

**HG-2-RPZ or DOUBLE CHECK STANDARD
(KR-BL) DIRECTED DISCHARGE DEVICE
CONSTRUCTION FOR ABOVE-GROUND
INSTALLATIONS****HYDRO-GUARD®****Automatic Water Distribution Flushing Equipment****With Bluetooth Programming (App managed, iOS or Android)****1. GENERAL DESCRIPTION**

- 1.1 The equipment furnished under this Section shall be automatic water distribution flushing equipment designed to be permanently or semi-permanently installed on water distribution lines.
- 1.2 The primary purpose of this equipment shall be to automatically flush the desired amounts of water from water distribution systems for the purpose of improving and/or maintaining water quality.

2. PERFORMANCE

- 2.1 This equipment shall be connected to a water distribution line as required by the plans or standard installation detail. The self-contained device is designed for automatic flushing of the water distribution line through the opening of a control valve that is an integral part of the device.
- 2.2 This equipment shall be capable of being programmed to activate up to 24 times daily on the days desired at a minimum of one (1) minute to six (6) hour increments (on a continually rotating 7-day cycle or on an interval between every 1 to 30 days).
- 2.3 All programming shall be accomplished by means of an integrated programmer module that is powered by a single 9-volt battery and a Bluetooth equipped smart phone.
- 2.4 The Bluetooth controlled programmer must be capable of receiving management data transmissions from up to 25 feet, line of sight.
 - a. The Bluetooth controller must be capable of being programmed up to 24 times per day and offer flush durations of one minute to 24 hours per event.
 - b. The Bluetooth controller must be capable of providing up to 5,000 separate on/off functions over the life of a single 9-volt Alkaline battery.
 - c. The Bluetooth controller must be capable of being programmed by a standard Android or iOS smart phone and the K-Rain and password protected App.

3. ACCEPTABLE MANUFACTURERS

Automatic water distribution flushing equipment to be supplied under this specification shall be **Hydro-Guard®** as manufactured by the Mueller Company or approved equal.

3.1 Controller/Programming

- a. Programming for the HG-2-RPZ or Double Check Standard Discharge Device shall be managed by a KR-BL Bluetooth controller with a single 9-volt battery and an iOS or Android App-based management system.

4. AUTOMATIC WATER DISTRIBUTION FLUSHING SYSTEM COMPONENTS

The automatic water distribution flushing system is comprised of the self-contained automatic flushing device with a dechlorination system, sampling quick connect, and freeze protection upgradeability and an integrated programming model with a single 9-volt lithium battery and a Bluetooth equipped smartphone.

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The automatic flushing device shall be a single device consisting of the major components described below:

5.1 Integral Piping and Control Valve – The piping and control valve components shall include the following:

- a. Device must be certified by Underwriters Laboratories (UL) as meeting or exceeding the criteria of NSF-372.
- b. The device's internal control valve shall be capable of being activated by a single 9-volt lithium battery-controlled programming interface that is managed by a Bluetooth equipped smart phone (Android or iOS).
- c. The control valve shall be a globe valve type design capable of passing sand and other debris up to 5/8" in diameter without obstructing the valve's throat.
- d. The device's standard internal piping shall be schedule 80 PVC with the option to upgrade the material to low lead brass or stainless-steel.
- e. The device's internal piping and control valve shall have an operational rating of 200 psi.
- f. Internal piping and control valve shall be capable of being removed from the housing by means of a threaded coupling allowing for ease of disconnect, thus permitting easy maintenance and repairs.
- g. The control valve shall be constructed of a non-corrosive glass-reinforced nylon, or equal, and shall be fitted with stainless-steel hardware. The valve shall be of the type that can be easily rebuilt.
- h. The valve shall include a single piece EPDM diaphragm.
- i. The valve must be actuated by a 9-volt latching solenoid. Solenoid must be pressure rated between 0-10 bar (0 to 145.037738 psi). Wetted parts must be stainless-steel 400 or Polyamide. Leads must be 0.32 mm² x 80 cm².
- j. The device shall be supplied with a standard 2-inch male NPT water supply connection.

5.2 Housing

- a. The components shall be protected from the environment and vandalism by a HDPE or other non-corrosive, high quality polyethylene material.
- b. The enclosure must feature a below graded base with a minimum of a nine (9) inch bury depth. The below grade base must provide stability and anti-buoyancy capabilities.
- c. The above ground housing must be vented.
- d. The device's above-grade housing shall be constructed of a non-corrosive maintenance-free material and shall be permanently colored light green to blend with typical residential and commercial environments unless otherwise specified by the owner. The material shall be specifically designed for direct exposure to the sun and weather and have a minimum life expectancy of 15 years.
- e. All mounting brackets and hardware shall be stainless-steel, 5052 aluminum or anodized aluminum.
- f. In the event the flushing system is equipped with freeze protection, the above ground housing must be insulated with a sheet insulation that has an R-rating of at least R-16. The insulation must be constructed of two 94%, or greater, reflective layers of film bonded to two internal layers of heavy gauge polyethylene bubbles offering a total thickness 5/16-inch of protection.

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- g. The discharged water shall be directed downward, through a flow concentration nozzle, into a discharge catch pipe with a recommended minimum diameter of six (6) inches (discharge pipe provided by others).
- h. The discharged water shall be directed via suitably-sized piping (provided by others) to a storm sewer, storm swale, retention pond or other discharge point.

5.3 Backflow Prevention

To reduce the possibility of back siphonage, the device has been equipped with a OEM installed, factory tested, Wilkins-Zurn Reduce Pressure Zone (RPZ) or Double Check Valve (DC). The RPZ or DC valve must be constructed of low lead brass and must be testable.

5.4 System Sampling – The sampling system shall include the following features:

- a. The sampling system shall be constructed of polyethylene or other material with equal or greater resistance to bacterial regrowth and be connected with low-lead brass or stainless-steel fittings.
- b. The sampling system shall be designed in such a way to reduce the potential for contamination of the sampling system by allowing access and inspection of the internal piping compartment and components without disassembly or depressurization of the sampling system.
- c. The sampling system shall draw water for water quality sampling from the inlet side of the two-inch (2") adjustable control valve and be tapped into the service piping of the device no more than twenty-four inches (24") from the utility's service connection to the device. This positioning is essential in order to allow for a sample to be an accurate representation of the utility's water quality at the point of entry into the flushing device.
- d. Connection to the device's sampling system shall be by means of a quick disconnect. The device's sampling connection shall be housed in a secure weather-tight area to minimize contamination of the sampling connection.
- e. The sampling connection itself shall be provided with a protective sanitary cover.

5.5 Electrical/Electronic System - The Electrical/Electronic System shall include the following features and capabilities:

- a. All programming shall be accomplished by means of an integrated programmer module that is powered by a single 9-volt Lithium battery a Bluetooth equipped smart phone.
- b. The Bluetooth-equipped device must be powered by a single 9-volt Alkaline battery that can power up to 5,000 on/off events over the life of the battery.
- c. The Bluetooth-equipped device must allow for up to 24 flush events daily with durations of one minute to 24 hours.
- d. The Bluetooth controller interface shall be capable of being managed from a maximum distance of 25 feet (line of sight/no obstructions) by way of a standard Android or iOS smart phone.
- e. The Bluetooth controller interface module must be password protected to prevent unauthorized operation.
- f. Offer 24 flushing program events per day.
- g. Be leap-year compatible, automatically accounting for February 29th every four years.
- h. Incorporate LCD readout of clock and programming functions on a removable handheld programmer.

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- i. No onsite programming functions shall be possible without the utilization of a handheld programmer, thus providing an added level security against unauthorized program changes.
- j. Offer manual on and off functions.
- k. Be secured and water-resistant.
- l. Offer a percentage increase/decrease option that will allow the operator to make monthly adjustments by increasing or decreasing the flush durations by a percentage without the need to reset flush duration times.
- m. Have heavy-duty power cable with an inferred connection that shall correspond with an inferred antenna on a programming module that shall be integrated into the flushing device.
- n. Use an integrated 9-volt or greater latching solenoid to operate the control valve.
- o. The solenoid must be able to be threaded directly into the two-inch (2") adjustable control valve without the use of secondary adaptors.

5.6 Winterization (optional)

- a. As per the local ordinance, the device shall be constructed either with or without a mechanical thermal control valve that will sense water temperatures and activate only when the water temperature is determined to be less than 40° Fahrenheit.
- b. The mechanical thermal control valve must be a barrel style valve constructed of stainless-steel and capable of flowing water when the water temperature ranges between 40° and 35° Fahrenheit.
- c. The mechanical thermal control valve must be capable of protecting the flushing device from damage caused by occasional freezing temperatures by allowing warmer subterranean water to flow through the device when water temperatures at the installation point approach 40° Fahrenheit.

5.7 OEM Installed Dechlorination System (optional)

- a. A tablet feed Dechlorination System shall be designed to accommodate 2 5/8th inch sodium sulfite or ascorbic acid tablets and it shall be installed inside of the device upon delivery.
- b. A portion of the water being flushed shall be directed through the tablet feeder in the creation of a concentrated solution of the dechlorinating agent.
- c. The directly treated, concentrated solution shall be introduced to the non-directly treated discharge on the device's splash plate resulting in a homogenous mixture effectively treating the entire discharge.

5.8 Maintenance and Security of Device

- a. Disassembly and reassembly of the devices must be accomplished by way of a unique security wrench and hex-style driver.
- b. The security wrench must be capable of removing the security screws used to secure the ground splash plate to the below-grade base.
- c. The hex driver must be capable of opening the exterior, above-grade enclosure and of removal of the four (4) bolt assembly that allows access to the below-grade components of the device.
- d. No programming functionality (i.e., buttons, knobs, dials, LCD, or LED screens, etc.) shall be present on the flushing device that could enable an unauthorized user or vandal to adversely impact the function of the device, hinder the performance of the water distribution system, cause harm, or negatively impact the water supply.

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- a. Prior to the installation, the drainage patterns for the intended installation location shall be viewed to ensure that any discharged water will not create hazardous conditions for pedestrian or vehicular traffic. The selected location's drainage pattern shall also permit discharged water to flow away from the automatic flushing device or be absorbed by the surrounding soil as to prevent pooling.
- b. Remove debris that might create uneven pressure on the device from the bottom of the hole. Compact the bottom of the hole to minimize settling after installation.
- c. Install a four-inch (4") lift of non-compacted sand or similar bedding material into the bottom of the hole.
- d. Backfill the hole around the automatic flushing valve with clean fill, #57 stone and/or a combination of other appropriate materials. Backfilling shall be accomplished in 6" lifts. Use a level to ensure the device is level after each lift.
- e. The area thirty-six inches (36") around the automatic flushing valve shall be prepared in order to prevent erosion.
- f. The automatic flushing valve shall be disinfected in accordance with ADH and AWWA standards.
- g. Backflow device should be checked annually in accordance with AWWA standards.



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