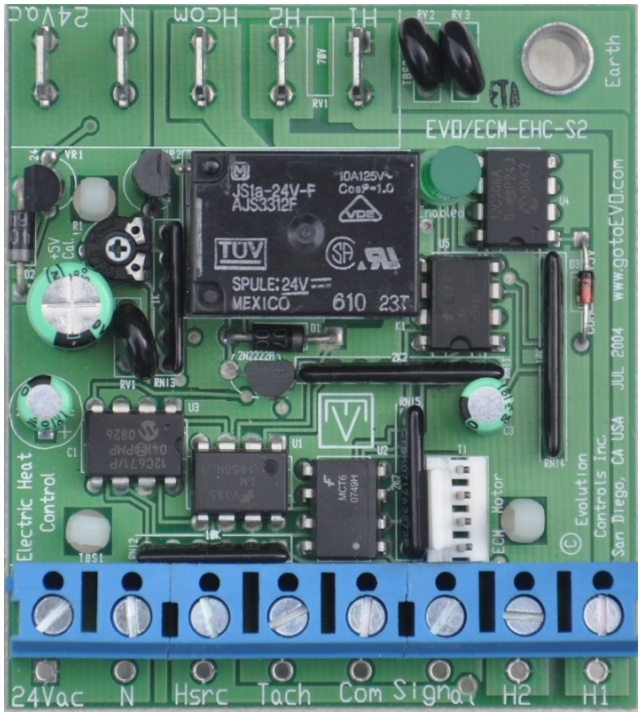
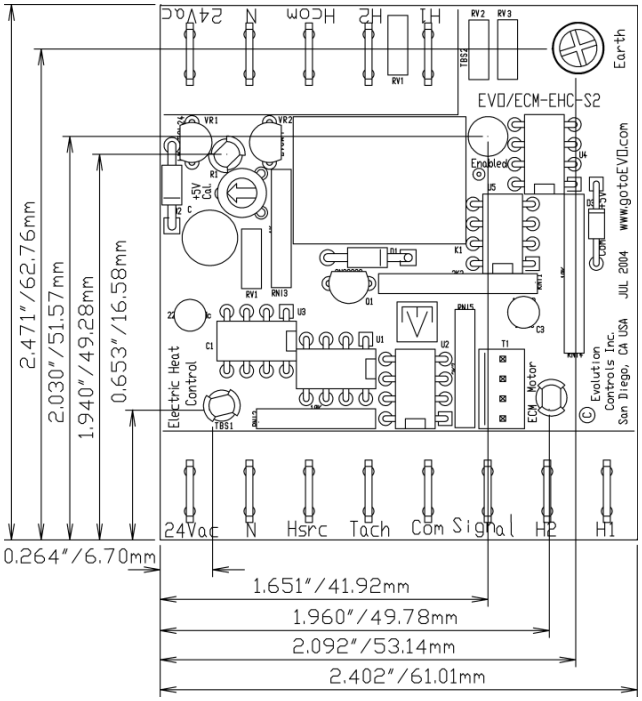
EC Motor

The EVO/ECM-EHC allows an automation system to control EC motors applied to fan powered electric heaters. The control monitors motor performance to ensure it is moving adequate airflow for heater operation. A relay contact closes when the motor operates in the proper RPM range for the airflow called by the signal. This interlock replaces conventional sail switches and differential pressure switches in fancoils and other applications where switch placement and adjustment is difficult. And especially in applications that exploit the high turn down ratio of EC motors.



Features

- +10V signal controls 1 or 2 Motors
- +10V RPM to Automation
- RPM enables Heaters
- Interlocks 1 or 2 heaters



Specifications

Power	NEC Class II or equal ~24V ± 20% 50/60 Hz 2W, 4VA + 1VA/Motor
Control Signal	0V to +10V = 0%-100% pwm
RPM	Signal 0V to +10V, 5 mA max. = 0 to 2,000 RPM in 10 RPM steps
Outputs	Go & VSpd +22V ±2V @ 20 mA 2 motor loads *RPM from 1 motor only*
Go & VSpd	+22V ±2V @ 20 mA 2 motor loads *RPM from 1 motor only*
FWS ~24V	35VA max.
Relays	~24V, 10 VA max

Mounting

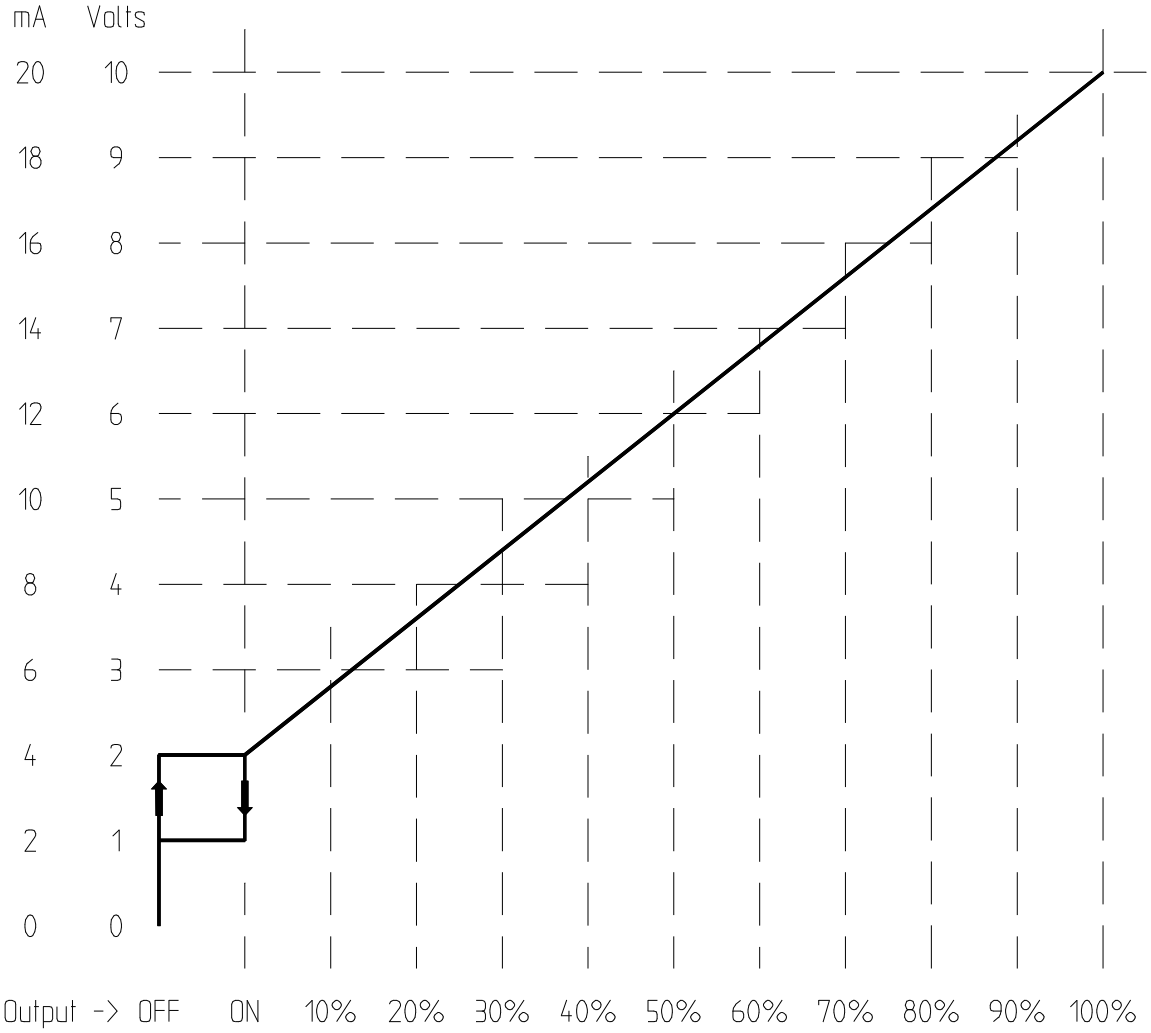
The control snaps into three 0.516”/4mm holes in the electrical panel using snap-in standoffs. A fourth mounting point is secured with a #6 Flat or oval head screw after the panel is snapped into place. The screw-in termination establishes an earth ground to reduce EMI.

Control Sequence

The motor turns on when the signal increases to +2V. When the signal drops below +2V, the motor runs at minimum output and turns off when the signal drops below +1V. The motor output increases from minimum to 100% of the motor’s programmed operating range as the signal increases from +2V - +10V.

The lockout sequence monitors motor RPM to prove the fan motor is running. The fan must be over 300 RPM for the interlock to close. If the fan drops below 200 RPM for 10 seconds, the heater is locked out for 5 minutes. If the fan drops below 300 RPM for 30 seconds, the heater is locked out for 5 minutes. The lockout may be cancelled by removing the call for heat, using Signal to turn the motor off, then on, or by cycling power to the EHC.

When Signal commands the motor off, heat is disabled and the motor continues to run for 15 seconds to scavenge residual thermal energy left in the heater.



Connections

A low voltage EC motor control connector allows plug-in connection to the EC Motor using an EVO/ECM-CBL-? (?=length in ft.) prefabricated cable.

MWS connections are made using 250 mil push-ons. Five positions connect the Class II power source and up to two electric heat relays sharing a common interlocked connection.

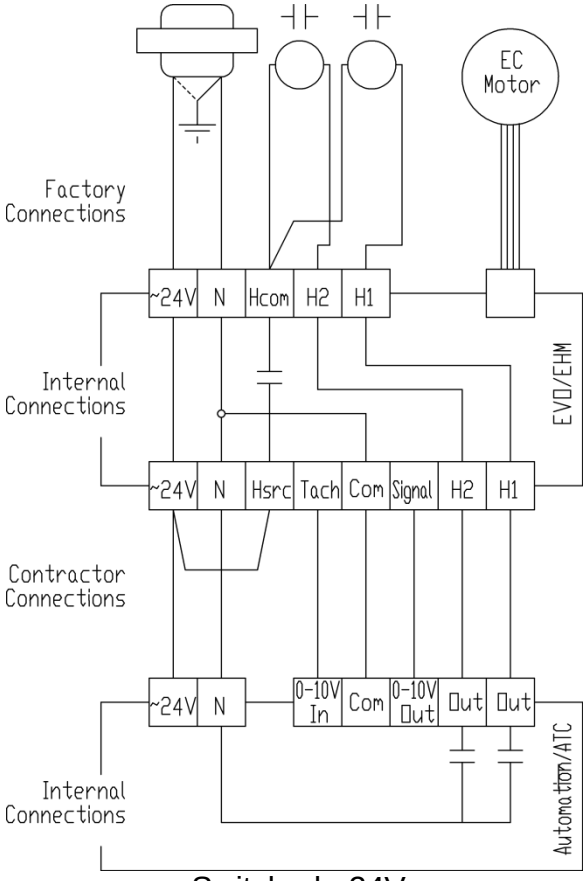
FWS connections are made to a strand capturing screw locked terminal strip. Seven positions allow connection of a variety of field applied automation controllers.

A 0- +10V signal starts/stops the fan and varies the fan CFM.

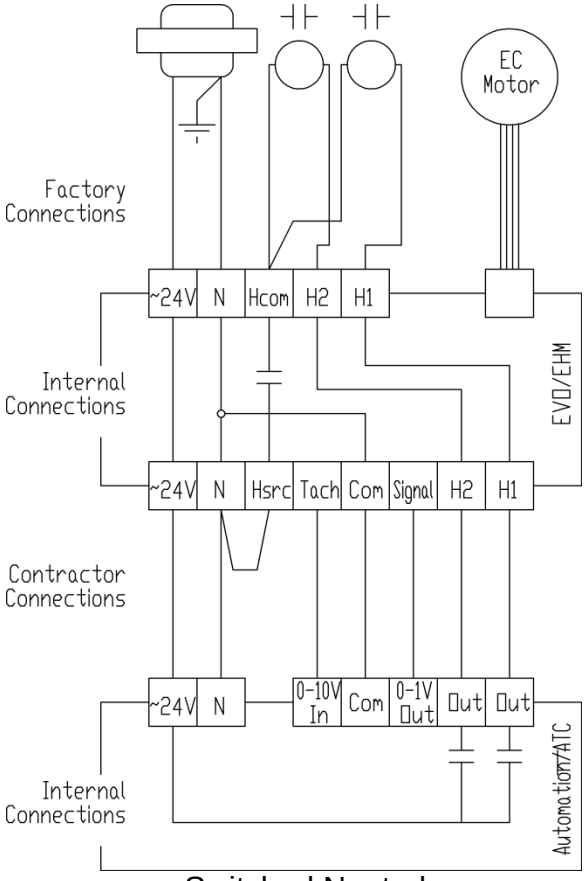
~24V Class II power applied to the heater 1 and/or heater 2 inputs feeds through to the MWS to energize the heater contactors.

To power external controls, two terminals source up to 35VA of power from the Class II power source connected to the MWS connector.

Most automation systems switch ~24V and others switch Neutral. Where neutral is switched, the transformer ground may need to be moved to ~24V and the 0-+10V automation tachometer input and signal output must be evaluated to make sure they are referenced to the EHC neutral/common connections.



Switched ~24V



Switched Neutral