

FT 1900. Continuous Monitoring with Installed Meters

Use in conjunction with:

- FT 1000 General Field Testing and Measurement
- FT-series Field Testing SOPs for applicable parameters
- FS 1000 General Sampling Procedures
- FD 1000 Documentation Procedures

1. INTRODUCTION: Many facilities rely on in-line continuous measurement devices to monitor parameters such as dissolved oxygen, conductivity, pH, temperature, residual chlorine and turbidity. In order to ensure the stability and reliability of such measurements, the calibration of these instruments must be checked regularly. In cases where it is impractical to take these instruments off-line on a daily basis, use the calibration procedures described below.

2. CALIBRATION AND VERIFICATION

2.1. Calibrate the continuous monitoring instrument **before installation** according to the manufacturer's specifications for initial calibration. Ensure that the instrument has been calibrated and the calibration verified according to the requirements in the applicable DEP SOPs.

2.2. **On a daily basis**, measure a grab sample taken at or as near as possible to the same location as the in-line meter. The grab-sample test measurements must be taken with an instrument that has been properly calibrated and verified per the applicable DEP SOPs for individual parameter tests.

2.3. Compare the results of the daily verification with the continuous meter reading taken at the same time as the grab sample was collected. The continuous meter calibration is acceptable for the applicable parameters if the differences with the grab-sample results meet the following criteria:

2.3.1. Dissolved Oxygen: no greater than 0.2 mg/L difference (or historically established criteria not to exceed 0.5 mg/L difference);

2.3.2. Specific Conductance: no greater than 10% of the calibrated instrument reading;

2.3.3. pH: no greater than 0.2 pH units difference (or historically established criteria not to exceed 0.5 pH units difference);

2.3.4. Temperature: no greater than 0.5°C difference;

2.3.5. Residual Chlorine: no greater than 20% of the calibrated instrument reading; and

2.3.6. Turbidity: no greater than 20% of the calibrated instrument reading.

2.4. When the comparisons performed in section 2.3 above indicate a changing trend in the difference between the grab sample measurement and the continuous meter measurement for any parameter, determine the cause of the problem and perform appropriate corrective actions, such as maintenance, repair, calibration or other activities needed for the proper operation of the continuous meter under calibrated conditions.

2.5. Perform the initial calibration (per section 2.1 above) each time the instrument is taken off-line, after every preventative maintenance activity, and **immediately** after determining that any of the criteria verifications in 2.3.1 through 2.3.6 above are not met.

2.6. All acceptable field data must be bracketed by acceptable calibration verifications (see section 2.3 above). Qualify data that are not bracketed by acceptable calibration verifications.

3. EXTENDED VERIFICATION INTERVALS

3.1. If historically generated data demonstrate that a specific instrument remains stable for longer periods of time, the time interval between initial calibration and calibration verifications may be increased.

3.2. The maximum time interval is one month or at the conclusion of a sampling event, whichever is less.

3.3. Base the selected time interval on the shortest interval that the instrument maintains stability.

3.4. If an extended time interval is used, and the instrument consistently fails to meet the final calibration verification:

3.4.1. The instrument may need maintenance to correct the problem; or

3.4.2. The time period is too long and must be decreased.

3.5. Retain all data associated with studies that support a decreased frequency of calibration verifications for at least five years after the procedure was last used.

4. PREVENTIVE MAINTENANCE: Refer to FT 1000, section 3.

5. DOCUMENTATION

5.1. Record all information specified in the individual field-testing SOPs.

5.2. Document the daily verifications of the continuous meter by recording:

- Project name (if applicable)
- Date and time (including time zone, if applicable)
- Source and location of the measurement or test sample (e.g., monitoring well identification number, outfall number, station number or other description)
- Analyte or parameter measured
- Reading from the continuous meter, including reporting units
- Reading from the second instrument used for the grab-sample measurement, including reporting units
- The name of the person conducting the verification
- Unique identification of the specific instrument unit(s) used for the test(s)

5.3. Where applicable, record the differences for the results of meter comparisons as specified in section 2.3 above.

5.3.1. Calculate the differences in the results between the meter measurements of the grab sample with the corresponding measurements from the continuous meter for the applicable parameters

5.4. Indicate the acceptability of the verifications per the criteria in section 2.3