VMS-50

BACK-UP CONTROL MODULE

Back-Up Control Module

VMS-50

BCM_VMS_50_PS_RevA_0421

WARREN CONTROLS

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DEPENDABLE, RUGGED, PRECISION CONTROL VALVES AND ACCESSORIES

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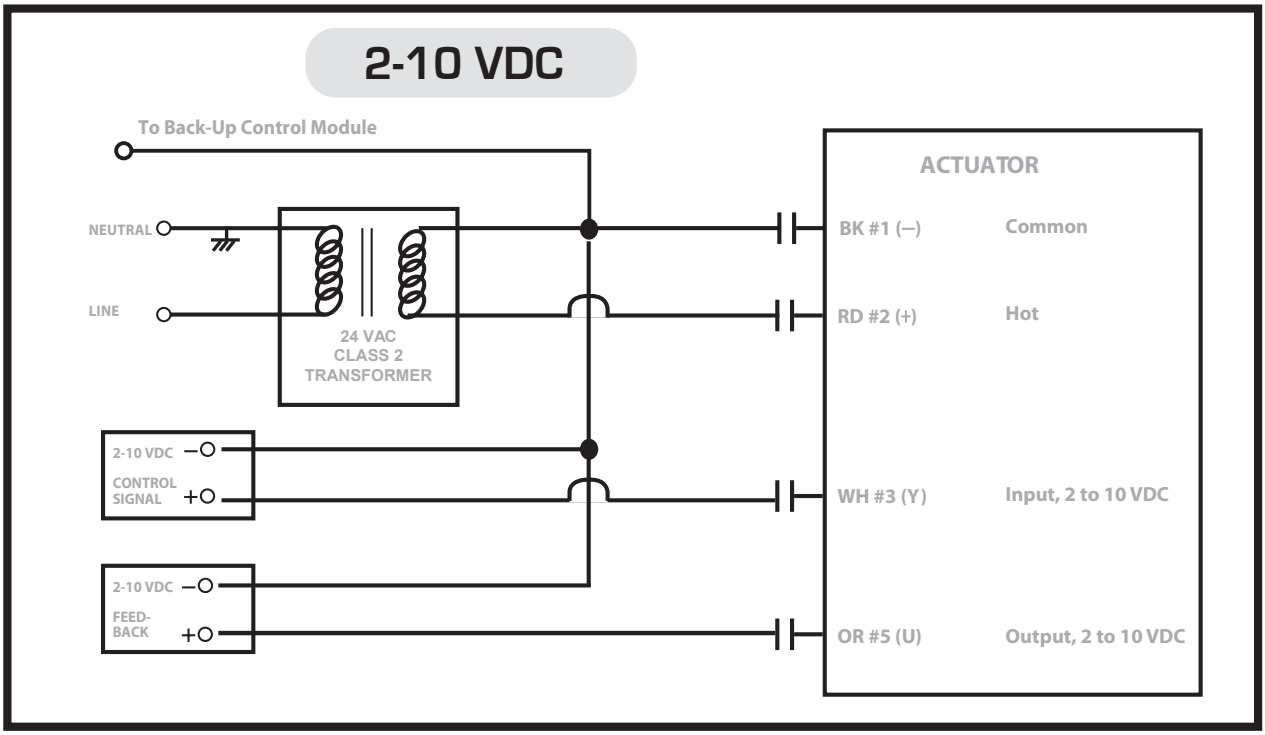
Control Valve Products for HVAC/BAC

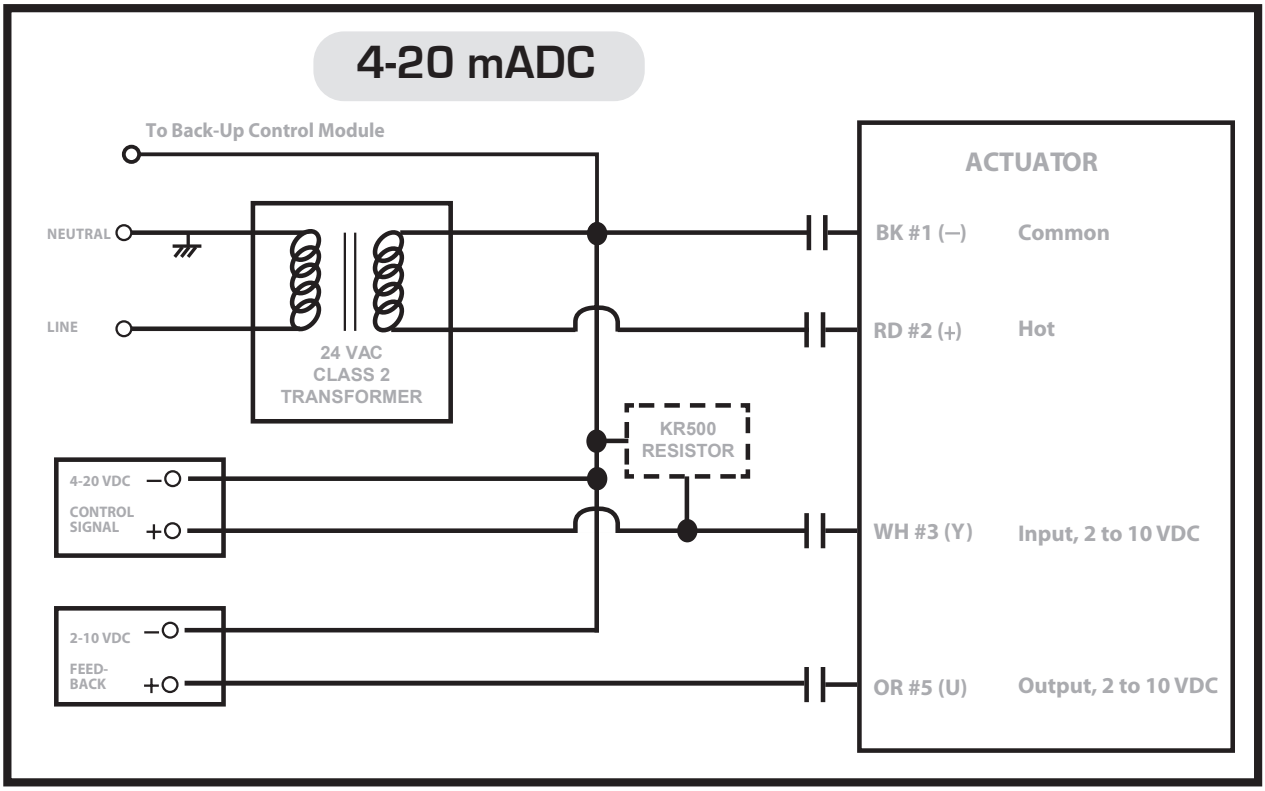
Specifying and buying a control valve begins with an understanding of the control and piping systems to which it will be connected. The Warren Controls staff has attempted to make the ordering process "user friendly" by placing products into well-defined categories and tabulating information like pipe size, body and trim materials, and flow capacity factors (Cv), followed by an assortment of actuators … a lot of information, in a logical format, intended to make your work as easy as possible.

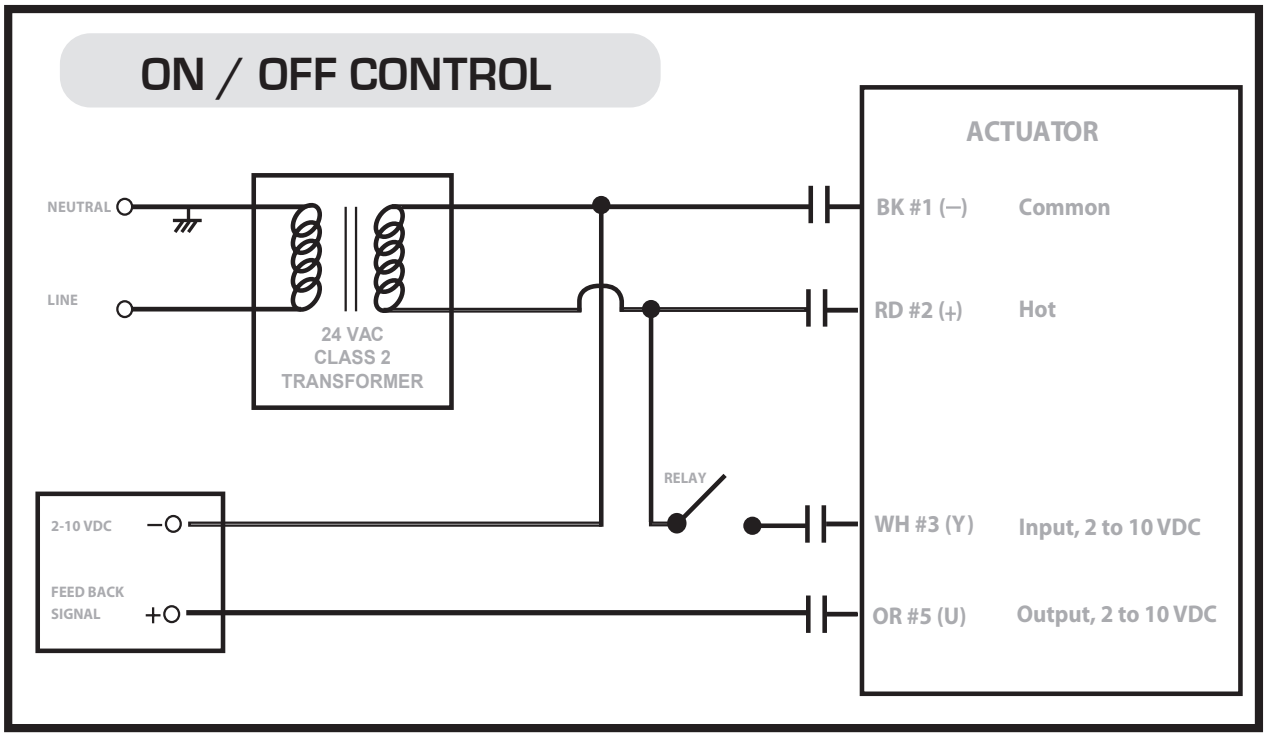
ACTUATOR WIRING DIAGRAMS

2-10 VDC



4-20 mADC

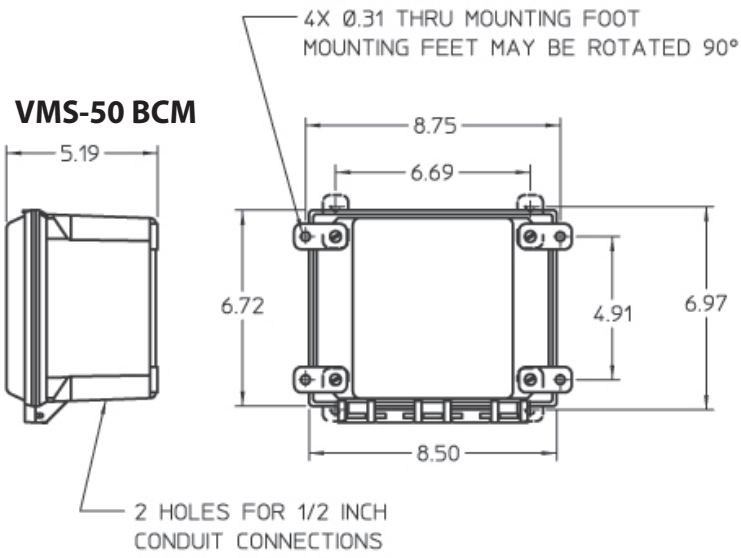



ON / OFF CONTROL
ACTUATOR
NEUTRAL
LINE
24 VAC
CLASS 2
TRANSFORMER
BK #1 (–)
Common
RD #2 (+)
Hot
RELAY
2-10 VDC
FEED BACK
SIGNAL
WH #3 (Y)
Input, 2 to 10 VDC
OR #5 (U)
Output, 2 to 10 VDC

VMS-50 BCM SPECIFICATIONS

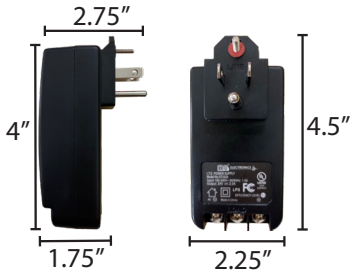
Actuator Usage:	Models E024, E029 or E031 *(NOTE: E031 is an E029 Actuator with a VMS-50-BCM. This does not include the VMS-50-PS.)*
Power Requirement:	24 Vdc 2.0 A from Separate External; Switching Power Supply
Power Output:	24 Vdc 48W Total
Number Actuators:	One, Two or Three
Construction:	Battery w/Circuit Board and Charger
Circuit Board Protection:	Fuse Littelfuse T6.3AH250VP
Enclosure Type:	NEMA 4X, IP66, UL 4X, CSA 4X
Flame Retardant:	UL 50
Construction:	UV Stabilized Fiberglass Reinforced Polyester, Polycarbonate Hinge and Closed Cell Neoprene Gasket
Connections:	Two 1/2 IN conduit with one plug
Number Batteries:	One
Initial Charge:	2-4 hours
Output Cycle Time:	6.0 Minutes from loss of power until circuit board times out
Battery Life:	Up to 5 years … Replacement battery model SP12-1.2 (12V1.4AH/T1)
Indication:	Red REPLACE BATTERY LED ON indicates Replace Battery (See REPLACE BATTERY LED Function)
Dimensions:	8.75″ (W) x 6.97″ (H) x 5.19″ (D)
Mounting:	Feet for Wall Mount (4.91″ x 8.75″ centers)
Environmental:	Operating/ Storage: Ambient +32°F to +104°F (0 to +40°C) – due to battery
Weight:	4.15 lbs (1.9 kg)
Safety Agency Listing:	Not listed

VMS-50 BCM

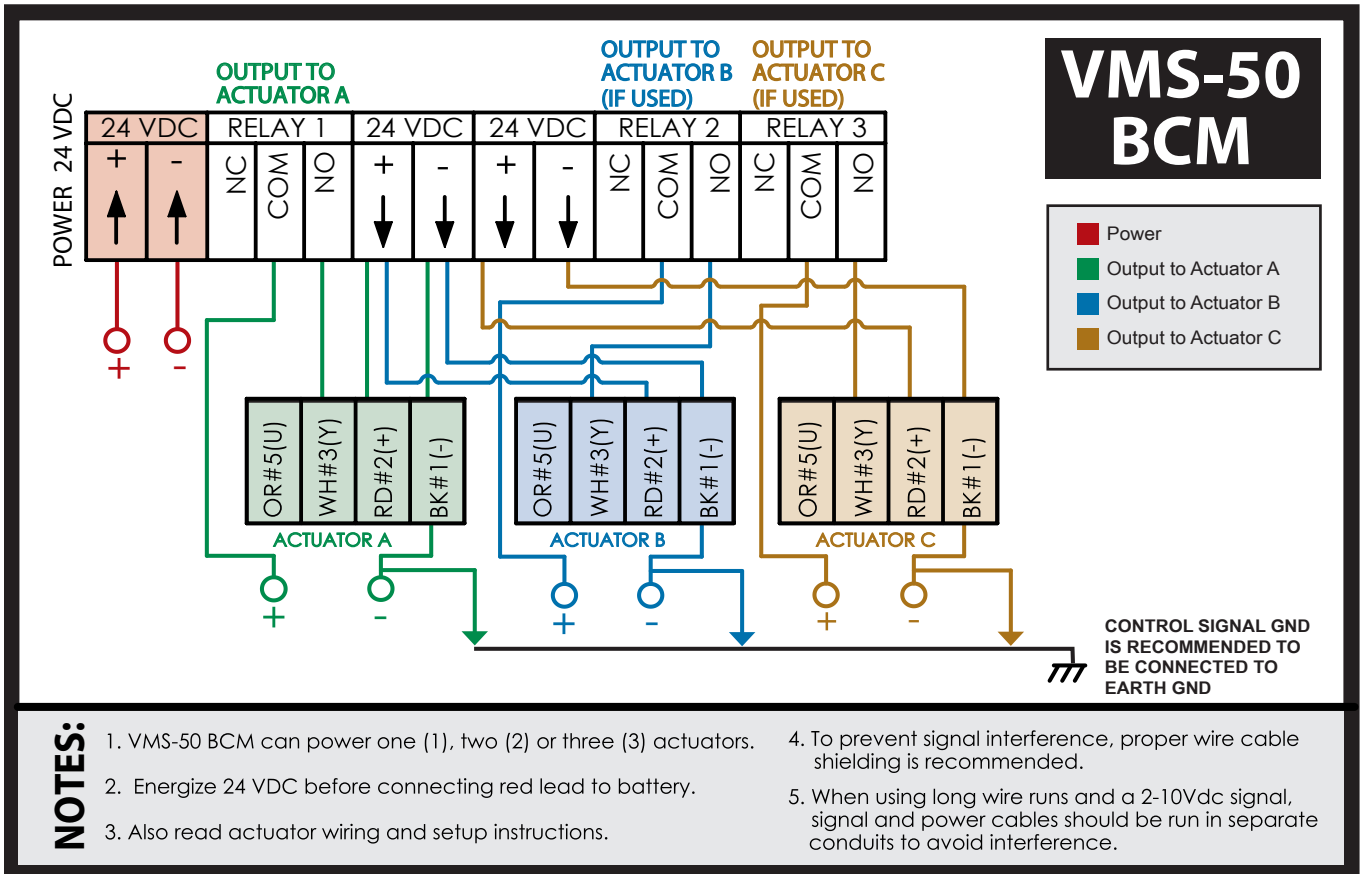


VMS-50 PS SEPARATE EXTERNAL SWITCHING POWER SUPPLY

Usage:	VMS-50 BCM (VMS-50 BCM does not include VMS-50 PS)
Input:	115 VAC 50/60 Hz 1.5A
Indication:	Red LED ON indicates Input Line Voltage Present
Output:	24 Vdc 2.0 A
Input Connector:	Three Pin Input Plug
Construction:	Molded Plastic
Environmental:	Ambient +32°F to +113°F (0 to +45°C)/
Operating/ Storage:	-40°F to +185°F/(-40 to +85°C)
Weight:	0.5 lbs (0.2 kg)
Safety Agency Listing:	UL listed



VMS-50 PROPORTIONAL CONTROL DIAGRAM



NOTES:

1. VMS-50 BCM can power one (1), two (2) or three (3) actuators.
2. Energize 24 VDC before connecting red lead to battery.
3. Also read actuator wiring and setup instructions.
4. To prevent signal interference, proper wire cable shielding is recommended.
5. When using long wire runs and a 2-10Vdc signal, signal and power cables should be run in separate conduits to avoid interference.

VMS-50 BCM	
TERMINAL IDENTIFICATION	**CONNECTION/DESCRIPTION**
24 VDC + ←	24 Vdc (+) IN
24 VDC - ←	24 Vdc (-) IN
RELAY 1 NC	Normally Closed Relay Contact 1st Actuator
RELAY 1 COM	Common Relay Contact/Control Signal (+) 1st Actuator
RELAY 1 NO	Normally Open Relay Contact 1st Actuator
24 VDC + →	24 Vdc (+) OUT
24 VDC - →	24 Vdc (-) OUT
RELAY 2 NC	Normally Closed Relay Contact 2nd Actuator
RELAY 2 COM	Common Relay Contact/Control Signal (+) 2nd Actuator
RELAY 2 NO	Normally Open Relay Contact 2nd Actuator
RELAY 3 NC	Normally Closed Relay Contact 3rd Actuator
RELAY 3 COM	Common Relay Contact/Control Signal (+) 3nd Actuator
RELAY 3 NO	Normally Open Relay Contact 3nd Actuator

Operation:

Proportional Normal:
24 Vdc External Power Supply LOAD connected to 24 Vdc IN terminals of VMS-50 BCM. Building Power Source, 115 VAC 50/60 Hz required for VMS-50 PS , connected to 24 Vdc External Power Supply LINE. Actuator responds to modulating input signal.

Power Failure: 24 Vdc OUT from VMS-50 BCM changes from 24 Vdc from External Power Supply to 24 Vdc from battery/inverter. Relay(s) break the connection between Common and Normally Open Contact terminals forcing the actuator(s) to go to the signal failure direction for their rotation switch position.

Loss of Signal: 24 Vdc External Power Supply connected to 24 Vdc IN terminals of VMS-50 BCM. Building Power Source, 115 VAC 50/60 Hz required for VMS-50 PS, connected to 24 Vdc External Power Supply. The control signal is broken forcing the actuator(s) to go to the signal failure direction for their rotation switch position.

PROPORTIONAL CONTROL

1. Disengage the building power circuit before wiring. Verify that the battery inside the VMS-50 BCM has its wires disconnected and leave them that way for now. Disconnect them if they are connected.

2. Connect the VMS-50 BCM to the actuator(s) as shown on wiring diagram. The VMS-50 BCM can power one, two or three actuators.

Actuator A: Connect Relay 1 Normally Open Contact **RELAY 1 NO** to white wire from actuator to drive the valve stem in the direction determined by the actuator rotation switch position. Connect 24 Vdc (+) OUT **24 VDC + →** to red wire from actuator to provide power. Connect grounded reference - negative/black wire from actuator to 24 Vdc (-) OUT **24 VDC - →**. Also connect the control signal (-) to the black wire from the actuator. Connect Relay 1 Common Contact **RELAY 1 COM** to the control signal positive (+). If the control signal is 4-20mADC a KR500 500 ohm resistor is required. Terminate the resistor between Relay 1 Normally Open Contact **RELAY 1 NO** and 24 Vdc (-) OUT **24 VDC - →**.

Actuator B: Connect Relay 2 Normally Open Contact **RELAY 2 NO** to white wire from actuator to drive the valve stem in the direction determined by the actuator rotation switch position. Connect 24 Vdc (+) OUT **24 VDC + →** to red wire from actuator to provide power. Connect grounded reference - negative/black wire from actuator to 24 Vdc (-) OUT **24 VDC - →**. Also connect the control signal (-) to the black wire from the actuator. Connect Relay 2 Common Contact **RELAY 2 COM** to the control signal positive (+). If the control signal is 4-20mADC a KR500 500 ohm resistor is required. Terminate the resistor between Relay 2 Normally Open Contact **RELAY 2 NO** and 24 Vdc (-) OUT **24 VDC - →**.

Actuator C: Connect Relay 3 Normally Open Contact **RELAY 3 NO** to white wire from actuator to drive the valve stem in the direction determined by the actuator rotation switch position. Connect 24 Vdc (+) OUT **24 VDC + →** to red wire from actuator to provide power. Connect grounded reference - negative/black wire from actuator to 24 Vdc (-) OUT **24 VDC - →**. Also connect the control signal (-) to the black wire from the actuator. Connect Relay 3 Common Contact **RELAY 3 COM** to the control signal positive (+). If the control signal is 4-20mADC a KR500 500 ohm resistor is required. Terminate the resistor between Relay 3 Normally Open Contact **RELAY 3 NO** and 24 Vdc (-) OUT **24 VDC - →**.

3. While still disconnected, wire the 24 Vdc External Power Supply LOAD to the VMS-50 BCM. Connect the POSITIVE (+) lead to the 24 Vdc (+) IN **24 VDC+ ←** terminal, then connect the NEGATIVE (-) lead to the 24 Vdc (-) IN **24 VDC - ←** terminal.

4. Connect the 24 Vdc External Power Supply LINE into the building power source. For the VMS-50 PS plug the three pin LINE input plug into the 115 VAC 50/60 Hz building power source.

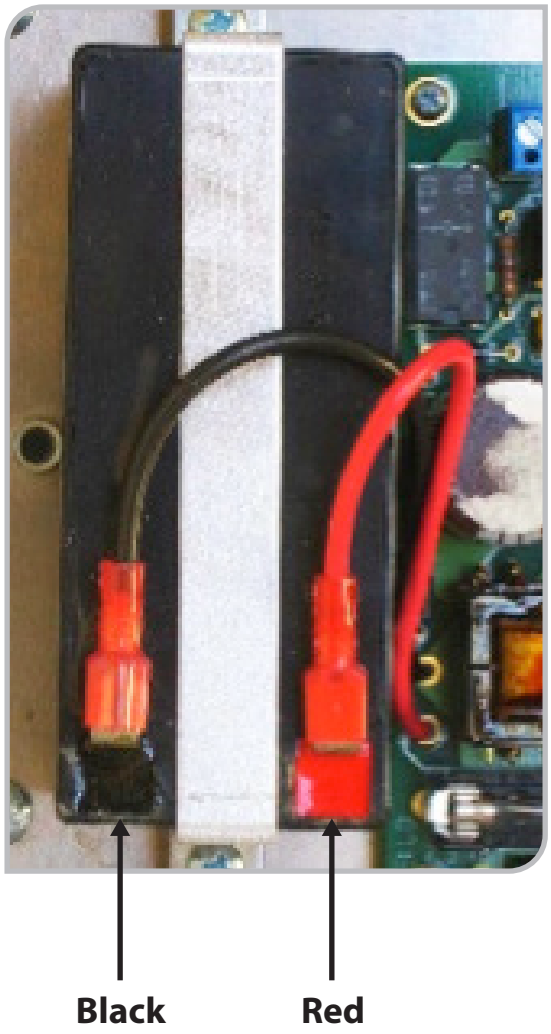
5. Verify that building power is live then connect the loose red wire inside the VMS-50 BCM enclosure to the positive (+) battery terminal and the black wire to the negative (-) battery terminal.

NOTE: Engage the building power to the VMS-50 BCM before connecting the battery. Connecting the battery first causes the VMS-50 BCM to go into the power failure mode.

REPLACE BATTERY LED FUNCTION

Under normal conditions of 24Vdc power supplied to the VMS-50 BCM, a battery requiring an initial charge should become fully charged in 2 to 4 hours and remain charged until a building power failure occurs. The VMS-50 BCM has a red REPLACE BATTERY LED. For the LED to illuminate the VMS-50 BCM must be powered by a 24Vdc external power supply. The LED will illuminate if the circuit board is unable to charge or maintain the charge of the battery. The LED will also illuminate if the battery terminals are not connected to the circuit board. If the REPLACE BATTERY LED illuminates and the battery is connected to the circuit board replace the battery. Typical battery life is 5 years. This common gel cell battery is available from most battery supply houses.

VMS-50 BCM (SP12-1.2 (12V1.4 AH/T1)) BATTERY REPLACEMENT



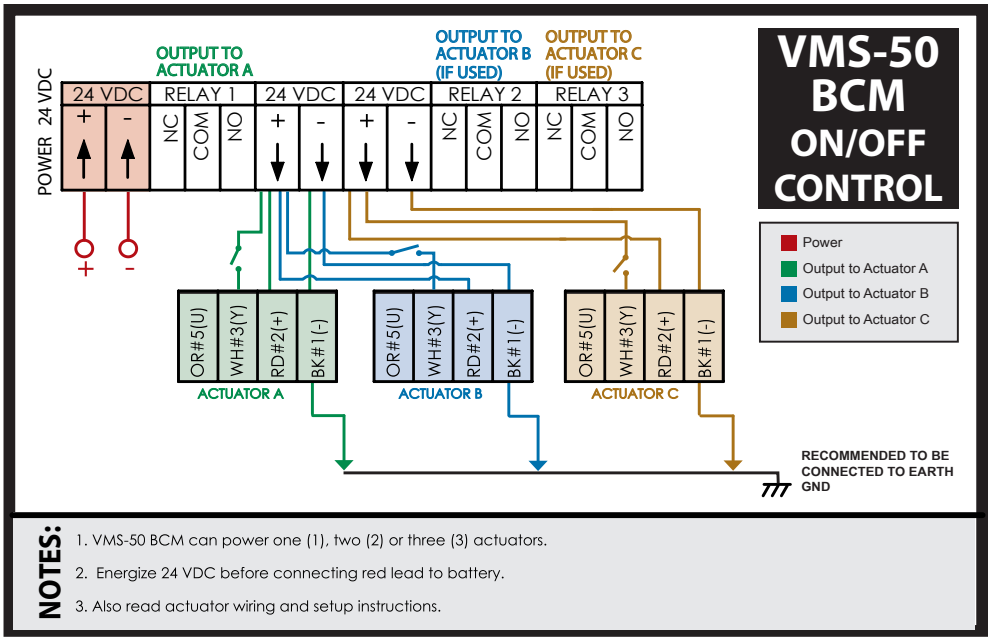
PROCEDURE:

NOTE: Normal valve operation under 24 Vdc power need not be interrupted during battery replacement; however, the fail-safe function will not be available until the new battery is in place, connected and sufficiently charged (typically 2-4 hours).

1. Refer to the picture (left) to locate and disconnect the Red and Black wires from the battery.
2. Remove the two battery mounting bracket screws and remove the battery and bracket.
3. Place the bracket over the new battery and install the assembly as shown, using the two screws removed in step 2 (above).
4. Connect the Black wire to the black (unmarked) terminal.
5. With 24 Vdc power present, connect the Red wire to the red terminal. VMS-50 BCM circuitry will automatically charge the battery. (If 24 Vdc is not present, the valve may move to its fail-safe position, depending upon residual charge in the new battery.)
6. Recycle or dispose of the old battery properly. Do not incinerate!

VMS-50 BCM SPECIFICATIONS

ON-OFF CONTROL



VMS-50 BCM ON-OFF	
TERMINAL IDENTIFICATION	**CONNECTION/DESCRIPTION**
24 VDC + ←	24 Vdc (+) IN
24 VDC - ←	24 Vdc (-) IN
RELAY 1 NC	Not Used
RELAY 1 COM	Not Used
RELAY 1 NO	Not Used
24 VDC + →	24 Vdc (+) OUT
24 VDC - →	24 Vdc (-) OUT
RELAY 2 NC	Not Used
RELAY 2 COM	Not Used
RELAY 2 NO	Not Used
RELAY 3 NC	Not Used
RELAY 3 COM	Not Used
RELAY 3 NO	Not Used

Operation:

On- Off Normal: 24 Vdc External Power Supply LOAD connected to 24 Vdc IN terminals of VMS-50 BCM. Building Power Source, 115 VAC 50/60 Hz required for VMS-50 PS , connected to 24 Vdc External Power Supply LINE. Actuator responds to opening and closing of contact between WH# 3(Y) white wire and 24 Vdc (+) OUT **24 VDC + →** terminal.

Power Failure: 24 Vdc OUT from VMS-50 BCM changes from 24 Vdc from External Power Supply to 24 Vdc from battery/inverter. Actuator responds to position of contact between WH# 3(Y) white wire and 24 Vdc (+) OUT **24 VDC + →** terminal.

1. Disengage the building power circuit before wiring. Verify that the battery inside the VMS-50 has its wires disconnected and leave them that way for now. Disconnect them if they are connected.

2. Connect the VMS-50 BCM to the actuator(s) as shown on wiring diagram. The VMS-50 BCM can power one, two or three actuators.

Actuator A: Connect 24 Vdc (+) OUT **24 VDC + →** to red wire from actuator to provide power. Connect grounded reference - negative/black wire from actuator to 24 Vdc (-) OUT **24 VDC - →**. Connect 24 Vdc (+) OUT **24 VDC + →** to white wire from actuator to drive the valve stem in the direction determined by the actuator rotation switch position. Disconnect 24 Vdc (+) OUT **24 VDC + →** from white wire from actuator to drive the valve stem in the opposite.

Actuator B: Connect 24 Vdc (+) OUT **24 VDC + →** to red wire from actuator to provide power. Connect grounded reference - negative/black wire from actuator to 24 Vdc (-) OUT **24 VDC - →**. Connect 24 Vdc (+) OUT **24 VDC + →** to white wire from actuator to drive the valve stem in the direction determined by the actuator rotation switch position. Disconnect 24 Vdc (+) OUT **24 VDC + →** from white wire from actuator to drive the valve stem in the opposite.

Actuator C: Connect 24 Vdc (+) OUT **24 VDC + →** to red wire from actuator to provide power. Connect grounded reference - negative/black wire from actuator to 24 Vdc (-) OUT **24 VDC - →**. Connect 24 Vdc (+) OUT **24 VDC + →** to white wire from actuator to drive the valve stem in the direction determined by the actuator rotation switch position. Disconnect 24 Vdc (+) OUT **24 VDC + →** from white wire from actuator to drive the valve stem in the opposite.

3. While still disconnected, wire the 24 Vdc External Power Supply LOAD to the VMS-50 BCM. Connect the POSITIVE (+) lead to the 24 Vdc (+) IN **24 VDC+ ←** terminal, then connect the NEGATIVE (-) lead to the 24 Vdc (-) IN **24 VDC - ←** terminal.

4. Connect the 24 Vdc External Power Supply LINE into the building power source. For the VMS-50 PS plug the three pin LINE input plug into the 115 VAC 50/60 Hz building power source.

5. Verify that building power is live then connect the loose red wire inside the VMS-50 BCM enclosure to the positive (+) battery terminal and the black wire to the negative (-) battery terminal.

NOTE: Engage the building power to the VMS-50 BCM before connecting the battery. Connecting the battery first causes the VMS-50 BCM to go into the power failure mode.

A VETERAN OWNED, PRIVATELY HELD, SMALL BUSINESS

BCM_VMS_50_PS_RevA_0421

Warren Controls was founded in the early 1950's and was known as Warren Automatic Controls. Warren is the name of the county in New Jersey where the business was founded. The first products were regulators designed for the HVAC and marine industries. The company was purchased and renamed Warren Controls Corporation in 1971, largely specializing and growing in a variety of flow control products for commercial, industrial, and military applications.

In 2003, Warren Controls Inc., as we are known today now resides in a modern 60,000 Sq. Ft. manufacturing facility in Bethlehem, PA. Our product lines continue to grow through extensive product development and target marketing. Today, Warren offers four broad product lines for Building Automation Control Valves, Industrial Process Valves up to ANSI Class 300, Mechanical Level Controls for deaerators and boilers, and Military / Marine Valves to MIL specifications.

We serve a variety of end use and OEM customers and manage an extensive independent representative and distribution sales network. Find out who the local Sales Agent is in your area. Or, feel free to contact the company directly to answer your questions and serve your needs.

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