

MESSAGE FROM



SERVICE INFORMATION

Date: 04-01-03
Ref. No: NS-12-03
To: Service Manual Holders
National, International and Canada
Field Sales and Waynesboro Personnel
Subject: Easy Cool™ Liquid Injection Oil Cooling (LIOC)

The Quantum™ control panel is now capable of Proportional, Integral and Derivative (PID) Control. YORK Refrigeration has devised a superior method of liquid injection oil cooling over conventional Thermo-Expansion. This new Easy Cool™ method utilizes an HMMR motorized valve, controlled by the Quantum control, based on the setup of one of the four available PID loops as opposed to a TX valve.

Advantages to this method of cooling are as follows:

- Low-pressure-drop requirements for adequate feeding, allow us to pipe the feed into a port of higher pressure, decreasing the capacity loss of the compressor by 2% over thermo-expansion.
- No manual adjustments/tuning. Adjusting the setpoints for the PID loop does all the tuning.
- Better temperature control. The control setpoint can be set as desired without the need of mechanical adjustments.
- By setting the control setpoint higher and running the discharge temperature at higher levels, similar to those of a machine with an external oil cooler, the excessive foaming in the separator which is a characteristic of conventional LIOC is minimized.
- Use the instructions on the following pages to set up an Easy Cool Circuit.

Please feel free to contact me direct at 717-765-2472 if you have any questions regarding this letter or any other controls related issue you may have.

Sincerely,

A handwritten signature in black ink that reads "John C. Cosner".

John C. Cosner
Product Support Specialist
YORK Refrigeration / Controls Department
john.cosner@york.com

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100 CV Avenue • P.O. Box 997 • Waynesboro, Pennsylvania USA 17268-0997
Phone: 717-762-2121 • FAX: 717-762-8624 • www.frickcold.com

Easy Cool™ LIOC (Liquid Injection Oil Cooling) Setup


Use the following steps in setting up the Easy Cool LIOC using the Quantum Panel PID loop from analog output channel one and the HMMR motorized valve.

- Ensure that a driver chip is in chip slot U-7 on analog board one.
- Ensure that a D/A converter chip is in chip slot U-15 on analog board one.
- Ensure that a jumper is between pins 2&3 on J-26 and pins 1&2 on J-39 of analog board one.
- Ensure that the software version on the analog board one e-prom is version 1.04 or higher. This chip is in slot U-13 and has a label calling out the version. If the label is missing press [Menu] > [About], the version should appear in the lower left corner of the screen.
- Ensure that the HMMR valve is wired to the Quantum control panel per drawing 649B0898.
- Set the High Oil Temperature alarm and shutdown setpoints to 165° and 170°F for ammonia or 170° and 175°F for R-22, R134A and R507 respectively.
- Once this is done press [Menu] > [Calibration] > [OK] > [More] > [Analog Out Calibration].
- Press [Calibration Setpoints] and enter a [2] for **Input Channel to Output** for analog output 1 > [Enter] > [OK]. The screen should appear as it is below.

Analog Output Setup				Thu 7 Mar 2002 23:16:43
	Input Channel to Output	Input	Output	Calibration Setpoints
Analog Output 1	<input style="width: 40px;" type="text" value="2"/>	196.4 F	50.0 %	Analog 1 Setpoints Calibration
Analog Output 2	<input style="width: 40px;" type="text" value="1"/>	196.4 F	50.0 %	Analog 2 Setpoints Calibration
Analog Output 3	<input style="width: 40px;" type="text" value="14"/>	13.6 %	13.6 %	Analog 3 Out Calibration
Analog Output 5	<input style="width: 40px;" type="text" value="21"/>	72.9 PSIG	17.5 %	Analog 5 Out Calibration
Analog Output 6	<input style="width: 40px;" type="text" value="21"/>	72.9 PSIG	17.5 %	Analog 6 Out Calibration

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- Press [Menu] > [Control Setup] > [More] > [PID Setup], you should see this screen.
- Press [PID Setup] for Output Channel 1 PID.

		<h2 style="margin: 0;">PID Setup</h2>		Mon 16 Jul 2001 19:36:45	
Output Channel 1 PID					PID Setup
SETPOINT	32.0 F	Control	1.03 needed		
ACTUAL	97.3 F	Output	60.3 %		
Output Channel 2 PID					PID Setup
SETPOINT	32.0 F	Control	1.03 needed		
ACTUAL	97.3 F	Output	60.3 %		
Output Channel 5 PID					PID Setup
SETPOINT	30.0 Hg	Control	1.03 needed		
ACTUAL	72.9 PSIG	Output	17.5 %		
Output Channel 6 PID					PID Setup
SETPOINT	30.0 Hg	Control	1.03 needed		
ACTUAL	72.9 PSIG	Output	17.5 %		

- Refer to the screen on the following page for the steps below.
- Press [Change Setpoints]
- Set the following setpoints as a starting point. Adjustment to the Proportional gain may be necessary. The use of values in the integral and derivative gains should not be necessary.

Setpoint: 150°F for Ammonia, 160°F for R-22, R134A and R507

Dead Band: 2.0°F

Proportional Gain: 5.00

Integral Gain: 0.00

Derivative Gain: 0.00

High Limit: 100%


Low Limit: 0%

Off Value: 0%

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Use the [Control], [Action] and [Off Value] keys to set the following:

- Set the **Control** for: When Running
- Set the **Action** for: Forward
- Set the **Off Value** for: 0%
- The **Actual Value** should be reading the current discharge temperature.
- The **Output** should be reading 0% with the machine off line.
- With the machine off line press [Menu] > [Calibration] > [OK] > [More] > [Analog Out Calibration] > [Analog 1 Calibration]. **Analog Output 1** should read 0%, **the Top End Value** 100%, **Bottom End Value** 0% and the **Offset Value** 0%.
- If the actual output signal is more than 20mA at 100% output follow the instructions at the bottom of this screen to correct the top end value setpoint.
- Regarding adjustment, the goal is to increase or decrease the proportional gain Setpoint until the discharge temperature holds within or close to the dead band with minimal fluctuation of the output signal.

		<h2 style="margin: 0;">PID Setup</h2>		Mon 16 Jul 2001 19:36:49	
Output Channel 1 PID					Change Setpoints
Control ACTUAL	1.03 needed 97.3 F	Action Output	Forward 60.3 %		
SETPOINT	<input style="width: 100px;" type="text" value="32.0 F"/>				Control
Dead Band	<input style="width: 100px;" type="text" value="0.0 F"/>				Action
Proportional Gain	<input style="width: 100px;" type="text" value="0.00"/>				Off Value
Integral Gain	<input style="width: 100px;" type="text" value="0.00"/>				
Derivative Gain	<input style="width: 100px;" type="text" value="0.00"/>				
High Limit	<input style="width: 100px;" type="text" value="100.0 %"/>				
Low Limit	<input style="width: 100px;" type="text" value="0.0 %"/>				
Off Value	<input style="width: 100px;" type="text" value="0.0 %"/>				

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