Energising Power
Solutions for the Power Industry

COOLING TOWER
Pure Water Analysis

BOILER HOUSE
Boiler Automation and Efficiency Monitoring System

TURBINE
Pure Water Analysis

COAL HANDLING PLANT
Coal Mill Analyser

DM PLANT
Pure Water Analysis

ECONOMISER
Trap Management System

ASH HANDLING PLANT
Demand Controller (MAC)

COMPRESSOR HOUSE
Free Air Delivery Measurement (FAD)
**Trusted Partners**

**Innovative Solutions**

**Trusted Partners**

For over 70 years, we have partnered the Industry in providing solutions in control instrumentation, energy conservation and environmental monitoring. Our teams of the finest engineers are dedicated to serve process industry across diverse sectors. World class manufacturing facilities and technology enable us deliver quality solutions globally. Our unique complementary expertise enables us engineer customised systems that improve manufacturing processes, conserve energy and are environmentally sustainable. We partner customers with our knowledge, comprehensive range of services, products and solutions for utilities and process control.

**Energy Conservation, Environment, Process Efficiency**

At Forbes Marshall we are focused on bringing together our knowledge, people and expertise in Steam Engineering and Process Control to deliver energy efficient solutions that are environment friendly. Energy Conservation Audits, design of steam and process control systems have enabled customers improve their processes and conserve energy. From high efficiency boilers to steam traps and condensate pumps our range of products encompass the complete steam loop efficiently. Improving and sustaining process efficiency is at the core of our process control solution. Our complete range of control valves, flow metering and DCS form the vital elements of process control solutions. Our wide range of advanced technology instrumentation for continuous emission monitoring and plant safety equipment is capable of meeting today’s tough environmental and legislative demands.

**Ensuring Clean, Safe & Efficient Power**

Any power plant today need to run safely, with maximum efficiency and ensure a clean and green environment. Forbes Marshall expertise in the field of control Instrumentation along with its decade of experience in the field of energy efficiency forms a perfect combination to ensure that power plant runs at more than 90% of the rated efficiency. Our condition monitoring helps improve uptime of the turbine & other rotating equipment. Our measurement solution help in decision making through analysis & control of any parameter in the process to achieve the rated efficiency.

Forbes Marshall will help you overcome each of these problems with world class products and systems that are specially designed.

We offer our services in handling your expansion needs as well as contribute to setting up new power plant.

We can improve the working of your existing equipment or handle your requirements, all this at very high engineering standards, taking care of safety aspects and caring for the environment. Discover a big spectrum of products for the Power Industry, ranging from Flow meters, Level Transmitters, Control Valves, PRDS Station, Desuperheater, Isolation Valves, Safety Valves, Drain Valves, Gate/Globe/Check/Ball Valves, Distributed Control System, Vibration Monitoring System (TSI), Flue Gas Analysers, Steam and Water Analysis System (SWAS) & Water Quality Analysers etc.

Also, with our in-depth know-how of energy systems, we are able to deliver great saving opportunities to our customers & achieve energy efficiency by providing Energy Audits.
Market leader in Pollution Monitoring

Direct connectivity to CPCB/SRPCB server via Blackbox unit.

**1000+ Blackbox connectivity in CPCB Server**
- 4000 Oudt Monitor
- 2250 flue gas analysers
- 350 Gas flow monitors

**Benefits**
- No sampling, heating or conditioning of flue gases required.
- Seamless data transfer to CPCB/SRPCB server.
- Low power consumption
- Continuous data availability.

Steam & Water Analytics (SWAS)

pH, Conductivity, Sodium, Dissolved Oxygen, Turbidity, Phosphate, Hydrazine

**Benefits**
- FM Sample cooler/Max operating temp - 150 degC
- Robotic Sampling Probe
- Effective sample isolation by needle valve so no plant leakages.
- Automatic Pressure Reducer

Remote Vibration Monitoring System

Fortress Marshall is a proven supplier of vibration monitoring systems with installed base of over 1,50,000 vibration sensors & 4,000+ customers.

**Benefits**
- Accurately monitors & analyses data
- Analysis provides predictive maintenance
- Trends, graphs provide complete controllability
- Remote support possible

Utility Monitoring

By monitoring utility consumption, help to bridge the gap between generation & consumption.

**Big Data Analytics** | **Prescriptive, Descriptive** | **Predictive Analytics** | **Alerts and Alarms**

**Steam**
- Flow Monitoring at
- Generation
- Distribution
- Temperature and Pressure Monitoring

**Compressed Air**
- Airflow Monitoring
- Compressors Generation
- Compressed Air Pressure
- Compressors Monitoring

**Water**
- Water Balancing for
- Flow Meter
- DEM/RO Water
- CIP
- Makeup Water
- Condensate

**Benefits**
- Creating a Benchmark on the overall Utility being consumed per section
- Help Monitor the efficiency of compressors and blower
- ROI through Utility Management with optimized utilization
- Continuous Data Logging with Advance Analytics
- Additional future options include: incorporation of leakage detection system
- Ensures continuity in production with full capacity & optimum utilization of utilities

Products Offerings in Power Industry

**Application / Instruments**

<table>
<thead>
<tr>
<th>Water Treatment Plant</th>
<th>Boiler</th>
<th>Turbine</th>
<th>Coal Feeding Plant</th>
<th>Anaerobic Digester</th>
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<tr>
<td>EEGC</td>
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<tr>
<td>Water Quality Analyzer</td>
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<td>Filter Switch</td>
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<tr>
<td>Water Quality Analyzer</td>
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<tr>
<td>Intelligent Valve</td>
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<tr>
<td>Proportional Analyzer</td>
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<tr>
<td>Digital Analyzer</td>
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<td>Industrial Software</td>
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<tr>
<td>SCADA</td>
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**SteamNetTM to Capture the complaints** - SteamNet is an effective knowledge sharing platform where steam enthusiasts can connect to discuss issues concerning energy conservation.

**Services**

**Energy Audit** - Fortress Marshall's audit focuses on improving specific energy consumption benchmarks, delivering savings by identifying best practices in the industry or carrying out trouble shooting of the steam system to address utility-related production bottlenecks. Our inherent strengths of engineering and project management enable us to deliver timely results.

**Outcome of Energy Audit**
- Reduce Operating Costs: Estimates clearly shows thermal losses & artificial demands.
- Improve Productivity
- Improve Quality
- Minimize or eliminate future capital costs
- Reduction in Auxilliary consumption of power plant.

**Remote AMC's** (Annual maintenance contracts) - Fortress Marshall can remotely access the Pollution Monitoring instruments Analyzer and provide remedial actions to maintain the same to meet CPCB requirements of 88% uptime.

**AMC Services** - For all your critical Instrument & control systems Fortress Marshall service team can take up the Annual maintenance contracts for up keeping the same.

Many Instruments/Analyzer which require continuous attention can be covered under the same to have the longer life & better up time.

**Our Solution - Coal mill Analyser**

**Benefits**
- By monitoring, CO & O₂ online, will ensure safe coal mill operation & can avoid scooting, even if prevents costly downtime from unnecessary shutdowns.
- Rapid & accurate results for coal mill safety.
- To prevent catastrophic damage to coal mill. Safe & efficient plant operation with Predictive Maintenance.

**Our Solution - Coal Bunker Level Measurement**

**Benefits**
- Heap measurement correction.
- Present cost forming because of shape & smooth surface of innovative Drop structure.
- Pouring is obsolete & maintenance is minimum.

**Our Solution - Optical dissolved oxygen sensor**

**Benefits**
- Flow & C2 independent reading
- Measuring range: Low 0 - 2000 ppm
- Flue Gas 0 - 5 ppm
- Rapid start-up with no polarisation
- Robust design enabling amplified maintenance

**Ensure Quick Start up in Power Plant - Degas-Cation Conductivity Measurement**

**Our Solution - Degas conductivity based CO₂ measurement**

**Benefits**
- Reduces the effective time of bating turbine.
- Power saving by waste heat recovery unit reduces the electrical consumption of the degas column heater by 50-75% over the operating range.
- Better control de-gasification which includes temperature control, heater health, sample flow & liquid gas separation.
**Seven Decades of Product Solutions**
We have created an efficient business by integrating our knowledge, services and technology to provide smarter solutions. Our installed base stands testimony to this.

<table>
<thead>
<tr>
<th>Flow Meters</th>
<th>Process Analyzers</th>
<th>Gauges</th>
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<tbody>
<tr>
<td>1,30,000+</td>
<td>2,25,000+</td>
<td>18,00,000+</td>
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<tr>
<td>Control Valve</td>
<td>Vibration Monitoring System</td>
<td>Steam and Water Analysis</td>
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<tr>
<td>80,000+</td>
<td>5000+</td>
<td>1500+</td>
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<tr>
<td>Boilers</td>
<td>Pressure Reducing Stations</td>
<td>Steam Traps</td>
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<tr>
<td>3600+</td>
<td>35,000+</td>
<td>30,00,000+</td>
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<tr>
<td>Condensate Pump</td>
<td>Dust and Gas Monitoring System</td>
<td>4000+</td>
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