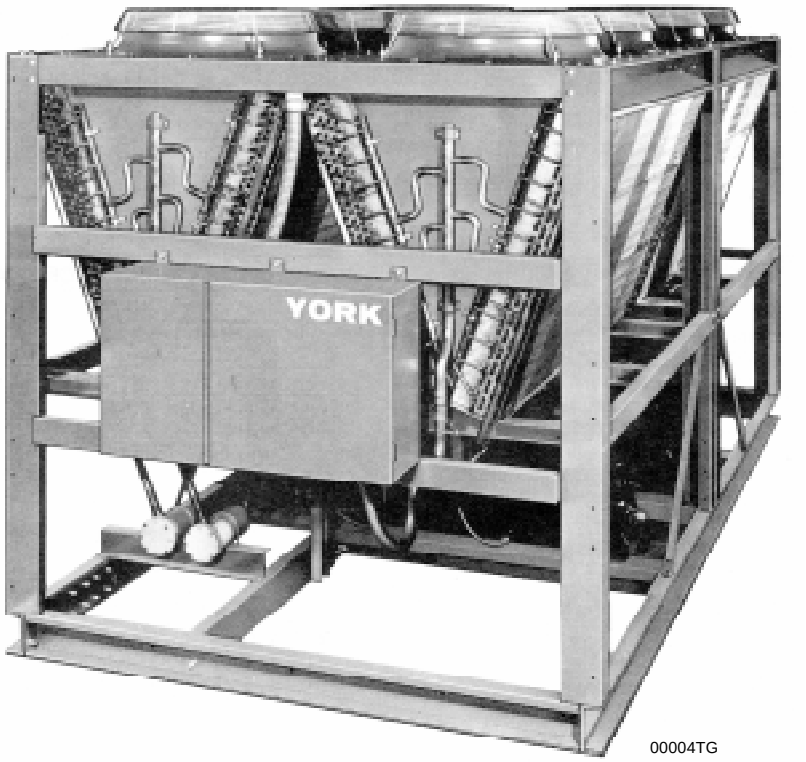
YORK®	PACKAGED LIQUID CHILLERS AIR COOLED – RECIPROCATING HERMETIC	
INSTALL., OPER., MAIN.	Supersedes: 150.40-NM20 (587)	Form 150.40-NM20 (597)

MODELS YCAQ10, YCAM12, YCAK14, YCAKI16, YCAG18 YCAR11, YCAN13, YCAL15, YCAJ17 & YCAH19 ALSO MODELS YCH100, 120, 150, 175, & 200 STYLE C*



00004TG

***WITH MICROPROCESSOR CONTROL PANEL**
WITH G.E. II. 4 EPROM (MODEL YCHA100)
WITH G.E. II. 3 EPROM (MODELS YCHA120 THRU 200)
WITH G.E. II. 5 EPROM (MODELS YCHA120 THRU 200)
(See page 2 for further clarifications)

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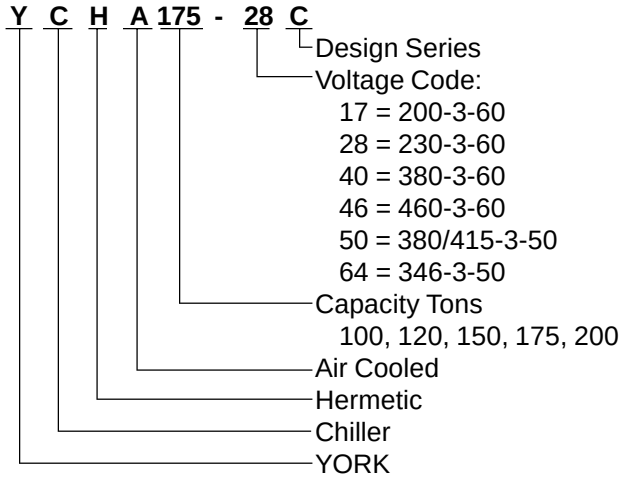
UNIT IDENTIFICATION

Effective May 1, 1987, YORK introduced a new method of unit identification (nomenclature). The new method of identification does **not** reflect any change in unit design; only a change in nomenclature. This manual is written based on the nomenclature used **before** May l, 1987. However, it is also fully applicable to units built after May 1, 1987 which are identified by the later nomenclature. A description of both nomenclatures is given below. Also a cross-reference chart of models is provided for your convenience.

CROSS REFERENCE CHART

NOMENCLATURE	
Before May 1, 1987	Effective May 1, 1987
YCHA100	YCA Q 10,YCA R 11
YCHA120	YCA M 12,YCA N 13
YCHA150	YCA K 14, YCA L 15
YCHA175	YCA I 16, YCA J 17
YCHA200	YCA G 18,YCA H 19

UNIT NOMENCLATURE (Before May 1, 1987)



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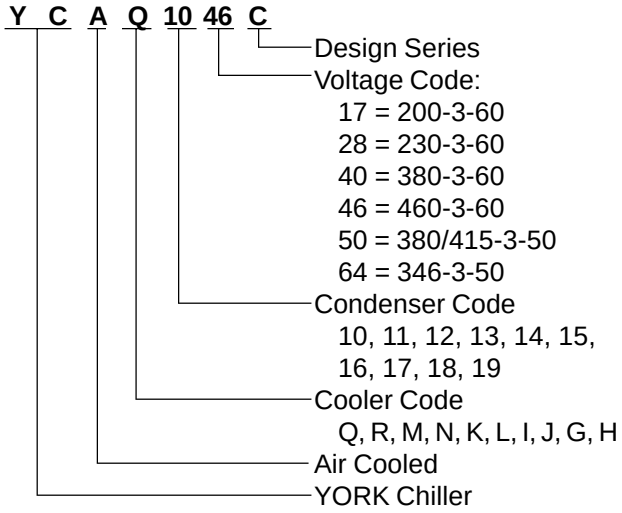


GENERAL INFORMATION

GENERAL DESCRIPTION

The YCHA packaged liquid chillers are completely self-contained outdoor units shipped ready for final job installation requiring only liquid connections, power and control wiring. They are designed primarily for central station air conditioning applications with normal installations being on roof-tops or on ground level beside the building.

CODE STATUS

The units are designed in accordance with N.E.C., ANSI B9.1, and ASME Codes.

OPERATING LIMITATIONS

LEAVING LIQUID TEMP., °F	MIN.	40
	MAX.	50
AIR ON CONDENSER, °F	MIN.	35*
	MAX.	130

UNIT MODEL YCHA	COOLER WATER GPM	
	MIN.	MAX.
100	120	550
120	120	580
150	120	580
175	150	640
200	200	700

* 0°F With Optional Low Ambient Kit.

NOTE: The evaporator is protected against freeze-up to - 20°F with an electrical heater cable.

COMPRESSOR NOMENCLATURE

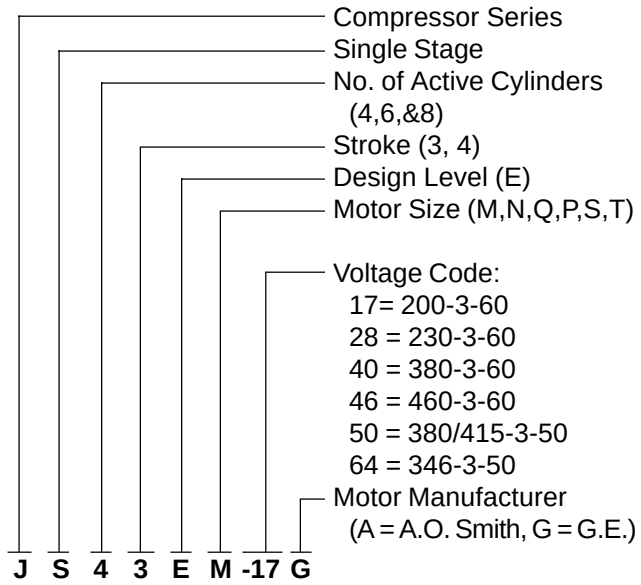


TABLE 1 – VOLTAGE LIMITATIONS

VOLTAGE CODE	OPTIMUM VOLTAGES	MIN. VOLTS	MAX. VOLTS
17	200-3-60	180	220
28	230-3-60	207	253
40	380-3-60	355	415
46	460-3-60	414	506
50	380/415-3-50	342	440
64	346-3-50	311	381

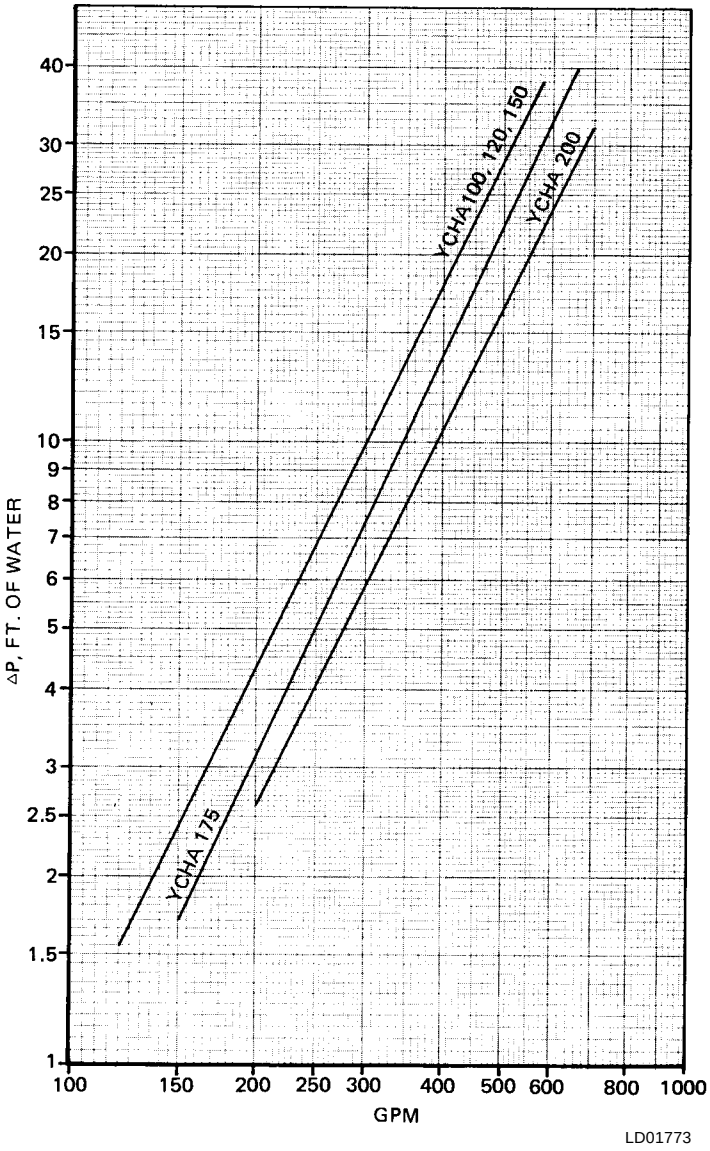
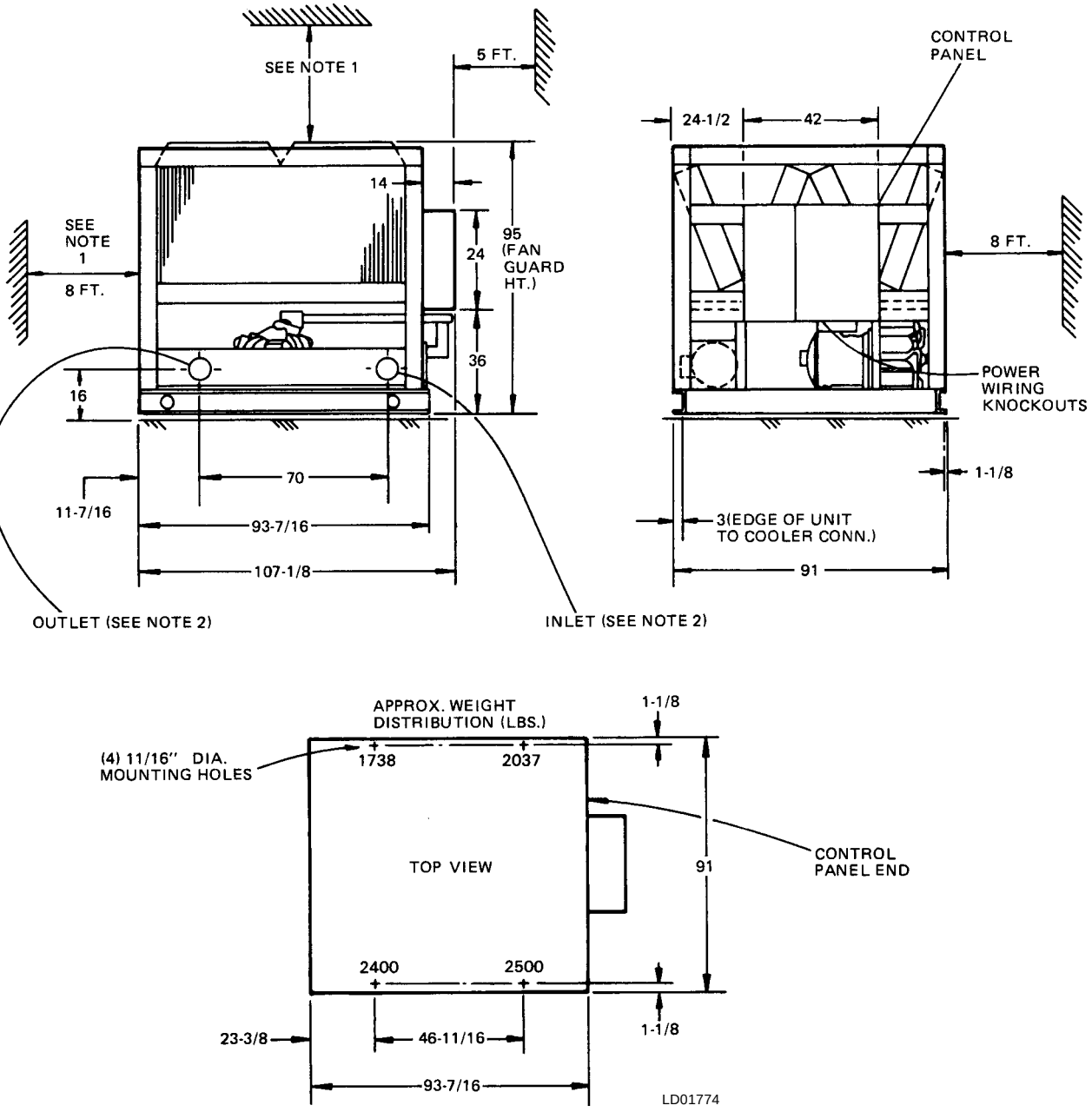


FIG. 1 – COOLER WATER PRESSURE DROP

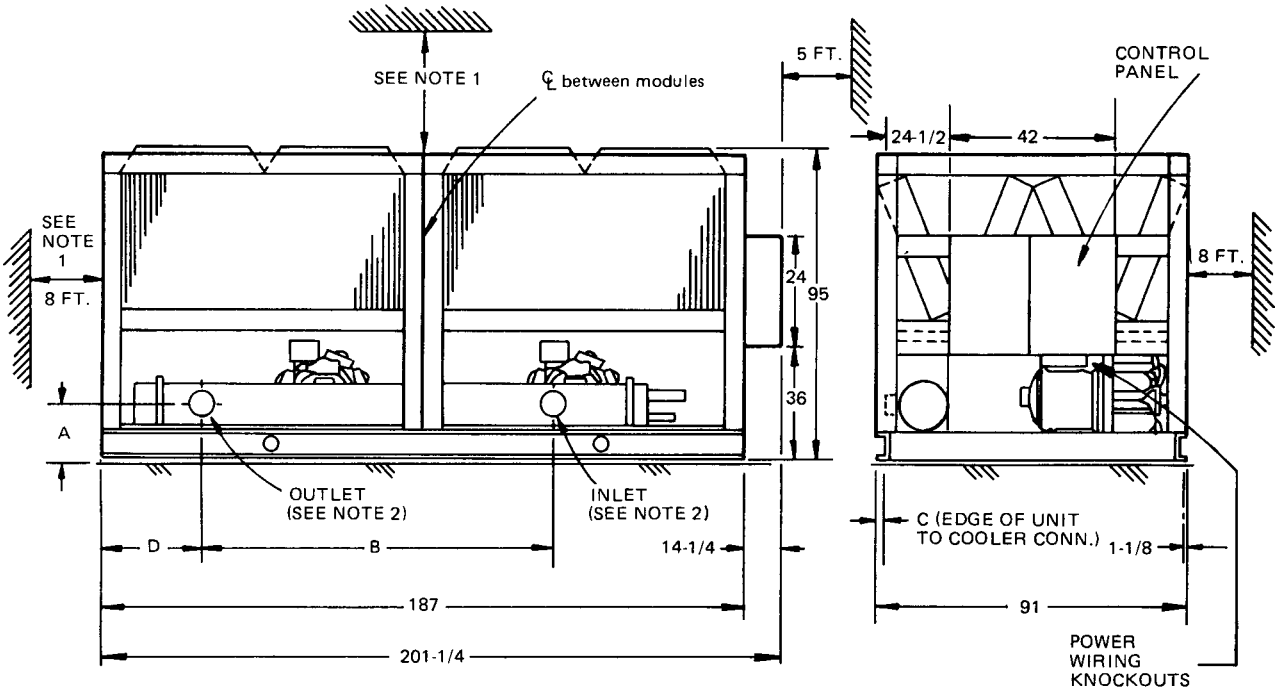
DIMENSIONS YCHA100



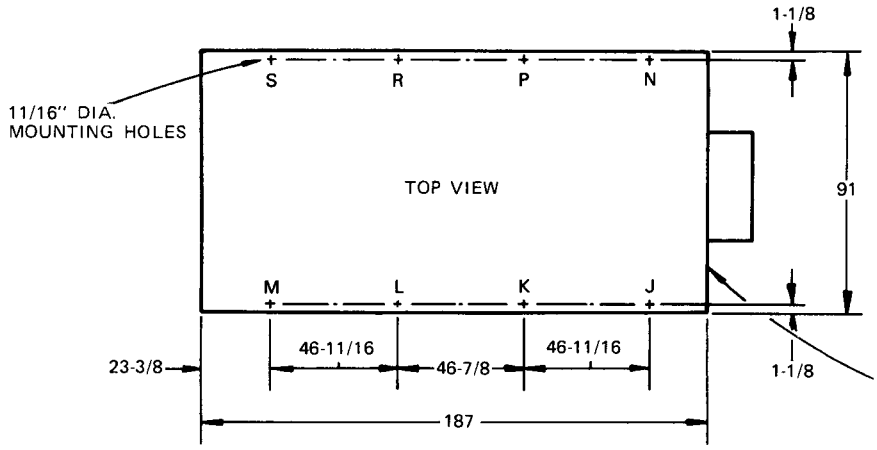
NOTES:

1. Clearances – Minimum YORK required clearances to prevent condenser air recirculation and faulty operation of units are as follows: Side to wall 8'–0"* Rear to wall 8'–0"* Control Panel End to wall 5'–0"* Top 50'–0"* Distance Between Adjacent units 12'–0" * No more than one wall can be higher than the top of the unit. The area within the clearances shown above and area under the unit must be kept clear of all obstructions that would impede free air flow to the unit. In installations where winter operation is intended and snow accumulations are expected, additional unit height must be provided to insure full air flow.
2. Cooler liquid connection sizes (inlet & outlet) 6" victaulic standard (flanges OPTIONAL).
3. Dimensions are in inches.
4. Spring Isolators (OPTIONAL) will increase overall height of unit.

DIMENSIONS YCHA120, 150, 175, 200



MODEL	A	B	C	D
120/150	16	85	3-7/8	21-15/16
175	17	85	2-7/8	21-15/16
200	17-1/2	95	2-1/2	15-1/16



APPROX. WT. DISTRIBUTION (LBS.)

DIM.	MODEL			
	120	150	175	200
J	1000	1050	1125	1120
K	1400	1480	2100	1980
L	1550	1510	1650	2720
M	1400	1750	1855	1530
N	1000	1020	1025	1180
P	1500	1700	2000	2070
R	1500	1930	1750	2480
S	1050	1100	1000	1420

LD01775

NOTES:

1. Clearances – Minimum York required clearances to prevent condenser air recirculation and faulty operation of units are as follows: Side to wall 8'–0"* Rear to wall 8'–0"* Control Panel End to wall 5'–0"* Top 50'–0" Distance Between Adjacent units 12' – 0"

   No more than one wall can be higher than the top of the unit. The area within the clearances shown above and area under the unit must be kept clear of all obstructions that would impede free air flow to the unit. In installations where winter operation is intended and snow accumulations are expected, additional unit height must be provided to insure full air flow.
2. Cooler liquid connection sizes (inlet & outlet) 6" victaulic for the YCHA120-175, 8" victaulic for the YCHA200 (flanges OPTIONAL).
3. Dimensions are in inches.
4. Spring Isolators (OPTIONAL) will increase overall height of unit.

ELECTRICAL DATA

MODEL YCHA		POWER	POWER SUPPLY									
			SYSTEM NO. 1					SYSTEM NO. 2				
			MIN. CIRCUIT AMP.	MAX. DUAL FUSE A	NON-FUSED DISC. SWITCH SIZE		INCOMING WIRE RANGE[2] CU/AL WIRE	MIN. CIRCUIT AMP.	MAX. DUAL FUSE A	NON-FUSED DISC. SWITCH SIZE		INCOMING WIRE RANGE[2] CU/AL WIRE
		VOLTS-PH-Hz			A	V				A	V	
100	-17	200-3-60	520	800	600	240	(1) #4-500MCM	—	—	—	—	—
	-28	230-3-60	460	700	600	240	(1) #4-500MCM	—	—	—	—	—
	-40	380-3-60	272	400	400	480	(1) #6-300MCM	—	—	—	—	—
	-46	460-3-60	230	350	400	480	(1) #6-300MCM	—	—	—	—	—
	-50	380/415-3-50	280	400	400	480	(1) #6-300MCM	—	—	—	—	—
	-64	346-3-50	319	450	400	480	(1) #4-500MCM	—	—	—	—	—
120	-17	200-3-60	282	400	400	240	(1) #4-500MCM	379	600	400	240	(1) #4-500MCM
	-28	230-3-60	247	350	400	240	(1) #4-500MCM	336	500	400	240	(1) #4-500MCM
	-40	380-3-60	147	225	200	480	(1) #14-2/0AWG	198	300	200	480	(1) #14-2/0AWG
	-46	460-360	125	200	200	480	(1) #14-2/0AWG	168	250	200	480	(1) #14-2/0AWG
	-50	380/415-3-50	149	225	200	480	(1) #14-2/0AWG	206	300	200	480	(1) #14-2/0AWG
	-64	346-3-50	162	250	200	480	(1) #6-300MCM	225	350	400	480	(1) #6-300MCM
150	-17	200-360	386	600	400	240	(1) #4-500MCM	386	600	400	240	(1) #4-500MCM
	-28	230-3-60	343	500	400	240	(1) #4-500MCM	343	500	400	240	(1) #4-500MCM
	-40	380-3-60	203	300	200	480	(1) #14-2/0AWG	203	300	200	480	(1) #14-2/0AWG
	-46	460-3-60	172	250	200	480	(1) #14-2/0AWG	172	250	200	480	(1) #14-2/0AWG
	-50	380/415-3-50	210	300	200	480	(1) #14-2/0AWG	210	300	200	480	(1) #14-2/0AWG
	-64	346-3-50	230	350	400	480	(1) #6-300MCM	230	350	400	480	(1) #6-300MCM
175	-17	200-360	399	600	400	240	(1) #4-500MCM	517	800	600	240	(1) #4-500MCM
	-28	230-3-60	353	500	400	240	(1) #4-500MCM	456	700	600	240	(1) #4-500MCM
	-40	380-3-60	209	300	200	480	(1) #6-300MCM	272	400	400	480	(1) #6-300MCM
	-46	460-3-60	177	250	200	480	(1) #6-300MCM	228	350	400	480	(1) #6-300MCM
	-50	380/415-3-50	215	300	200	480	(1) #6-300MCM	277	400	400	480	(1) #6-300MCM
	-64	346-3-50	235	350	400	480	(1) #4-500MCM	316	450	400	480	(1) #4-500MCM
200	-17	200-3-60	520	800	600	240	(1) #4-500MCM	520	800	600	240	(1) #4-500MCM
	-28	230-3-60	460	700	600	240	(1) #4-500MCM	460	700	600	240	(1) #4-500MCM
	-40	380-3-60	272	400	400	480	(1) #6-300MCM	272	400	400	480	(1) #6-300MCM
	-46	460-3-60	230	350	400	480	(1) #6-300MCM	230	350	400	480	(1) #6-300MCM
	-50	380/415-3-50	280	400	400	480	(1) #6-300MCM	280	400	400	480	(1) #6-300MCM
	-64	346-3-50	319	450	400	480	(1) #4-500MCM	319	450	400	480	(1) #4-500MCM

[2] Maximum wire size that can be accommodated by unit wiring lugs. Actual wire size must be determined based on ampacity and job requirements using NEC wire sizing information.

SINGLE POINT POWER WIRING (OPTIONAL)

MODEL		VOLTS-PH-Hz	MIN. CIR. AMPACITY	MAX. DUAL ELEM. FUSE A	NON-FUSED DISCONNECT SWITCH		INCOMING WIRE RANGE
					A	V	
YCHA120	-40	380-3-60	320	400	400	480	↑ (1) #1/0-600MCM or (2) #1/0-250MCM CU/AL ↓
	-46	460-3-60	271	350	400	480	
	-50	380/415-3-50	329	450	400	480	
YCHA150	-40	380-3-60	370	450	400	480	
	-46	460-3-60	312	400	400	480	
	-50	380/415-3-50	383	500	400	480	
YCHA175	-40	380-3-60	444	600	600	480	
	-46	460-3-60	374	500	400	480	
	-50	380/415-3-50	454	600	600	480	
YCHA200	-40	380-3-60	494	600	600	480	
	-46	460-3-60	419	500	600	480	
	-50	380/415-3-50	509	700	600	480	

ELECTRICAL DATA

CONTROL SUPPLY WITH TRANSFORMER					LOAD RATINGS													
					SYSTEM NO. 1						SYSTEM NO. 2							
MIN. CIR. AMP.	MAX. DUAL ELEM. FUSE		NON-FUSED DISC. SWITCH SZ.		COMPRESSOR LOAD			CONDENSER FAN LOADS			COMPRESSOR LOAD				CONDENSER FAN LOADS			
	A	V	A	V	RLA	PW-LRA	TRIP AMPS[3]	NO	HP	KW	FLA	RLA	PW-LRA	TRIP AMPS[3]	NO	HP	KW	FLA
15	15	250	30	240	380	1311	501.9	4	3	2.2	11.4	—	—	—	—	—	—	—
15	15	250	30	240	332	1212	445.6	4	3	2.2	11.4	—	—	—	—	—	—	—
8	8	600	30	480	199	733	264.4	4	3	2.2	5.8	—	—	—	—	—	—	—
8	8	600	30	480	166	606	219.5	4	3	2.2	5.7	—	—	—	—	—	—	—
8	8	600	30	480	204	760	272.4	4	3	2.2	6.2	—	—	—	—	—	—	—
8	8	600	30	480	234	897	314.6	4	3	2.2	6.6	—	—	—	—	—	—	—
15	15	250	30	240	198	665	262.7	3	3	2.2	11.4	267	950	363.0	4	3	2.2	11.4
15	15	250	30	240	170	602	224.9	3	3	2.2	11.4	232	826	314.6	4	3	2.2	11.4
8	8	600	30	480	104	364	139.0	3	3	2.2	5.8	140	500	192.5	4	3	2.2	5.8
8	8	600	30	480	86	301	116.2	3	3	2.2	5.7	116	413	159.4	4	3	2.2	5.7
8	8	600	30	480	104	400	139.0	3	3	2.2	6.2	145	590	197.1	4	3	2.2	6.2
8	8	600	30	480	114	450	149.2	3	3	2.2	6.6	159	700	216.8	4	3	2.2	6.6
15	15	250	30	240	272	950	363.0	4	3	2.2	11.4	272	950	363.0	4	3	2.2	11.4
15	15	250	30	240	238	826	314.6	4	3	2.2	11.4	238	826	314.6	4	3	2.2	11.4
8	8	600	30	480	144	471	192.5	4	3	2.2	5.8	144	471	192.5	4	3	2.2	5.8
8	8	600	30	480	119	413	159.4	4	3	2.2	5.7	119	413	159.4	4	3	2.2	5.7
8	8	600	30	480	148	590	197.1	4	3	2.2	6.2	148	590	197.1	4	3	2.2	6.2
8	8	600	30	480	163	700	216.8	4	3	2.2	6.6	163	700	216.8	4	3	2.2	6.6
15	15	250	30	240	283	950	376.5	4	3	2.2	11.4	377	1311	501.9	4	3	2.2	11.4
15	15	250	30	240	246	826	325.9	4	3	2.2	11.4	328	1212	445.6	4	3	2.2	11.4
8	8	600	30	480	149	471	197.1	4	3	2.2	5.8	199	733	264.4	4	3	2.2	5.8
8	8	600	30	480	123	413	162.6	4	3	2.2	5.7	164	606	219.5	4	3	2.2	5.7
8	8	600	30	480	152	590	201.8	4	3	2.2	6.2	202	760	272.4	4	3	2.2	6.2
8	8	600	30	480	167	700	224.9	4	3	2.2	6.6	232	897	314.6	4	3	2.2	6.6
15	15	250	30	240	380	1311	501.9	4	3	2.2	11.4	380	1311	501.9	4	3	2.2	11.4
15	15	250	30	240	332	1212	445.6	4	3	2.2	11.4	332	1212	445.6	4	3	2.2	11.4
8	8	600	30	480	199	733	264.4	4	3	2.2	5.8	199	733	264.4	4	3	2.2	5.8
8	8	600	30	480	166	606	219.5	4	3	2.2	5.7	166	606	219.5	4	3	2.2	5.7
8	8	600	30	480	204	760	272.4	4	3	2.2	6.2	204	760	272.4	4	3	2.2	6.2
8	8	600	30	480	234	897	314.6	4	3	2.2	6.6	234	897	314.6	4	3	2.2	6.6

The above recommendations are based on the National Electrical Code. Field wiring must also comply with local codes.

[3] Current Overload Setting – Protects motor by stopping unit if compressor motor current exceeds values shown.

LEGEND

A	=	Amps
AMP.	=	Ampacity
HZ	=	Hertz
HP	=	Horsepower
PH	=	Phase
V	=	Volts
RLA	=	Running Load Amps
FLA	=	Full Load Amps
PW	=	Part Wind

PHYSICAL DATA

MODEL YCHA			100	120	150	175	200
TONS[1]		60 Hz	94.2	118.8	140.3	167.4	191.3
		50 Hz	93.8	121.0	141.2	167.5	190.5
COMPRESSOR KW[1]		60 Hz	115.2	138.2	162.1	198.3	232.7
		50 Hz	115.8	141.3	166.6	200.7	234.0
NO. OF REFRIG. CIRCUITS			1	2	2	2	2
COMPRESSOR							
MODEL	60 HZ	Sys. 1	JS83E-S	JS43E-M	JS63E-P	JS63E-P	JS83E-S
		Sys. 2	—	JS63E-P	JS63E-P	JS83E-S	JS83E-S
	50 HZ	Sys. 1	JS84E-T	JS44E-P	JS64E-S	JS64E-S	JS84E-T
		Sys. 2	—	JS64E-S	JS64E-S	JS84E-T	JS84E-T
CAPACITY CONTROL %	STD.	Sys. 1 Lead	100,75,50,25	100,60,40,20	100,67,50,17	100,71,43,14	100,75,50,25
		Sys. 2 Lead	—	100,80,60,20	100,67,50,17	100,71,57,29	100,75,50,25
	OPT.	Sys. 1 Lead	—	100,80,60,40,20	100,83,67, 50,33,17	100,86,71,57, 43,29,14	100,88,75,62, 50,38,25,12
		Sys. 2 Lead	—	100,80,60,40,20	100,83,67, 50,33,17	100,86,71,57, 43,29,14	100,88,75,62, 50,38,25,12
OIL CHARGE (GALS)		Sys. 1	3	3	3	3	3
		Sys. 2	—	3	3	3	3
CONDENSER – DWP 450 PSIG NO. OF FANS (30" DIA. DIRECT DRIVE)			4	7	8	8	8
CFM (EACH)	60 Hz		11,000	11,000	11,000	11,000	11,000
	50 Hz		11,000	11,000	11,000	11,000	11,000
COOLER – DUAL CIRCUITED DWP – 235 PSIG REF. SIDE, 150 PSIG WATER SIDE DIA. x LENGTH			14" x 7'	14" x 8'	14" x 8'	16" x 8'	18" x 9'
WATER VOLUME (GAL.)			31	36	33	39	49
GPM		Min.	120	120	120	150	200
		Max.	550	580	580	640	700
WEIGHTS (LBS.)	SHIPPING	AL Fins	8,335	10,080	10,870	12,115	13,620
		CU Fins	9,935	11,980	12,970	14,815	16,820
	OPERATING	AL Fins	8,575	10,400	11,260	12,505	14,280
		CU Fins	10,175	12,300	13,360	15,205	17,480
REFRIGERANT CHARGE (LBS. R-22)		Sys.1	135	87	116	116	133
		Sys. 2	—	116	116	133	133

NOTE:

[1] Ratings are in accordance with ARI Standard 590 based upon nominal conditions of 44°F leaving chilled water temperature, 95°F ambient air temperature on condenser, 10 degree chilled water range and a 0.0005 fouling factor in the cooler.

INSTALLATION

HANDLING

These units are shipped as completely assembled units containing full operating charge, and care should be taken to avoid damage due to rough handling.

The units are shipped without export crating unless it is specified by Sales Order.

A unit should be lifted by inserting hooks through the holes provided in the base rails. Spreader bars should be used to avoid crushing the unit with the lifting chains. (See Fig. 2.)

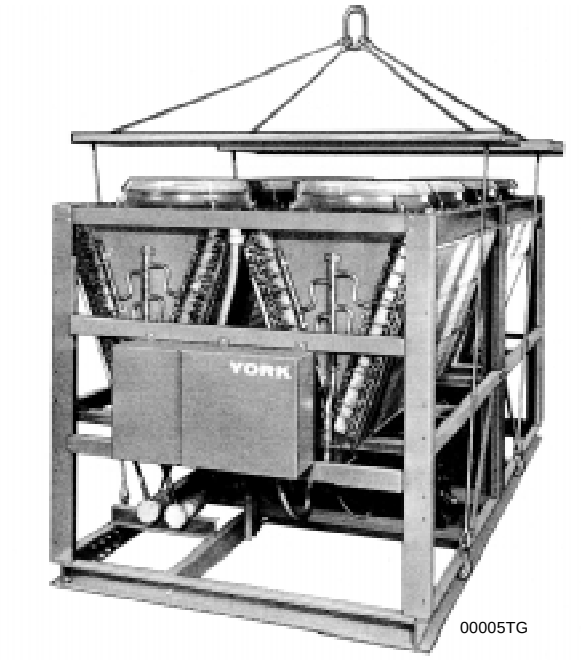


FIG. 2 – RIGGING THE CHILLER

INSPECTION

Immediately upon receiving the unit, it should be inspected for possible damage which may have occurred during transit. If damage is evident, it should be noted on the carrier's freight bill. A written request for inspection by the carrier's agent should be made at once. See "Instruction" Form 50.15-NM for more information and details.

LOCATION

These units are designed for outdoor installations on ground level, rooftop, or beside a building. The location should be selected for minimum sun exposure and to insure an adequate supply of fresh air for the condenser. (See CLEARANCES, pages 4 & 5.) Avoid locations beneath windows or between structures where normal operating sounds may be objectionable. The condenser fans are propeller type and are not suitable nor intended for use with duct work in the condenser air stream.

FOUNDATION

The unit should be mounted on a flat and level foundation, floor or rooftop, capable of supporting the entire operating weight of the equipment. If the unit is elevated beyond the normal reach of service personnel, a suitable catwalk must be constructed around the unit. The catwalk must be capable of supporting service personnel, their equipment, and the reciprocating compressor(s).

Ground Level Locations

It is important that the units be installed on a substantial base that will not settle. A one piece concrete slab with footers extended below the frost line is highly recommended. Additionally, the slab should not be tied to the main building foundations as noise and vibration may be transmitted.

Mounting holes (11/16" Dia.) are provided in the steel channel for bolting the unit to its foundation. (See DIMENSIONS.)

For ground level installations, precautions should be taken to protect the unit from tampering by or injury to unauthorized persons. Screws on access panels will prevent casual tampering. However, further safety precautions such as a fenced-in enclosure or locking devices on the panels may be advisable. Check local authorities for safety regulations.

Rooftop Locations

Choose a spot with adequate structural strength to safely support the entire weight of the unit and service personnel. If the unit is elevated on a steel structure, use at least a sixpoint mount. Care must be taken not to damage the roof. Consult the building contractor or architect if the roof is bonded. Roof installations should have wooden beams (treated to reduce deterioration), cork, or rubber under the base to minimize vibration.

SPRING ISOLATORS (OPTIONAL)

When ordered, eight (8)* vibration isolators will be furnished with each unit. They are of the level adjusting spring type, manufactured by either Mason Industries or Vibration Mounting & Controls, Inc.

*Four (4) on YCHA100

Installation Instructions

1. Identify manufacturers of isolator and locate at proper mounting point using appropriate table below.
2. Block up equipment so as to install spring mounts with pin on top of housing into Equipment Mounting Holes.
3. Mounting Adjustment Nut is inside the isolator mount located just below the top plate of the mount. Turn nut 2 turns clockwise (down) to load spring mount at each location.
4. Take two additional turns on Adjustment Nut of each mount.
5. Repeat step No. 3 as many times as necessary to bring height of isolator to proper height.
6. Take additional turns on mounts at low side or corner to level the equipment.

ISOLATOR MOUNTING LOCATIONS

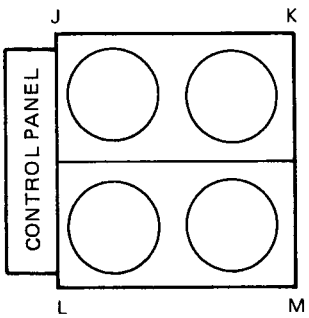
MASON INDUSTRIES

MOUNTING – ALUMINUM COIL UNITS

CHILLER MODEL NO.	ISOLATOR LOCATIONS							
	J	K	L	M	N	P	R	S
	TYPE & SIZE							
YCHA100	406	403	403	404	—	—	—	—
YCHA120	401	404	405	404	401	405	405	401
YCHA150	401	402	402	403	401	405	406	404
YCHA175	401	406	405	403	401	403	403	401
YCHA200	404	403	407	405	404	405	407	402

MOUNTING – COPPER COIL UNITS

CHILLER MODEL NO.	ISOLATOR LOCATIONS							
	J	K	L	M	N	P	R	S
	TYPE & SIZE							
YCHA100	407	407	406	406	—	—	—	—
YCHA120	404	405	403	405	404	405	405	404
YCHA150	404	403	403	406	404	406	404	402
YCHA175	402	407	406	406	402	407	406	402
YCHA200	402	407	407	403	405	407	407	402



YCHA100

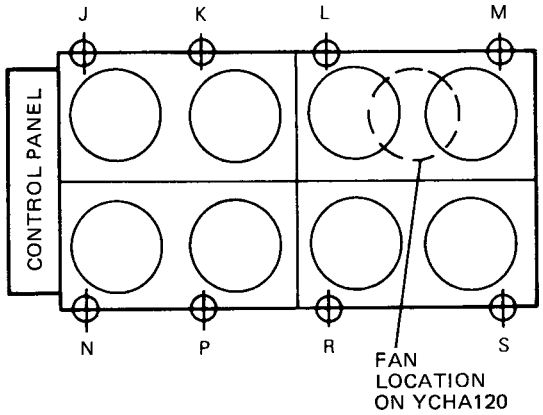
VIBRATION MOUNTING AND CONTROLS

MOUNTING – ALUMINUM COIL UNITS

CHILLER MODEL NO.	ISOLATOR LOCATIONS							
	J	K	L	M	N	P	R	S
	TYPE & SIZE							
YCHA100	2-31	2-31	2-31	2-27	—	—	—	—
YCHA120	1-31	1-32	2-28	1-32	1-31	2-28	2-28	1-31
YCHA150	1-31	2-27	2-27	2-28	1-31	2-28	2-28	2-31
YCHA175	1-32	2-31	2-28	2-31	1-31	2-31	2-28	2-31
YCHA200	1-32	2-31	4-27	2-27	1-32	2-31	2-32	2-27

MOUNTING – COPPER COIL UNITS

CHILLER MODEL NO.	ISOLATOR LOCATIONS							
	J	K	L	M	N	P	R	S
	TYPE & SIZE							
YCHA100	2-32	2-32	2-27	2-31	—	—	—	—
YCHA120	1-32	2-28	2-28	2-28	1-32	2-28	2-28	1-32
YCHA150	2-27	2-28	2-28	2-31	2-27	2-31	1-32	2-27
YCHA175	2-27	2-32	2-31	2-27	2-32	2-31	2-31	2-27
YCHA200	2-27	2-32	4-28	2-31	2-28	2-32	4-27	2-28

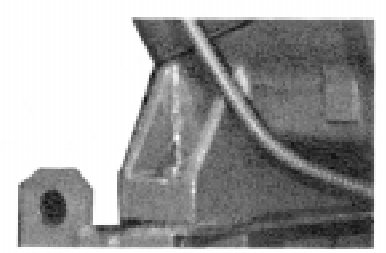


YCHA120, 150, 175, & 200

LD01776

COMPRESSOR MOUNTING

The compressor(s) are mounted on four (4) isolator pads (one under each compressor foot). (See Fig. 3.) The mounting bolts are not to be loosened or adjusted at installation.



00006TG

FIG. 3 – COMPRESSOR MOUNTING PAD

CHILLED LIQUID PIPING

General – When the unit has been located in its final position, the unit liquid piping may be connected. Normal installation precautions should be observed in order to receive maximum operating efficiencies. Piping should be kept as free as possible of all foreign matter. All liquid cooler piping must comply in all respects with local plumbing codes and ordinances.

Since elbows tees and valves decrease pump capacity, all piping should be kept as simple as possible.

Hand stop valves should be installed in all lines to facilitate servicing.

Piping to the inlet and outlet connections of the chiller may include high-pressure rubber hose or piping loops to insure against transmission of vibration. This is optional and the necessary components must be obtained in the field.

Drain connections should be provided at all low points to permit complete drainage of liquid cooler and piping system.

A small valve or valves should be installed at the highest point or points in the chilled liquid piping to allow any trapped air to be purged. Vent and drain connections should be extended beyond the insulation to make them accessible.

The piping to and from the cooler must be designed to suit the individual installation. It is important that the following considerations be observed:

1. The chilled liquid piping system should be laid out so that the circulating pump discharges directly into the cooler. The suction for this pump should be taken from the piping system return line and not the cooler.
2. The inlet and outlet cooler liquid connection sizes are given on pages 4 and 5.
3. It is recommended that a strainer, preferably 40 mesh, be installed in the cooler inlet line just ahead of the cooler.
4. All chilled liquid piping should be thoroughly flushed to free it from foreign material before the system is placed into operation. Use care not to flush any foreign material into or through the cooler.
5. As an aid to servicing, thermometers and pressure gauges are recommended for installation in the inlet and outlet water lines. One connection point (plugged) is provided in each cooler nozzle. Thermometers and gauges are not furnished with the unit and are to be furnished by other suppliers.
6. The chilled liquid lines that are exposed to outdoor ambients should be wrapped with a supplemental heater cable and insulated to protect against freeze-up during low ambient periods, and to prevent fomlation of condensation on lines in warm humid climates.
7. A chilled water flow switch, (either by YORK or others) must be installed in the leaving water piping of the cooler. There should be a straight horizontal run of at least 5 diameters on each side of the switch. Adjust the flow switch paddle to the size of pipe in which it is to be installed. (See: manufacturer's instructions furnished with switch.) The switch is to be wired to terminals in the control panel as shown in the WIRING DIAGRAM.

   WARNING: Flow switch must not be used to stop and start chiller.

ELECTRICAL WIRING

The YORK Series YCHA Packaged Liquid Chillers are shipped with all contained controls wired for operation.

Field Wiring – Power wiring must be provided through a fused disconnect switch. Minimum circuit ampacity and maximum dual element fuse size are given on page 6. A 115-1-60/ 50, 30 amp source must be supplied for the control panel through a fused disconnect when a control panel transformer (optional) is not provided. Refer to Wiring Diagrams.

Affiliated apparatus, such as a chilled water flow switch, auxiliary contacts from the chilled water pump starter, alarms, etc. should be interlocked into the control panel circuit. These field modifications may be made as shown on the WIRING DIAGRAMS.

MULTIPLE UNITS

For increased compressor protection and to reduce power inrush at start-up on multiple chiller installations, provisions must be made to prevent simultaneous start-up of two or more units. Also, some method must be employed to automatically cycle on or off one or more of the units to permit more efficient operation at part load conditions. A sequencing kit may be acquired through your local YORK representative.

UNIT CONTROLS AND OPERATION (YCHA100)

INTRODUCTION

The YORK YCHA100 MicroComputer Control Panel is a microprocessor based control system. The microprocessor monitors return water temperature and controls a single 8 cylinder compressor with 3 unloaders and 4 steps of unloading as needed to maintain the desired leaving water temperature.

Concise, step-by-step instructions are printed on the control panel to guide you through each control and monitoring procedcure.

The control panel is also compatible with a building automation/energy management system.

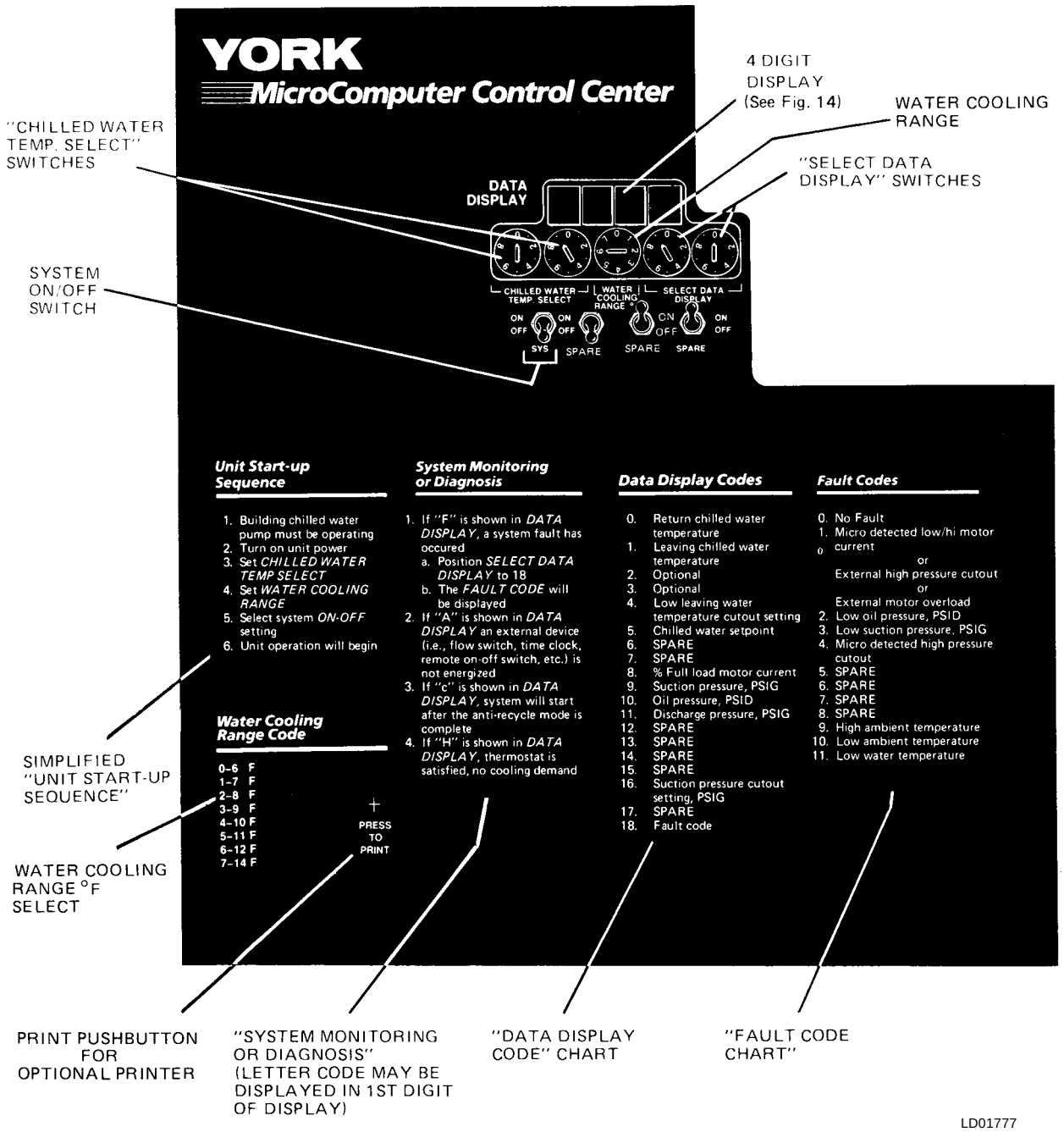


FIG. 4 – CONTROL CENTER (YCHA100)

(YCHA100)

A 4-digit display (See Fig. 4) allows the operator to select and display system operating parameters via two "Select Data Display" rotary switches. These parameters are:

- Return Chilled Water Temperature
- Leaving Chilled Water Temperature
- Low Leaving Water Cutout Temperature
- Return Chilled Water Setpoint
- % Full Load Motor Current
- Suction Pressure
- Oil Pressure, PSID
- Discharge Pressure
- Suction Pressure Cutout Setting, PSIG
- Water Cooling Range Temperature

(Also see Fig. 5 for a complete list)

The system "Return Chilled Water Temp" is entered by two rotary switches and the "Water Cooling Range" by a single rotary switch.

The compressor can be activated by the "SYS" toggle switch. The switch normally remains "ON" after startup.

Remote cycling and Return Chilled Water Temp Setpoint Reset can be accomplished as noted on Page 18. Loading and unloading decision making is done by software on the Micro Logic Board. These decisions are made according to temperature deviations from the selected setpoint and the selected cooling range resulting in more precise control of water temperature.

CONTROL PANEL

1. "CHILLED WATER TEMP SELECT"*

   Control is achieved by Return Chilled Water Setpoint (adjustable from 0°F to 70°F in one degree increments). Setpoint is entered via two rotary switches on the control panel marked "Chilled Water Temp. Select °F".

   *If needed, the unit can be configured to control Leaving Chilled Water Temp. This can be accomplished by a jumper/switch on the Micro Board. See Fig. 11 & 12.

J10 OUT/SW. 3 OFF	RWT Control
J10 IN/SW.3 ON	LWT Control

NOTE: It is recommended that RWT control be used unless LWT control is absolutely necessary.

2. "WATER COOLING RANGE" Select Switch

   Temperature control range is variable via a single rotary switch labeled "Water Cooling Range". There will be a choice of eight settings (0-7). Available ranges are 6.0°F, 7.0°F, 8.0°F, 9.0°F, 10.0°F, 11.0°F, 12.0°F, and 14.0°F, corresponding to setting 0-7 respectively.

3. SYS "ON/OFF" Switch

   The switch allows the operator to manually turn off the system. To operate the system, the switch must be in the "ON" position.

4. "DATA DISPLAY CODES"

   Refer to this list when selecting the desired system parameter to be displayed. A list of the codes and their respective number is shown in Fig. 5.

5. "UNIT START-UP SEQUENCE"

   This is a simplified start-up procedure for switch setup of the panel and system.

6. "SYSTEM MONITORING OR DIAGNOSIS"

   This list informs the operator of the meaning of the alphabetic codes which may appear on the display. Anti-recycle status, external device status, and fault information is displayed using this alphabetical code. (See Fig. 4 and 5.)

7. "FAULT CODES"

   Any time an "F" appears on the display, the compressor will be shut down on a safety control. At this time, the operator should turn the "SELECT DATA DISPLAY" rotary switches to the number "18". When this is done, a Fault Code will appear which can be compared to the "FAULT Code" list to determine the reason for system failure. A list of the codes and their respective number is shown in Fig. 5.

   An "F" Code overrides any other letter code display which may appear. See the "SHUTDOWN SAFETY CONTROLS" and "MANUAL RESET SAFETY CONTROLS" Section for a more detailed explanation of the codes.

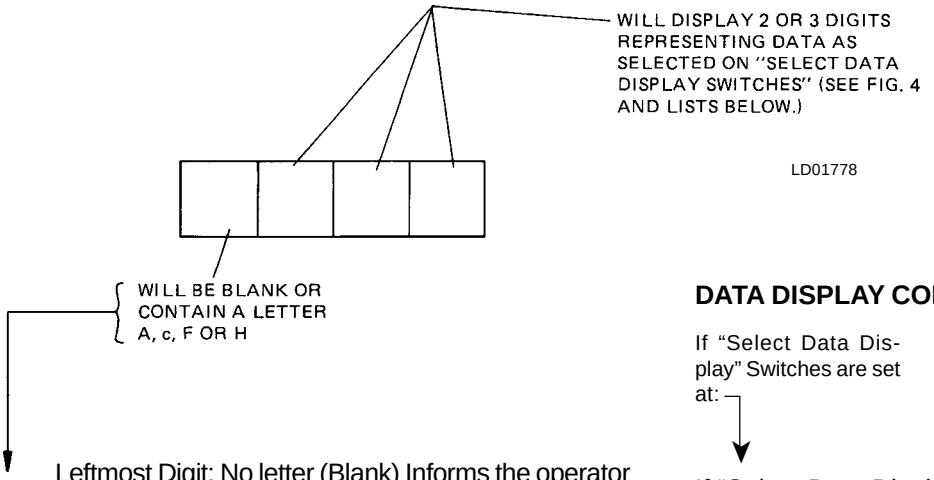
8. "WATER COOLING RANGE CODE"

   Refer to this list when setting up the "WATER COOLING RANGE" rotary switch. Since the switch does not read directly, decoding is necessary.

9. "SELECT DATA DISPLAY" Switches

   These switches can be used to display 18 Test Points for troubleshooting and data recording. This is done via the 2 Rotary Switches marked "Select Data Display". To look at a specific function, select the number of the function from the "Data Display Codes" listing on the panel.

   Proceed by dialing the number up on the "Select Data Display" Rotary Switches. In the event of a failure, the failure can be displayed by selecting #18 of the "Select Data Display". The mode of failure will then be indicated by a number from 0-11. This number can be translated by comparing the number to the "Fault Code" listing on the right side of the panel.



Leftmost Digit: No letter (Blank) Informs the operator that the compressor is ready to run or is running.

A – Indicates that the Flow Switch is open, time clock is telling the system to turn off, or a remote cycling device (EMS, BAS, etc.) is telling the system to turn off These are devices whose dry contacts may be connected in series across terminals 3 and 4 of the terminal block in the lower right corner of the Logic Panel.

c – Shows that the compressor is shut down and cycling on the 2-minute start-up or 10-minute anti-recycle timer. It will be available for start or will restart when the 2-minute and 10-minute anti-recycle timers time out, and demand allows. The "c" code will disappear as soon as the timers time out.*

F – Indicates that a safety threshold has been exceeded and the unit is shut down on a Fault. Turn the Select Data Display to "18" to determine the reason for shutdown. (See list at right.)

H – Indicates that the compressor is off because cooling demand is not present. The compressor will start as soon as cooling demand is required. The H code will override a "c" code.

*Anti-Recycle Timers:

Any time a compressor shuts down for any reason, restart cannot occur until the 10-minute anti-recycle timer has timed out and a minimum of 2 minutes (2-minute start-up timer) has expired since shutdown.

ex. Anti-recycle timer has 8 min. left at shutdown:
Restart can occur in 8 minutes (Anti-recycle time greater than 2 min.)

ex. Anti-recycle timer has 1 min. left at shutdown:
Restart can occur in 2 min. (Anti-recycle time less than 2 min.)

ex. Anti-recycle timer has timed out at shutdown:
Restart can occur in 2 min. (Anti-recycle time less than 2 min.)

ex. Power failure has occured:
Restart can occur 2 min. after the return of power (Anti-recycle time less than 2 min.)

FIG. 5 – DATA DISPLAY

DATA DISPLAY CODES

If "Select Data Display" Switches are set at: → This data will be displayed.

If "Select Data Display" Switches are set at

0.	Return chilled water temperature
1.	Leaving chilled water temperature
2.	Optional
3.	Optional
4.	Low leaving water temperature cutout setting
5.	Chilled water setpoint
6.	Outside Air Temperature
7.	Low Ambient Temperature Cutout Setting
8.	% Full load motor current
9.	Suction pressure, PSIG
10.	Oil pressure, PSID
11.	Discharge pressure, PSIG
12.	Spare
13.	Spare
14.	Spare
15.	Spare
16.	Suction pressure cutout setting, PSIG
17.	Optional
18.	Fault code (See below)**

**FAULT CODES

If F appears in leftmost position and "Select Data Display" Switches are set at 18, any of these Fault Codes may appear: → Description of Fault. (See Next Page for Diagnosis)

0.	No Fault
1.	Micro detected low/hi motor current **or** External hi pressure cutout **or** External motor overload
2.	Low oil pressure, PSID
3.	Low suction pressure, PSIG
4.	Micro detected high pressure cutout
5.	Spare
6.	Spare
7.	Spare
8.	Spare
9.	High ambient temperature
10.	Low ambient temperature
11.	Low water temperature

(YCAH 100)

FAULT CODE DIAGNOSIS

Any time an “F” code is displayed, the compressor will be shut down. The operator should then place the “SELECT DATA DISPLAY” rotary switches to “18”. This will cause a number from 0 to 11 to be displayed. This number can be referenced to the “Fault Codes” which tell the operator which system failed and what the cause was.

At the time of a Fault, the microprocessor stores operating data on the system at the instant of shutdown. Any display selected by the operator will show stored data. This data will remain in storage until the SYSTEM Switch is placed in the OFF position. This clears the microprocessor’s memory of stored data, and any display at this time will be of current system conditions. It also allows the faulted compressor to start.

Before placing the SYSTEM Switch to the OFF position, the operator may (via the “SELECT DATA DISPLAY” rotary switches) select the parameter which caused the fault, and any other related system function, and view their magnitudes at the time of the failure. This can provide valuable trouble-shooting information. Detailed explanations of all system safeties are included in the “START-UP SECTION”.

After clearing the Fault, placing the SYSTEM Switch to the ON position will cause a normal start sequence to begin unless the problem causing the original trouble is still causing safety thresholds to be exceeded. If this occurs, an “F” code will then reappear.

NOTE: The trouble may not immediately show up and the system may run for awhile.

CAUTION: Anytime the system shuts down on a Fault, steps should be taken to find and eliminate the cause of the problem before attempting to restart the system.

The operator should also be aware that before the unit will display an “F” code, the system has already shut down twice on a fault and restarted within the last 90 minutes. This insures that the system will not shut down and lock out on a nuisance trip or if the system is operating under marginal conditions.

The system will shut down instantly when a Manual Reset Fault is sensed, but it will allow automatic restart until it sees a total of any 3 Faults in a 90-minute period. A 90-minute counter is started as soon as the first Fault occurs. If 2 more faults do not occur in the next 90 minutes, the counter is reset to “0”.

After a fault, restart cannot be expected until the anti-recycle timer times out. No display (“F” Code) will be indicated during the first two faults except for a letter code telling the operator the anti-recycle timer is in effect.

After 3 faults, an “F” code will be displayed and the system will not restart. The fault can be cleared and the compressor restarted by placing the System Off/On Switch to the OFF position. However another fault will shut down the system and an “F” code will be displayed. The system will continue to shut down on every Fault until the system runs without faulting for 90 minutes or until power is cycled. Recycling power will reset the counter.

SYSTEM COMPONENTS

Micro Logic Board:

The Micro Logic Board is the controller and “decision maker” in the control panel. It looks at system inputs via the R.P. Relay, Analog Input, and optional Digital Input Boards and provides system control through the Relay Output Board.

Digital Input Board: (optional)

This board allows use of optional remote chilled water temperature select. These remote inputs are converted to logic levels which the Micro Logic Board can understand.

Analog Input Board:

This board receives analog information from transducer (Pressure) and thermistor (temperature) inputs and routes the data to the Micro Logic Board where it is used to control the system.

Relay Output Board:

This board converts logic level outputs from the Micro Logic Board to 120VAC levels used by motor contactors, solenoids, etc. This board allows the Micro Logic Board to control the system operation.

R.P. Relay (Run Permissive):

This Relay replaces the optional Digital Input Board. The R.P. Relay allows connection of remote start/stop and the flow switch contacts to the system.

Power Supply:

The power supply converts 120VAC input from 2T to DC voltages of +5V UNREG, +5V REG, +12V UNREG, +12V REG, and -12V UNREG for supply voltages to operate the integrated circuitry in the panel.

Motor Current Board and C.T.’s:

C.T.’s on the 3ϕ power wiring of the motor send AC signals proportional to motor current to the Motor Current Board which rectifies and filters the signal to variable DC voltage (analog). This analog level is then fed to the Analog Input Board allowing the Micro Logic Board to monitor motor current.

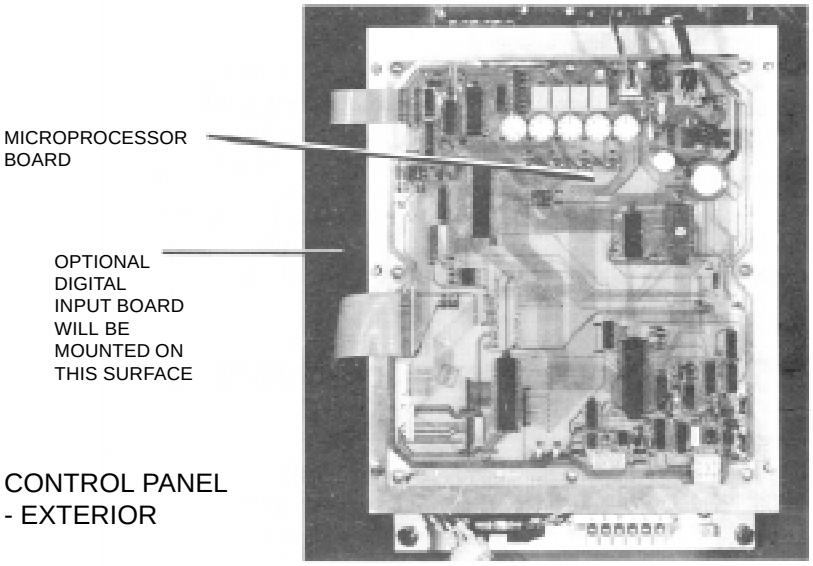


FIG. 6 – CONTROL PANEL - EXTERIOR

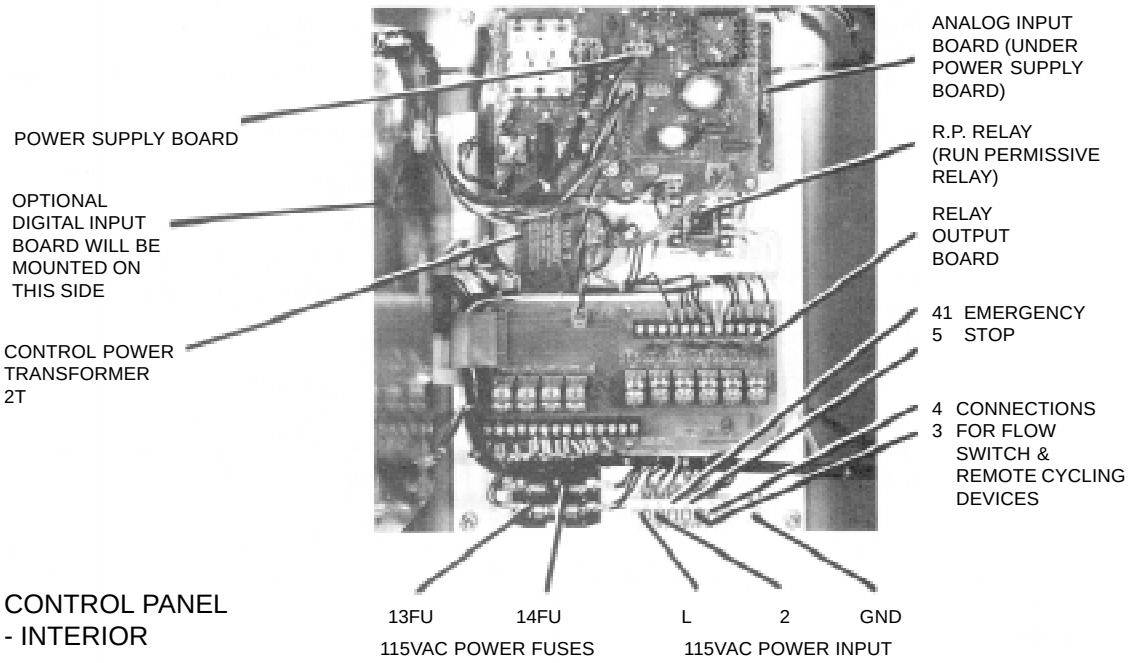


FIG. 7 – CONTROL PANEL - INTERIOR

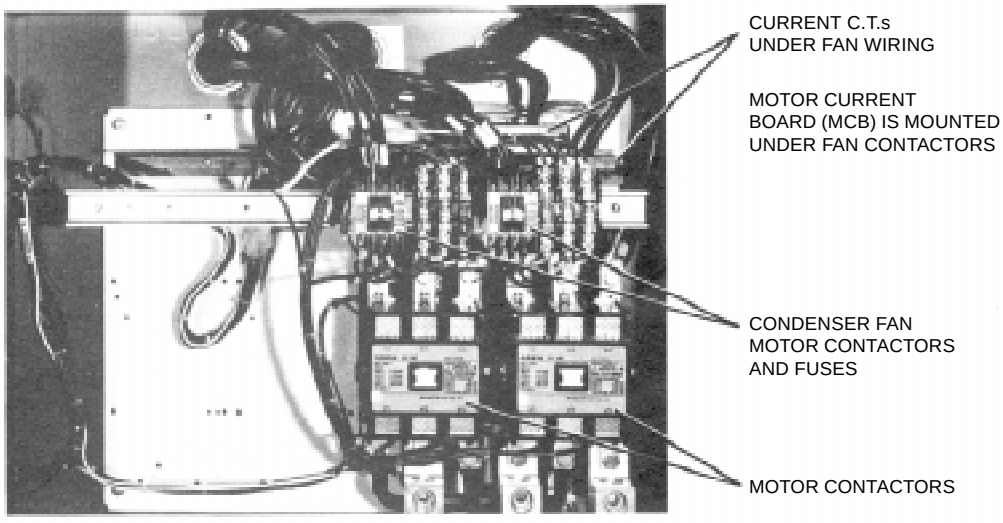


FIG. 8 – YCHA100 POWER PANEL

00007TG

(YCAH100)

SYSTEM SAFETIES

SHUTDOWN SAFETY CONTROLS

A. These software controls in the Micro Board automatically reset and allow restart of the system without operator intervention (auto-restart) when the condition causing the shutdown clears. After the condition causing the shutdown clears, the unit will restart in a minimum of 2 minutes or a maximum of 10 minutes, depending upon the remaining time on the anti-recycle timer. Restart will occur only if cooling demand is present. An "F" code will be displayed for LAT* and HAT* shutdowns. Otherwise, no code will be displayed other than one indicating the anti-recycle timer(s) is in effect.

1. **Power Failure**: After power has been restored, the unit will automatically restart after a 2 minute time delay. System acts as it does any time power is applied. Restart is dependent on cooling demand after the 2 minute start-up timer has completed its cycle.
2. **Flow Switch/Remote Cycling Device**: The Micro Board monitors the closure of the Flow Switch Contacts. Upon opening of the contacts, the unit will shut down and will remain off until the contacts close. Remote devices are wired in series with the Flow Switch and can be used to start and stop the unit. Anytime the contacts open, an "A" Code will appear on the display indicating a Flow Switch problem or an EMS/BAS/Time Clock stop.
3. **Low Pressure Cutout**: Compressor suction pressure cutout is a factory adjustable setpoint (R26) on the Analog Board. It will be factory set at 44 PSIG. If Glycol or Brine is utilized, then the cutout can be varied according to mixture. Suction pressure must be 80% cutout after 30 sec. of running and must remain above cutout after 4 minutes of operation. The system will restart after an LP shutdown provided the anti-recycle timer has timed out and a minimum 2 minute delay before restart has passed.

NOTE: The system will be locked out on a Fault if cycled on LP on 3 successive starts. See LEP (Low Evaporator Pressure Cutout) in the MANUAL RESET SAFETY CONTROLS section.

4. **Low Ambient Temperature Cutout (LAT*)**: Unit is locked out when the ambient temperature is below 0° to 50°F (Adjustable on Analog Board resistor R24). This is factory set at 35°F. Upon a rise in temperature above setpoint, the unit will restart provided the anti-recycle timer has timed out and a minimum 2-minute delay has passed. An "F 10" code will be displayed while the temperature is low and the system will be shut down. The "F" will disappear when temp. rises above cut-out.

* These controls are not furnished as part of the standard unit. A 10K ohm resistor is used in place of them.

5. **High Ambient Temperature Cutout (HAT*)**: Unit locks out when the ambient temperature is above 130°F. Upon a decrease in temperature below 130°F, the unit will restart providing the anti-recycle timer has timed out and a minimum 2-minute delay has passed. An "F9" code will be displayed while the temperature is high and the system will be shut down. The "F" will disappear when temp. drops below cut-out.

MANUAL RESET SAFETY CONTROLS

A. The system will shut down instantly when a Manual Reset Fault is sensed, but it will allow automatic restart until it sees a total of any 3 Faults in a 90-minute period.**A 90-minute counter is started as soon as the first Fault occurs. If 2 more faults do not occur in the next 90 minutes, the counter is reset to "0".

After a fault, restart cannot be expected until the anti-recycle timers time out. No display ("F" Code) will be indicated during the first two faults except for a letter code telling the operator the anti-recycle timer is in effect.

After 3 faults, an "F" code will be displayed and the system will not restart. The fault can be cleared and the compressor restarted by placing the System Off/On Switch to the OFF position. However another fault will shut down the system and an "F" code will be displayed. The system will continue to shut down after restart on **every** Fault with an "F" Code until the system runs without faulting for 90 minutes or until power is cycled. Recycling power will reset the counter to "0".

1. **HP**: Unit shuts down when the discharge pressure exceeds the pressure cutout setpoint of 395 PSI set in software. An "F4" will appear for this safety. See also Note 6) FS (Fault Stop) for external HP safety.
2. **Power Fault**: Analog signals are provided to the Micro-Board by the Motor Current Board (MCB) which gets info from 3 current transformers (C.T.'s). A signal of 4VDC = 100% FLA Current. The system shuts down if the signal is <1.2VDC (<30% FLA) or 4.6 VDC (>115% FLA) when Run Time > 4 sec. This protection assures that both contactors are energized, all C.T.'s are connected and operating, and that the motor is not drawing excessive current. An F1 will be displayed for this safety. NOTE: See also Note 6) FS (Fault Stop).
3. **Oil Pressure Cutout**: An analog signal is provided which is the Differential Oil Pressure (PSID). This PSID provided to the Micro Board = Oil Pressure PSIG - Suction Pressure PSIG. The system shuts down if < 10 PSID at run time 4 - 30 seconds; if <25 PSID at run time 30 seconds - 4 minutes; or if <20 PSID at run time > 4 minutes. An "F2" will be displayed for this cut-out.

** This does not apply to item #4 (LWT Freeze Safety). A fault on the LWT Freeze Safety will cause the system to shut down and lock out on a single fault.

4. **LWT Freeze Safety**: This analog signal is sent by the Leaving Chilled Water Sensor. If the temperature drops to ≤ 36°F(factory setpoint), the system shuts down. For Brine applications, the setpoint can be varied from 20°F to 40°F on the Analog Board by R25. An “F11” code will appear for this safety.
5. **LEP (Low Evaporator Pressure Cutout)**: At run time = 30 sees to 4 min. the micro checks to see that suction pressure is 80% cut-out. If not, it shuts the system down. If the analog signal to the Micro Board tells the system that the Suction Pressure is low on 3 consecutive starts, the system will shut down and lock out. See Shutdown Safety Controls, Low Pressure Cutout for trip points. Any time the system shuts down on a Low Pressure (LP Safety) a 90 min. timer starts and a “count to 3” counter is software is incremented to “1”. If the system goes down 2 more times on a LP Shutdown Safety before the 90 min. timer times out, the system will shut down and lock out on a LEP Manual Reset Safety. If the 90 min. timer times out without 2 more LP shutdowns, the “count to 3” counter will be cancelled and reset to “0”. This safety operates like all other Manual Reset Safeties. An “F3” will be displayed for this cutout.
6. **FS (Fault Stop)**: If external High Discharge Pressure Cutout or external Thermal Motor Overload Sensor contacts open, the system will shut down. The manual reset on the sensor(if equipped) must be reset before the system can be restarted. The external HP cutout is set at 395 PSI. An F1 will be displayed for this safety. Note: These same codes will also be displayed for a Motor Current (power) Fault. This occurs because these safeties do not allow the motor contactor to energize, causing motor current to be “0”. When the system is to start, the Micro sends the start signal to the contactor pilot relay on the Relay Output Board. The pilot relay closes a contact which applies 115VAC to the motor contactor. If the High Pressure C.O. or motor protector opens, their contacts which are wired in series with the pilot relay contacts keep 115VAC from being applied to the motor contactor. The contactor will not pull in as the Micro commands or will drop out if pulled in so the system will shut down on low motor current. Whenever an “F1” Fault occurs, check discharge pressure at the time of the fault, motor current at the time of fault, and also if the H.P. and motor protector contacts are open.

OTHER SAFETY CONTROLS

1. **Suction Pressure:** If Suction Pressure exceeds 105 PSIG, the Micro Board will unload the compressor. It will automatically reload when suction pressure drops below 95 PSIG.
2. Flow Switch: To assure that water flow is present in the evaporator, the Micro Board senses the Flow Switch input to the R.P. Relay whose contacts connect to J18 & J 19 of the Analog Input Board. If the Flow Switch opens, the system will shut down and will not restart until flow is present. An “A” code will be displayed. The Flow Switch is connected to terminals 3 & 4 of the terminal block at the bottom right of the Logic Panel. See Fig. 7.

REMOTE START/STOP BY A TIME CLOCK, BUILDING AUTOMATION, OR ENERGY MANAGEMENT SYSTEM

Remote starting and stopping is accomplished by opening and closing contacts, controlled by a remote source, connected to the R.P. Relay. These contacts will be wired in series with the Flow Switch. The Micro Logic Board looks for the closure of the contacts as a signal to start the system. Opening the contacts is a signal to stop the system. See Fig. 7 for connection points.

Since the remote contacts are wired in series with the Flow Switch, an “A” code will appear on the display when a REMOTE STOP command is given (contacts open). If the optional Digital Input Board is used for Remote Temperature Setpoint Reset, be sure that remote start and stop is connected in series with the Flow Switch and not to the Digital Input Board EMS Start and Stop inputs. These Start and Stop inputs are not active.

“OPTIONAL” REMOTE TEMPERATURE SETPOINT RESET

Remote Temperature Setpoint Reset capabilities can be added by adding an optional Digital Input Board and configuring a jumper/switch on the Micro Logic Board. J9 must be IN or Switch #4 must be ON. See Fig. 11 and 12 for jumper/switch location.

Temperature Setpoint changes are accomplished by closing the contacts between terminals 11 and 12 on the Digital Input Board for a defined period of time. The lowest temperature desired must be set on the panel via the “Return Water Temperature Setpoint” rotary switches. To change the setpoint, the contacts between terminals 11 and 12 must be closed for a period between 1 and 11 seconds. Closure for a period shorter than 1 second will be ignored by the Micro Logic Board. Closure longer than 11 seconds will be treated as 11 seconds.

The contact closure corresponds to a positive offset (rise) from the setpoint on the panel. 1 sec = +0° offset and 11 sec. = +15° or offset = 1.5 (time closed -1 sec.). For example: A setpoint of 51° on the panel and a contact closure of 4.33 sec. will result in an offset of +5°. This raises the RWT setpoint to 56°F.

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To maintain a remote setpoint, EMS Pulse Width Modulation input (terminals 11 and 12) on the Digital Input Board must be refreshed every 30 minutes or less (20 minutes is recommended). In other words, to maintain the 56°F RWT setpoint, the contacts between terminals 11 and 12 must be closed for a period of 4.33 seconds every 20 minutes. If this is not refreshed at least every 30 minutes, the Micro Logic Board will take this as a signal to change the RWT setpoint back to the original setpoint of 51° on the Control Panel.

ANNUNCIATION ALARM CONTACTS (OPTIONAL)

YORK can supply alarm contacts which will de-energize to function as a warning if unit malfunction occurs. A 28 volt external alarm circuit (by others) must be wired into the YORK supplied alarm circuit. If the alarm circuit is applied to chillers used for critical duty (such as process duty, or cooling other critical equipment) and the alarm circuit should fail to function, YORK will not be liable for damages. Any inductive devices (relays) wired into the Alarm circuitry must be suppressed. Use P/N 031-00808B suppressor.

EXTERNAL SYSTEM MONITORING AND DIAGNOSTICS (OPTIONAL)

RS-232 (or equivalent) Serial Communication Output Board

This port on the bottom right of the Logic Board (J6) allows service personnel to obtain a printout of unit conditions at any time. To make use of this option, contact YORK Service or Marketing for recommended printers.

A printout can be requested by pressing the “Press To Print” pushbutton on the Control Panel. This allows service personnel or the customer to obtain system parameters on a periodic basis. *

A print example is shown below.

YORK RECIPROCATING CHILLER
MICROCOMPUTER CONTROL CENTER
SYSTEM STATUS
NO SYSTEM FAULTS

RETURN WATER TEMPERATURE	55.4	DEGF
LEAVING WATER TEMPERATURE	44.0	DEGF
SYSTEM 1 OIL TEMPERATURE	44.0	DEGF
SYSTEM 2 OIL TEMPERATURE	130.8	DEGF
LOW WATER TEMP CUTOUT	36.0	DEGF
TEMPERATURE SETPOINT	54.0	DEGF
OUTSIDE AIR TEMPERATURE	90.2	DEGF
LOW AMBIENT TEMP CUTOUT	35.0	DEGF
SYSTEM 1 MOTOR CURRENT	87	%FLA
SYSTEM 1 SUCTION PRESSURE	66	PSIG
SYSTEM 1 OIL PRESSURE	44	PSID
SYSTEM 1 DISCHARGE PRESSURE	197	PSIG
SYSTEM 2 MOTOR CURRENT	87	%FLA**
SYSTEM 2 SUCTION PRESSURE	59	PSIG**
SYSTEM 2 OIL PRESSURE	51	PSID**
SYSTEM 2 DISCHARGE PRESSURE	191	PSIG**
LOW SUCTION PRESSURE CUTOUT	44	PSIG
TEMPERATURE CONTROL RANGE	54.0	DEGF
TO	48.0	DEGF
SYSTEM 1 LIQUID LINE SOL	NO	
SYSTEM 2 LIQUID LINE SOL	NO**	
SYSTEM 1 LOADED	NO	
SYSTEM 2 LOADED	NO**	
RUN PERMISSIVE	YES	

* Once the printout is obtained, the printer should be disconnected from the panel at J6.

** The values for System 2 will not relate to anything in the system.

(YCHA100)

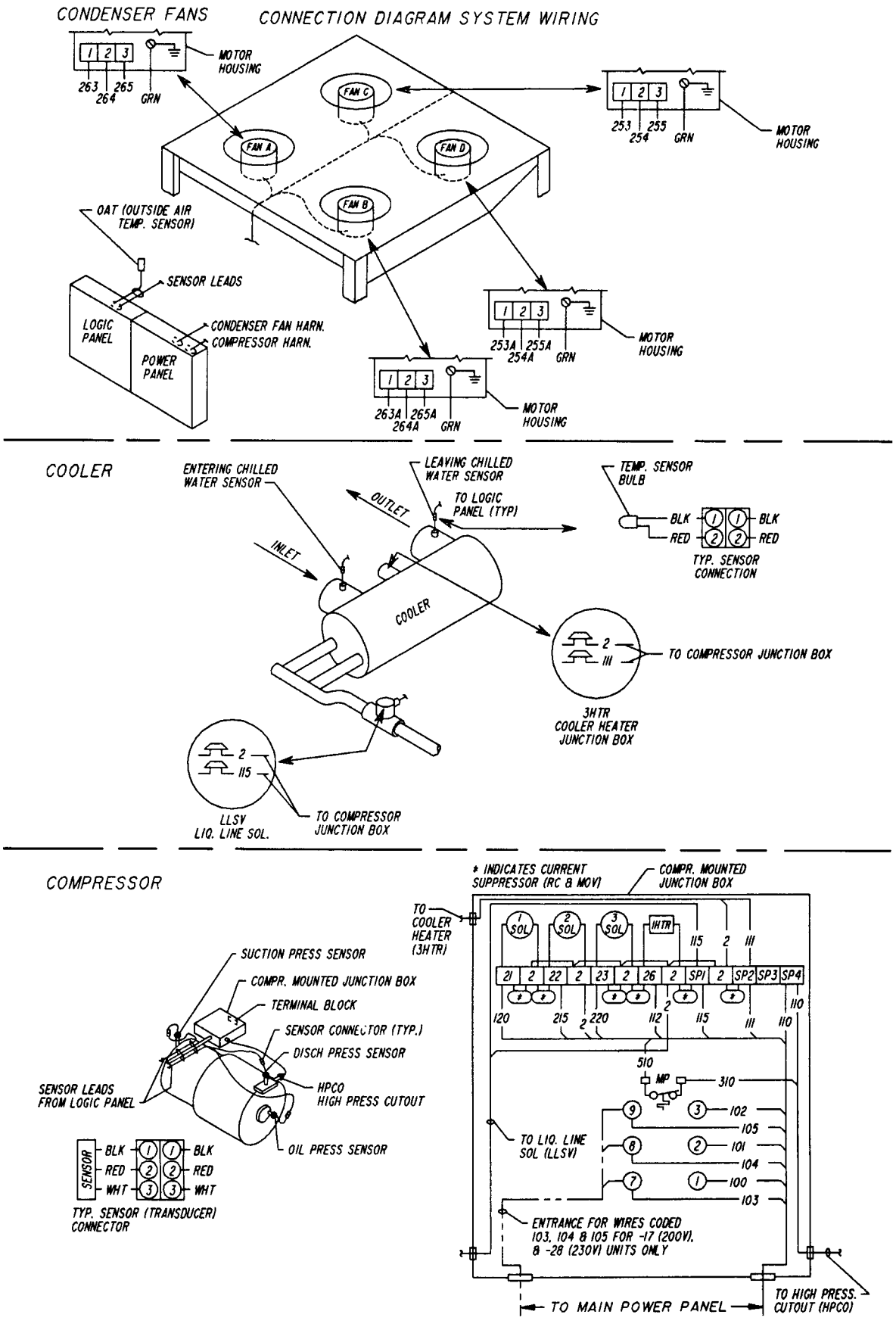

FIG. 9 – WIRING DIAGRAM YCHA100

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(YCHA100)

LEGEND

CDS	CONTROL DISCONNECT SWITCH
CR	CALIBRATING RESISTOR
CT1-CT6	CURRENT TRANSFORMERS
DRP	DIODE (RUN PERMISSIVE RELAY)
FLSW	FLOW SWITCH
1FU-12FU	COND. FAN FUSES 30A, 600V
7FU	CONTROL FUSE 15A, 250V
8FU	MICROPROCESSOR POWER FUSE 8A, 250V
HPCO	HIGH REFRIGERANT PRESS. CUTOUT OPEN 395 PSIG CLOSE 320 PSIG
1HTR	CRANKCASE HEATER
3HTR	COOLER HEATER
1,2,3LDSV	COMPR. LOADING SOLENOID VALVE
LLSV	LIQUID LINE SOLENOID VALVE
1M-2M	COMPRESSOR CONTACTORS
5M-6M	CONDENSER FAN CONTACTORS
MCB	COMPR. MOTOR CURRENT CIRCUIT BOARD
1MOV-6MOV	SURGE PROTECTOR
MP	COMPRESSOR MOTOR PROTECTOR
OAT	OUTSIDE AIR TEMP. SENSOR
P	PLUG
PDS	POWER DISCONNECT SWITCH
PF	POWER FUSE
R	RECEPTICAL
1RC-10RC	SURGE PROTECTOR
RP	RUN PERMISSIVE RELAY
1T	CONTROL TRANSFORMER 2KVA (OPTIONAL)
2T	MICRO PANEL TRANSFORMER
TH	COOLER HEATER THERMOSTAT OPEN 55°F CLOSE 40°F
△	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
□	TERMINAL BLOCK, CIRCUIT BOARD MOUNTED
⬡	TERMINAL BLOCK, COMPR. JUNCTION BOX
———	WIRING BY YORK
— — —	WIRING BY OTHERS

NOTES:

1. FIELD WIRING TO BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. NUMBERS ALONG THE RIGHT SIDE OF THE DIAGRAM ARE LINE IDENTIFICATION NUMBERS. THE NUMBERS AT EACH LINE INDICATE THE LINE NUMBER LOCATION OF RELAY CONTACTS. AN UNDERLINED CONTACT LOCATION SIGNIFIES A NORMALLY CLOSED CONTACT.
3. TERMINAL CONNECTION POINTS ARE INDICATED BY NUMBERS WITHIN A SQUARE (YORK CONNECTIONS) OR A TRIANGLE (CUSTOMER CONNECTIONS) I.E. 2 & 2. COMPONENT TERMINAL MARKINGS ARE INDICATED BY NUMBERS WITHIN A CIRCLE I.E. ②. NUMBERS ADJACENT TO CIRCUIT LINES ARE THE CIRCUIT IDENTIFICATION NUMBERS.
4. THE CHILLED WATER FLOW SWITCH (FLSW) IS CONNECTED BETWEEN TERMINALS 3 & 4.
5. TO CYCLE UNIT ON AND OFF AUTOMATICALLY, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH (FLSW), CONNECTED BETWEEN TERMINALS 3 & 4.
6. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 41 & 5. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 41 & 5.
7. CONTROL PANEL TO BE SECURELY CONNECTED TO EARTH GROUND.
8. CONTROL POWER TRANSFORMER IS OPTIONAL EQUIPMENT.
9. TO USE DATA PRINT-OUT FEATURE, REFER TO YORK INSTALLATION INSTRUCTIONS.

CAUTION:

DO NOT USE THE FLOW SWITCH AS A CYCLING DEVICE! IF WATER FLOW IS USED TO CYCLE THE UNIT, INTERLOCK THE PUMP CONTACTOR WITH A CONTACT CONNECTED IN SERIES WITH THE FLOW SWITCH.

NO CONTROLS (RELAYS, ETC.) SHOULD BE MOUNTED IN THE SMART PANEL ENCLOSURE. ADDITIONALLY, CONTROL WIRING NOT CONNECTED TO THE SMART PANEL SHOULD NOT BE RUN THROUGH THE CABINET. THIS COULD RESULT IN NUISANCE FAULTS.

ANY INDUCTIVE DEVICES (RELAYS) WIRED INTO THE ALARM CIRCUITRY OR PILOT RELAYS FOR CONDENSER PUMP STARTERS WIRED THROUGH MOTOR CONTACTOR AUXILIARY CONTACTS MUST BE SUPPRESSED. USE YORK P/N 031-00808B SUPPRESSOR.

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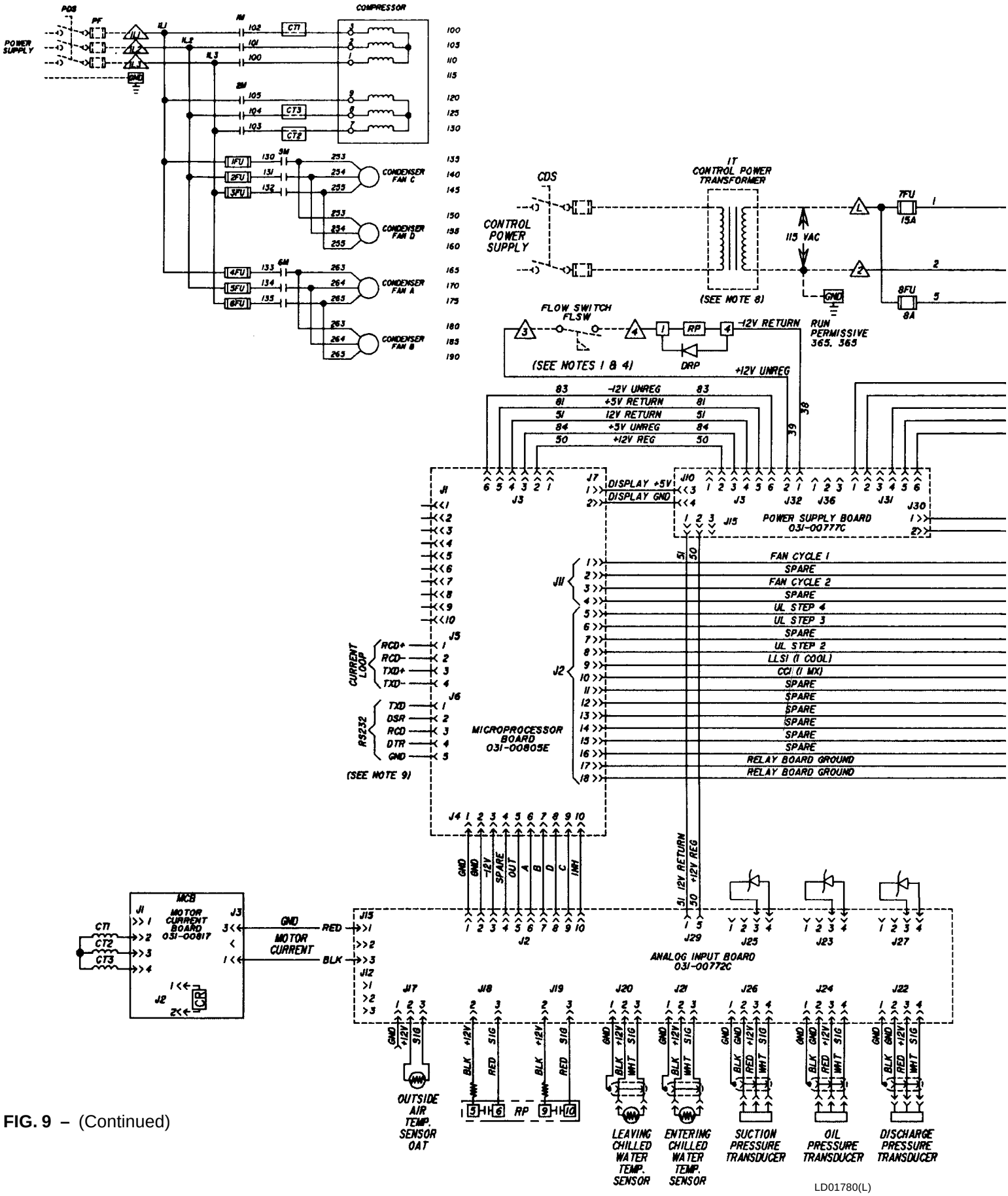
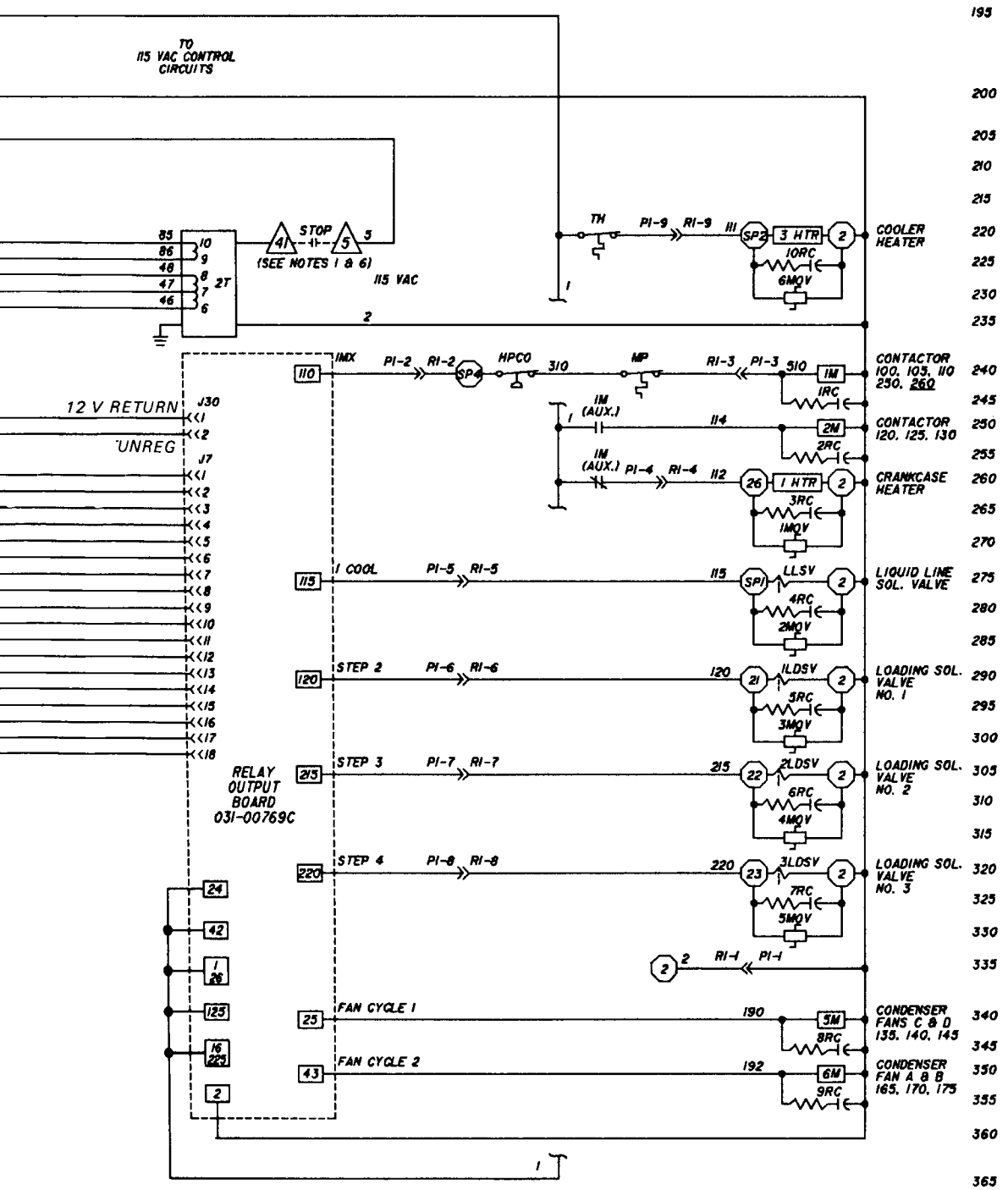


FIG. 9 – (Continued)

(YCHA100)



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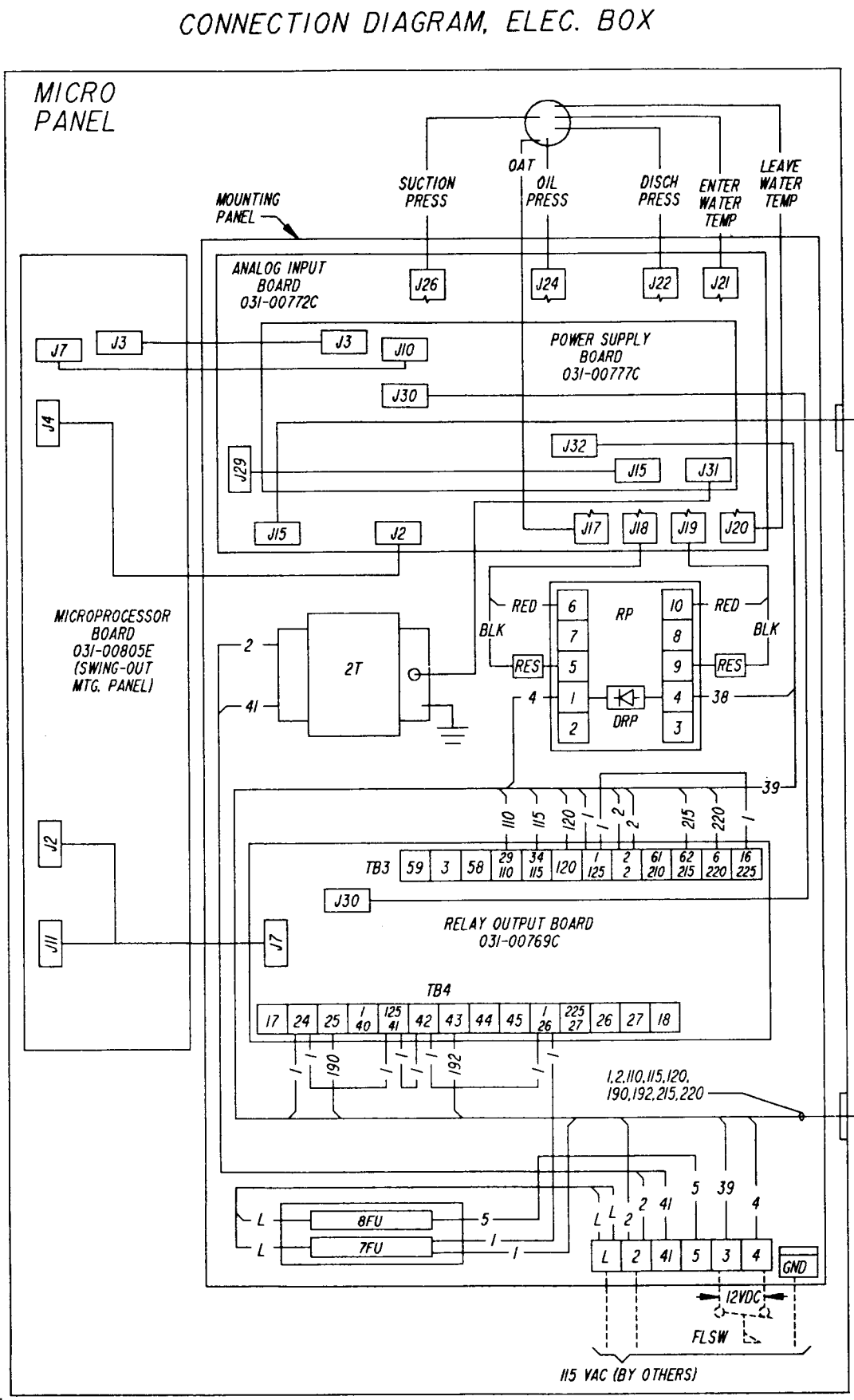

FIG. 9 – Continued

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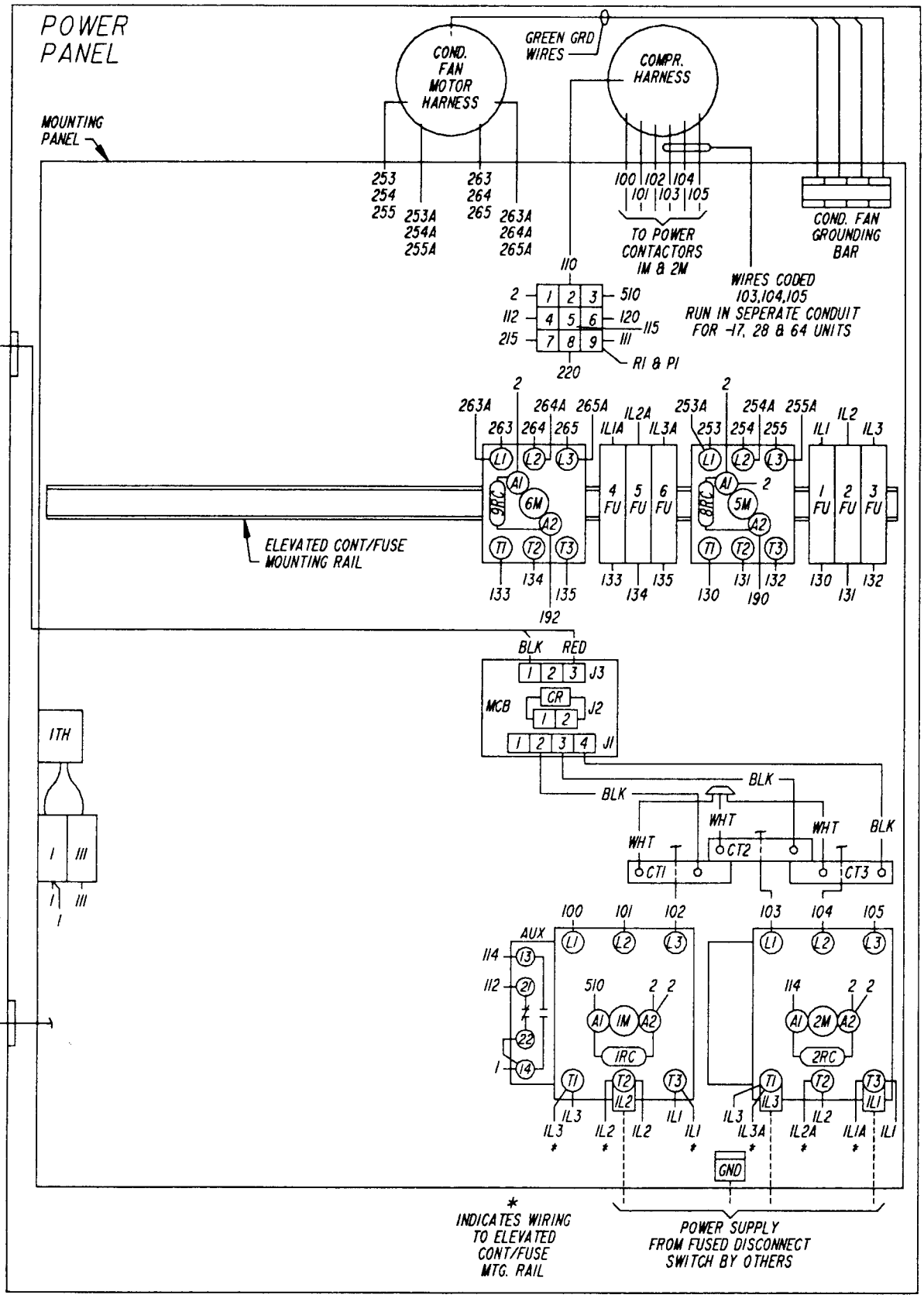

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SYSTEM START-UP AND OPERATION

Checking the System 24 Hours Prior to Initial Start-Up (No Power)

1. UNIT CHECKS
   A. Inspect the unit for shipping or installation damage.
   B. Assure that all piping has been completed and flushed.
   C. Check that the unit is properly charged and that there are no piping leaks.
   D. Suction and discharge stop valves and the refrigerant liquid stop valves are open (ccw).

CAUTION

Compressor lubrication circuit must be primed with YORK "C" oil prior to start-up. Priming should be done through the Schrader fitting at the compressor oil pump. Stroke oil pump 10 times to prime the lubrication circuit.

   E. "Full" oil quantity is shown by an oil level showing in the upper sight glass. "Low" oil quantity is shown by an oil level showing in the lower sight glass. If it is necessary to add oil, connect a YORK oil pump to the oil charging valve, but do not tighten the flare nut on the delivery tubing. With the bottom (suction end) of the pump submerged in oil to avoid the entrance of air, operate the pump until oil drips from the flare nut joint, allowing the air to be expelled, and tighten the flare nut. Open the compressor oil charging valve and pump in oil until oil reaches the proper level as described above. Close the compressor oil charging valve.
   F. Assure water pumps are on. Check and adjust water pump flow rate and pressure drop across cooler. Verify flow switch operation.
   G. Check panel to see that it is free of foreign material (wires, metal chips, etc.).
   H. Visually inspect wiring (power & control). Must meet NEC and all local codes.*, **
   I. Check for proper size fuses in main and control power circuits.
   J. Verify that field wiring matches the 3-phase power requirements of the compressor. See nameplate.**
   K. Assure 115VAC Control Power to TB1 has 30A minimum capacity.*
   L. Be certain all control bulbs are inserted completely in their respective wells and are coated with heat conductive compound.
2. PANEL CHECKS (Power On, System Switch "Off")
   A. Apply 3 phase power and verify its value.**
   B. Apply 115VAC and verify its value on the terminal block in the lower right of the Logic Panel. Make the measurement between terminals 41 and 2. Should be 115VAC ± 10%.*
   C. Assure crankcase heaters are on. Allow crankcase heaters to remain on a minimum of 24 hours before startup. This is important to assure no refrigerant is in the oil at start-up!
   D. *Checking The Electronics*

      A few simple checks will assure that the panel electronics are working and that the system will run when you come back in 24 hrs. for start-up.

      Checking the Microprocessor Board and its Parallel Interface

      Display the Return Water Temp. Setpoint and verify that it matches the Return Water Temp. Setpoint Switches.

      Checking the Analog Input Board and the Microprocessor Board's A/D Converter

      Display the Low Suction Pressure Cutout, Low Water Temp. Cutout, and Low Ambient Cutout. These displays should match the printout placed inside the unit. The printout will provide the unit specs. on the cutouts as ordered by the customer. Deviation from these could be due to a defective board or tampering with the Analog Input Board pots.

      Checking the R.P. Relay

      Remove the wire on terminal 3 & 4 of the terminal block in the lower right corner Logic Panel. Note: Water flow should be present and any remote cycling devices jumpered. By removing the wire, we simulate an open flow switch or cycling device. Consequently an "A" code should appear on the display.

      Checking the Power Supply Board

      If the other boards check out alright, there is almost a100% chance that the Power Supply Board is functioning properly. If any board malfunctions, check its supply voltages. UNREG voltages normally measure 40% high ± 10%. REG voltages should be ±.1V.
   E. By performing the previous checks, we will assure most of the system is functioning properly. Thermistors and transducers can be checked at this point. The display can be checked against a gauge if desired. To assure proper return and leaving water temp. displays, flow must be present. We won't be worrying about checking out the Relay Output Board. This board is easy to diagnose and can easily be field repaired with factory assistance if the need arises.

INITIAL START-UP

After the operator has read the proceeding pages, has become familiar with the control panel and its functions, and has performed the proceeding unit checks and panel checks, the unit can be put into operation. Proceed by setting the switches as follows:

*See Fig. 7. **See Fig. 8.

1. PANEL SWITCHES

   A. Set the Return Chilled Water Temp. to the desired temperature. (This will be leaving water temp. setpoint if this option is utilized.)

   B. Assure the Micro Logic Board jumpers/switches are configured for the unit design and the system's requirement. See pages 31 & 32.

2. Place the System Switch to the ON position. See the OPERATING SEQUENCE for unit operation. The compressor will start and a flow of liquid should be noted in the liquid indicator. After several minutes of operation, the bubbles should disappear and there will be a solid column of liquid when the unit is operating normally. On start-up, foaming of the oil may be evident in the compressor oil sight glass. After the water temperature has been pulled down to operating conditions, the oil should be clear. Normal operation of the unit is evidenced by a hot discharge line, clear oil in the compressor crankcase, solid liquid refrigerant in the liquid indicator and usually no more than 2 PSIG variation in suction pressure for any given set of operating conditions.

   Check direction of fan rotation. Air flow must be "up".

   Allow the compressor to run for a short time, being ready to stop it immediately if any unusual noise or other adverse condition should develop. When starting the compressor, always make sure the oil pump is functioning properly. Compressor oil pressure must be as described under "Oil Pressure Cutout" (See Control Description).

   Check the system operating parameters. Do this by selecting various readouts such as pressure and temperature. Compare these to test gauge readings.

CHECKING SUPERHEAT AND SUBCOOLING

The subcooling should always be checked when charging the system with refrigerant and/or before setting the superheat.

When the refrigerant charge is correct, there will be no bubbles in the liquid sight glass with the system operating under full load conditions, and there will be 10° to 15°F subcooled liquid leaving the condenser.

An overcharged system should be guarded against. Evidences of overcharge are as follows:

a. If the system is overcharged, the discharge pressure will be higher than normal. (Normal discharge pressure can be found in refrigerant temperature/pressure chart; use ambient temperature +30°F for normal condensing temperatures.

b. The temperature of the liquid refrigerant out of the condenser should not be more than 15°F less than the condensing temperature. (The temperature corresponding to the condensing pressure from refrigerant temperature/pressure chart.)

The subcooling temperature should be taken by recording the temperature of the liquid line at the outlet of the condenser and recording the liquid pressure at the liquid service valve and converting it to a temperature from temperature/pressure chart.

Example:

Liquid Line Pressure 260 PSIG converted to	120°F
Minus Liquid Line Temperature Subcooling	105°F
= to	15°F

Add refrigerant to the system to increase subcooling or remove refrigerant to lower subcooling. After the subcooling is set at 10-15°F the superheat should be checked.

The superheat should be checked only after steady operation of the chiller has been established, the leaving chilled liquid has been pulled down to the required temperature, and the unit is running fully loaded. Correct superheat setting is 8° - 12°F.

The superheat is the difference between the actual temperature of the returned refrigerant gas entering the compressor and the temperature corresponding to the suction pressure as shown in a standard pressure/temperature chart.

Example:

Suction Temperature	44°F
Minus Suction Pressure 60 PSIG Converted to Superheat	34°F
	10°F

The suction temperature should be taken 6" before the compressor service valve, and the suction pressure is taken at the compressor suction service valve.

Normally, the thermal expansion valve need not be adjusted in the field. If, however, an adjustment is to be made, the expansion valve adjusting screw should be turned not more than one turn at a time, allowing sufficient time (approximately 20 min.) between adjustments for the system and the thermal expansion valve to respond and return to settled operation. Make sure that expansion valve is not cycling by watching pressures end temperatures curing the waiting period.

If the unit has been functioning satisfactorily during the initial operating period it is ready for continuous operation.

OPERATING SEQUENCE

(Also See Compressor Capacity Control)

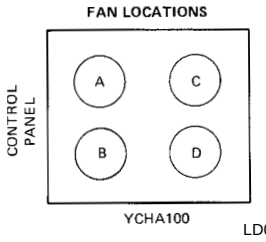
1. For the system compressor to run, all Manual Reset Cutouts must be reset, the Flow Switch must be closed, and any remote cycling contacts must be closed.
2. As long as power is applied, the Crankcase Heater will be on and stay on as long as the compressor is not running.
3. When the System Power Switch is applied, the unit will start a 2 minute start-up timer.

4. At the end of the 2 minute timer, the 10 minute anti-recycle timer will start at **T = 0**. At this time the Micro Board will check all system conditions. If no safeties are tripped and cooling demand is present, the compressor will start (unloaded). If a safety is tripped or no cooling demand is present, the timer will stay at **T = 0** until proper conditions exist. Coincident with the start of the compressor, the liquid line solenoid will open after pumpdown is completed.
5. **T = 4 sec. –** The motor current of the compressor must be > 30% FLA and < 115% FLA. Oil pressure must be ≥ 10 PSID. If these conditions are not met, the compressor shuts down.
6. **T = 30 sec. –** At this time the oil pressure of the compressor must be a minimum of 25 PSID and suction pressure must be 80% of cutout.
7. **T = 2 min. –** Compressor will load if cooling demand requires.
8. **T = 4 min. –** The compressor's suction pressure must be ≥ cutout (cutout = 44 PSIG). At the same time, the oil pressure of the compressor must be > 20 PSID.
9. **T = 10 min. –** The anti-recycle timer times out. This places the timer at **T = 0** position. The compressor will run as long as cooling demand exists.
10. If cooling demand drops and the compressor shuts down, restart cannot occur until the 10 minute anti-recycle timer times out and a minimum time of 2 minutes passes. This assures a minimum time of 2 minutes passes between starts, even if a power failure occurs. At restart, the 10 minute anti-recycle starts at **T = 0**.
11. **Crankcase Heater –** Any time the compressor stops, the crankcase heater will be energized.
12. **Pumpdown –** The system is equipped with a pumpdown on start-up routine which eliminates the need for re-cycling pumpdown. On start-up of the compressor, the system will pumpdown to approx. 15 lb. above the suction pressure cutout before the liquid line solenoid opens. As a result of this, no pumpdown mode is included in the system switch.

FAN CYCLING

Condenser Fans are normally cycled by the Micro in response to outside ambient temperature. If the outside temp. is above 35°F, fans C and D will come on 4 sec. after the compressor starts. If the outside temp. is above 55°F, fans A and B will come on 30 sec. after the compressor starts.

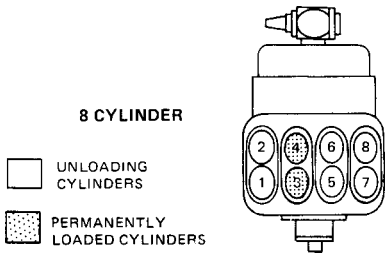
Fan cycling by temperature can be overridden (at temperatures below 55°F) by Condenser Pressure. If the temp. requirements are not met to turn on the fans, the fans will cycle according to discharge pressure on the chart below.



FAN CONTACTOR	FANS CONTROLLED	DISCHARGE PRES. TO CYCLE FANS	
		"ON"	"OFF"
5M	C, D	260 LB.	190 LB.
6M	A, B	280 LB.	210 LB.

COMPRESSOR CAPACITY CONTROL

The function of the compressor capacity control system is to automatically adjust the compressor pumping capacity to balance with the cooling load at a predetermined return water temperature and to permit the compressor to start under partial load. The compressor capacity control system is actuated by means of high pressure oil from the compressor oil pump. Oil pressure to the power element loads the associated cylinders and release of this pressure unloads them. Control of the oil pressure to the unloader elements is the function of the compressor capacity control solenoids located on the front handhole cover. The compressor is loaded when the solenoid is de-energized, and unloaded when the solenoid is energized. Unloading is accomplished by lifting and holding the suction valve off its seat. The gas, drawn into the unloaded cylinders on the down stroke of the piston, is pumped back into the suction chamber of the compressor housing, without compression, when the piston returns on its up-stroke. All cylinders equipped with unloaders will remain unloaded on start-up until the oil pressure has built up to normal. On the compressor, certain cylinders do not unload. (See Fig. 10.)



CHILLER MODEL	NO. OF CYLINDERS	
	60 Hz	50 Hz
YCHA100	8	8

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LOADING/UNLOADING [RETURN WATER TEMPERATURE (RWT) CONTROL – STANDARD]

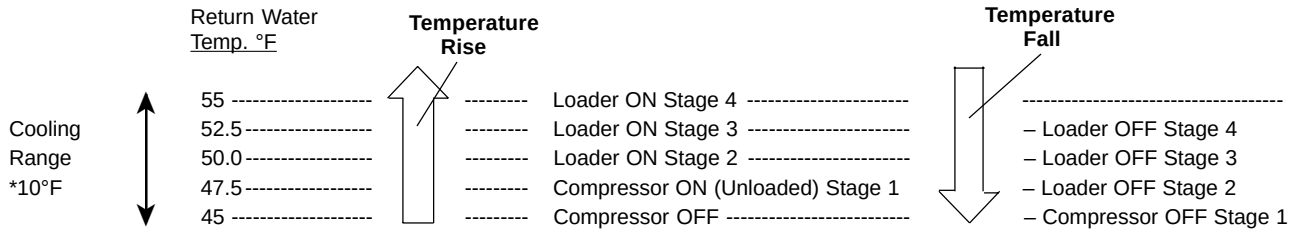
Loading/Unloading of cylinders is accomplished in response to return chilled water temperature as sensed by the Micro Logic Board. Cooling Ranges from 6 to 14°F can be selected to control loading/unloading. A typical example is illustrated below.

RWT Setpoint = 55°F

Cooling Range = 10°

System Switch = ON

J10 on Micro Logic = OUT
or
Sw. 3 on Micro = OFF
} RWT CONTROL



*10°F ÷ 4 stages = 2.5°F between stages of loading.

OPTIONAL LOADING/UNLOADING [LEAVING WATER TEMPERATURE (LWT) CONTROL]

Optional loading and unloading of cylinders can be accomplished in response to leaving chilled water temperature as sensed by the Micro Logic Board.

LWT Control is selected by placing Switch #3 ON or J10 IN on the Micro Logic Board. Various cooling ranges can then be selected depending upon the allowable deviation from setpoint.

Control Ranges can be selected on the front panel with the Cooling Range Rotary Switch. The Cooling Range Codes and their respective cooling ranges are listed at the right.

CODE	RANGE
0	± 1.0°F
1	± 1.2°F
2	±1.4°F
3	±1.5°F
4	±1.6°F
5	±1.8°F
6	±1.9°F
7	±2.0°F

NOTE: On LWT Control, the cooling ranges on the Control Panel are no longer meaningful.

CAUTION: Selection of the Cooling Range should be made according to the deviation from setpoint which can be tolerated and whether more than normal system cycling of the loaders and compressor is experienced due to a cooling range which is too tight.

Page 30 shows a listing of each cooling range code along with the temperatures at which each stage loads and unloads.

(YCHA100)

LWT COOLING RANGES

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.0°F	Setpoint plus 0.5°F
SWITCH = 0	Loader Stage 3	Setpoint plus 0.5°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 0.5°F
OF ± 1.0°F	Compressor Stage 1	Setpoint minus 0.5°F	Setpoint minus 1.0°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.2°F	Setpoint plus 0.6°F
SWITCH = 1	Loader Stage 3	Setpoint plus 0.6°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 0.6°F
OF ± 1.2°F	Compressor Stage 1	Setpoint minus 0.6°F	Setpoint minus 1.2°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.4°F	Setpoint plus 0.7°F
SWITCH = 2	Loader Stage 3	Setpoint plus 0.7°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 0.7°F
OF ± 1.4°F	Compressor Stage 1	Setpoint minus 0.7°F	Setpoint minus 1.4°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.5°F	Setpoint plus 0.8°F
SWITCH = 3	Loader Stage 3	Setpoint plus 0.7°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 0.8°F
OF ± 1.5°F	Compressor Stage 1	Setpoint minus 0.7°F	Setpoint minus 1.5°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.6°F	Setpoint plus 0.8°F
SWITCH = 4	Loader Stage 3	Setpoint plus 0.8°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 0.8°F
OF ± 1.6°F	Compressor Stage 1	Setpoint minus 0.8°F	Setpoint minus 1.6°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.8°F	Setpoint plus 0.9°F
SWITCH = 5	Loader Stage 3	Setpoint plus 0.9°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 0.9°F
OF ± 1.8° F	Compressor Stage 1	Setpoint minus 0.9°F	Setpoint minus 1.8°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 1.9°F	Setpoint plus 1.1°F
SWITCH = 6	Loader Stage 3	Setpoint plus 1.1°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 1.1°F
OF ± 1.9°F	Compressor Stage 1	Setpoint minus 1.0°F	Setpoint minus 1.9°F

	STAGE	ON	OFF
COOLING RANGE	Loader Stage 4	Setpoint plus 2.0°F	Setpoint plus 1.0°F
SWITCH = 7	Loader Stage 3	Setpoint plus 1.0°F	Setpoint
COOLING RANGE	Loader Stage 2	Setpoint	Setpoint minus 1.0°F
OF ± 2.0°F	Compressor Stage 1	Setpoint minus 1.0°F	Setpoint minus 2.0°F

(YCHA100)

MICRO LOGIC BOARD JUMPERS/SWITCHES

The Micro Logic Board can be configured for various options (Remote/Local Control and RWT/LWT Control). These options are available on REV. B and REV. C Micro Logic Boards.

REV. B boards actually utilize three jumpers for these options (J8, J9, and J10). REV. C boards replace the jumpers with a Dip Switch which has 7 miniature rocker switches built into a single pack. 2 of the 7 switches are active.

An explanation of the Jumpers/Switches on the Micro Logic Board is provided on this page and page 32.

MICRO LOGIC BOARD JUMPER OPTIONS (REV. B BOARDS)

Three jumpers are available for the options on the Rev. B Micro Logic Board.

J8: Spare

J9: Remote Temperature Setpoint Reset

- OUT: Local (Panel Control Only)
- IN: Remote (Remote Control of Temperature Setpoint Reset. You must have a Digital Input Board to use Remote Control.)

J10: Selects RWT or LWT Control

- OUT: RWT Control
- IN: LWT Control

See Figure below for J8, J9, and J10 location.

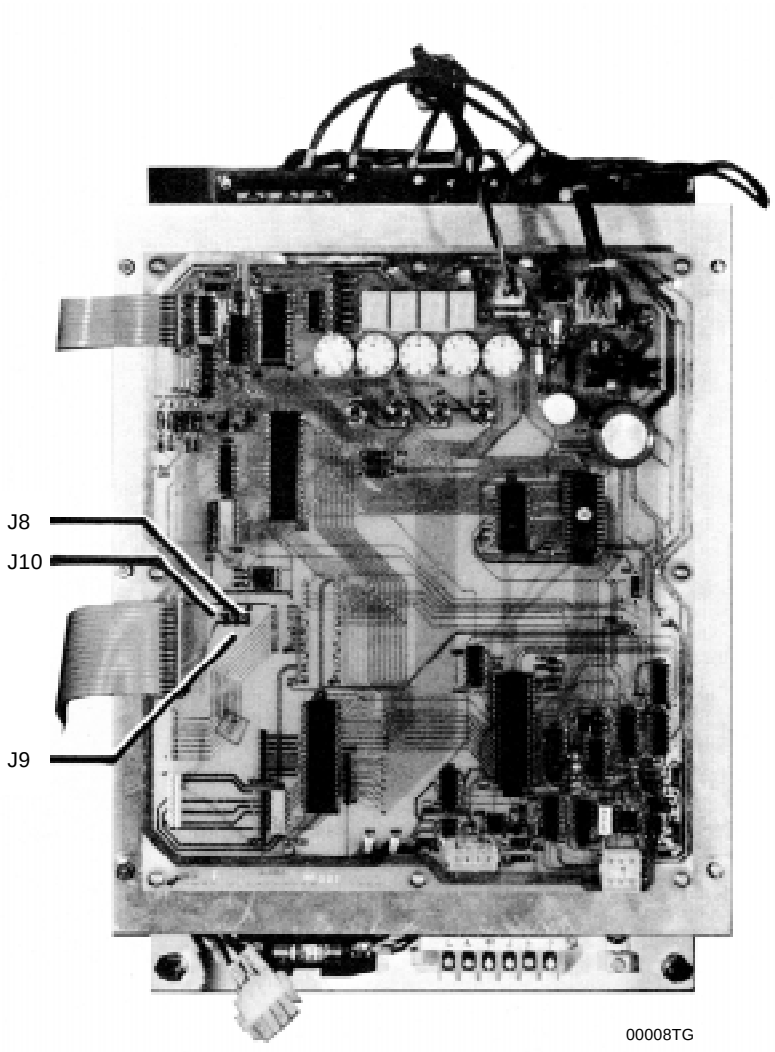
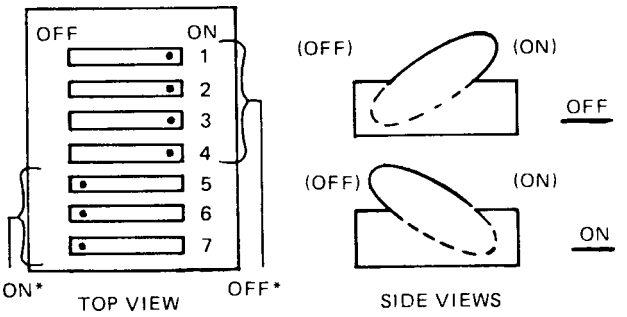


FIG. 11 – MICRO LOGIC BOARD JUMPERS (REV. “B” BOARD)

MICRO LOGIC BOARD DIP SWITCH OPTIONS (REV. C BOARDS)

A Dip Switch (U39) with 7 miniature rocker switches is available for options on the REV. C Micro Logic Board.



1 = Spare
2 = Spare
3 = OFF: RWT Control (Standard as Shipped)
ON: LWT Control
4 = OFF: No EMS Control (No Digital Input Board, Standard As Shipped)
ON: EMS Control (Optional Digital Input Board Installed) of Remote Temperature Setpoint Reset
5 = Spare
6 = Spare
7 = Spare

* Refer to above sketch to identify “OFF” and “ON” positions. The “dot” can be misleading when identifying switch position. See the “Side View” drawings for recommended position verification.

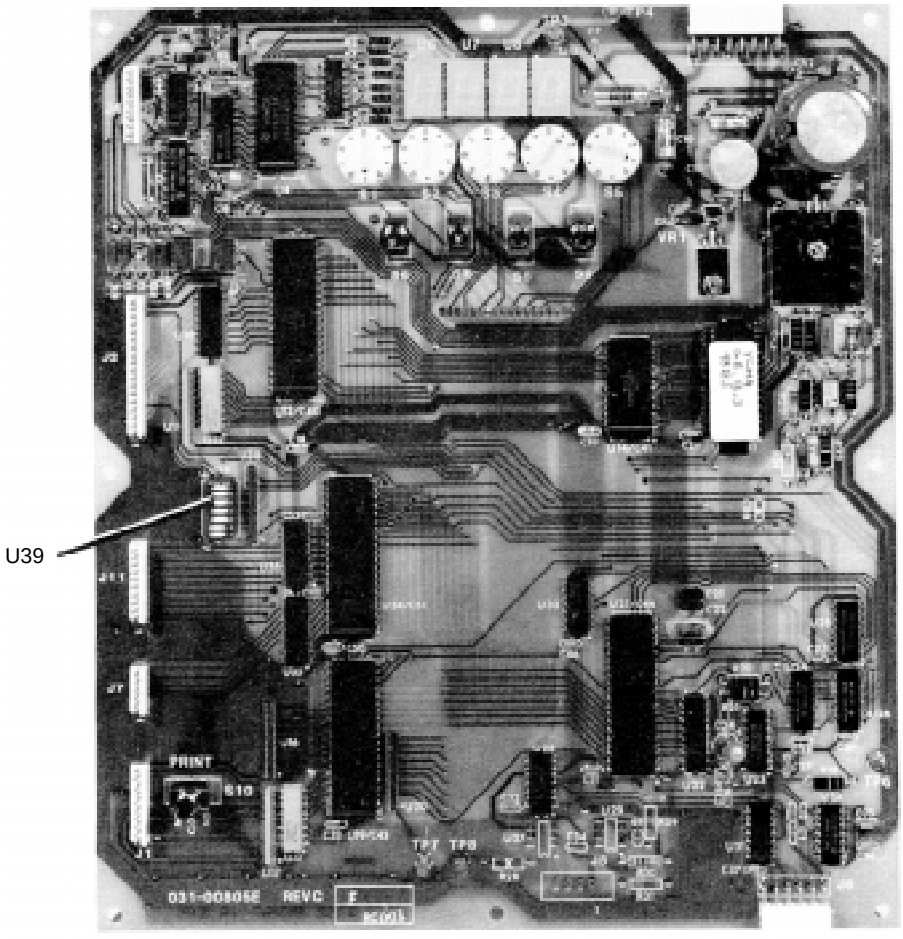


FIG. 12 – MICRO LOGIC BOARD DIP SWITCHES (REV. “C” BOARD)

(YCHA100)

PREVENTATIVE MAINTENANCE

It is the responsibility of the owner to provide the necessary daily, monthly and yearly maintenance requirements of the system. IMPORTANT – If a system failure occurs due to improper maintenance during the warranty period; YORK will not be liable for costs incurred to return the system to satisfactory operation. The following is intended only as a guide and covers only the chiller unit components. It does not cover other related system components which may or may not be furnished by YORK. System components should be maintained according to the individual manufacturers' recommendations as their operation will affect the operation and life of the chiller.

DAILY MAINTENANCE

It is recommended that the following items be checked daily.

1. Oil Level – Correct oil level is when oil appears in either of the compressor oil sight glasses after the unit has been in operation for about two hours. If it necessary to add oil after this operating period, see item #3 under the ANNUAL MAINTENANCE section.
2. Oil Pressure – Oil pressure should be a minimum of 20 PSI above suction pressure.
3. Compressor Superheat – Correct superheat is 10-15°F measured at the compressor.
4. Operating Pressures and Temperatures – Check to see that operating pressures and temperatures are within the LIMITATIONS shown in this book.

WEEKLY MAINTENANCE

It is recommended that the following items be checked weekly.

1. All items listed under DAILY MAINTENANCE.
2. Color of Compressor Oil – New oil is clear, and if the system is not contaminated with moisture and/or foreign material, should retain its new appearance for a reasonable length of operating time. Discoloration of the oil, either turning darker brown or in some cases lighter, is an indication of contamination, basically due to moisture. If it is necessary to charge oil refer to item #3 under the ANNUAL MAINTENANCE section.
3. Check the refrigerant circuit for leaks.

ANNUAL MAINTENANCE

It is recommended that the following items be checked annually.

1. All items listed under WEEKLY MAINTENANCE.
2. Operating Controls – Check to see if controls are set and operating within the proper limits. See Operating Controls in the OPERATION section of this book.
3. Compressor Oil – Drain inspect and refill with new oil. This requires pumping out the compressor. If possible, this should be done after the unit has been in operation for some time, when the oil in the crankcase will contain the least amount of refrigerant. To pump out the compressor proceed as follows:
   A. Close the suction stop valve.
   B. Open the discharge stop valve two turns of the stem.
   C. Operate the compressor until 15 to 20 inches vacuum is obtained. Do this by disconnecting the wiring to LLSV and repeatedly starting the compressor. Recycle 115VAC power to the Logic Panel to reduce anti-recycle time to 2 min. if needed. The compressor should in no case be operated under vacuum conditions for longer than 10 to 15 seconds.
   D. Stop the compressor and immediately close the discharge stop valve. The procedures outlined in steps (b) and (c) above should be repeated if the suction pressure rises rapidly to 15 PSIG or more which would indicate considerable refrigerant remaining in the crankcase oil. Do not expect to retain 0 PSIG, since some refrigerant will continually be released from the oil in the crankcase.
   E. After pumping down the compressor, wait until the pressure builds up to 2 or 3 PSIG before opening up any part of the hermetic compressor.
   F. Open the oil drain valve slowly and drain as much oil from the compressor as possible.
   G. Examine the oil for any metal particles which would indicate wear on the bearings, crankshaft or connecting rods. If metal particles are found, the need for closer examination by factory service personnel is indicated.
   H. If the oil is clean and free of metal particles, refill the compressor with YORK oil "C". To add oil or to fill the compressor crankcase, connect the delivery tube of the YORK Hand Oil Pump, YORK Part No. 470-10654 or equal to the compressor oil charging and drain valve. Expel all air from the delivery tube by pumping it full of oil, allowing a few drops to drip out before tightening the flare nut to the oil charging valve. Then open the oil charging valve and pump oil into the crankcase to the proper level. It is necessary that the suction end of the hand oil pump be kept submerged under the oil level in the container at all times to avoid entrance of air into the compressor.
   I. Before opening the suction or discharge stop valves, connect a vacuum pump to the pump-out port in the discharge stop valve. (Pumpdown port is port on valve stem side of valve.) With the vacuum line shutoff valve open, run the vacuum pump until a vacuum of at least 1000 microns is reached. Stop the vacuum pump, close the shut-off valve and open the discharge valve fully before disconnecting the line from the vacuum pump. Disconnect the vacuum pump and replace the plug in the pump-out port.

NOTE: If suction or discharge valves are not properly seated, a 1000 micron vacuum will not be obtained. Do not evacuate for extended periods of time.

   J. Be sure both discharge and suction stop valves are open before operating the unit.
4. Suction and Discharge Valves – The condition of the suction and discharge valves should be checked by YORK service personnel.

TROUBLE-SHOOTING THE YCHA 100 (STYLE C) CHILLER

Each YCHA (Style C) Chiller is equipped with a micro-processor control panel (sometimes referred to as a "Smart Panel"). The panel not only serves as a means of accurate, reliable chiller operation; but also as a valuable service (or trouble-shooting) aid. To obtain the greatest benefit from the panel, the operator or service technician must be familiar with the way it operates. The following steps are suggested:

1. Study (and re-study) the preceding pages on "Unit Controls and Operation".
2. Observe the panel frequently during normal operation.
3. Keep a daily "log sheet" of normal operating conditions such as pressures, temperatures, motor current, etc. See list at right.
4. Do not attempt to service or diagnose the unit unless you have completed the above steps.

This procedure will help you to make a prompt, accurate diagnosis of most operating problems.

The following trouble-shooting chart lists some common problems, their cause and suggested solution(s). Problems beyond the scope of this manual should be referred to the local YORK Service Representative.

GENERAL

Before starting any service, or attempting to correct an operating problem the operator should "dial up" the Data Display Codes and complete the following chart (also refer to page 14). *DO THIS BEFORE CHANGING THE POSITION OF ANY TOGGLE SWITCHES. CHANGING THE POSITION OF THE SYSTEM TOGGLE SWITCH WILL RESULT IN LOSS OF ALL STORED DATA.*

0. Return chilled water temperature _____°F
1. Leaving chilled water temperature _____°F
2. Optional
3. Optional

} Not used on YCHA 100

4. Low leaving water temp. cutout setting ____°F
5. Chilled water setpoint _____°F
6. Outside Air Temperature _____°F
7. Low Ambient Temp. Cutout Setting _____°F
8. % Full load motor current
9. Suction pressure _____ PSIG
10. Oil pressure _____ PSID
11. Discharge pressure _____ PSIG
12. Spare
13. Spare
14. Spare
15. Spare

} Not used on YCHA 100

16. Suction pressure cutout setting _____ PSIG
17. Optional – Not used on YCHA 100
18. Fault code (if any) see page 14

Using test equipment that is calibrated accurately (pressure gauges, temperature probes, digital volt meters, etc.) verify the Data Display Code readings logged above. Note any significant difference. Check that all sensors are properly installed and that the wiring to the sensors is not cut or shorted. Check that all manual stop valves on unit are open.

(YCHA 100 – STYLE C)
TROUBLE-SHOOTING CHART

PROBLEM	CAUSE	SOLUTION
No display on panel Unit will not operate	1. No 115VAC to 2T	1. Check wiring and fuse., Check emergency stop contacts 41 to 5
	2. Faulty Wiring	2. Check wiring 2T to PSB
	3. Power Supply Board (PSB)	3. Replace PSB
	4. 2T defective	4. Replace 2T
	5. Micro Board defective	5. Replace Micro Board (Contact the local YORK service representative)
"A" Code on Display	1. No Flow	1. Check Chilled Liquid Flow
	2. Flow Switch Installed Improperly	2. Check that Flow Switching is Installed According to Manufacturer's Instructions.
	3. Defective Flow Switch	3. Replace Flow Switch
	4. Remote Stop	4. Check Cycling Devices connected to terminals 3 & 4 of the Logic Panel Terminal Block
	5. Defective Run Permissive (R.P.) Relay	5. Replace R.P. Relay
	6. Defective Analog Input Board	6. Replace Analog Input Board (Contact the local YORK service representative.)

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PROBLEM	CAUSE	SOLUTION
F1 Fault Code Faults on motor current. Motor Contactor May or May Not Energize	1. External High Pressure Switch tripped	1. Check External High Pressure switch and related problems in “Cuts-out on High Discharge Pressure” section (F4 Fault Code)
	2. External Motor Overload tripped	2. Check for defective External Motor Overload, wiring, & motor problems
	3. Improper System High Voltage Supply	3. Check System High Voltage Supply
	4. Defective motor	4. Check motor
	5. Faulty wiring single phasing	5. Check wiring
	6. Motor Current Board defective	6. Replace Motor Current Board (Contact the local YORK service representative.)
	7. Defective Current Transformer	7. Replace defective Current Transformer
	8. Defective 13FU or 120VAC power missing from Relay Output Board and motor contactors.	8. Check fuse (13FU) & wiring
	9. Defective Motor Contact or Auxiliary Contacts	9. Replace Contactor or Auxiliary Contacts
	10. Defective Relay Output Board	10. Replace Relay Output Board (Contact the local YORK service representative.)
F2 Fault Code Low Oil Pressure Fault	1. Low Oil Charge	1. Oil level should be visible in either sight glass at all times. Add YORK “C” oil if necessary.
	2. Too much refrigerant in oil, particularly on start-up.	2. Check Crankcase Oil heater operation. (350 Watt heater should be “ON” when unit is “OFF”. Measure Heater Current Should be Min. 2 Amps).
	3. Liquid Line Solenoid Valve (LLSV) not opening.	3. Check wiring and LLSV
	4. Suction Press. Transducer defective	4. Replace Transducer
	5. Oil Press. Transducer defective	5. Replace Transducer
Follow steps listed under GENERAL above to verify cut-out point (44 PSIG), (or as appropriate for brine).		
F3 Fault Code Faults on Low Pressure	1. Low Refrig. Charge	1. Repair Leak/Add Refrig.
	2. Fouled Filter Drier	2. Change Drier Core
	3. Thermal Expansion Valve Failure	3. Adjust Compressor Suction Superheat to 110°F or Replace Power Element (or Valve)
	4. Reduced Flow of Chilled Liquid through cooler	4. Check GPM (See OPERATING LIMITATIONS, page 3) Check operation of pump. Clean Pump Strainer, Purge Chilled Liquid System of air
	5. Check LP Cutout Point on Panel	5. See manual for adjustment procedure
	6. Defective Suct. Press. Transducer	6. Replace Transducer
	7. Fouled Compressor Suction Strainer	7. Remove & clean strainer
	8. LLSV not opening	8. Check Wiring & LLSV
	9. Faulty wiring to Transducer	9. Check Wiring
	10. Defective Relay Output Board	10. Replace Relay Output Board (Contact the local YORK service representative.)
	11. Defective Analog Input Board	11. Replace Analog Input Board (Contact the local YORK service representative.)
	12. Defective Micro Board	12. Replace Micro Board (Contact the local YORK service representative.)

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PROBLEM	CAUSE	SOLUTION
F4 Fault Code Cuts out on High Discharge Pressure as sensed by Microprocessor via high discharge pressure transducer. *NOTE: If external H.P. Cut-out Switch trips the Fault Code will be an F1.*	1. Condenser fans not operating or rotating backwards. 2. Too much refrigerant 3. Air in refrigerant system 4. Defective Discharge Press. Transducer 5. Defective Relay Output Board 6. Defective Analog Input Board	1. Check fans, Fuses, and Contactors. Air flow must be “up”. 2. Remove Refrigerant 3. Evacuate and recharge 4. Replace Discharge Press. Transducer 5. Replace Relay Output Board (Contact the local YORK service representative.) 6. Replace Analog Input Board (Contact the local YORK service representative.)
F9 Fault Code Cuts out on high ambient temperature. (Max.= 130°F. Will re-start automatically if temperature drops below 130°F)	1. Temperature sensed incorrectly by thermistor 2. Fans Rotating Backwards 3. Air flow to unit restricted (or being re-circulated)	1. Verify actual ambient temperature at probe. 2. Air flow must be “up”. Correct fan rotation. 3. Check installation clearances. (See page 4)
F10 Fault Code Cuts out on Low Ambient Temperature (35°F min. for Std. Unit. 0°F min. for Low Ambient Unit.) *NOTE: Operation below 35°F requires Low Ambient Accessory Kit*	1. Temperature sensed incorrectly by thermistor. 2. Check Low Ambient Temp. Cut-out setting on display (Display Code 7)	1. Verify actual ambient temperature at probe. 2. Adjust if necessary.

Follow steps listed under GENERAL above to verify cutout set point and actual cutout reading. Factory Setting = 36°F (or as appropriate for brine).

F11 Fault Code Low Water Temperature Shutdown	1. Check LWT Cutout Point on Panel. 2. Defective LWT or RWT sensor	1. Adjust if necessary, and restart unit. 2. Check according to following table (use digital volt meter)* Replace if necessary. **Temp.° F** / **Voltage-(DC)** 30.9 / 1.67 33.6 / 1.79 36.3 / 1.91 38.9 / 2.03 41.4 / 2.15 43.9 / 2.28 46.3 / 2.40 48.6 / 2.52 50.8 / 2.64 53.0 / 2.76 55.1 / 2.89 57.2 / 3.01 59.3 / 3.13 61.3 / 3.25 63.2 / 3.37 *Check voltage on Analog Input Board LWT: J20-1 to J20-3 RWT: J21-1 to J21-3

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PROBLEM	CAUSE	SOLUTION
Low Compressor Oil Level (Particularly on Start-Up)	1. Low Oil Charge	1. Oil level should be visible in either sight glass at all times. Add YORK “C” oil if necessary.
	2. Excessive Flood back of Liquid Refrigerant	2. Adjust Thermal Expansion Valve (TXV) or replace Power Element. Check TXV Bulb Location. Should be located on suction line at least 8"-10" from nearest elbow. Bulb should be at 4 o’clock or 8 o’clock position, have good contact with suction line & be well insulated from surrounding air.
Crankcase Heater won’t Energize (should energize anytime unit is “OFF”) (Min. Current draw = 2 amps)	1. Open in 115VAC wiring to heater	1. Check wiring
	2. Defective Heater	2. Replace Heater
	3. Auxiliary contacts of Compressor Motor Contactor defective.	3. Replace Contactor
Compressor won’t load (solenoid valve de-energizes to load compressor)	1. Suction Pressure > 105 PSIG	1. Excessive load. Check OPERATING LIMITATIONS on page 3. Allow unit to operate until suction procedure drops to 95 PSIG.
	2. Discharge Pressure > 390 PSIG	2. Check OPERATING LIMITATIONS on page 3. Will reload @ 330 PSIG.
	3. Demand not great enough	3. OK
	4. Defective Loading Solenoid	4. Replace Compressor Loading Solenoid
	5. Faulty Wiring to loading Solenoid	5. Check Wiring
	6. Defective Water Temp. Sensor	6. Replace appropriate Sensor (LWT or RWT) (See chart under F11 Fault Code)
	7. Defective Evaporator Transducer	7. Replace Transducer
	8. Relay Output Board Defective	8. Replace Relay Output Board (Contact the local YORK service representative.)
	9. Defective Micro Board	9. Replace Micro Board (Contact the local YORK service representative.)
Lack of Cooling Effect	1. Fouled Evaporator Surface	1. Contact the local YORK Service Rep.
	2. Faulty Compr. Suction and/or Discharge Valves	2. Contact the local YORK Service Rep.

UNIT CONTROLS AND OPERATION
(YCHA120, 150, 175 & 200)

INTRODUCTION

The YORK YCHA120-200 MicroComputer Control Panel is a microprocessor based control system. The microprocessor monitors return water temperature and controls a 2-system (dual circuited) unit as needed to maintain the desired leaving water temperature.

Concise, step-by-step instructions are printed on the control panel to guide you through each control and monitoring procedure. The control panel is also compatible with a building automation/energy management system.

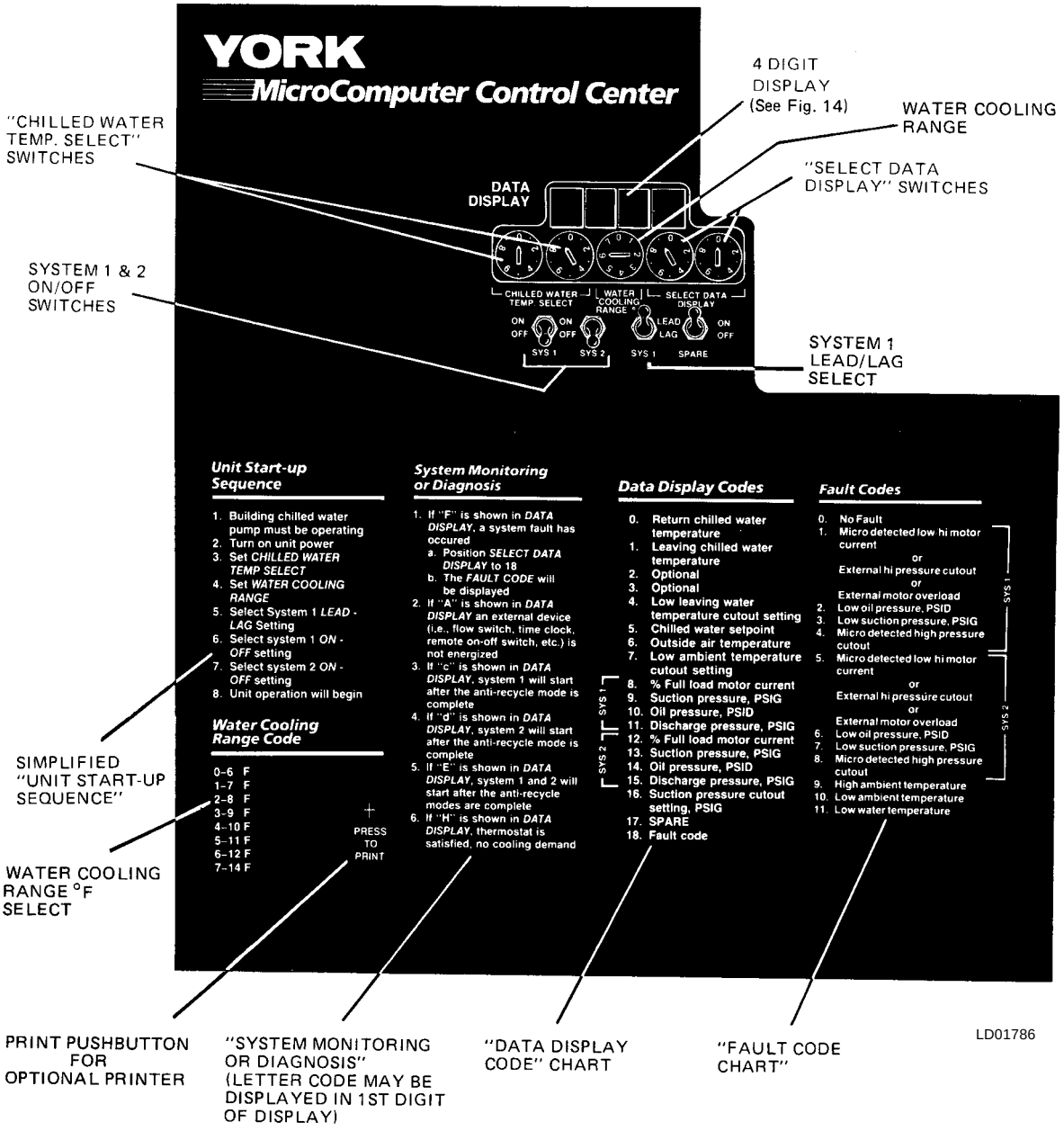


FIG. 13 – CONTROL CENTER (YCHA 120-200)

A 4-digit display (See Fig.13) allows the operator to select and display system operating parameters via two "Select Data Display" rotary switches. These parameters are:

- Return Chilled Water Temperature
- Leaving Chilled Water Temperature
- Low Leaving Water Cutout Temperature
- Return Chilled Water Setpoint
- System 1 % Full Load Motor Current
- System 1 Suction Pressure
- System 1 Oil Pressure, PSID
- System 1 Discharge Pressure

(YCHA120, 150, 175, & 200)

- System 2 % Full Load Motor Current
- System 2 Suction Pressure
- System 2 Oil Pressure, PSID
- System 2 Discharge Pressure
- Suction Pressure Cutout Setting, PSIG
- Water Cooling Range Temperature
  (Also see Fig. 14 for a complete list)

The system "Return Chilled Water Temp" is entered by two rotary switches and the "Water Cooling Range" by a single rotary switch.

System 1 and 2 can be activated by 2 toggle switches. These switches normally remain "ON" after startup. A toggle switch is available to select compressor #1 as the lead or lag system.

Remote cycling, unloading, and Return Chilled Water Temp Setpoint Reset can be accomplished as noted on Page 42. Loading and unloading decision making is done by software on the Micro Logic Board. These decisions are made according to temperature deviations from the selected setpoint and the selected cooling range resulting in more precise control of water temperature.

CONTROL PANEL

1. "CHILLED WATER TEMP SELECT"*

   Control is achieved by Return Chilled Water Setpoint (adjustable from 0°F to 70°F in one degree increments). Setpoint is entered via two rotary switches on the control panel marked "Chilled Water Temp. Select °F".

   *If needed,the unit can be configured to control Leaving Chilled Water Temp. This can be accomplished by a jumper/switch on the Micro Board. See Fig. 20 & 21.

   J10 OUT / SW. 3 OFF RWT Control
   J10 IN / SW. 3 ON LWT Control

NOTE: It is recommended that RWT control be used unless LWT control is absolutely necessary. Control via LWT is best obtained using optional additional steps of loading. Contact YORK Sales for this option.

2. "WATER COOLING RANGE" Select Switch

   Temperature control range is variable via a single rotary switch labeled "Water Cooling Range". There will be a choice of eight settings (0-7). Available ranges are 6.0°F, 7.0°F, 8.0°F, 9.0°F, 10.0°F, 11.0°F, 12.0°F, and 14.0°F, corresponding to setting 0-7 respectively.

3. SYS 1 and SYS 2 "ON/OFF" Switches

   These switches allow the operator to manually turn off either system. To operate a system, the respective switch must be in the "ON" position.

4. "DATA DISPLAY CODES"

   Refer to this list when selecting the desired system parameter to be displayed. A list of the codes and their respective number is shown in Fig. 14.

5. "UNIT START-UP SEQUENCE"

   This is a simplified start-up procedure for switch setup of the panel and system.

6. "SYSTEM MONITORING OR DIAGNOSIS"

   This list informs the operator of the meaning of the alphabetic codes which may appear on the display. Anti-recycle status, external device status, and fault information is displayed using this alphabetical code. (See Fig.13 and 14.)

7. "FAULT CODES"

   Any time an "F" appears on the display, one or both compressors will be shut down on a safety control. At this time, the operator should turn the "SELECT DATA DISPLAY" rotary switches to the number "18". When this is done, a Fault Code will appear which can be compared to the "FAULT Code" list to determine the reason for system failure. A list of the codes and their respective number is shown in Fig. 14.

   An "F" Code overrides any other letter code display which may appear. See the "SHUTDOWN SAFETY CONTROLS" and "MANUAL RESET SAFETY CONTROLS" Section for a more detailed explaination of the codes.

8. "WATER COOLING RANGE CODE"

   Refer to this list when setting up the "WATER COOLING RANGE" rotary switch. Since the switch does not read directly, decoding is necessary.

9. "SYS 1 LEAD/LAG" Select

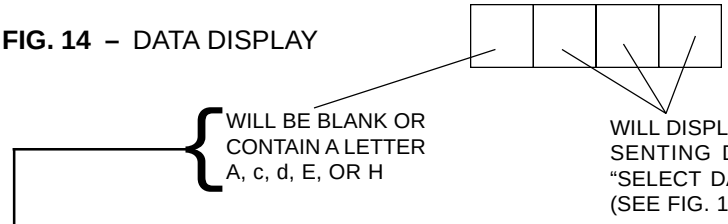
   This switch allows the operator to select SYS 1 as the lead or lag compressor. Note: See Micro Logic Board Jumper/Switch Section for automatic lead/lag switching by the Micro Logic Board.

10. "SELECT DATA DISPLAY" Switches

    These switches can be used to display 18 Test Points for troubleshooting and data recording. This is done via the 2 Rotary Switches marked "Select Data Display". To look at a specific function, select the number of the function from the "Data Display Codes" listing on the panel.

    Proceed by dialing the number up on the "Select Data Display" Rotary Switches. In the event of a failure, the failure can be displayed by selecting #18 of the "Select Data Display". The mode of failure will then be indicated by a number from 0-11. This number can be translated by comparing the number to the "Fault Code" listing on the right side of the panel.

FIG. 14 – DATA DISPLAY **(YCHA120, 150, 175 & 200)**



Leftmost Digit: No letter (Blank) – Informs the operator that both compressors are ready to run or are running.

A – Indicates that the Flow Switch is open, time clock is telling the system to turn off, or a remote cycling device (EMS, BAS. etc.) is telling the system to turn off. These are devices whose dry contacts may be connected in series across terminals 3 and 4 of the terminal block in the lower right corner of the Logic Panel.

c – Shows that System # 1 compressor is shut down and cycling on the 2-minute start-up or 10-minute anti-recycle timer. It will be available for start or will restart when the 2-minute start-up and 10-minute antirecycle timers time out, and demand allows. Tlle "c" code will disappear as soon as the timers time out.*

d – Shows that System #2 compressor is shut down and cycling on the 2-minute start-up or 10-minute anticycle timer. It will be available for or will restart when the 2-minute start-up and 10-minute anti-recycle timers time out, and demand allows. The "d" will disappear as soon as the timers time out.*

E – Indicates that both compressors are shut down and cycling on the 2-minute start-up or 10-minute anti-recycle timer. Both will be available for or will restart when the 2-minute start-up and 10-minute anti-recycle timers time out, and demand allows. The "E" code will disappear as soon as the timers tone out.*

F – Indicates that a safety threshold has been exceeded and the unit is shut down on a Fault. Turn the Select Data Display to "18" to determine the reason for shutdown. (See list at right.)

H – Indicates that both of the compressors are off because cooling demand is not present. The compressor(s) will start as soon as cooling demand is required. The H code will override c, d, or E code.

*Anti-Recycle Timers: Any time a compressor shuts down for any reason, restart cannot occur until the 10-minute anti-recycle timer has timed out and a minimum of 2 minutes (2 minute start-up timer) has expired since shutdown.

ex. Anti-recycle timer has 8 min. left at shutdown:
Restart can occur in 8 minutes (Anti-recycle time greater than 2 min.)

ex. Anti-recycle timer has 1 min. left at shutdown:
Restart can occur in 2 min. (Anti-recycle time less than 2 min.)

ex. Anti-recycle timer has timed out at shutdown:
Restart can occur in 2 min. (Anti-recycle time less than 2 min.)

ex. Power failure has occurred:
Restart can occur 2 min. after the return of power (Anti-recycle time less than 2 min.)

Both compressors can never start simultaneously under any condition. A one minute time delay will always seperate compressor starts.

If "Select Data Display" Switches are set at: ↓ This data will be displayed. ↓

DATA DISPLAY CODES

0. Return chilled water temperature
1. Leaving chilled water temperature
2. Optional
3. Optional
4. Low leaving water temperature cutout setting
5. Chilled water setpoint
6. Outside Air Temperature
7. Low Ambient Temperature Cutout Setting
8. % Full load motor current } System 1
9. Suction pressure, PSIG } System 1
10. Oil pressure, PSID } System 1
11. Discharge pressure, PSIG } System 1
12. % Full load motor current } System 2
13. Suction pressure, PSIG } System 2
14. Oil pressure, PSID } System 2
15. Discharge pressure, PSIG } System 2
16. Suction pressure cutout setting, PSIG
17. Optional
18. Fault code (See below) **

If F appears in leftmost position and "Select Data Display" Switches are set at 18, any of these Fault Codes may appear: ↓ Description of Fault. (See Next Page for Diagnosis) ↓

****FAULT CODES**

0. No Fault
1. Micro detected low/hi motor current **or** External hi pressure cutout **or** External motor overload } System 1
2. Low Oil Pressure, PSID } System 1
3. Low suction pressure, PSIG } System 1
4. Micro detected high pressure cutout } System 1
5. Micro detected low/hi motor current **or** External hi pressure cutout **or** External motor overload } System 2
6. Low oil pressure, PSID } System 2
7. Low suction pressure, PSIG } System 2
8. Micro detected high pressure cutout } System 2
9. High ambient temperature
10. Low ambient temperature
11. Low water temperature

(YCHA120, 150, 175, 200)

FAULT CODE DIAGNOSIS

Any time an "F" code is displayed, one of the compressors will be shut down. The operator should then place the "SELECT DATA DISPLAY" rotary switches to "18". This will cause a number from 0 to 11 to be displayed. This number can be referenced to the "Fault Codes" which tell tile operator which system failed and what the cause was.

At the time of a Fault, the microprocessor stores operating data on both systems at the instant of shutdown. Any display selected by the operator will show stored data. This data will remain in storage until the SYSTEM Switch for the faulted compressor is placed in the OFF position. This clears the microprocessor's memory of stored data, and any display at this time will be of current system conditions. It also allows the faulted compressor to start.

Before placing the SYSTEM Switch to the OFF position, the operator may (via the "SELECT DATA DISPLAY" rotary switches) select the parameter which caused the fault, and any other related system function, and view their magnitudes at the time of the failure. This can provide valuable trouble-shooting information. Detailed explanations of all system safeties are included in the "START-UP SECTION".

Both Systems Down on a Fault: The "F" code will be displayed and the associated stored data applies to both system conditions at the time of the1st Fault. A "." will appear next to the "F" or "F.". This is the indication that both systems are down on a Fault.

After clearing the 1st Fault, an "F" code will still be displayed, but without the ".". The stored data will still be that which was stored at the time of the 1st Fault. This will probably not provide any levels which were out of the allowed operating range for the second Fault, unless the Fault related to low leaving water temperature which affects both systems. This type of Fault occurs simultaneously on both systems and will require both System Switches to simultaneously be placed in the off position to clear. This can only be accomplished after temperature rises above the cut-out point.

After clearing the Fault(s), placing the SYSTEM Switch(s) to the ON position will cause a normal start sequence to begin unless the problem causing the original trouble is still causing safety thresholds to be exceeded. If this occurs, an "F" code will then reappear. **Note**: The trouble may not immediately show up and the system may run for awhile.

CAUTION: Anytime a system shuts down on a Fault, steps should be taken to find and eliminate the cause of the problem before attempting to restart the system.

The operator should also be aware that before the unit will display an "F" code, the problem system has already shut down twice on a fault and restarted within the last 90 minutes. This insures that the system will not shut down and lock out on a nuisance trip or if the system is operating under marginal conditions.

The system will shut down instantly when a Manual Reset Fault is sensed, but it will allow automatic restart until it sees a total of any 3 Faults in a 90-minute period. A 90-minute counter is started as soon as the 1st Fault occurs. If 2 more faults do not occur in the next 90 minutes, the counter is reset to "0".

After a fault, restart cannot be expected until the anti-recycle timers time out. No display ("F" Code) will be indicated during the first two faults except for a letter code telling the operator the anti-recycle timer is in effect.

After 3 faults, an "F" code will be displayed and the system will not restart. The fault can be cleared and the compressor restarted by placing the System Off/On Switch to the OFF position. However another fault will shut down the system and an "F" code will be displayed. The system will continue to shut down on every Fault until the problem system runs without faulting for 90 minutes or until power is cycled. Recycling power will reset the counter.

SYSTEM COMPONENTS

Micro Logic Board:
The Micro Logic Board is the controller and "decision maker" in the control panel. It looks at system inputs via the R. P. Relay, Analog Input, and optional Digital Input Boards and provides system control through the Relay Output Board.

Digital Input Board: (optional)
This board allows use of optional remote unloading and remote chilled water temp. select. These remote inputs are converted to logic levels which the Micro Logic Board can understand.

Analog Input Board:
This board receives analog information from transducer (pressure) and thermistor (temperature) inputs and routes the data to the Micro Logic Board where it is used to control the system.

Relay Output Board:
This board converts logic level outputs from the Micro Logic Board to 120VAC levels used by motor contactors, solenoids, etc. This board allows the Micro Logic Board to control the system operation.

R. P. Relay (Run Permissive):
This Relay replaces the optional Digital Input Board. The R. P. Relay allows connection of remote start/stop and the flow switch contacts to the system.

Power Supply:
The power supply converts 120VAC input from 2T to DC voltages of +5V UNREG, +5V REG. +12V UNREG, +12V REG, and -12V UNREG for supply voltages to operate the integrated circuitry in the panel.

Motor Current Board and C.T.'s:
C.T.'s on the 3ϕ power wiring of each motor send AC signals proportional to motor current to the Motor Cur-

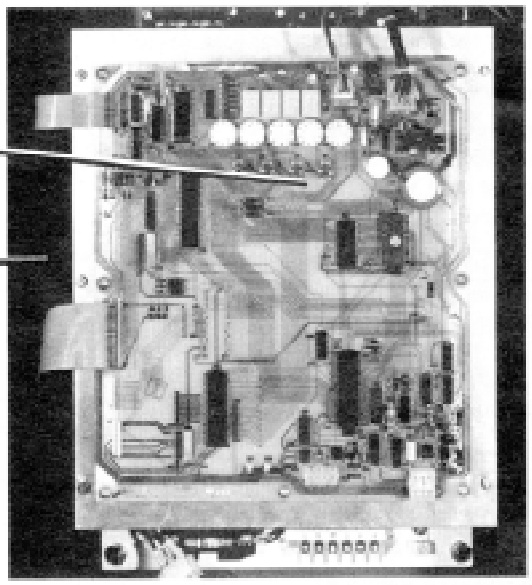


FIG. 15 – CONTROL PANEL – EXTERIOR

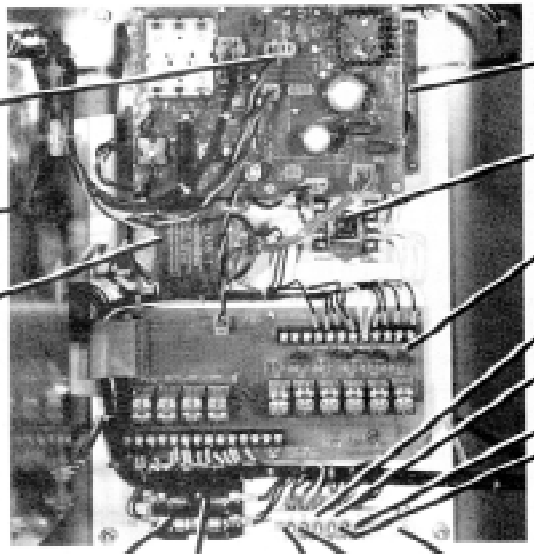


FIG. 15 – CONTROL PANEL – INTERIOR

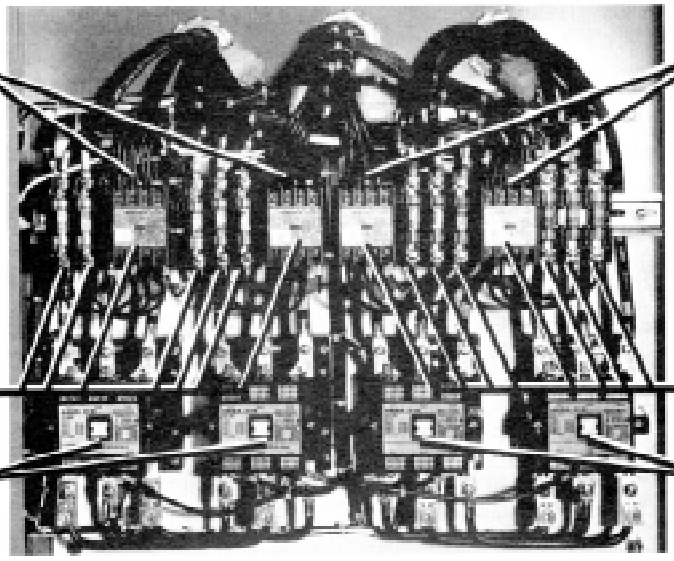


FIG. 15 – POWER PANEL

00010TG

rent Board which rectifies and filters the signal to variable DC voltage (analog). This analog level is then fed to the Analog Input Board allowing the Micro Logic Board to monitor motor current.

SYSTEM SAFETIES

SHUTDOWN SAFETY CONTROLS

A. These software controls in the Micro Board automatically reset and allow restart of the system without operator intervention (auto-restart) when the condition causing the shutdown clears. After the condition causing the shutdown clears, the unit will restart in a minimum of 2 minutes, or a maximum of 10 minutes, depending upon the remaining time on the anti-recycle timer. Restart will occur only if cooling demand is present. An "F" code will be displayed for LAT* and HAT* shutdowns. Otherwise, no code will be displayed other than one indicating the anti-recycle timer(s) is in effect.

1. **Power Failure:** After power has been restored, the unit will automatically restart after a 2 minute time delay. System acts as it does any time power is applied. Restart is dependent on cooling demand after the 2 minute start-up timer has completed its cycle.
2. **Flow Switch/Remote Cycling Device:** The Micro Board monitors the closure of the Flow Switch Contacts. Upon opening of the contacts, the unit will shut down and will remain off until the contacts close. Remote devices are wired in series with the Flow Switch and can be used to start and stop the unit. Anytime the contacts open, an "A" Code will appear on the display indicating a Flow Switch problem or an EMS/BAS/Time Clock stop.
3. **Low Pressure Cutout:** Compressor suction pressure cutout is a factory adjustable setpoint (R26) on the Analog Board. It will be factory set at 44 PSIG. If Glycol or Brine is utilized, then the cutout can be varied according to mixture. Suction pressure must be 80% cutout after 30 sec. of running and must remain above cutout after 4 minutes of operation. The system will restart after an LP shutdown provided the anti-recycle timer has timed out and a minimum 2 minute delay before restart has passed.

   NOTE: The system will be locked out on a Fault if cycled on LP on 3 successive starts. See LEP (Low Evaporator Pressure Cutout) in the MANUAL RESET SAFETY CONTROLS section.
4. **Low Ambient Temperature Cutout (LAT*):** Unit is locked out when the ambient temperature is below 0° to 50°F (Adjustable on Analog Board resistor R24). This is factory set at 35°F. Upon a rise in temperature above setpoint, the unit will restart provided the antirecycle timer has timed out and a minimum 2-minute delay has passed. An "F 10" code will be displayed while the temperature is low and both systems will be shut down. The F will disappear when temp. rises above cut-out.
5. **High Ambient Temperature Cutout (HAT*):** Unit locks out when the ambient temperature is above 130°F. Upon a decrease in temperature below 130°F, the unit will restart providing the anti-recycle timer has timed out and a minimum 2-minute delay has passed. An "F9" code will be displayed while the temperature is high and both systems will be shut down. The F will disappear when temp. drops below cut-out.

MANUAL RESET SAFETY CONTROLS

A. The system will shut down instantly when a Manual Reset Fault is sensed, but it will allow automatic restart until it sees a total of any 3 Faults in a 90-minute period.**A 90-minute counter is started as soon as the 1st Fault occurs. If 2 more faults do not occur in the next 90 minutes, the counter is reset to "0".

   After a fault, restart cannot be expected until the anti-recycle timers time out. No display ("F" Code) will be indicated during the first two faults except for a letter code telling the operator the anti-recycle timer is in effect.

   After 3 faults, an "F" code will be displayed and the system will not restart. The fault can be cleared and the compressor restarted by placing the System Off/On Switch to the OFF position. However another fault will shut down the system and an "F" code will be displayed. The system will continue to shut down after restart on <u>every</u> Fault with an "F" Code until the problem system runs without faulting for 90 minutes or until power is cycled. Recycling power will reset the counter to "0".

1. **HP:** Unit shuts down when the discharge pressure exceeds the pressure cutout setpoint of 395 PSI set in software. An F4 (Sys 1) or an F8 (Sys 2) will appear for this safety. See also 6) FS (Fault Stop) for external HP safety.
2. **Power Fault:** Analog signals are provided to the Micro-Board by the Motor Current Boards (MCB) which get info. from 6 current transformers (C.T.'s; 3 per system). A signal of 4VDC = 100% FLA Current. The affected system shuts down if the signal is < 1.2VDC (<30% FLA) or >4.6 VDC (> 115% FLA) when Run Time > 4 sec. This protection assures that both contactors are energized, all C.T.s are connected and operating, and that the motor is not drawing excessive current. An F1 (Sys 1) or an F5 (Sys 2) will be displayed for this safety. Note: See also 6) FS (Fault Stop).
3. **Oil Pressure Cutout:** An analog signal is provided

* These controls are not furnished as part of the standard unit. A 10K ohm resistor is used in place of them.

** This does not apply to item #4 (LWT Freeze Safety). A fault on the LWT Freeze Safety will cause the system to shut down and lock out on a single fault.

which is the Differential Oil Pressure (PSID). This PSID provided to the Micro Board = Oil Pressure PSIG – Suction Pressure PSIG. The affected system shuts down if <10 PSID at run time 4 - 30 seconds; if <25 PSID at run time 30 seconds – 4 minutes: or if <20 PSID at run time > 4 minutes. An F2 (Sys 1) or an F6 (Sys 2) will be displayed for this cut-out.

4. **LWT Freeze Safety:** This analog signal is sent by the Leaving Chilled Water Sensor. If the temperature drops to $\leq$ 36°F(factory setpoint), the system shuts down. For Brine applications, the setpoint can be varied from 20°F to 40°F on the Analog Board by R25. An F11 code will appear for this safety.
5. **LEP (Low Evaporator Pressure Cutout):** At run time = 30 secs to 4 min., the micro checks to see that suction pressure is 80% cut-out. If not, it shuts the system down. If the analog signal to the Micro Board tells the system that the Suction Pressure is low on 3 consecutive starts, the affected system will shut down and lock out. See Shutdown Safety Controls, Low Pressure Cutout for trip points. Any time a system shuts down on a Low Pressure (LP Safety) a 90 min. timer starts and a "count to 3" counter in software is incremented to "1". If the system goes down 2 more times on a LP Shutdown Safety before the 90 min. timer times out, the system will shut down and lock out on a LEP Manual Reset Safety. If the 90 min. timer times out without 2 more LP shutdowns, the "count to 3" counter will be cancelled and reset to "0". This safety operates like all other Manual Reset Safeties. An F3 (Sys 1) or an F7 (Sys 2) will be displayed for this cutout.
6. **FS(Fault Stop):** If external High Discharge Pressure Cut-out or External Thermal Overload Sensor contacts open, the affected system will shut down. The manual reset on the sensor (if equipped) must be reset before the system can be restarted. The external HP cutout is set at 395 PSI. An F1 (Sys. 1) or an F5 (Sys. 2) will be displayed for this safety. **Note**: These same codes will also be displayed for a motor current (power)Fault. This occurs because these safeties do not allow the motor contactor to energize, causing motor current to be "0". When a system is to start, the Micro sends the start signal to the contactor pilot relay on the Relay Output Board. The pilot relay closes a contact which applies 115VAC to the motor contactor. If the High Pressure C.O. or motor protector opens, their contacts which are wired in series with the pilot relay contacts keep 115VAC from being applied to the motor contactor. The contactor will not pull in as the Micro commands or will drop out if pulled in so the system will shut down on low motor current. Whenever an F1 or F5 Fault occurs, check discharge pressure at the time of the fault, motor current at the time of fault, and also if the H.P. and motor protector contacts are open.

OTHER SAFETY CONTROLS

1. **Suction Pressure:** If SYS 1 Suction Pressure exceeds 105 PSIG, the Micro Board will unload SYS 1 compressor. It will automatically reload SYS 1 when suction pressure drops below 95 PSIG. If SYS 2 Suction Pressure exceeds 95 PSIG, the Micro Board will unload SYS 2 compressor. It will automatically reload SYS 2 when suction pressure drops below 85 PSIG.
2. **Flow Switch:** To assure that water flow is present in the evaporator, the Micro Board senses the Flow Switch input to the R.P. Relay whose contacts connect to J18 & J19 of the Analog Input Board. If the Flow Switch opens, both systems will shut down and will not restart until flow is present. An "A" code will be displayed. The Flow Switch is connected to terminals 3 & 4 of the terminal block at the bottom right of the Logic Panel. See Fig. 16.
3. **Lead System Fault Override:** Whenever the lead system faults, the Micro automatically switches the lag system to the lead in an effort to keep chilled water temperature nearer to setpoint.

REMOTE START/STOP BY A TIME CLOCK, BUILDING AUTOMATION, OR ENERGY MANAGEMENT SYSTEM

Remote starting and stopping, is accomplished by opening and closing contacts, controlled by a remote source, connected to the R.P. Relay. These contacts will be wired in series with the Flow Switch. The Micro Logic Board looks for the closure of the contacts as a signal to start the system. Opening the contacts is a signal to stop the system. See Fig. 16 for connection points.

Since the remote contacts are wired in series with the Flow Switch, an "A" code will appear on the display when a REMOTE STOP command is given (contacts open). If the optional Digital Input Board is used for Remote Temperature Setpoint Reset, be sure that remote start and stop is connected in series with the Flow Switch and not to the Digital Input Board EMS Start and Stop inputs. These Start and Stop inputs are not active.

"OPTIONAL" REMOTE TEMPERATURE SETPOINT RESET

Remote Temperature Setpoint Reset capabilities can be added by adding an optional Digital Input Board and configuring a jumper/switch on the Micro Logic Board. J9 must be IN or Switch #4 must be ON. See Fig. 20 and 21 for the jumper/switch location.

Temperature Setpoint changes are accomplished by closing the contacts between terminals 11 and 12 on the Digital Input Board for a defined period of time. The lowest temperature desired must be set on the panel via the "Return Water Temperature Setpoint" rotary switches. To change the setpoint, the contacts between terminals 11 and 12 must be closed for a period between 1 and 1 seconds Closure for a period shorter than 1 second.will

be ignored by the Micro Logic Board. Closure longer than 11 seconds will be treated as 11 seconds.

The contact closure corresponds to a positive offset (rise) from the Setpoint on the panel. I sec. = +0° offset and 11 sec. = +15° or offset = 1.5 (time closed – 1 sec.). For example: A Setpoint of 51° on the panel and a contact closure of 4.33 sec. will result in an offset of +5°. This raises the RWT Setpoint to 56°F.

To maintain a remote setpoint, the EMS Pulse Width Modulation input (terminals 11 and 12) on the Digital Input Board must be refreshed every 30 minutes or less (20 minutes is recommended). In other words, to maintain the 56°F RWT setpoint, the contacts between terminals 11 and 12 must be closed for a period of 4.33 seconds every 20 minutes. If this is not refreshed at least every 30 minutes, the Micro Logic Board will take this as a signal to change the RWT setpoint back to the original setpoint of 51° on the Control Panel.

"OPTIONAL" REMOTE UNLOADING AND DEMAND LIMITING

A forced unload of the system, independent of water temperature demand, can be accomplished by closing a dry contact connected between terminals 9 & 10 of the optional Digital Input Board. This control feature forces turn-off of the lag compressor. **Note**: J9 must also be placed IN or Switch 4 must be in the ON position on the Micro Logic Board. See Fig. 20 and 21.

ANNUNCIATION ALARM CONTACTS (OPTIONAL)

YORK can supply alarm contacts which will de-energize to function as a warning if unit malfunction occurs. A 28 volt external alarm circuit (by others) must be wired into the YORK supplied alarm circuit. If the alarm circuit is applied to chillers used for critical duty (such as process duty, or cooling other critical equipment) and the alarm circuit should fail to function, YORK will not be liable for damages. Any inductive devices (relays) wired into the Alarm circuitry must be suppressed. Use P/N 031-00808B suppressor.

EXTERNAL SYSTEM MONITORING AND DIAGNOSTICS (OPTIONAL)

RS 232 (or equivalent) SERIAL COMMUNICATION OUTPUT PORT

This port on the bottom right of the Logic Board (J6) allows service personnel to obtain a printout of unit conditions at any time. To make use of this option, contact YORK Service or Marketing for recommended printers.

A printout can be requested by pressing the "Press To Print" pushbutton on the Control Panel. This allows service personnel or the customer to obtain system parameters on a periodic basis.*

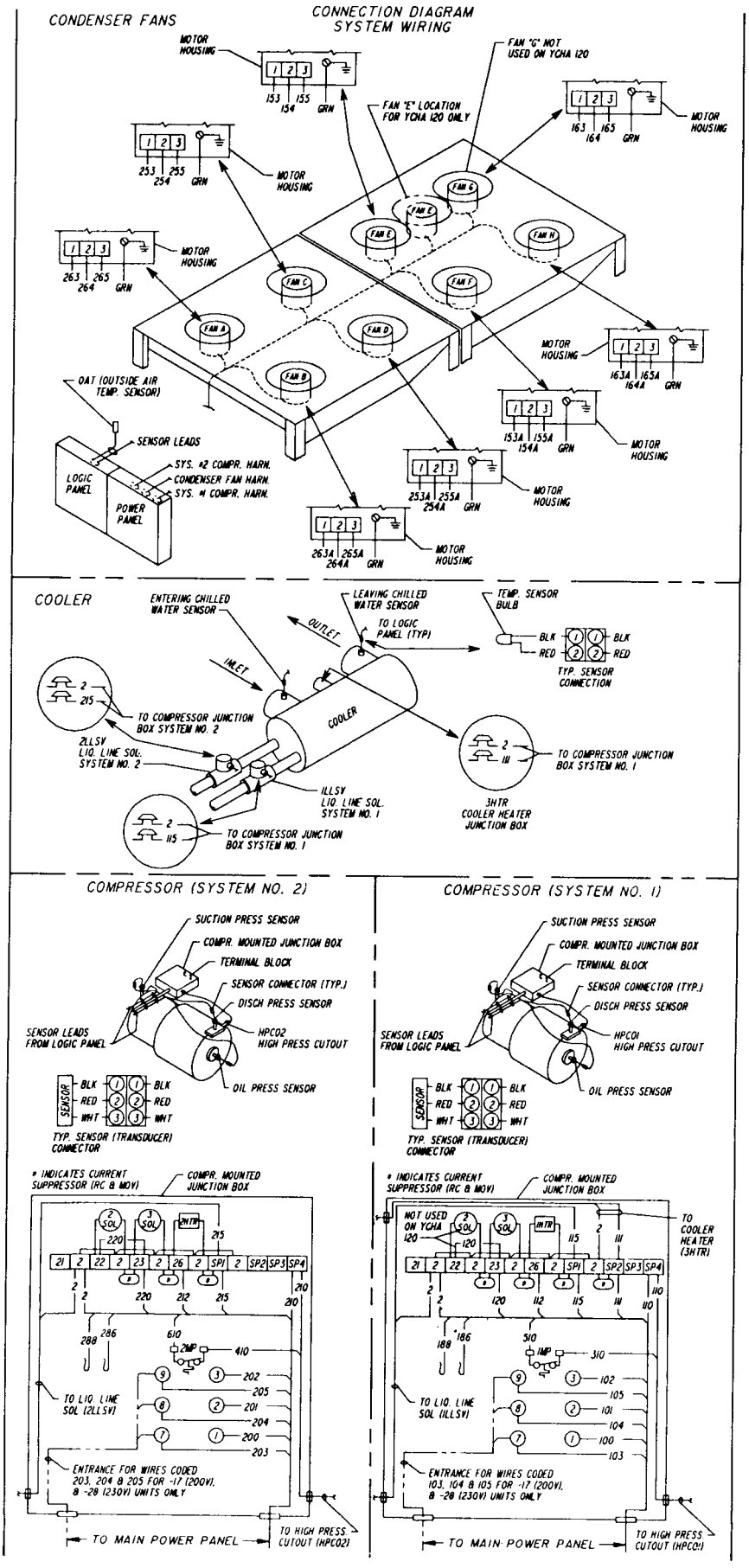
A print example is shown below.

```
                    YORK RECIPROCATING CHILLER
                  MICROCOMPUTER CONTROL CENTER
                          SYSTEM STATUS
                       NO SYSTEM FAULTS

RETURN WATER TEMPERATURE                    55.4  DEG F
LEAVING WATER TEMPERATURE                   44.0  DEG F
SYSTEM 1 OIL TEMPERATURE                   131.9  DEG F
SYSTEM 2 OIL TEMPERATURE                   130.8  DEG F
LOW WATER TEMP CUTOUT                       36.0  DEG F
TEMPERATURE SETPOINT                        54.0  DEG F
OUTSIDE AIR TEMPERATURE                    090.2  DEG F
LOW AMBIENT TEMP CUTOUT                     35.0  DEG F
SYSTEM 1 MOTOR CURRENT                       087  %FLA
SYSTEM 1 SUCTION PRESSURE                    066  PSIG
SYSTEM 1 OIL PRESSURE                        044  PSID
SYSTEM 1 DISCHARGE PRESSURE                  197  PSIG
SYSTEM 2 MOTOR CURRENT                       087  %FLA
SYSTEM 2 SUCTION PRESSURE                    059  PSIG
SYSTEM 2 OIL PRESSURE                        051  PSID
SYSTEM 2 DISCHARGE PRESSURE                  191  PSIG
LOW SUCTION PRESSURE CUTOUT                  044  PSIG
TEMPERATURE CONTROL RANGE                   54.0  DEG F
TO                                          48.0  DEG F
SYSTEM 1 LIQUID LINE SOL                      NO
SYSTEM 2 LIQUID LINE SOL                      NO
SYSTEM 1 LOADED                               NO
SYSTEM 2 LOADED                               NO
RUN PERMISSIVE                               YES
```

* Once the printout is obtained, the printer should be disconnected from the panel at J6.

(YCHA120, 150, 175 & 200)



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LEGEND

CDS	CONTROL DISCONNECT SWITCH
ICR,2CR	CALIBRATING RESISTORS
CT1-CT6	CURRENT TRANSFORMERS
DRP	DIODE (RUN PERMISSIVE RELAY)
FLSW	FLOW SWITCH
1FU-12FU	COND. FAN FUSES 30A, 600V
13FU	CONTROL FUSES 15A, 250V
14FU	MICROPROCESSOR POWER FUSE 8A, 250V
HPCO1, HPCO2	HIGH REFRIGERANT PRESS. CUTOUT OPEN 395 PSIG CLOSE 320 PSIG
1HTR-2HTR	CRANKCASE HEATER
3HTR	COOLER HEATER
1LDSV, 2LDSV	COMPR. LOADING SOLENOID VALVE
1LLSV, 2LLSV	LIQUID LINE SOLENOID VALVE
1M-4M	COMPRESSOR CONTACTORS
5M-8M	CONDENSER FAN CONTACTORS
MCB1, MCB2	COMPR. MOTOR CURRENT CIRCUIT BOARD
1MOV-7MOV	SURGE PROTECTOR
1MP, 2MP	COMPRESSOR MOTOR PROTECTOR
OAT	OUTSIDE AIR TEMP. SENSOR
P	PLUG
1PDS, 2PDS	POWER DISCONNECT SWITCH
1PF, 2PF	POWER FUSE
R	RECEPTICAL
1RC-15RC	SURGE PROTECTOR
RP	RUN PERMISSIVE RELAY (REPLACES OPTIONAL DIGITAL INPUT BOARD. ALLOWS CONNECTION OF REMOTE START/ STOP AND FLOW SWITCH CONTACTS TO THE SYSTEM.)
1T	CONTROL TRANSFORMER 2KVA (OPTIONAL)
2T	MICRO PANEL TRANSFORMER
TH	COOLER HEATER THERMOSTAT OPEN 55°F CLOSE 40°F
△	TERMINAL BLOCK FOR CUSTOMER CONNECTIONS
□	TERMINAL BLOCK, CIRCUIT BOARD MOUNTED
⬡	TERMINAL BLOCK, COMPR. JUNCTION BOX
———	WIRING BY YORK
– – – –	WIRING BY OTHERS

NOTES:

1. FIELD WIRING TO BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
2. NUMBERS ALONG THE RIGHT SIDE OF THE DIAGRAM ARE LINE IDENTIFICATION NUMBERS. THE NUMBERS AT EACH LINE INDICATE THE LINE NUMBER LOCATION OF RELAY CONTACTS. AN UNDERLINED CONTACT LOCATION SIGNIFIES A NORMALLY CLOSED CONTACT.
3. TERMINAL CONNECTION POINTS ARE INDICATED BY NUMBERS WITHIN A SQUARE (YORK CONNECTIONS) OR A TRIANGLE (CUSTOMER CONNECTIONS) I.E. 2 & △. COMPONENT TERMINAL MARKINGS ARE INDICATED BY NUMBERS WITHIN A CIRCLE I.E. ②. NUMBERS ADJACENT TO CIRCUIT LINES ARE THE CIRCUIT IDENTIFICATION NUMBERS.
4. THE CHILLED WATER FLOW SWITCH (FLSW) IS CONNECTED BETWEEN TERMINALS 3 & 4.
5. TO CYCLE UNIT ON AND OFF AUTOMATICALLY, INSTALL A CYCLING DEVICE IN SERIES WITH THE FLOW SWITCH (FLSW), CONNECTED BETWEEN TERMINALS 3 & 4.
6. TO STOP UNIT (EMERGENCY STOP) WITH CONTACTS OTHER THAN THOSE SHOWN, INSTALL THE STOP CONTACT BETWEEN TERMINALS 41 & 5. IF A STOP DEVICE IS NOT INSTALLED, A JUMPER MUST BE CONNECTED BETWEEN TERMINALS 41 & 5.
7. CONTROL PANEL TO BE SECURELY CONNECTED TO EARTH GROUND.
8. CONTROL POWER TRANSFORMER IS OPTIONAL EQUIPMENT.
9. TO USE DATA PRINT-OUT FEATURE, REFER TO YORK INSTALLATION INSTRUCTIONS.

CAUTION:

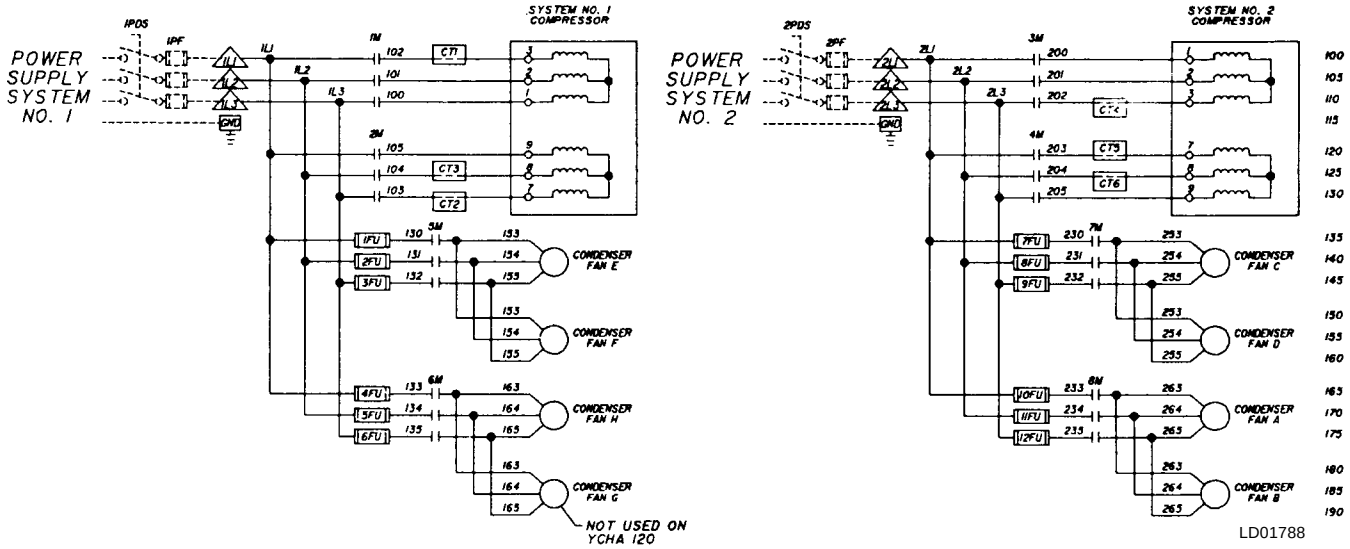
DO NOT USE THE FLOW SWITCH AS A CYCLING DEVICE! IF WATER FLOW IS USED TO CYCLE THE UNIT, INTERLOCK THE PUMP CONTACTOR WITH A CONTACT CONNECTED IN SERIES WITH THE FLOW SWITCH.

NO CONTROLS (RELAYS, ETC.) SHOULD BE MOUNTED IN THE SMART PANEL ENCLOSURE. ADDITIONALLY, CONTROL WIRING NOT CONNECTED TO THE SMART PANEL SHOULD NOT BE RUN THROUGH THE CABINET. THIS COULD RESULT IN NUISANCE FAULTS.

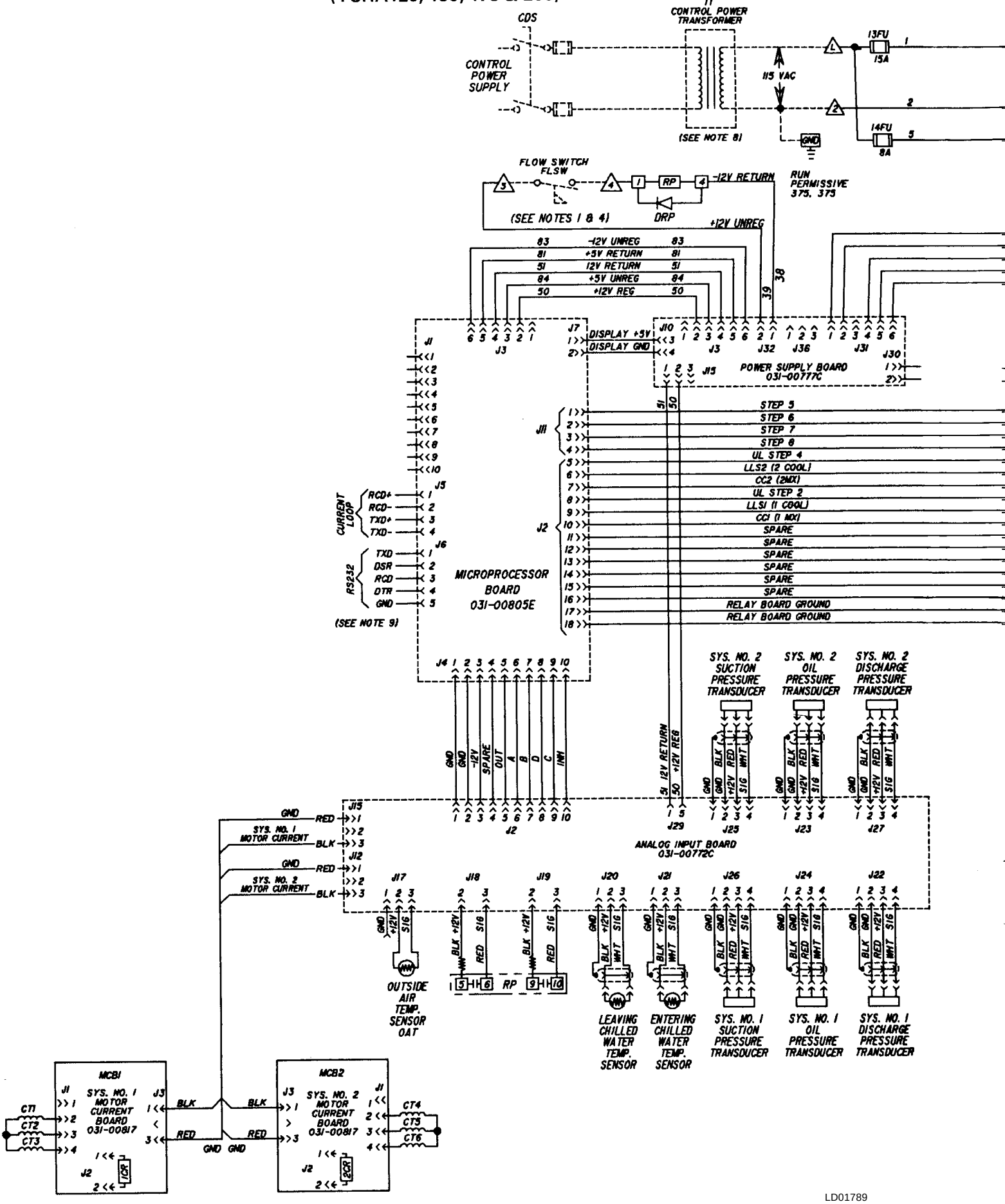
ANY INDUCTIVE DEVICES (RELAYS) WIRED INTO THE ALARM CIRCUITRY OR PILOT RELAYS FOR CONDENSER PUMP STARTERS WIRED THROUGH MOTOR CONTACTOR AUXILIARY CONTACTS MUST BE SUPPRESSED. USE YORK P/N 031-00808B SUPPRESSOR.

SINGLE POINT POWER WIRING (OPTIONAL)

MODEL	VOLTS-PH-HZ	MIN. CIR. AMPACITY	MAX. DUAL ELEM. FUSE	NON-FUSED DISC. SW	INCOMING WIRE RANGE
YCHA120-40	380-3-60	345A	500A	400A/480V	(1) #1-600 MCM or (2) #1-250 MCM
-46	460-3-60	281A	400A	400A/480V	
-50	380/415-3-50	332A	450A	400A/480V	
YCHA150-40	380-3-60	390A	500A	400A/480V	
-46	460-3-60	316A	400A	400A/480V	
-50	380/415-3-50	378A	500A	400A/480V	
YCHA175-40	380-3-60	457A	600A	600A/480V	
-46	460-3-60	378A	500A	400A/480V	
-50	380/415-3-50	453A	600A	600A/480V	
YCHA200-40	380-3-60	510A	700A	600A/480V	
-46	460-3-60	428A	600A	600A/480V	
-50	380/415-3-50	510A	700A	600A/480V	



(YCHA120, 150, 175 & 200)



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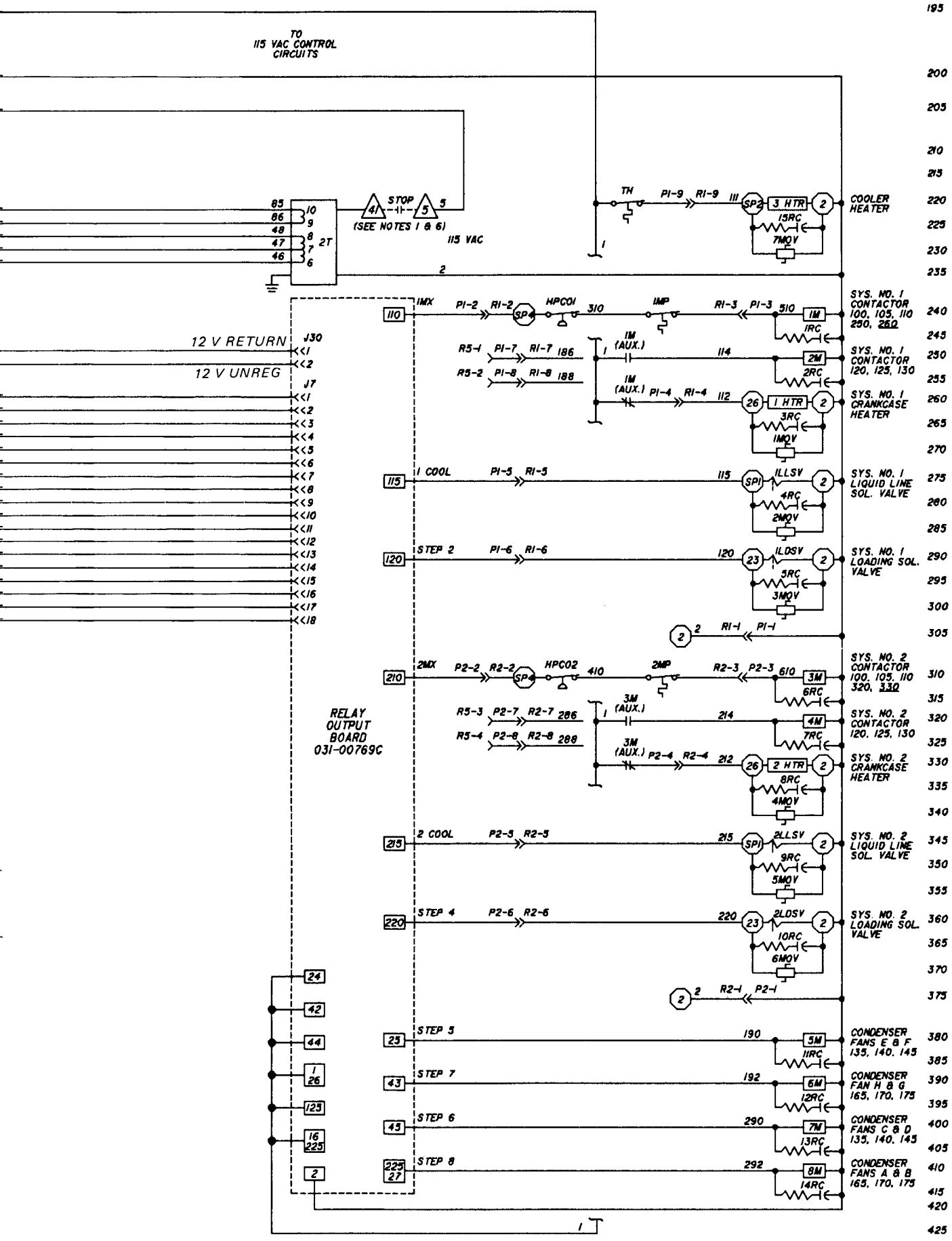
(YCHA120, 150, 175 & 200)



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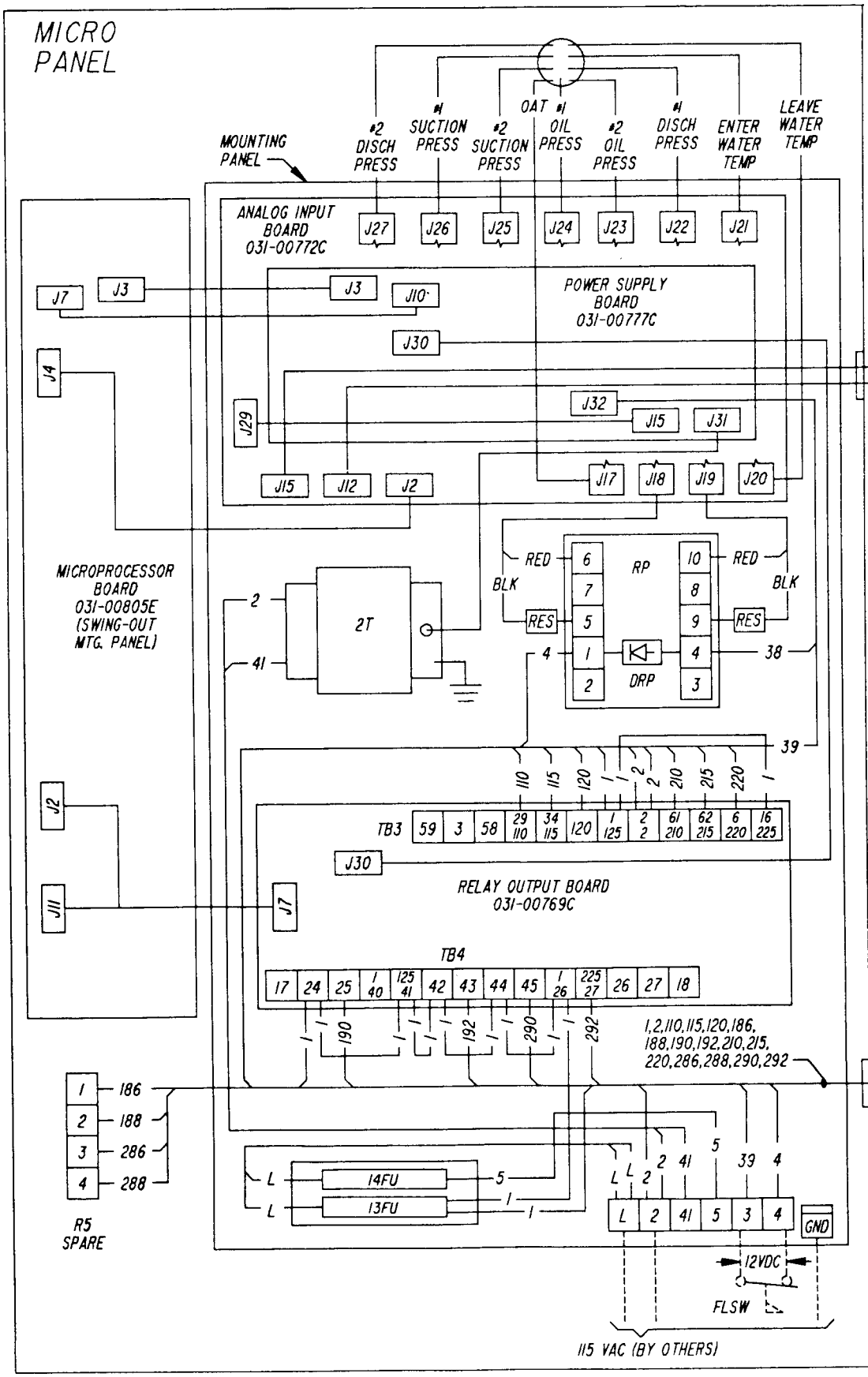
(YCHA120, 150, 175 & 200)

CONNECTION DIAGRAM, ELEC. BOX



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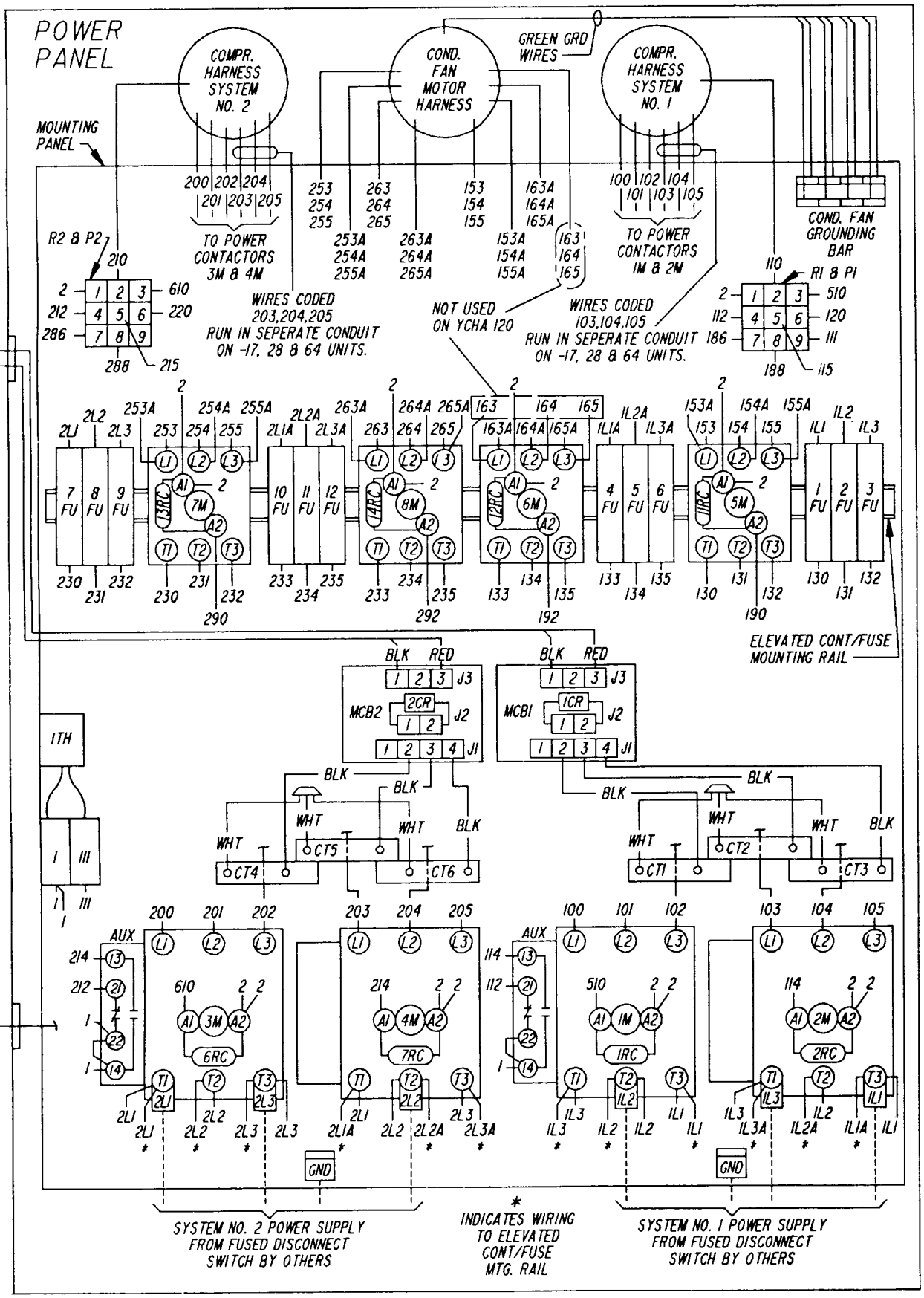

POWER PANEL
COMPR. HARNESS SYSTEM NO. 2
COND. FAN MOTOR HARNESS
GREEN GRD WIRES
COMPR. HARNESS SYSTEM NO. 1
MOUNTING PANEL
COND. FAN GROUNDING BAR
TO POWER CONTACTORS 3M & 4M
TO POWER CONTACTORS 1M & 2M
R2 & P2
R1 & P1
WIRES CODED 203,204,205 RUN IN SEPERATE CONDUIT ON -17, 28 & 64 UNITS.
NOT USED ON YCHA 120
WIRES CODED 103,104,105 RUN IN SEPERATE CONDUIT ON -17, 28 & 64 UNITS.
ELEVATED CONT/FUSE MOUNTING RAIL
MCB2
MCB1
1TH
GND
* INDICATES WIRING TO ELEVATED CONT/FUSE MTG. RAIL
SYSTEM NO. 2 POWER SUPPLY FROM FUSED DISCONNECT SWITCH BY OTHERS
SYSTEM NO. 1 POWER SUPPLY FROM FUSED DISCONNECT SWITCH BY OTHERS

LD01792

SYSTEM START-UP AND OPERATION

CHECKING THE SYSTEM 24 HOURS PRIOR TO INITIAL START-UP (NO POWER)

1. **Unit Checks**
   A. Inspect the unit for shipping or installation damage.
   B. Assure that all piping has been completed and flushed.
   C. Check that the unit is properly charged and that there are no piping leaks.
   D. Suction and discharge stop valves and the refrigerant liquid stop valves are open (ccw).

> ***CAUTION***
> *Compressor lubrication circuit must be primed with YORK "C" oil prior to start-up. Priming should be done through the Schrader fitting at the compressor oil pump. Stroke oil pump 10 times to prime the lubrication circuit.*

   E. "Full" oil quantity is shown by an oil level showing in the upper sight glass. "Low" oil quantity is shown by an oil level showing in the lower sight glass. If it is necessary to add oil, connect a York oil pump to the oil charging valve, but do not tighten the flare nut on the delivery tubing. With the bottom (suction end) of the pump submerged in oil to avoid the entrance of air, operate the pump until oil drips from the flare nut joint, allowing the air to be expelled, and tighten the flare nut. Open the compressor oil charging valve and pump in oil until oil reaches the proper level as described above. Close the compressor oil charging valve.
   F. Assure water pumps are on. Check and adjust water pump flow rate and pressure drop across cooler. Verify flow switch operation.
   G. Check panel to see that it is free of foreign material (wires, Metal chips, etc.).
   H. Visually inspect wiring (power & control). Must meet NEC and all local codes.*,**
   I. Check for proper size fuses in main and control power circuits.
   J. Verify that field wiring matches the 3-phase power requirements of the compressor. See nameplate.**
   K. Assure 115VAC Control Power to TBI has 30A minimum capacity.*
   L. Be certain all control bulbs are inserted completely in their respective wells and are coated with heat conductive compound.

2. **Panel Checks (Power On, System Switch "Off")**
   A. Apply 3 phase power and verify its value.**
   B. Apply 11 5VAC and verify its value on the terminal block in the lower right of the Logic Panel. Make the measurement between terminals 41 and 2. Should be 115VAC ± 10%.*
   C. Assure crankcase heaters are on. Allow crankcase heaters to remain on a minimum of 24 hours before startup. This is important to assure no refrigerant is in the oil at start-up!
   D. *Checking The Electronics* A few simple checks will assure that the panel electronics are working and that the system will run when you come back in 24 hrs. for start-up.
   Checking the Microprocessor Board and its Parallel Interface Display the Return Water Temp. Setpoint and verify that it matches the Return Water Temp. Setpoint Switches.
   Checking the Analog Input Board and the Microprocessor Board's A/D Converter Display the Low Suction Pressure Cutout, Low Water Temp. Cutout, and Low Ambient Cutout. These displays should match the printout placed inside the unit. The printout will provide the unit specs. on the cutouts as ordered by the customer. Deviation from these could be due to a defective board or tampering with the Analog Input Board pots.
   Checking the R.P. Relay Remove the wire on terminal 3 & 4 of the terminal block in the lower right corner Logic Panel. Note: Water flow should be present and any remote cycling devices jumpered. By removing the wire, we simulate an open flow switch or cycling device. Consequently an "A" code should appear on the display.
   Checking the Power Supply Board If the other boards check out alright, there is almost a 100% chance that the Power Supply Board is functioning properly. If any board malfunctions, check its supply voltages. UNREG voltages normally measure 40% high ± 10%. REG voltages should be ± .IV.
   E. By performing the previous checks, we will assure most of the system is functioning properly. Thermistors and transducers can be checked at this point. The display can be checked against a gauge if desired. To assure proper return and leaving water temp. displays, flow must be present. We won't be worrying about checking out the Relay Output Board. This board is easy to diagnose and can easily be field repaired with factory assistance if the need arises.

INITIAL START-UP

After the operator has read the proceeding pages, has be. come familiar with the control panel and its functions, and has performed the proceeding unit checks and panel checks, the unit can be put into operation. Proceed by setting the switches as follows:

* See Fig. 16
** See Fig. 17

(YCHA120, 150, 175 & 200)

1. **Panel Switches**

   A. Set the Return Chilled Water Temp. to the desired temperature. (This will be leaving water temp. setpoint if this option is utilized.)

   B. Assure the Micro Logic Board jumpers/switches are configured for the unit design and the system's requirement. See pages 58 & 59.

2. Place the System Switches to the ON position. See the OPERATING SEQUENCE for unit operation.

   The compressor will start and a flow of liquid should be noted in the liquid indicator. After several minutes of operation, the bubbles should disappear and there will be a solid column of liquid when the unit is operating normally. On start-up, foaming of the oil may be evident in the compressor oil sightglass. After the water temperature has been pulled down to operating conditions, the oil should be clear. Normal operation of the unit is evidenced by a hot discharge line, clear oil in the compressor crankcase, solid liquid refrigerant in the liquid indicator and usually no more than 2 PSIG variation in suction pressure for any given set of operating conditions. Check direction of fan rotation. Air flow must be "up".

   Allow the compressor to run for a short time, being ready to stop it immediately if any unusual noise or other adverse condition should develop. When starting the compressor, always make sure the oil pump is functioning properly. Compressor oil pressure must be as described under "Oil Pressure Cutout" (See Control Description).

   Check the system operating parameters. Do this by selecting various readouts such as pressure and temperature. Compare these to test gauge readings.

CHECKING SUPERHEAT AND SUBCOOLING

The subcooling should always be checked when charging the system with refrigerant and/or before setting the superheat.

When the refrigerant charge is correct, there will be no bubbles in the liquid sightglass with the system operating under full load conditions, and there will be 10° to 15°F subcooled liquid leaving the condenser.

An overcharged system should be guarded against. Evidences of overcharge are as follows:

a. If a system is overcharged, the discharge pressure will be higher than normal. (Normal discharge pressure can be found in refrigerant temperature/pressure chart; use ambient temperature +30°F for normal condensing temperatures.

b. The temperature of the liquid refrigerant out of the condenser should not be more than 15°F less than the condensing temperature. (The temperature corresponding to the condensing pressure from refrigerant temperature/ pressure chart.)

The subcooling temperature should be taken by recording the temperature of the liquid line at the outlet of the con" denser and recording the liquid pressure at the liquid service valve and converting it to a temperature from temperature/pressure chart.

Example:

Liquid Line Pressure 260 PSIG converted to	120°F
Minus Liquid Line Temperature Subcooling	105°F
= to	15°F

Add refrigerant to the system to increase subcooling or remove to lower.

After the subcooling is set at 10-15°F the superheat should be checked.

The superheat should be checked only after steady operation of the chiller has been established, the leaving chilled liquid has been pulled down to the required temperature, and the unit is running fully loaded. Correct superheat setting is 8° - 12°F.

The superheat is the difference between the actual temperature of the returned refrigerant gas entering the compressor and the temperature corresponding to the suction pressure as shown in a standard pressure/temperature chart.

Example:

Suction Temperature	44°F
Minus Suction Pressure 60 PSIG	34°F
Converted to Superheat	10°F

The suction temperature should be taken 6" before the compressor service valve, and the suction pressure is taken at the compressor suction service valve.

Normally, the thermal expansion valve need not be adjusted in the field. If, however, an adjustment is to be made, the expansion valve adjusting screw should be turned not more than one turn at a time, allowing sufficient time (approximately 20 minutes) between adjustments for the system and the thermal expansion valve to respond and return to settled operation. Make sure that expansion valve is not cycling by watching pressures and temperatures during the waiting period. If the unit has been functioning satisfactorily during the initial operating period, it is ready for continuous operation.

OPERATING SEQUENCE

(ALSO SEE COMPRESSOR CAPACITY CONTROL)

1. For the system compressors to run, all Manual Reset Cutouts must be reset, the Flow Switch must be closed, and any remote cycling contacts must be closed.
2. As long as power is applied, the Crankcase Heaters will be on and stay on as long as the compressors are not running.
3. When the System Power Switch is applied, the unit will start a 2 minute start-up timer.

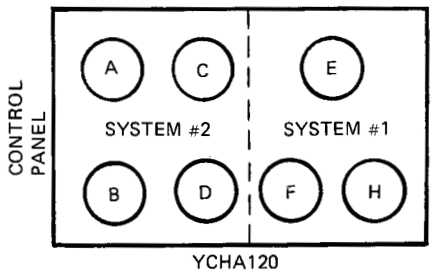
4. At the end of the 2 minute timer, the 10 minute anti-recycle timer will start at **T = 0**. At this time the Micro Board will check all system conditions. If no safeties are tripped and cooling demand is present, the lead compressor will start (unloaded) If a safety is tripped or no cooling demand is present, the timer will stay at **T = 0** until proper conditions exist. Coincident with the start of the lead compressor, the associated liquid line solenoid will open after pumpdown is completed.
5. **T = 4 sec.** The motor current of the lead compressor must be > 30% FLA and < 115% FLA. Oil pressure must be ≥ 10 PSID. If these conditions are not met, the lead compressor shuts down.
6. **T = 30 sec.** At this time the oil pressure of the lead compressor must be a minimum of 25 PSID and suction pressure must be 80% cutout.
7. **T = 60 sec.** If cooling demand requires and no safeties are tripped, the lag compressor starts (unloaded) and its liquid line solenoid opens after pumpdown is completed.
8. **T = 64 sec.** The motor current of the lag compressor must be >30% FLA and <115% FLA. Oil pressure must be ≥ 10 PSID. If these conditions are not met, the lag compressor shuts down.
9. **T = 90 sec**. The oil pressure of the lag compressor must be a minimum of 25 PSID. Suction pressure of the lag compressor must be 80% of cutout.
10. **T = 2 min.** The lead compressor will load if cooling demand requires.
11. **T = 3 min.** The lag compressor will load if cooling demand requires.
12. **T = 4 min.** The lead compressor's suction pressure must be > cutout (cutout = 44 PSIG). At the same time, the oil pressure of the lead compressor must be ≥ 20 PSID.
13. **T = 5 min.** The lag compressor's suction pressure must be > cutout (cutout = 44 PSIG). At the same time, the oil pressure of the lag compressor must be ≥ 20 PSID.
14. **T = 10 min.** The anti-recycle timer times out. This places the timer at **T = 0** position. The compressors will run as long as cooling demand exists.
15. If cooling demand drops and the compressor(s) shut down, restart cannot occur until the 10 minute anti-recycle timer times out and a minimum time of 2 minutes passes. This assures a minimum time of 2 minutes passes between starts, even if a power failure occurs. At restart, the 10 minute anti-recycle starts at **T = 0**.
16. Crankcase Heaters. Any time the compressor(s) stop, the crankcase heater(s) will be energized.
17. Pumpdown. The system is equipped with a pumpdown on start-up routine which eliminates the need for recycling pumpdown. On start-up of either compressor, the respective system will pumpdown to approx. 15 lb. above the suction pressure cutout before the liquid line solenoid opens. As a result of this, no pumpdown mode is included in the system switches.

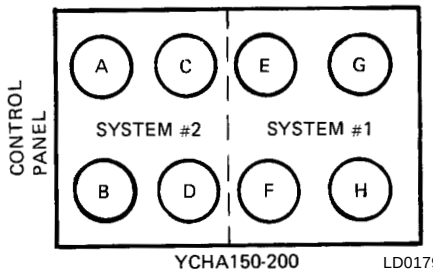
FAN CYCLING

Condenser Fans are normally cycled by the Micro in response to outside ambient temperature. If the outside temp. is above 35°F, COMPR 1 fans E and F and COMPR 2 fans C and D will come on 4 sec. after the respective compressor starts. If the outside temp. is above 55°F, COMPR 1 fans G and H and COMPR 2 fans A and B will come on 30 sec. after the respective compressor starts.

Fan cycling by temperature can be overridden (at temperatures below 55°F) by Condenser Pressure. If the temp. requirements are not met to turn on the fans, the fans will cycle according to discharge pressure on the chart below.

FAN LOCATIONS





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SYSTEM	FAN CONTACTOR	FANS CONTROLLED	DISCHARGE PRESSURE TO CYCLE FANS	
			"ON"	"OFF"
1	5M	E, F	260 LBS.	190 LBS.
1	6M	G, H	280 LBS.	210 LBS.
2	7M	C, D	260 LBS.	190 LBS.
2	8M	A, B	280 LBS.	210 LBS.

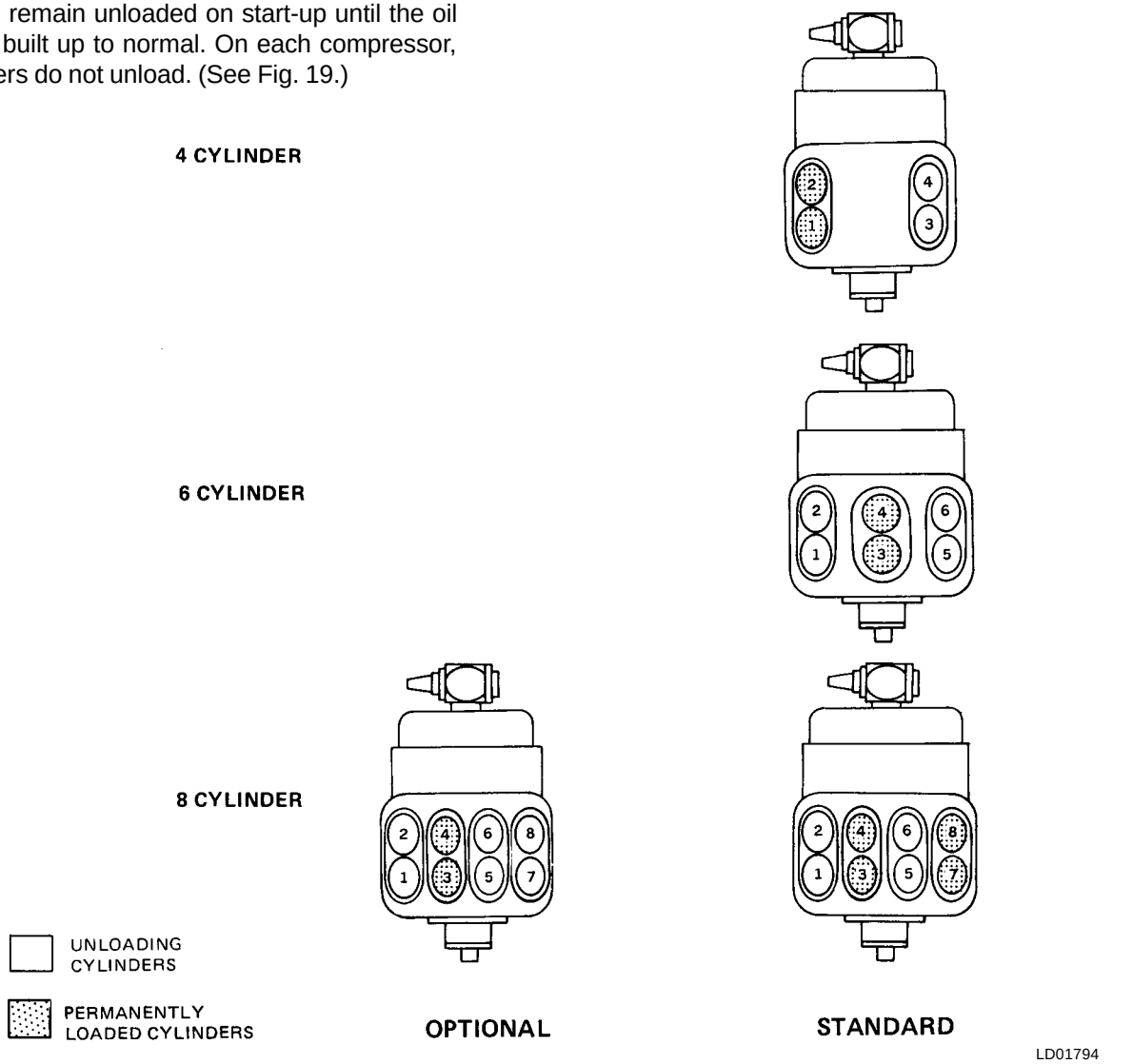
(YCHA120, 150, 175 & 200)

COMPRESSOR CAPACITY CONTROL

The function of the compressor capacity control system is to automatically adjust the compressor pumping capacity to balance with the cooling load at a pre-determined return water temperature and to permit the compressor to start under partial load. The compressor capacity control system is actuated by means of high pressure oil from the compressor oil pump. Oil pressure to the power element loads the associated cylinders and release of this pressure unloads them. Control of the oil pressure to the unloader elements is the function of the compressor capacity control solenoids located on the front handhole cover. The compressor is loaded when the solenoid is de-energized, and unloaded when the solenoid is energized. Unloading is accomplished by lifting and holding the suction valve off its seat. The gas, drawn into the unloaded cylinders on the down stroke of the piston, is pumped back into the suction chamber of the compressor housing, without compression, when the piston returns on its up-stroke. All cylinders equipped with unloaders will remain unloaded on start-up until the oil pressure has built up to normal. On each compressor, certain cylinders do not unload. (See Fig. 19.)

FIG. 19 – COMPRESSOR UNLOADING

CHILLER MODEL	NO. OF CYLINDERS	
	60 Hz	50 Hz
YCHA120		
SYS 1	4	4
SYS 2	6	6
YCHA150		
SYS 1	6	6
SYS 2	6	6
YCHA175		
SYS 1	6	6
SYS 2	8	8
YCHA200		
SYS 1	8	8
SYS 2	8	8

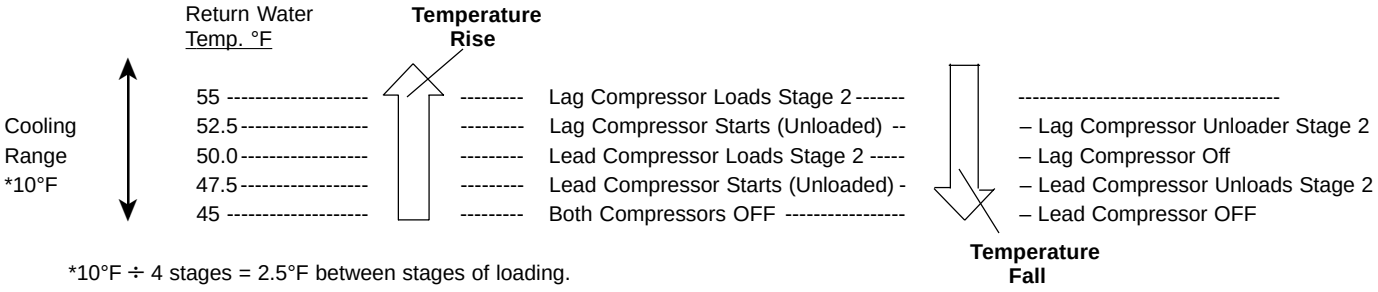


LOADING/UNLOADING (RETURN WATER TEMPERATURE (RWT) CONTROL – STANDARD)

Loading/Unloading of cylinders is accomplished in response to return chilled water temperature as sensed by the Micro Logic Board. Cooling Ranges from 6 to 14°F can be selected to control loading/unloading. A typical example is illustrated below (4 stages).

RWT Setpoint = 55° F
Cooling Range = 10°
System Switches = Both ON
SYS I = LEAD
J8 on Micro Logic = OUT
or
Sw. 5 on Micro = OFF
} Typical 4 stages of unloading

J10 on Micro Logic = OUT
or
Sw. 3 on Micro = OFF
} RWT Control

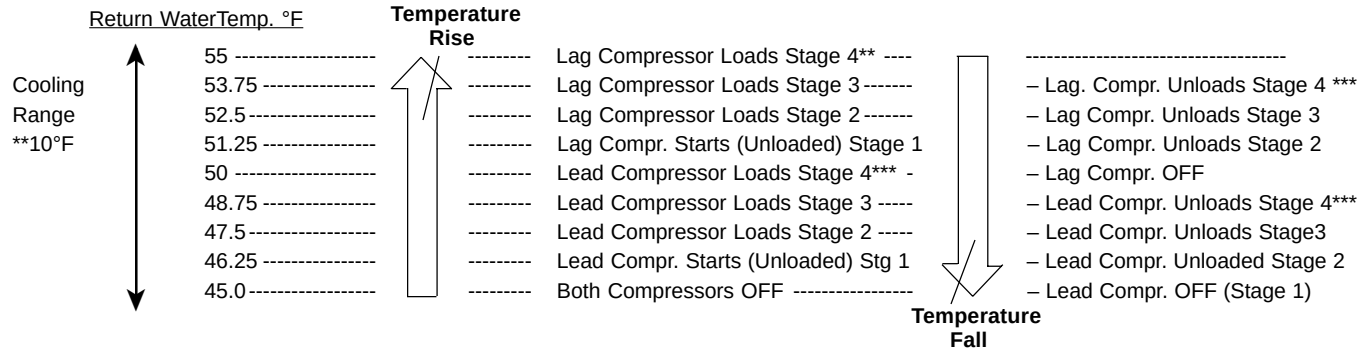


*10°F ÷ 4 stages = 2.5°F between stages of loading.

If optional 6 or 8 stages of unloading is included, typical loading and unloading is illustrated below.

RWT Setpoint = 55° F
Cooling Range = 10°
System Switches = Both ON
SYS 1 = LEAD
J8 on Micro Logic = IN
or
Sw. 5 on Micro = ON
} Optional 6 or 8 stages of unloading

J10 on Micro Logic = OUT
or
Sw. 3 on Micro = OFF
} RWT Control



** 10°F ÷ 8 stages = 1 .25°F between stages of loading.

*** If optional 6 stage loading/unloading is included, Stage 4 loading and unloading is not included on either compressor. Therefore, in the example above, no system response will take place on loading at 50°F and 55°F and no system response will take place on unloading at 53.75°F and 48.75°F.

(YCHA120, 150, 175 & 200)

OPTIONAL LOADING/UNLOADING (LEAVING WATER TEMPERATURE (LWT) CONTROL)

Optional loading and unloading of cylinders can be accomplished in response to leaving chilled water temperature as sensed by the Micro Logic Board.

It is advisable, to assure that cycling problems do not occur, to use LWT Control only if 8 stages of loading and unloading is present on the chiller. In addition, 8 stage control from the Micro Logic Board is initiated by placing J8 IN or Sw. 5 ON. Note: J8 should only be IN or Sw.5 ON if the chiller is equipped with 6 or 8 stages. LWT Control is selected by placing J10 IN or Sw. 3 ON on the Micro Logic Board. Various cooling ranges can then be selected depending upon the allowable deviation from setpoint.

Control Ranges can be selected on the front panel with the Cooling Range Rotary Switch. The Cooling Range Codes and their respective cooling ranges are listed above right for optional LWT Control. Note: ON LWT Control, the cooling ranges on the Control Panel are no longer meaningful.

Code	Range
0	± 1.0°F
1	± 1.2°F
2	± 1.4°F
3	± 1.5°F
4	± 1.6°F
5	± 1.8°F
6	± 1.9°F
7	± 2.0°F

CAUTION: Selection of the Cooling Range should be made according to the deviation from setpoint which can be tolerated and whether more than normal system cycling of the loaders and compressors is experienced due to a cooling range which is too tight.

Pages 57-59 show a listing of each cooling range code along with the temperatures at which each stage loads and unloads.

LWT COOLING RANGES (6 AND 8 STAGE)

If the LWT option is utilized, loading and unloading for each stage and the respective temperature at which it occurs is shown in the tables on pages 57-59. A table is provided for each of the Cooling Range Codes 0-7.

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.0°F	Setpoint plus 0.4°F
COOLING RANGE	Lag Compr. Loader Stage 3	Setpoint plus 0.8°F	Setpoint plus 0.2°F
SWITCH = 0	Lag Compr. Loader Stage 2	Setpoint plus 0.6°F	Setpoint
	Lag Compressor Stage 1	Setpoint plus 0.4°F	Setpoint minus 0.2°F
COOLING RANGE	Lead Compr. Loader Stage 4*	Setpoint plus 0.2°F	Setpoint minus 0.4°F
OF ±1°F	Lead Compr. Loader Stage 3	Setpoint	Setpoint minus 0.6°F
	Lead Compr. Loader Stage 2	Setpoint minus 0.2°F	Setpoint minus 0.8°F
	Lead Compressor Stage 1	Setpoint minus 0.6°F	Setpoint minus 1.0°F

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.2°F	Setpoint plus 0.9°F
COOLING RANGE	Lag Compr. Loader Stage 3	Setpoint plus 1.0°F	Setpoint plus 0.7°F
SWITCH = 1	Lag Compr. Loader Stage 2	Setpoint plus 0.8°F	Setpoint plus 0.5°F
	Lag Compressor Stage 1	Setpoint plus 0.5°F	Setpoint plus 0.2°F
COOLING RANGE	Lead Compr. Loader Stage 4*	Setpoint plus 0.3°F	Setpoint
OF ±1.2°F	Lead Compr. Loader Stage 3	Setpoint	Setpoint minus 0.4°F
	Lead Compr. Loader Stage 2	Setpoint minus 0.3°F	Setpoint minus 0.8°F
	Lead Compressor Stage 1	Setpoint minus 0.6°F	Setpoint minus 1.2°F

* If optional 6 stage loading/unloading is included, stage 4 loading and unloading is not included on either compressor. Therefore, in the examples above, no system response will take place at the temperatures where stage 4 is to be activated or deactivated.

(YCHA120, 150, 175 & 200)

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.4°F	Setpoint plus 1.1°F
	Lag Compr. Loader Stage 3	Setpoint plus 1.1°F	Setpoint plus 0.8°F
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 0.9°F	Setpoint plus 0.5°F
SWITCH = 2	Lag Compressor Stage 1	Setpoint plus 0.6°F	Setpoint plus 0.2°F
	Lead Compr. Loader Stage 4*	Setpoint plus 0.2 F	Setpoint minus 0.2°F
COOLING RANGE	Lead Compr. Loader Stage 3	Setpoint minus 0.1°F	Setpoint minus 0.4°F
OF ± 1.4°F	Lead Compr. Loader Stage 2	Setpoint minus 0.4°F	Setpoint minus 1.0°F
	Lead Compressor Stage 1	Setpoint minus 0.7°F	Setpoint minus 1.4°F

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.5°F	Setpoint plus 1.2°F
	Lag Compr. Loader Stage 3	Setpoint plus 1.2°F	Setpoint plus 0.9°F
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 0.9°F	Setpoint plus 0.5°F
SWITCH = 3	Lag Compressor Stage 1	Setpoint plus 0.6°F	Setpoint plus 0.1°F
	Lead Compr. Loader Stage 4*	Setpoint plus 0.2°F	Setpoint minus 0.3°F
COOLING RANGE	Lead Compr. Loader Stage 3	Setpoint minus 0.2°F	Setpoint minus 0.7°F
OF ± 1.5°F	Lead Compr. Loader Stage 2	Setpoint minus 0.5°F	Setpoint minus 1.1°F
	Lead Compressor Stage 1	Setpoint minus 1.0°F	Setpoint minus 1.5°F

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.6°F	Setpoint plus 1.2°F
	Lag Compr. Loader Stage 3	Setpoint plus 1.3°F	Setpoint plus 0.9°F
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.0°F	Setpoint plus 0.5°F
SWITCH = 4	Lag Compressor Stage 1	Setpoint plus 0.7°F	Setpoint plus 0.1°F
	Lead Compr. Loader Stage 4*	Setpoint plus 0.2°F	Setpoint minus 0.3°F
COOLING RANGE	Lead Compr. Loader Stage 3	Setpoint minus 0.2°F	Setpoint minus 0.7°F
OF ± 1.6°F	Lead Compr. Loader Stage 2	Setpoint minus 0.5°F	Setpoint minus 1.1°F
	Lead Compressor Stage 1	Setpoint minus 1.0 F	Setpoint minus 1.6°F

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.9°F	Setpoint plus 1.4°F
	Lag Compr. Loader Stage 3	Setpoint plus 1.5°F	Setpoint plus 1.0°F
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.2°F	Setpoint plus 0.5°F
SWITCH = 5	Lag Compressor Stage 1	Setpoint plus 0.8°F	Setpoint plus 0.2 F
	Lead Compr. Loader Stage 4*	Setpoint plus 0.2°F	Setpoint minus 0.3°F
COOLING RANGE	Lead Compr. Loader Stage 3	Setpoint minus 0.2°F	Setpoint minus 0.8°F
OF ± 1.8 F	Lead Compr. Loader Stage 2	Setpoint minus 0.5°F	Setpoint minus 1.3°F
	Lead Compressor Stage 1	Setpoint minus 1.0°F	Setpoint minus 1.8°F

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 1.9°F	Setpoint plus 1.3°F
	Lag Compr. Loader Stage 3	Setpoint plus 1.5°F	Setpoint plus 0.9°F
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.1°F	Setpoint plus 0.4°F
SWITCH = 6	Lag Compressor Stage 1	Setpoint plus 0.7°F	Setpoint minus 0.1°F
	Lead Compr. Loader Stage 4*	Setpoint plus 0.2°F	Setpoint minus 0.7°F
COOLING RANGE	Lead Compr. Loader Stage 3	Setpoint minus 0.2°F	Setpoint minus 1.1°F
OF ± 1.9°F	Lead Compr. Loader Stage 2	Setpoint minus 0.7°F	Setpoint minus 1.5°F
	Lead Compressor Stage 1	Setpoint minus 1.2°F	Setpoint minus 1.9°F

	STAGE	ON	OFF
	Lag Compr. Loader Stage 4*	Setpoint plus 2.0°F	Setpoint plus 1.4°F
	Lag Compr. Loader Stage 3	Setpoint plus 1.5°F	Setpoint plus 0.9°F
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.1°F	Setpoint plus 0.4°F
SWITCH = 7	Lag Compressor Stage 1	Setpoint plus 0.6°F	Setpoint minus 0.1°F
	Lead Compr. Loader Stage 4*	Setpoint plus 0.2°F	Setpoint minus 0.7°F
COOLING RANGE	Lead Compr. Loader Stage 3	Setpoint minus 0.2°F	Setpoint minus 1.1°F
OF ± 2.0°F	Lead Compr. Loader Stage 2	Setpoint minus 0.7°F	Setpoint minus 1.5°F
	Lead Compressor Stage 1	Setpoint minus 1.2°F	Setpoint minus 2.0°F

* If optional 6 stage loading/unloading is included, Stage 4 loading and unloading is not included on either compressor. Therefore, in the examples above, no system response will take place at the temperatures where Stage 4 is to be activated or deactivated.

(YCHA120, 150, 175 & 200)

LWT COOLING RANGES (4 STAGE)

The user may use LWT control with a 4 stage chiller. This can be accomplished by removing J8 (J8 OUT) or Sw. 5 OFF on the Micro Logic Board which configures the Micro for 4 stage control. The disadvantage of 4 stages is that we are cycling large tonnages each time we turn a stage on or off. This could cause continuous cycling with the possibility of undesirable fluctuating leaving water temperatures. The variation in LWT is primarily due to the compressors cycling off and water temperature rising before the anti-recycle timer times out to allow the compressor to restart. The factory does not recommend that the equipment be used in this manner.

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.0°F	Setpoint plus 0.5°F
SWITCH = 0	Lag Compressor Stage 1	Setpoint plus 0.5°F	Setpoint
COOLING RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 0.5°F
OF ± 1.0°F	Lead Compressor Stage 1	Setpoint minus 0.5°F	Setpoint minus 1.0°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.2°F	Setpoint plus 0.6°F
SWITCH = 1	Lag Compressor Stage 1	Setpoint plus 0.6°F	Setpoint
COOLING RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 0.6°F
OF ± 1.2°F	Lead Compressor Stage 1	Setpoint minus 0.6°F	Setpoint minus1.2°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.4°F	Setpoint plus 0.7°F
SWITCH = 2	Lag Compressor Stage 1	Setpoint plus 0.7°F	Setpoint
COOLI NG RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 0.7°F
OF ± 1.4°F	Lead Compressor Stage 1	Setpoint minus 0.7°F	Setpoint minus 1.4°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.5°F	Setpoint plus 0.8°F
SWITCH = 3	Lag Compressor Stage 1	Setpoint plus 0.7°F	Setpoint
COOLING RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 0.8°F
OF ± 1.5°F	Lead Compressor Stage 1	Setpoint minus 0.7°F	Setpoint minus 1.5°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.6°F	Setpoint plus 0.8°F
SWITCH = 4	Lag Compressor Stage 1	Setpoint plus 0.8°F	Setpoint
COOLING RANGE	Lead Compr. Loader Staqe 2	SetPoint	Setpoint minus 0.8°F
OF ± 1.6°F	Lead Compressor Stage 1	Setpoint minus 0.8°F	Setpoint minus 1.6°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.8°F	Setpoint plus 0.9°F
SWITCH = 5	Lag Compressor Stage 1	Setpoint plus 0.9°F	Setpoint
COOLING RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 0.9°F
OF ± 1.8°F	Lead Compressor Stage 1	Setpoint minus 0.9 F	Setpoint minus 1.8°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 1.9°F	Setpoint plus 1.1°F
SWITCH = 6	Lag Compressor Stage 1	Setpoint plus 1.1°F	Setpoint
COOLING RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 1.1°F
OF ± 1.9°F	Lead Compressor Stage 1	Setpoint minus 1.0°F	Setpoint minus 1.9°F

	STAGE	ON	OFF
COOLING RANGE	Lag Compr. Loader Stage 2	Setpoint plus 2.0°F	Setpoint plus 1.0°F
SWITCH = 7	Lag Compressor Stage 1	Setpoint plus 1.0°F	Setpoint
COOLING RANGE	Lead Compr. Loader Stage 2	Setpoint	Setpoint minus 1.0°F
OF ± 2.0°F	Lead Compressor Stage 1	Setpoint minus 1.0°F	Setpoint minus 2.0°F

MICRO LOGIC BOARD JUMPERS/SWITCHES

The Micro Logic Board can be configured for various types of systems (4 stage vs. 6 or 8 stages of unloading) and several options (Remote/Local Control and RWT/LWT Control). These options are available on REV. B and REV. C Micro Logic Boards. REV. C also allows for panel selectable Lead/Lag (Lead/Lag Switch) versus automatic time sharing of lead/lag by the Micro, which will equalize compressor run times.

REV. B boards actually utilize three jumpers for these options (J8, J9, and J10). REV. C boards replace the jumpers with a Dip Switch which has 7 miniature rocker switches built into a single pack. 4 of the 7 switches are active. An explanation of the Jumpers/Switches on the Micro Logic Board is provided on this page and page 61.

MICRO LOGIC BOARD JUMPER OPTIONS (REV. B BOARDS)

Three jumpers are available for the options on the Rev. B Micro Logic Board.

J8: Selects 4 or 8 Stage Control
OUT: 4 Stage
IN: 8 Stage

NOTE:J8 must be placed IN if optional 6 or 8 stages of unloading is present.

J9: Remote Temperature Setpoint Reset and Remote Unloading
OUT: Local (Panel Control Only)
IN: Remote (Remote Control of Temperature Setpoint Reset and Unloading. You must have a Digital Input Board to use Remote Control.)

J10: Selects RWT or LWT Control
OUT: RWT Control
IN: LWT Control

NOTE: Use on LWT Control Only if 6 or 8 stages of unloading is present.

See Figure below for J8, J9, and J10 location.

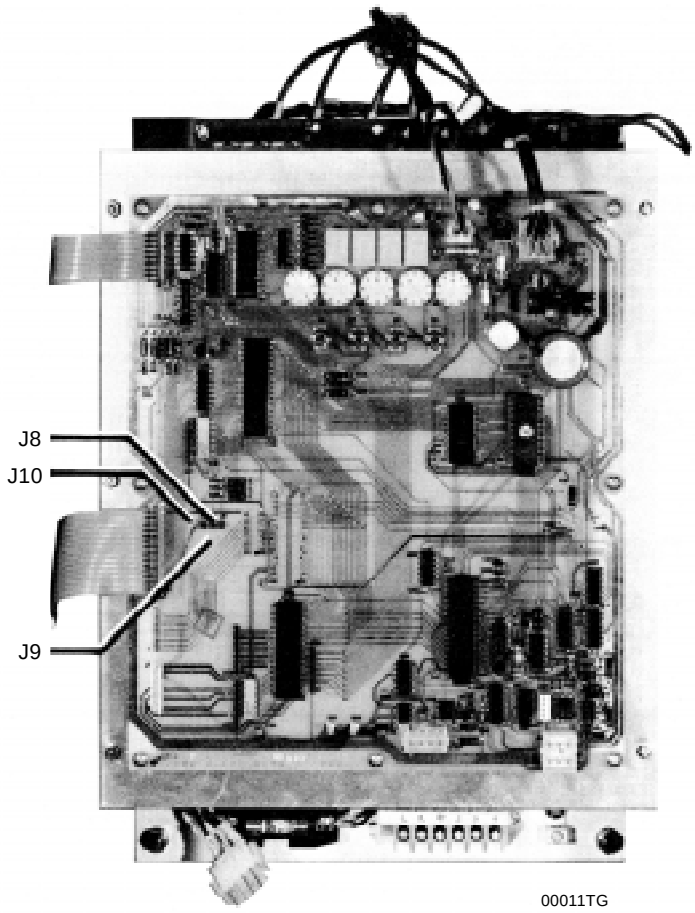
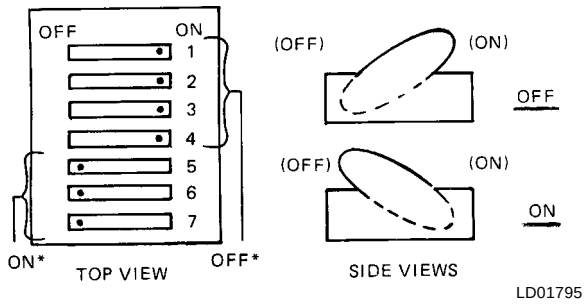


FIG. 20 – MICRO LOGIC BOARD JUMPERS (REV. "B" BOARD)

(YCHA120, 150, 175 & 200)

MICRO LOGIC BOARD DIP SWITCH OPTIONS (REV. C BOARDS)

A Dip Switch (U39) with 7 miniature rocker switches is available for options on the REV. C Micro Logic Board.



* Refer to above sketch to identify "OFF" and "ON" positions. The "dot" can be misleading when identifying switch position. See the "Side View" drawings for recommended position verification.

1	=	Spare	
2	=	Spare	
3	=	OFF:	RWT Control (Standard as Shipped)
		ON:	LWT Control
4	=	OFF:	No EMS Control (No Digital Input Board, Standard As Shipped)
		ON:	EMS Control (Optional Digital Input Board Installed)
5	=	OFF:	4 Stage Control (Standard as Shipped)
		ON:	8 Stage Control (Optional as ordered for 6, 7, or 8 stage control)
6	=	Spare	
7	=	OFF:	Automatic lead/lag compressor time sharing by Micro
		ON:	Manual Sys 1 lead/lag selection via Control Panel (Standard as Shipped)

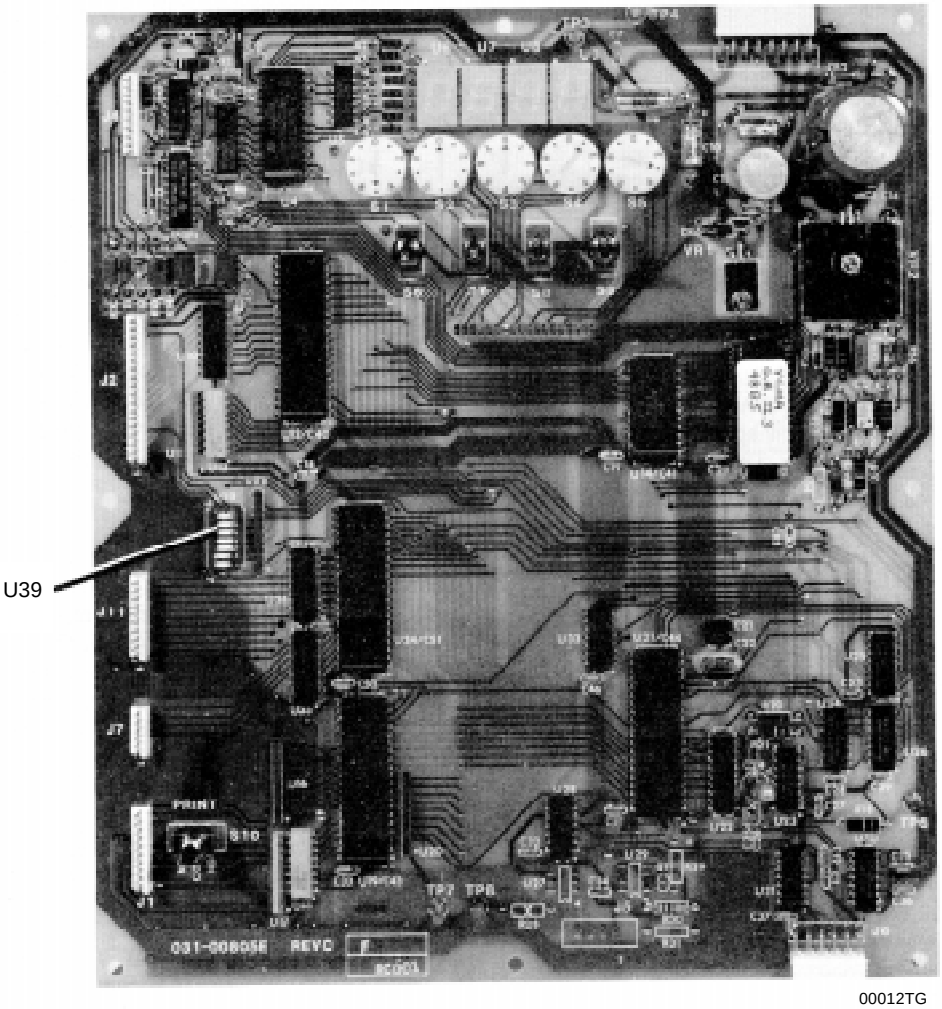


FIG. 21 – MICRO LOGIC BOARD DIP SWITCHES (REV. "C" BOARD)

PREVENTATIVE MAINTENANCE

It is the responsibility of the owner to provide the necessary daily, monthly and yearly maintenance requirements of the system. IMPORTANT – If a system failure occurs due to improper maintenance during the warranty period; YORK will not be liable for costs incurred to return the system to satisfactory operation. The following is intended only as a guide and covers only the chiller unit components. It does not cover other related system components which may or may not be furnished by YORK. System components should be maintained according to the individual manufacturers' recommendations as their operation will affect the operation and life of the chiller.

DAILY MAINTENANCE

It is recommended that the following items be checked daily.

1. **Oil Level –** Correct oil level is when oil appears in either of the compressor oil sight glasses after the unit has been in operation for about two hours. If it is necessary to add oil after this operating period, see item #3 under the ANNUAL MAINTENANCE section.
2. **Oil Pressure –** Oil pressure should be a minimum of 20 PSI above suction pressure.
3. **Compressor Superheat –** Correct superheat is 10-15°F measured at the compressor.
4. **Operating Pressures and Temperatures –** Check to see that operating pressures and temperatures are within the LIMITATIONS shown in this book.

WEEKLY MAINTENANCE

It is recommended that the following items be checked weekly.

1. All items listed under DAILY MAINTENANCE.
2. **Color of Compressor Oil –** New oil is clear, and if the system is not contaminated with moisture and/or foreign material, should retain its new appearance for a reasonable length of operating time. Discoloration of the oil, either turning darker brown or in some cases lighter, is an indication of contamination, basically due to moisture. If it is necessary to charge oil refer to item #3 under the ANNUAL MAINTENANCE section.
3. Check the refrigerant circuit for leaks.

ANNUAL MAINTENANCE

It is recommended that the following items be checked annually.

1. All items listed under WEEKLY MAINTENANCE.
2. **Operating Controls –** Check to see if controls are set and operating within the proper limits. See Unit Controls and OPERATION section of this book.
3. **Compressor Oil –** Drain, inspect and refill with new oil. This requires pumping out the compressor. If possible, this should be done after the unit has been in operation for some time, when the oil in the crankcase will contain the least amount of refrigerant. To pump out the compressor, proceed as follows:
   A. Close the suction stop valve.
   B. Open the discharge stop valve two turns of the stem.
   C. Operate the compressor until 15 to 20 inches vacuum is obtained. Do this by disconnecting the wiring to LLSV and repeatedly starting the compressor. Recycle 115VAC power to the Logic Panel to reduce anti-recycle time to 2 min. if needed. The compressor should in no case be operated under vacuum conditions for longer than 10 to 15 seconds.
   D. Stop the compressor and immediately close the discharge stop valve. The procedures outlined in steps (b) and (c) above should be repeated if the suction pressure rises rapidly to 15 PSIG or more which would indicate considerable refrigerant remaining in the crankcase oil. Do not expect to retain 0 PSIG, since some refrigerant will continually be released from the oil in the crankcase.
   E. After pumping down the compressor, wait until the pressure builds up to 2 or 3 PSIG before opening up any part of the hermetic compressor.
   F. Open the oil drain valve slowly and drain as much oil from the compressor as possible.
   G. Examine the oil for any metal particles which would indicate wear on the bearings, crankshaft or connecting rods. If metal particles are found, the need for closer examination by factory service personnel is indicated.
   H. If the oil is clean and free of metal particles, refill the compressor with YORK oil "C". To add oil or to fill the compressor crankcase, connect the delivery tube of the YORK Hand Oil Pump, YORK Part No. 470-10654 or equal to the compressor oil charging and drain valve. Expel all air from the delivery tube by pumping it full of oil, allowing a few drops to drip out before tightening the flare nut to the oil charging valve. Then open the oil charging valve and pump oil into the crankcase to the proper level. It is necessary that the suction end of the hand oil pump be kept submerged under the oil level in the container at all times, to avoid entrance of air into the compressor.
   I. Before opening the suction or discharge stop valves, connect a vacuum pump to the pumpout port in the discharge stop valve.(Pumpout port is port on valve stem side of valve.) With the vacuum line shutoff valve open, run the vacuum pump until a vacuum of at least 1000 microns is reached. Stop the vacuum pump, close the shut-off valve and open the discharge valve fully before disconnecting the line from the vacuum pump. Disconnect the vacuum pump and replace the plug in the pumpout port. *NOTE: If suction or discharge valves are not seated properly, a 1000 micron vacuum can not be obtained. Do not evacuate for long periods of time.*
   J. Be sure both discharge and suction stop valves are open before operating the unit.
4. **Suction and Discharge Valves –** The condition of the suction and discharge valves should be checked by YORK service personnel.

TROUBLE-SHOOTING THE YCHA 120-200 (STYLE C) CHILLER

Each YCHA (Style C) chiller is equipped with a micro-processor control panel (sometimes referred to as a "Smart Panel"). The panel not only serves as a means of accurate, reliable chiller operation; but also as a valuable service (or trouble-shooting) aid. To obtain the greatest benefit from the panel, the operator or service technician must be familiar with the way it operates. The following steps are suggested:

1. Study (and re-study) the preceding pages on "Unit Controls and Operation".
2. Observe the panel frequently during normal operation.
3. Keep a daily "log sheet"of normal operating conditions such as pressures, temperatures, motor current, etc. See list at right.

4. Do not attempt to service or diagnose the unit unless you have completed the above steps.

This procedure will help you to make a prompt, accurate diagnosis of most operating problems.

The following trouble-shooting chart lists some common problems, their cause and suggested solution(s). Problems beyond the scope of this manual should be referred to the local YORK Service Representative.

GENERAL

Before starting any service, or attempting to correct an operating problem the operator should "dial up" the Data Display Codes and complete the following chart (also refer to page 40). *DO THIS BEFORE CHANGING THE POSITION OF ANY TOGGLE SWITCHES. CHANGING THE POSITION OF THE SYSTEM TOGGLE SWITCHES WILL RESULT IN LOSS OF ALL STORED DATA. ALSO NOTE THE POSITION OF THE SYSTEM #1 LEAD/LAG* SWITCH.

0. Return chilled water temperature _____ °F
1. Leaving chilled water temperature ____ °F
2. Optional } Not Used
3. Optional }
4. Low leaving water temperature cutout setting __ °F
5. Chilled water setpoint _____ °F
6. Outside Air Temperature _____ °F
7. Low Ambient Temp. Cutout Setting ___ °F
8. % Full load motor current _____
9. Suction pressure _____ PSIG } System #1
10. Oil pressure _____ PSID }
11. Discharge pressure _____ PSIG }
12. % Full Load Motor Current _____ } System #2
13. Suction Pressure _____ PSIG }
14. Oil Pressure _____ PSIG }
15. Discharge Pressure _____ PSIG }
16. Suction pressure cutout setting ____ PSIG
17. Optional – Not used
18. Fault code **(if any) see page 40**

Using test equipment that is calibrated accurately (pressure gauges, temperature probes, digital volt meters etc.) verify the Data Display Code readings logged above. Note any significant difference. Check that all sensors are properly installed and that the wiring to the sensors is not cut or shorted. Check that all manual stop valves on unit are open.

(YCHA120-200)
TROUBLE-SHOOTING CHART

PROBLEM	CAUSE	SOLUTION
No display on panel Unit will not operate	1. No 115VAC to 2T.	1. Check wiring and fuse. Check emergency stop contacts to 41 to 5.
	2. Faulty wiring	2. Check wiring 2T to PSB
	3. Power Supply Board (PSB)	3. Replace PSB
	4. 2T defective	4. Replace 2T
	5. Micro Board defective	5. Replace Micro Board (Contact the local YORK service representative.)
"A" Code on Display	1. No Flow	1. Check Chilled Liquid Flow
	2. Flow Switch Installed Improperly	2. Check that Flow Switch is Installed According to Manufacturer's Instructions.
	3. Defective Flow Switch	3. Replace Flow Switch
	4. Remote Stop	4. Check Cycling Devices connected to terminals 3 & 4 of the Logic Panel Terminal Block
	5. Defective Run Permissive (R.P.) Relay	5. Replace R.P. Relay
	6. Defective Analog Input Board	6. Replace Analog Input Board (Contact the local YORK service representative.)

(YCHA120-200)

PROBLEM	CAUSE	SOLUTION
F1 or F5 Fault Code Faults on Motor Current. Motor Contactor May or may not Energize	1. External High Pressure Switch tripped	1. Check External High Pressure Switch and related problems in “Cuts-out on High Discharge Pressure” section (F4 or F8 Fault Code)
	2. External Motor Overload tripped.	2. Check for defective External Motor Overload, wiring, & motor problems
	3. Improper System High Voltage Supply.	3. Check System High Voltage Supply
	4. Defective motor	4. Check motor
	5. Faulty wiring single phasing	5. Check wiring
	6. Motor Current Board defective	6. Replace Motor Current Board (Contact the local YORK service representative.)
	7. Defective Current Transformer	7. Replace defective Current Transformer
	8. Defective 13FU or 120VAC power missing from Relay Output Board and motor contactors.	8. Check fuse (13FU) & wiring
	9. Defective Motor Contactor or Auxiliary contacts	9. Replace Contactor or Auxiliary Contacts
	10. Defective Relay Output Board	10. Replace Relay Output Board (Contact the local YORK service representative.
F2 or F6 Fault Code Low Oil Pressure Fault	1. Low Oil Charge	1. Oil level should be visible in either sight glass at all times. Add YORK “C” oil if necessary.
	2. Too much refrigerant in oil, particularly on start-up.	2. Check Crankcase Oil heater operation. (350 Watt heater should be “ON” when unit is “OFF”.) Measure Heater Current. (Should be Min. 2 Amps.)
	3. Liquid Line Solenoid Valve (LLSV) not opening.	3. Check wiring & LLSV
	4. Suction Press. Transducer defective	4. Replace Transducer
	5. Oil Press. Transducer defective	5. Replace Transducer
Follow steps listed under GENERAL above to verify cutout point (44 PSIG), (or as appropriate for brine).		
F3 or F7 Fault Code Faults on Low Pressure	1. Low Refrig. Charge	1. Repair Leak/Add Refrig.
	2. Fouled Filter Drier	2. Change Drier Core
	3. Thermal Expansion Valve Failure	3. Adjust Compressor Suction Superheat to 11°F or Replace Power Element (or Valve)
	4. Reduced Flow of Chilled Liquid through Cooler	4. Check GPM (See OPERATING LIMITATIONS, page 3) Check operation of pump. Clean Pump Strainer, Purge Chilled Liquid System of air
	5. Check LP Cutout Point on Panel	5. See manual for adjustment procedure
	6. Defective Suction Press. Transducer	6. Replace Transducer
	7. Fouled Compressor Suction Strainer	7. Remove & Clean Strainer
	8. LLSV not opening	8. Check Wiring & LLSV
	9. Faulty wiring to Transducer	9. Check wiring
	10. Defective Relay Output Board	10. Replace Relay Output Board (Contact the local YORK service representative.)
	11. Defective Analog Input Board	11. Replace Analog Input Board (Contact the local YORK service representative.)
	12. Defective Micro Board	12. Replace Micro Board (Contact the local YORK service representative.)

(YCHA120-200)

PROBLEM	CAUSE	SOLUTION
F4 or F8 Fault Code Cuts out on High Discharge Pressure as sensed by Microprocessor via high discharge pressure transducer. *NOTE: If external H.P. Cut-out Switch trips the Fault Code will be an F1 or F5.*	1. Condenser fans not operating or rotating backwards. 2. Too much Refrigerant 3. Air in Refrigerant System 4. Defective Discharge Press. Transducer 5. Defective Relay Output Board 6. Defective Analog Input Board	1. Check fans, Fuses, and Contactors. Air flow must “UP”. 2. Remove Refrigerant 3. Evacuate and recharge 4. Replace Discharge Press. Transducer 5. Replace Relay Output Board (Contact the local YORK service representative.) 6. Replace Analog Input Board (Contact the local YORK service representative.)
F9 Fault Code Cuts out on high ambient temperature. (Max. = 130°F Will re-start automatically if temperature drops below 130°F)	1. Temperature sensed incorrectly by thermistor 2. Fans Rotating Backwards 3. Air flow to unit restricted (or being re-circulated).	1. Verify actual ambient temperature at probe 2. Air flow must be up. Correct fan rotation. 3. Check installation clearances. (See page 5)
F10 Fault Code Cuts out on Low Ambient Temperature (35°F min. for Std. Unit. 0°F min. for Low Ambient Unit.) *NOTE: Operation below 35°F required Low Ambient Accessory.*	1. Temperature sensed incorrectly by thermistor. 2. Check Low Ambient Temp. Cut-out setting on the display (Display Code 7)	1. Verify actual ambient temperature at probe. 2. Adjust if necessary.

Follow steps listed under GENERAL above to verify cutout setpoint and actual cutout reading.
Factory Setting = 36°F (or as appropriate for brine.)

F11 Fault Code Low Water Temperature Shutdown	1. Check LWT Cutout Point on Panel 2. Defective LWT or RWT sensor.	1. Adjust if necessary, and restart unit. 2. Check according to following table (use digital volt meter)* Replace if necessary.

Temp. °F	Voltage - (DC)
30.9	1.67
33.6	1.79
36.3	1.91
38.9	2.03
41.4	2.15
43.9	2.28
46.3	2.40
48.6	2.52
50.8	2.64
53.0	2.76
55.1	2.89
57.2	3.01
59.3	3.13
61.3	3.25
63.2	3.37

*Check voltage on Analog Input Board
LWT: J20-1 to J20-3
RWT: J21-1 to J21-3

(YCHA120-200)

PROBLEM	CAUSE	SOLUTION
Low Compressor Oil Level (Particularly on Start-up.)	1. Low Oil Charge	1. Oil level should be visible in either sight glass at all times. Add YORK "C" oil if necessary.
	2. Excessive Flood back of Liquid Refrigerant	2. Adjust Thermal Expansion Valve (TXV) or Replace Power Element. Check TXV Bulb Location. Should be located on suction line at least 8"-10" from nearest elbow. Bulb should be at 4 o'clock or 8 o'clock position, have good contact with suction line & be well insulated from surrounding air.
Crankcase Heater won't Energize (should energize anytime unit is "OFF") (Min. Current draw = 2 amps)	1. Open in 115 VAC wiring to heater	1. Check wiring
	2. Defective Heater	2. Replace Heater
	3. Auxiliary contacts of Compressor Motor Contactor defective.	3. Replace Contactor
Compressor won't load (solenoid valve de-energizes to load compressor)	1. Suction Pressure >105 PSIG (System #1) or >95 PSIG (System #2)	1. Excessive load. Check OPERATING LIMITATIONS on page 3. Allow unit to operate until suction pressure drops to 95 PSIG (System # 1) or 85 PSIG (System #2)
	2. Discharge Pressure >390 PSIG (System #1) or > 380 PSIG (System # 2)	2. Check OPERATING LIMITATIONS on page 3. Will reload @ 330 PSIG (System #1) or 320 PSIG (System #2)
	3. Demand not great enough	3. OK
	4. Defective Loading Solenoid	4. Replace Compressor Loading Solenoid
	5. Faulty Wiring to Loading Solenoid	5. Check Wiring
	6. Defective Water Temp. Sensor	6. Replace appropriate Sensor (LWT or RWT) (See chart under F11 Fault Code)
	7. Defective Evaporator Transducer	7. Replace Transducer.
	8. Relay Output Board defective	8. Replace Relay Output Board (Contact the local YORK service representative)
	9. Defective Micro Board	9. Replace Micro Board (Contact the local YORK service representative)
Lack of Cooling Effect	1. Fouled Evaporator Surface	1. Contact the local YORK service representative.
	2. Faulty Compr. Suction and/or Discharge Valves	2. Contact the local YORK service representative.

SERVICE BULLETINS

BRINE COOLED
RECIP CHILLER MICRO PANELS

GE II.5BR REV. 0 EPROM REVISION LEVEL CHANGE TO GE II.5BR REV. 1

For the past year, the Brine EPROM used in both water cooled and air cooled Recip. Chillers 120 tons and above has been GE II.5BR Rev. 0. This EPROM enables the chiller's setpoint to be set to temperatures between 15 - 40°F.

A new GE II.5BR Rev. 1 EPROM will begin appearing in our new U.L. approved water and air cooled chillers above 120 tons. These chillers will have cost reduced micropanels with a Combo Board replacing the Motor Current Board, Analog Input Board, and Power Supply Board. A small quantity of non U.L. units with this new EPROM will also be built. These units will also have the cost reduced micropanel and can be identified by the presence of the Combo Board.

The GE II.5BR Rev. 1 EPROM will assume the old part number of the Rev. 0 (031-00928-004) and replace it as a Service Parts replacement. Should the need arise to replace an EPROM, the new Rev. 1 EPROM will be an exact replacement on all water cooled units (LCH 130 - 230, YCWK - YCWT) which used GE II.5 BR Rev. 0 EPROM's and came equipped with Analog Input, Power Supply and Motor Current Boards. However, if for some reason an EPROM requires replacement on an Air Cooled Chiller (YCHA 120 - 200, YCAG - YCAN) equipped with Analog Input, Power Supply and Motor Current Boards, a modification will be required to permit proper operation of the fans. This modification should be performed as follows:

1. Place SW2 on the Micrologic Board to the ON position (Right side pushed down). This enables manual adjustment of the low ambient cut-out.
2. Select Display Code 0, 7 on the Control Panel to view the low ambient cut-out.
3. Adjust R24 on the Analog Board until the low ambient cut-out on the display is as low as it will go (Typically 0 or 0.1°F).
4. Disconnect the J17 plug from the Analog Input Board. This causes the micro to sense outside air temperature as 1°F.
5. The micro is now fooled into thinking that outside air temperature is very low and will now cycle fans according to discharge pressure only (not temperature). Fan cycling will operate as follows:

	System 1	
FAN E & F	ON:	Condenser Press 260 PSI
	OFF:	Condenser Press 190 PSI
FAN *G & H	ON:	Condenser Press 280 PSI
	OFF:	Condenser Press 210 PSI

	System 2	
FAN C & D	ON:	Condenser Press 260 PSI
	OFF:	Condenser Press 190 PSI
FAN A & B	ON:	Condenser Press 280 PSI
	OFF:	Condenser Press 210 PSI

*Fan "G" not present on all chillers.

Failure to perform the modifications described will result in potential low discharge pressures and corresponding low suction pressures in outside ambient temperatures of 45 - 65°F. This will definitely cause low suction pressure and low motor current faults. Symptoms indicating that this modification has not been performed will be all 4 fans on a system starting 5 sec. after compressor start in ambient temperatures above 45°F.

In general, the Rev. 1 Brine EPROM functions the same as the Rev. 0 except for fan cycling. Even fan cycling remains much the same except that the wiring has changed on U.L. air cooled chillers and requires the Rev. 1 EPROM. Detailed operation of the new software is contained in FORM 150.24-NM25 and 150.40-NM25.

RECIP CHILLER MICRO PANELS
GE II .5 EPROM
REVISION LEVEL CHANGE TO GE II.5 REV. 2*

For the past 3 years, the standard EPROM in both water cooled and air cooled Recip. Chillers 120 tons and above has been GE II.5 REV. 0 or REV. 1. Both of these EPROM's are interchangeable and their operation is transparent to the user. The only important difference is the low motor current cut-out point (REV. 0 = 29%, REV. 1 = 23%). The cut-out point was lowered to enable 6 cyl. compressors, which unload to 2 cylinders, to operate under certain very low load / temperature conditions;

A new GE II .5 REV. 2 EPROM will begin appearing in our new U.L. approved water and air cooled chillers above 120 tons. These chillers will have cost reduced micropanels with a Combo Board replacing the Motor Current Board, Analog Input Board, and Power Supply Board. A small quantity of non U.L. units with this new EPROM will also be built. These units will also have the cost reduced micropanel and can be identified by the presence of the Combo Board.

The GE II.5 REV. 2 EPROM will assume the old part number of the REV. 0 and REV. 1 (031-00928-001) and replace them as a Service Parts replacement. Should the need arise to replace an EPROM, the new REV. 2 EPROM will be an exact replacement on all water cooled units (LCH 130 - 230, YCWK - YCWT) which used REV. 0 and REV. 1 EPROM's and came equipped with Analog Input, Power Supply and Motor Current Boards. However, if for some reason an EPROM requires replacement on an Air Cooled Chiller (YCHA 120 - 200, YCAG - YCAN) equipped with Analog Input, Power Supply and Motor Current Boards, a modification will be required to permit proper operation of the fans. This modification should be performed as follows:

1. Place SW2 on the Micrologic Board to the ON position (Right side pushed down). This enables manual adjustment of the low ambient cut-out.
2. Select Display Code 0,7 on the Control Panel to view the low ambient cut-out.
3. Adjust R24 on the Analog Board until the low ambient cut-out on the display is as low as it will go (Typically 0 or 0.1°F).
4. Disconnect the J17 plug from the Analog Input Board. This causes the micro to sense outside air temperature as 1°F.
5. The micro is now fooled into thinking that outside air temperature is very low and will now cycle fans according to discharge pressure only (not temperature). Fan cycling will operate as follows:

* GE II.5 REV. 2 EPROMS may also be labeled.
GE II.5S REV. 2 The two EPROMS are indentical.

	System 1	
FAN E & F	ON:	Condenser Press 260 PSI
	OFF:	Condenser Press 210 PSI
FAN *G & H	ON:	Condenser Press 280 PSI
	OFF:	Condenser Press 210 PSI

	System 2	
FAN C & D	ON:	Condenser Press 260 PSI
	OFF:	Condenser Press 190 PSI
FAN A & B	ON:	Condenser Press 280 PSI
	OFF:	Condenser Press 210 PSI

*Fan "G" not present on all chillers.

Failure to perform the modifications described will result in potential low discharge pressures and corresponding low suction pressures in outside ambient temperatures of 45 - 65°F. This will definitely cause low suction pressure and low motor current faults. Symptoms indicating that this modification has not been performed will be all 4 fans on a system starting 5 sec. after compressor start in ambient temperatures above 45°F.

In general, the REV. 2 EPROM functions the same as the REV. 0 and REV. 1 except for fan cycling. Even fan cycling remains much the same except that the wiring has changed on U.L. air cooled chillers and requires the REV. 2 EPROM. Detailed operation of the new software is contained in FORM 150.24-NM25 and 150.40-NM25.

WARRANTY PARTS PROCUREMENT PROCEDURE
RECIPROCATING CHILLER MICRO PANELS

The District office is to take out an S.D. number before calling in a parts order to YORK Baltimore Parts; 9003 Yellow Brick Rd.; P. O. Box #72229; Baltimore, MD 21237-2229. (Phone #1-301-574-0400)

All new printed circuit boards will be accompanied with a failure report tag which **must** be completed in **detail** on the defective component. This tag must be attached to the defective component.

Enclosed with the new part you will also receive a return address label which must be used when returning the defective part.

Only defective printed circuit boards are to be returned to the Electronic Center in Norcross, GA.

Any defective components which are returned to the Electronic Center without the tag or the tag not filled out completely will be **rejected** and charged to your district 702 account immediately, and you **will not receive credit**.

All defective printed circuit boards replaced on a warranty **must** be returned to the following address:

York International Corp.
6250 McDonough Dr.
Norcross, GA 30093
ATTN: Electronic Center

FIELD INSTALLATION OF OPTIONAL CUSTOMER ALARM STATUS CONTACTS ON "STYLE C"(NON "UL") RECIP SMART PANELS MODELS YCHA AND YCA

Optional Customer Alarm Status Contacts can be field installed into a non "UL" (single box enclosure) Recip Micro Panel. This option will provide individual NC dry contacts which will transition when the respective system faults ("F" Code on the display).

Order the Alarm Kit using York Part Number 025-27199. Be sure the Microboard & EPROM conforms to the following guidelines:

UNIT TYPE	MICROBOARD	EPROM
Single System	REV B or C	GE II.4, REV. 1, D157 (031-00928-002, water) GE II.4BR, REV. 0, B8BC (031-00928-005,brine)
Dual System	*REV B or C	GE II.5, REV. 1, B727 (031-00928-001, water) GE II.5BR, REV. 0, CID6(031-00928-004, brine)

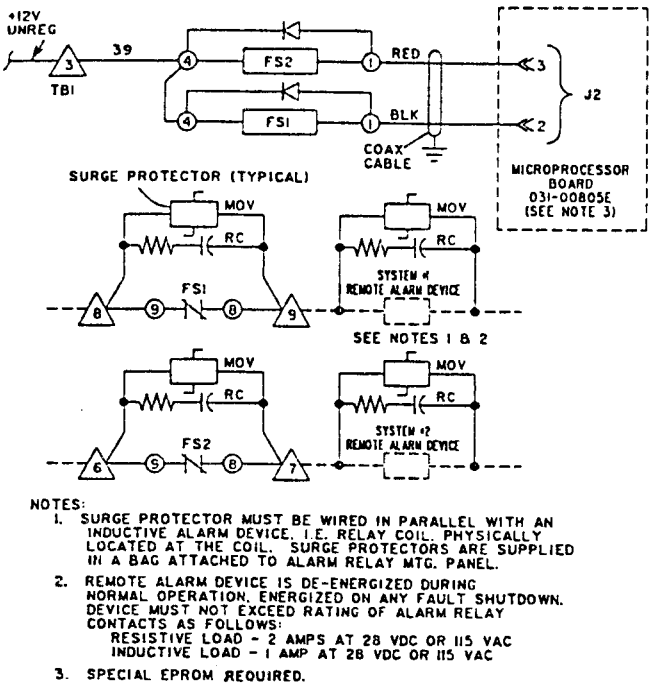
* If a low ambient kit is installed, a REV. C Microboard is necessary. Otherwise the low ambient cut-out adjustment on the Analog Input Board may not have the capability of being adjusted to the required cut-out. SW2 on the Microboard must be placed to the "ON" position to allow adjustment down to 0°F. If a REV. C Micrologic Board is needed, order York part number 031-00805-000. All current stock will be REV. C.

See page 2 for wiring connection to the existing Micropanel.

Shown below are Wiring Diagrams for the Kit:

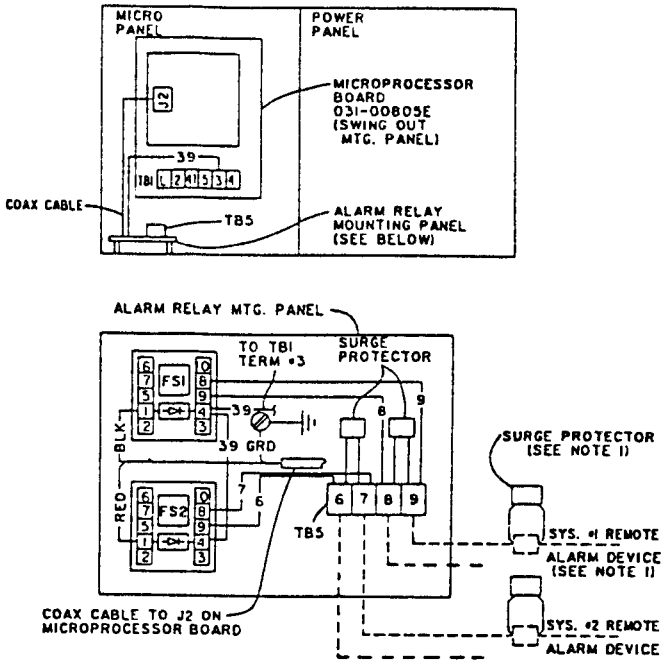
WIRING DIAGRAM FOR CUSTOMER ALARM CONTACTS

ELEMENTARY DIAGRAM



NOTES:
1. SURGE PROTECTOR MUST BE WIRED IN PARALLEL WITH AN INDUCTIVE ALARM DEVICE, I.E. RELAY COIL. PHYSICALLY LOCATED AT THE COIL. SURGE PROTECTORS ARE SUPPLIED IN A BAG ATTACHED TO ALARM RELAY MTG. PANEL.
2. REMOTE ALARM DEVICE IS DE-ENERGIZED DURING NORMAL OPERATION, ENERGIZED ON ANY FAULT SHUTDOWN. DEVICE MUST NOT EXCEED RATING OF ALARM RELAY CONTACTS AS FOLLOWS:
   RESISTIVE LOAD - 2 AMPS AT 28 VDC OR 115 VAC
   INDUCTIVE LOAD - 1 AMP AT 28 VDC OR 115 VAC
3. SPECIAL EPROM REQUIRED.

CONNECTION DIAGRAM



LD01893

RECIP CHILLER SMART PANEL
ALL MODELS YCH

Incorrect Field Insertion of J3 and J6 Plugs Into
the REV. C Microprocessor Board

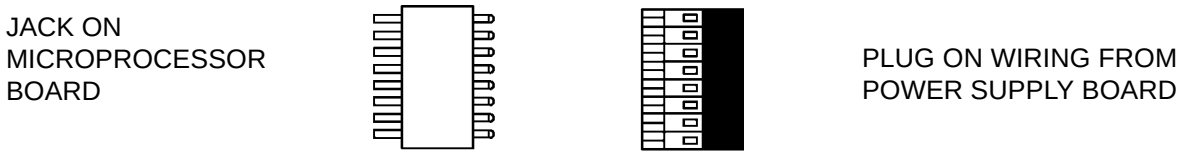
The J3 and J6 jacks on the REV. C Microprocessor Board will allow the plugs to be inserted upside down. This usually causes damage to the control panel as well as possibly an external device. The Micro Panel is susceptible to this problem when the Microprocessor Board is replaced or a printer is connected.

If J3 is inserted upside down, damage will most likely result to the 2T transformer and occasionally the Power Supply Board and the Microprocessor Board. Damage to the latter two is rare and will only occur if the internal fuse in the 2T transformer does not open. Normally the internal fuse opens in the 2T transformer and can be replaced by simply locating the fuse under the brown paper wrapping, carefully slitting the paper and soldering in a new fuse. The fuse is a standard 3/4 A glass type which can be acquired almost anywhere.

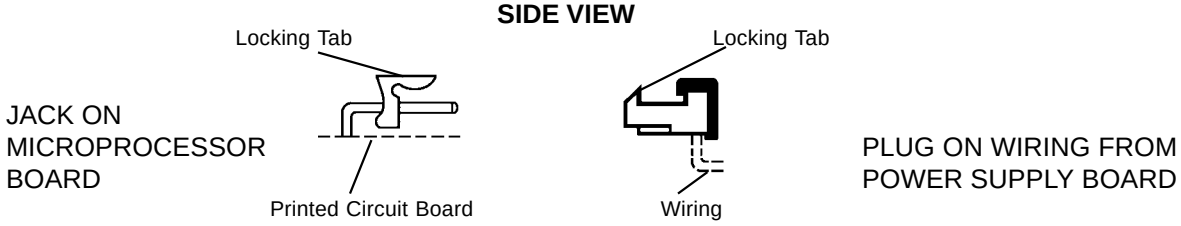
Incorrect insertion of the J6 plug may damage the Microprocessor Board RS-232 port and the external printer. Care should be taken since this plug is often connected and disconnected.

The following drawings show the correct and incorrect insertion of these plugs and how the locking tabs should line up when the plugs are properly mated.

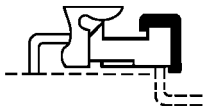
TOP VIEW



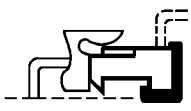
SIDE VIEW



<u>CORRECT</u> MATING OF JACK AND PLUG



<u>INCORRECT</u> MATING OF JACK AND PLUG



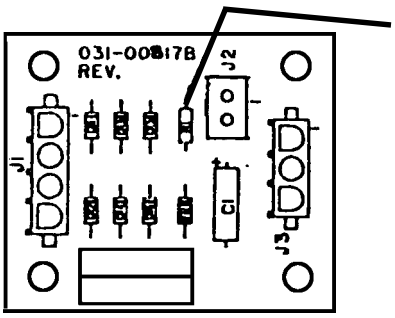
LD01898

RECIP. MICRO PANEL
MOTOR CURRENT BOARD 031-00817
LINE LEVELS

Two line levels of motor Current Boards (MCB's) are now present in Recip. Micro Panels. These line levels are line -000 and line -002. Line -000 is used in panels which utilize 200:0.2, 300:0.2, and 400:0.2 C.T.'s (Current Transformers). Line -002 is used only with 500:0.2 C.T.s.

Line -000 and line -002 are not interchangeable. The chiller usually will not run if the incorrect board is installed in the panel. This is because the MCB resistor plugged into J2 will not be the correct value.

When replacing an MCB, be sure to not only look at the line level, but also check the value of the R1 resistor next to the J2 connector where the MCB resistor is plugged in (See Fig. below). This will positively determine the line level of MCB you need.



LD01899

Line -000: 100Ω (Brown, Black, Brown)
Line -002: 10KΩ (Brown, Black, Orange)

The line level will be stamped behind the part number 031-00817B (i.e. 031-0081702. The "B" should be ignored and may not be present). No line number indicates a -000 and 02 indicates a -002. This is a deviation from normal YORK standards. The small size of the board does not allow the full three digit number to be stamped behind the part number.

Be sure the original MCB resistor plugged into J2 is placed into the new board. The resistor is sized to the compressor FLA and panel C.T. ratio during manufacturing. Compressor damage or faulting could occur if the MCB resistor is missing or incorrect.

These measures should insure that additional problems are not introduced into the panel if a Motor Current Board is replaced.

YCHA RECIP. CHILLER
CONDENSOR FAN OPERATION

Some questions have arisen on YCHA Condensor Fan Operation. The confusion seems to be concerning the temperature/pressure control scheme and whether temperature or pressure should be in command.

Temperatures Above 55°F As Sensed By the OAT (Outdoor Ambient Temperature) Sensor

Fan cycling will be by temperature control only, Discharge pressure will have no effect. Above 55°F. 4 sec. after the respective compresssor starts, Fans E and F (Compr. 1) or Fans C and D (Compr. 2) will come on. Thirty sec. after the respective compressor starts, Fans G and H(Compr. 1) or Fans A and B (Compr. 2) will come on. These fans will remain on, regardless of discharge pressure or loading, until the respective compressor stops or temperature drops below 55°F. Note: YCHA 120's will not have Fan G.

Temperatures 35°F to 55°F As Sensed By the OAT (Outdoor Ambient Temperature) Sensor

In this range, 2 fans on each system are cycled by temperature control only. **Discharge pressure will have no effect on these 2 fans**. Four (4) seconds after the respective compressor starts, Fans E and F (Compr. 1) or Fans C and D (Compr. 2) will come on. These fans will remain on, regardless of discharge pressure or loading, until the respective compressor stops or temperature drops below 35°F.

The other two fans on each system are cycled when the respective compressor is running according to discharge pressure only. Fans G and H (Compr. 1) or Fans A and B (Compr. 2) will cycle according to table below until temperature as sensed by the OAT sensor rises above 55°F, until the respective compressor stops, or temperature drops below 35°F. Note: YCHA 120's will not have Fan G.

SYSTEM	FAN CONTACTOR	FANS CONTROLLED	DISCHARGE PRESSURE TO CYCLE FANS	
			"ON"	"OFF"
1	5M	E, F	260 LB.	190 LB.
	6M	G, H	280 LB.	210 LB.
2	7M	C, D	260 LB.	190 LB.
	8M	A, B	280 LB.	210 LB.

Temperatures Below 35°F as Sensed By The OAT (Outdoor Ambient Temperature) Sensor

Below 35°F a Low Ambient Kit option must be installed. This kit will affect fan cycling below 35°F and 35°F to 55°F. Details on this option will be discussed in another Service Bulletin. Without this kit, the chiller will not operate below 35°F.

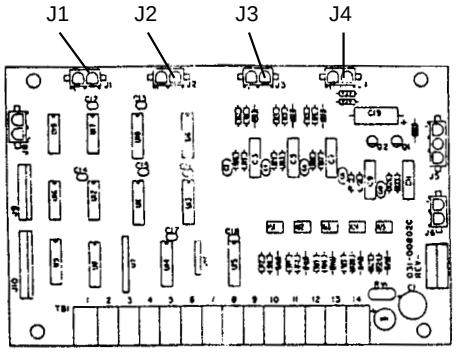
If any doubts arise concerning the temperature the OAT sensor is sensing, display a Code 06 on the Micro Panel Display. This display indicates the temperature sensed by the OAT sensor located outside on the back side of the Logic section of the control panel. It should coincide with a thermometer located in the same location ± 10°F.

RECIP. MICRO PANEL
RELAY OUTPUT BOARD JUMPERING

Some confusion has arisen as to how to jumper J34 and J35 on the Relay Output Board. All present production will have the jumpers in the “C” position and will continue as such regardless of the options. Incorrect jumpering will affect fan cycling on YCHA chillers and loading on LCH chillers. If you experience either of these problems, the cause is probably incorrect Relay Output Board jumpering.

Listed in the table below is a guide to follow for the Relay Output Board jumpering. The key to determining jumper position will be whether a Digital Input Board is present and whether plugs J1, J2, J3, and J4 on the Digital Input Board are connected to the external H.P. (High Pressure) cut-out and M.P. (Motor Protector) or whether the plugs are left open (See Fig. below for J1-J4 location). This information will also be helpful when replacing the Relay Output Board.

J34 and J35 POSITION	CHILLER TYPE	DIGITAL INPUT BD. INSTALLED?	PLUGS J1,J2,J3 AND J4 OF THE DIGITAL INPUT BOARD ARE CONNECTED TO THE H.P. CUTOUT AND M. P.	EMPROM IN U15 OF MICROPROCESSDR BOARD
R	LCH	Yes	Yes	“V” Series
R	LCH	Yes	Yes	Updated to “GE” Series
C	LCH	Yes	No	“GE” Series
C	LCH	No	Does Not Apply	“GE” Series
C	YCHA	Yes	No	“GE” Series
C	YCHA	No	Does Not Apply	“GE” Series



LD01900

EFFECTIVE IMMEDIATELY !
TRANSDUCER WARRANTY REQUIREMENTS
FOR
RECIP. SMART PANEL

YORK has made an agreement with Kavlico for reimbursement of parts cost plus reasonable labor for all Kavlico transducers which fail within the chiller warranty period. This will mean considerable savings for YORK as long as certain guidelines are followed. We would appreciate the cooperation of **all** District and Regional Managers, Supervisors, and Field Service Technicians to help us satisfy the requirements to collect this warranty.

When a Kaviico transducer fails write the word KAVLICO clearly on the warranty so there is no mistake about the manufacturer of the transducer. Be sure that there is no other labor or parts charged to the warranty. Note the type of transducer (oil, suction, or discharge), the pressure range (0 - 200 or 0 - 400), the pressure that was actually in the system as read on a gauge, and the fault code at the time the panel shutdown. Be sure that the number of labor hours on the warranty is accurate.

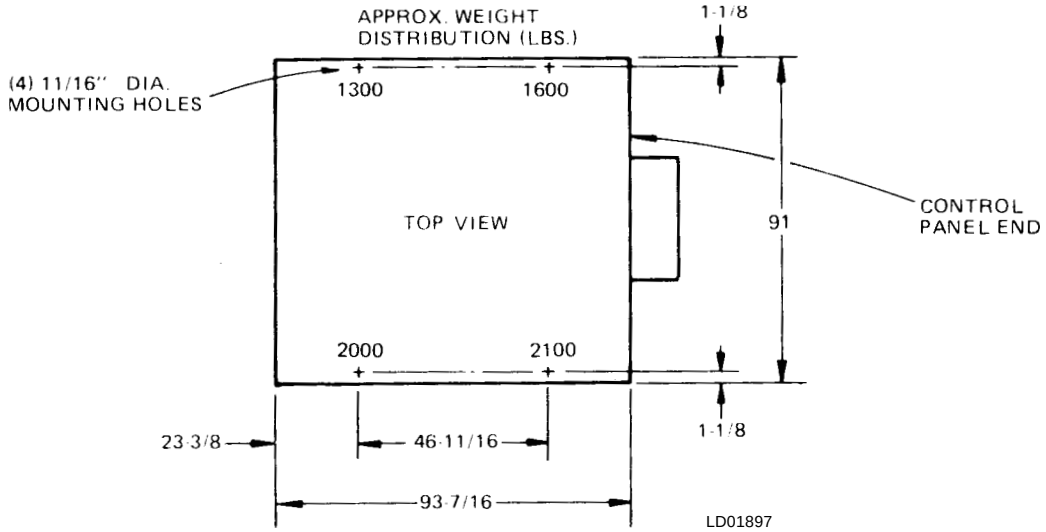
This information is necessary for Kavlico to evaluate the failure and determine reimbursement costs to YORK. Immediately ship the transducer with a copy of the warranty via UPS to the following address:

YORK INTERNATIONAL CORP.
631 S. Richland Ave., Door 100
York, PA 17403
Attn: Dave Saylor / 36BE

MODELS YCAQ10, YCAM12, YCAK14, YCAI16, YCAG18
YCAR11, YCAN13, YCAL15, YCAJ17 & YCAH19
ALSO
MODELS YCHA100, 120, 150, 175, & 200
STYLE C

CORRECTION TO FORM 150.40-NM20 CODED 587

The Weight Distribution shown on page 4, and the Weights shown in the PHYSICAL DATA table on page 8 of this form have been revised. Please substitute the data shown below and on the reverse side.



MODEL			YCHA100 YCAQ10 YCAR11	YCHA120 YCAM12 YCAN13	YCHA150 YCAK14 YCAL15	YCHA175 YCAI16 YCAJ17	YCHA200 YCAG18 YCAH19
NO. OF REFRIG. CIRCUITS		1	2	2	2	2	
COMPRESSOR MODEL	60 HZ	Sys. 1	JS83E-S	JS43E-M	JS63E-P	JS63E-P	JS83E-S
		Sys. 2	—	JS63E-P	JS63E-P	JS83E-S	JS83E-S
CAPACITY CONTROL %	STD.	Sys. 1 Lead	100, 75, 50, 25	100, 60, 40, 20	100, 67, 50, 17	100, 71, 43, 14	100, 75, 50, 25
		Sys. 2 Lead	—	100, 80, 60, 20	100, 67, 50, 17	100, 71, 57, 29	100, 75, 50, 25
	OPT.	Sys. 1 Lead	—	100, 80, 60, 40, 20	100, 83, 67, 50, 33, 17	100, 86, 71, 57, 43, 29, 14	100, 88, 75, 62, 50, 38, 25, 12
		Sys. 2 Lead	—	100, 80, 60, 40, 20	100, 83, 67, 50, 33, 17	100, 86, 71, 57, 43, 29, 14	100, 88, 75, 62, 50, 38, 25, 12
OIL CHARGE (GALS)		Sys. 1	3	3	3	3	3
		Sys. 2	—	3	3	3	3
CONDENSER DWP 450 PSIG NO. OF FANS (30" DIA DIRECT DRIVE)			4	7	8	8	8
CFM (EACH)			11,000	11,000	11,000	11,000	11,000
COOLER – DUAL CIRCUITED DWP 235 PSIG REF. SIDE, 150 PSIG WATER SIDE DIA. X LENGTH			14" x 7'	14" x 8'	14" x 8'	16" x 8'	18" x 9'
WATER VOLUME (GALS)			31	36	33	39	49
GPM		Min.	120	120	120	150	200
		Max.	550	580	580	640	700
WEIGHTS (LBS)	Shipping	AL Fins	6,760	10,080	11,150	12,115	13,840
		CU Fins	8,435	11,980	12,650	15,115	17,340
	Operating	AL Fins	7,000	10,400	11,540	12,505	14,500
		CU Fins	8,675	12,300	13,040	15,505	18,000
REFRIG. CHARGE (LBS. R-22)		Sys. 1	135	87	116	116	133
		Sys. 2	—	116	116	133	133

SMART PANEL EQUIPPED
LCH & YCHA RECIPROCATING CHILLERS

MIS-DIAGNOSING INCORRECT SERVICE VALVE
POSITIONING AS TRANSDUCER FAILURES

Recently we have been made aware that transducers mounted on Service valves have been sometimes mistakenly diagnosed as being defective. It was later found that the transducer's output was wrong because the transducer had been valved off due to incorrect Service valve positioning.

Be sure, after replacing a transducer or when starting a new chiller where the Service valves have been placed in the front-seat position to close off the system, that you back-seat all Service valves completely and then turn them **one** turn toward the front seat position to assure that the transducers are not valved off. This should also be checked when troubleshooting. In the past, we have found the customer's maintenance people have occasionally valved off transducers by mistake.

SUBJECT: WARNING - BLACK PLASTIC MICROBOARD COVER IS CONDUCTIVE

The earlier version, "rotary dial" type micropanel recip chillers contained a black plastic cover which fit over the microboard, and was secured in place by the hardware on the four bat-handle toggle switches on the microboard. You should be aware that these black plastic panels are coated inside with a conductive compound. This is intended to be a barrier against RFI-EMI emissions.

Because of this conductive coating, you should treat this panel as if it were made of metal. Do not place this cover inside the power panel of the chiller when doing service. The coated surface could get against the chiller's power lugs and cause a short circuit. Even worse is that the plastic could melt and ignite, creating a fire inside the power panel.

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U.S. Olympic Team

36USC380

P.O. Box 1592, York, Pennsylvania USA 17405-1592

Form 150.40-NM20 (597)
Supersedes: 150.40-NM20 (587)

YORK

File in SN Manual, behind tab labelled INSTALLATION.

SERVICE BULLETIN | Supersedes: None | 987 | Form 150.40-NM20

File with Form 150.40-NM20 (Supl. 1)

SMART PANEL EQUIPPED LCH & YCHA RECIPROCATING CHILLERS

MIS-DIAGNOSING INCORRECT SERVICE VALVE POSITIONING AS TRANSDUCER FAILURES

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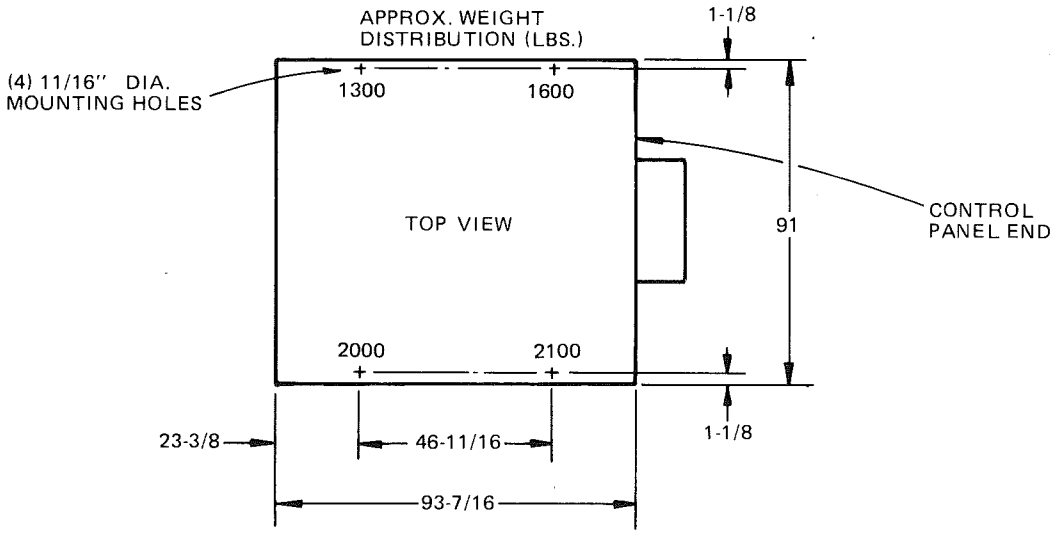
CODE:SN

MODELS YCAQ10, YCAM12, YCAK14, YCAI16, YCAG18 YCAR11, YCAN13, YCAL15, YCAJ17 & YCAH19 ALSO MODELS YCHA100, 120, 150, 175, & 200 STYLE C

CORRECTION TO FORM 150.40-NM20 CODED 587

The Weight Distribution shown on page 4, and the Weights shown in the PHYSICAL DATA table on page 8 of the above referenced Form have been revised. Please substitute the data shown below and on the reverse side.

MODEL YCAQ10, YCAR11, OR YCHA100



PHYSICAL DATA

MODEL			YCHA100 YCAQ10 YCAR11	YCHA120 YCAM12 YCAN13	YCHA150 YCAK14 YCAL15	YCHA175 YCAI16 YCAJ17	YCHA200 YCAG18 YCAH19
NO. OF REFRIG. CIRCUITS			1	2	2	2	2
COMPRESSOR MODEL	60 HZ	SYS. 1	JS83E-S	JS43E-M	JS63E-P	JS63E-P	JS83E-S
		SYS. 2	–	JS63E-P	JS63E-P	JS83E-S	JS83E-S
CAPACITY CONTROL %	STD.	SYS. 1 LEAD	100,75,50,25	100,60,40,20	100,67,50,17	100,71,43,14	100,75,50,25
		SYS. 2 LEAD	–	100,80,60,20	100,67,50,17	100,71,57,29	100,75,50,25
	OPT.	SYS. 1 LEAD	–	100,80,60,40,20	100,83,67, 50,33,17	100,86,71,57, 43,29,14	100,88,75,62, 50,38,25,12
		SYS. 2 LEAD	–	100,80,60,40,20	100,83,67, 50,33,17	100,86,71,57, 43,29,14	100,88,75,62, 50,38,25,12
OIL CHARGE (GALS)		SYS. 1	3	3	3	3	3
		SYS. 2	–	3	3	3	3
CONDENSER – DWP 450 PSIG NO. OF FANS (30" DIA. DIRECT DRIVE)			4	7	8	8	8
CFM (EACH)			11,000	11,000	11,000	11,000	11,000
COOLER – DUAL CIRCUITED DWP – 235 PSIG REF. SIDE, 150 PSIG WATER SIDE DIA. X LENGTH			14" x 7'	14" x 8'	14" x 8'	16" x 8'	18" x 9'
WATER VOLUME (GALS)			31	36	33	39	49
GPM		MIN.	120	120	120	150	200
		MAX.	550	580	580	640	700
WEIGHTS (LBS.)	SHIPPING	ALUM. FINS	6,760	10,080	11,150	12,115	13,840
		COPPER FINS	8,435	11,980	12,650	15,115	17,340
	OPERATING	ALUM. FINS	7,000	10,400	11,540	12,505	14,500
		COPPER FINS	8,675	12,300	13,040	15,505	18,000
REFRIG. CHARGE (LBS. R-22)		SYS. 1	135	87	116	116	133
		SYS. 2	–	116	116	133	133

York International Corporation **Applied Systems** **Post Office Box 1592-36BE** **York Pennsylvania 17405-1592** **Telephone 717 771 7890**

YORK

TPI 4M 1087 .10
Code: SN
Form 150.40-NM20(SUPL. 2)

YORK®

Shaded areas to be completed by Communications.

File in SN Manual, behind tab labelled INSTALLATION.

SERVICE BULLETIN | Supersedes: Nothing | 1087 | Form 150.40-NM20

(Supl.3)

EFFECTIVE IMMEDIATELY !

TRANSDUCER WARRANTY REQUIREMENTS

FOR

RECIP. SMART PANEL

York has made an agreement with Kavlico for reimbursement of parts cost plus reasonable labor for all Kavlico transducers which fail within the chiller warranty period. This will mean considerable savings for York as long as certain guidelines are followed. We would appreciate the cooperation of all District and Regional Managers, Supervisors, and Field Service Technicians to help us satisfy the requirements to collect this warranty.

When a Kavlico transducer fails write the word KAVLICO clearly on the warranty so there is no mistake about the manufacturer of the transducer. Be sure that there is no other labor or parts charged to the warranty. Note the type of transducer (oil,suction, or discharge), the pressure range (0-200 or 0-400), the pressure that was actually in the system as read on a gauge, and the fault code at the time the panel shutdown. Be sure that the number of labor hours on the warranty is accurate.

This information is ncessary for Kavlico to evaluate the failure and determine reimbursement costs to York. Immediately ship the transducer with a copy of the warranty via UPS to the following address:

YORK INTERNATIONAL CORP.
631 S. Richland Ave., Door 100
York, PA 17403
Attn: Dave Saylor/36BE

MG/gb

Code:SN

YORK®

File in SN Manual, behind tab labelled INSTALLATION .

SERVICE BULLETIN | Supersedes: Nothing | 1187 | Form 150.40-NM20

(Supl. 4)

RECIP. MICRO PANEL
RELAY OUTPUT BOARD JUMPERING

Some confusion has arisen as to how to jumper J34 and J35 on the Relay Output Board. All present production will have the jumpers in the "C" position and will continue as such regardless of the options. Incorrect jumpering will affect fan cycling on YCHA chillers and loading on LCH chillers. If you experience either of these problems, the cause is probably incorrect Relay Output Board jumpering.

Listed below in Table 1 is a guide to follow for the Relay Output Board jumpering. The key to determining jumper position will be whether a Digital Input Board is present and whether plugs J1,J2, J3, and J4 on the Digital Input Board are connected to the external H.P. (High Pressure) cut-out and M.P. (Motor Protector) or whether the plugs are left open (See Fig. #1 for J1-J4 location). This information will also be helpful when replacing the Relay Output Board.

J34 and J35 POSITION	CHILLER TYPE	DIGITAL INPUT BD. INSTALLED?	PLUGS J1,J2,J3 & J4 OF THE DIGITAL INPUT BOARD ARE CONNECTED TO THE H.P. CUTOUT & M.P.	EMPROM IN U15 OF MICROPROCESSOR BOARD
R	LCH	Yes	Yes	"V" Series
R	LCH	Yes	Yes	Updated to "GE" Series
C	LCH	Yes	No	"GE" Series
C	LCH	No	Does Not Apply	"GE" Series
C	YCHA	Yes	No	"GE" Series
C	YCHA	No	Does Not Apply	"GE" Series

Table 1

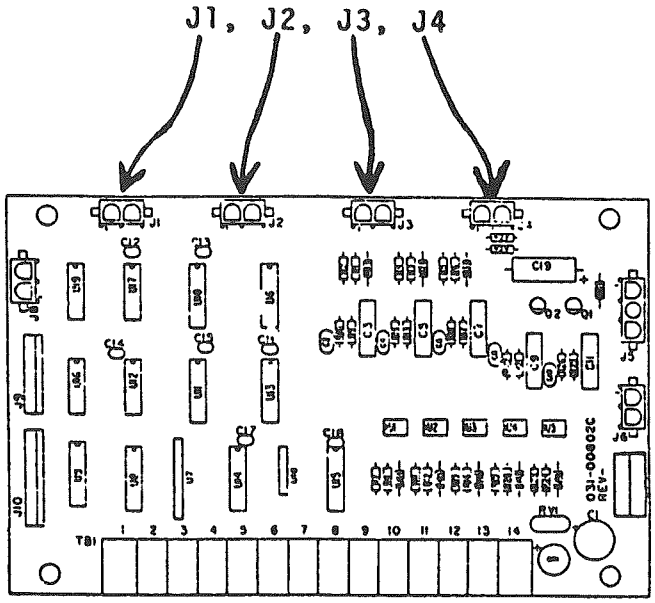


FIG. #1

Mike Greiman

Code:SN
YMS 1M 688 .10

YORK®

File in SN Manual(s).

SERVICE BULLETIN

Supersedes: Nothing	1287	Form 150.40-NM20(Sup1.5)
File with Form: 150.40-NM20		

YCHA RECIP. CHILLER
CONDENSOR FAN OPERATION

Some questions have arisen on YCHA Condensor Fan Operation. The confusion seems to be concerning the temperature/pressure control scheme and whether temperature or pressure should be in command.

Temperatures Above 55°F As Sensed By the OAT (Outdoor Ambient Temperature) Sensor

Fan cycling will be by temperature control only. Discharge pressure will have no effect. Above 55°F, 4 sec. after the respective compresssor starts, Fans E and F (Compr. 1) or Fans C and D (Compr. 2) will come on. 30 sec. after the respective compressor starts, Fans G and H(Compr. 1) or Fans A and B (Compr. 2) will come on. These fans will remain on, regardless of discharge pressure or loading, until the respective compressor stops or temperature drops below 55°F. Note: YCHA 120's will not have Fan G.

Temperatures 35°F to 55°F As Sensed By the OAT (Outdoor Ambient Temperature) Sensor

In this range, 2 fans on each system are cycled by temperature control only. Discharge pressure will have no effect on these 2 fans. Four (4) seconds after the respective compressor starts, Fans E and F(Compr 1) or Fans C and D (Compr 2) will come on. These fans will remain on, regardless of discharge pressure or loading, until the respective compressor stops or temperature drops below 35°F.

The other two fans on each system are cycled when the respective compressor is running according to discharge pressure only. Fans G & H (Compr 1) or Fans A and B (Compr 2) will cycle according to table #1 below until temperature as sensed by the OAT sensor rises above 55°F, until the respective compressor stops, or temperature drops below 35°F. Note: YCHA 120's will not have Fan G.

Code:SN

SYSTEM	FAN CONTACTOR	FANS CONTROLLED	DISCHARGE PRESSURE TO CYCLE FANS	
			"ON"	"OFF"
1	5M	E, F	260 LB.	190 LB.
1	6M	G, H	280 LB.	210 LB.
2	7M	C, D	260 LB.	190 LB.
2	8M	A, B	280 LB.	210 LB.

Table #1

Temperatures Below 35°F As Sensed By The OAT
(Outdoor Ambient Temperature) Sensor

Below 35°F a Low Ambient Kit option must be installed. This kit will affect fan cycling below 35°F and 35°F to 55°F. Details on this option will be discussed in another Service Bulletin. Without this kit, the chiller will not operate below 35°F.

If any doubts arise concerning the temperature the OAT sensor is sensing, display a Code 06 on the Micro Panel Display. This display indicates the temperature sensed by the OAT sensor located outside on the back side of the Logic section of the control panel. It should coincide with a thermometer located in the same location ± 10°F.

Mike Greiman

/gb

YORK®

File in SN Manual(s).

SERVICE BULLETIN

Supersedes: Nothing	1287	Form 150.40-NM20(Supl.6)
File with Form: 150.40-NM20		

RECIP. MICRO PANEL

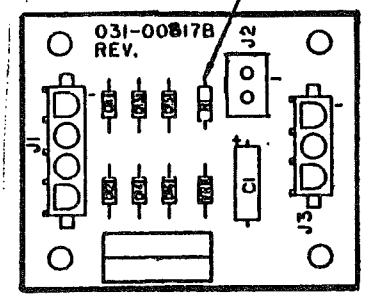
MOTOR CURRENT BOARD 031-00817

LINE LEVELS

Two line levels of motor Current Boards (MCB's) are now present in Recip. Micro Panels. These line levels are line -000 and line -002. Line -000 is used in panels which utilize 200:0.2, 300:0.2, and 400:0.2 C.T.'s (Current Transformers). Line -002 is used only with 500:0.2 C.T.'s.

Line -000 and line -002 are not interchangeable. The chiller usually will not run if the incorrect board is installed in the panel. This is because the MCB resistor plugged into J2 will not be the correct value.

When replacing an MCB, be sure to not only look at the line level, but also check the value of the R1 resistor next to the J2 connector where the MCB resistor is plugged in (See Fig. #1). This will positively determine the line level of MCB you need.



Line -000: 100Ω (Brown, Black, Brown)
Line -002: 10KΩ (Brown, Black, Orange)

FIGURE #1

The line level will be stamped behind the part number 031-00817B (ie: 031-0081702. The "B" should be ignored and may not be present). No line number indicates a -000 and 02 indicates a -002. This is a deviation from normal York standards. The small size of the board does not allow the full three digit number to be stamped behind the part number.

Be sure the original MCB resistor plugged into J2 is placed into the new board. The resistor is sized to the compressor FLA and panel C.T. ratio during manufacturing. Compressor damage or faulting could occur if the MCB resistor is missing or incorrect.

These measures should insure that additional problems are not introduced into the panel if a Motor Current Board is replaced.

Mike Greiman

Code:SN

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File in SN Manual(s).

SERVICE BULLETIN

Supersedes: Nothing	788	Form 150.40-NM20(Supl.7)
File with Form: 150.40-NM20		

S-24-88

RECIP CHILLER SMART PANEL

ALL MODELS YCH

Incorrect Field Insertion of J3 and J6 Plugs Into the REV C Microprocessor Board

The J3 and J6 jacks on the REV C Microprocessor Board will allow the plugs to be inserted upside down. This usually causes damage to the control panel as well as possibly an external device. The Micro Panel is susceptible to this problem when the Microprocessor Board is replaced or a printer is connected.

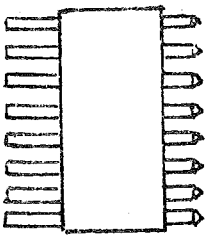
If J3 is inserted upside down, damage will most likely result to the 2T transformer and occasionally the Power Supply Board and the Microprocessor Board. Damage to the latter two is rare and will only occur if the internal fuse in the 2T transformer does not open. Normally the internal fuse opens in the 2T transformer and can be replaced by simply locating the fuse under the brown paper wrapping, carefully slitting the paper and soldering in a new fuse. The fuse is a standard 3/4 A glass type which can be acquired almost anywhere.

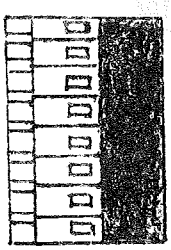
Incorrect insertion of the J6 plug may damage the Microprocessor Board RS-232 port and the external printer. Care should be taken since this plug is often connected and disconnected.

The following drawings show the correct and incorrect insertion of these plugs and how the locking tabs should line up when the plugs are properly mated.

Top View

Jack
on
Microprocessor Board

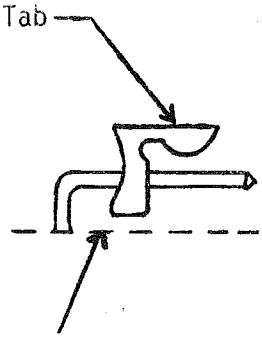




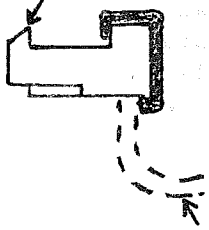
Plug on
Wiring from Power
Supply Board

Side View

Locking Tab



Locking Tab



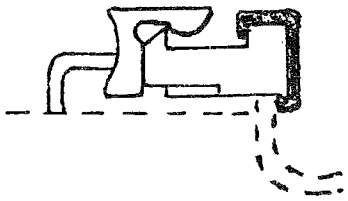
Jack on
Microprocessor
Board

Plug and
Wiring from
Power Supply
Board

Printed Circuit Board

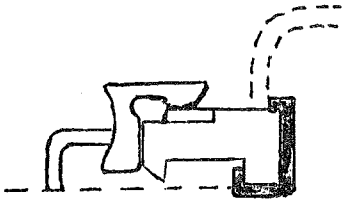
Wiring

CORRECT Mating of Jack and Plug



Note correct
position of
locking tabs

INCORRECT Mating of Jack and Plug



Note incorrect
position of
locking tabs

Mike Greiman
Service Engineer

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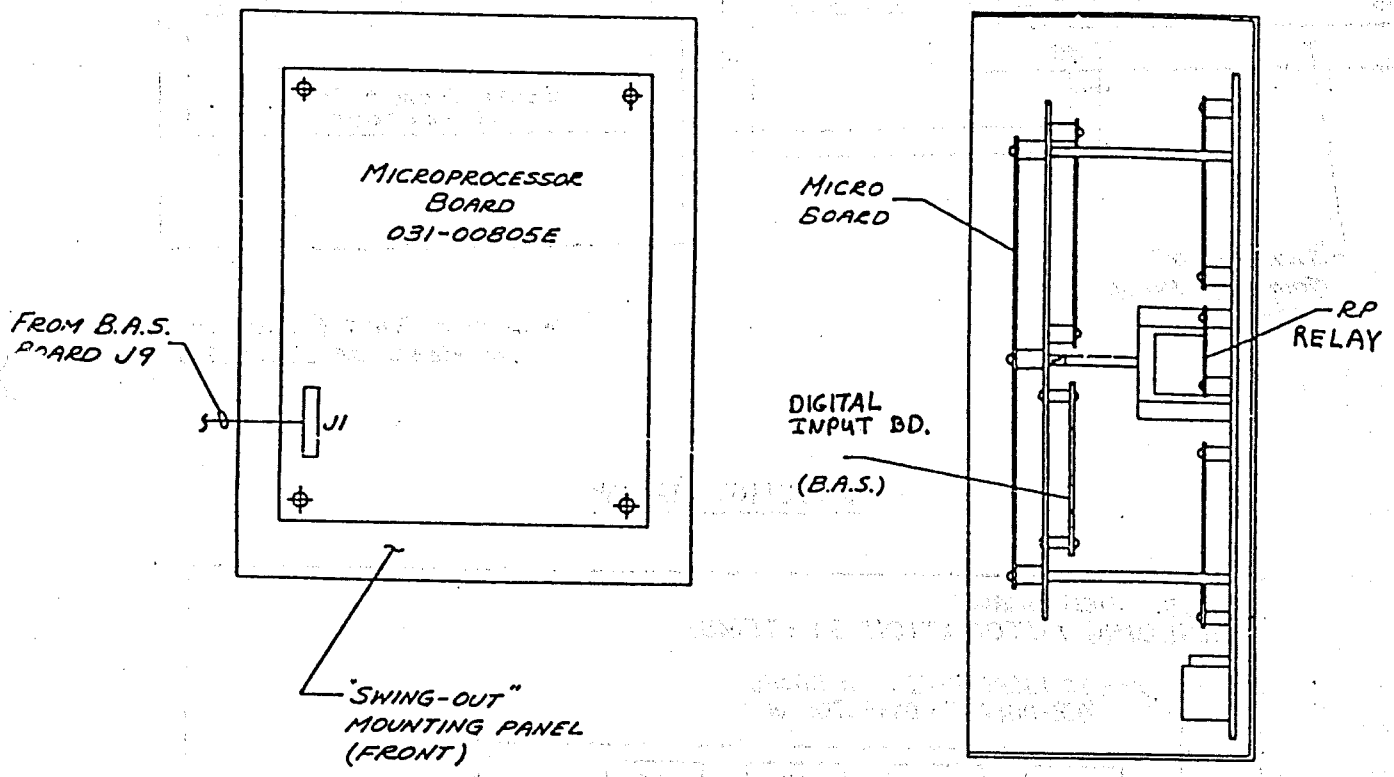
SERVICE BULLETIN

Supersedes: Nothing	788	Form 150.40-NM20(Supl.8)
File with Form: 150.40-NM20		

S-31-88

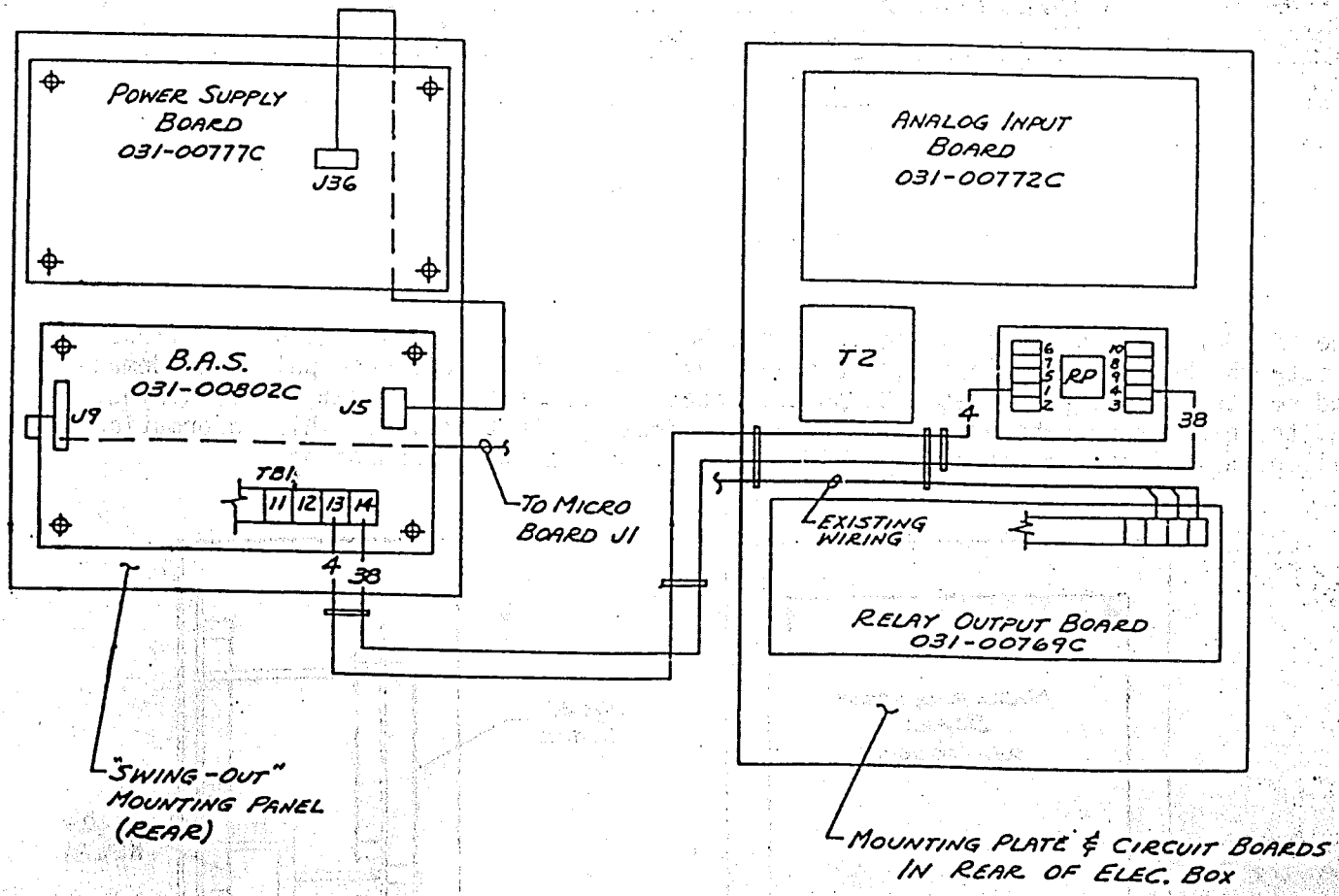
RECIP SMART PANEL
OPTIONAL BAS KIT FIELD WIRING

The BAS Option consists of a Digital Input Board and associated wiring which allows remote ON/OFF, remote unloading (turn lag system off, i.e. decrease pull-down demand), and remote temperature reset. Component location, connection diagram, field wiring, and the elementary schematic is shown in the drawings that follow. This information will be useful during start-up, field installation, and troubleshooting.

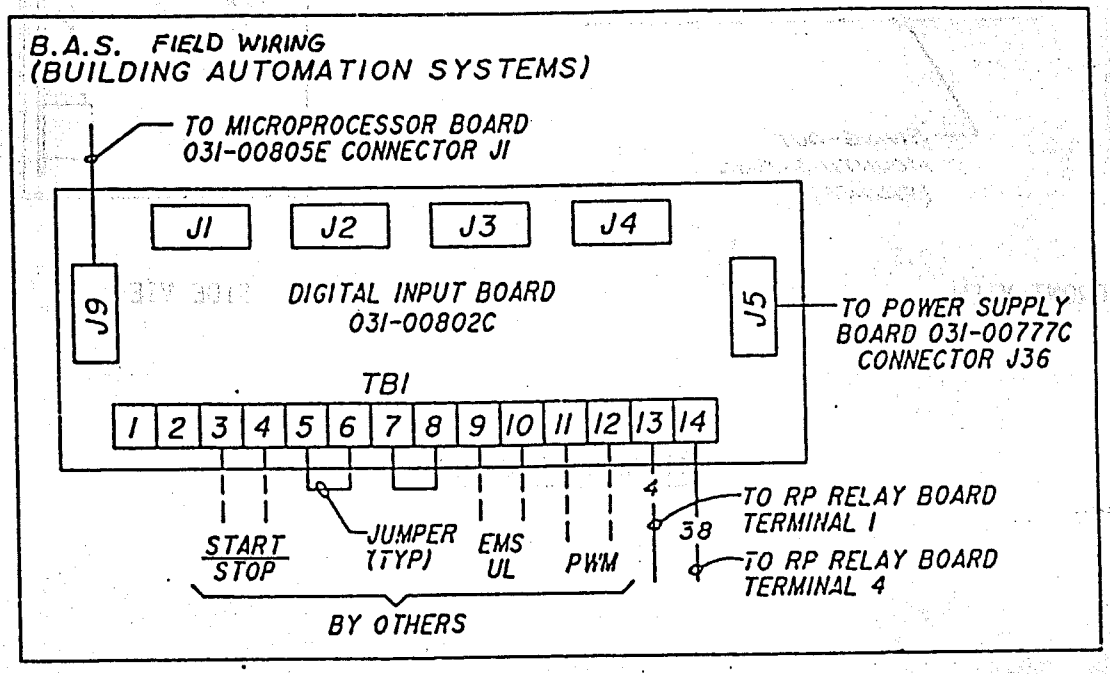


FRONT VIEW SIDE VIEW

COMPONENT LOCATION



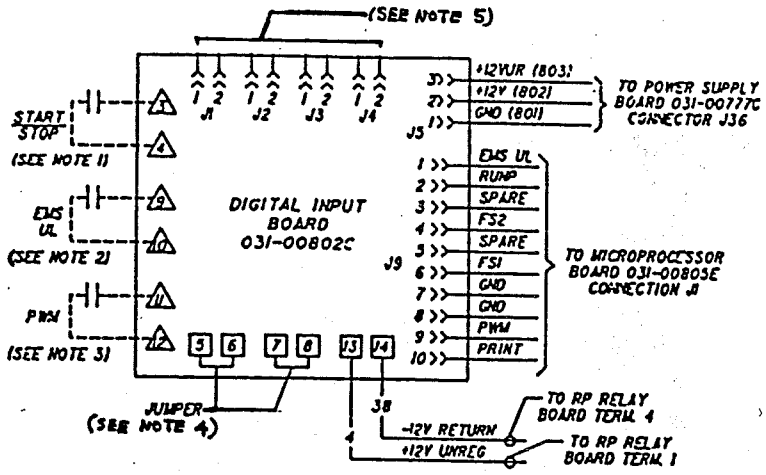
CONNECTION DIAGRAM



FIELD WIRING

NOTES:

1. TO START UNIT WITH BAS CONTROLLER, CLOSE CONTACTS (MAINTAIN CLOSED) BETWEEN TERMINALS 3 & 4, TO STOP UNIT, OPEN CONTACTS BETWEEN TERMINALS 3 & 4. IF BAS START/STOP IS NOT REQUIRED, INSTALL A JUMPER FROM TB3 TO TB4 OF BAS INTERFACE BOARD.
2. TO UNLOAD LAG COMPRESSOR (SHUT OFF LAG COMPRESSOR) WITH BAS CONTROLLER, CLOSE CONTACTS (MAINTAIN CLOSED) BETWEEN TERMINALS 9 & 10.
3. TO RESET WATER TEMPERATURE, CLOSE CONTACTS BETWEEN TERMINALS 11 & 12. RESET TEMP. = SP + 1.5°F[CLOSURE (SEC) -1(SEC)] . EG:SP=55 CLOSE FOR 2 SEC. RESET TEMP.=56.5°.
4. JUMPER THESE TERMINALS
5. EARLY STYLE CHILLERS, WITH THE JUMPERS ON THE RELAY OUTPUT BOARD IN THE "R" POSITION, WILL HAVE THE HP C.O. AND MP WIRED INTO THE DIGITAL INPUT BOARD ON J1-J4. NEW STYLE CHILLERS, WITH THE JUMPERS ON THE RELAY OUTPUT BOARD IN THE "C" POSITION WILL HAVE THESE INPUTS OPEN.



CAUTIONS:

1. WHEN THE BAS OPTION IS INSTALLED, SW4 MUST BE "ON" OR J9 MUST BE "IN" ON THE MICRO LOGIC BOARD FOR THIS OPTION TO OPERATE.
2. WHEN RESETTING THE WATER TEMP. SETPOINT, THE NEW SETPOINT MUST BE REFRESHED EVERY 20 MIN. OR LESS BY RECLOSING THE CONTACTS FOR THE REQUIRED PERIOD.
3. IF THE HP C.O., MP, OR FLOW SWITCH ARE CONNECTED INTO THE DIGITAL INPUT BOARD AS IN EARLY STYLE CHILLERS, THE BAS OPTION MUST ALWAYS REMAIN ACTIVE (SW4 "ON" OR J9 "IN" ON MICRO LOGIC BOARD). FAILURE TO DO SO WILL CAUSE THESE SAFETIES TO BE INACTIVE.

ELEMENTARY SCHEMATIC

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File in SN Manual(s).

SERVICE BULLETIN

Supersedes: Nothing	988	Form 150.40-NM20 (Supl. 9)
File with Form: 150.40-NM20		

S-54-88

FIELD INSTALLATION OF OPTIONAL CUSTOMER ALARM STATUS CONTACTS ON "STYLE C"(NON "UL") RECIP SMART PANELS MODELS YCHA AND YCA

Optional Customer Alarm Status Contacts can be field installed into a non "UL" (single box enclosure) Recip Micro Panel. This option will provide individual NC dry contacts which will transition when the respective system faults ("F" Code on the display).

Order the Alarm Kit using York Part Number 025-27199. Be sure the Microboard & EPROM conforms to the following guidelines:

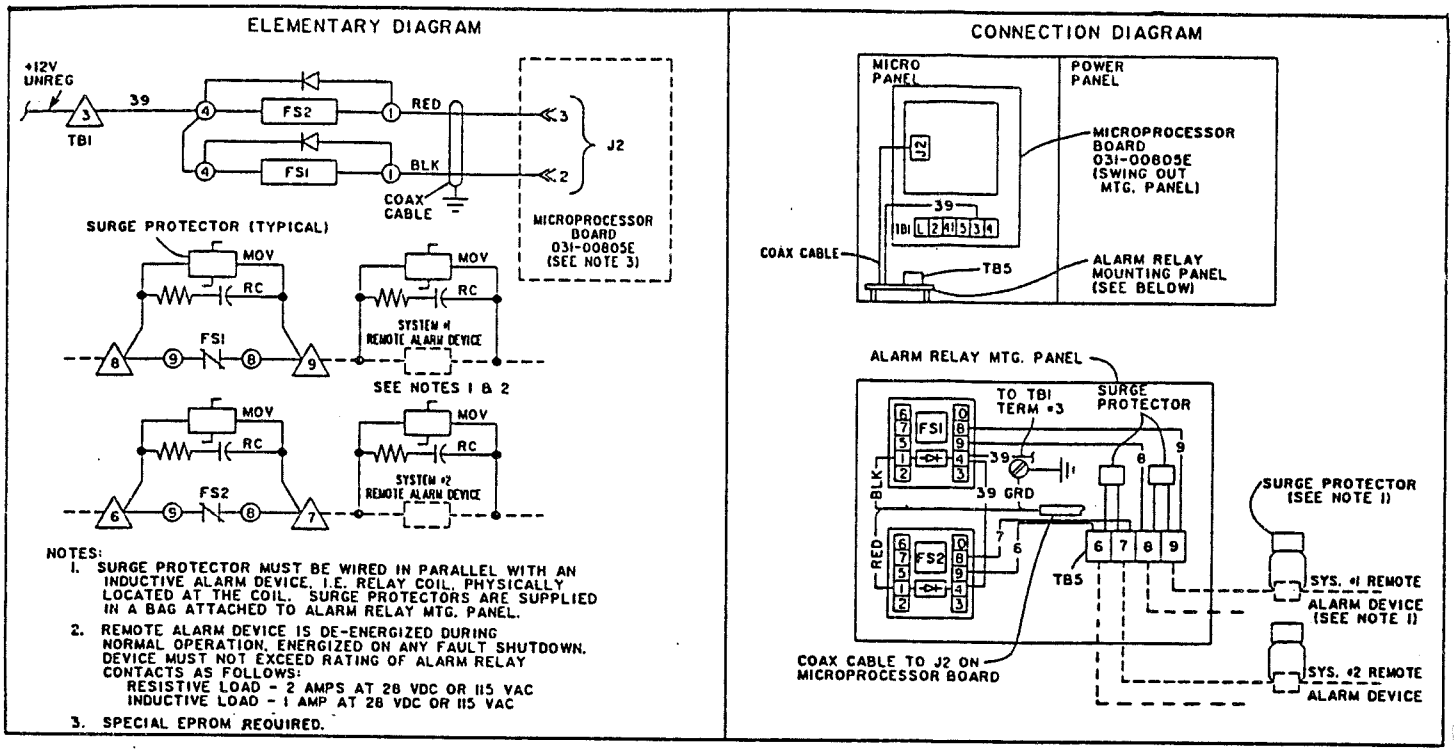
UNIT TYPE	MICROBOARD	EPROM
Single System	REV B or C	GE II.4, REV 1, D157 (031-00928-002, water) GE II.4BR, REV 0, B8BC (031-00928-005,brine)
Dual System	*REV B or C	GE II.5, REV 1, B727 (031-00928-001, water) GE II.5BR, REV Ø, CID6(031-00928-004, brine)

* If a low ambient kit is installed, a REV C Microboard is necessary. Otherwise the low ambient cut-out adjustment on the Analog Input Board may not have the capability of being adjusted to the required cut-out. SW2 on the Microboard must be placed to the "ON" position to allow adjustment down to 0°F. If a REV C Micrologic Board is needed, order York part number 031-00805-000. All current stock will be REV C.

See page 2 for wiring connection to the existing Micropanel.

Shown below are Wiring Diagrams for the Kit:-

WIRING DIAGRAM FOR CUSTOMER ALARM CONTACTS



Mike Greiman
Service Engineer

Code: SN

YMS SM 088 .10

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SERVICE BULLETIN

File in SN Manual(s).

Supersedes: Nothing | 1/89 | Form 150.40-NM20 (Supl. 10)

File with Form: 150.40-NM20

S-9-89

WARRANTY PARTS PROCUREMENT PROCEDURE

RECIPROCATING CHILLER MICRO PANELS

- The District office is to take out a S.D. number before calling in a parts order to York Baltimore Parts; 9003 Yellow Brick Rd.; P. O. Box #72229; Baltimore, MD. 21237-2229. (Phone #1-301-574-0400)
- All new printed circuit boards will be accompanied with a failure report tag which must be completed in detail on the defective component. This tag must be attached to the defective component.
- Enclosed with the new part you will also receive a return address label which must be used when returning the defective part.
- Only defective printed circuit boards are to be returned to the Electronic Center in Norcross, GA.
- Any defective components which are returned to the Electronic Center without the tag or the tag not filled out completely, will be rejected and charged to your district 702 account immediately, and you will not receive credit.
- All defective printed circuit boards replaced on a warranty must be returned to the following address:

York International Corp.
6250 McDonough Dr.
Norcross, GA. 30093

ATTN: Electronic Center

YMS 3M 189 .05

CODE, SN

Mike Greiman

Mike Greiman,
Electronic Product Service Engineer

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SERVICE BULLETIN

Supersedes: Nothing | 2/89 | Form 150.40-NM20 (Supl. 11)

File with Form: 150.40-NM20

S-13-89

RECIP CHILLER MICRO PANELS

GE II.5 EPROM

REVISION LEVEL CHANGE TO GE II.5 REV. 2*

For the past 3 years, the standard EPROM in both water cooled and air cooled Recip. Chillers 120 tons and above has been GE II.5 REV. 0 or REV. 1. Both of these EPROM's are interchangeable and their operation is transparent to the user. The only important difference is the low motor current cut-out point (REV. 0 = 29%, REV. 1 = 23%). The cut-out point was lowered to enable 6 cyl. compressors, which unload to 2 cylinders, to operate under certain very low load/temperature conditions.

A new GE II.5 REV. 2 EPROM will begin appearing in our new U.L. approved water and air cooled chillers above 120 tons. These chillers will have cost reduced micropanels with a Combo Board replacing the Motor Current Board, Analog Input Board, and Power Supply Board. A small quantity of non U.L. units with this new EPROM will also be built. These units will also have the cost reduced micropanel and can be identified by the presence of the Combo Board.

The GE II.5 REV. 2 EPROM will assume the old part number of the REV. 0 and REV. 1 (031-00928-001) and replace them as a Service Parts replacement. Should the need arise to replace an EPROM, the new REV. 2 EPROM will be an exact replacement on all water cooled units (LCH 130-230, YCWK-YCWT) which used REV. 0 and REV. 1 EPROM's and came equipped with Analog Input, Power Supply and Motor Current Boards. However, if for some reason an EPROM requires replacement on an Air Cooled Chiller (YCHA 120-200, YCAG - YCAN) equipped with Analog Input, Power Supply and Motor Current Boards, a modification will be required to permit proper operation of the fans. This modification should be performed as follows:

1. Place SW2 on the Micrologic Board to the ON position (Right side pushed down). This enables manual adjustment of the low ambient cut-out.

2. Select Display Code 0,7 on the Control Panel to view the low ambient cut-out.

3. Adjust R24 on the Analog Board until the low ambient cut-out on the display is as low as it will go (Typically 0 or .1°F).

4. Disconnect the J17 plug from the Analog Input Board. This causes the micro to sense outside air temperature as 1°F.

* GE II.5 REV. 2 EPROMS may also be labeled GE II.5S REV. 2. The two EPROMS are identical.

5. The micro is now fooled into thinking that outside air temperature is very low and will now cycle fans according to discharge pressure only (not temperature). Fan cycling will operate as follows:

System 1			System 2		
FAN E & F	ON:	Condenser Press 260 PSI	FAN C & D	ON:	Condenser Press 260 PSI
	OFF:	Condenser Press 210 PSI		OFF:	Condenser Press 190 PSI
FAN *G & H	ON:	Condenser Press 280 PSI	FAN A & B	ON:	Condenser Press 280 PSI
	OFF:	Condenser Press 210 PSI		OFF:	Condenser Press 210 PSI

*Fan "G" not present on all chillers.

Failure to perform the modifications described will result in potential low discharge pressures and corresponding low suction pressures in outside ambient temperatures of 45 - 65^{o}F. This will definitely cause low suction pressure and low motor current faults. Symptoms indicating that this modification has not been performed, will be all 4 fans on a system starting 5 sec after compressor start in ambient temperatures above 45^{o}F.

In general, the REV. 2 EPROM functions the same as the REV. 0 and REV. 1 except for fan cycling. Even fan cycling remains much the same except that the wiring has changed on U.L. air cooled chillers and requires the REV. 2 EPROM. Detailed operation of the new software is contained in FORM 150.24-NM25 and 150.40-NM25.

Mike Greiman

Michael L. Greiman
ELECTRONIC PRODUCTS SERVICE ENGINEER

CODE: SN
YMS 3M 389 .10

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File in SN Manual(s).

SERVICE BULLETIN

Supersedes: Nothing | 789 | Form 150.40-NM20(Supl. 12)

File with Form: 150.40-NM20

S-40-89

BRINE COOLED
RECIP CHILLER MICRO PANELS

GE II.5BR REV. 0 EPROM REVISION LEVEL CHANGE TO
GE II.5BR REV. 1

For the past year, the Brine EPROM used in both water cooled and air cooled Recip. Chillers 120 tons and above has been GE II.5BR Rev. 0. This EPROM enables the chiller's setpoint to be set to temperatures between 15 - 40°F.

A new GE II.5BR Rev. 1 EPROM will begin appearing in our new U.L. approved water and air cooled chillers above 120 tons. These chillers will have cost reduced micropanels with a Combo Board replacing the Motor Current Board, Analog Input Board, and Power Supply Board. A small quantity of non U.L. units with this new EPROM will also be built. These units will also have the cost reduced micropanel and can be identified by the presence of the Combo Board.

The GE II.5BR Rev. 1 EPROM will assume the old part number of the Rev. 0 (031-00928-004) and replace it as a Service Parts replacement. Should the need arise to replace an EPROM, the new Rev. 1 EPROM will be an exact replacement on all water cooled units (LCH 130-230, YCWK-YCWT) which used GE II.5 BR Rev. 0 EPROM's and came equipped with Analog Input, Power Supply and Motor Current Boards. However, if for some reason an EPROM requires replacement on an Air Cooled Chiller (YCHA 120-200, YCAG - YCAN) equipped with Analog Input, Power Supply and Motor Current Boards, a modification will be required to permit proper operation of the fans. This modification should be performed as follows:

1. Place SW2 on the Micrologic Board to the ON position (Right side pushed down). This enables manual adjustment of the low ambient cut-out.

2. Select Display Code 0,7 on the Control Panel to view the low ambient cut-out.

F061489GM-1-1

3. Adjust R24 on the Analog Board until the low ambient cut-out on the display is as low as it will go (Typically 0 or .1°F).

4. Disconnect the J17 plug from the Analog Input Board. This causes the micro to sense outside air temperature as 1°F.

5. The micro is now fooled into thinking that outside air temperature is very low and will now cycle fans according to discharge pressure only (not temperature). Fan cycling will operate as follows:

	System 1		System 2	
FAN E & F	ON:	Condenser Press 260 PSI	FAN C & D	ON: Condenser Press 260 PSI
	OFF:	Condenser Press 190 PSI		OFF: Condenser Press 190 PSI
FAN *G & H	ON:	Condenser Press 280 PSI	FAN A & B	ON: Condenser Press 280 PSI
	OFF:	Condenser Press 210 PSI		OFF: Condenser Press 210 PSI

*Fan "G" not present on all chillers.

Failure to perform the modifications described will result in potential low discharge pressures and corresponding low suction pressures in outside ambient temperatures of 45 - 65°F. This will definitely cause low suction pressure and low motor current faults. Symptoms indicating that this modification has not been performed, will be all 4 fans on a system starting 5 sec after compressor start in ambient temperatures above 45°F.

In general, the Rev. 1 Brine EPROM functions the same as the Rev. 0 except for fan cycling. Even fan cycling remains much the same except that the wiring has changed on U.L. air cooled chillers and requires the Rev. 1 EPROM. Detailed operation of the new software is contained in FORM 150.24-NM25 and 150.40-NM25.

Mike

Michael L. Greiman
ELECTRONIC PRODUCTS SERVICE ENGINEER

F061489GM-1-2

York International Corporation | **Applied Systems** | **Post Office Box 1592-36BE** | **York Pennsylvania 17405-1592** | **Telephone 717 771 7890**

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SERVICE BULLETIN

Supersedes: Nothing | 789 | Form 150.40-NM20(Supl. 13)

File with Form: 150.40-N M20

S-39-89

METRIC READOUT
RECIP CHILLER MICRO PANELS

GE II.5M REV. 0 EPROM REVISION LEVEL CHANGE TO
GE II.5M REV. 1 OR REV. 2

For the past year, the Metric EPROM used in both water cooled and air cooled Recip. Chillers 120 tons and above has been GE II.5M Rev. 0. This EPROM enables the operator to obtain readouts on the Micropanel's display in Metric units.

New GE II.5M Rev. 1 and Rev. 2 EPROM's will begin appearing in our new U.L. approved water and air cooled chillers above 120 tons. These chillers will have cost reduced micropanels with a Combo Board replacing the Motor Current Board, Analog Input Board, and Power Supply Board. A small quantity of non U.L. units with this new EPROM will also be built. These units will also have the cost reduced micropanel and can be identified by the presence of the Combo Board.

The GE II.5M Rev. 1 and Rev. 2 EPROM's will assume the old part number of the Rev. 0 (031-00928-007) and replace it as a Service Parts replacement. No obvious difference will be noticed between Rev. 1 or Rev. 2 except the Rev. 1 is not capable of providing setpoints between 0 - 5°C. Very few Rev. 1 devices have been shipped and all new devices will be Rev. 2. Unless setpoint problems are noted, do not replace Rev. 1 EPROM's with Rev. 2. Should the need arise to replace an EPROM, the new Rev. 1 or Rev. 2 EPROM's will be exact replacements on all water cooled units (LCH 130-230, YCWK-YCWT) which used GE II.5M Rev. 0 EPROM's and came equipped with Analog Input, Power Supply and Motor Current Boards. However, if for some reason an EPROM requires replacement on an Air Cooled Chiller (YCHA 120-200, YCAG - YCAN) equipped with Analog Input, Power Supply and Motor Current Boards, a modification will be required to permit proper operation of the fans. This modification should be performed as follows:

1. Place SW2 on the Micrologic Board to the ON position (Right side pushed down). This enables manual adjustment of the low ambient cut-out.

2. Select Display Code 0,7 on the Control Panel to view the low ambient cut-out.

F061489GM-1-1

3. Adjust R24 on the Analog Board until the low ambient cut-out on the display is as low as it will go (Typically -18°C).

4. Disconnect the J17 plug from the Analog Input Board. This causes the micro to sense outside air temperature as -17°C.

5. The micro is now fooled into thinking that outside air temperature is very low and will now cycle fans according to discharge pressure only (not temperature). Fan cycling will operate as follows:

	System 1		System 2	
FAN E & F	ON:	Condenser Press 1791 kPa	FAN C & D	ON: Condenser Press 1791 kPa
	OFF:	Condenser Press 1447 kPa		OFF: Condenser Press 1309 kPa
FAN *G & H	ON:	Condenser Press 1929 kPa	FAN A & B	ON: Condenser Press 1929 kPa
	OFF:	Condenser Press 1447 kPa		OFF: Condenser Press 1447 kPa

*Fan "G" not present on all chillers.

Failure to perform the modifications described will result in potential low discharge pressures and corresponding low suction pressures in outside ambient temperatures of 7.2 - 18.3°C. This will definitely cause low suction pressure and low motor current faults. Symptoms indicating that this modification has not been performed, will be all 4 fans on a system starting 5 sec after compressor start in ambient temperatures above 7.2°C.

In general, the Rev. 1 and Rev. 2 Metric EPROM's function the same as the Rev. 0 except for fan cycling. Even fan cycling remains much the same except that the wiring has changed on U.L. air cooled chillers and requires the Rev. 1 or Rev. 2 EPROM. Detailed operation of the new software is contained in FORM 150.24-NM25 and 150.40-NM25.

Michael L. Greiman
ELECTRONIC PRODUCTS SERVICE ENGINEER

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York International Corporation **Applied Systems** **Post Office Box 1592-36BE** **York Pennsylvania 17405-1592** **Telephone 717 771 7890**

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