

## AUTOMATIC COD ANALYZER

COD-203A

This instrument is suitable for analysis of Chemical Oxygen Demand (COD) in river water or plant effluent designed in compliance with JIS K 0806, "Automatic Chemical Oxygen Demand (COD) Analyzer", and has been favored by many customers for many years.

Its measurement principle conforms to JIS K 0102, "Acid Potassium Permanganate Method."

It also provides, in cases where the sample contains a high level of chloride ions, like sea water, an alternative alkali measurement.

### Features

- High reliability: proven oxidation-reduction potentiometric method is adopted
- Reducing routine maintenance work:  
Adoption of pinch valves and larger tubes (4mm or larger), and cleaning system of the sample line for every measurement, reduces clogging.
- Titration curves indication and print-out is available.
- User-friendly interactive operation using touch-screen
- Sufficient data storage capability: internal memory for 14-day measurement data, and data retrieval function
- Oxalic acid cleaning system cleans up the reactor vessel and electrode contaminated with over-provided permanganate
- Ammonia cleaning is available as an option to remove contamination with precipitated silver chloride.  
In the case of acidity measurement by adding silver nitrate, application of ammonia cleaning function greatly reduces contamination of the reactor vessel and electrode caused by silver chloride.

### Standard Specifications

Product name : Automatic COD Analyzer  
 Model : COD-203A  
 Measurement object : COD concentration in water  
 Measurement method : 100°C digestion with  $\text{KMnO}_4$  acidified by sulfuric acid, or 100°C digestion with alkaline  $\text{KMnO}_4$ .  
 End point detection : Oxidation-reduction potentiometric titration  
 Measurement range : (in mg/L)  
 (1) Single range ; 0 - 20 to 0 - 2000  
 (2) Dual range ; (Auto range switching)  
     Range 1 ; 0 - 20 to 0 - 1000  
     Range 2 ; 0 - 40 to 0 - 2000  
     Range 1 < Range 2; range ratio: 2  
 (3) Single range, 2 flow paths ; 0 - 20 to 0 - 2000



### (4) Dual range, 2 flow paths

Range 1 ; 0 - 20 to 0 - 1000 (flow path 1)

Range 2 ; 0 - 30 to 0 - 2000 (flow path 2)

Range 1 < Range 2

Measurement cycle : One measurement/hour (Measurement schedule is settable at 1-hour unit) or measurement start by external signal.

Display & recording : Digital, touch-screen (Japanese, English, or Chinese) Printing; English only

Items for record : Year, month, day, time; measurement values, measurement parameters; daily report (max., min., averages, number of measurements), etc.

Repeatability : (With calibration solution)

0 - 20mg/L range ; Within  $\pm 1\%$  FS

Over 20, up to

200mg/L range ; Within  $\pm 2\%$  FS

Other ranges ; Within  $\pm 5\%$  FS

Stability : (With calibration solution)

Zero drift ; Within  $\pm 3\%$  FS/day

Span drift

20mg/L range ; Within  $\pm 3\%$  FS/day

Over 20, up to ; Within  $\pm 4\%$  FS/day

200mg/L range

Other ranges ; Within  $\pm 5\%$  FS/day

Installation conditions : Indoors or inside cubicle.

- where protected from exposition to the direct sunlight and weather, and from vibration and shock, allowing sufficient maintenance space and away from noise sources.

- provision of adequate ventilation where corrosive vapors are present.

- provision of air-conditioning where the ambient temperature is 5°C or lower, or 40°C or higher.

Ambient conditions : 5 to 40°C, 85% (RH) or less

Sample conditions :

Temperature : 2 - 40°C

Pressure : 0.02 - 0.05MPa

Flow rate : 0.5 - 3L/min.

Coexisting components : Masking by AgNO<sub>3</sub> is required when the sample contains chloride ion like sea water. Too much chloride ion contained in the sample may precipitate AgCl and affect the measurement. Masking limit by AgNO<sub>3</sub> is 100 times of the full scale. (ex.) The limit is 10g Cl<sup>-</sup>/L at 0 - 20mg/L range.

Reagent consumption (when one measurement/hour)

5mmol/L KMnO<sub>4</sub> solution; approx. 6L for 2 weeks

12.5mmol/L Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> solution; without Na<sub>2</sub>C<sub>2</sub>O<sub>4</sub> cleaning; approx. 3.7L for 2 weeks

with hourly Na<sub>2</sub>C<sub>2</sub>O<sub>2</sub> cleaning; approx. 6L for 2 weeks

H<sub>2</sub>SO<sub>4</sub> (1+2); approx. 3.7L for 2 weeks

AgNO<sub>3</sub> (200g/L); (acidic method) approx. 1.85L for 2 weeks

NaOH (40g/L); (alkali method) approx. 1.85L for 2 weeks

Ammonia water (3.5%); (with ammonium cleaning) approx. 0.2L/cleaning

Input signal : Monitoring station stop, remote start, remote calibration, flow path switching.

Output signal : Measurement values: 4 - 20mA DC (max. load 600 ) and 0 - 1V DC (min. load 100k )

Under maintenance, under calibration, power cut off, abnormal measurement value, pretreatment control, analyzer fault 1, analyzer fault 2, etc.

Power source : 100 - 240V AC± 10%, 50/60Hz

Power consumption : Max; approx. 550VA

Average; approx. 200VA

Structure : Indoor, floor mounting type; Equivalent to IP30

Wetted part material : Hard PVC, PFA, PP, silicone, hard glass

Dimensions : 600 (W) x 600 (D) x 1600 (H) mm

Finishing paint : Munsell 5PB8/1 color

Weight : Approx. 160kg (excluding reagents)

**Utilities**

Tap water : For cleaning and diluting

Temperature : 2 - 35°C

Pressure : 0.1 - 0.5MPa

Consumption : Approx. 5L/measurement

**Options**

No AgNO<sub>3</sub> addition : For sample with no coexisting chloride ion

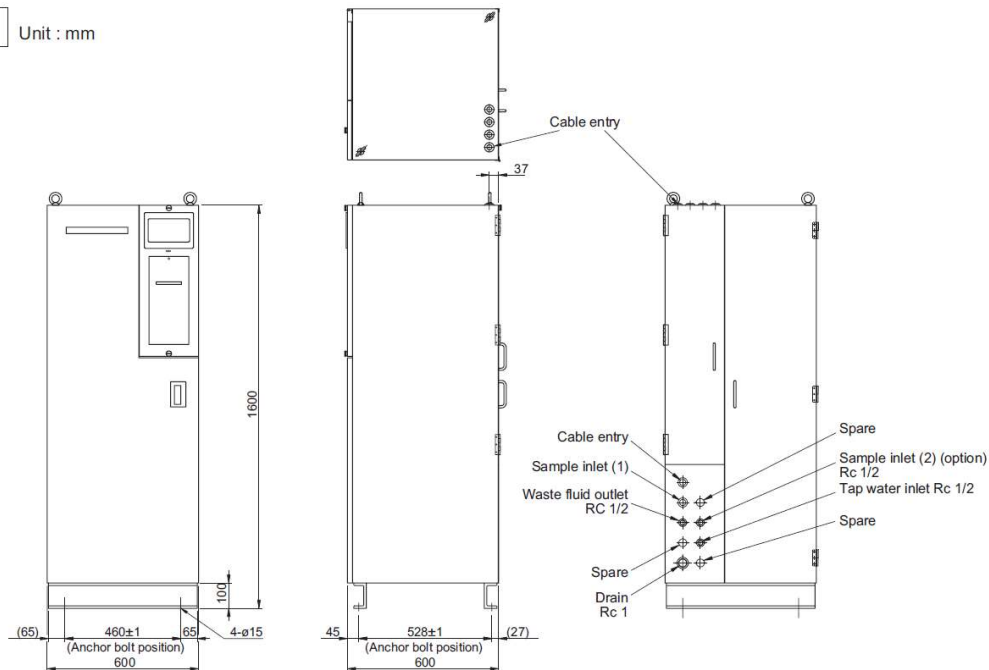
Communication : RS-485 or RS-232C

Ammonia cleaning : For reducing contamination by AgCl, combined with AgNO<sub>3</sub> addition in acidic method

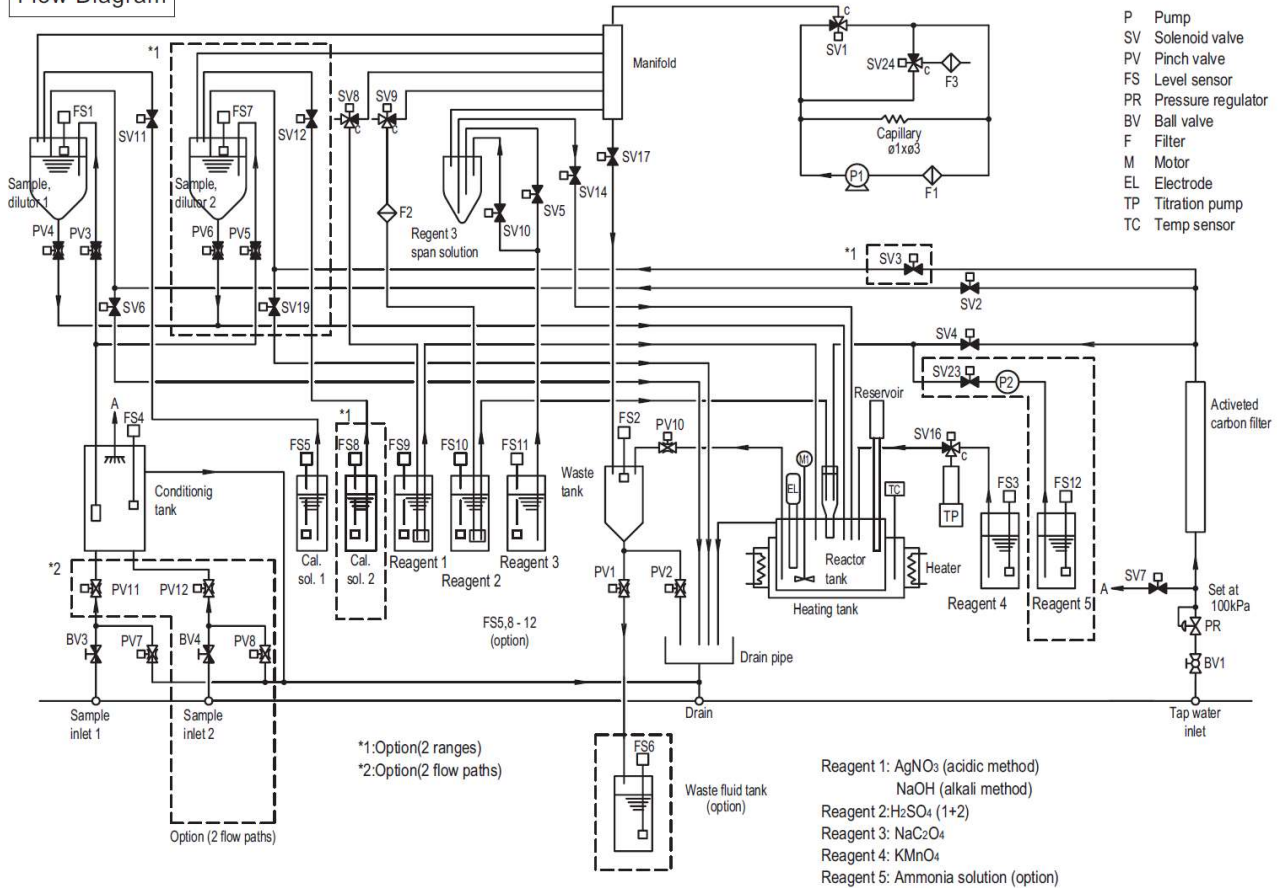
**Options**

Pollutant integrator : Model CALD-2030 calculator

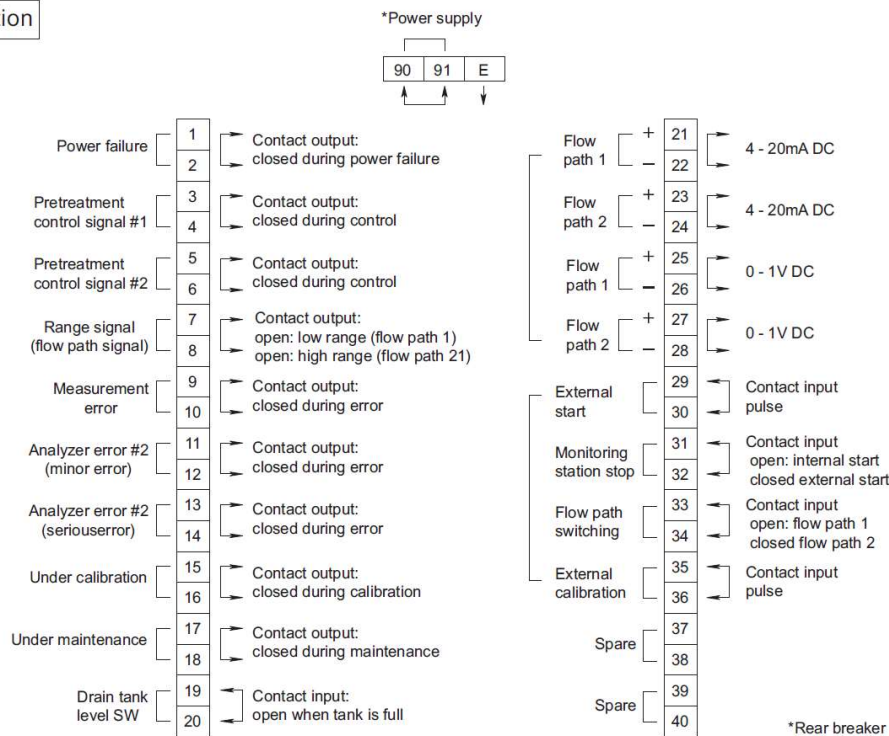
**Dimensions** Unit : mm



### Flow Diagram



### Terminal Connection





## Selection of Specifications

### Power source:

100V AC, 110V AC, 115V AC, 120V AC, 200V AC, 220V AC, 240V AC, or Custom spec. (\*\*1)

### Communication function

None (standard), RS-485 (\*\*2), or RS-232C (\*\*2)

### Measurement method

Acidic method or Alkali method

### Flow paths and measurement ranges

1 flow path with single range, 1 flow path with dual ranges (automatic switching),

2 flow paths with single range, or 2 flow paths with dual ranges

### Measurement range of the flow path 1 in mg/L \*\*3

0 - 20, 0 - 30, 0 - 40, 0 - 50, 0 - 100, 0 - 200, 0 - 300, 0 - 400, 0 - 500, 0 - 1,000, or 0 - 2,000

### Measurement range of the flow path 2 in mg/L \*\*3

0 - 30, 0 - 40, 0 - 50, 0 - 100, 0 - 200, 0 - 300, 0 - 400, 0 - 500, 0 - 1,000, or 0 - 2,000

### Ammonia cleaning function

None (standard) or Provided

### Auto-roller (roll paper)

None (standard) or Provided

### Marking

Japanese (standard), English, or Chinese

(\*\*1) 110 - 120V AC: built-in step-down transformer.

200V AC and over: external transformer.

(\*\*2) Consult DKK-TOA.

(\*\*3) Range 2 must be wider than Range 1. Range 2 should be twice as wide as Range 1 for 1 flow path with dual ranges.

Note 1 Printing is in English only.

Note 2 Consult DKK-TOA for drain pump.

Note 3 Receiving tank is built-in and no external tank is needed.

Note 4 Signal showing running out of reagents is only for acid potassium permanganate reagent tank.

For other reagents, consult DKK-TOA.

Note 5 Consult DKK-TOA if the arrestor to be provided for power source line or transmission line.



**DKK-TOA CORPORATION**



**CAUTION**

Do not operate products before consulting instruction manual.

### International Operations:

DKK-TOA Corporation

29-10, 1-Chome, Takadanobaba, Shinjuku-ku,

Tokyo 169-8648 Japan

Tel : +81-3-3202-0225 Fax : +81-3-3202-5685

<http://www.toadkk.co.jp/english>

Information and specifications are for a typical system and are subject to change without notice.