



Franklin Electric
FUELING SYSTEMS

REMOTE TANK OVERFILL ALARM

INSTALL GUIDE

000-1027 r8

MODELS

TS-RA1

TS-RA2

TS-RK

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CONVENTIONS USED IN THIS DOCUMENT

This document includes safety precautions and other important information presented in the following format:

NOTE: This provides helpful supplementary information.

IMPORTANT: This provides important supplementary information and instructions to avoid damaging hardware or a potential hazard.

▲ CAUTION: This indicates a potentially hazardous situation that could result in minor or moderate injury if not avoided. This may also be used to alert against unsafe practices.

▲ WARNING: This indicates a potentially hazardous situation that could result in severe injury or death if not avoided.

▲ DANGER: This indicates an imminently hazardous situation that will result in death if not avoided.

OPERATING PRECAUTIONS

Franklin Electric equipment is designed to be installed in areas where volatile liquids such as gasoline and diesel fuel are present. Working in such a hazardous environment presents a risk of severe injury or death if you do not follow standard industry practices and the instructions in this document. Before working with or installing the equipment covered in this document, or any related equipment, read this entire document, particularly the following precautions:

IMPORTANT: To help prevent spillage from an underground storage tank, make sure the delivery equipment is well-maintained, that there is a proper connection, and that the fill adaptor is tight. Delivery personnel should inspect delivery elbows and hoses for damage and missing parts.

▲ CAUTION: Use only original Franklin Electric parts. Substituting non-Franklin Electric parts could cause the device to fail, which could create a hazardous condition and/or harm the environment.

▲ WARNING: Follow all codes that govern the installation and service of this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and 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 while installing or servicing this product. Refer to this document (and documentation for related equipment) for complete installation and safety information.

▲ WARNING: Before entering a containment sump, check for the presence of hydrocarbon vapors. Inhaling these vapors may cause dizziness/ unconsciousness, and if ignited, can explode causing serious injury or death. Containment sumps are designed to trap hazardous liquid spills and prevent environmental contamination, so they can accumulate dangerous amounts of hydrocarbon vapors. Check the atmosphere in the sump regularly while work is in process. If vapors reach unsafe levels, exit the sump and ventilate it with fresh air before resuming work. Always have another person standing by for assistance.

▲ WARNING: 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.

▲ WARNING: Always secure the work area from moving vehicles. The equipment in this document is usually mounted underground, so reduced visibility puts service personnel working on it in danger from moving vehicles that enter the work area. To help prevent this safety hazard, secure the area by using a service truck or other vehicle to block access to the work area.

▲ DANGER: Inspect the installation location for potential ignition sources such as flames, sparks, radio waves, ionizing radiation, and ultrasound sonic waves. If any potential ignition sources are identified, implement proper safety measures.

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1 Introduction

The TS-RA1 and TS-RA2 (high intensity) alarms are remote audible and visible alarm units for use with Franklin Electric Automatic Tank Gauges. The TS-RK is a remote alarm acknowledge unit for use with TS-RA1 and TS-RA2 and all Franklin Electric Automatic Tank Gauges equipped with remote alarm annunciators.

1.1 Documentation

- This document is intended for qualified and certified installation persons.
- Instructions of this document are in English. All other language versions are translations of this original document.
- Illustrations in this document show a typical setup and are for instruction and description purposes only.
- Information given in this document is given as a guide only. It is the installer's responsibility to ensure that correct and safe procedures are followed at all times.
- This document and related documents are available from Franklin Electric at www.franklinfueling.com.

1.1.1 Symbol Legend



Wear Protective Headwear



Wear Eye Protection



Wear Protective Clothing



Wear High-Visibility Clothing



Wear Protective Gloves



Wear Safety Footwear



Refer to instruction guide.



Ventilate Before & During Entering



Ensure Continuous Ventilation



Connect an earth terminal to the ground



Disconnect main plug from electrical outlet



Disconnect before carrying out maintenance or repair



General Warning



Warning: Industrial vehicles



Warning: Electricity



Warning: Flammable Material



No open flame; Fire, open ignition source and smoking prohibited

2 Safety/Security

2.1 General Safety Information

- Only perform procedures in this document that you are qualified and certified to perform.
- Personnel working on or with energized equipment must be authorized by relevant regulatory bodies to carry out such work and must have the appropriate training. Check with your employer and relevant regulatory body's rules for working with energized equipment.
- Obey all local laws, rules, regulations, and instructions in this document. In case of inconsistency or contradiction between information contained in this document and any laws, rules and regulations, obey the stricter of the two.
- Keep unqualified personnel at a safe distance during installation.
- If it is necessary to remove safety/security devices, immediately reinstall the safety/security devices after completing the work.

2.1.1 Gas Station Owner or Operator

Save this guide for future use, and make sure you provide them to anyone who services this equipment.

2.2 Hazard Assessment

Prior to beginning work and prior to recommencing work after leaving and returning to the worksite, a worksite, *pre-job hazard assessment* must be performed to identify safety and environmental needs. At a minimum, this hazard assessment should:

- Identify possible hazards and risks.
- Identify the safety needs of the job.
- Identify the correct procedures, practices and equipment.
- Eliminate unsafe conditions and actions from the worksite.
- Identify the need for personal protective equipment.
- Inspect equipment before use.
- Confirm sheaths of all cables are secured and undamaged.
- Confirm plugs and connectors are properly connected and serviceable.
- Perform ongoing risk assessment during the project.

2.3 Required Personal Protective Equipment (PPEs)

These PPEs are required during all phases of installation.



Wear Protective Clothing



Wear Eye Protection



Wear High-Visibility Clothing



Wear Protective Gloves



Wear Protective Headwear



Wear Safety Footwear

2.4 Cyber Security

This product is designed to be connected to and to communicate information and data via a network interface. It is solely the owner's responsibility to provide and continuously ensure a secure connection between the product and Owner's network or any other network (as the case may be).

The Owner shall establish and maintain appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

The manufacturer, Franklin Electric, and its affiliates are not liable for damages and/or losses related to such security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

3 Technical Overview

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 an EVO™ Series console, T5 Series 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.

3.1 Alarm Specifications

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

3.1.1 TS-RA1

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

Table 3.1 – TS-RA1

Field	Rating/Description
Input Power	115 VAC (96 to 132 VAC), 60 Hz @ 0.125 Amps Maximum
Operating Temperature Range	–31 to 150°F
Humidity Range	Up to 95% humidity
Signal outputs	Visual (low intensity incandescent lamp) and audio tone (85 dB @ 10 feet)

3.1.2 TS-RA2

The TS-RA2 is an 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'.

Table 3.2 – TS-RA2

Field	Rating/Description
Input Power	115 VAC (96 to 132 VAC), 60 Hz @ 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 (99 dB to 75 dB @ 10 feet).

4 Installation



NOTE: When the installation is complete, make sure this guide is left with the service station owner or operator.

NOTE: Wiring diagrams are in Appendix section 6.1 of this guide.

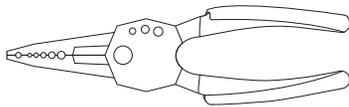
4.1 Pre-Installation Inspection

Upon Receipt of Item(s)

- Verify all items are in accordance with the order.
- Check all items for damage.
- If any item shows damage or is not in accordance with the order, inform Franklin Electric *immediately*.
- Remove the packaging material.
 - Follow all local laws, rules and regulations regarding disposal of discarded parts, packaging material or items and any subsequent components.

4.2 Required Tools And Materials

Tools



Materials

- **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" or 3/4" (the TS-RA2 has a 1/2" 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.

4.3 Location 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.

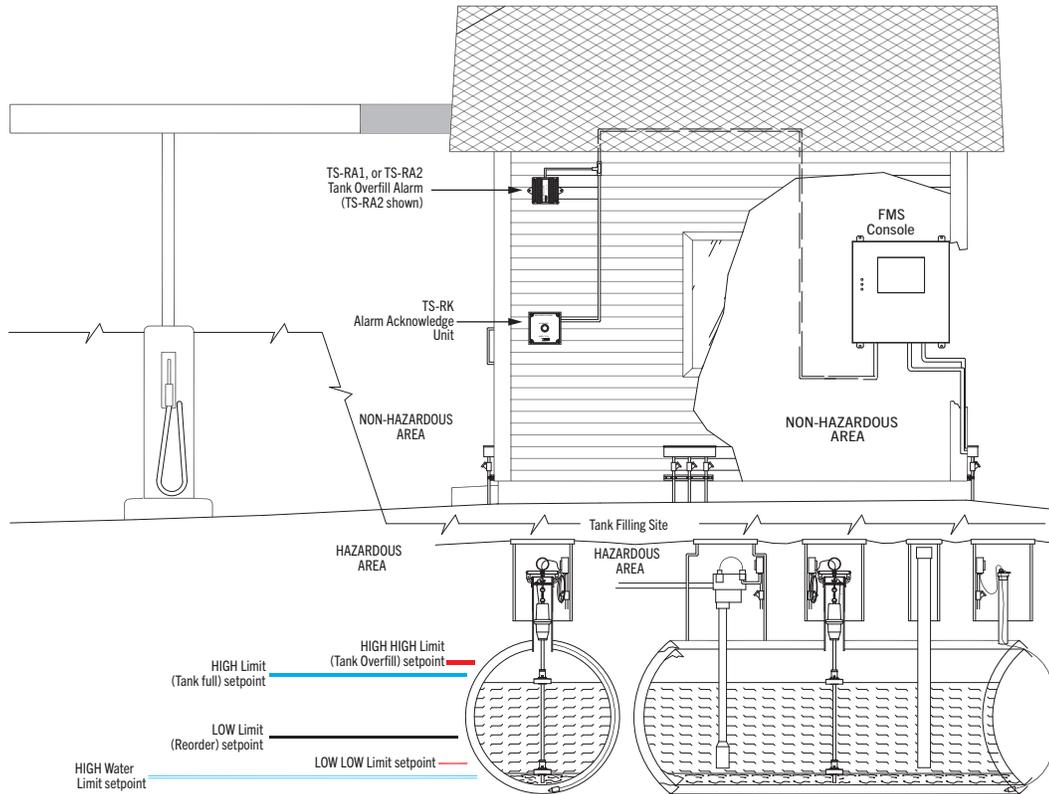


Figure 4.1: TS-RA and TS-RK Installation Overview

- The location of the Tank Overfill Alarm and Alarm Acknowledge unit enclosures must be less than 1000' 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.

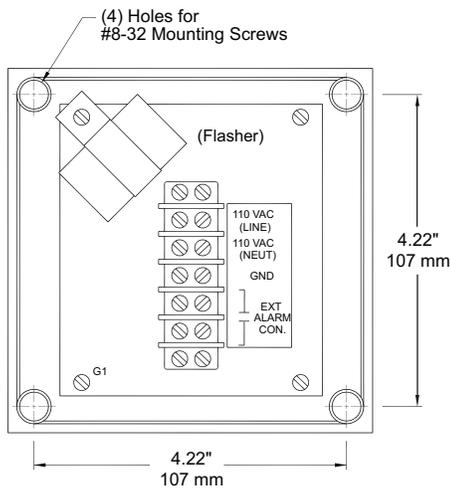
⚠ WARNING: Run wiring from the console to the TS-RA1 / TS-RA2 Tank Overfill Alarm and TS-RK Alarm Acknowledge units in separate conduit apart from any other wiring. All conduits must enter through supplied non-intrinsically safe enclosure knockouts only. Failure to do so may create an explosion hazard.

4.4 Install Instructions

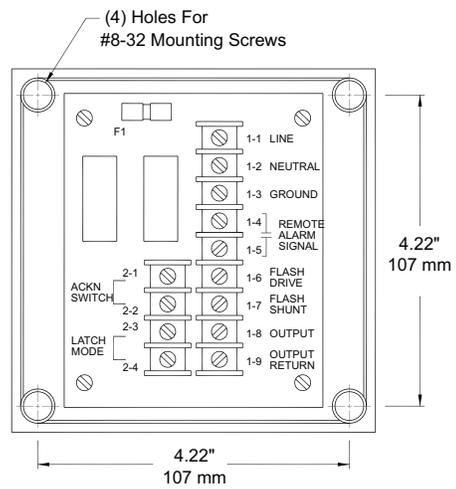
4.4.1 Mounting The Units

TS-RA1/TS-RK

- 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



Internal View (Cover Removed)
Figure 3: TS-RK Mounting Details

TS-RA2

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

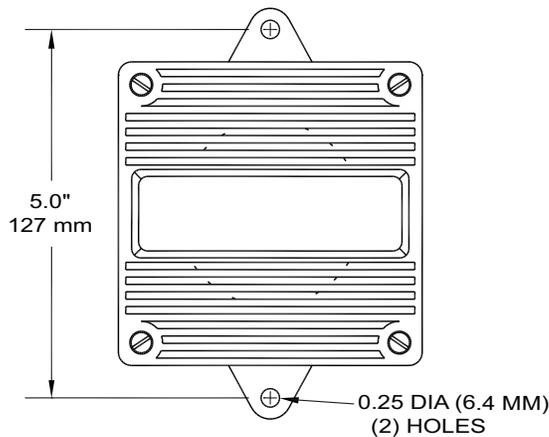
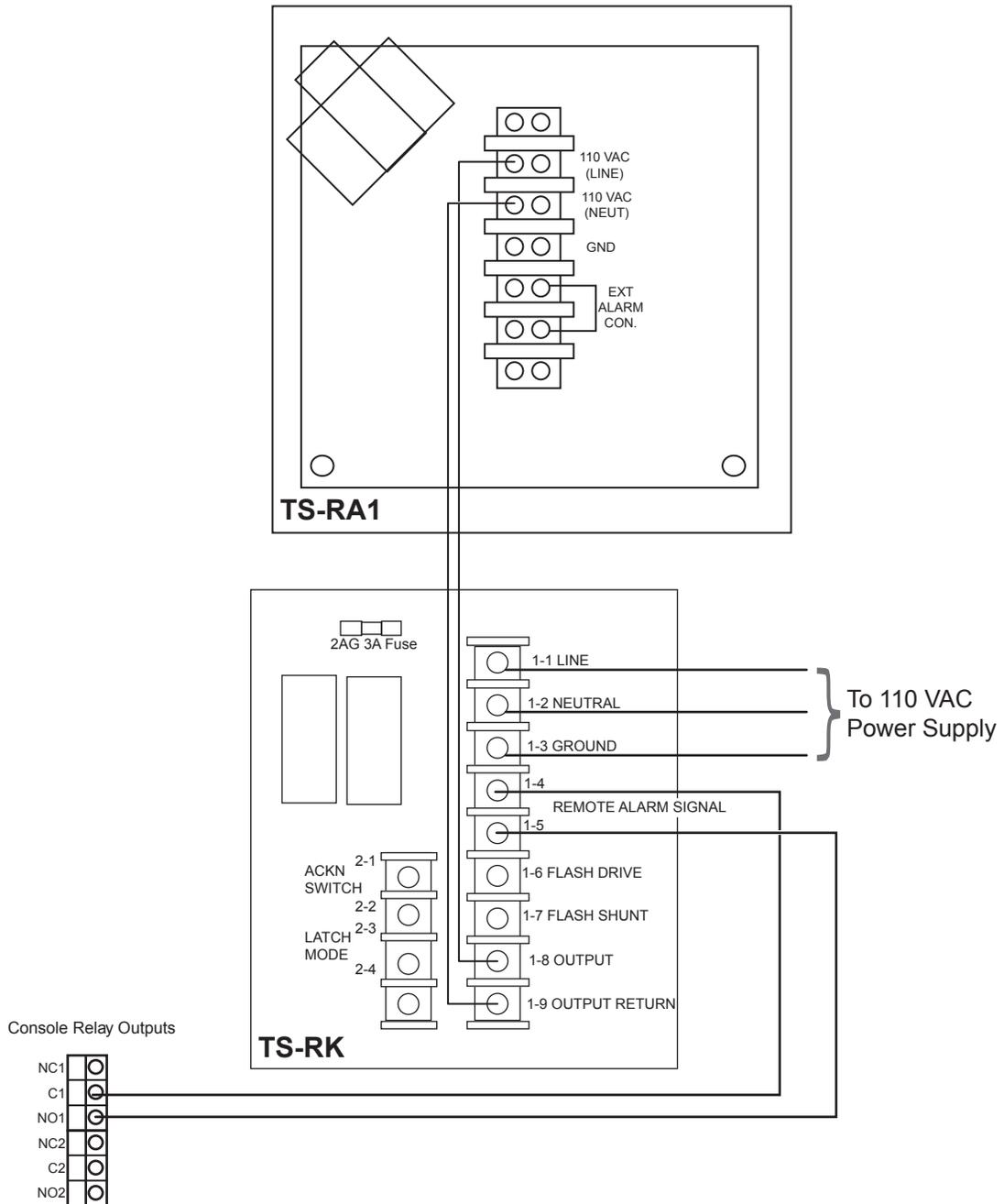


Figure 4: TS-RA2 Mounting Details

4.4.2 Wiring Schematics

4.4.2.1 TS-RA1 / TS-RK



4.4.2.2 TS-RA2/TS-RK

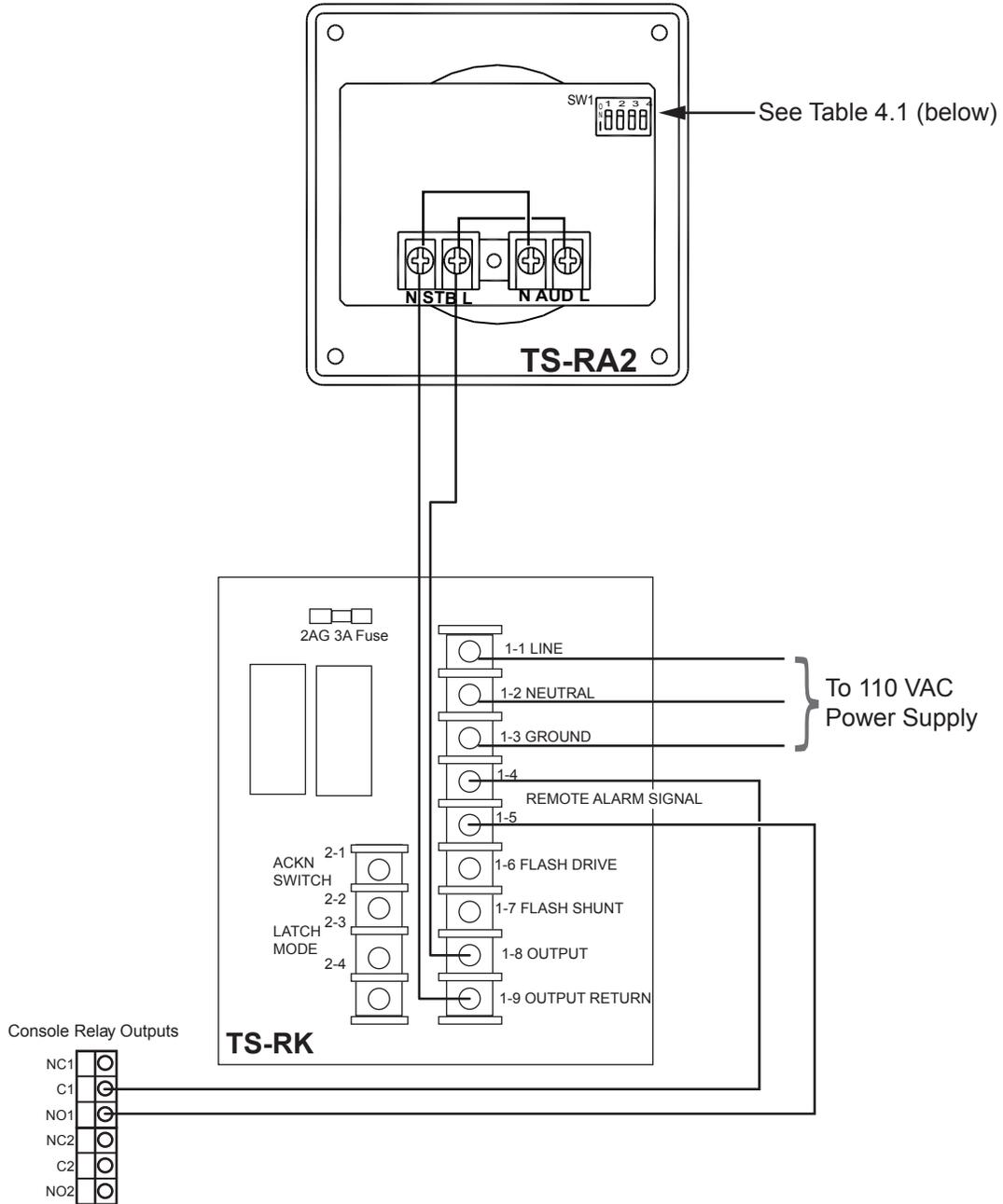


Table 4.1 – TS-RA2 SW1 Switch Position Settings (factory settings are shown in bold)

Sound Output 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

4.5 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 it is 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. The first action to activate the relay and the second action to deactivate the relay.

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

NOTE: Verify that the code selected refers to the correct High High or High product threshold. 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

4.6 Testing The System

4.6.1 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. From the Web Browser Interface, navigate to Tools > Test Operations on the EVO™ 200/400/600/6000 or navigate to System > Diagnostic > Relay status on the EVO™ 550/5000.
2. Select the Toggle Relay Active for the EVO™ 200/400/600/6000 or the Activate/Deactivate checkbox for the Overfill Alarm Relay.
3. Check to see if the Overfill Alarm is activated.
 - a. If the Overfill Alarm is activated, the wiring is correct. Select the Toggle Relay Active or 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 §4.2 and §4.4.2 for information about proper wiring.

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

4.6.2 Testing The Remote Alarm

Use the following procedure to verify that the tank Overfill Alarm is operating correctly.

1. Remove the probe.
2. Carefully remove the probe dust cap.
NOTE: Tanks are typically under pressure or vacuum and once the cap is removed, a rush of air will likely be present to equalize tank pressure.
3. Slowly raise the probe by carefully pulling on the yellow quick disconnect cable.
NOTE: While removing the probe, carefully guide floats through riser to avoid damage and prevent the probe from catching on the riser.
4. Once the probe and floats have cleared the riser, hold the probe by the shaft and disconnect the yellow quick disconnect cable.
5. Hold the probe with two hands along the shaft and carefully lower it to lay flat on the forecourt surface.
IMPORTANT: DO NOT allow probe to roll.
IMPORTANT: DO NOT place probe in an area of foot or vehicle traffic.
6. Clean up any fuel drips or spill from the probe.
7. Slowly raise the product float towards the probe head until the remote alarm sounds.
 - a. Confirm a High Product or High High Product Alarm, depending on configuration settings, for the corresponding tank has posted on the ATG.
 - b. Acknowledge the alarm by depressing the button on the alarm acknowledgment unit.
NOTE: Once the alarm acknowledgment unit has been depressed, The latching relay is released and the overfill alarm/ Remote Acknowledgement is now prepared to reinitiate overfill alarm in the case another tank experiences an overfill situation.
8. Repeat steps 1. – 3. for each tank.
9. Once the required testing of the probe/ overfill alarm has been completed, reinstall the probe per the probe installation guide. Confirm the probe is reading measurements correctly and that no alarms are active on the console.



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