

880-ECM(VDC) Head Pressure Controller

Description

The 880-ECM(VDC) Low Ambient Head Pressure Controller directly modulates ECM Condenser Motor(s) via a 0-10Vdc signal in low ambient temperatures, varying the volume of air through the condenser, to regulate Head Pressure. The controller monitors the liquid line temperature and degrees of excessive sub-cooling which are directly proportional to the condensing temperature and resulting head pressure.

Fan(s) Modulation from full speed occurs at 60°F ± Ambient (102°F Condensing, 80°F Liquid Line), and reaches Minimum Speed at 30°F ± Ambient (100°F Condensing, 50°F Liquid Line). The ECM Motor Cycles "OFF" for all Liquid Line °F temperatures of 50°F or below, and cycles "ON" at 53°F liquid line. Matching these operating parameters to your ECM motor may require motor specific customization. Consult factory for more information.

Assuming a 250 RPM Minimum Speed, and 1050 RPM Full Speed Motor, the motor cycles "OFF" at 250 RPM and back "ON" at 350 RPM and then modulates back to 250 RPM before cycling off. The motor remains "OFF" for longer and longer periods of time as the ambient continues to fall below 30°F ±. Eventually the motor remains "OFF" and ambient control ends.

The described ambient conditions above can be effected by the natural forced ambient air, unabated through the condenser coil. For extremely low ambient conditions, approaching 0°F ambient or below, see Engineering Bulletin 81XEB02 REV A, for additional precautions or requirements.

The 880-ECM(VDC) control may be capable of driving more than one ECM motor at a time. The number of motors is limited by the amount of current the individual motors will draw through their 0-10Vdc signal input circuit. The 880-ECM(VDC) control can provide up to 10ma of current on the 0-10Vdc signal output.

The 880-ECM(VDC) control also has an LED output indicator that is OFF at 0Vdc output and increases in intensity until full ON at 10Vdc to indicate normal operation.

Application

- The Controller is typically utilized on air-cooled condenser fan motors found in AC&R systems.
- The 880-ECM(VDC) is applicable to ECM motors only.
- The 880-ECM(VDC) is typically capable of driving up to 2 ECM motors.
- See the 880-ECM(XX)DS product line for additional ECM models with PWM output and higher drive current capabilities, if required.

Features and Benefits

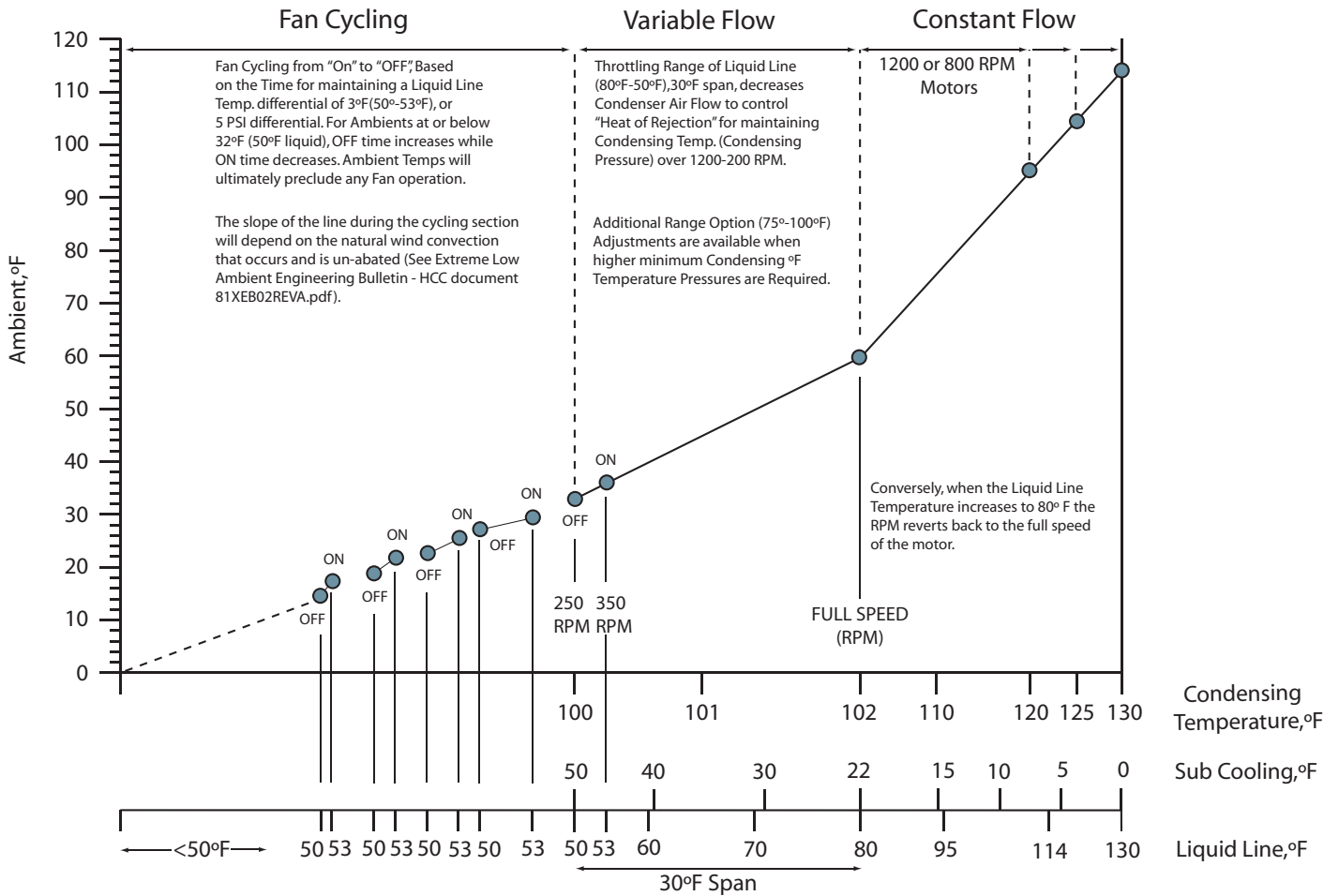
Many of the features for the Digital (Microprocessor Based) 814 and 816 Series Controller for PSC Motors, are available in the 880-ECM(VDC) Controller. These features are inclusive of:

- One control for all applications for any refrigerant.
- Any line voltage as is available from the motor manufacturer.
- Range Adjust – optimizes Head Pressure for TX Valves, Orifice or CapTube Expansion Devices. Adjusts from 50°F / 80°F to 70°F / 100°F operating ranges.
- 30° F liquid line Modulating Span.
- Heat Pump Defrost Cycle Over-ride. Direct or Reverse Acting Function (eliminates external relay).
- Fan modulates from Full Speed to Minimum Speed between 80° F and 50° F liquid line.
- Fan modulates +/-100 RPM between 53°F and 50°F liquid line for a 3° F hysteresis (condensing temperature).
- Low ambient control occurs between 102°F and 95°F condensing temperatures (varies with unit EER).
- Fan remains off for all liquid line temperatures below 50°F.
- Class II Controller, conformally coated.
- Available in with optional track package or with circuit board stand off mounting as shown.

Specifications

Input Voltage	24V AC (+20%/-10%)
ECM Motor Voltages	As available by motor manufacturer
Input Signals-Liquid Line Sensor	10K Thermistor
Output Signal, Standard*	0-10VDC @ 10ma (max) motor OFF @ 1.5VDC motor ON @ 2.0VDC
<i>*Optimal motor OFF/ON points can be furnished. Contact the factory for with your requirements.</i>	
Operating Ambient	-30°F to +160°F
Humidity	95%, Non-condensing
Conformal Coating	Yes
Dimensions (LxWxH)	STANDOFF MOUNT 3.0"x 4.35"x 1.5" TRACK MOUNT 4.0"x 5.0"x 1.5"
NEMA 2, 3, or 3R Enclosure	User Supplied / As Required

Low Ambient, Condensing, Sub Cooling, and Liquid Line Values for Constant, Variable, and Fan Cycling Operations Utilizing ECM Type AC Motor



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

IMPROVED HEAD PRESSURE REGULATION WITH ECM MOTORS

Multiple condenser fan equipment typically cycles condenser fan motors to accomplish low ambient control of head pressure. This function results in integral steps of air flow with a dis-proportionate control of air flow resulting in "reverse airflow" through non-operating fans as more and more motors are "cycled off".

The 880-ECM(VDC) controls all motors simultaneously resulting in a smooth, regulated air flow from full speed to minimum speed. This method precludes a sudden reduction of flow (heat rejection), there by eliminating sudden changes in head pressure and / or regulation of TXV super heat.