

EZ-ZONE™ PM Controllers Take the Pain Out of Solving Your Thermal Loop Requirements



Watlow's EZ-ZONE™ PM panel mount controller offers control options to reduce system complexity and the cost of thermal loop ownership. You can order the EZ-ZONE PM as a PID controller, an over/under limit controller or these functions can be combined into an integrated controller. You now have the option to integrate a high amperage power controller output with a high-performance PID controller and an over/under limit controller in one space-saving, panel mount package. A number of serial communication options are available to support your connectivity needs.

Because the EZ-ZONE PM controller is highly scalable you only pay for what you need. This controller is available in ½ or ⅙ DIN panel mount packages. If you are looking for a PID controller, an over/under limit controller or an integrated controller, the EZ-ZONE PM will make your life easier.

Features and Benefits - Standard

Advanced PID control algorithm

- Offers TRU-TUNE™+ adaptive control to provide tighter control for demanding applications
- Provides auto-tune for fast, efficient start up

Configuration communications with software

- Saves time and improves reliability of controller setup

Factory Mutual (FM) approved over/under limit with auxiliary outputs

- Increases user and equipment safety for over/under temperature conditions

Memory for saving and restoring parameter settings

- Reduces service calls and down time

Agency approvals: UL® listed, CSA, CE, RoHS, W.E.E.E. FM, SEMI F47-0200, Class I div. 2 rating on selected models

- Assures prompt product acceptance
- Reduces end product documentation costs

P3T armor sealing system

- Complies to NEMA 4X, IP66
- Allows controller to be cleaned and washed down
- UL® 50 independent certification to NEMA 4X specification

Touch-safe package

- Increases safety for installer/operator
- Complies to IP2X requirements

Consistent Termination Labeling (CTL) connection system

- Allows removable cage clamp connectors
- Provides consistent termination labeling

EZ-KEY

- Enables simple, one-touch operation of user defined, repetitive activities

Programmable menu system

- Reduces setup time and increases operator efficiency

Three-year warranty

- Demonstrates Watlow's reliability and product support

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Features and Benefits - Optional

Integrated PID and limit controller

- Reduces wiring time and termination complexity compared to connecting discrete products
- Reduces panel space
- Reduces installation costs
- Increases user and equipment safety for over/under temperature conditions

High amperage power control output

- Drives 15 amp resistive loads direct
- Reduces component count
- Saves panel space and simplifies wiring
- Reduces cost of ownership

Current monitoring

- Detects heater current flow and provides alarm indication of a failed output device or heater load

Serial communication capabilities

- Provides a wide range of protocol choices including Modbus® RTU, EtherNet/IP™, Modbus® TCP
- Supports network connectivity to a PC or PLC

Class I div. 2

- UL® 1604 rated for use in hazardous locations

Remote set point operation

- Supports efficient set point manipulation from a remote device such as a master control or PLC

Profile capability

- Offers pre-programmed process control
- Allows ramp/soak programming with four files and 40 total steps

Retransmit

- Supports industry needs for product process recording



Better Thermal Solutions...Faster

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WIN-EZPM-0307

ISO 9001



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UL® is a registered trademark of Underwriter's Laboratories Inc.
Modbus® is a registered trademark of Schneider Automation Incorporated.
EtherNet/IP™ is a trademark of Open DeviceNet Vendors Association.



Specifications

Line Voltage/Power

- 85 to 264V~(ac), 47 to 63Hz
- 20 to 28V~(ac), +10/-15 percent; 50/60Hz, ± 5 percent
- 12 to 40V=(dc)
- 10VA maximum power consumption
- Data retention upon power failure via nonvolatile memory
- Compliant with SEMI F47-0200, Figure R1-1 voltage sag requirements @ 24V~(ac) or higher

Environment

- -18 to 65°C (0 to 149°F) operating temperature
- -40 to 85°C (-40 to 185°F) storage temperature
- 0 to 90 percent RH, non-condensing

Accuracy

- Calibration accuracy and sensor conformity: ± 0.1 percent of span, $\pm 1^\circ\text{C}$ @ the calibrated ambient temperature and rated line voltage
 - Types R, S, B; 0.2 percent
 - Type T below -50°C ; 0.2 percent
- Calibration ambient temperature @ $25^\circ\text{C} \pm 3^\circ\text{C}$ ($77^\circ\text{F} \pm 5^\circ\text{F}$)
- Accuracy span: 540°C (1000°F) minimum
- Temperature stability: $\pm 0.1^\circ\text{C}/^\circ\text{C}$ ($\pm 0.1^\circ\text{F}/^\circ\text{F}$) rise in ambient maximum

Agency Approvals

- UL®/EN 61010 Listed
- UL® 1604 Class I div. 2 on non mechanical relay units
- UL® 50, NEMA 4X, EN 60529 IP66
- CSA 610110 CE
- RoHS, W.E.E.E.
- Limit version features FM Class 3545

Controller

- User selectable heat/cool, on-off, P, PI, PD, PID or alarm action, not valid for limit controllers
- Auto-tune with TRU-TUNE+™ adaptive control algorithm
- Control sampling rates: input = 10Hz, outputs = 10Hz
- Input and output capacity per controller type ordering information

Serial Communications

- Isolated communications
 - EIA 232/485, Modbus® RTU
 - EtherNet/IP™/Modbus® TCP (ODVA certified)
 - Future options include DeviceNet™ and Profibus™ DP

Wiring Termination—Touch-Safe Terminals

- Input, power and controller output terminals are touch safe removable 12 to 22 AWG

Universal Input

- Thermocouple, grounded or ungrounded sensors
 - $>20\text{M}\Omega$ input impedance
 - $3\mu\text{A}$ open sensor detection
 - Maximum of 20Ω source resistance
- RTD 2- or 3-wire, platinum, 100Ω and 1000Ω @ 0°C calibration to DIN curve ($0.00385 \Omega/\Omega/^\circ\text{C}$)
- Process, 0-20mA @ 100Ω , or 0-10V=(dc) @ $20\text{k}\Omega$ input impedance; scalable, 0-50mV, 0-1000 Ω
- Inverse scaling

Digital Input

- Update rate 10Hz
- DC voltage
 - Maximum input 36V at 3mA
 - Minimum high state 3V at 0.25mA
 - Maximum low state 2V
- Dry contact
 - Minimum open resistance $10\text{k}\Omega$
 - Maximum closed resistance 50Ω
 - Maximum short circuit 20mA

Digital Output

- Update rate 10Hz
- Output voltage 24V, current limit, Output 6 = 10mA maximum, Output 5 = 3 pole DIN-A-MITE® or 24 mA maximum

Current Measurement

- Accepts 0-50mA signal (user programmable range)
- Displayed operating range and resolution can be scaled and are user programmable
- Requires optional current transformer

Functional Operating Range

- Type J: -210 to 1200°C (-346 to 2192°F)
- Type K: -200 to 1370°C (-328 to 2500°F)
- Type T: -200 to 400°C (-328 to 750°F)
- Type E: -200 to 1000°C (-328 to 1832°F)
- Type N: -200 to 1300°C (-328 to 2372°F)
- Type C: 0 to 2315°C (32 to 4200°F)
- Type D: 0 to 2315°C (32 to 4200°F)
- Type F: 0 to 1395°C (32 to 2543°F)
- Type R: -50 to 1767°C (-58 to 3214°F)
- Type S: -50 to 1767°C (-58 to 3214°F)
- Type B: 0 to 1816°C (32 to 3300°F)
- RTD (DIN): -200 to 800°C (-328 to 1472°F)
- Process: -1999 to 9999 units

Output Hardware

- Switched dc = 22 to $32\text{V}=(\text{dc})$ @ 30mA
- Switched dc/open collector = $30\text{V}=(\text{dc})$ maximum @100mA maximum current sink
- Solid state relay (SSR), Form A, 0.5A @ 24V~(ac) minimum, 264V~(ac) maximum, opto-isolated, without contact suppression
- Electromechanical relay, Form C, 5A, 24 to 240V~(ac) or $30\text{V}=(\text{dc})$ maximum, resistive load, 100,000 cycles at rated load
- Electromechanical relay, Form A, 5A, 24 to 240V~(ac) or $30\text{V}=(\text{dc})$ maximum, resistive load, 100,000 cycles at rated load
- NO-ARC relay, Form A, 15A, 24 to 240V~(ac), no V=(dc), resistive load, 2 million cycles at rated load
- Universal process/retransmit, Output range selectable: 0 to $10\text{V}=(\text{dc})$ into a minimum $1,000\Omega$ load 0 to 20mA into maximum 800Ω load

Operator Interface

- Dual 4 digit, 7 segment LED displays
- Advance, infinity, up and down keys plus an EZ-KEY programmable function key (not available in $\frac{1}{2}$ DIN)
- Typical display update rate 1Hz

PID Model Ordering Information

- Universal Sensor Input, Configuration Communications
- TRU-TUNE™+ Adaptive Tune, Red Green Seven Segment Displays

Code Number

PM = EZ-ZONE PM controller

Package Size

- 3 = 1/2 DIN
- 6 = 1/6 DIN

Primary Function

- C = PID controller
- R = Ramp and soak
- S = Custom firmware

Power Supply, Digital I/O

- 1 = 100 to 240V~(ac)
- 2 = 100 to 240V~(ac) plus 2 digital I/O points
- 3 = 20 to 28V~(ac) or 12 to 40V=(dc)
- 4 = 20 to 28V~(ac) or 12 to 40V=(dc), plus 2 digital I/O points

Output 1 and 2 Hardware Options

Output 1

- CA = Switched dc/open collector
- CH = Switched dc/open collector
- CC = Switched dc/open collector
- CJ = Switched dc/open collector
- CK = Switched dc/open collector
- EA = Mechanical relay 5A, Form C
- EH = Mechanical relay 5A, Form C
- EC = Mechanical relay 5A, Form C
- EJ = Mechanical relay 5A, Form C
- EK = Mechanical relay 5A, Form C
- FA = Universal process
- FC = Universal process
- FJ = Universal process
- FK = Universal process
- AK = None
- KH = SSR Form A, 0.5A
- KK = SSR Form A, 0.5A

Output 2

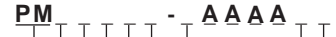
- None
- NO-ARC 15A power control (1/6 DIN only)
- Switched dc
- Mechanical relay 5A, Form A
- SSR Form A, 0.5A
- None
- NO-ARC 15A power control (1/6 DIN only)
- Switched dc
- Mechanical relay 5A, Form A
- SSR Form A, 0.5A
- None
- Switched dc
- Mechanical relay 5A, Form A
- SSR Form A, 0.5A
- NO-ARC 15A power control (1/6 DIN only)
- SSR Form A, 0.5A

Additional Communication Options, Standard Bus Always Included

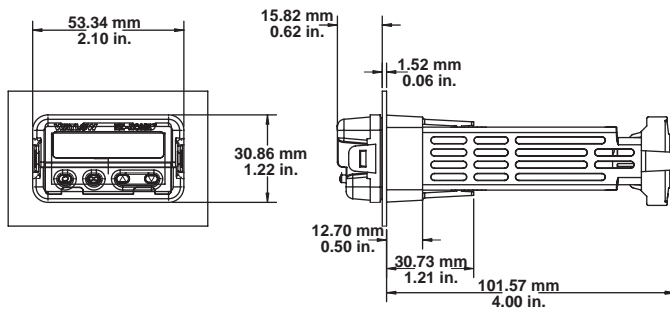
- A = None
- 1 = EIA 485 Modbus® RTU

Additional Options

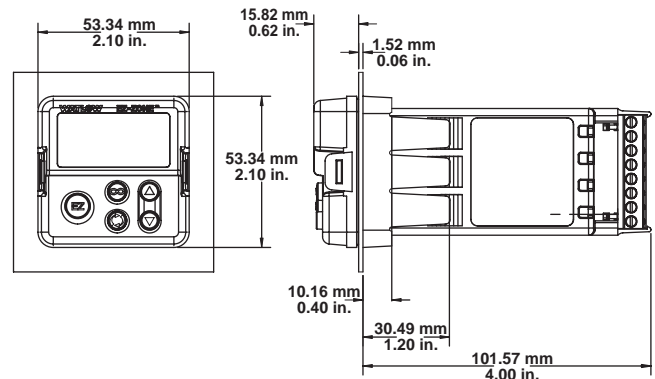
- AA = Standard EZ-ZONE PM face plate
- 12 = Class I div. 2 (not available with mechanical relay output types)
- Firmware, overlays, parameter settings



EZ-ZONE PM 1/2 DIN Dimensional Drawing



EZ-ZONE PM 1/6 DIN Dimensional Drawing



Limit Model Ordering Information

- Universal Sensor Input, Configuration Communications
- Red Green Seven Segment Displays

Code Number

PM = EZ-ZONE PM controller

Package Size

- 3 = 1/2 DIN
- 6 = 1/6 DIN

Primary Function

- L = Limit controller
- D = Custom firmware

Power Supply, Digital I/O

- 1 = 100 to 240V~(ac)
- 2 = 100 to 240V~(ac) plus 2 digital I/O points
- 3 = 20 to 28V~(ac) or 12 to 40V=(dc)
- 4 = 20 to 28V~(ac) or 12 to 40V=(dc), plus 2 digital I/O points

Output 1 and 2 Hardware Options

Output 1

- AJ = None
- CJ = Switched dc/open collector
- EJ = Mechanical relay 5A, Form C

Output 2

- Mechanical relay 5A, Form A
- Mechanical relay 5A, Form A
- Mechanical relay 5A, Form A

Additional Communication Options, Standard Bus Always Included

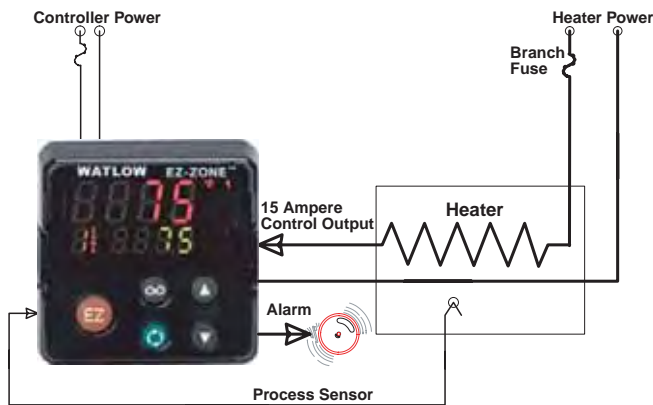
- A = None
- 1 = EIA 485 Modbus® RTU

Additional Options

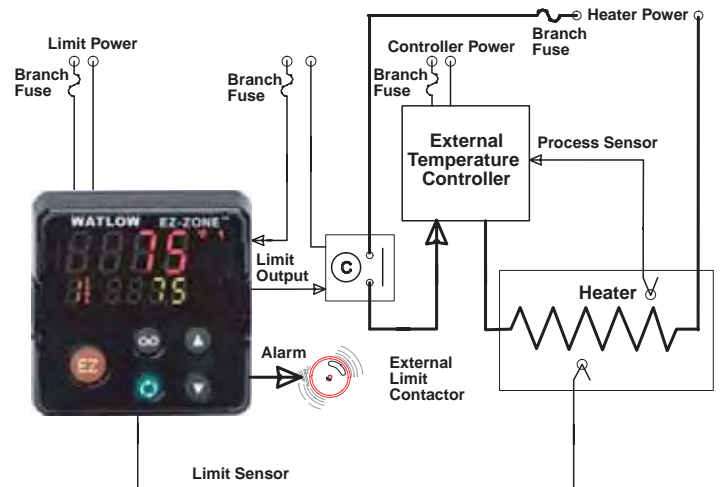
- AA = Standard EZ-ZONE PM face plate
- Firmware, overlays, parameter settings

Typical Block Diagrams

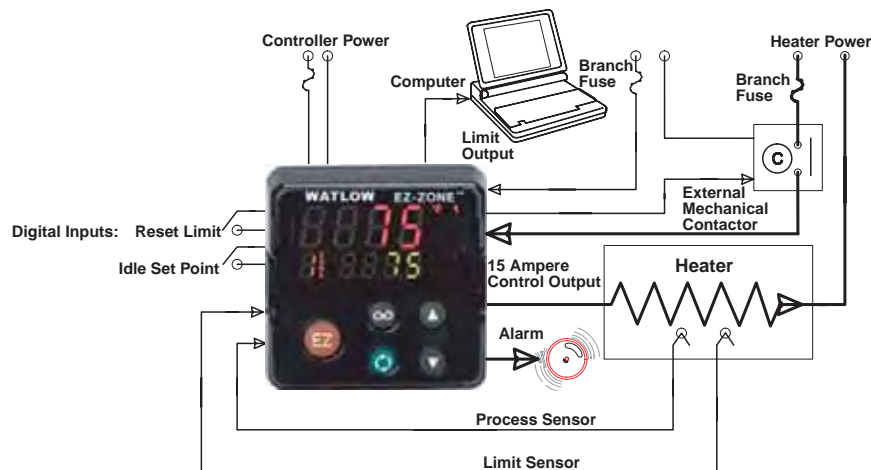
EZ-ZONE PM PID Model



EZ-ZONE PM Limit Model



EZ-ZONE PM Integrated PID Model



Integrated PID Controller Model Ordering Information

- Universal Sensor Input, Configuration Communications
- TRU-TUNE™+ Adaptive Tune, Red Green Seven Segment Displays

Code Number

PM 6 - - - - - A

PM = EZ-ZONE PM controller

Package Size

6 = 1/6 DIN

Primary Function

- C = PID controller
- R = Ramp and soak
- S = Custom firmware

Power Supply, Digital I/O

- 1 = 100 to 240V~(ac)
- 2 = 100 to 240V~(ac) plus 2 digital I/O points
- 3 = 20 to 28V~(ac) or 12 to 40V=(dc)
- 4 = 20 to 28V~(ac) or 12 to 40V=(dc), plus 2 digital I/O points

Output 1 and 2 Hardware Options

Output 1	Output 2
CA = Switched dc/open collector	None
CH = Switched dc/open collector	NO-ARC 15A power control
CC = Switched dc/open collector	Switched dc
CJ = Switched dc/open collector	Mechanical relay 5A, Form A
CK = Switched dc/open collector	SSR Form A, 0.5A
EA = Mechanical relay 5A, Form C	None
EH = Mechanical relay 5A, Form C	NO-ARC 15A power control
EC = Mechanical relay 5A, Form C	Switched dc
EJ = Mechanical relay 5A, Form C	Mechanical relay 5A, Form A
EK = Mechanical relay 5A, Form C	SSR Form A, 0.5A
FA = Universal process	None
FC = Universal process	Switched dc
FJ = Universal process	Mechanical relay 5A, Form A
FK = Universal process	SSR Form A, 0.5A
AK = None	SSR Form A, 0.5A
KH = SSR Form A, 0.5A	NO-ARC 15A power control
KK = SSR Form A, 0.5A	SSR Form A, 0.5A

Additional Communication Options, Standard Bus Always Included

- A = None
- 1 = EIA 485 Modbus® RTU
- 2 = EIA 232/485 Modbus® RTU
- 3 = EtherNet/IP™/Modbus® TCP
- 5 = DeviceNet™ (future option)
- 6 = Profibus DP (future option)

Auxiliary Control Functions

(If communications Options 2 thru 6 were ordered above then Option A must be ordered here)

- A = None
- R = Remote set point input
- T = Current transformer input (not valid Output 3 and 4 selections = FA, FC, FJ and FK)
- L = Integrated limit controller with universal input (only valid Output 3 and 4 selections = CJ, EJ and AJ)

Output 3 and 4 Hardware Options

(If communications Options 2 thru 6 were ordered above, then Option AA must be ordered here)

Output 3	Output 4
AA = None	None
AJ = None	Mechanical relay 5A, Form A
AK = None	SSR Form A, 0.5A
CA = Switched dc/open collector	None
CC = Switched dc/open collector	Switched dc
CJ = Switched dc/open collector	Mechanical relay 5A, Form A
CK = Switched dc/open collector	SSR Form A, 0.5A
EA = Mechanical relay 5A, Form C	None
EC = Mechanical relay 5A, Form C	Switched dc
EJ = Mechanical relay 5A, Form C	Mechanical relay 5A, Form A
EK = Mechanical relay 5A, Form C	SSR Form A, 0.5A
FA = Universal process	None
FC = Universal process	Switched dc
FJ = Universal process	Mechanical relay 5A, Form A
FK = Universal process	SSR Form A, 0.5A
KK = SSR Form A, 0.5A	SSR Form A, 0.5A

Future Options

Additional Options

- AA = Standard EZ-ZONE PM face plate
 - 12 = Class I div. 2 (not available with integrated limit option "L" or mechanical relay output types)
- Firmware, overlays, parameter settings

Enhanced Limit Model Ordering Information

- Universal Sensor Input, Configuration Communications
- Red Green Seven Segment Displays

Code Number

PM 6 - A A

PM = EZ-ZONE PM controller

Package Size

6 = 1/6 DIN

Primary Function

L = Limit controller
D = Custom firmware

Power Supply, Digital I/O

1 = 100 to 240V~(ac)
2 = 100 to 240V~(ac) plus 2 digital I/O points
3 = 20 to 28V~(ac) or 12 to 40V=(dc)
4 = 20 to 28V~(ac) or 12 to 40V=(dc), plus 2 digital I/O points

Output 1 and 2 Hardware Options

Output 1

AJ = None
CJ = Switched dc/open collector
EJ = Mechanical relay 5A, Form C

Output 2

Mechanical relay 5A, Form A
Mechanical relay 5A, Form A
Mechanical relay 5A, Form A

Additional Communication Options, Standard Bus Always Included

A = None
1 = EIA 485 Modbus® RTU
2 = EIA 232/485 Modbus® RTU
3 = EtherNet/IP™/Modbus® TCP
5 = DeviceNet™ (future option)
6 = Profibus DP (future option)

Output 3 and 4 Hardware Options

(If communications options 2 thru 6 were ordered above, then option AA must be ordered here)

Output 3

AA = None
AJ = None
AK = None
CA = Switched dc/open collector
CC = Switched dc/open collector
CJ = Switched dc/open collector
CK = Switched dc/open collector
EA = Mechanical relay 5A, Form C
EC = Mechanical relay 5A, Form C
EJ = Mechanical relay 5A, Form C
EK = Mechanical relay 5A, Form C
FA = Universal process
FC = Universal process
FJ = Universal process
FK = Universal process
KK = SSR Form A, 0.5A

Output 4

None
Mechanical relay 5A, Form A
SSR Form A, 0.5A
None
Switched dc
Mechanical relay 5A, Form A
SSR Form A, 0.5A
None
Switched dc
Mechanical relay 5A, Form A
SSR Form A, 0.5A
None
Switched dc
Mechanical relay 5A, Form A
SSR Form A, 0.5A
SSR Form A, 0.5A

Future Options

Additional Options

AA = Standard EZ-ZONE PM face plate
Firmware, overlays, parameter settings

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