• Accurate Fuel-Air Ratio Control
• Fuel Saving Oxygen Trim
• Electrical Energy Saving Variable Speed Drive (VSD)
• Easy to Use Touch Screen Operation and Commissioning
• Remote Monitoring via Standard Web Browser
• Integrated Flame Safeguard
Complete Boiler Control

Integrated fuel-air ratio, flame safeguard, draft, feedwater controls

**Draft Control**
Stable & repeatable draft control is essential for efficient boiler operation. This is especially important for boilers with induced Flue Gas Recirculation (FGR) NOx reduction.

**Flame Safeguard**
Independent, industrial-hardened microprocessor provides safe and reliable start-up, operation, and monitoring of oil or gas fired burners. Safety shut-off valves, fan, igniter, damper, and components are sequenced to ensure fully automatic operation.

**Feedwater Control**
Single element, two element, or three element feedwater control may be provided. Water column blowdown is prompted and logged to ensure proper maintenance.

**Oxygen Trim Control**
Flue gas oxygen is used to continuously adjust (trim) the fuel-air ratio. Oxygen trim saves fuel by fine tuning the burner to operate safely & reliably at reduced excess air levels. Additionally, flue gas temperature is monitored, allowing real time boiler efficiency with ASME "By Losses" method to be displayed. Efficiency monitoring enables boiler operators to instantly identify operational problems. Available flue gas temperature and oxygen warning alarms and burner safety shutdown interlocks improve boiler safety.

**Variable Speed Drive (VSD)**
Variable speed fan combustion air flow control maximizes electrical energy savings by keeping the FD fan damper(s) 100% open from high fire down to approximately 40% firing rate (field adjustable). From 40% firing rate down to minimum fire, the damper ramps from full open to partially closed to assure maximum burner turndown is achieved. It is well known that VSD controlled variable speed fans provide significant electrical savings compared to fixed speed fans with a damper. In most cases, the annual electrical cost savings due to the VSD are approximately the same as the annual fuel cost savings due to the oxygen trim system.

**Jackshaft Control**
The single point positioning control method mechanically links the fuel valves and air and flue gas control dampers to a single actuator. Generally, the fuel valve has a characterizable flow versus position relationship that is used to establish the fuel-air ratio over the range of modulation. This method is recommended when the boiler size or service hours do not justify the addition of a VSD.

**Parallel Positioning Control**
The parallel positioning control method includes up to five (5) servo channels allowing independent control of fuel valves and air and flue gas recirculation dampers. The fuel-air ratio is established and adjusted by use of a “soft” function curve of fuel valve vs. damper position. Parallel positioning enables “tighter” fuel-air ratio control, which improves boiler efficiency. Combining this control method with oxygen trim and variable speed fan control offers substantial cost savings for a fast payback.

**Fully Metered Control**
The fully metered control method with oxygen trim and variable speed fan control offers the best opportunity to save fuel and electrical cost with a control system upgrade. With fully metered systems both the fuel flow and the combustion air flow are measured. PID control is used for both fuel and air flow control, assuring the accurate maintenance of fuel and air flow setpoints.
Advanced Communications

Internet, Web Site Access
A standard WEB Browser provides remote monitoring and operation. Custom software is not required. Historical alarm and event data can be imported to spreadsheet applications such as MS Excel®.

Intranet Communication
The ethernet communication port is easily assigned an IP address and connected to a facility wide network. Remote monitoring, control and data collection is available via a standard WEB Browser. Building Automation Systems and SCADA Systems are interfaced via industry standard MODBUS Ethernet communication.

Touch Screen Operator Interface Terminal
Monitor and control boiler operation, setpoints, and process data from one convenient display. Commissioning activities are laid out in an easy to follow step by step procedure, eliminating the need for knowledge of controller menus and programming languages.

DCS-III Programmable Controller
The DCS-III is a state-of-the-art boiler-focused programmable logic controller. The large I/O quantity, small sub-panel footprint, intuitive “Blockware”, redundant memories, and built-in industry standard communications allows the DCS-III to be integrated into complex boiler control systems with a minimum number of external components.

Easy to Use Touch Screen

Flame Safeguard Overview
At-a-glance burner maintenance and trouble-shooting information.

Historical & Real Time Trends
Easy to use multiple pen charts allow quick boiler assessment and maintenance monitoring.

Fuel-Air Ratio Curve Setup
Setup screen is provided to enter setup data and to inspect the resultant fuel-air profile.
Controllers
Precise control for your specific boiler room application:
- Plant Wide Controller (PWC)
- DCS-III Programmable Controller
- BurnerMate Universal Controller
- JC-22D Draft Controller
- PCC-III Multiple-Loop Controller

Operator Interface
Local and Remote operator, technician, plant engineer or manager focused user interface stations:
- SCADA/Flex Distributed Control Station
- JC-10D Process Bargraph Indicators
- PCC-III Controller Faceplate Display
- BurnerMate Universal Message Display
- OIT6 Operator Interface Terminal
- OIT10 Operator Interface Terminal

Control Devices
Linear, Rotary, Trim, or Servo Actuators:
- DM-1E Rotary Actuator  150 in-lbs
- LTA Link Trim Actuator  Up to 76 lbs of thrust
- SM-3 Servo with Valve  36 in-lbs
- SM-15 Servo with Valve  180 in-lbs
- SM-37 Servo with Valve  444 in-lbs
- PL Linear Actuator  100 or 200 lbs

Sensors
- Tank Gauge and Leak Detection Sensors
- Pressure  4-20 mAdc
- Temperature  4-20 mAdc, Thermistor
- ZP Flue Gas Oxygen Sensor
- PCC-300 EPA Certifiable Opacity Monitor
- JC-30D Opacity Monitor