HYDRO-GUARD®

a **MUELLER** brand

HG-8 Cold Climate Flushing System

⚠️ **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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MUELLER

HG-8 COLD CLIMATE FLUSHING SYSTEM

GENERAL

Overview

The Hydro-Guard HG-8 Cold Climate Unit, is the industry's only Sub-Surface Discharge, programmable flushing apparatus. This Unit is suitable for year-round use in cold climates. This Automatic Flushing System has been designed, engineered, and manufactured to provide outstanding dependability and performance.

Please read and retain this manual for future reference, training, troubleshooting, and maintenance.

Site Evaluation

Each Hydro-Guard Unit 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. Discharged water flushed from the Hydro-Guard Unit must be routed away from the device. It is recommended that a 6" catch pipe (by others)
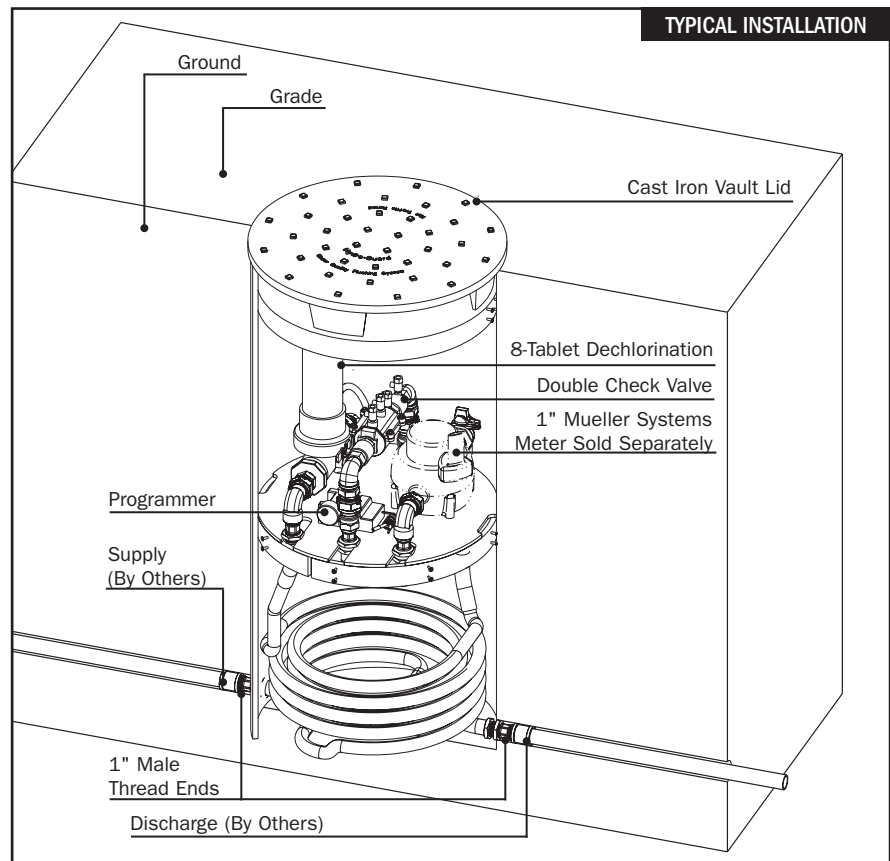
be installed inside of the HG-8's external cabinet. The catch pipe shall be mounted at least 3" under the discharge piping of the HG-8 (see Typical Installation illustration). The 6" pipe shall be installed a minimum of 24" below grade before a 90-degree bend or pipe size reduction. If desired, the 6" pipe can be reduced to a 3" or 4" pipe to continue the routing of the flow to a final discharge point. The recommended final discharge points may include a storm drain, drainage or retention pond, or a storm swale.

INSTALLATION

Hydro-Guard HG-8 Cold Climate Flushing Unit

The Hydro-Guard HG-8 Unit is housed in a Mueller Thermal-Coil Box that is approximately 21 inches in diameter. The bury depth will vary depending upon the depth of the utility's water lines. The box is constructed with low lead NTP male threads and is to be placed by the contractor at a location agreed upon by the end user. The box features coiled tubing that will route water from the water utility's potable water distribution line to the meter assembly, through the HG-8's flushing components, and discharge through a discharge service routed to an acceptable point of discharge (i.e., a storm sewer, swale, storm pond, etc.). The meter and flushing assembly can be raised for maintenance and repair and then lowered back down into the box below the frost line. A medium density foam insulation pad, freeze protection system, and composite lid help protect the flushing and meter assembly from freezing in the winter.

⚠ **WARNING: Proper lifting, loading / unloading tools and techniques must be followed when handling this device. Damage to working components can occur if dropped.**

TYPICAL INSTALLATION

Ground
Grade
Cast Iron Vault Lid
8-Tablet Dechlorination
Double Check Valve
1" Mueller Systems Meter Sold Separately
Programmer
Supply (By Others)
1" Male Thread Ends
Discharge (By Others)

1. Remove the Hydro-Guard Unit from its packaging and inspect for possible damage during shipping.

2. Turn off the service line feed.

3. 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, place non-compacted clean bedding material within the bottom of the hole. Provide a bed of crushed gravel approximately 6 inches thick or place bricks or cement blocks below the pit to allow for drainage and provide support.

INSTALLATION - (CONTINUED)

4. Slowly lower the Hydro-Guard HG-8 Cold Climate Flushing System into place, pressing it firmly into the non-compacted bedding material within the bottom of the hole.

5. Bury the pit so the top edge is at ground level.

6. Install the top approximately 1-1/2" below existing grade and ensure the meter lid is level with existing grade.

7. Place the pit in the excavated area and connect the inlet piping. Hand-tighten the fitting to the pit, then turn two full turns with a wrench. This will result in a leak-tight connection, without placing undue stress on the pit piping.

8. We recommend installing approximately 10' of pipe to the outlet connection so the plumber that is completing the service installation does not have to disturb the connection to the pit and possibly overtightened the connection or otherwise affect the contractor's proper installation of the pit itself.

9. Backfill the hole around the flushing device with clean fill and/or #57 stone. Backfilling should be accomplished 12 inches at a time and hand-tamp each layer until the service grade is restored.

10. After installation is complete, sod the area around the Hydro-Guard Unit or take other steps in order to prevent erosion.

11. 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.

12. The Hydro-Guard Automatic Flushing Device may now be programmed.

13. Once programming has been set, slowly lower the flushing / meter assembly into the lower part of the protective, below-grade, meter box. Insert the foam pad insulator and install cast iron meter lid.

⚠️ **WARNING: We do not recommend the following:**

1) Dumping fill material on top of the pit; 2) Using machinery to compact backfill.

PROGRAMMING HYDRO-GUARD UNIT FOR OPERATION

HG-8 (REQUIRES CONTROLLER)
Bluetooth Programming 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.


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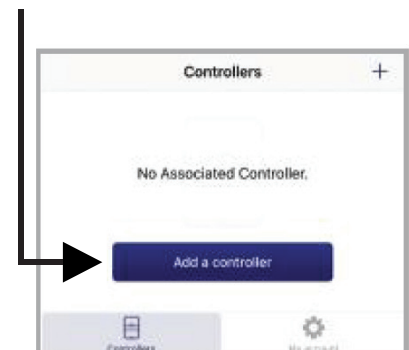
5. The app will now ask what type of Bluetooth device you would like to add:
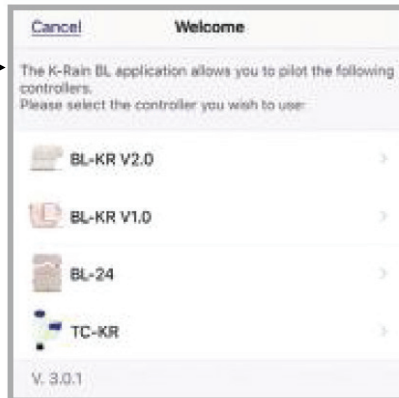
NOTE: The BL-KR V1.0 and BL-KR V2.0 have identical hardware and software configurations. The only distinction is the outside plastic housing.

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.
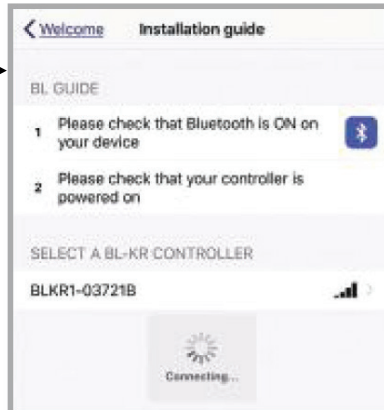
8. Once the device is connected, it will appear on the home screen when you launch the Application.

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-8 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, expected life is 1 year for a single battery and two years when using two.

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 isplay 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.

HG-8 COLD CLIMATE FLUSHING SYSTEM

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. 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 number (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.

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 though 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 irrigation on the current station and advance to the next station.

– Pressing the button when a station is running in manual watering will stop the irrigation 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.

HG-8 COLD CLIMATE FLUSHING SYSTEM

HG-8 DISASSEMBLY AND REASSEMBLY INSTRUCTIONS

TOOLS NEEDED: Philips screwdriver, flat-head screwdriver, HG-20087 T-handle wrench

Although the Hydro-Guard HG-8 Cold Climate Sub-Surface Unit was delivered completely assembled, it may be necessary and/or desirable to disassemble portions of the Unit, or the Unit in its entirety, in order to allow for required service and maintenance. If disassembly is necessary, please follow the directions below. Always close the curb stop before working on the unit.

Disassembly

1. Shut off water supply to the unit and remove the green housing cover.

2. Remove the composite or cast iron lid of HG-8 protective ground sleeve.

3. Remove foam insulation pad.

4. Using the lifting holes and/or lifting strap in the steel platform, raise the flushing system meter assembly to top of meter box and lock into place.

5. Modular design of valve and double check valve allow for service to be completed without removal of the devices' bodies from the piping assembly.

Electrical System Check

1. Pull internals of HG-8 to top of PVC in-ground protective housing and lock into place.

2. Unscrew solenoid from valve – be careful to not drop the solenoid plunger and spring into in-ground housing.

3. Using the TBOS-II handheld, connect the infrared connector of the handheld to the antenna on the controller interface mounted inside of the device. Using the programming keys of the handheld run a 2 minute manual flush sequence.

NOTE: Plunger inside solenoid should be down when running and up when off.

4. To prevent the loss of the solenoid plunger and spring, place an object or have a finger over the plunger of the solenoid. Allow the plunger enough space to kick out of the solenoid body into the object or finger hovering over it.

5. If test is successful, return the flush / meter assembly to its operating position below grade.

6. Return insulation pad and cast iron meter lid to their proper positions.

If everything checks out, the electrical system is in working order.

Valve Disassembly and Check

1. Remove six (6) bolts from top cover.

2. Slowly pull cover off the valve.

3. Remove rubber diaphragm and inspect for holes or worn areas.

4. Be certain to avoid contacting the EPDM rubber diaphragm with pipe putty. Pipe putty can cause the rubber to thin out and leak.

5. Remove the valve screen plug on the lower half of the valve body. Be careful not to exert too much force when pulling plug out.

6. Check for debris in the valve screen on the inlet side with the lower half of the valve body by removing the valve screen plug.

7. Return valve plug to its proper location when debris screen is cleared.

8. Replace the top cover back onto the diaphragm – make sure to line up the openings in both.

9. Match up the top cover of the valve with the bottom portion. The arrows have to align on both portions.

10. Replace the bolts and tighten down.

⚠ **WARNING: Avoid overuse of pipe sealant and never allow sealant to come into contact with EPDM rubber diaphram.**

Reassembly

1. If any disassembly has been conducted of the control valve and/or double check valve, verify that all bolts are properly tightened. Check assemblies for leakage prior to lowering flushing / metering assembly back into position below grade.

2. Using lifting holes and/or lifting strap on steel plate, lower flushing / metering assembly below grade by slowly lowering the steel mounting plate to the lower part of the in-ground protective housing (DO NOT apply excessive force to assembly).

3. Turn water supply to the unit on. Using the TBOS-II handheld controller, run a two minute manual flushing procedure to confirm all components are operational.

4. Return insulation pad and cast iron lid to their proper location.

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 interferring 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 FEATURES, UPGRADES AND SAMPLE COLLECTION

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

Integrated Sample Station

The HG-8 Cold Climate Sub-Surface Discharge Unit, features a Sample Port quick connect that allows the end user to collect a sample from the HG-8 installation site. To collect a sample from the sample quick connect the HG-S116 Portable Sample Valve will be required. (Recommendation: one HG-S116 per every five HG-8 units) 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 Hydro-Guard HG-8 is equipped with a dechlorination system. Dechlorination takes place as a portion of the discharged water passes through a housing containing either sodium sulfite or ascorbic acid tablets. This action creates a concentrated dechlorination solution that then mixes with the non-directly treated portion of the discharge to effectively dechlorinate the entire discharge volume.

BATTERY REPLACEMENT

1. Remove composite or cast iron lid and insulation pad.

2. Using the lifting holes and/or lifting strap in the steel mounting platform, raise the internals of the HG-8 to the surface.

HG-8 Built-In (NODE) Programming:

Unscrew cap from bottom of NODE programmer housing. Insert two 9-volt alkaline batteries. Tighten cap completely to ensure a water tight fit.
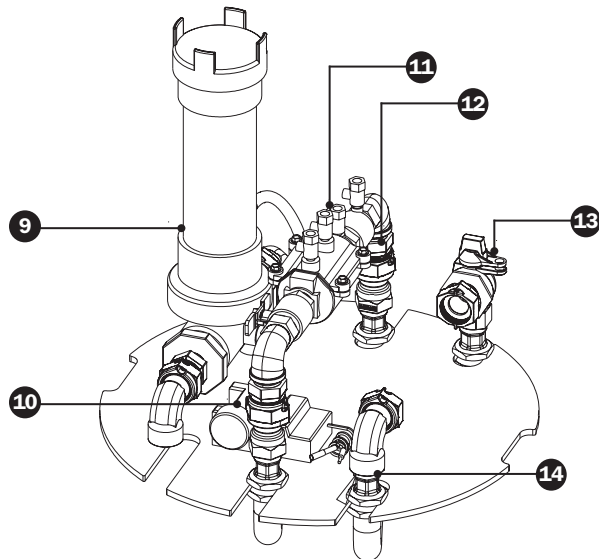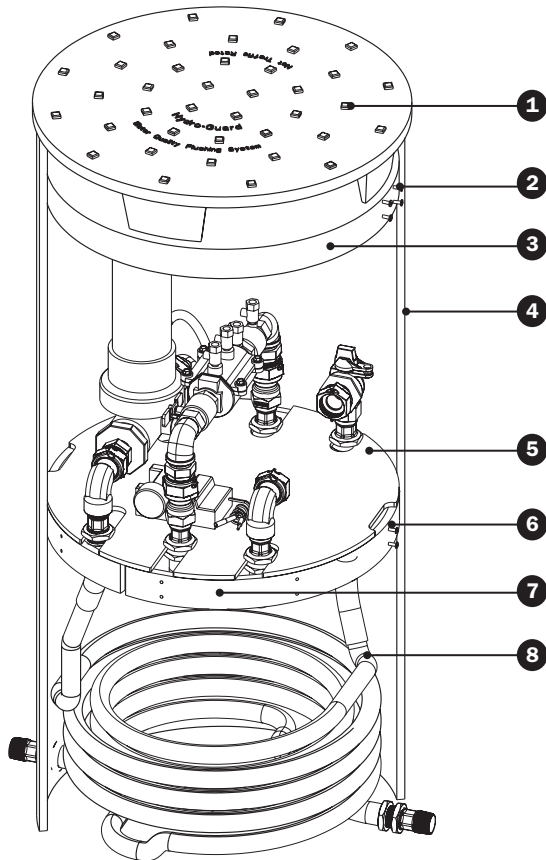
4. Place the battery back into the watertight integrated T-2 programming interface making certain to tighten the screw-on lid until snug.

5. Return the internals of the HG-8 to its proper location.

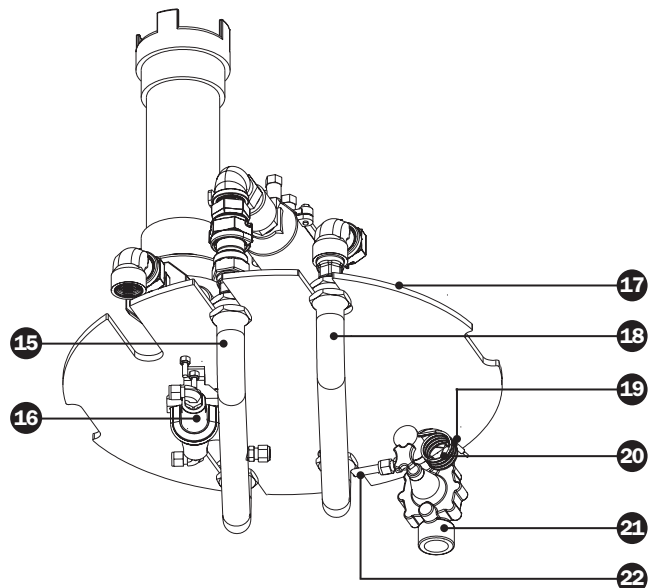6. Return the insulation pad and cast iron lid to their proper locations.

HG-8 COLD CLIMATE FLUSHING SYSTEM

Parts

REPLACEMENT PARTS

ID	PART #	DESCRIPTION
1	546787	Composite or Cast Iron Vault Lid
2	546799	HG-8 Plate Rest
3	546785	2" Foam Insulation Pad
4	790015	21" Ø Below-Grade Vault
5	HG-A102L	9-Volt Lithium Battery
6	546779	1" Valve & Meter Replacement Assembly
7	700014	Reinforcing Ring
8	546025	1" Coiled Tubing Assembly
9	HG-A119	320 Inline Dechlorination Assembly
10	HG-FP100	Thermal Control Valve
11	546138-100	1" Backflow Double Check Valve
12	014215 330N	1" Meter Coupling
13	024265 1 330N	1" Ball Angle Meter Valve
14	014210 1 330N	1" Meter Coupling
15	700507 Flow	U-Bar w/ Hole for FP
16	HG-FP100	Thermal Control Valve
17	5461219	Coated Steel Mounting Platform
18	700507	U-Bar
19	546596	Latching Solenoid
20	HG-FP108C	Molded Freeze Adapter / Gasket
21	HG-11010	1" Flow Control Valve
22	HG-V139	3/8" Poly Tubing

10