



State of Illinois
Office of the State Fire Marshal

Checklist for Documenting UST Compatibility

SUBMIT THIS FORM WITH SUPPORTING DOCUMENTATION ATTACHED.

ALL COMPONENTS MUST BE LISTED IN DETAIL, & COMPATIBILITY DOCUMENTATION MUST CLEARLY IDENTIFY THE COMPONENTS.

Facility where equipment is located:

Facility Number: NEW
Facility Owner: PILOT TRAVEL CENTER
Facility Name: PILOT TRAVEL CENTER #1174
Street Address: 104 TREFAZ DRIVE
City: MARSHALL
County: CLEARK

UST Information:

Tank ID Number: 3
Tank Material: Steel FRP
FRP yes
Single Wall _____ Double Wall yes
Tank Volume: 30,000
Tank Product: B-99

Complete the checklist below, listing compatibility determination, method used and description. **All answers must be "YES" and supported with a sufficient description or supporting documentation** in order for your UST system to demonstrate compatibility with the blended fuel/biofuel product.

UST SYSTEM COMPONENTS	DOCUMENTATION DEMONSTRATING COMPATIBILITY WITH SUBSTANCE LISTED ABOVE		METHOD A or B (MAY USE BOTH)	DESCRIPTION OF COMPONENT TYPE, MODEL NUMBER, & NATIONAL LABORATORY CERTIFICATION, LISTING OR MANUFACTURER APPROVAL (ATTACH TO CHECKLIST)
TANK	NO	YES X	B	30,000 GAL XERXES
PIPING	NO	YES X	B	AMRON LCX
CONTAINMENT SUMPS	NO	YES X	B	BRAVO B4872-S brovo b-7385 brovo b-830
PUMPING EQUIPMENT	NO	YES X	B	GRORMAN RUPP GHS2JP3-B(/S1)

UST SYSTEM COMPONENTS	DOCUMENTATION DEMONSTRATING COMPATIBILITY WITH SUBSTANCE LISTED ABOVE		METHOD A or B (MAY USE BOTH)	DESCRIPTION OF COMPONENT TYPE, MODEL NUMBER, & NATIONAL LABORATORY CERTIFICATION, LISTING OR MANUFACTURER APPROVAL (ATTACH TO CHECKLIST)
RELEASE DETECTION EQUIPMENT	NO	YES X	B	VEEDERROOT PROBE SERIES 8463X1 veederroot tank inerstitial p/n 794380-345 veederroot sump sener 794380-351 veederroot tls 450 plus
SPILL PREVENTION EQUIPMENT	NO	YES X	B	DOUBLE WALL SPILL BUCKET OPW 1C-3112D EDGE
OVERFILL PREVENTION EQUIPMENT	NO	YES X		opw 71so -400c
GASKETS & SEALS (installs after 10/13/18)	NO	YES X		EFUNDA O-RING SEALS
JOINT DOPES & ADHESIVES (installs after 10/13/18)	NO	YES X		BLUE MONSTER PTFE #76019

Methods:

- Certification or listing of UST system equipment or components by a nationally recognized, independent testing laboratory for use with the regulated substance stored.
- Equipment or manufacturer approval. The manufacturer's approval must be in writing, indicate an affirmative statement of compatibility, specify the range of biofuel blends the component is compatible with, and be from the equipment or component manufacturer

Note: Owners and operators may find American Petroleum Institute's Recommended Practice 1626, *Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations*, useful in complying with the compatibility requirements.

In order to be in compliance with the 2015 federal UST regulation compatibility requirements for storing biofuels, you must keep documentation of compatibility of the UST system components listed on this page as long as you store the fuel.

For your records, you should update this checklist each time you repair or replace components of your UST system to ensure you have all the required compatibility documentation while storing biofuels.

Checklist Completed By: print name: DAVID SCHAKEL

date completed: 4-18-19

signature: DAVID SCHAKEL

position/title: PROJECT MANAGER

LIMITED WARRANTY Underground Petroleum Storage Tanks

Xerxes Corporation ("Xerxes") warrants to owner ("Owner") that our underground petroleum storage tanks, if installed, used, and maintained in the United States or Canada in accordance with Xerxes' published specifications, installation instructions and operating guidelines, applicable supplemental materials, all applicable laws and regulations, and limited to storage of the products listed below at ambient temperatures or fuel oils, used in oil burning equipment, at temperatures not to exceed 150°F (65°C):

- 1) Will not fail for a period of thirty (30) years from date of original delivery by Xerxes due to natural external corrosion.
- 2) Will not fail for a period of thirty (30) years from date of original delivery by Xerxes due to internal corrosion, provided the tank is used solely, with or without tank water bottoms, to store the following products:
 - a. gasoline, jet fuel, aviation fuels, motor oils, motor vehicle waste oils, kerosene, diesel fuel, or fuel oils
 - gasoline with up to 20%, by volume, of methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), di-isopropyl ether (DIPE), tertiary butyl alcohol (TBA), tertiary amyl methyl ether (TAME), or tertiary amyl ethyl ether (TAEE)
 - b. gasoline and ethanol blended motor fuels (per applicable ASTM fuel standards)
 - E10 (90% gasoline and 10% ethanol)
 - E15 (85% gasoline and 15% ethanol)
 - E85 (85% ethanol and 15% gasoline)
 - other ethanol blends up to and including 100% ethanol
 - c. gasoline and methanol blended motor fuels (per applicable ASTM fuel standards)
 - M85 (85% methanol and 15% gasoline)
 - other methanol blends up to and including 100% methanol
 - Oxinol-50 waiver (90.5% gasoline and 9.5% Oxinol-50 comprised of a 4.75% methanol and 4.75% gasoline-grade tertiary butyl alcohol (GTBA) mixture)
 - Dupont EPA waiver (gasoline with 5% methanol and a minimum of 2.5% cosolvent – the blend may contain a maximum concentration of up to 3.7%, by weight, oxygen in the final fuel)
 - d. biodiesel fuel blends up to 100% biodiesel (per applicable ASTM fuel standards)
- 3) Will not fail for a period of thirty (30) years from date of original delivery by Xerxes due to structural failure (defined as spontaneous breaking or collapse caused by material defects in materials or workmanship).
- 4) Will meet Xerxes' published specifications and will be free of material defects in materials and workmanship for a period of one (1) year following the date of original delivery by Xerxes.

Xerxes warrants to Owner that all Xerxes-manufactured tank accessories, if installed, used and maintained in Canada or the United States in accordance with Xerxes' published specifications, installation instructions and operating guidelines, applicable supplemental materials, and all applicable laws and regulations, will be free of material defects in materials and workmanship for a period of one (1) year following the date of original delivery by Xerxes.

If any tank or accessory is to be removed from an installation, moved and reinstalled at Owner's new location and is intended for active service at the new location, the tank and accessories must be recertified by Xerxes to continue the balance of the limited warranty as originally extended.

The foregoing limited warranty does not extend to tanks or accessories ("individually and collectively Goods") damaged due to acts of God, war, terrorism, or failure of Goods caused, in whole or in part, by misuse, unlawful use, improper installation, storage, servicing or maintenance, or operation in excess of their rated capacity or contrary to their recommended use, whether intentional or otherwise, or any other cause or damage of any kind not the fault of Xerxes. Xerxes only warrants repairs or alterations performed by Xerxes or its authorized contractors performing work authorized in advance, in writing, by Xerxes. Xerxes does not warrant any product, components or parts manufactured by others. All consumable components including but not limited to o-rings and gaskets are excluded from this limited warranty.

Owner's sole and exclusive remedy for breach of warranty is limited at Xerxes' option to: (a) repair of the defective tank or accessory, (b) delivery of a replacement tank or accessory to the point of original delivery, or (c) refund of the original purchase price. No warranty claim will be considered without removing the tank and any accessory from the ground if Xerxes deems it necessary to evaluate a warranty claim. In the event of a breach of warranty claim, a claimant must give Xerxes the opportunity to observe and inspect the installation prior to the removal of any backfill below the tank top, and the removal of the tank and any accessory from the ground, or the claim will be forever barred. All claims must be made in writing within one (1) year after tank or accessory failure or be forever barred. ALL RIGHTS, OBLIGATIONS AND CLAIMS UNDER THIS LIMITED WARRANTY SHALL BE EXCLUSIVELY MADE AND DETERMINED IN THE COURTS OF, AND GOVERNED BY THE LAWS OF, THE STATE OF MINNESOTA, U.S.A., EXCLUDING ITS CONFLICT OF LAW PRINCIPLES.

THE FOREGOING WARRANTY CONSTITUTES XERXES' EXCLUSIVE OBLIGATION AND XERXES MAKES NO OTHER WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, WITH RESPECT TO THE GOODS, OR ANY SERVICE, ADVICE, OR CONSULTATION, IF ANY, FURNISHED TO OWNER BY XERXES OR ITS REPRESENTATIVES, WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. THE SELLER (XERXES) UNDERTAKES NO RESPONSIBILITY FOR THE QUALITY OF THE GOODS, EXCEPT AS OTHERWISE PROVIDED IN THIS CONTRACT. THE SELLER (XERXES) ASSUMES NO RESPONSIBILITY THAT THE GOODS WILL BE FIT FOR ANY PARTICULAR PURPOSE FOR WHICH YOU (OWNER) MAY BE BUYING THESE GOODS, EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT. THE REMEDIES SET FORTH IN THE ABOVE WARRANTY ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON OR ENTITY FOR BREACH OF WARRANTY OR FOR BREACH OF ANY OTHER COVENANT, DUTY, OR OBLIGATION ON THE PART OF XERXES. XERXES SHALL HAVE NO LIABILITY OR OBLIGATION TO ANY PERSON OR ENTITY FOR BREACH OF ANY OTHER COVENANT, DUTY, OR OBLIGATION UNDER THIS WARRANTY EXCEPT AS EXPRESSLY SET FORTH HEREIN. IT IS EXPRESSLY AGREED THAT THIS WARRANTY DOES NOT FAIL OF ITS ESSENTIAL PURPOSE. XERXES SHALL HAVE NO LIABILITY FOR COSTS OF INSTALLATION OR REMOVAL OF GOODS, ENVIRONMENTAL CONTAMINATION, FIRES, EXPLOSIONS, OR ANY OTHER CONSEQUENCES ALLEGEDLY ATTRIBUTABLE TO A BREACH OF WARRANTY, OR INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR OTHER DAMAGES OF ANY DESCRIPTION, WHETHER ANY SUCH CLAIM OR DAMAGES BE BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER TORT, OR OTHERWISE. IN NO EVENT SHALL XERXES' TOTAL LIABILITY HEREUNDER EXCEED THE ORIGINAL PURCHASE PRICE OF THE GOODS WHICH GAVE RISE TO SUCH LIABILITY.

Consumer Notice: This warranty gives you (Owner) specific legal rights. You (Owner) may also have other rights which vary from state to state.

Oxinol™ is a trademark of Atlantic Richfield Company
Xerxes® is a trademark of Xerxes Corporation
ASTM® and ASTM INTERNATIONAL® are trademarks of the American Society for Testing and Materials.

XERXES®
a xcl company

Effective: June 1, 2015
United States



Manufacturer of flexible metal hose and gas piping products

Bio-Diesel - Affirmative Statement of Compatibility

MANUFACTURER	MODEL	UL LISTING	SIZES	BIODIESEL BLEND CONCENTRATION
OmegaFlex	DoubleTrac Flex Connector	UL 2039	¼" thru 3"	B0 to B100

We declare, to be best of our knowledge and belief that is affirmative statement of compatibility and the information contained herein is true, correct, and complete.

Dean W. Rivest
Vice President
OmegaFlex Inc.

Dean W. Rivest P.E.

Authorized Signature

8/28/2018

Date



Your Formula for Success
RESINS | GEL COATS | COLORANTS

aliancys
QUALITY RESINS

November 8, 2018

To: Ryan Franklin
Painted Rhino

From: Michael Siegel
AOC Product Leader – CR/FR Resins

Re: Revchem / Painted Rhino / B100 Biodiesel

Ryan,

The following recommendation is based on email conversations that the end user has now requested a formal letter stating Vipel F764-PTX-20 is suitable for fabricating secondary containment tanks for Biodiesel (B-100).

Secondary containment refers to situations of an accidental release and typically cleaned up in a relative short period of time. This is not seen as constant exposure. By this definition, CR resins like Vipel F764 are certified for use to fabricate underground gasoline storage tanks based on our UL 1316 listing. Therefore for an application of secondary containment, for a properly fabricated and cured corrosion liner, Vipel F764 should perform well. The suggested corrosion liner for this secondary containment tank should consist of 1 ply C veil followed by either chopped strand glass mat or chopped strand roving. The corrosion barrier should be fabricated to a minimum of 0.1 inches in thickness. If the liner surface that is exposed to the B100 Biodiesel is cured in air, wax top coating with F764 is suggested to provide the best service and CR.

On behalf of AOC, we appreciate your interest in our premium line of Vipel Corrosion Resistant Resin.

Best Regards,

Mike Siegel



PAINTED RHINO

11-8-18

To: Neumayer Equipment.

For Site:
Pilot #708
1501 Harrisburg PK
Carlisle, PA 17013

This is a letter of affirmation confirms the secondary containment tanks built by Painted rhino Inc. is compatible with Biofuel B100. The resin being used has been tested to various fuels to UL standards based on AOC's resin listing UL 1316. The secondary containment liner was manufactured to either ASME RTP-1, ASTM D3299, or ASTM D4097 standards.

Further to the details above. This letter is to affirm that Painted rhino conducted a 96-hour continuous test on behalf of Neumayer equipment and the materials used to build the secondary containment sumps. Both single and double wall are compatible and withstand the effects of Biofuel B100 based on the material tested.

The test took place using a scaled version of the sump itself and added two gallons of biofuel B100. The test was monitored for a period of 96 hours. No leaks or ill effects were measured, visible, or present in the test sample.

Thank you,

FROM THE DESK OF RYAN FRANKLIN CEO.

22850 Perry st. Perris, Ca. 92570 p (951) 656-5524 f (951) 656-5535

CERTIFICATE OF COMPLIANCE

Certificate Number 20130201-MH26018
Report Reference MH26018-19990211
Issue Date 2013-FEBRUARY-01

Issued to: AOC L L C
950 HWY 57 E
COLLIERVILLE TN 38017

This is to certify that
representative samples of COMPONENT - FLAMMABLE AND COMBUSTIBLE
LIQUID TANK ACCESSORIES
See Addendum Page

Have been investigated by UL in accordance with the
Standard(s) indicated on this Certificate.

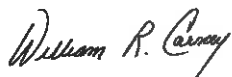
Standard(s) for Safety: See Addendum Page
Additional Information: See the UL Online Certifications Directory at
www.ul.com/database for additional information

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.

The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada:  and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Recognized Component Mark on the product.



William R. Carney, Director, North American Certification Programs

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/contactus



CERTIFICATE OF COMPLIANCE

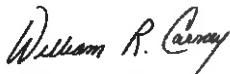
Certificate Number 20130201-MH26018
Report Reference MH26018-19990211
Issue Date 2013-FEBRUARY-01

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Standard(s) for Safety:

UL 1316 - Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures
UL 1746 - Safety for External Corrosion Protection Systems for Steel Underground Storage Tanks

Fiberglass-reinforced resin system for composite and jacketed steel underground tanks, and for glass-fiber-reinforced plastic underground storage tanks for use with petroleum products, alcohols and alcohol-gasoline mixtures, designated "F764-XXX-YY", "Vipel F764-XXX-YY", "F774-XXX-YY" and "Vipel F774-XXX-YY", where X is any letter A through Z and Y is any number 0 through 9.



William R. Carney, Director, North American Certification Programs

UL LLC

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INTERPLASTIC CORPORATION

2015 Broadway Street Northeast
Minneapolis, MN 55413-1775
651.481.6860 Fax 612.331.4235

November 5, 2018

Mr. Ryan Franklin
Painted Rhino
14310 Veterans Way
Moreno Valley, CA 92553

Dear Mr. Franklin:

This letter is regarding your request for corrosion recommendations for secondary containment equipment designed to contain B-100 biodiesel operating at temperatures up to 100 °F (38 °C).

Interplastic Corporation recommends the use of COR75-AQ-460-type polyester resins for the environment listed below, operating at a temperature up to 100 °F (38 °C).

➤ B-100 biodiesel

The corrosion liner should be manufactured according to ASME RTP-1, ASTM D3299, or ASTM D4097 with a resin-rich layer of surfacing veil as an inner surface followed by a fiberglass laminate that is a minimum of 0.10 inches thick. The structural portion of the equipment should be manufactured to design specifications and the resin sufficiently cured to ensure maximum service life.

If you have any questions regarding this or need more information on any of our products in general, please contact us at the following address: **corrosionquestions@interplastic.com**.

Sincerely yours,

INTERPLASTIC CORPORATION

Adam Pederson, Ph.D., Senior Resin Chemist
Corrosion and Specialty Resins

AMP:brh:alk

C: N Andrews, J Cecere, B Gellerman,
D Gerald, B Hazen, M Henricks,
G Prementine, R Schwiderski

Painted Rhino Secondary containment of biodiesel CorRec Franklin, R AMP 110518.doc

All specifications and properties specified above are appropriate. Specifications and properties of material delivered may vary slightly from those given above. Interplastic Corporation makes no representations of fact regarding the material except those specified above. No person has any authority to bind Interplastic Corporation to any representation except those specified above. Final determination of the suitability of the material for the use contemplated is the sole responsibility of the Buyer. Interplastic Corporation's sales representatives are available to assist in developing procedures to fit individual requirements.

Subject: Biodiesel Compatibility

This letter applies to Chromalox immersion heating equipment designed and manufactured using carbon steel and stainless steels as the wetted materials and for use in heating biodiesel up to temperatures of 100°F.

All Chromalox immersion heating equipment meeting this criterion are compatible and suitable for use with all blends of biodiesel from B2 to B100. Testing of compatibility of steel and stainless steel materials have been provided by several sources and is readily available on-line.

Sincerely,



Paul Neilson
Director of Engineering



Veeder-Root
 125 Powder Forest Drive
 P. O. Box 2003
 Simsbury, CT 06070-7684
 USA
 Phone: (860) 651-2700
 Fax: (860) 651-2719

To: Veeder-Root ATG customers
 From: Jeff Kappler, ATG Product Manager
 Date: October 7th, 2013
 Re: Biodiesel compatibility

The products listed in the table below are compatible with the alternative fuels as shown. TLS-450/350/300/2 tank gauge systems can be combined with any of these products to monitor the alternative fuels listed.

Equipment Type	Series or P/N	ASTM D6751 Biodiesel	Ethanol	Methanol
Magnetostrictive Probes (Aluminum)	Series 8463x0, 8473x0	0-20%	0-15%	0-7%
Magnetostrictive Probes (Stainless Steel)	Series 8463x1, 8473x1 <i>846391 -</i>	0-100%	0-100%	0-100%
Continuous Interstitial Tank System	P/N 857280-100, -200, -30x	0-20%	0-15%	0-5%
Electronic Line Leak Detector	Series 8475, 8484, 8494	0-20%	0-15%	0-5%
Groundwater Monitoring	P/N 794380-621, -622, -624	0-20%	0-15%	0-5%
Interstitial Detectors	P/N 794380-xxx P/N 794390-xxx P/N 847990-001, -002 P/N 857060-xxx P/N 857080-xxx	0-20%	0-15%	0-5%
Vapor Monitoring	P/N 394390-700	0-20%	0-15%	0-5%
Red Jacket Submersible Turbine Pump (non-AG)	P/N 41014x-xxx	0-20%	0-10%	0-10%
Red Jacket Submersible Turbine Pump (AG)	P/N 41014x-xxx	0-100%	0-100%	0-100%
Red Jacket FX Leak Detector	FXV series	0-20%	0-15%	0-20%

Jeff Kappler
 ATG Product Manager



the
MILL-ROSE
Company

Clean-Fit Division • 7310 Corporate Blvd. • Mentor, Ohio 44060-4896 • USA

April 18, 2019

To Whom It May Concern,

Please be advised our Blue Monster PTFE Thread Seal Tape has an “A-Excellent” rating for use on Biodiesel (B99)

Thank you,

Tammy Arcaro,
Customer Service Manager

*Manufacturer of Twisted **In** Wire Brushes*
Clean-Fit Products



From: Chuck Liebal
Product Manager
OPW-FCS
3250 Highway 70 Business West
Smithfield, NC 27577

To: Whom it may concern

The following products are compatible with B100 that meets the ASTM standard for this fuel quality:

61T-SS	Painted Stainless Steel Drop Tube
61SALP-MA	Nickel Coated Fill Swivel Adapter
1C-3xxxx	Edge Series Spill Containers
233-4430	Extractors
VPN4X7	4 X 7 Nipple
H12806M	4 X 5 Nipple
61JSK-44CB	Jack Screw Kit
116m-xxx	4" Pipe cap
23-0055	Vent cap
634LPC-0400	Fill cap

Best Regards,

Charles Liebal, Product Manager

A handwritten signature in black ink, appearing to read "Charles Liebal". The signature is fluid and cursive, with a long, sweeping underline.



Veeder-Root
 125 Powder Forest Drive
 P. O. Box 2003
 Simsbury, CT 06070-7684
 USA
 Phone: (860) 651-2700
 Fax: (860) 651-2719

To: Veeder-Root ATG customers
 From: Jeff Kappler, ATG Product Manager
 Date: October 7th, 2013
 Re: Biodiesel compatibility

The products listed in the table below are compatible with the alternative fuels as shown. TLS-450/350/300/2 tank gauge systems can be combined with any of these products to monitor the alternative fuels listed.

Equipment Type	Series or P/N	ASTM D6751 Biodiesel	Ethanol	Methanol
Magnetostrictive Probes (Aluminum)	Series 8463x0, 8473x0	0-20%	0-15%	0-7%
Magnetostrictive Probes (Stainless Steel)	Series 8463x1, 8473x1	0-100%	0-100%	0-100%
Continuous Interstitial Tank System	P/N 857280-100, -200, -30x	0-20%	0-15%	0-5%
Electronic Line Leak Detector	Series 8475, 8484, 8494	0-20%	0-15%	0-5%
Groundwater Monitoring	P/N 794380-621, -622, -624	0-20%	0-15%	0-5%
Interstitial Detectors	P/N 794380-xxx P/N 794390-xxx P/N 847990-001, -002 P/N 857060-xxx P/N 857080-xxx	0-20%	0-15%	0-5%
Vapor Monitoring	P/N 394390-700	0-20%	0-15%	0-5%
Red Jacket Submersible Turbine Pump (non-AG)	P/N 41014x-xxx	0-20%	0-10%	0-10%
Red Jacket Submersible Turbine Pump (AG)	P/N 41014x-xxx	0-100%	0-100%	0-100%
Red Jacket FX Leak Detector	FXV series	0-20%	0-15%	0-20%

Jeff Kappler
 ATG Product Manager



Interoffice Correspondence

Joie L. Folkers

Director of Sales & Marketing

5301 Hollister Dr., Suite 200

Houston, TX 77040

Phone: (713) 690-7777

Fax: (713) 690-2842

e-fax: (425) 732-7528

e-mail: JLF4Ameron@aol.com

jfolkers@ameronfpd.com

5/18/2005

To: Whom It May Concern

Subject: Bio-Diesel Compatibility

All components of Ameron Dualoy® piping systems (Dualoy 3000/L and 3000/LCX) are suitable for use with "bio-diesel". While the term bio-diesel is not specific to an exact formulation of fuel, the chemical compatibility of the thermosetting epoxy resin systems used in the products is suitable for all types of fuels and fluids made from petrochemical and biological sources.

All Dualoy products are Listed by Underwriters Laboratories Inc. and Underwriters Laboratories of Canada.

For further information, please visit our website at www.ameronfpd.com or contact our Engineering Department at +800.542.4070.

Thank you for your interest in Ameron Dualoy fiberglass piping.

Sincerely,

Joie L. Folkers

JLF:sdg



6745 Romiss Court
St. Louis, MO 63134
Phone 314-522-3300
Fax 314-522-3340

CERTIFICATE OF COMPLIANCE

September 4, 2018

**Neumayer Equipment Company
5060 Arsenal Street
Saint Louis, MO 63134**

.....
Neumayer PO #s 57592, 59590, 57530

Ferguson Item – FNW2200 series ball valve (RTFEs seats)

- Teflon Ring Gaskets
- Steel MI Fittings
- Steel Nipples

This is to certify that the item(s) listed above comply with the construction and materials specified by the part number and descriptions listed of the order. Ferguson guarantees that the item(s) listed above meet ASME and ANSI standards, and are suitable for bio-diesel service from B-0 to B-100.

Ferguson Item – FNW712 series BFV (Buna Seat)

This is to certify that the item(s) listed above comply with the construction and materials specified by the part number and descriptions listed of the order. Ferguson guarantees that the item(s) listed above meet ASME and ANSI standards, and are usable for bio-diesel service from B-0 to B-20. Viton with SS disc is preferred but not always relatively available.

Thank you,

Ferguson Enterprises, Inc.
6745 Romiss
St. Louis, Mo. 63134



S. Bravo Systems, Inc.

2929 Vail Avenue
Commerce, CA 90040
1-800-AT-BRAVO
www.sbravo.com

Wednesday - August 25 - 2010

R3 10.21.13

RE: Bravo Fiberglass Sumps and Alternative fuels

This letter is to certify the compatibility of Bravo (S. Bravo Systems, Inc.) Single and Double Wall Fiberglass Containment Sumps with Alternative Fuels such as Biodiesel and Ethanol blended fuels. It also addresses compatibility with DEF Diesel Exhaust Fluid.

Bravo Fiberglass products are engineered with the same UL Listed materials used in the manufacture and certification of Fiberglass Tanks, matching the UL Standard 1316. Since our Fiberglass containment sumps are Built like a Tank, they can withstand continuous fuel exposure to Biodiesel, Ethanol and Alcohol blends without failure.

All DoubleWall Containment Sumps are engineered to be fully compliant with the California State Water Resource Control Board Assembly Bill AB-2481 for DoubleWall Sumps and Continuous Monitoring Systems.

The following Single and Double Wall Containment Sumps manufactured by Bravo Systems in Commerce, California are compatible with Biodiesel and Ethanol fuel blends up to B100 and E100, respectively.

- | | |
|---|--------------------------|
| > B3XX Series Spill Buckets | > B1XXX Series UDC Sumps |
| > B4XX Series Tank Sumps & Covers | > B7XXX Series UDC Sumps |
| > B5XX Series Planter Transition Sumps | > B8XXX Series UDC Sumps |
| > B6XX Series Walkover Transition Sumps | > B9XXX Series UDC Sumps |
| > B7XX Series H-20 Rated Transition Sumps | |
| > B8XX Series Transition Sumps | |

Bravo Systems also certifies that these products are compatible with and approved for use in secondarily containing DEF Diesel Exhaust Fluid.

Each respective Series may be UL Listed in addition to being manufactured of UL recognized materials approved for use in the manufacture of Fiberglass UST tanks. Any other relevant documentation will be located in the documents area of each product's respective webpage.

Please feel free to contact us with any questions you may have at 800-AT-BRAVO.

Additionally, you may find further information at www.sbravo.com.

Sincerely,

Jonathan E. Smith
Director of Brand Management
S. Bravo Systems, Inc.





S. Bravo Systems, Inc.

2929 Vail Avenue
Commerce, CA 90040
1-800-AT-BRAVO
www.sbravo.com

Tuesday - August 30 - 2011

R3 10.21.13

RE: Bravo Fiberglass Entry Fittings and Alternative fuels

This letter is to certify the compatibility of Bravo (S. Bravo Systems, Inc.) Single and Double Wall Fiberglass Sump Entry Fittings with Alternative Fuels such as Biodiesel and Ethanol blended fuels. It also addresses compatibility with DEF Diesel Exhaust Fluid.

Bravo Fiberglass Fittings are engineered with the same UL Listed materials used in the manufacture and certification of Fiberglass Tanks, matching the UL Standard 1316. Since our Fiberglass Fittings are Built like a Tank, they can withstand continuous fuel exposure to, or submersion in Biodiesel, Ethanol and Alcohol blends without failure.

All Fiberglass Fittings designed for DoubleWall Sumps are engineered to be fully compliant with the California State Water Resource Control Board Assembly Bill AB-2481 for DoubleWall Sumps and Continuous Monitoring Systems.

The following Single and Double Wall Fiberglass Fittings manufactured by Bravo in Commerce, California are compatible with Biodiesel and Ethanol fuel blends up to B100 and E100, respectively.

- > **F-Series** "Full Body" Fiberglass Fittings.
- > **FF-Series** "Flange" Fiberglass Fittings.
- > **FPE-Series** Fiberglass Fittings for Flexible pipe.
- > **FLX-Series** Fiberglass Split Retrofit Fittings for Flexible pipe.
- > **FR-Series** Fiberglass Split Test Reducers.
- > **F-Series Retrofit-S & SD-AB** Fiberglass Split Retrofit Fittings.
- > **F-Series D-BLR-S & D-INR-S** Fiberglass Split Retrofit Fittings.
- > **TBF-Series** Fiberglass Tank Bung Fittings.

Bravo also certifies that these products are compatible with and approved for use in secondarily containing DEF Diesel Exhaust Fluid.

Each respective Series may be UL Listed in addition to being manufactured of UL recognized materials approved for use in the manufacture of Fiberglass UST tanks. Any other relevant documentation will be located in the documents area of each product's respective webpage.

Please feel free to contact us with any questions you may have at 800-AT-BRAVO.

Additionally, you may find further information at www.sbravo.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jonathan E. Smith'.

Jonathan E. Smith
Director of Brand Management
S. Bravo Systems, Inc.



Biodiesel Compatibility

Gorman-Rupp Pump Model: GHS2JP3-B (/S1)



Date: April 23, 2019

The Gorman-Rupp (G-R) rotary gear pump model listed herein is manufactured using the listed wetted materials of construction. These materials are generally suitable for use with typical bio-diesel media, such as B99 or B100. There are however, additives that can be added which may be proprietary to various blends and present chemical compatibility issues that are outside of G-R's scope or knowledge. It is important that the pump user perform a complete chemical compatibility analysis against each bio-diesel blend to assure full suitability.

Wetted Construction Materials

<u>Item</u>	<u>Material Description</u>	<u>Reference No.</u>
Exterior	Class 30 Cast Iron	ASTM #A48
Rotor & Idler (gears)	High Strength Iron	ASTM #A536, #A48, or B783
Idler Pin	8620 Alloy Steel: Nickel-Chromium-Molebdenum	ASTM #A29
Shaft	1144 Steel	ASTM #A311
Relief Valve	Ductile Iron 65-45-12	ASTM #A536
Idler Gear Bushing	Carbon Graphite	GRADE P658RCH or Metcarr M-134
Shaft Bushing	Carbon Graphite	GRADE P658RCH or Metcarr M-134
Mechanical Seal	Carbon Rotating Ring	
	Ni-Resist Stationary Seal Seat	
	Viton A Elastomer	
	18-8 Stainless Steel	
Head	Class 30 Cast Iron	ASTM #A48
Head Gasket	Compressed Synthetic Fibers with Buna Binder	
O-Rings	Viton A	

John Hoffner

A handwritten signature in blue ink, appearing to read 'John Hoffner'.

Rotary Gear Product Manager
The Gorman-Rupp Company
600 S. Airport Rd.
Mansfield, Ohio 44903

Compatible Fuels & Applications

NOV Fiber Glass Systems' Red Thread® IIA and Dualoy piping systems, which includes primary and secondary pipe, primary and secondary fittings, coaxial pipe and adhesives are **UL 971 Listed** for the following fuels:

Type A	Type B
100% Reference Fuel #2 (represents Diesel, per UL)	1% HCl
100% Fuel C (represents Unleaded Gasoline, per UL)	1% Nitric Acid
85% Fuel C / 15% MTBE	Sodium Bicarbonate (pH 10)
85% Fuel C / 15% Methanol	Sodium Hydroxide (pH 12)
70% Fuel C / 30% Ethanol	100% Toluene
100% Methanol	
100% Ethanol	
50% Fuel C / 50% Methanol	
50% Fuel C / 50% Ethanol	
100% Premium Leaded Gasoline	
100% Kerosene	

Fuels not specifically tested or UL971 Listed, but **compatible** with Red Thread IIA and Dualoy piping systems, which includes primary and secondary pipe, primary and secondary fittings, coaxial Dualoy and adhesives are as follows:

- E85 (although E85 is not specifically tested, UL did test E30, E50 and E100)
- Biodiesel (all blends)
- Aviation Gas

The 2005 UL 971 Standard, which became effective July 1, 2005, required testing for the following fuel groups:

MV Fuels - Motor Vehicle

Type A - 100% Ref. Fuel #2, 100% Fuel C, 85% Fuel C/15% MTBE, 85% "C"/15% Methanol, 70% "C"/30% Ethanol

Type B - 1% HCl, 1% Nitric Acid, Sodium Bicarbonate (pH 10), Sodium Hydroxide (pH 12)

CT Fuels - Concentrated

Type A - 100% Methanol and 100% Ethanol

Type B - None

HB Fuels - High Blend

Type A - 50% "C"/50% Methanol and 50% "C"/50% Ethanol

Type B - 100% Toluene

AM Fuels - Aviation and Marine

Type A - 100% Premium Leaded Gas and 100% Kerosene

Type B - None

The applications identified in the 2005 UL 971 Standard are as follows:

PC - Primary Carrier

SC - Secondary Containment

NV - Normal Vent

VR - Vapor Recovery

Red Thread IIA and Dualoy pipe, fittings and adhesives have been tested and UL Listed for all fuels and all applications identified in 2005 UL 971. This includes both the DW Bonded Sump Entry Fitting - termination style, and SW Bonded Sump Entry Fitting.

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Sensor Products

Application Guide

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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:

<http://www.nwglde.org>

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Sensor Application Matrix

	Where Used		Category					Product type										Notes				
	Standards	Dispenser Pan Spill Containment STP Annular Space Monitoring Well Oil/Water Separator Tank	Discriminating	Non-Discriminating	Position Sensitive	Level Sensing	Static Testing	Hydrostatic	ASTM D975	Kerosene	Jet Fuel	ASTM D7547	E-15	E-85	ASTM D7467	ASTM D6751	ASTM D975		Renewable (Green) Diesel	Diesel Exhaust Fuel (DEF)	Waste Oil	Motor Oil
	Sensor Description	Form Number																				
	DPS Standard Dispenser Pan	794380-322	x	x																		
	CSS Standard Containment Sump	794380-352		x																		
	DPO Optical Dispenser Pan	794380-320	x																			
	CSO Optical Containment Sump	794380-350		x																		
	MSS Mag Sump Sensor	857080-xxx	x	x																		
	SSDP Solid State Dispenser Pan	794380-321	x	x																		
	SSCS Solid State Containment Sump	794380-351		x																		
	Piping Sump	794380-208	x	x																		
	Position-Sensitive	794380-323	x	x																		
	Interstitial for Fiberglass Tanks, Discriminating	794380-343																				
	Interstitial for Fiberglass Tanks	794380-409																				
	Interstitial for Fiberglass Tanks, High Alcohol	794380-345																				
	Interstitial for Steel Tanks	794380-400																				
	Interstitial for Steel Tanks, Position Sensitive	794380-333		x																		
	Interstitial for Steel Tanks, High Alcohol	794380-430																				
	Interstitial for Steel Tanks, High Alcohol, small footprint	794380-344		x																		
	Hydrostatic Reservoir (Dual Point)	794380-303																				
	Single-Point Hydrostatic Sensor	794380-301																				
Single Point Mini Hydrostatic Reservoir (High Alcohol)	794380-304																					
Vapor	794380-700																					
GroundWater	794380-62X																					
Oil / Water Separator	794690-XXX																					

Discriminating Dispenser Pan and Containment Sump Sensors

These discriminating sensors are installed in a dispenser pan or in a containment sump and will detect the presence of, and differentiate between, hydrocarbons and other liquids. Two types of discriminating sensors (Standard, and Optical) are discussed in this section. A third type, the Mag Sump sensor, is discussed on page 4.

Table 1. Discriminating Sensor Features and Console Compatibility

Item	STANDARD Dispenser Pan (DPS) and Containment Sump (CSS) Sensors	OPTICAL Dispenser Pan (DPO) and Containment Sump (CSO) Sensors
Form Number	794380-322 (DPS); 794380-352 (CSS)	794380-320 (DPO); 794380-350 (CSO)
Operating principle	Conductive elastomer, reed switch/float	Conductive elastomer/optical
Product activation height ^{1, 2}	DPS: Gasoline - 0.005" (0.127mm); Water - low 1.37" (3.4cm), High 7.66" (19.5cm) CSS: Gasoline - 0.005" (0.127mm); Water - low 1.35" (3.4cm), High 12.28" (31.2cm)	Gasoline - 1.34 inches (3.4cm)
Operating temperature:	32 to +140°F (0 to +60°C)	-40 to +140°F (-40 to +60°C)
Dimensions	11.6" (29.4cm) high, 2.2" (5.6cm) dia. (DPS); 22.1" (56.1cm) high, 2.2" (5.6cm) dia. (CSS)	11.6" (29.4cm) high, 2.2" (5.6cm) dia. (DPO); 22.1" (56.1cm) high, 2.2" (5.6cm) dia. (CSO)
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series
Console Interface Module	TLS-350 Series - Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001	TLS-350 Series - Type B Interface Module, 6 sensor input, P/N 329950-001
	TLS-450/8600 Series - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001	
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004	
Maximum number of sensors monitored per console	TLS-350 Series (64); TLS-350J (3)	TLS-350 Series(48)
	TLS-450/TLS-450PLUS (32)	
	TLS4/8601 Series (12)	
Compatible fuels	See "Sensor Application Matrix" on page 1.	

¹For additional third party evaluation data of Standard Types see: http://www.nwglde.org/evals/veeder_root_o.html

²For additional third party evaluation data of Optical Types see: http://www.nwglde.org/evals/veeder_root_n.html

Miscellaneous

- An open sensor triggers a Sensor Out alarm
- Standard cable length: 12 feet (3.6m)
- Universal Sensor Mounting Kit, P/N 330020-012 (see Fig. 1)

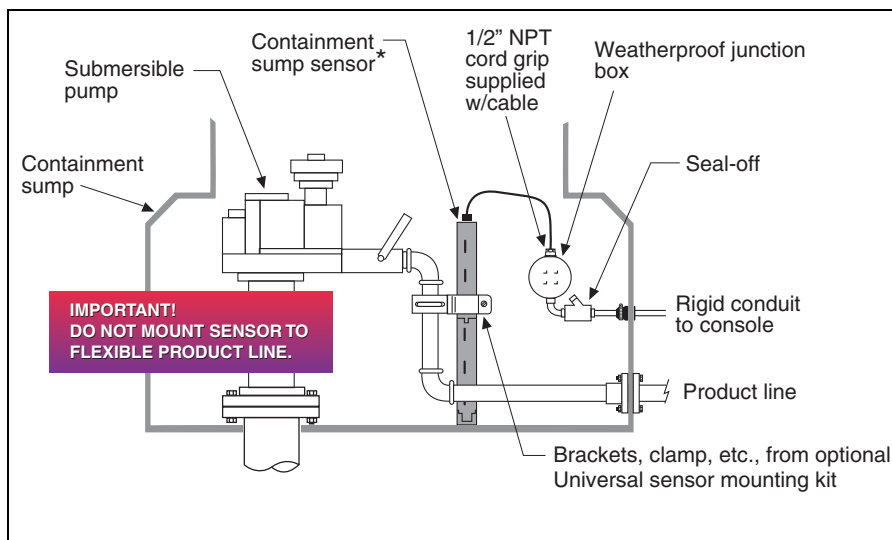


Fig. 1 Example Containment Sump Sensor Installation

Servicing Discriminating Dispenser Pan and Containment Sump Sensors

When replacing Dispenser Filters or servicing Dispensers

The sensor should be removed from the dispenser pan before replacing the filters. All fuel must be cleaned up in the dispenser pan prior to reinstalling the sensor. If the sensor is exposed to fuel during the filter replacement, the sensor may go into a fuel alarm. If this occurs the sensor must be removed from the dispenser pan and the sensor allowed to dry in a well ventilated area for up to 7 days. The recovery time will depend on how long the sensor was exposed to the fuel.

If the sensor has been exposed to diesel fuel or kerosene, it will be necessary to first soak the sensor in Coleman™ fuel for 30 minutes and then set aside to dry in a well ventilated area for up to 7 days. It is advisable that the affected sensor be replaced and taken to a location where the soaking and recovery process can be safely performed. The recovery time will depend on how long sensor was exposed to the diesel fuel or kerosene.

When Sensor is in alarm due to a spill or leak in the containment area

Remove the sensor from the containment area upon arrival at the location. Dry off the sensor and allow it to recover in a well ventilated area for up to 7 days. The recovery time will depend on how long the sensor was exposed to the fuel.

The sensor can be reinstalled in the containment area once the sensor has recovered and the source of the leak repaired. The containment area must be free of fuel.

If the sensor has been exposed to diesel fuel or kerosene, it will be necessary to first soak the sensor in Coleman™ fuel for 30 minutes and then set aside to dry in a well ventilated area for up to 7 days. It is advisable that the affected sensor be replaced and taken to a location where the soaking and recovery process can be safely performed. The recovery time will depend on how long sensor was exposed to the diesel fuel or kerosene.

Biodiesel Blend Limitations

Biodiesel blends that meet ASTM standards D6751 or D7467 are compatible with the respective sensors.

Mag Sump Sensor

The discriminating Mag Sump Sensor detects the presence and amount of water and/or fuel in the containment sump or dispenser pan. Using proven magnetostrictive technology, Veeder-Root's Mag Sump Sensor produces fast reaction and recovery times, which eliminates costly and unwarranted service calls and sensor replacements. And where it's allowed, stations can remain open when only water is detected.

Table 2. Mag Sump Sensor Features and Console Compatibility

Item	Description
Form Number	See Table 3 below
Operating principle	Magnetostrictive probe with dual floats
Product activation height¹	1.368" (3.47cm), gasoline; 1.614" (4.1cm), water; 1.116" (2.83cm) gasoline on 7" (17.8cm) of water (fuel alarm w/water present)
Operating temperature	-40 to +140°F (-40 to +60°C)
Dimensions	-111, -121, -211, -221 versions 22" (55.9cm) high, 2.2" (5.6cm) dia.; -112, -122, -212, -222 versions 34" (86.4cm) high, 2.2" (5.6cm) dia.
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series
Console Interface Module	TLS-350 Series - Smart Sensor Interface Module, 8 sensor input, -P/N 329356-004
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://www.nwglde.org/evals/veeder_root_x.html

Table 3. Mag Sump Sensor Form Numbers

Form Number	Product	Measurement Limit	Leak Detect	Fixed Threshold
857080-111	Gasoline & Diesel	12" (30.5cm)	No	No
857080-112		24" (61cm)	No	No
857080-121		12" (30.5cm)	No	Yes**
857080-122		24" (61cm)	No	Yes**
857080-211		12" (30.5cm)	Yes	No
857080-212		24" (61cm)	Yes	No
857080-221		12" (30.5cm)	Yes	Yes**
857080-222		24" (61cm)	Yes	Yes**

**This version has a fixed water warning of 1.7" (4.32cm), water alarm of 3.0" (7.6cm) and an alarm upgrade delay of 48 hours.

Miscellaneous

- Universal Sensor Mounting Kit (optional) - P/N 330020-012 (see Fig. 2)
- Standard cable length - 10 feet (3m)

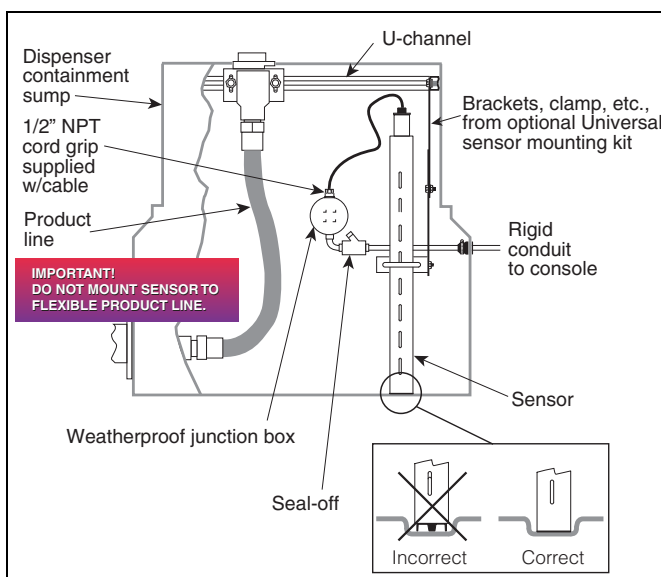


Fig. 2 Example Mag Sump Sensor Installation

Solid-State Dispenser Pan and Containment Sump Sensors

These solid-state, non-discriminating sensors are installed in a dispenser pan or in a containment sump and will detect the presence of a liquid. Optical liquid level sensing technology means no moving parts and a lower temperature operating limit.

Table 4. Non-Discriminating Sensor Features and Console Compatibility

Item	Description
Form Number	794380-321 (DP); 794380-351 (CS)
Operating principle	Optical
Product activation height¹	Gasoline or Water - 1.02 inches (2.6cm)
Operating temperature:	-40 to +140°F (-40 to +60°C)
Dimensions	11.6" (29.4cm) high, 2.2" (5.6cm) dia. (DP); 22.1" (56.1cm) high, 2.2" (5.6cm) dia. (CS)
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series
Console Interface Module	TLS-350 Series - Type A Sensor Interface Module, 8 sensor input, P/N 329956-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (64)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data of Standard Types see: http://www.nwglde.org/evals/veeder_root_r.html

Miscellaneous

- An open sensor triggers a Sensor Out alarm
- Standard cable length: 12 feet (3.66m)
- Universal Sensor Mounting Kit, P/N 330020-012 (see Fig. 1)

Piping Sump Sensor

The Piping Sump Sensor is installed in a tank piping sump and will detect the presence of a liquid. An open sensor triggers a Sensor Out alarm.

Table 5. Piping Sump Sensor Features and Console Compatibility

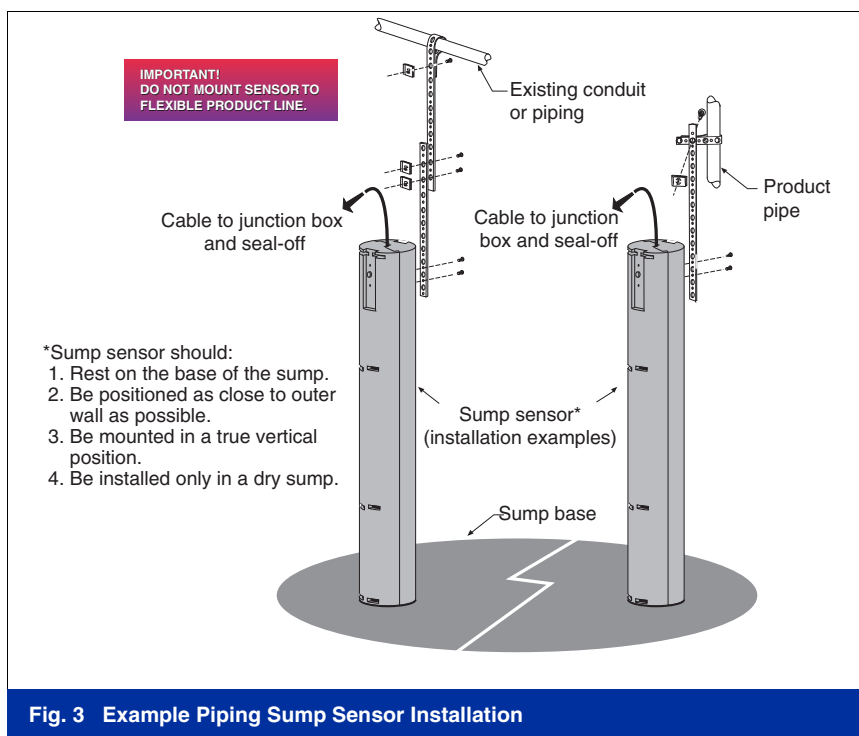
Item	Description
Form number ¹	794380-208
Operating principle	Float/magnetic reed switch
Product activation height ²	Gasoline - 1.84 inch (4.67cm)
Operating temperature	32 to +140°F (0 to +60°C)
Dimensions	12" (30.5cm) high, 1.9" (4.8cm) diameter
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - No input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series, (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹Sensors 794380-208 and -209 are direct replacements for sump sensor 794380-206

²For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_m.html

Miscellaneous

- Installation kit 330020-076 (see Fig. 3)
- Standard cable length: 12 feet (3.66m)



Stand-Alone Dispenser Pan Sensors

The Stand-Alone Dispenser Pan Sensors immediately shut down AC power to the dispenser when fluid is detected in the dispenser pan. These sensors control and shut down power to the dispenser without the need for additional relays, circuitry, wiring, or consoles. The separate sensor control interface ensures intrinsically-safe integrity in a Class I Div. 1 Group D; Class I Zone 0 IIA hazardous area. Two models of Stand-Alone Dispenser Pan sensors are available.

Table 6. Stand-Alone Dispenser Pan Sensor Features and Console Compatibility

Item	Dispenser Pan Stand-Alone Sensor Non-Discriminating	Dispenser Pan Stand-Alone Sensor Discriminating
Form Number	847990-001	847990-002
Operating principle	Product permeable, reed switch/float	Product permeable, reed switch/float
Product activation height ¹	Gasoline - 1.71" (4.34cm); Water - 1.62" (4.11cm)	Gasoline - 0.03" (0.76mm); Water - 6.39" (16.23cm)
Operating temperature:	32 to +140°F (0 to +60°C) freezing liquids; -13 to +140°F (-25 to +60°C) for hydrocarbons	
Compatible fuels	See "Sensor Application Matrix" on page 1.	

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_p.html

Miscellaneous

- Latching alarm circuitry ensures dispenser can't be restarted until hazardous condition has been corrected.
- Connects directly to dispenser wiring.
- Controls most manufacturer's dispensers.
- Cable length: 5 feet (1.5m).
- Sensor dimensions: 11.6" (29.5cm) high, 2.2" (5.6cm) dia.
- Control Interface dimensions: 9.4" (23.9cm) high, 2.2" (5.6cm) dia.

Installation Accessories

- Universal Sensor Mounting Kit, P/N 330020-012, contains sensor mounting brackets and screws (see Fig. 4).

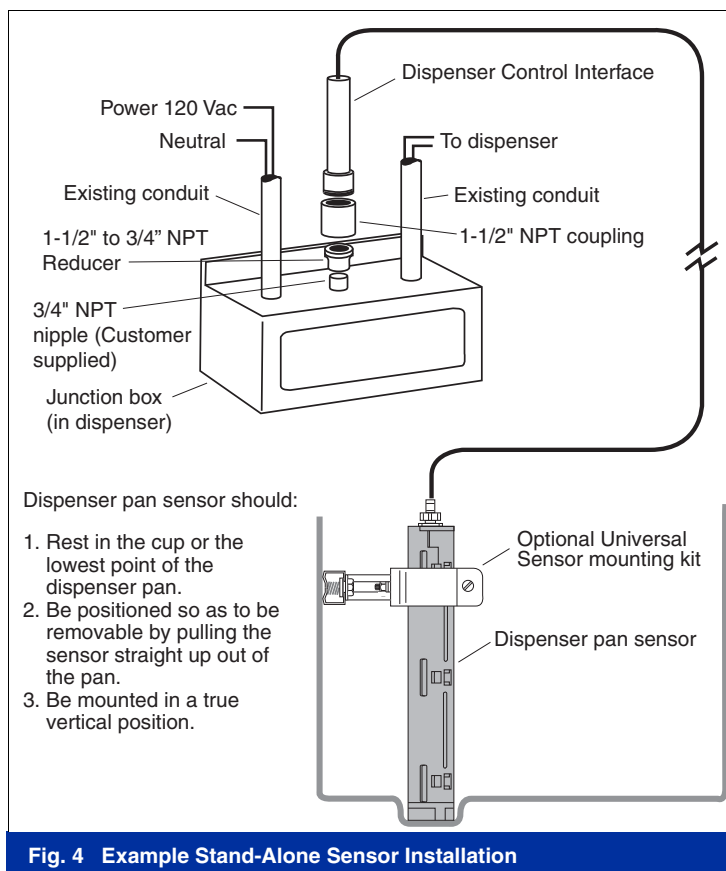


Fig. 4 Example Stand-Alone Sensor Installation

Position-Sensitive Sensor

Compatible with fuel blends up to 85%Ethanol!

The Position-Sensitive Sensor is installed in a pan/sump and incorporates a float switch to detect water and/or hydrocarbons. A Sensor Out alarm is triggered when sensor is moved off bottom of the pan/sump.

Table 7. Position-Sensitive Sensor Features and Console Compatibility

Item	Description
Form number	794380-323
Operating principle	Float switch
Product activation height ¹	1.52" (3.86cm)
Operating temperature	32 to +140°F (0 to +60°C)
Dimensions	12" (30.5cm) high, 2.2" (5.6cm) diameter
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - No input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://www.nwglde.org/evals/veeder_root_w.html

Miscellaneous

- Universal Sensor Mounting Kit (optional) - P/N 330020-012 (see Fig. 5)
- Standard cable length: 12 feet (3.66m)

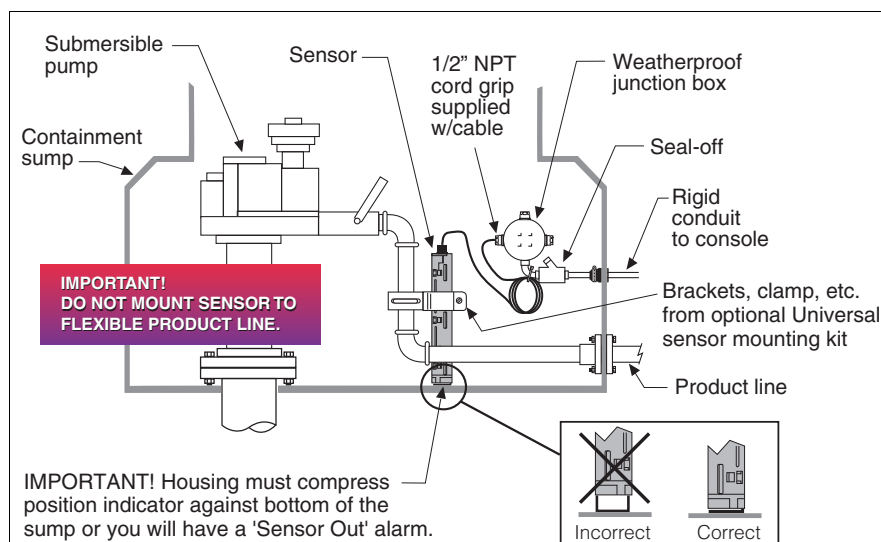


Fig. 5 Example Position-Sensitive Sensor Installation

Discriminating Interstitial Sensor for Double-Wall Fiberglass Tanks

The Discriminating Interstitial Sensor for double-wall fiberglass tanks uses solid-state liquid level sensing technology to detect liquid in the interstitial space of the tank. The sensor can differentiate between hydrocarbons and other liquids. An open sensor triggers a Sensor Out alarm.

Table 8. Discriminating Interstitial Sensor for Double-Wall Fiberglass Tanks Features and Console Compatibility

Item	Description
Form Number	794380-343 (includes 25 ft [7.6m] cable; for 4 - 10 ft [1.2 to 3m] I.D. fiberglass tanks)
Operating principle	Optical sensor and conductivity
Product activation height¹	Gasoline <0.1 inch (0.25cm); Water <0.1 inch
Operating temperature:	14 to +140°F (-10 to +60°C)
Dimensions	4.3" (11cm) length, 1.5" (3.8cm) width, 0.5" (1.3cm) thick
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series
Console Interface Module	TLS-350 Series - Type A Sensor Interface Module, 8 sensor input, P/N 329956-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (64)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data of Standard Types see: http://nwgldc.org/evals/veeder_root_u.html

Miscellaneous

- Installation example (see Fig. 6)

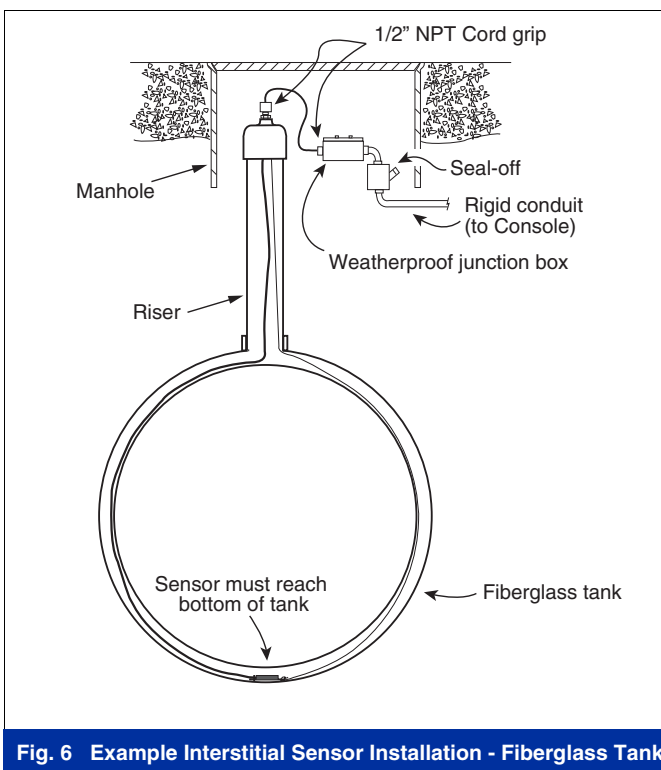


Fig. 6 Example Interstitial Sensor Installation - Fiberglass Tank

Interstitial Sensors for Double-Wall Fiberglass Tanks

The non-discriminating interstitial sensor for fiberglass tanks detects the presence of liquid in the interstitial space of the tank. An open sensor triggers a Sensor Out alarm.

Table 9. Interstitial Sensor for Double-Wall Fiberglass Tanks Features and Console Compatibility

Item	Description
Form number	794380-409 (includes 25 ft [7.6m] cable; for 4 - 12 ft [1.2 to 3.6m] I.D. fiberglass tanks)
Operating principle	Float switch
Product activation height¹	0.72 inches (1.84 cm)
Operating temperature	-4 to +140°F (-20 to +60°C)
Dimensions	2.2" (5.6cm) length, 1.3" (3.3cm) width, 0.6" (1.5cm) thick
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - No input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_m.html

Miscellaneous

- Installation example (see Fig. 6)

Interstitial High Alcohol Sensor for Double-Wall Fiberglass Tanks

Compatible with fuel blends up to 85%Ethanol!

The interstitial sensor for double-wall fiberglass tanks with high alcohol product uses solid-state liquid level sensing technology to detect liquid in the interstitial space of the tank. An open sensor triggers a Sensor Out Alarm.

Table 10. Interstitial High Alcohol Sensor for Double-Wall Fiberglass Tanks Features and Console Compatibility

Item	Description
Form Number	794380-345 (includes 25 ft [7.6m] cable; for 4 - 10 ft [1.2 to 3m] I.D. fiberglass tanks)
Operating principle	Optical sensor
Product activation height¹	Gasoline <0.2" (0.5cm); Water <0.2 inch
Operating temperature:	14 to +140°F (-10 to +60°C)
Dimensions	4.3" (11cm) length, 1.5" (3.8cm) width, 0.5" (1.3cm) thick
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series
Console Interface Module	TLS-350 Series - Type A Sensor Interface Module, 8 sensor input, P/N 329956-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (64)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data of Standard Types see: http://nwgldc.org/evals/veeder_root_zd.html

Miscellaneous

- Installation example (see Fig. 6)

Interstitial Sensors for Steel Tanks

The Interstitial Sensor for steel tanks detects the presence of liquid between the double walls of the tank. An open sensor triggers a Sensor Out alarm.

Table 11. Interstitial Sensor for Steel Tanks Features and Console Compatibility

Item	Description
Form number	794380-420 (16 foot [4.9m] cable); 794380-460 (30 foot [9.1m] cable)
Operating principle	Float switch
Product activation height¹	1.59 inches (4.05 cm)
Operating temperature	-4 to +140°F (-20 to +60°C)
Dimensions	2.5" (6.4cm) high, 1.5" (3.8cm) diameter
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - No input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwgldc.org/evals/veeder_root_m.html

Miscellaneous

- Riser cap and adapter kit (2") - P/N 312020-928
- Installation example (see Fig. 7)

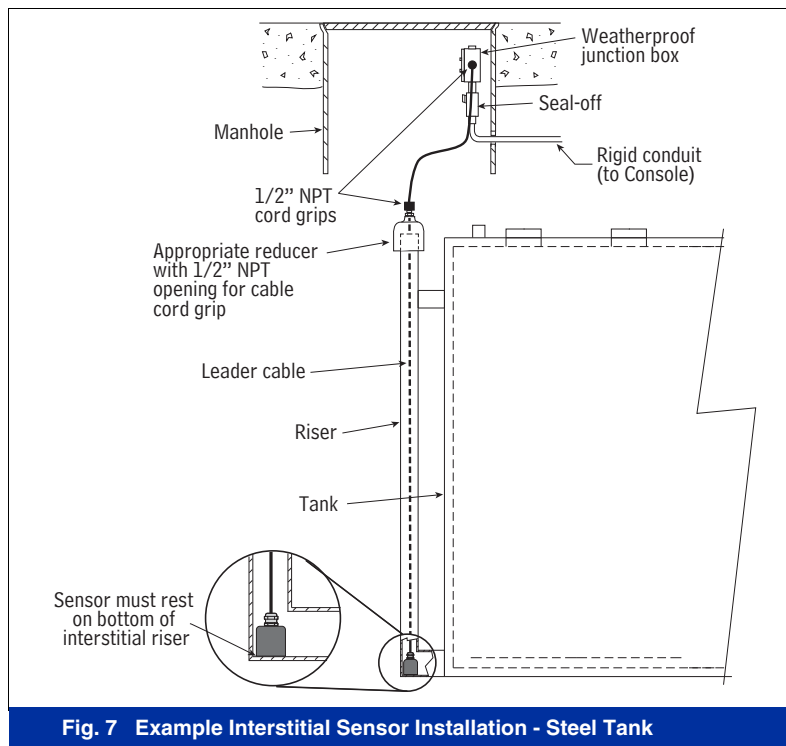


Fig. 7 Example Interstitial Sensor Installation - Steel Tank

Position Sensitive Interstitial Sensor for Steel Tanks

Compatible with fuel blends up to 85%Ethanol!

The sensor for steel tanks detects the presence of liquid between the double walls of the tank. In addition, it provides an alarm when the sensor is not positioned correctly on the bottom of the interstitial space.

Table 12. Position Sensitive Interstitial Sensor for Steel Tanks Features and Console Compatibility

Item	Description
Form number	794380-333 (15 Foot cable [4.6m])
Operating principle	Float switch
Product activation height	1.25" (3.2cm)
Operating temperature	-4 to +140°F (-20°C to +60°C) (hydrocarbons, non-freezing water)
Dimensions	3.5" (8.9cm) High, 1.75" (4.4cm) Diameter
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - No input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12), AC or DC versions of TLS4b only monitor a maximum of (6)
Compatible fuels	See "Sensor Application Matrix" on page 1.

Miscellaneous

- Riser cap and adapter kit (2" [50mm]) - P/N 312020-928
- Installation example (see Fig. 8) and control drawing 577014-041

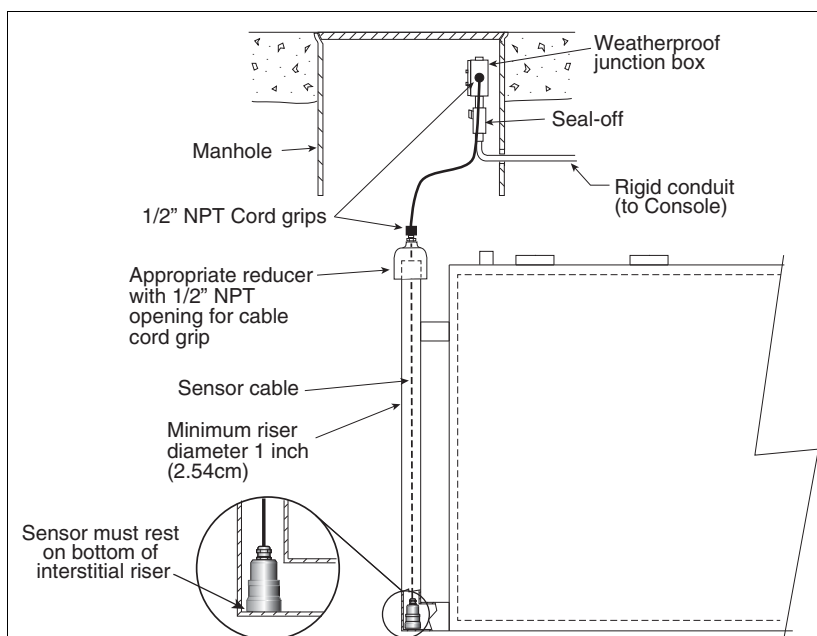


Fig. 8 Example Position Sensitive Interstitial Sensor for Steel Tanks

Interstitial High Alcohol Sensors for Steel Tanks

Compatible with fuel blends up to 85%Ethanol!

The Interstitial Sensor for steel tanks with high alcohol product detects the presence of liquid between the double walls of the tank. An open sensor triggers a Sensor Out alarm.

Table 13. Interstitial High Alcohol Sensors for Steel Tanks Features and Console Compatibility

Item	Description
Form number	794380-430 (15 foot [4.6m] cable)
Operating principle	Float switch
Product activation height ¹	0.95" (2.4cm)
Operating temperature	-4 to +140°F (-20 to +60°C)
Dimensions	2.5" (6.4cm) high, 1.5" (3.8cm) diameter
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - No input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_zb.html

Miscellaneous

- Riser cap and adapter kit (2" [50mm]) - P/N 312020-928
- Installation example (see Fig. 9)

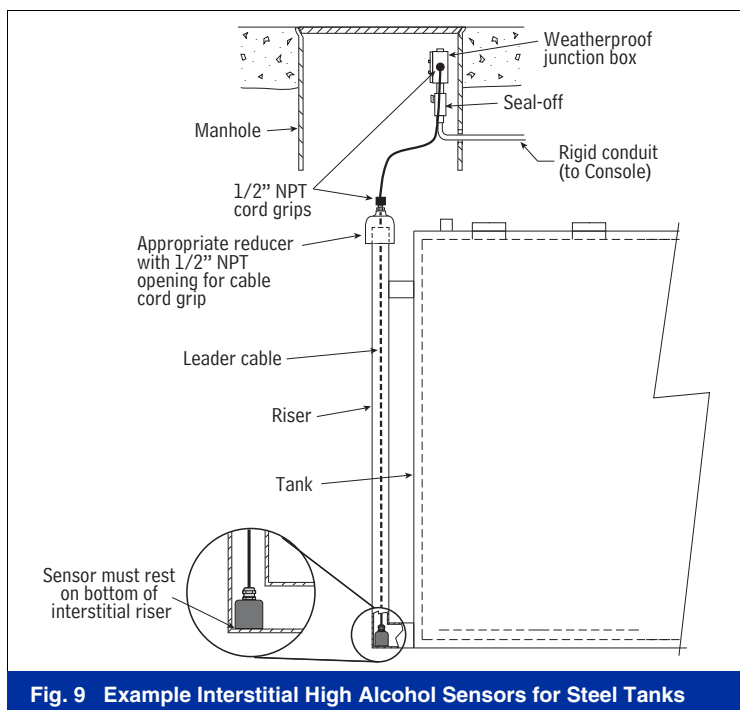


Fig. 9 Example Interstitial High Alcohol Sensors for Steel Tanks

MicroSensor

Compatible with fuel blends up to 85%Ethanol!

The non-discriminating small, easy to install solid-state MicroSensor is designed detect liquid in the interstitial space of a steel tank or a fill riser containment. An open sensor triggers a Sensor Out alarm.

Table 14. MicroSensor Features and Console Compatibility

Item	Description
Form number	794380-344 (25 foot [7.6m] cable)
Operating principle	Optical
Product activation height¹	0.95" (2.4cm)
Operating temperature	-25.6 to +140°F (-32 to +60°C)
Dimensions	0.63" (16mm) max. diameter, 2" (51mm) long
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series
Console Interface Module	TLS-350 Series, Type A Sensor Interface Module, 8 sensor input, P/N 329956-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_u.html

Miscellaneous

- Installation examples Fig. 10 and Fig. 11.

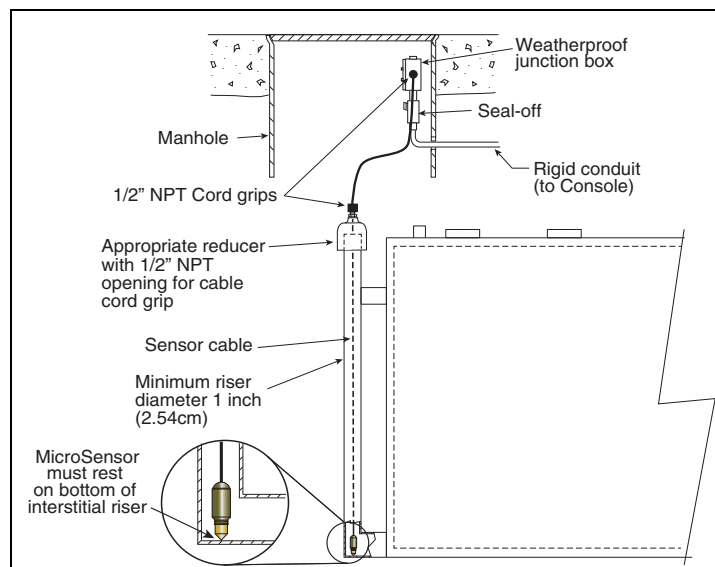


Fig. 10 Example Interstitial MicroSensor Installation - Steel Tank

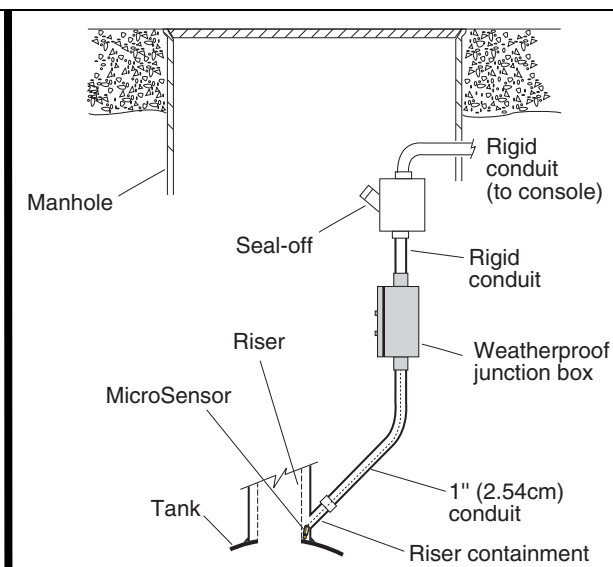


Fig. 11 Example MicroSensor Installation - Riser

Hydrostatic Reservoir Sensor

The Hydrostatic Reservoir Sensor accurately detects fluid level change in the reservoir and interstice of a double-wall storage tank. This sensor is available in a dual-point or single-point configuration. The Dual-Point version is ideal for high groundwater areas, and can differentiate between a high level alarm condition and a low level alarm condition. If an inner-wall leak occurs, the brine seeps into the tank triggering a low level alarm, if an outer wall leak occurs, fluid seeps into the interstice triggering a high level alarm. The Single-Point version can be used in low groundwater locations. If an inner-wall leak occurs, the brine seeps into the tank triggering a fuel alarm, or if the outer wall leaks, the brine seeps out of the tank interstice triggering a fuel alarm.

Table 15. Hydrostatic Reservoir Sensor Features and Console Compatibility

Item	Description
Form number	794380-301 Single-Point (12 foot [3.7m] cable); 794380-303 Dual-Point (12 foot [3.7m] cable)
Operating principle	Float switch
Product activation height¹	1.74" (4.4cm) Single-Point; Low 1.2" (3cm), High 13.13" (33.4cm) Dual-Point
Reservoir solutions	Up to 50% ethylene glycol in water; up to 50% propylene glycol in water; salt brine solution of up to 30% CaCl
Operating temperature	-13 to +122°F (-25 to +50°C)
Dimensions	6" (15cm) high, 2.5" (6.4cm) dia. Single-Point; 17.3" (44cm) high, 2.5" (6.4cm) dia. Dual-Point
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - no input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_q.html

Miscellaneous

- Interstitial sensor riser cap and adapter kit, 2" P/N 312020-928
- Sensor, fiberglass interstitial sensor installation kit P/N 330020-436
- Installation example (see Fig. 12)

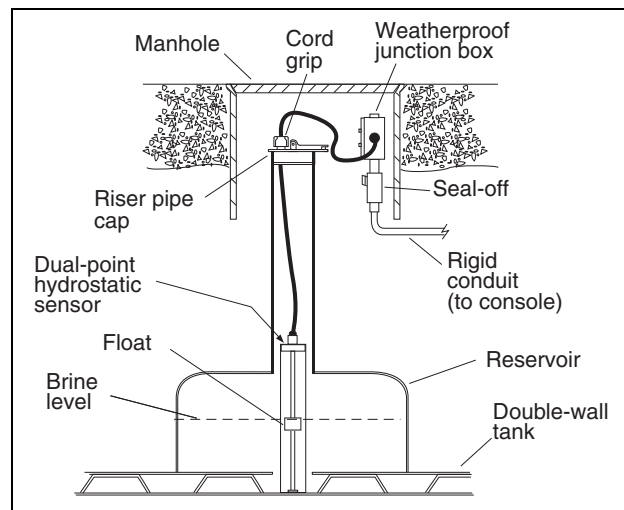


Fig. 12 Example Hydrostatic Dual-Point Sensor Installation

Single-Point Mini Hydrostatic Sensor for Double Wall Sumps

The Single-Point Mini Hydrostatic sensor accurately detects fluid level change in the interstice reservoir of a double-wall sump. If a leak occurs in the sump interstice, the brine seeps out of the reservoir triggering a low level alarm. An open sensor triggers a Sensor Out alarm.

Table 16. Mini Hydrostatic Reservoir Sensor Features and Console Compatibility

Item	Description
Form number	794380-304 (8 foot [2.4m] cable)
Operating principle	Float switch
Product activation height¹	0.793" (2cm)
Reservoir solutions	Up to 50% ethylene glycol in water; up to 50% propylene glycol in water; salt brine solution of up to 30% CaCl
Operating temperature	-13 to +122°F (-25 to +50°C)
Dimensions	2.5" (6.4cm) high, 1.5" (3.8cm) dia.
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series, TLS-300 Series
Console Interface Module	TLS-300 Series - no input module required
	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-300 Series (8)
	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_zs.html

Miscellaneous

- Installation example (see Fig. 13)

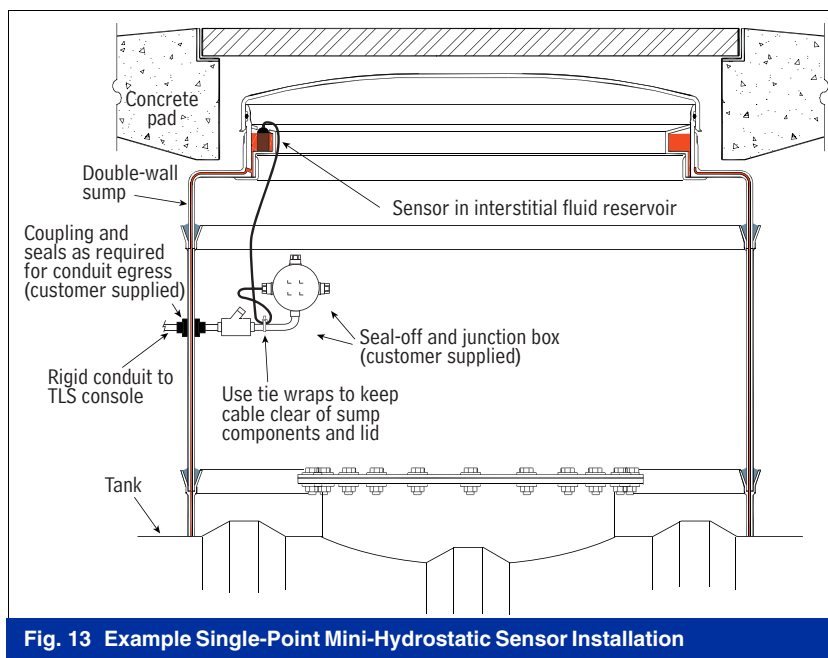


Fig. 13 Example Single-Point Mini-Hydrostatic Sensor Installation

Vapor Sensor

The Vapor Sensor detects hydrocarbon vapor exceeding the programmed threshold limit in the monitoring well. An open sensor triggers a Sensor Out alarm.

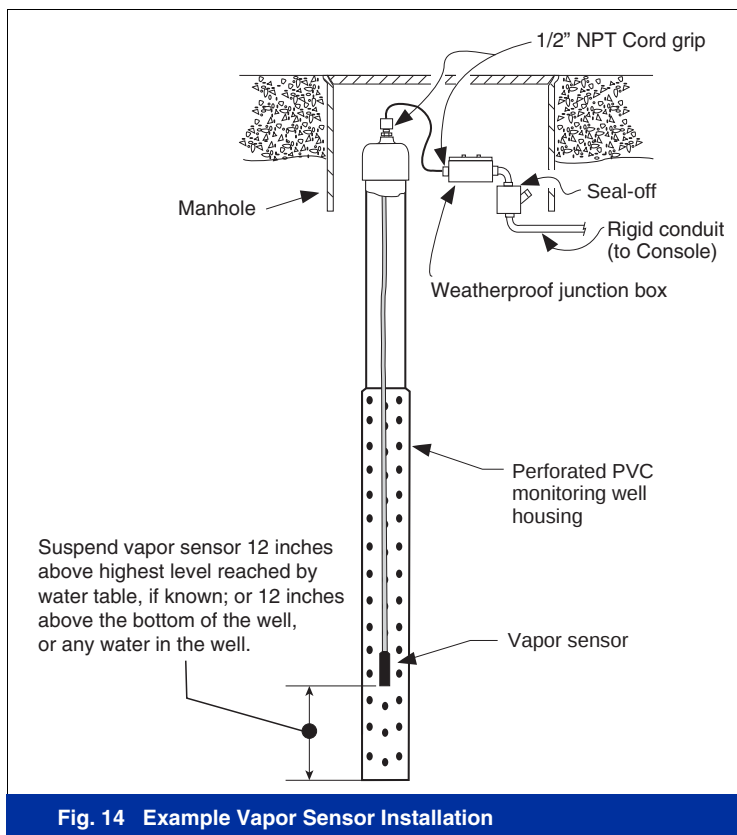
Table 17. Vapor Sensor Features and Console Compatibility

Item	Description
Form number	794390-700
Operating principle	Adsistor
Product activation ¹	500 ppm
Operating temperature	-4 to +140° (-20 to +60°C)
Dimensions	4.9" (12.4cm) long, 1.1" (2.8cm) dia.
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series,
Console Interface Module	TLS-350 Series, Vapor Sensor Interface Module, 5 sensor input, P/N 329357-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (30)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_t.html

Miscellaneous

- 4-inch (100mm) cap and adapter kit - P/N 312020-939
- Installation example (see Fig. 14)



Groundwater Sensor

The Groundwater Sensor detects free hydrocarbon product on the water table in up to 20 feet deep monitoring wells. Hydrocarbons in the C₅ to C₁₆ range trigger a Fuel alarm. Water table dropping below sensor triggers a Water Out alarm. An open sensor triggers a Sensor Out alarm.

Table 18. Groundwater Sensor Features and Console Compatibility

Item	Description
Form number	794380-621 (7 - 10 foot [2 - 3m] wells); 794380-622 (10 - 15 foot [3 - 4.5m] wells); 794380-624 (15 - 20 foot [4.5 - 6m] wells);
Operating principle	Electrical conductivity
Product activation height¹	0.02" (.05cm)
Operating temperature	32 to +104°F (0 to +40°C)
Dimensions	4.9" (12.4cm) long, 1.1" (2.8cm) dia.
Compatible consoles	TLS-450/TLS-450PLUS, TLS4/8601 Series, TLS-350 Series,
Console Interface Module	TLS-350 Series, Interstitial/Liquid Sensor Interface Module, 8 sensor input, P/N 329358-001
	TLS-450/TLS-450PLUS - Universal Sensor Module (USM), 16 sensor input, P/N 332812-001
	TLS4/8601 Series - Universal Sensor Input Output Module (USIOM) (AC ver.), 12 sensor input, P/N 333238-001; (AC ver.), 6 sensor input, P/N 333238-002; (DC ver.), 12 sensor input, P/N 333238-003; (DC ver.), 6 sensor input, P/N 333238-004
Maximum number of sensors monitored per console	TLS-350 Series (48)
	TLS-450/TLS-450PLUS (32)
	TLS4/8601 Series (12)
Compatible fuels	See "Sensor Application Matrix" on page 1.

¹For additional third party evaluation data see: http://nwglde.org/evals/veeder_root_s.html

Miscellaneous

- 4-inch (100mm) cap and adapter kit - P/N 312020-939
- Installation example (see Fig. 15)

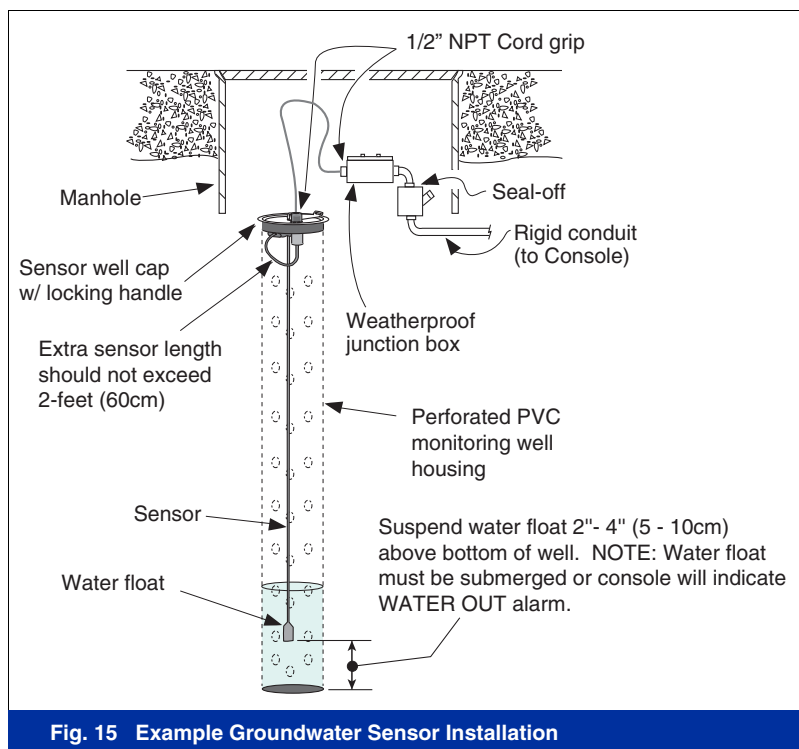


Fig. 15 Example Groundwater Sensor Installation

Direct Burial Cable

The Veeder-Root direct burial cable system provides everything needed for an alternative wiring installation method for use with our probes and sensors. Installation of buried cable should only be done in those locations where existing conduit is not available, and where local codes permit the use of buried cable instead of conduit, and epoxy splices instead of junction boxes. Before considering buried cable runs, check with the local authority having jurisdiction to be sure that direct burial practices are acceptable at your location.

If you are unfamiliar with direct burial techniques, you should consider either of two Veeder-Root kits:

- Direct Burial Cable Site Preparation kit (P/N 848100-500) which contains the Direct Burial Installation Manual, a splice kit installation manual and the 890-SL joint sealant instruction guide.
- Direct Burial Cable Site Demonstration kit (P/N 848100-502) which contains one splice kit with installation instructions, a 890-SL joint sealant instruction guide, a 6-inch piece of 2 conductor direct burial wire.

After reviewing the contents of these kits, and after verifying local code requirements, you should be much more informed as to the applicability of this wiring method for your site.

Direct Burial Cable Specifications

2-CONDUCTOR, SHIELDED CABLE		3-CONDUCTOR, SHIELDED CABLE	
Item	Description	Item	Description
Primaries		Primaries	
Conductor	#18 AWG (19/30) tinned copper	Conductor	#18 AWG (19/30) tinned copper
Insulation Type	Fluoropolymer	Insulation Type	Fluoropolymer
Primary O.D.	0.063" (1.6mm) nominal	Primary O.D.	0.063" (1.6mm) nominal
Drain	#20 AWG (7/28) tinned copper, located under the tape	Drain	#20 AWG (7/28) tinned copper, located under the tape
Jacket		Jacket	
Insulation type	Fluoropolymer	Insulation type	Fluoropolymer
Final O.D.	0.161" (4.1mm)	Final O.D.	0.171" (4.34mm)
Color	Red tint	Color	blue tint
UL temp rating	257°F (125°C)	UL temp rating	392°F (200°C)

Direct Burial Cable Components

Order equal lengths of filler rod and either type cable. Refer to V-R manual 576013-858 to estimate length.

- Filler rod - P/N 848100-1XX (lengths of 100 to 2000 feet [30.5 to 610m], in increments of 100 feet [30.5m])
- Filler rod installation tool P/N 848100-904 (adjusts to 1/8" [0.32cm], 1/4" [6.4mm], 3/8" [9.5mm], or 1/2" [12.7mm] saw cuts)
- 2-conductor cable - P/N 848100-2XX (lengths of 100 to 2000 feet (30.5 to 610m), in increments of 100 feet)
- 3-conductor cable - P/N 848100-3XX (lengths of 100 to 2000 feet, in increments of 100 feet)
- Cartridge of 890-SL sealant P/N 848100-800 (60 linear feet [18m] in 1/4" [6.4mm] wide cut)
- 4.5 gallon (17 liter) can of 890-SL sealant P/N 848100-805 (1200 linear feet [365m] in 1/4" [6.4mm] wide cut)
- Sealant cartridge gun, manual driven - P/N 8481021 (for use with P/N 848100-800 cartridge)
- Sealant bulk gun, air driven - P/N 848100-903 (for use with P/N 848100-805 4.5 gallon (17 liter) can)

Direct Burial Cable Installation Example

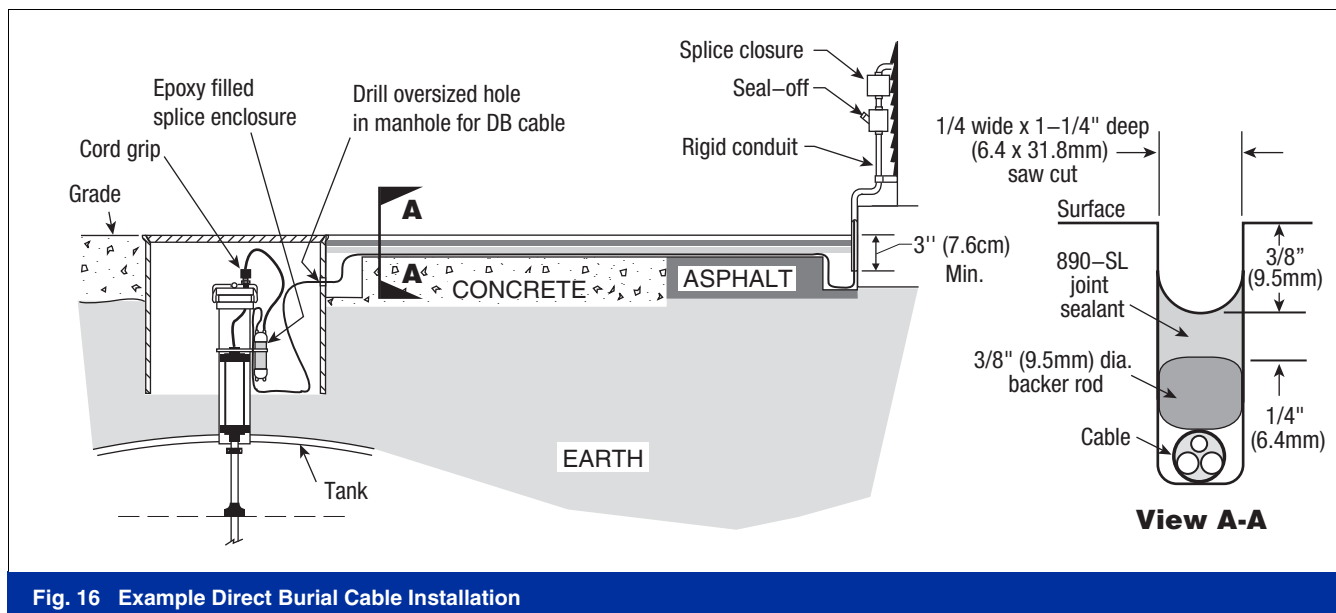


Fig. 16 Example Direct Burial Cable Installation

Appendix A - Sensor Type Programming Table

The table below is helpful when selecting Sensor Type (for TLS-3XX Series consoles) or Sensor Model (for TLS4/8601 and TLS-450 and TLS-450PLUS consoles) during sensor setup.

Sensor Type Programming Table for TLS Consoles

Sensor	Form Number	Sensor Category (Location)	TLS-3XX Series Sensor Type	TLS4/8601 Series TLS-450 and TLS-450PLUS Sensor Model
Discriminating Dispenser Pan and Sump Sensors - Standard	794380-322 (DPS), 794380-352 (CSS)	Sump/Pan	Liquid Sensor Setup: Sensor Type - Dual Float Discriminating	Device Setup Liquid Sensor: Model - Dual Float Discriminating
Discriminating Dispenser Pan and Sump Sensors - Optical	794380-320 (DPO), 794380-350 (CSO)	Sump/Pan	3-Wire C.L. Setup: Sensor Mode - Standard	Device Setup Type B Sensor: Model - Ultra/Z-1 (Standard)
Mag Sump Sensor	857080-XXX	Sump/Pan	Smart Sensor Setup: Sensor Category- Mag Sensor	Device Setup MAG Sensor
Solid-State Dispenser Pan and Containment Sump	794380-321 (DP); 794380-351 (CS)	Sump/Pan	2-Wire C.L. Setup: Sensor Type - Discrim Interstitial	Device Setup Type A Sensor: Model - Discrim. Interstitial
Piping Sump	794380-208	Sump/Pan	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
Position-Sensitive Sensor High Alcohol Compatible!	794380-323	Sump/Pan	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
Discriminating Interstitial Sensor for Double-Wall Fiberglass Tanks	794380-343	Annular Space	2-Wire C.L. Setup: Sensor Type - Discrim Interstitial	Device Setup Type A Sensor: Model - Discrim. Interstitial
Interstitial Sensors for Double-Wall Fiberglass Tanks	794380-409	Annular Space	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
Interstitial High Alcohol Sensor for Double-Wall Fiberglass Tanks High Alcohol Compatible!	794380-345	Annular Space	2-Wire C.L. Setup: Sensor Type - Ultra 2	Device Setup Type A Sensor: Model - Ultra 2
Interstitial Sensors for Steel Tanks	794380-4X0	Annular Space	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
Position Sensitive Interstitial Sensor for Steel Tanks High Alcohol Compatible!	794380-333	Annular Space	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
Interstitial High Alcohol Sensors for Steel Tanks High Alcohol Compatible!	794380-430	Annular Space	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
MicroSensor High Alcohol Compatible!	794380-344	Annular Space	2-Wire C.L. Setup: Sensor Type - Discrim Interstitial	Device Setup Type A Sensor: Model - Discrim Interstitial
Hydrostatic Reservoir	794380-301 (1 float)	Annular Space	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
	794380-303 (2 float)	Annular Space	Liquid Sensor Setup: Sensor Type - Dual Float Hydrostatic	Device Setup Liquid Sensor: Model - Dual Float Hydrostatic
Single-Point Mini Hydrostatic Sensor for Double Wall Sumps	794380-304	Annular Space	Liquid Sensor Setup: Sensor Type - Tri-State Liquid	Device Setup Liquid Sensor: Model - Tri-State
Vapor	794390-700	Monitor Well	Vapor Sensor Setup	Device Setup Vapor Sensor
Groundwater	794380-62X	Monitor Well	Groundwater Sensor Setup	Device Setup Groundwater Sensor
Oil/Water Separator	794690-XXX	Oil/Water Separator Tank	Liquid Sensor Setup: Sensor Type - Dual Float Discriminating	Device Setup Liquid Sensor: Model -Dual Float Discriminating

Appendix B - How To Order An Oil/Water Separator Sensor (OWSS)

Sensor Sizing

To determine the correct sensor length for the oil/water separator tank application use the manufacturer's tank chart to determine height - to - volume thresholds for warning and alarm conditions and make three measurements, including verifying fluid depths on the manufacturer's tank chart.

1. Determining The Lowest Point Of The Bottom (Alarm) Float

Measure and record the distance from inside the top of the tank to the maximum depth of waste oil/water interface in the tank as recommended by the tank's manufacturer (Fig.B-1). Subtract 3 inches from this measurement to determine the lowest permissible point in the tank for the centerline of the sensor's bottom (alarm) float and **note this measurement as D1**.

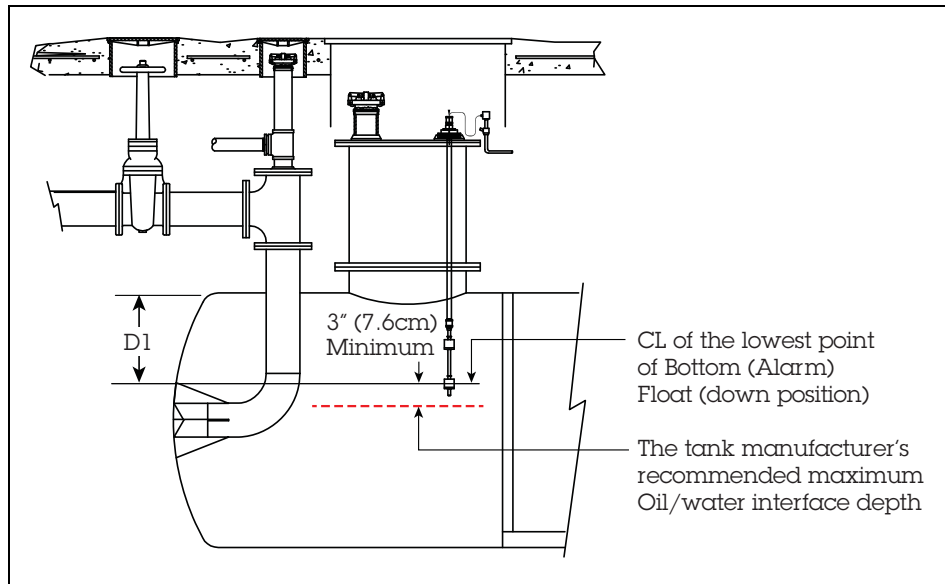


Fig. B-1.- Determining Lowest Point For O/W Sensor's Bottom Float

2. Determining Distance From Top Of Riser To Top Of Tank

Measure from the top of the riser down to the top of the tank and if using the riser reducing 4x2 fitting **note this measurement as D2**, OR, If using the riser reducing 4x2 coupling add 3" to the measured distance and **note this measurement as D2** (Fig.B-2)

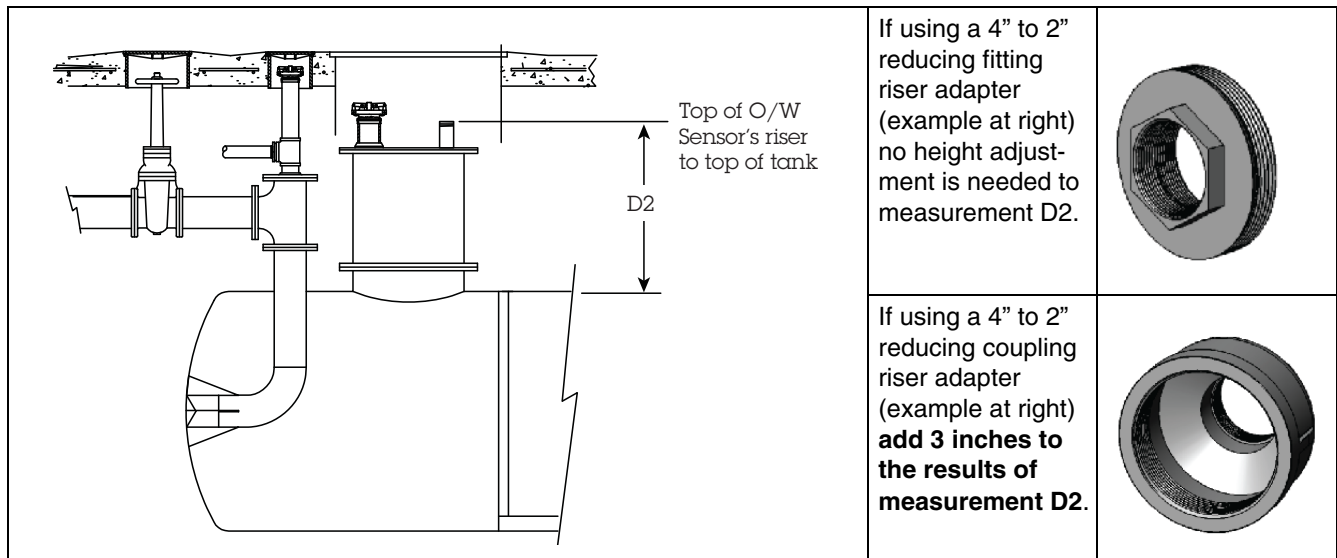


Fig. B-2.- Determining Distance D2

3. Determining The Top (Warning) Float Position

Consult the tank chart to determine the height of the top warning level (centerline of the top float). Measure the distance from the top of the tank to the centerline of the top float (Fig.B-3). **Note this measurement as D3.**

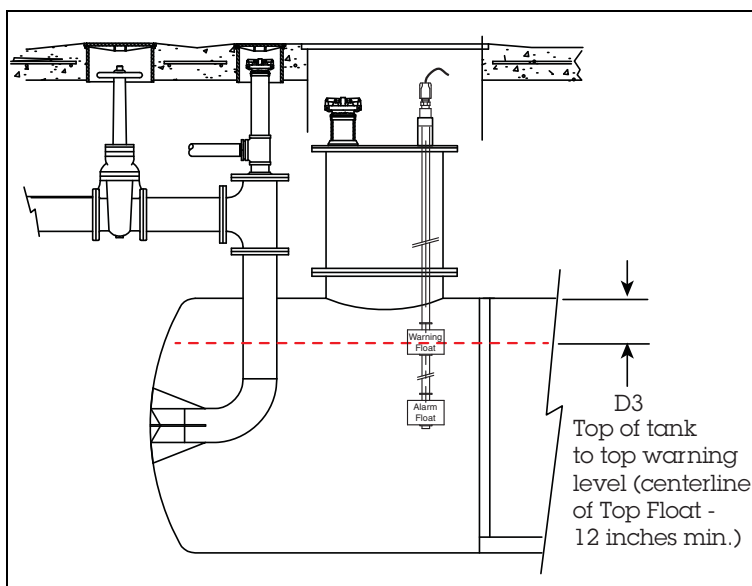


Fig. B-3.- Determining Distance D3

4. Determining Correct Sensor To Order

Use the D1, D2 and D3 measurements made in Steps 1 - 3 to determine the part number of the sensor from the V-R Oil/Water Separator Sensor matrix shown in Fig.B-4.

For example: D1 = 33", D2 = 24.5, D3 = 13"

D2 + D3 = Top float position, i.e., 24.5 + 13 = 37.5" (Dimension A in the V-R P/N matrix)

D1 - D3 = Bottom float position, i.e., 33 - 13 = 20" (Dimension B in the V-R P/N matrix)

Using the OWSS float positions calculated in the example above, the top float (Warning) would activate at 13 inches below the top of the tank and the bottom float (Alarm) would activate at 33" below the top of the tank. The correct part number for these example float positions would be 764690-053.

Round dimension A or B down to the nearest available option if necessary. Note: doing so will impact the float Warnings and Alarms generated on the TLS system.

Alarm Conditions

Alarm Type	Alarm Condition
Liquid Warning	Oil present in tank
Liquid Alarm	Oil has reached its maximum volume, remove from tank
Sensor Out Alarm	No communication to ATG
Normal	Tank is properly setup with liquid

Order OWSS part number 764690-XXX, where XXX equals the three digits where Dimensions A and B intersect in the part number matrix:

		DIMENSION "B"									
		5"	10"	15"	20"	25"	30"	35"	40"	45"	50"
DIMENSION "A"	18"	-010	-011	-012	-013	-014	-015	-016	-017	-018	-019
	22"	-020	-021	-022	-023	-024	-025	-026	-027	-028	-029
	26"	-030	-031	-032	-033	-034	-035	-036	-037	-038	-039
	30"	-040	-041	-042	-043	-044	-045	-046	-047	-048	-049
	34"	-050	-051	-052	-053	-054	-055	-056	-057	-058	-059
	38"	-060	-061	-062	-063	-064	-065	-066	-067	-068	-069
	42"	-070	-071	-072	-073	-074	-075	-076	-077	-078	-079
	46"	-080	-081	-082	-083	-084	-085	-086	-087	-088	-089
	50"	-090	-091	-092	-093	-094	-095	-096	-097	-098	-099
	54"	-100	-101	-102	-103	-104	-105	-106	-107	-108	-109
	58"	-110	-111	-112	-113	-114	-115	-116	-117	-118	-119
	62"	-120	-121	-122	-123	-124	-125	-126	-127	-128	-129
	66"	-130	-131	-132	-133	-134	-135	-136	-137	-138	-139
	70"	-140	-141	-142	-143	-144	-145	-146	-147	-148	-149
	74"	-150	-151	-152	-153	-154	-155	-156	-157	-158	-159
	78"	-160	-161	-162	-163	-164	-165	-166	-167	-168	-169
	82"	-170	-171	-172	-173	-174	-175	-176	-177	-178	-179
	86"	-180	-181	-182	-183	-184	-185	-186	-187	-188	-189
	90"	-190	-191	-192	-193	-194	-195	-196	-197	-198	-199

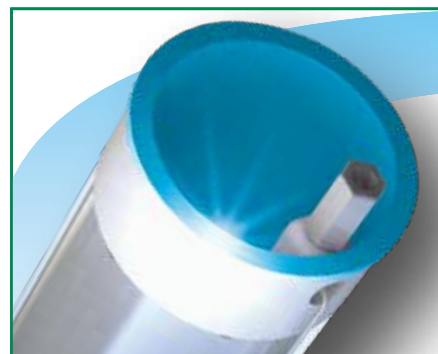
Fig. B-4.- Oil/Water Separator Sensor Part Number Matrix



Overfill Prevention and Venting Equipment

7150 Testable Overfill Valve

The OPW new patent-pending Testable 7150-T Overfill Prevention Valve is the easiest, quickest and most cost efficient way to ensure that your overfill valves will operate when called upon - verifiable without removing them from the tanks. The OPW 7150-T Testable Overfill Prevention Valve is the only UST Overfill Prevention Valve that is testable from the surface without removal from the tank.



6150 & 7150 Overfill Prevention Valves

The OPW 6150 and 7150 vapor-tight Overfill Prevention Valves are two-stage shut-off valves designed to prevent the overfill of underground storage tanks by providing a positive shut-off of product delivery. Models of the 6150 and 7150 are available to meet virtually any UST application, including two-point, coaxial, poppeted coaxial and remote fill. The 7150 vapor-tight model is designed for enhanced vapor recovery (EVR) applications. Both the 6150 and 7150 are designed for use on tight-fill gravity drop applications only, and can be installed in the fill riser of both new and existing underground storage tanks.



Ball Float Vent Valves and Extractor Fittings

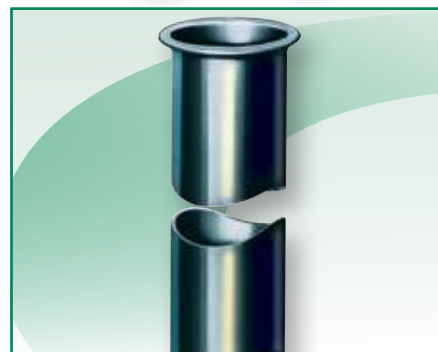
OPW Ball Float Vent Valves protrude into underground storage tanks from the Stage I vapor return riser pipe. As the tank becomes full during a product drop, the ball seats – restricting the flow of vapors back to the transport truck or through the tank vent. As the vapors are compressed in the tank, product flow into the tank is severely restricted.

OPW ball floats are mounted in OPW extractor fittings to maintain access through grade-level manholes.



Drop Tubes and Accessories

OPW drop tubes are installed inside tank fill risers to prevent fuel from contacting riser joints. Drop tubes extend close to the bottom of the tank to minimize turbulence and vapor production. Tank bottom protectors are installed on the bottom of drop tubes to prevent tank erosion at the fill point.



Pressure Vacuum Vents and Adaptors

Pressure Vacuum Vents are installed on the top of vent pipes from underground or aboveground fuel storage tanks. The vent cap and internal wire screen are designed to protect the tank vent lines against intrusion and blockage from water, debris or insects. A normally closed poppet in the valve opens at a predetermined pressure or vacuum setting to allow the tank to vent.



Patent Pending

Testable 71SO

Overfill Prevention Valve

**Are you Compliant
with the New EPA
Overfill Valve Test
Requirements?**



**Now you can be, with the
New OPW Testable 71SO
Overfill Prevention Valve**

*The easiest, most affordable way
to ensure overfill compliance*

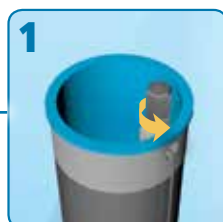
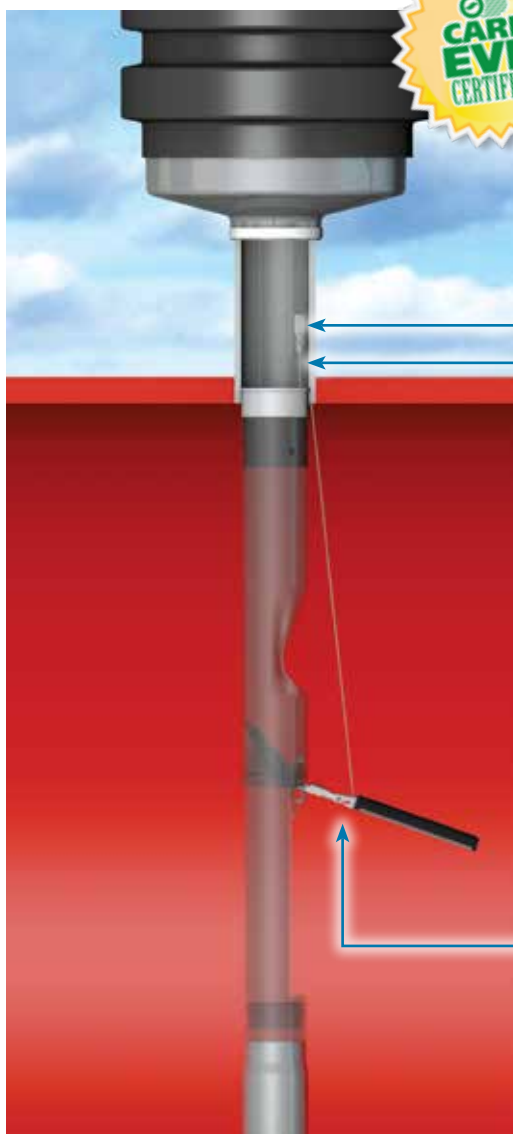
- ◆ UST systems (drop tube, overfill prevention valve, spill containers) must be tested for vapor tightness
- ◆ Overfill prevention valves shut off devices must be manually inspected
- ◆ OPW offers the only overfill prevention valve that can be tested without removal from the tank – test in 60 seconds versus 60 minutes per tank

Testable 7150 Overfill Prevention Valve

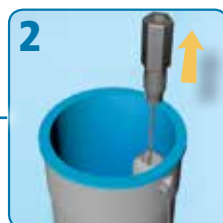
Patent Pending



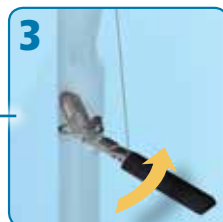
Testing & Verification Easy as 1·2·3



Loosen test plug



Lift float with cable to simulate fill



Validate proper poppet operation

The OPW Testable 7150 helps you be in compliance with the NEW EPA Regulations

- ◆ The Only UST Overfill Prevention Valve that is testable without removal from the tank
- ◆ A testable feature is attached to a sealed plug in the inlet Adaptor
- ◆ The plug is easily accessed with a standard socket extension
- ◆ Attached to the extension, the testable feature can be raised and lowered, allowing the user to inspect the valve operation from the inside of the tube
- ◆ The plug is then easily reinstalled to the inlet Adaptor from grade
- ◆ No fill components, overfill valves, or vapor tight seals have to be removed - avoids compromising vapor tight compliance
- ◆ The Testable 7150 uses the same industry leading overfill prevention technology for strong vapor tight compliance

◆ B100 Compatible (ULC)

NOTE: The OPW 7150 is designed for use on tight-fill gravity drop applications only. Do not use for pressure fill applications.

Ordering Specifications

Product #	Description	A- Upper Tube Length		B- Lower Tube Length		C- Overall Length		Max. Riser Length		Max. Nominal Tank Dia.		Max. Actual Tank Dia.		Weight	
		in.	m	in.	m	in.	m	in.	m	in.	m	in.	m	lbs.	kg
7150-400CTB*	Testable Vapor-Tight Overfill Valve, 5 Ft. Bury, 8 Foot Tank	60	1.5	83	2.1	154 ³ / ₄	3.9	53 ¹ / ₂	1.4	96	2.4	107	2.7	16	7
7150-410CTB*	Testable Vapor-Tight Overfill Valve, 10 Ft. Bury, 10 Foot Tank	120	3.1	102	2.6	234 ³ / ₄	5.9	113 ¹ / ₂	2.9	120	3.1	126	3.2	25	11
7150-420CTB*	Testable Vapor-Tight Overfill Valve, 10 Ft. Bury, 12 Foot Tank	120	3.1	126	3.2	258 ³ / ₄	6.5	113 ¹ / ₂	2.9	144	3.7	150	3.8	26	12

206740-Kit Replacement Cable Kit

* ULC B100 Compatible

Listings and Certifications



Look for this label for authentic OPW EVR Approved products.

OPW 7150 Overfill Prevention Valves

The CARB-certified OPW 7150 vapor-tight Overfill Prevention Valve is designed to prevent the overfill of underground storage tanks by providing a positive shut-off of product delivery. The shut-off valve is an integral part of the drop tube used for gravity filling. The OPW 7150 allows easy installation (without breaking concrete) and requires no special manholes.

The OPW 7150 is a vapor-tight two-stage shut-off valve. When the liquid level rises to about 95% of tank capacity, the valve mechanism is released, closing automatically with the flow. This reduces the flow rate to approximately 5 gpm through a bypass valve. The operator may then stop the filling process and disconnect and drain the delivery hose. As long as the liquid exceeds the 95% level, the valve will close automatically each time delivery is attempted.

If the delivery is not stopped and the liquid rises to about 98% of tank capacity, the bypass valve closes completely. No additional liquid can flow into the tank until the level drops below a reset point.

NOTE: The 7150 Overfill Prevention Valve can be adjusted to shutoff at any desired tank capacity. Please contact the Authority Having Jurisdiction (AHJ) and review local, state, and national codes to determine the regulatory requirements governing shut-off capacity in your region, as well as take into account other considerations such as extreme tank tilt. In all cases, the upper tube must protrude into the tank at least 6 1/2" to ensure that the valve can shut off flow into the tank completely before the top of the tank is wetted as per EPA requirements.

7150 Instruction Sheet Order Number: **H15524PA**

Listings and Certifications



Materials

Valve Body: Cast aluminum
Float: Nitrile rubber, closed cell foam
Valve: Aluminum
Seals: Viton®
Upper & lower Drop Tube: Aluminum
Plastic parts: Acetal
Hardware: Stainless steel

Features

- ◆ **Simple, Easy and Quick Installation** – no excavation or special manholes required.
- ◆ **Economical** – costs a fraction of expensive, complicated and difficult-to-install valves.
- ◆ **Furnished Complete** – supplied with new upper and lower drop tubes, mounting hardware and thorough instructions for quick job site time.
- ◆ **Completely Automatic Operation** – no prechecks to perform, no resets and no overrides to be broken or abused.
- ◆ **No Pressurization of the Tank** – operates directly from liquid level.
- ◆ **Will Accept a Dipstick for Gauging**



Important

In order to prevent product spillage from the Underground Storage Tank (UST), properly maintained delivery equipment and a proper connection at the tight-fill adaptor are essential. Delivery personnel should be managed and trained to inspect delivery elbows and hoses for damaged and missing parts. They should always make certain there is a positive connection between the adaptor and elbow. If delivery equipment is not properly maintained, or the elbow is not securely coupled to the adaptor, a serious spill may result when the OPW 7150 closes, causing a hazard and environmental contamination.

NOTE: The OPW 7150 is designed for use on tight-fill gravity drop applications only. Do not use for pressure fill applications.

- ◆ **Retrofits Directly** – for both new and existing tanks with 4" fill risers.
- ◆ **Quick Drain Feature** – automatically drains hose when head pressure is relieved.
- ◆ **Best Flow Rate in The Industry***

* OPW Test Lab results

Advantages of Overfill Prevention Compared to Overfill Warning Systems:

- ◆ **Completely Automatic Operation** – does not rely on the alertness or speed of response of the delivery attendant for certainty of overfill prevention.
- ◆ **Keeps the Top of UST "Dry," per EPA Requirements** – eliminating possible leaks at loose bung fittings and the need for double containment on vent lines.
- ◆ **Does Not Rely on Pressure in the UST to Stop Flow** – allowing faster fill times and reducing spill risk.
- ◆ **Speeds Delivery Operations** – product flows unimpeded into the tank until the hose "kick" that accompanies the valve shut-off provides a clear signal that the liquid has reached the shut-off level.
- ◆ **Simple and Inexpensive Installation** – in both two-point and coaxial fill applications, no additional excavation, manholes or vent piping are required.



Look for this label for authentic OPW EVR Approved products.
OPW 7150M is EVR Approved for E85

Raising The Standard In Overfill Prevention

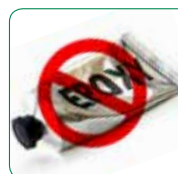
From the company that brought you the industry standard OPW 61SO, OPW raises the standard with the introduction of the **71SO Overfill Prevention Valve** – breakthrough innovation that takes overfill prevention to a whole new level of overfill perfection.

- **Eliminates curing issues due to hot or cold temperatures**
- **Easier, quicker, installation**
- **Higher quality, more reliable installation**
- **Lower costs**
- **Greater protection against fugitive emissions and pressure decay**
- **Fastest flow rate in the industry**

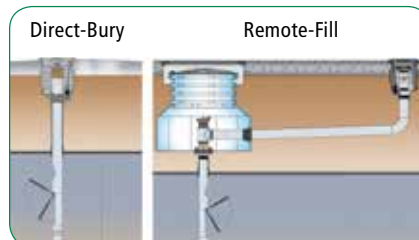
The new 71SO is a two-stage, positive shut-off valve, providing completely automatic operation with no pre-checks to perform, no resets, and no overrides to be broken or abused. The valve closes when the tank level rises to 95% capacity and provides a special bypass valve so the tank can be filled to a maximum capacity of 98%. The 71SO is available for direct-bury and remote applications.



All Vapor-Tight Overfill Valves are CARB EVR Certified



No Epoxy Sealants Required!



Replacement Parts

Part #	Description
61SOK-0001	Replacement Float Kit
H11931M	Drop Tube Seal
H14840M	Lower Tube Seal
C05117	Lower Tube
D02508	Vapor-Tight Inlet Tube
C03899M	Non-Vapor-Tight Inlet Tube
D02508	Vapor-Tight Inlet Tube (Blue)

71SO Ordering Specifications

Product #	Description	Bury Depth		Tank Diameter		Upper Tube Length		Lower Tube Length		Overall Length		Max. Riser Length		Max. Nominal Tank Dia.		Max. Actual Tank Dia.		Weight	
		ft.	m	ft.	m	in.	m	in.	m	in.	m	in.	m	in.	m	in.	m	lbs.	kg
71SO-400CB*	Vapor-Tight Overfill Valve	5	1.5	8	2.4	60	1.5	83	2.1	155 ³ / ₄	3.9	53 ¹ / ₂	1.4	96	2.4	107	2.7	16	7
71SO-410CB*	Vapor-Tight Overfill Valve	10	3.0	10	3.0	120	3.1	102	2.6	234 ³ / ₄	5.9	113 ¹ / ₂	2.9	120	3.1	126	3.2	25	11
71SO-420CB*	Vapor-Tight Overfill Valve	10	3.0	12	3.6	120	3.1	126	3.2	258 ³ / ₄	6.5	113 ¹ / ₂	2.9	144	3.7	150	3.8	26	12
71SO-4000	Non Vapor-tight Overfill Valve	5	1.5	8	2.4	60	1.5	83	2.1	155 ³ / ₄	3.9	53 ¹ / ₂	1.4	96	2.4	107	2.7	16	7
71SO-4010	Non Vapor-tight Overfill Valve	10	3.0	10	3.0	120	3.1	102	2.6	234 ³ / ₄	5.9	113 ¹ / ₂	2.9	120	3.1	126	3.2	25	11
71SOM-412C	E85 Vapor-tight Overfill Valve	10	3.0	10	3.0	120	3.1	102	2.6	234 ³ / ₄	5.9	113 ¹ / ₂	2.9	120	3.1	126	3.2	38	17.3
71SO-TOOLCT	71SO Installation Tool																	2.5	1
61JSK-4RMT	Jack Screw Kit For Vapor-Tight Remote Applications																	1.5	0.7
61JSK-4410	Jack Screw Kit For Composite Base Spill Bucketst																	1	0.5
61JSK-44CB	Jack Screw Kit For Cast Iron Base Spill Buckets																	1	0.5
71JSK-4RMT	E85 Jack Screw for Remote-Fill Applications																	1	0.5
71JSK-44MA	E85 Jack Screw for Direct-Fill Applications																	1.5	0.7

61JSK-4410 AND 61JSK-44CB Instruction Sheet Order Number: **H15289M**

*ULC B100 Compatible

71SO Vapor-Tight Remote Fill

The OPW Vapor-Tight Remote Fill is designed for two-point vapor-tight remote-fill applications, where the fill point is not directly over the UST. A CARB approved vapor-tight 71SO overfill valve is installed in the sump through a riser pipe directly over the tank.

