

Description

The NEW 815-10D Electronic Head Pressure Control is a simplified temperature based design that provides a minimum speed adjustment. All other control parameters are factory pre-set. This simplified design is only applicable for TXV thermal expansion type devices using any refrigerant type. The control modulates (varies) condenser fan motor speed in low ambient temperatures, varying the air volume through the condenser to regulate head pressure. This model's sensor input allows for the control of a single refrigerant circuit, sharing the same condenser fan motor(s). Only open drip proof, direct drive, PSC or Shaded Pole motors that are applicable for continuous motor speed regulation must be used.

The Controller's operation is dependent on the equipment's proper refrigerant charge and resulting subcooling of the liquid refrigerant from 4°F to 6°F subcooling at ARI condition at a 95°F ambient. This subcooled value must be sensed at the exit of the condenser. Therefore, the temperature sensor must be mounted on the liquid line as the line exists the condenser. The sensor should be insulated and weather protected.

The Controller monitors the liquid line temperature(degrees of excessive sub-cooling) which is directly proportional to the head pressure. Speed modulation begins at 80°F liquid line(65°F ambient temperature) and proportionally reduces the fan to minimum speed once the liquid line temperature reaches 50°F(25°F ambient temperature). Power to the motor is removed at liquid line temperatures of 50°F and below .

At 53°F the fan re-starts at full speed for about one second and then modulates back to minimum speed. When ambient temperatures are at or below approximately 25°F(50° liquid temperature), the condenser fan motor will cycle and modulate between minimum RPM and "off" to maintain proper head pressure. As ambient continues to fall, the motor remains OFF for longer and longer periods of time, until the liquid line temperature remains below 50°F. At this condition, air flow is discontinued and ambient control ends.

The above describes a 30°F span (80°F to 50°F) function; for expansion valve systems only. Variable condenser airflow is modulated from full to minimum speed over this 30°F span.

The controls' purpose assures adequate pressure for low ambients:

- to maintain adequate pressure differential across the TXV expansion devise for maintaining the designed dx coil load.
- to assure adequate suction pressures to preclude freezing of the DX coil for A/C applications.
- to eliminate oil foaming (oil migration) and/or liquid slugging.

A variable Minimum Speed Adjustment is provided to compensate for sleeve and ball bearing type motors employed by the fan motor manufacturer. A recommended minimum speed of 400-RPM for sleeve bearing motors ("MIN SPD" pot fully CW) or 200-RPM for ball bearing motors ("MIN SPD" pot fully CCW).

The 815-10D control **does not** include a transformer within the controller and **will require** an external 24VAC power source. This 24 VAC power is typically supplied by a dedicated 24 VAC to line voltage transformer.



815-10D
Electronic Head Pressure Controller

THIS 24 VAC SOURCE MUST BE IN PHASE WITH THE LINE VOLTAGE BEING SUPPLIED TO THE CONDENSER FAN MOTOR. THE 24 VAC TRANSFORMER'S PRIMARY WIRES MUST BE CONNECTED TO THE SAME CONTACTOR TERMINALS THAT THE CONDENSER FAN MOTOR'S WIRES ARE CONNECTED TO (Otherwise, damage to the motor or controller may result).

Important: It is extremely IMPORTANT that when installing any HCC Low Ambient Controller, the installing technician evaluate the system's:

- Liquid Line temperature for the current Ambient temperature.
- Measure and determine the Liquid Subcooling for the Ambient temperature.
- Adjust units Refrigerant charge to obtain Liquid Line & Subcooling values on "Low" Ambient, Condensing, Subcooling, and Liquid Line Temperature °F values graph.

Features

- One control for every application and refrigerant.
- A fixed 30°F span range allows for thermal expansion valve TXV applications only for optimum low ambient performance.
- Multi voltage model.(115/208-230)
- Applicable for all refrigerant types.
- Eliminates the need for system penetration.
- Monitors liquid line temperature (liquid subcooling).
- Single Sensor only applications.
- Full voltage "HARD START" ensures proper fan rotation.
- Fan cycles "OFF & ON" at various durations at minimum speed.

- Eliminates compressor “slugging” and oil migration.
- Simple field installation.
- Replaces fan cycling controls, full speed to off.
- Supplies up to 10 amps to condenser motor(s) without derating the 815-10D Control
- Optional **Weatherproof Kit** (NEMA 3R) — Part Number 545-0202-007.

Typical Air Conditioning and Refrigeration Applications

- Commercial air conditioning
- Supermarkets
- Computer rooms
- Frozen food storage
- Humidity control
- Glycol coolers
- Hospitals
- Any other low ambient application

Application

The Controller is typically utilized on air-cooled condenser fan motors found in AC&R systems. They are used on the following motor types:

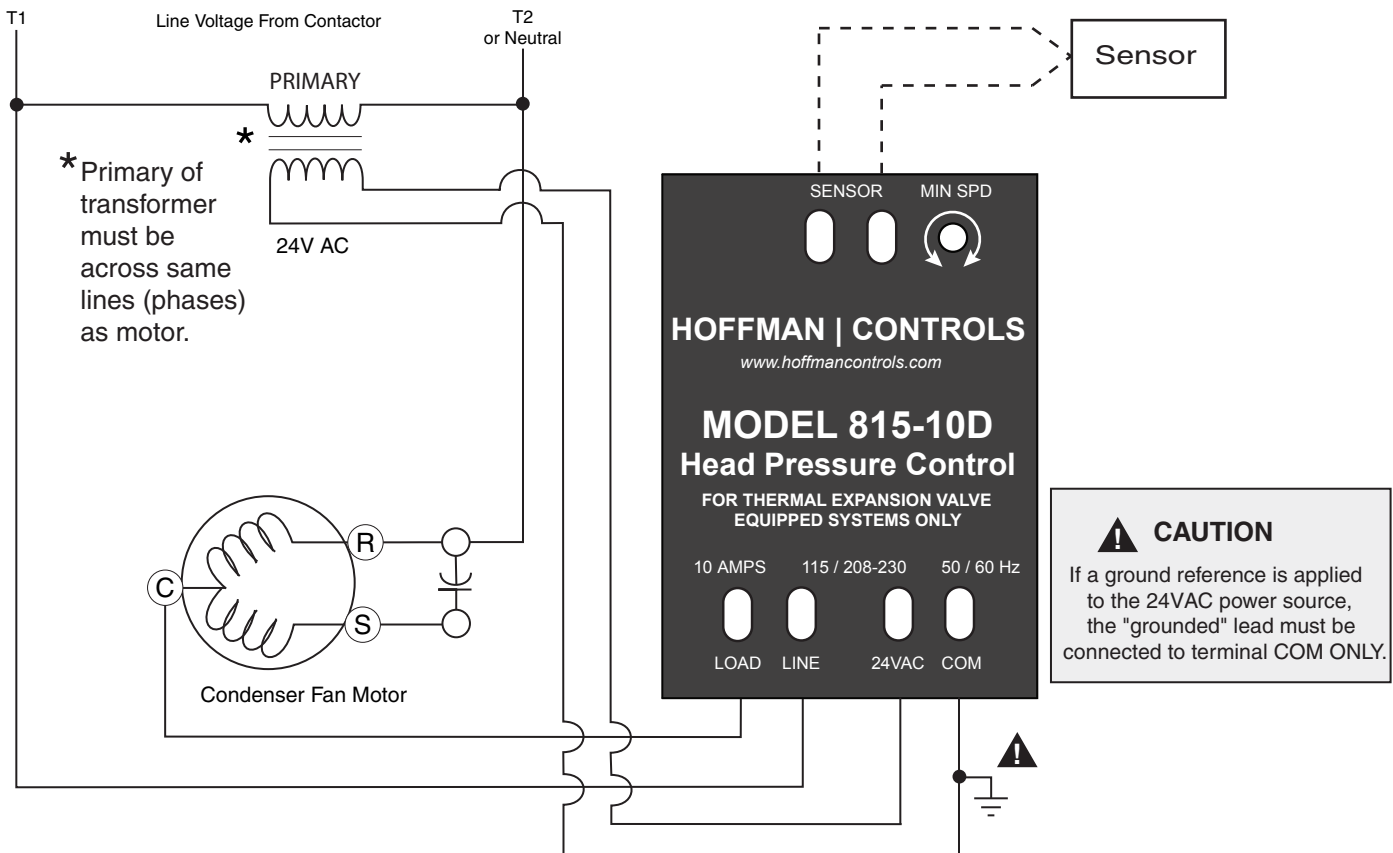
- Single Phase, single speed, open frame__PSC or Shaded Pole.
- Sleeve or ball bearing, direct drive only
- Some Totally Enclosed Motors (TEC) with 60°C ambient rating may be applicable, however the use of TEC motors is generally not recommended.

Minimum speed should be limited to approximately 400-RPM for sleeve bearing motors and 200 RPM for ball bearing motors.

Motors used should be designed for continuous variable speed and should be evaluated for suitability and acceptability. TEC (totally enclosed types) are not generally suitable or recommended.

Specifications

Voltage Range (Nominal)	115/208–230
Current (no derating required)	10 Amps
Frequency	50/60 Hz
Inputs	
Sensor (strap on)	10K ohm @ 77°F
Power/VA	24V AC/4VA
Outputs	
Single Phase	115V/208-230V AC
Adjustments	
Min. Speed Adjust	Ball Bearing–200 RPM Sleeve Bearing–400 RPM
Environment	
Operating, non-condensing	–30°F to +160°F
Dimensions (L x W x H)	5.56" x 3.32" x 1.25"



Wiring Diagram for the 815-10D
Figure 1

Hoffman|Controls