

# Installation and Operation



## Pulse<sup>®</sup> Asset Metered Dispense Valve

3A7274B  
EN

*For dispensing oil, automatic transmission fluid (ATF), gear oils, coolant, and windshield washer solvent\* in conjunction with wireless communication with a Pulse<sup>®</sup> Fluid Management system. For professional use only.*

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

1500 psi (10 MPa, 103 bar) Maximum Working Pressure

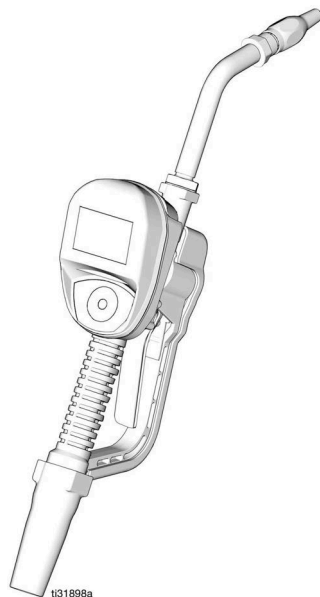
See page 4 for model information, including maximum working pressure and approvals.

\*See Fluid Compatibility in **Technical Specifications**, page 34.



### Important Safety Instructions

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



## Related Manuals

Manual in English	Description
3A5411	Pulse Tank Level Monitor (TLM)
3A5414	Pulse HUB

Contains Model XBee or S2C Radio, IC:1846A-XBS2C.

Contains FCC ID MCQ-XBS2C. 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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# Models

## Models

Model	Swivel	Extension	Nozzle	Fluid	Max. Volumetric Flow Rate	
					GPM	LPM
26D776	1/2 NPT	Rigid	Automatic	Oil	8	30
26D777	1/2 NPT	Rigid	Coolant	Coolant	8	30
26D778	1/2 NPT	Flex	Automatic	Oil	8	30
26D779	1/2 NPT	Flex	Coolant	Coolant	8	30
26D780	1/2 NPT	Rigid	High Flow	Oil	18	68
26D781	1/2 NPT	Flex	High Flow	Oil	18	68
26D782	1/2 NPT	Gear Lube	Manual	Gear Lube	5	19
26D783	1/2 NPT	Rigid Open	None	Windshield Washer Solvent	8	30
26D784	3/4 NPT	Rigid	High Flow	Oil	18	68
26D785	3/4 NPT	Flex	High Flow	Oil	18	68

# 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



### SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**



- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

## **WARNING**



### **EQUIPMENT MISUSE HAZARD**

Misuse can cause death or serious injury.



- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Specifications** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Specifications** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- 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.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

## **WARNING**



### **FIRE AND EXPLOSION HAZARD**

When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:



- Use equipment only in well-ventilated area.
- Eliminate all ignition sources, such as cigarettes and portable electric lamps.
- Ground all equipment in the work area.
- Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Use only grounded hoses.
- **Stop operation immediately** if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



### **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.

# Metered Dispense Valve Overview

## Metered Dispense Valve Overview

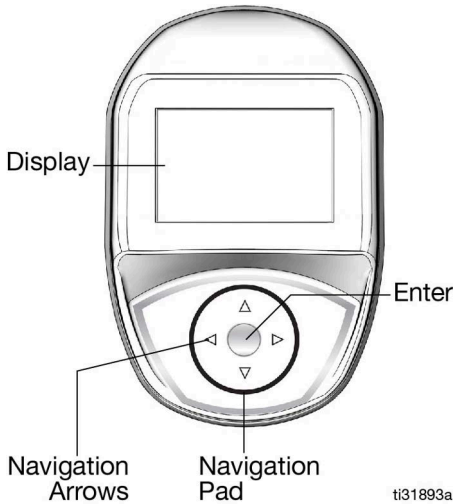
**NOTE:** The operating parameters for the metered dispense valve are controlled by the Pulse Fluid Management Software and set up by the System Administrator.

## Navigation Pad

The Navigation Pad (FIG. 1) includes four navigation arrows (UP, DOWN, LEFT, RIGHT) and a center button (ENTER).

**ARROWS:** Moves the cursor on the display.

**ENTER:** Selects or stores an entry.



**FIG. 1**

## Header Information

The following information appears at the top of the Work Offline and Dispense screens:



**FIG. 2**

- A Metered Dispense Valve Name - Unique Identification. Configure in the Pulse Fluid Management Software.
- B RF Signal Strength - Displays the last recorded strength of the signal received by the metered dispense valve, indicated by the number of bars displayed on the screen.
- C Battery Indicator - When the batteries are fully charged, the battery is completely filled in. As the battery discharges, the amount of battery filled declines. When the low battery symbol (FIG. 3) is shown, replace the batteries, see **Battery Replacement**, page 23.



**FIG. 3**



# Metered Dispense Valve Overview

## Sleep and Awake Mode

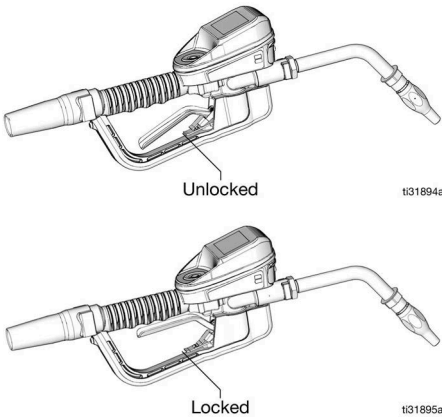
- Sleep: Battery saving mode
- Awake: Press any ARROW or the ENTER button on the navigation pad

## Locking and Unlocking the Trigger

The locking trigger locks in the dispense position. To release the lock, firmly squeeze the trigger to the handle (FIG. 4).

### NOTE:

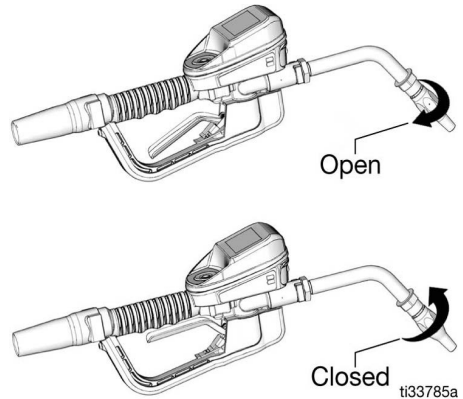
- Do not leave the metered dispense valve unattended during a dispense
- The locking trigger feature is not available on windshield washer solvent models



**FIG. 4**

## Open and Close the Nozzle

- Open the nozzle: Rotate clockwise (FIG. 5)
- Close the nozzle: Rotate counter-clockwise (FIG. 5)



**FIG. 5**

## Installation

### Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid, and moving parts, follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing the equipment.

1. Turn off the power supply to the pump or close the fluid shut-off valve.
2. Open the nozzle.
3. Use the Pulse Fluid Management software and authorize a test dispense, or authorize an offline dispense.
4. Trigger the metered dispense valve into a waste container to relieve pressure.
5. Open any bleed-type master air valves and fluid drain valves in the system.
6. Leave the drain valve open until ready to pressurize the system.

### Grounding



The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current.

Follow the pump manufacturer recommendations to ground your pump and fluid supply container.



#### FIRE HAZARD

Conductive metal surfaces on the metered dispense valve must not make contact with any positively charged metal surface, including, but not limited to, the starter solenoid terminal, the alternator terminal or the battery terminal. Such contact could cause electrical arcing and a fire.

To maintain ground continuity while flushing or relieving pressure, hold a metal part of the metered dispense valve firmly to the side of a grounded metal pail, then trigger the metered dispense valve.

**NOTE:** Only use electrically conductive hoses. Check the electrical resistance of the hoses, and if the total resistance to ground exceeds 29 megohms, replace hoses immediately.

### Pre-Installation Procedure



1. Relieve pressure, follow **Pressure Relief Procedure**, page 10.
2. Close the shut-off valve.
3. Ground the hose and reel or console.

**NOTE:** Leave at least two threads bare when using PTFE tape. The bare threads ensure ground is maintained.

## NOTICE

For a new installation, or if the fluid lines are contaminated, flush the lines before installation of the metered dispense valve. Contaminated lines could cause the metered dispense valve to leak.

Never dispense compressed air with a metered dispense valve. Dispensing compressed air damages the metered dispense valve.

4. Flush equipment (see **Flush Equipment**, page 11).

## Flush Equipment

The equipment is tested using lightweight oil, which is left in the fluid passages to protect the parts. To avoid contamination of the fluid, flush the equipment with a compatible solvent before use.



1. Close the main fluid outlet valve at the pump.
2. Adjust the air pressure to the pump motor to minimize the system flow rate without the metered dispense valve attached.
3. Verify that the air valve is open.
4. Slowly open the main fluid outlet valve.
  - a. Place the hose end (without the metered dispense valve connected) into a container used for waste oil.
  - b. Secure the hose in the container so it will not move during flushing.
  - c. For multiple dispense positions: Flush the dispense position furthest from the pump and work toward the pump.
5. Slowly open the shut-off valve at the dispense position.

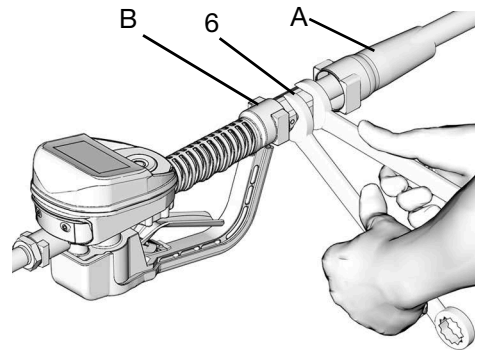
6. Flush out a sufficient amount of oil to ensure that the entire system is clean.
7. Close the shut-off valve.
8. Repeat steps 5 through 7 at all of the other positions.

## Install the Metered Dispense Valve



1. Relieve pressure, follow **Pressure Relief Procedure**, page 10.
2. Slide the swivel boot (A) back, over the hose, small end first to access the swivel fitting (6) (FIG. 6).
3. Apply thread sealant to the male threads of the hose fitting.
4. Thread the hose fitting (B) into the metered dispense valve swivel (6), and use two wrenches to tighten securely (FIG. 6).

**NOTE:** Allow the sealant to cure, according to the manufacturer recommendations, before allowing fluid to circulate through the system.



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**FIG. 6**

# Installation

## Install the Extension Tube

1. Adjust the nut (C) on the extension (2) so the maximum thread engagement of the extension (2) can be used (FIG. 7).
2. Thread the extension (2) into the housing until it bottoms out (FIG. 7).
3. Align the extension (2) with the metered dispense valve housing and handle (16) (FIG. 7).
4. Firmly tighten the nut (C) (FIG. 7).

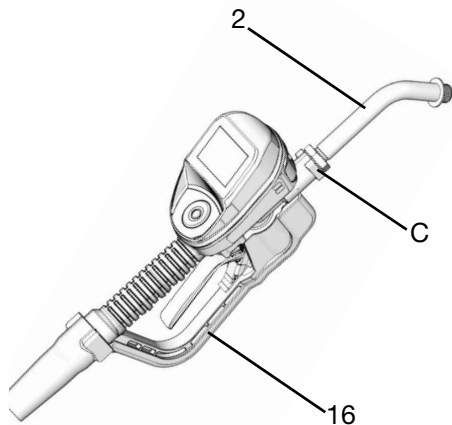


FIG. 7

## Install the Nozzle

1. Thread the nozzle (3) onto the extension (2) (FIG. 8).

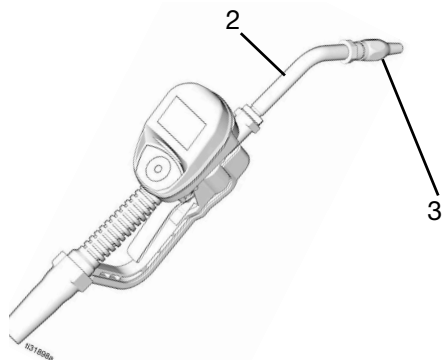


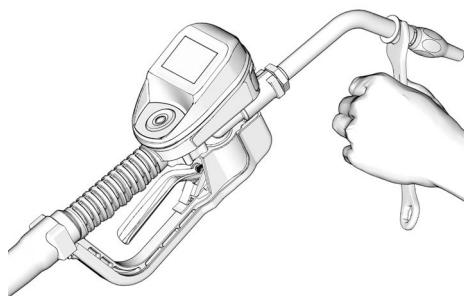
FIG. 8

2. Tighten firmly with an open-end adjustable wrench on the flats of the nozzle bushing (FIG. 9).

### NOTICE

To prevent damage to the nozzle, only tighten the nozzle with wrench on the flats of the nozzle bushing, as shown in FIG. 9.

Do not disassemble the bushing from the nozzle. Disassembly affects the performance of the nozzle.



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FIG. 9

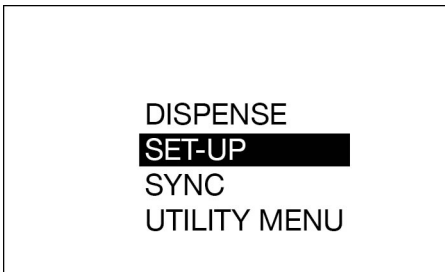
3. Open the automatic twist lock nozzle and all of the fluid shut-off valves.
4. Start the pump to pressurize the system.
5. Purge all air from the fluid lines and the metered dispense valve before use to ensure dispense accuracy.
6. Set the system flow to the desired flow rate. Typically, this is done by adjustments to the pump air pressure.

# Set Up

## Main Menu Screen

The screen provides access to the main metered dispense valve function (FIG. 10):

- DISPENSE
- SET-UP
- SYNC
- UTILITY MENU

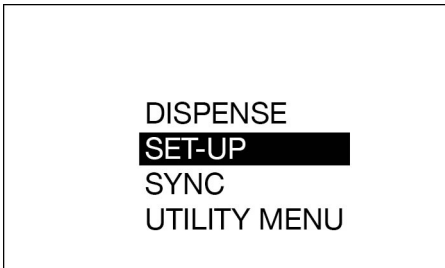


**FIG. 10**

## Register

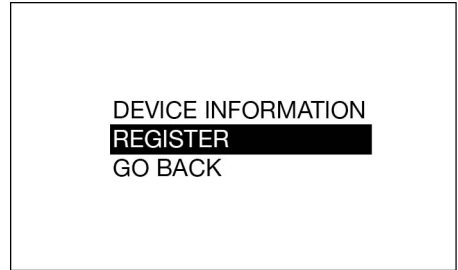
The metered dispense valve must register with the Pulse Fluid Management Software before it can dispense fluid.

1. Put the Pulse Fluid Management Software into DISCOVERY mode.
2. From the MAIN MENU screen, use the UP and DOWN arrows on the navigation pad to select SET-UP (FIG. 11).



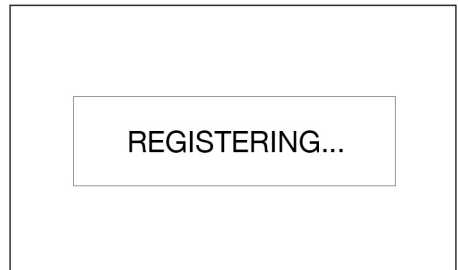
**FIG. 11**

3. From the SET-UP menu, use the UP and DOWN arrows on the navigation pad to select REGISTER (FIG. 12).



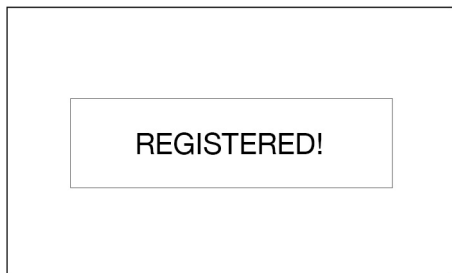
**FIG. 12**

4. Press the ENTER button on the navigation pad.
5. REGISTERING appears in the middle of the display during registration (FIG. 13).



**FIG. 13**

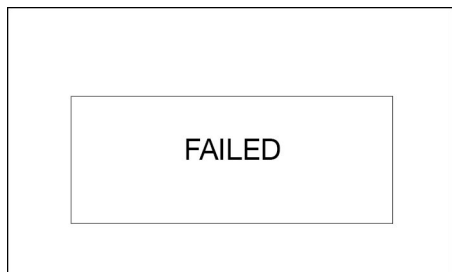
6. After the metered dispense valve registers with the Pulse Fluid Management Software, REGISTERED displays (FIG. 14). The SET-UP menu screen then displays.



**FIG. 14**

7. If the metered dispense valve does not register with the Pulse Fluid Management Software, FAILED appears on the display (FIG. 15).

**NOTE:** If the metered dispense valve fails to register with the Pulse Fluid Management Software, verify that the software is in DISCOVERY mode, then retry registration.



**FIG. 15**

## Calibrate the Metered Dispense Valve

**NOTE:** The calibration procedure requires a one quart or a one liter, calibrated, volumetric flask.

If the meter is configured to display fluid volume in pints, quarts or gallons, the calibration procedure requires the use of a one quart calibrated volumetric flask.

If the meter is configured to display fluid in liters, the calibration procedure requires the use of a one liter volumetric flask.

Calibrate the metered dispense valve before first time usage. Calibration of the metered dispense valve ensures that dispenses are accurate.

The calibration factors may vary due to fluid viscosity and flow rate. Calibrate the metered dispense valves for specific fluid at nominal flow rates.

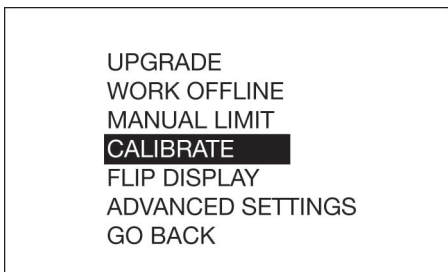
To calibrate the metered dispense valve:

1. For a system that is not fully primed, flush the metered dispense valve. See **Flush Equipment**, page 11.
2. Use the UP and DOWN arrows on the navigation pad to select UTILITY MENU (FIG. 16).



**FIG. 16**

3. Enter the UTILITY MENU code.
4. Use the UP and DOWN arrows on the navigation pad to select CALIBRATE (FIG. 17).



**FIG. 17**

5. This displays the calibration K-Factor screen (FIG. 18).

## Alternate Calibration

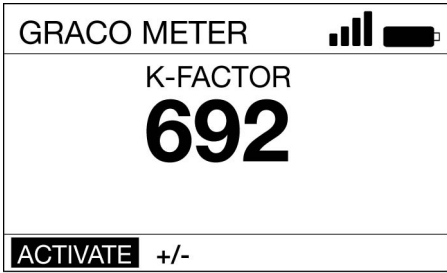
**NOTE:** Use this alternate calibration procedure when a one quart or one liter, calibrated, volumetric flask is not available.

- For a system that is not fully primed, flush the metered dispense valve. See **Flush Equipment**, page 11.
- Dispense a known volume of fluid into a clean, calibrated, volumetric flask. Note this volume as the VOLUME DISPENSED (see **Calculate the new K-FACTOR using the following equation:**, page 16, step 9).
- Record the volume displayed on the metered dispense valve. Note this volume as the VOLUME DISPLAYED ON THE metered dispense valve (see **Calculate the new K-FACTOR using the following equation:**, page 16, step 9).
- Use the UP and DOWN arrows on the navigation pad to select UTILITY MENU (FIG. 20).



**FIG. 20**

- Enter the UTILITY MENU code.
- Use the UP and DOWN arrows on the navigation pad to select CALIBRATE (FIG. 21).

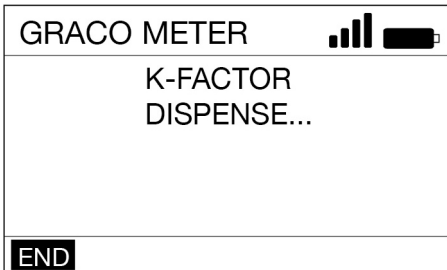


**FIG. 18**

- Use the UP and DOWN arrows on the navigation pad to select ACTIVATE, then press the ENTER button on the navigation pad to begin the metered dispense valve calibration (FIG. 19).
- Dispense exactly one quart or one liter of fluid into a clean, calibrated, volumetric flask.

**NOTE:** The metered dispense valve will not display the volume dispensed. The volume dispensed is determined by the flask measurement.

- When exactly one quart or one liter of fluid is dispensed into the flask, use the ENTER button to select END. The new calibration factor displays. Use the Enter button to select END a second time to complete the operation and save the new calibration factor

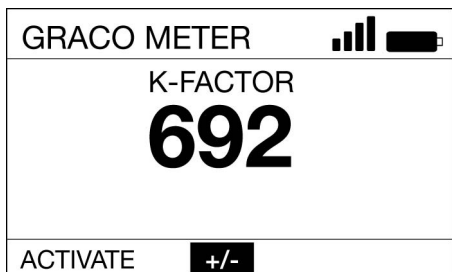


**FIG. 19**

UPGRADE  
 WORK OFFLINE  
 MANUAL LIMIT  
**CALIBRATE**  
 FLIP DISPLAY  
 ADVANCED SETTINGS  
 GO BACK

**FIG. 21**

- Use the RIGHT arrow on the navigation pad to select +/-, then press the ENTER button on the navigation pad (FIG. 22).



**FIG. 22**

- Note the current K-FACTOR displayed. The example displayed in FIG. 23 is 692.



**FIG. 23**

- Calculate the new K-FACTOR using the following equation:

$$K_{\text{new}} = \frac{(K_{\text{current}}) \times (\text{VOLUME DISPLAYED ON METER})}{(\text{VOLUME DISPENSED})}$$

**Example:**

$K_{\text{current}} = 692$

Volume displayed on metered dispense valve = 0.970 quart

Volume dispensed = 1 quart

$$K_{\text{new}} = \frac{(692) \times (0.970 \text{ quarts})}{(1.0 \text{ quarts})} = 671.2$$

Round to the nearest whole number: 671.2 = 671.

**NOTE:** The unit of measurement for both volumes must be the same in the above equation.

- Use the UP or DOWN arrows to adjust the K-FACTOR to the K-FACTOR ( $K_{\text{new}}$ ) calculated in step 9.

See **Table 1**, page 16, for recommended fluid calibration factors.

**NOTE:** The calibration number may vary slightly from the temperature or the rate of flow.

**Table 1**

Fluid	Calibration Factor
Oil (10W30)	692
Gear Lube	692
ATF	692
Coolant	600
Windshield Washer Solvent	600

- Press the ENTER button on the navigation pad to complete the calibration and save the new calibration factor.



## Security Authorization

### Utility Menu Code

Utility Menu Codes are set up by the System Administrator using the Pulse Fluid Management Software, and assigned in the Device Settings Section of the Pulse Fluid Management Software.

Utility Menu Codes access items in the meter utility menu. The System Administrator can set up a unique code for each meter or the same code may be used for all meters in the system.

### NFC FOB Authorization

When the meter prompts SCAN USER TAG or SCAN ASSET TAG, touch the NFC fob to the indicator located at the top of the bezel (FIG. 24).



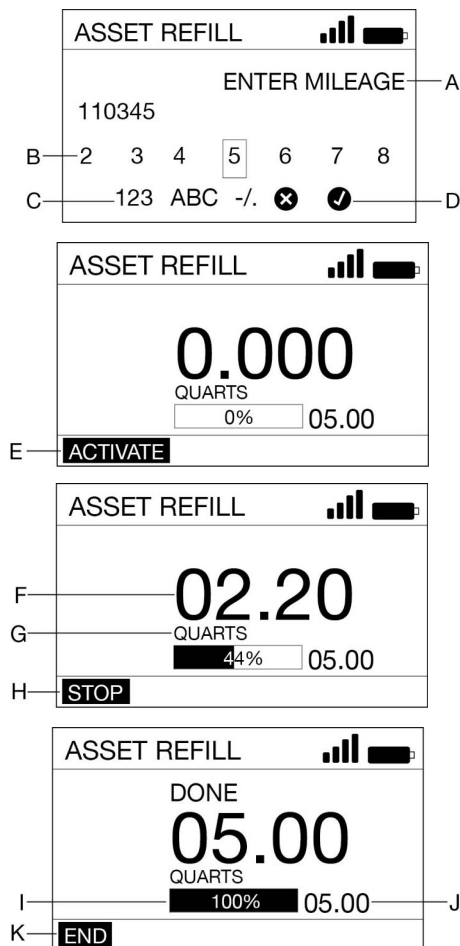
**FIG. 24**

A Dispense Screen displays if the dispense meter recognizes and validates the NFC fob.

When the NFC fob is not recognized or validated, the metered dispense valve displays INVALID and does not authorize a dispense.

## Operation

### Dispense Menus



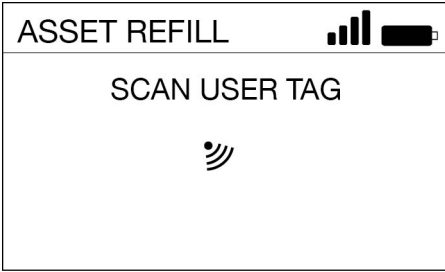
**FIG. 25**

- A Reference Prompt - asset specific reference data being requested.
- B Numbers/Characters - numbers and characters available (Maximum seven characters) to store as reference data.

- C 123 ABC -./ - sets the character parameters used to create reference data.
- D X/✓ - X cancels the dispense. ✓ saves the reference data and attaches it to the dispense record.
- E ACTIVATE - activates the trigger for a dispense.
- F Volume of Fluid Dispensed - the number increases, as fluid is dispensed, to reflect the quantity of fluid dispensed.
- G Unit of Measure - measurement is set using the Pulse Fluid Management Software.
- H STOP - stops a preset dispense before reaching the preset limit. Deactivates the trigger.
- I Progress Bar - an estimate of progress through the dispense task.
- J Total Preset Limit - amount of fluid that can be dispensed before the meter deactivates.
- K END - finalizes the dispense and stores it to the meter memory.

To dispense fluid to an asset:

1. Press any button on the navigation pad to wake the metered dispense valve (see FIG. 1, page 8).
2. Use the UP and DOWN arrows on the navigation pad to select DISPENSE on the screen then press the ENTER button.
3. Scan the user identification tag (NFC fob) (FIG. 26).



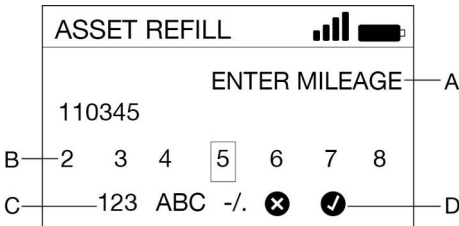
**FIG. 26**

- Scan the asset identification tag (NFC fob) (FIG. 27).



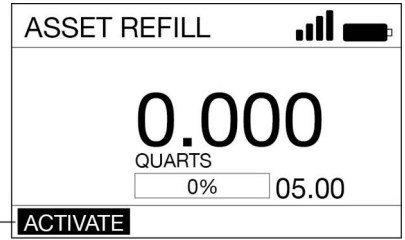
**FIG. 27**

- If the asset is configured to require reference data entry, enter the requested data using the keypad (FIG. 28).



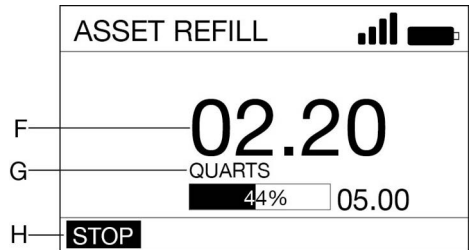
**FIG. 28**

- Press the ENTER button to select ACTIVATE (E) (FIG. 29).



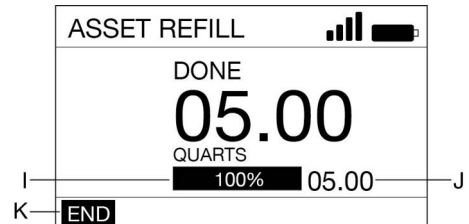
**FIG. 29**

- Pull the trigger to dispense fluid. The display shows the amount dispensed (F) (FIG. 30).



**FIG. 30**

- Release the trigger to stop the fluid flow when the desired amount has been dispensed.
- END (K) is highlighted on the screen. Press the ENTER button to select (FIG. 31).



**FIG. 31**

## Sync Menus

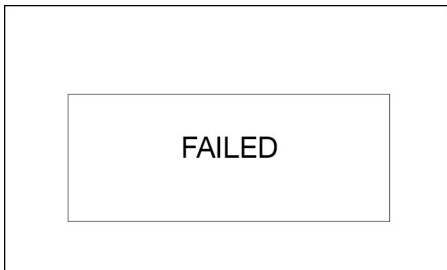
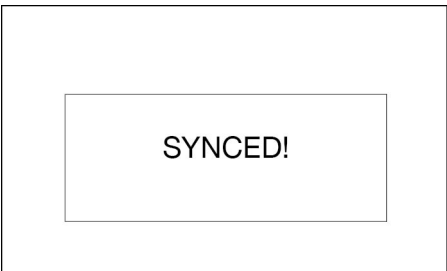
The dispense meter needs to be synced with the Pulse Pro system after it reaches maximum dispense storage queue size or maximum synchronization duration.

1. Press any button on the navigation pad to wake the metered dispense valve (see FIG. 1, page 8).
2. Use the UP and DOWN arrows on the navigation pad to select SYNC on the screen then press the ENTER button.
3. The meter will sync (FIG. 32).



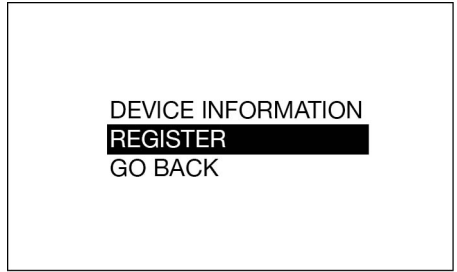
**FIG. 32**

4. The meter displays SYNCED if successful, or FAILED if unsuccessful (FIG. 33).



**FIG. 33**

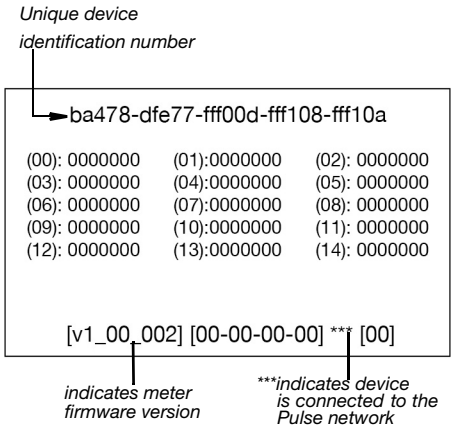
## Set Up Menus



**FIG. 34**

### DEVICE INFORMATION

The Device Information screen is used for diagnostics only (FIG. 35).



**FIG. 35**

### REGISTER

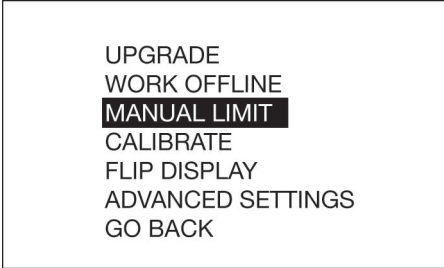
See **Register**, page 13.

### GO BACK

Goes back to the Main Menu screen, **Main Menu Screen**, page 13.

## Utility Menus

The Utility Menu is PIN or NFC Code protected. The Utility Menu Code must be entered to activate the menu.



**FIG. 36**

### UPGRADE

Modifies the firmware used by the metered dispense valve when a new or upgraded version of the firmware is released, or when a new feature is added. Upgrade instructions are provided by your Graco distributor.

### WORK OFFLINE

If the communication link between the metered dispense valve and the Pulse HUB is disrupted, the metered dispense valve will function if placed into WORK OFFLINE mode.

When the metered dispense valve is in WORK OFFLINE mode, no asset tracking or verification takes place.

When communication is reestablished, the metered dispense valve automatically changes back to online operation.

### CALIBRATE

Calibration of the metered dispense valve assures dispenses are accurate. See **Calibrate the Metered Dispense Valve**, page 14.

## MANUAL LIMIT

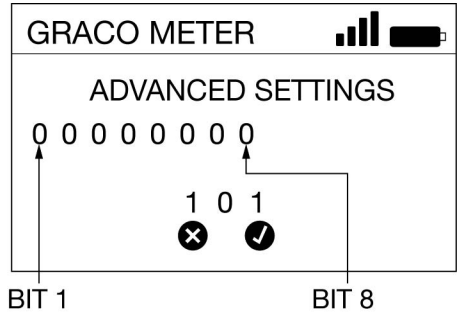
The maximum amount of fluid a user can dispense while the metered dispense valve is in MANUAL or WORK OFFLINE modes.

## FLIP DISPLAY

Flips the metered dispense valve display upside down to accommodate viewing data for oil bar installation.

## ADVANCED SETTINGS

Allows for manual control of the advanced meter settings. Modifications should only be done when instructed by your Graco distributor or Graco Technical Assistance.



**FIG. 37**

Bit 1: Disassociate meter from Pulse PAN.

0) Default value - meter retains association with current Pulse PAN.

1) Enable reset - if set to 1, and the ADVANCED SETTING mode is saved and exited, when the meter falls asleep, it disassociates from the active Pulse PAN. To return to service, the meter needs to be re-discovered.

Bit 2: Disable unauthorized dispense check.

0) Unauthorized dispense check enabled - meter monitors for unauthorized flow.

1) Unauthorized dispense check disabled - meter does not monitor for unauthorized flow.

# Operation

Bit 3: Disable secondary reed switch check.

- 0) Reed switch check enabled - meter monitors both reed switches for fault detection.
- 1) Reed switch check disabled - meter only monitors primary reed switch. There is no fault detection.

Bit 4 - 8: Not used.

## GO BACK

Goes back to the Main Menu screen, **Main Menu Screen**, page 13.

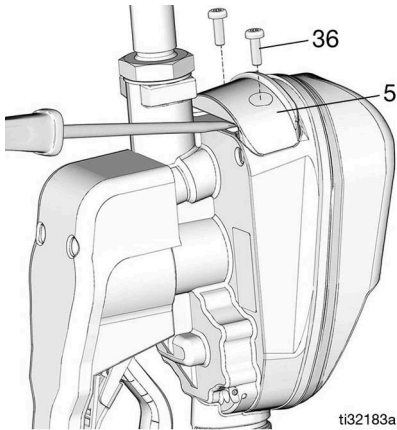
## Maintenance

### Battery Replacement

- Replace batteries with four AA, alkaline batteries.
- Follow the correct polarity, shown on the installation labels located on either side of the metered dispense valve, when installing batteries in the battery compartment (FIG. 39).
- Do not mix different types of batteries together, or old batteries with fresh batteries. Always replace all four batteries with four fresh, new, alkaline, AA batteries.

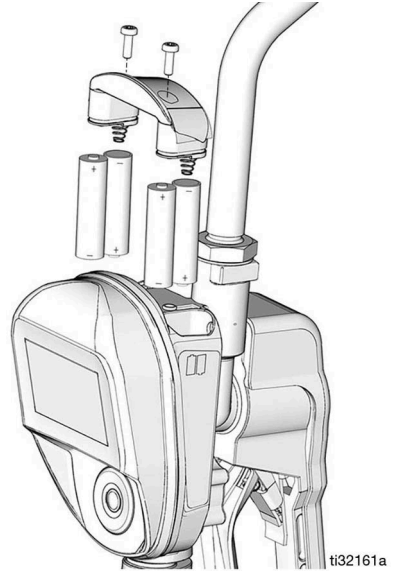
### Change Batteries

1. Remove screws (36) from the battery compartment cover (5) (FIG. 38).
2. Use a small, flat screwdriver to gently pry the cover from the metered dispense valve housing on the bottom of the cover, near the extension attachment (FIG. 38).



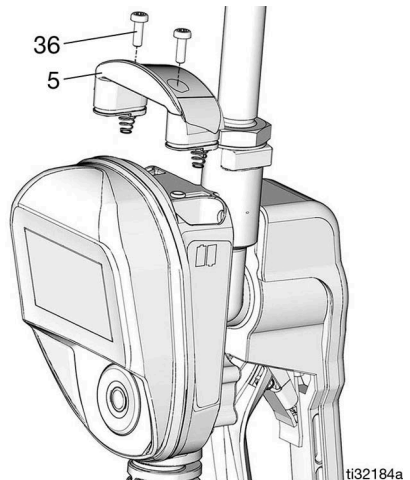
**FIG. 38**

3. Remove and recycle batteries according to all local rules and regulations.
4. Install four new batteries. See labels on each side of the housing for battery orientation (FIG. 39).



**FIG. 39**

5. Replace the cover (5) and screws (36). Do not over tighten the screws (FIG. 40).



**FIG. 40**

## Recycling and Disposal

### End of Product Life

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

- Perform the **Pressure Relief Procedure**, page 10.
- Drain and dispose of fluids according to applicable regulations. Refer to the material manufacturer's Safety Data Sheet.
- Remove motors, batteries, circuit boards, LCDs (liquid crystal displays), and other electronic components. Recycle according to applicable regulations.
- Do not dispose of electronic components with household or commercial waste.



- Deliver remaining product to a recycling facility.



## Troubleshooting



Perform **Pressure Relief Procedure**, page 10, before checking or repairing the metered dispense valve. Be sure all other valves, controls and pump are operating properly.

Problem	Cause	Solution
Battery dead icon is present.	Batteries are low.	See <b>Battery Replacement</b> , page 23.
Display does not activate	Batteries are dead.	See <b>Battery Replacement</b> , page 23.
	Electronic control is malfunctioning.	Replace the electronic bezel assembly. Contact your Graco distributor for assistance with ordering this part.
Slow or no fluid flow	Filter is clogged.	Relieve pressure following <b>Pressure Relief Procedure</b> , page 10. Clean or replace filter.  If the problem remains, contact your Graco distributor for repair or replacement.
	Pump pressure is low.	Increase pump pressure.
	Twist lock nozzle not fully open.	Aim nozzle into bucket. Fully open nozzle.  Do not trigger metered dispense valve when nozzle is closed. If the metered dispense valve is triggered with the nozzle closed, point the nozzle into a waste bucket, open the nozzle to relieve pressure, and expel the built up fluid.
	Shut-off valve is not fully open.	Fully open the shut-off valve.
	Foreign material is jammed in the metered dispense valve housing.	Contact your Graco distributor for repair or replacement.
Displayed dispensed amount is not accurate	Unit needs to be calibrated for the fluid being dispensed.	Calibrate the metered dispense valve for the fluid being dispensed, see <b>Calibrate the Metered Dispense Valve</b> , page 14.
Metered dispense valve leaks from cover/control	Poor seal at metering cover chamber	Contact your Graco distributor for repair or replacement.

# Troubleshooting

Problem	Cause	Solution
Metered dispense valve leaks from the nozzle when the nozzle is left in the closed position.	Nozzle has a damaged seal.	Replace nozzle. See <b>Install the Nozzle</b> , page 12.
Metered dispense valve leaks from the nozzle when the nozzle is left in the open position.	Metered dispense valve with a MANUAL nozzle should be closed after each use.	Close the MANUAL nozzle when meter is not in use.
<b>NOTE:</b> It is important to distinguish between open state and closed state of the nozzle to determine the cause of this problem. A new nozzle in the open state will NOT correct a fluid leak caused by a faulty valve.	Metered dispense valve with an AUTOMATIC nozzle left open exacerbated by thermal expansion inside of the meter.	Close nozzles when meters are not in use. Wipe nozzle tip after each use.
	Valve cartridge has damaged seals.	Close the nozzles when meters are not in use. Wipe nozzle tip after each use.  Replace valve cartridge. Replacement Kit Part 25D904.
Metered dispense valve leaks from swivel	Poor swivel/hose connection.	Apply PTFE tape (leave a minimum two engaged threads uncovered for electrical continuity) or sealant to threads of hose and tighten the connection.
	Poor swivel or metered dispense valve housing connection.	Torque the fitting to 20-25 ft-lb (27.12 - 34 N•m).
	Swivel seals have deteriorated and leak.	Replace swivel. Use Swivel Seal and Filter Replacement Kit 25D906.
Unit does not stop dispensing when assumed preset amount is dispensed.	Valve is dirty or seals are defective.	Replace valve cartridge. Replacement Kit Part 25D904.
	Low battery.	See <b>Battery Replacement</b> , page 23.
	Solenoid not functioning	Replace solenoid.
Weak or no RF signal	Changes or obstructions in RF pathway (for example, vehicle, overhead door)	Add Graco Extender to Pulse System. Order Graco Part No. 20A058 - US/Canada; 20A059 - EU; 20A151 - UK; 20A152 - ANZ.
Meter register fails	Poor RF signal	See <b>Troubleshooting, Weak or no RF signal</b> , page 26.
	PulseFluid Management software is not in Discovery Mode	Set software to Discover Mode, then retry registration.

Problem	Cause	Solution
Screen locks up or freezes		Remove batteries. Wait five minutes, then replace batteries and restart.
Device is unable to register to the Pulse Pro network or device does not rejoin the network after system reboot.	Device is not meshing properly with the device network.	Flip the screen on the meter twice. See <b>FLIP DISPLAY</b> , page 21. If this does not resolve the issue, toggle to Discovery mode on the HUB. Wait one minute and toggle it back.
User Tag scan returns INVALID	Failed NFC attempt	Scan User Tag again
	Invalid Asset Tag (card not programmed correctly)	Reprogram the User Tag using the Pulse Utility.
	Failed NFC unit	Replace the electronic bezel assembly. Contact your Graco distributor to order the part,
Asset Tag scan returns INVALID	Failed NFC attempt	Scan Asset Tag again
	Invalid User Tag (card not programmed correctly)	Reprogram the Asset Tag using the Pulse Utility.
	Dispense meter assigned fluid is not compatible with asset	Use a dispense meter compatible with the fluid for the asset being scanned.
DISPENSE menu selection returns SYNC REQUIRED	<p>The dispense meter has either:</p> <ul style="list-style-type: none"> <li>Exceeded dispense queue capacity</li> <li>Exceeded dispense without sync duration</li> <li>Meter needs to reconfigure settings (power loss)</li> </ul>	Bring meter within signal range of the Pulse Pro system and select the SYNC menu option.
SYNC menu selection returns FAILED	Poor RF signal	See <b>Troubleshooting, Weak or no RF signal</b> , page 26.
	Meter has not been registered to a Pulse Pro system	Set software to Discover mode, then retry registration.

# Fault Codes

## Fault Codes

Fault codes are listed below. Even in a fault condition the unit keeps track of the amount dispensed. Whenever a fault code is displayed, end the dispense.

<b>Fault Code</b>	<b>Cause</b>	<b>Solution</b>
<b>Fault 2</b>	Reed Switch Fault: Fault occurred with pick-up in internal gear.	Ensure the flow rate is not higher than 18 gpm (68 lpm). For further assistance, contact your Graco distributor.
	Reed switch malfunction.	Replace electronic bezel housing.
	Unit was dropped or unit encountered excessive vibration during shipping.	End dispense
	Air in fluid line	Fix leaks in pump suction line.
	Excessive fluid pulsation	Re-plumb pump suction line to a larger size.
<b>Fault 4</b>	Flow continues after it should have shut off.	End dispense
	Flow occurs in lockout condition.	
<b>Fault 5</b>	Manual limit reached on a dispense	Adjust manual limit higher if desired.
<b>Fault 6</b>	Zero-value preset in attempted dispense	Internal fault. Contact your Graco distributor.

## Definition of Terms

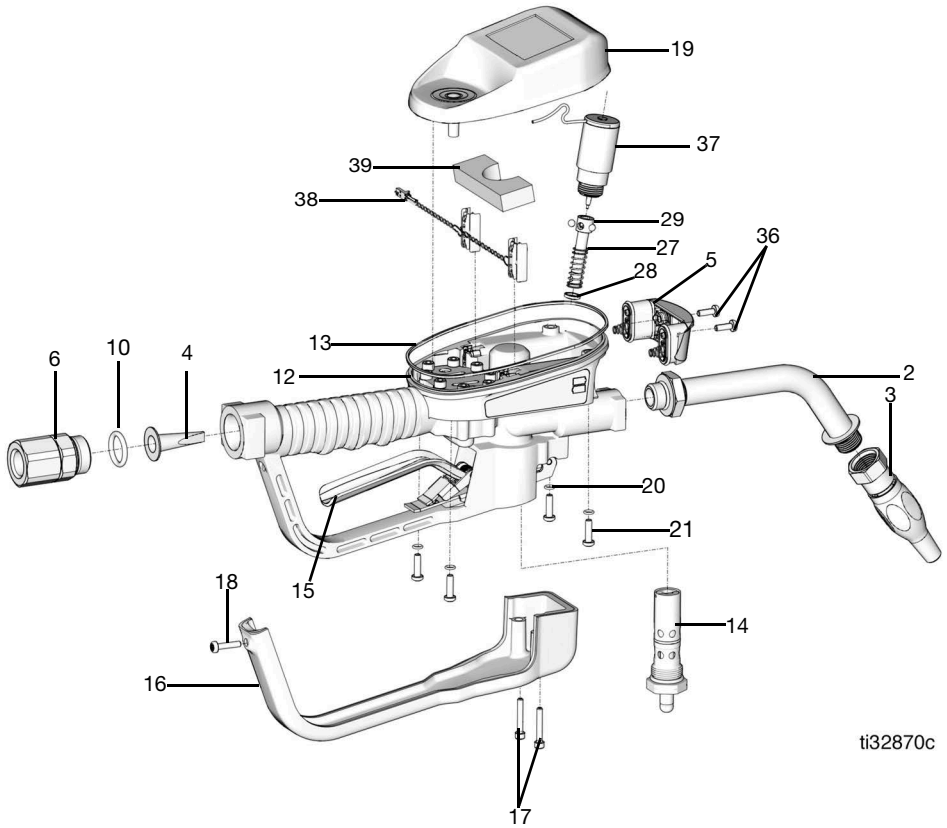
Terms	Definition
CALIBRATE	UTILITY MENU option: Calibration of the metered dispense valve ensures dispenses are accurate.
DEVICE INFORMATION	UTILITY MENU option: Used by System Administrator for diagnostics and set up.
DISCOVERY MODE	Mode of Pulse Fluid Management software that allows registration of new devices.
DISPENSE	DISPENSE prompts the user to identify themselves and the asset being filled before allowing a dispense.
FLIP DISPLAY	UTILITY Menu option: Allows the display to show data upside down.
GO BACK	Returns to the previous screen.
HUB	The Pulse HUB is a self-contained computer with the Pulse Fluid Management Software preloaded. It also is the Personal Area Network (PAN) host used for RF communication with other Pulse system components (meters, Pump Air Control [PAC's], Tank Level Monitors [TLM's]). Access to the Pulse Fluid Management system is accomplished by http protocol (web browser on the Local Area Network [LAN]).
MANUAL DISPENSE	Dispense amount determined by the operator
MANUAL LIMIT	UTILITY MENU option: The maximum amount of fluid the operator can dispense while the metered dispense valve is in MANUAL MODE or WORK OFFLINE MODE.
NFC CODE	Alpha-numeric code present on the NFC fob that authenticates a user to the system.
PIN CODE	A numeric password that authenticates a user to the system.
PRESET DISPENSE	The metered dispense valve is programmed to dispense a default, preset volume. The preset volume can be modified on a work order to work order basis when sending work orders from the Pulse Fluid Management Software. The preset volume can be increased or decreased by an amount at the metered dispense valve prior to beginning the dispense.
REGISTER	Similar to pairing. Allows the Pulse HUB to identify and communicate with individual Pulse devices.
SET UP	List of metered dispense valve function related to initial system set up, device information, registration and signal testing.
SYSTEM ADMINISTRATOR	A user defined in the Pulse Fluid Management system software with full administrative authority.
UPGRADE	UTILITY MENU option: Modifies the firmware software the metered dispense valve uses when a new and upgraded version of the software is released, or a new feature is added. When this is required, your Graco distributor will arrange the upgrade.

## Definition of Terms

Terms	Definition
UTILITY MENU	List of metered dispense valve functions: UPGRADE, WORK OFFLINE, MANUAL LIMIT, CALIBRATE, FLIP DISPLAY, GO BACK.
UTILITY MENU CODE	Utility Menu Codes access items in the meter utility menu. Can be a PIN or NFC Code.
WORK OFFLINE	UTILITY MENU option: If the communication link is disconnected between the metered dispense valve and the Pulse Fluid Management Software because of power loss or computer crash, the metered dispense valve continues to function if placed into WORK OFFLINE mode.



Parts



ti32870c

FIG. 41



Ref	Part	Description	Qty
1		VALVE, metered dispense valve (see models page 4)	1
2		EXTENSION	
	16Y863	<i>Flex</i>	
	255194	<i>Rigid</i>	1
	255854	<i>Gear Lube</i>	
	273079	<i>Windshield washer solvent</i>	
3		NOZZLE	
	17R220	<i>Automatic, quick close</i>	1
	17T207	<i>Manual Antifreeze</i>	
	255461	<i>High Flow</i>	
	255470	<i>Gear Lube/ATF</i>	
4★		STRAINER, mesh	1
5 †	25M593	COVER, battery	1
6		SWIVEL, straight	
	247344	<i>1/2 in. NPT</i>	1
	247345	<i>3/4 in. NPT</i>	
	24H097	<i>1/2 - 14 BSPT</i>	
	24H098	<i>1/2 - 14 BSPP</i>	
	24H099	<i>3/4 - 14 BSPT</i>	
	24H100	<i>3/4 - 14 BSPP</i>	
10★	155332	PACKING, o-ring	1
12		HOUSING, metered dispense valve	1
13	131258	PACKING, square ring	1
14	25D904	VALVE, metered dispense valve, assy	1
15	25M601	TRIGGER, assy, all models except windshield washer solvent	1
	25M723	TRIGGER, assy, windshield washer solvent models only	1

Ref	Part	Description	Qty
16	129619	COVER, trigger guard	
17	16E337	SCREW, cap, sch, sst	2
18	131256	SCREW, mach, torx pan hd	1
19	2007272	KIT, BEZEL, electrical	1
20	131257	PACKING, o-ring	4
21	25N342	SCREW, mach, torx pan hd	4
27◆		ROD, trip	1
28◆	129623	SEAL, molded	1
29◆		BALL, 5 mm	3
33	121413	BATTERY, pkg, 4 ct, alkaline AA (not shown)	1
36 †	112380	SCREW, mach, pan hd	2
37	26C276	SOLENOID	1
38*		Power Cable	1
39*		Foam	1

## Related Kits

Ref	Part	Description
◆	25D903	KIT, Trip Rod Repair, includes 27, 28, 29
★	25D906	KIT, Swivel Filter, includes 4 and 10
†	25D907	KIT, Battery Cover, includes 5 and 36
*	25P665	Kit, Power Cable, includes 38 and 39

# Technical Specifications

## Technical Specifications

	US	Metric
Flow range*	0.25 to 18 gpm	0.9 to 68 lpm
<i>*Tested in 10W motor oil. Flow rates vary with fluid pressure, temperature and viscosity.</i>		
Maximum Working Pressure	1500 psi	10.3 MPa, 103.4 bar
Units of Measure (factory set to quarts)	pints, quarts, gallons	liters
Weight	5.3 lb	2.4 kg
Dimensions (without extension)		
Length	13 in.	33 cm
Width	3.75 in.	9.5 cm
Height	5.75 in.	14.6 cm
Units of measure (factory set in quarts)	maximum recorded dispensed volume = 9999 units maximum preset volume = 9999 units	
Inlet	1/2-14 NPT or 3/4-14 NPT	
Outlet	3/4-16 straight thread o-ring boss	
Operating temperature range	4 °F to 158°F	-16°C to 70°C
Storage temperature range	-40°F to 158°F	-40°C to 70°C
Battery**	4 AA alkaline batteries	
<b>**Recommended battery:</b> Energizer® Alkaline E91.		
RF Frequency Band	2400-2483.5 MHz	
Maximum RF Transmit Power	6.3 mW (8 dBm)	
NFC Frequency Band	13.56 MHz	
Maximum NFC Transmit Power	1 mW (0 dBm)	
Wetted parts	aluminum, stainless steel, PBT, nitrile rubber, zinc plated carbon steel, nickel plated carbon steel	
Fluid compatibility	coolant, gear oil, crankcase oil, ATF, windshield washer fluid***	
Metered Dispense Valve Accuracy†	+/- 0.5 percent	

† At 2.5 gpm (9.5 lpm), at 70°F (21°C), with 10-weight oil and 1 gallon dispensed. May require calibration.

\*\*\* Windshield washer fluid contains mixtures of water, propylene glycol, ethylene glycol and up to 50% methanol or 50% ethanol. Contact Graco Technical Assistance for any other chemical(s) present in windshield washer fluid (WWS) or ensure the chemical is compatible with the wetted parts.

# California Proposition 65

## CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – [www.P65warnings.ca.gov](http://www.P65warnings.ca.gov).

# Graco 5-Year Meter and Valve Warranty

Graco warrants all equipment referenced in this document which is 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 from the date of sale as defined in the table below, repair or replace equipment covered by this warranty and 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.

Graco 5-Year Meter and Valve Extended Warranty	
Components	Warranty Period
Structural Components	5 years
Electronics	3 years
Wear Parts - including but not limited to o-rings, seals and valves	1 year

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 one (1) year past the warranty period, or two (2) years for all other parts.

**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

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

## Graco Information

For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

For patent information, see [www.graco.com/patents](http://www.graco.com/patents).

**TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.**

**Phone: 612-623-6928 or Toll Free: 1-800-533-9655, Fax: 612-378-3590**

*All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.*

Original instructions. This manual contains English. MM3A7274

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