MultiFix

Manual

MultiFix

Central unit

2015-12-01

C85C5EN16

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General information

It is important to read this manual before starting to use the instrument. If MultiFix is not used as described in the manual, the lifetime of the instrument may be reduced and warranties will cease to apply.

Safety information

It is important that only authorised and trained staff use the equipment. Be sure to follow local safety procedures when taking samples beside and in basins.

Within the EU, it is prohibited to dispose of electrical and electronic waste in the rubbish. Electrical and electronic waste may contain hazardous substances, and must be sorted and left for recycling. The products concerned are marked with a crossed-out dustbin. It is important for everyone to play their part in recovering electrical and electronic waste. If this waste is not recovered in accordance with the regulations (EU Directive 2002/96/EC), both the environment and human health may be endangered.

Description of operation

The MultiFix central unit can be used with several different types of Cerlic sensors in the Multi series. Up to two sensors can be connected to the central unit via M12 contacts on the bottom of the housing. There are four 4-20 mA signal outputs and two alarm relays for connection to an external control system.

Functions for measurement

Up to two sensors included in the Multi series can be connected to a MultiFix central unit. Each sensor presents the measured value and temperature on the display on the central unit.

Unpacking

Open the instrument housing and check that no damage has occurred during transport. The instrument housing should contain the following parts, and the manual; see Figure 1

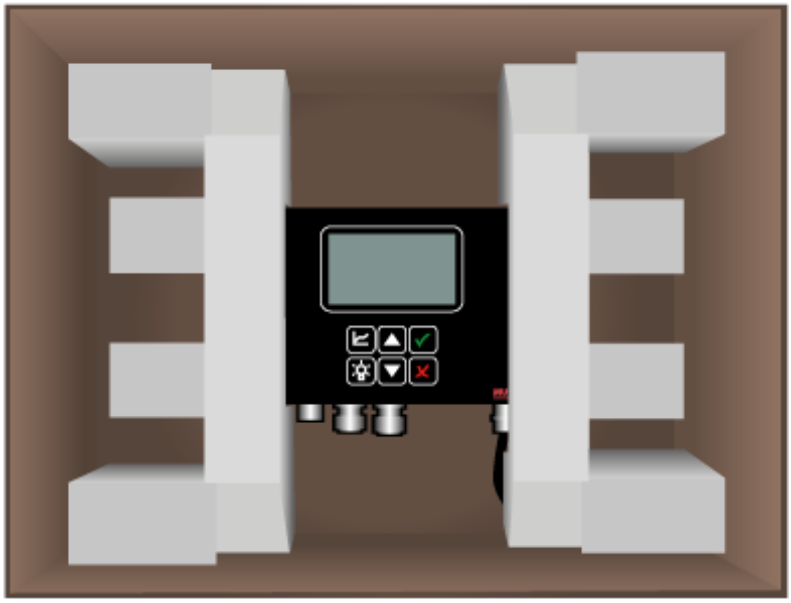


Fig. 1

Starting MultiFix

First switch on the central unit and check that it is working properly. Also check that the analogue outputs are connected correctly. At start-up without any sensors connected, the following display appears; see Figure 2.

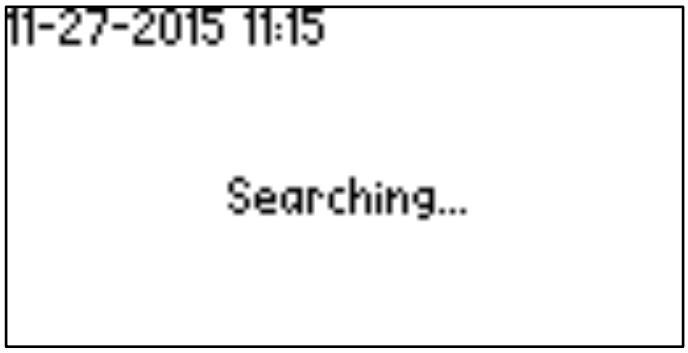


Fig. 2

Connect one sensor at a time to facilitate configuration and minimize the risk of error. When a sensor is connected, the MultiFix unit asks what position the sensor should be installed in. If a sensor has already been installed in this position, MultiFix asks whether the previous sensor should be replaced; see Fig. 3.

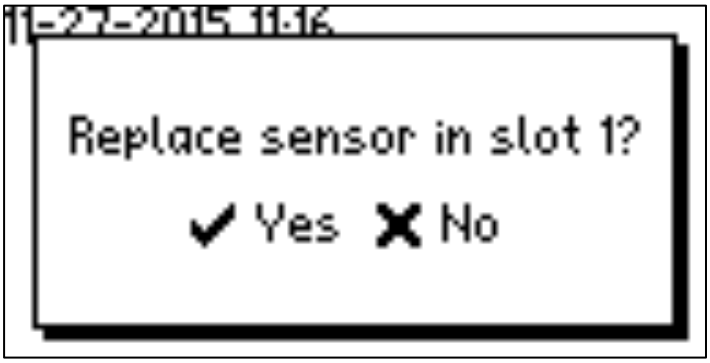


Fig. 3

The configuration of the sensors is automatically saved in the central unit. After a power outage, the unit restarts and starts measuring again as soon as the power supply has been restored. The measurements are shown as text on the display. The appearance of the display may vary according to the parameters being measured.

Handling and interfaces

The icons below represent the buttons on the keypad and describe their functions.

Opens the menu structure and confirms a selection from a menu.

Completes the present menu selection without changing any value, or goes back a step in the menu hierarchy (escape function).

Navigates up the menu hierarchy, or increases the value of the selected entry in a menu.

Navigates down the menu hierarchy, or decreases the value of the selected entry in a menu.

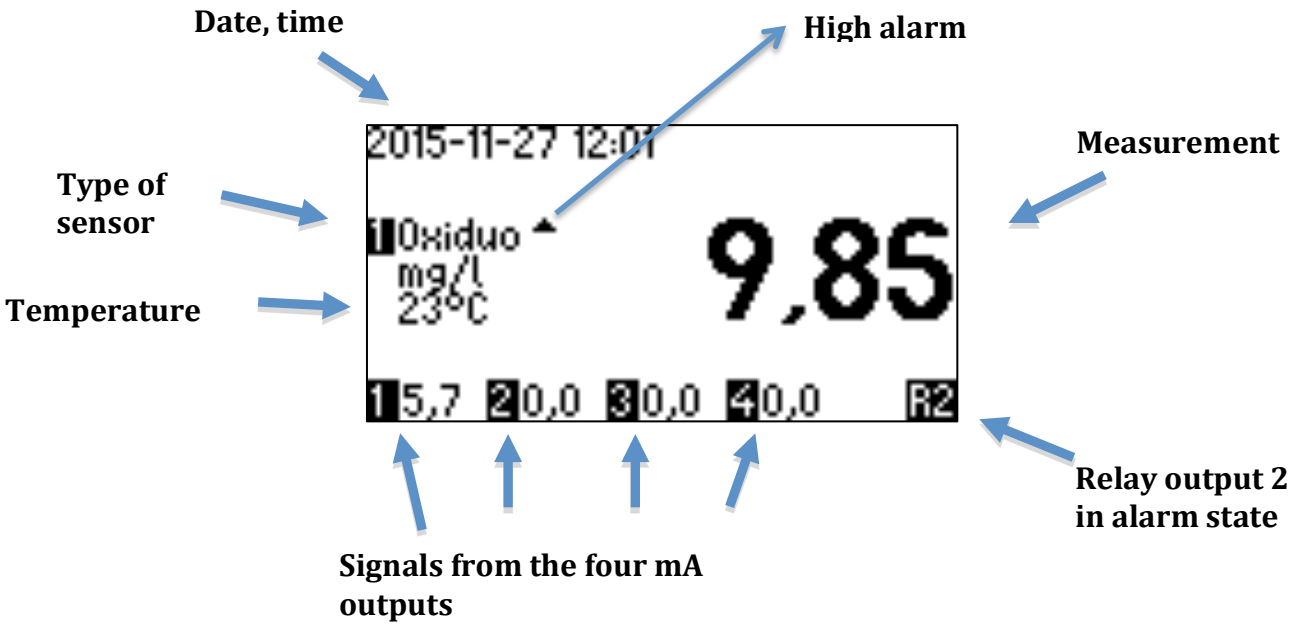
Graph button, toggles between measuring units.

Turns on backlighting of the display. The light stays on for two minutes, but the time can be adjusted under Preferences – "Light time".

Description of display

In the standard version, at start-up, the display looks like the Figure below. It shows the type of sensor, the measuring unit and the temperature on the left side of the display. The current measurement is shown on the right, and the signals from the four mA outputs can be read at the bottom. If either of the two alarm contacts is in an alarm state, this is shown on the display as "R1" or "R2" at the bottom right. General information such as time and date is always shown at the top left of the screen.

The information shown on the display will vary according to the sensor that is connected. The screenshot below is for an Oxyduo dissolved oxygen sensor.



Main menu

Press ✔ to open the main menu. See Fig. 5.

Use ▲ or ▼ to reach the right sub-menu and open this with ✔.

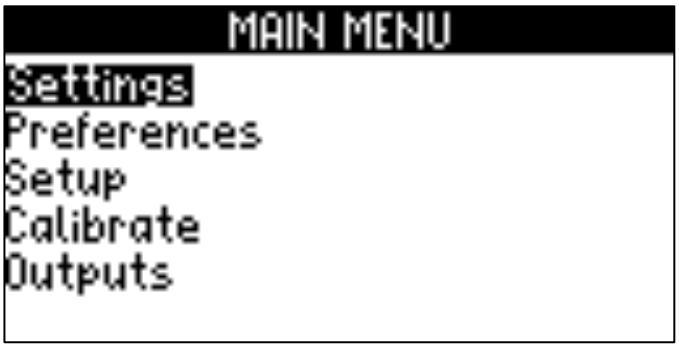


Fig. 5

Settings

Under SETTINGS in the menu (Fig. 5), you can configure alarm limits for the two relays in the central unit. In the menu, the alarm limits are called “Threshold 1” and “Threshold 2”. The relays are independent of each other and can be used as Min and Max alarms, for example. The settings depend on the sensor that is connected. The screenshot below shows an example of a lower alarm limit and an upper alarm limit for a sensor. (Fig. 6) These settings are needed for controlling the relays.

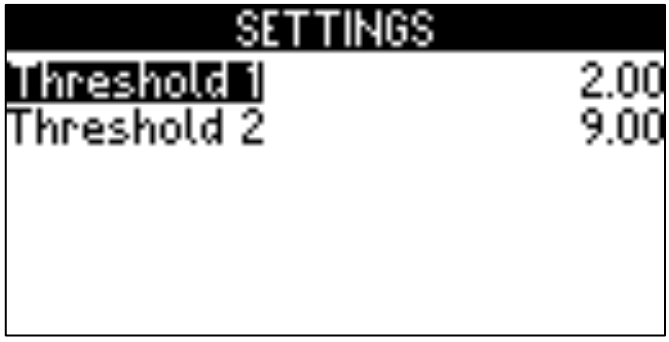


Fig. 6

Preferences

In the Preferences menu (Fig. 7) you can select the light time in minutes for backlighting of the display with a single keystroke.

Fig. 7

Setup

The Setup menu (Fig. 8) is used to select the language, date format, temperature units and units for displaying the measurement.

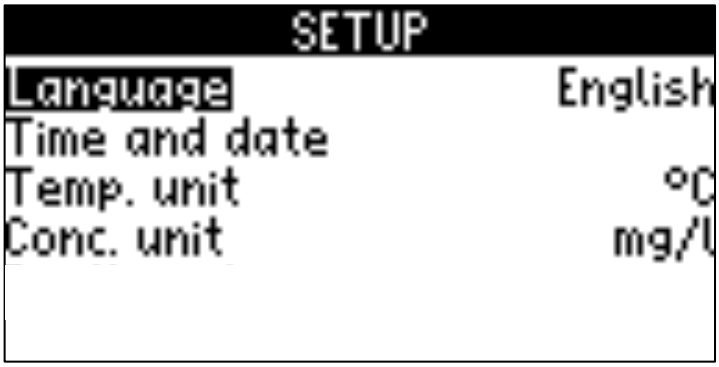


Fig. 8

Language

The following languages are installed on the instrument: Swedish, English, German and French. To change the language, proceed as follows:

Press ✔ to open the menu. Step down with ▼ and select “SETUP” using ✔. Select “Language” and confirm with ✔. Step up in the menu using ▲ or down using ▼ until your desired language is shown and confirm with ✔. Then back out of the menu with ✘ until it closes.

Time and date

To set the time and date:

Press ✔ to open the menu, Fig. 12. Step down in the menu with ▼ and select “SETUP” using ✔. Step down with ▼ and select “Time and Date”. Confirm with ✔. Step up with ▲ or down with ▼ until the right time and date format is selected. Step up with ▲ or down with ▼ and enter today's date and the current time. Confirm and step further through the menu with ✔. If all settings are complete, back out of the menu with ✘ until the menu closes.

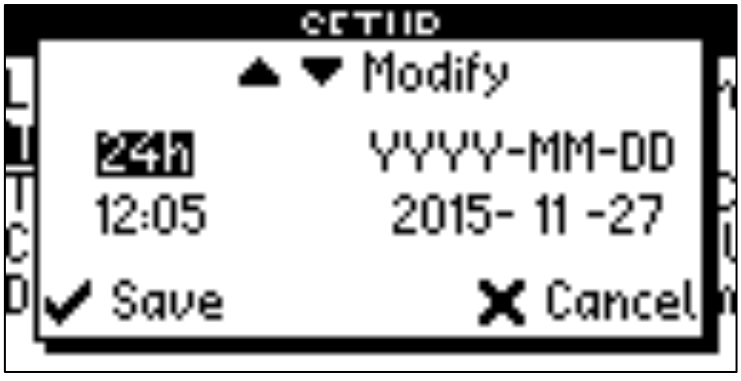


Fig. 12

Temperature units

The following temperature units are available: °C, °F, or °K.

Press ✔ to open the menu. Step down with ▼ and select “Setup” using ✔. Step down in the menu with ▼. Select “Temp. unit” and confirm your selection with ✔. Step up with ▲ or down with ▼ and select the desired unit (C, F, K). Confirm with ✔. If all settings are complete, back out of the menu with ✖ until the menu closes.

Measuring units (concentration)

The following units are available to display the measurements: g/l, mg/l, %, and ppm.

Press ✔ to open the menu. Step down with ▼ and select “Setup” using ✔. Step down in the menu with ▼ and select “Conc. unit”. Confirm with ✔. Step up with ▲ or down with ▼ and select the desired unit (g/l, mg/l, %, ppm). Confirm with ✔. If all settings are complete, back out of the menu with ✖ until the menu closes.

Outputs

The output menu can be used to configure connected sensors. There are four 4-20 mA signal outputs available in total. Normally, two outputs are used per sensor, one for the measurement and one for the temperature. (Fig. 9).

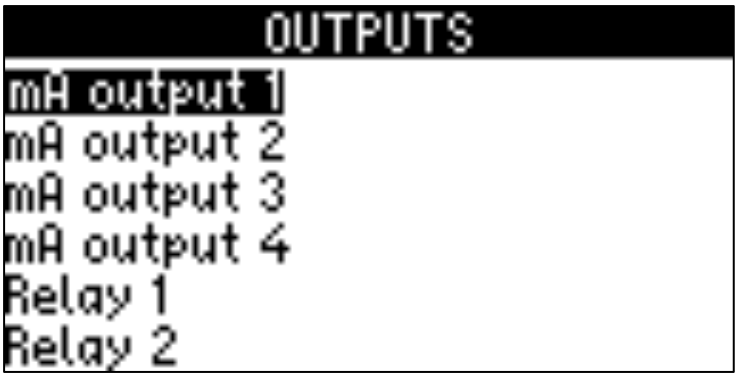


Fig. 9

4-20 mA outputs

When “mA output 1” is selected, the following display text is shown “Source sensor”. Select the type of sensor that should be linked to this analogue signal output. “Parameter” is used to select whether the output signal should relate to the measurement or the temperature. Under “Scaling 4 mA” and “Scaling 20 mA” you can set the Min and Max values for the measuring range in correspondence to the output signal. Outputs 2-4 are configured in the same way. The values for “Calibration 4 mA” and “Calibration 20 mA” must not be changed.

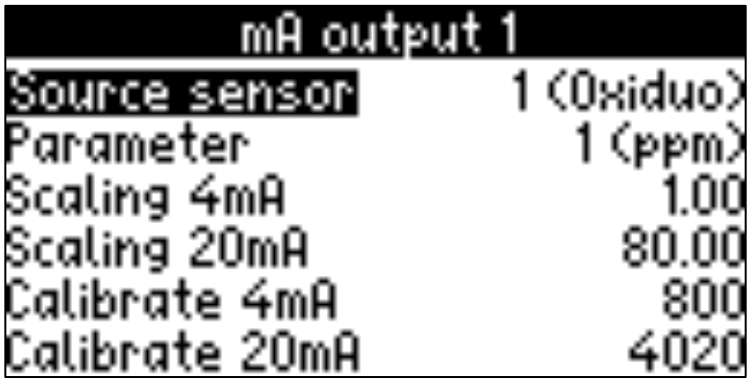


Fig. 10

Active or passive output

Above the terminal block for the output signals is a small jumper that can be switched between the “active” and “passive” signal outputs.

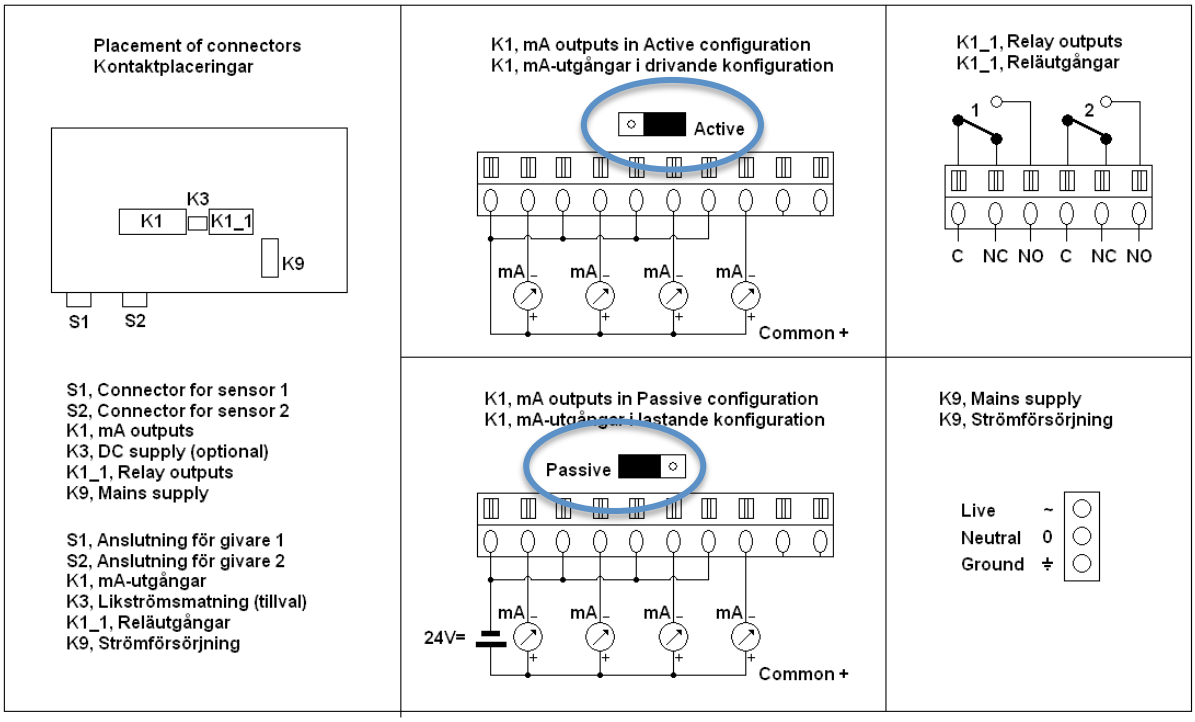


Fig. 15

Relay outputs

The two relay outputs can be configured for Max or Min alarms for one sensor or for several sensors at the same time. Min and Max values are linked to the alarm limits (thresholds) set for the different sensors. The relays (with changeover contacts) open or close (depending on the connection) when the measurement exceeds or drops below an alarm limit. (Fig. 11)

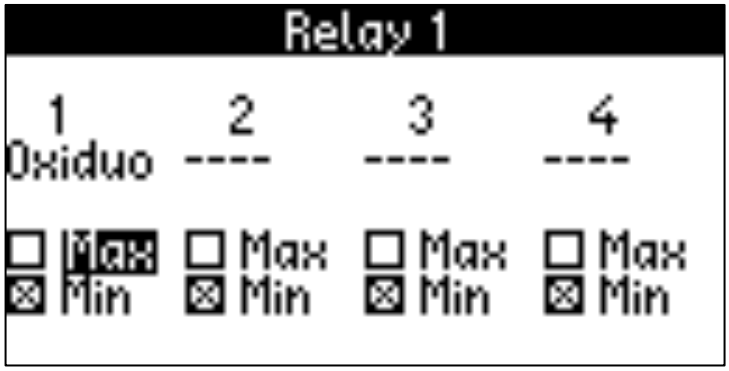


Fig. 11

Maintenance

The instrument is designed for minimum maintenance. The instrument housing is IP54 (NEMA3). The sensor cable is specially made in PUR™ with a strong shield and extra strands for long life. The sensor and the cable clamps are of the MatchClamp™ type to guarantee no leaky contacts or distorted cables.

Troubleshooting

Screen on the central unit is blank
- Check the fuses in and to the central unit and that the unit has a power supply.

No measurement or sensor found on the central unit
- Check that the sensors are connected correctly by the M12 contact.

If the instrument shows divergent values, it should be re-calibrated.
See section on Calibration under the relevant sensor for instructions.

If an error occurs that cannot be rectified by troubleshooting or calibration, contact Cerlic Controls for further information.

Contact Cerlic Controls AB before returning the instrument and fill in the service form on our website (www.cerlic.se) to simplify processing.

Contact information

The correct return address can always be obtained from the Cerlic website.
www.cerlic.se

Europe
Cerlic Controls AB
Mälarvägen 3, 141 71 SEGELTORP
Tel.: 08-50 169 400, E-mail: info@cerlic.com
Postal address: P.O. Box 5084, 141 05 KUNGENS KURVA
Internet: www.cerlic.com

US & Canada
Cerlic Environmental Controls, Inc.
200 Burdette Road
Atlanta, GA 30327
Tel.: 404-256-3097

Warranty

All instruments from Cerlic Controls AB are thoroughly checked and tested before delivery. Cerlic offers a warranty and will repair the instrument if it is found that the problem is traceable to our production or equipment. The warranty applies within a specified period

Technical specification, MultiFix

Number of sensor connections	Two
Measuring units	g/l, mg/l, %, ppm
Display	Graphical, 128 x 64 pixels, LCD
Backlighting	Yes, and time adjustment for summertime
Languages	Swedish, English, German, French
mA 4-20 outputs	4
RS232 outputs	1
Relay outputs	2
Supply voltage	110/220/240 VAC 50-60 Hz 12-24 VDC optional
Material, housing	Aluminium
Temperature range	-10 - +50°C
Keypad	6 membrane keys
Weight, Multifix central unit	1.5 kg
Weight of sensor	0.5 kg each
Dimensions, Multifix central unit	200x110x60 mm (W x H x D)
IP class	IP54 (NEMA 3)

Appendix 1, Oxyduo (Dissolved Oxygen Sensor)

Oxyduo
Dissolved Oxygen Sensor
for liquids

Description of function

Oxyduo has been developed to constantly measure the oxygen level in the treatment plant like aeration basins, waterworks, groundwater, lakes etc. The measurement is shown in text form on the central unit display and presented externally via a 4-20 mA output signal.

Measuring cells

The sensor is fitted with an electro-chemical Clark electrode. The sensor body contains electronics and mechanical parts that must not be subjected to impact. In the event of damage to the sensor body, water may penetrate and damage the optics/electronics. There is no way of replacing components; see “Maintenance” for more information.

Configuration

See section describing the MultiFix central unit.

Maintenance

The Oxyduo is designed for minimum maintenance. All metal parts are acid-resistant stainless steel (SS 2343/SS316). The sensor cable is specially made in PUR™ with a strong shield and extra strands for long life. The sensor and the cable clamps are of the MatchClamp™ type to guarantee a watertight sensor.

Inspection of the sensor

The sensor head should be cleaned if a deposit has accumulated on the cell. If not, it could affect the measurements. Use water and a soft sponge. To verify that the measuring cell is working properly, an air calibration can be performed. See section on “Calibration”.

Troubleshooting

In the event of malfunctions that cannot be fixed by calibration, contact Cerlic for further information. Contact Cerlic Controls AB before returning the instrument and fill in the service form on our website (www.cerlic.se) to simplify processing.

Calibration

The electro-chemical measuring cell (Clark electrode) is supplied fitted in the sensor. Two point calibration (Zero & air) has been performed in factory.
The procedure, described below, can be used to check the functioning of the measuring cell.

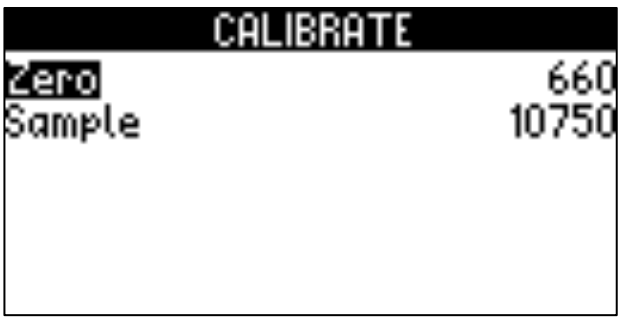


Fig. 13

Zeroing

Disconnect the electrode from the sensor.

Press  to open the menu and step down using  . Select “Calibration” using  . Step down with  and select “Zero”. Confirm with  . Wait until stable values are shown and confirm with  . When the zeroing is complete, back out of the menu with  all the way to the main menu and the measurement display.

Air calibration

Press  to open the menu and step down using  . Select “Calibration” using  . Step down with  and select “Sample”. Confirm with  . Hold the sensor vertical in the air (best result in high humidity air) and wait until the temperature reading is stable. Confirm with  . When air calibration is complete, back out of the menu with  all the way to the main menu and the measurement display.

Specification, Oxyduo

Parameter	Dissolved oxygen concentration
Measuring principle	Electro-chemical, Clark
Measuring range	0 to 20 mg/l (ppm)
Accuracy	1% FS (full scale)
Repeatability	< 2% of measured value
Type of measurement	Continuous
Measuring units	g/l, mg/l, ppm
Max. depth	10m
Temperature range - sample	0 – +50°C
Sensor body	Stainless steel
Cable	PUR, shielded
Cable clamp	MatchClamp™
Weight, sensor	450 g
Dimensions, sensor body	145mm x 32 mm Ø
Cable length	4 m, 8 m, or 12 m
IP class, sensor body	IP68 (NEMA 7)

Appendix 2, Solido (Suspended Solids Sensor)

Solido
Suspended Solids Sensor

Description of function
Solido is an optical suspended solids sensor developed to measure the suspended solid in basins and tanks in purification plants and outdoor waterworks with sludge concentrations up to 35,000 mg/l depending on the type of sludge.

Sensor
The sensor body contains optics and electronics that must not be subjected to mechanical impact. In the event of damage to the sensor body, water may penetrate and damage the optics/electronics. See section on “Maintenance” for more information.

Configuration
See section describing the MultiFix central unit.

Maintenance
Solido is designed for minimum maintenance. All metal parts are acid-resistant stainless steel (SS 2343/SS316). The sensor cable is specially made in PUR™ with a strong shield and extra strands for long life. The sensor and the cable clamps are of the MatchClamp™ type to guarantee a watertight sensor.

Inspection of the sensor
The sensor should be cleaned if a deposit has accumulated on the lenses in the measuring gap. To check whether cleaning is needed, the sensor should be dipped in clean de-aerated water. The measurement on the display should not differ by more than ±10mg/l from zero. If the measured result differ by more, the sensor should be cleaned.

Strong accumulated dirt:
Clean by dipping the sensor into a weak acid solution, about 3 % hydrochloric acid in water, for 10-15 minutes. (Just water and a sponge will not normally be enough). After cleaning, perform a further check in clean de-aerated water.

In case of lighter dirt, it may be sufficient to clean the sensor carefully with a sponge and water with some dish soap.

Rinse the sensor with clean water.

Make sure that the lenses are not scratched.

If the measurement still differs from zero, a zero calibration should be performed in the clean de-aerated water. See section on “Calibration”.

Troubleshooting
In the event of malfunctions that cannot be fixed by calibration, contact Cerlic for further information. Contact Cerlic Controls AB before returning the instrument and fill in the service form on our website (www.cerlic.se) to simplify processing.

Calibration

The sensor is factory-calibrated before delivery. After commissioning, we recommend calibrating the sensor once more, but this time in the relevant sludge.

Calibration with sludge

Press ✔ to open the menu and step down using ▼. Select “Calibration” using ✔. Step down with ▼ and select “Sample”. Dip the sensor in a sludge sample and stir the sample gently with the sensor to prevent sedimentation, confirm with ✔. When the calibration is complete, back out of the menu with ✘ all the way to the main menu and the measurement display.

Fig. 14

Lab test

Run a lab analysis on the sludge sample and determine the correct sludge concentration. Press ✔ to open the menu and step down using ▼. Then select “Calibration” with ✔. Step down with ▼ and select “Lab. test”. Confirm with ✔. Change the old value to the new one, obtained from the lab analysis, using ▲ or ▼. Confirm with ✔. Press ✘ all the way to the main menu and the measurement display.

Zeroing

The zeroing carried out at the factory does not need to be repeated and normally should not be. If the sensor does not show zero in completely clean de-aerated water despite cleaning in a weak acid solution, zeroing can be carried out according to the procedure below.

Press ✔ to open the menu and step down using ▼. Select “Calibration” using ✔. Step down with ▼ and select “Zero”. Confirm with ✔. Dip the sensor into clean water and confirm with ✔. When the zeroing is complete, back out of the menu with ✘ all the way to the main menu and the measurement display.

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Specification, Solido

Parameter	Suspended Solids
Measuring principle	Optical, transmission
Wavelength	NIR 850 nm
Measuring range	Up to 35,000 mg/l (ppm) depending on sludge type
Accuracy, sludge	1% FS (full scale)
Repeatability	< 2% of measured value
Type of measurement	Continuous
Measuring units	g/l, mg/l, %, ppm
Max. depth	19m
Temperature range - sample	0 – +50°C
Sensor body	Stainless steel, BK7 glass
Cable	PUR, shielded
Cable clamp	MatchClamp™
Weight, sensor	450g
Dimensions, sensor body	145mm x 32 mm Ø
Cable length	4 m, 8 m, 12 m, 20 m
IP class, sensor body	IP68 (NEMA 7)