Automatic Flushing Devices

HG-3 LongNeck™
User Operation Manual

Congratulations on your purchase of the Hydro-Guard® HG-3 LongNeck™ Unit; the industry's only patented, programmable flushing apparatus 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. It will be helpful for future reference, training, troubleshooting, and maintenance.

Hydro-Guard LongNeck™ Unit
(HG-3)
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Hydro-Guard® 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. Warranty service is available by telephoning Mueller Co. at (877) 864-8500 during regular business hours, or through contacting the Hydro-Guard Web Site at www.Hydro-Guard.com.

Hydro-Guard® Safety Procedures and Cautionary Statement

CAUTION*: 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.*

- 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.
- 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).
- 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.
- Always use all necessary safety equipment and follow all recommended procedures when installing, operating and maintaining the Hydro-Guard® Automatic Flushing Device.
- Perform annual safety inspections and replace worn or defective parts.
- Operate the Hydro-Guard® Automatic Flushing Device only when fully installed and correctly assembled.

Installation Procedures & Site Evaluation

Hydro-Guard® Installation Procedures & 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® or to be absorbed by the surrounding soil. The Unit's ground-level weather seal is designed to prevent infiltration by rainwater and normal discharges when placed in areas with acceptable drainage. Some utilities have opted to increase the excavation-site size creating a small drain field, or to install their Units on concrete splash pads in order to direct runoff. In cold weather applications multiple nightly flushes are effective in managing discharge volumes and preventing the accumulation of ice.

Installation of the Hydro-Guard® HG-3 LongNeck™ Unit

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

Step 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. Turn off service line feed.

Step 3
Slowly lower the Hydro-Guard® Unit into place, pressing it firmly into the non-compacted bedding material until it is fully seated. 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).

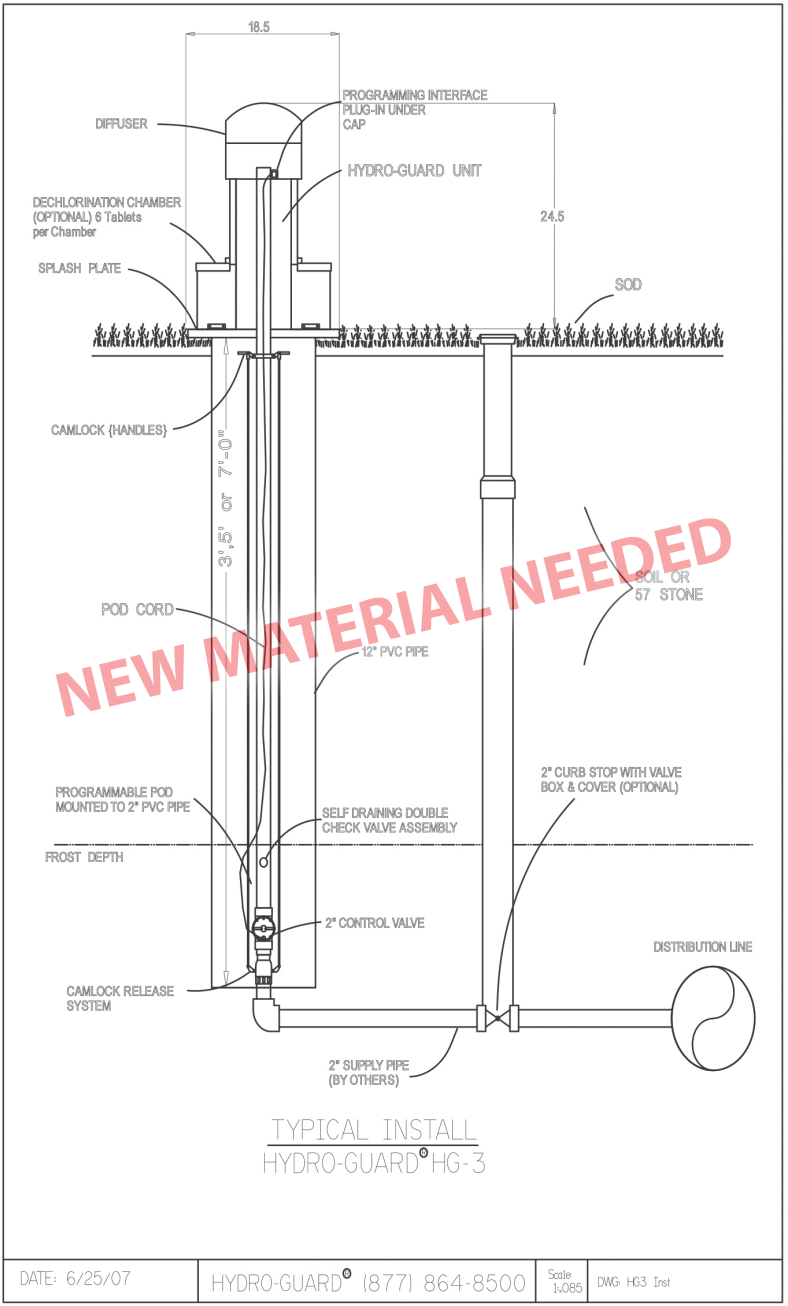
Step 4
Connect the utility's water system to the Hydro-Guard® Unit by means of the 2" threaded connection.

Step 5
Backfill the hole around the flushing device with clean fill and/or #57 stone. Backfilling should be accomplished in 6" compacted lifts. Check that the Unit is level.

Step 6
After installation is complete, sod the area around the Hydro-Guard® Unit or take other steps in order to prevent erosion. Inspect the area immediately around the Unit in order to ensure that the existing ground cover is not subject to severe erosion. You may opt to pour a concrete pad or create a custom installation to best suit your needs.

Step 7
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.

Step 8
The Hydro-Guard® Automatic Flushing Device may now be programmed and placed into service.


18.5
PROGRAMMING INTERFACE PLUG-IN UNDER CAP
DIFFUSER
HYDRO-GUARD UNIT
DECHLORINATION CHAMBER (OPTIONAL) 6 Tablets per Chamber
24.5
SPLASH PLATE
SOD
CAMLOCK (HANDLES)
3', 5' or 7'-0"
SOIL OR #57 STONE
POD CORD
12" PVC PIPE
NEW MATERIAL NEEDED
2" CURB STOP WITH VALVE BOX & COVER (OPTIONAL)
PROGRAMMABLE POD MOUNTED TO 2" PVC PIPE
SELF DRAINING DOUBLE CHECK VALVE ASSEMBLY
FROST DEPTH
2" CONTROL VALVE
DISTRIBUTION LINE
CAMLOCK RELEASE SYSTEM
2" SUPPLY PIPE (BY OTHERS)
TYPICAL INSTALL
HYDRO-GUARD® HG-3
DATE: 6/25/07
HYDRO-GUARD® (877) 864-8500
Scale 1:085
DWG: HG3 Inst

Programming Your Hydro-Guard® Unit for Operation

Features

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).

- 1 to 8 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 (9V lithium battery can be used in the built-in programming interface)

NOTE: In that the handheld was designed by its manufacturer to program irrigation systems, many displays use irrigation 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 curser 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.)

Note: Programming instructions for all available languages are available by contacting Mueller Co. at 800-423-1323.

Programming Flushing Schedule

NOTE: There are two ways to proceed– 1) select "**TBOS-II infra-red**" if IR cable is connected to a TBOS-II programming interface to access, change or load programs there, or 2) 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.

   a) Use **ON/OFF** keys to select program A, B and/or C (one or more can be assigned).
   b) 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 infra-red**" 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 Irrigation**" to cease the manual flush sequence.

The Problem: Failure to communicate.

The Likely Solutions:

1) The programming pod's battery is low or out of power or the Handheld Programmer is low or out of power; replace battery.
2) You may have an incorrect actuator and/or program code. Connect the handheld programmer via the cord, and set a new actuator code.
3) There might be a problem with a connection or solenoid. Perform an electrical system check.

Special Notes:

The Pod's internal memory lasts only 3 minutes. Any time the battery within the Programming Pod dies, it is necessary to plug the Handheld Programmer directly into the Pod and re-assign the Actuator ID and reprogram the Unit. While repeating the programming steps is only a minor inconvenience, a proactive approach to battery maintenance will serve to alleviate the frequency with which these steps must be completed.

For all other programming questions, please refer to the Hydro-Guard® Programming Guide. If the information you require is not available therein, please contact Hydro-Guard® Customer Service at (877) 864-8500.

Hydro-Guard® Options, Upgrades and Sample Collection

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

Integrated Sample Station

An optional feature on the HG-3 LongNeck™ Unit, Hydro-Guard's Sample Port upgrade allows the end user to collect the 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

All Hydro-Guard® Units are available with dechlorination upgrades. 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. This option is available to be retrofitted onto the HG-3 LongNeck™ Unit.

S.M.A.R.T. Upgrade

Call 877-864-8500 and ask about upgrading your unit to a Hydro-Guard® S.M.A.R.T. flushing system that

- 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®

Technical Section

Technical Section

Disassembly of the Hydro-Guard® HG-3 LongNeck™ Unit

Although the Hydro-Guard® Unit was delivered completely assembled, it may be necessary 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 making sure the supply line is shut off and secured.

HG-3 Machine Disassembly

Step 1
Shut off water supply. Remove two (2) security screws and then the top cover.

Step 2
Remove nuts and washers and then the diffuser.

Step 3
Remove two (2) 7/16" bolts and washers and then the yoke.

Step 4
Remove four (4) Security Bolts from the ground plate.

Step 5
Remove Riser and ground plate together by pulling straight up. Please Note: Secure O-Ring on top of riser. Set the assembly along side of unit.

Step 6
Push both handles down to release banjo coupling from bottom plate.

Step 7
Pull straight up and set internal assembly by ground plate.

Step 8
Remove 1/4" coil tube from relief valve at the bottom of the internal assembly.

Step 9
Remove phone line from program coupler. Pull Phone line from bottom of ground plate.

Disassembly complete.

Electrical System Check

Step 1
Disassemble unit.

Step 2
Unscrew Solenoid and be careful NOT TO LOSE THE O-RING.

Step 3
Attach phone line to program coupler (make sure battery box inside watertight housing is connected). Attach programmer cord to coupler.

Step 4
Run manual flush. Plunger inside solenoid should be down when running (up when off). If everything checks out, the electrical system works properly.

Step 5
Re-assemble unit.

Valve Disassembly and Check

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

Step 2
Slowly pull cover off the valve.

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

Step 4
Replace the top cover back onto the diaphragm– make sure to line up the openings in both.

Step 5
Match up the top cover of the valve with the bottom portion. The arrows have to align on both portions.

Step 6
Replace the bolts and tighten down.

Valve Disassembly and Check complete.

HG-3 Unit Assembly

After disassembly put riser and ground plate assembly next to the internal assembly

Step 1
Install phone line through bottom plate into coupler nipple and install coupler.

Step 2
Install1/4" coil tube into relief valve.

Step 3
Install internal assembly into body, handles facing down. Go straight down until unit is on male banjo coupling. Pull handles up to lock into place.

Step 4
Install riser and ground plate, lining up the 4 security bolts then tighten. Place O-Ring over pipe and push into groove. Install yoke and the 2 7/16" bolts.

Step 5
Install diffuser, nuts, and washer.

Step 6
Install cover with 2 security screws.

Step 7
Turn on water supply and run a manual flush to check that everything is O.K.

Assembly complete.

HG-3 Battery Replacement Instructions

Step 1
Loosen 4 security screws and remove ground plate and riser subassemblies.

Step 2
Use the handles to unclip the pipe subassembly and lift the internal components out of the ground pipe.

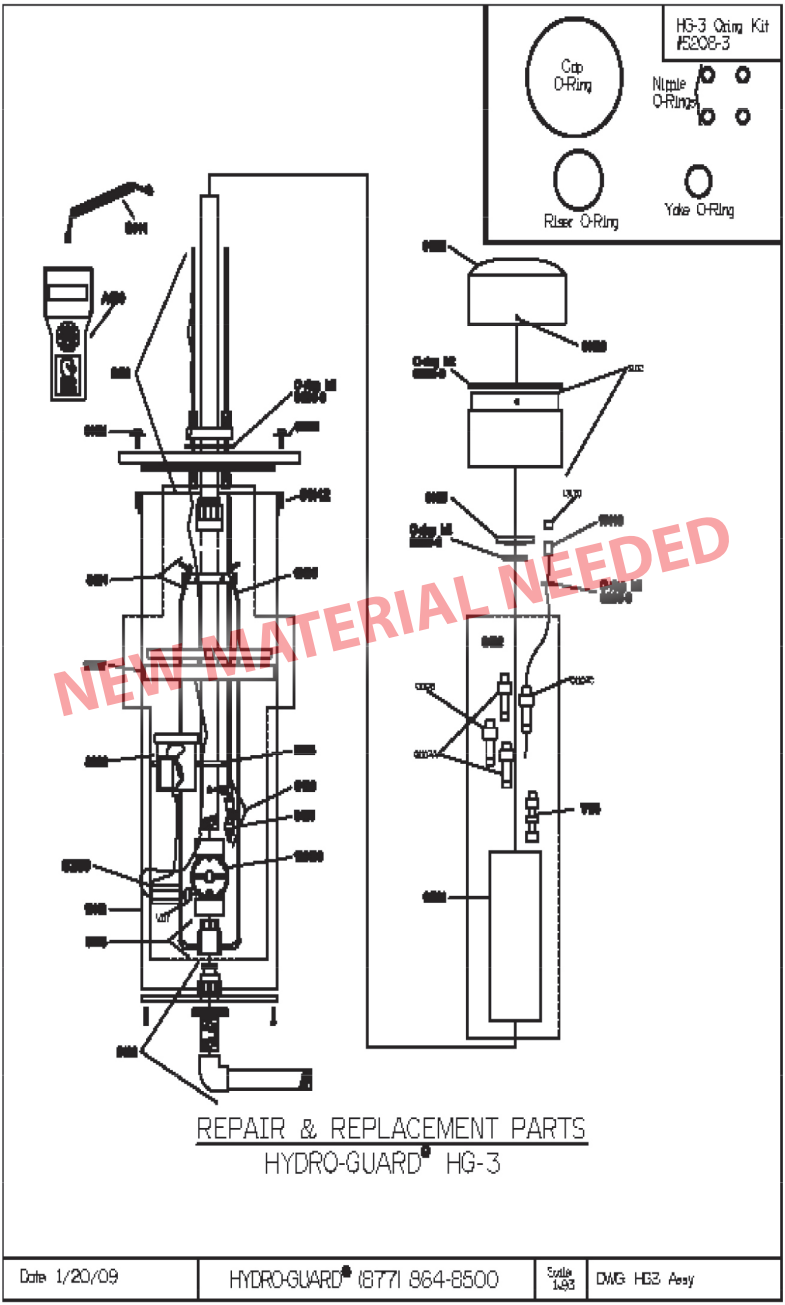
Step 3
Unscrew the grey cap off the watertight housing and pull the battery box out of the watertight housing. Replace 9-volt battery.

Step 4
Place the battery box back into the watertight pod housing and close the grey cap on the watertight pod housing.

Step 5
Re-install the internal components and latch handles to the locked position.

Step 6
Replace ground plate and riser subassemblies and replace 4 security screws.

HG-3 LongNeck™ Unit Parts Section


HG-3 Oring Kit
#5208-3
Cap
O-Ring
Nipple
O-Rings
Riser O-Ring
Yoke O-Ring
NEW MATERIAL NEEDED
REPAIR & REPLACEMENT PARTS
HYDRO-GUARD® HG-3
Date 1/20/09
HYDRO-GUARD® (877) 864-8500
Scale
1:83
DWG HG3 Assy

	Part Number	Part Description	Qty per Unit
1	01100	Cap	1
2	01113	Plastic Yoke	1
3	01121	3/8" x 1 1/2" SS Security Bolt	4
4	01122	3/8" x 1 1/4" SS Fender Washer	6
5	01126	1/4" x 3/4" SS Security Bolt	2
6	01142	SS Housing Bracket	4
7	123100	2" HIT Valve	1
8	13105	1/4" Latching Rod - 26"	2
9	13143	Program Coupler	1
10	13170	Protective Program Cap	1
11	S119	HG3 Ground Plate Sub Assy	1
12	S120	Low Pressure Relief Valve	1
13	S122	HG3 Riser Sub Assy	1
14	S123	HG3/4 Bottom Plate Sub Assy	1
15	S124	Latching Sub Assy	1
16	S125	Banjo Female Sub Assy	1
17	S133	Pod Clamp Sub Assy	1
18	S262	8030 Water Tight Housing - HG3/4	1
19	S141	HG Phone Cord	1
20	A100	Hand Held Programmer	1
21	S208-3	O-ring Kit	1
22	13127	11 3/4" x 1 1/2" Insulation Circle	1
23	S128	Relief Valve System Sub Assy	1
24	S260	8030 S. Controller Sub Assy	1
25	13112	12" PVC Housing Pipe - 5' Long	1
26	13162	Solenoid Adapter	1
27	S102	HG3 Diffuser Sub Assy	1
28	V116	1/4" Bulkhead Union Brass	1
29	01101	Riser	1
30	01103C	Coupler Nipple	1
31	01103A	Cut 5/8 Nipple	2
32	01103	Standard Nipple	1

PARTS LIST

HYDRO GUARD HG-3 3-5-7 ft bury depths

DATE: 3/27/09 HYDRO-GUARD (877) 864-8500 DWG: HG3/3,5,7 part list

Notes:

Notes:

All Hydro-Guard® products are manufactured by Mueller Co., based in Chattanooga, TN. Manufacturing facilities in Cleveland, TN. The Advance Maintenance Flushing concept using Automatic Flushing Units as presented is patented in the United States and Canada. Foreign patents pending. Hydro-Guard® is a registered trademark of Mueller Co.