

**HYDRO-GUARD™ HG-1-BASIC/S ATMOSPHERIC
DISCHARGE DEVICE CONSTRUCTION FOR ABOVE
GROUND INSTALLATIONS****HYDRO-GUARD®****Automatic Water Distribution Flushing Equipment****Approved Programming – Select One:**

- Built-in NODE Controller
- Bluetooth Controller

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.
- 2.2 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.
- 2.3 This equipment shall be capable of being programmed to activate up to 12 times daily on the days desired in one (1) minute to six (6) hours increments (on a continually rotating 7-day cycle or on an interval between every 1 to 30 days).
- 2.4 All programming shall be accomplished by means of an integrated programmer powered by a single 9-volt Alkaline battery with the ability to install a secondary 9-volt Alkaline battery for redundancy and extended life or by a Bluetooth equipped smart phone.
- 2.5 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

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

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GROUND INSTALLATIONS****HYDRO-GUARD™****4. AUTOMATIC WATER DISTRIBUTION FLUSHING SYSTEM COMPONENTS**

- 4.1 The automatic water distribution flushing system is comprised of the self-contained automatic flushing device with a de-chlorination system, sampling port, optional freeze protection, and an integrated programmer with a single 9-volt Alkaline battery with the ability to install a secondary 9-volt Alkaline battery for redundancy and extended life or a Bluetooth equipped smart phone (Android or iOS).

5. AUTOMATIC FLUSHING DEVICE - 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 with the ability to install a secondary 9-volt Alkaline battery for redundancy and extended life or 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. The valve body shall be a straight through pass design. The valve body shall not feature a center wall in the interior body of the valve.
- d. The device's standard internal piping shall be schedule 80 PVC with the option to upgrade the material to low lead brass.
- 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 quick-disconnect, 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's 9-volt latching solenoid shall be able to be threaded directly into the body of the control valve without the use of a secondary adaptor.
- k. The device shall be supplied with a standard 2-inch male NPT water supply connection.

5.2 Housing

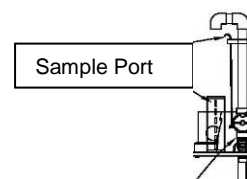
- a. The components shall be designed to dissipate the energy and distribute the flow of pressurized water leaving the water distribution system in a circular pattern inside of the device's protective exterior, above-grade, housing and discharging to atmosphere.
- b. The discharged water must be capable of passing through a series of energy dissipating vented ports that are a minimum of two inches in diameter located at the base of the exterior of the device's above-ground protective housing.

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- c. The discharged water shall be directed downward, through the energy dissipating evacuation ports, onto a ground-level splash pad directing the flow of water horizontally onto the surrounding area in a manner that does not promote erosion in adequately prepared areas.
- d. The self-contained device shall be supplied with an at-grade bottom-plate to provide stability for the device and protect the ground from erosion.
- e. The base shall be constructed of high to medium density Polyethylene or other non-corrosive, high quality, material.
- f. The device's above-grade components shall be constructed of a non-corrosive maintenance-free material and shall be permanently colored dark green to blend with typical residential and commercial environments unless otherwise specified by the owner.
- g. The material shall be specifically designed for direct exposure to the sun and weather and have a minimum life expectancy of 15 years.
- h. All mounting brackets and hardware shall be stainless steel, 5052 anodized aluminum or marine grade plastic.

5.3 System Sampling - The sampling system shall include the following features:



- a. The sampling system shall be constructed of low lead brass, stainless steel, 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 eighteen inches (18") 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. The device's sampling connection shall be housed in a secure weather-tight area to minimize contamination of the sampling connection. The sampling connection itself shall be provided with a protective sanitary cover.

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

- a. Be capable of storing instructions via an integrated programmer and capable of operating the device's internal control valve. The controller shall be powered by a single 9-volt Alkaline battery with the ability to install a secondary 9-volt Alkaline battery for redundancy and extended life or a Bluetooth equipped smart phone (Android or iOS).
- 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 a minimum of 12 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.
- i. Offer manual on and off functions.
- j. Be secured and water-resistant.
- k. Have heavy-duty power cable.
- l. Use an integrated latching solenoid to operate the control valve.
- m. The solenoid must be able to be threaded directly into the two-inch (2") adjustable control valve without the use of secondary adaptors.

5.5 Winterization (Optional) - As per the local ordinance the device shall be constructed either with or without a stainless steel mechanical thermal control valve that is engineered to sense water temperature.

- a. The mechanical thermal control valve must be capable of operation between 40°F and 35°F.
- b. The valve must open at 40°F and allow a small volume of warmer subterranean water to flow through the device's piping and valve system in an effort to protect the device's internal components from freeze damage.
- c. The mechanical thermal control valve must be capable of allowing a varying volume of water to flow through the device's piping and valve system when as temperatures of the water varies with a maximum volume of water flowing through the system at 35°F.
- d. The mechanical thermal control valve shall be fully mechanical and not require any power source.
- e. The mechanical thermal control valve must be capable of closing fully when water temperatures exceed 41°F.
- f. The design of the mechanical thermal control valve based freeze protection system must include a freeze valve adaptor assembly that shall be capable of fully actuating the flushing device's main control valve in a manner consistent with and in parallel with a 9-volt latching solenoid.



**HYDRO-GUARD™ HG-1-BASIC/S ATMOSPHERIC
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GROUND INSTALLATIONS****HYDRO-GUARD****5.6 OEM Installed Dechlorination System (Required)**

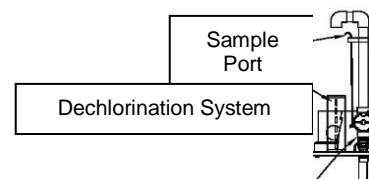
- a. A tablet feed Dechlorination System shall be designed to accommodate 2 5/8th inch sodium sulfite or ascorbic acid tablets and it shall be installed inside of the device upon delivery.
- b. A portion of the water being flushed shall be directed through the tablet feeder in the creation of a concentrated 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.

5.7 Maintenance and Security of the Device

- a. Disassembly and reassembly of the devices must be accomplished by way of a unique security key.
- b. The security key must be capable of unlocking the security lock assembly used to secure the ground splash plate to the below-grade base.
- c. The key must be capable of opening the exterior, above-grade, enclosure and allowing access to the below-grade components of the device.
- d. The housing must also feature a hasp that can be padlocked for a secondary layer of security against unauthorized entry.

5.8 Execution

- 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 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. The area thirty-six inches (36") around the automatic flushing valve shall be prepared in order to prevent erosion.
- e. The automatic flushing valve shall be disinfected in accordance with ADH and AWWA standards.

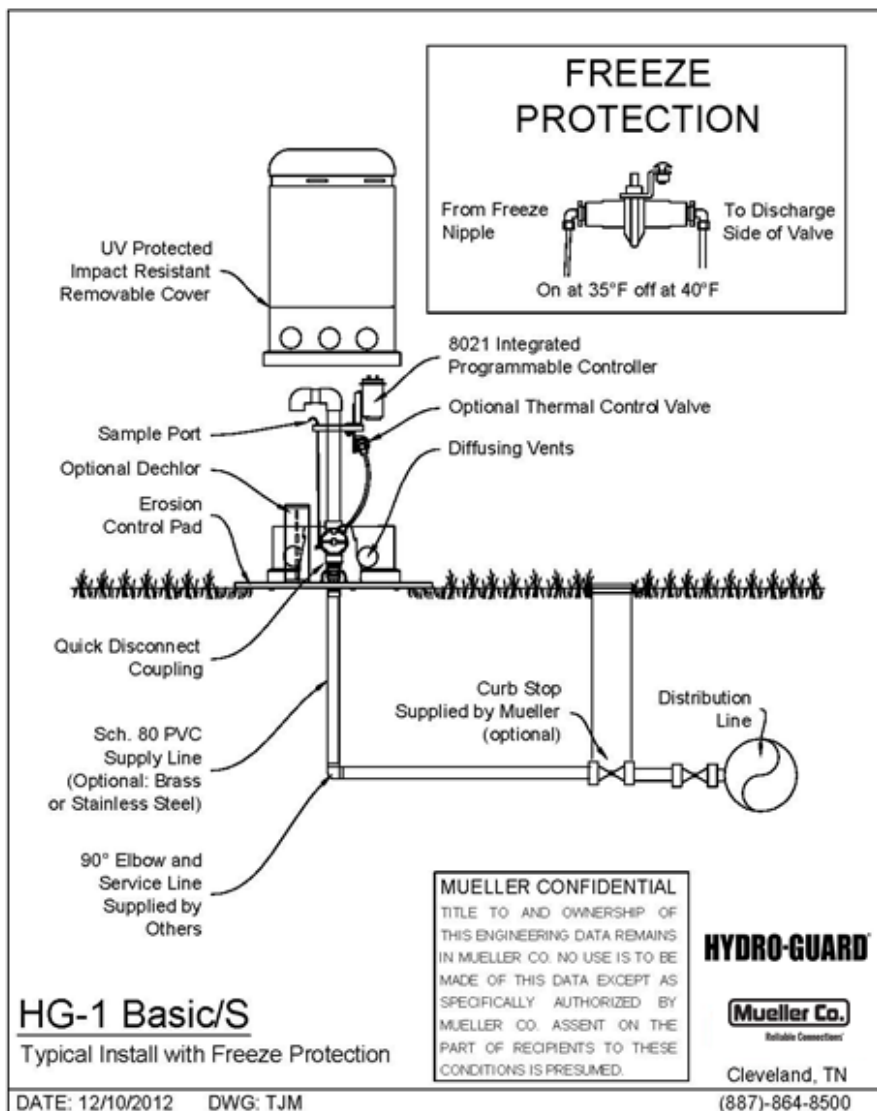


SUGGESTED SPECIFICATIONS

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6. DRAWING – HG-1 Basic/S – TYPICAL INSTALL WITH FREEZE PROTECTION



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