BurnerMaster Control Solutions

Burner Management System – Single Burner Boiler

**BurnerMaster Benefits**

- Meets regulatory compliance with the current NFPA 85 Standard and Factory Mutual’s Approval Standard (FM 7605) for PLC based Burner Management Systems (BMS)
- Can be configured for compliance with the ANSI/ISA 84 / IEC 61511 standards for SIL 1 or 2 Safety Instrumented Systems or the CSA B149.3 Standard
- Increased safety through the use of IEC 61508 SIL 2 safety capable 1756 Series ControlLogix® hardware
- Implementation procedures that have been independently audited and certified to IEC 61511 SIL 3 capable
- Increase in production with higher burner management system availability
- Reduced risk of damage to your boiler, surrounding equipment and personnel through the use of a proven-in-use BMS design
- Improved operator and maintenance personnel efficiency through the use of enhanced and comprehensive diagnostic messaging capability
- A flexible standard design that can be quickly configured for your specific boiler(s)

**Automatic Burner Management System Solution for Combustion Processes**

The BurnerMaster™ system by Rockwell Automation is a fully programmable automation controller-based burner management system (BMS) for industrialwatertube, firetube and single burner boilers. The BMS can be configured for fuel gas and/or light or heavy oil firing with recycling or non-recycling capability. The BMS is designed, assembled, programmed and tested to your specifications. Since it is extremely rare to find two boiler applications that are exactly the same, the BurnerMaster standard design is approximately 80-90% pre-configured with the remaining 10-20% customized to match the requirements for your specific boiler. The BurnerMaster system provides all of the code, required safety functions and interlocks for your boiler. This includes verification and monitoring of air pressures/flows, fuel pressures, damper and valve position, purging, opening and closing of all fuel valves, burner ignition, flame proving, fuel switchover, drum level and furnace pressure. A ControlLogix controller maintains these functions.
BurnerMaster System Components

The BurnerMaster base package consists of a fully configured and tested burner management system mounted in an enclosure with a PanelView™ Plus touchscreen HMI terminal and FactoryTalk® View ME BMS displays. The BurnerMaster enclosure has pre-wired terminations that are ready to be positioned, powered up and ready to go! You can add a new Integrated Flame Scanner(s) with internal flame relay to this unit or reuse your existing flame scanning hardware if it is compatible with this system.

The BurnerMaster system is typically supplied in a NEMA 12 enclosure with the following hardware:

- SIL 2 capable ControlLogix controller
- I/O chassis power supply
- Ethernet/IP communication module
- SIL 2 capable 1756 Series I/O modules
- Fusible IFM modules with pre-wired cables
- Watchdog circuit
- MFT circuit
- Power distribution hardware
- PanelView Plus touchscreen HMI terminal

Customer-specific options are also available including:

- NEMA 4 or 4X enclosures or provided on a back panel for installation into an existing enclosure
- Enclosure heating and/or cooling
- Z-Purge
- Redundant ControlLogix controllers and/or chassis power supplies
- GuardLogix® controller
- Combustion Control System or DCS communication protocol or hardwired connections
- A variety of HMI options

BurnerMaster System Design Features

- Customizable to your specific boiler application and safety requirements
- Designed to comply with the current NFPA 85 Standard and FM’s Approval Standard (FM 7605) for PLC based Burner Management Systems
- Utilizes IEC 61508 SIL 2 safety capable 1756 Series ControlLogix hardware
- BMS Implementation Procedure (design, programming, test and documentation) are certified for use in up to, and including, IEC 61511 SIL 3 capable BMS systems
- The I/O points are partitioned to minimize the effect of a potential hardware failure
- Each input to the BMS is periodically tested to verify its ability to detect field device state changes from the “fail-safe” position
- Critical outputs are monitored to verify that they are operating as commanded by the system logic
- A system watchdog circuit is provided, completely independent of the programmable automation controller, to continually verify the controller’s timing function as well as its ability to execute the logic and control the outputs
- A hardwired trip circuit (MFT) allows the operator or system watchdog circuit to initiate a master fuel trip
- The use of software interlocks helps guard against unauthorized modifications to the BMS program
- Over 100 start-up, first-out and system alarm and diagnostic messages
The BurnerMaster System Comes Fully Assembled, Programmed and Tested

The BurnerMaster system comes completely designed, assembled, programmed and tested. Because the BMS is a safety system, a full integration test is performed on every system to insure that each I/O point and every function in the program operates as designed. Once the integration test has been completed, the customer is invited to participate in a one day Factory Acceptance Test which familiarizes the customer with the system and verifies, to their satisfaction, that the system performs according to the written description of operation.

CombustionMaster System Compatibility

For single or multi fuel-fired boilers Rockwell Automation offers a 1756 Series ControlLogix-based combustion control system (CCS) called the CombustionMaster. The CombustionMaster can be provided with the BurnerMaster, in the same enclosure and sharing the same PanelView Plus HMI terminal, or as a separate standalone system. The CombustionMaster provides the boiler’s process control functionality including fuel/air ratio control, firing rate, excess air trim and drum level/feedwater control. Please refer to the Rockwell Automation publication “CombustionMaster” for additional information.

BurnerMaster System Documentation

Every BurnerMaster is provided with a complete documentation package of the system. The package includes:

• Drawing list
• Logic cabinet schematic wiring diagrams
• Symbol identification
• Cabinet control power distribution
• I/O schematic wiring
• Logic cabinet layout drawings
• Logic I/O module assignment
• Cabinet general arrangement
• Back-panel equipment assignment
• I/O list
• Description of operation
• FAT test plan
• A copy of the Studio/RSLogix 5000 and FactoryTalk View ME programs

For More Information

For more information on Rockwell Automation Industrial Combustion and Steam Generation solutions, please contact your local Rockwell Automation sales representative or your local Rockwell Automation Authorized Distributor.

Rockwell Automation’s Industrial Combustion and Generation Solutions Team offers a full complement of burner management, combustion/temperature control and Balance of Plant solutions for all of your industrial boiler and non-boiler applications. The solutions cover all industrial fuel firing applications from single or multiple burners, single or multiple gaseous, liquid and/or solid fuels for single burner boilers and dryers through electrical utility boilers and multiple burner/multiple zone furnaces.