Sistemas de Controlo e Medida

TBX556
MANUAL

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pH/Redox (ORP) Sensors for Process Monitoring

TB(X)5 Series

Quick Start Guide

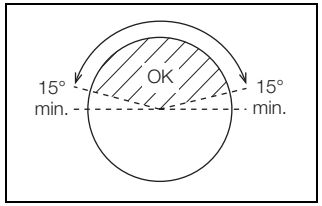
IM/TBX5–Q Issue 1

ABB

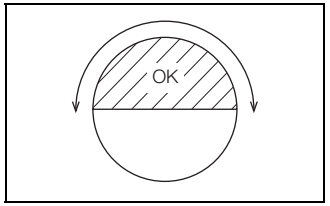
1 Installation

Install sensors:

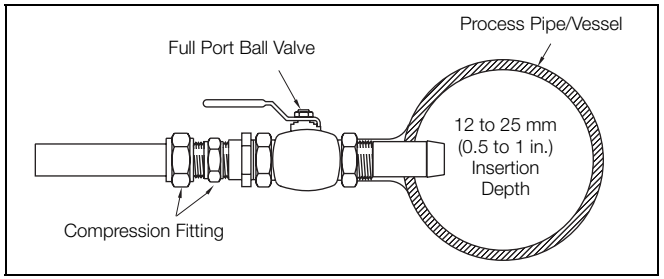
- in full pipelines to prevent the sensor from drying out
- with the electrode pointing downwards
- as shown below (flat glass electrodes)
- as shown below (hemispherical glass)



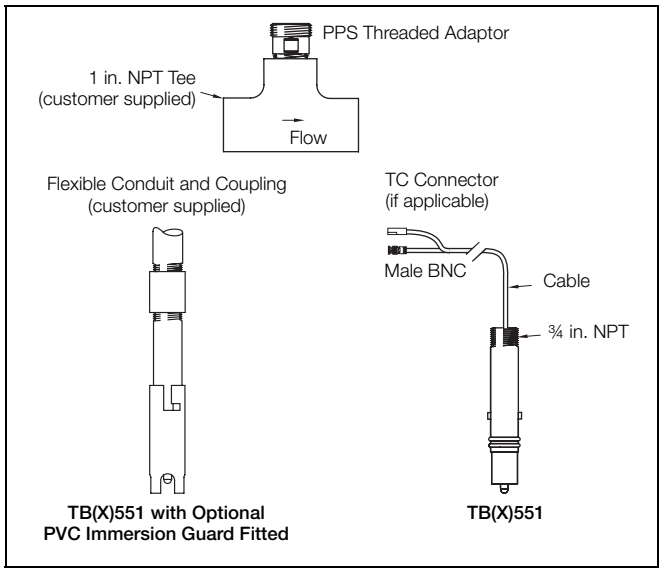
Mounting Range for Flat Glass Electrodes in Horizontal Piping



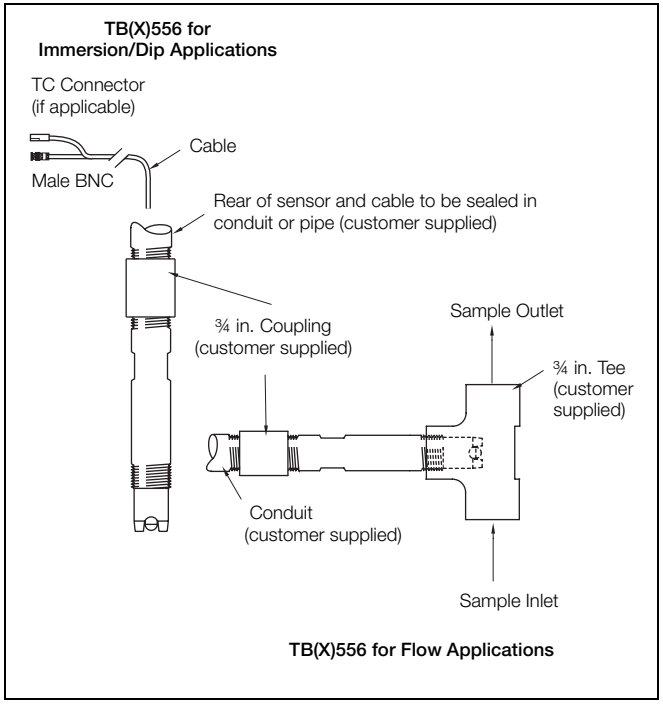
Mounting Range for Hemispherical Glass Electrodes in Horizontal Piping



Typical Retractable Sensor Installation – TB(X)587, TB(X)557 or TB(X)564 pH Sensor



Typical Twist-lock Sensor Installation – TB(X)551 pH Sensor



Typical Threaded Sensor Installation – TB(X)556 pH Sensor

Note. Installation drawings are available for other common ABB sensor styles. Contact your local ABB office or sales channel for more information.

2 Electrical Connections

TB82 / TB84 Terminal Block		TB5 Series Sensors		TB(X)5 Series Sensors	
Number	Label	Color	Function	Color	Function
1	SENSE	Blue	Glass/Metal Electrode	Blue	Glass/Metal Electrode
2	GUARD	–	–	Yellow	Shield/Screen
3	REF	Black	Reference Electrode	Black	Reference Electrode
4	SOL GND	–	–	Green	Solution Ground
5	RTD	Red	Temperature Compensator	Red	Temperature Compensator
6	RTD	White	Temperature Compensator	White	Temperature Compensator
7	SHIELD	–	–	Dark Green	Shield/Screen

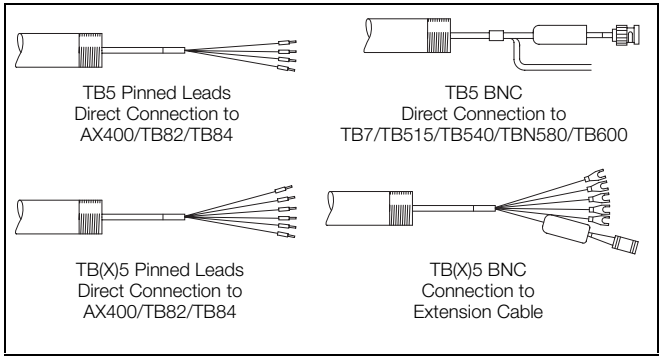
TB82PH / TB84PH Terminal Block Connections

AX4xx Analyzer Terminal Block		TB5 Series Sensors		TB(X)5 Series Sensors	
Sensor A	Sensor B	Color	Function	Color	Function
B9	B1	White	Temperature Compensator	White	Temperature Compensator
B10	B2	–	Link B1 to B2 and B9 to B10	–	Link B1 to B2 and B9 to B10
B11	B3	Red	Temperature Compensator	Red	Temperature Compensator
B12	B4	–	–	Black	Reference Electrode
B13	B5	–	–	–	–
B14	B6	Black	Reference Electrode	Green	Solution Ground
B15	B7	–	–	Yellow	Shield/Screen
B16	B8	Blue	Glass/Metal Electrode	Blue	Glass/Metal Electrode

AX4xx Terminal Block Connections

Integral Cable – 0 to 9 m (0 to 30 ft.)

Integral cable is available from ABB for installations where the pH sensor is close to the analyzer. Integral cable can be specified to 9 m (30 ft.) in length but, for ease of sensor replacement, keep cable length to a minimum. Standard cable has pinned leads to connect directly to the AX400, TB82 or TB84 terminals. An optional male BNC connector is also available for connection to other pH analyzers such as the TB7, TBN580, TB540, TB515 and TB600. These instruments have a mating female BNC for connections. The BNC connector is also useful for connecting to extension cables (see below). Note that the cable length and connection details are specified as part of the model number.

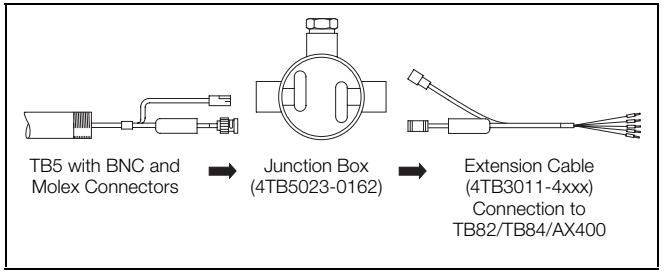


Integral Cable Types

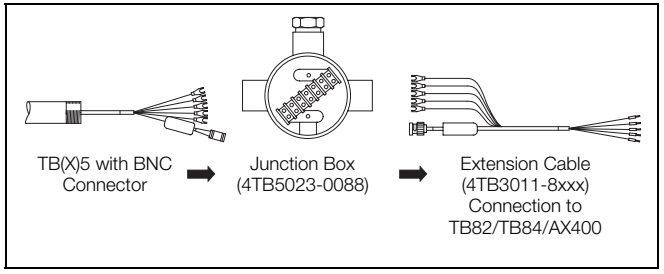
Extension Cable – 0 to 30 m (0 to 100 ft.)

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 VarioPin quick-connect wiring for TB(X)5 sensors are also available from ABB.

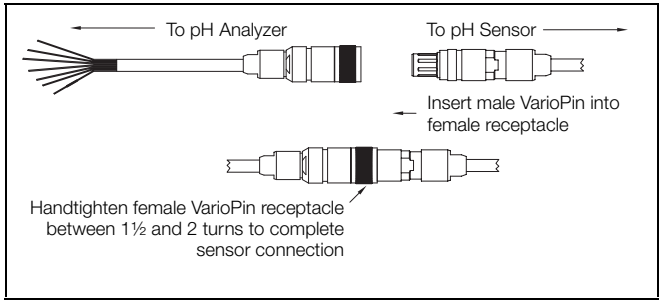
Note. The extra wires for ABB's TB(X)5 sensors are connected to a terminal strip within the junction box.



TB5 Sensor with Extension Cable



TB(X)5 Sensor with Extension Cable



TB(X)5 Sensor with VarioPin Connection

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 foulants	3 to 5 % hydrochloric acid solution High pressure water jet (from a pressurized canister)
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 metabisulfite and sodium hydrosulfite
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.

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