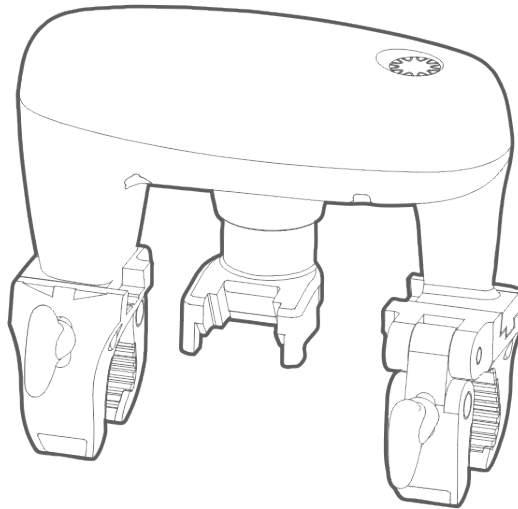


BALL VALVE SERVO USER MANUAL

FIREBOT BALL VALVE SERVO



Content

[1 FIREBOT BVS](#)

[2 BVS INSTALLATION](#)

[3 KEY & INDICATORS BEHAVIOR](#)

[4.1 Touch Sense Button](#)

[4.2 Visual Indicator](#)

[4.3 Sound Indicator](#)

[4 TOUCH SENSE BUTTON KEYLOCK](#)

[5.1 Touch Sense Button Keylock Enable](#)

[5.2 Touch Sense Button Keylock Disable](#)

[5.3 Pause Motor Running](#)

[5 WATER LEAK SENSOR & ALARM](#)

[6.1 Water Leak Detection & Alarm](#)

[6.2 Water Leak Alarm Cancellation](#)

[6 TEMPERATURE SENSOR](#)

[7.1 Temperature Report](#)

[7 APPENDIX](#)

[8.1 System Event Status](#)

[8.2 Touch Sense Button Keylock](#)

[8.3 Operation Mode](#)

[8.4 Water Valve Operation](#)

[8.5 Water Leak Event & Alarm](#)

8 FEATURES & SPECIFICATIONS

8.1 Physical Specifications

8.2 Hardware Specifications

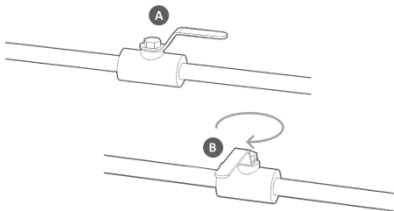
6 Steps Installation

1 FIREBOT BVS

Ball Valve Servo is capable for outdoor deployment for controlling water valve OPEN / CLOSE. It also supports auto CLOSE valve when water leak is detected by Local Leak Sensor Probe.

2 BVS INSTALLATION

- 1** Close valve: Rotate the handle from position A to position B to turn off your valve.

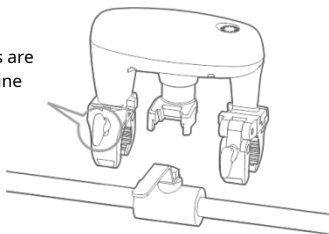


- 2** Install Firebot APP: Scan the QR code to install the mobile application.



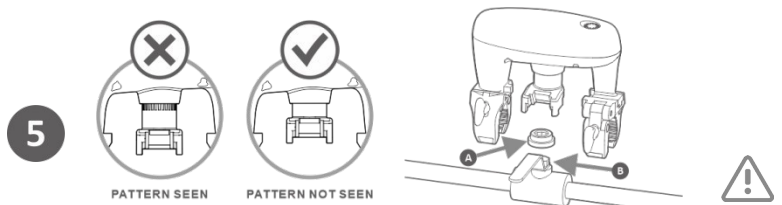
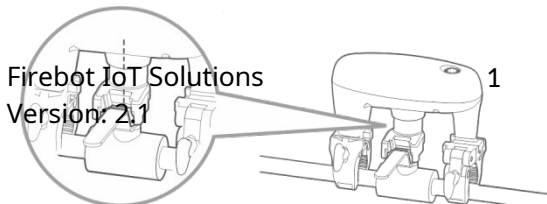
- 3** Prepare your valve: Position BVS over the top of the handle of ball valve.

! Make sure the knobs are facing on the same line

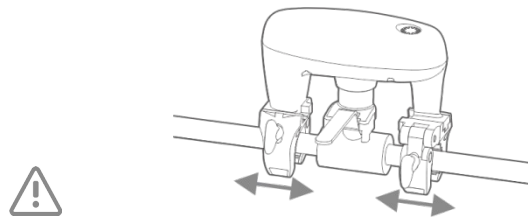


- 4** Install BVS on your valve
Align the pivot of the transmission fork with the hex bolt on top of the valve. Press down firmly to engage the spring loaded gear, then tighten 2 clamps;

Firebot IoT Solutions
Version: 2.1



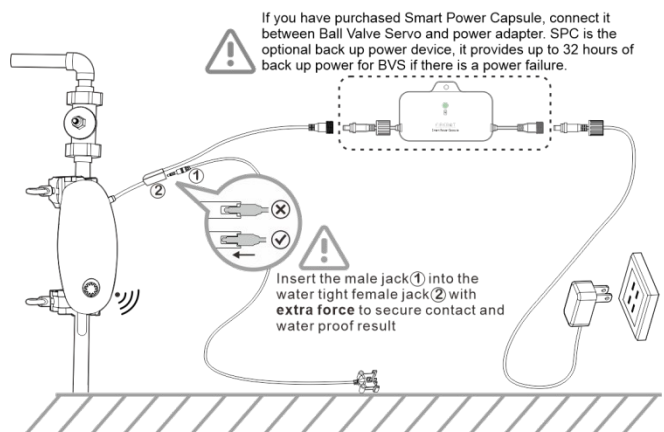
- 5** If you have oversized valve or your valve has adjacent pipe elbow, you may slide any or both clamps in or out to fit the space;



- 5** Check the transmission fork mechanic engagement by visual. You SHOULD NOT see the PATTERN on the top of transmission fork, if you do, you may not install it securely, please double check, make sure you have pushed the BVS down enough for a secured installation. Otherwise, you have a rare ultra low profile valve, the handle is too low for spring loaded mechanic to engage, in this case, please put the Space A between the hex bolt head of the valve B and the transmission fork.

Connect SPC & Power Adapter

Insert the local water detection probe (included) for close area leak detection, plug the male jack A to the female jack B from the power supply cable branch (Please push hard enough to achieve water tight result), it will trigger the valve to close whenever water is detected. (Remove the protection cap from female jack first)



You may install local water detection probe (included) for close area leak detection, plug the male jack ① to the female jack ② from the power supply cable branch. It will trigger the valve to close whenever water is detected. (remove the protection cap from female jack first)

Disabling option for outdoor installation

If you are installing the BVS outdoor, you may consider disabling the touch sense button to prevent activation from rain drops or pets.

A) To Disable the button:

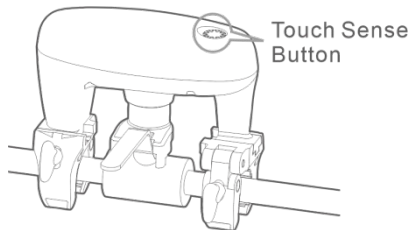
Tap and hold touch sense button for 3 beeps, then quickly tap 3 times in a row.

If success, the Yellow LED will flash once, then the Red LED with 1 beep. The LED will slowly flash Yellow indicating the touch sensor button has been locked.

B) To Re-Enable the button:

Do the same action again.

If success, the Yellow LED will flash once, the the Red LED with 3 beeps. LED will then slowly flash Green indicating the touch sense button has been unlocked.



3 KEY & INDICATORS BEHAVIOR

3.1 Touch Sense Button

Short Press: One click comes with one short beep sound.

Long Hold: Press and holding the key. "Come with 1 x short beep per second"

3.2 Visual Indicator

3 Colors LED: GREEN, YELLOW & RED

ON Event: ON, quick blinking, slow blinking and "fade-in & fade-out"

3.3 Sound Indicator

Buzzer: Long & short beep sound

4 TOUCH SENSE BUTTON KEYLOCK

BVS is capable for outdoor deployment. To prevent mis-operation by rain drop, end-user can enable Touch Sense Button Keylock function to forbid the operation of Touch Sense Button until to disable the keylock function.

4.1 Touch Sense Button Keylock Enable

After enabled Touch Sense Button Keylock function, BVS will ignore all key events excepting Touch Sense Button Keylock Disable function.

- i. Start: Long hold Touch Sense Button 3 seconds then short click 3 times.
- ii. Process: Green LED with 1 beep -> Yellow LED -> Red LED
- iii. Success: Yellow LED slow "fade in & fade out".

4.2 Touch Sense Button Keylock Disable

- i. Start: Long hold Touch Sense Button 3 seconds then short click 3 times.
- ii. Process: Green LED with 1 beep -> Yellow LED with 1 beep -> Red LED with 1 beep
- iii. Success: LED indicator resume normal status. (Yellow & Green LED blinking)

4.3 Pause Motor Running

- i. Short click 1 times on button will pause the open/close action during the motor is running.
- ii. Once the motor process has been paused, click button again will resume the motor action.

5 WATER LEAK SENSOR & ALARM

5.1 Water Leak Detection & Alarm

Firebot BVS comes with Local Leak Sensor Probe and support following functions, in short, once Water Leak is detected, Water Leak Alarm will be activated, depending on configuration parameter the water valve may be closed subsequently, at this moment all other operations will not be accepted except Water Leak Alarm Cancellation.

- i. Activated Water Leak Alarm
 - a. RED LED fast blinking.
 - b. Fast beep sound.
- ii. depending on configuration parameter the water valve may be closed subsequently
- iii. The operation is forbidden temporarily until perform Water Alarm Cancellation operation.

5.2 Water Leak Alarm Cancellation

Water Leak Alarm Cancellation only accepted when Local Water Leak Sensor Probe is no longer detected water.

- i. Start: Long hold Touch Sensor Button 2 seconds.
- ii. Success: The LED indicator changes to previous status. (Yellow LED blinking or Green LED slow blinking and buzzer goes silence.)
- iii. Send out dis-alarm report

6 TEMPERATURE SENSOR

6.1 Temperature Report

Firebot BVS will measure temperature per 5 mins and the report have 2 rules.

- i. If the difference between the two measurements is greater than 1, the BVS will send the temperature report early.
- ii. By default, the BVS will send the temperature report as a heartbeat per 15 mins

7 APPENDIX

Terminology, all events and operations details including action key event, LED and Buzzer status.

7.1 System Event Status

Event	Detail	LED	Buzzer
System Ready	BVS is ready to operate after power on or reset	Green LED ON 2 seconds	2 beep sounds
Idle mode	BVS is idle, no valve action processing	Yellow & Green LED blinking	---

Date: January 31, 2024

Event Success	Finished operation and success	Green LED ON 2 seconds	Short beep x 2
Event Error	Operation fails or not available	RED LED blinking 3 times	Long beep x 3 (1500ms per beep)
Event Timeout	Operation timeout	RED LED blinking 3 times	Short beep x 3 (500ms per beep)

7.2 Touch Sense Button Keylock

Event	Action / Status	Key Action	LED Status	Buzzer Status
Keylock Enable	Enable Lock Key Function	Hold 3 seconds & click 3 times	Green 300ms -> Yellow 300ms -> Red 300ms	Long beep×1
	Success	---	Yellow LED "fade in & out"	---
Keylock Disable	Disable Lock Key Function	Hold 3 seconds & click 3 times	Green 300ms -> Yellow 300ms -> Red 300ms	Long beep×3
	Success	---	Yellow & Green LED blinking	---

7.3 Operation Mode

Operation Mode	Function	Description	Action Key		Operation Support	
			Long	Short	Standalone	Network
Water Valve Manual Operation	1.Open	Control water valve to full open	---	1	Support	Support
	2.Close	Control water valve to full close	---	1	Support	Support
	3.Auto-calibration	Perform calibrate position and torque force	5	5	Support	Support
	4. Pause/Resume open/close action	Only work during open/close operation	---	1	Support	Support
	5.Alarm Cancellation	Resume to normal operation mode if no alarm triggered	2	---	Support	Support

7.4 Water Valve Operation

Event	Action / Status	Key Action	LED Status	Buzzer Status
OPEN Valve	Start OPEN (Valve in closed position)	Click 1 time	Green LED keep blinking	1" Pulse sound
	Processing	---	Green LED quick blinking	Keep short beep
	Success	---	Green LED blinking X 2	Short beep×2

Date: January 31, 2024

	Next status	---	Yellow & Green LED blinking	---
CLOSE Valve	Start CLOSE (Valve in opened position)	Click 1 time	Green LED ON 1 second	1" Pulse sound
	Processing	---	Yellow LED quick blinking	Keep beep (1 beep per 1 sec)
	Success	---	Green LED blinking X 2	Short beep×2
	Next status	---	Yellow & Green LED blinking	---
Manual Calibration	Start Manual Calibration	Hold 5 second & click 5 times	---	---
	Processing-Open & Close 1-2 cycles	---	Yellow LED blinking (2 blink per sec)	Keep beep (2 beep per 1 sec)
	Next Status	---	Yellow & Green LED blinking	---

7.5 Water Leak Event & Alarm

Event	Action / Status	Key Action	LED Status	Buzzer Status
Leak Sensor Probe Triggered	Start Water Leak Alarm	---	RED LED fast blinking	Fast beep sound
	Processing-Close Water Valve Automatically	---	RED LED fast blinking	Fast beep sound
Leak Alarm Cancellation	Alarm Cancellation	Long hold 2 seconds	Green LED blinking 2 times	Short beep×2
	Success cancellation	---	Green LED blinking 3 times	Short beep×3
	Next Status	---	Yellow & Green LED blinking	---

8 FEATURES & SPECIFICATIONS

8.1 Physical Specifications

Model No.	BVSULU (US) / BVSULE (EU)
Dimensions	14.8 x 9.6 x 13.3cm
Weight	BVS Unit: 603g
Body Color	White
Knob Color	Light Blue
Waterproof and Dustproof	IP66 level / Outdoor deployment
Usage	For Indoor and Outdoor Water Valve On/Off
Operation Temperature	14~122°F (-10 ~ +50°C)
Relative Humidity	8% ~ 80%

8.2 Hardware Specifications

RF Modulation	Chirp Spread Spectrum
RF Distance	40m (Indoor)/120m (Outdoor)
Region Frequency	923.3Mhz
Motor Torque Power	Adaptive torque output max: 8n.m
Water Leak Sensor	Local Water Leak Sensor Probe
Temperature Sensor	Built-in temperature sensor, Range from -40°C to +125°C / (-40°F to +257°F)
Action Button	Touch Sense Button x 1
LED Indicator	3 colors LED. (Green, Yellow & Red)
Sound Indicator	Buzzer (Max. 85dB)