WAT EC Motor

Quick Operation Guide

WARNING: CAUTION Before Starting Work:
Safety and Security Warnings

1. Disconnect Power Source: Before starting work on the electric motor or system, disconnect the power source. Ensure power is off, and use a lockout mechanism accessible only to authorized personnel.

2. Use Personal Protective Equipment (PPE): To prevent electrical shock, burns, or mechanical injuries during work, use appropriate PPE, including insulated gloves, safety goggles, anti-static wrist straps, and suitable work shoes.

3. Secure the Workspace: Ensure the workspace is free from clutter. Keep high-voltage equipment away from water and moisture. If working near power lines, inform nearby personnel and ensure a safe distance is maintained.

4. Verify Proper Connections: Pay attention to the power and signal cables in the WAT Motor cover, as shown in Figure 1. Before powering the system, check that all connections listed in Tables 1 and 2 are secure and correct.

5. Verify Grounding Connections: Ensure the motor and all related equipment are properly grounded to prevent electric shock and system errors. Lack of proper grounding can lead to serious injury or equipment damage.

6. Short Circuit and Overcurrent Protection: Use fuses and circuit breakers to protect against overcurrent or short-circuit risks in the electric motor system
This protection prevents motor overload and potential malfunctions.

7. Observe After Powering On: Once powered, observe the motor and surrounding equipment for proper operation. Stop the system immediately and recheck connections if you notice abnormal sounds, overheating, or vibrations

8. Emergency Stop: Ensure the emergency stop button is accessible to quickly stop the motor and system in an emergency. This minimizes potential hazards.

9. Periodic Maintenance and Control: Regularly maintain the motor and electrical system. Check cable connections, grounding, and signs of wear and tear on equipment.

1. Connections

Before starting work, make sure that all necessary safety precautions have been taken and that you have the required equipment with you. Ensure that the power source is off and that you are using appropriate personal protective equipment.
The WAT Motor cover has two cable outputs: a power cable and a signal cable.
Before powering the system, check that the connections listed in Table 1 and Table 2 are secure and correctly made.

1.1. Power Cable Connections

CABLE	FUNCTION	WIRE COLOR
1	L1	Brown
2	L2	Black
3	L3	Grey
4	Protective Earth	Yellow/Green

Tablo 1: Power Cables

1.2. Control Cable Connections

Detailed information about the control cables is available in Table 2.

CABLE	FUNCTION	WIRE COLOR	NAME
1	DC 24V output	Red	100mA max.
2	DC 10V output	Yellow	20mA max.
3	AI 2	Purple	
4	AI 1	Blue	0-10V Speed control
5	DO	Pink	Alarm
6	RS485 A	Green	
7	RS485 B	Gray	
8	DI 2	White	CW/CCW
9	DI 1	Orange	Run/Stop
10	COM	Black	Logic Ground

Table 2 Control Cables

2. Start/Stop

2.1. Starting/Stoping Your WAT EC Motor

24V can be supplied to the DI1 pin by using the internal 24V power supply on the control cable or by an external power supply connections. As shown in Figure 2, voltage can be supplied to the DI1 pin using the 24V power supply voltage between the WAT EC Motor control cables or an external voltage source.
To stop the system, the power supply to the DI1 input must be removed.

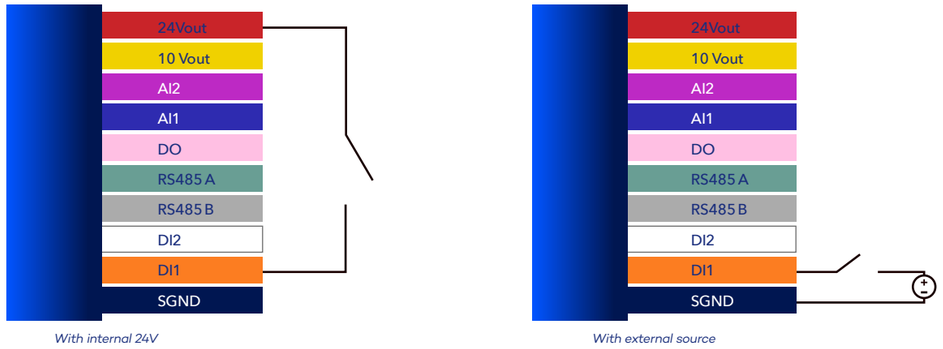


Figure 2 Start/Stop Wiring Diagram

3. Speed Adjustment

3.1. How to Adjust the Speed of Your WAT EC Motor?

First, make sure that you have all necessary tools on hand and always prioritize safety. Verify that the power source is off, the WAT EC Motor's electrical connections are secure, and that you are wearing appropriate personal protective equipment. After confirming that all required safety measures are in place, proceed with the process.
The speed reference can be applied by using internal 10V source and external potentiometer or by connecting an external controller as shown in Figure 3.

Analog Signal Input

You can use a 0-10V DC analog voltage signal as an input for the WAT EC Motor.

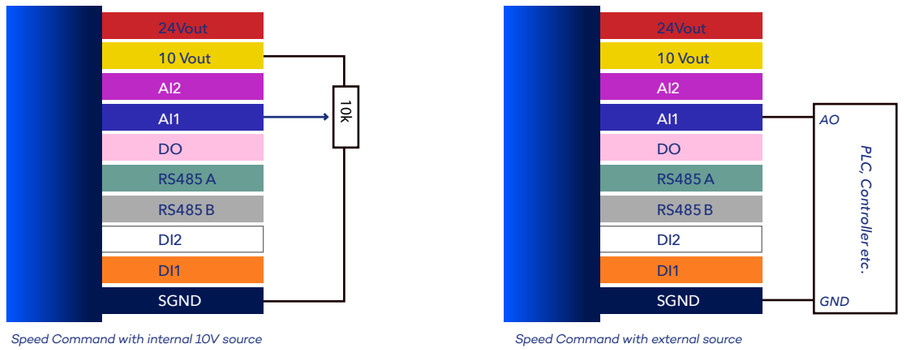


Figure 3 Speed Adjustment Wiring Diagram

For speed control, connect an external potentiometer, PLC, or other analog signal source to the AI1 cable on the WAT EC Motor, as shown in Figure 3.

Analog Input - Speed Reference

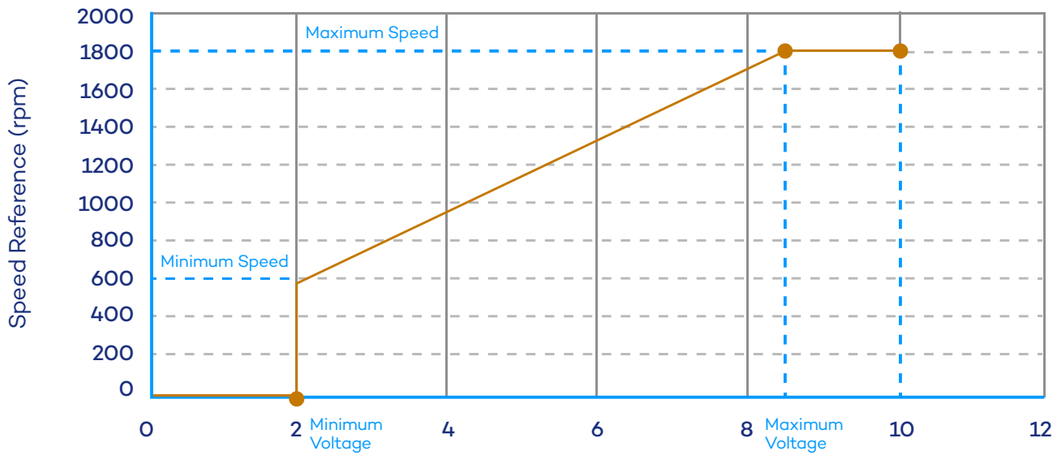


Figure 4 Analog Signal Input and Speed Reference

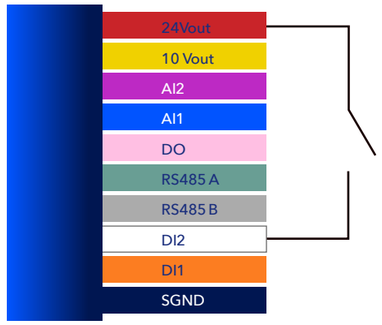
After making the relevant settings, the procedures described in the start/stop step should be performed to activate the motor.

Note: You can set the speed range and speed adjustment precision you want to use in the WAT EC Motor via the MODBUS interface according to your application requirements. With these settings, you can define the maximum and minimum speed values of your motor, as well as the analog input sensitivity. If you do not make these settings, the system will continue to operate with the default values shown in Figure 4.

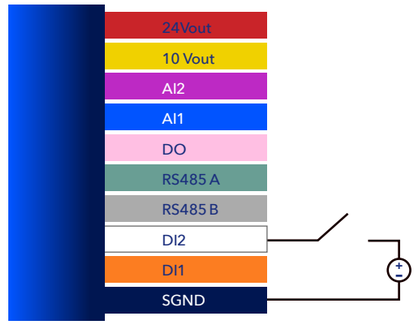
4. Changing the Direction of Rotation

4.1. How Can You Adjust the Direction of Rotation of Your WAT EC Motor?

First, ensure that you have all the necessary tools at hand and always prioritize safety. Make sure the power supply is turned off, that the electrical connections of the WAT EC Motor are made correctly, and that appropriate personal protective equipment is worn. After confirming that all necessary safety precautions have been taken, proceed with the operation.



Rotation change with internal 24V source

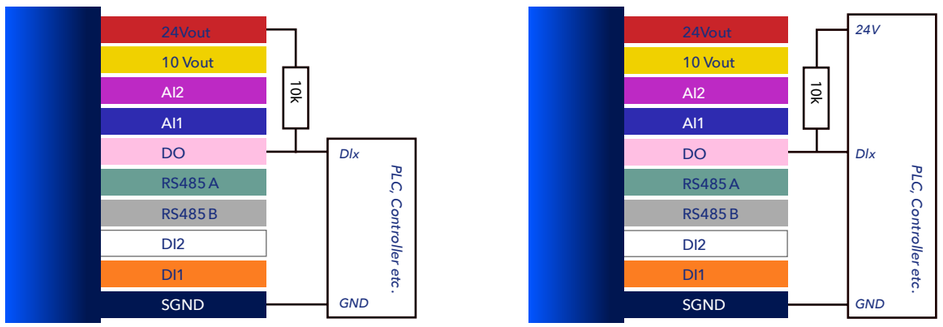


Rotation change with external 24V source

The direction of rotation of the WAT EC Motor can be adjusted by applying a voltage level to the DI2 pin. When making cable connections, it is recommended to ensure that the power is turned off for safety reasons. A 24V voltage can be implemented through the WAT EC Motor wiring or using an external power supply, as shown in Figure 5. The direction of rotation can be set by connecting a switch between the DI2 and 24Vout cables.
The switch should be OPEN for counterclockwise (CCW) rotation and CLOSED for clockwise (CW) rotation.
The direction of rotation is defined when viewed from the drive end of the motor (shaft).
If the direction of rotation is changed while the motor is running, the motor will slow down, reverse its direction, and then return to its previous speed.

5. Error Condition

When an error is detected on the WAT EC Motor, the DO (error notification) signal will drop to a low voltage level (SGND).



Open Controller fault output with internal 24V source (maks current 40mA)

Open Controller fault output with external 24V source (maks current 40mA)

Figure 6: Error Notification Signal Wiring Diagram

The recommended connection diagram for obtaining information through the relevant pin is shown in Figure 6.

Note: The DO pin can provide a maximum output current of 40 mA. The pull-up resistor to be connected should be selected according to this current level.

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