FORBES MARSHALL

Complete Water Analysis Solutions

Forbes Marshall manufactures and markets a wide range of water quality analytical systems for use in process, power, refinery, petrochemicals, cement, steel, sugar and municipal water treatment plants. We cater to online water quality requirements for ultra pure water, pure water, waste-water and process applications.

Our expertise

Forbes Marshall introduced online pH and conductivity measurement in the Indian market about 35 years ago. We manufacture, supply, erect and commission water quality analysers. We presently supply thousands of such systems to various market segments that are using these systems for online measurements. The main industry segments we deal with are power, pharmaceuticals, beverage, oil refineries, fertilizers, paper, sugar and textiles.

Our offering

We offer complete solutions for online measurement of pH/ORP, DO/O2 and conductivity/TDS consisting of a set of transmitters, suitable sensors, cable and holder assembly and other water quality analyzers for pure water, waste water or any process applications.

We also provide complete application based packages for monitoring and recoding of desired parameters including controls, if required. A few standard packages are mentioned here.

Aqua SMARTPRo® series Transmitters – Field Type

Type: 2 wire transmitters with intrinsically safe approval

Parameters: pH/ ORP, dissolved oxygen and conductivity / TDS

Ingress protection: field: IP67

Outputs: analog 4/20mA with HART

Power supply: 24 VDC, loop powered

Mounting: 2" pipe / wall

Aqua 2000 Pro Series Transmitters - Panel Type

Type: 2 wire single channel transmitters

Parameters: pH/ ORP, conductivity

Ingress protection: panel: IP54 front facia

Outputs: two 4/20mA

Power supply: 24 V DC, loop powered

Dimensions: 96 x 96 x 86 (w x h x d)

MAC 100 Transmitter

Type: 4 wire single/dual channel transmitter

Parameters: pH/ ORP, dissolved oxygen and conductivity/ TDS, chlorine, turbidity

Ingress protection: IP66

Outputs: max. three 4/20mA and three relays

Power supply: 100 – 230 V AC or 24V DC

Calibration logbook

AquaPro Multichannel Transmitter

Type: 4 wire transmitter with maximum 4 channels

Parameters: pH/ ORP, dissolved oxygen and conductivity/TDS, ozone, free chlorine, turbidity and suspended solids

Outputs: Two 0/4-20 analog outputs per channel (max of 8) and three relays

Integral PID control

Optional output: MODBUS 232, MODBUS RTU, Ethernet IP TCP/IP, device net can open and Profibus DP/V1

Capable of logging 1,000 data points at adjustable times and file extractable through the front USB port

Power supply: 100-230 VAC or 24 VDC

Standard pH Sensors

Range: from 0 to 14 pH

Temperatures: from -10 to max. 140º C

Pressure: from vacuum to maximum 10 bar

Glass sensors with 12mm shaft and various lengths available

Glass Sensors with PEEK body for harsh and waste-water application

Sterilizable, autoclavable and CIP able GLASS sensors for hygienic application

Available with all standard sensor head connections

Note: The features mentioned above may vary according to sensor model / application

Dissolved Oxygen Sensors

Type: Polarographic or Optical (Luminescence)

Range: from 1ppb to 40ppm; 0 to 300% sat

Temperatures: from 0 to max. 130º Deg C

Pressure: 0 to maximum 12 bar for optical and 0 to 6 bar for polarographic type sensors

12mm shaft and various lengths available

Special sensors for waste water applications and trace level detection

Sterilizable, Autoclavable and CIP able sensors for hygienic application

Available with all standard sensor head connections

Note: The features mentioned above may vary according to sensor model / application

Conductivity / TDS Sensors

Range: from 0 to max. 2 S/cm

Temperatures: from -10 to max. 200º C

Pressure: from vacuum to maximum 10 bar

Types: 2 pole contacting conductivity type; 4-pole contacting conductivity type; Toroidal type

Sterilizable, autoclavable and CIPable sensors for hygienic application

Note: The features mentioned above may vary according to sensor model / application

Digital Sensors: ARC Sensors

Parameters: pH/ ORP/ conductivity/ dissolved oxygen

Direct analog and digital/ RS485MODbus output from the sensor head with integrated transmitter

Monitoring of all sensor functions, status of the sensor quality etc

Online and offline calibration function

Configurable using the RS 485 interface with PC, ARC View handheld or by using the Modbus RTU protocol from the process control system

Saves all relevant process information: sensor identity and calibration data, operating hours, cleaning and sterilization cycles, errors and warnings, etc

Note: The features mentioned above may vary according to sensor model / application

Digital Sensors: SMARTSENS Sensors

Parameters: pH/ ORP/ conductivity/ dissolved oxygen

2 wire, loop powered type sensor with integrated transmitter

Zone 0 , IECex approval, T6 for increased safety

HART compatible with full flexibility to the user for programming and calibration facility via the HART hand-held devices

Online and offline calibration possible

Hygienic and corrosion free connectors

The true open standard in fieldbus systems

No special cable needed, these sensors can be connected by any type of VP cables

Note: The features mentioned above may vary according to sensor model / application

Armatures and Accessories

- Fixed type with threaded/ TC/ flanged connection/ dip type holders
- Flow chambers with customized designs
- Retractable with manual or pneumatically operated
- Available in metallic and non-metallic versions
- Available in various Immersion lengths

Conductivity Standards

- Certified standards with traceable calibration from DFM
- Stable for at least 1 year upto 3 years
- Bottle opening time upto 60 minutes
- Available in 300ml glass bottles and 500ml plastic bottles

pH Buffer Solutions

- Up to five year stability
- First class certificate with traceability to international standards
- Convenient 250ml and 500ml plastic bottles with built-in calibration compartment
- Available in from 1.09 pH to 12.00 pH values
- Immune to micro-organism

Total Organic Carbon (TOC) - FM TOC 101

- UV pursulphate oxidation by TIC removal
- Range: 0 to 10,000 ppm (please consult factory for higher range)
- Accuracy: +/- 2 % of span
- Outputs: 4/20mA; two relays and RS232 / RS485 / Profibus
- Power supply: 100 To 240 VAC 50/60 Hz
- Calibration: automatic, inbuilt
- Cleaning: automatic Inbuilt
- Measurement Mode : continuous online Type
- Comply to EPA 415.2 standard

Oil in Water Analyzer - CX1000-6011/21/31

UV fluorescence based (reagent and chemical free analysis)

Range: 0 to 10/100/1000 ppm

Accuracy: +/- 5 % of FS

Outputs: 4/20mA; two relays; RS232/ RS485

Power supply: 100 to 240 VAC 50/60 Hz

Response time : <10 sec

Cleaning: automatic, inbuilt

Autozero: autozero during clean cycle

Calibration: manual against lab standard

Chemical Oxygen Demand (COD) - CX1000-3011/21/31/51

UV absorption based (Reagent and Chemical free Analysis)

Range: 0 to 200/800/2000/5000 PPM

Accuracy: +/- 5 % of FS

Outputs: 4/20mA; two relays and RS232 / RS485

Power supply: 100 to 240 VAC 50/60 Hz

Response time: less than 10 seconds

Cleaning: automatic, inbuilt

Calibration: manual against lab standard

Auto-zero: auto-zero during clean cycle

Standard: in accordance with DIN3804 C3

Nitrate Analyzer - CX1000-8031/11/21

UV absorption based (reagent and chemical free analysis)

Range: 0 to 30/10/250 PPM

Accuracy: +/- 5 % of FS

Outputs: 4/20mA; two relays and RS232 / RS485

Power supply: 100 to 240 VAC 50/60 Hz

Response time: less than 10 sec

Cleaning: automatic, inbuilt

Calibration: manual against lab standard

Auto-zero: auto-zero during clean cycle

Silica Measurement - 2230 Colorimetric type

- Range: 0 to 5000 ppb
- Accuracy: +/- 5% of reading or +/- 0.5 ppb
- Outputs: 4/20mA; two relays and RS232 / RS485
- Power supply: 100 To 240 VAC 50/60 Hz
- Calibration: automatic, inbuilt
- Grab sample facility
- Communication: RS232 for data reporting
- Reagent consumption: 1ltr / 45 days

Sodium Analyzer - 2111LL/XP

Ion selective type

Range: 0.001ppb to 10ppm/ 0.1ppb to 10 ppm

Accuracy: +/- 5 % of reading

Outputs: two 4/20mA (for sodium and temperature); two relays

Power supply: 100 To 240 VAC 50/60 Hz

Calibration: dual Known addition (DKA)

Response time: < 2 min

PH buffering: non-contract type diffusion tubing / pump-less delivery

Reagents: DIPA solution / ammonia

Hardness Analyser - 2120XP

Ion selective type

Range: 25 ppb to 500 ppm

Accuracy: +/- 10 % of reading or +/- 10 ppb

Outputs: two 4/20mA (for hardness and temperature); two relays

Power supply: 100 to 240 VAC 50/60 Hz

Calibration: dual known addition (DKA)

Response time: < 2 min

PH buffering: non contract type diffusion tubing / pump-less delivery

Reagent: formic acid

Fluoride Analyser: 2109XP

Ion selective type

Range: 10 ppb to 200 ppm

Accuracy: +/- 10 % of reading or +/- 10 ppb

Outputs: two 4/20mA (for fluoride and temperature); two relays

Power supply: 100 To 240 VAC 50/60 Hz

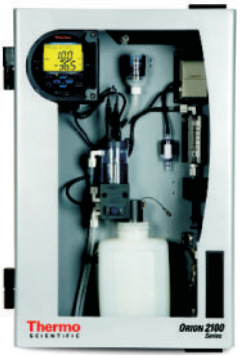
Calibration: dual Known addition (DKA)

Response time: < 2 min

PH buffering: non contract type diffusion tubing / pump-less delivery

Reagent: formic acid

Chloride Analyzer - 2117 XP/ LL



Ion selective type

Range:0.1 ppm to 100 ppm/ 5 ppb to 10 ppm.

Accuracy: +/- 10 % of reading

Outputs: two 4/20mA (for chloride and temperature); two relays

Power supply: 100 to 240 VAC 50/60 Hz

Calibration: LL model dynamic calibrator

XP model : dual known addition (DKA)

Response time: < 2min

PH buffering: non contract type diffusion tubing / pump-less delivery

Reagent: formic acid

Free Residual Chlorine Analyzer - OPTISYS CL 1100

- Potentiostatic ampearometric measurement with fast response time
- 0 to 5 ppm
- Membrane - free sensor for long term stability
- Automatic sensor cleaning for good accuracy and minimum maintenance
- No sample preparation or adding of reagent
- 3 analog 4-20 mA output and 3 programmable relays
- No electrolyte required
- Maintenance free system
- Accuracy: +/- 2% of full scale

Turbidity Analyzer - OPTISYSTUR 1050

Precise turbidity measurement through the 90º scattered light method

Range: 0.02...100 NTU / FNU or 0.02...1000 NTU / FNU

Measurement with EPA compliance

Minimum maintenance due to automatic ultrasonic cleaning system

Traceable simple calibration with reusable liquid calibration cuvettes/ Do not use dangerous formazine

Fast calibration in less than 15 minutes

Accuracy: +/- 2% of reading for < 40 NTU
+/- 5% of reading for > 40 NTU

Calibration: reusable liquid calibration cuvettes for online calibration

Turbidity Analyzer - FMTSC-10(E) & FMTSC-Mx(E)

- P90 degree scattered light method
- Range: 0 to 500 NTU; 20 to 10,000 NTU
- Measurement with EPA compliance
- Accuracy: +/- 5% of reading
- Single point calibration with distilled water
- The built-in wiper cleaning system easily keeps the lenses clean
- The optical windows are made of hard-to-scratch sapphire glass. This facilitates scrubbing of the window surface to keep the turbidity sensor clean
- SS316L sensor with sapphire glass as measuring head, cable length of 10m and IP68 protection

Total Suspended Solids analyzer - FMSC-T4

Method: 180° IR absorption type.

Range: 0 to 1000 mg/l

Accuracy: +/- 3% of measurement

Built in wiping cleaning system certainly keeps lenses clean.

Easy to clean scratch –proof Sapphire glass for optical windows.

Compact size can fit into any installation site

SS316L sensor with Sapphire glass as measuring head, cable length of 10m and IP68 protection

Heavy Metals Analyzers - CL1000 Series

Parameter: Al, Cu, Fe, Mn, Ni, Zn, sulphate, cyanide, high range silica, phosphate, chromium

Method: colorimetric IR LED absorption

Accuracy: +/- 2% of absorption value

Measurement interval: programmable interval, continuous or discrete

Measurement time: about 15 min each cycle

Outputs: analog outputs, relays contacts

High range: Inbuilt auto dilution facility to measure higher ranges of parameters

DO Based Efficient Aeration Control System for ETP/CETP for:

- An efficient aeration system
- Optimisation of process parameters
- Monitoring, recording, report and analysis of ETP aeration parameters
- Meeting Pollution Control Board norms
- Avoiding environmental hazards
- Reduction in the operational cost of the ETP
- Reducing manpower requirement and its dependency
- Reduction in electricity bills

pH/DO/Conductivity measurement with automatic sensor cleaning system for demanding applications

Option of manual mode of operation during maintenance

Pneumatically retractable holders with feedback mechanism for 12mm sensors

Choice of metallic and non-metallic holders MOC; SS, PVDF, PP and PEEK

Choice of various process connections; Flanges, NPT threads, Tri clamps or special as per process requirement

Telescopic arrangement with excellent guidance and short travel of insertion tube

No Sensor – no insertion, thanks to integrated sensor detection

Complete separation between pneumatic drive and rinsing chamber

AirMAX

Oxygen based nitrogen purity / trace level and O_2 measurement applications

Direct mounting type instead of extractive type

Quick results as sampling system/lines are not required

Maintenance-free O_2 sensor with luminescence principal

Integrated electronics with direct output from the O_2 sensor head

Sensors available for safe as well and hazardous area applications

Option of second pressure input possible for pressure compensation

Programmable display as per application requirement

Multi-Parameter Analyser: CX 1000 series - 39xx

Online measurement of COD/BOD/TSS/pH for waste-water treatment plants

Method: COD/BOD/TSS: UV-VIS absorption dual beam spectrophotometry at 190~750nm

pH : Potentiometric with combination pH sensor

Auto zero calibration for COD/BOD/TSS with OFFSET correction

Automatic cleaning function, User programmable

Reagent & chemical free analysis

Accuracy: COD/BOD/SS: ± 5% - 10% of F.S.
pH: ±0.1 pH

Display type: touch screen, alpha numeric display 240 x 128 pixels LCD with backlit

Response time: within10 Sec

Analog output: 0/ 4-20 mA DC, isolated

Power supply: 110- 230V AC,50Hz, 30 VA

Digital output: RS 232/ RS 485

Notes

More than analysis, complete solutions for:

Pure Water Applications

Boiler feed water
DM water
Boiler blow down
Condensate
RO water

Drinking Water Applications

Turbidity measurement
Residual chlorine measurement at distribution point
Active Chlorine Measurement at chlorination point

Waste-water Applications

pH control in neutralization pit
DO Control in aeration tank
Filter back wash control
Nitrification/ denitrification
Desludge control of primary clarifier
Chemical dosing control in clarifiers

Pharmaceutical Applications

pH/DO in fermentation process
TOC in WFI
pH in bulk drug
Uncompensated conductivity in WFI

Industry Segment

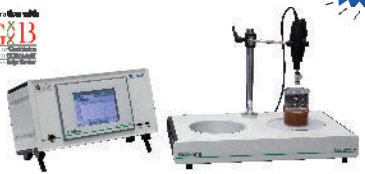
Thermal power
Nuclear power
Steel industry
Chemical industry
Petrochemical
Refineries
Alumina refinery
Sugar industry
Textile
Pulp and Paper Industry
Food and beverages
Dairy
Breweries
Fertilizers
Municipal sewage treatment
Cement industry
Automobiles
Tanneries

www.forbesmarshall.com/pasales

Biochemical Oxygen Demand Analyser - BioSens

New Patented Technology

In technical collaboration with IGIB



Quick biodegradation of contaminants in sample using patented BioSens membrane

BOD analysis within 40 minutes

No need of dilution, incubator or titration

No need of hazardous chemicals and multiple glassware

Shows direct reading in mg/l with advanced features for data analysis

Less power consumption

Ouput: USB, printer, Ethernet ports

Power: 230V AC

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