Magnetostrictive Probes

VEEDER-ROOT

Quick Troubleshooting Guide

NOTICE

- Veeder-Root makes no representation or warranty about the information in this publication. A qualified professional is required for service of the components addressed in this publication.

- The information in this publication cannot be used as a substitution for the knowledge and experience of a qualified professional.

- The information contained in this publication is merely for the consideration of a qualified professional, which should make their own determination of how to address any issues based on the situation.

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- Contact TLS Systems Technical Support for additional troubleshooting information at 800-323-1799.

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Installer Certification (Level 1): Contractors holding valid Installer Certification are approved to perform wiring and conduit routing; equipment mounting; probe, sensor and carbon canister vapor polisher installation; wireless equipment installation; tank and line preparation; and line leak detector installation.

Technician Certification (Level 2/3): Contractors holding valid Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. In addition, Contractors with the following sub-certification designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.
  - Wireless 2
  - Tall Tank

VR Vapor Products Certification: Contractors holding a certification with the following designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.
  - ISD – In Station Diagnostics
  - PMC – Pressure Management Control
  - CCVP - Veeder-Root Vapor Polisher
  - Wireless – ISD/PMC Wireless
  - A current Veeder-Root Technician Certification is a prerequisite for the VR Vapor Products course.

Warranty Registrations may only be submitted by selected Distributors.

Safety Warnings

FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD RESULT IN SERIOUS INJURY OR DEATH, AND/OR CAUSE DAMAGE TO PROPERTY, AND THE ENVIRONMENT.

EXPLOSIVE: Fuels and their vapors are extremely explosive if ignited.

FLAMMABLE: Fuels and their vapors are extremely flammable.

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ELECTRICITY: High voltage exists in, and is supplied to, the device. A potential shock hazard exists.

TURN POWER OFF: Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.

WARNING: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

READ ALL RELATED MANUALS: Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.

This system operates near highly combustible fuel storage tanks.

To ensure proper installation, operation, and continued safe use of this product:

1. Read and follow all instructions in this manual, including all safety warnings.

2. Have equipment installed by a contractor trained in its proper installation and in compliance with all applicable codes including: National Electrical Codes 70 and 30A; federal, state, and local codes; and other applicable safety codes.

3. Substitution of components may impair intrinsic safety.

4. Do not modify or use service parts other than those provided by Veeder-Root.

Safety Precautions

The following safety symbols are used throughout this manual to alert you to important safety hazards and precautions.

	EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.		**FLAMMABLE** Fuels and their vapors are extremely flammable.
	ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.		**TURN POWER OFF** Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.
	WARNING Indicates a hazardous situation which, if not avoided, could result in death or serious injury.		**WEAR EYE PROTECTION** Wear eye protection when working with pressurized fuel lines to avoid possible eye injury.
	USE SAFETY BARRICADES Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape, and your vehicle to block the work area.		**APPROVED CONTAINERS** Use nonbreakable, clearly marked containers, suitable for collecting and transporting hazardous fuels during service.
	READ ALL RELATED MANUALS Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.		

Suggested Equipment: The operations manual for the console that is installed at the site; field wiring epoxy pack; metal paper clip and several feet of string; spare magnetostrictive probe of identical type with faulty probe with identical float kit; length of Belden shielded cable to run from probe (removed from tank) back to TLS; A digital multi-meter capable of measuring up to 1 MOhm (1 million ohms), or higher, full scale; necessary tools to remove and replace the faulty probe.

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Please refer to Manual - TLS-3XX Series Consoles Troubleshooting Guide, part number 576013-818 for complete information.

Troubleshooting Steps:

1. Check history. Is probe completely out or is it intermittently in and out of service?
   a. If completely out check the wiring or the probe itself as described in the steps below.
   b. If intermittent you may have noise. Look for variable frequency drivers as described in Step 14.
   c. If there are erratic readings/false deliveries, please go to the mag riser (Step 13).
   d. check the probe float installation (Float installed upside down, boot missing, etc.).

2. Check samples_read / sample_used to see probe performance previous to being "out".
   a. If there is a difference (>1%) between the 2 numbers, continue to Step 3.
   b. If there is little or no difference (<1%) between the 2 numbers refer to the ATG troubleshooting guide.

3. Verify that the probe wire is shielded and the shield is grounded in the TLS only. Verify polarity of the wires.

4. Verify that wiring is less than 1000 feet.

5. Verify that the intrinsically safe wiring and the probe wiring do not share the conduit with any other wiring and that the intrinsic wiring is isolated from the AC voltage circuit.
   a. Inspect the wiring trough where the probe wires come into the building.
   b. If the probe wires are sharing the trough with any other device (high voltage or non Veeder Root wires), they will have to be isolated using rigid metal conduit or metal shielding plates.

6. Check that the TLS AC power is on its own circuit breaker.

7. Verify that the TLS is grounded and confirm if TLS ground point is 1 ohm or less to source.

8. Swap the probe channel in the ATG.
   a. If the problem follows the probe, replace the probe.
   b. If the problem stays on the probe channel follow the ATG troubleshooting manual.
   c. Note if this is a TLS-4XX console note the Console software version and the firmware on the USM.

9. Inspect and test probe cables. Measure probe wiring resistance and verify if it is correct values.
   a. 14 AWG should measure 2.52 ohms/1000 feet.
   b. 16 AWG should measure 4.02 ohms/1000 feet.
   c. 18 AWG should measure 6.39 ohms/1000 feet.

10. Unscrew the probe connector from the top of the probe and inspect the connecting pins for corrosion. If there are signs of corrosion, replace the probe cable.

11. Open the probe junction box and inspect for water. Make sure the probe wires and the connecting field wiring have Veeder Root epoxy packs on the splices. Corroded splices will create probe outs. Inspect the epoxy packs to make sure there is no water inside.

12. Swap probe with a known good probe and check for the following:
    a. Problem follows probe – in which case the probe probably is bad. Swap probes back to original positions. If original probe is still bad, replace probe.
    b. Problem follows tank – in which case there is a wiring/connection problem in the original problem tank. Return probes to original positions and repair wiring/connections.
    c. Both probes are good – in which case there is likely a connection problem that should be found and repaired.
    d. Both probes are out –least likely scenario. Return probes to original positions and check/repair wiring/connections.

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    e. Remove probe from tank and connect directly to the TLS to isolate wiring. If probe works when connected directly, verify wiring issue.

    f. When possible, you can isolate wiring by running a field wire above ground from the TLS to the probe.

13. Verify that the probe riser is NOT magnetized. Using a paper clip on a string, dangle it in the probe riser to determine if the riser pipe may be magnetized. If the paper clip attracts to one side of the riser pipe, please contact technical support (step 16). If the clip method is not feasible please take the probe out and lay it down, and move product float to a known height; if the readings are normal the riser may be magnetized.

14. Check for Variable Speed Controllers and Variable Frequency Controllers. Note the manufacturer and manufacturer model number. Contact Technical Support (U.S - 1-800-323-1799).

15. For further assistance call technical support (U.S - 1-800-323-1799).