918DP Clock Gauge

Installation, Operation, and Maintenance Instructions

The 918DP Clock Gauge is designed to measure liquid volume in an aboveground storage tank. The gauge mounts on top of the tank and is activated by a float connected to a cable. The 918DP contains two normally open switches to connect to an alarm device that can provide an audible alarm at two desired tank levels that are set during installation.

Failure to follow any or all of the warnings and instructions in this document could result in a hazardous liquid spill, which could result in property damage, environmental contamination, fire, explosion, serious injury or death.

NOTE: The most accurate method to calibrate the tank is with fluid in it. This will take into account variables associated with the float position, the mechanism, and the fluid density. To calibrate a low alarm setting, **the tank fluid level must be several inches lower than the desired alarm level setting.**

Electrical Switch Ratings

10 watt resistive load, 127VAC-354mA max / 180VDC-500mA max *(Ratings for resistive loads only.)*

*Do not use for inductive loads.

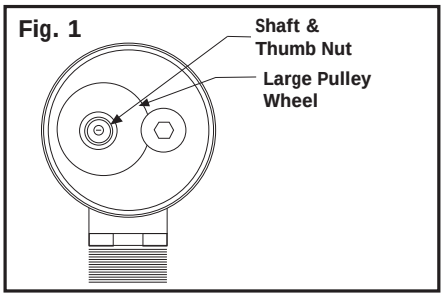
Gauge Installation & Calibration

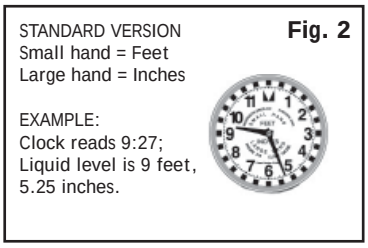
WARNINGS

- **Fire Hazard – Death or serious injury could result from spilled liquids.**
- **You must be trained to install or maintain this gauge. Stop now if you have not been trained.**
- **Any modification to this gauge other than those stated in these installation instructions will void the product warranty.**
- **This device is intended to be used as an auxiliary warning to the operator of a possible overfill situation and should not be the only system in place to prevent a tank from overfilling. It is the sole responsibility of the operator to continuously prevent any spillage regardless of the situation or status of the gauge.**
- **Install in accordance with all applicable local, state, and federal laws.**
- **For your safety, it is important to follow local, state, federal and/or OSHA rules that apply to working inside, above, or around the storage tank and piping area. Use all personal protective equipment required for working in the specific environment.**
- **Tanks could be under pressure. Vapors could be expelled from tank vents, piping, valves or fittings while performing installation. Vapors could catch fire or cause an explosion. Avoid sparks, open flame, or hot tools when working on gauge.**
- **Use a dampened cloth when cleaning the clear front cover of the gauge or 918 alarm device to prevent static buildup and discharge.**
- **In the event of malfunction, contact Morrison Bros. Customer Service.**

Steps

1. Verify contents of box. You should have received the gauge, float, installation instructions, re-order/overfill labels, warning tag, cable tie, and optionally the alarm device. Inspect the items for shipping damage. **DO NOT** use if damage is found. **DO NOT** pull and release the cable uncontrollably. This can cause damage to the internal mechanism and render the gauge inoperable. **ALWAYS** hold onto cable and allow it to move in a slow steady motion.
2. Locate the opening, on the top of the tank, where the gauge is to be installed. If possible, select a location away from the fill port to avoid excessive turbulence that could affect the float. Also make certain that there are no objects inside the tank, near the selected opening, upon which the float and cable could get tangled.
3. Once an opening is selected, measure to the bottom to determine the current liquid level height in the tank. Record this height in feet and inches as you will need it to set the gauge once it is installed.
4. Apply pipe dope or Teflon tape to the male threads on the gauge. If you have a gauge with female threads, apply the pipe dope or Teflon tape to the male threads of the pipe on the tank. **DO NOT** get pipe dope on the cable of the gauge.
5. Open the float clip and attach the float clip to the swivel end of the cable. Latch the float clip making sure the float clip is securely closed.
6. Slowly lower the float into the tank. Guide the cable through your fingers letting the cable slide through slowly**. DO NOT** allow the float to free fall into the tank as this will cause the cable to come off of the pulley mechanism and render the gauge inoperable.
7. Once the float is resting on the liquid level (or tank bottom if the tank is empty) thread the gauge into, or onto, the tank fitting. Use a pipe wrench or strap wrench, on the large hex at the bottom of the gauge, to tighten the gauge into, or onto, the tank fitting.
8. Remove the back plate retaining ring and back metal cover from the gauge. Hold the large pulley wheel in place and loosen the thumb nut (Figure 1). Insert a small flat blade screwdriver into the slot on the end of the shaft. Rotate the shaft with the screwdriver, which will move the gauge hand, until the gauge hands indicate the level that you recorded in Step 3. Note: Short hand indicates feet and long hand indicates inches





9. Once you have the hands in the correct position, hold the screwdriver firmly in position and tighten the thumb nut on the shaft.
10. Remove the front face retaining ring and remove the clear front cover.

11. Setting Alarm Points

Option 1: To calibrate an alarm setting to activate when fluid is rising (example-high level):

<u>IMPORTANT:</u> The tank fluid level must be several inches lower than the desired alarm level setting.

<u>IMPORTANT:</u> The 918DP alarm switches are normally open. For setting an alarm with fluid rising, alarming device inputs (918AC, 918D, or 918Q) should be set to normally open. See instruction and operations manuals for 918S, 918D, 918Q, and 918AC for proper configuration.

A. Connect desired alarm wire pair (A or B) to an alarming device such as a 918S, 918D, 918Q, or 918AC.

B. Rotate the thumb nut counter-clockwise (when facing rear of gauge, see Figure 4) to the desired alarm set point (see Figure 5). This will raise the float assembly out of the liquid. Be careful to maintain a firm grasp of the thumb nut to prevent free fall of the float.

FIGURE 4: Raising the float with thumb nut to desired alarm trip point.

FIGURE 5: Hold thumb nut at desired trip point. Example- Alarm set point at 9 feet - 0 inches.

C. Hold the thumb nut steady (see Figure 4) and face the clock face of the gauge (see figure 5.)

D. While holding the thumbwheel at desired set point, look and listen to determine if the alarm device (918AC, 918D, or 918Q) has already been activated:

- If **<u>yes</u>**
  - If using a 918S, 918D, or 918Q, press test/cancel button at the alarm box.
    - Slowly rotate alarm pointer counter-clockwise till alarm state comes on and at that point release alarm pointer.
  - If using a 918AC pull the alarm pointer out and rotate counter-clockwise, until alarm state turns off, and slowly keep rotating alarm pointer till alarm state comes on and at that point release alarm pointer.
- If **<u>no</u>**
  - Pull the alarm pointer out and slowly rotate counter-clockwise till alarm state comes on and at that point release alarm pointer.

E. Verify alarm setting:

- Turn thumbwheel clockwise (when facing rear of gauge, see Figure 4) slowly let float drop to clear alarm state.
- If using a 918S, 918D, or 918Q, alarm state must be cleared by pressing test/cancel button.
- Once alarm state is off, turn thumb wheel counter clockwise (when facing rear of gauge, see Figure 4) raising the float raising the float to within 3 inches of set point.
- Then creep up on to set point, alarm state should come on <u>within +/- 1 inch of desired set point.</u>

F. Fine tuning alarm setting:

- **<u>If alarm state is coming on before</u>** desired alarm set point.
  - Pull up alarm pointer up and rotate it <u>ever so slightly</u> clockwise and release alarm pointer.
  - Verify alarm set point and adjust accordingly, alarm state should come on within +/- 1 inch of desired set point.
- **<u>If alarm state is coming on after</u>** desired alarm set point.
  - Pull up alarm pointer up and rotate it <u>ever so slightly</u> counter-clockwise and release alarm pointer.
  - Verify alarm set point and adjust accordingly, alarm state should come on <u>within +/- 1 inch of desired set point.</u>

G. Once set, slowly carefully allow the float to drop.

11. Setting Alarm Points Continued...

Option 2: To calibrate an alarm setting to activate when fluid is dropping (example-low level):

IMPORTANT: The tank fluid level must be several inches lower than the desired alarm level setting.

IMPORTANT: The 918DP alarm switches are normally open. For setting an alarm with fluid dropping, alarming device inputs (918AC, 918D, or 918Q) should be set to normally closed. See instruction and operations manuals for 918S, 918D, 918Q, and 918AC for proper configuration.

A. Connect desired alarm wire pair (A or B) to an alarming device such as a 918S, 918D, 918Q, or 918AC.

B. Rotate the thumb nut counter-clockwise (when facing rear of gauge, see Figure 4) to the desired alarm set point (see Figure 5). This will raise the float assembly out of the liquid. Be careful to maintain a firm grasp of the thumb nut to prevent free fall of the float.

FIGURE 4: Raising the float with thumb nut to desired alarm trip point.

FIGURE 5: Hold thumb nut at desired trip point. Example- Alarm set point at 9 feet - 0 inches.

C. Hold the thumb nut steady (see Figure 4) and face the clock face of the gauge (see Figure 5.)

D. While holding the thumbwheel at desired set point, look and listen to determine if the alarm device (918AC, 918D, or 918Q) has already been activated:

- If **yes**
  - If using a 918S, 918D, or 918Q, press test/canceled button at the alarm box.
    - Slowly rotate alarm pointer clockwise till alarm state comes on and at that point release alarm pointer.
  - If using a 918AC pull the alarm pointer out and rotate clockwise, until alarm state turns off and slowly keep rotating alarm pointer till alarm state comes on and at that point release alarm pointer.
- If **no**
  - Pull the alarm pointer out and slowly rotate clockwise till alarm state comes on and at that point release alarm pointer.

E. Verify alarm setting:

- Turn thumb wheel counter clockwise (when facing rear of gauge, see Figure 4) raising the float to clear alarm state.
- If using a 918S, 918D, or 918Q, alarm state must be cleared by pressing test/cancel button.
- Once alarm state is off, slowly turn thumbwheel clockwise (when facing rear of gauge, see Figure 4) dropping the float to within 3 inches of set point.
- o Then creep down on to set point, alarm state should come on within +/- 1 inch of desired set point.

F. Fine tuning alarm setting:

- **If alarm state is coming on before** desired alarm set point.
  - Pull up alarm pointer up and rotate it ever so slightly counter-clockwise and release alarm pointer.
  - Verify alarm set point and adjust accordingly, alarm state should come on within +/- 1 inch of desired set point.
- **If alarm state is coming on after** desired alarm set point.
  - Pull up alarm pointer up and rotate it ever so slightly clockwise and release alarm pointer.
  - Verify alarm set point and adjust accordingly, alarm state should come on within +/- 1 inch of desired set point.

G. Once set, slowly carefully allow the float to drop.

12. Before continuing, check alarm points to an alarming device to verify alarm settings.
13. If installing the alarm box, leave the gauge front and rear covers removed. If the alarm box will not be installed, or will be installed at a later date, replace the front and rear covers of the gauge.

Alarm Installation and Testing

Refer to 918 Series Alarm Installation, Operation and Maintenance Instructions (918S--0142 PP) for 918S, D, and Q models or (918AC-0142 PP) for the 918AC Series Alarm Devices.

Failure to follow any or all of the warnings and instructions in this document could result in a hazardous liquid spill, which could result in property damage, environmental contamination, fire, explosion, serious injury or death.

Operation

Steps

1. To determine the height of fluid in the tank, read the position of the gauge hands. Interpolate if necessary.
   Note: Short hand indicates feet and long hand indicates inches. See Figures 2 and 3 above.
2. The tank manufacturer's chart will be required to translate fluid height into fluid volume.
3. Before a tank fill is initiated, the alarm device should be checked for proper operation and sufficient loudness. Refer to the Alarm Installation, Operation and Maintenance Instructions (918S--0142 PP) for 918 S, D, and Q models or (918AC-0142 PP) for the 918AC Series Alarm Devices.
4. If the alarm sounds while the tank is being filled, immediately halt filling operations.

Maintenance

This gauge should be maintained per applicable codes, or at least once each year.

Refer to 918 Series Alarm Installation, Operation and Maintenance Instructions (918S--0142 PP) for 918S, D, and Q models or (918AC-0142 PP) for the 918AC Series Alarm Devices.

WARNINGS

- **Fire Hazard – Death or serious injury could result from spilled liquids.**
- **You must be trained to install or maintain this gauge. Stop now if you have not been trained.**
- **Any modification to this gauge other than those stated in these installation instructions will void the product warranty.**
- **This device is intended to be used as an auxiliary warning to the operator of a possible overfill situation and should not be the only system in place to prevent a tank from overfilling. It is the sole responsibility of the operator to continuously prevent any spillage regardless of the situation or status of the gauge.**
- **Install in accordance with all applicable local, state, and federal laws.**
- **For your safety, it is important to follow local, state, federal and/or OSHA rules that apply to working inside, above, or around the storage tank and piping area. Use all personal protective equipment required for working in the specific environment.**
- **Tanks could be under pressure. Vapors could be expelled from tank vents, piping, valves or fittings while performing installation. Vapors could catch fire or cause an explosion. Avoid sparks, open flame, or hot tools when working on gauge.**
- **Use a dampened cloth when cleaning the clear front cover of the gauge or 918 alarm device to prevent static buildup and discharge.**
- **In the event of malfunction, contact Morrison Bros. Customer Service.**

Steps

1. Visually inspect the gauge and alarm for damage or excessive wear. If either is found replace the gauge or alarm.
2. If necessary, clean the clear front cover of the gauge or alarm box with a damp cloth.
3. Measure the fluid height and correlate it to the tank manufacturer's volume chart to verify the gauge volume reading. If readings do not match adjust the gauge setting according to the installation instructions.
4. Check alarm points to an alarming device to verify alarm settings. **The tank fluid level must be several inches lower than the alarm level setting.**
5. Refer to the Alarm Installation, Operation and Maintenance Instructions (918S--0142 PP) for 918 S, D, and Q models or (918AC-0142 PP) for the 918AC Series Alarm Devices.
6. Inspect the warning tag located near the tank fill and off-loading area. If the tag is damaged or difficult to read, contact Morrison Bros. at (800) 553-4840 for a free replacement tag.

Failure to follow any or all of the warnings and instructions in this document could result in a hazardous liquid spill, which could result in property damage, environmental contamination, fire, explosion, serious injury or death.

Optional Overfill and Reorder Label Installation

NOTE: The template (see Figure 7) is intentionally reversed (mirror image) so the labels may be placed on the inside surface of the clear front cover. Therefore, the lettering of the labels is on the adhesive side and will read correctly once placed.

Steps

1. Template units are shown in feet. It will be necessary to determine the desired overfill and reorder points and convert those into feet in order to use this template.
2. Remove the front face retaining ring and remove the clear front cover.
3. Place the clear cover onto the template aligning the outside edge to the outside circle.
4. Remove indicator label backing and place label on the clear cover as shown on template. Align wider end against inside circle and narrower end pointing toward the level you want to indicate.
5. If both overfill and reorder labels are used, make sure each is pointing to the correct foot reading that provides the volumes you desire.
6. Reinstall the clear front cover with the labels on the inside. Make sure indicators are in correct location and wording is readable before putting gauge in service. Replace the front face retaining ring making certain the ring snaps all the way down into the groove. You will need to use pliers to squeeze the ring into the groove. The retaining ring is correctly squeezed into place if the ends of the retaining ring do not overlap.

WARRANTY: If you believe this gauge has a defect due to material or workmanship, please contact Morrison for a return authorization. All products are thoroughly tested before shipment and meet all applicable performance standards and specifications. Only material found to be defective in manufacture will be replaced or repaired at our discretion. Claims must be made within one year from the date of installation, and Morrison Bros. Co. will not allow claims for labor or consequential damage resulting from purchase, installation or misapplication of the product. The warranty registration information must be provided to the end user.

Fig. 7: Overfill and Reorder Label Template