YORK®	MILLENNIUM ROTARY SCREW LIQUID CHILLERS	
SERVICE BULLETIN	Supercedes: Nothing	Form 160.47-M2 (SB23) (200)
	File with: 160.47-M2	

Subject: Screw Chiller (125-675TR) Non-Graphic Control Center –
Eprom Version S.01F.19

On/about March 2000, Eprom Version S.01F.19 (York P/N 031-01102-002) will be available for non-Graphic Control Centers equipped with Micro Board 031-01065-XXX. It contains the following enhancements that revise Service Manual 160.47-M2 as follows:

SLIDE VALVE UNLOAD BEFORE SHUTDOWN

To assure the Slide Valve unloads to < 30% position during shutdown, it is unloaded to < 30% prior to shutting down the chiller on certain shutdowns.

While the chiller is running, if one of the below listed shutdown commands occur and the slide valve position is > 30%, a continuous unload signal is applied to the slide valve until its position is < 30%. While the slide valve is unloading, "SYSTEM SHUTTING DOWN – SV UNLOADING' is displayed. If the Status key is pressed, a message describing the cause of shutdown is displayed. When the slide valve position becomes < 30%, the chiller shutsdown and the normal 2-minute lockout period begins. The shutdown commands that initiate this operation are:

- Multi-Unit Sequence TB2-9
- Remote/Local Cycling TB2-13
- Remote Stop TB2-8
- Low Water Temp
- Daily Schedule Internal Time Clock

To assure that a defective slide valve actuator or mechanical problems cannot prevent a chiller shutdown, if the slide valve has not unloaded to < 30% within 210 seconds of receiving the shutdown command, a shutdown occurs regardless of slide valve position.

MINIMUM LOAD CONTROL

There are now two selectable methods of preventing Separator oil loss under low load conditions: **Minimum Allowed Slide Valve Position** and **Minimum Allowed Motor Current**. Although both of these methods have been previously used in various eprom versions, they were never available in the same eprom. The actual method that should be used is determined by the application. While the slide valve minimum position is being limited by either method, "System run – Minimum Load Control" is displayed.

A description of each follows:
Minimum Allowed Slide Valve Position: Following a 3 minute bypass at chiller start and after the slide valve is loaded to at least a 25% position, it is not permitted to unload to < 5% position.
Minimum Allowed Motor Current: Following a 3 minute bypass at chiller start, if the motor current is < the programmed "Minimum Allowed Motor Current" value, "System Run- Minimum Load Control" is displayed and a 1 second load pulse is applied to the slide valve every 3 seconds until the motor current is ≥ the setpoint plus 2%. Manual slide valve control overrides this feature. The programmed "Minimum Allowed Motor Current" value has priority over any is "Pulldown Demand" or "Current Limit" setpoint.

Select the desired method using Access Code 1380 and the % MOTOR AMPS/% SLIDE VALVE key. When prompt message "Low Limit Control = x (0=%SV;1=%FLA)" is displayed, enter "0" or "1" for the desired method. If "%FLA" method is selected, use UNLOAD service key to enter the desired motor current value. When prompt message "Minimum Current Load Limit = XX%FLA", enter desired value between 15% and 70% FLA. Both methods are selectable, regardless of the position of Program Jumper JP4.

The method selected is displayed as a scrolled message of the DISPLAY DATA key as either "% Slide Valve Determines low Limit" or "Motor % FLA determines Low Limit".

STANDBY CHILLER FREEZE PROTECTION

In this Eprom version, this feature has been modified as described below.

In previous eprom version S.01F.17, detailed in 160.47-M2 (SB18), the freeze threat was based on the **Evaporator Saturation Temperature** decreasing below 32° F and the warning was displayed after the chiller was shutdown for at least 10 minutes. The warning cleared when the temperature increased above 35° F. During shutdown, the condenser pump was turned on when the temperature decreased below 35° F and was turned off when it was greater than 45° F.

In this version, freeze threat is based the **Condenser Saturation Temperature** as follows: After the chiller has been shutdown for at the least the user programmed bypass time (30-60 minutes), programmed with the "Freeze Warning Delay Time" setpoint below, if the temperature decreases below 28° F, "Freeze Threat From Operating Chiller" is displayed and the Warning Relay is energized. The Warning Relay is K6 on the Relay Board and when energized, the contacts close between TB3-34 and TB3-1. As before, closure of these contacts applies 115Vac to TB3-34 and this signal can be used for alarm purposes. The warning clears and the relay is de-energized when the temperature increases above 28° F.

As before, the Condenser Pump is driven from Relay Board TB4-55 & 56 (dry closure contacts of relay K0)(Relay Board 031-00932-02 is required; -001 does not contain K0). The relay is energized to turn on the pump and de-energized to turn it off. Normally, the pump is started at the beginning of "Start Sequence Initiated". At chiller shutdown, the pump continues to run until the Condenser Saturation temperature increases above 35° F. During shutdown, anytime the temperature decreases below 30° F, the pump is turned on until it rises above 35° F.

Program the "Freeze Warning Delay Time" using Access code 9675 or 1380 and the REFRIGERANT PRESSURES key. When prompt message "Freeze Warning Delay Time =

XXMin" is displayed, enter desired time between 30 and 60 minutes.

With this Eprom, a Condenser Water Flow Switch can be connected between Digital Input Board terminals TB1-71 and TB2-1 (or TB1-1). The flow switch is bypassed for 60 seconds after the Condenser Pump is turned on with TB4-55 & 56 as described above. After the bypass, if it opens continuously for 2 seconds, a cycling shutdown is performed and "Day-Time-Cond Flow Switch-Autostart" is displayed. If the Condenser Pump is being run due to a low Condenser Saturation Temperature as described above, and the flow switch opens continuously for 2 seconds, "Freeze Threat – Cond Water Flow Fault" is displayed.

DISPLAY DATA KEY - CORRECTION

In previous eprom versions, when the Seal Oil Pressure Transducer operation was enabled, the Evaporator and Condenser Saturation Temperatures were no longer displayed as one of the scrolled messages of the Display Data Key. In this version, the Saturation Temperatures are displayed regardless of Seal Oil Pressure Transducer status.

HOT GAS BYPASS CONTROL SELECTION

In Eprom versions S.01F.12 and earlier, the Hot Gas Bypass control was based on Slide valve Position as follows: After a 3 minute bypass at start, the valve was opened (energized) when the Slide Valve position decreases to $\leq$ 5%. When it increases to $\geq$15%, it is de-energized (closed).

In Eprom version S.01F.13 and later, it was controlled, after a 3 minute bypass at start, per the difference between the Entering Chilled Water Temperature and the Leaving Chilled Liquid Temperature Setpoint as follows: When the Entering Chilled Water Temperature minus the Leaving Chilled Water Temperature Setpoint differential decreases to the programmed ON threshold (1 to 10° F), the valve is energized (opened). When the differential increases to the programmed OFF threshold (2 to 15° F), the valve is de-energized (closed).

The position of Micro Board Program Jumper JP4 does not affect Hot Gas operation as it did previously.

Both of these methods are available in this new Eprom version. The desired method is selectable as follows:

1.) Enter PROGRAM mode using Access code 1 3 8 0.
2.) Press CHILLED LIQUID TEMPS Display key.
    "HOT GAS USES-X (0=%SLD VLV;1=TEMP DIFF)" is displayed.
3.) Using ENTRY keys, press 0 to select Slide Valve method or 1 for Setpoint Differential method.
4.) Press ENTER key.
5.) If 0 was entered in step no.3, press PROGRAM key to exit. If 1 was entered, press ADVANCE DAY/SCROLL key.
    "(ECWT – LCWSP): HOT GAS ON = XX°F; OFF=XX°F" is displayed.
6.) Using ENTRY keys, enter differential threshold (1 to 10° F) at which it is desired to turn on the Hot Gas Bypass. Use leading zeroes where necessary (ie, 03). The Cursor will automatically move to the OFF entry. Enter the differential threshold (2 to 15° F) at which it is desired to turn off the Hot Gas Bypass.
7.) Press PROGRAM key to exit.