

## Specifications

Model	Line Voltage (VAC)	Motor Voltage (VAC)	Continuous Motor Current (Amps)	Motor Horsepower Range
ACT400-10	115 230	115 230	10.0	1/8 - 1/2 1/4 - 1

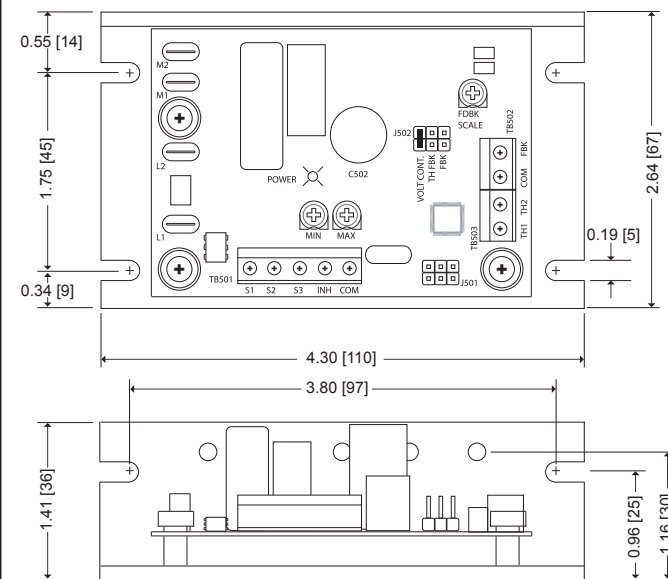
AC Line Voltage.....115/230 VAC ± 10%, 50/60 Hz, single phase  
AC Line Current.....Same as motor current at full speed  
AC Motor Voltage.....115/230 VAC, 60 Hz, single phase  
Overload Capability.....200% (2x) for 1 minute  
Acceleration Time Range.....0.5 seconds  
Analog Input Voltage Range (Signal must be isolated).....0 - 4.75 VDC  
Input Impedance (S1 to S2).....>100K ohms  
Vibration (0 - 50 Hz).....0.5G maximum  
(>50 Hz).....0.1G maximum  
Ambient Temperature Range.....0°C - 55°C  
Weight.....0.3 lbs

## Safety Warnings

### READ ALL SAFETY WARNINGS BEFORE INSTALLING THIS EQUIPMENT

- **DO NOT INSTALL, REMOVE, OR REWIRE THIS EQUIPMENT WITH POWER APPLIED.** Have a qualified electrical technician install, adjust and service this equipment. Follow the National Electrical Code and all other applicable electrical and safety codes, including the provisions of the Occupational Safety and Health Act (OSHA), when installing equipment.
- **Circuit potentials are at 115 or 230 VAC above earth ground.** Avoid direct contact with the printed circuit board or with circuit elements to prevent the risk of serious injury or fatality. Use a non-metallic screwdriver for adjusting the calibration trim pots. Use approved personal protection equipment and insulated tools if working on this drive with power applied.
- Reduce the chance of an electrical fire, shock, or explosion by using proper grounding, over-current protection, thermal protection, and enclosure. Follow sound maintenance procedures.
- **ACE strongly recommends the installation of a master power switch in the line voltage input.** The switch contacts should be rated for 250 VAC and 200% of motor nameplate current.
- **Removing AC line power is the only acceptable method for emergency stopping.** Removing AC line power is the only acceptable method for emergency stopping.
- Line starting and stopping (applying and removing AC line voltage) is recommended for infrequent starting and stopping of a drive only. Using a Run/Stop switch in conjunction with a potentiometer is recommended for frequent starts and stops. Frequent starting and stopping can produce high torque. This may cause damage to motors.
- **Do not disconnect any of the motor leads from the drive unless power is removed or the drive is disabled.** Opening any one lead while the drive is running may destroy the drive.
- Under no circumstances should power and logic level wires be bundled together.
- Be sure potentiometer tabs do not make contact with the potentiometer's body. Grounding the input will cause damage to the drive.
- Because the ACT Series is a triac based drive, it only varies the voltage, not the frequency, to the motor. Therefore, the motor will drop out around 66% of rated speed (the drop out speed is determined by the motor's characteristics however, not the ACT drive).
- The ACT Series drive does not have current limiting capability. Therefore, the motor is not protected from current spikes or excessive current pull during a jam / stall condition. Exceeding the ACT Series current rating for extended periods of time could cause damage to the unit.
- Drive is designed to work with permanent split capacitor, shaded pole, synchronous, and universal motors. In general, the drive can work with capacitor-start motors, but it is conditional on the current pull when the capacitor is in effect and how long the application calls for a speed that the capacitor will stay in the auxiliary winding.

## Dimensions



ALL DIMENSIONS IN INCHES [MILLIMETERS]

## Installation

### Mounting

- Drive components are sensitive to electrostatic discharge. Avoid direct contact with the circuit board. Hold the drive by the chassis only.
- Protect the drive from dirt, moisture, and accidental contact.
- Provide sufficient room for access to the terminal block and calibration trim pots.
- Mount the drive away from heat sources. Operate the drive within the specified ambient operating temperature range.
- Prevent loose connections by avoiding excessive vibration of the drive.
- Mount the drive with its board in either a horizontal or vertical plane. Six 0.19" (5 mm) wide slots in the chassis accept #8 pan head screws.
- The chassis should be earth grounded. Use a star washer beneath the head of at least one of the mounting screws to penetrate the chassis surface and to reach bare metal.

### Wiring

Use 18 - 24 AWG wire for logic wiring (COM, FBK, INH, S1, S2, S3, TH1, TH2).  
Use 14 - 16 AWG wire for AC line (L1, L2) and motor (M1, M2) wiring.

### Shielding Guidelines

As a general rule, ACE recommends shielding of all conductors. If it is not practical to shield power conductors, ACE recommends shielding all logic-level leads. If shielding of logic-level leads is not practical, the user should twist all logic leads with themselves to minimize induced noise. Refer to the user's manual for details on earth grounding shielded wires and filtering.

### Fusing

ACE drives require an external line fuse for protection. Use fast acting fuses rated for 250 VAC or higher and 150% of the maximum line current. Fuse the HOT leg of the AC line when using 115 VAC or both legs when using a 230 VAC line.

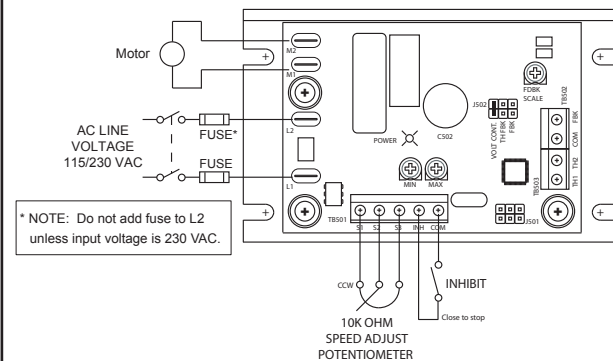
## Connections

### Line Input

Connect the AC line power leads to terminals L1 and L2 (115) if using 115 VAC line power, L1 and L2 (230) if using 230 VAC line power, or to a double-throw, single-pole master power switch (recommended). The switch should be rated at a minimum of 250 VAC and 200% of motor current.

### Motor

Connect the AC motor leads to terminals M1 and M2.



### POWER

### LOGIC

### Speed Potentiometer

Use a 10K ohm, 1/4 W potentiometer for speed control. Connect the counter-clockwise end of the potentiometer to S1, the wiper to S2, and the clockwise end to S3. If the potentiometer works inversely of desired functionality, (i.e. to increase motor speed, you must turn the potentiometer counterclockwise), power off the drive and swap the S1 and S3 connections.

### Inhibit

Close the COM and INH terminals to coast the motor to minimum speed. Open the COM and INH terminals to accelerate the motor to set speed. If no enable switch is desired, jumper terminals E1 and E2.

**Do not use the inhibit for emergency stopping.**

### Thermistor Feedback (Optional)

If using a thermistor for feedback, connect it to terminals TH1 and TH2. Thermistor feedback is used to maintain a temperature. See the Startup section for jumper J502 settings.

### Voltage Feedback (Optional)

If using an analog VDC signal for feedback, connect it to terminals COM and FBK. Acceptable feedback ranges are between 0 - 5 VDC and 0 - 50 VDC. See the Startup section for jumper J502 settings.

# Startup

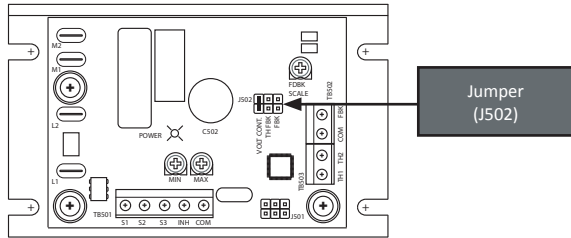
## SELECT JUMPERS

### Mode Jumper (SW501)

Mode 1: Voltage Control - Jumper VOLT CONT on J502 for open loop operation using either the speed adjust potentiometer or an external analog 0-5 VDC signal for speed adjustment. Voltage control is the most commonly used mode of operation.

Mode 2: Thermistor Feedback - Jumper TH FBK on J502 for closed loop control with customer supplied thermistor feedback. Thermistor feedback is used to maintain a temperature.

Mode 3: Voltage Feedback (PI) - Jumper FBK on J502 for closed loop control using a 0-5 VDC feedback signal. The PI is not adjustable.



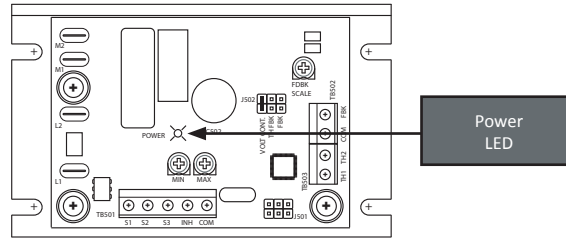
## STARTUP

- Verify that no foreign conductive material is present on the printed circuit board.
- Ensure that the jumper is properly set.

1. Turn the speed adjust potentiometer full counterclockwise (CCW).
2. Apply AC line voltage.
3. Make sure the inhibit switch is open.
4. Slowly advance the speed adjust potentiometer clockwise (CW). The motor slowly accelerates as the potentiometer is turned CW. Continue until the desired speed is reached.
5. Remove AC line voltage from the drive to coast the motor to a stop.

# LEDs

**Power (IL1):** Green LED lights whenever AC line voltage is applied to the drive.



# Calibration

**Minimum Speed (MIN):** The MIN setting determines the motor speed when the speed adjust potentiometer is set for minimum speed. It is factory set for zero speed. To calibrate the MIN:

1. Set the MIN trim pot full CCW.
2. Set the speed adjust potentiometer for minimum speed (full CCW).
3. Adjust MIN trim pot until the desired minimum speed is reached.

**Maximum Speed (MAX SPD):** The MAX setting determines the motor speed when the speed adjust potentiometer is set for maximum speed. To calibrate the MAX SPD:

1. Set the MAX SPD trim pot full CCW.
2. Set the speed adjust potentiometer for maximum speed (full CCW).
3. Adjust MAX SPD trim pot until the desired maximum speed is reached.

**Feedback Scale (FDBK SCALE):** The FDBK SCALE setting scales the feedback input from a thermistor or analog signal. If no feedback is being used, the FDBK SCALE will have no effect on the motor control.

To calibrate the FDBK SCALE with thermistor feedback:

1. Set the speed potentiometer or analog signal to a desired temperature.
2. Allow enough time for the actual temperature to stabilize.
3. Adjust the FDBK SCALE trim pot in small increments over time until the actual temperature equals the desired temperature.

To calibrate the FDBK SCALE with an analog feedback:

1. Set the process control signal (speed potentiometer or analog signal on S1, S2) to a desired speed.
2. Adjust the FDBK SCALE trim pot in small increments over time until the actual speed equals the desired temperature.