

OXYGEN

Dissolved Oxygen Sensor



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Introduction

The O2X DUO sensor is designed to continuously measure dissolved oxygen levels in liquids. The O2X DUO is effective in saving energy costs associated with aeration systems in an activated sludge process. In addition, accurate measuring of dissolved oxygen allows for better control of nitrification/denitrification.

The O2X DUO features two different principles of measuring; Clark Cell electrode or optical cell. See section 3 below.

1. A few words about this manual

This manual details installation procedures and operational features of the Cerlic O2X DUO sensor. Menu navigation and technical data for the BB1/BB2 control box can be found in the BB1/BB2 service manual.

2. Design

The O2X DUO sensor is manufactured with SS2343 (316SS) stainless steel. Built-in flushing nozzles allow for the most accurate readings with little maintenance. The electronics is protected in the rugged casing, ensuring its reliability in very demanding environments.

The sensor has a fixed, shielded 10 m (33') M12 cable used for signal transmission between the sensor and the BB1/BB2 control box. The cable sheath is made of Hytrel and is highly resistant to aggressive materials and fluids.

3. Measuring principle

Clark cell, The electrode is a Clark type electrode with FEP membrane. The Clark cell detects the oxygen through its reduction at the Gold electrode. The sensor consists of a Gold cathode and Silver anode. A membrane covers the gold & silver electrodes and blocks access of solids to the electrodes. Only dissolved gases such as oxygen can pass through the membrane, hence the reduction current responds to the oxygen concentration.

Active components included in the electrode are treated to maximize their life span. Inside the electrode there is also a temperature sensor mounted in a way that minimizes problems with temperature adjustments. This provides compensation of the electrode due to temperature changes. There is a connector on the electrode for the O2X amplifier cable. The temperature can be read on the BB1/BB2 and can be used as secondary signal when an O2X sensor is configured to use two mA outputs. The temperature measurement is not a precision measurement but should rather be seen as an indication.

Optical cell, The optical cell is using phase shift technology to determine the oxygen concentration. A special coating is applied to the acrylic disc in the top of the optical electrode and called sensor cap in the manual. The optical cap is not sensitive to UV light, but it is recommended when doing an air calibration to have the sensor in the shade. The Clark & Optical cells can be interchanged in the O2X DUO sensor but an air calibration must be performed. There is a connector on the electrode for the O2X amplifier cable. The temperature can be read on the BB1/BB2 and can be used as secondary signal when an O2X DUO sensor is configured to use two mA outputs. The temperature measurement is not a precision measurement but should rather be seen as an indication.

4. Unpacking the sensor

The unit has been tested and approved before delivery from the supplier. Please check to confirm that no visible damages occurred during shipment.

Damages

If damages occurred during shipment, immediately contact the forwarder as well as your Cerlic representative. The shipment can be returned only after contact has been made with Cerlic.

Packaging

The original packaging is designed to protect the equipment and should be used for storage or if the goods must be returned.

Content

Please check that the content corresponds to your order and packing list.

You will also need an electrode (below) to get the sensor working:

Optional parts for O2X DUO:	P/N
• Clark Electrode cartridge.	11805160
• Optical Cell cartridge	10306099
• Protection plates for Electrodes/Optical Cells Membranes	10305470
• Sensor Holder	11205541
• Telescopic Rod, 3 sections, Fiberglass 4 Meter (13,1')	20205652
• Stainless steel Handrail Mounting bracket X, including rod holder	11205539
• Adjustable SS slide rail and sensor holder 66 mm	11205600
• Solenoid valve for flushing, 230 VAC Inlet hose ØØ16mm (5/8") , to sensor ØØ 8mm (1/4")	11705516A
• Solenoid valve for flushing, 115 VAC Inlet hose ØØ16mm (5/8") , to sensor ØØ 8mm (1/4")	11705516B
• Aluminum mounting plate predrilled for BB2 or solenoid valves and connection boxes w/ u-bolts.	10305532
• Aluminum mounting plate predrilled for BB2 and solenoid valves and connection boxes w/ u-bolts.	10305851
• 10 meter (33 ft) M12 extension cable with plug-in connectors.	20805510
• 30 meter (100 ft) M12 extension cable with plug-in connectors.	20850727
• Connection box for two sensors to one BB1/BB2 control box with 1m. (3 ft) cable to connect to BB1/BB2	11505748
• Connection box for four sensors to one BB1/BB2 control box with 1m (3 ft.) cable to connect to BB1/BB2	11505785

5. Mounting the sensor

Cable Connections

Connect the sensor to the BB1/BB2 control box using the attached M12 connector on the end of the sensor cable. In the event that two sensors are to be connected to the same BB1/BB2 control box, use the Y-splitter (P/N 21505534) or 4-way Connection box (P/N 11505785).

NOTE! Never try to turn the M12 connector housing on the cable to fasten or remove the connector, only the fluted ring at the top of the M12 connector shall be turned. Dielectric paste can be applied to the connector for corrosion protection.

The O2X DUO sensor is mounted on a telescopic fibreglass rod and placed in a mounting bracket that fastens to a handrail, please refer to the Appendix 1 for further details. As an alternative way of mounting the sensor, an adjustable SS slide rail holder is available, please refer to the Appendix 2 for further details.

Note! For best DO measurement, the rod shall be mounted at an angle of 5° – 30° from vertical.

Installation Tips

- Adjust the rod so that the sensor is at least 30 cm (12”) below the liquid surface or the lowest water level in decant applications (SBR’s) to prevent the sensor from coming out of the liquid.
- In an aeration tank, ensure that the sensor is not directly above a diffuser head. To obtain the most representative dissolved oxygen level, the sensor should be installed on the backside of the rolling diffuser action.
- In an aeration basin, flushing may not be required if the tank is well agitated. To verify the need for flushing, remove the sensor from the liquid after it has been in the liquid for several days. If the sensor is coated with solids, flushing with water or compressed air is recommended.

NOTE! The sensor is delivered with the electrode uninstalled. A yellow plastic cap protects the electrode connection plug and the flushing nozzle in the transmitter. The plastic cap must be removed and the electrode must be installed and calibrated before the transmitter is submerged into water (refer to Section 7). Retain the yellow cap as it may be used as protection later. Do not press on the top of the cap if the electrode is installed.



6. Removing the sensor

The SS sensor housing may not be opened except by Cerlic service personnel. Opening the sensor housing will void factory warranty.

The sensor is removed in the following steps:

- Disconnect the sensor cable from the BB1/BB2 control box and the flushing hose from the solenoid.
- Open the SS safety clamp, and pull the telescoping rod out of the SS handrail mounting bracket.
- Make sure all water inside the rod & pvc sensor holder is drained.
- Clean the sensor and telescoping rod with a brush or clean cloth. Do not use a wire brush!
- Open the black plastic sensor to rod adaptor.
- Flush the inside of the telescoping rod with clean water.
- Install the red protective cap (or a small plastic bag) on the M12 sensor cable connector.
- Pull the flushing hose out of the rod first and then the M12 cable.
- Blow compressed air through the flushing hose to get rid of the water in the hose and the sensor.

7. Changing or installing a new electrode/cell

The electrode/cell can be both assembled and disassembled without special tools. Do not clamp the SS sensor housing or the cable when installing or removing the SS flushing head.

Please note: The new optical cell can be mounted on all sensors with serial number higher than 7-25-078 bought later than 1 sept 2014. For older models please contact Cerlic.

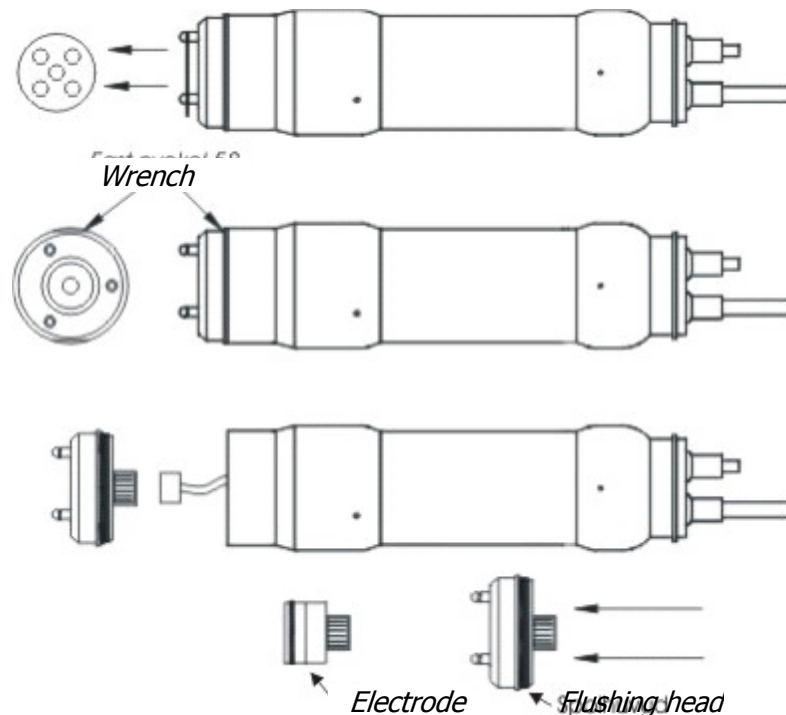
Removing an old electrode/cell:

- Make sure the automatic flushing is turned off.
- If using the SS protection plate, you must remove it before changing the electrode/cell. Remove the flushing head by rotating it counterclockwise.
- **Make sure the electrode/cell housing is dry.** Water may come into the housing when the flushing head is removed.
- Unplug the electrode/cell. Remove the electrode from the flushing head by pressing firmly with your fingers on the backside of the electrode near the cable connector.
- Confirm that the O-ring that seals the flushing head is installed in the proper position in the SS sensor body.
- Screw the flushing head back into the sensor but do not screw it in to tightly.

- If a new electrode is not to be installed, then the yellow plastic cap shall be mounted to protect the electrode connection plug and the flushing nozzles on the sensor.

Installing a new electrode/cell:

- Loosen and remove the SS flushing head.
- Remove the cable connector from the electrode/cell and clean the connector.
- Use a new o-ring, 31.6x2.4 mm EPDM, on the electrode when exchanging the electrode.
- Plug the electrode/cell cable into the connector on the top of the electrode.
- Install the new electrode/cell into the SS flushing head. **Don't touch the cap lens on the electrode/cell when installing.**
- For the optical cell, the grooves in the electrode must be adapted to the holes for the flush pipes.
- Tighten the SS flushing head and mount the protection plate, if needed. See below the instructions on mounting the protection plate.
- A new air-calibration must be performed whenever the electrode/cell is changed. For the optical cell also a 0-calibration shall be done.
- The date when the electrode/cell is changed shall be entered in the calibration menu.



Mounting the protection plate

First: remove the small o-rings mounted in the groove at the top of the three flushing nozzles. Bend the plate slightly and press it down between the flushing nozzles and into the grooves. Confirm that the plate fits into the notches on the flushing nozzles. Do not remove a flushing nozzle in order to mount the protection plate. The nozzles are fastened with a special locking glue.

8. Cleaning the Sensor



The sensor is equipped with built-in flushing nozzles. The nozzles are used to direct the cleaning medium, compressed air or water, via a flushing hose that is connected to the top of the sensor. The air or liquid is controlled with a solenoid valve that is wired into the BB1/BB2 control box. Please refer to the technical description for allowed pressure.

Note! Pay attention to the requirements for protection against backflow, according to the EN 1717 standard for drinking water devices. If possible, use plant reuse water or effluent water for cleaning.

- Our recommendation is max flushing one time/hour and at max 2 bars pressure.
- Flush as little as possible, flushing wears the surface of the electrode/cell. Excessive flushing reduces the lifetime of the electrode/cell.
- Try flushing twice per day (720 minutes interval, 5 seconds length). If this doesn't keep the electrode/cell clean, first reduce the interval, then increase the flushing time.
- Never flush when the electrode/cell is not installed.
- When the electrode/cell is not installed, the yellow plastic cap should be kept on the end of the sensor for protection.

Flushing must be activated in the “Settings” menu in the BB1/BB2 control box:



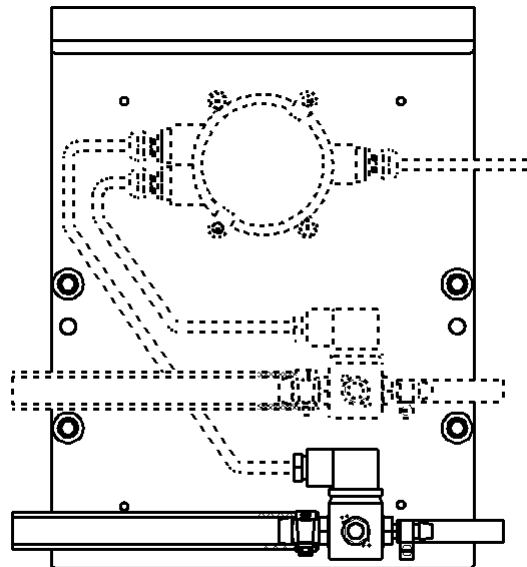
- Select the O2X DUO sensor in the Main Menu by using the  or  buttons,
- Press ENTER for five seconds to enter the Sensor Menu.
- Use the arrows to select “Cleaning” and press ENTER.
- If the sensor is to be cleaned as master, i.e. it has its own relay, then set the “Cleaner” setting to “flush”, specify the cleaning interval in minutes, and the flush time in seconds. If the sensor is to be cleaned as a slave, along with another sensor, then these parameters are set for the sensor being the master. Specify the freeze time in seconds after the flush for recover.
- If the sensor shall be cleaned as master, specify the relay to be used according to the wiring inside the control box. For example, if the solenoid is wired to relay #1, select “#1” for flushing. If the sensor is to be cleaned as a slave, specify “Along #1” or “Along #2” depending on what relay the master sensor uses.
- For sensors configured as masters, “Next time” displays the next time flush will be activated, pushing ENTER will set it to current time and start cleaning cycle.

Cleaning the Flushing Nozzle

If the flushing nozzle becomes plugged, removing the flushing head and backflush the nozzles with clean water. Before removing the flushing head, close the valve for the flush water source. Place a 1/2" hose over the flush nozzle and carefully open the water valve. The pressure should clear the nozzle of solids. If backflushing does not work initially, try cleaning the three flushing nozzles with a needle or wire. Try backflushing the nozzles again as described above until clean water comes out.

Mounting plate for solenoid valves

To provide an easy mounting of solenoid valves for the built-in flushing nozzles Cerlic offers a predrilled Aluminum handrail mounting plate. The Mounting plate is fixed to the rail using two u-bolts.





Mounting plate P/N 10305533 for one or two solenoids, outside US version P/N 11705516A (11705516 B US Version) and a connection box P/N 11505748.

9. Sensor display

By simultaneously pressing **↓** and ENTER you change between BB1/BB2 main menu and the sensor information display for the selected sensor. O2X DUO sensor has two information displays, the first menu shows: measured DO value, current temperature of the electrode in air, the solubility DO value in air for this air temperature, and the “slope” of the electrode at the last air calibration. The second menu display shows: the date of the last calibration and the date the electrode was replaced or changed.

10. Menu for O2X DUO Sensor

Use  or  to select the sensor on the main display. The menu for the selected sensor is accessed by pressing ENTER for five seconds. If the selected sensor is not active (the text **No transmitter** is shown) a warning is displayed that asks you to make another choice in order to show the sensor menu.

Settings

Tag	Name of the sensor (10 characters) shown on the main display.
I--Time	Integration time or dampening -- can be set up to 999 seconds.
Decimals	1 or 2 for display and menu.
Analog	"None" , "Out1", "Out2", "Out3", "Out4", "Out1+2", or "Out3+4". Pick which analog output(s) to be used with this sensor.
Second	"Temp" or "=Prim". If two are chosen above, the first will always give the primary value or DO reading according to the sensors selected scale. The second will either give the temperature scaled as stated below, or the same signal (primary value) as the first channel. The temperature is additional information, not a precision measurement.
Temp 0--	Temperature scaling, value that will give max output on second channel. Default is 100 C but can be adjusted????

Calibrate

Airpres.mB	Specify within 10 mBar. Go to weather station on internet to obtain for your zip code or location.
Calibrate	"No", "Zero", or "Air". Select what calibration to do.
Temp (info)	Shows actual temperature in the electrode
Test (info)	Shows actual dissolved oxygen level
Setvalue	Theoretical reading in air at current temperature and with the air pressure entered above. Should be the same as "test" immediately after the calibration
Slope	Slope of the electrode/cell at last air calibration. This value is an indication of the life of the electrode and it is normally over 80 for a well functioning Clark electrode. But there is nothing that eliminates the possibility of an electrode functioning well at lower values. However at values below 50 it is recommended to replace the Clark electrode.
Calibrated	Date of last air calibration.
New eletcr.	Date when electrode/cell was last changed. Push ENTER to edit the date, then ENTER again to store it.

Cleaning

	Press ENTER to go to Cleaning program
Cleaner	"None", "Flush", or "Brush". Do not select "Brush" since this does not exist for the O2X sensor
Interval min	0-999 minutes, time between cleaning cycles
Length sec	0-999 seconds, duration of flushing cycle
Freeze sec	0-999 seconds, extra freeze time of output signal after a flushing cycle so sensor can go back to the original values.
Relay	"-", "#1", "#2", "Along #1", or "Along #2". Select relay to operate solenoid for flush cycle, if this sensor is a master with its own relay, or relay used by master, if this sensor is a slave. These are the same relays used for "Alarm relay" below
Next time	The next scheduled cleaning time. Pushing "Enter" on this line will reset the time to current time and start a cleaning cycle. This could be used to test the "Flush" cycle.

Scale / Alarm

Max	0-99.9 mg/l, measured value equal to 20 mA output signal.
Min	0-99.9 mg/l, measured value equal to 4 mA output signal.
Hi-Alarm	0-99.9 mg/l, the value zero inactivates the alarm
Low-Alarm	0-99.9 mg/l, the value zero inactivates the alarm
Alarm Relay	"-", "#1", "#2", or "#1 and #2". Check to make sure that the relay is not being used for cleaning.

System

Type	Type of sensor, (read only)
Serial	Serial number of the sensor, (read only)
SoftW	Software version of the sensor, (read only)
Temp	Sensor temperature, (read only)
MaxTemp	The highest temperature the sensor has been exposed to, (read only)
Info	Press "ENTER" to go to "info" (read only)
MS0	SA value for zero sample
MS1	SA value for air sample
Cons 1	Calculated concentration at last air calibration
Ch1	Raw value for dissolved oxygen measurement
Ch2	Raw value for channel temperature measurement
Con	mg/l, This is what is displayed on main screen
Samp/s	Number of samples per second
Service	Not accessible for users.

11. Calibration

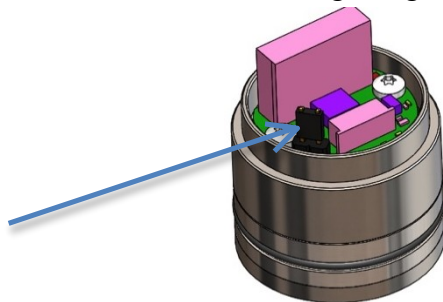
It is important that the instrument has been turned on for about 30 minutes prior to calibration so that the sensor and electronics can stabilize.

Zero Calibration



The sensor is zero calibrated at the factory, and does not need to be zero calibrated. We do however recommend to do a new zero calibration when replacing the electrode since half the job is then already done.

For Clark electrode: Remove the electrode before performing a zero calibration. Refer to “Section 8 – Changing or installing a New Electrode”.

For Optical cell: Remove the black protective cover around the new cell contact. Use the jumper to close the circuit, see fig. Plug in the cell.

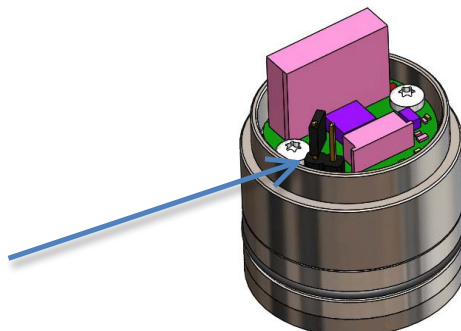


Zero calibrating a sensor:

- Select the O2X DOU sensor in the Main Menu by using the  or  buttons.
- Press ENTER for approximately five seconds to enter the Sensor Menu.
- Use the arrows to select the “Calibration” sub menu, and press ENTER.
- Select “Calibrate”. Press ENTER.
- Use the arrows to select “Zero” (three choices can be done, Air/No/Zero). Press ENTER.
- Wait for the zero calibration to finish (usually takes about ten seconds). A dialog box saying "Calibration done" will come up after successful calibration, Press Enter to return to the previous menu.



For Clark electrode: Install the electrode before performing an air calibration. Refer to “Section 8 – Changing or installing a New Electrode”. Continue with “*Air calibrating a sensor*”

For Optical cell: Disconnect the jumper again. Put the jumper on one of the pins for future usage. Mount the protective cover. Plug in the cell.



Air calibrating a sensor

The most important thing to keep in mind while performing an air calibration is to create a constant environment. The electrode/cell cartridge must be dry with no water drops on the membrane or luminophore. Fill a bucket halfway with water. Place the sensor ~1-1.5 ft above the water surface to create a humid environment and cover the bucket with a towel. If rain and/or strong winds are present, the calibration procedure could be disturbed. In this case shield the equipment so that it is protected from the rain or wind. An open plastic bag over the sensor may slow the calibration time down, but is otherwise a good way to help maintain constant conditions.

- Select the O2X DUO sensor in the Main Menu by using the  or  buttons.
- Press ENTER for approximately five seconds to enter the Sensor Menu.
- Select the “Calibration” press ENTER.
- Enter the current air pressure in mBar. It is sufficient to specify the pressure within 10 mBar (see table below for conversion from inHg to mBar).
- Select “Calibrate”. Press ENTER.
- Use the arrows to select “Air” (three choices can be made, Air/No/Zero). Press ENTER.
- Wait for the sensor to be calibrated. A successful calibration will take anywhere between 3 to 15 minutes for the sensor to stabilize. A dialog box saying "Calibration done" will come up after successful calibration. Press “Enter” to return to the calibration menu.

The following appear in the Calibration menu as read-only:

- Temp (info): Displays the current temperature of the sensor.
- Test (info): Displays the current measured dissolved oxygen value. Immediately after calibration and before the sensor is placed in the liquid, this value should closely equal the solubility value. A reading outside of an acceptable range may indicate that the electrode needs to be replaced.
- Set value: Ideal solubility value calculated using temperature and air pressure.

Air pressure conversion

It is important to enter the correct air pressure before doing an air calibration. Air pressure is measured in mBar (which is exactly the same as the SI-unit hPa).

Below is a formula and a table to convert from inHG to mBar (and thus to hPa).

InHg	mBar / hPa
29.2	990
29.3	993
29.4	997
29.5	1000
29.6	1003
29.7	1007
29.8	1010
29.9	1014
30.0	1017
30.1	1020
30.2	1024
30.3	1027
30.4	1030

$$mBar = \frac{inHg * 1000}{29.5}$$

12. Scaling

The “Scale / Alarm” menu allows the user to set the high and low limits for the 4-20mA output signal. In addition, this menu allows the user to set high and low alarms values that can be used to notify when the level has reached critical points.

Max sets the 20 mA point output

Min sets the 4 mA point output (may be a negative value for special applications)

Hi-Alarm sets the High Alarm set point, the value zero inactivates the alarm

Low-Alarm sets the Low Alarm set point, the value zero inactivates the alarm

13. Technical description

O2X DUO	P/N 11305473
Material	SIS2343 (316SS)
Dimensions	See section 13.
Weight	2,1 kg. (4.6 lbs)
Process connection	Submerged
Max Depth	10 m (33 ft.)
Max temperature	50°C (122°F)
Measuring principles	Clark electrode or Optical Cell
Cable, connection	5-pin M12-plug
Cable, length	10 m (33 ft.)
Cable, material	Hytrel
Flushing, Pressure	Clark electrode: Water 3 bar (45 psi) and filtered air 2 bar (30 psi) Optical cell: Air/water max 2 bar (30 psi)
Flushing hose, length	10 m (33 ft.)
Flushing hose, material	PE-LD
Enclosure	IP68 (NEMA 4X)

Certificate of conformity:

The O2X DUO sensors along with their central unit BB1/BB2 Control Box are in conformance with the following EC Directive(s) when installed in accordance with the installation instructions contained in the product documentation:

2014/35/EU	Low Voltage Directive, LVD
2014/30/EU	Electromagnetic Compatibility (EMC) Directive

The following standards have been applied:

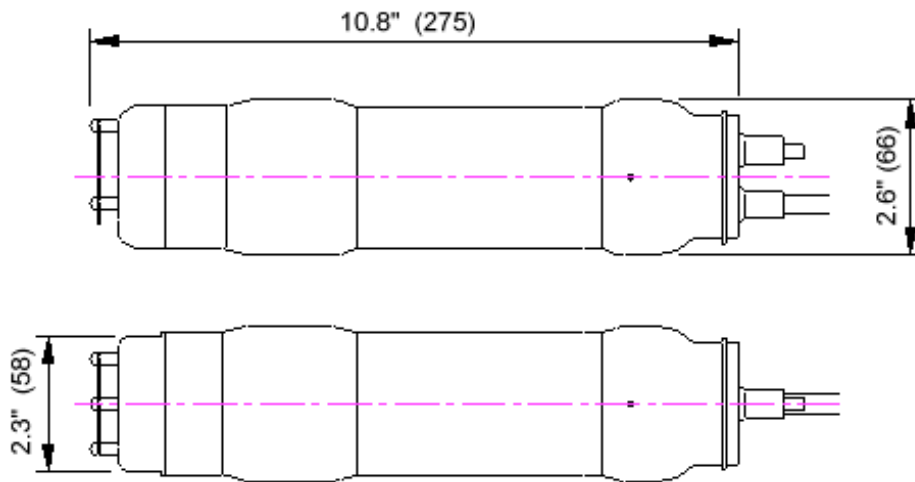
Low Voltage Directive:

SS-EN-60950 1	Edition 2:2006 Information technology equipment - Part 1: General requirements.
SS-EN-61010-1	Edition 3:2010 Electric equipment for measurement, control and laboratory use – Security – Part 1: General requirements.

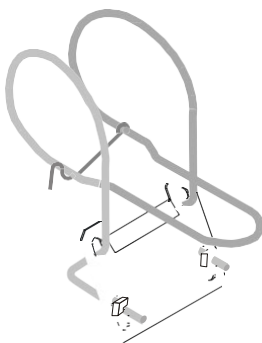
EMC Directive

- SS-EN 61000-6-2 Edition 3:2005 Electromagnetic compatibility – Part 6-2:
Generic standards – Immunity for industrial environments.
- SS-EN 61000-6-4 Edition 2:2007 Electromagnetic compatibility - Part 6-4:
Generic standards – Emission standard for industrial
environments.

14. Dimensions

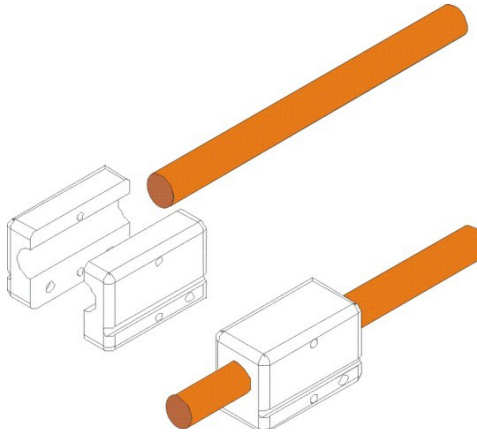
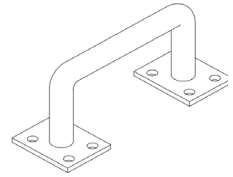


Appendix 1, Assembly of handrail mounting kit



Mount the Flexible Mounting Bracket on handrail diameter of 1 ¼” – 2” (32-50 mm) Ø or square 1 1/8” – 1 5/8” (28-42 mm). The bent lip on the mounting plate shall be on top and faced toward the liquid or tank. Adjust the Mounting Bracket to the correct angle and tighten the SS nuts. The bracket shall be fixed to the rail, and it shall not be able to move it.

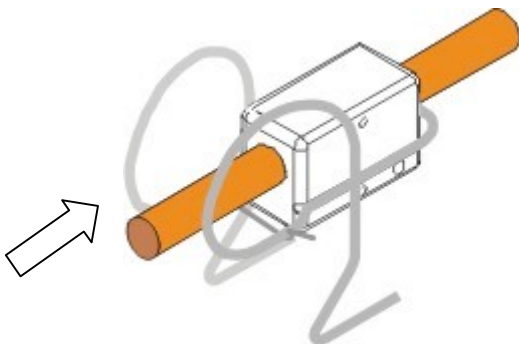
Example of a handrail when no handrail is available.



- Disassemble the plastic Rod guide and place around the telescopic rod.
- Use the SS screws on bracket to tighten the bracket to the rod.

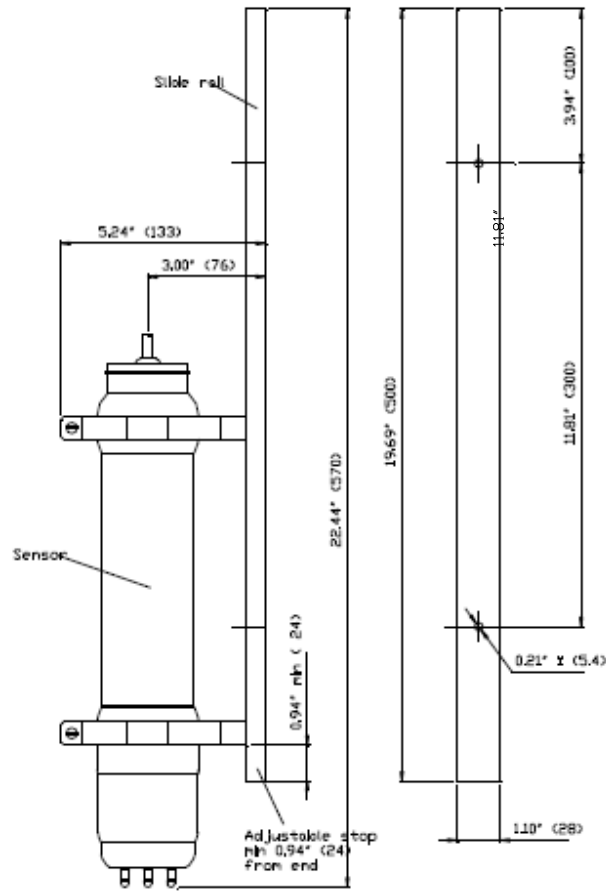


- Pull the M12 cable and flush hose through the sensor holder and rod.
- Connect the telescoping fiberglass rod to the sensor with the two piece black plastic adapter.
- The adapter halves should be tightened until snug, which will leave about 1-2 mm (1/16") gap. **NOTE!** The gap is required so the water can drain from the rod and sensor holder.
- Adjust the length of the telescopic sensor rod as necessary by twisting the 2 nuts while holding the rod.
NOTE! Do not extend the rod sections beyond the black lines. This could lead to rod damage.



- Insert the PVC bracket guide with the telescopic rod into the SS mounting bracket. Make sure that the bracket guide tracks are properly seated in the bracket.
- Fasten the safety-locking clamp.
- Check that the SS mounting bracket is safely fixed to the handrail for the spring to work the way it is intended.
- To make it easier to inspect and service the instrument, wind up a couple of meters of the cable and fasten it on the rail with attached cable tie.
- Hint on pick up: let the rod hang freely and lift it straight up before you swing it over the rail.

Appendix 2, Assembly of adjustable slide rail



Appendix 3, Support information

Before calling Cerlic support, please complete the information in this form and have it ready.


Company__ Name

_____ **Phone**

_____ **E-mail** _____

Sensor Type _____




Position / Tag

First go to the BB1/BB2 menu, it is accessed by pressing  and ENTER at the same time for five seconds. Select “System” and press ENTER.

Version____ Serial

_____ **Box temp** _____

Box heat _____

Leave the BB1/BB2 menu by pressing  and ENTER at the same time. Use  or  to select the sensor in the main display. Go to the sensor menu, it is accessed by pressing ENTER for five seconds. Select “System” and press ENTER.

Type _____

Serial _____

SoftW _____

Temp _____

Select “Info”, then press “ENTER” to go to the “info” menu.

MS0 _____


MS1 _____

Cons 1 _____

Ch1 _____

Ch2 _____

Con _____

Samp/s_____ Leave the BB2 menu by pressing  and ENTER at the same time.

Appendix 4, Setup information

This sheet can be used to document the setup values of an O2X sensor.

Sensor Type _____

Position / Tag _____

In the System sub menu of the sensor menu the following information can be collected.

Serial _____

SoftW _____

In the Settings sub menu of the sensor menu the following parameters can be set.

I-time _____ **No**

of decimals _____ **Analog** _____

Second _____

In the Cleaning sub menu of the sensor menu the following parameters can be set. **Cleaner**

Cleaning interval _____

Cleaning length _____

Cleaning freeze _____

Cleaning relay _____

In the Scale / Alarm sub menu of the sensor menu the following parameters can be set. **Max**

_____ **Min**

High-Alarm _____ **Low-**

Alarm _____

Alarm Relay _____

Leave the BB2 menu by pressing  and ENTER at the same time.