Hardwired: Line Voltage Switching

Motorola Cellular Subscriber Facility, IL
Globetrotter's Engineering – Architects

Line Voltage Switching – Hardwired (Direct Wiring)

MechoShade possesses a variety of Line Voltage Switches for basic control of shades equipped with standard, line voltage (120/240 VAC, 50/60 Hz) tubular motors. The motors wire directly to the switches that control them in a hardwired, homerun (direct) fashion and therefore do not require any intermediate controller electronics. The switches are single-pole/double-throw (SPDT) and double-pole, double-throw (DPDT) center-off devices that offer the control of one or two motorized shading assemblies in an isolated fashion from a common switch.

In general, these systems represent the most economical control solution and are best wired into renovate/new construction projects where the switches are controlling only one or two motors or a multi-banded group of shades. Shade operation is typically full-up/full-down where absolute alignment with another shade group is not a priority. Switches can be selected for operation in a momentary or maintained fashion to accommodate the user's requirements. If mid-window settings are required the switch must run in a supervised fashion so that the user stops the shade when it reaches the desired position. These switches can operate up to two separate motors simultaneously and come in a variety of styles and colors to suit virtually any décor.

All switch variations meet the various local and national building codes for indoor usage. Each one also has been certified to UL and CSA recognized component standards. Select switches have been further qualified by ETL under stringent *system testing* requirements with regard to their application under UL325 and CSA 22.2 along with all of MechoShade's available motors and hardware. These are the E-Switch™ Series of switches which provide the installer and end user with additional confidence that the entire MechoShade solution and the methods used to install and wire it meet the strictest safety and reliability standards in the industry.

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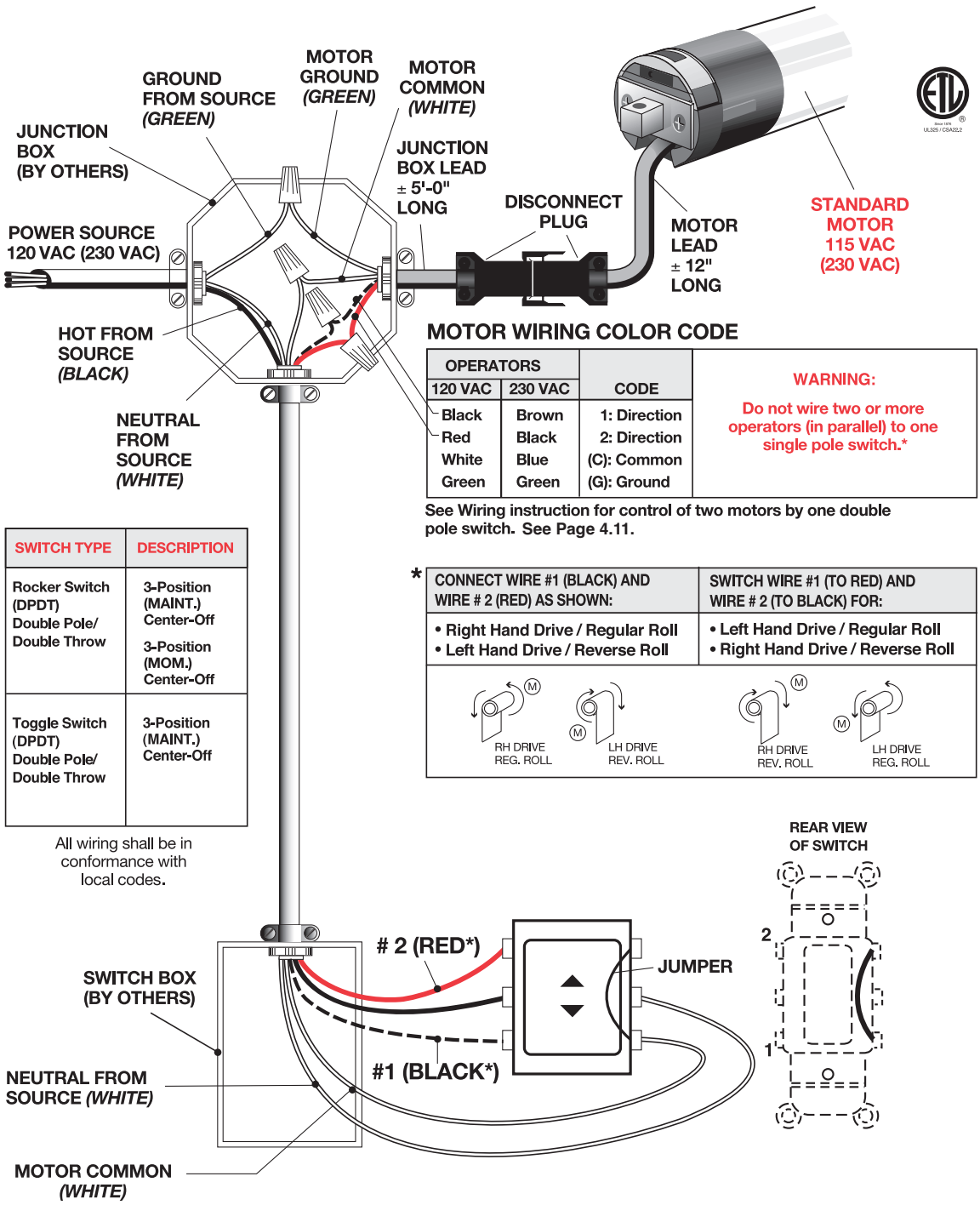
Hardwired: Line Voltage Switching

Line Voltage Switching for One Standard Type Motor with One Double-Pole Switch



MOTOR WIRING COLOR CODE

OPERATORS		
120 VAC	230 VAC	CODE
Black	Brown	1: Direction
Red	Black	2: Direction
White	Blue	(C): Common
Green	Green	(G): Ground

WARNING:

Do not wire two or more operators (in parallel) to one single pole switch.*

See Wiring instruction for control of two motors by one double pole switch. See Page 4.11.

SWITCH TYPE	DESCRIPTION
Rocker Switch (DPDT) Double Pole/ Double Throw	3-Position (MAINT.) Center-Off 3-Position (MOM.) Center-Off
Toggle Switch (DPDT) Double Pole/ Double Throw	3-Position (MAINT.) Center-Off

All wiring shall be in conformance with local codes.

*

CONNECT WIRE #1 (BLACK) AND WIRE # 2 (RED) AS SHOWN:	SWITCH WIRE #1 (TO RED) AND WIRE # 2 (TO BLACK) FOR:
• Right Hand Drive / Regular Roll • Left Hand Drive / Reverse Roll	• Left Hand Drive / Regular Roll • Right Hand Drive / Reverse Roll

Note:
Drawings are incomplete unless both pages of this Wiring Diagram, 4.10 – 4.11, plus the Electrical Notes pages 4.49 – 4.51 are included.

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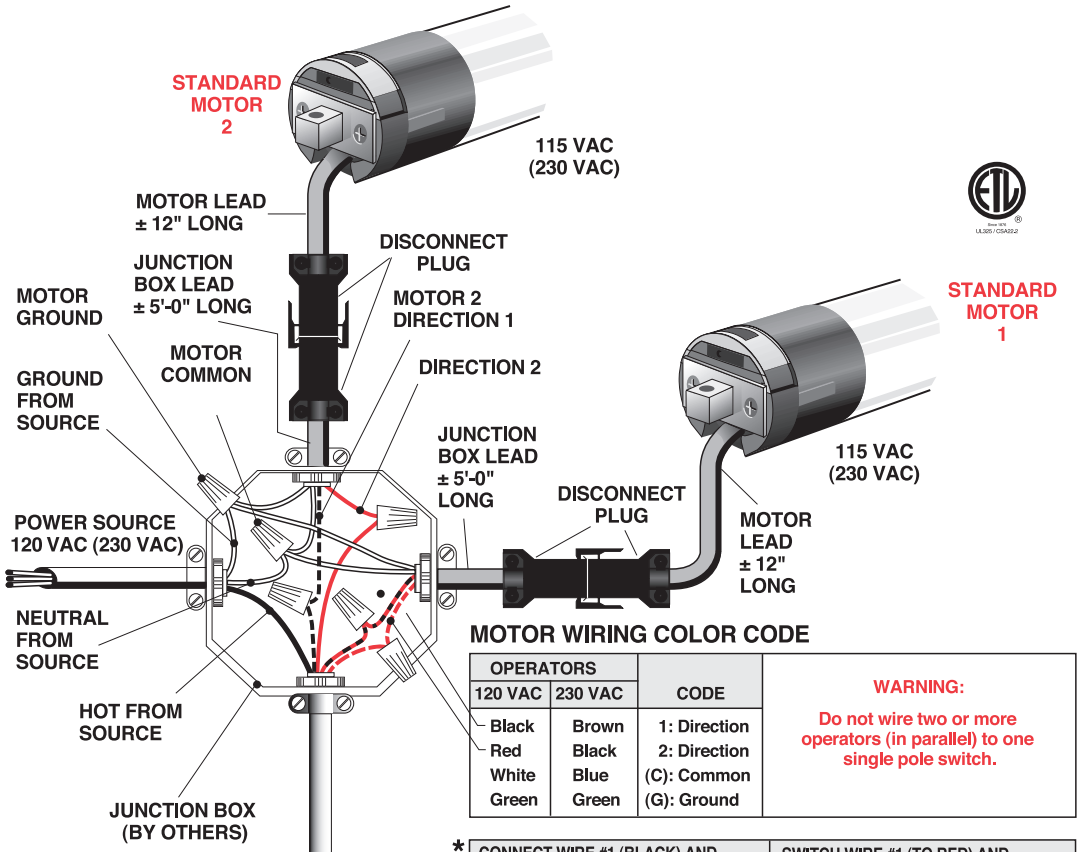
Hardwired: Line Voltage Switching

Line Voltage Switching for Two Standard Type Motors with One Double-Pole Switch



MOTOR WIRING COLOR CODE

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WARNING:

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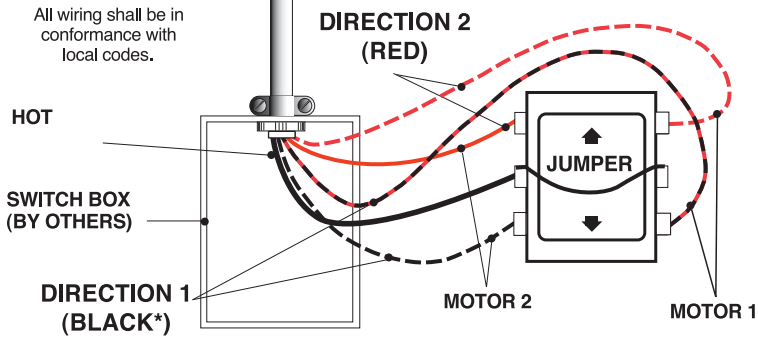
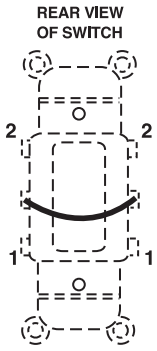
CONNECT WIRE #1 (BLACK) AND WIRE # 2 (RED) AS SHOWN:	SWITCH WIRE #1 (TO RED) AND WIRE # 2 (TO BLACK) FOR:
• Right Hand Drive / Regular Roll • Left Hand Drive / Reverse Roll	• Left Hand Drive / Regular Roll • Right Hand Drive / Reverse Roll

SWITCH TYPE	DESCRIPTION
Rocker Switch (DPDT) Double Pole/ Double Throw	3-Position (MAINT.) Center-Off 3-Position (MOM.) Center-Off
Toggle Switch (DPDT) Double Pole/ Double Throw	3-Position (MAINT.) Center-Off

All wiring shall be in conformance with local codes.





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Hardwired: Low Voltage Controls

Bank Boston, Sao Paulo, Brazil
SOM-Chicago – Architects

Low Voltage Controls – Hardwired (Direct Wiring)

MechoShade Systems, Inc. possesses a diverse line of hardwired, low voltage controls. All offer enhanced operation of motorized shades equipped with standard, line voltage (120/240 VAC, 50/60 Hz) tubular motors. Each line voltage motor is directly powered by a dedicated connection to a motor controller. The motor controller establishes the shade position based on input from a low voltage network of contact closure based switches and accessories such as automation sensors (ie. Photocells, occupancy sensors, etc.), timers/schedulers, wireless remote controls and other third party controllers. This is considered to be a hardwired control network where the inputs on the motor controller are wired directly to the low voltage switches and accessories that actuate them. In general these types of control solutions are best applied to renovate/new construction projects where wiring can more easily be installed behind the drywall.

Flexible and Less Costly to Install

Low voltage control offers many installation advantages over line voltage control including safety, simplicity, flexibility and ultimately cost. Low voltage control connections operate at voltages that are designed to be non-hazardous. Therefore, it does not require a licensed electrician to pull this cabling and install it although it is highly recommended that a trained professional perform the job in order to minimize problems.

Low voltage connections do not typically require conduit or junction boxes (local code dependent). This eliminates installation hardware costs and makes the installation process easier and more flexible for future changes.

Large, Multi-Level Control Groups

Some low voltage control networks are isolated from the line voltage power mains (ie. I•CON) which helps to ensure that controllers operating from different phases of the building's incoming power can be interconnected reliably to form large shade groups controlled by a common switch. In addition, often times the same shade can be part of more than one shade group depending on the design of the controller (I•CON). This is called multi-level control which enables a motor/shade to be controlled as an individual shade, part of a group of shades or even be controlled from within a master switching circuit that includes all of the shades within a control network.

Advanced Control Logic

Low voltage controllers such as the IQ/MLC are designed using microprocessors in order to provide more flexibility in the operational features available to the user. For instance, if someone wanted to position a shade in the middle of the window a typical line voltage switch may require the user to

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Hardwired: Low Voltage Controls

actuate the switch until the shade hits the desired point. This is called supervised operation. Within a low voltage controller the user may have the ability to push a single button momentarily which will cause the shade to move directly to a specific position on the window – ie. half-way down. Depending on the controller these stop positions may be programmable and may offer assured alignment opportunities with surrounding shades as well – regardless of varying window heights.

Other opportunities afforded by a microprocessor-based controller may include advanced, intelligent user interfaces such as keypads and LCD touchscreens. Various operating modes may also be offered such as Uniform Mode where a shade cannot be stopped anywhere on the window except at full up/full down and the established mid-window stop positions.

Seamless Integration

MechoShade's low voltage controllers are designed to be open, interoperable devices which can work in coordination with other manufacturers' controllers or systems to provide enhanced functionality and features. This can include operation with controllers for Lighting, HVAC, A/V, Security, Life/Fire/Safety or more generally into Building Management Systems (BMS). The methods available for seamless integration of MechoShade's controllers into these other systems include dry contact closures or RS232 / 485 from a software standpoint. These same methods are also available to integrate with various environmental sensors (photosensors, occupancy sensors, radiometers, thermostats, etc.) in order to provide automated convenience, comfort and/or energy management control for example supporting Title 24 or Green Building applications.

Systems Testing – Safety and Reliability

All of MechoShade's low voltage controllers have been tested by ETL to meet UL325 and CSA 22.2 system requirements to ensure the installer and end user that the entire MechoShade solution including the hardware, motors and controls in addition to the methods used to install and wire it meet the strictest industry safety and reliability standards.

Quick Selection Guide: Low Voltage Controls – Hardwired

Feature	Description	MLC	IQ/MLC
Daisy Chain	Supports motors from separate controllers operating simultaneously via the same low voltage input (ie. switch, sensor, Lighting control)	X	X
# Motors/Controller Max Controllers/	The number of motors independently connected to a controller	4	4
Switch Input	The number of controllers which can be daisy chained to a single switch	25	10
Master Control	Operates all motors within a controller simultaneously	X	X
Individual Control	Operates each motor within a controller independently – Local Control		X
Group Control	Operates a combination of motors within a controller simultaneously		X
Reconfigurable	How does one change the "Switch - Motor" assignments?	Wiring	DIP Switch /Wiring
Alignment Positions	The number of points where 2 or more independent shades can be made to align including Full Up and Full Down	2	5
Programmable, Mid-Window Positions	The number of Alignment Positions within the span of the window where a single button press can align a group of shades		3
Assured Alignment	Can the controller support repeatedly aligning groups of shades		X
Uniform Mode	Can each motor of the controller be set to only allow the shade to stop at the Alignment Positions?		X
Integration with third party controls	Methods available to integrate seamlessly with third party control systems such as Lighting, HVAC, A/V and Building Management Systems (BMS)	Dry Contact	Dry Contact RS232/485
Integration with low voltage accessories	Integrates with automation sensors, timers, remote controls, etc. over the low voltage control network	X	X

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