MC21 Reversing Motor Controller

The MC21 interfaces to the Argus control system to provide relay control for reversing electric motors in greenhouse and horticultural systems.

Applications

The MC21 Reversing Motor Controller is designed to be a universal reversing motor controller interface.

It can be easily field jumpered to control almost any single or three-phase reversing motor used in horticultural applications.

Examples of typical controlled equipment include roof and wall vents and shade curtains.

Alternatives

Use a motor reversing control box supplied by the reversing motor manufacturer. Please note that the Argus Control System requires open, close, and common connections at 24 V to interface to the manufacturer supplied control box. Use an Argus relay panel with built-in reversing motor controls. Refer to the **AIMS product data sheet** for additional information.

There are some specific reversing motor types such as instant-reversing motors with internal limit switches (e.g. Somfy tube motors) that do not need all the features of an MC21 controller. A field constructed relay box is usually more economical.

Options

- **Internally Mounted Transformer**– Space is provided for mounting a 24 VAC Class 2 transformer. This transformer is required when the controller sending the reversing signal does not provide 24 V AC power, or when the MC21 is used for stand-alone operation.
- **External Manual Control Switch** - May be wired to the MC21 for manual control from a remote location. This allows both the override switch and the motor reversing relays to be in the most convenient locations.
- **Internally Mounted Thermal Motor-Overload Relay** – Request when required by local electrical code. Full motor specifications must be provided for proper sizing.

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Features

- **Application Specific** – The MC21 is designed with greenhouse equipment loads in mind and is optimized for use with Argus computer control products.
- **Travel Limit Connections** –Terminals are provided for wiring of travel limit switches. The limit switch terminals are jumpered together when the motor has internally wired limit switches.
- **Support for Overload Relays** – Mounting space is provided for a thermal motor-overload relay. The overload contacts are wired into the control circuit to stop motor operation, when the overload trips.
- **Reversing Delay –** The integrated MC11 signal interface board includes a time-delay electrical interlock to prevent instant reversing of motors. This ensures safe operation from manual control switches, computers and other controllers that may not delay the reversing signal. This feature prevents damage to the motor and the equipment it operates.
- **Manual Override** – The manual override simplifies troubleshooting, travel-limit switch adjustments, and permits emergency operation in the event of a failure of the automatic control system.
- **Onboard Status Indicators –** Status LEDs show control power, control, and limit-switch status. Status indicators assist in troubleshooting.

Specifications

MC11 Dimensions	2.5” x 2.25” x 1.5” (length x width x height)
Enclosure	10” x 8” x 6” (height x width x depth)
Control Power Requirement	24 VAC, 6VA
Manual Override	4-position (OFF, OPEN, CLOSE, AUTOMATIC) control knob
Motor Ratings (Maximum)	3φ - 5HP (3.7 kW) @ 240 V 1φ – 2HP (1.5 kW) @ 240 V 1φ – 1HP (750W) @ 120 V

Important:

Wiring errors, torque overloads, "single-phasing", and other problems, especially during installation, frequently result in motor damage. For these reasons, it is imperative that all line voltage motors have overload protection.

Many single-phase motors have internal overload protection and do not require additional protection, but three-phase motors will require an external overload device. Install and adjust overload protection before you operate the motor!

A disconnect switch and/or overload may be required for the motor. Check local electrical code requirements.

Travel limits and safety limits must be correctly installed and adjusted to protect the mechanical system and motor from damage caused by over-travel in either direction.

Consult with Argus before purchase to ensure selection of the proper motor control products and options for your motor.

Enclosure

Enclosure: The durable NEMA 4 fiberglass enclosure protects the MC21 components from corrosive elements, heat, water, and dust. A foam gasket assures a watertight and dust-tight seal.

Hardware Installation

General Installation Notes:

The MC21 has a NEMA-4 enclosure rated for wet locations. The MC21 should be mounted close to the motor/gearbox being controlled. The operating life of the product will be extended if it is protected from high temperatures and direct sunlight.

On three-phase motors, the MC21 reverses two of the three power lines to reverse the motor.

On single-phase motors, the MC21 reverses the start winding with respect to the run winding to reverse the motor. Motor reversal starts after a ten-second time delay to ensure proper reversal. The motor must come to a full stop for reversal to occur.

Check local electrical codes to determine disconnect switch and overload relay requirements. If required, the disconnect switch is mounted near the motor/gearbox for safe servicing and adjustment of the motor and limit switches.

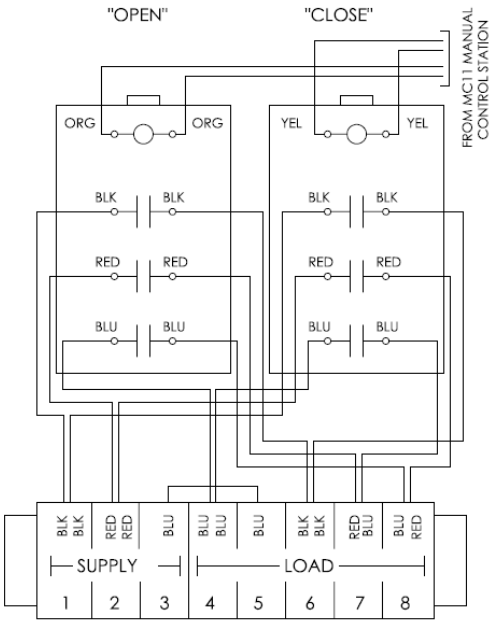
Important: All wiring must be brought in through holes in the bottom of the enclosure and secured using approved cable-clamps/strain-reliefs. This will eliminate the possibility of water entering the enclosure from the top.

Supply and Motor Load Wiring Diagrams

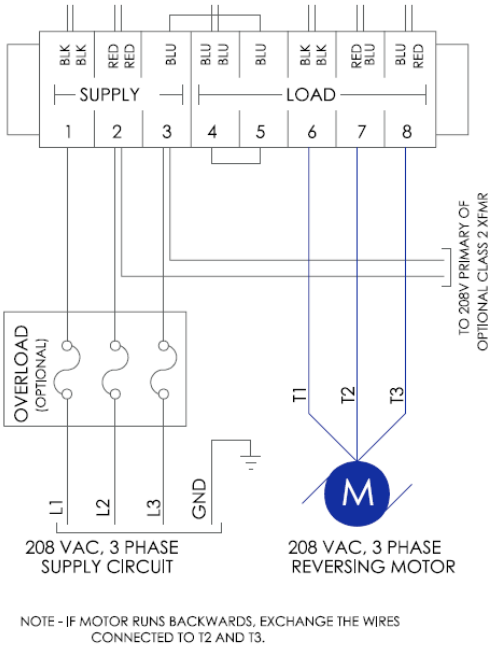
Two three-pole relays are pre-wired to the terminal block as shown on the left. The motor-wiring configuration for a three-phase motor is shown on the right. Common motor-wiring configurations for single-phase motors are shown on the following page.

Other configurations are supported – please contact Argus for additional information.

VC Relays Prewired to Terminal Block



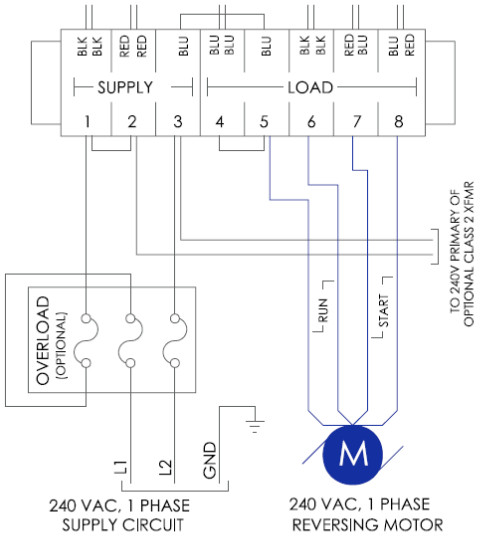
Three-phase, 3 wire, 208 VAC supply



NOTE - IF MOTOR RUNS BACKWARDS, EXCHANGE THE WIRES CONNECTED TO T2 AND T3.

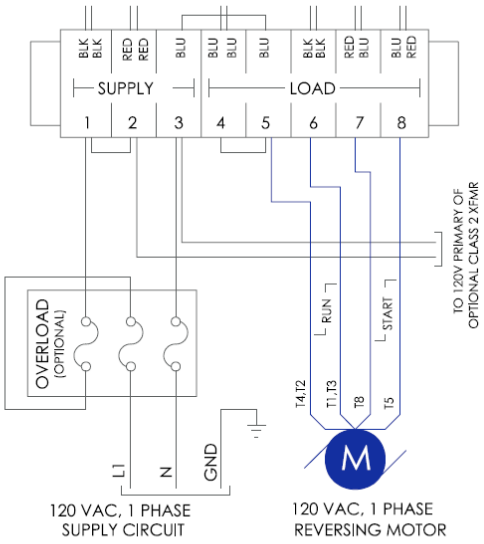
Hardware Installation Continued

Single-phase, 4 wire, 240 VAC supply



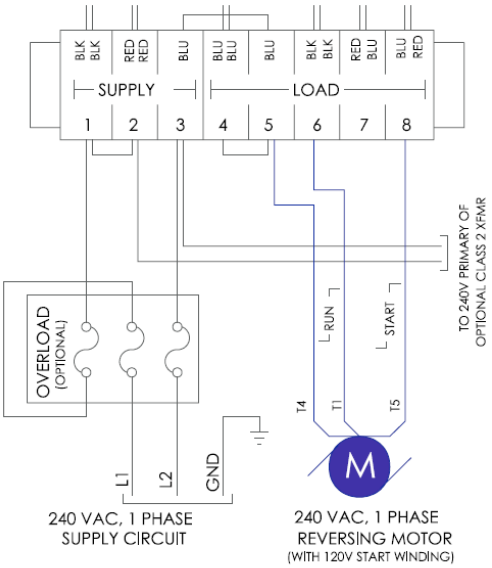
NOTE - REMOVE ANY JUMPERS OR LINKS JOINING THE START WINDING TO THE RUN WINDING. IF MOTOR RUNS BACKWARDS, EXCHANGE THE WIRES CONNECTED TO THE START WINDING.

Single-phase, 4 wire, 120 VAC supply



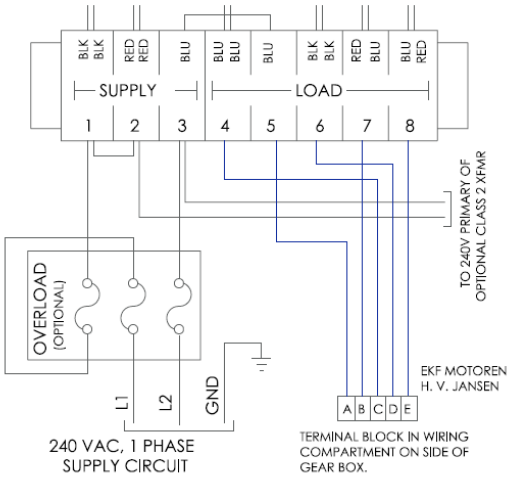
NOTE - REMOVE ANY JUMPERS OR LINKS JOINING THE START WINDING TO THE RUN WINDING. IF MOTOR RUNS BACKWARDS, EXCHANGE THE WIRES CONNECTED TO THE START WINDING.

Single-phase, 3 wire, 240 VAC supply

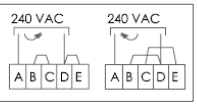


NOTE - JOIN T2 TO T3 AND T8 IN THE MOTOR AND REMOVE ANY OTHER JUMPERS OR LINKS. IF MOTOR RUNS BACKWARDS, EXCHANGE THE WIRES CONNECTED TO T1 AND T4.

Single-phase, terminal block connection



COMPARE THIS TO THE WIRING DIAGRAM INCLUDED WITH THE MOTOR, TO IDENTIFY THE TERMINALS IN THE WIRING COMPARTMENT THAT CORRESPOND TO THE ONES MARKED A THRU E ON THIS DRAWING.



NOTE – REMOVE JUMPERS FROM TERMINAL BLOCK. IF MOTOR RUNS BACKWARDS, EXCHANGE THE WIRES CONNECTED TO "B" AND "E".

Additional Information

See the owner's manual for installation instructions and troubleshooting assistance.

For additional information on the MC11, see the MC11 product data sheet.

For more information, please contact Argus.

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