

BurnerMate TS Boiler Controller System

Overview

52

TS Boiler Controller

BurnerMate TS is a **custom-programmable boiler control and flame safeguard system** that includes DCS-IV loop controllers and a flame safeguard microprocessor communicating via Modbus with a 10" or 15" OIT touch screen. The system provided includes an industrial enclosure with necessary pushbuttons, selector switches, power supplies, terminal blocks; factory wired and tested with other field devices for a complete system.

Advanced Combustion Control Options

- **Parallel Positioning** control with Oxygen Trim and Variable Speed Fan Combustion Air Flow Control. Combined fuel and electrical savings for fast payback.
- **Fully Metering** control with Oxygen Trim and variable speed fan combustion air flow control creates superior control for Low NOx burner applications. Essential for simultaneous dual fuel firing, multiple burner boilers and balanced draft applications.
- Optional Drum Level, Draft and/ or Flue Gas Recirculation Control

Integral Flame Safeguard or Optional PLC

- Independent, industrial-hardened microprocessor.
- Automatic single burner, dual fuel, gas or oil firing, sequencing, ignition and flame monitoring protection.

Easy to Order, Stock and Field Upgrade

- Factory wired and tested control system.

Flexible & Expandable

A second, optional DCS-IV Multiple Loop Controller can be supplied to provide draft and drum level control loops and balance of plant monitoring with up to 15 analog inputs, 6 analog outputs, 5 triac pair outputs, 6 relay outputs, 13 digital 120 VAC inputs, or combinations of these. BurnerMate TS is designed to be monitored and controlled by the optional SCADA/Flex Distributed Control System.

Easy to Operate

BurnerMate TS with its large, industrial-grade color touch screen provides an intuitive, easily used control system that displays current boiler status, alarms, and historical logging. The system is password protected for security. Historical trending is standard. Scalable objects enable accurate process displays. X/ Y plots are provided for intuitive Fuel/ Air Curves display and commissioning. The NEMA 4X front panel eliminates the need for protective viewing doors. Easily used OIT_Edit® configuration software can be used to customize graphic pages.

PLC Flame Safeguard System

As an option the BurnerMate TS can be optioned with a PLC Flame Safeguard System.

Integral Oxygen Analyzer

The ZP Oxygen Probe is directly connected to the DCS-IV controller (eliminating the need for a field mounted transmitter), which simplifies installation. The Model ZP with DCS-IV-Zxxx is a full function analyzer which includes specific analyzer diagnostic codes for rapid trouble shooting and continuous monitoring of cell impedance for predicting cell health.

Easy Commissioning

Using "Learn Mode" – F(x) characterizer curves are set by manually positioning fuel and air for safe and reliable operation and optimum Oxygen level and then pressing the "STORE" button. Air and oxygen setpoint curves are simultaneously setup. The process can be repeated for a maximum of 11 load points. Independent curves for each fuel are automatically selected.



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Combustion Control Shown with Optional Flame Safeguard, Drum Level, Draft and FGR Control, Flue Gas Oxygen Analyzer, Flame Scanner, and SCADA/Flex Distributed Control System

Specs found here



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53

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Remote Control and Monitoring

The optional SCADA/FLEX Distributed Control System provides remote operation, graphic display of information, alarm message displays, alarm printing, and remote boiler tuning capabilities. The system is networked to the boiler control and Flame Safeguard Systems.

Standard Features

- Advanced Communication- 10 Base T/100 Base TX Ethernet
 - One RS-485, Second Optional
 - Two RS-232 Ports
 - Remote Web Access
 - Isolated, Simultaneous Modbus Master & Slave
- Real Time and Historical Trending Standard, optional Flash Card allows historical data to be exported to MS Excel.
- Scalable objects enable accurate process displays
- X/Y Plots, for intuitive Fuel/ Air Curves display and commissioning
- NEMA 4X Front Panel eliminates the need for protective viewing doors.
- Easily used OIT_Edit® Configuration Software

Major Benefits

- Integration with DCS-IV Controllers enables intuitive commissioning without the use of Laptops or PCC-IV Controller Faceplate.
- BurnerMate TS Systems may be commissioned without the need for blockware training or laptops.

Specifications

Mechanical

Enclosure Type: Windbox Mounted
(optional Wall Mounted)

Size: Typically - 30"H x 30"W x 12"D

Electrical

Input Power: 120 VAC

Environmental

Operating Temp: 32° F to 122° F (0° to 50° C)

Storage Temp: -20° to 150° F (-28° to 65° C)
log 15 to 85% (noncondensing)

Front Panel: NEMA 13/IP65

Communication

Network:

Protocol: Modbus (ASCII or RTU mode)

Speed: 4800-115,200 baud

Type: RS485, optically isolated

Configuration:

Type: RS232

Configuration, DCS-IV Controller

Language: Function block style,

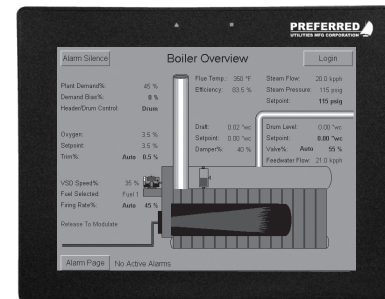
Laptop (optional): PC4_Edit™ object-oriented editor

OIT Touch Screen

Mechanical 10.4" TFT 256 Color VGA
800 x 600 pixel LCD

Communication

10 Base T/100 Base TX Ethernet
One RS-485, Second Optional
One RS-232 Ports
Remote Web Access
Isolated, Simultaneous Modbus
Master & Slave



Typical Boiler Overview Screen is customized for the application



DCS-IV Multiple Loop Controller

BurnerMate TS Boiler Controller System

Ordering Information

Additional Ordering Information (when required)

1. Specify required pressure, temperature, or flow sensor ranges
2. Specify Variable Speed Drive (VSD) motor data
3. Specify In-Situ Oxygen Sensor probe length and cable length
4. Specify SCADA/Flex Distributed Control requirements

Catalog Number Example:

BMTS-HW-FMC-VSD-ZP-FSG-DRT-2-FWC-FGRT: BurnerMate TS for Hot Water Generator with Fully Metered Combustion Control with current outputs, Variable Speed Drive (VSD) Combustion Air Fan Control, Oxygen Trim Control, Flame Safeguard, Draft Control with triac output, Two Element Feedwater Control with current output, and Flue Gas Recirculation Control with triac output.

Consult factory for VSD bypass or additional monitoring and control requirements.

Ordering Information

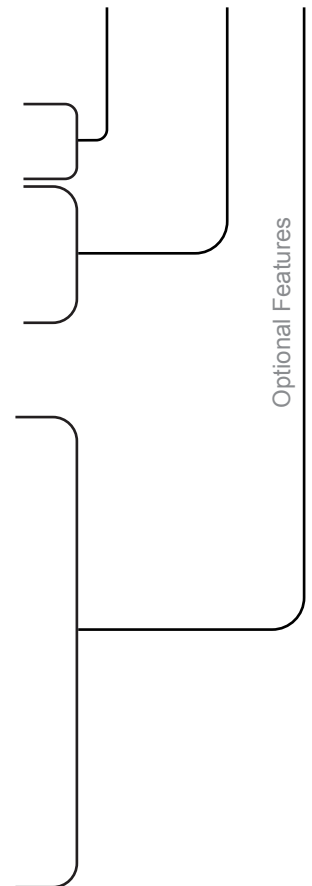
BMTS - _____

Combustion Control	Type	Catalog Number
Steam or Hot Water Boiler	Steam	ST
	Hot Water	HW
Single Point Positioning Combustion Control	Triac**	SPT
	Current*	SPC
Parallel Positioning Combustion Control	Triac	PPT
Fully Metered Combustion Control	Current	FMC

Optional Features	Output Type	Catalog Number
Variable Speed Drive (VSD) Combustion Air Fan Control (PPT or FMC systems only)	Current*	add "-VSD" suffix
Oxygen Trim Control	--	add "-ZP" suffix
Flame Safeguard		add "-DRT" suffix
Draft Control	Triac	add "-DRT" suffix
	Current	add "-DRC" suffix
Drum Level (Feedwater) Control "X" - Feedwater (1, 2, or 3) Element	Triac	add "-FWT" suffix
	Current	add "-FGRC" suffix
Flue Gas Recirculation (FGR) Control	Triac	add "-FGRT" suffix
	Current	add "-FGRC" suffix

Wall Mounted style enclosure (instead of Burner Windbox Mounted style)

add "-WM" suffix



* "Current" outputs provide a 4-20 mADC signal to drive electric or pneumatic actuators.

** "Triac" outputs provide direct control of electric actuators such as the SM-15

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Suggested Specifications

55

Application: Supply a self-contained Boiler Control System with 10" (or 15") color touch screen to provide process control of steam pressure, combustion air, and fuel flow. The control system shall be microprocessor-based and suitable for wall or windbox mounting. All the logic required to ensure that pre-purge, post-purge, light-off, and burner modulate cycles are automated shall be provided.

Combustion Control: A PID-based single point positioning combustion control logic scheme shall be used to maintain steam drum pressure at setpoint. The fuel flow control valve shall be mechanically linked to the air flow control device to assure an air rich fuel/air ratio. Mechanical linkage adjustment shall be required to adjust the fuel/air ratio. A combustion control microprocessor failure shall not prevent the continued manual operation of the boiler. Fuel valve and air damper shall be modulated in response to an external Plant Master demand signal or measured boiler drum pressure compared to setpoint. At a minimum, the control system shall display the following: Steam Pressure, Steam Pressure Setpoint, Boiler Firing Rate and alarm messages for Low Pressure, High Pressure, and Pressure Setpoint Deviation. The following color touch screen graphic pages shall be provided: Boiler Overview, Flame Safeguard Overview, Control Panel Faceplate with real time and historical trending, Set up and Commissioning screens, and Boiler Alarm.

Boiler Controllers: To assure system integrity, a pre-wired and factory-tested, microprocessor-based, multiple loop controller system shall be provided. The controller shall include process variable and "first - out" annunciator, 120 VAC discrete inputs and outputs, and 4-20 mA DC analog inputs and outputs. All control logic, tuning, and fuel/air ratio curves shall be field configurable. If required to allow field modifications to the controller logic, provide one configuration tool or laptop computer per facility.

Communication: Each controller shall be equipped with an optically isolated RS485 modbus communications data highway connection to the color touch screen. The touch screen shall communicate with the plant BAS, EMS, or DCS by a Modbus over Ethernet communications data highway and shall allow: Auto/Manual mode change, setpoint change, variation of the manual output, sensing and silencing of alarms, change of any configuration parameter (including PID tuning constants), change of timers, etc. Provide all equipment capabilities specified in this paragraph, even if a connecting SCADA system is not included in this project.

Quality Assurance: The system shall be factory manufactured and tested according to UL508A requirements (CSA C22.2 #14 for use in Canada). The control system shall be a Preferred Instruments, Danbury, CT, BurnerMate TS Model BMTS-STSPx ('x' = "C" or "T" to denote a Current or Triac Control Output).