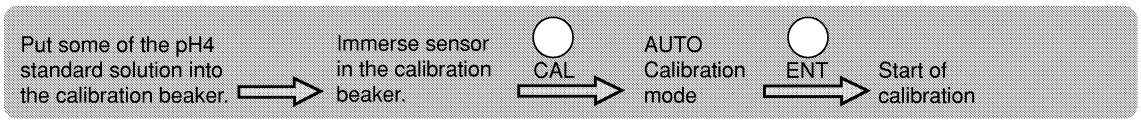
3.2.2 AUTO calibration method

To obtain correct measurement, it is necessary to calibrate the sensor using the standard solution before performing measurement. Previous calibration records shown in calibration log.
(☞ 4.3.2 *Calling up The calibration log*, page 43.)

Note

- In the AUTO calibration mode, the pH, COND, and TURB sensors are calibrated in the pH4 standard solution, and the DO and DEP sensors in the atmosphere simultaneously.
- Values may be unstable if there is temperature fluctuation. Calibrate after waiting for about an hour.

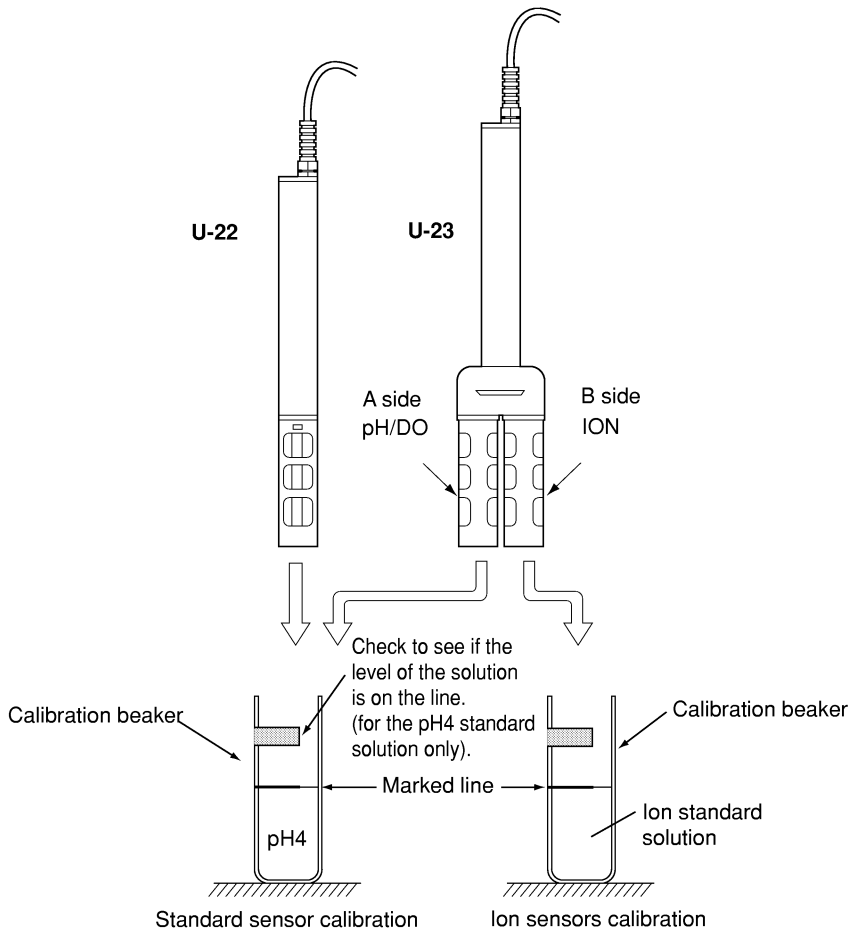


Calibrate using the following procedure.

1. Wash the sensor in distilled water a few times and put some of the pH4 standard solution into the calibration beaker to the marked line. Then immerse the sensor in it.
For the U-23 model, immerse the sensor A side.

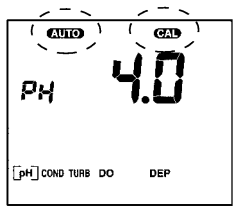
Important

- Use the label on the calibration beaker and check to see if the level of the calibration solution is on the line.



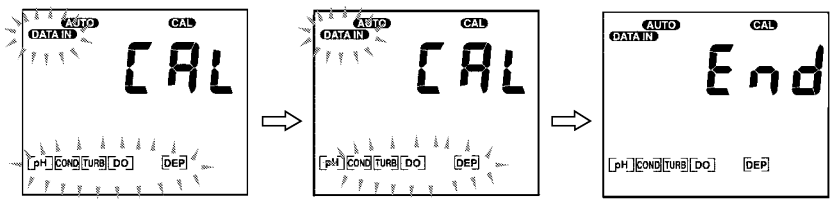
2. Press the **CAL** key in one of the Measurement modes pH, COND, TURB, DO and DEP.

AUTO and **CAL** appear and the instrument enters the AUTO Calibration mode.



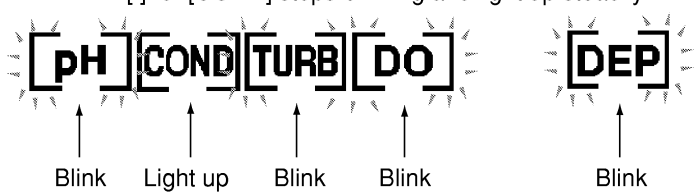
3. Press the **ENT** key to start AUTO Calibration.

Upon completion of all of the pH, COND, TURB, DO, and DEP modes, End will be displayed.
During calibration, **DATA IN** and [ ] for the selected measurement item blink. [ ] light up for the item of which calibration is finished.



With DATA IN is blinking
To stop calibrating the sensor .... press the CAL key.
To establish the calibration ..... press the ENT key.

Example: When COND calibration is finished:
[ ] for [COND] stops blinking and light up steadily.



Note

- [ ] continues to blink because calibration is not performed for the item for which an error has happened. If two or more errors happen, an error with a smaller number appears. (See pages 89 to 92 for these errors and ways to solve them.) These calibration errors disappear when the sensor is calibrated properly again, or when the instrument is turned ON again.
- Calibration should be performed for maximum three minutes. When the indications become stable, calibration should be finished.

4. Press the **MEAS** key to return to the Measurement mode.

Important

- Neutralize any basic pH 4 fluids before disposal.

AUTO calibration of the ion sensors (U-23 model only)

AUTO calibration of the ion sensors (only for the combination of Cl^-, NO_3^-, Ca^{2+}).
The AUTO calibration function can be performed if the user has selected the combination of Cl^-, NO_3^-, Ca^{2+} ion sensors. For other combination of the ion sensors, be sure to set the ion valency described on page 74 for the manual calibration.

Important

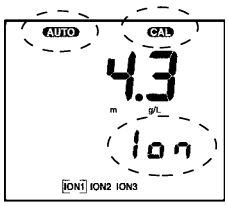
- Ion sensors take time to give stable indications. Therefore, immerse the ion sensors in the sample for approximately one hour. Then calibrate the ion sensors and perfom measurements.

1. Wash the sensor in distilled water a few times and put some of the supplied ion standard solution (#130) into the calibration beaker to the marked line. Then immerse the B side of the sensor in it.

2. Enter ion measurement mode 1, 2 or 3.

3. Press the **CAL** key.

AUTO, **CAL**, and "Ion" below them appear. The instrument then enters the AUTO Calibration mode.

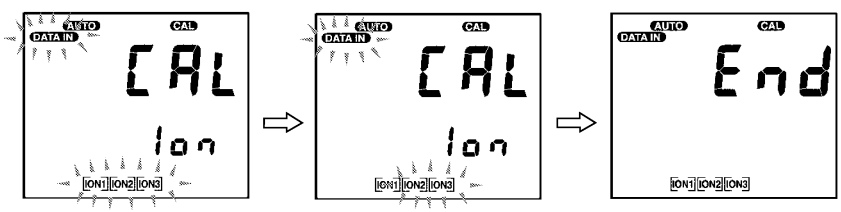


Important

- Only the standard supplied ion sensors (Cl^-, NO_3^-, and Ca^{2+}) can be calibrated automatically in the supplied ion standard solution (#130).

4. Press the **ENT** key to start AUTO calibration.

Upon completion of the AUTO calibration of all the ion sensors ION1, ION2, and ION3, End will be displayed.



End of calibration

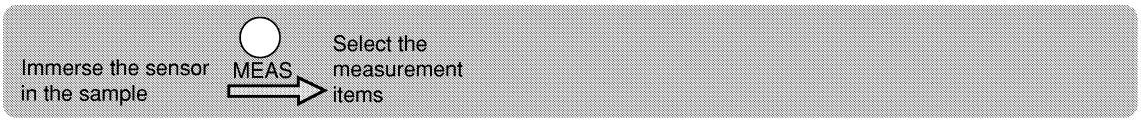
With DATA IN is blinking
To stop calibrating the sensor .... press the CAL key.
To establish the calibration ..... press the ENT key.

5. Press the **MEAS** key to return to the Measurement mode.

Important

- When the AUTO calibration is performed on the ion sensors, the data for the ion sensor calibrated manually is erased.

3.2.3 Measurement



1. Immerse the sensor in the sample.

2. Select the measurement item.

Use the MEAS key to switch measurement items in the following order:

For model U-22

pH → COND → TURB → DO → TEMP → DEP → SAL → TDS → σ_t → ORP → TIME … then back to pH.

For model U-23

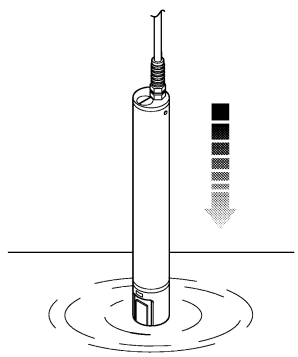
pH → COND → TURB → DO → TEMP → DEP → SAL → TDS → σ_t → ORP → ION1 → ION2 → ION3 → TIME … then back to pH.

Note

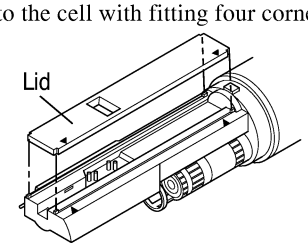
- [GPS] lights up when the optional G.P.S. sensor is connected to the instrument and position information is received from the G.P.S. sensor.
- The above measurement items can be changed by setting "*Measurement item setting*" described on page 79.

Important

- When immersing the sensor probe in the sample, slowly lower the sensor probe into the sample.



- Don't remove the COND/TURB lid during calibration or measurement.
- Attach the lid to the cell with fitting four corners and facing ▲ marks each other.



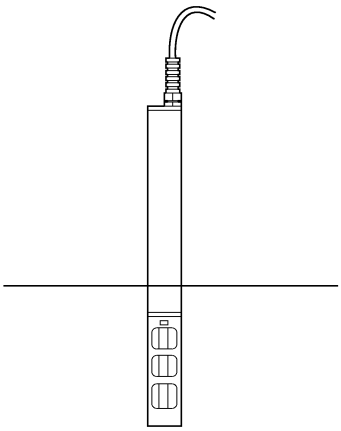
- Perform AUTO calibration after attaching the lid again, when the lid has been removed for the cleaning. A slight difference of the fitting position of the lid causes the difference of the indicated value for turbidity.

Two useful uses of the U-20 Series models

Making measurements

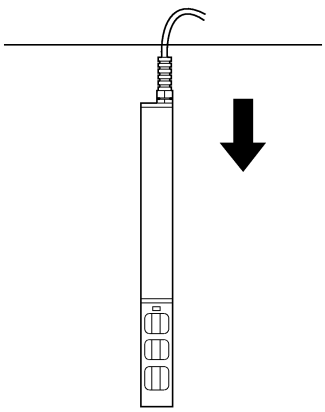
1. Manually storing the measurement data after checking the indication becomes stable

Example: After switching measurement items with the MEAS key, you can then store the measurement data after checking the indication becomes stable.
(☞ 4.1 *Manual storage of data while monitoring the measurement data*, page 34.)



2. Storing data

Example: Data can be stored continuously at constant intervals from the start of the automatic data storage. This function is useful in obtaining data in depth direction and in storing data continuously.
(☞ 4.2 *Automatic data storage*, page 36.)



Notes in obtaining data on depth

- When the instrument is placed at a depth of 100 m or more, the instrument may be broken.
  In measurements on the model U-23, the Ca^{2+} and NH_4^+ ion sensors can be used only at depth up to 15 m, and the K^+ ion sensor only at depth up to 3 m. This is because of the properties of the responsive membrane.

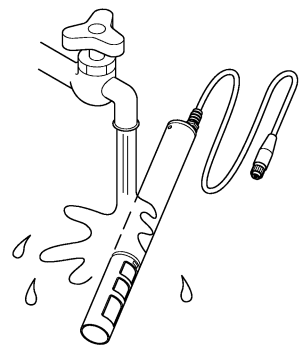
Notes for reliable measurements

- Any sensor contamination may affect measurements. Use the AUTO calibration mode to check for contamination on sensors about once a day for ion measurements and about once a week for others.

3.2.4 After completion of measurement

1. Turn the power to the instrument off.

2. Use tap water to completely wash off the sample on the sensor and then wipe waterdrops.



3. Put distilled water into the calibration beaker to the marked line with distilled water.
Then, attach the calibration beaker to the sensor probe, cover the connector with the rubber cap and store the probe assembly in the carrying case.

Important

- Do not put water in the calibration beaker before attaching it to the ion sensor end (B side) of U-23.

Now you have read the description for performing measurements. For further information on how to use the instrument, refer to the chapters hereafter.