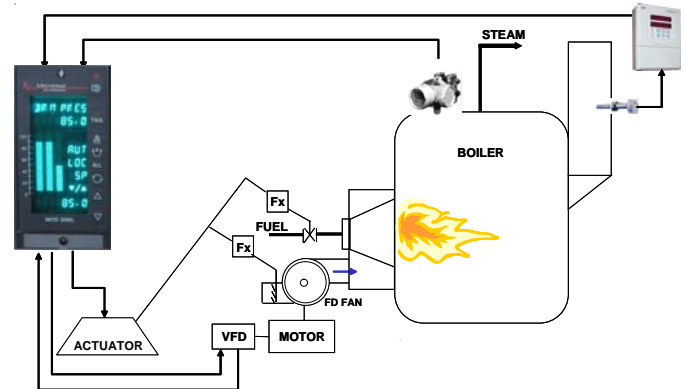




STEAMPAK Series TrimPAK

Jackshaft Controller with O2 Trim

- **Continuous, on-line adjustment of fuel-air ratio**
- **O2 Trim control for improved efficiency**
- **Increased safety for personnel & equipment**
- **Reduced maintenance costs**
- **Reduced fuel consumption / increased steam production**
- **Enhanced environmental protection**
- **Electricity savings with VFD**
- **Online efficiency calculation, variable retransmission and FGR control options**



SYSTEM DESCRIPTION

If your boiler isn't operating at design efficiency due to mechanical wear, old controls, or conservative fuel/air settings, upgrading your combustion control system to a TrimPAK can improve boiler efficiency 5% or more, with a resulting reduction in fuel consumption or increase in steam for the same amount of fuel. It can also provide additional benefits of reducing the need to replace refractory or tubing, reduction in the total amount of NOX and CO2 emissions and significant savings in electricity.

TrimPAK is a pre-engineered, pre-configured combustion control system with oxygen trim for single- or dual-fuel jackshaft boilers. It is ideal for upgrading older control systems that can no longer maintain the original design efficiency of the boiler. TrimPAK provides the instrumentation and pre-configured programs for continuous adjustment of the fuel-air ratio, for optimum combustion efficiency.

Installing a TrimPAK system on an existing jackshaft boiler requires adding control of the air flow. This can be done by adding a Variable Frequency Drive (VFD) to the FD fan motor and adjusting the air volume to demand by regulating the speed of the fan; or by the traditional method of separating the jackshaft and installing an air damper actuator. TrimPAK supports both methods, although the VFD will result in greater savings through reduced electricity consumption.

TrimPAK provides a higher level of safety than traditional jackshaft control systems, including: output limits on the O2 controller; alarm and boiler trip on insufficient air; automatic switch to Manual on loss of drum pressure or O2 signal; and air feedback signal with deviation alarm on fan speed or actuator position.

All entries for combustion tests, engineering unit ranges and other commissioning 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.

The boiler master in the TrimPAK controller can be set up at commissioning time to act as either a drum pressure controller or a bias station, or to allow the operator to switch from one to the other if necessary. When set up as a drum pressure controller, the boiler master receives the drum pressure signal from the pressure transmitter or the plant, compares it with a predetermined setpoint and generates an output. When set up as a bias station, the boiler master receives an input signal from the Plant Master, applies a locally entered bias and generates an output. The output of the boiler master represents fuel demand, and is connected to the jackshaft actuator to control fuel flow. The same signal is sent to lookup tables within the controller which contain the air settings for a certain fuel flow as determined during the combustion test. The signal from the oxygen analyzer is the process input for the excess air (O2) control loop, which compares it with the fuel demand from the lookup tables. The result becomes the setpoint for that loop.

The output of the O2 controller is used to trim the output of the pressure control loop. This adjusted signal is connected either to the VFD on the FD fan motor or to the air damper actuator. In this way the boiler is always operating with the correct fuel-air ratio, eliminating the need for seasonal adjustments and compensating for changes in temperature and mechanical wear.

EQUIPMENT DESCRIPTION

The TrimPAK system includes:

- TrimPAK controller, pre-configured, with the I/O required for combustion control with O2 trim, alarm relay output, and interlocks to Burner Management System
- All necessary documentation for the installation, startup and operation of the system.

The TrimPAK 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 nonvolatile 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 24Vdc, 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 controller and adjacent signals from electrical damage and ensures continued operation. Each controller includes RS-485 Modbus RTU communications as standard.

TrimPAK OPTIONS

Boiler Efficiency Calculation - continuous, on-line monitoring and display of boiler efficiency and stack temperature with high stack 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.

Variable Retransmission - Adds one retransmission output. During controller setup, select from Fuel Output, Drum Pressure, Oxygen, Stack Temperature or Boiler Efficiency for retransmission via 4-20mA signal.

Backup Memory Module - provides redundant, removable nonvolatile 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 restart of the system after a power outage or equipment failure, with the latest values.

Field Instrumentation - MicroMod can provide a pressure transmitter, O2 analyzer and other field instruments. Contact our Sales or Customer Service department for assistance.

Custom Application Engineering - if the standard TrimPAK 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.

The MicroMod SteamPAK Series

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

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

PlantPAK - plant master controller, with optional lead/lag sequence control

BoilerPAK - single-point jackshaft position control

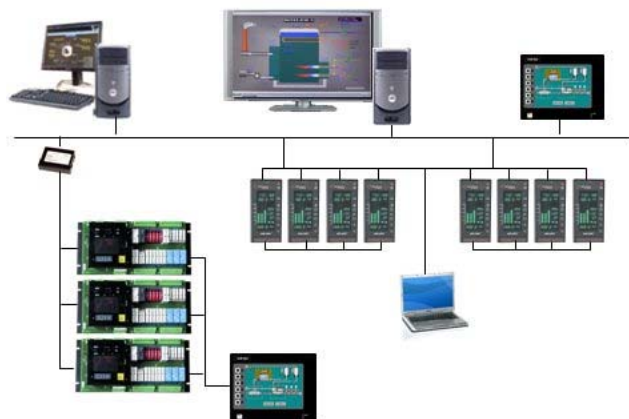
BurnerPAK - Burner Management Systems

MeterPAK - Fully metered combustion control system with O2 trim

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

Plantwide System

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



Inputs / Outputs:

- Analog Inputs
 - 4-20mA, isolated
 - Plant Master
 - VFD Feedback signal
 - 4-20mA, isolated, with 24Vdc transmitter power
 - Drum Pressure
 - Excess O2
 - Stack Temperature (with Efficiency option)
- Analog Outputs
 - 4-20mA, non isolated
 - Jackshaft Actuator
 - FD Fan motor VFD or Air Actuator
 - 4-20mA, isolated
 - FGR Damper (with FGR option)
 - Retransmission (with Retransmission option)
- Digital Inputs (110Vac, isolated) for connection to BMS
 - Low Fire
 - Purge
 - Release-to-Auto
 - Fuel Select (Gas, Oil)
- 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

ORDERING INFORMATION

TrimPAK 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)

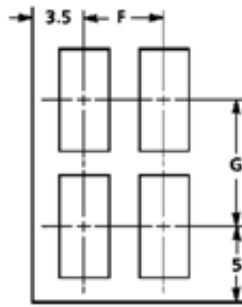
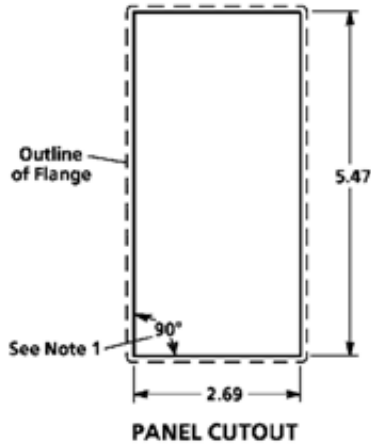
	TRM	01 - 03	04	05	06	07	08
Base Controller Combustion controller with O2 Trim, configured	TRM						
Auxiliary Control None FGR (Flue Gas Recirculation)		0 1					
Data Acquisition None Boiler Efficiency Calculation ¹ Retransmission Output Boiler Efficiency Calculation ¹ & Retransmission Output			0 1 2 3				
Mounting Standard Remote Faceplate (Not available in NEMA 4X)				0 1			
Operator Language English Spanish					E S		
Design Level Design Level							B

¹Requires 4-20mA input signal from stack temperature transmitter (transmitter not included)

Additional Options

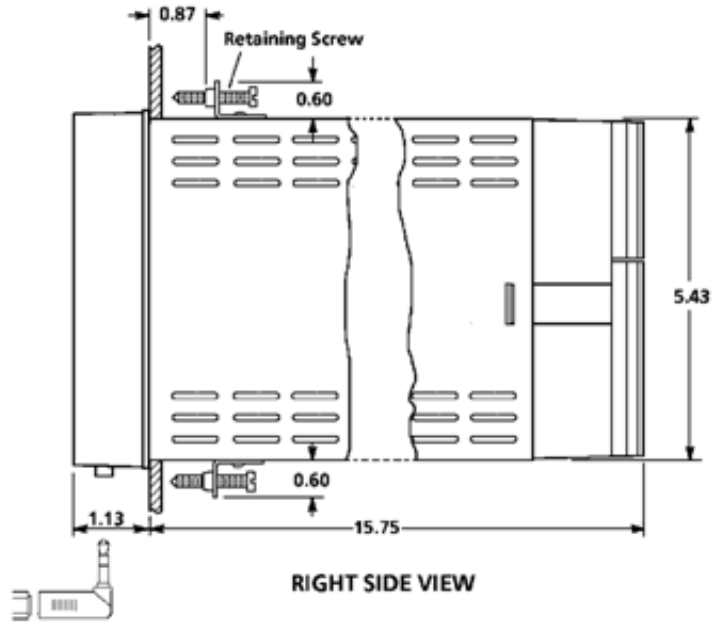
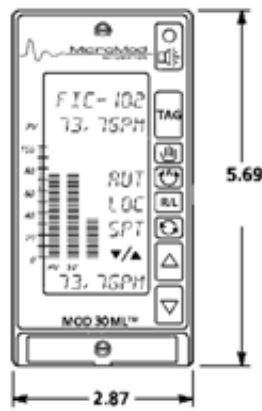
Portable Memory Module	2010PZ10000A
Field Instruments (pressure transmitter, O2 analyzer, VFD)	Contact Factory
Custom Application Engineering	Contact Factory

MOUNTING DIMENSIONS



Distance between centers when mounting multiple controllers (inches):

	F	G
Recommended	4	8
Minimum	3.5	7



Notes:

- 1 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.
- 2 Dimensions in the diagrams are in inches.

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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