FIELD RETROFIT
YORK MODEL YT CHILLERS
STYLES "E" & "F"

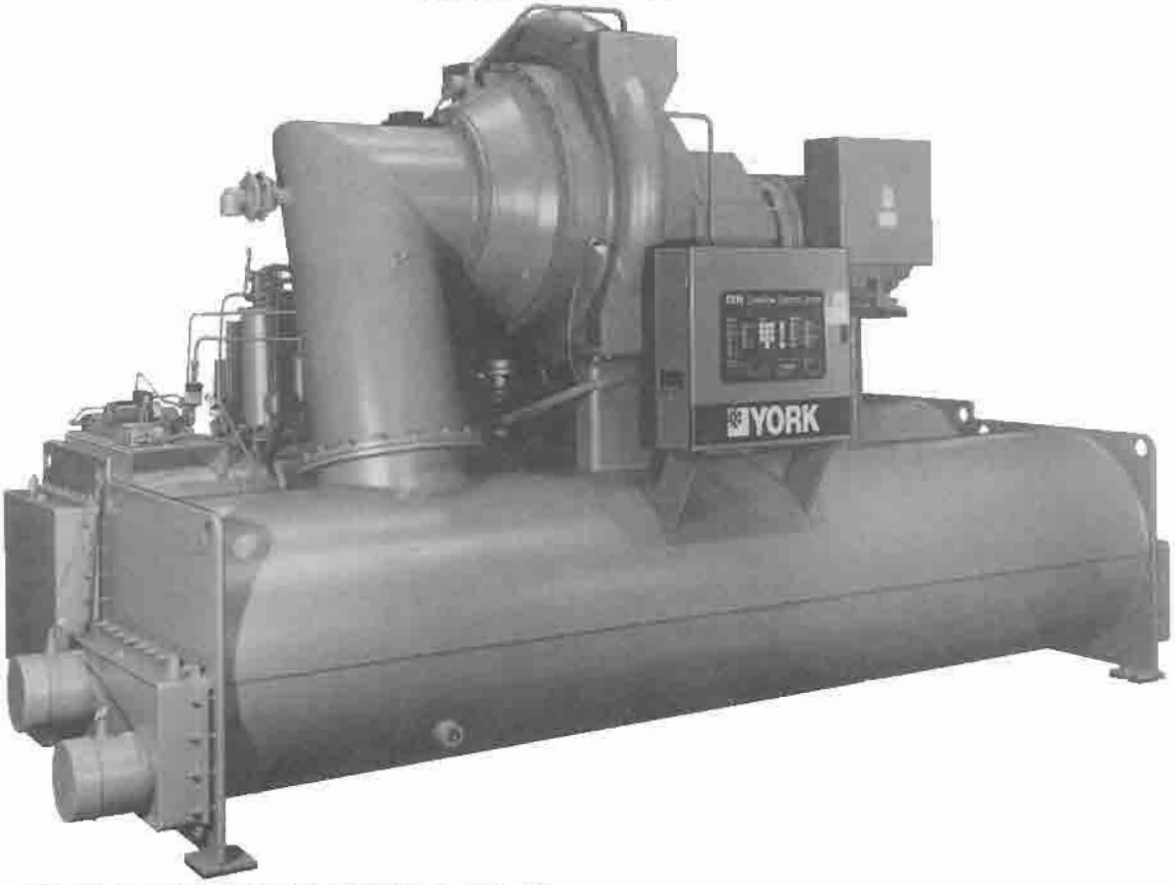


FIG. 1 – HIGH EFFICIENCY TURBOGUARD PURGE UNIT INSTALLED ON YT CHILLER

GENERAL DESCRIPTION

The kit contains components necessary to upgrade York YT chillers equipped with micropanels and the standard TurboGuard purge to the new High Efficiency Purge Unit including oil boost pump and new excess purge logic. Components included are the pump/valve sub-assembly with high pressure cutout switch, purge pressure transducer, fittings for the oil supply and a new EPROM, with user defined excess purge threshold, appropriate to the particular chiller/micropanel. It is assumed that the chiller is equipped with a TurboGuard purge tank in good condition.

INSTALLATION (See Fig. 2)

1. Disconnect power supply to chiller control panel and compressor motor.

2. Remove and store refrigerant charge from chiller.

3. Remove existing purge oil supply and return lines and three way solenoid valve.

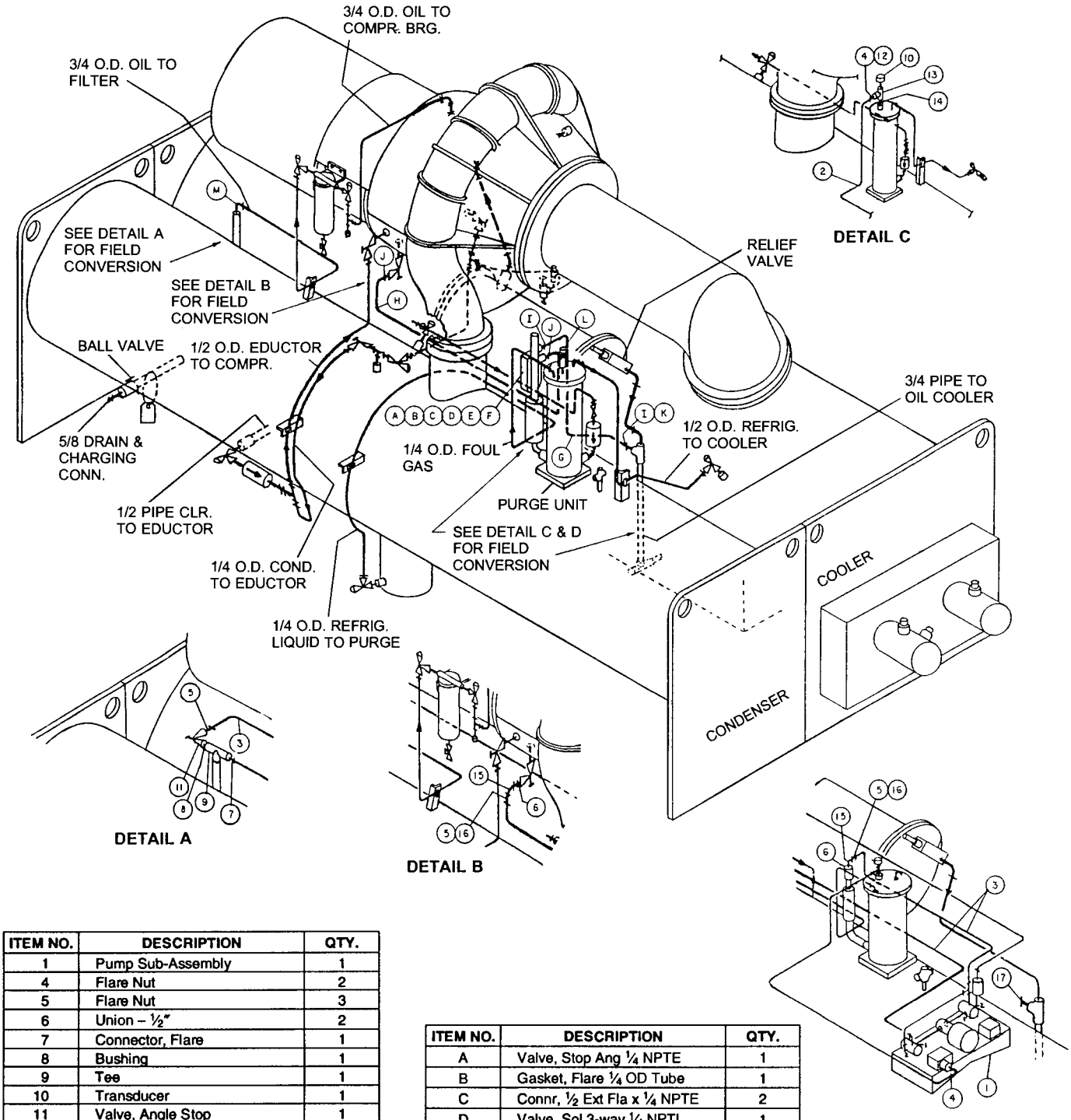
4. Plug existing oil supply point with pipe plug.

5. Remove 90 degree elbow downstream from oil cooler in oil supply line to the compressor oil filter. Replace with 3/4″ tee provided, with compressor oil supply hydraulic fitting installed in leg of tee.

6. Install 3/4″ x 1/2″ bushing and angle valve in run of tee.

7. Position pump sub-assembly between the purge tank and the end of the condenser and spot weld to the condenser shell at four points of contact. (See Fig. 2.)

8. Run 3/8″ copper line from common connection at port on the pump sub-assembly solenoid valves to the purge tank filter/drier.



ITEM NO.	DESCRIPTION	QTY.
1	Pump Sub-Assembly	1
4	Flare Nut	2
5	Flare Nut	3
6	Union – ½"	2
7	Connector, Flare	1
8	Bushing	1
9	Tee	1
10	Transducer	1
11	Valve, Angle Stop	1
12	Connector, Flare	1
13	Tee	1
14	Nipple	1
15	Elbow	2
16	Connection, Flare	2
17	Plug, Pipe	1
18	Bonnet, ¼"	1
19	Dot Plug	1
20	Wiring Harness	1
21	Connector	1

ITEM NO.	DESCRIPTION	QTY.
A	Valve, Stop Ang ¼ NPTE	1
B	Gasket, Flare ¼ OD Tube	1
C	Connr, ½ Ext Fla x ¼ NPTE	2
D	Valve, Sol 3-way ¼ NPTI	1
E	Union, Swivel ¼ Int Fla	1
F	Hrns, Wiring Purge Kit	1
G	Tube, Copper ⅜ OD	1
H	Tube, Copper ½ OD	1
I	Nut, Fla Short Forged ⅜ OD	2
J	Nut, Fla Short Forged ½ OD	2
K	Connr, ⅜ Ext Fla x ¾ NPTE	1
L	Transducer, Pressure	1
M	Elbow, ¾ Int Fla Hyd x ¾ NPTI	1

NOTES:
1. All items designated with a letter are to be removed prior to the installation of the purge kit.
2. All items designated with a number are supplied with the purge kit, with the exception of tubing. Item 2 is 1/4 O.D. x .030 wall copper tubing and Item 3 is 3/8 o.d. x .032 wall copper tubing.
3. Item 18 (Orifice), 19 (Dot Plug), 20 (Harness) and 21 (Conduit Conn.) are not shown.

FIG. 2 – CONVERSION TO HIGH EFFICIENCY PURGE UNIT

9. Run 3/8″ copper line from oil return port on pump sub-assembly to oil return angle valve on compressor.

10. Run 3/8″ copper line from angle valve previously installed in tee to oil supply strainer on pump sub-assembly.

11. Remove old pressure transducer from purge tank. Install tee fitting at tank pressure port. Install new pressure transducer, (part number 025-29148-008), on the run of the tee.

12. Run 1/4″ copper line from the leg of the tee installed on the tank to the high pressure cutout switch on the pump sub-assembly. Verify that switch is set at 90 PSIG.

13. Remove check-valve on purge exhaust solenoid valve and install the exhaust orifice bonnet from the kit at this location. Reinstall check valve with orifice.

MICROBOARDS AND EPROMS

STYLE "F" CHILLERS

Microboard 031-01065-000 or -001 is required. All Style "F" chillers were shipped with the required microboard 031-01065-000 or -001. The EPROM, however, must be one that is listed in the right-hand column of Table 1. If the microboard is not equipped with the required EPROM, refer to Table 1 to make the selection. Use the procedure below to change the EPROM.

NOTE: Since microboard 031-00940-000 or -001 cannot be used with this high efficiency purge unit, this retrofit is not applicable to those units connected to FAX-4000/Andover BAS systems.

STYLE "E" CHILLERS

Microboard 031-01065-000 or -001 is required. If equipped with microboard 031-00940-000/001, it must be replaced. Also, the EPROM must be one that is listed in the right-hand column of Table 1. If the microboard and/or EPROM is not correct, refer to Table 1 to make the selection. Use the procedure below to change the EPROM.

NOTE: Since microboard 031-00940-000 or -001 cannot be used with this high efficiency purge unit, this retrofit is not applicable to those units connected to FAX-4000/Andover BAS systems.

1. Be sure hands are free of oil, grease and metal. Wash hands if necessary.

TABLE 1

IF MICROCOMPUTER CONTROL CENTER EQUIPPED WITH:			REPLACE WITH:			
MICRO BOARD	EPROM		MICRO BOARD	EPROM		APPLICATION
	P/N	VERSION		P/N	VERSION	
031-00940-000 or -001	031-00956-001	3.B	031-01065-000 or -001	031-01097-009	C.00S.10	STD, R11/R123, NRT
031-00940-000 or -001	031-01027-002	3.E	031-01065-000 or -001	031-01097-008	C.01S.10	STD, R11/R123, WRT
031-00940-000 or -001	031-01027-003	3.ER	031-01065-000 or -001	031-01097-008	C.01S.10	STD, R11/R123, WRT
031-00940-000 or -001	031-01027-005	3.CT	031-01065-000 or -001	031-01097-004	C.00T.10	GUARDIAN, R11/R123, NRT
031-00940-000 or -001	031-01027-006	3.ET	031-01065-000 or -001	031-01097-002	C.01T.10	GUARDIAN, R11/R123, WRT
031-00940-000 or -001	031-01027-007	3.ERT	031-01065-000 or -001	031-01097-002	C.01T.10	GUARDIAN, R11/R123, WRT
031-00940-000 or -001	031-01027-009	3.XC	031-01065-000 or -001	031-01097-010	C.10S.10	67-70 "E" COMP R11/R123, WRT
031-00940-000 or -001	031-01027-010	3.YC	031-01065-000 or -001	031-01097-011	C.20S.10	67-70 "B/C" COMP R11/R123, WRT
031-00940-000 or -001	031-01027-011	3.ZC	031-01065-000 or -001	031-01097-012	C.30S.10	64 COMP R11/R123, WRT
031-01065-000 or -001	031-01074-001	C.01S.01 thru .09	Use Existing Board	031-01097-008	C.01S.10	STD, R11/R123, WRT
031-01065-000 or -001	031-01097-001	C.01F.01 thru .09	Use Existing Board	031-01097-001	C.01F.10	FAX-4500, R11/R123, WRT
031-01065-000 or -001	031-01097-002	C.01T.01 thru .09	Use Existing Board	031-01097-002	C.01T.10	GUARDIAN, R11/R123, WRT
031-01065-000 or -001	031-01074-002	C.00S.01 thru .09	Use Existing Board	031-01097-009	C.00S.10	STD, R11/R123, NRT
031-01065-000 or -001	031-01097-003	C.00F.01 thru .09	Use Existing Board	031-01097-003	C.00F.10	FAX-4500, R11/R123, NRT
031-01065-000 or -001	031-01097-004	C.00T.01 thru .09	Use Existing Board	031-01097-004	C.00T.10	GUARDIAN, R11/R123, NRT
031-01065-000 or -001	031-01074-003	C.10S.01 thru .09	Use Existing Board	031-01097-010	C.10S.10	67-70 "E" COMP R11/R123, WRT
031-01065-000 or -001	031-01074-004	C.20S.01 thru .09	Use Existing Board	031-01097-011	C.20S.10	67-70 "B/C" COMP R11/R123, WRT
031-01065-000 or -001	031-01074-005	C.30S.01 thru .09	Use Existing Board	031-01097-012	C.30S.10	64 COMP R11/R123, WRT
031-01065-000 or -001	031-01097-005	C.10F.01 thru .09	Use Existing Board	031-01097-005	C.10F.10	FAX-4500, 67-70 "E" COMP R11/R123, WRT
031-01065-000 or -001	031-01097-006	C.20F.01 thru .09	Use Existing Board	031-01097-006	C.20F.10	FAX-4500, 67-70 "B/C" COMP R11/R123, WRT
031-01065-000 or -001	031-01097-007	C.30F.01 thru .09	Use Existing Board	031-01097-007	C.30F.10	FAX-4500, 64 COMP R11/R123, WRT

NRT – Narrow Range Transducers WRT – Wide Range Transducers STD – Standard

2. Remove AC power from control center. Attach an antistatic wrist strap and clip the other end to a panel ground screw or other unpainted, grounded metal fastener in the control center.

3. Using the extractor tool, carefully remove the EPROM from the U17 socket on the microboard, York part number 031-01065-000/001.

4. Being sure that the notch in the replacement EPROM is pointed up, carefully insert the pins in the U17 socket. It may be easier to insert one side of the pins slightly and then insert the other side. When all the pins are properly aligned with the socket, gently press the EPROM in place.

5. Run 16 gauge stranded wire from terminal block 24 in control panel through conduit to main junction box mounted on chiller for boost pump power supply. (See Fig. 3.)

6. Run 3/8" conduit with wires 2, 24 and 61 from chiller junction box to pump sub-assembly junction box. Crimp all wire connections. Wires 61 and 24 should be 16 gauge, stranded wire 2 should be 14 gauge.

7. Evacuate and recharge chiller with all valves opened.

OPERATION

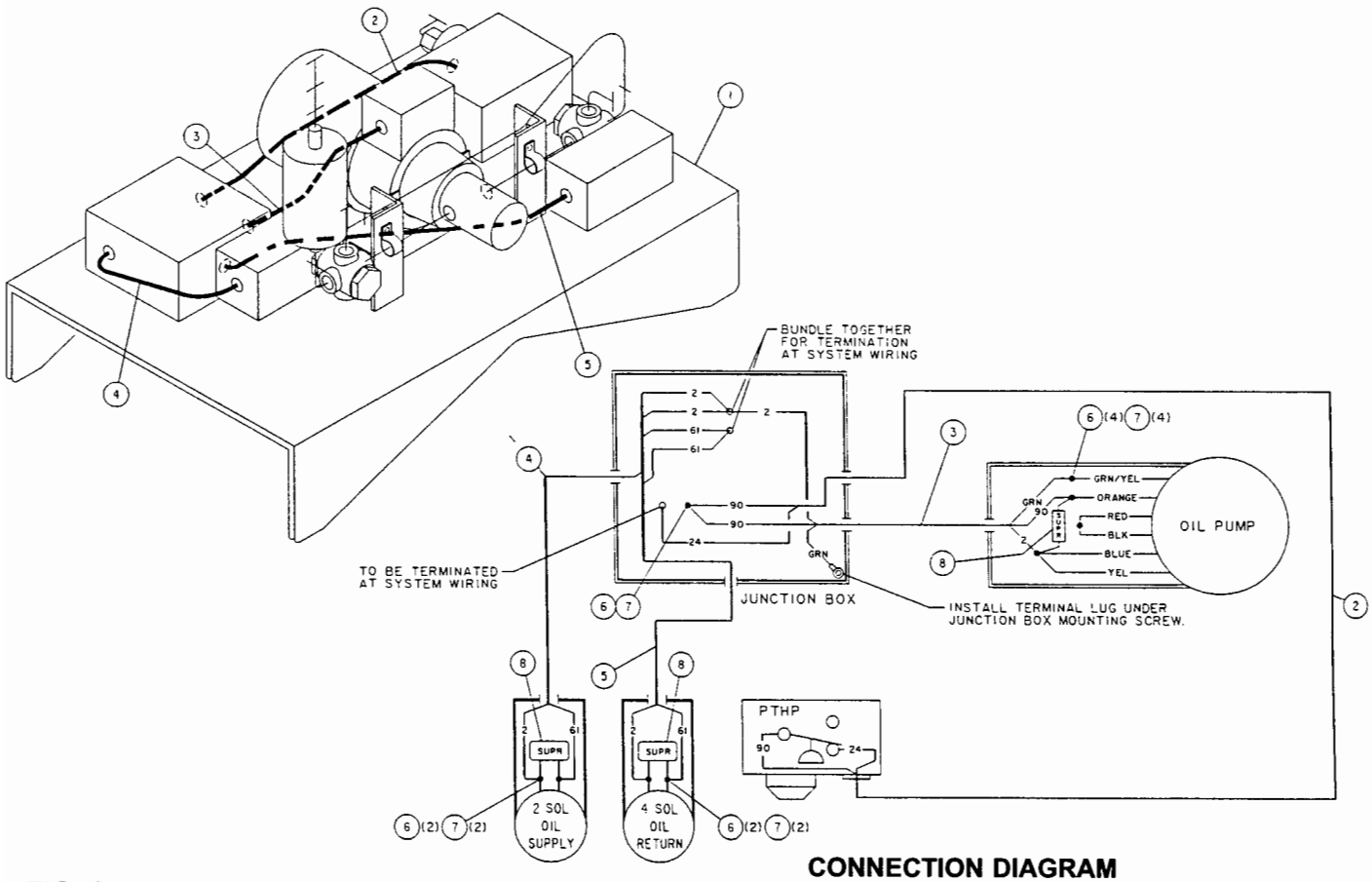
Purge operation is similar to the present TurboGuard design. There is a fill and drain cycle which is controlled via the action of the tank float switches. The oil boost pump raises the oil supply pressure to the purge tank to enable exhaust release at 90 PSIA. When an exhaust is made, the tank pressure will drop from 90 to 80 PSIA. The pump is also used in the drain portion of the purge cycle to pump out the purge tank. This provides for uniform purge cycle duration. The oil supply to the purge tank is taken downstream from the chiller oil cooler in order to provide cool oil to the tank and increase refrigerant separation efficiency. If the purge air exhaust solenoid valve fails to open at 90 PSIA, the power to the pump will be cut off at 105 PSIA with the high pressure cutout switch. Manual reset is required in order to re-energize the boost pump.

START-UP

1. Place the control panel in "Program" mode as follows:

   a. Press the "Access Code" key.

   b. "ENTER VALID ACCESS CODE" is displayed.



CONNECTION DIAGRAM

FIG. 3 – PUMP SUB-ASSEMBLY WIRING

c. Using entry keys enter the special service access code (Ref. Service Manual Form 160.46-M2 Style E; 160.48-M2 Style F).

d. As each digit is entered, the characters **Y O R K** are displayed. *NOTE: If digits other than the correct digits are entered,* **Y O R K** *is still displayed.*

e. Press "Enter" key. *NOTE: If digits other than the correct digits were entered in Step No. 4, "INVALID ACCESS CODE" is displayed when the "Enter" key is pressed. If this occurs, enter the correct access code and proceed.*

f. "ACCESS TO PROGRAM KEY AUTHORIZED" is displayed. *NOTE: Unless terminated by pressing the "Access Code" key again, the operator will have access to the "Program" key for 10 minutes. When 10 minutes have elapsed, access to program key will be automatically disabled and the operator must return to Step No. 1 to gain access.*

g. Press "Program" key.

h. "PROGRAM MODE. SELECT SETPOINT" is displayed.

2. Select the TurboGuard boost pump, as follows:

   Press the "Auto Vanes" service key. Press the "Advance Day/Scroll" key repeatedly (if needed) until the message "TURBOGUARD BOOST PUMP SELECTED" is displayed. Press the "Enter" key and the display shall read "PROGRAM MODE; SELECT SETPOINT".

   Press the "Auto" key to verify that the message "TURBOGUARD BOOST PUMP SELECTED" is displayed.

   Press the "Access Code" key to exit "Program" mode.

3. All field piping connections should be leak checked.

4. The purge pump motor will be energized when the chiller compressor is started; the purge pump motor fan should be in motion. If the pump motor fails to start, try resetting the high pressure cutout switch by depressing and releasing the manual reset button. The purge will go through a fill/drain cycle every 8 to 12 minutes depending on the amount of air present in the system. An air exhaust is made if enough non-condensible is present to bring purge condenser pressure to 90 PSIA. Purge cycling can be monitored on the control panel by using the "Display Data" key to display purge tank pressure.

EXCESS PURGE THRESHOLD

The excess purge threshold can be programmed by the serviceman or customer operator personnel. When this threshold is met, an excess purge message is displayed alternately with the normal foreground message. The serviceman, using the special service access code, can program the threshold for 1-30 purges per hour. The customer operator personnel, using access code 9675, can program the threshold for 10-30 purges per hour. The default value is 20. Enter the excess purge threshold as follows:

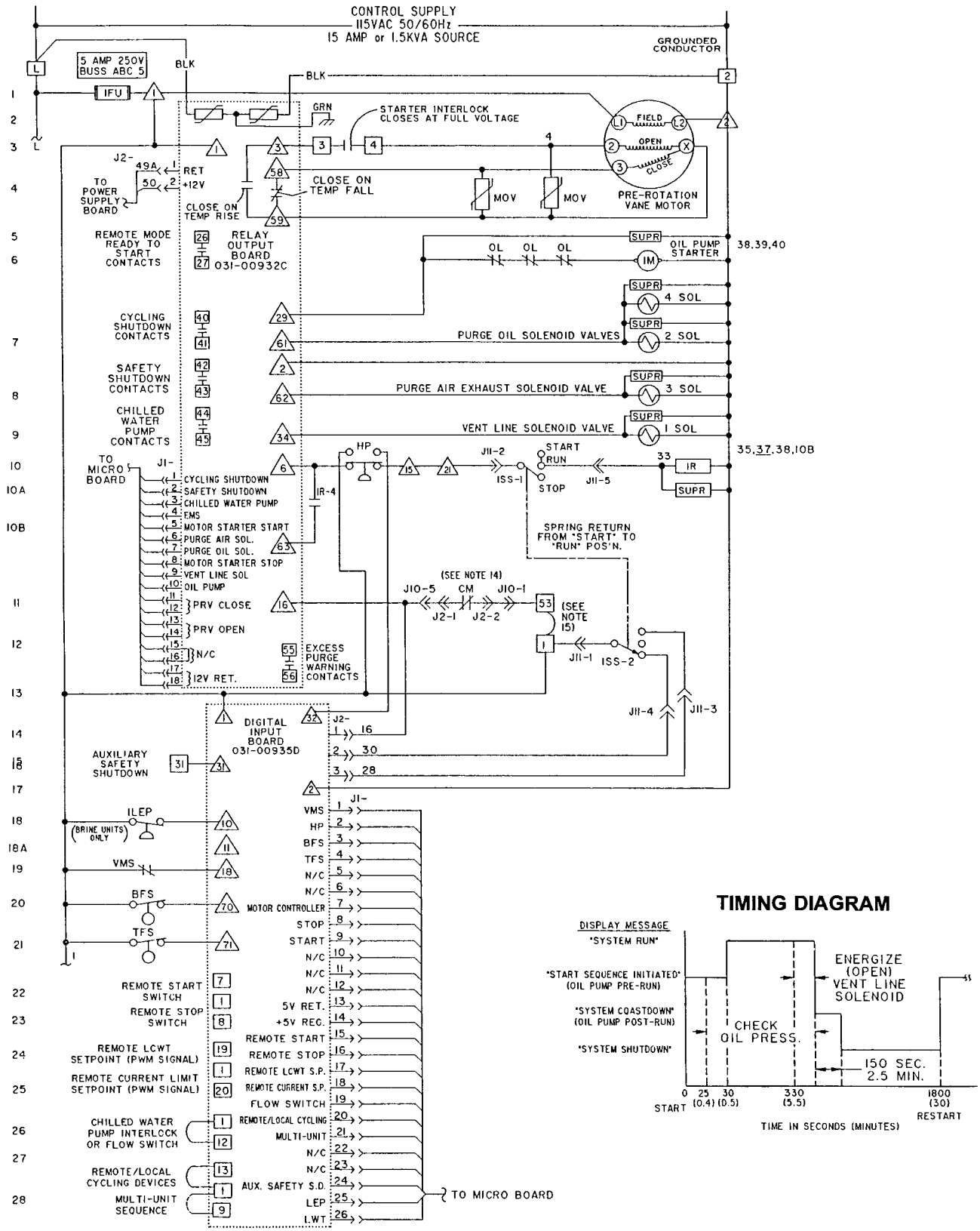
1. Press the "Access Code" key.
2. "ENTER VALID ACCESS CODE" is displayed.
3. Using entry keys enter the appropriate access code per above description.
4. As each digit is entered, the characters **Y O R K** are displayed. *NOTE: If digits other than the correct digits are entered,* **Y O R K** *is still displayed.*
5. Press "Enter" key.
   NOTE: If digits other than the correct digits were entered in Step No. 4, "INVALID ACCESS CODE" is displayed when the "Enter" key is pressed. If this occurs, enter the correct access code and proceed.
6. "ACCESS TO PROGRAM KEY AUTHORIZED" is displayed. *NOTE: Unless terminated by pressing the "Access Code" key again, the operator will have access to the "Program" key for 10 minutes. When 10 minutes have elapsed, access to program key will be automatically disabled and the operator must return to Step No. 1 to gain access.*
7. Press the "Program" key. "PROGRAM MODE, SELECT SETPOINT" is displayed.
8. Press "Display Data" key. "MAXIMUM PURGES PER HOUR = XX" is displayed.
9. Using the "Entry" keys, enter the desired value. Use leading zeroes where necessary (i.e.: 06).
10. Press the "Enter" key.
11. Press "Program" key to exit "Program" mode.

PURGE MESSAGES

The purge messages are displayed as part of the scrolled messages using the "Display Data" key as follows:

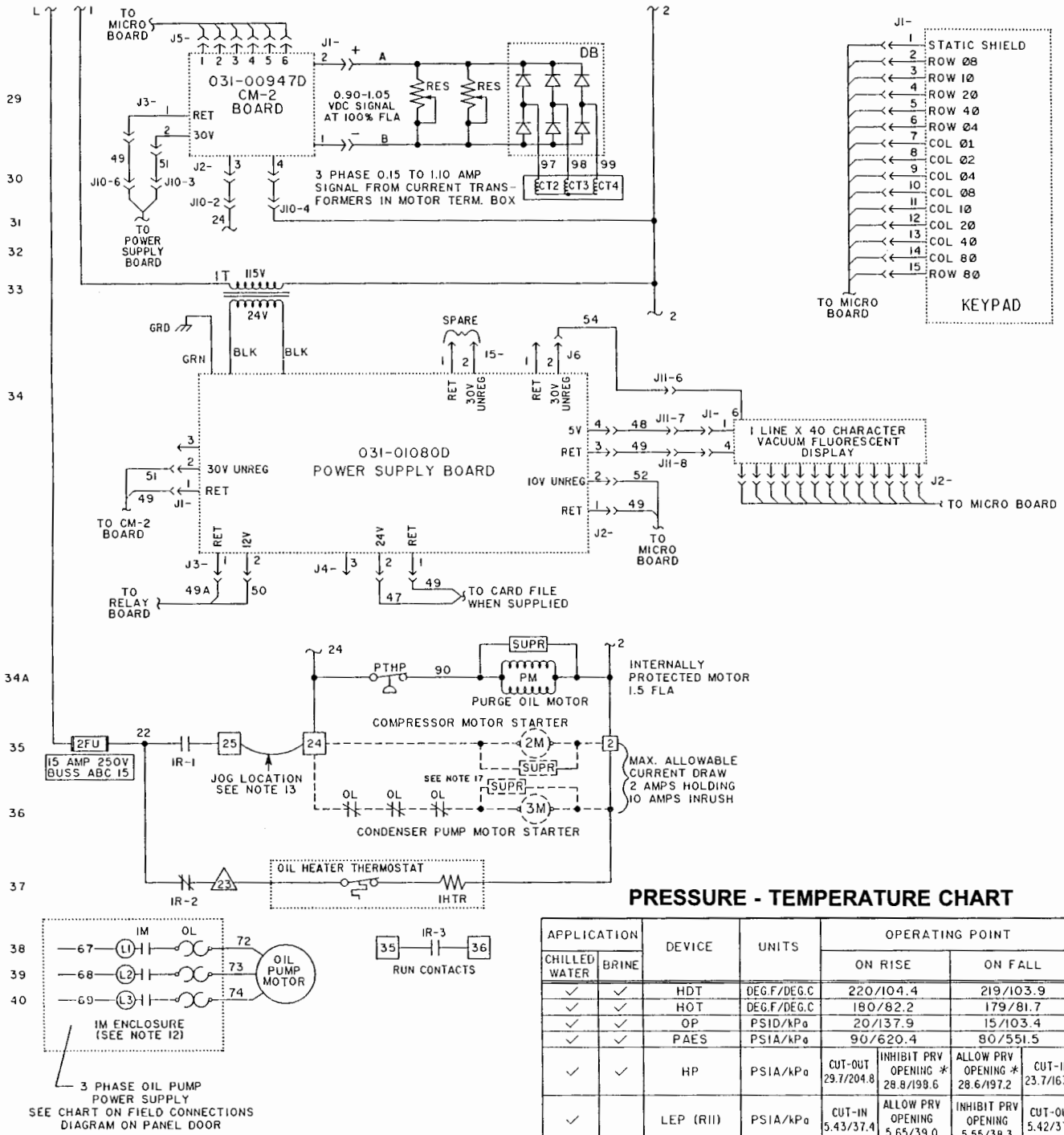
1. "PURGE PRESSURE = XXX PSIA" – As before, this message displays the pressure as sensed by the purge transducer.
2. "60 MINUTE PURGE COUNT BYPASS; XX MIN LEFT" – Purge exhausts are not counted during the first 60 minutes of chiller operation. Therefore, this message replaces the purge count messages below during the first hour of operation.

ELEMENTARY DIAGRAM



TIMING DIAGRAM

FIG. 4 – TYPICAL WIRING WITH PUMP SUB-ASSEMBLY



PRESSURE - TEMPERATURE CHART

APPLICATION		DEVICE	UNITS	OPERATING POINT			
CHILLED WATER	BRINE			ON RISE		ON FALL	
✓	✓	HDT	DEG.F/DEG.C	220/104.4		219/103.9	
✓	✓	HOT	DEG.F/DEG.C	180/82.2		179/81.7	
✓	✓	OP	PSID/kPa	20/137.9		15/103.4	
✓	✓	PAES	PSIA/kPa	90/620.4		80/551.5	
✓	✓	HP	PSIA/kPa	CUT-OUT 29.7/204.8	INHIBIT PRV OPENING * 28.8/198.6	ALLOW PRV OPENING * 28.6/197.2	CUT-IN 23.7/163.4
✓		LEP (RII)	PSIA/kPa	CUT-IN 5.43/37.4	ALLOW PRV OPENING 5.65/39.0	INHIBIT PRV OPENING 5.55/38.3	CUT-OUT 5.42/37.4
✓		LEP (RI23)	PSIA/kPa	CUT-IN 4.41/30.4	ALLOW PRV OPENING 4.70/32.4	INHIBIT PRV OPENING 4.50/31.0	CUT-OUT 4.40/30.3
	✓	ILEP	PSIG				
✓	✓	HOP	PSID/kPa	60/413.7		59/406.8	
✓	✓	FDTS	DEG.F/DEG.C	30.0/-1.10		29.9/-1.20	
✓		LWT	DEG.F/DEG.C	CHILLED LIQUID TEMP. SETPOINT		AT OR ABOVE LCWT= 40/4.4, LWT=4/2.2 BELOW THE CHILLED LIQ. TEMP. SETPOINT: WHEN THE SETPOINT IS RAISED, LWT= 36/2.2 FOR 10 MINUTES. BELOW LWCT=40/4.4, LWT=36/2.2	
	✓	LWT	DEG.F/DEG.C	CHILLED LIQUID TEMP. SETPOINT		LWT = 4/2.2 BELOW THE CHILLED LIQ. TEMP. SETPOINT	
✓	✓	LOT	DEG.F/DEG.C	71.0/21.7		55.0/12.8	
✓	✓	PTHP	PSIA/kPa	105/723		99/682 MANUAL RESET	

* - FUNCTION PROVIDED BY CONDENSER TRANSDUCER

3. "PURGES LAST XX MIN = XX; MAX PURGES/HR = XX" – After the first hour of chiller operation has elapsed, purge exhausts are counted. This message is displayed during the first hour following the initial 1 hour bypass (see above), and after the excess purge message is cleared. The minutes elapsed during this first hour of purge exhaust counting are displayed. The purge count is incremented each time a purge exhaust occurs. Also, the excess purge threshold that has been programmed by the operator or serviceman is displayed as "MAX PURGES/HR". When the minute count reaches 60, this message is replaced with the following message.

4. "PURGES LAST HOUR = XX; MAX PURGES/HR = XX" – After the initial 1 hour bypass and the first hour of purge exhaust counting has elapsed as explained above (2 hours of chiller run time), this message is displayed thereafter. A running total of the number of purge exhausts that have occurred within the last hour is displayed. The excess purge threshold that has been programmed by the operator or serviceman is displayed as "MAX PURGES/HR".

EXCESS PURGE

Anytime after the first hour of chiller operation, if the purge exhaust count equals the programmed "MAX PURGE/HR" threshold, "DAY <TIME> WARNING – EXCESS PURGE" is alternately displayed with the normal foreground message. The day and time displayed is the time the excess purge event occurred. This message will be displayed until manually cleared using the "Warning Reset" key in "Service" mode. Clearing the message also resets the purge exhaust count to zero and invokes the message "PURGES LAST XX MIN = XX; MAX PURGES/HR = XX".

While the excess purge message is displayed, the purge exhaust count will continue to increment until the 1 hour period has elapsed. The count is then frozen until the excess purge message is cleared. This provides a record of the total number of purge exhausts that occurred within the 1 hour period that the excess purge event occurred.

PURGE COUNT

Following a 1 hour bypass at start, purge exhausts are counted and displayed in the above massages while the chiller is running. With the exception of the first hour after the bypass, the value displayed is the number of exhausts that have occurred in the "Last Hour". For example, if you walk up to the control center at 9:11AM and press the "Display Data" key and it says that there have been 7 purges in the "Last Hour", that means that there have been 7 exhausts since 8:11AM. If you do this at 2:57PM, it means that there have been 7 exhausts since 1:57PM, etc.

The purge count is reset to zero by the following:

1. Clearing the excess purge message.
2. Moving the micro board program jumper J57 (CLK ON/OFF) from "Clk Off" to "Clock On" position.
3. Starting the chiller.

The purge count is frozen by the following:

1. When the chiller is not running.
2. An excess purge message is being displayed and at least 1 full hour of purge exhausts have accumulated.

HIGH PURGE PRESSURE WARNING MESSAGE

If the purge transducer output is indicating a pressure of greater than 95.0 PSIA for 255 continuous seconds, "WARNING – HIGH PURGE PRESSURE" is alternately displayed with the normal foreground message. When the pressure decreases to less than 95.0 PSIA, the message is automatically cleared.

EXCESS PURGE ALARM CONTACTS

When the MicroComputer Control Center is equipped with optional relay board part number 031-00932-002, a set of alarm contacts is provided on this board at terminals TB4-55/56. These are dry N.O. contacts rated at 2A inductive @ 250 VAC and 5A resistive @ 250 VAC.

These contacts can be used to annunciate an excess purge condition to a remote location. Anytime an excess purge condition occurs, these contacts close and remain closed until the excess purge warning message is cleared by pressing the "Warning Reset" key in "Service" mode. This causes the contacts to open.

MAINTENANCE

In addition to standard TurboGuard purge maintenance requirements, the exhaust orifice should be cleaned and checked on a yearly basis.

YORK®

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