



Recorder



Flow



Pressure



Temp



Analyzer



Level

Datasheet

Permanganate Index Analyzer

SUP-MDE20-IMN

Supmea[®]

Committed to process automation solutions

Tel: 86-15158063876

E-mail: info@supmea.com

www.supmea.com

Datasheet**Permanganate Index (IMN) Analyzer
SUP-MDE20-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

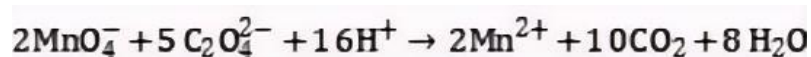
- **Highly Integrated Structure:** the all-in-one digestion module and integrated plunger pump design help to reduce component wear, enhance stability, and extend the service life of the equipment.
- **Standardized Quick Connection:** Modular components with plug-and-play capability simplify installation 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(KMnO₄), and sulfuric acid (H₂SO₄) 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 KMnO₄ oxidizes organic and inorganic reducing substances present in the water. After digestion, an excess of sodium oxalate (Na₂C₂O₄) is added to react with the residual KMnO₄:



The excess Na₂C₂O₄ is subsequently titrated with a standard KMnO₄ solution, and the volume of titrant consumed is used to determine the permanganate index of the water sample.

Parameters	
Performance	
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	$\leq 5.0\%$
Zero drift	$\pm 5\%$
Range drift	$\pm 5\%$
Comparison test with the actual water sample	$\pm 10\%$
Voltage stability	$\pm 5\%$
Output	
Current output	(4~20)mA output
Communication	RS232, RS485, RJ45 interface
Electrical specifications	
Power supply	(220 $\pm$ 22) VAC, (50 $\pm$ 0.5) Hz
Power consumption	$\leq 100W$
Insulation resistance	$\geq 20M\Omega$
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	$\leq 5mA$
Process conditions	
Water sample temperature	(0~50) $^{\circ}C$
Environmental conditions	
Ambient temperature	(5~40) $^{\circ}C$
Relative humidity	$\leq 90\%$ (no condensation)
Construction	
Dimensions	315mm $\times$ 239.5mm $\times$ 500mm (D $\times$ W $\times$ 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	$\geq 720\text{h/time}$
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

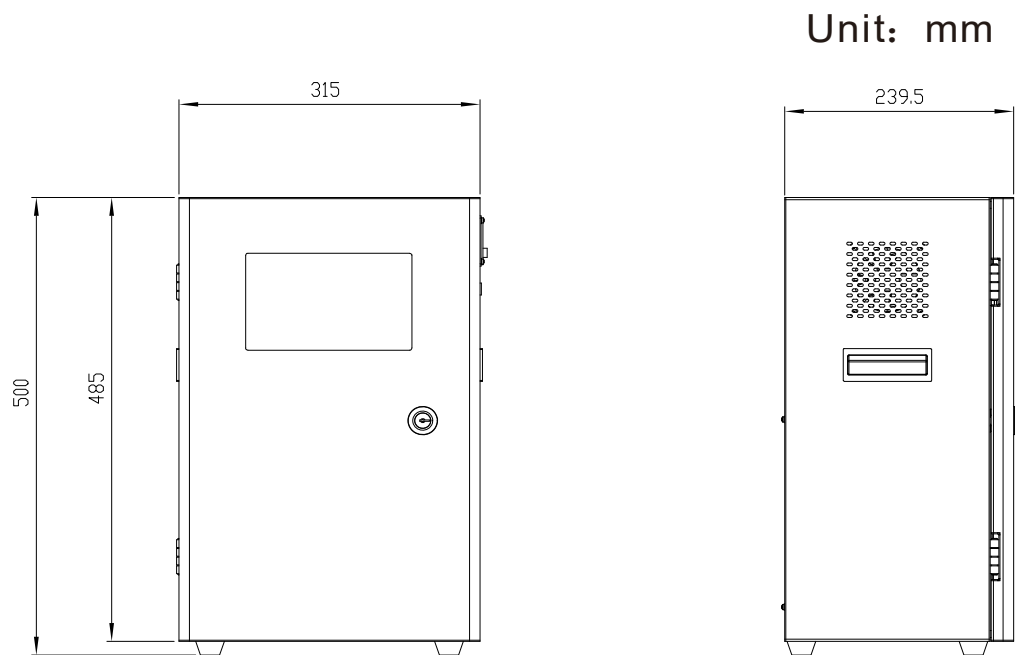


Fig.1 Dimensions (unit: mm)

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

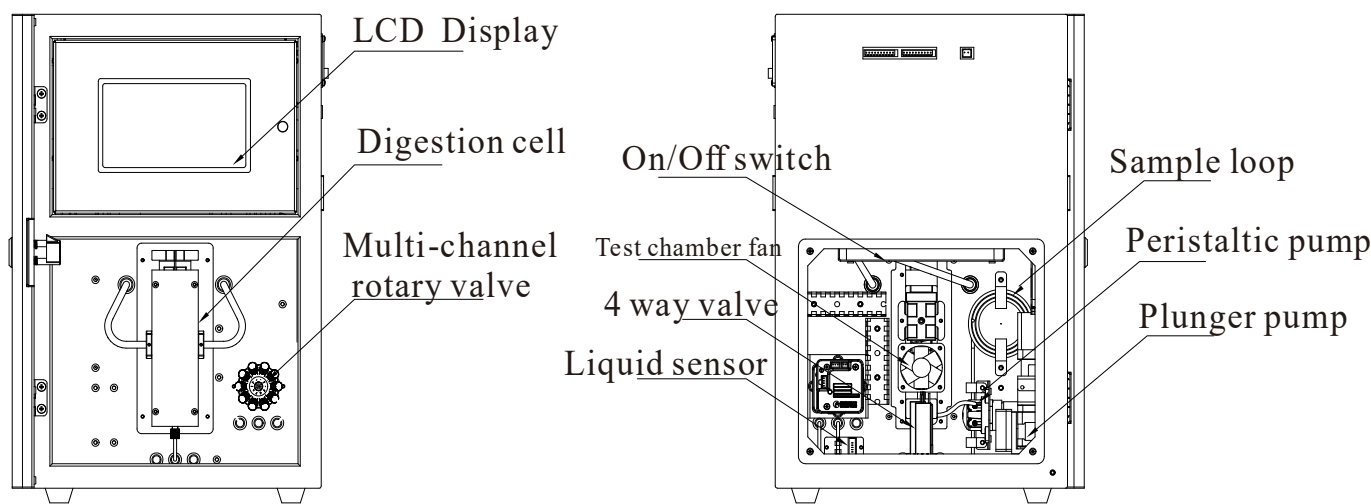


Fig.2 The diagram of the analyzer's internal structure

Wiring

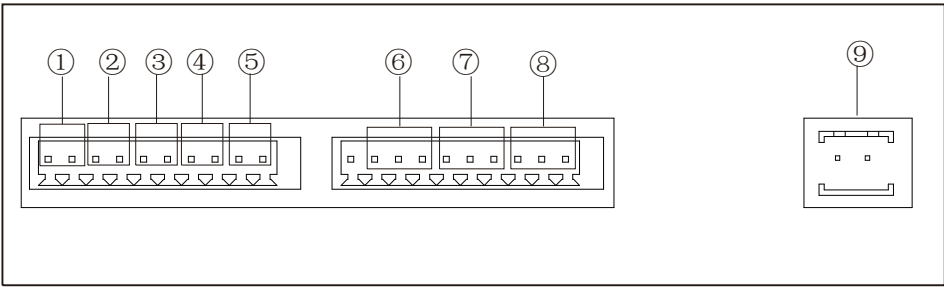


Fig.3 Diagram of the back panel interface

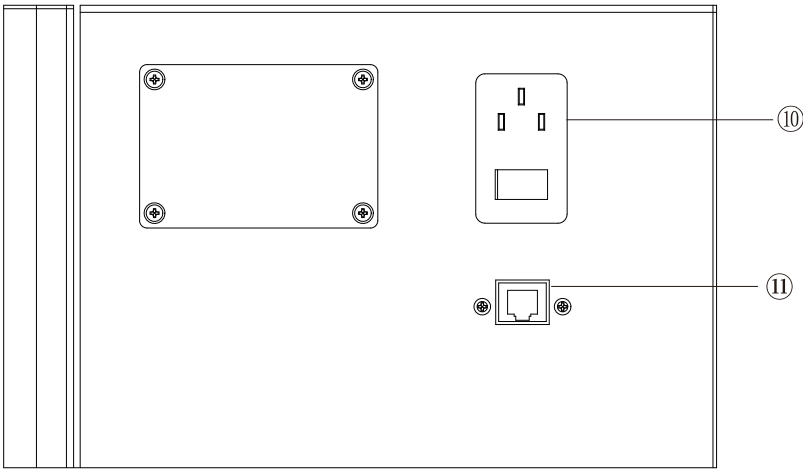


Fig.4 Diagram of the ports on the analyzer's right side

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 ² 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

SUP-MDE20-IMN												Description
MDE20-IMN	-	-	-	-	-	-	-	-	-	-	-	
Measuring Range	DC											0-10mg/L
	WC											0-20mg/L
	DE											0-50mg/L
	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