



MULTI FUNCTION ANALYSERS MFA-NTU

FOR THE MEASUREMENT OF TURBIDITY

TECHNICAL INFORMATION

The new Multi Function Analysers **MFA-NTU** are a modern generation of hardware for measurement and control applications in water treatment processes. This development is the result of experience and cooperation within the worldwide **USF Wallace & Tiernan** Group which has produced a powerful electronic system ensuring precise measurement. The on-line turbidity meter provides a simple and efficient method for monitoring potable water. The new development of the **MFA-NTU** module is completely pre-assembled and pre-wired on a common panel.



ADVANTAGES

- High accuracy
- Maximum reproducibility
- Selectable measuring ranges
- Stepless adjustable range
- Short response time
- Modern, user-friendly micro-processor technology with interactive menu assistance
- Isolated signal inputs and outputs
- Modular construction
- Luminescent display with adjustable display contrast
- Plain-text menu assistance with 5 selectable languages
- User-adjustable limit contacts
- Direct logging by printer
- RS485 interface
- CE Mark (89/336/EWG)

INTRODUCTION

Turbidity measurement is an analysing method ensuring a quick check of the amount of particulate matter in a fluid. Due to their uncomplicated design turbidity meters are excellent instruments for the continuous monitoring of the performance of water treatment plants.

Turbidity of a fluid is caused by undissolved substances such as inorganic or organic particles, colloids or gas bubbles. If light strikes such particles, the beam of light is reflected or refracted, and a small amount of the light is scattered in the fluid. The intensity of the light scattered is determined by the amount and the properties (size, shape, colour) of these particles. Measurement of the turbidity is based on the evaluation of the intensity of the scattered light.

The measurement value depends on the wave length of the light used and the geometry of the measuring instruments (angle of measurement).

In order to establish an international standard of turbidity, these parameters are defined in the DIN standards EN 27027 and the equivalent standard ISO 7027. Light of a defined wave length is measured at an angle of 90 °C.

For turbidity measurements in clear water (low turbidity level) light having a wave length of 550 nm and a band width of 30 nm produces a high intensity of scattered light and provides a more stable display.

THEORY OF OPERATION

The **MFA-NTU** system is specifically designed to monitor turbidity in process water. The instrument consists of the **MFA-NTU** module and the MICRO 200 BW sensor. Both components are pre-assembled on a panel and can easily be integrated into existing process lines.

The turbidity sensor Micro 200 BW operates on the proven through-flow principle. A sample of the fluid to be analysed is passed over the NTU through-flow sensor through the turbidity meter body. A tungsten lamp having a defined colour temperature generates a beam of light which is passed through the sample. This light is measured by two sensors arranged at an angle of 90° and the resulting signal is conditioned by an integral electronic circuit and transmitted to the **MFA-NTU** module. Apart from easy maintenance the sensor also provides quick and simple calibration.

The **MFA-NTU** module is used to display the measurement data and to perform functions such as limit-value monitoring.

Up to four limit values can be monitored. The adjustment of the limit contacts as well as all other operating steps can easily be performed using the plain-language menu assistance.

A RS485 interface is integrated into the MFA module for data exchange with PLC systems or control rooms. In addition, a printer with RS422 interface can be connected for direct data recording as line graphics.

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TECHNICAL DATA

MFA-NTU MODULE

Measuring Ranges:

Range 1
0...10 NTU, resolution 0.001 NTU
Range 2
0...100 NTU, resolution 0.01 NTU

Accuracy:

0...40 NTU, 2% of FS
40...100 NTU, 5% of FS

Repeat accuracy:

1%

Linearity:

1%

Analogue Output:

0/4...20 mA
Isolated up to 500 V with respect to earth,
output load $\leq 600 \Omega$, accuracy $\pm 0.1\%$ of FS,
temperature drift 0.1% / 10 K

Ambient Temperature:

0°C ... 50°C (not condensed)
Storage -20°C ... 70°C

Switching Outputs:

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

Electrode Input:

for turbidity sensor Micro 200 BW, isolated up to 100 V with
respect to earth

Digital Input:

Function selectable in menu (for example sample flow
monitoring), isolated up to 500 V with respect to earth

Interface:

RS485 asynchronous, complying with EIA RS485,
DIIN 66259 T4 or ISO 8482, 19200 baud, non-isolated

Power supply:

115/230 V $\pm 10\%$, 50...60 Hz, 14 VA

MICRO 200 BW TURBIDITY SENSOR

Measuring Principle:

90° scattered light process
Wave length 550 nm, bandwidth 30 nm,
complying with DIN EN ISO 7027 (Sept. '98),
measurement at very low turbidity levels complies
with or exceeds EPA method 180.1

Measuring Ranges:

0...10.000 NTU and 0...100.00 NTU
– for potable water only –

Accuracy:

refer to MFA-NTU module

Temperature Range:

use 0°C ... 50°C
storage -20°C ... 60°C

Maximum Operating Pressure:

4 bar g

Sample Pressure:

min. 1 bar g without back pressure
min. 1 bar g above back pressure

Sample Flow:

50 \pm 10 l/h (flow control valve is installed)

COMPLETE SYSTEM

Dimensions (W x H x D):

570 x 360 x 270 mm

Weight (including packing):

9 kg

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