HYDRO-GUARD®

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200 SERIES WARM CLIMATE HIGH PROFILE DIRECT DISCHARGE UNIT FOR ABOVE-GROUND INSTALLATIONS

Suggested Specifications

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 installed on above-ground 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 water quality.

2. PERFORMANCE

2.1 This equipment shall be connected to a water distribution line as required by the plans or above-ground installation detail. The unit is designed for automatic flushing of the water distribution line through the opening of a control valve that is an integral part of the unit.

2.2 This equipment shall be capable of being programmed to activate up to 12 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 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.

2.4 Additional programming capabilities shall include activation at the desired time of day and for the desired duration (durations ranging from one minute to four hours per flush event).

2.5 All programming capabilities shall be accomplished by means of an integrated programmer with a minimum of 12 possible flush events, or a Bluetooth controller capable of 24 different flush events. Both controller options shall offer a minimum range of operation of one (1) minute to six (6) hours.

2.6 The Bluetooth controlled programmer must be capable of receiving management data transmissions from at least 25 feet, line of sight.

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2.6.1 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.

2.6.2 The Bluetooth controller must be capable of providing at least 5,000 separate on/off functions over the life of a single 9-volt Alkaline battery.

2.6.3 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. Required standards for phone or tablet connection must be Bluetooth SMART 4.0, (low energy) on an iPhone with iOS version 7 (minimum) or an Android phone/tablet with Marshmallow version 6.0 or higher.

3. ACCEPTABLE MANUFACTURERS

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

3.1 Controller/Programming

3.1.1 Programming for the 200 Series Warm Climate High Profile Direct 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 composed of the automatic flushing unit, a multi-event programmable controller, and a portable sampling device.

5. AUTOMATIC FLUSHING UNIT

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

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

5.1.1 The unit's internal control valve shall be capable of being activated by an internal alkaline or lithium battery with an operating life of 6–to-12 months under normal operating conditions or a Bluetooth equipped smart phone (Android or iOS).

5.1.2 The control valve shall be a globe style valve with a straight pass design capable of passing sand and other debris without obstructing the valve's throat.

5.1.3 The unit's standard internal piping shall be either schedule 80 PVC or No-Lead Brass (customer preference).

5.1.4 The unit's internal piping and control valve shall have a recommended operational rating of up to 200 psi. However, where pressures are likely to be sustained at or above 120 psi a pressure reducing valve shall be installed in line with the device.

5.1.5 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.

5.1.6 The control valve shall be constructed of a non-corrosive, glass-reinforced nylon, brass, or equal, and shall be fitted with stainless-steel hardware. The valve shall be of the type that can be easily rebuilt.

5.1.7 The unit shall be supplied with a standard 2" male NPT water supply connection.

5.1.8 The unit shall be equipped with an Air Gap for backflow prevention. The air gap must be a minimum of 12" from the tip of the discharge piping to the top of the catch basin where discharged water shall flow through in route to the final point of discharge.

5.2 Housing

5.2.1 The unit shall be supplied with a vented 17-inch by 24-inch by 35-inch above ground enclosure and an 18-inch by 25-inch by 16-inch below grade base, each constructed of superior quality HDPE or other non-corrosive, polyethylene material.

5.2.2 The unit's components 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. The material shall be specifically designed for direct exposure to the sun and weather and have a minimum life expectancy of 15 years.

5.2.3 All mounting brackets and hardware shall be constructed of stainless-steel and/or anodized aluminum.

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

5.3.1 The sampling system shall be constructed of copper, stainless-steel, polyethylene, or other material with equal or greater resistance to bacterial regrowth and be connected with brass or stainless-steel fittings.

5.3.2 The sampling system shall be designed in such a way to reduce the potential for sampling system contamination by allowing access and inspection of the internal piping compartment and components without disassembly or depressurization of the sampling system.

5.3.3 Connection to the unit's sampling system shall be by means of a stainless-steel quick connection valve. The unit'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.

5.3.4 Sampling system shall include a quick connect that can only be accessed by use of a portable sample valve (PSV).

5.3.5 The Portable Sample Valve must be removable and feature (check preference) a stainless-steel sampling tip ___ and/or a polyethylene sample tube ___.

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

5.4.1 Controller must be capable of storing instructions. It shall be either an (Check indicates preference) (___) integrated, "Built-In", programmer capable of operating the device's internal control valve using a single replaceable 9-volt alkaline battery with the potential for adding a second like battery; or a Bluetooth-equipped smart phone.

5.4.2 The Bluetooth-equipped device must be powered by a single 9-volt Alkaline battery that can power a minimum of 5,000 on/off events over the life of the battery.

5.4.3 The Bluetooth-equipped device must allow for up to 24 flush events daily with durations of one minute to 24 hours.

5.4.4 The Bluetooth controller interface shall be capable of being managed from a minimum distance of 25 feet (line of sight/no obstructions) by way of a standard Android or iOS smart phone.

5.4.5 The Bluetooth controller interface module must be password protected to prevent unauthorized operation.

5.4.6 The built-in control option must offer a minimum of twelve (12) flushing programmable events per day. The Bluetooth control option must offer a minimum of twenty-four (24) programmable flush events per day.

5.4.7 Be leap-year compatible, automatically accounting for February 29th every four years.

5.4.8 The built-in option must offer an LCD readout for viewing ease of clock and programming functions.

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5.4.9 The Bluetooth controller option must be compatible with Bluetooth SMART 4.0, (low energy) on an iPhone with iOS version 7 (minimum) or an Android phone/tablet with Marshmallow version 6.0 or higher.

5.4.10 The Bluetooth controller must be capable of connecting to a cellular phone via the phone's Bluetooth functionality. The phone's Bluetooth function must meet the minimum standards mentioned.

5.4.11 The Bluetooth controller must offer at least 24 different flush event programming with minimum programming ranges of one (1) minute to six (6) hours.

5.4.12 Use an integrated latching solenoid to operate the control valve. Manufacturer must be able to readily provide replacement parts for the solenoid and valve.

5.5 Winterization

The unit shall have available as an upgrade a self-actuating thermal control valve for use in automatically acting to prevent water from freezing within the assembly.

5.6 Dechlorination System

A tablet feeder designed to accommodate up to twelve 2 $^{5}/_{8^{th}}$ inch sodium sulfite or ascorbic acid tablets may be installed on the unit. 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. 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. Depending upon the level of neutralization required, as many as five tablet feeders may be installed on a single flushing device.

5.7 Execution

5.7.1 Prior to installation, flush water service lines to remove construction debris from service line. Ensure service line is free of coupons, shavings, wood, rocks, or other debris that may damage the flushing device and hinder its operation.

5.7.2 Prior to the installation, the drainage patterns for the intended installation location shall be 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 valve or be absorbed by the surrounding soil as prevent pooling.

5.7.3 Remove debris that might create uneven pressure on the unit from the bottom of the hole. Compact the bottom of the hole to minimize settling after installation.

5.7.4 Install a 4" lift of non-compacted sand or similar bedding material into the bottom of the hole.

5.7.5 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 unit is level after each lift.

5.7.6 The area 36" around the automatic flushing valve shall be prepared in order to prevent erosion.

5.7.7 The automatic flushing valve shall be disinfected in accordance with ADH and AWWA standards.