Micro Step Driver Manual (Model: MVD62)

8.5 Amper Stepper Motor Driver

Important notice: Please read this user manual carefullybefore operating this driver

Thank you for selecting this driver

The driver introduced in this user manual benefits from a powerful U.S. built chip and is developed using innovative technology. Due to advanced current control, this driver outperforms all other available counterparts. Precise implementation of the Micro Step and high starting torque make this driver highly functional.

1 - Environmental specifications and functioning conditions :

Cooling	Natural Cooling or Forced cooling	
Operating Environment	Environment	Avoid dust, oil fog and corrosive gases
	Ambient Temperature	0 ℃ － 50℃ (32℉ － 122℉)
	Humidity	40%RH － 85%RH
	Operating Temperature	70℃ (158℉) Max
	Vibration	5.8m/s2 Max
Storage Temperature	-10 ℃ － 70℃ (14℉ － 158℉)	
Weight	Approx. 650g	

2 - Technical Specifications :

Parameter	MVD62			
	Min	Typical	Max	Unit
Output current	1.8	-	6.7 (4.7RMS)	A
Supply voltage	18	42	55	VAC
	+24	+52	+75	VDC
Logic signal current	7	10	16	mA
Pulse input frequency	0	-	80	KHz
Isolation resistance	500	-	-	Mega ohm

3. Dimensions and full sizes: unit (mm | inch)

9 | 0.354

150 | 5.906

13.5 | 0.531

5 | 0.196

52 | 2.04

150 | 5.906

114 | 4.488
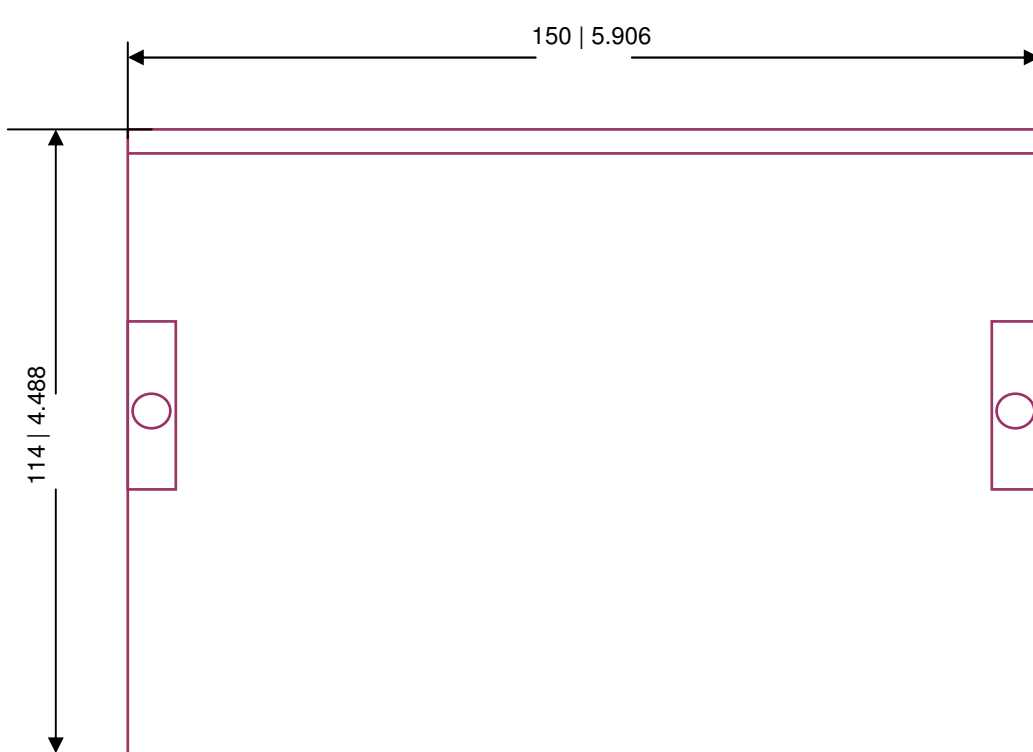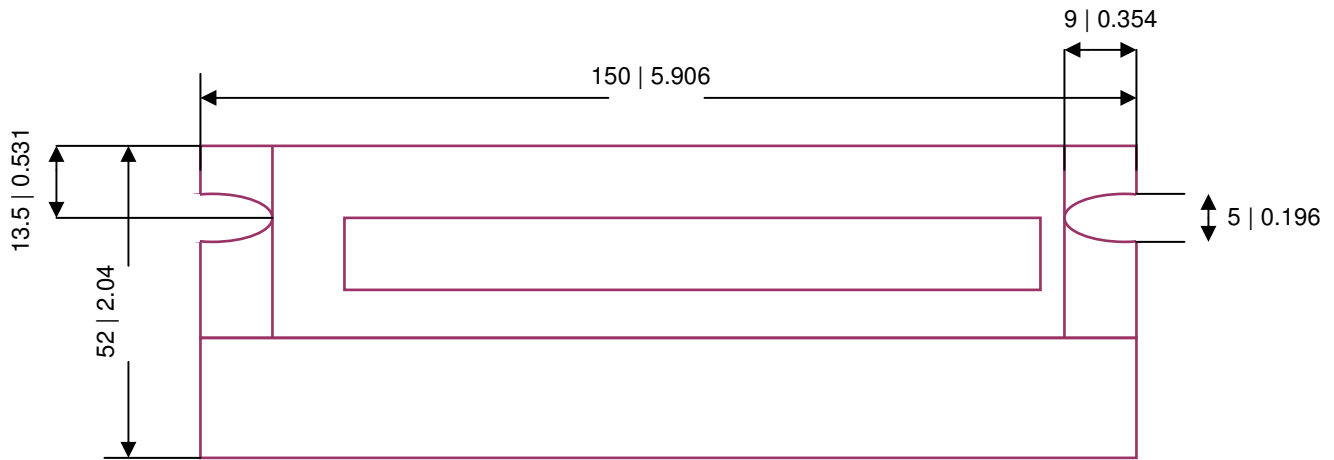
Recommended for better heat dissipation, as lateral
and vertical installation

4. Applicability:

This driver is able to operate with a wide range of step motors "NEMA" (size of 17 to 43). Various machines can utilize this driver, including: Labeling machines, X-Y tables, Laser cutting machines, packaging line machines, food industry machines, etc.

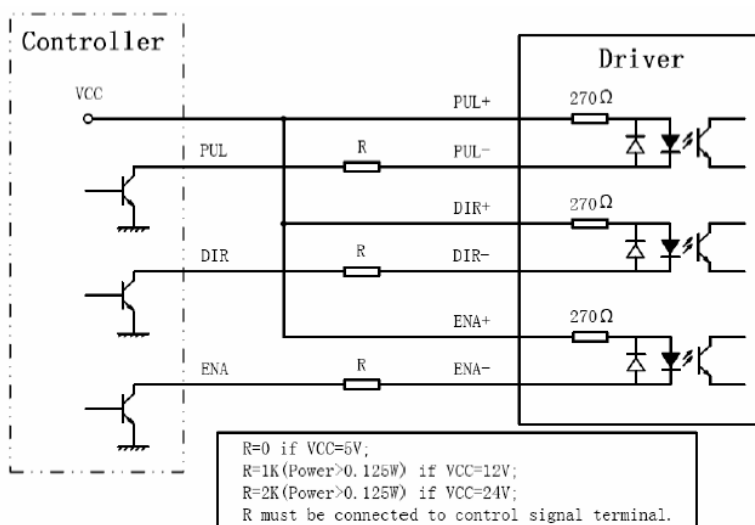## 5. Operation conditions for signal terminals:

DIR- , DIR+ :

This input is used for determining and changing the rotation direction in the step motor. These two terminals should receive a voltage in the range of 4-5 volts in order to change rotation direction. Positive and negative directions of input voltage must be observed. A current-limiting resistor should be connected in series with the input if the voltage is higher than 5 volts.
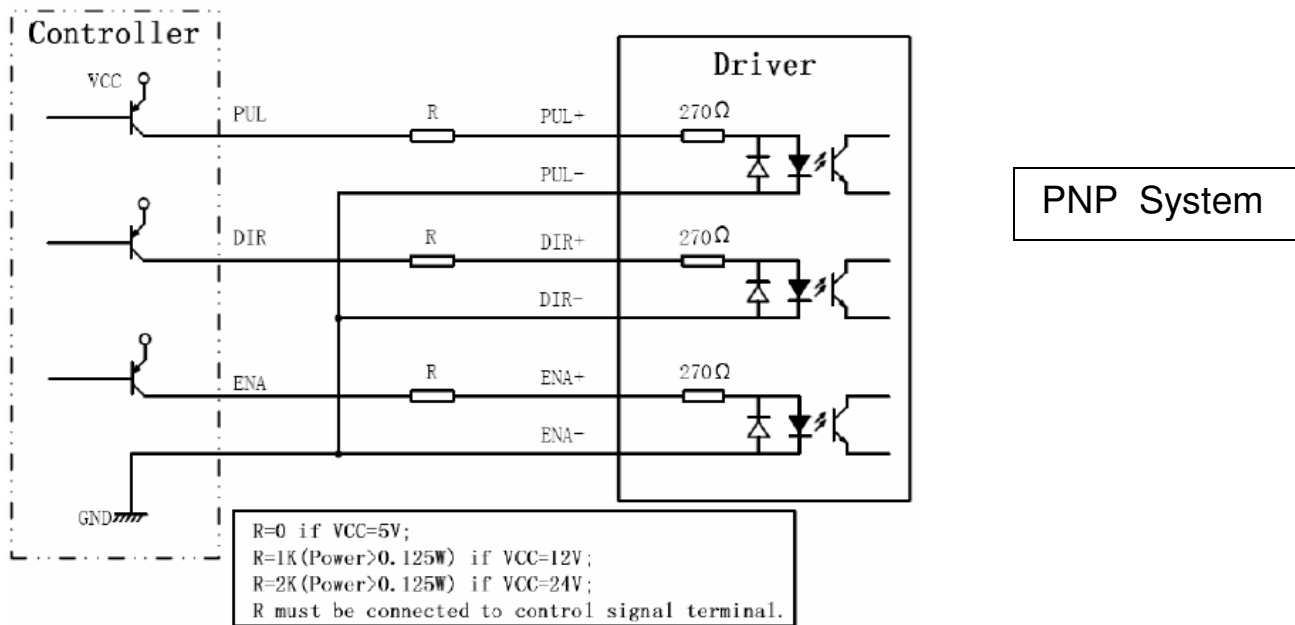
PUL-, PUL+,

This input is used to generate required pulses for step motor rotation. Input pulse frequency and Micro Step settings are calculated considering required speed and accuracy. For better performance, input pulse width should not be less than 1.5 s. Pulse zero-level is 0-0.5 volts and pulse one-level is 4-5 volts. A current-limiting resistor should be connected in series with the input if the voltage is higher than 5 volts.

ENA-, ENA+,

This input is used for unloading/loading step motor. If this input receives a voltage, step motor will be unloaded and green light flashes. If this terminal is free, step motor will be loaded and green light will be constantly ON. Pulse zero-level is 0-0.5 volts and pulse-one level is 4-5 volts. A current-limiting resistor should be connected in series with the input if the voltage is higher than 5 volts.

NPN OR Open collector System

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.

```
Controller
  VCC
        PUL          R      PUL+    270Ω
                            PUL-

        DIR          R      DIR+    270Ω
                            DIR-

        ENA          R      ENA+    270Ω
                            ENA-

  GND
```

Driver

PNP System

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.

6. Selecting proper power supply:

Appropriate power supplying is of critical importance to reach the best performance.

The "MVD62" driver only requires an AC voltage that can be easily provided by a step down transformer. Output voltage and current of transformer depend on the application type and motor type. When operating speed of step motor is high, output voltage should increase up to the highest permissible value. However, if the driver is overloaded, transformer current must be high in order to produce higher torques, which leads to increased heat of motor and driver. Hence, a cooling system is needed. However, if the required speed is not high, it is recommended to employ a lower supply voltage, which reduces noise and heat and increases efficiency.

 It is also possible to consider only one high current transformer for all drivers in parallel connection, which leads to reduction of cost, weight and space of panel; otherwise, one supply source must be considered for each driver.

7. Selecting voltage level of power supply:

Permissible voltage range for power transistors is between 18 and 55 volts (AC) or 24 and 75 volts (DC) comprising of input voltage and return voltage "EMF" from step motor coil.

Increasing supply voltage can raise speed and power of motor which are useful for lost steps. However, higher supply voltages can result in vibration of motor in low speeds. In addition, high voltage or damage alarms are likely to occur.

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8. Adjustment of the front panel Micro switches :

There are on the front panel drivers 8 micro switches . each of micro switches **Off** to the **left** and to the **right** will be **On** If the driver be held vertically and the terminal is in front of us and the LED indicator above.

9. Micro Step setting table:

	Microstep	Pulse/rev	SW1	SW2	SW3	SW4
2 Phase	1	Full step	off	off	off	off
Wave drive	1	Full step	on	off	off	off
Half step	2	400	off	on	off	off
Micro step	4	800	on	on	off	off
Micro step	8	1600	off	off	on	off
Micro step	16	3200	on	off	on	off
Micro step	32	6400	off	on	on	off
Micro step	64	12800	on	on	on	off
Micro step	128	25600	off	off	off	on
Micro step	256	51200	on	off	off	on
Micro step	256	51200	off	on	off	on
Micro step	256	51200	on	on	off	on
Micro step	256	51200	off	off	on	on
Micro step	256	51200	on	off	on	on
Micro step	256	51200	off	on	on	on
Micro step	256	51200	on	on	on	on

10. Driver output current setting table:

Ref Current (rms)	Peak Current	SW5	SW6	SW7
1.80 Amper	3.00	off	off	off
2.60 Amper	3.80	on	off	off
3.35 Amper	4.50	off	on	off
4.00 Amper	5.30	on	on	off
4.60 Amper	6.10	off	off	on
5.25 Amper	6.90	on	off	on
5.95 Amper	7.70	off	on	on
6.70 Amper	8.50	on	on	on

11. Current system setting in stop and full-load conditions:

Setting the current system in stop and full-load conditions is performed using switch the **SW8** switch. In normal condition, this switch is **OFF**. However, in certain conditions, this switch is **ON** to generate more currents in STOP condition.

Important notice: Once this switch changes its state, driver's supply should be turned OFF and ON one time.

12. Driver wiring:

Shielded cables should be used for signals in order to prevent the effects of noise and other cables.

Supply cable and motor cable should not be placed together with signal cable, that is, at least 10 cm distance should be considered between supply cable and signal cables.

When the driver is ON, plugging or unplugging terminals sockets are strictly prohibited; otherwise, damages are likely to occur.

13. Connecting motor to the driver:

Various two-phase and four-phase motors can be operated by this driver.

A) Four-lead motor connections:

Having four leads, this motor has the easiest connections. The power and speed of the motor depend on the coil inductance.
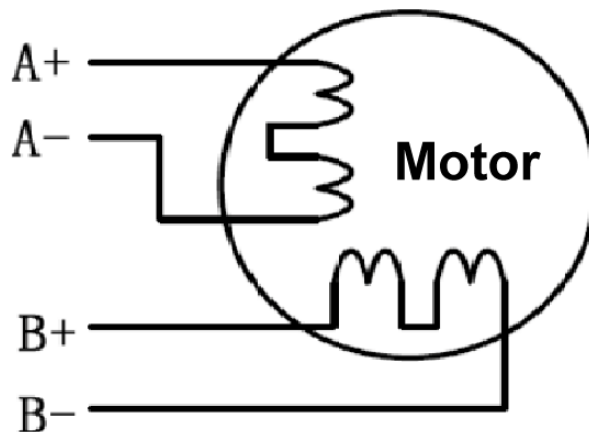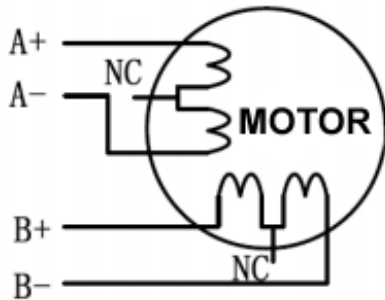

B) Six-lead motor connections:

Six-lead motors have two configurations for connecting to the driver. In order to reach the highest speed, half of the coils are used; while, the highest power is reachable by using the entire coils.
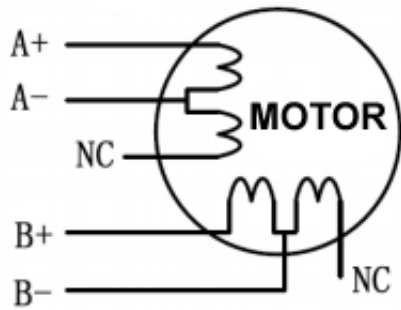
Configurations for higher speed

6-lead motor half coil (higher speed) connections


Configurations for higher torque

6-lead motor full coil (higher torque) connections

C) Eight-lead motor connections:

Eight-lead motors have also two configurations for connecting to the driver. In order to reach the highest speed, coils are connected in parallel. In addition, the highest power is reachable by connecting two sets of coils in series.

Configurations for higher speed
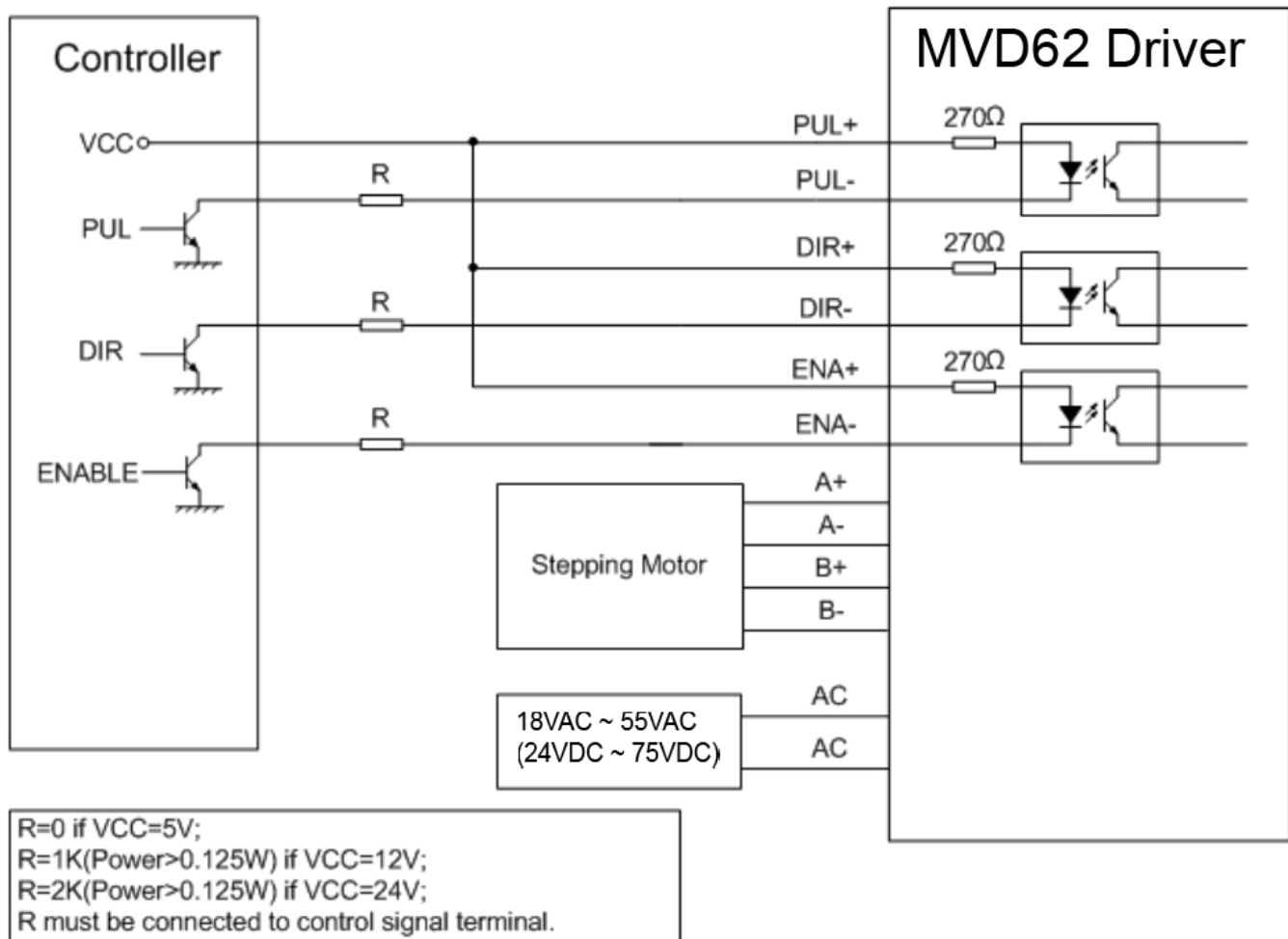
Configurations for higher torque
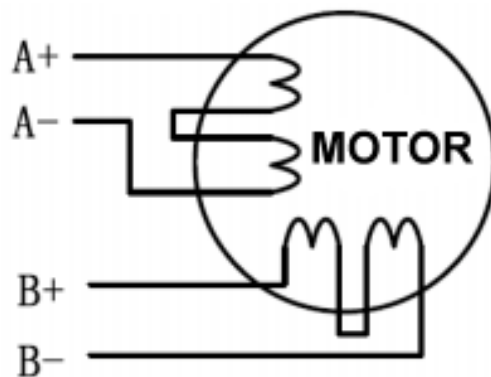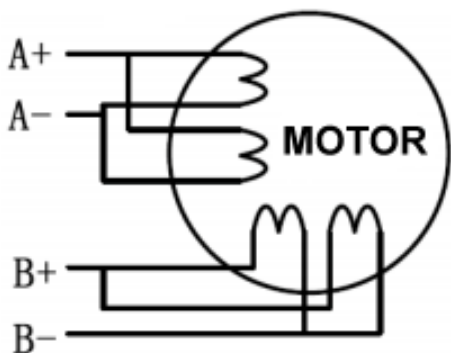
8-lead motor parallel connections

8-lead motor series connections

14. Protective system:

In the case of any abrupt increase in motor current or input voltage, electronic fuse will operate in few microseconds; then, all outputs will be disconnected and red lights will be ON, which if for protecting the hardware. Obviously, the driver will be damaged if input voltage violates the permissible limits.

15. full Connections guide for driver:

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.

Important notice: In order to avoid any damages to the driver, its block and step motor block should be earthed.

Thank you for your choice

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