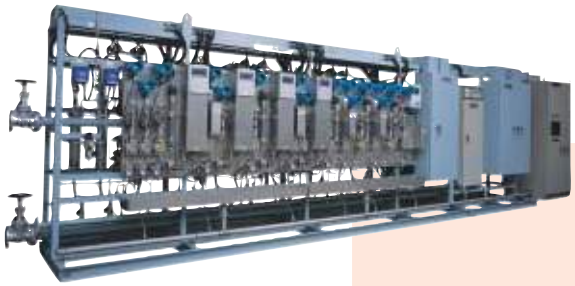
ANALYZERS & SAMPLING SYSTEMS FOR THERMAL POWER PLANT

Power Plant Water Quality Analyzers/Monitoring Systems

DKK-TOA CORPORATION

DKK-TOA assists water quality control at power

DKK-TOA backs up electric supply system that is crucial to life through providing various
have been produced with the aid of technologies and expertise accumulated over the pa
stability and durability



Boiler Water Quality Analyzers & Sampling Systems

Boiler and sampling systems are the heart of power plant and quality control of boiler water is essential to sustain steady plant operation. DKK-TOA provides various types of analyzers such as pH, conductivity, dissolved oxygen, silica, and hydrazine analyzers. Various sampling systems are available to serve wide range of demands.

Analyzers for Wastewater Treatment

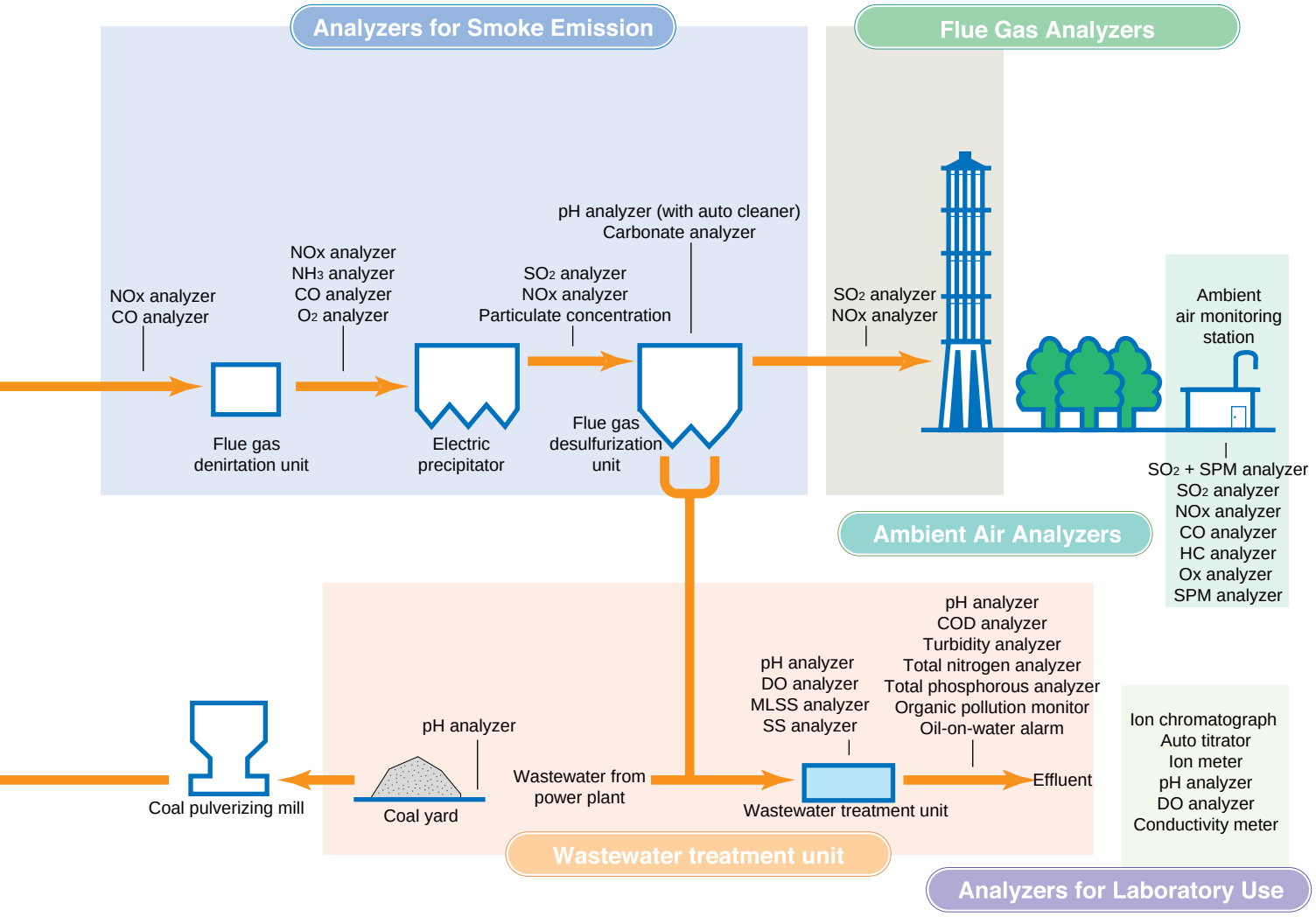
Pollutants such as COD, nitrogen, phosphorus in wastewater are monitored to keep clean environmental water. DKK-TOA is engaged in development of wastewater treatment analyzers and backs up the wastewater treatment, which is essential to sustain environment.

Analyzers for Smoke Emission

pH, SO_2 and NOx analyzers are available for control of flue gas denitration and desulfurization. DKK-TOA provides pH electrode holder with chemical cleaner specially designed for dissolving and removing gypsum slurry as well as other analyzers well designed for process requirements.

plants and preservation of environment.

analyzers. Wide variety of analyzers and sampling systems introduced in this catalogue
ast 45 years since DKK-TOA's foundation and proven to have highest accuracy, reliability,



Flue Gas Analyzer

To control flue gas that has a direct link to the environmental conservation, SO_2, NOx and CO are measured.
DKK-TOA aims to provide analyzers free of maintenance to enable stable continuous measurement over long-term.

Oil-on-water Monitor

Oil-on-water alarm monitors oil out-flow to environment from the plant. Optic sensor continuously monitors water surface and alarm is generated instantly upon detection of oil out-flow.

Ambient Air Analyzer

DKK-TOA has been vigorously engaged in development of ambient air analyzers over the years. Analyzers introduced for power plants embrace technologies and expertise accumulated in DKK-TOA and enable measurement of SO_2, NOx, CO, HC, Ox and SPM.

Sampling Systems for Boiler Water

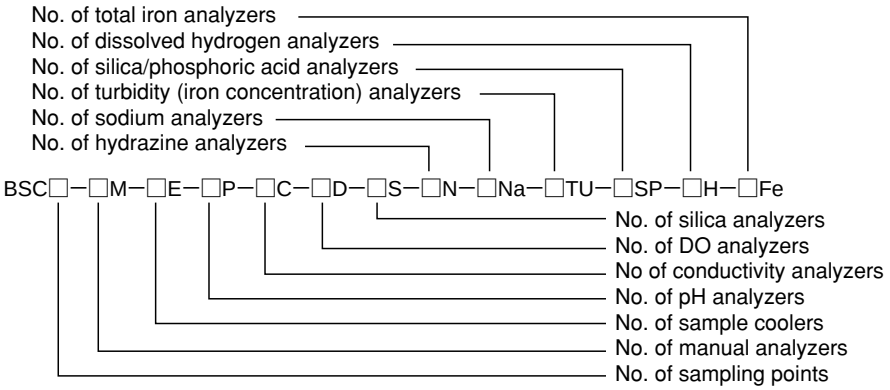
Outlines of the System

Monitoring and controlling of boiler water is necessary for safe operation of the boilers in power generation plants of utility companies and IPP (Independent Power Producer), and waste heat recovering systems. The high-temperature and pressure samples are introduced to the analyzers after reduction to the suitable temperature and pressure. The measurement results are output as transmission signals.

The sampling system adopts automatic temperature compensation system built in the pH transmitter, instead of complicated, expensive, and maintenance-required constant-temperature unit. Also adopted is the flow stabilizing unit, which provides the sample at a stable flow rate even when the incoming sample pressure fluctuates by three times.

Product Coding System and Measurement Items

BSC: Sampling system
BSCX: Automatic sampling system
BCC: Condenser leak detection system



■Measurement Items and Purposes

Measurement Item	Measurement point		Measurent purpose	Examples of measurement range
	Feed water	Boiler water		
pH	○	○	Iron corrodes less at 9.3 to 9.4pH or over, while copper corrodes more at higher pH. To get the optimum pH for boiler by adding pH adjuster prevents corrosion.	2～12pH 4～14pH 6～14pH
Conductivity	○	○	Boiler water gets condensed and needs stabilization in quality by blow, etc. To control the concentration below a certain level enables securing steam purity and preventing scales.	0～20μS/cm 0～100μS/cm
Conductivity after cation	○		To get the sample to pass through cation resin enables conductivity measurement without ammonium, and transform salt into hydrochloric acid, enhancing conductivity as high as three times, thus, facilitates easy detection of sea water in the boiler water.	0～1μS/cm 0～10μS/cm
DO	○		DO in water is likely to quickly corrodes piping materials. To control DO concentration below approx. 7ppb avoids risks of pitting corrosion by DO.	0～20ppb 0～200ppb
Hydrazine	○		Hydrazine deoxidizes DO, which is corrosive. To control hydrazine concentration at 0.01ppm eliminates DO.	0～100ppb 0～500ppb 0～200ppb

Unit:1mS/m＝10μS/cm

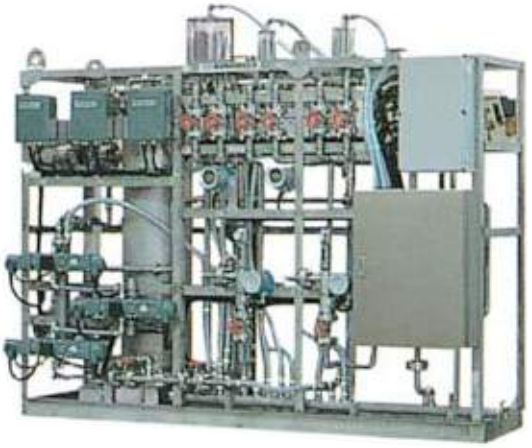
1 Sampling Systems for Boiler Water

Automatic Sampling System for IPP Power Plant (390MW)

Model: BSC12-10M-9E-4P-9C-1D-1N-1S-1TU
[4,200(W)×700(D)×2,100(H)mm]

Sampling System for Geothermal Power Plant (30MW)

Model: BSS3-3M-1E-2P-3TU
[3,000(W)×700(D)×2,000(H)mm]



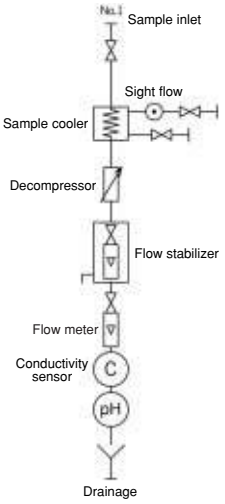
Automatic Sampling System for Super Critical Pressure Boiler (700MW)

Model: BSC4-4M-4E-3P-4C-1D
[1,500(W)×500(D)×1,800(H)mm]

Sampling System for Industrial Waste Treatment Plant

Model: BSC3-3M-3E-3P-3C
[1,100(W)×500(D)×1,800(H)mm]

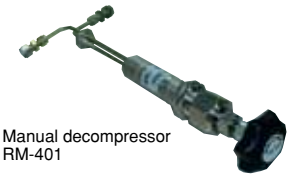
Pole stanchion flow



2 Major Components

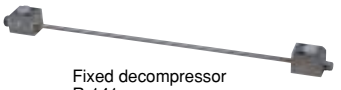
Automatic Decompressor/Manual Variable Decompressor

Automatic decompressor
Model: RA-401



Manual decompressor
RM-401

Manual decompressor
with gauge



Fixed decompressor
R-141

Fixed decompressor: The length of the insertion of the core rod is fixed.
Manual decompressor: The length of the insertion of the core rod is manually controlled.
Automatic decompressor: The length of the insertion of the core rod is automatically controlled for stable sample supply under pressure-varying operation of the boiler.

Sample Cooler

Sample cooler cools high temperature sample down to normal temperature.

Sample cooler
H732
H742

Flow Stabilizer

Combined with decompressor, flow stabilizer keeps inflow of the sample to analyzer
at a constant rate under pressure-varying conditions.

3 Boiler Water Quality Analyzer

pH Analyzer

Model: Transmitter HBM-160, PCP-20T, HBM-100A
Sensor BPC-64 (trace type)
Measurement method: Glass electrode method
(with double temperature compensation)
Measurement range: 2 to 12 pH, 6 to 12pH, etc.

HBM-160

PCP-20T

HBM-100A

BPC-64

Conductivity Analyzer

Model: Transmitter WBM-160, ECP-20T, WBM-100
Sensor A6-13 (Flow-through type)
Measurement method: AC 2-pole electrode method
Measurement range: 0 to 1, 0 to 10.0, 0 to 100, 0 to 1,000mS/cm, etc.

WBM-160

ECP-20T

WBM-100

A6-13

Low Concentration DO Analyzer

Model: Transmitter HBM-160, DCP-21T, OBM-100A/H
Sensor BOC-64
Measurement method: Polarographic method
Measurement range: 0 to 200, 0 to 1,000µg/L, etc.

HBM-160

DCP-21T

OBM-100A/H

BOC-64

Hydrazine Analyzer

Model: Transmitter HYM-300
Sensor BYC-64
Measurement method: Oxidization-reduction electrode method
Measurement range: HYM-300 0 to 999.9µg/L, 0 to 10mg/ L

HYM-300

BYC-64

Dissolved Hydrogen Analyzer

Model: Transmitter DHM-100
Flow cell CLZ-5
Measurement method: Membrane type polarographic method
Measurement range: DH_2: 0 to 2mg/L
H_2O: 0 to 200%

DHM-100

CLZ-5

Analyzers and Related Equipment for Condenser

■Product Coding System for Condenser Leak Detection System

BCC□−□M−□C−□P
- No. of pumps
- No of conductivity analyzers
- No. of manual analyzers
- No. of sampling points

1 Condenser Leak Detection System

Condenser Leak Detection System

Model: BCC2-2M-2P-2C
Model: BCC4-2M-2P-2C
Configuration:
Pumps, bellows, level switches, conductivity analyzers (after cation)

2 Ion Analyzer at Outlet Port of Condensate Demineralizer

Ion Chromatograph

Model: XIC-1000
Measurement method: Ion chromatograph
Measurement path: 5 at max.
Measurement section:
Cation, anion, 1 system each per transition metal
Measurement item: Cl^-, Na^+, SO_4^{--}

3 Sodium Analyzer for Condensed Water

Model: EMNA-10
Measurement method: Ion electrode method
Measurement range:
0.1 to 10, 1 to 100,
10 to 1,000ppb (manual change)

Analyzers for Deionizing

1 pH Analyzer

Model: Transmitter HBM-160, HDM-136A
Sensor UHC-8C
Measurement method:
Glass electrode method
Measurement range: 0 to 14 pH
Installation: Field mount type

HBM-160

HDM-136A

UHC-8C

2 ORP Analyzer

Model: Transmitter HBM-162, HDM-138A
Sensor UHC-8C
Measurement method:
Oxidation-reduction potentiometry
Measurement range: 300 to 700mV, etc.
Installation: Field mount type

HBM-162

HDM-138A

UHC-8C

3 Residual Chlorine Analyzer

Model: CLF-1600
Measurement method:
Polarographic (continuous)
method by eccentric electrode rotation
Measurement range:
0 to 2, 0 to 5mg/L, etc.

4 Turbidity Analyzer

Model: TUF-1600
Measurement method:
Surface light scattering method
Measurement range:
0 to 10, 0 to 20, 0 to 50, 0 to 100ppm, etc.

5 Conductivity Analyzer

Model: Transmitter WBM-160, WDM-136A
Sensor A6-111, A6-112, A6-113, A6-131, etc.
Measurement method: AC 2-pole electrode method
Measurement range: 0 to 0.2, 0 to 0.5, 0 to 1.0, 0 to 5.0μS/cm, etc.

WBM-160

WDM-136A

Conductivity Sensor with Amplifier
Model: AA-111, AA-112, AA-113, etc.
Measurement method: AC 2-pole electrode method
Measurement range: 0 to 1.0, 0 to 20, 0 to 200μS/cm, etc.

Conductivity Sensor with Amplifier
AA-111

A6-131

6 Automatic Silica Analyzer

Model: XAT-200
Measurement method: Molybudenum blue absorptiometric method
Measurement range: 0 to 50, 0 to 5,000μg/L
Measurement path: 1 to 4 (to be specified)

7 Dissolved Oxygen Analyzer

Model: Transmitter ODM-100A, ODM-110A, DCP-21T
Sensor OC-64
Measurement method: Polarographic method
Measurement range: 0 to 2,000μg/L

ODM-100A (2-wire type)
ODM-101A (4-wire type)

DCP-21T

OC-64

Flue Gas Analyzers

1 Flue Gas Analyzer

Model: GIP-250
Measurement method:
SO_2, NOx, CO, CO_2: NDIR; O_2: Zirconia
Measurement range:
SO_2, NOx, CO, CO_2: 0 to 50/100/500/1,000ppm
O_2: 0 to 25%

2 Flue Gas CO/O_2 Analyzer

Model: GCO-200
Measurement method:
CO: Controlled potential electrolysis method
O_2: Galvanic cell method
Measurement range:
CO: 0 to 200ppm
(Settable at 100ppm unit for 200 to 2,000ppm)
O_2: 0 to 25%

3 Process Sulphur Analyzer

Model: HSCA-2000/SCA-200
Measurement method:
Energy dispersion X-ray fluorescence method
Measurement range:
0 to 10, 0 to 500ppm (HSCA-2000)
0 to 0.1, 0 to 5wt% (SCA-200)

Analyzers for Wastewater Treatment

1 pH Analyzer

pH Transmitter

Model: HBM-160, HDM-136A
Measurement method: Glass electrode method
Measurement range: 0 to 14 pH, etc.

HBM-160

HDM-136A

pH Sensor

Model: UHC-7C (Immersion type with ultrasonic cleaner)
UHC-8C (Flow-through type with ultrasonic cleaner)

UHC-7C

UHC-8C

2 MLSS Analyzer

Model: SSD-16□□
Measurement method: Transmitted light measurement method
Measurement range:
0 to 5,000/10,000/20,000ppm (3-range, manual change)

3 Ammonium Ion Monitor

Model: NHMS-4
Measurement method: Ammonium ion electrode method
Measurement range: 0.5 to 100mg/L

4 Turbidity Analyzer

Model: TUF-1600
Measurement method:
Surface light scattering method (continuous)
Measurement range: Selectable from
0 to 2/5/10/20/50/100/200/500/1,000/2,000ppm

5 COD Analyzer

Model: COD-203A
Measurement method:
100℃ digestion with $KMnO_4$ acidified by sulfuric acid, or
100℃ digestion with alkaline $KMnO_4$
Measurement range:
Selectable from
0 to 20/30/40/50/100/200/300/400/500/1,000mg/L

6 Automatic Total Nitrogen/Phosphorus/ COD Analyzer

Model: NPW-160
Measurement method:
TP: Decomposition of potassium peroxydisulofate
- molybudenum blue absorptiometry
TN: Decomposition of alkali potassium peroxydisulfate
COD (UV): 2-wavelength absorptiometry,
UV absorptiometry
Measurement range:
TP: 0 to 20mg/L
TN: 0 to 200mg/L
COD (UV): 0 to 500mg/L

7 Oil-on-water Monitor

Model: SODL-1600
Measurement method: Reflectance measurement of visible light
Measurement item: Oil slick on water surface

Model: OF-1600
Measurement method:
Reflectance measurement of
near infrared ray
Measurement item:
Oil slick on water surface

SODL-1600

OF-1600

Analyzers for Desulfuration

1 pH/ORP Analyzers

pH Analyzer

Model: Transmitter
HBM-160, HDM-136A
Sensor
RHC-7C (S), NHC-893 (S), UHC-7C
Measurement method:
Glass electrode method
Measurement range: 0 to 8pH, etc.

HBM-160

ORP Analyzer

Model: Transmitter
HBM-162, HDM-137A
Sensor
RHC-7C (S), NHC-893 (S), UHC-7C
Measurement method:
Oxidation-reduction potentiometry
Measurement range: 0 to 1,400mV

HBM-162

HDM-136A

RHC-7C (S)

UHC-7C

NHC-893

2 Carbonate Analyzer

Model: XP-1815
Measurement method: NDIR method
Measurement range:
0 to 200mMol/L $CaCO_3$ (intermittent measurement)

Ambient Air Analyzers

Nitrogen Oxides Analyzer

Model: GLN-314E
Measurement method: Chemiluminescence method
Measurement range: 0 to 0.1/0.2/0.5/1/2ppm
Regulations & standards:
US-EPA, EN measurement standards

Sulphur Dioxide Analyzer

Model: GFS-312E
Measurement method: UV fluorescence method
Measurement range: 0 to 0.05/0.1/0.2/0.5/1ppm
Regulations & standards:
US-EPA, EN measurement standards

Ozone Analyzer

Model: GUX-313E
Measurement method: UV photometric method
Measurement range: 0 to 0.1/0.2/0.5/1ppm
Regulations & standards:
US-EPA, EN measurement standards

Non-methane Hydrocarbon Analyzer

Model: GHC-255
Measurement method: Gas chromatograph
Measurement range:
0 to 5/10/20/50ppmC, 4-range auto/manual change

Carbon Monoxide Analyzer

Model: GFC-311E
Measurement method: Gas filter correlation method
Measurement range: 0 to 5/20/20/50/100ppm, auto/manual change
Regulations & standards: US-EPA, EN measurement standards

Particulate Monitor

Model: FPM-222
Measurement method:
Beta ray attenuation method
Measurement range:
0 to 1, 0 to 5mg/m^3
Regulations & standards:
US-EPA

Analyzers for Laboratory Use

pH Meter

Model: HM-25R/30R
Measurement method: Glass electrode method
Measurement range:
pH: 0.000 to 14.000pH
mV: 0 to +/-2,000mV
Temp.: 0 to 100.0℃

Conductivity Meter

Model: CM-25R/30R
Measurement range:
Conductivity: 0 to 200.0S/m (7 ranges)
Resistivity: 0 to 2,000MΩm(7 ranges)
Salinity: 0 to 400%
Temp.: 0 to 100.0℃

Multi-function Water Quality Meter

Model: MM-60R
Measurement item:
pH, ORP, ion, conductivity, resistivity, salinity, concentration, temperature, DO, saturation

Ion Chromatograph

Model: ICA-2000
System configuration: Main unit: ICA-2000 (PC, printer not included.)
Conductivity sensor unit: ICA-200C

Automatic Titrator

Model: AUT-701
Measurement range:
pH: 0.00 to 14.00pH
mV: 0 to +/-2,000.0mV
Temp.: 0 to 100.0℃
Current: 0 to 1,000μA **
Conductivity: 0 to 200.0S/m
Transmittance: 0 to 100.0% **
**: When optional unit is used.

Portable Total Nitrogen/Phosphorus Meter

Model: Main unit TNP-10
Heater TNP-HT
Measurement method: Photo-diode type absorptiometry
Measuring object: TN, TP, COD, PO_4-P, PO_4, NO_3-N, NO_3, NO_2-N, NO_2, NH_4-N, NH_4

Simplified COD Meter

Model: COD-60A
Measurement range: Standard: 0 to 1,000mg/L (6 ranges)
Option: settable at 0 to 10 - 2,000mg/L

Portable Analyzers

Portable Water Quality Meter P30 series

Model: Portable pH Meter HM30P/31P
Portable ORP Meter RM-30P
Portable Elecrtical Conductivity Meter CM-31P
Portable Elecrtical Conductivity/pH Meter WM-32EP
Portable Ion/pH Meter IM-32P
Portable Dissolved Oxygen/pH Meter DM-32P

Portable residual chlorine meter

Model: RC-31P
Measurement method: Polarographic method adopted
Measurement range: 0 to 2.00mg/L

Handheld Multi-parameter Water Quality Meter

Model: WQC-24
Measurement item:
pH, DO, conductivity, turbidity, temp., salinity,TDS, seawater specific gravity, water depth,ORP, chlorophyll, ions (6 kinds)

Low density dissolved oxygen meter

Model: DO-32A
Measurement method: Membrane type polarographic method
Measurement range: DO;0.00 to 19.99/199.9μg/L
0.00 to 1.999/19.99mg/L

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⚠ CAUTION
Do not operate products before consulting instruction manual.

Local Distributor

• Information and specifications are subject to change without notice.
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