

# Watlow's Fiber Optic Temperature Measurement and Control System Offers Improved Accuracy, Precision and Reliability in High RF Environments

By combining advances in fluorescent temperature sensing with the power of the proven EZ-ZONE® RM control system, Watlow® developed a best-in-class fiber optic temperature measurement and control system that provides industry-leading performance for your specific application. By integrating fiber optic sensing capabilities into the EZ-ZONE RM control system, users will save space, improve performance with faster response times while simplifying their control system.

Watlow's EZ-ZONE RMZ and EZ-ZONE RMF make the system adaptable to specific customer requirements. Both are compatible with all other modules within the EZ-ZONE RM family and self-discover all existing modules within the system making a seamless integration into your temperature control/logic system.

## Fiber Optic Temperature Probes are Ideal for RF Environments

The fiber optic temperature probes are specifically designed for high RF environments. They are immune to the electrical noise found in plasma chambers but offer industry-leading accuracy, precision and reliability. The probes can be positioned in hard to reach areas and can be focused to measure small or precise locations.

## EZ-ZONE RMZ Offers Fiber Optic Sensing Capabilities and EtherCAT® Communications

The EZ-ZONE RMZ integrates fiber optics, PID temperature control and EtherCAT® communications into a single package. It features multi-channel control, hosting up to four channels of fiber optic inputs as well as supporting up to 44 additional control loops from other EZ-ZONE RM modules. These modules support a wide array of capabilities including I/O, logic, current measurement, power switching and more.



## EZ-ZONE RMF Offers Additional Fiber Optic Inputs for Expansion Opportunities

The EZ-ZONE RMF module is a dedicated fiber optic input module integrating the advanced control technology of the EZ-ZONE system with one to eight channels of fiber optic temperature sensing.

The EZ-ZONE RMF can also serve as additional inputs to the EZ-ZONE RMZ enabling extensive expansion opportunities for future system needs. The EZ-ZONE RMF is ideal either as an expansion module or configured with built-in temperature control loops (outputs via EZ-ZONE RME module). The EZ-ZONE RMF can be used independently when only sensing is required.

## Benefits of Watlow's high-performance fluorescence-based temperature measurement system include:

- Compact integrated fiber optic sensing with temperature control
- Easily expands to increase number of zones as your system needs increase
- Integrates seamlessly with the temperature control system avoiding additional analog signal processing
- Faster temperature sampling rates with high resolution
- Minimizes installed footprint due to the small form factor and DIN-rail mounting
- Highly accurate fluorescent signal processing electronics
- Offers highly reliable LED light source designed to run at low currents for maximum life
- Up to 48 loops of input and control with all EZ-ZONE RM temperature control features
  - Temperature / limit loops
  - Current measurement
  - Power switching
  - Logic

## Specifications—EZ-ZONE RMZ/RMF

	EZ-ZONE RMZ	EZ-ZONE RMF
Optical Inputs	1 to 4	1 to 8
Communications	EtherCAT®, Standard Bus, EtherNet/IP™, DeviceNet™, PROFIBUS DP, Modbus® TCP, Modbus® RTU	
Short Term Stability	3σ ±0.03°C	
Operating Ambient Temperature	-18°C to 65°C	
Unit to Unit Accuracy (electronics)	±0.05°C	
Module Dimensions (mm)	112 (H) x 51.6 (W) x 148 (D)	
Measurement Ranges <sup>②</sup>	-196°C to 700°C (calibrated at -40°C)	
Maximum Drift (electronics) <sup>③</sup>	±0.15°C	
Analog Output <sup>①</sup>	0-10V, 0-20mA	

<sup>①</sup> Outputs via EZ-ZONE RME module

<sup>②</sup> Consult engineering center for measurement ranges outside of these values

<sup>③</sup> Data based on accelerated aging testing

## Specifications—Contact Probe

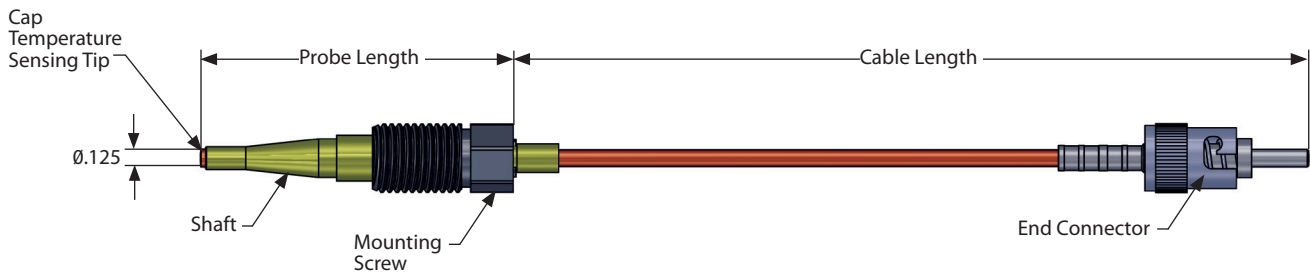
	200°C	440°C	700°C
Tip Temperature Range	-197°C to 200°C <sup>①</sup>	0°C to 440°C	0°C to 700°C
Accuracy	±0.5°C / ±0.25°C / ±0.1°C	±1°C / ±0.1°C <sup>②</sup>	±0.3°C <sup>③</sup>
Tip Material	Copper, Aluminum	Aluminum nitride	Aluminum nitride
Standard Probe Diameter	1/8 in. <sup>③</sup>		
Probe Shaft Material	PEEK™	Polyimide, Stainless	Alumina
Standard Shaft Lengths	0.25 to 12 in.		
Extension Cable Lengths	0.5 to 3 meters		
Standard Mounting Method	Spring loaded threaded adapter <sup>③</sup>		

<sup>①</sup> Lower temperatures available upon request

<sup>②</sup> Probe calibration required

<sup>③</sup> Custom designs available upon request

## Dimensional Drawing—Contact Probe



## EZ-ZONE RMZ Ordering Information

Module for EtherCAT® Communications Protocol, Universal Control Inputs, Wireless Development Communications and Legacy Communications



Part Number

① ② ③ ④	⑤ ⑥	⑦ ⑧	⑨	⑩	⑪ ⑫
EZ-ZONE Rail Mount	Number of Control Loops	Number of Optical Inputs	Wireless Comms.	Legacy Comms.	Connector Style/Additional Options
<b>RMZ4</b>	-				

⑤ ⑥	Number of Control Loops
AA =	No control loops
04 =	4 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
08 =	8 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
12 =	12 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
16 =	16 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
20 =	20 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
24 =	24 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
28 =	28 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
32 =	32 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
36 =	36 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
40 =	40 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
44 =	44 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)
48 =	48 universal inputs (T/C, 2-wire RTD, 0-10VDC, 0-20mA)

⑦ ⑧	Number of Optical Inputs
AA =	No optical inputs
04 =	4 fiber optic inputs, temp. range 0-200°C (option for legacy communications is A only)
05 =	4 fiber optic inputs, temp. range 0-300°C (option for legacy communications is A only)

⑨	Wireless Communications
A =	No wireless communications
B =	Bluetooth® (wireless) development communications

⑩	Legacy Communications
A =	No wireless communications
1 =	Standard bus
2 =	Modbus®
3 =	Standard bus and Modbus®
4 =	Standard bus and DeviceNet™

⑪ ⑫	Connector Style/Additional Options
AA =	Standard
12 =	Class 1, Div. 2
XX =	Custom

## EZ-ZONE RMF Ordering Information

Module for Fiber Optic Inputs with PID Temperature Control

Part Number

<b>① ② ③ ④</b> EZ-ZONE Rail Mount	<b>⑤ ⑥</b> Number of Fiber Optic/Temperature Control Loops	<b>⑦</b> Future Option	<b>⑧</b> Future Option	<b>⑨</b> Future Option	<b>⑩</b> Comms. Protocol Options	<b>⑪ ⑫</b> Add'l Options
<b>RMFA</b>		<b>A</b>	<b>A</b>	<b>A</b>		



<b>⑤ ⑥</b>	<b>Number of Fiber Optic/Temperature Control Loops</b>
AA =	No fiber optic/temperature control loops
1A =	1 fiber optic input without temperature control loop
1T =	1 fiber optic input with temperature control loop
2A =	2 fiber optic inputs without temperature control loop
2T =	2 fiber optic inputs with temperature control loop
3A =	3 fiber optic inputs without temperature control loop
3T =	3 fiber optic inputs with temperature control loop
4A =	4 fiber optic inputs without temperature control loop
4T =	4 fiber optic inputs with temperature control loop
5A =	5 fiber optic inputs without temperature control loop
5T =	5 fiber optic inputs with temperature control loop
6A =	6 fiber optic inputs without temperature control loop
6T =	6 fiber optic inputs with temperature control loop
7A =	7 fiber optic inputs without temperature control loop
7T =	7 fiber optic inputs with temperature control loop
8A =	8 fiber optic inputs without temperature control loop
8T =	8 fiber optic inputs with temperature control loop

<b>⑩</b>	<b>Communication Protocol Options</b>
A =	Standard bus
1 =	Standard bus and Modbus® RTU 485
<b>Note:</b> To obtain communication protocol other than standard bus or Modbus® 485 order the applicable EZ-ZONE RMZ4.	

<b>⑪ ⑫</b>	<b>Additional Options</b>
AA =	Standard
12 =	Class 1, Div. 2
XX =	Custom

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