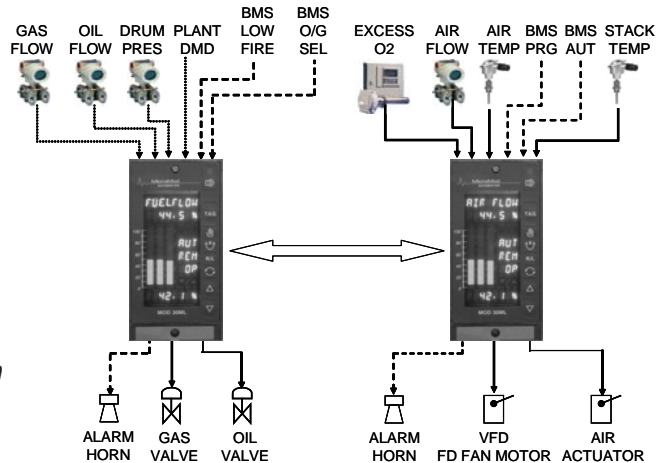




STEAMPAK Series MeterPAK Combustion Control System Full Metered with O2 Trim

- **Instantaneous & continuous adjustment for correct fuel/air ratio**
- **Increased safety for personnel & equipment**
- **Reduced maintenance costs**
- **Reduced fuel consumption**
- **Enhanced environmental protection**
- **Pre-engineered, pre-programmed system with application-specific instruction manuals**



2-Controller Architecture

SYSTEM DESCRIPTION

The MeterPAK Combustion Control system consists of Fuel and Air Flow control with continuous O2 trim for a single- or dual-fuel boiler. The system includes the Boiler Master loop, the Fuel Flow control loop, the Air Flow control loop and the Oxygen control loop. Indication and totalization of gas and oil flows are also provided.

The Boiler Master can be set up during commissioning as a Drum Pressure controller or a Bias Station. When set up as a drum pressure controller, the boiler master loop receives the drum pressure signal from the pressure transmitter and compares it to setpoint. When set up as a Bias Station it receives an input signal from the Plant Master and applies a local bias value. The output of the Boiler Master is the Remote Setpoint signal for the Fuel Flow and the Air Flow control loops. When the Boiler Master is switched from Manual to Automatic mode it automatically detects the difference between total fuel flow and plant demand and applies a bias to provide bumpless transfer to Automatic mode, and the boiler operates according to plant demand. When the Boiler Master is in Manual mode the boiler firing rate is decoupled from the plant demand and runs independently.

The Fuel Flow loop receives its setpoint signal from the Boiler Master, compares it to the measured fuel flow and controls the output to the fuel actuator. The Oxygen control loop receives the excess O2 signal from the oxygen analyzer and puts out a limited adjustment to the Air Controller's remote setpoint for the amount of air for the current amount of fuel.

The Air Flow control loop receives its setpoint signal from the Boiler Master, compares it to the measured air flow and controls the output to the air actuator.

Cross Limits on fuel and air ensure sufficient combustion air at all times and preventing a fuel-rich atmosphere. To provide for additional safety and ease of operation the controllers have automatic mode switching based on the status of the Air Controller and the BMS. "Reject to manual" is a standard preconfigured feature.

MeterPAK is available in two architectures, depending on the plant's operating preference: a two-controller version with Boiler Master/Fuel Flow control in one device and Air Flow/O2 Trim in the other; and a three-controller version with a separate Boiler Master. Online, continuous Boiler Efficiency Calculation and FGR control are available as options with either architecture.

All entries for combustion tests, engineering unit ranges and other commissioning/setup data can be made through the front panel of the controller. No special software or external programming device is required for installation, startup or operation.

EQUIPMENT DESCRIPTION

The MeterPAK system includes:

- Two or three MeterPAK controllers, preconfigured, with the I/O required for fully metered combustion control with O₂ trim
- Application-specific documentation for the installation, startup and operation of the system.

The MeterPAK controller is a multiloop controller with flexible, isolated I/O. It has a high-visibility display with clear, informative screens for ease of operation. The basic controller includes the CPU, power supply, vacuum fluorescent display, and terminal block. The controller memory is non-volatile RAM which contains the configured database and all current process parameters. The terminal block provides direct connection of field wiring at the rear of the controller. The power supply is 85-250Vac and the front panel has a NEMA 4 rating. The controller also provides failsafe and power fail-recovery settings for all configured parameters and output points. Isolated, single-point I/O protects the controllers from electrical damage and ensures continued operation. Each controller includes RS-485 Modbus RTU communication as standard. Signal exchange between the MeterPAK controllers is via a secure peer-to-peer network.

MeterPAK OPTIONS

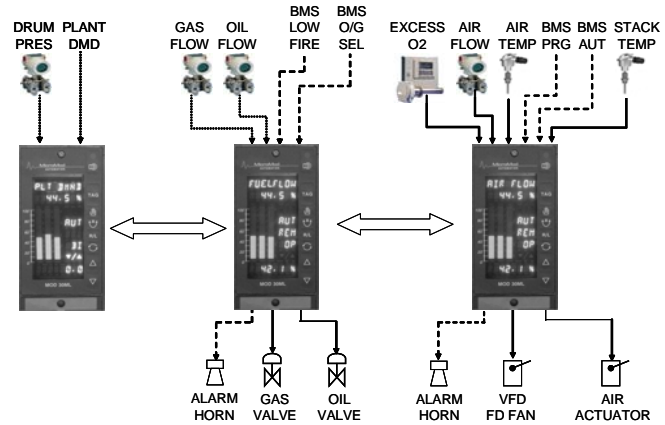
Boiler Efficiency Calculation - continuous, on-line monitoring and display of boiler efficiency and stack temperature, and a high temperature alarm. This option requires a 4-20mA signal from a Stack Temperature transmitter.

Flue Gas Recirculation (FGR) Control - maintains a predetermined ratio of flue gas to air. Adds one 4-20mA output.

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.

Custom Application Engineering - if the standard MeterPAK 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.

Field Instrumentation - MicroMod can assist in the selection of temperature, pressure and flow measuring devices and final control elements. Contact our Sales or Customer Service department.



3-Controller Architecture

SteamPAK Series

MeterPAK is just one of MicroMod's 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 jackshaft position control

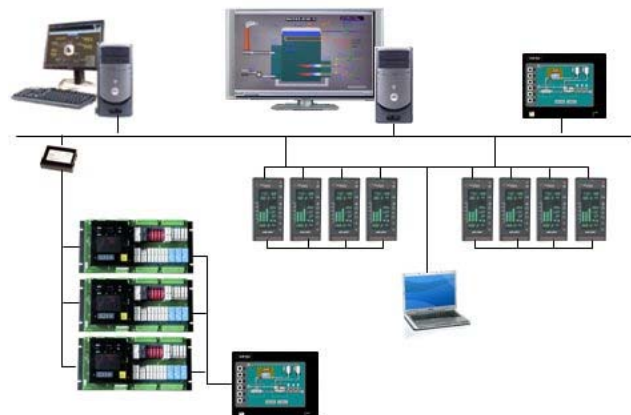
TrimPAK - Parallel position combustion control system with O₂ trim. Ideal for upgrading jackshaft control systems to obtain maximum boiler efficiency.

BurnerPAK - Burner Management Systems for single-burner, dual-fuel boilers

Combustion control packages are also available for High Temperature Hot Water systems.

Plantwide System

All SteamPAK products can be integrated into a plant-wide, Ethernet-based system with advanced operator stations, alarm/event logging and reporting.



Inputs / Outputs:

Analog Inputs (4-20mA with transmitter power, isolated)
 Drum Pressure
 Plant Demand
 Gas Flow
 Oil Flow
 Excess O₂
 Air Flow
 Air Temperature
 Stack Temperature (with Efficiency option)

Analog Outputs (4-20mA, isolated)
 Gas Valve
 Oil Valve
 FD Fan motor VFD
 FGR Damper (with FGR option)

Digital Inputs (110Vac, isolated)
 Fuel Select
 Low Fire
 Purge
 Release-to-Auto

Digital Output (Mechanical relay 110Vac, isolated)
 Alarm Horn

Power Supply: 85-250V rms, 50-400Hz

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

ORDERING INFORMATION

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

End-user Company Name and Complete Address

Contact Name

Telephone and Fax Number

Email address

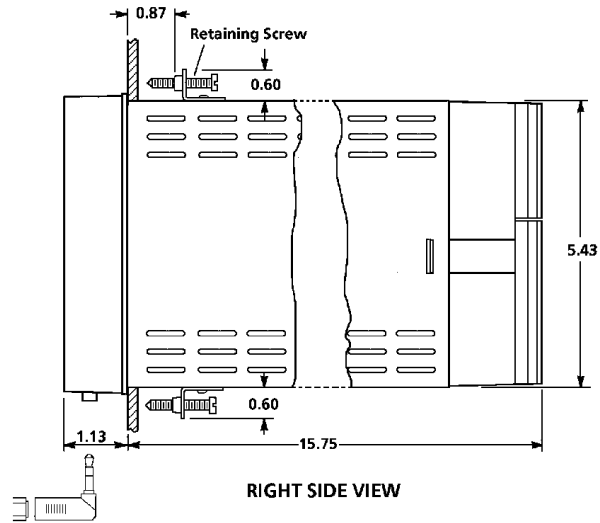
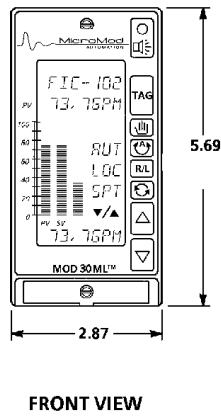
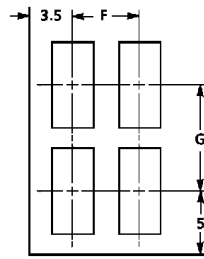
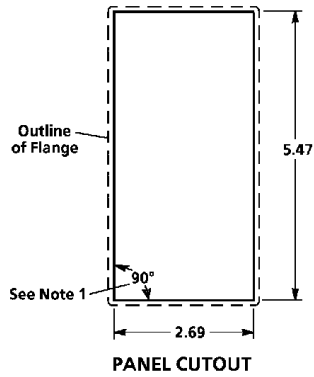
	MTR	___	___	___	___	B
	01 - 03	04	05	06	07	08
MeterPAK Full Metered Combustion Control System with Cross-Limits	MTR					
Architecture ¹ Boiler Master/Fuel and O ₂ /Air (two controllers) Boiler Master, Fuel Master and O ₂ /Air (three controllers)		1 2				
Options None Boiler Efficiency Calculation (requires 4-20mA signal for stack temperature) FGR (Flue Gas Recirculation) Boiler Efficiency Calculation and FGR control			0 1 2 3			
Mounting Standard Remote faceplate				0 1		
Operator Language English Spanish					E S	
Design Level Design Level						B

¹Option 1 includes the Boiler Master function and operations display in the Fuel Controller. Option 2 provides separate Boiler Master controller. Both options provide for input signal from Plant Master controller or from Drum Pressure controller (selected during setup).

Available Options (please specify on order):

Backup Memory Module (blank)	2010PZ10000B
Field Instruments (flow/pressure/temperature measuring elements and/or transmitters)	Contact Factory
Custom Application Engineering - per hour	Contact Factory

MOUNTING DIMENSIONS



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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