

HydrX™ Fuel Conditioning System

Setup & Operation Manual - ATG Control

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1 - General Device Setups and Information	
Overview	1
Manual Notes	1
Related Manuals	1
GENERAL DEVICE SETUPS	
HydrX Mag Probe Setup	2
HydrX Pressure Sensor Setup	3
External Input Pump Control	4
Relay Setup for STP Control	5
HydrX Inlet Valve Relay Setup Screen	6
HydrX Outlet Valve Relay Setup Screen	7
Pumps and Lines Setup	8
Pumps Setup	8
Lines Setup	9
CYCLE DESCRIPTIONS	
HydrX Cycle/Function Descriptions	11
Auto Cycle Overview	11
Auto Cycle Notes	11
New Filter Cycle Overview	12
additional HydrX Cycles	12
Filter Alarm Setting	14
Overview	14
Filter Alarm Setting Notes	14
2 - HydrX Control	15
HYDRX SETUP	15
HYDRX OPERATION	
HydrX Overview Screen	19
HydrX Diagnostics Overview Screen	20
HydrX Reports	22
HydrX Cycles Report	22
HydrX Water Collection Report	26
HydrX Diagnostics Manual Control Screen	27
3 - Troubleshooting and System Specifications	
HydrX System Maintenance Alerts	28
Specifications	34
Recommended HydrX Fuel Conditioning Controller Settings	35

Figures

Figure 1.	Accessing Probe Setup	2
Figure 2.	Example Probe Setup Screen	2
Figure 3.	Example Pressure Sensor Setup Screen	3
Figure 4.	Example External Input Setup Screen	4
Figure 5.	Relay Setup Screen	5
Figure 6.	Relay Setup Screen	6
Figure 7.	Relay Setup Screen	7
Figure 8.	Accessing Pumps and Lines Setup Screens	8
Figure 9.	Example Pumps Setup Screen	8

Figure 10.	Line Setup Screen	9
Figure 11.	Line Setup Screen - Last Page	10
Figure 12.	Accessing HydrX Setup Screen	15
Figure 13.	Example HydrX Setup Screen - Page 1	15
Figure 14.	Example HydrX Setup Screen - Page 2	16
Figure 15.	Example HydrX Setup Screen - Page 3	17
Figure 16.	Example HydrX Setup Screen - Page 4	17
Figure 17.	HydrX Overview Screen	19
Figure 18.	Accessing HydrX Diagnostic Screens	20
Figure 19.	Example HydrX Diagnostics Overview Screen - Page 1	20
Figure 20.	Example HydrX Diagnostics Overview Screen - Page 2	21
Figure 21.	HydrX Diagnostics Overview Actions Menu	21
Figure 22.	Accessing HydrX Reports	22
Figure 23.	Example HydrX Cycle Report - Left Side of Page	23
Figure 24.	Example HydrX Cycle Report - Middle of Page	24
Figure 25.	Example HydrX Cycle Report - Right Side of Page	24
Figure 26.	Actions Buttons Menu - HydrX Cycles Report	25
Figure 27.	Show Selected Columns Menu - HydrX Cycles Report	25
Figure 28.	Filter Menu Selections - HydrX Cycles Report	25
Figure 29.	Example HydrX Water Collection screen	26
Figure 30.	Actions Buttons Menu - HydrX Water Collection Report	26
Figure 31.	Example HydrX Diagnostics Manual Control Screen	27

1 - General Device Setups and Information

Overview

The Veeder-Root HydrX™ system has been designed to help maintain diesel underground storage tanks (UST) and their fuel contents in optimal condition by continuously removing water as well as filtering fuel. As the HydrX system is removing water, it is preventing the establishment of an environment that supports the development of bacterial colonies that, left unchecked, will foul fueling system components, such as, check valves, shear valves, filters and nozzles causing equipment down time and loss of business. The bacteria that thrive in these very specific conditions, where they access nutrients from fuel at the fuel water interface, will also create acids in the UST that contribute to corrosion and possible long-term failure of fueling system components, including, submersible turbine pump (STP) columns, shear valves or other ferrous components within the fueling system.

Along with direct water removal, the HydrX system provides a multi-stage filtration system and provides a means for continuous “polishing” of the UST fuel contents. The multi-stage filters provide a combined 25-micron (um) particle filter with a coalescing element that separates any entrained water from the fuel. In addition, a second element provides a fine water separation as well as another 25-micron (um) filtration barrier. This second stage prevents any possibility of returning emulsified fuel and water back to the UST. A novel water intake device (WID) provides direct access to water at the tank bottom at it's farthest reaches. As water is removed from the tank bottom, only clean fuel is returned through the multi-stage filtering. The unique configuration of the WID and filtering provides long life for the filter element as well as providing the cleanest, “driest” fuel that protects the critical flash point and cetane rating of the fuel product necessary for today's high performance diesel engines.

The HydrX system is comprised of several components that operate together to provide optimal water removal and intelligent cycle control while minimizing impact to site operations. Intelligent cycle control continuously monitors the HydrX system and determines the best strategy for water removal while managing the STP to minimize run time while providing the required time to remove water and clean fuel in the UST. In addition, the intelligent cycle control prioritizes line and tank testing to maintain site compliance. If water is not collected over the course of a daily Auto Cycle, the HydrX system will halt processing until a new delivery into the tank occurs. HydrX components include:

- TLS-4xx (TLS-450PLUS or TLS4 with TLS-XB)
- HydrX Fuel Conditioner (FC)
- Water Intake Device (WID)
- Guide Tube and Guide Tube Riser
- Input/Output Module With 3 unused relays and 1 high voltage input.
- Universal sensor module with 2 open inputs
- Software version 10F or higher
- HydrX software feature (P/N 332972-032)

Manual Notes

This manual is divided into three sections:

1-General Device Setup And Information

2- HydrX Control

3-Troubleshooting and System Specifications

Related Manuals

577014-490 HydrX™ Fuel Conditioning System - FCC to ATG Conversion Guide

577014-446 HydrX™ Fuel Conditioning System Installation Manual

GENERAL DEVICE SETUPS

The ATG must have Version 10F or later system software and have the HydrX System 'In-Sump Fuel Conditioner' software feature (P/N 332972-032) installed. If necessary, install the In-Sump Fuel Conditioner software feature as follows:

- For TLS-450PLUS Consoles, follow Feature Upgrade instructions in the TLS-450PLUS Board And Software Replacement/Upgrade manual (P/N 577014-076), or similar instructions in the TLS-450PLUS Online Help.
- For TLS4 with TLS-XB Consoles, follow Feature Upgrade instructions in the TLS4 Series Software and Hardware Upgrade and Replacement manual (P/N577014-043), or similar instructions in the TLS4 Online Help.

HydrX Mag Probe Setup

1. Touch **Menu>Setup>Devices** (see Figure 1) and touch the Probe button (item 1) to open the Probe setup screen, in this example it is Probe 2 (see Figure 2).



Figure 1. Accessing Probe Setup



Figure 2. Example Probe Setup Screen

2. Touch the **Enabled** radio button to configure this probe.
3. Touch the **Address** field and select the address of the probe connected to the HydrX, e.g., B1:S1:1.
4. Touch **Label** field and enter a description of this mag probe (up to 20 alphanumeric characters) that will appear on the console screens and in reports, e.g., HydrX.
5. **Serial Number** - is a read only value.
6. **Type** - is a read only value.
7. **Float Type** - is a read only value.
8. Touch the check button to save your choice.

HydrX Pressure Sensor Setup

1. Touch **Menu>Setup>Devices** and touch the Line Pressure Sensor button (see Item 2, Figure 1) to open the Pressure Sensor setup screen (see Figure 3).

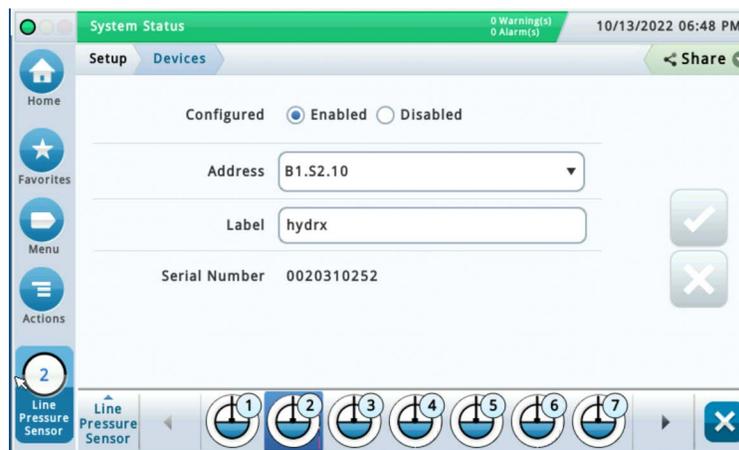


Figure 3. Example Pressure Sensor Setup Screen

2. Touch the **Enabled** radio button to configure this pressure sensor.
3. Touch the **Address** field and select the address of the pressure sensor connected to the HydrX, e.g., B1:S2:10.
4. Touch **Label** field and enter a description of this sensor (up to 20 alphanumeric characters) that will appear on the console screens and in reports, e.g., HydrX.
5. **Serial Number** is a read only value.
6. Touch the check button to save your choice.

External Input Pump Control

NOTICE This step can be skipped if the diesel product line is already setup for control by the ATG. HydrX will be assigned to the existing diesel line on which it is installed.

1. Touch **Menu>Setup>Devices** and touch the External Input button (see Item 3, Figure 1) to open the Pump Sense External Input setup screen (see Figure 4).

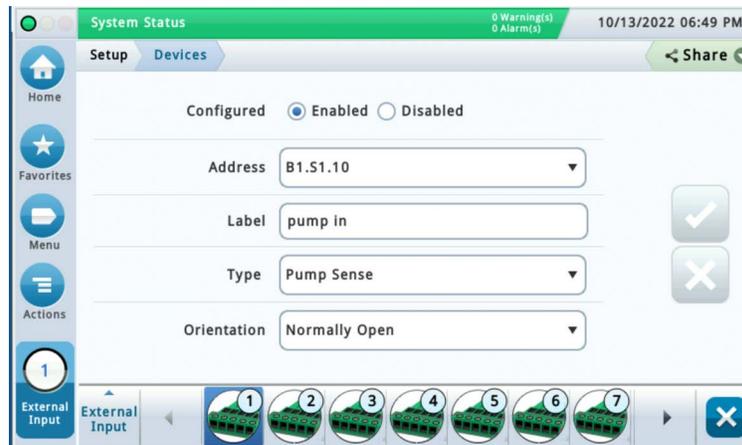


Figure 4. Example External Input Setup Screen

2. Select the External Input you want to configure for the HydrX switch contact.
3. Touch the **Enabled** radio button to configure this External Input.
4. Touch the **Address** field and select the address of the input, e.g., B1.S1.10.

NOTICE External Inputs connected to the IOM Module will display the following possible address codes in the Address Field: B1:Sx:X, where Sx is the slot in which the IOM Module is installed (from 1 to 4) and X is the connector Input which is wired to the Diesel Input (from 10 to 14). Reference HydrX Installation manual, P/N 577014-446.

5. Touch **Label** field and enter a description of this relay (up to 20 alphanumeric characters) that will appear on the console screens and in reports, e.g., 'pump in'.
6. Touch the **Type** field and select 'Pump Sense'.
7. Touch the **Orientation** field and select 'Normally Open'.
8. Touch the check key to accept the selections.

Relay Setup for STP Control

NOTICE This step can be skipped if the diesel product line is already setup for control by the ATG. HydrX will be assigned to the existing diesel line on which it is installed.

1. Touch **Menu>Setup>Devices** and touch the Relay button (see Item 4, Figure 1) to open the Pump Control Relay Setup screen (see Figure 5).

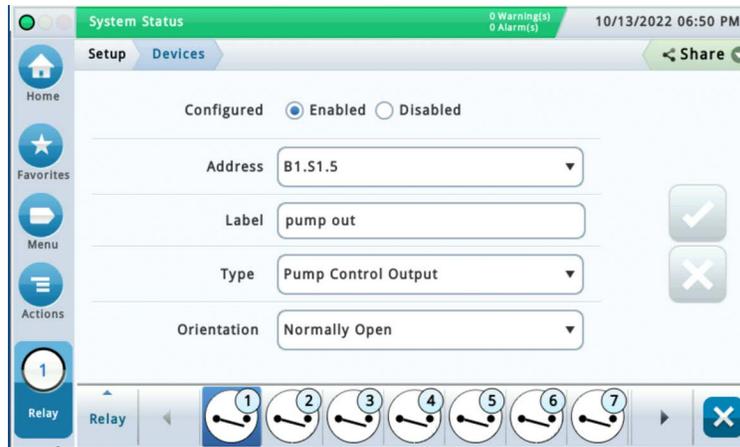


Figure 5. Relay Setup Screen

2. Select the Relay you want to configure on the lower horizontal section of the screen
3. Touch the **Enabled** radio button to enable the Relay you want to configure.
4. Next, select the **Address** for the High Voltage Relay Output that is wired to the Diesel Relay or pump controller that will engage or turn on the Diesel STP (labeled LINE/PUMP OUTPUT in wiring diagrams).

NOTICE Relay outputs connected to the IOM will display the following possible address codes in the Address Field: B1:Sx:X, where Sx is the slot in which the IOM is installed (from 1-4) and X is the connector output (from 5-9) which is wired to the diesel contractor that turns on the submersible. Reference HydrX Installation Manual, P/N 577014-446.

5. Touch the **Label** field and enter a description of the relay that will appear on the console screens and in reports, e.g., pump out
6. Touch the **Type** field and select '**Pump Control Output**'.
7. Touch the **Orientation** field and select '**Normally Open**'.
8. Accept the rest of the screen defaults and touch the check key to accept the selections.

HydrX Inlet Valve Relay Setup Screen

1. Touch **Menu>Setup>Devices** and touch the Relay button (see Item 4, Figure 1) to open the Relay Setup screen. Select the Relay connected to the HydrX Inlet Valve, e.g., Relay 3 in Figure 6

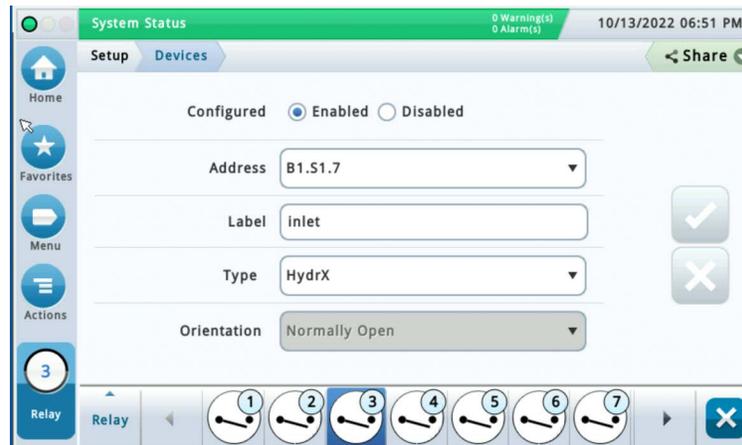


Figure 6. Relay Setup Screen

2. Select the Relay you want to configure on the lower horizontal section of the screen
3. Touch the **Enabled** radio button to enable the Relay you want to configure.
4. Touch the **Address** field and select the address of the relay for the HydrX inlet valve, e.g., B1.S1.7.
5. Touch the **Label** field and enter a description of the relay that will appear on the console screens and in reports, e.g., inlet.
6. Touch the **Type** field and select '**HydrX**'.
7. Accept the rest of the screen defaults and touch the check key to accept the selections.

HydrX Outlet Valve Relay Setup Screen

1. Touch **Menu>Setup>Devices** and touch the Relay button (see Item 4, Figure 1) to open the Relay Setup screen. Select the Relay connected to the HydrX Outlet Valve, e.g., Relay 2 in Figure 7.

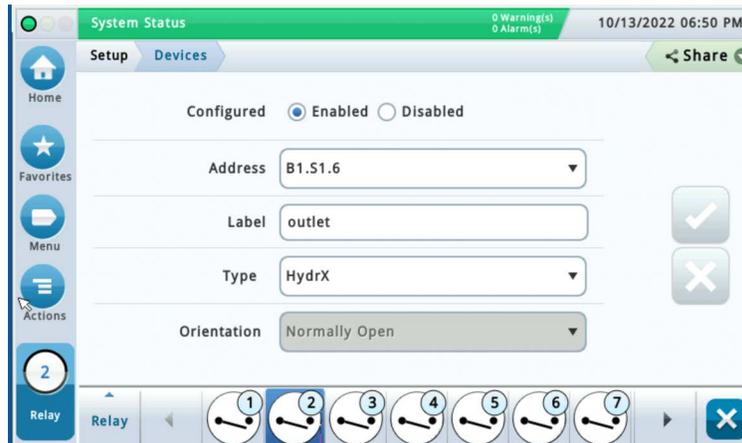


Figure 7. Relay Setup Screen

2. Select the Relay you want to configure on the lower horizontal section of the screen
3. Touch the **Enabled** radio button to enable the Relay you want to configure.
4. Touch the **Address** field and select the address of the relay for the HydrX inlet valve, e.g.,B1.S1.6.
5. Touch the **Label** field and enter a description of the relay that will appear on the console screens and in reports, e.g., outlet.
6. Touch the **Type** field and select '**HydrX**'.
7. Accept the rest of the screen defaults and touch the check key to accept the selections.

Pumps and Lines Setup

NOTICE These steps can be skipped if the diesel pump on which the HydrX is installed is set up for control by the ATG.

PUMPS SETUP

1. Go to **Menu>Setup>Pump and Lines** and touch the **Pumps** selection (Item 1, Figure 8) to open the Pumps setup screen (see Figure 9).

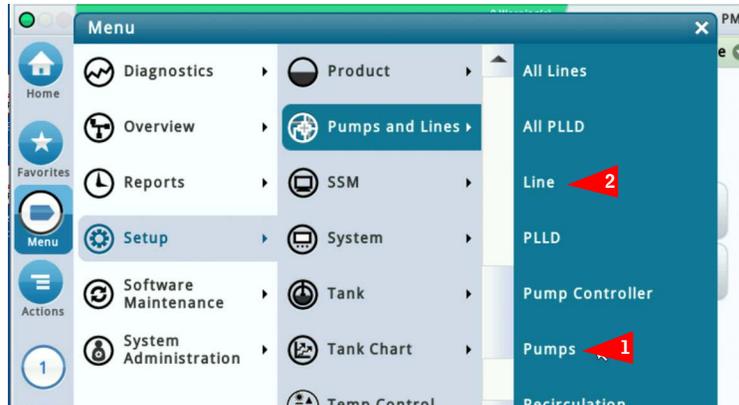


Figure 8. Accessing Pumps and Lines Setup Screens



Figure 9. Example Pumps Setup Screen

2. Touch the lower left hand corner where it shows **Pump 1** and select the Pump along the bottom horizontal section of the screen for the Pump you want to configure.
3. Touch the **Enabled** radio button to configure this pump control setup.
4. Touch the **Label** field to identify the pump, e.g. Diesel Pump.
5. Touch the **Mode** field and select 'TLS Pump Control'.
6. Touch the **Tank** field and select the tank with the pump to be controlled, e.g., Tank 1: Diesel.

NOTICE The thermal coefficient must be 0.000450 in for the tank selected in step 6 (accessed through **Menu>Setup>Tank>General**).

7. Touch the **Pump Control** field and select the Relay that was previously configured in **Devices>Relay** for diesel pump control, e.g., R1: pump out (ref. Figure 5).
8. Touch the **Pump Sense** field and select the External Input that was previously configured in **Devices>External Input** for the diesel pump, e.g., External Input 1: pump in (ref. Figure 4).
9. Accept the rest of the screen defaults and touch the check key to accept the selections.

LINES SETUP

NOTICE These steps can be skipped if the diesel pump on which the HydrX is installed is set up for control by the ATG.

NOTICE The Lines setup may differ depending if the site is running DPLLD or not. Both sets of instructions will be shown below:

1. Go to **Menu>Setup>Pump and Lines**, open Pumps and Lines and touch the **Lines** selection (Item 2, Figure 8) to open the Pumps setup screen (see Figure 10).



Figure 10. Line Setup Screen

2. Select the Line along the bottom horizontal section of the screen for the Line you want to configure, e.g., Line 1.
3. Touch the **Enabled** radio button for the Line to configure the setup selections.
4. Touch the **Line Label** field to identify the Line you are going to configure e.g. Diesel Line 1.
5. Touch the **Leak Monitoring** field and select (Monitoring PLLD) if the site is using DPLLD, or, select (Monitoring None) if the site has No DPLLD
6. Touch the **Pressure Sensor** field and select the (LPR Sensor) if the site is using DPLLD, or, select (Not Assigned) if the site has No DPLLD.
7. Leave the Recirculation field at none. This option is only used on DEF Tanks and Line.
8. The **Line Active Relay**, **Manifolded**, **Dispense Mode**, **Active Switchover**, **Switchover Volume Threshold** and **Switchover Height Threshold** fields can be programmed for a site with DPLLD depending on the DPLLD application at the site. If no DPPLD, these screens can be left at their default values.
9. In this page of Line setup screens (see Figure 11), all configured Pumps will display in the left hand column for all pumps that were configured for each product. Identify the Pump that was configured in the previous Pumps

menu for the Diesel Product and touch the Right Hand arrow next to the Diesel Pump to move the Diesel Pump to the right hand Selected Pumps column.



Figure 11. Line Setup Screen - Last Page

10. Touch the check key to accept the selections.

CYCLE DESCRIPTIONS

HydrX Cycle/Function Descriptions

AUTO CYCLE OVERVIEW

Auto Cycle time is a user adjustable setting that controls the STP run time and is typically programmed for quiet hours or overnight shutdowns when sales are slow, or when a site is closed for business.

NOTICE The system only runs for the duration of the programmed start and end hours if water is being removed, or on new system startup, or if a delivery occurs in the tank in which HydrX is installed.

If water extraction and any required fuel circulation ends before the programmed Auto Run end time, the HydrX goes into an idle state.

NOTICE If CSLD or SLD is running on the tank HydrX is installed in, Auto Cycle Start and Stop time must be adjusted as not to interfere with tank testing time window.

AUTO CYCLE NOTES

1. Except for new system startup, an Auto Cycle is run when the following conditions are met:
 - a. Water has been collected in the previous day. And,
 - b. HydrX is within the auto start and auto end times. Or,
 - c. A delivery has occurred. And,
 - d. HydrX is within the auto start and auto end times. Or,
 - e. An Auto Cycle is manually started.
2. An Auto Cycle always runs after initial system startup without regard to any prior water removal.
3. Any Auto Cycle interval is held pending due to any of the following conditions:
 - a. A line test is in progress
 - b. A tank leak test is in progress
 - c. A delivery is in progress and the HydrX is running a delivery polish cycle
4. An Auto Cycle will not run due to any of the following conditions:
 - a. HydrX requires a water drain service
 - b. HydrX requires a filter service
 - c. A line test shutdown on the line assigned to the HydrX
 - d. A tank test shutdown on the tank assigned to the HydrX
 - e. A line LPR fault on the line assigned to the HydrX
 - f. A tank probe fault, or any In Tank Alarm on the tank in which HydrX is installed.
 - g. Failure of any HydrX sensor (either probe or pressure sensor)
5. An Auto Cycle always starts with vacuum cycles, followed by sweep cycles, followed by polish cycles. The rules for vacuum and sweep cycles are defined in notes 6 - 8 below.
6. The Low Water Cycles setting is the number of consecutive vacuum cycles without water removal when the Fuel Conditioner float is on the bottom of the HydrX tank.

7. The Water Cycles setting is the number of consecutive vacuum cycles without water removal when the Fuel Conditioner float is not on the bottom of the HydrX tank.
8. The Sweep Cycles setting is the number of consecutive combined sweep and vacuum cycles without water removal after the HydrX has completed vacuum only cycles.

NEW FILTER CYCLE OVERVIEW

When a HydrX System is first started, after installation and connection to the STP, or after the filters are replaced, this feature fills the HydrX tank with fuel. A New Filter Cycle includes the time programmed as Fill Time followed by a vacuum interval, determined by the programmed Fill Time, to completely fill and de-aerate the tank. During the New Filter Cycle, the inlet and outlet filter initial pressures are independently measured and stored as reference values that are used to calculate filter life. Inlet filter initial pressure is measured during the pressurized interval. Outlet filter initial pressure is measured during the vacuum interval. As the filters accumulate debris and clog, the difference between initial pressure and current pressure are used to determine remaining filter life.

New Filter Cycle Notes:

1. A complete New Filter Cycle consists of a pressurized fill interval, determined by programmed fill time, plus a vacuum interval, determined by programmed fill time. Assuming a typical 15 minute fill time, the New Filter Cycle interval is 30 minutes.
2. **Only** run a New Filter Cycle during initial system startup or after filter replacement. Running a New Filter Cycle on used filters may not provide Accurate Filter Life Calculation.

ADDITIONAL HYDRX CYCLES

Fill

This function refills the HydrX with liquid following any service that requires the unit to be opened without replacing the filters.

Sweep

This function reverses flow through the WID by using pressure from the STP to push fuel to the bottom of the tank. The Sweep Cycle forces any standing water towards the lowest point in the tank for more efficient pick up as well as clearing any potential clogs that may have built up from vacuuming the tank bottom.

Vacuum

This function is used to vacuum from the bottom of the UST. This is the primary means for extracting water from the tank. While customers are dispensing fuel, the system will also enter vacuum mode for the duration of the dispense.

Polish

This function circulates fuel through the HydrX filters. Polishing simply recycles fuel from the UST at a rate of approximately 6 gallons per minute (gpm) or 360 gallons per hour (gph). Any entrained water and fine water droplets are continuously separated from the fuel in this process as well as any particulate or contamination down to 25 micron (um) in size.

Drain

This function automatically operates the STP to eject water from the HydrX via a Veeder-Root 330020-880 Water Drain Kit, or similar. After coupling the kit to the HydrX, the Auto Drain cycle initiates the HydrX drain sequence. The P/N 330020-880 kit includes a nozzle to control the flow out of the HydrX. The Auto Drain feature continuously monitors the water level in the HydrX and, once the water float reaches the HydrX tank bottom, or the programmed Drain Time has expired, automatically shuts down the STP.

Extended Drain

Extended Drain is a fine adjustment that lets the drain extend briefly to allow water to clear below the HydrX probe's lower detection limit of 0.75". Default is 0 seconds.

Water Cycles

Water Cycles limit the number of vacuum cycles used to determine that water is not being extracted when the HydrX probe float is above its 0.75" minimum detection limit and the float is off the HydrX tank bottom. This is typically set to 2 cycles.

Low Water Cycles

Low Water Cycles limit the number of vacuum cycles used to determine that water is not being extracted when the HydrX probe float is below its 0.75" minimum detection limit and the float is resting on the HydrX tank bottom. This is typically set to 4 cycles and typically higher than Water Cycles limit used when the float is off the HydrX tank bottom.

Sweep Cycles

Sweep Cycles limit the number cycles intended to move any standing water along the tank bottom to the lowest point. Sweeping improves the overall water collection efficiency of the HydrX by encouraging water to move to the end vacuum point that is optimized for water extraction as well as keeping the lines clear from debris buildup in the WID. This is typically set to 2 cycles. A Sweep cycle combines a sweep period, as programmed by the sweep time parameter, with a vacuum period, as programmed by the vacuum time parameter. The combined sweep and vacuum intervals count as a single sweep cycle.

Water Limit

Water Limit is the maximum volume of water that the HydrX tank can hold before indicating that a drain out is required. Typically set to System capacity (5 gallons (Model 500D) or 2.5 gallons (Model 250D)).

Min Water Change

Min Water Change sets a minimum height change of the HydrX probe's water float. If movement of the water float does not exceed this amount, the system will determine that water is not being extracted and will move on to the next cycle or mode. This is typically set to 0.05".

Inlet Filter Alarm

Inlet Filter Alarm - This is the percentage value of remaining filter life that the HydrX will signal the user that the inlet filter must be replaced. This is typically set to 5% to prevent any possibility of contamination or system degradation caused by completely clogged filter elements.

Inlet Filter Warning

Inlet Filter Warning - This is the percentage value of remaining filter life that the HydrX will signal the user that the inlet filter must be replaced. This is typically set to 10% to prevent any possibility of contamination or system degradation caused by completely clogged filter elements. The HydrX System will continue to operate while filter warnings are active.

Outlet Filter Alarm

Outlet Filter Alarm - This is the percentage value of remaining filter life that the HydrX will signal the user that the outlet filter must be replaced. This is typically set to 5% to prevent any possibility of contamination or system degradation caused by completely clogged filter elements.

Outlet Filter Warning

Outlet Filter Warning - This is the percentage value of remaining filter life that the HydrX will signal the user that the outlet filter must be replaced. This is typically set to 10% to prevent any possibility of contamination or system degradation caused by completely clogged filter elements.

Filter Alarm Setting

Overview

The Filter Alarm setting tells the HydrX the maximum pressure drop (loss) across each filter element as well as when to signal the user that a filter change is required based on percent life remaining. An increasing pressure drop indicates loss of flow through the filter due to element clogging. HydrX filters have high surface area, long life elements. Due to cost and disruption caused by element servicing, filter replacement kits include both inlet and outlet filters which should be replaced at the same time.

Filter Alarm Setting Notes

1. Filters should always be replaced in pairs followed by a New Filter Cycle to maximize performance and minimize risk of reduced water removal protection.
2. To avoid reduced or lost performance caused by loss of flow into the HydrX Fuel Conditioner, the Inlet Filter Alarm recommended setting is 5%. Technically, this can be set to 0%, however, the amount of time between a remaining life of 5% and 0% is not material with respect to the cost of the filter replacement or potential loss of protection.
3. To avoid reduced or lost performance caused by loss of vacuum in the HydrX Fuel Conditioner, the Outlet Filter Alarm recommended setting is 5%. Technically, this can be set to 0%, however, the amount of time between a remaining life of 5% and 0% is not material with respect to the cost of the filter replacement or potential loss of protection.

2 - HydrX Control

HYDRX SETUP

1. Touch **Menu>Setup>HydrX** and touch **HydrX** (Item 1, Figure 12) to open the HydrX setup screen (Figure 13).

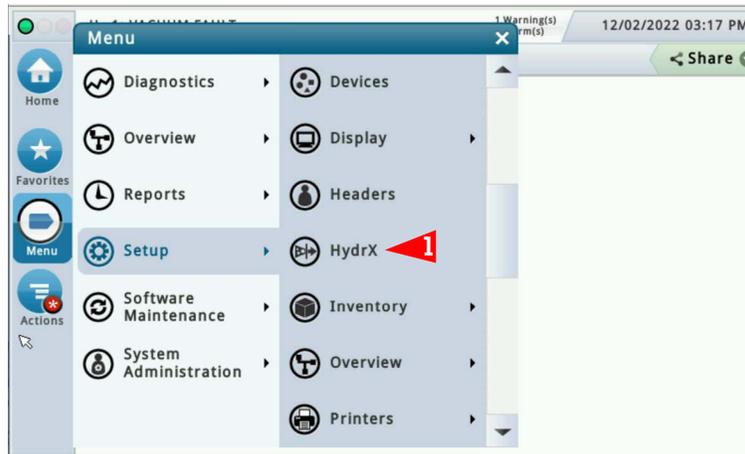


Figure 12. Accessing HydrX Setup Screen



Figure 13. Example HydrX Setup Screen - Page 1

2. Touch the **Enabled** radio button to configure HydrX setup.
3. Touch the **Label** field to enter the line on which HydrX is installed, e.g. diesel 1.
4. Touch the **Probe** field and select the probe in the HydrX system, e.g., Pb 2: HydrX.
5. Touch the **Pressure Sensor** field and select the pressure sensor in the HydrX system, e.g., PI 2: hydrx.
6. Touch the **Pump** field and select the STP controlled by the HydrX system, e.g., diesel 1.
7. Touch the **Controller** radio button for ATG control of the HydrX system.

8. Scroll down to the page 2 of the HydrX setup (see Figure 14).



Figure 14. Example HydrX Setup Screen - Page 2

9. Touch the **Inlet Valve** field (ref. Figure 14) and select the inlet valve relay previously set up on Page 6 of this manual.
10. Touch the **Outlet Valve** field (ref. Figure 14) and select the outlet valve relay previously set up on Page 7 of this manual.
11. In the **Model** field the model will automatically select based on the probe installed in the HydrX tank, 250 or 500D.

NOTICE The following fields (Steps 13 - 29) are automatically populated as default values that can be adjusted based on site operation. Default values provide optimum performance for average through-put sites.

NOTICE While in the HydrX setup screen, Pressing Actions>Restore Defaults will set HydrX cycles to default settings listed on Page 35 of this manual. When prompted with the Confirmation Message, select the check mark to proceed and select the X mark to cancel.

12. The HydrX **Auto Cycle Start/Stop Time** is typically programmed for quiet hours or overnight shutdowns when sales are slow, or when a site is closed for business. The STP is only run for the duration of the programmed start and end hours if water is being removed at new system startup or if a delivery occurs in the tank in which HydrX is installed. If CSLD or SLD is running on the tank in which HydrX is installed, Auto Cycle Start and Stop time must be adjusted as not to interfere with tank testing time window. The default Auto Cycle Start Time is 12 a.m. and the default Auto Cycle End Time is 8 a.m.
13. Touch the **Fill Duration** field and enter the desired Fill Duration time (default is 15 minutes).
14. Touch the **Sweep Duration** field and enter the desired Sweep Duration time (default is 2 minutes).
15. Scroll down to the next HydrX set up page (see Figure 15).
16. Touch the **Vacuum Duration** field and enter the desired Vacuum Duration time (default is 15 minutes).
17. Touch the **Polish Duration** field and enter the desired Polish Duration time (default is 240 minutes).

NOTICE At high through-put sites receiving 1 or more deliveries per day, it is recommend that polish time be set to 1 hour.

18. Touch the **Drain Duration** field and enter the desired Drain Duration time (default is 10 minutes).

19. Touch the **Extended Drain Duration** field to select an extra amount of time in seconds to continue the draining process. Default is 0 seconds.
20. Touch the **Water Cycles** field and enter a limit to the number of vacuum cycles used to determine that water is not being extracted when the HydrX probe float is above its 0.75" minimum detection limit and the float is off the HydrX tank bottom. Default is 2 cycles.

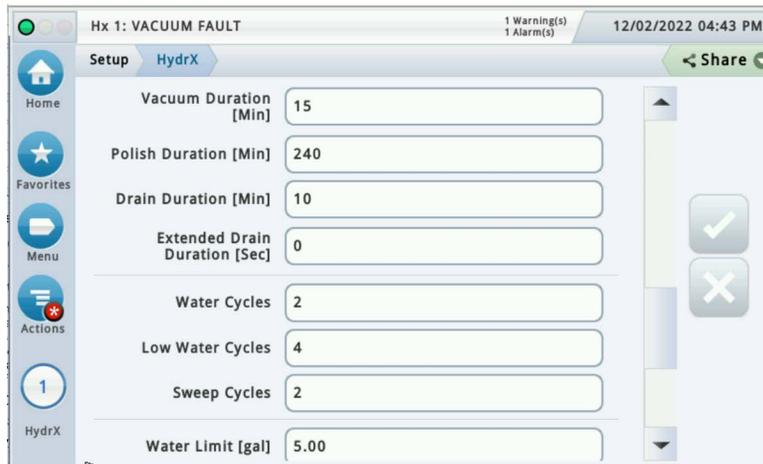


Figure 15. Example HydrX Setup Screen - Page 3

21. Touch the **Low Water Cycles** field and enter a limit to the number of vacuum cycles used to determine that water is not being extracted when the HydrX probe float is below its 0.75" minimum detection limit and the float is resting on the HydrX tank bottom. This is typically set to 4 cycles and typically higher than Water Cycles limit used when the float is off the HydrX tank bottom.
22. Touch the **Sweep Cycles** field and enter a limit to the number of cycles intended to move any standing water along the tank bottom to the lowest point. This is typically set to 2 cycles.
23. Touch the **Water Limit** field and enter the maximum volume of water that the installed HydrX tank can hold before indicating that a drain out is required.
24. Scroll down to the remaining HydrX setup fields (see Figure 16).



Figure 16. Example HydrX Setup Screen - Page 4

25. Touch the **Minimum Water Changes** field to enter a minimum height change of the HydrX probe water float. If the water float moves less than this amount, the system assumes that water is not being extracted and skips to the next cycle or mode. This is typically set to 0.05 inch.
26. Touch the **Inlet Filter Warning** field and enter a HydrX Inlet Filter remaining life percentage, which when reached, causes the ATG to post an Inlet Filter Warning. This is typically set to 10%. The system will continue operation until the filter alarm threshold is reached.
27. Touch the **Outlet Filter Warning** field and enter a HydrX Outlet Filter remaining life percentage, which when reached, causes the ATG to post an Outlet Filter Warning. This is typically set to 10%. The system will continue operation until the filter alarm threshold is reached.
28. Touch the **Inlet Filter Alarm** field and enter a HydrX Inlet Filter remaining life percentage, which when reached, causes the ATG to post an Inlet Filter Alarm. This is typically set to 5%. The system will shut down until filters are serviced.
29. Touch the **Outlet Filter Alarm** field and enter a HydrX Outlet Filter remaining life percentage, which when reached, causes the ATG to post an Outlet Filter Alarm. This is typically set to 5%. The system will shut down until filters are serviced.
30. Touch the check key to accept the selections.

HYDRX OPERATION

HydrX Overview Screen

1. Touch **Menu>Overview>HydrX** to open the HydrX Overview Screen (Figure 17).

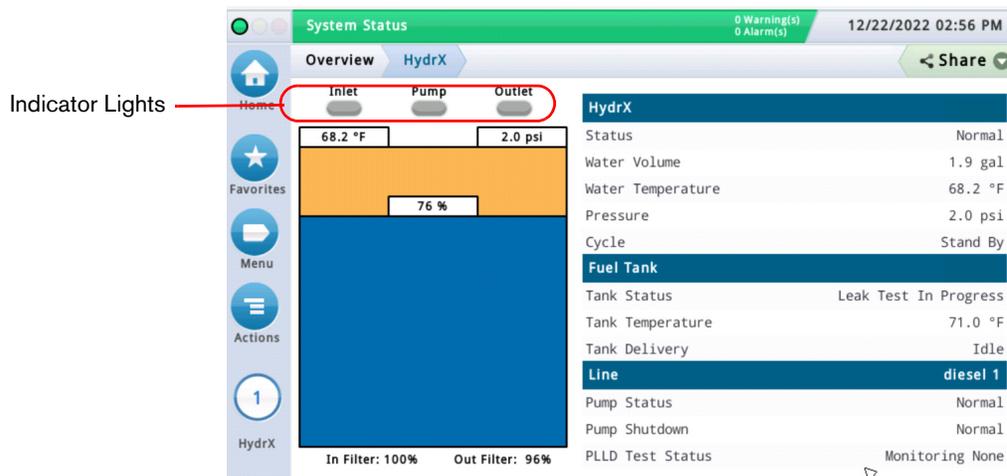


Figure 17. HydrX Overview Screen

2. The HydrX tab displays information regarding the HydrX filter housing:
 - a. HydrX Status
 - b. Water volume
 - c. Temperature
 - d. Pressure
 - e. Current cycle
3. The visual on the left of the screen displays information about HydrX in a visual format including:
 - a. Valve status
 - a. Pump status
 - b. Filter life as a %
 - c. Water volume as a %
4. The Fuel Tank tab displays information regarding the tank on which HydrX is installed:
 - a. Test Status
 - b. Tank Temperature
 - c. Delivery Status
5. The Line tab displays information regarding the line on which HydrX is installed:
 - a. Pump status
 - b. Pump shutdown
 - c. PLLD test status

HydrX Diagnostics Overview Screen

1. Touch **Menu>Diagnostics>HydrX** to open the HydrX Diagnostic Screen, then touch **Overview** (Item 1, Figure 18) to open the HydrX Diagnostics Overview screen (Figure 19).

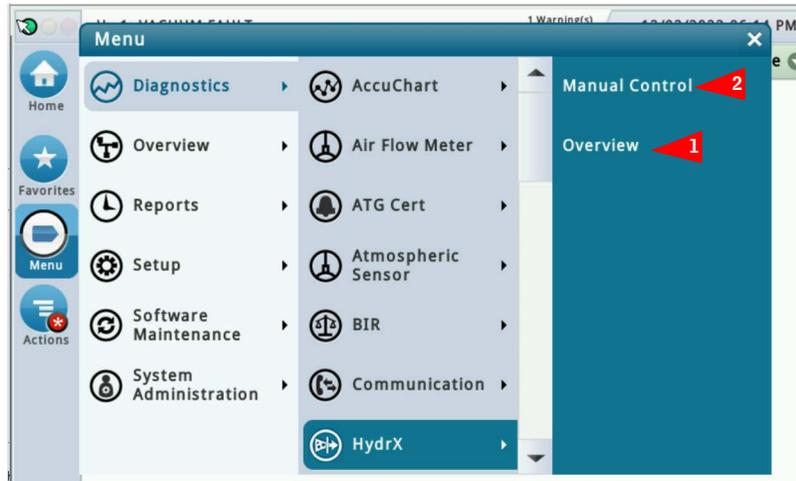


Figure 18. Accessing HydrX Diagnostic Screens

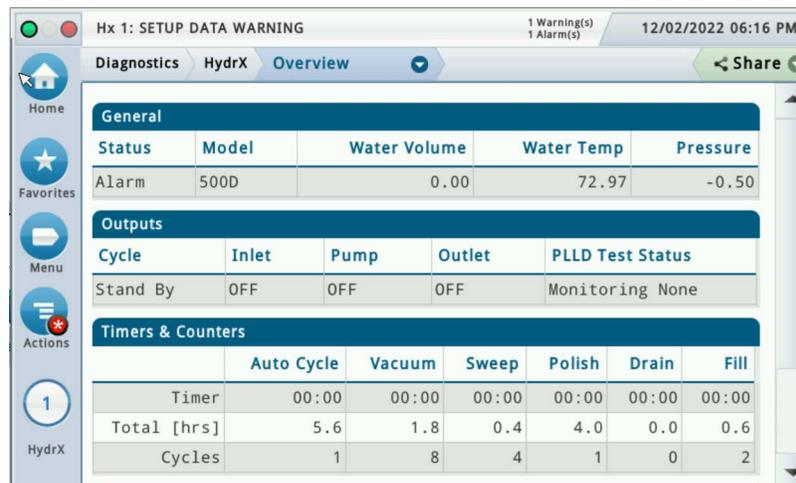


Figure 19. Example HydrX Diagnostics Overview Screen - Page 1

2. The **General** tab contains the alarm status of the HydrX, water level, temperature and pressure values recorded on the HydrX pressure sensor.
3. The **Outputs** tab contains current HydrX cycle and status of the Inlet/Outlet Valves, the STP and PLLD tests.
4. The **Timers & Counters** tab contains a historical record of the number and duration of the various HydrX cycles.

5. Scroll down to view the **Filters Performance** tab (see Figure 20) which displays:
 - Inlet and Outlet Filter Initial Pressure-The pressure recorded during the most recent 'New Filter Cycle'
 - Inlet and Outlet Filter Last Pressure - the pressure recored during the last cycle run.
 - Inlet and Outlet Filter life (%) - remaining filter life as a percentage.
 - Services - number of times filters have been replaced. This value increments at the successful completion of each new filter cycle

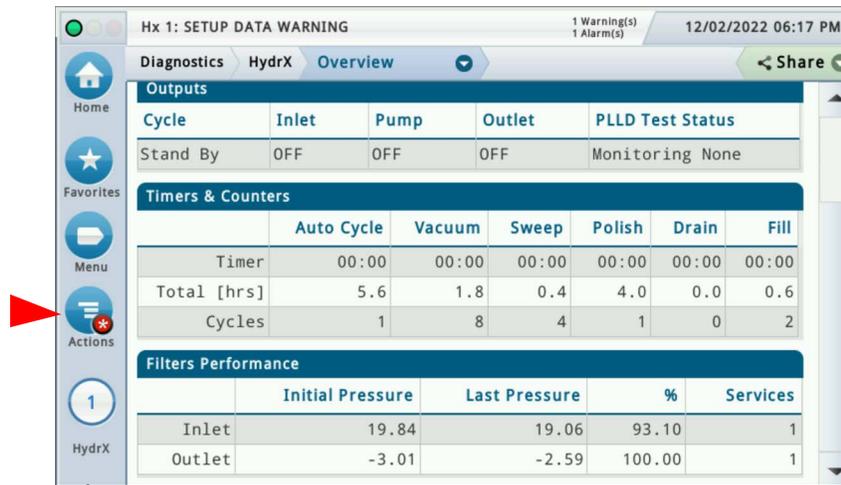


Figure 20. Example HydrX Diagnostics Overview Screen - Page 2

6. Touch the **Actions** button to open the HydrX diagnostic service buttons menu (see Figure 21). Note: Gray Action buttons are disabled.

NOTICE Reference HydrX System Maintenance Alerts table beginning on Page 28 of this manual regarding when action buttons are enabled/disabled.



Figure 21. HydrX Diagnostics Overview Actions Menu

- a. Touch the **New Filter** button to run a New Filter cycle during initial system startup or after a filter replacement. Running a New Filter Cycle on used filters may invalidate the filter life calculation. Assuming a typical 15 minute fill/vacuum times, the New Filter Cycle interval is 30 minutes.

- b. Touch the **Auto Cycle** button to run a complete Auto Cycle. An Auto Cycle always starts with vacuum cycles followed by sweep cycles followed by a Polish Cycle. The Auto Cycle interval depends on entered HydrX cycle duration entires (ref. Figure 14 - Figure 16).
- c. Touch the **Vacuum** button to run a Vacuum cycle. The Vacuum Cycle interval depends on time entered in HydrX setup (ref. Figure 15).
- d. Touch the **Sweep** button to run a Sweep cycle. The Sweep Cycle interval depends on time entered in HydrX setup (ref. Figure 14).
- e. Touch the **Polish** button to run a Polish cycle. The Polish Cycle interval depends on time entered in HydrX setup (ref. Figure 15).
- f. Touch the **Drain** button to run a Drain cycle. The Drain Cycle interval depends on time entered in HydrX setup (ref. Figure 15).

NOTICE The Drain button is only available directly through the TLS-4xx GUI and is not available for use through the web interface. Drain button is active when water level on HydrX probe is above 0".

- g. Touch the **Fill** button to run a Fill cycle. The Fill Cycle interval depends on time entered in HydrX setup (ref. Figure 14).

NOTICE This function is used to re-fill the conditioner following service where filters are NOT replaced or to clear fault conditions.

- h. Touch the **Stop Cycle** button to abort any HydrX cycle currently running.

NOTICE Reference HydrX System Maintenance Alerts table beginning on Page 28 of this manual regarding when action buttons are enabled/disabled.

HydrX Reports

HYDRX CYCLES REPORT

1. Touch **Menu>Reports>HydrX** to open the HydrX Diagnostic Screen, then touch **Cycles Report** (Item 1, Figure 22) to open the HydrX Diagnostics Manual Control screen (Figure 23).

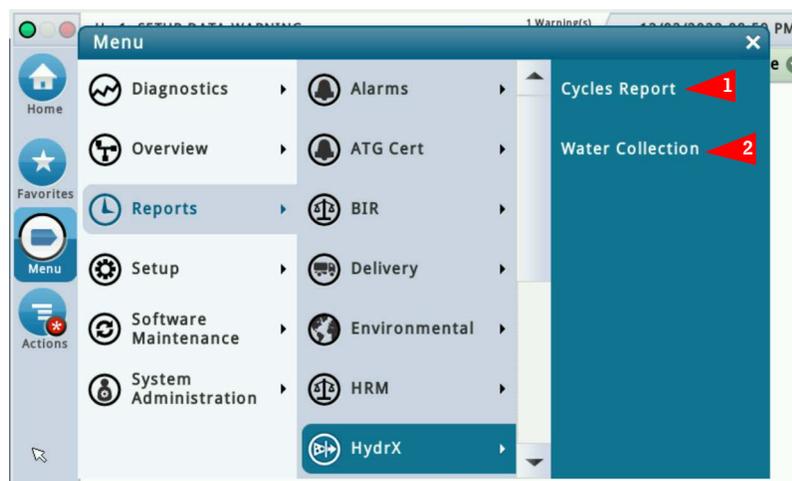


Figure 22. Accessing HydrX Reports

The screenshot shows the HydrX Cycles Report interface. The top header displays "Hx 1: SETUP DATA WARNING" and "1 Warning(s) 1 Alarm(s)" on the left, and "12/02/2022 09:01 PM" on the right. Below the header, there are navigation tabs for "Reports", "HydrX", and "Cycles Report". A "Share" button is visible on the right. The main content area shows a table of cycle data for the "Current Month". The table has columns for "Date & Time", "Cycle", "Started By", "Ended By", "Duration", and "Status". The table contains 15 rows of data, with the first row highlighted. The left sidebar contains navigation icons for Home, Favorites, Menu, and Actions, along with a "HydrX" indicator.

Date & Time	Cycle	Started By	Ended By	Duration	Status
12/02/2022 08:36 PM	Manual	Manual Action	Completion	00:02	Alarm
12/02/2022 08:36 PM	Manual	Manual Action	Completion	00:02	Alarm
12/02/2022 08:36 PM	Manual	Manual Action	Completion	00:02	Alarm
12/02/2022 08:32 PM	Manual	Manual Action	Completion	00:02	Alarm
12/02/2022 01:34 AM	Polish	Auto Cycle	Completion	3:59:59	Normal
12/02/2022 01:19 AM	Vacuum	Auto Cycle	Completion	15:00	Normal
12/02/2022 01:17 AM	Sweep	Auto Cycle	Completion	01:59	Normal
12/02/2022 01:02 AM	Vacuum	Auto Cycle	Completion	14:59	Normal
12/02/2022 01:00 AM	Sweep	Auto Cycle	Completion	01:59	Normal
12/02/2022 12:45 AM	Vacuum	Auto Cycle	Completion	14:59	Normal

Figure 23. Example HydrX Cycle Report - Left Side of Page

- This screen contains a data log of each HydrX cycle. The information is useful for understanding system performance, as well as troubleshooting alarms. The Cycle Report table contains the following data:
 - Date and time of cycle start
 - Cycle Type
 - How the cycle was started
 - How the cycle was ended
 - Cycle duration
 - System status at the beginning of the cycle
 - System status at the end of the cycle
 - Water volume at the beginning of the cycle
 - Water volume at the end of the cycle
 - Temperature at the start of the cycle
 - Temperature at the end of the cycle
 - Pressure at the start of the cycle
 - Pressure at the end of the cycle
 - Inlet filter life at the beginning of the cycle
 - Inlet filter life at the end of the cycle
 - Outlet filter life at the beginning of the cycle
 - Outlet filter life at the end of the cycle

Status End	Volume Start	Volume End	Temperature Start	Temperature End	Pressure Start
Alarm	0.00	0.00	72.6	72.6	-0.3
Alarm	0.00	0.00	72.6	72.6	-0.3
Alarm	0.00	0.00	72.6	72.6	-0.3
Alarm	0.00	0.00	72.6	72.6	-0.5
Normal	0.00	0.00	74.2	78.9	-2.5
Normal	0.00	0.00	73.3	74.2	19.0
Normal	0.00	0.00	73.2	73.3	-2.6
Normal	0.00	0.00	72.6	73.2	19.2
Normal	0.00	0.00	72.5	72.6	-2.7
Normal	0.00	0.00	72.1	72.5	-2.8

Figure 24. Example HydrX Cycle Report - Middle of Page

Status End	Pressure Start	Pressure End	Inlet Filter EOL Start	Inlet Filter EOL End	Outlet Filter EOL Start	Outlet Filter EOL End
72.6	-0.31	-0.31	93.10	93.10	100.00	100.00
72.6	-0.31	-0.31	93.10	93.10	100.00	100.00
72.6	-0.30	-0.31	93.10	93.10	100.00	100.00
72.6	-0.50	-0.50	93.10	93.10	100.00	100.00
78.9	-2.58	15.64	93.10	93.10	100.00	100.00
74.2	19.00	-2.58	93.10	93.10	100.00	100.00
73.3	-2.67	19.00	95.29	93.10	100.00	100.00
73.2	19.23	-2.67	95.29	95.29	100.00	100.00
72.6	-2.76	19.23	97.81	95.29	100.00	100.00
72.5	-2.83	-2.76	97.81	97.81	100.00	100.00

Figure 25. Example HydrX Cycle Report - Right Side of Page

3. Touch the Actions button to modify table contents (see Figure 27 and Figure 28).

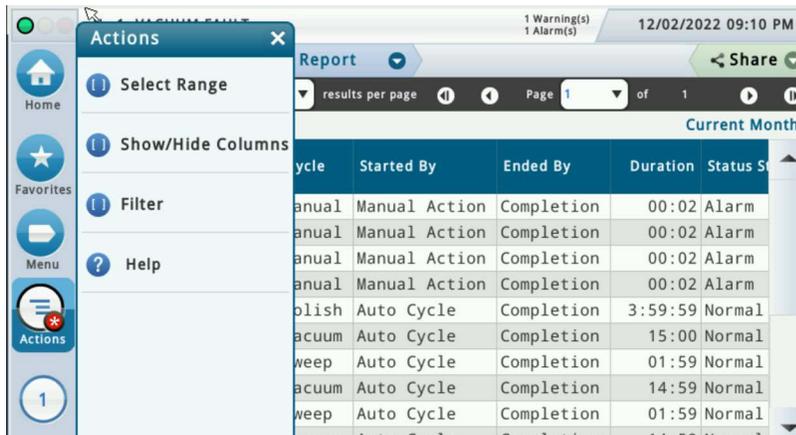


Figure 26. Actions Buttons Menu - HydrX Cycles Report

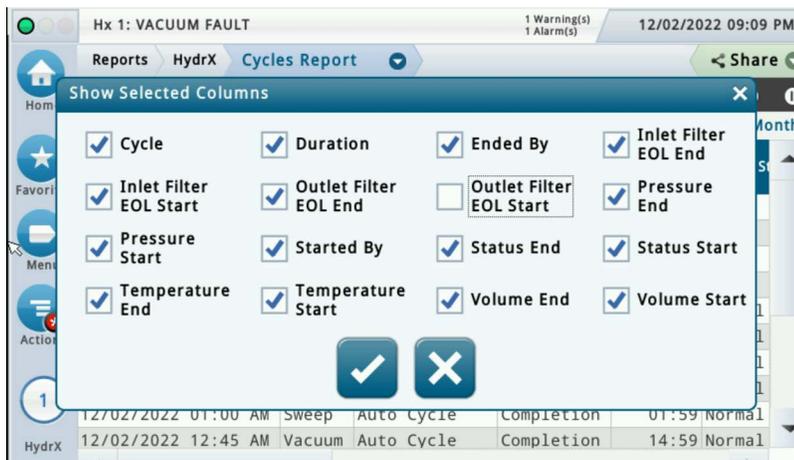


Figure 27. Show Selected Columns Menu - HydrX Cycles Report

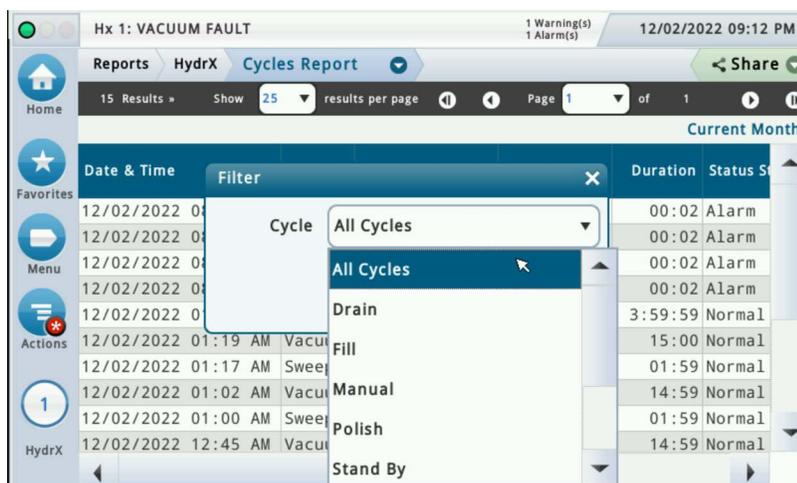


Figure 28. Filter Menu Selections - HydrX Cycles Report

HYDRX WATER COLLECTION REPORT

1. Touch **Water Collection** (Item 2, Figure 22) to open the HydrX Water Collection Report screen (Figure 29).



Figure 29. Example HydrX Water Collection screen

2. This screen shows water collection history for user-selectable time intervals (touch Actions button to select report range).

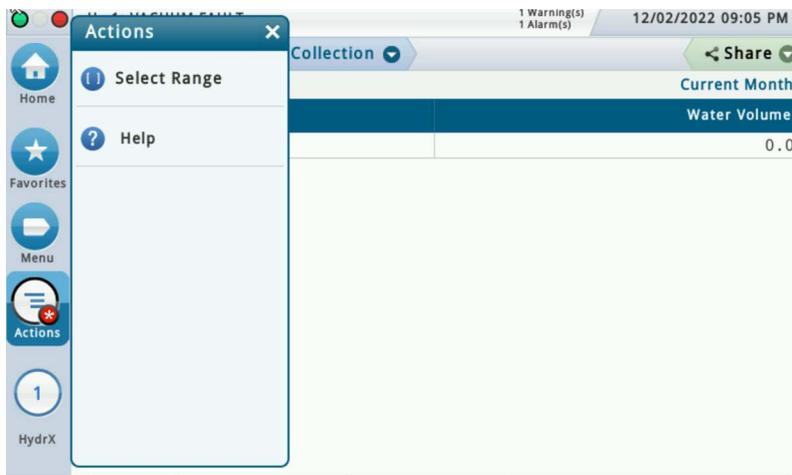


Figure 30. Actions Buttons Menu - HydrX Water Collection Report

HydrX Diagnostics Manual Control Screen

1. Touch **Menu>Diagnostics>HydrX** to open the HydrX Diagnostic Screen, then touch **Manual Control** (Item 2, Figure 18) to open the HydrX Diagnostics Manual Control screen (Figure 31).

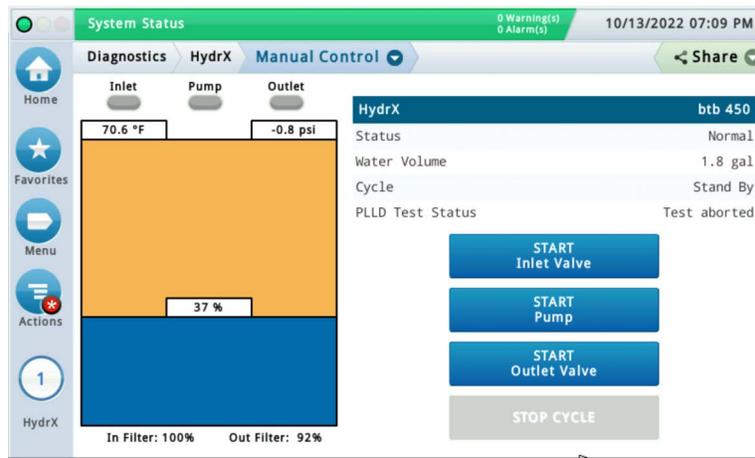


Figure 31. Example HydrX Diagnostics Manual Control Screen

2. The HydrX Manual Control screen allows you to view the status of the HydrX System and manually control the Inlet/ Outlet Valves and the STP for advanced troubleshooting purposes. Each action will run for 10 minutes or until you either touch the start button again or you touch the STOP CYCLE button.
 - Touching the **Start Inlet Valve** button sends power to the Inlet Valve and turns the Inlet Indicator green and the 'START Inlet Valve' button red.
 - Touching the **Start Pump** button turns the Pump Indicator green and the 'START Pump' button red.
 - Touching the **Start Outlet Valve** button turns the Outlet Indicator green and the 'START Outlet Valve' button red.
 - Touching the **STOP CYCLE** button aborts any HydrX action currently running.

NOTICE Reference **HydrX System Maintenance Alerts** table beginning on **Page 28** of this manual regarding when action buttons are enabled/disabled.

NOTICE The Manual Control actions are only usable directly through the TLS-4xx GUI and are not available for use through the web interface.

3 - Troubleshooting and System Specifications

HydrX System Maintenance Alerts

Numbers in Applicable Notes Column refer to the 4 actions below

1	WARNING! Before beginning this action the circuit breakers supplying power to HydrX and the STP must be LOCKED and TAGGED OUT. The pump adapter ball valve must also be CLOSED to prevent accidental release of fuel during troubleshooting.
2	Following any service where filters are replaced, or at new system startup, a NEW FILTER CYCLE must be run to return the system to an operational state.
3	Following any service where hardware is disconnected a FILL CYCLE must be run to return the system to an operational state.
4	Full manual on this procedure available at Veeder.com

Alarm	Description	Cause	Applicable Notes	Action
Pressure Fault	HydrX inlet pressure is outside of operating limits · New Filter Cycle Min Pressure 15 psi · Operating range 7-50 psi	Submersible Turbine Pump is not turning on		Verify Circuit breaker for the STP is in the ON position.
				Check to ensure there are no alarms on the ATG or STP Controller that would disable the pump.
				When starting up a new site with DPPLD, a passing 3.0 gph test is required to enable the STP.
		STP pressure is not entering the HydrX housing		Confirm Inlet Valve wiring and operation using HydrX manual control screen to activate inlet valve.
				Ensure HydrX pump adapter ball valve is in the open position by observing the arrow on the handle.
			1 , 2	Ensure the check valve on the HydrX pump adapter is installed in the proper orientation. Confirm arrow on check valve is pointed in the correct direction. Arrow should point away from ball valve, toward hose connected to port P on the HydrX manifold. Pump Adapter ball and check valve may be disassembled to correct.
		Insufficient pressure in HydrX housing	1 , 2	If insufficient pressure is present at startup, ensure pump adapter ball valve is opened fully.
			3	Access HydrX cycles report through Menu>Reports>HydrX>Cycles report, compare the last 2 sweep cycle pressures, if they are greater than 2.5 psi apart this produces pressure alarm. Attempt Fill Cycle.
			1 , 2, 4	A leak can cause insufficient pressure, check HydrX / STP sump for any signs or leakage and ensure Flare-Tite fittings have been installed as outlined in HydrX installation manual.
4	HydrX Installation Manual 577014-446 'Installation' section available at Veeder.com.			
Negative pressure during Fill or New Filter Cycle stage 1	4	HydrX inlet and Outlet valve are wired backwards, verify valve operation using HydrX Manual Control		
	4	HydrX Installation Manual 577014-446 'System Wiring' section available at Veeder.com.		

Numbers in Applicable Notes Column refer to the 4 actions below

1 	WARNING! Before beginning this action the circuit breakers supplying power to HydrX and the STP must be LOCKED and TAGGED OUT. The pump adapter ball valve must also be CLOSED to prevent accidental release of fuel during troubleshooting.
2	Following any service where filters are replaced, or at new system startup, a NEW FILTER CYCLE must be run to return the system to an operational state.
3	Following any service where hardware is disconnected a FILL CYCLE must be run to return the system to an operational state.
4	Full manual on this procedure available at Veeder.com

Alarm	Description	Cause	Applicable Notes	Action	
Vacuum Fault	HydrX outlet pressure is outside of operating limits -New Filter Cycle vacuum range -1.25 to -10psi -Min operating Vacuum: Outlet initial pressure + 1.75 psi -Idle min Vacuum: -0.75psi	Submersible Turbine Pump is not turning on		Verify Circuit breaker for the STP is in the ON position.	
				Check to ensure there are no alarms on the ATG or STP Controller that would disable the pump.	
				When starting up a new site with DPPLD, a passing 3.0 gph test is required to enable the STP.	
		STP is not providing flow to HydrX Venturi			Ensure HydrX pump adapter ball valve is in the open position by observing the arrow on the handle.
			1  , 2		Ensure the check valve on the HydrX pump adapter is installed in the proper orientation. Confirm arrow on check valve is pointed in the correct direction. Arrow should point away from ball valve, toward hose connected to port P on the HydrX manifold.
		HydrX Outlet Valve issue			Confirm Outlet Valve wiring and operation using HydrX manual control screen to activate outlet valve.
			1  , 2, 3		Ensure HydrX Outlet valve is securely mounted to HydrX manifold.
		Blocked HydrX Siphon Cartridge.	1  , 3, 4		Remove the HydrX Siphon Cartridge from the top of the HydrX manifold.
			1  , 3, 4		Remove debris from HydrX Siphon Cartridge screen.
			1  , 3, 4		Remove debris from HydrX Siphon Cartridge mounting cavity.
			1  , 4		Reinstall Siphon Cartridge.
			4		HydrX Siphon Cartridge Service Manual 577014-478 Available at Veeder.com

Numbers in Applicable Notes Column refer to the 4 actions below

1 	WARNING! Before beginning this action the circuit breakers supplying power to HydrX and the STP must be LOCKED and TAGGED OUT. The pump adapter ball valve must also be CLOSED to prevent accidental release of fuel during troubleshooting.
2	Following any service where filters are replaced, or at new system startup, a NEW FILTER CYCLE must be run to return the system to an operational state.
3	Following any service where hardware is disconnected a FILL CYCLE must be run to return the system to an operational state.
4	Full manual on this procedure available at Veeder.com

Alarm	Description	Cause	Applicable Notes	Action
Vacuum Fault	HydrX outlet pressure is outside of operating limits ·New Filter Cycle vacuum range -1.25 to -10psi ·Min operating Vacuum: Outlet initial pressure + 1.75 psi ·Idle min Vacuum: -0.75psi	Slow Vacuum loss (-0.75 to 0 psi)	1  , 3	Inspect HydrX / STP sump for signs of leakage and trace back to the source.
			1  , 3	Verify That all Flare-Tite fittings were installed as outlined in the HydrX Installation Manual.
			4	HydrX Installation Manual 577014-446 'Installation' section available at Veeder.com.
			1  , 3	Inspect HydrX drain quick disconnect on top of the HydrX manifold. The surface of the operator should be flush with the valve body.
			1  , 3	Ensure HydrX Outlet valve is securely mounted to HydrX manifold.
			1  , 3	Inlet valve contamination can cause slow vacuum loss. This applies to systems in service for extended periods of time. Remove the Coil nut and electrical conduit from the inlet (square body) valve. Remove the 4 Allen-head bolts securing the inlet valve to the HydrX manifold. Carefully clean valve parts and manifold cavity, taking care not to misplace any valve components.
		1  , 3	Remove the 3 bolts securing the WID to the guide tube and raise the WID enough to inspect where the clear tubing attaches. Verify All hoses are free from damage, blockage or kinks.	
		3	Using HydrX Manual Control, Activate the STP and inlet valve to flush heavy debris from the HydrX WID and associated flow path, Re-Attempt previously failed cycle.	
		1  , 3	Remove WID and inspect along the entire lengths for and damage or kinks. Items damaged during installation or shipping must be returned.	
		High vacuum (-10 psi) New Filter Cycle		

Numbers in Applicable Notes Column refer to the 4 actions below

1 	WARNING! Before beginning this action the circuit breakers supplying power to HydrX and the STP must be LOCKED and TAGGED OUT. The pump adapter ball valve must also be CLOSED to prevent accidental release of fuel during troubleshooting.
2	Following any service where filters are replaced, or at new system startup, a NEW FILTER CYCLE must be run to return the system to an operational state.
3	Following any service where hardware is disconnected a FILL CYCLE must be run to return the system to an operational state.
4	Full manual on this procedure available at Veeder.com

Alarm	Description	Cause	Applicable Notes	Action
Drain Warning	HydrX water level has not returned to 0 following a Drain Cycle	HydrX Drain Cycle timed out before completion. Solid debris accumulation at bottom of HydrX housing is interfering with HydrX water float.	4	Repeat Drain Cycle using Menu>Diag>Hydrx>Overview Actions Drain.
			4	Waste water Drain Manual 577014-474 available at Veeder.com
			1  , 3, 4	<ol style="list-style-type: none"> 1. Remove HydrX Outlet Filter lid (smaller lid). Refer to Inlet/Outlet Filter Replacement Manual 577014-473 available at Veeder.com 2. Remove HydrX Outlet Filter and save, this filter will be re-installed. 3. Locate the square cavity at the bottom of the Outlet Filter cavity and insert an approved pump to access the bottom of the housing. 4. Pump liquid and debris from the HydrX housing into an approved container. 5. Inspect the bottom of the HydrX housing. If heavy debris is still present continue to flush housing by introducing clean diesel and removing it with an approved pump. 6. Re-Install HydrX Outlet Filter and lid.
Drain Alarm	HydrX water level has exceeded the limit set in Menu>Setup>HydrX	Schedule and perform HydrX drain cycle	1  , 4	<ol style="list-style-type: none"> 1. Locate HydrX drain kit provided with HydrX system. V-R kit# 330020-880. Refer to Waste water Drain Manual 577014-474 Available at Veeder.com 2. Connect HydrX Drain kit to quick disconnect on HydrX manifold. 3. Start HydrX drain cycle using Menu>Diag>HydrX>Overview>Actions Drain. 4. Discharge waste water into an approved container and dispose of properly. 5. Confirm water level has reached 0% by navigating to Menu>Overview>Hydrx on ATG.
Filter Warning	One, or, both filters are below the % limits in Menu>Setup>HydrX.	One or both HydrX filters in approaching End Of Life Limit set in Menu>Setup>HydrX.	1  , 2, 4	<p>HydrX system will continue to operate until Filter Alarm.</p> <ol style="list-style-type: none"> 1. Obtain HydrX Filter replacement Kit V-R kit# 330020-904 and schedule replacement. Refer to Inlet/Outlet Filter Replacement Manual 577014-473 available at Veeder.com. 2. Remove HydrX Filter Lids, remove, and replace filters, dispose of used filters properly.
Filter Alarm	One, or, both filters are below the % limits in Menu>Setup>HydrX.	One or both HydrX filters is at End Of Life Limit set in Menu>Setup>HydrX.	1  , 4	<p>HydrX will be disabled until filter service is performed.</p> <ol style="list-style-type: none"> 1. Obtain HydrX Filter replacement Kit V-R kit# 330020-904 and schedule replacement. Refer to Inlet/Outlet Filter Replacement Manual 577014-473 available at Veeder.com. 2. Remove HydrX Filter Lids, remove, and replace filters, dispose of used filters properly.

Numbers in Applicable Notes Column refer to the 4 actions below

1	 WARNING! Before beginning this action the circuit breakers supplying power to HydrX and the STP must be LOCKED and TAGGED OUT. The pump adapter ball valve must also be CLOSED to prevent accidental release of fuel during troubleshooting.
2	Following any service where filters are replaced, or at new system startup, a NEW FILTER CYCLE must be run to return the system to an operational state.
3	Following any service where hardware is disconnected a FILL CYCLE must be run to return the system to an operational state.
4	Full manual on this procedure available at Veeder.com

Alarm	Description	Cause	Applicable Notes	Action
Low Temperature Warning	HydrX is approaching freezing temperatures.	HydrX Housing is below 37°F		No action required.
				HydrX will run an extended Sweep cycle in an attempt to warm itself using fuel from the UST.
				Warning clears when HydrX temperature is 38°F for 5 minutes.
				Observe HydrX cycles report for information on low temperature circulation at Menu>Reports>HydrX>Reports Cycles Report on ATG.
Low Temperature Alarm	HydrX is below freezing temperature.	HydrX Housing is below 25°F.		No action required.
				HydrX is disabled.
				Alarm clears when HydrX is above 25°F for 5 minutes.
				HydrX Will run low temperature circulation in the form of an extended Sweep Cycle.
	Observe HydrX cycles report for information on low temperature circulation at Menu>Reports>HydrX>Reports Cycles Report on ATG.			
High Temperature Warning	HydrX is approaching a high temperature condition.	HydrX Housing is above 113°F.		No action required.
				HydrX will run an extended Sweep Cycle in an attempt to cool itself using fuel from the UST.
				Warning clears when HydrX temperature is below 100°F for 5 minutes.
				Observe HydrX cycles report for information on high temperature circulation at Menu>Reports>HydrX>Reports Cycles Report on ATG.
High Temperature Alarm	HydrX is in a high temperature condition.	HydrX Housing is above 120°F.		No action required.
				HydrX is disabled.
				Alarm clears when HydrX temperature is below 120°F for 5 minutes.
				HydrX Will run high temperature circulation in the form of an extended Sweep Cycle.
	Observe HydrX cycles report for information on high temperature circulation at Menu>Reports>HydrX>Reports Cycles Report on ATG.			

Numbers in Applicable Notes Column refer to the 4 actions below

1	 WARNING! Before beginning this action the circuit breakers supplying power to HydrX and the STP must be LOCKED and TAGGED OUT. The pump adapter ball valve must also be CLOSED to prevent accidental release of fuel during troubleshooting.
2	Following any service where filters are replaced, or at new system startup, a NEW FILTER CYCLE must be run to return the system to an operational state.
3	Following any service where hardware is disconnected a FILL CYCLE must be run to return the system to an operational state.
4	Full manual on this procedure available at Veeder.com

Alarm	Description	Cause	Applicable Notes	Action
Low Pressure Alarm	Excessive vacuum upon startup during New Filter Cycle, vacuum is between -10 and -13 psi.	WID is blocked, or damaged		Using HydrX Manual Control, Activate the STP and Inlet Valve to flush heavy debris from the HydrX WID and associated flow path, Re-Attempt previously failed cycle.
			1  , 3	Remove the 3 bolts securing the WID to the guide tube and raise the WID enough to inspect where the clear tubing attaches. Verify All hoses are free from damage, blockage or kinks.
			1  , 3	Remove WID and inspect along the entire lengths for and damage or kinks. Items damaged during installation or shipping must be returned.
High Pressure Alarm	HydrX Pressure is above 50 psi.	HydrX LPr assigned to a product line with trapped air.		Verify HydrX LPr sensor wiring and assignment.
		HydrX LPr out of calibration	1  , 3, 4	Replace HydrX LPR V-R using kit# 330020-872. Refer to Pressure Sensor Replacement Manual 577014-470 available at Veeder.com
HydrX Probe Out	ATG has lost communication with the HydrX Probe. HydrX is disabled.	Poor wiring connection.		Verify junction box splice of probe cable to field wiring Verify connection at ATG USM terminal
		Faulty probe	1  , 3, 4	1. Disconnect probe cable at HydrX probe. 2. Connect alternate probe to HydrX probe cable. 3. If the ATG reads the new probe, replace the HydrX probe using V-R kit# 330020-873 (19" probe) Model 500D or kit# 330020-903 (12" probe) Model 250D as appropriate.
HydrX LPr Out	ATG has lost communication with the HydrX LPr. HydrX is disabled	Poor wiring connection.		Verify junction box splice of LPr to field wiring Verify connection at ATG USM terminal
		Faulty LPr sensor	1  , 3, 4	Replace LPr sensor V-R kit# 330020-872. Refer to Pressure Sensor Replacement Manual 577014-470 available at Veeder.com.
Invalid Height	Probe Height is out of range. Reading less than 0 ". Reading > probe length.	HydrX probe installation issue.	1  , 3, 4	Remove and inspect probe to verify that float and boot are properly installed.
		Faulty HydrX probe	1  , 3, 4	Replace probe using V-R kit# 330020-873 (19" probe Model500D) or kit# 33030-903 (12" probe Model250D) as appropriate. Refer to Mag Probe Replacement manual 577014-469 available at veeder.com.
HydrX Out	One of the component devices is in alarm and prevents HydrX Operation	Any alarm associated with the tank/line HydrX is installed will cause a HydrX Out alarm.		Address alarm condition. HydrX Out will clear when underlying condition is addressed.

Specifications

Attribute	Rating	Unit	Comment
Filtration			
Multi-Stage Filtration			
Inlet Type:	Particle plus Coalescing media		
Outlet Type:	Fine water separation		
Filtration:	25 micron (all elements)	mm	
Water Holding Capacity			
FC Tank:	5 or 2.5 (depending on HydrX model)	gal	
Electrical			
Two Class 1 Valves:	Rated 120 Vac, 60 Hz, 7.3 W UL listed CLASS 1, DIV. 1 GROUP D Hazardous Locations Reference UL File E37780		Switched AC power provided by HydrX Fuel Conditioning Controller, rated 120 Vac, 5 A
Two Intrinsically Safe Circuits:	Rated 12.6 Vdc, 0.196 A, 0.62 W UL listed CLASS 1, DIV. 1 GROUP D Hazardous Locations Reference UL File MH11766		Intrinsically safe DC power provided for HydrX Fuel Conditioner Probe and Pressure Sensor by ATG
Performance			
Flow Rate - Pressurized:	6	gpm	Nominal rating, varies with pump pressure and filter life
Flow Rate - Vacuum:	0.6	gpm	Nominal rating, varies with pump pressure and filter life
Maximum Rated Operating Pressure:	50	psi	Proof pressure rated 5X, 250 psi maximum
Environmental			
Operating Temperature - Maximum:	122	°F	
Operating Temperature - Minimum:	-40	°F	
Storage Temperature - Maximum:	156	°F	
Storage Temperature - Minimum:	-40	°F	
Operating Humidity:	95	% RH	

Recommended HydrX Fuel Conditioning Controller Settings

Category	Setting	Units	Min.	Max.	Comment
Auto Run Time					
Start	00:00	HH:MM	0	24	24 hour format. NOTE: If start and end are both set to 0:00 auto cycle will not run.
End	08:00	HH:MM	0	24	
Cycle Time Parameters					
Fill Time	15	Minutes	3	30	If a value is entered and ??? is returned, verify setting is within min/max value range.
Vacuum time	15	Minutes	3	60	
Sweep Time	2	Minutes	2	10	
Polish Time	4 ¹	Hours	0	6	If a value is entered and ??? is returned, verify setting is within min/max value range. NOTE: If polish is set to 0, system will polish only while a delivery is in progress.
Conditioner Tank Settings					
Drain time	10	Minutes	5	10	
Extended Drain	0	Seconds	0	60	
Tank Volume	5.00 or 2.5	Gallons	0	5 or 2.5	Depends on FC Conditioner Model (500D or 250D)
Volume/Inch	0.3536	Gallons/Inch	0.3536	0.3536	Gallons per inch is determined by bowl geometry and must always be set to 0.3536.
Conditioner Processing Cycles					
Low Water Cycles	4	Cycles	1	10	Number of contiguous cycles where detected water change is less than the 'Minimum Water Change' setting and the FC water float is reading 0.
Water Cycles	2	Cycles	1	10	Number of contiguous cycles where detected water change is less than the 'Minimum Water Change' setting and the FC water float is reading <0.
Sweep Cycles	2	cycles	1	10	Number of contiguous cycles where detected water change is less than the 'Minimum Water Change' setting after alternating sweep and vacuum cycles.
Minimum Water Change	0.05	Inches	0.05	0.25	Minimum change in FC water float height used to evaluate if water is being extracted from UST.
ATG Device Mapping					
Fuel Conditioner	1, 2, 3, ... ²		1	15	Always set to 1 if only one HydrX system is installed. Additional HydrX units will receive subsequent numbers.
HydrX Mag Probe	1, 2, 3, ... ³		1	15	User specified by ATG settings (probe address).

¹If installed at a high throughput site receiving 1 or more deliveries per day, it is recommend that polish time be set to 1 hour. This will give the HydrX more quiet time during the day to run vacuum cycles while people are dispensing fuel as well as allow any immersed water in the fuel (that may have come in via a delivery) to separate out and drop to the bottom of the tank. Having the Polish cycle running for 4 hrs at a site that gets lots of deliveries, will override any vacuum cycles during dispensing.

²HydrX unit assignment.

³HydrX Probe assignment.



For technical support, sales or
other assistance, please visit:
veeder.com