



MULTI FUNCTION ANALYSERS MFA-REDOX

FOR MEASUREMENT OF REDOX POTENTIAL

TECHNICAL INFORMATION

The new **MFA** Multi Function Analysers are a modern generation of hardware for measuring and control applications in water treatment processes. This latest development is the result of experience and cooperation within the worldwide **Wallace & Tiernan** Group which has produced a powerful electronic system which ensures precise measurement and stable control. Applications range from simple process measurement through to demanding closed-loop control processes for the treatment of swimming pool, drinking and process water as well as waste water. The totally new development of the **MFA-Redox** module is designed for connection to redox electrodes.



ADVANTAGES

- Modular, user-friendly micro-processor technology with interactive menu assistance
- Isolated signal inputs and outputs
- User-selectable measuring ranges
- Measurement and calibration in accordance with DIN 19408 Part 6
- Digital input for enabling additional functions
- Automatic fault detection and monitoring of measuring cell
- Luminescent display with adjustable display contrast
- Plain-text menu assistance in a choice of 5 languages
- User-adjustable limit contacts
- RS485 interface
- CE Mark (89/336/EEC)
- Diagnostics menu to assist maintenance and installation

METHOD OF OPERATION

Sample water is taken from the process water flow and fed to the redox combined measuring and reference electrode through a sample water pipe. This electrode is housed either in a flow-through fitting or directly in the top of the **DEPOLOX® 4** measuring cell.

The combined electrode silver/silver chloride (Ag/AgCl) delivers a voltage signal equivalent to the measured value to the **MFA** module via a coaxial cable.

The theoretical redox potential (referred to the standard hydrogen electrode) consists of the measured value + reference voltage:

$$U_H = U_G + U_B$$

The **MFA** module measures and displays the value U_G referred to Ag/AgCl. The reference voltage U_B for Ag/AgCl/Cl⁻ in 3 mol KCl is 207 mV at 25 °C.

The actual **MFA** module is used to display and process the measurement data, e.g. for limit value monitoring.

Optionally, the **MFA** module can also display the sample water temperature as well as the redox measurement. This requires the connection of a temperature sensor. Pt100 and NTC or AD592 sensors can be connected as required.

Up to four limit values can be monitored. Limit contact settings and all operating procedures are straightforward thanks to plain-language menu prompting.

The **MFA** module has an integral RS485 interface which supports data exchange with programmable-controller systems or control rooms. In addition, the special interface module **MF485** allows direct output to a printer as line graphics.

APPLICATIONS

The Redox potential is defined in DIN 38404 Part 6: „The redox potential is caused by oxidising or reductive substances dissolved in the water...“. Generally speaking, unwanted substances in the water can be regarded as reductive substances. Oxidising substances include disinfectants, among others Cl₂, ClO₂, O₃.

The relationship between the redox potential and the power of the disinfectant in water is as follows: The higher the redox potential, the shorter the sterilisation time.

For example, the sterilisation time for E. Coli in fresh water is roughly 3 hours with a redox potential of approximately 550 mV as opposed to 30 seconds with a redox potential of 750 mV.

According to DIN 19643, this measurement must be made in swimming pool water by a permanently installed measuring and recording system. Recording the redox potential makes it possible to track the contamination of the water at specific times. Measurement of the redox potential also yields important evidence concerning the overall operation of treatment plants.

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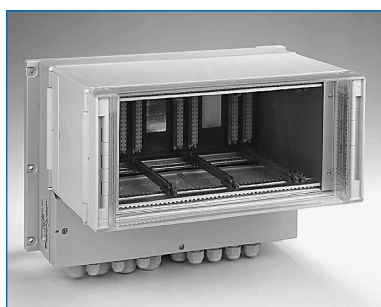
a U.S. Filter Company

Wallace & Tiernan GmbH
Postfach 1563, D-89305 Günzburg, GERMANY
Street address: Auf der Weide 10,
D-89312 Günzburg, GERMANY
Tel.: (49) 8221-9040, Fax: (49) 8221-904203

TECHNICAL INFORMATION



MFA Housing with MFA-Cl₂, MFA-pH, MFA-Redox Analysers and MF485 Interface Module



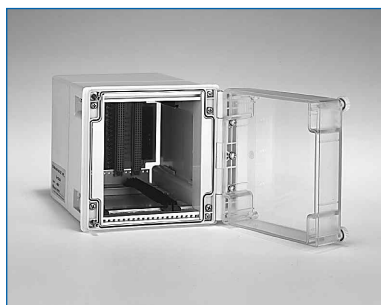
Triple Wall-Mounted Housing

Dimensions (W x H x D): 360 x 266 x 235 mm
 Weight: 2.8 kg
 Type of protection: IP 66



Triple Housing for Panel-Mounting

Dimensions (W x H x D): 288 x 144 x 195 mm
 Weight: 1.7 kg
 Type of protection: IP 41 (IP 65 with cover)



Single Housing for Panel-Mounting

Dimensions (W x H x D): 144 x 144 x 195 mm
 Weight: 1.2 kg
 Type of protection: IP 41 (IP 65 with cover)

MFA for continuous redox potential measurement to be connected to a combined measuring and reference electrode based on a silver/silver chloride (Ag/AgCl/Cl⁻) electrode in a 3 mol KCl solution (electrolyte gel). Equipped with up to four limit contacts and an input for an enabling signal as standard; optionally available with temperature measurement.

Measuring Range:

User-adjustable, limits -1000 to +1000 mV, factory setting 400 to 900 mV
 Display flashes if measuring range is exceeded or undershot.

Measurement Input:

-1000 mV to +1000 mV
 max. adjustment: ± 50 mV
 Isolated, up to 100 V relative to earth

Optional Temperature Input:

For temperature display Pt100 and NTC or AD592 sensors.

Isolated, up to 100 V relative to earth

Switching Input:

(e.g. for external enabling)
 Selectable input 24 V, 115 V, 230 V AC or DC
 Isolated, up to 500 V relative to earth

Analogue Output (0/4 to 20 mA):

Output load ≤ 600 A, accuracy ± 0.1% FS
 Isolated, up to 500 V relative to earth

Switching Outputs:

For up to four limit contacts
 max. 1250 VA to 250 V AC
 max. 150 W to 220 V DC

Interface:

RS485, asynchronous, complying with EIA RS485, DIN 66259 Pt 4 and ISO 8482, 19200 baud, non-isolated

Mains Voltage:

115/230 V ± 10%, 50-60 Hz, 14 VA
 24 V DC according to EN 61131-2

Module Dimensions (W x H x D):

76 x 129 x 175 mm (including contact strip)

Weight (Including Packaging):

1.8 kg