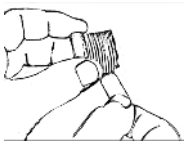
Thank you for purchasing your U.S. Solid Motorized Ball valve. We are happy to have you as a customer! We want you to get the most out of your new equipment, so we have included a few pointers to get you started. Unfold this manual for simple wiring diagrams, schematics, and specifications on your valve.



THREADING

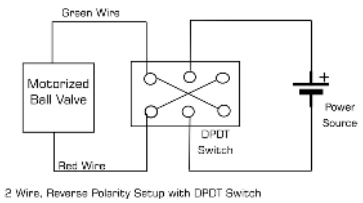
U.S. Solid Valves follow National Standards for pipe thread. In the U.S.A. we use NPT, while in England we use BSPT. We recommend use of tefflon tape to ensure seal of the NPT threading, as shown in the figure to the left.

WIRING

There are 4 different wire setups with U.S. Solid Models. Please Note the model number and wiring setup indicated in the table below.

Wiring Setup	Model (USS-MSV000...)
2 Wires, Reverse Polarity	04, 05, 06, 12, 21, 22, 26
2 Wires, Auto-Return	07,08, 09, 10, 17, 18, 27
3 Wire Setup	01, 02, 03, 11, 19, 20, 25
5 Wires, Indicator Signal Setup	13, 14, 15, 16, 23, 24, 28

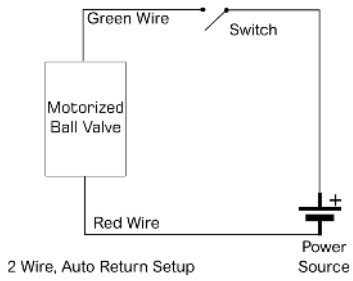
The following wiring diagrams are only examples. There are many other possible ways to wire these ball valves. Before making any electrical connections, make sure the power is off.



2 Wire, Reverse Polarity Setup with DPDT Switch

2 Wire Reverse Polarity

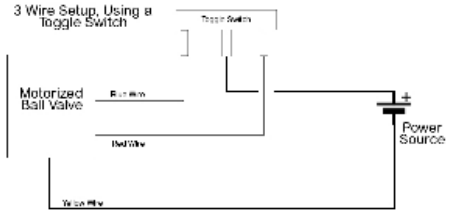
Once energized, Red (+) and Green (-), the valve will open. Once reversed, Red (-) and Green (+), the valve will close. This can be achieved with a DPDT switch or similar arrangement.



2 Wire, Auto Return Setup

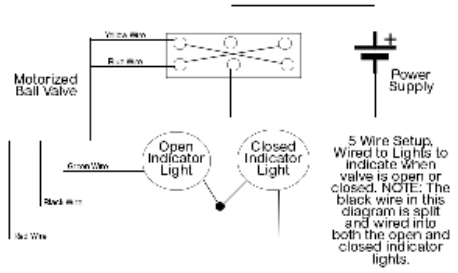
2 Wire Auto Return

The 2 wire auto return can be connected directly to a simple On/Off Switch. When the valve is energized (by switching on), the valve will open. It will remain open until the valve is de-energized (by turning the switch off, or due to loss of power).



3 Wire Setup

The three wire setup shows an example of wiring with a toggle switch (SPDT). It is important in this setup that the Yellow Wire is connected to the (-) pole from the power supply.



5 Wire Setup

In this 5 wire setup, the motorized ball valve is hooked up to a DPDT switch. It is also connected to 2 separate indicator lights, so it is simple to see if the valve is open or closed, for automation purposes.

FREQUENTLY ASKED QUESTIONS

1) Is my valve de-energized when fully open or fully closed?

Answer: For 2 wire reverse polarity models, and 3 wire models, yes. For other models, there is a negligible amount of power used once fully open. For the 5 wire model, there is energy used when closed, as well. This allows the indicator lights to remain working. Check out the specifications sheet for further questions.

2) Does the valve require water or air pressure to work?

Answer: No! One of the benefits of motorized ball valves is they can work with little water pressure. This means a motorized ball valve can work even with gravity fed arrangements.

3) Can this valve operate when partially open or closed?

Answer: For all but the Auto Return models, yes. You will have to carefully monitor time and voltage to get it to stop at an exact point repeatedly, though.

4) Can this valve be actuated manually?

Answer: No. Models depicted in this sheet are not designed to be opened or closed manually.

5) Will this return to closed if power goes out?

Answer: If you purchased an Auto Return Model, then yes. All other models will remain in the current position if power were to go out. If this is a concern, we recommend getting one of the Auto-Return Models.

6) Can this valve be used outside?

Answer: The motorized ball valves all have a rating of IP65, which means they can withstand spray from water. However, if permanently installed outdoors, it is recommended that you enclose the motorized ball valve in some protective housing.

7) Can this motorized ball valve be powered continuously?

Answer: Due to the power limiting features of these valves, they can be hooked up to power non-stop without risk of overheating.

8) How does the threading work?

Answer: All of these motorized ball valves use NPT threading. This is the most common type in the United States. When connecting the valve to other piping, be sure to use some sort of thread sealant.

SPECIFICATIONS

Models: USSMSV000...	01,02,03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 17,18,19,20,21,22, 25,26,27	13, 14, 15, 16, 23, 24, 28
Torque	2 N m	6 N m
Open/Close Time	3-5 Seconds	6-8 Seconds
Voltage	9V-24V DC or AC/DC	
Max Power	2W	5W
IP Rating (Casing)	IP65	IP65
Max Pressure	1.0Mpa	1.0Mpa
Temp. Range for Flow Medium	0°C to 90° C	0°C to 100° C
Ambient Temp. Range	-10°C to 40° C	-5°C to 40° C
De-Energized Fully When Open or Closed	Yes	No

Models with AC/DC voltage: 01/02/03/07/08/09/10 /11/17/18/19/20/25/27

U.S. SOLID
High Quality Valves

WIRING SCHEMATICS

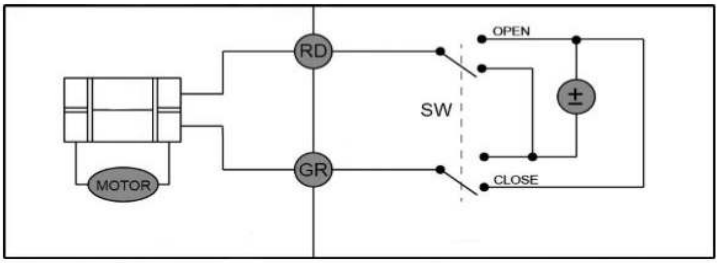
MOTORIZED BALL VALVES

MSV MODELS

Wiring Schematics

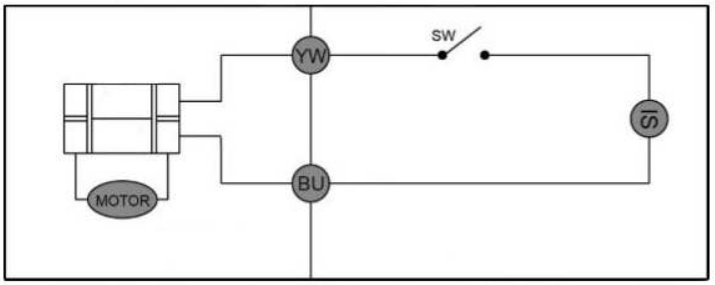
Included below are the wiring schematics for all four wiring setups included in this information sheet. These are a more formal presentation of wiring options for your valve. Be aware, there are many possible ways to wire your motorized ball valve.

2 Wires, Reverse Polarity



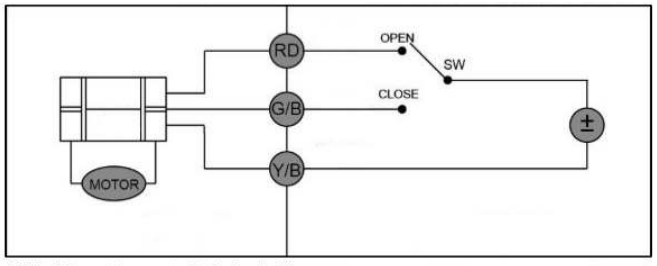
1. When the Switch is set to open, the valve fully opens. Once in this state, the valve is de-energized (power consumption is zero). This occurs when the Red Wire is connected to the (+) pole, and the Green Wire is connected to the (-) pole.
2. When the switch is set to close, the valve will fully close. Once in this state, the valve is de-energized (power consumption is zero) This occurs when the Red Wire is connected to the (-) pole and the Green Wire is connected to the (+) pole.
3. In case of power loss, valve will remain in its current state.

2 Wires, Auto Return



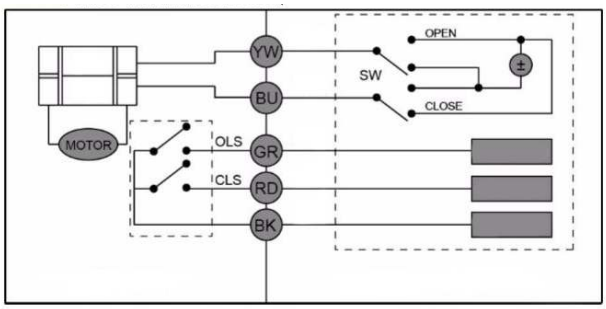
1. When the circuit is closed (switch connecting the valve is on), the valve will open, and remain open. Once open, power consumption is nominal.
2. When the circuit is open (switch connecting the valve is off or power is lost), the valve will close. Once in this state, the valve is fully de-energized (power consumption is zero).

3 Wire Setup



1. Yellow Wire must be connected to the (-) pole of the power source.
2. When switch is set to open, valve will fully open. Once in this state, the valve is de-energized (power consumption is zero).
3. When switch is set to close, valve will fully close. Once in this state, the valve is de-energized (power consumption is zero).
4. In case of power loss, valve will remain in its current state.

5 Wires with Indicators Setup



1. When switch is set to open, the valve will fully open. Once fully open, the valve will largely de-energize. The Open Limited Signal will be energized, indicating that the valve is fully open.
2. When switch is set to close, the valve will fully close. Once fully closed, the valve will largely de-energize. The Closed Limited Signal will be energized, indicating that the valve is fully closed.
3. In case of power loss, valve will remain in its current state.

WARRANTY

All U.S. Solid motorized ball valves come with a one year warranty.
We realize that other questions or concerns may arise during the installation and operation of your valve. Please contact us or visit our website for help.

Phone: 800-209-4177
Email: service@ussolid.com
Website: www.ussolid.com