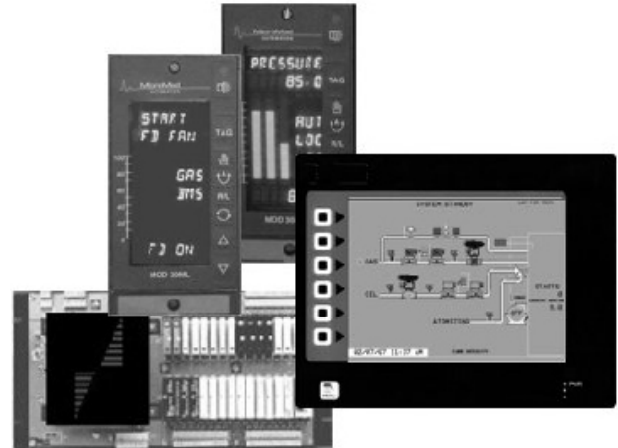


STEAMPAK Series BurnerPAK BMS Burner Management Systems

- **Sequence of operation, ignition and control of burners**
- **Meets NFPA 85 safety standard**
- **MFT alarming with manual reset, first-out indication**
- **Optional enhanced alarming with detailed indication**
- **Tamper resistant & fault tolerant**
- **Configurable, hardware independent purge, FFRT, postpurge & flame stabilization times**
- **Flame scanner interface**
- **Pre-engineered, pre-programmed system with application-specific instruction manuals**



SYSTEM DESCRIPTION

BurnerPAK is a series of microprocessor-based, single-burner control systems designed to provide the correct burner sequence, ignition and flame monitoring protection on automatically ignited oil, gas, and combination fuel burners. In conjunction with limit and operating controls, a BurnerPAK system provides control and monitoring of the startup and shutdown sequence of burners and related equipment, monitors the operation of the equipment at all times, and initiates safe shutdown procedure on detection of an unsafe operating condition. The system also provides current operating status and lockout information in the event of a safety shutdown.

BurnerPAK systems include pre-programmed logic for:

- Recycle / Standby with pre-fire checks
- Fan Start
- Furnace Purge
- Igniter / Pilot Trial
- Main Flame Trial
- Modulation
- Post Purge
- First-out alarming with manual reset
- Continuous, graphic indication of flame scanner

BurnerPAK systems provide hardware-independent, configurable times for purge, post-purge, flame failure response time (FFRT), and flame stabilization as well as maximum travel time for the air actuator and FD fan startup time. Maximum FFRT is 5 seconds. All setup screens are password protected for security.

BurnerPAK-1 is a self-contained standalone controller that provides burner management and drum pressure control, and is ideal for small package boilers. An analog input is provided for the steam pressure signal. The controller compares the signal to an operator-entered setpoint and generates an output signal to the jackshaft actuator. The integral display panel provides operation and monitoring of the drum pressure control loop as well as indication of burner sequence, status and MFT alarm information. Setup of the drum pressure loop and the burner sequence times is done through the display keypad.

BurnerPAK-3 is a standalone Burner Management System for use with any combustion control system. In addition to control and indication of the burner sequence, BurnerPAK-3 provides enhanced alarming and identification of the specific limit in the operating control circuit or running interlock circuit which caused the burner shutdown, as well as system runtime information and fuel totalization. A color operator terminal is used for operation and indication.

EQUIPMENT DESCRIPTION

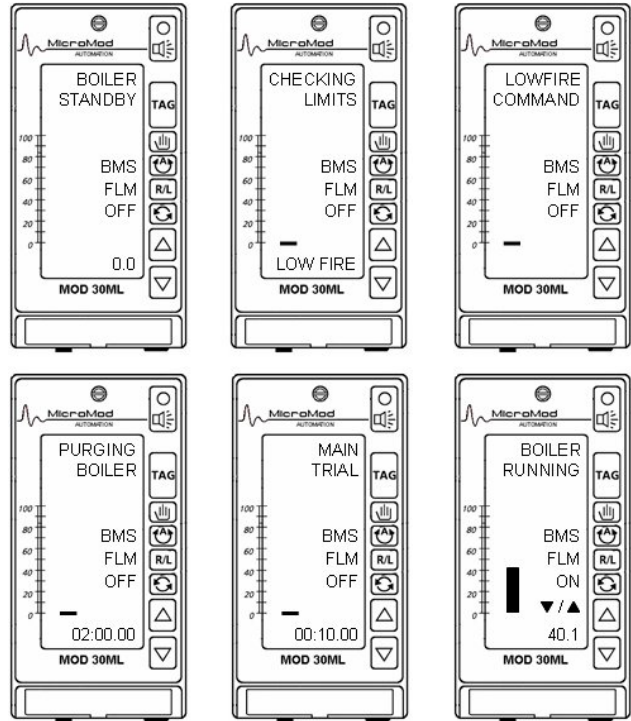
The BurnerPAK systems contain sequence logic for operation and mandatory safety shutdown of the boiler in accordance with NFPA standard 85 and are CSA and FM Class 1, Div 2, Groups A,B,C,D approved. All BurnerPAK controllers are multiloop controllers with flexible, isolated I/O. BurnerPAK-1 has an integrally mounted, high-visibility display with clear, informative screens for ease of operation. BurnerPAK-3 includes a separately mounted operator panel for display and operation. BurnerPAK controllers have non-volatile memory which contains the configured database and retains all position information in the event of a power interruption. The terminal blocks provide direct connection of field wiring. The controllers also provide failsafe and power fail-recovery settings for all configured parameters and output points.

BurnerPAK systems may be used with existing or third-party flame scanners, provided control contacts and a 4-20mA flame intensity signal are available.

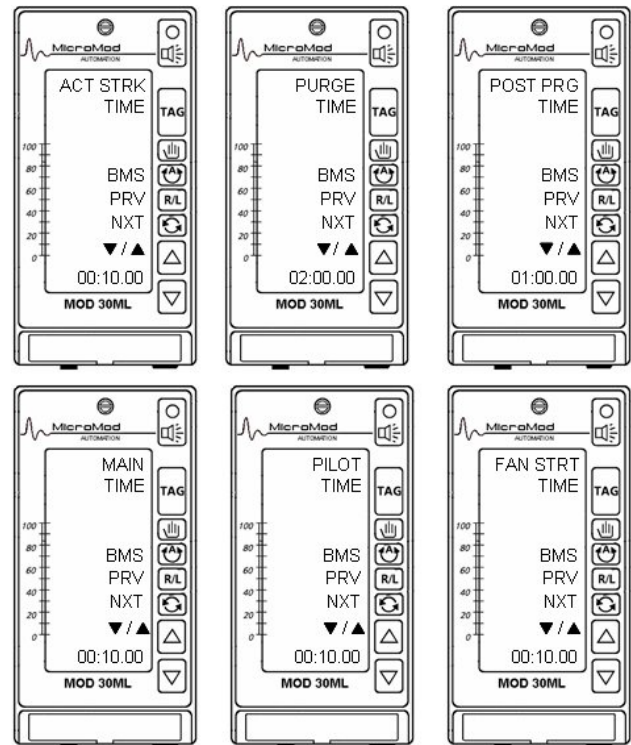
BurnerPAK-1 includes:

- Burner management controller, pre-configured, with the required I/O for burner sequence control and indication, interface to a flame scanner unit, and programming and I/O for Drum Pressure Control. The operator display is an integral, built-in display panel.
- Text indication of burner startup sequence:
 - Standby
 - Check limits
 - Fan start
 - Purge command
 - Low fire
 - Pilot trial for ignition
 - Main fuel trial for ignition
 - Boiler modulating
- Pre-programmed communication to host PC
- Application-specific documentation for the installation, startup and operation of the system.

Unlike most Burner Management Systems, the functional operation of the control (purge, post purge, trial for ignition) is not dependent upon physical hardware selection. These times are entered during commissioning through a series of password-protected setup displays on the controller front panel.



Selected BurnerPAK-1 Sequence Displays



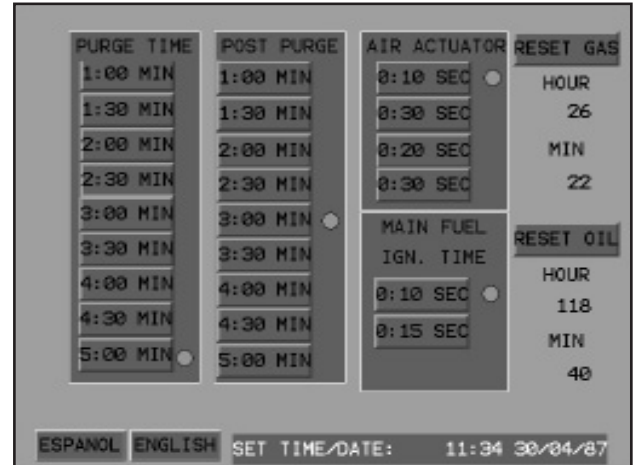
Selected BurnerPAK-1 Setup Displays

BurnerPAK-3 includes:

- Burner management controller, pre-configured, with the required I/O for burner sequence control, interface to a flame scanner unit, and indication plus enhanced alarm indication.
- Remote-mounted full color operator touch-screen panel with Ethernet interface to PC or plant network
- Modbus RS-485 communications for PC interface
- Application-specific documentation for the installation, startup and operation of the system.

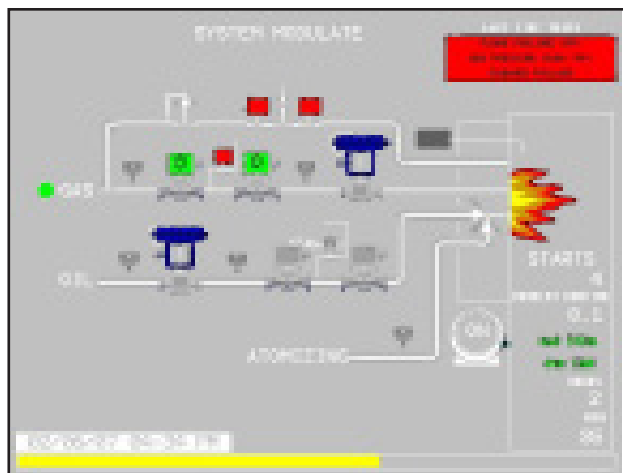
The BurnerPAK-3 operator panel provides three standard operating screens:

- Graphic representation of fuel system with burner start sequence, number of starts, boiler run time, and alarm indication
- Text screen with burner start sequence, fuel run times, and event log
- Hardware layout showing digital I/O module status for troubleshooting

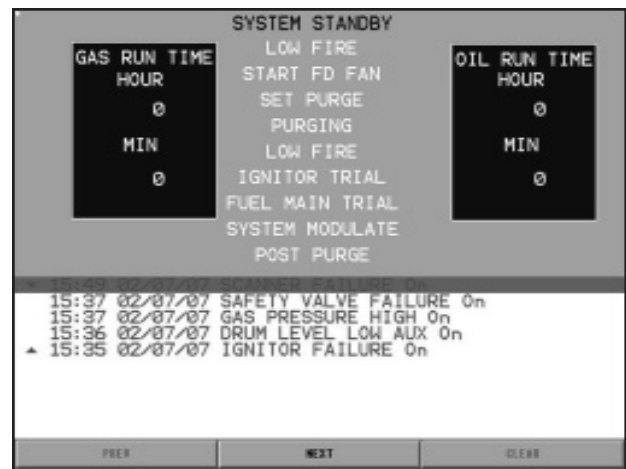


Setup Screen

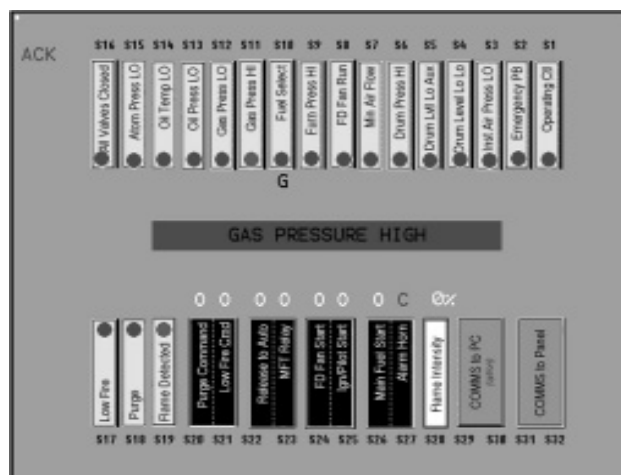
A password-protected setup screen allows software selection of control functions (purge, post purge, actuator travel time, and ignition trial time) as well as reset of the totalized main fuel operating hours and time/date settings. Pressing the English or Spanish buttons will change the language on all operating displays.



Graphic Display



Text Display



I/O Module Display

ALARM DETECTION & INDICATION

Both MicroMod BurnerPAK systems provide first-out alarm indication.

BurnerPAK-1 provides the following alarm detection and indication based on the following:

- Flame failure
- Valve failure (any fuel or safety valve)
- Actuator failure
- Limit failure (any limit switch)
- Ignition failure
- Loss of flame (during operation)

BurnerPAK-3 provides enhanced alarm detection and indication:

- Operator trip
- Flame failure
- Instrument air pressure
- Drum level low, low-low
- Drum pressure
- Minimum air flow
- FD fan running
- Furnace pressure
- Gas pressure high, low
- Oil pressure high, low
- Atomizer pressure
- Fuel valves closed (any)
- Fuel select

BurnerPAK systems are designed to meet NFPA standard 85 when all required field devices are installed.

OPTIONS

Flame Scanner - Fireye integrated flame scanner with internal flame relay.

Backup Memory Module - provides redundant, removable non-volatile RAM which backs up the controller database. In addition, if left on the controller during operation, it is updated every 50ms with current process data such as output values, controller mode, tuning parameters etc. This allows immediate re-start of the system after a power outage or equipment failure, with the latest values.

Field Instrumentation - MicroMod can provide a pressure transmitter for BurnerPAK-1 if required. We can also assist with field devices required for NFPA. Contact our Sales or Customer Service department for assistance.

Custom Application Engineering - if the standard BurnerPAK configuration doesn't meet your application needs, MicroMod will work with you to develop a cost-effective solution to improve your boiler's efficiency and optimize your fuel consumption. Solutions for multi-burner boilers are also available.

The MicroMod SteamPAK Series

BurnerPAK is just one of MicroMod's series of pre-engineered packages for industrial and institutional boiler controls. The SteamPAK family includes:

DrumPAK - one, two- and three-element drum level control

PlantPAK - plant master controller, with optional lead/lag

BoilerPAK - single-point position pressure control

TrimPAK - single-point position with O₂ trim. Ideal for upgrading jackshaft control systems to obtain maximum boiler efficiency.

MeterPAK - Fully metered combustion control system with O₂ trim

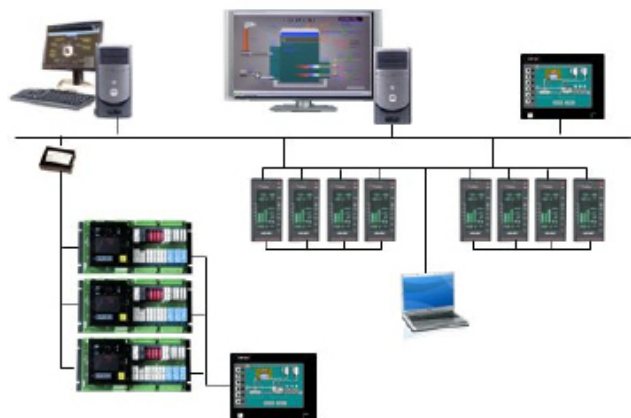
TrimPAK-PLUS - prewired combustion control panels with color touchscreen operator interface, for one or two boilers

Watchman - integrated boiler control panels for combustion and drum level control, with color touchscreen operator interface.

Combustion control packages are also available for High Temperature Hot Water systems, and alternative biofuels.

Plantwide System

All SteamPAK products can be integrated into a plantwide, Ethernet-based system with advanced operator stations, alarm/event logging and reporting. Connection to existing building automation systems is easy using industry-standard communications.



INPUTS & OUTPUTS

BurnerPAK-1

Analog Inputs (4-20mA with transmitter power, isolated)
Flame Intensity
Steam Pressure

Analog Outputs (4-20mA, isolated)
Fuel/Air Actuator

Digital Inputs (110Vac, isolated)
Operating Control
Running Limits
Fuel Valve Interlocks
Purge Limits
Low Fire Limits
Flame Relay

Digital Output (110Vac, isolated)
MFT Relay
FD Fan Start Relay
Ignitor/Pilot Relay
Main Fuel Relay
Alarm Horn

CONTROLLER SPECIFICATIONS

BunerPAK-1 and BurnerPAK-3

Power Supply:

AC option: 85-250V rms, 50-400Hz
DC option: 20-50V dc

Power Consumption (120V rms, 60Hz, Full load):

50W maximum

Operating temperature: 0 to +50°C

Storage Temperature: -40 to +75°C

Humidity: 5 to 95% RH, noncondensing

INPUTS & OUTPUTS

BurnerPAK-3

Analog Inputs (4-20mA with transmitter power, isolated)
Flame Intensity

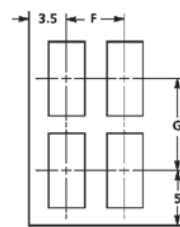
Digital Inputs (110Vac, isolated)
Operator Control
Emergency Trip Pushbutton
Instrument Air Pressure Switch - Low
Drum Level Switch Low Low
Drum Level Switch Low Low (Auxiliary)
Drum Pressure Switch - High High
Air Flow Switch - Low
FD Fan Running Contact
Furnace Pressure Switch - High
Fuel Select Switch
Gas Pressure Switch - High
Gas Pressure Switch - Low
Oil Temperature Switch - Low
Atomizing Supply Pressure Switch - Low
Fuel Safety Valves
Air or Damper Actuator Position Switch - Low Fire
Air or Damper Actuator Position Switch - Purge
Flame Relay

Digital Outputs

Low Fire command to combustion control system
Purge command to combustion control system
Release-to-Auto
Master Fuel Trip Relay
FD Fan Start Relay
Ignitor/Pilot Relay
Main Fuel Start Relay
Alarm Horn

MOUNTING DIMENSIONS, BurnerPAK-1

DISTANCE BETWEEN CENTERS

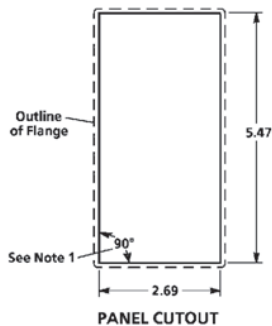


Distance between centers when mounting multiple controllers (inches)

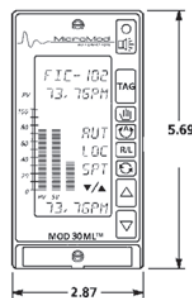
	F	G
Recommended	4.0	8.0
Minimum	3.5	7.0

Notes:

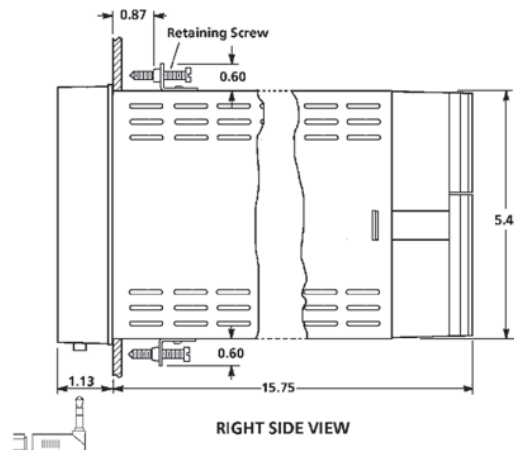
- When mounting housings in a panel or in a rack with a bezel turn the retaining screws until the point touches the back of the panel or rack. Excessive tightening of retaining screws can distort the housing. The housing must be square after adjusting retaining screws.
- All dimensions in inches (mm)



PANEL CUTOUT



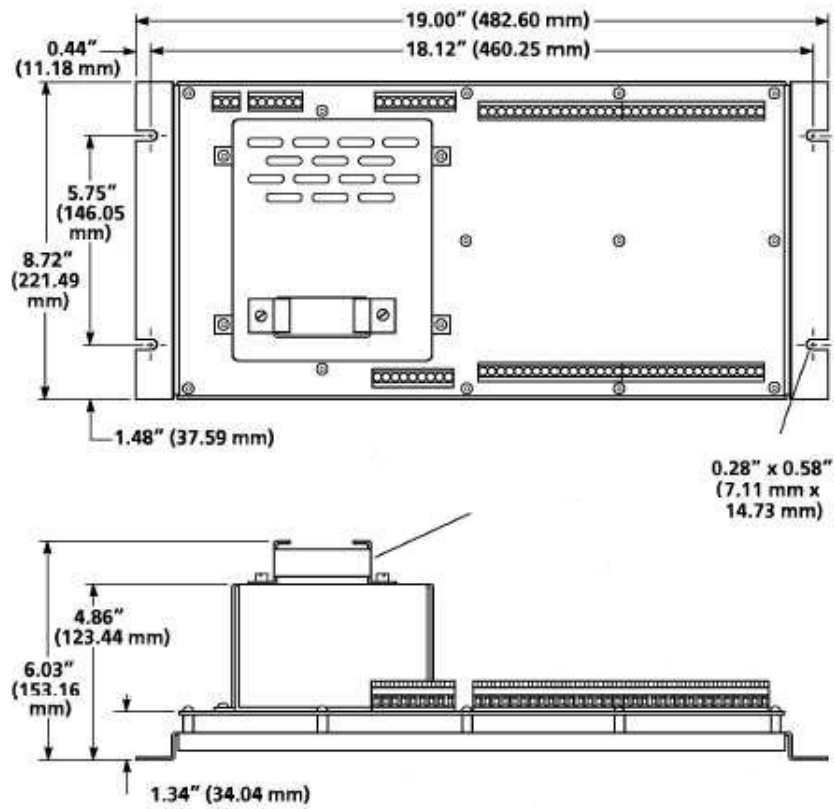
FRONT VIEW



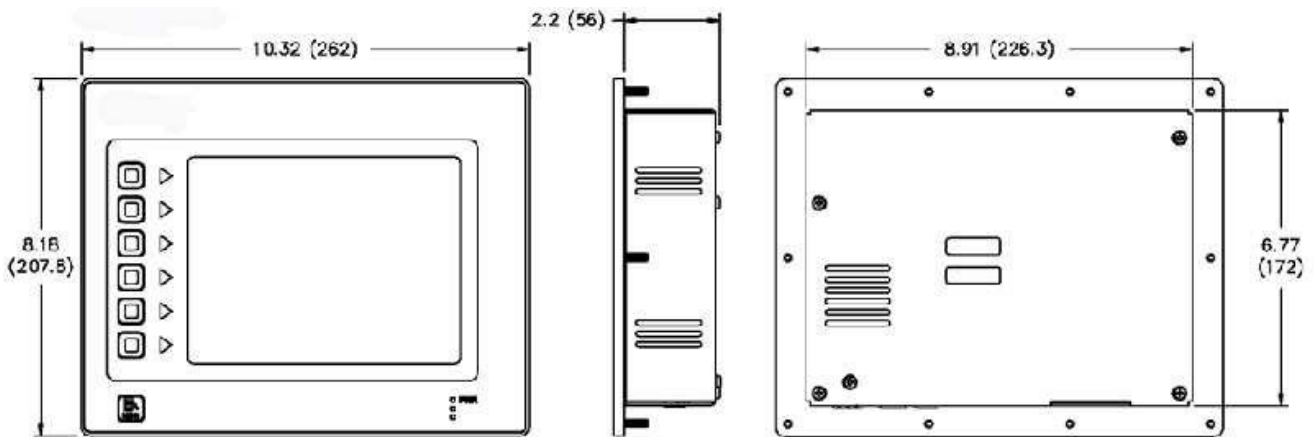
RIGHT SIDE VIEW

inches	mm	inches	mm
0.6	15.2	5.43	137.9
0.87	22.1	5.47	138.9
1.13	28.7	5.69	144.5
2.69	68.3	7	177.8
2.87	72.9	8	203.2
3.5	88.9	15.75	400
4	101.6		

MOUNTING DIMENSIONS, BurnerPAK-3



BurnerPAK-3 Controller



BurnerPAK-3 Operator Panel

ORDERING INFORMATION

BurnerPAK is a licensed package. The following end-user information must be supplied with each order:

- End-user company name
- Complete address
- Telephone and fax number
- Contact name
- Email address (if available)

	BRN	04	05	06	07	08	B
	01 - 03						09
BurnerPAK Burner Management System for Oil and/or Gas	BRN						
Power Supply 24V dc 85 to 250V ac		0 1					
Control Type Standalone BMS with Drum Pressure Control Standalone BMS with Enhanced Alarming			1 3				
Reserved Character Not Used				0			
Operator Language English Spanish					E S		
Design Level Design Level						B	
Flame Scanner None Flame Scanner (integrated flame scanner with internal flame relay)							0 1

Available Options (please specify on order):
 Backup Memory Module (blank) 2010PZ10000B
 Field Instruments (pressure measurement / transmitter)
 Custom Application Engineering - per hour

Note: Specific field devices are required for compliance with NFPA-85. Visit our website at www.micromod.com/burner-management for a complete checklist.

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

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