

# Power Step 3M860



## Key Features:

- 18 to 80VDC Supply Voltage
- H-Bridge, 3 Phase Bi-polar Micro-stepping Drive
- Suitable for 3-phase, step motors, with Nema size 16 to 34
- Output current selectable from 2.0 ~ 8.3 peak
- Current reduction by 50% automatically, when motor standstill mode is enabled
- Pulse Input frequency up to 200 kHz
- Optically isolated differential TTL inputs for Pulse, Direction and Enable signal inputs
- Selectable resolutions up to 12800 steps
- Over Voltage, Coil to Coil and Coil to Ground short circuit protection.

## Introduction

3M860 is a bi-polar three phase micro-stepping drive applying pure-sinusoidal current control technique. It had the potential of delivering more torque with smoother stepping motion with a three phase motor. This results in lower vibration and higher performance as compared to the two phase type. It is best suited for applications that desire extreme low speed smooth motion, especially in multi-axes linear and circular interpolated application, or application that is sensitive to vibration, at extreme slow speed.

With precise current control technique and optimization in speed control, this three phase PowerStep drive is well suited for three phase hybrid step motor, producing a performance close to a brushless DC servo operation.

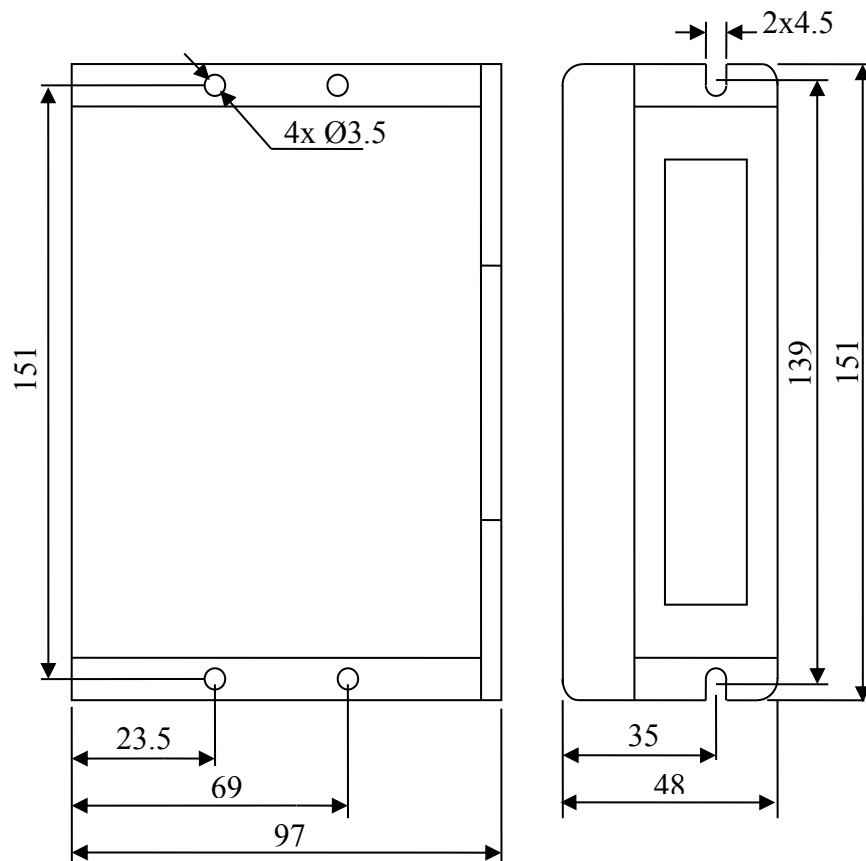
## Specifications

Parameters	Min	Typical	Max	Unit
Output Current (Peak)	2. 0	-	8. 3	Amps
Supply voltage	24	48	80	VDC
Logic Input Current	7	10	16	mA
Pulse input frequency	0	-	200	KHz
Low Level Time	2.5			μsec

<b>Cooling</b>	Natural Cooling or Forced Convection	
<b>Environment</b>	Space	Avoid dust, oil frost and corrosive gases
	Ambient Temperature	0°C – 50°C
	Humidity	40 – 80%RH
	Vibration	5.9m/s <sup>2</sup> Max
<b>Storage Temp.</b>	-10°C – 80°C	
<b>Weight</b>	Approx. 500 gram	

## Dimensions

Dimensions in mm



## Current Setting

Current Setting (A)	SW1	SW2	SW3
2. 0	OFF	OFF	OFF
2. 8	ON	OFF	OFF
3. 9	OFF	ON	OFF
4. 8	ON	ON	OFF
5. 7	OFF	OFF	ON

6. 5	ON	OFF	ON
7. 3	OFF	ON	ON
8. 3	ON	ON	ON

## Microstep Setting

Step / Rev	SW5	SW6	SW7	SW8
200	OFF	OFF	OFF	OFF
400	ON	OFF	OFF	OFF
500	OFF	ON	OFF	OFF
800	ON	ON	OFF	OFF
1000	OFF	OFF	ON	OFF
1250	ON	OFF	ON	OFF
1600	OFF	ON	ON	OFF
2000	ON	ON	ON	OFF
2500	OFF	OFF	OFF	ON
3200	ON	OFF	OFF	ON
4000	OFF	ON	OFF	ON
5000	ON	ON	OFF	ON
6400	OFF	OFF	ON	ON
8000	ON	OFF	ON	ON
10000	OFF	ON	ON	ON
12800	ON	ON	ON	ON

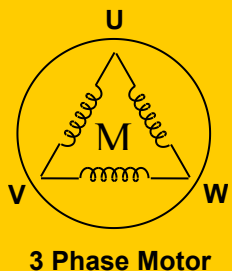
\* SW4: ON=Full current, SW4 : OFF=Half current

## P1 Pin Assignment

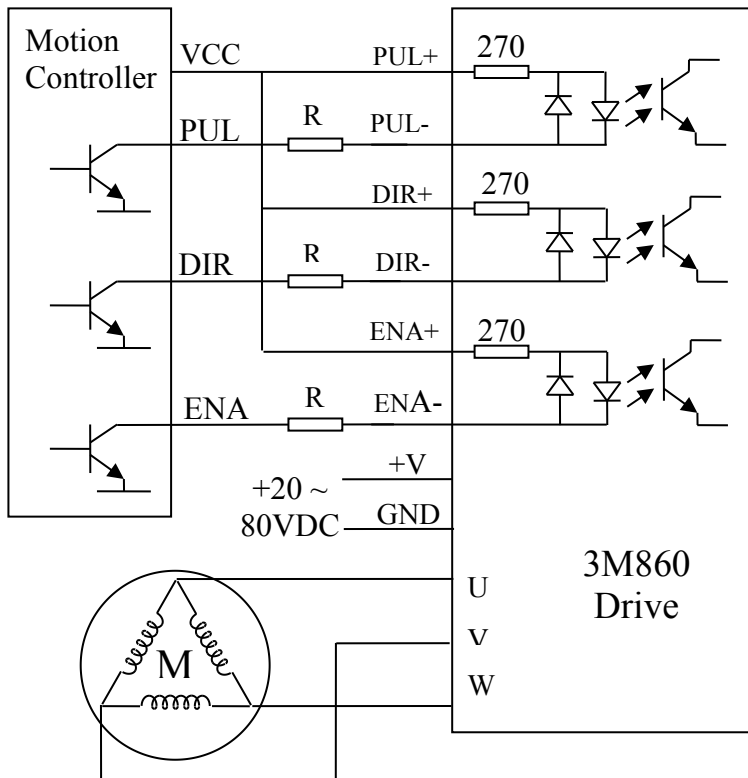
Signal	Function and Descriptions
PUL+	<u>Pulse or Step Input</u> TTL differential input with high-going pulse, 1 $\mu$ s min width. For +12V or +24V operation, a current limiting resistor had to be pull up or connected in series from the PUL+ to the VCC.
PUL-	
DIR+	<u>Direction Input</u> Logic High = positive (CW) rotation—4.0 ~ 5.0V Logic Low = negative (CCW) rotation—0 ~ 0.5V The DIR signal must be stable for at least 5ms before the drive receives the first pulse.
DIR-	
ENA+	<u>Enable Input</u> Logic High = Drive Enabled Logic Low = Drive Disabled This input, if left unconnected, is recognised as Logic High

by the drive, and it will be enabled.

## P2 Pin Assignment

P2 Signal	Function and Descriptions
GND	DC Power Ground
+V	DC Power Supply, +24VDC ~ +80VDC
U V W	 3 Phase Motor

## Wiring



R=0 if VCC=5V

R=1K(Power>0.125W) if VCC=12V;

R=2K(Power>0.125W) if VCC=24V;

R must be connected to control signal terminal.