



CALIBRATING A WASTEWATER LIFT STATION

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Calibrating a wastewater lift station ensures accurate monitoring, reliable pump operation, and proper control of wastewater levels. Calibration helps avoid overflows, reduces pump wear, and optimizes energy efficiency.

1. Understand the Components

Before calibration, you should be familiar with the main components:

- **Wet Well** – The basin that collects wastewater.
- **Pump(s)** – Move wastewater to the next treatment stage.
- **Level Sensors** – Typically ultrasonic, float, or pressure transducers.
- **Control Panel** – Receives level input and controls pump start/stop sequences.
- **Alarm Systems** – High/low-level alarms for emergency notification.

2. Safety First

- **Lockout/Tagout (LOTO)**: Ensure pumps are de-energized before accessing equipment.
- **PPE**: Wear gloves, eye protection, and boots.
- **Confined Space Awareness**: Wet wells are confined spaces; follow all safety regulations if entry is required.

3. Inspect Equipment

- Check for **sensor fouling**, corrosion, or debris.
- Inspect **pump impellers** for clogging or damage.
- Confirm **control panel wiring** is intact and free of moisture.

4. Choose Calibration Method

A. Manual Level Method (Physical Measurement)

- Measure the actual water level using a **marked stick or measuring tape**.
- Compare the measured level to the sensor reading.
- Adjust the sensor's calibration settings on the control panel until readings match.

B. Pump Test Method

- Run the pump at known intervals or for a set time.
- Measure volume discharged using flow meters or by timing the pump.
- Adjust sensor settings to ensure level readings match the expected volume pumped.

5. Calibrating Float Switches

Float switches operate on a **discrete on/off level**:

1. Ensure float moves freely without obstruction.
2. Raise the float to simulate high level → pump should start.
3. Lower the float to simulate low level → pump should stop.
4. Adjust mounting if necessary for proper start/stop levels.

6. Calibrating Ultrasonic or Pressure Transducers

Ultrasonic Sensor Calibration

1. Remove any foam or debris from the water surface.
2. Program the sensor with the **wet well depth**.
3. Compare readings to manual water level measurements.
4. Adjust offsets until sensor accurately reads the water level.

Pressure Transducer Calibration

1. Record the zero point (empty well) and full-scale point (full well).
2. Compare sensor output (usually mA signal) to actual water level.
3. Adjust scaling in the controller for accurate level-to-signal mapping.

7. Verify Pump Start/Stop Points

- High-level alarm → verify pump starts before water reaches the overflow point.
- Low-level cutoff → ensure pump stops above the minimum submergence to avoid pump damage.
- If there are multiple pumps, check lead/lag sequencing for balanced operation.

8. Test Alarms and Communication

- Simulate **high and low water levels** to ensure alarms trigger.
- Verify SCADA or remote monitoring receives accurate readings.

9. Document Calibration

- Record sensor type, calibration date, offset values, and measured levels.
- Include pump start/stop setpoints.
- Keep documentation for regulatory compliance and future reference.

10. Regular Maintenance & Recalibration

- Inspect sensors and floats **monthly**.
- Clean ultrasonic sensors to remove debris and buildup.

- Recalibrate after any pump replacement or wet well modifications.
- Seasonal adjustments may be necessary if inflow patterns change.

Tips & Best Practices

- Always compare electronic readings with manual measurements.
- Keep spare floats and sensors on hand.
- Label all control panel adjustments for clarity.
- Regular calibration prevents costly overflows and reduces maintenance needs.

WASTEWATER LIFT STATION CALIBRATION CHECKLIST

Date: _____

Operator: _____

Lift Station ID: _____

1. Safety Checks

- Lockout/Tagout (LOTO) applied if entering the wet well.
- Personal Protective Equipment (PPE) worn: gloves, boots, eye protection.
- Confined space precautions reviewed if entry required.

2. Visual Inspection

- Wet well free of excessive debris, rags, or grease.
- Pumps and impellers intact, no visible damage or clogging.
- Level sensors clean, no corrosion, algae, or buildup.
- Control panel and wiring dry and undamaged.

3. Sensor Calibration

Float Switches

- Float moves freely without obstruction.
- Simulate high level → pump starts.
- Simulate low level → pump stops.
- Adjust float mounting if necessary.

Ultrasonic Sensors

- Remove surface debris or foam.
- Measure wet well depth.
- Compare sensor reading to manual measurement.
- Adjust sensor offset until readings match.

Pressure Transducers

- Record empty (zero) and full-scale points.
- Compare sensor output to actual water level.
- Adjust scaling in controller for accuracy.

4. Pump Verification

- Pump starts at correct high-level setpoint.
- Pump stops at correct low-level cutoff.
- Lead/lag pump sequencing verified.
- Pump run-time matches expected flow volume.

5. Alarm & Communication Checks

- High-level alarm activates correctly.
- Low-level alarm activates correctly.
- SCADA/remote monitoring receives accurate readings.

6. Documentation

- Record sensor type, calibration offsets, and date.
- Record pump start/stop setpoints.
- Note any maintenance or adjustments made.
- File records for regulatory compliance.

7. Post-Calibration Maintenance

- Clean sensors if needed.
- Inspect floats and wiring monthly.
- Schedule next calibration or check.

Operator Signature