ICE MAKER

POCKET GUIDE

“I” SERIES CUBE ICE MAKERS

IMI CORNELIUS
One Cornelius Place
Anoka, MN 55303
1–800–238–3600

3/1/95
Rev 9/18/95

TD 202

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introduction

This guide is published as an aid to the Service Technician. It is not intended to replace the service manual. In it you will find useful information not found in the service manual. This information will help you more quickly identify specific problems, however not all problems or situations may be listed. We appreciate your comments or suggestions, or if you have a specific problem not addressed in this guide or service manual.

Please feel free to contact our service department at:

IMI CORNELIUS
One Cornelius Place
Anoka, MN 55303
1–800–554–3526

The warranty on Cornelius icemakers begins on the date of installation, as reported on the warranty registration card to the original owner/user. If no warranty card is received by the factory, the date of shipment from the factory will determine the start of the warranty.

Warranty labor will be paid per the labor rate guide and is subject to change without notice. Call the Service Department for a copy of the current Labor Rate Guide and/or applicable Warranty Document Copy.

ORIGINAL OWNER, END-USER RESPONSIBILITY

1. To verify the equipment installation date by the return of the warranty registration card to the factory within five days of the installation.
2. To pay freight or handling charge.
3. To pay for service labor and/or parts required to correct improperly installed equipment. Installation must comply with the installation instructions.
4. To pay for normal maintenance, adjustments and cleaning.
5. To pay for service labor and/or parts required to correct unit modification or the use of non-approved remote condensers.
6. To pay for service labor and/or parts required because of neglect, abuse, misuse, accident, fire, flood, freezing or any act of God.
7. To pay for mileage, truck charges, travel time, premium labor for holidays, weekends or after hours work, flat rate service call charges, miscellaneous tool charges, use of diagnostic meters or equipment and all material not listed on the Warranty Time Rate Guide.

Serial Plate Locations

Exterior: Left side, Lower Front corner.
Interior: Firewall, Front.

Model and Serial Number Defined

IAC 1230

I	A	C	12	30
Product Identification	A=Air Cooled Condenser W=Water Cooled R=Remote	Cuber	Series 3 5 6 8 10 12 14	30" Wide Cabinet 22 = 22" Wide 48 = 48" wide

94	A	C	E	0000
Year (the first 2 digits indicates year of production)	Month Production	Product Code	Manufacturing Tracking Code	Unit Serial Number

Month of production code will be:

A = January	G = July
B = February	H = August
C = March	J = September
D = April	K = October
E = May	L = November
F = June	M = December

Note: The letter (I) is not used to avoid being confused with the number(1)

Product Code:

A = Accessory*	D = Dispenser (motel/hotel)
B = Bin (storage)	E = External condenser (Remote)
C = Cuber	F = Flaker

* Any accessory determined to be required to have a serial number.

Serial Number Defined after January 1, 1995

AF	95	01	BC	0000
Eng change level	year	Month	Product Code	Unit Serial Number

Engineering change level can be either 1 or 2 digits depending on the revision level.

Month of production code will be:

01 = January	07 = July
02 = February	08 = August
03 = March	09 = September
04 = April	10 = October
05 = May	11 = November
06 = June	12 = December

Note: The Month *must* always be 2 digits.

Product Code:

BA = Accessory*	BD = Dispenser (motel/hotel)
BB = Bin (storage)	BE = External condenser (Remote)
BC = Cuber	BF = Flaker

* Any accessory determined to be required to have a serial number.

Electrical Specification

MODEL	IAC322/330	IWC322/330	IAC522/530	IWC522/530
UNIT				
Volts	115	115	115	115
Phase	1	1	1	1
Hertz	60	60	60	60
No. Wires	2+ground	2+ground	2+ground	2+ground
MIN. CIRCUIT				
Amps	20	20	20	20
MAX FUSE SIZE (HVAC CIRCUIT BREAKER REQ)				
Amps	20	20	20	20
REFRIGERANT				
Type	R404a (HP62)	R404a (HP62)	R404a (HP62)	R404a (HP 62)
Weight (oz)	17	15	26	23
Weight (g)	482	425	737	652
COMPRESSOR				
Volts	115	115	115	115
Phase	1	1	1	1
Hertz	60	60	60	60
LRA	51	51	59	59
RLA	11.5	11.5	11.6	11.6
CONDENSER FAN MOTOR (Air-Cooled System only OR AIR CIRCULATION FAN MOTOR (Water-Cooled and Remote Systems only)				
Volts	115	115	115	115
Phase	1	1	1	1
Hertz	60	60	60	60
Amps Running	1.7	0.38	1.75	0.38
Watts	50	6	50	6
WATER PUMP				
Volts	115	115	115	115
Phase	1	1	1	1
Hertz	60	60	60	60
Amps Running	0.88	0.88	0.76	0.88
HP	1/40	1/40	1/40	1/40

MODEL	IAC630	IWC630	IRC630	IAC830	IWC830	IRC830
UNIT ELEC.						
Volts	208/230	208/230	208/230	208/230	208/230	208/230
Phase	1	1	1	1	1	1
Hertz	60	60	60	60	60	60
No. Wires	2+ground	2+ground	2+ground	2+ground	2+ground	2+ground
MIN. CIRCUIT						
Amps	20	20	20	20	20	20
MAX FUSE SIZE (HVAC CIRCUIT BREAKER REQUIRED)						
Amps	20	20	20	20	20	20
REFRIGERANT						
Type	R404a(HP62)	R404a(HP62)	R404a(HP62)	R404a(HP 62)	R404a(HP 62)	R404a(HP 62)
Weight (oz)	43	35	170	55	33	170
Weight (g)	1219	992	4820	1559	936	4820
COMPRESSOR						
Volts	230	230	230	230	230	230
Phase	1	1	1	1	1	1

COMPRESSOR (CONT'D)						
Hertz	60	60	60	60	60	60
LRA	69	69	69	61	61	61
RLA	8.8	8.8	8.8	12.5	12.5	12.5
CONDENSER FAN MOTOR (Air-Cooled System only) or AIR CIRCULATION FAN MOTOR (Water-Cooled and Remote Systems only)						
Volts	230	230	230	230	230	230
Phase	1	1	1	1	1	1
Hertz	60	60	60	60	60	60
Amps Running	1.09	0.36	0.36	1.09	0.36	0.36
Watts	75	6	6	75	6	6
WATER PUMP						
Volts	208/230	208/230	208/230	208/230	208/230	208/230
Phase	1	1	1	1	1	1
Hertz	60	60	60	60	60	60
Amps Running	0.5	0.5	0.5	0.5	0.5	0.5
HP	1/30	1/30	1/30	1/30	1/30	1/30

All Product Supply Voltages Should Read 208/230 –5%, +10%

MODEL	IAC1230	IWC1230	IRC1230	IAC1448	IWC1448	IRC1448
UNIT ELEC.						
Volts	208/230	208/230	208/230	208/230	208/230	208/230
Phase	1	1	1	1	1	1
Hertz	60	60	60	60	60	60
No. Wires	2+ground	2+ground	2+ground	2+ground	2+ground	2+ground
MIN. CIRCUIT						
Amps	20	20	20	25	25	25
MAX FUSE SIZE (HVAC CIRCUIT BREAKER REQUIRED)						
Amps	20	20	20	25	25	25
REFRIGERANT						
Type	R404a(HP62)	R404a(HP62)	R404a(HP62)	R404a(HP 62)	R404a(HP 62)	R404a(HP 62)
Weight (oz)	49	45	210	92	44	250
Weight (g)	1389	1276	5954	2608	1247	7088
COMPRESSOR						
Volts	208/230	208/230	208/230	208/230	208/230	208/230
Phase	1	1	1	1	1	1

COMPRESSOR (CONT'D)						
Hertz	60	60	60	60	60	60
LRA	96	96	96	95.6	95.6	95.6
RLA	13.5	13.5	13.5	23.9	23.9	23.9
CONDENSER FAN MOTOR (Air-Cooled System only) or AIR CIRCULATION FAN MOTOR (Water-Cooled and Remote Systems only)						
Volts	230	230	230	230	230	230
Phase	1	1	1	1	1	1
Hertz	60	60	60	60	60	60
Amps Running	0.89 X 2	0.36	0.36	0.4	0.36	0.36
Watts	50 W X 2	6 W	6 W	1/15 HP	6 W	6 W
WATER PUMP						
Volts	208/230	208/230	208/230	208/230	208/230	208/230
Phase	1	1	1	1	1	1
Hertz	60	60	60	60	60	60
Amps Running	0.5	0.5	0.5	0.5	0.5	0.5
HP	1/30	1/30	1/30	1/30	1/30	1/30

All Product Supply Voltages Should Read 208/230 –5%, +10%

MODEL	IRC630	IRC830.	IRC1230	IRC1448
UNIT				
Volts	230	230	230	230
Phase	1	1	1	1
Hertz	60	60	60	60
No. Wires	2+ground	2+ground	2+ground	2+ground
MIN. CIRCUIT				
Amps	20	20	20	25
MAX FUSE SIZE (HVAC CIRCUIT BREAKER REQUIRED)				
Amps	20	20	20	25
REFRIGERANT				
Type	R404a (HP62)	R404a (HP62)	R404a (HP62)	R404a (HP 62)
Weight (oz)	170	170	210	250
Weight (g)	4820	4820	5954	7088
COMPRESSOR				
Volts	230	230	230	230
Phase	1	1	1	1
Hertz	60	60	60	60
LRA	69	61	96	95.6
RLA	8.8	12.5	13.5	23.9
AIR CIRCULATION FAN MOTOR				
Volts	230	230	230	230
Phase	1	1	1	1
Hertz	60	60	60	60
Amps Running	0.36	0.36	0.36	0.36
Watts	6	6	6	6
WATER PUMP				
Volts	230	230	230	230
Phase	1	1	1	1
Hertz	60	60	60	60
Amps Running	0.5	0.5	0.5	0.5
HP	1/30	1/30	1/30	1/30

Remote Condenser

MODEL	CR800	CR1200	CR1400
Volts	230	230	230
Phase	1	1	1
Hertz	60	60	60
Amps	1.0	1.0	1.0
Output, HP	1/6	1/6	1/6
Max. fuse size, Amps (HVAC circuit breaker required)	20	20	20

ICE CAPACITY INFORMATION

Ice Capacity

Ice capacity of any ice maker is affected by many operating conditions, such as water and air temperature and location factors. Please review the capacity tables in this manual for average 24–hour capacity under various conditions.

NOTE: All printed capacity ratings are ± 10% except 50 HZ units these products have 12% increase in cycle time and capacity decrease of approximately 17%.All printed capacity ratings are ± 10% except 50 HZ units these products have 12% increase in cycle time and capacity decrease of approximately 17%.

Ice Production Check

If air cooled, take air temperature at the intake of the condenser, 2″ from the condenser fins.. Incoming water temperature at the outlet of the "float" valve.*

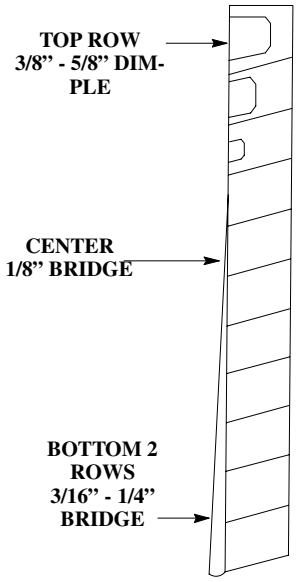
Cycle time (CT) = freeze time plus harvest time, in minutes and seconds. 1440 divided by CT = number of cycles per 24 hours.

Measure weight of ice from one cycle in pounds and fractions of a pound.

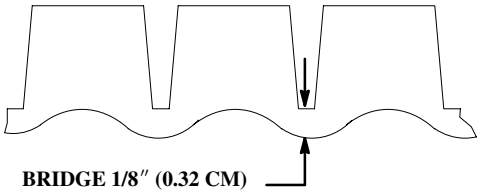
Example: Weight/cycle x cycles/day = total production/24 hrs. Compare to the production tables.

* If water cooled be certain water regulator valve is set to maintain 300/310 PSI head pressure.

ADJUSTMENT OF ICE BRIDGE THICKNESS



For optimum ice production and maximum cube separation, the ice connecting the individual cubes should be a minimum of 1/8" (.32cm) thick at the center area of the ice waffle.



It is normal for the ice slab to be slightly thicker at the bottom and taper off in a slight wedge pattern at the top. The top row of cubes must have a complete pattern of ice on all four sides and the back wall. Remember, when you operate the product with the panels off during testing the additional heat at the top of the evaporator will cause thinner ice at the top than when the panels are in place.

Should a different thickness of the bridge be desired, it will be required to adjust the ice thickness "POT", located on the circuit board, as follows:

1. Thinner Bridge – turn the ice thickness "pot" adjustment screw CW one full turn. Allow two cycles before determining if additional adjustments are required.
2. Thicker Bridge – turn the ice thickness "pot" adjusting screw CCW one full turn. Allow two cycles before determining if additional adjustments are required.

NOTE: **Never judge the thickness of the ice from the first batch of the ice produced – the first cycle is a balance cycle. Always wait for the second cycle before making any adjustments.**

ICE PRODUCTION CAPACITIES AND CHARTS

IAC322/IAC330

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	200	39	9:5	150	105	1:1	2.4	325
80	70	228	42	12:4	160	110	0:9	2.4	260
90	70	267	44	14:3	183	133	0:7	2.5	240
90	80	270	45	15.1	181	130	0.7	2.4	220
100	70	299	47	19:8	199	142	0:6	2.8	200

IWC322/IWC330

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	300	40	12:1	143	103	0:9	2.8	310
80	70	300	42	15:3	160	116	1:1	2.8	245
90	70	300	43	16:2	160	118	1:2	2.9	240
90	80	303	44	16.4	173	120	1.1	2.8	230
100	70	300	44	16:3	160	117	1:3	2.6	215

IAC522/IAC530

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE HEAD PRESSURE Psig	FREEZE CYCLE SUCTION PRESSURE Psig	FREEZE CYCLE CYCLE TIME Min:Sec	HARVEST CYCLE HEAD PRESSURE Psig	HARVEST CYCLE SUCTION PRESSURE Psig	HARVEST CYCLE CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	220	38	12:5	155	95	1.0	5.1	540
80	70	250	42	14:6	175	111	0:9	4.8	450
90	70	275	41	17:4	195	120	0:7	5.1	405
90	80	290	45	17.9	200	120	0.6	5.0	387
100	70	320	46	20:9	220	120	0:6	5.2	350

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IWC522/IWC530

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	323	44	11:3	156	106	1:3	4.3	490
80	70	327	45	13:7	168	115	1.2	4.4	425
90	70	326	45	13:8	173	117	1:1	4.3	420
90	80	328	47	15.2	184	127	1:1	4.3	384
100	70	327	45	13:9	175	119	1:1	4.3	415

IAC630

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE HEAD PRESSURE Psig	FREEZE CYCLE SUCTION PRESSURE Psig	FREEZE CYCLE CYCLE TIME Min:Sec	HARVEST CYCLE HEAD PRESSURE Psig	HARVEST CYCLE SUCTION PRESSURE Psig	HARVEST CYCLE CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	225	34	8:4	148	88	1:5	5.4	755
80	70	261	37	11:3	166	101	1.2	5.6	640
90	70	296	40	12:6	183	113	1:1	5.6	590
90	80	297	40	13:2	184	113	1:0	5.5	560
100	70	333	43	17:1	200	125	1:1	6.0	475

IWC630

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	299	35	10:1	143	86	1:6	5.8	715
80	70	299	38	12:4	152	92	1.4	6.0	622
90	70	300	38	12:3	153	93	1:4	5.9	620
90	80	304	39	14:0	166	100	1:2	6.0	570
100	70	300	38	12:2	152	93	1:4	5.8	615

IRC630

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE HEAD PRESSURE Psig	FREEZE CYCLE SUCTION PRESSURE Psig	FREEZE CYCLE CYCLE TIME Min:Sec	HARVEST CYCLE HEAD PRESSURE Psig	HARVEST CYCLE SUCTION PRESSURE Psig	HARVEST CYCLE CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	225	34	8:4	148	88	1:5	5.2	755
80	70	261	37	11:3	166	101	1.2	5.6	640
90	70	296	40	12:6	183	113	1:1	5.6	590
90	80	297	40	13:2	184	113	1:0	5.5	560
100	70	333	43	17:1	200	125	1:1	6.0	475

IAC830

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	253	29	7:6	163	83	1:5	5.3	840
80	70	293	33	9:0	187	97	1.0	5.2	745
90	70	335	36	11:5	210	111	0:9	5.8	680
90	80	339	37	12:0	209	111	0:9	5.8	645
100	70	379	40	13:8	232	126	0:8	6.0	595

IWC830

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE HEAD PRESSURE Psig	FREEZE CYCLE SUCTION PRESSURE Psig	FREEZE CYCLE CYCLE TIME Min:Sec	HARVEST CYCLE HEAD PRESSURE Psig	HARVEST CYCLE SUCTION PRESSURE Psig	HARVEST CYCLE CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	298	32	8:6	154	81	1:5	5.6	795
80	70	296	34	10:2	163	86	1.3	5.7	715
90	70	295	34	10:7	164	87	1:3	5.9	710
90	80	298	37	12:1	166	88	1:2	6.0	650
100	70	295	34	11:1	175	93	1:3	5.9	690

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IRC830

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	253	29	7:6	163	83	1:5	5.3	840
80	70	293	33	9:0	187	97	1.0	5.2	745
90	70	335	36	11:5	210	111	0:9	5.8	680
90	80	339	37	12:0	209	111	0:9	5.8	645
100	70	379	40	13:8	232	126	0:8	6.0	595

IAC1030

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	240	33	13.5	164	75	1.7	11.6	1101
80	70	276	36	14.2	177	83	1.4	10.5	969
90	70	312	38	15.9	196	91	1.1	10.5	890
90	80	313	38	16.8	198	91	1.1	10.5	840
100	70	349	41	18.7	215	100	1.0	10.8	793

IWC1030

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	296	34	13.0	155	73	1.8	10.7	1046
80	70	297	36	15.3	161	75	1.7	10.9	925
90	70	297	36	15.7	161	77	1.5	11.0	920
90	80	300	36	17.9	175	81	1.4	11.0	823
100	70	297	41	15.8	164	77	1.5	11.0	915

IRC1030

		FREEZE CYCLE			HARVEST CYCLE				
AMBIENT TEMP °F	WATER TEMP °F	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	240	33	13.5	164	75	1.7	1.6	1101
80	70	276	36	14.2	177	83	1.4	10.5	969
90	70	312	38	15.9	196	91	1.1	10.5	890
90	80	313	38	16.8	198	91	1.1	10.5	840
100	70	349	41	18.7	215	100	1.0	10.8	793

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AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	231	30	8:8	175	75	1:5	8.9	1249
80	70	266	33	11:4	191	84	1.1	9.5	1090
90	70	296	35	13:6	211	95	1:0	10.1	1000
90	80	295	36	14:5	211	93	0:9	10.1	948
100	70	331	38	16:3	232	105	0:9	10.3	865

IWC1230

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE HEAD PRESSURE Psig	FREEZE CYCLE SUCTION PRESSURE Psig	FREEZE CYCLE CYCLE TIME Min:Sec	HARVEST CYCLE HEAD PRESSURE Psig	HARVEST CYCLE SUCTION PRESSURE Psig	HARVEST CYCLE CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	336	30	10:1	187	73	1:4	9.8	1221
80	70	324	30	13:2	177	76	1.3	10.7	1065
90	70	330	33	14:0	180	76	1:3	10.9	1030
90	80	323	32	14:8	180	78	1:3	10.9	973
100	70	324	30	14:0	180	76	1:3	10.9	1025

IRC1230

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	231	30	8:8	175	75	1:5	8.9	1249
80	70	266	33	11:4	191	84	1.1	9.5	1090
90	70	296	35	13:6	211	95	1:0	10.1	1000
90	80	295	36	14:5	211	93	0:9	10.1	948
100	70	331	38	16:3	232	105	0:9	10.3	865

IAC1448

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE HEAD PRESSURE Psig	FREEZE CYCLE SUCTION PRESSURE Psig	FREEZE CYCLE CYCLE TIME Min:Sec	HARVEST CYCLE HEAD PRESSURE Psig	HARVEST CYCLE SUCTION PRESSURE Psig	HARVEST CYCLE CYCLE TIME Min:Sec	AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
70	50	246	31	10:1	185	79	1:3	12.1	1525
80	70	280	34	11:8	201	88	1.3	12.3	1355
90	70	315	35	13:2	220	97	1:1	12.6	1275
90	80	317	37	13:7	222	98	1:1	12.4	1205
100	70	352	38	15:8	242	106	0:8	13.1	1140

3/1/95
Rev 9/18/95

IWC1448

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	316	32	9:9	180	73	1:7	12.1	1505
80	70	318	35	11:9	188	77	1.4	12.7	1370
90	70	318	36	12:2	190	78	1:3	12.8	1360
90	80	317	37	13:0	194	80	1:3	12.6	1270
100	70	316	36	12:7	189	77	1:4	13.1	1335

IRC1448

AMBIENT TEMP °F	WATER TEMP °F	FREEZE CYCLE			HARVEST CYCLE			AVERAGE ICE WEIGHT lb/Cycle	AVERAGE ICE WEIGHT lb/day
		HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec	HEAD PRESSURE Psig	SUCTION PRESSURE Psig	CYCLE TIME Min:Sec		
70	50	246	31	10:1	185	79	1:3	12.1	1535
80	70	280	34	11:8	201	88	1.3	12.4	1365
90	70	315	35	13:2	220	97	1:1	12.7	1285
90	80	317	37	13:7	222	98	1:1	12.5	1215
100	70	352	38	15:8	242	106	0:8	13.3	1150

"I" SERIES
SEQUENCE OF OPERATION

When the on off clean switch is pushed to the on position the compressor will start after a 2 second delay. The fan motor and pump are delayed. The condenser fan motor on integral air cooled unites will start when the condenser temperature rises to approximately 100° F. The water pump will start when the suction line temperature reaches approximately 25°F. Temperature information is transmitted to the control board thru thermistor sensors. The unit is now in the freeze cycle. If after approximately 6 minutes of operation the suction line temperature is not below 40°F, the unit will shut down and show an error light on the control board. When the harvesting set point temperature is reached, the circuit board will switch to the harvest cycle.

At the start of the harvest cycle the condenser fan motor will shut off and the Dump Valve and Hot Gas Valve will open. The Water Pump will shut down in approximately 15 seconds. Harvest will continue for approximately 90 seconds. when the Ice is harvested the evaporator curtain opens and closes breaking a magnetic field of the evaporator proximity switch which signals the circuit board to switch back to the Freeze Cycle.

When the Evaporator Curtain is held open, in the freeze cycle, breaking the Evaporator Switch Magnetic Field for 5 to 8 seconds, the circuit board is signaled that a full bin condition has been reached , and shuts down the unit.

COMPONENT FUNCTIONS

Circuit Board

The circuit board controls the operation of the Ice Maker through information it receives from Thermistor Sensors and Proximity (magnetic) Switches.

LED Indicators

The LEDs are board circuit indicators. If the LED in the functional board circuit is complete, check component.

Example: Contactor does not energize and LED is “ON”, board circuit is OK. Check contactor, coil, leads, & connections.

Yellow;

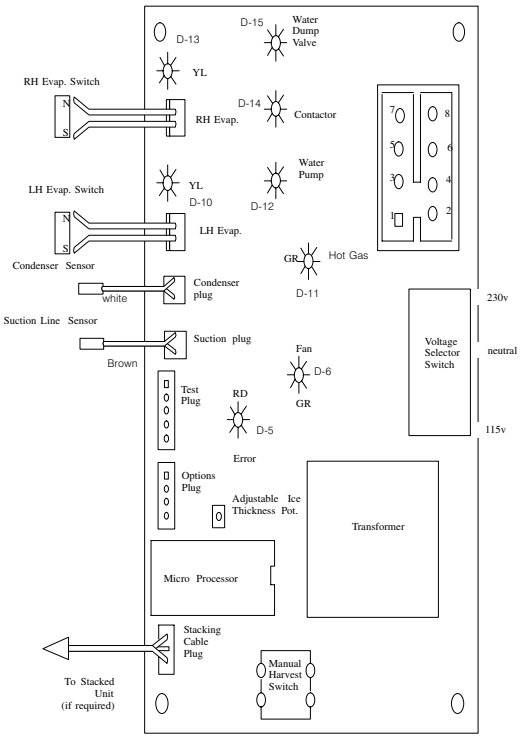
- Evaporator switch(s) (proximity)

Green;

- D15 Water dump valve
- D14 Compressor contactor
- D12 Water Pump
- D11 Hot Gas Valve
- D6 Condenser Fan (cycles on & off with fan)

Red D5;

Error in system operation. Product shut down.



LED STATUS INDICATOR CHART

D6	Green LED	Condenser Fan
D10	Yellow LED	Left Water Curtain
D11	Green LED	Hot Gas Valve
D12	Green LED	Water Pump
D13	Yellow LED	Right Water Curtain
D14	Green LED	Compressor Contactor
D5	Red LED	Error
D15	Green LED	Dump Valve

Curtain Open			
D13	Yellow LED	Off	Right evaporator curtain open
D10	Yellow LED	Off	Left evaporator curtain open
Pre-Chill Mode			
D6	Green LED	(on or off)	Condenser fan cycles on & off depending upon condenser temperature
D14	Green LED	(on)	Compressor contactor active – Compressor running
D13	Yellow LED	(on)	Right evaporator curtain closed
D10	Yellow LED	(on)	Left evaporator curtain closed (only if unit has two evaporators)
Ice Making Mode			
D6	Green LED	(on or off)	Condenser fan cycles on and off depending upon condenser temperature
D12	Green LED	(on)	Water pump active
D14	Green LED	(on)	Compressor contactor active – compressor running
D13	Yellow LED	(on)	Right evaporator curtain closed
D10	Yellow LED	(on)	Left evaporator curtain closed (only if unit has two evaporators)

Table continued on page. 36

Harvest Mode			
D11	Green LED	(on)	Three seconds after water dump valve becomes active, the hot gas valve becomes active
D12	Green LED	(on) 15 sec.	Fifteen seconds after water dump valve becomes active, the water pump deactivates
D14	Green LED	(on)	Compressor contactor active – compressor running
D15	Green LED	(on) 15 sec.	Water dump valve becomes active at the start of harvest. Water dump valve is active for 15 seconds
D13	Yellow LED	(on)	Right evaporator curtain closed. When the ice falls and the curtain opens the LED will turn off.
D10	Yellow LED	(on)	Same as D13 if there is a second (left) evaporator
Error LED			
D5	Red LED	(on)	EVAPORATOR OPEN THERMISTOR CIRCUIT - thermistor open / broken wire / poor connection. Ice maker is SHUT DOWN. Consult service manual (Diagnostic Section) for trouble shooting guide.
D5	Red LED	(on)	EVAPORATOR HIGH TEMP. ERROR: Six minutes into the Freeze cycle the suction line temperature failed to reach 40°F or below. Ice Maker is SHUT DOWN. Consult service manual (Diagnostic Section) for trouble shooting guide.
D5	Red LED	(on)	TWO REPEATED FAILED HARVEST CYCLES - No ice drop.

Table continued on page .37

Error LED (cont'd)			
D5	Red LED	Flashing, 1/sec	CONDENSER OPEN THERMISTOR CIRCUIT (Air Cooled only) - Thermistor open / broken wire / poor connection. Ice Maker is SHUT DOWN. Consult service manual (Diagnostic Section) for trouble shooting guide.
D5	Red LED	Flashing, 1/sec	CONDENSER LOW TEMPERATURE CONDITION. - Condenser midpoint reaches 36°F - Ice Maker is SHUT DOWN.
D5	Red LED	Flashing, 1/sec	CONDENSER HIGH TEMPERATURE SAFETY SHUT DOWN

Reset Operation

When Cuber is functionally shut down and red "Error LED" is operational, the Cuber power switch must be turned off for 5 seconds and returned to the on position to reset the circuit board and allow the Cuber to restart operation.

Voltage Selector Switch

1. Selector bar in center position, switch is open. Product is inoperative
2. Selector bar in down position, selection is for 115 VAC.
3. Selector bar in up position, selection is for 230 VAC.

Stacking Cable

When stacking the "I" series cuber the connecting cable (connecting the two (2) circuit boards) will allow: When the bottom product shuts off on the full bin signal (or any error code) the top product will finish the cycle it is in and will also shut down. The "I" series should never be stacked more than two high.

Test Plug

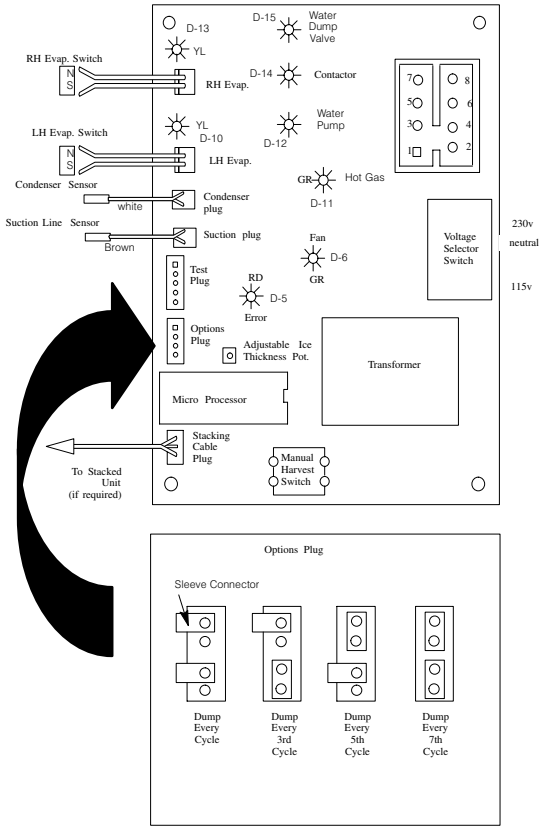
Board manufactures check point.
DO NOT ATTEMPT ANY VOLTAGE CHECKS AT THESE PINS.

Dump Cycle Options

You have the option of selecting dump cycle intervals of:

- every cycle; (Standard setting from factory)
- every 3rd cycle;
- every 5th cycle;
- every 7th cycle.

Remember, the higher the mineral content in the water supply the more often it will be required to dump the water and/or clean the product if proper water treatment is not used.



Condenser Fan Cycling Control (Intergal Condenser)

The condenser fan on air-cooled cubers is cycled by the circuit board. The condenser sensor signals the circuit board when the condenser temperature reaches 100°F (38°C) the fan starts and continues to run until the temperature is reduced to 88°F (31°C).

NOTE: There is no pressure control used to cycle the fan motor on Intergal Air Cooled Condenser Units.

Harvest Safety Termination

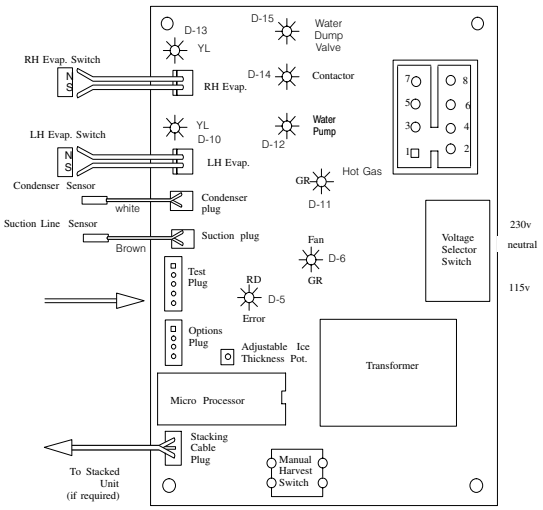
After 4 minutes in the harvest mode, the safety timer in the circuit board will terminate the harvest mode and place the Cuber back into a freeze mode. This safety cycle will protect the evaporator etc. should the product fail to terminate the harvest mode for any reason.

Circuit Board Diagnosis

Turn the power switch off, center position. Disconnect the proximity switches and thermistors from the circuit board. Remove a sleeve jumper from the options terminal and place it on terminals 4 and 5 (bottom 2 pins) of the test plug. (See Illustration on page 40) Turn the power switch to the "on" position and immediately remove the sleeve jumper from terminals 4 and 5. The LED indicators will cycle "on" for approximately 2 seconds each in the following sequence.

1.	Red	D-5	(error)* *Will only cycle if ice thickness (pot) is within factory setting
2.	Green	D-6	(Condenser fan)
3.	Green	D-11	(hot gas valve)
4.	Green	D-12	(water pump)
5.	Green	D-14	(relay-contractor)
6.	Green	D-15	(dump valve)

Failure of the LED's to cycle in this sequence will signal a defective circuit board.



Sensors

Condenser sensor (white) and suction line sensor (brown) are thermistors rated 1k ohm at room temperature.

- Condenser sensor signals the circuit board for fan cycling and also serves as the high temperature safety shut down. The red “Error LED” will flash on and off every second, during high temperature safety shut down. Product is functionally shut down. Reset procedure must be performed to restart product operation.
- Suction line sensor signals the circuit board the suction line temperature, to control ice bridge thickness. Also the sensor serves as suction line high temperature signal (Cuber has 6 minutes to reduce suction line temperature to 40°F (4.4°C) in the freeze mode). The red “Error LED” will be steady on ...should this time frame not be met, product is functionally inoperative during this safety shut down. Reset procedure must be performed to restart product operation.

Sensor [Thermistor] Diagnosis

Sensors

Condenser or suction line – Turn Cuber power switch OFF. Disconnect sensor plug from board. Use digital multimeter set for D.C. Voltage. Turn power switch ON connect leads of meter across the two pins of the sensor being checked, meter should read 2.5 VDC±0.2 output voltage from the board. If voltage is not correct, replace the circuit board.

Should the cuber operation indicate there may be a fault in the sensor [thermistor] or the control board circuit proceed as follows.

1. Using a good multimeter check the control board sensor output voltage.
2. Voltage checks are correct proceed:
   a. Disconnect the suction line sensor (brown lead) from the control board.
   b. Install the special test cord* to the control board and reinstall the sensor to the test cord terminals.
   c. Connect the multi-meter (set on VDC - millivolts) to the test cord leads.
   d. Operate the cuber in the freeze cycle.
3. As the suction line temperature decreases the Millivolt reading will increase.
4. **Sensor Shorted** - milli-volt reading will cease to increase and will remain steady indicating a shorted sensor.
5. **Sensor Open** - The voltage reading will indicate the control board output voltage of 2.5 VDC.
6. Should either “4.” or “5.” happen during this test, the sensor will require replacement.

   * Special test cord, part # 164984009, may be ordered through the Service Department.
7. Condenser Sensor **(white leads) - self-contained air cooled only - water cooled and remote systems use a resistor plug on the control board.** Complete the sensor and multi-meter connections as described in 2- b.,c.,d..
8. **Shorted sensor** - a steady low milli-volt reading will be recorded. The reading will not change.
9. **Open sensor** - the multi-meter will record control board output voltage of 2.5 VDC.

10. Should sensor (thermistor) pass the voltage test proceed to the control board diagnosis for LED sequence (see page 39).

NOTE: The sensor controls the condenser fan cycling from 88/100 degree Fahrenheit. Thus any defects in the condenser circuit will effect the fan cycling rate.

Evaporator Switches

Proximity Switches are half mounted to the water curtain, and the other half mounted to the evaporator side rail. They provide signals to the control board to allow the board to change cycles from harves to freeze as well as shut down of the unit in a full bin condition.

Switch Notes

1. Manually holding the curtain open during freeze mode, will shut the Cuber down in 5 seconds.
2. During harvest cycle, if curtain is open for 10 seconds, the water pump will stop. The compressor will operate for 20 additional seconds before Cuber shut down takes place. When the water curtain closed, the Cuber will begin the normal start-up process.
3. In single evaporator machines, the proximity switch connection must be on the top (RH) connection on the circuit board.
4. In dual evaporator machines, both RH and LH switches must open and reset to start the next freeze mode.

Voltage Checks

Turn Cuber power switch Off. Disconnect proximity switch plug(s) from the circuit board. Use a digital multimeter set for D.C. Voltage; turn power switch ON, connect leads of meter across the top two terminal pins on the board, (for the switch being tested), meter should read 5 VDC ± 0.2 output voltage. If not, replace the circuit board.

Water Regulating Valve

The water regulating valve is used on water–cooled cubers only. The valve is installed in the condenser outlet water line. It's function is to control the proper operating head pressure by regulating the amount of water flowing through the condenser. The valve is adjustable and factory set to maintain condenser discharge water temperature @ 108/112°F (42-44°C). Setting the water regulating valve to maintain discharge water temperature eliminates the need to enter the sealed refrigeration system. When checking the valve, the water temperature should be taken as close to the condenser discharged as possible. The water temperature will equate to operating head pressure of approximately 310 PSI (21.1 BAR).

Should adjustment be required, the valve has an adjustment stem on the top of the valve. After allowing the cuber to operate for 10 minutes in the ice making mode to balance the system, turning the adjusting stem CW will increase the discharge water temperature, and CCW will decrease the discharge water temperature.

The water regulating valve must close off condenser water flow completely during the "hot gas" harvest cycle. There should be no discharge water flowing out of the condenser during the harvest cycle. Should the valve fail to close during the harvest mode, the condenser will continue to condense the compressor discharge vapor needed for the harvest cycle and this will result in long harvest times.

Leaking (by–passing) water regulating valves are normally the result of scale build–up on the valve diaphragm and the valve should be flushed, not replaced. To flush the valve, open the adjusting stem wide open CCW (or force the valve spring up with a screwdriver), open and close the water supply to the condenser resulting in the flushing action. Should this not correct the problem replace the valve diaphragm. This can be done without entering the sealed refrigeration system.

Damage to the water regulating valve may also be caused by water hammer. Water hammer will result from the condenser inlet and outlet water lines being reversed or defective valve stops in the water supply line. Proper installation of water cooled equipment should always include an anti–water hammer standpipe in the supply inlet line as close to the cuber as possible.

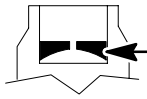
High Pressure Safety Switch

All water-cooled and remote products contain a high pressure safety cut-out switch. The function of this switch is to shut down the cuber should excessive pressure develop in the high side of the refrigeration system. This switch will open the power supply at 450 PSI (30.61 BAR) high side pressure. Should this control open, it must be reset manually and the cause for the increase in pressure determined.

Float Valve with Flow Washer

The Float Valve Maintains the proper water level in the water reservoir.

There is a flow washer in the inlet side of the float assembly that will control inlet water pressure from 20/120 PSI (1.37/8.16 Bars). This will prevent float flutter. In low water pressure conditions, 20 PSI (1.37 Bars) or less, the flow washer may have to be removed from the float assembly for proper volume.



Flow control washer flat side up

Service Stem Valves

When closing the service stem valves to remove your gauge and manifold set always close the high side stem valve first. Following this procedure will allow the system to "PULL" the refrigerant vapor from your manifold set to reduce refrigerant loss. When the pressure has been reduced, close the low side stem valve.

Thermostatic Expansion Valves

The following suggestions for diagnosis of automatic Thermostatic Expansion Valve (TXV) are given with the understanding the following have been checked and are correct and/or have been corrected prior to proceeding.

1. The condenser and fan blade are clean and have proper operating conditions.
2. Water supply to the product is correct and flow over the evaporator is correct.
3. Cuber refrigerant charge is correct.
4. TXV sensing bulb is properly located and secured to the suction line and correctly insulated.
5. Hot gas valve(s) are not leaking and/or weeping through.

DIAGNOSIS

Starving TXV - Product Symptoms

1. Suction pressure lower than normal for the operating conditions.
2. Ice production lower than normal and/or none.
3. Ice pattern on evaporator (if any) thin at top and thick at bottom.

Flooding TXV - Product Symptoms

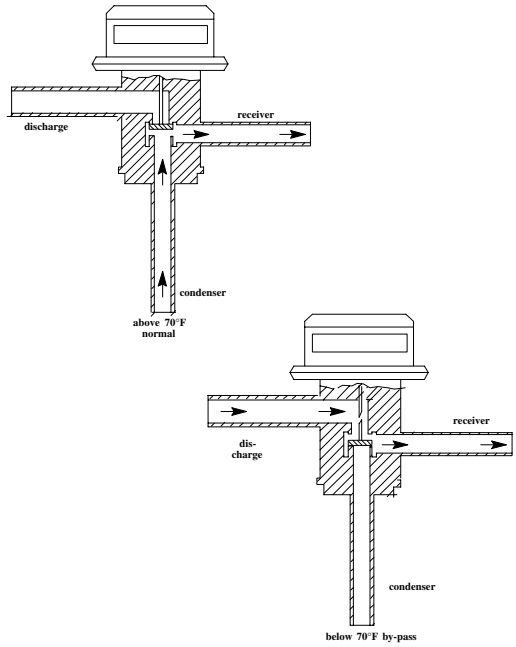
1. Ice production lower than normal and/or none.
2. Suction pressure stabilizes at higher than normal pressure for operating conditions. Suction pressure does not modulate and may start to slowly rise.
3. Ice pattern will be very heavy at the bottom and thin at the top of the evaporator. Product may not enter harvest cycle because of higher than normal suction line temperature.

Important: Frost on the suction line may be normal on medium temperature refrigeration equipment. Frost should be considered a red flag, long run times will normally produce some type of frost pattern.. Before checking the sealed refrigeration system, the external conditions that could lead to frost follow:

1. Dirty condenser
2. Dirty condenser fan blade
3. Improper air clearance around Cuber
4. Loose TXV bulb mount
5. Poor water flow over evaporator
6. Ventilation problems

The expansion valves used on Cornelius “I” series ice equipment have special super heat settings and bulb charge designed from the product load and HP 62 refrigerant. Should the need arise to replace this or any refrigerant components, be certain to use only components recommended by Cornelius for the model of the Cuber being serviced. Use of nonapproved components will compound system difficulties and may void product warranty.

Head Pressure Control Valve [Headmaster]/Fan Cycle Switch (Remote Units Only)



The Cornelius "I" series remote systems use an Alco Head Pressure Control, normally referred to as a headmaster. This control is mounted in the remote condenser with a fan cycling control switch. Using both these controls gives the system positive operation under a wide range of condensing temperatures.

The fan cycling switch starts the fan at 270 PSI and stop it at 205 PSI allowing a positive efficient operation at the high temperature operating ranges.

The headmaster controls the operation when the condensing temperature drops below 70°F. The "I" series refrigerant charge is HP - 62 [R - 404A] and the headmaster dome charge setting is 200 PSI of nitrogen pressure making it stable under the low temperature operating range down to - 20°F. (Continued on page 46)

The normal flow pattern through the headmaster is from the condenser port to the receiver port. When this flow pattern is unable to

maintain a receiver outlet pressure equal to or above the dome pressure setting of the valve the dome pressure will force the valve portage to change closing the condenser port and opening the bypass port from the compressor discharge line. This allow the high pressure vapor from the discharge port to "buck" the receiver pressure back up. With the condenser port closed, the refrigerant is backed up in the condenser, basically reducing the condenser size, assisting in maintaining the discharge portage flow and increasing the head pressure.

Remember, sense of touch to the lines of the headmaster will determine the flow path the headmaster is in, condenser to receive or bypass to receiver.

High side gauge installed at the receiver outlet valve will determine if the headmaster is functioning to maintain the proper operating pressure.

In the event the control appears to be "stuck in bypass", the pressure drop across the headmaster must be measured. With a gauge installed at the receiver outlet valve and the high side service valve, the pressure difference at these two points must be less the 15 PSI. Three most common causes of an excessive pressure drop are shortage of refrigerant, kinked remote lines, and excessive line length.

Eliminate refrigerant shortage first. Add refrigerant in two pound increments (not to exceed six pounds) to determine if it corrects the pressure drop. If pressure drop is not corrected, inspect line set for sharp bends or kinks, correct as required. If adding refrigerant does not correct continued (bypass) condition and line set is not damaged, replace headmaster.

Contactor Compressor

The contactor serves as the voltage supply switch for the compressor circuit. Voltage to the coil of the contactor is supplied by the circuit board.

Check Out:

The two (2)* line supply screws of the contactor should always have supply voltage present when voltage is on to the product.

The other two (2)* screws (load) should have line voltage when the contactor is energized. The contactor coil receives its supply voltage from the circuit board. Should the contactor fail to energize:

Check for supply voltage from circuit board, lead connections to contactor coil, and ohms value of coil.

* (3) if the product is 3 phase

Compressor & Starting Component Check-Out Procedure

When compressors fail to start or run properly, it is normally the external electrical supply or the compressor start components that are defective. The overload protector, start and/or run capacitor, relay, circuit board, safety controls, etc.

1. Check voltage at compressor terminals. NO voltage will require checking the electrical circuit working back from the compressor to determine where the voltage supply is interrupted and correct as required. The load voltage, while compressor is trying to start, should not be less than 90% of rated required voltage.

Line voltage and wire size effect the life expectancy of the electrical components, compressor, motor winding, solenoid coils, etc.

Poor line quality voltage will cause many erratic electrical problems. Remember every electrical product, ice machine, dispenser, walk–in, reach–in, air conditioner, etc. required proper power supply to operate. Be certain when voltage checks are performed that you are measuring load voltage, not line voltage.

2. A defective capacitor or start relay may prevent the compressor from starting. Should the compressor attempt to start, but is unable to do so, or if the compressor hums or trips off on the over protector, check the following:

NOTE: For 50 HZ application on dual rated 50/60 HZ models, load voltage while compressor is starting must not be less than 90% of 50 HZ rating.

Relay

Potential –

For the potential type, contacts are normally closed. The start contacts open by C.E.M.F. generated by the compressor at approximately 80% of the normal operating speed. As the contacts open, only the start capacitor is removed from the start circuit. Both the start and run winding and the run capacitor remain in the circuit. This relay may or may not be directional in mounting.

Current –

For the current type, contacts are normally open. The start contacts close by the high current draw from the locked rotor condition with only the run winding in the circuit. As the contacts close, the start capacitor and the start winding is energized and the compressor starts. At approximately 80% of its operating speed the current draw drops off, the relay contacts open removing the start winding and start capacitor from the circuit. Remember, current relays are directional in their mounting to allow contacts to lift and close.

Capacitors

A quick check is to replace suspected defective capacitors with known good capacitors being careful to stay within the range for substitute values. Should those values be unknown, a basic rule for capacity is: for start capacitors $\pm$10% and run capacitors $\pm$5% of the rating on the defective original capacitor being replaced. Voltage should always try and be matched, if it cannot be it is acceptable to

increase up to 10% higher than the voltage listed on the capacitor being replaced. NEVER put a capacitor on a product with a voltage rating lower than the original being replaced. If a capacitor analyzer is not available, an ohm meter may be used to check a capacitor for short or open circuits. Set the ohm meter to its highest scale and connect its leads to the capacitor terminals.

1. With a capacitor, without plate defect, the indicator should first move to zero (0) and then gradually increase to infinity.
2. If there is no movement of the ohm meter indicator, an open circuit is indicated.
3. If the ohm meter indicator moves to zero (0) and remains there, or on a low resistance reading, a short circuit is indicated.
4. Please note this check does not determine if the capacitor will deliver the proper rated MFD/UFD required, it only shows if the capacitor has shorted or open circuits.
5. Capacitors that show any signs of leakage of electrolyte, or damage of the can, should be replaced. DO NOT TEST!

Compressor

1. Using an ohm meter, check for continuity from compressor terminal C to R and C to S. If the compressor is hot, wait one (1) hour for compressor to cool and recheck. An open internal overload protector can cause a lack of continuity. If continuity cannot be measured through all windings, the compressor must be replaced.
2. To check the compressor motor for accidental ground, perform a continuity check between terminals C, R and S to the compressor shell or a copper line of the refrigeration system (do not use a painted surface). Continuity present, the compressor windings are grounded and the compressor must be replaced.

If the compressor starts, but trips repeatedly on the overload protector, remember that the overload is both temperature and current activated. Be sure to check; (Continued on page 49)

- Low voltage
- Undersized supply lines
- High head pressure
- High suction pressure
- Defective capacitors
- Compressor mechanical problems
- Low Refrigerant Charge

Moisture Contamination

With the major changes in refrigerants in today's marketplace and the use of hydroscopic oils the control of moisture and contaminates have become more critical to safeguard against than ever before in the history of mechanical refrigeration.

Contaminates are also the most difficult of all problems to determine. A Meg–Ohm meter "Megger" can be a valuable tool to aid in the analysis of this problem. A Meg–Ohm reading log may be started any time after 90 days of operation of the product. To perform the test, proceed as listed.

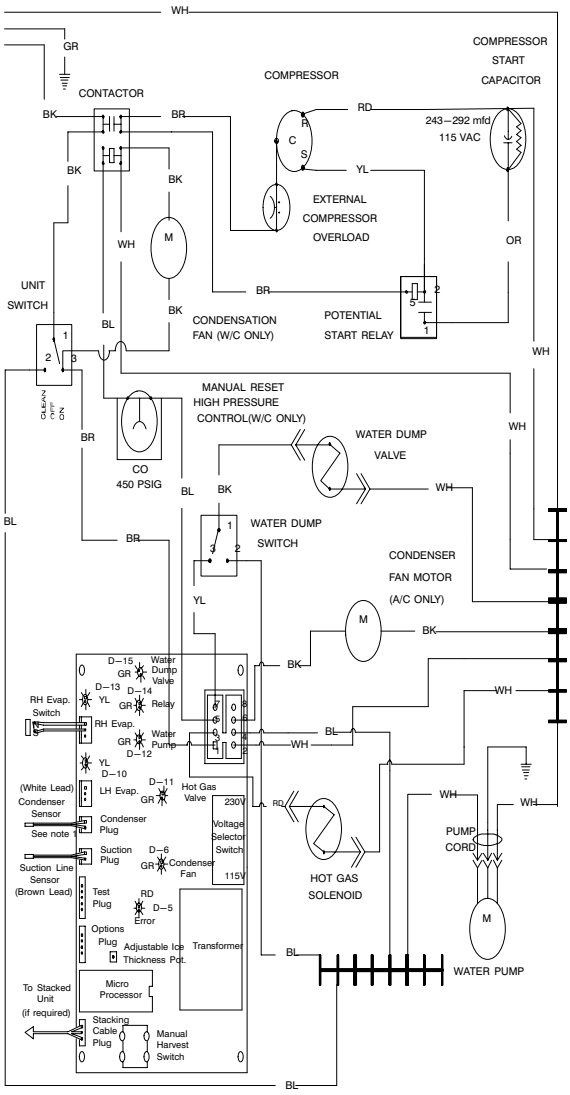
Disconnect all three (3) compressor leads, take a Meg-Ohm meter reading from each compressor terminal to a good chassis ground. Compare reading to chart below:

Meter Reading Meg-Ohm	Compressor Condition	Maintenance Required
100 - ∞	Okay	None needed.
50 to 100	Moisture present	Replace drier.
20 to 50	Severe moisture & possible contaminated oil with acid present	Replace drier with acid hold type. Run 24 hours, change to regular drier.
.5 to 20	System has severe contamination	Remove compressor oil and refrigerant charge. Evacuate, install liquid and suction line driers (acid hold type). Recharge with new oil and refrigerant. Run 24 hours. Discharge system, discard suction line drier, replace the liquid line drier. Evacuate and recharge.

(Continued on page 51)

Readings in the range listed below 100 Meg–Ohm would be an indicator that the system being tested may have a contamination problem. Where does the problem come from? As an example, the filter drier may become saturated and hold large percentages of moisture and the system function without a problem until such time as the product operating conditions change. Should the room temperature increase, or the condenser plug–up etc., the higher operating pressures and temperatures may cause the drier filter to release a portion of it's held moisture. It is also imperative to avoid opening the sealed refrigeration system whenever possible and when it is done to be certain the true problem is correctly diagnosed and repaired. Remember, service gauge sets should only be installed after all external checks have been performed.

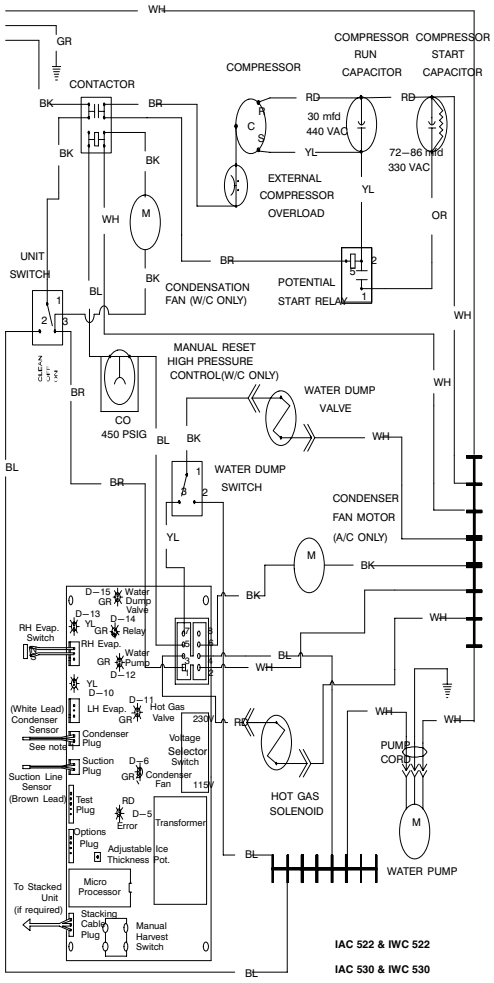
Caution: Megger checks should NEVER be performed on any compressor that is under a vacuum.



IAC 322 & IWC 322

IAC 330 & IWC 330

NOTE 1: CONDENSER SENSOR USED ONLY ON A/C UNITS.
1.8K ohm RESISTOR USED ONLY ON W/C UNITS.



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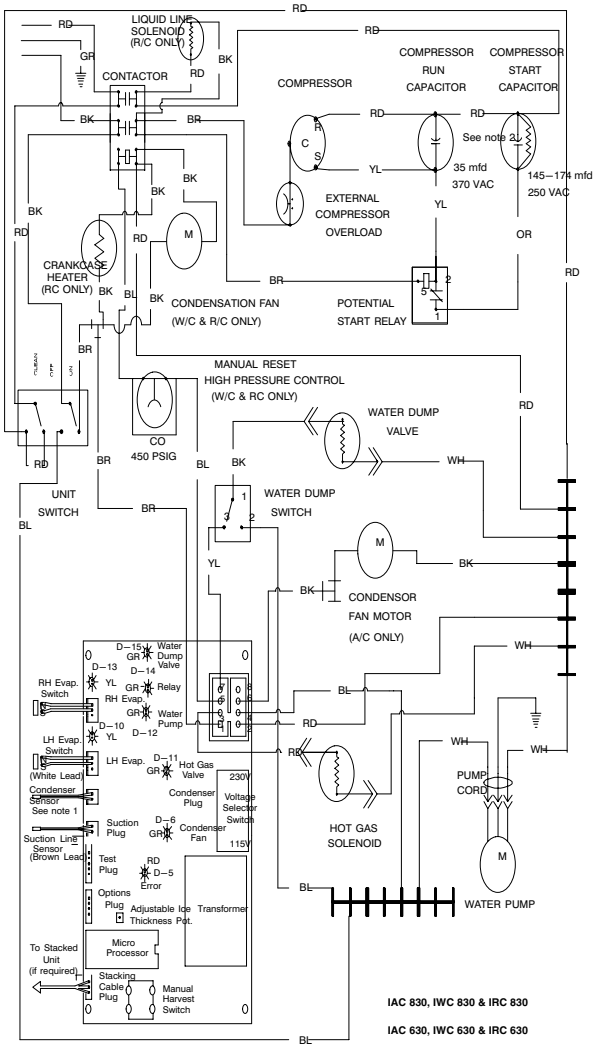
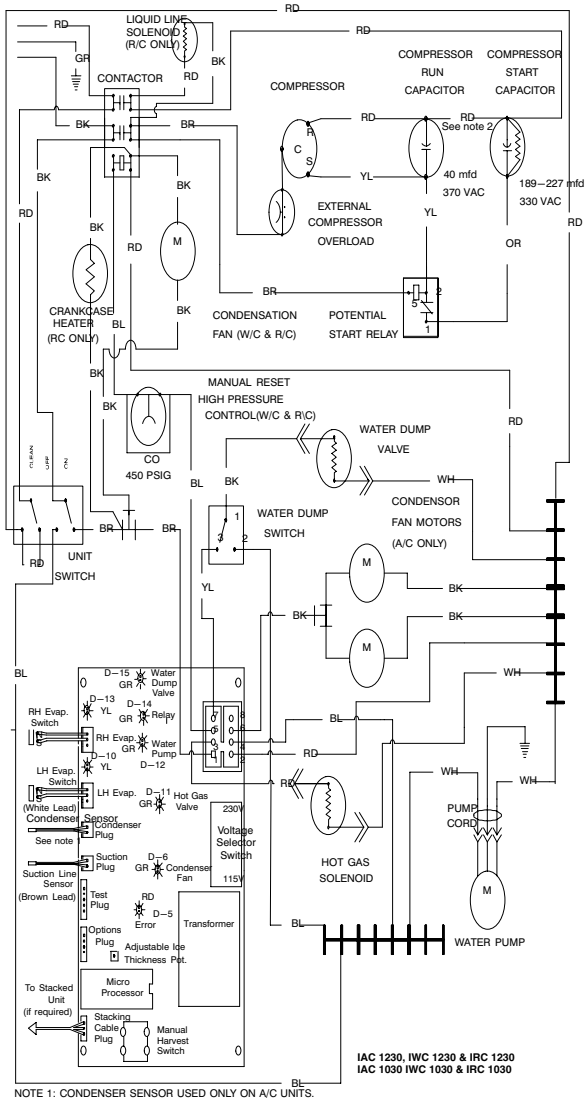


NOTE 1: CONDENSER SENSOR USED ONLY ON A/C UNITS.
1.8K ohm RESISTER USED ONLY ON W/C & R/C UNITS.

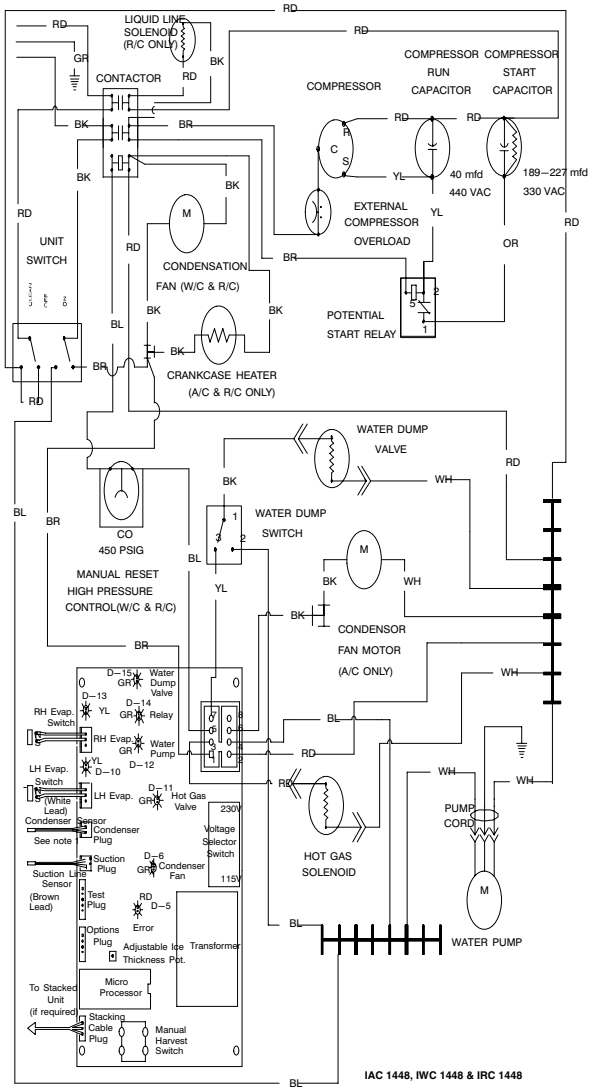
NOTE 2: CAPACITORS USED ON 630 BRISTOL COMPRESSOR:
RUN CAP. 25mfd 440 VAC
START CAP. 161–193mfd 250 VAC



NOTE 1: CONDENSER SENSOR USED ONLY ON A/C UNITS.

1.8K ohm RESISTER USED ONLY ON W/C & R/C UNITS.

2: Capacitors used on 103 Compressor
RUN CAP. 37 mfd 370V
START CAP. 145-174 MFD 250v



NOTE 1: CONDENSER SENSOR USED ONLY ON A/C UNITS.
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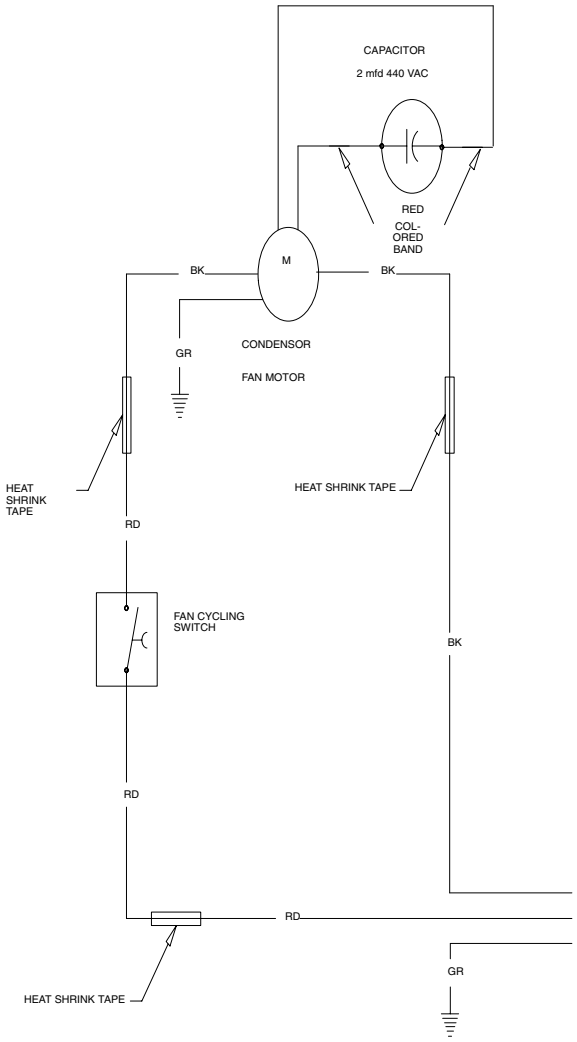


CR800, CR1200, & CR1400 REMOTE CONDENSERS

208/230 VOLTS 60 HZ

TROUBLESHOOTING

IMPORTANT: Only qualified personnel should service internal components or electrical wiring.

Trouble	Probable Cause	Remedy
CUBER NOT OPERATING	A. Power switch in center “OFF” position.	A. Place switch in “ON” position.
CUBER NOT OPERATING INDICATOR LIGHTS “OFF”, NO POWER TO CIRCUIT BOARD	A. Test power switch and leads.	A. If defective, replace.
	B. High pressure cut-out open. (water cooled or remote systems)	B. Press manual reset. Determine cause: Water supply shut off; water pressure too low; water valve defective or out of adjustment; water condenser dirty or corroded; unit over-charged; water inlet pressure too high. Replace defective component as needed.

Trouble	Probable Cause	Remedy
CUBER NOT OPERATING INDICATOR LIGHTS “OFF”, POWER TO THE CIRCUIT BOARD	A. Magnet not in proximity switch field.	A. Water curtain drifting out of switch range. Reduce clearance between curtain and proximity switch.
	B. No curtain movement.	B. Adjust proximity switch.
	C. Faulty proximity switch.	C. Replace proximity switch.
	D. Unit “OFF” due to bin full.	D. Remove ice from curtain. Eliminate curtain restriction.
COMPRESSOR DOES NOT RUN, CIRCUIT BOARD INDICATOR LIGHTS “ON”	A. Check contactor and leads.	A. Replace if defective.
	B. Compressor overload “open”.	B. Permit overload to cool and reset or replace.
	C. Check compressor and start components.	C. Replace as needed.

Trouble	Probable Cause	Remedy
COMPRESSOR RUNS BUT DOES NOT COOL, CIRCUIT BOARD INDICATOR LIGHTS “ON”	A. Low charge.	A. Leak check – Recharge.
	B. Hot gas solenoid leaking.	B. Replace.
	C. Defective expansion valve.	C. Replace.
	D. Inefficient compressor.	D. Replace.
	E. Internal by-pass open, compressor noisy.	E. Permit pressures to equalize.
CUBER REMAINS IN THE FREEZE CYCLE	A. Check suction line thermistor (sensor) lead wire connection at the circuit board.	A. Tighten, reattach.
	B. Evaporator thermistor shorted.	B. Replace.
	C. Check thermistor (1K ohm).	C. Replace if out of range.
	D. Ice bridge setting too low.	D. Adjust per bridge adjustment instructions.

Trouble	Probable Cause	Remedy
	E. Expansion valve failure (will not pull down).	E. Tighten bulb, replace as needed, See check-out procedure.
CUBER REMAINS IN THE HARVEST CYCLE	SUCTION LINE THERMISTOR OPEN (STARTS IN HARVEST)	
	A. Loose connection at the circuit board.	A. Tighten or reconnect.
	B. Test thermistor.	B. Replace if out of range.
	PROXIMITY SWITCH LIGHT “OUT”	
	C. Loose wire connection at circuit board.	C. Tighten, reattach wire.
	D. Proximity switch defective, see check-out procedure.	D. Replace as needed.
	E. Water curtain stuck, curtain frozen to ice on evaporator. Curtain hung on water pan, proximity switch out of range.	E. Check and adjust as needed.
	PROXIMITY SWITCH LIGHT “ON”	

Cleaning Procedures

Approved ice machine cleaners by brand names:

- Lime-A-Way
- Calgon Nickel Safe (green color only)

NOTE: All ice machine cleaners labeled safe for nickel ARE NOT the brand CALGON NICKEL SAFE.

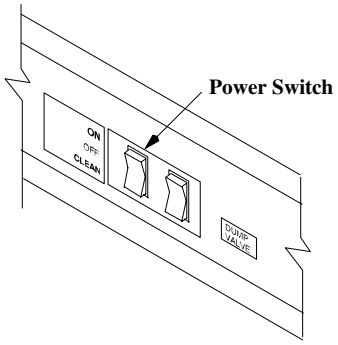
Caution: Ice machine cleaners are acidic-based chemicals. Before begnning any cleaning of the cuber, the ice in the storage bin or dispenser must be removed.

Caution: When using any chemical, rubber gloves and eye protection should be worn.

Prep – Cleaning

Use full-strength ice machine cleaner on a coarse-surface cloth material (such as terry cloth) and wipe down the inside wall of the evaporator area, the water pan, the water curtain and evaporator plastic extrusions. If the water distributor tube has heavy scale build–up, remove and soak it in full-strength ice machine cleaner (or exchange the tube and clean the scaled tube at a later date).

Cleaning the Water System & Evaporator



1. Set the switch to *Clean* and allow any ice on the evaporator to release and melt away.
2. Remove all ice from the storage bin.
3. Remove the water curtain(s), pour 1/2 oz. of ice machine cleaner down the rear key-slot openings. The cleaner will drain into the water pan.

4. Return the water curtain(s) to their proper operating position.
5. Add 3 oz. for a single evaporator, or 5 oz. for a dual evaporator of “Calgon Nickel-Safe” or “Lime-A-Away” ice machine cleaner directly into the water pan the float will balance with inlet water. Set switch to CLEAN, circulate for a maximum of 15 minutes.
6. Depress and hold the dump switch to allow the cleaner to drain away.
7. Fill the water pan with clean fresh water, circulate for approximately 3 minutes. Depress and hold the DUMP switch and allow the water to drain away. **Repeat the procedure 3 times.**
8. After third rinse cycle, place product power switch in ice position. Allow Cuber to produce one slab of ice – DISCARD THE ICE.
9. When the clean cycle is complete, return cuber to normal operating mode.

NOTE: Please Take Note of the Following:

- Ice machines should only be cleaned when needed, not by a timed schedule of every 60 days, etc.
- Should your ice machine require cleaning more than twice a year, consult your distributor or dealer about proper water treatment.

Sanitizing Procedures

NOTE: To be performed only after cleaning the ice machine:

1. Add 1/4 ounce sodium hypochlorite solution (common liquid laundry bleach) to the water pan and allow the pump to circulate the solution for 5 minutes. You may also use a commercial sanitizer such as Calgon Ice Machine Sanitizer following the directions on the product label.
2. Turn the Cuber power switch off and depress and hold the dump switch to drain the water pan.
3. To sanitize the bin and other surface areas, use 1 ounce of liquid bleach per gallon of water and wipe all areas with the solution. Or use a commercial sanitizer.
4. Place the Cuber power switch in the ice position. Discard the first batch of ice produced.
5. Cleaning and sanitizing are now complete. Cuber may be returned to normal service.