PWM 系列直流马达驱动器

PWM DC MOTOR DRIVE

MMT-110/220DP04BL SPECIFICATIONS

济南科亚电子科技有限公司

Jinan Keya Electronic Co., Ltd

Please read this operation manual thoroughly before using this device.

Any failures and damages caused by non-compliance of precautions stipulated in this operation and installation manual are beyond the scope of warranty and the manufacturer disclaims any responsibility for them. This manual must be carefully kept. In case of any question, please contact us!

This picture represents a kind of important notice or warning.

Safety precautions

- Installation, connection and commissioning of this device shall be carried out by professionals.
- Do not install, remove or replace device circuit under charged circumstances.
- Please make sure that necessary protectors are mounted between power input end of this device and power supply (storage battery) to avoid accidents or fatal damages; Devices need to be mounted: over-current protector, fuse, emergency switch.
- Isolation and insulation protection between device and ground as well as devices shall be well equipped.
- In case that charged commissioning of this device is really needed, well-insulated nonmetal special screwdriver or special commissioning tools shall be used.
- This device shall be installed in well-ventilated environment.
- This device shall not be directly exposed to abnormal environments with high humidity, dust, corrosive gas and intense vibration.

I. Overview:

Jinan Keya MMT Series servo control system, PWM DC speed-regulating system are the high-precision electronic speed-adjusting devices with the latest international digital control speed regulation technology and special parts. The device adopts international standard technical specifications with the technical indicators which meet international requirements of similar products. The device has a simple structure, small size, light weight, and other advantages, which can be used for SZ series, ZYT series, Z2 Series with DC motor stepless speed regulation ranging from tens of Watts to 5KW. The product has multiple protection, security, stability and reliability. It can be fully compatible with similar international products, and has international quality and home-made prices.

II. Scope of application:

MMT series of DC speed governor are widely used in the machine tools, paper printing, textile printing and dyeing, fiber-optic cable equipment, packaging machinery, electrotechnical machinery, food processing machinery, rubber machinery, biological equipment, printed circuit board equipment, experimental equipment, welding cutting, light industry machinery, logistics transportation equipment, locomotives and rolling stock, medical equipment, communication equipment, and other industries.

III. Product performance

1. The mechanical characteristics of hardness, static error rate of 1%.
2. Wide speed-regulating range (0 - max).
3. Rapid dynamic response process.
4. Automatic smooth transition process during acceleration or deceleration.
5. Better excavator characteristics, can limit overload current to set value current.
6. High reliability and compact structure, high performance-price ratio.

IV. Characteristics of products

1. Speed regulation ratio 1:80 (Open loop)
2. Large moment at low speed operation
3. PWM pulse width modulation technology, low noise
4. Double closed loop PI regulation
5. Current settings, current limiting protection, over-current warning.
6. Setting function of soft starting and soft stop.
7. With fast response and good following.
8. Function of enabling block control.
9. Short current function.

V. Main Parameters:

1. Input Voltage：AC　110/220V±10%, depend on the controller label.

2. Output Voltage：DC 0~110V/220V or other voltage can be set.

3. Output Current：DC 4A

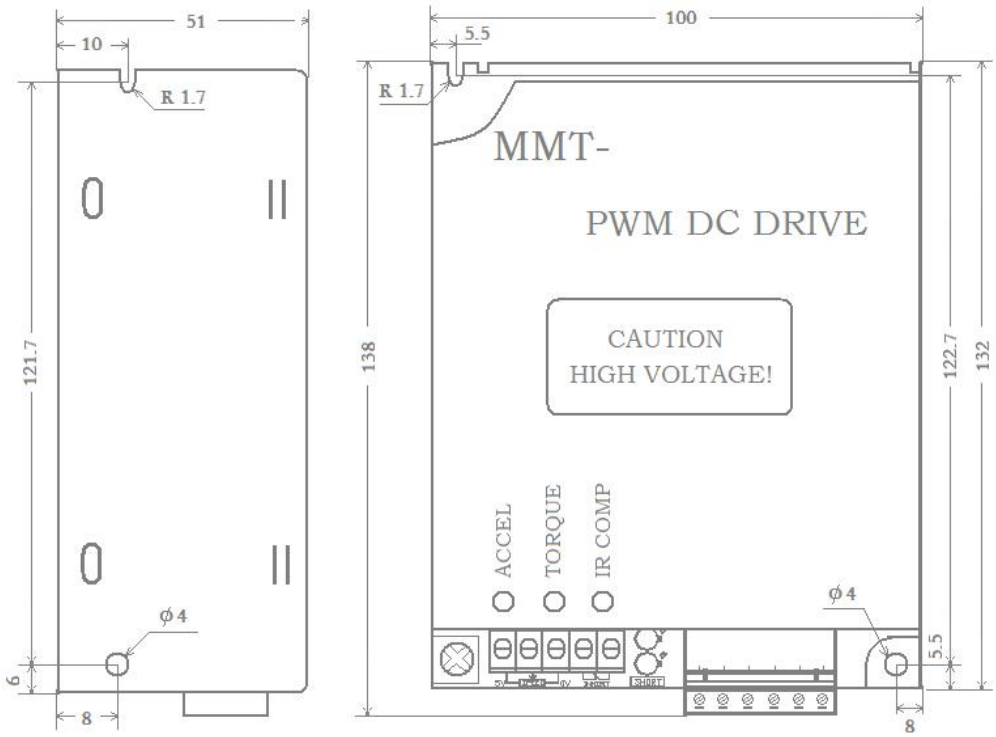
4．Rated Exciting Voltage/Current: DC 220V (110V) / 3A

5．Given signal model：potentiometer

6．The environment temperature： -10℃~+60℃

7．The environment Humidity: ≤ 80 RH relative humidity (Non-condensing)

VI. Boundary dimension: 132*100*50mm



单位：mm

VII. Installation requirements:

WARNING

1. Controller cannot be installed, connected or removed when powered. Otherwise accidents or severe damages may be caused. You should read and understand the details of "safety warning"(Page 1) before installation, and obey the rules strictly.

2. Drive element is sensitive to electrostatic magnetic interference shall be kept away from environments where static is easy to be generated; otherwise, speed controller may be damaged.

3. The driver shall be kept away from dust, high humidity environment and prevented from accidental contact. Sufficient space shall be reserved around the driver for easy ventilation and regulation.

4. When fixed, the driver shall be kept from other heat sources. Guarantee that the driver works in the specified environment temperature range.

5. The driver shall not be installed on equipments with extreme vibration; if not, precaution against vibration shall be taken.

VIII. Wiring requirements:

1. Do not connect wire under charged.
2. Insulated connection, shielded wire which match with driver's voltage current shall be selected and connected, specifications of driver's power input wire and motor's wire are shown below:

Wire Specification and Length Table

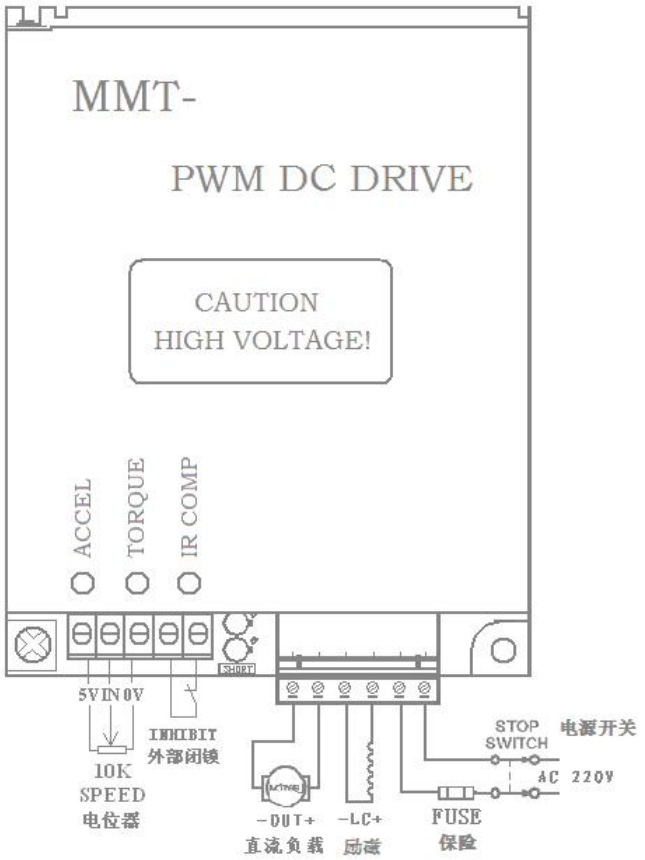
Current (A)	Wire specification (mm^2)	Max. length (m)
2	**0.5**	**15**
4	**0.75**	**15**

3. Signal line and control line shall adopt shielded wire and shall be separated with power input wire and output wire.

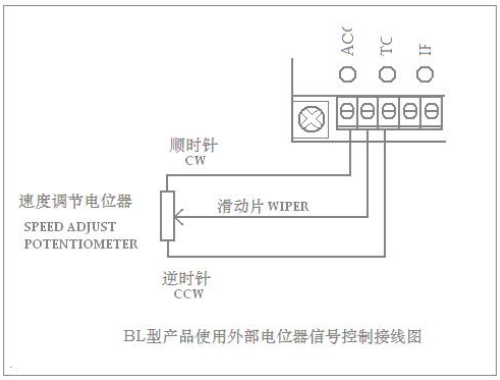
> ⚠ WARNING
> In any cases, signal line and logic control line shall not be bound, mixed and wired with power input wire, output wire (motor line) and other power lines. Induced voltage generated may cause interface, malfunction or directly damage the driver.

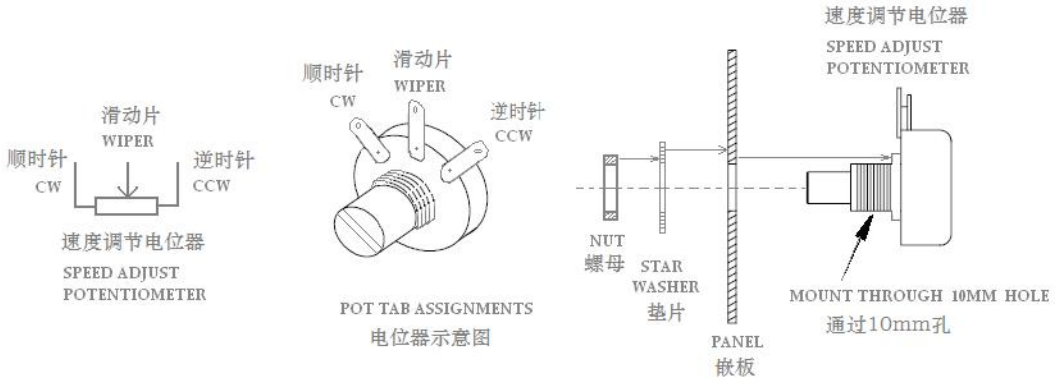
4. The driver do not have internal power supply reverse connection protection function, make sure that wiring between power input and driver is correct, otherwise the driver may be damaged.
5. Proper tools shall be used for wiring and make sure that wiring is correct.

IX. Driver terminal function diagram:



Connection about speed control potentiometer：





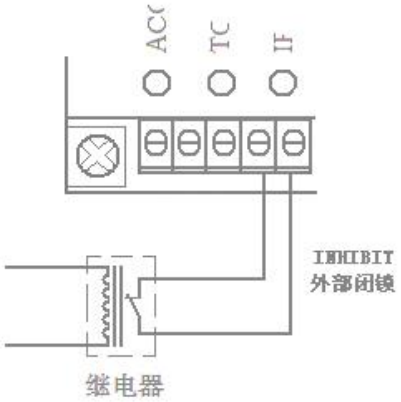
Caution:
Connecting wires of control terminals should be away from conductors of power input terminal and output in sake for reducing unnecessary interfere of electronic signals. The length of connecting wire should be shortening as far as possible. If the length is over 0.5m, the shielding wire is recommended.

Instructions of terminal blocks

1. AC IN: Access AC power source input terminal
2. LC + -: exciting output（connected to motor exciting terminal, when use PMDC motor, don't need connect LC+-）
3. OUT + -: Armature output (connected to motor armature)
4. External enabling circuit block（INHIBIT）: Enabling circuitry connecting - the control by a "enabling circuitry" to stop and open control (running when closed and stop when disconnected). Connect Switch to the terminal INHIBIT. See figure 1.

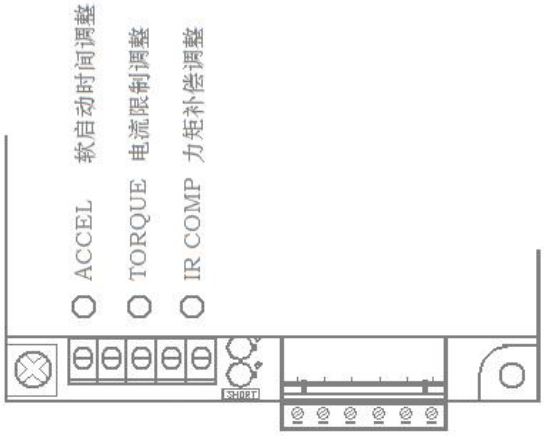
Figure 1

[Note] when the control distance is relatively long, please use the conversion transmission (nearby connection) mode, And must use the shield cable, the shielding cable is grounded at one end. As shown in the following figure:



[Note] this INHIBIT must be used when frequently controlling the start and stop of the motor. Otherwise, the controller may be damaged.

X. Instructions on adjustment of internal potentiometer （Forward increased）



1．Current Setting/Limiting Adjustment: TORQUE

This potentiometer adjustment is intended for setting/limiting the max output current of the driving board according to the rated current of the motor. Through adjusting this potentiometer, the max output current can be up to 120%~200% of the motor rated current.

2．Torque Compensation Adjustment: IR COMP

IR COMP potentiometer is used to keep the motor speed constant when the motor working with different loads.

3．Soft Starting Time Adjustment: ACCEL

Through adjusting this potentiometer ACCEL, the upward slope from the starting speed to the preset speed can be defined (i.e. the time required to reach the preset speed, optionally between 0.3—10s). See Figure 2

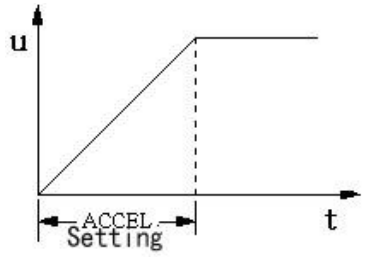


Figure 2

4. Soft Stopping Time Adjustment (we have fix it before delivery): DECEL

Through adjusting this potentiometer DECEL, the downward slope from max speed to the minimum speed can be defined (that is falling time, set time adjustable during 0-10 seconds). See Figure 3

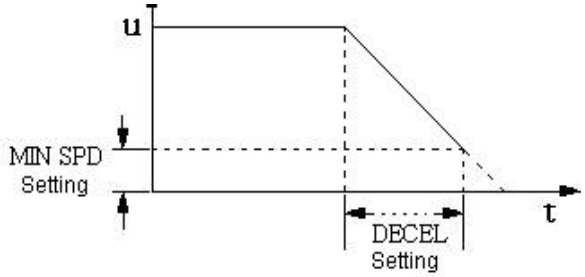


Figure 3

5. The highest output voltage adjustment: MAX COMP

Adjustment of the potentiometer can be make sure driver's highest output voltage, adjustment range: 50%---110%.

XI. Instructions of LED indicators:

1. **POWER**：Power normal instructions (Green)

2. **TORQUE**：Over current (Red)

When the output current of driver over "TORQUE" set value (see the first item in the adjustment instructions of potentiometer), the light is on (whether the driver stops output, please refer to the "Instructions on interpolation interface and plug-in selection"

Ways of reset: After troubleshooting, reset "INHIBIT" switch or reconnect driver's power source.

3. **SHORT**: Short circuit protection instructions (Red)

When the driver "+ OUT -" output terminal has the external short-circuit, the drivers will quickly stop exporting, at the same time light "L2 over current / short circuit protection indicator".

Reasons of reset: After identify the reasons and troubleshooting, re-connect driver's power source.

XII. Over current protection mode options (inside of the drive)

Short needle to A- B options:

Short access to short-needle A: The driver output current reaches the set value, the

drive will be automatically restricted in the current settings (TORQUE set value) to achieve protection purposes of the motor current limit. See Figure 4

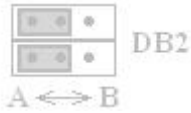


Figure 4

Short access to B end of needle: The driver output current reaches the set value of 0.7 seconds; the driver will automatically stop output, and maintain the state. See **Figure 5**

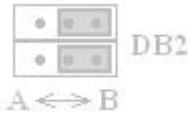


Figure 5

Warning!

It is non-isolated driver, all the external lead wires have high-voltage surge, please take insulation and other safety measures to avoid electric shock accidents!

XIII. Some actual connection example:

1. Conventional connection mode of one-way operation:

This kind of connection mode can use the "INHIBIT" can make switch control motor start or stop. As shown in figure 6

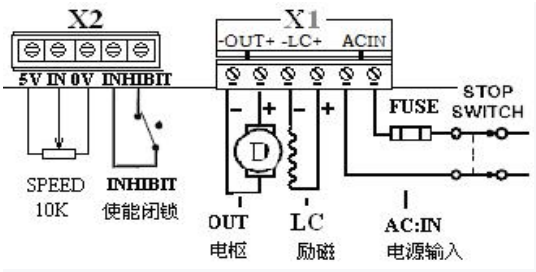


Figure 6

2. Example of wiring with simple forward/reverse reversing control mode:

This connection mode can be used to control the forward, stop, reverse of the motor by three poles three switches, as shown in figure 7

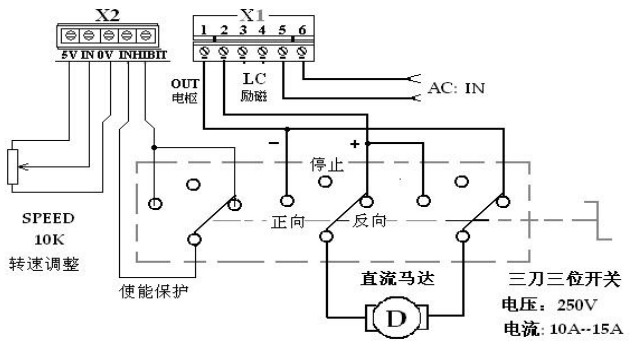


Figure 7

3. Example of contactor reversing connection:

This connection mode can be used for the linkage with other equipment or automatic control mode. As shown in figure 8.

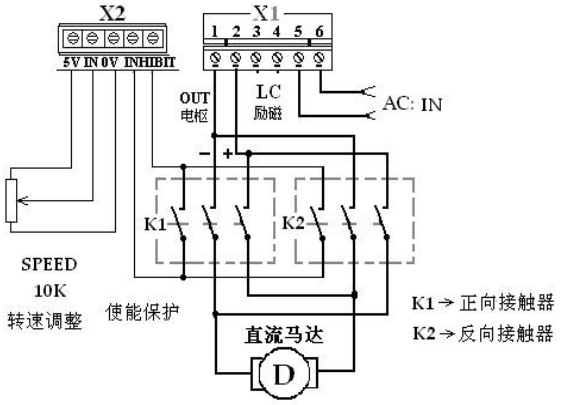


Figure 8

XIV. Solutions to Frequent Troubles

Troubles	Causes	Resolutions
The fuse is broken	1. Check whether the specification of the fuse is right. 2. Check whether the output is short- circuited. 3. Check whether the motor matches the driver.	1. Choose the right fuse according to the power of the motor. 2. Check the connection between the driver and the motor. 3. Choose a right driver.
The motor does not work	1. The input signal is 0V. 2. The INHIBIT terminal is closed. 4. Check whether the current output is limited. 5. Check whether the connection is right.	1. Adjust the speed potentiometer. 2. Disconnect the INHIBIT terminal. 3. After making sure the locked rotor is not the cause, adjust the TORQUE potentiometer setting. 4. Check the connection between driver and motor. (F1 F2: Connected to the motor's excitation.) (A1 A2: Connected to the motor's armature.)
The motor does not stop when the speed potentiometer has been set to the lowest	MIN SPD is set too high.	Adjust the MIN SPD setting.
The motor speed is too fast	1. MAX SPD and MIN SPD are set too high. 2. The motor lacks excitation voltage.	1. Adjust the MAX SPD and MIN SPD settings. 2. Check the excitation voltage of the motor.
The motor can not reach the required speed	1. MAX SPD is set too low. 2. IR COMP is set too low. 3. TORQUE is set too short. 4. The rotor is locked.	1. Adjust upward the MAX SPD setting. 2. Adjust upward the IR COMP setting. 3. Adjust upward the TORQUE setting. 4. Check the load of the motor (Adjust the motor specification if necessary.).
The motor vibrates after being loaded	1. IR COMP is set too high. 2. Current limit has not been set.	1. Adjust the IR COMP setting carefully until the motor speed is stable. 2. After making sure that the motor matches the driver, adjust the TORQUE setting.
The motor runs reversely	(A1 A2)+ — terminals are connected inversely.	Exchange the〔 A1 A2 〕+ — terminals.
The motor speed rises after being loaded	IR COMP is set too high.	Adjust downward the IR COMP setting.
The motor speed falls after being loaded	IR COMP is set too low.	Adjust upward the IR COMP setting.

COMPANY: Jinan Keya Electron Science And Technology Co.,ltd
Email:sales@jnky.com
ADD: NO.66-102 of Xinmao Qilu Technology Park, NO.1 of Zidong Road, Tianqiao District, Jinan Shandong China