HYDRO-GUARD®

a **MUELLER** brand

OPERATING INSTRUCTIONS MANUAL

HG-6 Hydrant-Based Flushing System

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⚠ WARNING:

1. Read and follow instructions carefully. Proper training and periodic review regarding the use of this equipment is essential to prevent possible serious injury and/or property damage. The instructions contained herein were developed for using this equipment on fittings manufactured by Mueller Co. only, and may not be applicable for any other use.
2. DO NOT exceed the pressure ratings of any components or equipment. Exceeding the rated pressure may result in serious injury and/or property damage.
3. Safety goggles and other appropriate protective gear should be used. Failure to do so could result in serious injury.

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HG-6 FLUSHING SYSTEM

Installation Instructions

GENERAL

Overview

The Hydro-Guard HG-6 Hydrant-Based Flushing System is a portable and emergency use device designed to flush water lines from fire hydrants located anywhere in the distribution network. These devices require the hydrant to be live when programmed for flushing. The HG-6 has been engineered and manufactured to provide outstanding dependability and performance.

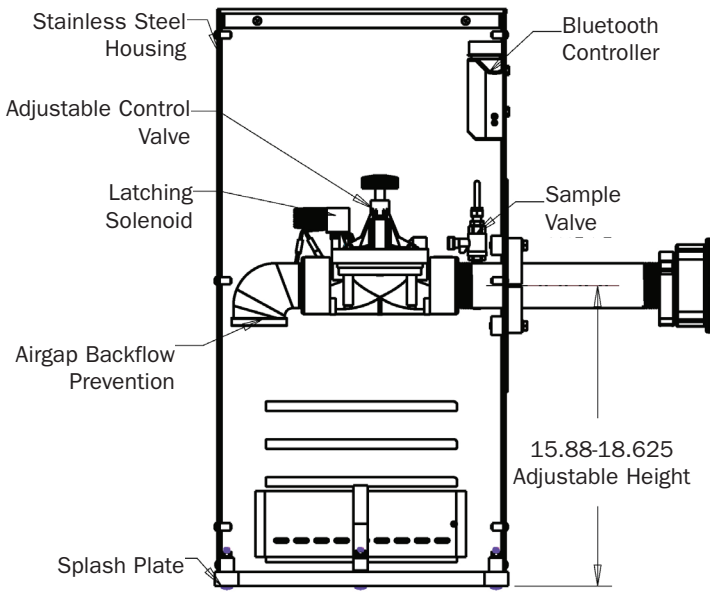
Please read and retain this manual. It will be helpful for future reference, training, troubleshooting, and maintenance.

Site Evaluation

Each installation is unique and will require a minimum of advance planning. Prior toinstallation, 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 or to be absorbed by the surrounding soil. The Unit's ground-level erosion controlling splash plate is designed to disperse the water energy from the discharging water and reduce the risk of erosion from around the base of the fire hydrant. In order to prevent undue pooling of the effluent water, multiple nightly flushes are effective in managing discharge volumes.

INSTALLATION

1. Remove the Hydro-Guard Unit from its packaging and inspect for possible damage during shipping.
2. Using the pumper nozzle, flush hydrant for several minutes to ensure the water flow is free of debris (i.e., rocks, etc.)
3. Confirm hydrant is turned off.
4. Gather 2" NTP connector and hydrant wrench.
5. If necessary, loosen but do not remove the four bolts on the side of the Hydrant Flusher in order to adjust connection height, ensuring the device is supporting its own weight. Once proper height is determined, tighten the four height adjustment bolts.
6. Connect the Hydro-Guard Unit by means of the 2" threaded nipple and supplied hose adapter.
7. Open the hydrant's valve in order to charge the hydrant.
8. If the HG-6 has been shipped with the Dechlorination System; remove the security screws at side of unit to access, remove the dechlorination chamber, open, fill with sodium sulfite or ascorbic acid tablets, reinsert and replace security screw.
9. Disinfect the Hydro-Guard Automatic Flushing Device in accordance with the utility's policy. Do not exceed the dosage and contact times recommended by the American Water Works Association.
10. The Hydro-Guard Automatic Flushing Device may now be programmed and placed into service.



PROGRAMMING HYDRO-GUARD UNIT FOR OPERATION

Technical Data

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

Note: Where sustained pressures may exceed 120 psi 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-6 REMOVABLE (REQUIRES CONTROLLER)

Bluetooth Instructions

The BL-KR battery powered irrigation module communicates with the K-Rain BL Application on a Smartphone or Tablet by using 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.

Important:

⚠ For use only with 9V DC Latching Solenoids. As some solenoids will come from the manufacturer with the plunger already magnetically latched open, some zones will default to OPEN. Follow the start-up procedure for systems with DC Latching Solenoids. (Page 09)

⚠ For every change to the program in the Mobile App, you must exit back to the home screen and tap the blue TRANSMIT button (bottom right corner). The Application aggregates changes and transmits them to the controller when you have finished programming.

⚠ Programs A, B, and C are independent programs, including start times, run times, watering days, and water budget.

1. **Install the App:**
   From the App Store
   or Google Play
   Install the free K-RainBL App:
2. **Install a 9 Volt Battery in the Controller:**
   Unscrew the cap, remove the seal and fasten the battery to the correct terminals. Replace the seal and cap and hand-tighten the cap to ensure it seals.

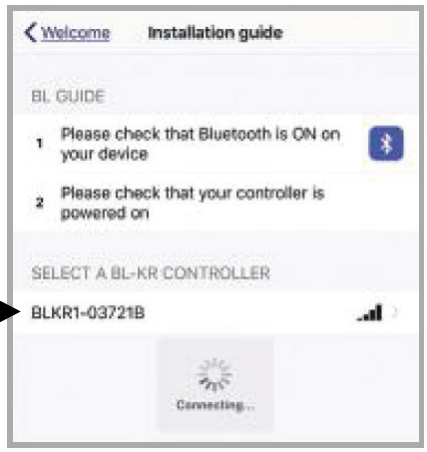
NOTE: Before you launch the App, you will need to enable locations services on your phone/tablet in order for the App to geolocate your device during installation. On Android, location services must be enabled in order for the App to connect to the BL-KR device.

3. **Launch the application on your Smartphone or Tablet.**
4. **Associate the controller with your phone by tapping the Add a Controller button.**

5. The app will now ask what type of Bluetooth device you would like to add:

NOTE: The BL-KR V1.0 and BL-KR V2.0 have identical hardware and software configurations. The only distinction is the outside plastic housing.

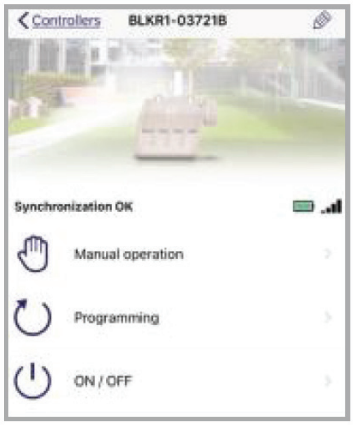
6. The App will now search for devices in range.
7. **Choose the Controller.** The serial numbers that populate the device list can be found on the label located on the back of the controller housing with the designation “Default name.” The App will indicate that it is in the process of connecting.
8. Once the device is connected, it will appear on the home screen when you launch the Application.



To add another controller, tap the plus sign in the upper right hand corner of the home screen

Application Home Screen

Device Home Screen



NOTE:
You can associate up to 400 devices with the K-Rain BL-KR App. The number of devices is limited to the internal memory on the Smartphone/Tablet.

HG-6 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 showstime 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 **HOURGLASS** 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.t

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.

HG-6 DISASSEMBLY AND REASSEMBLY INSTRUCTIONS

TOOLS NEEDED: 3/8" Socket, 7/16" Wrench, Philips screwdriver, A103 Security screwdriver.

Disassembly

1. If attached to a fire hydrant; close hydrant's water supply and allow to drain.
2. Relieve any remaining water pressure within Hydro-Guard® unit by opening sample port.
3. Place HG-6 in area clear of debris.
4. Remove the six security screws from top cover.
5. Remove the four security screws for the unit's splash pad assembly.
6. Remove the ten 1/4" bolts from the HG-6 housing. It's necessary to hold corresponding 7/16" lock nuts from inside the housing.
7. Detach Latching Solenoid from control valve.
8. Detach electrical conectors connecting the wiring of the controller (NODE or T-2) and the Latching Solenoid.
9. Remove the four bolts from the sliding clamp assembly prior to removing the two inner clamps.
10. Loosen clamping bolt on bottom of outside face clamp.
11. Slide clamp assembly away from the unit's 2" Flow Control Valve.
12. Unscrew valve from 2" brass pipe.
13. Remove six 3/8" bolts from valve cover.
14. Pull the top part of the valve away.
15. Check valve for any damages or debris in the inlet and outlet holes on valve.
16. Check diaphragm for any damages and check for any debris in the inlet and outlet holes on inside of the valve cover. When reinstalling valve cover to base, all arrows must point the same direction.

Reassembly

1. Screw valve onto 2" brass pipe.
2. Assemble sliding clamp assembly.
3. Slide clamp assembly toward the unit's 2" Flow Control Valve.
4. Assemble HG-6 housing by installing the ten 1/4" bolts. Don't forget the corresponding 7/16" lock nuts inside the housing.
5. Attach Controller to Latching Solenoid.
6. Install top cover with the six security screws.
7. Install the six security screws from cover assembly.
8. Reinstall diaphragm, following inspection into valve's top section.

⚠ WARNING: Use caution to avoid damaging plastic screen plug.

9. Reinstall screws in valve and tighten

⚠ WARNING: Use caution when tightening screws. Overtightening can damage valve body.

⚠ WARNING: Ensure flow arrows on top and bottom of valve body are facing the same direction and match the flow pattern of the flushing device.

BATTERY REPLACEMENT

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

HG-6 Built-In Node Controller

1. Follow HG-6 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-6 Unit to service.
5. Reinstall Exterior Housing Cover and restore water supply to unit.

TROUBLESHOOTING THE PROGRAMMER

If the LCD is not working, the battery could be expired. If the flashing battery symbol appears, the battery power is low. Replace the old battery with a new battery.

Battery Replacement

It is recommended that batteries be changed every six (6) months or when the low battery icon appears (see Programming for battery type).

If you need further assistance, please contact us at 1.800.423.1323.

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)

HYDRO-GUARD KEY FEATURES, OPTIONS AND UPGRADES

From the integrated sample stations to dechlorination upgrades, your Hydro-Guard Device offers an outstanding return on investment.

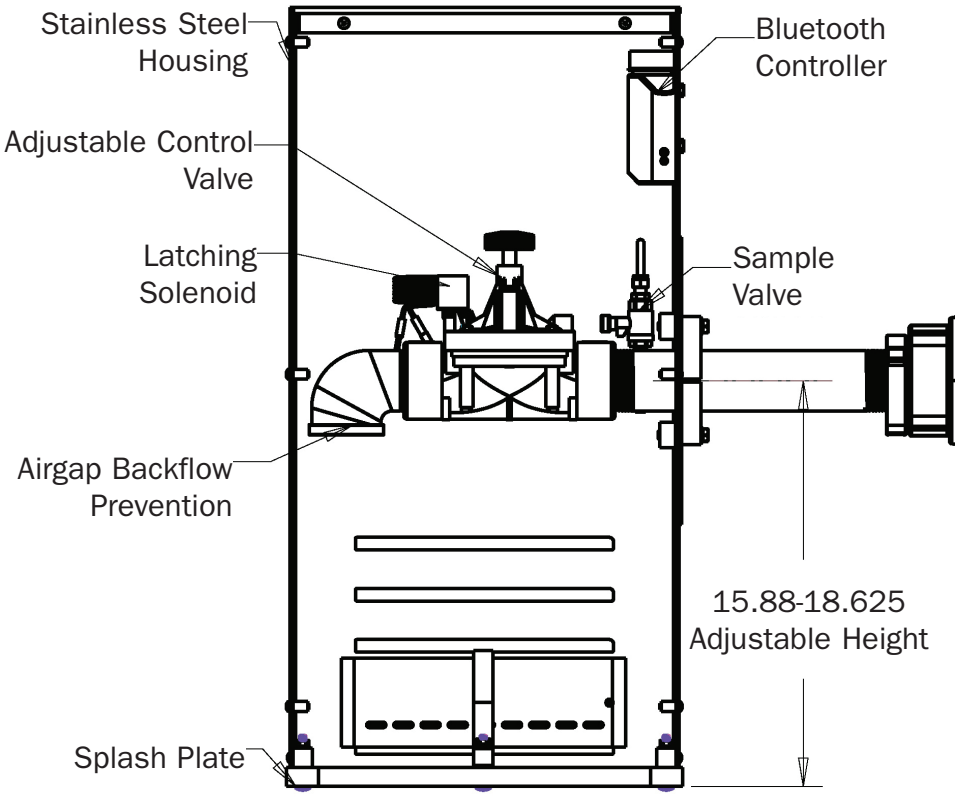
The following is a brief overview and introduction to our options.

Integrated Sample Station

Increase your control of chlorine or chloramines residual maintenance through the integrated sample station. The built-in Sample Valve is located inside the top lid of the HG-6 (this feature in an option on the HG-6 / Basic). Make sure to firmly grip the tubing and then turn the ball valve, and collect your sample. You may wish to run a brief manual-mode flush prior to the collection in order to ensure water indicative of the main-line water quality is being sampled. Generally a two-minute flush is sufficient. Track your residual levels and alter flushing frequency and/or duration in order to maximize water conservation.

Dechlorination

The HG-6 Hydrant-Based Flushing System has a built-in Dechlorination chamber located in the base of the unit. By removing the Dechlorination Chamber access door, locate opposite of the inlet piping and hydrant adapter, pull out the chamber and load it with sodium sulfite or ascorbic acid tablets. Dechlorination takes place as a portion of the discharged water passes through this chamber. This action creates a concentrated dechlorination solution that then mixes with the non-directly treated portion of the discharged water.



1. Available option on HG-6 / Basic
2. Not available on HG-6 / Basic
3. Only available on HG-6 / Basic

Notes

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