

Cyanide Ion Monitor

CNMS-4

This device is a cyanide ion monitor equipped with automatic calibration and automatic cleaning functions.

It employs a simple measurement method using ion-selective electrodes (non-distillation measurement), making it suitable for continuous monitoring of water quality in factory wastewater, rivers, and lakes. Mixing an ionic strength adjuster with the sample water maintains a constant pH and temperature, ensuring stable measurements.

This monitor measures free cyanide present as ions in water. If you need to measure total cyanide, including metal complex forms, please consider our total cyanide analyzers. Please contact us for details.

Features

- Reagent consumption reduced by half compared with our conventional model.

By stabilizing the flow rates of reagents and samples and reducing the internal volume of the measurement cell, we reduced the consumption of reagents and samples to 1/2 of that of our conventional model (CNMS-3) without compromising performance such as responsiveness. This has also reduced the amount of waste liquid, lowering running costs and environmental impact.

- Space-saving design

By reducing reagent consumption, we downsized the reagent tanks installed inside the instrument, thereby making the entire instrument more compact. Furthermore, the front-access maintenance structure has significantly reduced the installation space required.

- Cyanide Ion Standard Solution Management (Lockable Door Option)

The toxic cyanide ion standard solution (calibration solution) is stored inside the instrument. The instrument door can be locked with a padlock. For the optional waste solution recovery unit that separately collects the calibration solution, the waste tank can be stored either inside the instrument or in a lockable storage compartment secured with a padlock.

The padlock is sold separately (Code No. 122B409).



- Support various measurement data output methods

Measurement data is output via analog transmission and digital communication (Modbus/RTU). Data can also be recorded to a USB flash drive in CSV format for up to approximately one year. An optional recorder can be installed to enable recording on recording charts.

Related Devices

- Total Cyanide Monitor (Process Automatic Analyzer XAT Series)

These automatic analyzers quantify total cyanide concentrations by incorporating pretreatment (heating distillation at pH 2 or below) and absorptiometry (4-pyridinecarboxylic acid-pyrazolone method).

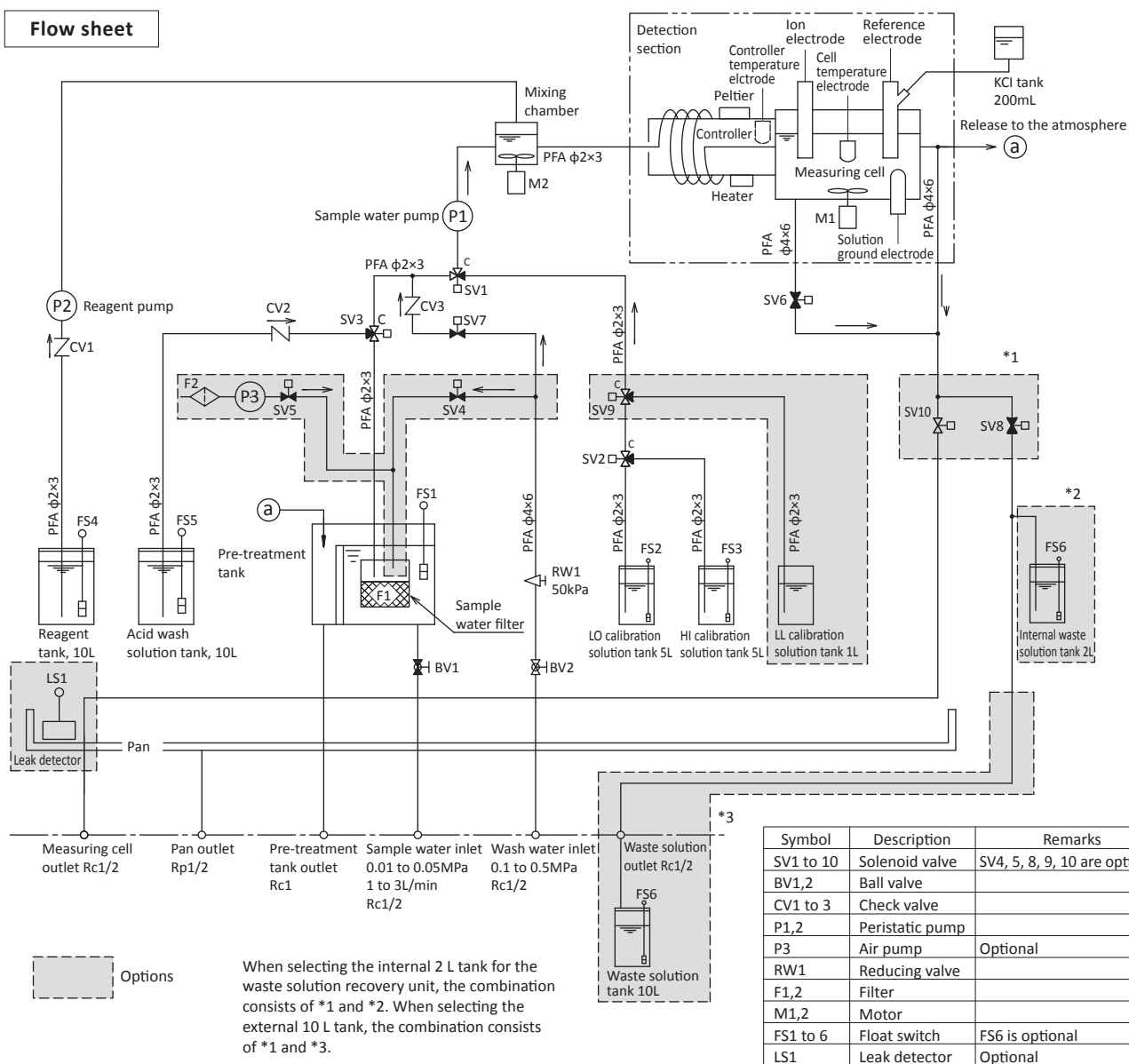
(In accordance with JIS K 0102)

Standard Specifications

Product name	: Cyanide ion monitor
Model	: CNMS-4
Measurement method	: Ion-selective electrode method (Ionic strength adjuster mixing method)
Measurement ranges	: 0.03 to 5.00 mg/L
Ranges	: 0.03 to 2.00 mg/L (standard) 0.05 to 5.00 mg/L * Please contact us for ranges exceeding 2 mg/L.
Repeatability	: Within $\pm 10\%$ of the read value (by HI or LO calibration solution)
Response	: 15 minutes or less at 90% response (after pre-treatment tank)

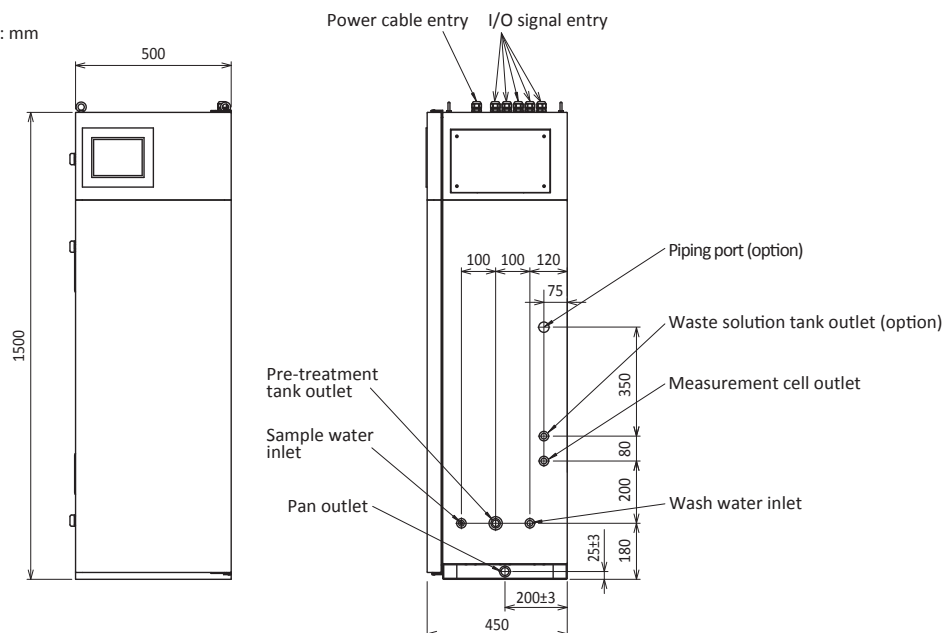
Temperature compensation	: Constant temperature measurement method * Can be used together with the temperature compensation function.	detected by the ion-selective electrode, resulting in lower read values.
Measurement method	: Continuous measurement and intermittent measurement (minimum interval: 1 hour)	(2) High salt concentrations in the sample can inhibit cyanide ion dissociation, affecting the read value. Furthermore, fluctuations in these salt concentrations may cause variations in the read values.
Automatic calibration	: Periodic calibration with a fixed period or period adjusted by ACAS (Automatic Calibration Cycle Adjustment System) Interval: 1 to 99 days (Initial: 7 days)	Wash water conditions : Equivalent to city water (Turbidity level: 2 or less, Color level: 5 or less) Water temperature: 2 to 40°C (no freezing) Pressure: 0.1 to 0.5 MPa Consumption: Approx. 2 L/time
Automatic wash	: Periodic wash • Wash sample line and measurement cell by acid • Wash sample line by city water Interval: 1 to 999 hours (Initial: 12 hours)	Acid cleaning solution : HCl 3 w/v% (standard) 5 w/v% and 10 w/v% hydrochloric acid are also available. Higher concentrations may shorten the electrode life. Consumption: Less than 2 L/month (at a wash interval of 12 hours) Tank capacity: 10 L
Display	: Color LCD touch screen (7 inches)	Reagent : Ionic Strength Adjuster Flow rate: Approx. 0.2 mL/min Tank capacity: 10 L Consumption: Approx. 10 L/month (continuously measurement, flow rate 0.2 mL/min)
Measurement point	: 1 channel	Calibration solution : HI (high concentration) calibration solution LO (low concentration) calibration solution (2 types of calibration solution) Consumption: Less than 5 L/month Tank capacity: 5 L
Analog output	: Linear output, 4 to 20 mA DC, Load resistance: 600 Ω or less	Construction : Indoors self-standing cabinet
External contact output	: 10 points (9 NO contacts, 1 NC contact) Power off (NC contact), Failure 1 (serious), Failure 2 (minor), Concentration higher alarm, Concentration high alarm, Concentration low alarm, Under calibration, Under wash, Under maintenance, Under measurement Contact capacity: 30V DC, 0.1A	Dimensions : 500 (W) × 450 (D) × 1500 (H) mm
External contact input	: 6 points: (Non-voltage contact input) Measurement start, Measurement stop, Calibration start, Wash start, Continuous / intermittent switching, Waste solution switch ON-resistance: 50 Ω or less, Short-circuit current: Max.10mA, Open-circuit voltage: DC 12V	Weight : Approx. 100 kg (except reagent, optional features)
Digital I/O	: RS-485 1 point Protocol: Modbus/RTU * Remote monitoring (measurement values, etc.) and remote operation (starting measurements, etc.) are possible.	Installation conditions : Indoor. No direct sun light. Ambient temperature: 0 to 40°C Humidity: Less than 85%RH (no condensation)
Recording	: Equipment memory; 1 month's worth of data is recorded every minute. The data can be displayed as a graph on the screen. USB flash drive; 1 year's worth of data is recorded every minute.	Optional features : • Power supply with built-in transformer compatible with various power supply voltages • Measuring channel Up to 3 channels. dimensions are as follows: Dimensions for 2ch: 1000 (W) × 500 (D) × 1650 (H) mm Dimensions for 3ch: 1500 (W) × 500 (D) × 1650 (H) mm • Recorder 1 to 3 pen type Chart type 100 mm wide, length 16 m • Air cleaning The sample water filter is backwashed with bubbling air-mixed washing water. • Waste solution recovery mechanism The optional waste solution recovery unit separates and collects the calibration solution. Available tank options include a 2 L internal tank, a 10 L external tank, or a 10 L tank with a cabinet. • Low concentration calibration unit (3-point calibration) LL (low concentration) Calibration solution Tank capacity: 1 L • Leak detector installed in bottom pan • Junction box compatible with AC contact output Contact capacity: 100V AC, 2A • Lockable storage door for the cyanide standard solution and cabinet for the optional waste solution recovery unit (padlocks sold separately).
Sensor electrode	: Cyanide ion electrode, EL7000	
Reference electrode	: ELR-009	
Power supply	: 100V AC ±10%, 50/60Hz (Other options available)	
Power consumption	: Max. 240VA, approx. 120VA on average (at an ambient temperature of 25°C, excluding options)	
Sample water conditions	: Water temperature: 2 to 40°C (no freezing) Flow rate: Approx. 1 to 3 L/min * If the sampling point is far away, the response will be slow. In this case, install a bypass line near the instrument. Pressure: 0.01 to 0.05 MPa SS: 50 mg/L or less (particle diameter: 100 μm or less) pH: pH5.8 or more Coexisting Components; (Please consult us in advance regarding sample composition.) *The following components may affect measurement values. Maximum coexisting ratio of major ions (Molar concentration ratio of coexisting ions that gives the same reading as cyanide ions) S ²⁻ = Coexistence not permitted Γ = 0.1 S ₂ O ₃ ²⁻ = 10 SO ₄ ²⁻ , HPO ₄ ²⁻ , CO ₃ ²⁻ = 1000 SO ₃ ²⁻ , NO ₂ ²⁻ , NH ₄ ⁺ (1) Metal-cyanide complexes cannot be	

Flow sheet



Dimensions

Unit : mm



Product code

CNMS4-1-□□□□□□□□

A	Power supply* ¹
B	100V AC, 50/60Hz
C	110V AC, 50/60Hz
D	115V AC, 50/60Hz
E	120V AC, 50/60Hz
F	200V AC, 50/60Hz
G	220V AC, 50/60Hz
H	230V AC, 50/60Hz
Z	240V AC, 50/60Hz
	Custom spec.
1	Measuring channel
2	1 channel (standard)
3	2 channel parallel measurement* ²
9	3 channel parallel measurement* ²
	Custom spec.
A	Measurement range for 1st channel* ³
B	0.03 to 2.00 mg/L
Z	0.05 to 5.00 mg/L
	Custom spec.* ⁴ * ⁵
A	Measurement range for 2nd channel* ³
B	0.03 to 2.00 mg/L
Y	0.05 to 5.00 mg/L
Z	Not applicable
	Custom spec.* ⁵
A	Measurement range for 3rd channel* ³
B	0.03 to 2.00 mg/L
Y	0.05 to 5.00 mg/L
Z	Not applicable
	Custom spec.* ⁵
0	Recorder (100mm)
1	None (standard)
2	1 pen type
3	2 pen type
9	3 pen type
	Custom spec.
0	Air cleaning (sample water filter with bubbling)
1	None (standard)
	Supplied
A	Waste solution recovery unit (separation of calibration solution)
B	None (standard)
C	Supplied (2 L tank built-in)
D	Supplied (10 L tank included)
	Supplied (10 L tank+waste liquid tank storage cabinet)* ⁶
0	Low concentration calibration unit (3 point calibration)
1	None (standard)
	Supplied
0	Leak detector (bottom of cabinet)
1	None (standard)
9	Supplied
	Custom spec.
0	Junction box (option unit for AC power type contact output)
1	None (standard)
	Supplied
A	Language (of documents)
B	Japanese (standard)
Z	English
	Custom spec.

Custom spec. code;
Numeric digit: 9
Alphabet: Z

- *1. If a power supply other than 100V AC is used, a transformer will be incorporated. Please inform us of the power supply specifications.
- *2. If there is a large distance between sampling points, there may be a response delay.
- *3. The analog output (4 to 20mA) corresponds to a range from 0 to the upper limit of the measurement range.
- *4. Certain sample properties may make measurement impossible. Please check the coexisting components and consult us in advance.
- *5. Please indicate the desired measurement range.
- *6. To add padlocks for locking the instrument door and the cabinet for the optional waste solution recovery unit, please specify them separately. (Padlock Code No. 122B409)



DKK-TOA CORPORATION



Please read the operation manual carefully before using products.

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