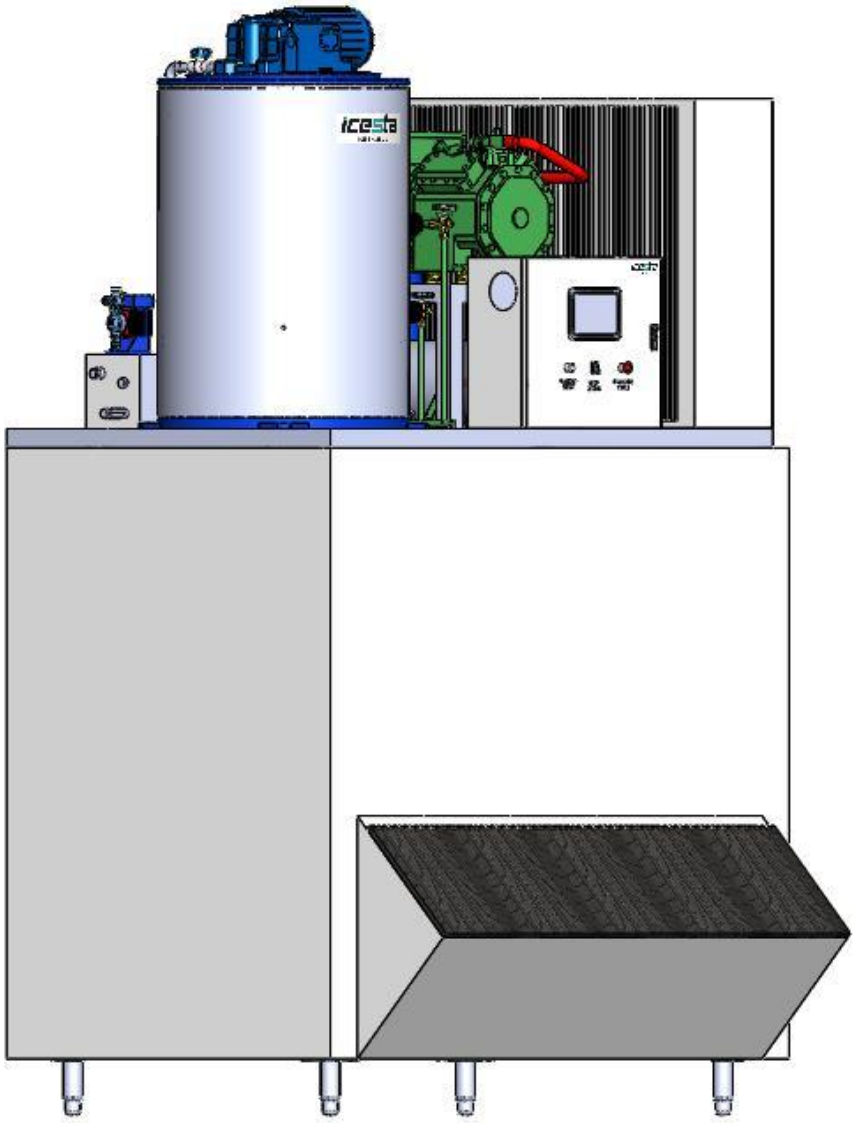
Small Flake Ice Machine

Directives of Installation, Operation & Maintenance



Shenzhen Brother Ice System Co., Ltd
Website: www.icesta.com

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Warnings & Notes

"Warnings" and "Heeds" and "Notes" signs will be shown in appropriate positions in this document. Please read carefully the contents below these two signs.

Warning: This sign indicates there are occasions of potential danger, ignorance of which may cause deaths or severe personal injuries.

Heed: this sign indicates there are occasions of potential danger, ignorance of which may cause minor personal injuries. It is shown as a reminder of unsafe operation

Note: This sign indicates there are occasions of potential equipment damage or property damage

Warning tags on the related equipment are all listed in this document and should be taken attention to

Care of the Environment!

It is indicated through scientific research that some man-made chemicals are released to the atmosphere which has depleted the ozonosphere. Special attention should be paid to the following chemicals which are the main ozonosphere depletion materials: CFC, HCFC. ICESTA advocates a responsible way of dealing with all refrigerants and use of replacements of refrigerant that contains CFC and HCFC, like HFC.

The Refrigerants ICESTA uses are those stipulated in *Montreal Protocol* which do no harm to the environment

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Summarization

Please read carefully this manual before installing, commissioning and operating the ice machine.

This manual introduces the working conditions, performance parameters, installation and commissioning, and operation procedures of IF series flake ice machines. This series of flake ice machines goes with their ice storage bins. Ice making system is that of an inner ice scraping. The ice machine is equipped with a PLC control, which monitors all procedures of it, protects it and gives failure information on a screen for trouble shooting purposes. With a touch screen, the failures can be easily diagnosed and eradicated.

Applicable Model List:

Machine Type	Model No	Daily Capacity
Flake Ice Machine	IF05T	500kg/24Hr
	IF1T	1000kg/24Hr
	IF1.2T	1200kg/24Hr
	IF1.5T	1500kg/24Hr
	IF2T	2000kg/24Hr
	IF2.5T	2500kg/24Hr
	IF3T	3000kg/24Hr
	IF5T	5000kg/24Hr

Machine Identification:

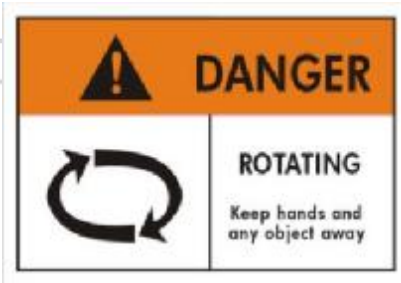
When operating and maintaining the machine, the following identifying signs should be given special notice to avoid personal injuries or equipment damage.

A. High Temperature Sign, which is normally found near a compressor or compressor's discharge pipe. When the machine is in operation, touching on these pipes are strictly prohibited to avoid skin scalds:

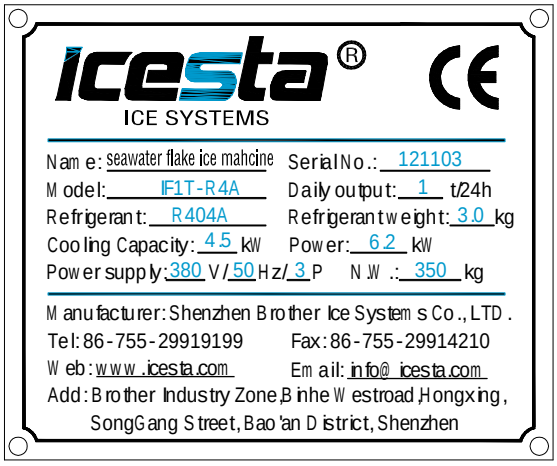
B. Earthing Sign, is located in a lower position inside a control box. An Grounding cable should be properly connected for control box wiring:

C. Electric Shock Sign, is located on the bottom corner of the control box door, which reminds of careful operation side the control box.

D. Rotation Sign, located in the revolving parts of a motor and fan, reminding of danger of clamping a figure.



E. Name Plate, located on the bottom of an evaporator, shows the model number of the ice machine and related parameters.



Model No Naming

Name plate of each piece of equipment is located on bottom of an evaporator. A typical name plate is shown as follows, including the following information of the equipment.

Equipment's name and model info

Equipment's serial number and daily capacity

Equipment's power consumption and weight

Equipment power requirement

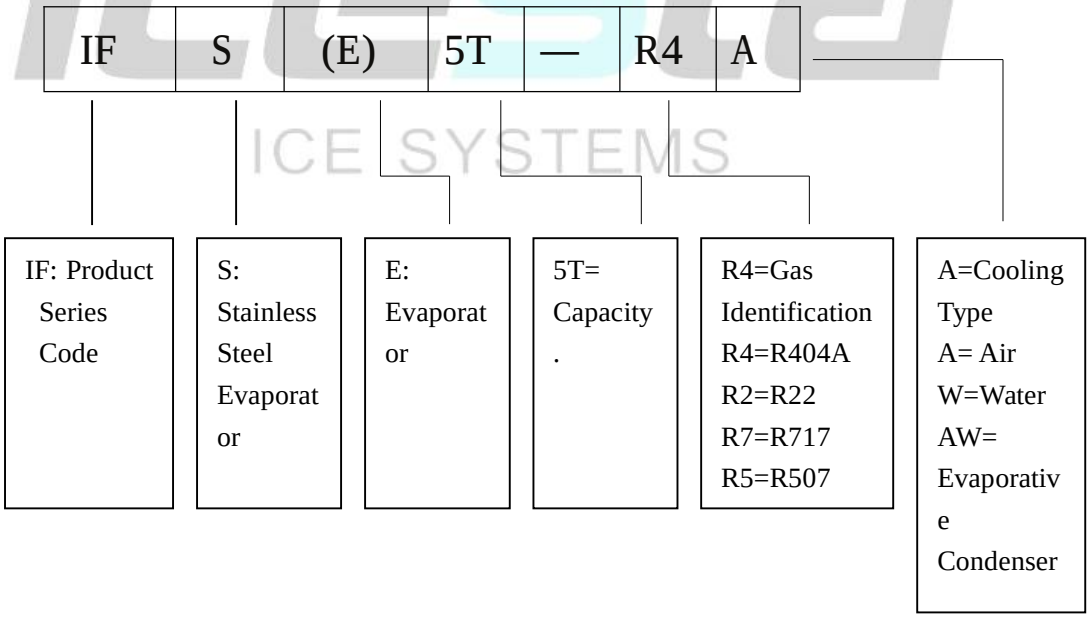
Correct type of refrigerant and amount of this refrigerant

Manufacturer's information

Model Number – this number is important for identifying features in cases of purchasing replacement or maintenance.

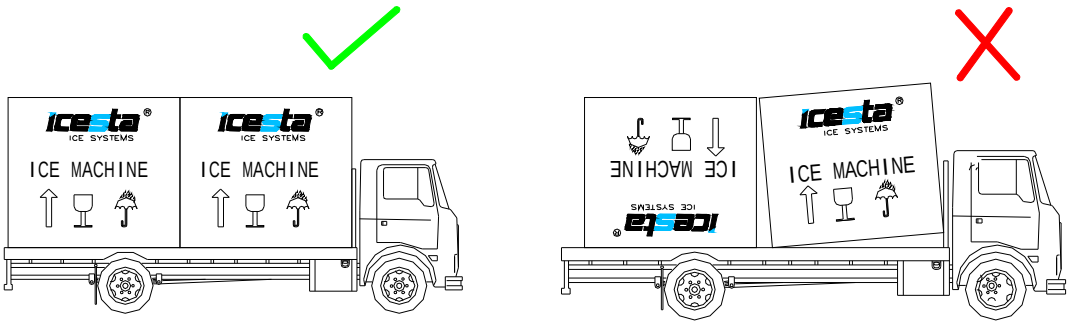
Serial Number – this number provides a unique identity for every single piece of equipment manufactured by ICESTA. This number should always be presented to ICESTA for telephone maintenance service and component identification.

Standard model number naming codes and their meaning:



Installation

Transportation



Check if there is any transportation damage to the external packing before unloading.

Each ice machine is a hermetic and complete package prior to shipment. All connections are done properly. The machine is tested in the factory. A split style ice machine or a water cooling part of a water cooled type machine is shipped in different parts.

All valves are closed during transportation to avoid refrigerant leakage during transportation and handling.

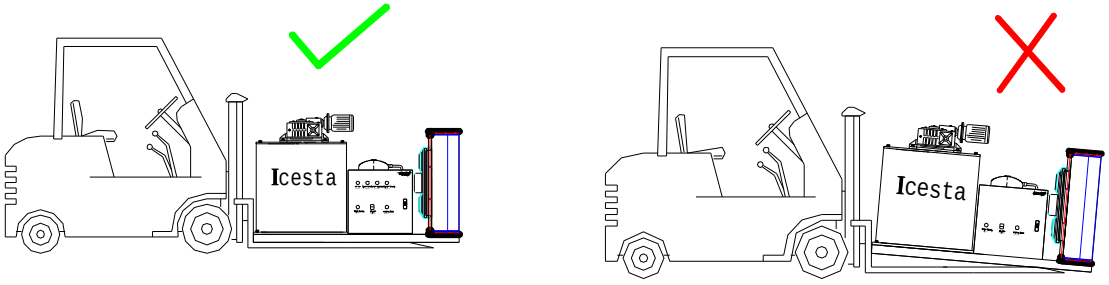
The enclosed shipping list indicates the amount, model number of the shipped goods. Check thoroughly if there is any damage or shortage. And check:

1. pressure meters and its readings for confirmation of compactness and tightness of the equipment;
2. and find the accessory box that goes with the shipment;
3. the oil level mirror and confirm there is refrigeration oil in the system. When oil level is not visible in your system, contact the local distributor of ICESTA or the company's headquarter immediately.

Unloading

Unloading and craning of the subject equipment must be done with the assistance of a forklift or crane.

For an ICESTA ice machine of daily capacity 15T (including), a crane must be present for unloading and installing.



Installation

Installation Requirements and User's Responsibilities

List of jobs and responsibilities is shown below (Subject to a specific contract)

Starting ICESTA's ice machine must be done by ICESTA's servicing staff or technical staff of a contracted company approved by ICESTA.

Requirement	ICESTA Provides ICESTA Installs	ICESTA Provides Onsite Installation	Customer Provides Onsite Installation
Foundation			Meets the required foundation
Unloading & Craning			Forklift or Crane
Power Supply	1. Circuit Breaker Included. 2. 3 meters of power cable supplied for machine lower than 8T 3. 20 meters of power cable supplied for cooling tower and cooling pump.	Power cable connection is done on site.	1. Main Power circuit breaker or fusible switch (Recommended by ICESTA) 2. Connecting of cables to the ICESTA control Box 3. Wire Terminal connection 4. Earthing Cable Connection
Water Piping	Water pipe supplying for ice maker: 1.5 meter Cooling Tower: 20 meters	Connecting water pipe on site	1. Thermometer (upon request) 2. Filter (upon request) 3. Interface reserved for Ice machine & cooling tower water supply, distance no farther than 1.5 meter.
Safety Auxiliary Devices			Ventilation conduit
Insulation material	For Split type machine	For Split type machine	For Split type machine
Water Pipe Connectors	Differs Depending on Different Models		Onsite commissioning
Other Materials			Refrigerant (Upon Request) Nitrogen (Upon request) Contractual items

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Placing the machine before installation

Requests for placing an ice machine before installation:

1. Solid Foundation
2. No vibration
3. Dry environment
4. Temp range: -40 to 70 degrees
5. Keeping the plastic cover as it is
6. No refrigerant filling
7. Storing the refrigerant as instructed by the manufacturer.
8. Conducting pressure and leakage check after a non-use period of 1 year.

Basic Parameters:

Model No	Size(mm)	Size with Ice Bin(mm)	Weight(kg)
IF05T-R4A	1280*800*800	1280*1082*1850	300
IF1T-R4A	1320*900*900	1320*1183*2100	450
IF1.2T-R4A	1320*900*900	1320*1183*2100	460
IF1.5T-R4A	1400*950*1000	1500*1384*2300	480
IF2T-R4A	1500*1100*1050	1500*1383*2350	500
IF2T-R4W	1500*1100*1050	1500*1383*2350	530
IF2.5T-R4A	1500*1200*1100	1700*1519*2835	550
IF2.5T-R4W	1500*1200*1100	1700*1519*2835	580
IF3T-R4A	1640*1200*1200	1700*1518*2935	600
IF3T-R4W	1500*1200*1200	1700*1518*2935	650
IF5T-R4A	2030*1650*1420	1700*2018*3255	960

Working Environment

To ensure the normal performance of electrical components of the ice machine, please do not place it in a dusty/muddy/corroding gas/overheated/over humid environment.

	MIN	MAX
Ambient Temp	5℃	45℃
Water Temp	5℃	35℃
Water Feed Pressure	0.15MPa	0.5MPa
Rated Power Error	-10%	+10%

Attention:

Potential equipment damage!

When the ice machine is running in an environment of ambient temp higher than 45 degrees, the compressor is working at its upper limit. That may add to the possibility of refrigeration system failure and component damage.

If the control box is not well ventilated, the components inside may be damaged. Ventilation conditions in the control room are essential for ice machine performance.

Foundation Requirement

To ensure good performance of ICESTA ice machine, a level calibration should be done after the machine is put on the foundation. The deviation should be kept within 2mm.

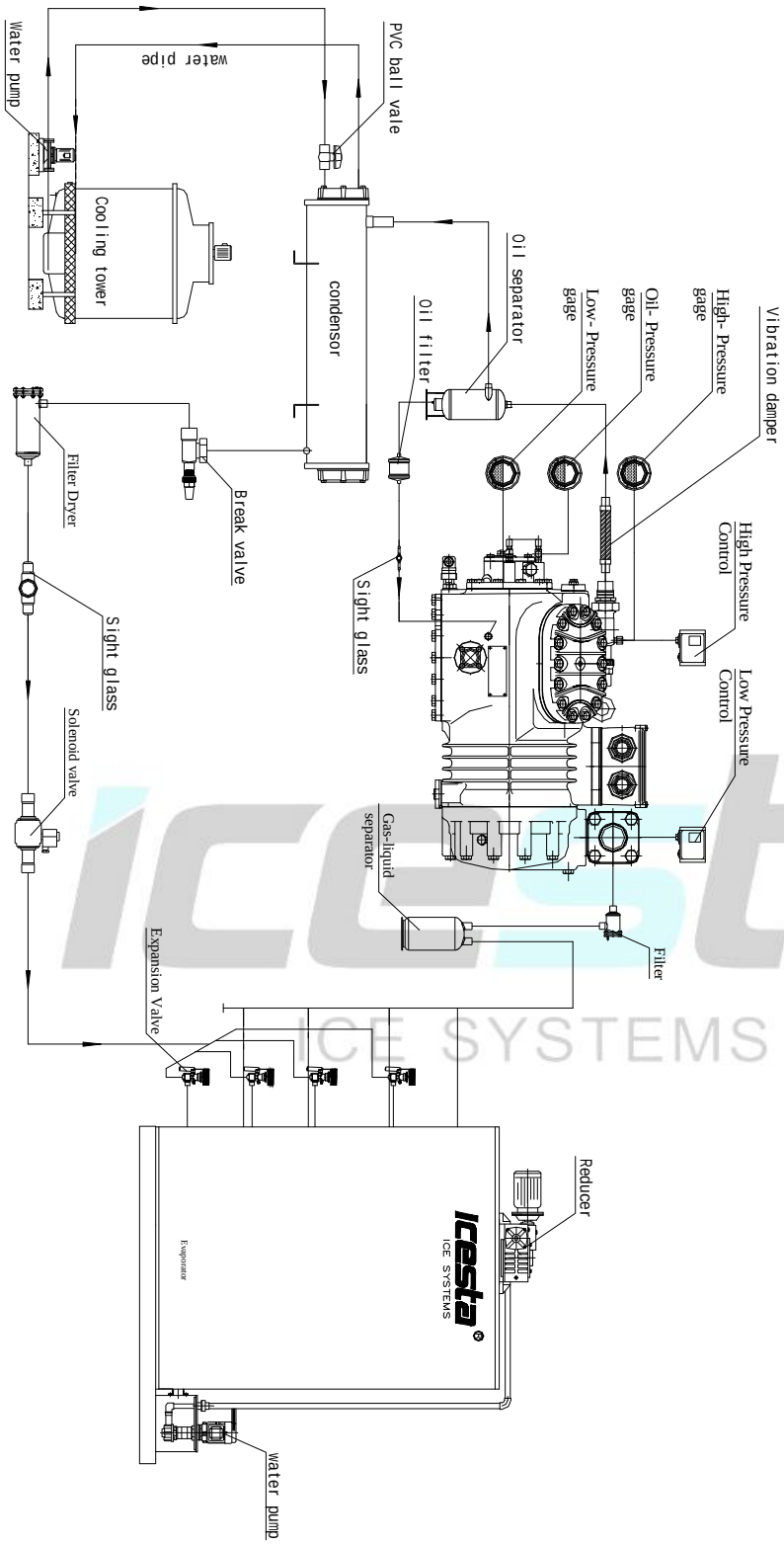
The weight figure for each ice machine in this manual is an approximate. Please refer to the file that is submitted for foundation requirement for an actual weight of the subject ice machine. ICESTA is not to be held responsible for any damage caused by improper foundation.

Electric and water supply requirement:

Model No	Power Supply	Cable(mm2)	Breaker	Water Pipe
IF05T-R4A	3P/380V/50Hz	3×2.5＋2×1.5	16A	1/2”
IF1T-R4A	3P/380V/50Hz	3×2.5＋2×1.5	16A	1/2”
IF1.2T-R4A	3P/380V/50Hz	3×4＋2×1.5	16A	1/2”
IF1.5T-R4A	3P/380V/50Hz	3×4＋2×1.5	32A	1/2”
IF1.5T-R4W				
IF2T-R4A	3P/380V/50Hz	3×6＋2×1.5	32A	1/2”
IF2T-R4W				
IF2.5T-R4A	3P/380V/50Hz	3×6＋2×1.5	32A	1/2”
IF2.5T-R4W				
IF3T-R4A	3P/380V/50Hz	3×6＋2×4	32A	1/2”
IF3T-R4W				
IF5T-R4A	3P/380V/50Hz	3×10＋2×6	63A	1/2”
IF5T-R4W				

Installation

Major Components of ICESTA Ice Machine (Typical Ice Making Cycle)



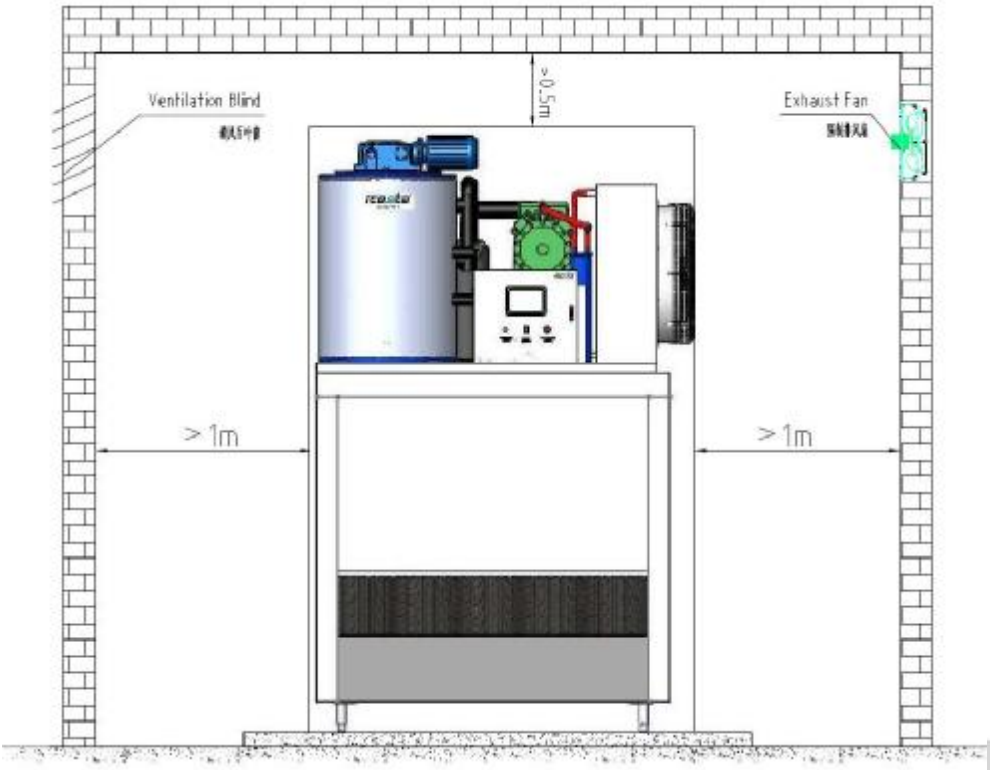
Note: ICESTA ice machines may not include all components listed above.

Installation

Machine Maintenance Space

Proper maintenance space should be kept around and above the ice machine for

servicing and maintenance operation.



Craning

A crane of forklift is supposed to be present for handling of the ice machine. Please refer to crane chapter for the details.

Warning!

Steel ropes (steel chains or slings) must be chosen in accordance with manufacturer's advice. Each and every of steel rope (steel chains or slings) should bear the subject ice machine weight. Proper adjustment of the rope length should be done to assure a smooth and level craning action. Improper craning other than what is suggested may cause death or severe personal injuries.

Improper craning of the ice machine!

Attempt to lift the ice machine up by 50 cm from the ground to check of the correct gravity center. And adjust the gravity center if necessary. Improper craning of ice machine may cause death or severe personal injuries or cause severe damage to the ice machine or other properties.

※ Note: Proceed cautiously to avoid any damage to the wiring inside the control box during craning and reassembly activity.

Installation

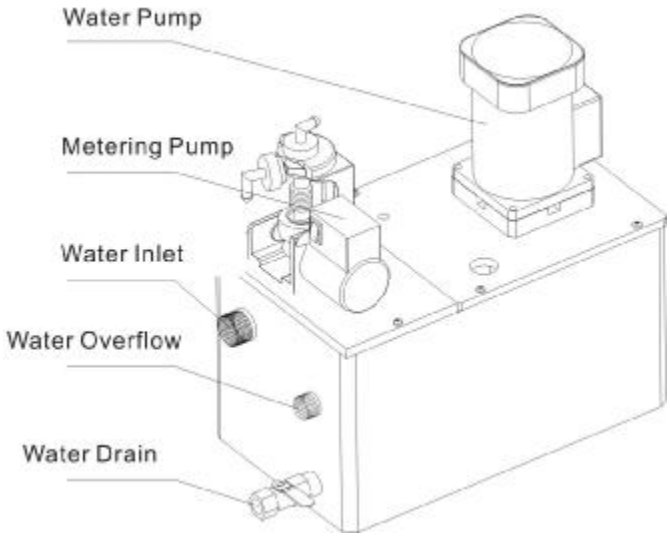
Steps of Placing Ice Machine & Ice Bin:

Placing the ice machine on top its Ice bin, as shown below:

Make sure the floor is level for the ice machine and ice bin:

Water Pipe Connection

Connect the water inlet to a water supply line using soft water pipe/PVC pipe. And connect the Water Overflow and Water Drain to another Water pipe with height difference no less than 4 cm.



Installation

Water Pipe Connection

More than just one water pipe should be connected to the ice machine.

Note: a reasonable layout and supporting of water pipe is necessary to offset

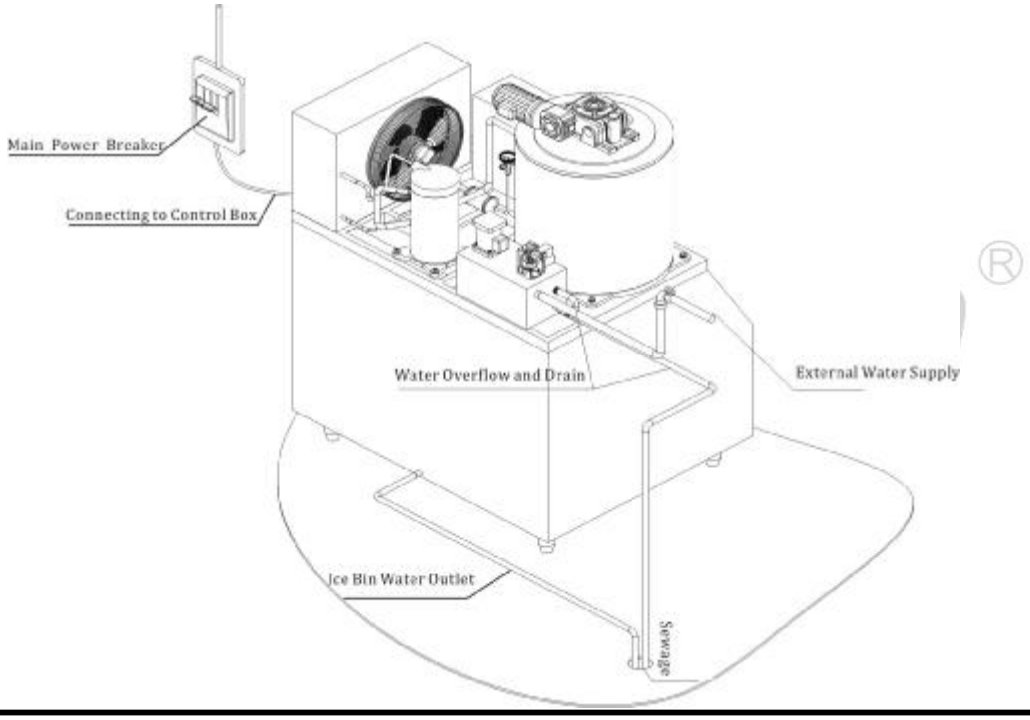
unnecessary pressure to the system. A distance of 1 meter should be kept between water piping and ice machine. This will help with a correct arrangement for the installation job on site.

Water Treatment

The water that is used for the condenser should be properly treated to avoid scaling, corrosion, alga or silt accumulation. User is suggested to filter the water used for the condenser. Damages caused to the ICESTA equipment by water untreated or not properly treated are not to be taken care of by ICESTA.

Filter

Filtering water of ice making can be decided by user depending on their specific requirements. Installing filter between the main water supply and the ice machine water inlet is highly suggested.



※Note:

When the ice machine is not to work for a long time, you are suggested to drain the water inside the cooling tower and condenser and clean the heat exchanger of the condenser before starting the machine next time.

Customer will take care of the damage servicing charge if it is caused by bad water quality.

Installation

Electric Supply Connection

Note: Electric cables on the installation site should be in compliant with national electrical regulations and directives or any national or local regulations applicable. Please

make sure that earthing is properly done.

All cable connections on site should be done in accordance with correct terminals. A through check should be done on the possibility of short-circuit and improper grounding.

Heeding: Refer to the electric diagram that goes with the ice machine for details of wire connections.

The subject ice machine is supposed to work on a power supply of 3-phase (5-core cable). There must be three live wires, one neutral wire and one grounding wire. The external power supply cable should comply with the electric feature of the ice machine. The power supply stability should be guaranteed and the error rate should stay within a range of ±10%.

$$\text{Current Error Rate} = \frac{\text{Max Current - Average of all 3 phases}}{\text{Average of all 3 phases}} * 100\%$$

$$\text{Voltage Error Rate} = \frac{\text{Max Voltage - Average of all 3 phases}}{\text{Average of all 3 phases}} * 100\%$$

Current Error Rate: ±3%; Voltage Error Rate: ±2.25%

The subject ice machine is supposed to work on a power supply of 3-phase (5-core cable). For the regions where the power supply is not sable, a voltage stabilizer is supposed to be installed for protecting the safe operation of the compressor.

A designated power supply control box is supposed to be in place for the ice machine.

※Note:

Damages caused by imbalanced voltage power supply are deemed as improper operation and not covered in our warranty policy.

All electric wires supplied for the ice machine electrical box must be copper cores which will help avoid corrosion and overheat on the wire connection terminals.

Control cables should be laid out in a protection cable tube and be separated from the electrical cables to avoid interference caused by electrical cables.

NOTE: Control cable of 24V should not be laid out in the same cable tube with that of a higher voltage. Electrical cables for main power supply should be selected according to the spec of Max current indicated on the circuit breaker inside the ICESTA control box. And the main power supply is supposed to be 1.3 times higher than the ICESTA equipment. Electrical cables should be capable of carrying electricity slightly higher than the max running current of the ICESTA equipment, with proper consideration of the working environment.

Installation

Power Supply Connection

Fusibility and circuit trip are indispensable elements in any electric cycle (Refrigeration and water cooling systems included). 5-core cable of 3 phases (neutral and grounding cables

included) is the basic requirement for an electric cable.

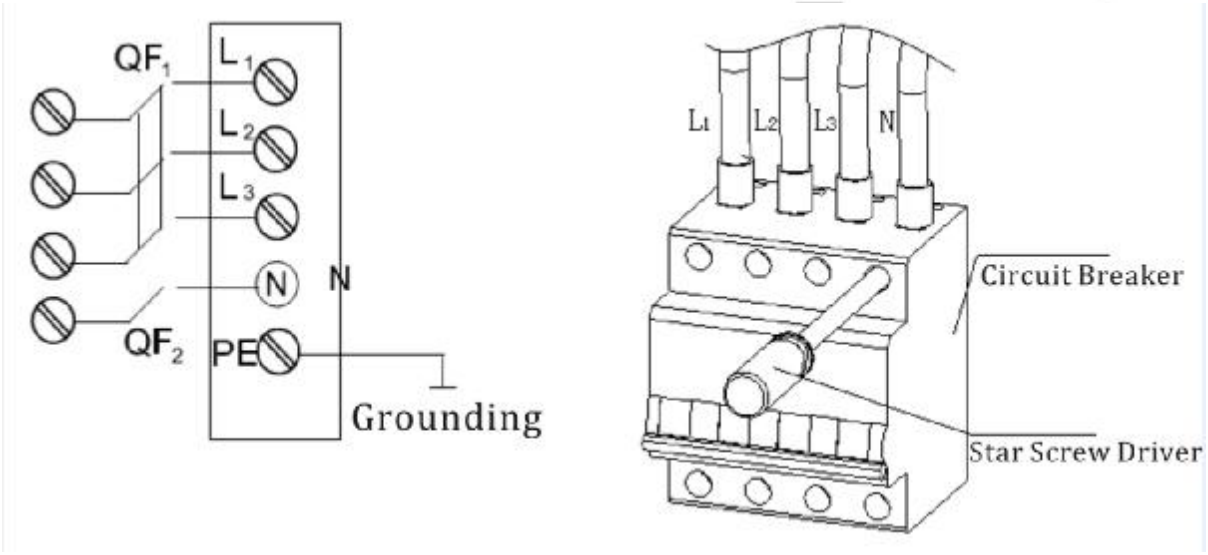
Modification by cutting to the electric control box for the purpose of electric connecting is not advised. When this is just required for wire connection, proceed with great caution and prevent metal scraps from falling inside the electric components. Metal scraps may cause electric short circuit or severe damage to electric components and personnel.

※ Note:

During the installation, commissioning, maintenance and trouble shooting process, there might be cases of control box being connected to live electricity. This kind of job should be done by an qualified electrician or qualified staff with an electric training background. Operations in this situation should be proceeded on with great caution and in strict accordance with electric safety precautious procedures to avoid death or severe personal injuries.

※ Warning:

Identify Neutral Wire and Live Wires (L1/L2/L3) while doing the wire connecting. Wrong wiring may cause severe damages to the electric components.



Prep for Running the Machine

Tools

Common refrigeration tools

Multimeter (Above Grade 3)

Clamp meter (Above Grade 5)

Pressure Meter

Refrigeration Pressure Gauge with Pipes (high pressure range: 0 – 3.5Mpa; low pressure range: 0-1.5Mpa)

500V Megger Tester

Power Check

A thorough check should be done by ICESTA technician or qualified serving staff authorized by ICESTA before starting the ice machine.

Electric Check

Check and confirm that the main power supply capacity matches the power rate of the ice machine and electric cables is capable of bearing the max working current before starting the ice machine.

Check and confirm the main power supply matches the electric requirement of the ice machine. It should be 3 phases of 5-core cable (Three live wires, one neutral wire and one grounding wire. The max voltage fluctuation rate should be ±10%).

Check and confirm all screws on wire terminals are tightly fastened (some terminal screws may come loose during the long distance transportation and craning). Ignoring this check may result in damage to the electric components in the control box (for example: circuit breaker and contactors). Check all the electric gauges and meters for correct wire connecting.

Check with a multimeter each and every electric line and confirm all wire connecting are well done. Check and confirm there is no electric short circuit with a megger tester.

Check and confirm the grounding wire is properly connected. The grounding wire resistance should be greater than 2 MΩ. Check and confirm all wires are in conformance with the requested capacities.

Check and confirm the electric cable of main power supply is connected with a main circuit breaker.

Refrigeration system Check

Make sure compressor's suction/discharge valves are open, and check valves are fully open;

Check and confirm the pressure value is normal;

Check and confirm the oil level of compressor is correct (in between 1/2~3/4 of the oil level mirror), and add refrigeration oil if there is not enough in it;

The refrigeration oil should be heated for a minimum period of 8 hours before starting the ice machine to prevent bubbles of refrigeration oil from running out of compressor during the starting of ice machine.

Prep for Running the Machine

The oil heater is still heating the oil when the ice machine stops. An oil temperature of 23 degrees is a necessity for compressor's normal operation.

Check the refrigerant filling status. When the machine is on its full load, and bubbles are

visible on the sight glass, that indicates that the filling of refrigerant is not sufficient. More refrigerant should be pumped into the system.

Check and confirm the compressor control box is correctly wired. Start the compressor and stop it immediately, and check the pressure changes. If the discharge pressure is rising and the suction discharge is falling, that means the wire is done correctly. Change the wire sequence otherwise.

Check motors for correct revolving directions.

Water System Check

Check and confirm that the water pumps and water pipe connections are properly connected before starting the machine;

Check and confirm water pump wiring and water flow control wiring is correctly connected (refer to the electric diagram);

Start the evaporator pump and turn on the water valve to check the working status;

Check the water flow direction; start cooling tower fan motor for checking the direction of fan, and change the wire sequence otherwise.

Turn off all the water valves that go into the ice machine water cycle before starting the machine. Make sure that the water is clean before it goes into the ice machine system.

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Running the Ice Machine

Power Supplying and Ice Machine Starting

When the installation is properly done, and electrical power is properly connected, switch on the main circuit breaker inside the ICESTA control box and the breakers of control system and neutral wire. The green power indicator on the control box is on. Put the power

switch on the control box to ON position. Put the Emergency Stop switch to OFF position. Make sure the water supply is normal(if a message of System Failure shows when power is connected, put the main power supply breaker down, and change either two of the live wires of the power supply and switch the breaker on). Press Start/Stop button, the machine starts. First the reducer starts revolving, then the condenser fan, then refrigeration part like solenoid valve starts. 30 seconds later, the compressor starts working. The first batch of ice flakes drops into the ice bin 3 minutes after machine works. And 10 minutes later, the machine is working at its full load.

Stopping the Machine

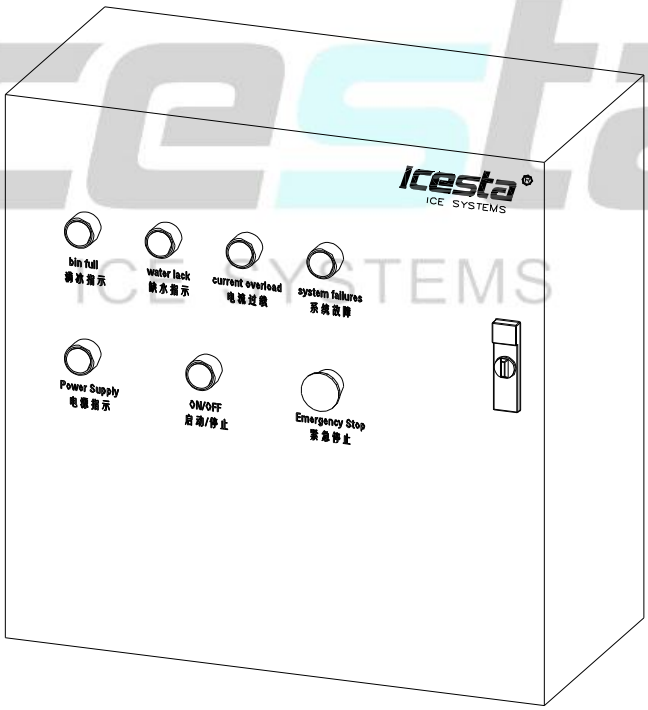
Press Start/Stop button during operation of ice machine;

First Solenoid valve or compressor stops;

60 seconds later, water pump starts, cooling tower fan or condenser fan stops, evaporator pump stops, reducer stops;

Then the machine stops completely.

Operation of a Common Electrical Box



Running the Ice Machine

Indicator on the Control Box

※Bin Full Indicator (red):

When the ice bin is full, the infrared sensors located at the bottom of the ice making unit signals the PLC to stop the ice machine. And this indicator is on. When ice is harvested, the Bin Full Indicator is off. The ice machine starts automatically in 15 minutes, or can be started

manually.
※Water Lack Indicator(red): When water level of water tank is below the lowest allowable level, the water level switch will signal the PLC to stop the ice machine, and the Water Lack Indicator is on. User should check if the water supplying is normal. And when confirmed, put Start/Stop button to Stop position, put the breaker off and then on, and start the machine once again.
※Current Overload Indicator(red) When the current for compressor, condenser fan or reducer is overloaded, the thermal relay will trip, and the machine stops. User should check if there is any fault in the circuit and then put the RESET button on the thermal relay. Put the breaker off and then on, when the Current Overload Indicator is off, start the machine once again.
※System Failures Indicator(red): The ice machine's pressure control will trip to stop the ice machine when there is a wrong/insufficient phase connection, a high condensing pressure or a low evaporating pressure. For piston compressors with oil differential control or pressure protection module, the oil differential control or the pressure protection model is connected to this contact. When there is such a failure, user is supposed to wash the fins of the condenser as a trouble shooting attempt. If this failure insists, contact ICESTA agents or headquarter for assistance.
※Power Supply Indicator(green): This indicator is for power standby status indication. When the electric wire connection is correctly done, circuit breaker in the control box is switched on, and the neutral wire and PLC breakers are switched on. This indicator is on.

Note: Detailed trouble shooting methods can be found on the Common Trouble Shooting Page.

Running the Ice Machine

Controls on the Control Box:

※Start/Stop Button(green): This button is for starting or stopping the machine. Theoretically, this button is to provide a pulse signal to the PLC which will start or stop the ice machine.
※Emergency Stop Control(red):

When the machine is in a dangerous situation, put this control down to cut off the power. All components stop completely in order to prevent people and device from getting harmed. Release this button when the failure is reset.

※ Note: Emergency Stop control is prohibited from pressing down when the machine is in normal operation. This control is used only in emergency as its name suggests.

If the machine stops temporarily, keep the circuit breaker on.

Precautions of a Non-use Period

Turn off the water valve near the ice machine;

Shut the suction and discharge valves of compressor;

Drain the water inside the ice machine. To prevent the water conduit of the machine from getting corroded, use nitrogen gas to drive air out. Tighten all the valves;

Keep the ice machine room dry/clean/well ventilated. Do a regular maintenance job on the machine and system;

Unauthorized access to the ice machine during a non-use period may cause damage to the machine;

Drain all water inside the ice machine system if it is a long non use period in winter.

※Note:

Power PLC and touch screen for a period of 1-2 hours to keep the memory of history failure when the machine is stored for a long non use period (more than 15 days).

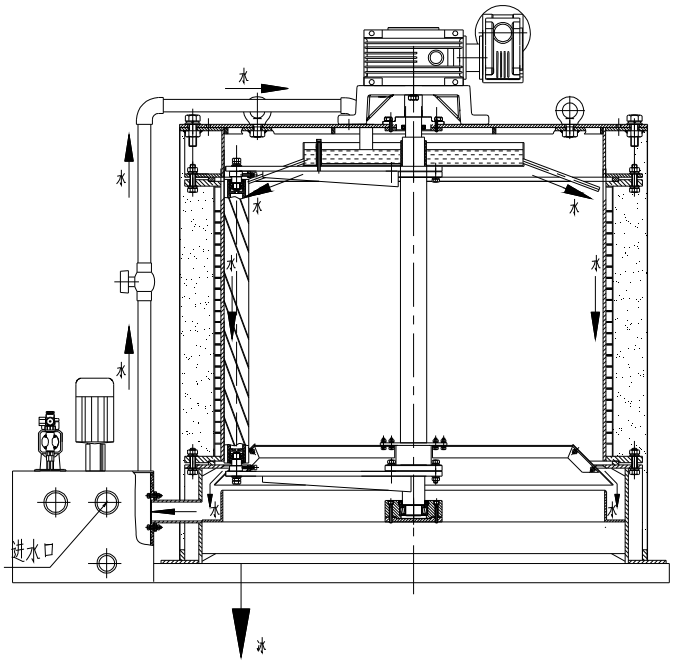
An environment of high humidity is highly unadvisable for a non use period. That may cause condensing water on the circuit of touch screen and PLC which may burn components affected when the machine starts again.

Observation of Running Status and Precautions

The working theory of ice making cycle

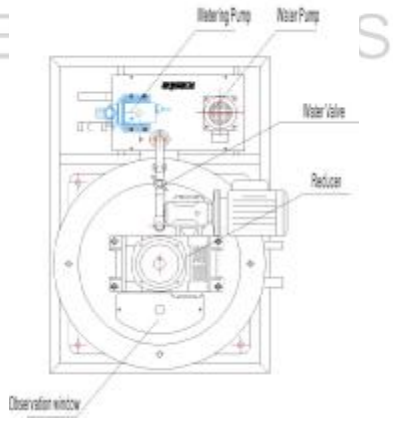
The water comes through water supplying pipe to the water tank located at the bottom of the ice making unit (evaporator), and then is pumped through the evaporator pump to the water distributing pan, which sprays water on the freezing surface of the evaporator. With the work of evaporating refrigerant inside the evaporator, water turns into ice, which is scraped and drops down by a revolving ice blade. The surplus goes along the freezing

surface back to the water tank for the next ice making.



Direction of revolving ice blade

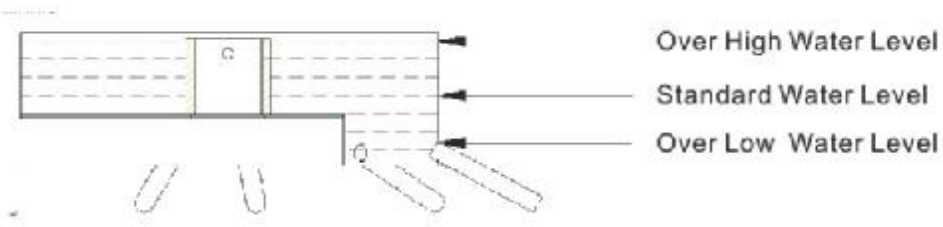
A phase protecting control is installed inside the control box, which will give failure information if the phase sequence is not correct. And user should observe when ice machine starts for the first time the direction of the revolving blade. When the blade is revolving anti clockwise along the freezing surface of the evaporator, that means the blade is working properly. Otherwise, stop the machine and consult with ICESTA local distributor or ICESTA after sales service staff immediately.



Observation of Running Status and Precautions

Water supplying status

Check through the observation window for the water supplying status inside the distribution pan. Correct water supplying status is shown below:



When the water level is not near the standard line, adjust the water valve near the reducer for proper water flow volume.

Salt water adding:

A proper dosage of salt inside the water used for ice making will help increase the ice flake quality and make the ice forming and ice cutting easier. And the noise of ice blade cutting can be thus reduced. The working lifetime will be dramatically lengthened.

The metering pump can feed salt water in a properly calculated quantity inside the water tank. The ratio of salt to water should be properly done and observation should be conducted regularly for timely replacement and adding. Goes with the machine is a salt water plastic bucket of a 30L capacity. Normally, 80 grams of salt is good enough for 1000kg of ice.

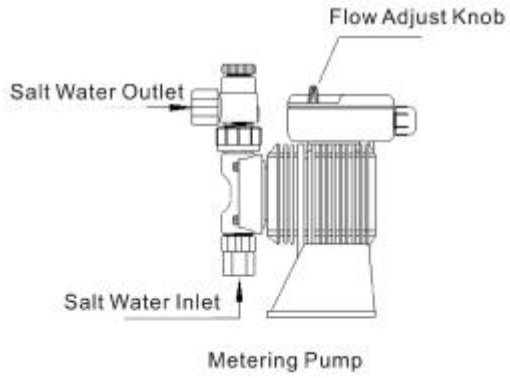
Refer to the diagram as follows:

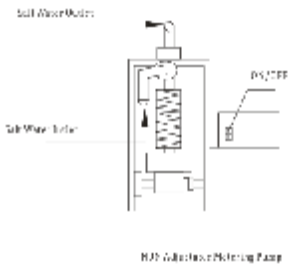
Model No	Ice Production	Salt Dosage	Interval
IF05T-R4A	500kg/24Hr	250 grams	24 hours
IF1T-R4A	1000kg/24Hr		24 hours
IF1.2T-R4A	1200kg/24Hr		24 hours
IF1.5T-R4A	1500kg/24Hr	500 grams	24 hours
IF2T-R4A	2000kg/24Hr		24 hours
IF2.5T-R4A	2500kg/24Hr		24 hours
IF3T-R4A	3000kg/24Hr		24 hours
IF5T-R4A	5000kg/24Hr	1000 grams	24 hours

Note: there are two types of metering pumps: one is adjustable type, another is non-adjustable type. Just follow the diagram above for non adjustable type metering pump, for adjustable types, follow the below:

Observation of Running Status and Precautions

Adjustment of the metering pump

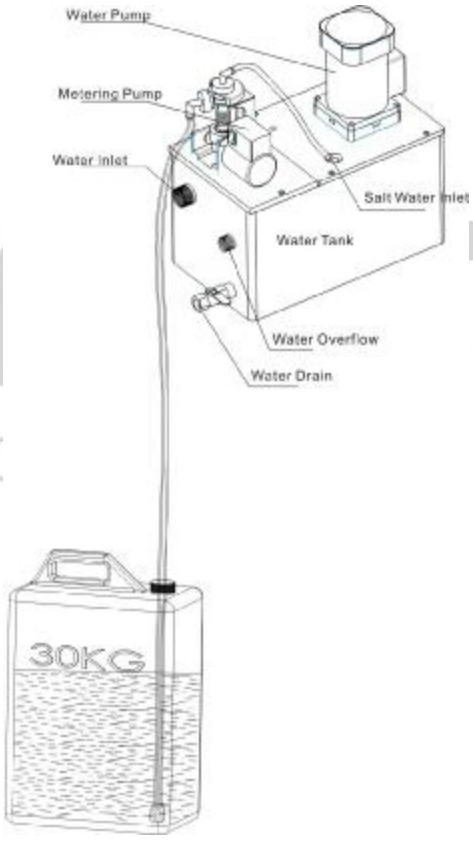




Adjustable metering pump NON Adjustable metering pump

When salt water is prepared, just turn the Flow Adjust Knob to a numeric lower than 10.

Illustration of how to connect the metering pump:



Note: the height difference between metering pump and salt water plastic bucket should be less than 2 meters.

Managing and Maintaning

Operation Managing

Follow strictly the instructions of this manual for correct start-up and stop of the machine.

Make a good and visible record of the working status during the operation of the ice machine. Constant and regular check of the operation status is quite necessary for normal running of the machine. The items that should be checked on a regular basis include water quality/water temperature/water pressure/refrigerant/refrigeration oil/pumps/cooling tower fan motors. Make a proper trouble shooting once an abnormality is located.

When a failure occurrence causes an abnormal stop of the ice machine, a qualified staff is supposed to be called in for a thorough check, and when the failure is not reset, contact the ICESTA headquarter for a solution.

The ice machine room should be taken care of by a designated staff. Unauthorized staff is prohibited from entering this room for operation of the machine.

The ice machine room should be equipped with relevant safety devices and maintenance tools like pipe pressure gauge and thermometers. Tools should be placed in a designated position.

The ice machine room should be kept dry, clean and well ventilated.

Maintenance

To lengthen the lifetime of an ice machine and increase the efficiency for energy-saving purpose, a regular check on the ice machine is quite necessary. User is suggested to make a monthly/quarterly/yearly record of maintenance and servicing and a very detailed log of the damage servicing so that servicing personnel can properly trace the failure history during trouble shooting process.

Daily Maintenance

Start and Stop the machine as instructed in this manual;

Make a regular record of the parameters in operation daily;

Regular check on the Dryer Filter is necessary. If frost is found on the outlet of the Filter, that may mean jamming inside the Filter. This symptom is normally accompanied by low evaporating pressure and higher condensing water temperature.

Check if the refrigeration oil is normal. If there is lack of refrigeration oil, add more. And if the oil is dirty and goes bad, change it and clean the oil filter and change to a new filter core.

When there is lack of refrigerant, to prevent frequent turn-off of the machine, the capacity status should be set to a partial load. After refrigerant is filled, set the capacity status to full load.

Any failure occurrence should not go unnoticed. A thorough analysis should be done for the cause of failure. Make a thorough analysis of the failure may help with finding a solution to the problem. And notice the ICESTA after-sale service department of the analysis that is done.

Managing and Maintaining

Regular Maintenance

Regular maintenance includes maintenance on a weekly/monthly/quarterly/yearly basis. User can refer to the following scientific maintenance scheme and carry it out in a

strict manner. That may help with prevention of failures in a substantially crucial way.

Weekly maintenance

Check and make an analysis of the parameters of ice machine in operation.

Monthly maintenance

Check and make an analysis of the record of parameters of ice machine in operation;

Check the bolts fastening the power wires are always tight;

Check and confirm there is no noise on all moving parts of the ice machine, and there is no abnormality in operation;

Check the water system is working properly;

Check the Compressor's oil heater is working properly;

Check the High & Low Pressure is normal;

Check the operation current of compressors and motors is normal; check the resistance is normal. If the resistance is lower than 5 MΩ, stop the machine immediately.

Quarterly maintenance

Check and make an analysis of parameters record;

Check the Oil level of the compressor;

Clean the water tank, Evaporator, ice storing bin, water pan. Clean with a piece of sponge immersed with stainless steel cleaning agent and then use clean water to wash off the agent bubbles. Motors (like water pump/reducer motor/fan motor) should be cleaned with dry and soft cloth.

Clean the fins of the air cooling condenser of dust;

Check the fastening bolts and screws inside the control box.

Check if the distance between ice blade and evaporator freezing surface is correct. Use a feeler to get the right distance (0.5-3T: 0.1-0.2mm; 5-8T ice machine: 0.1-0.25mm; 8-30T: 0.1-0.3mm)

※Warning:

In order to prevent personal injuries caused by moving parts or live parts, servicing work should be done after the main power supply is cut. And there should be a "NO TURNING ON" sign on the main power supply electric control box!

Managing and Maintaining

Yearly Maintenance

Check and analyze the operation parameters;

Check the compressor oil and make a physical analysis of the refrigeration oil. And if the

oil is already emulsified, change it with the same brand refrigerant oil.

Check the reducer oil level. This level should be no lower than half of the oil mirror. And the oil should be replaced on yearly basis. The oil brand name is Mobil 634 (460)

Check the Condenser scaling status. Do a regular cleaning and check the water quality regularly. If a severe scaling is found, clean the condenser's tubes. If the water is contaminated, cleaning will have to be more frequent. Condenser high pressure and low ice production capacity can be caused by condenser's scaling. Washing of condenser tubes should be done with a designated brush in order not to scratch the tubes.

Check while the machine stops the water distributing pan, the water shield and the ice blade. There should be no visible distortion. And the ice blade must be capable of moving smoothly and the distance in between ice blade and evaporator freezing surface should always be correct. There should be no abnormal noise heard.

Check the windings of compressor electric box and the grounding wire resistor (should be done by qualified staff).

Furthermore, contact a qualified servicing agency like ICESTA Servicing Department for a thorough check over the equipment after a 3-year operation. The focus shall be on the working status of the compressor(s), system tightness of copper pipes and the electric control box.

Common Trouble Shooting

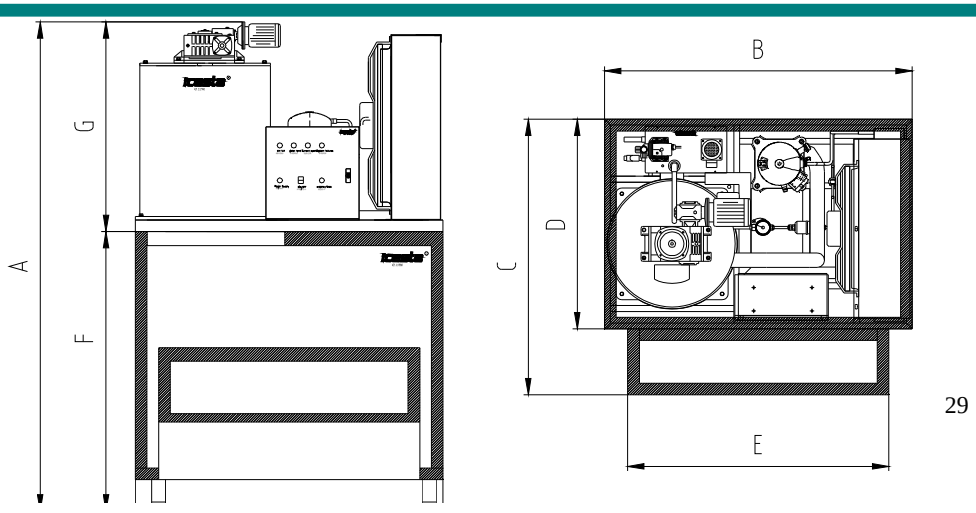
※ Note: when there is a failure occurrence, check the system as instructed in the diagram below for a solution to failure. If the failure insists, contact ICESTA agent or ICESTA after-sales servicing department for further instruction.

Symptom	Possible Cause	Solution
Pressing	Electric supply is cut	Check the power supply for a confirmation

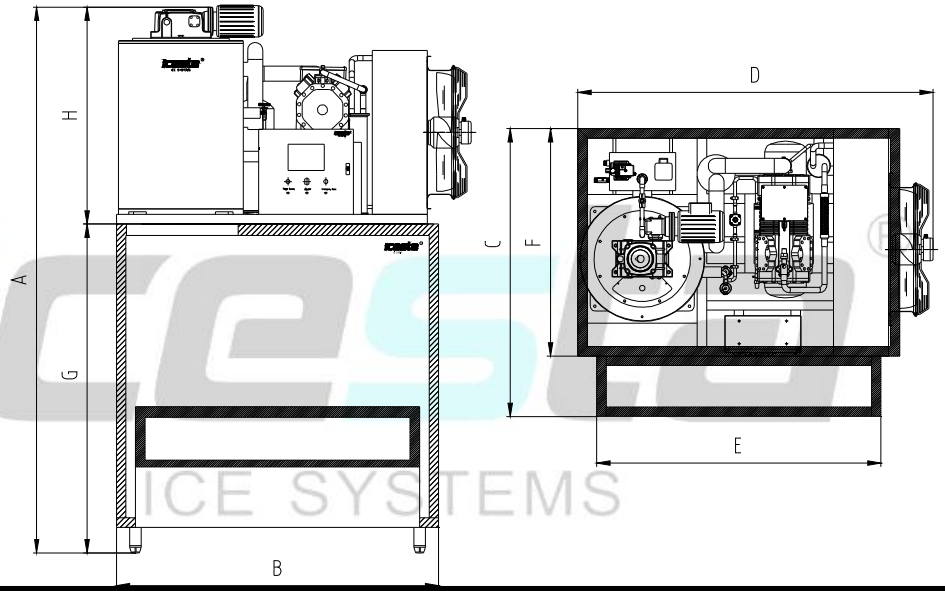
<table>
<tr><td></td><td colspan="2">Circuit Breaker is not On</td><td>Put the Breaker On</td></tr>
<tr><td></td><td colspan="2">The Start/Stop Control fails</td><td>Change the control</td></tr>
<tr><td rowspan="7">System Failure indicator is on, and machine cannot be started</td><td colspan="2">Ice Bin Full</td><td>Harvest the ice and then start the machine once again.</td></tr>
<tr><td colspan="2">Lack of Water in water tank</td><td>Check the water supply and the water pump</td></tr>
<tr><td rowspan="4">Refrigeration System fails</td><td>Low Pressure</td><td rowspan="4">Clean the fins of the condenser and put the RESET button of pressure control. Contact ICESTA agent or headquarter for a solution if failure still insists.</td></tr>
<tr><td>High Pressure</td></tr>
<tr><td>Oil Differential Control fails</td></tr>
<tr><td>Comp Overheat</td></tr>
<tr><td rowspan="3">Current Overload</td><td>Comp Overload</td><td rowspan="3">Pressing the RESET release the trip and start again. If there is abnormal noise, stop the machine immediately and contact ICESTA agent or headquarter for a solution.</td></tr>
<tr><td>Fan or Pump OL</td></tr>
<tr><td>Reducer Overload</td></tr>
<tr><td rowspan="4">Ice blade making Noise and ice is crystal</td><td colspan="2">Salt water is not added</td><td>Adding salt water as instructed on Page 24</td></tr>
<tr><td colspan="2">Salt water pipe jammed</td><td>Check and clean the pipe</td></tr>
<tr><td colspan="2">Salt water pipe filled with air</td><td>Get the air out and start again</td></tr>
<tr><td colspan="2">Metering pump damaged</td><td>Replace the metering pump</td></tr>
<tr><td rowspan="3">Ice machine working while no ice produced</td><td colspan="2">Refrigerant leakage</td><td>Contact ICESTA for gas refilling and leakage checking</td></tr>
<tr><td colspan="2">Water distribution pan low level</td><td rowspan="2">Adjust the Evaporator water valve as instructed on Page 24</td></tr>
<tr><td colspan="2">Water distribution pan over flow</td></tr>
<tr><td colspan="2">Refrigeration unit fails</td><td>Contact ICESTA for a solution</td></tr>
<tr><td rowspan="6">Ice forms on Freezing surface while does not fall</td><td colspan="2">Refrigerant leakage</td><td>Contact ICESTA for gas refilling and leakage checking</td></tr>
<tr><td colspan="2">High Density of salt water</td><td>Adding salt water as instructed on Page 24</td></tr>
<tr><td colspan="2">Ice blade is not properly adjusted</td><td>Adjust the ice blade as indicated on Page 27</td></tr>
<tr><td colspan="2">Refrigeration unit fails</td><td>Contact ICESTA for a solution</td></tr>
<tr><td colspan="2">Ice Blade bearings fail</td><td>Contact ICESTA for a replacement</td></tr>
<tr><td colspan="2">Reducer is not revolving</td><td>Check the electric control or check the reducer motor. Contact ICESTA for a solution</td></tr>
</table>

※Note: The trouble shooting methods are provided for reference only. When user cannot resolve the failure problem, contact ICESTA for a solution by the after-sales hotline: 0086 4006 180 150

ICESTA Product Parameters

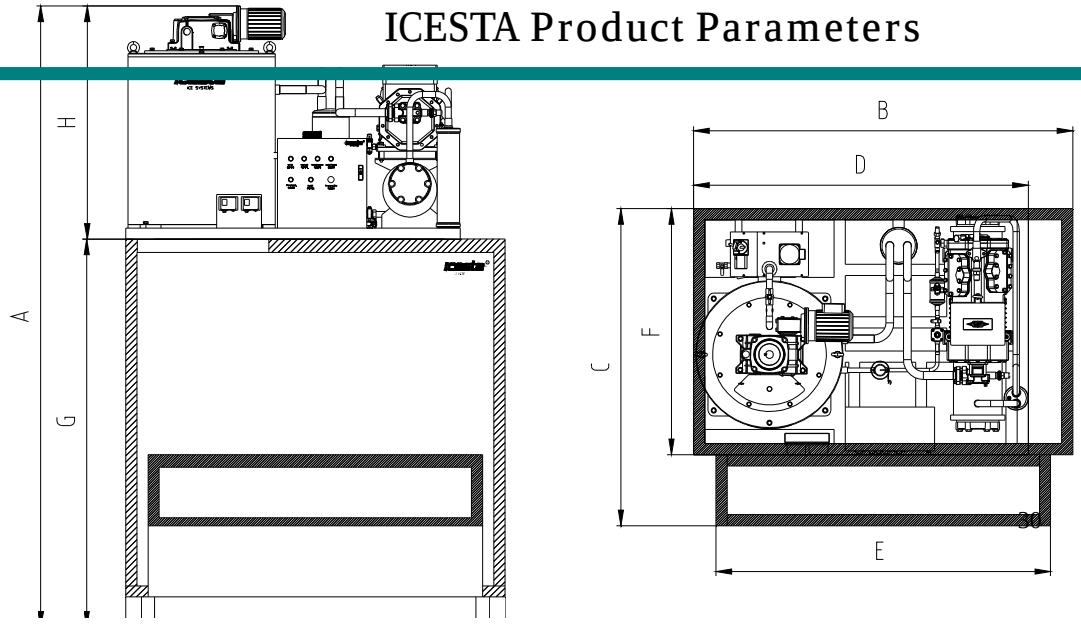


Model NO	A	B	C	D	E	F	G
IF05T-R4A	1850	1280	1082	800	1080	1050	800
IF1T-R4A	2100	1320	1183	900	1120	1200	900
IF1.2T-R4A	2100	1320	1183	900	1120	1200	900
IF1.5T-R4A	2300	1500	1418	1100	1300	1300	1000

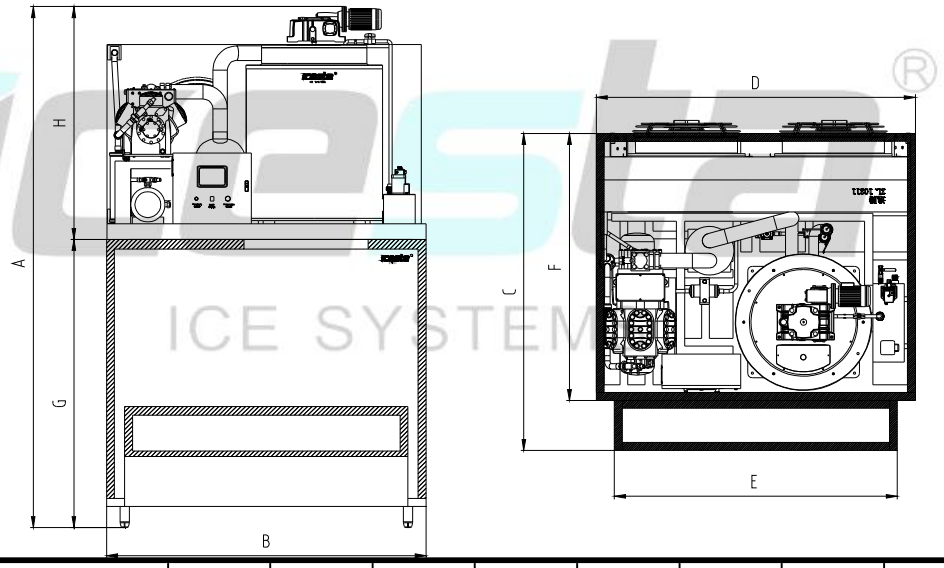


ICE SYSTEMS

Model No	A	B	C	D	E	F	G	H
IF2T-R4A	2350	1500	1418	1733	1300	1100	1300	1050
IF2.5T-R4A	2835	1700	1519	1733	1500	1200	1735	1100
IF3T-R4A	2935	1320	1519	1876	1500	1200	1735	1200



Model No	A	B	C	D	E	F	G	H
IF2T-R4W	2350	1500	1418	1500	1300	1100	1300	1050
IF2.5T-R4W	2835	1700	1519	1500	1500	1200	1735	1100
IF3T-R4W	2935	1320	1519	1500	1500	1200	1735	1200
IF5T-R4W	3255	2030	2018	2030	1800	1700	1835	1420



Model No	A	B	C	D	E	F	G	H
IF5T-R4A	3255	2030	2018	2030	1800	1700	1835	1420

ICESTA Statment

ICESTA reserves the right of modifying the contents in this manual without any advance notice.

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