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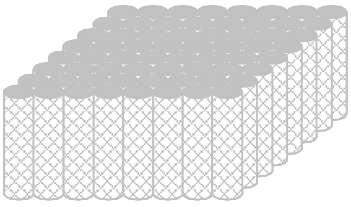
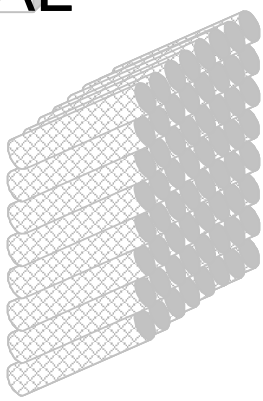
C&V
Control y Ventilación, S.L.

HUMIBAT®

TECHNICAL MANUAL





HUMIBAT®
Evaporative Cooling

PANAL C&V
Fill for
Cooling Towers

Núcleos de Interfase
Cooling Towers

OTHER BRANS:

Fancom®
Climatic Control

Control y Ventilación, S.L., registered in the Mercantil Register of Alicante, volume 2075, book 0, folder 12, section 8, leaf A-45701

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1. INTRODUCTION TO THE *HUMIBAT®* SYSTEM

1.1. THE MOST NATURAL WAY OF COOLING

The ***HUMIBAT®*** system uses the very same method of cooling as nature itself, the evaporation of water. When the unsaturated air comes into direct contact with water, it cools, providing that the evaporation of the water absorbs energy in the form of heat. The ***HUMIBAT®*** system uses this natural phenomenon concentrated in the least amount of space with the largest possible contact surface between water and air.

1.2. THE PHILOSOPHY OF THE *HUMIBAT®* SYSTEM

The evaporative cooling units manufactured by Control y Ventilaciòn, S.L, under the trademark ***HUMIBAT®***, are designed to have a long lifetime and easy maintenance.

Therefore the ***HUMIBAT®*** units are made from the best quality materials (casing of reinforced polyester with glass fiber, the fill of high-density polythene mesh, the distribution system of PVC, and the pump from stainless steel).

The contact surface between water and air is where the cooling systems manufactured by Control y Ventilaciòn really differs. The contact surface consists of the C&V invented drift eliminator and evaporative pad. The special evaporative pad is made of high-quality polythene mesh formed like a honey comb in order to give the maximum contact surface in the least amount of space and the least amount of air-resistance. The pad is very resistant to calcium, lime, and dust and can be rinsed easily. The drift eliminator is made of the same high quality plastic material and promises to avoid water spray and the problems this can cause.

The ***HUMIBAT®*** system is very adaptable and can be adapted to just about any type of installation and covers models that work with depression as well as overpressure.

In the models that operate with **overpressure** the air is introduced into the building via the ***HUMIBAT®*** units. The ***HUMIBAT®*** units that work by overpressure consist of the casing, C&V fill and drift eliminator, distribution system, motor, and ventilator. The introduced air circulates through the building and exits through windows, doors, or other designated openings. The distribution of the air is not very selective, but the thermal loss through seams is avoided and so are the effects of stale air. The distribution of the air in the building can be improved by installing extracting ventilators with adjustable air-flow.

In the models that operate with **depression**, the air is sucked in through extracting ventilators and enters into the building via the ***HUMIBAT®*** units, which in this case do not have a built-in motor driven ventilator. The distribution of the air in the building is easily controlled by adjusting the flow of each extracting ventilator.

Control y Ventilaciòn can make the adequate calculations needed to find the exact model and air exits needed to achieve the desired effect.

To sum up, the use of the evaporative cooling effect of the air is a technique that allows for the cooling of buildings, combined with ventilation, in a simple and low-cost way. The advantages of the use of such cooling and ventilation is important in industrial buildings as well as in agricultural buildings. The installation of evaporative cooling units in this type of buildings give an improved output in a surprisingly short time.

Therefore, to take advantage of the evaporative cooling, Control y Ventilación, S.L, presents the ***HUMIBAT®*** system, which incorporates this cooling technique with the highest quality in design and production. The ***HUMIBAT®*** units incorporate the special in-house invented **C&V pad** made from high-density polythene mesh which substitutes more traditional contact surfaces such as wood shavings and cellulose plates. The pad is difficult to obstruct and very durable which means that it

keeps its thermal effectiveness for many years and always expels air free from water drift.

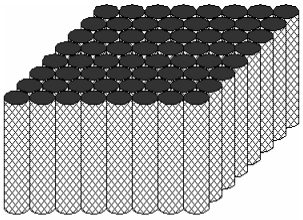
2. DESCRIPTION OF THE *HUMIBAT®* SYSTEM

The ***HUMIBAT®*** system consists of the following main parts: the casing, evaporative pads, drift eliminator, distribution system, pump, and ventilator.

2.1. CASING

The ***HUMIBAT®*** system's cases are made from reinforced polyester with glass fiber. This makes them very durable.

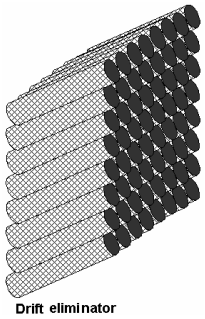
2.2. EVAPORATIVE PADS (PADS C&V)


Evaporation pad

The evaporative pad is made from high density polythene mesh. The mesh is formed into a pad that resembles that of a honey comb, using a special technique of folding and soldering. This shape allows a big contact area but a small volume. Furthermore the pad has a long lifespan due to the high quality materials, the strong soldering, and the square shape.

The pads are constructed with straight flutes, which means that the ***HUMIBAT®*** system offers a better air flow than other systems and therefore will take up less space.

2.3. DRIFT ELIMINATOR


Drift eliminator

The ***HUMIBAT®*** evaporative cooling system incorporates a special drift eliminator made from high density polythene mesh shaped much like that of the evaporative pad, but with slanted flutes which literally catch the water drops. It is the only evaporative cooling system that incorporates a drift eliminator of this type. With the drift eliminator ***HUMIBAT®*** guarantees that the air flow will not drag drops of water with it, thereby eliminating the side effects this could cause.

2.4. DISTRIBUTION SYSTEM

The distribution system consists of a net of tubes and nozzles made from PVC. The nozzles wet the pad evenly and thoroughly and are sufficiently large so that they are difficult to obstruct by calcium residue.

2.5. PUMP

The ***HUMIBAT®*** units can be installed and used alone as long as they are fitted with a pump with build in re-circulation made from stainless steel. When several units are used it is, however, recommended to use just one pump and one outside water deposit and connect all of the units to these. Therefore the ***HUMIBAT®*** units can be delivered with or without a fitted pump.

2.6. VENTILATORS

The ventilator type depends on the ***HUMIBAT®*** model. In the P-10 and P-20 models the ventilators are axial fans with two speed settings. In the T-10 model the axial fan has just one setting. In the P-40 model the axial fan has a low consumption and a low noise-level. In the "C" series the ventilation is centrifugal. In each case the ventilators have enough pressure to canalize the air and offer the possibility of adjusting the necessity of water and pressure in each installation.

3. TECHNICAL CHARACTARISTICS

Although the purpose of all the ***HUMIBAT®*** models is the same, to cool and ventilate; they wary in way of size, shape, method of functioning, etc. Therefore a detailed description of all the models follows below.

3.1. *HUMIBAT®* AUTONOMOUS "T" AND "P" MODELS WITH AXIAL FAN

The **T-10** model is designed to be installed on roofs whereas the **P-10**, **P-20** and **P-40** models should be installed on walls. The numbering of each model indicates their air flow capacity, respectively 10.000m^3, 20.000m^3, and 40.000m^3. The power supply used for the fans should be 230/400V three-phase for the models **T-10** and **P-40**. For the models **P-10** y **P-20** the power supply should be 400V three-phase, all though the models can be delivered with a 230/400V three-phase motor if desired.

These autonomous units can be supplied with an internal stainless steel submergible pump. The pump needs a power supply of 220V single-phase.

In the table below the technical characteristics of the models can be seen.

TYPE	AIR FLOW (m^3/h)	POWER FAN (Kw)	POWER PUMP (Kw)	DIMENSIONS L x W x H (mm)	INSTALLED WEIGHT (Kg)	SHELL WEIGHT (Kg)	Ø EXIT (mm)	AIR EXIT
T 10	10.000	0,71	0,43	1.550 x 1.000 x 1.750	220	75	560	Vertical
P 10	10.000	1,17	0,43	915 x 1.000 x 1.400	190	50	560	Horizontal
P 20	20.000	1.45	0.43	1.020 x 1.500 x 1.900	315	85	800	Horizontal
P 40	40.000	1,10	0,43	1.100 x 2.000 x 2.400	515	125	1400	Horizontal

3.2. *HUMIBAT®* SERIE "C" – AUTONOMOUS WITH CENTRIFUGAL VENTILATOR

The "C" series consists of three basic models, C-10, C-20 y C-40. They are equipped with evaporation pads of the type SN-240 and a motor-driven centrifugal ventilator with an air flow of 9.000 to 45.000m^3/h.

The pump that recycles the water is centrifugal monocelular and made entirely of stainless steel.

The body of the ventilator and the pump are made of aluminum, number of protection IP55 and have a three-phase power supply

In the tables below the technical characteristics of the "C" series can be seen.

TYPE	AIR FLOW (m^3/h)	POWER FAN (Kw)	POWER PUMP (Kw)	PRESSURE (Pa)	TYPE OF VENTILATOR
C-10/15/1.1	9.000	1.1	0,38	90	AT 15/15
C-10/15/2.2	11.000	2.2	0,38	185	AT 15/15
C-20/22/1.5	16.000	1.5	0,38	110	AT 22/22
C-20/22/3.0	20.000	3.0	0,38	185	AT 22/22
C-20/22/5.5	25.000	5.5	0,38	325	AT 22/22
C-40/25/4.0	35.000	4.0	0,55	100	AT 25/25
C-40/30/5.5	40.000	5.5	0,55	150	AT 30/28
C-40/30/7.5	45.000	7.5	0,55	195	AT 30/28

TYPE	WEIGHT EMPTY (Kg.)	WEIGHT IN USE (Kg.)	DIMENCIONS Length x width x Height (mm)	AIR EXIT Width x height (mm)
C-10/15/1.1	105	148	1.850x1.000x1.250	404 x 471
C-10/15/2.2	117	160	1.850x1.000x1.250	404 x 471
C-20/22/1.5	178	280	1.850x1.500x1.750	692 x 695
C-20/22/3.0	188	290	1.850x1.500x1.750	692 x 695
C-20/22/5.5	207	310	1.850x1.500x1.750	692 x 695
C-40/25/4.0	370	490	1.850x2.000x2.250	794 x 797
C-40/30/5.5	405	525	2.450x2.000x2.250	870 x 936
C-40/30/7.5	415	535	2.450x2.000x2.250	870 x 936

3.3. *HUMIBAT®* SERIES S, L, SF, F (DEPRESSION)

The ***HUMIBAT®***s in these series are designed to ventilate using depression. They are recommended for buildings where there are already installed ventilators.

They are designed to be installed on walls, normally opposite the air ventilators. The units can be delivered with build-in pump or without (without pump if they are to work in a group with a centralized pump).

The models are designed to be placed over straight or square openings (between 50 and 240cm). They can be placed at various distances in order to follow the construction of the building or can even be places over existing windows

In the table below the technical characteristics of the **S**, **L**, **SF**, **F** series can be seen:

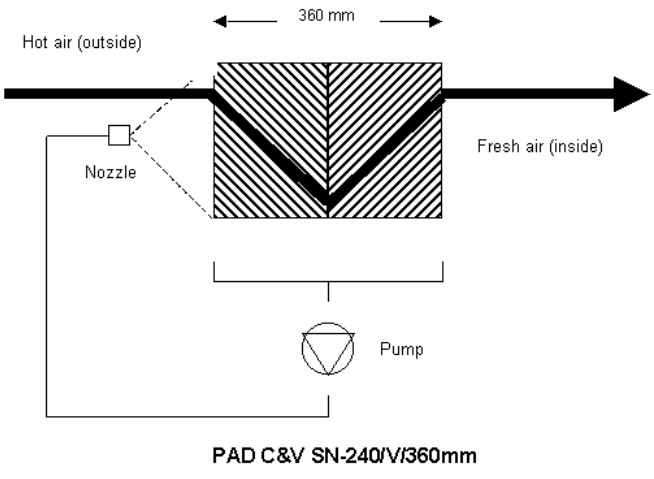
TYPE	AIR FLOW (m^3/h)	DIMENSIONS L x W x H (mm)	DIMENSIONS EXIT (W x H mm)	WEIGHT INSTALLED (Kg.)	WEIGHT EMPTY (Kg.)	PAD TYPE	AIR EXIT
L 5	5.000	650 x 1.000 x 750	1.000 x 500	90	23	SN-240	Horizontal
L 10	10.000	650 x 2.000 x 750	2.000 x 500	120	42	SN-240	Horizontal
L 20	20.000	650 x 2.000 x 1.250	2.000 x 1000	150	56	SN-240	Horizontal
S 10	10.000	650 x 1.000 x 1.250	1.000 x 1.000	100	40	SN-240	Horizontal
S 20	20.000	650 x 1.500 x 1.750	1.500 x 1.500	120	55	SN-240	Horizontal
S 40	40.000	650 x 2.000 x 2.250	2.000 x 2.000	180	90	SN-240	Horizontal
SF 10	10.000	540 x 1.000 x 1.400	1.000 x 1.000	75	28	RF-240	Horizontal
SF 20	20.000	540 x 1.500 x 1.900	1.500 x 1.500	95	42	RF-240	Horizontal
SF 40	40.000	540 x 2.000 x 2.400	2.000 x 2.000	115	64	RF-240	Horizontal
F 5	5.000	440 x 1.500 x 800	1.500 x 500	65	16	RF-240	Horizontal
F 10	10.000	440 x 2.250 x 900	2.250 x 600	82	25	RF-240	Horizontal
F 20	20.000	440 x 2.250 x 1.500	2.250 x 1.200	106	40	RF-240	Horizontal
F 40	40.000	440 x 2.250 x 2.700	2.250 x 2.400	127	72	RF-240	Horizontal

4. TWO TYPES OF *C&V* PADS, TWO WAYS OF WORKING

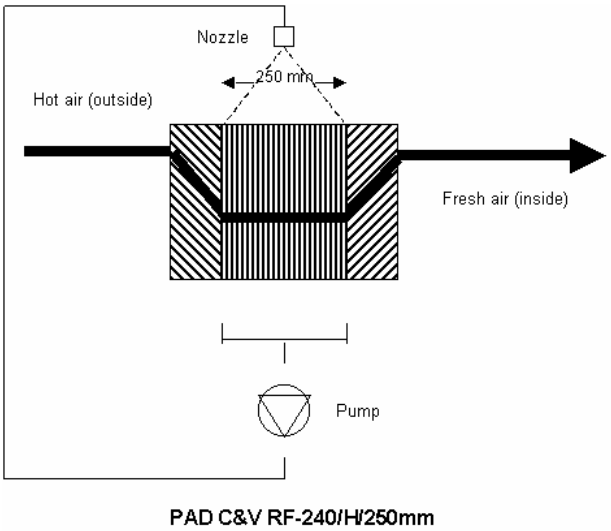
The ***HUMIBAT®*** can be delivered with two different kinds of ***C&V*** pads. The different types are ***PAD C&V* RF-240/H/250** and ***PAD C&V* SN-240/V/360 mm**.

The ***C&V*** pad **RF-240** is made of a strong mesh forming vertical funnels with top showering. This model is recommended when the water has a somewhat low lime content or the aerodynamic resistance is not of great importance. The ***HUMIBAT®*** models that apply this pad are the models **F**, **T**, **P**, and **SF**.

The **C&V** pad **SN-240** is made from a finer mesh and forms slanted funnels (inclination 80%) with frontal showering. This model is recommended when the water has a high lime content or when very low aerodynamic resistance is required. The models that apply this pad are the models **C**, **S**, and **L**



PAD C&V SN-240/V/360mm



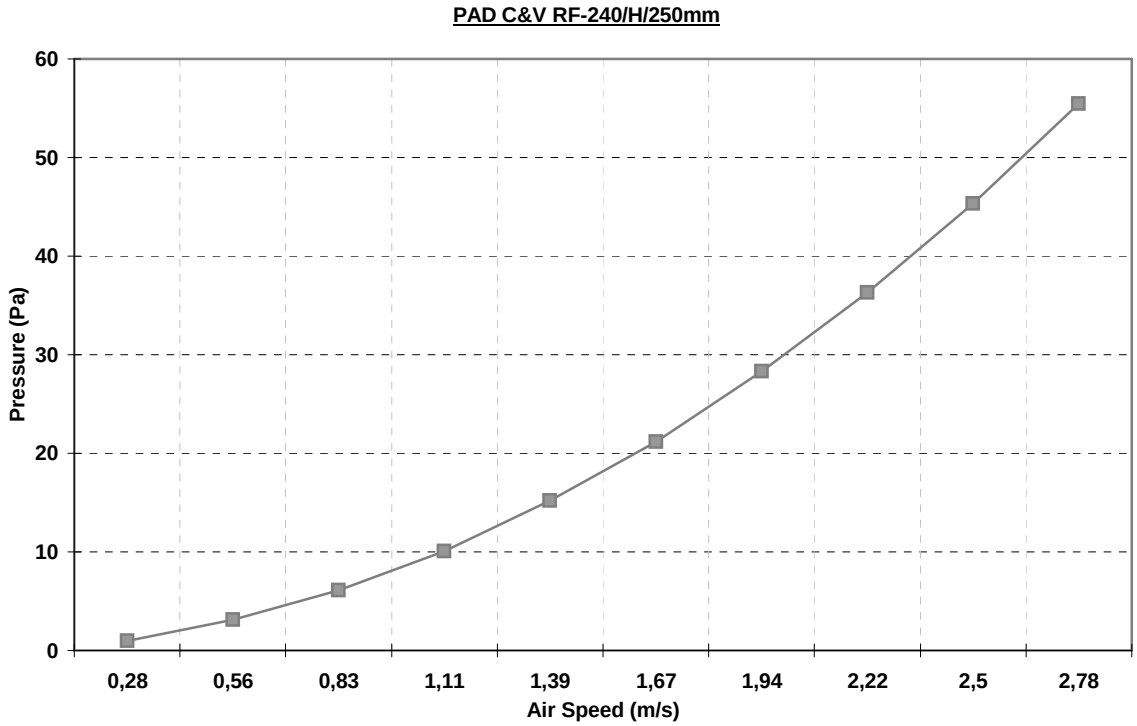
PAD C&V RF-240/H/250mm

Below the technical specifications of the two pad types can be seen.

4.1. TECHNICAL SPECIFICATIONS OF PAD C&V RF-240/H/250MM

Saturation performance: 80 % at an air speed of 2,01 m/s,
Resulting air temperature: se table 4.3. on the next page,
Water consumption: 3,6 Lit/h per m^2 of pad and per ºC decrease in temperature

AIR SPEED (m/s)	PRESSURE (Pa)	AIR FLOW (m^3/h)
0,29	0,99	1.000
0,58	3,11	2.000
0,88	6,11	3.000
1,17	10,07	4.000
1,46	15,18	5.000
1,75	21,17	6.000
2,05	28,31	7.000
2,34	36,33	8.000
2,63	45,31	9.000
2,92	55,45	10.000

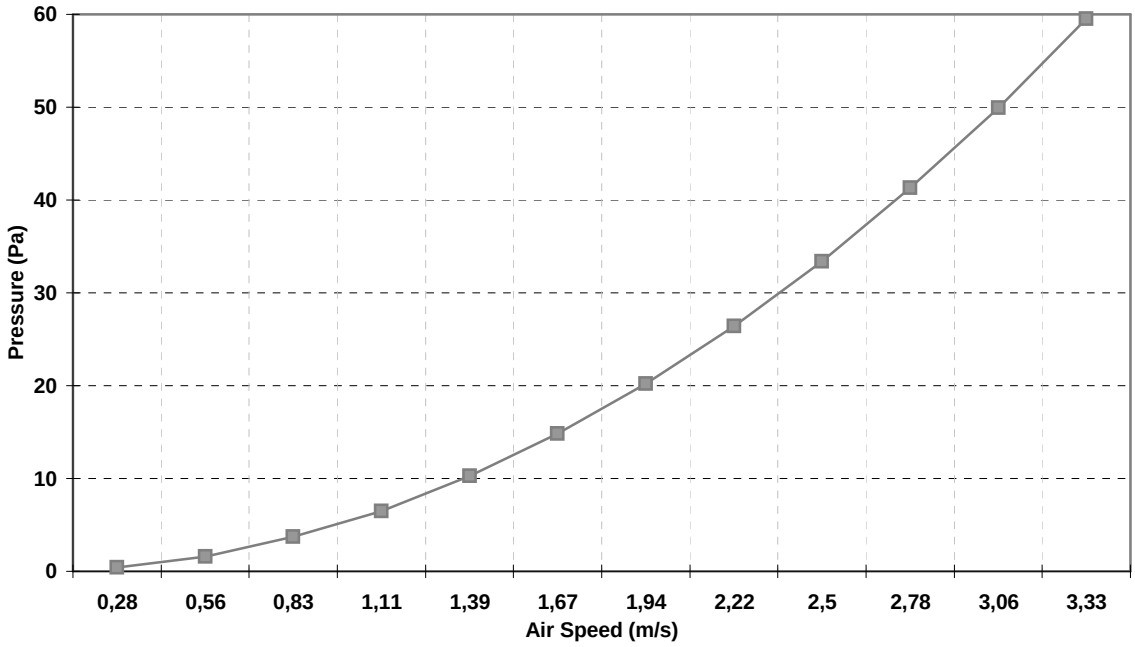


technical specifications of pad c&v sn-240/v/360mm

Saturation performance: 80 % at an air speed of 2,78 m/s
Resulting air temperature: Se table **4.3.** on the next page,
Water consumption: 5 Lit/h per m^2 of pad and ºC temperature drop
Air flow/m2 of pad and air speed:

AIR SPEED (m/s)	PRESSURE (Pa)	AIR FLOW (m^3/h)
0,28	0,4	1.000
0,56	1,6	2.000
0,83	3,7	3.000
1,11	6,5	4.000
1,39	10,3	5.000
1,67	14,8	6.000
1,94	20,2	7.000
2,22	26,4	8.000
2,50	33,4	9.000
2,78	41,3	10.000
3,06	49,9	11.000
3,33	59,5	12.000

PAD C&V SN-240/V/360mm



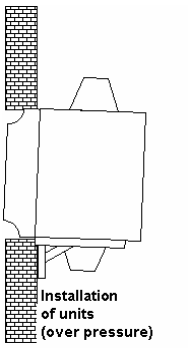
4.2. AIR OUTPUT TEMPERATURES

	C°					
Humidity (%)	**20**	**25**	**30**	**35**	**40**	**45**
10	9.8	13.2	16.3	19.6	22.6	25.8
20	11.2	14.8	18.4	22.0	25.6	29.2
25	11.9	15.6	19.4	23.2	26.9	30.8
30	12.6	16.4	20.3	24.2	28.2	32.2
35	13.2	17.2	21.2	25.2	29.3	33.4
40	13.8	17.9	22.0	26.2	30.4	34.6
45	14.4	18.6	22.8	27.2	31.4	35.7
50	15.0	19.2	23.6	28.0	32.4	36.8
55	15.5	19.9	24.3	28.8	33.2	37.8
60	16.1	20.5	25.0	29.6	34.1	38.8
65	16.6	21.2	25.7	30.4	35.0	39.7
70	17.1	21.7	26.4	31.2	35.8	40.5

5. INSTALLATION

5.1. AUTONOMOUS UNITS.

The ***HUMIBAT®*** **T-10** is delivered ready to mount on the roof. It comes with a mounting plate in a wave like shape to fit the roof. In this way it is not necessary to construct anything to support the unit. The T-10 can be delivered with the mounting plate made to specifications, if a sample of the roof is supplied.



The ***HUMIBAT®*** **P-10, P-20** and **P-40** are made to mount on the outer wall of the building. The units have to be supported by steel structures. Furthermore holes have to be made in the wall. For the **P-10** the hole needs to be 700 x 700 mm. For the **P-20** the measurements are 900 x 900 mm, this allows space for both the ventilator as well as the air exit. The **P-40** model has to be build into the wall, therefore the hole has to be 1400 x 1400 mm.

The ***HUMIBAT®*** **(C-10, C-20 and C-40)** are delivered with a steel structure that can be adapted to all walls

a) Hydraulic connections

The hydraulic connections consists of a ½" outlet for water replenishment and two 1" exits to spill and empty out water.

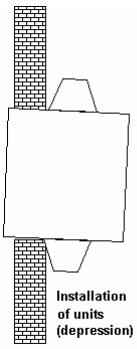
b) Electrical connections

In the **P** models the fan connection is on the engine terminals. In the **T-10** model and the **C** models the fan connections are in a box of terminals situated on the exterior of the unit. The same applies

to the connections to the pumps.

5.2. COOLING UNITS *HUMIBAT®* SERIES F, SF, S, AND L (DEPRESSION)

These units allow for the cooling of the air in thin-walled buildings or in buildings with several small rooms interconnected through a passageway. The units are installed by making an opening in the wall and fitting the ***HUMIBAT®*** in it. It is also necessary to support the unit with a metal frame fastened to the wall.



The openings needed are the following:

TYPE	DIMENSIONS OF OPENINGS Width x height (mm)	WEIGHT INSTALLED (Kg.)
L 5	1.000 x 500	90
L 10	2.000 x 500	120
L 20	2.000 x 1000	150
S 10	1.000 x 1.000	100
S 20	1.500 x 1.500	120
S 40	2.000 x 2.000	180
SF-10	1.000 x 1.000	75
SF-20	1.500 x 1.500	95
SF-40	2.000 x 2.000	115
F 5	1.500 x 500	65
F 10	2.250 x 600	82
F 20	2.250 x 1.200	106
F 40	2.250 x 2.400	127

a) Hydraulic connections

The units are ready to use with just one central pump. The water drive collector is connected to the general movement tube, and the water exit to the water drainage deposit (cistern). The general movement tube should have a bifurcation with a valve for water emptying.

The hydraulic connections consists of a 1” water replenishment and a 2” exit to spill and empty out water

5.3. CALCULATION OF INSTALL. OF THE *HUMIBAT®* (CENTRALIZED PUMP)

The dimensions of the drive, return tubes, and the tank will depend on the installation. The requirements are as follows:

a) Pump

HUMIBAT	Air Flow
L-5	1,00 m^3/h x nº of units
S-10 / L-10	2,00 m^3/h x nº of units
S-20 / L-20	4,50 m^3/h x nº of units
S-40	8,00 m^3/h x nº of units
T-10 / P-10 / SF-10	1,25 m^3/h x nº of units
P-20 / SF-20	1,50 m^3/h x nº of units
P-40 / SF-40	1,75 m^3/h x nº of units
F-5	1,25 m^3/h x nº of units
F-10 / F-20 / F-40	1,75 m^3/h x nº of units

Pressure: Mín. 10 m.c.a.

b) Capacity of Deposit

HUMIBAT	
L-5	50 liters x nº of units
T-10 / P-10 / SF-10	100 liters x nº of units
S-20	150 liters x nº of units
S-40	200 liters x nº of units
P-20 / SF-20	75 liters x nº of units
P-40 / SF-40	150litersx nº of units
F-5	100 liters x nº of units
F-10 / F-20 / F-40	150 liters x nº of units

c) Water drive collector

HUMIBAT	
L / S	22 x square root m^2 of pads
T-10 / P-10 / SF-10	19 x square root nº of units
P-20 / SF-20 / F-5	20 x square root nº of units
F-10 / F-20 / F-40 / P-40 / SF-40	21 x square root nº of units

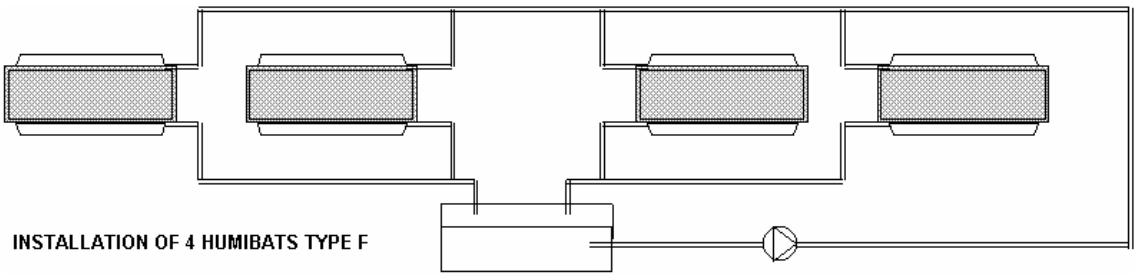
d) Return collector

HUMIBAT	
L / S	32 x square root of m^2 pad
T-10 / P-10 / SF-10	29 x square root nº of units
P-20 / SF-20 / F-5	30 x square root nº of units
F-10 / F-20 / F-40 / P-40 / SF-40	31 x square root nº of units

Always choose the superior commercial for the water drive collector and the return collector: 32, 40, 50, 63, 75, 90, 110, 125, 160 mm.

e) Selection of Ebara pumps for installation in the HUMIBAT® units

EBARA MODEL	Power (Kw)	AIR FLOW (m^3/h)	HEIGHT (m) c.a.	HUMIBAT model
CMA 0.50 T	0.37	5,4	10	5 L-5 / 2 S-10 / 1 S-20 / 5 SF-10 / 4 SF-20 / 4 F-5 / 3 F-10
CMB 0.75 T	0.55	13,2	10	13 L-5 / 6 S-10 / 2 S-20 / 1 S-40 / 13 SF-10 / 10 SF-20 / 10 F-5 / 7 F-10
CMB 1.00 T	0.74	17,0	10	17 L-5 / 8 S-10 / 3 S-20 / 2 S-40 / 17 SF-10 / 13 SF-20 / 9 SF-40 / 13 F-5 / 9 F-10
CMD 1.50 T	1.10	23,0	10	14 S-10 / 6 S-20 / 3 S-40 / 16 SF-40 / 16 F
CMD 2.00 T	1.50	39,0	10	21 S-10 / 9 S-20 / 5 S-40 / 24 SF-40 / 24 F
CMD 3.00 T	2.20	54,0	10	30 S-10 / 13 S-20 / 7 S-40 / 34 SF-40 / 34 F



6. STARTING UP

Make sure that the correct power supply is being used.

When the power supply has been checked and connected, check to see if the sprinklers irrigate the pads evenly and make sure there are no obstructions (if any of the sprinklers are obstructed they must be cleaned. To clean the obstructed sprinklers unscrew them and make a water jet circulate upstream).

Check to see if the ventilator rotates in the correct direction (the air has to circulate from the pad towards the ventilator).

Finally, make sure that the ampere of the pump and the ventilator are below the indicated in the instructions.

7. MAINTENANCE

General maintenance of the ***HUMIBAT®*** units is very simple. If you are sure to follow the maintenance instructions it will prolong the life and efficiency of your ***HUMIBAT®*** unit.

Once a month: check and if necessary clean water nozzles. These can be easily removed and cleaned with running water. If necessary nozzles can be treated with any commercial lime remover.

Quarterly: Clean water and air conducts by simply washing them with clear water. The pads can easily be removed from the unit and be thoroughly shaken in order to remove possible lime incrustations. If necessary, the pads can be cleaned with a commercial lime remover. Check and if necessary clean water drainage system.

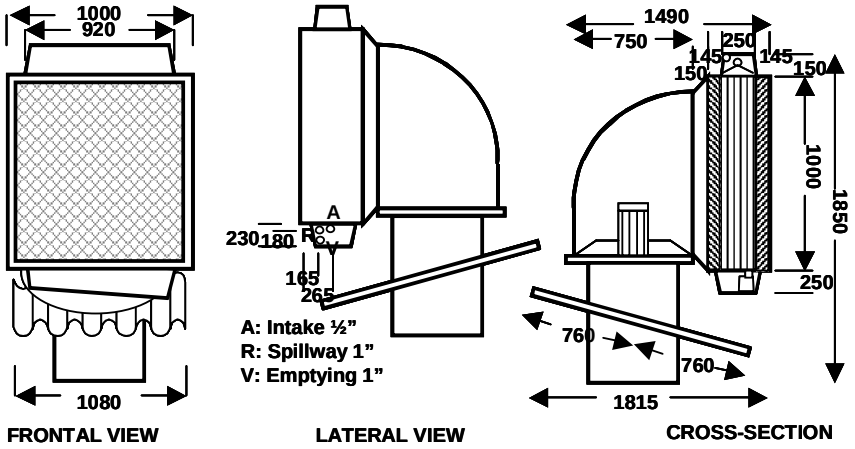
Annually: STOP THE UNIT. It is advisable to stop the unit for a minimum of five days once a year in order to empty out the water circuit completely. When empty, clean water deposit, clean water nozzles, clean fan blades, and empty and clean hydraulic circuit. Make sure that the water deposit and hydraulic circuits are dry before starting the unit up again.

Finally, users must obtain and apply local regulation for the use of evaporative cooling systems. Even though the above mentioned maintenance procedure should comply with most local regulations, it is the users responsibility to ensure this and comply with any additional requirements.

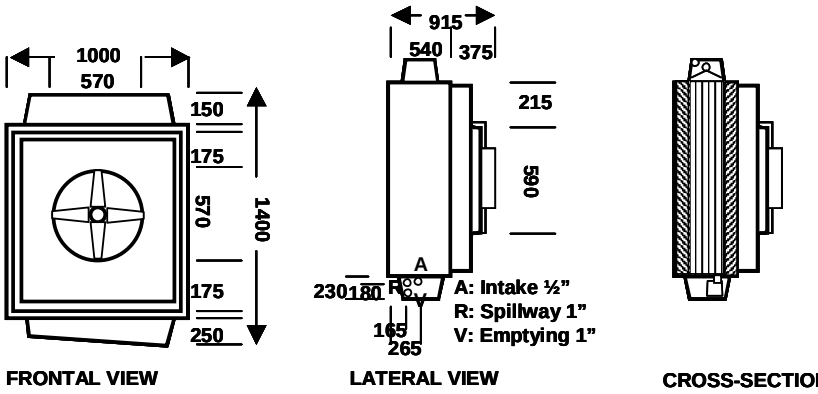
8. EXAMPLES OF RELATIVE HUMIDITY NEEDED

PRODUCT TYPE	RELATIVE HUMIDITY (%)	PRODUCT TYPE	RELATIVE HUMIDITY (%)
Vegetable warehouse	85 - 90	**Wool industry**	55 - 65
Foods	80 - 90	**Breweries**	65 - 75
Vegetables	90 - 95	**Cardboard**	45 - 60
Egg-laying houses	70 - 80	**Glue**	50 - 70
Agriculture	65 - 75	**Skin/hide**	50 - 60
Breeding of animals	45 - 65	**Photo development**	55 - 65
Cotton	60 - 70	**Printing**	50 - 65
Tobacco	60 - 70	**Computers**	50 - 65
Incubators	55 - 70	**Hospitals**	45 - 65
Mills	80 - 90	**Museums**	40 - 55
Textile industry	45 - 70	**Art galleries**	30 - 55
Wood industry	45 - 70	**For health and comfort**	65
Sows	85 - 55	**Fattening of pigs**	85 - 55
Fattening of poultry	75 - 65	**Egg-laying hens**	70 - 60
Egg-laying	65 - 60	**Fattening of lambs**	80 - 70
Reproduction of rabbits	60 - 50	**Fattening of rabbits**	60 - 50

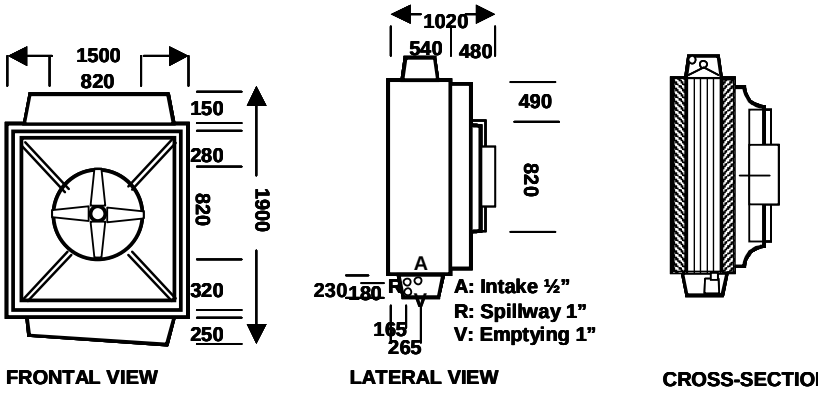
9. APPENDIX – DRAWINGS OF THE HUMIBAT MODELS



T-10B



P-10B



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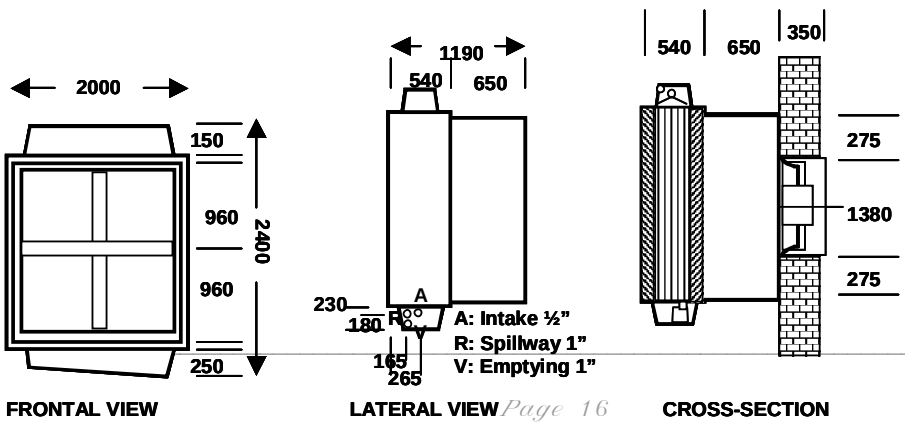
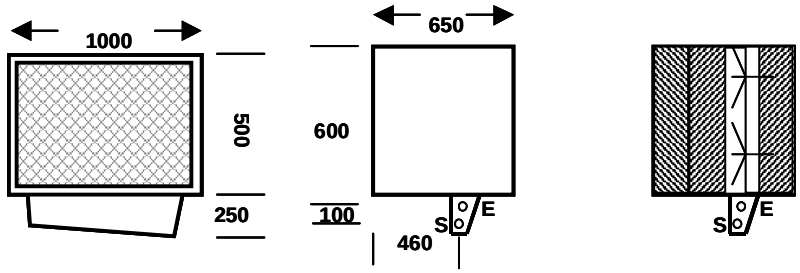


P-40B

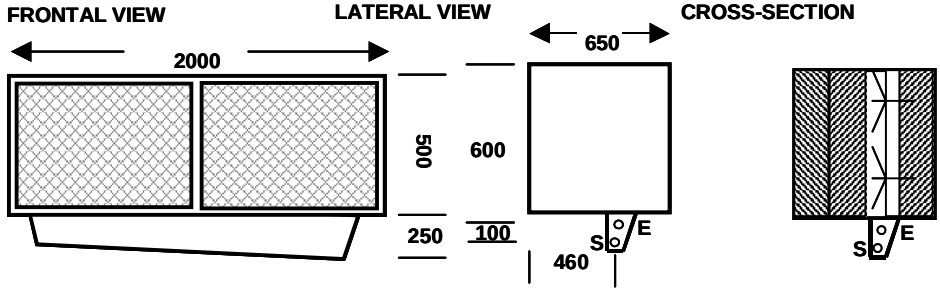


L-5

E: Water Intake 1” male

S: Water Exit 2” male

FRONTAL VIEW **LATERAL VIEW** **CROSS-SECTION**

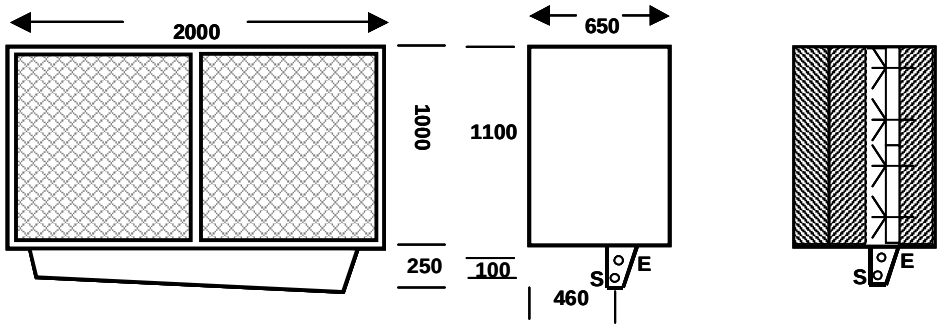


L-10

E: Water Intake 1” male

S: Water Exit 2” male

FRONTAL VIEW **LATERAL VIEW** **CROSS-SECTION**

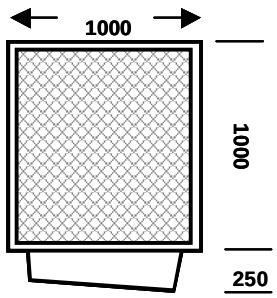


L-20

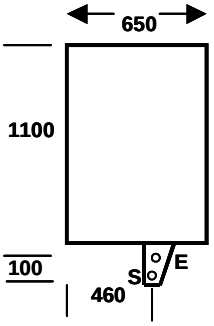
E: Water Intake 1” male

S: Water Exit 2” male

FRONTAL VIEW **LATERAL VIEW** **CROSS-SECTION**



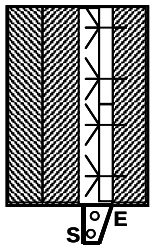
FRONTAL VIEW



E: Water Intake 1" male

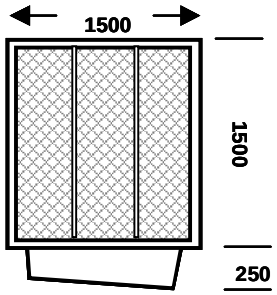
S: Water Exit 2" male

LATERAL VIEW

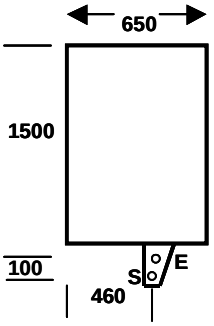


CROSS-SECTION

S-10



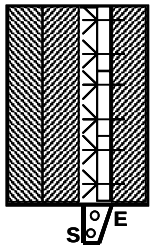
FRONTAL VIEW



E: Water Intake 1" male

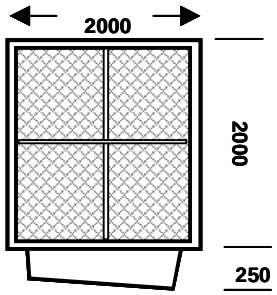
S: Water Exit 2" male

LATERAL VIEW

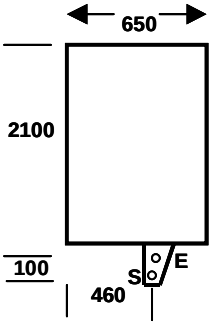


CROSS-SECTION

S-20



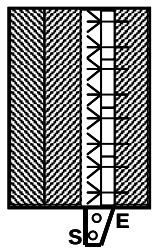
FRONTAL VIEW



E: Water Intake 1" male

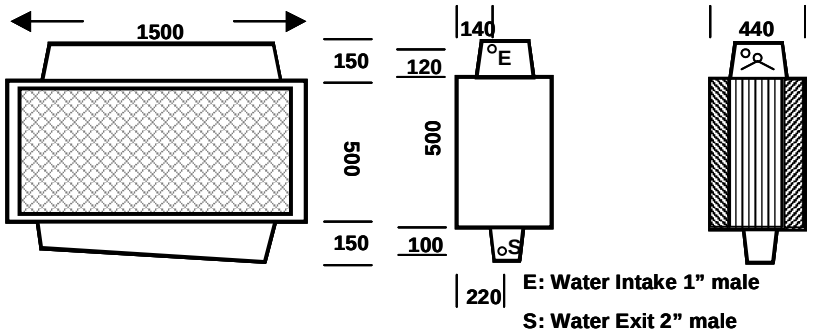
S: Water Exit 2" male

LATERAL VIEW

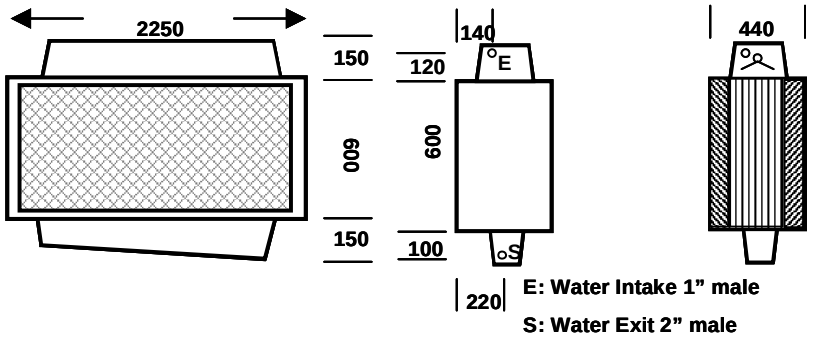


CROSS-SECTION

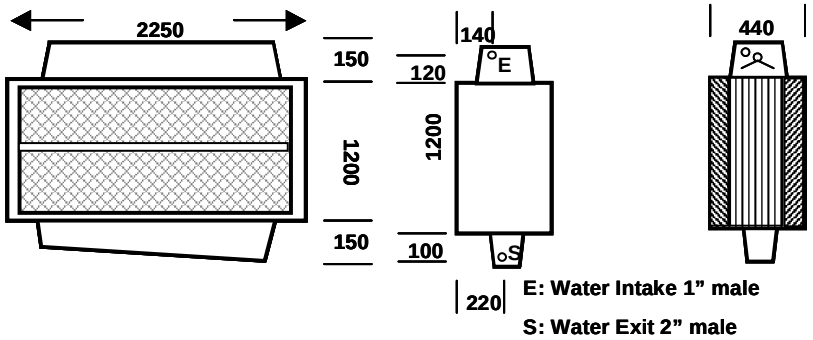
S-40



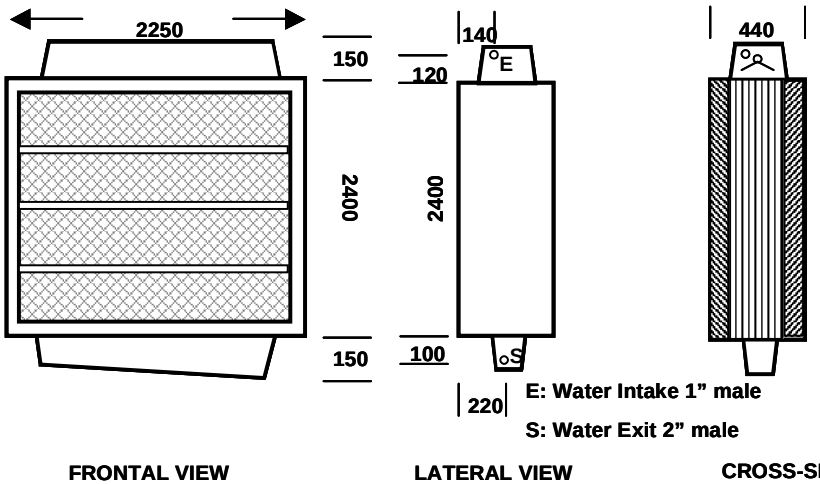
F-5



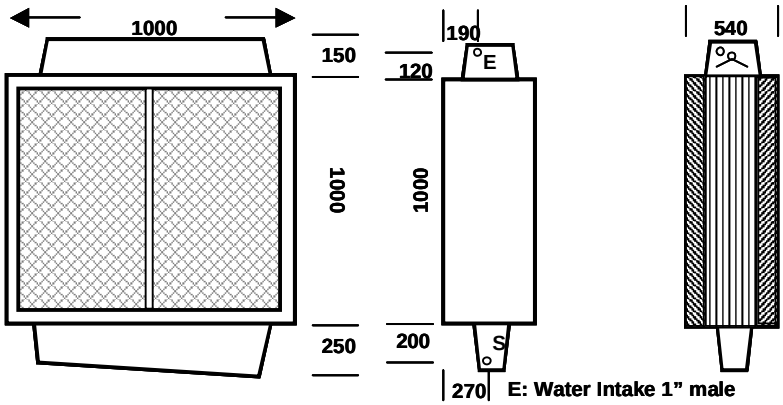
F-10



F-20



F-40



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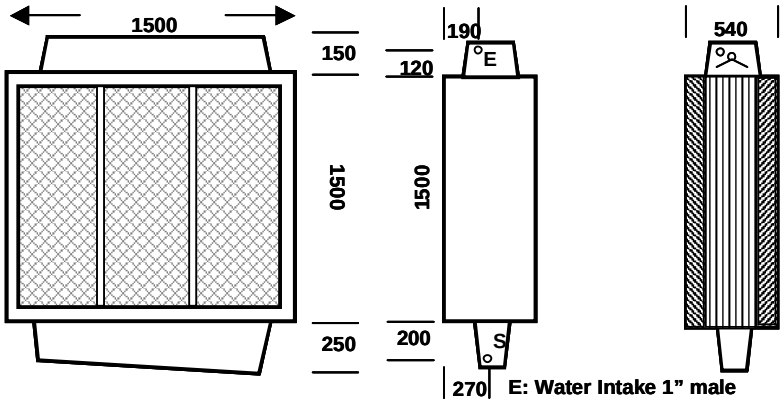

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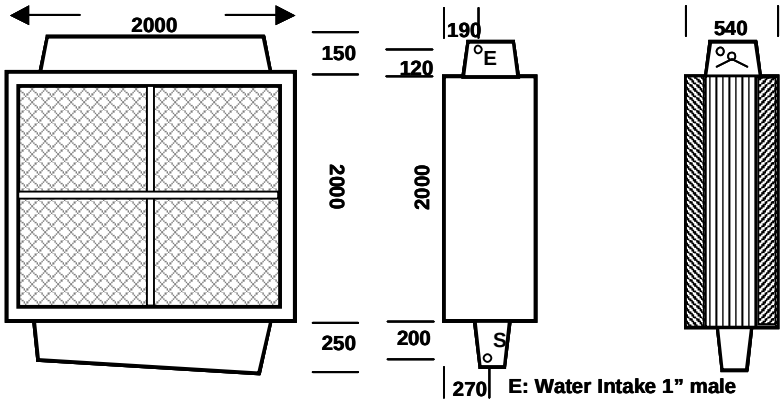
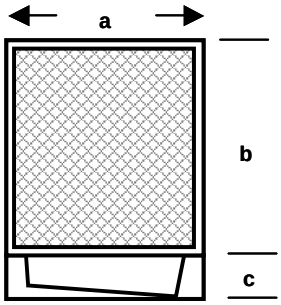
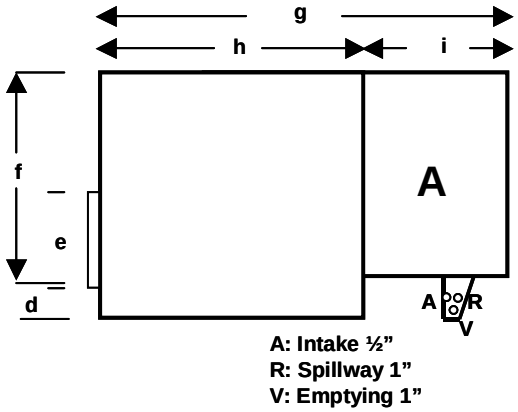


SF-40



FRONTAL VIEW



A: Intake ½"
R: Spillway 1"
V: Emptying 1"

LATERAL VIEW

C-

TABLE OF MEASUREMENTS (mm.)

TYPE	a	b	c	d	e	f	g	h	l	(Evaporative Body) A
C-10/15/1.1	1.000	1.000	250	216	403	1.100	1.850	1.200	650	S-10
C-10/15/2.2	1.000	1.000	250	216	403	1.100	1.850	1.200	650	S-10
C-20/22/1.5	1.500	1.500	250	308	700	1.500	1.850	1.200	650	S-20
C-20/22/3.0	1.500	1.500	250	308	700	1.500	1.850	1.200	650	S-20
C-20/22/5.5	1.500	1.500	250	308	700	1.500	1.850	1.200	650	S-20
C-40/25/4.0	2.000	2.000	250	343	800	2.000	1.850	1.200	650	S-40
C-40/30/5.5	2.000	2.000	250	415	945	2.000	2.450	1.800	650	S-40
C-40/30/7.5	2.000	2.000	250	415	945	2.000	2.450	1.800	650	S-40

10. APPENDIX – EU DECLARATION OF CONFORMITY

EU DECLARATION OF CONFORMITY

Mr. Pedro J. Ventura Rodríguez, Director of and representing:

CONTROL Y VENTILACION, S.L

C/Isaac Peral, 23, Pol. Ind. La Pedrera
03720 Benissa (Alicante), Spain

hereby declares, under his responsibility, that the evaporative cooling units HUMIBAT, models:

P10, P20, P40, L5, L10, L20, S10, S20, S40, T10, F5, F10, F20, F40, SF10, SF20, SF40, C10, C20, and C40

are in compliance with the basic security requirements outlined by **Royal Decree 1435/1997** and by **Machine Directive 98/37/CEE.**

For the specific requirements for these units the following standards and technical specifications have been applied:

- ***Directive Standard EN 292-1:93*** Machine safety. Basic concepts, general design method. Part I: Basic terminology, methodology.
- ***Directive Standard EN 292-2:93*** Machine safety. Basic concepts, general design method. Part II: Principles and technical specifications.
- ***Directive Standard EN 60204-1:99*** Machine safety. Electrical equipment in machines. Part I: General requirements.

Benissa, the 27th of October 2003

Signed by: Pedro J. Ventura Rodríguez
Director of CONTROL Y VENTILACIÓN, S.L