



Recorder



Flow



Pressure



Temp



Analyzer



Level

Datasheet

Total Nitrogen (TN) Analyzer

SUP-MDE20-TN

Supmea[®]

Committed to process automation solutions

Tel: 86-15158063876

E-mail: info@supmea.com

www.supmea.com

Datasheet

Total Nitrogen (TN) Analyzer SUP-MDE20-TN

The Total Nitrogen (TN) Analyzer for water quality is a new generation monitoring instrument developed by our company. It is widely applicable to the nitrogen monitoring in environmental pollution discharge outlets, municipal wastewater, industrial wastewater, 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-TN

- **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

Total Nitrogen (TN) refers to the sum of organic nitrogen and inorganic nitrogen (e.g., NH_4^{++} $\text{NO}_2^- + \text{NO}_3^-$) present in water. It is an internationally recognized key indicator for assessing water eutrophication. In municipal wastewater treatment, the anaerobic/aerobic biological process is commonly used to reduce total nitrogen emissions, making TN one of the most important parameters in wastewater treatment.

This analyzer adopts the alkaline potassium persulfate digestion-UV spectrophotometry method to determine the nitrogen content in water samples. In the reaction unit, the sample, oxidant, and alkaline solution are digested under high temperature and pressure in a sealed environment, converting all nitrogen species into nitrate nitrogen. Its concentration is directly proportional to the total nitrogen content in the sample. After digestion, the xenon-lamp spectrophotometric system collects and processes the absorbance signal, and the result is converted into a TN value for output.

Parameters	
Performance parameters	
Measured variables	Total Nitrogen
Measuring range	(0~4) 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	±10%
Linearity	±10%
Comparison test with the actual water sample	±10%
Voltage stability	±10%
Output	
Current output	(4~20)mA output
Communication	RS232, RS485, RJ45 interface
Electrical specifications	
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
Process conditions	
Water sample temperature	(0~50)°C
Environmental conditions	
Ambient temperature	(5~40)°C
Relative humidity	≤90% (no condensation)
Construction	
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	$\geq 720\text{h/time}$
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

Unit: mm

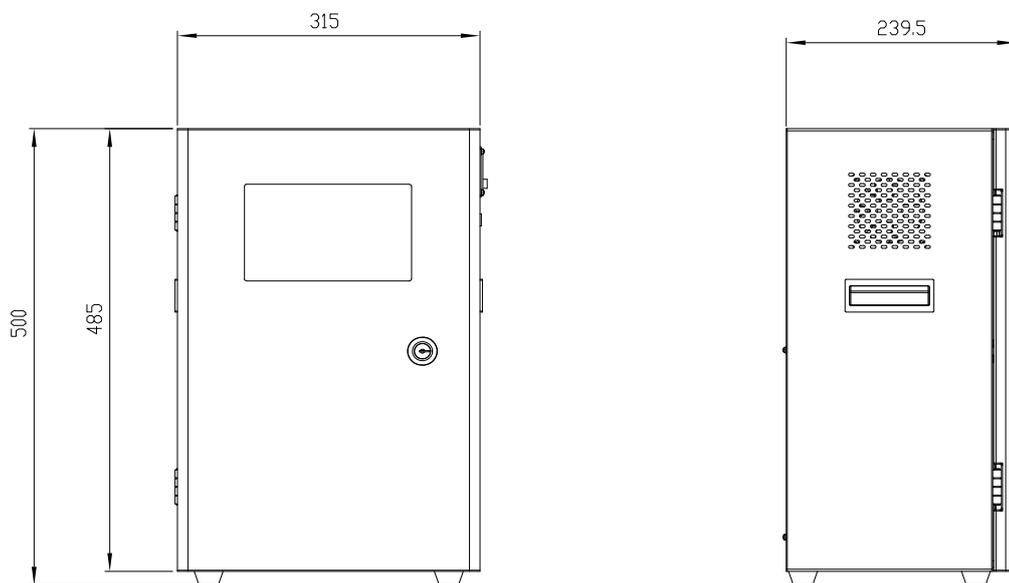


Fig.1 Dimensions (unit: mm)

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

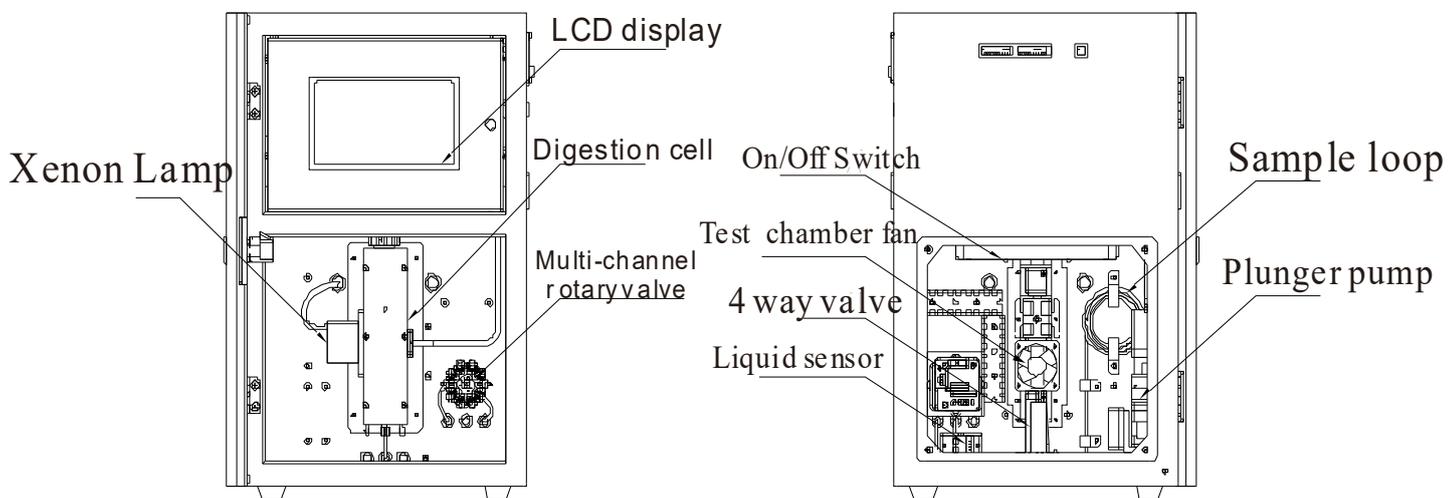


Fig.2 The diagram of the analyzer's internal structure

Wiring

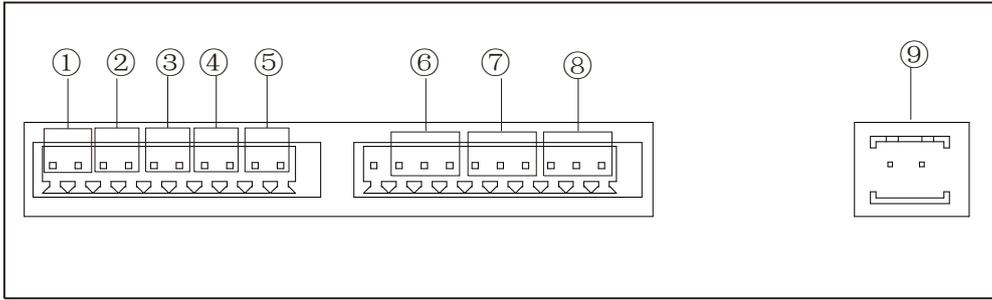


Fig.3 Diagram of the back panel interface

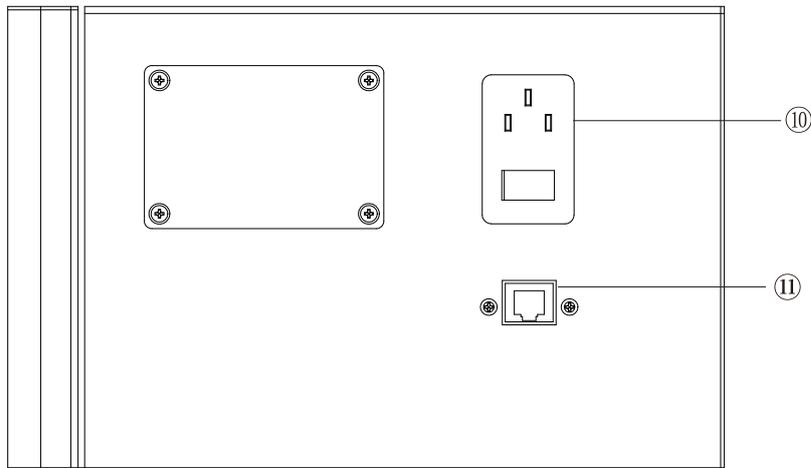


Fig.4 Diagram of the ports on the analyzer's right side

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-TN												Description	
MDE20-TN	-	-	-	-	-	-	-	-	-	-	-	-	0-4mg/L
	DB												0-20mg/L
Measuring Range	WC												0-50mg/L
	DE												Others
	XX												
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
						S2							4 mg/L
						S5							20 mg/L
Standard solution						S6							50 mg/L
						XX							Others