

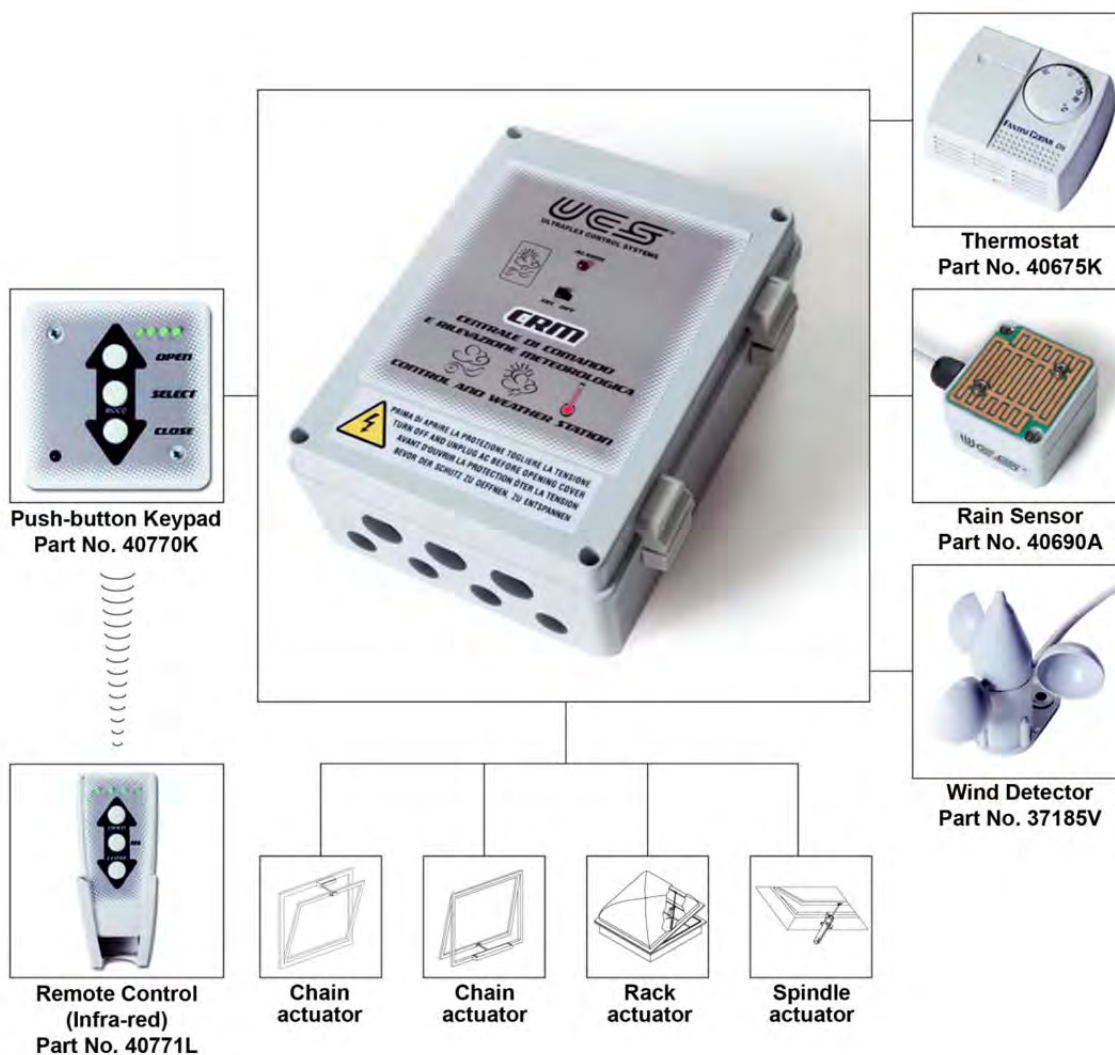
CRM Control Panel and Weather Detection System

CRM3 for DC actuators (part # 40821J)

CRM4 for AC actuators (part # 40822K)

CRM Applications

- CRM includes a control relay box and a power supply; additional relay box or power supply is not needed, unless use exceeds CRM capacity (4 amp for CRM3 for DC actuators; 7 amps for CRM4 for AC actuators).
- Use CRM to add **Remote Control** option to actuator(s).
- Use CRM to add **Weather Sensor** option(s) to actuators.



Recommendations for FFI Actuators & Controls: FFI only recommends UL compliant systems. FFI is a UL registered firm. Read FFI data sheets & installation guides before specifying project details. Project-specific needs vary depending on the number of actuators, electrical layouts, building management systems, distance between power supplies & actuators, and other details. Project specifications to comply with electric & building codes—for wire gauge, wire connections and run distance, conduits, junction boxes—must be arranged by the project electrical contractors. Distribute this guide to all project parties, including electrical contractors, architects, and building management personnel.

CRM Specifications

	CRM3 for DC actuators part # 40821J	CRM4 for AC actuators part # 40822K
Supply Voltage	115 Vac $\pm$ 10%, 60 Hz (line voltage)	115 Vac $\pm$ 10%, 60 Hz (line voltage)
Total output (all 4 groups)*	4 amps @ 24 Vdc	7 amps @ 115 Vac
Power Cable	2 wires (polarity inversion)	4 wires (Open, Close, Common, Ground)
Safety Marks	CE rated, not UL-Recognized	CE rated, not UL-Recognized
Operating environment	14° to 140° F (-10° to 60° C)	14° to 140° F (-10° to 60° C)
Max. Relative Humidity	60%	60%
Case Dimensions	7-13/16" x 5-11/16" x 3-1/8"	7-13/16" x 5-11/16" x 3-1/8"

* FFI recommends do not exceed 80% of maximum amp capacity for control panels.

Attention:

Prior to installation it is essential to read these safety notices, warnings and installation instructions.

SAFETY NOTICES

- (1) Read this guide carefully prior to installation.
- (2) After installation keep these instructions for later review.
- (3) Incorrect application or improper installation may result in system malfunction and/or damage to people or property.
- (4) To avoid electrocution when the CRM's cover is removed, check that the CRM is disconnected from the power circuit prior to making electrical connections at its internal terminals, or performing any other operation.
- (5) It is recommended that the CRM be connected to a dedicated power circuit.
- (6) Installation must be done by licensed electricians and/or engineers.
- (7) Prior to installation make sure that:
 - a) The existing electrical system complies with local building codes and regulations.
 - b) The power supply is compatible with the CRM's specifications.

WARNINGS

- (1) Do not attempt to repair the CRM Control Panel. In case of malfunction, contact FFI Customer Service at 800-677-0228 or service@fenestration.net for instructions. For defect claims, FFI must inspect the component. The two-year warranty is provided by Ultraflex Control Systems (UCS).
- (2) CRM control panel, keyboard, remote control, and thermostat are for indoor use only, and not recommended for high humidity areas, such as greenhouses. Naturally, the rain and wind detectors can be installed outdoors.
- (3) To be covered by the Warranty, UCS actuators must be used together with UCS-approved accessories (such as power supplies, control panels, control boxes, relay boxes, weather detectors, switches, etc.)

MANUFACTURER'S LIMITED WARRANTY

Ultraflex Control Systems S.r.l. (UCS) products are guaranteed against defects in material and workmanship for a period of **two years** from the date of manufacture. Alleged defective products returned, freight prepaid, within the warranty period will be repaired or replaced free of charge, at UCS's option, if found effectively below UCS quality standards. This guarantee does not cover other claims for direct or indirect damages. In particular, UCS declines liability and excludes guarantee (except for what is stated above) if improper installation or misuse should result in a failure of UCS products. UCS motors should be used together with UCS-approved accessories. Substitutions must meet UCS specifications.

Functional Fenestration Inc. (FFI) will honor the manufacturer's limited warranty (stated above) for two years from the date of sale listed on FFI's invoice.

FFI TERMS

Liability of Functional Fenestration Inc (FFI), Hawthorne, CA, as the seller for any defective product is limited to the replacement or credit of FFI product at original cost, and shall not include damages of any kind, whether incidental, consequential or otherwise. Any claim and return must be made in accordance with **FFI Terms and Conditions**.

CORRECT DISPOSAL OF THIS PRODUCT

Responsible disposal of this and other electronic products will help prevent potential negative consequences for the environment and human health. Its aluminum case and other re-usable elements should be re-cycled.

INSTALLATION INSTRUCTIONS

These instructions refer to the installation and sample wiring diagrams on the following pages.

Installation Overview and Preparation

The physical dimensions of the CRM3/CRM4 Control Panel are shown in the diagram “Control Panel Dimensions”.

The **CRM3, 24 Vdc Control Panel, part# 40821J** can deliver power directly to **low voltage** actuators; or it can serve as a switch for multiple RB24 Relay Boxes, which deliver power to low voltage actuators, as shown in sample diagrams on the following pages. It allows independent control of 1 to 4 actuator groups via output terminals M1-M4, **subject to a maximum current draw of 4 amps on any combination of the 4 terminals**.

Its input power requirement is a line voltage connection, 115 Vac, 60Hz. A back-up power source can be connected at the JP4 terminal within the CRM case.

The **CRM4, 115 Vac Control Panel, part# 40822K** delivers power directly to **line voltage** actuators. It allows independent control of 1 to 4 actuator groups via its output terminals M1-M4, **subject to a maximum current draw of 7 amps on any combination of the 4 terminals**. Its input power requirement is a line voltage connection, 115 Vac, 60Hz. A back-up power source can be connected at the JP4 terminal within the CRM case.

The Control Panel’s four actuator groups start up sequentially to eliminate the risk of excess current draw.

The Control Panel can receive commands from the **optional** control accessories shown in the table below. Signals from these accessories cause an “alarm state” within the Control Panel, and thereby cause the actuators to close the windows. Alarm State 1 persists for a minimum of 8 minutes, during which the windows cannot be opened via the Keypad, Momentary Switch or External Control System unless the rain and wind sensors are disabled.

Control Accessory	Alarm State Seniority	Alarm State Minimum Duration	Enable/Disable Switch
Rain sensor	1	8 minutes	External switch on Control Panel
Wind detector	1	8 minutes	External switch on Control Panel
Thermostat	2	3 minutes	External switch on Thermostat
Push-button Keypad	3	3 minutes	Not Applicable
Infra-red Remote Control	3	3 minutes	Not Applicable
Momentary contact switch or other external control system	3	3 minutes	Not Applicable

Installation Procedure

When reading the text below please refer to the sample diagrams on the following pages.

☐ Check that the Control Panel's electrical fuses are in place, as shown in diagram "Control Panel Fuse Locations".

☐ Momentary Contact Switch or External Control System

A single pole double throw (SPDT) momentary contact switch or external control system connects to the Control Panel at terminal **JP7**. The momentary switch delivers the OPEN and CLOSE commands as brief "impulse" signals (0.5 to 2 seconds duration). The Control Panel then acts on all four actuator groups, as if the command came from a Keypad with all 4 LEDs turned on.

Both the Keypad and the Momentary Contact Switch can be connected to the Control Panel.

For Wall Switch (Momentary Contact Switch):

- 15 amps max draw per switch; use with DC motors with CRM or relay box.
- Dimensions: 4" x 1-1/4" x 1-1/2".

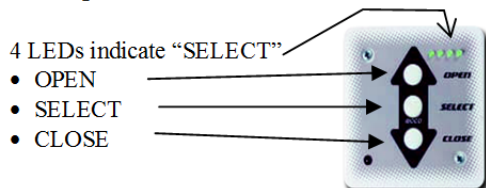


☐ Push-Button Keypad Installation (Part # 40770K)

The Keypad connects to the Control Panel at terminals JP5 and JP6, as shown in Sample Wiring Diagram B.

Multiple keypads can be connected in parallel, as shown in Sample Wiring Diagram C. Dimensions: 3" x 3" x 1-1/2".

The Keypad allows independent **control of 1 to 4 actuator groups** (by means of a serial communication protocol).



Use the SELECT button to turn on 1, 2, 3, 4 or all 4 LEDs, which are mounted in the Keypad's cover.

Each LED corresponds to actuator groups 1 to 4. After selecting the desired group(s), press the OPEN or CLOSE buttons to activate the actuators. Press the opposite button once to stop the motor.

In response to input from the Keypad, the Control Panel delivers power to the actuator group(s) for a 3-minute interval, at which time power is turned off as a safety precaution.

The Keypad has an **8-channel infra-red signal detector** for receiving commands from the Remote Control. When set to **channel 0 (factory setting)**, the Keypad accepts commands on **all** frequencies. When set to any of channels 1-7, the Keypad accepts commands only from Remote Controls transmitting commands on that channel.

Select channel 0-7 using the 3 switches (BASE 2)		ON			ON			ON			ON		
(0) 000	(4) 100												
(1) 001	(5) 101												
(2) 010	(6) 110												
(3) 011	(7) 111												
		Channel 0			Channel 4			Channel 2			Channel 6		

☐ Remote Control Installation (optional, part # 40771L)

The Remote Control uses a serial communication protocol and line-of-sight, infra-red light signals to communicate with the Keypad. (Therefore remote must be pointed at the keypad, not at the actuator, to work.) Its effective range is approximately 30 feet. Its buttons resemble the Keypad's buttons and work the same way. The Remote Control requires **two 1.5V AAA alkaline batteries (not included)**.

The Remote Control has an **8-channel infra-red signal transmitter** for issuing commands to the Keypad.

When set to **channel 0 (factory setting)**, the Remote Control issues commands on channel 0. When set to any of channels 1-7, the Remote Control issues commands on that channel **only**. Dimensions: 4" x 1-13/16" x 1".

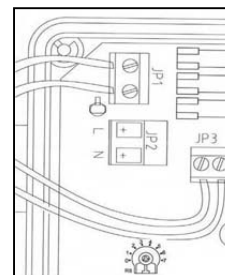


☐ Wind Detector (optional weather sensor, part # 37185V)

The wind detector (anemometer) connects to the Control Panel at terminal JP9. It sends the Control Panel a variable signal according to wind intensity. An **8-position selector** within the Control Panel sets the threshold for closing the windows. “0” disables the wind detector; positions 1-7 correspond to the Beaufort wind force scale, listed in the table below. One wind sensor can connect with up to **six** CRM Control Panels.

Disable the sensor via the external switch on the Control Panel Case.

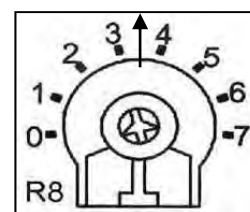
Dimensions: 4-1/2” x 4” x 4”.



Intensity Setting for the Wind Detector

Selector Position	Beaufort Scale	Knots	Mi/Hr	Feet/sec	Description
0	0	0	0	0	calm
1	1	1-3	1-3	<7	light air
2	2	4-6	4-7	7-10	light breeze
3 (factory setting)	3	7-10	8-12	11-16	gentle breeze
4	4	11-16	13-18	17-23	moderate breeze
5	5	17-21	19-24	24-33	brisk breeze
6	6	22-27	25-31	34-43	strong breeze
7	7	28-33	32-38	44-53	near gale

Wind Intensity Selector
(Located in Control Panel)



☐ Thermostat (optional weather sensor, part # 40675K)

The thermostat has a single threshold setting. When the ambient temperature rises above the threshold, the windows open. When the temperature is below the threshold, the windows close. **The rain and wind sensors have priority over the thermostat. To disable sensor, use the external ON/OFF switch on the thermostat's Case.**

One thermostat can connect with up to **six** CRM Control Panels. Dimensions: 3” x 3-1/4” x 1-1/2”.

☐ Rain Sensor (optional weather sensor, part # 40690A)

Rain sensor connects to CRM at terminal **JP8**. One rain sensor can connect to up to **six** CRM Control Panels.

Mount the sensor **outside** with its copper-colored grid exposed to the sky. Dimensions: 1-1/2” x 2” x 2”.

The Rain sensor has a heating element to prevent ice from forming on the sensor surface.

When choosing a location for the sensor, consider prevailing winds and keep it away from obstructions. Do not run wiring through an opening in a window screen occupied by the actuator's chain, or anywhere near the chain's path.

The rain and wind sensors have priority over the thermostat. To disable the sensor, use the external switch on the Control Panel Case. Do not use rain sensor if the actuator is being used for Smoke Ventilation.

Plan for routine maintenance to clean the rain sensor. Dirt or debris on the sensor's copper-colored grid can produce “alarm states” within the Control Panel, which will cause the vents to stay closed even when rain is not present. Clean the sensor surface regularly with a mild soap and water.

Rain Sensor sample installation diagrams (generic examples, not project specific):

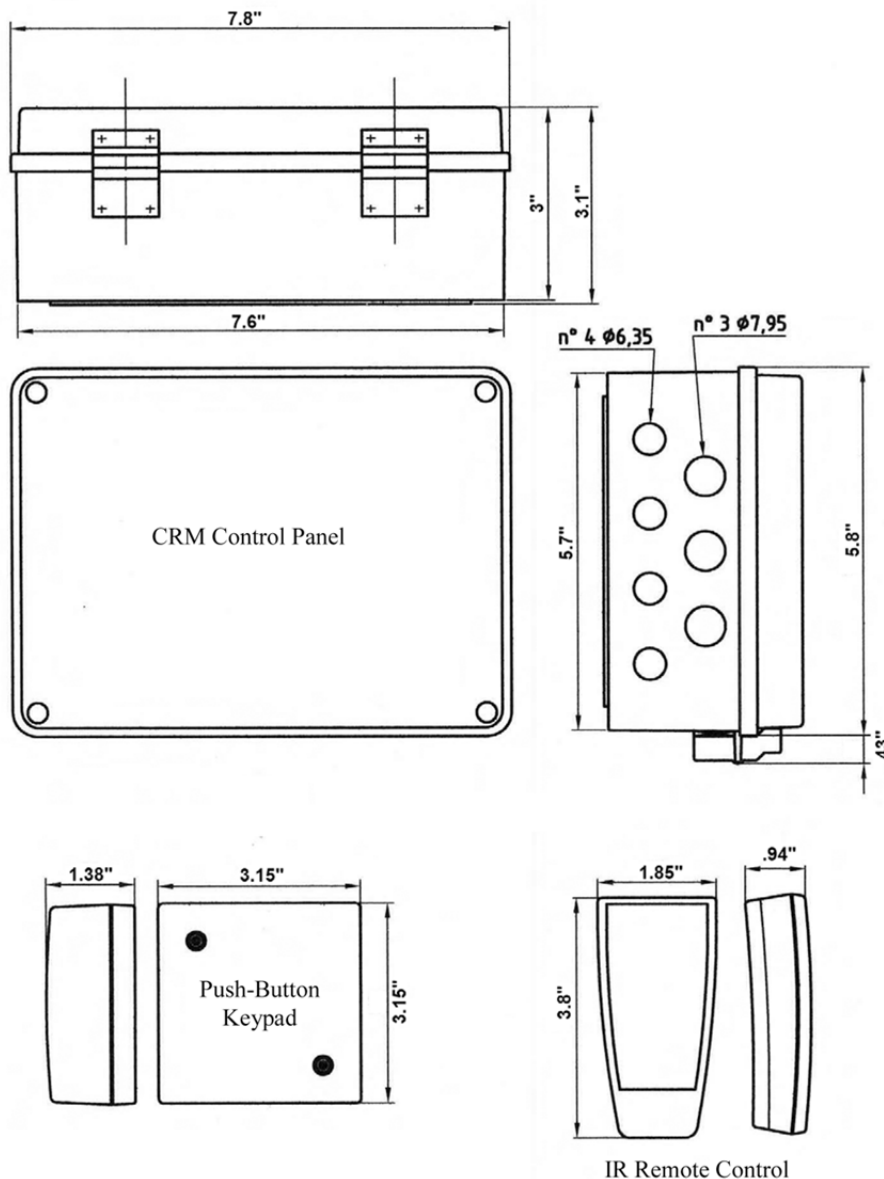
☐ **Actuator Connections**

Groups of actuators connect to the Control Panel at output terminals M1, M2, M3 and M4.

CRM3 24 Vdc Control Panel, part# 40821J, delivers power directly to DC **low voltage** actuators; or it can serve as a switch for multiple Relay Boxes, which deliver power to low voltage actuators, as shown in sample diagram on the following pages. It allows independent control of 1 to 4 actuator groups via its output terminals M1-M4, **subject to a maximum current draw of 4 amps on any combination of the 4 terminals**. Input power required is a line voltage connection, 115 Vac, 60Hz. A back-up power source can be connected at the JP4 terminal within the CRM case.

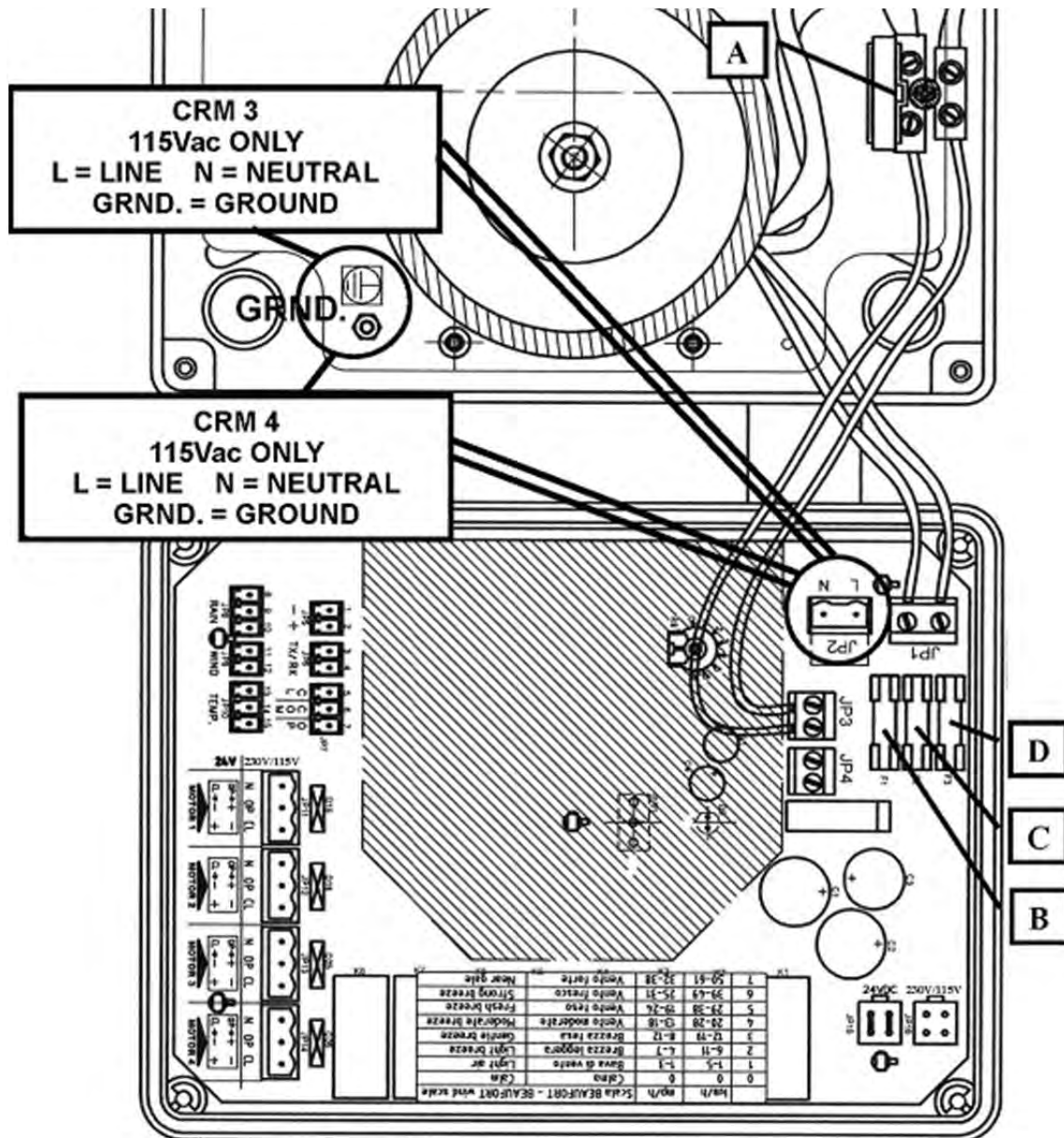
CRM4 115 Vac Control Panel, part# 40822K, delivers power directly to AC **line voltage** actuators. It allows independent control of 1 to 4 actuator groups via output terminals M1-M4, **subject to a maximum current draw of 7 amps on any combination of the 4 terminals**. Input power required is a line voltage connection, 115 Vac, 60Hz. A back-up power source can be connected at the JP4 terminal within the CRM case.

Control Panel Approx. Dimensions



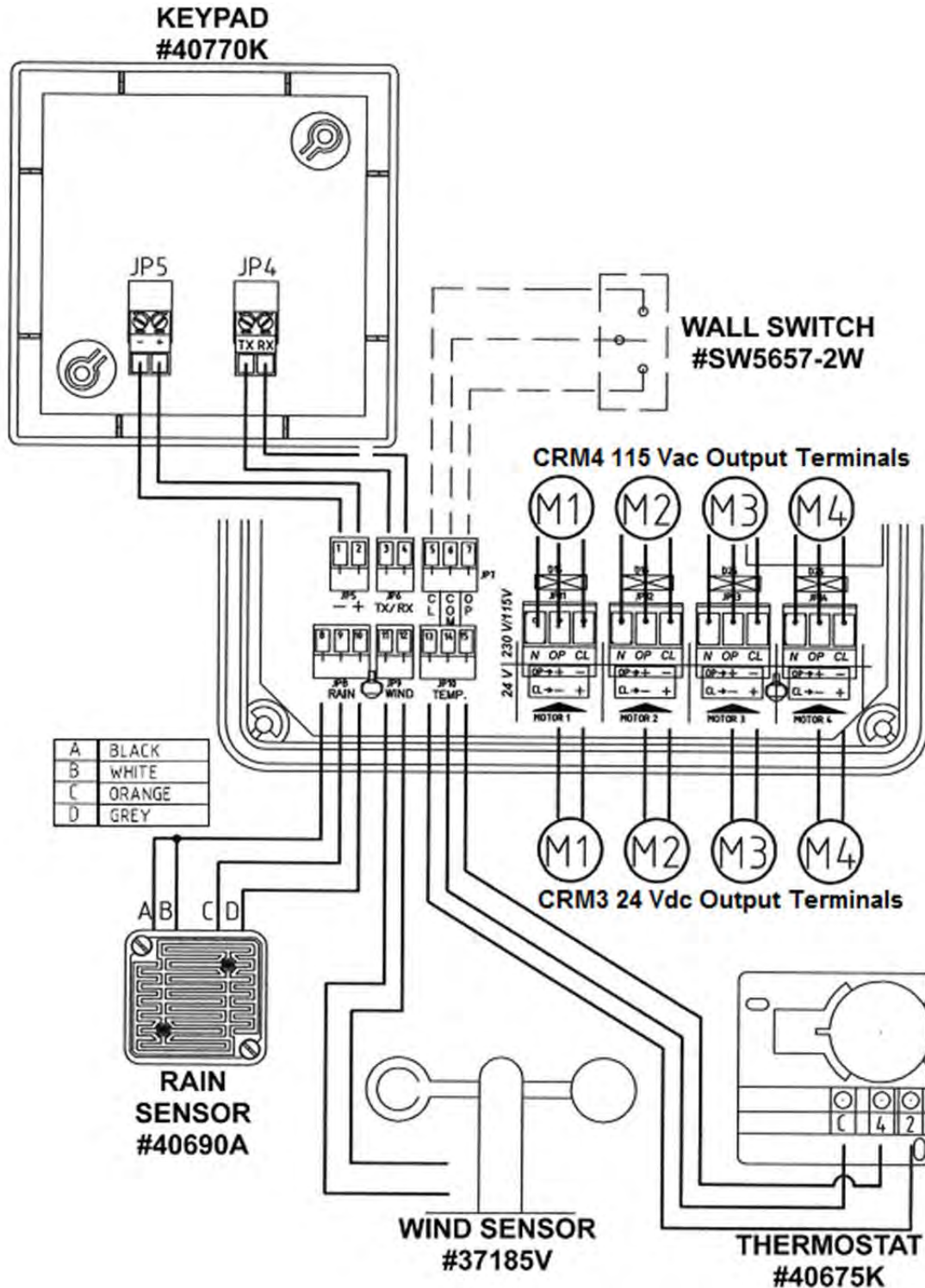
Control Panel Fuse Locations

Fuse	Controls	CRM3	CRM4	Part #
A	Transformer	5x20 5A (fast)	5x20 5A (fast)	58812L
B	Input & Output Line Voltage	5x20 1A (time delayed)	5x20 1A (time delayed)	82983N
C	Input & Output Line Voltage	None	5x20 6.3A (time delayed)	82982M
D	Input & Output Line Voltage	None	5x20 6.3A (time delayed)	82982M



Control Panel Internal Sample Wiring Diagram A

CONNECTION SPECIFICATIONS SHOWN ARE GENERIC AND NOT PROJECT SPECIFIC.

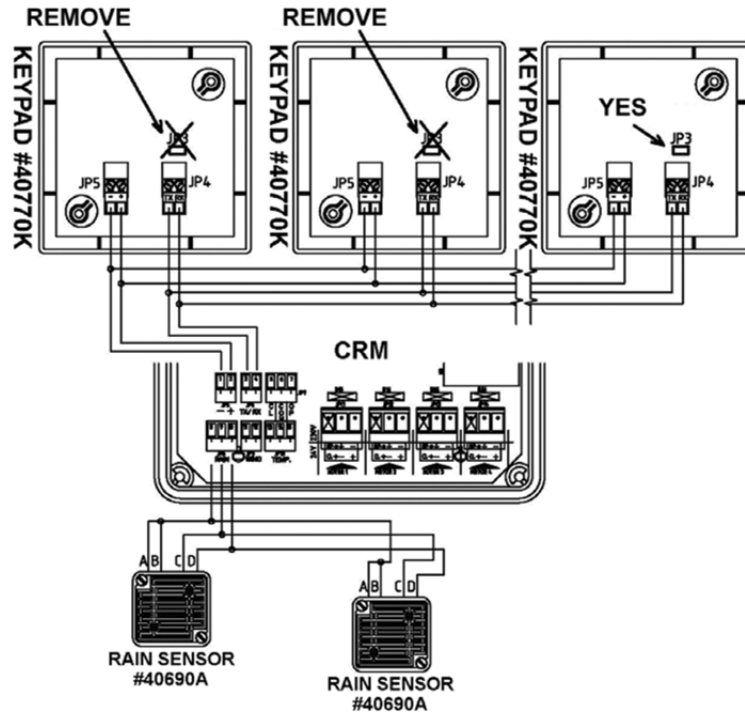


Read FFI actuator and installation guides before specifying and purchasing for automation projects.

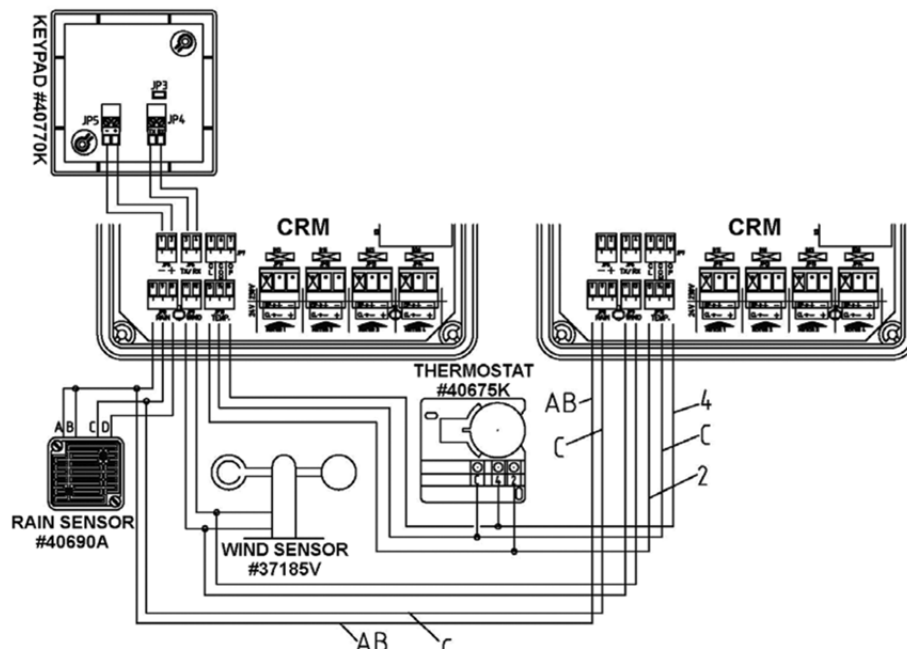
Control Panel Internal Sample Wiring Diagram B

CONNECTION SPECIFICATIONS SHOWN ARE GENERIC AND NOT PROJECT SPECIFIC.

Example B-1: Using Multiple Keypads with one CRM



Example B-2: Using CRM accessories with multiple CRMs

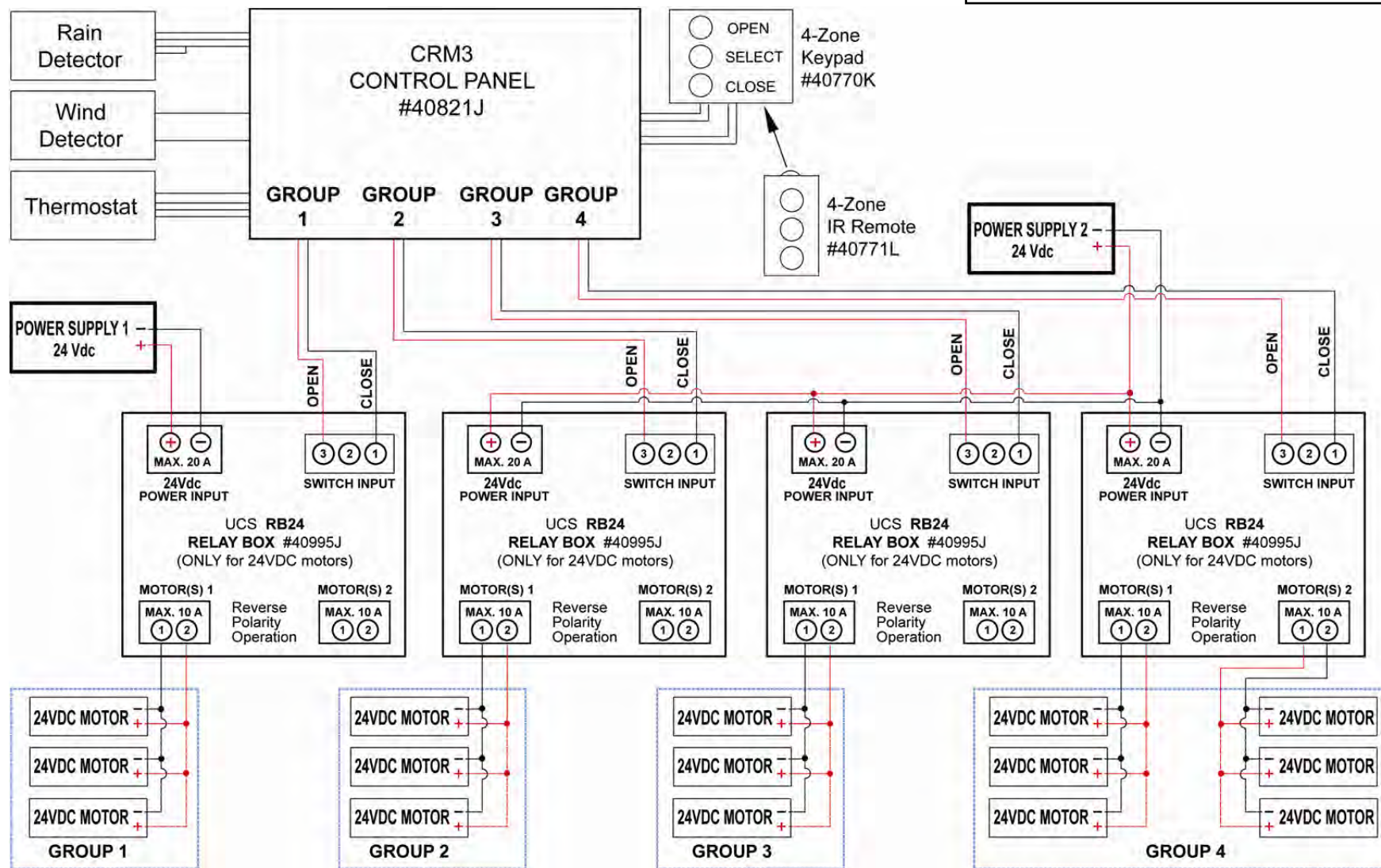


Read FFI actuator and installation guides before specifying and purchasing for automation projects.

Control Panel Internal Sample Wiring Diagram C: Control Panel Switching RB24 Relay Boxes

CONNECTION SPECIFICATIONS SHOWN ARE GENERIC AND NOT PROJECT SPECIFIC.

Read FFI actuator & installation guides
before specifying and purchasing
for automation projects.



RB24 Relay Box - Internal Connections for 24V DC motors only

CONNECTION SPECIFICATIONS SHOWN ARE GENERIC AND NOT PROJECT SPECIFIC.

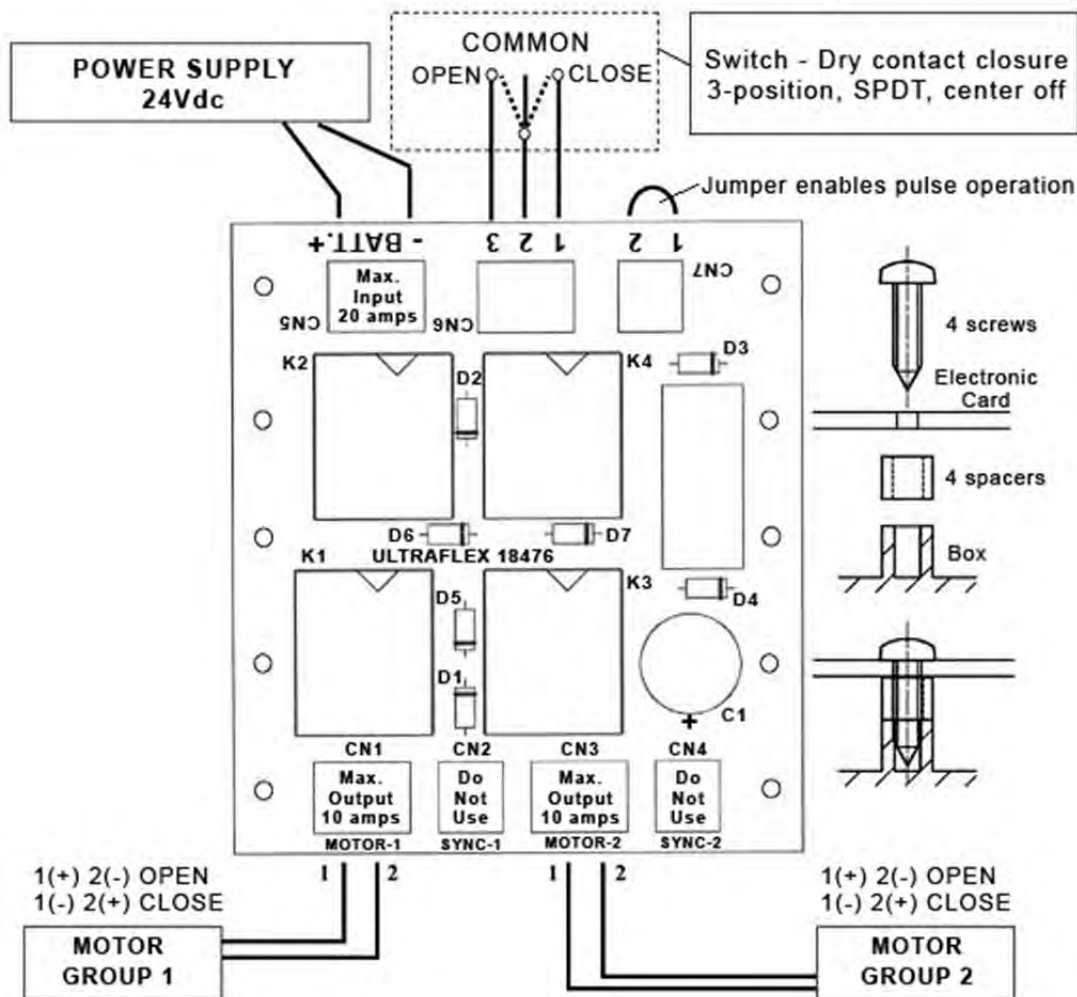
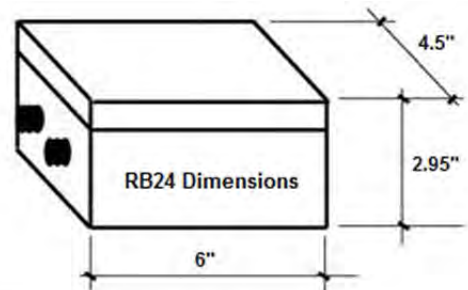
The RB24 Relay Box is a passive device for use in controlling low voltage actuators via its output terminals Motor1 and Motor2, **subject to a maximum current draw of 10 amps on each terminal or 20 amps per Relay Box.** The Relay Box takes care of reversing the polarity of the output terminals Motor1 and Motor2. A single pole double throw (SPDT) momentary contact switch or external control system connects to the Relay Box at terminal CN6. The momentary switch delivers the OPEN and CLOSE commands as brief "impulse" signals (0.5 to 2 seconds). The switch operates **all actuators** connected to the Relay Box.

Operation with Jumper In Place (One Touch Switch Operation)

Press the switch once and the RB24 powers the actuators for a 3-minute interval, long enough to fully open or close.
To stop the motor, press the switch for opposite direction.

Operation with Jumper Removed (Press & Hold Switch Operation)

Press and hold switch until full OPEN or CLOSE complete.
To stop the motor, release the switch.



Read FFI actuator and installation guides before specifying and purchasing for automation projects.