# Instructions

GRACO®

# Pulse® Level
# WiFi Tank Level Monitor

3A8507E

EN

*Measures the distance between the device and the surface of the fluid to determine the volume of fluid within a tank. For use only with Pulse Level. Intended fluids: oil, diesel, waste oil, automatic transmission fluid (ATF), kerosene, anti-freeze, windshield washer solution, waste water, and DEF. For professional use only. Not suitable for tank overfill protection.*

**Not approved for use in explosive atmospheres or hazardous (classified) locations.**

| Part No. | Model | Description | Radio Approvals | Model Approvals |
|----------|-------|-------------|-----------------|-----------------|
| 25T460 | TEK 750 | Pulse Level WiFi | FCC, IC, CE, RCM | CE |

### Important Safety Instructions

Read all warnings and instructions in this manual and in all related Pulse manuals before using the equipment. Save all instructions.

## ⚠ WARNING

**EQUIPMENT MISUSE HAZARD**

Misuse can cause death or serious injury.

- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

**PERSONAL PROTECTIVE EQUIPMENT**

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, and inhalation of toxic fumes.

This Tank Level Monitor (TLM) contains FCC ID 56T784. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not case harmful interference.

- This device must accept any interference received, including interference that may cause undesired operation.
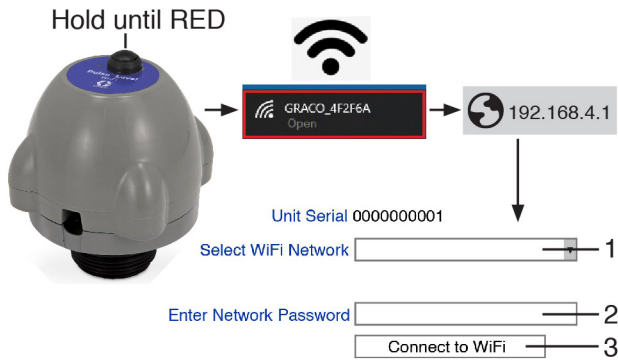
# Installation

## Set Up

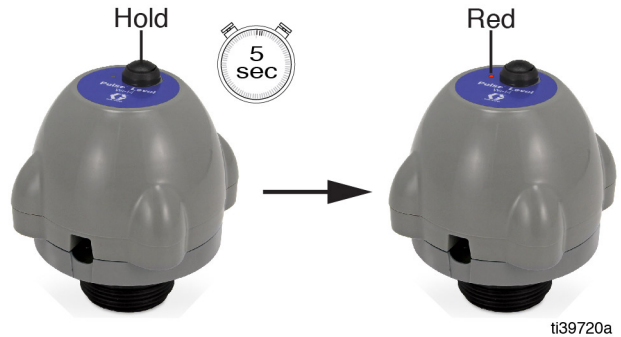| NOTICE |
| --- |
| • Do not over tighten TLM into tank bung. Over tightening can cause permanent damage and result in inaccurate readings. |
| • Do not use the TLM with pressurized tanks. Using the TLM in a pressurized tank will damage the TLM. |
| • Do not use thread sealant or adhesive. Many of these products are chemically incompatible with the ABS plastic threads. |

## Connecting to a Network

### Summary

Please refer to the instructions in this section, unless indicated otherwise.



**FIG. 1**

1.  Press and hold the button on the top of the Pulse sensor until the LED light turns red.



**FIG. 2**

2.  Using a mobile device (e.g. laptop, smart phone, tablet), search for a WiFi network beginning with GRACO and connect.

3.  Open a web browser and enter "http://192.168.4.1" into the address bar.

4.  After the WiFi settings page is loaded, select the intended WiFi network from the drop down bar.

5.  Enter the selected WiFi network password.

6.  Click the Connect to WIFI button.

7.  The LED on the Pulse sensor turns green (FIG. 3).



**FIG. 3**

8.  Wait approximately 20 seconds.

9.  The sensor flashes red or green several times.

•   Green flashes indicate that a connection to the network has been established.

•   Red flashes indicate that a connection to the network has not been established. The number of red flashes identifies the problem:

## Error Flash Patterns (LED)

| No. of Flashes | Function | Resolution |
|---|---|---|
| 1 | Unable to find WiFi network | Verify that Connect to WiFi was selected on the browser |
| 2 | Unable to connect to WiFi network | Improve WiFi signal strength or enable MAC filtering on the router |
| 3 | WiFi password is incorrect | Verify information entered is correct<br><br>Verify that the WiFi network's security supports WEP, WPA, or WPA2 security |
| 5 | Pulse Level is unavailable | Confirm that port 80 is not blocked for your device IP address |
| 6 | Invalid response from the Pulse Level | Retry |
| 7 | Firmware download failed | Check that the network is up and stable before trying again |
| 8 | Low battery | Change batteries |
| 9 | Critical failure | Replace the Tank Level Monitor |

## Register TLM to Tank in Pulse Level Software

Assign a TLM serial number to a tank in Pulse Level.

Navigate to URL: level.gracopulse.com

After creating user, organization, branch and site, navigate to Devices (located in the upper right corner of the screen). Associate the device to your organization by entering the serial number and activation code. When you create a tank for the site, the device will be assignable.

## Typical Installation



**FIG. 4**

## Mount Options

Identify a threaded opening on the top of the tank for the sensor. The location should be vertical with a clear path to the contents of the tank. There should be no obstructions that could interfere with the signal.

1.  If the hole is not threaded, place the foam gasket (included with kit) over the opening.

2.  Place the mounting adapter (included with kit) on top of the foam gasket.

3.  Use the two (2) stainless steel self-tapping, counter-sunk screws (included with kit) to attach the adapter to the tank. Do not over tighten.

4.  Attach the sensor to the adapter. To form a secure seal, make sure that the sensor is vertical on the tank, that it is secured correctly to the base, and that the threads have not crossed.

NOTE: If the tank does not contain a suitably positioned opening at the top of the tank, reference **Drilling**, page 4.
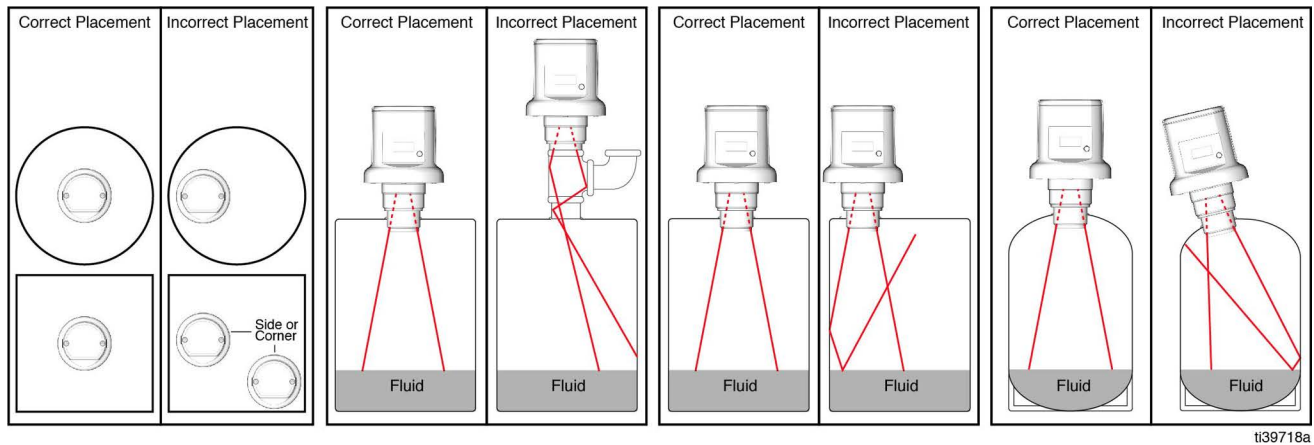
# Installation Examples


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## Drilling

If the tank does not contain a suitable positioned opening at the top of the tank, it will be necessary to manually drill into the top of the tank.

1. Select a flat area on the top of the tank located towards the center (FIG. 5).

2. Drill a 1.5 in. bsp hole at the selected area using a 45.5 mm tapping drill.

3. Continue with **Mount Options**, steps 1 through 4.

# Operation

## View Data

The TLM can be configured with the Pulse Level (level.gracopulse.com) to take a reading at predefined times.

After configuring the TLM using the TLM Pulse Level, press the button until the green LED is lit, to create a connection between the TLM and the Pulse Level to load the configuration.

NOTE: Frequent measurements result in shorter battery life.

# Manual Measurement

To force a measurement:

1. Press and hold the button until the green light illuminates.Release the button.
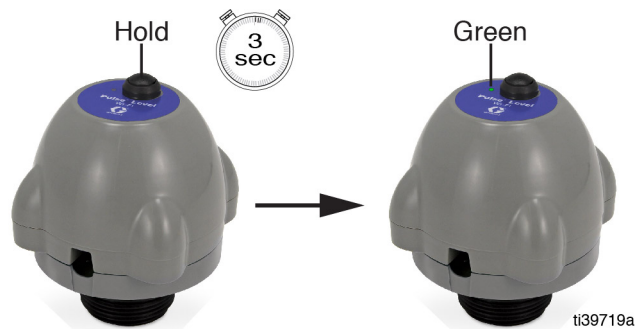

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FIG. 6

# Recycling and Disposal

## End of Product Life

At the end of the product's useful life, dismantle and recycle it in a responsible manner.

*   Remove batteries, circuit boards, LCDs (liquid crystal displays), and other electronic components. Recycle according to applicable regulations.

*   Do not dispose of batteries or electronic components with household or commercial waste.

*   Deliver remaining product to a recycling facility.

# Troubleshooting

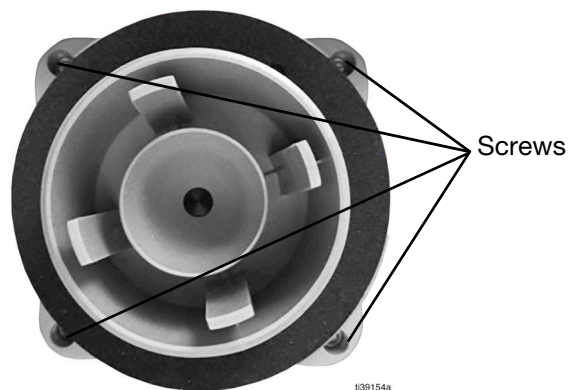| Problem | Cause | Solution |
|---|---|---|
| Monitor is not reporting scheduled readings. | Out of WiFi range. WiFi obstruction. | Ensure that the TLM is not encased in metal, since this would obstruct the signal. Take a manual measurement and review LEDs during the measurement. |
| | Weak or dead batteries. | Replace batteries. See **Replace Batteries**, page 6. |
| | Tank Level Monitor was not associated with profile after scheduled times were entered into software. | Assign TLM serial number to a tank. Press TLM button to take a manual reading. |
| | Reading is scheduled when pump is operating. | Ensure readings are scheduled during times that the pump is not operating. |
| LED will not turn on. | Button released too soon. | Hold button down for a longer period of time. |
| | Weak or dead batteries. | Replace batteries. See **Replace Batteries**, page 6. |

# Service

After the TLM has been installed, the only additional maintenance or service necessary is changing the batteries.

## Replace Batteries

# ⚠ WARNING

**Fire and Explosion Hazard**

Sparking can occur when changing batteries. Only replace the batteries in a non-hazardous location away from flammable fluids and fumes.

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*NOTICE*

After battery placement, press the button to synchronize the TLM internal clock to maintain scheduled TLM readings.

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1. Remove the TLM adapter from the tank.

2. Remove the four screws that keep the case together (FIG. 7).

Screws

**FIG. 7**

3. Carefully pull the TLM case halves apart to access the battery (FIG. 8).

NOTE: The TLM case halves are tightly connected. Use caution when opening the device to prevent unnecessary damage.

**FIG. 8**

4. Replace the 3.6V C-size battery. See **Technical Specifications**, page 8, for battery information. Install the battery as shown in FIG. 9, with the positive end on the right. This is the clip that has shrink tubing on it.

5. To maintain the IP rating, make sure that the gasket is properly installed (FIG. 9).

Place Gasket Here

**FIG. 9**

6. Reconnect the two halves and replace the four screws.

# Dimension - Tank Specifications

## Vertical Tank:

- Maximum Volume - 999,999 gallons or liters.

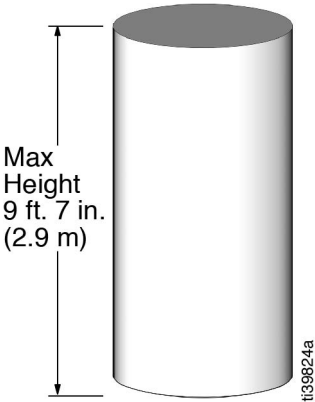- Tank walls must be uniformly vertical from empty level to full.
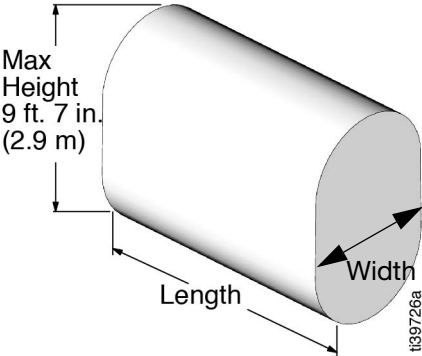
**FIG. 10**

## Cylindrical Tank:

- Maximum volume = 999,999 gallons or liters.

- Tank end walls must be flat; they cannot be any other shape, including belled.

**FIG. 11**

## Obround Tank:

- Maximum volume = 999,999 gallons or liters.

- Tank end walls must be flat; they cannot be any other shape, including belled.
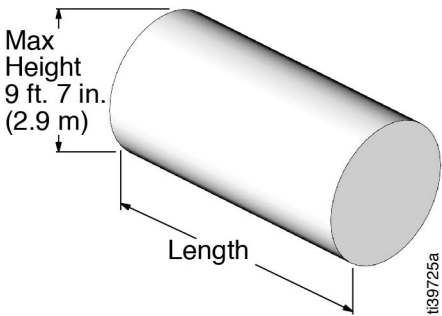
**FIG. 12**

## Non-Standard Tanks:

- Maximum volume = 999,999 gallons or liters.

- Define strapping table in Pulse Level Software.

- Up to 100 strapping table points to correlate tank fluid height to volume.

# Technical Specifications

| Tank Level Monitor (TLM) | | |
|---|---|---|
| | **US** | **Metric** |
| Compatible Fluids | oil, kerosene, diesel, lubricants, additives, DEF/AdBlue®, coolants, water, waste oil, waste water, automatic transmission fluid (AFT), anti-freeze, and windshield washer solution | |
| Ultrasonic Tank Depth Measurement range | 5.0 in. to 9 ft. 7 in. | 12 cm (minimum) to 300 cm |
| Fluid Level Measurement Accuracy | +/- 1.0 in. | +/- 2.0 cm |
| Mounting | 1.25 in., 1.5 in, and 2.0 in. threaded npt connector | |
| Clearance: Height above tank for TLM | 7.5 in. | 19.1 cm |
| Weight | 0.5 lb. | 226.8 g |
| RF Frequency Band | 2.412 GHz - 2.462 GHz | |
| Maximum RF Transmit Power | 18 dBm | |
| Operating Temperature Range | 0°F to 122°F | -17.8°C to 50°C |
| Storage Temperature Range | 0°F to 122°F | -17.8°C to 50°C |
| Batteries | Li-SOCl2 Size R14, 3.6V C-cell | |
| Battery Life | 7.5 years* from activation | |
| Enclosure (Ingress Protection) | IP67 | |
| Tanks | | |
| Maximum Volume | 999,999 gallons | 999,999 liters |
| Maximum Height | 9 ft. 7 in. | 300 cm |
| Altitude | <6,000 ft. | < 2 km |
| Wireless | 2.4 GHz 802.11 b/g/n | |
| * *The battery life is based upon four (4) measurements per day and one (1) WiFi connection per day from a location where the WiFi coverage does not require retries, and a normal distribution over the operating temperature range centered at +25°C (77°F).* | | |
| All trademarks or registered trademarks are the property of their respective owners. | | |

# California Proposition 65

**CALIFORNIA RESIDENTS**

⚠ **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

# Graco Extended Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twenty four months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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