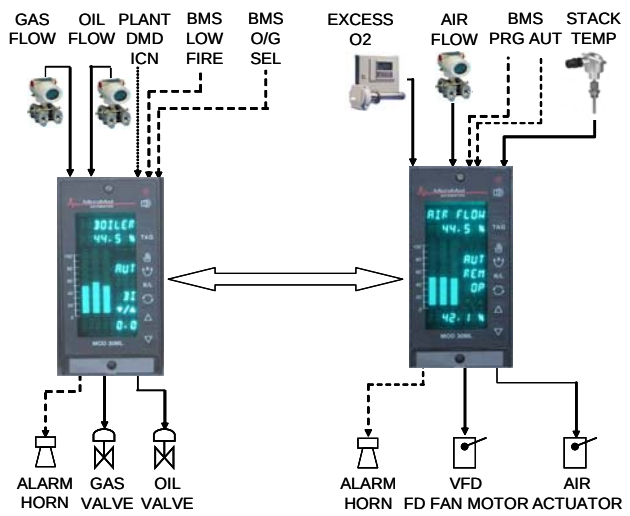
STEAMPAK Series
MeterPAK Combustion Control System
Full Metered with O2 Trim

- ***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***



SYSTEM DESCRIPTION

The MeterPAK Combustion Control system consists of Fuel and Air Flow control with continuous O2 trimfor a single- or dual-fuel boiler . The system includes two control devices: the Fuel Controller and the Air Controller. The Fuel Controller contains the Boiler Master and the Fuel Flow control loop. The Air Controller contains the Air Flow control loop and the Oxygen Controller. The Fuel Flow controller also provides indication and totalization of gas and oil flows.

The Boiler Master can be set up during commission-ing as a Drum Pressure controller or a Bias Station. When set up as a drum pressure controller, the boiler master the drum pressure signal from the pressure transmitter or the plant 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 Controller 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 damper actuator.

Cross Limits on fuel and air ensure that air increases before fuel on a demand increase, and that fuel decreases before air when demand decreases, guaranteeing 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.

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 standalone Boiler Master, a Fuel Flow controller, and an Air/O2 Trim controller. Online, continuous Boiler Efficiency Calculation is available as an option.

All tuning and combustion parameters can be entered from the front panel of the MeterPAK controllers, without the need for an external handheld or personal computer.

EQUIPMENT DESCRIPTION

The MeterPAK system includes:

- MeterPAK controller, pre-configured, with the I/O required for fully metered combustion control with O2 trim
- Optional pressure transmitter and oxygen analyzer with sensor
- 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 or 24Vcd, 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. The Instrument Communication Network (ICN) is standard and provides secure, peer-to-peer communication between MeterPak controllers and other SteamPAK series systems such as PlantPAK plant master control.

OPTIONS

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

Modbus Communications - An RS-485 communications module is added to the controller to provide a second network connection for Modbus RTU over RS-485, for connecting the TrimPAK controller to a host PC or operator graphic panel.

Field Instrumentation - MeterPAK can be ordered with a gage pressure transmitter for Drum Pressure and/or an oxygen analyzer, and comes pre-configured to match the standard ranges. The drum pressure transmitter provides local and infinite adjustment of zero and span and has an accuracy of ±0.075%. Two non-volatile EEPROMs, one in the primary electronics and one in the secondary electronics, back up the transmitter configuration. When replacing the electronics, the new assembly instantly recognizes the original configuration. The zirconia analyzer is designed for boilers and burner control. The analyzer performs the oxygen calculation on the signal received from the mV signal received from the probe. The probe uses a proven, highly reliable design that allows in situ maintenance.
For non-standard field instrument ranges contact the factory. Additional field instrumentation (transmitters, flow elements) can be provided on request.

Standard Application Engineering - This can include setting up the MeterPAK controller database to communicate with other SteamPAK cotnrollers, adding Flue Gas Recirculation Control, configuration and display of additional alarm and/or data acquisition points, or integration with ViewPAK software. (Note: FGR control is not available if the Boiler Efficiency Calculation option is selected).

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.

Additional Data Acquisition / Alarm Points - depending on the options selected, up to 4 additional inputs or outputs may be specified for data acquisiton or alarming. This option typically requires Custom Application Engineering.

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.

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.

ORDERING INFORMATION

Ordering Instructions:

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

End-user Company Name
Complete Address
Contact Name
Telephone Number
Fax Number

	MeterPAK	___	___	___	___	___
	01 - 07	08	09	10	11	12
MeterPAK Full Metered Combustion Control System with Cross-Limits	MeterPAK					
Architecture[1] Boiler Master/Fuel and O2/Air (two controllers) - standalone Boiler Master, Fuel Master and O2/Air (three controllers) - standalone Boiler Master/Fuel and O2/Air (two controllers) - for use with PlantPAK only Boiler Master, Fuel Master and O2/Air (three controllers) - for use with PlantPAK only		1 2 3 4				
Optional Indication None Boiler Efficiency Calculation *(requires 4-20mA signal for stack temperature)*			0 1			
Serial Communication Option None Modbus - *for communication to host PC*				0 1		
Operator Language English Spanish					E S	
Optional Field Instruments[2] None Drum Pressure Transmitter *(0 - 348 psi)* Oxygen Analyzer *(0 - 25% O2)* Drum Pressure Transmitter *(0-348 psi)* and Oxygen Analyzer *(0-25%)*						0 1 2 3

[1]Options 1 and 3 include the Boiler Master function in the Fuel Controller. Options 2 and 4 provide separate Boiler Master controllers. Options 2 and 3 are for use with hardwired plant master or drum pressure controller. Options 3 and 4 are configured to operate in conjuntion with MicroMod's PlantPAK Plant Master, and can also be used as drum pressure controllers (see specification sheet S-STEAMPAK-METERPAK for details)

[2]MeterPAK controllers are pre-ranged for standard field instruments as shown. To order transmitter or analyzer with nonstandard ranges contact factory.

Available Options (please specify on order):

Standard Application Engineering (may include one or more of the following):
- Configuration for communication with other SteamPAK controllers (e.g. PlantPAK)
- Configuration / display of additional data acquisition points
- Flue Gas Recirculation Control (not available if Efficiency Calculation selected)
- Integration with ViewPAK software

Backup Memory Module (blank)

Additional data acquisition points:
- Analog (hardware only) - per point
- Digital (hardware only) - per point

Custom Application Engineering

Inputs / Outputs:
Analog Inputs (4-20mA with transmitter power, isolated)
- Gas Flow
- Oil Flow
- Excess O2
- Air Flow
- Stack Temperature (with Efficiency option)

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

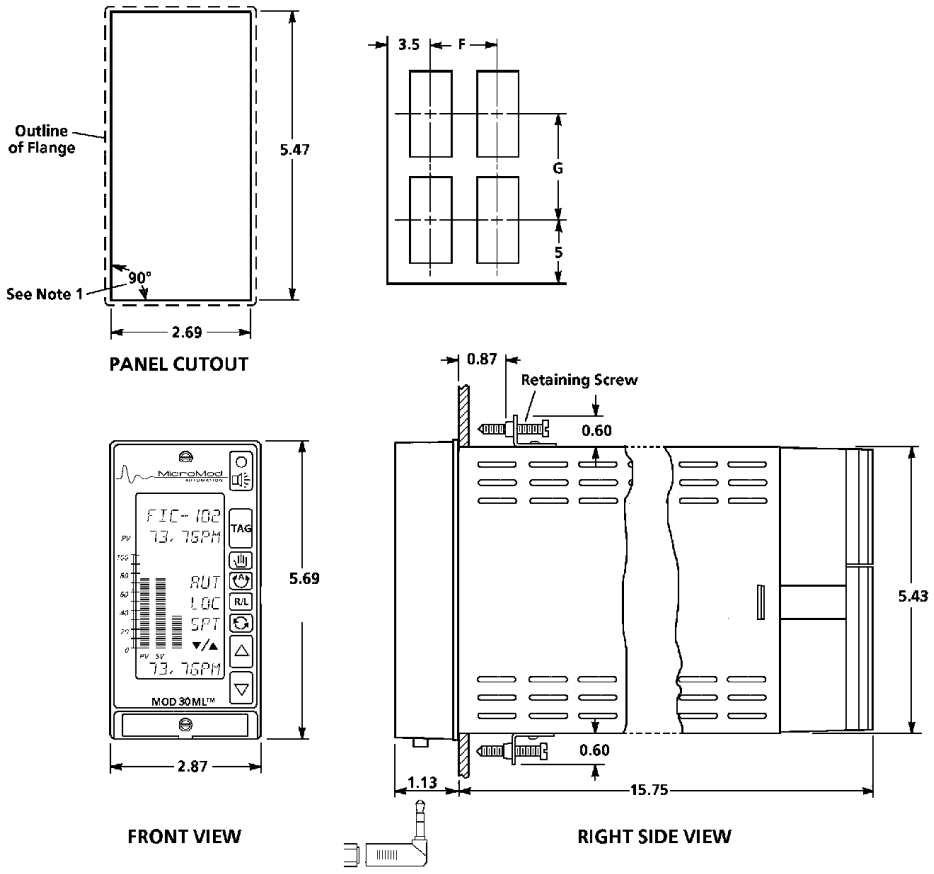
Digital Inputs (110Vac, isolated)
- Low Fire
- Purge
- Release-to-Auto

Digital Output (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

MOUNTING DIMENSIONS



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