

Installation, Operation, and Maintenance Manual

Series LFF113FP

Wireless Smart Universal Flood Protection ACV System with SentryPlus Alert™ Technology



⚠ WARNING

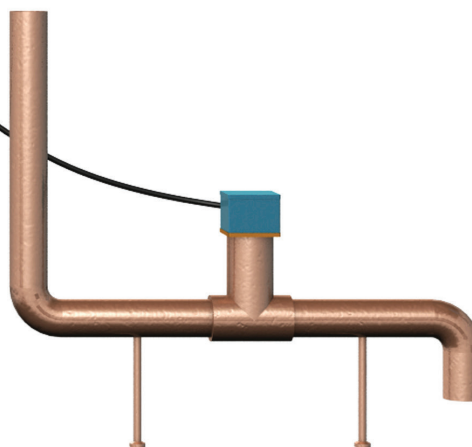


Read this Manual **BEFORE** using this equipment. Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment. Keep this Manual for future reference.



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Important Safety Information

WARNING



To avoid death, serious personal injury, property damage, or damage to the equipment:

- Learn how to properly and safely use the equipment **BEFORE** installing, setting up, using, or servicing.
- Keep the manual available for easy access and future reference.
- Replace missing, damaged, or illegible manual and product labels.
- Read the manual and all product labels and follow all safety and other information.
- Replacement manuals available at Watts.com.

Understanding Safety Information



This safety-alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION). A pictorial and/or safety message to identify hazards and alert you to the potential for death or serious personal injury.

DANGER

Identifies hazards which, if not avoided, will result in death or serious injury.

WARNING

Identifies hazards which, if not avoided, could result in death or serious injury.

CAUTION

Identifies hazards which, if not avoided, could result in minor or moderate injury.

NOTICE

Identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.



This pictorial alerts you to the need to read the manual.



This pictorial alerts you to electricity, electrocution, and shock hazards.

Description

- The Series LFF113FP Wireless Smart Universal Flood Protection ACV System with SentryPlus Alert™ Technology detects continuous water discharge from a Reduced Pressure Zone (RPZ) Backflow Preventer and shuts down the valve in case of abnormality.
- SentryPlus Alert wirelessly alerts the user of the problem via text, call, or email.
- The system is installed upstream of the RPZ Backflow Preventer with the valve normally open. It closes when continuous discharge from the RPZ Relief Valve is sensed or by engaging the Solenoid Bypass.
- The Position Indicator provides local visual indication of valve closure.
- The valve is reset manually. Pressure Gauge (provided) indicates valve reset for automatic service.
- Reverse Flow Main Valve closes in the event of diaphragm failure for fail-safe operation.
- The Junction Box is pre-mounted to the valve body, but can be mounted remotely in field.
- The Flow Sensor and the SentryPlus Alert Wireless Node both require field installation.

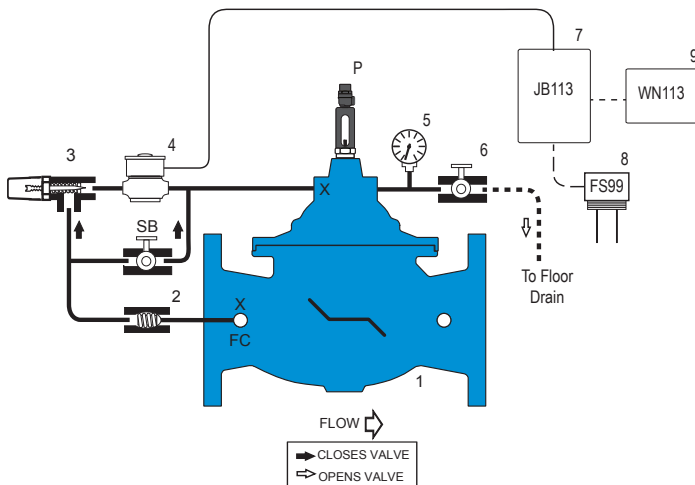
List of Parts

The Series LFF113FP Wireless Universal Flood Protection ACV System with SentryPlus Alert Technology includes the following standard components:

- (1) Main Valve (Single Chamber)
- (2) Check Valve
- (3) Adjustable Closing Speed
- (4) 2-Way Solenoid
- (5) Pressure Gauge
- (6) Manual Reset Ball Valve
- (7) Junction Box (JB113)
- (8) Flow Sensor (FS99)
- (9) SentryPlus Alert™ Wireless Node (WN113)
- (P) Position Indicator
- (SB) Solenoid Bypass
- (X) Isolation Cocks
- (FC) Flow Clean Strainer

Required Tools and Materials for Installation

- ❑ Small Phillips head screwdriver
- ❑ Screws to mount Wireless Node; holes are 0.27" diameter. Select screws based on your application conditions.
- ❑ Installation Tee for Flow Sensor
- ❑ Pressure gauges to monitor inlet and outlet pressure



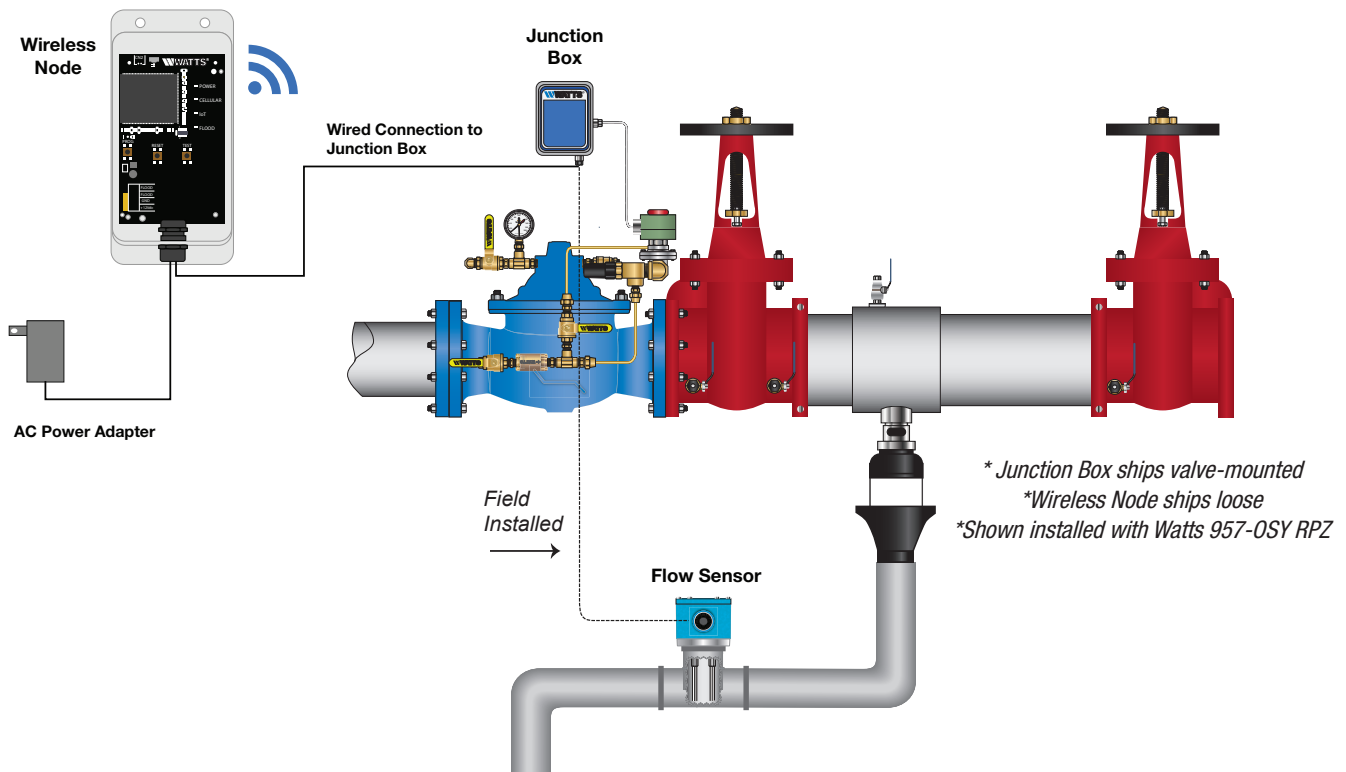
Installation and Operation

Installing the ACV

- Prior to installation, flush the line to remove any debris.
- Install valve horizontally “in line” with the cover facing up, so the flow arrow matches the flow through the line. Avoid installing valves 6” and larger vertically. If installing the valve vertically, make sure you have contacted the factory and ordered a system that is designed for that type of application.
- Install inlet and outlet isolation valves.

NOTE: When using butterfly valves, ensure disc does not contact control valve. Damage or improper valve seating may occur.

- Provide adequate clearance for valve servicing and maintenance.
- Install pressure gauges (not included) to monitor valve inlet and outlet pressure.



Installation and Operation

Solenoid Operation

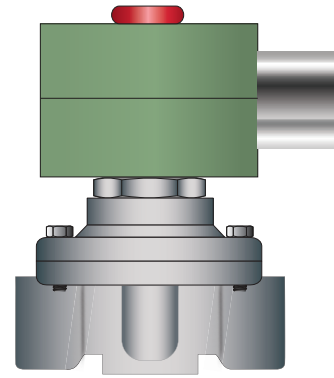
The Solenoid is prewired to the Junction Box and is equipped with a Solenoid Bypass valve (normally closed) which manually closes the Main Valve when engaged.

Opening the Solenoid Bypass Valve pressurizes the Main Valve cover as indicated by Pressure Gauge, closing the Main Valve.

Closing Solenoid Bypass Valve and opening the Manual Reset Ball Valve returns the Main Valve to the full open position.

Pressure Gauge returns to zero when the Main Valve is fully open.

NOTE: Manual Reset Ball Valve must be closed for normal operation.



Installing the Flow Sensor

⚠ WARNING

Certified electrician to connect main power and Flow Sensor to Junction Box.

The Flow Sensor is installed in the discharge piping from the RPZ relief valve. If the Flow Sensor senses water in the discharge piping, it will signal the Junction Box to close the valve.

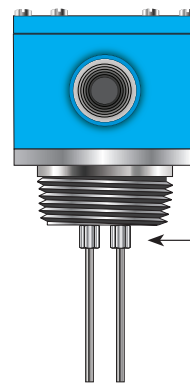
Installation Notes

1. Client/Contractor to provide installation Tee for Flow Sensor.
2. Cut Sensor Probes to length. The ends of the Sensor Probes should be located between $\frac{1}{3}$ and $\frac{1}{2}$ of the pipe's inner diameter from the pipe bottom. The probes MUST NOT BE less than $\frac{1}{4}$ " from the pipe wall
3. Install Flow Sensor in RPZ discharge line in HORIZONTAL position as shown.

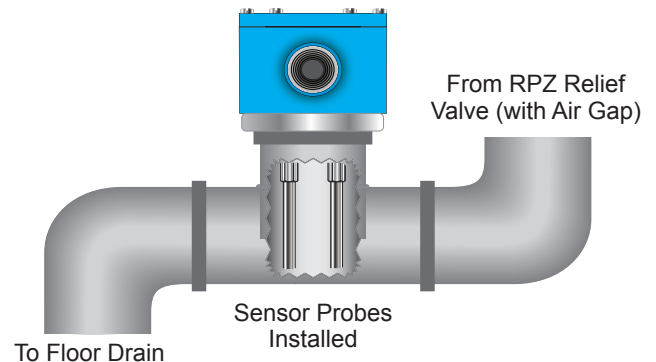
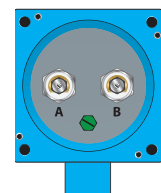
⚠ CAUTION

Ensure Sensor Probes do not contact pipe bottom or sides.

Front View

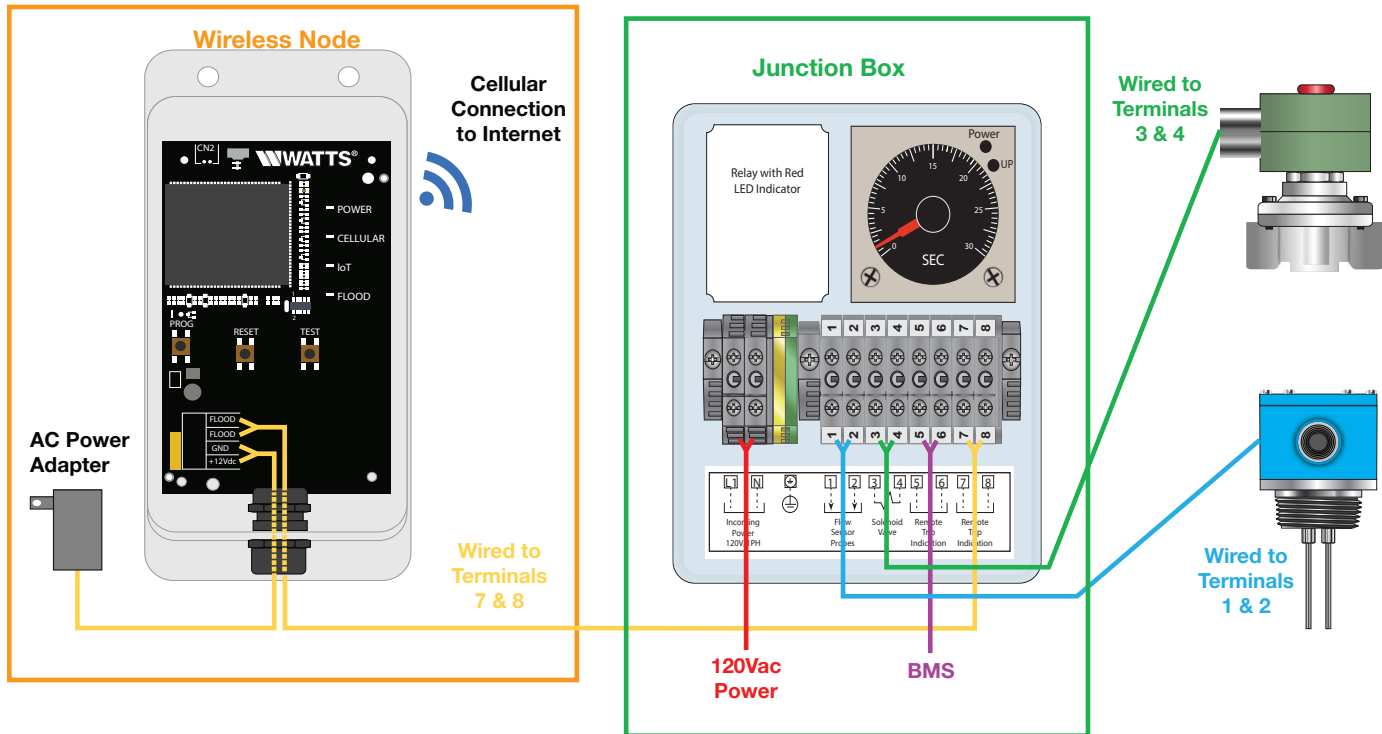


Top View with Cover Removed



Installation and Operation

Connecting the Junction Box



The Junction Box is valve-mounted, but includes brackets for wall mounting.

Wiring the Junction Box

WARNING



Ensure that all power supply to the Junction Box is turned off before making any connections to the Junction Box. Failure to do so may result in electrocution, personal injury, and /or death.

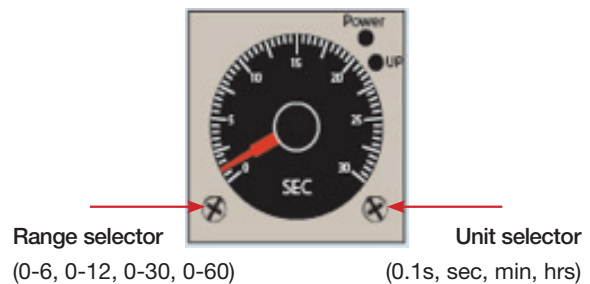
- Connect the Flow Sensor to the Junction Box using terminals 1 and 2.
- The Solenoid Valve is pre-wired to terminals 3 and 4. If needed, the connection can be extended by using similar gauge extension wire and a terminal box.
- Connect to a Building Management System or alarm for remote indications of a continuous water discharge using terminals 5 and 6.
- Connect to the Wireless Node using terminals 7 and 8.

NOTICE

- The terminal block accepts 10-22 AWG.
- Terminals 5 and 6 have 120V, 10A maximum.
- The Junction Box voltage is 120V.
- The Sensor Probe voltage is 120VAC, 1.5mA.
- The terminal block has a less than 1 amp draw.

Adjusting the Time Delay

- Adjust the time delay to avoid valve closure due to intermittent or nuisance relief valve discharge. The delay is adjustable from 0 seconds to over 1 hour.
- Adjust the time delay by using the delay adjustment dial in the Junction Box.
- Use a small Phillips head screwdriver to adjust either the range selector (0-6, 0-12, 0-30, 0-60) on the left side or the unit selector (0.1 sec, sec, min, hr) on the right side.
- Increase the time delay by adjusting the dial clockwise; decrease the time delay by adjusting the time delay counter-clockwise.
- Recommended adjustment delay is 30-60 seconds. However, the ideal set point can vary widely depending on the product application, including drain size, location, backflow preventer, water pressure, and tolerance for discharge.



RANGE SELECTION	0.1 sec	Sec	Min	Hrs
0-6	0.05-0.6s	0.5-6s	0.5-6min	0.5-6hr
0-12	0.1-1.2s	1-12s	1-12min	1-12hr
0-30	0.25-3s	2.5-30s	2.5-30min	2.5-30hr
0-60	0.5-6s	5-60s	5-60min	5-60hr

Installation and Operation

Installing the Wireless Node

⚠ WARNING



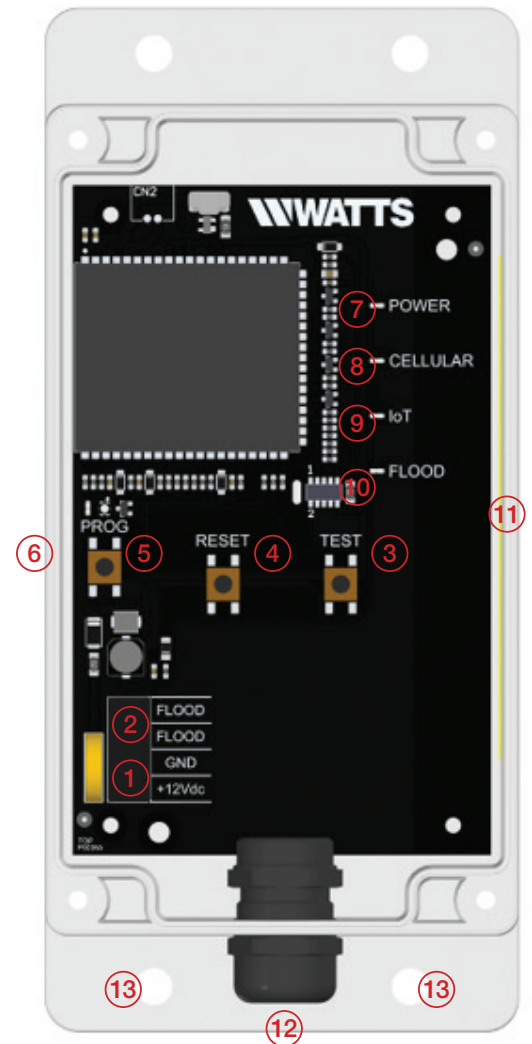
Ensure all power supply to the Wireless Node is turned off before making any connections to the Wireless Node. Failure to do so may result in electrocution, personal injury, and/or death.

1. Identify preferred location for mounting Wireless Node. The Wireless Node must be located away from large metal components and structures that may block the cellular signal. In addition, the cellular antenna is located on the inner sidewall of the enclosure (11). When mounting, ensure that this side of the device is away from any walls, wires, pipes, or other obstructions, especially anything metallic.
2. Before mounting, plug in the Wireless Node to ensure that a connection can be made in the preferred location. Once plugged in, the device will automatically go through a start-up process. A cellular connection has been made if, after the start-up process, the Cellular LED (8) is a steady blue. If it is blinking, there is a poor connection, and if it is off, there is no connection. If there is a poor or no connection, identify a new location for mounting.
3. Unplug the Wireless Node from the power supply.
4. Mount the Wireless Node in the identified location using the four 0.27" diameter mounting holes (13). Screws are not included.
5. Route wires from terminals 7 and 8 of the Junction Box through the wiring gland (12) and connect to the Wireless Node at the "Flood" screw terminal (2). Polarity does not matter. Six feet of wire is supplied with the unit, but the Wireless Node can be located up to 100 feet away from the Junction Box. If additional wire is used, it must meet the required rating for the Junction Box (300V, 16-24 AWG).
6. Route wires for included 12VDC power supply through the wiring gland (12) and connect to the Wireless Node at the appropriate screw terminal (1). Polarity must be correct or the Wireless Node will not operate.

⚠ CAUTION

Use only the provided power supply as other power supplies may not meet the rating and specifications for this device.

7. Tighten the wiring gland (12) to prevent water or dust from entering the Wireless Node.
8. Connect the power supply to the Wireless Node and Junction Box.



Installation and Operation

Wireless Node Operation

1. **Start-Up** – Upon start-up, the Power LED (7) will light up a steady green to indicate power is supplied. The Wireless Node will automatically go into its start-up sequence. During the start-up sequence, the light over the Program button (5) will begin as solid white and then change to a blinking green, indicating the Wireless Node is searching for a cellular connection. Once a cellular connection is established, the Program button light will start blinking cyan, indicating that the Wireless Node is connecting to the Cloud. Once a Cloud connection is established, the Program button light will blink rapidly for a few seconds, and then shut off. The Cellular LED (8) and IoT LED (9) should both be a solid blue.
2. **Cellular Connection** – Once the start-up sequence is completed, the Cellular LED will be a steady blue if there is a good connection. It will blink if there is a poor connection. There will be no color if there is no connection.
3. **IoT Connection** – If there is a Cloud connection, the IoT LED will be a steady blue. There will be no color if it is off.

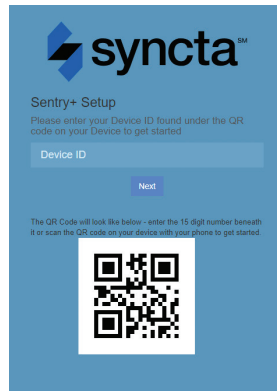
NOTICE

If there is no Cloud connection, then notifications will not be sent to the user via Syncta.

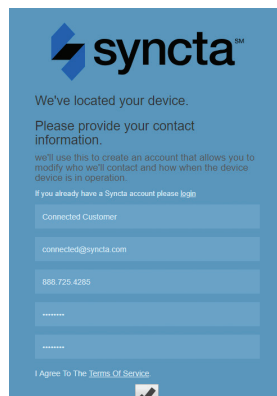
4. **Flood LED** – If a flood event occurs, the Flood LED (10) will be a steady orange. It will remain on so long as there is a flood condition.
5. **Test Button** – When Cellular and Cloud connections have been made, a test message can be sent through the Syncta app by pressing the Test Button (3).
6. **Reset Button** – You can reset the Wireless Node and restart the start-up sequence by pressing the Reset button (4). This will cause all on-going operations to cease.
7. **Program Button** – The Program button (5) should not be pressed and is for factory use only.

Registering Your Device and Alert Configuration

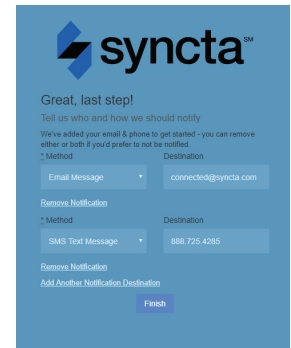
1. Using a smart phone or tablet, scan the QR code on the side on the Wireless Node, or go to <https://connected.syncta.com>.



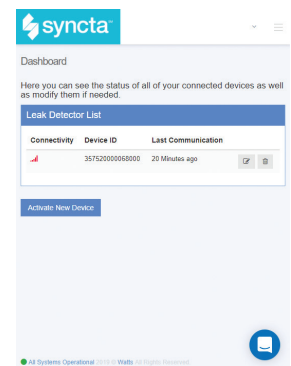
2. When prompted, enter the Device ID. The Device ID is a 15-digit number found beneath the QR code on the side of the Wireless Node.



3. Follow onscreen prompts to create a Syncta account, or if you are an existing Syncta user, log in to your account. The device can be registered to multiple accounts.



4. Once the device is registered to your account, follow prompts to add notifications. To manage alerts, login to your account on Syncta.com.



Start-up Instructions

Proper Automatic Control Valve start-up requires bringing the valve into service in a controlled manner. All adjustments to control pilots and speed controls should be made slowly, allowing the valve to respond and the system to stabilize. NOTE: Control Valves should be set up in a dynamic (flowing) condition for proper start-up. Provisions for flow must be made to ensure proper settings.

NOTE: Refer to valve schematic on page 3 for components identified in parentheses.

1. Close Solenoid Bypass Valve (SB). Locate and open Manual Reset Ball Valve (6). Open upstream and downstream isolation valves to allow controlled filling of the Valve and Backflow Assembly. Open all Isolation Ball Valves.
2. Inlet pressure will open the valve fully. Close Manual Reset Ball Valve.
3. Open Solenoid Bypass Valve to simulate electrical shut-down signal. Inlet pressure will be indicated on Pressure Gauge (5) and valve will begin to close. Due to low / no flow condition, valve closure may be slower than normal operation.
4. Close Solenoid Bypass Valve and open Manual Reset Ball Valve. Pilot System Pressure Gauge will drop to zero. Valve will open fully and is ready for electrical activation. Allow for cover volume to discharge to floor drain. Refer to the chart below for Valve Cover Chamber Capacity. Close Manual Reset Ball Valve.
5. Open Junction Box. Apply power and observe the Electric Relay Control.
6. Pour adequate amount of water into RPZ Relief Valve Air Gap until the red LED indicator light on the Electrical Relay illuminates / flashes. This indicates the Flow Sensor is properly installed and is sensing water in the discharge piping.
7. Trap water in discharge piping and observe red LED on Electrical Relay. Solenoid will energize when duration of Time Delay elapses. Valve will go closed and must be manually reset. Adjust Time Delay to Customer / Project specifications. To manually reset valve, refer to Step 4.
8. For final test simulate actual RPZ Relief Valve discharge and observe floor drain for excessive pooling or flooding. Re-adjust time delay and Adjustable Closing Speed (3) control as needed to achieve desired valve closure time.

Valve Travel

VALVE SIZE - INCHES	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
Travel - Inches	3/8	3/8	3/8	5/8	3/4	1	1 1/2	2	2 1/2

Valve Cover Chamber Capacity

VALVE SIZE - INCHES	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
fl.oz.	4	4	4	10	10	22	70		
U.S. Gal								1 1/4	2 1/2

Performance and Specifications

OPERATING PRESSURE

Threaded = 400 psig
 150 Flanged = 250 psig
 300 Flanged = 400 psig
 Grooved End = 400 psig

OPERATING TEMPERATURE

Buna-N: 160°F Maximum
 EPDM: 300°F Maximum
 Viton: 250°F Maximum

Flow Data

VALVE SIZE - INCHES		1 1/4	1 1/2	2	2 1/2	3	4	6	8	10
C _V SUGGESTED	Maximum Continuous Flow Rate gpm (Water)	93	125	208	300	460	800	1800	3100	5000
	Maximum Intermittent Flow Rate gpm (Water)	115	158	260	370	570	1000	2300	3900	6250
	Minimum Flow Rate gpm (Water)	3	5	6	9	15	16	17	25	55
	Factor gpm (Globe)	29	34	55	75	125	220	460	775	1215
	Factor gpm (Angle)	39	53	66	99	170	280	650	1100	1530

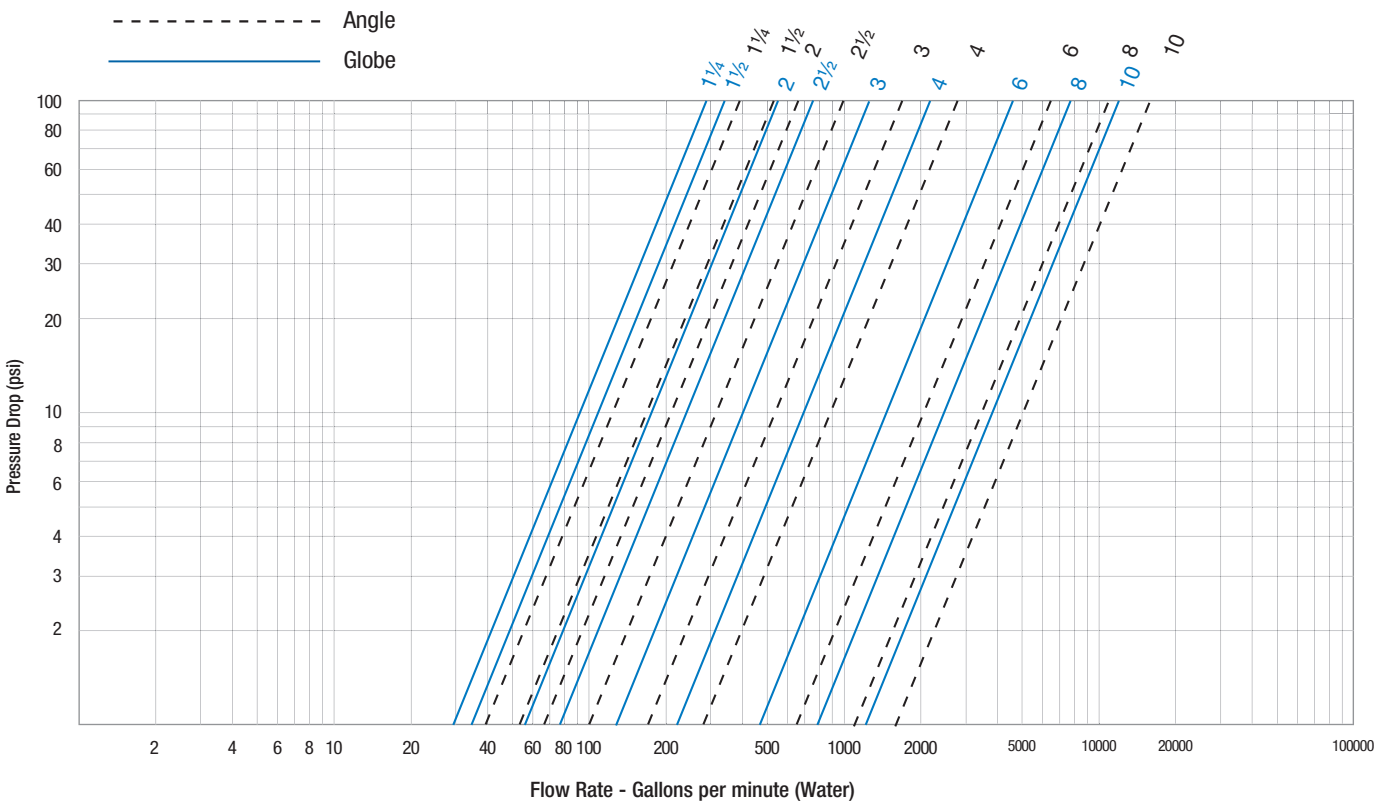
- Maximum continuous flow based on velocity of 20 ft. per second.
- Maximum intermittent flow based on velocity of 25 ft. per second.
- Minimum flow rates based on a 20-30psi pressure drop.
- The C_V factor of a valve is the flow rate in US gpm at 60°F that will cause a 1psi drop in pressure.

- C_V factor can be used in the following equations to determine Flow (Q) and Pressure Drop (ΔP):

$$Q (\text{Flow}) = C_V \sqrt{\Delta P} \quad \Delta P (\text{Pressure Drop}) = (Q/C_V)^2$$

- The C_V factors stated are based upon a fully open valve.
- Many factors should be considered in sizing control valves including inlet pressure, outlet pressure, and flow rates.
- For sizing questions including cavitation analysis, consult Watts with system details.

Headloss



The C_V factor of a valve is the flow rate in US gpm at 60° F that will cause a 1 psi drop in pressure. The factors stated are based upon a fully open valve.

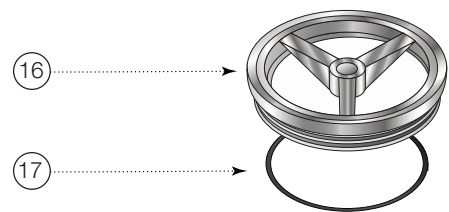
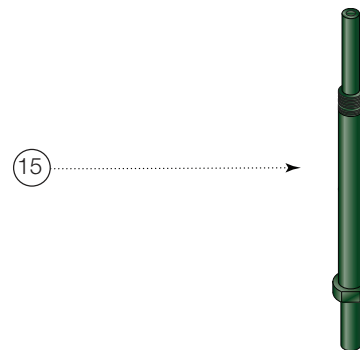
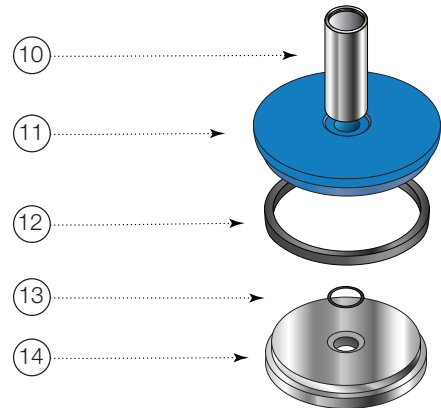
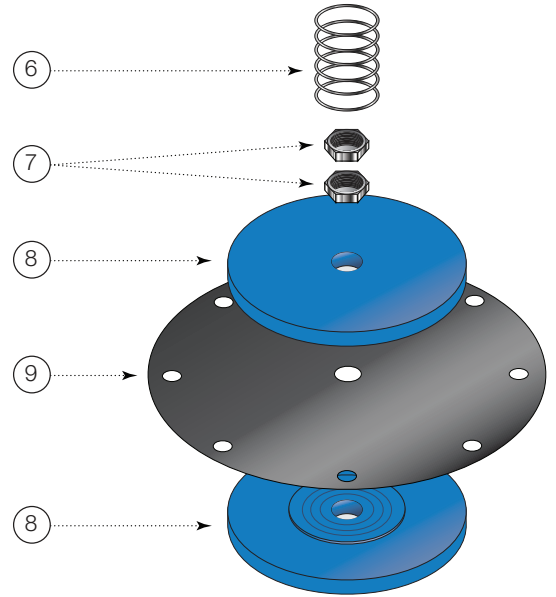
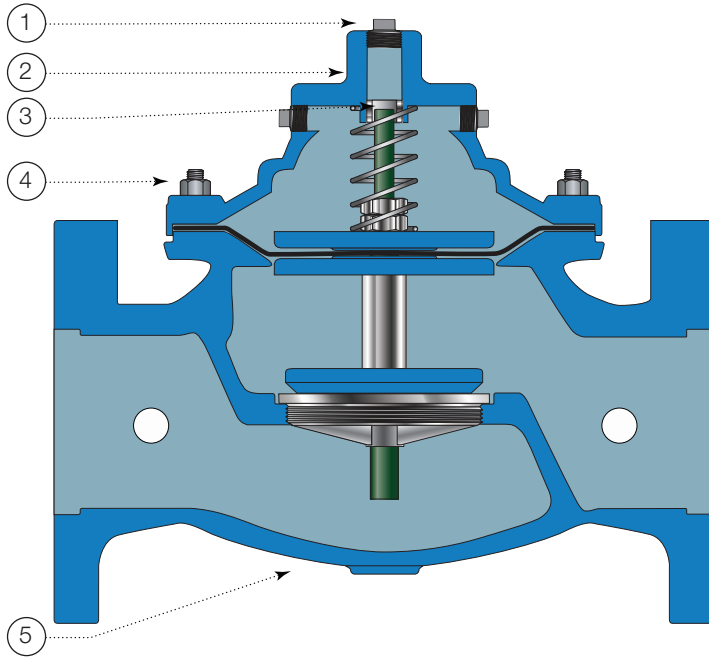
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$$Q (\text{Flow}) = C_V \sqrt{\Delta P} \quad \Delta P (\text{Pressure Drop}) = (Q/C_V)^2$$

Performance and Specifications

Typical Main Valve

Threaded and Flanged Designs



ITEM	DESCRIPTION	MATERIAL
1	Pipe Plug	Lead Free Brass
2	Cover	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
3	Cover Bearing	ASTM A276 304 Stainless Steel
4	Stud with Cover Nut and Washer	ASTM A570 Gr.33 Zinc Plated Steel
5	Body	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
6	Spring	ASTM A276 302 Stainless Steel
7	Stem Nut	ASTM A276 304 Stainless Steel
8	Diaphragm Washer	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
9	Diaphragm*	Buna-N (Nitrile)
10	Spacer	ASTM A276 304 Stainless Steel
11	Quad Seal Retainer	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
12	Quad Seal*	Buna-N (Nitrile)
13	O-Ring*	Buna-N (Nitrile)
14	Quad Seal Plate	ASTM A743 CF8M (316) Stainless Steel
15	Shaft / Stem	Xylan coated ASTM A276 304 Stainless Steel
16	Seat Ring	ASTM A743 CF8M (316) Stainless Steel
17	Seat Gasket*	Buna-N (Nitrile)

* Contained in Main Valve Repair Kit

Maintenance

We recommend establishing a periodic maintenance schedule to inspect the ACV's valve stem for calcium or hard water deposits and to check the condition of the diaphragm, seat disc, strainers, and port openings.

An annual preventative maintenance schedule can help to identify potential problem situations before emergency repairs are needed.

For more severe service, semi-annual or quarterly inspections may be required.

The normal replacement parts are the seat disc and diaphragm. These are available individually or together in a rubber repair kit. Rubber repair kits for control pilots are sold separately.

For maximum life expectancy, all rubber repair parts should be stored in a cool, dry environment and not be exposed to direct sunlight.

In the event a non-rubber component part is required, review the cross-sectional drawing in the product specification sheet and consult your local representative or the factory.

Limited Warranty: Watts (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. **SO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.**

