



# PermaTest Scan

MEASUREMENT ANALYZER FOR  $\text{MnO}_4^-$



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# PermaTest Scan

## MEASUREMENT ANALYZER FOR $\text{MnO}_4^-$

**PermaTest** is a compact and automatic system designed for the **continuous measurement of residual permanganate ( $\text{MnO}_4^-$ )** in drinking or industrial water.

The instrument uses an electrochemical measuring cell with **selective electrodes** and provides analog outputs and remote communication for integration into control systems.

Residual permanganate monitoring is a key parameter in water treatment processes, particularly when oxidants such as **Potassium Permanganate ( $\text{KMnO}_4$ )** or **Sodium Permanganate ( $\text{NaMnO}_4$ )** are used.

Both compounds perform a selective oxidizing function but require **accurate dosing control** to avoid overdosing (which may cause pink coloration of the water or formation of by-products) or underdosing (resulting in reduced treatment effectiveness).

In this context, PermaTest serves as a strategic continuous monitoring tool, enabling **precise and reliable in-line measurement** of residual permanganate.

## APPLICATION FIELDS



DRINK. WATER  
TREAT. PLANTS



WASTE  
WATER



IRON AND MANGA-  
NESE OXIDATION



INDUSTRIAL



MONITORING

## MAIN FEATURES

- Automatic Control
- Easy Calibration with known Permanganate solutions
- Robust Sensor
- 2 Sampling and Measuring Streams
- Designed to operate with turbid water and water rich in manganese dioxide
- Wide operating range: from ultrapure water to seawater without recalibration
- Peristaltic sampling and reagent pumps with stepper motor
- Fast response time: 30 seconds
- Remote control capability via Ethernet Modbus TCP-IP
- Case-type enclosur
- Electrical connections via connectors
- Alarms (all alarms are configured as remote alarms)

## TECHNICAL SPECIFICATIONS OVERVIEW

|                   |                                                                                                                       |
|-------------------|-----------------------------------------------------------------------------------------------------------------------|
| Protection        | IP55                                                                                                                  |
| Dimensions        | 655 x 630 x Depth 330 mm                                                                                              |
| Materials         | PP, PMMA, Aluminum                                                                                                    |
| Measurement       | From $\text{MnO}_4^-$ sensor                                                                                          |
| Sampling          | Batch                                                                                                                 |
| Frequency         | Programmable                                                                                                          |
| Streams           | 2 streams (customer-selectable: pre-oxidation, sedimentation inlet, sedimentation outlet, filtration outlet)          |
| Analysis Time     | 30 seconds                                                                                                            |
| Digital Inputs    | Sampling completed via SL1 probe                                                                                      |
| Display           | 4" Touch Screen (1/4 VGA), 32,000 color                                                                               |
| Digital Outputs   | General Alarm                                                                                                         |
| Analog Outputs    | Proportional to measurement, 4-20 mA; max load 500 ohm<br>Galvanically isolated outputs — Range 0.00 to max 5.00 mg/L |
| Measuring Range   | 0.000-5.000 ppm $\text{MnO}_4^-$                                                                                      |
| Power Supply      | 100-230 Vac $\pm 10\%$ , 50/60 Hz, 150 VA                                                                             |
| Communication     | Ethernet; Modbu; TCP-IP protocol                                                                                      |
| Temperature Limit | 0-40 °C                                                                                                               |
| Weight            | 5 kg                                                                                                                  |

## TECHNICAL SPECIFICATIONS MEASURING ELECTRODE

|                           |                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Body Material             | Glass                                                                                                                                      |
| Sensor                    | 201S-090                                                                                                                                   |
| Analysis Technique        | Electrochemical analysis with selective electrodes                                                                                         |
| Measuring Range           | 0,000 - 10,000 ppm $\text{MnO}_4^-$                                                                                                        |
| pH Range                  | 2 to 10                                                                                                                                    |
| Sample Conductivity Range | From 0 (ultrapure water) to seawater                                                                                                       |
| Accuracy                  | $\pm 1\%$ f.s.                                                                                                                             |
| Analog Outputs            | Proportional to measurement, 4-20 mA; max load 500 ohm<br>Galvanically isolated outputs — Range 0.00 to max 5.00 mg/L                      |
| Uncertainty               | $\pm 0.5\%$ full scale                                                                                                                     |
| Sensitivity               | 0.001 mg/L                                                                                                                                 |
| Repeatability             | 2%                                                                                                                                         |
| Drift                     | < 2% of value per month                                                                                                                    |
| Buffer Solution           | Added via peristaltic pump                                                                                                                 |
| Operating Pressure        | Free discharge                                                                                                                             |
| Response Time             | 30 seconds rise time (90% of final value)                                                                                                  |
| CE Compliance             | In accordance with Machinery Directive 2006/42/EC<br>Complies with requirements of 93/68/EEC<br>Electromagnetic compatibility; Low voltage |

