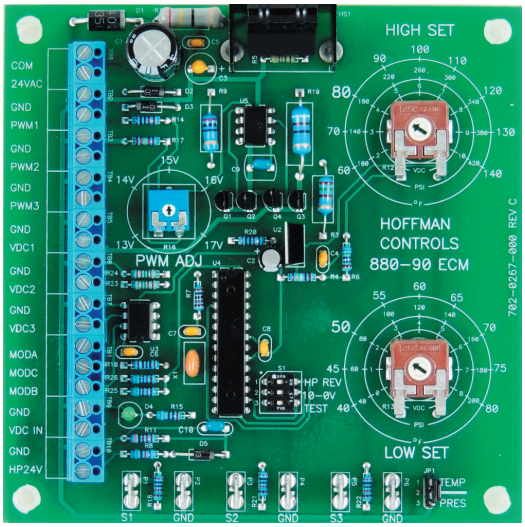
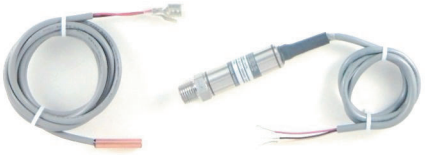
Hoffman|Controls
Product Data

880-90 Low Ambient Head Pressure Control for ECM Motors





Description

The 880-90 Low Ambient Head Pressure Control is designed to modulate energy efficient Electrically Commutated condenser fan Motors (ECM) in air conditioning and refrigration systems. The 880-90 control varies the speed of the condenser fan ECM motor(s) to vary the air volume through the condenser consequently regulating head pressure for proper heat rejection in low ambient temperatures.

The 880-90 Head Pressure Control monitors the head pressure by sensing the sub-cooled liquid line temperature by placing a 10K sensor on the refrigerant liquid line. As the liquid line temperature drops, the motor speed will be reduced to prevent freezing of the coil. As minimum motor speed is reached, the control will cycle the motor off until the liquid line coil temperature has returned to safe operating levels. At this point, the motor will modulate back to full speed to maintain proper heat rejection. The 880-90 control provides an adjustable LOW SET point of 40°F to 80°F and an adjustable HIGH SET point of 60°F to 140°F for the ability to custom tune the control for any application.

The common settings for most applications is a LOW SET point of 50°F and a HIGH SET point of 80°F. In this example, the condenser fan(s) modulation from full speed occurs at 80°F liquid line (ambients above 60ºF), and reaches minimum speed at 50°F liquid line (ambients below 30°F). The ECM condenser fan motor cycles “OFF” at liquid line temperatures below 50°F, and cycles back "ON" to minimum speed at 53°F liquid line temperature. The ECM condenser fan motor will modulate from minimum speed to full speed between 53°F and 80°F.

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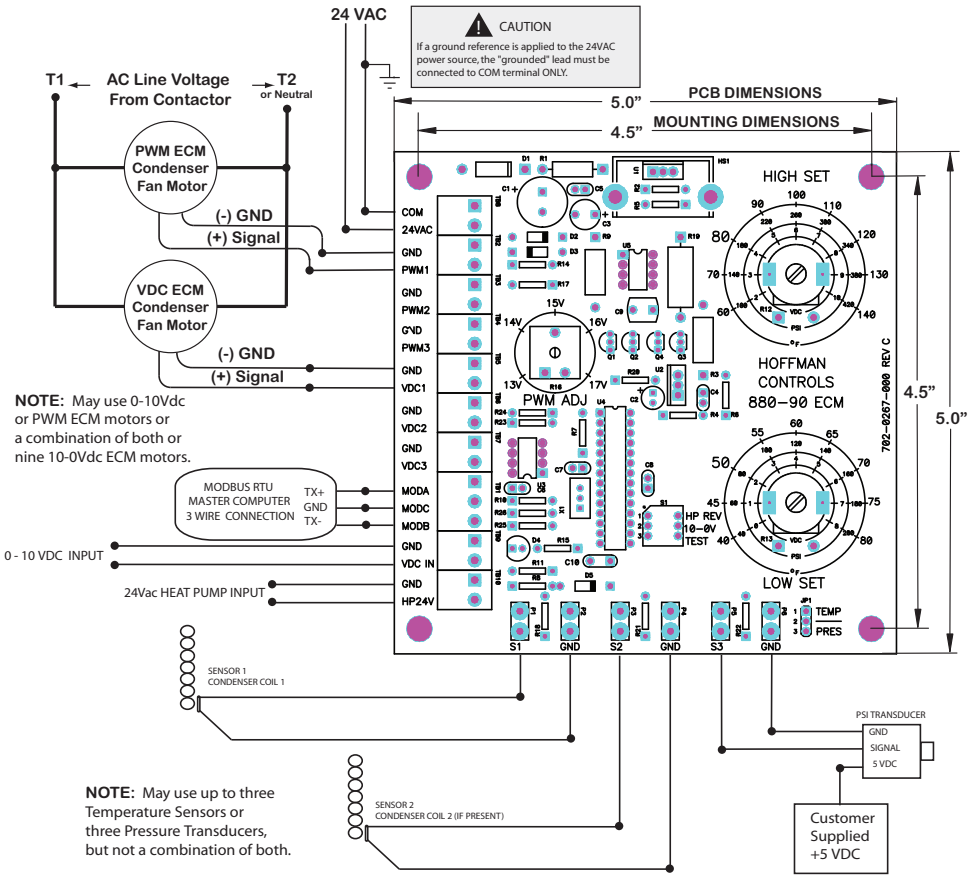
The 880-90 Model includes three jumper selected liquid line sensor monitoring inputs with the hottest sensor controlling operation or three jumper selected pressure transducer inputs with the highest pressure controlling operation. The 880-90 Model also includes a 0-10VDC input control signal option, sensor temperature Low & High Set point adjustments with LED indicator, Self-Test mode, Hard Start feature, Modbus communications and a 90ma (typically nine) ECM motor drive capability. The 880-90 Model provides three ECM motor drive options: a switch selectable 0-10VDC or 10-0VDC (fail safe) signal and/or an adjustable 13-17VDC, 80Hz PWM signal. The control also has a switch selectable Direct or Reverse acting Heat Pump over-ride function.

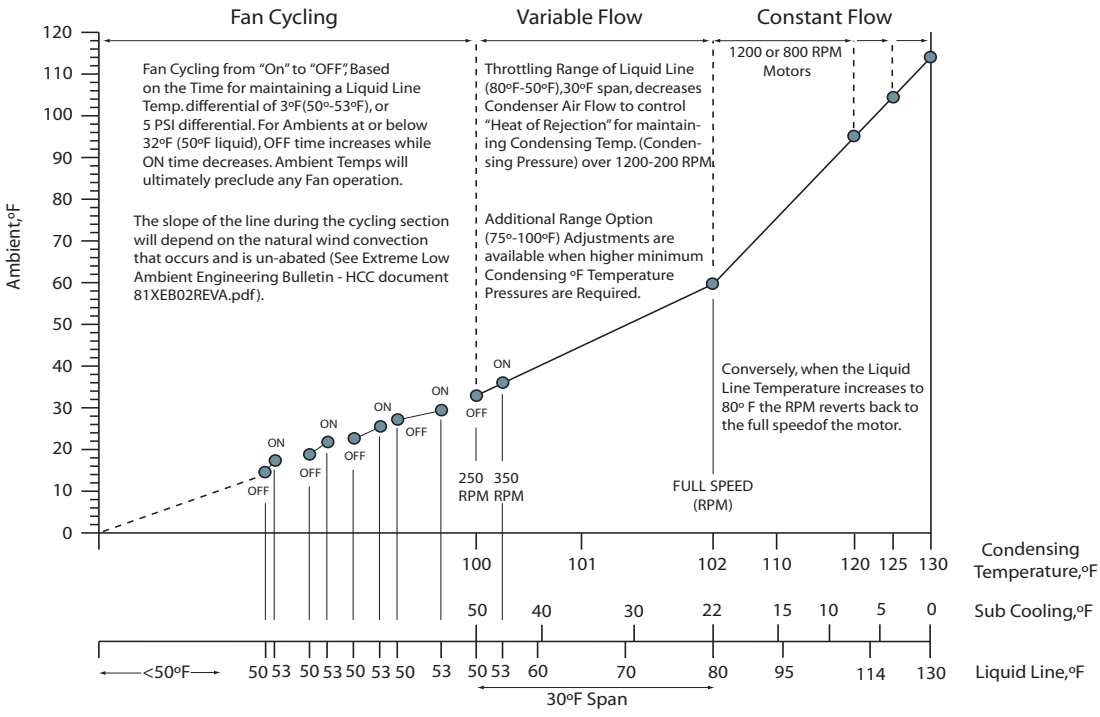
880-90 Features and Specifications

- Not refrigerant specific Class II Controller, conformal coated.
- Three selectable 10K liquid line temperature sensor or three 0.5- 4.5VDC, 500psi pressure transducer inputs including a 0-10VDC input option with LED Set Point indication.
- Temperature input Low Set Point range 40°F to 80°F and High Set Point range 60°F to 140°F in 1°F increments.
- Pressure input Low Set Point range 40psi to 200psi and High Set Point range 100psi to 420psi in 2psi increments.
- 0-10VDC input Low Set Point range 0.5-8.0VDC and High Set Point range 2-10VDC in 0.1VDC increments.
- Hysteresis values: Temp - 3°F, Pressure - 6psi, VDC - 0.8V.
- Self-Test feature will check ECM motor operation.
- ECM motor drive options include adjustable 13-17VDC, 80Hz PWM and 0-10VDC or 10-0VDC (fail safe) signals with 90ma drive capability (typically nine motors).
- 2.5 second full speed Hard Start.
- Direct or Reverse acting Heat Pump Override.
- Controller operates as a Modbus slave over a Modbus RTU Series Interface. 25 registers can be read and 16 registers can be set remotely via Modbus
- Operating Ambient -31°F to +160°F, Humidity 95%, Non-condensing, Dimensions 5.0L x 5.0W x 1.75H, Power supply 22-30VAC, 3VA.

880-90 WIRING DIAGRAM



Low Ambient, Condensing, Sub Cooling, and Liquid Line Values for Constant, Variable, and Fan Cycling Operations



Typical Fan Operation with Ambient, Condesing, and Liquid Line Temperatures

Hoffman|Controls

2463 Merrell Road, Dallas, Texas 75229 • Phone: (972) 243-7425 • Fax: (972) 247-8674 • Toll Free: 1-888-HCC-1190

www.hoffmancontrols.com

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