

# HYDRO-GUARD®

## HG-1 Automatic Flushing System

TABLE OF CONTENTS	PAGE
Installation Instructions	2
Programming Unit	3-6
Assembly, Disassembly & Maintenance Instructions	7
Troubleshooting	8
Options	9
Parts	10
Notes	11

**⚠ WARNING:**

Failure to read and follow the instructions contained within this manual could result in serious personal injury, and/or damage to the Hydro-Guard® Automatic Flushing Device.

1. Each person involved in the assembly, installation and/or maintenance of the Hydro-Guard Automatic Flushing Device must read this manual carefully and follow all instructions prior to performing any installation or maintenance procedures involving the Unit.
2. Verify the drainage path prior to installation to ensure that pedestrian and vehicular hazards will not be created by the installation and use of the Hydro-Guard Automatic Flushing Device (In areas in which freezing may occur, special attention should be given to this procedure).
3. **Never** assemble, disassemble, or perform Hydro-Guard maintenance unless the influent supply valve has been closed, verified and secured, and internal piping pressure has been relieved.
4. Always use all necessary safety equipment and follow all recommended procedures when installing, operating and maintaining the Hydro-Guard Automatic Flushing Device.
5. Replace worn or defective parts with OEM parts and check your battery twice a year.
6. Operate the Hydro-Guard Automatic Flushing Device only when fully installed and correctly assembled.

**⚠ CAUTION:**

The recommended optimal operating pressure for a Hydro-Guard® Automatic Flushing System is between 20psi and 120psi. In the event pressure may exceed 120psi it is recommended that a Pressure Regulating Valve be installed ahead of the Hydro-Guard flushing system.



**Reliable Connections™**

Customer Service Center

Decatur, Illinois

800.798.3131

[www.muellercompany.com/hydro-guard](http://www.muellercompany.com/hydro-guard)

[moreinfo@muellercompany.com](mailto:moreinfo@muellercompany.com)

# HYDRO-GUARD® HG-1 Flushing System

## Installation Instructions

### GENERAL

#### Overview

The Hydro-Guard® HG-1 Automatic Flushing System, the industry's premium patented, programmable flushing apparatus, is suitable for year-round use in warm climates. This Automatic Flushing System has been designed, engineered, and manufactured to provide outstanding dependability and performance.

Please read and retain this manual. It will be helpful for future reference, training, troubleshooting, and maintenance.

#### Site Evaluation

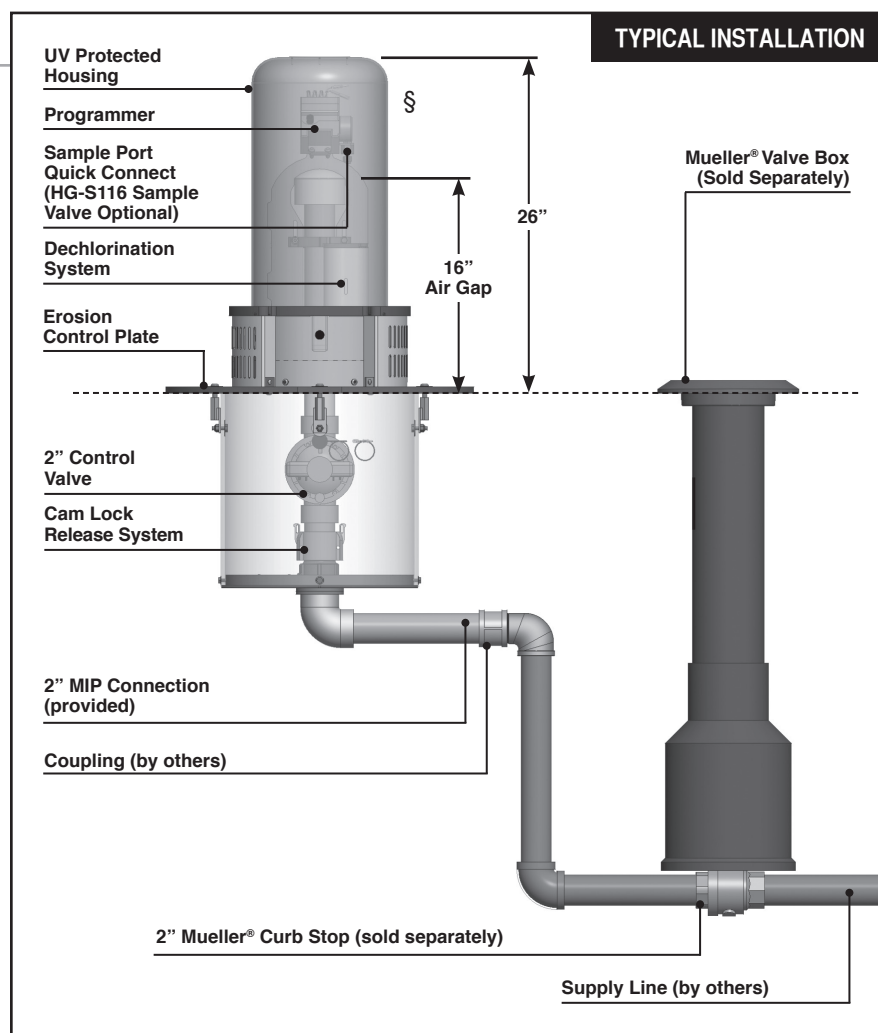
Each Hydro-Guard® installation is unique and will require a minimum of advance planning. Prior to the installation of the device, the

drainage patterns for the intended installation location should be reviewed. The drainage pattern must permit discharged water to flow away from the Hydro-Guard Unit in the case of a backflow situation. In cold-weather applications, multiple nightly flushes are effective in managing discharge volumes and preventing the accumulation of ice.

### INSTALLATION

#### Hydro-Guard® HG-1 Atmospherically Discharged Flushing Unit

1. Remove the Hydro-Guard® Unit from its packaging and inspect for possible damage during shipping.
2. Excavate a suitably-sized ditch ensuring it is connected on one side to the utility's service line trench. Remove any debris that might create uneven pressure on the Unit. Compact the bottom of the hole in order to minimize settling after installation. Place #57 stone, then non-compacted clean bedding material within the bottom of the hole.
3. Slowly lower the Hydro-Guard® Unit into place, pressing it firmly into the noncompacted bedding material until it is fully seated.
4. Connect the utility's water system to the Hydro-Guard® Unit by means of the 2" threaded connection. Ensure that the Unit is level before beginning the backfilling operation (The bottom of the ground plate should be approximately 1" above the final grade).
5. Backfill the hole around the Unit with clean fill and/or #57 stone. Backfilling should be accomplished in 6" compacted lifts. Check that the Unit is level.



6. Disinfect the Hydro-Guard® Flushing Device in accordance with the utility's policy. DO NOT exceed the dosage and contact times recommended by the AWWA.

7. The Hydro-Guard® Automatic Flushing Device may now be programmed and placed into service.

### PROGRAMMING HYDRO-GUARD® UNIT FOR OPERATION

Discharged water flushed from the Hydro-Guard® Unit should be routed away from the device into the surrounding environment. Proper preparation of the area around the device is essential. Use of sod or rock is recommended (See typical installation illustration on page 2).

#### Technical Data

- Operating temperature range of 32° to 120° F
- Operating Pressure: 7 to 200psi

**NOTE: Where sustained pressures may exceed 120psi the installation of a pressure reducing valve (PRV) is recommended.**

#### Battery Life

- Will vary based on number of cycles per year, operating pressure, and temperature. We recommend checking the battery every 6 months, but in many cases, you will get more life out of them.

#### HG-1 (Requires Handheld)

##### TBOS-II Programming Instructions

The TBOS-II handheld uses on screen prompts for intuitive programming. It will control current programming interface (T-2: dark gray case), as well as the previous model of programming interface (T-1 modules programmed by the TBOS-US handheld).

##### Features

- 1 to 24 possible flushing events daily, or on selected days weekly, 365-day calendar
- Flush duration 1 minute to 12 hours (1 minute increments)
- Preprogram and store up to 3 different schedules

- Rechargeable battery (low battery indicator shows both handheld and controller battery conditions) with recharging adaptor (9-volt lithium battery can be used in the built-in programming interface)

**NOTE: In that the handheld was designed by its manufacturer to program flush systems, many displays use flush terminology. In the following instructions, in such cases the equivalent flushing terminology is shown in parentheses.**

**⚠ CAUTION: Leaving the infra-red connector connected to the built-in programming interface can significantly reduce the battery life of the 9-volt batteries in the programming interface and the rechargeable battery in the TBOS-II handheld.**

##### TBOS-II Handheld Keys

**HOME** – press three seconds to turn handheld on.

**ABC** – press to choose from three available programs (to store a program when preprogramming, or uploading a program to controller).

**LEFT** and **RIGHT ARROWS** – move cursor left or right, also go back or forward one screen.

**ON** and **OFF/+** and **- /UP** and **DOWN ARROWS** – Used to set flushing events on or off, move selector up and down on screen, or increase or decrease duration and other values.

**OK** – press to make selection final.

##### TBOS-II Handheld Home Screen Menu

1. **TBOS infra-red** – accessible only when connected to programming interface via the IR cable: select to connect handheld to programming interface via infrared cable and access programs on it, or to transfer programs from handheld to programming interface.
2. **Templates (TBOS-II)** – select to program handheld without connecting to programming interface.
3. **Settings** – select to access and set time, date, and various other available user settings.

##### First Time Use

1. Press **HOME** key for three seconds to turn on handheld.
2. Press **RIGHT ARROW** key or the **OK** key to access “Settings”
3. Use **DOWN ARROW** to select and set the following:
  - a) Date and Time
  - b) Contrast of the screen
  - c) Name of the handheld controller (can be assigned to a specific operator)
  - d) Language (English, French, Spanish, Italian, Dutch, Portuguese, Turkish, etc.)

# HYDRO-GUARD® HG-1 Flushing System

## Programming Unit

### Programming Flushing Schedule

There are two ways to proceed:

- select “**TBOS-II infra-red**” if IR cable is connected to a TBOS-II programming interface to access, change or load programs there, or
- select “**Templates (TBOS-II)**” to create or change programs stored on the handheld to load onto a programming interface at a later time (IR cable not used).

**NOTE: The home screen for “TBOS-II infra-red” shows battery condition for programming interface and ON/OFF state of any current operation in progress.**

1. Press **HOME** key for three seconds to turn handheld on.
2. Press **RIGHT ARROW** key or the **OK** key to access “**Settings**”.
3. Use **DOWN ARROW** to select “**Templates**” and press **OK**.
4. Use **DOWN ARROW** to select “**Programs**” and press **OK**.
5. Use **DOWN ARROW** to select “**Watering Days**” (Days to Flush) and press **OK**.
6. Use **UP/DOWN ARROWS** to select one of the following:
  - a) **Custom Cycle (Week)**: use **RIGHT/LEFT ARROWS** to move to days of the week, use **ON/OFF** keys to highlight days on which to flush, then press **OK** to confirm days when selections are complete.
  - b) **Even Days**: to Flush on even dates, press **OK** to set.
  - c) **Odd Days**: to Flush on odd dates including 31st, press **OK** to set.
  - d) **Odd Days 31**: to Flush on odd dated except 31st, press **OK** to set.
  - e) **Cyclical**: to Flush every “X” days, set “X” using **ON/OFF** keys (X=1 to 31), press **OK** to set; then set start date “dd/mm/yyyy” using **ON/OFF** keys, press **OK** to set.

7. Use **LEFT ARROW** to navigate back to the program “**Settings**” menu.
8. Select “**Start times**”, press **OK** to set.
9. Use **ABC** to select program to be set up.
  - a) Set hours and minutes for each start time (up to 8 per program) using **ON/OFF** keys, press **OK** to set each (hours are indicated using 24 hour clock). [When exiting this screen, start times will automatically sort into chronological order.]

10. Use **LEFT ARROW** to navigate back to the program “**Settings**” menu.
  - a) Use **DOWN ARROW** to select “**Valve Run Times**” (Flush Duration), press **OK** to set.

**NOTE: Although six valves may be shown on screen, only Valve 1 is used to manage the Hydro-Guard® unit.**
  - b) Use **ON/OFF** keys to select program A, B and/or C (one or more can be assigned).
  - c) Then use **ON/OFF** keys to set Flush duration (hours and/or minutes) for program just set, use **LEFT/RIGHT ARROW** keys to move between hours and minutes and + and – keys to set times (1 minute to 12 hours), press **OK** to set.

### Transmitting Time, Date and Programs to Programming Interface, Clearing/Checking Programs, Manual Start

Connect handheld to programming interface using IR cable.

1. To transmit: from home screen, use **DOWN ARROW** to select “**TBOS-II infrared**” and press **OK**. TBOS-II handheld will receive data (settings) from built-in programming interface.
2. Once data receipt is complete press **RIGHT ARROW** to move to “**Settings**” menu.

3. From “**TBOS-II infra-red**” settings screen select “**Transmit**” and press **OK** again. When program to be transmitted appears, press **OK** to confirm.
4. To clear programs A, B, or C: from “**TBOS-II infra-red**” welcome screen, use **DOWN ARROW** to select “**Clear Programs**” and press **OK**, then select type of program to clear and follow prompts.
5. To check programs A, B, or C: from “**TBOS-II infra-red**” welcome screen, use **DOWN ARROW** to select “**Programs**” and press **OK**, then select what is to be checked and follow prompts.

### Manual Flushing

Using TBOS-II handheld on the T-2 built-in programming interface (dark gray in color).

**NOTE: Manual start cannot be initiated if there is no program in the programming interface.**

1. To start manual flushing from “**TBOS-II infra-red**” welcome screen.
  - a) Use **DOWN ARROW** to select “**Manual Watering**” (Manual Flush) and press **OK**,
  - b) Select “**Start Valve**” (Open Control Valve) then using **ON/OFF** keys select “**Valve 1**” and press **OK**,
  - c) Use **ON/OFF** keys to set the manual Flush Time (1 minute to 12 hours) and press **OK** to confirm. Flushing will start after a four (4) second delay.

### Stop Manual Flush Sequence

1. Reconnect IR cable to built-in interface, then hold down **HOME** key on handheld.
2. Use **RIGHT ARROW** to select “**TBOS-II infra-red**” menu and select “**Manual Watering.**”
3. Select “**Cancel Flush**” to cease the manual flush sequence.

### HG-1 Built-In: (Integrated)

#### NODE Programming Instructions

##### Batteries

The NODE uses standard 9-volt alkaline batteries to operate the control valve and program the controller. The controller can operate with one or two batteries installed. Under normal conditions, potential life is 1 year for a single battery.

##### Battery Installation

1. Unscrew rear body of the NODE to gain access to battery compartment.
2. Insert battery/batteries into battery tray and connect the battery connector to controller.
3. Make sure no water is inside battery compartment.
4. Screw the NODE rear body back onto front half.

**NOTE: Make sure that seal marker on rear half of the NODE lines up with front half, ensuring a proper seal is created. Also, The NODE has non-volatile memory, which allows battery replacement without losing program information.**

##### Idle Mode – Waking Up

Normally the NODE display shows time and day, day of week, and battery life indicator. During a short period of inactivity the display will shut off to retain battery power. Pressing any key will wake up the NODE to the Idle Mode.

##### Run Mode

When controller is operating a program, items shown on display will include station number (always “1”), program letter (A, B, or C), remaining runtime, and a blinking Rotor icon.

#### Programming

The NODE has the capability to hold 3 programs (A, B, C) and 4 start times per program. When programming, flashing portion of display can be changed by pressing + or – keys. To change something not flashing, press **LEFT or RIGHT ARROWS** until desired item is flashing.

##### Setting Date/Time

1. Press **RETURN/ENTER** key until **CLOCK** icon is displayed.
2. All 4 digits will be displayed representing the year. Use + or – keys to change year. Press **RIGHT ARROW** key to proceed to setting month.
3. All 4 digits will be displayed with two digits on left flashing representing the **MONTH**. Use + or – key to change month. Press **RIGHT ARROW** key to proceed to setting **DAY**.
4. Only two digits on right will be flashing, representing the **DAY**. Press + or – key to change day. Press **RIGHT ARROW** key to proceed to changing **TIME**.
5. The **AM/PM/24** time setting is shown flashing. Press + or – key to change to AM, PM, or 24-hour time. Press **RIGHT ARROW** key to proceed to setting the **HOUR**.
6. All 4 numbers are shown with two numbers on the left flashing, representing the **HOUR**. Press + or – key to change the hour. Press **RIGHT ARROW** key to proceed to setting **MINUTES**.
7. All 4 numbers are shown with two numbers on right flashing, representing **MINUTES**. Press + or – key to change minutes. (Pressing **RIGHT ARROW** key will return to **YEAR** setting at step #2.)
8. Press **RETURN/ENTER** key to proceed to next programming function, or allow controller to return to idle mode.

#### Setting Flush Sequence Start Times

1. Press **RETURN/ENTER** key until **CLOCK** icon is displayed.
2. The **START TIME** will be displayed flashing, along with the program letter (A, B, or C) and start time number (1, 2, 3, or 4) in the upper left of the display. Up to 4 different start times can be set for each program.
3. Use + or – key to change **START TIME** for program displayed. Each press of key will change start time in 15-minute increments.
4. Press **RIGHT ARROW** key to add an additional **START TIME** to program displayed. The start time number is shown in upper left corner of display.
5. Press **PRG** key to add **START TIME** to a different program.
6. Press **RETURN/ENTER** key to proceed to next programming function, or allow controller to return to idle mode.

#### Setting Flush Duration Times

1. Press **RETURN/ENTER** key until **HOURLASS** icon is displayed. **RUN TIME** will be displayed flashing. Also shown is program letter (A, B, or C) and active station # (always #1– all other stations not used) on lower left side of display.
2. Press + or – key to change station **RUN TIME** from 1 minute to 6 hours.
3. Press **PRG** key to add a **RUN TIME** to another program.
4. Press **RETURN/ENTER** key to proceed to next programming function, or allow controller to return to idle mode.

# HYDRO-GUARD® HG-1 Flushing System

## Programming Unit

### Setting Flushing Days

1. Press **RETURN/ENTER** key until **CALENDAR** icon is displayed. The program letter (A, B, or C) will be displayed. Arrows point at specific days of week in which flushing will occur.
2. Press **LEFT** or **RIGHT ARROW** to scroll through days.
3. Press **+** key to activate that day for program displayed, or **-** key to cancel watering for that day. The arrow will show on flushing days for active program.
4. Press **PRG** key to set days to flush for a different program, if desired.
5. Press **RETURN/ENTER** key to proceed to next programming function, or allow controller to return to idle mode.

### Manual Flushing

Manual flushing allows user to test the Hydro-Guard® unit or a program for a specified run time.

Make sure controller is in Idle Mode.

1. Press and hold **RIGHT ARROW** until **HAND** icon is displayed. The station number (always #1) will be displayed in lower left side of display along with **RUN TIME**.
2. Use the **LEFT** or **RIGHT ARROW** to select #1 station if not already displayed, and **+** or **-** key to set manual flushing time.
3. To manually activate a program, press **PRG** key. Program letter (A, B, or C) will show on screen. If a different program is needed, press **PRG** key until desired program is displayed.
4. To stop **MANUAL FLUSHING** cycle press **-** key until time is reduced to zero.

5. Press **RETURN/ENTER** key to proceed to next programming function, or allow controller to return to idle mode.

#### **NOTE:**

- **Pressing + or - key when running in MANUAL FLUSH mode will modify FLUSH TIME for that station.**
- **Pressing the button when a station is running in manual watering will stop flush on the current station and advance to the next station.**
- **Pressing the button when a station is running in manual watering will stop the flush on the current station and revert to the previous station.**

### Turn System Off

To turn off controller, press **RETURN/ENTER** key button until icon resembling water spray and **OFF** is displayed on screen. To return controller to auto programming mode, press **RETURN/ENTER** key. The controller will immediately return to auto programming mode and will display time and battery life indicator.

### NODE Quick Check

This circuit diagnostic procedure can quickly identify "shorts" commonly caused by faulty solenoids or when bare common wire touches a bare station control wire. To initiate **NODE Quick Check** procedure:

1. From Idle Mode, press and hold **+, -, LEFT ARROW, and RIGHT ARROW** keys.
2. Display will show all segments. Release keys.
3. Press **+** key to initiate **NODE Quick Check** test.
4. Controller will then activate flushing unit for 1 second to verify operation.

### Battery Life Indicator

Remaining battery life can be estimated from the battery life indicator shown on display. The **NODE** can operate using either a single 9-volt battery or using two 9-volt batteries. Using two nine volt batteries will yield approximately twice the battery life of a single 9-volt battery. The battery life indicator chart below shows an estimate of remaining battery life.

**Full:** 100-60% remaining battery life

**Med:** 60-25% remaining battery life

**Low:** 25-0% remaining battery life

**Replace battery immediately!**

### Resetting Controller

Resetting controller will erase current program data and restart controller. A reset does not, however, delete a program saved to permanent memory using the Easy Retrieve Memory feature to save a preferred program.

1. From Idle Mode, press and hold **-, RIGHT ARROW, and PRG** keys.
2. After two seconds screen will go blank. Continue to hold keys.
3. 12:00 will flash on display. Release keys.
4. The controller may show a countdown from 10 to 1 on display, and then 12:00 am will be shown flashing when reset is complete. The controller can now be reprogrammed.

# HYDRO-GUARD® HG-1 Flushing System

## Assembly, Disassembly & Maintenance Instructions

### HG-1 DISASSEMBLY AND REASSEMBLY INSTRUCTIONS


 **TOOLS NEEDED:** HG-A104 Security Wrench, HG-A2023 Security Tool, Philips screwdriver, flat-head screwdriver

The HG-1 Unit is designed to operate unattended and with minimal need for service. In the event it is necessary to service the flushing unit's control valve, solenoid, or any other below-grade component, or to load the Dechlorination Chamber please follow these instructions.

#### Disassembly

1. Shut off water supply to unit.
2. Use HG-A2023 Security Tool to unlock and remove protective Exterior Housing Cover.
3. Loosen, DO NOT remove, two stainless steel nuts in Bracket holding Dechlorination Chamber Covers in place.
4. Use HG-A104 Security Wrench to remove four security bolts from Erosion Controlling Ground Plate.
5. Lift upper assembly up and off pipe leading down into lower in-ground part of unit, taking care not to stretch wiring and poly-tube sampling line.
6. Remove the internal subassembly from the bottom plate assembly of the HG-1 by releasing the Cam-Lock handles at the base of the female side of the Cam-Lock.

#### Reassembly

1. Return internal assembly to proper location and lock the Cam-Lock handles in place on the female side of the Cam-Lock.
  2. Pull up on internal assembly to be sure it is locked in place (recommendation: use a zip-tie to hold two Cam-Lock handles in position to assure they remain locked in place during operation of the unit).
  3. Gently lift upper section, making certain to not stretch wires or poly-tube, and place it over pipe and lower it onto top of in-ground section of unit.
  4. Line up four holes of Ground Plate with brackets of in-ground Protective Sleeve.
-  **CAUTION: DO NOT rotate the plate more than 90° in either direction, which could stretch wiring or poly-tube.**
5. Reinstall four Security Screws and use HG-A104 Security Wrench to tighten them securely.
  6. Lower Dechlorination Chamber Bracket to original position and retighten two nuts securely.

7. Check battery life of Battery in Programming Interface or on-board Programmer (according to model of unit), replace and restore programming if necessary.

8. Align Lock on Exterior Housing Cover with Locking Bracket on lower assembly of unit and reinstall Exterior Housing Cover (lock will engage when cover is properly seated).

9. Restore water supply to unit.

#### Loading Dechlorination Chamber

1. Follow instructions "HG-1 Machine Disassembly", steps 1 – 3.
2. Slide Bracket upward as far as possible and remove Dechlorination Chamber Covers.
3. Check for partially dissolved chlorine tablets or residuals and clean the chamber as needed.
4. Insert up to four 3" chlorine tables in each chamber.
5. Reinstall chamber covers, lower bracket to secure them and retighten two nuts securely.
6. Follow instruction #8 above to reinstall Exterior Housing Cover, and restore water supply to unit.

### BATTERY REPLACEMENT

#### HG-1 Removable TBOS-II Controller

1. Use HG-A2023 Security Tool to unlock and remove protective Exterior Housing Cover.
2. Unscrew protective cap from gray Programming Interface located at top of unit.
3. Extract battery harness and remove old battery (dispose of battery appropriately).
4. Connect fresh industrial grade 9-volt lithium or alkaline battery. Reinsert with harness into Programmer.

5. Screw protective cap back into place and hand tighten securely.
6. Use Handheld Controller to reset all programs and assure flushing sequence is correct prior to returning the HG-1 Unit to service.
7. Reinstall Exterior Housing Cover and restore water supply to unit.

#### HG-1 Built-In NODE Controller

1. Follow HG-1 Removable TBOS-II Controller steps 1 – 3 (left) to access on-board Programmer.

2. Connect fresh industrial grade 9-volt alkaline battery and reinsert it with harness into Programmer (an optional battery harness is provided for redundancy and extended battery life).
3. Screw protective cap back into place and hand tighten securely.
4. Confirm that desired flushing sequences are correct prior to returning the HG-1 Unit to service.
5. Reinstall Exterior Housing Cover and restore water supply to unit.

# HYDRO-GUARD® HG-1 Flushing System

## Troubleshooting

### TROUBLESHOOTING THE PROGRAMMER

PROBLEM	CAUSE	SOLUTION
Controller does not flush as desired	Water at main water supply is shut off	Check main supply valve
	Battery dead	Replace battery
	Controller set to OFF	Set controller to desired program
	Controller improperly programmed	Check program and clock settings
Blank display	Battery dead	Replace battery
Water does not turn off	Overlapping programming	Review all programming and edit any program that is in conflict with desired off schedule  Clear all programming in memory and reset
	Programmer not communicating	Check Programming  Run Manual On/Off with solenoid removed from valve (hold finger or object over solenoid plunger to prevent plunger from dislodging from solenoid body)  Check wiring for damage and connectors to ensure proper connection (red to red & black to black)

### TROUBLESHOOTING THE UNIT

**If your Hydro-Guard® Unit does not activate:**

**Possible Causes**

- Water pressure off or low.
- Batteries weak or dead.
- Connection loss from controller to solenoid.
- Solenoid not working properly.
- Obstruction in flow of water.

**Try this Correction**

- Check if curb stop is open.
- Change batteries.
- Check connections for corrosion, breaks, or lack of connection.

- Run a manual flush and confirm the solenoid plunger is kicking out and pulling back in by listening for a click.
- Check to make sure the flow control knob is open on the valve OR Check the pipes for obstructions OR Check the valve.

**The Hydro-Guard® Unit will not shut off:**

**Possible Causes**

- The solenoid is stuck in the open position or debris is interfering with the plunger.
- Batteries weak or dead.

- Connection loss from battery box to solenoid.
- The solenoid is loose or there is debris in the adapter.
- There is a hole in or debris around the diaphragm.

**Try this Correction**

- Run a manual flush for 1 minute.
- Change batteries.
- Check connections for corrosion, breaks, or lack of connection.
- Check the adapters and solenoid for debris – Run the electrical systems check.
- Refer to valve troubleshooting for possible corrective measures.



### HYDRO-GUARD® OPTIONS AND UPGRADES

The following is a brief overview and introduction to Hydro-Guard® Options.

#### LOW LEAD BRASS INTERNAL COMPONENTS AND PIPING

##### Freeze Protection

The Hydro-Guard® HG-1 Unit is freeze protected to 18" by virtue of the bury depth of the main 2" valve. The HG-1 offers a valve bury depth of approximately 16" with above ground electronics that can be powered by a 9-volt Lithium battery (operational in temperatures as low as -20° F). For additional freeze

protection, consider the HG-3 design. The HG-3 (18" to 108" bury) can be equipped with an optional patented freeze protection system that allows the water in the service piping to drain from the piping when a flush sequence is ceased.

##### S.M.A.R.T. Monitoring and Flush Management

The Hydro-Guard HG-1 can be upgraded to include a S.M.A.R.T. controller and a variety of water quality sensors. The S.M.A.R.T. equipped HG-1 will allow a utility to remotely monitor, in real-time, the water quality at a specific flush point

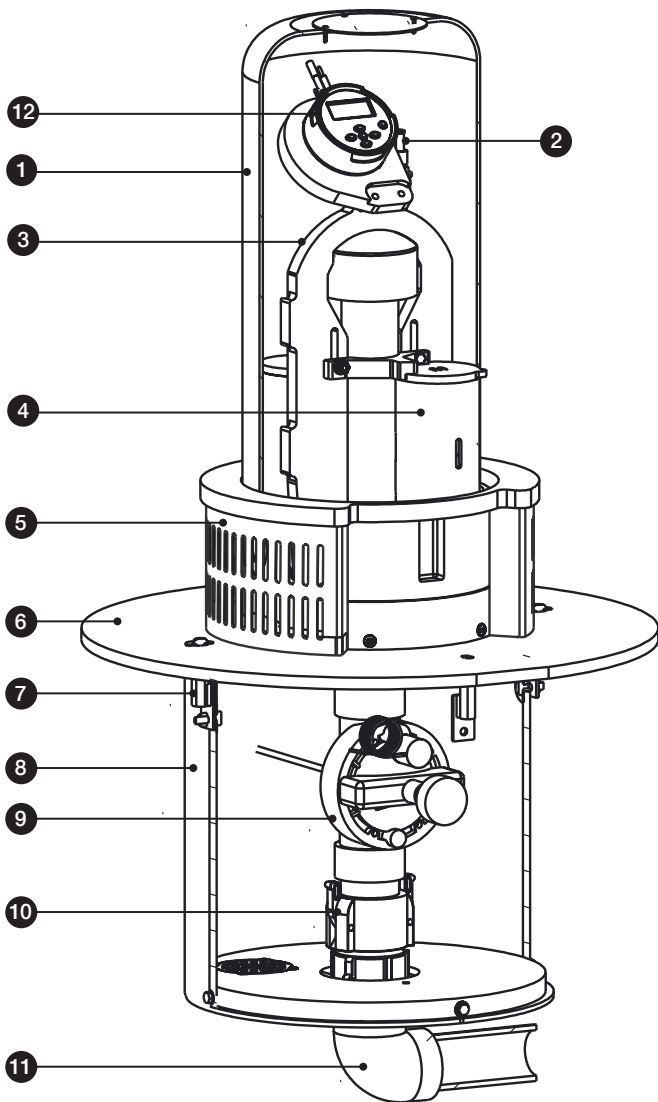
and automatically initiate a flush event when water quality conditions warrant.

##### The Hydro-Guard® S.M.A.R.T. flushing system:

- Monitors chlorine levels (total or free).
- Flushes distribution line when residual disinfectant drops below acceptable levels.
- Monitoring of pH, flow, temperature or turbidity available.
- Two-way real-time communication via cellular, wifi, ethernet or BlueTooth®.

# HYDRO-GUARD® HG-1 Flushing System

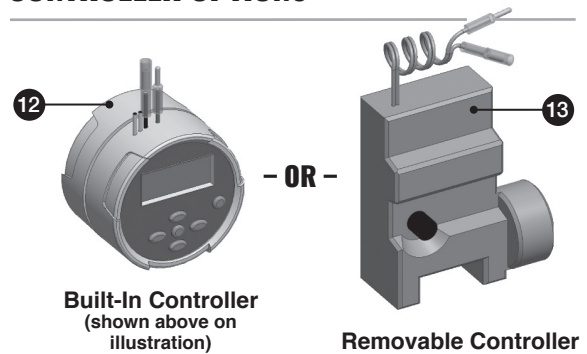
## Parts



### REPLACEMENT PARTS

ID	PART #	DESCRIPTION
1	546284	UV Protective Housing
2	HG-123104	Quick Connect/B-QC
	HG-123105	Quick Connect Sanitary Cap
3	546703	Riser Assembly
4	546519	OEM Dechlorination System
5	546514	Housing Diffuser Top
6	546292	Ground Plate
7	HG-01141A	Stainless Steel Housing Bracket
8	546025	15" PVC Housing Pipe
9	HG-123100	2" Valve 520-050 w/Flow Control
10	HG-13101	Cam Lock Release System
11	546330	Splash Pad
12 or 13	HG-5292	NODE Controller Sub Assembly
	HG-5295	TBOS-II Controller Sub Assembly

### CONTROLLER OPTIONS



**Built-In Controller**  
(shown above on  
illustration)

**Removable Controller**

PART NUMBER	PIPE MATERIAL
HG1ARM2BRN018LPLG	PVC
HG1AIN2BRN018LPLG	Brass
HG1ARM2PVC018LPLG	PVC
HG1AIN2PVC018LPLG	Brass

# HYDRO-GUARD® HG-1 Flushing System

Notes

## LIMITED WARRANTY

This Hydro-Guard® Automatic Flushing Device is warranted for one year from the date of delivery. Mueller Co. will repair or replace any defective part or component as long as the Unit is installed and operated in accordance with the procedures described within this manual. Damage or failure caused by the improper installation, assembly, disassembly, maintenance or operation of the Hydro-Guard Automatic Flushing Device is not covered by the terms of this warranty. Call Mueller Co. at 877.864.8500 during regular business hours, or contact Hydro-Guard at [www.Hydro-Guard.com](http://www.Hydro-Guard.com) for details on warranty service.



**Reliable Connections®**

Water (U.S.)

1.800.423.1323

[www.muellercompany.com](http://www.muellercompany.com)

[moreinfo@muellercompany.com](mailto:moreinfo@muellercompany.com)

International

1.423.490.9555

[www.mueller-international.com](http://www.mueller-international.com)

[international@muellercompany.com](mailto:international@muellercompany.com)

Copyright © 2016 Mueller Co., LLC. All Rights Reserved.

The trademarks, logos and service marks displayed in this document herein are the property of Mueller Co., LLC, its affiliates or other third parties.

Products above marked with a section symbol ( § ) are subject to patents or patent applications. For details, visit [www.mwppat.com](http://www.mwppat.com). These products are intended for use in potable water applications. Please contact your Mueller Sales or Customer Service Representative concerning any other application(s).

**Form 12769 - Rev 05/16**