ROBUR
caring for the environment

Installation, use and maintenance manual

AD evaporative coolers

For natural, simple and affordable cooling of medium and large buildings

DISPOSAL
The appliance and all its accessories must be disposed of separately in accordance with the regulations in force.

Use of the WEEE symbol (Waste Electrical and Electronic Equipment) indicates that this product cannot be disposed of as household waste. Proper disposal of this product helps to prevent potential negative consequences for the environment and human health.

Revision: D
Code: D-LBR754EN

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I INTRODUCTION

Installation, use and maintenance manual

This Manual is an integral part of the AD unit and must be handed to the end user together with the appliance.

I.1 RECIPIENTS

This Manual is intended for:

- ► End user, for appropriate and safe use of the appliance.
- ► Qualified installer, for correct appliance installation.
- ► Planner, for specific information on the appliance.

I.2 CONTROL DEVICE

In order to work, the AD unit requires a control device to be connected by the installer (see Paragraph 1.4 *p. 10*).

II SYMBOLS AND DEFINITIONS

II.1 KEY TO SYMBOLS

DANGER

WARNING

NOTE

PROCEDURE

REFERENCE (to other document)

II.2 SIGNAGE APPLIED ON THE APPLIANCE

Live electrical parts: warns of danger from live electrical parts.

Mechanical parts: warns of danger due to moving mechanical parts.

II.3 TERMS AND DEFINITIONS

Appliance / Unit = equivalent terms, both used to refer to the evaporative cooler AD.
TAC = Technical Assistance Centre authorised by Robur.

III WARNINGS

III.1 GENERAL AND SAFETY WARNINGS

Installer's qualifications

Installation must exclusively be performed by a qualified firm and by skilled personnel, with specific knowledge on heating, hydraulic and electrical systems, in compliance with the laws in force in the Country of installation.

Declaration of conformity

Upon completing installation, the installing firm shall issue to the owner/client the appliance's workmanlike conformity declaration, according to national/local regulations in force and the manufacturer's instructions/provisions.

Misuse

The appliance must only be used for the purposes for which it has been designed. Any other use is deemed hazardous. Incorrect use may affect operation, duration and safety of the appliance. Adhere to the manufacturer's instructions.

Use of the appliance by children

The device can be used by children over 8 years old, and by people with reduced physical, sensory or mental capabilities, or lack of experience or knowledge, only if they are under surveillance or after they have received instructions regarding safe use of the appliance and understanding the dangers inherent in it. Children should not play with the appliance.

Hazardous situations

- Do not start the appliance in hazardous conditions, such as: problems with the electrical system, disassembled or damaged parts of the appliance, malfunctioning, disabling or bypassing of control and safety devices.
- In case of danger, request intervention by qualified personnel.
- In case of danger, switch off the electrical power supply only if this can be done in total safety.

- Do not entrust children, persons with physical, sensory or mental disabilities or persons with poor knowledge and experience with use of the appliance.

Moving parts

The appliance contains moving parts.
- Do not remove guards during operation, and in any case prior to disconnecting the power supply.

Electrocution hazard

- Disconnect the electrical power supply before any operation on appliance components.
- For electrical connections exclusively use compliant components and according to the specifications provided by the manufacturer.
- Ensure the appliance cannot be accidentally switched back on.

Earthing

Electrical safety depends on effective earthing system, correctly connected to the appliance and installed according to the regulations in force.

Aggressive substances in the air

The air of the installation site must be free of any aggressive substances or impurities that could contaminate the evaporative packs of the appliance.

Switching the appliance off

- Except in the event of danger, do not disconnect the power supply to switch off the appliance, but always and exclusively act through the provided control device.

In the event of failure

Operations on internal components and repairs may exclusively be carried out by a TAC, using only original parts.
- In the event of failure of the appliance and/or breakage of any component, do not attempt to repair and/or restore and immediately contact the TAC.

Appliance positioning

Do not install the machine in closed areas; it must be installed outside the room to be treated, unless by specific approval by the manufacturer.

First start-up

Do not operate the unit until the air supply duct has been installed and connected.

Wastewater

During normal operation of the system in cooling mode, the evaporation process produces an accumulation of mineral salts and solid residues in the waste water; this water is not potable.

Routine maintenance

Proper maintenance assures the efficiency and good operation of the appliance over time.
- Maintenance must be performed according to the manufacturer's instructions (see Chapter 7 *p. 20*) and in compliance with current regulations.
- Enter into a maintenance contract with an authorised specialised firm for routine maintenance and for servicing in case of need.
- Use only original parts.

Keep the Manual

This Installation, use and maintenance manual must always accompany the appliance and must be handed to the new owner or installer in the event of sale or removal.

III.2 CONFORMITY

EU directives and standards

The AD evaporative coolers comply with the essential requirements of the following Directives:
- ► 2014/30/EC "Electromagnetic Compatibility Directive" as amended and added.
- ► 2014/35/EC "Low Voltage Directive" as amended and added.
- ► 2006/42/EC "Machine Directive" as amended and added.
- ► 327/2011/EU "Ecodesign requirements for fans" as amended and added.

Other applicable provisions and standards

The design, installation, operation and maintenance of the systems shall be carried out in compliance with current applicable regulations, depending on the Country and location, and in accordance with the manufacturer's instructions. In particular, regulations regarding the following shall be complied with:
- ► Electrical systems and equipment.
- ► Any other applicable law, standard and regulation.

III.3 EXCLUSIONS OF LIABILITY AND WARRANTY

Any contractual or extra-contractual liability of the manufacturer for any damage caused by incorrect installation and/or improper use and/or failure to comply with regulations and with the manufacturer's directions/instructions shall be disclaimed.

In particular, the warranty on the appliance may be

rendered void by the following conditions:

- Incorrect installation.
- Misuse.
- Failure to comply with the manufacturer's indications on installation, use and maintenance.
- Alteration or modification of the product or any part thereof.
- Extreme operational conditions or however outside of the operational ranges set forth by the manufacturer.
- Damages caused by external agents such as salts, chlorine, sulphur or other chemical substances present in the air of the installation site and/or in the water supply to the appliance.
- Abnormal actions transmitted to the appliance by the system or installation (mechanical stresses, pressure, vibrations, thermal expansion, electrical surges...).
- Accidental damages or due to force majeure.

1 FEATURES AND TECHNICAL DATA

1.1 FEATURES

1.1.1 Available range

The AD evaporative coolers are available in two models, which differ in the maximum air flow that can be delivered:
- ► AD14 with air flow up to 13000 m^3/h
- ► AD20 with air flow up to 20000 m^3/h

Three different versions are available for each model, two of which are equipped with an independent basic (ECO) or advanced (EVO) remote control for each unit, and the third (SC) is suitable for the centralised management of a system composed of a maximum of 30 units, to be associated with a centralised control system, supplied by Robur. The three versions can be summarized as follows:
- ► AD14/AD20 ECO: equipped with the basic ECO remote control (Paragraph 1.4.2 *p. 10*).
- ► AD14/AD20 EVO: equipped with the advanced EVO remote control (Paragraph 1.4.3 *p. 10*).
- ► AD14/AD20 SC: without individual remote control, but designed for a centralised control (Paragraphs 1.4.4 *p. 10* and 1.4.5 *p. 11*).

1.1.2 Operation

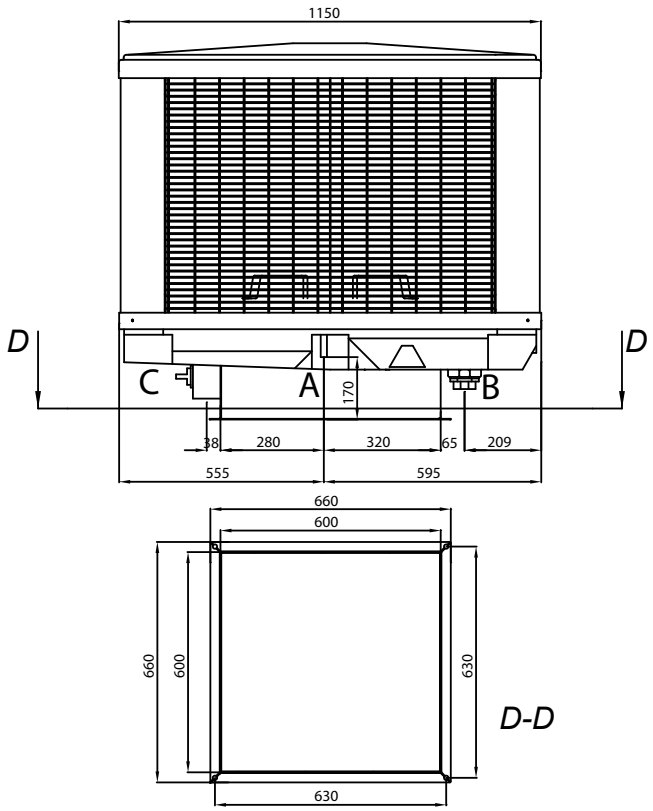
To improve the summer microclimate inside an industrial, commercial or another type of room, it is necessary to ventilate the room with many fresh and filtered air changes, possibly cooled. In the case of large rooms, for example industrial ones, an air cooling system is often not advisable because, due to the large volume of air to be cooled and the thermal loads of the processes to be neutralized, the amount of energy required is very high and the cooling effect is reduced by the exhaust air extraction systems and by the frequent opening of the doors to carry out the activity.

An excellent solution is represented by an evaporative cooling system that cools the air with a natural principle: the air passes through special filters wet with water, transfers part of its heat during the process of evaporation of the water and lowers its temperature. The absence of refrigeration machines reduces energy consumption to a minimum and allows large volumes of air to be treated for the many necessary air renewals.

The AD evaporative cooler can be installed in all environments where it is necessary to improve the microclimate, where it is necessary to ventilate the environment with many fresh and filtered air changes, possibly cooled, such as:
- ► production and crafts premises
- ► commercial premises and warehouses
- ► sports premises in general

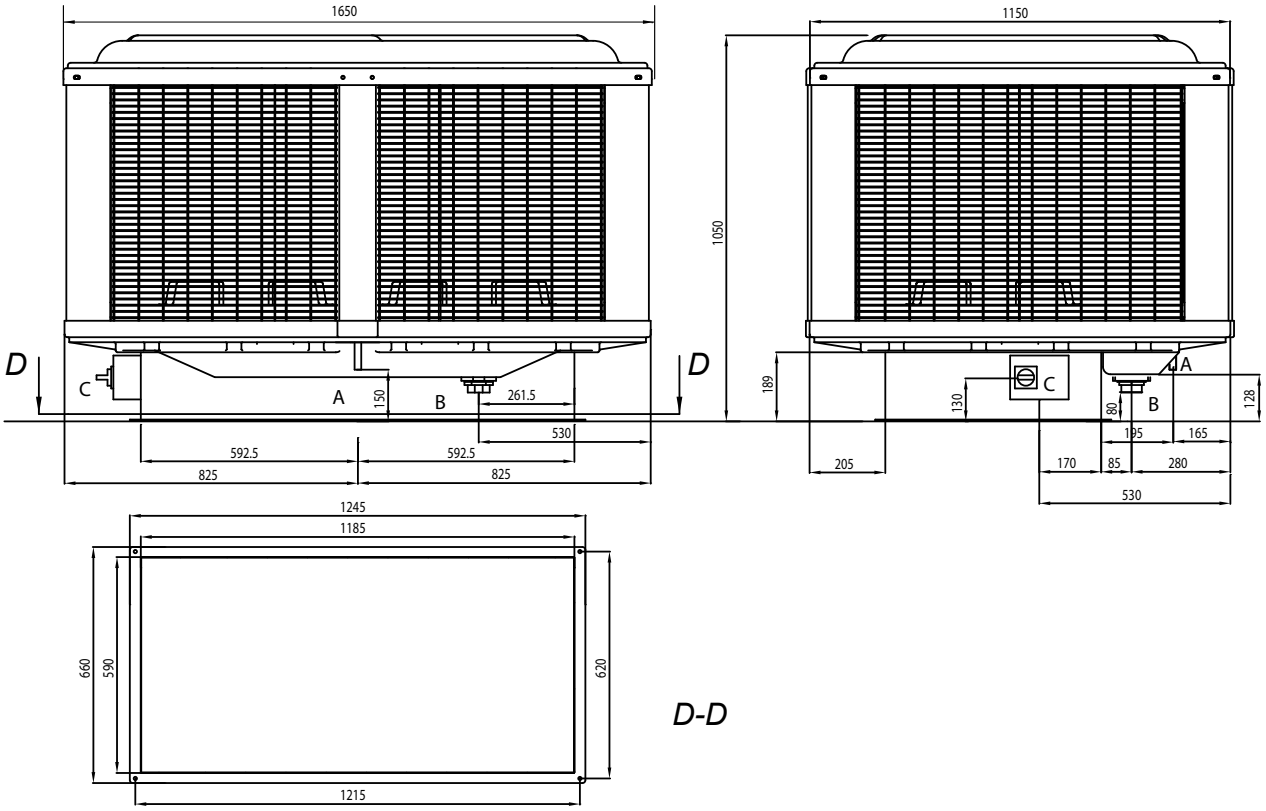
1.2 DIMENSIONS

Figure 1.1 *AD14 dimensions*



A Water inlet 3/8" M
B Water drain 60 mm M
C Electrical panel

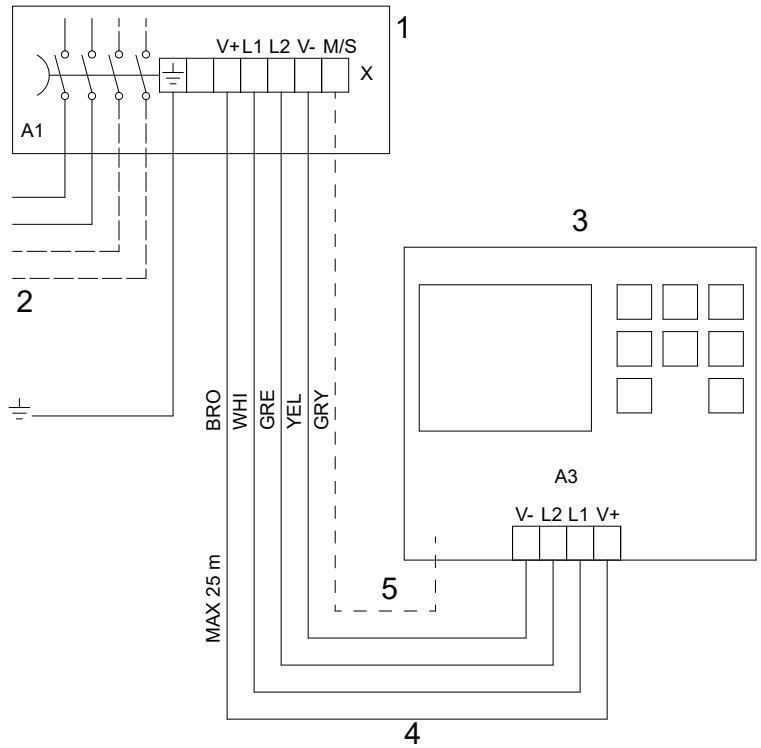
Figure 1.2 *AD20 dimensions*



A Water inlet 3/8" M
B Water drain 60 mm M
C Electrical panel

1.3 ELECTRICAL WIRING DIAGRAM

Figure 1.3 *Electrical wiring diagram*



1 Onboard electrical panel
2 Power supply 230 V - 50 Hz
3 Remote control
4 20 AWG 5x0,5 mm² shielded cable
5 Do not connect
A1 Main switch onboard the appliance
BRO Brown
WHI White
GRE Green
YEL Yellow
GRY Grey

1.4 CONTROLS

1.4.1 Control device

The operation of the appliance is controlled by a remote control, available in the following versions:

1. ECO basic remote control (versions AD14/AD20 ECO)
2. EVO advanced remote control (versions AD14/AD20 EVO)
3. OCDS010/OCDS011 centralised control combined with OCDS009 network board (AD14/AD20 SC versions)
4. Centralised control with ODSP035 router (one AD14/AD20 ECO or EVO and up to 4 AD14/AD20 SC)

1.4.2 ECO basic remote control

Figure 1.4 *ECO basic remote control*

The ECO basic remote control is the basic control system for AD evaporative coolers.
The features of the ECO basic remote control are:

- ► Turning the appliance on and off.
- ► Cooling/ventilation selection.
- ► Ventilation speed selection (3 levels).
- ► Diagnostics of any faults.

All settings must be made manually, as there is no time programming for this control.

For further information refer to the instruction sheet supplied with the ECO remote control.

1.4.3 EVO advanced remote control

Figure 1.5 *EVO advanced remote control*

The EVO advanced remote control is the advanced control system for AD evaporative coolers, which includes a humidity and temperature probe already installed and connected to the control.
The features of the EVO advanced remote control are:

- ► Automatic/manual operation selection.
- ► Cooling/ventilation selection.
- ► Automatic or manual selection of the ventilation speed (3 levels).
- ► Room temperature detection by integrated thermostat.
- ► Ambient humidity detection by integrated humidistat.
- ► Automatic operation based on the setpoint.
- ► Daily programming of the operating time schedule.
- ► Diagnostics of any faults.

The EVO control can guarantee automatic regulation of the cooler, thanks to the temperature and humidity probe, being able to adjust the fan speed accordingly on the 3 available levels. With the EVO control, it is also possible to set a daily time program, being able to set the cooling or fan-only mode.

For further information refer to the instruction sheet supplied with the EVO remote control.

1.4.4 OCDS010/OCDS011 centralised control

Figure 1.6 *OCDS009 network board*

Figure 1.7 *OCDS010/OCDS011 centralised control*

The OCDS010/OCDS011 centralised control allows centralised management of systems consisting of several SC version cooling units (up to a maximum of 30).
The functions of the centralised control are:

- ► Display and setting of date and time on network boards.
- ► Display of temperature and humidity measured by network boards.
- ► Display and change of temperature and relative humidity setpoints for each network board.
- ► Display and change network device parameters (network boards and coolers).
- ► Switching on/off of each individual network board.

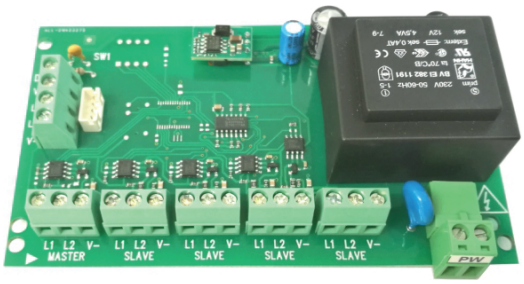
- ► Daily programming of the operating time schedule of the whole system.
- ► Selection of automatic/manual/off operation for each individual cooler.
- ► Cooling/fan-only/off selection for each individual cooler.
- ► Diagnostics of any faults.
- ► Keyboard lock via key (supplied).

Each cooler must be in SC version (without individual control) and must be equipped with a network board (optional OCDS009, with temperature and humidity probe already mounted and connected to the board), which communicates with the centralised control panel via SC bus (OCDS010) and possibly provides an additional Modbus interface (OCDS011).
OCDS010 is the version of the centralised control that communicates exclusively via SC bus, suitable if the centralised control is not connected to other external supervisory devices.
OCDS011 is the version of the centralised control that communicates with the network boards via SC bus, but has an additional Modbus interface, suitable for connection to external supervision systems (e.g. a BMS).

For further details please refer to the instruction sheet supplied with the OCDS009 network board and the OCDS010/OCDS011 centralised control.

1.4.5 Centralised control via ODSP035 router

Figure 1.8 *ODSP035 router*

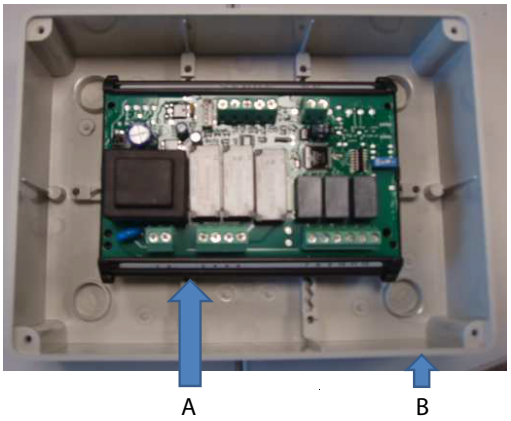


The purpose of the ODSP035 router is to replicate, on several AD coolers, the commands from a single ECO/EVO control, which normally controls only one AD.
The AD cooler used as master will be of the ECO or EVO type, while the other AD coolers must be of the SC type, i.e. without control.
The ODSP035 router can manage a maximum of 5 AD coolers, divided between a master and 4 slaves.

For further information refer to the instruction sheet supplied with the ODSP035 router.

1.4.5.1 ODSP036 extension board

Figure 1.9 *ODSP036 extension board*



A Extension board B Plastic box

The ODSP036 extension board is an electronic control board, functionally identical to the one onboard the AD coolers, provided with the relative plastic housing box.
The extension board is used to control the operation of devices other than coolers, typically air extractors, so that they can be operated in a similar way to coolers.
The ODSP036 extension board must necessarily be combined with the ODSP035 router or the OCDS009 network board, available as optional.

For further information please refer to the instruction sheets for the specific devices.

1.5 TECHNICAL DATA

Table 1.1 *Technical data*

			AD14	AD20
Installation data				
Air flow	at maximum speed	m^3/h	13000	20000
	at average speed	m^3/h	9700	15000
	at minimum speed	m^3/h	6500	10000
fan type		-	axial	
maximum useful pressure head		Pa	80	
water consumption		l/h	43 (1)	64 (1)
Water inlet	type	-	M	
	thread	"	3/8	

(1) Test conditions: outdoor temperature 33 °C, relative humidity 60%.
(2) Maximum sound pressure levels in free field, with directionality factor 2, obtained from the sound power level in compliance with standard EN ISO 9614.

				AD14	AD20
Water drain	type		-	M	
	diameter (Ø)		mm	60	
Humidifying panel	surface		m^2	2,7	3,4
	thickness		mm	100	
	saturation efficiency		%	89	87
sound power L_w	at maximum speed		dB(A)	94,0	90,0
	at average speed		dB(A)	85,0	82,0
	at minimum speed		dB(A)	80,0	77,0
sound pressure L_p at 5 m	at maximum speed		dB(A)	72,0 (2)	68,0 (2)
	at average speed		dB(A)	63,0 (2)	60,0 (2)
	at minimum speed		dB(A)	58,0 (2)	55,0 (2)
Dimensions	width		mm	1150	1650
	depth		mm	1150	
	height		mm	1050	
	Air delivery outlet	width	mm	600	1185
		height	mm	600	590
Weight	weight		kg	67	120
	in operation		kg	88	146
Electrical specifications					
Power supply	voltage		V	230	
	type		-	single-phase	
	frequency		Hz	50	
Electrical power absorption	nominal		kW	1,10	1,90
maximum power consumption			A	4,8	7,0

(1) Test conditions: outdoor temperature 33 °C, relative humidity 60%.
(2) Maximum sound pressure levels in free field, with directionality factor 2, obtained from the sound power level in compliance with standard EN ISO 9614.

1.6 SYSTEM OPERATION

1.6.1 Ventilation and cleaning of the room

The evaporative cooling system is a system that works dynamically and works on the basis of a natural principle: it introduces large quantities of cooled external air into the room and extracts the exhausted hot air through doors, windows and other evacuation openings that are left open.
The operating principle is very simple: if the system expels all the introduced air, the system produces maximum efficiency, grants all the planned air renewals and cools the environment under the design conditions.
It is also possible to have a slightly lower extract air flow than the supplied one (but not less than 80%), which allows the room to be kept slightly overpressurised compared to the outside, preventing the outside hot air from re-entering the room through the natural openings.
The ideal condition is to place the air diffusers away from the openings (windows, doors, etc.) and distribute them evenly inside the room. By opening a window away from the diffusers, the air passes through the room cooling it before being extracted. By calculating the correct dimensions of the evacuation openings the maximum efficiency of the system is reached. The system must be able to extract the large volume of air supplied so as not to reduce the effectiveness of the system.
If the available openings are not sufficient, it is necessary to add forced air extraction systems (extraction towers).
Failure to comply with these conditions precludes the planned air renewal, reduces the cooling effect and increases the relative humidity inside the room.
To extract the exhaust air, natural openings of about 1 m^2 per 1000 m^3 of air are required.

1.6.2 Performances of the system

the system increases its air cooling capacity as the relative humidity of the outside air decreases: the drier the fresh outside air is, the higher the possibility of saturation, the higher the reduction of the sensible heat contained in it, therefore the greater the achievable decrease in the air temperature.
The AD evaporative cooler is equipped with a high saturation efficiency evaporating unit which produces a good level of cooling even at relative air humidity values of around 70%.
In areas with high humidity, the cooler must be oversized to ensure improved air renewal, so as to compensate for the smaller temperature difference. In these areas, maximum cooling will be achieved by ensuring that there are the correct air changes and that the unit is put into operation early in the morning to stop the increase of latent heat within the cooled space. In the design phase, however, it is advisable to consider the local climatic conditions. On days when the external relative humidity rate is close to or higher than 70÷75%, it is advisable to operate the unit in ventilation mode only.
The cooling efficiency is not only related to the efficiency of the appliance, but also to the design of the ductwork and the installation. Insulated ceilings will decrease the internal temperature significantly compared to non-insulated ceilings. The same concept is applicable for air ducting.

2 TRANSPORT AND POSITIONING

2.1 WARNINGS

Damage from transport or installation

The manufacturer shall not be liable for any damage during appliance transport and installation.

On-site inspection

- Upon arrival at the site, ensure there is no transport damage on packing, metal panels or the remote control.
- After removing the packing materials, ensure the appliance is intact and complete.

Packing

- Only remove the packing after placing the appliance on site.
- Do not leave parts of the packing within the reach of children (plastic, polystyrene, nails...) since they are potentially dangerous.

Weight

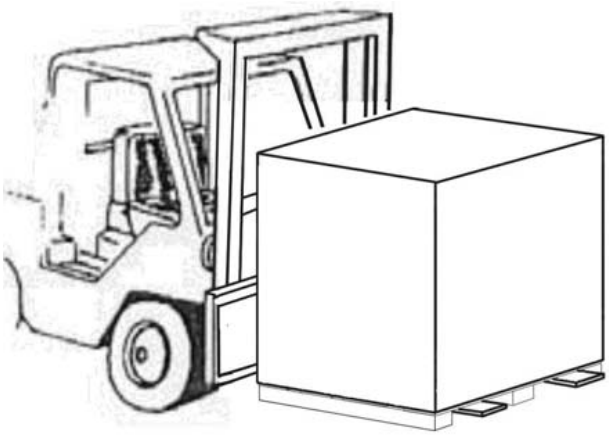
- The lifting equipment must be suitable for the load.

2.2 HANDLING

2.2.1 Handling and lifting

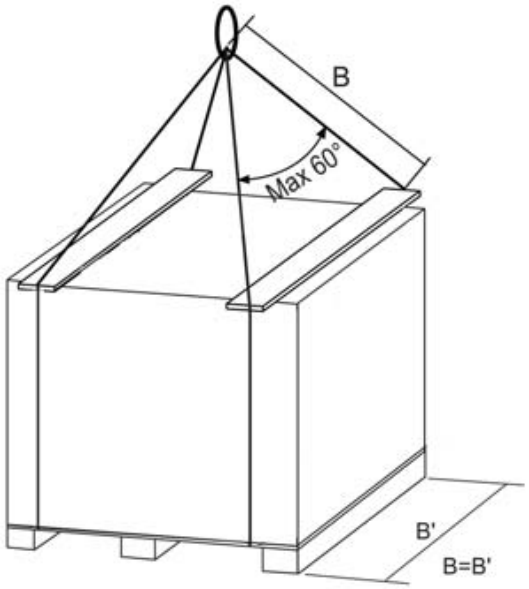
► Always handle the appliance in its packing, as delivered by the factory.
► Comply with safety regulations at the installation site.

Figure 2.1 *Lifting with a forklift*



Widen the forks as much as possible to balance the load.

Figure 2.2 *Lifting with cables*



It is strongly recommended to apply the ropes as shown in Figure 2.2 *p. 13* interposing spacers of adequate length to prevent the ropes from damaging the casing when tightened.

It is absolutely forbidden to stand under the suspended loads and within the operating range of the lifting equipment.

2.3 STORAGE

During transport and storage, make sure that the ambient temperature is between -10 and 50 °C.

If the evaporative cooling unit must be stored, make sure that the relative humidity in the warehouse is between 5% and 90%.

2.4 APPLIANCE POSITIONING

Do not install the machine in closed areas; it must be installed outside the room to be treated, unless by specific approval by the manufacturer.

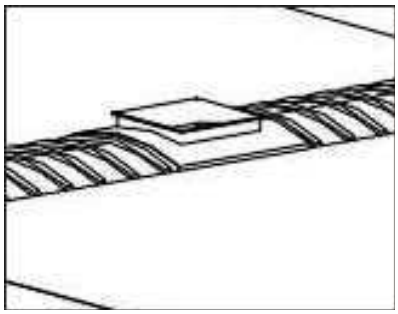
2.4.1 Roof installation

How to mount the unit on the roof

1. Prepare and secure a flanged air inlet duct having the same dimensions as the appliance's flanged duct trunk (Paragraph 1.2 *p. 8*), which must be secured

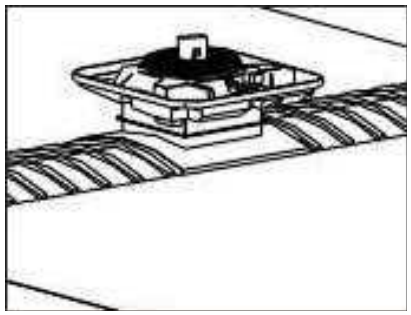
to the flange of the previously prepared duct (Figure 2.3 *p. 14*).

Figure 2.3 *Prepare a flanged duct.*



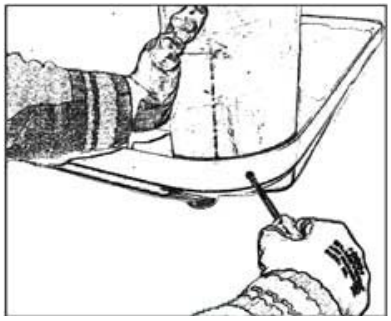
2. Bring the base of the evaporative cooler to the mounting point (Figure 2.4 *p. 14*).

Figure 2.4 *Bring the base of the evaporative cooler to the mounting point.*



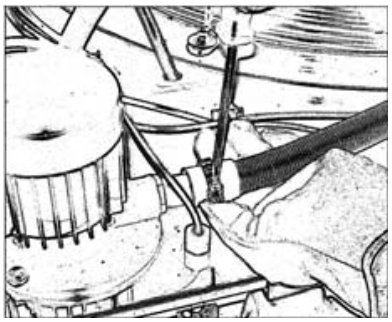
3. Secure the two flanges (base duct flange-inlet duct flange) by bolting.
4. It is recommended to place some silicon paste between the two flanges connections to ensure perfect insulation from external agents.
5. Position and secure the uprights at the base of the cooler using the screws provided (Figure 2.5 *p. 14*).

Figure 2.5 *Position and secure the uprights at the base of the cooler*



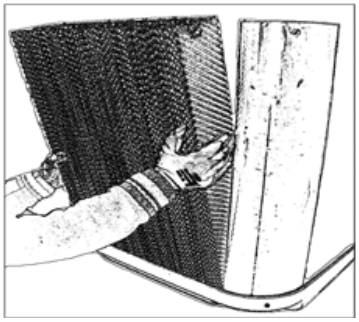
6. Check the tightening of the hose clamp on the hose connected to the pump (Figure 2.6 *p. 14*).

Figure 2.6 *Check the tightening of the hose clamp on the hose connected to the pump*



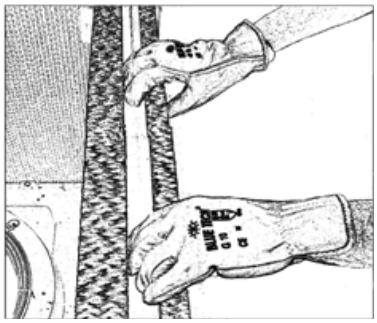
7. Apply the humidifying panels leaning them against the uprights, keeping the groove, obtained on one side of the panel, upwards and towards the outside of the appliance (Figure 2.7 *p. 14*).

Figure 2.7 *Apply the humidifying panels leaning them against the uprights*



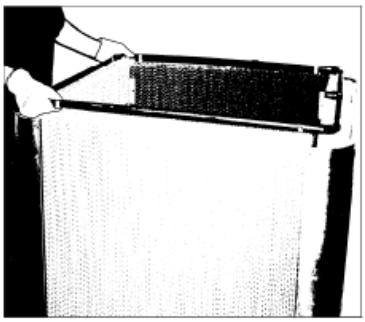
8. Insert the water distribution stripes into the pad grooves. Check that these are pressed down firmly to the bottom of their seat (Figure 2.8 *p. 14*).

Figure 2.8 *Insert the water distribution stripes into the pad grooves*



9. Insert the water distributor into the grooves of the humidifying panels making sure that its supports rest evenly on the pad grooves (Figure 2.9 *p. 15*).

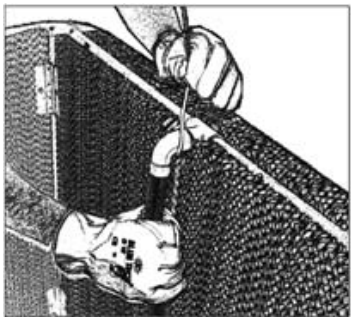
Figure 2.9 *Insert the water distributor*



10. Keep the hose holder on the side of the appliance where the water pump is, taking care to make an opening in the humidifying panel at the hose holder to allow it to pass through.

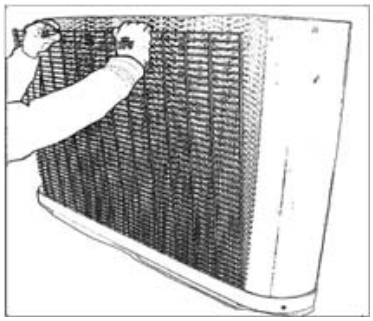
11. Connect the flexible hose coming from the pump to the distributor fitting and secure it with a hose clamp (Figure 2.10 *p. 15*).

Figure 2.10 *Connect the flexible hose coming from the pump to the distributor fitting*



12. Insert the side and rear grates of the appliance, fixing them with the clips provided. Do not mount the grate on the front side (component/ connection side) (Figure 2.11 *p. 15*).

Figure 2.11 *Insert the side and rear grates of the appliance*



13. Insert the clips on both sides of the grate, initially up to the "first click" and then force them until they are completely inserted so that they do not protrude, in height, beyond the humidifying panels (Figure 2.12 *p. 15* and Figure 2.13 *p. 15*).

Figure 2.12 *Secure by using the clips provided*

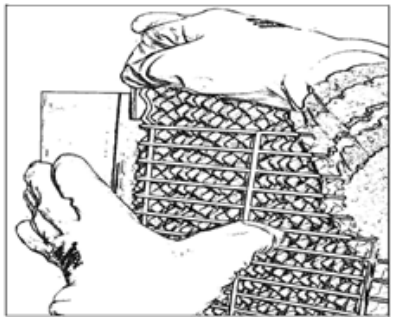
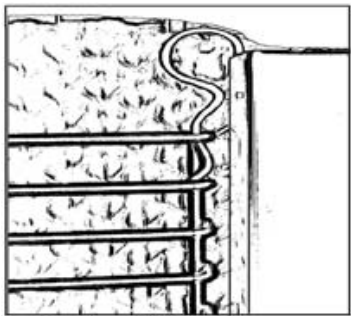
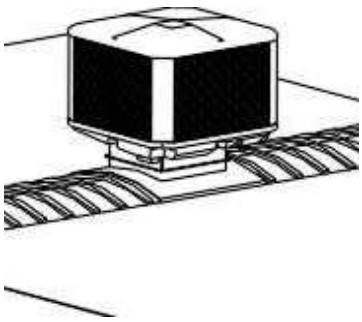


Figure 2.13 *Insert the clips on both sides of the grate*



14. Position the cap without securing it so that the front grate can be fitted later. Raise the cap until the grate is properly seated (Figure 2.14 *p. 15*).

Figure 2.14 *Position the cap*



15. Do not secure the front grate with clips as this would prevent easy access to the inside of the appliance for any maintenance operations.

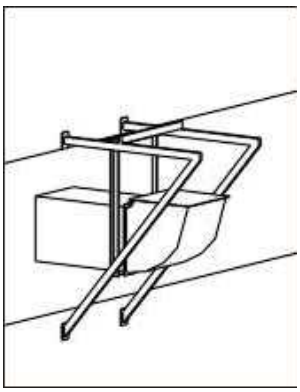
16. Once the protection grates have been positioned, secure the cap with the screws provided.

2.4.2 Wall/window mounting

How to mount the unit on the wall/window

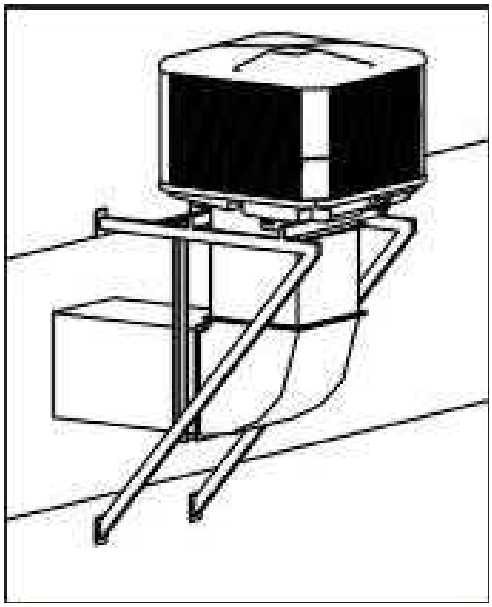
1. Prepare and secure a machine support frame and a flanged air inlet duct having the same dimensions as the flanged duct trunk of the appliance, which must be secured to the flange of the previously prepared duct (Figure 2.15 *p. 16*).

Figure 2.15 *Prepare and secure a machine support frame and a flanged duct*



2. Check that the support frame is able to support the weight of the appliance and that it does not cause vibrations and that it is perfectly horizontal (use a level to check the position).
3. Bring the evaporative cooler to the mounting point (Figure 2.16 *p. 16*).

Figure 2.16 *Bring the evaporative cooler to the mounting point*



4. Secure the two flanges (base duct flange-inlet duct flange) and the base to the frame by bolting.
5. It is recommended to place some silicon paste between the two flanges connections to ensure perfect insulation from external agents.

2.4.3 Other notes

Prepare the anchorage points inside the building for the support chains of the air intake duct. These must be defined in such a way that the chains do not cause excessive stress on the duct itself. Ensure that the duct is aligned with the appliance.
For anchoring ducts to the ceiling or wall, use chains and relative accessories with a test certificate, made of galvanised or stainless steel, with a wire diameter of no less than 3 mm or in any case sized in relation to the weight it will have to bear, taking into account the safety margins imposed by the standards.

Do not use aluminium alloy or similar components.

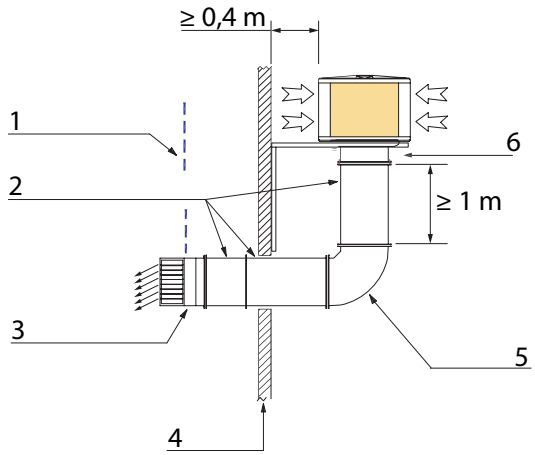
The ducts must be sized according to the system and the aeraulic characteristics of the fan. An incorrect calculation of the ducts causes losses or excess output causing possible faults.

After installing the system, turn the diffuser louvres outwards and adjust them optimally to direct the airflow.

2.4.4 Installation examples

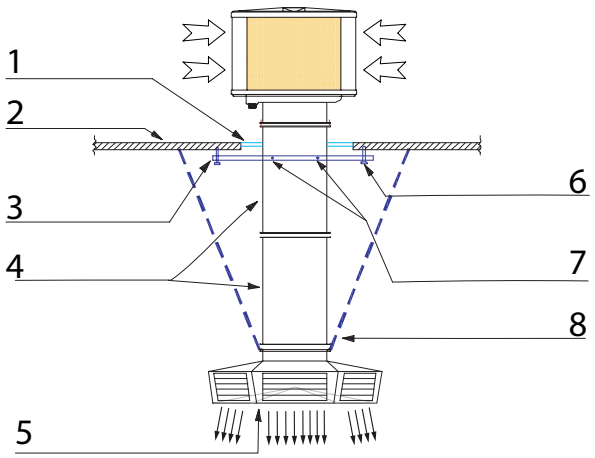
The following Figures show installation examples.

Figure 2.17 *Installation example*



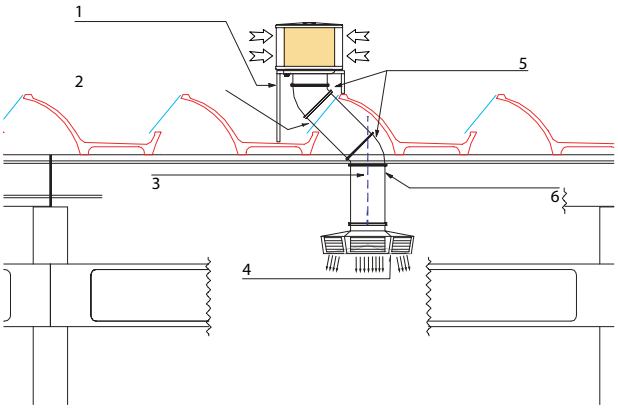
1 Galvanized or stainless steel chains for fixing the ducts to the ceiling
2 Duct with flanges and neoprene gaskets
3 2-way diffuser with adjustable louvres
4 Wall
5 90° curve with flanges and neoprene gaskets
6 Support frame

Figure 2.18 *Installation example*



1 Skylight
2 Coverage
3 Stainless steel brackets
4 Duct with flanges and neoprene gaskets
5 6-way diffuser with adjustable louvres
6 Dowels to secure the brackets to the ceiling
7 Screws to secure the duct to the brackets
8 Galvanized or stainless steel chains for fixing the ducts to the ceiling

Figure 2.19 *Installation example*



1 Support frame
2 Duct with flanges and neoprene gaskets
3 Galvanized or stainless steel chains for fixing the ducts to the ceiling
4 6-way diffuser with adjustable louvres
5 45° curve with flanges and neoprene gaskets
6 Duct with flanges and neoprene gaskets

3 HEATING ENGINEER

3.1 WARNINGS

3.1.1 General warnings

Read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.

Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site.

Installation must also comply with the manufacturer's provisions.

3.2 HYDRAULIC CONNECTIONS

3.2.1 Plumbing fittings

at the bottom (Figure 1.1 *p. 8* and Figure 1.2 *p. 9*).
A. Water inlet 3/8" M
B. Water drain 60 mm M

3.2.2 Connection to the water supply

Always provide, near the appliance:

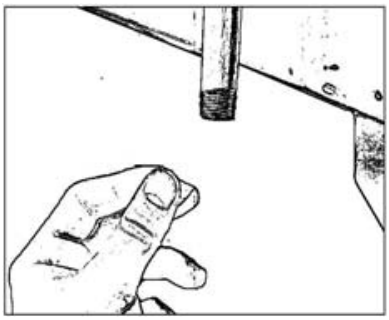
- ► on the inlet water piping
  - ■ isolation ball valve
  - ■ sand filter
  - ■ softening system (in the case of hardnesses > 27 °f)
- ► on the output water piping
  - ■ drainage system for emptying the system before the winter season

The water supply system must grant a minimum flow rate of 7 l/min for each unit at a pressure of 1,5÷3 bar (maximum allowed pressure: 6 bar).

It is recommended to build the water pipe inside the building, otherwise provide a properly insulated pipe.

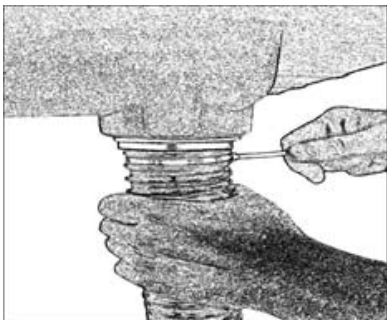
It is recommended to use drinking water, of hardness not exceeding 27 °f and not less than 7 °f.
Don't use demineralized water.
Proceed to connect the 3/8" M sleeve to the main water supply without stressing it excessively (Figure 3.1 *p. 18*).

Figure 3.1 *Connecting the 3/8" sleeve to the water mains*



The machine is also equipped with a threaded sleeve Ø 60 mm M for water drainage.
Connect the flexible hose (supplied) to the sleeve, fixing it by means of a hose clamp, taking care not to stress the sleeve and absolutely preventing it from rotating (Figure 3.2 *p. 18*).

Figure 3.2 *Connect the flexible hose to the sleeve*



If there is a central drainage system, convey the pipe to the central drainage system in accordance with the regulations in force in the country of installation.

4 ELECTRICAL INSTALLER

4.1 WARNINGS

General warnings

Read the warnings in Chapter III *p. 4*, providing important information on regulations and on safety.

Compliance with installation standards

Installation must comply with applicable regulations in force, based on the installation Country and site, in matters of safety, design, implementation and maintenance of electrical systems.

Installation must also comply with the manufacturer's provisions.

Live components

- After placing the appliance in the final position, and prior to making electrical connections, ensure not to work on live components.

Earthing

- The appliance must be connected to an effective earthing system, installed in compliance with regulations in force.
- It is forbidden to use gas pipes as earthing.

Cable segregation

Keep power cables physically separate from signal ones.

Do not use the power supply switch to turn the appliance on/off

- Never use the power supply switch to turn the appliance on and off, since it may be damaged in the long run (occasional blackouts are tolerated).
- To turn the appliance on and off, exclusively use the suitably provided control device.

4.2 ELECTRICAL SYSTEMS

Electrical connections provide:
A. Power supply (Paragraph 4.3 *p. 18*).
B. Control system (Paragraph 4.4 *p. 19*).

How to make connections

All electrical connections must be made in the connection terminal block located near the electrical panel:
1. Ensure the appliance is not live.
2. To access the electrical panel, open the electrical box located on the air duct flange (detail C of Figure 1.1 *p. 8* and Figure 1.2 *p. 9*).
3. Identify the appropriate connection terminals.
4. Perform the connections as shown in Figure 1.3 *p. 9*.
5. Close the electrical panel.

4.3 ELECTRICAL POWER SUPPLY

4.3.1 Power supply line

Provide (by the installer) a protected single-phase line (230 V - 50 Hz) with:
► Cable type H05 VVF 3x1,5 mm^2.
► Bipolar disconnector with minimum contact opening of 3 mm.
► Magnetothermic breaker.

How to connect the power supply

To connect the three-pole power supply cable:

1. Access the connection terminal block according to Procedure 4.2 *p. 18*.
2. Connect the three wires to the terminal block as shown in Figure 1.3 *p. 9*.
3. Provide the earth lead-in wire longer than live ones (last to be torn in the event of accidental pulling).

4.4 CONTROL SYSTEM

To connect the remote control use a shielded cable 20 AWG 5x0,5 mm² with a maximum length of 25 meters. Perform the connections as shown in Figure 1.3 *p. 9*.

For further information refer to the instruction sheet supplied with the specific remote control.

4.4.1 Positioning the control system

Install the selected control system according to the following guidelines:

- ► At about 1,5 m from the floor, protected against air draughts, direct exposure to sun rays and direct heat sources (lamps, air flow from the unit itself, etc.).
- ► If possible, do not place the control system on walls bordering the outside, to avoid false temperature readings and therefore affect system operation. If this is not possible, shield the control system by placing a sheet of insulating material (cork, polystyrene or other similar) between the control system and the wall.

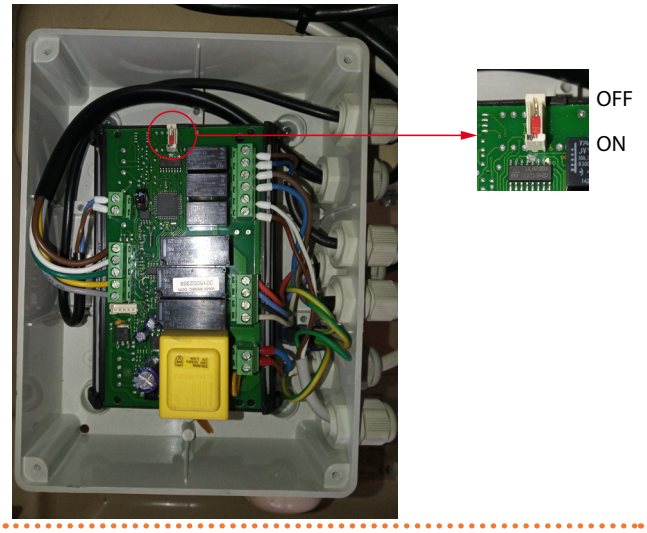
By following the above guidelines, unwanted starting and stopping of the system can be avoided and optimal comfort in the heated space can be guaranteed.

4.4.2 Dip switch position

The evaporative coolers have a dip switch on the electronic board, whose position must be changed if the ECO control is used rather than EVO:

- ■ OFF: when using the EVO control
- ■ ON: when using the ECO control

Figure 4.1 *Dip switch position*



Change the position of the dip switch only when the appliance is switched off.

5 FIRST START-UP

The installer is obliged to carry out preliminary checks described in Paragraph 5.1 *p. 19*.

5.1 PRELIMINARY CHECKS

Paragraph dedicated to the installer.

5.1.1 Preliminary checks for first start-up

Upon completing installation, the installer must check:

- ► Electrical system suitable for the required capacities and equipped with all safety and control devices required by the regulations in force.
- ► Power supply mains complying with the appliance's rating plate data.
- ► Appliance correctly installed, according to the manufacturer's instructions.
- ► System installed in a workmanlike manner, according to national and local regulations.

5.1.2 Abnormal or hazardous installation situations

Should any abnormal or hazardous installation situations be found, the appliance shall not be commissioned.
These situations may be:

- ► Conditions that do not warrant access and maintenance in safety.
- ► Appliance switched on/off with the main switch, instead of the provided control device.
- ► Appliance defects or faults caused during transport or installation.
- ► All situations that may involve operation abnormalities or are potentially hazardous.

5.1.3 Non-compliant system and corrective actions

In case of intervention of a TAC, should it find any non-conformities, the user/installer is bound to perform any corrective procedures required by the TAC.
After performing the remedial actions (the installer's responsibility), if the TAC deems that safety and conformity conditions are in place, first start-up may be effected.

5.2 SUGGESTIONS FOR THE FIRST START-UP

For optimal operation of the appliance, it is essential

that the fan is set to the minimum speed when it is first switched on and that it is maintained for at least one day.

Failure to carry out the above procedure could cause, only for the first day of use, a malfunction of the evaporating panels with consequent outflow of water drops from the ducts.

In the first few hours after the cooling system is first put into operation, an unusual smell may be felt, due to the wetting of the treated cellulose materials that make up the evaporative panels. The duration of this phenomenon is however limited to a few hours and the substances emitted are not harmful in any case.
The fan motor may also emit a particular smell for a short period of time, caused by the initial heating and residues of oils or paints on the surface of the motor itself.

6 NORMAL OPERATION

This section is for the end user.

6.1 WARNINGS

General warnings

Prior to using the appliance carefully read the warnings in Chapter III.1 *p. 4*, providing important information on regulations and on safety.

Never power the appliance off while it is running

NEVER power the appliance off while it is running (except in the event of danger, Chapter III.1 *p. 4*).

6.2 SWITCH ON AND OFF

Routine switching on/off

The appliance may exclusively be switched on/off by means of the suitably provided control device.

Checks before switching on

Before switching on the appliance, ensue that:
- water valve open
- appliance electrical power supply (main switch ON)
- connection and any necessary power supply of the control device

6.2.1 Control device

The AD evaporative coolers must be equipped with a remote control that allows their operation.
Paragraph 1.4 *p. 10* details the types of controls available and their features.

For details about the operating modes, refer to the instruction sheet supplied with the specific remote control used.

7 MAINTENANCE

7.1 WARNINGS

Correct maintenance prevents problems, assures efficiency and keeps running costs low.

Maintenance operations described herein may be performed by the TAC or skilled maintenance technician.

Any operation on internal components may exclusively be performed by the TAC.

Before performing any operation, switch off the appliance by means of the control device and wait for the end of the shutdown cycle, then disconnect power supply, by acting on the electrical disconnector.

7.2 END OF SEASON MAINTENANCE

- ► Disconnect the unit from the power supply using the main power switch.
- ► Close the water supply.
- ► Empty the water supply system to prevent failures due to freezing.
- ► Remove the appliance cap.
- ► Check that the water ducts are clean and that there are no obstructions in the water distributor, at the top of the unit. Remove any debris from the water recirculation pump's float.
- ► Gently, but thoroughly, clean the base of the unit. Use a mild detergent, but not a solvent as it may react with the plastic material.
- ► Replace the cover and make sure that it is securely fastened with the appropriate bolts.
- ► Apply the protection cover (optional OCPR003) to the appliance, checking in advance that it is not damaged and, if it is, check that it can be repaired, otherwise replace it.

In order to prevent the appliance from being damaged by the climatic factors to which it may be subjected during the rest period (smog, acid rain, freezing, etc.), the protective cover should be applied already at the end of the season.

7.3 PRE-SEASON MAINTENANCE

- ► Disconnect the unit from the power supply using the switch on the electrical panel on board the appliance.
- ► If the protective cover is present, remove it and check that it has not been damaged, clean it thoroughly with a mild detergent and store it in a place where it is not directly exposed to the weathering.
- ► Remove the appliance cap.
- ► If necessary, clean the base.
- ► Check the evaporating panels and, if necessary, clean them of any sludge deposits by washing them with water and of small limescale deposits by shaking them. If there are significant deposits, the panel must be replaced.
- ► Check that the water ducts are clean and that there are no obstructions in the water distributor, at the top of the unit. Remove any debris from the water recirculation pump's float.
- ► Supply the power to the appliance via the switch on the electrical panel on board.
- ► Open the water supply.
- ► Activate, through the control system provided, the operation in cooling mode and observe that the drain valve closes and the tank is filled with water until the point where the loading valve will cease to supply water.
- ► Check that the water is distributed evenly over all the evaporating panels.
- ► Check the operation of the drain valve, making sure that it opens within 5 minutes from appliance switch off.
- ► Check for water leaks from tanks and supply pipes.
- ► Check cables conditions.
- ► Replace the cover and make sure that it is securely fastened with the appropriate bolts.

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22/07/2021
21MCLSDC023
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