pH/Redox (ORP) Sensors for Process Monitoring

TB(X)5 Series

Quick Start Guide
IM/TBX5–Q Issue 1

1 Installation

Install sensors:
- in full pipelines to prevent the sensor from drying out
- with the electrode pointing downwards
- as shown below (flat glass electrodes)
- as shown below (hemispherical glass)

2 Electrical Connections

<table>
<thead>
<tr>
<th>TB82 / TB84 Terminal Block Number</th>
<th>TBS Series Sensors Label</th>
<th>Color</th>
<th>Function</th>
<th>TB(X)5 Series Sensors Color</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SENSE</td>
<td>Blue</td>
<td>Blue</td>
<td>Glass/Metal Electrode</td>
<td>Blue</td>
<td>Glass/Metal Electrode</td>
</tr>
<tr>
<td>2 GUARD</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Yellow</td>
<td>Shield/Screen</td>
</tr>
<tr>
<td>3 REF</td>
<td>Black</td>
<td>Black</td>
<td>Reference Electrode</td>
<td>Black</td>
<td>Reference Electrode</td>
</tr>
<tr>
<td>4 SOL GND</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Green</td>
<td>Solution Ground</td>
</tr>
<tr>
<td>5 RTD</td>
<td>Red</td>
<td>Red</td>
<td>Temperature Compensator</td>
<td>Red</td>
<td>Temperature Compensator</td>
</tr>
<tr>
<td>6 RTD</td>
<td>White</td>
<td>White</td>
<td>Temperature Compensator</td>
<td>White</td>
<td>Temperature Compensator</td>
</tr>
<tr>
<td>7 SHIELD</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>Dark Green</td>
<td>Shield/Screen</td>
</tr>
</tbody>
</table>

Note. Installation drawings are available for other common ABB sensor styles. Contact your local ABB office or sales channel for more information.
Extension Cable – 0 to 30 m (0 to 100 ft.)

An extension cable is available from ABB for installations where the pH sensor is more than 9 m (30 ft.) but less than 30 m (100 ft.) from the analyzer. Using an extension cable simplifies sensor replacement. The extension cable can be permanently installed between the sensor and the analyzer. The sensor has a junction box mounted either directly on it or in close proximity. The extension cable and the sensor are connected together inside the junction box. Sensor replacement is performed by simply opening the junction box and disconnecting the leads. A quick-release Molex connector is used on the temperature leads and a BNC connector is used for the pH signal leads. Optional VariPin quick-connect wiring for TB(X)5 sensors are also available from ABB.

Note. The extra wires for ABB’s TB(X)5 sensors are connected to a terminal strip within the junction box.

3 Calibration

pH sensors are consumable products requiring periodic recalibration. Initial calibration must be a two-point calibration performed with liquid buffer solutions.

For best results, subsequent calibrations must be single-point grab-sample calibrations. This type of calibration is done by taking a sample of the process liquid and, before it can cool, verifying its pH using a laboratory or portable pH meter. The reading from the laboratory or portable pH meter is then used to adjust the reading in the pH analyzing system.

4 Cleaning

To clean | Use
--- | ---
General foultants | 3 to 5 % hydrochloric acid solution
Oils and greases | Isopropyl alcohol (rubbing alcohol)
| Methanol
| Other solvent known to cut the specific grease
| High pressure water jet (from a pressurized canister)
Scales (and similar) from medium to high pH solutions | 5 to 10 % hydrochloric acid solution
| 3 to 7 % sulfuric acid solution
| Industrial toilet bowl cleaner (mix of strong hydrochloric acid and phosphoric acid)
Scales (and similar) from low (<5) pH solutions | 5 to 10 % warm (>54 °C [130 °F]) caustic solution
| Rust stain remover
Sulfates and carbonates | 5 to 10 % hydrochloric acid solution
| Industrial toilet bowl cleaner (mixture of strong hydrochloric acid and phosphoric acid)
| Combination of sodium metabisulphite and sodium hydrosulphite
Silica or tenacious scales | 2 to 3 % hydrofluoric acid solution

Note. If the TB5/TB(X)5 sensor has been cleaned, refit it to the process or place it in distilled water before use or calibration.

5 Storage

Caution. Do not allow the glass membrane and reference junction to dry out as this irreversibly affects the electrode’s response.

If it is necessary to remove the electrode from the sample line, fill the retained protective cap with buffer solution and cotton wool (or equivalent) and fit it to the sensor.