

TECH - SPEC'S

Technician's Pocket Guide

#80050

This technicians pocket guide covers all Hoshizaki H-Series ice maker models.

Additional technical information, full parts, and service manuals are available for review and download on the Tech Support page of the Hoshizaki web site.

See “www.hoshizakiamerica.com” for manuals, Tech- Tips, and additional technical information on Hoshizaki products.

See Tech-Spec's #80024 purple pocket guide for older models using R-12/502 refrigerant.

See Tech-Spec's #80021 green pocket guide for E-Series models using R-22.

See Tech-Spec's #80045 orange pocket guide for F and early H series ice maker models.

These guides can be downloaded from the Hoshizaki web site or purchased through your local Hoshizaki Distributor.

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HOSHIZAKI MODEL NUMBER IDENTIFICATION CODE

ex. KM-1300SAH-E

Code - Designation

KM - UNIT TYPE

- B - Bin
- DB - Dispenser Bin
- DCM - Dispenser Cubelet Maker
- DKM - Dispenser KM Combo
- DM - Countertop Dispenser
- DT - DCM/F Combo
- F - Flaker
- FD - Dispenser model (24" deep)
- FS - Flaker Serenity
- KM - Crescent Cuber
- KMD - Dispenser model (24" deep)
- KML - Low Profile Crescent Cuber
- KMS - KM Serenity

1300 - PRODUCTION

Approximate production/24 Hours
@ 70°F Air/50°F Water

S - UNIT STYLE

- B - Self contained with bin
- M - Modular
- S - Stackable

A - CONDENSER STYLE

- A - Air Cooled
- L - Low Side
- R - Remote Air Cooled
- W - Water Cooled

H - GENERATION/SERIES

Model designation
H - R404A latest model

E - SPECIAL MODEL DESIGNATION

- 50 - 50 HZ.
- C - Cubelet
- E - European - 50 HZ.
- OS - Opti-Serve

Nameplate

HOSHIZAKI ICE MAKER	
MODEL NUMBER	
SERIAL NUMBER	
AC SUPPLY VOLTAGE	
COMPRESSOR	
FAN	
MAXIMUM FUSE SIZE	
MAX. HACR BREAKER (USA ONLY)	
MAX. CIRC. BREAKER (CANADA ONLY)	
MINIMUM CIRCUIT AMPACITY	
DESIGN PRESSURE	
REFRIGERANT	
MOTOR-COMPRESSOR THERMALLY	
PROTECTED	
HOSHIZAKI AMERICA, INC. Peachtree City, GA	
	LISTED ICE MAKER WITHOUT STORAGE MEANS 946Z
	
	
COMPONENT 	

See the Nameplate for electrical and refrigeration specifications. This Nameplate is located on the upper right hand side of rear panel. Since this Nameplate is located on the rear panel of the icemaker, it cannot be read when the back of the icemaker is against a wall or another piece of kitchen equipment. Therefore, the necessary electrical and refrigeration information is also on the rating label, found by removing the front panel of the icemaker. We reserve the right to make changes in specifications and design without prior notice.

Warranty Information

Registration

Warranty registration is available online and a registration card is supplied with the equipment. Registration must be completed to initiate warranty. The warranty begins on the date of installation if registration procedures are followed. If registration is not completed, the warranty date will be the date of sale or date of shipment from the factory, respectively.

Warranty Coverage

The warranty will cover defects in material or workmanship under normal and proper use and maintenance service as specified by Hoshizaki. Coverage for parts and labor is limited to the repair or replacement of parts or assemblies that in Hoshizaki's opinion are defective.

Coverage Chart

ITEM	PRODUCT	PARTS	LABOR
Total Unit	Standard bin DB/DM F/DCM KM Cuber	3 Years 1 Year 2 Years	3 Years 1 Year 2 Years
Compressor & Air-Cooled Condenser	KM Cuber F/DCM	5 Years 5 Years	3 Years 2 Years
Evaporator Plate	KM Cuber	5 Years	5 Years
Evaporator, Auger Gear Motor Assy.	F/DCM	2 Years	2 Years
	Large Bin	5 Years	5 Years
Accessory	Drain Pump Other	1 Year 90 Days	--- ---

See Warranty Statement supplied with the unit for details. Warranty valid in United States, Canada, Mexico, Puerto Rico, and U. S. Virgin Islands.

Contact factory for warranty in other countries, territories, or possessions.

KM Installation

General Specs

The ice machine is not intended for outdoor use.

Operating Conditions - ALL MODELS

Item	Model	Range
Voltage Range	115V units	104~127V
	208-230V units	187~264V
	220-240 or 230V	198~254V
Ambient Temp.	All	45~100 °F
	Remote Con- denser	-20~122 °F
Water Supply Temp.	All	45~90 °F
Water Supply Pressure	All	10~113 PSIG

Allow 6" clearance at rear, sides, and top for proper air circulation and ease of maintenance or service. 20" top clearance for F/DCM.

Plumbing Requirements

Water Supply: On KM units the water supply line size is critical due to the water assisted harvest and the use of a ported inlet water valve solenoid.

Model	Line Size	Fitting Size
KM- 61 ~ KM-900	3/8" OD	1/2 FPT
KM-1300 ~ KM-2500	1/2" OD	1/2 FPT
All F/DCM	3/8" OD	1/2 FPT

*Water cooled condenser units require two separate supplies sized as per list above.

Drain Connections:*Some models have 2 drain outlets.

Model	Line Size	Fitting Size
All Bins	3/4" OD	3/4 FPT
All KM models	3/4" OD	3/4 FPT

Model	Line Size	Fitting Size
Flakers/DCM	3/4" OD	3/4 FPT*

Water Cooled Condenser Outlet:

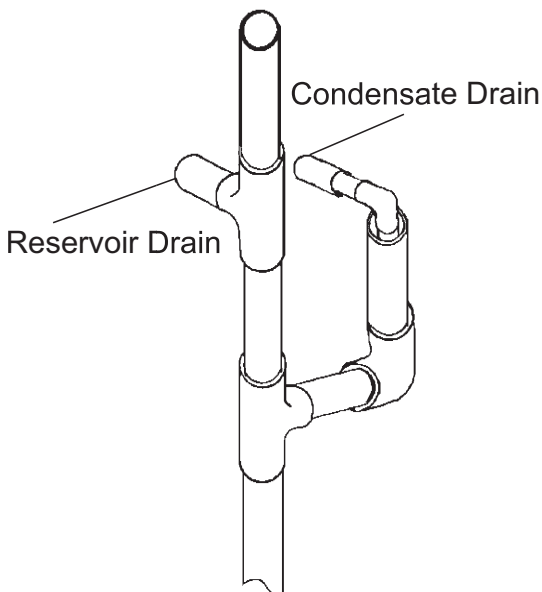
KM-151BWH, KM-250BWH, KM-255BWH, KM-1600SWH, KM-1600SWH3, KM-2000SWH3 have 1/2" FPT outlet.

All other KM, KML, KMD, Flaker, and DCM models have 3/8" FPT outlet.

Hoshizaki recommends that the ice machine drain and bin drain be piped separately to the drain connection point allowing 1/4" per foot fall.

Condensate Drain

The condensate drain is generally connected to the ice



Note: Restricting the drain size will cause water to overflow the reservoir or drain pan!

Flow Rates

The minimum flow rate requirements for Hoshizaki ice maker units are as follows:

Models	GPM
KM-61/101/151/255	0.26~0.31
KM-201B/251B/260B/320M, KML-351MWH, KML-451M	0.53
DKM-500B, KML-250/350/450/631, KML-351MAH, KM-461/501/515/901M All F/DCM's	0.8
KM-515M-E/650M-E	1.06
KMD-450/700/900M, KML-600M, KM-500/600/650M	1.58
KM-630/900/1340/1601M, KM-900M50, KM-630M-E, KMD-850M/901M, KMS-750/1230/1300/1400	2.11
KM-1601S/1801S/2001S/2500S	3.0
KM-1800S/2000S/2400S	3.34
KM-1300S/1600S, KM-1300S-E, KM-1301S, KM-1301S-E	3.96

Filtration

Hoshizaki recommends that filtration be installed on our products. The type of filtration will vary with local water quality. In some cases, treatment is needed to address water hardness, or high mineral content.

There are many possibilities for water treatment: In general, a filter median is used for sediment/dirt and trash. Carbon is used for taste and odor and polyphosphate is used for scale control.

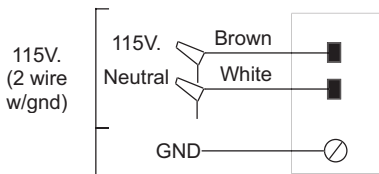
There are also other possibilities, such as a water softener (not recommended for F/DCM's), or in some cases, reverse osmosis (RO). RO can be aggressive, but is acceptable if the RO output has a neutral pH of 7.

See your local Hoshizaki distributor, or a water expert, for the best recommendation for your area.

Note: Filtration, or treatment, must be sized properly to be effective. Inadequate flow rate will cause problems with production and operation of the icemaker.

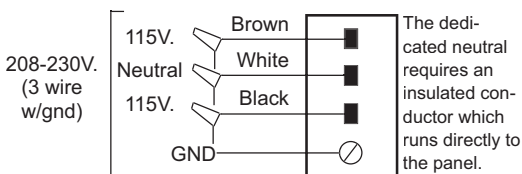
Electrical Connections

115 VOLT/1 PHASE



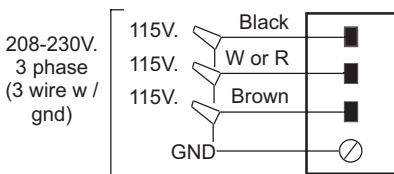
208-230 VOLT/1PHASE

208-230V/1 Phase units require a dedicated neutral due to the use of 115V components.

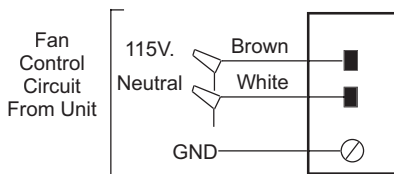


If high leg is present, connect to black wire. A transformer can be used to provide 115V control circuit.

208-230 VOLT/3 PHASE



Remote Condenser Connections

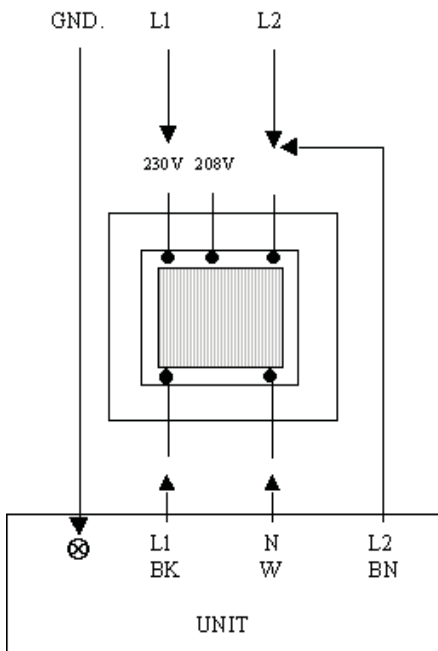


Note: All Electrical connections must be made in accordance with all national and local electrical codes.

Transformer Application (Optional)

All 208V-230V 3 ph models include a 115V transformer with a 208/230V selector switch. **Be sure to select the position that best matches the incoming voltage prior to supplying power to the unit.** (Voltage from the center tap to case ground will be 67.5V due to the transformer circuit.) 208/230V models include 115V controls. They require a 115/208-230V circuit which has 4 wires: L1, L2, dedicated neutral, and ground.

If a dedicated neutral is not available, or the previous unit used a 3 wire circuit (L1,L2, & gnd.), a step-down transformer can be used at the unit to provide power to the 115V components. This will save on installation time and cost if a dedicated neutral is not present. Transformer #4A0817-01 or equivalent can be used for KM models. Transformer #446240-01 or equivalent can be used for F-1000 models. The transformer should be mounted inside the compressor compartment and wired using the following generic diagram.



Remote Applications Condenser Chart

Condenser Model	Remote Model Number's
URC-5F	KM-461/515M/650M, *F-1001M, FD-1001M
URC-6F	KM-500/501/630M, *F-1001M
URC-7F	KML-600M
URC-9F	KML-631M, KMD-850/901M
URC-12F	KM-900/1300M, KM-1300S, *KMD-700M, KMD-900M, *F-1500
URC-14F	KM-1340M, KM-1301S, *KMD-700M, *F-1500
URC-20F	KM-1600M, KM-1600/1800/ 2000S, F-2000M
URC-21F	*KM-1601M/S, *KM-1900S
URC-22F	*KM-1601M/S, *F-2000M, *KM-1900S, KM-2100S
URC-23F	KM-2500S
URC-24F	KM-2400S
SRC-10H	FS-1001MLH
SRK-7H	KMS-750MLH
SRK-13H	KMS-1230MLH
SRK-14H	KMS-1400/1401MLH
SRK-14H3	KMS-1401MLH
*Model has 2 possible matches.	

When installing a remote application the unit/condenser combination must match with the above chart. A non-OEM multi-pass condenser can be used with prior written factory approval. See service bulletin SB99-00019R1

Remote Lines

Hoshizaki has 3 precharged line set lengths available: 20 ft, 35 ft, and 55 ft. The line sets are available in different sizes for different models.

Line Set Identification Code

ex. R404 - 35610

R404 - Refrigerant

35 - Length In Feet

6 - Liquid Line Size in 16th's

10 - Discharge Line Size in 16th's

Line Set Applications

Models	Line Set	LL-DL (Size)
KM-461/500/515/650MRH, F-1001MRH, FD-1001MRH KML-600	R404-2046-2 R404-3546-2 R404-5546-2	1/4" OD-3/8" OD
KM-900/901MRH, KM-1300/1301/1340M/S, KML-631MRH, KMD-700/850/900/901MRH, F-1500M	R404-2068-2 R404-3568-2 R404-5568-2	3/8" OD-1/2" OD
KM-1600/1601M/S/3 KM-1800/1900/2000S/3 KM-2100S/3 KM-1800SRH(3) KM-2500SRH3 KM-2400SRH/(3) F-2000MRH/3/-C	R404-20610 R404-35610 R404-55610	3/8" OD-5/8" OD
KMS- 750/1230/1400/1401MLH	R404-20810 R404-35810 R404-55810	1/2" OD-5/8" OD
FS-1001MLH	R404-20410 R404-35410 R404-55410	1/4" OD-5/8" OD

Remote Condenser Installation on Roof

Air flows into coil.
Allow 24" clearance
for air circulation

Air Flow out louver.

Secure Legs
to Roof Curb

The Remote Con-
denser should not
be more than 33'
above the icemaker
or more than 10'
below it.
These distances
are measured from
fitting to fitting.

Liquid
Line

Discharge
Line

2½" Dia. Hole in
roof for tubing.
Seal after instal-
lation to prevent
leaking

Electrical connections
must meet all local
codes

Liquid
Line

Service loop can be horizontal
or vertical and should not be
more than a half loop.

Line Set Installation

Universal line set adapter kits (part number OS-QUICK for KM and HS-0231 for KMS) are available if you need to field engineer your line set. Both lines should be insulated separately the entire length of run.

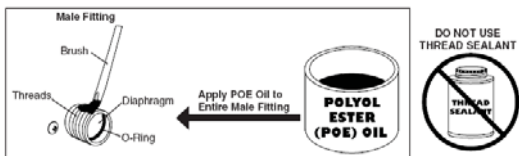
The refrigerant charge for a new unit is distributed between the unit head and the URC condenser. The line set has a minimal holding charge of 15 to 30 psig refrigerant vapor.

If you need to field engineer your line set, or shorten/ lengthen a precharged line set, you can do so by following these steps:

1. Using the correct connector kit, braze the line set connection. (If you shorten or lengthen a pre-charged line set, recover the holding charge, cut/lengthen, and braze the connections.)
2. Pressurize the lines and leak check all braze joints.
3. Evacuate the lines through the service ports on the quick connect fittings.
4. Charge both lines with 15 to 30 psig R-404A vapor.

To make quick connect connections:

1. Lubricate threads and O-rings with clean refrigerant oil.



2. Align the male and female couplings straight.
 3. Tighten the female connector until it bottoms out.
- Note:** Always use a back up wrench when tightening these fittings.
4. Once secure, mark a reference line and turn the fittings an additional 1/6 turn to assure a good brass seal.



5. Leak check the joints with soap bubbles or electronic leak detector.

R-404A Refrigerant System Information

System Charge

The ice machine head and URC condenser are shipped with enough refrigerant charge for up to 66 ft. of line set length. The maximum line set length is 100 equivalent feet from the head to the condenser.

For applications longer than 66 ft. (up to the maximum 100 ft. length), additional refrigerant must be added.

For any length over 66 ft. add 0.4 oz. per foot.

For units utilizing 3/8" L.L. no line size change is needed.

For units utilizing 1/4" L.L. and 3/8" D.L., the line size should be increased to 3/8" L.L. and 1/2" D.L. for the entire length of the run then add 16.5 oz + 0.4 oz. per foot over 66 foot.

Note:

- (1) Recommended line sizes are same as listed in the line set application chart.
- (2) Older models utilize R-502 refrigerant or R-22 refrigerant. Always check the unit nameplate for the correct refrigerant type.

Do NOT connect components using different type refrigerants!

- (3) If refrigerant is added due to extended line set length, mark the correct total charge on the unit nameplate for future reference.
- (4) When routing and installing remote lines, always use standard refrigerant piping practices.
- (5) Hoshizaki recommends eliminating any excess loops in a pre-charged line set application before making the unit connections. This will eliminate oil traps and possible crimps in the excess tubing.
- (6) A service loop can be included behind the unit as shown in the illustration on page 13 to allow the unit to be moved away from the wall if needed.

Critical Charge Amount: The total system charge is critical for proper operation according to Hoshizaki specification. Always weigh in the proper charge, per the following charge chart. (Remote units show standard charge good for up to 66 ft.) Unit charge information is also found on the unit Nameplate.

**FOR FACTORY SUPPORT
CONTACT HOSHIZAKI TECHNICAL SUPPORT AT:
1-800-233-1940
E-Mail: techsupport@hoshizaki.com**

Cuber Charge Chart (Refrigerant R-404A)

Model	Total Charge	Refrigerant
KM-61BAH	6.4 oz	R134A
KM-101BAH	7.8 oz	R134A
KM-151BAH	8.5 oz	R134A
KM-151BWH	10.7 oz	R134A
KM-201BAH	12 oz	R404A
KM-201BWH	11 oz	R404A
KM-251BAH	15 oz	R404A
KM-255BAH	1 lb 1 oz	R404A
KM-260BAH	12.7 oz	R404A
KM-260BWH	13.8 oz	R404A
KM-280MAH(-E)	12 oz	R404A
KM-320MAH(-E)	1 lb 4.3 oz	R404A
KM-320MWH	1 lb 0.8 oz	R404A
KM-461MAH	1 lb 11.5 oz	R404A
KM-461MRH	5 lbs 4.7 oz	R404A
KM-461MWH	1 lb 2.5 oz	R404A
KM-500MAH(-E)	1 lb 10 oz	R404A
KM-501MRH	4 lbs	R404A
KM-501/515MWH	15 oz	R404A
KM-501MAH	1 lb 10 oz	R404A
KM-515MAH	1 lb 7.3 oz	R404A
KM-515MAH-E	1 lbs 2.5 oz	R404A
KM-515MRH	4 lbs 4.8 oz	R404A
KM-600MAH	1 lbs 11 oz	R404A
KM-630MAH(-E)	1 lb 6 oz	R404A
KM-630MRH	4 lbs 4 oz	R404A
KM-630MWH	1 lb 4.3 oz	R404A
KM-630MWH-LO-M1	1 lb 3 oz	R404A

NOTE: To convert to grams multiply oz. x 28.35.

Cuber Charge Chart (continued)

Model	Total Charge	Refrigerant
KM-630MWH-M2	1 lb 4.3 oz	R404A
KM-650MAH(-E)	1 lb 6.6 oz	R404A
KM-650MRH	5 lbs 11 oz	R404A
KM-650MWH	1 lb 5.7 oz	R404A
KM-900MAH(-50)	3 lbs 7 oz	R404A
KM-900MRH(3)	9 lbs 14 oz	R404A
KM-900MWH(3)	1 lb 14 oz	R404A
KM-900MWH-L0-M2	1 lb 7 oz	R404A
KM-901MAH	2 lbs 15 oz	R404A
KM-901MRH(3)	9 lbs 4 oz	R404A
KM-901MWH	1 lb 15.4 oz	R404A
KM-1300MAH	4 lbs	R404A
KM-1300MRH	9 lbs 15 oz	R404A
KM-1300MWH	2 lbs 9 oz	R404A
KM-1300SAH(3)(-E)	3 lbs 14 oz	R404A
KM-1300SRH(3)	11 lbs 7 oz	R404A
KM-1300SWH(3)	2 lbs 2 oz	R404A
KM-1301SAH	3 lbs 15.5 oz	R404A
KM-1301SAH-E	3 lbs 9.1 oz	R404A
KM-1301SRH(3)	10 lbs 5.8 oz	R404A
KM-1301SWH(3)	2 lbs 8.2 oz	R404A
KM-1340MAH	4 lbs 11.4 oz	R404A
KM-1340MRH	9 lbs 14.7 oz	R404A
KM-1340MWH	2 lbs 9 oz	R404A
KM-1600SWH(3)	3 lbs 1 oz	R404A
KM-1600M/SRH(3)	14 lbs 12 oz	R404A
KM-1601MRH(3)	24 lbs 4.0 oz	R404A
KM-1601SRH(3)	24 lbs 14.6 oz	R404A
KM-1601SWH(3)	3 lbs 1 oz	R404A

Cuber Charge Chart (continued)

Model	Total Charge	Refrigerant
KM-1800SAH(3)	4 lbs 7 oz	R404A
KM-1800SRH(3)	15 lbs 7 oz	R404A
KM-1800SWH(3)	3 lbs 2 oz	R404A
KM-1900SAH(3)	4 lbs 10.1 oz	R404A
KM-1900SRH(3)	23 lbs 7.7 oz	R404A
KM-1900SWH(3)	3 lbs 1.4 oz	R404A
KM-2000SRH3	16 lbs 2 oz	R404A
KM-2000SWH3	3 lbs 7 oz	R404A
KM-2400SRH3	24 lbs	R404A
KM-2500SWH3	4 lbs 11.5 oz	R404A
KM-2500SRH3	24 lbs 12.3 oz	R404A
KMD-450MAH	1 lb 5.2 oz	R404A
KMD-450MWH	1 lb 0.9 oz	R404A
KMD-700MAH	2 lbs 8.6 oz	R404A
KMD-700MRH	10 lbs 0.5 oz	R404A
KMD-700MWH	1 lb 10 oz	R404A
KMD-850MAH	2 lbs 8.2 oz	R404A
KMD-850MRH	9 lbs 4.2 oz	R404A
KMD-850MWH	1 lb 12.6 oz	R404A
KMD-900MAH	3 lbs 8.3 oz	R404A
KMD-900MRH	9 lbs 6 oz	R404A
KMD-900MWH	2 lbs	R404A
KMD-901MAH	4 lbs 3 oz	R404A
KMD-901MRH	9 lbs 14.7 oz	R404A
KMD-901MWH	2 lbs 3.3 oz	R404A
KML-250/350MAH	1 lb 2 oz	R404A
KML-250MWH	14.1 oz	R404A
KML-350MWH(-M3)	13.5 oz	R404A
KML-351MAH/MWH	1 lb 2 oz	R404A
KML-450MAH	1 lb 6 oz	R404A

Cuber Charge Chart (continued)

Model	Total Charge	Refrigerant
KML-450MWH	15.8 oz	R404A
KML-451MAH T0 & T2	1 lb 13.1 oz	R404A
KML-451MAH T1, U1>	1 lb 8.7 oz	R404A
KML-451MWH < U0	1 lb 2.3 oz	R404A
KML-451MWH U1>	15.2 oz	R404A
KML-600MAH	2 lbs 4 oz	R404A
KML-600MRH	10 lbs 6 oz	R404A
KML-631MAH	2 lbs 10.3 oz	R404A
KML-631MRH	9 lbs 8.4 oz	R404A
KML-631MWH	1 lb 9.6 oz	R404A
KMS-1230MLH KMS-1400MLH	16 lbs 5 oz	R404A
KMS-750MLH	10 lbs 11 oz	R404A

URC Charge Chart

(Condenser charge is included in total charge.)

Model	Factory Charge	Refrigerant
URC-5F/6F	1lb 14oz	R404A
URC-7F	2lbs 5oz	R404A
URC-9F	3lbs 14.8oz	R404A
URC-12F	4lbs 7oz	R404A
URC-14F	4lbs 7oz	R404A
URC-20F	7lbs 11oz	R404A
URC-21F	9lbs 11oz	R404A
URC-22F	7lbs 11.5oz	R404A
URC-23F	9lbs 11oz	R404A
URC-24F	11lbs	R404A
SRC-10H	8lbs 6oz	R404A
SRK-7H	10lbs 4oz	R404A
SRK-13H/14H/14H3	15lbs 14oz	R404A

Refrigerant Oil

All R-404A models use Polyol Ester (POE-EAL) oil. POE oil absorbs moisture easily. Extra care must be taken to reduce the possibility of moisture entering the system during service. If moisture contamination is suspected, the oil should be changed and the liquid line drier must be replaced. Changing the oil requires removal of the compressor so that the oil can be drained and replaced with the correct amount. See compressor data chart for oil amount.

Replacement compressors are shipped with POE oil.

Flakers/DCM'S Charge Chart (Refrigerant R-404A)

Model	Total Charge	Refrigerant
DCM-270BAH	14.8 oz	R404A
DCM-500BAH	1 lb 4.1 oz	R404A
DCM-500BWH	14.1 oz	R404A
DCM-750BAH	1 lb 7.1 oz	R404A
DCM-750BWH	1 lb 2.7 oz	R404A
DKM-500BAH	2 lbs	R404A
DKM-500BWH	1 lb 2 oz	R404A
DT-400BAH-OS	1 lb 1 oz	R404A
F-330BAH(-C)	7.1 oz.	R404A
F-450MAH(-C), F-500BAH(-C)	1 lb	R404A
F-800MAH(-C)	1 lb 10 oz	R404A
F-800MWH(-C)	13.8 oz	R404A
F-801MAH(-C)	1 lb 12 oz	R404A
F-801MWH(-C)	1 lb 1 oz	R404A
F-1001MAH(-C)	1 lb 12 oz	R404A
F-1001MAH-22C	1 lb 7 oz	R404A
F-1001MLH(-C)	3.5 oz	R404A
F-1001MRH(-C)	4 lbs 1 oz	R404A
F-1001MWH(-C)	15 oz	R404A
F-1500MAH(-C)	2 lbs 5 oz	R404A
F-1500MRH(-C)	9 lbs 9 oz	R404A

Model	Total Charge	Refrigerant
F-1500MWH(-C)	1 lb 4 oz	R404A
F-2000MLH(-C)	3.5 oz	R404A
F-2000MRH(3)(C)	14 lbs 9 oz	R404A
F-2000MWH(-C)	2 lbs	R404A
FD-1001MAH-C	1 lb12 oz	R404A

Heat Load for AC & Cooling Tower

The heat of rejection information listed below by model number should be used for sizing air conditioning equipment or water-cooled cooling tower applications.

Cuber Heat Load Chart BTU/hr.		
Model	Air Cooled	Water Cooled
KM-61BAH	1,600	----
KM-101BAH	2,320	----
KM-151BAH	3,840	3,840
KM-201BAH	4,120	4,120
KM-251BAH	5,300	5,300
KM-255BAH	4,100	4,100
KM-260BAH	4,313	4.313
KM-280MAH(-E)	8,159	----
KM-320M_H	7,400	5,700
KM-1300M_H	19,800	15,185
KM-1300S_H	19,800	15,560
KM-1300S_H3	18,130	15,450
KM-1300SAH-E	20,400	----
KM-1301S_H(3)	20,300	17,600
KM-1301SAH-E	19,000	----
KM-1340M_H	22,600	20,500
KM-1600S_H	----	18,220
KM-1600S_H3	----	17,560
KM-1601S_H	----	23,100
KM-1601S_H3	----	23,500

Cuber Heat Load Chart BTU/hr. (continued)

Model	Air Cooled	Water Cooled
KM-1800S_H	24,720	26,200
KM-1800S_H3	24,150	25,900
KM-1900S_H	23,800	26,800
KM-1900S_H3	23,700	27,100
KM-2000S_H3	----	27,170
KM-2100SWH3	----	31,100
KM-2500SWH3	----	35,500
KM-320MAH-E	5,400	----
KM-461M_H	7,800	7,300
KM-500MAH-E	7,371	----
KM-501M_H	9,200	6,800
KM-515M_H	9,600	8,300
KM-515MAH-E	10,400	----
KM-600MAH	9,500	----
KM-61BAH	1,600	----
KM-630M_H	9,639	8,770
KM-630MAH-E	10,375	----
KM-650MAH	10,600	10,000
KM-650M_H-E	9,800	10,000
KM-900M_H	14,800	13,000
KM-900MAH-50	14,375	----
KM-901M_H	15,400	13,500
KMD-450M_H	7,700	6,800
KMD-700M_H	14,590	12,200
KMD-850M_H	13,200	10,400
KMD-900M_H	18,865	13,480
KMD-901M_H	16,300	12,400
KML-250M_H	5,560	5,000
KML-350M_H	6,550	5,600

Cuber Heat Load Chart BTU/hr. (continued)		
Model	Air Cooled	Water Cooled
KML-350MWH L0~M2	----	5,370
KML-351M_H	6,550	5,500
KML-450M_H	7,480	6,180
KML-451M_H	7,100	6,400
KML-600M_H	11,580	9,850
KML-631M_H	11,600	9,900

Flaker & DCM Heat Load Chart BTU/hr.		
Model	Air Cooled	Water Cooled
DCM-270B	3,532	----
DCM-500B	6,300	5,438
DCM-750B	8,314	7,945
DKM-450	8,098	6,900
DT-400B	4,923	----
C-100BAE-AD	1850	----
F-330BAH(-C)	3,800	----
F-450MAH(-C)	5,150	----
F-800M_H(-C)	7,500	6,270
F-801M_H(-C)	6,398	5,155
F-1001M_H(-C)	9,050	7,110
F-1500M_H(-C)	15,323	13,874
F-2000M_H	----	15,530
FD-1001MAH-C	8,800	7,110

Figures shown are at 90° F air temp. 70° F water temp. conditions. Always allow for a pressure differential of 10 psi across the water cooled condenser. This means that the inlet pressure must be at least 10 psi higher than the outlet pressure to allow for proper water flow through the water regulating valve and condenser.

Component Technical Data

“E” Control Board Adjustment Guide

The early “E” boards have 8 dip switches. The latest “E” boards have 10 dip switches.

“E” Board Dip Switch Setting Guide					
ADJUSTMENTS	DIP #	Switch Code 1=ON 0=OFF			
DEFROST COMPLETION TIMER	1	0	1	0	1
	2	0	0	1	1
	seconds	60	90	120	180
PUMP OUT TIME	3	0	1	0	1
	4	0	0	1	1
Length of pump out	seconds	10	10	10	20
Min Defrost Time	seconds	150	180	120	180
Inlet Water Valve	status	OFF	OFF	ON	OFF
PERIODIC PUMP OUT FREQUENCY	5	0	1	0	1
	6	0	0	1	1
	cycles	1/1	1/2	1/5	1/10
BIN CONTROL SWITCH	7	OFF for thermostatic control ON for mechanical control			
TEST	8	ALWAYS OFF			
MAX. FREEZE TIME (Improved E board only.)					Default
	9	1	1	0	0
	10	1	0	1	0
	minutes	75/50hz 60/60hz	70	50	60

NOTE:

1. **TO IMPROVE BUILT-IN CLEANING** Adjust switches 1&2 to provide for longer flush and switches 5&6 to every cycle pump-out 1/1. Do not adjust 1&2 on KM150/250 in high ambient area.
2. **DO NOT ADJUST 3, 4, 7, 8, 9 & 10** from factory setting.
3. **DO NOT MAKE CONNECTION to the red K-4 terminal** unless a special bin control / red connector is provided. Dip switch 7 must be ON in this case.
4. Dip-switches 9&10 are on improved “E” board only.

“E” Board S4 Switch Setting Chart for H Models										
Factory Dip Switch Settings:	SWITCH CODE 1=ON 0=OFF									
Model	1	2	3	4	5	6	7	8	9	10
KM-280MAH	1	0	0	1	1	1	0	0	0	0
KM-280MWH	0	0	0	1	1	1	0	0	0	1
KM-320MA/WH	0	0	0	1	1	1	0	0	0	0
KM-320MAH-E	1	0	0	1	1	1	0	0	1	1
KM-461MAH	0	0	0	0	1	1	0	0	1	0
KM-461MRH	1	0	0	0	1	1	0	0	1	0
KM-461MWH KM-501MAH	0	1	0	0	1	1	0	0	1	0
KM-501MW/RH KM-600/650MAH	0	0	0	0	1	1	0	0	0	0
KM-515MAH(-E) KM-1900SAH(3) KM-1900SWH(3)	0	0	0	0	0	0	0	0	1	0
KM-650MAH-E	0	0	0	0	0	0	0	0	1	1
KM-650MRH	0	0	0	0	1	1	0	0	1	0
KM-650MA/WH	0	0	0	0	1	1	0	0	0	0
KM-900MAH-50	0	0	1	0	1	1	0	0	1	0
KM-901M_H(3)	1	0	1	0	1	1	0	0	0	1
KM-900M_H(3) KM-1300MWH KM-1340MWH KM-1600MRH(3) KM-1601MRH(3)	0	0	1	0	1	1	0	0	0	1
KM-1300MAH KM-1300S_H(3) KM-1340MAH KM-1800SWH(3) KM-2000SW/RH3	0	0	1	1	1	1	0	0	0	0
KM-1300MRH KM-1340MRH	0	0	1	0	1	1	0	0	0	0
KM-1300S/RH3 KM-1800SAH(3)	0	0	1	1	1	1	0	0	0	0

E Board Continued:	SWITCH CODE 1=ON 0=OFF									
Model	1	2	3	4	5	6	7	8	9	10
KM-1300SAH-E	0	0	1	1	0	0	0	0	1	0
KM-1600SRH(3)	1	0	1	1	1	1	0	0	0	0
KM-1600SWH(3)	0	0	0	0	0	0	0	0	0	1
KM-1601SWH(3)	0	0	0	0	1	1	0	0	0	1
KM-1800SRH(3)	0	1	1	1	1	1	0	0	1	0
KM-1900SRH(3)	1	0	1	1	0	0	0	0	1	0
KM-2100SWH3	0	0	0	0	0	0	0	0	1	0
KM-2100SRH3	1	0	1	1	0	0	0	0	1	0
KM-2400SRH3	0	0	1	0	0	0	0	0	0	1
KM-2500S_H3	0	0	0	0	0	0	0	0	0	1
KMD-700MAH KMD-900MA/RH	0	0	0	0	1	1	1	0	0	0
KMD-700MW/RH KMD-900MWH	1	0	0	0	1	1	1	0	0	0
KML-*250MAH KML-351MAH T0>	0	0	0	1	1	1	0	0	1	0
KML-*250MWH KML-*350MA/WH KML-351MAH S0	0	0	0	1	1	1	0	0	0	1
KML-351MWH	1	0	1	1	0	0	0	0	0	1
KML-*450MA/WH KML-*600MA/WH	0	0	0	0	1	1	0	0	0	1
KML-451MAH	0	0	0	0	0	0	0	0	0	1
KML-451MWH	1	0	0	0	1	1	0	0	0	1
KML-*600MRH	1	0	0	0	1	1	0	0	0	1
KML-631MAHS0, S2	1	1	0	0	1	1	0	0	0	1
KML-631MRH	1	0	0	0	1	1	0	0	0	1

Note: The above chart reflects the factory dip-switch settings for models using R-404A refrigerant. Adjustments may be made to switches 1, 2, 5, & 6 to improve the built-in cleaning ability as per the DIP SWITCH SETTING GUIDE. If you replace the control board, match the cleaning settings with the original board. Switches 3, 4, 7, 8, 9, & 10 must remain in the factory position. For * models Dip 7 is ON if mechanical bin control is used.

“G” Board S4/“H” Board S1 Dip Switch Adjustment Guide					
ADJUSTMENTS	DIP #	SWITCH CODE: 1=ON 0=OFF			
DEFROST	1	0	1	0	1
COMPLETION	2	0	0	1	1
TIMER	seconds	60	90	120	180
PUMP OUT TIME	3	0	1	0	1
	4	0	0	1	1
Length of pump out	seconds	10	10	10	20
Min defrost time	seconds	150	180	120	180
Inlet water valve	status	OFF	OFF	ON	OFF
PERIODIC PUMP OUT FREQUENCY	5	0	1	0	1
	6	0	0	1	1
	cycles	1/1	1/2	1/5	1/10
PUMP @ end of defrost	7	ON - YES		OFF - NO	
TEST	8	ALWAYS OFF			
MAX FREEZE TIME					DEFAULT
	9	1	1	0	0
	10	1	0	1	0
	minutes	75/50hz 60/60hz	70	50	60

NOTE:

1. G board part number is 2A3792-01
2. Dip switches have different functions from E board.
3. Do not adjust dip switches 3, 4, 7, & 8 from factory setting.
4. Do not adjust 5&6 on KM251/255B since they have multiple fill cycles.
5. If G Board is used without a mechanical bin control, a jumper must be installed on the red K4 connector.

Additional Dip Switches

“G” Board S5 & “H” Board S2 Dip switches are factory set and SHOULD NOT be adjusted!

“G” Board Factory Dip Switch Settings										
S4 Block	SWITCH CODE 1=ON 0=OFF									
Model:	1	2	3	4	5	6	7	8	9	10
KM-251BAH	0	1	0	1	1	1	1	0	0	0
KM-255BAH	0	1	0	1	1	1	1	0	0	0
KM-320M	1	0	0	1	1	1	0	0	0	0
KM-320MAH-E	1	0	0	1	1	1	0	0	1	1
KM-515M(-E)	0	0	0	0	0	0	0	0	1	0
KM-650MA/WH	0	0	0	0	1	1	0	0	0	0
KM-650MRH	0	0	0	0	1	1	0	0	1	0
KM-650MAH-E	0	0	0	0	0	0	0	0	1	1
KM-901M	1	0	1	0	1	1	0	0	0	1
KM-1301SA/WH(3)	0	0	1	1	1	1	1	0	0	0
KM-1301SRH(3)	0	0	1	1	1	1	1	0	1	0
KM-1301SAH-E	0	0	1	1	1	1	1	0	1	1
KMD-850M_H, KMD-901M_H	0	0	0	1	1	1	1	0	0	0
KMS-1230MLH	1	0	0	1	1	1	1	0	0	1
KMS-750MLH, KMS-1400MLH	0	0	0	1	1	1	1	0	0	1
KMS-1401MLH	0	0	0	1	0	0	1	0	0	1
S5 Block	DO NOT ADJUST!									
Model:	1	2	3	4	5					
KM-251BAH	1	1	0	0	1					
KM-255BAH	1	0	1	0	1					
KM-320MA/WH KM-515/650/901M KM-1301S_H(3)(-E)	0	0	0	0	0					
KMD-850/901M	0	0	0	0	0					
KMS-750MLH	0	0	0	0	0					

NOTE: On S4 Block do NOT adjust 3, 4, 7, 8, 9, 10 from factory setting!

Positive Harvest Feature

The small KM's, KMS and KM-1301S_H(3) models include the positive harvest feature. This feature turns off the water valve and turns on the pump motor for the last 0~50 seconds of harvest.

The G Board and additional relays are used to allow the pump to turn in the correct direction during this feature.

KMS models have 4 relays with additional functions.

KM-1301S_H(3) models with serial code U0 and before have 3 relays.

KM-1301S_H(3) models with serial code U1 and after have 2 relays.

A full explanation of the sequence of operation, including these relays, is included in the individual service manual.

The H Board used on small KM's has the same feature however relays are included on the board.

“H” Board Factory Dip Switch Settings										
	SWITCH CODE 1=ON 0=OFF									
	S1 DIP SWITCH									
Model:	1	2	3	4	5	6	7	8	9	10
KM-61/151BAH	0	0	1	1	1	1	0	1	0	1
KM-101BAH	1	0	1	1	1	1	0	1	1	0
KM-151BWH	0	0	1	1	1	1	0	1	1	0
KM-201B_H	0	0	0	0	1	1	0	1	1	0
KM-260B_H	0	0	0	0	1	1	1	0	1	0
KMD-450MAH	0	0	1	1	1	1	1	1	0	1
KMD-450MAH	0	0	1	1	1	1	1	1	0	0
	S2 DIP SWITCH									
Model:	1	2	3	4	5	6				
KM-201/260B KMD-450M	1	0	0	0	0	1				

NOTE: DO NOT adjust S1-3,4,7,8,9,10 for S2 from factory

“E” Control Board Functions

An instruction label explaining the “E” board features is included on the unit. It can be found either on the control box cover, the inside of the front panel, or under the top panel. A stick on label is also included with the service replacement board. If you are replacing an “E” board, be sure to place the new label over the original label. This will advise anyone performing future service that the original board has been replaced and explain the application switch as outlined below.

The #2A1410-02 replacement board has an application switch between relays X3 & X4 that is not included on the original factory board supplied with the unit. This application switch allows the replacement board to be used on older C and Alpine control board models. The application switch has 2 positions : C & ALP. On R-404A models, this switch must be in the ALP position. If the switch is left in the C position, the compressor contactor will energize as soon as power is supplied to the unit whether the power switch is ON or OFF.

There are 4 green LED's which light in sequence throughout the unit operation.

NOTE: The green LED's are not numbered consecutively. LED1 is located at the edge of the board beside the K-2 transformer connection. The numbering sequence from the outside edge of the board is 1, 4, 3, and 2.

The green LED's are also used for a built-in output test that can be conducted to diagnose a bad board. The label explains the output test procedure. Always assure that dip # 8 is in the OFF position before doing the output test!

The correct lighting sequence for the output test is as follows: When control switch is ON and output test switch S-3 is ON or pressed, after a 5 second delay, LED2 lights up. 5 seconds later LED2 goes out and LED3 lights up. 5 seconds later LED3 goes out and LED4 lights up. 5 seconds later LED4 goes out and LED1 lights up. 5 seconds later LED1 goes out and LED4 lights up to begin the normal sequence of operation.

If the LED's follow this sequence, the board sequence is OK. If any other lighting sequence occurs, the board is bad.

A copy of the “E” board label is included in this guide. Review the board label thoroughly to understand the “E” board functions.

Manual Reset Safeties

The “**E**” **control board** can have up to 5 manual reset safeties. They are outlined in the control board function label. These safeties shut the unit down and assist the service technician in diagnosing the problem.

The safeties include the following audible and visual alarms:

1 Beep = 127°F (52.8°C) high evaporator temperature safety.

2 Beeps & orange LED = 2 consecutive 20 minute harvest cycles.

3 Beeps & yellow LED = 2 consecutive maximum freeze cycles.

With Dip Switch #7 ON:(Mechanical Bin control installed)

4 Beeps = Short circuit on mechanical bin control circuit.

5 Beeps = Open circuit on mechanical bin control circuit.

*To reset either safety: **press the white reset button on the control board with the power ON.**

Next, proceed to check the items outlined on the function label. The items listed on the function label represent the most common reasons that will trigger the safety.

Voltage Protection:

Built-in voltage protection for the “E” board will automatically shut the unit down and beep to signify that a high or low voltage problem has occurred:

6 Beeps = Low voltage condition.

7 Beeps = High voltage condition.

A voltage alarm will **automatically reset** when voltage is corrected.

If a voltage alarm occurs, check the power supply circuit to assure an independant circuit is used and that all external connections are secure. If voltage alarm continues, contact an electrician or the power company.

The high and low voltage protections are the **only** board alarms that automatically restart the unit when the voltage returns to normal.

If constant voltage fluctuation occurs, additional external voltage protection will be required.

Control Board Lights, Alarms, and Test

At startup, a 5-second delay occurs while the control board conducts an internal timer check. A beep occurs when power is turned off. The red LED indicates proper control voltage and remains on unless a control voltage problem occurs. The green LEDs 1 through 4 energize and sequence from initial startup as listed in the table below. Note that the order of the LEDs from the outer edge of the control board is 1, 4, 3, 2.

Sequence Step	LED	Energized Components	Time LEDs are On		
			Min.	Max.	Avg.
1-Minute Fill Cycle	4	WV			1 minute
Harvest Cycle	1, 4, 2	Comp, FMR, WV, HGV	2 minutes	20 minutes	3 to 5 minutes
Freeze Cycle	1	Comp, FM/FMR, PM, LLV	5 minutes	freeze timer setting	30 to 35 minutes
Pump-Out Cycle	1, 4*, 3, 2	Comp, FMR, WV*, PM, HGV, SR, DV	10 seconds	20 seconds	*pump-out timer setting

The built-in safeties shut down the unit and have alarms as listed below.

No. of Beeps (every 3 sec.)	Type of Alarm	Notes
1	High Evaporator Temp. (temperature > 127°F) (53°C)	Check for harvest problem (stuck HGV or relay), hot water entering unit, stuck HM, or shorted thermistor.
2	Harvest Backup Timer (harvest > 20 min. for two cycles in a row)	Orange "H TIMER" LED on. Check for open thermistor, HGV not opening, TXV or LLV leaking by, low charge, inefficient Comp, or WRV leaking by.
3	Freeze Timer (freeze > freeze timer setting for two cycles in a row)	Yellow "F TIMER" LED on. Check for F/S stuck closed (up), WV leaking by, HGV leaking by, PM not pumping, TXV not feeding properly, LLV not opening, low charge, HM not bypassing, or inefficient Comp.
4	Short Circuit (mechanical bin control models)	Short circuit between the K4 connection on the control board and the bin control. Check connections and replace wire harness if necessary.
5	Open Circuit (mechanical bin control models)	Open circuit between the K4 connection on the control board and the bin control. Check connections and replace wire harness if necessary.
To reset the above safeties, press the "ALARM RESET" button with the power supply on.		
6	Low Voltage (92Vac±5% or less)	Red LED turns off if voltage protection operates.
7	High Voltage (147Vac±5% or more)	The control voltage safeties automatically reset when voltage is corrected.

Legend: **Comp**—compressor; **DV**—drain valve (*KMD, KML only*); **FM**—fan motor; **FMR**—fan motor-remote; **F/S**—float switch; **HGV**—hot gas valve; **HM**—headmaster (C.P.R.); **LLV**—liquid line valve; **PM**—pump motor; **SR**—service relay (*KMD, KML only*); **TXV**—thermostatic expansion valve; **WRV**—water regulating valve; **WV**—inlet water valve

To perform an output test, first move the control switch to the "ICE" position. Press the "OUTPUT TEST" button. The correct LED lighting sequence is none, 2, 3, 4, 1. Components (e.g., compressor) cycle during the test. Following the test, the icemaker resumes operation.

The dip switches should be adjusted per the chart in the unit's service manual. S4 dip switch 8 must remain off.

"E" Board

3A2220-011

Control Board Lights, Alarms, and Test

At startup, a 5-second delay occurs while the control board conducts an internal timer check. A beep occurs when the control switch is moved to the "ICE" position. The red LED indicates proper control voltage and remains on unless a control voltage problem occurs. The green LEDs 1 through 4 energize and sequence from initial startup as listed in the table below. Note that the order of the LEDs from the outer edge of the control board is 1, 4, 3, 2.

Sequence Step	LED	Energized Components	Time LEDs are On		
			Min.	Max.	Avg.
1-Minute Fill Cycle	4	WV			1 minute
Harvest Cycle	1, 4, 2	Comp, FMR, WV, HGV	2 minutes	20 minutes	3 to 5 minutes
Harvest Pump Timer	1, 3, 2	Comp, FMR, PM, HGV	0 seconds	50 seconds	harvest pump timer setting
Freeze Cycle	1	Comp, FM/ FMR, PM, LLV	5 minutes	freeze timer setting	30 to 35 minutes
Pump-Out Cycle	1, 4*, 3, 2	Comp, FMR, WV*, PM, HGV, SR, DV	10 seconds	20 seconds	*pump-out timer setting

The built-in safeties shut down the unit and have alarms as listed below.

No. of Beeps (every 3 sec.)	Type of Alarm	Notes
1	High Evaporator Temp. (temperature > 127°F) (53°C)	Check for harvest problem (stuck HGV or relay), hot water entering unit, stuck HM, or shorted thermistor.
2	Harvest Backup Timer (harvest > 20 min. for two cycles in a row)	Check for open thermistor, HGV not opening, TXV or LLV leaking by, low charge, inefficient Comp, or WRV leaking by.
3	Freeze Timer (freeze > freeze timer setting for two cycles in a row)	Check for F/S stuck closed (up), WV leaking by, HGV leaking by, PM not pumping, TXV not feeding properly, LLV not opening, low charge, HM not bypassing, or inefficient Comp.
To reset the above safeties, press the "ALARM RESET" button with the power supply on.		
6	Low Voltage (92Vac±5% or less)	Red LED turns off if voltage protection operates. The control voltage safeties automatically reset when voltage is corrected.
7	High Voltage (147Vac±5% or more)	

Legend: **Comp**—compressor; **DV**—drain valve (*KMD, KML only*); **FM**—fan motor; **FMR**—fan motor-remote; **F/S**—float switch; **HGV**—hot gas valve; **HM**—headmaster (C.P.R.); **LLV**—liquid line valve; **PM**—pump motor; **SR**—service relay (*KMD, KML only*); **TXV**—thermostatic expansion valve; **WRV**—water regulating valve; **WV**—inlet water valve

To perform an output test, first move the control switch to the "ICE" position. Press the "OUTPUT TEST" button. The correct LED lighting sequence is 1, 4, 3, 2. Components (e.g., compressor) cycle during the test. Following the test, the icemaker resumes operation.

The dip switches should be adjusted per the chart in the unit's service manual. S4 dip switch 8 must remain off.

"G" Board - KM, KMD, KML

3A4799-011

Control Board Lights, Alarms, and Test

At startup, a 5-second delay occurs to stabilize the circuit. The "POWER OK" LED indicates proper control voltage and remains on unless a control voltage problem occurs. The "POWER OK" LED flashes continuously when the bin is full and PM and DV energize for a maximum of 5 minutes to drain the water tank. LEDs 4 through 9 energize and sequence from initial startup as listed in the table below. Note that the order of the LEDs from the outer edge of the control board is 5, 6, 8, 9, 4, 7.

Sequence Step	LED	Energized Components	Time LEDs are On		
			Min.	Max.	Avg.
1-Minute Fill Cycle	8	WV1			1 minute
Harvest Cycle	5, 6, 8	Comp, FMR, HGV, WV1	2 minutes	20 minutes	3 to 5 minutes
Harvest Pump Timer	5, 6, 7	Comp, FMR, HGV, PM	0 seconds	50 seconds	harvest pump timer setting
Freeze Cycle	5, 7 (and 9 at refill)	Comp, FM/FMR, PM, LLV (WV2 at refill)	5 minutes	freeze timer setting	30 to 35 minutes
Pump-Out/ Drain Cycle	5, 6, 4, 7*	Comp, FMR, HGV, DV, PM*	10 seconds	20 seconds	*pump-out/ drain selector setting

The built-in safeties shut down the unit and have alarms as listed below.

No. of Beeps (every 3 sec.)	Type of Alarm	Notes
1	High Evaporator Temp. (temperature > 127°F) (53°C)	Check for harvest problem (stuck HGV or relay), hot water entering unit, stuck HM, or shorted thermistor.
2	Harvest Backup Timer (harvest > 20 min. for two cycles in a row)	Check for open thermistor, HGV not opening, TXV or LLV leaking by, low charge, inefficient Comp, or WRV leaking by.
3	Freeze Timer (freeze > freeze timer setting for two cycles in a row)	Check for F/S stuck closed (up), WV1 or WV2 leaking by, HGV leaking by, PM not pumping, TXV not feeding properly, LLV not opening, low charge, HM not bypassing, or inefficient Comp.
To reset the above safeties, press the "ALARM RESET" button with the power supply on.		
6	Low Voltage (92Vac±5% or less)	"POWER OK" LED turns off if voltage protection operates. The control voltage safeties automatically reset when voltage is corrected.
7	High Voltage (147Vac±5% or more)	

Legend: **Comp**—compressor; **DV**—drain valve; **FM**—fan motor; **FMR**—fan motor-remote; **F/S**—float switch; **HGV**—hot gas valve; **HM**—headmaster (C.P.R.); **LLV**—liquid line valve; **PM**—pump motor; **TXV**—thermostatic expansion valve; **WRV**—water regulating valve; **WV1**—inlet water valve 1; **WV2**—inlet water valve 2 (if applicable)

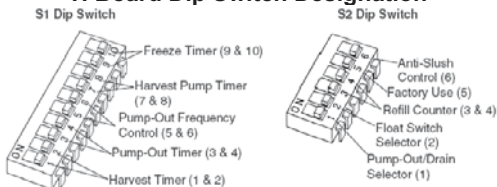
To perform an output test, move the control switch to the "ICE" position while pressing the "OUTPUT TEST" button. The correct LED lighting sequence is 5, 6, 7, 8, 9, 4. Components (e.g., compressor) cycle during the test. Each LED stays on for 5 seconds. LED 5 stays on while LED 6 is on. Following the test, the icemaker resumes operation.

The dip switches should be adjusted per the chart in the unit's service manual.

"H" Board

3A5616-01Q

H Board Dip Switch Designation



Note: S2 Dips must be set to factory setting by model. DO NOT vary from Factory settings. Dip 5 MUST remain OFF.

LED's

The H Board has 9 red LED's that light up during the unit operation as indicated by the H Board operation chart. The LED's are designated as follows:

DS1: Power OK LED

- Comes on 5 seconds after the unit is switched to ICE.
- Indicates proper control voltage (10.5 volts) from the control transformer.
- If the bin control is satisfied (Open), this LED blinks.

DS2: H Timer (Harvest Timer)

- Indicates 2 long (20 minute) harvest back to back
- 2 beep alarm

DS3: F Timer (Freeze Timer)

- Indicated 2 long (time is adjustable) freeze times back to back
- 3 beep alarm

DS4: X6 Relay

- Indicates Drain Valve (DV) is open.
- DV opens for 5 minutes when bin control opens.

DS5: X1 Relay

- Indicates Compressor and Remote Fan Motor are energized.

DS6: X2 Relay

- Indicates Hot gas Valve is energized.
- Energizes the Condenser Fan Motor when OFF.

DS7: Relay X3

- Indicates Pump motor energized

DS8: X4 Relay

- Indicated Harvest Inlet Water Valve is energized.

DS8: X5 Relay

- Indicated Refill/Freeze Water Valve is energized
- Service board only

COMPRESSOR DATA

* Remote units use –02 compressor which has crankcase heater.		LRA = Lock Rotor Amperage		RWR = Run Winding Resistance			
-E = European model / 50 hz.		SWR = Start Winding Resistance		RLA = Running Load Amperage (see performance data)			
Resistance is measured with Wheatstone bridge under controlled ambient conditions.							
Model	Part #	Manufacturer #	LRA	SWR (Ohms)	RWR (Ohms)	Oil Type	Oil Charge (Fl.oz./cc)
DCM-270BAH	4A2272-01	Copeland	ASE24C3E-IAA-257	39	7.3	POE EAL	15/444
DCM-500B_H (-OS), DT-400BAH-OS/AR	4A2300-01	Copeland	RS43-C2E-CAA	51	4.08	POE EAL	24/710
DCM-750B(-OS), DKM-500BAH	4A1843-01	Copeland	RS55C2E-CAA-219	60	4.2	POE EAL	24/710
DKM-500BWH	4A4376-01	Copeland	RST55C1E-CAA-202	70	2.6	POE EAL	15/444
F-330BAH(-C)	4A4185-01	Danfoss	NF7CLX	28	5.4	POE EAL	10.8/320
F-450MAH(-C), F-801MA/WH(-C)	4A2300-01	Copeland	RS43-C2E-CAA	51	4.08	POE EAL	24/710
F-800M(-C)	4A1843-01	Copeland	RS55C2E-CAA-219	60	4.2	POE EAL	24/710
F/FD-1001M(-C)	4A1322-01	Copeland	RS70-C1E-PFV	34	4.89	POE EAL	24/710
F-1500M(-C)	4A1539-01	Copeland	CS10K6E-PFV	56	3.044	POE EAL	45/1279
F-2000M	4A1420-02	Copeland	CS20-K6E-PFV	96	2.333	POE EAL	45/1279

COMPRESSOR DATA

Model	Part #	Manufacturer #	LRA	SWR (Ohms)	RWR (Ohms)	Oil Type	Oil Charge (Fl.oz./cc)
F-2000MRH3(-C)	4A1419-02	Copeland	75	Line to Line 1.058		POE EAL	45/1279
KM-61BAH, also AM-50BAE & C-100BAE	P00023-01	Panasonic	14.5	9.69	2.41	FREOL	8.5/250
KM-101BAH	P00024-01	Panasonic	23.1	7.93	1.41	FREOL	8.5/250
KM-151B	P00025-01	Panasonic	30.7	7.53	1.06	FREOL	8.5/250
KM-201BAH	P01130-01	Danfoss	28	5.4	1.7	POE EAL	10.8/320
KML-250M/KM-320M	4A2456-01	Copeland	33.6	7.3	1.2	POE EAL	12/355
KM-251/255BAH	4A3677-01	Danfoss	53	2.9	0.7	POE EAL	20.3/600
KM-260BAH	P01081-01	Danfoss	41.9	4.3	1	POE EAL	18.6/550
KM-280M	4A1812-01	Tecumseh	58.8	4.22	0.59	POE EAL	17.3/512
KM-280MAH-E	4A1924-01	Tecumseh	58.8	4.22	0.59	POE EAL	17.3/512
KM-320MAH-E	4A4426-01	Copeland	15.8	14.15	5.7	POE EAL	12/355
KML-351M, KM-461M	4A2300-01	Copeland	51	4.08	0.59	POE EAL	24/710
KMD-450M	4A4479-01	Copeland	54.5	2.66	0.43	POE EAL	15/426
KML 450 MAH	4A1843-01	Copeland	60	4.2	0.66	POE EAL	24/710

COMPRESSOR DATA

Model	Part #	Manufacturer #	LRA	SWR (Ohms)	RWR (Ohms)	Oil Type	Oil Charge (FloZ./cc)
KM-500M, KM-501M	4A1820-01	Tecumseh	AKA9455ZXA	50	5.95	POE EAL	17.3/511
KM-500MAH-E	4A1925-01	Tecumseh	AKA9455ZXC	26.3	7.149	POE EAL	17.3/512
KM-515M, KM-600M	4A4376-01	Copeland	RST55C1E-CAA-202	70	2.6	POE EAL	15/444
KM-515MAH-E, KM-650MAH-E	4A4462-01	Copeland	RST64C1E-CAZ-202	38	8.31	POE EAL	15/444
KML-600M, KMD-700M	4A1539-01	Copeland	CS10K6E-PFV-237	56	3.044	POE EAL	45/1331
KM-630MAH Serial M1	4A2302-01	Copeland	RS64C2E-CAV	37	7.92	POE EAL	24/710
KM-630MAH-E Serial M2 >	4A2301-01	Copeland	RS64C1E-IAZ-219	33	7.002	POE EAL	24/710
KML-631M, KMD-850M	4A4066-01	Copeland	CS08KQE-PFV-255	54	3.044	POE EAL	35/1035
KM-650M_H	4A4072-01	Copeland	RS55C2E-CAV-219	40	3.82	POE EAL	24/710
KMD-901MWH/MRH	4A1539-01	Copeland	CS10K6E-PFV-279	56	3.044	POE EAL	45/1331
KM-900M, KMD-900M	4A1412-01	Copeland	CS14K6E-PFV	61	2.594	POE EAL	45/1279
KM-900MAH-50	4A1749-01	Copeland	CS14K6E-PFJ	58	2.646	POE EAL	45/1331
KM-900MRH3	4A1484-02	Copeland	CS14K6E-TF5	55	Line to Line 1.609	POE EAL	45/1331

COMPRESSOR DATA

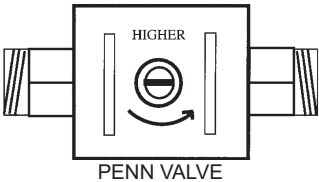
Model	Part #	Manufacturer #	LRA	SWR (Ohms)	RWR (Ohms)	Oil Type	Oil Charge (FlOz./cc)
KMD-901MAH, KM-901M, KM-1301SRW	4A4134-01	Copeland	56	3.044	1.107	POE EAL	45/1331
KM-901MRH3	4A4135-02	Copeland	51	Line to Line 1.77		POE EAL	45/1331
KM-1300M/S, KM-1340M	4A1412-01	Copeland	61	2.594	0.999	POE EAL	45/1331
KM-1300/1301SAH3	4A1484-01	Copeland	55	Line to Line 1.609		POE EAL	45/1331
KM-1300/1301SAH-E	4A1749-01	Copeland	58	2.646	1.346	POE EAL	45/1331
KM-1301SR/WH3	4A4135-01	Copeland	51	Line to Line 1.77		POE EAL	45/1279
KML-600M, KMD-700M	4A1539-01	Copeland	56	3.044	1.107	POE EAL	45/1279
KM-1600MRH/SRH	4A1420-02	Copeland	96	2.333	0.623	POE EAL	45/1279
KM-1600M3/S3	4A1419-02	Copeland	75	Line to Line 1.058		POE EAL	45/1279
KM-1601MRH	4A2334-02	Copeland	82	2.82	0.715	POE EAL	45/1279
KM-1601MRH3	4A2330-02	Copeland	65.5	Line to Line 1.256		POE EAL	45/1279
KM-1601S, KM-1800S	4A2334-01	Copeland	82	2.82	0.715	POE EAL	45/1279
KM-1601S3, KM-1800S3	4A2330-01	Copeland	65.5	Line to Line 1.256		POE EAL	45/1279
KM-1900S	4A4581-01	Copeland	73	2.131	0.847	POE EAL	45/1279

COMPRESSOR DATA

Model	Part #	Manufacturer #	LRA	SWR (Ohms)	RWR (Ohms)	Oil Type	Oil Charge (FloZ./cc)
KM-1900S_H3	4A4582-01	Copeland	66	Line to Line 1.256		POE EAL	45/1279
KM-2000S_H3, KM-2100S_H3	4A1419-01	Copeland	75	Line to Line 1.256		POE EAL	45/1279
KM-2400SRH3	4A2043-01	Maneurop	12.5	Line to Line 0.62		POE EAL	61/1804
KM-2500SWH3	4A4486-01	Copeland	105	Line to Line 0.853		POE EAL	45/1279
KM-2500SRH3	4A4782-01	Maneurop	135	Line to Line 0.55		POE EAL	63/1863
SRC-10H	4A3494-01	Copeland	46	4.45	1.36	POE EAL	24/710
SRK-13H, SRK-14H	4A2334-02	Copeland	82	2.82	0.715	POE EAL	45/1279
SRK-14H	4A2334-02	Copeland	54	2.82	0.715	POE EAL	45/1279
SRK-14H3	4A2330-02	Copeland	66	Line to Line 1.168-1.344		POE EAL	45/1279
SRK-7H	4A4066-01	Copeland	54	3.044	1.107	POE EAL	35/994

Water-Cooled Head Pressure Controls

An adjustable (Pressure Modulated) water-regulating valve is installed on the water-cooled condenser **outlet**. A #V46, Johnson Controls Penn valve, is used. The Penn valve is identified by a label on the valve housing.



ADJUSTMENT CONTROLS	
CW	lower pressure and outlet water temperature with higher water flow
CCW	higer pressure and outlet water pressure with lower water flow

CONDENSER OUTLET WATER TEMPERATURE RANGE		
Model	Range	High side pressure
All KM	104 ~ 115 °F	270 psig.
All DCM	100 ~ 104 °F	260 psig.
All F	100 ~ 104 °F	260 psig.

If the water-cooled unit has been in operation for a long period of time, adjusting the water-regulating valve may not allow proper pressures.

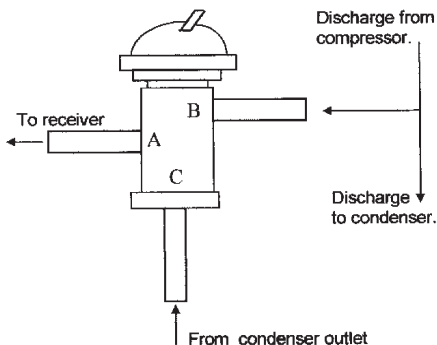
In this case: the water-cooled condenser likely contains an exorbitant amount of scale and requires cleaning.

An acid based condenser cleaner should be circulated using an acid pump, in reverse flow through the coil until the inner tube is free of scale. Once the scale is removed, the water-regulating valve should be adjusted to maintain the range and pressure listed above.

Remote Head Pressure Control

All remote condenser units utilize a condensing pressure regulating (CPR/Headmaster) valve to maintain head pressure in low ambient conditions.

Condenser/Unit	Headmaster
URC-5F/9F/14F/21F/22F, KM-2500S	LAC 4-190
URC-6F/7F/12F/20F, SRC-10H, SRK-7H/13H	LAC 4-210
KM-2400S	LAC 5-210



The symptoms of a bad headmaster are similar to those of an undercharged unit.

To diagnose a bad headmaster:

Add additional refrigerant in 2 lb. increments and watch the pressures.

If the pressures begin to look normal, the unit was undercharged.

In this case: Leak check the system to find the leak.

Use normal refrigeration practices to recover, repair, evacuate and recharge the unit.

If not: A bad headmaster is a possibility.

Check to see if the valve is stuck open by conducting temperature checks at the outlet of the headmaster.

Replace the headmaster as necessary.

Use safe refrigeration practices when removing the valve and protect the valve from overheating.

High Pressure Safety Switch

An automatic reset high pressure safety switch is utilized on all Hoshizaki ice makers. The typical high pressure switch is an automatic reset switch with a long capillary tube. **In the future, this switch will be changed to a stub style switch with a large diameter pipe instead of a capillary tube.** Look for this stub HP switch on recent and future production.

Pressure switch part numbers & settings are as follows:

Pressure Switch Chart R-404A Models			
Capillary type			
Models	part number	cut out (psig.)	cut in (psig.)
All KM & DCM water-cooled, DCM-270, and Flaker	433441-05	384 ± 21.3	284 ± 21.3
DCM-500/750BAF All KM Air & Remote	433441-07	412 ± 21.3	327 ± 21.3

Stub Type			
Models	part number	cut out (psig.)	cut in (psig.)
KM Air & Remote	463180-04	412 ± 21.3	327± 21.3
KM Water	463180-05	384 ± 21.3	284± 21.3

Bin Control

KM cubers will use one of three types of bin controls. The type of bin control will vary depending on the unit style, or model and serial number.

1. Thermostatic Bin Control

The thermostatic bin control is the primary control that supplies 115 volts to all major components in the unit, except the compressor. When this control is closed, 115V is supplied to the control transformer and the K1 control board connector (which switches 115 volts to the components as the sequence dictates).

A thermostatic capillary bulb is mounted in the ice drop zone area or on a drop down bracket which extends into the bin

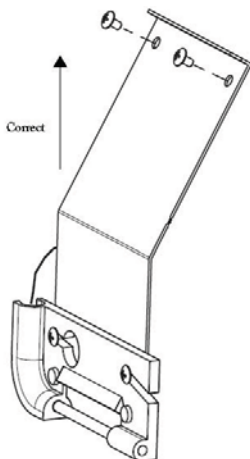
cavity. The thermostatic control opens on temperature drop and closes on temperature rise. When ice touches the thermostatic bulb, the bulb pressure opens the bin control contacts to shut the unit down. The unit will not operate in the ICE or WASH position, **unless** the thermostatic bin control switch is closed.

The thermostatic bin control will shut the unit down at any point in the sequence of operation if ice contacts the control bulb. Shut down time depends on the control adjustment. This adjustment is factory set, however it should **always** be checked at start-up to assure proper operation. The factory setting is to shut off within 3~10 seconds after ice contacts the bulb.

NOTE: High altitude areas require adjustment.

When ice is moved away from the bulb, the unit will always restart during the 1-minute fill cycle.

Larger M and S models include a drop down bulb bracket. This bracket should be secured to the unit base and the control plug connection **must be made** before the unit will operate. A bin control extension bracket is included with all S models. It is secured to the drop down with a wire tie. Be sure to install the extension bracket. When installing, make sure the bracket points downward, with the elbow joint facing out, so that the cubes will easily fall away from the bin control bulb, as shown in the figure.



When replacing a thermostatic bin control:

Check the operation by holding ice against the thermostatic bulb with the control switch in the wash position.

The pump should stop within 3 to 10 seconds. Adjustment up to 30~45 seconds is acceptable, depending on the application. Adjust the control "CCW" for a faster shut down.

Note: Control board dip switch number 7 must be OFF for this control to operate the unit. A thermostatic bin control may be used on KML models and is required for some dispenser application.

2. Mechanical Bin Control

KMD/KMS and some M models use a mechanical bin control. This control includes a proximity switch and actuator paddle assembly.

The mechanical bin control assembly mounts in the ice drop zone area and will shut the unit down within 5 to 15 seconds when ice pushes the actuator paddle to the full right position, away from the proximity switch. Shut down will only occur during the first 5 minutes of the freeze cycle when the paddle is moved away from the proximity switch. If the paddle is moved away from the proximity switch and held at any other time during the sequence, the unit will continue to run until the next freeze cycle occurs.

This feature allows for a full batch of ice every cycle so that there are no small cubes in the bin.

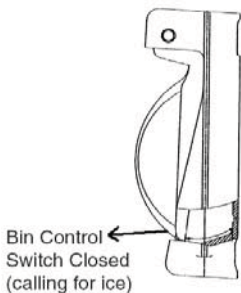
A resistor wiring harness connects the mechanical bin control to the red K4 connector on the E control board. As the proximity switch opens and closes, the resistance value will change to either start up or shut down the unit.

a) When the control paddle is hanging in the normal position, the resistance at the red K4 connector will be 7.9 K ohms and the unit will start.

BIN EMPTY

On E Board - Mech control in the normal position supplies 7.9 K ohms at red K4 connector to start unit.

On G Board - No resistor is used. Green LED marked "BC CLOSED" will light.

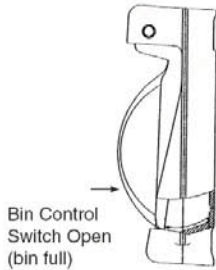


b) When the paddle is held to the right, the resistance at the K4 red connector will be 15.8 K ohms and the unit will shut down within 3 seconds during the first 5 minutes of the freeze cycle. It will not shut down at any other time in the sequence of operation.

BIN FULL

On E Board - Mech control in full right position supplies 15.8K ohms at red K4 connector to shut unit down.

On G Board - No resistance is used. Yellow LED marked "BC OPEN" will light.



Note: On E control board dip switch number 7 must be ON for this control to operate the unit.

Mechanical Bin Control with G Board

The "G" board does not require a resistor wiring harness for mechanical bin control operation. A wiring harness connector without resistors is required (Part Number 4A2200G05). An open circuit on the red K4 connector will shut the unit down within the first 5 minutes of the freeze cycle. A closed circuit on the red K4 connector will start the unit in the 1 minute fill cycle. The "G" board has LED's that indicate the status of the mechanical bin control.

BC OPEN (yellow) = open bin control, calling for shut down.
BC CLOSED (green) = closed bin control, calling for ice.

When the actuator is in the closed position, the switch will close the K4 connector and the green LED will light. This indicates that the unit should be in the ice making mode.

Note: If unit is converted to thermostatic bin control for any reason, the K4 connector must be jumped in order to start the unit. Use special jumper # 4A4883G01 for K4 red connector.

Mechanical Bin Control with H Board

H board has different connectors and does not require resistors to switch the board operation. The mechanical proximity switch will open to shut the unit down when ice fills and pushes actuator over the same as the G board operation. When ice is moved, the switch closes and the unit starts.

3. F/DCM Bin Control

Flaker / DCM units use a mechanical bin control. A paddle pivots on a hinge pin to operate either a micro-switch or magnetic proximity switch. The DCM-270B model uses either magnetic switch or a lift pin and micro switch.

For proper operation, make sure that the paddle swings freely. Check this control for an open circuit when the paddle is held away from the magnetic proximity switch. The best location to check this control is at the timer board connections. Simply disconnect the terminals to the switch at the timer board and check it with an ohm meter.

Infrared Controls

The FS-1001MLH cubelet unit uses an infrared eye control sensor, mounted to the base of the ice chute. When the eye senses ice, it starts a time delay relay. When the timer completes, the unit will shut down.

This control is used in conjunction with a mechanical proximity switch mounted in the top of the spout. The mechanical control acts as a safety backup for the primary infrared control.

Since it is designed for dispenser applications, the FS-1001 MLH-C cubelet control adjusts to vary the ice level in the bin. The infrared eye control operates on the control transformer power. The adjustment is made to a delay timer that delays shut down and allows the unit to fill more or less in the bin. Adjusting for a longer delay fills the dispenser to a higher level.

This same control is used on the new FD-1001M_H dispenser model. On the FD model, the spout mounted mechanical control is referenced as bin control #1. The infrared sensor control is referenced as bin control #2.

Bin control #2 is the primary control for unit operation.

Bin control #1 is the back up spout safety. If this control is cycling the unit, check the operation of bin control #2.

An audible alarm will occur if #2 control fails on the FD unit.

See service bulletin SB09-0004 for operation and diagnosis of this infrared control.

KM Cuber Sequence Of Operation

Note: When power is supplied to the “E” or “G” Control board, a 10 second delay occurs at start-up. The board checks power for 5 seconds and the red “POWER OK” LED lights. The board checks for alarms and 5 seconds later the unit starts.

The general steps in the operation sequence are as follows:

1. 1 Minute Fill Cycle

The unit always starts with the 1 minute fill cycle. When power is applied to the unit, the water, or refill, valve is energized and the fill period begins.

After 1 minute the board checks for a closed float switch. If the float switch is closed the harvest cycle begins.

If not, the unit will not start without adequate water in the reservoir. This serves as a low water safety.

The water valve will remain energized through additional 1 minute cycles, until water enters the reservoir and the float switch closes.

2. 1st Harvest Cycle

The compressor starts, hot gas valve opens, water valve remains open and harvest begins.

As the evaporator warms, the thermistor located on the suction line checks for a 48° F. temperature. When 48° F. is reached, the harvest is turned over to the adjustable control board defrost timer which is factory set for normal conditions. This adjustment can vary the defrost timer from 1 to 3 minutes.

Note: This note explains the new **positive harvest feature**.

1. On the “G” board, the pump starts 50 seconds before the end of the harvest. This is factory set by the S5 dip switches. DO NOT ADJUST these dip switches.

2. On H board, the pump starts 30 seconds before the end of harvest.

3. The H board can be adjusted to allow for pump operation 0, 10, 30, or 50 seconds before the end of harvest. This is adjustable with S2 dip switches. Dip switches on S2 should remain at factory settings.

3. Freeze Cycle

After the timer terminates the harvest cycle, the hot gas and water valves close, and the ice production cycle starts. For the first 5 minutes the controller board will not accept a signal from the float switch. This 5 minute minimum freeze acts as a short cycle protection. After 5 minutes, the float switch assumes control.

Note: In some newer models, a refill will occur during the freeze cycle. This is controlled by a second float switch and the board settings.

As ice builds on the evaporator, the water level in the reservoir lowers. The freeze continues until the float switch opens and terminates ice production.

4. Harvest Pump Out

When the float switch opens and signals the completion of the freeze cycle, the harvest cycle begins. The hot gas valve opens and the compressor continues to run. The drain timer starts counting the 10/20 second pump out. The water pump stops for 2 seconds and reverses, taking water from the bottom of the reservoir and forcing pressure against the check valve seat, allowing water to go through the check valve and down the drain. At the same time, water flows through the small tube to power flush the float switch. When the drain timer stops counting, the pump out is complete.

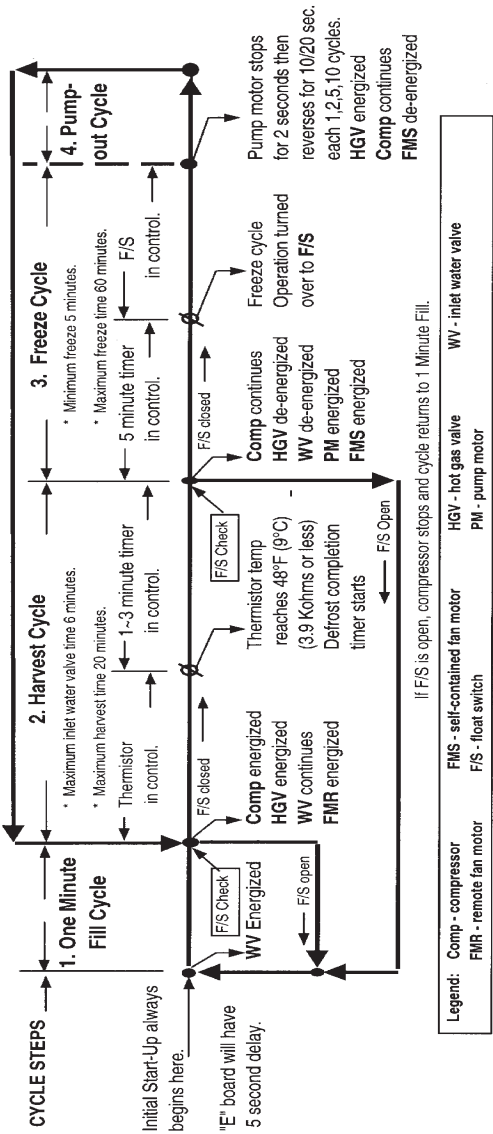
On the E & H boards, pump out always occurs on the 2nd harvest after startup. These control boards allow for adjustment, so pump out occurs every cycle, or every 2nd, 5th or 10th cycle from this point.

Note: On G board, the first pump out will vary depending on the adjustment of S4 dip switches 5 & 6. It does not occur on the second harvest as mentioned above.

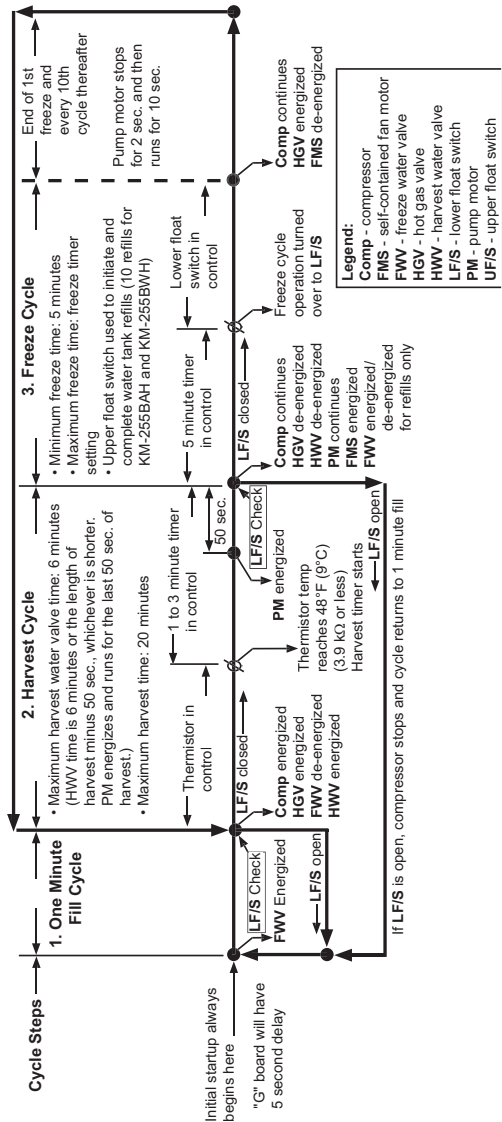
5. Normal Harvest Cycle

The water valve opens to allow water to assist the harvest. As the evaporator warms, the thermistor reaches 48° F. The control board receives the thermistor signal of 3.9 K ohms or less and starts the defrost timer. The water valve is open during harvest (defrost) for a maximum of 6 minutes, or the length of harvest, whichever is shorter. When the defrost timer completes its count down, the defrost cycle is complete and the next freeze cycle starts. The unit continues to cycle through sequence steps 3, 4, and 5 until the bin control senses ice and shuts the unit down.

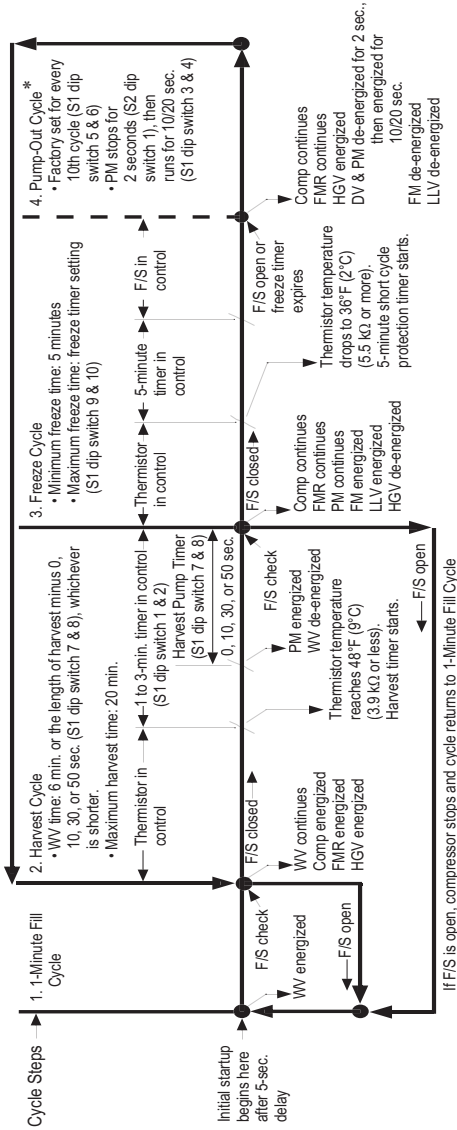
Basic KM Sequence Flow Chart and Component Operation



KM-251/255BAH and KM-255BWH Sequence Flow Chart and Component Operation

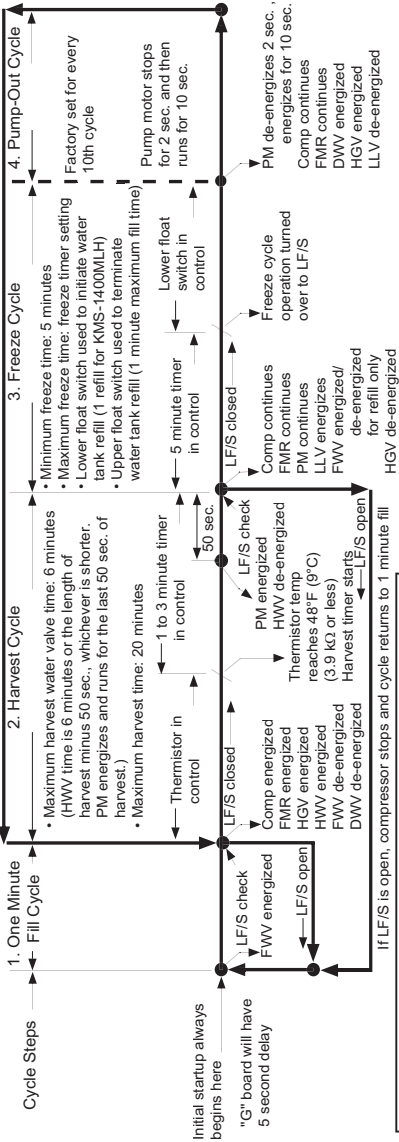


KM-61~260B and Small KMD with "H" Control Board Sequence Flow Chart



*NOTE: On KM-61/101/151, pump stops during pumpout and reservoir drains by gravity.

KMS-750/1230/1400/1401MLH Sequence Flow Chart and Component Operation



Legend:

Comp - compressor	DWV - drain water valve	FMR - remote fan motor
F/WV - fill water valve	HGV - hot gas valve	HWV - harvest water valve
LF/S - lower float switch contacts	LLV - liquid line valve	PM - pump motor
	UF/S - upper float switch contacts	

Basic Check Out Procedure for E & H Boards

The 10 minute check out procedure is a sequence check that can be used at unit start-up or for system diagnosis. Using this check out procedure will allow you to diagnose electrical system and component failures in approximately 10 minutes (under normal operating conditions of 70°F or warmer air and 50°F or warmer water temperatures).

Before conducting a 10 minute checkout:

1. Check for correct installation and proper supply voltage.
2. Adequate water supply and clean evaps and condenser.
3. Control board dips 7 & 8 in correct position.

As you go through the procedure, check to assure the components energize and de-energize correctly. If not, those components and controls are suspect.

10 Minute Check Out Procedure

1. Turn power OFF - gain access to unit control box.
2. Turn power ON – place control switch in ICE position.

Note: A 5 second delay occurs due to board safety checks.

A) 1 Minute Fill Cycle begins – **WV** energized.

After 1 minute, control board checks **FS**.

If **FS** is closed: unit cycles to harvest. Continue to (B).

If **FS** is open: unit repeats 1 minute fill cycle until water enters and **FS** closes (low water safety protection during initial start up and at the end of each harvest).

Diagnosis

If **WV** does not open: check for no supply voltage at **WV** terminals, bad coil, or plugged screen or external filter (no water flow). If unit fails to start harvest: check for open **FS** or bad 1 minute timer in board.

B) Initial Harvest Cycle – **WV** remains energized **CC** energizes to start **C**, **HGV**, & energize (**FM**, on remote model).

Evaporator warms, thermistor senses 48°F and turns operation of harvest to control board defrost completion timer. Timer completes counting (1~3 minutes) and the unit cycles in order to freeze. On H models, **WV** stops and pump starts for last 30 seconds of harvest.

Diagnosis

Check to see if **C** is running, **HGV** is open, and **WV** is still open. Avg. harvest cycle at factory setting is 2 ~ 3 minutes. How long does initial harvest last? 1.5 minutes after initial harvest begins, touch **C** discharge line. Is it hot? If no check refrigerant pressures and **C** operation. If yes, touch inlet line to the evaporator. Is it hot? If yes, but unit is not starting freeze cycle,

check: defrost completion timer adjustment, thermistor (for open circuit), discharge line temperature, **C** efficiency, and that **HGV** is fully open.

- C) Freeze cycle** – **C** remains energized, **PM**, (**LV** on **RS** model), and **FM** energize. **WV** & **HGV** de-energize. Unit is held in freeze by 5 minute short cycle protection timer. After 5 minutes, freeze cycle operation is transferred to **FS** for freeze termination. During first 5 minutes of freeze, confirm that evaporator temperature drops. After 7 minutes in freeze, remove black **FS** lead from **K5** connector. Unit should immediately switch to pump out cycle.

Diagnosis

If evaporator is not cold, check for **HGV** still open, **TXV** not opening properly, **WV** continuing to fill reservoir, improper unit pressures, and inoperative **C**. If unit remains in freeze with **FS** removed replace board. * Normal freeze cycle will last 20 ~ 40 minutes depending on model and conditions. Cycle times and pressures should follow performance data provided in Tech –Specs.

- D) Pump Out Cycle** – In this 10/20 second pump out, **C** remains energized, **HGV** energizes, **FM** de-energizes, **PM** stops for 2 seconds and starts in reverse rotation for 10/20 seconds.

This removes contaminants from the water reservoir, through check valve, down the drain and allows for power flush of **FS**.

Check clear tubing at check valve housing, or unit drain, for water flow.

Diagnosis

If **PM** does not reverse, check **PM** circuit and capacitor. If water does not pump out, remove housing and check/clean valve assembly.

- E) Normal Harvest Cycle** – This is the same as Initial Harvest Cycle. Return to **B**) and unit cycles through **B**), **C**), & **D**) until bin control is satisfied or power is switched OFF.

Note: Setting can be adjusted to skip **D** until every 2, 5, of 10 cycles and the unit always restarts at **A**).

Legend:

C – Compressor, **CC** – Contactor Coil, **FM** – Condenser Fan Motor
FS – Float Switch, **HGV** – Hot Gas Valve, **LV** – Line Valve
PM – Pump Motor, **RS** – Remote System, **WV** – Inlet Water Valve

Reservoir Flush System

A displacement device (cap or assembly) is positioned over the top of the overflow stand pipe. This device allows sediment to be pulled from the bottom of the reservoir and flush down the drain when overflow occurs. Water should always overflow the stand pipe for a short period, towards the end of harvest, to allow this flushing action. To extend this flushing action, adjust dip switches 1 & 2 for longer harvest. If overflow does not occur, you likely have restricted water flow into the unit. Check the inlet water valve screen, incoming water line size, or the external filter system. The displacement device must be in position for proper operation. If not, water goes down the drain during freeze and short cycling occurs.

Pump-Out Check Valve

On standard KM models, A mechanical spring & seat check valve is located in the pump-out housing. If this check valve sticks open, water flows down the drain during freeze and a 5 minute freeze cycle occurs. In this case, check for a displaced seat, trash, or a weak spring. Replace the spring if it is weak. When reinstalling the check valve, the seat always faces the pump supply.

Pump Out Check Valve Parts			
Model	Seat	Spring	O-ring
KM - 320	433468-01	322110-01	7611-G035
KM - 515/600/650/ 900/901/1301/1800 /1900/2000/2100/ 2400/2500	433705-01	322110-01	7611-G035
KM - 1340/1601	433705-01	322685-01	7611-G035

KML/Small KMD Pump-Out

The Standard KM series has a dual winding pump motor that reverses direction during the pump-out cycle. The reverse rotation pumps sediment down the drain. The KML models have a single winding pump motor that does not reverse. Instead of a pump-out check valve and reversing pump, a drain solenoid and the pump motor are energized by a relay so that sediment is pumped out.

KM-61/101/151 Drain Cycle

These small KM's empty the reservoir during the pump out period by gravity. This is called "the drain cycle" on these units. The pump stops for 10 seconds and the drain valve opens to drain minerals out.

KM Control Switch

The standard KM unit has a single control switch as shown below.

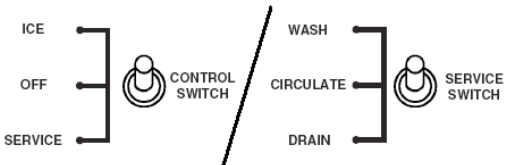


This is a double pole/double throw, 3 position switch.

1. Placing the switch in ICE will start the ice making process by closing switch contacts to terminals 1 & 2 and 4 & 5.
2. Placing the switch to OFF open's these contacts.
3. Placing the switch in WASH will start the pump by closing switch contacts to terminals 5 & 6. 2 & 3 will also close.

KML/KMS Control Switches:

The KML and KMS models have dual control switches.



The Service Switch is not in the circuit until the Control Switch is placed in the SERVICE position.

The Control Switch is a double pole/double throw, 3 position switch.

1. Placing the switch in ICE will start the ice making process by closing switch contacts 2 & 3 and 5 & 6.
2. Placing the switch to OFF open's these contacts.
3. Placing the switch in SERVICE will close contacts 1 & 2 and energize the Service Switch and close contacts 4 & 5 to energize the pump.

The Service Switch is a single pole/single throw, 3 position switch.

1. Placing the switch to the DRAIN position will close contacts 1 & 2 to open the drain valve.
2. Placing the switch to the CIRCULATE position will open these contacts and the pump continues to run.
3. Placing the switch to the WASH position will close contacts 2 & 3 and open the water bypass valve.

Control Board Fuse

Beginning in May 2002, Hoshizaki began including a 10 Amp control fuse on KM models. This new feature was added to specific models as they were produced. The fuse is located in a fuse holder, which is mounted on the control box and connected in the circuit supplying 115V to the control board 10-pin connector through pins 10 & 7.

The purpose of this fuse is to protect the control board from damage in case of a short circuit in one of the components. This fuse will also offer some protection against external wiring problems, voltage spikes, and surges.

If the fuse is blown, you should isolate each individual component and check for shorts and grounded conditions. It is important that any external wiring connections, including the remote condenser circuit be checked before replacing this fuse. If the problem is not corrected, the fuse will blow again.

In general, you should check the component that connects to the pin that has a burnt trace on the back side of the board first. The fuse is a Bussman AGC 10 Amp 250VAC fast acting fuse, Hoshizaki part # **4A0893-07** and should only be replaced with one of identical size and type. A replacement fuse is taped to the control box.

Should you want to add this feature to an existing KM unit in the field, you can order fuse holder # **4A0892-01**, fuse label # **4A2817-01** and fuse # **4A0893-07**, through your local distributor. You should also make a note on the wiring diagram indicating the fuse addition, fuse size and type.

On the following page, you will find a typical wiring diagram showing where the fuse is wired in the circuit and the label that is included on the control box.

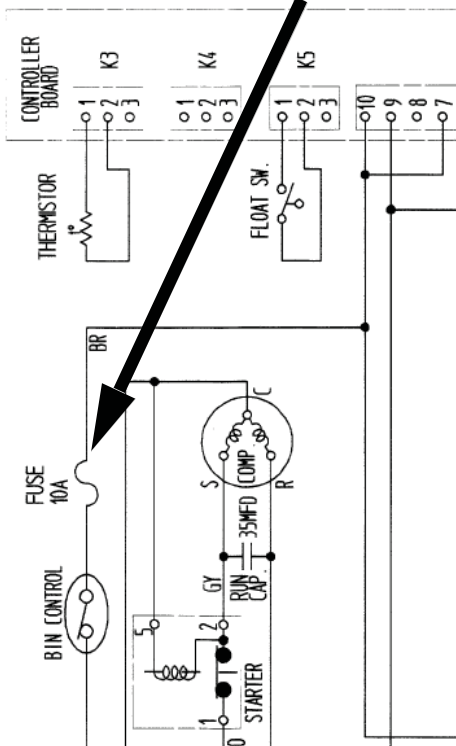
A fuse is used on all KM-H models whether a thermostat or mechanical bin control is used.

(Fuse Label)

CONTROL FUSE (10A)

If fuse blows, look for shorted component before replacing.

4A2817-01



Component Checks

Float Switch

Check out the float switch with an ohm meter. When the float is up, the switch is closed. When the float is down, the switch is open.

Sticking Float Switch

It is important to remember that the float switch is in the water circuit and is susceptible to scale buildup. This can cause the float to stick up or down. If the float switch is sticking, it should be cleaned thoroughly with ice machine cleaner and checked for proper operation. If the float switch is defective, it should be replaced however, a dirty float switch is not considered a warranty item.

Heavy scale can be difficult to remove from the float. The float is available as a replacement part as well as the float pin. If the housing is defective, replace the complete float switch assembly.

The symptoms of a sticking float are:

UP/CLOSED: 60 minute freeze cycle, larger cubes, and pump cavitates prior to harvest.

After 2 consecutive maximum freeze cycles, the unit will shut down on a 3 beep safety.

To reset this alarm, press the Alarm Reset button on the board with power ON.

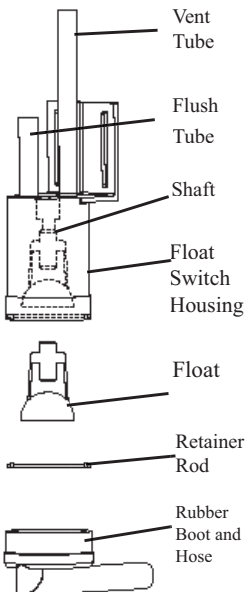
DOWN/OPEN: Unit shuts down on low water safety and water runs continuously.

Float Number:

4A1104-01

Retainer rod number:

4A3624F02



Universal Replacement Float Switch

There are two styles of KM float switches. One has no hole in the outside pipe and one has a hole in the outside pipe. Float switch number **4A3624-01** can be used as a universal replacement on any KM unit. Simply seal off the small hole in the outside tube with silicone or a seal cap from 3/8" refrigeration tubing if it is not needed.

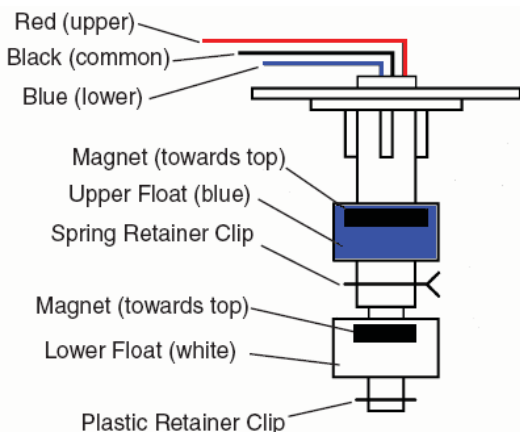
This universal replacement cannot be used on some models: KM-61/101/151B uses float switch number 4A3624-02. KM-201/260B uses a unique float switch number P00816-01. KMD-450M uses float switch part number 4A3624-04. DKM-500BAH uses float switch part number 4A3624-03.

Dual Float Switch

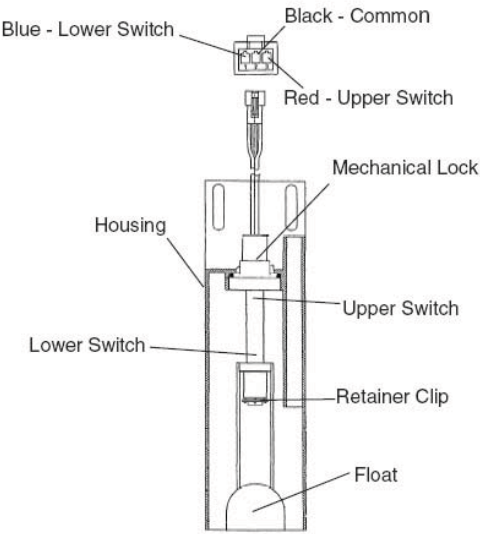
Some newer models use a dual float switch to operate the refill water valve. This is necessary because of the size of the reservoir on some designs. The switches can be checked with an ohm meter using the black lead as common and check either the red or blue circuit. When the float is raised up, the switch should be closed.

This is the same float switch used of F/DCM models.

KM-251/255 Float Switch Part # 435490-02 has 2 floats and 2 switches.

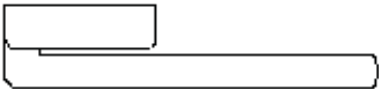


KMS Float Switch Part # 468264-01 has 1 float and 2 switches.



Connector Boot

The float switch boot will sometimes collect scale deposits since it is in a low area of the water circuit. The boot should be cleaned thoroughly during scheduled maintenance. Due to age and high amounts of chlorine in the local water supply, it can also deteriorate and may cup upward in the middle holding the float up. In this case, the boot should be replaced. Order part number **426799-01** as universal replacement part and cut the tube to length as needed.



Universal float boot

426799-01

Thermistor

Thermistor part number 429006-03, can be used as a universal replacement for all E and G board units, except DKM-500B which uses longer part number 429006-06. H board thermistor P00027-01 has a unique connector. For all KM Thermistors, check out the thermistor mounting and check resistance versus temperature per this chart:

THERMISTOR TEMPERATURE / RESISTANCE	
SENSOR TEMP (F°)	RESISTANCE (K OHMS)
0	14.4
10	10.6
32	6.0
50	3.9
70	2.5
90	1.6

The symptoms of a bad thermistor are:

OPEN: 20 minute harvest cycle. The unit will shut down on a 2 beep safety after 2 consecutive 20 minute harvest cycles.

SHORTED: Unit locks out on manual reset high temperature 1 beep safety and will not reset in this case.

High Temperature Safety: If evaporator reaches 127°F the thermistor signal (500 ohms) shuts down the unit on this manual reset. A 1 beep alarm will occur. ***To reset this alarm, press the Alarm Reset button on the board with power ON.*** Then check the items listed on the control board label for a 1 beep alarm.

Note: The Thermistor must be mounted using a heat sink compound to assure good heat transfer and accurate sensing. Use Hoshizaki Part Number **4A0683-01** or equivalent (Radio Shack #276-1372 or GE Electronics #10-8108, ect.).

Control Board (E or G Board)

The electronic control board maintains the sequence of operation. There are 3 input connections to the board.

1. The Float switch connects to the control board through the black K5 connector.
2. The thermistor connects to the control board through the white K3 connector.
3. If a mechanical bin control is used, it will connect to the K4 red connector.

The control transformer supplies 10.5 VAC control voltage to the K2 connection. The control board will not operate unless control voltage is present at K2. Proper control voltage is indicated by the Power OK red LED ON.

The final connector on the control board is the K1 10-pin connector. This connector supplies 115 VAC into the control board for switching components or relay contacts and powers the individual components during the sequence of operation.

The control board also has dip switches that allow for board adjustments. These switches are set from the factory for proper operation and maximum efficiency. See control board adjustment chart for factory settings and adjustments.

E or G Board Checkout

Before replacing a control board that does not show a visible defect and that you suspect is bad, always conduct the following checkout procedure. This procedure will help you verify your diagnosis.

1. Check the dip switch settings to assure that #3,4, 7, 8, 9, & 10 are in the factory setting. Output test switch S3 should also be OFF. Switches 1, 2, 5, & 6 are cleaning adjustments and the settings are flexible.
2. Turn the control switch to ICE and check for proper control voltage. If the Red LED is ON, the control voltage is good. If the Red LED is OFF, check the control transformer circuit. See checking control transformer.
3. Next, check the 115 volt input at the 10-pin connector. Check the brown wire at pin #10 to a white neutral wire for 115 volts. (Always choose a white neutral wire to establish a good neutral connection when checking voltages.) A jumper also feeds 115 volts into pin # 7. If no voltage is present, check the 115 volt supply circuit.
4. Check the board sequence using the S3 output test.
 - a) Turn the control switch to OFF.
 - b) Turn the Control switch to ICE. Press S3. Watch the lighting sequence of the 4 green LED's numbered 1, 4, 3, 2 from the board edge. The Red LED should light in about 5 seconds. **For E Board:**
About 5 seconds later, LED 2 should light.
5 seconds later, Led 2 will go out and LED 3 will light.
5 seconds later, Led 3 will go out and LED 4 will light.

5 seconds later, Led 4 will go out and LED 1 will light.
5 seconds later, Led 1 will go out and LED 4 will light.
This sequence completes the output test and the unit is now in the 1 minute fill cycle.

G Board: LED's light in the following sequence during the S3 outpost test. 1, 4, 3, 2, back to 4.

Note: If the LED's light in a different sequence or the 5-second interval does not occur as explained, the control board is bad and should be replaced. If the test sequence is correct, turn the control switch OFF and switch S3 OFF. The S3 switch must remain in the OFF position during normal operation. The components will cycle during this test.

5. You have checked the board sequence and now need to check the output to each component through the K1 10-pin connector for 115 volts. Follow the wiring color code on the wiring diagram or use the generic drawing in the wiring diagram section to check each component for 115 volts through out the sequence and check from each pin to a white wire.

Note: Checking from pin to case ground can give a false reading in some instances. Always choose a white neutral wire to establish a good neutral connection when checking voltages.

Bin Control

Checkout for the bin control will vary depending on the model and control that is used.

- a) Thermostatic Bin Control:** The thermostatic bulb is mounted in the ice drop area to sense the ice buildup. **To adjust the bin control**, hold ice against the bulb while the unit is operating. You will find it easier to place the control switch to the wash position to check the bin control operation. It is easy to hear the pump motor stop when the bin control opens. The unit should shut off within approximately 6 to 10 seconds when the control is adjusted properly. If this does not occur, adjust the thermostatic control by turning the screwdriver slot. Adjusting towards warmer will allow the unit to shut down quicker. This adjustment should be checked at installation, when diagnosing a bin control problem, or if a replacement bin control is installed.

KM's from the KM-280~901M and KML units have a bin

control mounted in the ice drop zone area. KM-1300M / S and larger units have a drop down bracket that must be dropped down, secured, and plugged in at installation. **The ice must contact the bulb to operate the bin control.** Some bin applications require an extension bracket or relocation of the bulb mounting to allow for proper shut down. Check this positioning if the control is adjusted properly and ice continues to back up into the evaporator section. Assure that the extension bracket is installed.

The symptoms of a bad thermostatic control are:

STUCK CLOSED: The unit continues to operate when the bin is full. This allows ice to back up in the evaporator compartment and generally causes a freeze up condition. This will also occur if the bin control is adjusted too cold or fully "CW". Check the adjustment and bulb location before you diagnose a stuck bin control.

STUCK OPEN: The unit will not start in the ice position. An easy method to check for an open bin control is to flip the control switch to WASH. If the pump starts, the bin control is closed.

- b) Mechanical Bin Control:** The mechanical bin control uses a moving actuator paddle to open and close a magnetic proximity switch. The control is connected to the red K5 connector on the control board. For E boards it connects through a resistor harness. On G boards it connects through a wiring harness without resistors. As the proximity switch opens or closes, the switch will open and close, or the resistance will change to signal the control board to start up or shut down. The control board will only respond to this change during the first 5 minutes of each freeze cycle.

There are different styles of mechanical bin controls on various models in the field however they all work basically the same.

- a. When Ice fills the bin and pushes the actuator paddle in or towards the magnetic switch, the switch will open and shut the unit down.
- b. When the ice falls away from the actuator, the switch closes and the unit starts.

Note: On the E board, dip switch # 7 must be in the ON position for this control. When dip switch # 7 is ON, the following 2 safeties will occur if the mechanical control fails:

4 Beeps = Short circuit on K5 bin control circuit.

5 Beeps = Open circuit on K5 bin control circuit.

To reset either safety, press the white reset button on the control board with the power ON.

Checkout: To check this control with the unit running, you must be in the first 5 minutes of the freeze cycle. Turn the control switch to OFF and back to ICE. Allow the unit to cycle through the 1 minute fill cycle and initial harvest cycle. When LED 1 is on, you will know that the freeze cycle has begun, push the control paddle to the full right position and the unit should shut down within 5 seconds for the E board or 15 seconds for the G board.

Another method to check this control is to unplug the wiring harness from the K5 Red connector.

For E board units, check the resistance at the end of the harness with an ohm meter as the proximity switch opens and closes.

- 1) When the control paddle is hanging in the normal position (Bin Empty), the resistance at the red K4 connector will be 7.9 K ohms.
- 2) When the control paddle is held to the full right position (Bin Full), the resistance at the red K4 connector will be 15.8 K ohms.

Note: Remember that dip switch # 7 must be ON and the control will have 4 and 5 beep safeties.

Mechanical control on G or H board

It is important to note that dip switch # 7 does not control the red connector on the G or H board. It has a different function and should remain in the factory position.

The G board has LEDs which indicate Bin Control Open (Yellow LED) and Bin Control Closed (Green LED). These LEDs can be used as a visual check for proper bin control operation on a G board unit.

To electrically check a mechanical control on a G board or H board , unplug the connector and use an ohm meter on the control.

- a) Push the actuator/paddle to the bin full position and the switch should be open.
- b) Allow the actuator to hang in the normal position and the switch should be closed.

c) F/DCM Bin Control: DCM bin controls may be a mechanical flapper with a magnetic proximity switch or a micro-switch assembly. Since these controls have moving parts, make sure that all parts move freely for proper operation. Sticking can occur if scale builds up at the pivot points. If the control is sticking, clean the mechanism with ice machine cleaner and spray the pivot pins with food grade silicone. Always assure that the paddle assembly does not bind or stick after cleaning

Flakers and Cublets use a mechanical flapper in the spout. When ice pushes against the flapper, the magnetic proximity switch opens to shut the unit down. When no ice is present, the proximity switch is closed to call for ice production. If the bin control fails, the spout will fill with ice causing higher gear motor current and the gear motor protect fuse will blow.

If Cubelet machines are installed on a dispenser, they will likely have an additional thermostatic control wired in series with timer terminal 4 and water control relay terminal 6. The spout control acts as a backup safety in this case. When ice touches the bulb, the switch opens within about 6 seconds. An optional dispenser kit is available for standard cubelet models installed on a dispenser. See the sales catalog for the correct dispenser kit.

FS&FD-1001 models use an adjustable infra red bin sensor powered by the 24V control transformer. When the sensor senses ice, it starts an adjustable delay timer. The timer adjustment represents seconds of delay before shut down.

The factory setting is adequate for most dispenser applications however in some cases, more or less ice storage is needed

- a. Adjusting the timer longer will allow the ice to build higher in the bin.
- b. Adjusting the timer shorter will shut down the unit faster when ice is sensed and result in a lower ice level.

See SB09-0004 for operation and trouble shooting tips.

KM Control Transformer

The KM control transformer supplies 10.5 VAC to the control board through the K2 connector. This 115V/10.5V stepdown transformer is a heavy duty component with an internal thermal overload. The primary winding of this transformer will handle higher voltage without damage because the thermal overload will open to protect the winding in the case of improper supply voltage. The control board monitors the output voltage of this control transformer and provides automatic reset high and low voltage protection.

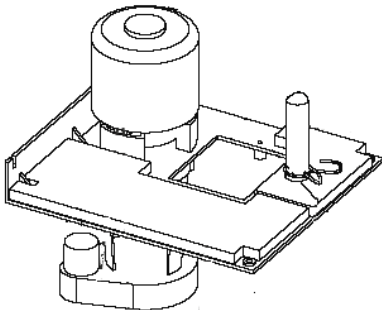
The Power OK LED on the control board will not light if no control voltage is supplied. The 115V transformer primary circuit is supplied through the thermostatic bin control, control switch, high pressure switch, and low pressure switch (if included). If either of these switches are open, there is no control voltage at the transformer connector and the unit will not operate.

On some models, the transformer secondary circuit includes an interlock switch at the cleaning valve. If this switch is open, no control voltage is supplied to the K2 connector so the unit will not operate. Always check the cleaning valve position and interlock switch if the Power OK LED is off.

Note: Because of the voltage protection, if the control transformer fails, it is important to use the correct OEM part as a replacement.

KML & Small KMD Pump Assemblies

KML units use a vertical shaft, single winding pump assembly. The original assembly did NOT include a capacitor. The most recent pump and service replacement does. The assembly is NOT rebuildable and includes the mounting bracket as shown:



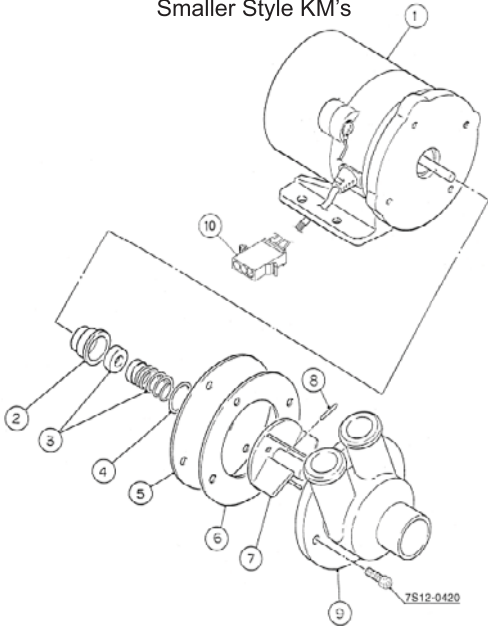
KM Pump Motor Assembly

The standard KM pump assembly has a dual winding PSC motor with an internal overload. The motor has a cast housing and sealed stainless steel roller bearings. No lubrication is required for these roller bearings.

If the pump motor fails, always repalce the pump motor capacitor. See the wiring diagram reference chart for the pump motor capacitor rating. If other failures occur, the front end of the pump assembly is rebuildable. The mechanical seal is the most common failure part and can be replaced.

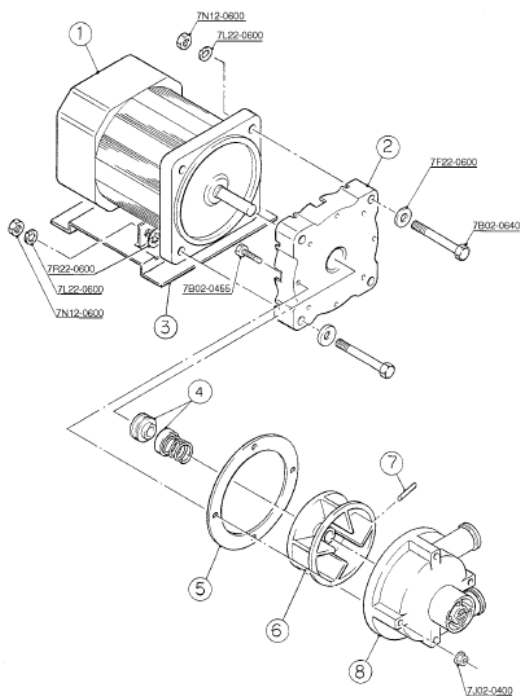
Following, are the assembly diagram's for two generic pump assemblies. Use these drawings as a guide to reassemble a pump assembly that you are rebuilding.

Pump Motor Assembly Diagram: Smaller Style KM's



1	Motor	4	“O” Ring	7	Impeller
2	Retainer	5	Plate	8	Pin
3	Mechanical Seal	6	Pump Gasket	9	Pump Gasket

Larger Style KM's



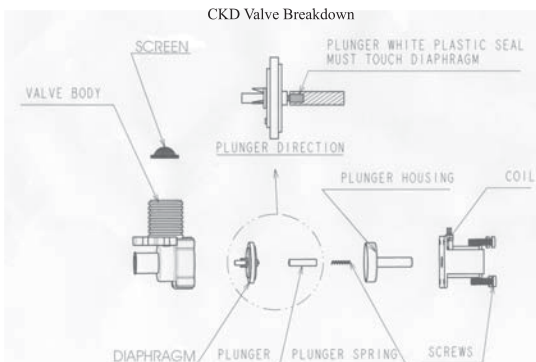
1	Motor
2	Pump Flange
3	Bracket
4	Mechanical Seal
5	Packing
6	Impeller
7	Pin
8	Pump Housing

Inlet Water Valve

Hoshizaki uses an inlet water valve solenoid to fill the reservoir for ice making. This constant duty solenoid valve is very reliable however, in areas of hard water and high levels of chlorine, the diaphragm is susceptible to failure. Water quality is constantly changing and local municipalities are now adding higher levels of chlorine, chloramine, and chlorine dioxides to the water. These agents can damage rubber parts and affect the diaphragm life. Newer valve diaphragms use an improved viton material to reduce deterioration.

The diaphragm is made of rubber and ABS, with a bleed port on the inside ABS piece. This port allows the pressure to balance on the top and bottom of the diaphragm so that the valve will open and close properly with the spring pressure. If the rubber becomes dry and brittle or the bleed port is plugged with trash or debris, the valve will leak by. In this case, the valve can be disassembled for cleaning and the diaphragm and inlet screen can be cleaned or replaced. It is important to remember that the warranty covers repair of defects and not cleaning. Should the valve be scaled or dirty, it should be cleaned and billed to the customer.

Some water valves include a replaceable diaphragm. Below you will find an exploded view of the valve assembly and instructions for reassembly of the valve. When replacing the diaphragm and re-assembling the valve, it is important that the plunger is in the correct position. This plunger has a white plastic seal on one end and is metal on the other. The white seal end of the plunger **must** be in contact with the diaphragm in order for the valve to work correctly.



Note: Because of the different flow rates, it is important to use the correct OEM water valve when servicing a Hoshizaki ice maker. Use the following chart to identify the correct valve, diaphragm, or inlet screen.

CKD Valves

Model #'s	Valve #	Vender #	Part #
KM-251/255B	3U0152-01	J248-662	4A3362-01
KM-201/260B, KM-320M, KML-351MWH, KML-451M, DKM-500BAH	3U0150-01	J248-647	4A3362-01
DKM-500BWH, KML-250/350, KML450/631, KML-351MAH, KM-461/501, KM-515/901M	3U0111-04	J248-702	4A3362-01
KMD-300M/450M, KML-600M, KM-500/600/650M	3U0111-03	J248-033	4A3362-01
KM-900/1340M, KM-1601M, KMD-850M/901M, KMS-750/1230, KMS-1300/1400	3U0111-02	J248-032	4A3362-01
KM-1800/2000S, KM-2400S	3U0136-01	J248-106	4A3362-01
KM-1300S/1600S	3U0111-01	J248-030	4A3362-01

Replacement Water Valve Gasket

The replacement rubber gasket or packing {valve washer} for all valves is #413854-03. This gasket must be in place or the inlet water valve will leak.

Replacement Water Valve Screen

Replacement screen for all CKD valves # SP9200010. This is an 80 mesh screen designed to catch debris from the water system. It should be checked during regular maintenance and replaced if damaged.

Invensys, EATON, and Other Valves

Model #'s	Part #	Vender #	Diaphragm #
KM-61B	P00463-01	N/A	Non-replaceable
KM-101/151B	P00464-01	N/A	Non-replaceable
KM-320M-E	4A1176-05	1261860	Non-replaceable
KM-515/650M-E	4A1176-06	1261840	Non-replaceable
KM-500M-E, KMD-700M/900M	4A1176-03	1268160	Non-replaceable
KM-630/M-E, KM-900M50	4A1176-01	126757-0	Non-replaceable
KM-1601/1800S, KM-1900/2100S, KM-2501S	4A1176-04	26144	Non-replaceable
KM-1300S-E, KM-1301S/-E	4A1176-02	126756-0	Non-replaceable
All DCM & Flakers	4A0865-01	S-30	SA0020

* Replacement screen for valves above is part number SA0019

Water Valve Coil

The coil or solenoid for ALL KM water valves operates on 115 volts. F/DCM models use a 24 volt coil. The coil is not replaceable on any water valves. Check the coil for proper voltage during the fill cycle.

On KM models the inlet water valve is typically supplied power through the orange wire. The most common problem with a water valve coil is an open winding. If power is supplied and the valve does not energize, check the coil for an open winding with an ohm meter. This would read infinity on the ohm meter. A good coil will generally measure in the 270~305 ohm range +/- 10%.

If the valve energizes and hums but does not open check for sticking valve or plugged screen.

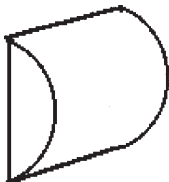
Check other components using a good quality multimeter and normal electrical diagnostic procedures.

Diagnosing Water Problems

Many common water related problems will cause cubes to look unnatural. Looking at the ice in the bin will point you towards the problem area. Study these shapes and causes to help you diagnose water related problems.

1. Normal cube, No problem.

Average cube size 1/2" thick x 1 1/8" wide x 1 1/2" high.



2. Larger than normal cube with heavy saddled edges.

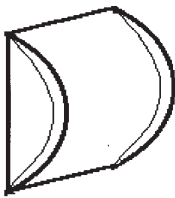
Note: Normal cube may have slight saddled edge.

If the float switch sticks in the up position, (closed) the unit will have a consistent 60



minute freeze cycle. This will result in heavy saddled edges and may cause pump cavitation and ice to stick on the evaporator or ice bridging (see #3).

Note: If ice sticks, due to larger edges, a freeze up may occur.



3. Bridging/Ice Strips

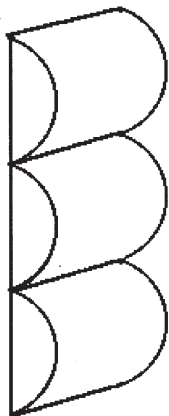
a) Bridging, that occurs on all ribs of all evaporator plates, is the result of excessive water in the reservoir. This is caused by the inlet water valve leaking by.

Check for a plugged bleed port in the water valve diaphragm or a defective water valve.

b) May be the result of larger than normal ice cubes (see #2).

c) Bridging can occur on a few ribs if some of the holes in the water distribution tubes are plugged. An inspection of the ice build up on the evaporator will show some ribs with no ice and others with strips.

Clean the water distribution system.



- d) Bridging on 1 or 2 plates of a multiple evaporator unit can result from water distribution problems or a refrigeration system problem. Eliminate water problems first then check TXV, hot gas valve, charge, etc.

Note: *Bridging will generally cause a freeze up.*

4. Back of Cube Melted Away

- a) This can occur if the evaporator plate is scaled up. De-scaling is required.
- b) Insufficient water flow during harvest can also cause the flat side of the cube to melt away. Check for a plugged inlet water valve screen, plugged external filter, low water pressure, or a small water line size.



Note: *Either, or both, of these problems can cause this symptom.*

5. Small Cube

Note: *Size will depend on how much water is in the reservoir.*

- a) Can be caused by a low volume of water at the beginning of freeze. Check for adequate water flow during harvest. See item 4b)
- b) If the pump out check valve is stuck open or has a weak spring, the water left in the reservoir will be pumped out during the first five minutes of freeze. This results in a short cycle and slivers of ice or small cubes.
- c) Any loss of water, whether by leak, water trail, or loose stand pipe can cause this problem.



Note: Freeze ups can be caused by #2, #3, or #4 in any combination. Below are the 3 most common causes.

1. The number one cause however, is a dirty (scaled up) water system or evaporator. Scales reduces water flow through the water distribution system, impedes heat transfer and will not allow cubes to harvest from the plates. A thorough cleaning will eliminate most freeze ups. Hard to remove scale will require extra effort and a stronger cleaning solution.

2. The second most common reason for freeze up is low water flow. Always check the evaporator, and water flow first, then go to other checks when diagnosing freeze ups.

3. The third most common cause for freeze ups is a bin control that will not shut the unit off when the bin is full.

Freeze Up Check List

Complete When Diagnosing A Freeze-Up, Refrigerant Leak, Or Low Charge.

MODEL# _____ SERIAL# _____

INSL DATE _____ FAIL DATE _____

- | | Single / Stacked | |
|---|------------------|-----|
| | [] | [] |
| 1. Single unit or stacked equipment? | [] | [] |
| | YES NO | |
| 2. Condition of float switch - Dirty float? | [] | [] |
| Are contacts opening when float is down?? | [] | [] |
| 3. Confirm... Is water pump always running during freeze cycle? | [] | [] |
| 4. Is thermistor properly mounted? | [] | [] |
| 5. Is the TXV bulb tight and insulated? | [] | [] |
| 6. Is water flow adequate to fill sump to overflow last 60~90 seconds of a normal harvest? | [] | [] |
| 7. Is the water line sized properly? Small units up to KM-900 3/8", Large units 1/2"? If not _____" | [] | [] |
| 8. Do some ice cubes remain on evaporator plates when next freeze cycle starts? | [] | [] |
| 9. For stacked or side by side units...are separate water lines supplied? | [] | [] |
| 10. When evaporator plates are dry, do you see scale?
Scale color: _____ [] []
Date evaporators were last cleaned _____ | [] | [] |
| 11. Will thermostatic bin control cycle unit OFF within 6 seconds when in contact with ice? | [] | [] |
| 12. Have you checked the bin control to assure the capillary is not touching a hot or cold source? | [] | [] |
| 13. Are the evaporator separators, blue hooks and cube guides positioned properly? | [] | [] |
| 14. Does Mechanical bin control cycle unit off in 6~15 seconds within first 5 minutes of freeze cycle? | [] | [] |
| 15. Does the unit have any water filtration? [] []
If so, please list the following: | [] | [] |

Filter brand: _____
Filter model: _____
Filter pressure gauge reading during fill _____ psig.
Date filter last replaced _____

16. Is water inlet valve screen clean? [] []
17. Does water valve close completely when de-energized
i.e. does it leak by in freeze cycle [] []
18. What is inlet water pressure? _____ psig
What is inlet water temperature? _____ °F
19. List the control board dip switch settings. OFF / ON
1 _____ 2 _____ 3 _____ 4 _____ 5 _____
6 _____ 7 _____ 8 _____ 9 _____ 10 _____
20. Is cube size consistent from inlet to outlet of evaporator plates? (full freeze pattern) **YES** **NO**
[] []
21. Is KM cube normal shape and size? [] []
If not describe: _____
22. Was any refrigerant added to the unit? [] []
If so, how much? _____
23. Was the unit leak-checked? [] []
Were any leaks found? [] []
If so, where? (Be specific)

24. What is the head pressure?
Freeze _____ Harvest _____
25. What is the suction pressure?
Freeze _____ Harvest _____
26. What is length of Freeze cycle _____
Harvest cycle? _____
27. Ambient temperature at unit _____ ° F, at cond. _____ ° F
28. Water-cooled condenser outlet water temp. _____ °F
29. Is the hot gas valve opening? [] []
30. List model & manufacturer of bin: _____
Or Dispenser: _____
31. If non-Hoshizaki bin, what modifications have been made to
bin control mounting? _____
32. Has stainless steel extension bracket been installed on the
bin control assembly? [] []
33. **ICE DROP BATCH WEIGHT:** _____

Preventative Maintenance

Perventative Maintenance is the key to long equipment life and maximum efficiency. Hoshizaki recommends performing the following maintenance steps annually. The PM frequency will depend on the local water quality and operating conditions.

Preventative Maintenance Steps

1. Clean the removable air filter. Hoshizaki air-cooled units include a front accessible and cleanable air filter. This filter collects dirt, dust, and grease. It can be cleaned with warm soapy water. Hoshizaki recommends cleaning the air filter twice a month or more, depending on conditions.
2. Service the external water filter system (if equipped) and check and clean inlet water valve screen.
3. Clean and sanitize the water system and bin. A cleaning label with detailed instructions is usually located on the inside of the front panel.
4. Check bearings on Flaker/DCM annually, for wear. Pull the auger and inspect evaporator, auger, and bearing surfaces for wear. Bearing inspections may be needed more frequently in areas with poor water quality.
5. Visually inspect the unit for loose wires, oil spots, water drips, etc.
6. Clean & wipe exterior with a soft cloth and neutral cleaner.

Stainless Steel Cleaning

Water quality is constantly changing and local municipalities are now adding higher levels of chlorine, chloramine, and sometimes chlorine dioxides to reduce bacteria in the water. Stainless steel is a durable metal however, it can be susceptible to corrosion due to exposure to chlorine gas.

As ice forms on a cuber evaporator, chlorine outgases and settles to the lowest point in the bin. This gas sticks to wet surfaces and around the door opening of the bin to form hydrochloric acid. If this acid remains on the stainless steel, rust colored corrosion occurs. With enough exposure, the corrosion can pit and damage the stainless.

If rust colored corrosion is found, it should be cleaned thoroughly with a non-abrasive cleaner and protected with a stainless steel polish. Heavy corrosion will require some effort to remove and may require the use of a cleaning agent like "Brasso" or non-abrasive powdered cleaner like "Zud" or "Bon Ami". Care should be taken so as not to scratch the stainless during the cleaning process.

Cleaning/Sanitizing Procedure

A maintenance label that details the step by step cleaning/sanitizing procedure is located somewhere in the unit. It is generally located on the inside front panel or under the top panel. These instructions are also provided in the Instruction Manual shipped with each unit. Follow these instructions to conduct a thorough cleaning and sanitizing of the water system. Annual cleanings are recommended. More frequent cleanings may be required in bad water areas.

Cleaners

Hoshizaki recommends “Hoshizaki Scale Away” or a similar ice machine cleaner however, any FDA approved ice machine cleaner with a 28%~30% phosphoric acid solution is acceptable. If you carry a nickel safe cleaner it is important to note that if it contains a citric acid, it is not recommended for Hoshizaki products as citric acid can affect tin solder. Remember that KM models have larger reservoirs and require more cleaning solution than other ice makers.

Recommended Cleaning Solution Mixture		
Model	Cleaner	Water
KM-61~260B	5.0 Fl oz	1.0 Gal
KML-250M, DCM-270B	6.0 Fl oz	1.0 Gal
KMD-450M, FD-1001M, DCM-500/750B	9.6 Fl oz	1.6 Gal
KML-350/351/450/451M	10.5 Fl oz	2.0 Gal
KML-600/631M	13.5 Fl oz	2.5 Gal
KM-320~901M	16.0 Fl oz	3.0 Gal
KMS-750/1230/1400M	22.0 Fl oz	4.0 Gal
KM-1301S/1340M/1601S/M	27.0 Fl oz	5.0 Gal
KM-1800/1900/2000/2100 2400/2500S	38 Fl oz	7.0 Gal

Note: For KM's, a longer circulation time may be required if heavy scale is present. Additional cleaner may added to provide a stronger solution for KM's with heavy calcium or iron scale. **Do not use a stronger solution for F/DCM's.**

Additional Cleaning

Inlet Water Valve Screen

The inlet water valve includes an 80 mesh screen to protect the water system from debris. Always check and clear this screen during the cleaning procedure.

Air filter

A removable, cleanable mesh air filter is included on self-contained air cooled units. A dirty air filter will cause high head pressure and reduce production. Clean the filter twice a month with warm soapy water to assure proper air flow.

Other cleaning

In addition to cleaning the reservoir and water distribution system, these items should be cleaned with cleaning solution and rinse thoroughly. The float switch and boot should be cleaned. Always drain the reservoir and clean and inspect the float switch housing and float assembly. Also, clean reservoir tube along with the float boot. To assure proper operation, also disassemble and clean the pump-out check valve housing and seat and the mechanical bin control assembly if included in your model. Make sure the reservoir is thoroughly flushed prior to advancing to the sanitizing step.

Sanitizing

The system should be sanitized using a solution of water and 5.25% sodium hypochlorite (chlorine bleach). Any commercial sanitizer recommended for ice machine application is acceptable.

Recommended Sanitizing Solution Mixture		
Model	Cleaner	Water
KM-61~260B, KML-250M	0.5 Fl oz	1.0 Gal
DCM-500/750B	0.82 Fl oz	1.6 Gal
KML-350/351/450/451M, KMD-450M	1.0 Fl oz	2.0 Gal
KML-600/631M	1.25 Fl oz	2.5 Gal
DCM-270B, KM-320M~901M	1.5 Fl oz	3.0 Gal
KMS-750/1230/1400M	2.0 Fl oz	4.0 Gal
KM-1301S/1340M/1601S/M	2.5 Fl oz	5.0 Gal
KM-1800/1900/2000/2100 2400/2500S	3.5 Fl oz	7.0 Gal

KM Production Check

The steps for a cuber production check are as follows:

1. Time a complete cycle from the beginning of one freeze cycle to the beginning of the next freeze cycle.
2. Catch all of the ice from this freeze cycle and weigh the total batch. (Use a dish tote, large pan or plastic trash bag to catch all the ice cubes).
3. Divide the total minutes in a 24 hour day (1440 minutes) by the complete cycle time in minutes to obtain the number of cycles per day.
4. Multiply the number of cycles per day by the cycle batch weight for the cuber production per 24 hours.

$(1440 \cdot \text{Total Cycle Time}) \times \text{Ice Batch Weight} = 24 \text{ Hour Production}$

Once you calculate the production, check the incoming water temperature and ambient condensing temperature at the cuber. Cross reference the temperatures to performance data included in this manual to see if the calculation falls within 10% of the performance data specification.

For the most accurate production check, a normal production cycle should be checked. A production cycle will start at the beginning of the freeze cycle and go until the beginning of the next freeze cycle. (Freeze + Harvest = Production Cycle)

If the evaporator compartment has been opened for service or the unit has been cut off for a long period of time, the first freeze cycle will be longer than normal because the evaporator compartment is warm. Timing this cycle can result in an inaccurate production check.

To avoid this:

1. Start the unit and allow it to operate for 10 minutes in the freeze cycle.
2. Unplug the float switch lead from K5 and cause the unit to cycle into harvest mode.
3. Replug the float switch and start timing as soon as the next freeze begins.

Note: Remember that the evaporator compartment **must** be closed during the production check. Removing the front cover to check the ice buildup during a production check will allow heat into the evaporator and will affect the total cycle time and actual production.

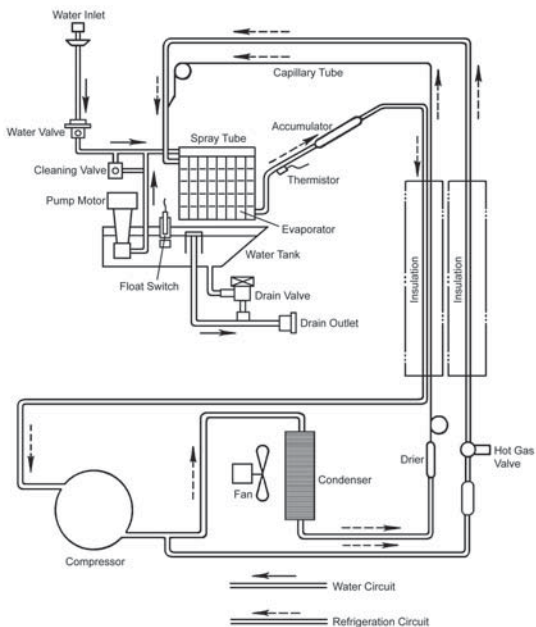
Cuber Water/Refrigeration Circuit Drawing Reference List

Note: Some drawings have been combined to represent more than one model.

<u>MODEL</u>	<u>DRAWING</u>	<u>PAGE</u>
KM-61BAH, KM-101BAH.....	A.....	88
KM-151BAH.....	B.....	89
KM-201BAH, KM-260BAH.....	C.....	90
KM-251 BAH, KM-255 BWH.....	D.....	91
KM-280MAH/MWH, KM-280MAH-E/MWH-E KM-320MAH/MWH.....	E.....	92
DKM-500BAH/BWH, KML-250MAH/MWH KML-350MAH/MWH, KML-351MAH/MWH KML-450MAH/MWH, KML-451MAH/MWH KML-600MAH/MWH, KML-631MAH/MWH.....	F.....	93
KML-600MRH, KML-631MRH.....	G.....	94
KM-461MAH/MWH, KM-501MAH/MWH KM-515MAH/MWH, KM-600MAH/MWH KM-630MAH/MWH, KM-900MAH/MWH KM-901MAH/MWH.....	H.....	95
KM-461MRH, KM-501MRH, KM-515MRH KM-630MRH, KM-650MRH, KMD-700MRH KMD-900MRH.....	I.....	96
KMD-700MAH/MWH, KMD-850MAH/MWH KMD-900MAH/MWH, KMD-901MAH/MWH.....	J.....	97
KM-900MRH/3, KM-901MRH/3.....	K.....	98
KMD-850MRH, KMD-901MRH.....	L.....	99
KMS-750MLH w/SRK-7H.....	M.....	100
KMS-1230MLH w/SRK-13H KMS-1400MLH w/SRK-14H KMS-1401MLH w/SRK-14H(3).....	N.....	101
KM-1300MAH/MWH, KM-1340MAH/MWH.....	O.....	102
KM-1300SAH/3, SWH/3 KM-1301SAH/3, SWH/3 KM-1600SWH/3, KM-1601SWH/3.....	P.....	103
KM-1300MRH, KM-1340MRH KM-1600MRH/3, KM-1601MRH/3.....	Q.....	104
KM-1300SRH/3, KM-1301SRH/3 KM-1600SRH/3, KM-1601SRH/3.....	R.....	105
KM-1800SAH/3, SWH/3 KM-1900SAH/3, SWH/3 KM-2000SWH3, KM-2100SWH3.....	S.....	106
KM-1800SRH3, KM-1900SRH3, KM-2000SRH3 KM-2400SRH3, KM-2500MRH3.....	T.....	107
KM-2500SWH3.....	U.....	108

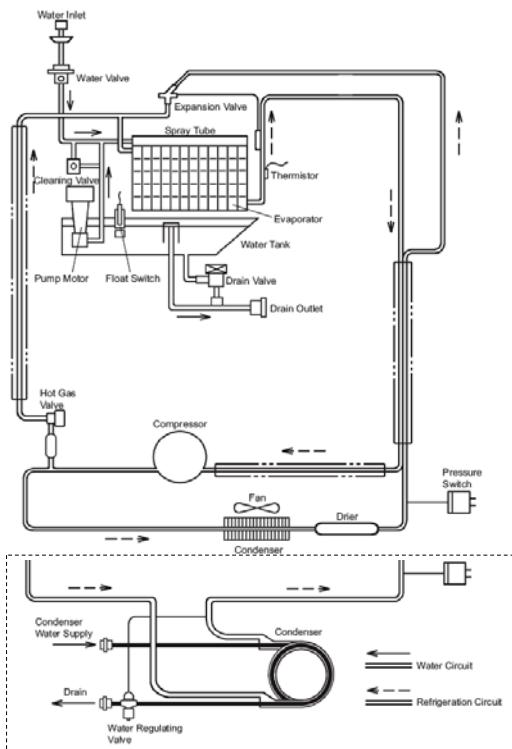
A

KM-61BAH, KM-101BAH



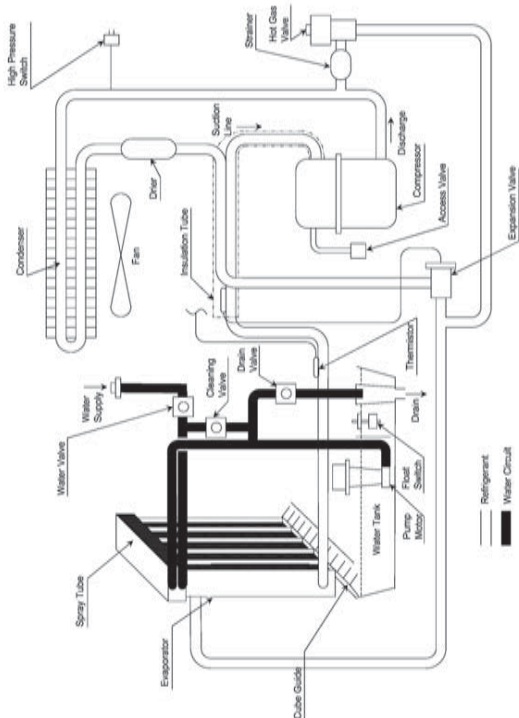
B

KM-151BAH/BWH



C

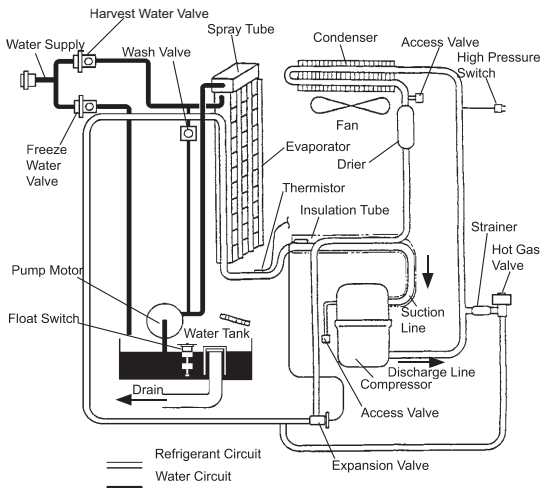
KM-201BAH, KM-260BAH



Note: Cleaning drain valve piping may vary slightly between models.

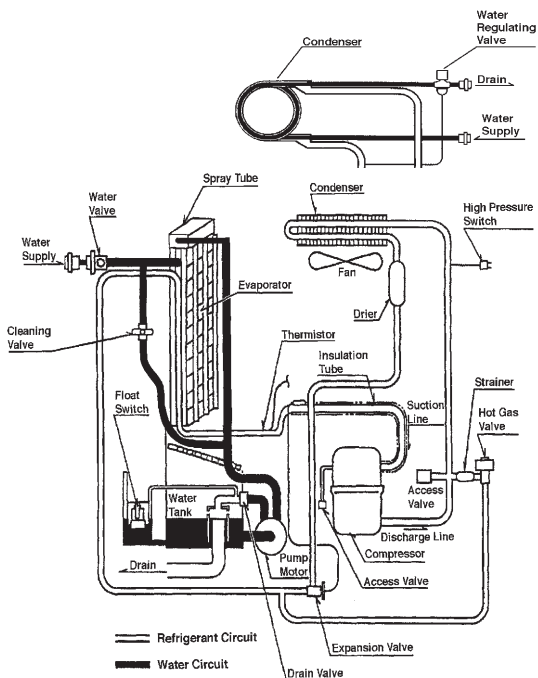
D

KM-251BAH, KM-255BWH



E

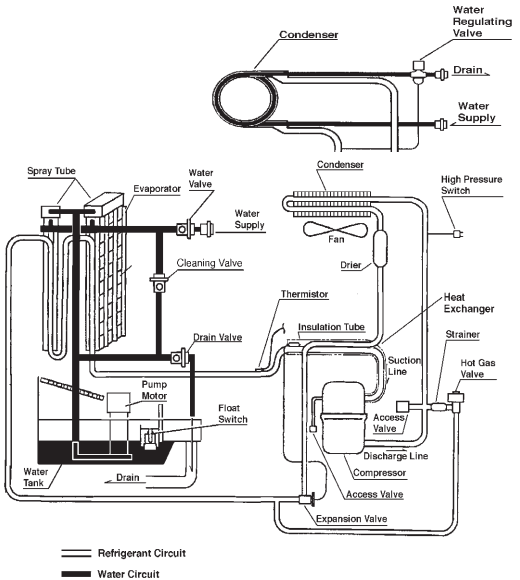
KM-280MAH/MWH, KM-280MAH-E/MWH-E KM-320MAH/MWH



Note: “- E” models do NOT have a cleaning valve.

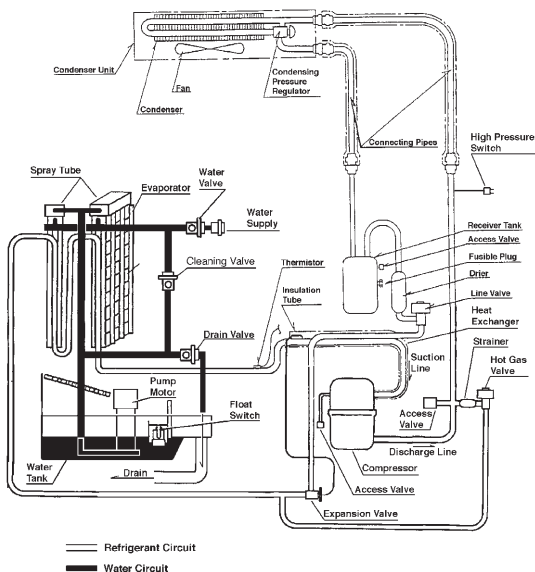
F

DKM-500BAH/BWH, KML-250MAH/MWH
 KML-350MAH/MWH, KML-351MAH/MWH
 KML-450MAH/MWH, KML-451MAH/MWH
 KML-600MAH/MWH, KML-631MAH/MWH



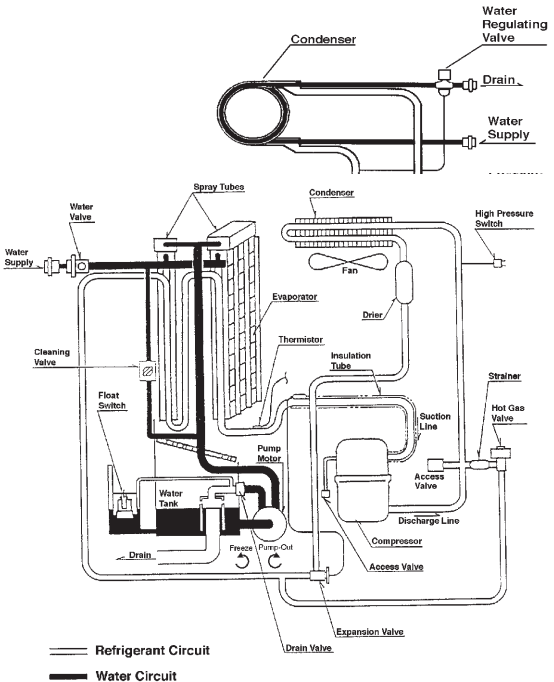
G

KML-600MRH, KML-631MRH



H

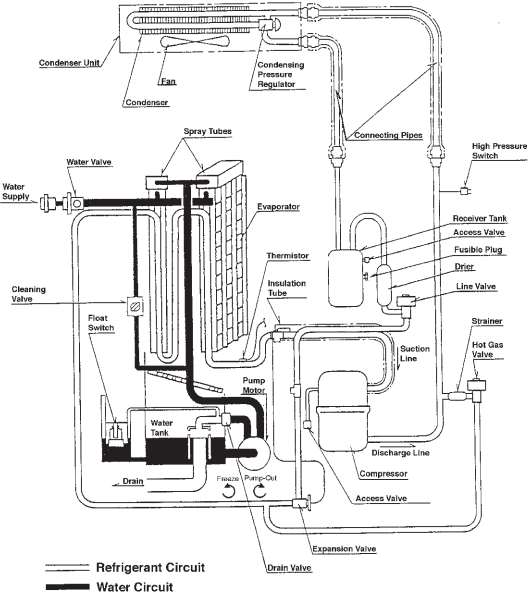
**KM-461MAH/MWH, KM-501MAH/MWH
KM-501MAH-E, KM-515MAH/MWH,
KM-515MAH-E, KM-600MAH/MWH,
KM-630MAH/MWH, KM-630MAH-E,
KM-900MAH/MWH, KM-900MAH50,
KM-901MAH/MWH**



Note: KM-901 MAH/MWH has 2 expansion valves and check valves at hot gas valve outlet.

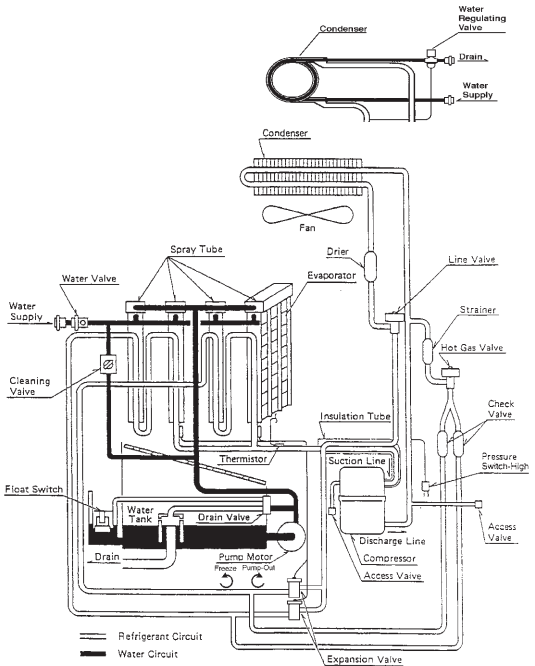
I

KM-461MRH, KM-501MRH, KMD-650MRH KM-515MRH, KM-630MRH, KMD-700MRH KMD-900MRH



J

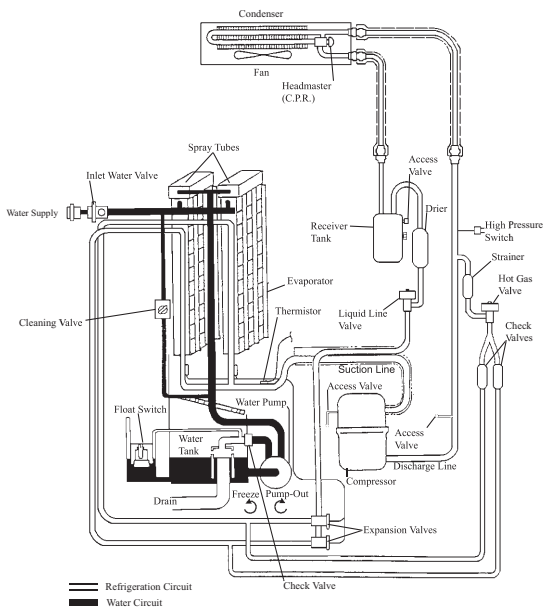
KMD-700MAH/MWH, KMD-850MAH/MWH, KMD-900MAH/MWH, KMD-901MAH/MWH



Note: KMD-700 MAH/MWH has 1 expansion valve.

K

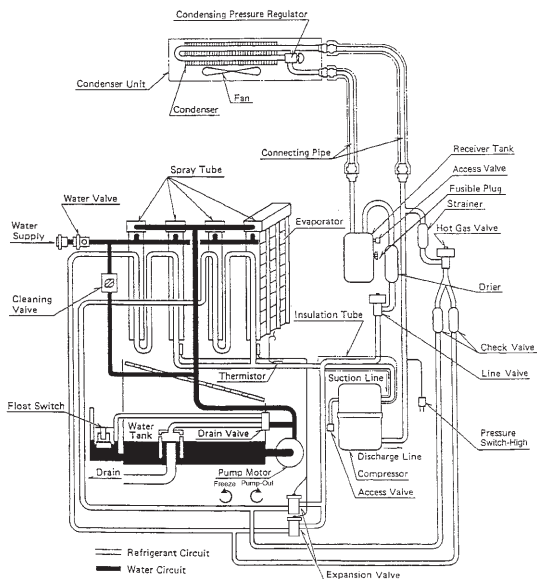
KM-900MRH/3, KM-901MRH/3



Note: KM-900MRH/3 has 1 expansion valve.

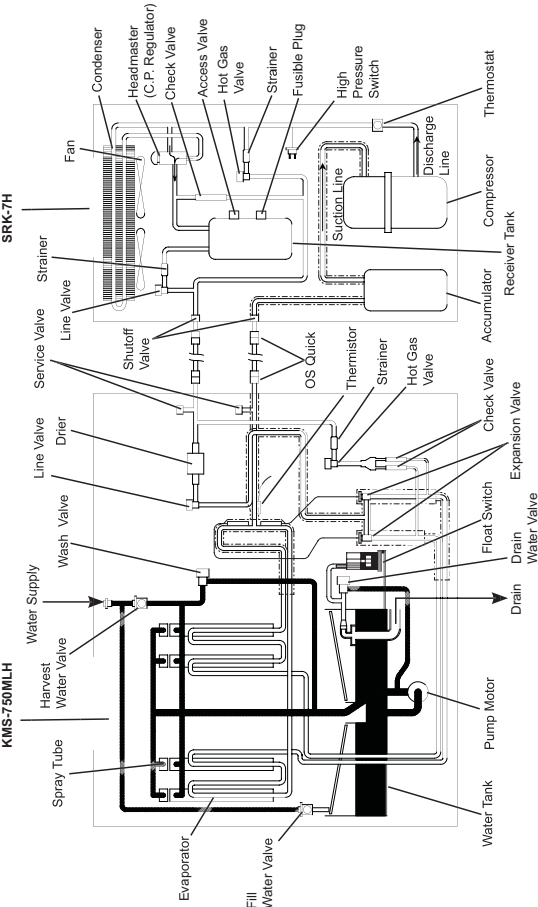
L

KMD-850MRH, KMD-901MRH



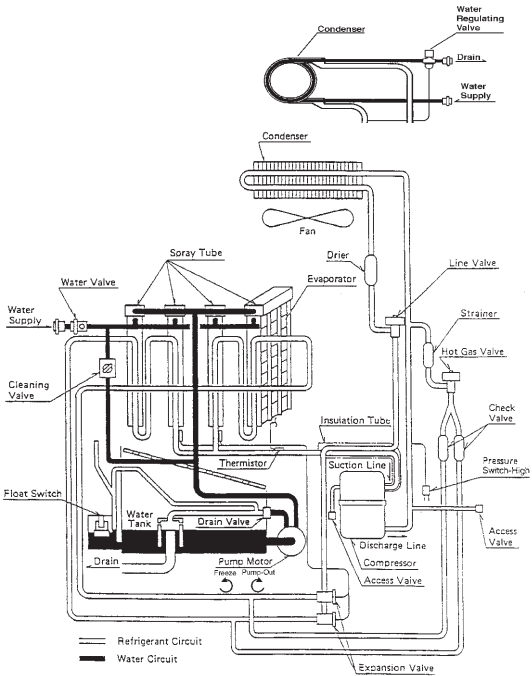
M

KMS-750MLH w/SRK7H

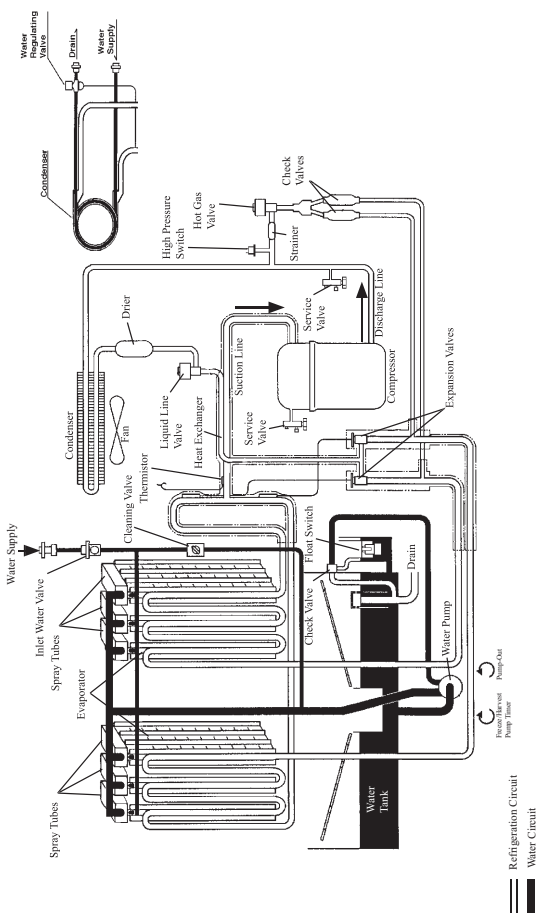


O

KM-1300MAH/MWH, KM-1340MAH/MWH

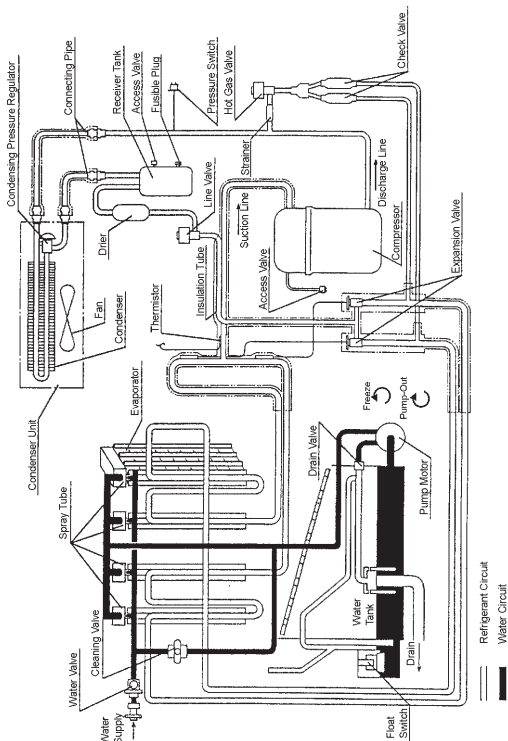


P
KM-1300SAH/3,SWH/3
KM-1301SAH/3, SWH/3
KM-1600SWH/3, KM-1601SWH/3



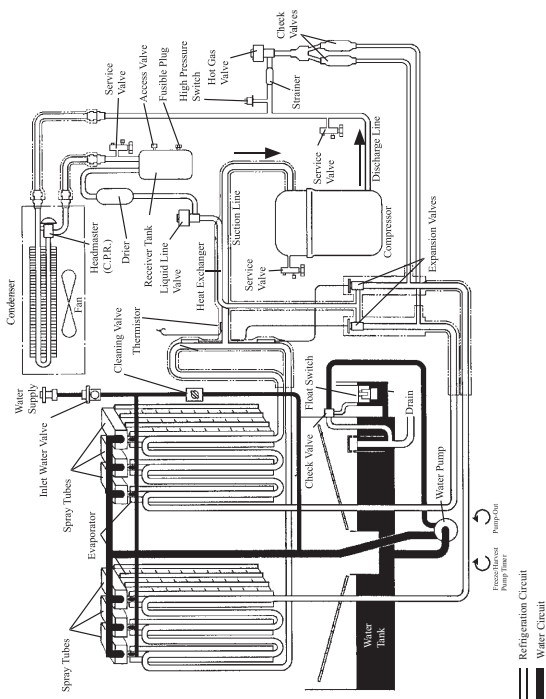
Q

KM-1300MRH, KM-1340MRH KM-1600MRH/3, KM-1601MRH/3

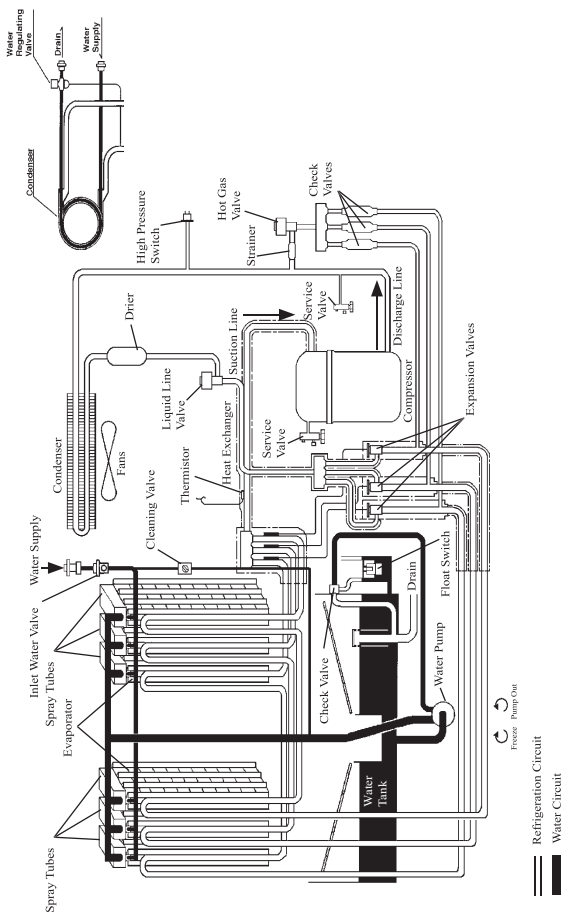


R

KM-1300SRH/3, KM-1301SRH/3, KM-1600SRH/3, KM-1601SRH/3

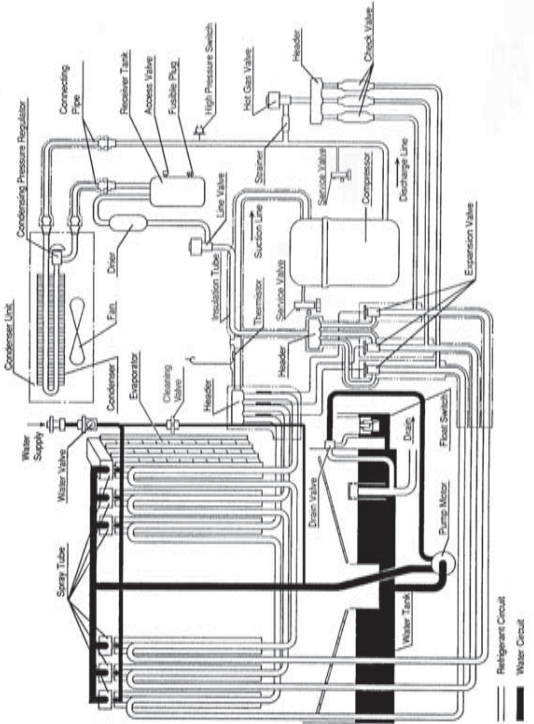


S
KM-1800SAH/3, SWH/3
KM-1900SAH/3, SWH/3
KM-2000SWH3, KM-2100SWH3

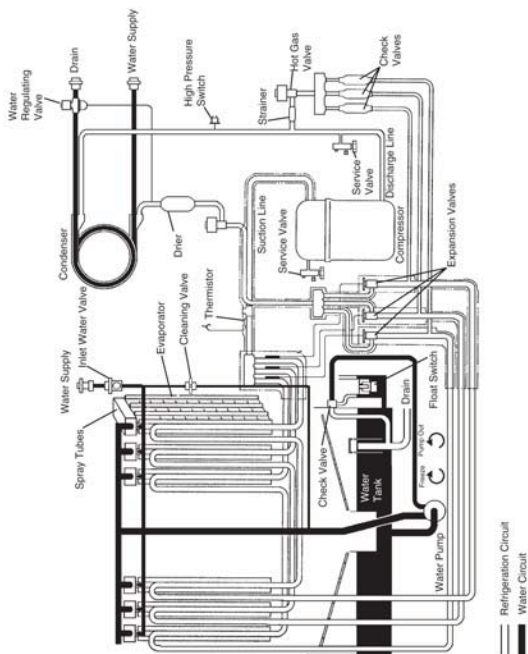


T

**KM-1800SRH3, KM-1900SRH3
KM-2000SRH3, KM-2100SRH3
KM-2400SRH3, KM-2500SRH3**



U KM-2500SWH3



PERFORMANCE DATA

MODEL: KM-61BAH

Supply Voltage: 115/60/1 ** Refrigerant: R134A

Total Amperage (Compressor RLA): Air: 3.4A (2.29A)

Ice Production per cycle: 1.7 lbs, 80 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	71	66	55	64
	70 / 21	65	56	49	48
	90 / 32	58	51	43	38
Cycle Time Freeze	50 / 10	31	34	34	37
	70 / 21	34	39	43	44
	90 / 32	20	21	51	58
Cycle Time Harvest	50 / 10	2.5	2.4	2.4	2.2
	70 / 21	2.4	2.2	2.0	2.0
	90 / 32	2.0	2.0	2.0	2.0
Pressure High Side	50 / 10	104	115	119	121
	70 / 21	119	139	155	159
	90 / 32	135	153	171	185
Pressure Suction	50 / 10	10	11	14	12
	70 / 21	11	13	15	16
	90 / 32	14	17	18	21

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-101BAH

Supply Voltage: 115/60/1

**Refrigerant: R134A

Total Amperage (Compressor RLA):		Air: 5.2A (3.39A)		Ice Production per cycle: 2.31 lbs, 110 pcs	
Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	115	109	107	106
	70 / 21	107	97	88	86
Cycle Time Freeze	90 / 32	97	87	78	69
	50 / 10	26	28	28	29
	70 / 21	28	30	33	34
Cycle Time Harvest	90 / 32	20	21	37	41
	50 / 10	2.7	2.6	2.5	2.3
	70 / 21	2.5	2.3	2.1	2.1
Pressure High Side	90 / 32	2.0	2.0	2.0	2.0
	50 / 10	109	122	127	130
	70 / 21	127	150	170	175
Pressure Suction	90 / 32	148	170	191	210
	50 / 10	12	14	14	15
	70 / 21	14	17	19	20
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	17	20	23	26

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-151BAH

**Refrigerant: R134A

Supply Voltage: 115-60-1

Total Amperage (Compressor RLA):

Air: 7A (6.01A)

Ice Production per cycle: 2.75 lbs, 130 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	146	140	139	137
	70 / 21	139	129	121	119
Cycle Time Freeze	90 / 32	129	119	111	101
	50 / 10	21	22	23	23
	70 / 21	23	24	26	27
Cycle Time Harvest	90 / 32	20	21	29	31
	50 / 10	3.3	3.0	2.9	2.5
	70 / 21	2.9	2.4	2.0	2.0
Pressure High Side	90 / 32	2.0	2.0	2.0	2.0
	50 / 10	114	124	128	132
	70 / 21	128	146	161	166
Pressure Suction	90 / 32	148	167	182	202
	50 / 10	12	13	13	13
	70 / 21	13	14	15	15
	90 / 32	14	15	16	17

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-201B_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 6.1A (5.2A) Water: 6.1A (5.2A)

Ice Production per cycle: 4 lbs, 182 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 119 Gal/24hrs

90/70 (32/21) 226 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 70 (32/21)		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	201	215	193	209	190	207	187	203
	70 / 21	190	207	177	195	165	186	161	182
Cycle Time Freeze	90 / 32	176	192	162	180	150	171	136	157
	50 / 10	25	22	26	23	27	23	28	24
	70 / 21	27	23	30	25	32	26	33	27
Cycle Time Harvest	90 / 32	30	25	31	27	35	29	39	31
	50 / 10	3.2	2.5	2.9	2.4	2.8	2.4	2.5	2.2
	70 / 21	2.8	2.4	2.4	2.2	2.0	2.0	2.0	2.0
Pressure High Side	90 / 32	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	50 / 10	235	285	250	285	255	285	257	285
	70 / 21	255	285	281	285	303	285	308	285
Pressure Suction	90 / 32	277	285	300	285	323	285	342	285
	50 / 10	51	43	52	44	52	44	53	45
	70 / 21	52	44	54	46	56	48	56	49
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	54	47	56	49	58	51	59	53
	Pressure data is recorded 5 minutes into the freeze cycle.								

MODEL: KML-250M_H

PERFORMANCE DATA

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 8.2A (7A) Water: 7.5A (6.5A)

Ice Production per cycle: 6.6 lbs, 360 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 226 Gal/24hrs

90/70 (32/21) 349 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	307	314	292	307	287	305	260	301
	70 / 21	287	305	260	294	238	284	234	280
Cycle Time Freeze	90 / 32	267	290	245	277	220	267	204	252
	50 / 10	27	28	29	29	29	29	33	29
	70 / 21	29	29	32	30	35	31	36	31
Cycle Time Harvest	90 / 32	32	31	35	32	38	33	41	35
	50 / 10	4.7	4.1	4.1	3.7	4.0	3.6	3.2	3.4
	70 / 21	4.0	3.6	3.0	3.0	2.2	2.5	2.2	2.4
Pressure High Side	90 / 32	3.7	3.3	3.1	2.8	2.1	2.2	2.0	2.0
	50 / 10	247	280	261	280	266	280	295	282
	70 / 21	266	280	290	280	311	280	318	284
Pressure Suction	90 / 32	293	284	319	286	340	285	366	290
	50 / 10	58	61	59	61	59	61	61	62
	70 / 21	59	61	61	62	62	62	62	62
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	60	63	62	63	63	64	64	65
	Pressure data is recorded 5 minutes into the freeze cycle.								

PERFORMANCE DATA

MODEL: KM-251B_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 9A (8A) Water: 5.5A(5A)

Ice Production per cycle: 4 lbs, 204 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	225	217	214	196
	70 / 21	214	201	189	184
Cycle Time Freeze	90 / 32	195	178	168	148
	50 / 10	20	21	21	24
	70 / 21	21	23	25	26
Cycle Time Harvest	90 / 32	24	26	28	30
	50 / 10	5.3	5	5	4.5
	70 / 21	5	4.5	3.7	3.5
Pressure High Side	90 / 32	4.5	4	3.5	3.2
	50 / 10	200	223	231	229
	70 / 21	231	271	305	309
Pressure Suction	90 / 32	254	285	323	340
	50 / 10	33	36	37	37
	70 / 21	37	43	48	48
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	40	44	50	52

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-255BAH

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 9A (8.1A)

Ice Production per cycle: 4 lbs, 204 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	235	229	227	211
	70 / 21	227	216	207	202
	90 / 32	207	191	184	163
Cycle Time Freeze	50 / 10	20	21	22	24
	70 / 21	22	24	25	26
	90 / 32	24	25	27	29
Cycle Time Harvest	50 / 10	4.3	4	4	3.5
	70 / 21	4	3.5	3.1	3
	90 / 32	4	3	3	2.7
Pressure High Side	50 / 10	220	238	243	245
	70 / 21	243	274	300	305
	90 / 32	267	293	321	340
Pressure Suction	50 / 10	35	37	38	38
	70 / 21	38	42	45	45
	90 / 32	40	43	47	48

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-260B_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 7.6A (7A) Water: 7.5A (7A)

Ice Production per cycle: 5 lbs, 238 pcs

Water Consumption for MWH Condenser:

90/70 (32/21) 255 Gal/24hrs

70/50 (21/10) 151 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 70 (32/21)		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		Water		Air		Water	
	50 / 10	263		268		251		259	
	70 / 21	247		259		226		237	
	90 / 32	227		242		207		218	
Cycle Time Freeze	50 / 10	25		21		27		22	
	70 / 21	27		22		30		28	
	90 / 32	30		27		31		29	
Cycle Time Harvest	50 / 10	3.2		2.6		2.9		2.5	
	70 / 21	2.8		2.5		2.4		2.1	
	90 / 32	2.0		2.0		2.0		2.0	
Pressure High Side	50 / 10	217		285		230		285	
	70 / 21	234		285		257		285	
	90 / 32	257		285		279		285	
Pressure Suction	50 / 10	51		46		52		47	
	70 / 21	52		47		54		48	
	90 / 32	54		51		56		53	

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

MODEL: KM-280M_H

PERFORMANCE DATA

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 11.6A (10.2A) Water: 10A (9.2A)

Ice Production per cycle: 4.7 lbs, 240 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 209 Gal/24hrs

90/70 (32/21) 318 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	269	271	252	263	247	260	242	259
	70 / 21	247	260	218	246	194	234	188	232
Cycle Time Freeze	90 / 32	219	249	192	237	166	224	141	215
	50 / 10	22	20	24	21	25	21	26	21
	70 / 21	25	21	28	22	31	23	32	23
Cycle Time Harvest	90 / 32	30	22	34	23	37	24	42	25
	50 / 10	3.0	3.5	2.8	3.3	2.7	3.2	2.5	3.2
	70 / 21	2.7	3.2	2.3	2.8	2.0	2.5	2.0	2.5
Pressure High Side	90 / 32	2.6	3.0	2.4	2.7	2.0	2.3	2.0	2.2
	50 / 10	236	280	254	280	259	280	262	281
	70 / 21	259	280	290	280	316	280	321	284
Pressure Suction	90 / 32	285	283	312	284	339	284	361	287
	50 / 10	45	47	49	48	50	48	50	49
	70 / 21	50	48	56	49	61	50	62	51
	90 / 32	54	51	60	53	65	54	69	57

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

MODEL: KM-280MAH-E

Total Amperage (Compressor RLA):

Air: 5.1A (4.3A)

Supply Voltage: 220-240/50/1

Ice Production per cycle: 4.7 lbs, 240 pcs

PERFORMANCE DATA

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	258	237	231	229
	70 / 21	231	196	166	160
Cycle Time Freeze	90 / 32	204	175	142	120
	50 / 10	20	22	23	25
	70 / 21	23	28	31	33
Cycle Time Harvest	90 / 32	30	35	39	45
	50 / 10	3.1	3.1	3.1	3.0
	70 / 21	3.1	3.0	2.9	2.9
Pressure High Side	90 / 32	3.0	2.5	2.9	2.9
	50 / 10	245	262	267	269
	70 / 21	267	296	320	325
Pressure Suction	90 / 32	290	315	341	360
	50 / 10	55	57	58	58
	70 / 21	58	62	65	66
	90 / 32	61	64	68	70

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-320M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 9.7A (7A)

Water: 9.2A (8.2A)

Ice Production per cycle: 7.2 lbs, 360 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 327 Gal/24hrs

90/70 (32/21) 528 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	325	352	315	349	311	348	304	337
	70 / 21	311	348	293	342	278	337	272	330
	90 / 32	287	324	265	309	251	308	226	281
Cycle Time Freeze	50 / 10	29	27	31	28	31	28	32	29
	70 / 21	31	28	34	30	37	31	38	31
	90 / 32	35	30	38	32	41	33	45	35
Cycle Time Harvest	50 / 10	5.5	5.0	4.8	4.5	4.6	4.4	3.6	3.6
	70 / 21	4.6	4.4	3.5	3.5	2.5	2.8	2.5	2.8
	90 / 32	4.2	4.0	3.4	3.4	2.3	2.6	2.1	2.4
Pressure High Side	50 / 10	216	263	230	263	235	263	237	264
	70 / 21	235	263	259	263	280	263	285	263
	90 / 32	255	265	277	265	299	265	317	267
Pressure Suction	50 / 10	52	53	53	54	53	54	53	54
	70 / 21	53	54	54	56	55	57	55	57
	90 / 32	54	55	54	56	56	58	56	58

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-320MAH-E

Supply Voltage: 220-240/50/1

Total Amperage (Compressor RLA):

Air: 5.1A (4.3A)

Ice Production per cycle: 8 lbs, 360 pcs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		Air		Air		Air	
	50 / 10	293		279		275		273	
	70 / 21	275		252		232		228	
	90 / 32	255		234		213		196	
Cycle Time Freeze	50 / 10	34		36		37		37	
	70 / 21	37		42		47		47	
	90 / 32	39		42		47		48	
Cycle Time Harvest	50 / 10	5.8		5.1		4.9		3.9	
	70 / 21	4.9		3.8		2.8		2.8	
	90 / 32	4.5		3.8		2.7		2.5	
Pressure High Side	50 / 10	210		229		235		233	
	70 / 21	235		268		295		298	
	90 / 32	253		276		308		320	
Pressure Suction	50 / 10	56		57		57		57	
	70 / 21	57		59		60		60	
	90 / 32	58		60		61		62	

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KML-350M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 11.5A (11.5A) Water: 10.5A (10.5A) Ice Production per cycle: 7.3 lbs, 360 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 397 Gal/24hrs 90/70 (32/21) 457 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90/70 (32/21)		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		Water		Air		Water	
	50 / 10	350		352		344		349	
	70 / 21	342		349		331		342	
Cycle Time Freeze	90 / 32	309		324		287		309	
	50 / 10	25		27		26		28	
	70 / 21	27		28		29		30	
Cycle Time Harvest	90 / 32	30		30		33		32	
	50 / 10	4.0		5.0		3.6		4.5	
	70 / 21	3.4		4.4		2.6		3.5	
Pressure High Side	90 / 32	3.2		4.0		2.8		3.4	
	50 / 10	240		263		256		263	
	70 / 21	261		263		288		263	
Pressure Suction	90 / 32	285		263		310		265	
	50 / 10	48		53		50		54	
	70 / 21	50		54		53		56	
	90 / 32	53		55		56		56	
	50 / 10	51		54		51		54	
	70 / 21	56		57		56		57	
	90 / 32	62		58		62		59	

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KML-351M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 13.2A (11.5A) Water: 7.5A (6.7A)

Ice Production per cycle: 7.3 lbs, 360 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 273 Gal/24hrs

90/70 (32/21) 428 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air (S-O)	Air (T-O,etc.)	Water	Air (S-O)	Air (T-O,etc.)	Water	Air (S-O)	Air (T-O,etc.)	Water	Air (S-O)	Air (T-O,etc.)	Water
	50 / 10	334	350	345	312	344	341	312	342	340	311	328	330
	70 / 21	312	342	340	284	331	333	260	322	327	256	313	321
	90 / 32	291	309	318	268	287	303	241	282	300	224	245	275
Cycle Time Freeze	50 / 10	25	25	25	27	26	26	28	27	26	28	28	27
	70 / 21	28	27	26	31	29	27	34	31	28	35	32	29
	90 / 32	31	30	28	34	33	30	37	35	31	40	38	33
Cycle Time Harvest	50 / 10	4.8	4.0	4.8	4.8	3.6	4.4	4.4	3.4	4.3	4.0	2.6	3.9
	70 / 21	4.4	3.4	4.3	3.9	2.6	3.8	3.4	2.0	3.4	3.4	2.0	3.4
	90 / 32	4.3	3.2	4.2	3.9	2.8	3.9	3.4	2.0	3.4	3.4	2.0	3.4
Pressure High Side	50 / 10	228.8	240	268.6	247	256	269	253	261	269	257	284	272
	70 / 21	253	261	269	285	288	270	312	310	270	318	315	272
	90 / 32	281	285	275	311	310	279	339	333	278	364	355	285
Pressure Suction	50 / 10	52.4	48	54	53	50	54	54	50	54	54	51	54
	70 / 21	54	50	54	55	53	54	56.2	55	55	57	56	55
	90 / 32	55	53	55	57	56	55	58	59	55	59.6	62	56

PERFORMANCE DATA

MODEL: KML-450M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 13.3A (11.6A) Water: 10.6A (10.6A) Ice Production per cycle: 6.6 lbs, 360 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 355 Gal/24hrs 90/70 (32/21) 614 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 70 (32/21)		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		Water		Air		Water		Air	
	50 / 10	432		433		411		429		404	
	70 / 21	404		428		367		422		336	
Cycle Time Freeze	90 / 32	381		402		353		385		318	
	50 / 10	20		20		21		20		22	
	70 / 21	22		21		24		21		26	
Cycle Time Harvest	90 / 32	23		22		25		23		27	
	50 / 10	3.0		3.5		2.8		3.2		2.7	
	70 / 21	2.7		3.1		2.3		2.5		2.0	
Pressure High Side	90 / 32	2.6		2.9		2.4		2.6		2.0	
	50 / 10	250		280		270		280		276	
	70 / 21	276		280		311		280		340	
Pressure Suction	90 / 32	293		286		316		289		350	
	50 / 10	42		47		45		47		46	
	70 / 21	46		48		52		48		56	
	90 / 32	49		52		52		55		58	
	50 / 10	46		48		52		48		56	
	70 / 21	49		52		52		55		59	
	90 / 32	49		52		52		55		58	
	50 / 10	46		48		52		48		56	
	70 / 21	49		52		52		55		59	

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KML-451M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 9.5A (7.9A) Water: 9.8A (9.0A)

Ice Production per cycle: 7.6 lbs, 360 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 319 Gal/24hrs

90/70 (32/21) 548 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	401	429	391	402	387	402	377	393
	70 / 21	387	402	366	399	349	397	340	392
Cycle Time Freeze	90 / 32	355	384	328	373	313	374	279	352
	50 / 10	24	23	23	21	23	21	24	22
	70 / 21	23	21	25	22	29	24	28	23
Cycle Time Harvest	90 / 32	25	23	28	24	30	24	32	25
	50 / 10	4.5	3.7	3.7	3.9	3.6	3.8	3.2	3.2
	70 / 21	3.6	3.8	3.1	3.1	2.7	2.6	2.7	2.5
Pressure High Side	90 / 32	3.5	3.5	3.2	3.1	2.7	2.4	2.7	2.2
	50 / 10	218	269	243	260	248	260	253	264
	70 / 21	248	260	279	261	294	261	311	263
Pressure Suction	90 / 32	276	267	305	271	332	270	357	278
	50 / 10	45	44	44	44	45	45	47	46
	70 / 21	45	45	49	46	53	50	54	48
	90 / 32	51	48	55	50	59	51	64	55

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-461M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Air: 12A (10.6A) Water: 12.1A (9.4A) Remote: 10.4A (10.4A) Ice Production per cycle: 10.4 lbs, 480 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 250 Gal/24hrs 90/70 (32/21) 503 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	452	438	446	438	433	435	434	432	431	423	420	421
	70 / 21	434	432	431	409	423	412	389	416	396	380	408	387
	90 / 32	398	404	399	368	385	373	349	382	359	313	350	325
Cycle Time Freeze	50 / 10	28	29	30	30	29	31	30	30	31	31	30	32
	70 / 21	30	30	31	33	31	34	35	32	36	36	32	36
	90 / 32	33	32	34	36	33	37	38	34	39	41	36	41
Cycle Time Harvest	50 / 10	4.4	4.9	4.7	3.9	4.4	4.1	3.7	4.2	3.9	2.9	3.5	3.1
	70 / 21	3.7	4.2	3.9	2.8	3.4	2.9	2.0	2.7	2.0	2.0	2.7	2.0
	90 / 32	3.5	4.0	3.7	2.9	3.5	3.1	2.0	2.6	2.0	2.0	2.5	2.0
Pressure High Side	50 / 10	238	259	211	255	260	226	260	260	230	262	262	233
	70 / 21	260	260	230	289	262	255	313	263	276	318	264	281
	90 / 32	283	265	251	308	268	274	334	269	296	353	274	315
Pressure Suction	50 / 10	50	52	50	52	53	52	52	53	52	53	55	54
	70 / 21	52	53	52	55	55	55	58	57	58	59	58	59
	90 / 32	56	57	57	59	59	61	62	61	63	65	64	68

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: DKM-500B_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 13.3A (11.6A)

Water: 10 (10A)

Ice Production per cycle: 7.5 lbs, 360 pcs

Water Consumption for BWH Condenser:

70/50 (21/10) 319 Gal/24hrs

90/70 (32/21) 606 Gal/24hrs

Kg=lbs x.454 Production 24 hours (lbs)	70 / 21		80 / 27		90 / 32		100 / 38	
	Air	Water	Air	Water	Air	Water	Air	Water
Cycle Time Freeze	50 / 10	466	455	453	448	450	390	390
	70 / 21	448	450	425	406	439	399	430
	90 / 32	420	419	395	376	399	348	363
Cycle Time Harvest	50 / 10	19	19	19	19	19	23	23
	70 / 21	19	19	21	22	22	22	22
	90 / 32	21	21	23	26	24	26	26
Pressure High Side	50 / 10	3.9	3.9	3.5	3.3	3.3	2.6	2.6
	70 / 21	3.3	3.3	2.6	2.0	2.0	2.0	2.0
	90 / 32	3.1	3.1	2.7	2.0	2.0	2.0	2.0
Pressure Suction	50 / 10	262	267.8	277	282	268	284	284
	70 / 21	282	268	308	330	267	335	267
	90 / 32	305	268	329	353	268	374	269
	50 / 10	56	43.4	57	57	44	57	44
	70 / 21	57	44	58	59	45	60	45
	90 / 32	58	45	60	61	46	62	47

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-500MAH-E

Supply Voltage: 220-240/50/1

Ice Production per cycle: 9.5 lbs, 480 pcs

Total Amperage (Compressor RLA): Air: 5.5A (5.5A)

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	480	454	446	438
	70 / 21	446	402	365	355
	90 / 32	403	360	321	281
Cycle Time Freeze	50 / 10	29	31	32	33
	70 / 21	32	36	39	40
	90 / 32	37	41	44	50
Cycle Time Harvest	50 / 10	3.4	3.3	3.3	3.3
	70 / 21	3.3	3.1	2.9	2.9
	90 / 32	3.2	3.0	2.9	2.8
Pressure High Side	50 / 10	250	263	268	273
	70 / 21	268	291	310	316
	90 / 32	23	316	336	360
Pressure Suction	50 / 10	50	52	53	53
	70 / 21	53	56	59	59
	90 / 32	55	57	61	62

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-501M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 13A (11A) Water: 10A (10A)

Remote: 15A (11A) Ice Production per cycle: 9.5 lbs, 480 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 390 Gal/24hrs

90/70 (32/21) 670 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	498	498	482	480	496	476	474	495	475	463	480	458
	70 / 21	474	495	475	442	491	465	416	488	457	406	479	446
Cycle Time Freeze	90 / 32	433	465	437	397	447	412	372	449	410	332	413	367
	50 / 10	26	26	26	27	26	27	28	26	27	29	27	28
	70 / 21	28	26	27	30	27	29	32	27	30	33	27	31
Cycle Time Harvest	90 / 32	31	28	30	34	29	32	36	29	33	39	31	36
	50 / 10	4.5	4.0	4.5	4.0	3.6	4.0	3.9	3.4	3.9	3.2	2.8	3.0
	70 / 21	3.9	3.4	3.9	3.0	2.6	3.0	2.3	2.0	2.3	2.3	2.0	2.3
Pressure High Side	90 / 32	3.6	3.2	3.5	3.2	2.8	3.0	2.3	2.0	2.1	2.3	2.0	2.0
	50 / 10	235	275	220	250	275	231	254	275	235	257	282	241
	70 / 21	254	275	235	279	275	254	300	275	270	305	279	276
Pressure Suction	90 / 32	276	289	259	298	296	280	321	293	296	340	310	320
	50 / 10	45	45	50	47	45	50	47	45	51	47	47	51
	70 / 21	47	45	51	50	45	51	53	45	52	53	46	52
	90 / 32	49	49	52	52	51	53	55	50	54	56	55	55

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-515M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 11.7A (10.3A) Water: 9.6A (9.2A)

Remote: 11.3A (9.7A) Ice Production per cycle: 10.3 lbs, 480 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 352 Gal/24hrs

90/70 (32/21) 546 Gal/24hrs

Ambient Temp (F°/C°)			70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10		501	500	491	486	494	482	482	493	480	472	481	465
	70 / 21		482	493	480	456	483	465	435	475	452	426	467	442
	90 / 32		447	465	443	416	445	417	396	441	408	361	409	368
Cycle Time Freeze	50 / 10		26	29	26	27	29	27	27	29	27	28	30	28
	70 / 21		27	29	27	30	29	29	32	29	31	33	30	31
	90 / 32		30	30	30	33	31	32	35	31	34	37	33	36
Cycle Time Harvest	50 / 10		4.4	3.8	5.0	4.0	3.6	4.5	3.9	3.5	4.3	3.4	3.1	3.6
	70 / 21		3.9	3.5	4.3	3.2	3.0	3.4	2.7	2.7	2.7	2.7	2.7	2.7
	90 / 32		3.8	3.4	4.1	3.4	3.1	3.6	2.7	2.7	2.7	2.7	2.7	2.7
Pressure High Side	50 / 10		226	270	216	244	271	230	250	271	234	254	272	235
	70 / 21		250	271	234	282	272	257	308	273	277	314	274	281
	90 / 32		278	274	252	306	276	272	335	277	294	359	280	309
Pressure Suction	50 / 10		45	50	47	48	51	49	49	52	50	50	53	50
	70 / 21		49	52	50	55	54	54	59	56	57	60	57	57
	90 / 32		54	56	52	60	59	54	64	61	58	69	65	59

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-515MAH-E

Supply Voltage: 220-240/50/1

Total Amperage (Compressor RLA): Air: 7.2A (7.1A)

Ice Production per cycle: 10.2 lbs, 480 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x .454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	513	490	482	474
	70 / 21	482	442	408	398
Cycle Time Freeze	90 / 32	441	401	366	328
	50 / 10	26	28	28	29
	70 / 21	28	31	33	34
Cycle Time Harvest	90 / 32	32	35	37	40
	50 / 10	3.4	3.3	3.2	3.1
	70 / 21	3.2	3.0	2.9	2.9
Pressure High Side	90 / 32	3.2	3.1	2.9	2.9
	50 / 10	245	262	267	271
	70 / 21	267	296	320	326
Pressure Suction	90 / 32	294	321	346	370
	50 / 10	50	53	54	54
	70 / 21	54	60	65	65
	90 / 32	57	61	67	69

NOTE: Total Cycle Time = Freeze + Harvest Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-600MAH

Supply Voltage: 115-120/60/1

Total Amperage (Compressor RLA): Air: 12A (10.3A)

Ice Production per cycle: 14.3 lbs, 720 pcs

Ambient Temp (F°/C°)	70 / 21	80 / 27	90 / 32	100 / 38
Water Temp F°/C°	Air	Air	Air	Air
Kg=lbs x.454 Production 24 hours (lbs)	50 / 10	572	566	551
	70 / 21	532	503	490
	90 / 32	474	447	396
Cycle Time Freeze	50 / 10	34	35	36
	70 / 21	38	40	41
	90 / 32	42	44	48
Cycle Time Harvest	50 / 10	3.7	3.6	2.9
	70 / 21	2.7	2.0	2.0
	90 / 32	2.9	2.0	2.0
Pressure High Side	50 / 10	254	259	266
	70 / 21	287	310	318
	90 / 32	319	342	372
Pressure Suction	50 / 10	56	56	57
	70 / 21	58	59	59
	90 / 32	60	61	62

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KML-600M_H
 Total Amperage (Compressor RLA): Air: 9.5A (9.5A) Water: 8.3A (8.3A) Remote: 9.5 (9.5A) Ice Production per cycle: 10 lbs, 480 pcs
 Water Consumption for MWH Condenser: 70/50 (21/10) 344 Gal/24hrs 90/70 (32/21) 561 Gal/24hrs
 Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	631	602	635	606	593	618	575	590	613	540	535	602
	70 / 21	599	590	613	556	573	585	513	546	550	506	552	551
	90 / 32	542	559	574	492	536	540	458	525	518	401	492	478
Cycle Time Freeze	50 / 10	20	21	20	21	21	20	22	22	20	24	22	21
	70 / 21	21	22	20	23	22	21	24	23	21	25	23	21
	90 / 32	24	23	21	26	24	23	27	25	23	30	26	25
Cycle Time Harvest	50 / 10	3.5	3.1	3.5	3.2	2.9	3.3	2.9	2.8	3.2	2.5	2.6	3.2
	70 / 21	3.1	2.8	3.2	2.5	2.4	2.8	2.0	2.0	2.5	2.0	2.0	2.4
	90 / 32	2.9	2.7	2.9	2.6	2.4	2.6	2.0	2.0	2.2	2.0	2.0	2.0
Pressure High Side	50 / 10	250	280	220	266	280	229	280	280	232	310	284	239
	70 / 21	271	280	232	298	280	247	320	280	260	328	282	266
	90 / 32	302	287	255	332	291	274	354	289	286	385	298	310
Pressure Suction	50 / 10	38	40	32	40	40	34	41	41	35	43	42	37
	70 / 21	41	41	35	45	41	39	48	42	42	49	43	44
	90 / 32	47	44	41	51	46	46	54	46	49	60	50	55

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KML-600MWH Serial L0-M1

Total Amperage (Compressor RLA):

Water: 8.9A (8.3A)

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Ice Production per cycle: 10 lbs, 480 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 412 Gal/24hrs

90/70 (32/21) 712 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 70 (32/21)	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Water	Water	Water
	50 / 10	572	553	547	535
	70 / 21	547	515	488	486
Cycle Time Freeze	90 / 32	534	513	481	475
	50 / 10	21	21	22	22
	70 / 21	22	22	23	23
Cycle Time Harvest	90 / 32	23	24	25	26
	50 / 10	3.9	3.6	3.5	3.5
	70 / 21	3.5	2.9	2.5	2.4
Pressure High Side	90 / 32	3.2	2.8	2.2	2.0
	50 / 10	270	272	272	275
	70 / 21	272	275	278	280
Pressure Suction	90 / 32	280	285	287	295
	50 / 10	35	36	36	39
	70 / 21	36	37	38	40
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	42	46	46	53
	Pressure data is recorded 5 minutes into the freeze cycle.				

PERFORMANCE DATA

MODEL: KM-630M_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 7.5A (6A) Water: 6.5A (6A)

Remote: 9.5A (6A) Ice Production per cycle: 14.3 lbs, 720 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 354 Gal/24hrs

90/70 (32/21) 536 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	600	621	603	571	607	580	562	603	573	554	590	564
	70 / 21	562	603	573	512	578	532	470	558	499	459	548	489
	90 / 32	514	563	531	466	532	491	422	514	457	378	473	418
Cycle Time Freeze	50 / 10	31	31	31	33	32	33	34	32	33	35	33	34
	70 / 21	34	32	33	37	34	36	40	35	39	41	36	39
	90 / 32	38	35	37	41	37	40	44	38	43	48	41	47
Cycle Time Harvest	50 / 10	4.4	3.8	4.1	4.0	3.5	3.7	3.8	3.4	3.6	3.1	3.4	3.0
	70 / 21	3.8	3.4	3.6	3.0	2.8	2.9	2.4	2.3	2.4	2.4	2.3	2.4
	90 / 32	3.5	3.1	3.3	2.9	2.7	2.8	2.2	2.1	2.2	2.0	2.0	2.0
Pressure High Side	50 / 10	245	280	232	262	280	238	267	280	240	272	282	249
	70 / 21	267	280	240	296	280	251	320	280	260	327	285	266
	90 / 32	296	286	263	324	288	281	349	288	288	375	295	313
Pressure Suction	50 / 10	43	47	42	44	47	42	44	47	42	44	48	44
	70 / 21	44	47	42	46	48	43	47	48	43	47	48	44
	90 / 32	46	48	45	47	49	47	49	49	47	50	50	50

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-630MAH-E

Supply Voltage: 220-240/50/1

Total Amperage (Compressor RLA): Air: 9A (8.1A)

Ice Production per cycle: 14.3 lbs, 720 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	624	587	576	568
	70 / 21	576	513	460	447
Cycle Time Freeze	90 / 32	520	463	406	357
	50 / 10	32	35	35	37
	70 / 21	35	40	44	45
Cycle Time Harvest	90 / 32	42	47	51	57
	50 / 10	3	3	3	3
	70 / 21	3	3	2.9	2.8
Pressure High Side	90 / 32	3	3	2.9	2.8
	50 / 10	270	286	291	291
	70 / 21	291	318	340	344
Pressure Suction	90 / 32	309	330	356	370
	50 / 10	50	50	51	51
	70 / 21	51	51	52	52
	90 / 32	52	53	54	55

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KML-631M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 7.6A (6.4A)

Water: 6.8A (6.1A)

Remote: 7.8A (6.4A) Ice Production per cycle: 9.7 lbs, 480 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 448 Gal/24hrs

90/70 (32/21) 750 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	575	632	636	558	632	626	553	631	622	543	611	605
	70 / 21	553	631	622	525	631	604	501	630	589	491	618	576
Cycle Time Freeze	90 / 32	515	593	578	481	572	545	459	579	535	420	532	486
	50 / 10	19	18	18	20	18	18	20	18	18	20	19	19
	70 / 21	20	18	18	22	19	20	24	20	21	24	20	21
Cycle Time Harvest	90 / 32	22	20	20	24	21	22	26	21	23	27	22	24
	50 / 10	4.9	4.1	4.4	4.3	3.8	3.9	4.2	3.7	3.8	3.3	3.2	3.2
	70 / 21	4.2	3.7	3.8	3.1	3.1	3.1	2.3	2.6	2.5	2.2	2.6	2.4
Pressure High Side	90 / 32	3.8	3.4	3.5	3.2	3.0	2.9	2.1	2.4	2.2	2.0	2.2	2.0
	50 / 10	225	229	202	243	229	214	248	230	217	253	234	221
	70 / 21	248	230	217	279	230	238	305	231	255	311	234	259
Pressure Suction	90 / 32	276	239	237	305	245	257	332	244	275	357	255	293
	50 / 10	42	35	33	44	36	34	45	36	35	47	37	36
	70 / 21	45	36	35	49	37	38	53	37	40.4	54	38	41
	90 / 32	51	38	39	55	40	42	59	40	44	64	43	48

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-650M_H
 Total Amperage (Compressor RLA): Air: 6.6A (6A) Water: 5.3A (5.1A) Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)
 Water Consumption for MWH Condenser: 70/50 (21/10) 408 Gal/24hrs Remote: 7.1A (5.6A) Ice Production per cycle: 13.5 lbs, 720 pcs
 90/70 (32/21) 741 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	589	680	615	572	676	601	566	675	597	555	651	583
	70 / 21	566	675	597	537	668	574	512	662	554	501	647	543
Cycle Time Freeze	90 / 32	526	626	556	490	595	523	467	598	506	426	540	462
	50 / 10	30	27	29	31	28	30	32	28	31	33	29	32
	70 / 21	32	28	31	35	30	33	37	31	34	38	31	35
Cycle Time Harvest	90 / 32	35	30	33	38	32	36	40	33	37	43	35	40
	50 / 10	4.6	4.7	4.6	4.1	4.3	4.0	3.9	4.1	3.8	3.1	3.4	3.0
	70 / 21	3.9	4.1	3.8	3.0	3.4	2.8	2.2	2.8	2.0	2.2	2.7	2.0
Pressure High Side	90 / 32	3.6	3.7	3.6	3.0	3.1	3.0	2.1	2.5	2.0	2.0	2.1	2.0
	50 / 10	225	231	214	241	231	229	246	231	233	249	235	235
	70 / 21	246	231	233	275	231	258	298	231	279	303	233	283
Pressure Suction	90 / 32	270	238	254	295	242	275	320	240	298	341	249	315
	50 / 10	53	50	51	54	51	53	55	51	53	56	51	54
	70 / 21	55	51	53	57	54	56	59	56	58	60	56	59
	90 / 32	58	53	56	61	54	59	63	56	61	67	57	64

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-650MAH-E

Supply Voltage: 220-240/50/1

Total Amperage (Compressor RLA): Air: 6.8A (5.7A)

Ice Production per cycle: 14 lbs, 720 pcs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		Air		Air		Air	
	50 / 10	653		620		610		602	
	70 / 21	610		554		507		495	
	90 / 32	558		506		456		409	
Cycle Time Freeze	50 / 10	29		31		32		32	
	70 / 21	32		34		37		38	
	90 / 32	35		38		40		43	
Cycle Time Harvest	50 / 10	3.9		3.7		3.6		3.3	
	70 / 21	3.6		3.2		2.9		2.9	
	90 / 32	3.5		3.3		2.9		2.9	
Pressure High Side	50 / 10	236		254		259		263	
	70 / 21	259		290		315		321	
	90 / 32	286		314		341		365	
Pressure Suction	50 / 10	53		55		55		56	
	70 / 21	55		58		60		61	
	90 / 32	58		60		63		65	

NOTE: Total Cycle Time = Freeze + Harvest Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KMD-700M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 13.5A (10.2A) Water: 12A (9.8A)

Remote: 13A (10A) Ice Production per cycle: 9.6 lbs, 624 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 403 Gal/24hrs

90/70 (32/21) 607 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	696	701	730	661	681	719	650	675	715	641	665	690
	70 / 21	650	675	715	589	640	696	539	611	679	526	601	662
Cycle Time Freeze	90 / 32	593	634	655	536	597	614	483	569	605	432	530	538
	50 / 10	17	19	17	18	19	18	19	20	18	19	20	18
	70 / 21	19	20	18	21	20	19	23	21	20	24	21	20
Cycle Time Harvest	90 / 32	21	21	20	24	22	21	26	23	22	28	24	24
	50 / 10	3.3	2.2	3.3	3.0	2.2	3.0	2.9	2.1	2.9	2.5	2.1	2.5
	70 / 21	2.9	2.1	2.9	2.4	2.1	2.4	2.0	2.0	2.0	2.0	2.0	2.0
Pressure High Side	90 / 32	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	50 / 10	250	275	215	268	276	221	273	276	222	273	280	226
	70 / 21	273	276	222	304	277	232	330	278	240	334	280	244
Pressure Suction	90 / 32	293	284	236	316	289	248	346	288	256	360	298	270
	50 / 10	45	40	35	47	41	36	48	42	36	48	45	37
	70 / 21	48	42	36	52	44	38	56	46	40	56	48	41
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	51	49	39	54	53	41	58	54	43	60	62	45
	Pressure data is recorded 5 minutes into the freeze cycle.												

PERFORMANCE DATA

MODEL: KMS-750MLH & SRK-7H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): 13A (7A)

Ice Production per cycle: 15 lbs, 832 pcs

Ambient Temp (F°/C°)		70 / 21	80/27	90/32	100/38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Low Side	Low Side	Low Side	Low Side
	50 / 10				
	70 / 21				
	90 / 32				
Cycle Time Freeze	50 / 10	770	754	749	706
	70 / 21	749	722	700	684
	90 / 32	691	647	630	566
Cycle Time Harvest	50 / 10	25	25	26	28
	70 / 21	26	27	28	29
	90 / 32	28	30	31	34
Pressure High Side	50 / 10	3	3	3	2
	70 / 21	3	2	2	2
	90 / 32	3	2	2	2
Pressure Suction	50 / 10	222	229	231	235
	70 / 21	231	243	253	257
	90 / 32	247	261	270	286
NOTE: Total Cycle Time = Freeze + Harvest	50 / 10	46	48	48	49
	70 / 21	48	50	51	52
	90 / 32	51	53	54	57

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KMD-850M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 9.8A (6.4A) Water: 8.3A (6.2A)

Remote: 9.8A (6.7A) Ice Production per cycle: 11.8 lbs, 624 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 565 Gal/24hrs

90/70 (32/21) 1035 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x .454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	786	836	833	753	831	803	743	830	793	732	809	782
	70 / 21	743	830	793	686	822	741	639	815	698	625	802	685
	90 / 32	685	786	738	629	759	686	580	759	641	526	708	589
Cycle Time Freeze	50 / 10	19	18	18	20	18	18	21	18	19	21	19	19
	70 / 21	21	18	19	23	19	20	25	20	22	26	20	22
	90 / 32	23	20	21	26	21	23	27	21	24	30	23	26
Cycle Time Harvest	50 / 10	3.2	3.0	2.9	2.9	2.8	2.7	2.8	2.7	2.6	2.5	2.4	2.4
	70 / 21	2.8	2.7	2.6	2.4	2.4	2.3	2.0	2.1	2.0	2.0	2.1	2.0
	90 / 32	2.7	2.6	2.5	2.5	2.4	2.4	2.0	2.0	2.0	2.0	2.0	2.0
Pressure High Side	50 / 10	248	228	205	265	229	219	270	229	223	276	233	229
	70 / 21	270	229	223	300	231	248	324	232	268	331	234	274
	90 / 32	300	237	250	330	241	275	355	241	296	383	250	321
Pressure Suction	50 / 10	43	39	38	46	39	40	47	39	41	49	41	43
	70 / 21	47	39	41	51	40	44	55	40	47	57	41	49
	90 / 32	53	43	47	59	46	53	63	45	55	70	50	62

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-900M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 11A (9.6A) Water: 10.2A (9.6A) Remote: 12.5A (10.5A) Ice Production per cycle: 14.3 lbs, 720 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 491 Gal/24hrs 90/70 (32/21) 916 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	838	846	835	812	836	824	804	833	821	795	814	808
	70 / 21	804	833	821	759	815	802	721	801	786	710	788	776
	90 / 32	759	787	786	715	754	758	676	745	745	634	694	708
Cycle Time Freeze	50 / 10	21	21	21	22	21	22	22	22	22	23	22	22
	70 / 21	22	22	22	24	22	23	26	23	24	27	23	24
	90 / 32	25	23	24	27	25	25	29	25	26	31	27	28
Cycle Time Harvest	50 / 10	4.5	3.9	4.5	4.1	3.6	4.1	4.0	3.5	3.9	3.9	3.5	3.2
	70 / 21	3.9	3.5	3.9	3.1	2.9	3.1	2.5	2.4	2.5	2.4	2.4	2.4
	90 / 32	3.5	3.2	3.5	3.0	2.8	3.0	2.2	2.2	2.2	2.0	2.0	2.0
Pressure High Side	50 / 10	245	280	220	262	280	230	267	280	233	272	284	239
	70 / 21	267	280	233	296	280	251	320	280	265	327	284	270
	90 / 32	296	288	255	324	292	274	349	290	288	375	300	310
Pressure Suction	50 / 10	33	36	32	35	38	34	36	38	34	37	38	35
	70 / 21	36	38	34	39	41	37	42	43	40	43	43	41
	90 / 32	40	39	37	43	41	40	46	44	43	50	44	45

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-900MRH3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Remote: 6.5A (4.7A)

Ice Production per cycle: 14.3 lbs, 720 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 10	842	830	826	811
	70 / 21	826	806	789	777
	90 / 32	784	753	739	694
Cycle Time Freeze	50 / 10	22	22	23	23
	70 / 21	23	23	24	24
	90 / 32	24	26	26	28
Cycle Time Harvest	50 / 10	4.5	4.1	3.9	3.2
	70 / 21	3.9	3.1	2.5	2.4
	90 / 32	3.5	3.0	2.2	2.0
Pressure High Side	50 / 10	225	233	235	241
	70 / 21	235	249	260	265
	90 / 32	254	270	281	300
Pressure Suction	50 / 10	30	32	32	33
	70 / 21	32	35	38	39
	90 / 32	35	38	41	44

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-900MAH-50

Supply Voltage: 220-240/50/1

Total Amperage (Compressor RLA): Air: 10A (8.1A)

Ice Production per cycle: 14.3 lbs, 720 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	839	810	801	785
	70 / 21	801	751	710	694
	90 / 32	738	681	641	578
Cycle Time Freeze	50 / 10	23	24	25	26
	70 / 21	25	27	29	30
	90 / 32	28	31	33	36
Cycle Time Harvest	50 / 10	3.8	3.4	3.2	2.8
	70 / 21	3.2	2.6	2.0	2.8
	90 / 32	3.1	2.7	2.9	2.8
Pressure High Side	50 / 10	240	256	261	266
	70 / 21	261	288	310	317
	90 / 32	289	316	339	365
Pressure Suction	50 / 10	40	42	42	43
	70 / 21	42	45	48	49
	90 / 32	46	49	52	55

NOTE: Total Cycle Time = Freeze + Harvest Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KMD-900M_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 15A (11.2A) Water: 14A (11.2A) Remote: 14A (11.2A)

Ice Production per cycle: 9.6 lbs, 624 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 526 Gal/24hrs 90/70 (32/21) 831 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	875	886	906	850	865	885	842	859	878	817	848	857
	70 / 21	842	859	878	799	823	842	763	793	812	743	782	795
	90 / 32	767	816	814	706	777	763	676	747	737	596	705	669
Cycle Time Freeze	50 / 10	13	14	13	13	14	13	14	15	13	14	15	14
	70 / 21	14	15	13	15	15	14	17	16	15	17	16	15
	90 / 32	15	16	14	17	16	15	18	17	16	20	18	17
Cycle Time Harvest	50 / 10	3.5	3.2	2.7	3.2	3.0	2.6	3.1	3.0	2.5	2.6	2.7	2.3
	70 / 21	3.1	3.0	2.5	2.5	2.7	2.2	2.0	2.4	2.0	2.0	2.4	2.0
	90 / 32	2.0	2.5	2.0	2.0	2.4	2.0	2.0	2.3	2.0	2.0	2.2	2.0
Pressure High Side	50 / 10	210	275	210	228	276	219	233	276	222	241	280	226
	70 / 21	233	276	222	264	277	237	290	278	250	299	281	255
	90 / 32	268	285	240	301	290	257	326	289	270	360	300	288
Pressure Suction	50 / 10	27	32	26	31	33	28	32	33	28	33	36	30
	70 / 21	32	33	28	39	34	31	45	35	34	47	37	35
	90 / 32	39	39	34	46	43	38	52	43	40	58	50	46

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-901M_H

Supply Voltage: 208-230/60/1

Total Amperage (Compressor RLA):

Air: 11.4A (9.9A) Water: 8.7A (8.1A) Remote: 11.6A (9.4A)

Ice Production per cycle: 13.6 lbs, 720 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 631 Gal/24hrs

90/70 (32/21) 1162 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	874	912	889	842	895	866	832	889	859	826	878	843
	70 / 21	832	889	859	778	860	818	732	835	785	721	825	771
	90 / 32	785	849	803	736	815	755	687	791	724	646	751	668
Cycle Time Freeze	50 / 10	19	18	18	20	19	19	20	19	20	21	19	20
	70 / 21	20	19	20	22	19	21	24	20	22	24	20	23
	90 / 32	22	20	21	24	21	23	26	21	24	27	22	26
Cycle Time Harvest	50 / 10	4.3	4.1	4.3	4.0	3.9	4.0	3.9	3.8	3.9	3.3	3.4	3.4
	70 / 21	3.9	3.8	3.9	3.3	3.4	3.4	2.8	3.1	2.9	2.7	3.0	2.8
	90 / 32	3.6	3.6	3.6	3.1	3.3	3.2	2.6	2.9	2.7	2.4	2.7	2.4
Pressure High Side	50 / 10	219	227	208	234	229	224	238	230	229	242	234	232
	70 / 21	238	230	229	263	233	256	284	236	279	289	239	284
	90 / 32	261	240	252	284	247	277	306	249	301	327	260	322
Pressure Suction	50 / 10	35	33	35	36	34	37	37	34	37	38	36	38
	70 / 21	37	34	37	39	36	40	41	37	43	42	38	44
	90 / 32	41	38	41	44	40	45	46	41	47	50	45	51

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-901MRH3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Remote: 7A (5.9A)

Ice Production per cycle: 14.2 lbs, 720 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 10	899	880	874	855
	70 / 21	874	842	815	800
Cycle Time Freeze	90 / 32	817	772	749	689
	50 / 10	19	20	20	20
	70 / 21	20	21	22	23
Cycle Time Harvest	90 / 32	21	23	24	26
	50 / 10	4.4	4.0	3.9	3.4
	70 / 21	3.9	3.3	2.8	2.7
Pressure High Side	90 / 32	3.6	3.2	2.6	2.4
	50 / 10	206	220	225	229
	70 / 21	225	249	270	275
Pressure Suction	90 / 32	248	272	293	315
	50 / 10	36	37	38	39
	70 / 21	38	40	42	43
	90 / 32	41	44	46	49

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KMD-901M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 10.8A (8.4A) Water: 7.8A (6.6A)

Remote: 10A (7.9A) Ice Production per cycle: 12 lbs, 624 pcs

Water Consumption for MWH Condenser:

70/50 (21/10) 593 Gal/24hrs

90/70 (32/21) 1088 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	890	876	848	870	875	832	864	874	827	843	852	805
	70 / 21	864	874	827	830	872	798	801	870	775	784	856	759
	90 / 32	803	831	768	754	805	723	730	812	705	665	759	641
Cycle Time Freeze	50 / 10	16	17	17	16	17	18	17	17	18	17	18	19
	70 / 21	17	17	18	18	18	20	19	18	21	19	19	21
	90 / 32	18	18	20	20	19	22	23	20	23	23	21	25
Cycle Time Harvest	50 / 10	3.3	3.3	3.5	3.0	3.1	3.1	3.0	3.0	3.1	2.5	2.7	2.6
	70 / 21	3.0	3.0	3.1	2.4	2.7	2.5	2.0	2.4	2.0	2.0	2.3	2.0
	90 / 32	2.8	2.8	2.9	2.5	2.5	2.6	2.0	2.2	2.0	2.0	2.0	2.0
Pressure High Side	50 / 10	231	232	210	246	233	223	251	233	227	258	237	231
	70 / 21	251	233	227	276	234	250	298	235	269	306	237	274
	90 / 32	281	241	248	309	245	270	330	245	290	360	254	309
Pressure Suction	50 / 10	36	38	36	38	38	38	39	39	38	41	40	40
	70 / 21	39	39	38	43	39	41	46	40	44	48	41	45
	90 / 32	45	41	43	51	43	47	53	44	50	60	57	55

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KMS-1230MLH & SRK-13H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): 15A (10A)

Ice Production per cycle: 24 lbs, 12488 pcs

Ambient Temp (F°/C°)		70 / 21	80/27	90/32	100/38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Low Side	Low Side	Low Side	Low Side
	50 / 10	1115	1117	1118	1089
	70 / 21	1118	1122	1126	1102
	90 / 32	1042	1001	1022	927
Cycle Time Freeze	50 / 10	26	26	26	27
	70 / 21	26	26	27	27
	90 / 32	28	29	29	31
Cycle Time Harvest	50 / 10	6	5	5	4
	70 / 21	5	4	3	3
	90 / 32	5	4	3	3
Pressure High Side	50 / 10	230	231	231	240
	70 / 21	231	233	235	240
	90 / 32	249	260	258	280
Pressure Suction	50 / 10	39	40	40	40
	70 / 21	40	41	42	42
	90 / 32	41	43	44	45

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1300M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 13.2A (10.2A) Water: 11.5A (9.7A) Remote: 13.5A (10A) Ice Production per cycle: 28.6 lbs, 1440 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 824 Gal/24hrs 90/70 (32/21) 1330 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	1289	1291	1322	1238	1276	1291	1222	1271	1281	1198	1238	1252
	70 / 21	1222	1271	1281	1133	1244	1228	1059	1222	1183	1034	1200	1159
	90 / 32	1120	1193	1193	1026	1138	1121	952	1126	1082	853	1038	989
Cycle Time Freeze	50 / 10	28	29	27	29	30	28	30	30	29	31	30	30
	70 / 21	30	30	29	33	31	31	35	32	32	36	32	33
	90 / 32	33	32	31	37	33	34	39	34	35	43	36	38
Cycle Time Harvest	50 / 10	4.6	4.0	4.4	4.2	3.7	4.0	4.0	3.6	3.9	3.3	3.6	3.0
	70 / 21	4.0	3.6	3.9	3.3	3.0	3.2	2.6	2.6	2.6	2.5	2.6	2.5
	90 / 32	3.6	3.3	3.5	2.5	2.9	3.0	2.3	2.4	2.3	2.0	2.2	2.0
Pressure High Side	50 / 10	247	279	227	264	279	236	269	280	239	272	285	242
	70 / 21	269	280	239	297	281	255	321	282	268	326	286	272
	90 / 32	293	291	255	318	298	271	344	297	285	365	311	300
Pressure Suction	50 / 10	49	47	47	50	48	48	50	48	48	50	48	48
	70 / 21	50	48	48	52	49	49	53	50	50	53	50	50
	90 / 32	52	49	49	53	50	51	55	51	52	56	52	53

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1300S_H
 Total Amperage (Compressor RLA): Air: 12.6A (10.2A) Water: 9.7A (9.7A) Remote: 14.5A (10A) Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)
 Water Consumption for SWH Condenser: 70/50 (21/10) 668 Gal/24hrs 90/70 (32/21) 920 Gal/24hrs Ice Production per cycle: 30.1 lbs, 1440 pcs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1283	1284	1296	1252	1283	1266	1242	1282	1257	1203	1243	1230
	70 / 21	1242	1282	1257	1188	1280	1206	1143	1278	1163	1114	1255	1141
Cycle Time Freeze	90 / 32	1135	1208	1173	1053	1166	1105	1017	1180	1068	902	1089	980
	50 / 10	30	32	29	32	32	30	32	33	30	33	33	31
	70 / 21	32	33	30	35	33	31	37	34	32	38	35	33
Cycle Time Harvest	90 / 32	36	35	33	39	36	36	41	37	36	44	39	40
	50 / 10	4.5	4.3	5.0	4.0	3.9	4.4	3.8	3.7	4.2	3.1	3.8	3.3
	70 / 21	3.8	3.7	4.2	2.9	2.9	3.1	2.2	2.3	2.2	2.2	2.3	2.2
Pressure High Side	90 / 32	3.5	3.4	3.8	3.0	2.9	3.2	2.1	2.1	2.1	2.0	2.0	2.0
	50 / 10	255	275	220	268	277	229	273	278	232	277	282	235
	70 / 21	273	278	232	296	282	247	315	285	260	320	288	264
Pressure Suction	90 / 32	296	288	247	318	295	262	338	297	276	360	308	290
	50 / 10	45	47	45	46	47	46	47	48	46	47	48	47
	70 / 21	47	48	46	49	48	48	51	49	50	51	49	51
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	49	49	49	51	49	51	53	50	53	55	51	55

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1300S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Air: 7.8A (6.1A) Water: 6.9A (5.8A) Remote: 10.8A (7A) Ice Production per cycle: 30.1 lbs, 1440 pcs

Water Consumption for SWH3 Condenser: 70/50 (21/10) 640 Gal/24hrs 90/70 (32/21) 927 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1320	1254	1308	1278	1261	1299	1265	1264	1296	1230	1220	1252
	70 / 21	1265	1264	1296	1192	1276	1279	1132	1287	1266	1102	1263	1238
	90 / 32	1153	1191	1203	1060	1157	1145	1006	1186	1148	890	1093	1039
Cycle Time Freeze	50 / 10	30	30	30	32	31	31	32	31	31	33	32	32
	70 / 21	32	31	31	35	32	32	37	33	33	38	33	34
	90 / 32	36	33	33	39	34	35	41	35	36	45	37	39
Cycle Time Harvest	50 / 10	4.0	4.2	4.8	3.6	3.8	4.2	3.4	3.6	4.0	2.8	3.0	3.2
	70 / 21	3.4	3.6	4.0	2.7	2.8	3.0	2.1	2.2	2.2	2.1	2.2	2.2
	90 / 32	3.2	3.3	3.7	2.8	2.9	3.1	2.0	2.1	2.1	2.0	2.0	2.0
Pressure High Side	50 / 10	255	270	230	270	273	239	274	274	242	277	277	246
	70 / 21	274	274	242	299	280	257	320	285	270	325	287	274
	90 / 32	296	284	259	318	291	275	341	295	288	360	305	305
Pressure Suction	50 / 10	47	48	50	48	49	51	48	49	51	49	49	52
	70 / 21	48	49	51	50	50	52	52	51	53	52	51	54
	90 / 32	50	50	53	52	51	55	54	52	56	55	53	58

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1300SAH-E

Supply Voltage: 220-240/50/1

Total Amperage (Compressor RLA): Air: 11.5A (10.3A)

Ice Production per cycle: 30.1 lbs, 1440 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	1200	1129	1106	1086
	70 / 21	1106	983	880	853
	90 / 32	988	871	763	655
Cycle Time Freeze	50 / 10	26	28	29	31
	70 / 21	29	33	37	38
	90 / 32	35	40	43	49
Cycle Time Harvest	50 / 10	5	4	4	4
	70 / 21	4	4	3.5	4
	90 / 32	4	4	4	3.5
Pressure High Side	50 / 10	240	261	268	265
	70 / 21	268	304	335	338
	90 / 32	287	313	348	360
Pressure Suction	50 / 10	50	51	51	52
	70 / 21	51	53	55	56
	90 / 32	54	56	58	60

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1301S_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 12.4A (10A) Water: 8.2A (8.2A) Remote: 13.5A (9.3A) Ice Production per cycle: 31 lbs, 1440 pcs

Water Consumption for SWH Condenser:

70/50 (21/10) 861 Gal/24hrs 90/70 (32/21) 1561 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1329	1318	1353	1292	1319	1324	1281	1319	1315	1253	1281	1281
	70 / 21	1281	1319	1315	1217	1321	1264	1164	1323	1222	1140	1301	1196
Cycle Time Freeze	90 / 32	1188	1249	1219	1109	1211	1144	1060	1228	1110	965	1141	1008
	50 / 10	31	31	31	32	31	32	32	31	32	33	32	33
	70 / 21	32	31	32	34	32	33	35	32	35	36	33	35
Cycle Time Harvest	90 / 32	35	33	34	37	34	36	38	34	37	41	36	40
	50 / 10	4.7	4.5	4.1	4.1	4.0	3.7	3.9	3.9	3.6	3.1	3.2	3.0
	70 / 21	3.9	3.9	3.6	2.9	3.1	2.9	2.1	2.4	2.3	2.1	2.4	2.3
Pressure High Side	90 / 32	3.7	3.5	3.3	3.1	3.0	2.9	2.2	2.2	2.2	2.1	2.1	2.1
	50 / 10	255	235	211	269	236	222	273	236	226	278	241	230
	70 / 21	273	236	226	297	237	246	317	238	262	323	241	267
Pressure Suction	90 / 32	298	246	246	321	253	265	342	252	282	365	264	301
	50 / 10	50	50	50	50	50	50	50	50	51	52	51	52
	70 / 21	50	50	51	50	49	51	50	49	52	51	50	53
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	53	52	53	55	52	55	55	52	56	59	54	59

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1301S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA):

Air: 9.5A (7.1A) Water: 6.1A (6.1A) Remote: 10.7A (6.2A)

Ice Production per cycle: 32.2 lbs, 1440 pcs

Water Consumption for SWH3 Condenser:

70/50 (21/10) 857 Gal/24hrs 90/70 (32/21) 1547 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	1298	1333	1339	1267	1326	1307	1257	1323	1297	1225	1286	1266
	70 / 21	1257	1323	1297	1204	1311	1243	1159	1300	1197	1133	1277	1171
	90 / 32	1162	1246	1203	1086	1198	1127	1049	1201	1088	947	1110	988
Cycle Time Freeze	50 / 10	32	30	31	33	31	32	33	31	32	34	31	33
	70 / 21	33	31	32	35	32	34	36	32	35	37	33	36
	90 / 32	36	32	35	39	33	37	40	34	39	43	35	42
Cycle Time Harvest	50 / 10	4.2	4.5	3.9	3.8	4.0	3.5	3.6	3.8	3.4	2.9	3.1	2.9
	70 / 21	3.6	3.8	3.4	2.8	3.0	2.8	2.1	2.4	2.2	2.1	2.3	2.2
	90 / 32	3.4	3.5	3.2	2.9	3.0	2.8	2.1	2.2	2.1	2.1	2.1	2.1
Pressure High Side	50 / 10	254	237	214	268	238	224	272	238	228	276	244	234
	70 / 21	272	238	228	295	239	246	315	240	261	321	244	267
	90 / 32	296	249	252	319	256	273	339	255	287	361	269	311
Pressure Suction	50 / 10	48	50	50	49	50	50	49	50	51	50	51	52
	70 / 21	49	50	51	50	49	51	51	49	52	52	50	53
	90 / 32	52	52	54	54	53	56	55	52	56	58	55	60

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1340M_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 9.7A (9.5A) Water: 9.2A (9.2A) Remote: 9.5A (9.5A) Ice Production per cycle: 28.1 lbs, 1440 pcs

Water Consumption for MWH Condenser: 70/50 (21/10) 824 Gal/24hrs 90/70 (32/21) 1430 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	1325	1382	1401	1289	1370	1367	1278	1366	1357	1257	1330	1333
	70 / 21	1278	1366	1357	1218	1344	1299	1167	1327	1251	1147	1303	1229
	90 / 32	1200	1284	1274	1130	1230	1204	1081	1224	1159	1003	1130	1075
Cycle Time Freeze	50 / 10	27	26	25	28	26	26	29	26	27	29	27	27
	70 / 21	29	26	27	31	27	29	33	28	31	33	28	31
	90 / 32	31	29	29	34	30	31	36	30	33	38	33	35
Cycle Time Harvest	50 / 10	4.9	4.8	5.5	4.4	4.4	5.0	4.3	4.3	4.8	3.4	3.7	4.0
	70 / 21	4.3	4.3	4.8	3.4	3.7	3.9	2.7	3.2	3.2	2.6	3.1	3.1
	90 / 32	3.8	3.9	4.3	3.2	3.4	3.6	2.3	2.8	2.8	2.0	2.5	2.4
Pressure High Side	50 / 10	251	237	208	267	239	221	272	240	226	274	244	229
	70 / 21	272	240	226	299	243	250	322	246	270	327	250	275
	90 / 32	293	251	247	316	258	269	341	260	290	359	272	309
Pressure Suction	50 / 10	45	45	44	48	46	46	48	46	47	48	47	47
	70 / 21	48	46	47	52	48	50	56	49	53	56	50	53
	90 / 32	50	49	49	53	51	51	57	52	54	58	55	55

NOTE: Total Cycle Time = Freeze + Harvest Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KMS-1400MLH & SRK-14H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): 15A (10.3A)

Ice Production per cycle: 24 lbs, 1248 pcs

Ambient Temp (F°/C°)		70 / 21	80/27	90/32	100/38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Low Side			
	50 / 10	1284	1252	1242	1170
	70 / 21	1242	1188	1142	1121
	90 / 32	1164	1097	1054	974
Cycle Time Freeze	50 / 10	22	23	24	26
	70 / 21	24	26	27	27
	90 / 32	25	26	28	29
Cycle Time Harvest	50 / 10	6	5	5	4
	70 / 21	5	4	3	3
	90 / 32	5	4	2	2
Pressure High Side	50 / 10	186	200	204	206
	70 / 21	204	228	247	252
	90 / 32	224	245	266	283
Pressure Suction	50 / 10	39	39	40	40
	70 / 21	40	41	42	42
	90 / 32	41	42	43	45

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1600MRH

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA): Remote: 18A (18.6A)

Ice Production per cycle: 28.6 lbs, 1440 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 32
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 9	1486	1454	1444	1411
	70 / 21	1444	1389	1343	1317
	90 / 32	1347	1270	1231	1128
Cycle Time Freeze	50 / 9	23	24	24	25
	70 / 21	24	26	27	27
	90 / 32	26	28	29	31
Cycle Time Harvest	50 / 9	4.5	4.2	4.1	4.0
	70 / 21	4.1	3.5	3.0	2.9
	90 / 32	3.5	3.0	2.5	2.0
Pressure High Side	50 / 9	227	236	239	244
	70 / 21	239	254	267	272
	90 / 32	259	277	289	310
Pressure Suction	50 / 9	40	41	42	42
	70 / 21	42	44	46	46
	90 / 32	44	46	48	50

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1600MRH3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Remote: 11A (11.4A)

Ice Production per cycle: 28.6 lbs, 1440 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 10	1524	1486	1474	1453
	70 / 21	1474	1409	1354	1333
Cycle Time Freeze	90 / 32	1392	1319	1266	1185
	50 / 10	23	24	24	25
	70 / 21	24	26	27	27
Cycle Time Harvest	90 / 32	26	28	29	31
	50 / 10	4.5	4.2	4.1	4.0
	70 / 21	4.1	3.5	3.0	2.9
Pressure High Side	90 / 32	3.5	3.0	2.5	2.0
	50 / 10	225	234	237	244
	70 / 21	237	252	265	271
Pressure Suction	90 / 32	260	279	291	315
	50 / 10	35	37	37	38
	70 / 21	37	40	42	43
	90 / 32	40	42	45	47

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1600S_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Water: 15A (14A)

Remote: 21A (14A)

Ice Production per cycle: 30.9 lbs, 1440 pcs

Water Consumption for SW/H Condenser:

70/50 (21/10)

1061 Gal/24hrs

90/70 (32/21)

1993 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	Water	Remote	Water	Remote	Water	Remote
	50 / 10	1551	1430	1553	1423	1553	1421	1507	1383
	70 / 21	1553	1421	1556	1410	1558	1400	1531	1376
	90 / 32	1468	1343	1422	1295	1443	1299	1338	1207
Cycle Time Freeze	50 / 10	24	25	24	26	25	26	25	26
	70 / 21	25	26	25	27	26	28	26	28
	90 / 32	26	28	28	29	28	30	30	32
Cycle Time Harvest	50 / 10	4.7	5.5	4.3	4.9	4.1	4.8	3.8	3.9
	70 / 21	4.1	4.8	3.8	3.8	2.7	3.0	2.7	2.9
	90 / 32	3.9	4.3	3.5	3.7	2.7	2.7	2.7	2.5
Pressure High Side	50 / 10	271	225	271	233	272	235	273	242
	70 / 21	272	235	272	249	273	260	274	265
	90 / 32	275	256	277	273	277	283	281	305
Pressure Suction	50 / 10	39	38	40	39	40	39	41	40
	70 / 21	40	39	42	41	43	43	44	43
	90 / 32	42	41	44	43	46	45	48	47

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1600S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Water: 9.5A (9A) Remote: 11A (9.5A)

Ice Production per cycle: 30.9 lbs, 1440 pcs

Water Consumption for SWH Condenser: 70/50 (21/10) 1005 Gal/24hrs

90/70 (32/21) 1740 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	Water	Remote	Water	Remote	Water	Remote
	50 / 10	1500	1461	1510	1442	1514	1436	1473	1409
	70 / 21	1514	1436	1532	1403	1547	1375	1526	1355
Cycle Time Freeze	90 / 32	1451	1365	1423	1311	1456	1291	1373	1213
	50 / 10	24	25	24	25	25	26	25	26
	70 / 21	25	26	25	26	26	27	26	27
Cycle Time Harvest	90 / 32	26	27	26	29	27	29	28	31
	50 / 10	5.0	5.5	4.4	4.9	4.3	4.8	3.4	3.9
	70 / 21	4.3	4.8	3.3	3.8	2.5	3.0	2.4	2.9
Pressure High Side	90 / 32	3.8	4.3	3.2	3.7	2.2	2.7	2.0	2.5
	50 / 10	270	225	271	233	271	235	272	240
	70 / 21	271	235	273	249	275	260	276	264
Pressure Suction	90 / 32	274	252	276	267	278	278	280	295
	50 / 10	40	37	41	38	41	38	42	39
	70 / 21	41	38	42	39	43	40	44	41
	90 / 32	43	41	45	43	46	44	48	47

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1601MRH

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA): Remote: 11.6A (16.6A)

Ice Production per cycle: 29.8 lbs, 1440 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x .454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 10	1508	1489	1483	1449
	70 / 21	1483	1450	1422	1398
	90 / 32	1399	1338	1320	1227
Cycle Time Freeze	50 / 10	23	24	24	24
	70 / 21	24	25	27	27
	90 / 32	26	27	28	30
Cycle Time Harvest	50 / 10	5.3	4.8	4.6	3.7
	70 / 21	4.6	3.6	2.8	2.8
	90 / 32	4.1	3.4	2.5	2.2
Pressure High Side	50 / 10	200	211	215	217
	70 / 21	215	234	251	254
	90 / 32	231	249	266	281
Pressure Suction	50 / 10	35	36	37	37
	70 / 21	37	39	41	41
	90 / 32	39	41	43	45

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1601MRH3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Remote: 8.4A (8.4A)

Ice Production per cycle: 28.0 lbs, 1440 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 10	1471	1453	1448	1408
	70 / 21	1448	1417	1392	1365
	90 / 32	1354	1290	1277	1171
Cycle Time Freeze	50 / 10	23	23	24	24
	70 / 21	24	25	27	27
	90 / 32	26	27	29	31
Cycle Time Harvest	50 / 10	5.7	5.1	4.9	4.0
	70 / 21	4.9	3.9	3.1	3.0
	90 / 32	4.4	3.6	2.7	2.3
Pressure High Side	50 / 10	203	214	218	224
	70 / 21	218	237	253	259
	90 / 32	242	263	279	303
Pressure Suction	50 / 10	38	40	40	40
	70 / 21	40	43	45	45
	90 / 32	42	44	47	48

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1601S_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Water: 13.4A (12.1A)

Remote: 12.8A (12.8A)

Ice Production per cycle: 30.2 lbs, 1440 pcs

Water Consumption for SWH Condenser: 70/50 (21/10)

1628 Gal/24hrs

90/70 (32/21)

1866 Gal/24hrs

	Ambient Temp (F°/C°)	70 / 21		80 / 27		90 / 32		100 / 38	
		Water	Remote	Water	Remote	Water	Remote	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°								
	50 / 10	1492	1564	1499	1551	1501	1547	1453	1512
	70 / 21	1501	1547	1513	1524	1523	1505	1496	1482
	90 / 32	1419	1468	1378	1415	1408	1407	1303	1317
Cycle Time Freeze	50 / 10	24	24	24	25	25	25	25	26
	70 / 21	25	25	25	27	26	28	26	29
	90 / 32	26	27	28	29	28	30	30	32
Cycle Time Harvest	50 / 10	4.7	5.6	4.3	4.8	4.1	4.6	3.8	3.6
	70 / 21	4.1	4.6	3.8	3.4	2.7	2.4	2.7	2.3
	90 / 32	3.9	4.2	3.5	3.4	2.7	2.2	2.7	2.0
Pressure High Side	50 / 10	271	201	271	211	272	215	273	219
	70 / 21	272	215	272	233	273	248	274	253
	90 / 32	275	235	277	254	277	269	281	288
Pressure Suction	50 / 10	39	36	40	38	40	38	41	39
	70 / 21	40	38	42	41	43	43	44	44
	90 / 32	42	41	44	44	46	47	48	50

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1601S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Water: 9A (7.3A) Remote: 7.9A (7.9A)

Ice Production per cycle: 30.2 lbs, 1440 pcs

Water Consumption for SWH3 Condenser: 70/50 (21/10) 1714 Gal/24hrs

90/70 (32/21) 1937 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	Water	Remote	Water	Remote	Water	Remote
	50 / 10	1555	1585	1557	1568	1558	1563	1507	1520
	70 / 21	1558	1563	1562	1535	1565	1511	1536	1482
	90 / 32	1466	1464	1417	1396	1440	1387	1326	1273
Cycle Time Freeze	50 / 10	24	24	24	25	24	25	25	26
	70 / 21	24	25	25	27	26	28	26	29
	90 / 32	26	27	27	29	28	30	30	32
Cycle Time Harvest	50 / 10	6.0	5.5	5.2	4.8	4.9	4.6	3.8	3.6
	70 / 21	4.9	4.6	3.6	3.4	2.4	2.4	2.4	2.4
	90 / 32	4.4	4.1	3.6	3.4	2.2	2.2	2.0	2.0
Pressure High Side	50 / 10	239	202	240	212	241	215	249	221
	70 / 21	241	215	244	233	246	247	251	253
	90 / 32	257	237	268	257	267	271	287	293
Pressure Suction	50 / 10	41	37	42	38	42	39	43	40
	70 / 21	42	39	44	41	45	43	46	44
	90 / 32	45	42	47	45	48	47	51	51

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1800S_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 18A (13A) Water: 12.4A (10.9A) Remote: 16.5A (10.9A) Ice Production per cycle: 42.9 lbs, 2160 pcs

Water Consumption for SWH Condenser: 70/50 (21/10) 1640 Gal/24hrs 90/70 (32/21) 1998 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1756	1816	1817	1708	1812	1780	1692	1810	1768	1590	1801	1723
	70 / 21	1692	1810	1768	1609	1803	1704	1539	1797	1651	1513	1791	1617
	90 / 32	1589	1789	1643	1496	1774	1546	1428	1770	1504	1326	1746	1369
Cycle Time Freeze	50 / 10	31	31	32	33	31	33	33	31	34	37	31	35
	70 / 21	33	31	34	36	32	36	39	32	38	40	32	39
	90 / 32	36	32	37	39	32	39	42	33	41	45	33	44
Cycle Time Harvest	50 / 10	6.0	5.7	5.4	5.4	5.1	5.0	5.3	4.9	4.9	4.2	4.0	4.2
	70 / 21	5.3	4.9	4.9	4.3	3.9	4.2	3.5	3.0	3.7	3.4	2.9	3.6
	90 / 32	4.6	4.4	4.4	3.9	3.7	3.8	3.0	2.7	3.2	2.5	2.4	2.8
Pressure High Side	50 / 10	230	256	220	246	255	226	251	255	227	255	256	235
	70 / 21	251	255	227	278	253	237	300	252	245	306	252	250
	90 / 32	277	255	247	303	255	262	326	253	268	350	254	290
Pressure Suction	50 / 10	50	50	40	51	50	41	51	50	41	52	50	42
	70 / 21	51	50	41	53	50	43	55	50	45	56	50	46
	90 / 32	54	50	44	56	50	46	58	50	48	60	50	50

NOTE: Total Cycle Time = Freeze + Harvest
Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1800S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Air: 11A (7.5A) Water: 9.7A (8.2A) Remote: 10.9A (7.5A) Ice Production per cycle: 43.7 lbs, 2160 pcs

Water Consumption for SWH3 Condenser: 70/50 (21/10) 870 Gal/24hrs 90/70 (32/21) 1282 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1757	1761	1775	1707	1765	1735	1691	1766	1722	1597	1742	1691
	70 / 21	1691	1766	1722	11604	1773	1658	1532	1778	1595	1509	1765	1568
Cycle Time Freeze	90 / 32	1597	1726	1618	1507	1707	1531	1434	1722	1479	1344	1671	1372
	50 / 10	32	31	32	34	31	33	34	31	34	38	31	35
	70 / 21	34	31	34	37	32	37	40	33	39	41	33	39
Cycle Time Harvest	90 / 32	37	32	37	40	32	40	43	33	42	45	33	45
	50 / 10	6.0	5.7	5.8	5.3	5.1	5.3	5.1	4.9	5.1	4.1	4.0	4.3
	70 / 21	5.1	4.9	5.1	4.0	3.9	4.3	3.0	3.0	3.6	2.9	2.9	3.5
Pressure High Side	90 / 32	4.6	4.4	4.6	3.9	3.7	4.0	2.7	2.7	3.2	2.5	2.4	2.8
	50 / 10	240	253	225	257	252	231	262	252	232	291	253	234
	70 / 21	262	252	232	291	250	242	315	249	250	319	249	252
Pressure Suction	90 / 32	283	253	242	306	253	252	333	251	260	350	253	270
	50 / 10	52	50	43	53	50	44	53	50	44	54	50	45
	70 / 21	53	50	44	54	50	46	55	50	48	56	50	48
NOTE: Total Cycle Time = Freeze + Harvest	90 / 32	55	51	46	57	51	48	58	51	50	60	52	52
		Pressure data is recorded 5 minutes into the freeze cycle.											

PERFORMANCE DATA

MODEL: KM-1900S_H

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 14.4A (11.3A) Water: 12.5A (11.1A) Remote: 14.9A (11.4A) Ice Production per cycle: 47 lbs, 2160 pcs

Water Consumption for SWH Condenser: 70/50 (21/10) 1022 Gal/24hrs 90/70 (32/21) 1832 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1867	1876	1915	1798	1870	1848	1777	1868	1827	1744	1800	1786
	70 / 21	1777	1868	1827	1659	1858	1712	1560	1850	1616	1526	1809	1577
Cycle Time Freeze	90 / 32	1638	1734	1676	1511	1655	1543	1413	1673	1451	1278	1511	1299
	50 / 10	32	32	31	34	33	33	34	33	33	36	34	34
	70 / 21	34	33	33	37	34	36	40	35	38	41	35	39
Cycle Time Harvest	90 / 32	39	35	37	42	37	40	44	38	43	49	41	46
	50 / 10	4.8	4.6	4.9	4.4	4.2	4.5	4.2	4.1	4.4	3.6	3.5	4.0
	70 / 21	4.2	4.1	4.4	3.4	3.4	3.9	2.8	2.8	3.4	2.7	2.8	3.4
Pressure High Side	90 / 32	4.0	3.9	4.3	3.5	3.4	4.0	2.7	2.7	3.4	2.7	2.7	3.4
	50 / 19	241	238	212	258	240	224	263	241	228	266	247	231
	70 / 21	263	241	228	291	245	249	315	249	267	321	253	271
Pressure Suction	90 / 32	288	254	247	314	263	266	339	265	285	362	279	301
	50 / 10	49	49	49	50	49	50	50	49	50	51	50	51
	70 / 21	50	49	50	52	50	52	53	50	53	53	50	53
	90 / 32	52	51	52	54	51	54	55	52	55	57	53	57

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-1900S_H3

Supply Voltage: 208-230/60/1 (3wire w/neutral for 115V)

Total Amperage (Compressor RLA): Air: 8.6A (8.4A) Water: 8.4A (7.8A) Remote: 11A (8A)

Ice Production per cycle: 45.9 lbs, 2160 pcs

Water Consumption for SW/H3 Condenser: 70/50 (21/10) 982 Gal/24hrs 90/70 (32/21) 1796 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	1859	1825	1965	1786	1823	1897	1763	1822	1876	1738	1754	1827
	70 / 21	1763	1822	1876	1636	1818	1758	1530	1814	1660	1499	1774	1617
	90 / 32	1633	1693	1708	1507	1619	1566	1398	1642	1474	1277	1484	1304
Cycle Time Freeze	50 / 10	32	32	31	34	33	33	34	33	33	35	34	34
	70 / 21	34	33	33	37	34	36	40	34	38	41	35	39
	90 / 32	38	35	37	41	37	40	44	38	42	48	41	46
Cycle Time Harvest	50 / 10	4.5	4.7	4.9	4.1	4.2	4.5	4.0	4.1	4.4	3.4	3.5	4.0
	70 / 21	4.0	4.1	4.4	3.3	3.4	3.8	2.7	2.7	3.4	2.7	2.7	3.4
	90 / 32	3.8	3.9	4.3	3.4	3.5	4.0	2.7	2.7	3.4	2.7	2.7	3.4
Pressure High Side	50 / 10	237	239	202	255	241	215	260	241	219	262	248	220
	70 / 21	260	241	219	291	244	241	317	246	259	322	250	263
	90 / 32	284	255	236	311	264	255	339	264	275	359	280	289
Pressure Suction	50 / 10	50	50	49	51	50	49	51	50	50	52	51	50
	70 / 21	51	50	50	53	50	50	54	50	51	55	50	51
	90 / 32	53	51	51	55	52	53	57	52	53	59	53	55

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-2000S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA):

Water: 9.5A (9A) Remote: 12A (9A)

Ice Production per cycle: 46.3 lbs, 2160 pcs

Water Consumption for SWH3 Condenser: 70/50 (21/10) 964 Gal/24hrs

90/70 (32/21) 1435 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	Water	Remote	Water	Remote	Water	Remote
	50 / 10	1891	1865	1885	1839	1883	1831	1851	1801
	70 / 21	1883	1831	1873	1786	1864	1748	1844	1725
	90 / 32	1817	1746	1776	1679	1740	1649	1701	1558
Cycle Time Freeze	50 / 10	30	30	30	31	31	31	31	32
	70 / 21	31	31	31	33	32	34	32	34
	90 / 32	32	33	33	35	34	36	35	38
Cycle Time Harvest	50 / 10	5.0	5.0	4.5	4.6	4.3	4.4	4.0	4.4
	70 / 21	4.3	4.4	3.4	3.6	2.7	3.0	2.6	2.9
	90 / 32	3.9	3.8	3.3	3.2	2.4	2.5	2.2	2.0
Pressure High Side	50 / 10	275	233	275	241	275	243	276	249
	70 / 21	275	243	276	257	276	268	276	273
	90 / 32	276	263	277	280	277	290	278	310
Pressure Suction	50 / 10	48	45	48	45	48	46	48	46
	70 / 21	48	46	49	46	49	47	49	47
	90 / 32	49	47	49	48	50	49	50	50

NOTE: Total Cycle Time = Freeze + Harvest Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-2100S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA):

Water: 10.5A (9A) Remote: 12.5A (9.2A)

Ice Production per cycle: 46.8 lbs, 2160 pcs

Water Consumption for SWH3 Condenser: 70/50 (21/10) 1121 Gal/24hrs

90/70 (32/21) 1948 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	Water	Remote	Water	Remote	Water	Remote
	50 / 10	2096	2034	2086	1984	2083	1968	2005	1908
	70 / 21	2083	1968	2065	1882	2050	1810	2003	1764
	90 / 32	1927	1800	1834	1670	1848	1613	1662	1432
Cycle Time Freeze	50 / 10	28	29	29	30	29	30	30	32
	70 / 21	29	30	30	33	31	35	31	36
	90 / 32	31	34	33	37	33	38	36	42
Cycle Time Harvest	50 / 10	4.9	5.4	4.5	5.0	4.4	4.9	3.8	4.3
	70 / 21	4.4	4.9	3.7	4.2	3.2	3.6	3.1	3.5
	90 / 32	4.0	4.6	3.6	4.2	2.9	3.5	2.7	3.4
Pressure High Side	50 / 10	244	217	247	229	248	233	255	236
	70 / 21	248	233	254	253	258	270	263	274
	90 / 32	264	252	275	271	278	289	296	306
Pressure Suction	50 / 10	48	45	48	46	48	46	49	46
	70 / 21	48	46	49	48	49	49	49	49
	90 / 32	49	48	50	49	50	51	51	52

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-2400SRH3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Remote: 17A (15A)

Ice Production per cycle: 44 lbs, 2160 pcs

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	Remote	Remote	Remote
	50 / 10	2301	2305	2307	2231
	70 / 21	2307	2315	2321	2278
	90 / 32	2172	2100	1980	1968
Cycle Time Freeze	50 / 10	23	23	24	24
	70 / 21	24	24	25	26
	90 / 32	26	27	28	30
Cycle Time Harvest	50 / 10	5.7	5.2	5.0	4.8
	70 / 21	5.0	4.1	3.4	3.4
	90 / 32	4.7	4.2	3.3	3.2
Pressure High Side	50 / 10	237	244	247	253
	70 / 21	247	259	270	275
	90 / 32	267	283	292	313
Pressure Suction	50 / 10	52	53	53	54
	70 / 21	53	54	55	56
	90 / 32	55	57	58	60

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

PERFORMANCE DATA

MODEL: KM-2500S_H3

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA): Water: 14.2A (12.2A) Remote: 17.7 A (15.4A)

Ice Production per cycle: 46.3 lbs, 2160 pcs

Water Consumption for SWH3 Condenser: 70/50 (21/10) 1430 Gal/24hrs

90/70 (32/21) 1430 Gal/24hrs

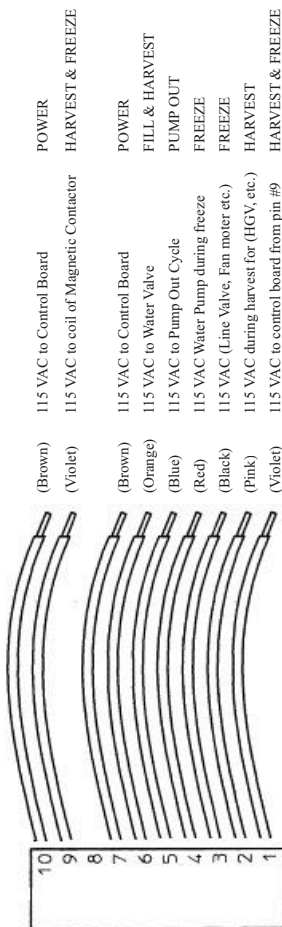
Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	Water	Remote	Water	Remote	Water	Remote
	50 / 10	2408	2424	2398	2385	2395	2373	2327	2301
	70 / 21	2395	2373	2379	2306	2365	2250	2323	2200
	90 / 32	2256	2196	2172	2069	2184	2035	2018	1837
Cycle Time Freeze	50 / 10	24	25	24	26	24	26	25	27
	70 / 21	24	26	25	27	26	27	26	28
	90 / 32	26	28	27	30	28	30	30	32
Cycle Time Harvest	50 / 10	5.0	5.0	4.6	4.5	4.4	4.3	25	3.6
	70 / 21	4.4	4.3	3.7	3.5	3.1	2.8	26	2.8
	90 / 32	4.1	4.1	3.6	3.6	2.9	2.7	30	2.7
Pressure High Side	50 / 10	245	214	249	227	250	231	259	236
	70 / 21	250	231	256	253	261	271	267	277
	90 / 32	272	255	287	277	289	296	314	319
Pressure Suction	50 / 10	39	35	39	36	40	36	41	37
	70 / 21	40	36	40	38	41	39	42	39
	90 / 32	42	38	44	40	44	41	47	43

NOTE: Total Cycle Time = Freeze + Harvest

Pressure data is recorded 5 minutes into the freeze cycle.

10-PIN CONNECTOR FOR E & G BOARDS:

NOTE: This connector diagram shows the standard color code and component layouts. Use it as a guide for circuit diagnosis.



KM Wiring Diagrams

The wiring diagrams on the following pages are generic in some cases because they can represent several models. Hoshizaki provides a specific wiring label on every unit for electrical diagnosis. You will also find wiring diagrams in the service manual by model. See the following wiring diagram chart for your model and capacitor information.

KM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
Mechanical Bin Control		182				
KM-61BAH	A	183	None	None	1	None
KM-101BAH, KM-151BAH	A	183	100	None	1	None
KML-250MAH/MWH	B	184	72~88	20	None	None
KML-350MAH/MWH	B	184	243~292	15	None	None
KML-351MAH/MWH Serial S and Before	B	184	72~88	20	None	5
KML-351MAH/MWH Serial T and After	B	184	243~292	15	None	5
KML-450MAH/MWH	B	184	189~277	25	None	5
KML-451MAH/MWH	B	184	243~292	15	None	5
KML-600MAH/MWH/MRH, KML-631MAH/MWH	B	184	145~174	30	None	5
KM-251BAH/BWH, KM-255BAH/BWH	C	185	410	None	1	5

KM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
KM-201BAH, KM-260BAH	D	186	260	None	1	6
KM-280MAH/MWH	E	187	378~445	None	5.5	5
KM-280MAH-E, KM-500MAH-E	F	188	72~86	15	5.5	2.5
KM-630MAH-E	F	188	88~108	None	5.5	2.5
DKM-500BAH Serial UxxxxxA and Before	G	189	189~227	25	None	5
DKM-500BAH Serial UxxxxxJ and After	G	189	243~292	20	2.5	5
KM-461MRH	H	190	243~292	15	5.5	10
KM-501MRH	H	190	72~86	25	5.5	10
KM-515MRH	H	190	243~292	35	5.5	10
KM-320MAH/MWH	I	191	72~86	20	5.5	5
KM-461MAH/MWH	I	191	243~292	15	5.5	5
KM-501MAH/MWH	I	191	72~86	25	5.5	5

KM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
KM-515MAH/MWH	I	191	243~292	35	5.5	5
KM-600MAH	J	192	243~292	35	5.5	5
KM-900MRH3, KM-901MRH3	K	193	None	None	5.5	10
KM-630MAH/MWH	L	194	88~108	15	5.5	5
KM-650MAH/MWH	L	194	175~216	25	5.5	5
KM-900MAH/MWH	L	194	145~174	35	5.5	5
KM-901MAH/MWH	L	194	145~174	30	5.5	5
KM-630MRH	M	195	88~108	15	5.5	10
KM-650MRH	M	195	175~216	25	5.5	10
KM-900MRH	M	195	145~174	35	5.5	10
KM-901MRH	M	195	145~174	30	5.5	10
KMD-450MAH	N/A	N/A	243~292	35	2.5	6

KM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
KMD-700MAH/MWH, KMD-850MAH/MWH	N	196	145~174	30	10	5
KMD-700MAH/MWH, KMD-850MAH/MWH						
KMD-900MAH/MWH	N	196	145~174	35	10	5
KMD-700MRH, KMD-850MRH, KMD-901MRH	O	197	145~174	30	10	10
KMD-900MRH	O	197	145~174	35	10	10
KMS-750MLH w/SRK-7H	P	198	145~174	30	10	10
KMS-1230MLH w/SRK13H, KMS-1400MLH w/SRK14H	P	198	145~174	35	10	10
KMS-1400MLH w/SRK-14H(3)	Q	199	None	None	10	10
KM-1600SRH3, KM-1600SWH3	R	200	None	None	10	10
KM-1600MRH3, KM-1601MRH3						
KM-1300SAH, KM-1300SWH	S	201	145~174	35	10	5
KM-1300MWH, KM-1340MAH/MWH, KM-1601SWH						
KM-1600SWH	S	201	189~227	40	10	none

KM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
KM-1300SAH3, KM-1300SWH3	T	197	None	None	10	5
KM-1300SRH3	U	198	None	None	10	10
KM-1301SAH	V	199	145~174	35	10	5
KM-1301SWH	V	199	145~174	30	10	None
KM-1301SAH3, KM-1301SWH3 Serial U0 and Before	W	200	None	None	10	5
KM-1301SAH3, KM-1301SWH3 Serial U1 and After	X	201	None	None	10	5
KM-1301SRH Serial U0 and Before	Y	202	145~174	30	10	10
KM-1301SRH Serial U1 and After	Z	203	145~174	30	10	10
KM-1301SRH3 Serial U0 and Before	AA	204	None	None	10	10
KM-1301 SRH3 Serial U1 and After	BB	205	None	None	10	10
KM-1300SRH, KM-1340MRH, KM-1601SRH, KM-1601MRH	CC	206	145~174	35	10	10

KM Wiring Diagram Reference Chart

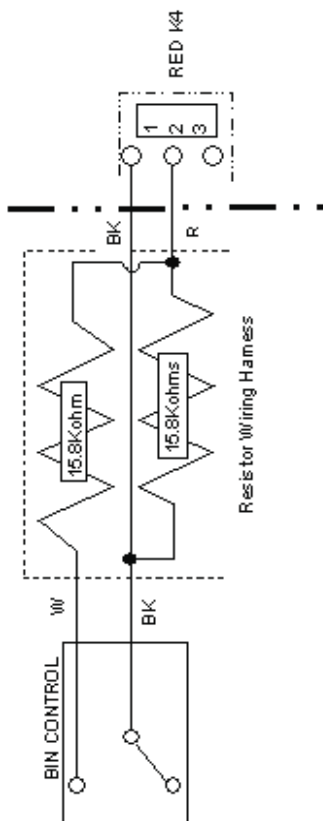
Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
KM-1600SRH, KM-1600MRH	CC	211	189~227	40	10	10
KM-1800SAH, KM-1900SAH, KM-1300MAH	DD	212	145~174	35	10	5
KM-1900SAH	DD	212	189~227	35	10	5
KM-1600MRH3/SRH3, KM-1601MRH3/SRH3 KM-1800SWH3/SRH3, KM-1900SWH3/SRH3 KM-2000SWH3/SRH3	EE	213	None	None	10	10
KM-1800SWH, KM-1800SRH	FF	214	145~174	35 MFD	10	10
KM-1900SWH, KM-1900SRH	FF	214	189~227	35 MFD	10	10
KM-1800SAH3, KM-1900SAH3	GG	215	None	None	10	5
KM-2000SWH3/SRH3, KM-2100SWH3/SRH3	HH	216	None	None	10	10
KM-2400SRH3,	HH	216	None	None	15	15

KM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Pump Capacitor	Fan Capacitor
URC-5F/6F/7F/9F						10
URC-12F/14F/20F/21F/22F/23F (2 FANCAPS)						10
URC-24F (4 FANCAPS)						15
SRC-10H			189~227	30		10
SRK-7H (2 FANCAPS)			145~174	30		10
SRK-13H/14H (2 FANCAPS)			145~174	35		10
SRK-14H3 (2 FANCAPS)						10



MECHANICAL BIN CONTROL OPERATION:

The mechanical bin control is included on some models. The mechanical assembly is located in the ice drop zone area .

When the actuator paddle is in the normal (Bin Empty) position, the bin control proximity switch will close. On E board models,

1. When the switch contacts close, 7.6 K Ohms of resistance is supplied to the K4 board connector.
2. When the ice pushes the paddle to the full right position (Bin Full), the proximity switch opens as shown above and will supply 15.8 K Ohms to the K4 board connector.

For G Board models, resistors are not used. The switch will close to start the unit and open to stop the unit.

**KML-250MAH/MWH, KML-350MAH/MWH,
KML-351MAH/MWH, KML-450MAH/MWH,
KML-451MAH/MWH.**

KML-631MAH/MWH,KML-600MAH/MWH/MRH

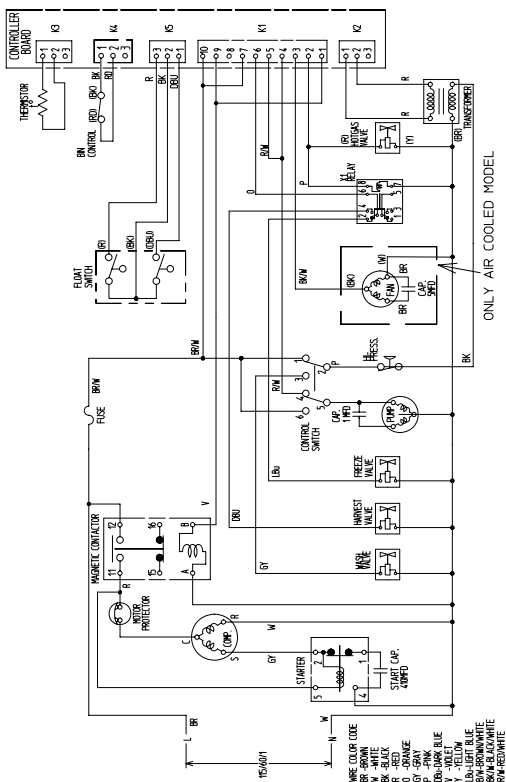


ONLY AIR COOLED MODEL

- 184

C

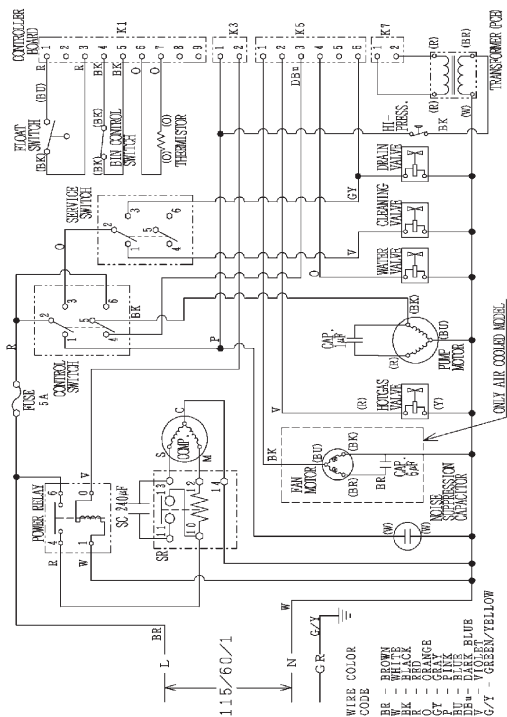
KM-251BAH/BWH, KM-255BAH/BWH



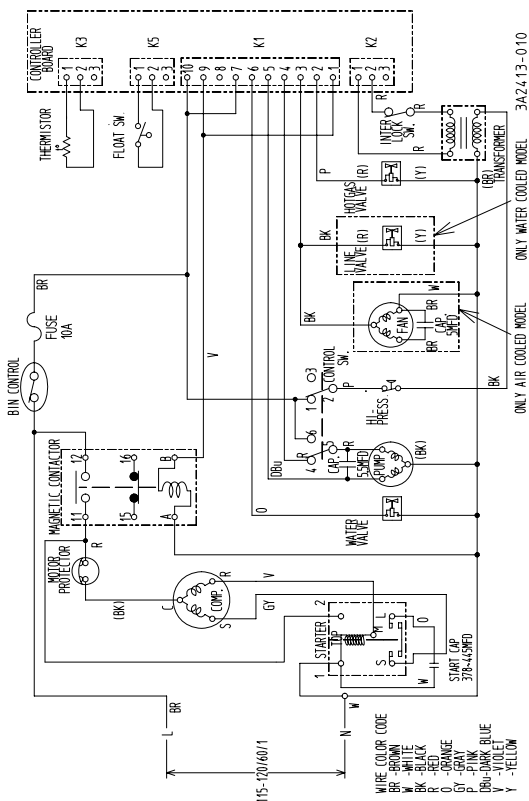
3A3443-011

D

KM-201BAH, KM-260BAH



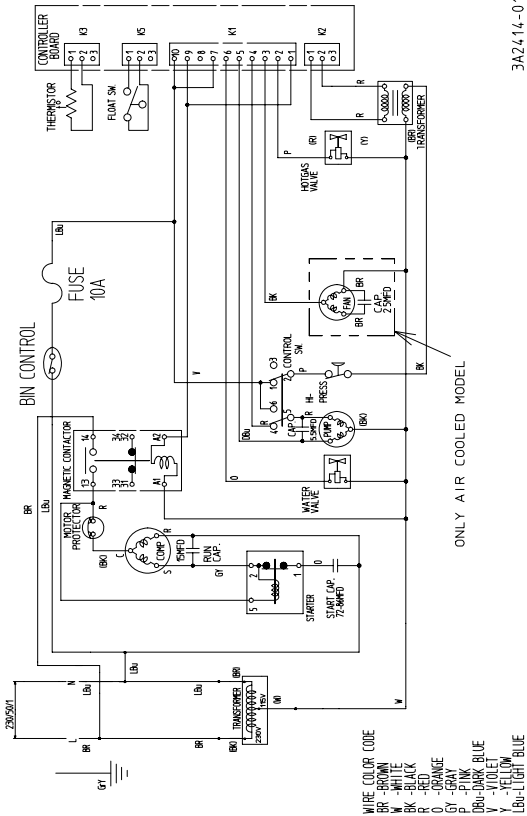
E KM-280MAH/MWH



- Note:** 1. Some models use mechanical bin control instead of thermostatic bin control with fuse as shown.
2. Generic Diagram: See unit service manual or wiring diagram chart for capacitor ratings by model.

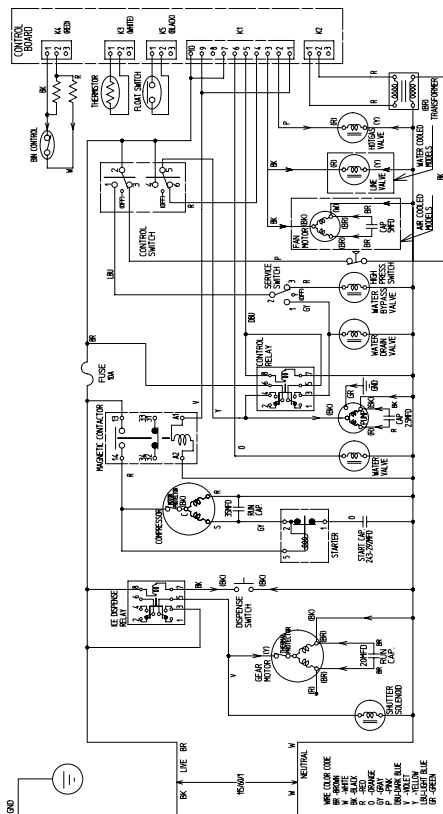
F

KM-280MAH-E, KM-500MAH-E, KM-630MAH-E



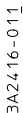
- Note:** 1. Some models use mechanical bin control instead of thermostatic bin control with fuse as shown.
2. Generic Diagram: See unit service manual or wiring diagram chart for capacitor ratings by model.

G DKM-500BAH



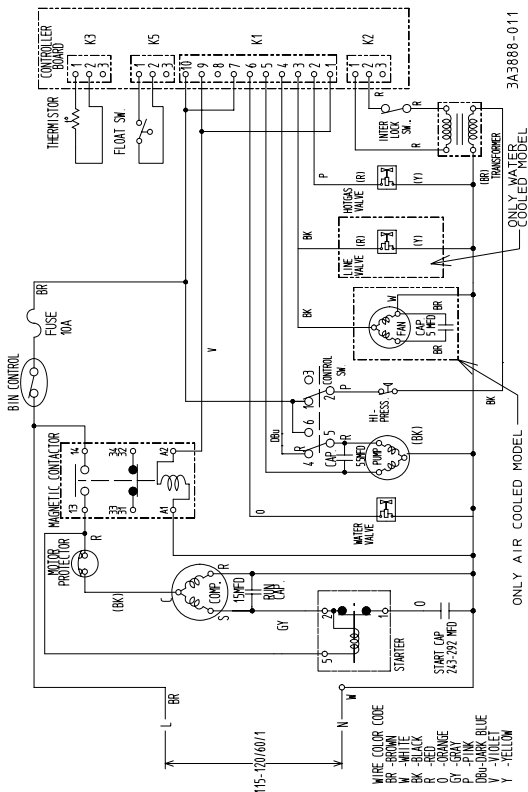
3A5467-01 0

H



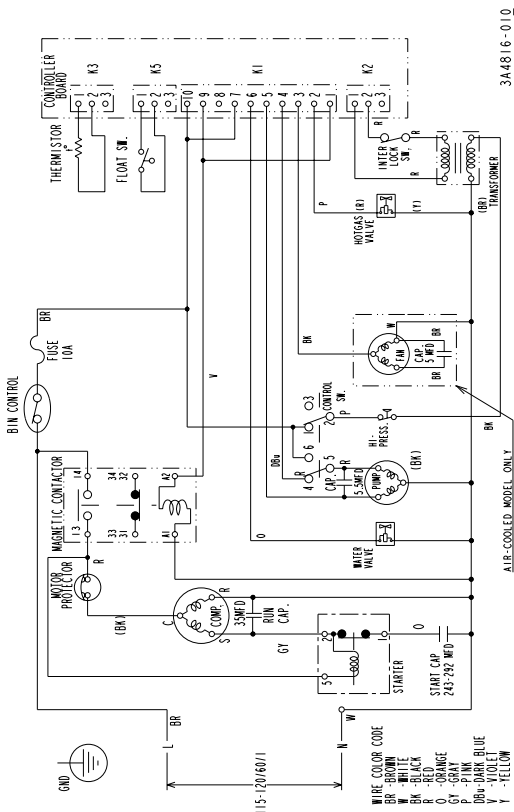
11/09

KM-320MAH/MWH, KM-461MAH/MWH, KM-501MAH/MWH, KM-515MAH/MWH

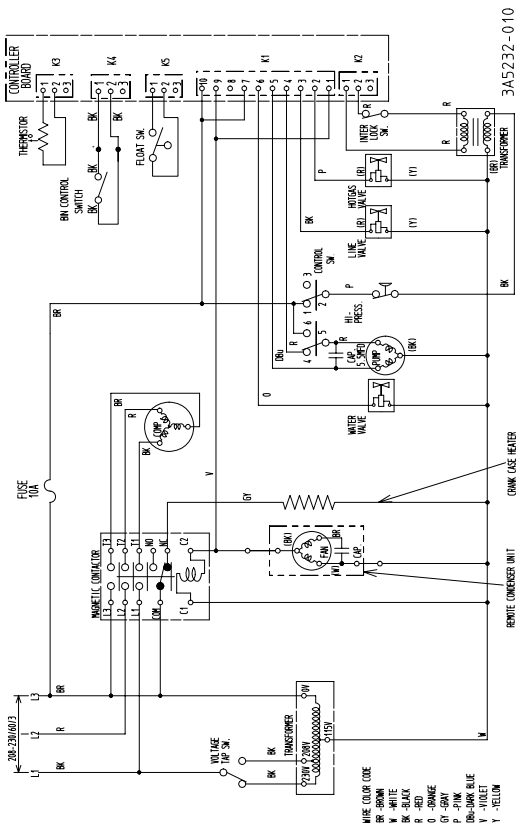


- NOTE: 1.Generic diagram: See unit, service manual, or wiring diagram chart for capacitor ratings by model.
- 2.Production of KM-320/515M after February 09 uses G board and mechanical bin control with no resistors in wiring harness.

J KM-600MAH



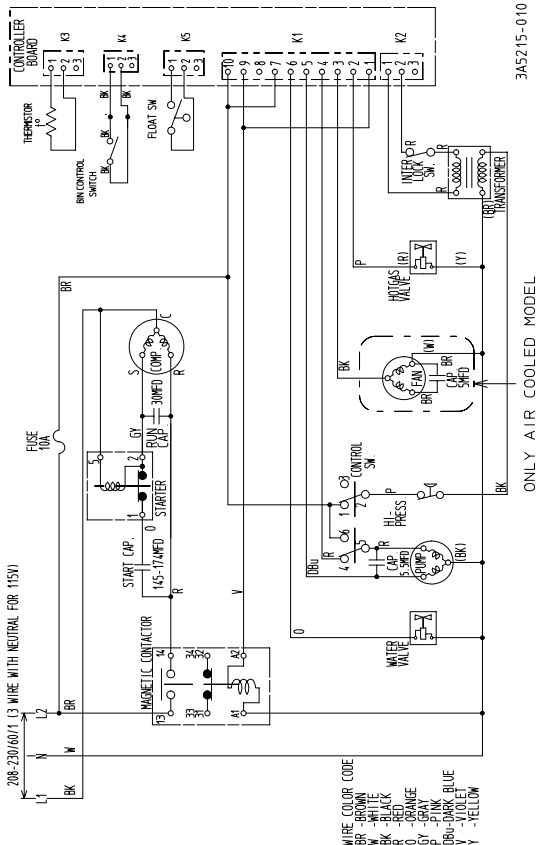
K KM-900MRH3, KM-901MRH3



- Note:** 1. Some models use thermostatic bin control with fuse instead of mechanical bin control as shown.
2. Production after February 09 uses G board and mech bin control with no resistors in wiring harness.

L

KM-630MAH/MWH, KM-650MAH/MWH, KM-900MAH/MWH, KM-901MAH/MWH



- Note:**
1. Some production models will include thermostatic bin control with fuse instead of mechanical bin control as shown.
 2. Generic diagram: See unit, service manual or wiring diagram chart for capacitor ratings by model.
 3. Production after February 09 uses G board and mechanical bin control with no resistors in wiring harness.

M



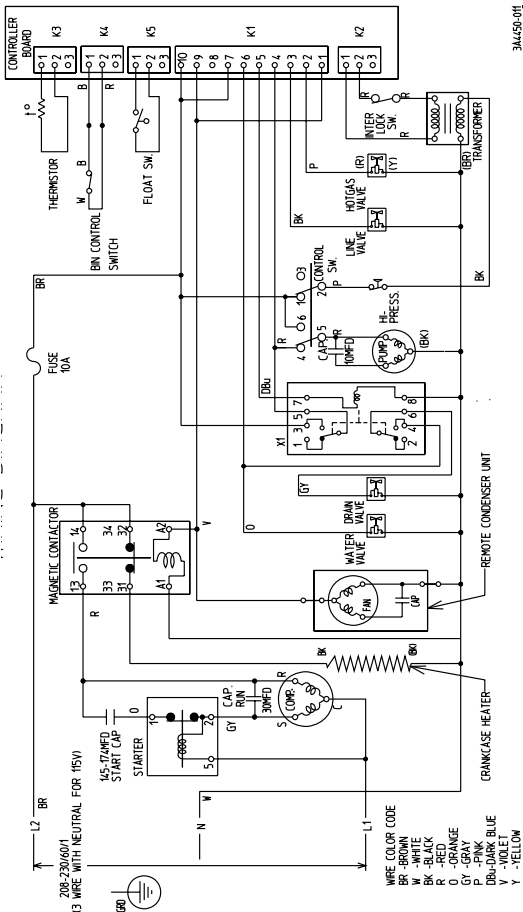
- 195

N



- 11/09

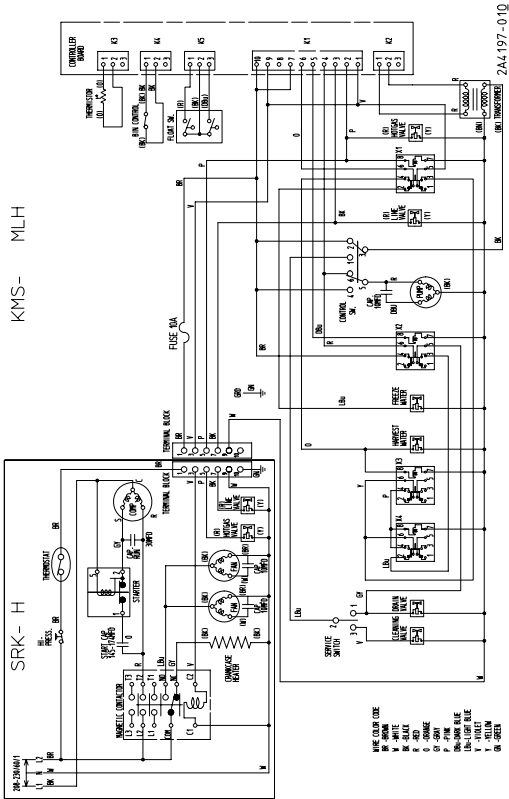
O **KMD-700MRH, KMD-850MRH, KMD-900MRH, KMD-901MRH**



- Note:** 1. Generic diagram: see unit, service manual, wiring diagram chart for capacitor ratings by model.
2. KMD-700/900M use E board and resistor wiring harness.

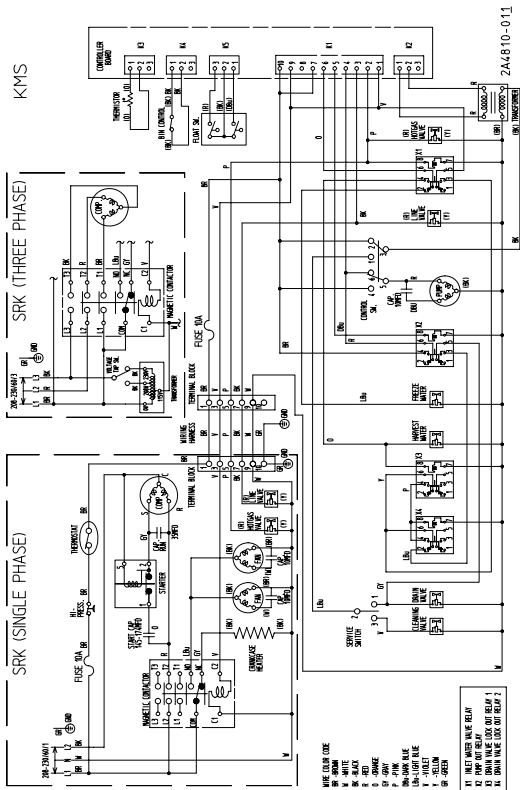
P

KMS-750MLH w/SRK-7H,
KMS-1230MLH w/SRK13H,
KMS-1400MLH w/SRK-14H



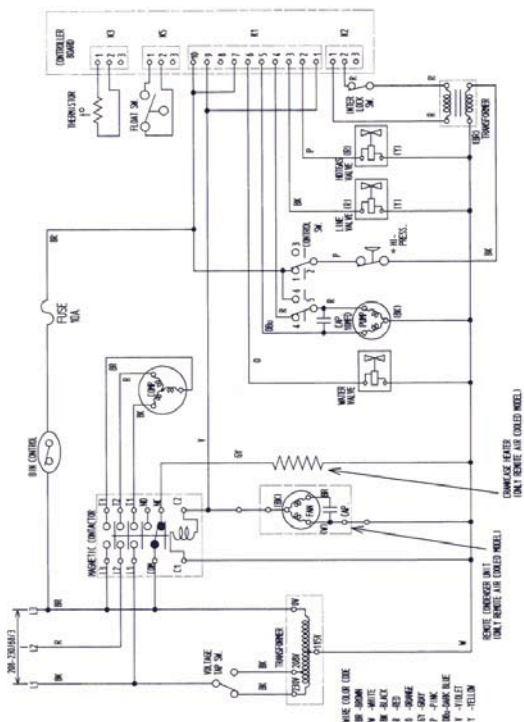
Note: Generic diagram: See unit, service manual wiring diagram chart for capacitor ratings by model.

Q KMS-1400MLH w/SRK-14H(3)



R

KM-1600SRH3, KM-1600SWH3, KM-1600MRH3, KM-1601MRH3



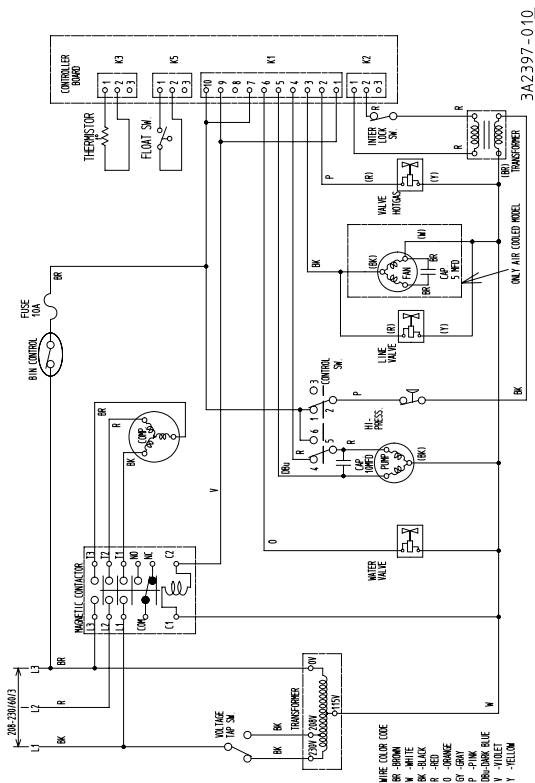
S



ONLY AIR-COOLED MODEL

T

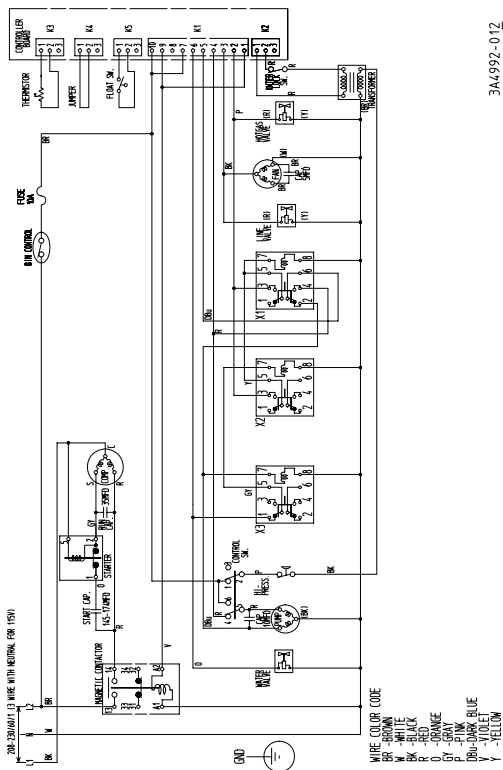
KM-1300SAH3, KM-1300SWH3



U



V
KM-1301 SAH, KM-1301SWH



Note: SWH does NOT include fan.

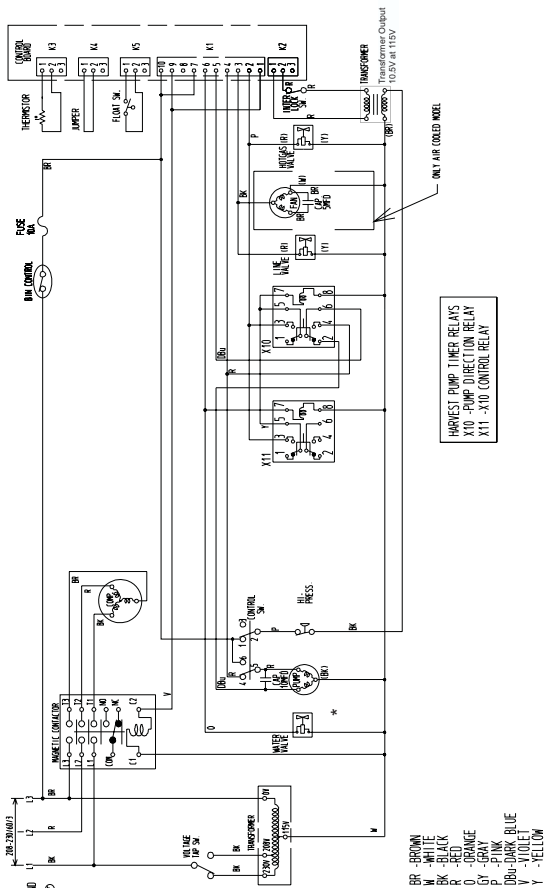
W

Serial Code: U0 and before



X

Serial Code: U1 and after

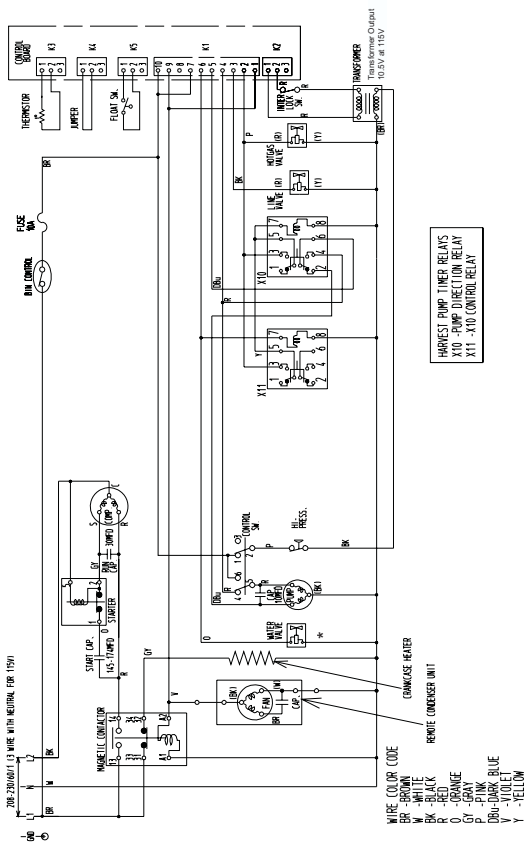


Serial Code: U0 and before



Z KM-1301SRH

Serial Code: U1 and after

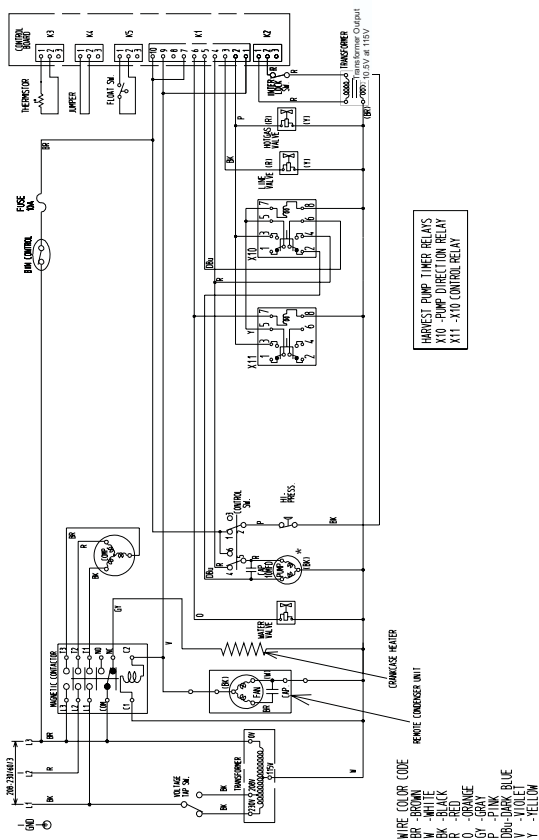


Serial Code: U0 and before



BB KM-1301SRH3

Serial Code: U1 and after

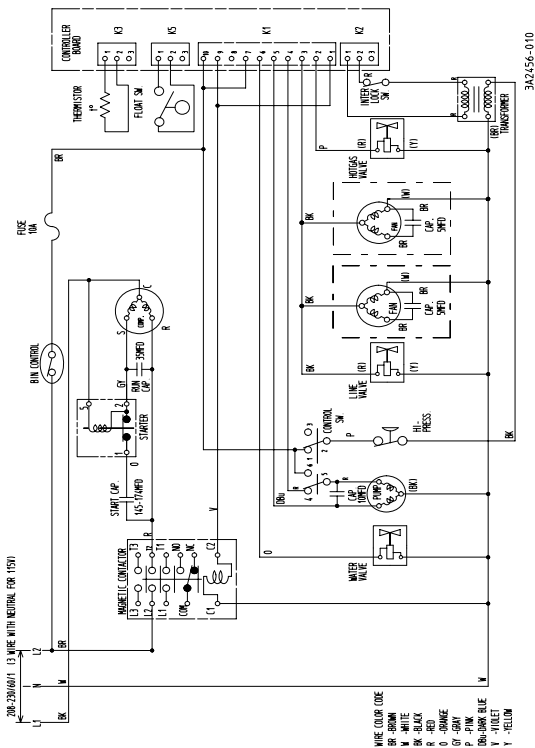


CC



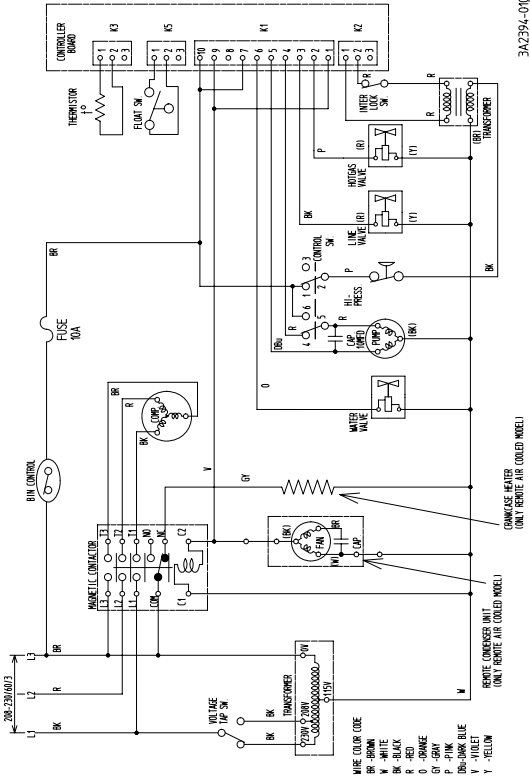
ONLY AIR-COOLED MODEL

DD
KM-1800SAH,
KM-1900SAH,
KM-1300MAH



EE

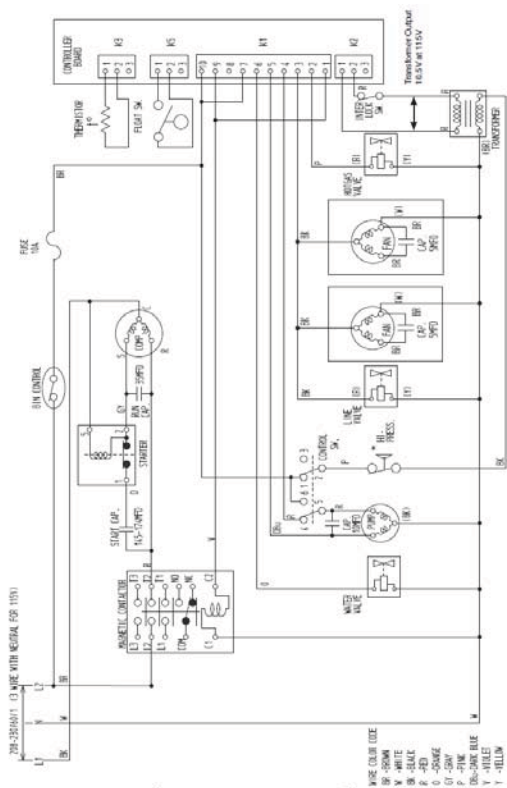
**KM-1600MRH3/SRH3, KM-1601MRH3/SRH3,
KM-1800SWH3/SRH3, KM-1900SWH3/SRH3,
KM-2000SWH3/SRH3**



3A2394-010

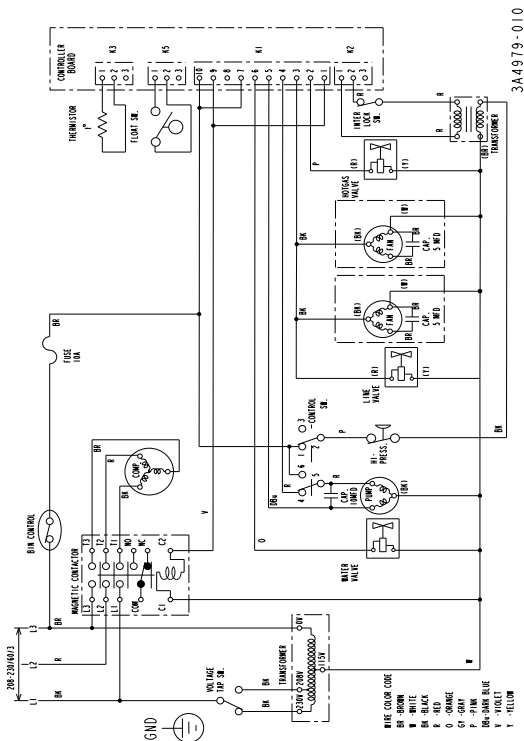
FF

KM-1800SWH, KM-1800SRH, KM-1900SWH, KM-1900 SRH



GG

KM-1800SAH3, KM-1900SAH3



3A4979-010

BA2394-01Q



Flaker/DCM

General Installation

As always, you should follow the installation instructions that are provided in the instruction manual supplied with the unit. Three things are critical for a proper F/DCM installation:

1. The water temperature should fall within the 45° F to 90° F range.
Note: Colder water can cause excess stress on the auger gear motor which may activate the gear motor overload.
2. A filter system is very important in poor water quality areas as high mineral content can cause premature bearing wear, poor production, and inefficient operation.
3. The unit should be level, front to back, side to side to assure proper evaporator water level and maximum production. This is necessary because of the gravity feed water distribution.

Cubelet Models

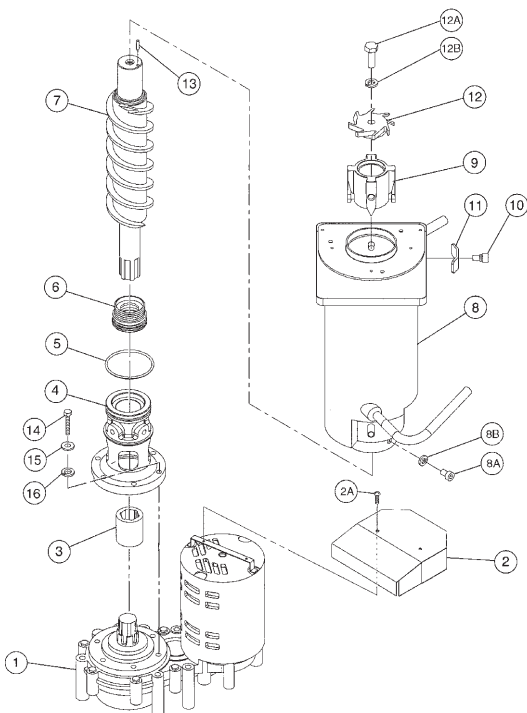
The DCM product produces cubelet ice. Most flaker models are available to produce cubelet ice. This requires changing the extruding head and cutter at the top of the evaporator assembly and in most cases, an evaporator barrel heater. The flaker models which are produced as cubelet models are designated by a -C at the end of the model number.

Converting a flaker to a cubelet maker reduces the overall production by around 8~10%. This drop in production is due to the compacting of the ice in the extruding head. The flaker gear motor is sized to handle the extra load of producing cubelet ice with only a slight increase in the running amperage. The evaporator outlet temperature and operating pressures will be similar to the standard flaker model. Use the temperature and pressure information provided on the standard flaker performance data provided as a bench mark when diagnosing a converted cubelet (-C) unit.

Internal Auger Design

Hoshizaki Flakers and DCM's use an internal auger system to provide high quality crisp flakes and cubelet ice. The evaporator cylinder and auger are made of anti-magnetic stainless steel. This higher quality stainless steel eliminates pitting caused by harmful minerals in the water. This maintains a smooth surface to reduce restriction to ice flow providing consistent production and quality.

The picture below is a generic breakdown of the F/DCM evaporator assembly. The extruding head #9 and cutter #12 can be exchanged so that this Flaker assembly will produce Cubelet style (chunklet) ice like the DCM application. The sleeve type alignment bearings are pressed into the housing #4 and extruding head #9. The mechanical seal #6 and "O" ring #5 seal the lower end of the evaporator system.



Component Technical Data

Control Transformer

Hoshizaki Flaker units include a 24 volt control transformer. This transformer has a 115 volt primary and 24 volt secondary and is protected by a 1 amp control fuse (The DCM has a dual output secondary of 10.5V to terminals K4 - 1 & 2 with a 0.5A fuse and 24V on terminals K2 - 7 & 2 with a 1A fuse). The 24 volt secondary supplies power to: the solid state timer board, relay coils, inlet water valve and flush timer circuit. The flush valve will either be 24 volts AC or DC, depending on the model. A rectifier is provide in the flush valve circuit to convert to 24VDC. Without control voltage on pins 1 and 2, the timer board will not allow the unit to start.

Gear Motor Protection

The auger gear motor circuit includes two overload safeties. The primary safety is a manual reset, current type protector, or slow blow fuse located in the control box. This is a time delay protection which operates if high amp draw occurs. The secondary safety is a thermal protector incorporated into the gear motor windings.

The current type gear motor safety has been replaced with a slow blow fuse on most models. The fuse provides more consistant protection in low voltage applications and the correct fuse type and amprage must be used.

Gear Motor Protection	
Model	Protection
F-330B, DCM-270/750B	Current type protector
F-450M_H, DCM-500B	2 amp fuse
F-800M_H	1.5 amp fuse
F - 8 0 1 / 1 0 0 1 M _ H (- C) , FD-1001MAH-C	3 amp fuse.
F-1500M_H	7 amp fuse 10 amp circuit protector
F-2000M_H	7 amp fuse 10 amp circuit protector

Gear motor failure can be expensive and it is very important to find the cause of the failure when it is replaced. There are several possibilities for the cause of gear motor failure. The following check list is designed to help you find the reason your failure occurred.

Gear Motor Checkout

1. Normal Amperage: The amperage for gear motor should be listed on the nameplate. Answer the following questions to discover the possible cause for your failure:

1. Is Ambient Temperature above 45 degrees F.
2. Does the unit have the Wrong Extruding Head. Check the Extruder Type. Is it a Flaker or Cubelet style. (The cubelet style head will have smaller openings for the ice to extrude.)
3. Does the unit have the Wrong Cutter. The cutter should match the extruding head style. Flake or Cubelet.
4. Do you have a Damaged Extruder. Look for following imperfections. A. Dents B. Fins Bent C. Scale D. Other Resistance

Note: A dirty, or scaled up, evaporator can cause the gear motor fuse to blow.

5. Does the unit have the Correct Auger. Is the auger a dual flight auger? (Double Spirals) Check the parts breakdown for the correct auger style.
6. Check the Voltage Supply and circuit amperage. Is this unit on it's own dedicated circuit? The supply voltage should be within +/- 10% of the rated voltage when the unit is making ice.
7. Check the Running Voltage at the gear motor. (While the unit is making Ice.)
8. Inspect bearings for wear. (Use bearing gauge) Are the Bearings OK? If the upper bearing is worn, both bearings should be replaced.
9. Check Evaporator Cylinder/ Barrel for signs of scoring.
10. Is there any condensation dripping onto the Gear Motor windings? If yes, find the source and take action to stop the moisture.
11. Is the galvanized shield mounted over the motor assembly to protect from moisture?
12. Verify that you have the proper Gear Motor Capacitor.
13. Is the Gear Motor Locked. Check motor winding resistance.

2. Wrong Gear Motor Overload/Fuse: Check fuse size. Has the original overload reset been replaced with the wrong size and type fuse? The Flaker requires a slow blow type. Replacing it with a standard fuse will cause the fuse to blow again.

Note: Although it is common practice to install a larger fuse during service diagnosis, you should not leave a larger fuse in the unit when you leave the site. This could cause a seri-

Note: You should **never** jumper the fuse protector!

3. Miswiring

Is gear motor wired correctly and wire connections tight. Check the wiring diagram for the proper wiring.

4. Bin Control Switch Does Not Operate

Check the bin control operation. A bad or miswired bin control can cause ice to back up in the spout and chute and cause higher gear motor amperage. Is Bin Control wired correctly and are the wire connections tight?

Make sure there are no metallic components interfering with the magnetic bin control. Verify top panel is non-magnetic. Assure that the proximity switch is mounted properly. The switch must be secure and mounted level to the chute top. Does the Bin Control Paddle move freely and is it unobstructed?

Gear Motor Stress

As you can see, there are many factors that can cause a gear motor to fail. Every effort should be made to determine the cause for a gear motor failure when the gear motor is replaced. When looking for the cause of a gear motor failure, you should consider anything that will add stress to the assembly. Stress on the gear motor will increase the gear motor amperage and torque. The most common causes for stress is scale on the auger surface and evaporator walls. Scale insulates the evaporator walls and causes reduced heat transfer. As a result, the ice will be wet and mushy. This poor quality ice does not extrude well and tends to pack in the evaporator outlet and extruding head.

Heavy scale build up must be removed using an acid based cleaner which will loosen the scale. Follow the cleaning instructions provided on the cleaning label to preform a maintenance cleaning. If the unit has not been cleaned and maintained frequently, it may require you to pull the auger and clean the cylinder wall with a Scotchbrite pad & cleaner. The extruding head surface may also have heavy scale and can be cleaned with Scotchbrite & cleaner as well.

Loose bolts on the gear motor, housing, and extruding head can also cause stress. Always check to assure they are secure when conducting preventative maintenance.

Auger Bearings

Bearing Type: Sleeve/Alignment,

Bearing Material: Poly/Carbon

The bearings are pressed into the top extruding head and lower brass housing. A repress program is available through the local Hoshizaki Distributor for undamaged extruding heads and housings. The bearings should always be replaced as a set. Return the extruding head and housing to your distributor for an exchange set or to be returned for repressing.

Bearing Inspections

It is important to remember that bearings are a wear item. Annual bearing inspections are recommended. More frequent inspections may be necessary in poor water quality areas. The steps for bearing inspections are as follows:

- (1) Gain access to the ice chute head by removing the top panel and spout connectors as necessary. Use warm water to melt any ice in the evaporator if necessary.
- (2) Remove the thumbnuts which hold the ice chute head in place and lift it up and off of the evaporator (take care to place the O-ring in a safe location until you replace the head.)
- (3) Remove the stainless steel bolt holding the cutter or breaker in place and lift off to access the extruding head and auger shaft.
- (4) Replace the bolt into the auger shaft and use it to push the auger back and forth from left to right to check for excessive movement.
- (5) Pull the auger towards you and try to insert a .02" round stock or pin gauge in between the back side of the auger shaft and bearing surface. Check several locations around the auger shaft. If the gauge will go in between the shaft and bearing surfaces, it is time to install new bearings. Both top and bottom bearings should be replaced if the top bearing is worn. If there is no excessive movement in the auger shaft and the gauge does not fit, the bearings are okay. Replace the cutter, O-ring, ice chute head and connectors.

Auger Inspection / Bearing Replacement

A visual inspection of the auger bearing shaft surface is also

recommended annually in poor water areas. The steps for this inspection is as follows:

Note: If heavy scale is present the auger may be difficult to remove. In this case, you will find it helpful to clean the evaporator system following the instructions located on the Inside front panel, before you attempt to remove the auger.

- (1) Follow steps 1 through 5 of the bearing inspection procedure above.
- (2) Remove the (metric) Allen head cap screws with seals that secure the extruding head in place.
- (3) Thoroughly drain the water supply system.
- (4) Turn the cutter up-side down, replace the bolt and use the cutter to lift the auger out of the evaporator.
- (5) With the auger removed, remove the cutter and slide the extruding head from the top of the auger. Visually inspect the bearing surface at the top and bottom of the auger. Also inspect the auger flight and mechanical seal for any damage. The extruding head contains the top bearing, the bottom bearing is pressed into the brass housing at the bottom of the evaporator. To remove the housing:
- (6) To remove the housing: Remove the Allen screws that secure the evaporator to the housing.
- (7) Loosen the belly band screw and lift the evaporator up and off of the housing. Holding the evaporator up, re-tighten the belly band. This will hold the evaporator up so that you can remove the housing.
- (8) Remove the bolts that secure the housing to the gear motor assembly and remove the housing. The mechanical seal, ceramic disk and boot are pressed into the top of the housing. Remove these parts before you exchange the bearings. Exchange the extruding head and housing for a repressed set at your local distributor To replace the new parts, reverse the order above. Use a light coat of food grade silicone lubricant around the inside bottom of the evaporator and on the o-ring to and help keep it in place as you lower the evaporator.

Note: Do not use mineral oil as it can damage the o-ring material.

Inspect the mechanical seal thoroughly and reuse it, if it is in good shape. Take care not to get oil or dirt on the seal surfaces.

When replacing the bolts holding the extruding head, a good seal is important. Replace the bolts and seals if a damaged seal is present. All bolts should be torqued securely and checked during each preventative maintenance check, as severe temperature changes can loosen them. The seal between the drain pan and top of the evaporator is also important. Do not pull upwards on the evaporator drain pan. If seal is broken, reseal with silicone.

Flaker Safety's

Mechanical failures in an auger style ice machine can be time consuming and expensive repairs. Hoshizaki has incorporated several safety's in our Flaker and DCM units which add protection against this type of failure.

The following safety's are included in all Hoshizaki F and DCM units:

1. **Low water safety:** Designed to protect against dry operation or possible freeze up in the evaporator due to low water flow. This safety utilizes the dual float switch and a 90 second timer to shut down the unit when water flow is interrupted. The unit will automatically restart when water flow is resumed.
2. **Protect relay safety:** This safety incorporates a relay in the gear motor circuit and will not allow the refrigeration system to operate unless the gear motor is running. If the gear motor fails during normal operation, the protect relay shuts down the compressor to protect against evaporator freeze-up.
3. **Gear motor circuit safety's:** The gear motor has 2 additional safety's which will operate if the gear motor is subjected to excessive load or improper voltage. A current type manual reset safety or slow blow fuse is located in the control box and will trip when the gear motor amperage exceeds normal amp draw. This acts as a primary safety for the gear motor. A secondary internal thermal overload is included in the motor windings. Both will work in conjunction with the protect relay to shut the unit down.

The gear motor current protector serves as a back-up for the bin control on other models. These safety's protect the Flaker or DCM models from internal failures.

4. **Voltage protect relay:** This relay will shut the unit off in case of a voltage surge and automatically restart the unit when the voltage is correct.
5. **High pressure switch:** All Hoshizaki ice machines include an automatic reset high pressure safety switch to shut down the unit in case of high head pressures.
6. **Fuse protection:** A lamp buss-type fuse is utilized in the control circuit. Smaller units like the DCM-240 and F-300 have a fuse in the incoming power circuit.
7. **Short cycle protection timer:** A 1 minute time delay is included in the start-up sequence to protect against short cycling the gear motor or compressor.
Note: The FD has a 5 minute time delay.
8. **Compressor protection** is provided either internally or by means of an external motor circuit protector. This is an automatic reset thermal type circuit breaker.
9. **Some F-1500/2000 have a spout safety control** to shut down the unit if the bin control fails for any reason. This is a manual reset safety and will notify the technician by means of a indicator light on the control box. To reset this safety, turn the control switch OFF and back ON. This re-sets the holding relay circuit and turns off the light.

Note: This feature was removed from F-1500/2000M in late 2009 production and after.

Dual Float Switch

Hoshizaki float switch, part number 435490-01 can be used as a universal replacement on any Hoshizaki Flaker or DCM model in the field excluding the C-100BAE-AD. It now subs for all previous float switch numbers in our parts system.

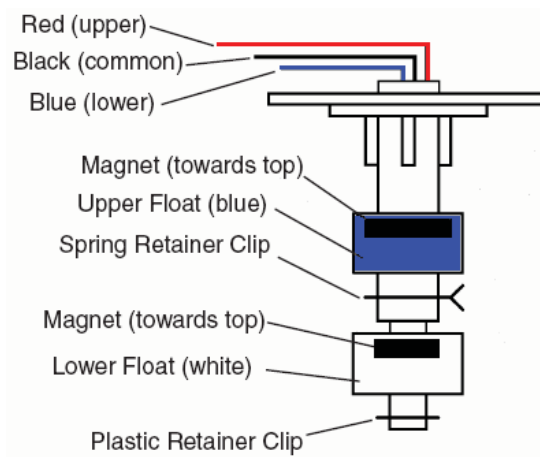
Since the float switch is mounted into the water reservoir, it is susceptible to scale build-up. The amount of scale build-up will depend on the local water quality. Scale on the switch shaft can cause the floats to stick. This will effect the unit operation. In this case, the float switch should be cleaned and checked.

The float switch is held in place on the top cover by a twist lock bracket. To remove it, twist the switch flange and lift. Soak the switch assembly in ice machine cleaner. While it is not necessary to do so, some technicians remove the floats

from the shaft during cleaning. If you remove them, note that the blue float is on top. Also it is important to clearly mark the top of the floats so that they can be replaced correctly. The magnet side should always be at the top of the float when it is reassembled. (See drawing below). Installing the floats upside down will effect the timing of the float switch operation. Once clean, rinse and wipe the cleaner off and check the switch with a good quality ohm meter.

This float switch has three wires (the black wire is common) and two separate switches. Check the top switch by ohming out the black and red wires. When the float is up the switch should be closed. Check the bottom switch by ohming out

Dual Float Switch Drawing



Flaker Water Fill System

Standard Timer Board Models

The reservoir in a Hoshizaki auger type ice maker feeds water by gravity flow to the evaporator cylinder. The level of water in the reservoir is maintained by the operation of the dual float switch.

The dual float switch assembly is made up of two reed switches inside of a sealed shaft. The reed switch contacts are operated by individual magnets attached inside the top of the two separate floats.

As ice is made and extruded from the evaporator cylinder, the water level in the reservoir drops. When the level drops, the top float opens the top switch contacts (considered a latching circuit). Opening these contacts allows the bottom float switch control of the water control relay in the control circuit. As the water level continues to drop, the bottom float contacts open to de-energize the water control relay.

De-energizing the water control relay closes a circuit to supply 24 volts to the inlet water valve solenoid. This allows water to fill the reservoir. It also opens a circuit to the timer board (terminals 3 & 4) which starts a 90 second low water safety shutdown timer.

When the water supply is available, the reservoir refills. As the reservoir level rises, these two switches swap jobs. The bottom float is now the latching circuit and the top float re-energizes the water control relay. This will stop the safety timer and shut off the water flow to the reservoir.

If no water is available, i.e. the filter or screen is stopped up or the water supply is turned off, the unit cycles down and the water valve remains energized. This same action occurs if the inlet water valve fails. When the water supply is restored, the reservoir fills and the top float switch re-energizes the water control relay to automatically restart the unit. This system provides a consistent water level in the reservoir and evaporator as well as providing an automatic reset low water safety protection.

Since the float switch is mounted into the water reservoir, it is susceptible to scale build-up. The amount of scale build-up will depend on the local water quality. Scale on the switch shaft can cause the floats to stick. This will effect the unit operation. In this case, the float switch should be cleaned and checked.

Flaker Timer Board

This standard solid state timer board part #437305-01, is used on all F-models and the DCM-270BAH model. It is a simple electronic sequence timer. In order for the board to sequence, certain circuits must be closed. In order to diagnose a bad timer board, it is necessary to check these circuits to assure they are operating properly. If you are trouble-shooting a timer board, the first thing you should check is the incoming control voltage. All Hoshizaki flakers have a 24 volt control transformer. The output of this transformer is protected by a 1 amp buss type fuse. Control voltage comes in the timer board on pins 1 & 2. If you do not have 24 volts at pins 1 & 2, check the transformer and fuse.

After the reservoir fills, check for 24 volts (some models may be 120V) across pins 8 & 2. If voltage is present, the timer board has cycled up to energize the gear motor circuit which indicates there is not a problem in the timer board. The problem may be in the gear motor relay circuit. Remember that there is a time delay from the time you turn the unit on to the time it cycles up completely. This time will be from 1 ~ 2.5 minutes, depending on the unit model.

In order for the flaker to start up, the reservoir must be full and both float switches must be closed. This closes the control circuit to pins 3 & 4. Do not confuse these pins with the line voltage terminals marked 3 & 4 on the compressor relay located on the board. You can check this circuit with a volt meter across the pins or by placing a jumper across them. If the unit cycles up with the jumper in place, the board is good and your problem is in the water relay control circuit.

Note: In self contained models, the bin control will be in series with terminals 3 & 4. Check the bin control operation if this circuit is open and the water control relay is closed.

Next, you should check the bin control circuit at pins 5 & 6. Check for a closed circuit with a volt meter or place a jumper across them. If the unit cycles up with the jumper in place, the board is good and the bin control circuit is the problem.

The last circuit check is across pins 10 & 11. These pins connect to the gear motor protect relay and will shut down the unit if the gear motor fails. Check for a closed circuit with a volt meter or place a jumper across them. If the unit cycles up with the jumper in place, the board is good and the gear motor protect circuit is suspect.

Flaker Sequence of Operation

The Hoshizaki Flaker utilizes a solid state sequence timer board to switch the components on and off as needed. This sequence of operation is accomplished through a series of timers within the solid state timer board.

The sequence for the standard timer board is as follows:

With proper voltage and water supplied to the Flaker and the flush and ice switch is in the ice position, power is supplied to the inlet water valve. The unit will not start unless the reservoir is full and both floats on the dual float switch are closed (in the up position). The operation is then turned over to the bin control. If the bin control is closed and calling for ice, the gear motor and condenser fan motor are energized. One minute later, the compressor starts. As the refrigeration system cools the water in the evaporator, ice will start to form within 2 to 5 minutes. This depends on the inlet water temperature and ambient conditions. Ice production will continue until the bin control is satisfied (opens). The shut down process is very simple. On the F-450/801/1001/1500/2000 units, the entire unit shuts down within 6 seconds after the bin control switch opens. On the F-330, 90 seconds after the bin control switch opens, the compressor and fan motor stops, one minute later the gear motor stops.

Flaker Periodic Flush

Beginning with the F-450M and larger flakers, a periodic flush cycle is included. A 12 hour mechanical timer will cycle the unit down and open the flush valve which allows the complete water system to drain. The unit will remain off for 15 minutes which allows any ice remaining in the evaporator to melt and flush the evaporator walls and mechanical seal out. The inlet water valve is not energized during this flush period. The unit will automatically restart after 15 minutes on the flush timer.

The F-330B will flush when the bin control is open.

FD Flush

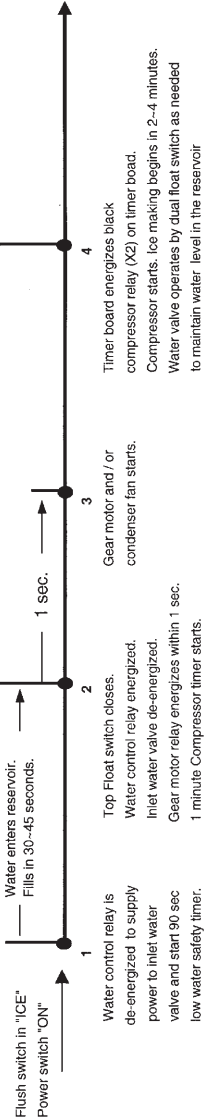
On the FD control board, the unit does not shut down to flush. There are 2 settings available:

1. The drain valve will open for 2 seconds every hour and the unit continues to operate.
2. Every 12 hrs. the unit will cycle down and allow for a 10 minute drain cycle.

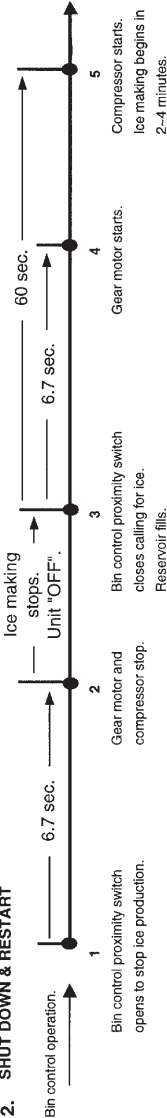
Either option can be selected by a dip switch adjustment.

Flaker Sequence Flow Chart (Standard timer)

1. INITIAL START UP.



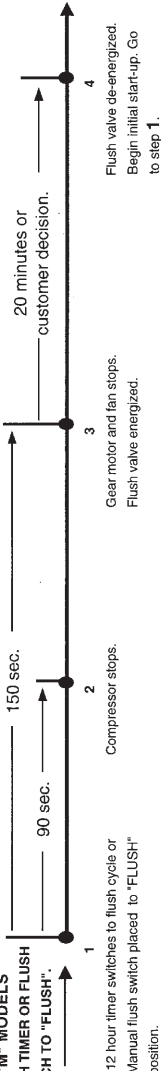
2. SHUT DOWN & RESTART



Flush/Low Water Safety Flow Chart (Standard timer)

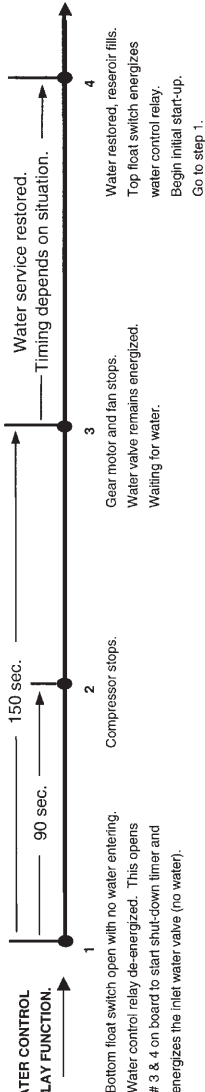
3. "M" MODELS

FLUSH TIMER OR FLUSH SWITCH TO "FLUSH".



4. LOW WATER SAFETY.

WATER CONTROL RELAY FUNCTION.



New FD Control Board

The FD-1001MAH-C unit has a new control board design. The design incorporates the necessary circuitry for use on the DCM models at a later date. For now, it is utilized on the FD-1001MAH-C model only. It has additional safeties, longer delay timers, audible alarms and dip switch adjustments for flexibility between models.

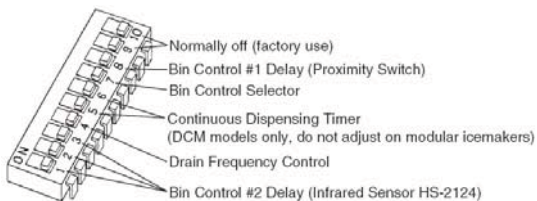
The control board part number is 2A4296-01. The following alarms are included. The alarm will repeat every 5 seconds until reset.

****To reset the manual alarms, turn the power OFF and Back ON.**

1. **1 Beep - Low Water Safety** – This alarm will occur if water supply is interrupted. It will automatically reset when water supply is restored.
2. **2 Beep - Control Switch in DRAIN position** – This alarm will occur if control switch is left in the DRAIN position for more than 15 minutes. It will automatically reset when control switch is moved to ICE.
3. **3 or 4 Beep - High Pressure Alarm**
 - a. A 3 beep alarm will occur if HP switch activates (opens) first or second time in 1 hour. Unit will shut down and alarm will automatically reset when HP switch closes.
 - b. A 4 beep alarm will occur if HP switch activates third time in 1 hour. The machine will shut down and must be manually reset. The high pressure issue must be resolved in this case.
4. **5 Beep – Freeze Timer Alarm** – This alarm will occur if lower float switch does not open to refill reservoir within 30 minutes of the upper float switch closing. The machine will shut down and must be manually reset and system diagnosis is required.
5. **6 Beep – Low Voltage Alarm** – If supply control voltage drops to 92 volts +/- 5% unit will shut down to protect the components and Power OK LED will turn off. Alarm will automatically reset when voltage corrects.

6. **7 Beep – High Voltage Alarm** – If control voltage reaches 142 volts +/- 5% unit will shut down to protect the components and Power OK LED will turn off. Alarm will automatically reset when voltage corrects.
7. **8 Beeps – Gear Motor Alarm** – Occurs if gear motor-protect relay circuit operates, compressor and gear motor will stop. Manually reset after checking gear motor circuit.
8. **9 Beeps – Bin Control Alarm** – Occurs if unit shuts down on bin spout control and infrared sensor is calling for ice. Manually reset and check infrared bin control operation.

Adjustable dip switches are provided on this control board. These dip switches will allow flexibility in the board application. This control board will be used for other models at a later date. They function as follows:



For the FD unit application, the factory setting is switches 1~7 OFF, 8 ON, 9 & 10 OFF. These dip switches should remain in the factory setting for proper operation of this model.

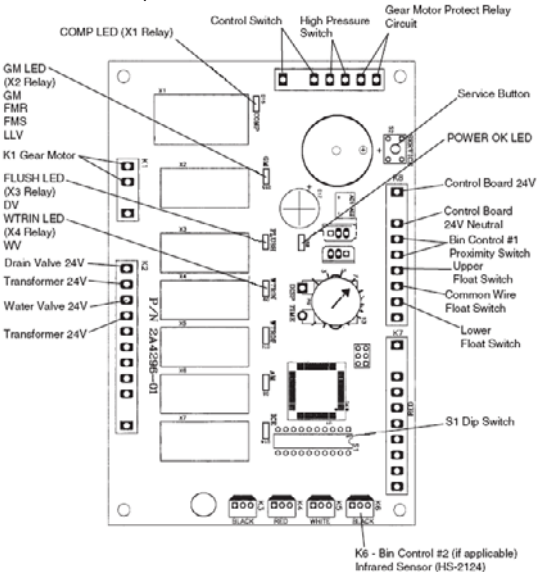
FD Board S1 Dip Switch Adjustment Chart

Dip switch				
1	2	3	Delay Timer Setting	
OFF	OFF	OFF	0 Seconds	
ON	OFF	OFF	100 Seconds (1.6 minutes)	
OFF	ON	OFF	1100 Seconds (18.3 minutes)	
OFF	OFF	ON	1650 Seconds (27.5 minutes)	
ON	ON	OFF	2200 Seconds (36.7 minutes)	
OFF	ON	ON	0 Seconds	
ON	ON	ON	0 Seconds	
4			Drain Timer Interval	Drain Valve Open
OFF			1 hr	2 secs
ON			11 hrs 36 min	10 mins
5	6	Dispense Time (DCM's ONLY)		
OFF	OFF	No limit		
ON	OFF	20 Seconds		
OFF	ON	60 Seconds		
ON	ON	No Limit		
7			Bin Control Application	
OFF			Mechanical Spout Safety Switch Only	
ON			Mechanical Spout Safety Switch and Infrared Sensor	
8			Mechanical Spout Safety Shut-down Delay	
OFF			0.25 Seconds	
ON			6.7 seconds	

**See FD service manual for more details on sequence of operation and service diagnosis of the FD board and product.

FD Control Board Drawing

This pictorial will allow you to locate the board component locations. Since this is a new board, it will help you become more familure with the board. You will see this board used on future flaker products.

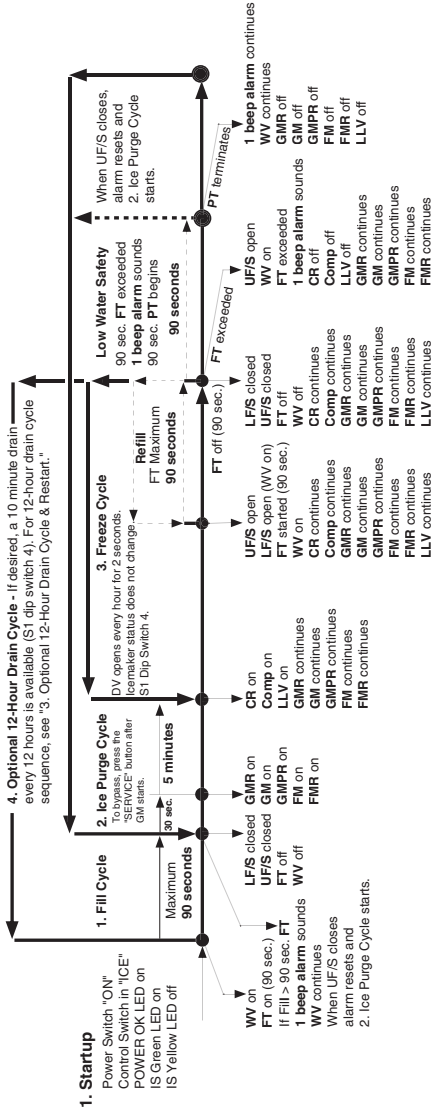


FD Sequence Chart

Sequence Step	LED
1. Fill Cycle	Power OK, WTRIN (Water in)
2. Ice Purge Cycle	Power OK, GM
3. Freeze Cycle	Power OK, GM, COMP, WTRIN* (refill)
4. Drain Cycle	Power OK, DRAIN

Step	Energized Components	Min	Max
1.	WV		
2.	GM, FMS, FMR, LLV	5 min.	5 min.
3.	GM, COMP, FMS, FMR, LLV WV* (refill)	* 20 sec.	* 90 sec.
4.	DV (S1 Dip Switch 4)>>	2 sec.	10 min.

FD Bin Control #2 (infrared sensor) Sequence Flow Chart and Operation

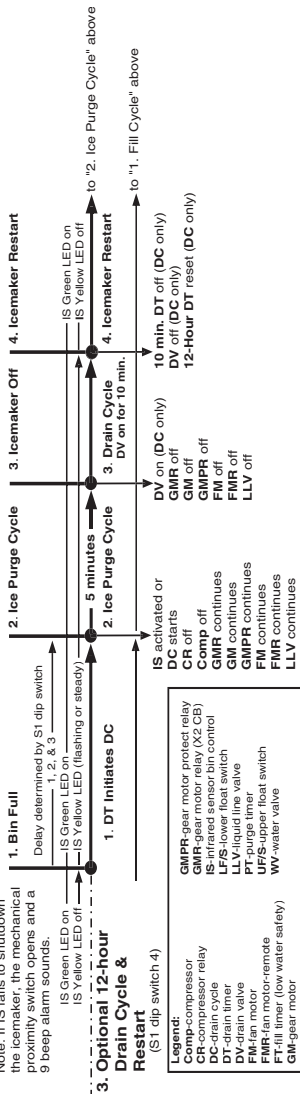


Note: When proximity switch bin control is used, step 2 does NOT include 30 sec gear motor delay.

FD Bin Control #2 (infrared sensor) Sequence Flow Chart and Operation (continued)

2. Infrared Sensor Shutdown & Restart

Note: If IS fails to shutdown the icemaker, the mechanical proximity switch opens and a 9 beep alarm sounds.



Note: When proximity switch bin control is used unit shuts down in 6 seconds and restarts when ice level drops away from control paddle.

DCM Sequence of Operation

DCM sequence for the ice making unit is similar to the F-330B with a delay of the compressor at start up and a delay of the gear motor at shut down.

A periodic flush is also incorporated in the DCM units. Also, all DCM models have periodic agitation in the bin to eliminate ice bridging. The DCM-270 model uses a solid state relay to turn the gear motor for .2 seconds every 90 minutes. On DCM-500 /750B models, the solid state timer board will start the agitation motor for .6 seconds every 12 seconds of accumulated dispensing time. A full explanation of the DCM sequence of operation can be found in the unit service manual.

Note: The DT-400BAH-0S is a new dispenser model. The refrigeration system is mounted in the bottom of the unit and the dispenser is on top. This allows a DCM type dispenser that is 22.5" wide and 72.5" tall. The operation will be the same as a standard DCM-500B. A replacement refrigeration system DT-400-AR is available for this model.

Flaker/DCM Production Check

Performing a production check is an excellent way to prove proper F/DCM operation. Checking the production on these models is a simple process.

To check the production you will need a small trash bag, bucket or pan to catch the ice and a set of scales to weigh the ice.

For best results, you should always check production on a unit that has a cold evaporator. After the unit has operated for 10 to 20 minutes, catch the ice production directly from the evaporator for 10 full minutes. Weigh the ice to establish the batch weight. Multiply the batch weight by 144 for the total production in 24 hours.

Some prefer to catch the ice for 20 minutes and multiply the weight by 72 for a more realistic production check. It is true that a longer catch is more accurate however, it doubles your test time and may only show a 1 to 2% difference in total production.

Once you know the 24 hour production, check it against the unit specifications for your ambient and inlet water conditions on the performance data chart. If the production is within +/- 10% of the data on the chart, it is OK.

DCM-500/750B_H Timer Board

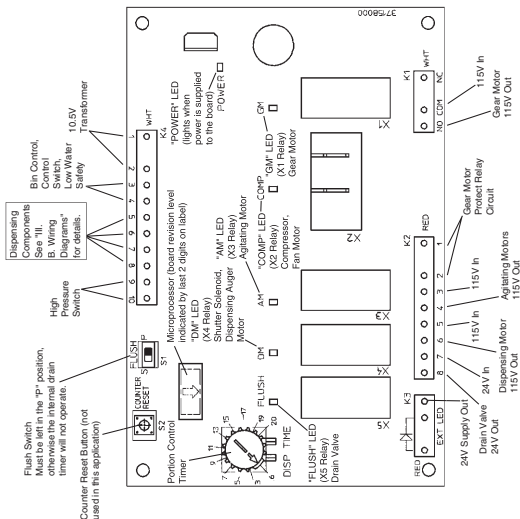
This timer board allows the DCM to operate as per the sequence flow chart.

The DCM 500/750B_H timer board includes the following safeties:

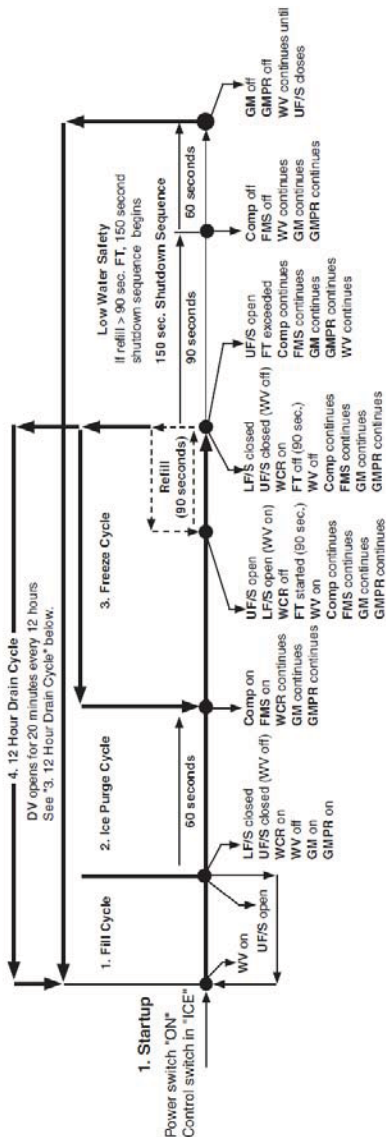
- A. **Low Water Safety** - Automatic shutdown and restart if water supply is interrupted.
- B. **Ice Purge** - Allows gear motor delay to remove ice from the evaporator during shut down.
- C. **Short Cycle protection** for the compressor - Delays restart of compressor if unit is switched off and on or if power is interrupted.
- D. **Power LED** - Indicates control voltage is available.

*Flush switch MUST remain in the P position.

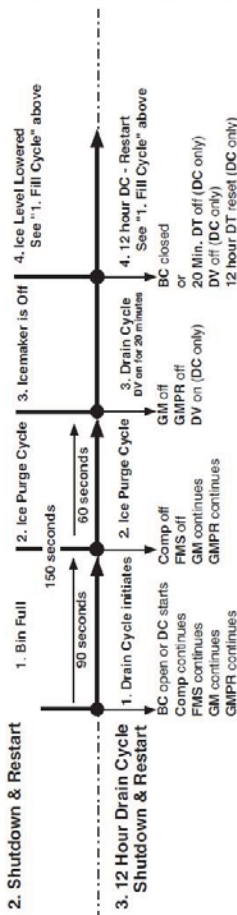
*The portion control adjustment is set from the factory at 0.6 seconds of dispense time. Each second equals approximately 1.2 oz of ice dispensed.



DCM-500/750B_H Timer Board Flow Chart



DCM-500/750B_H-OS Timer Board Flow Chart (continued)



Legend:
 BC - bin control
 Comp - compressor
 DC - drain cycle
 DT - drain timer
 DV - drain valve
 FMS - self-contained fan motor
 FT - fill timer (low water safety)
 GM - gear motor
 GMPR - gear motor protect relay
 LF/S - lower float switch
 UF/S - upper float switch
 WCR - water control relay
 WV - inlet water valve

Components Energized when the Control Switch is in the "DRAIN" Position
 The "DRAIN" position on the control switch is used when cleaning and sanitizing the unit. This allows cleaner and sanitizer to drain from the reservoir and evaporator assembly. When switching to the "DRAIN" position during the freeze cycle, the drain valve does not energize until the 150 second shutdown sequence terminates (2. Shutdown & Restart).
 Note: To bypass the 150 second shutdown sequence, move the power switch to the "OFF" position, place the control switch in the "DRAIN" position, then move the power switch back to the "ON" position.

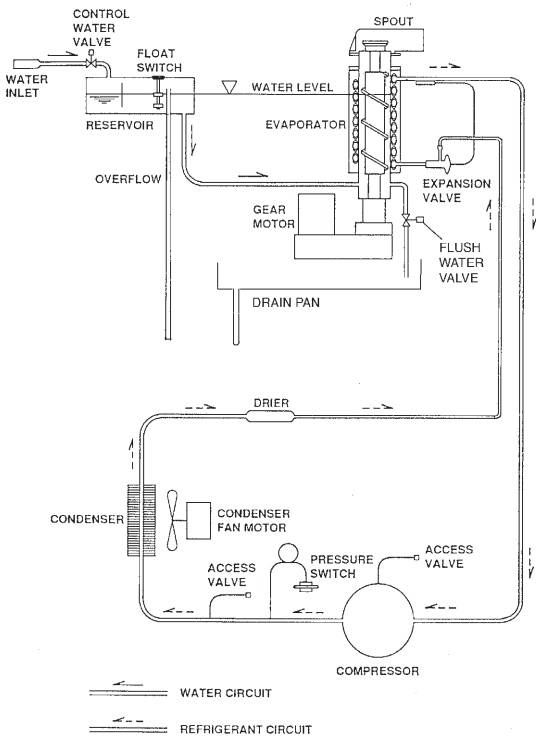
**Flaker/DCM Water/Refrigeration Circuit
Drawing Reference List**

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NOTE: Some drawings have been combined to represent more than one model.

A

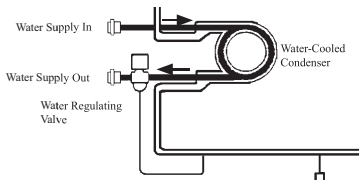
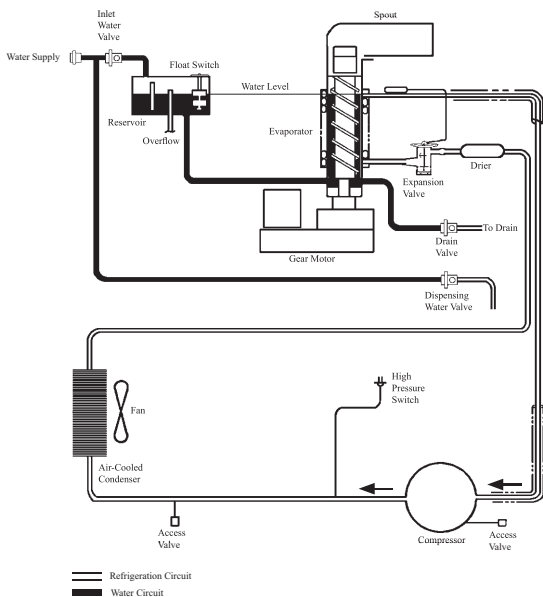
DCM-270BAH-OS



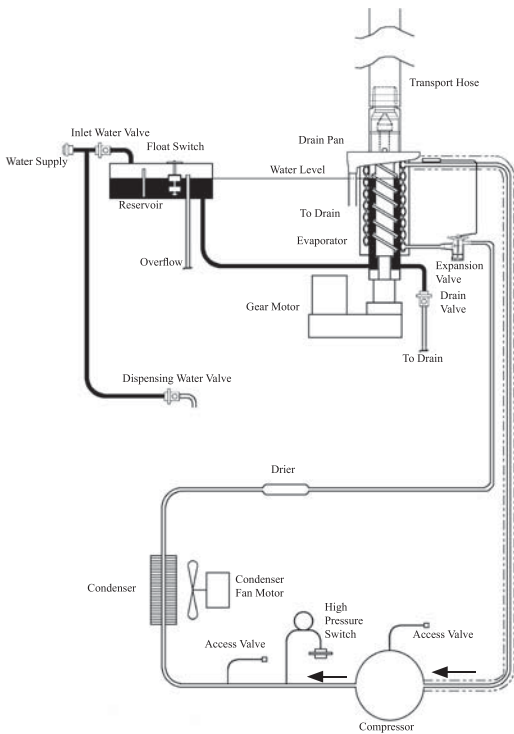
B

DCM-500BAH/BWH-OS

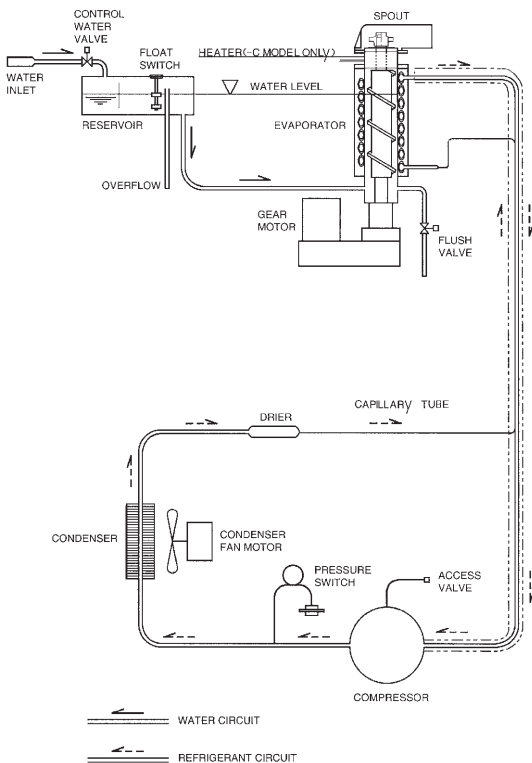
DCM-750BAH/BWH-OS



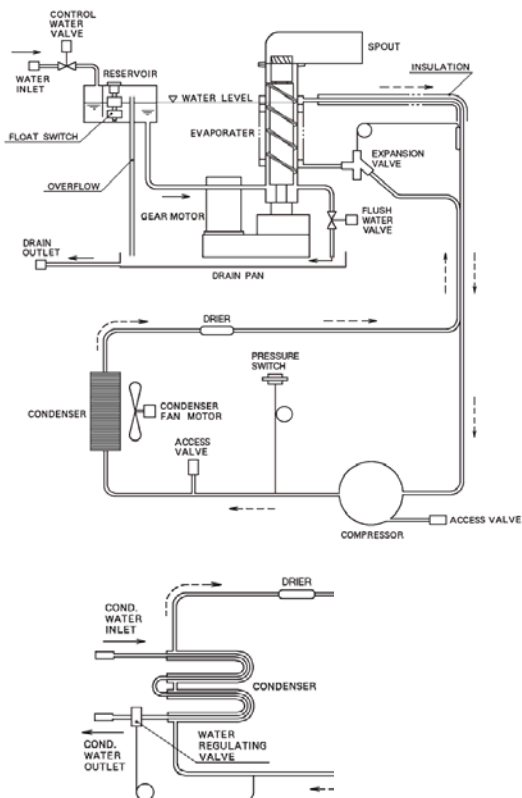
C
DT-400BAH-OS



D F-330BAH

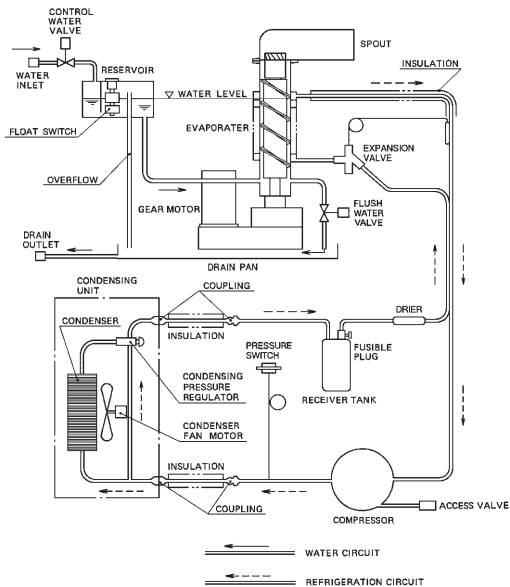


E
F-450MAH, F-800MAH/MWH,
F-801MAH/MWH, F-1001MAH/MWH,
FD-1001MAH/MWH-C,
F-1500MAH/MWH



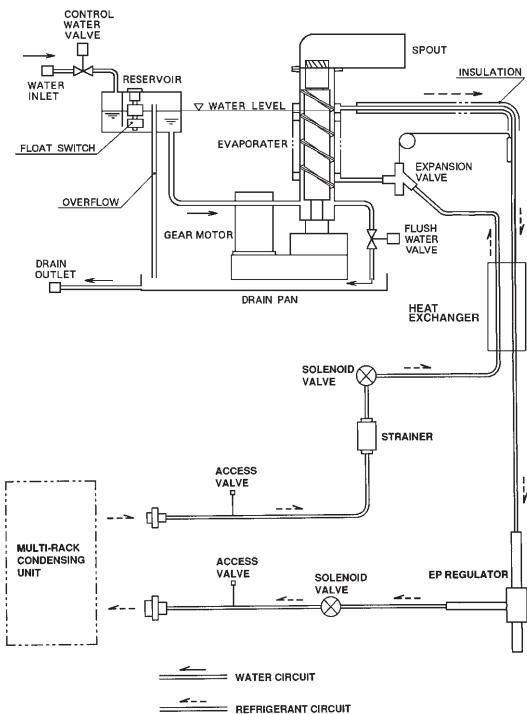
F

F-1001MRH FD-1001MRH-C

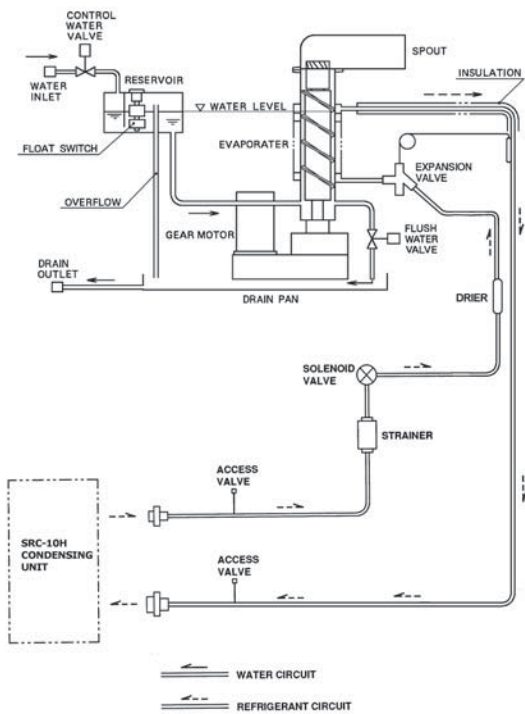


G

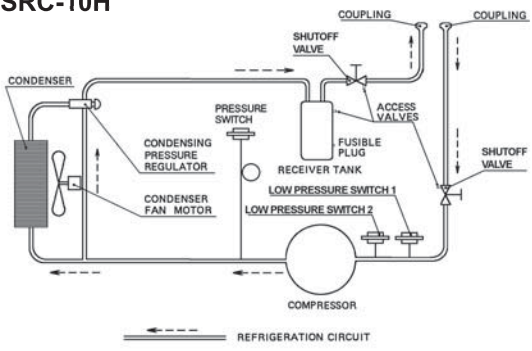
F-1001MLH



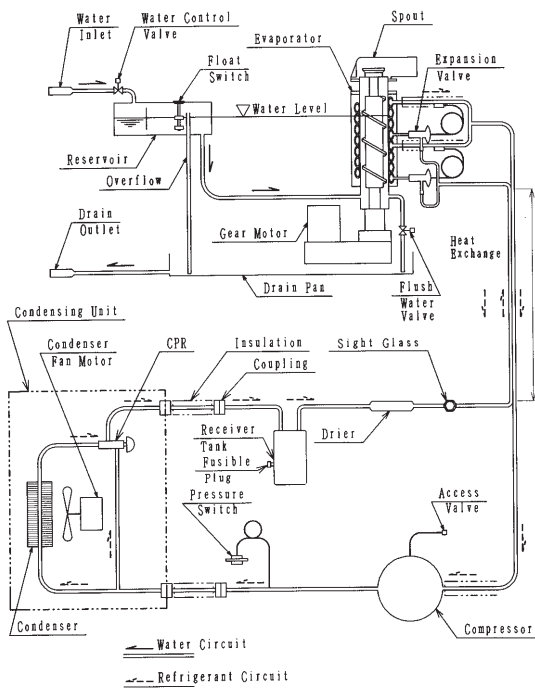
H FS-1001MLH



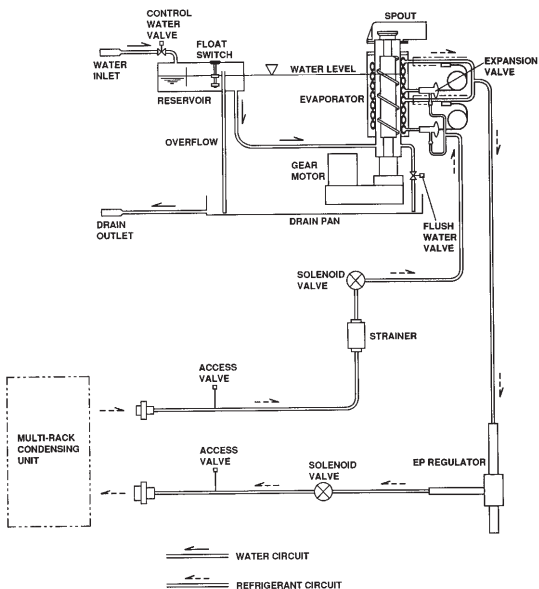
SRC-10H



J F-2000MRH



K F-2000MLH



PERFORMANCE DATA

MODEL: DCM-270BAH (-OS)

Total Amperage (Compressor RLA): 8.5A (6A)

Supply Voltage: 115/60/1

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	282	248	219	192
	70 / 21	271	238	215	184
Evaporator Outlet temp.	90 / 32	259	228	201	172
	50 / 10	20	20	23	24
	70 / 21	20	23	23	24
Pressure High Side	90 / 32	20	23	24	24
	50 / 10	217	251	285	327
	70 / 21	217	251	285	327
Pressure Suction	90 / 32	217	251	285	327
	50 / 10	37	40	43	46
	70 / 21	37	40	43	46
	90 / 32	37	40	43	46

PERFORMANCE DATA

MODEL: DCM-500B_H(-OS)

Total Amperage (Compressor RLA): BAH 11.5A (7.9A)

BWH 10.5A (7.9A)

Supply Voltage: 115/60/1

Water Consumption for BWH Condenser: 70/50 (21/9) 251 Gal/24hrs

90/70 (32/21) 352Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	535	567	461	529	396	500	340	472
	70 / 21	510	549	438	519	385	495	323	464
	90 / 32	485	539	416	509	358	481	304	428
Evaporator Outlet Temp.	50 / 10	23	19	23	19	26	19	28	19
	70 / 21	23	19	26	19	26	19	28	19
	90 / 32	23	19	26	19	28	19	28	19
Pressure High Side	50 / 10	230	266	264	266	297	266	335	266
	70 / 21	230	267	264	267	297	267	335	267
	90 / 32	230	270	264	270	297	270	335	270
Pressure Suction	50 / 10	33	44	35	44	37	44	43	44
	70 / 21	33	44	35	44	37	44	43	44
	90 / 32	33	47	35	47	37	47	43	47

PERFORMANCE DATA

MODEL: DCM-750B_H (-OS)

Total Amperage (Compressor RLA):

BAH 15.7A (11.1A)

BWH 14.6A (10A)

Supply Voltage: 115/60/1

Water Consumption for BWH-OS Condenser:

70/50 (21/9)

325 Gal/24hrs

90/70 (32/21)

606 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		Water		Air		Water	
	50 / 10	803		744		684		662	
	70 / 21	770		719		645		654	
	90 / 32	726		708		608		640	
Evaporator Outlet Temp.	50 / 10	30		19		30		19	
	70 / 21	30		19		32		19	
	90 / 32	30		19		32		19	
Pressure High Side	50 / 10	249		265		280		265	
	70 / 21	249		267		280		267	
	90 / 32	249		266		280		266	
Pressure Suction	50 / 10	44		50		47		50	
	70 / 21	44		50		47		50	
	90 / 32	44		51		47		51	

PERFORMANCE DATA

Supply Voltage: 115/60/1

MODEL: DT-400BAH-OS

Total Amperage (Compressor RLA): Air: 11.5A (8A)

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Air	Air	Air
	50 / 10	409	354	308	268
	70 / 21	388	338	296	256
	90 / 32	370	322	281	242
Evaporator Outlet Temp.	50 / 10	15	16	17	19
	70 / 21	16	16	17	19
	90 / 32	16	17	18	20
Pressure High Side	50 / 10	236	236	236	236
	70 / 21	303	303	303	303
	90 / 32	342	342	342	342
Pressure Suction	50 / 10	30	30	30	30
	70 / 21	35	35	35	35
	90 / 32	38	38	38	38

PERFORMANCE DATA

MODEL: F-330BAH

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 6.7A (4.5A)

-C: 7.4A (5A)

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air		-C		Air		-C	
	50 / 10	330		320		290		275	
	70 / 21	315		300		280		265	
	90 / 32	300		290		270		250	
Evaporator Outlet Temp.	50 / 10	16		16		13		12	
	70 / 21	16		13		13		12	
	90 / 32	16		13		12		12	
Pressure High Side	50 / 10	320		299		279		212	
	70 / 21	320		299		279		212	
	90 / 32	320		299		279		212	
Pressure Suction	50 / 10	36		39		42		45	
	70 / 21	36		39		42		45	
	90 / 32	36		39		42		45	

PERFORMANCE DATA

MODEL: F-450MAH (-C)

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 11A (8.5A)

Ice Production per cycle: 7.5 lbs, 360 pcs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x .454 Production 24 hours (lbs)	Water Temp F°/C°								
	Air	-C		Air		-C		Air	
	50 / 10	484		424		380		372	
	70 / 21	462		406		365		362	
	90 / 32	442		389		350		341	
Evaporator Outlet Temp.	50 / 10	3		3				7	
	70 / 21	3		7				7	
	90 / 32	3		7				9	
Pressure High Side	50 / 10	225		256		286		324	
	70 / 21	225		256		286		324	
	90 / 32	225		256		286		324	
Pressure Suction	50 / 10	28		31		33		37	
	70 / 21	28		31		33		37	
	90 / 32	28		31		33		37	

PERFORMANCE DATA

MODEL: F-800/801M_H

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 11.7A (9.2A)

Water: 10.8A (8.5A)

Water Consumption for MWH Cond: 70/50 (21/10) F-800/801= 318/219 Gal/24hrs 90/70 (32/21) F-800/801 = 539/360 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10	823	720	711	661	613	616	528	573
	70 / 21	786	693	677	646	599	605	502	560
	90 / 32	748	677	644	630	555	587	471	520
Evaporator Outlet Temp.	50 / 10	15	17	16	19	17	20	19	20
	70 / 21	16	17	16	19	17	20	19	20
	90 / 32	16	18	17	20	18	20	20	21
Pressure High Side	50 / 10	204	265	204	265	204	265	204	265
	70 / 21	266	265	266	265	266	265	266	265
	90 / 32	302	266	302	266	302	266	302	266
Pressure Suction	50 / 10	38	42	38	42	38	42	38	42
	70 / 21	42	43	42	43	42	43	42	43
	90 / 32	46	44	46	44	46	44	46	44

PERFORMANCE DATA

MODEL: F-800/801M_H-C

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA):

Air: 13.3A (9/4A)

Water:11.53A (8.5A)

Water consumption for MWH-C Cond: 70/50 (21/10) F-800/801= 318/199 Gal/24hrs 90/70 (32/21) F-800/801 = 553/302 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Air	Water	Air	Water	Air	Water
	50 / 10 70 / 21 90 / 32	752 728 688	645 620 608	650 614 580	596 585 574	548 552 490	563 550 541	463 437 405	531 521 485
Evaporator Outlet Temp.	50 / 10 70 / 21 90 / 32	14 14 14	20 20 21	14 14 14	21 21 21	14 14 16	21 21 21	16 18 18	21 21 22
	50 / 10 70 / 21 90 / 32	200 212 219	263 263 264	226 233 241	263 263 264	249 265 265	263 263 264	273 282 296	263 263 264
Pressure High Side	50 / 10 70 / 21 90 / 32	38 41 42	46 46 47	42 42 42	46 46 47	43 43 43	46 46 47	43 44 48	46 46 47
	50 / 10 70 / 21 90 / 32								

PERFORMANCE DATA

MODEL: F-1001M_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 7.9A (7A)

Water: 7A (4.2A)

Remote: 10A (4.2A)

Water Consumption for MWH Condenser: 70/50 (21/10) 303 Gal/24hrs 90/70 (32/21) 480 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	970	890	930	855	820	835	755	770	750	665	720	675
	70 / 21	930	855	895	820	805	805	740	755	745	635	705	650
	90 / 32	890	840	865	785	785	780	695	735	700	595	655	605
Evaporator Outlet Temp.	50 / 10	19	23	23	19	23	25	23	23	26	25	23	28
	70 / 21	19	23	24	23	23	26	23	23	27	25	23	28
	90 / 32	19	25	25	23	25	26	25	25	28	25	25	28
Pressure High Side	50 / 10	213	263	221	244	263	239	274	263	256	315	263	295
	70 / 21	213	266	221	244	266	239	274	266	256	315	266	295
	90 / 32	213	269	221	244	269	239	274	269	256	315	269	295
Pressure Suction	50 / 9	32	33	33	35	33	35	38	33	36	41	33	39
	70 / 21	32	34	33	35	34	35	38	34	36	41	34	39
	90 / 32	32	35	33	35	35	35	38	35	36	41	35	39

PERFORMANCE DATA

MODEL: F-1001M_H-C
 Total Amperage (Compressor RLA): Air: 7.9A (4.2A) Water: 7A (4.2A) Remote: 10A (4.2A)
 Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)
 Water Consumption for MWH-C Condenser: 70/50 (21/10) 303 Gal/24hrs 90/70 (32/21) 492 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
	50 / 10	910	790	840	800	735	765	730	695	700	632	660	640
	70 / 21	860	760	810	770	720	745	680	685	695	610	645	620
	90 / 32	830	750	790	740	710	720	660	670	660	575	600	575
Evaporator Outlet Temp.	50 / 10	18	23	23	18	23	25	23	23	26	27	23	28
	70 / 21	18	23	24	23	23	26	23	23	27	27	23	28
	90 / 32	18	25	25	23	25	26	27	25	28	27	25	28
Pressure High Side	50 / 10	209	263	220	243	263	238	277	263	256	317	263	295
	70 / 21	209	266	220	243	266	238	277	266	256	317	266	295
	90 / 32	209	269	220	243	269	238	277	269	256	317	269	295
Pressure Suction	50 / 10	32	33	34	35	33	36	38	33	37	41	33	40
	70 / 21	32	34	34	35	34	36	38	34	37	41	34	40
	90 / 32	32	35	34	35	35	36	38	35	37	41	35	40

PERFORMANCE DATA

MODEL: F-1001MLH (-C)

Supply Voltage: 115/60/1

Total Amperage : 3.03A

This unit designed for connected to a rack system using R-404A. The data below is calculated.

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	-C	Remote	-C	Remote	-C	Remote	-C
	50 / 10	1150	1020	980	885	900	805	830	735
	70 / 21	1035	945	950	860	885	795	805	710
	90 / 32	1005	915	925	835	805	760	690	640
Evaporator Outlet Temp.	50 / 10	21		21		21		23	
	70 / 21	21		21		21		23	
	90 / 32	21		21		23		23	
Pressure High Side	50 / 10	106		125		143		166	
	70 / 21	106		125		143		166	
	90 / 32	106		125		143		166	
Pressure Suction	50 / 10	26		30		33		35	
	70 / 21	26		30		33		35	
	90 / 32	26		30		33		35	

Note: The data provided is calculated by using a refrigeration capacity of 5700BTU/h with a high side pressure of 213PSIG and suction pressure of 31.2 PSIG. The actual production and system operating pressures will vary depending on the specific R-404A rack system setup. Factory setting for the Evaporator Pressure Regulating Valve (EPR) is 32 PSIG for an evaporator temperature no less than 0 °F (-17.7 °C).

PERFORMANCE DATA

MODEL: FS-1001MLH-C

Supply Voltage: 115/60/1

Total Amperage (Compressor RLA): Low Side MLH: 3A SRC-10H condenser: 13.1A (9.6A)

Ambient Temp (F°/C°)		70 / 21	80 / 27	90 / 32	100 / 38
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Low Side	Low Side	Low Side	Low Side
	50 / 10	832	765	712	663
	70 / 21	803	747	703	647
	90 / 32	784	729	679	600
Evaporator Outlet Temp.	50 / 10	14	14	16	18
	70 / 21	14	16	16	18
	90 / 32	14	16	18	18
Pressure High Side	50 / 10	224	233	242	279
	70 / 21	224	233	242	279
	90 / 32	224	233	242	279
Pressure Suction	50 / 10	29	30	31	33
	70 / 21	29	30	31	33
	90 / 32	29	30	31	33

PERFORMANCE DATA

MODEL: F-1500M_H

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 16.25A (9.8A) Water: 15.9A (9.8A)

Remote: 18.9A (9.8A)

Water Consumption for MWH Condenser:

70/50 (21/10) 435 Gal/24hrs

90/70 (32/21) 675 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1590	1435	1585	1382	1335	1439	1206	1260	1309	1051	1185	1192
	70 / 21	1514	1390	1532	1321	1310	1394	1170	1245	1300	1005	1160	1155
Evaporator Outlet Temp. (F°)	90 / 32	1447	1360	1484	1262	1285	1351	1100	1210	1230	945	1075	1070
	50 / 10	16	25	19	16	25	19	18	25	21	19	25	23
	70 / 21	16	25	19	18	25	21	18	25	21	19	25	23
Pressure High Side	90 / 32	16	25	19	18	25	21	19	25	23	19	25	23
	50 / 10	210	262	215	240	262	228	270	262	240	310	262	275
	70 / 21	210	263	215	240	263	228	270	263	240	310	263	275
Pressure Suction	90 / 32	210	265	215	240	265	228	270	265	240	310	265	275
	50 / 10	35	40	36	38	40	38	40	40	40	42	40	42
	70 / 21	35	40	36	38	40	38	40	40	40	42	40	42
	90 / 32	35	41	36	38	41	38	40	41	40	42	41	42

PERFORMANCE DATA

MODEL: F-1500M_H-C

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Air: 16.25A (9.8A) Water: 15.9A (9.8A) Remote: 18.9A (9.8A)

Water Consumption for MWH-C Condenser:

70/50 (21/10) 435 Gal/24hrs 90/70 (32/21) 630 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100 / 38		
		Air	Water	Remote	Air	Water	Remote	Air	Water	Remote	Air	Water	Remote
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°												
	50 / 10	1300	1125	1335	1145	1050	1223	1011	1010	1123	892	980	1031
	70 / 21	1245	1075	1294	1099	1040	1188	990	975	1120	855	970	1002
Evaporator Outlet Temp.	90 / 32	1194	1060	1258	1054	1025	1155	930	990	1060	800	905	925
	50 / 10	16	24	19	16	24	19	18	24	21	19	24	23
	70 / 21	16	23	19	18	23	21	18	23	21	19	23	23
Pressure High Side	90 / 32	16	28	19	18	28	21	19	28	23	19	28	23
	50 / 10	210	264	215	240	264	228	270	264	240	310	264	275
	70 / 21	210	264	215	240	264	228	270	264	240	310	264	275
Pressure Suction	90 / 32	210	265	215	240	265	228	270	265	240	310	265	275
	50 / 10	35	40	36	38	40	38	40	40	40	42	40	42
	70 / 21	35	40	36	38	40	38	40	40	40	42	40	42
	90 / 32	35	43	36	38	43	38	40	43	40	42	43	42

PERFORMANCE DATA

MODEL: F-2000M_H (3)

Supply Voltage: 208-230/60/3

Total Amperage (Compressor RLA):

Water: 16.9A (10.8A)

Remote: 19.4A (10.8A)

Water Consumption for MWH Condenser:

70/50 (21/10) 981 Gal/24hrs 90/70 (32/21) 1374 Gal/24hrs

Ambient Temp (F°/C°)		70 / 21			80 / 27			90 / 32			100/38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote	(3)	Water	Remote	(3)	Water	Remote	(3)	Water	Remote	(3)
	50 / 10	2030	1990	2010	1876	1825	1845	1760	1685	1700	1650	1550	1550
	70 / 21	1955	1930	1950	1835	1775	1795	1730	1675	1695	1615	1510	1525
	90 / 32	1915	1880	1880	1795	1730	1750	1685	1595	1610	1500	1395	1410
Evaporator Outlet Temp.	50 / 10	11	12	14	11	12	14	11	12	14	11	14	14
	70 / 21	11	12	14	11	12	14	11	12	14	11	14	14
	90 / 32	11	12	14	11	12	14	11	14	14	11	14	14
Pressure High Side	50 / 10	262	221	219	262	230	230	262	238	241	262	274	271
	70 / 21	263	221	219	263	230	230	263	238	241	263	274	271
	90 / 32	265	221	219	265	230	230	265	238	241	265	274	271
Pressure Suction	50 / 10	26	25	25	26	26	26	26	26	27	26	29	29
	70 / 21	27	25	25	27	26	26	27	26	27	27	29	29
	90 / 32	28	25	25	28	26	26	28	26	27	28	29	29

PERFORMANCE DATA

MODEL: F-2000M_H-C

Supply Voltage: 208-230/60/1 (3 wire w/neutral for 115V)

Total Amperage (Compressor RLA):

Water: 10.8A (6.11A) Remote: 10.8A (5.6A) Low Side: 6.11A (N/A)

Water Consumption for MWH-C Condenser:

70/50 (21/10) 735 Gal/24hrs 90/70 (32/21) 1165 Gal/24hrs

Ambient Temp (F°/C°)			80/27			90 / 32			100 / 38		
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Water	Remote (3)	Water	Remote (3)	Water	Remote (3)	Water	Remote (3)	Water	Remote (3)
	50 / 10	1790	1715 (1725)	1670	1595 (1615)	1585	1500 (1515)	1510	1410 (1420)	1510	1410 (1420)
	70 / 21	1725	1660 (1685)	1640	1560 (1580)	1560	1490 (1525)	1485	1380 (1390)	1485	1380 (1390)
	90 / 32	1700	1630 (1650)	1615	1530 (1545)	1535	1435 (1450)	1375	1270 (1275)	1375	1270 (1275)
Evaporator Outlet Temp.	50 / 10	10	12	10	12	10	14	10	14	10	14
	70 / 21	10	12	10	14	10	14	10	14	10	14
	90 / 32	12	12	12	14	12	14	12	14	12	14
Pressure High Side	50 / 10	262	220	262	227	262	233	262	266	262	266
	70 / 21	263	220	263	227	263	233	263	266	263	266
	90 / 32	266	220	266	227	266	233	266	266	266	266
Pressure Suction	50 / 10	27	26	27	26	27	27	27	29	27	29
	70 / 21	27	26	27	26	27	27	27	29	27	29
	90 / 32	28	26	28	26	28	27	28	29	28	29

PERFORMANCE DATA

MODEL: F-2000MLH (-C)

Supply Voltage: 115/60/1

Total Amperage : 6.11A

This unit designed for connected to a rack system using R-404A. The data below is calculated.

Ambient Temp (F°/C°)		70 / 21		80 / 27		90 / 32		100 / 38	
Kg=lbs x.454 Production 24 hours (lbs)	Water Temp F°/C°	Remote	-C	Remote	-C	Remote	-C	Remote	-C
	50 / 10	2280	1965	2010	1755	1760	1565	1650	1500
	70 / 21	1955	1680	1835	1615	1730	1540	1615	1475
	90 / 32	1915	1660	1795	1585	1685	1515	1370	1245
Evaporator Outlet Temp.	50 / 10	12		12		12		14	
	70 / 21	12		12		12		14	
	90 / 32	12		12		14		14	
Pressure High Side	50 / 10	190		190		190		190	
	70 / 21	256		256		256		256	
	90 / 32	297		297		297		297	
Pressure Suction	50 / 10	16		16		16		16	
	70 / 21	21		21		21		21	
	90 / 32	22		22		22		22	

Note: The data provided is calculated by using a refrigeration capacity of 116000 BTU/h with a high side pressure of 22PSIG and suction pressure of 22 PSIG. The actual production and system operating pressures will vary depending on the specific R-404A rack system setup. Factory setting for the Evaporator Pressure Regulating Valve (EPR) is 22 PSIG for an evaporator temperature no less than -14 °F (-25 °C).

Flaker/DCM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Fan Capacitor	Gear Motor Capacitor
DCM-270BAH	A	272	145~174	None	None	10
DCM-270BAH-OS	B	273	145~174	None	None	10
DCM-500BAH, DCM-500BWH	C	274	243~292	15	5	20
DCM-500BAH-OS, DCM-500BWH-OS	D	275	243~292	15	5	20
DCM-750BAH, DCM-750BWH	E	276	189~227	25	5	24
DCM-750BAH-OS, DCM-750BWH-OS	F	277	189~227	25	5	24
DT-400BAH-OS	G	278	243~292	15	5	20
F-330BAH(-C)	H	279	280	None	None	10
F-450MAH(-C)	I	280	243~292	15	5	20
F-800MAH(-C), F-800MWH(-C)	J	281	189~277	25	5	12
F-801MAH(-C), F-801MWH(-C)	J	281	243~292	15	5	24
F-1001M_H(-C)	K	282	108~130	25	5	24

Flaker/DCM Wiring Diagram Reference Chart

Note: All capacitor values are in MFD

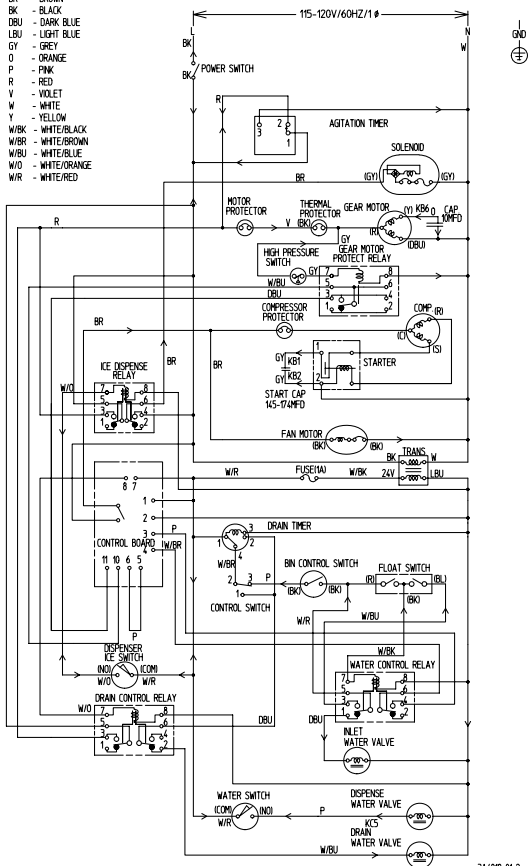
Model	Wiring Diagram	Page	Start Capacitor	Run Capacitor	Fan Capacitor	Gear Motor Capacitor
F-1001MLH(-C)	L	283	None	None	None	65
F-1500MAH(-C)	M	284	145~174	30	5	65
F-1500MWH(-C), F-1500MRH(-C)	N	285	145~174	30	10	65
F-2000MLH(-C)	O	286	None	None	None	65
F-2000MWH(-C), F-2000MRH(-C)	P	287	189~227	40	10	65
F-2000MWH3(-C), F-2000MRH3(-C)	Q	288	None	None	10	65
FD-1000MAH/MWH/MRH	R	289	108~130	25	5	24
FS-1001MLH-C	S	290	None	None	None	24
SRC-10H	T	291	189~227	30	10	None
C-100BAE-AD	U	292	PTA Relay	None	None	10

A

DCM-270 BAH

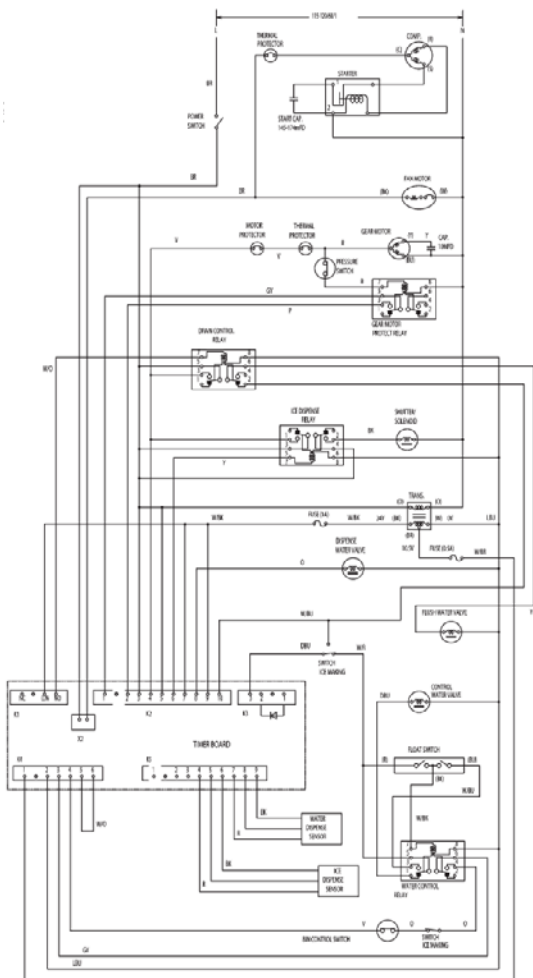
WIRE COLOR CODE

BR	- BROWN
BK	- BLACK
DBU	- DARK BLUE
LBU	- LIGHT BLUE
GY	- GREY
O	- ORANGE
P	- PINK
R	- RED
V	- VIOLET
W	- WHITE
Y	- YELLOW
W/BK	- WHITE/BLACK
W/BR	- WHITE/BROWN
W/BU	- WHITE/BLUE
W/O	- WHITE/ORANGE
W/R	- WHITE/RED



3A481B-01 2

B
DCM-270BAH-OS

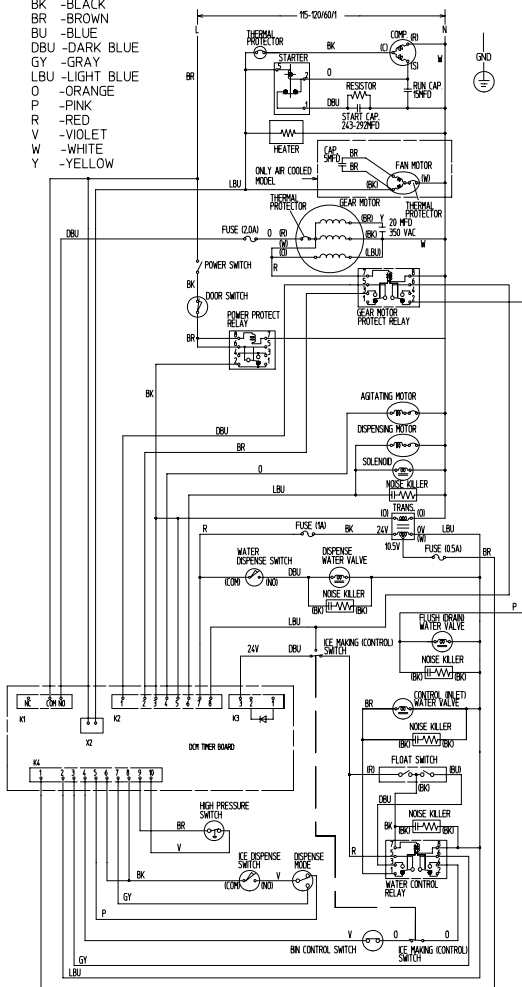


C

DCM-500 BAH, DCM-500 BWH

WIRE COLOR CODE

BK -BLACK
 BR -BROWN
 BU -BLUE
 DBU -DARK BLUE
 GY -GRAY
 LBU -LIGHT BLUE
 O -ORANGE
 P -PINK
 R -RED
 V -VIOLET
 W -WHITE
 Y -YELLOW



3A4468-012

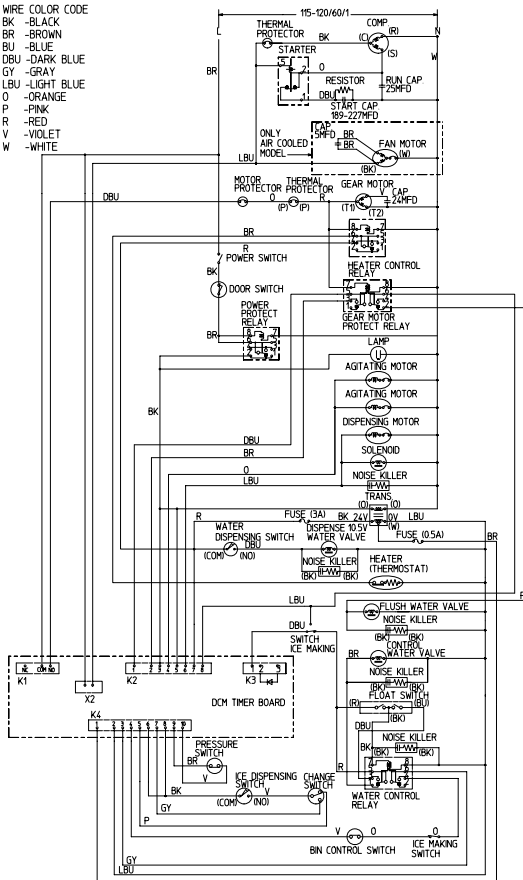
D



E

DCM-750 BAH, DCM-750 BWH

WIRE COLOR CODE
 BK -BLACK
 BR -BROWN
 BU -BLUE
 DBU -DARK BLUE
 GY -GRAY
 LBU -LIGHT BLUE
 O -ORANGE
 P -PINK
 R -RED
 V -VIOLET
 W -WHITE



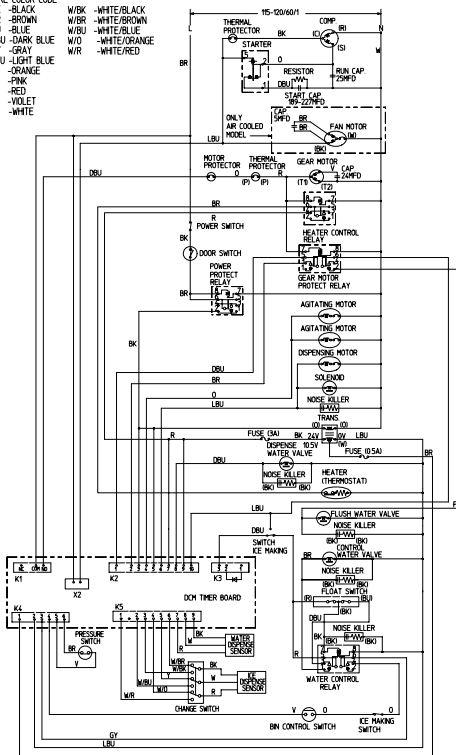
3A1530-011

F

DCM-750 BAH-OS, DCM-750 BWH-OS

WIRE COLOR CODE

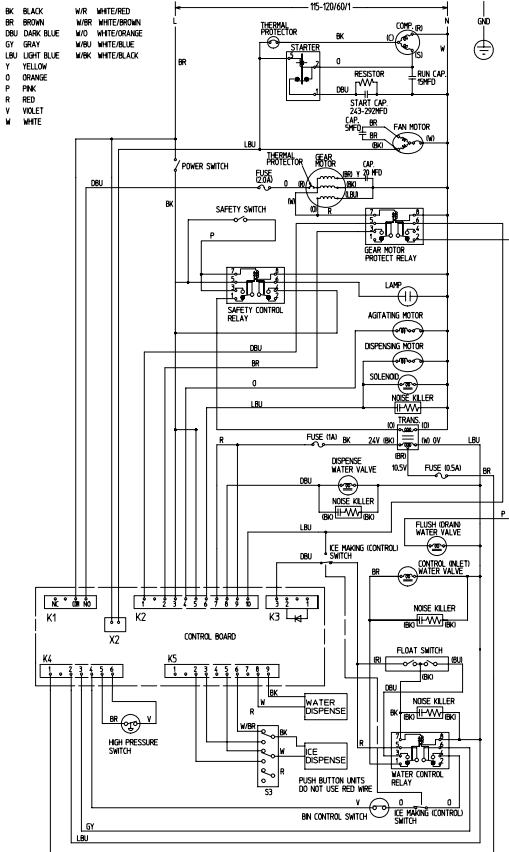
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BR	-BROWN	W/BR	-WHITE/BROWN
BU	-BLUE	W/BU	-WHITE/BLUE
DBU	-DARK BLUE	W/O	-WHITE/ORANGE
GY	-GRAY	W/R	-WHITE/RED
LBU	-LIGHT BLUE		
O	-ORANGE		
P	-PINK		
R	-RED		
V	-VIOLET		
W	-WHITE		



3A2567-010

G

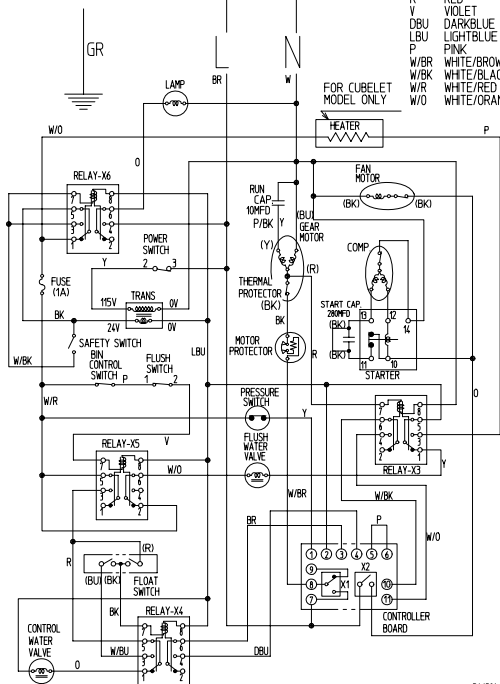
DT-400 BAH-OS



3A4822-011

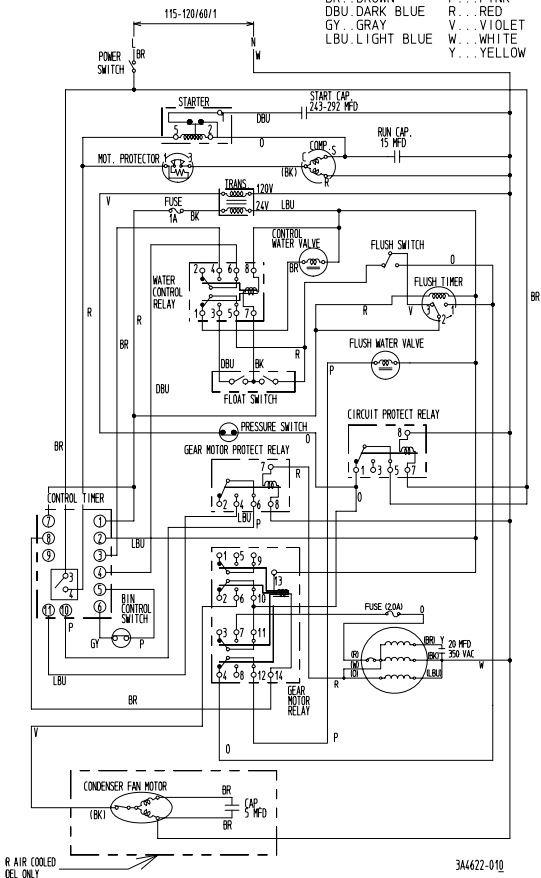
115-120/60/1

BR	BROWN
O	ORANGE
W	WHITE
BK	BLACK
BU	BLUE
Y	YELLOW
R	RED
V	VIOLET
DBU	DARKBLUE
LBU	LIGHTBLUE
P	PINK
W/BR	WHITE/BROWN
W/BK	WHITE/BLACK
W/R	WHITE/RED
W/O	WHITE/ORANGE

3A4301-01¹

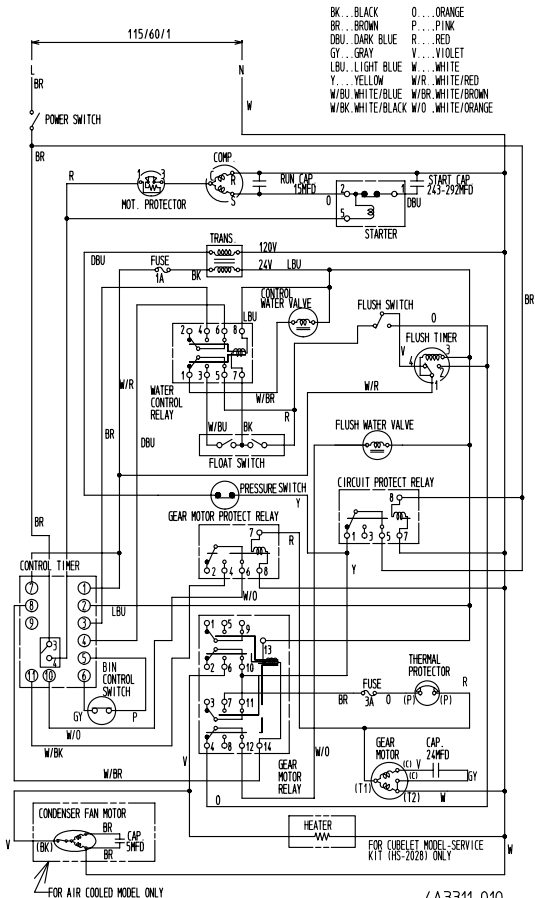
I F-450 MAH-C

BR...BLACK
BR...BROWN
DBU...DARK BLUE
GY...GRAY
LBU...LIGHT BLUE
O...ORANGE
P...PINK
R...RED
V...VIOLET
W...WHITE
Y...YELLOW



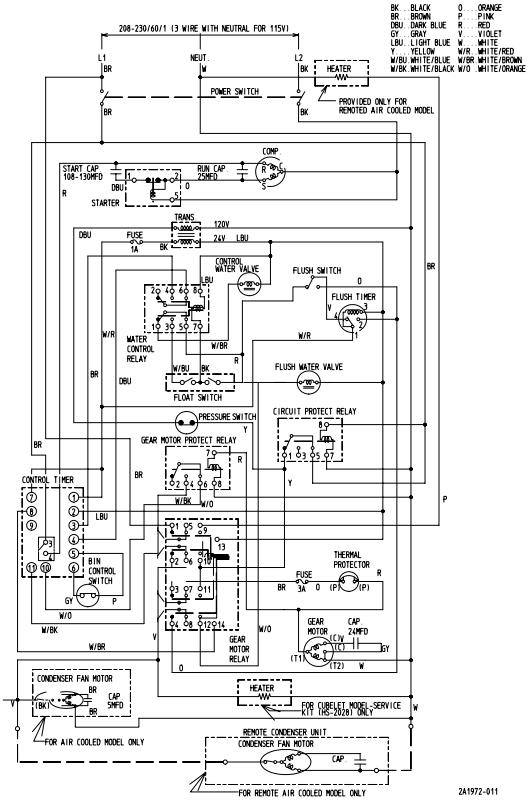
J

F-801 MAH/-C, F-801 MWH/-C



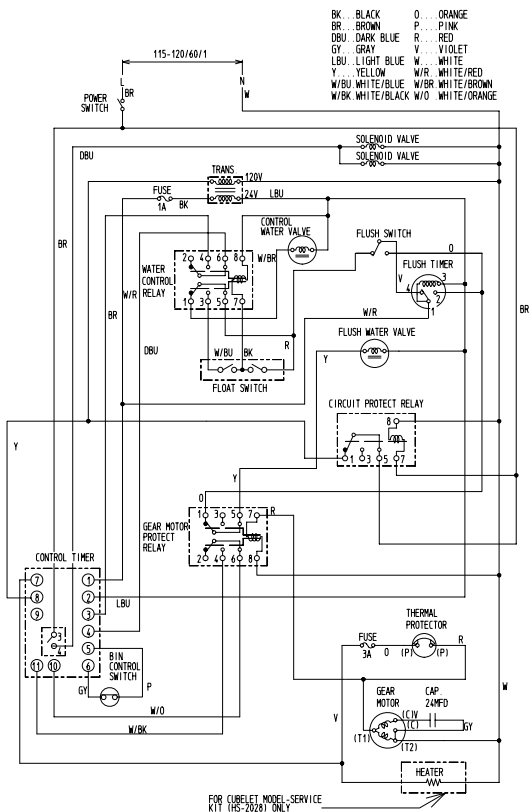
K

F-1001 MAH/-C, MWH/-C, MRH/-C

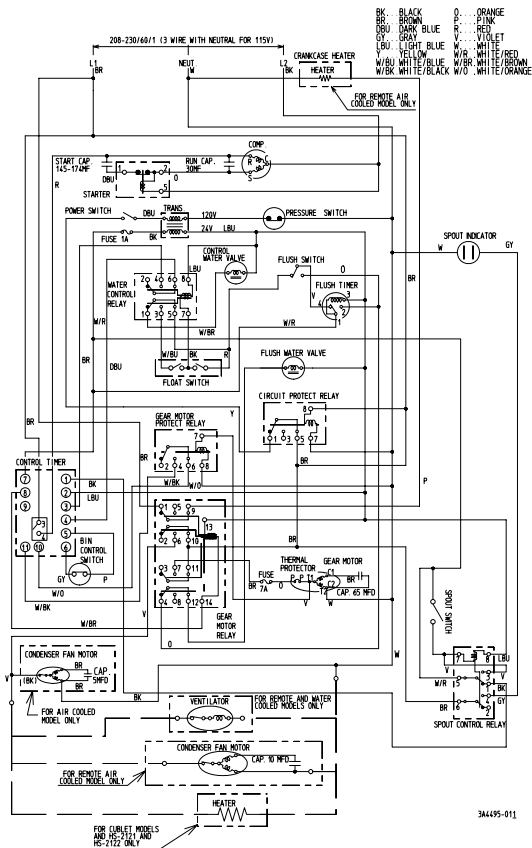


2A1972-011

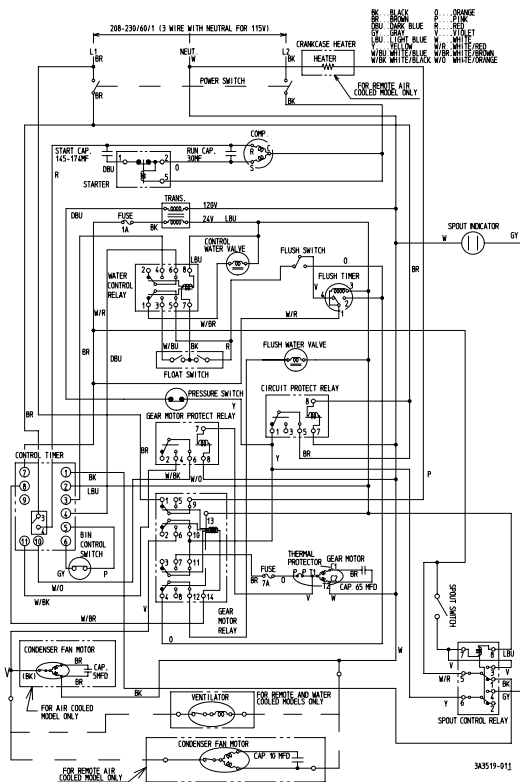
L F-1001 MLH/-C



M F-1500 MAH(-C)



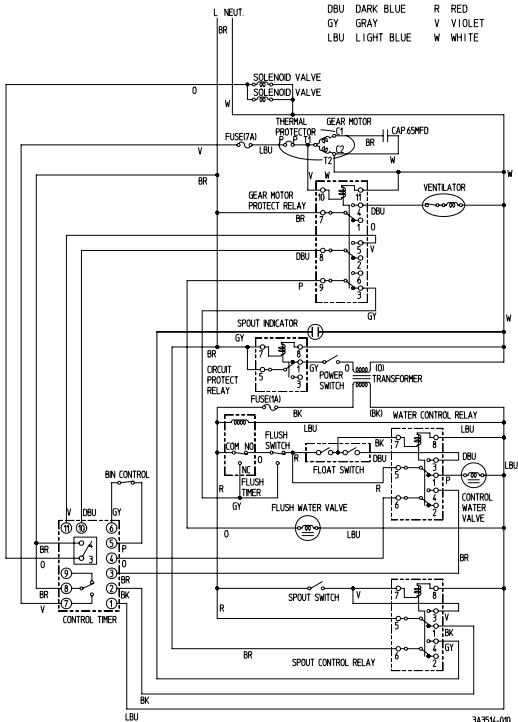
N F-1500 MWH(-C), F-1500 MRH(-C)



O F-2000 MLH/-C

WIRING COLOR CODE

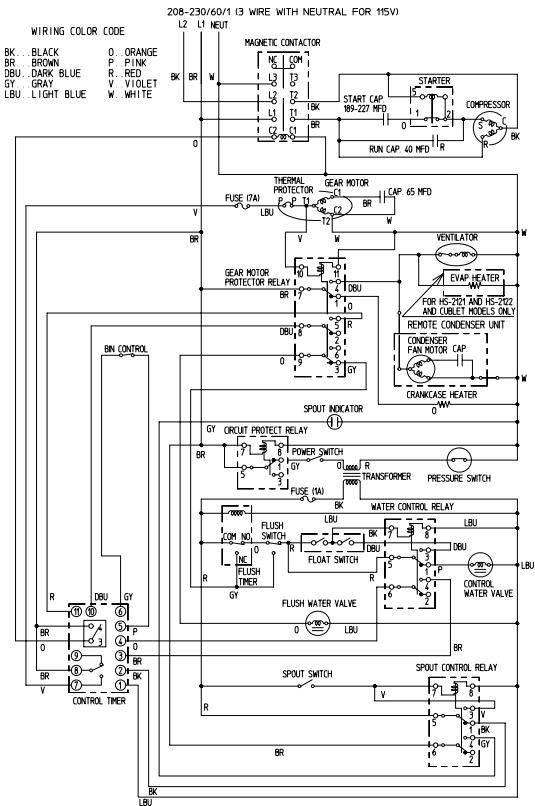
BK	BLACK	O	ORANGE
BR	BROWN	P	PINK
DBU	DARK BLUE	R	RED
GY	GRAY	V	VIOLET
LBU	LIGHT BLUE	W	WHITE



3A3514-010

P

F-2000 MWH/-C, F-2000 MRH/-C

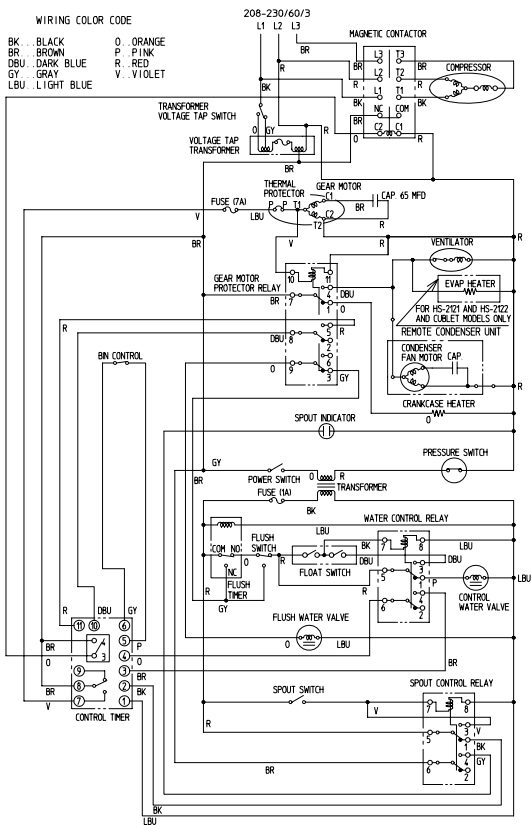


Q

F-2000 MWH3/-C, F-2000 MRH3/-C

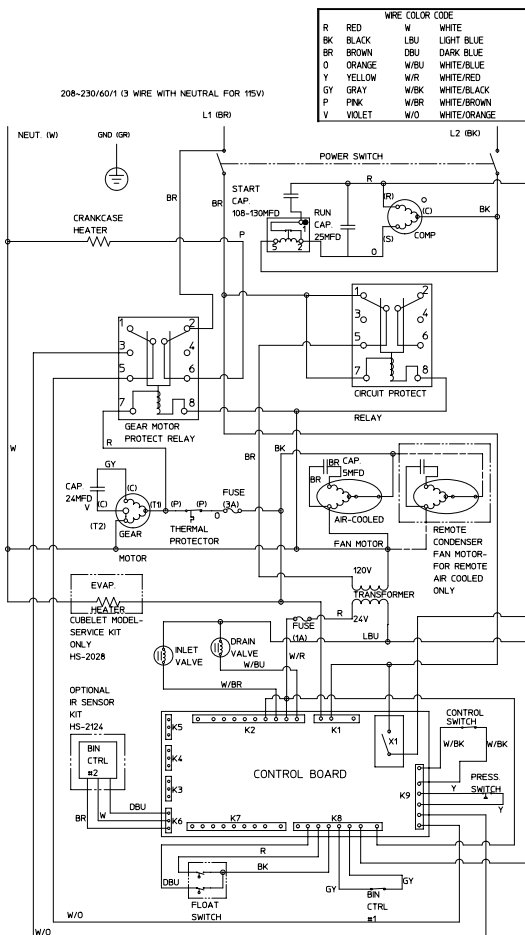
WIRING COLOR CODE

BK . . BLACK	O . . ORANGE
BR . . BROWN	P . . PINK
DBU . . DARK BLUE	R . . RED
GY . . GRAY	V . . VIOLET
LBU . . LIGHT BLUE	



3A3516-01.1

R FD-1001 MAH/MWH/MRH



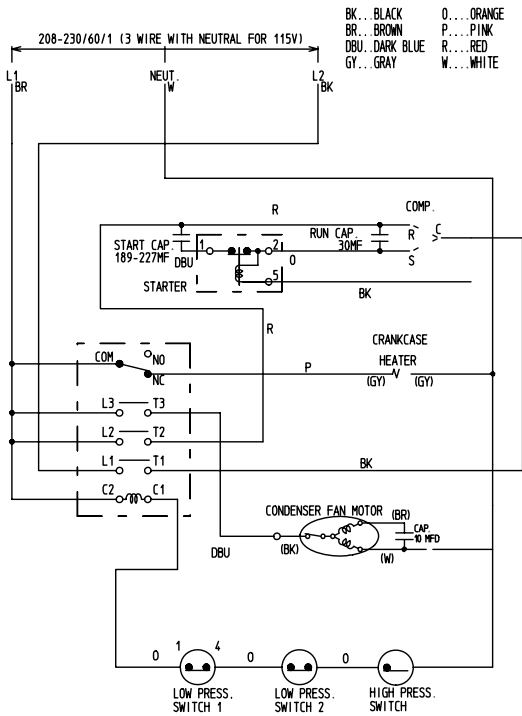
S

BK...BLACK	O...ORANGE
BR...BROWN	P...PINK
DBU...DARK BLUE	R...RED
GY...GRAY	V...VIOLET
LBU...LIGHT BLUE	W...WHITE
Y...YELLOW	W/R...WHITE/RED
W/BU...WHITE/BLUE	W/BR...WHITE/BROWN
W/BK...WHITE/BLACK	W/O...WHITE/ORANGE



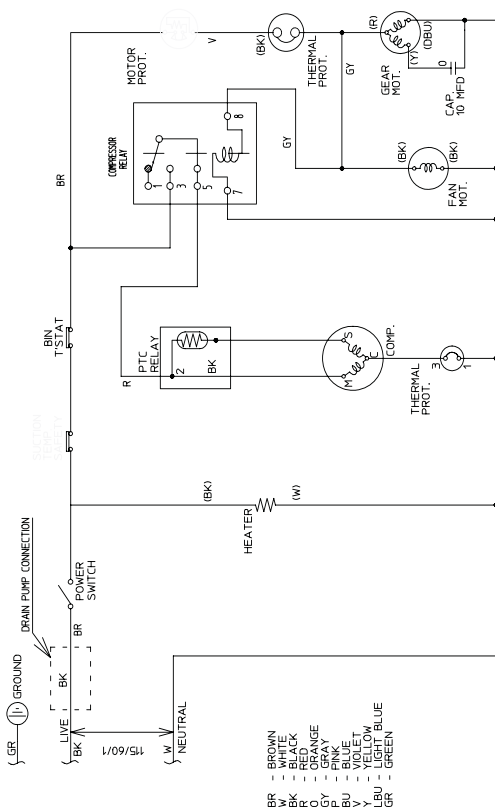
3A3505-010

T SRC-10H

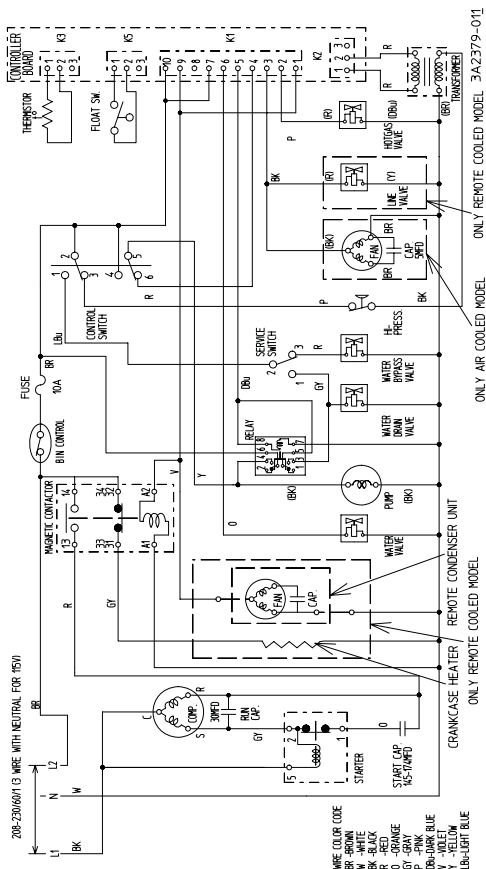


3A3179-011

U C-100BAE-AD



KML-600MAH/MWH/MRH, KML-631MAH/MWH **For 208/230V units from page 184**



- Note:** 1. Some models use mechanical bin control instead of thermostatic bin control with fuse as shown.
2. Generic Diagram: See unit service manual or wiring diagram chart for

NOTES