



# MULTI FUNCTION ANALYSERS MFA-TEMPERATURE

FOR THE MEASUREMENT OF TEMPERATURE

## TECHNICAL INFORMATION

The new Multi Function Analysers **MFA** are a modern generation of hardware for measurement and control applications in water treatment processes. This latest 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 and stable control. Applications range from simple measurement through to demanding closed-loop control processes for the treatment of potable and pool water as well as process water. The totally new development of the **MFA** modules are designed for connection to the **USF Wallace & Tiernan** DEPOLOX® 4 analyser with integral temperature sensor or to a thermometer to DIN 43760 with resistor Pt100.



## ADVANTAGES

- Compatible with all commercial Pt100 sensors
- Automatic compensation of the cable length by 3-wire sensor connection
- User-selectable measuring ranges from -30°C to +120°C
- Selectable measuring range °C and °F
- Modern, user-friendly microprocessor 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
- RS485-interface
- CE mark (89/336/EEC)

## APPLICATION

The microprocessor based temperature measurement unit is used in potable and pool water applications, it can also be employed for monitoring and controlling process water treatment systems. A thermometer to DIN 43760 with integrated resistor Pt100 is used to measure the temperature.

Depending on the type of application, different models with a range of protective pipes and temperature ranges are required. The temperature sensors may be installed either in-line, or in a flow-through fitting, or directly into the top of the DEPOLOX® 4 measuring cell.

The temperature amplifier can be directly connected to a three-wire Pt100 sensor with automatic compensation of the cable length.

Temperature characteristics to IEC 751 (DIN 43760) for Pt100 temperature sensors

Temperature (in °C)	Resistance (in Ohms)
- 50.00	080.31
- 40.00	084.27
- 30.00	088.22
- 20.00	092.16
- 10.00	096.09
0.00	100.00
10.00	103.90
20.00	107.79
30.00	111.67
40.00	115.54
50.00	119.40
100.00	138.50
150.00	157.31
200.00	175.84
250.00	194.07

## METHOD OF OPERATION

The measuring principle of the thermometer is based on the change of resistance in metallic wires proportional to temperature. A Pt100 sensor consists of platinum wires whose electrical resistance represents exactly a corresponding temperature, for example at 0 °C the resistance is precisely 100 Ohms ± 0.12 %.

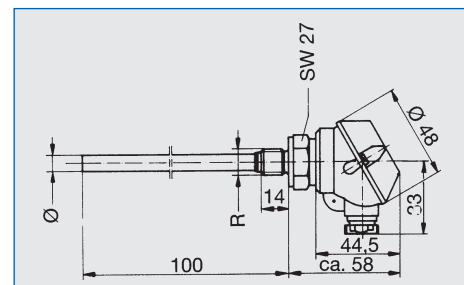
With increasing temperatures the resistance increases in accordance with a characteristic curve to DIN 43760. By the **MFA** electronics this curve is automatically linearised by compensation.

**Due to these standardised basic values no re-calibration of the MFA module is required when a Pt100 thermometer is exchanged.**

**Example for Pt100 model:**

Screw-mounted thermometer with lead sealed head, form J 20, connection R 1/2"

Protective pipe: st. steel 1.4571  
Length of sensor: 100 mm  
Shaft diameter: Ø 7 mm



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# TECHNICAL DATA

## MFA MODULE FOR TEMPERATURE MEASUREMENT

### Measuring Range:

-30 °C ... +120 °C

Max. range (Delta): 150 °C

Min. range (Delta): 30 °C

Selectable ranges °C and °F

Display flashes if measuring range is exceeded or undershot.

### Accuracy:

≤ 0.5 % of FS

### Analogue Output:

0/4 ... 20 mA

Isolated up to 500 V with respect to earth.

Output load ≤ 600 Ohm,

accuracy ± 0.1 % of FS,

Temperature drift 0.1 % / 10 K

### Ambient Temperature:

0 °C ... 50 °C (non-condensing)

Storage -20 °C ... 70 °C

### Switching Outputs:

For up to four limit contacts or optional two limit contacts

and two control contacts (mixer, 2-point or 3-point

PI controller, continuous 2-point or 3-point controller)

max. 1250 VA to 250 V AC

max. 150 W to 220 V DC

### Digital Input:

(for example for sample monitoring)

Selectable inputs 24 V, 115 V, 230 V AC or own supply for unpowered contacts

### Interface:

RS485 asynchronous, to EIA RS485,

DIN 66259 T4 or ISO 8482

19.2 K baud, non-isolated

### Power Supply:

115/230V ± 10 %, 50 - 60 Hz, 14 VA

24 V DC to EN 61131-2

### Module Dimensions (W x H x D):

76 x 129 x 175 mm (incl. terminal strip)

### Weight (incl. packing):

1.8 kg

## PT100 TEMPERATURE SENSOR

### Sensor:

Pt100 sensor with characteristics

to IEC 751 (DIN 43760)

### Measuring Principle:

3-wire resistance measurement incl. compensation of cable length

### Material:

st. steel 1.4571 (similar SS 316),

ceramic; glass; Duran

### Sensor Types:

Screw-mounted Duran sensor with PG 13.5

cable connector, head suitable for flow-through fitting or

direct installation in DEPOLOX® 4 cell cover,

pressureless or pressurised type available.

## MFA-HOUSINGS

MFA modules are presently available for Cl<sub>2</sub>, ClO<sub>2</sub>, O<sub>2</sub>, O<sub>3</sub>, KMnO<sub>4</sub>, pH, Redox, conductivity, temperature, fluoride.

All MFA modules can be freely combined with each other.

### Triple Wall-Mounted Housing

Dimensions (W x H x D): 360 x 266 x 235 mm

Weight: 2.8 kg

Enclosure: IP 66

### Triple Housing for Panel-Mounting

Dimensions (W x H x D): 288 x 144 x 195 mm

Weight: 1.7 kg

Enclosure: IP 41 (IP 65 with cover)

### Single Wall-Mounted Housing

Dimensions (W x H x D): 210 x 266 x 235 mm

Weight: 1.5 kg

Enclosure: IP 66

### Single Housing for Panel-Mounting

Dimensions (W x H x D): 144 x 144 x 195 mm

Weight: 1.2 kg

Enclosure: IP 41 (IP 65 with cover)

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