



Franklin Fueling Systems

TS-RA1, TS-RA2 and TS-RK Tank Overfill Alarms

Installation Guide

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Important Safety Messages

FFS equipment is designed to be installed in association with volatile hydrocarbon liquids such as gasoline and diesel fuel. Installing or working on this equipment means working in an environment in which these highly flammable liquids may be present. Working in such a hazardous environment presents a risk of severe injury or death if these instructions and standard industry practices are not followed. Read and follow all instructions thoroughly before installing or working on this, or any other related, equipment. As you read this guide, please be aware of the following symbols and their meanings:



This symbol identifies a warning. A warning sign will appear in the text of this document when a potentially hazardous situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous situation may involve the possibility of severe bodily harm or even death.



This is a caution symbol. A caution sign will appear in the text of this document when a potentially hazardous environmental situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous environmental situation may involve the leakage of fuel from equipment that could severely harm the environment.



This symbol identifies an electrical danger. An electrical danger sign will appear in the text of this document when a potentially hazardous situation involving large amounts of electricity may arise if the instructions that follow are not adhered to closely. A potentially hazardous situation may involve the possibility of electrocution, severe bodily harm, or even death.



Follow all applicable codes governing the installation and servicing of this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and any related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on during installation or servicing. Please refer to the *Installation and Owner's Manual* for this equipment, and the appropriate documentation for any other related equipment, for complete installation and safety information.



Follow all federal, state and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30, 30A and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage and/or environmental contamination.



When the Fuel Management System system is used to monitor tanks containing gasoline or other flammable substances, you may create an explosion hazard if you do not follow the requirements in this manual carefully.



All wiring from probes or sensors to the console must be run in conduit separate from all other wiring. Failure to do so will create an explosion hazard.

Product Overview and Theory of Operation

The TS-RA1, and TS-RA2 are remote audible and visual alarm units that are used with Fuel Management System consoles. The TS-RA1, TS-RA2, and the TS-RK **Tank Overfill Alarm and Alarm Acknowledge** units are mounted near the tank filling site. If the tank product level reaches the FMS overfill alarm setpoint, then the Tank Overfill Alarm will become active. An active Tank Overfill Alarm alerts the tank filling attendant to immediately stop the filling operation before a spill occurs. The TS-RK is an optional remote alarm acknowledge unit. This unit gives the tank filling attendant the means to silence a Tank Overfill Alarm at the filling site. The TS-RK is required when a TS-RA1 or TS-RA2 is connected to a T5 series Fuel Management System console or a Colibri Automatic Tank Monitor. When in an alarm condition, depressing the acknowledge button on the TS-RK will silence the Tank Overfill Alarm at the tank filling site.

Alarm Specifications

The TS-RA1 is a standard intensity, remote alarm device that has a useful signal range up to 50 feet.

Ratings

Input Power	115 VAC (96 to 132vac), 60Hz @ 0.125 amps Maximum
Operating Temperature Range	-31 to 150 °F
Humidity Range	Up to 95% humidity
Signal outputs	Visual (low intensity incandescent lamp) & audio tone (85 dB @ 10 feet)

The **TS-RA2** is alarm device that has a strobe-light, and eight user-selectable output tones with two user-selectable sound intensities. In the high-intensity mode, the TS-RA2 has a useful signal range up to 200 feet.

Ratings

Input Power	115 VAC (96 to 132vac), 60Hz @ 0.125 amps Maximum
Operating Temperature Range	-31 to 150 °F
Humidity Range	Up to 95% humidity
Signal outputs	Visual strobe (15 Candela), and audio tone (99dB to 75 dB @ 10 feet).

When properly installed, wired, and programmed, this alarm system will help prevent dangerous fuel spills, environmental contamination, and cleanup costs.

Installation

Overview

The mounting location of TS-RA1, TS-RA2, TS-RK units should be based on: cable run length, ease of conduit routing, alarm light visibility, alarm horn audible range limitations, and the distance away from hazardous areas. In addition, the following limitations and requirements must be met.

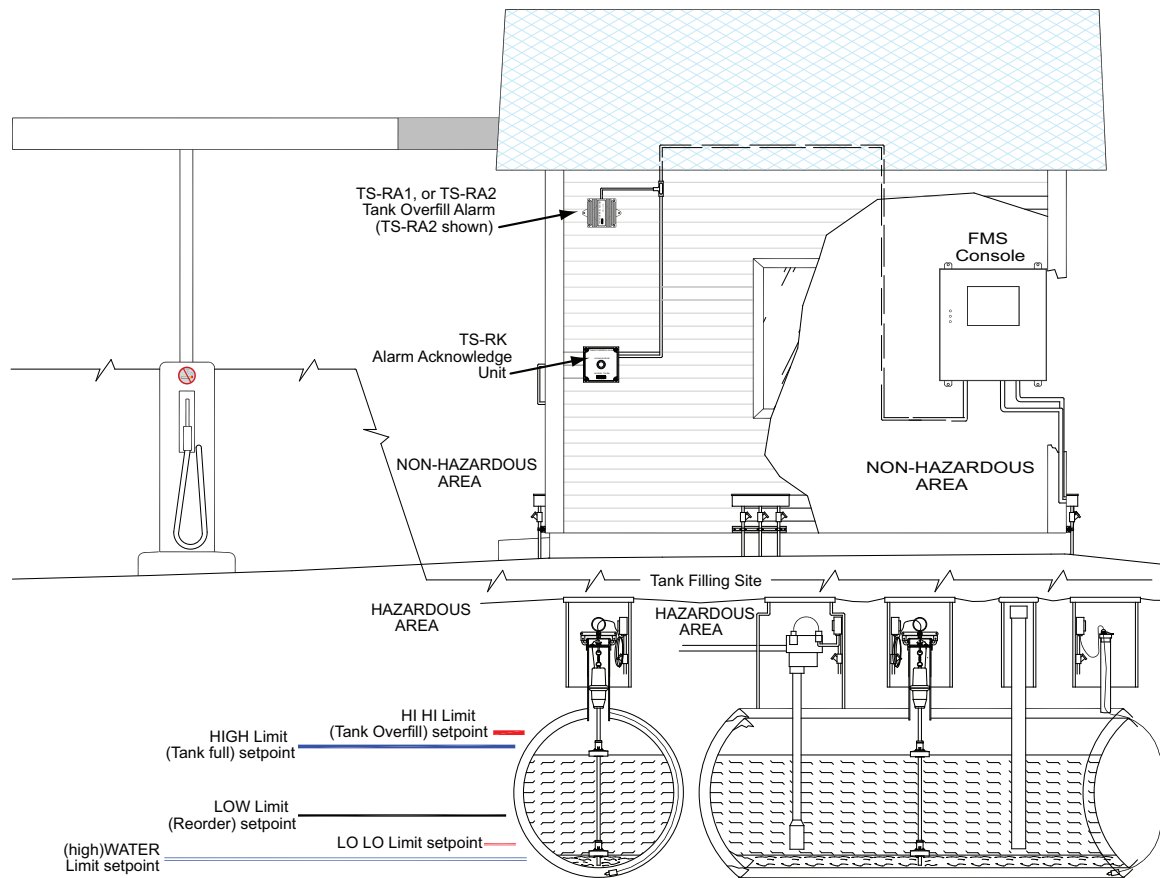




Figure 1: TS-RA and TS-RK Installation Overview

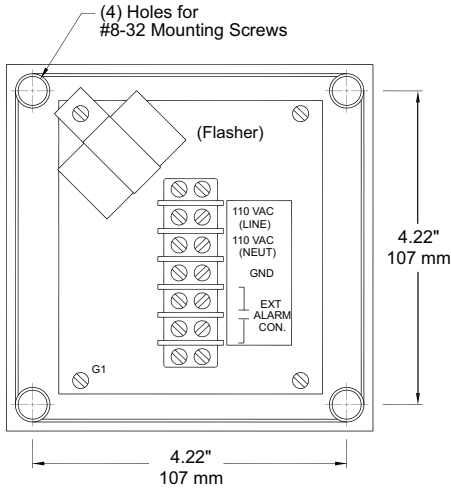
- The location of the Tank Overfill Alarm and Alarm Acknowledge unit enclosures must be less than 1000 feet away from the 120 VAC electrical power (source) panel.
- The TS-RA1, or TS-RA2 Tank Overfill Alarm unit should be mounted near the fuel tank filling area.
- The alarm light must be visible and the alarm horn must be audible at the fuel tank filling area.
- These units should be mounted in a protected location that minimizes exposure to direct sunlight, snow and rain.
- The TS-RK Tank Overfill Alarm Acknowledge unit should be accessible to the tank filling attendant. Access to the TS-RK from the filling area must be clear with no obstructions.

Warning  **DO NOT install the Tank Overfill Alarm, or Alarm Acknowledge units in a volatile, combustible, or explosive atmosphere. Failure to do so may create an explosion hazard.**

Warning  **Run wiring from the Tank Sentinel console to the TS-RA1/TS-RA2 Tank Overfill Alarm, and TS-RK Alarm Acknowledge units in separate conduit apart from any other wiring. All conduits must enter through supplied non-intrinsically safe enclosure knockouts only. Failure to do so may create an explosion hazard.**

Mounting the Units

- Mount the TS-RA1, and/or TS-RK units through the four (4) mounting holes provided in the case under the front cover.



Internal View (Cover Removed)

Figure 2: TS-RA1 Mounting Details

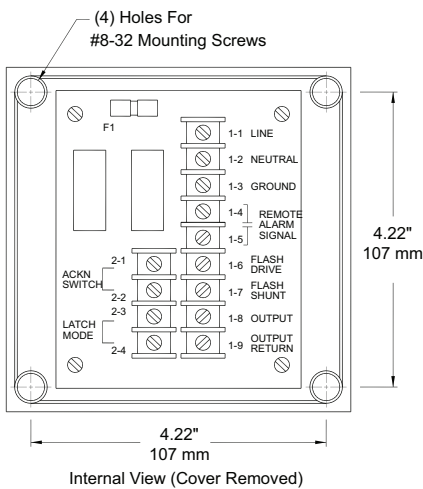


Figure 3: TS-RK Mounting Details

- Mount the TS-RA2 unit through the two (2) mounting holes provided.

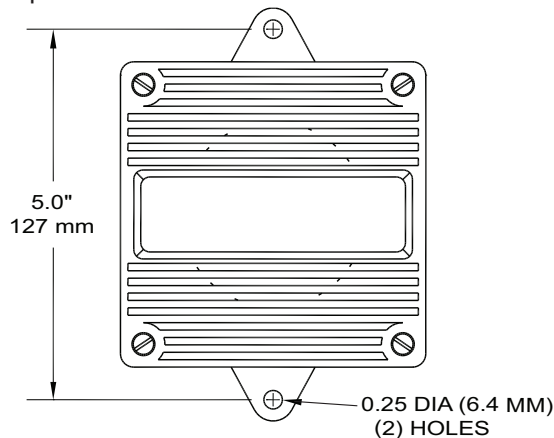


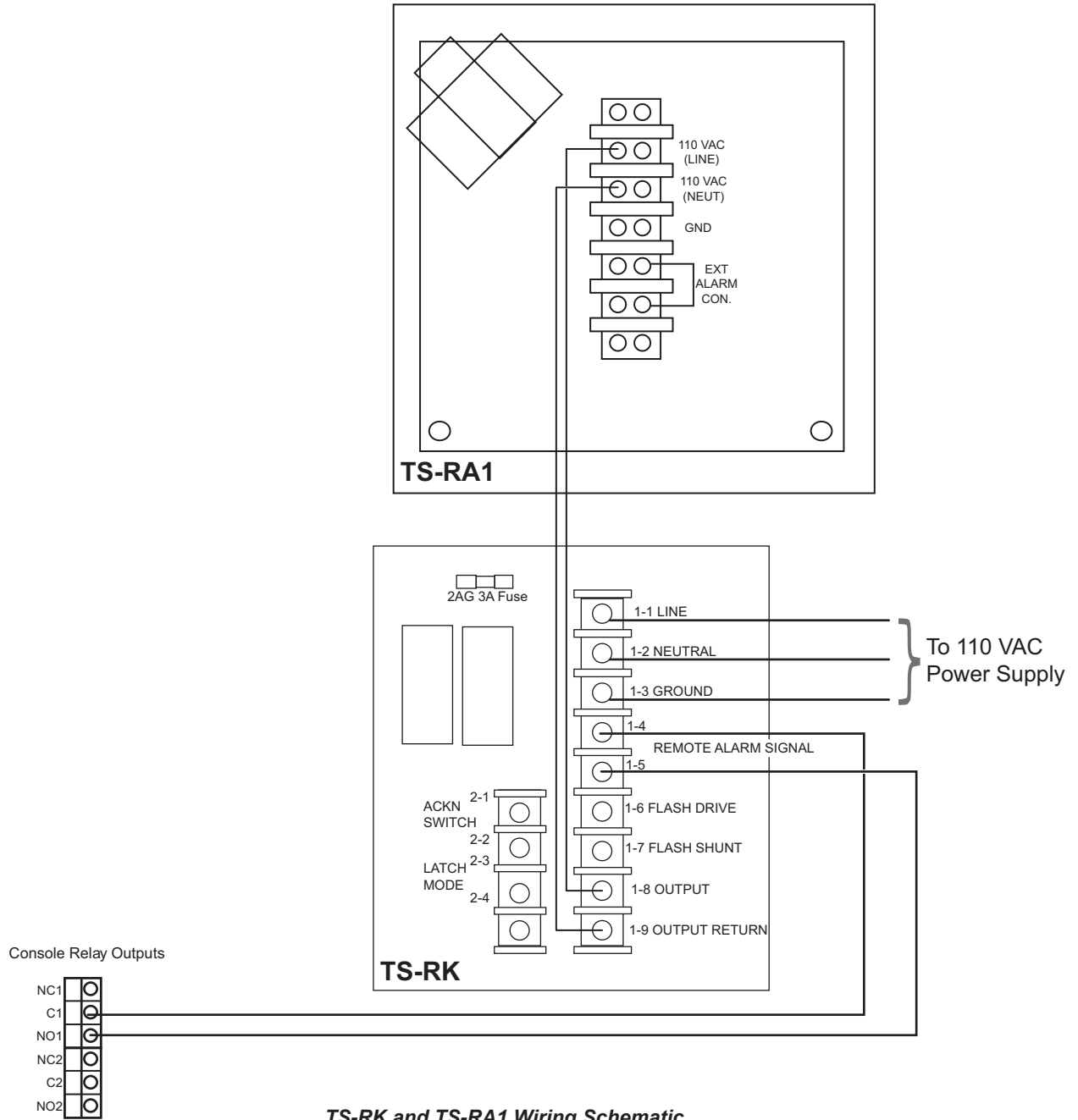
Figure 4: TS-RA2 Mounting Details

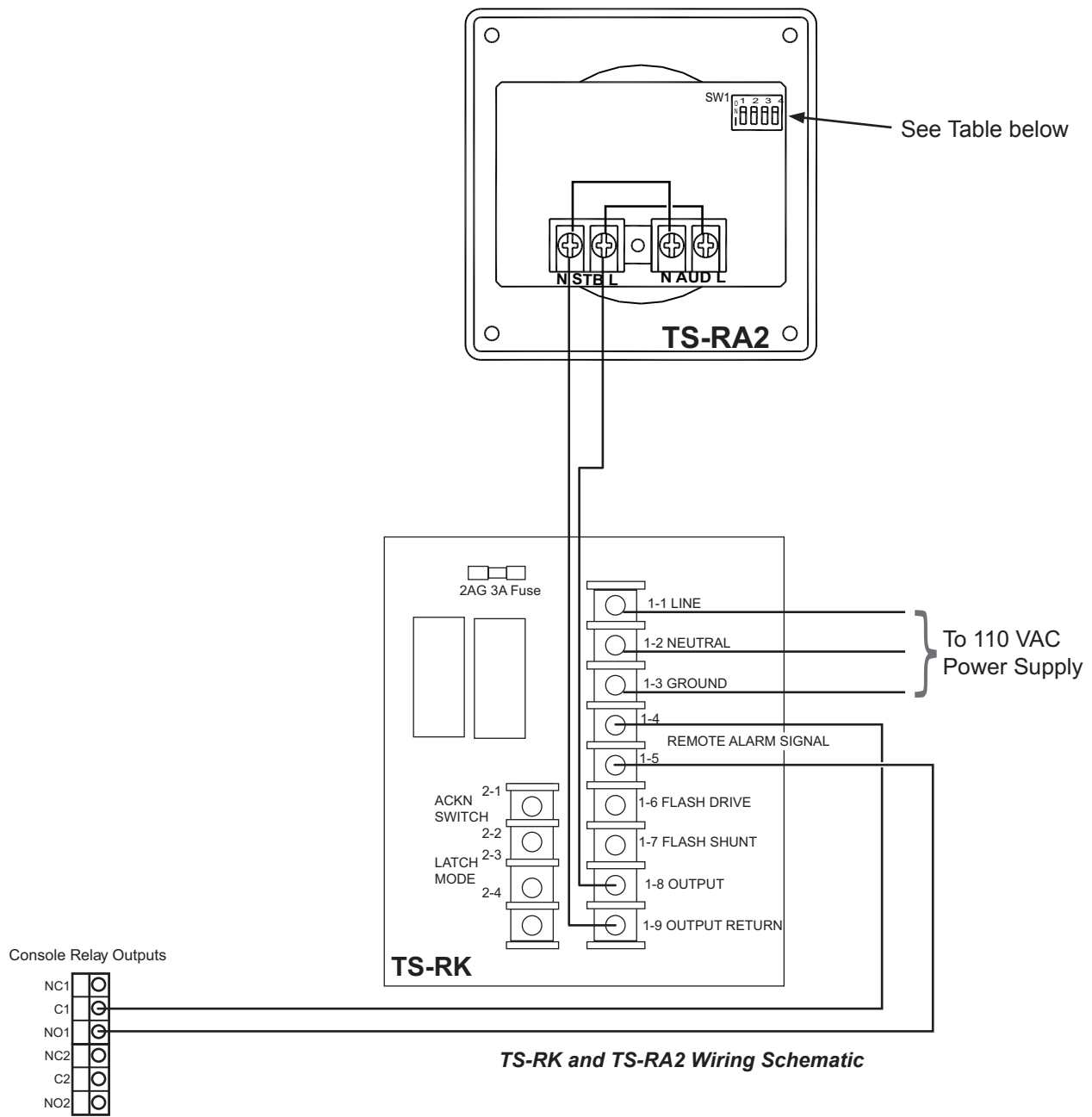
Wiring the Units

Materials Required

- Wire: 18 to 14 AWG, 300 Volt, type TFFN, THWN, or THHN (Note: THHN is not available in 18 AWG). Recommended insulation colors are black, white, green, and blue.
 - Conduit: 1/2 inch, or 3/4 inch (the TS-RA2 has a 1/2 inch NPT for threaded conduit/fitting).
 - Fittings: for conduit used, and conduit hold-down clamps.
 - Sealant: waterproof conduit, fittings, fitting threads, and conduit accesses to the building.
 - Fasteners: appropriate for the wall construction involved.
- Refer to the schematics on the following page for connection information.

Schematics





TS-RA2 SW1 Switch Position Settings
(factory settings are shown in bold italic>)

Sound Ouput Level	Position 1	Tone	Pos. 2	Pos. 3	Pos. 4
High dB	ON	Horn (continuous)	ON	ON	ON
Standard db	OFF	Bell	ON	OFF	ON
		March Time Horn	OFF	OFF	ON
		Code-3 Horn	ON	ON	OFF
		Code-3 Tone	OFF	ON	ON
		Slow Whoop	OFF	ON	OFF
		Siren	ON	OFF	OFF
		HI/LO	OFF	OFF	OFF

Setup and Operation

Set up the console so that the alarms operate properly:

1. Identify the relay that is being used to activate the overfill alarm equipment.
2. Navigate to the setup programming of that relay.
3. Confirm that the relay is programmed according to the following:
 - Name: Overfill Alarm Relay (or similar).
 - Enabled: Yes
 - Type: Alarm
 - Polarity: Normal
 - Logic: OR Logic
 - Physically Wired As: Normally Open
 - Number of inputs: 0

NOTE: If you have a legacy console, refer to the associated programming manuals for specific information.

4. Make sure the rule activates the overfill alarm equipment when a HIGH or HIGH HIGH tank alarm occurs. Go to the Rules section of programming:
 - Rule: Overfill Alarm Activate (or similar)
 - Name: Overfill Alarm Activate (or similar)
 - Enabled: Yes
 - Events
 - Event: Type Alarm Occurred
 - Category: FMS
 - Device: Tank
 - Device ID: Any
 - Code: High high product level

Actions

- Action Type: Relay
- Module: Power Supply Module
- Channel: Overfill Alarm Relay
- Action: One Pulse
- Duration: 2

NOTE: Legacy consoles that do not have the One Pulse option must incorporate two separate actions. One action to activate the relay, the second action to deactivate the relay.

NOTE: Verify that the code you select sounds the alarm at the correct volume/limit set for each tank.

NOTE: Verify that the code you select refers to the correct High High or High product threshold. You can confirm the units in which the High and High High thresholds are measured under Fuel Management Systems/High Product Limit.

5. Force the tank into the High or High High Alarm by manually raising the product float beyond the threshold and confirming the Overfill alarm sounds. Press the acknowledge button on the TS-RK to silence the alarm.

Testing the Alarm Wiring

Use the following procedure to verify that the tank Overfill Alarm is wired correctly. If the Setup and Operation procedure does not produce an Overfill Alarm, use the following procedure to verify that the issue is not caused by improper wiring.

1. Go to System/Diagnostic/Relay Status.
2. Select the Activate/Deactivate checkbox for the Overfill Alarm Relay (or a similar relay). The Active indicator becomes GREEN for the associated relay.
3. Make sure the Overfill Alarm is activated.
 - a. If the Overfill Alarm is activated, the wiring is correct. Clear the Overfill Alarm Relay checkbox to deactivate the relay. Press the acknowledgment button on the TS-RK to silence the alarm.
 - b. If the Overfill alarm is not activated, there is an issue with the wiring. Clear the Overfill Alarm Relay checkbox to deactivate the relay. Consult the TS-RA1, TS-RA2, TS-RK installation manual for information about proper wiring.

NOTE: If you have a legacy console, refer to the associated programming manuals for information about manually activating relays.



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