


<b>Product Description</b>	<p>The Veeder-Root HydrX Fuel Conditioning System combats in-tank corrosion by providing continuous water removal within diesel storage tanks. HydrX unique design removes water from the lowest point in the tank, preventing water from stagnating on the tank bottom and breeding microbial contaminants. The integrated filtration removes entrained water, rust, sand, and microbial particulate from the fuel, polishing it before returning clean fuel back to the tank.</p>			
<b>System Features</b>	<b>System Description</b>			
	<p>The Fuel Conditioning System shall be of coalescing type with integrated filtration and provide continuous water removal. The Fuel Conditioner shall install in the Submersible Turbine Pump (STP) sump, mounted to a 4" riser that houses the Guide Tube and Water Intake Device. If there is not space in the STP sump, the HydrX Fuel Conditioner can be installed in a nearby Transition sump.</p>			
	<b>Fuel Conditioner</b>	<b>Water Intake Device (WID)</b>		
	<p>The Fuel Conditioner is a fully integrated system that effectively removes water and maintains fuel cleanliness. The Fuel Conditioner includes two automatic solenoid valves that control the flow of water removed from the bottom of the diesel storage tank and the flow of clean fuel returning back to the tank. Integrated sensors enable predictable maintenance for the site operator. The Fuel Conditioner comes in two models: HydrX 250D with a 2.5-gallon waste water capacity and HydrX 500D with a 5.0-gallon waste water capacity.</p>	<p>The WID contains 1-6 fluid transfer tubes (depending on the configuration of the tank) that extend along the tank bottom to the lowest point of the tank. The WID operates in multiple modes and is powered by the STP to circulate fluids through the Fuel Conditioner in the sump. Vacuum mode uses suction from the STP port to pull fuel, water and particulate into the Fuel Conditioner. Sweep mode uses clean fuel to push water and particulate to the lowest point in the tank where it is then extracted using vacuum mode. Polishing mode is activated when the vacuum and sweep modes are complete (i.e., no more water is being collected).</p>		
	<b>Guide Tube</b>	<b>STP Adapter</b>		
	<p>The Guide Tube is a reinforced composite tube that extends vertically into the tank below the Fuel Conditioner through a custom riser. The Guide Tube provides mounting and precise orientation of the WID. A stainless steel elbow at the distal end guides the WID along the tank bottom.</p>	<p>The STP Adapter is a stainless steel connector that links an STP port through a standard hose fitting that connects to the Fuel Conditioner. An integrated ball valve on the STP Adapter allows for maintenance on the Fuel Conditioner without shutting down the STP.</p>		
	<b>HydrX Software Enhancement Feature</b>	<b>Filters</b>		
<p>The HydrX Software Feature Enhancement allows for full system control through a TLS-450PLUS or TLS4 Automatic Tank Gauge (ATG), and remote access to settings, system status, reporting, and alarms through the Web UI.</p>	<p>Two filters are installed in the Fuel Conditioner housing. The inlet filter is a two-stage particle and coalescing type filter. The outlet filter is a single stage fine water separating element that provides a fine polish for optimal fuel quality.</p>			
<b>Specifications</b>	<b>System Specifications</b>			
	<b>Operating Temperature</b>	25°F (-4°C) to 120°F (49°C)	<b>Fuel Compatibility</b>	100% Diesel
	<b>Storage Temperature</b>	-40°F (-40°C) to 158°F (70°C)		Biodiesel (B100)
	<b>Installation Location</b>	Diesel Storage Tank in the STP sump or Transition sump within 10 feet of the STP sump		Biodiesel Blends
	<b>Relative Humidity</b>	0-100% (Condensing)		Renewable Diesel
	<b>Waste Water Capacity</b>	2.5-gallons or 5.0-gallons		Dyed Diesel (Off-Road)
	<b>Filter Element Efficiency</b>			
	<b>Particulate Removal (Per ISO 16889 ver. 2022)</b>	20 micron: >99.9% 15 micron: >99.5% 10 micron: >90.0%		
	<b>Water Separation (Per SAE J1488 ver. 2024)</b>	Up to 96.5% efficient (3 GPM in #2 Diesel ULSD)		

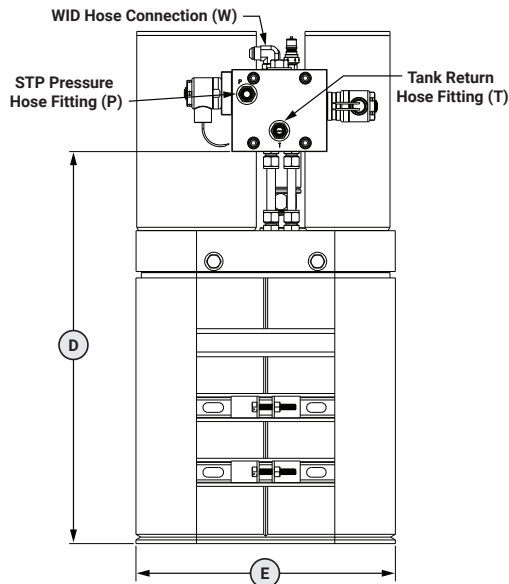
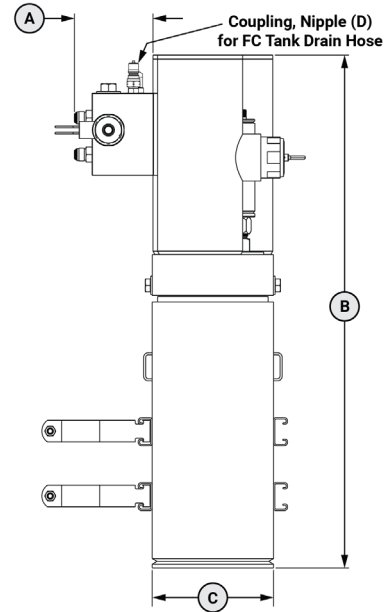
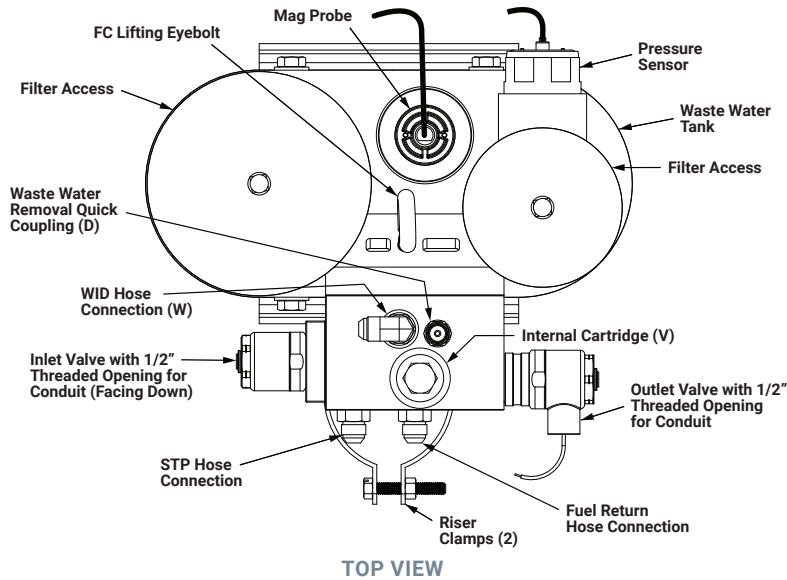
System Specifications (Continued)		
<b>Specifications (Continued)</b>	<b>Water Removal</b>	Water removal throughout the tank bottom and from the lowest point in the tank
	<b>Intelligent Operation</b>	Pump utilization is optimized based on water removal. HydrX gives the user complete control over how much time is allotted per day to polish the fuel. Logic is built-in to prevent freezing under extreme temperature conditions.
	<b>Fuel Conditioner External Dimensions</b>	
	<b>HydrX 250D (2.5-Gallons)</b>	23" (H) x 15" (W) x 12" (D)
	<b>HydrX 500D (5.0-Gallons)</b>	30" (H) x 15" (W) x 12" (D)
System Construction		
Fuel Conditioner		
<b>Lifting Eyebolt</b>	Stainless Steel	
<b>Waste Water Tank</b>		
<b>Water Removal Fitting</b>		
<b>WID Hose Connection</b>		
<b>Filter Housing &amp; Access Caps</b>	Anodized Aluminum	
<b>Solenoid Manifold</b>		
Guide Tube		
<b>Elbow</b>	Stainless Steel	
<b>Guide Tube Flange</b>		
<b>Tube</b>	Fiberglass Reinforced Composite	
Water Intake Device (WID)		
<b>Body</b>	Stainless Steel	
<b>Fittings</b>		
<b>Vacuum Tip Sled</b>		
<b>WID Manifold</b>		
<b>Intake Lines</b>	Fluorinated Ethylene Propylene (FEP)	
<b>Sleeve</b>	Polyethylene/Polyester	
Approvals & Manuals		
<b>Component Approvals</b>	<b>Solenoid Valve:</b> UL/cUL recognized components, reference UL/cUL E37780 <b>Intrinsically Safe Sensors:</b> UL/cUL listed, reference UL/cUL MH11766	
<b>Manuals</b>	<b>HydrX Fuel Conditioning System Installation Manual</b>	577014-446
	<b>HydrX Fuel Conditioning System Quick Help – ATG Control</b>	577014-493
	<b>HydrX Fuel Conditioning System Setup &amp; Operation Manual – ATG Control</b>	577014-492
	<b>HydrX Fuel Conditioner Inlet/Outlet Filter Replacement Instructions</b>	577014-473
	<b>HydrX Fuel Conditioner Waste Water Tank Draining Instructions</b>	577014-474
	<b>HydrX Fuel Conditioner Mag Probe Replacement Instructions</b>	577014-469
	<b>HydrX Fuel Conditioner Siphon Cartridge Service/Installation Guide</b>	577014-478
	<b>HydrX Fuel Conditioner Offset Mounting Bracket Installation Guide</b>	577014-476
	<b>HydrX Fuel Conditioner Pressure Sensor Replacement Instructions</b>	577014-470
System Requirements		
<b>Site Requirements</b>	Equipment Requirements	
	<ul style="list-style-type: none"> <li>• TLS-450PLUS or TLS4 ATG with TLS-XB Expansion Box with software version 10.U or higher</li> <li>• Compatible with 4" STPs up to 4 HP and Red Jacket® 6" Maxxum® STPs up to 5 HP</li> <li>• Veeder-Root Compatible STP Models: The Red Jacket, The Red Jacket AG, The Red Armor®, and The Red Jacket Maxxum</li> <li>• FE Petro® Compatible STP Models: MagShell™ fixed speed and variable speed STPs with MagVFC™</li> <li>• Universal Sensor Module (USM) with 2 unused inputs and a Universal Input/Output Module (UIOM) with 3 unused relay outputs and 1 unused high-voltage input</li> <li>• Intelligent Pump Control (IPC) must be disabled on the diesel line and the ATG Pump Control must be used for diesel product</li> <li>• STP must have a spare pressure port</li> <li>• Line manifolded and siphon manifolded tanks with STPs are supported. Siphon manifolded tanks without STPs are not supported.</li> </ul> <p><b>Note:</b> Sump sensors are recommended with HydrX and may be required by local jurisdictions having authority</p>	

System Requirements (Continued)			
Site Requirements (Continued)	<b>Tank Requirements</b>		
	<ul style="list-style-type: none"> <li>• Diesel storage tanks less than or equal to 30,000-gallons</li> <li>• Fiberglass and steel tanks are supported</li> <li>• Tank diameters between 4' (48") and 12' (144") are supported</li> <li>• Line manifolded and siphon manifolded tanks with STPs are supported. Siphon manifolded tanks without STPs are not supported</li> <li>• HydrX is compatible with Aboveground Storage Tanks (ASTs), provided the following criteria is met:               <ul style="list-style-type: none"> <li>- Mount the Fuel Conditioner on top of the tank to ensure proper operation</li> <li><b>Recommended:</b> <ul style="list-style-type: none"> <li>- Install the Fuel Conditioner inside an enclosure                   <ul style="list-style-type: none"> <li>a. A containment monitoring device must be used inside the enclosure</li> <li>b. If installing the HydrX in an area where temperatures are expected to be outside the HydrX operating range, then it is recommended that the enclosure have environmental controls to ensure the HydrX Operating Temperatures are maintained</li> </ul> </li> </ul> </li> </ul> </li> </ul>		
	<b>Sump Requirements</b>		
	<ul style="list-style-type: none"> <li>• Spare 4" bung in tank top with clearance for a riser (and space for the Fuel Conditioner required). If there is not enough clearance in the STP sump, a Transition sump may be needed.</li> <li>• Clearance for the Fuel Conditioner footprint around the spare bung (Dimensions can be found on page 5). <b>Note:</b> The True To Size Fit-Test Model or a 1:1 scale template can be used to quickly confirm space available</li> <li>• <b>The Fuel Conditioner comes in two models:</b> HydrX 250D with a 2.5-gallon waste water capacity that is 23" tall and HydrX 500D with a 5.0-gallon waste water capacity that is 30" tall. It requires 10" of clearance above the system to any fixed, immovable portion of the sump to service the filters. If the Fuel Conditioner fits in the center of the sump, directly under the sump lid, a 6" clearance to the sump lid is sufficient.</li> </ul>		
<b>Recommendations for New to Industry (NTI) Sites</b>			
<ul style="list-style-type: none"> <li>• Install 48" diameter sumps and manway lids with 4+ bung openings to maximize HydrX placement options</li> <li>• Route product line and conduit around perimeter of sump, leaving room for the HydrX Fuel Conditioner footprint depicted on page 5</li> <li>• Tank tilted preferably away from STP sump</li> <li>• Size high voltage and low voltage conduit for additional HydrX wiring – Wiring requirements identified below</li> <li>• Pull additional HydrX wiring during site construction</li> </ul>			
Wiring Requirements	<b>System Requirements</b>		
	<b>HydrX Solenoid Valve Power Requirements (to the sump)</b>	<p>AC Power Wiring carrying line voltage to power solenoid valves on a separate breaker. Local electrical codes or site requirements may also require a separate Emergency Stop Control. Minimum wire size shall be 14 AWG. 5 wires total: 2 wires for valve control voltage, 2 neutral wires, and 1 ground wire.</p>	
	<b>HydrX Sensor Wiring Requirements</b>	<ol style="list-style-type: none"> <li><b>1. Wire Type</b> – Shielded cable required regardless of conduit material or application. Shielded cable must be rated less than 100 picofarad per foot manufactured with a suitable material such as Carol C2534 or Belden 88760, 8760, or 8770.</li> <li><b>2. Wire Length</b> – Maximum 1,000' to meet intrinsic safety requirements. Improper system operation could result for runs over 1,000'.</li> <li><b>3. Wire Gauges</b> – Color coded – shielded cable used in all installations. Wires should be #14 - #18 AWG stranded copper wire and installed as Class 2 circuits. As an alternate method when approved by the local authority having jurisdiction, #22 AWG wire such as Belden 88761 may be suitable with the following requirements: Wire run is less than 750'; Capacitance does not exceed 100 pF/ft; Inductance does not exceed 0.2 uH/ft.</li> </ol> <p><b>Note:</b> 2 Intrinsically Safe (IS) pairs are required</p>	
Fuel Conditioning System Components	<b>First Time Installation Orderable Part Numbers</b>		
	<b>Fuel Conditioner Kit – 120VAC</b>		
	<b>Part Number</b>	<b>Description</b>	<b>Quantity Required</b>
	0342909-325	HydrX 250D Fuel Conditioner Kit – 120VAC/60Hz/Single Phase/UL	1 required per system, includes riser, valve conduit, water drain kits, and software
	0342909-350	HydrX 500D Fuel Conditioner Kit – 120VAC/60Hz/Single Phase/UL	
	<b>250D Fuel Conditioner &amp; Required Components – 240VAC *</b>		
	0860580-225	HydrX 250D Fuel Conditioner – 240VAC/60Hz/Single Phase/UL	1 required per system
	0860580-325	HydrX 250D Fuel Conditioner – 240VAC/50Hz/Single Phase/UL	
	0330020-901	Kit – Fuel Conditioning System Riser for 250D – 8.75" Length	1 required per system
	0330020-885	Kit – Valve Conduit	1 required per system
0330020-880	Kit – Water Drain	1 required per system	
0332972-032	HydrX Software Feature Enhancement	1 required per system	
* For the 240VAC related part numbers (Fuel Conditioner and Required Components), everything needs to be ordered separately.			

First Time Installation Orderable Part Numbers		
Part Number	Description	Quantity Required
<b>500D Fuel Conditioner &amp; Required Components – 240VAC *</b>		
0860580-250	HydrX 500D Fuel Conditioner – 240VAC/60Hz/Single Phase/UL	1 required per system
0860580-350	HydrX 500D Fuel Conditioner – 240VAC/50Hz/Single Phase/UL	
0330020-867	Kit – Fuel Conditioning System Riser for 500D – 15.5" Length	1 required per system
0330020-885	Kit – Valve Conduit	1 required per system
0330020-880	Kit – Water Drain	1 required per system
0332972-032	HydrX Software Feature Enhancement	1 required per system
* For the 240VAC related part numbers (Fuel Conditioner and Required Components), everything needs to be ordered separately.		
<b>Installation Kit:</b>		
Part Number	Description	Quantity Required
0330020-875	The Red Jacket Installation Kit	1 required per system
0330020-921	The Red Jacket Maxxum Installation Kit	
0330020-874	FE Petro® Installation Kit	
<b>Guide Tube and WID:</b>		
Part Number	Description	Quantity Required
08608xx-xxx	Water Intake Device (WID)	1 required per system
0860780-xxx	Guide Tube (produced in 6 inch increments from 050 - 164)	1 required per system
<b>Fuel Conditioning System Components (Continued)</b>		
<b>Accessories &amp; Replacement Parts</b>		
Part Number	Description	Category
<b>Accessories</b>		
0330020-869	Kit – Alignment Bar	Accessory
0330020-881	Kit – 90° Hose End Adapter	Accessory
0330020-893	Kit – Mounting Rail Extension	Accessory
<b>Filter Cartridges &amp; O-Rings</b>		
0330020-868	Kit – Fuel Conditioner Filter Cartridges *	Replacement
0330020-879	Kit – Fuel Conditioner O-Rings	Replacement
0330020-904	Kit – Fuel Conditioner Filter Cartridges – SAE Seals	Replacement
0330020-905	Kit – Fuel Conditioner O-Rings – SAE Seals	Replacement
<b>Hose Connections</b>		
0330020-870	Kit – FE Siphon Jet Access Port Adapter Assembly	Replacement
0330020-871	Kit – RJ Siphon Port Adapter Assembly	Replacement
0330020-920	Kit – RJ Maxxum Siphon Port Adapter Assembly	Replacement
0330020-876	Kit – Tank Return Hose	Replacement
0330020-878	Kit – Manifold Hose	Replacement
0330020-884	Kit – Water Drain Quick Coupling	Replacement
0330020-899	Kit – HydrX Siphon Cartridge *	Replacement
0330020-902	Kit – Flaretite Seal *	Replacement
<b>Sensors &amp; Valves</b>		
0330020-855	Kit – Water Float, Diesel	Replacement
0330020-872	Kit – Replacement Pressure Sensor *	Replacement
0330020-873	Kit – Replacement Probe, HydrX 500D	Replacement
0330020-903	Kit – Replacement Probe, HydrX 250D	Replacement
0330020-882	Kit – Inlet Valve Service – 120VAC/60Hz/Single Phase/UL *	Replacement
0330020-883	Kit – Outlet Valve Service – 120VAC/60Hz/Single Phase/UL *	Replacement
0330020-912	Manifold Replacement Assembly – 120VAC/60Hz/Single Phase/UL	Replacement
* Denotes critical spares, recommended to have these on hand.		
<b>Fuel Conditioning System Parts</b>		

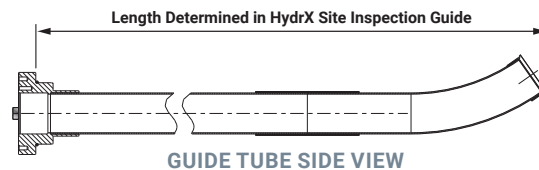
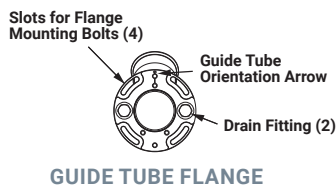
## System Overview

### Fuel Conditioner

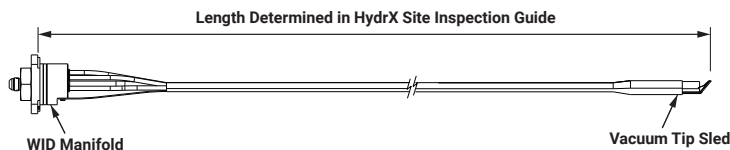


Dimension	250D	500D
A	4.53" (115.06mm)	4.53" (115.06mm)
B	22.92" (582.17mm)	29.63" (752.60mm)
C	7.00" (177.80mm)	7.00" (177.80mm)
D	15.89" (403.61mm)	22.70" (576.58mm)
E	15.00" (381.00mm)	15.00" (381.00mm)

### Guide Tube



### Water Intake Device



# Notice

---

Veeder-Root makes no warranty of any kind with regard to this publication, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

**Veeder-Root shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication.**

Veeder-Root reserves the right to change system options or features, or the information contained in this publication.

This publication contains proprietary information which is protected by copyright. All rights reserved. No part of this publication may be photocopied, reproduced, or translated to another language without the prior written consent of Veeder-Root.

## **Example Illustrations**

Illustrations used in this guide for example sensor installations may contain components that are customer supplied and not included with the sensor. Please check with your Veeder-Root Distributor for recommended installation accessories.

## **Third Party Evaluations**

Third party evaluations of the Veeder-Root sensors contained in this application guide can be found under the Veeder-Root vendor name on the National Work Group on Leak Detection Evaluations (NWGLDE) website:

<https://neiwpsc.org/nwglde/>