

**ATM** OPEN TOWER

**ATiM** HYBRID OPEN CIRCUIT COOLER

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# Modular Open circuit Cooling tower: **ATM-ATiM** series

## Jacir- Air Traitement

With more than 50 years experience, our company:

- has gained a great deal of experience in aeraulics, acoustics and water cooling towers.
- has invested in detailed research and development in order to propose technical solutions according to the environmental protection.
- today is the European leader thanks to its technology beyond market requirements.

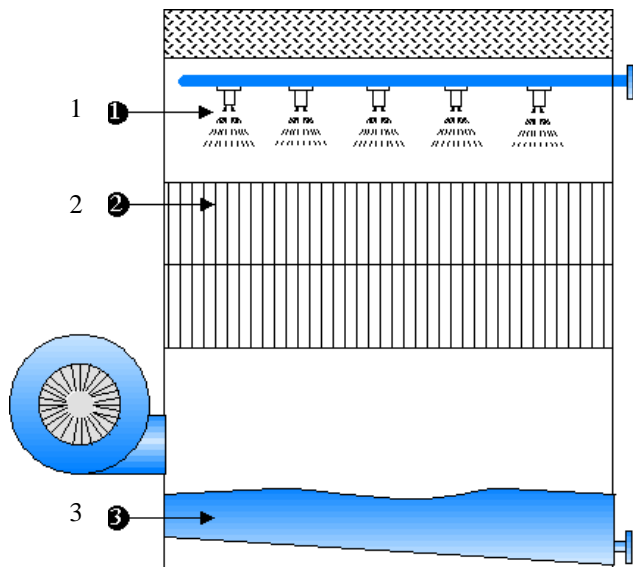
## STRONG ADVANTAGES OF MODULAR **ATM-ATiM** SERIES

- **SILENCE :** very quiet towers in standard version, **NR 30 at m 10** can be achieved,
- **EXCHANGE SURFACE :** manufactured by **Jacir - Air Traitement**, made of polyethylene material allowing a large cooling range up to 75°C,
- **ANTICORROSION COATING :** made of galvanized steel in standard , casing is also available constructed in weld less X-STEEL stainless steel which resistance to corrosion is superior to 316 L stainless steel as an option,
- **EASY MAINTENANCE :** large access doors, fan outside of the tower and at man height, exchange surface is cleanable at high pressure spray and with elastic distortion without deterioration, inclined basin for a complete drain.
- **LOW PROFILE :** m 2,42 for the whole range without option.
- **ELECTRICAL POWER :** extremely minimized.
- **FLEXIBILITY :** possible delivery in parts to assemble directly on site.
- **SINGLE PIECE :** easy handling and transport.

## Open circuit Cooling Tower Principle : ATM-ATiM series

A cooling tower is a heat exchanger, which enables water to be cooled through direct contact with air. The heat transfer from the water to the air is carried out partly by sensible heat transfer, but mainly by latent heat transfer (evaporation of part of the water into the air), which makes it possible to reach cooling temperatures lower than ambient temperatures.

### Operation :



The hot water to be cooled is pumped to the top of the tower through pipes. This water is divided and distributed over the heat exchange surface (2) by low pressure water distribution nozzles (1).

Blown by the fan, the fresh air enters into the lower section of the unit and escapes through the upper section after being heated and saturated by passing through the wetted heat exchange surface.

As a result of surface tension, due to the exchange surface mesh, the water spreads in uniform way, falls down the whole height. The exchange surface is then increased.

The water, cooled thanks to forced ventilation, falls into the inclined basin (3) at the bottom of the tower.

### Advantages compared to dry coolers :

#### Energy savings

- Chillers, condensers associated to a cooling tower will be cooled at a lower temperature and then will have a better cooling capacity. Their efficiency is higher.
- Seven to ten times more air must be blown in a dry cooler, which means a lot of fans and electric motors. So, the electrical consumption is about 40% higher.
- A tower costs 30 to 50% of the price of a dry cooler for a same evacuated power.
- A 1°C increase of the ambient air has direct effect on the performance of dry air cooler, while the efficiency of a cooling tower will not be as much affected as the wet bulb has not fluctuated in the same way

#### Noise reduction

- **JACIR - AIR TRAITEMENT** can supply much quieter tower than a dry cooler.

## Manufacturing details : **ATM-ATiM** series

### ATM-ATiM tower casing

Self-supporting rigid panels, with double folds on the four sides, (designed by **Jacir – Air Traitement**) allows sound absorption casing.

Thanks to this technology, we can offer cooling towers with an acoustic level lower than **NR 30 at m 10**.

Towers are assembled with waterproof stainless steel rivets (uniform, high-capacity locking).

There is no welding during assembly; a high covering seal ensures the close fit between the panels.

Single unit delivery (m 2,42 high) up to 5 modules.

As standard model, the panels are in galvanised steel mm2 thick ZENDZIMIR process gr / m<sup>2</sup> 275 (galvanised plates are protected by the zinc oxidation on the surface).

**X-STEEL** Stainless steel is optional, which resistance to corrosion is superior to 316L (1.4404) and 10 years non-pitting guaranteed.

### Inclined basin

- It has a high capacity to take into account the needs and inertia of the installation, and contains 700 litres / module for **ATM** version, 880 litres / module for **GATM** version, (Ex: **GATM** 5 modules - large inertia for the circuit because the basin contains 4400 litres).

- The inclined basin allows an **easy and complete drain**.

- No welding on surfaces in contact with the water.

On the utility panel of the basin are installed :

- overflow connection,
- drain connection,
- float valve or electrical solenoid make up water system as an option,
- water return through a removable strainer in stainless steel or PEHD) with a flange, oversized to eliminate cavitations, with a perforated steel plate,
- large access door(s) for nozzles : (mm 740 x mm 390), and for basin : (mm 540 x mm 390),
- options: electrical heater of V 230 or V 400 and waterproof thermostat with separate bulb.

For automatic control of resistance, suitable contactors must be provided.

### Exchange surface

The **COFINTER** exchange surface, also called *packing or film*, manufactured by **Jacir – Air Traitement**, is based on a welded high-density polyethylene material. This material is non-putrescible, long lasting, and has good temperature resistance, is easily

cleanable at high pressure spray and with elastic distortion without deterioration. The packing has also the following advantages:

- high efficiency (m<sup>2</sup>/m<sup>3</sup> 240 or 280),
- mechanical softness,
- easy to maintain,
- high resistance to chemicals,
- operating range temperature up to 75°C as standard,
- low pressure drop thanks to vertical straight channels which enables very low resistance to the airflow, so reduces power and consumption and secures a very low sound level.

### Water distribution

Water distribution is made of PVC pipes through highly efficient water distributors. The nozzles made of polypropylene distribute water in the form of a full jet cone. These nozzles are screwed to the distribution pipes, for easy maintenance and strong mechanical resistance.

An internal turbulator distributes the water so that a uniform water distribution reaches the exchange surface.

### Drift eliminators

Highly efficient, they prevent the water from being sprayed out of the tower. Ultraviolet resistant, they are easy to remove from the top in order to access to the distributors and to the exchange surface.

### Accessibility

In standard, a large polyester access door 1350x900mm is installed . This large access door helps to remove quickly the drift eliminators, nozzles, exchange surface and water distribution pipes. Optional supplementary identical door for the other modules are proposed.

### Connections

As standard, flanges are made of galvanised steel whatever diameter and tower casing material. Overflow is made of PP.

### Fans

The centrifugal fans are specially designed and manufactured by **JACIR – Air Traitement**. The impeller is a double side air inlet type.

The air inlet ducts are removable to access to the impeller, and are made of polyester. Their shape noticeably improves the performances of the fans.

The bearings are self-aligning, lubricated in our factory and to be regularly lubricated. Each shaft is supported by two bearings and there are maximum two fans per shaft.

There is one fan per module and only one motor driving a maximum two fans. In case of a third fan, the connection is secured by a flexible coupling between shaft which supports two fans and shaft supporting the third one.

The volutes side-plates are used to fix the motor support.

This design prevents the belts from producing a slapping effect.

Trapezoidal pulleys and V-belts transmission are used. Tension is applied to the belts by tipping the motor seat, for easy adjustment. The motor is located above the fan casing.

The fan is protected from corrosion by an ELASTAIR coating (thickness :  $\mu\text{m}$  350-400) ultra-violet proof.

The impeller is treated and protected by a baked EPOXY coating.

A completely stainless steel volute and impeller design can be selected as an option.

### **Plume suppression coil (ATiM option)**

In standard, the header coil is in carbon steel, primer and epoxy coated. Two air valves secure the freezing matters. The tubes are assembled in a triangular pitch, in copper, outside diameter 16 mm, 0.5 mm thick. In option, they can be in stainless steel. The fins are in aluminium epoxy coated in standard, optionally in copper or in stainless steel. The fin pitch is 3 mm in standard. A monitored valve to adjust the water spray on the infill is associated to the plume coil. As soon as ambient conditions are met, this system makes it possible to operate significant water savings by cooling the water in the dry mode, rather than spraying and evaporating it.

### **Standard motor**

- asynchronous three-phases motor,
- rpm 1500,
- V 230 / 400 up to kW 5,5,
- V 400 / 690 above kW 5,5,
- Hz 50,
- IP55 (possible open sky operating),
- direct connection to terminal box,

### **Sound - attenuation (4 options)**

#### **IB - Sound attenuation**

The air inlet sound attenuators consist in fan housing by self supporting stiff panels, double folded on the 4 sides.

Internal lagging in absorbent material.

Complete front opening inspection doors for maintenance.

Air inlet sound attenuator includes a cone, reducing the acoustic emission surface.

#### **ICV - Complete sound attenuation**

As **IB** sound attenuation. In addition are installed easily removable high density rock wool sound baffles.

At the air inlet, the rock wool is coated by a fibre glass layer.

At the air outlet, is added a stainless steel grid.

#### **ICVK - Complete sound attenuation, double casing**

The entire casing of **ICV** cooling tower is fitted with a double casing : another plate covers a high density mineral wool - **ICVK**.

#### **NR 30 - Special sound attenuation**

**ICVK** solution is adapted to reach required sound level, up to **NR 30 at m 10**.

## **OPTIONS**

- Plum suppression system (see **ATiM** series),
- X-STEEL stainless steel casing (for others 304L(1.4301) or 316L (1.4404) contact us)
- Electric heater with thermostat,
- Two - speed motor (Dahlander type – rpm 1500/750, separate wiring or PAM – rpm 1500/1000),
- Stand - by motor ready to be connected,
- Frequency controller,
- Water level control with solenoid valve (with electric-valve and input filter),
- Automated Inductive deconcentration (see DAi documentation),
- Fired polyester powder protection for all parts that are not in contact with the water,
- All stainless steel fittings (fan casing, wheel, plumeless battery, etc.),
- Discharge cone (increase of air outlet speed),
- Air filtration (fan covering + filters),
- Air pressure available for connection to the duct,
- Control panel,
- Equipment delivered in parts, ready to be assembled,
- Assembly on site by experimented technicians from our factory,
- Anti-vibrations supports,
- Fan bearing lubrication line (Rilsan) extended on the fan stack.

# Technical Characteristics : ATM series

OPEN TOWER WITHOUT SOUND ATTENUATION									IB SOUND ATTENUATION		
Type	Ref heat power.(1) [kW]	Nber of NDKL 560 fan	Outlet air flow rate [m <sup>3</sup> /h]	Heater power [kW]	Motor power [kW]	Sound level (2) at 20 m [dB(A)]	Shipping weight (without beams) [kg]	Operating weight (without beams) [kg]	Sound level (2) at 20m [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]
<b>ATM 1 HZ</b> (from m <sup>3</sup> /h 15 to 47)									<b>ATM 1 HZ ... - IB</b>		
30	270	1	16 400	3	3	44	550	1448	40	950	1838
55	315		19 000		5,5	46					
<b>GATM 1 HZ</b> (from m <sup>3</sup> /h 20 to 59)									<b>GATM 1 HZ ... - IB</b>		
55	330	1	23 600	3	5,5	47	600	1747	42	1010	2127
75	380		25 000		7,5	49					
<b>ATM 2 HZ</b> (from m <sup>3</sup> /h 30 to 94)									<b>ATM 2 HZ ... - IB</b>		
75	430	2	33 200	3	7,5	47	940	2656	42	1560	3276
90	510		38 300		9	49					
<b>GATM 2 HZ</b> (from m <sup>3</sup> /h 40 to 117)									<b>GATM 2 HZ ... - IB</b>		
110	660	2	47 200	3	11	50	1020	3174	44	1630	3784
150	760		50 000		15	52					
<b>ATM 3 HZ</b> (from m <sup>3</sup> /h 45 to 140)									<b>ATM 3 HZ ... - IB</b>		
110	810	3	49 900	3	11	49	1330	3934	44	2160	4714
150	945		53 900		15	51					
<b>GATM 3 HZ</b> (from m <sup>3</sup> /h 58 to 175)									<b>GATM 3 HZ ... - IB</b>		
150	1060	3	70 800	6	15	52	1450	4641	46	2250	5451
150/75	1160		75 000		15 + 7,5	54					
<b>ATM 4 HZ</b> (from m <sup>3</sup> /h 60 to 190)									<b>ATM 4 HZ ... - IB</b>		
75 D	1080	4	66 300	6	2 x 7,5	50	1720	5112	45	2770	6162
90 D	1260		76 600		2 x 9	52					
<b>GATM 4 HZ</b> (from m <sup>3</sup> /h 78 to 235)									<b>GATM 4 HZ ... - IB</b>		
110 D	1430	4	94 400	6	2 x 11	53	1850	5188	47	2890	7108
150 D	1540		100 000		2 x 15	55					
<b>ATM 5 HZ</b> (from m <sup>3</sup> /h 75 to 235)									<b>ATM 5 HZ ... - IB</b>		
110/75	1350	5	83 000	6	11 + 7,5	51	2100	6340	46	3370	7600
150/90	1575		92 200		15 + 9	53					
<b>GATM 5 HZ</b> (from m <sup>3</sup> /h 100 to 295)									<b>GATM 5 HZ ... - IB</b>		
150/110	1750	5	118 000	6	15 + 11	54	2260	7535	48	3510	8785
150/220	1920		125 000		15 + 22	56					

(1): Reference cooling capacities calculated for thermal conditions of 32 / 27 / 21°C.

(2): Sound level: Pressure level (Lp) average in free field in 5 directions.

Note: Tower may be juxtaposed to obtain greater power.

## Technical Characteristics : ATM Series

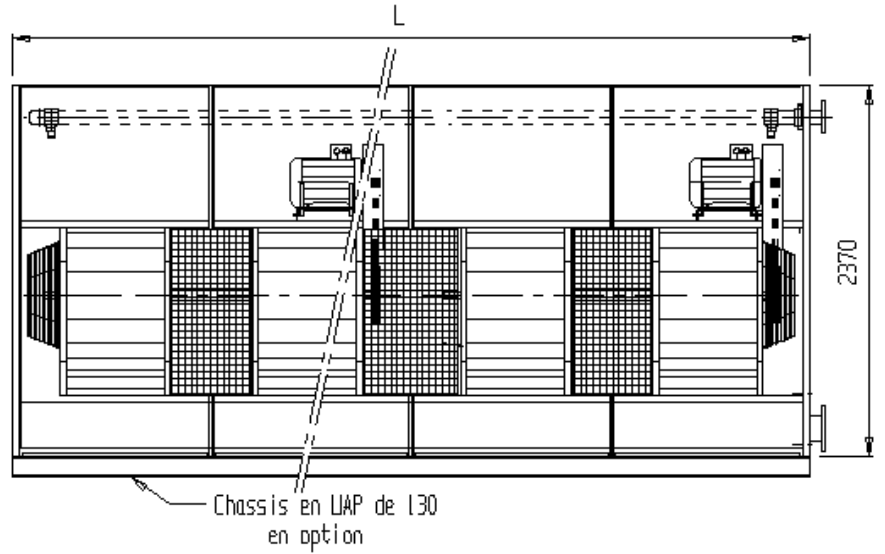
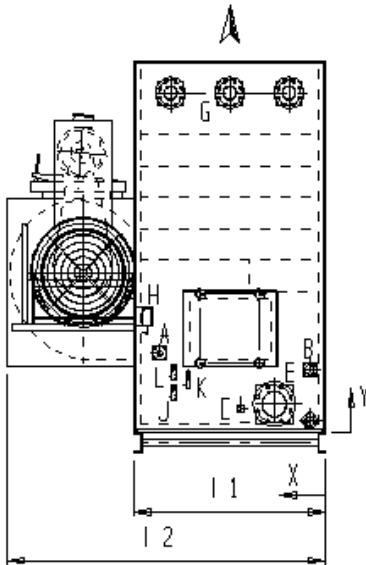
COMPLETE SOUND ATTENUATION									COMPLETE SOUND ATTENUATION WITH DOUBLE CASING OF BODY TOWER			NR 30		
												SPECIAL SOUND ATTENUATION		
Type	Ref heat power (1) [kW]	Nber of NDKL 560 fan	Outlet air flow rate [m <sup>3</sup> /h]	Heater power [kW]	Motor power [kW]	Sound level (2) at m 20 [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]	Sound level (2) at m 20 [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]	Sound level (2) at m 10 [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]
<b>ATM 1 HZ</b> (from m <sup>3</sup> /h 15 to 47)						<b>ICV</b>			<b>ICVK</b>			<b>NR 30</b>		
<b>40</b>	270	1	17 500	3	4	34	1176	2009	NR 30	1384	2217	NR 30	1466	2299
<b>55</b>	315		19 000		5,5	36			31			NR 30		
<b>ATM 2 HZ</b> (from m <sup>3</sup> /h 30 to 94)						<b>ICV</b>			<b>ICVK</b>			<b>NR 30</b>		
<b>90</b>	430	2	35 500	3	9	37	1987	3653	32	2338	4004	NR 30	2499	4165
<b>110</b>	510		38 300		11	39			34			NR 30		
<b>ATM 3 HZ</b> (from m <sup>3</sup> /h 45 to 140)						<b>ICV</b>			<b>ICVK</b>			<b>- Sp</b>		
<b>150</b>	810	3	49 900	3	15	39	2798	5297	34	3292	5791	NR 30	3532	6032
<b>185</b>	945		53 900		18.5	41			36			40		
<b>ATM 4 HZ</b> (from m <sup>3</sup> /h 60 to 190)						<b>ICV</b>			<b>ICVK</b>			<b>- Sp</b>		
<b>90 D</b>	1080	4	70 900	6	2 x 9	40	3608	6940	35	4245	7577	39	4566	7898
<b>110 D</b>	1260		76 500		2 x 11	42			37			41		
<b>ATM 5 HZ</b> (from m <sup>3</sup> /h 75 to 235)						<b>ICV</b>			<b>ICVK</b>			<b>- Sp</b>		
<b>90/150</b>	1350	5	85 400	6	9 + 15	41	4419	8584	36	5199	9364	40	5599	9764
<b>110/185</b>	1575		92 200		11 + 18,5	43			38			42		

(1): Reference cooling capacities calculated for thermal conditions of 32 / 27 / 21°C.

(2): Sound level: Pressure level (Lp) average in free field in 5 directions.

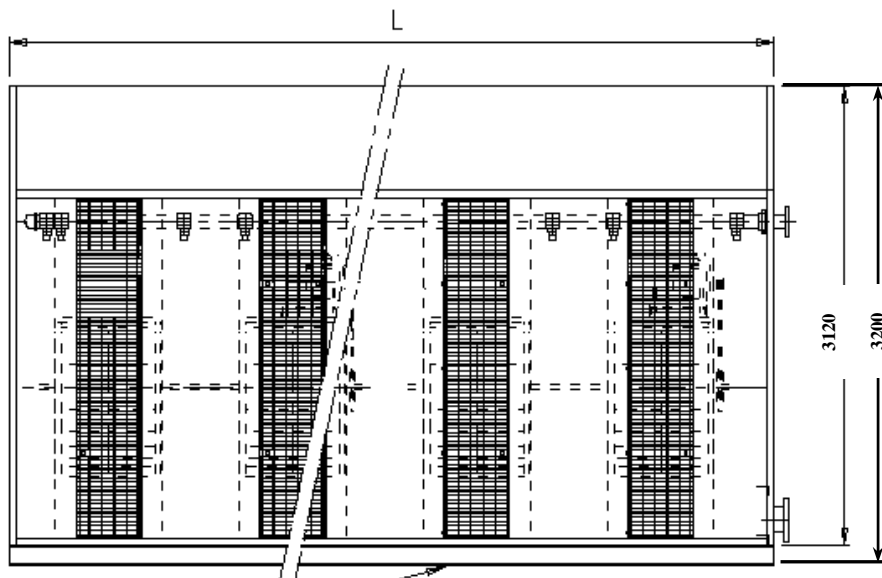
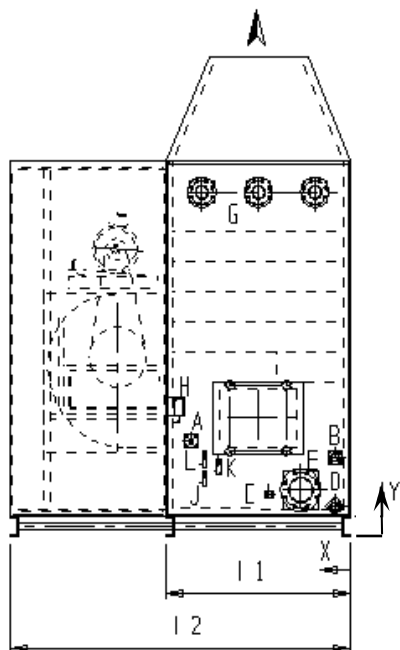
Note: Tower may be juxtaposed to obtain greater power (see **KS** Series).

# Drawings and Dimensions : ATM series without sound attenuation



SERIES		DIMENSIONS WITHOUT FRAMEWORK										
		ATM		GATM		ATM		GATM		ATM		GATM
Dimensions mm x / y reference on drawing		1 HZ		2 HZ		3 HZ		4 HZ		5 HZ		
Length L		1400		2700		4000		5300		6600		
Width l1		1300	1600	1300	1600	1300	1600	1300	1600	1300	1600	
Width l2		2160	2460	2160	2460	2160	2460	2160	2460	2160	2460	
A	Float valve (male) Make up water	Ø	3/4	1'	1' 1/4	1' 1/4	1' 1/4	1' 1/4	1' 1/4	1' 1/4	1' 1/4	
		DN	20	25	32	32	32	32	32	32	32	
		X	1125	1425	1125	1425	1125	1425	1125	1425	1125	1425
		Y	555	555	555	555	555	555	555	555	555	555
B	Overflow (female)	DN	50	50	50	50	50	50	50	50	50	
		X	110	110	110	110	110	110	110	110	110	
		Y	525	525	525	525	525	525	525	525	525	
C Heater												
D	Drain (female)	DN	50	50	50	50	50	50	50	50	50	
		X	110	110	110	110	110	110	110	110	110	
		Y	70	70	70	70	70	70	70	70	70	
E	Strainer (water outlet)	DN	100	150	150	200	200	200	200	200	200	
		X	350	650	350	650	350	650	350	650	350	650
		Y	175	175	175	180	180	180	180	180	180	
G	Pipes supply ATM x 3 - GATM x 4	DN	80	80	80	80	80	80	80	80	80	
		Y	2215	2215	2215	2215	2215	2215	2215	2215	2215	
G Header (option)												
H Thermostat (option)												
J Safety water level switch (option)												
K Low level switch (option)												
L High level switch (option)												

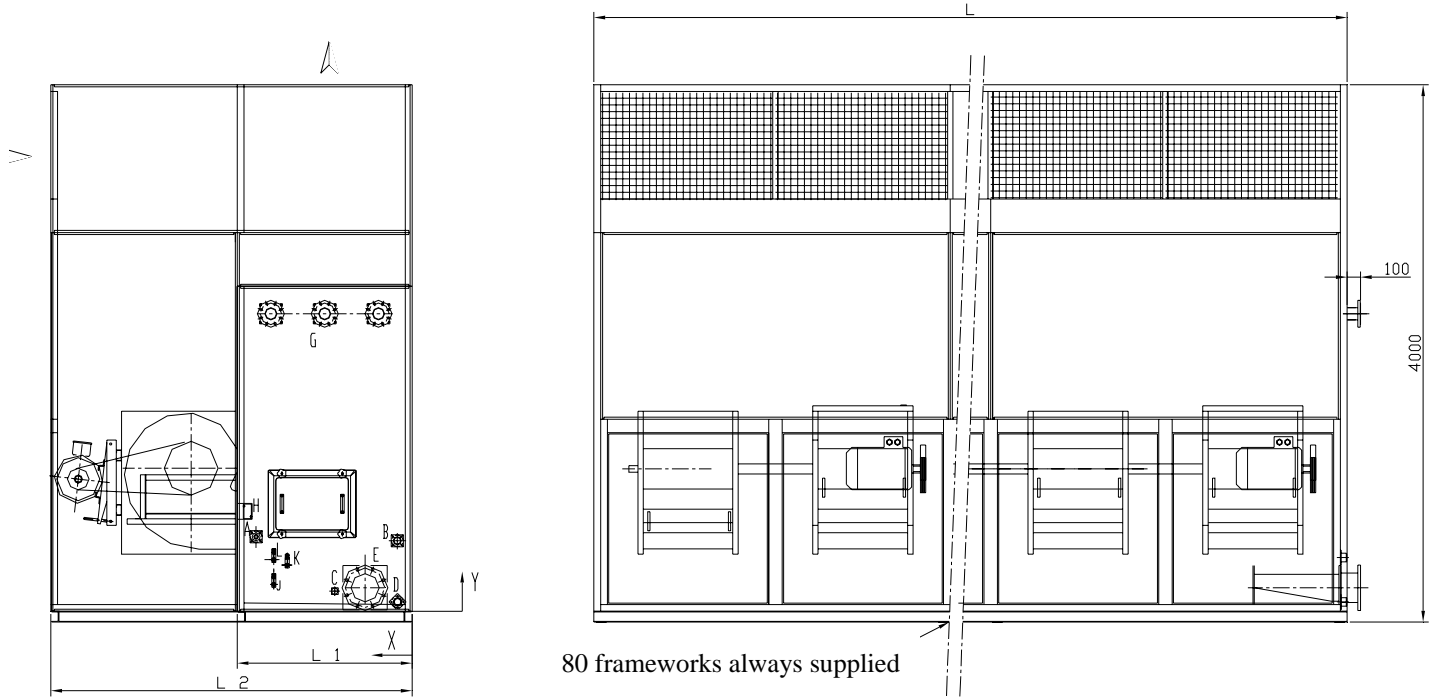
# Drawings and Dimensions : ATM series with IB sound attenuation



80 frameworks always supplied

SERIES		DIMENSIONS WITH FRAMEWORK													
		ATM	GATM	ATM	GATM	ATM	GATM	ATM	GATM	ATM	GATM				
		1 HZ		2 HZ		3 HZ		4 HZ		5 HZ					
Dimensions mm x / y reference on drawing		Length L		1400		2700		4000		5300		6600			
		Width l1		1300		1600		1300		1600		1300		1600	
		Width l2		2400		2700		2400		2700		2400		2700	
A	Float valve (male) Make up water	Ø	3/4		1'		1' 1/4		1' 1/4		1' 1/4		1' 1/4		
		DN	20		25		32		32		32		32		
		X	1125	1425	1125	1425	1125	1425	1125	1425	1125	1425	1125	1425	
		Y	635		635		635		635		635		635		
B	Overflow (female)	DN	50		50		50		50		50		50		
		X	110		110		110		110		110		110		
		Y	605		605		605		605		605		605		
C		Heater													
D	Drain (female)	DN	50		50		50		50		50		50		
		X	110		110		110		110		110		110		
		Y	150		150		150		150		150		150		
E	Strainer (water outlet)	DN	100		150		150	200	200		200		200		
		X	350	650	350	650	350	650	350	650	350	650	350	650	
		Y	255		255		255		260		260		260		
G	Pipes supply ATM x 3 - GATM x 4	DN	80		80		80		80		80		80		
		Y	2295		2295		2295		2295		2295		2295		
G		Header (option)													
H		Thermostat (option)													
J		Safety water level switch (option)													
K		Low level switch (option)													
L		High level switch (option)													

# Drawings and Dimensions : ATM series with ICV(K) sound attenuation



SERIES			DIMENSIONS WITH FRAMEWORK				
			ATM 1 HZ	ATM 2 HZ	ATM 3 HZ	ATM 4 HZ	ATM 5 HZ
Dimensions mm x / y reference on drawings							
Length L			1400	2700	4000	5300	6600
Width l 1			1300	1300	1300	1300	1300
Width l 2			2686	2686	2686	2686	2686
A	Float valve (male) Make up water	Ø	3/4	1"	1" 1/4	1" 1/4	1" 1/4
		DN	20	25	32	32	32
		X	1125	1125	1125	1125	1125
		Y	635	635	635	635	635
B	Overflow (female)	DN	50	50	50	50	50
		X	110	110	110	110	110
		Y	605	605	605	605	605
C Heater							
D	Drain (female)	DN	50	50	50	50	50
		X	110	110	110	110	110
		Y	150	150	150	150	150
E	Strainer (water outlet)	DN	100	150	150	200	200
		X	350	350	350	350	350
		Y	255	255	255	260	260
G	Pipes supply ATM x 3 - GATM x 4	DN	80	80	80	80	80
		Y	2295	2295	2295	2295	2295
G Header (option)							
H Thermostat (option)							
J Safety water level switch (option)							
K Low level switch (option)							
L High level switch (option)							

## Technical characteristics : ATiM series

OPEN TOWER WITHOUT SOUND ATTENUATION									IB SOUND ATTENUATION		
Type	Ref heat power.(1) [kW]	Nber of NDKL 560 fan	Outlet air flow rate [m <sup>3</sup> /h]	Heater power [kW]	Motor power [kW]	Sound level (2) at 20 m [dB(A)]	Shipping weight (without beams) [kg]	Operating weight (without beams) [kg]	Sound level (2) at 20m [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]
<b>ATiM 1 HZ</b> (from 15 to 47 m <sup>3</sup> /h)									<b>ATiM 1 HZ ... - IB</b>		
<b>30</b>	270	1	16 400	3	3	44	705	1668	40	1100	2058
<b>55</b>	315		19 000		5,5	46					
<b>GATiM 1 HZ</b> (from 20 to 59 m <sup>3</sup> /h)									<b>GATiM 1 HZ ... - IB</b>		
<b>55</b>	330	1	23 600	3	5,5	47	790	2017	42	1200	2397
<b>75</b>	380		25 000		7,5	49					
<b>ATiM 2 HZ</b> (from 30 to 94 m <sup>3</sup> /h)									<b>ATiM 2 HZ ... - IB</b>		
<b>75</b>	430	2	33 200	3	7,5	47	1240	3076	42	1860	3696
<b>90</b>	510		38 300		9	49					
<b>GATiM 2 HZ</b> (from 40 to 117 m <sup>3</sup> /h)									<b>GATiM 2 HZ ... - IB</b>		
<b>110</b>	660	2	47 200	3	11	50	1390	3694	44	2000	4304
<b>150</b>	760		50 000		15	52					
<b>ATiM 3 HZ</b> (from 45 to 140 m <sup>3</sup> /h)									<b>ATiM 3 HZ ... - IB</b>		
<b>110</b>	810	3	49 900	3	11	49	1770	4554	44	2600	5334
<b>150</b>	945		53 900		15	51					
<b>GATiM 3 HZ</b> (from 58 to 175 m <sup>3</sup> /h)									<b>GATiM 3 HZ ... - IB</b>		
<b>150</b>	1060	3	70 800	6	15	52	1995	5411	46	2800	6221
<b>150/75</b>	1160		75 000		15 + 7,5	54					
<b>ATiM 4 HZ</b> (from 60 to 190 m <sup>3</sup> /h)									<b>ATiM 4 HZ ... - IB</b>		
<b>75 D</b>	1080	4	66 300	6	2 x 7,5	50	2310	5942	45	3360	6992
<b>90 D</b>	1260		76 600		2 x 9	52					
<b>GATiM 4 HZ</b> (from 78 to 235 m <sup>3</sup> /h)									<b>GATiM 4 HZ ... - IB</b>		
<b>110 D</b>	1430	4	94 400	6	2 x 11	53	2570	7108	47	3610	8128
<b>150 D</b>	1540		100 000		2 x 15	55					
<b>ATiM 5 HZ</b> (from 75 to 235 m <sup>3</sup> /h)									<b>ATiM 5 HZ ... - IB</b>		
<b>110/75</b>	1350	5	83 000	6	11 + 7,5	51	2830	7370	46	4100	8630
<b>150/90</b>	1575		92 200		15 + 9	53					
<b>GATiM 5 HZ</b> (from 100 to 295 m <sup>3</sup> /h)									<b>GATiM 5 HZ ... - IB</b>		
<b>150/110</b>	1750	5	118 000	6	15 + 11	54	3160	8805	48	4410	10055
<b>150/220</b>	1920		125 000		15 + 22	56					

(1): Reference cooling capacities calculated for thermal conditions of 32 / 27 / 21°C.

(2): Sound level: Pressure level (Lp) average in free field in 5 directions.

Note: Tower may be juxtaposed to obtain greater power (see **KS** Series).

## Technical characteristics : ATiM series

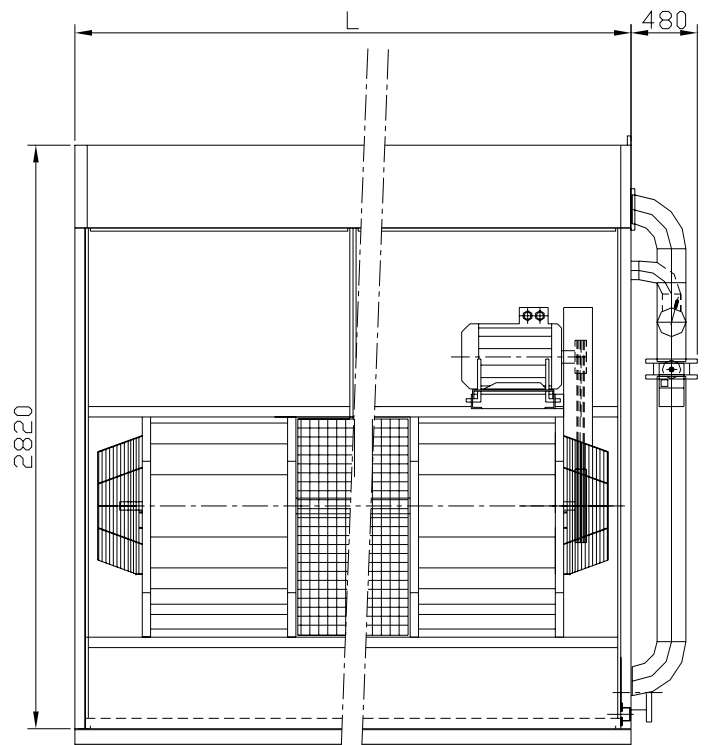
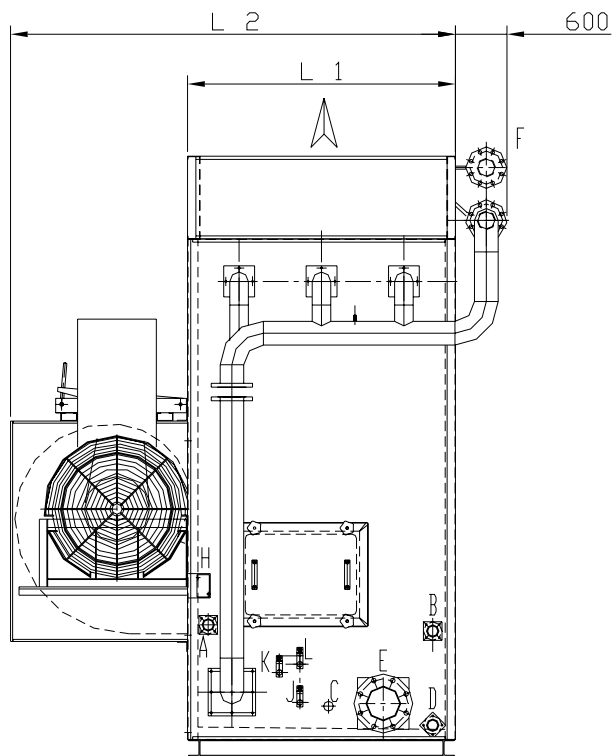
COMPLETE SOUND ATTENUATION									COMPLETE SOUND ATTENUATION WITH DOUBLE CASING OF BODY TOWER			NR 30		
												SPECIAL SOUND ATTENUATION		
Type	Ref heat power. (1) [kW]	Nber of NDKL 560 fan	Outlet air flow rate [m <sup>3</sup> /h]	Heater power [kW]	Motor power [kW]	Sound level (2) at m 20 [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]	Sound level (2) at m 20 [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]	Sound level (2) at m 10 [dB(A)]	Shipping weight (with beams) [kg]	Operating weight (with beams) [kg]
<b>ATiM 1 HZ</b> (from 15 to 47 m <sup>3</sup> /h)						<b>ICV</b>			<b>ICVK</b>			<b>NR 30</b>		
<b>40</b>	270	1	17 500	3	4	34	1330	2228	NR 30	1540	2438	NR 30	1620	2518
<b>55</b>	315		19 000		5,5	36			31			NR 30		
<b>ATiM 2 HZ</b> (from 30 to 94 m <sup>3</sup> /h)						<b>ICV</b>			<b>ICVK</b>			<b>NR 30</b>		
<b>90</b>	430	2	35 500	3	9	37	2290	4076	32	2640	4426	NR 30	2800	4586
<b>110</b>	510		38 300		11	39			34			NR 30		
<b>ATiM 3 HZ</b> (from 45 to 140 m <sup>3</sup> /h)						<b>ICV</b>			<b>ICVK</b>			<b>- Sp</b>		
<b>150</b>	810	3	49 900	3	15	39	3240	5924	34	3740	6414	NR 30	3970	6654
<b>185</b>	945		53 900		18,5	41			36			40		
<b>ATiM 4 HZ</b> (from 60 to 190 m <sup>3</sup> /h)						<b>ICV</b>			<b>ICVK</b>			<b>- Sp</b>		
<b>90 D</b>	1080	4	70 900	6	2 x 9	40	4200	7772	35	4830	8402	39	5150	8722
<b>110 D</b>	1260		76 500		2 x 11	42			37			41		
<b>ATiM 5 HZ</b> (from 75 to 235 m <sup>3</sup> /h)						<b>ICV</b>			<b>ICVK</b>			<b>- Sp</b>		
<b>90/150</b>	1350	5	85 400	6	9 + 15	41	5150	9620	36	5930	10390	40	6330	10790
<b>110/185</b>	1575		92 200		11 + 18,5	43			38			42		

(1): Reference cooling capacities calculated for thermal conditions of 32 / 27 / 21°C.

(2): Sound level: Pressure level (Lp) average in free field in 5 directions.

Note: Tower may be juxtaposed to obtain greater power (see **KSIM** Series).

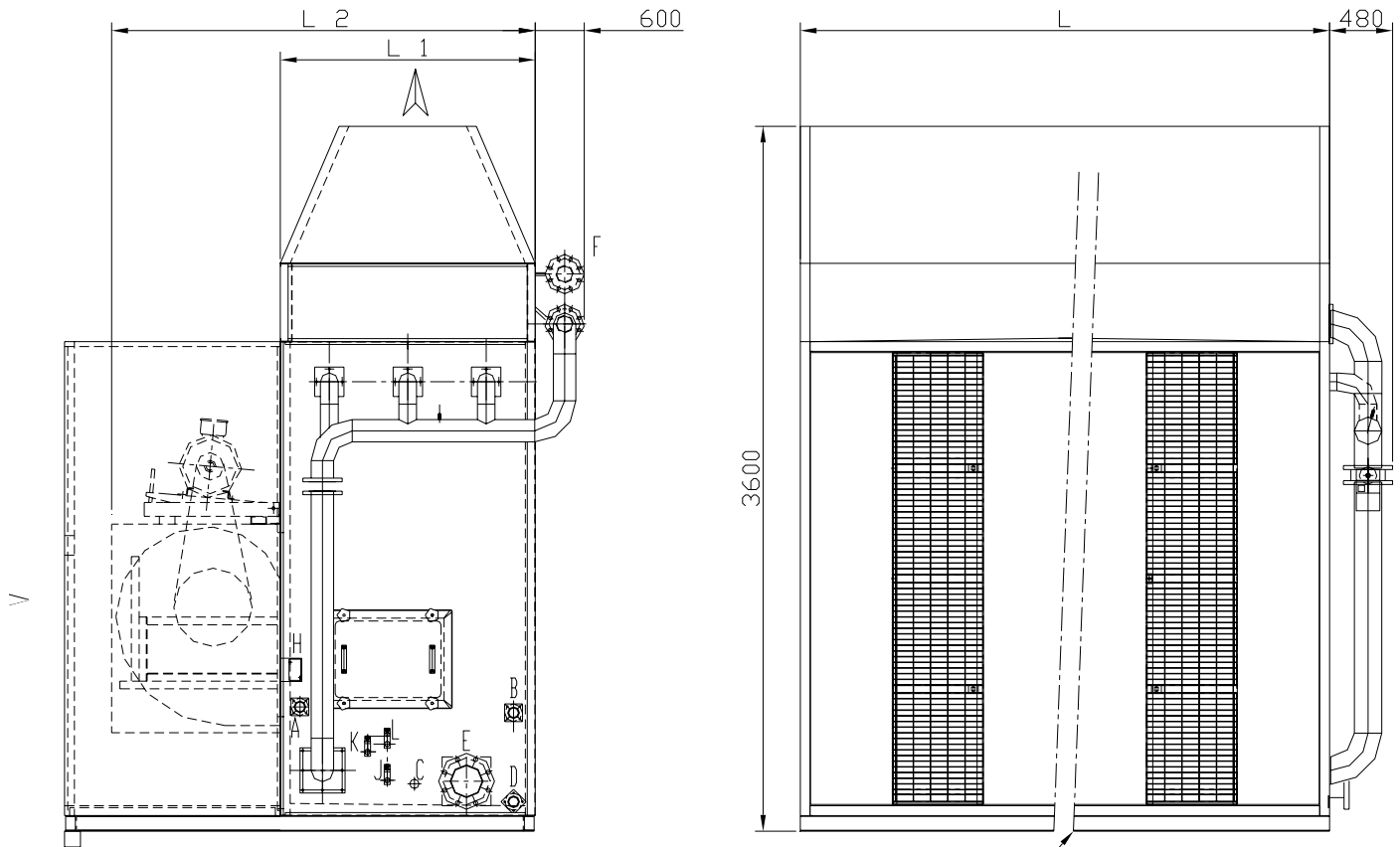
# Drawings and Dimensions : ATiM series without sound attenuation



80 frameworks optional

SERIES		DIMENSIONS WITHOUT FRAMEWORK											
		ATiM		GATiM		ATiM		GATiM		ATiM		GATiM	
		1 HZ		2 HZ		3 HZ		4 HZ		5 HZ			
Length L		1400		2700		4000		5300		6600			
Width L1		1300	1600	1300	1600	1300	1600	1300	1600	1300	1600		
Width L2		2160	2460	2160	2460	2160	2460	2160	2460	2160	2460		
A	Float valve (male) Make up water	Ø		3/4	1"	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4	1" 1/4		
		DN		20	25	32	32	32	32				
		X		1125	1425	1125	1425	1125	1425	1125	1425		
		Y		555	555	555	555	555	555				
B	Overflow (female)	DN		50	50	50	50	50	50				
		X		110	110	110	110	110					
		Y		525	525	525	525	525					
C		Heater											
D	Drain (female)	DN		50	50	50	50	50	50				
		X		110	110	110	110	110					
		Y		70	70	70	70	70					
E	Strainer (water outlet)	DN		100	150	150	200	200	200				
		X		350	650	350	650	350	650	350	650		
		Y		175	175	175	180	180					
F	Water inlet	DN from 80 to 150 depending on water flow											
		X		1450	1750	1450	1750	1450	1750	1450	1750		
		Y		2765	2765	2765	2765	2765					
H		Thermostat (option)											
J		Safety water level switch (option)											
K		Low level switch (option)											
L		High level switch (option)											

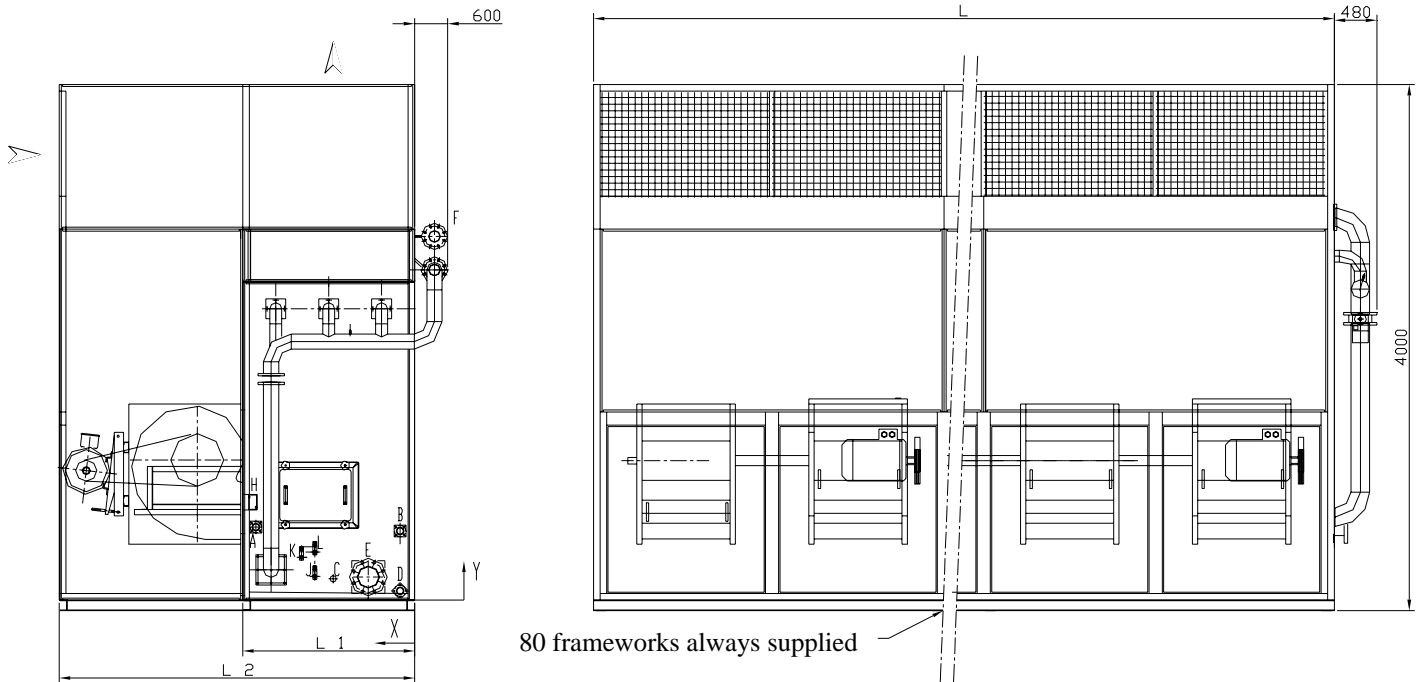
# Drawings and Dimensions : ATiM Series with IB sound attenuation



80 frameworks always supplied

SERIE		DIMENSIONS WITH FRAMEWORK																				
		ATiM 1 HZ		GATiM 1 HZ		ATiM 2 HZ		GATiM 2 HZ		ATiM 3 HZ		GATiM 3 HZ		ATiM 4 HZ		GATiM 4 HZ		ATiM 5 HZ		GATiM 5 HZ		
Length L		1400		2700		4000		5300		6600												
Width l 1		1300		1600		1300		1600		1300		1600		1300		1600		1300		1600		
Width l 2		2400		2700		2400		2700		2400		2700		2400		2700		2400		2700		
A	Float valve (male) Make up water	Ø	3/4		1"		1" 1/4		1" 1/4		1" 1/4		1" 1/4		1" 1/4		1" 1/4					
		DN	20		25		32		32		32		32		32		32					
		X	1125		1425		1125		1425		1125		1425		1125		1425		1125		1425	
		Y	555		555		555		555		555		555		555		555		555			
B	Overflow (female)	DN	50		50		50		50		50		50		50		50					
		X	110		110		110		110		110		110		110		110					
		Y	525		525		525		525		525		525		525		525					
C		Heater																				
D	Drain (female)	DN	50		50		50		50		50		50		50		50					
		X	110		110		110		110		110		110		110		110					
		Y	70		70		70		70		70		70		70		70					
E	Strainer (water outlet)	DN	100		150		150		200		200		200		200		200					
		X	350		650		350		650		350		650		350		650		350		650	
		Y	175		175		175		175		180		180		180		180					
F	Water inlet	DN	DN from 80 to 150 depending on water flow																			
		X	1450		1750		1450		1750		1450		1750		1450		1750		1450		1750	
		Y	2765		2765		2765		2765		2765		2765		2765		2765		2765			
H		Thermostat (option)																				
J		Safety water level switch (option)																				
K		Low level switch (option)																				
L		High level switch (option)																				

# Drawings and Dimensions : ATiM Series with ICV(K) sound attenuation



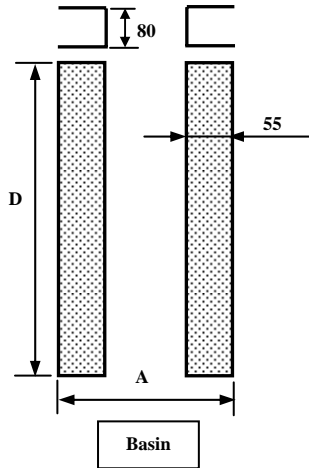
SERIE			DIMENSIONS WITH FRAMEWORK				
			ATiM 1 HZ	ATiM 2 HZ	ATiM 3 HZ	ATiM 4 HZ	ATiM 5 HZ
Dimensions mm X / Y reference on drawing							
Length L			1400	2700	4000	5300	6600
Width l 1			1300	1300	1300	1300	1300
Width l 2			2686	2686	2686	2686	2686
A	Float valve (male) Make up water	Ø	3/4	1"	1" 1/4	1" 1/4	1" 1/4
		DN	20	25	32	32	32
		X	1125	1125	1125	1125	1125
		Y	505	505	505	505	505
B	Overflow (female)	DN	50	50	50	50	50
		X	110	110	110	110	110
		Y	605	605	605	605	605
C Heater							
D	Drain (female)	DN	50	50	50	50	50
		X	110	110	110	110	110
		Y	70	70	70	70	70
E	Strainer (water outlet)	DN	100	150	150	200	200
		X	350	350	350	350	350
		Y	175	175	175	180	180
F	Water inlet	DN	DN from 80 to 150 depending on water flow				
		X	-150	-150	-150	-150	-150
		Y	2845	2845	2845	2845	2845
H Thermostat (option)							
J Safety water level switch (option)							
K Low level switch (option)							
L High level switch (option)							

## Support : ATM-ATiM series

Our cooling towers can stand on the ground or on a concrete ground, but we recommend to install them on a concrete longitudinal beams or on a steel frame (support beams optional).

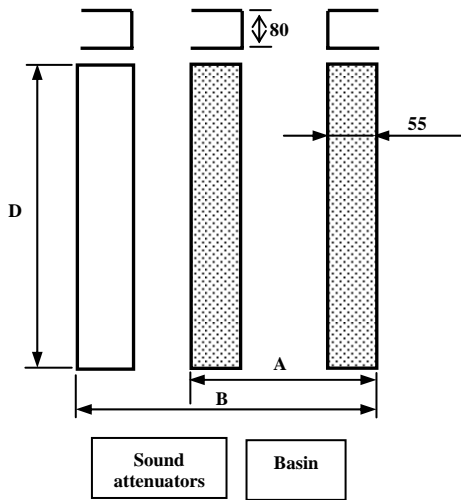
Check that the ground can stand the operating load, and that the surface or supports are flat.

### Quantity and position of beams on a tower without sound attenuation



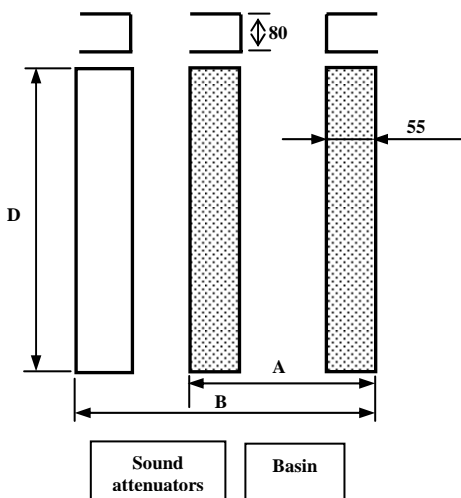
	Qty	Length D [mm]	Width A [mm]
ATM 1 HZ	2	1400	1290
GATM 1 HZ			1590
ATM 2 HZ		2700	1290
GATM 2 HZ			1590
ATM 3 HZ		4000	1290
GATM 3 HZ			1590
ATM 4 HZ		5300	1290
GATM 4 HZ			1590
ATM 5 HZ		6600	1290
GATM 5 HZ			1590

### Quantity and position of beams on a tower with IB sound attenuation



	Qty	Length D [mm]	Width A [mm]	Width B [mm]
ATM 1 HZ - IB	3	1400	1290	2400
GATM 1 HZ - IB			1590	2700
ATM 2 HZ - IB		2700	1290	2400
GATM 2 HZ - IB			1590	2700
ATM 3 HZ - IB		4000	1290	2400
GATM 3 HZ - IB			1590	2700
ATM 4 HZ - IB		5300	1290	2400
GATM 4 HZ - IB			1590	2700
ATM 5 HZ - IB		6600	1290	2400
GATM 5 HZ - IB			1590	2700

### Quantity and position of UAP beams on a tower with ICV(K) or NR 30 sound attenuation



	Qty	Length D [mm]	Width A [mm]	Width B [mm]
ATM 1 HZ -ICV(K)	3	1400	1290	2686
ATM 2 HZ -ICV(K)		2700		
ATM 3 HZ -ICV(K)		4000		
ATM 4 HZ -ICV(K)		5300		
ATM 5 HZ -ICV(K)		6600		

## Lay Out : ATM-ATiM series

Walls, higher or equal to the tower must not surround on all sides a cooling tower, furthermore without any openings.

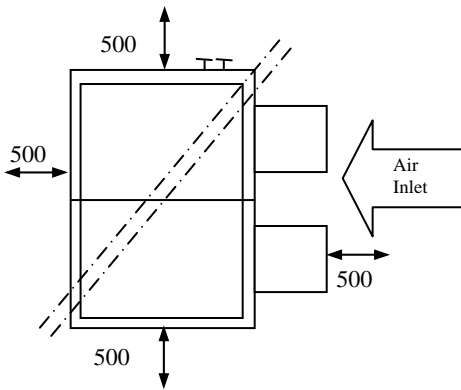
This could create a risk of a « re-circulation »; the air discharged (hot and saturated) may be recycled into the unit and significantly reduces the thermal efficiency of the tower.

In any case, the free access on the four sides of the tower must be secured to ensure that the fans are supplied correctly with air and that there is proper access for installation and maintenance.

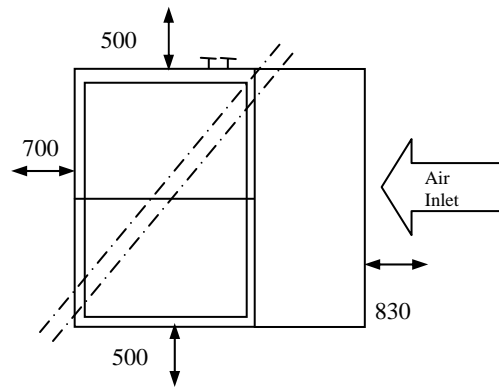
If these rules are not applied, it is inevitable that the cooling tower will not operate properly.

### Recommended minimum free access (mm) for standard cooling towers: Top view

Tower without sound attenuation



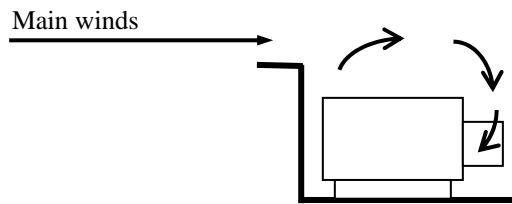
Tower with IB or ICV(K) sound attenuation



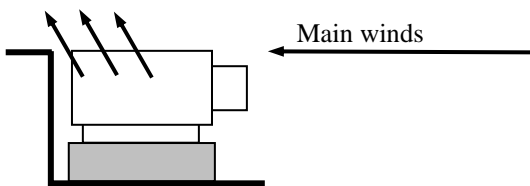
Do not hesitate to contact us for any advice

### Setting out examples:

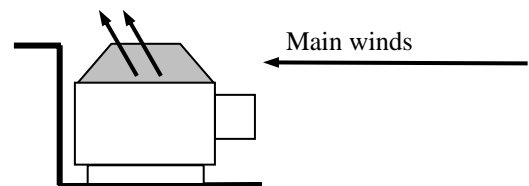
#### TO AVOID



#### ALTERNATIVE SOLUTIONS



Install a base in order to up the tower



Install a cone in order to up air outlet.

## Water Treatment : ATM-ATiM series

### WATER EVAPORATION

Consumption by evaporation is approximately kg/h 1,7 per kcal/h 1 000.

### DECONCENTRATION

Due to the evaporation and to the water recycling, impurities or salts in the water are concentrated. To make sure that this concentration is not too high, drain must be carried out.

If not, concentration rates of 10, 100 or even 1,000 would occur over time.

In order to pre-determine the installation requirements, consider drain value twice the evaporation level. In operation, with an efficient water treatment, this figure may decrease, specially in the case of a stainless steel cooling tower (concentration rate of 3 to 5 possible).

There are three possibilities to choose according to the case:

#### ➤ 1- Continuous blow down

Connection piece to be installed at the pump discharge just before the tower, if possible at the level of the water distribution pipes so that the purge only takes place when the circulation pump is operating.

The blow down flow rate can be calculated using the formula:  $[100 S / (M - S)]$  % of the make-up water in which:

S: Salinity of the make-up water compensating for evaporation.

M: Maximum acceptable salinity level of water in circuits.

#### Example :

Salinity of make-up water = HT 20 ° F

Maximum acceptable salinity = HT 40 ° F

$100 \times 20 / (40 - 20) = 100$  % make-up water flow rate

Therefore, the continuous blow down must be equal to the evaporated make-up water flow rate (rate=2).

Consequently, the real water consumption is twice the theoretical evaporated water flow.

#### ➤ 2- Discontinuous blow down

The conductivity of the water in the circuit is controlled and the device is purged while not exceeding the TH value.

#### ➤ 3- JACIR - AIR TRAITEMENT Automated Inductive Deconcentration device

Once water conductivity level has been reached, a motorised valve can be activated to drain the required quantity of water to maintain the right concentration level.

See separate documentation.

### WATER TREATMENT

It is essential that good quality water is available to ensure that the closed circuit cooling network operates correctly.

If the water contains a significant amount of impurities, it is recommended that a filtration device to be installed in parallel for 5 to 10 % of the recycled water flow.

If the water contains salts that form deposits, iron or corrosive chemical elements, a make-up water treatment system must be installed to obtain purer water, which is close to being chemically neutral, and which can supply the cooling devices without causing damage.

In some cases, algae, moss, fungus or permanent shells can tend to grow in cooling towers. There are products that can be added periodically to the water circuit to stop these organisms from developing.

**Water treatment should be undertaken by a specialized Company.**

**PREVENTS THE RISK OF LEGIONNAIRES' DISEASE : See separate documentation**

## Prescription : ATM series

Evaporative water-cooling tower, modular with a forced draft centrifugal(s) fan(s), Jacir – Air Traitement, **ATM** series.....

### Thermal characteristics

The heat power is kW ..... for conditions between ...°C and .....°C with a wet bulbe of..... °C at air inlet.

### Acoustic characteristics

The sound pressure level of the tower must not exceed.... dB (A) at ..... meters in free field over all directions. To ensure this, the tower has one of the following types of soundproofing devices:

- a) - **IB** sound attenuators without baffles at suction and discharge cone,
- b) - Complete (**ICV**) sound attenuation with parallel baffles both at air inlet and outlet fan housing,
- c) - Complete with sound attenuation of the casing (**ICVK**) same design as the **ICV**, but also has a double casing consisting of 50mm of high density mineral wool covered by mm 1.2 thick sheet metal.
- d) - Special NR 30 at m 10 (approximately 35 dB(A) at m 10).

### Tower casing and inclined basin

These are made of single, self-supporting sheet steel panels with double folds on the 4 sides. Side panels are designed to be able to receive a double casing if necessary. Stainless steel rivets with a high locking capacity are used for assembly. The basin is fitted with an inspection door, floating valve that can easily be adjusted, a drain, an overflow and an anti-cavitations strainer. The tank is inclined so that all the water can be replaced easily and the cleaning is simple.

### Ventilation

The low-pressure centrifugal fan with forward-inclined blades and double air admission is placed outside the basin. It is placed in dry airflow at man height and is easy to access without disassembly. The polyester inlet ducts stand out to optimise air suction and can be disassembled for easy maintenance.

The impeller is coated by baked EPOXY, and the volute is protected by a  $\mu$  350 to 400 thick ELASTAIR covering. The wheel is mounted on a full shaft supported by two bearings.

### Electric motor and coupling

The motor is a closed type with ventilated case with a power of kW....., rpm ....., IP55 protected class F. V-belts, selected for 150 % of nominal power, are used for transmission.

### Packing (infill)

**COFINTER** : is made by hot welding of high density polyethylene in compact blocks with vertical canals which minimise pressure drop, easily removable and in standard form withstands temperature of 75°C.

These flexible blocks avoid breakage and allow a complete cleaning at high pressure spray by elastic distortion without any damages.

### Water distribution

Nozzles made of polypropylene are easy to disassemble and have an internal turbulator for optimal water distribution.

### Accessibility

In standard, a large polyester access door 1350x900mm is installed per tower. This large access door helps to remove quickly the drift eliminators, nozzles, exchange surface and water distribution pipes.

### Steel structure

There is no welding in the assembly; water tightness between panels is ensured by a high covering seal. The tower is made of:

- a) Zenzimir process galvanized metal (mm 2 thick) at gr/m<sup>2</sup> 275 with finishing Epoxy paint applied to the external sides after assembly,
- b) X-STEEL stainless steel, with 10 years non-pitting guarantee.

Distributed by...



# Prescription : **ATiM** Series

Evaporative water-cooling tower, modular with a forced draft centrifugal(s) fan(s), Jacir – Air Traitement, **ATiM** series.....

## Thermal characteristics

The heat power is kW ..... for conditions between ...°C and .....°C with a wet bulbe of..... °C at air inlet.

## Plume suppression coil

In standard, the header coil is in carbon steel, primer and epoxy coated. Two air valves secure the freezing matters. The tubes are assembled in a triangular pitch, in copper, outside diameter 16mm, 0.5mm thick. In option, they can be in stainless steel. The fins are in aluminium epoxy coated in standard, optionally in copper or in stainless steel. The fin pitch is 3mm in standard. A monitored valve to adjust the water spray on the infill is associated to the plume coil. As soon as ambient conditions are met, this system makes it possible to operate significant water savings by cooling the water in the dry mode, rather than spraying and evaporating it.

## Acoustic characteristics

The sound pressure level of the tower must not exceed.... dB (A) at ..... meters in free field over all directions. To ensure this, the tower has one of the following types of soundproofing devices:

- a) - **IB** sound attenuators without baffles at suction and discharge cone,
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- c) - Complete with sound attenuation of the casing (**ICVK**) same design as the **ICV**, but also has a double casing consisting of 50mm of high density mineral wool covered by mm 1.2 thick sheet metal.
- e) - Special NR 30 at m 10 (approximately 35 dB(A) at m 10).

## Tower casing and inclined basin

These are made of single, self-supporting sheet steel panels with double folds on the 4 sides.

Side panels are designed to be able to receive a double casing if necessary.

Stainless steel rivets with a high locking capacity are used for assembly.

The basin is fitted with an inspection door, floating valve that can easily be adjusted, a drain, an overflow and an anti-cavitations strainer.

The tank is inclined so that all the water can be replaced easily and the cleaning is simple.

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The impeller is coated by baked EPOXY, and the volute is protected by a  $\mu$  350 to 400 thick ELASTAIR covering. The wheel is mounted on a full shaft supported by two bearings.

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The motor is a closed type with ventilated case with a power of kW....., rpm ....., IP55 protected class F. V-belts, selected for 150 % of nominal power, are used for transmission.

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In standard, a large polyester access door 1350x900mm is installed per tower. This large access door helps to remove quickly the drift eliminators, nozzles, exchange surface and water distribution pipes.

## Steel structure

There is no welding in the assembly; water tightness between panels is ensured by a high covering seal. The tower is made of:

- a) Zendzimir process galvanized metal (mm 2 thick) at gr/m<sup>2</sup> 275 with finishing Epoxy paint applied to the external sides after assembly,
- b) X-STEEL stainless steel, with 10 years non-pitting guarantee.



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