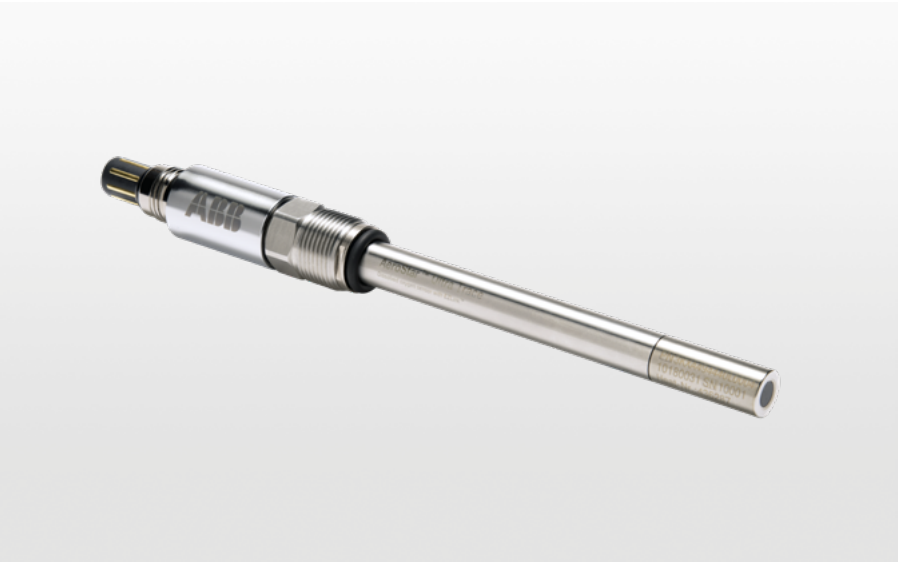
AeroStar™ Ultra Series

Optical low-level dissolved oxygen sensors



Introduction

ABB's AeroStar Ultra series of sensors deliver ultralow (to sub-ppb) level dissolved oxygen (DO) measurement with unmatched precision and reliability, making it the ideal solution for ultrapure water measurements in power, semiconductor, and beverage industries.

Engineered for environments where downtime is costly, the AeroStar Ultra sensors ensure stable, accurate, and low maintenance performance through its advanced luminescence quenching optical design. Its fast response time, robust construction, and long-lasting sensor cap (up to 2 years) significantly reduce calibration frequency and total cost of ownership.

The AeroStar Ultra provides measurement from 4 ppb to 25 ppm, while the AeroStar Ultra Trace delivers reliable dissolved oxygen monitoring down to 0.8 ppb.

For more information

Further publications are available for free download from: abb.com/measurement or by scanning this code:

AeroStar Ultra Series – Data sheet	DS/ADS56X
AeroStar Ultra Series – Commissioning instruction	CI/ADS56X
12 mm flow cell – Quick setup guide	IN/12MM/FLOWCELL

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1 Health and safety

1.1 Document symbols

Symbols that appear in this document are explained below:

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

1.2 Safety precautions

For safe and correct use of the AeroStar Ultra sensors, it is essential that both operating and service personnel follow generally accepted safety procedures as well as the safety instructions given in this document.

The specification given in the AeroStar Ultra Data Sheet as regards to temperature, pressure etc., may under no circumstances be exceeded. Inappropriate use or misuse can be dangerous.

The lifetime of the AeroStar Ultra sensors highly depends on the specific conditions of the application. Temperature, pressure, chemicals used may accelerate the aging of both the sensor and their respective caps. See "Maintenance" on page 14 for replacement conditions.

Cleaning, assembly and maintenance should be performed by personnel trained in such work. Before removing the sensor from the measuring setup, always make sure that no process medium can be accidentally spilled. When removing and cleaning the sensor, it is recommended to wear safety goggles and protective gloves.

The sensor can not be repaired by the operator and has to be sent back to ABB for inspection.

Necessary precautions should be taken when transporting the sensors. For repair or shipment the sensor should be sent back in the original reusable packaging box. Every AeroStar Ultra sensor sent back for repair must be decontaminated.

If the conditions described in these operating instructions are not adhered to or if there is any inappropriate interference with the equipment, all of our manufacturer's warranties become obsolete.

1.3 Operating the AeroStar Ultra sensor

When using the AeroStar Ultra sensors in process environment suitable protective clothing, safety glasses and protective gloves must be worn, particularly when dealing with a malfunction where the risk of contamination from spilled liquids exists. Installation and maintenance of sensors must be performed only by trained personnel. The mobile devices and sensors must be used for their intended applications, and in optimum safety and operational conditions.

Make sure that the PG13.5 thread and the O-ring are not damaged when screwing the sensor into the process. O-rings are consumable parts which must be exchanged regularly (at least once per year). Even when all required safety measures have been complied with, potential risks still exist with respect to leaks or mechanical damage to the sensor body. Wherever there are seals or screws, gases or liquids may leak out undetected. Always make sure that no process medium can be accidentally spilled before removing the sensor from its measurement setup. Make sure that no air or gas bubbles sticks to the sensitive part of the sensor. As a consequence, the measurement value could be unstable. Do not put stress on the system by vibration, bending or torsion. Before use, verify that the sensor is properly configured for your application.

Failure to observe and carry out the maintenance procedures may impair the reliability and correct functioning of the measurement system.

NOTICE

When unscrewing the PG13.5 thread connection never turn the sensor at the connector head because you can loosen the cap from the sensor shaft and fluid can reach the interior of the sensor.

NOTICE

To avoid humidity problems, make sure that the cap is always attached firmly to the sensor shaft, and that the O-ring between the shaft and cap is undamaged.

...1 Health and safety

1.4 Electrical safety precautions

Always use ABB's EZLink VP8 sensor cables for safe connection (refer to "Accessories and spares" on page 19). Make sure the cable is intact and properly plugged to avoid any short circuit.

Keep the AeroStar Ultra sensor away from other equipment which emits electromagnetic radio frequency fields, and minimize static electricity in the immediate environment of the optical measuring parts. Carefully follow all the instructions in the commissioning instruction to avoid electrical damage to the sensor. The contacts must be clean and dry before sensor is connected to the cable.

1.5 Safety standards

This product has been designed to satisfy the requirements of IEC61010-1:2010 3rd edition 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use' and complies with US NEC 500, NIST and OSHA.

1.6 Product symbols

Symbols that may appear on this product are shown below:



Protective earth (ground) terminal.



Functional earth (ground) terminal.

Alternating current supply only.

Direct current supply only.



This symbol, when noted on a product, indicates a potential hazard which could cause serious personal injury and/or death. The user should reference this instruction manual for operation and/or safety information.



This symbol, when noted on a product enclosure or barrier, indicates that a risk of electrical shock and/or electrocution exists and indicates that only individuals qualified to work with hazardous voltages should open the enclosure or remove the barrier.



The equipment is protected through double insulation.



Recycle separately from general waste under the WEEE directive.

1.7 Product recycling and disposal (Europe only)



ABB is committed to ensuring that the risk of any environmental damage or pollution caused by any of its products is minimized as far as possible. The European Waste Electrical and Electronic Equipment (WEEE) Directive that initially came into force on August 13 2005 aims to reduce the waste arising from electrical and electronic equipment; and improve the environmental performance of all those involved in the life cycle of electrical and electronic equipment. In conformity with European local and national regulations, electrical equipment marked with the above symbol may not be disposed of in European public disposal systems after 12th August 2005.

For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment for proper disposal.

1.8 Information on RoHS Directive 2011/65/EU (RoHS II)



ABB, Industrial Automation, Measurement & Analytics, UK, fully supports the objectives of the RoHS II directive. All in-scope products placed on the market by IAMA UK on and following the 22nd of July 2017 and without any specific exemption, will be compliant to the RoHS II directive, 2011/65/EU.

2 Cyber security

This product and the EZLink Connect app is designed to be connected to and to communicate information and data via a digital communication interface.

It is your sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be). You shall establish and maintain any appropriate measures (such as but not limited to the application of authentication measures etc.) to protect the product, the EZLink Connect app, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB Ltd and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Although ABB provides functionality testing on the products and updates that we release, you should institute your own testing program for any product updates or other major system updates (to include but not limited to code changes, configuration file changes, third-party software updates or patches, hardware change out, etc.) to ensure that the security measures that you have implemented have not been compromised and system functionality in your environment is as expected.

3 Installation

3.1 Connect the sensor to the transmitter



01 AeroStar sensor and transmitter overview

1. Connect the VP8 connector of the EZLink VP8 sensor cable to the sensor.
2. Connect the other end of the cable to the transmitter's EZLink connector.
3. Press the key on the transmitter to start the Easy Setup.

The cable assembly provides a 3 meter (10 ft) connection to the transmitter. If you need a longer cable, you will need to attach an extension cable to the EZLink connector. Refer to "Accessories" on page 19.

3.2 Earthing

The sensor has to be mounted at the mounting location electrostatically conductive (< 1 MΩ). It is recommended to assign the sensor shaft and VP 8 cable shield to earth (PE potential equalization) especially in electromagnetically noisy environments. This significantly improves noise immunity and signal quality. The VP8 thread is connected to the sensor body.

When installing in the AeroStar flow cell, refer to the instructions for earthing of the flow cell.

When installing directly into a metallic tank, ensure the tank is earthed.

...3 Installation

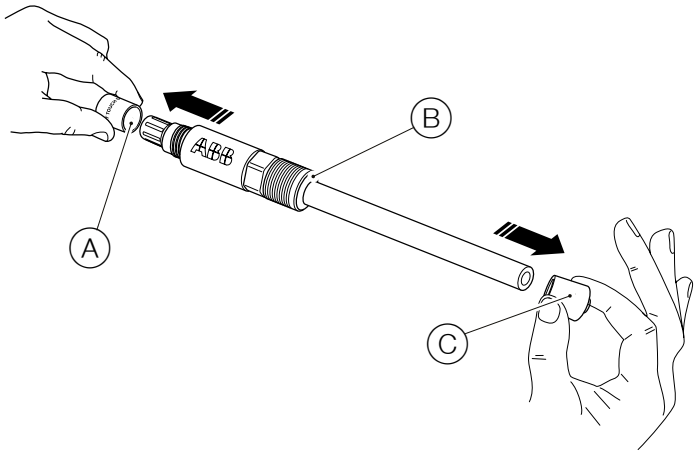
3.3 Prepare the sensor

The AeroStar Ultra and Ultra Trace sensors are designed for use with ABB's 12 mm stainless steel flow cell.

⚠ CAUTION

Pressure hazard

Sensors must be installed and maintained by suitably trained personnel only. Shut down and depressurize process lines before inserting or removing sensors.



O2 Sensor removed from packaging

NOTICE

Only use the sensor within the specifications. Failure to do so may lead to damage or measurement failure.

1. Remove the protective caps (A) and (C) from the sensor.
2. Check the O-ring (B) on the sensor shaft and verify if the sensor cap is screwed firmly to the sensor shaft. Refer to "Replace the sensor cap" on page 15.
3. Verify the correct sensor cap is being used, and set it up by entering the cap serial number in the transmitter. Refer to "Sensor setup" on page 7.
4. Verify the functionality of the sensor including the sensor cap (page 14).
5. Calibrate the sensor ("Calibration" on page 8).
6. Mount the sensor to the flow cell or process connection.

NOTICE

No oxygen measurement is performed at a temperature higher than 85 °C (185 °F) to protect the optoelectronics and enhance the sensor lifetime. Oxygen measurement will not be updated below 0 °C (32 °F) because of the oxygen solubility.

NOTICE

To ensure a correct measurement when changing a sensor cap, please configure it (currently only available Ultra Cap C3 and Ultra Trace Cap U1). Refer to "Sensor setup" on page 7.

4 Sensor setup

Menu	Comment	Default
Tag	16 character alphanumeric tag	TAG1
DO units	Select the DO units: • ppm / ppb / mg/L / µg/L / %sat / %vol	ppm (AeroStar Ultra) ppb (AeroStar Ultra Trace)
Range high	Set the span value used in **Chart** and **Bargraph** views.	25 ppm (AeroStar Ultra) 2,000 ppb (AeroStar Ultra Trace)
Range low	Set the zero value in **Chart** and **Bargraph** views.	0.0 ppb (AeroStar Ultra) 0 ppb (AeroStar Ultra Trace)
Filter type	Select the signal filtering type: • None / Low / Medium / High	None
Salinity	Enter the salinity measurement • 0 to 50 mS/cm	0 mS/cm
Pressure	Enter the local barometric pressure • 10 to 1,200 mbar If you do not know the barometric pressure, leave the default sea level value of 1,013 mbar.	1,013 mbar
Meas. interval	Select the measurement interval 3 to 300 s Increasing the interval will increase the life of the sensor cap but will also provide a slower reaction time for an oxygen change. **Note:** During a zero or span calibration if the measurement interval is greater than 3 s, the measurement interval is temporarily set to 3 s and is restored to its configured value 10 minutes after calibration is completed or after a power up. When a grab sample calibration is performed, the measurement interval is not changed.	3 s
Num sub samples	Select the number of sub samples. • AeroStar Ultra 1 to 16 if Measurement interval is 3 or greater • AeroStar Ultra Trace 8 to 16 The measured value in each measurement interval is an average of a number of samples. The advantage of using a smaller amount of sub-measurements is a shorter exposure of the luminophore in the sensor cap to the excitation light reducing photo bleaching. The disadvantage is a reduced signal quality.	3 (AeroStar Ultra) 8 (AeroStar Ultra Trace)
Temp compensation	Select the automatic temperature compensation • Automatic/Manual	Automatic
Manual temperature	Select the manual temperature **Note:** Only displayed if temperature compensation is set to Manual	25.0 °C 77 °F
Sensor failure action	Select the action to be applied to the measured value (PV) if a sensor failure is detected • Do nothing / Hold / Custom	Custom
Custom value	Enter the Custom Value the measured value (PV) will be set to when a sensor failure occurs **Note:** Only displayed if action set to Custom	0.0000
Replace cap	Displays the cap part number that is installed on the sensor	C3 (AeroStar Ultra) U1 (AeroStar Ultra Trace)
Cap serial number	Enter the serial number etched on the cap (6 characters max.) After the serial number is entered, a cap replaced audit log entry is created.	—
Reset To Defaults	Select to reset sensor setup to default values. **Note:** The sensor calibration data is not reset by this function.	—

5 Calibration

5.1 Calibration menus

Menu	Comment	Default
S1 (to 4): LLDO	Select the LLDO sensor to calibrate	
PV Zero Cal	Calibrate the Zero of the oxygen sensor. Zero calibration can only be performed at 0 in the configured units.	—
PV Span Cal	Calibrate the span of the sensor in air AeroStar Ultra	
	AeroStar Ultra Trace	
Cal. units*	Edit value at which the Calibration will be performed in selected units. • % vol / ppb	%vol
	A grab sample calibration allows an additional point between zero and span to be calibrated. It allows a calibration based on a laboratory reference value from a collected sample. This calibration requires 2 steps:	
Sample collection	This is used to store the oxygen measurement value at the point a sample is collected in order to be evaluated at a laboratory or other verified means	
Enter reference value	The collected sample should be evaluated to ascertain the reference value to be entered. When this is done a calibrated point will be created, by the sensor, at the reference value. **Note:** Only displayed if Sample collection has been completed.	
Cancel complete	Cancels the previous sample collection. **Note:** Only displayed if sample collection has been completed.	—

5.2 Calibration safety

⚠ CAUTION

The AeroStar calibration usually uses nitrogen gas.
Make sure that health and safety considerations are made before you handle the gas. Personnel must be suitably trained to use the gas.

* Calibration units is displayed only for AeroStar Ultra Trace.

5.3 PV zero calibration

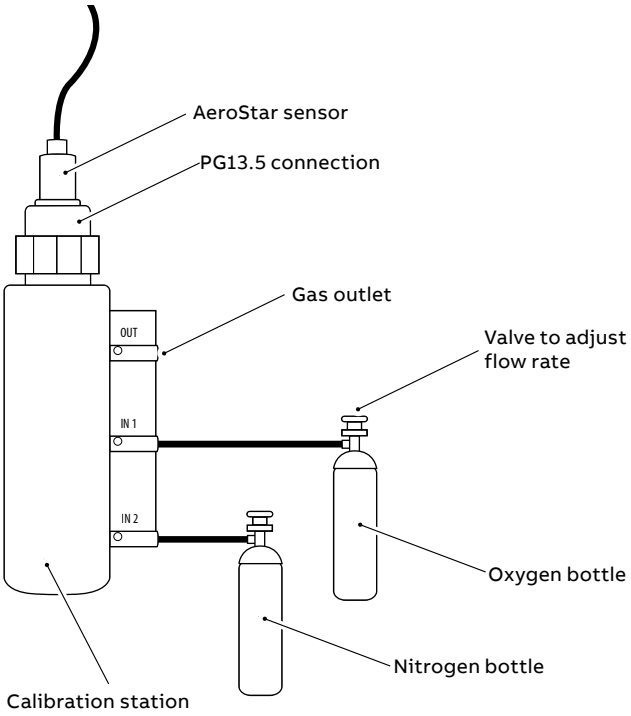
This procedure is the PV zero calibration for AeroStar Ultra series. The procedure is the same for AeroStar Ultra and AeroStar Ultra Trace.

1 Expose the tip of the sensor to zero point solution (0 % oxygen). This may be performed either in pure nitrogen gas (99.999 %), water saturated with nitrogen, or in a freshly prepared 2 % sodium sulfite solution.

Optimum calibration is achieved when using pure nitrogen and the AeroStar Ultra calibration station (3KXA494440L0007).

2 If using a gas calibration:

a Install the sensor in the calibration station. Tighten the sensor to hand-tight, then tighten it a further quarter-turn.



O3 Sensor installed in the calibration station

b Connect the OUT port (top) to the gas exhaust line.

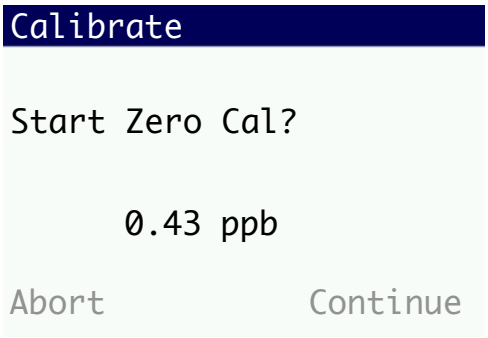
c Connect the IN 2 port (bottom) to the zero-oxygen gas (99.999 % nitrogen).

d Make sure that the valves are open, and any valves on spare ports are closed.

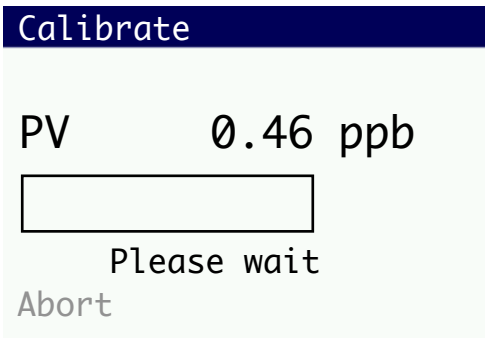
e Flow gas through the calibration station. The ideal flow rate is 0.5 L/min.

f Wait for the reading to become stable (usually 2 to 3 minutes).

3 On the transmitter, navigate to the PV zero calibration menu.

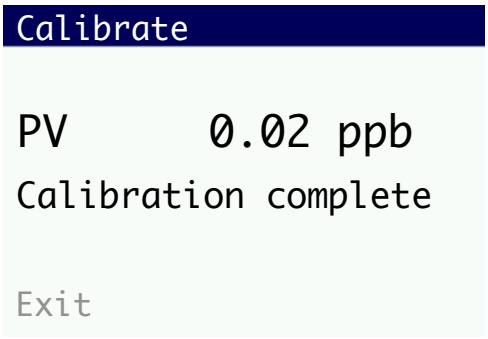


4 Wait for the reading to become stable before you select Continue.



5 Wait for the calibration to complete.

When the calibration finishes successfully, the Calibration Complete screen shows.
If the calibration fails, refer to "Diagnostics" on page 16.



6 Turn off the gas flow and remove the sensor from the calibration station.

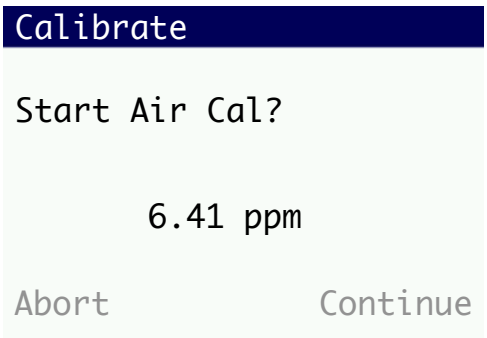
...5 Calibration

5.4 PV span calibration

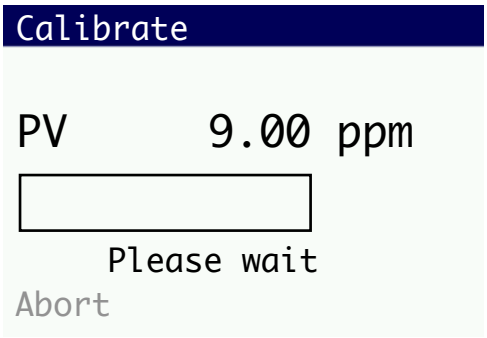
5.4.1 PV span calibration for AeroStar Ultra

1 Expose the sensor tip to air.

2 On the transmitter, navigate to the PV span calibration menu.

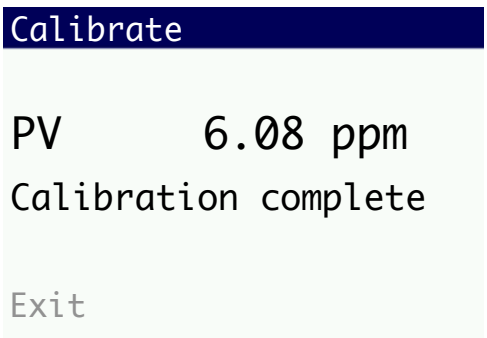


3 Wait for the reading to stabilize before you select Continue.



4 Wait for the calibration to complete.

When the calibration finishes successfully, the Calibration Complete screen shows.
If the calibration fails, refer to "Diagnostics" on page 16.

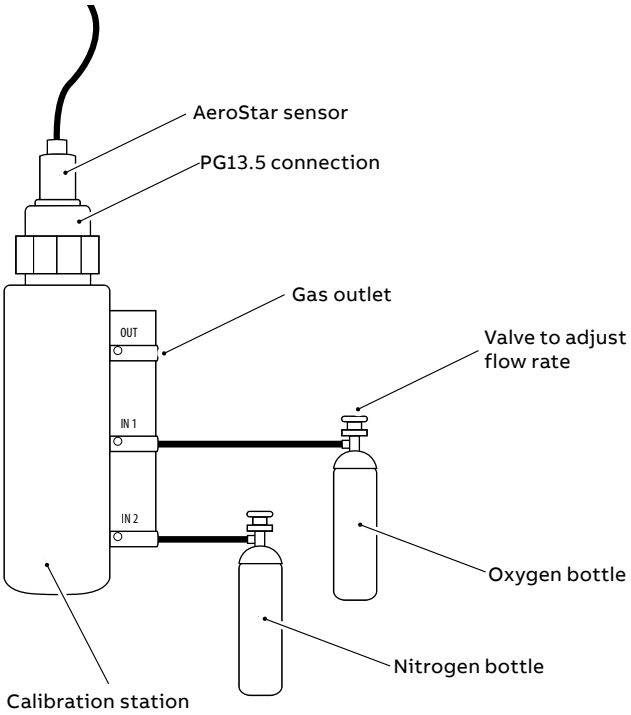


5.4.2 PV span calibration for AeroStar Ultra Trace

1 Expose the tip of the sensor to the span solution using a gas with a known concentration in the region of 40 to 800 ppb (0.1 to 2.03 % vol at 25 °C).

Optimum calibration is achieved when using 400 ppb (1 %vol at 25 °C) and the AeroStar Ultra calibration station (3KXA494440L0007).

2 Install the sensor in the calibration station. Tighten the sensor to hand-tight then tighten it further a quarter-turn.



04 Sensor installed in the calibration station

3 Connect the OUT port (top) to the gas exhaust line.

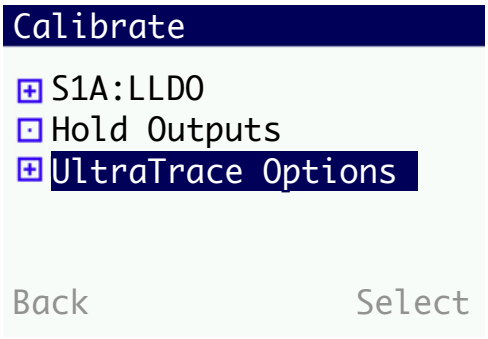
4 Connect the IN 1 port (middle) to the span oxygen gas.

5 Make sure that the valves are open, and any valves on spare ports are closed.

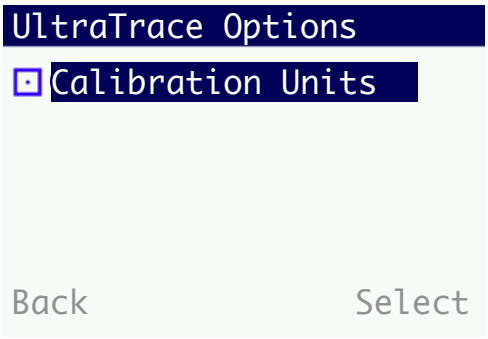
6 Flow the gas through the calibration station.
The ideal flow rate is 0.5 L/min.

7 Wait for the reading to become stable (usually 2 to 3 minutes).

8 On the transmitter, navigate to the calibration UltraTrace Options menu.



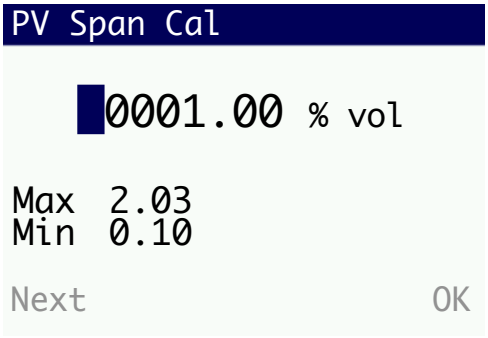
9 Select Calibration Units.



10 Navigate to the PV span calibration menu.

11 Select the PV span.

12 Press to move to the next digit, then press ▲/▼ to change the value. The acceptable range is between 40 to 800 ppb (0.1 to 2.03 % vol at 25 °C).



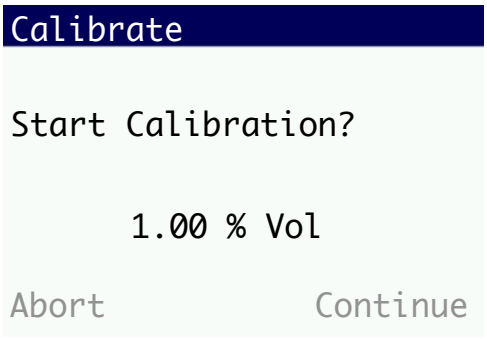
13 After you enter the new value, select OK to update the PV span calibration value.

14 Select Continue to start the calibration.

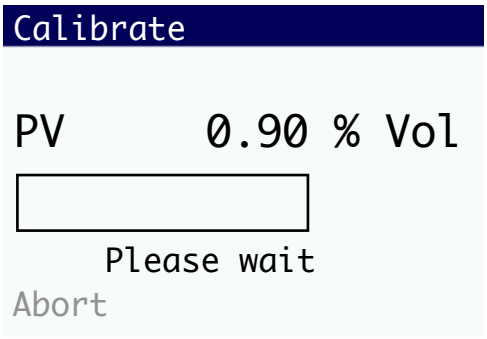
...5 Calibration

...5.4 PV span calibration

...5.4.2 PV span calibration for AeroStar Ultra Trace

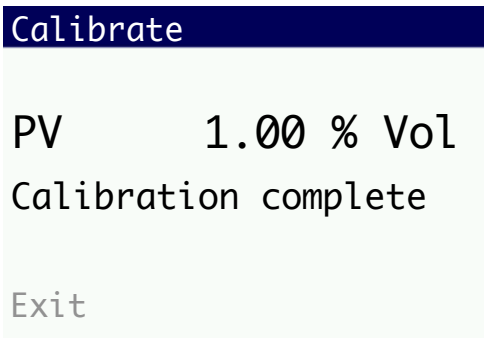


15 Wait for the calibration to finish.



When the calibration finishes successfully, the Calibration Complete screen shows.
If the calibration fails, refer to "Diagnostics" on page 16.

16 Turn off the gas flow and remove the sensor.



5.5 Sample collection

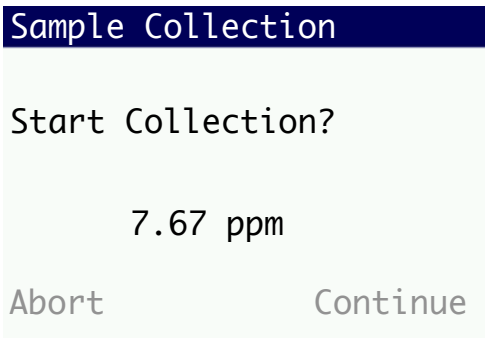
The sample collection allows the user to perform a process calibration to a known reference value without removing the sensor from the process.

Make sure that the process is stable before you do this procedure.

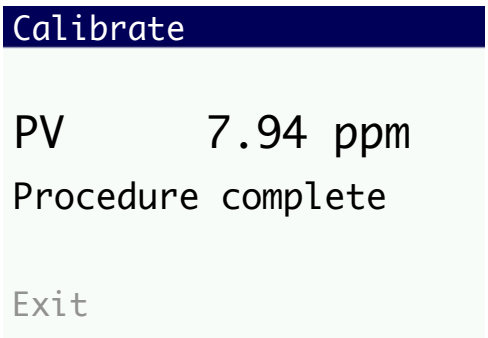
The process is the same for AeroStar Ultra & AeroStar Ultra Trace.
Note:
For AeroStar Ultra and Ultra Trace, the process must be inside the limits of 0.8 to 22* ppm (2 to 55 % vol at 25 °C).

1 On the transmitter, navigate to the Sample Collection menu.

1 Press Continue to start the sample collection.



2 When the sample collection is complete, select Exit to go back to the main menu.

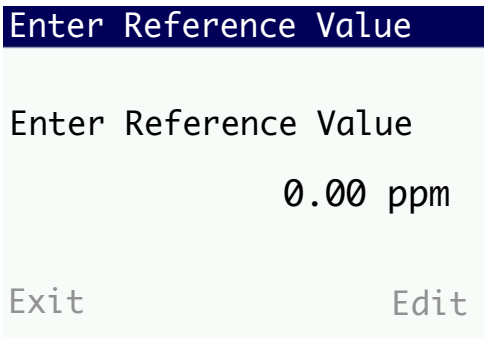


* 2 ppm (5 % vol at 25 °C) for liquid samples in the case of the AeroStar Ultra Trace as that is the maximum measuring range.

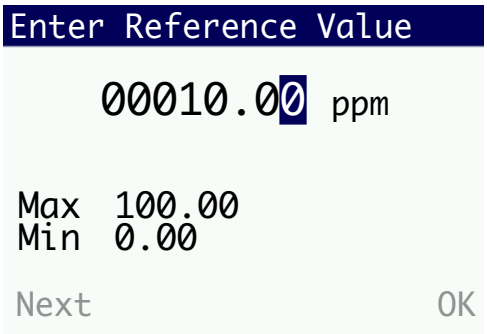
5.6 Enter the reference value

1 On the transmitter, navigate to the reference value menu.

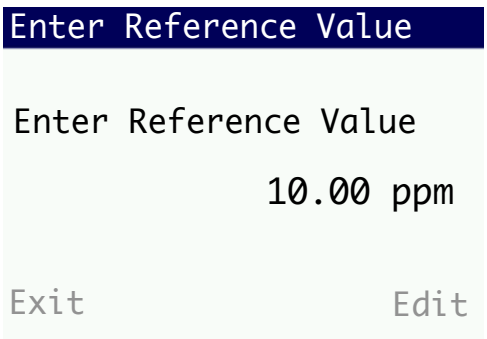
2 Enter the reference value returned from the lab by pressing Edit



3 Press ◥ to move to the next digit, then press ▲/▼ to change the value.
Note:
For AeroStar Ultra and Ultra Trace, the process must be inside the limits of 0.8 to 22* ppm (2 to 55 % vol at 25 °C).



4 After you enter the new value, select OK to update the sensor.

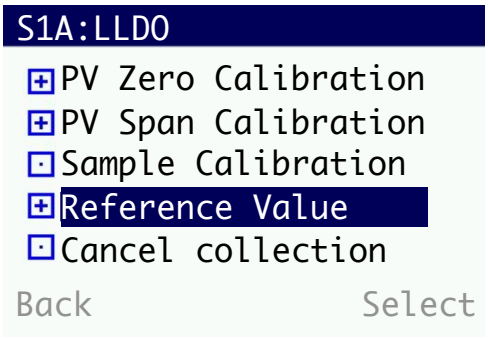


5 Select Next to continue with the reference value displayed.

6 Select Continue.

7 Wait for the calibration to complete.

When the calibration finishes successfully, the screen below shows.
If the calibration fails, refer to "Diagnostics" on page 16.



5.7 Cancel complete



Select OK to cancel the sample collection calibration. Press the Back key to go back to the main menu.

* 2 ppm (5 % vol at 25 °C) for liquid samples in the case of the AeroStar Ultra Trace as that is the maximum measuring range.

6 Maintenance

Periodic maintenance routines need to be run in order to ensure safe and reliable operation and measurement of the sensor and accessories.

NOTICE

Avoid any contact of the equipment with corrosive media.

6.1 Verify sensor status and sensor cap functionality

1 Connect the sensor to the transmitter via the EZLink connection.

2 Check the quality of the sensor cap in the health check feature and change the sensor cap or sensor if required.

NOTICE

The lifetime of the sensor highly depends on the specific conditions of the application. Temperature, pressure, chemicals used may accelerate the aging of both the sensor and its sensor cap. A warning "DO Replace Sensor Cap" remains active as long as the sensor quality is below 40 %. The health check feature takes sensor and cap into account.

6.2 Clean the sensor

This chapter outlines a manual cleaning procedure for the care and maintenance of optical dissolved oxygen sensors including a procedure for the cleaning the sensing membrane in particular.

CAUTION

Cleaning, assembly and maintenance should be performed by personnel trained in such work. Do not use any abrasive tissues or cleaning materials and do not use any cleaning chemicals other then described above. Before removing the sensor from the measuring setup, always make sure that the setup is pressure-less and cold and that no process medium can be accidentally spilled. When removing and cleaning the sensor, it is recommended to wear safety glasses and protective gloves.

Requirements

PPE required



Table 1 Consumables required

Description	Quantity
Dust-free cloth or tissue	As required
Isopropyl alcohol	As required
Deionized water	As required

Procedure

1 Remove sensor from the measuring setup.
Note:
Do not touch the sensor membrane or the sensor lens.

2 Check if the sensor cap is mounted firmly on the shaft.

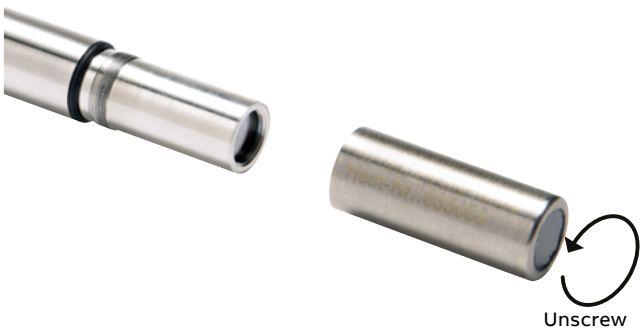
3 Soak a dust-free cloth or tissue paper with water and wipe the wetted parts with it. Thoroughly rinse the wetted parts and the sensing membrane with deionized water afterwards.

4 Dry the wetted parts with a clean, dust-free cloth or tissue, and store the sensor in dry and dark conditions (AeroStar Ultra caps are light-sensitive).

5 If the sensing membrane on the front of the cap is contaminated with oil, grease, or other organic matter, use a clean, dust-free cloth soaked with isopropyl alcohol to clean. Rinse residual isopropyl alcohol immediately from the membrane with deionized water, and gently wipe over the membrane.

6 After cleaning, always perform a new calibration before carrying out measurements. (See "Maintenance" on page 14).

6.3 Replace the sensor cap



O5 Replace the sensor cap

NOTICE

- Do not touch the end of the sensor cap or the sensor lens.
- Do not let moisture or atmospheric humidity in the sensor.
- Do not get water or other liquids on the lens area.

1 Isolate the transmitter and remove the sensor from the process.

2 Loosen and remove the sensor cap. There is a short piece of silicone tubing provided with the sensor to help hold and remove the cap.

3 Remove the sensor cap O-ring from the sensor body and replace it with the O-ring supplied in the cap spares kit.



O6 O-ring installed on the sensor body

4 Install the sensor cap by screwing it tightly onto the sensor body.

5 Remove the silicone tubing from the sensor cap.

6 Examine the condition of the process connection O-ring (ø11 × 3) and replace it if it is damaged or worn.

It is recommended to change this O-ring when you change the cap.

Note:
The spare caps (3KXA494440L0003 and 3KXA494440L0004) include one O-ring.



O7 Process connection O-ring

7 Diagnostics

NOTICE

Errors cannot be ignored and corrective action is immediately necessary.

NOTICE

Warnings can be ignored but the warning will be displayed continuously until the corrective action is successfully completed.

The transmitter is programmed to display NAMUR 107 diagnostic icons and messages to provide information on servicing requirements and any other conditions that develop during operation.

All diagnostic messages displayed on the transmitter are added to the transmitter's audit log.

Table 2 NAMUR 107 diagnostic icons

			
Failure	**Check function**	**Out of specification**	**Maintenance required**
Process value invalid due to malfunction in sensor or transmitter	Process value temporarily invalid due to specified action	Process value unreliable due to sensor operating outside specified range/limits	Process value valid – intervention required to correct operational conditions

7.1 S(n): PV Failure

Diagnostic message


S(n): PV Failure

Cause

The measurement is not valid.

Recovery action

1 Make sure that the sensor cap is installed correctly.

2 Check the sample and process.

3 Contact technical support.

7.2 S(n): Pressure Failed

Diagnostic message


S(n): Pressure Failed

Cause

The measured partial pressure of oxygen is higher than the user-set local barometric pressure.

Recovery action

1 Set the local barometric pressure in sensor setup.

7.3 S(n): Temp. Failed

Diagnostic message


S(n): Temp. Failed

Cause

The temperature sensor is defective.

Recovery action

1 Replace the sensor or contact technical support.

7.4 S(n): Cap missing

Diagnostic message


S(n): Cap missing

Cause

The sensor cap is not installed.

Recovery action

1 Do not immerse the sensor in a measurement solution. Make sure that the correct AeroStar Ultra sensor cap is installed.

7.5 S(n): Cap Defective

Diagnostic message


S(n): Cap Defective

Cause
The sensor cap is not working.

Recovery action
1 Replace the sensor cap.

7.6 S(n): Sensor Voltage Error

Diagnostic message


S(n): Sensor Voltage Error

Cause
Sensor voltage is too high or too low for a reliable measurement.

Recovery action
1 Check the EZLink connection and cable or contact technical support

7.7 S(n): Hardware error

Diagnostic message


S(n): Hardware error

Cause
A sensor hardware problem is preventing a reliable measurement.

Recovery action
1 Replace sensor or contact technical support.

7.8 S(n): PV Out of Limits

Diagnostic message


S(n): PV Out of Limits

Cause
The oxygen value is outside the measurement range of the sensor.

Recovery action
1 Check the sample flow.

2 Check the process.

7.9 S(n): Process Temp Out of Range

Diagnostic message


S(n): Process Temp Out of Range

Cause
The process temperature is too high or too low.

Recovery action
1 Make sure that the process temperature is within the required limits.

7.10 S(n): Sensor Voltage Warning

Diagnostic message


S(n): Sensor Voltage Warning

Cause
The supply voltage for the sensor is outside the expected range.

Recovery action
1 Check the EZLink connection and cable.

7.11 S(n): Calib recommended

Diagnostic message


S(n): Calib recommended

Cause
The measurement accuracy is not reliable.

Recovery action
1 Perform a calibration.

7.12 S(n): Replace Cap

Diagnostic message


S(n): Replace Cap

Cause
The sensor cap quality is not sufficient for reliable measurement.

Recovery action
1 Replace the sensor cap.

…7 Diagnostics

7.13 S(n): Replace Sensor

Diagnostic message


S(n): Replace Sensor

Cause

The sensor quality is low.

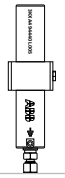
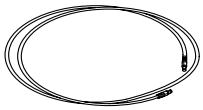
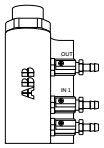
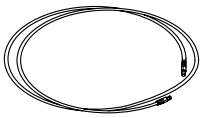
Recovery action

1 Sensor replacement is recommended.

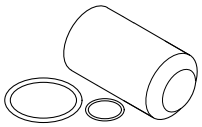
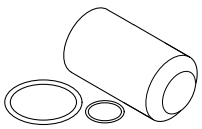
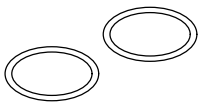
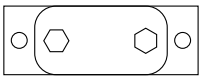
2 Contact technical support.

8 Accessories and spares

8.1 Accessories

Part number	Description	
3KXA494440L0005	12 mm sensor stainless steel flow cell (incl. mounting kit)	
3KXA494440L0006	EZLink VP8 sensor cable, 3 m (9.8 ft)	
3KXA494440L0007	AeroStar Ultra calibration station	
AWT4009010 AWT4009030 AWT4009050 AWT4009100 AWT4009150 AWT4009250 AWT4009500	1 m (3.3 ft) EZLink cable 3 m (9.8 ft) EZLink cable 5 m (16.4 ft) EZLink cable 10 m (32.8 ft) EZLink cable 15 m (49.2 ft) EZLink cable 25 m (82.0 ft) EZLink cable 50 m (164.0 ft) EZLink cable	

8.2 Spares

Part number	Description	
3KXA494440L0003	AeroStar Ultra cap (incl. process connection O-ring and sensor cap O-ring)	
3KXA494440L0004	AeroStar Ultra Trace cap (incl. process connection O-ring and sensor cap O-ring)	
3KXA494440L0008	O-ring for process connection (pack of 2)*	
3KXA494440L0009	Mounting kit for flow cell	

* One O-ring included with AeroStar caps 3KXA494440L0003 and 3KXA494440L0004.

Trademarks

- AeroStar is a trademark of ABB Limited.
- EZLink is a trademark of ABB Limited.
- Modbus is a registered trademark of Schneider Electric USA, Inc.

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