

ISSUED: FEB. 1, 1985



SERVICE MANUAL

MODULAR CRESCENT CUBER

Model KM-601DU
KM-601DWU

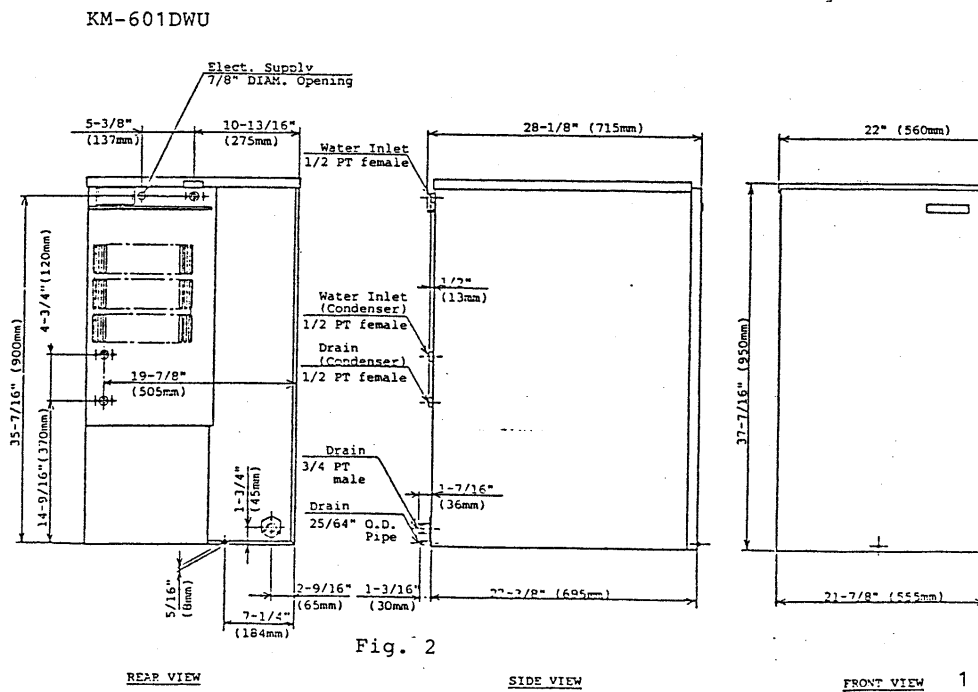
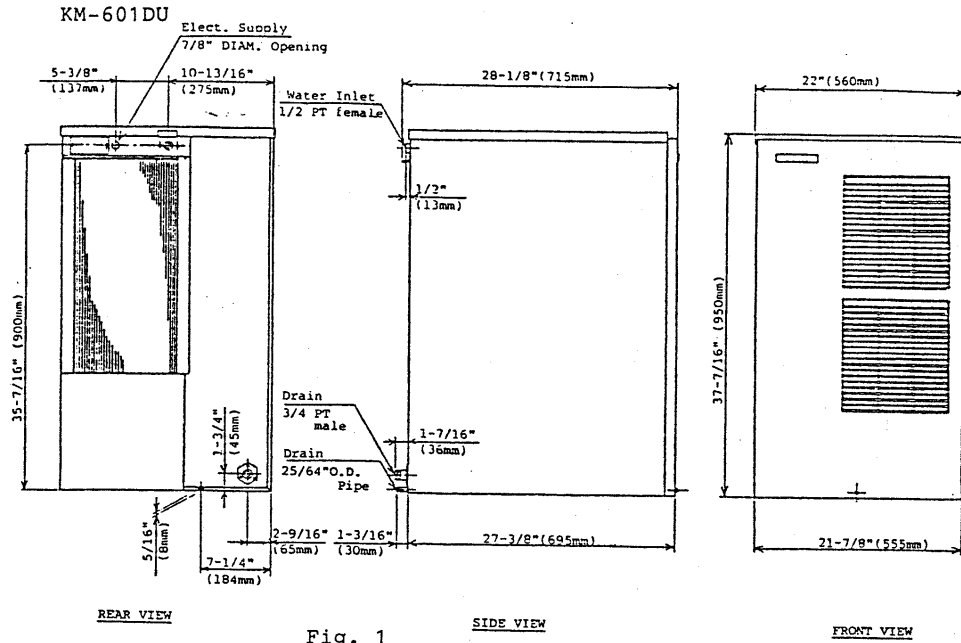
TABLE OF CONTENTS

| | |
|--|----|
| I. SPECIFICATIONS | 1 |
| 1. DIMENSIONS/CONNECTIONS | 1 |
| 2. SPECIFICATIONS | 2 |
| 3. NAMEPLATE RATING | 4 |
| II. GENERAL INFORMATION | 5 |
| 1. CONSTRUCTION | 5 |
| a. KM-601DU (Air-cooled) | 5 |
| b. KM-601DWU (Water-cooled) | 6 |
| 2. CONTROLLER BOARD | 7 |
| a. Solid-state Control | 7 |
| b. Controller Board | 7 |
| c. Sequence | 9 |
| d. Controls and Adjustment | 10 |
| e. Removal and Replacement of Thermistor | 12 |
| f. Checking Controller Board | 13 |
| III. INSTALLATION AND OPERATING INSTRUCTIONS | 14 |
| 1. CHECKS BEFORE INSTALLATION | 14 |
| 2. LOCATION | 14 |
| 3. SET UP | 15 |
| 4. ELECTRICAL CONNECTION | 16 |
| 5. WATER SUPPLY AND DRAIN CONNECTIONS | 16 |
| 6. FINAL CHECK LIST | 18 |
| 7. START UP | 19 |
| 8. SHUT OFF | 20 |
| IV. MAINTENANCE AND CLEANING INSTRUCTIONS | 21 |
| 1. CLEANING INSTRUCTIONS | 21 |
| 2. MAINTENANCE | 23 |
| V. TECHNICAL INFORMATION | 24 |
| 1. WATER CIRCUIT AND REFRIGERANT CIRCUIT | 24 |
| a. KM-601DU (Air-cooled) | 24 |
| b. KM-601DWU (Water-cooled) | 25 |
| 2. WIRING DIAGRAM | 26 |
| 3. SEQUENCE | 27 |
| 4. PERFORMANCE DATA | 29 |
| VI. SERVICE DIAGNOSIS | 32 |
| 1. No ice production. | 32 |
| 2. Low ice production. | 35 |
| 3. Abnormal ice. | 35 |
| 4. Others. | 36 |

| | |
|---|----|
| VII. REMOVAL AND REPLACEMENT OF COMPONENTS | 37 |
| 1. SERVICE FOR REFRIGERANT LINES | 37 |
| a. Refrigerant Discharge | 37 |
| b. Evacuation and Recharge | 37 |
| 2. BRAZING | 37 |
| 3. REMOVAL AND REPLACEMENT OF COMPRESSOR | 37 |
| 4. REMOVAL AND REPLACEMENT OF DRIER | 38 |
| 5. REMOVAL AND REPLACEMENT OF EXPANSION VALVE | 38 |
| 6. REMOVAL AND REPLACEMENT OF HOT GAS VALVE | 39 |
| 7. REMOVAL AND REPLACEMENT OF WATER REGULATING VALVE (WATER COOLED MODEL ONLY) | 39 |
| 8. REMOVAL AND REPLACEMENT OF FAN MOTOR | 40 |
| 9. REMOVAL AND REPLACEMENT OF WATER VALVE | 40 |
| 10. REMOVAL AND REPLACEMENT OF PUMP MOTOR | 40 |
| 11. REMOVAL AND REPLACEMENT OF WATER DISTRIBUTOR | 40 |
| VIII. PARTS LIST | 41 |
| A. GENERAL ASSEMBLY | 41 |
| KM-601DU (Air-cooled) | 41 |
| KM-601DWU (Water-cooled) | 44 |
| B. REFRIGERATION UNIT ASSEMBLY | 46 |
| KM-601DU (Air-cooled) | 46 |
| KM-601DWU (Water-cooled) | 49 |
| C. WATER SUPPLY LINE ASSEMBLY | 52 |
| D. CONTROL BOX ASSEMBLY | 55 |
| E. CONTROLLER BOX ASSEMBLY | 57 |
| KM-601DU (Air-cooled) | 57 |
| KM-601DWU (Water-cooled) | 59 |
| F. INSTRUCTION SHEET/LABEL LOCATION | 60 |
| KM-601DU (Air-cooled) | 60 |
| KM-601DWU (Water-cooled) | 62 |
| G. WATER SUPPLY JOINT (P) ASSEMBLY | 64 |
| H. WATER PUMP ASSEMBLY | 66 |
| I. ACCESSORIES | 68 |

I. SPECIFICATIONS

1. DIMENSIONS / CONNECTIONS



SPECIFICATIONS

| | | |
|--|--|--|
| SPEC NO. 84063 | | ISSUED: JUNE 28, 1984 |
| MODEL: MODULAR CRESCENT CUBER KM-601DU | | |
| NAMEPLATE RATING AC SUPPLY VOLTAGE AMPERES MAXIMUM FUSE SIZE MINIMUM CIRCUIT AMPACITY TEST PRESSURE REFRIGERANT DIMENSIONS (HxDxW) CONNECTIONS ELECTRICAL WATER SUPPLY & DRAIN | 115/230V 3Wire 60Hz 1Phase 8A (5 minute, Freeze, 104°F/81°F) 15A 15A High - 318PSI, Low - 162PSI R502 2lbs 3oz (1000g) 37-7/16"x27-3/8"x22" (950mmx700x560) | Permanent-connected Supply Inlet 1/2" Female Drain Outlet 3/4" Male Condensate 25/64" O.D. Pipe |
| EXTERIOR ACCESSORIES WEIGHT | Stainless Steel, Galvanized Steel (Rear) Scoop (1), Top Kit (1), Fastener & Instruction (1), Manual (1) Net 190Lbs (86kg) Shipping 216Lbs (98kg) | |
| REFRIGERATION ICEMAKING SYSTEM COMPRESSOR CONDENSER DEFROST EVAPORATOR SUCTION PRESSURE CONTROL REFRIGERANT CONTROL CONDENSER WATER CONTROL | Vertical Evaporator Hermetic 750W, Model KL100TD-3 Air-cooled Hot Gas & Water dual Stainless Steel, Copper Pressure Switch Cut-out 94.4±7PSI Cut-in 49.7±7PSI Thermostatic Expansion Valve, Solder-connection NONE | |
| ELECTRICAL CUBE CONTROL DEFROST CONTROL WATER SUPPLY CONTROL BIN CONTROL | Float Switch Thermistor & Timer Timer Thermostat | |
| PROTECTIONS COMPRESSOR REFRIGERATION | Overload (Auto reset) High Pressure Control Switch, Fusible Plug (Relief at 221°F) | |
| LIMITATIONS AMBIENT TEMPERATURE WATER TEMPERATURE WATER SUPPLY PRESSURE VOLTAGE VARIATION | Min. 45°F - Max. 100°F Min. 45°F - Max. 90°F Min. 7PSI - Max. 113PSI Min. 200V - Max. 264V | |
| ICE PRODUCTION (MAX. CUBE SIZE) PER 24HR PER CYCLE FREEZE CYCLE TIME ELECTRICAL CONSUMPTION WATER CONSUMPTION PER 24HR | 600Lbs (70°/50°F), 485 (90/70) 14.3Lbs, 720Pcs. 32Min (70/50), 41 (90/70) 1440W (90/70°F, Average) 246Gal (70/50°F) 127Gal (90/70°F) | |

We reserve the right to make changes in specifications and designs without prior notice.

SPECIFICATIONS


| | | | |
|--|--------------------------|--|--|
| SPEC NO. 84064 | | ISSUED: JUNE 28, 1984 | |
| MODEL: MODULAR CRESCENT CUBER KM-601DWU | | | |
| NAMEPLATE RATING | | | |
| AC SUPPLY VOLTAGE | AMPERES | 115/230V 3Wire 60Hz 1Phase | 6.6A (5 Min, Freeze, 104°F/81°F) |
| MAXIMUM FUSE SIZE | MINIMUM CIRCUIT AMPACITY | 15A | 15A |
| TEST PRESSURE | REFRIGERANT | High -300PSI, Low - 162PSI | R502 11b 5oz (600g) |
| DIMENSIONS (HxDxW) | | 37-7/16"x27-3/8"x22" | (950mmx700x560) |
| CONNECTIONS | | | |
| ELECTRICAL | WATER SUPPLY & DRAIN | Permanent-connected | Supply Inlet 1/2" Female Drain Outlet 3/4" Male Condensate 25/64" O.D. Pipe Condenser Inlet 1/2" Female Condenser Outlet 1/2" Female |
| EXTERIOR | | Stainless Steel, Galvanized Steel (Rear) | |
| ACCESSORIES | | Scoop (1), Top Kit (1), Fastener & Instruction (1), Manual (1) | |
| WEIGHT | | Net 179Lbs (81kg) Shipping 216Lbs (98kg) | |
| REFRIGERATION | | | |
| ICEMAKING SYSTEM | COMPRESSOR | Vertical Evaporator | Hermetic 750W, Model KL100TD-3 |
| CONDENSER | DEFROST | Water-cooled | Hot Gas & Water dual |
| EVAPORATOR | SUCTION PRESSURE CONTROL | Stainless Steel, Copper | Pressure Switch Cut-out 94.4±7PSI Cut-in 49.7±7PSI |
| REFRIGERANT CONTROL | CONDENSER WATER CONTROL | Thermostatic Expansion Valve, | Solder-connection Water Regulator |
| ELECTRICAL | | | |
| CUBE CONTROL | DEFROST CONTROL | Float Switch | Thermistor & Timer |
| WATER SUPPLY CONTROL | BIN CONTROL | Timer | Thermostat |
| PROTECTIONS | | | |
| COMPRESSOR | REFRIGERATION | Overload (Auto reset) | High Pressure Control Switch, Fusible Plug (Relief at 221°F) |
| LIMITATIONS | | | |
| AMBIENT TEMPERATURE | WATER TEMPERATURE | Min. 45°F - Max. 100°F | --Min. 45°F - Max. 90°F |
| WATER SUPPLY PRESSURE | VOLTAGE VARIATION | Min. 7PSI - Max. 113PSI | Min. 200V - Max. 264V |
| ICE PRODUCTION (MAX. CUBE SIZE) | | | |
| PER 24HR | PER CYCLE | 619Lbs (70/50°F), 549 (90/70) | 14.3Lbs, 720Pcs. |
| FREEZE CYCLE TIME | ELECTRICAL CONSUMPTION | 30Min (70/50), 36 (90/70) | 1280W (90/70°F, Average) |
| WATER CONSUMPTION | PER 24HR | 761Gal (70/50°F) | 1110Gal (90/70°F) |


We reserve the right to make changes in specifications and designs without prior notice.

3. NAMEPLATE RATING

Air-Cooled Model


| HOSHIZAKI ICE MAKER | |
|--------------------------|----------------------------|
| MODEL NUMBER | KM-601DU |
| AC SUPPLY VOLTAGE | 115/230V 3 WIRES 1 PH 60Hz |
| AMPERES | 8 AMPS |
| MAXIMUM FUSE SIZE | 15 AMPS |
| MINIMUM CIRCUIT AMPACITY | 15 AMPS |
| ○ TEST PRESSURE | HI-318 PSI LO-162 PSI ○ |
| REFRIGERANT 502 | 2.2 lbs. |
| SERIAL NUMBER | |


 LISTED
ICE MAKER WITHOUT
STORAGE MEANS
946Z

 HOSHIZAKI
ELECTRIC CO., LTD.
MADE IN JAPAN

Water-Cooled Model

| HOSHIZAKI ICE MAKER | |
|--------------------------|----------------------------|
| MODEL NUMBER | KM-601DWU |
| AC SUPPLY VOLTAGE | 115/230V 3 WIRES 1 PH 60Hz |
| AMPERES | 6.6 AMPS |
| MAXIMUM FUSE SIZE | 15 AMPS |
| MINIMUM CIRCUIT AMPACITY | 15 AMPS |
| ○ TEST PRESSURE | HI-300 PSI LO-162 PSI ○ |
| REFRIGERANT 502 | 1.32 lbs. |
| SERIAL NUMBER | |

 LISTED
ICE MAKER WITHOUT
STORAGE MEANS
946Z

 HOSHIZAKI
ELECTRIC CO., LTD.
MADE IN JAPAN

See NAMEPLATE for electrical and refrigeration specifications. Locate the Nameplate on the upper part of the Rear Panel.

We reserve the right to make changes in specifications and design without prior notice.

b. KM-601DWU (Water-cooled)

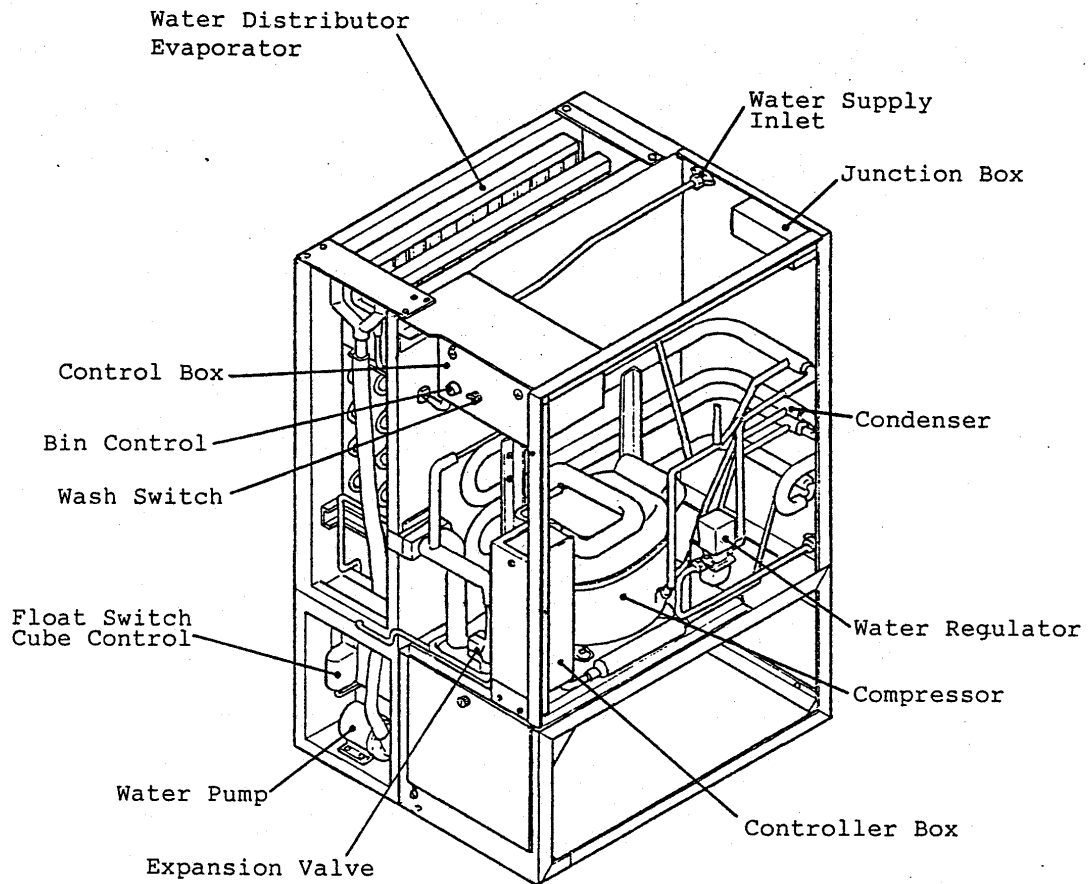


Fig. 4

2. CONTROLLER BOARD

a. Solid-State Control

- 1) A HOSHIZAKI EXCLUSIVE solid-state control is employed in KM-601DU and -601DWU, modular crescent cubers. This control includes a Micro Processor (LSI), which is developed by HOSHIZAKI.
- 2) A Printed Circuit Board (hereafter called "Controller Board") includes a stable and high-quality control system.
- 3) Any complicated adjustment is not required all year around. All models cuber are pretested and factory adjusted.

b. Controller Board

CAUTION

1. FRAGILE, handle very carefully.
2. A controller board contains CMOS integrated circuits, which are SUSCEPTIBLE FAILURE DUE TO STATIC DISCHARGE. It is especially important that an anti-static wrist strap be used when handling or replacing the board.
3. Do not touch the board reverse and tiny electronic devices on the board to prevent damage to them.
4. Do not change wiring and connections. Especially, never misconnect K2 and K3, because same connector is used for Thermistor and Float Switch.
5. Do not fix the electronic devices or parts on the board in the field. Always replace the hole board assembly when it goes bad.

A controller board, Part Code 427004-02, is used for KM-601DU, Air-cooled model. And another, Part Code 427004-01, for KM-601DWU, Water-cooled. Both are basically same except for a Jumper Lead on K5 connector, resulting in two kinds of maximum water supply period.

| Part Code | Model | K5 Jumper | *Max. Period |
|-----------|-----------|-----------|--------------|
| 427004-01 | KM-601DWU | Yes | 3 minute |
| 427004-02 | KM-601DU | No | 4 minute |

Note: *Maximum Water Supply Period
Water solenoid valve opening, in Defrost (Harvest) Cycle, is limited by maximum period. Water valve can not be opened exceeding the maximum period. And water valve closes even within maximum, when defrost cycle is completed.

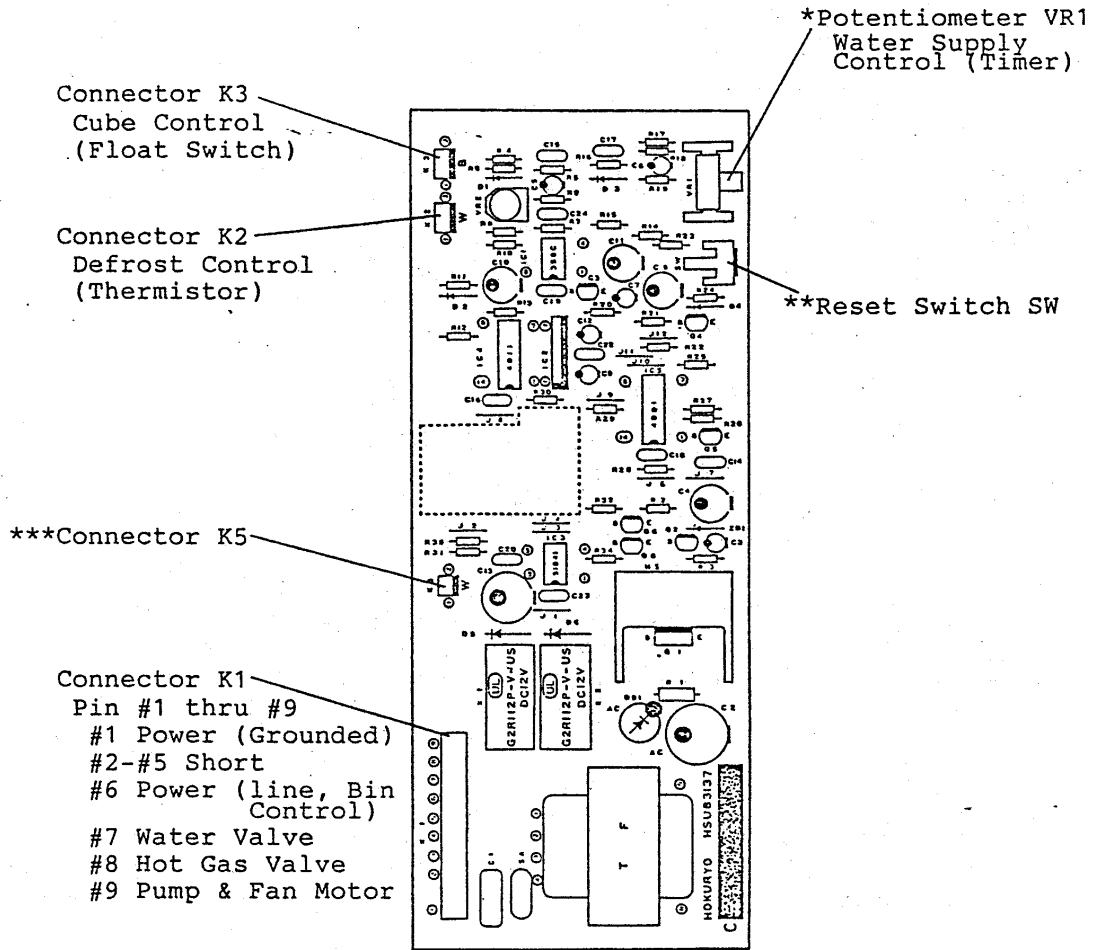


Fig. 5

Note: *Adjustable, Min. 1 minute to Max. 3 minute.
Min. position is factory setting.

**Fragile, handle very carefully.

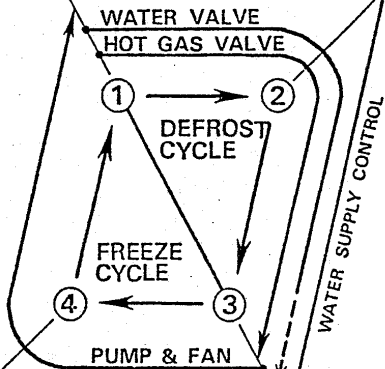
***KM-601DU - without Jumper
KM-601DWU - with Jumper

c. Sequence

1st Cycle

1. Unit energized and wash switch to ICE position. Defrost cycle starts.

2. In more than 1 minute and thermistor reads 48°F. Water Supply Control starts counting.



*Signal from
1. Cube Control
2. Reset Switch (Manual)

4. Thermistor reads 43°F and after first 5 minute. *Ready to complete freeze cycle.

IMPORTANT
Never accepts completion signal within first 5 minute in freeze cycle.

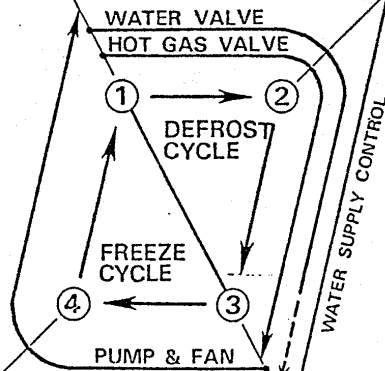
3. Water supply control stops counting. Defrost cycle is completed and freeze cycle starts.

Fig. 6

2nd Cycle and after

1. Float switch opens and signals to complete freeze cycle.

2. Thermistor reads 48°F. Water Supply Control starts counting.



4. Thermistor reads 43°F and after first 5 minute. Ready to complete freeze cycle.

IMPORTANT
Never accepts completion signal within first 5 minute in freeze cycle.

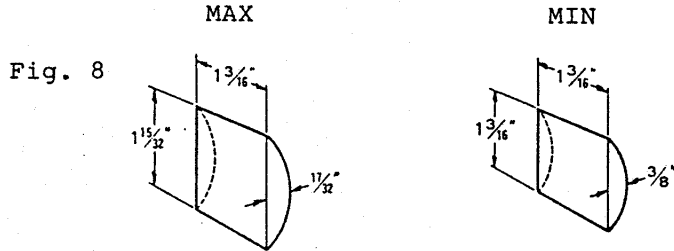
3. Water supply control stops counting. Defrost cycle is completed and freeze cycle starts.

Fig. 7

d. Controls and Adjustment

1) Cube Control

A float switch, located next to water pump, signals to complete a freeze cycle. This switch is factory adjusted to the lowest position, or Max. Cube Size position. Setting to upper position makes cube size smaller.



See specifications or performance data sheets.

Ice Production 10% Down
Water Consump. 4% Up

2) Defrost Control

A thermistor (Semiconductor) is used for defrost control sensor, whose resistance varies depending on suction pipe temperatures. No adjustment is required. If necessary, check for resistance between thermistor leads, and visually check thermistor attachment portion, located on suction pipe next to evaporator outlet.

| Temperature (°F) | Resistance (kOhm) |
|------------------|-------------------|
| 0 | 14.401 |
| 10 | 10.613 |
| 32 | 6.000 |
| 50 | 3.871 |
| 70 | 2.474 |
| 90 | 1.633 |

3) Water Supply Control

No adjustment is required under normal use, as factory adjusted to Min. (1 minute) position. Adjust, if necessary where water quality is bad, to longer position by rotating potentiometer (VR1) clockwise using an electrician screwdriver. Always remove K5 Jumper when attempt to adjust on water-cooled model.

| Hardness (ppm) | Setting |
|----------------|---------------------------|
| 200 or less | Minimum (1 minute) |
| 200 - 250 | Middle (2 minute) |
| 250 - 300 | Maximum (3 minute) |
| 300 or more | Install a water softener. |

4) Bin Control

CAUTION

When ambient temperatures are below 45°F, bin control thermostat operates to stop the ice maker. The ice maker operates continuously when the thermostat is set to CONTINUOUS OPERATION RANGE. Then the ice maker will not stop even if the ice storage bin is filled with ice. This might cause severe damage to the ice maker resulting in failure.

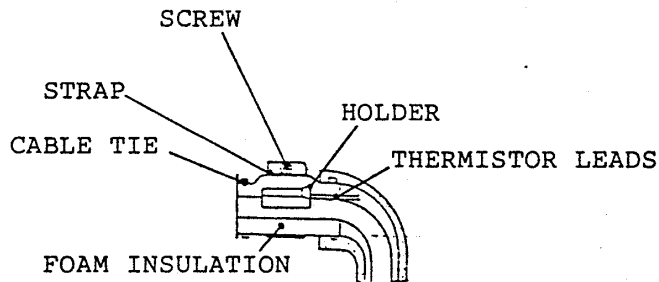
No adjustment is required under normal use, as factory adjusted. Adjust, if necessary, so that the ice maker stops automatically in approximately 6 to 10 second after ice contacts the bin control thermostat bulb, which is attached to a bracket near bin opening.

e. Removal and Replacement of Thermistor

CAUTION

1. FRAGILE, handle very carefully.
2. Always use a recommended sealant (High Thermal Conductive Type), Model KE4560RTV manufactured by SHINETSU SILICONE, or equivalent.
3. Always use a recommended foam insulation (Non-absorbent Type) or equivalent.

- (1) Disconnect power source.
- (2) Remove the front panel.
- (3) Disconnect thermistor leads from K2 connector on the controller board.
- (4) Locate thermistor attachment portion on the suction pipe next to evaporator outlet.
- (5) Remove screw and strap holding thermistor attachment.
- (6) Remove foam insulation covering thermistor holder.
- (7) Remove thermistor holder and thermistor.
- (8) Scrape away old sealant on the thermistor holder and suction pipe.
- (9) Smoothly apply recommended sealant (KE4560RTV) to thermistor holder concave.
- (10) Wipe off moisture or condensate on the suction pipe.
- (11) Attach a new thermistor to the suction pipe very carefully to prevent damage to the leads. And secure it using thermistor holder and recommended foam insulation.
- (12) Secure insulation using plastic cable ties.
- (13) Secure thermistor attachment portion using strap and screw.
- (14) Place connector and front panel in position.
- (15) Connect power source.



f. Checking Controller Board

- 1) Visually check sequence with the icemaker operated.
- 2) Visually check by following procedures. Or

- (i) Adjust water supply control to minimum position. Disconnect thermistor and float switch leads from the controller board. Jumper connector K2 pins (#1 and #2) and energize the unit.

In 2 minute \pm 40 second, unit should start freeze cycle.

- (ii) Remove jumper from K2 pins, and connect thermistor and float switch leads. Energize unit and disconnect thermistor after defrost cycle is completed, or in freeze cycle, but before 5 minute of ice production completed. And then disconnect float switch after 5 minute \pm 50 second of total freezing time.

The unit should go into defrost cycle.

- (iii) Reconnect thermistor and float switch leads to the controller board, and energize unit. After 5 minute of ice production, disconnect thermistor leads, and then float switch.

At this point, unit should start defrost cycle.

- 3) If necessary, electrically check voltage at connector K1 pins for 21VAC output, by using a voltmeter.

| Output | Between |
|------------------|-----------|
| Pump & Fan Motor | #1 and #9 |
| Hot Gas Valve | #1 and #8 |
| Water Valve | #1 and #7 |

III. INSTALLATION AND OPERATING INSTRUCTIONS

1. CHECKS BEFORE INSTALLATION

WARNING

Remove shipping cartons, tapes and packing. If any left in the icemaker, it will not work properly.

- * Remove the panels to prevent damage when installing the icemaker.
- * Remove the package containing accessories.
- * Remove the protective plastic film on the Panels. If the icemaker exposed to the sun or heat, remove the film after the icemaker cooled.
- * Check that refrigerant lines do not rub or touch lines or other surfaces, and that fan blade moves freely.
- * Check that the compressor is snug on all mounting pads.
- * See nameplate, located on the rear panel. Check that your source voltage corresponds with the voltage specified on the nameplate.

2. LOCATION

WARNING

This icemaker is not designed for outdoor installation. Air temperatures should be below 100°F(38°C) or above 45°F(7°C). Water temperatures should be below 90°F(32°C) or above 45°F(7°C). Extended periods of operation at temperatures exceeding these limitations will constitute misuse resulting in loss of warranty coverage.

1. Position the icemaker in the selected permanent position.
 - * Maximum Air Temperature 100°F, Minimum Air Temperature 45°F.
 - * Maximum Water Temperature 90°F, Minimum Water Temperature 45°F.
 - * Keep away from heat, and near the portable water source and drainage.
 - * Avoid the site where no dripping is allowed.
 - * More than 6"(15cm) clearance at rear, sides and top for good ventilation and easy services. Use a space indicator provided on the rear panel.
2. Level the icemaker in both the left-to-right and front-to-rear directions. Metal shims should be added to legs of the storage bin to get the level required.

Note: This icemaker will not work at sub-freezing temperatures. To prevent damage to the water supply line, drain the icemaker when air temperature is below 32°F(0°C).

3. SET UP - See Fig. 9

1. Unpack the storage bin and attach 4(four) adjustable legs provided to the bottom of the bin.
2. Position the storage bin in the selected permanent position.
3. Unpack the icemaker. Remove all shipping cartons, tapes and packing.
4. Remove the panels to prevent damage when installing the icemaker.
 - a. Front Panel Remove a bolt. Lift up and toward you.
 - b. Top Panel Lift up at front slightly, push rearward and lift off.
 - c. Side Panel (R) Slide forward slightly and lift off.
 - d. Separating Panel ... Remove a hex bolt. Pull toward you.
 - e. Base Cover Remove a bolt. Decline and pull toward you.
5. Attach the icemaker to the top of the storage bin, and secure using 2(two) screws provided.
6. Attach the bin thermostat bulb bracket and secure using a Hex Bolt.
7. Level the icemaker/storage bin in both the left-to-right and front-to-rear directions.
8. Place the panels in position.
9. Attach the Top Kit to the top of the storage bin and secure using 2(two) screws provided. Seal the gap between icemaker and top kit, if necessary, using a Silicone Sealant.

Note: When install the second unit.

- * Remove the Top Kit.
- * Install the 2nd icemaker next to the 1st one.
- * Seal the gap between icemakers using a Silicone Sealant.

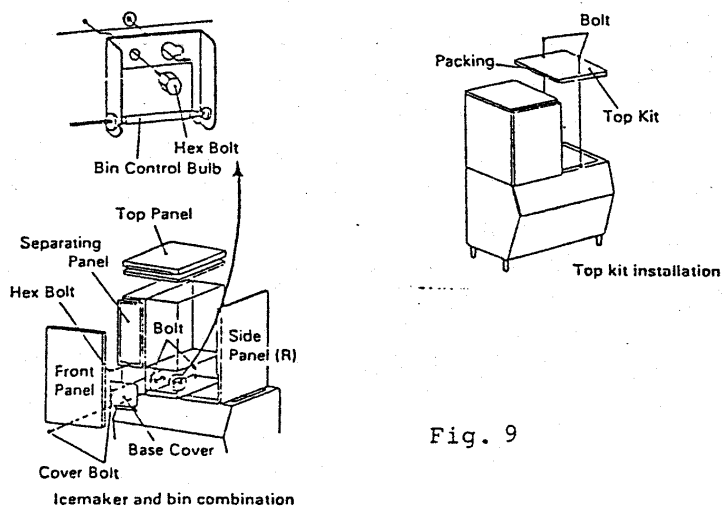


Fig. 9

4. ELECTRICAL CONNECTION

WARNING

This icemaker requires a ground that meets the national and local electrical code requirements. To prevent possible severe electrical shock injury to individuals or extensive damage to equipment, install a proper-ground wire to this icemaker.

1. This icemaker must be connected to the separated power source which has enough capacity. Voltage range should be minimum 200V or maximum 264V.
2. Usually an electrical permit and services of a licensed electrician will be required.

5. WATER SUPPLY AND DRAIN CONNECTIONS - See Fig. 10

WARNING

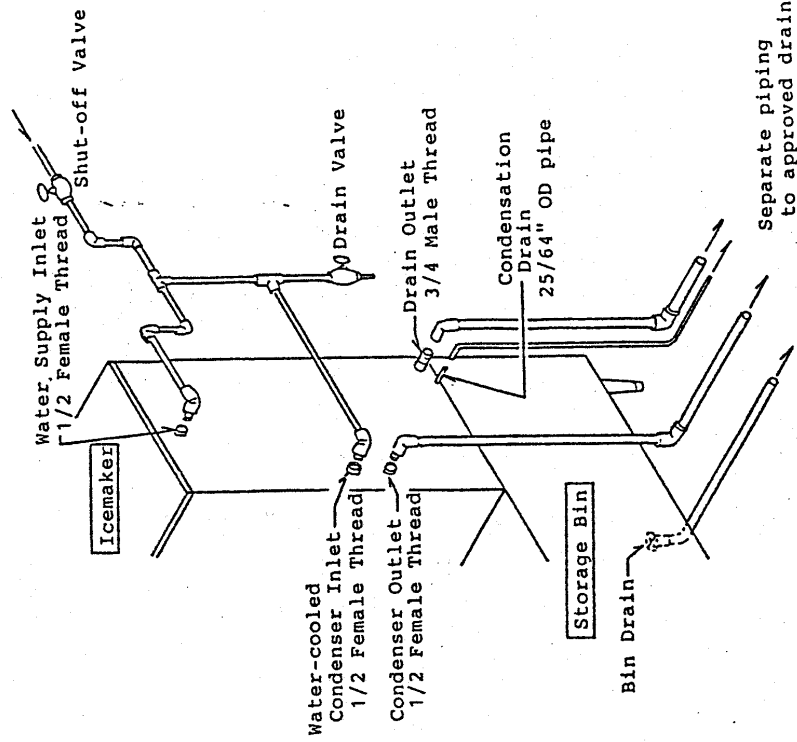
To prevent damage to equipment, do not operate this icemaker when the water supply is OFF, or is below 7 PSIG(0.5kg/cm²), the recommended water pressure. Stop the icemaker until proper water pressure is resumed.

1. Water supply Inlet is 1/2"PT female thread.

Note: On Water-cooled model, 2(two) Water Supply Inlets provided.
One is for water line, and the other for Water-cooled Condenser.

2. A water supply line shut-off valve and drain valve must be installed. A minimum of 3/8 O.D. copper tubing is recommended for the water supply line.
3. Water supply pressure should be minimum 7 PSIG(0.5kg/cm²) and maximum 113 PSIG(8kg/cm²). If the pressure exceeds 113 PSIG(8kg/cm²), use a pressure reducing valve.
4. Drain outlet for icemaker dump is 3/4"PT male thread. Drain for condensation is 25/64" O.D. pipe. Drain for storage bin is 1" IPS female thread. Icemaker Drain and Condenser Drain piping connections must be made separately from Bin Drain
Note: On Water-cooled model, 1/2"PT female thread provided for Water-cooled Condenser Drain.
5. Drain must be 1/4" fall per 1'(2cm per 1m) on horizontal runs to get good flow.
6. In some cases, a plumbing permit and services of a licensed plumber will be required.

KM-601DWU



KM-601DU

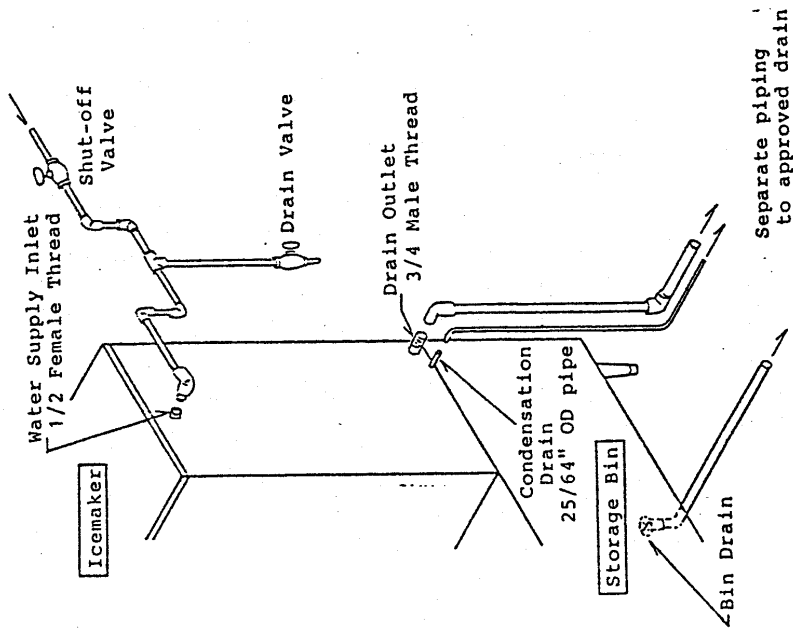


Fig. 10

6. FINAL CHECK LIST

1. Is the icemaker level?
2. Is the icemaker in a site where ambient temperatures are a minimum of 45°F (7°C) and maximum 100°F(38°C) all year around?
3. Is there at least 6"(15cm) clearance around the icemaker for good ventilation, easy maintenance and service?
4. Have all shipping tape, carton and packing been removed from the icemaker?
5. Have all electrical and piping connections been made?
6. Has the electrical power supply voltage been tested or checked against the nameplate rating? Has a proper ground been installed to the icemaker?
7. Is the water supply line shut-off valve and drain valve installed? Has the water supply pressure been checked to ensure a minimum of 7 PSIG(0.5kg/cm²) and maximum 113 PSIG(8kg/cm²)?
8. Have the compressor hold-down bolts and all refrigerant lines been checked against vibration and possible failure?
9. Has the Bin Control Switch (Thermostat) been checked to work normally?
10. Has the Storage Bin been cleaned and wiped with a clean cloth?
11. Has the user been given the Instruction Manual and instructed on how to operate the icemaker and the importance of periodic maintenance recommended?
12. Has the user been given the name and telephone number of the Authorized Service Agency?

7. START UP

1. Open the water supply line shut-off valve.
2. Remove the front panel.
3. Move the toggle ON-OFF WASH SWITCH, on the front of the Control Box, to the WASH position.
4. Turn on the power supply switch, and start washing process for 10 minutes.
5. Turn off the icemaker, and remove the Base Cover.
6. Remove one end of the Pump Tubing, and drain the Water Tank. (See Fig.12)
7. Place the Pump Tubing and Base Cover in position.
8. Clean the Storage Bin.
9. Turn on the power supply switch, and move the Wash Switch to the ICE position, starting automatic icemaking process.
10. Place the front panel in position.

WARNING

1. All parts are factory-adjusted. Improper adjustments may result in failure.
2. Wait for at least 3 minutes before restarting the icemaking process to prevent damage to the Compressor.

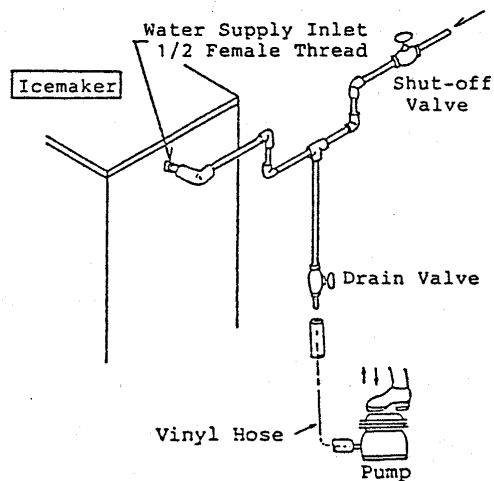
8. SHUT OFF

WARNING

When shut off the icemaker for a period, drain the water tank and remove ice from the storage bin. The storage bin should be cleaned up to dry. Drain the icemaker to prevent damage to the water supply line at sub-freezing temperatures, using a foot or hand pump. Shut off the icemaker until proper air temperature is resumed.

1. Close the water supply line shut-off valve.
2. Remove the front panel.
3. Move the toggle ON-OFF WASH SWITCH, on the front of the Control Box, to the WASH position.
4. Turn off the power supply switch, and remove the Base Cover.
5. Remove one end of the Pump Tubing, and drain the Water Tank. (See Fig.12)
6. Place the Pump Tubing and Base Cover in position.
7. Remove ice from the storage bin, and clean up.
8. Place the front panel in position.

KM-601DU



When shut off the icemaker at sub-freezing temperatures, run the icemaker, with the shut-off valve closed, and blow out the water inlet line using air pressure.

Fig.11

IV. MAINTENANCE AND CLEANING INSTRUCTIONS

1. CLEANING INSTRUCTIONS

WARNING

1. Clean and sanitize the icemaker Water System periodically using recommended cleaner and sanitizer.
2. Do not use any Ammonia-type Cleaner to prevent damage to the icemaker and injury to individuals.
3. Wear Liquid-Proof Gloves for safe handling the cleaning and sanitizing solution to prevent possible irritation.

Cleaning Procedure

1. Disconnect the power supply and close the water supply line shut-off valve.
2. Dilute approximately 16 oz. of cleaner ("LIME-A-WAY", Economics Laboratory, Inc.) with 3 gallons of water.
3. Remove the Front Panel, Separating Panel and Base Cover.
4. Remove all ice from the icemaker and Storage Bin.
- *5. Remove one end of the Pump Tubing to drain the Water Tank. (See Fig. 12)
6. Place the Pump Tubing in position.
7. Pour the cleaning solution into the Water Tank.
8. Place the Separating Panel in position.
9. Move the toggle ON-OFF Wash Switch, on the front of the Control Box, to the WASH position.
10. Turn on the icemaker and start washing process.
11. Turn off the icemaker in 30 minutes.
12. Remove one end of the Pump Tubing to drain the Water Tank. Place the pump tubing in position.
13. Open the water supply line shut-off valve.
14. Turn on the icemaker and start rinse process. Turn off the icemaker in 8 minutes. Remove one end of the pump tubing to drain the water tank. Place the pump tubing in position.
15. Repeat the above step No. 14 three more times to rinse thoroughly.

Note: *The water tank can be drained in another way, or by operating water pump. See next page Note.

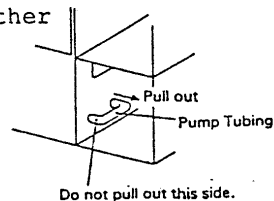


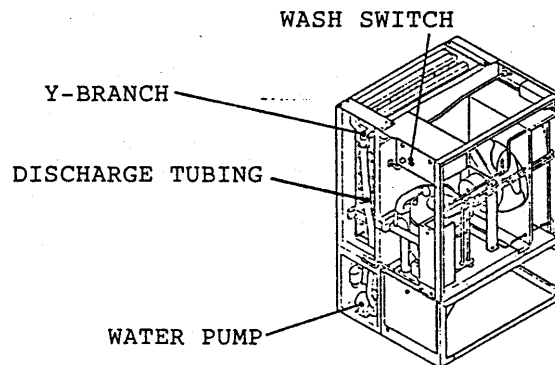
Fig. 12

Sanitizing Procedure ----- Following cleaning procedure.

1. Disconnect the power supply and close the water supply line shut-off valve.
2. Dilute approximately 24 oz. of a 5.25% Sodium Hypochlorite Solution with 3 gallons of water.
3. Remove the Separating Panel.
4. Pour the sanitizing solution into the Water Tank.
5. Place the separating panel in position.
6. Turn on the icemaker and start sanitizing process.
7. Turn off the icemaker in 15 minutes.
- *8. Remove one end of the Pump Tubing to drain the Water Tank.
9. Place the pump tubing in position.
10. Rinse two times as described above. (Refer to Step No. 14, Cleaning Procedure)
11. Clean the storage bin with water.
12. Move the Wash Switch to the ICE position.
13. Place the Base Cover and Front Panel in position.
14. Open the water supply line shut-off valve.
15. Turn on the icemaker and start automatic icemaking process.

Note: *Also the water tank can be drained by following procedures. This is recommended when ice storage could not be removed by some reasons.

- 1) Disconnect power source.
- 2) Remove a water pump discharge tubing at connector next to Y-branch, by disconnecting clamp.
- 3) Energize the unit with wash switch in WASH position, and drain water by operating the water pump.
- 4) Disconnect power source, and reinstall the discharge tubing.



2. MAINTENANCE

IMPORTANT

CLEAN AIR FILTER TWICE A MONTH. This icemaker must be maintained individually, referring to the INSTRUCTION MANUAL and LABELS provided with the unit.

* Stainless Steel Exterior

To keep the exterior from rust, wipe occasionally with a clean and soft cloth. Use a damp cloth containing a neutral cleaner to wipe off oil or dirt.

* Storage Bin and Scoop

- * Wash your hands before removing ice. Use a plastic scoop provided.
- * The storage bin is for ice use only. Do not store anything except ice in the bin.
- * Keep the scoop clean. Clean using a neutral cleaner at least once a day and rinse thoroughly.
- * Clean inside the bin at least once a month using a neutral cleaner. Rinse thoroughly after cleaning.

* Air Filter (Air-cooled model only)

A plastic mesh air filter removes dirt or dust in the air, and keep the condenser from clogging. When the filter gets clogged, the icemaker performance will be reduced. Clean the filter at least twice a month. More frequent cleaning will be required depending on the location. When clogged by oil, use a warm solution containing a neutral cleaner. Handle with care to prevent damage to the mesh.

* Condenser (Air-cooled model only)

When the condenser gets clogged by small particles through the air filter, the icemaker performance will be more reduced than the air filter clogged. Clean the condenser at least once a year using a brush or vacuum cleaner.

V. TECHNICAL INFORMATION

1. WATER CIRCUIT AND REFRIGERANT CIRCUIT

a. KM-601DU (Air-cooled)

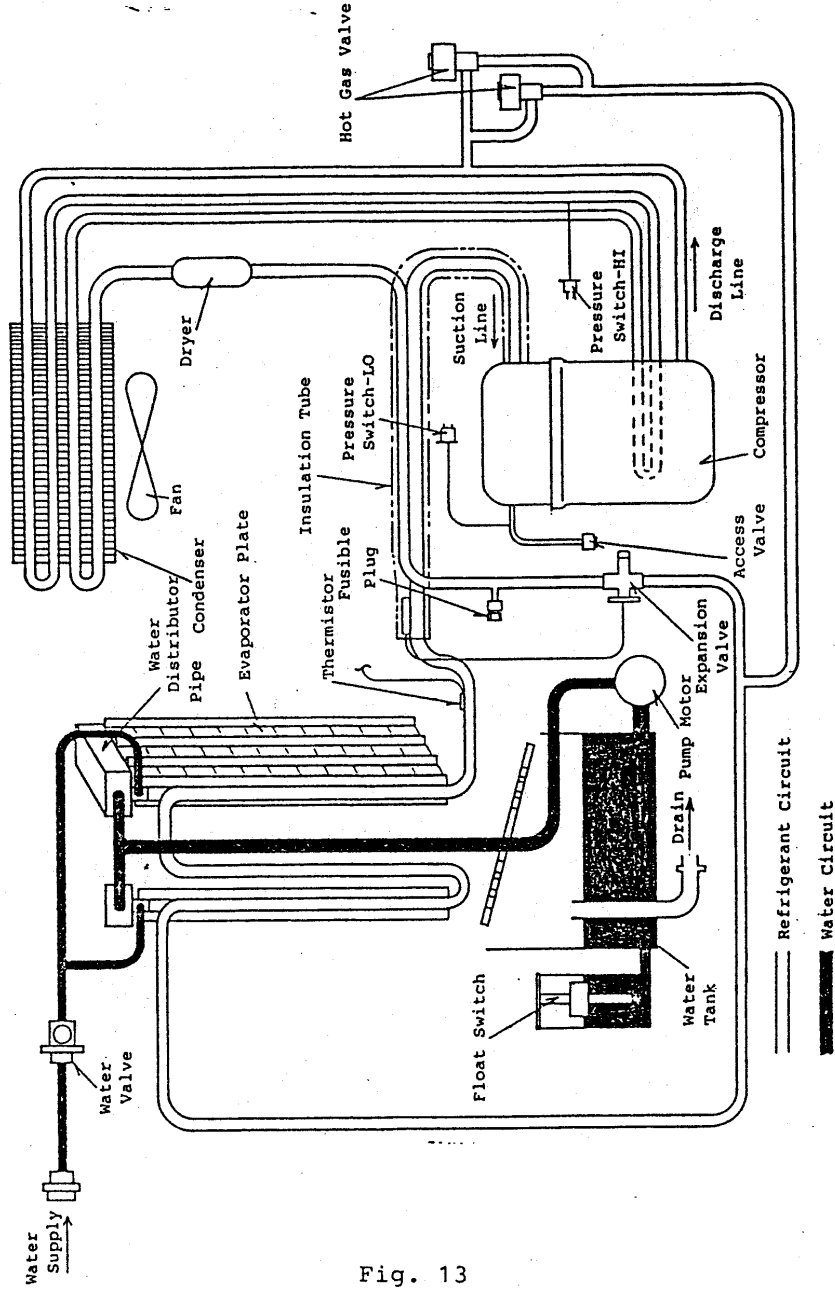


Fig. 13

b. KM-601DWU (Water-cooled)

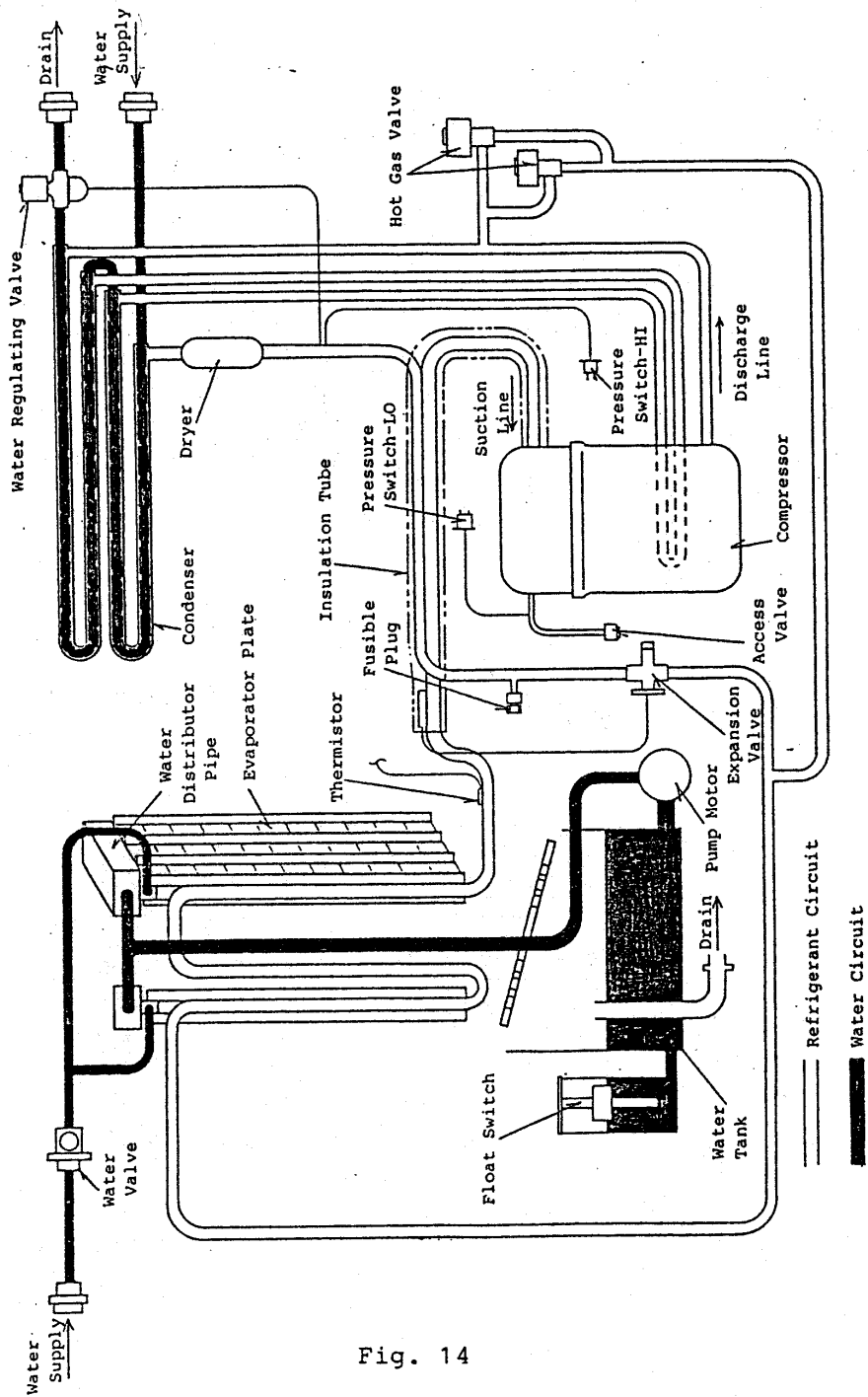
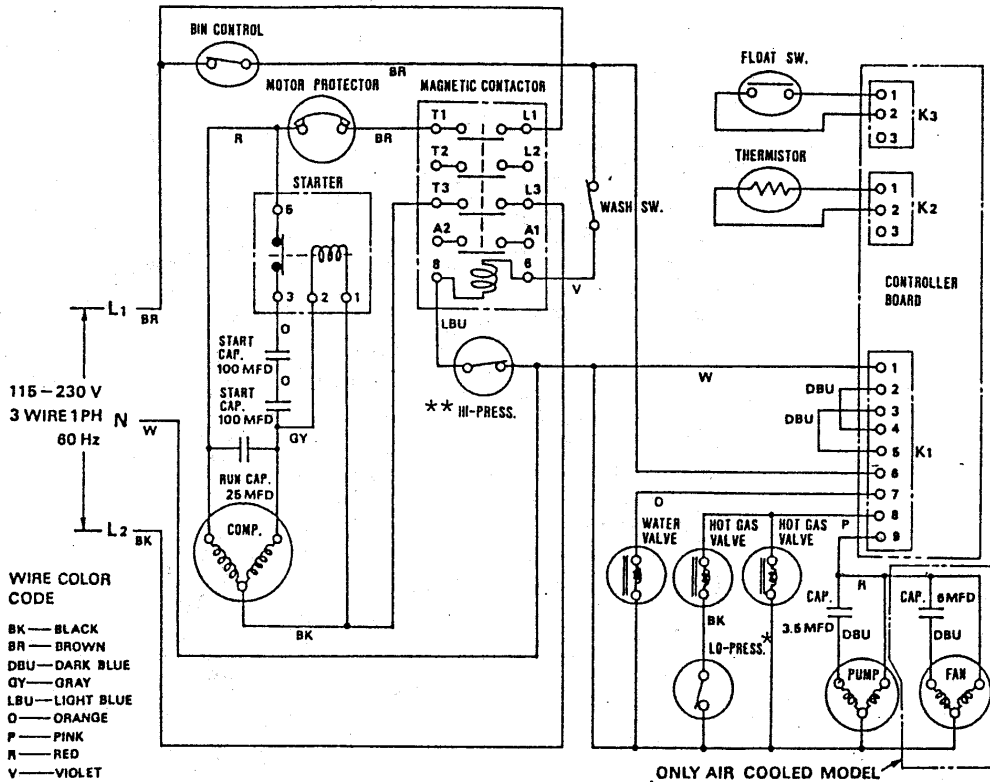


Fig. 14

2. WIRING DIAGRAM

Fig. 15

WIRING DIAGRAM



Note: *Pressure Control - Low-side
Cutout 94.4±7 PSIG
Cutin 49.7±7 PSIG

**Pressure Control - High-side
Cutout 355.5±21.3 PSIG
Cutin 255.9±21.3 PSIG

3. SEQUENCE

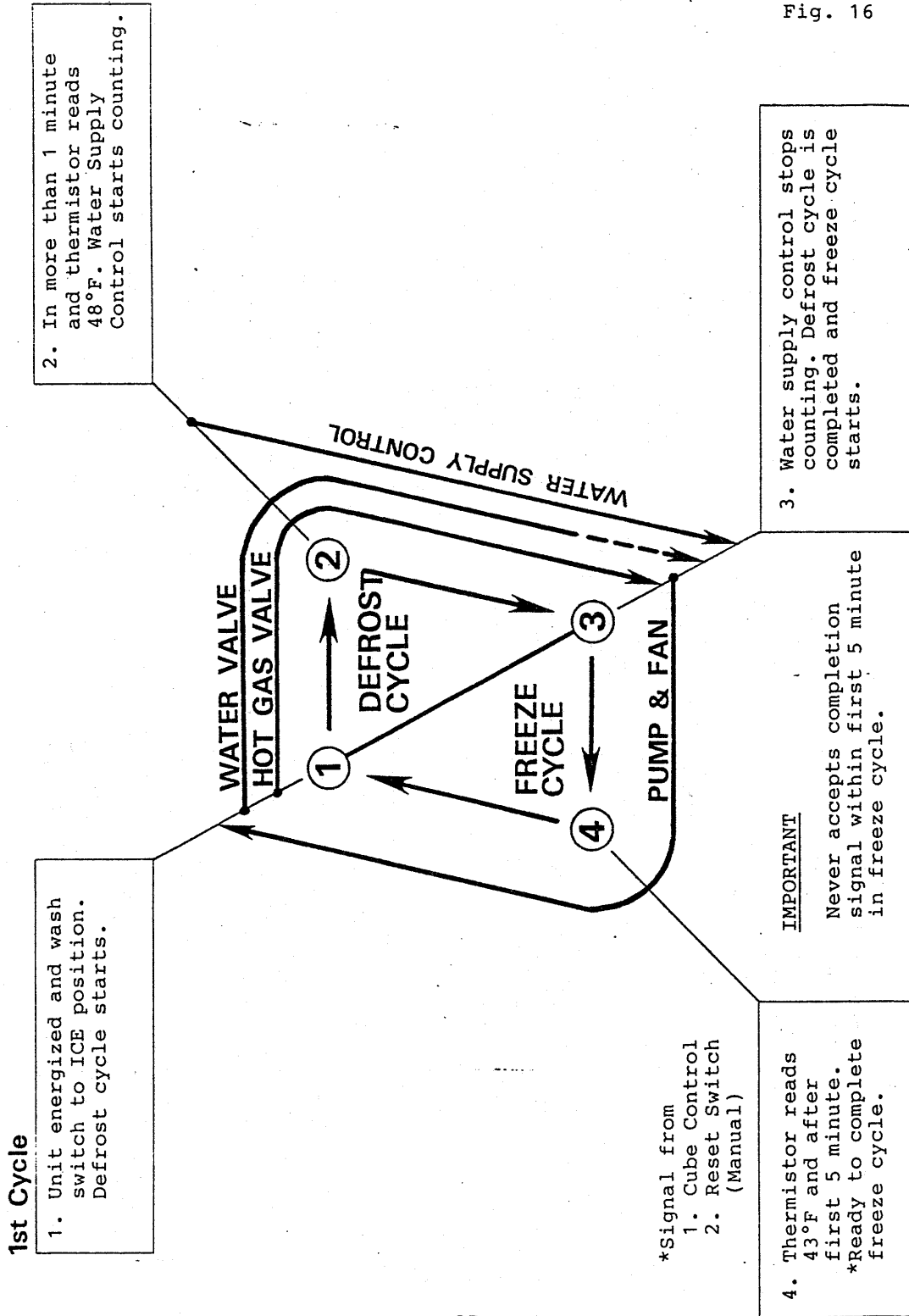
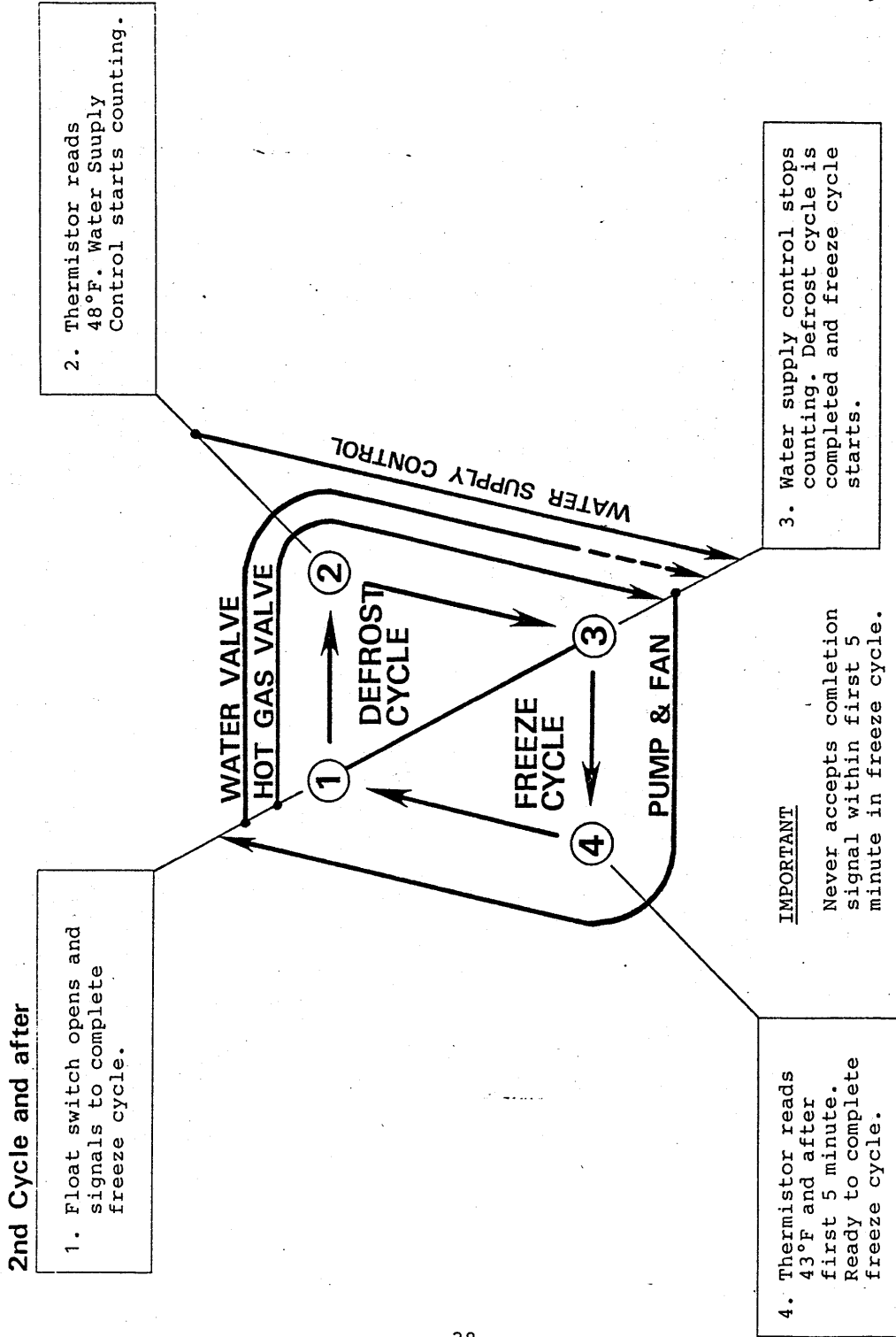


Fig. 16



4. PERFORMANCE DATA

a. KM-601DU (Air-cooled)

Table 1

| Water Temp. (°F) Room Temp. (°F) | Ice Production Capacity (lbs/day) (kg) | | | Freeze Cycle Time (min.) | | | Harvest Cycle Time (min.) | | | Head Pressure* (PSI) (kg/cm ²) | | | Electric Consumption (W) | | | Water Consumption (gal/day) (m ³) | | |
|-------------------------------------|--|------------|------------|--------------------------|----------|----|---------------------------|----|----|--|-------------|-------------|--------------------------|------|-------------|---|-------------|----|
| | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 |
| 70 | 600 272 | 598 268 | 580 263 | 32 33 | 33 34 | 34 | 3 | 2 | 2 | 196 13.8 | 199 14.0 | 202 14.2 | 1350 1360 | 1370 | 246 0.93 | 164 0.62 | 156 0.59 | |
| 80 | 550 249 | 540 245 | 530 240 | 35 | 36 | 37 | 3 | 2 | 2 | 222 15.6 | 229 16.1 | 234 16.5 | 1380 1400 | 1410 | 225 0.85 | 148 0.56 | 143 0.54 | |
| 90 | 495 225 | 485 220 | 475 215 | 39 | 41 | 42 | 3 | 2 | 2 | 251 17.7 | 260 18.3 | 270 19.0 | 1420 1440 | 1460 | 203 0.77 | 127 0.48 | 124 0.47 | |
| 100 | 440 200 | 430 195 | 420 191 | 45 | 47 | 48 | 2.5 | 2 | 2 | 284 20.0 | 293 20.6 | 301 21.2 | 1460 1480 | 1500 | 151 0.57 | 111 0.42 | 108 0.41 | |

Note: *First 5 minute, in Freezing Cycle

b. KM-601DWU (Water-cooled)

Table 2

| Water Temp. (°F) Room Temp. (°F) | Ice Production Capacity (lbs/day) (kg) | | | Freeze Cycle Time (min.) | | | Harvest Cycle Time (min.) | | | Head Pressure* (PSI) (kg/cm ²) | | | Electric Consumption (W) | | | Water Consumption (gal/day) (m ³) | | |
|-------------------------------------|--|------------|------------|--------------------------|----|----|---------------------------|-----|----|--|-------------|-------------|--------------------------|------|-------------|---|--------------|----|
| | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 | 50 | 70 | 90 |
| 70 | 620 281 | 560 254 | 500 227 | 30 | 34 | 39 | 3 | 2.5 | 2 | 227 16.0 | 227 16.0 | 266 18.7 | 1260 1280 | 1340 | 761 2.88 | 1123 4.25 | 1971 7.46 | |
| 80 | 620 281 | 560 254 | 500 227 | 30 | 35 | 39 | 3 | 2 | 2 | 227 16.0 | 227 16.0 | 267 18.8 | 1260 1280 | 1340 | 761 2.88 | 1104 4.18 | 1971 7.46 | |
| 90 | 610 277 | 550 249 | 490 222 | 31 | 36 | 40 | 3 | 2 | 2 | 227 16.0 | 230 16.2 | 270 19.0 | 1260 1280 | 1340 | 756 2.86 | 1110 4.20 | 1947 7.37 | |
| 100 | 590 268 | 530 240 | 470 213 | 32 | 37 | 42 | 3 | 2 | 2 | 230 16.2 | 231 16.3 | 273 19.2 | 1260 1280 | 1340 | 761 2.88 | 1099 4.16 | 1918 7.26 | |

Note: *First 5 minute, in Freezing Cycle

NOTE: THESE DATA SHOULD BE USED AS A BENCH MARK.
 ALLOW 10% VARIATION FROM DATA FOR ERRORS IN TEST EQUIPMENT.

KM-601DU (Air-cooled)

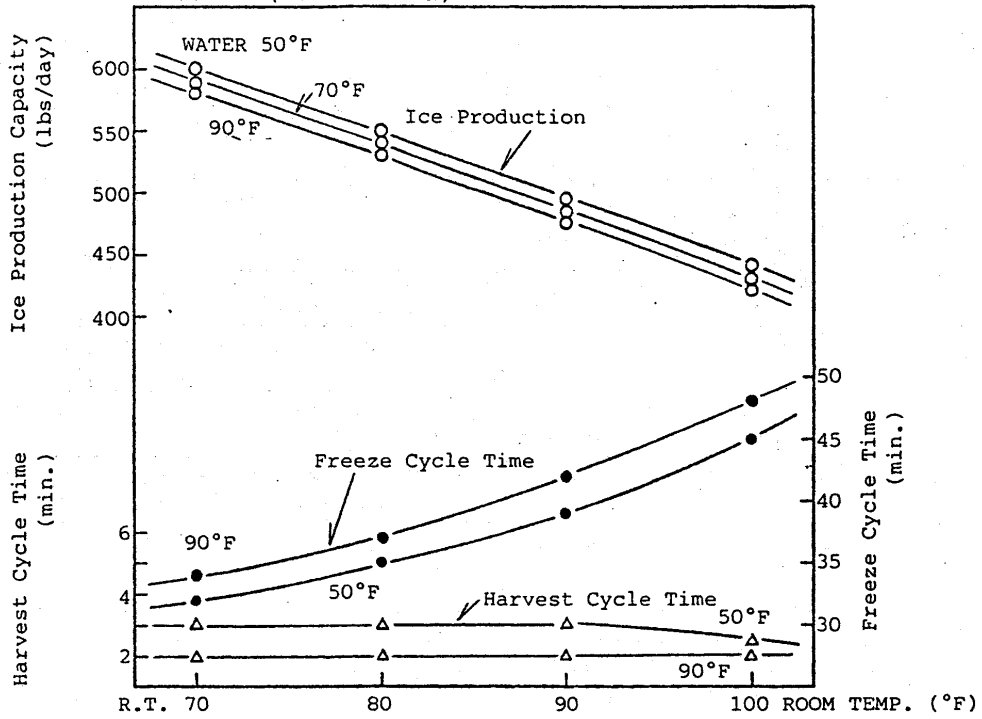


Fig. 18

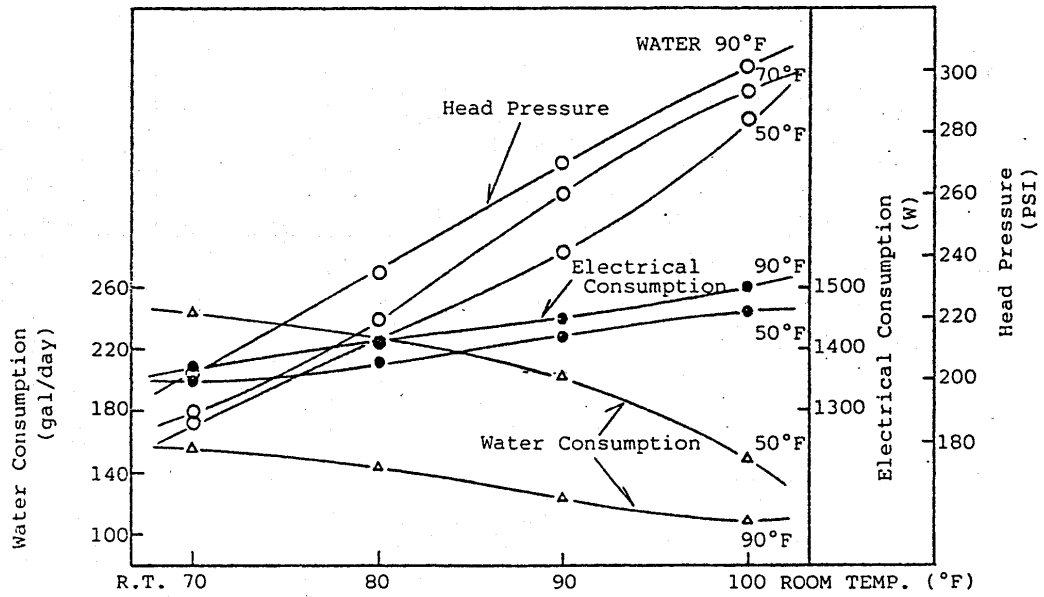


Fig. 19

NOTE: THESE DATA SHOULD BE USED AS A BENCH MARK.
 ALLOW 10% VARIATION FROM DATA FOR ERRORS IN TEST EQUIPMENT.
 KM-601DWU (Water-cooled)

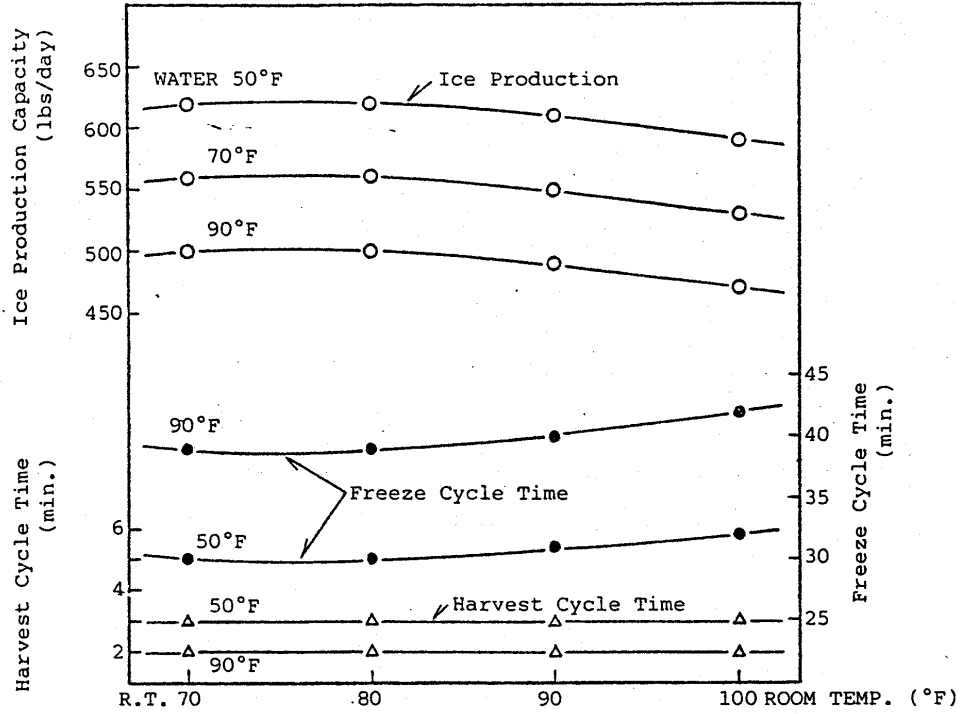


Fig. 20

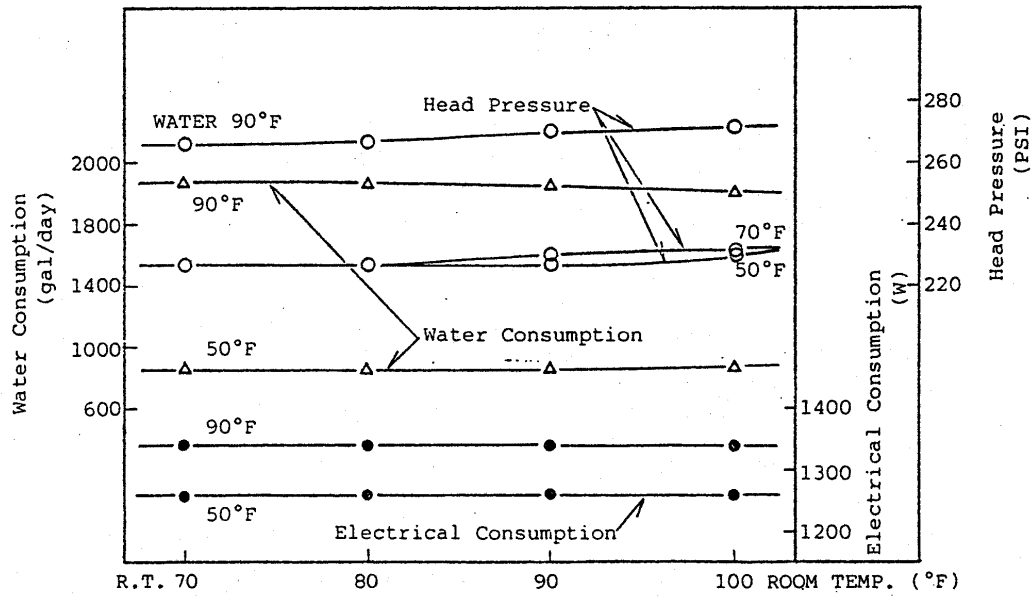


Fig. 21

VI. SERVICE DIAGNOSIS

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|---|--|---|
| 1. No ice production. | | |
| 1) The icemaker will not start. | <p>a. Power Source</p> <ol style="list-style-type: none"> 1. OFF position 2. Loose connections 3. Bad contacts <p>b. Fuse (Inside Fused Disconnect, if any)</p> <ol style="list-style-type: none"> 1. Blownout <p>c. Bin Control Thermostat</p> <ol style="list-style-type: none"> 1. Tripped, with bin filled with ice 2. Ambient temperature too cool 3. Set too warm 4. Bulb out of position 5. Bad contacts or leaks from bulb | <ol style="list-style-type: none"> 1. Move to ON position 2. Tighten 3. Check for continuity and replace 1. Check for short-circuit and replace 1. Remove ice 2. Get warmer 3. Adjust to colder 4. Place in position 5. Check for continuity, and replace |
| 2) Compressor will not start, or operates intermittently. | <p>a. Wash Switch</p> <ol style="list-style-type: none"> 1. WASH position 2. Bad contacts <p>b. High Pressure Control</p> <ol style="list-style-type: none"> 1. Bad contacts 2. Dirty air filter or condenser 3. Ambient or condenser water temperature too warm 4. Refrigerant overcharged 5. Water pressure too low or off 6. Fan not operating 7. Refrigerant line or component plugged <p>c. Water Regulator</p> <ol style="list-style-type: none"> 1. Set too high <p>d. Overload</p> <ol style="list-style-type: none"> 1. Bad contacts 2. Voltage too low 3. Refrigerant overcharged | <ol style="list-style-type: none"> 1. Move to ICE position 2. Check for continuity and replace 1. Check for continuity, with icemaker OFF 2. Clean 3. Get cooler 4. Recharge 5. Check and get recommended pressure 6. See chart 1.-6) 7. Clean and replace drier 1. Adjust to lower 1. Check for continuity, with icemaker OFF 2. Get higher 3. Recharge |

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|--|---|---|
| 2) contd. | e. Starter 1. Bad contacts | 1. Check for continuity, with icemaker OFF |
| | f. Start Capacitor or Run Capacitor 1. Defective | 1. Check for short-circuited, and replace |
| | g. Magnetic Contactor 1. Coil winding opened 2. Bad contacts or defective coil | 1. Replace 2. Check for continuity |
| | h. Compressor 1. Wiring to compressor | 1. Check for loose connection, miswiring or open, and replace |
| | i. Voltage 1. Too low | 1. Get higher |
| 3) No water is supplied. | a. Water Supply Line 1. Water pressure too low or OFF | 1. Check and get recommended pressure |
| | b. Water Solenoid Valve 1. Dirty mesh filter or orifice 2. Coil winding opened 3. Wiring to water valve | 1. Clean 2. Replace 3. Check for loose connection, miswiring or open, and replace |
| | 4. Check Controller Board | 4. See "Checking Controller Board". |
| 4) Water continues to be supplied in freeze cycle. | a. Water Solenoid Valve 1. Diaphragm does not close | 1. Check for water leaks with icemaker OFF |
| | 2. Check Controller Board | 2. See "Checking Controller Board". |
| 5) No water comes from water distributors, or water pump will not start. | a. Water Tank 1. Water level too low | 1. See chart 1.-3) |
| | b. Pump Motor 1. Coil winding opened 2. Bearing worn out 3. Wiring to pump motor 4. Defective Capacitor | 1. Replace 2. Replace 3. Check for loose connection, miswiring or open, and replace |
| | 5. Check Controller Board | 4. Replace 5. See "Checking Controller Board". |

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|--|--|--|
| 5) contd. | <p>c. Pump Assembly</p> <ol style="list-style-type: none"> 1. Defective impeller 2. Mechanical Seal worn out <p>d. Water System</p> <ol style="list-style-type: none"> 1. Water leaks | <ol style="list-style-type: none"> 1. Replace 2. Check for water leaks, and replace 1. Check connections for water leaks, and replace |
| 6) Fan motor will not start, or is not operating. | <p>a. Fan Motor</p> <ol style="list-style-type: none"> 1. Wiring to fan motor 2. Coil winding opened 3. Bearing worn out 4. Defective capacitor <p>5. Check Controller Board</p> <p>b. Fan Blade</p> <ol style="list-style-type: none"> 1. Bound | <ol style="list-style-type: none"> 1. Check for loose connection, miswiring or open, and replace 2. Replace 3. Replace 4. Replace 5. See "Checking Controller Board". 1. Check and replace |
| 7) Ice formed on evaporator plate will not fall into bin. | <p>a. Cube Control Float Switch</p> <ol style="list-style-type: none"> 1. Float does not move freely 2. Bad contacts <p>b. Thermistor</p> <ol style="list-style-type: none"> 1. Loose attachment 2. Defective <p>c. Hot Gas Solenoid Valve</p> <ol style="list-style-type: none"> 1. Coil winding opened 2. Plunger does not move 3. Wiring to hot gas valve | <ol style="list-style-type: none"> 1. Check and replace 2. Check for continuity and replace 1. Reinstall 2. Replace 1. Replace 2. Replace 3. Check for loose connection, miswiring or open, and replace |
| 8) The icemaker skips freezing cycle, or freezing cycle time is too short. | <p>d. Controller Board</p> <ol style="list-style-type: none"> 1. Misconnected, or float switch connected to thermistor 2. Check Controller Board <p>a. Thermistor</p> <ol style="list-style-type: none"> 1. Connector disconnected 2. Leads opened <p>b. Cube Control Float Switch</p> <ol style="list-style-type: none"> 1. Connector disconnected 2. Water level too low | <ol style="list-style-type: none"> 1. Place in position 2. Replace 1. Place in position 2. See chart 1.-3) |

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|---|--|---|
| 8) contd. | b. contd. | |
| | 3. Float does not move freely | 3. Check and replace |
| | 4. Wiring opened | 4. Check for continuity and replace |
| | 5. Defective switch | 5. Replace |
| | 6. Check Controller Board | 6. See "Checking Controller Board". |
| 9) All components runs, but no ice is produced. | a. Refrigerant | 1. Check for leaks and recharge |
| | | 2. Clean and replace drier, and recharge |
| | b. Compressor | 1. Replace |
| | c. Hot Gas Solenoid Valve | 1. Check and replace |
| | 1. Defective valve | |
| | 1. Continues to open in freezing cycle | |
| 2. Low ice production. | | |
| | POSSIBLE CAUSE | REMEDY |
| | 1. Freezing cycle time is too long. | 1. See Chart 1. And check Dirty filter or condenser, Ambient or water temperature, Water pressure, Water regulator, Thermistor, Refrigerant charge or Water solenoid valve. |
| 2) Harvest cycle time is too long. | a. Water Tank | 1. See Chart 1.-5) |
| | b. Hot Gas Solenoid Valve | 1. See Chart 1.-7) |
| | | 2. Defective low pressure switch |
| | c. Ambient and Water temperature | 2. Check and replace |
| | | 1. Get warmer |
| 3. Abnormal ice. | | |
| | POSSIBLE CAUSE | REMEDY |
| 1) Small cube | a. Water Tank | 1. See Chart 1.-5) |
| | | |
| | 1. Water level too low | |

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|----------------|--|---|
| 1) contd. | b. Cube Control Float Switch 1. Upper position | 1. Move to lower position |
| | c. Ice Cube Guide 1. Out of position. Circulated water falls into bin | 1. Place in position |
| 2) Cloudy cube | a. Water System 1. Dirty | 1. Clean |
| | b. Water Distributor and Water Supply Guide 1. Plugged | 1. Clean |
| | c. Water Quality 1. High hardness or contains impurities | 1. Move water supply control to longer, or install a water softener |
| | d. Circulated Water 1. Too little | 1. See Chart 1.-5) |

4. Others.

| TROUBLE | POSSIBLE CAUSE | REMEDY |
|---|---|-----------------------------------|
| 1) Icemaker will not stop when bin filled with ice. | a. Bin control Thermostat 1. Set too cold 2. Defective | 1. Adjust to warmer 2. Replace |
| 2) Abnormal noise | a. Pump motor 1. Bearings worn out | 1. Replace |
| | b. Fan motor 1. Bearings worn out | 1. Replace |
| | c. Compressor 1. Bearings worn out, or cylinder valve broken | 1. Replace |
| 3) Ice in storage bin often melts. | a. Bin drain 1. Plugged | 1. Clean |

1. SERVICE FOR REFRIGERANT LINES

a. Refrigerant Discharge

A refrigerant Access Valve is provided with the icemaker unit. Install a proper fitting on the HIGH-SIDE line, if necessary, to check for Gauge Pressure.

b. Evacuation and Recharge

1. Attach Charging Hoses, Service Manifold and Vacuum Pump to the system.
2. Turn on the Vacuum Pump.
3. Allow vacuum pump to pull down to a 29.9"Hg vacuum. Evacuating period depends on Pump Capacity.
4. Close a Low-side Valve on the Service Manifold.
5. Disconnect the vacuum pump, and attach a Refrigerant Service Can. Remember to loosen the connection, and blow the Air from the hose. See NAMEPLATE for refrigerant charge.
6. Open the Low-side Valve. DO NOT invert the service can. A LIQUID CHARGE will damage the Compressor.
7. Turn on the icemaker when charging speed gets SLOW. Turn off the icemaker when the Low-side Gauge shows approximately 0 PSIG. DO NOT run the icemaker at vacuum pressures. Close the Low-side Valve when the Service Can gets empty.
8. Repeat STEP #4 through #7, if necessary, until a required amount of refrigerant enters the system.
9. Close the Refrigerant Access Valve, and disconnect the Hoses, Service Manifold, etc.
10. Cap the Access Valve to prevent possible leak.

2. BRAZING

DANGER

- (1) Refrigerant R502 itself is not flammable, explosive and poisonous. However, when exposed to an open flame, R502 creates Phosgene gas, hazardous in large amount.
- (2) Always purge system through hose wanted to the outside, because it is dangerous that the room is filled with R502, easily displacing the air.
- (3) Do not use silver alloy or copper alloy containing Arsenic.

NOTE: All solder-connections on the refrigerant circuit components are clear-paint coated. Sandpaper the solder-connections before unsolder the components. Use a good abrasive cloth to remove paint.

3. REMOVAL AND REPLACEMENT OF COMPRESSOR

- (1) Disconnect the power source.
- (2) Remove the Front Panel, Top Panel, Right Side Panel.
- (3) Blow refrigerant from the system.
- (4) Remove TERMINAL COVER on the compressor, and disconnect Solderless Terminals.
- (5) Remove the DISCHARGE and SUCTION pipes using a Brazing equipment.
- (6) Remove the HOLD-DOWN BOLTS, WASHERS and RUBBER GRUMMETS.
- (7) Slide the compressor and remove.
Unpack a New Compressor package. Install a new compressor.

- (8) Attach the RUBBER GRUMMETS of the prior compressor.
- (9) Sandpaper the SUCTION and DISCHARGE pipes.
- (10) Place the compressor in position, and secure it using the BOLTS and WASHERS.
- (11) Remove PLUGS from the SUCTION and DISCHARGE pipes.
- (12) Braze or solder the ACCESS, SUCTION and DISCHARGE lines (DO NOT change this order), with NYTROGEN GAS flowing at the pressure 3 - 4 PSIG.
- (13) Check for leaks using NYTROGEN GAS (140 PSIG) and soap bubble.
- (14) Evacuate the system and charge refrigerant.
See NAMEPLATE for required refrigerant charge.
- (15) Connect the Solderless Terminals and place the TERMINAL COVER in position.
- (16) Place PANELS in position.
- (17) Connect the power source.

4. REMOVAL AND REPLACEMENT OF DRIER

- (1) Disconnect the power source.
- (2) Remove the Front Panel, Top Panel and Right Side Panel.
- (3) Blow refrigerant from the system.
- (4) Remove the DRIER using a Brazing equipment.
- (5) Braze or solder a new Drier, with the ARROW on the drier, in the DIRECTION of the REFRIGERANT FLOW.
Use NYTROGEN GAS at the pressure of 3 - 4 PSIG when brazing tubings.
- (6) Check for leaks using NYTROGEN GAS (140 PSIG) and soap bubble.
- (7) Evacuate the system and charge refrigerant.
See NAMEPLATE for required refrigerant charge.
- (8) Place panels in position.
- (9) Connect the power source.

5. REMOVAL AND REPLACEMENT OF EXPANSION VALVE

- (1) Disconnect the power source.
- (2) Remove the Front Panel.
- (3) Blow refrigerant from the system.
- (4) Remove the Expansion Valve Bulb.
- (5) Disconnect the Solder-connections of the Valve, using a Brazing equipment.
- (6) Braze or solder a new expansion valve, with NYTROGEN GAS flowing at the pressure of 3 - 4 PSIG.
- (7) Check for leaks using NYTROGEN GAS (140 PSIG) and soap bubble.
- (8) Evacuate the system and charge refrigerant.
See NAMEPLATE for required refrigerant charge.
- (9) Attach the Bulb to the suction line in position.
Be sure to secure it using a wire, and tape insulation.
- (10) Place the panels in position.
- (11) Connect the power source.

IMPORTANT - Sometimes moisture in the Refrigerant Circuit exceeds Drier Capacity and freeze up at the Expansion Valve.
Drier should be replaced at the same time.

6. REMOVAL AND REPLACEMENT OF HOT GAS VALVE

- (1) Disconnect the power source.
- (2) Remove the Front Panel, Top Panel and Right Side Panel.
- (3) Disconnect the HOT GAS VALVE leads.
- (4) Remove screw and SOLENOID.
- (5) Remove the solder connection using Brazing equipment.
- (6) Install a new valve. Always PROTECT the valve body using a DAMP CLOTH to prevent damage to valve against overheat. DO NOT braze with the valve body exceeding 250°F. Use NYTROGEN GAS at the pressure of 3 - 4 PSIG when brazing the valve.
- (7) Check for leaks using NYTROGEN GAS (140 PSIG) and soap bubble.
- (8) Evacuate the system and charge refrigerant. See NAMEPLATE for required refrigerant charge.
- (9) Attach a Solenoid to the valve body, and secure it with screw.
- (10) Connect the Leads.
- (11) Place the panels in position.
- (12) Connect the power source.

Note: Always use same diameter and length of copper pipe when replace hot gas lines. This may otherwise cause much reduction of performance.

7. REMOVAL AND REPLACEMENT OF WATER REGULATING VALVE (WATER COOLED MODEL ONLY)

VALVE BODY

Close the water supply Shut-off Valve.

- (1) Disconnect the power source.
- (2) Remove the Front Panel, Top Panel and Right Side Panel.
- (3) Disconnect the Flare-connections of the Water Regulating valve.
- (4) Remove the valve from the Bracket.
- (5) Remove 4(four) screws holding the Valve Body.
- (6) Remove the Valve Body, install a new valve body, with the ARROW on the Valve Body, in the DIRECTION of the WATER FLOW.
- (7) Place the valve in position, and reassemble in reverse order.
- (8) Open the shut-off valve.
- (9) Connect the power source.
- (10) Check for leaks.
- (11) Place the panels in position.

WHOLE VALVE

Close the water supply Shut-off Valve.

- (1) Disconnect the power source.
- (2) Remove the Front Panel, Top Panel and Right Side Panel.
- (3) Blow refrigerant from the system.
- (4) Cut off the copper tube near the Capillary Tube solder connection, using a pipe cutter.
- (5) Cut off the Capillary Tubes of the Valve and High-pressure Switch, using a File and a Pliers. Be careful not to damage the capillary tube end.
- (6) Disconnect the Flare-connections of the valve.
- (7) Remove the screws and the valve from the Bracket.
- (8) Install a new valve, and insert the Capillary tubes into the copper tube.
- (9) Reduce the diameter of the copper tube end, and braze or solder copper tube and capillary tubes together.
- (10) Check for leaks using NYTROGEN GAS (140 PSIG) and soap bubble.

- (11) Evacuate the system and charge refrigerant.
See NAMEPLATE for required refrigerant charge.
- (12) Connect the Flare-connections.
- (13) Open the shut-off valve, and connect the power source.
- (14) Check for water leaks.
- (15) Place the panels in position.

8. REMOVAL AND REPLACEMENT OF FAN MOTOR

- (1) Disconnect the power source.
- (2) Remove the Front Panel, Top Panel and Right Side Panel.
- (3) Remove the Wire Connectors from the Fan Motor leads.
- (4) Remove the Fan Motor Bracket and Fan Motor.
- (5) Install a new fan motor in reverse order.
- (6) Place the panels in position.
- (7) Connect the power source.

9. REMOVAL AND REPLACEMENT OF WATER VALVE

- (1) Close the water supply line Shut-off Valve.
- (2) Disconnect the power source.
- (3) Disconnect the Receptacle (leads) from the Water Valve.
- (4) Remove the Valve Outlet tubing disconnecting the Clamp.
- (5) Remove the bracket from the unit.
- (6) Remove the Fitting Nut and Water Valve.
- (7) Install a new valve in reverse order.
- (8) Open the shut-off valve.
- (9) Connect the power source.
- (10) Check for leaks.
- (11) Place the panels in position.

10. REMOVAL AND REPLACEMENT OF PUMP MOTOR

- (1) Disconnect the power source.
- (2) Remove the Front Panel and the Pump Cover.
- (3) Remove the Wire Connectors from the Pump Motor leads.
- (4) Remove screws and Pump Motor.
- (5) Disconnect the Pump SUCTION and DISCHARGE tubings.
- (6) Dis-assemble the pump motor and check motor or parts.
- (7) Install a new motor or parts in reverse order.
- (8) Connect the power source, and check for leaks.
- (9) Place the panels in position.

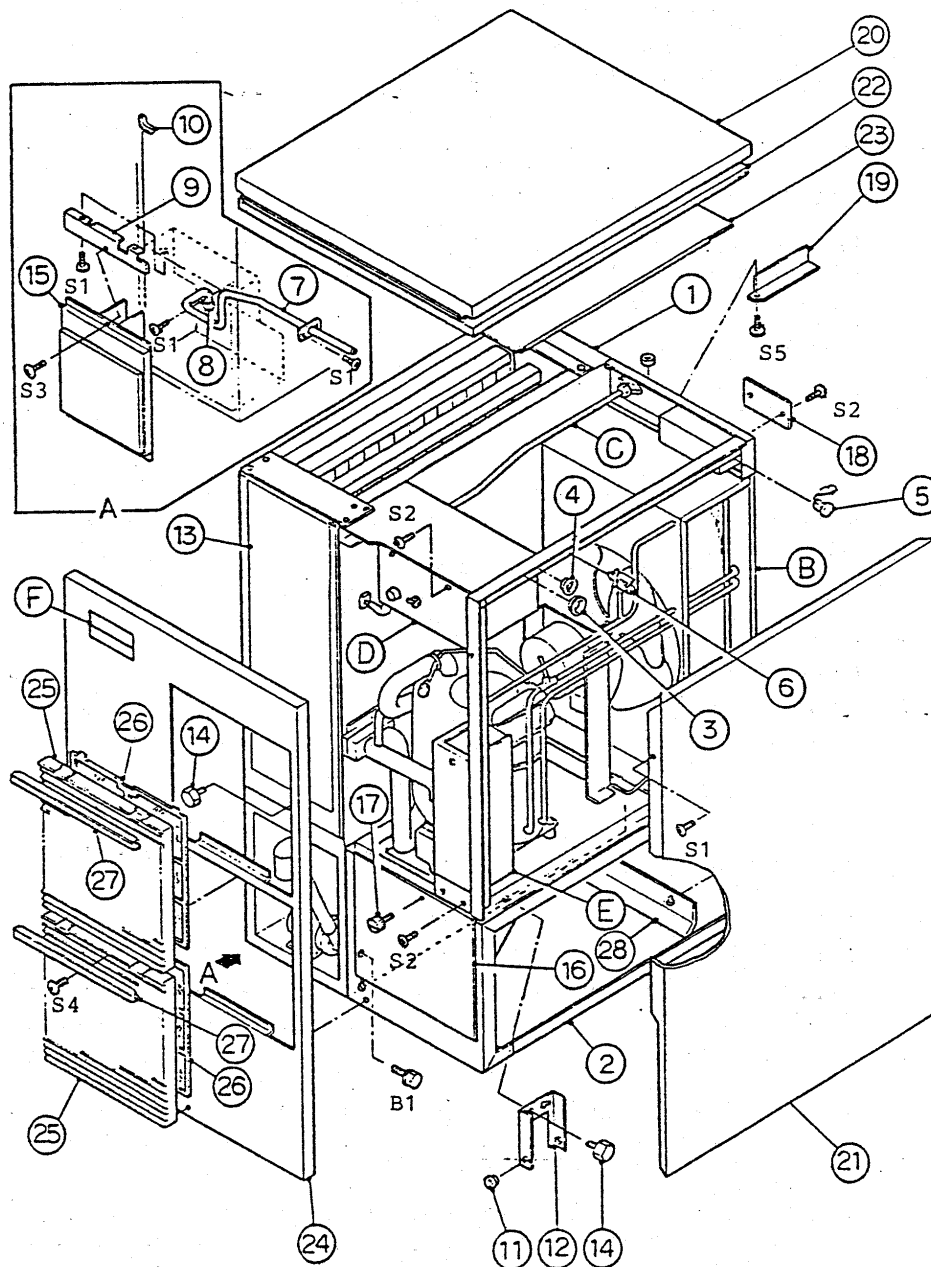
11. REMOVAL AND REPLACEMENT OF WATER DISTRIBUTOR

- (1) Disconnect power source and close the water supply line shut-off valve.
- (2) Remove the front panel and the front insulation.
- (3) Remove the rubber hose (Y branch) from the water distributors (Water Supply pipe) by removing the hose clamps.
- (4) Loosen the fasteners (plungers) on the water distributors by pulling the heads.
- (5) Remove the water distributors.
- (6) Install new water distributor in reverse order.

VIII. PARTS LIST

KM-601DU(Air-cooled)

A. GENERAL ASSEMBLY

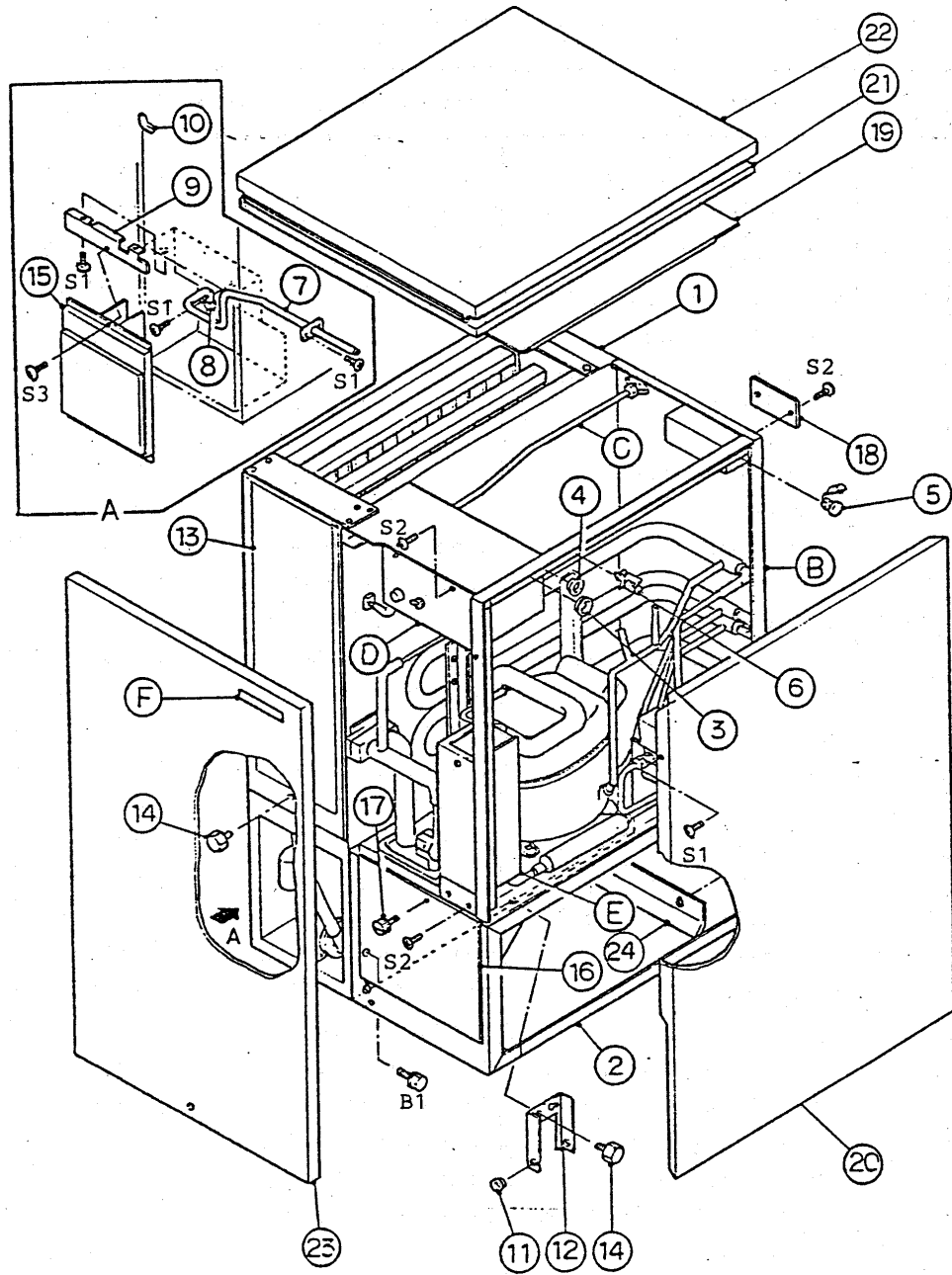


FASTENER

- S1 - Sheetmetal Screw, Stainless, M4 x 8
- S2 - Sheetmetal Screw, M4 x 8
- S3 - Machine Screw, Stainless, M4 x 6
- S4 - Machine Screw, Stainless, M4 x 8
- S5 - Machine Screw, M4 x 8
- B1 - Machine Bolt and Washer, Stainless, M6 x 16

| MODEL | | TITLE | | |
|-----------------------|----------------------------------|--------------------------|-------------|--------------|
| KM-601DU (Air-cooled) | | A. GENERAL ASSEMBLY | | (1/2) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| B | Refrigeration Unit Assembly | - | - | 1 |
| C | Water Supply Line Assembly | - | - | 1 |
| D | Control Box Assembly | - | - | 1 |
| E | Controller Box Assembly | - | - | 1 |
| F | Instruction Sheet/Label Location | - | - | 1 |
| 1 | Evaporator Case | - | 103305G01 | 1 |
| 2 | Base Frame | - | 426962G01 | 1 |
| 3 | Snap Bushing | Model SB-1093-15 | 420470-03 | 1 |
| 4 | Snap Bushing | Model SB-750-10 | 420470-05 | 1 |
| 5 | Relief Bushing | Model SR-30-1 | 420472-03 | 1 |
| 6 | Locking Wire Saddle | Model LWS-2NA | 7830-0002 | 2 |
| 7 | Tubing - Wiring | Copper | 427008G01 | 1 |
| 8 | Clamp | Model NK-6N | 418814-06 | 1 |
| 9 | Guard | Stainless Steel | 426917-01 | 1 |
| 10 | Bushing | Model KG-012 | 414116-01 | 1 |
| 11 | Bushing - Capillary Tube | EP Rubber | 425307-01 | 3 |
| 12 | Bracket - Bulb | Stainless Steel | 426920-01 | 1 |
| 13 | Insulation - Front | ABS | 316846G01 | 1 |
| 14 | Fastener - Bracket | ABS | 415949G01 | 2 |
| 15 | Pump Cover | Galvanized Steel | 316891G01 | 1 |
| 16 | Base Cover | Stainless Steel | 316999G01 | 1 |
| 17 | Fastener - Base Cover | Stainless Steel | 425221-01 | 1 |
| 18 | Cover - Junction Box | Galvanized Steel | 426922-01 | 1 |
| 19 | Clearance Indicator | Galvanized Steel | 426921-01 | 1 |
| 20 | Top Panel | Stainless Steel | 316894G01 | 1 |
| 21 | Side Panel (Right) | Stainless Steel | 208704G01 | 1 |
| 22 | Insulation - Top Panel | Polyurethane | 426923-01 | 1 |
| 23 | Guard - Top Panel | Galvanized Steel | 316916-01 | 1 |
| 24 | Front Panel | Stainless Steel | 316932-01 | 1 |

| MODEL | | TITLE | | |
|----------------------|----------------|--------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | A. GENERAL ASSEMBLY | | (2/2) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 25 | Louver | ABS | 103121-01 | 2 |
| 26 | Air Filter | ABS | 208283G01 | 2 |
| 27 | Cover - Louver | ABS | 316079-01 | 2 |
| 28 | Guide | Galvanized Steel | 427834-01 | 1 |

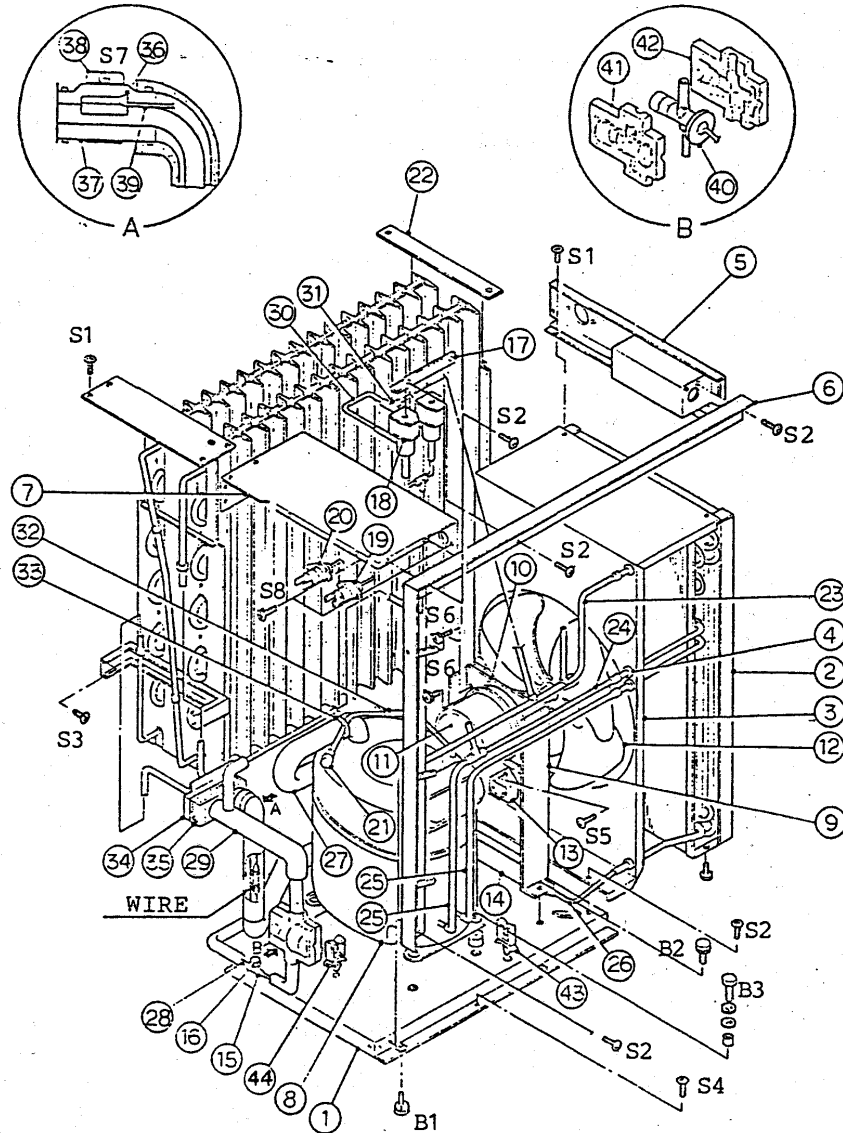


FASTENER

- S1 - Sheetmetal Screw, Stainless, M4 x 8
- S2 - Sheetmetal Screw, M4 x 8
- S3 - Machine Screw, Stainless, M4 x 6
- B1 - Machine Bolt and Washer, Stainless, M6 x 16

| MODEL | TITLE | (1/1) |
|-------------------------|---------------------|-------|
| KM-601DWU(Water-cooled) | A. GENERAL ASSEMBLY | |

| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
|-----------|----------------------------------|--------------------------|-------------|--------------|
| B | Refrigeration Unit Assembly | - | 103313A01 | 1 |
| C | Water Supply Line Assembly | - | 103307A01 | 1 |
| D | Control Box Assembly | - | 208703A01 | 1 |
| E | Controller Box Assembly | - | 316912A01 | 1 |
| F | Instruction Sheet/Label Location | - | 316974A01 | 1 |
| 1 | Evaporator Case | - | 103305G01 | 1 |
| 2 | Base Frame | - | 426962G02 | 1 |
| 3 | Snap Bushing | Model SB-1093-15 | 420470-03 | 1 |
| 4 | Snap Bushing | Model SB-750-10 | 420470-05 | 1 |
| 5 | Relief Bushing | Model SR-30-1 | 420472-03 | 1 |
| 6 | Locking Wire Saddle | Model LWS-2NA | 7830-0002 | 2 |
| 7 | Tubing-Wiring | Copper | 427008G01 | 1 |
| 8 | Clamp | Model NK-6N | 418814-06 | 1 |
| 9 | Guard | Stainless Steel | 426917-01 | 1 |
| 10 | Bushing | Model KG-012 | 414116-01 | 1 |
| 11 | Bushing-Capillary Tube | EP Rubber | 425307-01 | 3 |
| 12 | Bracket - Bulb | Stainless Steel | 426920-01 | 1 |
| 13 | Insulation - Front | ABS | 316846G01 | 1 |
| 14 | Fastener - Bracket | ABS, Stainless Steel | 415949G04 | 2 |
| 15 | Pump Cover | Galvanized Steel | 316891G01 | 1 |
| 16 | Base Cover | Stainless Steel | 316999G01 | 1 |
| 17 | Fastener - Base Cover | Stainless Steel | 425221-01 | 1 |
| 18 | Cover - Junction Box | Galvanized Steel | 426922-01 | 1 |
| 19 | Guard - Top Panel | Galvanized Steel | 316916-01 | 1 |
| 20 | Side Panel (Right) | Stainless Steel | 208704G01 | 1 |
| 21 | Insulation - Top Panel | Polyurethane | 426923-01 | 1 |
| 22 | Top Panel | Stainless Steel | 316894G01 | 1 |
| 23 | Front Panel | Stainless Steel | 316915-01 | 1 |
| 24 | Guide | Galvanized Steel | 427834-01 | 1 |

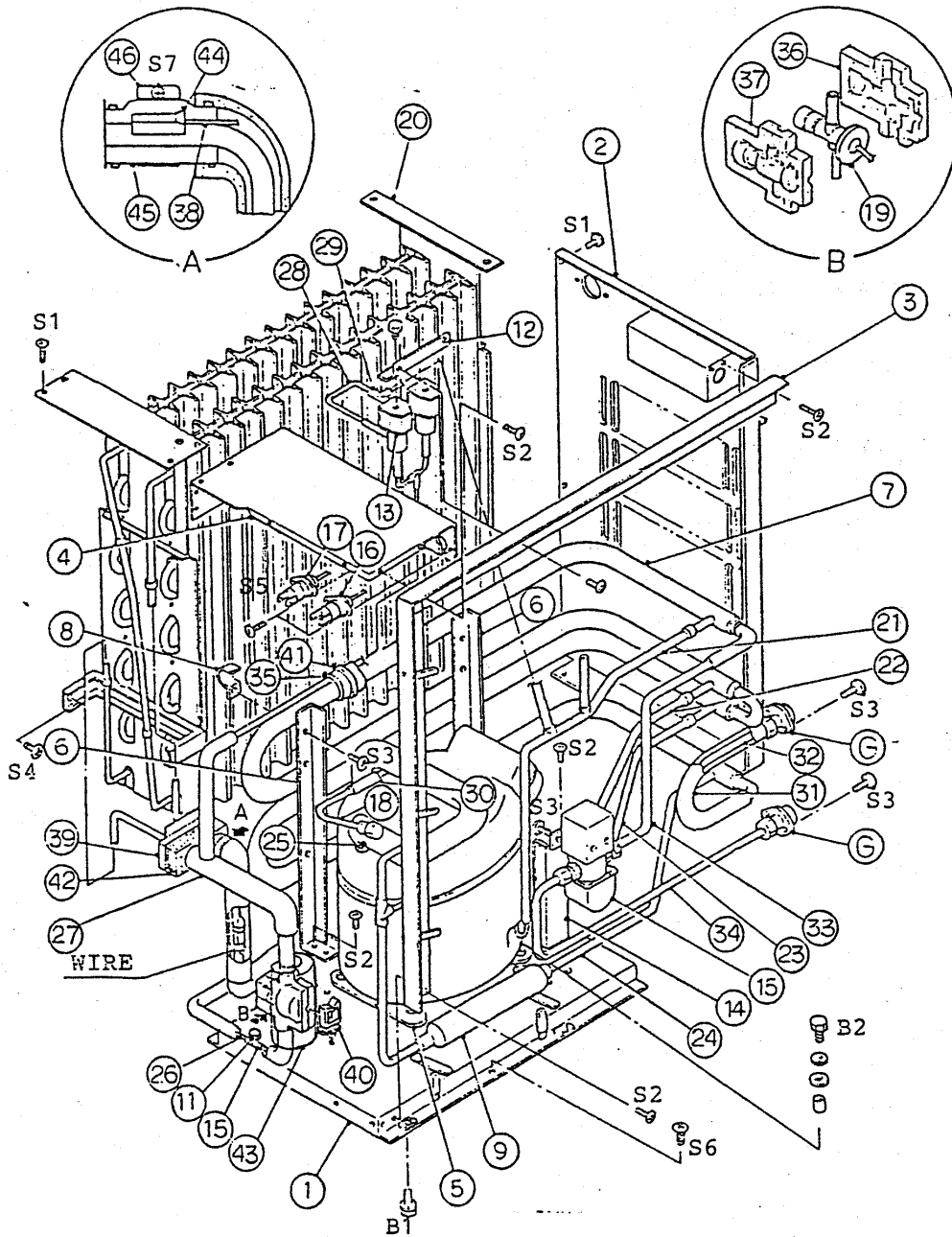


FASTENER

- S1 - Sheetmetal Screw, Stainless, M4 x 8
- S2 - Sheetmetal Screw, M4 x 8
- S3 - Machine Screw, Stainless, M4 x 8
- S4 - Machine Screw, Stainless, M4 x 6
- S5 - Machine Screw, M4 x 8
- S6 - Machine Screw and Washer, M4 x 12
- S7 - Machine Screw, Stainless, M4 x 12
- S8 - Sheetmetal Screw, M3 x 8
- B1 - Machine Bolt and Washer, Stainless, M6 x 12
- B2 - Machine Bolt and Washer, M5 x 12
- B3 - Machine Bolt

| MODEL | | TITLE | | |
|----------------------|----------------------------------|--------------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | B. REFRIGERATION UNIT ASSEMBLY | | (1/2) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Chassis | Galvanized Steel | 316961G01 | 1 |
| 2 | Condenser - Air-cooled | Galvanized Steel | 426961G01 | 1 |
| 3 | Shroud | Galvanized Steel | 316933-01 | 1 |
| 4 | Bushing | - | 413855-02 | 4 |
| 5 | Junction Box | Galvanized Steel | 316887G01 | 1 |
| 6 | Frame - A | Galvanized Steel | 316928G01 | 1 |
| 7 | Frame - B | Galvanized Steel | 316888G01 | 1 |
| 8 | Compressor | Model KL100TD-3 | 2U0043-01 | 1 |
| 9 | Bracket (A) - Fan Motor | Galvanized Steel | 316930-01 | 1 |
| 10 | Bracket (B) - Fan Motor | Galvanized Steel | 426982-01 | 1 |
| 11 | Fan Motor | Model IJ30104 | 2U0064-01 | 1 |
| 12 | Fan Blade | Model ϕ 300 | 427075-01 | 1 |
| 13 | Capacitor - Fan Motor | Model 6MFD 220V | 427076-01 | 1 |
| 14 | Drier | Model KC-6749 | 427061-01 | 1 |
| 15 | Tee - Fusible Plug | Model YWP-251-HD | 421832-01 | 1 |
| 16 | Fusible Plug | Model FUP-1105H12 | 4U0010-01 | 1 |
| 17 | Bracket - Hot Gas Solenoid Valve | Stainless Steel | 426983-01 | 1 |
| 18 | Hot Gas Solenoid Valve | Model ABS-25-1-HD-2 | 3U0033-01 | 2 |
| 19 | Pressure Switch (High) | Model PS-7CUT OFF25K | 3U0069-01 | 1 |
| 20 | Pressure Switch (Low) | Model PS-7CUT OFF7K | 3U0069-02 | 1 |
| 21 | Refrigerant Access Valve | Model TCJ-2F15-HD | 417366-01 | 1 |
| 22 | Evaporator | - | 103316G01 | 1 |
| 23 | Pipe (A) - High Side | Copper | 317357G01 | 1 |
| 24 | Pipe (B) - High Side | Copper | 317358G01 | 1 |
| 25 | Pipe (C) - High Side | Copper | 317359-01 | 1 |
| 26 | Pipe (D) - High Side | Copper | 427588-01 | 1 |
| 27 | Heat - exchanger | Copper | 317361G01 | 1 |
| 28 | Pipe (F) - High Side | Copper | 427589-01 | 1 |
| 29 | Pipe - Low side | Copper | 317360G01 | 1 |
| 30 | Hot Gas Pipe (A) | Copper | 427590-01 | 1 |
| 31 | Tee | Copper | 420041-03 | 1 |
| 32 | Pipe | Copper | 427591-01 | 1 |

| MODEL | | TITLE | | |
|----------------------|-----------------------------|--------------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | B. REFRIGERATION UNIT ASSEMBLY | | (2/2) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 33 | Nylon Tie | Model CV-150 | 7920-0003 | 14 |
| 34 | Seal | FPDM | 426867-01 | 1 |
| 35 | Insulation - Seal | Polyethylene Foam | 427437-01 | 1 |
| 36 | Holder - Thermistor | C1100P | 427430-01 | 1 |
| 37 | Insulation - Thermistor | Polyethylene Foam | 427441-01 | 1 |
| 38 | Bracket - Thermistor | Stainless Steel | 427431-01 | 1 |
| 39 | Thermistor | - | 427062-01 | 1 |
| 40 | Expansion Valve | Model ABE-R10-HD | 427063-01 | 1 |
| 41 | Cover (B) - Expansion Valve | Polyethylene Foam | 317257-02 | 1 |
| 42 | Cover (A) - Expansion Valve | Polyethylene Foam | 317257-01 | 1 |
| 43 | Locking Wire Saddle | Model LWS-4NA | 7830-0007 | 1 |
| 44 | Locking Wire Saddle | Model LWS-2NA | 7830-0002 | 1 |



FASTENER

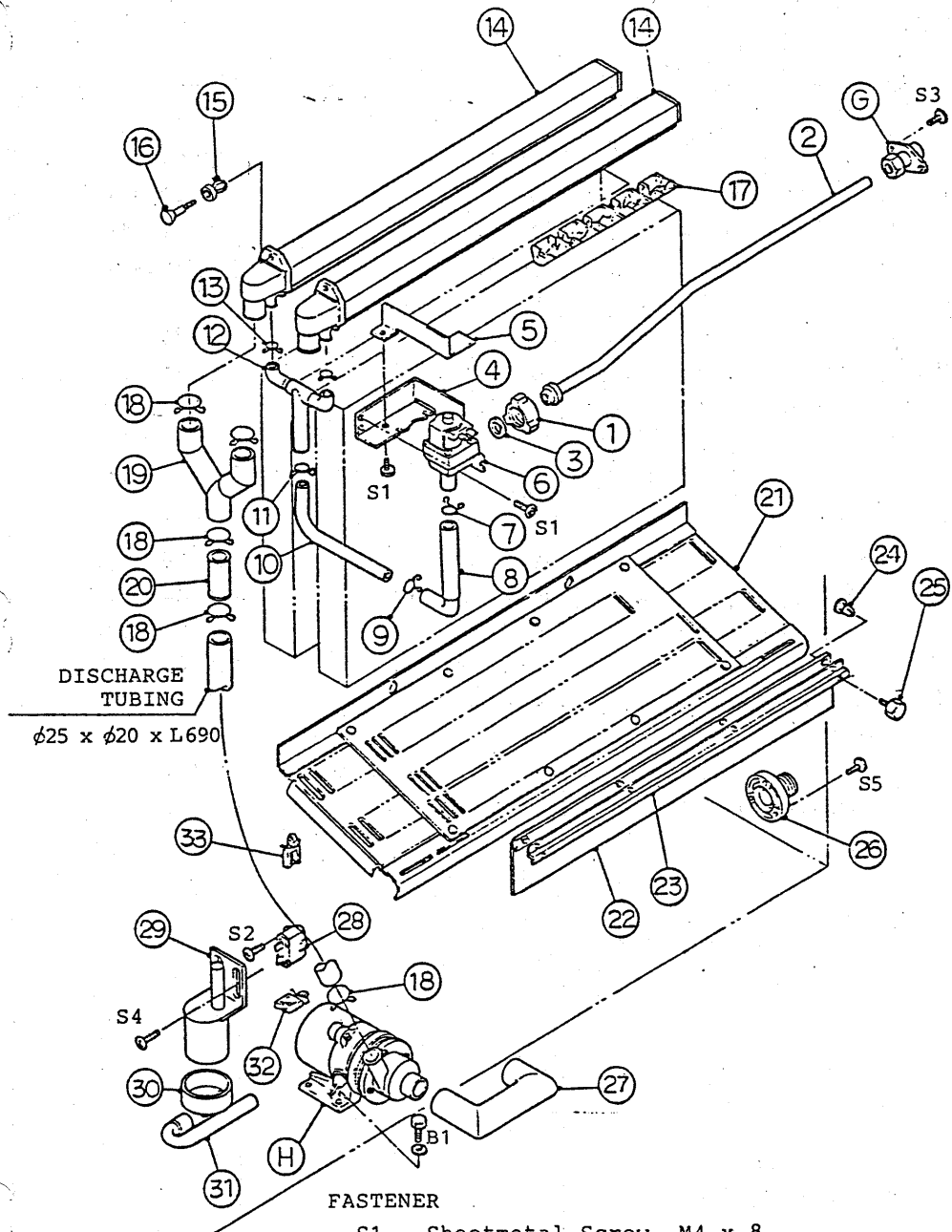
- S1 - Sheetmetal Screw, Stainless, M4 x 8
- S2 - Sheetmetal Screw, M4 x 8
- S3 - Machine Screw, M4 x 8
- S4 - Machine Screw, Stainless, M4 x 8
- S5 - Sheetmetal Screw, M3 x 8
- S6 - Machine Screw, Stainless, M4 x 6
- S7 - Machine Screw, Stainless, M4 x 12
- B1 - Machine Bolt and Washer, Stainless, M6 x 12
- B2 - Machine Bolt

| MODEL | | TITLE | | |
|--------------------------|-----------------------------------|--------------------------------|-------------|--------------|
| KM-601DWU (Water-cooled) | | B. REFRIGERATION UNIT ASSEMBLY | | (1/2) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| G | Water Supply Joint(P) Assembly | - | 311425A01 | 2 |
| 1 | Chassis | Galvanized Steel | 316960G01 | 1 |
| 2 | Rear Panel | Galvanized Steel | 316917G01 | 1 |
| 3 | Frame (A) | Galvanized Steel | 316928G02 | 1 |
| 4 | Frame (B) | Galvanized Steel | 316888G01 | 1 |
| 5 | Compressor | Model KL100TD-3 | 2U0043-01 | 1 |
| 6 | Bracket (A) - Condenser | Galvanized Steel | 426984-01 | 2 |
| 7 | Condenser - Water-cooled | - | 103314G01 | 1 |
| 8 | Bracket (B) - Condenser | Galvanized Steel | 426950-01 | 5 |
| 9 | Drier | Model KC-6749 | 427061-01 | 1 |
| 10 | Tee - Fusible Plug | Model YMP-251-HD | 421832-01 | 1 |
| 11 | Fusible Plug | Model FUP-1105H12 | 4U0010-01 | 1 |
| 12 | Bracket - Hot Gas Solenoid Valve | Stainless Steel | 426983-01 | 1 |
| 13 | Hot Gas Solenoid Valve | Model ABS-25-1-HD-2 | 3U0033-01 | 2 |
| 14 | Bracket - Water Regulator | Stainless Steel | 427012-01 | 1 |
| 15 | Water Regulator | Model WVII-33RHD | 415425-01 | 1 |
| 16 | Pressure Switch (High) | Model PS-7 CUT OFF 25K | 3U0069-01 | 1 |
| 17 | Pressure Switch (Low) | Model PS-7 CUT OFF 7K | 3U0069-02 | 1 |
| 18 | Refrigerant Access Valve | Model TCJ-2F15-HD | 417366-01 | 1 |
| 19 | Expansion Valve | Model ABE-R10-HD-1 | 427063-01 | 1 |
| 20 | Evaporator | - | 103316G01 | 1 |
| 21 | Pipe (A) - High Side | Copper | 317440G01 | 1 |
| 22 | Pipe (B) - High Side | Copper | 427703-01 | 1 |
| 23 | Pipe (C) - High Side | Copper | 427703-02 | 1 |
| 24 | Pipe (D) - High Side | Copper | 427704-01 | 1 |
| 25 | Heat - Exchanger | Copper | 209051G01 | 1 |
| 26 | Pipe (F) - High Side | Copper | 427589-01 | 1 |
| 27 | Pipe - Low Side | Copper | 317360G02 | 1 |

| MODEL | | TITLE | | |
|--------------------------|-----------------------------|--------------------------------|-------------|--------------|
| KY-601DWU (Water-cooled) | | B. REFRIGERATION UNIT ASSEMBLY | | (2/2) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 28 | Hot Gas Pipe (A) | Copper | 427590-01 | 1 |
| 29 | Tee | Copper | 420041-03 | 1 |
| 30 | Pipe | Copper | 427591-01 | 1 |
| 31 | Pipe Insulation (A) | Polyethylene | 103313-55 | 1 |
| 32 | Pipe (A) - Condenser | Copper | 427705-01 | 1 |
| 33 | Pipe (B) - Condenser | Copper | 427706-01 | 1 |
| 34 | Pipe (C) - Condenser | Copper | 427707-01 | 1 |
| 35 | Pipe Insulation (B) | Polyethylene | 103313-54 | 1 |
| 36 | Cover (A) - Expansion Valve | Polyethylene Foam | 317257-01 | 1 |
| 37 | Cover (B) - Expansion Valve | Polyethylene Foam | 317257-02 | 1 |
| 38 | Thermistor | - | 427062-01 | 1 |
| 39 | Seal | EPDM | 426867-01 | 1 |
| 40 | Locking Wire Saddle | Model LWS-2NA | 7830-0002 | 1 |
| 41 | Nylon Tie | Model CV-150 | 7920-0003 | 1 |
| 42 | Insulation - Seal | Polyethylene | 427437-01 | 1 |
| 43 | Pipe Insulation (C) | Polyethylene | 103313-63 | 1 |
| 44 | Holder - Thermistor | C1100P | 427430-01 | 1 |
| 45 | Insulation - Thermistor | Polyethylene Foam | 427441-01 | 1 |
| 46 | Bracket - Thermistor | Stainless Steel | 427431-01 | 1 |

KM-601DU (Air-cooled)

KM-601DWU (Water-cooled) C. WATER SUPPLY LINE ASSEMBLY



DISCHARGE
TUBING
 $\phi 25 \times \phi 20 \times L690$

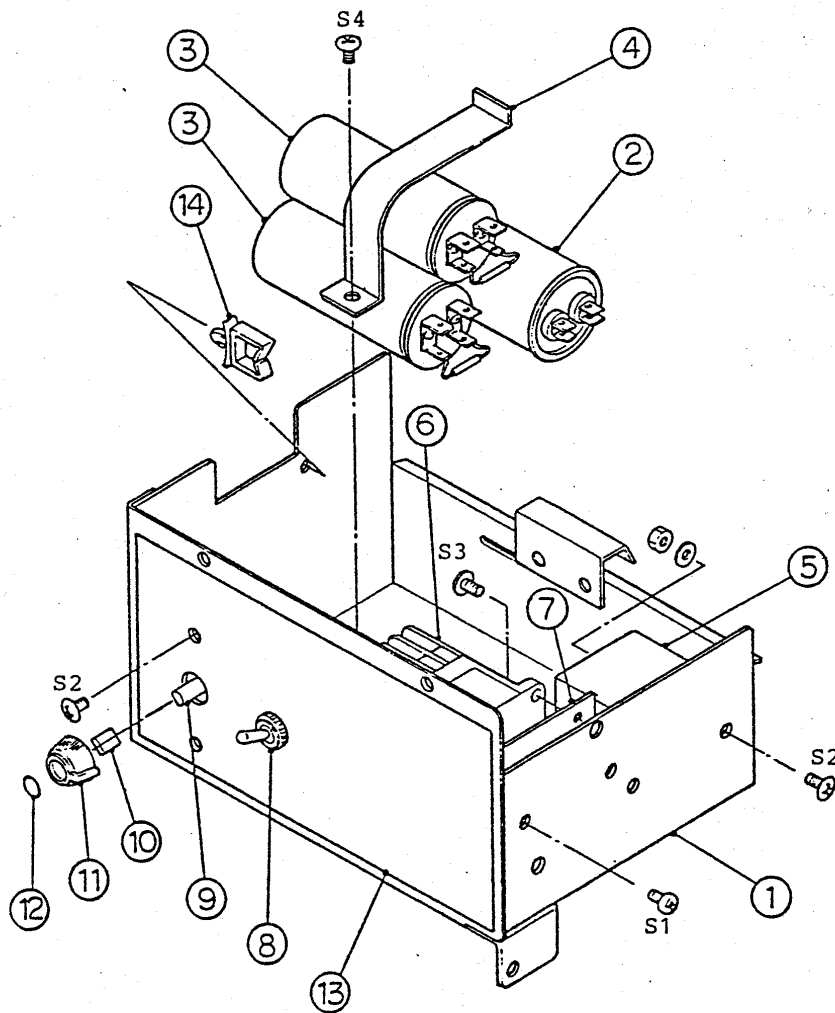
FASTENER

- S1 - Sheetmetal Screw, M4 x 8
- S2 - Sheetmetal Screw, Stainless M4 x 12
- S3 - Machine Screw, M4 x 8
- S4 - Machine Screw, Stainless M4 x 8
- S5 - Machine Screw, M4 x 12
- B1 - Machine Bolt, Stainless M4 x 12

| MODEL | | TITLE | | |
|-------------------------|---------------------------------|-------------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | C. WATER SUPPLY LINE ASSEMBLY | | (1/2) |
| KM-601DWU(Water-cooled) | | | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| G | Water Supply Joint (P) Assembly | - | 311425A01 | 1 |
| H | Water Pump Plate | - | 316805A01 | 1 |
| 1 | Fitting Nut | Acetal Copolymer | 426910-01 | 1 |
| 2 | Water Supply Line | Stainless Steel | 426909G01 | 1 |
| 3 | Packing - Water Valve | Nitrated Sheet | 413854-01 | 1 |
| 4 | Bracket - Water Solenoid Valve | Galvanized Steel | 426926-01 | 1 |
| 5 | Barrier - Water Solenoid Valve | Galvanized Steel | 426911-01 | 1 |
| 6 | Water Solenoid Valve | Model J246-354 | 3U0070-02 | 1 |
| 7 | Clamp | Model SK-165 | 426148-06 | 1 |
| 8 | Hose | EPDM | 416794-01 | 1 |
| 9 | Clamp | Model SK-145 | 426148-03 | 1 |
| 10 | Pipe | ABS | 426868-01 | 1 |
| 11 | Clamp | SWPA | 427443-02 | 1 |
| 12 | Y Branch (A) | EPDM | 426795-01 | 1 |
| 13 | Clamp | SWPA | 427443-01 | 2 |
| 14 | Water Supply Pipe | ABS | 426869G01 | 2 |
| 15 | Grommet | Model H322-4-2 | 422300-03 | 2 |
| 16 | Plunger | Model H323-4-5-2 | 422299-03 | 2 |
| 17 | Guide - Water Supply | Polyethylene | 208586-01 | 6 |
| 18 | Clamp | SWPA | 427441-03 | 5 |
| 19 | Y Branch (B) | EPDM | 426798-01 | 1 |
| 20 | Connector | ABS | 426797-01 | 1 |
| 21 | Guide - Ice Cube | Stainless Steel | 317150G01 | 1 |
| 22 | Curtain | - | 427432G01 | 1 |
| 23 | Reinforcement - Curtain | Stainless Steel | 317241-01 | 1 |
| 24 | Snap Button | Model KB-09 | 427030-01 | 4 |
| 25 | Fastener - Curtain | ABS | 415949G04 | 2 |
| 26 | Drain Pipe | PVC | 316845-01 | 1 |
| 27 | Suction Tubing | EPDM | 426796-01 | 1 |

| MODEL | | TITLE | | |
|--------------------------|--------------------------|-------------------------------|-------------|--------------|
| KM-601DU (Air-cooled) | | C. WATER SUPPLY LINE ASSEMBLY | | (2/2) |
| KM-601DWU (Water-cooled) | | | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 28 | Capacitor - Pump Motor | Model 3.5 MFD MF | 3U0042-02 | 1 |
| 29 | Float Switch | Model FS-0893A | 426616-01 | 1 |
| 30 | Connector - Float Switch | EPDM | 426799-02 | 1 |
| 31 | U Hose | EPDM | 427482-01 | 1 |
| 32 | Locking Wire Saddle | Model LWS-4NA | 7830-0007 | 1 |
| 33 | Locking Wire Saddle | Model LWS-2NA | 7830-0002 | 2 |

KM-601DU (Air-cooled)
KM-601DWU (Water-cooled) D. CONTROL BOX ASSEMBLY



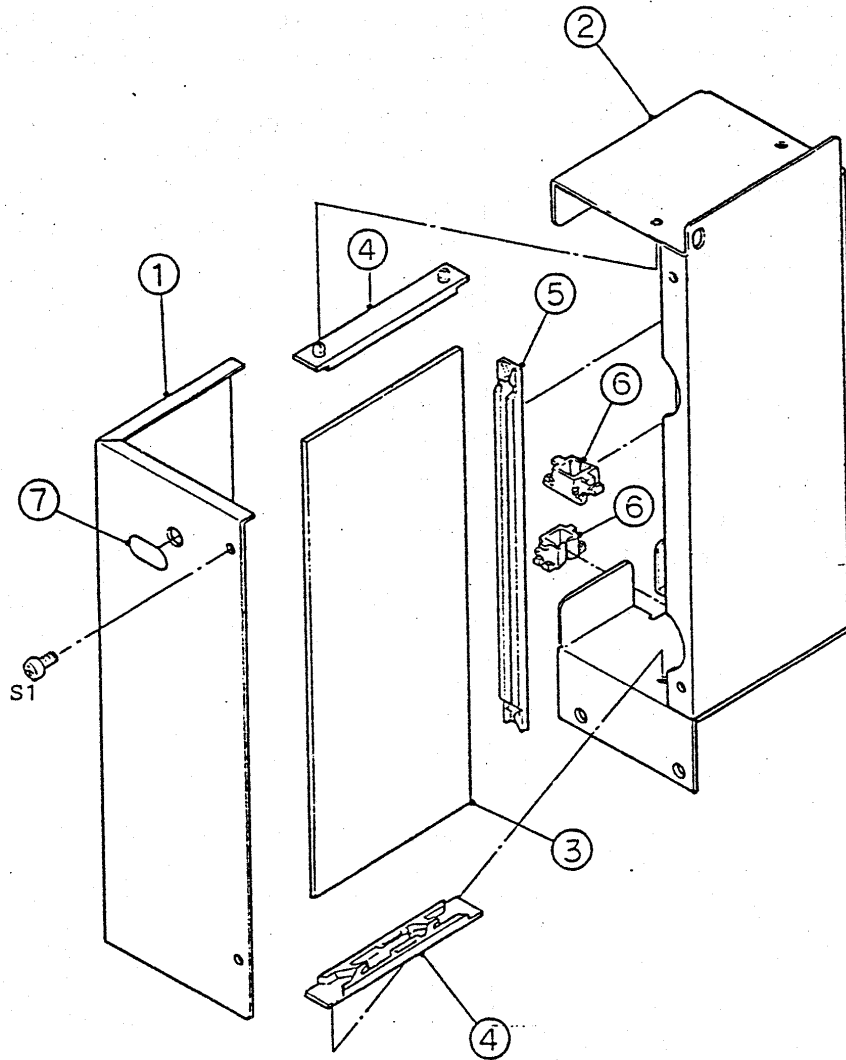
FASTENER

- S1 - Sheetmetal Screw, M4 x 8
- S2 - Machine Screw, M4 x 6
- S3 - Machine Screw, M4 x 16
- S4 - Machine Screw, M4 x 8

| MODEL | | TITLE | | |
|--------------------------|---------------------------------|--------------------------------------|-------------|--------------|
| KM-601DU (Air-cooled) | | D. CONTROL BOX ASSEMBLY | | |
| KM-601DWU (Water-cooled) | | (1/1) | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Control Box | Galvanized Steel | 316889G01 | 1 |
| 2 | Run Capacitor | Model PMT-40250P 400V 25MFD | 3U0058-01 | 1 |
| 3 | Start Capacitor | Model MS 180F100CJR 180VAC 100MFD | 3U0054-01 | 2 |
| 4 | Bracket - Capacitor | Galvanized Steel | 426915-01 | 1 |
| 5 | Start Relay | Model FST-275B | 422619-01 | 1 |
| 6 | Magnetic Contactor | Model C-10FE | 427003-01 | 1 |
| 7 | Bracket - Magnetic Contactor | Galvanized Steel | 426916-01 | 1 |
| 8 | Toggle Switch | Model ST-103A | 405135-02 | 1 |
| 9 | Thermostat - Bin Control | Model A10-9756 | 420465-01 | 1 |
| 10 | Dial Spacer | Polyethylene | 407927-01 | 1 |
| 11 | Dial | Plastics ABS | 309332-01 | 1 |
| 12 | Label - Dial | Synthetic Fiber Film | 415993-01 | 1 |
| 13 | Label - Control Box | Aluminium | 427044-01 | 1 |
| 14 | Locking Wire Saddle | Model LWS-3NS | 7830-0003 | 2 |

KM-601DU(Air-cooled)

KM-601DWU(Water-cooled) E. CONTROLLER BOX ASSEMBLY



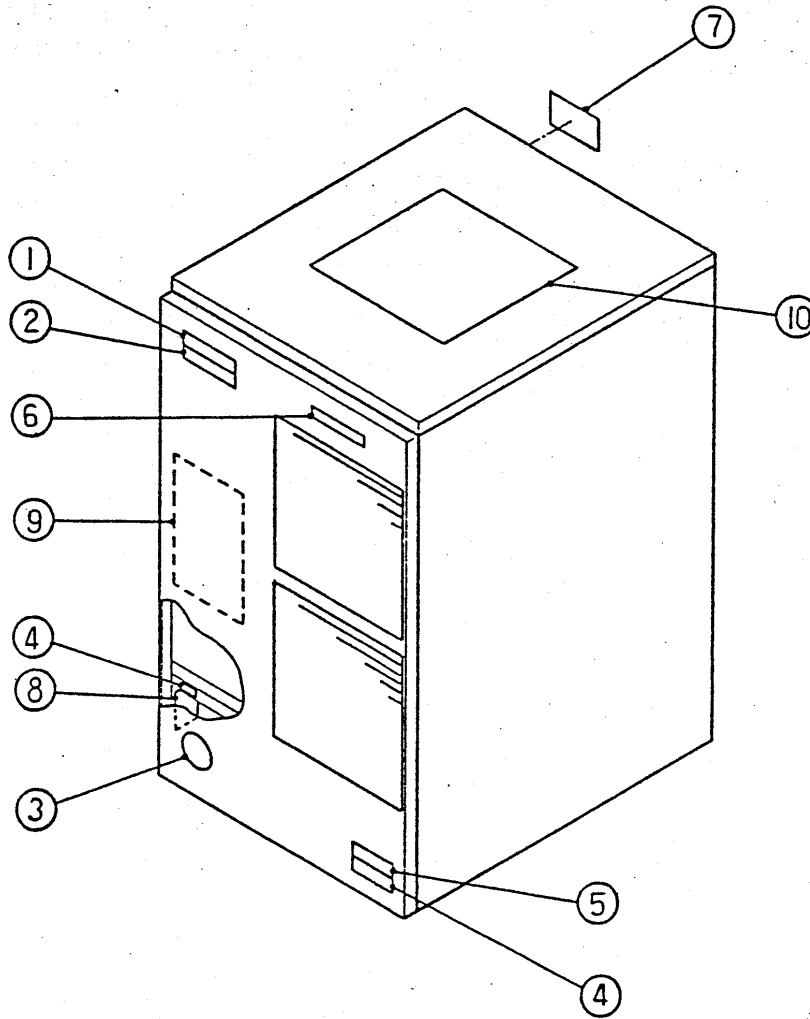
FASTENER

S1 - Sheetmetal Screw, M4 x 8

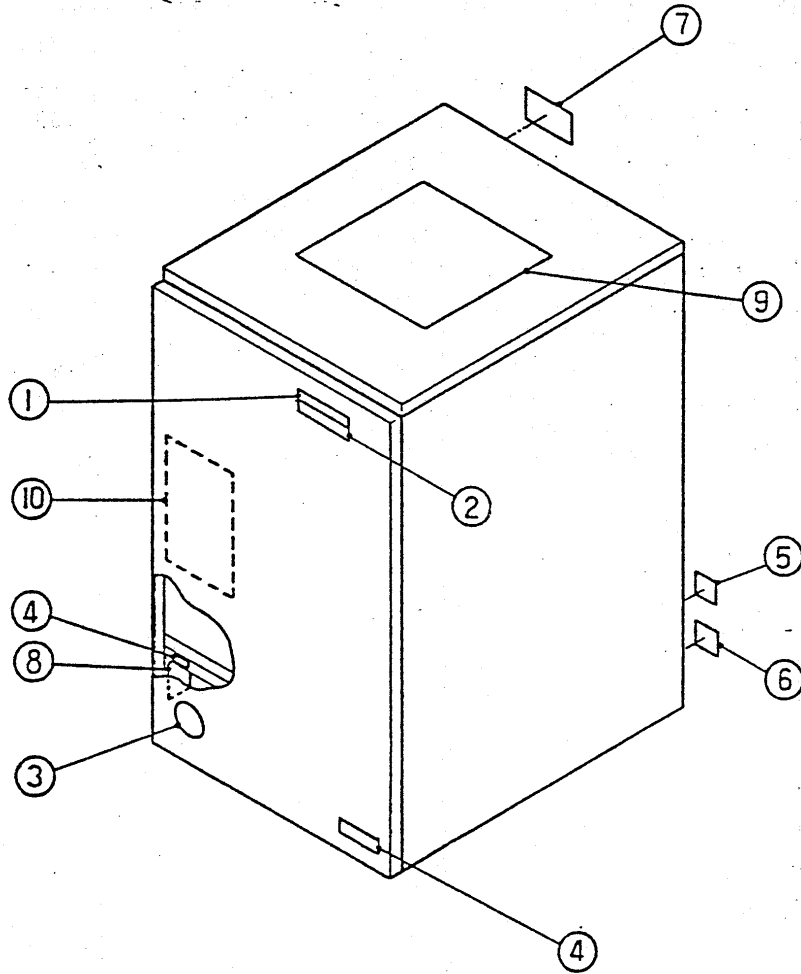
| MODEL | | TITLE | | |
|----------------------|--------------------------|----------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | E. CONTROLLER BOX ASSEMBLY | | (1/1) |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Cover - Controller Box | Galvanized Steel | 426948G01 | 1 |
| 2 | Controller Box | Galvanized Steel | 426946G01 | 1 |
| 3 | Controller Board | Model HSU83137-01 | 427004-02 | 1 |
| 4 | Guide (B) | Model SPC-3000 | 427006-01 | 2 |
| 5 | Guide (A) | Model GR-180S | 427005-01 | 1 |
| 6 | Edge Saddle | Model EDS-2 | 421552-02 | 2 |
| 7 | Label - Factory Adjusted | Synthetic Fiber Film | 419404-01 | 1 |

| | | |
|--------------------------|----------------------------|-------|
| MODEL | TITLE | |
| KM-601DWU (Water-cooled) | E. CONTROLLER BOX ASSEMBLY | (1/1) |

| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
|-----------|--------------------------|--------------------------|-------------|--------------|
| 1 | Cover - Controller Box | Galvanized Steel | 426948G01 | 1 |
| 2 | Controller Box | Galvanized Steel | 426946G01 | 1 |
| 3 | Controller Board | Model HSU83137-01 | 427004-01 | 1 |
| 4 | Guide (B) | Model SPC-3000 | 427006-01 | 2 |
| 5 | Guide (A) | Model GR-180S | 427005-01 | 1 |
| 6 | Edge Saddle | Model EDS-2 | 421552-02 | 2 |
| 7 | Label - Factory Adjusted | Synthetic Fiber Film | 419404-01 | 1 |



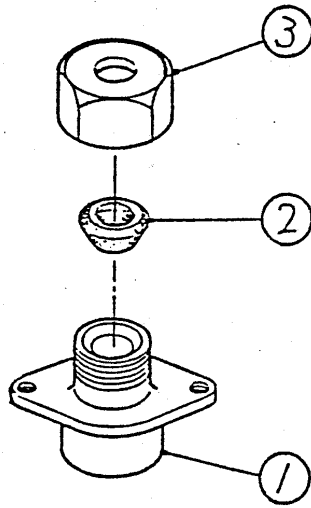
| MODEL | | TITLE | | |
|-----------------------|---|---|-------------|--------------|
| KM-601DU (Air-cooled) | | F. INSTRUCTION SHEET/LABEL LOCATION (1/1) | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Brand Badge | ABS | 418634G01 | 1 |
| 2 | Label - Model Number | Synthetic Fiber Film | 426985--- | 1 |
| 3 | Penguin Label | Synthetic Fiber Film | 410994-01 | 1 |
| 4 | Label - WARNING | PVC Film | 425322-01 | 2 |
| 5 | Label - CAUTION | Synthetic Fiber Film | 425323-01 | 1 |
| 6 | Label - Air Filter | Synthetic Fiber Film | 426177-01 | 1 |
| 7 | Nameplate | Aluminium | 428109-01 | 1 |
| 8 | Label - Float Switch Adjustment | PVC Film | 427043-01 | 1 |
| 9 | Label - Maintenance | Paper | 316975-01 | 1 |
| 10 | Instruction Sheet -Installation & Operating | Paper | 208750-01 | 1 |



| MODEL | | TITLE | | |
|-------------------------|--|---|-------------|--------------|
| KM-601DWU(Water-cooled) | | F. INSTRUCTION SHEET/LABEL LOCATION (1/1) | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Brand Badge | ABS | 418634G01 | 1 |
| 2 | Label - Model Number | Synthetic Fiber Film | 426986--- | 1 |
| 3 | Penguin Label | Synthetic Fiber Film | 410994-01 | 1 |
| 4 | Label - WARNING | PVC Film | 425322-01 | 2 |
| 5 | Label - Condenser Water Inlet | Synthetic Fiber Film | 418029-04 | 1 |
| 6 | Label Condenser Drain Outlet | Synthetic Fiber Film | 418029-05 | 1 |
| 7 | Nameplate | Aluminium | 428110-01 | 1 |
| 8 | Label - Float Switch Adjustment | PVC Film | 427043-01 | 1 |
| 9 | Instruction Sheet - Installation & Operating | Paper | 208750-01 | 1 |
| 10 | Label - Maintenance | Paper | 316975-01 | 1 |

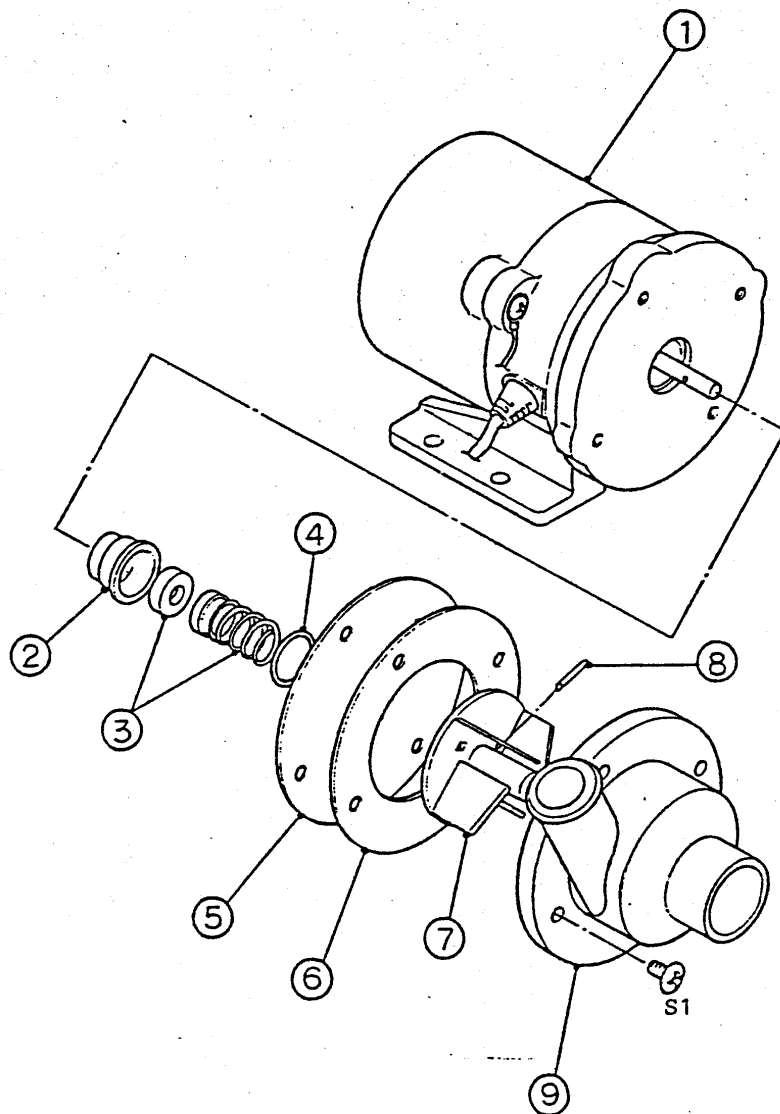
KM-601DU(Air-cooled)

KM-601DWU(Water-cooled) G. WATER SUPPLY JOINT (P) ASSEMBLY



| MODEL | | TITLE | | |
|-------------------------|--------------------|------------------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | G. WATER SUPPLY JOINT (P) ASSEMBLY | | (1/1) |
| KM-601DWU(Water-cooled) | | | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Water Supply Joint | Brass | 310978-01 | 1 |
| 2 | Taper Packing | Synthetic Rubber | 415715-01 | 1 |
| 3 | Nut | Brass | 415713-01 | 1 |

KM-601DU(Air-cooled)
KM-601DWU(Water-cooled) H. WATER PUMP ASSEMBLY

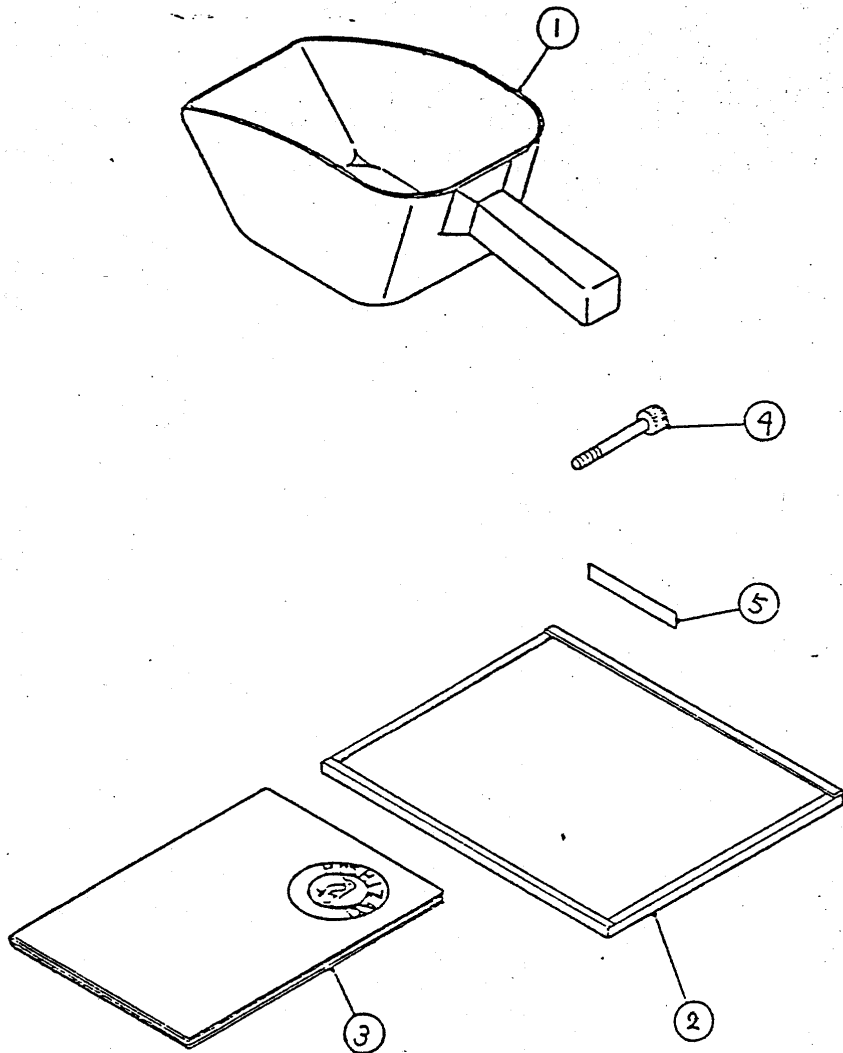


FASTENER

S1 - Machine Screw, Stainless, M4 x 20

| MODEL | | TITLE | | |
|--------------------------|--------------------|--------------------------|-------------|--------------|
| KM-601DU (Air-cooled) | | H. WATER PUMP ASSEMBLY | | (1/1) |
| KM-601DWU (Water-cooled) | | | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Pump Motor | Model AP-TA9 | 2U0029-01 | 1 |
| 2 | Retainer | Stainless Steel | 418584-01 | 1 |
| 3 | Mechanical Seal | Model H5 PS9 | 404653-01 | 1 |
| 4 | O Ring | Viton Rubber | 404779-01 | 1 |
| 5 | Fix Plate - O Ring | Stainless Steel | 403013-01 | 1 |
| 6 | Packing | Natural Rubber | 403014-01 | 1 |
| 7 | Impeller | ABS | 417082-01 | 1 |
| 8 | Pin | Stainless Steel | 414102-01 | 1 |
| 9 | Pump Housing | HBS | 204451-02 | 1 |

KM-601DU (Air-cooled)
KM-601DWU (Water-cooled) I. ACCESSORIES



| MODEL | | TITLE | | |
|-------------------------|---------------------------------|--------------------------|-------------|--------------|
| KM-601DU(Air-cooled) | | I. ACCESSORIES | | (1/1) |
| KM-601DWU(Water-cooled) | | | | |
| INDEX NO. | DESCRIPTION | MATERIAL OR MODEL NUMBER | PART NUMBER | REQ'D NUMBER |
| 1 | Scoop | Acetal Copolymer | 208185-01 | 1 |
| 2 | Top Kit | - | 316972G01 | 1 |
| 3 | Instruction Manual | - | 91U1GA11A | 1 |
| 4 | Fastener - Front Panel | Stainless steel | 411549-03 | 1 |
| 5 | Instruction Sheet - Fastener | Paper | 427122-01 | 1 |