



Recorder



Flow



Pressure



Temp



Analyzer



Level

Datasheet

Permanganate Index Analyzer

AI-ME-IMN



## Datasheet

### Permanganate Index (IMN) Analyzer AI-ME-IMN

The Permanganate Index (IMn) Analyzer (hereinafter referred to as the IMN Analyzer) is a new-generation water quality monitoring instrument developed by our company. It is suitable for a wide range of applications, including monitoring IMN levels in water from environmental pollution discharge outlets, municipal wastewater, industrial effluent, and process water in industrial production.

#### Applications

- Environmental discharge outlets
- Municipal wastewater
- Industrial effluents
- Water used in industrial processes

#### Features

- **Highly Integrated Structure:** the all-in-one digestion module and integrated plunger pump design help to reduce component wear, enhance stability, and extend the service life of the equipment.
- **Standardized Quick Connection:** Modular components with plug-and-play capability simplify installation and maintenance, significantly reducing operation and maintenance costs.
- **Intelligent Anti-fouling Compensation Algorithm:** Based on the water sample onsite, the system features an automatic anti-fouling mode to deliver reliable and accurate monitoring results.

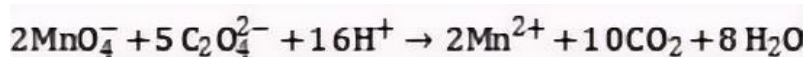


**MDE20-IMN**

- **Innovative Reagent Mixing Technology:** Ensures thorough reaction between the water sample and reagents, improving measurement accuracy.
- **Industry-Specific Customization:** Optimized reagent formulations and detection sequences tailored for various industries such as chemical manufacturing, municipal wastewater, and electroplating, ensuring broad applicability.
- **Fully Automated Intelligent Monitoring:** Supports automatic calibration, cleaning, and sample injection. In case of unexpected interruptions, the system can resume operation automatically, ensuring continuous monitoring.
- **Reagent Shortage Detection and Alarm:** Automatically detects insufficient water or reagent supply to prevent reagent-free measurements.
- **Flexible Measurement Modes:** Supports both real-time online monitoring and batch sampling to meet the needs of different application scenarios.
- **Seamless Data Integration:** Monitoring data is automatically stored and uploaded in real time to regulatory platforms, supporting efficient decision-making.

#### Measuring principle

In operation, the water sample, potassium permanganate (KMnO<sub>4</sub>), and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) are sequentially introduced into the reaction chamber and mixed in the detection chamber. The mixture is then heated to digest the water sample, during which KMnO<sub>4</sub> oxidizes organic and inorganic reducing substances present in the water. After digestion, an excess of sodium oxalate (Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub>) is added to react with the residual KMnO<sub>4</sub>:



The excess Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> is subsequently titrated with a standard KMnO<sub>4</sub> solution, and the volume of titrant consumed is used to determine the permanganate index of the water sample.

<b>Parameters</b>	
<b>Performance</b>	
Measured variables	Permanganate Index ( $I_{Mn}$ )
Measuring range	(0~10) mg/L; (0~20) mg/L; (0~50) mg/L; Note: the range can be switched online
Repeatability	≤5.0 %
Zero drift	±5%
Range drift	±5%
Comparison test with the actual water sample	±10%
Voltage stability	±5%
<b>Output</b>	
Current output	(4~20)mA output
Communication	RS232, RS485, RJ45 interface
<b>Electrical specifications</b>	
Power supply	( 220±22) VAC, (50±0.5) Hz
Power consumption	≤100W
Insulation resistance	≥20MΩ
Dielectric strength	The power inlet and chassis of the analyzer can withstand a 50Hz, 1.5kV AC(rms) test voltage for 1 minute with a current limit of 5 mA, without flashover or breakdown.
Leakage current	≤5mA
<b>Process conditions</b>	
Water sample temperature	( 0~50 )°C
<b>Environmental conditions</b>	
Ambient temperature	(5~40)°C
Relative humidity	≤90% (no condensation)
<b>Construction</b>	
Dimensions	315mm×239.5mm×500mm (D×W×H)
Weight	20kg
Material	Cold-rolled SPCC
Fixing method	Install on a flat, level platform

Table 1 Function

No.	Project	Content
1	Measurement mode	Online mode, maintenance mode, remote control mode
2	Continuous running time	$\geq 720$ h/time
3	Automatic calibration	Calibration interval can be set from 1 to 999 hours, at any desired time
4	Automatic cleaning	Automatic cleaning after each measurement; periodic cleaning can be performed according to the complexity of the on-site water sample
5	Range switching	Realize online switching of different ranges according to the measured value.
6	Liquid level detection	Detects sample and reagent levels; alerts for insufficient liquid
7	Online fitting	Selectable fitting method based on application requirements
8	User interface	Full color touchscreen, with resolution 1024×600
9	Data storage	Continuously store data for more than 5 years
10	Communication	RS232/RS485/ RJ45/CAN, etc.
11	USB drive	Upgrade via USB flash drive
12	Other features	Reagent shortage warning, system logs, and fault alarms.

## Dimensions

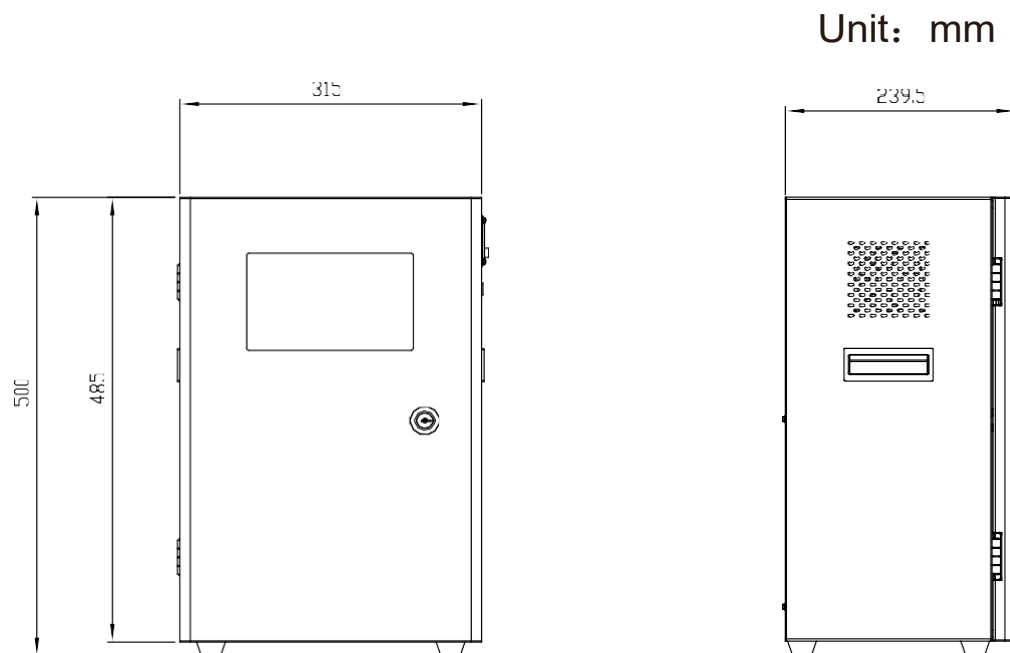


Fig.1 Dimensions (unit: mm)

The internal structure of the IMN analyzer is shown as below:

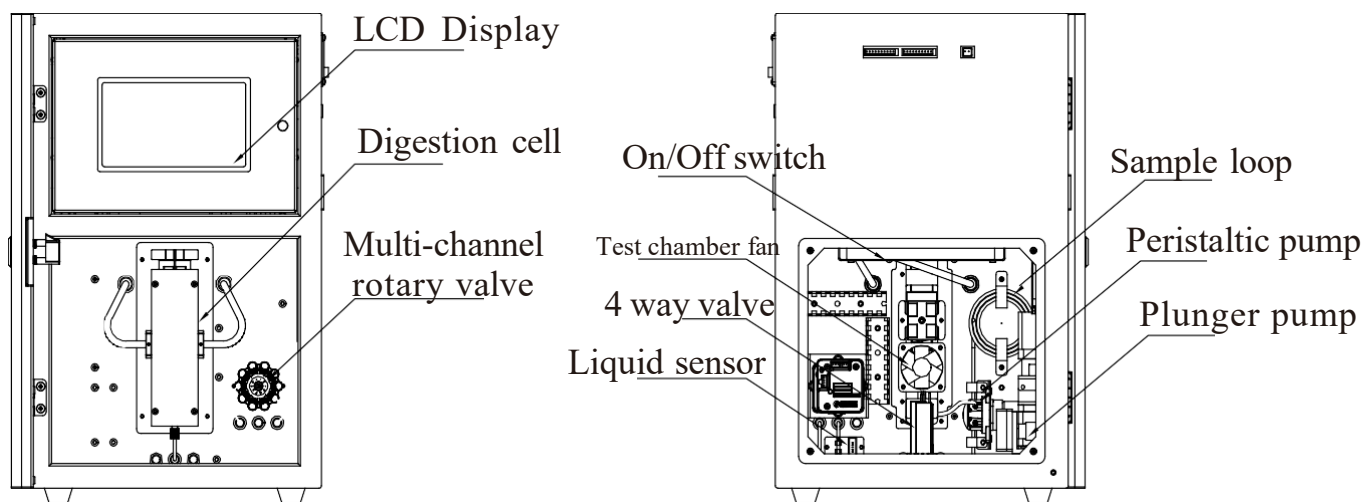


Fig.2 The diagram of the analyzer's internal structure

Wiring

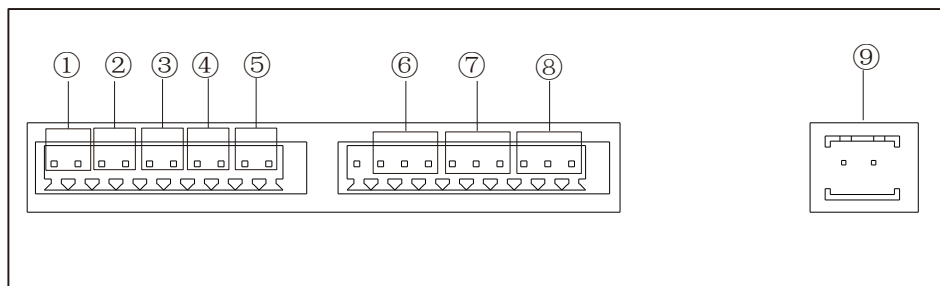


Fig.3 Diagram of the back panel interface

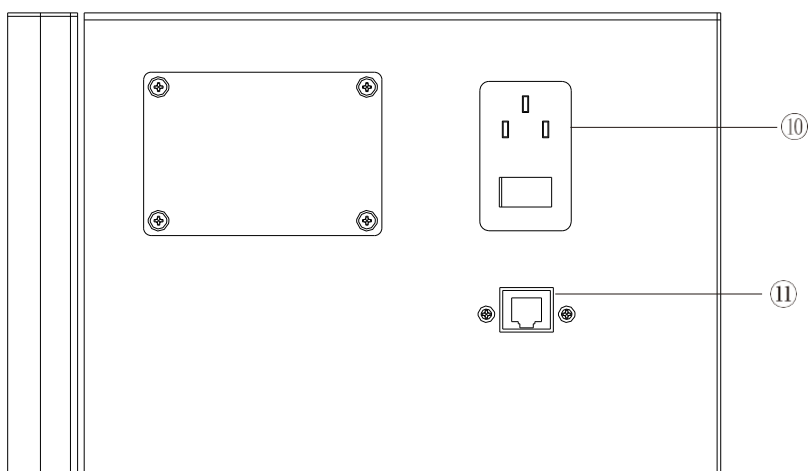


Fig.4 Diagram of the ports on the analyzer's right side

Table 2 Interface description

No.	Interface	Specification and description
1	Reserved port	/
2	Analog output	Used to output analog signals with external instruments
3	24V input	24VDC power input
4	24V output	Supply power to sensors and low-voltage displays
5	CAN interface	CAN interface
6	Mainboard RS232	Mainboard RS232 output interface
7	Screen RS232	Screen RS232 output interface
8	Screen RS485	Screen RS485 output interface
9	24V output	Supply power to sensors and low-voltage displays
10	Power inlet	Pure copper, national standard-compliant three-core 1 mm <sup>2</sup> power cord, which is the main power cord of the instrument
11	Network cable interface	Standard RJ45 network interface, wired access to the Internet or VPN network communication

## Ordering Code

AI-ME-IMN												Description	
ME-IMN	-DC	-	-	-	-	-	-	-	-	-	-	-	0-10mg/L
	WC												0-20mg/L
Measuring	DE												0-50mg/L
Range	XX												Others
Output	G												4-20mA + RS485 + RS232 + RJ45
Switch output		1											1 channel
Power supply				E									220VAC
Housing material and protection level					7								SPCC cold-rolled sheet, IP00
Standard solution						S4							10 mg/L
						S5							20 mg/L
						S6							50 mg/L
						XX							Others



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