



AC Motor Group Controller Installer's Guide

**A Step-by-Step Guide for Installing, Operating and Maintaining a Lutron
AC Motor Group Controller**

Please Read Before Installing

Models:

WC-2M-GC 2 Motor Controller

WC-4M-GC 4 Motor Controller

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Description

The WC-2M-GC and WC-4M-GC Group Controllers are designed to control AC motorized window treatments and projection screens. Both control single phase, bi-directional AC motors (three wire motors: open, close, neutral). Two models are available to control up to two motors (WC-2M-GC) or up to four motors (WC-4M-GC). Both accept inputs from controls that provide low-voltage, Class 2, dry contact closures. Each Group Controller has individual motor control inputs as well as a master control input. This allows individual control of each motor or control of all motors at the same time.

Ratings

Input

110–127 V~, 60 Hz Single Phase
20 A maximum input current

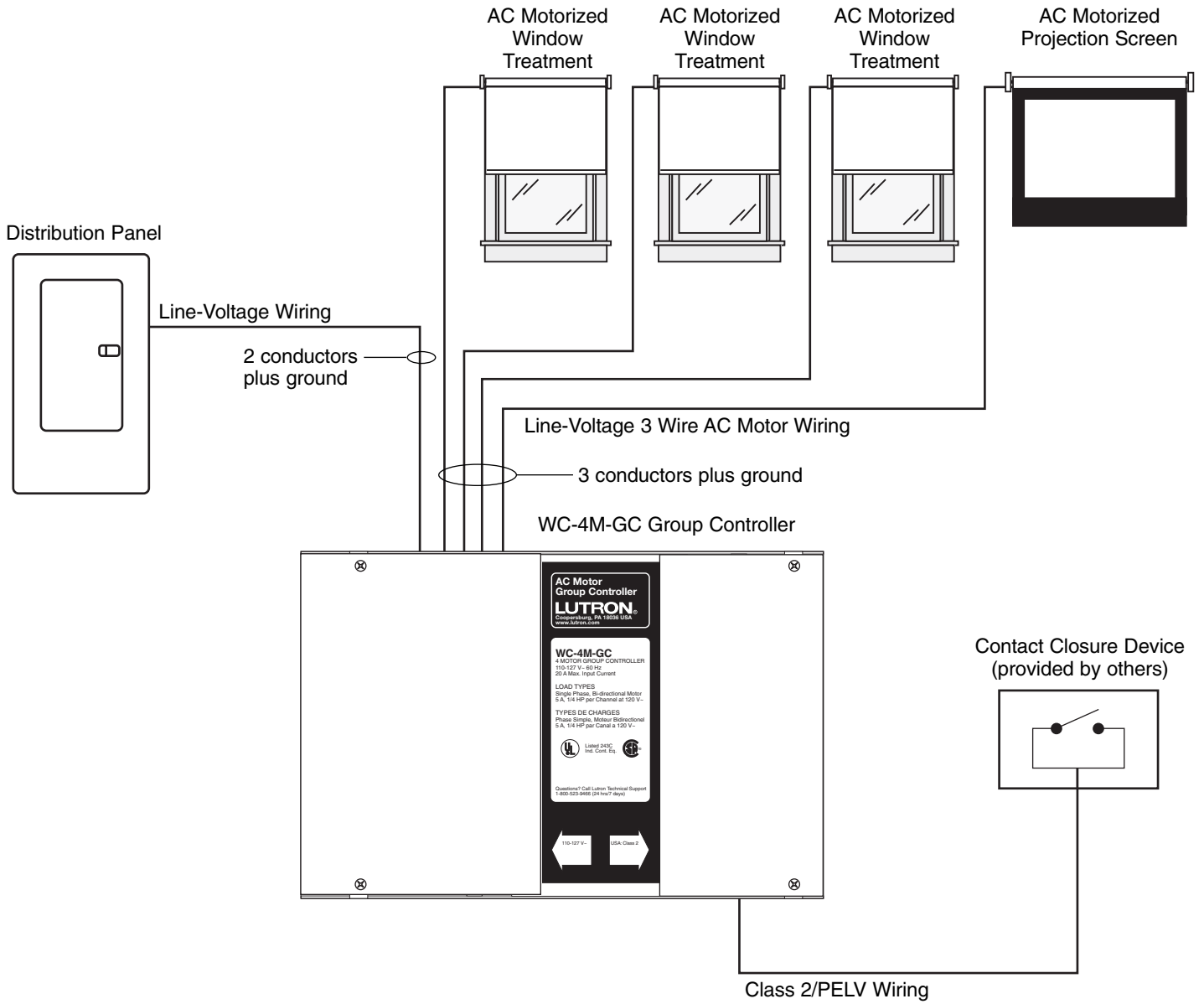
Load Capacity

5 A, 1/4 HP motor load per channel @ 120 V~

Important Information

- Before starting the installation, please completely read these installation instructions.
- This control must be installed by a certified electrician.
- Install in accordance with all local and national electrical codes.
- Turn power OFF at circuit breaker or remove fuse before installing and wiring the controller. **Do not wire with power ON.**
- Operating environment should be between 32° F to 104° F (0° C to 40° C).
- Proper short circuit protection and overload protection must be provided at the distribution panel. You can use up to a 20 A breaker for your application, where applicable.

System Diagram

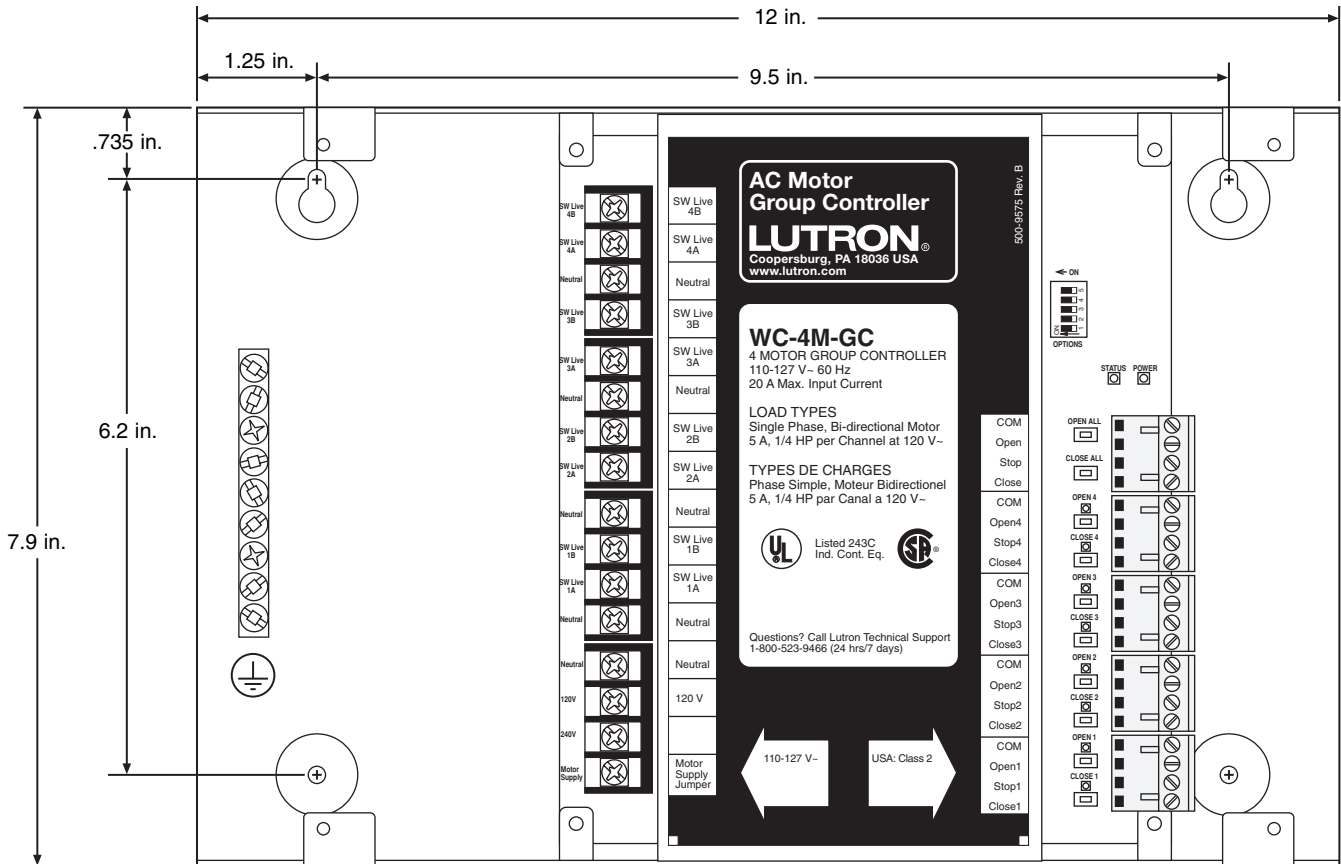


Determine a Mounting Location

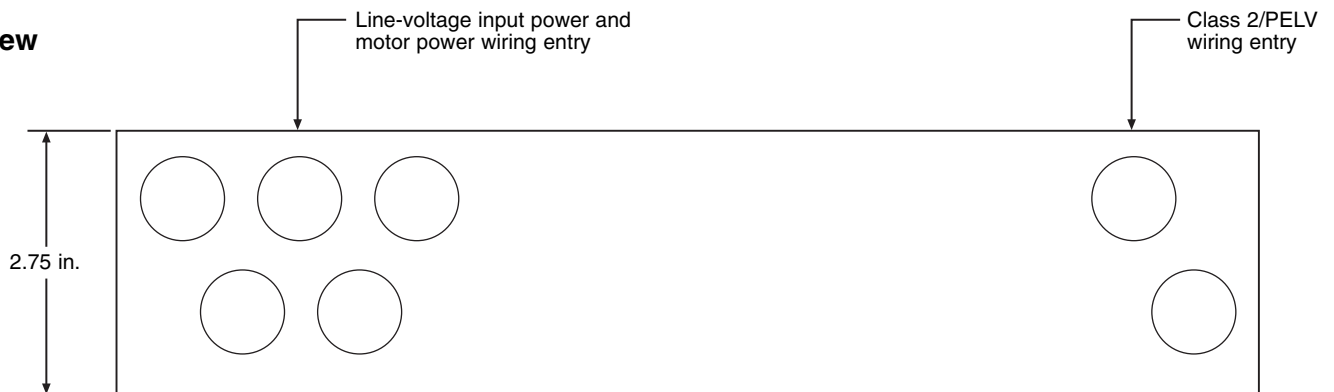
- Mount the WC-2M-GC, WC-4M-GC on a dry, flat indoor surface such as an electrical closet wall.
- Mount unit in a location that is accessible to allow for system programming and setup.
- Unit may be mounted in any orientation.

- The unit's relays will click audibly in normal use. Mount in a location where this is acceptable.
- The keyholes accept a maximum of 3/16" (5 mm) mounting bolt. No. 8 (M4) bolt recommended.
- Knockouts are 7/8" (22 mm) in diameter.

Front View



Side View



Pre-installation Motor Wiring Check

Test your wiring before connecting to the Group Controller. Use either a momentary, Single Pole Double Throw (SPDT) switch (as described below) or a motor wiring test kit (available from Lutron). To order the motor wiring test kit, contact Lutron at 1-888-SIVOIA1 (1-888-748-6481) and ask for model 6020086.

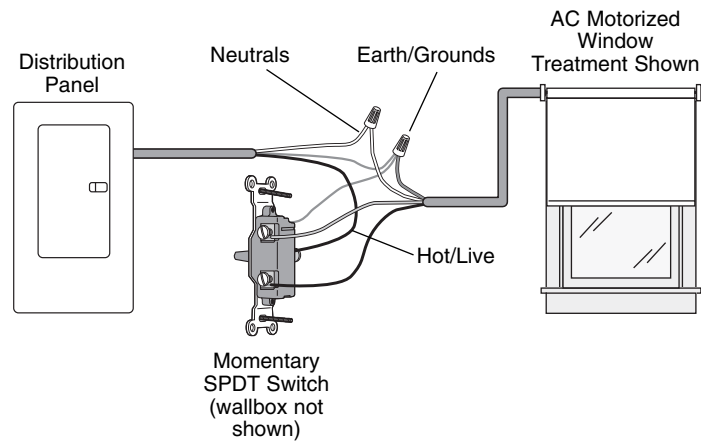
Note: If using the motor wiring test kit, please refer to the instructions provided with the kit.



Danger - Locate and lock the supply breaker in the OFF position or remove the supply fuse before working on any circuit.

Testing motor wiring using a SPDT switch:

1. Turn power **OFF** at circuit breaker (MCB) or remove fuse.
2. Connect the motor ground wire to earth ground. Connect earth ground to the ground terminal on the switch.
3. Connect the motor neutral wire to supply neutral.
4. Using one momentary, Single Pole Double Throw (SPDT) switch for **each motor**, connect hot/live to the common terminal on the switch.
5. Connect one each of the motor power wires to the output terminals on the switch. **Never wire more than one motor to a switch.**
6. Mount switch in a wallbox. Be sure no bare wires or terminals on the switch are exposed.
7. After verifying it is safe to restore power, turn power ON.
8. Verify motor will raise/open and lower/close properly. If necessary, remove power and correct wiring.



Line-Voltage Wiring

Connect line voltage and the AC Motors to the Group Controller.

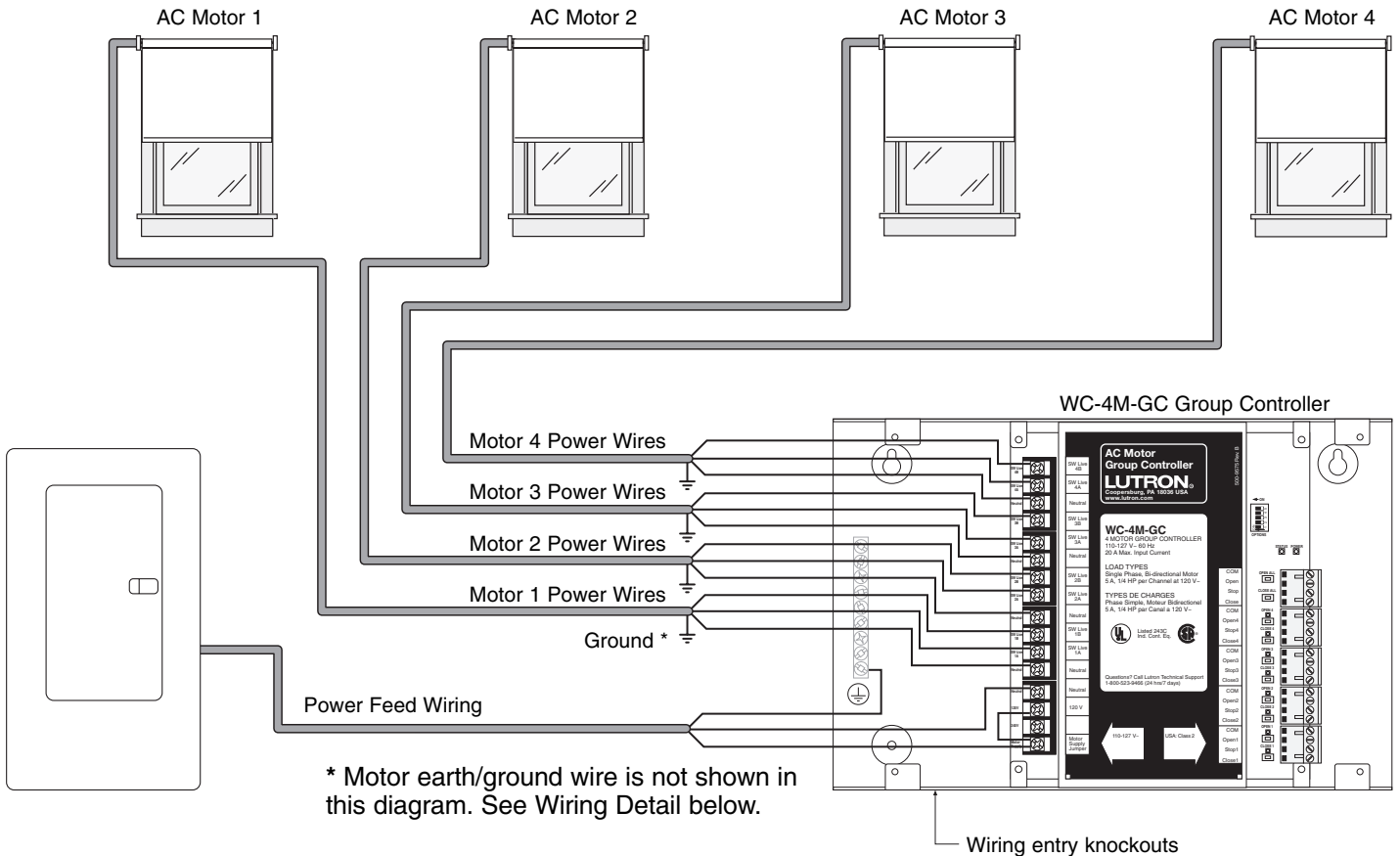


Danger - Locate and lock the supply breaker in the OFF position or remove the supply fuse before working on any circuit.

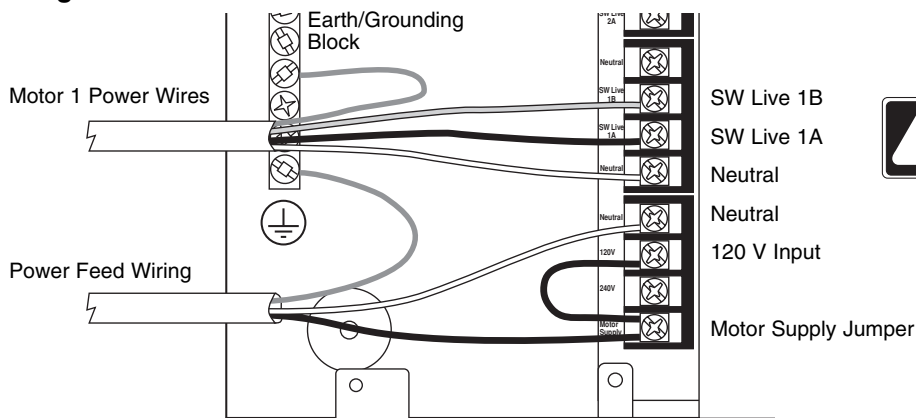
- Only connect one motor to each output. Never wire motors in parallel.
- The WC-2M-GC and WC-4M-GC accepts 110-127 V~, 60 Hz.
- Strip 1/2" of insulation from all power feed and motor power wires.

- Run power to the Motor Supply Jumper terminal. Connect the Motor Supply Jumper terminal to the 120 V Input Voltage terminal using a piece of wire of the same gauge as the power feed wiring.
- Connect the motor power wires to the appropriate terminals indicated in the diagram below.
- There is a dedicated earth/grounding block to land the ground connections for the power feed and each motor. The recommended tightening torque is 9.0 in-lbs for line-voltage connections and 10 in-lbs for earth ground connections.
- Run all power feed and motor power wiring through the knockout holes on the sides of the unit.

Wiring Overview



Wiring Detail



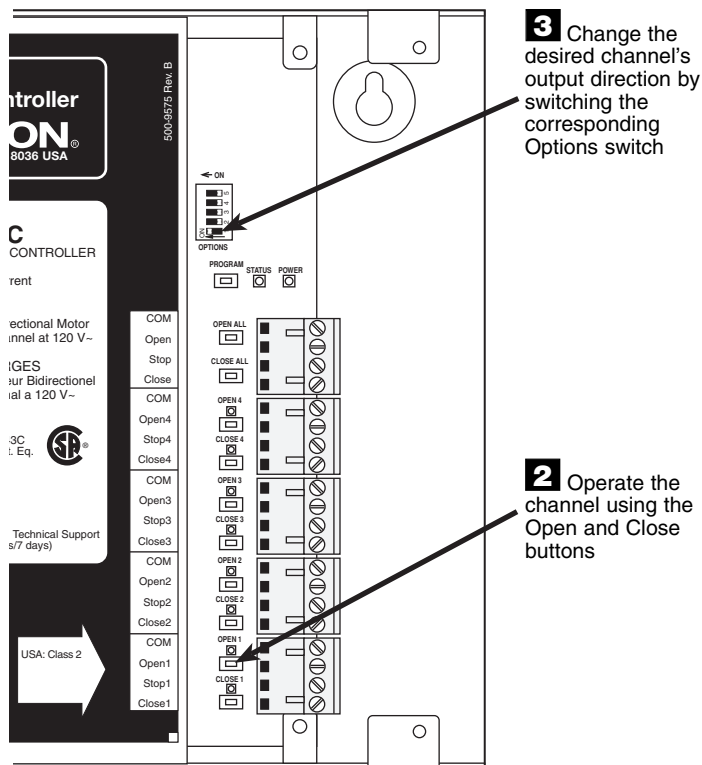
Note: Motor power wire colors may vary depending on the motor manufacturer. Refer to the motor manufacturer's instructions for more detailed wiring information.

Configuring the Motor Direction for the Open and Close Functions

For each Channel of the unit, the motor's direction of rotation needs to be configured for the Open and Close functions so that the AC Motor will move in the proper direction. This is accomplished using the Options Switches, #1 through #4. This step needs to be performed whether each channel is controlled individually or all channels are controlled together.

- 1. Restore power to unit.** Once the appropriate line voltage and motor connections have been made to the unit, replace the cover on the line voltage wiring compartment. Remove the cover from the Class 2 wiring compartment. Turn power back ON.
- 2. Determine AC motor position.** Determine whether the AC Motor that is controlled by Channel 1 is open or closed. If it is open, press the Close 1 manual override button. If it is closed, press the Open 1 manual override button. If the AC Motor moves to the desired position, the Channel is configured properly. Proceed to Step 4. If the AC Motor does not move to the desired position, proceed to Step 3.
- 3. Verify motor movement.** If the AC Motor did not move to the desired position in the prior step, slide the Options Switch #1 to the opposite position. Press the same button again that was pressed in Step 2 (Open or Close). If the AC Motor moves to the desired position Channel 1 is now configured properly. Proceed to Step 4.
- 4. Repeat for remaining motors.** Repeat Steps 2 and 3 for the rest of the Channels that are connected to AC Motors. Options Switch #2 configures Channel 2, Options Switch #3 configures Channel 3*, and Options Switch #4 configures Channel 4*.

* Channel 3 and 4 are only available on Group Controller model GRX-4M-GC.



Note: Do not change the position of Options Switch #5. This switch is used to change the contact closure input type. See section *Setting the Contact Closure Input Type* on page 12 for more details on the Options Switch #5.

Contact Closure Input Control Wiring

The WC-2M-GC and WC-4M-GC accept Class 2, dry contact closure inputs. The contact closure inputs for this unit may be either momentary or maintained. The contact closure type selected using the Options switch #5 (OFF = Momentary, ON = Maintained). Momentary dry contact closure inputs require a minimum closure time of 0.2 seconds.

The contact closure device must be able to switch 2 mA at 30 Vdc. If multiple channels or Group Controllers are wired in parallel to one contact closure, the contact closure device must be rated for the total current of all the channels or Group Controllers wired together (total current = 2 mA times the number of Group Controllers or channels in parallel). *Example*, if you connect 4 Group Controllers in parallel, the contact closure device would need to be rated for at least 8 mA, at 30 Vdc.

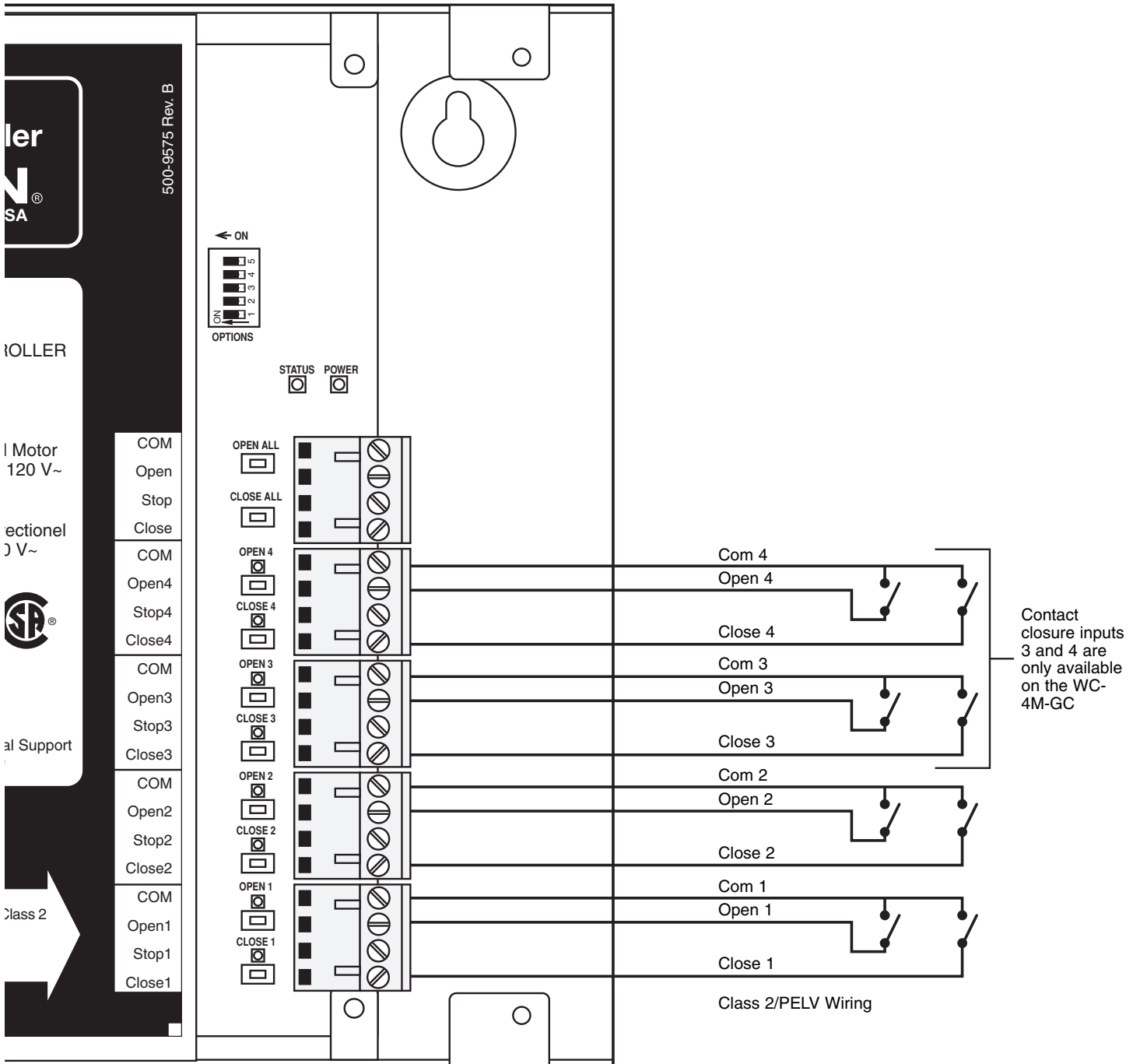
Each motor channel has a contact closure input terminal block. In addition, the unit has a master control contact closure input terminal block. The master control contact closure input will operate all four motor channels simultaneously. See the wiring diagrams on pages 10–11.

The stop function can be achieved either by providing a contact closure input to the stop terminal of the input terminal block, or by simultaneously providing a closure on the open and close terminals of the input terminal block. Both stop methods will be addressed in the wiring diagrams on pages 8–11.

Example of Individual Control (no dedicated stop input)

In this wiring example, the stop function is achieved by simultaneously providing a closure on the open and close terminals of the input terminal block. No connection is made to the stop terminal on the input terminal block.

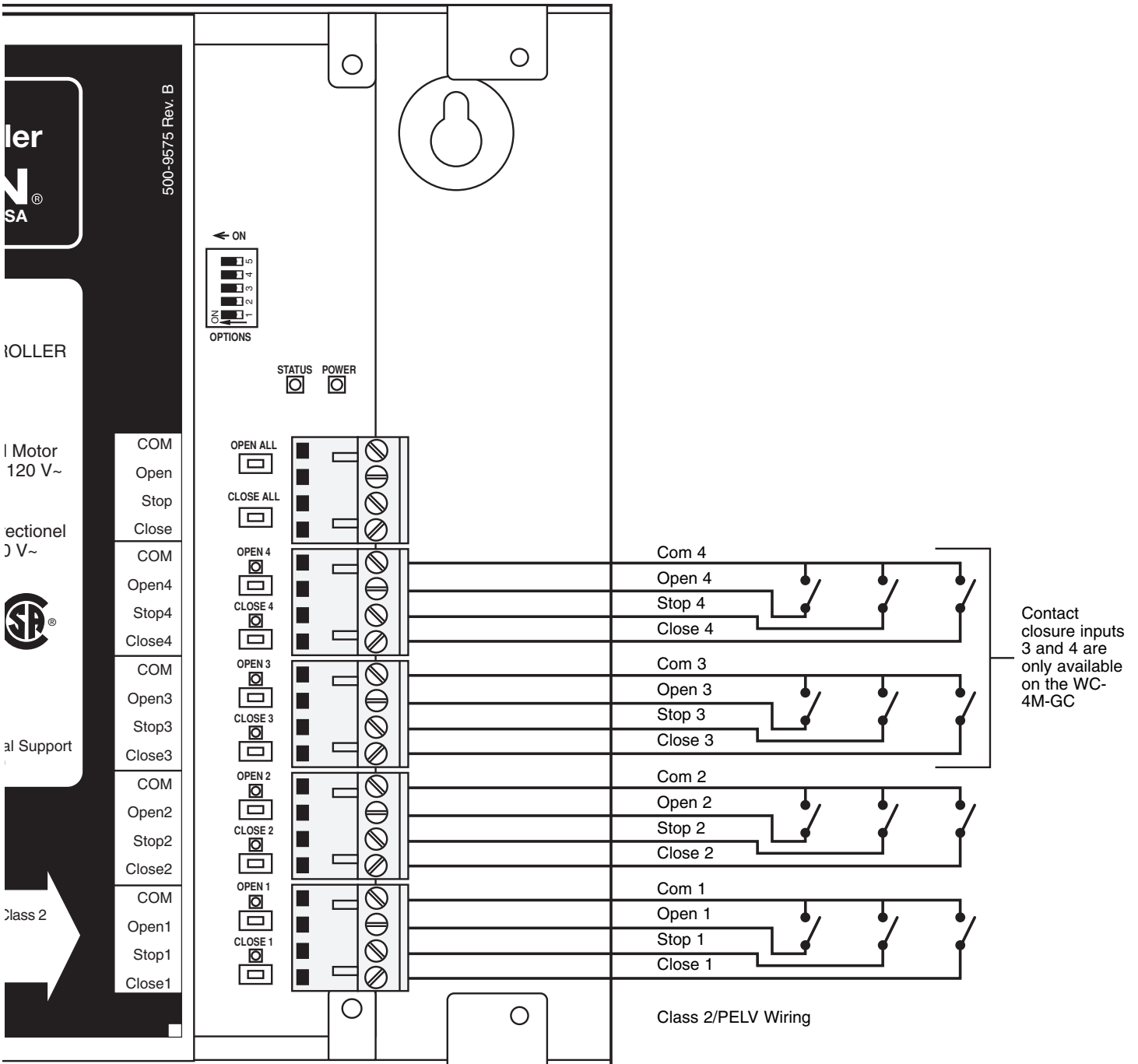
WC-4M-GC Group Controller Shown



Example of Individual Control (with dedicated stop input)

In this wiring example, the stop function is achieved by providing a closure to the stop terminal of the input terminal block.

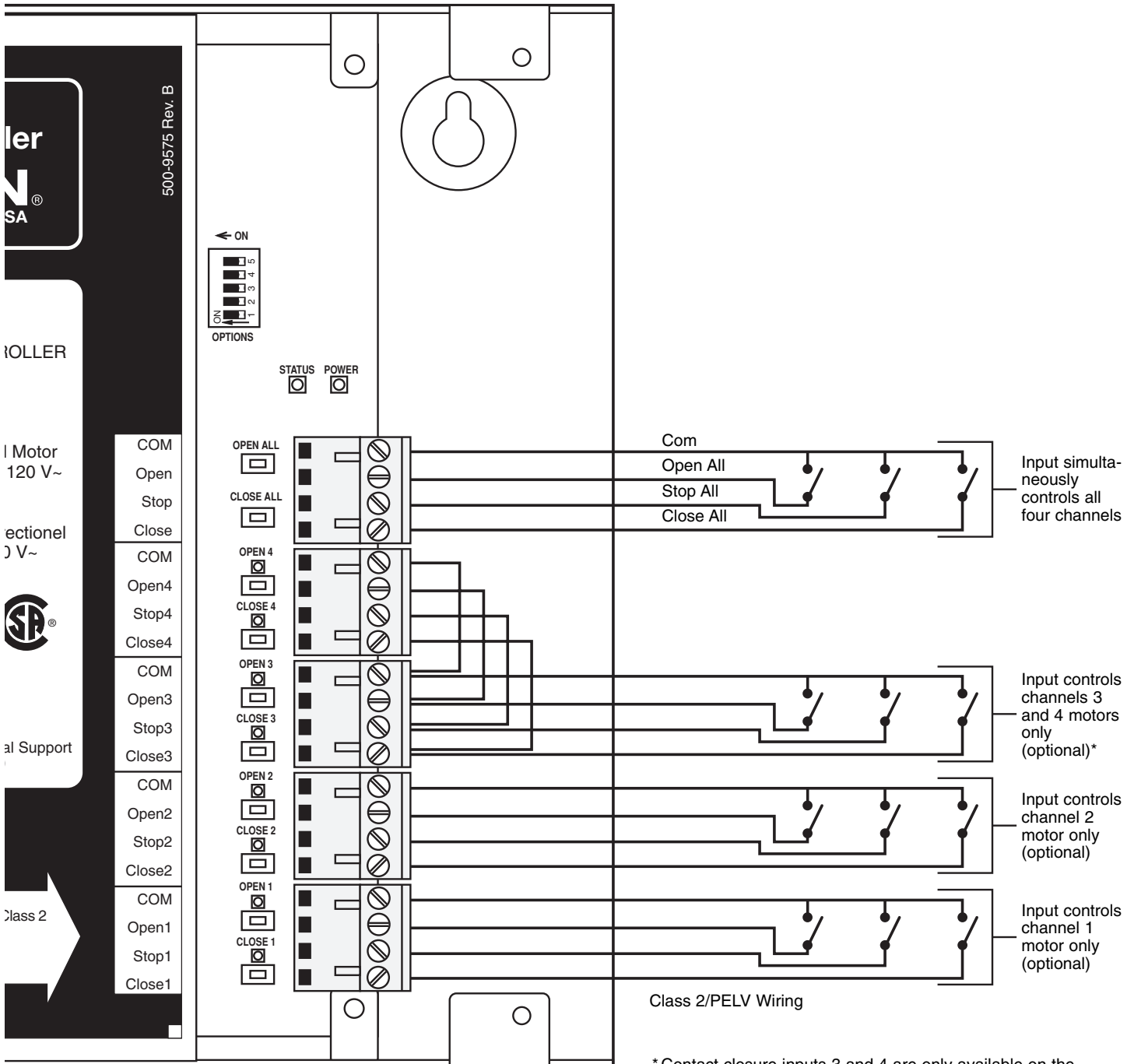
WC-4M-GC Group Controller Shown



Example of Master Control (with dedicated stop input)

In this wiring example, each master function is achieved by providing a closure to the open, stop, or close terminal of the input terminal block. Activating any closure will affect all motors connected to this Group Controller.

WC-4M-GC Group Controller Shown

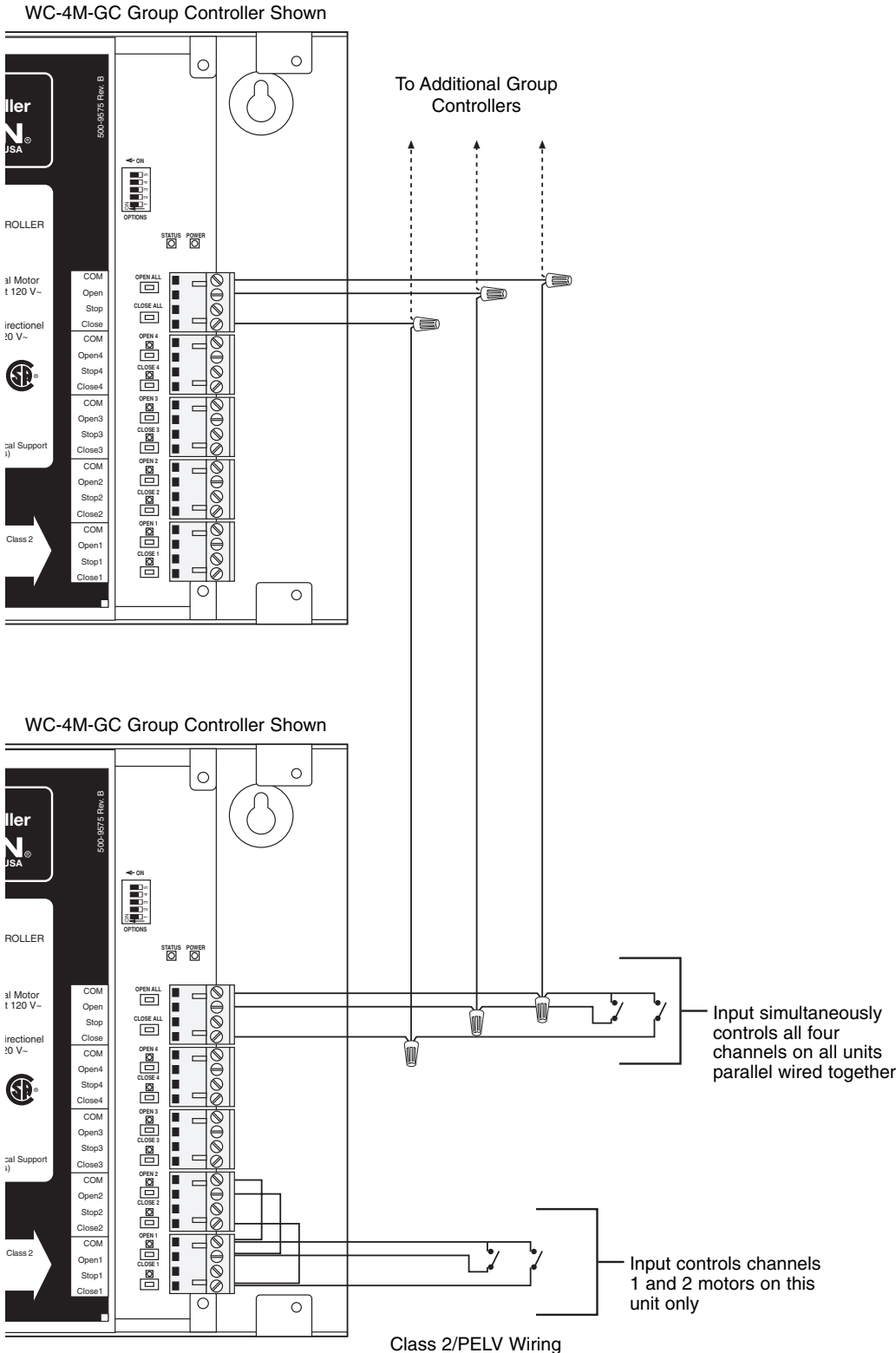


* Contact closure inputs 3 and 4 are only available on the WC-4M-GC

Connecting Multiple Group Controllers

Multiple Group Controllers can be wired in parallel on the Class 2/PELV side to obtain simultaneous control of multiple shades. To do this, parallel wire the control wires from the contact closure device to each Group Controller's contact closure input terminal block. See the diagram below. This may be used for the individual inputs and/or master control input.

Note: When connecting multiple Group Controllers in parallel, make sure the contact closure device is rated for the total amount of current delivered by each Group Controller (total current = 2 mA times the number of Group Controllers). *Example*, if you connect 4 Group Controllers in parallel, the contact closure switch would need to be rated for at least 8 mA, at 30 Vdc.



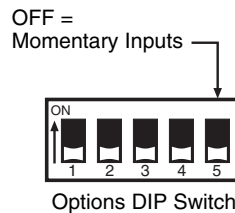
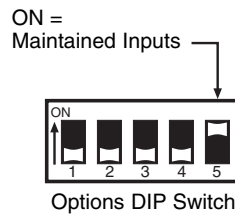
Setting the Contact Closure Input Type

When operating from contact closure inputs, the WC-2M-GC and WC-4M-GC can accept either momentary or maintained contact closure inputs. See Appendix A on page 13 for a more detailed description

Momentary Inputs: The unit will accept a momentary closure input of greater than 0.2 seconds to activate the desired function, i.e. raise, lower, or stop. The power relays will open 2 minutes after either the open or close contact closure is received, or when another contact closure is received, whichever comes first. The relays will open immediately upon receiving the stop contact closure.

Maintained Inputs: The power relays remain closed as long as the input closure remains closed. However, the most recent command received will be executed even if the previous contact closure is still maintained.

Momentary or maintained inputs are selected using Options switch #5. In the ON position, maintained mode is selected. In the OFF position, momentary operation is selected.



Appendix A

Contact Closure Inputs:

Maintained Mode Operation

In maintained mode, the Switched Live output for a channel, for instance SW Live 1A, is energized only while the contact closure is provided to the input for that channel. As soon as the contact closure is removed from the input, the Switched Live output is de-energized. This gives rise to possible conflicts if a contact closure is provided during the time another contact closure is provided. Below are descriptions of how the Group Controller addresses these situations.

Inputs on a single channel

When a contact closure is provided to a single input on an individual channel, the Group Controller will energize the appropriate Switched Live output. If a contact closure is then provided to another input on that same channel while the first contact closure is provided, the Group Controller will recognize this combination as a request to stop. This will happen regardless of how much time elapses between the application of the two contact closure inputs.

For example, if a contact closure is provided to Close 1, the Group Controller will energize the Switched Live output to close the AC motor on Channel 1. If a contact closure is provided to Open 1 while a contact closure is still provided to Close 1, the Group Controller will de-energize the Switched Live output on Channel 1, stopping the AC motor.

If contact closures are provided to both the Open and Close inputs on a particular channel, the Group Controller will de-energize the Switched Live outputs for that channel. If one of the contact closures is then released, the Group Controller will NOT recognize that as a request to move the AC motor to the position indicated by the contact closure that is still provided. Instead, the Group Controller will leave the Switched Live outputs de-energized. In order for the Group Controller to recognize a new input signal, the contact closure must be removed and then provided again.

Note: It is not recommended to connect two or more contact closure devices on the same channel if Momentary mode is selected. If this is done, it is possible for a channel to become unresponsive to inputs if contact closures are provided by the two devices at the same time.

For instance, if one device provides a contact closure to the Open input, the Group Controller energizes the Switched Live output that opens the AC motor. If the second device then provides a contact closure to the Close input, the Group Controller will then de-energize the Switched Live output, stopping the AC motor. At this point, both contact closures must be removed before the Group Controller will recognize a new request.

If it is desired to connect two or more contact closure devices on the same channel, use Maintained mode.

Inputs on a single channel and Master Control

When a contact closure is provided to a single input on an individual channel, the Group Controller will energize the appropriate Switched Live output. If a contact closure is then provided to a Master Control input while the first contact closure is still provided, the Group Controller will energize the Switched Live outputs requested by the Master function on all channels of the Group Controller.

For example, if a contact closure is provided to Close 1, the Group Controller will energize the Switched Live output to close the AC motor on Channel 1. If a contact closure is then provided to the Master Open input while a contact closure is still provided to the Close 1 input, the Group Controller will energize the Switched Live outputs to open the AC motor on all channels.

When a contact closure is provided to a Master Control input, the Group Controller will energize the appropriate Switched Live outputs on all channels of the Group Controller. If a contact closure is then provided to a single input on an individual channel while the Master Control contact closure is still provided, the Group Controller will activate the Switched Live output requested by the individual input, while keeping the Switched Live output in the same state for the other three channels.

For example if a contact closure is provided to the Master Open input, the Group Controller will energize the Switched Live outputs to open the AC motor on all channels. If a contact closure is then provided to the Close 1 input, the Group Controller will energize the Switched Live output on Channel 1 to close the AC motor on Channel 1, but continue energizing the Switched Live outputs on Channels 2, 3 and 4

Troubleshooting

Symptom	Possible Cause	Solution
AC motor does not move in either direction when manual override buttons pressed.	• Motor wired to Group Controller improperly.	Verify motor wiring.
	• Limit switches on motor not set properly.	Verify limit switch settings on motor.
	• Motor Supply Jumper terminal is not jumpered to 120 V terminal.	Place a jumper wire of sufficient wire gauge between Motor Supply Jumper and 120 V Input Voltage terminals. See page 6.
Motors cannot be controlled from low-voltage contact closure inputs but operate properly with the manual Open/Close buttons.	• Contact closure miswire.	Verify connections on contact closure inputs.
Motors only move while low-voltage contact closure is applied.	• Options Switch #5 in ON position.	Change position of Options Switch #5 to OFF. See page 11.
Motor moves in the wrong direction.	• Options Switch not set properly.	Reverse the corresponding Options Switch. See page 7.

Notes

Worldwide Technical and Sales Assistance

If you have questions concerning the installation or operation of this product, call the **Lutron Technical Support Center**. Please provide exact model number when calling.

(800) 523-9466 (U.S.A., Canada, and the Caribbean)

Other countries call (610) 282-3800

Fax (610) 282-3090

Visit our web site at www.lutron.com

LIMITED WARRANTY

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., Coopersburg, PA 18036-1299, postage pre-paid.

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