FORBES MARSHALL

Automation Solutions for the Water and Wastewater Industry

Energy Conservation | Environment | Process Efficiency

www.forbesmarshall.com

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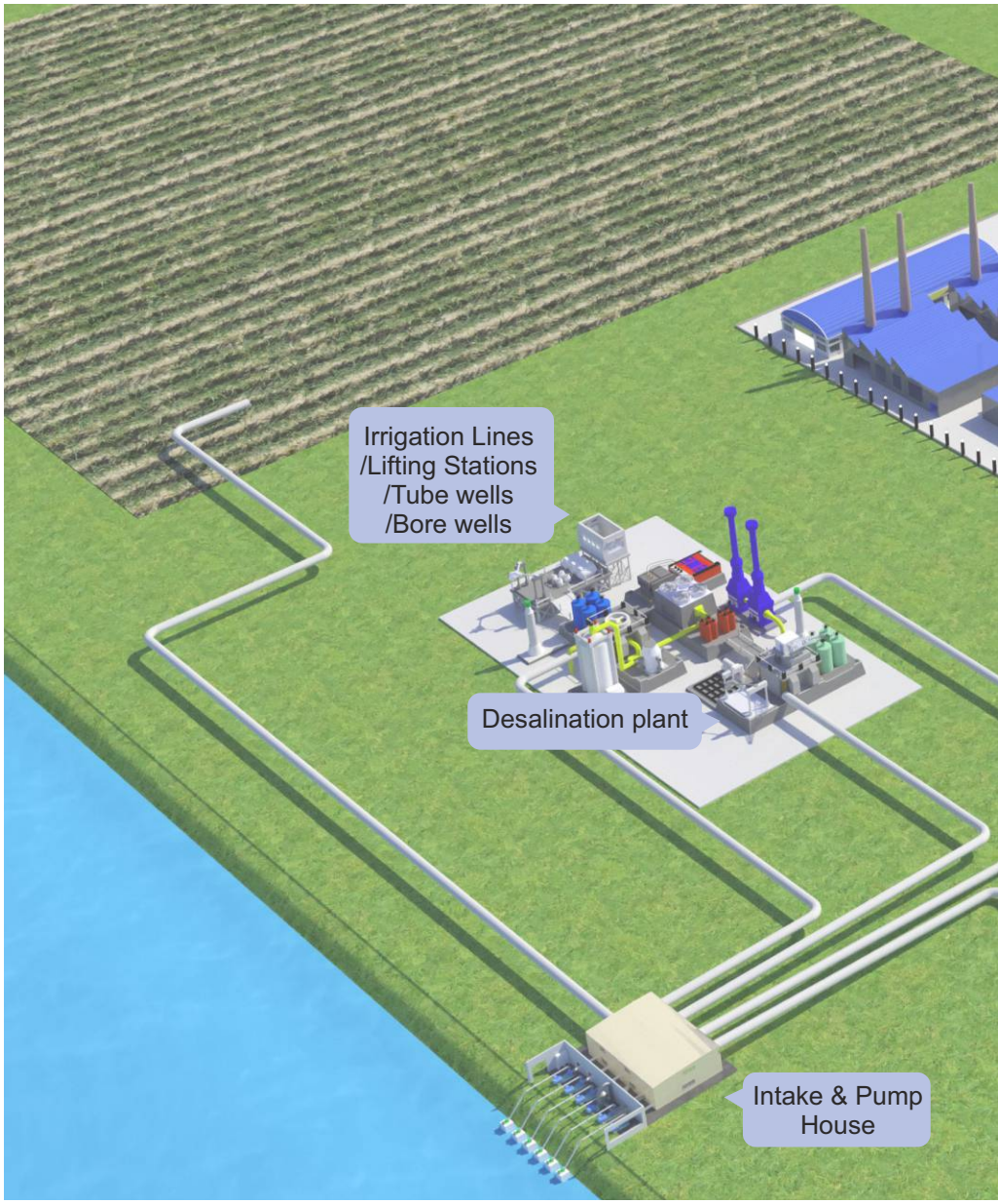


Water is the most precious natural resource. As the world develops, population increases and the demand for fresh water keeps increasing.

Only 3% of the earth's water is fresh and non-saline of which only 31% is accessible.

However, all fresh water is not safe – in developing countries, a high percentage, some studies say 90% of sewage and 70% of industrial waste, is released untreated into rivers.

Forbes Marshall provides a complete range of solutions for water, drinking water, wastewater, effluent and sewage water applications. With optimally designed measurement technology we help our customers to improve the efficiency of their water systems. Our systems are customised to suit customer requirements for a wide range of applications.

Application Areas

Intake and Pump House

Metering

Controls

SCADA solutions

Water Treatment Plants

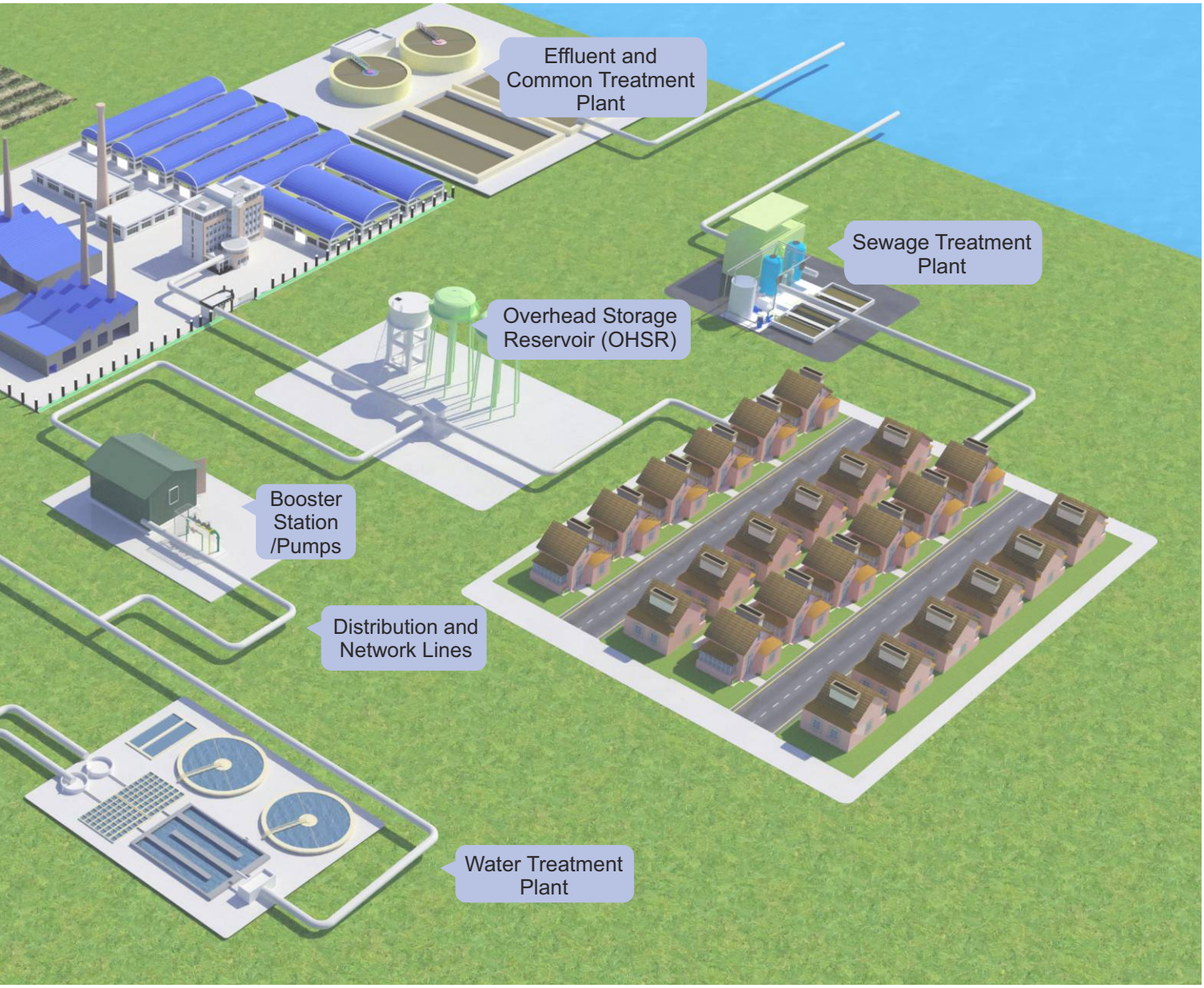
Analytical and automation solutions for effective WTP operation

Irrigation Lines / Lifting Stations / Tube Wells / Bore Wells

Wireless systems and monitoring for flow and pressure

Booster Stations / Pumps

Control and measuring systems



Overhead Storage Reservoirs (OHSR)

Automatic control of flow and level with central monitoring

Effluent and Common Treatment Plants

Integrated metering and monitoring solutions with SCADA

Desalination Plants

Analytics, Metering, Valves

Control Systems

Distribution and Network Lines

Leakage monitoring and NRW measurement

Sewage Treatments Plants

Cost Effective and statutory compliance solutions

Control systems

Water quality analytics

Product Offerings

	Products	Intake and Pump House	Irrigation Lines/Lifting Stations/ Tube wells	Water Treatment Plant	Booster Stations/ Pumps	Overhead Storage Reservoirs (OHSR)	Distribution and Network Lines	Sewage Treatments Plants	Efluent and Common Treatment Plants	Desalination Plants
	Electromagnetic flowmeters	✓	✓	✓	✓	✓	✓	✓		✓
	Ultrasonic/Guided wave radar level meters			✓		✓				✓
	Battery powered magmeters	✓	✓			✓	✓			
	ER PLC & RTU Control systems / SCADA systems	✓	✓	✓	✓	✓	✓	✓	✓	✓
	DCS (SX series) - control systems	✓		✓	✓				✓	✓
	Accelerometers/ Velocity - vibration transmitters	✓	✓	✓	✓					
	VibTrans™R multichannel vibration rack	✓	✓	✓	✓			✓		✓
	VibAssist™ software for analysis	✓			✓					
	Valves					✓				✓
	pH/Cond./ TDS/ DO_2 analyser	✓		✓		✓	✓	✓	✓	✓
	Ozone / CLO_2 analyser (Free residual Chlorine)			✓		✓	✓	✓	✓	✓
	COD							✓	✓	
	BOD							✓	✓	
	TSS			✓				✓	✓	
	Ammonia / Ammonical Nitrogen analyser							✓	✓	
	Total Phosphorus / Total Nitrogen							✓	✓	
	Heavy metals			✓				✓	✓	
	Sludge level and Density monitors							✓	✓	
	Pressure Transmitters	✓	✓	✓	✓		✓	✓	✓	✓
	Level switches			✓				✓	✓	
	Pressure gauges	✓	✓	✓					✓	✓

Flow

Electromagnetic Flowmeter

KROHNE Marshall's electromagnetic flowmeters have been an industry standard for the last 35 years for flow measurement of conductive liquids

Mains powered electromagnetic flowmeters are available in sizes ranging from DN 2.5 to DN 3000. They have diverse applications in water and waste water management.

Smart signal convertors, which are an important part of a flow measuring system, are available in various versions to suit different site requirements. They are state of the art, user friendly and compatible with PLCs, SCADA and RTUs. We offer both mains power as well as battery powered flowmeters.

Level

Guided Wave Radar Level

We offer a wide range of guided wave radar level sensors which serve various applications like accurate level measurement of OHTs, sumps, GSR, water reservoirs in the water and waste water industry

The probes are suitable for various operating conditions and not affected by physical properties like di-electric constants, density and conductivity. Level can be measured accurately in tanks at height upto 20 meters. The robust and rugged design withstands open to environment installation. Smart transmitters enable communication with higher level hierarchy of automation.

Analytics

Online Multi-parameter Analyser

This state of the art water monitoring system is specially designed for high reliability and low operating cost with less footprint area

The multiparameter analyser features a UV_VIS absorption spectroscopy or fluorescence based sensor to monitor various parameters like COD, BOD, TSS, oil, colour, TOC, phenol, etc. They come with built in units for data transmission to pollution control boards as per statutory requirements.

Aqua Series 2/4 – Wire Transmitters for pH / ORP, Dissolved Oxygen and Conductivity/TDS

The Forbes Marshall Aqua series range of transmitters are micro controller based transmitters with HART compatibility for continuous and reliable measurement of vital parameters like pH / ORP, dissolved oxygen and conductivity / TDS and temperature

The Forbes Marshall Aqua4Trans is a versatile 4 wire transmitter to measure various analytical parameters. It offers single as well as dual channel measurement with flexible combinations and is suitable for field as well as panel mounting .

The Aqua4Trans is a new age solutions that covers the needs of almost every industrial process under water chemistry

Turbidity / Suspended Solids Analyser

Forbes Marshall turbidity analyser is used to monitor the clarity of water in drinking and potable water at various locations in water treatment as well as in waste water treatment plants.

These sensors are compact and robust, to suit every application. They are available in panel as well as field mounting variants. Maintenance in minimum due to built in wiper cleaning system which keeps the sapphire glass optical windows always clean.

Free Chlorine Analyser

Membrane free chlorine sensors without the need for electrolyte and maintenance

Built in pH compensation is an add on feature

Potentiostatic amperometric measurement with quick response time

Sensors for chlorine measurement

Multichannel transmitter options also available

Automatic sensor cleaning for accuracy and minimum maintenance

Heavy Metal Analyser

Our heavy metal analyser is an ideal solution for measurements of parameters like aluminum, copper, iron, manganese, nickle, zinc, sulphate, cyanide, high range silica, phosphate and chromium (Cr6)

It operates on the colorimetric IR LED absorption method

Measurement can be at programmed intervals, continuous or discrete, with a cycle time of 15 minutes

It comes with an Inbuilt auto dilution facility for higher measurement ranges

Total Phosphorus / Total Nitrogen Online Analyser for Nutrient Monitoring

The Total Nitrogen (TN) / Total Phosphorus (TP) analyser is a true measurement analyser for monitoring of TN or TP in water

Total Nitrogen= Organic nitrogen + Ammonia (NH_3) + nitrate (NO_3) + nitrite (No_2)

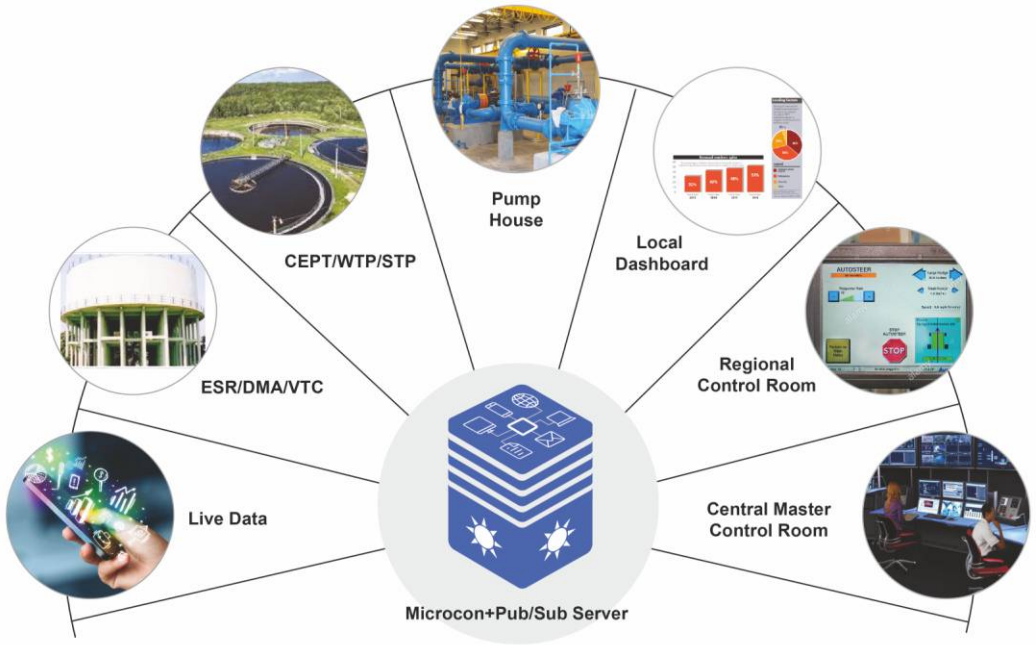
Total Phosphorous = Organic Phosphorus + Inorganic Phosphorus Compounds in Water

Both these analysers use spectrometer / spectrophotometer for stable measurements. There is no interference from chromaticity or turbidity and no additional compensation required.

SCADA Solutions

Cloud Based SCADA for Effective Data Management and Analysis

For cost effective data collection across many small measurement and controls like water distribution centres of a village ,district measurement areas or irrigation projects.

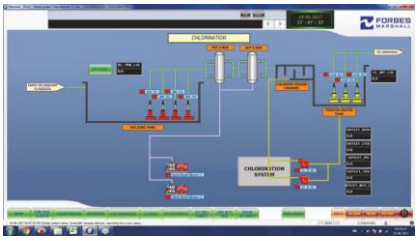


The Architecture

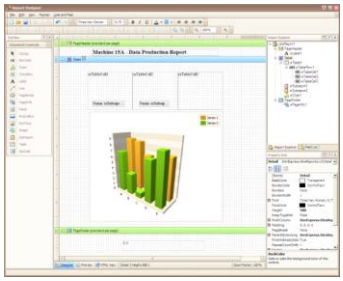
ProView Software

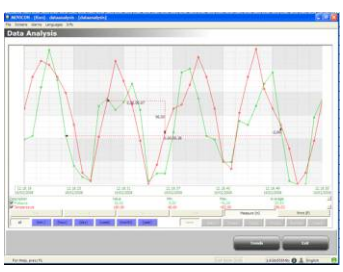
microcon revolutionises the concept of industrial supervisors. The ProVue software provides a vast variety of tools for creating powerful visualisation and control projects with a few clicks. It also incorporates the most innovative technologies to enable your application easily integrate with the entire world, both in distributing information for enterprise information management systems (MES, ERP) and distributing information to local or remote clients across the web. The system can be accessed safely from any part of the world, any platform with real "web-enabled" architecture exploiting java security. ProVue software can be integrated from I/O control to local HMI, from supervision to analysis for managing and optimising productivity.

Effective HMI

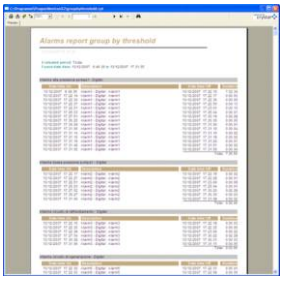


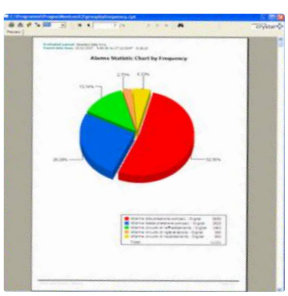
Ready To Use Reports





Effective Alarm Analysis





When information needs to be managed across multiple plants and geographical areas, completely scalable central monitoring software can be utilised to bring about effective capacity utilisation.

Geo Map with Realtime Plant Information

GIS mapping

Dashboards

To keep a constant eye on KPI and OFE key performance indicator operator equipment efficeincy

Web Reports

To generate useful information on the fly

Control Hardware

Remote Terminal Unit (RTru201)

The advent of Industry Internet 4.0, demands intelligent plants capturing raw data and translating it into information just before connecting it to a cloud / central server

The Forbes Marshall RTru201 works as an integral device with edge computing, with built in PLC and modem to drive IIoT enabled ecosystems

The RTru201 collates raw parameters from multiple processes and utilities, derives Key Performance Indicators (KPIs) and Key Result Areas (KRAs) from them, enabling proactive decision making on-the-go

ER Series Programmable Logic Controller (PLC)

The ER series PLC can perform both small PLC functions such as data transmission, comparison, calculations, cycling, sub-programme calling, network communication and multiple-layer nesting, as well as mid sized and large PLC functions like SP tilt, PID control and soft-start. It not only performs close loop analog control over temperature, pressure, flow etc., but also motion control over position, speed, acceleration, etc.

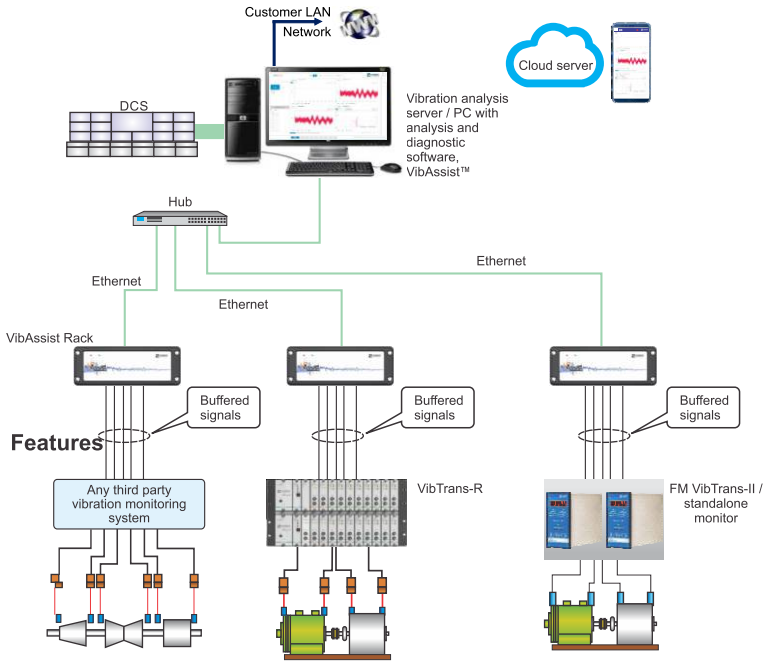
microcon Distributed Control Systems

Forbes Marshall's Microcon+ is a modern state-of-the-art DCS to meet current needs and cater to future expansions

It features the best speed, open architecture and reduced hardware cost, all as part of the standard integrated offering. It protects your initial investment in hardware, software and installation, while minimising life cycle costs and also protects your system even in the harshest industrial environments, and ensures reliability with optimal uptime.

Vibration Monitoring

Vibration Analysis and Remote Monitoring System



Vibration monitoring systems from Forbes Marshall comply with ISO and API670 standards. They are equipped with advanced analysis and diagnosis software to check machine performance. Reports are available as FFT spectrums, orbit plots, Bode plots, vector plots, etc. Remote analysis through web connectivity helps reduce plant downtime.

VibTrans™R

The VibTrans-R 19" Vibration Monitoring Rack, is the latest technology for maintaining safety in large industrial rotating machines

It is a simple cost effective machinery protection system. It provides online information which can be connected with the PLC or DCS of a plant and plan a proper shut down

It is ideal for bearing housing / casing vibration monitoring on pumps, fan, motors, gear boxes, crushers and blowers

Loop Powered Velocity Sensor

Forbes Marshall velocity sensors are internally amplified i.e. two wire loop powered 4-20mA transducers proportional to peak or RMS velocity

They are available in a wide range of frequencies, amplitude and temperature range and do not need signal conditioners

Piezoelectric Accelerometer

Forbes Marshall piezoelectric accelerometers are used to measure vibrations of rotating machinery supported by anti-friction bearing which include high frequencies. Piezoelectric pickup is standardised to a sensitivity of 100mV/g

Precision Measurement

Pressure Gauges

Fofbes Marshall offers a wide variety of pressure gauges:

MS casing with brass internals (process temperature max 100 deg C and no dampening / vibration on equipment) sizes recommended 2", 2.5", 4", 6"

SS case with brass internals with glycerine (process temperature max 100 deg C and sizes recommended 2.5", 4" (both back and bottom)

SS case with SS internals with glycerine (process temperature max 150 deg C and sizes recommended 2" and 2.5" (both back and bottom)

SS casing with SS internals with and without glycerine (process temperature max 200 deg C sizes recommended 4" and 6" (both back and bottom)

Pressure Transmitters

Standard version pressure transmitter output of 4mA to 20mA for fixed range applications

Process connection of ¼" BSP(M)

Process temperature is max 100 deg C

Smart Pressure Transmitter

Pressure transmitter for standard pressure and level applications

Compact design with recessed stainless steel diaphragm and optional display module

Range
0.1…100 psi

Connection
Thread: G1⁄2, 1⁄2 NPT (male, female)

Output
2-wire 4…20 mA/HART®

Hydrostatic Level Transmitters

Submersible level probe for water and wastewater applications

For continuous hydrostatic level measurement in basins and wells

With corrosion-resistant ceramic measuring cell

Level (water)
1…20 m

Pressure Range
0.1…10 bar

Output
2-wire, 1 x 4…20 mA, HART®

Pressure Switches

Aluminium housing with standard range pressure switches up to 10kg/cm /bar pressure switch is available. This switch is ON and OFF control only. Micro switch electrical rating is standard.

Training

Forbes Marshall has always believed in the practice of empowerment through knowledge and technical skills. Training programmes are a way of life at Forbes Marshall. All personnel undergo sufficient training. When new products are launched, Forbes Marshall engineers from all over India are given essential training to become product experts.

Since customers need to be well acquainted with the benefits and working of their products, customer-training programmes are conducted on-site as well at our head office campus.

Customer Service

Because we believe in serving our customers above and beyond their expectations, Forbes Marshall has earned the loyalty of customers for generations. We have a large network of sales and service engineers dedicated to customer care and service in India and abroad. Our Customer Support Department engineers follow an elaborate complaint monitoring system to log and attend service complaints promptly.

This system is integrated with organisation wide ERP for effective resolution and communication with our customers.

Manufacturing Facilities

We have 4 benchmark manufacturing facilities in India and one in the UK. Our state-of-the-art manufacturing facility at Chakan spread over 52 acres, manufactures among other things, emission and pollution monitoring equipment, high efficiency biomass and waste fuel boilers, DCS and control systems, vibration monitoring systems, skids for gases and steam and variety of steam system products and all types of valves. The campus is a mirror of what the Forbes Marshall group stands for. It reflects high technological and global standards.

Our new expanded KROHNE Marshall facility is truly world class with NABL accredited calibration rigs and automated manufacturing processes following KROHNE worldwide standards, for manufacturing flow and level instruments.

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Forbes Solar
Forbes Vyncke
Forbes Marshall Steam Systems

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