



814-10E
Electronic Head Pressure Controller

Description

The 10D and 10E Series Head Pressure Controllers modulate (vary) the condenser fan speed in low ambient temperatures. Head pressure is regulated by varying the air volume through the condenser.

The “-10D” Series requires an external 24V AC transformer power source. The primary of 24V AC transformer source must be derived from the same phase(s) (lines) serving the motor(s).

The “-10E” Series includes a transformer within the Controller and does not require an external 24V AC power source.

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 (\approx 65°F ambient temperature) and proportionally reduces the fan speed until liquid line temperature reaches 50°F (\approx 0°F ambient temperatures). Power to the motor is removed at 50°F. At 53°F (liquid line temperature) the fan restarts at full speed; then modulates near minimum RPM.

The effect of the control maintains a minimum pressure differential across the expansion device as ambient temperature falls.

Minimum ambient control regulation is dependent upon the minimum speed at which a specific motor will effectively operate/function.

Application

The Controllers are typically utilized on air-cooled condenser fan motors found in Air Conditioning and Refrigeration systems. They are used on the following motor types:

- Single Phase, single speed
- Sleeve or ball bearing direct drive
- Open frame — PSC or Shaded Pole
- Some Totally Enclosed Motors (TEC) with 60°C ambient rating may be applicable.

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 Phase Proportioning and should be evaluated for suitability and acceptability. TEC (totally enclosed types) are not generally suitable or recommended.

Typical Air Conditioning and Refrigeration Applications

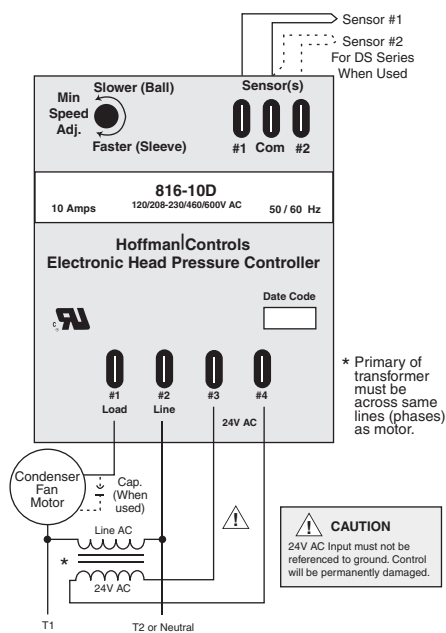
- Commercial air conditioning
- Supermarkets
- Computer rooms
- Frozen food storage
- Humidity control
- Cooling tower fans
- Glycol coolers
- Liquid heat exchangers

Features and Benefits

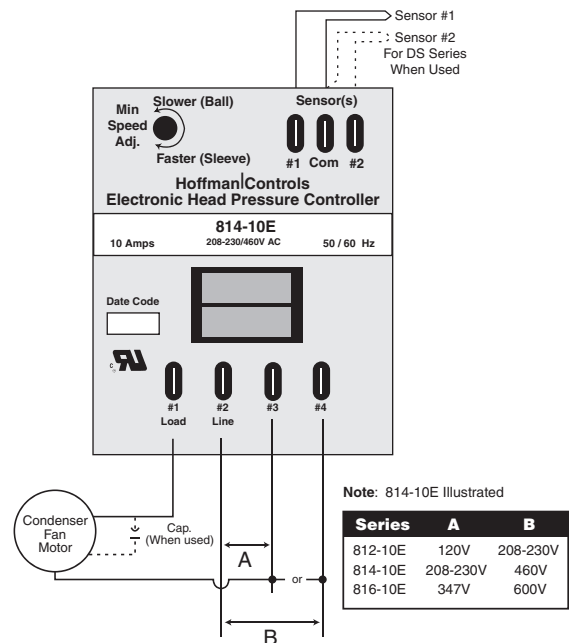
- Dual voltage/multi voltage models.
- Applicable for all refrigerant types.
- Eliminates the need for system penetration.
- Simple field calibration.
- Monitors liquid line temperature (liquid refrigerant).
- Full voltage start to ensure proper fan rotation.
- Cycles fan “OFF” when minimum flow is achieved.
- Eliminates compressor “slugging”.
- Eliminates fan cycling controls.
- Models 812-10E, 814-10E, 816-10E include internal 24V AC trans. “10D” suffix requires external 24V AC.
- Models 812, 814, 816 with DS suffix include dual sensor inputs.
- Optional **Weatherproof Kit** (NEMA 3R) — Part Number 545-0202-007.

Specifications

Models	816-10D	816-10DDS	812-10E	812-10EDS	814-10E	814-10EDS	816-10E	816-10EDS
AC Voltage (Nominal)	120/208-230 460/600	120/208-230 460/600	120/208-230	120/208-230	208-230/460	208-230/460	347/600	347/600
Min./Max., Nominal	-10%, +10%	-10%, +10%	-10%, +10%	-10%, +10%	-10%, +10%	-10%, +10%	-10%, +10%	-10%, +10%
Current Rating (Amps)	10	10	10	10	10	10	10	10
Internal Transformer	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sensor Inputs	Single	Dual	Single	Dual	Single	Dual	Single	Dual
Phase	Single	Single	Single	Single	Single	Single	Single	Single
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Voltage, Input	20-30V AC	20-30V AC	N/A	N/A	N/A	N/A	N/A	N/A
Power @ 24V AC	4VA	4VA	4VA	4VA	4VA	4VA	4VA	4VA
Operating Ambient	-30°F - +160°F	-30°F - +160°F	-30°F - +160°F	-30°F - +160°F	-30°F - +160°F	-30°F - +160°F	-30°F - +160°F	-30°F - +160°F
Sensor (Strap-on)	10K	10K	10K	10K	10K	10K	10K	10K
Control Range								
Liquid Line Temp.	80°F - 50°F	80°F - 50°F	80°F - 50°F	80°F - 50°F	80°F - 50°F	80°F - 50°F	80°F - 50°F	80°F - 50°F
Ambient Temp.	65°F - 0°F	65°F - 0°F	65°F - 0°F	65°F - 0°F	65°F - 0°F	65°F - 0°F	65°F - 0°F	65°F - 0°F
Min. Speed Adj.								
Ball Bearing	200 RPM	200 RPM	200 RPM	200 RPM	200 RPM	200 RPM	200 RPM	200 RPM
Sleeve Bearing	400 RPM	400 RPM	400 RPM	400 RPM	400 RPM	400 RPM	400 RPM	400 RPM
Weatherproof Kit (Accessory)	NEMA-3R	NEMA-3R	NEMA-3R	NEMA-3R	NEMA-3R	NEMA-3R	NEMA-3R	NEMA-3R
Dimensions (L x W x H)	5.56" x 3.32" x 1.25"	5.56" x 3.32" x 1.25"	5.56" x 3.32" x 1.75"	5.56" x 3.32" x 1.75"	5.56" x 3.32" x 1.75"	5.56" x 3.32" x 1.75"	5.56" x 3.32" x 1.75"	5.56" x 3.32" x 1.75"



Wiring for 816-10D and 10DDS
Figure 1



Wiring for 814-10E and 10EDS
Figure 2

Note: See Installation and Operating Instructions for additional diagrams for Dual Run Capacitor and Heat Pump Applications.

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