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MET MANN[®]



USE AND INSTRUCTIONS MANUAL

AD-09/12/15-H

AD-09/12/15-V

AD-09/12/15-VS

- REF. MI-AD09-I
- September 2014 edition
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VERY IMPORTANT

Water contains 4 chemical properties that must be taken into account:

CONDUCTIVITY:

It is the measure of the water capacity for conducting electricity. Pure water, without dissolved minerals, does not conduct the electric current. Conductivity is a measure of the solid amounts dissolved in water; if dissolved minerals increase, the conductivity increases as well as the possibility of finding corrosion and incrustations.

HARDNESS

Hardness, due to the presence of dissolved salts of calcium and magnesium, measures the water capacity for producing incrustations, which can be made on cooler panels, diminishing the system yield.

ALKALINITY

It is one of the most important properties of water, since if its value is high it exists a high possibility of deposits creation, but if its value is low, there can be corrosion processes. The two alkalinity sources are carbonates and bicarbonates. Under certain conditions, calcium and carbonates react together, creating hard incrustations called calcium carbonate.

pH

The pH measures the amount of hydrogen ions which are present in water. If the hydrogen amount increases, the pH diminishes and the water becomes acidic.

The pH is measured in a scale from 0 to 14, being the 7 neutral, over the basic 7 and under the acidic 7. The higher is the pH, the more possibilities of incrustation creation we find. The lower is the pH, the more probabilities of corrosion processes.

Normally, the water that feeds evaporative coolers is water which comes from general networks of villages and cities. This water contains certain mineral amounts and salts of which concentrations and amounts are variable depending on the geographical area.

During the evaporation process, water is charged with pure water and mineral and salts are deposited in the water tray and on the humidifying panels of the equipment.

It is for that, that these salts and minerals concentrations (also called conductivity) are bigger in the water tray of the cooler than in the water from the network inflow.

If salts and minerals concentration (especially calcium) is very high, some incrustations are deposited on the metal parts of the equipment and on humidifying panels, causing oxidations and pluggings on the humidifying panel.

In order to fight this problem, the most efficient system (at the same time microorganisms growth is prevented) is to carry out the total emptying of the water tray in a periodic way, depending on conductivity of minerals and salts which are deposited in waters. Also the equipment disposes of a device for the discontinuous purge of the water (page 8, right lower figure).

Conductivity from the water tray cannot be superior to 2.000 micro siemens.

Normally, waters from the network are suitable for evaporative coolers. Nevertheless, this fact **does not exempt them** from carrying out the assembly of the automatic water emptying system. .

If any kind of treated water or water from a well is used, the water quality must be taken into account by carrying an analysis out in order to determine if the used water is suitable for evaporative coolers.

The values to take into account are those of the pH, calcium concentration (CA_2), bicarbonate concentration (HCO_3) and conductivity.

For any question on that, you can contact us at:

Tel. 902 10 13 74

E-mail: metmann@metmann.com

The use of preventive treatment of waters inadequate or not authorized for METALURGICA MANLLEUENSE, S.A. will carry the loss of the guarantee.

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Security warnings

Technique rules, legal rules and works inspection must be fulfilled in order to carry out the installation and the start-up of the equipment.

Only a specialized company must carry out the assembly, the water connection, the first start-up, and the current connection, as well as the maintenance and the upkeep.

Only qualified staff and/ or staff authorized by MET MANN S.A. should carry out water and electric installations.

Electric consumption

MODEL	AD-09-H AD-09-V AD-09-VS	AD-12-H AD-12-V AD-12-VS	AD-15-H AD-15-V AD-15-VS
Motor intensity at 230V I	4,89 (A)	9,30 (A)	
Motor intensity at 230V III	3,31(A)	6,11 (A)	7,95 (A)
Motor intensity at 400V III	1,91(A)	3,53 (A)	4,59 (A)
Pump intensity at 230V	0,17 (A)	0,17 (A)	0,17 (A)
Solenoid intensity	0,05 (A)	0,05 (A)	0,05 (A)

Kind of start-up	(1)	(1)	(1)
------------------	-----	-----	-----

(1) Direct start-up.

General dimensions

MODEL	AD-09-H AD-09-V AD-09-VS	AD-12-H AD-12-V AD-12-VS	AD-15-H AD-15-V AD-15-VS
Wide (mm)	1135	1135	1135
Long (mm)	1135	1135	1135
Height (mm)	1274	1274	1274
Idle weight (Kg)	160	160	160
Weight with wáter (Kg)	180	180	180

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Operation characteristics

MODEL	AD-09-H	AD-12-H	AD-15-H
	AD-09-V	AD-12-V	AD-15-V
	AD-09-VS	AD-12-VS	AD-15-VS
Airflow (m³/h)	9.000	12.000	15.000
Available pressure (Pa)	110	128	98
Charges loss of panel (Pa)	15	25	40
Saturation performance	69%	81%	87%
Fan motor power	0,75 kW	1,5 kW	2,2 kW
Pump motor power	0,038 kW	0,038 kW	0,038 kW
Consumption l/ h (40°C 30% HR)	46	64,4	82,8
Consumption l/ h (30°C 40% HR)	27	37,8	48,6

Characteristics plate



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Nº FABRICACIÓN
Nº PRODUCTION
MODELO
MODEL
SERIE
SERIES
FECHA FABRICACIÓN
PRODUCTION DATE
CAUDAL (Lts/min)

CAUDAL (m³/h)
AIR FLOW (m³/h)



MOTOR VENTILADOR (kW)
FAN MOTOR (kW)
TENSION (Voltios)
ELECTRICAL TENSION (Volt)
AMPERIOS / Hz
AMPERES / Hz
BOMBA MODELO
PUMP MODEL
TENSION (Voltios)
ELECTRICAL TENSION (Volt)
AMPERIOS / Hz
AMPERES / Hz

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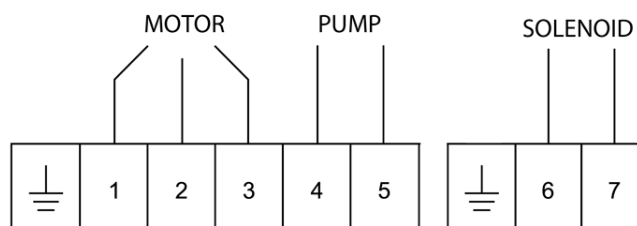
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Electric connection

The installer will make the connection from the control panel to the different elements of the cooler into the internal terminals box, according this sketch.



The installer will have ensure et confirm that all the protection elements of the machines, and the full installation in general, they have their corresponding protection elements according their maximum consumptions according the consumptions table page 4.

Motors connection

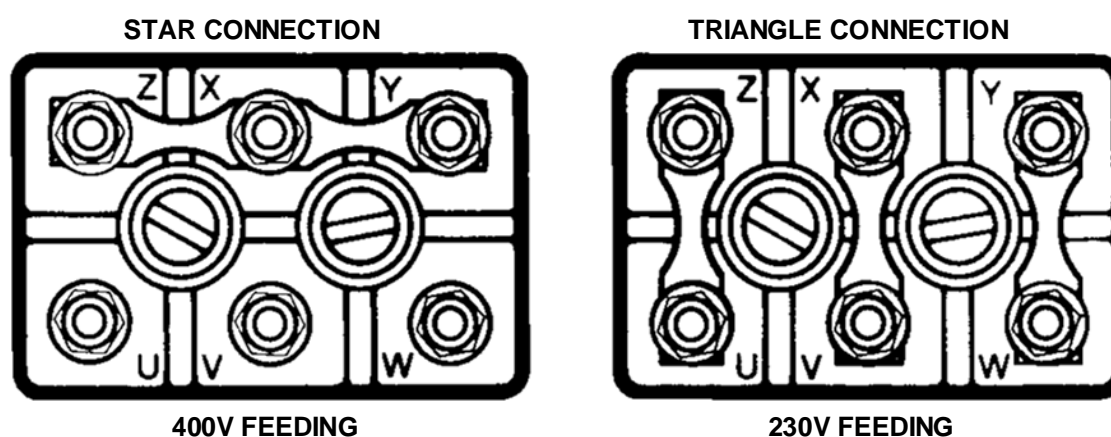
Current supply must be carried out by a starter equipped with an appropriate thermal protection and by using appropriate conductors with suitable dimensions, according applicable regulations.

The motor terminals box has six consoles, and another one for earth, with three bridges that can only be used when the kind of start-up is direct.

Direct start-up

When the motor starts directly and knowing that motors can work in two tensions – 220V III and 240V III, the following sections must be taken into account:

1. Observe the feeding tension and place the plates as indicated below.



2. If the feeding net tension is 220V, you must must take into account:
 - To place the bridge as indicated in the electric diagram.
 - To change the electric motors connections by turning the star connection into triangle connection, as indicated on the drawings.
 - To adjust the thermal relays, which have the motor protectors incorporated according to the motor consumption intensity, detailed in the electric consumption table (page 4) or to observe the motor plate, where the consumption is specified according to the tension.
 - Check the good turn direction of the fan. If it isn't correct (and for the case of three-phase motor), you have invert the turn direction of the fan permuting two phases of the motor.

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Connection with inverter

Under demand, you can request a control panel with inverter for the regulation of the fan motor speed. In these cases the installation will be scrupulously following the wiring diagrams provided, the instructions of the inverter installed and in strict compliance with the following instructions:



WARNING

**IN THE CONTROL PANELS WITH INVERTER,
IS IMPERATIVE FOR THE FAN MOTOR CONNECTION THE
USE OF AN INDEPENDENT AND SHIELDED CABLE WITH THE
MESH CONNECTED TO THE GROUND BY ONE END.
FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT
IN EQUIPMENT MALFUNCTION.**

Water pump connection

For this connection, follow the water pump installation instructions.

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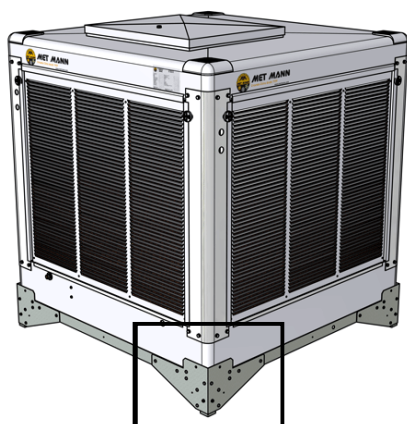
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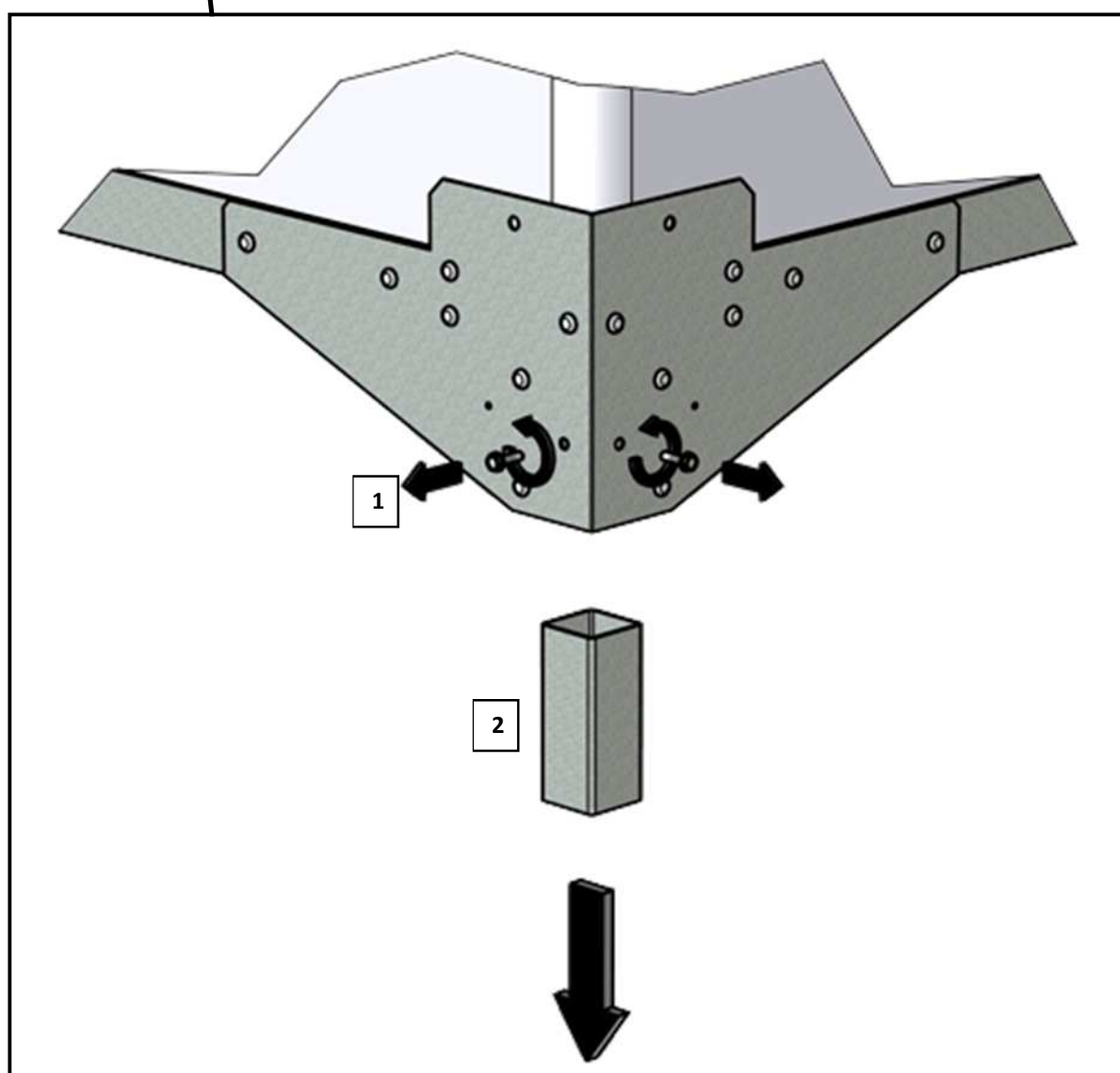
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Preliminary installation

Before installing the machine in place have to remove the four protective tubes of the bank:



- 1- Remove the eight screws that secure the tube bank.
- 2- Remove the tube.



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Index B calculate for the continuous purge

To calculate the index B of the pouring out, is necessary an analysis of the sweet waters. If you don't know the quality of your water we can help you with the analysis. Send a small sample of your water to our local representative. Depending of the quality of the water, will be possible to find the constant C_B in the following graphic of the quality of the water.

Example:

We suppose that your water sample analysis is:

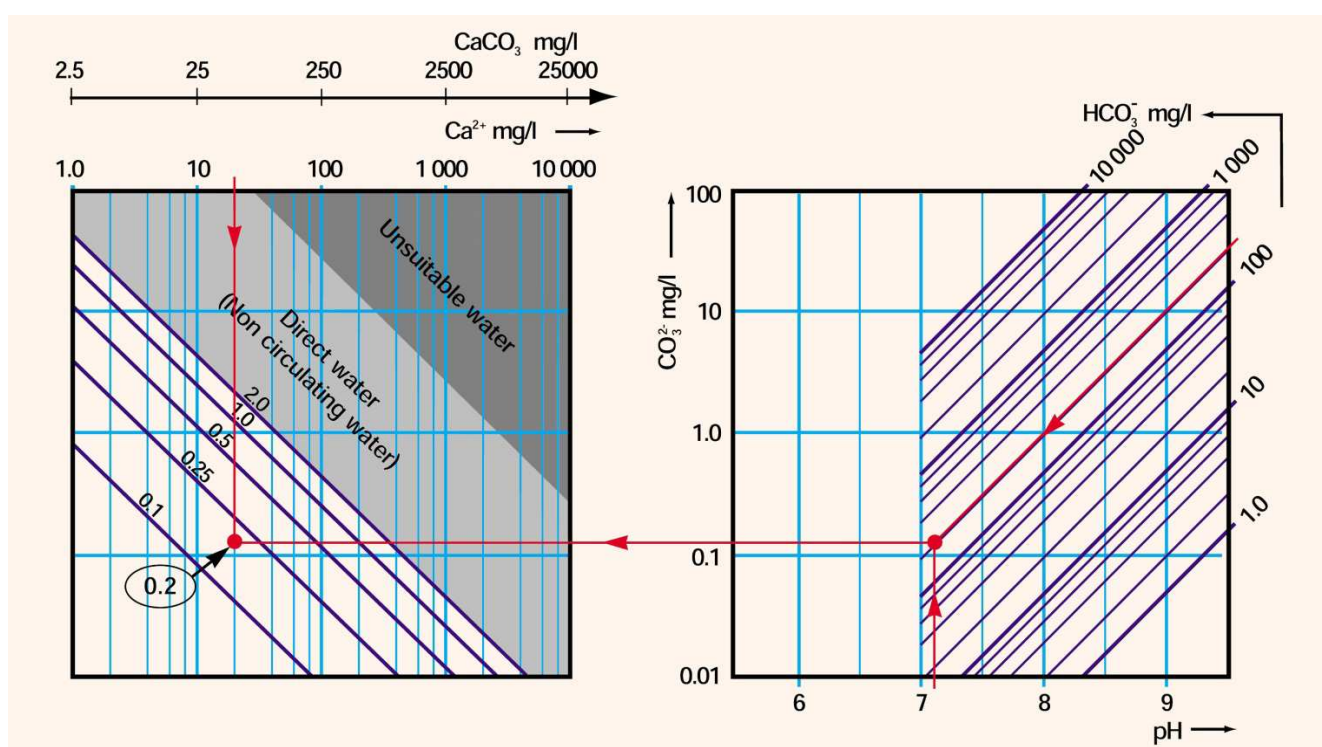
Value of the pH of the sweet water	7,1
Bicarbonate concentration	
HCO_3	200mg/l
Calcium concentration	
Ca_2	20mg/l
Water evaporation	
E	120l/h = 2l/min

Using the water quality graphic, the pouring out constant is $C_B=0,2$

So, the purge of the index B is calculated in the following way:

$$B = C_B \times E = \text{l/min}$$

$$B = 0,2 \times 2 = 0,4 \text{ l/min}$$



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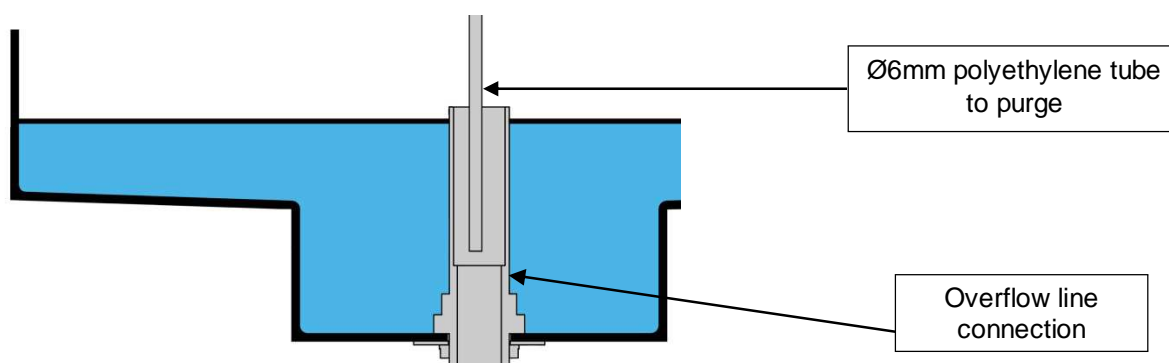
Verification of transmission and ventilation elements

- 1) Check visually that all transmission elements are in perfect state.
- 2) Check the belts tightening.
- 3) Move the turbine by hand to make sure that nothing obstructs its way.
- 4) Start the motor in order to check the correct turn direction.
- 5) When doing the first fan start-up, you have to re-tighten the transmission belts.

First water filling

Once the motor and the pump are electrically connected, you have to fill the evaporative cooler tray. Before carrying out this operation, you must do the following:

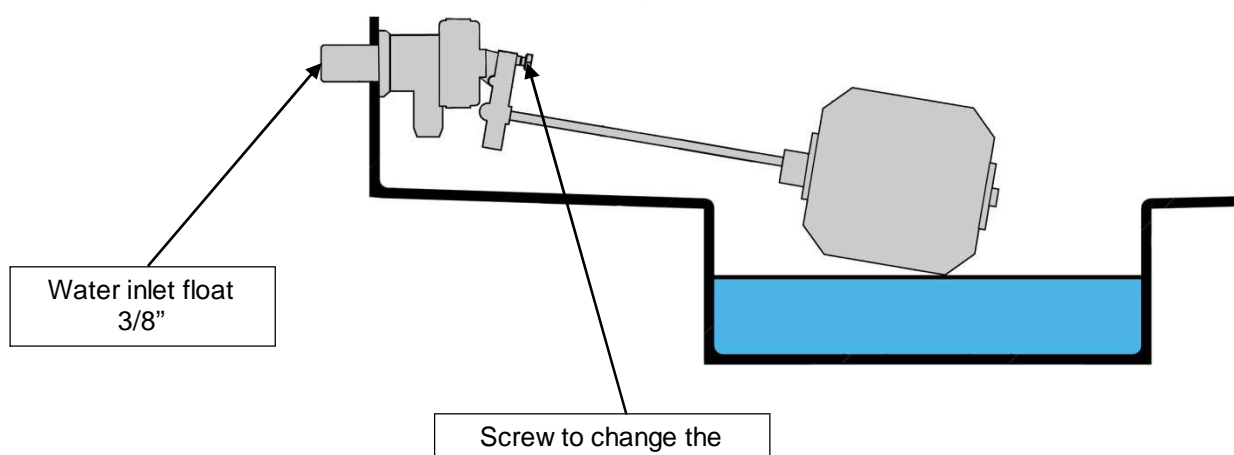
- 1) To clean all waste that may be originated during assembly and check the correct FASTENING of the water pump.
- 2) To place the water level float in the equipment entrance and assembly the porexpan float at the end of it.
- 3) To place the level regulator or the water overflowing tube as indicated in the following drawing.



- 4) To place a closing valve in the hole of the tray drainpipe or the cap of 1" ¼ of the hydraulic kit.
- 5) To check that the minimum pressure is 1 bar and the maximum pressure is 4 bars.

After having carried out these operations, you can start to fill the bucket with water by turning on the water tap. Leave the water get the necessary level, thus, when the machine is in operation, the pump always has a minimum level of water to avoid the equipment works when idle.

If you want to change the water level of the tray, you just need to screw on or unscrew the screw showed in the following picture, taking into account the maximum and minimum levels of water.



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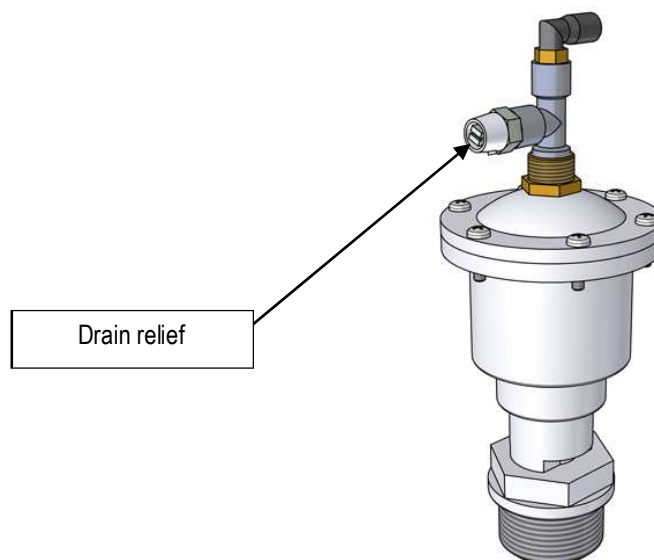
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Filling-up and bleed-off

The bleed-off system designed by MET MANN allows the water bucket bleed-off when:

- 1- Manual stop
- 2- Using a timer (optional)

While you are filling up the water bucket, loose the circuit relief drain with a screwdriver. Check that a small quantity of water comes out of the drain, thus allowing the valve cylinder relief to permit the valve opening. This small quantity of water coming out of the drain must always be less than the quantity of water the equipment evaporates.



Once you have filled up the water bucket, start-up and switch off the equipment a couple of times to check it works correctly and that it is well watertight. If results are positive, the start-up is concluded.

Advantages of the automatic bleed-off system

When using the automatic bleed-off system, you can empty completely the accumulated water in the bucket and therefore assure a constant renovation of the water circuit. This system eliminates the 90% of deposits produced by evaporation.

- Eliminates contamination risks because the evaporative cooler works with properly treated water. Eliminates mud produced by water stagnation.
- Less consumption of the products used to avoid legionnaire's disease.
- Maximizes cooling pads useful life.
- Eliminates legionnaire's disease risks thanks to the complete bleed-off of the bucket and the subsequent drying of filters and buckets.



PRESSURE WATER INLET

Minimum 2 bar
Maximum 4 bar

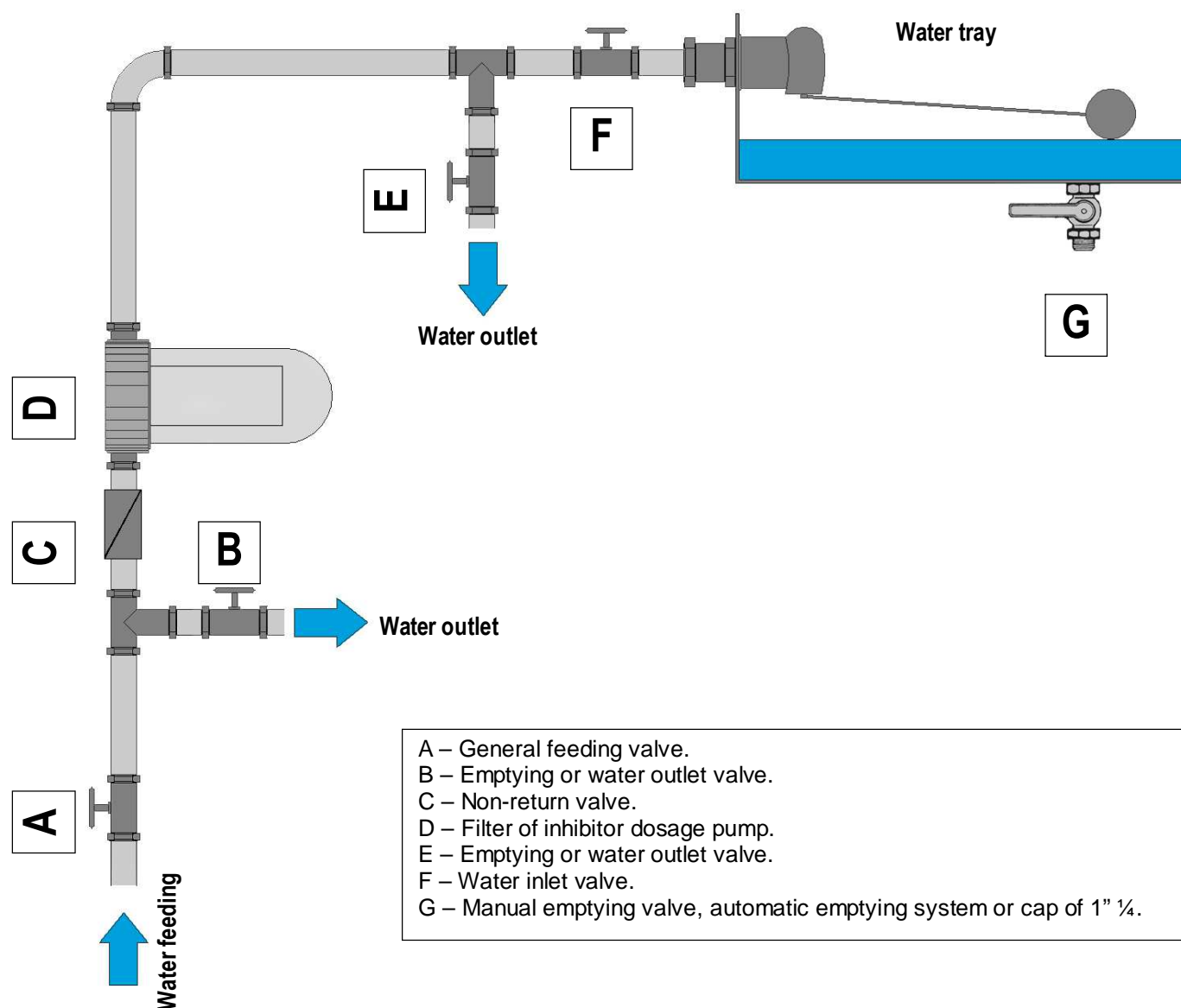
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Diagram of the water feeding system



Instructions

At the end of the season, you must remove the water from inside the water tray and from the water feeding system to protect the equipment from freezing and thus avoid the possible appearance of cracks during winter.

Do as following:

- Turn off "A" feeding valve.
- Turn on "B", "E" and "G" valves and leave the accumulated water empties completely.

At the beginning of the season:

- Turn off "B", "E" and "G" feeding valves.
- Turn on "A" and "F" valves.

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Pump start-up and water flow adjustment

Once the tray is filled with water, the following step is to start-up the water pump.

For doing this operation, you must follow these steps:

- 1) Turn on completely the pump sphere valve.
- 2) Turn the switch to the "pump" position in order to start-up the pump.
- 3) Check that water flows correctly in all water distributors as an uniform courtain. If the water flow is insufficient for all the distributors, we have a problem of water pressure (see page 16). If the water flow is excessive, regulate the flow through the sphere valve
- 4) Once the pump has humidified the panels, check that the minimum water left in the deposit covers the pump aspiration. If not, increase the tray water level to its beginning modifying the float height, by means of the screw within.
- 5) Also verify the not existence of water dragging to the turbine and ducts, because of water excess in the panels distributors: after 30 work minutes, to stop the cooler and verify the not existence of water remains into the turbine and ears. If this is the case, regulate the water flow to the distributors through the sphere valve in the way to avoid this dragging, but keeping at the same time the correct water arrival to the distributors and the correct humidification of the panels: they have be fully soaked of water.

Once you have adjusted the water flow, you must assembly the panels (COMPLEK).

Start-up

If you have followed the previous steps, now you can put the evaporative cooler into operation.

Once you have started the equipment, you must check:

- 1) The motor electric consumption.
- 2) The electric installation is properly insulated.
- 3) The drain valve is completely turned off.
- 4) Uncharacteristic noises of a good operation.
- 5) After the first starting, check belts tightness and re-tighten them because rubber tends to expand.
- 6) For the good equip maintenance and the legionella prevention, it's necessary to empty it regularly, or to carry out continuous water purges in quantity and measure depending of the water quality and evaporation rate, for that it's placed one small valve, which drainpipes through the overflow line connection.
- 7) When we want to stop the machine, will stop the pump but shouldn't stop the fun. That one should stop much later than the pump because the panels they get dry in uniform way, avoiding the upbringing of microbacterium, fungus and smells and extending the machine lifetime. The METMANN panels are all in that system.

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Troubleshooting

Before checking a possible failure, we recommend you to verify:

- If there is electric feeding.
- If there is water in the tray.
- If there is water feeding in the tray.
- The correct adjustment of the feeding flows in all humidifying panels.
- The correct direction of the rotation of both the pump and the motor.
- The correct electric tension.

KIND OF BREAKDOWN	POSSIBLE CAUSE	SOLUTION
Strange noises	• The turbine has moved because the shaft is loose.	• Centre the turbine and re-tighten the screws.
	• Unbalanced turbine.	• Balance it.
	• Bearings in bad state.	• Replace them.
Airflow leak	• Plugged cellulose humidifying panels.	• Clean them or replace them.
	• Loose belts.	• Tighten them or replace them.
	• Bad positioned air impulsion grids.	• Direct them to the right position.
	• Lack of exterior air outlet.	• Increase outlet overtures. • Example: $1\text{ m}^2 = 10.000\text{ m}^3/\text{h}$.
	• Load loss in the impulsion outlet.	• Do not put bends with closed angles in the machine outlet (one metre high minimum).
It does not cool the air	• Incorrect turn of the pump.	• Reverse its direction.
	• Burned or blocked pump.	• Replace it.
	• Lack of water in the tray.	• Check water feeding and/ or level regulator.
	• Plugged cellulose humidifying panels.	• Clean or replace them.
	• Water flows throttling.	• Open them.
	• The water distributor is plugged.	• Clean it.
	• The pump aspiration mouth is plugged.	• Clean it.
Air smells bad	• Dirty water in the tray.	• Empty the tray, clean it and fill it again with clean water. • Automatic bleed-off.
Bothering draught air	• The impulsion grids are wrongly adjusted.	• Re-adjust them correctly.
The motor or the fan does not start up.	• Coils short circuit.	• Repair or replace it.
The pipe is dripping.	• Excess of water in the water distributor.	• Reduce water flow and adjust it correctly.
	• Loose water distributor.	• Put it in the correct way.
	• Excess of water in the tray.	• Adjust the buoy.
	• Filters are damaged.	• Replace them.
	• Deflectors are damaged.	• Replace them.
The pump is dripping	• The retainer is damaged.	• Replace it.
High corrosion	• Water with high amount of lime. • Water from rain.	• Water softener. • Bleed-off with water purges. • Do not use it.

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TROUBLESHOOTING IN AUTOMATIC BLEED-OFF SYSTEM		
KIND OF BREAKDOWN	POSSIBLE CAUSE	SOLUTION
The valve does not turn off and leaks water	• Lack of pressure in the system	• Minimum pressure of the water main supply must be 1 bar.
	• Defective or wore out 0610341 O-ring	• Replace it.
The valve turns off but it leaks water through the drainpipe	• O-ring Ref. 0610313 is defective or wore out.	• Replace it.
	• Piston base Ref. 0411710 is defective or wore out.	• Replace it.
	• Deposits in the closing area.	• Dismantle the valve and clean
The valve turns off but leaks water inside the machine bucket	• Cylinder cap Ref. 0411707 is not well tightened.	• Re-tighten screws.
	• Joints Ref. 0610334 or Ref. 0610350 are defective.	• Replace them.
	• Deposits in the closing area.	• Dismantle the valve and clean.
The valve does not turn on	• The electrovalve of the system water intake Ref. 2107113203C does not turn off correctly.	• Repair or replace
	• The valve piston does not turn on.	• Check and activate on the relief bend Ref. 1603CG638 .
	• Broken spring.	• Replace it.
	• Broken piston set.	• Replace it.



IMPORTANT:

Use plastic covers to protect equipments from weather inclemencies during winter or while not using them.

Empty completely the water tray at the end of the season and clean the pump and the motor in order to prolong the equipment life.

 **This action is highly more important in the case the cooler has internally installed an UV lamp; if it contains water within, the frost would broken the internal glass of the lamp.**

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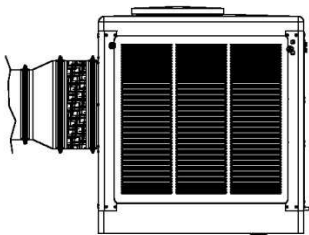
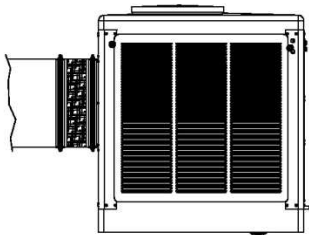
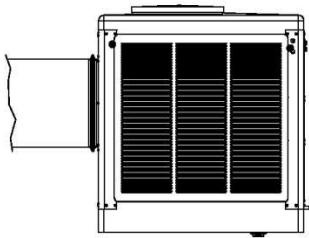
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Evaporative coolers connections

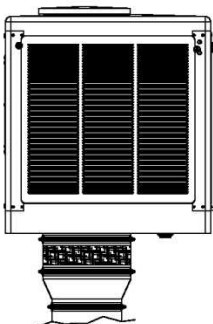
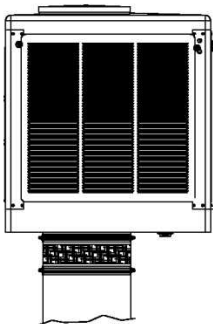
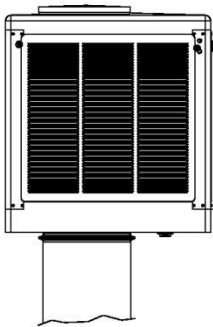
Kind of connections:

The connections have be made directly on the outlet frame, or through a elastic joint Ref. **1805AC4740** (AD-09/12/15-H/V/VS), not included with the cooler. If you want work with ducts of 450x450 mm., this is possible through the adaptor de Ref. **180547404545** (AD-09/12/15-H/VS), not included with the cooler.

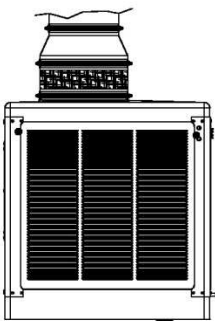
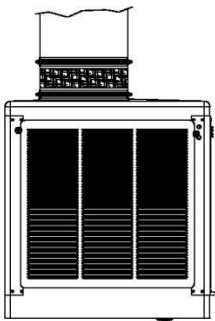
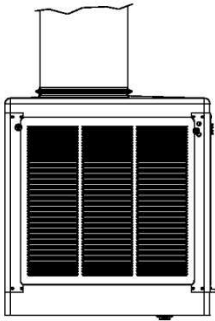
Version “H”



Version “V”



Version “VS”



Get In Touch

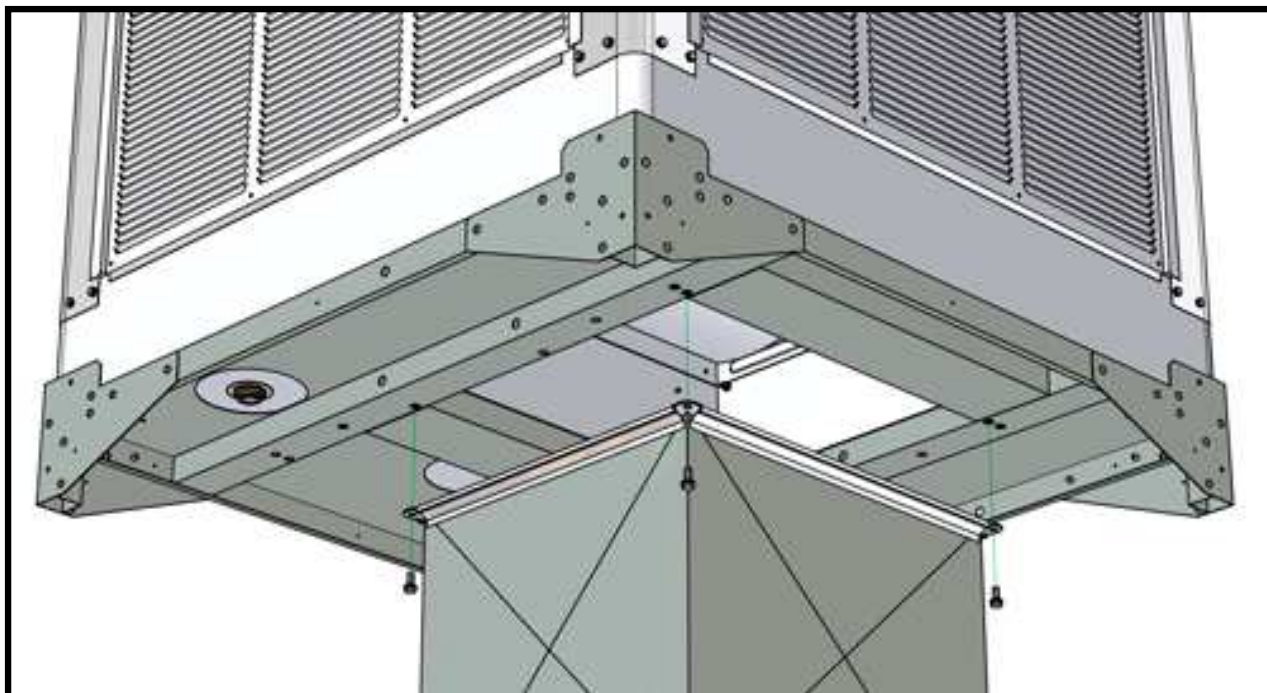
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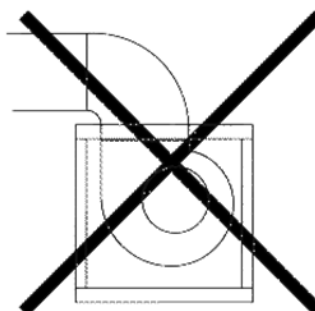
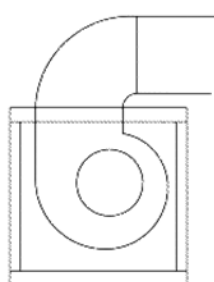
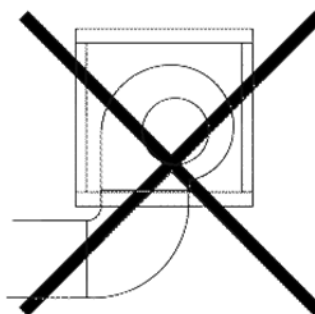
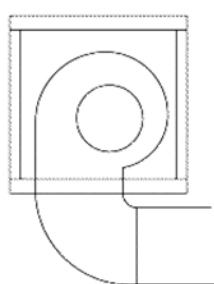
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Evaporative cooler connection (only model “V”)

The connection of Evaporative cooler version “v”, is done through 4 holes leading the bench.
Ducts **555x480** or **600x600** can be fitted.

**WARNING**

**INSTALL THE UNITS “V” AND “VS” AS
THE SKETCH IS SHOWING**



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Spare parts

Attached the spare parts list, the most vulnerable to be replaced because of natural wear.

MODEL	FAN	MOTOR	TRANSMISIÓN BELT	FAN PULLEY	MOTOR PULLEY	COMPLEK	COOLING PANEL
AD-09-H	041501014002	07011010	1301SPZ01637	1305315Z1	1305090Z1	041501009001	PL14749
AD-09-V			1301SPZ01562				
AD-09-VS			1301SPZ01462				
AD-12-H		07011020	1301SPZ01587	1305280Z2	1305095Z2	041501012001	PL14750
AD-12-V			1301SPZ01512				
AD-12-VS			1301SPZ01400				
AD-15-H		07101030	1301SPZ01612	1305280Z2	1309100Z2	041501015002	PL14751
AD-15-V			1301SPZ01512				
AD-15-VS			1301SPZ01437				

Technical assistance

You can ask your seller for a technician's assistance or get in touch with METALURGICA MANLLEUENSE, S.A., which will give you the address of the Technical Assistance Service nearby.



C/FONTCUBERTA, 32-36
POL. IND. "LA COROMINA"
08560-MANLLEU
(BARCELONA)

TELF. 902- 10 13 74
FAX. 902- 10 13 73

Get In Touch

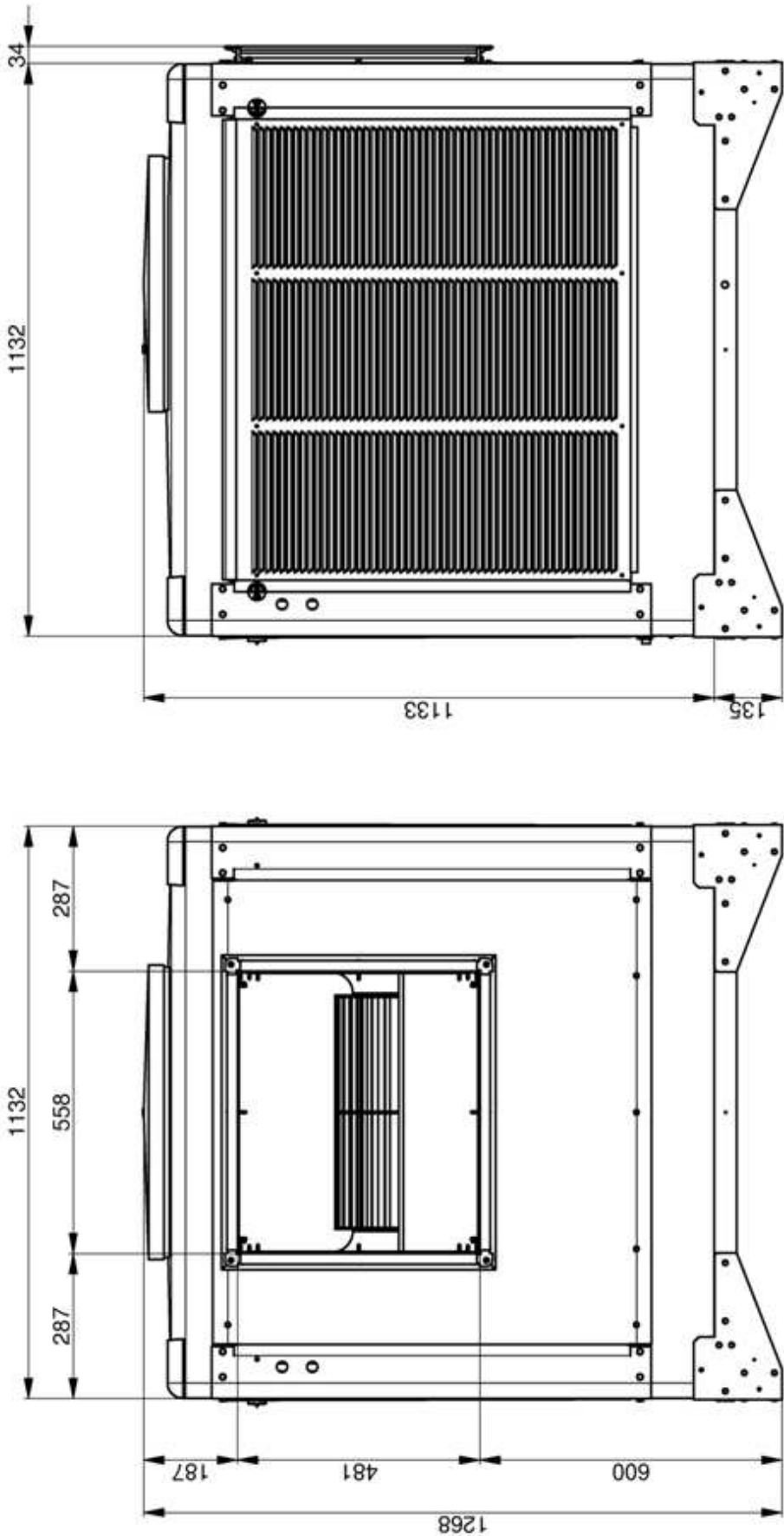
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General dimensions

AD-09/12/15-H



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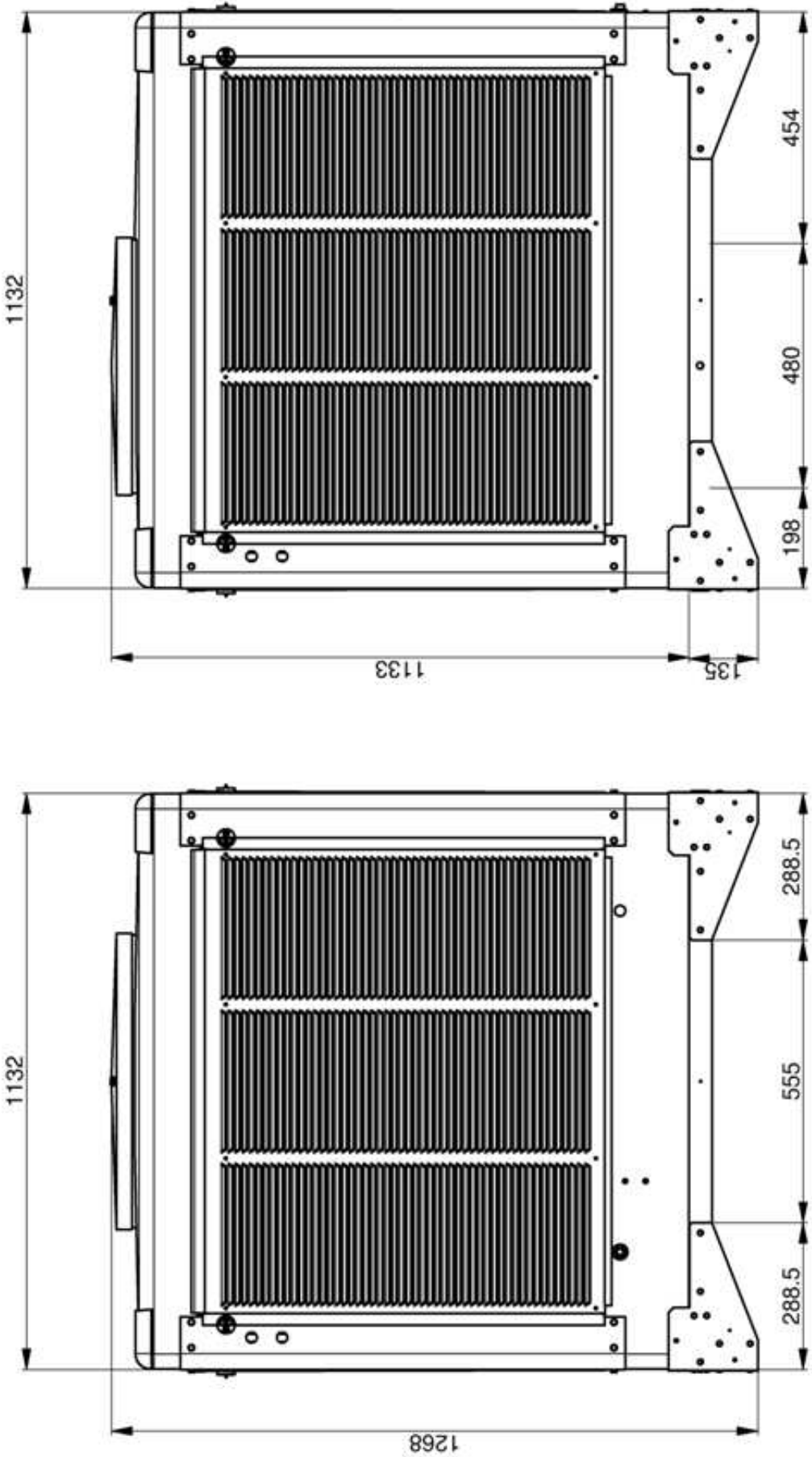
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AD-09/12/15-V



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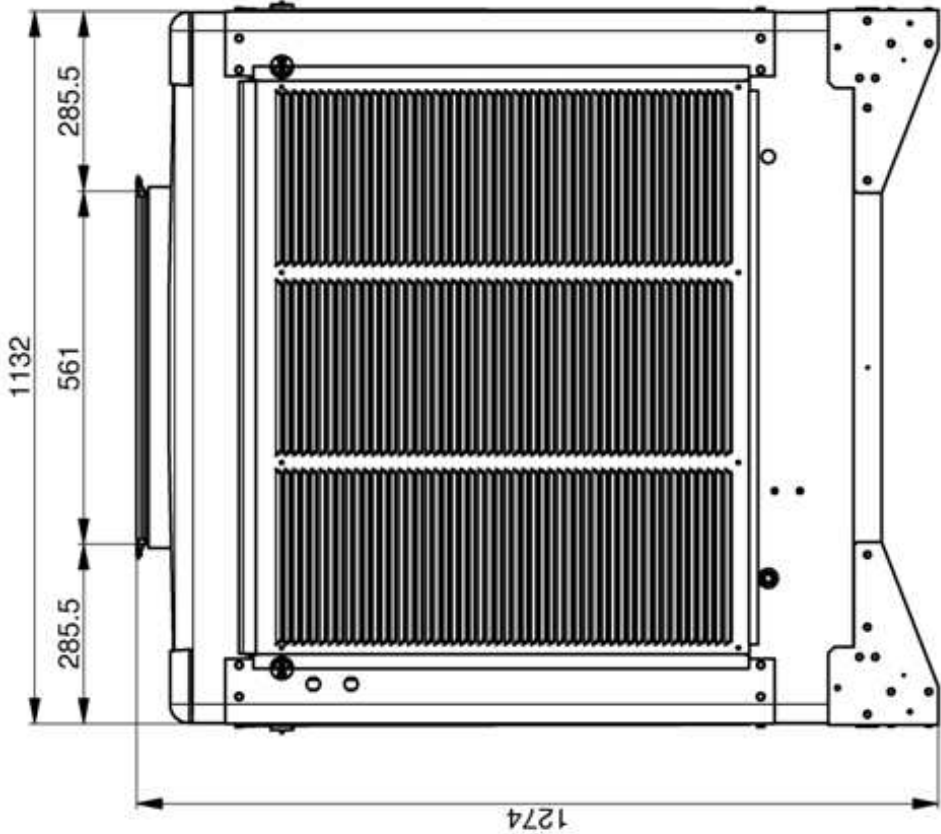
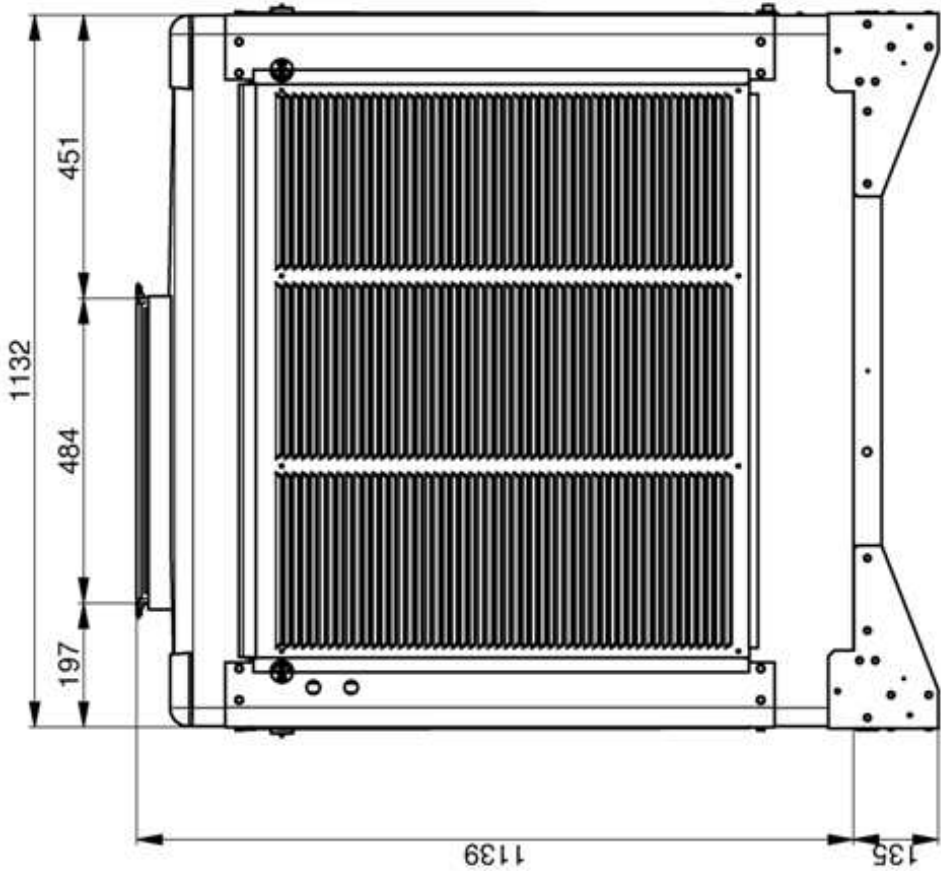
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AD-09/12/15-VS



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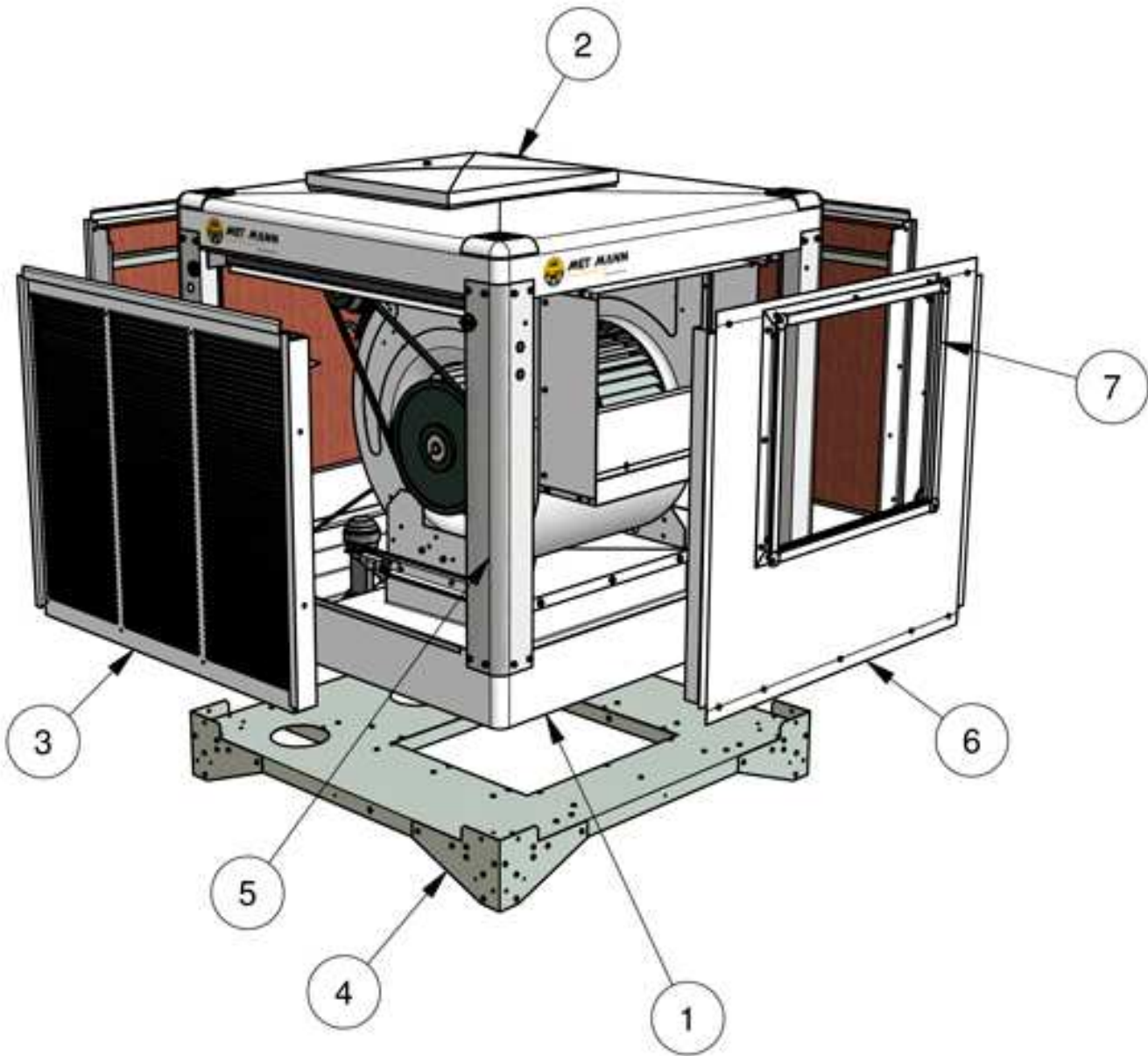
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Equipment breakdown drawing
AD-09/12/15-H



Position	Description
1	Tray
2	Roof set
3	Complek-09/12/15
4	Base bedframe
5	Corner stick
6	Side air outlet set
7	Reinforcement air entrance

Get In Touch

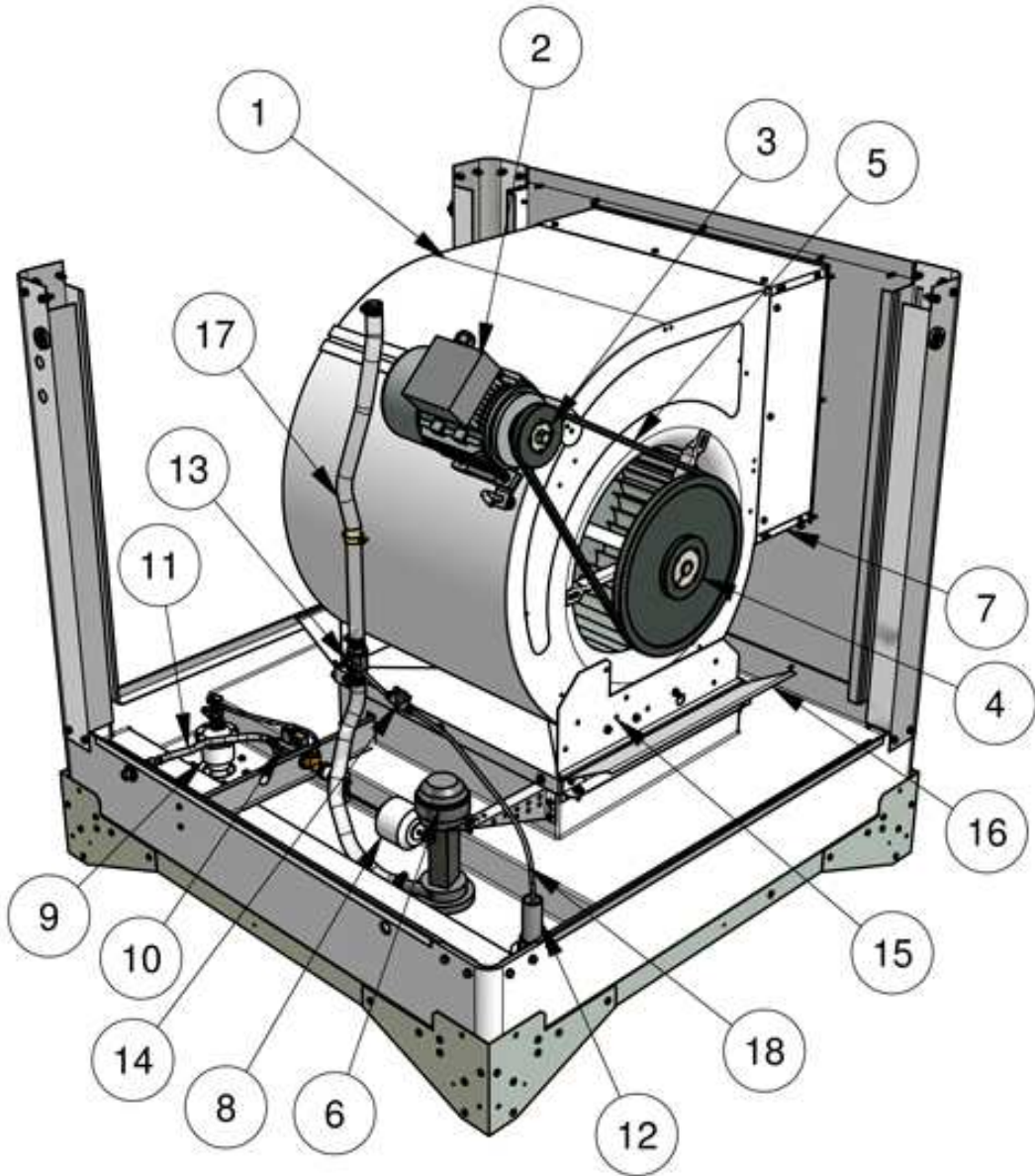
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AD-09/12/15-H
(Inside)



Position	Description	Position	Description
1	Fan group	10	Electrovalve
2	Motor	11	Entrance water hose
3	Pulley motor	12	Overflow tube
4	Pulley fan	13	Union sleeve with adapter
5	Transmission belt	14	Water purge valve
6	Water pump	15	Fan support
7	Internal entrance	16	Deflector
8	Buoy float	17	Mesh tube ø20x26
9	Drain valve	18	Polyethylene tube

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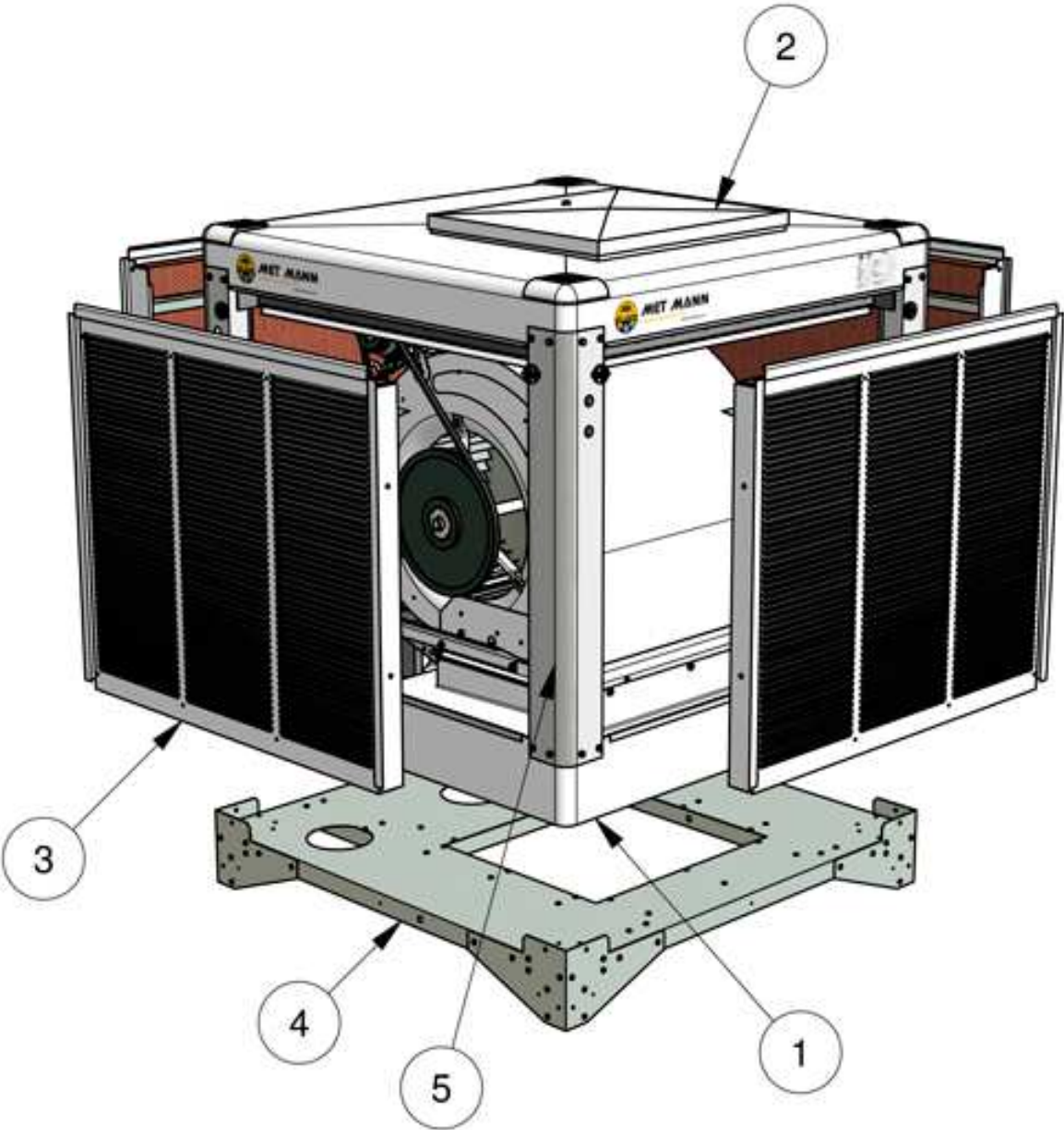
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AD-09/12/15-V



Position	Description
1	Tray
2	Roof set
3	Complek-09/12/15
4	Base bedframe
5	Corner stick

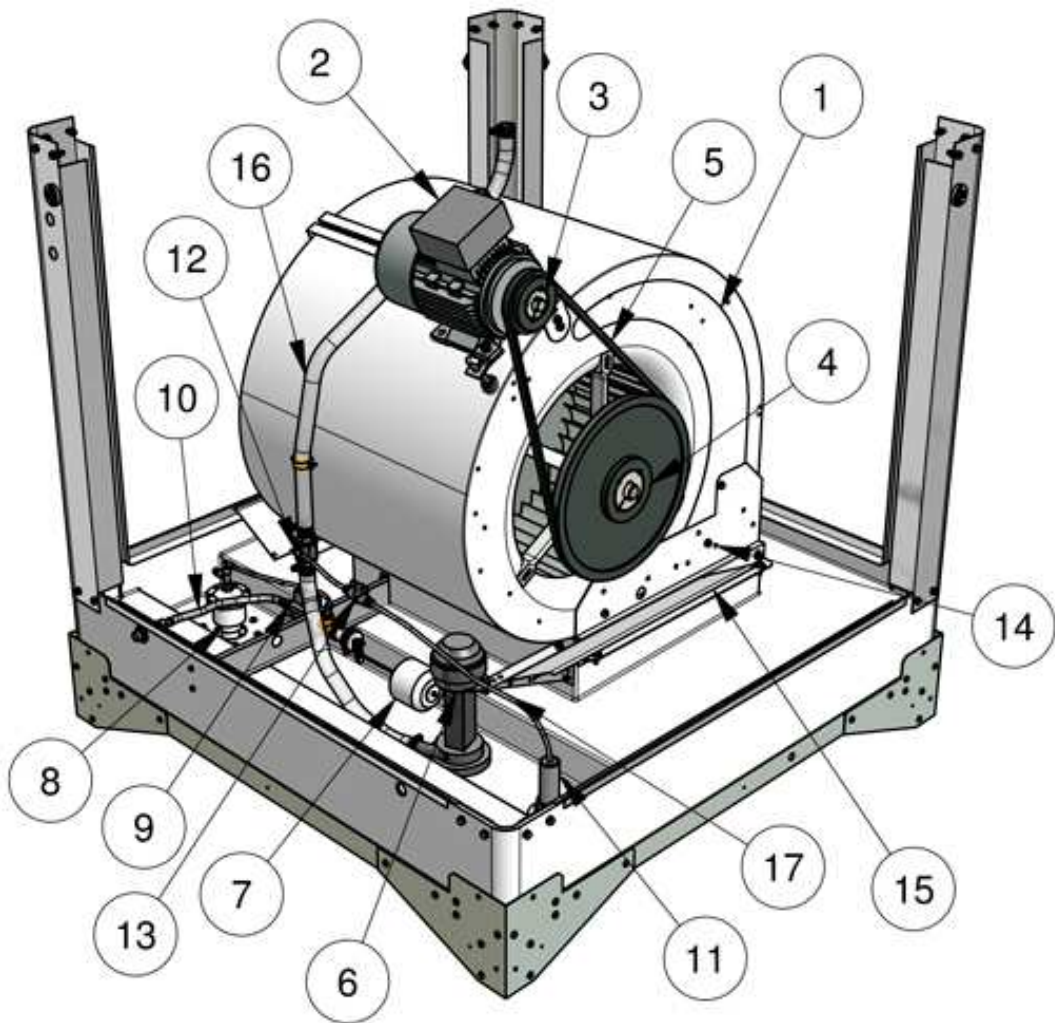
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AD-09/12/15-V
(Inside)



Position	Description	Position	Description
1	Fan group	10	Entrance water hose
2	Motor	11	Overflow tube
3	Pulley motor	12	Union sleeve with adapter
4	Pulley fan	13	Water purge valve
5	Transmission belt	14	Fan support
6	Water pump	15	Deflector
7	Buoy float	16	Mesh tube ø20x26
8	Drain valve	17	Polyethylene tube
9	Electrovalve		

Get In Touch

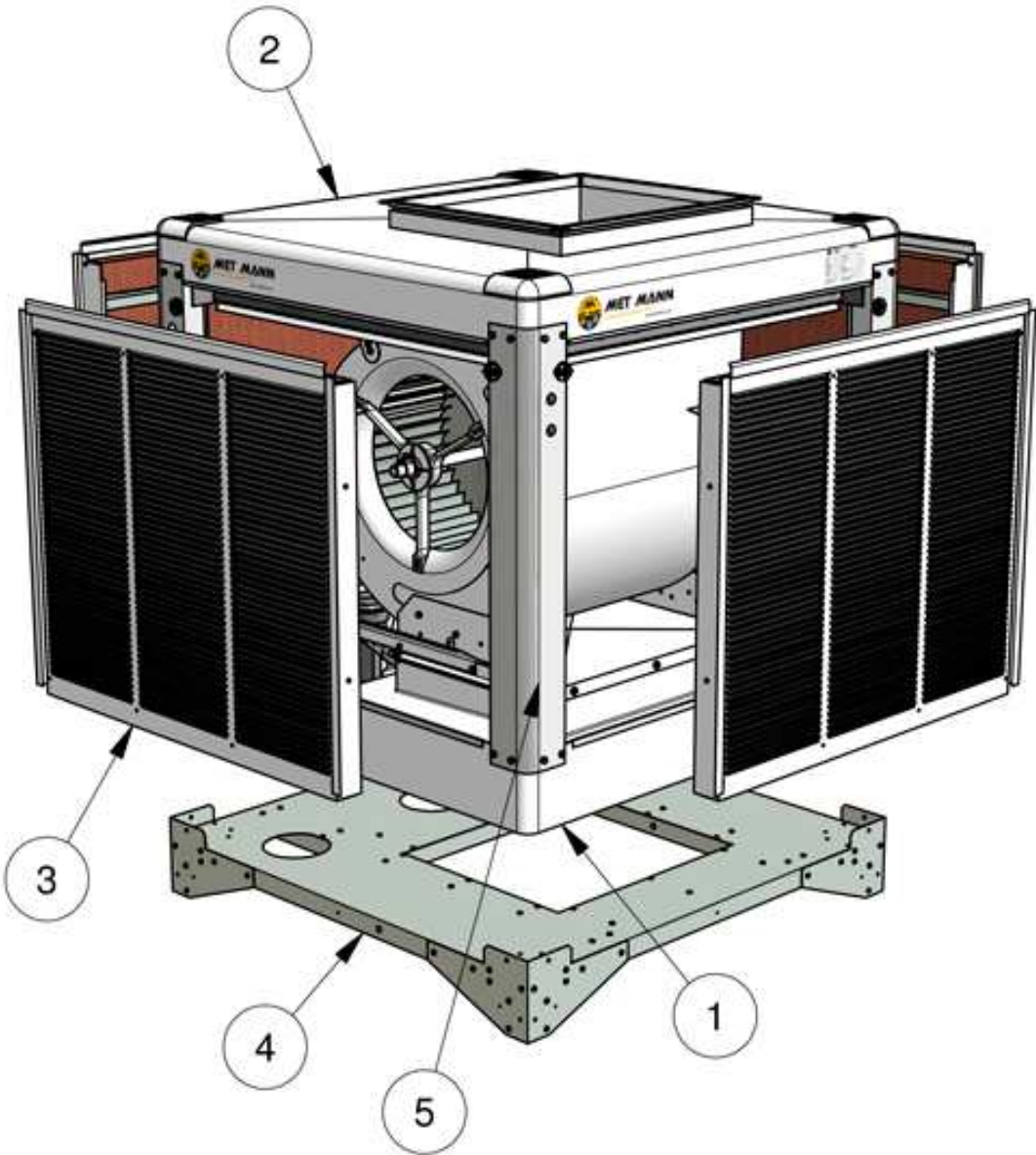
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AD-09/12/15-VS



Position	Description
1	Tray
2	Roof set
3	Complek-09/12/15
4	Base bedframe
5	Corner stick

Get In Touch

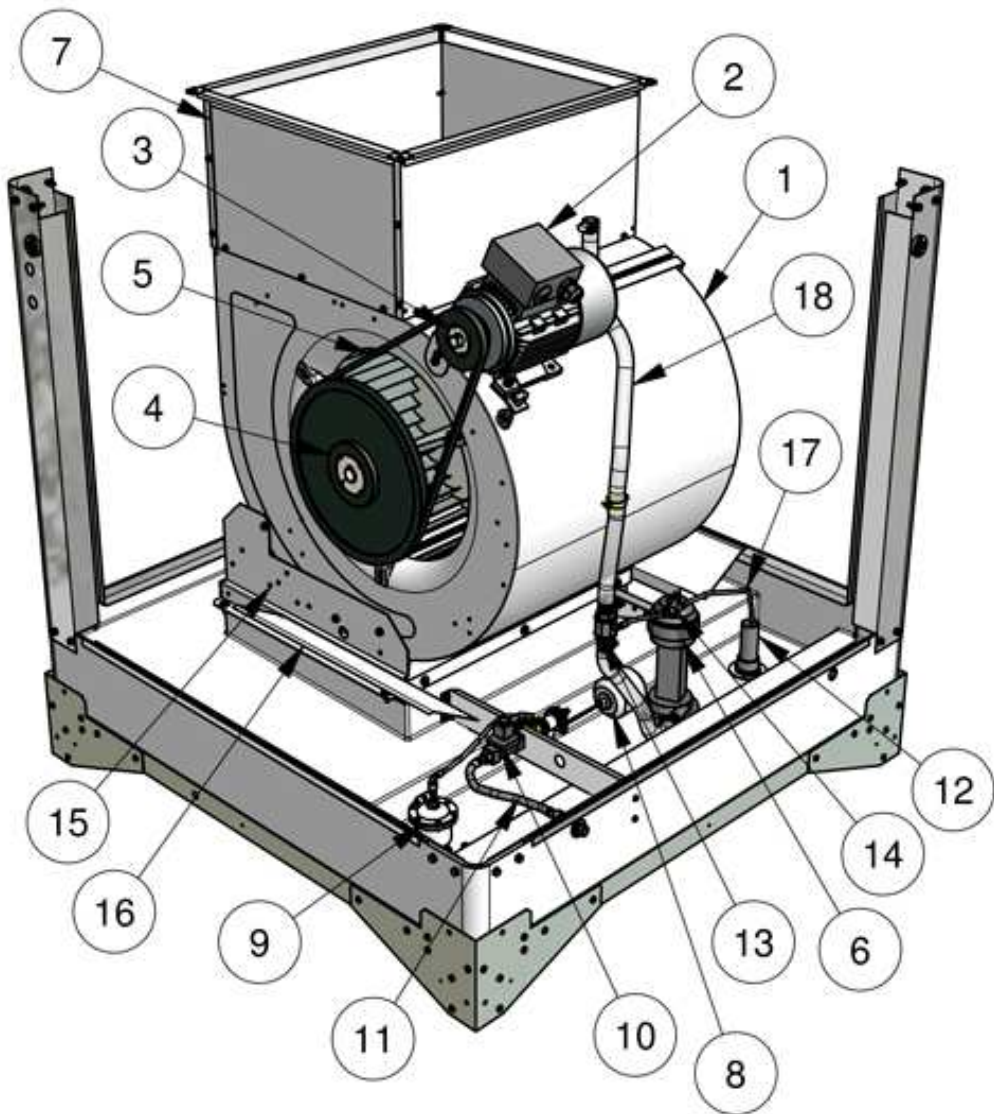
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AD-09/12/15-VS
(Inside)



Position	Description	Position	Description
1	Fan group	10	Electrovalve
2	Motor	11	Entrance water hose
3	Pulley motor	12	Overflow tube
4	Pulley fan	13	Union sleeve with adapter
5	Transmission belt	14	Water purge valve
6	Water pump	15	Fan support
7	Internal entrance	16	Deflector
8	Buoy float	17	Mesh tube ø20x26
9	Drain valve	18	Polyethylene tube

Get In Touch

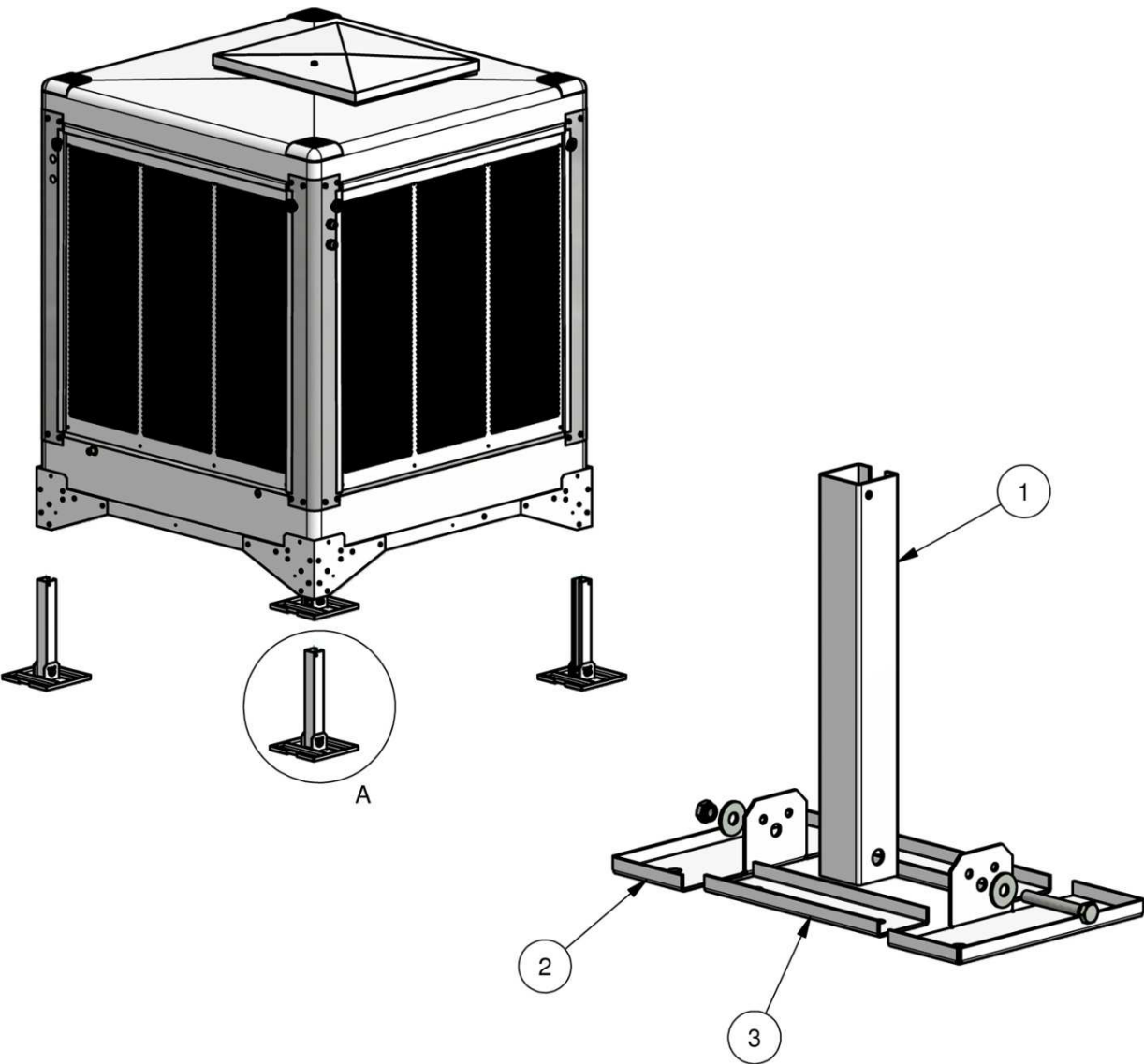
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Complement kit floor base bedframe 03KITBANSUELO1



Position	Description
1	Support tube
2	Support base
3	Fixation base

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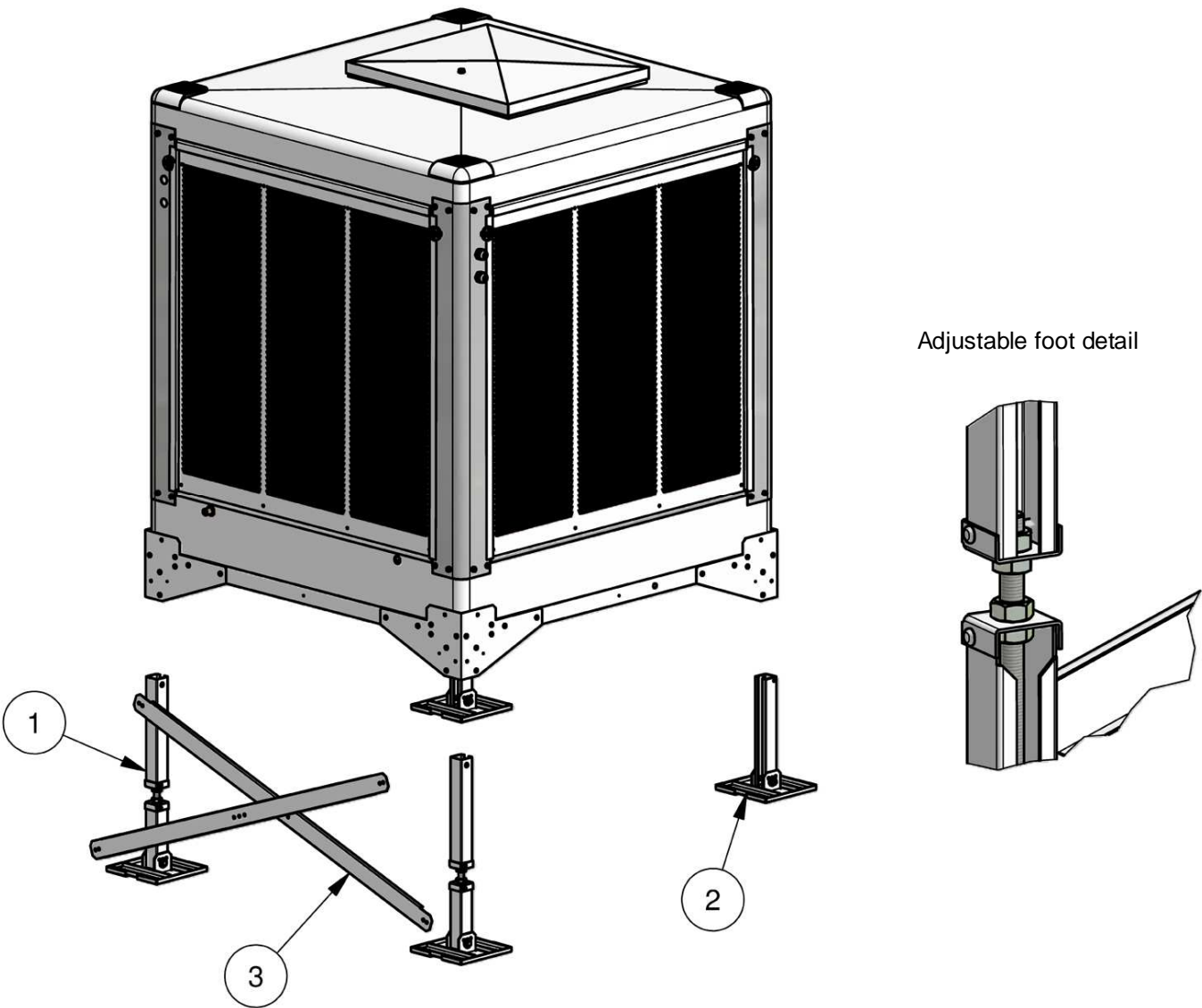
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Complement kit roof base bedframe (optional)
03KITBANTEJADO1



Position	Description
1	Adjustable foot
2	Fix foot
3	Bedframe reinforcement

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C07TM / C15TM / C22TM Electric panel

Product description

Electric panel with protection and manoeuvre elements according to the European rules.

This panel is specially designed for MET MANN evaporative coolers operation.

Each panel is suitable for the following models:

- C07TM = AD-09 (Maximum power 0,75 KW)
- C15TM = AD-12 (Maximum power 1,50 KW)
- C22TM = AD-15 (Maximum power 2,20 KW)



Power panel



Manoeuvre switch

Installation remarks

- Place the electric panel between 0.6 and 1.9 metres above the ground level.
- A padlock can be used in the main switch when its position is “OFF” in order to assure protection against a non-authorized, an unnoticed or a mistaken connection.
- An automatic switch must protect the electric installation.
- The earth wire must be bicolour (yellow and green)
- Connection terminals must be situated at least at 0.2m above the current inlet/ outlet.
- Wires from outside the panel must keep the same protection once the wires inlet is done (IP-65).
- The electric panel voltage must be 400-420V.

Instructions for use

Place the electric panel close to the evaporative cooler so that the equipment can be switched off while doing maintenance tasks.

The switch, which carries out the following functions, must be located in an accessible place for users:

- | | |
|----------------------|---|
| 0 POSITION | Complete shutdown of the equipment. |
| VENT POSITION | Exclusive start-up of the fan train. |
| COOL POSITION | Start-up of the water pump and the fan train when the level regulator indicates it can start-up with no problems. |

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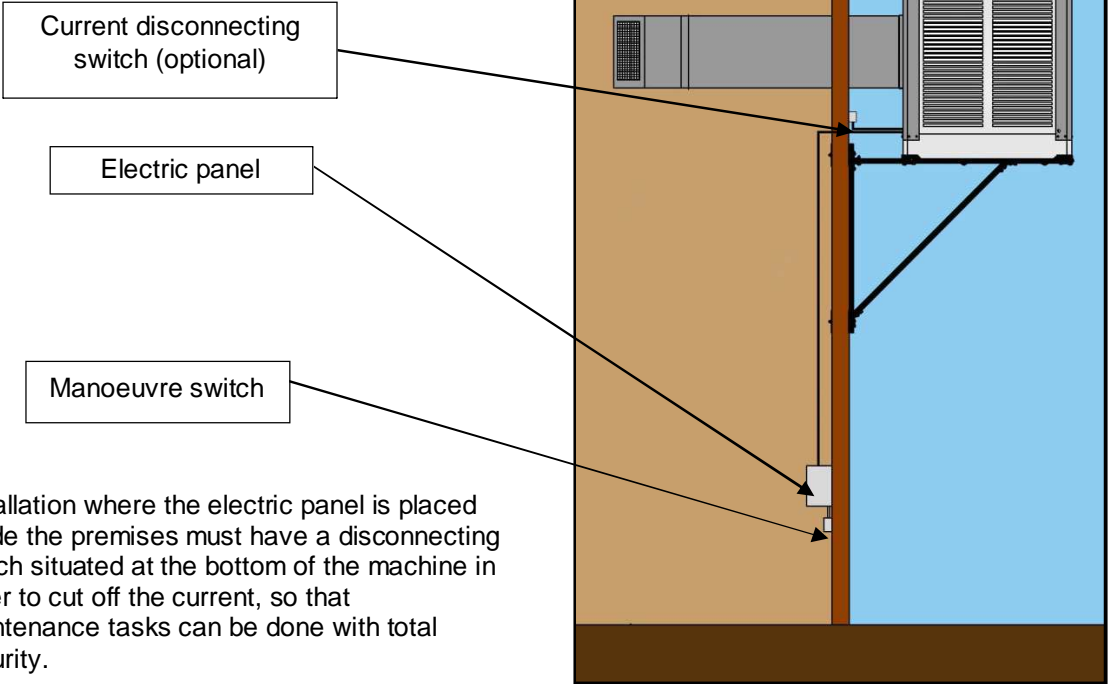
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Electric panel position

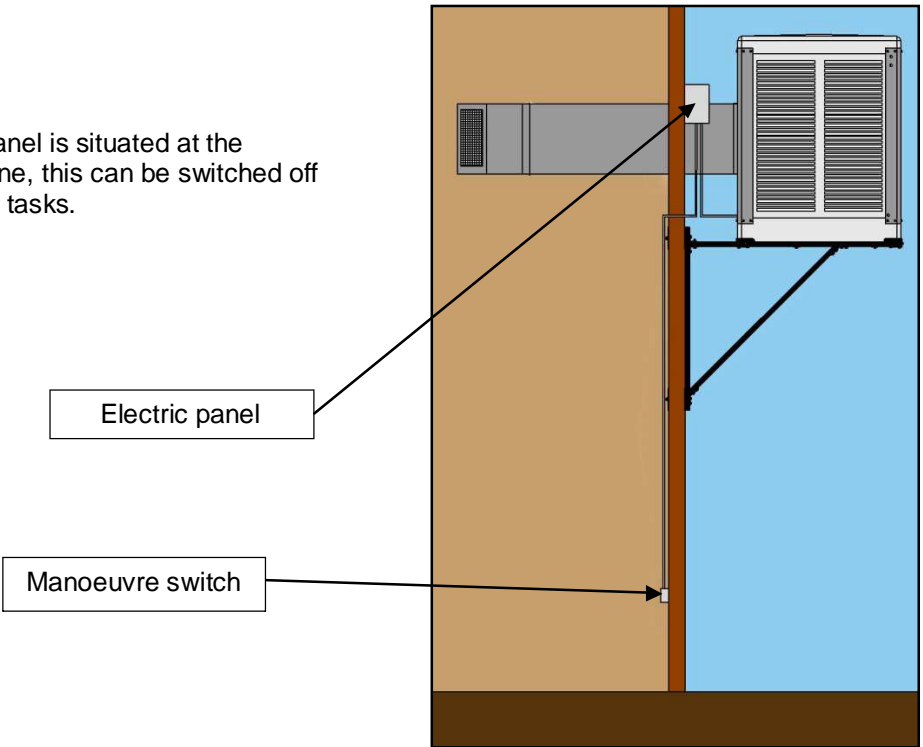
The electric panel can be assembled in two different ways:

“A position”



“B position”

When the electric panel is situated at the bottom of the machine, this can be switched off for the maintenance tasks.



Maintenance

Coolers maintenance program

According to the article 4 of the Royal Decree 865/2003, facilities holders **must carry out periodic maintenance programs that guarantee the correct operation of their facilities.**

The maintenance must be done by specialized companies. As it is of usually season operation (annex 4.B), it will be necessary to do a preventive maintenance program one time by year as minimum, at the beginning of work season for the units.

The program will consist on checking the different parts of the equipment, repairing the detected breakdowns, and the general cleaning of all the elements of the coolers.

These works must be carried out by qualified staff.

The following operations will be carried out:

- a) Check that potentiometers of the batcher pump are located in the suitable position.
- b) Check that the equipment receives the network water correctly, and with the suitable pressure.
- c) Check that all the electric components get electric tension, as well as to check that each one's function is the suitable one.
- d) Check the suitable and correct water distribution on all the cooling panels , check that they don't show any leak of water and that the panel receive water in a full and correct way for all his width; check, clean and eliminate possible incrustations into the water distributor, placed on top of the cellulose panels.
- e) Check the good conditions of the CELdek panels: remove it and carry out a good cleaning with pressure water, previously mixed with HIDRO-IC. It's advisable the replacement of the CELdek panels after their 2-3 years of operation in order to ensure a perfect cooling power of the equipment. If the HIDRO-IC inhibitor has been used, the panels durability is longer since it acts as a scale remover.
- f) Check the fan optimum conditions and operation; if bearings make an unusual noise, it is advisable to replace them for new ones before trying to recover the anomalous ones.
- g) Re-tighten the belts, replacing them if they suffer from deterioration.
- h) Check the general conditions of the treated air impulsion pipes and clean them if you observe they are dirty.
- i) If the unit has installed G4 filters, remove the G4 blanket and put it in clean water in the way to dissolve all the dirty. When it's dry, don't wring out ! let it dry without wrinkle. When it's dry, install it in this grid which will be cleaned, too. It's advisable the replacement of the filters after 2 work years as maximum.
- j) If the unit has installed a UV lamp, check his good conditions: open up the lamp and check the quartz tube is in good conditions and operating (DON'T TOUCH the quartz tube with the fingers !!!), replace it if it's necessary (his useful life is of 8.000 hours); check the good conditions of the joints replacing them if they are deteriorated.

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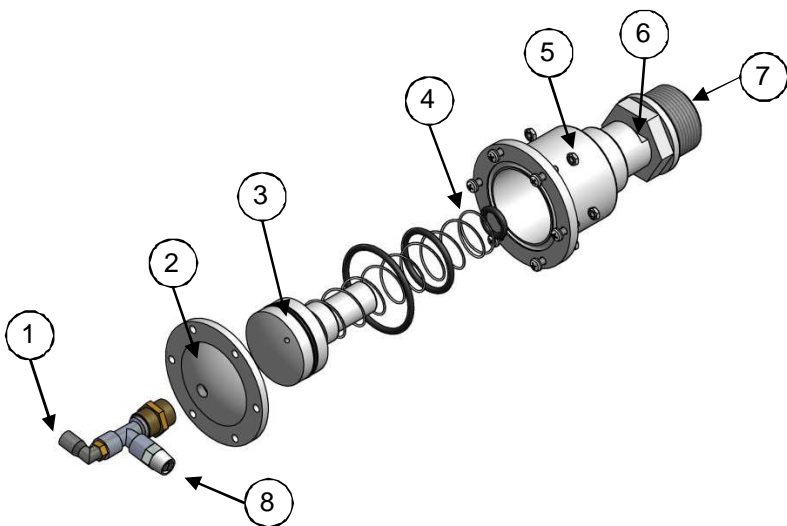
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Humidification system

- a) Check that the internal recirculation pump works properly and drives the water correctly.
- b) Clean and eliminate all possible incrustation in any of all elements of the water distribution system (hoses, distributors,...)
- c) The automatic starting pump system^(*) must be revised in the presence of possible pluggings of the level adjustment system: dismantle the element, clean and eliminate all sediment or incrustation it can contain, and check its correct operation.
- d) Check the suitable and correct water distribution in all the cooling panels, and they don't show any water leak and/or that the panel receives the water fully and correctly in all the width of the panel. Dismantle and check the water distributor, placed just on top of the cellulose panels; clean and eliminate possible incrustations on the water distributor.
- e) Check the correct operating of the float and that the water lever in the tray is the correct one.
- f) Check the purge flow is the suitable to, in this way, maintain the correct water regeneration in this tray.
- g) Check that the bleed-off automatic system is correctly working:
 - dismantle the emptying valve and eliminate the internal incrustations
 - check his correct work: when the water entrance solenoid is open, the water entries by (1) and push the piston (3), descending and closing the water exit (6). In other hand, when the solenoid is closed, the water stops his entrance by (1) and the spring (4) push up the piston opening the exit to the water to outdoor.
 - Check that the decompression valve (8) is sufficiently opened to permit the water evacuation when there is a decompression when the piston closes the solenoid of water entrance. Is enough to check that a little stream is leaking by the hole of the decompression valve.
 - At the final, start-up and stop the cooling system checking that at the cooler stop the device are doing the emptying in a correct way.



Position	Description
1	Water inlet
2	Cylinder head
3	Piston
4	Spring
5	Cylinder
6	Water outlet hole
7	Drain
8	Decompression valve





AFTER THE REGULAR MAINTENANCE, IT MUST START-UP THE UNIT TO VERIFY HIS FULL AND CORRECT OPERATING

When ending the revision, the correspondent Register of maintenance control must be signed.

^(*) Equipments manufactured since 2005

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At the final of the units work season, make a complete emptying of the water tray and make a general cleaning, and clean the pump, too; in the way to extend his work life.

Cleaning and disinfection program

According to the article 4 of the Royal Decree 865/2003, facilities holders **must carry out the periodic maintenance programs that guarantee the correct operation of their facilities.** The cleaning and disinfection program must be carried out by authorised staff. As it is of seasonal operation (annex 4.B), it will be necessary to do a preventive maintenance program one time by year as minimum, at the beginning of work season for the units.



When the subcontracted company carries out the cleaning and disinfection of MET MANN evaporative coolers, the **HIDRO-IC** can be used, since its composition is based on hypochlorites together with anticorrosives and antiscalles; we must carry out the following procedure:

- a) Previously to the cleaning and disinfection program, carry out all the maintenance operations of the equipment, previously detailed on “Coolers Maintenance Program”.
- b) To open the water entrance valve, filling the cooler tray with water. To put into operation the water recirculation pump in order it flows through all the circuits and therefore it covers the panels, maintaining the fan stopped.
- c) To add directly the HIDRO-IC amount indicated in the following table, depending on the model, in order to achieve at least a chlorination of 5 ppm (parts par million) of free residual chlorine, maintaining a pH between 7 and 8. HIDRO-IC manipulation must be carried out with protection gloves and glasses, as indicated in your Security Data Card.

MODELS	HIDRO-IC AMOUNT (for 5 ppm)
AD-07	0,12 litres
AD-09 / AD-12	0,75 litres
AD-15	1,00 litres
AD-30 / AD-35 / AD-40	2,00 litres
AD-55 / AD-70	4,00 litres

- d) To carry out the system recirculation during three hours, with the fans disconnected.
Note: Since the machine had no water and the tray has been filled with new water from the net, it is not necessary to measure the chlorine level.
- e) To empty the whole equipment.
- f) To clean thoroughly the internal equipment surfaces with detergent and pressurised water. Proceed to an exhaustive rinse and empty again the equipment.

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- g) To open the water entrance valve, filling again the cooler tray with net water and putting into operation only the water recirculation pump (the fan must be stopped). To add the PANEVAP IC amount indicated in the following table, depending on the model, in order to achieve 15 ppm of free residual chorine.

MODELS	HIDRO-IC AMOUNT (for 15 ppm)
AD-07 / AD-09	2,25 litres
AD-12 / AD-15	3,00 litres
AD-30 / AD-35 / AD-40	6,00 litres
AD-55 / AD-70	12,00 litres
AD-07 / AD-09	2,25 litres

- h) To recirculate the system during two hours, with the fan stopped.
- i) To empty it and rinse it.
- j) To put the batcher pump into operation. To open the water entrance valve to the evaporative cooler. Once the tray is full, the fan can be put into operation. The cleaning and disinfection process has ended.
- k) When ending the revision, the correspondent Register of maintenance control must be signed.



If you contract an external maintenance company, take care it does not use corrosive products, since the proper operation of the equipment can be put in danger.

(There is the possibility that the internal elements oxidise due to the use of this kind of products that are not suitable for MET MANN equipments.)

MET MANN only recommends HIDRO-IC use, since it is the suitable product for the cleaning and disinfection of our equipments.

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Planning of the OXIDANT PREVENTION pump

This batcher pump has the special feature of being regulated from the control panel. We can observe in it the cc/hour injected by the pump, which means a simplification on the current existing pumps that do not contain this information in the regulation.

It allows chemical products dosage in evaporative coolers. It just has to be proper installed with the equipments fans motor and the correspondent dosage must be selected.

Its installation is very simple since it just needs a small support to be assembled on the wall.

ON / OFF SWITCH

Standing or running switch of the batcher pump.

DOSAGE REGULATOR

It allows regulating the chemical product dosage from 0 to 200 cc / hour

SWITCH x1 / x5

The value indicated on the dosage regulator is multiplied by one or by five depending on the installation necessities.

PURGE

When a replacement is made or a chemical product carafe is put for the first time, it is advisable to open this valve in order to make easier the pump build-up, and when you see that chemical product goes away during the purge, you can close the valve.

TABLE OF MET MANN EQUIPMENTS DOSAGE

AD-03 / AD-07	AD-10 / AD-14 / AD-20	AD-30 / AD-35 /AD-40	AD-55 / AD-70
5 cc / hour	12 cc / hour	24 cc / hour	38 cc / hour

For calculating other dosages, you may use the following formula:

Air flow installed on the same water line / 1400 = _____ cc / hour to be dosed

Example number 1:

If we have got 4 coolers, model AD-70-V (63.000 m³/h), on a same line of water inflow we will dose:

$63.000\text{ m}^3/\text{h} * 4u = 256.000\text{ m}^3/\text{h}$
 $256.000 / 1.400 = 182,85\text{ cc / hour to be dosed}$

For this example we will put the regulator approximately at 180 and the multiplier on the position x 1.

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Example number 2:

If we have got 8 coolers, model AD-70-V (63.000 m³/h), on a same line of water inflow we will dose:

$$63.000 \text{ m}^3/\text{h} * 8u = 504.000 \text{ m}^3/\text{h}$$

$$504.000 / 1.400 = 360 \text{ cc / hour to be dosed}$$

For this example we will put the regulator approximately at 70 and the multiplier on the position x 5.

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Installation register

HOLDER COMPANY

Name:		
Person in charge:		
Direction:		
Town:		
Telephone number:	Fax number:	E-mail:

INSTALLER COMPANY

Name:		
Person in charge:		
Direction:		
Town:		
Telephone number:	Fax number:	E-mail:

EQUIPMENTS CHARACTERISTICS

Kind of installation	ENFRIADOR EVAPORATIVO
Model	
Number of installed equipments	
Serial number	
Year of installation	
Fan power (kW)	

EQUIPMENTS LOCATION

Is it easy to have access to the equipment?	<input type="checkbox"/> YES <input type="checkbox"/> NO
Is there a draft on the carried out installation?	<input type="checkbox"/> YES <input type="checkbox"/> NO

WATER HARNESSING

<input type="checkbox"/> Public network	
<input type="checkbox"/> Superficial own supply	
<input type="checkbox"/> Subterraneous own supply	
<input type="checkbox"/> Is there a deposit?	<input type="checkbox"/> YES (Specify its location) <input type="checkbox"/> NO



PREVENTION SYSTEMS

¿Does it have PANEPA IC additive batcher system?	<input type="checkbox"/> YES <input type="checkbox"/> NO
¿Does it have automatic water emptying system?	<input type="checkbox"/> YES <input type="checkbox"/> NO

Date:	
Holder company's signature and seal:	Installer company's signature
<div></div>	<div></div>

You must send a copy of this document to the plant in order that the machine guarantee begins to work. Start-up files will be not accepted after three months from the machine consignment.

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 Email: info@adremit.co.uk

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HIDRO-IC Dosage control register Number _____

EQUIPMENTS CHARACTERISTICS

Kind of installation	ENFRIADOR EVAPORATIVO	
Model		
Number of installed equipments		
Operation system	<input type="checkbox"/> Continuous	<input type="checkbox"/> Seasonal
Water origin	<input type="checkbox"/> Public network	<input type="checkbox"/> Well
Potentiometer position 1		
Potentiometer position 2		

REGISTER CARDS EVERY 15 DAYS

Date:		
HIDRO-IC level:	<input type="checkbox"/> Enough	<input type="checkbox"/> Insufficient (carafe replacement)
Operator's name and signature:		



Date:		
HIDRO-IC level:	<input type="checkbox"/> Enough	<input type="checkbox"/> Insufficient (carafe replacement)
Operator's name and signature:		

Date:		
HIDRO-IC level:	<input type="checkbox"/> Enough	<input type="checkbox"/> Insufficient (carafe replacement)
Operator's name and signature:		

Date:		
HIDRO-IC level:	<input type="checkbox"/> Enough	<input type="checkbox"/> Insufficient (carafe replacement)
Operator's name and signature:		

Date:		
HIDRO-IC level:	<input type="checkbox"/> Enough	<input type="checkbox"/> Insufficient (carafe replacement)
Operator's name and signature:		

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Coolers maintenance control register number _____

EQUIPMENTS CHARACTERISTICS

Installation equipment	ENFRIADOR EVAPORATIVO	
Model		
Number of installed equipments		
Operation system	<input type="checkbox"/> Continuous	<input type="checkbox"/> Seasonal
Water origin	<input type="checkbox"/> Public network	<input type="checkbox"/> Well
Potentiometer position 1		
Potentiometer position 2		

CARRIED OUT WORKS

Kind of intervention	Consent	Non consent
Cleaning with pressurised water of all external parts of the equipment		
The batcher pump potentiometers are proper.		
The equipment receives properly the net water.		
All electric components receive electric current.		
The electric components function is the suitable one.		
The internal recirculation pump works properly.		
The water distribution in panels is uniform.		
The automatic start system of the pump works properly.		
The automatic emptying system works properly.		
Bands conditions and tension are suitable.		
The fan operation is proper and does not make an anomalous noise.		
CELdek panels have not lime incrustations.		
Impulsion pipes conditions are correct.		
Cleaning and disinfection have been carried out.		

OBSERVATIONS

Date and operator’s signature

This manual has been adapted to the ROYAL DECREE 865/2003
“HYGIENIC AND HEALTH CRITERIA FOR LEGIONELOSIS PREVENTION AND CONTROL”

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HIDRO- IC Incrustation and corrosion inhibitor in evaporative coolers

Product description

HIDRO-IC is a liquid product that acts as a corrosion antiscaling, deflocculant and inhibitor in evaporative panel circuits, maintaining the panels in good conditions, multiplying its useful life and increasing the system efficacy.

It restores the free chlorine values because of its hypochlorite content, that is why it controls the microorganisms (as Legionella) growing.

Composition

Poly acrylate, poly phosphate and hypochlorite presence.

Usage instructions

It is used by being injected on the inflow water line of the panels through automatic batcher pump of OXIDANT PREVENTION®.

Dosage

120 ppm into the inflow water

Presentation

Containers of 25Kg.



Get In Touch



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Security data card

1. IDENTIFICATION OF THE PRODUCT OR PREPARATION		
- Specific risks	Corrosive	
- Commercial name	HIDRO-ic	
- Product code	P-IC	
- Security card number	P-IC-001	
- Emission date	March - 2001	
- Identification of the company	MET MANN, S.A.	NIF: A-08316028
- Further information	Toxicology National Institute: +34 91- 562 04 20	
2. COMPOSITION / COMPONENTS INFORMATION		
- Chemical constitution of the product	Aqueous solution with deflocculant, antiscaling and sodium hypochlorite.	
- CAS number		
- Dangerous compounds	Sodium hypochlorite	
- Concentration	5%	
- CEE classification symbol		
- R phrases	R 36/38.	
3. RISKS IDENTIFICATION		
- Through inhalation	Irritant	
- Through contact with skin	Irritant	
- Through contact with eyes	Irritant	
- Ingestion	Irritant	
4. FIRST AID		
- In case of contact with skin	Clean it with abundant water.	
- In case of contact with eyes	Clean it with abundant water during 15 minutes. Ask for a doctor.	
- In case of inhalation		
- In case of ingestion	Do not make the victim vomit. Go to the doctor immediately.	
- Precautions (S phrases)	S 26, S 28, S 36/38	
5. MEASURES OF FIGHT AGAINST FIRE		
- Particular risks of FIRE or explosion	It is not appropriate	
- Explosivity limits (% vapour in the air)	It is not appropriate	
- Explosivity limits (g/m³ dust in the air)	It is not appropriate	
- Extinction measures	It is not appropriate	
- Particular measures of protection on the fight against fire.	It is not appropriate	

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6. ACCIDENTAL SPILLAGES	
- Measures to be taken in case of accidental spillage	Clean the area with abundant water.
7. MANIPULATION AND STORAGE	
- Precautions of storage and handing	Maintain containers closed when not using them. Handle with usual protections, as with any chemical product.
- Packing and packaging material	Plastic
8. EXPOSITION CONTROL; WORKERS PROTECTION	
- Individual protection measures	Handle with protection gloves and glasses
- Special protection measures	
9. PHYSICAL AND CHEMICAL PROPERTIES	
- Aspect	Transparent liquid
- Colour	Colourless or slightly yellow
- Smell	-
- pH (20°C)	2.3 - 3.5
- Fusion temperature	Approximately 0°C
- Boiling temperature	Approximately 100°C
- Decomposition temperature	>200°C
- Burst point (closed cup)	°C
- Self inflammation point	°C
- Vapour pressure	
- Density (20°C)	1.03 g/cm ³
- Viscosity (20°C)	- Mpas
- Solubility/miscibility in water	Absolutely soluble
- Solubility/miscibility in solvents	
- Further data	Non volatile components at temperatures inferior to 150°C
10. STABILITY AND REACTIVITY	
- Dangerous reactions	
- Dangerous decomposition products	
11. TOXICOLOGIC INFORMATION	
- DL50 oral rata	mg / kg
- Further data	
Limit value of exposure:	
Limit value (VLE)	
Medium value (VME)	

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12. ECOLOGIC INFORMATION	
- Biodegradability	
- DBO ₅	mg O ₂ /l
- DQO	mg O ₂ /l
- Ecotoxicity	
- Microtox	5min: ppm - 15min: ppm
- CL 50	
13. CONSIDERATIONS RELATING TO ITS ELIMINATION	
- Destruction process of products and waste	Residual water can be eliminated through chemical flocculation
- Processing procedure of contaminated containers	Follow local rules
14. INFORMATION RELATING TO FREIGHTS	
- Labelling of dangerous substances and preparations	
- CEE number	
16. FURTHER INFORMATION	
- Usage	Conditioner of refrigeration circuits water with deflocculant and scale remover.
- Further data	All raw materials used for this product formulation are included in section 21CFR173.310 of FDA, secondary additives in direct contact with food for human consumption.
<p>This card does not replace technical information but complements it. Data here contained is based on our current knowledge and legislative texts and rules relating to products promulgated on the emission date. It must not be considered as an exhaustive enumeration and in any case it neither exempts the product user of referring to the ensemble of official texts nor exempts him/her of knowing obligations that are incumbent upon him/her. We can not be responsible for an incorrect application of the product, since we can not control at any time the use that everyone makes of it. Warning for the user about risks that fall eventually when the product is used for in other applications different from those for what it is made.</p>	

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METMANN COOLERS, and the true Legionella risks

The bacterium :

Gram-negative Bacillus measuring 0,5 to 1 micron in diameter, and 1 to 3 microns in length
Legionella bozemani (3% of the cases)

The 3 main pathogenic rules :

Legionella pneumophila (75% of the cases)
Legionella jordanis (10% of the cases)

The main contamination sources : multiplication :

Auto-refrigerant tours
Air conditioners
Showers, Jacuzzis, hydro massages
Refrigerant and/or decorative fountains

Favouring factors to the Legionella

Water temperature between 20°C and 45°C
Water stagnancy and bio-films presence

Sources : Royal Decree 865/2003 in BOE n.171 18/07/2003 (Health Ministry of Spain)
Royal Decree 830/2010 in BOE n.170 14/07/2010 (Health Ministry of Spain)

Why the water evaporation cooling system doesn't transmit the Legionella ?!?

The coolers by water evaporation are exclusively working with water. It's important not confound with the auto-refrigerant tours or the evaporation condensers, that present potential risks of legionnaire disease. It isn't the same work's way for the evaporative coolers.

The Legionella bacterium development is connected to the temperature and stagnancy of the water. Depending the temperature, the bacterium is active to a temperatures from 20°C to 45°C (68°F to 113°F) and the optimum growth tax is around 37°C to 41°C (99°F to 106°F). The bacterium is in sleep state on temperatures lower than 20°C, and his development is slowing down over of 50°C (122°F). It doesn't survive on temperatures higher than 60°C (140°F).

The coolers by water evaporation usually work with water temperatures lower than 20°C, temperature where the bacterium isn't active.



The Legionella bacterium penetrates into the lungs by extremely thin water droplets (aerosols), with a size from 1 to 5 microns. The evaporative coolers mainly release water in vapour form; the water vapour molecules are so much smaller to contain and transport the bacterium.

CONCLUSIONS

THE METMANN COOLER IS AN EFFICIENT AND SURE DEVICE:

- The water is in continuous renewing and movement; so impossible stagnancy
- If the water is from the city, the water is cool, it's treated (chlorinated) and potable
- On the cooler's stop it's automatically emptying, so impossible stagnancy. In addition, the fan's stop is delayed for the perfect media drying.
- The water is transformed in water vapour (gas); the molecules are so much smaller to contain and/or transport the bacterium inside
- The air speed through the media (<2 m/s) doesn't cause water droplets

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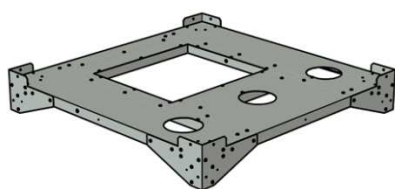
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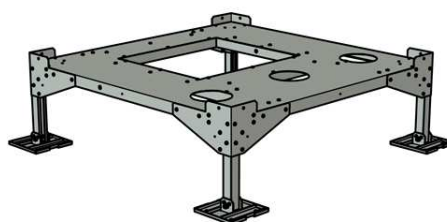
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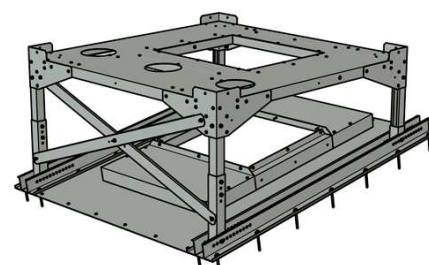
MOST USUAL ACCESSORIES



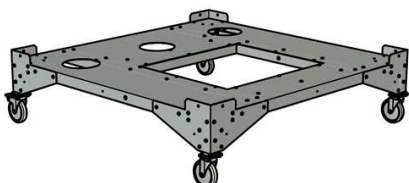
Bed bedframe (BB)



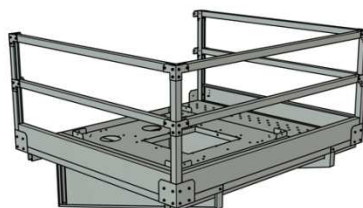
Base bedframe with legs (BBP)



Roof bedframe kit (KBT)



Mobile base (BM)



Wall bedframe kit (KBM)



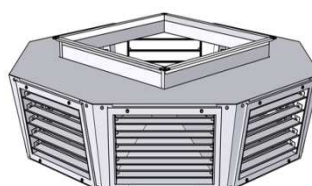
Protection covers (FU)



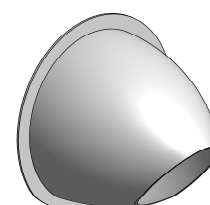
Three-outlet
diffuser bucket
(DCH 3)



Six-outlet diffuser
bucket (DCH 6)



Eight-outlet
diffuser bucket
(DCH 8)



High induction
cone



Manoeuvre electric panels



Hygiene and maintenance systems



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ACREDITADO POR ENAC

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WARNING

MET MANN will not assume any responsibility for any direct or indirect damage to users or objects caused by a use of this documental material or the machine in conditions different from those which they are made for.

MET MANN will not be responsible for damages to users or objects by incorrect use of the equipment, omission of the security elements or disrespectful use of the security rules and recommendations that appear in the this guide.

MET MANN will not be responsible for damages in the equipment caused by the inappropriate use of water treatments in which very corrosive products are used, as for instance chlorine.

MET MANN has a specific product called PANEVAP-IC, which is harmless for the equipment, for disinfection and continuous control for avoiding the growing of microorganisms.



FACTORY AND OFFICES

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