

NO: 73122

ISSUED: September 12, 2005



# **HOSHIZAKI MODULAR FLAKER**

**MODEL  
FS-1001MLH/-C**

**ALSO COVERS  
HOSHIZAKI CONDENSING UNIT  
MODEL SRC-10H**

## **SERVICE MANUAL**

## — IMPORTANT —

Only qualified service technicians should attempt to service or maintain this icemaker. No such service or maintenance should be undertaken until the technician has thoroughly read this Service Manual.

HOSHIZAKI provides this manual primarily to assist qualified service technicians in the service and maintenance of the icemaker.

Should the reader have any questions or concerns which have not been satisfactorily addressed, please call or write to the HOSHIZAKI Technical Support Department for assistance.

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618 Highway 74 South  
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Attn: HOSHIZAKI Technical Support Department

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(770) 487-3360

Web Site: [www.hoshizakiamerica.com](http://www.hoshizakiamerica.com)

NOTE: To expedite assistance, all correspondence/communication MUST include the following information:

- Model Number
- Serial Number
- Complete and detailed explanation of the problem

Please review this manual. It should be read carefully before the icemaker is serviced or maintenance operations are performed. Only qualified service technicians should service and maintain the icemaker. This manual should be made available to the technician prior to service or maintenance.

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# **I. Specifications**

## **A. Ice maker**

### **1. FS-1001MLH**

**No Data Available**

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

## 2. FS-1001MLH-C

AC SUPPLY VOLTAGE	115/60/1		
GEAR MOTOR	120 V	3 FLA	1/4 HP
OTHER	120 V	0.03A	
MAXIMUM FUSE SIZE	15 A		
MAX. HACR BREAKER (USA ONLY)	15 A		
MAX. CIRC. BREAKER (CANADA ONLY)	15 A		
MINIMUM CIRCUIT AMPACITY	15 A		
APPROXIMATE ICE PRODUCTION PER 24 HR. lbs./day ( kg/day ) Reference without *marks	Ambient Temp.(°F)	WATER TEMP. (°F)	
		50	70
	70	*830 (380)	805 (365)
	80	765 (350)	750 (340)
	90	710 (325)	*705 (320)
	100	660 (300)	*600 (275)
SHAPE OF ICE	Cubelet		
ICE QUALITY	Approx. 80%, Ice (90/70°F, Conductivity 200 µs/cm)		
APPROXIMATE STORAGE CAPACITY	N/A		
ELECTRIC & WATER CONSUMPTION	90/70°F	70/50°F	
ELECTRIC W (kWH/100 lbs.)	1745 (5.96)	1713 (4.94)	FS-1001MLH-C & SRC-10H
ELECTRIC W (kWH/100 lbs.)	331 (1.13)	345 (1.00)	FS-1001MLH-C ONLY
POTABLE WATER gal./24HR (gal./100 lbs.)	84 (12)	100 (12)	
EXTERIOR DIMENSIONS (WxDxH)	30" x 11" x 26" (766 x 279 x 660mm)		
EXTERIOR FINISH	Stainless Steel		
WEIGHT	Net 126 lbs. ( 57 kg ), Shipping 166 lbs. ( 75 kg )		
CONNECTIONS - ELECTRIC	Cord Connection		
- WATER SUPPLY	Inlet 1/2" FPT		
- DRAIN	Outlet 3/4" FPT		
- REFRIGERATION	Suction line 1-1/16-12 UNF Fitting (#10 AEROQUIP)		
CIRCUIT	Liquid line 5/8-18 UNF Fitting (#6 AEROQUIP)		
ICE MAKING SYSTEM	Auger type		
HARVESTING SYSTEM	Direct Driven Auger ( 1/4 HP Gear Motor )		
ICE MAKING WATER CONTROL	Float Switch		
COOLING WATER CONTROL	N/A		
BIN CONTROL SYSTEM (Primary)	Photoelectric Sensor		
BIN CONTROL SYSTEM (Secondary)	Mechanical Bin Control ( Proximity Sw. )		
CONDENSING UNIT	Air-cooled Remote Condensing unit SRC-10H Required		
EVAPORATOR	Copper Tube on Cylinder		
REFRIGERANT CONTROL	Thermostatic Expansion Valve		
	Condensing Pressure Regulator on SRC-10H		
REFRIGERANT CHARGE	R-404A, 8 lb.6oz. (3800g) (Ice Maker: 4 oz., Cond. Unit: 8 lb. 2 oz. )		
DESIGN PRESSURE	High 427 PSIG, Low 230 PSIG		
P.C. BOARD CIRCUIT PROTECTION	Fuse (1A)		
GEAR MOTOR PROTECTION	Fuse (3A)		
LOW WATER PROTECTION	Float Switch and Timer		
ACCESSORIES -SUPPLIED	Spare Fuse		
-REQUIRED	Ice Storage Bin		
OPERATING CONDITIONS	VOLTAGE RANGE	104-127 V	
	AMBIENT TEMP.	45-100° F	
	WATER SUPPLY TEMP.	45-90° F	
	WATER SUPPLY PRESSURE	10-113 PSIG	

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

## B. Condensing Unit

### 1. SRC-10H

AC SUPPLY VOLTAGE	208-230/60/1 (3 WIRE W/ NEUTRAL FOR 115V)		
COMPRESSOR	208-230	9.6 RLA	46 LRA
FAN MOTOR	120 V	3 A	MAX
OTHER	120 V	0.5 A	
MAXIMUM FUSE SIZE	20 A		
MAX. HACR BREAKER (USA ONLY)	20 A		
MAX. CIRC. BREAKER (CANADA ONLY)	20 A		
MINIMUM CIRCUIT AMPACITY	20 A		
EXTERIOR DIMENSIONS (WxDxH)	28-1/4" x 23" x 19-7/8" (717 x 584 x 506mm)		
DIMENSIONS WITH LEGS (WxDxH)	30-1/4" x 25-3/8" x 34-7/8" (770 x 645 x 886mm)		
EXTERIOR FINISH	Galvanized Steel		
WEIGHT (approximate)	Net 143 lbs. ( 65 kg ), Shipping 169 lbs. ( 77 kg )		
CONNECTIONS - ELECTRIC	Permanent - Connection		
- REFRIGERATION	Discharge line 1-1/16-12 UNF Fitting (#10 AEROQUIP)		
CIRCUIT	Liquid line 5/8-18 UNF Fitting (#6 AEROQUIP)		
COMPRESSOR	Hermetic, Model RS80-C2E-CAV		
CONDENSER	Air-cooled fin and tube type		
FAN MOTOR PROTECTION	Thermal Protector		
REFRIGERATION PROTECTION	Auto-reset High Pressure Switch, Manual low Pressure Switch		
REFRIGERANT CONTROL	Condenser Pressure Regulator		
PUMPDOWN CONTROL	Auto-reset Low Pressure Switch		
REFRIGERANT CHARGE	R-404A, 8 lb.6oz. (3800g) (Ice Maker: 4 oz., Cond. Unit: 8 lb. 2 oz. )		
DESIGN PRESSURE	High 427 PSIG, Low 230 PSIG		
COMPRESSOR PROTECTION	Internal Protector		
ACCESSORIES -SUPPLIED	Leg		2 pcs.
	Hex. Head Bolt w/ Washer 8X16		8 pcs.
	Hex. Nut		8 pcs.
OPERATING CONDITIONS	VOLTAGE RANGE		187-253 V
	AMBIENT TEMP.		-4-122° F
	HEAT OF REJECTION		10500 BTU/hr

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

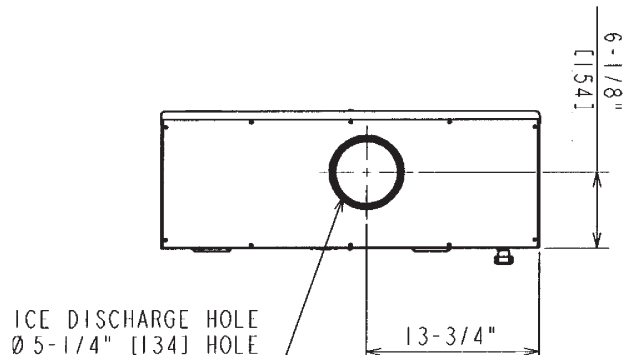
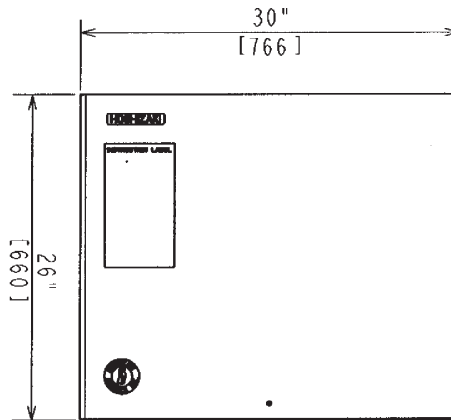
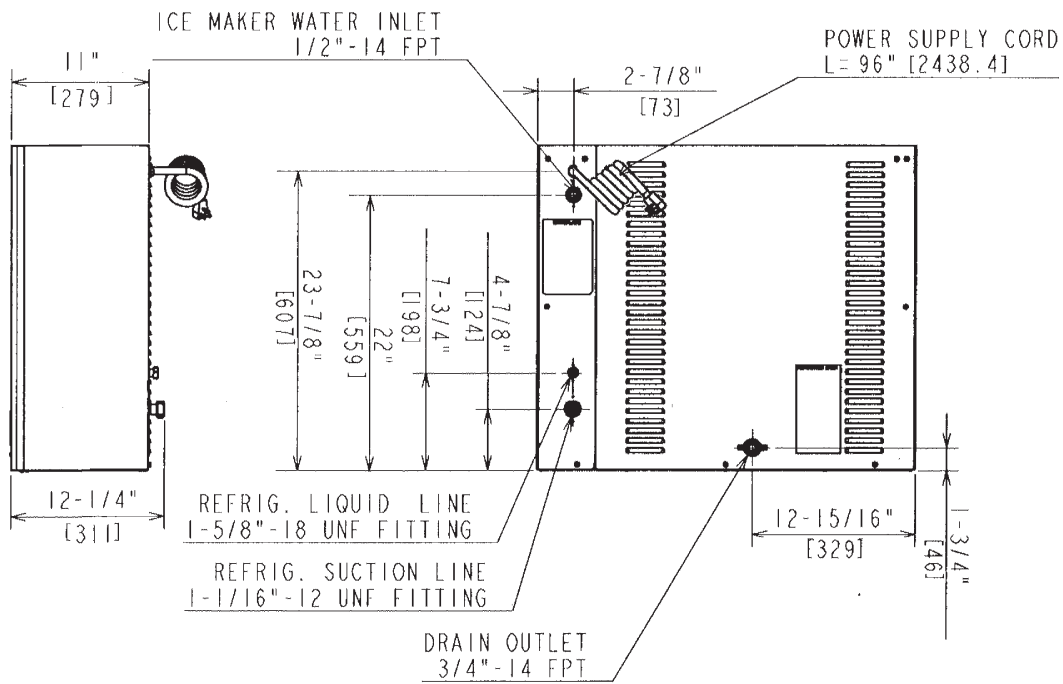
## II. General Information

### A. Dimensions

#### 1. Icemaker

##### a) FS-1001MLH-C

Unit = inches [mm]

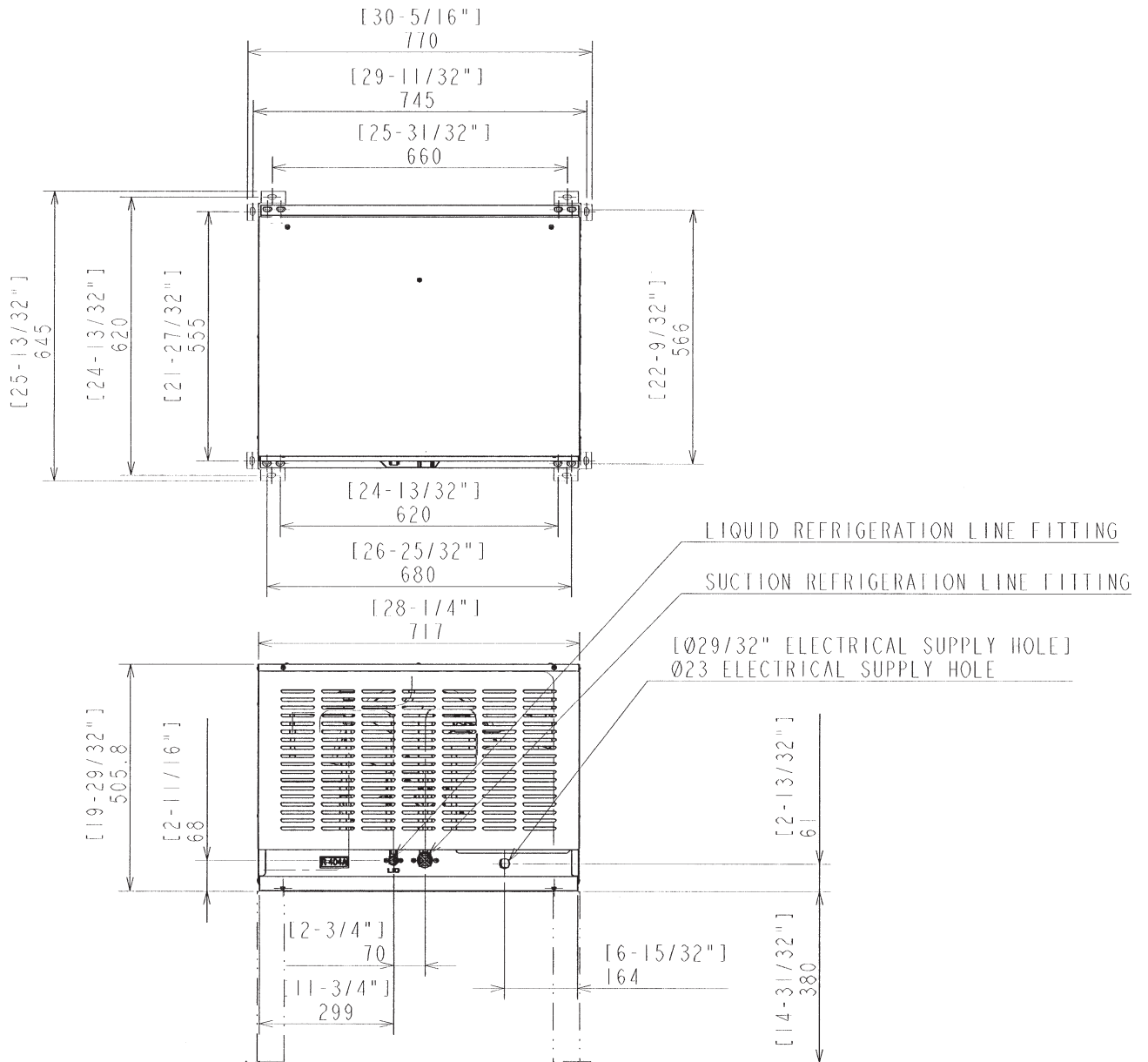




## 2. Condensing Unit

### a) SRC-10H

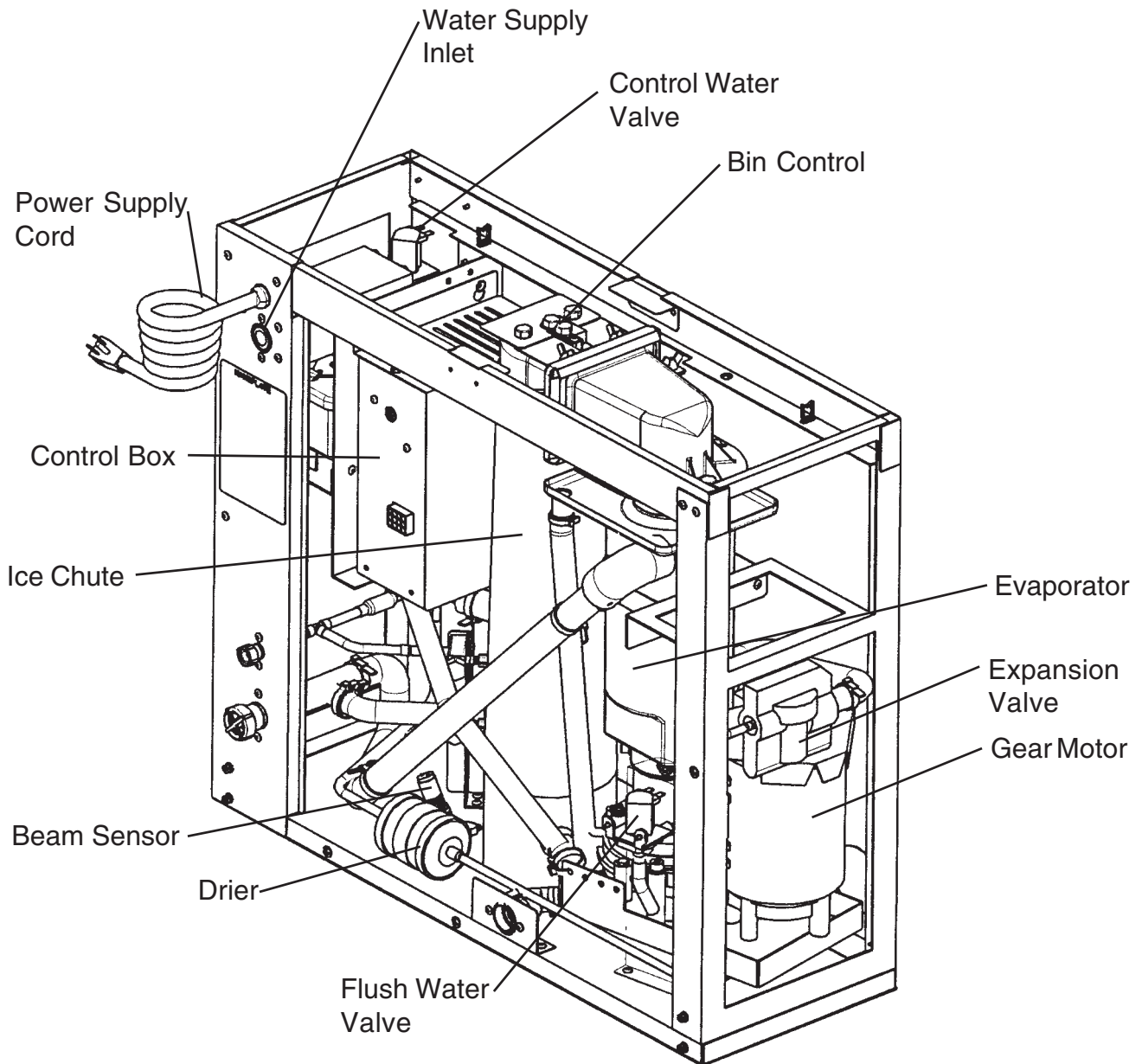
Unit = [inches] mm



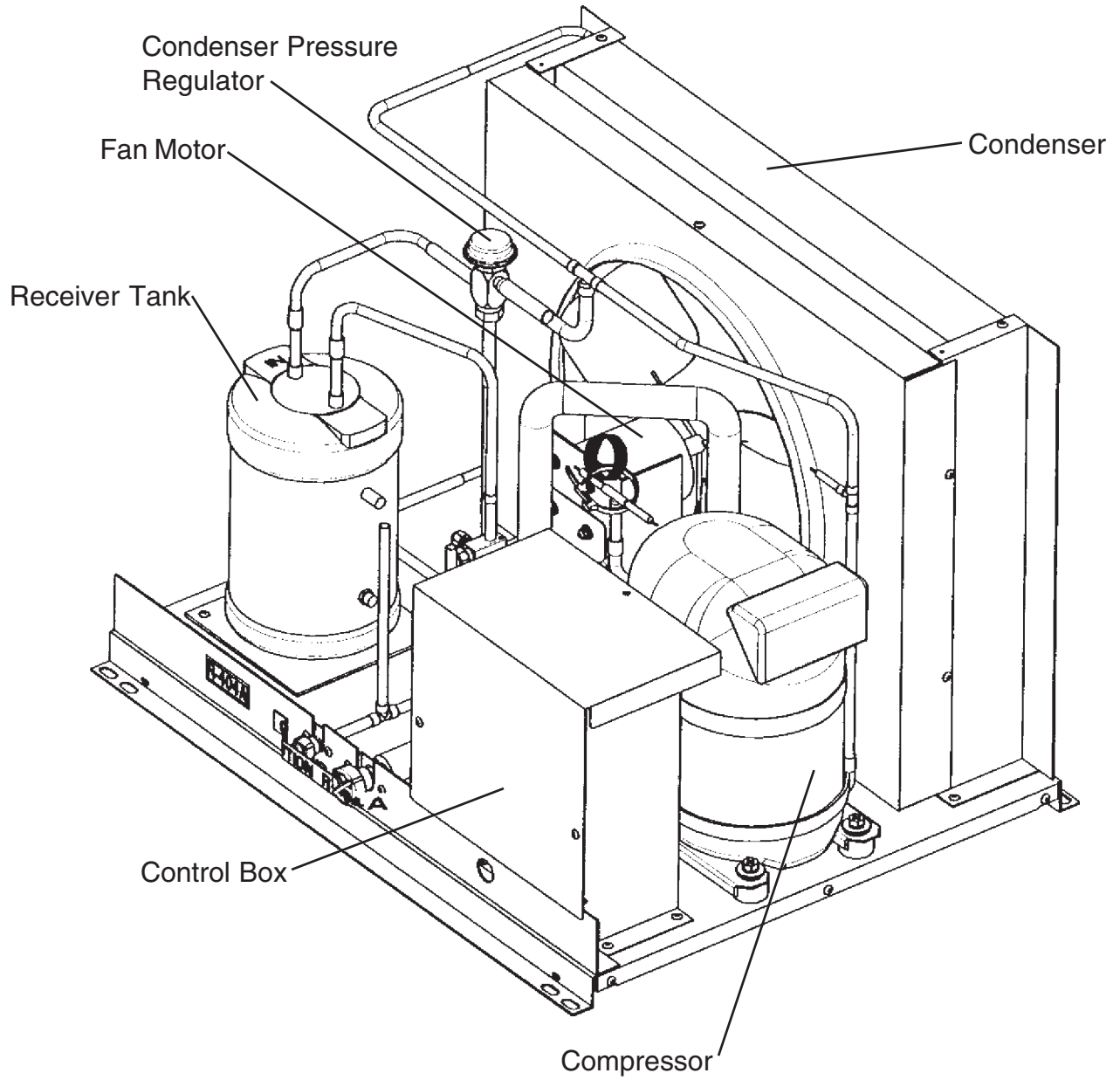
## B. Construction

### 1. Icemaker

#### a) FS-1001MLH-C



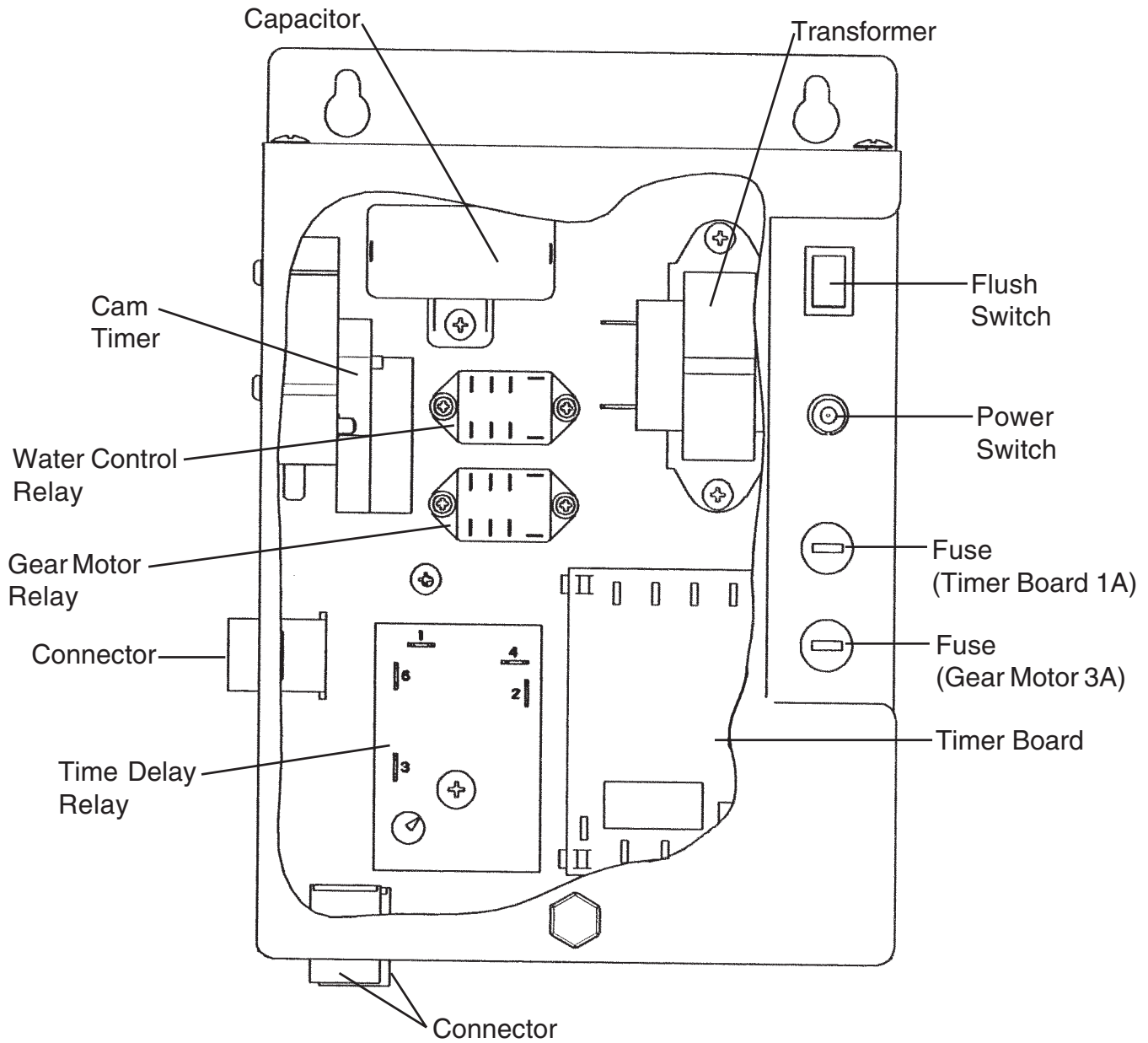
**2. Condensing Unit**  
**a) SRC-10H**



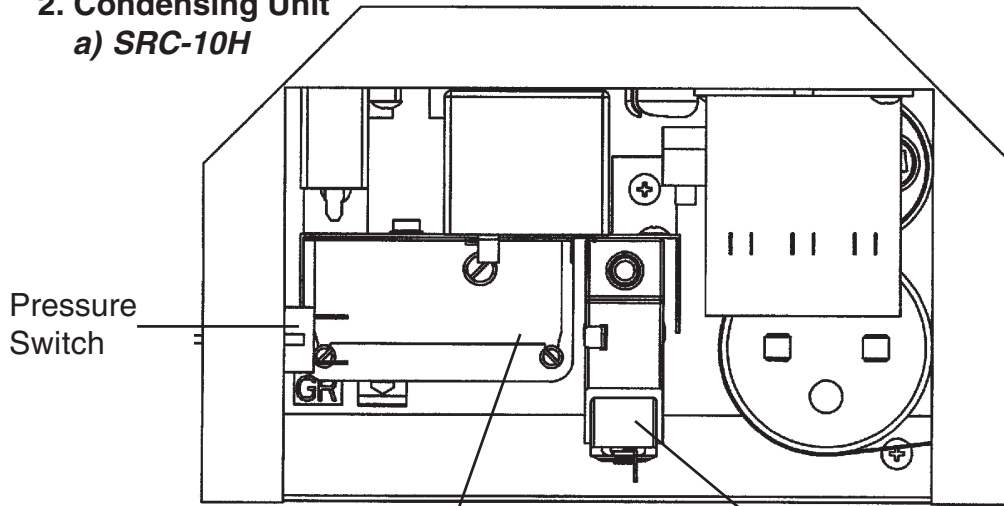
## C. Control Box Layout

### 1. Icemaker

#### a) FS-1001MLH-C



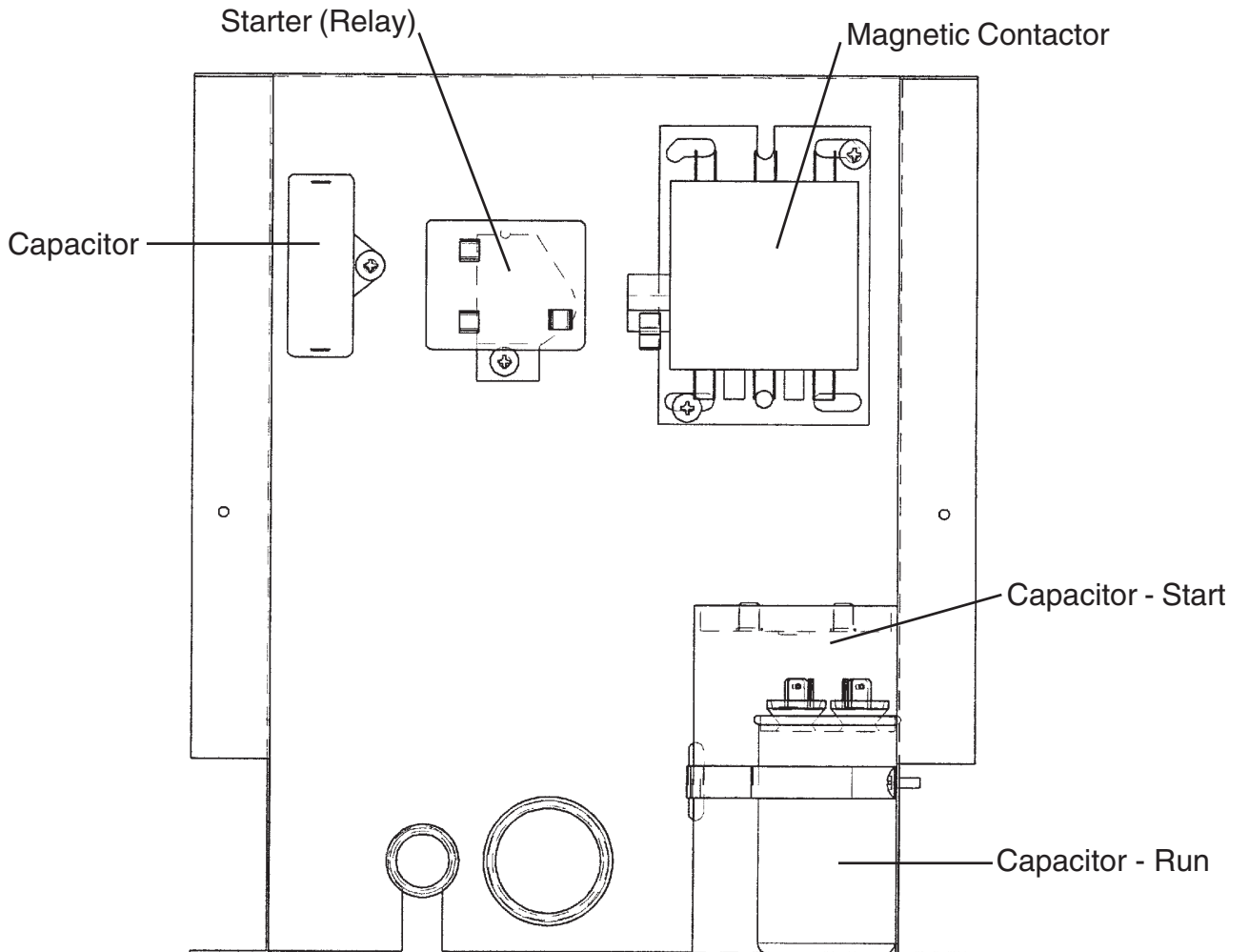
**2. Condensing Unit**  
**a) SRC-10H**



Pressure Switch

Low Pressure Switch 1 (Control)  
 Cut-out 9 psig  
 Cut-in 29 psig

Low Pressure Switch 2 (Safety)  
 Cut-out 3 psig  
 Cut-in 6 psig (manual reset)



Starter (Relay)

Magnetic Contactor

Capacitor

Capacitor - Start

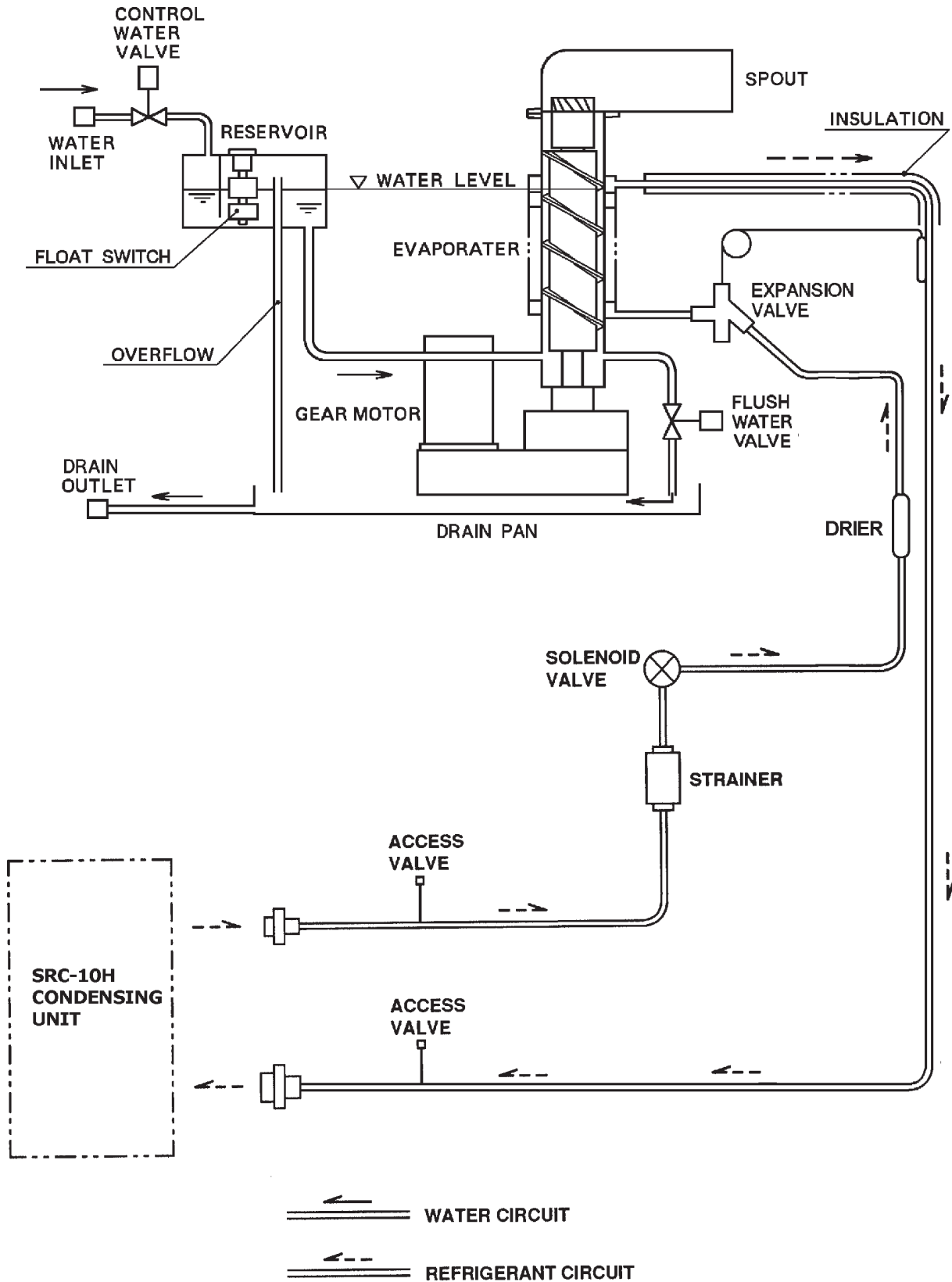
Capacitor - Run

### III. Technical Information

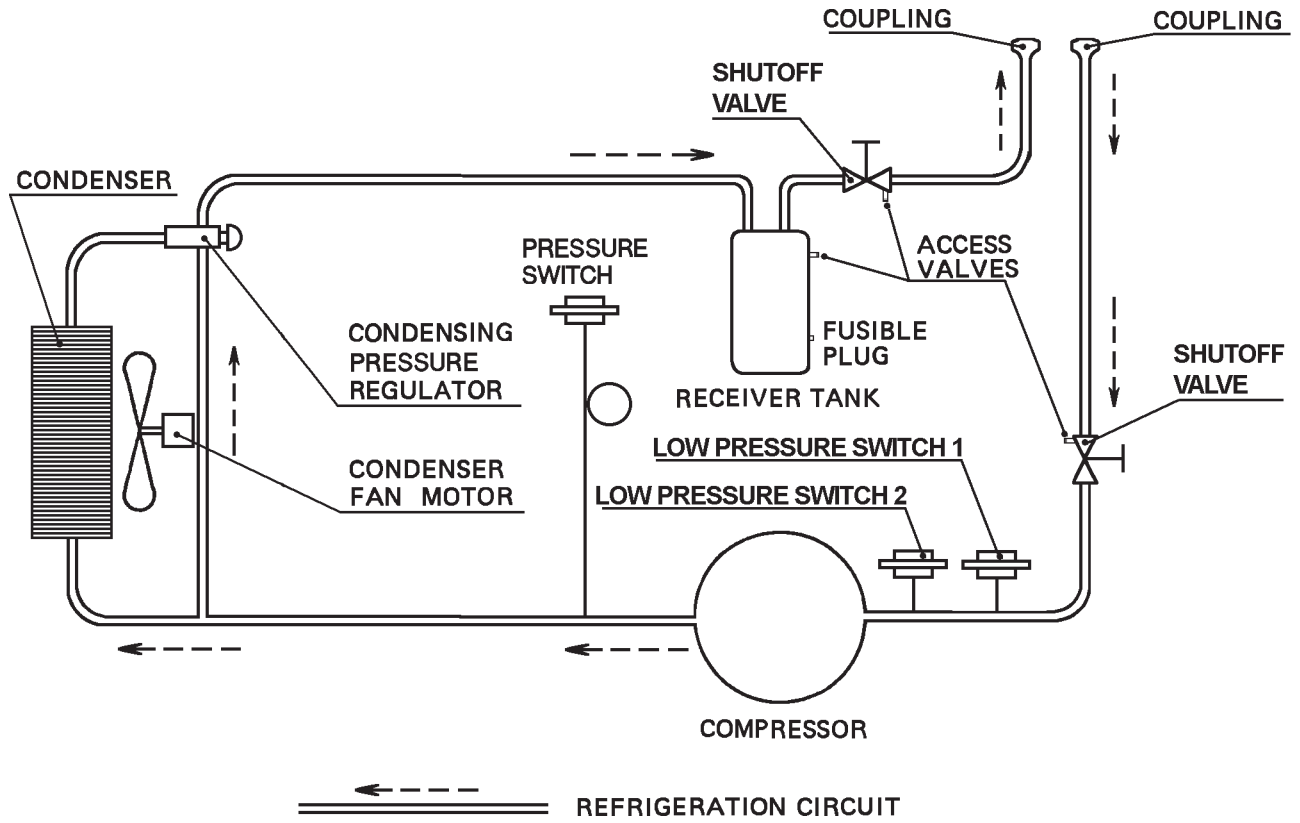
#### A. Water Circuit and Refrigeration Circuit

##### 1. Icemaker

##### a) FS-1001MLH-C



2. Condensing Unit  
a) SRC-10H

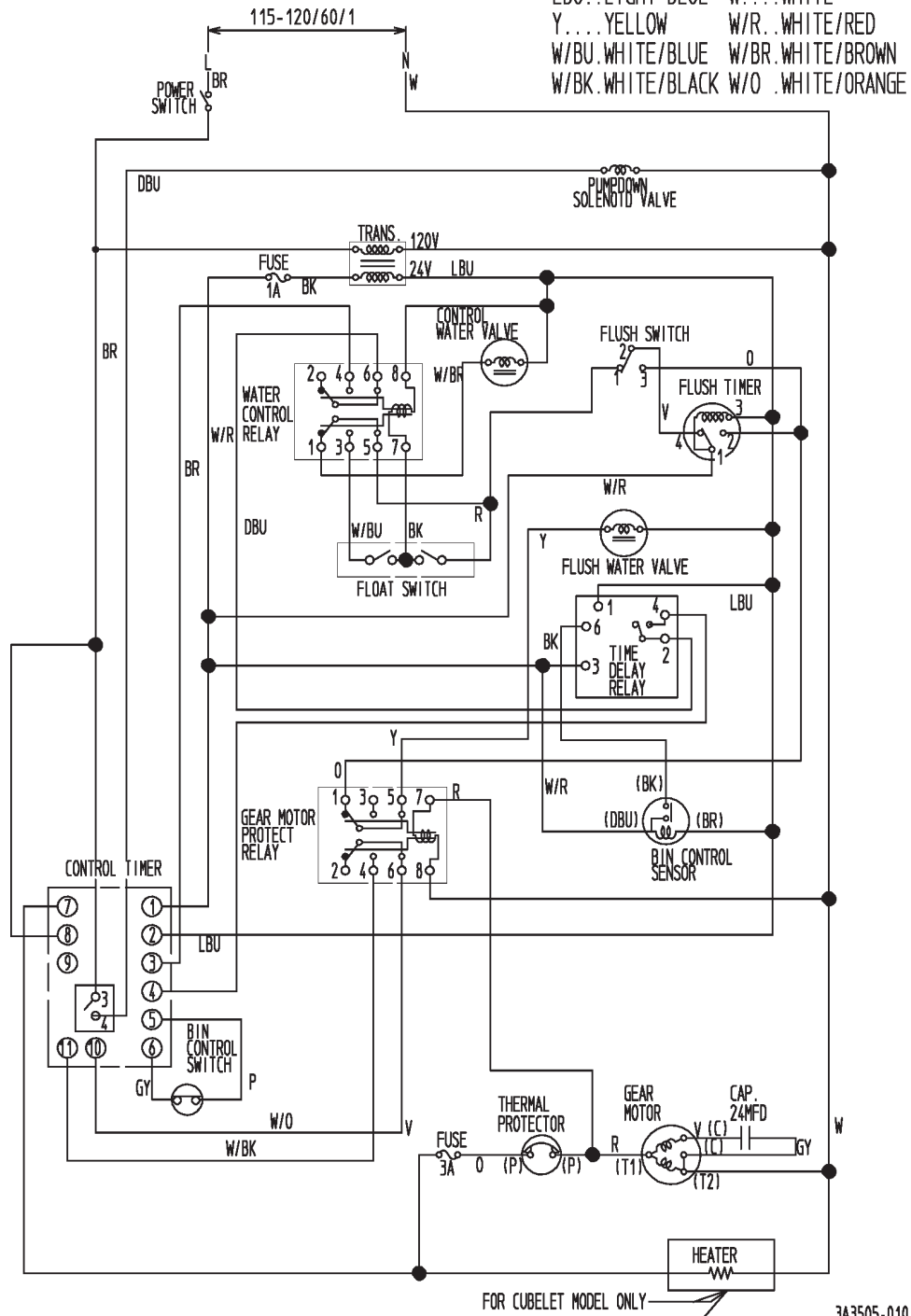


## B. Wiring Diagram

### 1. Icemaker

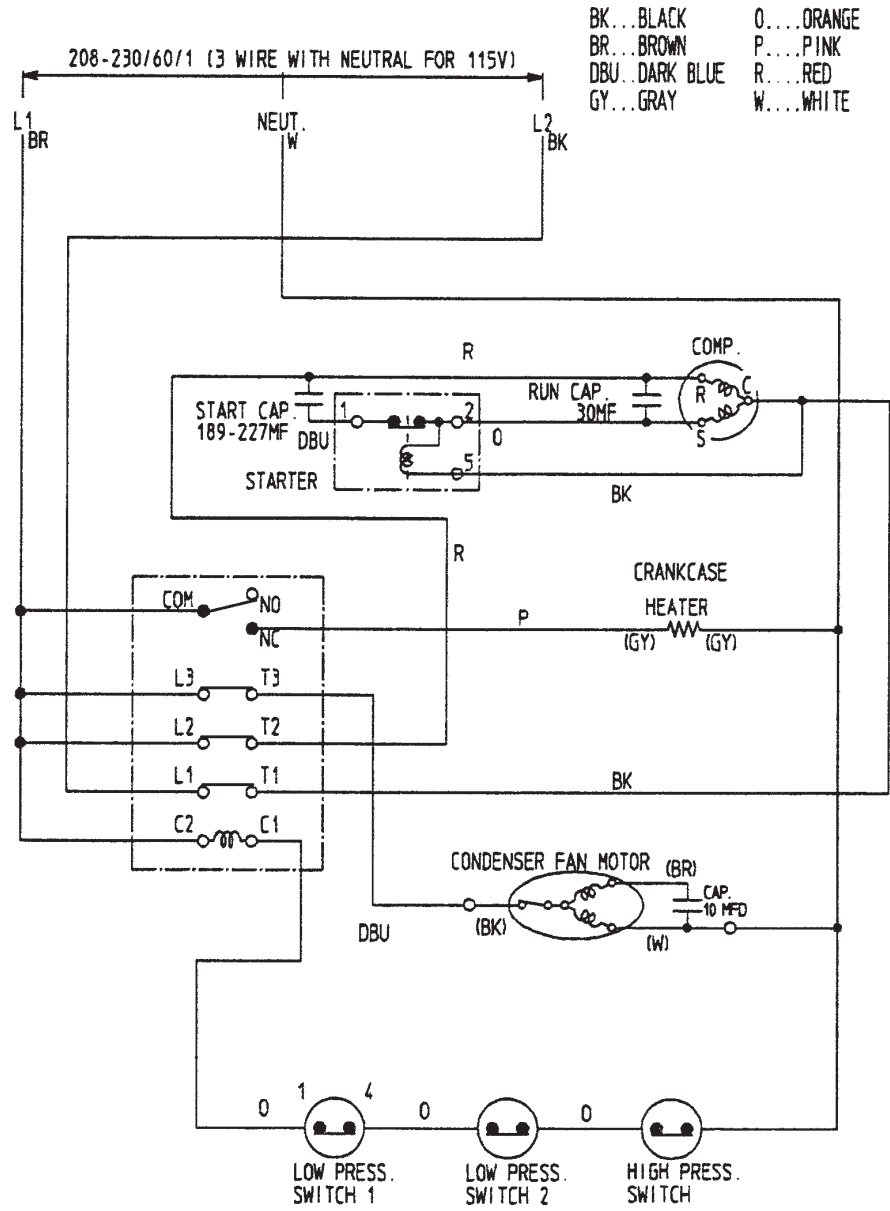
#### a) FS-1001MLH-C

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





2. Condensing Unit  
 a) SRC-10H

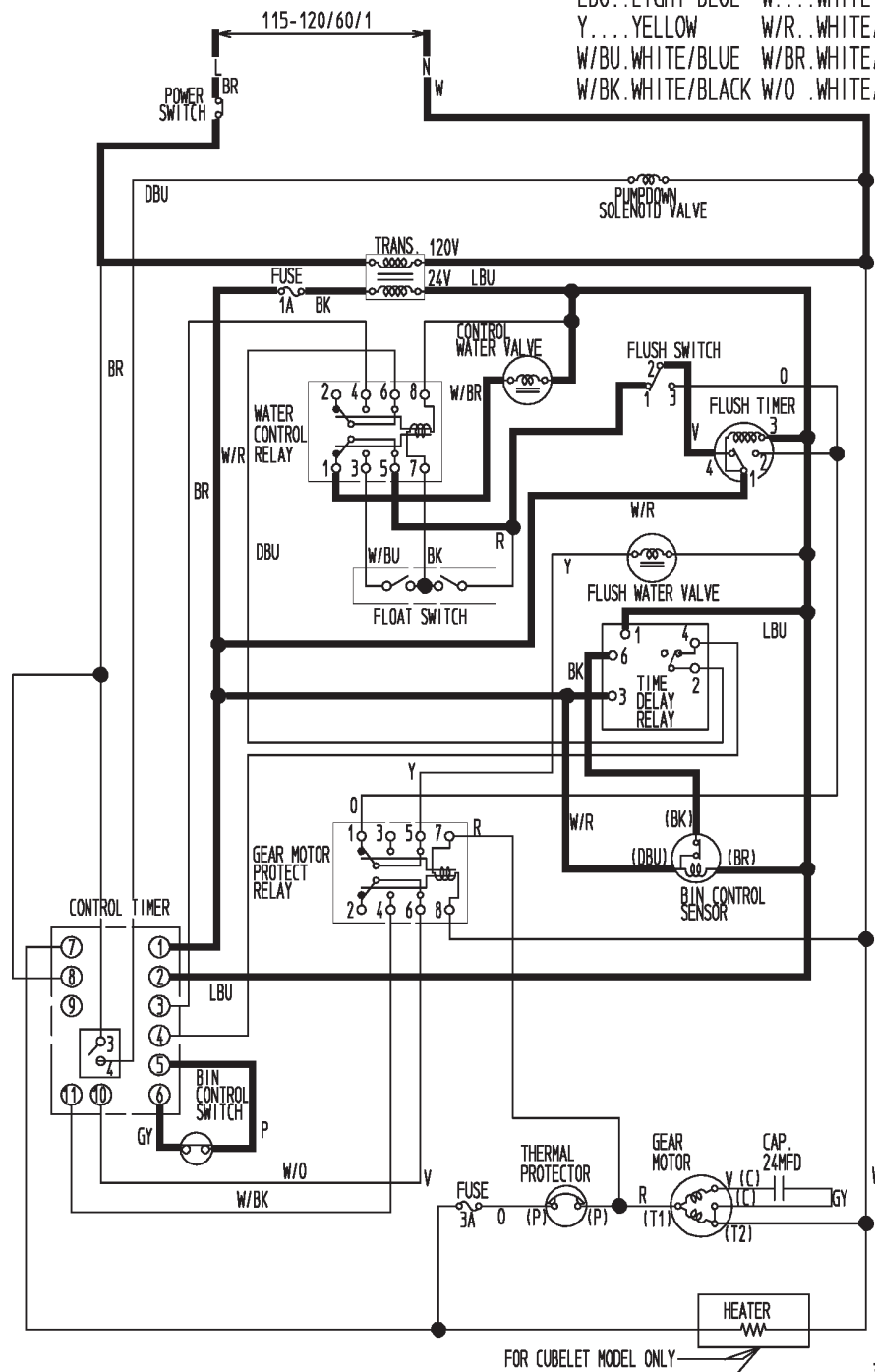


## C. Sequence of Electrical Circuit

### 1. Icemaker

1. When the power switch is moved to the "ON" position and the flush switch to the "ICE" position, water starts to be supplied to the reservoir.

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

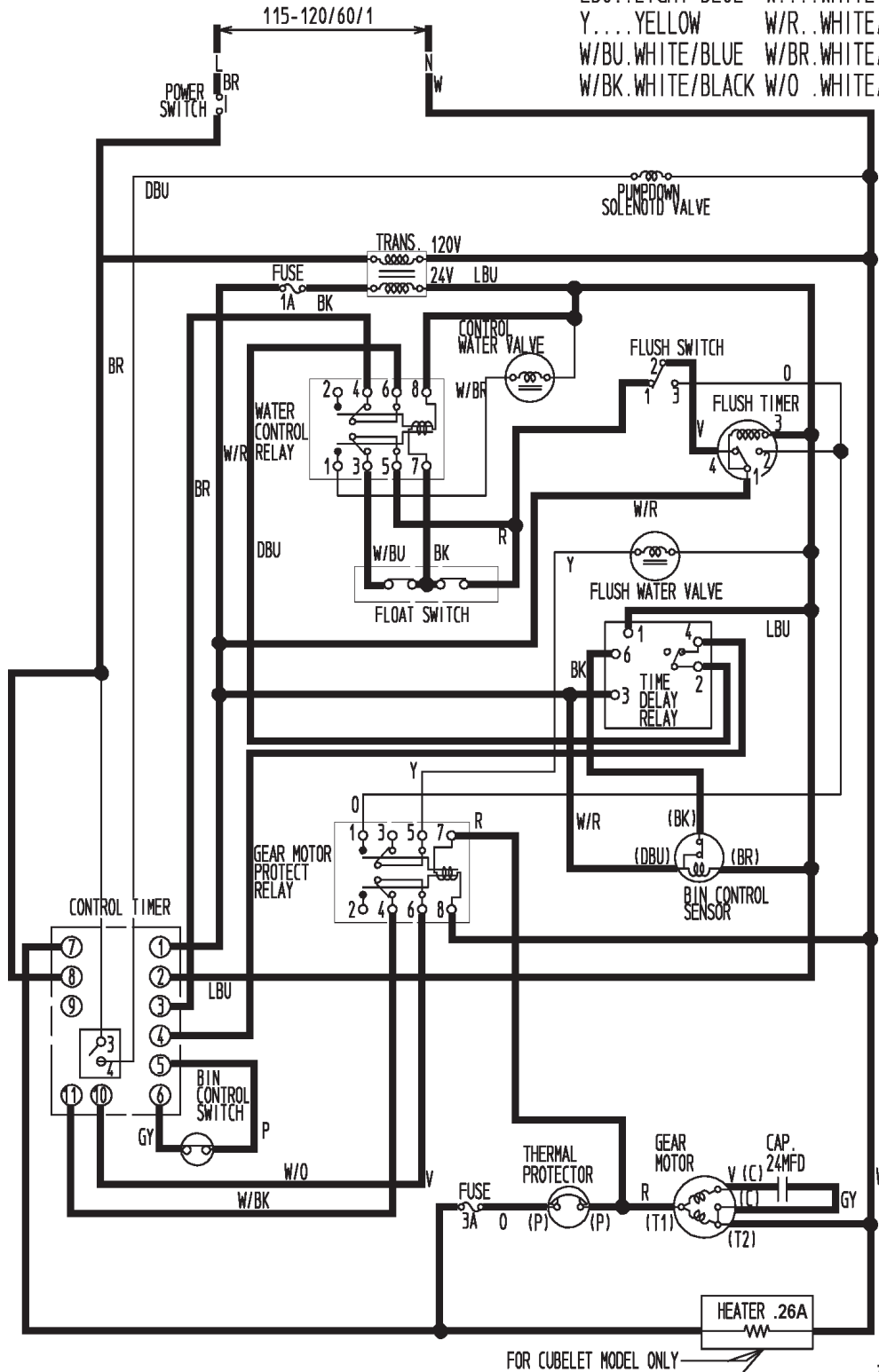


FOR CUBELET MODEL ONLY

3A3505-01Q

2. When the reservoir has been filled, the gear motor starts immediately.

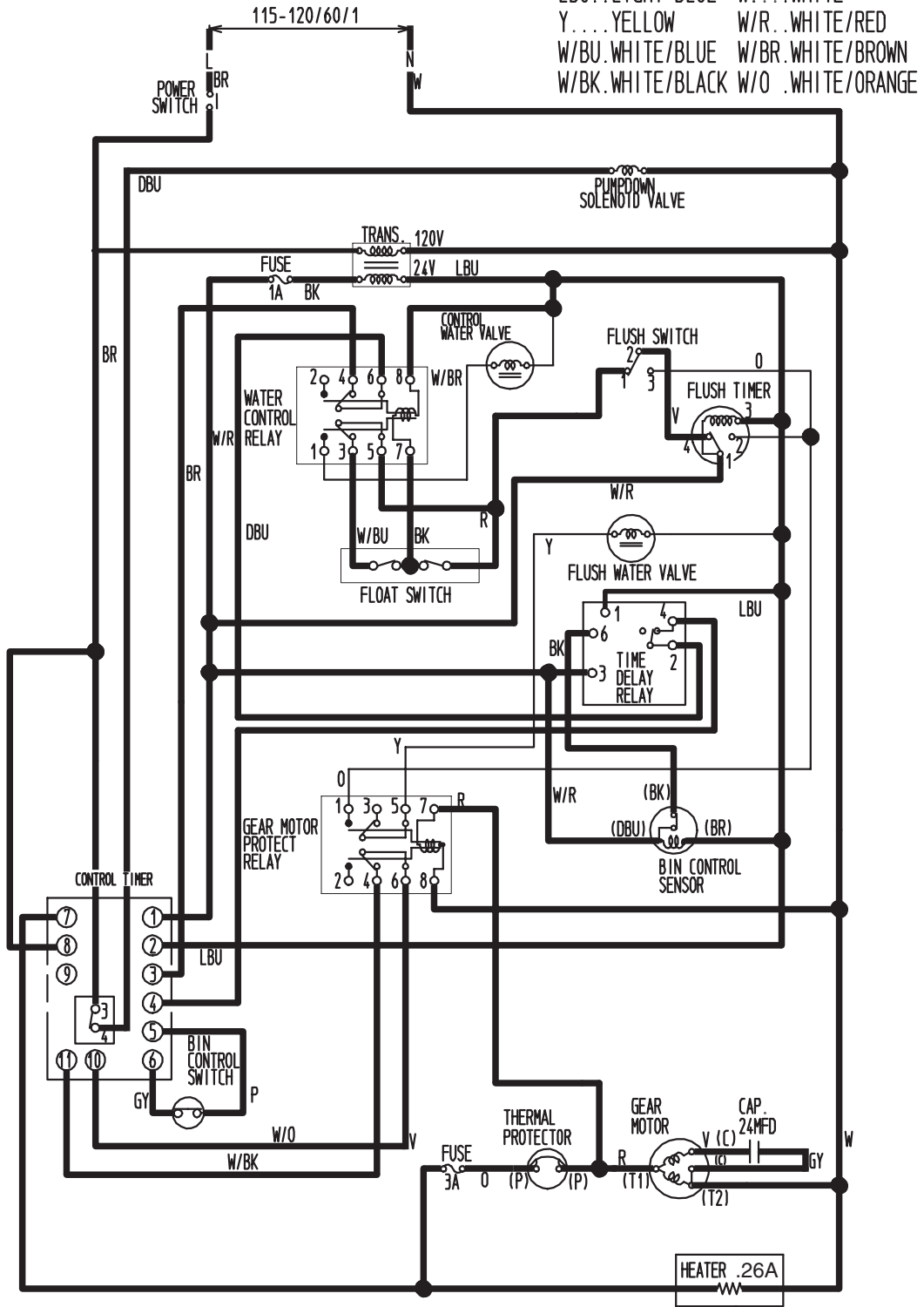
- |                    |                    |
|--------------------|--------------------|
| BK...BLACK         | O...ORANGE         |
| BR...BROWN         | P...PINK           |
| DBU...DARK BLUE    | R...RED            |
| GY...GRAY          | V...VIOLET         |
| LBU...LIGHT BLUE   | W...WHITE          |
| Y...YELLOW         | W/R...WHITE/RED    |
| W/BU...WHITE/BLUE  | W/BR...WHITE/BROWN |
| W/BK...WHITE/BLACK | W/O...WHITE/ORANGE |



FOR CUBELET MODEL ONLY 3A3505-01Q

3. The pumpdown solenoid valve energizes about 60 sec. after the gear motor starts.

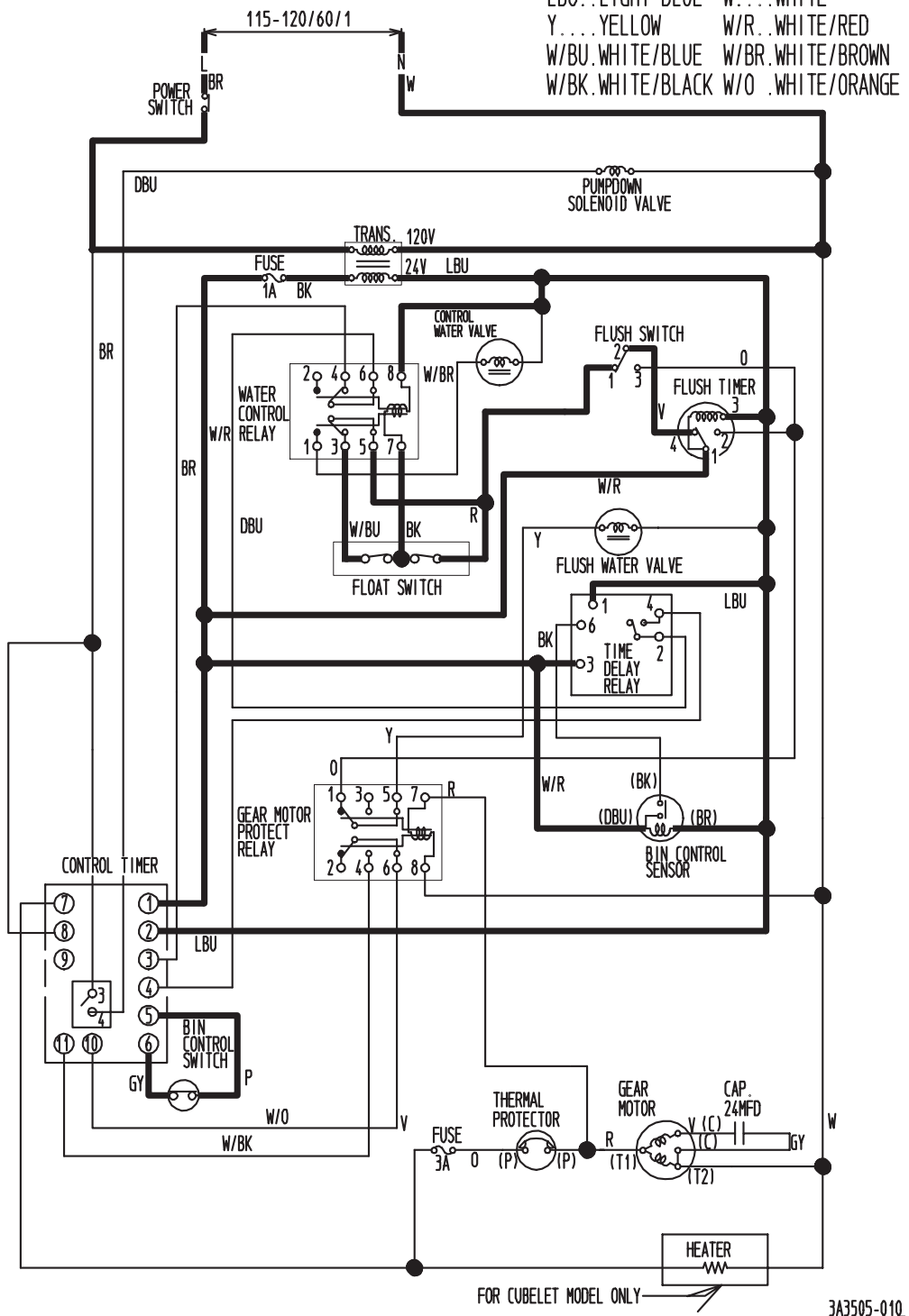
BK...BLACK	O....ORANGE
BR...BROWN	P....PINK
DBU..DARK BLUE	R....RED
GY...GRAY	V....VIOLET
LBU..LIGHT BLUE	W....WHITE
Y....YELLOW	W/R..WHITE/RED
W/BU.WHITE/BLUE	W/BR.WHITE/BROWN
W/BK.WHITE/BLACK	W/O .WHITE/ORANGE



FOR CUBELET MODEL ONLY 3A3505-01Q

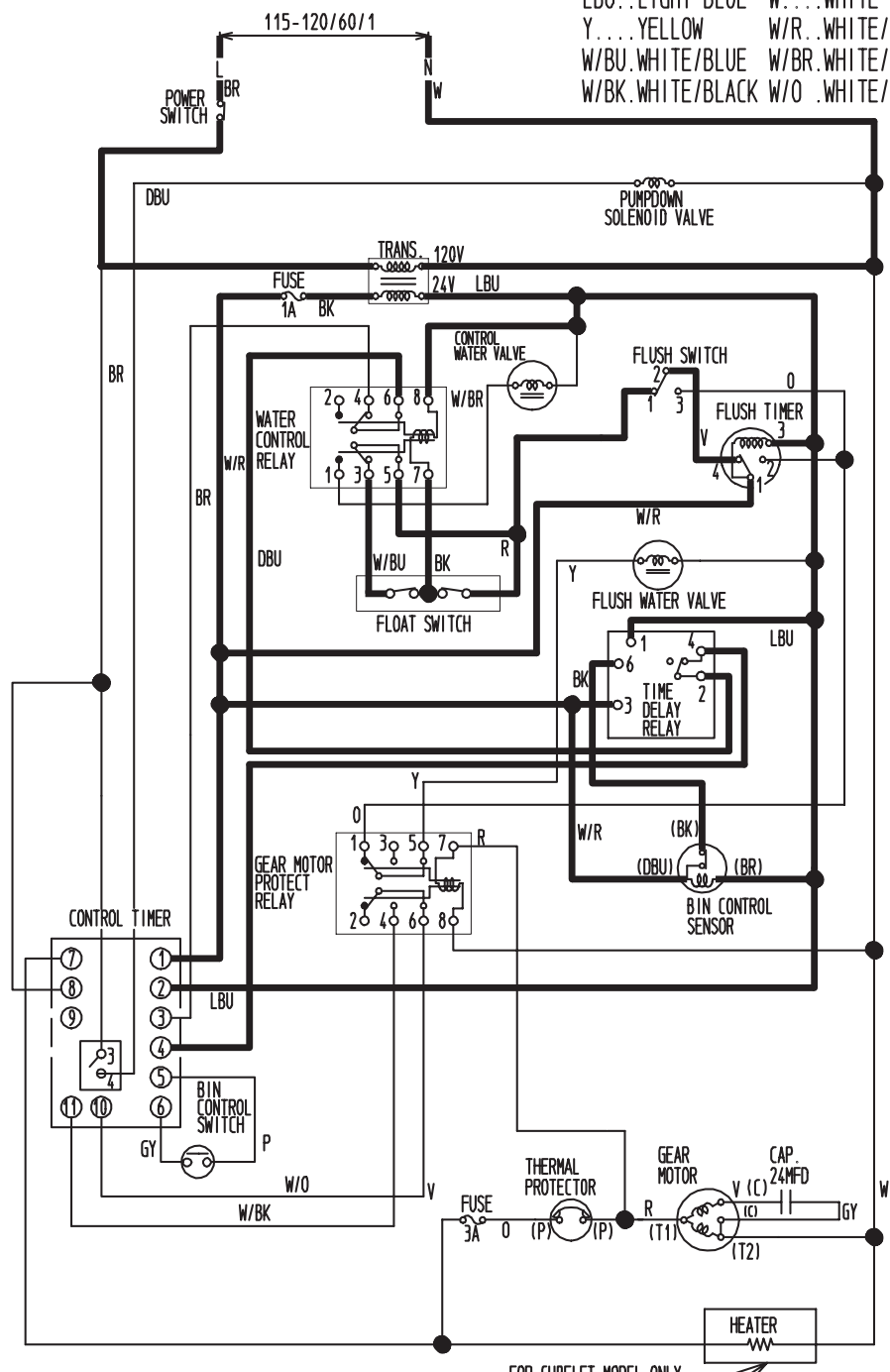
4a. The bin control sensor operates and the pumpdown solenoid deenergizes after a time delay set by the user. 60 seconds after that the gear motor stops.

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



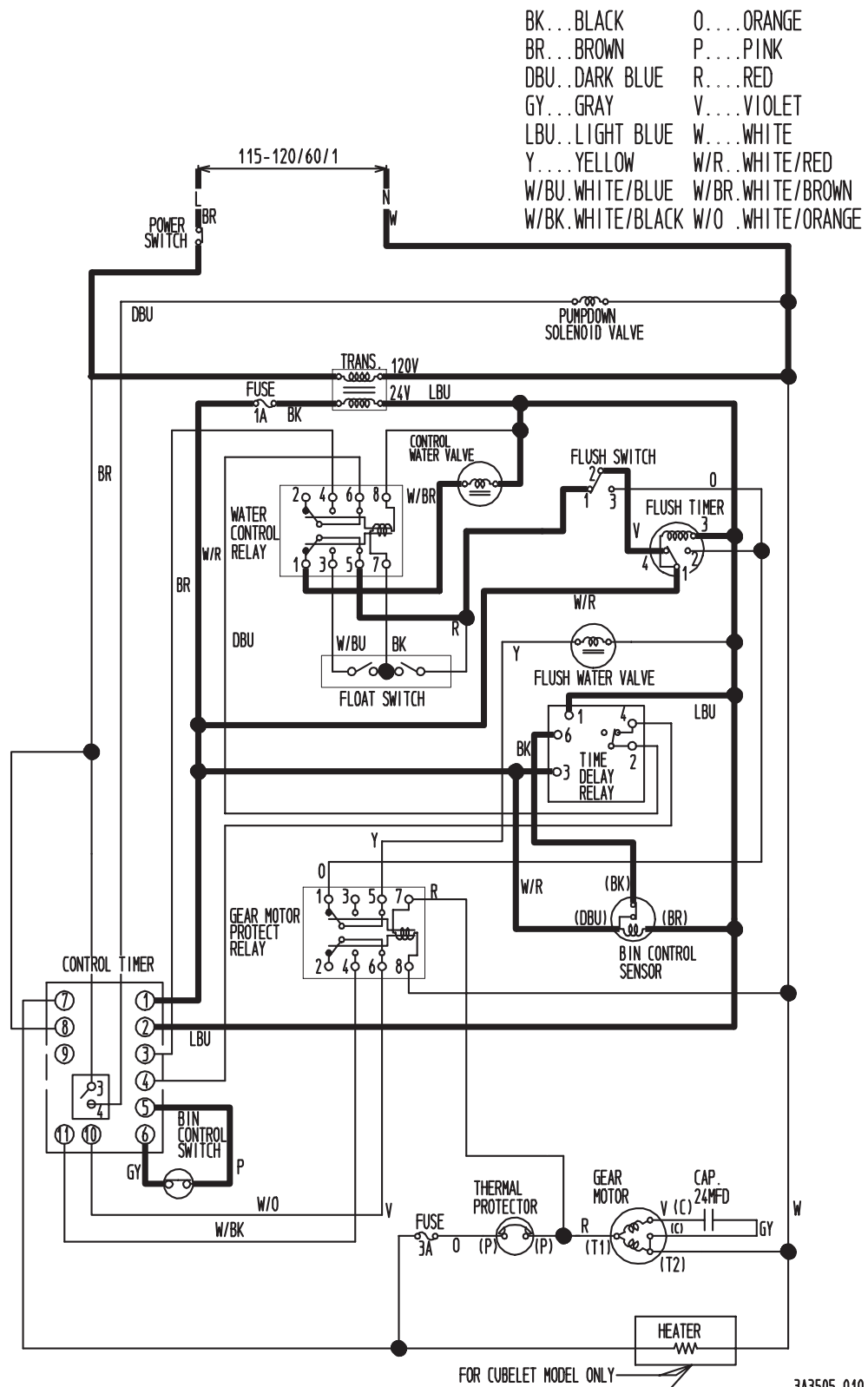
4b. Should the bin control sensor fail and the bin control switch operate, the pumpdown solenoid valve and gear motor will stop simultaneously 6 sec. after operation.

- |                    |                    |
|--------------------|--------------------|
| 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 |



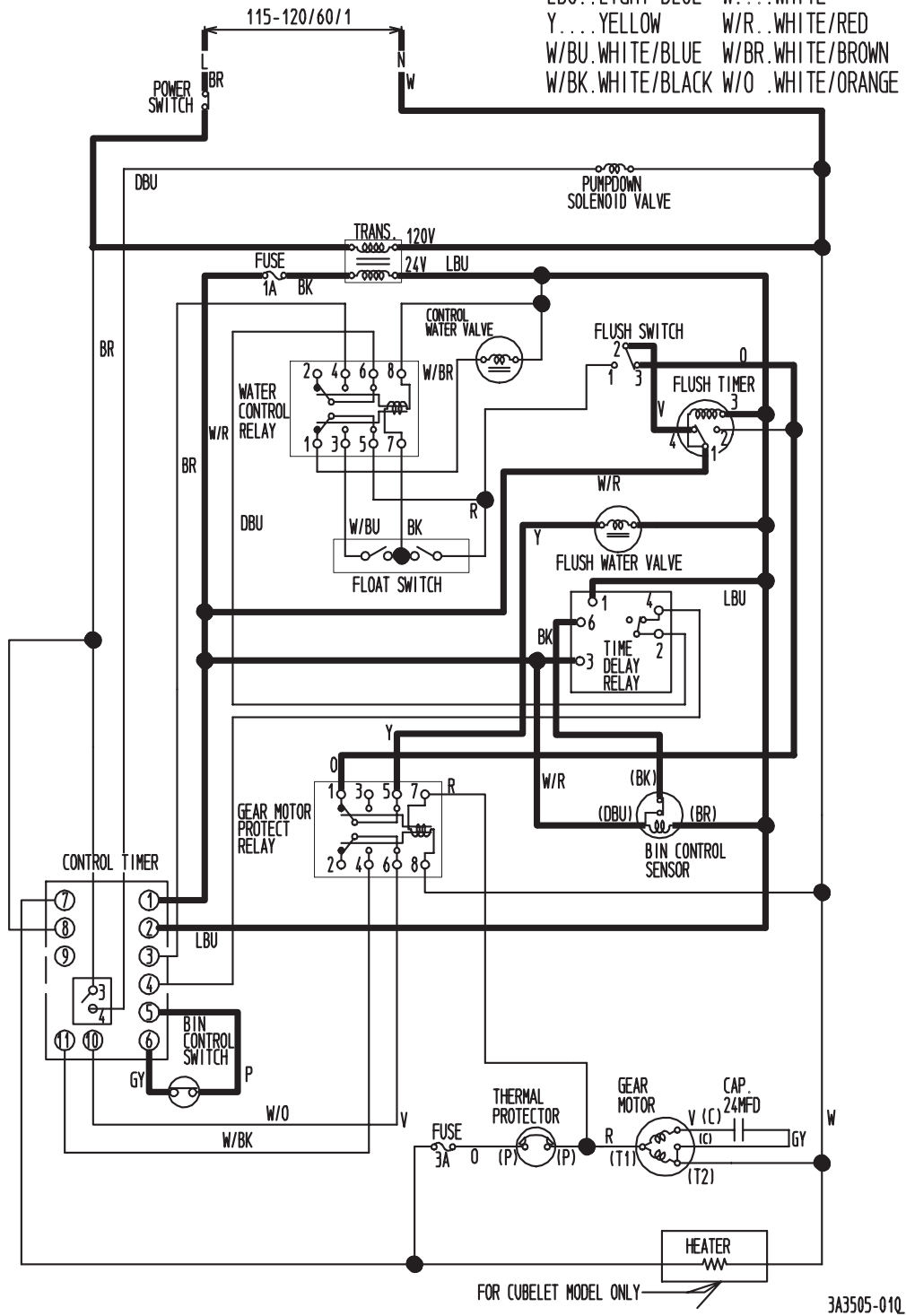
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## 5. Low water.



6. When the flush switch is moved to the “FLUSH” position, the flush water valve opens and flushes the reservoir and evaporator.

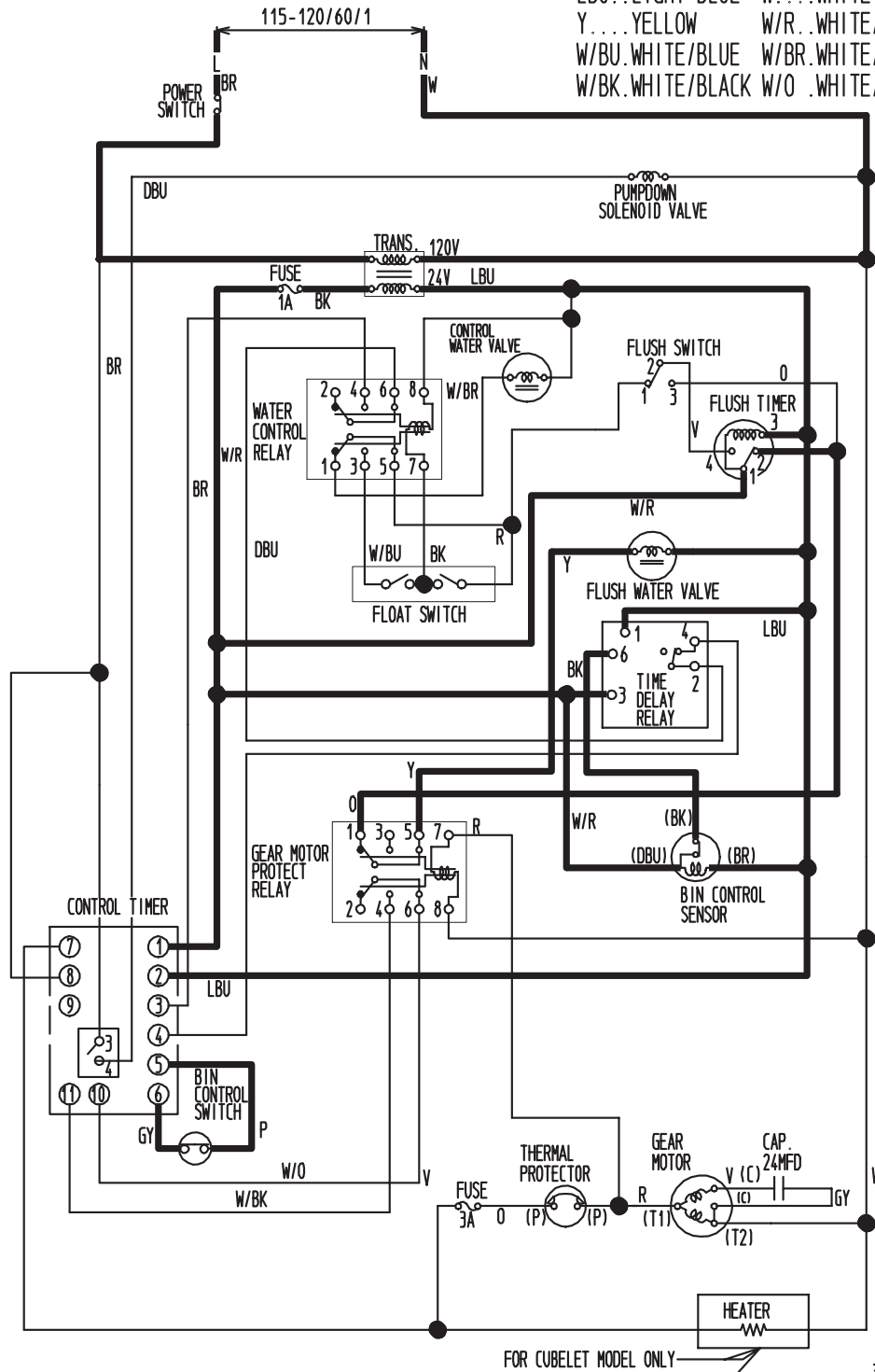
BK... BLACK	O.... ORANGE
BR... BROWN	P.... PINK
DBU.. DARK BLUE	R.... RED
GY... GRAY	V.... VIOLET
LBU.. LIGHT BLUE	W.... WHITE
Y.... YELLOW	W/R.. WHITE/RED
W/BU.. WHITE/BLUE	W/BR.. WHITE/BROWN
W/BK.. WHITE/BLACK	W/O .. WHITE/ORANGE





7. When the flush timer operates (for 15 min. every 12 hours).

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

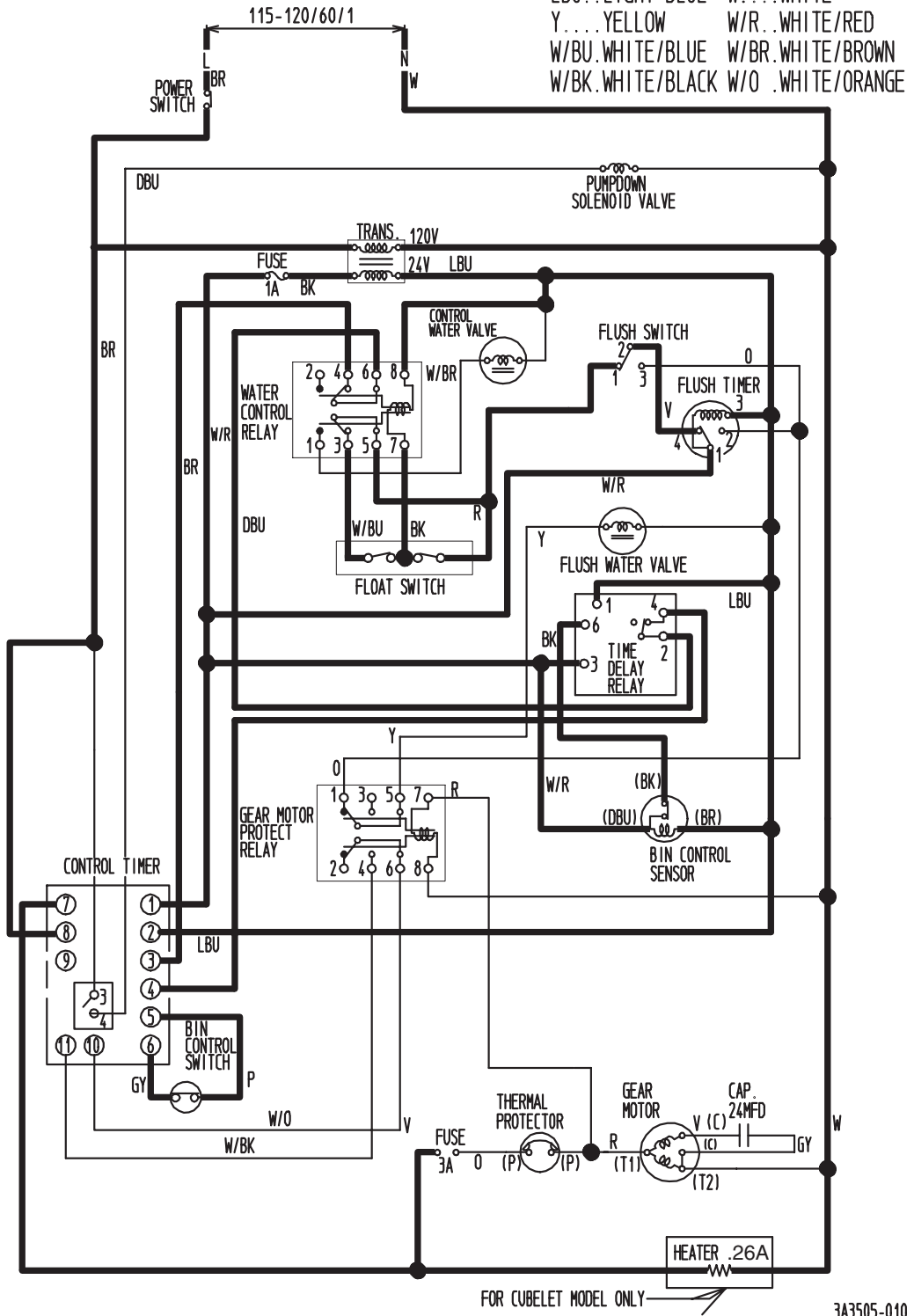


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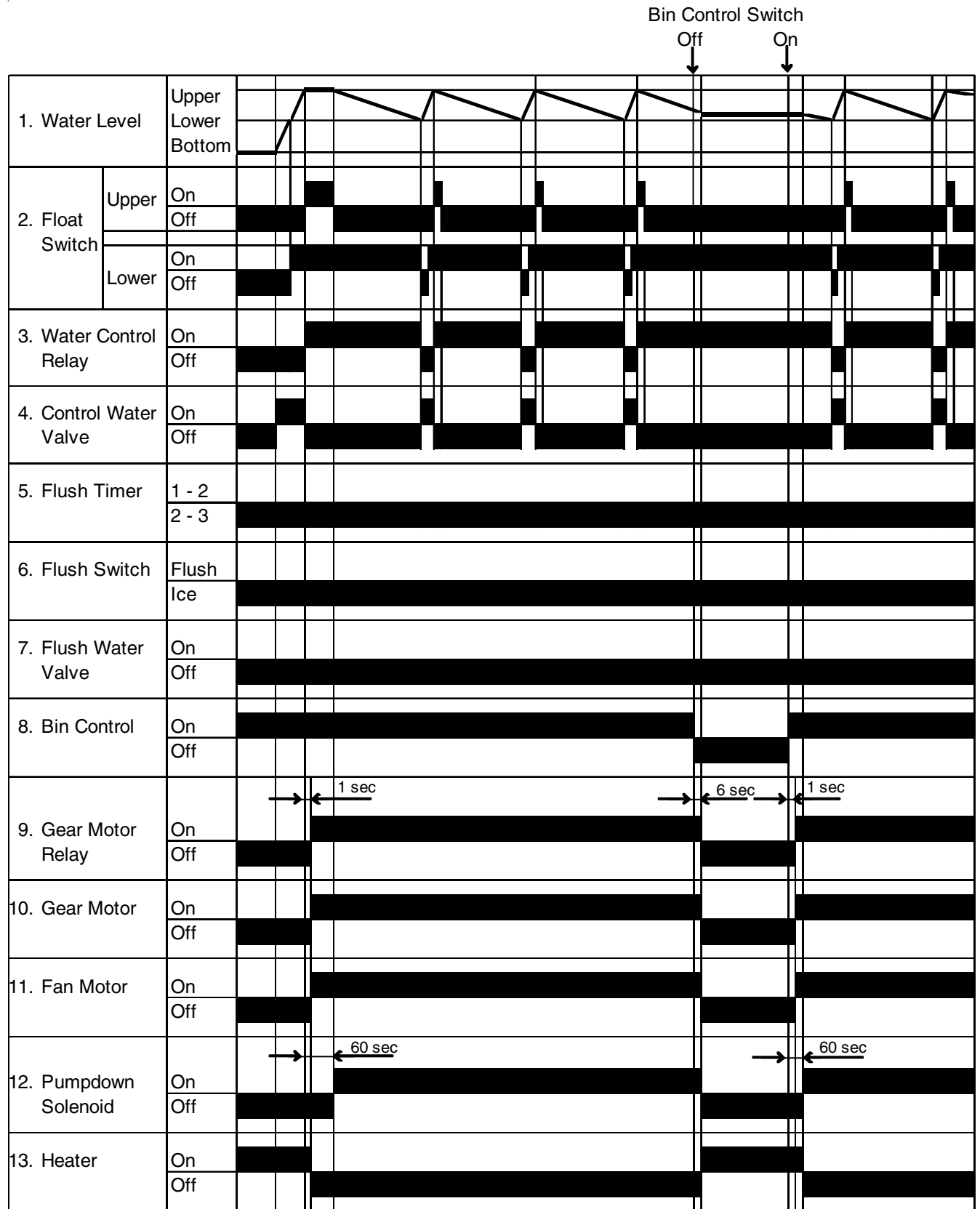
8. If the gear motor fuse (3A) blows, the solenoid valve and gear motor will turn off immediately.

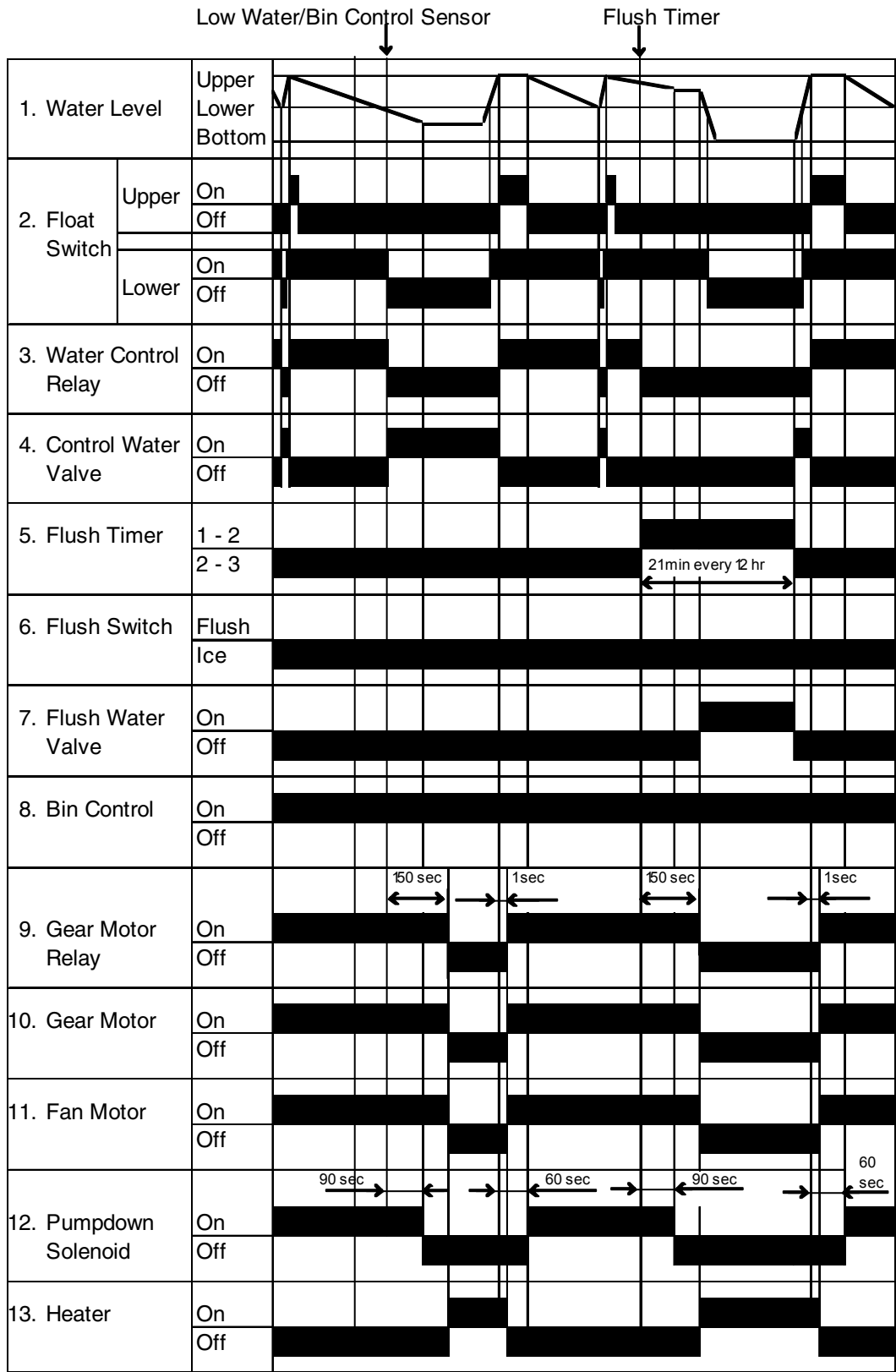
BK...BLACK	O...ORANGE
BR...BROWN	P...PINK
DBU...DARK BLUE	R...RED
GY...GRAY	V...VIOLET
LBU...LIGHT BLUE	W...WHITE
Y...YELLOW	W/R...WHITE/RED
W/BU...WHITE/BLUE	W/BR...WHITE/BROWN
W/BK...WHITE/BLACK	W/O...WHITE/ORANGE

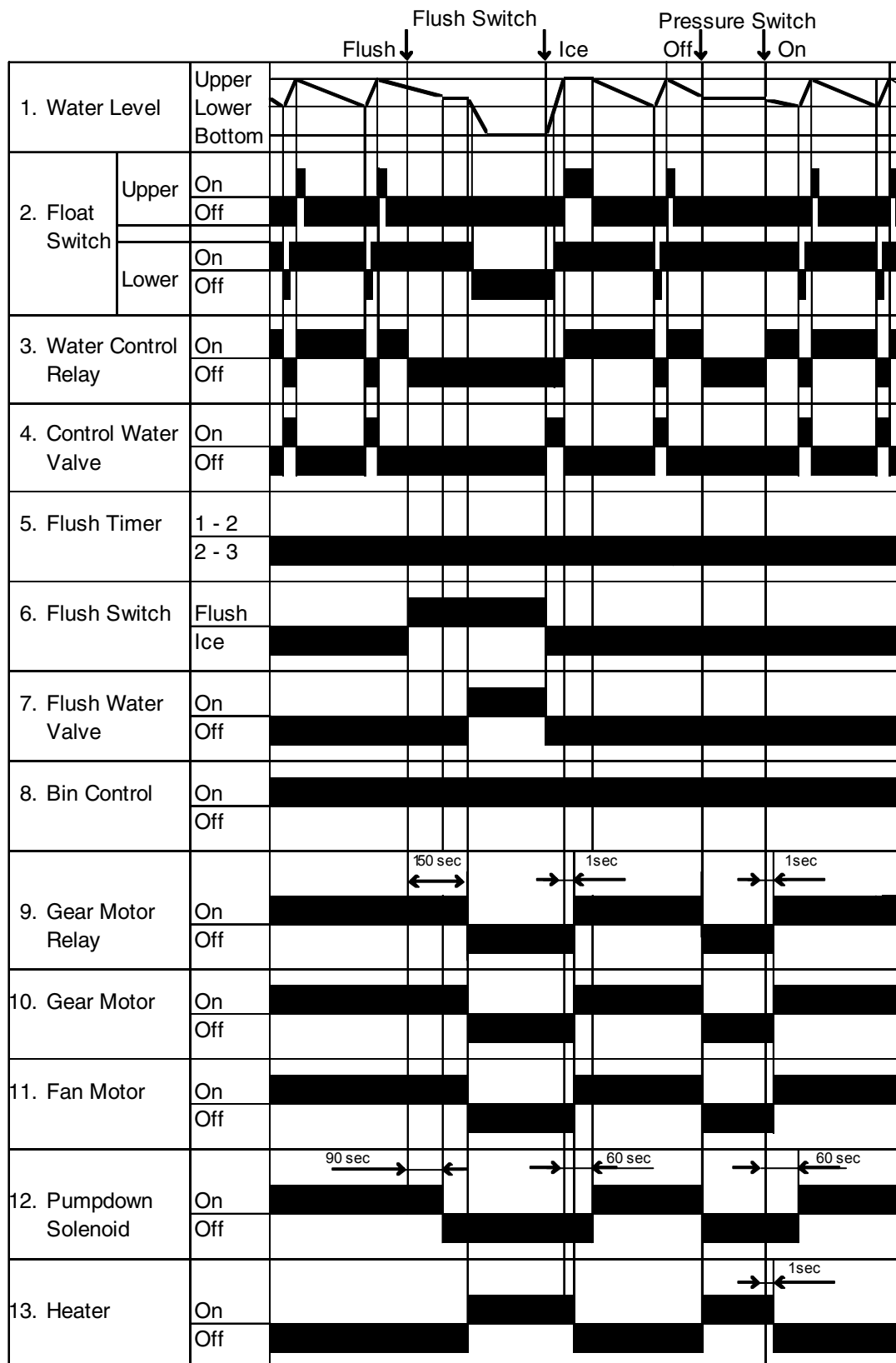


3A3505-01Q

## D. Timing Chart







**E. Performance Data**  
**1. FS-1001MLH**

**No Data Available**

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

## 2. FS-1001MLH-C

### Performance Data:

APPROXIMATE ICE PRODUCTION PER 24 HR.  lbs./DAY ( l/day)	Ambient Temp. (F)	Water Temp. (F)					
		50		70		90	
	70	*832	<u>378</u>	803	<u>365</u>	784	<u>356</u>
	80	765	<u>347</u>	747	<u>340</u>	729	<u>331</u>
	90	712	<u>324</u>	*703	<u>320</u>	679	<u>309</u>
	100	663	<u>301</u>	647	<u>294</u>	*600	<u>273</u>
APPROXIMATE ELECTRIC CONSUMPTION  watts	70	1713	--	1717	--	1722	--
	80	1727	--	1731	--	1736	--
	90	1740	--	1745	--	1760	--
	100	1775	--	1789	--	1804	--
APPROXIMATE WATER CONSUMPTION PER 24 HR.  gal. / day (l/day)	70	*100	<u>377</u>	96	<u>364</u>	94	<u>356</u>
	80	92	<u>347</u>	90	<u>339</u>	88	<u>331</u>
	90	85	<u>323</u>	*84	<u>319</u>	81	<u>308</u>
	100	80	<u>301</u>	78	<u>293</u>	*72	<u>272</u>
EVAPORATOR OUTLET TEMP. F ( C)	70	*14	<u>-10</u>	14	<u>-10</u>	14	<u>-10</u>
	80	14	<u>-10</u>	16	<u>-9</u>	16	<u>-9</u>
	90	16	<u>-9</u>	*16	<u>-9</u>	18	<u>-8</u>
	100	18	<u>-8</u>	18	<u>-8</u>	*18	<u>-8</u>
HEAD PRESSURE  PSIG (kg/sq.cmG)	70	*224	<u>15.7</u>	224	<u>15.7</u>	224	<u>15.7</u>
	80	233	<u>16.4</u>	233	<u>16.4</u>	233	<u>16.4</u>
	90	242	<u>17.0</u>	*242	<u>17.0</u>	242	<u>17.0</u>
	100	279	<u>19.6</u>	279	<u>19.6</u>	*279	<u>19.6</u>
SUCTION PRESSURE PSIG (kg/sq.cmG)	70	*29	<u>2.0</u>	29	<u>2.0</u>	29	<u>2.0</u>
	80	30	<u>2.1</u>	30	<u>2.1</u>	30	<u>2.1</u>
	90	31	<u>2.2</u>	*31	<u>2.2</u>	31	<u>2.2</u>
	100	33	<u>2.3</u>	33	<u>2.3</u>	*33	<u>2.3</u>
HEAT OF REJECTION FROM BODY		1130 BTU/hr AT 90 F/WT 70 F					

Note: The data without \*marks should be used for reference.

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

## IV. Service Diagnosis

### A. No Ice Production

#### 1. Icemaker

Problem	Possible Cause	Remedy	
[1] The icemaker will not start.	a) Power Supply	1. OFF position.	1. Move to ON position.
		2. Loose connection.	2. Tighten.
		3. Bad contacts.	3. Check for continuity and replace.
		4. Blown fuse.	4. Replace.
	b) Power Switch (Control Box)	1. Off position.	1. Move to ON position.
		2. Bad contacts.	2. Check for continuity and replace.
	c) Fuse (Control Box)	1. Blown out.	1. Check for short circuit and replace.
	d) Circuit Protect Relay	1. Miswiring.	1. Check power supply voltage and wire properly.
	e) Flush Timer	1. Flushing out.	1. Wait for 15 minutes.
		2. Bad contacts.	2. Check for continuity and replace.
	f) Flush Switch	1. FLUSH position.	1. Move to ICE position.
		2. Bad contacts.	2. Check for continuity and replace.
	g) Transformer	1. Coil winding opened.	1. Replace.
	h) Control Water Valve	1. Coil winding opened.	1. Replace.
	i) Shut-off Valve	1. Closed.	1. Open.
		2. Water failure.	2. Wait until water is supplied.
j) Plug and Receptacle (Control Box)	1. Disconnected.	1. Connect.	
	2. Terminal out of plug or receptacle.	2. Insert terminal back in position.	
k) Bin Control Sensor	1. Failed sensor.	1. Check LED with power switch on. Replace if necessary.	
	2. Wet or scaled eye.	2. Wipe off and clean sensor eye.	
[2] Water does not stop, and the icemaker will not start.	a) Water Control Relay	1. Contact fused.	1. Replace.
		2. Coil winding opened.	2. Replace.
	b) Float Switch	1. Bad contacts.	1. Check for continuity and replace.
		2. Float does not move freely.	2. Clean or replace.
	c) Flush Water Valve	1. Valve seat clogged and water leaking.	1. Clean or replace.
d) Hoses	1. Disconnected.	1. Connect.	



<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>	
[3] Water has been supplied, but the icemaker will not start.	a) Water Control Relay	1. Bad contacts.	1. Check for continuity and replace.
	b) Bin Control	1. Bad contacts.	1. Check for continuity and replace.
		2. Actuator does not move freely.	2. Clean shaft and its corresponding holes or replace bin control.
		3. Make sure that sensor eye is clear.	3. Clear/clean sensor eye.
	c) Gear Motor Relay	1. Coil winding opened.	1. Replace.
2. Bad contacts.		2. Check for continuity and replace.	
d) Control Timer (Printed Circuit Board)	1. Broken.	1. Replace.	
[4] Water has been supplied, but gear motor will not start and solenoid will not energize.	a) Gear Motor Fuse (BUSSMAN GMD 3.0A)	1. Blown fuse.	1. See "C. [3]." Determine the cause and replace the fuse.
	b) Thermal Protector (Gear Motor)	1. Bad contacts.	1. Check for continuity and replace.
[5] Gear motor starts and solenoid energizes, but machine does not make ice or makes ice intermittently.	a) High Pressure Switch	1. Dirty condenser.	1. Clean.
		2. Ambient air temperature at condensing unit too warm.	2. Need cooler conditions.
		3. Refrigerant overcharged.	3. Recharge.
		4. Refrigerant line or components plugged.	4. Clean and replace drier.
		5. Bad contacts.	5. Check for continuity and replace.
		6. Loose connections.	6. Tighten.
[6] Gear motor starts, but solenoid valve will not energize or energizes intermittently.	a) X2 Relay on Control Timer	1. Bad contacts.	1. Check for continuity and replace.
		2. Coil winding opened.	2. Replace timer.
	b) Solenoid Valve	1. Bad contacts.	1. Check for continuity and replace.
		2. Coil winding opened.	2. Replace coil.
		3. Valve stuck closed.	3. Replace valve body.
[7] Gear motor starts and solenoid energizes, but no ice is produced.	a) Refrigerant Line	1. Gas leaks.	1. Check for leaks with a leak detector. Reweld leak, replace drier and charge with refrigerant. The amount of refrigerant is marked on nameplate or label.
		2. Refrigerant line clogged.	2. Replace clogged component.

<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>
[7] Continued from previous page.	b) Condensing Unit	1. Not functioning properly. 1. Proceed to "2. Condensing Unit."

## 2. Condensing Unit

<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>	
[8] Condensing unit does not start.	a) Power Supply	1. OFF position. 2. Incorrect wiring.	1. Turn supply on. 2. Correct wiring.
	b) Secondary Low Pressure Switch	1. Awaiting reset.	1. Find cause and press Reset button.
	c) Ice Machine	1. Ice machine off.	1. Turn on ice machine.
[9] Compressor will not start or operates intermittently.	a) Low Pressure Switches	1. Faulty or malfunctioning.	1. Check for continuity and replace.
	b) Magnetic Contactor	1. Coil winding opened.	1. Replace.
	c) Starter	1. Bad contacts.	1. Check for continuity and replace.
		2. Coil winding opened.	2. Replace.
		3. Loose connections.	3. Tighten.
	d) Start or Run Capacitor	1. Defective.	1. Replace.
	e) Compressor	1. Loose connections.	1. Tighten.
2. Motor winding open or grounded.		2. Replace.	
3. Motor protector tripped.		3. Find cause of overcurrent or overheat.	
f) Power Supply	1. Circuit Ampacity too low.	1. Install larger conductor.	

## B. Low Ice Production

<b>Problem</b>	<b>Possible Cause</b>	<b>Remedy</b>	
[1] Low ice production.	a) Refrigerant Line	1. Gas leaks.	1. See "A. 1. [7] a) Refrigerant Line."
		2. Refrigerant line clogged.	2. Replace the clogged component.
		3. Overcharged.	3. Recharge.
	b) High-side Pressure Too High	1. Dirty condenser.	1. Clean.
		2. Ambient air temperature at condensing unit too warm.	2. Need cooler conditions.
		3. Condensing unit out of order.	3. Check condensing unit.
	c) Expansion Valve (not adjustable)	1. Low-side pressure too low.	1. Replace.
		2. Low-side pressure too high.	2. See if expansion valve bulb is mounted properly, and replace the valve if necessary.

### C. Other

<b>Problem</b>	<b>Possible Cause</b>		<b>Remedy</b>
[1] Abnormal noise.	a) Refrigerant Lines	1. Rub or touch lines or other surfaces.	1. Replace.
	b) Gear Motor (Ice Making)	1. Bearing or gear worn out / damaged.	1. Replace.
	c) Evaporator	1. Too much pressure loss.	1. Replace.
		2. Scale on inside wall of freezing cylinder.	2. Remove auger. Use "SCALE AWAY" or "LIME-A-WAY" solution to clean periodically. If the water is found hard by testing, install a softener.
[2] Overflow from reservoir (Water does not stop.)	a) Water Supply	1. Water pressure too high.	1. Install a pressure reducing valve.
	b) Control Water Valve	1. Diaphragm does not close.	1. Clean or replace.
	c) Float Switch	1. Bad contacts.	1. Check for continuity and replace.
[3] Gear motor fuse blown frequently.	a) Power Supply Voltage	1. Too high or too low.	1. Connect the unit to a power supply of proper voltage.
	b) Ice Making Unit	1. Bearings or auger worn out.	1. Replace bearings or auger.
	c) Bin Control	1. Bad contacts.	1. Check for continuity and replace.
		2. Actuator does not move freely.	2. Clean shaft and its corresponding holes or replace bin control.

## V. Removal and Replacement of Components

### IMPORTANT

Ensure all components, fasteners and thumbscrews are securely in place after the equipment is serviced.

### IMPORTANT

1. The Polyolester (POE) oils used in R-404A units can absorb moisture quickly. Therefore it is important to prevent moisture from entering the system when replacing or servicing parts.
2. Always install a new filter drier every time the sealed refrigeration system is opened.
3. Do not leave the system open for longer than 15 minutes when replacing or servicing parts.

## A. Service for Refrigerant Lines

### 1. Refrigerant Recovery

The icemaker unit is provided with two refrigerant service valves - one on the low-side and one on the high-side line. Using proper refrigerant practices recover the refrigerant from the service valves and store it in an approved container. Do not discharge the refrigerant into the atmosphere.

### 2. Evacuation and Recharge [R-404A]

#### *a) Complete*

For complete evacuation of ice machine and condensing unit, follow the steps below.

Note: For replacement of components inside the ice machine, a complete evacuation is not necessary. For partial evacuation with pumpdown, see "Partial evacuation with pumpdown" below.

- 1) Attach charging hoses, a service manifold and a vacuum pump to the system. Be sure to connect charging hoses to both high-side and low-side service valves.

### WARNING

Service valves have no valve core. Be sure valve stems are closed before removing the flare caps to attach charging hoses.

### IMPORTANT

The vacuum level and vacuum pump may be the same as those for current refrigerants. However, the rubber hose and gauge manifold to be used for evacuation and refrigerant charge should be exclusively for POE oils.

- 2) Turn on the vacuum pump. Never allow the oil in the vacuum pump to flow backwards.
- 3) Allow the vacuum pump to pull down to a 29.9" Hg vacuum. Evacuating period depends on pump capacity.
- 4) Close the low-side valve and high-side valve on the service manifold.
- 5) Disconnect the vacuum pump and attach a refrigerant service cylinder to the high-side line. Remember to loosen the connection and purge the air from the hose. See the rating label on the control box in the icemaker for the required refrigerant charge. Hoshizaki recommends only virgin refrigerant or reclaimed refrigerant which meets ARI Standard No. 700-88 be used.
- 6) A liquid charge is recommended for charging an R-404A system. Invert the service cylinder if necessary. Open the high-side, service manifold valve.
- 7) Allow the system to charge with liquid until the pressures balance.
- 8) If necessary, add any remaining charge to the system through the low-side. Use a throttling valve or liquid dispensing device to add the remaining liquid charge through the low-side access port with the unit running.
- 9) Close the two refrigerant service valves and disconnect the hoses and service manifold.

**WARNING**

Service valves have no valve core. Be sure valve stems are closed before disconnecting the hoses.

- 10) Cap the service valves to prevent a possible leak.

***b) Partial evacuation with pumpdown***

For replacement of components inside the ice machine, only a partial evacuation with pumpdown is necessary.

- 1) If not already running, turn on the ice machine, making sure that the solenoid valve energizes and that the bin control is not activated.
- 2) Turn off the power supply to the condensing unit.
- 3) In the condensing unit, close the liquid line shut-off valve by rotating the valve stem clockwise until it is fully seated.

- 4) Turn the power supply to the condensing unit back on.
- 5) Once the automatic pumpdown cycle is complete and the condensing unit shuts itself down, turn off the power supply to the condensing unit.
- 6) Close the suction line shut-off valve by rotating the valve stem clockwise until it is fully seated.
- 7) See “1. Refrigerant Recovery” for instructions to recover remaining charge left in line sets and ice machine.
- 8) When service is complete, evacuate line set and ice machine to 29.9” Hg vacuum.
- 9) Recharge ice machine and line set with 50g of R-404A refrigerant.
- 10) Close the two refrigerant service valves and disconnect the charging hoses, replacing the flare caps on the service valves when finished.

**WARNING**

Service valves have no valve core. Be sure valve stems are closed before disconnecting the hoses.

- 11) At the condensing unit, open both the liquid line and suction line shutoff valves.
- 12) Turn the power supply to the condensing unit back on.

## **B. Brazing**

**DANGER**

1. Refrigerant R-404A itself is not flammable at atmospheric pressure and temperatures up to 176° F.
2. Refrigerant R-404A itself is not explosive or poisonous. However, when exposed to high temperatures (open flames) R-404A can be decomposed to form hydrofluoric acid and carbonyl fluoride both of which are hazardous.
3. Always recover the refrigerant and store it in an approved container. Do not discharge the refrigerant into the atmosphere.
4. Do not use silver alloy or copper alloy containing arsenic.
5. Do not use R-404A as a mixture with pressurized air for leak testing. Refrigerant leaks can be detected by charging the unit with a little refrigerant, raising the pressure with nitrogen and using an electronic leak detector.

## C. Service for Condensing Unit

Note:

1. The condensing unit is wired independently from the icemaker. The compressor and condenser fan motor energize when the suction line primary low pressure switch closes. This switch has a cut-out point of 9 psig and a cut-in point of 29 psig. Because of the independent wiring, the condensing unit may periodically energize for short periods of time in order to keep suction pressures from building. This is an automatic, continuous pumpdown and is perfectly normal for the machine.
2. A secondary low pressure switch exists in the suction line to ensure that the machine will not be damaged should the primary switch fail. It has a cut-out point of 3 psig and a differential of 6 psi. The switch is also equipped with a manual reset, so that if it activates and shuts the condensing unit down it must be reset after the cause of the failure has been found.

### 1. Removal and Replacement of Compressor

#### **IMPORTANT**

Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacements have been made.

- 1) Turn off the power supply, and remove the panels.
- 2) Remove the terminal cover on the compressor and disconnect the compressor wiring.
- 3) Recover the refrigerant and store it in an approved container, if required by an applicable law.
- 4) Remove the discharge, suction and access pipes from the compressor using brazing equipment.

#### **WARNING**

When repairing a refrigerant system, be careful not to let the burner flame contact any electrical wires or insulation.

- 5) Remove the bolts and rubber grommets.
- 6) Slide and remove the compressor. Unpack the new compressor package. Install the new compressor.
- 7) Attach the rubber grommets of the prior compressor.

- 8) Sandpaper the discharge, suction and access pipes.
- 9) Place the compressor in position and secure it using the bolts.
- 10) Remove plugs from the discharge, suction and access pipes.
- 11) Braze the access, suction and discharge lines (Do not change this order), while purging with nitrogen gas flowing at a pressure of 3 - 4 psig.
- 12) Install the new drier in the icemaker.
- 13) Check for leaks using nitrogen gas (140 psig) and soap bubbles.
- 14) Evacuate the system, and charge it with refrigerant. See the rating label on the control box in the icemaker for the required refrigerant charge and type.
- 15) Connect the terminals to the compressor, and replace the terminal cover in its correct position.
- 16) Replace the panels in their correct positions, and turn on the power supply.

## **2. Removal and Replacement of Condensing Pressure Regulator (C.P.R.)**

### **IMPORTANT**

Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repairs or replacements have been made.

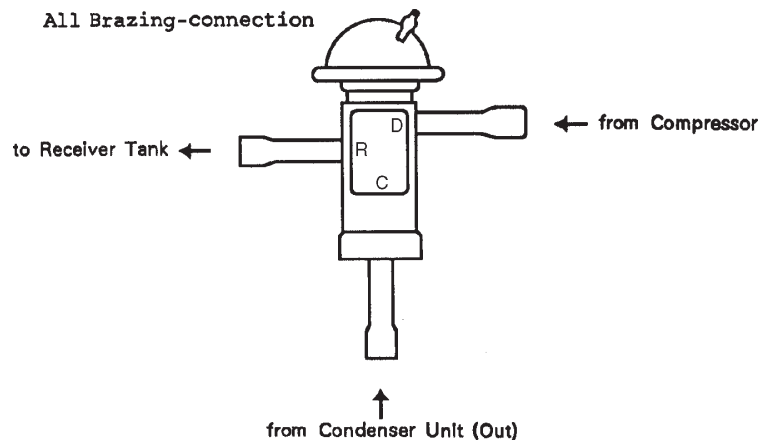
- 1) Turn off the power supply to the condensing unit.
- 2) Remove the panels from the condensing unit.
- 3) See chapter V, section A. 2. a) and perform the complete evacuation procedure.
- 4) Recover the refrigerant and store it in an approved container.
- 5) Remove the C.P.R. using brazing equipment.
- 6) Braze the new C.P.R. with nitrogen gas flowing at a pressure of 3 - 4 psig.

### **WARNING**

Always protect the C.P.R. body by using a damp cloth to prevent the C.P.R. from overheating. Do not braze with the C.P.R. body exceeding 250°F.



- 7) Install the new drier in the icemaker.
- 8) Check for leaks using nitrogen gas (140 psig) and soap bubbles.
- 9) Evacuate the system. Charge it with refrigerant. See the rating label on the control box in the icemaker.
- 10) Replace the panels in their correct position.
- 11) Turn on the power supply



## D. Removal and Replacement of Drier

### IMPORTANT

Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacements have been made.

- 1) Turn off the power supply, and remove the panels.
- 2) See chapter V, section A. 2. for evacuation procedure.
- 3) Recover the refrigerant and store it in an approved container, if required by applicable law.
- 4) Remove the drier using brazing equipment.
- 5) Install the new drier with the arrow on the drier in the direction of the refrigerant flow. Use nitrogen gas at a pressure of 3 - 4 psig when brazing the tubings.
- 6) Check for leaks using nitrogen gas (140 psig) and soap bubbles.
- 7) Evacuate the system, and charge it with refrigerant. See the rating label on the control box in the icemaker for the required refrigerant charge and type.
- 8) Replace the panels in their correct position and turn on the power supply.

## E. Removal and Replacement of Expansion Valve

### IMPORTANT

Sometimes moisture in the refrigerant circuit exceeds the drier capacity and freezes up at the expansion valve. Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repairs or replacements have been made.

- 1) Turn off the power supply, and remove the panels.
- 2) See chapter V, section A. 2. for evacuation procedure.
- 3) Recover the refrigerant and store it in an approved container, if required by applicable law.
- 4) Remove the expansion valve bulb at the evaporator outlet.
- 5) Remove the expansion valve cover and remove the expansion valve using brazing equipment.
- 6) Braze the new expansion valve with nitrogen gas flowing at a pressure of 3 - 4 psig.

### WARNING

Always protect the valve body by using a damp cloth to prevent the valve from overheating. Do not braze with the valve body exceeding 250°F.

- 7) Install the new drier.
- 8) Check for leaks using nitrogen gas (140 psig) and soap bubbles.
- 9) Evacuate the system. Charge it with refrigerant. See the rating label on the control box in the icemaker for the required refrigerant charge and type.
- 10) Attach the bulb to the suction line and make it level. Be sure to secure the bulb using a band and to insulate it.
- 11) Place the new set of expansion valve covers in position.
- 12) Replace the panels in their correct position and turn on the power supply.

## F. Removal and Replacement of Evaporator Assembly

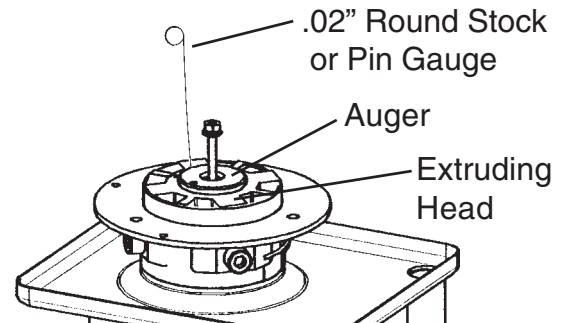
- 1) Turn off the power supply.
- 2) Remove the panels.
- 3) Move the flush switch to the "FLUSH" position.
- 4) Turn on the power supply and drain out all water from the water line.
- 5) Turn off the power supply.
- 6) Remove the strap connecting the spout to the chute assembly.
- 7) Remove the three thumbscrews and take off the spout from the evaporator.

### Cutter

- 8) Remove the bolt and lift off the cutter.
- 9) Remove the rubber O-ring and the nylon ring at the top of the evaporator.

### Extruding Head

- 10) Replace the bolt in the auger shaft. Use the bolt to move the auger towards you and then try to insert a .02" round stock or pin gauge in between the back side of the auger shaft and the bearing surface. Check several locations around the auger shaft. If the gauge goes between the shaft and the bearing at any point, both the top bearing in the extruding head and the lower bearing in the housing should be replaced. Instructions for removing the housing are located later in this procedure.



Note: Replacing the bearing requires a bearing press adaptor. If one is not available, replace the whole extruding head and housing.

- 11) Remove the four socket head cap screws and lift off the extruding head.

### Auger

- 12) Lift off the auger. If the area in contact with the bearing is worn out or the blade scratched, replace the auger.

## Evaporator

Note: Skip the following steps 13) through 15) when the evaporator does not need replacement.

- 13) See chapter V, section A. 2. b) and perform the partial evacuation procedure.
- 14) Recover the refrigerant and store it in an approved container, if required by an applicable law.

### **IMPORTANT**

Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacements have been made.

- 15) Remove the bulb of the expansion valve.
- 16) Disconnect the brazing-connections of the expansion valve and the copper tube-low side from the evaporator, using brazing equipment.
- 17) Remove the two truss head machine screws and the strap securing the evaporator.
- 18) Disconnect the two hoses from the evaporator.
- 19) Remove the four socket head cap screws securing the evaporator to the housing.
- 20) Lift off the evaporator.

## Housing, Lower Bearing and Mechanical Seal

- 21) The mechanical seal consists of two parts. One moves along with the auger, and the other is fixed on the housing. If the contact surfaces of these two parts are worn or scratched, the mechanical seal may cause water leaks and should be replaced.
- 22) Remove the O-ring from the housing.
- 23) Remove the six bolts and the housing from the gear motor. If inspection of the bearing inside the extruding head (earlier in this procedure) indicated that it is out of tolerance, replace both it and the bearing inside the housing.

Note: Replacing the bearing requires a bearing press adaptor. If one is not available, replace the whole extruding head and housing.

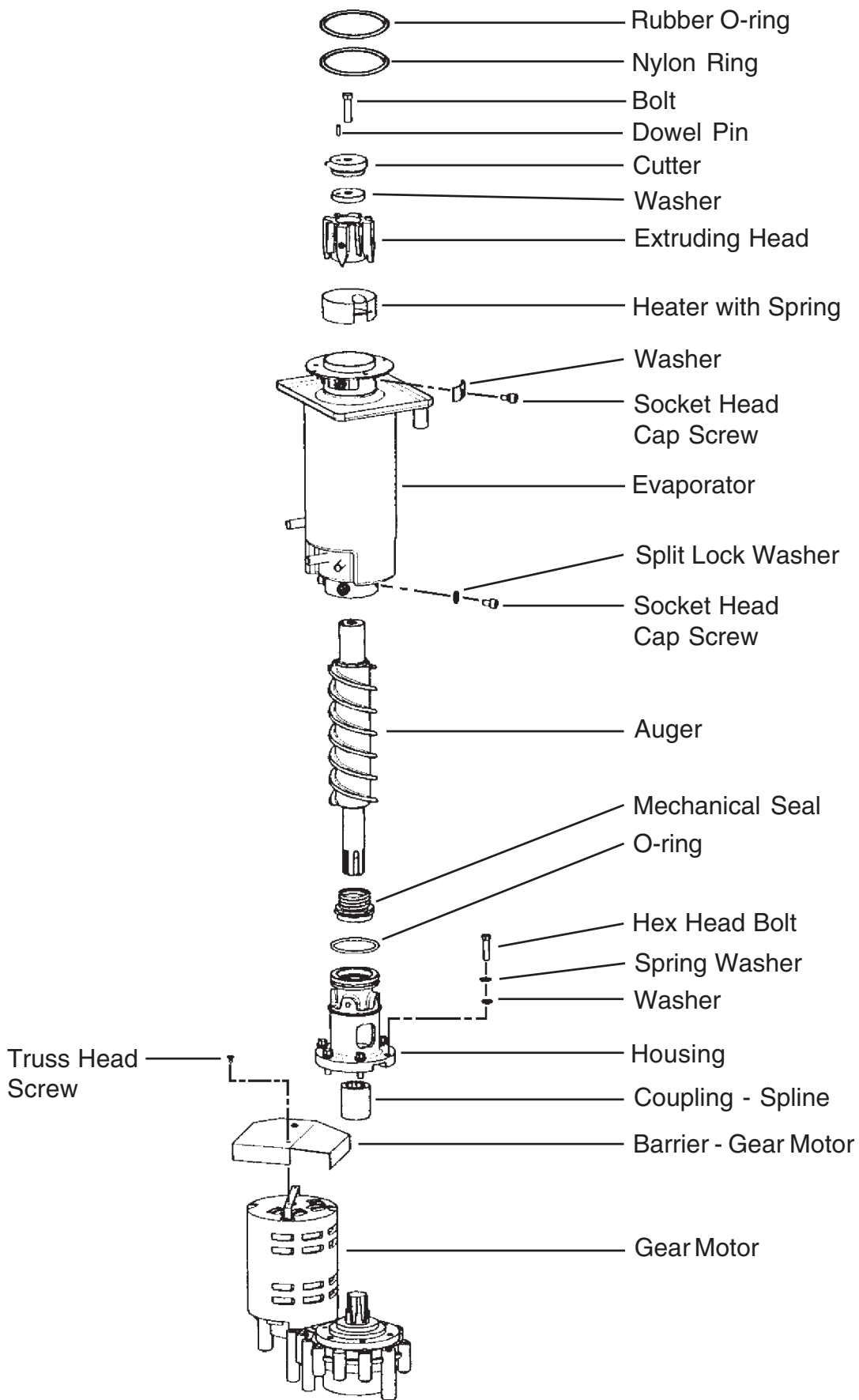
## **Gear Motor**

- 24) Remove the coupling-spline on the gear motor shaft.
- 25) Remove the barrier on the top of the gear motor.
- 26) Remove the three socket head cap screws securing the gear motor.
- 27) Assemble the removed parts in the reverse order of the above procedure.

### **WARNING**

Be careful not to scratch the surface of the O-ring or it may cause water leaks. Handle the mechanical seal with care not to scratch or contaminate its contact surface.

- 28) When replacing the evaporator;
  - (a) Braze the new evaporator with nitrogen gas flowing at a pressure of 3 - 4 psig. Be careful not to burn the evaporator insulation.
  - (b) Replace the drier.
  - (c) Check for leaks using nitrogen gas (140 psig) and soap bubbles.
  - (d) Evacuate the system. Charge it with refrigerant.
- 29) Move the flush switch to the "ICE" position.
- 30) Replace the panels in their correct position.
- 31) Turn on the power supply.



## **G. Removal and Replacement of Control Water Valve**

- 1) Turn off the power supply, remove the panels and close the water supply line shut-off valve.
- 2) Disconnect the terminals from the control water valve.
- 3) Loosen the fitting nut on the control water valve inlets and remove the control water valve. Do not lose the packings inside the fitting nut.
- 4) Remove the water supply hose from the control water valve.
- 5) Install the new control water valve.
- 6) Assemble the removed parts in the reverse order of the above procedure.
- 7) Open the water supply line shut-off valve.
- 8) Check for water leaks.
- 9) Replace the panels in their correct position, then turn on the power supply.

## H. Removal and Replacement of Flush Water Valve

- 1) Turn off the power supply, remove the panels and close the water supply line shut-off valve.
- 2) Remove the clamp and disconnect the flush water valve.

Note: Water may still remain inside the evaporator. Be sure to drain the water into the drain pan.

- 3) Disconnect the terminals from the flush water valve.
- 4) Remove the flush water valve from the bracket.
- 5) Remove the drain pipe from the flush water valve.
- 6) Connect the drain pipe to the new flush water valve and place the valve in position.
- 7) Connect the hose to the flush water valve and secure it with the clamp.
- 8) Pour water into the reservoir and check for water leaks on the flush water valve.
- 9) Open the water supply line shut-off valve, then turn on the power supply.
- 10) Move the flush switch to the "ICE" position.
- 11) Check for water leaks.
- 12) Move the flush switch to the "FLUSH" position and make sure water is flushing.
- 13) Move the flush switch to the "ICE" position.
- 14) Replace the panels in their correct position.



## VI. Cleaning and Maintenance

### IMPORTANT

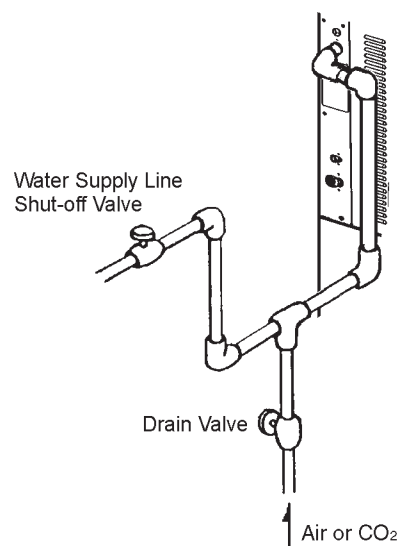
Ensure all components, fasteners and thumbscrews are securely in place after any maintenance or cleaning is done to the equipment.

### A. Preparing the Icemaker for Long Storage

#### WARNING

When shutting off the icemaker for an extended time, drain out all water from the water line and remove the ice from the storage bin. The storage bin should be cleaned and dried. Drain the icemaker to prevent damage to the water supply line at sub-freezing temperatures, using air or carbon dioxide. Shut off the icemaker until the proper ambient temperature is resumed.

- 1) Run the icemaker with the water supply line shut-off valve closed.
- 2) Open the drain valve and blow out the water inlet line by using air pressure.
- 3) Turn off the power supply.
- 4) Remove the front panel.
- 5) Move the flush switch on the control box to the "FLUSH" position.
- 6) Turn on the power supply, and then drain out all water from the water line.
- 7) Turn off the power supply.
- 8) Turn off the power switch on the control box.
- 9) Replace the front panel in its correct position.
- 10) Close the drain valve.
- 11) Remove all ice from the storage bin, and clean the bin.



## B. Cleaning and Sanitizing Instructions

### WARNING

1. HOSHIZAKI recommends cleaning this unit at least once a year. More frequent cleaning, however, may be required in some existing water conditions.
2. To prevent injury to individuals and damage to the icemaker, do not use ammonia type cleaners.
3. Always wear liquid-proof gloves to prevent the cleaning and sanitizing solutions from coming into contact with skin.

### 1. Cleaning Solution

Dilute 4.8 fl. oz. (142 ml) of recommended cleaner Hoshizaki “Scale Away” or “LIME-A-WAY” (Economics Laboratory, Inc.) with 0.8 gallons (3 l) of warm water. This is a minimum amount. Make more solution if necessary.

### IMPORTANT

For safety and maximum effectiveness, use the solution immediately after dilution.

### 2. Cleaning Procedure

The cleaning process will remove lime deposits from the water system.

- 1) Remove the front panel and top panel, then turn off the power supply.
- 2) Close the water supply line shut-off valve.
- 3) Remove all ice from the storage bin.
- 4) Move the flush switch to the “FLUSH” position.
- 5) Turn on the power supply and drain out all water from the water line.
- 6) Turn off the power supply.
- 7) Remove the control water valve by removing the fitting nut and two mounting screws. Do not lose the packing.
- 8) Check the control water valve screen for debris and clean as necessary.

- 9) Replace the control water valve in its correct position.
- 10) Remove the strap connecting the spout to the chute assembly.
- 11) Remove the thumbscrews securing the spout and lift it off.
- 12) Pour the cleaning solution over the extruding head until the evaporator assembly and the reservoir are filled and the solution starts to overflow into the drain pan.  
Note: If there is excess scale on the extruding head, fill the evaporator assembly and reservoir as described above, then use a clamp on the reservoir hose between the reservoir and evaporator assembly to block flow. Pour additional cleaning fluid over the extruding head until the evaporator assembly is completely full.
- 13) Replace the spout and strap in their correct positions.
- 14) Allow the icemaker to sit for about 10 minutes before operation. If you placed a clamp on the reservoir hose in step 9, remove it before operation.
- 15) Move the flush switch to the "ICE" position, then turn on the power supply. Replace the top panel and front panel in their correct positions. Make ice using the solution until the icemaker stops making ice.  
Note: Always discard the contaminated ice produced during this procedure.
- 16) Remove the front panel.
- 17) Move the flush switch to the "FLUSH" position to drain the remainder of the solution.
- 18) After the solution is drained, move the flush switch to the "ICE" position.
- 19) Replace the front panel in its correct position.
- 20) Open the water supply line shut-off valve and supply water to the reservoir.
- 21) When the gear motor starts, remove the front panel and turn off the power supply.
- 22) Drain out all water from the water line. See 4) through 6).

### 3. Sanitizing Solution

Dilute 2.5 fl. oz. (74 ml or 5 tbs) of IMS-II Sanitizer or a 5.25% sodium hypochlorite solution (chlorine bleach) with 5 gallons (19 l) of warm water.

#### **IMPORTANT**

For safety and maximum effectiveness, use the solution immediately after dilution.

### 4. Sanitizing Procedure - Initial

The sanitizing process will sanitize the icemaker.

- 1) Close the water supply line shut-off valve.
- 2) Remove the strap connecting the spout to the chute assembly.
- 3) Remove the thumbscrews securing the spout and lift it off. Remove the rubber O-ring and nylon O-ring at the top of the cylinder and also remove the packing between the spout and the chute.
- 4) Pour the sanitizing solution over the extruding head until the evaporator assembly and the reservoir are filled and the solution starts to overflow into the drain pan.
- 5) Remove the two thumbscrews securing the proximity switch to the chute assembly.
- 6) Remove the chute assembly from the icemaker.
- 7) Remove the packing at the bottom of the ice chute.
- 8) Remove the three ties and the chute insulation.
- 9) Remove the six wing nuts and two baffles.
- 10) Remove the two thumbscrews, the plate and the packing from the top of the ice chute, then remove the bin control assembly by sliding it slightly toward the chute opening and lifting it off.
- 11) Disassemble the bin control assembly by removing the two snap pins, shaft and actuator.
- 12) Soak the removed parts in .25 gallons (1 l) of sanitizing solution for 10 minutes then wipe them down.
- 13) Rinse the parts thoroughly.

#### **IMPORTANT**

If the solution is left on these parts, they will rust.

14) Replace all parts in their correct positions.

### **IMPORTANT**

When installing the baffles, make sure that the bent surface (the one without the studs) faces the actuator so that the bent surface can guide the ice to the center of the actuator.

15) Move the flush switch to the “ICE” position, then turn on the power supply. Replace the top panel and front panel in their correct positions. Make ice using the solution until the icemaker stops making ice.

Note: Always discard the contaminated ice produced during this procedure.

## **5. Sanitizing Procedure - Final**

1) Remove the front panel and top panel, then turn off the power supply.

2) Move the flush switch to the “FLUSH” position.

3) Turn on the power supply and drain out all water from the water line.

4) Turn off the power supply.

5) Remove the strap connecting the spout to the chute assembly.

6) Remove the thumbscrews securing the spout and lift it off.

7) Pour the sanitizing solution over the extruding head until the evaporator assembly and the reservoir are filled and the solution starts to overflow into the drain pan.

8) Replace the spout and strap in their correct positions.

9) Allow the icemaker to sit for about 10 minutes before operation.

10) Move the flush switch to the “ICE” position, then turn on the power supply. Replace the top panel and front panel in their correct positions. Make ice using the solution until the icemaker stops making ice.

Note: Always discard the contaminated ice produced during this procedure.

11) Remove the front panel.

12) Move the flush switch to the “FLUSH” position to drain the remainder of the solution.

13) After the solution is drained, move the flush switch to the “ICE” position.

14) Replace the front panel in its correct position.

15) Open the water supply line shut-off valve and supply water to the reservoir.

- 16) When the gear motor starts, remove the front panel and turn off the power supply.
- 17) Drain out all water from the water line. See 2) and 3).
- 18) Move the flush switch to the “ICE” position and run the icemaker.
- 19) Turn off the power supply after 30 minutes.
- 20) Pour warm water into the storage bin to melt all ice, and then clean the bin liner with the solution.
- 21) Flush out any solution from the storage bin.
- 22) Turn on the power supply and start the automatic icemaking process.

**IMPORTANT**

1. After cleaning, do not use ice made from the sanitizing solution. Be careful not to leave any solution in the storage bin.
2. Follow carefully any instructions provided with the bottles of cleaning or sanitizing solution.
3. Never run the icemaker when the reservoir is empty.

## C. Maintenance Instructions

### IMPORTANT

1. This icemaker must be maintained individually, referring to the instruction manual and labels provided with the icemaker.
2. To achieve optimum icemaker performance, the following parts need periodic inspection and maintenance:

- Extruding Head and Upper Bearing
- Housing and Lower Bearing
- Evaporator Cylinder
- Auger
- Gear Motor
- Mechanical Seal

These parts should be inspected at least once a year or every 10,000 hours of operation. Their service life, however, depends on water quality and environment. More frequent inspection and maintenance are recommended in bad or severe water conditions.

Replacement of the following consumable parts is recommended if wear exceeds factory recommendations:

- Upper Bearing
- Lower Bearing
- Mechanical Seal

Consult with your local distributor about inspection and maintenance service. To obtain the name and phone number of your local distributor, call Hoshizaki Technical Support at 1-800-233-1940 in the USA.

#### 1) Stainless Steel Exterior

To prevent corrosion, wipe the exterior occasionally with a clean and soft cloth. Use a damp cloth containing a neutral cleaner to wipe off oil or dirt build up.

#### 2) Storage Bin and Scoop

- Wash your hands before removing ice. Use the plastic scoop provided (bin accessory).
- The storage bin is for ice use only. Do not store anything else in the bin.
- Keep the scoop clean. Clean using a neutral cleaner and rinse thoroughly.
- Clean the bin liner using a neutral cleaner. Rinse thoroughly after cleaning.

#### 3) Condenser

Check the condenser once a year, and clean the coil if required by using a brush or vacuum cleaner. More frequent cleaning may be required depending on the location of the condensing unit.