

# Chapter 10: Appendix









Troubleshooting Alarms, Errors and Control Issues			
Indication	Description	Possible Causes	Corrective Action
Alarm won't clear or reset	Alarm will not clear or reset with keypad or digital input	<ul style="list-style-type: none"> <li>Alarm latching is active</li> <li>Alarm set to incorrect output</li> <li>Alarm is set to incorrect source</li> <li>Sensor input is out of alarm set point range</li> <li>Alarm set point is incorrect</li> <li>Alarm is set to incorrect type</li> <li>Digital input function is incorrect</li> </ul>	<ul style="list-style-type: none"> <li>Reset alarm when process is within range or disable latching</li> <li>Set output to correct alarm source instance</li> <li>Set alarm source to correct input instance</li> <li>Correct cause of sensor input out of alarm range</li> <li>Set alarm set point to correct trip point</li> <li>Set alarm to correct type: process, deviation or power</li> <li>Set digital input function and source instance</li> </ul>
Alarm won't occur	Alarm will not activate output	<ul style="list-style-type: none"> <li>Alarm silencing is active</li> <li>Alarm blocking is active</li> <li>Alarm is set to incorrect output</li> <li>Alarm is set to incorrect source</li> <li>Alarm set point is incorrect</li> <li>Alarm is set to incorrect type</li> </ul>	<ul style="list-style-type: none"> <li>Disable alarm silencing, if required</li> <li>Disable alarm blocking, if required</li> <li>Set output to correct alarm source instance</li> <li>Set alarm source to correct input instance</li> <li>Set alarm set point to correct trip point</li> <li>Set alarm to correct type: process, deviation or power</li> </ul>
<b>ALe1</b> Alarm Error <b>ALe2</b> <b>ALe3</b> <b>ALe4</b>	Alarm state cannot be determined due to lack of sensor input	<ul style="list-style-type: none"> <li>Sensor improperly wired or open</li> <li>Incorrect setting of sensor type</li> <li>Calibration corrupt</li> </ul>	<ul style="list-style-type: none"> <li>Correct wiring or replace sensor</li> <li>Match setting to sensor used</li> <li>Check calibration of controller</li> </ul>
<b>ALl1</b> Alarm Low <b>ALl2</b> <b>ALl3</b> <b>ALl4</b>	Sensor input below low alarm set point	<ul style="list-style-type: none"> <li>Temperature is less than alarm set point</li> <li>Alarm is set to latching and an alarm occurred in the past</li> <li>Incorrect alarm set point</li> <li>Incorrect alarm source</li> </ul>	<ul style="list-style-type: none"> <li>Check cause of under temperature</li> <li>Clear latched alarm</li> <li>Establish correct alarm set point</li> <li>Set alarm source to proper setting</li> </ul>
<b>ALh1</b> Alarm High <b>ALh2</b> <b>ALh3</b> <b>ALh4</b>	Sensor input above high alarm set point	<ul style="list-style-type: none"> <li>Temperature is greater than alarm set point</li> <li>Alarm is set to latching and an alarm occurred in the past</li> <li>Incorrect alarm set point</li> <li>Incorrect alarm source</li> </ul>	<ul style="list-style-type: none"> <li>Check cause of over temperature</li> <li>Clear latched alarm</li> <li>Establish correct alarm set point</li> <li>Set alarm source to proper setting</li> </ul>
<b>Er..1</b> Error Input	Sensor does not provide a valid signal to controller	<ul style="list-style-type: none"> <li>Sensor improperly wired or open</li> <li>Incorrect setting of sensor type</li> <li>Calibration corrupt</li> </ul>	<ul style="list-style-type: none"> <li>Correct wiring or replace sensor</li> <li>Match setting to sensor used</li> <li>Check calibration of controller</li> </ul>

## Troubleshooting Alarms, Errors and Control Issues (cont.)

Indication	Description	Possible Causes	Corrective Action
<b>[LP]</b> Loop Open Error	Open Loop Detect is active and the process value did not deviate by a user-selected value in a user specified period.	<ul style="list-style-type: none"> <li>• Setting of Open Loop Detect Time incorrect</li> <li>• Setting of Open Loop Detect Deviation incorrect</li> <li>• Thermal loop is open</li>   <li>• Open Loop Detect function not required but activated</li> </ul>	<ul style="list-style-type: none"> <li>• Set correct Open Loop Detect Time for application</li> <li>• Set correct Open Loop Deviation value for application</li> <li>• Determine cause of open thermal loop: misplaced sensors, load failure, loss of power to load, etc.</li> <li>• Deactivate Open Loop Detect feature</li> </ul>
<b>[LR]</b> Loop Reversed Error	Open Loop Detect is active and the process value is headed in the wrong direction when the output is activated based on deviation value and user-selected value.	<ul style="list-style-type: none"> <li>• Setting of Open Loop Detect Time incorrect</li> <li>• Setting of Open Loop Detect Deviation incorrect</li> <li>• Output programmed for incorrect function</li> <li>• Thermocouple sensor wired in reverse polarity</li> </ul>	<ul style="list-style-type: none"> <li>• Set correct Open Loop Detect Time for application</li> <li>• Set correct Open Loop Deviation value for application</li> <li>• Set output function correctly</li>   <li>• Wire thermocouple correctly, (red wire is negative)</li> </ul>
<b>[RP]</b> Ramping 1	Controller is ramping to new set point	<ul style="list-style-type: none"> <li>• Ramping feature is activated</li> </ul>	<ul style="list-style-type: none"> <li>• Disable ramping feature if not required</li> </ul>
<b>[AUT]</b> Autotuning 1	Controller is autotuning the control loop	<ul style="list-style-type: none"> <li>• User started the autotune function</li> <li>• Digital input is set to start autotune</li> </ul>	<ul style="list-style-type: none"> <li>• Wait until autotune completes or disable autotune feature</li> <li>• Set digital input to function other than autotune, if desired</li> </ul>
No heat/cool action	Output does not activate load	<ul style="list-style-type: none"> <li>• Output function is incorrectly set</li> <li>• Control mode is incorrectly set</li>   <li>• Output is incorrectly wired</li> <li>• Load, power or fuse is open</li> <li>• Control set point is incorrect</li>   <li>• Incorrect controller model for application</li> </ul>	<ul style="list-style-type: none"> <li>• Set output function correctly</li> <li>• Set control mode appropriately (Open vs Closed Loop)</li> <li>• Correct output wiring</li> <li>• Correct fault in system</li> <li>• Set control set point in appropriate control mode and check source of set point: remote, idle, profile, closed loop, open loop</li> <li>• Obtain correct controller model for application</li> </ul>
No Display	No display indication or LED illumination	<ul style="list-style-type: none"> <li>• Power to controller is off</li> <li>• Fuse open</li> <li>• Breaker tripped</li> <li>• Safety interlock switch open</li> <li>• Separate system limit control activated</li> <li>• Wiring error</li> <li>• Incorrect voltage to controller</li> </ul>	<ul style="list-style-type: none"> <li>• Turn on power</li> <li>• Replace fuse</li> <li>• Reset breaker</li> <li>• Close interlock switch</li> <li>• Reset limit</li>   <li>• Correct wiring issue</li> <li>• Apply correct voltage, check part number</li> </ul>
No Serial Communication	Cannot establish serial communications with the controller	<ul style="list-style-type: none"> <li>• Address parameter incorrect</li> <li>• Incorrect protocol selected</li> <li>• Baud rate incorrect</li> <li>• Parity incorrect</li> <li>• Wiring error</li> <li>• EIA-485 converter issue</li> <li>• Incorrect computer or PLC communications port</li> <li>• Incorrect software setup</li>   <li>• Termination resistor may be required</li> </ul>	<ul style="list-style-type: none"> <li>• Set unique addresses on network</li> <li>• Match protocol between devices</li> <li>• Match baud rate between devices</li> <li>• Match parity between devices</li> <li>• Correct wiring issue</li> <li>• Check settings or replace converter</li> <li>• Set correct communication port</li>   <li>• Correct software setup to match controller</li> <li>• Place 120 Ω resistor across EIA-485 on last controller</li> </ul>

## Troubleshooting Alarms, Errors and Control Issues (cont.)

Indication	Description	Possible Causes	Corrective Action
Process doesn't control to set point	Process is unstable or never reaches set point	<ul style="list-style-type: none"> <li>• Controller not tuned correctly</li> <li>• Control mode is incorrectly set</li> <li>• Control set point is incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Perform autotune or manually tune system</li> <li>• Set control mode appropriately (Open vs Closed Loop)</li> <li>• Set control set point in appropriate control mode and check source of set point: remote, idle, profile, closed loop, open loop</li> </ul>
Temperature runaway	Process value continues to increase or decrease past set point.	<ul style="list-style-type: none"> <li>• Controller output incorrectly programmed</li> <li>• Thermocouple reverse wired</li> <li>• Controller output wired incorrectly</li> <li>• Short in heater</li> <li>• Power controller connection to controller defective</li> <li>• Controller output defective</li> </ul>	<ul style="list-style-type: none"> <li>• Verify output function is correct (heat or cool)</li> <li>• Correct sensor wiring (red wire negative)</li> <li>• Verify and correct wiring</li> <li>• Replace heater</li> <li>• Replace or repair power controller</li> <li>• Replace or repair controller</li> </ul>
 Device Error	Controller displays internal malfunction message at power up.	<ul style="list-style-type: none"> <li>• Controller defective</li> </ul>	<ul style="list-style-type: none"> <li>• Replace or repair controller</li> </ul>
Menus inaccessible	Unable to access  ,  ,  ,  or  menus or particular prompts in Home Page	<ul style="list-style-type: none"> <li>• Security set to incorrect level</li> <li>• Digital input set to lockout keypad</li> <li>• Custom parameters incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Check lockout setting in Factory Page</li> <li>• Change state of digital input</li> <li>• Change custom parameters in Factory Page</li> </ul>
EZ-Key doesn't work	EZ-Key does not activate required function	<ul style="list-style-type: none"> <li>• EZ-Key function incorrect</li> <li>• EZ-Key function instance not correct</li> <li>• Keypad malfunction</li> </ul>	<ul style="list-style-type: none"> <li>• Verify EZ-Key function in Setup Menu</li> <li>• Check that the function instance is correct</li> <li>• Replace or repair controller</li> </ul>

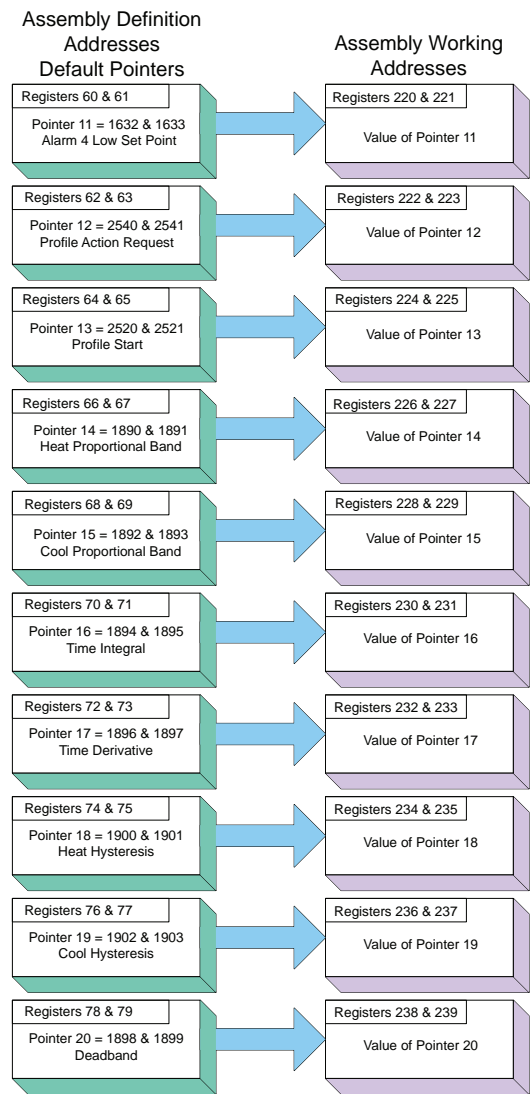
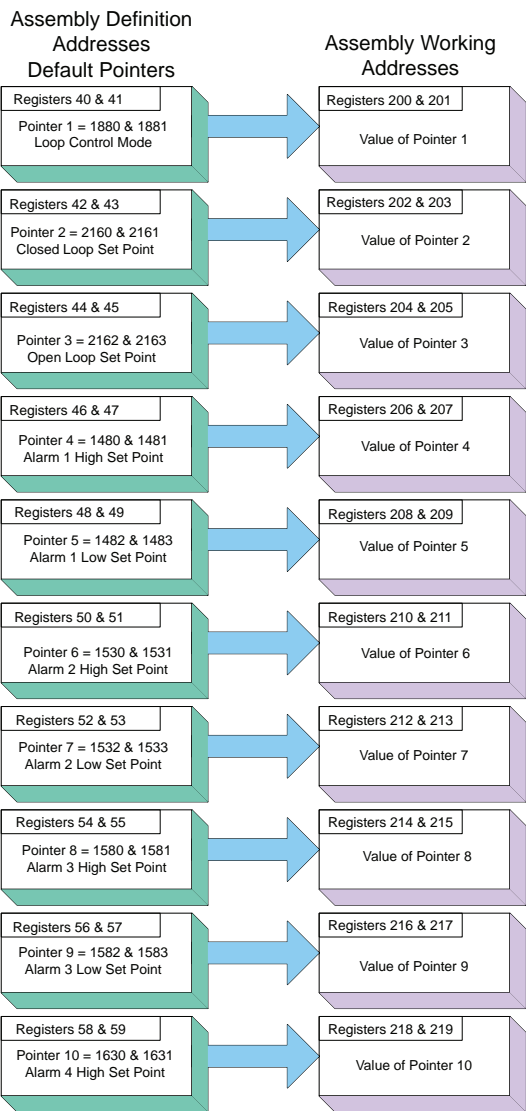
## Troubleshooting Alarms, Errors and Control Issues (cont.)

<b>Detection of and Rules Around Abnormal Sensor Conditions</b>	
<b>Inputs</b>	<b>Detection of Abnormal Conditions</b>
<b>Thermocouple</b>	
Shorted	No direct detection, Open loop firmware detection.
Open	Yes, Parasitic pull-up
Reversed	Yes, firmware detection
<b>Current Source</b>	
Shorted	Range limiting only
Open	Range limiting only
Reversed	Range limiting only
<b>Voltage Source</b>	
Open	Range limiting only
Shorted	Range limiting only
Reversed	Range limiting only
<b>RTD</b>	
S1 open	Yes, pulled up.
S2 open	Not implemented.
S3 open	Yes, pulled up.
S1 short to S2	Yes, pulled up
S1 short to S3	Yes, pulled down to under range.
S2 shorted to S3	Not implemented, Possible, monitor S2 voltage.
S1 and S2 open	Yes, pulled down to under range.
S1 and S3 open	Yes, S1 pulled up.
S2 and S3 open	Yes pulled up.
<b>Thermistor</b>	
S1 open	Yes, pulled up to sensor over range.
S3 open	Yes, pulled up to sensor over range.
S1 short to S3	Yes, pulled down to sensor under range.
S1 and S3 open	Yes, S1 pulled up to sensor over range.

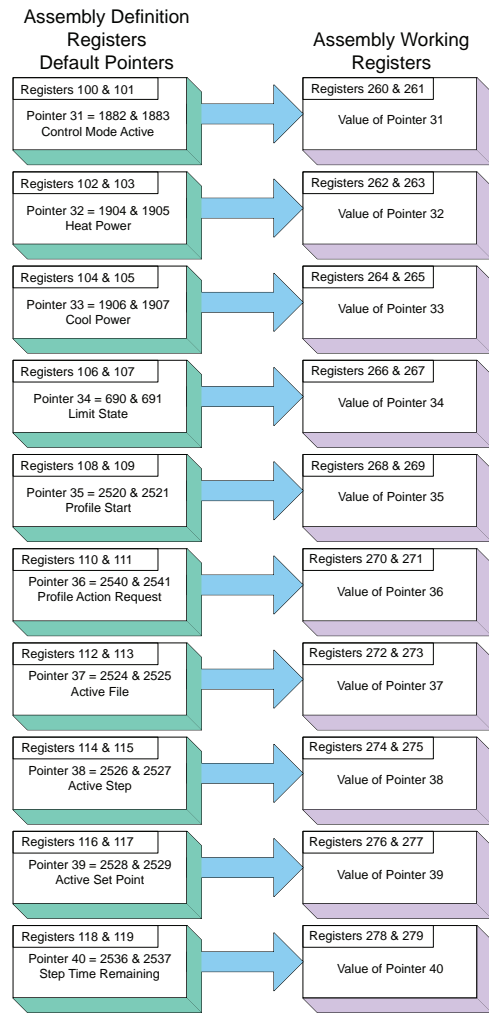
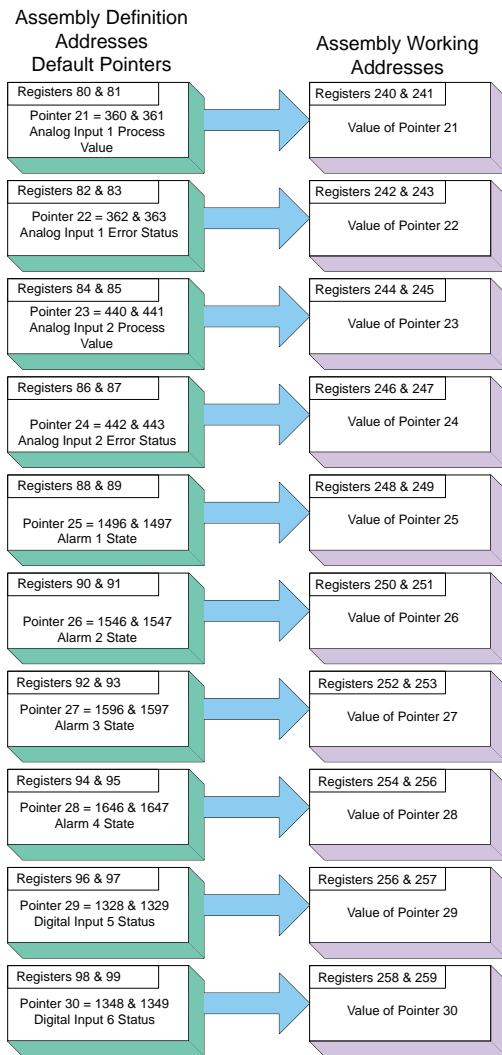
# Modbus - Programmable Memory Blocks

## Assembly Definition Addresses and Assembly Working Addresses

Assembly Definition Addresses	Assembly Working Addresses	Assembly Definition Addresses	Assembly Working Addresses
40 & 41	200 & 201	80 & 81	240 & 241
42 & 43	202 & 203	82 & 83	242 & 243
44 & 45	204 & 205	84 & 85	244 & 245
46 & 47	206 & 207	86 & 87	246 & 247
48 & 49	208 & 209	88 & 89	248 & 249
50 & 51	210 & 211	90 & 91	250 & 251
52 & 53	212 & 213	92 & 93	252 & 253
54 & 55	214 & 215	94 & 95	254 & 255
56 & 57	216 & 217	96 & 97	256 & 257
58 & 59	218 & 219	98 & 99	256 & 259
60 & 61	220 & 221	100 & 101	260 & 261
62 & 63	222 & 223	102 & 103	262 & 263
64 & 65	224 & 225	104 & 105	264 & 265
66 & 67	226 & 227	106 & 107	266 & 267
68 & 69	228 & 229	108 & 109	268 & 269
70 & 71	230 & 231	110 & 111	270 & 271
72 & 73	232 & 233	112 & 113	272 & 273
74 & 75	234 & 235	114 & 115	274 & 275
76 & 77	236 & 237	116 & 117	276 & 277
78 & 79	238 & 239	118 & 119	278 & 279



# Modbus Default Assembly Structure 80-119



# Specifications

## LineVoltage/Power (Minimum /Maximum Ratings)

- 85 to 264V~ (ac), 47 to 63Hz
- 20 to 28V~ (ac), 47 to 63Hz
- 12 to 40V= (dc)
- 14VA maximum power consumption (PM4, 8 & 9)
- 10VAm maximum power consumption (PM3 & 6)
- Data retention upon power failure via nonvolatile memory
- Compliant with SEMIF47-0200, FigureR1-1 voltage sag requirements @24V ~ (ac) 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
- Types R, S, B; 0.2%
- Type T below -50°C; 0.2%
- Calibration ambient temperature @ 77 ±5°F (25±3°C)
- Accuracy span :1000 °F (540°C) min.
- Temperature stability: ±0.1 °F/°F (±0.1 °C/°C) rise in ambient maximum

## Agency Approvals

- UL® Listed to UL® 61010-1 File E185611
- UL® Reviewed to CSA C22.2 No.61010-1-04
- UL® 50 Type 4X, NEMA 4X indoor locations, IP66 front panel seal (indoor use only)
- FM Class 3545 File 3029084 temperature limit switches
- CE-See Declaration of Conformity RoHS and W.E.E.E.compliant
- This equipment is suitable for use in Class 1, Div.2, Groups A, B, C and D or non-hazardous locations only. Temperature Code T4A
- UL® Listed to ANSI/ISA 12.12.01-2007 File E184390
- All models, CSA C22.2 No. 24 File 158031 Class 4813-02, CSA Approved
- UL® reviewed to Standard No. CSA C22.2 No.213-M1987, Canadian Hazardous locations

## Controller

- User selectable heat/cool, on-off, P, PI, PD, PID or alarm action
- Auto-tune with TRU-TUNE®+ adaptive control algorithm
- Control sampling rates: input = 10Hz, outputs = 10Hz

## Profile Ramp/Soak - Real Time Clock and Battery Back-up

- Accuracy (typical): ±30PPM at 77°F (25°C)
- +30/-100 PPM at -4 to 149°F (-20 to 65°C)
- Battery type: lithium (recycle properly)
- Battery typical life: three cumulative years of unpowered life at 77°F (25°C)

## Isolated Serial Communications

- EIA232/485, Modbus® RTU

## Wiring Termination—Touch-Safe Terminals

- Input, power and controller output terminals are touch safe removable 3.30 to 0.0507 mm<sup>2</sup> (12 to 22 AWG)
- Wire strip length 7.6 mm (0.30 in.)
- Torque 0.8 Nm (7.0 lb.-in.)

## Universal Input

- Thermocouple, grounded or ungrounded sensors
- >20MΩ input impedance
- 3μA open sensor detection
- Max. of 2KΩ source resistance
- RTD 2 or 3 wire, platinum, 100Ω and 1000Ω @ 0°C calibration to DIN curve (0.00385Ω/Ω/°C)
- Process, 0-20mA @ 100Ω ,or 0-10V =(dc) @ 20kΩ input imped-

ance

## Voltage Input Ranges

- Accuracy ±10mV ±1 LSD at standard conditions
- Temperature stability ±100 PPM/°C maximum

## Milliamp Input Ranges

- Accuracy ±20μA ±1 LSD at standard conditions
- Temperature stability ±100 PPM/°C maximum

## Resolution Input Ranges

- 0 to 10V: 200 μV nominal
- 0 to 20 mA: 0.5 mA nominal

- Potentiometer: 0 to 1,200Ω

- Inverse scaling

Input Type	Max Error @ 25 Deg C	Accuracy Range Low	Accuracy Range High	Units
J	±1.75	0	750	Deg C
K	±2.45	-200	1250	Deg C
T (-200 to 350)	±1.55	0	350	Deg C
N	±2.25	0	1250	Deg C
E	±2.10	-200	900	Deg C
R	±3.9	0	1450	Deg C
S	±3.9	0	1450	Deg C
B	±2.66	870	1700	Deg C
C	±3.32	0	2315	Deg C
D	±3.32	0	2315	Deg C
F (PTII)	±2.34	0	1343	Deg C
RTD, 100 ohm	±2.00	-200	800	Deg C
RTD, 1000 ohm	±2.00	-200	800	Deg C
mV	±0.05	0	50	mV
Volts	±0.01	0	10	Volts
mAdc	±0.02	0	20	mAmps DC
mAac	±5	-50	50	mAmps AC
Potentiometer, 1K range	±1	0	1000	Ohms
Thermistor, 5K range	±5	0	5000	Ohms
Thermistor, 10K range	±10	0	10000	Ohms
Thermistor, Thermistor	±20	0	20000	Ohms
Thermistor, 40K range	±40	0	40000	Ohms

## Operating Range

Input Type	Range Low	Range High
J	-210	1200
K	-270	1371
T	-270	400
N	-270	1300
E	-270	1000
R	-50	1767

Operating Range		
S	-50	1767
B	-50	1816
C	0	2315
D	0	2315
F (PTII)	0	1343
RTD (100 ohm)	-200	800
RTD (1000 ohm)	-200	800
mV	-50	50
Volts	0	10
mAdc	0	20
mAac	-50	50
Potentiometer, 1K range	0	1200
Resistance, 5K range	0	5000
Resistance, 10K range	0	10000
Resistance, 20K range	0	20000
Resistance, 40K range	0	40000

### Thermistor Input

- 0 to 40K $\Omega$ , 0 to 20K $\Omega$ , 0 to 10K $\Omega$ , 0 to 5K $\Omega$
- 2.252K $\Omega$  and 10K $\Omega$  base at 77°F (25°C)
- Linearization curves built in
- Third party Thermistor compatibility requirements

Base R @ 25C	Alpha Techniques	Beta THERM	YSI	Prompt E.C.
2.252K	Curve A	2.2K3A	004	A
10K	Curve A	10K3A	016	B
10K	Curve C	10K4A	006	C

### 2 Digital Input/Output Option - 2 DIO

- Digital input update rate 10Hz
  - DC voltage
    - Max. input 36V @ 3mA
    - Min. high state 3V at 0.25mA
    - Max. low state 2V
  - Dry contact
    - Min. open resistance 10K $\Omega$
    - Max. closed resistance 50 $\Omega$
    - Max. short circuit 20mA
- Digital output update rate 10Hz
  - Output voltage 24V, current limit, Output 6 = 10mA max., Output 5 = 3 pole DIN-A-MITE<sup>®</sup> or 24mA max.

### Output Hardware

- Switched dc = 22 to 32V $\approx$  (dc) @30mA
- Switched dc/open collector = 30V $\approx$  (dc) max. @ 100mA max. current sink
- Solid state relay (SSR), FormA, 0.5A @ 24V $\sim$  (ac) min., 264V $\sim$  (ac) max., opto-isolated, without contact suppression, 20 VA 120/240V $\sim$  (ac) pilot duty
- Electromechanical relay, FormC, 5A, 24 to 240V $\sim$  (ac) or 30V $\approx$  (dc) max., resistive load, 100,000 cycles at rated load, 125 VA pilot duty at 120/240V $\sim$  (ac), 25 VA at 24V $\sim$  (ac)
- Electromechanical relay, FormA, 5A, 24 to 240V $\sim$  (ac) or 30V $\approx$  (dc) max., resistive load, 100,000 cycles at rated load, 125 VA pilot duty at 120/240V $\sim$  (ac), 25 VA at 24V $\sim$  (ac)
- NO-ARC relay, FormA, 15A, 24 to 240V $\sim$  (ac), noV $\approx$  (dc), resistive load, 2 million cycles at rated load
- Universal process/retransmit, Output range selectable:
  - 0 to 10V $\approx$ (dc) into a min. 1,000 $\Omega$  load

- 0 to 20mA into max. 800 $\Omega$  load

#### Resolution

- dc ranges: 2.5mV nominal
- mA ranges: 5  $\mu$ A nominal

#### Calibration Accuracy

- dc ranges:  $\pm$ 15 mV
- mA ranges:  $\pm$ 30  $\mu$ A

#### Temperature Stability

- 100 ppm/ $^{\circ}$ C

### Operator Interface

- Dual 4 digit, 7 segment LED displays
- Advance, infinity, up and down keys, plus optional programmable EZ-KEY(s) depending on model size
- Typical display update rate 1Hz
- RESET key substituted for infinity on all models including the limit control

### Dimensions

Dimensions				
Size	Behind Panel (max.)	Width	Height	Display Character Height
1/32	101.6 mm (4.00 in)	53.3 mm (2.10 in)	30.9 mm (1.22 in)	left: 7.59 mm (0.299 in) right: 5.90 mm (0.220 in)
1/4	100.8 mm (3.97 in)	100.3 mm (3.95 in)	100.3 mm (3.95 in)	up: 11.43 mm (0.450 in) middle: 9.53 mm (0.375 in) low: 7.62 mm (0.300 in)
1/16	101.6 mm (4.00 in)	53.3 mm (2.10 in)	53.3 mm (2.10 in)	up: 10.80 mm (0.425 in) low: 6.98 mm (0.275 in)
1/8 (H)	101.6 mm (4.00 in)	100.3 mm (2.10 in)	53.9 mm (1.22 in)	top: 11.4 mm (0.450 in) middle: 9.53 mm (0.375 in) bottom: 7.62 mm (0.300 in)
1/8 (V)	101.6 mm (4.00 in)	53.3 mm (2.10 in)	100.3 mm (3.95 in)	top: 11.4 mm (0.450 in) middle: 9.53 mm (0.375 in) bottom: 7.62 mm (0.300 in)

### Weight

1/32 DIN (PM3)	1/8 DIN (PM8&9)
• Controller: 127 g (4.5 oz.)	• Controller: 284 g (10 oz.)
1/16 DIN (PM6)	1/4 DIN (PM4)
• Controller: 186 g (6.6 oz.)	• Controller: 331 g (11.7 oz.)
<b>User's Guide</b>	
• 221.81 g (7.82 oz)	

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### Note:

These specifications are subject to change without prior notice.



# Ordering Information for PID Controller Models

## Controller

EZ-ZONE® PID Controller Models  
 TRU-TUNE+® Adaptive Tune, red-green 7-segment displays

P M

## Package Size

- 3 Panel Mount 1/32 DIN
- 6 Panel Mount 1/16 DIN
- 8 Panel Mount 1/8 DIN Vertical
- 9 Panel Mount 1/8 DIN Horizontal
- 4 Panel Mount 1/4 DIN Horizontal

## Primary Function

- C PID Controller with Universal Input
- R PID Controller with Universal Input and Profiling Ramp and Soak
- B PID Controller with Universal Input and Profiling Ramp and Soak and Battery Backup with Real Time Clock
- J PID Controller with Thermistor Input
- N PID Controller with Thermistor Input and Profiling Ramp and Soak
- E PID Controller with Thermistor Input and Profiling Ramp and Soak and Battery Backup with Real Time Clock
- S Custom Firmware

- Options B and E are not available with PM3 or PM6

## Power Supply, Digital Input/Output

- 1 100 to 240V~ (ac)
- 2 100 to 240V~ (ac) plus 2 Digital I/O points
- 3 15 to 36V= (dc) and 24V~ (ac)
- 4 15 to 36V= (dc) and 24V~ (ac), 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 15 A power control
CC	Switched dc/open collector	Switched dc
CJ	Switched dc/open collector	Mechanical relay 5 A, form A
CK	Switched dc/open collector	Solid-State Relay 0.5 A, form A
EA	Mechanical relay 5 A, form C	None
EH	Mechanical relay 5 A, form C	NO-ARC 15 A power control
EC	Mechanical relay 5 A, form C	Switched dc
EJ	Mechanical relay 5 A, form C	Mechanical relay 5 A, form A
EK	Mechanical relay 5 A, form C	Solid-State Relay 0.5 A, form A
FA	Universal process	None
FC	Universal process	Switched dc (cannot use variable time base)
FJ	Universal process	Mechanical relay 5 A, form A (cannot use variable time base)
FK	Universal process	Solid-State Relay 0.5 A, form A (cannot use variable time base)
AK	None	Solid-State Relay 0.5 A, form A
KH	Solid-State Relay 0.5 A, form A	NO-ARC 15 A power control
KK	Solid-State Relay 0.5 A, form A	Solid-state relay 0.5 A, form A

## Communications Options

- A None
- 1 EIA 485 Modbus RTU®

- Standard Bus EIA-485 always included - all models

## Future Options

- AAA None

## Isolated Input Option

- A None
- D Isolated Input 1

## Custom Options

- AA Standard EZ-ZONE face plate
- 12 Class 1, Div. 2 (Not available with mechanical relay output types E, H, J)

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# Declaration of Conformity

Series EZ-ZONE<sup>®</sup> PM



WATLOW  
1241 Bundy Blvd.  
Winona, MN 55987 USA

an ISO 9001 approved facility since 1996.

Declares that the following product:

Designation: **Series EZ-ZONE<sup>®</sup> PM (Panel Mount)**  
Model Numbers: PM (3, 6, 8, 9 or 4)(Any Letter or number) – (1, 2, 3 or 4)(A, C, E, F or K) (A, C, H, J or K)(Any letter or number) – (Any letter or number)(A, C, E, F or K)(A, C, H, J or K) (Any three letters or numbers)  
Classification: Temperature control, Installation Category II, Pollution degree 2, IP66  
Rated Voltage and Frequency: 100 to 240 V~ (ac 50/60 Hz) or 15 to 36 V= dc/ 24 V~ac 50/60 Hz  
Rated Power Consumption: 10 VA maximum PM3, PM6 Models.  
14 VA maximum PM8, PM9, PM4 Models

Meets the essential requirements of the following European Union Directives by using the relevant standards show below to indicate compliance.

### **2004/108/EC Electromagnetic Compatibility Directive**

<b>EN 61326-1</b>	<b>2006</b>	<b>Electrical equipment for measurement, control and laboratory use – EMC requirements (Industrial Immunity, Class B Emissions).</b>
EN 61000-4-2	1996 +A1,A2	Electrostatic Discharge Immunity
EN 61000-4-3	2006	Radiated Field Immunity 10V/M 80–1000 MHz, 3 V/M 1.4–2.7 GHz
EN 61000-4-4	2004	Electrical Fast-Transient / Burst Immunity
EN 61000-4-5	2006	Surge Immunity
EN 61000-4-6	1996 +A1,A2,A3	Conducted Immunity
EN 61000-4-11	2004	Voltage Dips, Short Interruptions and Voltage Variations Immunity
EN 61000-3-2	2006	Harmonic Current Emissions
EN 61000-3-3 <sup>1</sup>	2005	Voltage Fluctuations and Flicker
SEMI F47	2000	Specification for Semiconductor Sag Immunity Figure R1-1

<sup>1</sup>For mechanical relay loads, cycle time may need to be extended up to 160 seconds to meet flicker requirements depending on load switched and source impedance.

### **2006/95/EC Low-Voltage Directive**

<b>EN 61010-1</b>	<b>2001</b>	<b>Safety Requirements of electrical equipment for measurement, control and laboratory use. Part 1: General requirements</b>
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### **Compliant with 2002/95/EC RoHS Directive**

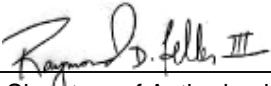
Per 2002/96/EC W.E.E Directive  Please Recycle Properly.

Raymond D. Feller III  
Name of Authorized Representative

Winona, Minnesota, USA  
Place of Issue

General Manager  
Title of Authorized Representative

June 2009  
Date of Issue

  
Signature of Authorized Representative

CE DOC EZ-ZONE PM-06-09