

## **INTRODUCTION**

### **WARNING**

The installation of this equipment should be done by the Technical Assistance Service department.

The inlet jack should always be placed on an accessible location.

ALWAYS disconnect the power supply from the machine BEFORE any cleaning or maintenance service operation.

Any change needed on the electrical installation for the appropriate connection of the machine, should be exclusively performed by qualified and certified professional personnel only.

Any use of the icemaker not intended to produce ice, using drinking water, is considered inappropriate.

It is extremely dangerous to modify or intend to modify this machine, and shall make any type warranty void.

This machine should not be used by children or handicapped without the proper supervision and monitoring.

Children should be monitored to assure that they do not play near the equipment. This machine is not intended to be used outdoors nor exposed to the rain.

Connect the equipment to the drinking water network.

The machine should be connected using the power cable supplied with the equipment. The connection is not intended for fixed cabling.

**IT IS MANDATORY TO GROUND THE EQUIPMENT.**

To avoid possible discharges on individuals or damages to equipment, the machine should be grounded pursuant local and/or national regulations as the case may be.

**THE MANUFACTURER SHALL BE HELD HARMLESS IN CASE OF DAMAGES ARISING DUE TO THE LACK OF THE GROUND INSTALLATION.**

In order to assure the proper operation and efficiency of this equipment, it is of paramount importance to follow the recommendations of the manufacturer, **SPECIALLY THOSE RELATED TO CLEANING AND MAINTENANCE OPERATIONS**, which should be performed mostly by qualified personnel only.

### **CAUTION:**

Do not try to perform repairs. The intervention of non-qualified personnel, besides of being dangerous, could result in serious malfunctioning. In case of damages, contact your distributor. We recommend to always use original replacement and spare parts.

Perform all discharge and recovery of materials or waste according the national regulations in force.

## PRINCIPLE OF OPERATION

When the machine is switched on, the compressor, the programmer and the water inlet valve are started. After a few minutes (maximum 4 minutes), the water valve closes and the turbine starts to cool the water. The timer stops.

The machines are equipped with a cycle thermostat housed in the evaporator, which starts the timer when the evaporating temperature reaches the set point (the cycle thermostat can be adjusted).

Once the production time has elapsed, the turbine is stopped and the hot gas and water inlet valves are opened until the cubes fall into the storage tank, starting a new cycle.

## OPERATION OF THE MACHINE ACCORDING TO THE WIRING DIAGRAM

Power is supplied to the machine through the line connected to terminals 1 (blue) and 4 (brown). The brown wire goes directly to the compressor starting system and the programmer motor. The blue wire goes to terminal 4 of the stock TI thermostat, which closes contact with 3. Another blue wire goes to terminal 2 of the micro (G1), which is currently closing 1 with 4).

From the T1 stock thermostat (3), a red wire comes out that through terminal 2 of the terminal block feeds the compressor, contact 3 of the cycle thermostat and 1 of the micros (G1) and (G2) that when closing with 4 give current (the G1) to the programmer motor (G).

At this moment we have in operation:

- Compressor (S)
- Water inlet valve (P)
- Hot gas valve (Q)
- Programmer's engine (G)
- The fan through its pressure switch (condensed air)
- The solenoid valve is condensed through its pressure switch (with water at P 15.25 and 35)

As the motor (G) is running, the tappets will stop acting on the micro rollers, thus closing the 1-2 circuits.

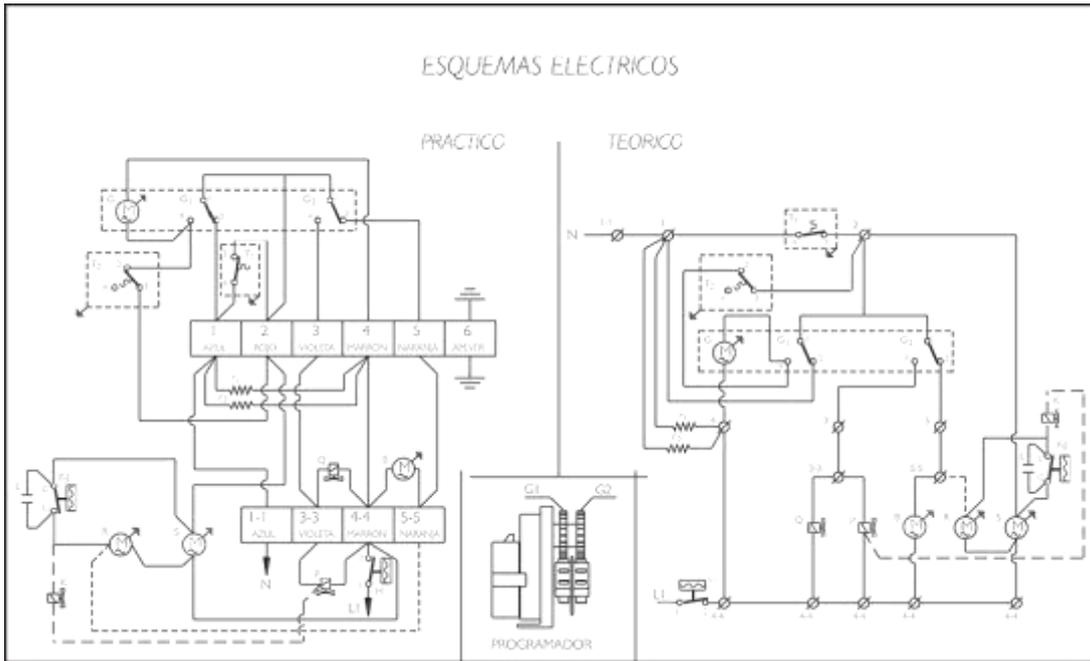
Now, through contact 2 of the micro (G2), the current passes to the turbine motor and fan (in water condensation) and circuit 4 of the micro (G2) that feeds the hot gas (Q) and water (P) valves is interrupted. At the same time, when the thermostat (T2) is between 4-3, the current to the motor (G) of the programmer is interrupted. The compressor continues to run but producing cold.

In the P 15-25-35 machines, the water cools down until it reaches a temperature (approx. 3°C) when the cycle thermostat (T2) changes and closes the circuit 3-2.

When the cycle is completed, the tappets will force the micros to change circuit, stopping the turbine and opening the hot gas and water valves. The hot gas together with the incoming water causes the cycle thermostat (T2) to change position.

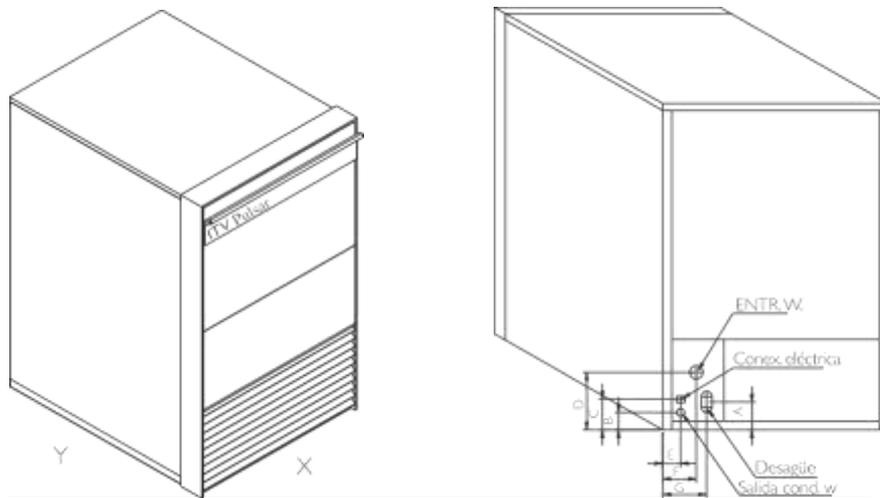
The manufacturing/detach cycle will repeat until the stock tank is full, at which time the stock thermostat (T1) cuts off the machine; if when this thermostat cuts off, the manufacturing cycle has started, it will terminate as the current passes through contacts 1-2 of the micro (G1) until the defrost cycle has started and the thermostat contacts (T2) change.

The machine remains stopped in the takeoff area waiting for the stock thermostat (T1) to change and start a new production process when the cubes are consumed.



## ESPECIFICATIONS

Models: PULSAR 15/25/35/45/65/85/145



MODELO	X	Y	Z	A	B	C	D	E	F	G
PULSAR 15	410	510	670	60	35	65	123	22	42	84
PULSAR 25	410	510	740	60	35	65	123	22	42	84
PULSAR 35	410	510	790	60	35	65	123	22	42	84
PULSAR 45	525	555	870	60	42	74	123	42	52	84
PULSAR 65	685	555	870	60	42	74	123	42	52	84
PULSAR 85	685	555	1120	60	42	74	123	42	52	84
PULSAR 145	685	705	1120	60	42	74	123	42	52	84

## TECHNICAL DATA

MODELO	Consumo agua cond. L/hora (l)	Consumo agua fábrika L/hora (l)	Consumo agua total L/hora (l)	Peso Neto (Kg)	Dimensiones embalado x - y - z	Peso Bruto (Kg)	Volumen (m <sup>3</sup> )
PULSAR 15 A		11	11	40	490x590x740	46	0.21
PULSAR 15 W	25	11	36	40	490x590x740	46	0.21
PULSAR 25 A		9	9	44	490x590x810	51	0.23
PULSAR 25 W	27	9	36	44	490x590x810	51	0.23
PULSAR 35 A		11	11	49	490x590x900	56	0.25
PULSAR 35 W	32	11	43	49	490x590x900	56	0.25
PULSAR 45 A		14	14	60	590x610x970	70	0.35
PULSAR 45 W	34	14	48	60	590x610x970	70	0.35
PULSAR 65 A		11	11	75	750x610x970	85	0.44
PULSAR 65 W	39	11	50	75	750x610x970	85	0.44
PULSAR 85 A		13	13	90	750x610x1220	100	0.56
PULSAR 85 W	53	13	66	90	750x610x1220	100	0.56
PULSAR 145 A		17	17	100	750x1220x760	115	0.70
PULSAR 145 W	76	17	93	100	750x1220x760	115	0.70

- 1) Data obtained with Tamb=20°C, water inlet T=15°C and water quality =500ppm.
- 2) Maximum consumption obtained at Tamb=43°C, according to UNE standards for climatic classification Class T (Tropicalised). NOTE: Expansion controlled by capillary.



MODELO	Consumo agua cond. L/hora (l)	Consumo agua fábrica L/hora (l)	Consumo agua total L/hora (l)	Peso Neto (Kg)	Dimensiones embalado x - y - z	Peso Bruto (Kg)	Volumen (m <sup>3</sup> )
MP 145 A		18	18	75	750X970X610	85	0.44
MP 145 W	80	18	96	75	750X970X610	85	0.44

MODELO	Carga refr. (Gr)	High pressure				Low pressure		INTENS. TOTAL (2) (A)	FUSIBLE SEGURIDAD (A) (INSTALAR) (A)	POTENCIA COMPRESOR (1) (W)	POTENCIA TOTAL ABSORBIDA (2) (W)
		MÍN		MAX		MEDIUM					
MP 145 A (cubito de 40/50 gr)	725	16	228	17	242	2.5	38	5	16	800	950
MP 145 W (cubito de 40/50 gr)	550	16	228	17	242	2.5	38	5	16	800	950

MODELO	Carga refr. (Gr)	High pressure				Low pressure		INTENS. TOTAL (2) (A)	FUSIBLE SEGURIDAD (A) (INSTALAR) (A)	POTENCIA COMPRESOR (1) (W)	POTENCIA TOTAL ABSORBIDA (2) (W)
		MINMA		MAX		MEDIUM					
		Kg/cm2 Psi		Kg/cm2 Psi		Kg/cm2 Psi					
MP 145 A (cubito de 60 gr)	1000	15	214	17	242	2.5	38	5	16	800	950
MP 145 W (cubito de 60 gr)	1000	15	214	17	242	2.5	38	5	16	800	950

1) Data obtained with Tamb=20°C, water inlet T=15°C and water quality =500ppm.

2) Maximum consumption obtained at Tamb=43°C, according to UNE standards for climatic classification Class T (Tropicalised). NOTE: Expansion controlled by capillary.

# PRODUCTION PULSA ICE MACHINES (40GR)

PULSAR 15

45	39	40	41	42	43	44	45
	15	14	14	13.5	13	12.5	12
40	36	39	40	41	42	43	44
	16	15	14.5	14	13.5	13	12.5
35	34	36	39	36	41	42	43
	17	16	15	16	14	13.5	13
30	32	34	36	39	40	41	42
	18	17	16	15	14.5	14	13.5
25	30	32	34	36	39	40	41
	19	18	17	16	15	14.5	14
20	29	30	32	34	36	39	40
	21	19	18	17	15.5	15	14.5
15	28	29	30	32	34	36	39
	22	21	19	18	16.5	15.5	15
10	27	28	29	30	32	35	37
	23	22	21	19	17.5	16.5	15
	5	10	15	20	25	30	35

PULSAR 25

46	49	52	53	54	55	56	
	25	24	23	22	21	20	
43	46	49	52	53	54	55	
	27	25	24	23	22	21	
40	43	46	49	52	53	54	
	29	27	25	24	23	22	
38	40	43	46	49	52	53	
	31	29	27	25	24	23	
37	38	40	43	46	49	52	
	32	31	29	27	25	24	
36	37	38	40	43	46	49	
	33	32	31	29	27	25	
35	36	37	38	40	43	46	
	34	33	32	31	29	27	
34	35	36	37	38	40	43	
	35	34	33	32	31	29	
	5	10	15	20	25	30	35

PULSAR 35

45	45	49	51	52	53	54	55
	25	24	23	22	21	20	19
40	40	45	49	51	52	53	54
	29	25	24	23	22	21	20
35	36	40	45	49	51	52	53
	32	29	25	24	23	22	21
30	32	36	40	45	49	51	52
	37	32	29	25	24	23	22
25	30	32	36	40	45	49	51
	40	37	32	29	25	24	23
20	29	30	32	36	40	45	49
	41	40	37	32	29	25	24
15	28	29	30	32	36	40	45
	42	41	40	37	32	29	25
10	26	28	29	30	32	36	40
	46	42	41	40	37	32	29
	5	10	15	20	25	30	35

PULSAR 45

29	30	31	32	33	34	35	
	40	38	36	35	34	33	
28	29	30	31	32	33	34	
	42	40	38	36	35	34	
27	28	29	30	31	32	33	
	44	42	40	38	36	35	
26	27	28	29	30	31	32	
	46	44	42	40	38	36	
25	26	27	28	29	30	31	
	47	46	44	42	40	38	
24	25	26	27	28	29	30	
	49	47	46	44	42	40	
23.5	24	25	26	27	28	29	
	50	49	47	46	44	42	
23	23.5	24	25	26	27	28	
	52	50	49	47	46	44	
	5	10	15	20	25	30	35

ROOM TEMPERATURE °C

PULSAR 65

45	48	50	52	54	55	56	57
	49	45	43	41	40	39	38
40	45	48	50	52	54	55	56
	53	49	45	43	41	40	39
35	41	45	48	50	52	54	55
	58	53	49	45	43	41	40
30	38	41	45	48	50	52	54
	63	58	53	49	45	43	41
25	37.5	38	41	45	48	50	52
	64	63	58	53	49	45	43
20	37	37.5	38	41	45	48	50
	65	64	63	58	53	49	45
15	36	37	37.5	38	41	45	48
	66	65	64	63	58	53	49
10	35	36	37	37.5	38	41	45
	68	66	65	64	63	58	53
	5	10	15	20	25	30	35

PULSAR 85

43	46	48	49	50	51	52	
	67	63	60	59	58	56	
40	43	46	48	49	50	51	
	72	67	63	60	50	58	
37	40	43	46	48	49	50	
	80	72	67	63	60	59	
35	37	40	43	46	48	49	
	84	80	72	67	63	60	
34.5	35	37	40	43	46	48	
	85	84	80	72	67	63	
34	34.5	35	37	40	43	46	
	87	85	84	80	72	67	
33	34	34.5	35	37	40	43	
	90	87	85	84	80	72	
32	33	34	34.5	35	37	40	
	92	90	87	85	84	80	
	5	10	15	20	25	30	35

WATER INLET TEMPERATURE °C

Water quality 500 Ppm

Min/ciclo
Kg/día

ROOM TEMPERATURE °C

**PULSAR | 45**

45	36 112	37 105	39 100	41 94	45 88	52 80	53 76
40	35 120	36 112	37 105	39 100	41 94	45 88	52 80
35	31 126	35 120	36 112	37 105	39 100	41 94	45 88
30	29 133	31 126	35 120	36 112	37 105	39 100	41 94
25	28 136	29 133	31 126	35 120	36 112	37 105	39 100
20	27.5 137	28 136	29 133	31 126	35 120	36 112	37 105
15	27 138	27.5 137	28 136	29 133	31 126	35 120	36 112
10	26.5 142	27 138	27.5 137	28 136	29 133	31 126	35 120
	5	10	15	20	25	30	35

**MP 145 (cubito 40gr)**

35	36 120	37 112	39 105	41 100	45 94	52 88	53 80
31	35 126	36 120	37 112	39 105	41 100	45 94	52 88
29	31 133	35 126	36 120	37 112	39 105	41 100	45 94
28	29 136	31 133	35 126	36 120	37 112	39 105	41 100
27.5	28 137	29 136	31 133	35 126	36 112	37 105	39 100
27	27.5 138	28 137	29 136	31 133	35 126	36 112	37 105
26.5	27 142	27.5 138	28 137	29 136	31 133	35 126	36 112
26	26.5 146	27 142	27.5 138	28 137	29 136	31 133	35 126
	5	10	15	20	25	30	35

**MP 145 (cubito 50gr)**

45	37 105	39 100	41 94	45 88	52 80	53 76	58 70
40	36 112	37 105	39 100	41 94	45 88	52 80	53 76
35	35 120	36 112	37 105	39 100	41 94	45 88	52 80
30	31 126	35 120	36 112	37 105	39 100	41 94	45 88
25	29 133	31 126	35 120	36 112	37 105	39 100	41 94
20	28 136	29 133	31 126	35 120	36 112	37 105	39 100
15	27.5 137	28 136	29 133	31 126	35 120	36 112	37 105
10	27 138	27.5 137	28 136	29 133	31 126	35 120	36 112
	5	10	15	20	25	30	35

**MP 145 (cubito 60gr)**

39	41 100	45 94	52 88	53 80	58 76	62 71	68
37	39 105	41 100	45 94	52 88	53 80	58 76	62 71
36	37 112	39 105	41 100	45 94	52 88	58 76	62 71
35	36 120	37 112	39 105	41 100	45 94	52 88	58 76
31	35 126	36 120	37 112	39 105	41 100	45 94	52 88
29	31 133	35 126	36 120	37 112	39 105	41 100	45 94
28	29 136	31 133	35 126	36 120	37 112	39 105	41 100
27.5	28 137	29 136	31 133	35 126	36 112	37 105	39 100
	5	10	15	20	25	30	35

WATER INLET TEMPERATURE °C

Water quality 500 PPM

Min/ciclo Kg/día
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## RECEPTION OF THE MACHINE

Inspect the outside packing. In case of damages, MAKE THE CORRESPONDING CLAIM TO THE CARRIER. To confirm the existence of damages, UNPACK THE MACHINE IN THE PRESENCE OF THE CARRIER and state any damage on the equipment on the reception document, or

on a separate instrument. As from May 1, 1998, we comply with the European regulations on management of packing and packing waste, inserting the "**Green Dot Label**" on all our packages.

Always state the machine number and model. This number is printed on three locations:

### Packing

On the outside, it contains a label with the manufacturing number (1).

### Exterior of the equipment

On the back of the equipment, there appears a label with the same characteristics as the previous one (1).

### Nameplate

On the back of the machine.

Check that in interior of the machine the installation kit is complete and comprises:

- Ice scraper, 3/4 gas piper, 22 mm (0.86 inches) discharge hose, filters and manual, WARRANTY AND SERIAL NUMBER.
- In some models, shims are included



(1)

**CAUTION: ALL PACKING ELEMENTS (plastic bags, carton boxes and wood pallets) SHOULD BE KEPT OUTSIDE THE REACH OF CHILDREN, AS THEY ARE A SOURCE OF POTENTIAL HAZARD.**

## INSTALLATION

THIS ICE MAKER **IS NOT** DESIGNED FOR OUTDOOR OPERATION.

**An incorrect installation of the equipment may cause damages to individuals, animals or other materials, being the manufacturer not responsible for such damages.**

### CAUTION:

The FINGER ICE machines are designed to operate at room temperature between 5°C (41°F) and 43°C (109.40°F), with inlet water temperature between 5°C (41°F) and 35°C (95°F).

There may be some difficulties in ice-cube removal under the minimum temperatures. Above the maximum temperature, the life of the compressor is shortened and the production is substantially less.

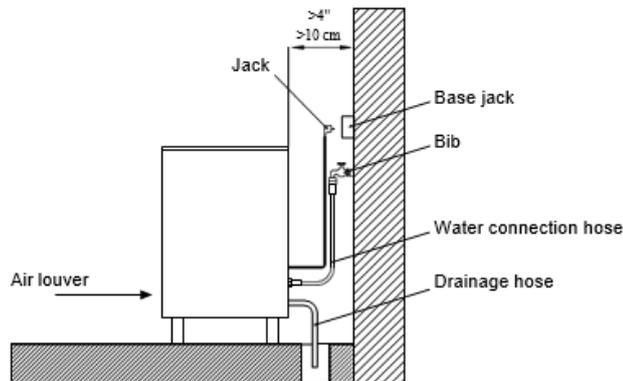
Do not place anything over the maker or facing the front louver.

In case the front air louver is not enough, the exit is either total or partially obstructed or due to

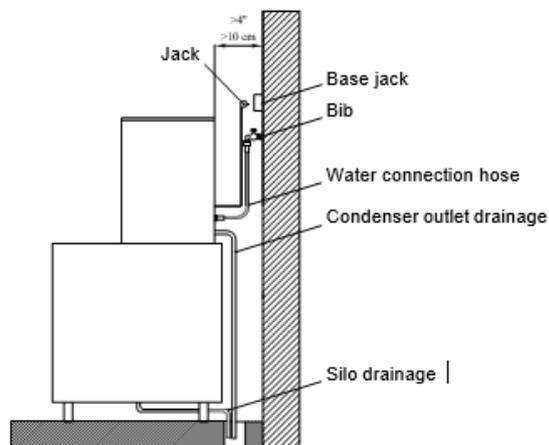
its placement, it will receive hot air from another device, we strongly recommend, in case it is not possible to change the location of the machine, **TO INSTALL A WATER CONDENSER.**

**IT IS IMPORTANT THAT THE WATER PIPING DO NOT PASS BY OR NEAR SOURCES OF HEAT SO AS NOT TO LOSE ICE PRODUCTION.**

**THREAD THE SUPPORT LEGS TO THE BASE OF THE MACHINE ON THE HOUSING SET TO SUCH END AND REGULATE THE HEIGHT AS TO HAVE THE EQUIPMENT PERFECTLY LEVELED.**



### IN MODULAR MACHINES MP145



## WATER AND DRAINAGE

Water quality has a remarkable influence on the appearance, hardness and flavor of the ice as well as on the condensates by water on the life of the condenser.

### CONNECTIONS TO THE WATER NETWORK

Use a flexible pipe (1.3 m – 4.27 feet length) with the two filter joints supplied with the machine. We strongly discourage the use of two-exit bibs and two switches as, due to an error could close that back one, leaving the machine without water supply. This could result on a damage call without actually existing one.

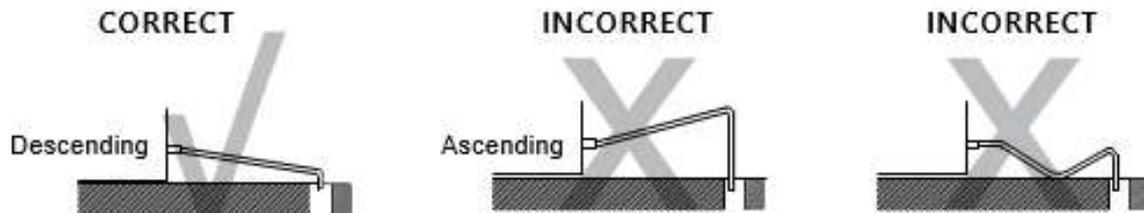
Pressure should be established between 0.7 and 6 Kg/cm<sup>2</sup> (10 / 85 psi.)

If pressures overpass such values, install the necessary corrective devices.

### CONNECTION TO DRAINAGE

Drainage should be located lower to the machine level, at 150 mm (6") minimum.

It is convenient that the drainage pipe is of 30 mm (1-1/8") of interior diameter and with a minimum gradient of 3 cm (1.18 in) per meter (see figure).



## ELECTRICAL CONNECTION

IT IS MANDATORY TO GROUND THE EQUIPMENT.

**To avoid possible discharges on individuals or damages to the equipment, the machine should be grounded pursuant local and/or national regulations as the case may be.**

THE MANUFACTURER SHALL BE HELD HARMLESS IN CASE OF DAMAGES ARISING DUE TO THE LACK OF THE GROUND INSTALLATION.

The machine is supplied with a 1.5 m (4.92 feet) cable of length. In case the supply cable is damaged, it should be replaced by a cable or special assembly to be furnished by the manufacturer or post-sale service. Such replacement should be performed by qualified technical service only.

The machine should be placed in such a way as to allow a minimum space between the back and the wall to allow an easy access and without risks to the cable jack.

Safeguard the base of the jack.

It is convenient to install adequate switches and fuses.

Voltage and tension are indicated in the nameplate and on the technical specifications of this manual.

Variation on voltage above the 10% stated on the nameplate could result on damages or prevent the machine start-up.

The line up to the jack should have a minimum section of 2.5 mm<sup>2</sup> (0.0038 in<sup>2</sup>).

## INSTALLATION OF MODULAR EQUIPMENTS OVER DEPOSITS OR SILOS

Modular makers should be installed over deposits or silos, following the instructions contained in this manual.

The resistance and stability of the container-machine/s assembly should be verified, as well as the fastening elements.

## START-UP

### PREVIOUS CHECKUP

Is the machine leveled?

Are voltage and frequency the same as those on the nameplate?

Are the discharges connected and operating?

\*\* If air condensed: Are the air circulation and site temperature appropriate?

	ROOM	WATER
<b>MAXIMUM</b>	<b>43°C / 109,40°F</b>	<b>35°C / 95°F</b>
<b>MINIMUM</b>	<b>5°C / 41°F</b>	<b>5°C / 42°F</b>

- \*\* Is water pressure appropriate?

<b>MINIMUM</b>	<b>0.7 KG/CM<sup>2</sup> (10 PSIG)</b>
<b>MAXIMUM</b>	<b>6 KG/CM<sup>2</sup> (85 PSIG)</b>

**Note:** In case input water pressure is higher that 6 kg/cm<sup>2</sup> (85 psig), install a pressure reducer. PRESSURE SHOULD NEVER BE REDUCED CLOSING THE BIBB CONNECTION.

## START-UP

Once the installation instructions are followed (ventilation, site conditions, temperatures, waterquality, etc.), proceed as follows:

1. In the case of modular modules, remove the upper cover to access the installation kit (filters, connection hoses, legs, etc.).
2. In case of compact models, open the deposit door to access the installation kit.
3. Connect the drainage following the instructions indicated in this manual.
4. Open the water inlet. Verify the existence of leakages.
5. Connect the machine to the electrical network.
6. Verify that there are no vibrations or frictions on the elements.
7. Verify the start of ice production.
8. Verify that after 15 minutes, the frost on the aspiration pipe is at 20 mm (0.78 in) of the compressor.

### **CAUTION:**

**INSTRUCT THE USER ABOUT MAINTENANCE, INFORMING THAT: MAINTENANCE AND CLEANING OPERATION AS WELL AS DAMAGES DUE TO THE LACK OF SUCH OPERATIONS: ARE NOT INCLUDED ON THE WARRANTY.**

The technical installer shall invoice traveling costs, hours and materials used on such operations.

## REGULATING

### 1. Condenser water valve pressure switch

(UNTIL PRESSING 35 WATER CONDENSATION)

The pressure switch controls the high pressure by stopping and starting of the condenser water valve. The differential is fixed at 1 kg/cm<sup>2</sup> (14 Psi).

The stop pressure should be 16 Kg/cm<sup>2</sup> (228 Psi), equivalent to a condensation water outlet temperature of 38°C. Below this pressure there may be difficulties in the separation of the ice cubes.

Above this pressure, the compressor life is shortened and ice production decreases.

These figures are valid when the water reaches less than 32°C. Above this temperature, the pressure and outlet temperature of the water increases.

Turning clockwise increases the pressure. One turn is equivalent to approximately 1.5 Kg/cm<sup>2</sup>.

### 2. Water valve pressure switch (from pressure switch model 45W)

REGULATION: By turning clockwise, the valve opens (decreases the water pressure and temperature).

Pressure switches

### 3. Fan pressure switch (air condensation)

This pressure switch controls the high pressure by fan stop and start. The differential is fixed at 1 Kg/cm<sup>2</sup> (14 Psi). The stop pressure must be 16 Kg/cm<sup>2</sup> (228 Psi). Below this pressure, there may be difficulties for the cubes to detach.

Above it, compressor life is shortened. And ice production decreases.

Turning clockwise increases the pressure. One turn equals approximately 1.5 Kg/cm<sup>2</sup>.

### 4. Safety pressure switch

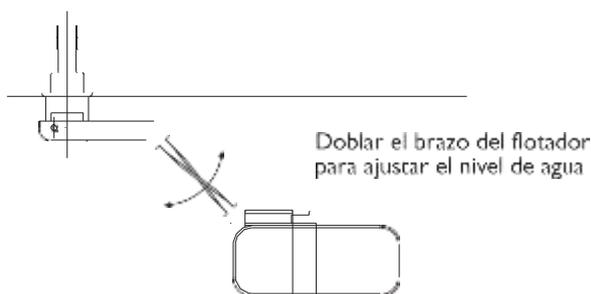
The pressure switch has a safety function in the event of excessive discharge pressure, which may be caused by:

- a) Dirty condenser, poor air circulation, or very high room temperature (air condensation).
- b) Lack of water or very high water temperature (water condensation).

HIGH PRESSURE REGULATION (fixed) 27-21 Kg/cm<sup>2</sup> (380-296 Psi)

### 5. Float valve level (Pulsar Modular models only)

This valve is factory set; however, there may be variations with extreme water pressure values. If an adjustment is required, it should be done manually with care by bending the steel arm that fixes the float (DO NOT force the float while bending). The level should not exceed 30 mm, as it will slow down the manufacturing time by bringing in mains water (hot) during the manufacturing process.



If water pressure variations are high, it is recommended to install a pressure regulator, due to the difficulty of maintaining a constant water level.

\*Bend the float arm to adjust the water level

## MAINTENANCE AND CLEANING INSTRUCTIONS

**CAUTION:** Maintenance and cleaning operations, and damages due to the lack of those activities: Are not included on the warranty.

If a good maintenance is performed, the machine will continue producing a good quality ice and will be free of damages.

Maintenance and cleaning intervals will depend on the conditions of the location and water quality.

**CAUTION:** At least, one revision and cleaning should be performed every six months.

On dusty environments, it might be necessary to clean the condenser on a monthly basis.

### MAINTENANCE AND CLEANING PROCEDURES

**CAUTION:** For all cleaning and maintenance operations: Disconnect the machine from the power supply.

#### WATER CONDENSER

1. Disconnect the machine.
2. Disconnect the water inlet and outlet from the condenser.
3. Prepare a solution at the 50% of phosphoric acid and distilled or demineralized water.
4. Make the solution circulate through the condenser. (The solution is more effective if hot –between 35°C [95°F] and 40°C [104°F]).

**DO NOT USE HYDROCHLORIC ACID.**

#### AIR CONDENSER

5. Disconnect the machine.
6. Disconnect the water inlet or close the bib.
7. Clean the louvered area with the help of an aspirator with a brush, non-metallic brush or low-pressure air.

#### CLEANING THE STOCK CONTAINER (COMPACT MODELS)

8. Disconnect the machine, close the water and empty the ice-cube stock.
9. Use a dishcloth and bleach with detergent.
10. In case the white lime spots remain, rub them with lemon, wait a few minutes and use again a dishcloth. Clear with water, dry and start the machine again.

## EXTERIOR CLEANING

Use the same procedure as the one indicated for the container.

## CLEANING OF THE INLET FILTERS

They are easily obstructed during the first days of operation, MAINLY WITH NEW PIPING INSTALLATIONS. Loose the hose and clean it under water.

## WATER LEAK CONTROL

When working on the machine, always check the water connections and drainage, status of the clamps and hoses with the purpose of avoiding leakages and prevent damages or floods.

### Maintenance table

PERFORMANCE	MONTHLY	QUARTERLY	HALF-YEARLY	ANNUALY	BIENNIAL	UNIT TIME
Cleaning air condenser	○	○	■	■	■	30 min
Cleaning water condenser				□	■	90 min
Cleaning of the water circuit		□	□	■	■	45 min
Cleaning of sanitary facilities		□	□	■	■	30 min
Cleaning/change water filters	■	□	■	■	■	30 min
Cleaning of stock tank	●	●	●	●	●	--
Cleaning of exterior	●	●	●	●	●	--

- Depending on site conditions
- Depending on water quality and conditions
- TO BE PERFORMED BY THE USER
- ESSENTIAL

### MAINTENANCE AND CLEANING OPERATIONS AND BREAKDOWNS CAUSED BY THEIR OMISSION ARE NOT COVERED BY THE WARRANTY

The installer will bill for travel, time and materials used in these operations.

# TABLE OF INCIDENTS

SYMPTOMS	POSSIBLE CAUSES	CORRECTION
1) No electrical components work	<ul style="list-style-type: none"> <li>a) The machine is unplugged</li> <li>b) The line fuse is blown or the circuit breaker or differential disconnected.</li> <li>c) The power supply is incorrectly connected or in poor condition,</li> <li>d) Faulty safety pressure switch.</li> <li>e) Stop thermostat incorrectly set or defective.</li> </ul>	<ul style="list-style-type: none"> <li>a) Plug in the machine</li> <li>b) Replace the fuse or reset.</li> <li>c) Check connections and supply cable.</li> <li>d) Replace</li> <li>e) Check and adjust or replace.</li> </ul>
2) All electrical parts are working. Compressor does not operate.	<ul style="list-style-type: none"> <li>a) Loose wire</li> <li>b) Compressor relay defective</li> <li>c) Klixon defective</li> <li>d) Compressor defective</li> </ul>	<ul style="list-style-type: none"> <li>a) Check connections.</li> <li>b) Change the relay.</li> <li>c) Change Klixon.</li> <li>d) Change compressor.</li> </ul>
3) All electrical parts are working. The compressor clicks.	<ul style="list-style-type: none"> <li>a) Low voltage</li> <li>b) Dirty condenser</li> <li>c) Faulty or blocked air circulation</li> <li>d) Fan defective</li> <li>e) Defective compressor electrolytic condenser</li> <li>f) Fan pressure switch incorrectly regulated or defective</li> <li>g) Water pressure valve incorrectly set or defective</li> <li>h) Water condensation pressure switch incorrectly set or defective.</li> <li>i) Defective condensing water inlet valve.</li> <li>j) Non-condensable gases in the system.</li> </ul>	<ul style="list-style-type: none"> <li>a) Check voltage and lines.</li> <li>b) Clean</li> <li>c) Improve air circulation</li> <li>d) Change ventilator</li> <li>e) Change</li> <li>f) Adjust or change</li> <li>g) Adjust or change</li> <li>h) Adjust or change</li> <li>i) Change</li> <li>j) Vacuum and charge gar.</li> </ul>
4) Everything seems to be working fine, but no ice is produced in the evaporator.	<ul style="list-style-type: none"> <li>a) Inefficient refrigeration system (dirty condenser, defective or poorly regulated pressure switch or condensation water inlet valve or lack of refrigerant).</li> <li>b) Humidity in the system.</li> <li>c) No water entering the tank</li> </ul>	<ul style="list-style-type: none"> <li>a) Check components and system</li> <li>b) Change the dehydrator, vacuum and charge.</li> <li>c) Check water inlet solenoid valve and replace if necessary..</li> </ul>
5) Cubes form, but do not detach.	<ul style="list-style-type: none"> <li>a) Dirty water inlet filters.</li> <li>b) Low water pressure.</li> <li>c) Fan or condensing water pressure switch too low or broken.</li> <li>d) Defective condensing water inlet valve (machines condensed by water without pressure).</li> <li>e) Too open or defective water pressure switch valve (machines condense with water with this valve).</li> <li>f) Ambient or water temperature below 7°C.</li> <li>g) Faulty programmer or microprocessor.</li> <li>h) Manufacturing time too long. The cubes have chips outside the mold.</li> <li>i) Hot gas valve defective or incorrectly connected.</li> </ul>	<ul style="list-style-type: none"> <li>a) Clean filters.</li> <li>b) Increase the pressure (sometimes the problem is solved by removing the flow meter from the water inlet valve).</li> <li>c) Adjust or replace</li> <li>d) Check or replace</li> <li>e) Adjust, repair or replace</li> <li>f) Increase takeoff time.</li> <li>g) Check and eventually change.</li> <li>h) Adjust by reducing cycle thermostat time.</li> <li>i) Check and possibly change.</li> </ul>
6) Low ice production	<ul style="list-style-type: none"> <li>a) Dirty condenser, obstructed air circulation or hot air is received from another appliance.</li> <li>b) (Water condensed machines). Dirty condenser, incorrectly set pressure switch, defective water inlet valve or too closed or defective water pressure valve.</li> <li>c) Defective hot gas valve, always lets some hot gas through (tube temperature is an indication).</li> <li>d) Fan pressure switch or condensing water inlet valve set too low or defective.</li> <li>e) Refrigerant charge too high or too low.</li> <li>f) Water inlet valve does not close (leaks).</li> <li>g) Compressor ineffective.</li> </ul>	<ul style="list-style-type: none"> <li>a) Clean condenser, release air circulation or change the location of the machine.</li> <li>b) Clean condenser or adjust pressure switch or pressure switch valve and replace if necessary.</li> <li>c) Replace the hot gas valve.</li> <li>d) Adjust or replace</li> <li>e) Adjust the load</li> <li>f) Check and replace if necessary.</li> <li>g) Change the compressor</li> </ul>
7) The cubes are so large that they join together and form a slab of ice	<ul style="list-style-type: none"> <li>a) Cycle start thermostat set too low or defective.</li> <li>b) Touch wheels do not turn.</li> <li>c) Programmer motor is faulty.</li> <li>d) Programmer micro-switches in bad condition or incorrectly connected.</li> </ul>	<ul style="list-style-type: none"> <li>a) Adjust and/or change</li> <li>b) Tighten screws</li> <li>c) Check and replace.</li> <li>d) Check connections and/or replace.</li> </ul>
8) Cubes too full.	<ul style="list-style-type: none"> <li>a) Cycle thermostat set too high</li> </ul>	<ul style="list-style-type: none"> <li>a) Adjust the thermostats</li> </ul>
9) Cubes too empty.	<ul style="list-style-type: none"> <li>a) Cycle thermostat set too low</li> <li>b) Refrigerant charge too low</li> </ul>	<ul style="list-style-type: none"> <li>a) Adjust thermostat</li> <li>b) Re-gas until at the end of the cycle the ice is 5 cm away from the compressor.</li> </ul>
10) Empty cubes, with irregular and very white edges	<ul style="list-style-type: none"> <li>a) Loss of water in the water tank during the cycle.</li> <li>b) Curtain slats do not close tightly, lock up and water is lost</li> </ul>	<ul style="list-style-type: none"> <li>a) Eliminate water leakage</li> <li>b) Adjust the curtain slats or clean the shaft (it may have scale that prevents the slats from turning smoothly).</li> </ul>

11) The machine does not stop, even if it is full of ice cubes	a) Poorly regulated or defective stock thermostat	a) Adjust and/or change
12) The cubes are melted in the stock tank	a) Obstruction in the drainage of the machine or in the drainage of the installation	a) Unblock