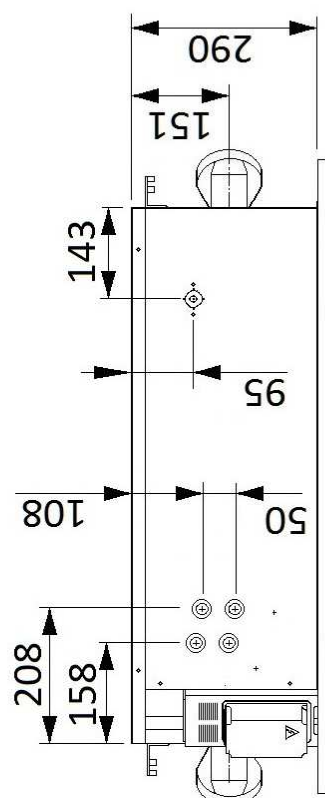
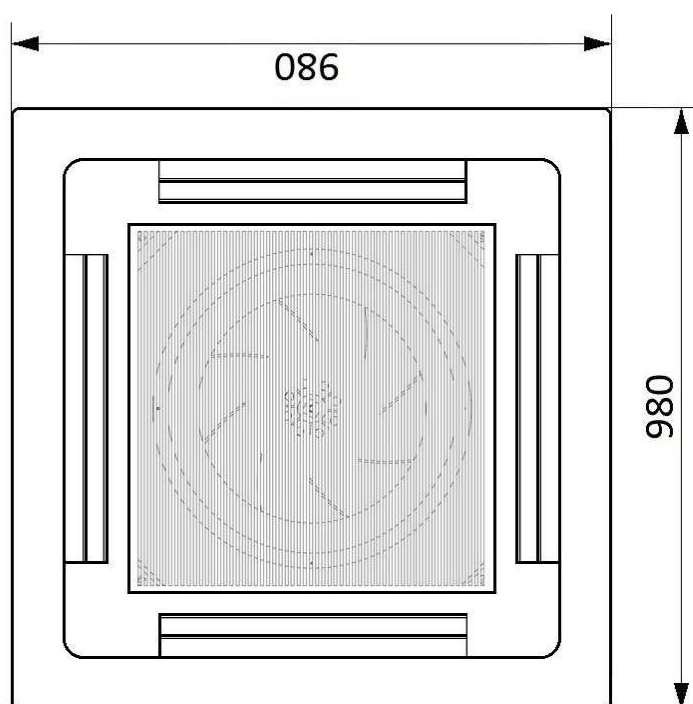
BALI 60 = 32 kg net



BALI 90



BALI 90 = 53 kg net



11. **Start-up**

- The unit should not be started up until the system piping has been cleaned and all the air has been purged.
- Check condensate drain pipe slope.
- After you have connected the main power supply to the cassette unit, it is necessary to check that the condensate water pump installed inside the unit is in working order.
- Due to transport vibration it is possible that the float switch is suspended and the pump might not work correctly. For this reason, you must do the following to ensure the unit works effectively.
- Install the cassette unit in an absolute horizontal position.
- Fill the internal drain pan (manually) with enough water to check the drain pump is working.
- You can fill the internal drain pan by pouring water through the external drain pan.
- If everything is functioning correctly, the water will be expelled from the unit into the pipe work you have installed. If the water is not expelled, please manually check the float switch is not faulty.
- Make sure that the air filter is clean and properly installed.
- Ensure that the power rating values of the electrical connection correspond with the unit rating label.
- Verify that all the louvers can be manually opened smoothly by hand.

12. MAINTENANCE

Cleaning and maintenance operations must be performed by qualified personnel.

Before any work turn the main power switch OFF.

Cleaning / Filter removal

- Cleaning of the filters depends on the conditions of operation of the cassette (approximately every two months).

Filter Removal

- Unlock the two fasteners on the front panel.
- Open the grille downward with care.
- Pull the filter out.
- Clean the filter and reassemble. The filter is made of acrylic fiber and is washable in water.



Figure 31

Removing the internal components

- The electrical panel is easily accessible by removing the cover panel.
- The inspection or replacement of internal components such as the heat exchanger coil, condensate drain pump, or float switch, involves the removal of the condensate drain pan.
- During the removal of the condensate drain pan protect the floor under the unit from water spillage with a plastic sheet.
- Unscrew the drain pan fixture and remove the condensate drain pan with care.
- The appliance is meant to be maintained by qualified service personnel and located at a height of 2.5m or more.
- Please see section B. Safety Precaution.

Fan motor replacement

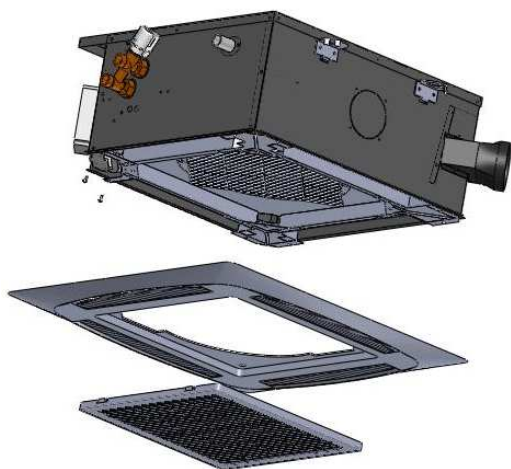


Use a spanner to remove the fan blower

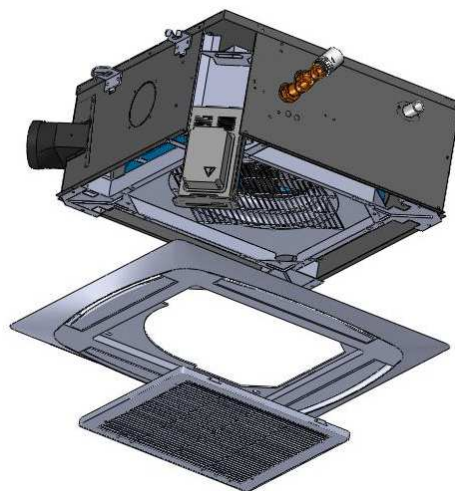


Remove the motor by undoing the 4 bolts and then disconnect the fan motor wire connector

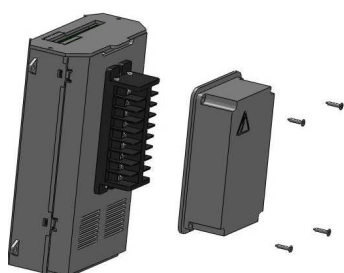
Replacement control box



Remove 2 screws from control box

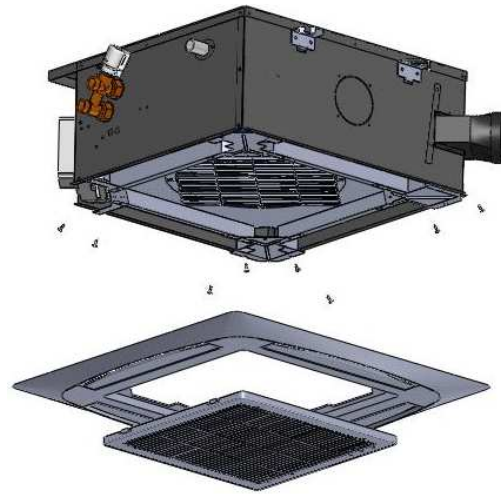
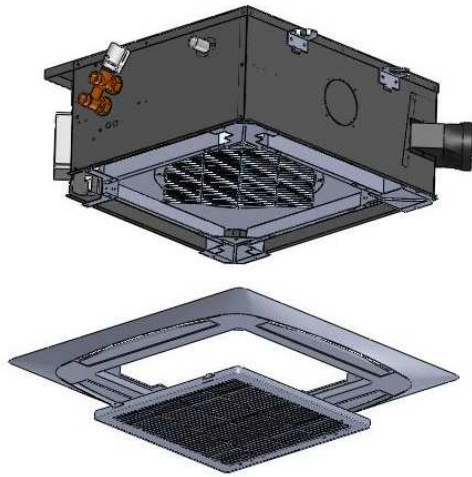


Slide out the control box

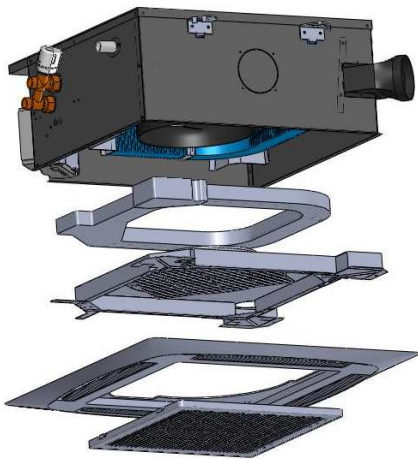


Remove the terminal cover by unscrewing the 4 screws and unplugging the wiring on the terminal. Replace with a new control box

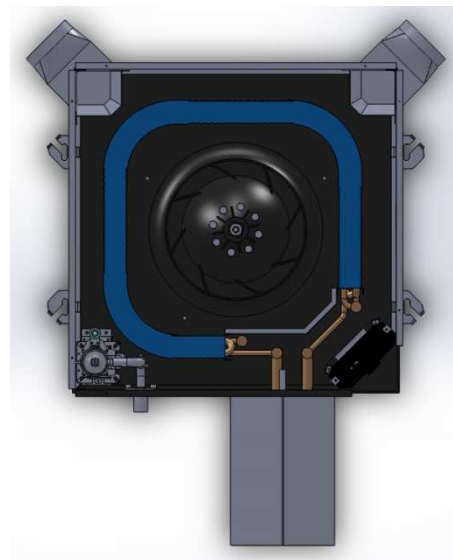
Condensate pump replacement



Remove the drain pan fixture by unscrewing the 8 screws as shown

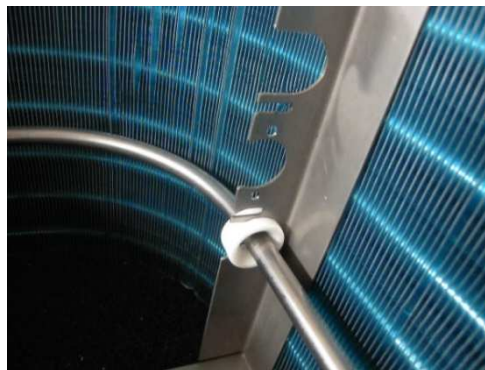
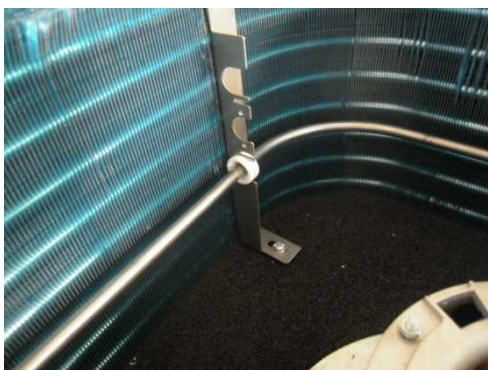


Remove the drain pan fixture and internal drain pan

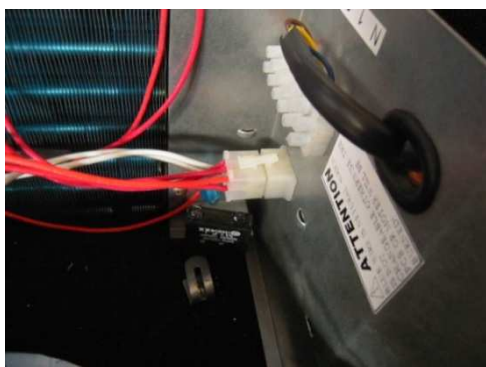


Remove the drain pump or valve

Replacing electrical resistance



Snap in the insulated ring of
the electric heater



Plug in the electric heater wiring to the connector
shown above.

Remark:

If the air flow is not sufficient to cool the electrical heater safety, the alimentation is automatically turned OFF. This concern mainly the use at low speed. If necessary fit a higher speed until the electrical heater is correctly cooled.

Long shutdown periods

Before turning on the unit and at least once a year:

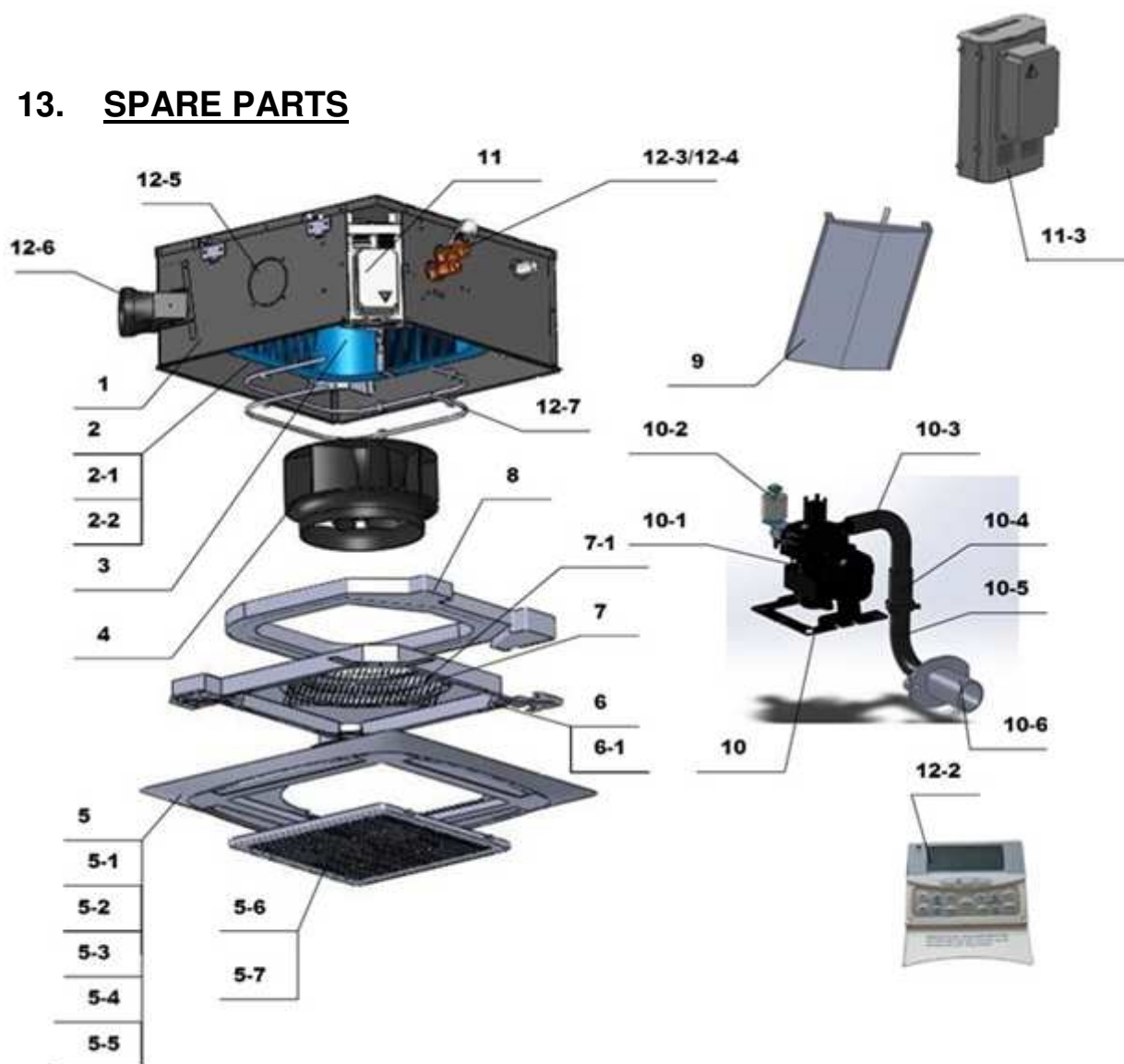
- Clean or replace filters of the unit.
- Inspect the fins of the coil and if necessary remove any accumulation of dust.
- Inspect and clean the drain pan of the unit and remove all foreign matter.
- Check that the electrical connections are tight.

User Guide

When installation and tests are completed explain to users the main points of operation and maintenance manual, paying particular attention to the main operating modes of the tape:

- How to turn the air conditioner on and stop, change modes, temperature.
- Give to the user the installation manuals of the unit, as well as the manual and maintenance so that could be check for maintenance, if installed in another location or other contingencies.

13. SPARE PARTS



Item	Description	QTY	Item	Description	QTY
1	Casing	1	6	Mounting fixture	1
2	Coil	1	6-1	Room sensor	1
2-1	Chilled water coil sensor	1	7	Finger guard	1
2-2	Hot water coil sensor	1	7-1	Venturi	1
3	EC Motor	1	8	Drain pan	1
4	Fan blower	1	9	External drain pan	1
5	Front panel	1	10	Pump system	1
5-1	Front cover	1	10-1	Pump	1
5-2	Louver	4	10-2	Float switch	1
5-3	IR receiver	1	10-3	Pump pipe-1	1
5-4	Stepping motor	2	10-4	Check valve	1
5-5	Stepping motor	2	10-5	Pump pipe-2	1
5-6	Grille	1	10-6	Drainage head	1
5-7	Filter	1	11 - 3	Plug & play control box	1

12-Accessories

Item	Item	Item	Item
12-2	12-2	12-2	12-2
12-3	12-3	12-3	12-3
12-4	12-4	12-4	12-4
12-6	12-6	12-6	12-6
12-7	12-7	12-7	12-7
12-7	12-7	12-7	12-7

Diagrams and photographs are not contractual.

In a continuing effort to improve products, we reserve the right to change, without notice, the specifications.



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