



Recorder



Flow



Pressure



Temp



Analyzer



Level

Datasheet

Chemical Oxygen Demand (COD) Analyzer

SUP-MDE20-COD

Supmea[®]

Committed to process automation solutions

Tel: 86-15158063876

E-mail: info@supmea.com

www.supmea.com

Datasheet**Chemical Oxygen Demand (COD) Analyzer
SUP-MDE20-COD**

The Chemical Oxygen Demand (COD) Online Water Quality Analyzer (hereinafter referred to as the COD analyzer) is a new-generation water quality monitoring instrument developed by our company. It is widely applicable to the monitoring of COD levels in various water bodies, including environmental discharge outlets, municipal wastewater, industrial effluents, and water used in industrial processes.

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.
- **Strict Compliance with National and Industry Standards:** Fully conforms to GB/HJ 828 “Water Quality—Determination of Chemical Oxygen Demand — Dichromate Method” and HJ 377 “Technical Specifications

**MDE20-COD**

and Test Procedures for Water Quality Online Automatic Monitoring Equipment of Chemical Oxygen Demand (CODCr)", ensuring the accuracy and validity of monitoring data.

- **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.
- **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

Chemical Oxygen Demand (COD) refers to the oxidant amount consumed when a water sample is treated with potassium dichromate under strong acidic and heated conditions. It is expressed in milligrams of oxygen per liter (mg/L). COD is a key indicator used to comprehensively assess the degree of water pollution. As one of the most important parameters in water quality monitoring, COD plays a crucial role in the implementation of total pollutant discharge control. It is also an important and relatively accessible parameter in the study of river and industrial wastewater, as well as in evaluating the performance of sewage treatment plants.

COD reflects the total amount of oxidizable substances in water, primarily organic compounds, but also including certain inorganic reducing agents such as nitrites, ferrous ions, sulfides, and more. Organic contamination is common in water samples. These organic pollutants are decomposed through microbial oxidation, consuming large amounts of dissolved oxygen, which leads to black, foul-smelling water, the death of aquatic life, ecological imbalance, and

deterioration of the human living environment. Therefore, timely monitoring of COD concentration in water is essential for water quality assessment and pollution control.

Details:

In the measurement process, a specific amount of potassium dichromate ($K_2Cr_2O_7$) and the catalyst silver sulfate (Ag_2SO_4) are added to the water sample. Under high-temperature and high-pressure sealed conditions, part of the potassium dichromate is reduced by oxidizable substances in the sample, converting Cr^{6+} into green Cr^{3+} . The degree of color change is proportional to the concentration of oxidizable substances in the sample. The analyzer detects this color change and converts it into a corresponding COD value.

Parameters	
Measurement Performance	
Measured variables	COD
Measuring range	(0~200) mg/L; (0~500) mg/L; (0~2000) mg/L; Note: The range can be switched online
Indication error	20% range: $\pm 10.0\%$ 50% range: $\pm 8.0\%$ 80% range: $\pm 5.0\%$
Repeatability	$\leq 5.0\%$
Low-level drift in 24h	$\pm 5\text{mg/L}$
High-level drift in 24h	$\leq 5.0\%$
Limit of quantitation(LOQ)	$\leq 15\text{mg/L}$ (indication error $\pm 30\%$)
Memory effect	80% $\rightarrow$ 20%: $\pm 5\text{mg/L}$ 20% $\rightarrow$ 80%: $\pm 5\text{mg/L}$
Interference of voltage	$\pm 5.0\%$
Interference of chloridion	$\pm 10.0\%$
Interference of environmental temperature	$\pm 5.0\%$
Comparison test with the actual water sample	COD<50mg/L: $\leq 5\text{mg/L}$ COD $\geq 50\text{mg/L}$: $\leq 10\%$
Minimum period between maintenance operations	$\geq 168\text{h/time}$
Data availability	$\geq 90.0\%$
Conformity	$\geq 90.0\%$
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	$\leq 100\text{W}$
Insulation resistance	$\geq 20\text{M}\Omega$
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	$\leq 5\text{mA}$
Process conditions	
Water sample temperature	(0~50) $^{\circ}\text{C}$

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 sheet (SPCC)
Fixing method	Mount on a flat, level, and stable surface.

Table 1 Function

No.	Project	Content
1	Measurement mode	Online mode, maintenance mode, remote control mode
2	Continuous running time	≥720h/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 upgrade	Upgrade via USB flash drive
12	Other features	Reagent shortage warning, system logs, and fault alarms.

Dimensions

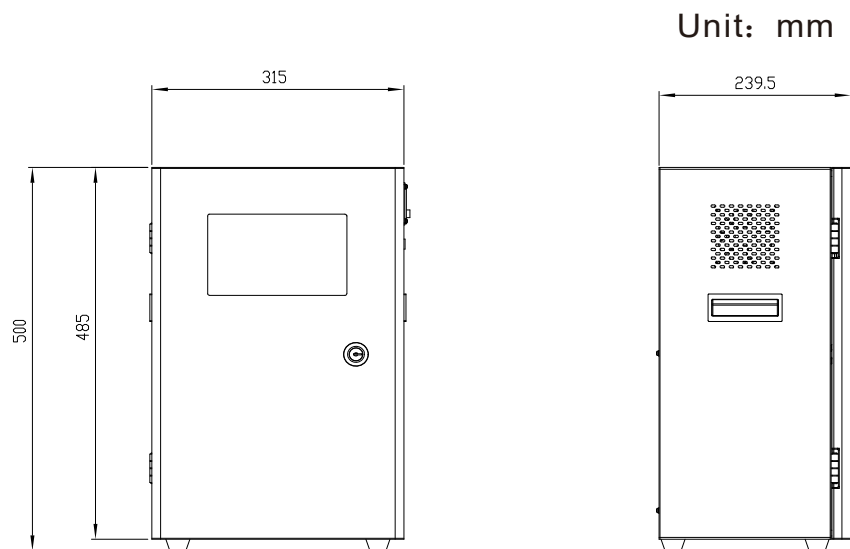


Fig.1 Dimensions (unit: mm)

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

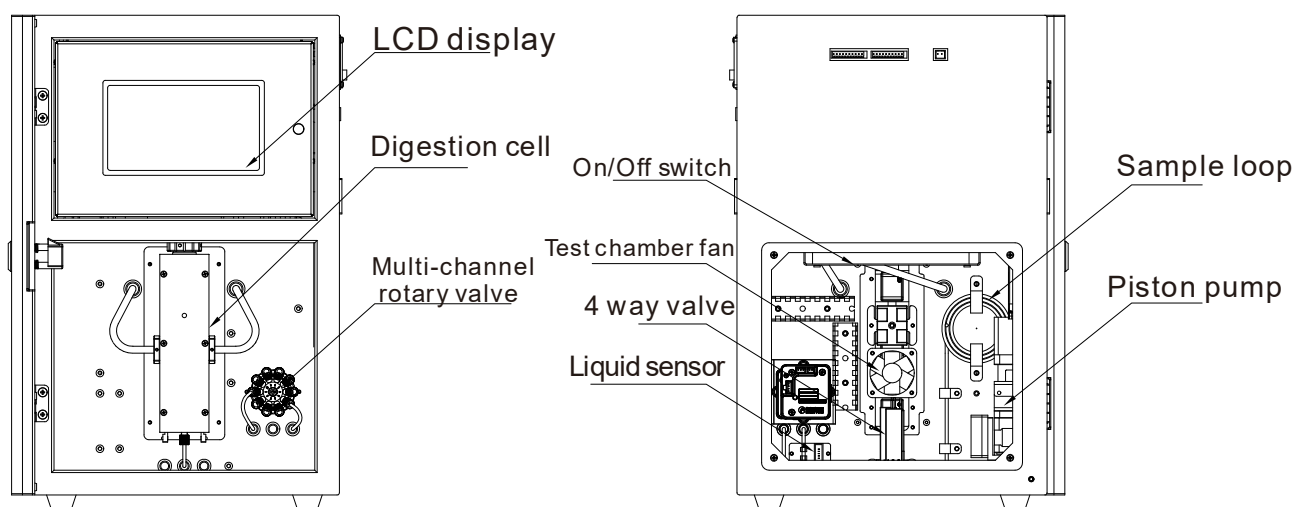


Fig.2 The diagram of the analyzer's internal structure

Wiring

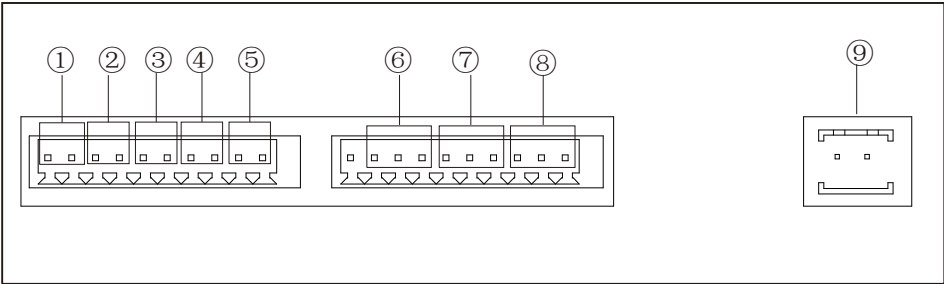


Fig.3 Diagram of the back panel interface

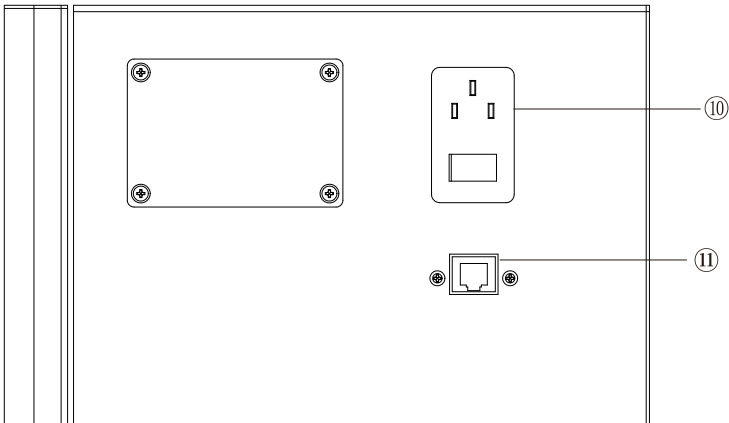


Fig.4 Diagram of the ports on the analyzer's right side

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-COD												Description
MDE20-COD	-	-	-	-	-	-	-	-	-	-	-	
Measuring Range	DF											0-200 mg/L
	DG											0-500 mg/L
	DH											0-2000 mg/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						S7						200 mg/L
						S8						500 mg/L
						S9						2000 mg/L
						XX						Others