

**HYDRO-GUARD™ HG-8 COLD CLIMATE INGROUND
PROGRAMMING****HYDRO-GUARD®****Directed Discharge Device Construction - Automatic Water Distribution Flushing Equipment****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 in moderate to severe cold climates.
- 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 installed completely below grade and protected above grade by an at-grade cast or composite twenty-two and ¾-inch (22 ¾-inch) lid.
- 2.2 The 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.
- 2.3 This equipment shall be capable of being programmed to activate up to 24 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.
- 3.2 The automatic water distribution flushing system is comprised of the self-contained automatic flushing device with a sampling quick connect, freeze protection and an optional dechlorination system.

4. AUTOMATIC FLUSHING DEVICE

4.1 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 controller.
- 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 constructed of low lead brass piping and flexible tubing that shall allow the internals of the device to be raised and lowered within a protective ground sleeve. The internals of the device must be mounted on a steel plate that is protected from corrosion by a Rilsan Nylon coating or comparable coating.
- e. The device's internal piping and control valve shall have an operational rating of 200 psi.
- f. 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.
- g. The valve shall include a single piece EPDM diaphragm.
- h. 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.
- i. The device shall feature an industry standard and approved, testable, double check valve for backflow prevention. The backflow prevention device must be constructed of low lead brass and a removable composite check valve body.
- j. The device must provide a standard connection for a flow meter with a removable jumper bar installed for use where a meter is not to be installed and removable when a meter is to be utilized in the application.
- k. The device must provide a dechlorination chamber that will accommodate a minimum of eight (8) dechlorination tablets for the adequate dechlorination of discharged water from the device.
- l. The device must include a cylindrical style mechanical thermal control valve capable of detecting water temperatures ranging between 40°F and 35°F. The device must be capable of manually activating and allowing water to flow through the thermal control valve. Water passing through the thermal control valve must be capable of activating the control valve, thus initiating a flush event that will allow for warmer subterranean waters to flow through the device and reduce the potential for freeze damage to the device's piping.
- m. The device shall be supplied with a standard one inch (1") male NPT water supply connection.

4.2 Housing

- a. The components shall be protected from the environment and vandalism by a below-grade twenty-one inch (21") diameter PVC housing and an optional cast or composite lid that shall be mounted at grade on top of the below grade PVC housing.
- b. The self-contained device shall be supplied with a below-grade bottom-vented protective base that shall protect the internals of the flushing device; provide stability; and provide anti-buoyancy capabilities.

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- c. The protective ground sleeve shall be constructed of Schedule 40 PVC (ASTM D2241, grade 1120) with a minimum diameter of 21-inches.
- d. The below-grade base shall provide for an optional full debris shield that can be affixed to the bottom of the base.
- e. The optional debris shield shall include a drain with filter fabric that must allow water to exit the base while preventing debris from entering the ground sleeve.

4.3 System Sampling (Required) - The device must be capable of being equipped with an optional, fully functional, sampling system that shall draw water quality samples from a point located between the utility water service line and the one-inch (1") control valve of the flushing system. The sample collection point must be easily accessible from the top of the device. 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 one-inch (1") adjustable control valve nearest to the service piping of 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 low lead or stainless steel quick connection. The sampling tip shall be constructed from stainless steel or low lead brass. 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.

4.4 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.

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- 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.

4.5 Winterization (Required) - As per the local ordinance the device shall be constructed with 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.

- a. 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.
- b. The mechanical thermal control valve must be capable of protecting 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.

4.6 OEM Installed De-chlorination 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.

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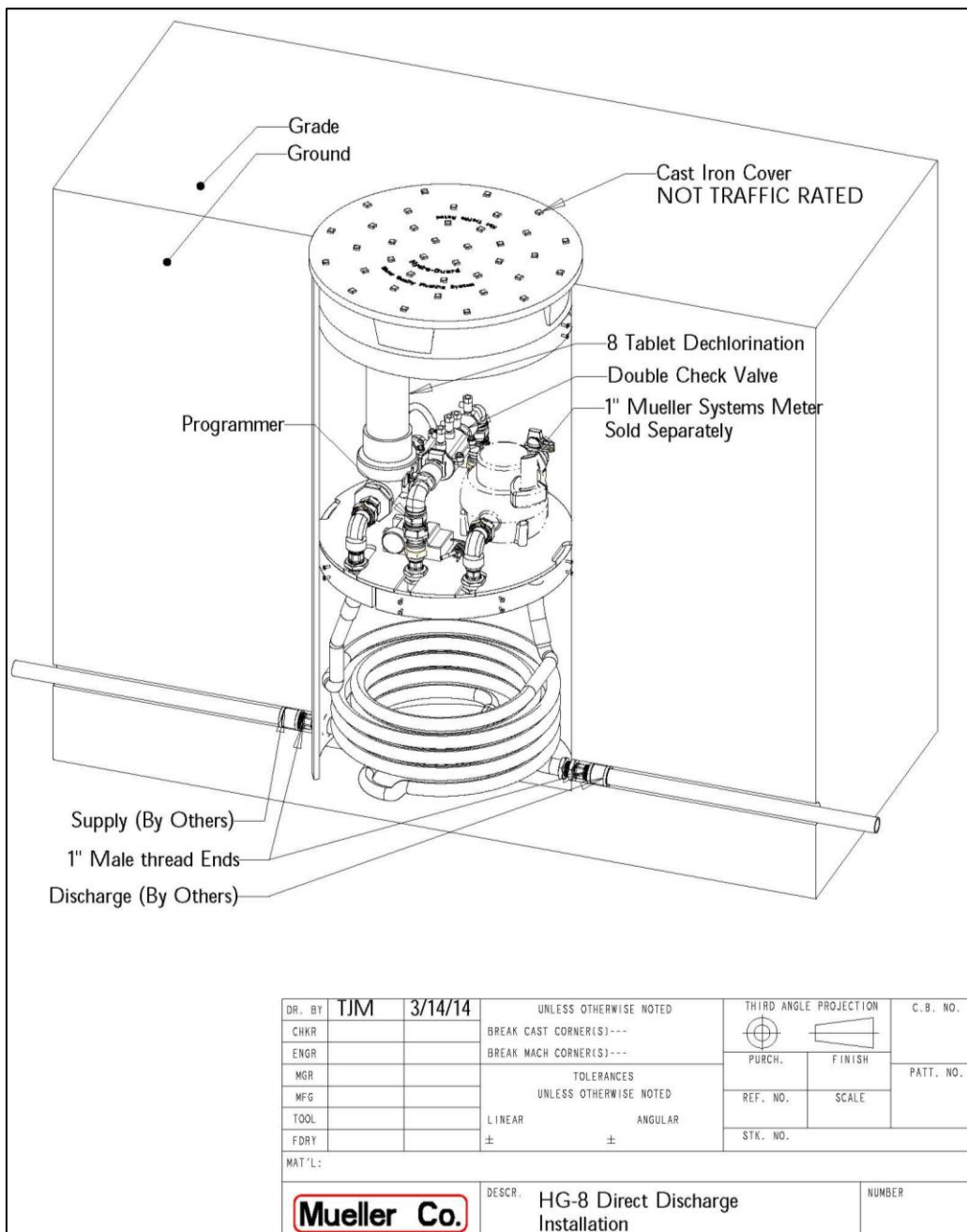
- a.** Prior to the installation, the drainage patterns for the intended installation location shall be viewed to ensure that any discharged water will not create hazardous conditions for pedestrian or vehicular traffic. The selected location's drainage pattern shall also permit discharged water to flow away from the automatic flushing device or be absorbed by the surrounding soil as 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.
- e.** Backfilling shall be accomplished in 6" lifts.
- f.** Use a level to ensure the device is level after each lift.
- g.** Ensure the lid is level.
- h.** The automatic flushing valve shall be disinfected in accordance with ADH and AWWA standards.

SUGGESTED SPECIFICATIONS

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4.8 Installation Drawing



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