

Scotsman®



SERVICE MANUAL

MVP 456

MVP 606

MVP 806

MVP 1006

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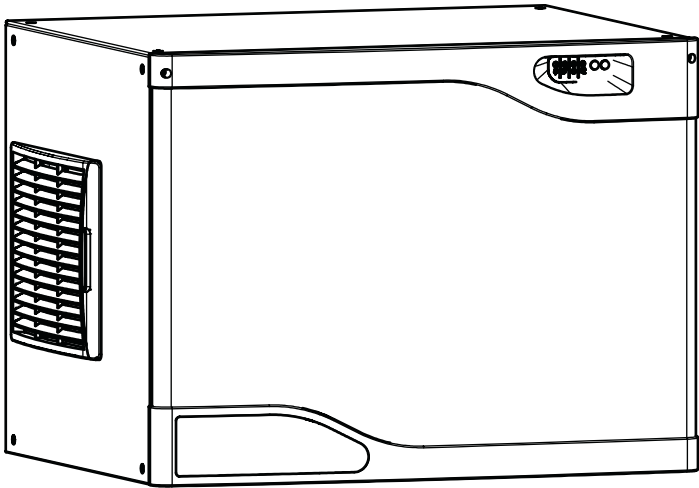
INTRODUCTION

This technical manual covers the New Prodigy MVP line.
All models are shipped with an Installation and User's manual, which can be referred to separately.
General installation information is included in this manual.

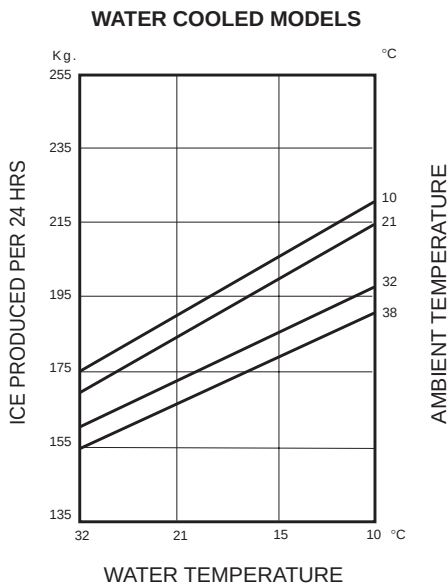
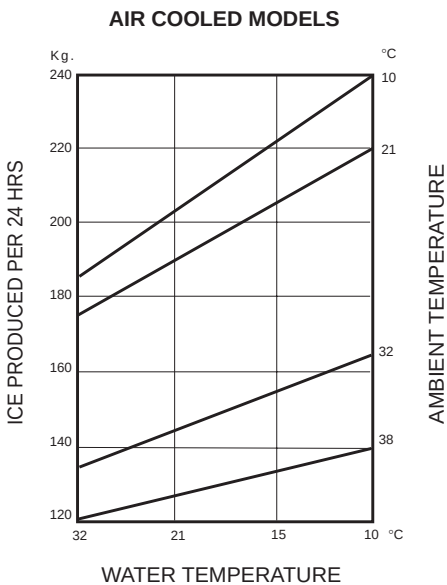
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SPECIFICATIONS

MODULAR CUBER MVP 456

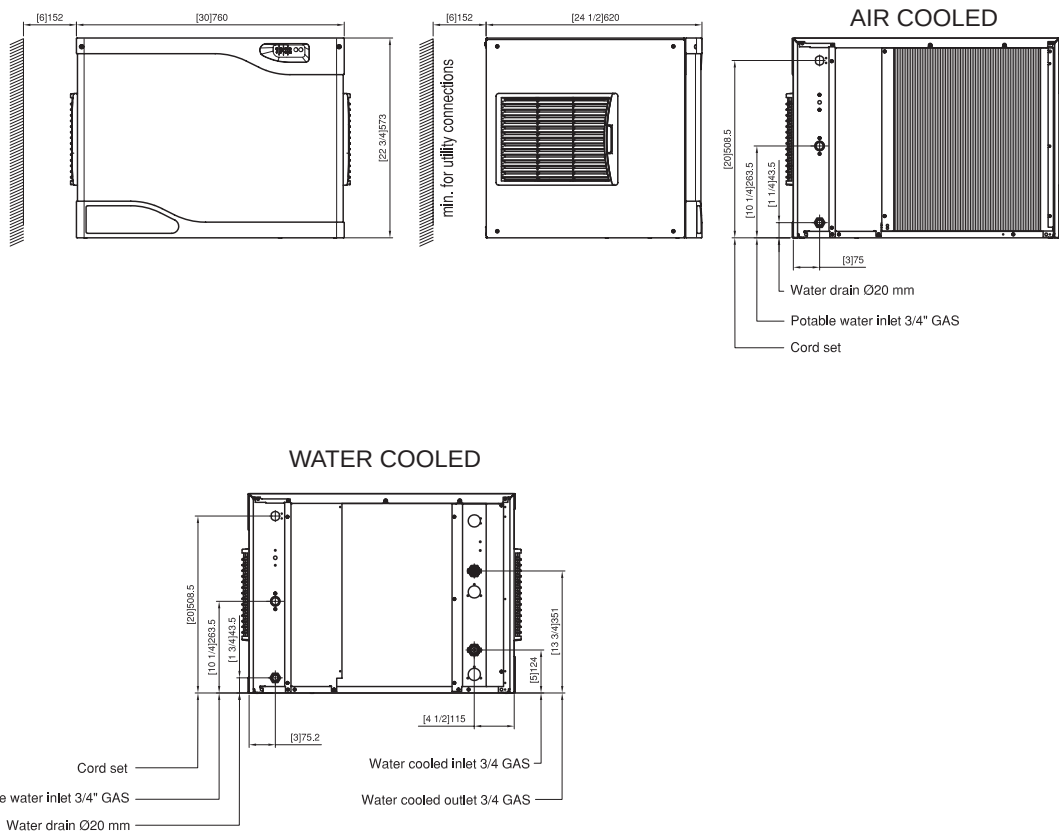


ice making capacity



NOTE. To keep your Modular cuber performing at its maximum capacity, it is necessary to perform periodic maintenance as outlined on last pages of this manual.

SPECIFICATIONS (CONT'D)



Dimensions:

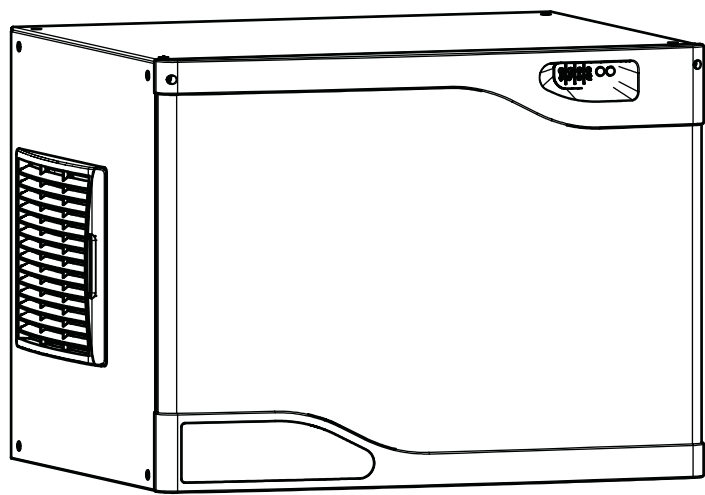
HEIGHT	575 mm. (22" 1/2)
WIDTH	760 mm. (30")
DEPTH	620 mm. (24" 1/2)
WEIGHT	77 Kgs.

MVP 456 - MACHINE SPECIFICATIONS

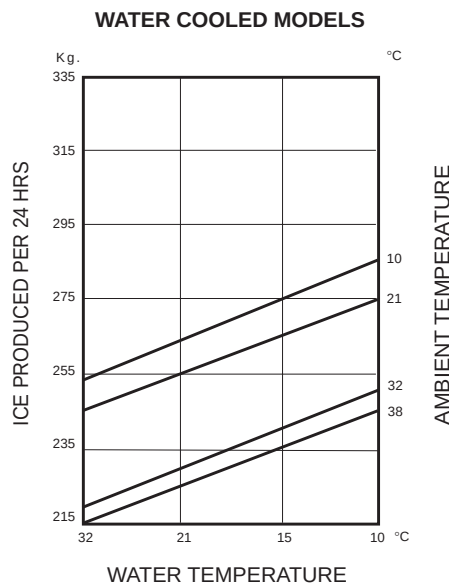
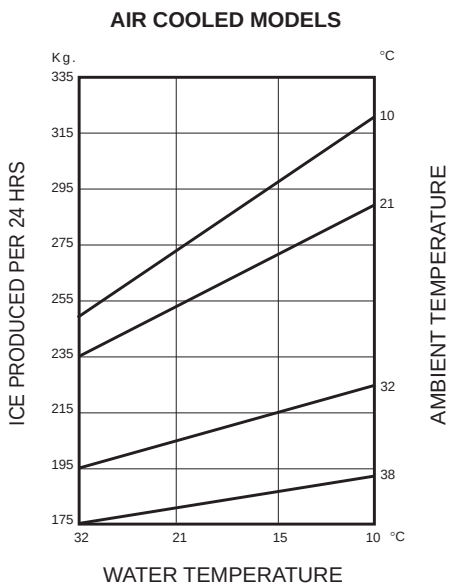
Model	Cond. unit	Finish	Comp. HP	Water req. lt/24 HR.			
MVP 456 - AS MVP 456 - WS	Air Water	Stainless Steel	7/8	410 2400*			
Model	Basic electr.	amps	Start amps	watts	Electric power cons. Kwhx24 HR.	N. of wires	Amps Fuse
MVP 456 - AS MVP 456 - WS	220-240/50/1	4.5 4.0	29	1000 850	23 19.5	3x1,5 mm²	16
Cubes per harvest: 234 Full - 468 Half * With water at 15°C							

SPECIFICATIONS

MODULAR CUBER MVP 606



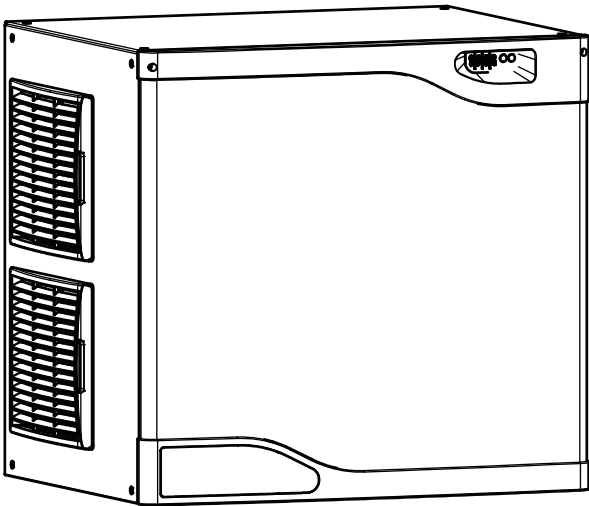
ice making capacity



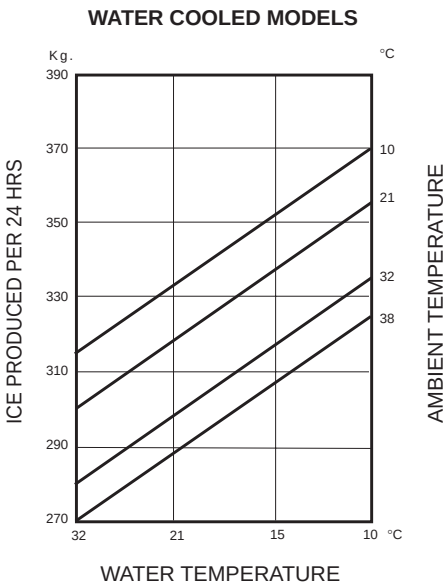
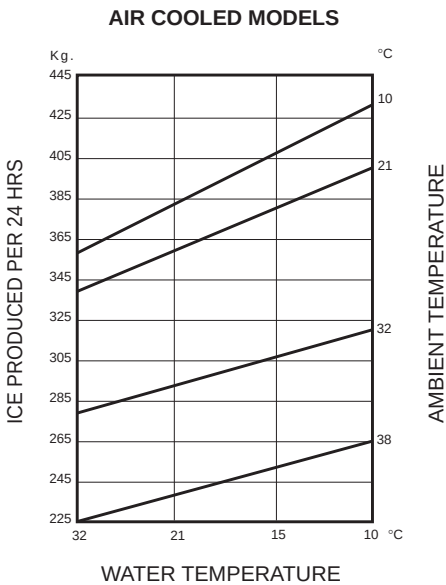
NOTE. To keep your Modular cuber performing at its maximum capacity, it is necessary to perform periodic maintenance as outlined on last pages of this manual.

SPECIFICATIONS

MODULAR CUBER MVP 806

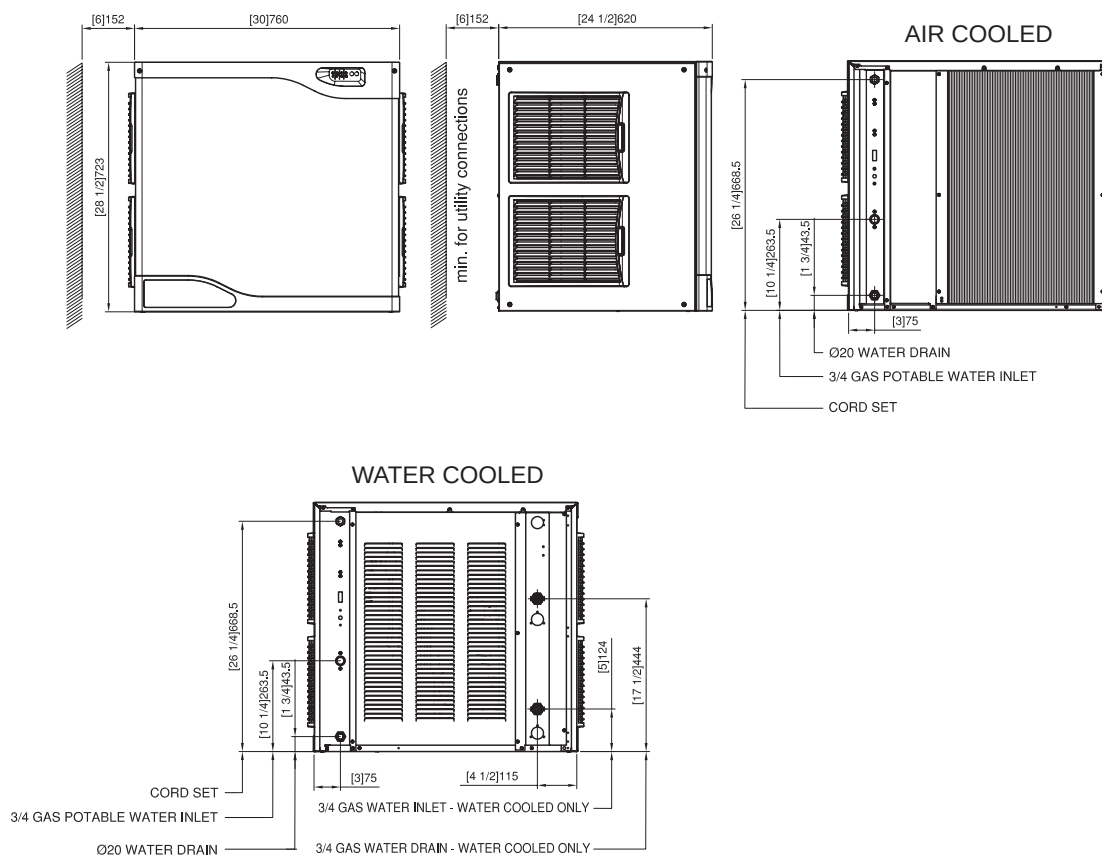


ice making capacity



NOTE. To keep your Modular cuber performing at its maximum capacity, it is necessary to perform periodic maintenance as outlined on the last pages of this manual.

SPECIFICATIONS (CONT'D)



Dimensions:

HEIGHT	725 mm. (28" 1/2)
WIDTH	760 mm. (30")
DEPTH	620 mm. (24" 1/2)
WEIGHT	97 Kgs.

MVP 806 - MACHINE SPECIFICATIONS

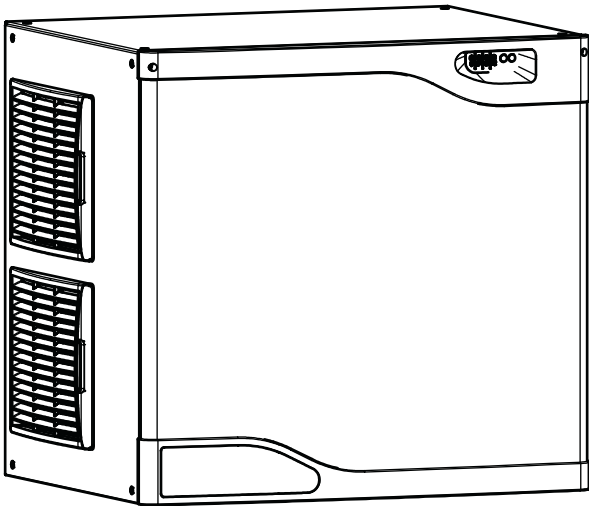
Model	Cond. unit	Finish	Comp. HP	Water req. lt/24 HR
MVP 806 - AS MVP 806 - WS	Air Water	Stainless Steel	1 5/8	580 3900*

Model	Basic electr.	amps	Start amps	watts	Electric power cons. Kwhx24 HR.	N. of wires	Amps Fuse
MVP 806 - AS MVP 806 - WS	220-240/50/1	9.0 8.0	31	1850 1450	40 33.4	3x1,5 mm ²	16

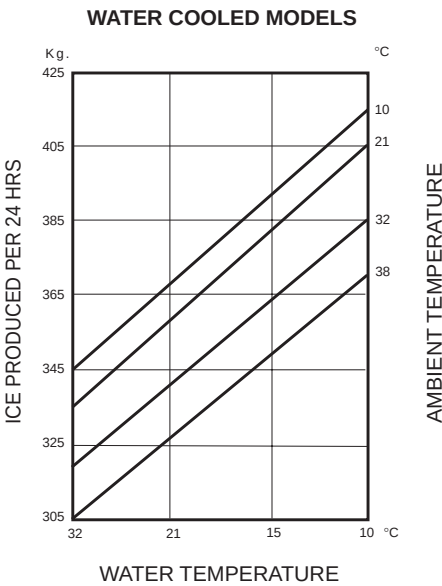
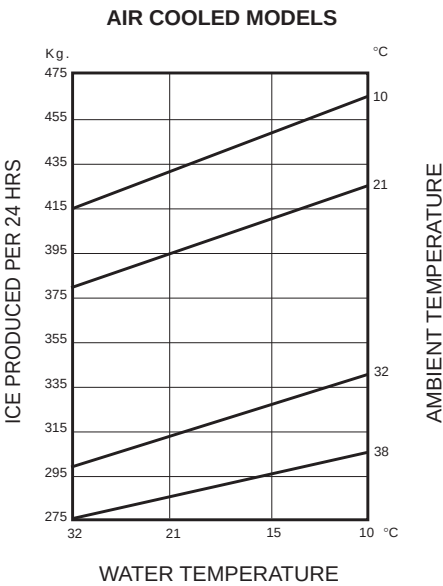
Cubes per harvest: 342 Full - 684 Half
* With water at 15°C

SPECIFICATIONS

MODULAR CUBER MVP 1006

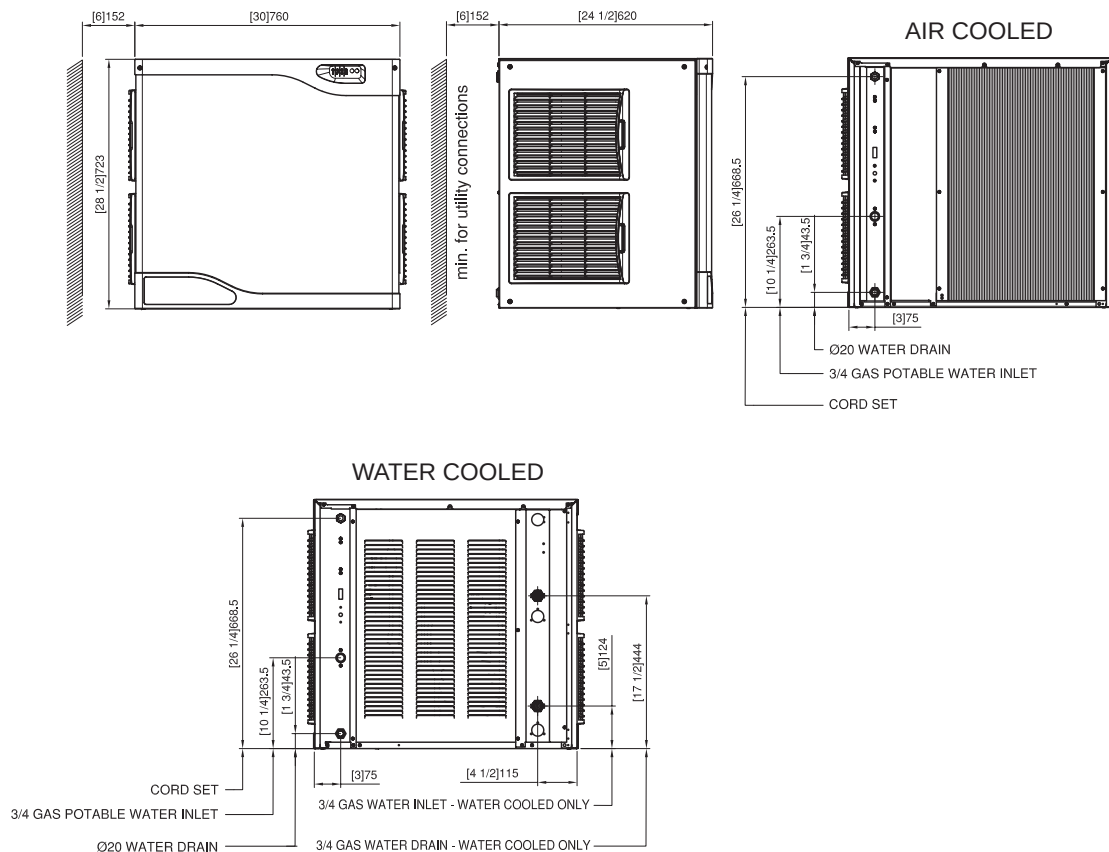


ice making capacity



NOTE. To keep your Modular cuber performing at its maximum capacity, it is necessary to perform periodic maintenance as outlined on the last pages of this manual.

SPECIFICATIONS (CONT'D)



Dimensions:

HEIGHT	725 mm. (28" 1/2)
WIDTH	760 mm. (30")
DEPTH	620 mm. (24" 1/2)
WEIGHT	104 Kgs.

MVP 1006 - MACHINE SPECIFICATIONS

Model	Cond. unit	Finish	Comp. HP	Water req. lt/24 HR
MVP 1006 - AS MVP 1006 - WS	Air Water	Stainless Steel	2	600 3800*

Model	Basic electr.	amps	Start amps	watts	Electric power cons. Kwhx24 HR.	N. of wires	Amps Fuse
MVP 1006 - AS MVP 1006 - WS	380-400/50/3	3.5 3.3	24	1900 1600	41.3 37	5x1,5 mm ²	10

Cubes per harvest: 342 Full - 684 Half
 * With water at 15°C

WATER

The quality of the water supplied to the ice machine will have an impact on the time between cleanings and ultimately on the life of the product. There are two ways water can contain impurities: in suspension or in solution. Suspended solids can be filtered out. In solution or dissolved solids cannot be filtered, they must be diluted or treated. Water filters are recommended to remove suspended solids. Some filters have treatment in them for suspended solids. Check with a water treatment service for a recommendation.

RO water. This machine can be supplied with Reverse Osmosis **water, but the water conductivity must be no less than 10 microSiemens/cm.**

Potential for Airborne Contamination

Installing an ice machine near a source of yeast or similar material can result in the need for more frequent sanitation cleanings due to the tendency of these materials to contaminate the machine. Most water filters remove chlorine from the water supply to the machine which contributes to this situation. Testing has shown that using a filter that does not remove chlorine will greatly improve this situation, while the ice making process itself will remove the chlorine from the ice, resulting in no taste or odor impact. Additionally, devices intended to enhance ice machine sanitation can be placed in the machine to keep it cleaner between manual cleanings.

Water Purge

Cube ice machines use more water than what ends up in the bin as ice. While most water is used during ice making, a portion is designed to be drained out every cycle to reduce the amount of hard water scale in the machine. That's known as water purge, and an effective purge can increase the time between needed water system cleaning.

In addition, this product has the capability to automatically vary the amount of water purged based on the purity of the water supplied to it. The water purge rate can also be set manually. Adjustments of purge due to local water conditions are not covered by warranty.

GENERAL INSTALLATION

Air or Water Cooled

Location Limitations:

The product is designed to be installed indoors, in a controlled environment. Air cooled models discharge very warm air into the room out the back. Space must be allowed at the left side and back for air intake and discharge. Water cooled models discharge warm water into the building's drain. Space needs to be provided on both sides and above for service access.

Space Limitations

***Note:** Although the machine will function, ice capacity of air cooled machines will be significantly reduced with minimal clearance at the sides, back and top. Some space is recommended for service and maintenance purposes on all models.*

15 cm (6") of space at the sides and back are required for adequate operation. To get the most capacity, locate the machine away from heat producing appliances and heating ducts. Airflow is in the left side, out the back (as viewed from the front).

Environmental Limitations

	Minimum	Maximum
Air temperature	10°C (50F)	40°C (100F)
Water temperature	5°C (40F)	40°C (100F)
Water pressure	1 bar (14 psi)	5 bar (70 psi)

Power supply - acceptable voltage ranges

	Minimum	Maximum
115	104	126
230	207	253

Warranty Information

The warranty statement for this product is provided separately from this manual. Refer to it for applicable coverage. In general warranty covers defects in material or workmanship. It does not cover maintenance, corrections to installations, or situations when the machine is operated in circumstances that exceed the limitations printed above.

Plumbing Requirements

All models require connection to cold, potable water. A hand actuated valve within site of the machine is required. Air cooled models have a single 3/4" male inlet water connection. Water cooled models have the same inlet fitting plus an additional 3/4" male condenser inlet water connection.

Water Filters

If connecting to water filtration, filter only the water to the reservoir, not to the condenser. Install a new cartridge if the filters were used with a prior machine.

All models require drain tubing to be attached to them. Air cooled models have a single 21mm O.D. male drain fitting in the back of the cabinet. Water cooled models have the same fitting plus an additional 3/4" male drain fitting in the back of the cabinet.

Note: *This NSF listed model has a 1" anti-back flow air gap between the water inlet tube end and the highest possible reservoir water level, no back flow device is required for the potable water inlet.*

Drain Tubing:

Use rigid drain tube supplied with machine and route them separately - do **not** Tee into the bin's drain.

Horizontal runs of drain tubing need a 1/4" fall per foot of run for proper draining.

Follow all applicable codes.

Electrical

See the spec sheet or User's Manual for Wire Size and Maximum Fuse Size ratings.

The machine is supplied with a 1,5 meter length power cord.

Install the electrical plug accordingly to the local standard needed.

The dataplate on the back of the cabinet details the power requirements, including voltage, phase, minimum circuit ampacity and maximum fuse size. Extension cords are not permitted. Use of a licensed electrician is recommended.

Follow all applicable local, state and national codes.

ADJUSTMENTS

Ice Bridge Thickness

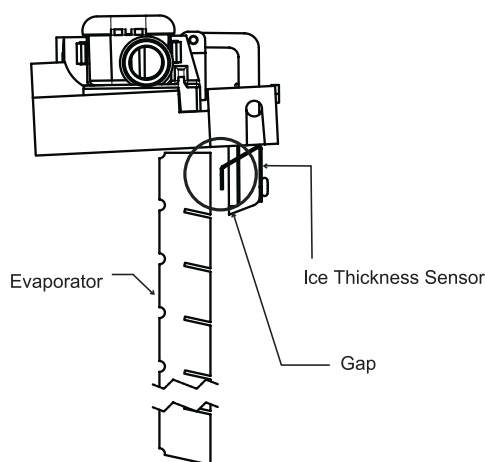
Caution: Do not make the bridge too thin or the machine will not harvest properly. Bridge thickness adjustments are not covered by warranty.

Shut machine off.

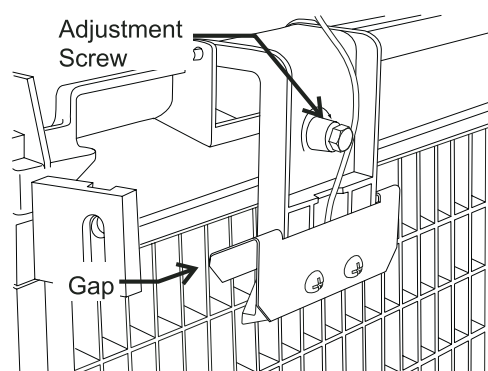
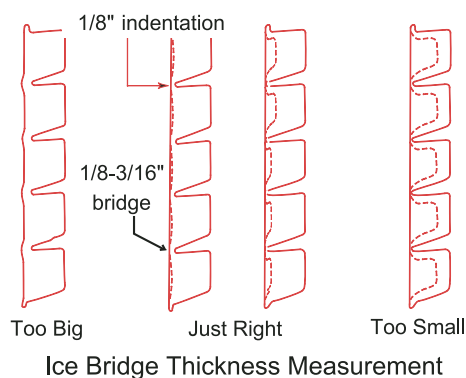
Access the ice thickness sensor.

Check gap between metal tip and evaporator grid. Small cube standard gap is 5 mm (3/16"), medium cube standard gap is 5,5 mm (7/32"). To set, place a 5 mm - 3/16" (small cube) or 5,5 mm - 7/32" (medium cube) drill bit between sensor tip and evaporator to check. Adjust gap using adjustment screw.

Restart unit and check ice bridge. Repeat as needed.



Side View of Evaporator and Ice Thickness Sensor



Ice Thickness Sensor Adjustment

To set:

Switch the machine OFF by holding the Off button in until a number or the letter A shows on the display.

Press and release the On button repeatedly until the number on the display corresponds to the desired setting.

Press and release the Off switch again to return to the normal control state.

WATER PURGE SETTING

The water purge is factory set to the Automatic setting. The setting can be changed to one of 5 manual settings or placed on automatic. The purge setting shows in the Code Display.

purge setting	1 - Minimum	2 - Moderate	3 - Standard	4 - Heavy	5 - Maximum	A - Automatic
Water Type	RO water or equivalent (very soft $\leq 4^{\circ}\text{f}$)	Soft water ($5 \leq ^{\circ}\text{f} \leq 9$)	Setting for typical water ($10 \leq ^{\circ}\text{f} \leq 16$)	Hard water ($17 \leq ^{\circ}\text{f} \leq 22$)	Very hard water ($^{\circ}\text{f} \geq 23$)	Any with conductivity not less than 10 microSiemens/cm

PRODIGY CUBER SYSTEM INFORMATION

Overall System Type:

- Refrigeration: Mechanical, either air cooled, water cooled.
- Water System: Inlet water solenoid valve fills reservoir once per cycle. Purge solenoid valve opens to discharge some reservoir water once per cycle.
- Control System: Electronic
- Harvest cycle sensor: Conductivity probe
- Water full/empty sensor: Conductivity probe
- Bin Control: Curtain Switch
- Ice type: Unified
- Harvest system: Hot gas defrost with mechanical assist

Electrical Components:

- Compressor
- Contactor
- Water Pump
- Inlet Water Solenoid Valve
- Purge or purge Valve
- Fan Motor(s)
- Fan motor pressure control
- High pressure cut out
- Harvest Assist Solenoid
- Hot Gas Valve
- Controller
- Transformer - 12v AC for the controller only
- Water Level Sensor
- Ice Thickness Sensor
- Curtain Switch

CONTROLLER INFORMATION

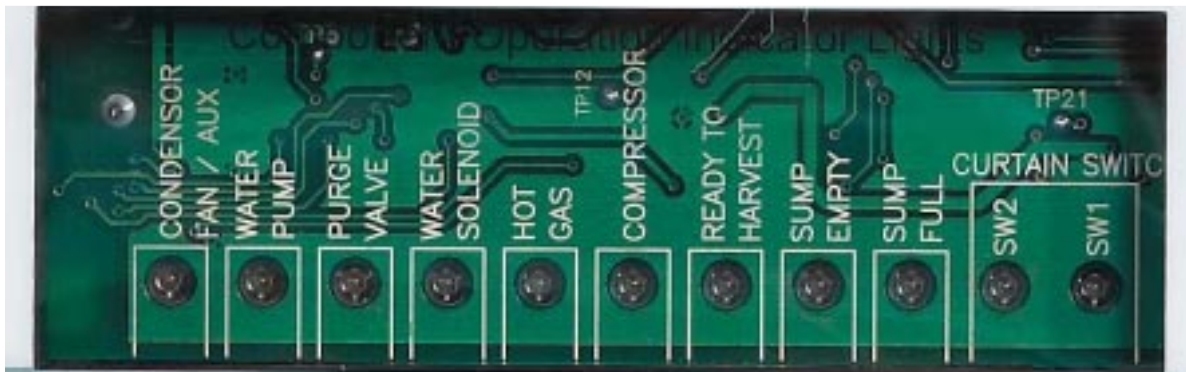
Machine Indicator Lights

- Power
- Status
- Water
- Clean

CONTROLLER INFORMATION

Component Indicator Lights

- Condenser Fan
- Water Pump
- Purge Valve
- Water Solenoid
- Hot Gas
- Compressor
- Ready to Harvest
- Sump Empty
- Sump Full
- Curtain SW1
- Curtain SW2



Code Display

Main codes - automatically displayed

F	Freeze Cycle
F flashes	Freeze Cycle is Pending
H	Harvest Cycle
H flashes	Manual Harvest
b	Bin is Full
C	Clean Cycle
L	Board Locked
d	Test Mode
O	Off
E	Self Test Failed
1 flashes	Max Freeze - Retrying
1	Max Freeze Time Shut Down
2 flashes	Max Harvest - Retrying
2	Max Harvest Time Shut Down
3	Slow Water Fill
4	High Discharge Temp
5	Sump Temp Sensor Failure
7	Discharge Temp Sensor Failure
8 flashes	Short Freeze - Retrying
8	Short Freeze - Thin ice

Setting Codes - requires push button sequence for access

Water Purge Settings

A, 1, 2, 3, 4, 5

De-scale Interval Settings

6, 5, 3, 3



- Compressor
- Ready to Harvest
- Sump Empty
- Sump Full
- Curtain SW1
- Curtain SW2 (not used)

HOW IT WORKS - AIR COOLED

Freeze Cycle. At start up the controller drains and refills the reservoir. The reservoir refills when the mid length water level sensor probe is uncovered and continues to fill until the top probe is in contact with water. When the reservoir has filled, the compressor and water pump start. After the discharge pressure has increased past the cut in point of the fan pressure control, the fan motor(s) will begin to operate and warm air will be discharged out the back of the cabinet. The fan motor will switch on and off as the discharge pressure rises and falls. Water flows over the evaporator as the refrigeration system begins to remove heat. When the water temperature falls to a preset point, as measured by the water temperature sensor, the controller shuts off the water pump for 30 seconds. The freeze cycle resumes when the pump restarts and ice begins to form on the evaporator. As it forms, the water flowing over the ice moves closer and closer to the metal tip of the ice thickness sensor. When it comes into contact with the sensor for a few continuous seconds, that signals the controller that the freeze cycle is complete.

The controller may shut the air cooled fan motor off for a variable period of time to build up heat for harvest. This is dependant upon the temperature of the discharge line sensor.

Harvest Cycle. When the harvest cycle begins, the controller shuts off the fan motor, switches on the hot gas valve, and through a parallel circuit, the harvest assist solenoid. After a few seconds the purge valve opens and water is drained from the reservoir. Based on either the automatic purge or manual purge setting, the pump and purge valve will be switched off at a time determined to have drained enough water for that setting. The inlet water valve will open to fill the reservoir anytime the mid length probe is uncovered, which occurs during the reservoir drain cycle. Harvest continues as the hot discharge gas flows into the evaporator serpentine, heating up the evaporator. At the same time the harvest assist solenoid is pushing against the back of the ice slab. When the ice releases from the evaporator, it harvests as a unit, and the harvest assist probe provides some additional force to push it off. When the ice falls off it will force the curtain open. An open curtain during the harvest cycle signals the controller that the evaporator has released its ice terminating harvest. If the curtain remains open, the controller will shut the machine at bin full. Anytime harvest is complete the hot gas valve and harvest assist solenoid are shut off. The harvest assist solenoid pin returns to its normal position by spring pressure.

If the curtain re-close after harvest, the freeze cycle will restart.

HOW IT WORKS - WATER COOLED

Freeze Cycle. At start up the controller drains and refills the reservoir. The reservoir refills when the mid length water level sensor probe is

uncovered and continues to fill until the top probe is in contact with water. When the reservoir has filled, the compressor and water pump start. After the discharge pressure has increased past the set point of the water regulating valve, the water regulating valve will open and warm water will be discharged out the condenser drain. The water regulating valve will modulate to maintain a relatively constant discharge pressure. Water flows over the evaporator as the refrigeration system begins to remove heat. When the water temperature falls to a preset point, as measured by the water temperature sensor, the controller shuts off the water pump for 30 seconds. The freeze cycle resumes when the pump restarts and ice begins to form on the evaporator. As it forms, the water flowing over the ice moves closer and closer to the metal tip of the ice thickness sensor.

When it comes into contact with the sensor for a few continuous seconds, that signals the controller that the freeze cycle is complete.

Harvest Cycle. When the harvest cycle begins, the controller switches on the hot gas valve, and through a parallel circuit, the harvest assist solenoid. After a few seconds the purge valve opens and water is drained from the reservoir. Based on either the automatic purge or manual purge setting, the pump and purge valve will be switched off at a time determined to have drained enough water for that setting. The inlet water valve will open to fill the reservoir anytime the mid length probe is uncovered, which occurs during the reservoir drain cycle. Harvest continues as the hot discharge gas flows into the evaporator serpentine, heating up the evaporator. At the same time the harvest assist solenoid is pushing against the back of the ice slab. When the ice releases from the evaporator, it harvests as a unit, and the harvest assist probe provides some additional force to push it off. When the ice falls off it will force the curtain open. An open curtain during the harvest cycle signals the controller that the evaporator has released its ice terminating harvest. If the curtain remains open, the controller will shut the machine at bin full. Anytime harvest is complete the hot gas valve and harvest assist solenoid are shut off.

The harvest assist solenoid pin returns to its normal position by spring pressure.

If the curtain re-close after harvest, the freeze cycle will restart.

ELECTRICAL SEQUENCE

Air or Water Cooled

Power connected, unit previously switched Off.

Control board does a self check. If the self check fails, the unit displays an E and no further action will occur.

If the self check passes, the controller will display a 0, the curtain light will be ON and the Power and Sump Empty lights will be ON.

Pushing and releasing the On button will start the ice making process.

The display will begin to blink F. The component indicator lights will switch on and off to match the following process:

The purge valve opens and the water pump starts to empty the reservoir. This is done to discharge any excess water from ice melting into the reservoir.

The hot gas valve and the harvest assist solenoid are energized.

The inlet water valve will open to fill the reservoir. The water valve can open any time the water level is low.

After a few seconds the purge valve closes and the pump shuts off.

When the reservoir is full the inlet water valve stops and the compressor switches on. Five seconds after the compressor starts the hot gas valve and the harvest assist solenoid are de-energized.

Light Information: The display shows a non-blinking F. The Power and Status Lights will be Green. The compressor, fan motor, water pump, sump full and the curtain switch lights will be ON.

The air cooled model's fan motor will start to turn when the discharge pressure has built up to the fan pressure control's cut in point. This is about 15 seconds after the compressor starts.

The Freeze cycle continues. The compressor, water pump, fan motor and curtain indicator lights will be ON. When the reservoir water temperature falls to a certain preset point, the water pump will shut off for 30 seconds. This is the anti-slush period. At this time the controller checks the conductivity of the water in the reservoir for the auto-purge feature. After the water pump restarts the Sump Full light will go out and neither sump lights will be on for the rest of the freeze cycle.

When the ice has built up enough so that the water flowing over the evaporator comes into continuous contact with the ice level sensor, the Ready to Harvest light will begin to blink on and off. When it has been On continuously for 3 seconds, the controller will switch the machine into a Harvest cycle.

ELECTRICAL SEQUENCE

Air or Water Cooled

Indicator Information: The display shows a non-blinking H. The Power and Status Lights will be Green. The compressor, hot gas valve and one curtain switch lights will be ON. After a few seconds the water pump, purge valve and inlet water valve lights will come on.

The fan motor(s) shut off and remain off throughout the harvest cycle.

The harvest assist solenoid is connected in parallel with the hot gas valve. Although it is energized throughout the harvest cycle, its piston does not move until the ice has become partially loosened from the evaporator plate by the action of the hot refrigerant gas passing through the evaporator serpentine.

The water pump and purge valve will shut off when the purge level setting time has been reached, either the manual time or the automatic time. The inlet water valve will remain on until it fills the reservoir. The Ready to Harvest light will switch Off when the ice falls from the evaporator.

Harvest continues until the ice slab is ejected from the evaporator and falls, opening the curtain. When the curtain opens, the magnetic reed curtain switch opens, breaking the circuit to the controller. If the curtain re-closes within 30 seconds, the controller switches the machine back into another freeze cycle. If the curtain switch remains open, the controller shuts the machine down at bin full.

ELECTRICAL COMPONENT DETAIL

Compressor

- Operated by the compressor contactor. Single or three phase.

Contactor

- Operated by the controller and the high pressure cut out switch. Line voltage coil. When energized the Compressor indicator light will be ON.

Water Pump

- Operated by the controller. When energized, the Water Pump indicator light will be ON.

Inlet Water Solenoid Valve

- Operated by the controller. Line voltage coil. When energized, the Water Solenoid indicator light will be ON.

Purge Valve

- Operated by the controller. Line voltage coil. When energized, the Purge Valve indicator light will be ON. Energized for a time during harvest.

Fan Motor(s)

- Operated by the controller and the fan pressure control. Can cycle on and off in the freeze cycle, always off during harvest. When the controller has energized it, the indicator light will be ON but the fan will not turn unless the discharge pressure is high enough to close the high pressure control.
- Fan(s) may shut off near the end of the freeze cycle to build up heat for harvest. Time of shut off depends upon available heat, as measured by the discharge temperature.

High pressure cut out

- Some air cooled and all remote and all water cooled models have a high pressure cut out switch that shuts the power off to the compressor contactor if the discharge pressure is too high. It is an automatic reset.

Harvest Assist Solenoid

- Operated by the controller in parallel with the hot gas valve. Cycles on and off at the beginning of a restart. Energized throughout the harvest cycle. Line voltage coil.

Hot Gas Valve

- Operated by the controller in parallel with the harvest assist solenoid. Cycles on and off at the beginning of a restart. Energized throughout the harvest cycle. Line voltage coil.

Controller

- Senses ice thickness, water level, water temperature, discharge temperature. Controls compressor contactor, fan motor, water pump, inlet water valve, hot gas valve, purge valve, harvest assist solenoid. Indicates status and component operation. 12 volt.

Transformer

- 12 volt secondary, supplies power to controller only.

Water Level Sensor

- Three probe conductivity sensor. Bottom probe is common, mid probe is refill sump, top probe is full sump. Refill can occur at any time.

Ice Thickness Sensor

- Single wire conductivity sensor. Circuit made from controller to ground to controller when

water contacts a probe suspended over ice plate. Signals ready for harvest.

Curtain Switch

- Magnetic reed switch. Normally open, switch is closed when magnet is nearby and can be connected to either J8 or J7 of controller. Curtains may be removed in the freeze cycle without affecting controller operation. A curtain removed during harvest will cause the controller to terminate harvest and shut the unit off. If it remains open for 30 seconds that signals the controller to shut the unit off at bin full.

Water temperature sensor.

- Thermistor inserted into the water pump discharge hose. Reported temperature used by the controller to determine anti-slush cycle start time.

Discharge temperature sensor.

- Thermistor attached to the discharge line near the compressor. Reported temperature used by the controller to determine end-of-cycle-fan-off-delay time. If discharge temperature exceeds a preset maximum, controller will shut the machine off.

Note: Controller will operate machine in a default mode with thermistors disconnected from the controller. Diagnostic code #3 will be displayed during that time.

Component Indicator Light Table

SYSTEM	INDICATOR LIGHT ON
Condenser Fan or Liquid Line Valve	Fan Motor Powered or LLV open
Water Pump	Pump Motor Powered
Purge Valve	Purge Valve Opens
Inlet Water Solenoid Valve	Inlet Water Valve Opens
Hot Gas	Hot Gas Valve Opens
Compressor Contactor	Contactors Closes
Ready to Harvest	Water contacting ice thickness sensor probe
Sump Empty	Open between mid sensor and common
Sump Full	Closed between top probe and mid probe
Curtain Switch	Curtain open



REFRIGERATION

Refrigerant: R-404A

Compressors: Copeland or Tecumseh hermetic by model

Expansion valves: Non adjustable, internally equalized.

Hot gas valve: Pilot operated, line voltage coils.

Condensers: Forced draft air, counterflow water. All air cooled models have left side air inlet. All air cooled models exhaust air out the back.

Air filters: Surface mounted to left side panel. Filter media removable without removing panel.

Fan blades: Reduced vibration blades in most air cooled models.

Fan pressure control. All AC. Controls fan motor operation in the freeze cycle.

High pressure cut out. WC, AC.

Evaporator: Unified cell plate. Nickel plated copper. Two heights: 12" and 18". Small cube = half dice, medium cube = full dice.

Small cube: 22 mm high x 22 mm deep x 9,5 mm high (7/8" high x 7/8" deep x 3/8" high).

Medium cube: 22 mm high x 22 mm deep x 22 mm high (7/8" high x 7/8" deep x 7/8" high).

WATER SYSTEM

Batch type. Water reservoir contains full water charge for each ice making cycle.

Water valve: Solenoid type. Opens to fill reservoir when mid sensor probe no longer makes a circuit to the bottom probe. Closes when reservoir is full and top probe makes circuit to mid probe.

Pump: Unsealed pedestal type, S.S. side mounting bracket

Water purge valve: Solenoid type. Opens to purge water during harvest cycle.

Water Level Sensor: Three probe conductivity.

Distributor: ABS plastic. Evenly distributes water over the evaporator surface. Slides off the evaporator top. Removable cover for ease of cleaning.



CONTROL OPERATION

Standard control:

- Electronic controller operating from a 12 AC volt power supply. Will operate within a voltage range between 10 and 15.5.
- User's Indicator lights, four front visible: Power, Status, Water, De-scale/Sanitize.
- Accessible On switch.
- Accessible Off switch.
- Code Display: Displays letters and numbers to indicate cycles and diagnostic codes.
- Manual Harvest switch: Use to trigger harvest at any time.
- Clean switch: Use to initiate and finish the de-scale or sanitizing cycles.
- Component Operation Indicator Lights: Indicate the status of certain components; water level; ready for harvest; curtain switch position.
- Power Light: On when power is being supplied to the controller.
- Status Light: Green when machine is in ice making mode and is operating correctly. Blinks red when a machine malfunction has been detected.
- Water Light: Blinks red when reservoir does not fill with allowed time period.
- De-scale / sanitize: Yellow when the controller has determined it is time to de-scale and sanitize the machine. Use clean process to reset light. Time is determined by power up time and controller's setting. Standard setting is 6 months. See adjustment process

Controller Connections:

- J1 - Ground and Power Supply
- J2 - High voltage power harness to loads
- J3 - Factory use
- J4 - Optional board connector
- J5 - Communications port
- J6 - Thermistor connection
- J7 - Curtain switch
- J8 - Curtain switch
- J9 - Water level sensor
- J10 - Ice thickness sensor
- J11 - Bin thermostat. Use with NO thermostat (closes on temperature fall) & specified harness.

CONTROL SAFETIES

Max freeze time - 45 minutes

When exceeded, control shuts the unit off for 50 minutes and will attempt a restart. If the condition is exceeded again the next cycle, the control will shut the unit off for 50 minutes and attempt a restart. If it fails a third consecutive time the controller will shut the machine down and must be manually reset.

Min freeze time - 6 minutes

If the controller switches the machine into harvest within 20 seconds of the minimum freeze time, the controller will harvest for a preset time and does not stop if the curtain switch opens. If this occurs again in the next three cycles, the machine will shut down and must be manually reset.

Max harvest time - 3 minutes

If the harvest cycle has continued for 3 minutes without the curtain opening, the controller will shut the machine off for 50 minutes and then restart. If there is another the machine will shut the machine off for another 50 minutes and then restart. If it fails a third consecutive time the controller will shut the machine down and must be manually reset.

- Time between resets - 50 minutes
- Number of automatic resets - 2
- Max water fill time - 5 minutes. Machine will attempt a restart every 20 minutes.
- Max discharge temp - 120°C (250 degrees F).
- Time interval between cleanings - 6 months power on time - adjustable in one month increments, can be set at 6, 5, 4 or 3 months of power up time.
- Manual harvest time - 3 minutes
- Minimum compressor off time - 4 minutes
- Continuous Run Time Maximum Cycles - 25

RESTARTS

Power Interruption

The controller will automatically restart the ice machine after adequate voltage has been restored.

- H blinks on code display
- Status indicator light blinks
- Reservoir is drained and refilled
- Default harvest is initiated. The curtain switch does not have to open to terminate harvest, harvest will continue until either the curtain's switch opens or the default harvest time expires. Default harvest time is 2 and half minutes. The machine will then return to a normal freeze cycle.

Water Interruption

- The controller will attempt to fill the reservoir every twenty minutes until it is successful.

On-Off Switch Access

All models ship with the On and Off switches front accessible.

CONTROL BUTTON USE (from standby)

Set purge level, 1-5 (1 is minimum, 5 is maximum) or Automatic:

- Hold off button in till a number or the letter A shows on display and green STATUS led ON. . Release.
- Press and release the On button to cycle through and select one of the five purge settings (1->5) or to use the Automatic setting (A).

Recall diagnostic code:

- Hold off button in till a number or the letter A shows on display and green STATUS led ON. . Release.
- Press and release the Harvest button to cycle through each of the last 10 error codes from most recent to oldest.

Clear diagnostic code:

- Hold Clean and Harvest buttons in for 3 seconds to clear all prior codes.

Reset control:

- Depress and release Off, then depress and release On.

Start Test Mode:

- Hold off button in till a number or the letter A shows on display and green STATUS led ON. . Release.
- Hold Clean button in till letter d shows on display. Release.

Lock / Unlock control:

- Hold On button in for 3 seconds, keep holding then press and release Off twice.

Empty reservoir:

- Hold Clean button in till dash (-) shows on display. Release. Pump and purge valve will be ON for 30 seconds. Repeat as needed.

Test Mode: See next page for Air and Water Cooled mode.

- Hold off button in till a number or the letter A shows on display and green STATUS led ON, release. Then depress Clean for 3 seconds till letter d shows on display.
- The sump will fill the first 30 seconds of the test. If the sump is full it will overflow into the bin. At 30 seconds the WIV will shut off and the WP will turn on. You will be able to see and hear the water running over the plate. After 10 seconds the PV and HGV will turn on. Water will be purging from the machine. After 10 more seconds the compressor will start. 5 seconds later the HGV will close. The compressor will run for a total of 20 seconds. After which everything will turn off for 5 seconds. After that time the HGV will open and you'll be able to hear the hissing as the pressure is equalized. 10 seconds later the fan will turn on (if air cooled). After 10 seconds all will be off and the output test will be complete.

Change De-Scale Notification Interval

Like the others, this feature is accessible only from standby (Status Light Off).

- Press and hold harvest button till a number shows on display.
- This will allow control to enter Time to Clean Adjustment State.
- Display current time to clean months on 7 segment display.
- Pressing clean button repeatedly will cycle through one of 4 possible settings:
6 months (4380 hours) (default)
5 months (3650 hrs)
4 months (2920 hrs)
3 months (2190 hrs)

Test Mode Sequence Table - Air or Water Cooled

Time (seconds)	On	Off
0	WIV -30 seconds	WP, HGV, Comp, Fan, PV
30	WP -10 seconds	WIV, HGV, Comp, Fan, PV
40	WP, PV, HGV -10 seconds	WIV, Comp, Fan
50	HGV, Comp -5 seconds	WIV, WP, Fan, PV
55	Comp -15 seconds	WIV, HGV, WP, Fan, PV
70	None -5 seconds	All
75	HGV -10 seconds	WIV, WP, Comp, Fan, PV
85	Fan -10 seconds	WIV, HGV, WP, Comp, PV
95	None	All - Test Complete

SERVICE SPECIFICATION

In servicing a machine, it is often, useful to compare that individual units operating characteristics to those of a normally operating machine. The data that follows gives those characteristics; however, be aware that these values are for NEW, CLEAN machine operating at 21 °C ambient and 15 °C water. USE THESE NUMBERS AS A GUIDELINE ONLY.

OPERATING CHARACTERISTICS

On air-cooled models during the freezing cycle, the discharge pressure is maintained between two preset values by means of fan control (condenser sensor); and at the same time, the suction pressure will also decline reaching it's lowest point just before harvest. Compressor amps experience a similar drop.

On water-cooled, the discharge pressure is constantly, maintained during the freeze cycle by the water regulating valve. However, suction pressure and compressor amps, will still decline as the machine freezes ice.

MODEL	Disch. Pressure Freeze max bar	Disch. Pressure Freeze min bar	Hi Pressure CUT OUT bar	Suction Pressure Beginning Freeze bar	Suction Pressure end Freeze bar	Cycle time minutes	Amps Compressor Beginning Freeze	Amps Compressor end Freeze
MVP 456 A - 230/50/1	17,5	15,5	33	3,5	2,0	15	4,7	3,6
MVP 456 W - 230/50/1	16,5	16,5	33	3,5	2,2	16	4,2	3,4
MVP 606 A - 230/50/1	18	16	33	2,7	1,5	13	6,2	4,8
MVP 606 W - 230/50/1	16,5	16,5	33	3,2	1,7	13	5,8	4,5
MVP 806 A - 230/50/1	18,5	16,5	33	2,0	1,8	12,5	8,6	6,4
MVP 806 W - 230/50/1	16,5	16,5	33	3,5	1,9	14,5	9,0	6,7
MVP 1006 A - 400/50/3	16	14	33	2,9	1,6	12	3,7	3,0
MVP 1006 W - 400/50/3	16,5	16,5	33	3,2	1,8	13,5	3,6	2,8

Refrigerant charge R 404 A - gr.

MODEL	MVP 456	MVP 606	MVP 806	MVP 1006
Air cooled	700	850	1300	1600
Water cooled	500	550	650	1200

Refrigerant metering device

Thermostatic expansion valve.

NOTE: Always check nameplate on individual icemachine for special refrigerant charge before charging the refrigeration system. Such refrigerant charge is the average charge for the MVP Modular Cubers. However it is important to check nameplate for each machine.

DIAGNOSIS

No ice

Problem	Likely Cause	Probable Solution
No power to unit	Power disconnected replace, restart and check	Check breaker or fuse. Reset or
No power to controller	Transformer open	Replace transformer
Shut down on maximum water fill time	Water shut off	Restore water supply
Shut down on maximum freeze time	Water leak Air filters clogged Dirty condenser Restricted location, intake air too hot Ice thickness sensor dirty or disconnected Water distributor dirty Inlet water valve leaks through during freeze Connected to hot water Incomplete harvest High pressure cut out opened Fan motor pressure control open Fan motor not turning Water pump not pumping	Check purge valve, curtain, sump, pump hose Clean air filters Clean condenser Have machine moved Check ice thickness sensor probe Remove and clean water distributor Check inlet water valve Check for bleed thru from / missing check valve in building water supply Check harvest system Check fan motor pressure control, check fan motor, check controller using test mode Check fan pressure control Check fan motor, check fan blade, check controller using test mode Check pump motor, check controller using test mode
Shut down on maximum freeze time	Pump hose disconnected Compressor not operating Low refrigerant charge Hot gas valve leaks through during freeze Thermostatic expansion valve bulb loose Thermostatic expansion valve producing very low or very high superheat Compressor inefficient	Check hose Check compressor contactor, check controller using test mode Check compressor start components Check compressor voltage Check compressor windings Add some refrigerant and restart unit. If cycle time improves, look for leak. Check hot gas valve for hot outlet during freeze Check bulb Check evaporator superheat, change TXV if incorrect Check compressor amp draw, if low and all else is correct, change compressor

DIAGNOSIS

Problem	Likely Cause	Probable Solution
Shut down on maximum harvest time	Ice bridge thickness too small, not enough ice to open curtain Ice bridge thickness too large, ice frozen to evaporator frame Purge valve does not open, water melts ice bridge, not enough ice to open curtain Incomplete ice formation Curtain out of position Curtain switch does not open when curtain does Machine in very cold ambient Hot gas valve does not open Harvest assist probe out of position - ejector pin not retracted Damaged evaporator Fan motor stays on during harvest	Check and adjust if needed Check and adjust if needed Check purge valve Check water distributor for partially plugged holes Check curtain for swing restriction Check switch with ohmmeter Move machine to a warmer location Check hot gas valve, check controller using test mode Check harvest assist mechanism - spring should retract pin Check evaporator surface Check controller using test mode
Shut down on minimum freeze time	Grounded ice thickness sensor	Check sensor for dirt and position. Clean and check gap to evaporator surface.
Long freeze cycle	Dirty air filters Dirty condenser Hot ambient Water leak Water inlet valve leaks through Low on refrigerant Incorrect superheat Fan(s) cycle on and off	Clean filters Clean condenser Reduce room air temperature Check purge valve, check curtain Check inlet valve Add refrigerant, if cycle time drops, check for leak Check evaporator superheat, if significantly low or high, replace TXV Check pressures fans cycle at. Replace fan pressure switch if too low
Long Harvest Cycle	Dirty evaporator No harvest assist Bridge thickness too big Machine in very cool ambient	De-scale water system Check harvest assist solenoid Check and adjust bridge thickness Increase room temperature
False bin full signal	Ice jammed in between curtain and sump Curtain does not close correctly	Clear ice away Check curtain for proper swing
Fan blade vibrates	Blade is bent Fan motor mount is broken	Replace fan blade Replace motor mount
Compressor vibrates	Mounting bolts loose	Tighten bolts
Water pump vibrates	Pump bearings worn	Replace pump
Panels vibrate	Mounting screws loose	Tighten screws

TEST PROCEDURES

All electrical components in this ice machine can be diagnosed with a volt-ohmmeter.

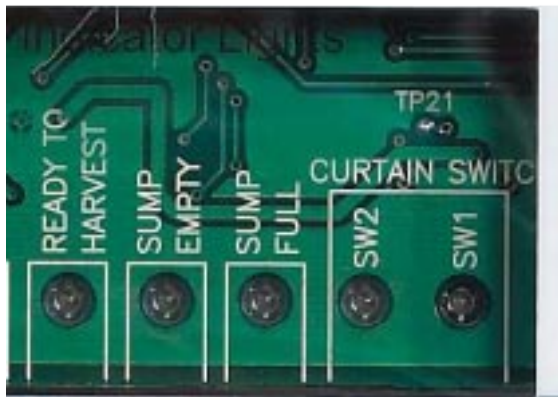
Curtain Switch:

1. Test using the controller's indicator lights. Observe SW1 or SW2. Open and close the curtain in question. When the curtain is opened, the SW light will be ON. When the curtain gets to within a half inch of closing (at the switch) the SW light will go OUT.

Note. As the Prodigy MVP series is equipped with just one Curtain Switch, it's normal to have one SW led always ON.

2. Test with an ohmmeter. Disconnect electrical power. Open the control box cover. Unplug the curtain switch lead from the controller. Connect an ohmmeter to the leads of the switch. Open and close the curtain. When the curtain is closed, the switch is closed and there will be continuity. When the curtain is open, the switch is open and the circuit will be open.
3. Test the controller's curtain switch circuit by jumping the connectors on J1 or J2 together.

Reconnect electrical power. When jumped, the matching SW light will go out. When unplugged or open, the SW light will be ON.



ICE THICKNESS SENSOR

1. Test using the controller's indicator light. Observe the Ready To Harvest light. Shut the machine off. Use a wire to connect the metal part of the Ice Thickness sensor to the evaporator or simply remove the Ice Thickness Sensor and touch its metal surface to the metal control box wall. The Ready for Harvest light should go ON.
2. Test with an Ohmmeter. Disconnect electrical power. Open the control box cover. Unplug the ice thickness sensor lead from the controller. Connect an ohmmeter lead to the ice thickness sensor lead, touch the other ohmmeter lead to the ice machine chassis. There must be an open circuit. If there is continuity, the sensor must be replaced. If there is no continuity, touch the ohmmeter lead to the metal part of the ice thickness sensor. There should be continuity. If open, check the ice thickness sensor for scale build up. Clean and recheck. If still open, replace the ice thickness sensor.
3. Test the controller's ice thickness sensor circuit by connecting a wire from J10 to ground. Reconnect electrical power. The Ready for Harvest light should go ON

CONDENSER FAN	WATER PUMP	PURGE VALVE	WATER IN SOLENOID	HOT GAS VALVE	COMPRESSOR	READY TO HARVEST	SUMP EMPTY	SUMP FULL	CURTAIN SWITCH	
☐	☐	☐	☐	☐	☐	☒	☐	☐	SW 2	SW 1
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐



WATER LEVEL SENSOR

1. Test using the controller's indicator lights (sump empty and sump full). Unit must be powered up and there must be water in the sump. Add some manually if needed. Locate water level sensor. Release from sump cover and slowly lift up until the mid-length probe is out of the water. The sump empty light should come on, and if the unit is on the inlet water solenoid valve will open to fill the reservoir. Return the water level sensor to its normal position. If the unit is on and calling for ice the water will fill until the top probe is in contact with it, at that time the sump full light will switch ON.
2. Test with an ohmmeter. Disconnect electrical power. Open the control box cover. Unplug the connector at J9. Locate water level sensor and

remove it from the sump cover. Test 1: Place one lead of the ohmmeter on the longest probe and the other on the controller end of the red wire, there should be continuity. Test 2: Place one lead on the controller end of the white wire and the other on the mid-length probe, there should be continuity. Test 3: Place one lead on the controller end of the black wire and the other on the shortest probe, there should be continuity. If not, clean the probes and recheck.

3. Test the controller's water level sensor circuit. Reconnect electrical power. Unplug harness from water level sensor, the sump empty light should be ON. Jump harness wires white and black. The sump full light should be ON. Jump harness wires black and red, the sump full and sump empty lights will be OFF. Check harness wire by wire for continuity if there is no reaction from the controller during this test.

CONDENSER FAN	WATER PUMP	PURGE VALVE	WATER IN SOLENOID	HOT GAS VALVE	COMPRESSOR	READY TO HARVEST	SUMP EMPTY	SUMP FULL	CURTAIN SWITCH	
☐	☐	☐	☐	☐	☐	☐	☒	☒	SW 2	SW 1



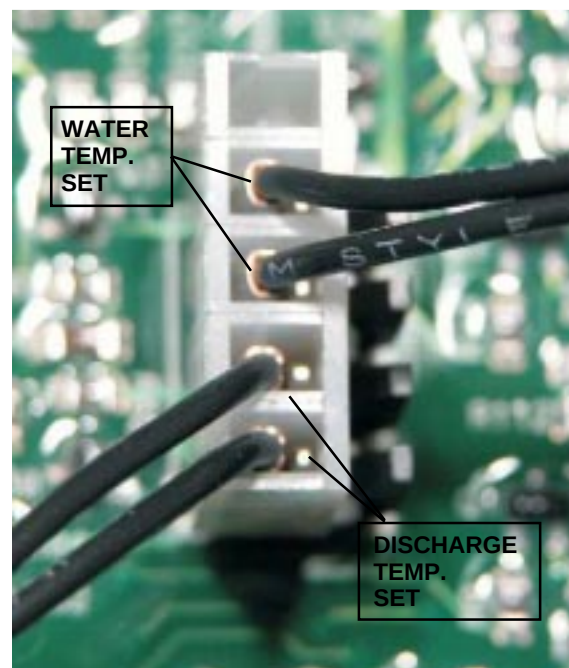
TEMPERATURE SENSOR

1. Check controller. If the sensor calibration is completely out of range, the code display will read either 5 or 7.
2. Check with an ohmmeter. Open control box cover, unplug sensor from J6. Water temperature probe: Measure the temperature of the water. Push and release the clean button. Wait one minute. Measure the resistance of the water probe (two leads next to the open socket) and compare to the resistance in the chart for that

temperature. Any reading within 1000 ohms is acceptable. Discharge sensor: Measure the temperature of the discharge line as close to the sensor as possible. Measure the resistance of the discharge temperature sensor (two leads farthest away from the open socket on the harness connector) and compare to the resistance in the chart for that temperature. Any reading within 1000 ohms is acceptable.

3. Alternate procedure: Remove both water and discharge sensors from their places on the ice machine. Put both into a container of ice water. Put a thermometer in the water. When the thermometer is at 0°C (32 degrees F), check the resistance of each sensor. The resistance should be 32650 ohms

°C	Ohms
0	32650
10	19000
15	15715
20	12495
25	10000
30	8055
35	6530



Compressor

Failure to start.

Single phase models. All have resistance start, capacitor run type motors. Check voltage to compressor at the contactor. Compare the idle voltage (compressor off) to the active voltage (compressor starting). The supply voltage must not be less than the lowest rated voltage for the ice machine. If the voltage is correct, proceed to the next step.

Check starting components.

Potential relay. If the compressor will not start, check the amp draw of the starting circuit. If very low, the potential relay contacts or start capacitor may be open. Measure the resistance of the potential relay contacts and the start capacitor. If either is open it should be replaced. If the compressor starts but draws very high amps from the starting circuit, the potential relay may not switch off. In that case the relay should be replaced.

Measure resistance from Common to ground. It should be infinite. Measure resistance from Common to Run - compare to the chart. Measure resistance from Common to Start - compare to the chart.

Compressor check for high amp draw. Measure amp draw of starting circuit. If it does not drop off immediately after start up, the starting relay should be replaced.

If the compressor is drawing excessive amps but is operating, the run capacitor may be open. Disconnect electrical power, discharge the capacitor and measure its resistance. If open, replace it. If shorted to ground, replace it.

Anytime the compressor is replaced, the potential relay, start capacitor and run capacitor should be replaced with the compressor.

Fan motor

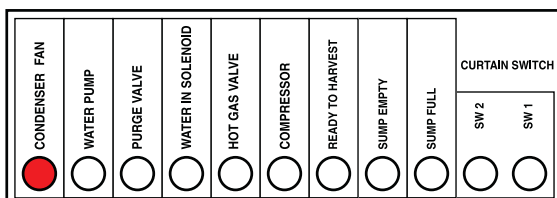
1. Test using the controller's indicator lights.

Note: Fan pressure control connection must be jumped to perform this test.

Put the controller into test mode (depress Off for 3 seconds then depress Clean for 3 seconds). At the end of the test cycle, the fan motor will be powered and the Condenser Fan motor indicator light will be on. The fan motor should start and run at that time. If it does not, repeat the test but check the voltage to the fan motor, it must receive full voltage at the fan motor lead connection at the end of the test. If there is voltage and the motor does not operate, replace the motor. If there is no voltage, check the controller high voltage harness connection.

The fan motor lead is the top wire. Check voltage from it to ground, at the end of the test, when the fan motor indicator light is On, there must be voltage from this pin to ground. Note: high voltage power is supplied to the bottom pin from the contactor line. Refer to the machine wiring diagram as needed.

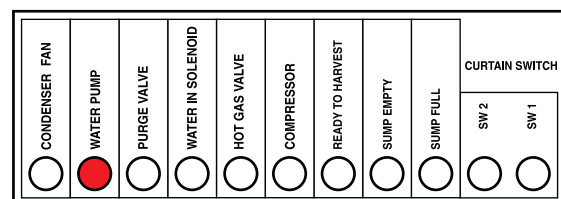
2. Test using an ohmmeter. Disconnect electrical power. Unplug fan motor from harness. Measure fan motor winding resistance. If open, replace the fan motor.



Water Pump

1. Test using the controller's indicator lights. Check the indicator light during the freeze cycle. The light will be On for all but the 30 second anti-slush period, so observe the light for one minute. When it is On, check the water pump, it should be operating. If not, check voltage to the pump. If low check the voltage from the controller to ground. The water pump pin is number 6. If there is voltage at that pin to ground, but very low voltage at the pump motor, there must be a broken wire in the harness. If the voltage is low at pin 6, the controller should be replaced.

2. Test using an ohmmeter. Disconnect electrical power. Unplug the water pump motor leads from the harness. Measure the resistance of the motor windings. If open, replace the pump. Measure resistance to ground. If there is any, replace the pump.

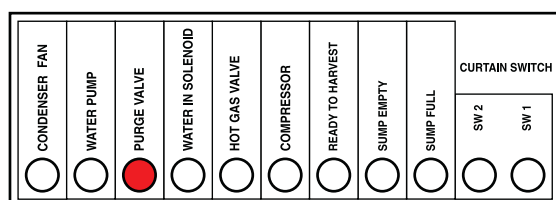


Purge valve

1. Test using the controller's indicator lights. Shut unit off by holding the Off button for 3 seconds. Wait four minutes. Push and release the On button, observe the Purge Valve indicator light. As the unit drains the reservoir, the purge valve will be powered. When it gets power, the indicator light will be ON. If the purge valve does not open to drain the reservoir when its indicator light is on, do a voltage check. Shut the unit down by holding the Off button in for 3 seconds. Unplug the harness connection from the purge valve. Wait

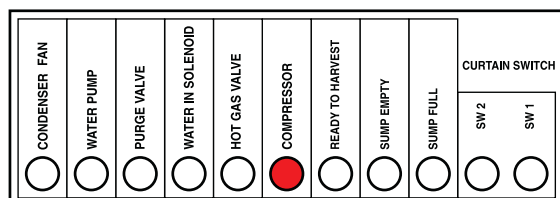
four minutes. Push and release the On button to restart the machine. As the unit drains the reservoir, the purge valve connection should receive full voltage. If it does, the purge valve should be replaced. If there is no voltage, check voltage from the controller to ground. The purge valve pin is 3 (dump valve on wiring diagram). If there is voltage from that pin to ground, but low voltage at the valve harness connection, the harness has a broken wire or poor connection and must be replaced. If the voltage to ground is low, the controller should be replaced.

Note: The coil of this valve is internally rectified, and will normally show infinite resistance when tested with an ohmmeter.



Compressor contactor

- Test using the controller's indicator lights. When the unit is in ice making mode the compressor contactor will have power. Check the Compressor indicator light, when it is on the compressor contactor will have pulled in. If it is not, do a voltage check. Place voltmeter leads on the coil of the contactor. There should be full voltage. If there is full voltage present and the contactor has not pulled in, replace the contactor. If there is no voltage check if the high pressure cut out is open. If the high pressure cut out is closed, check for voltage from the controller to ground. The contactor pin is 4. Check from 4 to ground when the compressor indicator light is on. There should be voltage. If not, replace the controller. If there is voltage at the controller but not at the contactor coil, the harness wires or connectors are damaged and must be replaced.
- Test using an ohmmeter. Test the coil of the contactor for continuity or shorts to ground. Replace if open or shorted.
- Check connections and contacts. Be sure connections are tight and that the contacts are not burnt. Replace any contactor with burnt contacts.



Pressure switches

There are two pressure switches: Fan and High Pressure cut out.

Fan. The fan pressure switch will open to shut the fan motor off at a certain pressure and re-close at a preset higher pressure.

High pressure cut out. The high pressure cut out switch will open at a preset pressure, shutting off power to the compressor contactor. After the pressure has fallen to another preset level, the switch will re-close and the contactor coil will be energized.

To Test Fan Pressure Switch:

- Attach refrigeration gauge set to high side port.
- Unplug both wires from fan pressure control. **Be SURE the wire's terminals are wrapped in electrical tape to prevent short circuits to ground during the test.**
- Connect ohmmeter to terminals of fan pressure control.
- Switch ice machine on, observe pressure that the pressure control closes at, compare to spec. Switch unit off, allow system to equalize, observe pressure the pressure control opens at, compare to spec.

To Test High Pressure Switch:

- Attach refrigeration gauge set to high side port.
- Unplug fan motor or shut water off if water cooled.
- Measure voltage between contactor side terminal of high pressure control and ground.
- Switch ice machine on, observe pressure that the pressure control opens at, compare to spec. Allow system to equalize, observe the pressure that the pressure control closes at, compare to spec.

Transformer

Check secondary voltage, it must be between 10 and 15.5 AC volts. Replace if no voltage is output or if above or below the acceptable voltage.

Controller

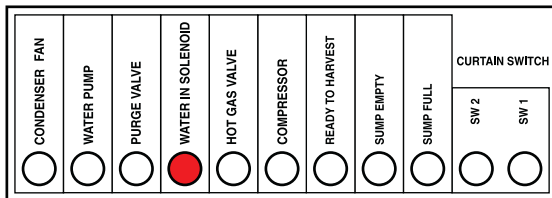
The controller's software operation is confirmed if it is functioning. Execute the test to confirm its operation of the loads. Illumination of a diagnostic code (other than E) is not an indication of controller failure. Each code requires its own diagnosis.

Inlet Water Solenoid Valve

- Test using the controller's indicator lights. Shut unit off by holding the Off button for 3 seconds. Wait four minutes. Push and release the On button, observe the Water Solenoid indicator light. After the unit drains the reservoir, the inlet water valve will be powered to refill the reservoir. When it gets power, the indicator light

will be ON. If the water valve does not open to fill the reservoir when its indicator light is on, do a voltage check. Shut the unit down by holding the Off button in for 3 seconds. Unplug the harness connection from the inlet water valve. Wait four minutes. Push and release the On button to restart the machine. After the unit drains the reservoir, the inlet water valve connection should receive full voltage. If it does, the inlet water valve should be replaced. If there is no voltage, check voltage from the controller to ground. The inlet water solenoid valve pin is 7. If there is voltage from that pin to ground, but low voltage at the valve harness connection, the harness has a broken wire or poor connection and must be replaced. If the voltage to ground is low, the controller should be replaced.

2. Test using an ohmmeter. Disconnect electrical power. Unplug coil from harness. Measure coil resistance. If open, replace the inlet water solenoid.

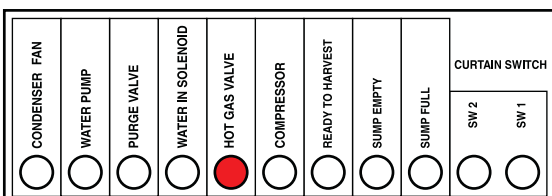


Harvest assist solenoid

1. Test using the controller's indicator lights. Push and release the Harvest button. The Hot Gas indicator light will be on. At the same time the Harvest Assist Solenoid will be powered. If the ice on the evaporator is thin, the solenoid will extend. If the ice is nearly full sized, the solenoid will press against the ice until it releases from the evaporator, then the solenoid probe will extend. If the probe extends, the solenoid is good. If not, do a voltage check. Unplug the high voltage harness from the harvest assist solenoid. Attach a voltmeter to the harness connector. Push and release the Harvest button. There should be full voltage at the connector.

If there is and the solenoid does not extend, replace the solenoid. If full voltage is not present, check voltage at the controller. If there is no voltage, check voltage from the controller to ground. The hot gas / harvest assist pin is 5. If there is voltage from that pin to ground, but low voltage at the solenoid harness connection, the harness has a broken wire or poor connection and must be replaced. If the voltage to ground is low, the controller should be replaced.

Note: The coil of this valve is internally rectified, will normally show infinite resistance when tested with an ohmmeter.



Hot Gas Valve

1. Test using the controller's indicator lights. If the unit is running, or has been off for more than 4 minutes, push and release the Harvest button. The Hot Gas indicator light will be on and the hot gas valve will be energized. The compressor will force discharge gas into the evaporator inlet, warming it. If the evaporator inlet does not warm up, do a voltage check. Shut the unit off by holding the Off button in for 3 seconds. Unplug the high voltage harness from the hot gas solenoid. Attach a voltmeter to the harness connector. Wait 4 minutes. Push and release the Harvest button. There should be full voltage at the connector. If there is and the solenoid does not open, replace the solenoid coil. If full voltage is not present, check voltage at the controller. If there is no voltage, check voltage from the controller to ground. The hot gas pin is 5. If there is voltage from that pin to ground, but low voltage at the solenoid harness connection, the harness has a broken wire or poor connection and must be replaced. If the voltage to ground is low, the controller should be replaced.

2. Test with an ohmmeter. Disconnect electrical power. Unplug high voltage harness from hot gas or vapor valve. Measure resistance of hot gas or vapor valve coil. If open, replace the coil.

CONTROLLER DIFFERENCES

The controllers are programmed at the factory for the model they are installed on, they cannot be moved from one model to another due to differences in:

- Water purge time per setting
- Maximum harvest time
- Number of evaporator plates

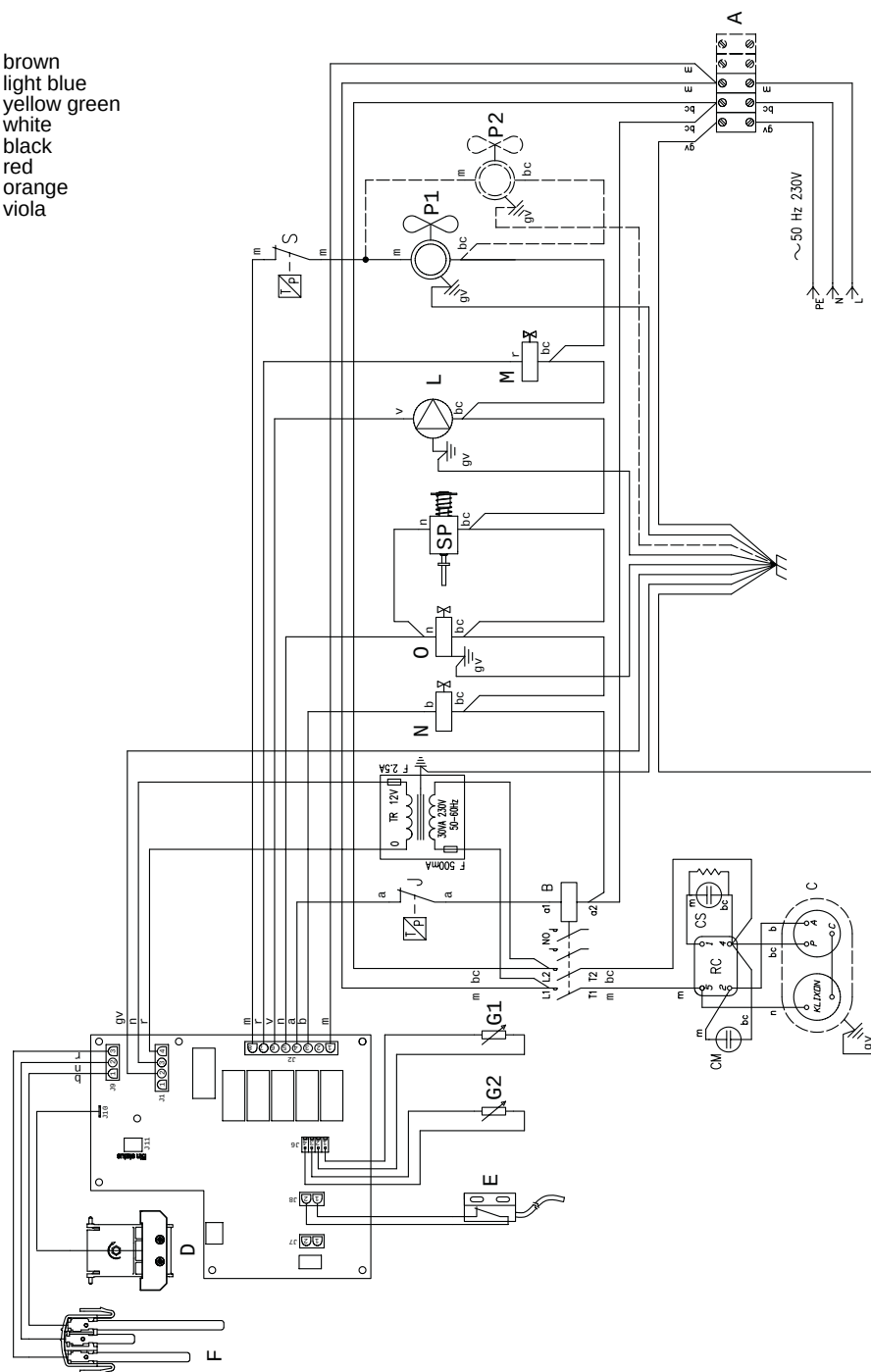
The service controller has a selector switch that allows it to be used as a replacement part in any of the Prodigy models in production at the time the controller was manufactured. As new Prodigy models are introduced, those models will be added to the list of models new service controllers will work with.

The Service Controller includes a selector switch. The switch must be set to the model the controller is being installed on. As new models are introduced, their setting will be added to service controllers produced after that point.



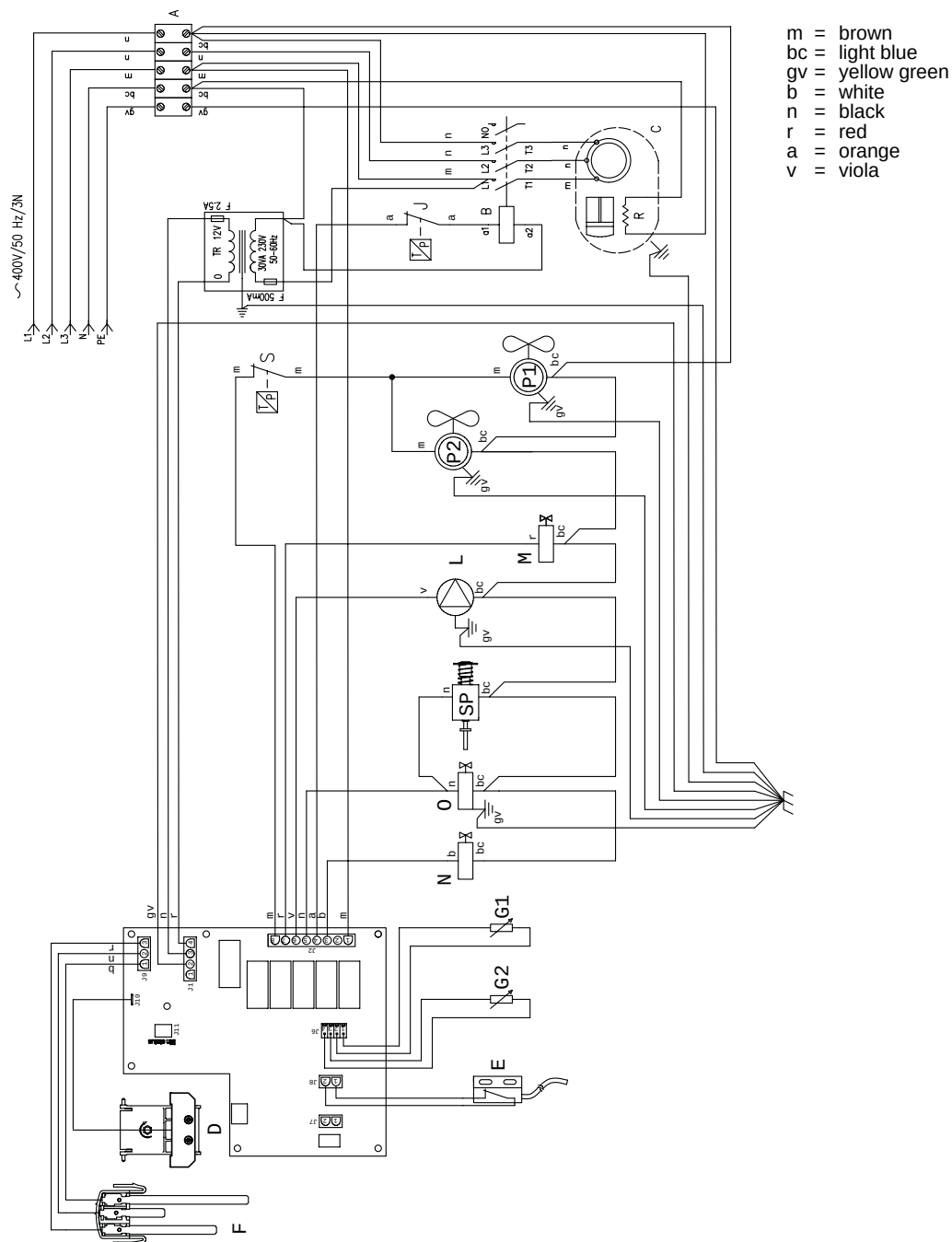
MVP 456/606/806/1006 - WIRING DIAGRAM **220 V. 50 Hz. 1 ph.**

m = brown
bc = light blue
gv = yellow green
b = white
n = black
r = red
a = orange
v = viola



- | | |
|--------------------------------------|---|
| A - Input terminal board | K - Automatic reset switch |
| B - Compressor remote control switch | L - Water pump |
| C - Compressor | M - Water inlet valve |
| D - Ice sensor | N - Water discharge valve |
| E - End defrosting switch | O - Hot gas valve |
| F - Water level sensor | SP - Solenoid harv assist |
| G1 - Condenser temperature probe | P1 - Fan motor 1 (only AIR cooled unit) |
| G2 - Water temperature probe | P2 - Fan motor 2 (only AIR cooled unit) |
| H - Led card | RC - Compressor relay |
| I - Electronic card | CS - Start condenser |
| J - Max pressure switch | CM - Run condenser |

MV 1006 - WIRING DIAGRAM **400 V. 50 Hz. 3 ph.**



A - Input terminal board
 B - Compressor remote control switch
 C - Compressor
 D - Ice sensor
 E - End defrosting switch
 F - Water level sensor
 G1 - Condenser temperature probe
 G2 - Water temperature probe
 H - Led card
 I - Electronic card
 J - Max pressure switch
 S - Fan pressure switch

K - Automatic reset switch
 L - Water pump
 M - Water inlet valve
 N - Water discharge valve
 O - Hot gas valve
 SP - Solenoid harv assist
 P1 - Fan Motor 1 (only AIR cooled unit)
 P2 - Fan Motor 2 (only AIR cooled unit)
 RC - Compressor relay
 CS - Start condenser
 CM - Run condenser
 R - Run condenser

REPAIR PROCEDURES

Ice thickness sensor

- 1 Push and release the Off switch.
- 2 Remove front and top panels.
- 3 Push and release the Harvest switch
- 4 Disconnect electrical power.
- 5 Open the control box.
- 6 Remove curtain.
- 7 Locate sensor, squeeze mounting legs together to release it from the mounting bracket.



- 8 Remove sensor, follow wire back to control box.
- 9 Disconnect from controller connection J10.
- 10 Remove sensor from machine.
- 11 Reverse to reassemble.
- 12 Set initial probe-to-evaporator-surface gap using a 5,5 mm drill bit as a gauge.

Controller

- 1 Disconnect electrical power.
- 2 Remove front panel.
- 3 Open control box door.



- 4 Unplug all wires from controller.
- 5 Remove screws holding controller to door
- 6 Push controller snaps down and pull controller from mounting bracket.
- 7 Before touching new controller, discharge any static electricity by touching the metal surface of the ice machine cabinet.

- 8 Rotate selector switch to the proper model number for the machine the controller is being installed on.



- 9 Install new controller on mounting bracket, secure with original screws.
- 10 Attach all wires removed.
- 11 Shut control box cover.
- 12 Switch on the electrical power.

Curtain

- 1 Push and hold the Off button to shut the machine off.
- 2 Remove front panel.
- 3 Remove evaporator cover.
- 4 Push inside tab in to release front curtain pin from holder.
- 5 Pull curtain from machine.
- 6 Reverse to reassemble.
- 7 Push and release the ON button to restart the machine.

Curtain switch

- 1 Push and hold the Off button to shut the machine off.
- 2 Disconnect electrical power
- 3 Remove front panel.
- 4 Open control box.
- 5 Locate curtain switch on evaporator mounting bracket. Pull switch from its snaps.
- 6 Dismount wires from sump cover and remove from J7 or J8 connector on control board.
- 7 Reverse to reassemble. Be sure wires are re-mounted to sump cover edge.

Water level sensor

- 1 Push and hold the Off button until the machine shuts off.
- 2 Remove the front panel.
- 3 Squeeze the locking tabs together and pull the sensor up and out of the sump.
- 4 Unplug the electrical connection from the sensor.
- 5 Reverse to reassemble.

CLEANING, SANITATION AND MAINTENANCE

This ice system requires three types of maintenance:

- Remove the build up of mineral scale from the ice machine's water system and sensors.
- Sanitize the ice machine's water system and the ice storage bin or dispenser.
- Clean or replace the air filter and clean the air cooled condenser (air cooled models only).

It is the User's responsibility to keep the ice machine and ice storage bin in a sanitary condition. Without human intervention, sanitation will not be maintained. Ice machines also require occasional cleaning of their water systems with a specifically designed chemical. This chemical dissolves mineral build up that forms during the ice making process.

Sanitize the ice storage bin as frequently as local health codes require, and every time the ice machine is cleaned and sanitized.

The ice machine's water system should be cleaned and sanitized a minimum of twice per year.

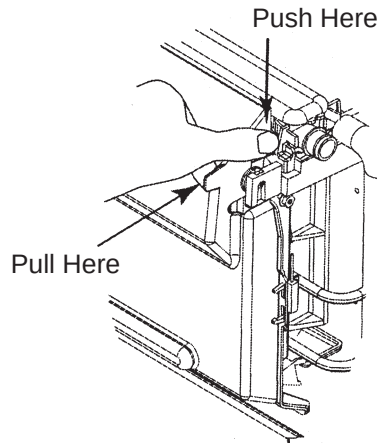
1. Remove the front panel.
2. If the machine is operating, push and release the Harvest button. When the machine completes the Harvest cycle it will stop. If the bin is full (*b* shows in display) push and release the Off button.
3. Remove all ice from the storage bin or dispenser.
4. Push and release the Clean button. The yellow Clean light will blink and the display will show *C*. The machine will drain the reservoir and refill it. Go onto the next step when the reservoir has filled.
5. Pour 500 ml of Scotsman Cleaner ice machine scale remover into the reservoir.
6. Allow the ice machine scale remover to circulate in the water system for at least 10 minutes.

Ice machine cleaner contains acids. Acids can cause burns. If concentrated cleaner comes in contact with skin, flush with water. If swallowed, do NOT induce vomiting. Give large amounts of water or milk. Call Physician immediately. Keep out of the reach of children.

7. Push and release the Clean button again. The yellow Clean light will be on continuously and the machine will drain and refill the reservoir repeatedly to purge out the ice machine scale remover and residue.
8. Allow the drain and refill process to continue for at least 20 minutes.
9. Push and release the Off button. The clean cycle will stop and the display will show *O*.

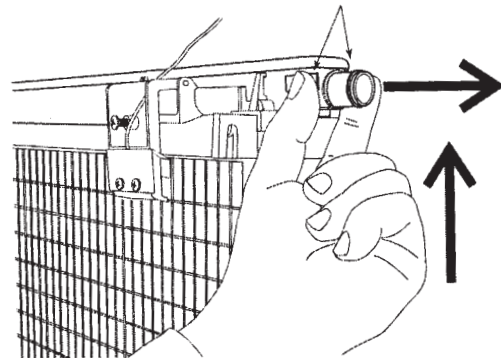
Note: If unit has not been de-scaled for an extended period of time and significant mineral scale remains, repeat steps 5-10.

10. Locate curtain, push in on edge of curtain by pivot pin to release it. Pull curtain out of machine.



11. Remove water distributor from ice machine. Inspect distributor for restricted orifice holes. Be sure all holes are fully open.

Squeeze Tabs Together, Slide Out Until it Stops, Then Lift to Remove



Remove Water Distributor



Inspect Orifice Holes

Inspect Water Distributor

12. Locate ice thickness sensor. Squeeze mounting legs together to release sensor. Wash the metal surfaces of the sensor and the adjustment screw with ice machine scale remover solution. Also wash the water distributor and curtain with the ice machine cleaner solution.

13. Locate water level sensor. Squeeze catches together and pull up to remove sensor. Wash metal surfaces of sensor with ice machine scale remover solution.

14. Mix a solution of sanitizer.

Note: A possible sanitizing solution may be made by mixing 5 ml of liquid household bleach with 7 liters of warm (35-45°C) potable water.

15. Thoroughly wash all surfaces of the ice thickness sensor, water level sensor, curtain and water distributor with the sanitizer solution.

16. Wash all interior surfaces of the freezing compartment, including evaporator cover and right side panel liner with the sanitizer solution.

17. Return water level sensor, ice thickness sensor, water distributor and curtain to their normal positions.

18. Push and hold the clean button to drain the reservoir. Push and release the clean button again and when the purge valve indicator light goes out, immediately pour the remaining cleaning solution into the reservoir.

19. Circulate the sanitizer solution for 10 minutes, then push and release the Clean button.

20. Allow the water system to be flushed of sanitizer for at least 20 minutes, then push and release the Off button.

21. Return the evaporator cover and front panel to their normal position and secure with the original fasteners.

22. Push and release the On button to resume ice making.

Ice Storage Bin

1. Remove and discard all ice.

2. Mix a solution of 200 ml of Scotsman Clear ice machine scale remover in 2,5 liters of potable water and wash all interior surfaces of the ice storage bin to remove any mineral scale build up. Pour excess cleaner solution into the bin's drain.

3. Mix a solution of sanitizer and thoroughly wash all interior surfaces of the ice storage bin. Pour excess sanitizer solution into the bin's drain.

Air cooled condenser filter

1. Pull air filter(s) forward from side panel.

2. Wash the dust and grease off the filter.

3. Return it to its original position.

Do not operate the machine without the filter in place except during cleaning.

Air cooled condenser

If the machine has been operated without a filter the air cooled condenser fins will need to be cleaned.

They are located under the fan blades. The services of a refrigeration technician will be required to clean the condenser.

Exterior Panels

The front and side panels are durable stainless steel. Fingerprints, dust and grease will require cleaning with a good quality stainless steel cleaner.