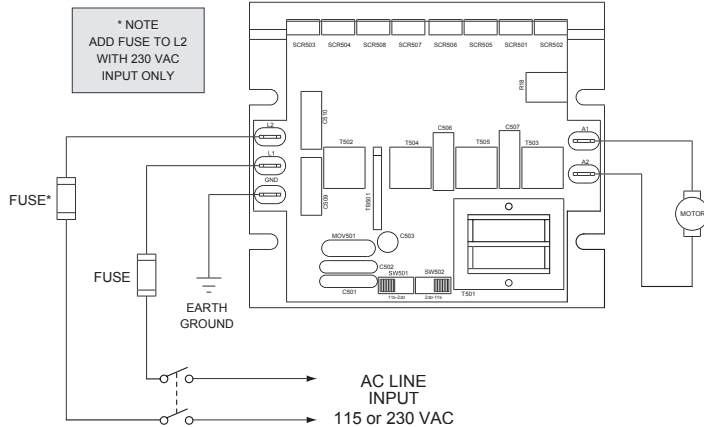


### WIRING

#### GS60U BOTTOM BOARD



AC Line Voltage	115 VAC or 230 VAC	50/60Hz, single phase
Armature Voltage (115 VAC Input)	0 - 90 VDC	
Armature Voltage (230 VAC Input)	0 - 180 VDC	
Armature Current	10 'A	
Form Factor	1.37	at base speed
HP Rating (90 VDC)	1/8 - 1 HP	
HP Rating (180 VDC)	1/4 - 2 HP	
Accel. Time Range:	0.5 - 6 seconds	
Decel. Time Range:	0.5 - 6 seconds	
Analog Input Voltage Range (signal must be isolated; S0 to S2):	0 to +/- 10 VDC	
Load Regulation		
with Armature Feedback:	1%	base speed
with Tachogenerator Feedback:	0.1%	base speed

<sup>1</sup> Requires heatsink GS223-0159 when above 5 Amps

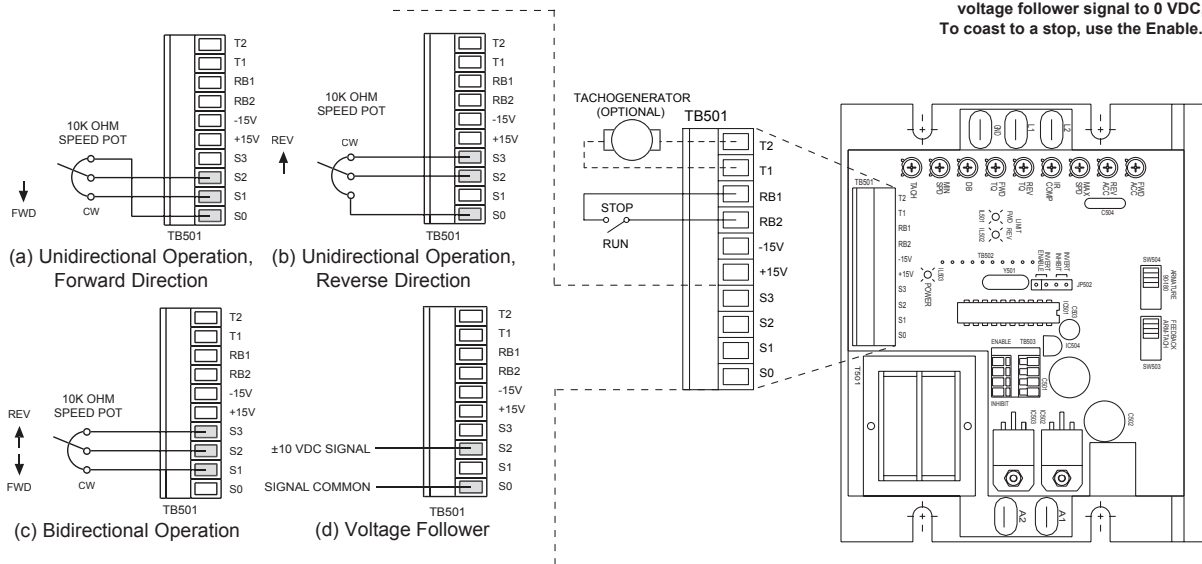
### STARTING & STOPPING

#### To start the drive:

1. Set the speed adjust potentiometer or reference voltage to zero speed.
2. Set the input switches SW501 and SW502 to either 115 or 230 accordingly (bottom board).  
Set the output switch SW504 to either 90 or 180 accordingly (top board).  
Set the feedback switch SW505 to TACH if using a tachogenerator, otherwise set to ARM (top board).
3. Apply AC line voltage.
3. Slowly turn the speed adjust potentiometer clockwise or counter clockwise to rotate the motor in the forward or reverse direction.  
If in voltage follower mode, slowly increase the voltage in either the positive or negative direction to rotate the in the forward or reverse direction. Continue until the desired speed is reached.

#### To stop the drive:

- To regeneratively brake the drive, use Inhibit
- To decelerate the drive, turn the speed adjust potentiometer fully CCW, decrease the voltage follower signal to 0 VDC, or close RB1 and RB2.
- To coast to a stop, use the Enable.



### Recommended Line Fuse Sizes

90 VDC Motor Horsepower	180 VDC Motor Horsepower	Max. DC Armature Current (amps)	AC Line Fuse Size (amps)
1/20	1/10	0.5	3
1/15	1/8	0.8	3
1/8	1/4	1.5	5
1/6	1/3	1.75	5
1/4	1/2	2.5	8
1/3	3/4	3.5	8
1/2	1	5.0	10
3/4	1 1/2	7.5	15
1	2	10	20

#### GS60U TOP BOARD

**MINIMUM SPEED (MIN SPD)**

The MIN SPD trimpot setting determines the minimum speed when the speed adjust potentiometer is turned full CCW. It is factory set to zero speed. The minimum speed feature applies only when the drive is operating in unidirectional mode.

To calibrate MIN SPD:

1. Set the speed adjust potentiometer to full CCW
2. Adjust the MIN SPD trimpot until the desired minimum motor speed is reached.

**MAXIMUM SPEED (MAX SPD)**

The MAX SPD trimpot setting determines the maximum forward and reverse speed. It is factory set for maximum rated motor speed.

To calibrate MAX SPD:

1. Set the MAX SPD trimpot to full CCW
2. Turn the speed adjust potentiometer CW so that the motor is running at full speed.
3. Adjust the MAX SPD trimpot until the desired maximum motor speed is reached.

*NOTE:* Check the MIN SPD and MAX SPD adjustments after recalibrating to verify that the motor runs at the desired minimum and maximum speed.

**FORWARD TORQUE (FWD TQ)**

The FWD TQ setting determines the maximum current limit for accelerating and driving the motor in the forward direction. It is factory set at 120% of maximum rated drive current.

To calibrate FWD TQ:

1. With the power disconnected from the drive, connect a DC ammeter in series with the armature.
2. Set the FWD TQ trimpot to minimum (full CCW).
3. Set the speed adjust potentiometer to maximum (full CW).
4. Carefully lock the motor armature. Be sure that the motor is firmly mounted.
5. Apply line power. The motor should be stopped.
6. Slowly adjust the FWD TQ trimpot CW until the armature current is 120% of motor rated armature current.
7. Set the speed adjust potentiometer to minimum.
8. Remove the power from the drive.
9. Unlock the motor shaft.
10. Remove the ammeter in series with the motor armature if it is no longer needed and re-apply power to the drive.

**REVERSE TORQUE (REV TQ)**

The REV TQ setting determines the maximum current limit for accelerating and driving the motor in the reverse direction. It is factory set at 120% of maximum rated drive current.

To calibrate REV TQ:

1. With the power disconnected from the drive, connect a DC ammeter in series with the armature.
2. Set the REV TQ trimpot to minimum (full CCW).
3. Set the speed adjust potentiometer to maximum (full CW).
4. Carefully lock the motor armature. Be sure that the motor is firmly mounted.
5. Apply line power. The motor should be stopped.
6. Slowly adjust the REV TQ trimpot CW until the armature current is 120% of motor rated armature current.
7. Set the speed adjust potentiometer to minimum.
8. Remove the power from the drive.
9. Unlock the motor shaft.
10. Remove the ammeter in series with the motor armature if it is no longer needed and re-apply power to the drive.

**IR COMPENSATION (IR COMP)**

The IR COMP trimpot setting determines the degree to which motor speed is held constant as the motor load changes. It is factory set for optimum motor regulation.

To calibrate IR COMP:

1. Set the IR COMP trimpot to minimum (full CCW).
2. Rotate the speed adjust potentiometer until the motor runs at mid-speed without load (for example, 900 RPM for an 1800 RPM motor). A hand held tachometer may be used to measure motor speed.
3. Load the motor armature to its full load armature current rating. The motor should slow down.
4. While keeping the load on the motor, rotate the IR COMP trimpot until the motor runs at the speed measured in step 2. If the motor oscillates (overcompensation), the IR COMP trimpot may be set too high (CW). Turn the IR COMP trimpot CCW to stabilize the motor.
5. Unload the motor.

**FORWARD ACCELERATION (FWD ACC)**

The FWD ACC setting determines the time the motor takes to ramp to either a higher speed in the forward direction or a lower speed in the reverse direction, within the limits of available torque. The FWD ACC setting is factory set for its fastest forward acceleration time. Turn the FWD ACC trimpot CW to increase the forward acceleration time, and CCW to decrease the forward acceleration time.

**REVERSE ACCELERATION (REV ACC)**

The REV ACC setting determines the time the motor takes to ramp to either a higher speed in the reverse direction or a lower speed in the forward direction, within the limits of available torque. The REV ACC setting is factory set for its fastest reverse acceleration time. Turn the REV ACC trimpot CW to increase the reverse acceleration time, and CCW to decrease the reverse acceleration time.

**DEADBAND (DB)**

The deadband trimmer potentiometer determines the time that will elapse between the application of current in one direction before current is applied in the opposite direction.

The deadband trimmer potentiometer affects the resistance that a motor has to changes in shaft position at zero speed. It does this by applying AC voltage to the motor armature.

Deadband is factory calibrated with the notch at approximately the 3 o'clock position for 60 Hz AC line operation. Recalibrate the deadband with the notch at the 9 o'clock position for 50 Hz AC line operation. If you hear motor noise (humming), the deadband might be set too high. Turn the deadband trimpot CCW until the motor noise ceases.

**TACH GENERATOR (TACH)**

Calibrate the TACH setting only when a tachogenerator is used. The TACH setting, like the IR COMP setting, determines the degree to which motor speed is held constant as the motor load changes.

To calibrate TACH trimpot:

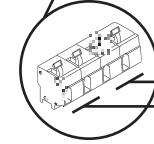
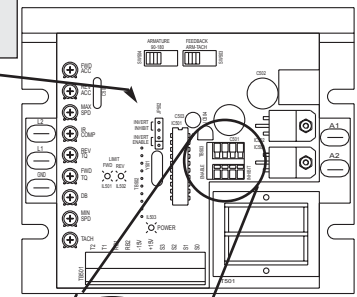
1. Connect the tachogenerator to T1 and T2. The polarity is positive (+) for T1 and negative (-) for T2 with the motor running in the forward direction.
2. Set SW503 to ARM for armature feedback.
3. Set the speed adjust potentiometer full CW. Measure the armature voltage across A1 and A2 using a voltmeter.
4. Set the speed adjust potentiometer to 0 (zero speed).
5. Set SW503 to TACH for tachogenerator feedback.
6. Set the IR cOMP trimpot to full CCW.
7. Set the TACH trimpot to full CW.
8. Apply line power.
9. Set the speed adjust potentiometer to full CW.
10. Adjust the TACH trimpot until the armature voltage is the same value as the voltage measured in step 3.

Check the the tachogenerator is properly calibrated. The motor should run at the same speed when SW503 is set to either armature or tachogenerator feedback.

**Do not make any connections, rewire, install, or disconnect this drive while power is applied.**

INHIBIT & ENABLE

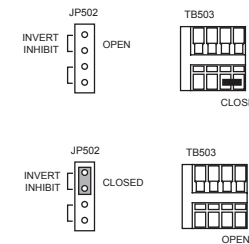
INVERT INHIBIT & INVERT ENABLE Jumper Settings (JP502)



INHIBIT TERMINALS  
ENABLE TERMINALS

INHIBIT SETTINGS

CONFIGURATION



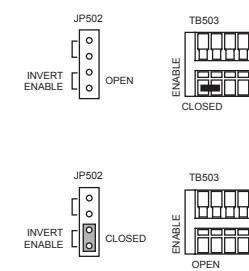
DRIVE RESPONSE

**INHIBIT MODE**  
MOTOR REGENERATIVELY BRAKES WHEN INHIBIT TERMINALS ARE CLOSED

**INVERT INHIBIT MODE**  
MOTOR REGENERATIVELY BRAKES WHEN INHIBIT TERMINALS ARE OPENED

ENABLE SETTINGS

CONFIGURATION



DRIVE RESPONSE

**ENABLE MODE**  
MOTOR COASTS TO STOP WHEN ENABLE TERMINALS ARE MAINTAINED CLOSED

**MAINTAINED CLOSED**  
MOTOR COASTS TO STOP WHEN ENABLE TERMINALS ARE MAINTAINED CLOSED

**MAINTAINED OPEN**  
MOTOR COASTS TO STOP WHEN ENABLE TERMINALS ARE MAINTAINED OPEN