



Specifications

Model	Line Voltage (VAC)	Armature Voltage Range (VDC)	Continuous Armature Current (Amps)	Horsepower Range
LGD430-1.5	115 230	0 - 90 0 - 180	1.5	1/20 - 1/8 1/10 - 1/4
LGD430-10	115 230	0 - 90 0 - 180	10.0*	1/8 - 1 1/4 - 2

* Heat sink kit HSK-0002 must be used when the continuous output current is over 5 amps.

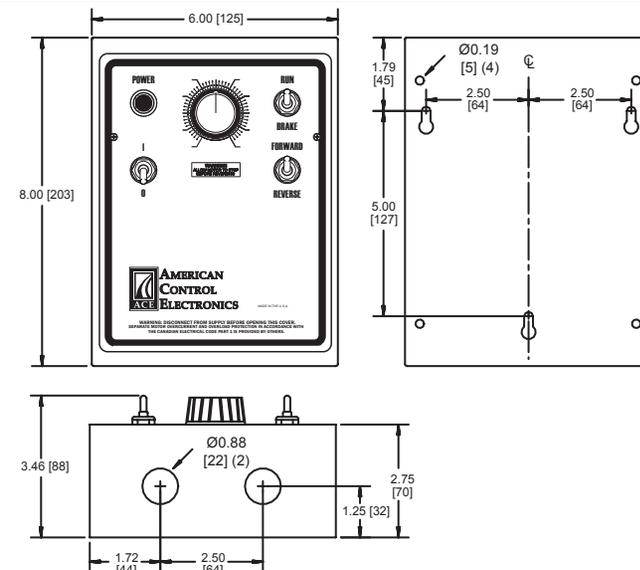
AC Line Voltage.....	115/230 VAC ± 10%, 50/60 Hz, single phase
Form Factor.....	1.37 at base speed
Acceleration Time Range.....	0.5 - 17 seconds
Deceleration Time Range.....	coast to stop - 25 seconds
Analog Input Range (Signal must be isolated; S1 to S2).....	0 - 2.5 VDC
Input Impedance (S1 to S2).....	>100K ohms
Load Regulation.....	1% base speed or better
Speed Range.....	60:1
Vibration (0 - 50 Hz).....	0.5G maximum
(>50 Hz).....	0.1G maximum
Ambient Temperature Range.....	10°C - 40°C
Weight.....	3.0 lbs
Safety Certifications.....	UL/cUL Listed Equipment, file # E132235
	UL/cUL Overload Protection
	CSA Certified Component, file # LR41380

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 techniques, over-current protection, thermal protection, and enclosure. Follow sound maintenance procedures.
- **Removing AC line power is the only acceptable method for emergency stopping.** Do not use dynamic braking, decelerating to minimum speed, or coasting to a stop for emergency stopping. They may not stop a drive that is malfunctioning. 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. Dynamic braking, decelerating to minimum speed, or coasting to a stop 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.
- Change voltage switch settings only when the drive is disconnected from AC line voltage. Make sure both switches are set to their correct position. If the switches are improperly set to a lower voltage position, the motor will not run at full voltage and may cause damage to the transformer. If the switches are improperly set to a higher voltage, the motor will overspeed, which may cause motor damage, or result in bodily injury or loss of life.
- **Do not change the FORWARD/REVERSE switch while the motor is running.** The motor must come to a complete stop before reversing. Changing motor direction before allowing the motor to completely stop will damage the drive and/or motor.

Dimensions



ALL DIMENSIONS IN INCHES [MILLIMETERS]

Installation

Mounting

NEMA 1 cased drives come with two 0.88 inch (22 mm) conduit holes at the bottom of the case. The drives may be vertically wall mounted or horizontally bench mounted using the three keyholes on the back of the case.

1. For access to the keyholes and the terminal strip, remove the two screws from the front of the case by turning them counterclockwise. Grasp the front cover and pull it straight out.
2. Install the mounting screws in the three keyholes.
3. Set the POWER switch to the OFF position before applying the AC line voltage.
4. Install conduit hardware through the conduit holes at the bottom of the case. Connect external wiring to the terminal block.
5. Reinstall the front cover. Avoid pinching any wires between the front cover and the case.
6. Reinstall the two screws on the front cover. Turn the screws clockwise to tighten.

Heat Sinking

The LGD430-10 requires an additional heat sink when the continuous armature current is above 5 amps. Use ACE heat sink kit part number HSK-0002. Use a thermally conductive heat sink compound (such as Dow Corning 340® Heat Sink Compound) between the back of the case and the heat sink surface for optimal heat transfer.

Wiring

Use 14 - 16 AWG wire for AC line and motor 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. It may be necessary to earth ground the shielded cable. If noise is produced by devices other than the drive, ground the shield at the drive end. If noise is generated by the drive, ground the shield at the end away from the drive. Do not ground both ends of the shield.

Fusing

LGD430 series drives provide fusing for the AC line (1, 3). Fuses are fast acting fuses. LGD430-1.5 models contain fuses rated for 3A at 250 VAC. LGD430-10 models contain fuses rated for 15A at 250 VAC.

Connections

POWER

Line Input
Connect the AC line power leads to terminals 1 and 2 if using 115 VAC line power or to terminals 1 and 3 if using 230 VAC line power.

Motor

Connect the DC armature leads to terminals 4 and 5. If the motor does not spin in the desired direction, power down the drive and reverse these connections.

LOGIC

Speed Potentiometer (Pre-wired)

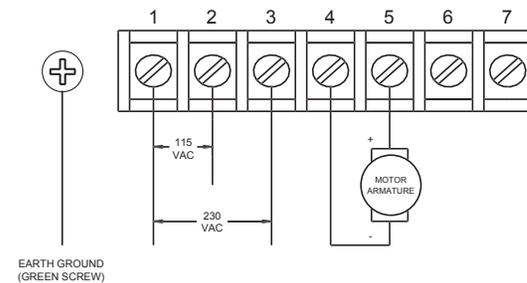
LGD430 series drives are pre-installed with a 10K ohm, 1/4 W potentiometer for speed control.

Run/Stop Switch (Pre-wired)

LGD430 series drives are pre-installed with a Run/Stop switch. When set to Stop, this switch will inhibit the drive, disconnect the motor armature, and connect a dynamic braking resistor across the motor. The dynamic braking resistor allows the motor to stop quicker than if allowed to naturally coast to a stop.

Forward/Reverse Switch (Pre-wired)

LGD430 series drives are pre-installed with a Forward/Reverse switch. This switch swaps the motor armature wires to change motor rotation direction. To use the Forward/Reverse Switch, first set the Run/Stop switch to Stop. When the motor has come to a complete stop, toggle the direction switch and then set the Run/Stop switch to Run. **Do not change the Forward/Reverse switch while the motor is running.**



Startup

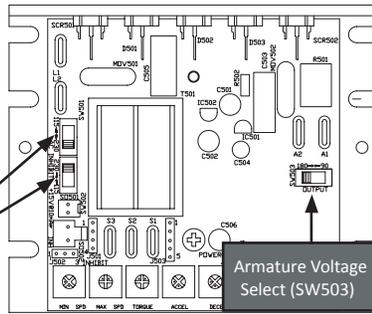
SELECT SWITCHES

Input Voltage Select (SW501, SW502)

Set the voltage switch SW501 and SW502 to either 115V or 230V to match the AC line voltage.

Armature Voltage Select (SW503)

Set the voltage switch SW503 to either 90V or 180V to match the maximum armature voltage.



Input Voltage Select
(SW501, SW502)

Armature Voltage
Select (SW503)

STARTUP

- Verify that no foreign conductive material is present on the printed circuit board.
- Ensure that all switches and jumpers are properly set.

1. Set the RUN/BRAKE switch to the BRAKE position.
2. Set the speed adjust potentiometer to "0" (full CCW).
3. With the POWER switch in the OFF position, apply AC line voltage.
4. Set the POWER switch to the ON position.
5. Set the FORWARD/REVERSE switch to the desired direction of rotation.
6. Set the RUN/BRAKE switch to the RUN position.
7. 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.
8. To reverse direction:
 - a. Set the RUN/BRAKE switch to the BRAKE position.
 - b. WAIT UNTIL THE MOTOR HAS COME TO A COMPLETE STOP.
 - c. Set the FORWARD/REVERSE switch to the desired direction of rotation.
 - d. Set the RUN/BRAKE switch to the RUN position.
9. To brake the motor, set the RUN/BRAKE switch to the BRAKE position. To coast the motor to a stop, set the POWER switch to the OFF position.

Operation

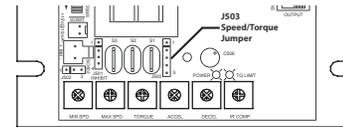
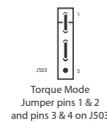
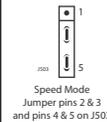
MODES

Speed (Voltage) Mode

In speed mode, the external potentiometer adjusts the speed (voltage) of the motor. The on-board MAX SPD trim pot sets the maximum speed of the motor. The on-board TORQUE trim pot sets the maximum torque available. The drive comes factory calibrated for speed mode. To run the drive in Speed Mode, jumper pins 2 & 3 and pins 4 & 5 on J503.

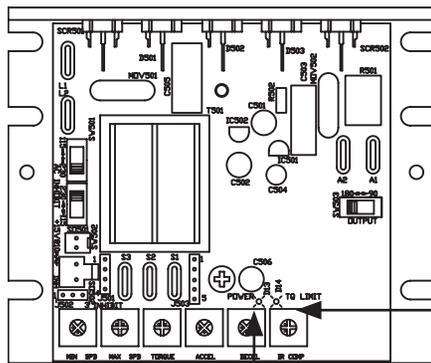
Torque (Current) Mode

In torque mode, the external potentiometer adjusts the torque (current) of the motor. The on-board MAX SPD trim pot sets the maximum torque available. The on-board TORQUE trim pot sets the maximum speed of the motor. The drive comes factory calibrated for speed mode. To run the drive in Torque Mode, jumper pins 1 & 2 and pins 3 & 4 on J503.



LEDs

Current Limit (TQ LIMIT): Red LED lights whenever the drive reaches current limit.
Power (POWER): Green LED lights whenever AC line voltage is applied to the drive.



Current Limit
LED

Power LED

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Calibration

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

1. Set the MIN SPD trim pot full CCW.
2. Set the speed adjust potentiometer for minimum speed.
3. Adjust the MIN SPD trim pot until the desired minimum speed is reached or is just at the threshold of rotation.

Maximum Speed (MAX SPD): The MAX SPD setting determines the maximum 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.
3. Adjust the MAX SPD trim pot until the desired maximum speed is reached.

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

Torque (TORQUE): The TORQUE setting determines the maximum torque for accelerating and driving the motor. To calibrate the TORQUE:

1. With the power disconnected from the drive, connect a DC ammeter in series with the armature.
2. Set the TORQUE trim pot to minimum (full CCW).
3. Set the speed adjust potentiometer to maximum speed (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 TORQUE trim pot CW until the armature current is 150% of motor rated armature current. **Continuous operation beyond this rating may damage the motor.**
7. Turn the speed adjust potentiometer CCW.
8. Remove line power.
9. Remove the stall from the motor.
10. Remove the ammeter in series with the motor armature if it is no longer needed.

IR Compensation (IR COMP): The IR COMP setting determines the degree to which motor speed is held constant as the motor load changes. To calibrate the IR COMP:

1. Set the IR COMP trim pot full CCW.
2. Increase the speed adjust potentiometer until the motor runs at midspeed without load. A handheld 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 trim pot until the motor runs at the speed measured in step 2. If the motor oscillates (overcompensation), the IR COMP trim pot may be set too high (CW). Turn the IR COMP trim pot CCW to stabilize the motor.
5. Unload the motor.

Acceleration (ACCEL): The ACCEL setting determines the time the motor takes to ramp to a higher speed. ACCEL is factory set for the shortest acceleration time (full CCW). To calibrate the ACCEL:

1. Set the speed adjust potentiometer for minimum speed.
2. Set the speed adjust potentiometer for maximum speed. Measure the time it takes the motor to go from minimum speed to maximum speed.
3. If the time measured in step 2 is not the desired acceleration time, turn the ACCEL trim pot CW for a longer acceleration time, or CCW for a shorter acceleration time. Repeat steps 1 through 3 until the acceleration time is correct.

Deceleration (DECEL): The DECEL setting determines the time the motor takes to ramp to a lower speed. DECEL is factory set for the shortest deceleration time (full CCW). To calibrate the DECEL:

1. Set the speed adjust potentiometer for maximum speed.
2. Set the speed adjust potentiometer for minimum speed. Measure the time it takes the motor to go from maximum speed to minimum speed.
3. If the time measured in step 2 is not the desired deceleration time, turn the DECEL trim pot CW for a longer deceleration time, or CCW for a shorter deceleration time. Repeat steps 1 through 3 until the deceleration time is correct.