MMT-

90DR10AL

110DR10AL

180DR10AL

220DR10AL

DC Controller instructions

Jinan Keya Electron& Technology 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 an 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 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.

⚠️**This picture represents an important notice or warning**

MMT-115/230DR Series DC motor driver is a kind of speed governing product developed and produced by adopting past successful experience and combining modern advanced technology. This series of products have met international standard requirements and are sold to many countries. This driver adopts thyristor chopping control principle and uses independent trigger mode. Even there is no velocity feedback, high speed ratio can be achieved to make it more accurate and reliable.

Excellent performance, reliable quality and high cost performance make it a strong performer in DC motor driver field and it was widely used in plastic machinery, food machinery, cable equipment, machining, paper printing, testing equipment, laboratory equipment and mixing equipment, etc.

I. Specification and model

■SMT technology, small size

■Good following features, rapid respond speed

■Wide speed ratio, strong mechanical features

■Applicable to permanent magnet ,separate excitation type and DC torque motor

■Double closed-loop PI regulation (Voltage, current)

■Current setting and current-limiting protection (continuous operation setting current)

■Large low speed output moment

■Over-current protection function

■Quick stop function

■Arbitrary setting of upper and lower speed

■Soft start, soft stop setting function

■Selection of speed mode, torque mode

■Normally open, close selection of enable signal

■Selection of input, output voltage switch

■Driver speed governing controlled by standard signal input 0-5V or 10K potentiometer

II Specifications and models:

| Model	Max output current DC: (A)	Max output voltage DC: (V)	Rated input voltage AC: (V)
90DR10AL	10	90	220V±10
110DR10AL	10	110	220V±10
180DR10AL	10	180	220V±10
220DR10AL	10	220	220V±10

III.Technical Parameters:

☐ Input voltage AC: 220V ± 10% (Other voltage can be customized according to customer requirements)

☐ Frequency: 50 / 60HZ ± 5%

☐ Output voltage DC: 0 ~ 90V 0-110V 0-160V 0-180V 0-220V (Can be set)

☐ Rated excitation current: (DC110V or 220V) 3A

☐ Rated output current: 10A

☐ speed speed ratio: 80:1

☐ Output voltage accuracy: ≤ 0.1%

☐ Ambient temperature: -10 ℃ ~ +60 ℃

☐ Humidity:Relative humidity ≤ 65% (no condensation)

IV Product performance:

1．Strong mechanical features, static rate is 1％.

2．Wide speed governing range (0-MAX SPD setting value)

3．Rapid dynamic response process

4．Automatic smooth transition process during speed up and cut.

5．Good excavation features which automatically limit over-current within the range of set value.

6．High reliability, compact structure, extremely high cost performance

Installation instructions:

L * W * H = 150mm *115mm * 60mm
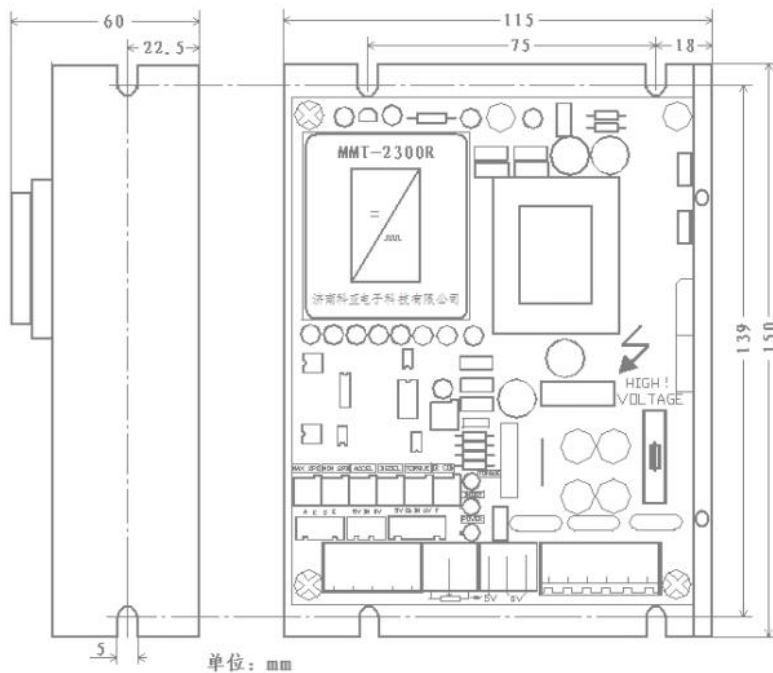
V:Wiring diagram:
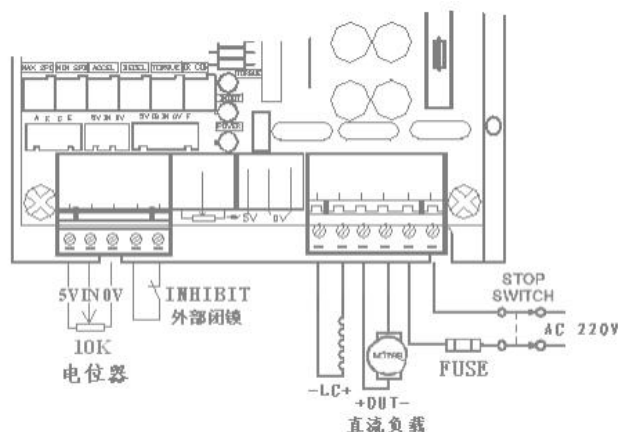
The choice of control signal input method:

This controller is designed in full isolation mode, the external given signal can be directly connected with the signal input of the driver.　Note: Potentiometer wiring is best to use shielded cable.
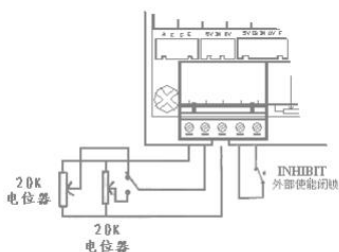
　1, the external potentiometer signal and analog signal connection mode:
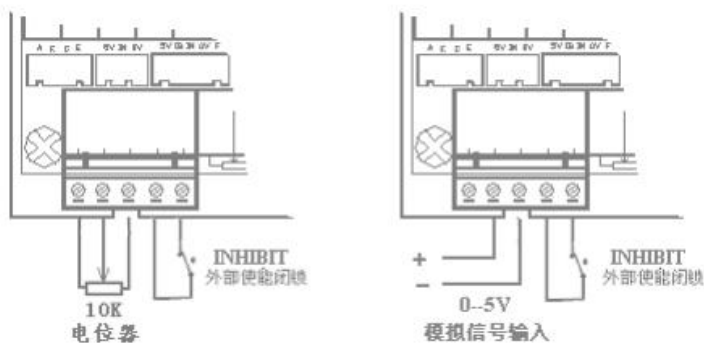
2, Potentiometer string / parallel use:

Mode 1: Potentiometer parallel

This control method can be adjusted two or more areas, the usage is simple and reliable. However, the total resistance of the potentiometer must be equal to 10K.　Note: Potentiometer wiring is best to use shielded cable.


Mode 2: Resistors in series

This control method can achieve multi-speed control, used in a variety of occasions. However, the total resistance of the resistor in series must be equal to 10K.Note: Potentiometer wiring is best to use shielded cable.
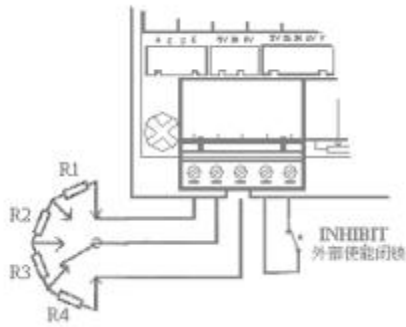
Ⅵ:**Enable control: INHIBIT**

Enable connection: This control mode stops and opens the controller output through an "enable line". Connect the switch to terminal INHIBIT, see below.
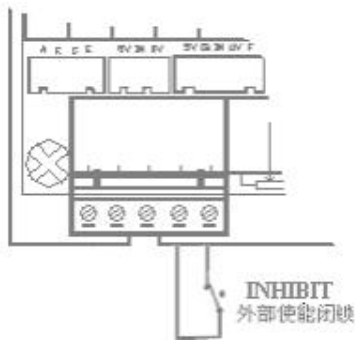
When two ends of "enable control terminals" are closed, its internal circuit will rapidly accelerate the motor speed until reaches MAX SPD setting value.

When two ends of "enable control terminals" are disconnected, its internal circuit will rapidly decelerate the motor speed until reaches MIN SPD setting value(Note: see J3 contact pin settings), in case that setting value of MIN SPD is 0, motor will be stopped.

Note: wiring of enable control shall be shielded wire.

Note: when the motor is started, stopped frequently, terminal control shall be used. Otherwise, equipment may be damaged.

Ⅶ:**AC input voltage Description:**

Description of AC input power

1. A quick-fused fuse and power main emergency switch shall be mounted between power input end and power supply to protect the driver from necessary emergency power off. See figure below：

STOP SWITCH

AC 220V
交流输入

保险 FUSE
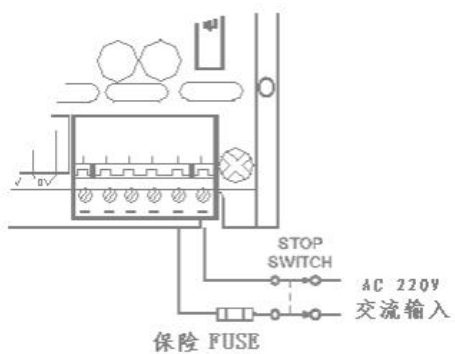
Ⅷ: **Description of DC motor wiring**

-LC+
+OUT-
直流负载
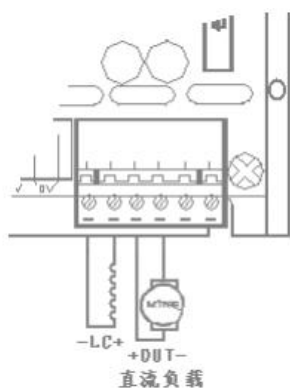
Note: The wiring is for incentive motor as a example, if the motor is a permanent magnet motor, -LC + will be hang.

Ⅸ: **Field voltage Description:**

全波式整流

半波式整流

-220V+

+110V-

Note: The field voltage is corresponds to the AC input voltage (eg AC input 220V, full-wave rectified output: DC 220V, half-wave rectified output is DC 110V).

Ⅹ:**Fast braking (energy braking) connection:**

Such control mode can achieve good breaking effect.

Selection of break resistance: P (power of break resistance) = actual power of motor×0.8

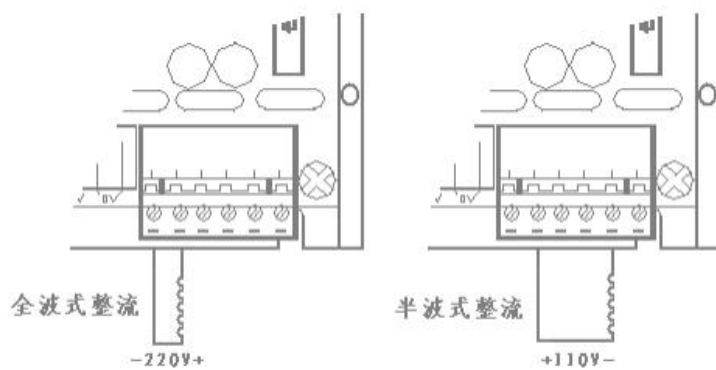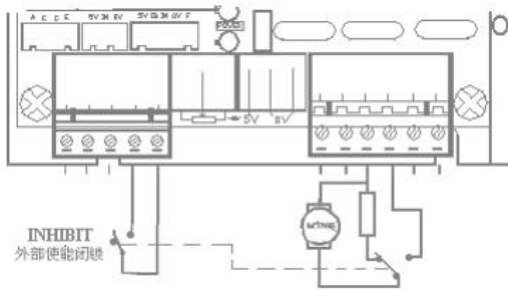P (value of break resistance) = rated voltage ÷(rated current×1.2)

Note: When such mode is used for breaking (dynamic breaking), be sure to be used with enable terminal cooperatively, otherwise, drivers may be damaged.

ⅩⅠ. Reverse control mode of forward/reverse rotation
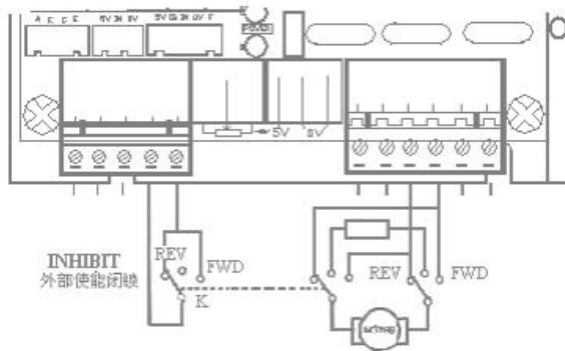
Note: When such mode is used for breaking (dynamic breaking), be sure to be used with enable terminal cooperatively, otherwise, drivers may be damaged.

ⅩⅡ. Indicator description
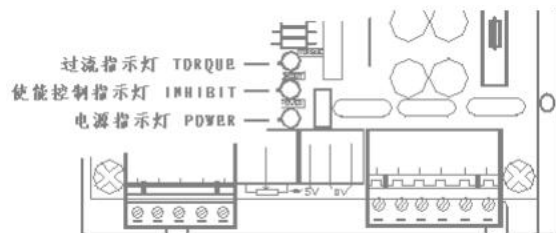
1, Power indicator (green): POWER

Various internal working power supply is normal and stand ready, the light is on;

2, Enable the control indicator (yellow light): INHIBIT

When the external enable terminal is disconnected, the light is on (the controller does not work); when the external enable terminal is on, the light is off (the controller is working).

3, Over-current indicator (red): TORQUE

When the output current reaches the setting value of TORQUE, the light will be on (keep running at the setting current); if the setting value of TORQUE is not reached, the light will be off.

XIII:Potentiometer adjustment instructions:
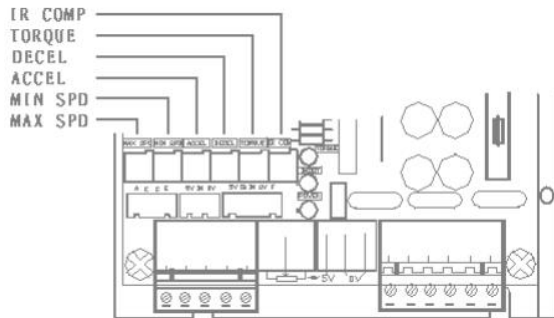
The factory setting is as follows:
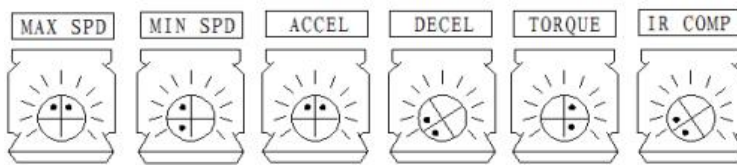
Note: adjustable angle of all potentiometer is 273°.

1, Maximum speed limit: MAX SPD

Turn the given potentiometer up to maximum value, and then regulate MAX SPD potentiometer to limit the maximum output revolving speed, clockwise rotate to increase output voltage.

2, Minimum speed limit: MIN SPD

Turn the given potentiometer up to minimum value, and then regulate MIN SPD potentiometer to limit the minimum output revolving speed, clockwise rotate to increase output voltage. Note: The speed set by MIN SPD is not controlled by INHIBIT terminal control.

3, Soft starting time regulation: ACCEL

Regulate the ACCEL of such potentiometer can confirm that clockwise time of rising slop rises from initial speed to setting speed (i.e. rise time, setting time can be adjustable within 0.2-20s).
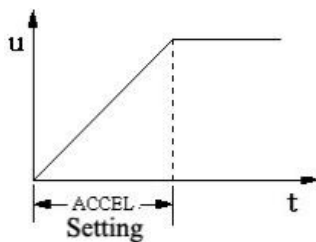
4, Soft stopping time regulation: DECEL

Regulate the DECEL of such potentiometer can confirm that clockwise time of descending slop declines from maximum speed to minimum speed (i.e. fall time, setting time can be adjustable within 0.2-10s).

Note: The minimum actual speed is limited by the MIN SPD potentiometer setting.

5, Current limit regulation: TORQUE

Regulate such potentiometer can limit the maximum output current of driver board, according to motor's rated current settings selected, maximum output current of driver board shall be 120%-200% of motor's rated current. Clockwise rotate to increase current.

6, Torque compensation regulation: IR COMP

Regulate IR COMP potentiometer to operate the motor under different loads and keep it revolving speed constant, clockwise rotate to increase torque.

XIV:Introduction of special interface

1, The sensor line interface: with Keya company dedicated sensor line (CGX-02)

2, Digital interface: with Keya company dedicated digital form (SX-R01).

3, Digital display control panel: Dedicated digital control panel with Keya company (SX-R02).

Solutions to common faults

Faults	Causes	Solutions
Fuse is blown	1. Fuse is not applicable. 2. The output has short circuit. 3. Motor does not match with the driver.	1. Select proper fuse according to motor power. 2. Check the wiring between driver and motor. 3. Select proper driver.
Motor is out-of-operation	1. Command signal is 0 V. 2. Disconnection of INHIBIT enable terminal. 3. Current output is limited. 4. Wiring is incorrect.	1. Regulate speed potentiometer. 2. Close enable terminal: INHIBIT 3. Confirm whether motor is locked. Regulate the setting of TORQUE potentiometer. 4. Check the wiring between driver and motor. (0UT+ - Terminal: armature which connects with the motor)
Speed of potentiometer is at minimum but motor cannot be stopped.	Setting of J3 contact pin	Setting of J3 contact pin is 2
Motor speed is too fast	Setting of MAX SPD and MIN SPD is too high	Regulate MAX SPD and MIN SPD setting.
Required speed of motor cannot be reached	1. MAX SPD setting is too small 2. IR COMP setting is too small 3. TORQUE setting is too small 4. Motor is blocked	1. Increase MAX SPD setting. 2. Increase IR COMP setting. 3. Increase TORQUE setting 4. Check the motor load [if required, regulate the motor's specifications].
Motor vibrates after acting load	1. IR COMP setting is too big 2. Lack of current limit	1. Carefully regulate the setting of IR COMP until the motor speed remains steady. 2. Regulate the TORQUE setting after confirming that motor matches well with the driver
Motor runs in reverse direction	Reversal connection of [0UT] + —terminal wiring	Exchange [0UT]+ —terminals

Speed up after acting load of motor	IR COMP setting is too big	Decrease IR COMP setting
Slow down after acting load of motor	IR COMP setting is too small	Increase IR COMP setting