SPECIFICATION SHEET

PM LEGACY™ Panel Mount Controller

Ideally Suited for Basic Applications or Usage Levels

The Watlow® PM LEGACY™ series panel mount controller is an industry leading PID controller that allows optimal performance utilizing simple control and menu functionality without complex features. It is ideally suited for basic applications and usage levels.

The LEGACY includes one universal input and an option for up to two outputs and is available in $^{1}/_{32}$, and $^{1}/_{16}$ DIN panel mount packages. It can be ordered as a PID process controller or as a dedicated over and under-temperature limit controller.

Features and Benefits

Simplified menu
- Fits basic applications with a user-friendly interface supported by two menus and a streamlined list of parameters
- Eliminates user complexity often experienced with more advanced controllers and unnecessary features
- Reduces user training costs and user programming errors

PID auto-tune
- Provides auto-tune for fast, efficient start-up

Standard bus communications
- Allows easy product configuration via PC communications protocol and free software
- Saves time, simplifies programming process and improves reliability of controller setup

Factory Mutual (FM) approved over and under limit with auxiliary outputs
- Increases user and equipment safety for over and under-temperature conditions

Touch-safe package
- Increases installer and operator safety
- Complies with IP2X requirements

Features and Benefits (cont)

EZ-LINK™ mobile application for iPhone® and Android™
- Expedites controller setup with intuitive navigation
- Simplifies setting parameters with plain text names and descriptions
- Connects quickly and easily via Bluetooth® wireless communications

SMOOTH TOUCH™ keypad
- Eliminates contamination points on the front of the controller
- Prevents premature failure of mechanical components
- Creates a better seal on front panel
- Ensures an easy to clean surface

Agency approvals: UL® listed, CSA, CE, RoHS, W.E.E.E., FM, SEMI F47-0200, Class 1, Div. 2 rating on selected models
- Assures prompt product acceptance
- Reduces end product documentation costs

P3T armor sealing system
- Complies to NEMA 4X, IP66 and IP67 specifications
- Allows controller to be cleaned and washed
- Certified UL® 50 independent to NEMA 4X specification

Consistent Termination Labeling (CTL) connection system
- Simplifies switching between products
- Speeds up user's system documentation

Three-year warranty
- Demonstrates Watlow's reliability and product support

High-amperage power control output ($^{1}/_{16}$ DIN only)
- Drives 15 ampere resistive loads direct
- Reduces component count
- Saves panel space and simplifies wiring
- Reduces cost of ownership

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ISO 9001
Registered Company
Winona, Minnesota USA

Specifications

Line Voltage/Power
- 85 to 264VAC, 47 to 63Hz
- 20 to 28VAC, +10/-15%; 50/60Hz, ±5%
- 12 to 40VDC
- 10VA (1/32 and 1/16 DIN)
- Data retention upon power failure via non-volatile memory
- Compliant with SEMI F47-0200, Figure R1-1 voltage sag requirements @ 24VAC or higher

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

Accuracy
- Calibration accuracy and sensor conformity: ±0.1% of span, ±1°C @ the calibrated ambient temperature and rated line voltage
  - Type S: 0.2%
  - Type T below -50°C: 0.2%
- Calibration ambient temperature @ 77°F ±5°F (25°C ±3°C)
- Accuracy span: 1000°F (540°C) min.
- Temperature stability: ±0.1°F/°F (±0.1°C/°C) rise in ambient max.

Agency Approvals
- cULus® UL/EN/CSA C22.2 No 61010-1 Listed, File E185611
- CSA C22.2 No. 24, File 158031
- UL® 50 4X indoor locations, NEMA 4X, IP66, IP67 front seal
- cULus® ANSI/ISA 12.12.01-2007, CSA-C22.2 No. 213-1987, Class 1, Div. 2, Groups A, B, C and D, temperature code T4A, File E184390 (optional)
- CE, RoHS by design, W.E.E.E.
- FM Class 3545 (limit controls)

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

Serial Communications
- Isolated communications
- Standard bus configuration protocol

Wiring Termination—Touch-Safe Terminals
- Input, power and controller output terminals are touch safe removable 12 to 22 AWG

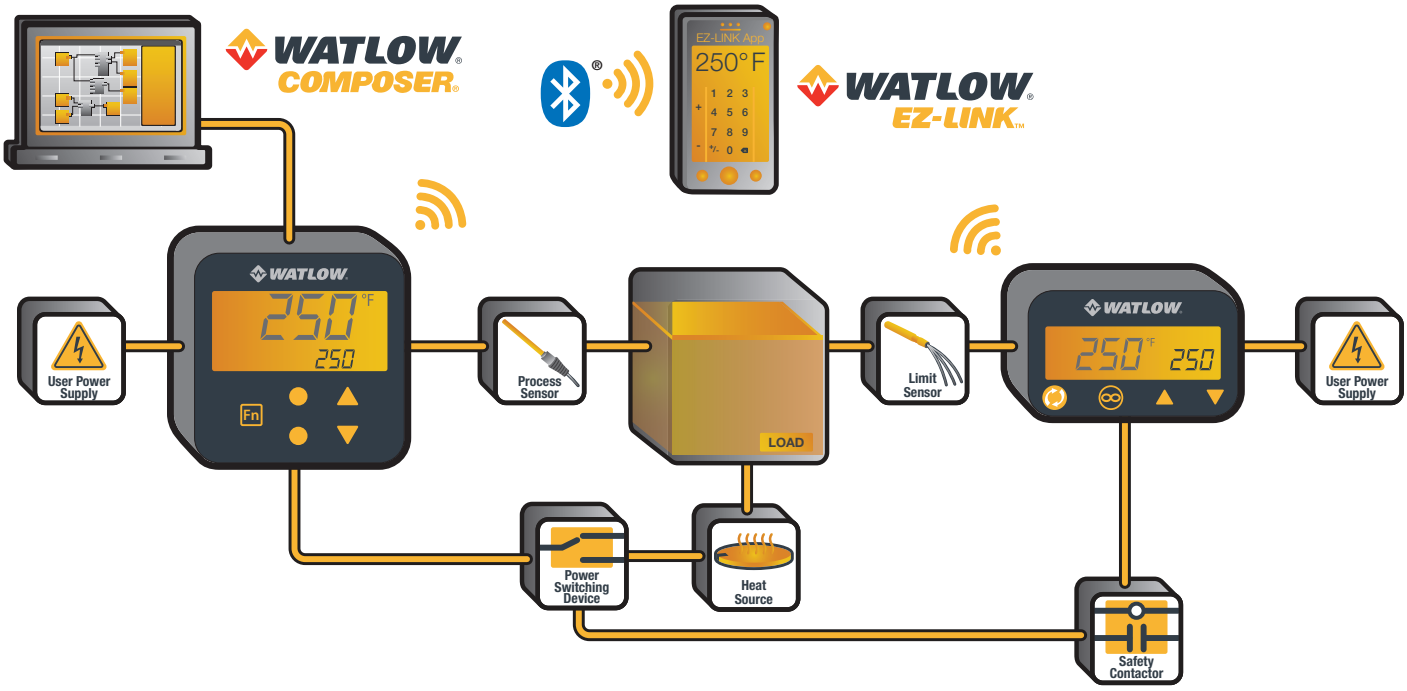
Universal Input
- Thermocouple, grounded or ungrounded sensors, greater than 20MΩ input impedance, 2kΩ source resistance max.
  - Non-isolated to switched dc and process output
- RTD 2- or 3-wire, platinum, 100Ω @ 0°C calibration to DIN curve (0.00385 Ω/Ω/°C)
- Process, 4-20mA @ 100Ω, or 0-10VDC @ 20kΩ input impedance; scalable

Functional Operating Range
Type J: -346 to 2192°F (-210 to 1200°C)
Type K: -454 to 2500°F (-270 to 1371°C)
Type T: -454 to 750°F (-270 to 400°C)
Type E: -454 to 1832°F (-270 to 1000°C)
Type N: -454 to 2372°F (-270 to 1300°C)
Type C: 32 to 4200°F (0 to 2315°C)
Type D: 32 to 4200°F (0 to 2315°C)
Type F: 32 to 2449°F (0 to 1343°C)
Type R: -58 to 3214°F (-50 to 1767°C)
Type S: -58 to 3214°F (-50 to 1767°C)
Type B: 32 to 3300°F (0 to 1816°C)
RTD (DIN): -328 to 1472°F (-200 to 800°C)
Process: -1999 to 9999 units

Output Hardware
- Switched dc = 22 to 32VDC @ 30mA
- Open collector = 30VDC max. @ 100mA max. current sink
- Solid state relay (SSR), Form A, 0.5A @ 24VAC min., 264VAC max., opto-isolated, without contact suppression
- Electromechanical relay, Form C, 24 to 240VAC or 30VDC max., 5A resistive load, 100,000 cycles at rated load
- Electromechanical relay, Form A, 24 to 240VAC or 30VDC max., 5A resistive load, 100,000 cycles at rated load
  - Output 2 is limit for limit models
- NO-ARC relay, Form A, 24 to 240VAC, 15A @ 122°F (50°C), resistive load, no VDC, 2 million cycles at rated load
- Universal process output: range selectable; 0 to 10VDC ±15mV into a min. 1,000Ω load with 2.5mV nominal resolution; 4 to 20mA ±30µA into max. 800Ω load with 5µA nominal resolution; temperature stability 100ppm/°C

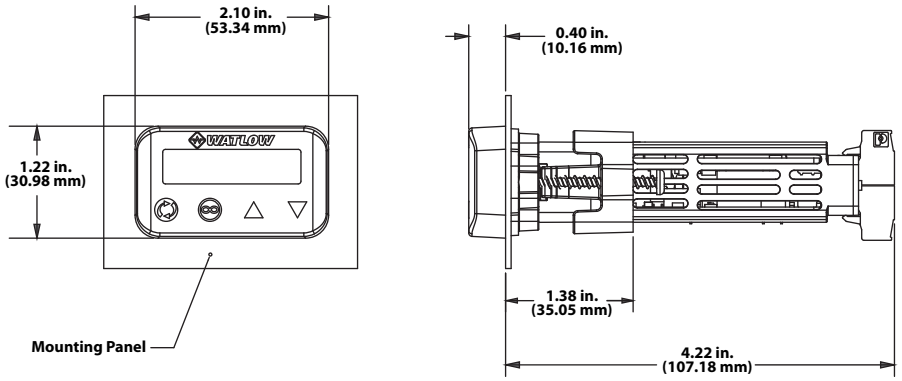
Operator Interface
- Dual 4 digit, 7 segment LED displays
- Typical display update rate 1Hz
- Advance, infinity (RESET), up and down keys plus a FUNCTION KEY (not available in 1/32 DIN)
- Infinity key is also labeled RESET on limit control models
- FUNCTION KEY on 1/16 DIN package automatically programmed as an auto/manual transfer mode function on PID models.

Typical Block Diagram

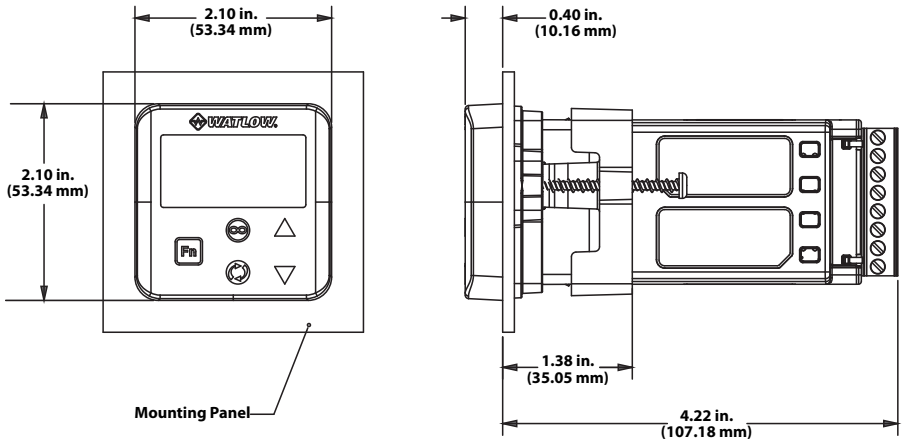


Dimensional Drawings

PM LEGACY 1/32 DIN



PM LEGACY 1/16 DIN

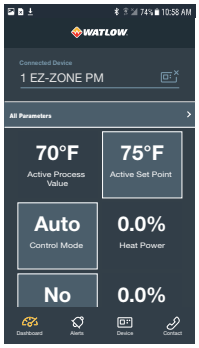


Comparison of Available Features

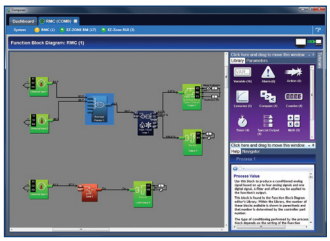
	1/32 DIN	1/16 DIN
PID Loops	1	1
Profile Ramp/Soak	40 total steps	None
Full Menu	Yes	None
Express Menu	Yes	Yes
Number of Digital Inputs/Outputs	0 to 2	0 to 2
Number of Outputs	1 to 4	1 to 6
Integrated Limits	None	None
Discrete Limit	Yes	Yes
Maximum Power Output	5A mechanical relay	15A NO-ARC
Current Measurement	None	None
Standard Bus Communications	Yes	Yes
Bluetooth® Technology	Yes	Yes
Field Bus Communications	Modbus® RTU 485	Limit only
Countdown Timer	Yes	None

Compatible Accessories

More information is available on these products at www.watlow.com



Watlow's new EZ-LINK™ app allows users to easily setup, monitor and adjust Watlow PM PLUS controllers via Bluetooth®. The app is available free-of-charge from the app store for phones and tablets, and provides access to the controller's parameters with fully spelled out names in plain text with help topics that explain each parameter and option. EZ-LINK mobile application connects quickly and easily via Bluetooth® wireless communications. Download the EZ-Link App for iPhone® at GET IT ON Google Play for Android™ or Download on the App Store



COMPOSER is Watlow's easy-to-use software for configuring and customizing controllers. Use it to optimize Watlow's F4T and PM PLUS and RM controllers for specific applications. Task-specific views simplify all aspects of commissioning new controllers including managing the inputs and outputs from pluggable flex modules, setting up functions such as control loops and alarms and creating and editing profiles. COMPOSER software is available for download at www.watlow.com.

SpecView is designed for industrial users with features such as data logging, trending and support for bar code readers and touch screens. Errors are reduced, for any process, by creating application-specific screens. The software provides a historical replay option, easy-to-use recipe features and remote access options, including LAN, Internet and modem.

Silver Series EM touch screen operator interface terminals provide a customizable user interface, email event notifications and log and graph data for Watlow controllers and other devices. A Silver Series EM operator interface terminal paired with Watlow controllers is the perfect solution for your industrial process or machine control application.

PM LEGACY™ Control Configuration Information

①②	③	④	⑤	⑥⑦	⑧	⑨⑩⑪	⑫	⑬⑭
	Package Size	Primary Functions	Power Supply, Digital I/O	Output 1 and 2 Hardware Options	Comm. Options	Future Options	Model Selection	Custom Options
PM						A A A		

③	Package Size
3 =	1/32 DIN
6 =	1/16 DIN

④	Primary Functions
C =	PID controller with universal input
R =	PID controller with universal input and profiling ramp/soak **(Not available on 1/16 DIN or Express version)**
T =	PID controller with universal input and countdown timer **(Not available on 1/16 DIN or Express version)**
J =	PID controller with thermistor input **(Not available on 1/16 DIN or Express version)**
N =	PID controller with universal input and profiling ramp/soak **(Not available on 1/16 DIN or Express version)**

⑤	Power Supply, Digital Inputs/Outputs (I/O)
1 =	100 to 240VAC
2 =	100 to 240VAC plus 2 digital I/O points **(Not available on 1/16 DIN or Express version)**
3 =	20 to 28VAC or 12 to 40VDC
4 =	20 to 28VAC or 12 to 40VDC, plus 2 digital I/O points **(Not available on 1/16 DIN or Express version)**

⑥⑦	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

*CH, EH, KH - Not available with the 1/32 DIN (PM3) package size.

⑧	Communication Options
Standard bus always included	
A =	None
B =	Bluetooth®
E =	EIA-485 Modbus® RTU and Bluetooth® **(Not available on 1/16 DIN or Express version)**
1 =	EIA-485 Modbus® RTU **(Not available on 1/16 DIN or Express version)**
Note: Bluetooth® not available in all countries, contact factory.	

⑫	Model Selection
N =	PM LEGACY Version **(Only available in PM3) (Input 1 always isolated)**
H =	PM LEGACY EXPRESS Version **(Available in PM3 or PM6) (Input 1 always isolated)**

⑬⑭	Custom Options
WP =	Watlow logo face plate
WN =	No logo/no name face plate
AG =	Conformal coating
12 =	Class 1, Div. 2 (not available with mechanical relay Output Types E, H or J)

PM LEGACY Limit Model Configuration Information

①②	③	④	⑤	⑥⑦	⑧	⑨	⑩⑪	⑫	⑬⑭
	Package Size	Primary Functions	Power Supply, Digital I/O	Output 1 and 2 Hardware Options	Comm. Options	Future Option	Output 3 and 4 Hardware Options	Model Selection	Custom Options
PM						A			

③	Package Size
3 =	1/32 DIN
6 =	1/16 DIN

④	Primary Functions
L =	Limit controller with universal input
M =	Limit controller with thermistor input

⑤	Power Supply, Digital Inputs/Outputs (I/O)
1 =	100 to 240VAC
2 =	100 to 240VAC plus 2 digital I/O points **(Not available on Express version)**
3 =	20 to 28VAC or 12 to 40VDC
4 =	20 to 28VAC or 12 to 40VDC, plus 2 digital I/O points **(Not available on Express version)**

⑥⑦	Output 1 and 2 Hardware Options	
	Output 1	Output 2
AJ =	None	Mechanical relay 5A, Form A
CJ =	Switched dc/open collector	Mechanical relay 5A, Form A
EJ =	Mechanical relay 5A, Form C	Mechanical relay 5A, Form A

⑧	Communication Options
Standard bus always included	
A =	None
B =	Bluetooth®
E =	EIA-485 Modbus® RTU and Bluetooth® **(Not available on Express version)**
F =	Modbus® RTU 232/485 and Bluetooth® **(Not available on PM3 or Express version)**
G =	EtherNet/IP™/Modbus® TCP and Bluetooth® **(Not available on PM3 or Express version)**
H =	DeviceNet™ and Bluetooth® **(Not available on PM3 or Express version)**
J =	PROFIBUS DP and Bluetooth® **(Not available on PM3 or Express version)**
1 =	EIA-485 Modbus® RTU **(Not available on Express version)**
2 =	EIA-232/485 Modbus® RTU **(Not available on PM3 or Express version)**
3 =	EtherNet/IP™/Modbus® TCP **(Not available on PM3 or Express version)**
5 =	DeviceNet™ **(Not available on PM3 or Express version)**
6 =	PROFIBUS DP **(Not available on PM3 or Express version)**
Note: Bluetooth® not available in all countries, contact factory.	

⑩⑪	Output 3 and 4 Hardware Options	
	Output 3	Output 4
AA =	None	None
AJ =	None	Mechanical relay 5A, Form A
AK =	None	SSR Form A, 0.5 A
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, 0.5 A
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
Note: Only available on 1/16 DIN models if communication Options F, G, H, J or 2 thru 6 is ordered in previous digit, then Option AA must be ordered here.		

⑫	Model Selection
G =	PM LEGACY Version **(Input 1 always isolated)**
H =	PM LEGACY EXPRESS Version **(Available in PM3 or PM6) (Input 1 always isolated)**

⑬⑭	Custom Options
WP =	Watlow logo face plate
WN =	No logo/no name face plate
AG =	Conformal coating

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To be automatically connected to the nearest North American Technical Sales Office:

1-800-WATLOW2 • www.watlow.com

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