USER MANUAL OF BRUSHLESS MOTOR SPEED CONTROLLER

Part number: **MTR-019.CTL**

Introduction

The **MTR-019.CTL** is an advanced digital speed controller that uses the latest technology to precisely manage brushless motors. It works best with **brushless speed-regulating motors that are 400 watts or less**.

What It Does:

This controller can completely replace older **AC induction motors** and **brushed DC motors** in your setup.

Key Benefits:

- **Powerful at Low Speeds:** Get strong twisting power (**high torque**) even when the motor is running slowly.
- **Flexible Speed Control:** Adjust the motor's speed across a very **wide range**.
- **Quick Start and Response:** The motor will **start and respond quickly** to your commands.
- **Saves Energy:** It operates with **high efficiency**, meaning it uses less power and helps you save on energy costs.

Precautions

To ensure your safety and the proper functioning of your device, please observe the following precautions:

- **Avoid Hazardous Environments:** Do not use this product in areas containing **flammable gas**, **corrosive substances**, or

where it may come into contact with **water**. Keep it away from all **flammable materials**.

- **Protect from Debris:** Take steps to prevent **flying metal chips** or other foreign objects from entering the drive unit.
- **Professional Handling:** All procedures for **setting up, connecting, operating, inspecting, and troubleshooting** this device must be carried out by **qualified personnel** and strictly according to the provided instructions.
- **Power Off Before Handling:** Always ensure the unit is **switched off** before attempting any **movement, installation, connection, or inspection**.
- **Residual Voltage Warning:** Even after switching off the power, **wait at least 30 seconds** before touching any terminal connections on the drive. There may be **residual voltage** present, which could cause an electric shock.
- **Environmental Conditions:** This product is designed for **indoor use only**. It must be protected from **direct sunlight, rain, water droplets, condensation, and corrosive gases**.
- **Motor Compatibility:** This product is exclusively compatible with **motors supplied by our company**. We cannot accept responsibility for any issues arising from **unauthorised modifications**.

Key Features

- Low Speed, High Torque
- Wide speed range
- Simple to Operate
- Rapid Start-up and Response
- Highly Efficient and Energy-Saving

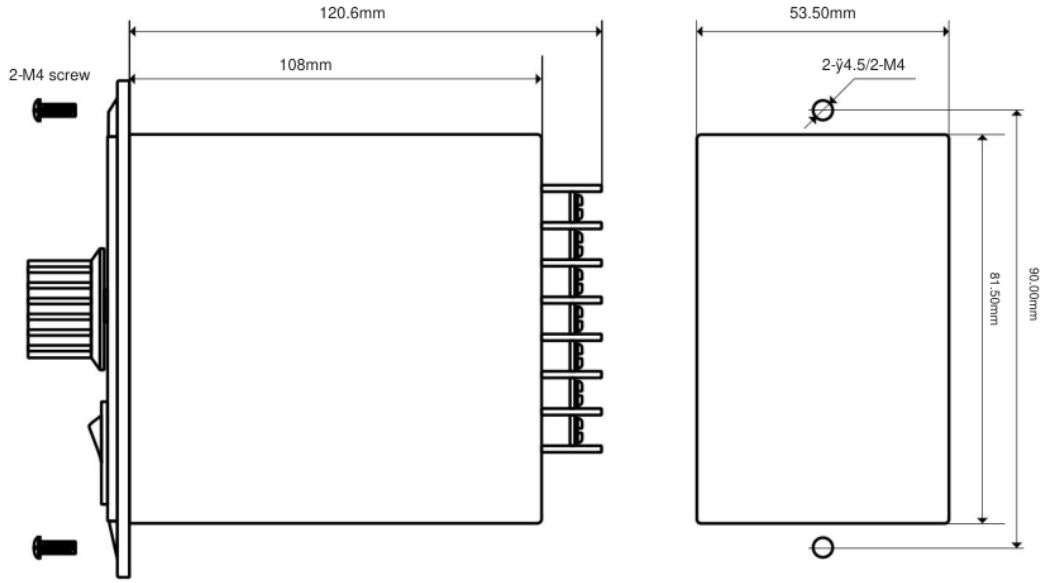
Please pay close attention to the following warnings to prevent damage to the unit or personal injury:

- Always **ground yourself** to discharge any static electricity before handling the device.
- Ensure you **install the specified grounding ring** correctly.
- Do not touch any **connectors on the component boards**.
- Do not touch the **circuitry of any components** within the device.

Operating Environment

Operating Ambient Temperature	-10~50°C
Operating Environment Humidity	<80% RH, condensation or frost present
Use Height	Altitude below 1000M
Use Environment Vibration	Maximum vibration < 5.7m/s
Storage temperature	-20~50°C, avoid dusty environments

Dimensions



Electrical Parameters

Input Voltage	AC220V
Input Current	4.5A Max
Peak Current	8.5A Max
Work with motors	400W Max
Speed Control	Manual control /Pulse Frequency / PWM

Functions

- **Digital Control and Display:** This product is a **digital brushless speed controller** with a built-in display, ensuring clear and accurate control.
- **External Control Compatible:** You can easily control the motor's speed using signals from an external **host computer** (like a PLC or microcontroller) via **pulse frequency** or **PWM** (Pulse Width Modulation).
- **Multi-Mode Display:** The built-in display can show you various important details, including the **motor's speed**, the **reducer's output shaft speed** (which you can set using an electronic gear ratio), and **alarm codes** if an issue arises.
- **Alarm and Speed Output:** The controller can send **alarm signals** and **speed feedback** directly to your host computer for enhanced system monitoring.
- **Adjustable Acceleration/Deceleration:** There's a convenient knob at the back for adjusting how quickly the motor speeds up or slows down. You can set this range from **0 to 15 seconds**, or even customise it further using software.

Motor Rotation Direction Setting

You can easily change the direction your motor spins.

- **Default Direction:** By default, the controller is set for **clockwise (CW) rotation**.
- **Changing to Counter-Clockwise (CCW):** If you need the motor to spin counter-clockwise, simply move the **short-circuit wire** from the **CW position** to the **CCW position**. This means you'll create a short circuit between the **CCW terminal** and **GND/COM**.

Manual Direction Switching

For manual control of the motor's direction, we recommend using a **rocker switch**. Suitable models include the **SW-RCK-029** or **SW-RCK-010**, depending on your specific application.

SW-RCK-029

SW-RCK-010

Switching Direction via PLC or Host Computer

If you need to switch the motor's direction using a **PLC** or another **host computer**, you can connect the **CW**, **CCW**, and **COM** terminals directly to the output terminals of your PLC or host computer. This allows you to change the motor's direction without needing an external relay (please refer to Diagram 1 for wiring details).

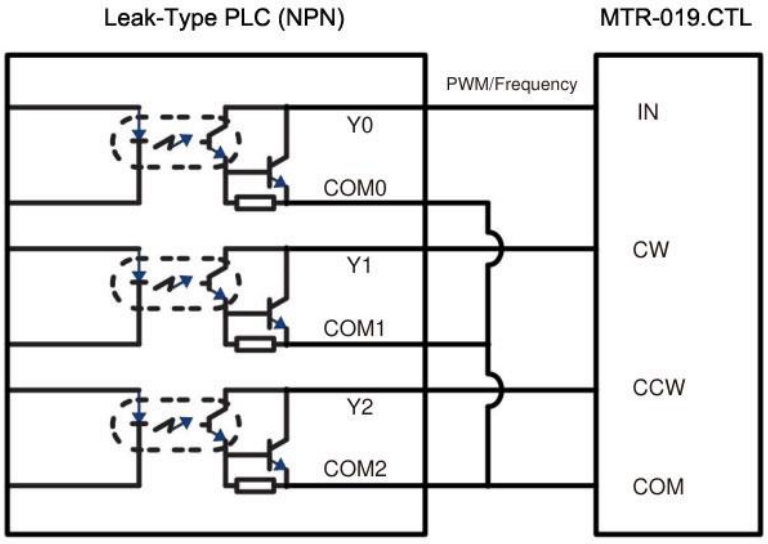
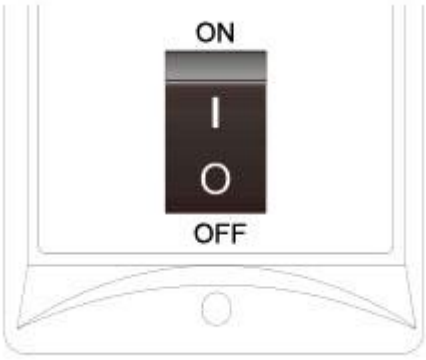


Diagram 1

Start & Stop The Motor

You have a few ways to start and stop your motor:

- **Using the Panel Switch:** Simply use the **ON/OFF switch on the control panel** to start, stop, or shut down the motor.

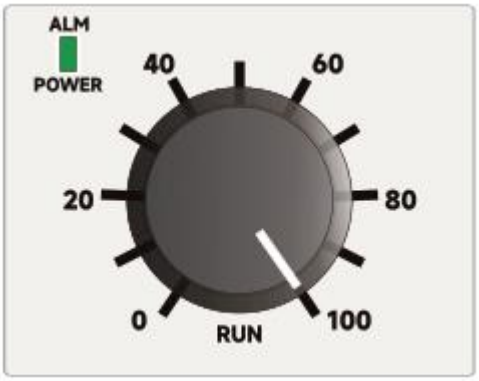


- **Using a Rocker Switch for Remote Control:** You can also control the motor's start and stop by disconnecting the connections between **CW and GND/COM**, and between **CCW and GND/COM**. We recommend using a rocker switch for this, such as models **SW-RCK-029** or **SW-RCK-010**, depending on what works best for your setup.
- **Via a PLC or Host Computer:** If you're using a **PLC** or another host computer for control, you just need to simultaneously disconnect the **CW and CCW direction signals**. This will effectively start, stop, and shut down the motor (please refer to Diagram 1 for wiring instructions).

Speed Control

You have several ways to control the motor's speed:

- **Using the Control Panel Knob:** By default, you can simply adjust the **potentiometer knob** on the unit's panel to set the desired speed.



- **Using PWM (Pulse Width Modulation):** For more advanced control, you can regulate the speed by sending a **PWM signal** from a PLC or another host computer. This works with **NPN Leak-type PLCs**. (See Diagram 1 for wiring instructions.)
- **Using Pulse Frequency:** You can also control the speed by providing a **frequency signal** from a host computer, such as an **NPN Leak-type PLCs**. For this method, **1 Hz equals 1 RPM** (revolutions per minute). (Refer to Diagram 1 for wiring details.)

Signal Input and Output

The MTR-019.CTL provides important signalling features to keep you informed about its status and the motor's performance:

- **Alarm Output (Default):** If the speed controller experiences an abnormality, the motor will stop, and a specific **alarm code** will appear on the display. When the **OUT port** is set for alarm output, it will connect to **COM** and operate at a **low electrical level**. (Refer to Diagram 2 for wiring.)
- **Speed Output:** As the motor runs, the controller will provide a **synchronised frequency output** that directly reflects the current motor speed. For this output, **1 RPM (revolutions per minute) equals 1 Hz**. (See Diagram 2 for wiring details.)

Please contact your supplier or our technical support if you require functions other than these default settings.

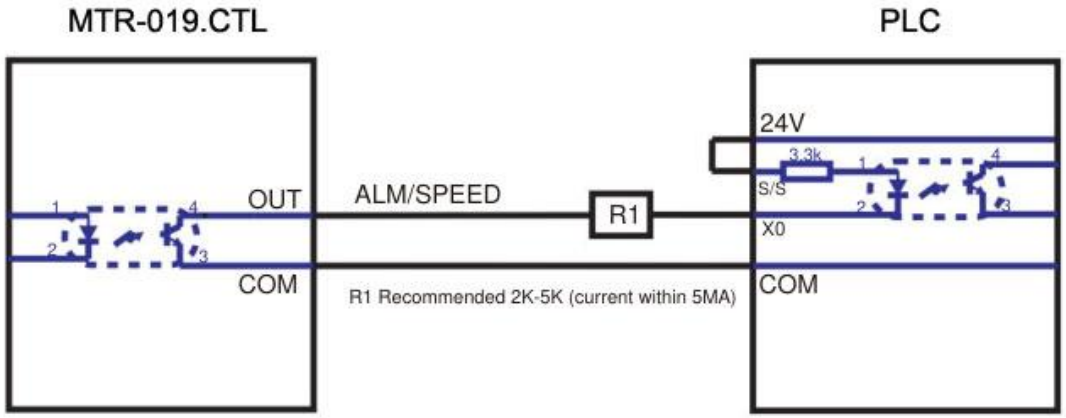


Diagram 2

Alarm Codes

Display	Type of Alarm	Cause	Solution
AL01	Over-current	Short circuit in the junction line / hardware failure	Reconnect the connector/replace the driver
AL02	Over-heat	The driver is operating at an elevated environmental temperature / hardware failure	Switch the driver off and let the machine cool down
AL05	Hall line failure	Poor contact or incorrect connection of the Hall line / hardware failure	Check the connection of the hall line / replace the driver
AL08	Stall Alarm	The motor does not rotate for a specified period of time.	Check if the motor is stuck or overloaded
10-20	Hardware failure	hardware failure	Try switching it off and on again
30/31/32/33	Storage failure	hardware failure	Try switching it off and on again

Serial Port

Located on the side of the product, under the label, you'll find the **serial port**. This port allows for advanced configuration of your motor system.

Through the serial port, you can adjust settings such as:

- The **number of motor pole pairs**.
- The **maximum rated speed** of the motor.
- The **acceleration and deceleration settings** for when the motor starts and stops.

Please get in touch with your supplier or our technical support team if you need any more instructions.