



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

Function key

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

Touch-safe package

- Increases installer and operator safety
- Complies with IP2X requirements

Features and Benefits (con't)

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





Specifications

Line Voltage/Power

- 85 to 264VAC, 47 to 63Hz
- 20 to 28VAC, +10/-15%; 50/60Hz, $\pm 5\%$
- 12 to 40VDC
- 10VA ($\frac{1}{32}$ and $\frac{1}{16}$ 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: $\pm 0.1\%$ of span, $\pm 1^\circ\text{C}$ @ the calibrated ambient temperature and rated line voltage
 - Type S: 0.2%
 - Type T below -50°C : 0.2%
- Calibration ambient temperature @ $77^\circ\text{F} \pm 5^\circ\text{F}$ ($25^\circ\text{C} \pm 3^\circ\text{C}$)
- Accuracy span: 1000°F (540°C) min.
- Temperature stability: $\pm 0.1^\circ\text{F}/^\circ\text{F}$ ($\pm 0.1^\circ\text{C}/^\circ\text{C}$) 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 $20\text{M}\Omega$ input impedance, $2\text{k}\Omega$ source resistance max.
 - Non-isolated to switched dc and process output
- RTD 2- or 3-wire, platinum, 100Ω @ 0°C calibration to DIN curve ($0.00385 \Omega/\Omega/^\circ\text{C}$)
- Process, 4-20mA @ 100Ω , or 0-10VDC @ $20\text{k}\Omega$ 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 $\pm 15\text{mV}$ into a min. $1,000\Omega$ load with 2.5mV nominal resolution; 4 to 20mA $\pm 30\mu\text{A}$ into max. 800Ω load with $5\mu\text{A}$ nominal resolution; temperature stability $100\text{ppm}/^\circ\text{C}$

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 $\frac{1}{32}$ DIN)
- Infinity key is also labeled RESET on limit control models
- FUNCTION KEY on $\frac{1}{16}$ DIN package automatically programmed as an auto/manual transfer mode function on PID models.



PM LEGACY™ Control Configuration Information

① ②	③	④	⑤	⑥ ⑦	⑧	⑨ ⑩ ⑪	⑫	⑬ ⑭
PM	Package Size	Primary Functions	Power Supply, Digital I/O	Output 1 and 2 Hardware Options	Comm. Options	Future Options	Model Selection	Custom Options
						A A A		

③	Package Size
3 =	1/32 DIN (coming soon)
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)

⑥ ⑦ 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.		

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⑧	Communication Options
Standard bus always included	
A =	None
B =	Bluetooth®
E =	EIA-85 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)

⑬ ⑭	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

① ②	③	④	⑤	⑥ ⑦	⑧	⑨	⑩ ⑪	⑫	⑬ ⑭
PM	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
						A			

③	Package Size
3 =	1/32 DIN (coming soon)
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)

⑥ ⑦	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.	

10 11	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)

⑬ ⑭	Custom Options
WP =	Watlow logo face plate
WN =	No logo/no name face plate
AG =	Conformal coating

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