Instruction Manual

GRACO®

Pulse® Level Pressure Tank Level Monitor

3A8622D

EN

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

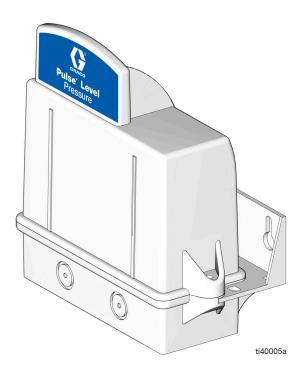| Part No.	Model	Description	Radio Approvals	Model Approvals
25T462	TEK 822	Pulse Level Cellular North America	FCC, IC	CSA® C US **Class 1, Division 1 Gr C D** **Class 1 Zone 0 AEx ia IIB T4 Ga**
133621	TEK 822	Pulse Level Cellular International	CE, RCM	Ex **II 1G Ex ia IIB T4 Ga** **(-30<Ta<+55C)** 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.

This Tank Level Monitor (TLM) contains FCC ID XMR 201707 BG96. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

• This device may not cause harmful interference.

• This device must accept any interference received, including interference that may cause undesired operation.

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Contents

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠ 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.

INSTRINSIC SAFETY

Intrinsically safe equipment that is installed improperly or connected to non-intrinsically safe equipment will create a hazardous condition and can cause fire, explosion, or electric shock. Follow local regulations and the following safety requirements.

- Be sure your installation complies with national, state, and local codes for the installation of electrical apparatus in a Class I, Group D, Division 1 Hazardous Location, including all of the local safety fire codes, NFPA 33, NEC 500 and 516, and OSHA 1910.107.
- Use only the supplied level sensor that is attached to the log device. Do not connect any other items or devices to the equipment.
- Do not connect level monitor to any external or internal voltage source which will lead to the battery being changed in the event of a single fault or abnormal operation.
- Servicing of the circuitry involving the batteries and replacement of the lithium batteries must only be done by a trained technician.
- Only use Graco 19D216 replacement battery.
- Under certain extreme circumstances, exposed plastic and ungrounded metal parts of the enclosure may store electrostatic charges capable of ignition.
    - Locate the equipment where a charge generating mechanism (such a windblown dust) is unlikely to be present.
    - Clean only with a damp cloth.

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.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Installation

Register TLM to Tank in Pulse Level Software
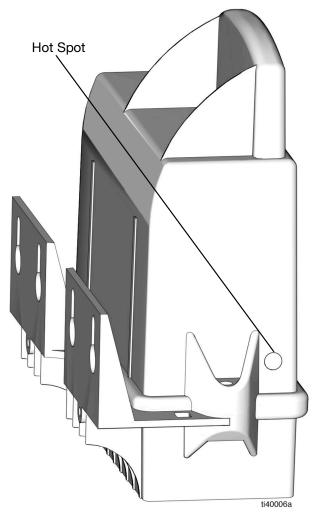
Navigate to URL: level.gracopulse.com

This device requires access to a cellular network to work, and can be activated in Pulse Level. Refer to Pulse Level terms of service in the About section of the software.

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. When you create a tank for the site, the device will be assignable.

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

Activation

1. Hold the magnet (supplied) to the Hot Spot on the side of the log device marked by a yellow sticker (FIG. 1).

Hot Spot

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FIG. 1

2. Keep holding the magnet to the Hot Spot. The log device chirps once per second, and then sounds a long beep.

3. Remove the magnet after the long beep.

4. There will be a series of short chirps until it connects to Pulse Level.

5. Successfully connecting is indicated by a high/low/high series of beeps that indicate the data is being sent to Pulse Level.

6. Once activated, the device uploads readings at scheduled times, if assigned to a tank in Pulse Level.

Beep Pattern

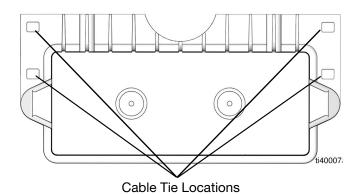| Beep Pattern	Definition
Beep once per second	Network registration
High/Low combination beep	Incoming data
Low/High combination beep	Outgoing data
Low double beep every four (4) seconds	Network Listen
Low double beep every two (2) seconds	Reestablish the Network connection
High double beep every four (4) seconds	TCP Listen
High double beep every two (2) seconds	Reestablish TCP

Mount Options

Log Device

The log device can be mounted in three ways:
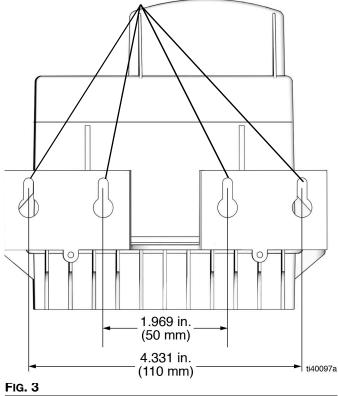
1. Using the adhesive strips to attach to a flat surface. This is typically used to vertically mount the device.
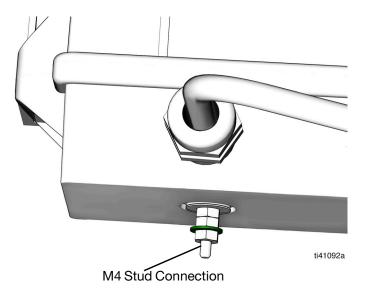
2. Using cable ties (FIG. 2):

Cable Tie Locations

FIG. 2

3. Using wall mount screws (FIG. 3):

Wall Mount Screw Locations

1.969 in. (50 mm)

4.331 in. (110 mm)

FIG. 3

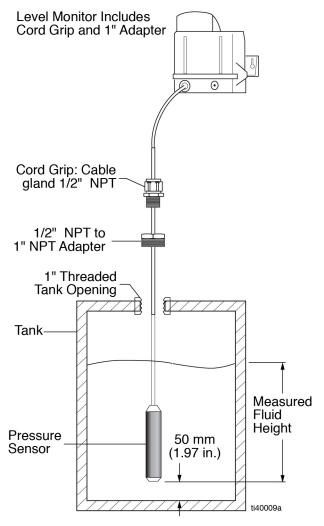4. For ATEX or hazardous (classified) locations, connect a grounding wire between the M4 stud and the chassis ground of the tank. This provides equipotential grounding of the pressure sensor housing.(FIG. 4).

M4 Stud Connection

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FIG. 4

Pressure Sensor

1. Position the pressure sensor so it is hanging downwards on the cable (FIG. 6).

2. Make sure that the inlet openings on the protective cap are not clogged (FIG. 5).

Protective Cap

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FIG. 5

3. Insert the pressure sensor through the 1 in. npt hole.

4. Position and screw a 1/2 in. to 1 in. adapter into the 1 in. npt hole.

5. Tighten the 1/2 in. cord grip to 1.3 ft-lbs (1.8 N•m) to set the pressure sensor position. A fixed sensor position is required to prevent measurement errors.

6. Position the sensor at least 2 in. (50 mm) from the bottom of the tank to avoid sediment or other contaminants that may interfere over time with the device taking accurate measurements.

Level Monitor Includes Cord Grip and 1" Adapter

Cord Grip: Cable gland 1/2" NPT

1/2" NPT to 1" NPT Adapter

1" Threaded Tank Opening

Tank

Pressure Sensor

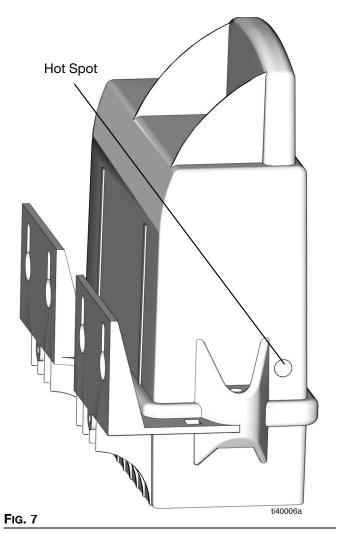50 mm (1.97 in.)

Measured Fluid Height

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FIG. 6

Operation

View Data

The TLM is configurable with Pulse Level (level.gracopulse.com) to take readings at predefined times.

After configuring the TLM using the Pulse Level, apply the magnet to the hot spot, which causes the TLM to make short chirps (once per second). Hold the magnet in place until a long beep is heard. The TLM makes short chirps as it creates a connection with Pulse Level (FIG. 7).

NOTE: Frequent measurements results in shorter battery life. The TLM may require up to ten (10) minutes of rest between readings to recharge the internal electronics.

Manual Measurement

1. Hold the magnet (supplied) to the Hot Spot marked by the yellow sticker on the side of the device (FIG. 7).

2. Keep holding the magnet to the Hot Spot. The TLM will chirp once per second and then emit a long beep.

3. Remove the magnet after the long beep.

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.

Hot Spot

FIG. 7

Troubleshooting

Problem	Cause	Solution
Device is not reporting scheduled readings.	Out of cellular range. Obstruction or interference of cellular RF signal.	Consider implementing a WiFi network and using Graco's WiFi TLM. Ensure that the TLM is not encased in metal, since this would obstruct the signal.
	Weak or dead batteries.	Change batteries using approved battery pack. See **Replace Batteries**, page 9.
	Tank Level Monitor was not associated with a tank in software.	Assign TLM serial number to tank.
	Reading is scheduled when pump is operating.	Ensure readings are scheduled during times that the pump is not operating.
Device does not beep when attempting to activate.	Magnet not making contact.	Move the magnet around the yellow sticker to locate a sensitive spot. Use a stronger magnet.
	Weak or dead batteries.	Change batteries using approved battery pack.

Service

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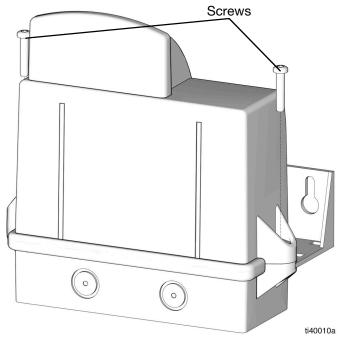
Replace Batteries

⚠️ **WARNING**

Fire and Explosion Hazard

Equipment must comply with the following conditions to avoid a hazardous condition which can cause fire or explosion. Follow local regulations.

- Sparking can occur when changing batteries. Only replace the batteries in a non-hazardous location away from flammable fluids and fumes.
- Do not connect level monitor to any external or internal voltage source which will lead to the battery being changed in the event of a single fault or abnormal operation.
- Servicing of the circuitry involving the batteries and replacement of the lithium batteries must only be done by a trained technician.
- Only use Graco 19D216 replacement battery.

1. Remove the two (2) screws that keep the case together (FIG. 8).

Screws

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FIG. 8

2. Gently pull the case apart.

3. Disconnect the battery pack from the circuit board (FIG. 9).

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FIG. 9 Disconnect Battery

4. Slide the battery pack forward to remove (FIG. 10).

Battery
Pack

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FIG. 10

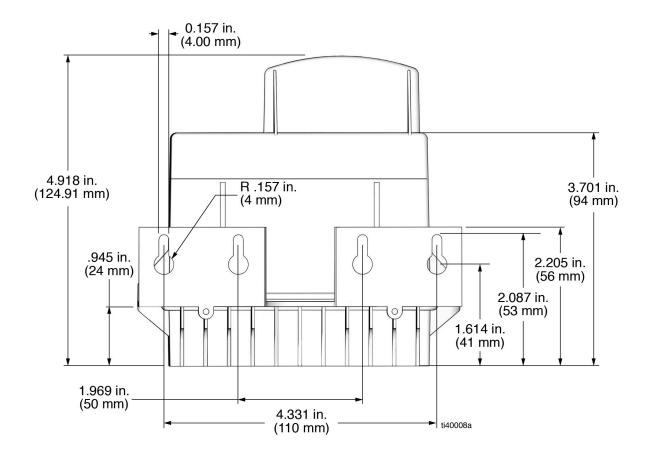5. Slide the new battery pack into place (FIG. 11).

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FIG. 11

6. Reconnect the battery pack to the circuit board
    (see FIG. 9).

7. Reassemble the case.

Kits and Accessories

Part	Description	Qty
19D216	Battery, Pack	1

Dimensions

0.157 in.
(4.00 mm)

4.918 in.
(124.91 mm)

3.701 in.
(94 mm)

R .157 in.
(4 mm)

.945 in.
(24 mm)

2.205 in.
(56 mm)

2.087 in.
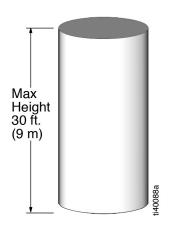(53 mm)

1.614 in.
(41 mm)

1.969 in.
(50 mm)

4.331 in.
(110 mm)

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Dimensions - Tank Specifications

Vertical Tank:

- Maximum Volume - 999,999 gallons or liters.

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

FIG. 12

Cylindrical Tank:

- Maximum volume = 999,999 gallons or liters.

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

FIG. 13

Obround Tank:

- Maximum volume = 999,999 gallons or liters.

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

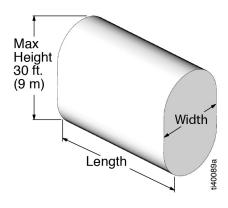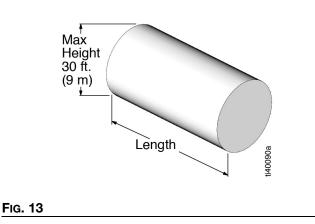**FIG. 14**

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, diesel, fuel, waste oil, automatic transmission fluid (ATF), kerosene, anti-freeze, windshield washer solution, waste water, gasoline, and DEF	
Tank Depth Measurement range	30 ft.	9 m
Mounting	Screw mount, adhesive strips, or cable ties	
Weight (excluding the cable and gland/external connectors)	0.75 lb	0.34 kg
RF Frequency Band	LTE CAT-M	
Transmitting Power Rating	23 dBm Max	
Operating Temperature Range	-4°F to 131°F	-20°C to 55°C
Storage Temperature Range	-4°F to 122°F	-20°C to 50°C
Batteries	3.6V Lithium Thionyl Chloride Exi "Bobbin Type" construction. Use only Graco part number 19D216 battery.	
Battery Life	10 years*	
Enclosure (Ingress Protection)	IP68	
Tanks		
Maximum Volume	999,999 gallons	999,999 liters
Maximum Height	30 ft.	9 m
Altitude	<6,000 ft.	< 2 km
* *The battery life is based upon four (4) measurements per day and one (1) cellular connection per day from a location where the cellular 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.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

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.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

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For patent information, see www.graco.com/patents.
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