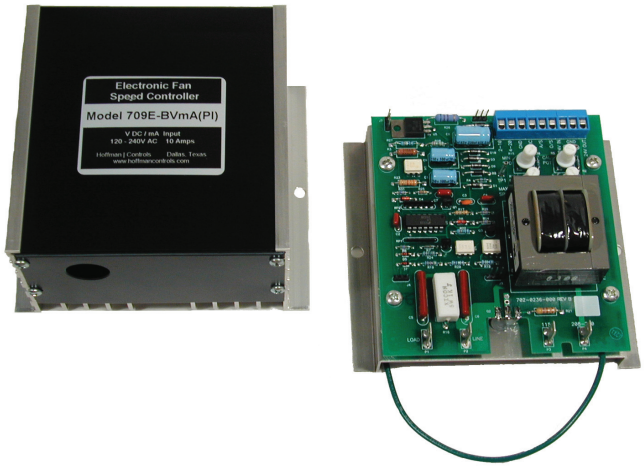
Hoffman Controls
Product Data

709D-VmA and 709E-VmA Series
Electronic Fan Speed Controllers



709-VmA Series
Electronic Fan Speed Controller

Description

Variable Speed Drive of Blower or Propeller fans can provide the optimum temperature, volume, or pressure as may be required by an application. The application may be controlled as a Direct Acting (DA) and/or Reverse Acting (RA) function. The Direct Acting (DA) application provides a proportional increase in the signal input above a set point as the demand increases. Conversely, the Reverse Acting (RA) application provides a proportional increase in the signal input below a set point as the demand increases.

The controller is available with or without a 24VAC power supply. The D suffix after the 709 indicates that no 24VAC transformer is provided. The E suffix indicates that the 24VAC transformer is PCB mounted and wired. D suffix models can function as 120V, 208-240V, 277V, or 480V. E suffix models are available for use in 120V and 208-240V applications.

The 709E controller has sufficient VA (power) to drive the optional Proportional Integration (PI) Interface plug in card and one of the the following signal sources; a Hoffman Controls 203-5(24)V Flow Transducer, a 203-6(24)P Pressure Transducer, or a 906VmA Thermostat. IMPORTANT: When using 709D series controllers, select a transformer to meet the requirements of all the components being used.

Variable Speed Drives can control the flow of conditioned air or fluids to maintain temperature, maintain a constant flow as pressure changes, or maintain a constant pressure as a result of varying flow rates. These conditions can be controlled by providing a proportional output signal from a thermostat, flow, or pressure transducer. The 709-VmA Series controller accepts a 2-10V DC or 4-20mA input providing the set point and span for the application. A 906 Series thermostat or 203 Series transducer provides the output that matches the 709-VmA Series Variable Speed Drive input requirements. Averaging Air Flow or Static Pressure duct mounted "pick up" assemblies up to 4000fpm or 4.0" WG are available for the 203 series transducers. The controller provides a Minimum and Maximum speed adjustment (RPM) over the input signal's span. An additional independent cut off adjustment to maintain Minimum Speed, at or above set point, or remove power from the motor at a pre-selected value, is available.

Proportional Control

When controlling temperature, the variable flow of cold air (DA mode) or warm air (RA mode), provides a proportional flow of conditioned air over a 2°F span from the 906-VmA thermostat's selected set point. Mode change may be manual or automatic from a NO or NC switch or aquastat. Closure provides a Reverse Acting function, "open" provides a Direct Acting Function. When a constant flow or pressure is required, a DA or RA mode may also be applicable.

Proportional and Integral Control - PI

In addition to the basic proportional function of the Variable Speed Drive controller, some application may require that the controller control at set point, without any signal error (span). This application therefore requires that the proportional signal be "integrated" so that any demand (requirement) will be met at set point with no span or signal error. The PI function is accomplished by adding, "plugging in", a 265-PI card to the main controller. When this optional accessory is used, the input signal is connected directly to the PI terminal block rather than the 709 terminals. Set point and time constant adjustments are made from the PI board. The time constant is adjustable for minimizing or eliminating "hunting" of the control signal. The 709 controller and 265-PI Interface Integrator may be used to control temperature, flow (fpm), or static pressure (WG).

Application

1) Controlling conditioned air flow by varying the volume of air to a space for maintaining a constant temperature in a zone or area, or constant temperature of supply air.
2) Maintaining a constant flow rate (fpm) or volume (cfm) as the pressure of a system increases or decreases.
3) Maintaining a constant negative or positive pressure within an air distribution system or space.
4) Maintaining a constant pressure differential between two spaces or areas.

Thermostat and Transducer Inputs

Thermostats are available for control of temperature in two ranges; 50°-90°F for environmental applications and 30°-180°F for commercial or industrial applications with both 2-10V DC and 4-20mA outputs. 906-VmA Series thermostats utilize a linear millivolt sensor output that directly converts mV to °F. (773mV=77.3°F) The 906 thermostat is available with an optional "on" - "off" - "offset" three position switch. Offset is adjustable from 0° to 20°F above or below setpoint. See 906 Series thermostat Product Data for wall or remote type thermostats, sensors, and available ranges.

Transducers are available to provide flow in fpm or pressure in inches water gauge (WG). Transducers are temperature compensated

and factory calibrated for various flow ranges up to 4000fpm and up to 4.0" WG pressure. See 203-5(24)V Series for flow applications and 203-6(24)P Series for pressure applications. A 2-10V DC output signal only is standard for both flow or pressure transducers.

Signal Averaging

A 206-10-1 Series multiple input signal control, with averaging signal output, is available for determining the collective average of the total number of individual inputs when required. This interface can provide a common output signal that represents the average of all inputs for setting a demand for the system. These inputs can be a DA and/or RA function, and typically is the average of the multiple thermostat signals. This averaged output signal is represented by a 2-10V DC signal. Two volts DC would represent zero demand, ten volts would represent 100% demand. This multi-signal input, with average output signal represents the proportional percent value of the demand required of the system. This average output signal can provide the percent demand for multiple compressors, heating stages, etc. for setting the required capacity for meeting the load.

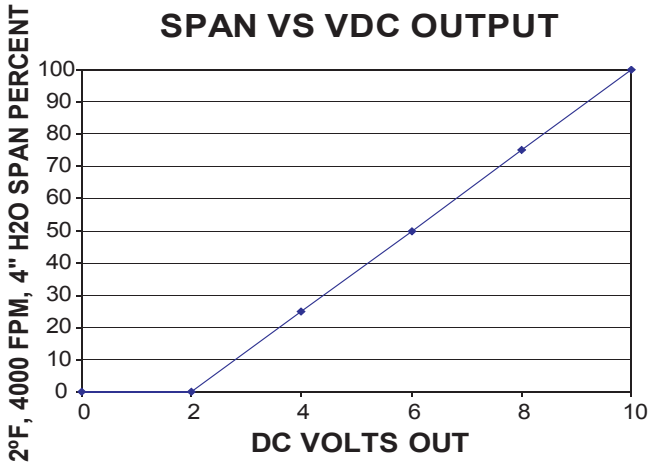
Flexibility

When the 709 controller is utilized with the optional PI Interface, Thermostat, Flow or Pressure Transducer, all of the peripheral controls provide a "closed loop" "single source" manufacturer of components. Therefore, all of the controls are designed, manufactured, and calibrated to function together as a complete system.

Features and Benefits

Applicable for controlling shaded pole or permanent split capacitor motors.

- Multi-voltage applications.
- Minimum/Maximum speed adjustments.
- Motor cut-out adjustment.
- Optional **265-PI Interface** (Proportional Integration).
- Optional **906 Series** LM34 1°F/10mV Thermostat
- Optional **206-10-1** Signal Averaging Interface
- Optional **203-5(24)V** Flow, or **203-6(24)P** Pressure Transducers.

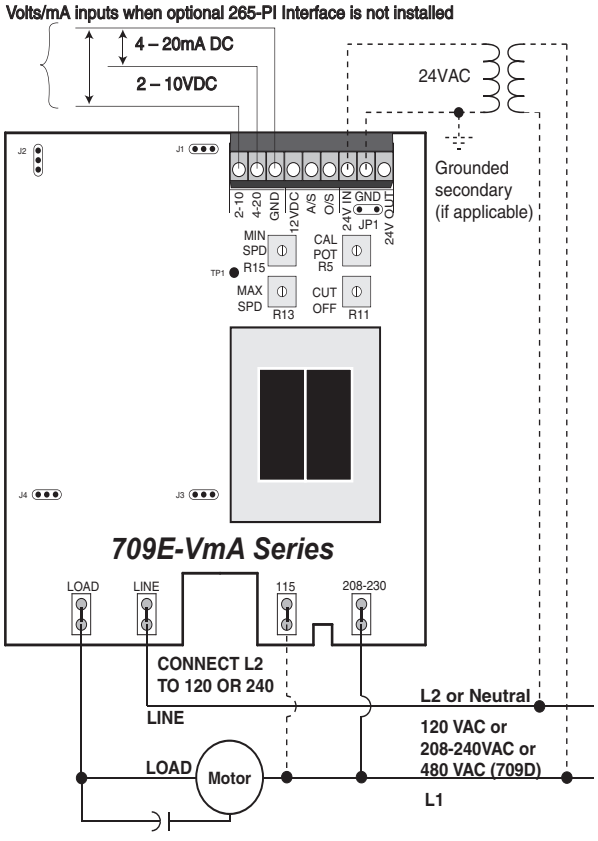


NOTE: Consult the 203-5 & 203-6 Series Transducer literature for complete details of applicable flow and pressure operating ranges.

Specifications

Voltage, Input (nominal)	24V AC
Transformer Power	3.4VA
709E Power, 24V AC	1.0 VA
Accessory Power Available	2.4VA
Frequency	60 Hz
Voltage, Line (nominal)	
709D-xVmA	120, 208-240,277, 480 VAC
709E-xVmA	120, 208-240 VAC
Current (maximum)	
709x- VmA	5 Amps
709x-BVma	10 Amps
709x-CVmA	18 Amps
Input Signals	
DC Volts	2–10V DC
Load Impedance	10,000 Ohms Min.
DC milliAmps	4–20 m A D C
Load	500 Ohms
Operating Ambient	32°F to 120°F
Humidity	95%, Non-condensing
Dimensions (L x W x H)	5.0" x 5.5" x 3.15"

709D-VmA and 709E-VmA Series Product Illustration



* NOTE: If 709D Series controller is used, connect external transformer as shown in dotted lines.
CAUTION: Ground only GND terminal on controller.

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Form:-172-0236-000 Rev. A