Quick Start Guide

WATLOW

EZ-ZONE® PM

For Part Numbers:

PM6 [**C**,**R**,**B**,**J**,**N**,**E**] _ [**E**,**F**,**C**] [**J**,**C**] - _ AAA _ _ _

Follow the steps in this quick start guide to wire and set up your new Watlow controller

For assistance contact Watlow: www.watlow.com
+1-(507)-494-5656
wintechsupport@watlow.com

0600-0056-0001 Rev. B

August 2014

1 Installation

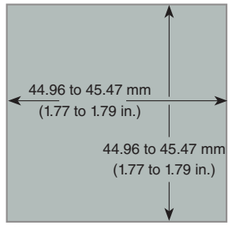


figure 1.

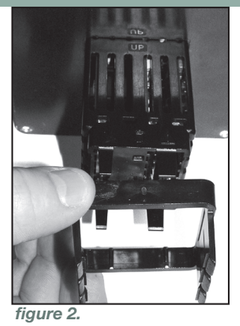


figure 2.

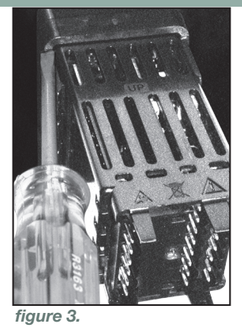
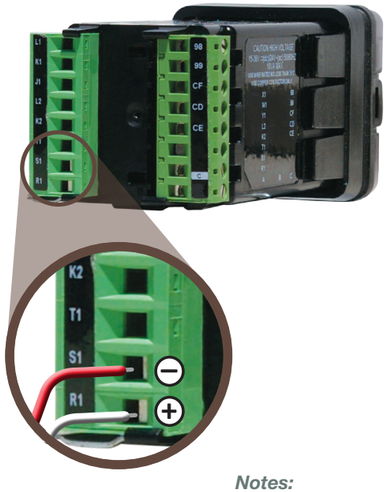


figure 3.

1. Make the panel cutout (*see figure 1*).
2. Remove the green screw terminal connectors from the controller.
3. Insert the case assembly into the panel cutout and slide the mounting collar over the back of the controller (*see figure 2*).
4. Push the collar to the panel and secure into position.
5. Place the blade of a screwdriver against each of the four corners of the mounting collar and apply pressure to achieve IP65 seal (*see figure 3*).
6. Reinstall the screw terminal connectors on the controller now or first connect field wiring as indicated in the steps that follow.

Caution: ⚠
Reinstall screw terminal connectors in their original locations

2 Sensor Input



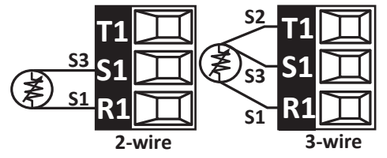
Connect your sensor as indicated in the corresponding diagram.

Notes:

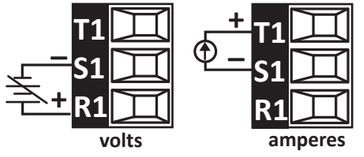
- RTD: 20Ω maximum round trip lead resistance
- Voltage: 0 to 50 mV or 0 to 10V @ 20kΩ
- Current: 0 to 20 mA @ 100Ω

Thermocouple

Platinum 100Ω or 1000Ω RTD

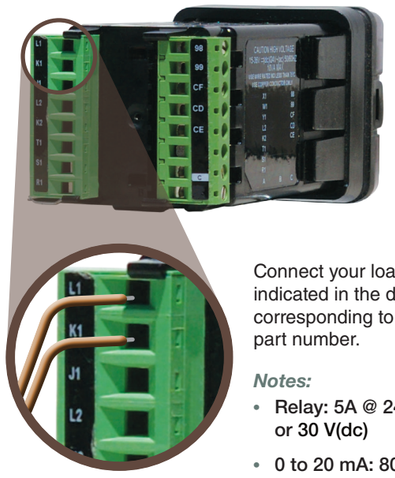


Process Voltage or Current



For other sensor types see the User's Guide

3 Output 1

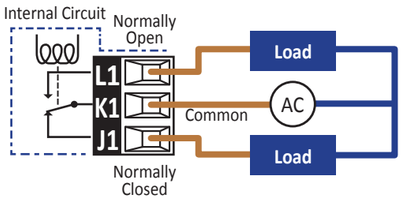


Connect your load as indicated in the diagram corresponding to your part number.

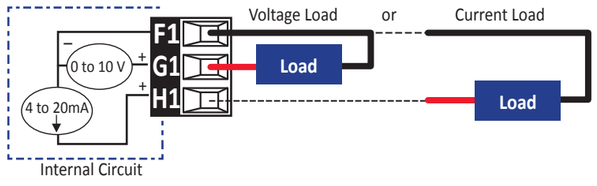
Notes:

- Relay: 5A @ 240 V(ac) or 30 V(dc)
- 0 to 20 mA: 800Ω max. load
- 0 to 10V: 1kΩ min. load

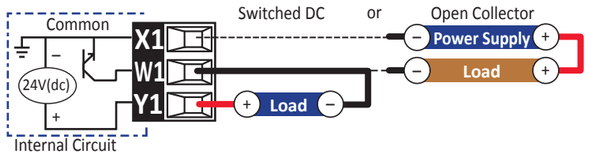
PM6_ _ E _ - _ _ _ _ _ _ _: 5 A Form C Relay



PM6_ _ F _ - _ _ _ _ _ _ _: Universal Process

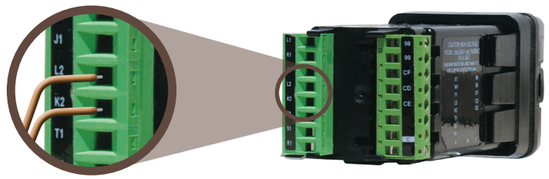


PM6_ _ C _ - _ _ _ _ _ _ _: Switched DC or Open Collector

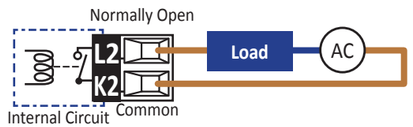


For other output types see the User's Guide

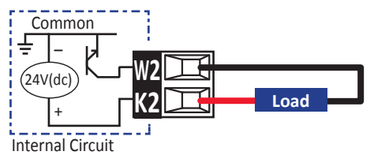
4 Output 2



PM6_ _ _ J - _ _ _ _ _ _ _: 5A Form A Relay



PM6_ _ _ C - _ _ _ _ _ _ _: Switched DC



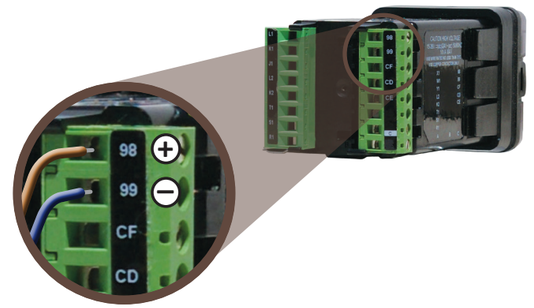
Connect your load as indicated in the diagram corresponding to your part number.

Notes:

- Relay: 5A @ 240 V(ac) or 30 V(dc)

For other output types see the User's Guide

5 Power



PM6_ _ _ _ - _ _ _ _ _ _ _

Connect the power source corresponding to your part number.

1 or 2: 120 to 240 V(ac)
3 or 4: 24 V(ac or dc)

Caution: ⚠
Do not connect high voltage to a controller that requires low voltage.

Set-up Guide

User Interface

Infinity Key:
- Exits to previous menu or page

Advance Key:
- Displays next menu item

Arrow Keys:
- Change settings
- Hold both for Operation or Setup page

Special Display Characters

h = H, h	K = K, k
i = I, i	1 = 1
u = U, u	v = V, v
m = M, m	w = W, w
t = T, t	2 = Z, z, 2

For assistance contact Watlow: www.watlow.com
+1-(507)-494-5656
wintechsupport@watlow.com

http://www.watlow.com/downloads/en/manuals/pmpmi.pdf

Scan for full manual.

6 Set up the Input

Starting at the Home Page:

1. To enter the Setup Page press and hold ▲ and ▼ until "SEt" appears in lower display.
2. Press ◉ to enter the Analog Input menu.
3. Press ◉ to view the Sensor Type setting.
4. To change the sensor type from thermocouple "tC" to another type, press ▲ until the desired type is displayed.
5. Press ◉ and continue with the instructions for that sensor type below.

Thermocouple (tC):

6. To change the sensor type from "J" to another type, press ▼ until the desired type is displayed.

   To exit the Analog Input menu, press ∞ twice to return to the Setup Page.

100Ω or 1000Ω RTD (r0.1H or r 1.0H):

6. Set the number of RTD leads to 2 or 3 according to the sensor you are using. To change this press ▲ until the desired setting is displayed.

   To exit the Analog Input menu, press ∞ to return to the Setup Page.

Note:

This takes about six seconds and you will see the operations page first. If you release the arrow keys too soon, press ∞ once and then start again.

Sensor Types:

tC	thermocouple
mVu	millivolts
voLt	volts
mA	milliamp
r0.1H	100Ω RTD
r 1.0H	1000Ω RTD
Pot	potentiometer
oFF	analog input off

For other sensor types see the user manual.

7 Set up Outputs for Heat, Cool and Alarm

Starting at the Setup Page:

1. To view the output menu, press ▼ until "otPt" appears in upper display.
2. To enter the Output menu press ◉
3. If the controller has more than one output, use ▲ and ▼ to select the output and press ◉ to view the output's function.
4. To set what the output does in the controller, use ▲ and ▼ to select the desired function.
5. For hEAt or Cool, press ◉ and continue with the hardware specific options below (step 6).

   For an ALrM, press ◉ and use ▲ and ▼ to select which alarm drives the output.

   For other output functions or after selecting the alarm press ∞ to return to the top of the Output menu or press it twice to return to the Setup Page.

Form A, Form C or No-Arc Relay:

6. Use ▲ and ▼ to set the time base, the length of an on-off cycle.

Switched DC or Open Collector:

6. Use ▲ to set the method the controller uses to switch the output (Output Control).

   For fixed time base use ▲ and ▼ to set the length of the on-off cycle.

7. Press ∞ to return to the top of the Output menu or press it twice to return to the Setup Page.

Output Functions:

hEAt	heat control output
Cool	cool control output
EntA	event output a
Entb	event output b
ALrM	alarm
oFF	output off

Output Control:

Ftb	fixed time base: output switches per time base setting
vtb	variable time base: output switches up to 20 times per second.

Repeat for other outputs

For other output types and settings see the user manual.

8 Set up an Alarm

Starting at the Setup Page:

1. To view the alarm menu press ▼ until "ALrM" appears in the upper display.
2. Press ◉ to enter the alarm menu.
3. Press ▲ to select the alarm and press ◉ to view the alarm type.
4. Press ▲ to set the alarm type.
5. Press ◉ until "ASd" appears in the lower display and use ▲ to set on which sides of the process value alarms occur.

   To return to the top of the Alarm menu, press ∞ or press it twice to return to the Setup page.

Alarm Types:

PrAL	process alarm: alarm set points are set directly.
dEAL	deviation alarm: alarm set points are set relative to the control loop's set point.
oFF	alarm does not occur.

Alarm Sides:

high	high: alarm only when process is above high alarm set point.
Lolo	low: alarm only when process is below low alarm set point.
both	both: high and low alarms are active.

For other alarm settings see the user manual.

Repeat for other alarms

9 Set Alarm Set Points

Starting at the Home Page:

1. To enter the Operations Page press and hold ▲ and ▼ until "oPEr" appears in lower display.
2. To view the alarm menu, press ▲ until "ALrM" appears in the upper display. Then press ◉ to enter the alarm menu.
3. Press ▲ to select the alarm and press ◉ to view the alarm set point.
4. Use ▲ and ▼ to set the desired alarm set point and press ◉ to go on to the next menu.

   To return to the top of the Alarm menu, press ∞ or hold it for the Home page.

Note:

To get to the home page, hold ∞ until the process value and set point appear in the display.

Note:

Whether you can set a high alarm, a low alarm or both depends on how the Alarm Sides is set.

Note:

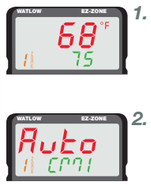
The low set point for a deviation type alarm should be set as a negative number.

Repeat for other alarms

10 Loop Control Mode/Loop Set Point

Set Loop Control Mode

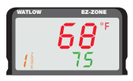
Starting at the Home Page:



1. To view the control mode, press ◉ until "Cntl" appears in the lower display.
2. Use ▲ and ▼ to change the control mode.

Adjust Loop Set Point

On the Home Page:



Use ▲ and ▼ to adjust the value in the lower display.

Hint:

Hold the arrow key to change a number such as the set point at an accelerating rate. Release the key before reaching the desired setting and fine tune the value to avoid overshooting.

Note:

To get to the home page, hold ∞ until the process value and set point appear in the display.

Note:

By default the control loop hEAt algorithm (hAG) is enabled for PID control. The Cool algorithm (CAG) is set oFF by default. To enable, go to Setup Page and then to the Loop menu.

Control Modes:

Auto	automatic: loop adjusts output to make process match set point.
mAn	manual: control loop output power is set by the user in percent power.
oFF	off: control loop outputs are off.

11 Autotune the Control Loop

Starting at the Home Page:

1. Set the loop's control mode to auto and adjust the set point to the value at which you want the system tuned.
2. Press ◉ until "AUt" appears in the lower display.
3. Press ▼ to set the value to "YES" and start the auto-tuning function.
4. Press ∞ to return to the top of the Home Page.

Caution:

The autotune feature turns on the loop's heat output until the process value exceeds 90% of the set point then turns the output off and repeats this. When finished the loop continues to control at the set point. Before starting the autotune, first consider if it is safe to do so at this time.

Note:

The system must be operational for autotuning to correctly select the PID settings.

Note:

The upper display flashes "tUn" while the autotune function is working.

When the autotune function is completed, the loop continues in auto mode.