



# 4 Quadrant SCR GEN-PACK H-W DC Drive Instructions

## Models 12M6-42000 and 12M6-42001

### INTRODUCTION

The GEN-PACK H-W™ is a half wave regenerative SCR drive for intermittent operation of permanent magnet motors in a single or bi-directional mode. It provides forward and reverse torque in both directions, maintains constant speed with overhauling loads and provides rapid deceleration, reversing, and controlled regenerative braking. Feedback is jumper selectable from either armature voltage or from a DC tachometer generator with fast response in both feedback modes.

### Specifications:

Speed Range: 50:1  
Overload Capacity: 150% for 60 seconds  
Maximum Speed Adjustment: 50-110%

Model	Mounting	Input Voltage	Output V. Range	HP	Output Amps	
					Cont.	Max.
12M6-42000	Open chassis	115/230 VAC	0 to 90/180VDC	1@115VAC, 2@230V	10	20
12M6-42001	NEMA 12 Encl.	115/230	0 to 90/180	1@115VAC, 2@230V	10	20

### GENERAL

These instructions provide basic information for installation and adjustment. Please contact Gemini Corp. if further information is necessary. It is possible to damage the drive through misuse or misapplication. Please read this material thoroughly before proceeding with installation.

Unpack the equipment noting any shortages or damaged equipment. Immediately notify the carrier of any damage. Store in clean, dry location if the product is not used immediately. The relative humidity should not exceed 95%, non-condensing.

**Caution: This control provides half wave rectified power to the DC motor. Peak currents result in an RMS equivalent current that may be considerably higher than with a full wave source of power. For this reason it may be necessary to derate the motor to avoid overheating. Consult with the motor manufacturer and Gemini for specific information.**

### INSTALLATION

Carefully mount the chassis or enclosure allowing clearances for access, air flow and conduit entry. The environment should be free of vibration and contaminants. The operating temperature range for the Gemini drive is 32 to 104 degrees Fahrenheit (0-40C). Since the drive produces heat, utilize a source of cooling, such as a fan, when the ambient temperature approaches 104 degrees.

**WARNING:** Do not drill or file the enclosure or chassis when the controller is installed, as metal particles can cause shorts and damage.

### WIRING

#### 1. Input Wiring

a. Since the control will operate on either 115 or 230VAC, jumper(s) must be applied to obtain the required voltage. For 115VAC input, place a jumper between terminals "H1" and "H3", and another jumper between terminals "H2" and "H4". For 230VAC input, place a jumper between "H3" and "H2". Connect the AC line to terminals "L1" and "L2" (note wiring diagram). Terminals "S1" and "S2" are used as wiring points when a line switch is used for ON-OFF control. Wire one pole of a two pole switch to connect between terminals "L1" and "S2". Wire the other pole to connect "L2" and "S2".

If required, the chassis may be grounded at one of the unused holes. Input wire size must be in compliance with the National Electrical Code and all local codes and restrictions.

**WARNING:** Do not connect line power to the motor terminal connections.

b. Note the jumper terminals on the top circuit board. Install a small shunt type jumper at position "K" for a 115VAC input and

90VDC motor, or "J" for a 230VAC input and 180VDC motor.

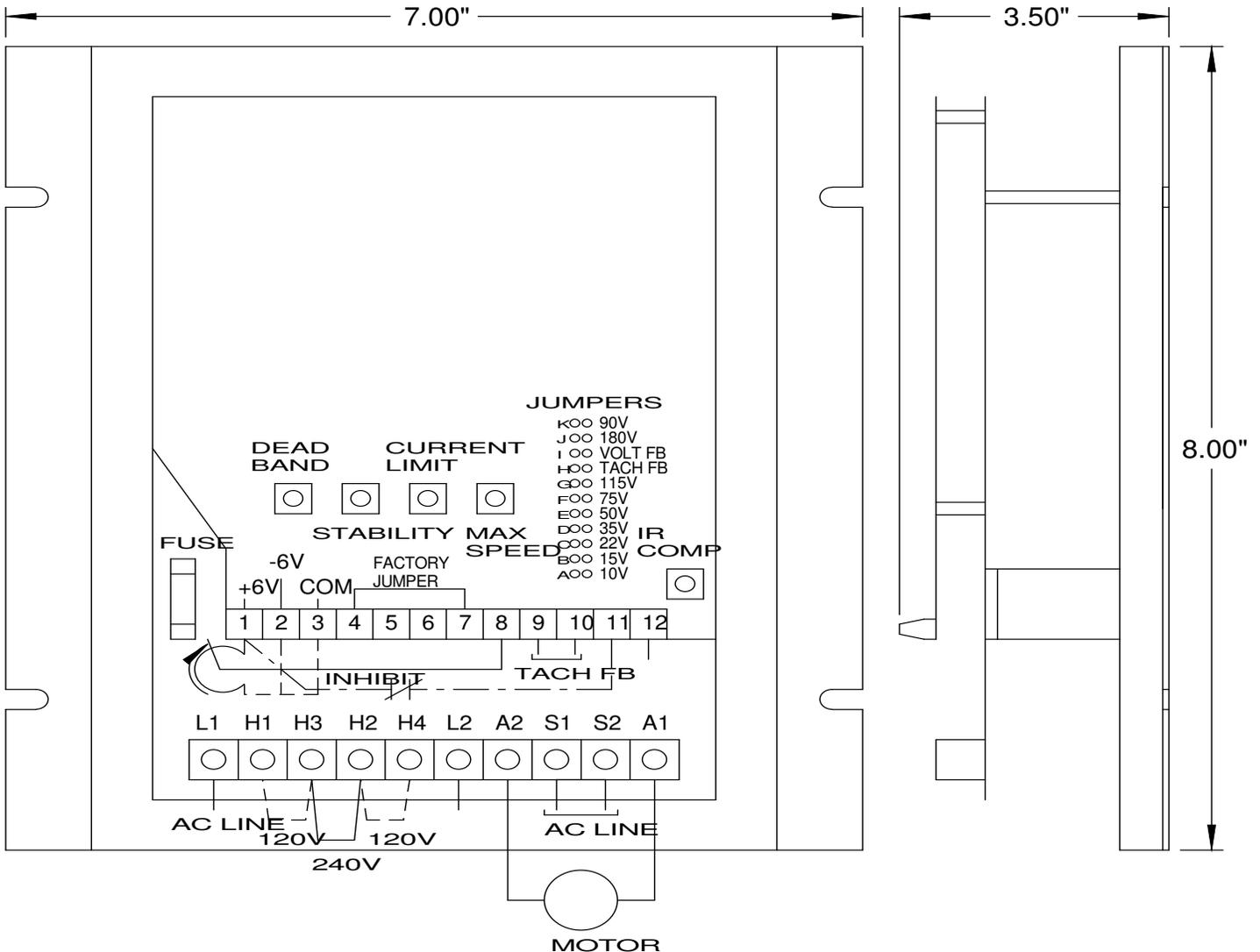
**2. Output Wiring**

- a. Connect the motor to the "A1" and "A2" terminals of the drive. Do not operate the control without connection to the motor.
- b. Install a jumper for armature voltage feedback at position "I".

**3. Control Wiring**

- a. Speed potentiometer - For unidirectional rotation, connect a 5K, 1/4 watt speed potentiometer, with the wiper connected to terminal "8" and CCW end to terminal "3". Connect the other end to terminal "1". For bi-directional rotation, connect the CCW end to terminal "2".
- b. If an external speed reference signal is used, first set-up and adjust the system with a 5K potentiometer as a speed reference. Connect the external source only after satisfactory operation with a potentiometer, as any problem may then be directed toward interfacing. The frequency of a pulse width modulated input signal must exceed 50Hz, otherwise damage may result. An external signal of 0 to positive 6VDC is used for forward motion. A zero to -6VDC signal is required for reverse motion. Wire common to terminal "3" and reference signal to terminal "8".

**Wiring Diagram and Model 12M6-42000**



## SETUP FOR TACH FEEDBACK

If tach feedback is used, first setup the drive with armature voltage feedback.

1. Change the jumper on the top board from position "T" to position "H".
2. Install a jumper on position "A, B, C, D, E, F, or G", whichever corresponds to the maximum tach voltage at rated speed.
3. Turn the "IR COMP" pot. fully counterclockwise. Turn the "CL" pot. down to 25%.
4. Apply a 10% speed reference and turn power on, observing the direction of rotation and whether the motor stabilizes at a low speed or runs away to full speed.
  - a. If the motor runs away in the desired direction, remove power and reverse the polarity of the tach leads.
  - b. If the drive runs in the wrong direction, remove power and reverse the polarity of the armature leads.
  - c. If the drive runs at a low controlled speed, but in the wrong direction, remove power and reverse the polarity of both the armature and tach leads.
  - d. If the drive runs at controlled low speed in the proper direction, all connections are correct.
5. Increase the current limit setting "CL" to 50%, and adjust the stability pot. "STAB" for optimum stability while varying the speed reference.
6. Adjust the maximum speed pot. "MAX SP" for rated motor speed, and repeat step 5.
7. Adjust the current limit "CL" only as high as needed for the application, but not high enough to permit more than 10 amperes DC to the motor, as measured with a DC ammeter in series with the motor.

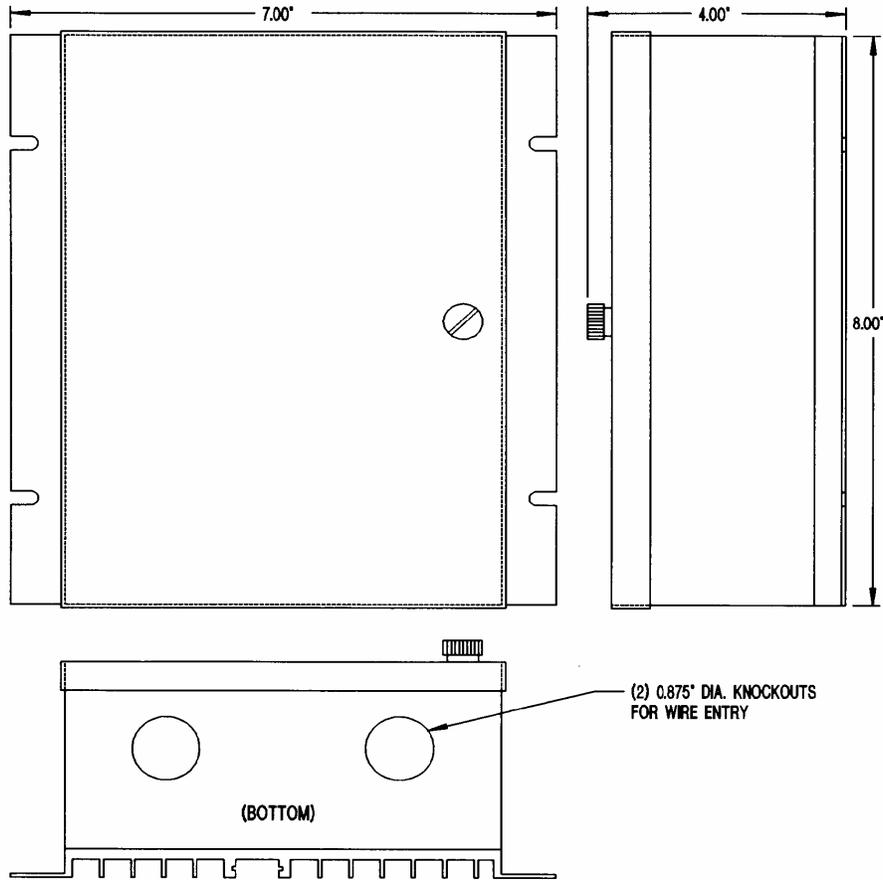
This completes the drive setup.



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## Model 12M6-42001 Enclosure



### ADJUSTMENTS AND START-UP

1. Remove any speed reference signal.
2. Turn the deadband pot. "DEAD B" and the current limit "CL" potentiometer to their full counterclockwise position.
3. Turn the power on. The motor should not rotate, or if it does, it should only slowly accelerate. If it accelerates rapidly, the null adjustment is incorrect. Using an insulated shaft screwdriver with a narrow blade, adjust the "NULL" pot. slowly until the motor no longer rotates, or accelerates very slowly.
4. Turn the current limit pot. "CL" clockwise approximately 25-30%. The motor should not be rotating.
5. Turn the deadband pot. "DEAD B" clockwise until a slight buzzing is heard.
6. Reconnect the speed pot. or external signal, and set the current limit pot. "CL" to approximately 50%.
7. Increase speed and observe motor direction. Remove power and reverse the motor leads if incorrect.
8. While varying the signal up and down, adjust the stability pot. "STAAB" for fast response without overshoot or hunting.
9. Adjust the maximum speed pot. "MAX SP" for rated speed, and repeat step 8.
12. Adjust the "IR COMP" for good regulation with varying loads.

The drive is now ready to operate with armature voltage feedback.