

EC Motor

Series 2

Application

The EVO/ECM-VCU control allows accurate manual adjustment and monitor of EC Motors. These are high efficiency electrically commutated permanent magnet motors featuring microprocessor controlled commutation. The design provides exceptional efficiency, performance and motor life. In air moving applications, these self-regulating motors may be factory configured so the fan provides constant mass airflow.

The EVO/ECM-VCU features a 4-digit LED numerical display allowing easy locating and reading in dark spaces. Watch the display and set the flow index with a screwdriver adjust. In legacy mode, the display shows flow index. Then, the display periodically alternates between the flow index and motor RPM. Jumpers select a variety of flow index and RPM displays for other modes.

One or two motor(s) may be connected to the EVO/ECM-VCU.

The EVO/ECM-VCU is recommended for stand-alone equipment and automation systems that only turn the motor on or off. Use the EVO/ECM-ACU+ where automation also needs to control flow.

The VCU is compatible with many PWM controlled fan motors, pump motors, inverters and VFDs.

Specifications

Power	NEC Class 2 Only ~24V ± 20% 50/60 Hz 5 W, 7 VA
Adjustment	270° rotation F Off-0-100% <i>pwm</i>
RPM	0-2000 RPM ± 2RPM
Run & PWM ¹	+24V @ 20 mA PWM with Pilot Pulse ²
Thermal Stability	>0.01%/°F >0.018%/°C
Operating Environment	0°F to 130 °F (-18°C to 55°C) 10%-80% rh
Connections	0.250 in. / 6.35 mm Tabs

¹ Also called Go & Vspd.

² Also called Autoswitch Function.



EVO/ECM-VCU-MP

Ordering

EVO/ECM-VCU	Control without plate
EVO/ECM-VCU-MP	Control with plate

Please use our model number as your part number, or include in your order description.

Operation

EC Motors may be factory configured so an external PWM signal controls motor output as torque, RPM, or mass flow in fan and pump applications.³

The motor's configuration data is included in the motor's profile. The profile includes a minimum output and maximum output defining the adjustment range.

The PWM signal sets the motor output between the minimum output and maximum output as the VCU is adjusted between F⁴ 0 and 100. Refer to the equipment manufacturer's specifications, data and charts to convert the flow index to torque or mass airflow.

Rotating a single screwdriver adjuster changes the PWM signal to the motor from off to full output. While rotating the adjuster, the numerical flow index is locked on the illuminated numerical display. After adjustment, the display shows fan RPM(s) per the jumper setting.

³ Refer to motor specs to see available control features.

⁴ F = PWM with Pilot Pulse.

Motor Profile

Motor profiles are unique to each manufacturer and motor. Refer to the motor manufacturers instructions to develop the motor profile. The following are a few considerations important to operation with the VCU:

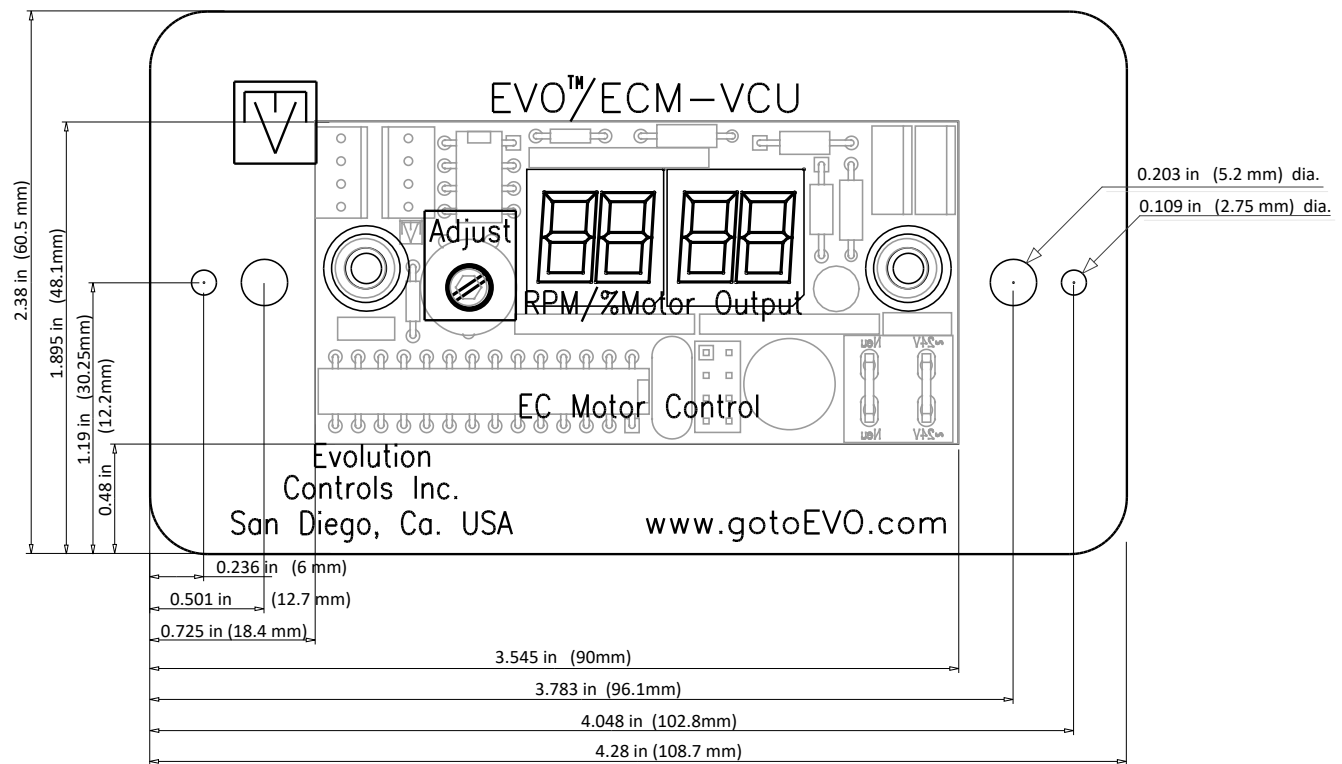
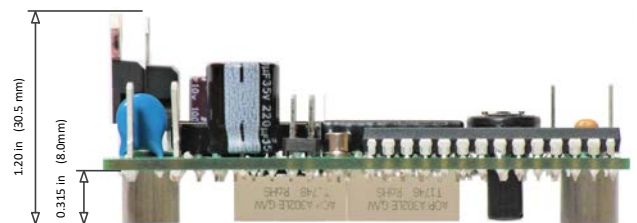
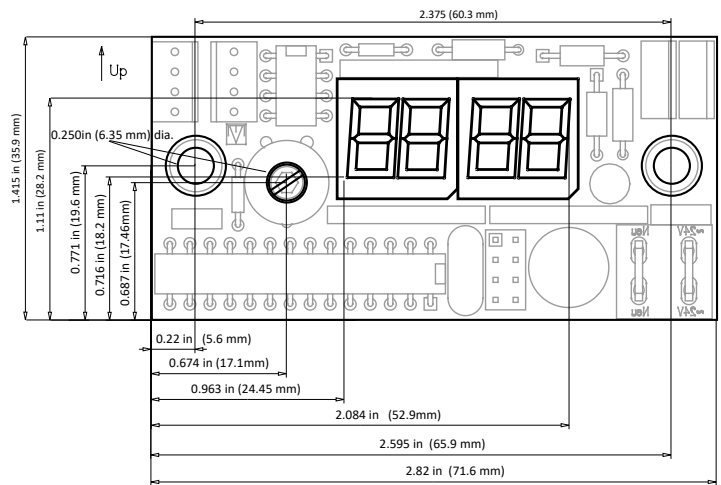
- ☑ PWM control.
- ☑ Status to RPM only.
- ☑ Motor start stop points if motor does not use a run line.

Mounting

Mount the control inside a metal control cabinet or enclosure with the display and adjuster visible through cutouts in the enclosure. Fasten the control mounting posts to a grounded metal surface.

The “MP” option provides the control mounted to a metal plate that fastens to a single gang electrical box^{USA}.

Mount the control with clearance for the ~/+24V power wires and control cable connector. The control’s motor cable connector is sized so it may be pulled through an empty 3/4” conduit.



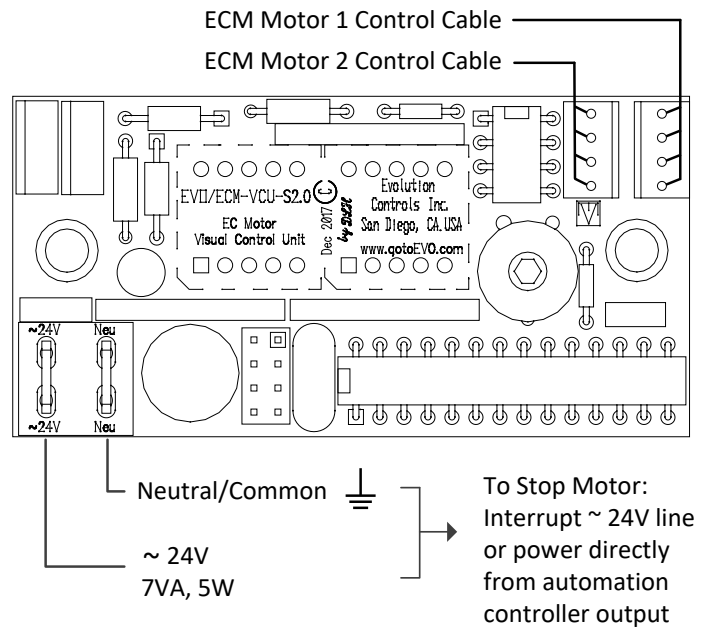
Wiring

Power the EVO/ECM-VCU control with a ~24V NEC Class 2^{USA} power source. DC voltages from +20V to +30V may also be used to power the control. Observe all code agency requirements and follow all safety practices regarding low voltage power supplies and circuits to insure a safe, reliable installation. Be sure to use removable push on connectors. Locking push on connectors required for high voltage motor connections are not required for low voltage connections to the VCU. Removing locking push on connectors often destroys the VCU when the push on must be removed to correct wiring or troubleshoot problems.

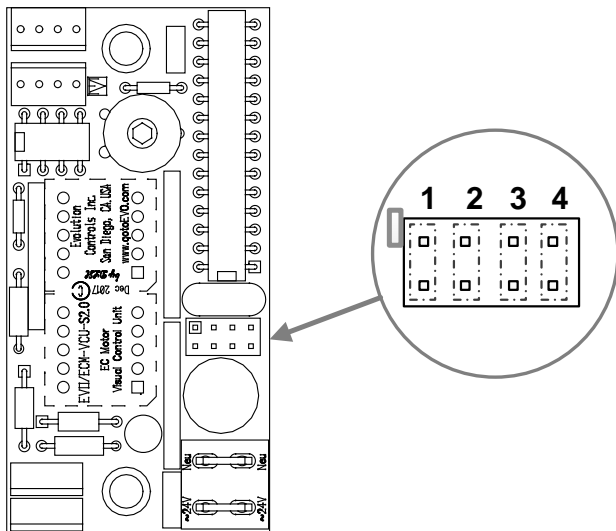
Ground one leg of the ~24V power source at the transformer. Then connect it to the VCU's neutral connection. Connect the other leg of the ~24V power source to the VCU's ~24V connection.

You may interrupt the VCU's ~24V connection to stop the EC Motor. Most automation controllers will power the control directly from an on/off output.

Connect the VCU to the motor using an EVO/ECM-CBL motor control cable. Do not route or bundle the control cable with motor power or other high voltage wiring.



Jumpers



Jumpers		Function	Description
1	2	VCU-1.0 Legacy Mode	For one or two motors. Display flow and RPM. RPM is the average with 2 motors connected.
x		Two Motors & Alarm	Display flow and RPM. RPM is the average from both motors. If the difference between the RPMs > 200, RPM display blinks, indicating alarm.
	x	Two Motors, Two RPMs	Flow and both RPMs are displayed sequentially => Flow, RPM1, RPM2
x	x	Flow display Only	No RPM display

Insert Jumper 3 to remove the flow display from the selected function.

Insert Jumper 4 to change tachometer from 36 PPT (Pulses Per Turn) to 18 PPT.

36 PPT Motors: EON, ECM 2.3, PerfectSpeed

18 PPT Motors: SyMAX-i56