

# G212 INSTALLATION NOTES:

(June 3, 2005)

Thank you for purchasing the G212 drive. The G212 Microstep drive is warranted to be free of manufacturing defects for 1 year from the date of purchase. Also anyone who is dissatisfied with it or is unable to make it work will be cheerfully refunded the purchase price if the G210A is returned within 15 days of the purchase date.

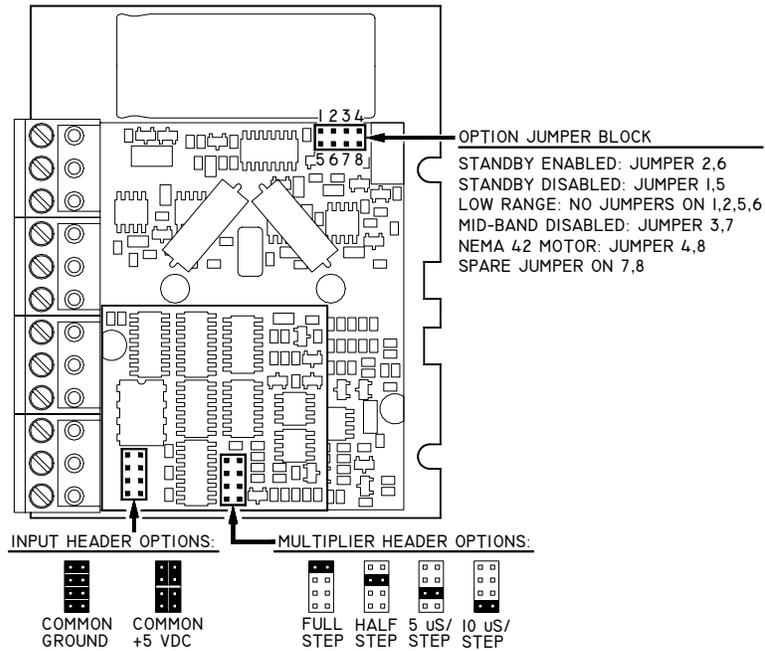
## PLEASE READ FIRST BEFORE USING THE G212

Before you start, you must have a suitable step motor, a DC power supply suitable for the motor and a current set resistor. The motor's rated phase current must be between 1A and 7A, or 0.3A to 2A for the low current range. The power supply voltage must be between 4 times and 20 times the motor's rated voltage. The current set resistor may be a 1/4 Watt, 5% part. Finally have a STEP and DIRECTION pulse source available.

## G210A MULTIPLIER AND INPUT OPTION HEADERS

### MULTIPLIER OPTION HEADER

The G212 has a built in STEP PULSE MULTIPLIER. This circuit makes the G212 selectable for full-step, half-step, 5 microstep and 10 microstep operation. In all cases the motor will move with microstep smoothness. Use the MULTIPLIER HEADER to select the desired resolution. Do not operate the drive without a jumper.



### INPUT OPTION HEADER

The INPUT OPTION HEADER allows the STEP and DIRECTION opto-isolators to be configured as either common ground or common +5VDC.

If the G212 inputs are driven by a source that has only ground available, such as a PC parallel port, move the 4 jumpers on the header so that it looks like the COMMON GROUND setting. Connect the input driver ground to TERM 10 on the main connector.

If the G212 inputs are driven by open collector transistors or standard TTL gates, move the 4 jumpers on the header so that it looks like the COMMON +5VDC setting.

## G212 TERMINAL WIRING

**(TERM. 1) POWER GROUND** Connect the power supply ground to term.1

**(TERM. 2) 24 - 80 VDC** Connect the power supply "+" to this terminal

The power supply voltage must be between 24 VDC and 80 VDC. The maximum power supply current required is 67% of the motor's rated phase current. An unregulated power supply may be used as long as the voltage stays between the limits; keep the ripple voltage to 10% or less for best results.

**CAUTION!** Power supply voltage in excess of 80 VDC will damage the G212.

The choice of power supply voltage depends on the high speed performance required of the motor; doubling the voltage doubles the motor's high speed power. In all cases the power supply voltage should be no less than 4 times or no more than 25 times the motor's rated voltage. The motor may not run as smoothly as possible if the power supply voltage is less than 4 times the motor's rated voltage. A power supply voltage greater than 25 times the motor's rated voltage will overheat and damage the motor, even if it is not turning. Motor winding inductance should be 500 uH or greater.

**(TERM. 3) COIL A** Connect one motor winding to this terminal

**(TERM. 4) COIL /A** Connect the other end of the winding to this terminal

**(TERM. 5) COIL B** Connect the other motor winding to this terminal

**(TERM. 6) COIL /B** Connect the other end of the winding to this terminal

One motor winding connects to term. 3 and 4, while the other winding connects to term. 5 and 6. Turn the power supply off when connecting or disconnecting the motor. If the motor turns in the wrong direction, exchange the motor winding connections to term. 3 and 4.

4-wire, 6-wire and 8-wire motor may be used. When 6-wire motors are used, they may be connected in half winding or full winding. This is equivalent to an 8-wire motor connected in parallel or series. If a motor is connected in series or full winding, the motor's phase current rating is half of its parallel or unipolar rating. The choice depends on the high-speed performance required; a parallel-connected motor will provide twice the power of a series-connected motor at the same power supply voltage.

**(TERM. 7) NC** There is no connection to this terminal.

**(TERM. 8) DIRECTION** Connect the DIRECTION line to this terminal.

**(TERM. 9) STEP PULSE** Connect the STEP line to this terminal.

**(TERM. 10) COMMON** Connect this terminal to the controller +5VDC power supply or ground.

These inputs are optically isolated from the rest of the drive. Term. 10 is the common connection for the opto-isolators and must be connected to the +5 VDC supply or ground of your pulse generator, depending on how the input header is configured.

These inputs are to be driven by standard TTL logic or other driver capable of sinking 16 mA of current. The minimum logic "0" time is 0.5 uS while the minimum logic "1" time is 4.5 uS. Microstepping occurs on the falling edge of the step input.

**(TERM. 11) CURRENT SET** Connect the current set resistor to this terminal

**(TERM. 12) CURRENT SET** Connect the other end of the current set resistor to this terminal

This input programs the G212's current output to the motor windings. The G212 will accommodate motor winding currents from 1 amp to 7 amps. Use the following equation to calculate the value, (in kilo-ohms) of the current set resistor:  $R \text{ (in kilo-ohms)} = 47 * I / (7 - I)$ , or  $R = 47 * I / (2 - I)$  for the low current range.

**HEATSINKING:** The G212 needs heatsinking for current settings greater than 6 amps. The case temperature (measured on the bottom plate) should not exceed 70 degrees C, and for best life should be kept to 50 degrees or less. Use heatsink compound between the G210A and the heatsink.

**.AUTO CURRENT REDUCTION:** The G212 reduces motor phase current to 33% of the set value when the motor is stopped. To disable this feature remove the cover and jumper **JP1** (see Fig. 2).

**ADJUST:** This trimpot adjusts the motor for the smoothest possible low-speed operation. Set the motor speed to about 1/4 revolution per second and then turn the trimpot until a distinct null is noted in the motor's vibration. This will result in the most even microstep placement for a given motor and power supply voltage.

**MAIN CONNECTOR:** The G212 uses a 2-piece modular main connector. The connector is split in two pieces; terminals 1 thru 6 (power supply and motor leads) and terminals 7 thru 12 (control interface). Each can be removed separately by pulling the connector body upwards and off of the mating header pins on the G212. The connectors must initially be removed to mount the G212 to a heatsink or chassis.

**SPECIFICATIONS:**

Supply Voltage:	24 to 80 VDC
Phase Current:	1 to 7 Amps
Auto Current Reduction:	33% of set current, 1 second after last Step Pulse
Size:	3.125"W, 2.5"D, .85"H (79.4mm, 63.5mm, 21.5mm)
Mounting Pattern:	4 6-32 screws, 1.75" by 2.375" (44.5 mm, 60 mm)
Quiescent Current:	15 Ma or less
Weight:	4.5 oz. (130 gm)
Step Frequency:	0 to 200 kHz
Step Pulse "0" Time:	0.5 uS min (Step on falling edge)
Temp:	0 to 70 C
Step Pulse "1" Time:	4 uS min
Humidity:	0 to 95 % (non-condensing)
Direction Setup:	1 uS min
Power Dissipation:	1 to 18 W (1 to 7 Amps)

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# G212 Step Motor Drive

Cover: Aluminum, Anodized  
 Plate: Aluminum, Hard Anodized  
 Color: Black, OrangeText  
 Weight: 4.5 oz (130 gm)  
 Size: 3.125" X 2.5" X 0.825"  
 (79.4 X 63.5 X 21 mm)

