



# 5 Cap High Power PWM Instructions

## Models 12M04-00096 and 12M04-00097

### INTRODUCTION

The 115VAC input 12M04-00096 and 230VAC 12M04-00097 models are designed for operation with 1 1/2 and 3 HP DC brush-type permanent magnet motors. Designed for high power industrial applications, maximum drive and motor protection is provided by: under/over voltage protection, over temperature cutout that detects cooling fan loss or overload, and fused output. Four LEDs are provided for convenience and diagnostic purposes.

### Specifications:

Speed Range: 100:1

Overload Capacity: 150% of rated current for 60 seconds

Maximum Speed Adjustment: 50-110% of rated speed

<u>MODEL</u>	<u>Input Voltage</u>	<u>Output V. Range</u>	<u>HP</u>	<u>Cont. Output Amps</u>
12M04-00096	115	0-90	1 1/2	20 (15 amps with 120VDC motor)
12M04-00097	230	0-180	3	15

### 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.

### INSTALLATION

Carefully mount the chassis 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:** This motor control contains a high voltage DC bus with considerable capacitance and a large amount of stored energy. Direct contact with this bus can be very dangerous. Do not touch any conductors or connections to the control while power is on, for at least five minutes after removal of power. Use insulated tools for any adjustments.

### WIRING

1. Input Wiring - Connect the AC line to terminals "L1" and "L2" (note wiring diagram), with 115VAC "hot" wired to "L1". 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.

2. Output Wiring - Connect the negative and positive of the motor to the "A-" and "A+" terminals of the drive. Do not operate the drive without connection to the motor.

3. Control Wiring - Connect a 10K, 1/4 watt speed potentiometer to the "L", "W", and "H" terminals, with the wiper connected to the "W" terminal, and the CCW end to the "L" terminal.

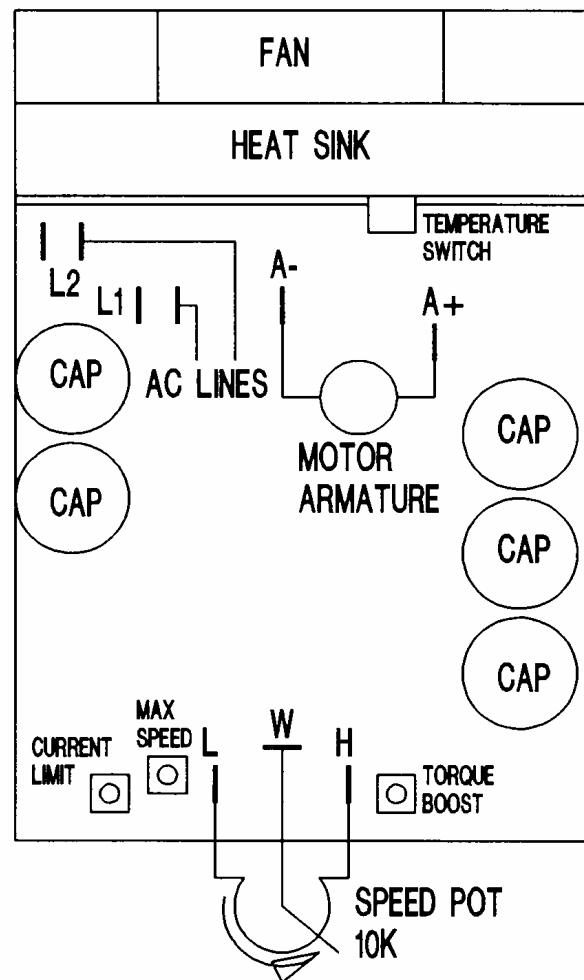
If an external 0-10VDC speed reference signal is used, first set-up and adjust the system with a 10K potentiometer as a speed reference. Connect the **isolated**, external source only after satisfactory operation with a potentiometer, as any problem may then be directed toward interfacing. The frequency of a pulse width modulated, **isolated**, input signal must exceed 50Hz, otherwise damage may result. Wire the common to the "L" terminal and the positive voltage to the "W" terminal.

If shielded wire is used, ground the shield at the potentiometer. Never connect the shield at both ends. Do not run control wiring in conduit with high voltage (115V or greater) wiring.

## ADJUSTMENTS AND START-UP

1. Turn the “TORQUE BOOST” and “MAX SPEED” potentiometers, located on the board, and speed adjustment potentiometer to their full counterclockwise position. Rotate the “CURR LIM” potentiometer to the mid-position.
2. Apply power and rotate the speed potentiometer slightly clockwise. Observe the direction of rotation. If incorrect, turn off the power and reverse the motor armature connections.
3. Rotate the speed potentiometer to the extreme clockwise position, and adjust the “MAX SPEED” potentiometer for the desired maximum speed, or for rated motor voltage as measured with a DC meter at the armature connection.
4. Run the motor at approximately 10% speed and adjust the “TORQUE BOOST” potentiometer clockwise very slowly until the motor surges. Back off on the adjustment until the motor just stops surging.
5. The “CURR LIMIT” potentiometer can now be adjusted so that the motor will not stall under maximum load. Clockwise adjustment increases the current limit, and the torque available from the motor. If additional torque is required for acceleration, increase the current limit setting.
6. An optional zero speed lockout prevents the motor from turning when the speed potentiometer is not set at zero. A jumper is provided to deactivate the feature if not desired.
7. Four LEDs provide the following functions:
  - LED 1 - Power On Indication
  - LED 2 - Armature Voltage Present
  - LED 3 - Drive in ready mode
  - LED 4 - Trip mode
8. Two fuses provide protection for the drive and motor. Fuse 1 protects the drive and Fuse 2 protects the motor. Return the drive to the factory if fuse 1 blows.

The system is now ready for operation.



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