

## 12 amp 24 volt sensorless motor drive

Designed for specialty applications requiring a wide speed range or very low electrical noise, this drive has a 12v 5ma logic input and a separate 0.6 to 24 volt power input. This drive does not pwm, speed control is accomplished by varying the power supply input voltage, current is limited by the power supply current limit. A speed range of 40:1 even with no load can be achieved with most motors. The drive provides 99% efficiency, no inductors required for slotless or ironless motors. The maximum motor speed is approximately 200,000 rpm for a 2 pole motor.

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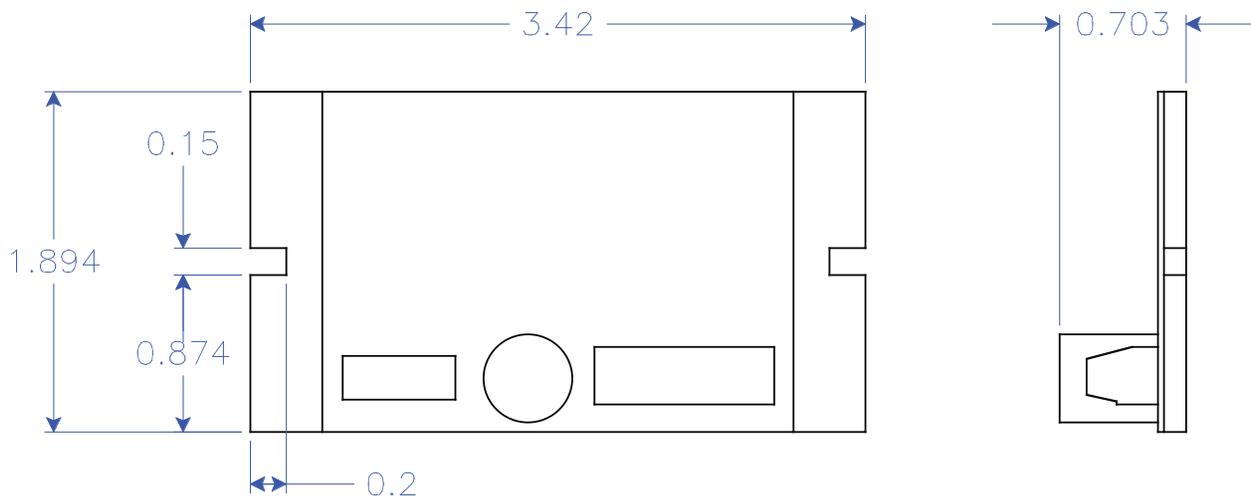
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Ultra high efficiency miniature sensorless drive designed for special applications requiring a wide speed range and or low electrical noise. The drive has no minimum inductance and will operate slotless or ironless brushless motors without the need for bulky, cumbersome inductors. The drive requires an adjustable voltage power supply with an adjustable current limit. Motor speed is adjusted by adjusting the power supply voltage.



The current limit should be set according to the motor used, or the applicaiton but should be no more then 12 amps. When starting up the voltage should be ramped slowly from 0 volts until the motor starts. Depending on the motor and load this should occur around .6 to 2.5 volts. For monitoring the speed or closing the speed loop externally the tach output TC can be used. TC outputs a 5v square wave with a frequency equals to 3 pulses per revolution for a 2 pole motor, 6 for a 4 pole etc. The motor rotation direction by changed by applying 5 volts to DR or by switching any two motor wires. The maximum motor speed is aproximately 200,000 rpm. The maximum motor speed is affected by the motor design. The drive weighs 1.9 oz. The operating temperature range is -55°C to 105°C. Drive life may be reduced at baseplate temperatures above 60°C.



Terminal block positions (motor leadhook up for Koford motors).

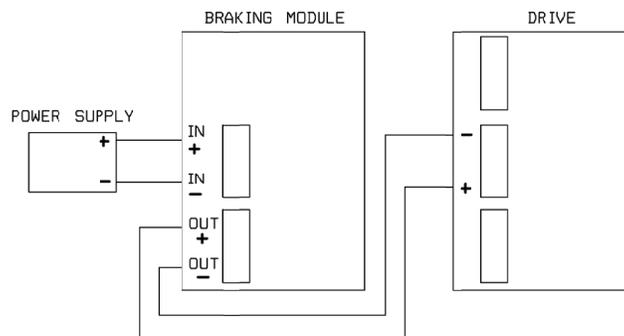
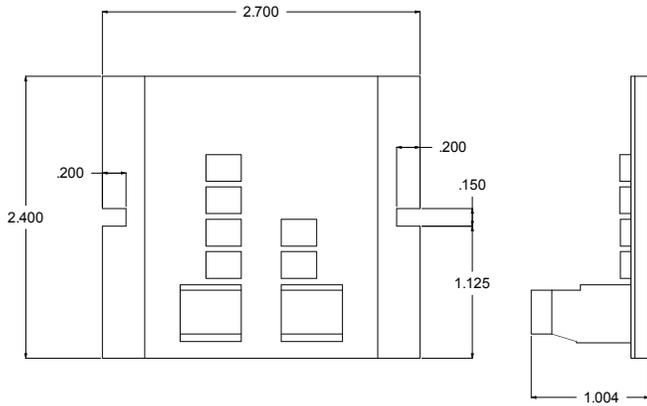
+ = connect to red (+) lead of motor power supply  
 - = connect to black (-) lead of motor power supply  
 BK = unconnected is off, or 0v=off, 5v=on  
 12 = connect to red (+) lead of logic power supply (12v)  
 0 = connect to black (-) lead of logic power supply  
 EN = enable  
 DR = direction

BK = brake  
 A = blue motor wire  
 B = white motor wire  
 C = brown motor wire  
 TC = tach/encoder output 3 pulses per revolution per magnet pole pair (2000 hz=40,000 rpm, 2 pole motor)

**Ordering information:**

S24V12A

The CV-2 braking module is for use when a drive with braking function is connected to a power supply. If a battery supplies the power, the module is not needed. The module is needed on a system with a power supply because otherwise the regenerated energy would cause an overvoltage condition in the power supply. That would cause power supply shut off and/or power supply damage. The module contains Schottky diodes to prevent current backflow and also a TVS to absorb the transient braking energy. The TVS is needed because otherwise the braking energy would cause an overvoltage in the drive damaging it.



## Notes

1. When using first connect 12v logic supply and then turn on the power supply for the motor. No damage will result in not turning the 12v supply on first but the motor will not run at motor power supply voltages below about 4 volts unless the 12v is on.
2. Usually the best way to start the motor is to slowly ramp up the power supply voltage for the motor starting at 0 volts. The voltage that the motor will start at depends on the motor and the load but 1-2 volts is typical.
3. Once started the motor voltage can be reduced down to 0.5 or 0.6 volts.
4. The current limit must be set to no more than 12 amps or the drive may be damaged.