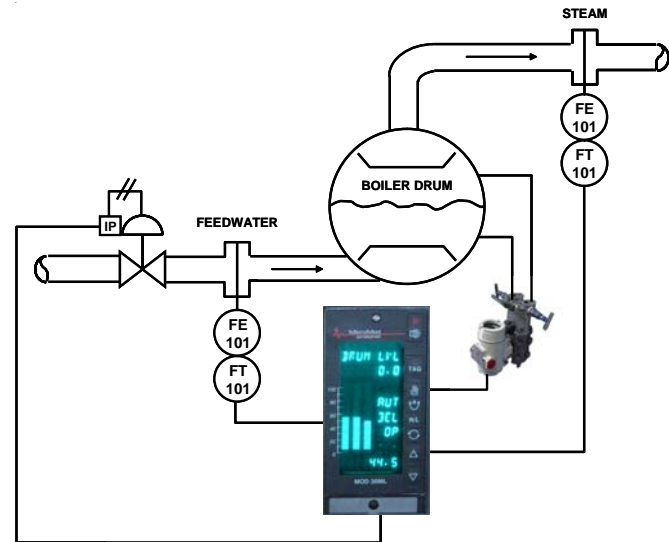




## STEAMPAK Series DrumPAK Boiler Drum Level Controller

- **Avoid unplanned boiler shutdowns due to drum level and feedwater pressure changes**
- **Increase safety for personnel and equipment**
- **Select from single-, two- or three-element control strategies**
- **Optional draft control, fuel totalizers and economizer monitoring**
- **Simple setup screens: no programming required**
- **Application-specific installation & operations documentation**



### SYSTEM DESCRIPTION

DrumPAK is a pre-engineered control package designed to provide significant improvements in maintaining drum water level, stabilizing the effects of feedwater pressure changes, and responding to plant load changes. Preconfigured templates allow selection of single-, two- or three-element control and entry of user parameters such as engineering unit ranges, tuning constants, and alarm limits from the front panel.

**Single-Element Control:** The DrumPAK controller receives the Drum Level signal from the drum level transmitter, compares it to a pre-determined setpoint, and adjusts the output to the feedwater flow valve. A single-element system, while simple and low-cost, does not protect against “shrink” and “swell”, and cannot anticipate large or sudden changes in plant steam demand. Therefore this strategy is typically used on small boilers with slow load changes.

**Two-Element Control:** adds Steam Flow measurement for “shrink” and “swell” compensation and better response to load changes. The controller calculates the feedwater requirement based on level, and uses the Steam Flow signal from a flow transmitter or vortex meter as a feedforward signal to anticipate the effect of steam demand changes on level. The output is fed to an X,Y lookup table that is programmed with predetermined valve positions for given steam flows (entered from the front panel during commissioning) before being sent to the Feedwater Flow Control Valve in the field.

**Three-Element Control:** adds measurement and control of feedwater, which allows the system to compensate for variations in feedwater pressure and valve linearity. The output of the Drum Level control algorithm, adjusted with the Steam Flow feedforward input, becomes the Remote Setpoint for the Feedwater Flow algorithm. The DrumPAK controller compares the Feedwater Flow signal from the flow transmitter to this setpoint and sends the output to the Feedwater Flow Control Valve in the field. Large boilers or those with large or rapid load changes benefit most from a 3-element control system.

With two- and three-element control, the controller switches to single-element control at a user-determined low steam flow value, ensuring continued level control even if the steam flow signal is lost.

*Installing DrumPAK can significantly reduce or eliminate boiler shutdowns due to drum level or feedwater pressure. DrumPAK not only helps prevent loss of valuable production time and materials, but increases the safety of your boiler. A DrumPAK system more than pays for itself when it prevents just one shutdown per year.*

## EQUIPMENT DESCRIPTION

Each DrumPAK includes:

- DrumPAK controller, pre-configured, with the I/O required for one-, two- and three-element drum level control and any selected options
- All necessary documentation for the installation, startup and operation of the system.

The DrumPAK 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. RS-485 serial communications is standard with every DrumPAK controller.

## DrumPAK OPTIONS

**Draft Control** - provides additional I/O, setup menus and operator display for furnace draft control using a damper or ID fan. Requires a 4-20mA input signal from a Furnace Pressure transmitter.

**Fuel Totalizers** - provides additional analog inputs, setup menus and operator display for gas and oil flow totalization and indication. Requires 4-20mA signal from gas and/or oil flowmeter.

**Economizer Monitoring** - provides analog inputs for indication of boiler outlet temperature, feedwater inlet temperature and feedwater outlet temperature. Requires 4-20mA signals from temperature transmitters.

**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 drum level, furnace pressure, and temperature transmitters as well as level, flow and temperature measurement devices. Contact our Sales or Customer Service department for assistance.

**Custom Application Engineering** - if the standard DrumPAK configuration doesn't meet your application needs, MicroMod will work with you to develop a cost-effective solution to improve your boiler operation.

## The MicroMod SteamPAK SERIES

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

**PlantPAK** - plant master controller, with optional automatic lead/lag and plant steam flow feedforward control

**BoilerPAK** - single-point jackshaft position control

**TrimPAK** - Combustion control with O<sub>2</sub> trim for jackshaft boilers. Ideal for upgrading older control systems to obtain maximum boiler efficiency.

**MeterPAK** - Fully metered combustion control system with O<sub>2</sub> trim

**BurnerPAK** - Burner Management Systems

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 with transmitter power, isolated)
- Drum Level
  - Steam Flow
  - Feedwater Flow
  - Furnace Pressure (optional)
  - Gas Flow (optional)
  - Oil Flow (optional)
  - Boiler Outlet Temperature (optional)
  - Feedwater Inlet Temperature (optional)
  - Feedwater Outlet Temperature (optional)
- Analog Outputs (4-20mA, isolated)
- Feedwater Flow Valve
  - Draft Demand (optional)
- Relay Output (110Vac, isolated)
- Alarm

**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**

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

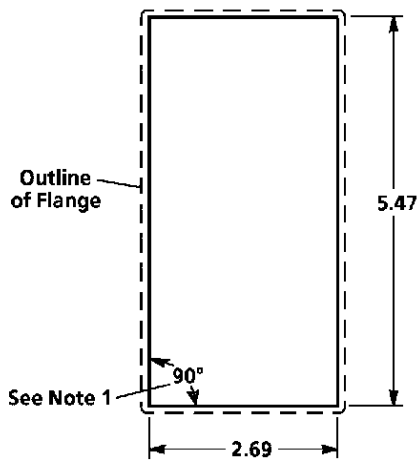
- End-user Company Name
- Complete Address
- Contact Name
- Telephone and Fax Number
- Email address

	<b>DRM</b>					<b>B</b>
	01-03	04	05	06	07	08
<b>Base Controller</b> Drum Level Controller for single-, two- or three-element control	DRM					
<b>Auxiliary Control</b> None Draft Control		0 1				
<b>Data Acquisition</b> None Fuel Totalization Economizer Monitoring Fuel Totalization + Economizer Monitoring			0 1 2 3			
<b>Mounting</b> Standard Remote Faceplate				0 1		
<b>Operator Language</b> English Spanish					E S	
<b>Design Level</b> Design Level						B

**Additional Options**

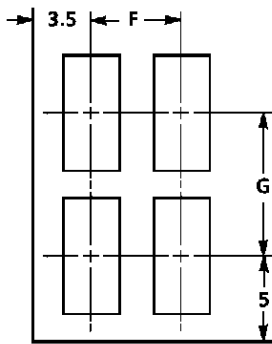
Portable Memory Module	2010PZ10000A
Field Instruments (level / pressure / temperature measurement & transmitters)	
Custom Application Engineering	

## MOUNTING DIMENSIONS



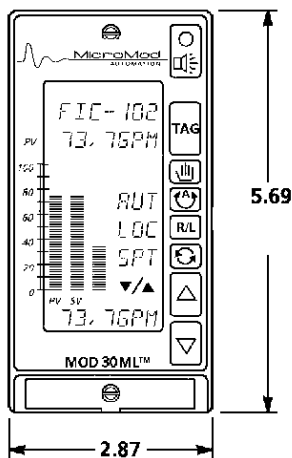
**PANEL CUTOUT**

### DISTANCE BETWEEN CENTERS

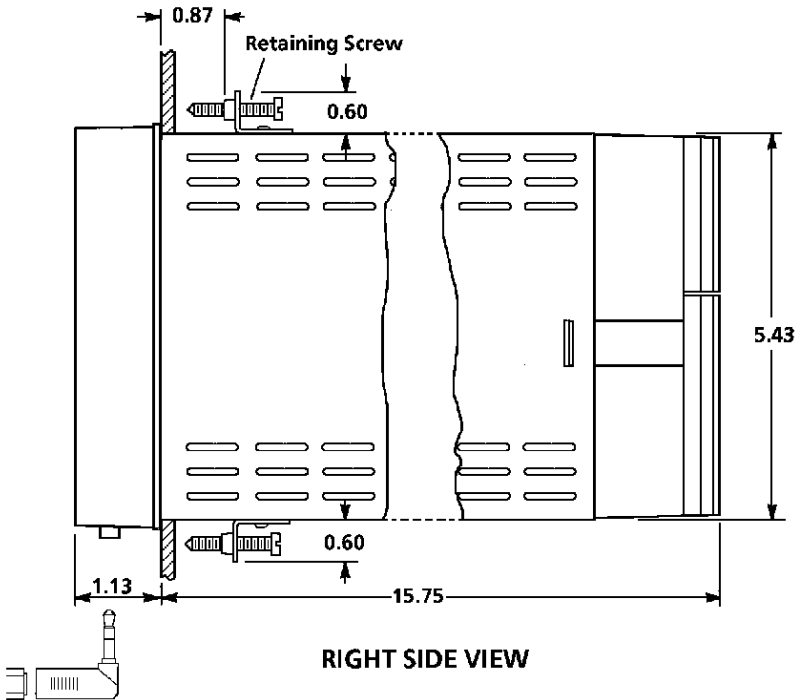


Distance between centers when mounting multiple controllers (inches)

	F	G
Recommended	4.0	8.0
Minimum	3.5	7.0



**FRONT VIEW**



**RIGHT SIDE VIEW**

**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.

Printed in USA Sept 2009

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