Instrumentation Solutions for Power Generation
ABB – Your Supplier of plant systems

1 Stack
- Thermal mass flow
- Temperature
- Pressure
- Flue gas monitor
- Emission monitoring systems

2 Fuel System
- Coriolis mass flow (oil)
- Vortex flow (gas)
- Differential pressure
- Multivariable flow

3 Fuel Supply (conveyor or compressor)
- Motors, variable frequency drives

4 Boiler Outlet
- Carbon in ash

5 Combustion System
- Coal flow monitoring
- Flame detector and analysis

6 Scrubbers
- Flow
- Pressure
- pH

7 De-aerator
- Differential pressure (level)
- Dissolved oxygen
- Actuators & positioners

8 Boiler Feedwater
- Vortex flow
- Temperature
- Pressure
- Differential pressure (flow)
- Conductivity
- Dissolved oxygen
- Hydrazine
- pH
- Actuators and positioners

9 Electrical Balance of Plants
- MV & LV
- Breakers & switchgear
- Motor control centers
- Auxiliary transformers

ABB supplies an unparalleled selection of instrumentation products and systems throughout all stages of the power generation process. Utilizing ABB’s innovative solutions, you can create advanced systems that will help you ensure a high and economical performance of your power plant facilities.
17 Boiler Drum
- Temperature
- Pressure
- Differential pressure (level)
- Chloride
- Conductivity
- Phosphate
- pH
- Silica

16 Steam Line
- Temperature
- Pressure
- Differential pressure (flow)
- Conductivity
- Silica
- Sodium
- Actuators and positioners

15 Cooling Water System
- Electromagnetic flow
- Temperature
- Differential pressure
- Pressure

14 Control Room
- Data recording

13 Turbine and Generator
- Temperature
- Differential pressure
- Pressure
- Hydrogen purity/purge gas monitoring
- Electro-hydraulic systems
- Condition monitoring & assessment systems

12 Condenser
- Temperature
- Differential pressure (level)
- Chloride
- Conductivity
- pH
- Silica

11 Extraction Pump
- Pressure
- Conductivity
- Dissolved oxygen
- Actuators and positioners

10 Sample Station
- Steam water analysis system
Combustion Management

**Coal Flow Monitoring and Control**
Poor distribution of pulverized-fuel causes combustion inefficiency and also environmental issues. ABB’s PiMaster system is a continuous online measurement for pulverized-coal fuel into boilers. The integration of such instrument into boiler controls allows the influencing of two critical factors of combustion performance: excess air and mill dynamics. Any instability in mill performance and pulverized-fuel pipework is instantly evident. A return on investment of 1 to 2 years is possible.

Customer Benefits
- Reduction in excess air increases boiler efficiency
- Decreased NOx creation reduces ammonia consumption

**Carbon in Ash Monitoring and Control**
ABB’s Carbon in Ash Load Instrument is a patented non-extractive monitoring instrument, which provides reliable and accurate real-time measurement of unburnt carbon in fly ash. Once installed, either open loop monitoring or active closed loop control is possible.

Customer Benefits
- Improves the quality for sales
- Improved heat rate
- Enables monitoring of malfunctions in the combustion process

![Fig. 1: Principle of Carbon-in-Ash Sensor](Image)
Flame Detection and Analysis
Flame detection and analysis is a crucial part of a boiler’s safety system. ABB offers a broad selection of flame scanners and flame analysis units based on different fuel type and firing types. ABB’s flame scanner technology has been implemented successfully in use for many years on boilers and gas turbines.

Customer Benefits
• ABB helps our customers comply with the applicable state emission standards and codes
• Assist the operator to minimize emissions

Emission Monitoring Systems
The measurement of hazardous emissions is becoming increasingly more important to your company. Regulatory standards are getting stricter and you have an environmental commitment towards society. ABB offers solutions that provide optimum measurements while being highly cost effective at the same time.

We offer pre-engineered systems with compact and modular design using ABB’s powerful analysis technology.

Customer Benefits
• Low ownership, maintenance and installation cost through multi-component measurement technology with only one sampling system
• Easy to operate
• Extended maintenance intervals
Condition Monitoring and Assessment

ABB offers a wide range of products and solutions to monitor vibration and assess the condition of rotating machinery. Starting with basic measurement systems for vibration data up to complex diagnostic expert systems, ABB has the solution needed to meet condition assessment requirements, allowing cost effective planning of maintenance needs.

Industry is dependent upon reliable and predictable operation of machinery for timely and cost effective production. To meet the need for improved reliability, ABB has several solutions for monitoring, protecting and assessing the condition of rotating machinery. These solutions include client software packages as well as platform specific I/O modules for condition monitoring and protection that can interface almost any available type of probe.

Analyst™ is a user direct graphical analysis tool with specialized plots for assessing the condition of rotating machinery. SpriteMax™ is a cost-effective wireless network data acquisition and fault diagnostic system for assessing the condition of your plants important machines. ExpertAdvisor™ is a ruled-based automated diagnostic system that continuously monitors in-coming data to determine faults in common rotating machines.

Customer Benefits
- Reduces data analysis and machine fault diagnosis time by hours
- Provides quick access to any data in your condition assessment program through the new Windows graphical user interface
- Provides the customer with a crystal clear picture of a machine’s faults using the new analysis tools
- Provides the customer with the tools to get the results out to other team members and manager
Hydraulic Systems

The use of advanced control systems for steam and gas turbines, as well as bypass systems, often requires the use of electro-hydraulic control and protection systems. For this purpose, ABB offers electro-hydraulic and hydraulic products and solutions as well as design expertise and consulting.

Our solutions are universal products including electrical servo operators, low pressure hydraulics, and high pressure hydraulics with separate oil supply up to 200 bar, and they can all be integrated into almost any type of mechanical system used today.

ABB offers electro-hydraulic converters for modulated control oil pressure applications.

These products include final element actuators, pilot valve actuators, trip oil status manifolds, trip solenoid manifolds, accumulator stands, and hydraulic power units.

Environmental Systems

Steam Water Analysis System

These self-contained chemical monitoring systems comprise complete instrumentation systems for measuring chemical parameters critical to steam-raising plant operations and water treatment.

These systems can be used to measure everything from pH and conductivity through to silica and phosphate. Supplied fully pre-manufactured and pre-tested, ABB’s system assemblies are delivered to site ready for operation. Only connection to sampling features, drains, power supply and signal outputs is necessary on site.

Customer Benefits

- Reduces installation costs and time
- Simplifies maintenance
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