EZ-ZONE® RM MULTI-LOOP CONTROLLER

EZ-ZONE® RM Introduces High-Density Modules Which Integrate Temperature, Process, Limit and Power Control from 1 to 152 Loops

The EZ-ZONE® RM controller family simplifies thermal system management. The EZ-ZONE RM controller family is comprised of six module types: an integrated on-off or PID control, monitoring and over/under temperature limit module, a high-density on-off or PID control module, a high-density limit only module, an input/output (I/O) expansion module, a high-density monitor/scanner module and a data logging and field communications access module. A system is configured by connecting any combination of module types to address specific application needs. The EZ-ZONE RM is extremely flexible and scalable allowing mixing and matching of I/O to configure 1 to 152 control loops and up to 256 monitor points.

Optional integrated controller functions can be combined or ordered in different quantities:

- PID control loops
- Over/under temperature limit control loops
- 10 and 15 ampere power output/heater driver options
- On-board data logging
- Current measurement input
- Sequencer start up and control function
- · Programmable timer and counter functions
- · Programmable math and logic options
- Multiple communication protocols options
- Mobile configuration with removable secure digital (SD) flash card

Benefits of using an integrated controller solution:

- Reduces wiring time and termination complexity compared to connecting multiple discrete products
- Improves system reliability
- Reduces termination and installation cost
- Eliminates compatibility issues often encountered with using various discrete components and brands
- Reduces troubleshooting time and downtime costs because the system can specifically identify any problems with a sensor, controller, solid state relay (SSR) power output or heater load
- Complete thermal solution saves engineering time and labor costs while shortening project schedules



Features and Benefits

Multiple inputs; from 1 to 152 PID loops of control or monitor up to 256 analog inputs

- Mix and match I/O to fit any application; from 1 input with 2 outputs to 152 analog inputs with 152 outputs, or monitor up to as many as 256 analog inputs all in one system
- Reduces cost because only required loops are purchased
- Allows a common controller platform across many design applications as both loops and outputs can be ordered in single increments

Advanced PID control algorithm

- Offers TRU-TUNE®+ adaptive control to provide tighter control for demanding applications
- Enables auto-tune for fast, efficient start-up

Communication capabilities

 Provides a range of protocol options including universal serial bus (USB) device port, Modbus[®] RTU, EtherNet/ IP[™], Modbus[®] TCP, DeviceNet[™] and PROFIBUS

USB Port

• Provides data log retrieval

SPLIT-RAIL control

- Allows modules mounted in separate high-voltage and low-voltage cabinets to function as an integrated system
- Minimizes the length and cost of wire runs and improves system reliability by locating inputs closer to sensors and outputs closer to loads

AUTO CLONE

 Reduces time and configuration complexity by automatically building a new module with the same parameter settings as the replaced module

SENSOR GUARD

 Prevents unplanned process shutdowns and product loss by switching to a backup sensor if the primary sensor fails





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Better Thermal Solutions...*Faster*

Additional Key Functions

- · Configuration communication port (standard bus)
- Removable modules and connectors
- Ring lug and front-screw terminal options
- Profile ramp soak with 400 total steps
- Retransmit and remote set point input virtually inside controller eliminating costs for input/output hardware
- User configuration settings can be stored and recalled
- Thermistor input
- Elevated operating range of 0 to 149°F (-18 to 65°C)
- UL[®] listed, CSA, CE, RoHS, W.E.E.E. FM, SEMI F47-0200, Class 1, Div. 2 rating on selected models

Common Specifications (Applies to all modules)

Line Voltage/Power

- 20.4 to 30.8VAC/VDC, 50/60Hz ±5%
- Any external power supply used should comply with a Class 2 or SELV rating (see specific module specification listing for max. VA power consumption)
- Data retention upon power failure via non-volatile memory
- Compliant with Semi F47-0200, Figure R1-1 voltage sag requirements

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

Functional Operating Range for RMC, RMH, RML and RMS

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 B: 32 to 3300° F (0 to 1816° C) RTD (DIN): -328 to 1472° F (-200 to 800° C) Process: -1999 to 9999 units

Agency Approvals

- UL®/EN 61010 Listed, File E185611, C-UL® C22.2 #61010ANSI/ISA 12.12.01-2007 Class 1, Div. 2-Group A, B, C, D temperature code T4 (optional)
- UL[®] 1604 Class 1, Div. 2 (optional)
- EN 60529 IP20
- UL[®] 50, NEMA 4X, EN 60529 IP66; ¹/₁₆ DIN remote user interface (RUI)
- CSA 610110 CE
- RoHS by design, W.E.E.E.
- FM Class 3545 on limit control versions
- CE

Serial Communications

 All modules ship with standard bus protocol for configuration and communication with all other EZ-ZONE products

Implicit Messaging

Number of data members accessible through implicit messaging

Protocol	RM System	RMC	RMH	RML	RME	RMS	RMA
Ethernet/IP™	100	20	40	40	20	40	20
DeviceNet™	200	20	40	40	20	40	20

User Interface

- Seven-segment LED, address/protocol indicator programmed via push button switch
- Communication activity, 2 LEDs
- Error condition of each loop, 4 LEDs
- Output status indication, 16 LEDs

Maximum System Configuration

 One access module plus up to 16 additional control or expansion modules (any combination), up to 152 loops

Mounting

- DIN-rail specification EN50022, 1.38 x 0.30 in. (35 x 7.5 mm)
- DIN-rail mounted or chassis mounted with customer supplied screws

Wiring Termination—Touch-Safe Terminals

- Right angle and front screw type terminal blocks (slots A, B, D, E)
- Input, power and controller output terminals, touch safe, removable, 12 to 30 AWG

Programmable Application Blocks

Compare

• Greater than, less than, equal, not equal, greater than or equal, less than or equal

Counters

• Counts up or down, loads predetermined value on the load signal. Output is active when the count value equals or exceeds predetermined target value

Linearization

Interpolated or stepped relationship

Logic

• And, nand, or, nor, equal, not equal, latch, flip flop

Math

 Average, process scale, deviation scale, differential (subtraction), ratio (divide), add, multiply, absolute difference, min., max., square root, sample and hold, altitude and dew point

Process Value

• Sensor backup, average, crossover, wet/dry bulb, switch over, differential (subtraction), ratio (divide), add, multiply, absolute difference, min., max., square root, altitude, visala and dew point

Special Output Function

- Compressor turns on-off compressor for one or two loops (cool and dehumidify with single compressor)
- Motorized valve turns on-off motor open/closed outputs causing valve to represent desired power level
- Sequencer turns on-off up to four outputs to distribute a single power across all outputs with linear and progressive load wearing

Timers

- On pulse produces an output of fixed time on the active edge of timer run signal
- Delay output is a delayed start of timer run and off at same time
- One shot oven timer
- Retentive measures timer run signal and output on when accumulated time exceeds target

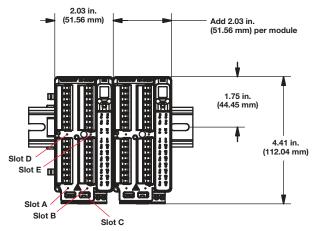
Variable

• User value for digital or analog variable

EZ-ZONE RM Family Comparison

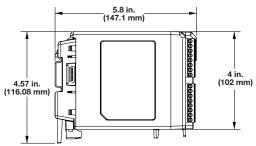
	Control Module	High-Density Control Module	High-Density Limit Module	Expansion Module	High-Density Scanner Module
Number of modules per system	1 to 16	1 to 16	1 to 16	1 to 16	1 to 16
Number of PID loops per module	1 to 4	4, 8, 12 or 16	0	0	0
Number of limit loops per module	1 to 4	0	4, 8 or 12	0	0
Number of monitoring points per module	1 to 3	0	0	0	4, 8, 12 or 16
Mechanical relays per module	1 to 8	4 or 8	4, 6 or 8	4, 8 or 12	4 or 8
Digital I/O points per module	6	6 or 12	6 or 7	6, 12, 18 or 24	6 or 12
Actions (events) per module	8	24	16	8	16
Alarms per module	8	24	16	8	16
Compare per module	4	24	16	8	24
Counters per module	4	24	16	8	24
Linearization per module	4	24	16	8	24
Logic per module	4	24	16	8	24
Math per module	8	24	16	8	24
Process value per module	1 to 4	1 to 24	0	0	16
Special output function per module	4	0	0	4	0
Timers per module	4	24	16	8	24
Variable per module	8	24	16	8	24

Dimensional Drawings

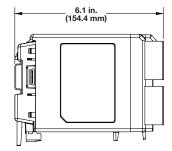


Connector Type	Module Depth in. (mm)
Standard (Right Angle)	5.8 (148)
Straight (Front Screw)	6.1 (155)
Ring Terminal	6.5 (166)

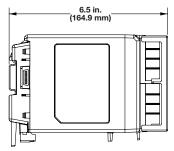
Standard Connectors



Front-Screw Connectors



Ring Terminal Connectors



Control Module Specifications (RMC)

(Select an RMC module for 1 to 4 loops of control.) Line Voltage/Power

- Power consumption: 7 W, 14VA
- Any external power supply used should comply with a Class 2 or SELV rating

Controller

• User-selectable heat/cool, on-off, P, PI, PD, PID or alarm action, not valid for limit controllers

Process PID or Over-temperature Limit Mode Options

- Auto-tune with TRU-TUNE+ adaptive control
- Control sampling rates: input = 10Hz, output = 10Hz (non-divisional)

Isolated Serial Communications

- All modules ship with standard bus protocol for configuration and communication with all other EZ-ZONE controllers
- Optional EIA 485, Modbus® RTU

Profile Ramp and Soak (RMC only, not available with high-density controller)

- Profile engine affects one to four loops
- 25 profiles and 15 sub-routines, 400 steps total
- Option for battery backup and real time clock is via the access module

Calibration Accuracy

• $\pm 0.1\%$ of span, $\pm 1^{\circ}$ C. See user manual for details.

Universal Input

- Thermocouple, grounded or ungrounded sensors
- >20MΩ input impedance
- Max. of 2kΩ source resistance
- RTD 2- or 3-wire, platinum, 100Ω and 1000Ω @ 32°F (0°C) calibration to DIN curve (0.00385Ω/Ω/°C)
- Process, 0-20mA @100 $\Omega,$ or 0-10VDC @ 20k Ω input impedance; scalable, 0-50mV
- Potentiometer: 0 to 1,200Ω
- Inverse scaling
- Current: input range is 0 to 50mA, 100Ω input impedance Response time: 1 second max., accuracy ±1mA typical

Thermistor Input

- 0 to 40kΩ, 0 to 20kΩ, 0 to 10kΩ, 0 to 5kΩ
- 2.252kΩ and 10kΩ base at 77°F (25°C)

Digital Input

- Update rate 10Hz
- Max. input 36VDC at 3mA
- Min. high state 3VDC at 0.25mA
- Max. low state 2V

Dry Contact Input

- Update rate 10Hz
- Min. open resistance $10k\Omega$, max. closed resistance 50Ω

Current Measurement Input

- Accepts 0-50mA signal (user programmable range)
- Displayed operating range and resolution can be scaled and are user programmable

Output Hardware

- Switched dc:
 - Max. 32VDC open circuit
 - Max. current 30mA per single output
 - Max. current 40mA per paired outputs (1 & 2, 3 & 4, 5 & 6, 7 & 8)
- Open collector:
 - Max. 30VDC @ 100mA
- 6 digital inputs/outputs:
 - Switched dc, max. 20VDC @ 40mA, 12VDC @ 80mA
 - Open collector, max. 32VDC @ 1.5A, max. 8A per 6 outputs combined
- SSR, Form A, 1A at 50°F (10°C) to 0.5A at 149°F (65°C), 0.5A @ 24VAC min., 264VAC max., opto-isolated, without contact suppression
- Electromechanical relay, Form C, 5A, 24 to 240VAC or 30VDC max., resistive load, 100,000 cycles at rated load, requires a min. load of 20mA at 24V, 125VA pilot duty
- Electromechanical relay, Form A, 5A, 24 to 240VAC or 30VDC max., resistive load, 100,000 cycles at rated load, requires a min. load of 20mA at 24V, 125VA pilot duty
- NO-ARC relay, Form A, 15A @ 122°F (50°C), 85 to 264VAC, no VDC, resistive load, 2 million cycles at rated load
- Universal process/retransmit, output range selectable:
 - 0 to 10VDC $\pm 15mV$ into a min. 1,000 Ω load with 2.5mV nominal resolution
 - 0 to 20mA ±30µA into max. 800Ω load with 5µA nominal resolution
 - Temperature stability is 100ppm/°C

Control Module Ordering Information Requires 24 to 28VDC power supply, includes communication port for configuration with EZ-ZONE configurator and PC. Part Number

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2 Control with thermistor input 5 Limit with universal input (only valid Output 3 and 4, options will be B, F, L) 6 Limit with thermistor input (only valid Output 3 and 4, options will be B, F, L) 7 Current transformer input (not valid Output 3 and 4, options are N, P, R, S) 8 Auxiliary 2nd input (inversal input) P Auxiliary 2nd input (inversal input) P Auxiliary 2nd input (inversal input) P Auxiliary 2nd input (inversal input) D Switched dc/open collector 0 Output 3 and 4 Hardware Options 0 Output 3 and 4 Hardware Options 0 Switched dc/open collector 0 Output 3 0 Output 4 0 Switched dc/open collector 10 Switched dc/open collector 11 Switched dc/open collector 12 Switched dc/open collector 13 None 14 Mechanical relay 5A, Form C 14 Mechanical relay 5A, Form A, 0.5A 15 Switched dc/open collector 14 Mechanical relay 5A, Form C 15 Switched dc/open collector				B = None Mechanical relay 5A, Form A
will be B, F, L) Switched do Open collector Switched do Capen collector Switched do Capen collector 6 = Limit with thermistor input (not valid Output 3 and 4, options are N, P, R, S) = Switched do Open collector None SSR Form A, 0.5A 7 = Current transformer input (not valid Output 3 and 4, options are N, P, R, S) = Machanical relay 5A, Form C None None 8 = Auxiliary 2nd input (thermistor input) = Machanical relay 5A, Form C None None 7 = Current transformer input (not valid Output 4 = None Mechanical relay 5A, Form C None 8 = None Machanical relay 5A, Form A, 0.5A None None None 9 Switched do/open collector NoneARC 15A power control SSR Form A, 0.5A None 10 Switched do/open collector No-ARC 15A power control SSR Form A, 0.5A NO-ARC 15A power control 11 = Switched do/open collector No-ARC 15A power control SSR Form A, 0.5A NO-ARC 15A power control 12 = Machanical relay 5A, Form C None SSR Form A, 0.5A NO-ARC 15A power control 12 = Machanical relay 5A, Form C None SSR Form A, 0.5A NO-ARC 15A power cont	2 = Co	ntrol with thermistor input	alid Output 2 and 4 antions	D = Switched dc/open collector NO-ARC 15A power control
6 = Limit with thermistor input (only valid Output 3 and 4, options will be B, F, L) 7 = Current transformer input (not valid Output 3 and 4, options are N, P, R, S) 8 = Auxiliary 2nd input (internation input) 9 = None None 10 = Switched dc/open collector None 11 = Switched dc/open collector None 12 = Switched dc/open collector None 13 = Mechanical relay 5A, Form C SR Forn A, 0.5A 14 = Mechanical relay 5A, Form C SR Forn A, 0.5A 15 = Switched dc/open collector None SSR Forn A, 0.5A 14	wil	ll be B, F ,L)		
7 = Current transformer input (not valid Output 3 and 4, options are N, P, R, S) Image: Sharper Sharpe			valid Output 3 and 4, options	G = Switched dc/open collector SSR Form A, 0.5A
afe N, P, H, S) P = Auxiliary 2nd input (universal input) P = Auxiliary 2nd input (thermistor input) Q Output 3 and 4 Hardware Options Q Output 3 and 4 Hardware Options Q Output 3 and 4 Hardware Options Q Output 3 Output 4 A = None None B = None Mochanical relay 5A, Form C SSR Form A, 0.5A D = Switched dc/open collector None SSR Form A, 0.5A D = Switched dc/open collector None SSR Form A, 0.5A B = None Mechanical relay 5A, Form C SSR Form A, 0.5A B = Shore collector None SSR Form A, 0.5A J = Switched dc/open collector SSR Form A, 0.5A SSR Form A, 0.5A J = Mechanical relay 5A, Form C No-ARC 15A power control SSR Form A, 0.5A K = Mechanical relay 5A, Form C SSR Form A, 0.5A SSR Form A, 0.5A M = Mechanical relay 5A, Form C SSR Form A, 0.5A SSR Form A, 0.5A M = Mechanical relay 5A, Form C SSR Form A, 0.5A SSR Form A, 0.5A M = Mechanical relay 5A, Form C SSR Form A, 0.5A SSR Form A, 0.5A M = Mechanical relay 5A, Form C SSR Fo	7 = Cu	rrent transformer input (not va	alid Output 3 and 4, options	
P Auxiliary 2nd input (Intermistor input) 0 Output 3 and 4 Hardware Options 0 Output 3 Output 4 A = None None B = None None B = None None D = Switched dc/open collector None ARC 15A power control D = Switched dc/open collector No-ARC 15A power control F = Switched dc/open collector SSR Form A, 0.5A M = Mechanical relay 5A, Form C SSR Form A, 0.5A G = Switched dc/open collector Mochanical relay 5A, Form A H = Mechanical relay 5A, Form C None J = Mechanical relay 5A, Form C SSR Form A, 0.5A K = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C SSR Form A, 0.5A M = Mechanical relay 5A, Form C SSR Form A, 0.5A M = Universal process None P = Universal process None R = Universal process SSR Form A, 0.5A R = Univ	R = Aux	xiliary 2nd input (universal inpu	ut)	
Output 3 Output 4 A = None None B = None Mechanical relay 5A, Form A U = Switched dc/open collector None D = Switched dc/open collector No-ARC 15A power control E = Switched dc/open collector SSR Form A, 0.5A F = Switched dc/open collector No-ARC 15A power control G = Switched dc/open collector SSR Form A, 0.5A H = Mechanical relay 5A, Form C SSR Form A, 0.5A H = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C No-ARC 15A power control K = Universal process None P = Universal process None P = Universal process None R = Universal process SSR Form A, 0.5A R = Universal process SSR Form A, 0.5A R = Universal process None P = Universal process None R = Universal process SSR Form A, 0.5A R = Universal process SSR Form A, 0.5A R = Universal process SSR Form A, 0.5A <td>P = Aux</td> <td>xiliary 2nd input (thermistor in</td> <td>put)</td> <td>M = Mechanical relay 5A, Form C SSR Form A, 0.5A</td>	P = Aux	xiliary 2nd input (thermistor in	put)	M = Mechanical relay 5A, Form C SSR Form A, 0.5A
Output 3 Output 4 A = None None B = None Mechanical relay 5A, Form A U = Switched dc/open collector No-ARC 15A power control E = Switched dc/open collector No-ARC 15A power control E = Switched dc/open collector Set Form A, 0.5A F = Switched dc/open collector Set Form A, 0.5A S = Universal process SSR Form A, 0.5A J = Mechanical relay 5A, Form C No-e J = Mechanical relay 5A, Form C No-e J = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C No-ARC 15A power control K = Mechanical relay 5A, Form C Set Form A, 0.5A M = Mechanical relay 5A, Form C Set Form A, 0.5A M = Universal process Set Form A, 0.5A R = Universal process Set Form A, 0.5A M = Universal process None P = Universal process Set Form A, 0.5A Y = SSR Form A, 0.5A Set Form A, 0.5A Y = SSR Form A, 0.5A Set Form A, 0.5A Y = SSR Form A, 0.5A Set Form A, 0.5A S = Universal process Set Form A,	1	Output 3 and 4 Hard	dware Options	
B None Mechanical relay 5A, Form A U Switched dc/open collector None D Switched dc/open collector None F Switched dc/open collector None A SSR Form A, 0.5A SSR Form A, 0.5A B Witched dc/open collector SSR Form A, 0.5A SSR Form A, 0.5A C SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A B Switched dc/open collector SSR Form A, 0.5A SSR Form A, 0.5A H Mechanical relay 5A, Form C None SSR Form A, 0.5A J Mechanical relay 5A, Form C None SSR Form A, 0.5A M Mechanical relay 5A, Form C SSR Form A, 0.5A SSR Form A, 0.5A M Universal process None SSR Form A, 0.5A SSR Form A, 0.5A T None SSR Form A, 0.5A SSR Form A, 0.5A Mechanical relay 5A, Form C Y SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A S Universal process SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A Z SSR Form A, 0.5A SSR Form				R = Universal process Mechanical relay 5A, Form A
U = Switched dc/open collector None D = Switched dc/open collector NO-ARC 15A power control E = Switched dc/open collector Switched dc/open collector F = Switched dc/open collector Switched dc/open collector G = Switched dc/open collector Mechanical relay 5A, Form C J = Mechanical relay 5A, Form C None J = Mechanical relay 5A, Form C SSR Form A, 0.5A K = Mechanical relay 5A, Form C SSR Form A, 0.5A N = Mechanical relay 5A, Form C SSR Form A, 0.5A S = Universal process None P = Universal process None S = Universal process SSR Form A, 0.5A S = SR Form A, 0.5A SSR Form A, 0.5A T = None SSR Form A, 0.5A S = SR Form A, 0.5A SSR Form A, 0.5A S = Control with universal input SSR Form A, 0.5A S = Control with universal input SSR Form A, 0.5A S = Control with universal input SSR Form A, 0.5A S = Control with universal input SSR Form A, 0.5A S = Control with universal input SSR Form A, 0.5A S = Limit with universal input (only valid Output 5 and 6, options will be B, F, L) 6 = Limit with thermist				T = None SSR Form A, 0.5A
E Switched dc/open collector Switched dc/ F Switched dc/open collector Switched dc/ G Switched dc/open collector SSR Form A, 0.5A H Mechanical relay 5A, Form C None J Mechanical relay 5A, Form C None A, 0.5A M Mechanical relay 5A, Form C None A, 0.5A L Mechanical relay 5A, Form C None A, 0.5A N Universal process None P Universal process SSR Form A, 0.5A Y SSR Form A, 0.5A None Y SSR Form A, 0.5A None A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y E Control with universal input Social relay 5A, poin				
G Switched dc/open collector SSR Form A, 0.5A H Mechanical relay 5A, Form C None J Mechanical relay 5A, Form C NO-ARC 15A power control K Mechanical relay 5A, Form C Switched dc L Mechanical relay 5A, Form C Switched dc R Mechanical relay 5A, Form C Switched dc R Mechanical relay 5A, Form C Switched dc R Mechanical relay 5A, Form C SSR Form A, 0.5A N Universal process None Ssn Form A, 0.5A R Universal process SSR Form A, 0.5A A Y SSR Form A, 0.5A SSR Form A, 0.5A Additional Options Y SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A A Input 3 Adeletional contectors hardware only for the entered model number. Additional c	E = Sw	vitched dc/open collector	Switched dc	
H Mechanical relay 5A, Form C None J Mechanical relay 5A, Form C No-ARC 15A power control K Mechanical relay 5A, Form C Switched dc L Mechanical relay 5A, Form C Switched dc N Universal process None P Universal process Switched dc R Universal process Switched dc R Universal process Switched dc R Universal process Switched dc T None SSR Form A, 0.5A T None SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Y SSR Form A, 0.5A SSR Form A, 0.5A Z SSR Form A, 0.5A SSR Form A, 0.5A A None SSR Form A, 0.5A 1 Control with universal input SSR Form A, 0.5A 2 Control with universal input Mechanical relay 5A, options will be B, F, L) Control with thermistor input San 6, options 6 Limit with universal input (only valid Output 5 and 6, options will be B, F, L) Current transformer input (not valid Out				
K = Mechanical relay 5A, Form C Switched dc L = Mechanical relay 5A, Form C Mechanical relay 5A, Form C N = Universal process None P = Universal process None R = Universal process Nethanical relay 5A, Form A, 0.5A T = None SSR Form A, 0.5A T = None SSR Form A, 0.5A T = None C SSR Form A, 0.5A T = None C SSR Form A, 0.5A Z = SSR Form A, 0.5A SSR Form A, 0.5A M Input 3 Additional Options A = None 1 = Control with universal input 2 = Control with universal input (only valid Output 5 and 6, options will be B, F, L) 6 Limit with thermistor input (only valid Output 5 and 6, options will be B, F, L) 7 = Current transformer input (universal input) 7 = Current transformer input (universal input)			Mechanical relay 5A, Form A SSR Form A. 0.5A	12 Connector Style
M Enhanced Options N = Mechanical relay 5A, Form C SSR Form A, 0.5A N = Universal process None P = Universal process Switched dc R = Universal process SSR Form A, 0.5A Y = SSR Form A, 0.5A NO-ARC 15A power control Z = SSR Form A, 0.5A NO-ARC 15A power control Z = SSR Form A, 0.5A SSR Form A, 0.5A Imput 3 A = None 1 = Control with universal input Enhanced Options 2 = Control with universal input Enhanced Options 2 = Control with universal input Enhanced Options 3 = Limit with universal input Enhanced Options 4 = None Standard 3 = Control with universal input Enhanced Options 4 = Control with universal input (only valid Output 5 and 6, options will be B, F, L) Custom 6 = Limit with universal input (not valid Output 5 and 6, options are N, P, R	G = Sw H = Me	itched dc/open collector chanical relay 5A, Form C	SSR Form A, 0.5A None	A = Right angle screw connector (standard)
N = Universal process None P = Universal process Switched dc R = Universal process Switched dc R = Universal process SSR Form A, 0.5A T = None SSR Form A, 0.5A Y = SSR Form A, 0.5A NO-ARC 15A power control Z = SSR Form A, 0.5A SSR Form A, 0.5A Will be average Input 3 A = Standard A = None Standard A = None Imput 3 A = Control with universal input Control with thermistor input 2 = Control with thermistor input Stand 6, options 5 = Limit with universal input (only valid Output 5 and 6, options will be B, F, L) Firmware, P, R, S) 6 = Current transformer input (not valid Output 5 and 6, options are N, P, R, S) XX R = Auxiliary 2nd input (universal input) Standard	G = Sw H = Me J = Me K = Me	vitched dc/open collector achanical relay 5A, Form C achanical relay 5A, Form C achanical relay 5A, Form C	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc	A = Right angle screw connector (standard)
R Universal process Mechanical relay 5A, Form A S Universal process SSR Form A, 0.5A T None SSR Form A, 0.5A Y = SSR Form A, 0.5A NO-ARC 15A power control Z = SSR Form A, 0.5A SSR Form A, 0.5A Mone Input 3 A = None 1 = Control with universal input 2 = Control with thermistor input 3 = Limit with universal input (only valid Output 5 and 6, options will be B, F, L) 6 = Limit with thermistor input (not valid Output 5 and 6, options will be B, F, L) 7 = Current transformer input (not valid Output 5 and 6, options are N, P, R, S) 8 Auxiliary 2nd input (universal input)	G = Sw H = Me J = Me K = Me L = Me	vitched dc/open collector chanical relay 5A, Form C chanical relay 5A, Form C chanical relay 5A, Form C chanical relay 5A, Form C	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only)
S = Universal process SSR Form A, 0.5A T = None SSR Form A, 0.5A Y = SSR Form A, 0.5A NO-ARC 15A power control Z = SSR Form A, 0.5A SSR Form A, 0.5A Imput 3 SSR Form A, 0.5A SSR Form A, 0.5A A = None 1 = Control with universal input 2 = Control with thermistor input 5 = Limit with universal input (only valid Output 5 and 6, options will be B, F, L) 6 = Limit with thermistor input (not valid Output 5 and 6, options are N, P, R, S) 7 = Current transformer input (not valid Output 5 and 6, options are N, P, R, S) 8 = Auxiliary 2nd input (universal input)	G = Sw H = Me J = Me K = Me L = Me M = Me N = Uni	vitched dc/open collector schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C iversal process	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only)
Y = SSR Form A, 0.5A NO-ARC 15Å power control Z = SSR Form A, 0.5A SSR Form A, 0.5A Imput 3 Input 3 A = None 1 = Control with universal input 2 = Control with thermistor input 5 = Limit with universal input (only valid Output 5 and 6, options will be B, F, L) 6 = Limit with thermistor input (not valid Output 5 and 6, options will be B, F, L) 7 = Current transformer input (not valid Output 5 and 6, options will y and input (universal input) R = Auxiliary 2nd input (universal input)	G = Sw H = Me J = Me K = Me L = Me M = Me N = Uni P = Uni	vitched dc/open collector chanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C viersal process iversal process	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None Switched dc	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only) Image: Construct of the screw connector (slots A, B, D and E only)
 Input 3 A = None Control with universal input Control with thermistor input Control with thermistor input Elimit with universal input (only valid Output 5 and 6, options will be B, F, L) Elimit with thermistor input (not valid Output 5 and 6, options will be B, F, L) Current transformer input (not valid Output 5 and 6, options are N, P, R, S) Auxiliary 2nd input (universal input) 	$\begin{array}{cccc} G &=& Sw\\ H &=& Me\\ J &=& Me\\ K &=& Me\\ L &=& Me\\ M &=& Me\\ N &=& Uni\\ P &=& Uni\\ R &=& Uni\\ S &=& Uni \end{array}$	vitched dc/open collector chanical relay 5A, Form C achanical relay 5A, Form C icchanical relay 5A, Form C icchanical relay 5A, Form C icchanical relay 5A, Form C icchanical relay 5A, Form C iversal process iversal process iversal process	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) II Enhanced Options A = Standard bus 1 = Standard bus and Modbus® RTU 485 (selectable via dipswitch)
Imput 3 model number. Additional cost for the model can be disregarded as you are only ordering replacement connectors. 1 = Control with universal input Control with thermistor input 2 = Control with universal input (only valid Output 5 and 6, options will be B, F, L) Mathematical relay options) 6 = Limit with thermistor input (only valid Output 5 and 6, options will be B, F, L) XX = Custom 7 = Current transformer input (not valid Output 5 and 6, options are N, P, R, S) Auxiliary 2nd input (universal input)	$\begin{array}{cccc} G &=& Sw\\ H &=& Me\\ J &=& Me\\ K &=& Me\\ L &=& Me\\ N &=& Me\\ N &=& Un\\ R &=& Un\\ R &=& Un\\ S &=& Un\\ T &=& No\\ Y &=& SS\end{array}$	vitched dc/open collector chanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C viersal process viersal process viersal process ne R Form A, 0.5A	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A NO-ARC 15A power control	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) II Enhanced Options A = Standard bus I = Standard bus and Modbus® RTU 485 (selectable via dipswitch) III Additional Options Firmware, Overlays, Parameter Settings
1 Control with universal input 2 Control with thermistor input 5 Limit with universal input (only valid Output 5 and 6, options will be B, F, L) 6 Limit with thermistor input (only valid Output 5 and 6, options will be B, F, L) 7 Current transformer input (not valid Output 5 and 6, options are N, P, R, S) 8 Auxiliary 2nd input (universal input)	$\begin{array}{cccc} G &=& Sw\\ H &=& Me\\ J &=& Me\\ K &=& Me\\ L &=& Me\\ N &=& Un\\ R &=& Un\\ R &=& Un\\ R &=& Un\\ T &=& No\\ Y &=& SS\\ Z &=& SS\end{array}$	vitched dc/open collector chanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C iversal process iversal process iversal process iversal process ne R Form A, 0.5A R Form A, 0.5A	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) II Enhanced Options A = Standard bus I = Standard bus and Modbus® RTU 485 (selectable via dipswitch) II Additional Options Firmware, Overlays, Parameter Settings AA = Standard
1 Control with thermistor input 2 Control with thermistor input 5 Limit with universal input (only valid Output 5 and 6, options will be B, F, L) 6 Limit with thermistor input (only valid Output 5 and 6, options will be B, F, L) 7 Current transformer input (not valid Output 5 and 6, options are N, P, R, S) 8 Auxiliary 2nd input (universal input)	G = Sw H = Me J = Me K = Me M = Me M = Me N = Uni R = Uni S = Uni Y = SSS Z = SSS	vitched dc/open collector chanical relay 5A, Form C achanical relay 5A, Form C chanical relay 5A, Form C chanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C iversal process iversal process iversal process ne R Form A, 0.5A R Form A, 0.5A Input 3	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) II Enhanced Options A = Standard bus I = Standard bus and Modbus® RTU 485 (selectable via dipswitch) IV IV Additional Options Firmware, Overlays, Parameter Settings AA = Standard AB = Replacement connectors hardware only for the entered model number. Additional cost for the model can be
 a Limit will be B, F, L) b Limit with thermistor input (only valid Output 5 and 6, options will be B, F, L) c Limit with thermistor input (not valid Output 5 and 6, options are N, P, R, S) A uxiliary 2nd input (universal input) 	G = Sw H = Me J = Me J = Me K = Me N = Uni P = Uni T = Noi Y = SS; Z = SS; A = Noi	vitched dc/open collector chanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C iversal process iversal process iversal process iversal process ne R Form A, 0.5A R Form A, 0.5A Input 3 ne	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Standard bus Enhanced Options A = Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and RTU 485 (selectable via dipswitch) Image: Standard bus and RTU 485 (selectable via dipswitch) Image: Standard bus and RTU 485 (selectable via dipswitch) Image: Standard bus and RTU 485 (selectable via dipswitch) Image: Standard bus and RTU 485 (selectable via dipswitch) Image: Standard 485 (selectable via dipswitch)
 Limit with thermistor input (only valid Output 5 and 6, options will be B, F, L) Current transformer input (not valid Output 5 and 6, options are N, P, R, S) Auxiliary 2nd input (universal input) 	G = Sw H = Me J = Me K = Me M = Me M = Uni R = Uni S = Uni T = Noi Y = SS Z = SSI 8 A = Noi 1 = Coi 2 = Coi	vitched dc/open collector chanical relay 5A, Form C achanical relay 5A, Form C achanical relay 5A, Form C achanical relay 5A, Form C achanical relay 5A, Form C iversal process iversal process iversal process iversal process iversal process iversal process ne R Form A, 0.5A R Form A, 0.5A Input 3 ne introl with universal input introl with thermistor input	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Standard bus Enhanced Options A = Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Replacement connectors hardware only for the entered model number. Additional cost for the model can be disregarded as you are only ordering replacement connectors. I2 = Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)
 7 = Current transformer input (not valid Output 5 and 6, options are N, P, R, S) R = Auxiliary 2nd input (universal input) 		vitched dc/open collector chanical relay 5A, Form C ichanical relay 5A, Form C iversal process iversal process iversal process iversal process ine R Form A, 0.5A R Form A, 0.5A Input 3 ine introl with universal input it with universal input	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Standard bus Enhanced Options A = Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Replacement connectors hardware only for the entered model number. Additional cost for the model can be disregarded as you are only ordering replacement connectors. I2 = Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)
R = Auxiliary 2nd input (universal input)		ritched dc/open collector chanical relay 5A, Form C schanical relay 5A, Form C iversal process iversal process iversal process ne R Form A, 0.5A R Form A, 0.5A R Form A, 0.5A Input 3 ne ntrol with universal input introl with thermistor input nit with universal input (only vi l be B, F, L)	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Standard bus Enhanced Options A = Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Replacement connectors hardware only for the entered model number. Additional cost for the model can be disregarded as you are only ordering replacement connectors. I2 = Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)
P = Auxiliary 2nd input (thermistor input)	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	vitched dc/open collector chanical relay 5A, Form C ichanical relay 5A, Form C icha	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A SSR Form A, 0.5A	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Standard bus Enhanced Options A = Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Replacement connectors hardware only for the entered model number. Additional cost for the model can be disregarded as you are only ordering replacement connectors. I2 = Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ritched dc/open collector chanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C schanical relay 5A, Form C ichanical relay 5A, Form C ichanical relay 5A, Form C iversal process iversal process iversal process iversal process ne R Form A, 0.5A R Form A, 0.5A R Form A, 0.5A Input (ne introl with universal input introl with thermistor input it with universal input it with universal input it with thermistor input it with thermistor input (only vi I be B, F, L) rrent transformer input (not va e N, P, R, S)	SSR Form A, 0.5A None NO-ARC 15A power control Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A None Switched dc Mechanical relay 5A, Form A SSR Form A, 0.5A SSR Form A, 0.5A NO-ARC 15A power control SSR Form A, 0.5A alid Output 5 and 6, options valid Output 5 and 6, options	A = Right angle screw connector (standard) F = Front screw connector (slots A, B, D and E only) Image: Standard bus Enhanced Options A = Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Modbus® RTU 485 (selectable via dipswitch) Image: Standard bus and Replacement connectors hardware only for the entered model number. Additional cost for the model can be disregarded as you are only ordering replacement connectors. I2 = Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)

High-Density Control Module Specifications (RMH)

(Select an RMH module for 4 to 16 loops of control.) Line Voltage/Power

- Power consumption: 7 W, 14VA
- Any external power supply used should comply with a Class 2 or SELV rating

Controller

• User-selectable heat/cool, on-off, P, PI, PD, PID or alarm action, not valid for limit controllers

Process PID Options

- Auto-tune with TRU-TUNE+ adaptive control
- Control sampling rates: input = 10Hz, output = 10Hz (non-divisional)

Isolated Serial Communications

- All modules ship with standard bus protocol for configuration and communication with all other EZ-ZONE controllers
- Optional EIA 485, Modbus® RTU

Calibration Accuracy

• ±0.1% of span, ±1°C. See user manual for details.

Universal Input

- Thermocouple, grounded or ungrounded sensors
- >20MΩ input impedance
- Max. of 2kΩ source resistance
- RTD 2-wire, platinum, 100Ω and 1000Ω @ 32°F (0°C) calibration to DIN curve (0.00385Ω/Ω/°C)
- Process, 0-20mA @100Ω, or 0-10VDC @ 20kΩ input impedance; scalable, 0-50mV

Thermistor Input

- 0 to 40kΩ, 0 to 20kΩ, 0 to 10kΩ, 0 to 5kΩ
- 2.252kΩ and 10kΩ base at 77°F (25°C)

Digital Input

- Update rate 10Hz
- Max. input 36VDC at 3mA
- Min. high state 3VDC at 0.25mA

Dry Contact Input

- Update rate 10Hz
- Min. open resistance 10k Ω , max. closed resistance 50 Ω

Output Hardware

- 6 digital inputs/outputs:
 - Switched dc, max. 20VDC @ 40mA, 12VDC @ 80mA
 - Open collector, max. 32VDC @ 1.5A, max. 8A per 6 outputs combined
- Electromechanical relay, Form A, 5A, 24 to 240VAC or 30VDC max., resistive load, 100,000 cycles at rated load, requires a min. load of 20mA at 24V, 125VA pilot duty

Tri-Process (Three universal process/retransmit outputs)

- Output range selections: 0 to 10VDC into a min. 4KΩ load
- 0 to 20mA into max. 400Ω load

Quad SSR

• Four SSRs at 2A each. SSRs are grouped in 2-pairs with each sharing a common.

Ambient Temp.	1 Quad SSR Card	More than 1 Quad SSR Card
-18	2	1.5
20	2	1.5
65	1	0.75

High-Density Control Module Ordering Information

Requires 24 to 28VAC/VDC power supply, includes communication port for configuration with EZ-ZONE configurator and PC.

Part Nu	Part Number													
12	3 4	5	6	7	8	9		10	1) 12					
EZ-ZONE		Olat	Olat	01-4	Olat	F		Eshamod	Additional					
Rail Mount	Control Connector Module Style	Slot A	Slot B	Slot D	Slot E	Fut Opt		Enhanced Options	Options					
RM	н –					- A	ι.							
4														
	A = Right angle screw connector (standard) A = None													
	F = Front screw connector 1 = 4 universal inputs (T/C, RTD 2-wire, 0-10VDC, 0-20mA) with													
S = (Custom					2 =			puts with control loops					
5	5	Slot A				2 – C =		igital I/O						
	4 universal inputs (T/C, R	TD 2-wire, (0-10VDC, ()-20mA) v	with	F =		0	cess/retransmit outputs					
	control loops 4 thermistor inputs with c	ontrol loon	2			J = 4 mechanical relay 5A, Form A								
2 = 4	thermistor inputs with c		5			L = 4 SSR's at 2A each. SSR's grouped in 2-pairs with each pair								
6	5	Slot B						aring a com						
	None					10			Enhanced Options					
	4 universal inputs (T/C, R control loops	TD 2-wire, (0-10VDC, (0-20mA)	with	A =	Sta	ndard Bus						
	4 thermistor inputs with c	ontrol loop	2			1 =			and Modbus® RTU 485 (user-selectable)					
2			5											
7	5	Slot D				11 12			Additional Options					
	None						_		Parameter Settings					
	4 universal inputs (T/C, R	TD 2-wire,	0-10VDC, (0-20mA)	with	AA = AB =		indard	connectors hardware only for the entered					
	control loops					AD =		t number	connectors hardware only for the entered					
	4 thermistor inputs with c 6 digital I/O	control loop	5			XX =		stom						
-	o digital 1/0 3 universal process/retrai	nemit outpu	ite											
	4 mechanical relay 5A, Fo		110											
L = 4	4 SSR's at 2A each. SSR sharing a common.		in 2-pairs v	vith each	pair									

High-Density Limit Module Specifications (RML)

(Select an RML module for 4 to 12 safety limits.) Line Voltage/Power

- Power consumption: 7 W, 14VA
- Any external power supply used should comply with a Class 2 or SELV rating

Isolated Serial Communications

- All modules ship with standard bus protocol for configuration and communication with all other EZ-ZONE controllers
- Optional EIA 485, Modbus® RTU

Calibration Accuracy

• ±0.1% of span, ±1°C. See user manual for details.

Universal Input

- Thermocouple, grounded or ungrounded sensors
- >20MΩ input impedance
- Max. of 2kΩ source resistance
- RTD 2-wire, platinum, 100Ω and 1000Ω @ 32°F (0°C) calibration to DIN curve (0.00385Ω/Ω/°C)
- Process, 0-20mA @100 Ω , or 0-10VDC @ 20k Ω input impedance; scalable, 0-50mV

Thermistor Input

- 0 to 40kΩ, 0 to 20kΩ, 0 to 10kΩ, 0 to 5kΩ
- 2.252k Ω and 10k Ω base at 77°F (25°C)

rounded or ungrounded sensors

Digital Input

- Update rate 10Hz
- Max. input 36VDC at 3mA
- Min. high state 3VDC at 0.25mA

Dry Contact Input

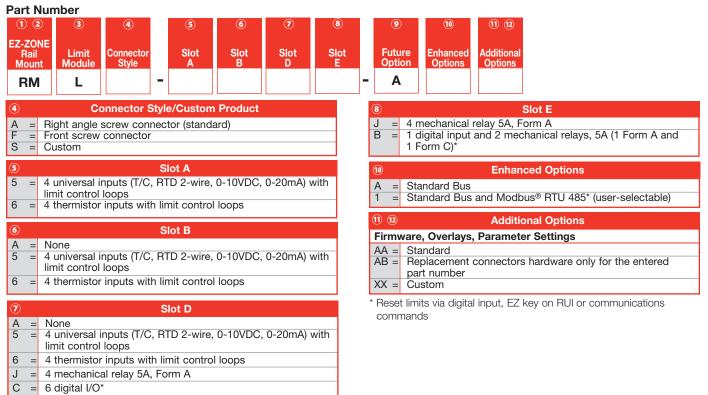
- Update rate 10Hz
- Min. open resistance 10kΩ, max. closed resistance 50Ω

Output Hardware

- 6 digital inputs/outputs:
 - Switched dc, max. 20VDC @ 40mA, 12VDC @ 80mA
 - Open collector, max. 32VDC @ 1.5A, max. 8A per 6 outputs combined
- Electromechanical relay, Form A, 5A, 24 to 240VAC or 30VDC max., resistive load, 100,000 cycles at rated load, requires a min. load of 20mA at 24V, 125VA pilot duty

High-Density Limit Module Ordering Information

Requires 24 to 28VAC/VDC power supply, includes communication port for configuration with EZ-ZONE configurator and PC.



Expansion Module Specifications (RME)

(Select an RME module for additional inputs and outputs and higher amperage outputs.)

- Line Voltage/Power
- Power consumption: 7 W, 14VA
- Any external power supply used should comply with a Class 2 or SELV rating

Serial Communications

 All modules ship with standard bus protocol for configuration and communication with all other EZ-ZONE products

Wiring Termination—Touch Safe Terminals

- Right angle and front-screw type terminal blocks (slots A, B, D, E)
 - Input, power and controller output terminals, touch safe, removable, 12 to 30 AWG
- Ring lug terminal blocks (slots A and D only)
 - Input, power and controller output terminals are touch safe and removable

Digital Input

- Update rate 10Hz
- Max. input 36VDC at 3mA
- Min. high state 3VDC at 0.25mA

Dry Contact

- Min. open resistance 100k Ω
- Max. closed resistance 50Ω

Output Hardware (6 digital inputs/outputs)

• Update rate 10Hz

- Switched dc
 - Output voltage 20VDC max.
 - Max. supply current source 40mA at 20VDC and 80mA at 12VDC
- Open collector
 - Switched voltage max. 32VDC
 - Max. switched current per output 2.5A
 - Max. switched current for all six outputs combined 10A

Dual Solid State Relay

 Two SSR board option, Form A, 10A max. each SSRs combined @ 24VAC min., 264VAC max., opto-isolated, without contact suppression, max. resistive load 10A per output at 240VAC, max. 20A per card at 122°F (50°C), max. 12A per card at 149°F (65°C)

Four Mechanical Relay

• Four electro mechanical relays, Form A, 5A, 24 to 240VAC or 30VDC max., resistive load, 100,000 cycles at rated load. Requires a min. load of 20mA at 24V, 125VA pilot duty

Tri-Process (Three universal process/retransmit outputs)

- Output range selections: 0 to 10VDC into a min. $4K\Omega$ load
- 0 to 20mA into max. 400Ω load

Quad SSR

• Four SSRs at 2A each. SSRs are grouped in 2-pairs with each sharing a common.

Ambient Temp.	1 Quad SSR Card	More than 1 Quad SSR Card
-18	2	1.5
20	2	1.5
65	1	0.75

Expansion Module Ordering Information

Requires 24 to 28VDC power supply, includes communication port for configuration with EZ-ZONE configurator and PC. **Part Number**

i ui i i	lumber										
1 2 EZ-ZOI	Ŭ	(4) Connector	5	6	7	8		9 (0	1) (
Rail Moun	Expansion	Style/ Custom Product	Slot A	Slot B	Slot D	Slot E		Futur Optior		Additio Optio	
RM	E	-					-	AA			
4	Co	onnector St	yle/Custo	m Produc	t			7			
A = Right angle screw connector (standard)A = NoneF = Front screw connector (slots A, B, D and E only)C = 6 digitaR = Ring lug connector (if ordered, then slots B and E must be = A)F = 3 univeS = CustomJ = 4 mechK = 2 SSRs											
5			Slot A					L =		nust b SSR's	
A = C =	None 6 digital I/O									haring	
F = J = K =	3 universal p 4 mechanica 2 SSRs, For must be = <i>I</i> 4 SSR's at 2 sharing a co	al relay 5A, F m A, 10A ma A) 2A each. SSF	orm A ax. each (i	f ordered,				8 A = C = F = L =	= 6 = 3 = 4 sl	one digital univer SSR's haring	
6			Slot B					T =		uad in ngle-p	
A = C = F =	None 6 Digital I/O 3 universal p		ansmit out	nuts					h	ardwa uture c	
J =	4 mechanica	al relay 5A, F	orm A					11 12)		
L =	4 SSR's at 2 sharing a co		r's groupe	ed in 2-pair	s with eac	n pair		Firm		re, Ove	
		-]		AA = AB =	R R	tandar eplace art nur isregar	

7		Slot D
А	=	None
C F J K	=	6 digital I/O
F	=	3 universal process/retransmit outputs
J	=	4 mechanical relay 5A, Form A
К	=	2 SSRs, Form A, 10A max. each (if ordered, then slot E must be = A)
L	=	4 SSR's at 2A each. SSR's grouped in 2-pairs with each pair sharing a common.
8		Slot E
А	=	None
C F	=	6 digital I/O
	=	3 universal process/retransmit outputs
L	=	4 SSR's at 2A each. SSR's grouped in 2-pairs with each pair sharing a common.
Т	=	Quad inputs for external current transformers. Can do either single-phase or three-phase system measurement for all hardware outputs ordered within the expansion module (future option, contact factory)
1	12	Additional Options
Fir	mv	vare, Overlays, Parameter Settings
AA	. =	Standard
AB	3 =	Replacement connectors hardware only, for the entered part number. Additional cost for the model can be

- part number. Additional cost for the model can be disregarded as you are only ordering replacement connectors.
 12 = Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)
- XX = Custom

High-Density Scanner Module Specifications (RMS)

(Select an RMS module for 4 to 16 auxiliary analog inputs.) Line Voltage/Power

- Power consumption: 7 W, 14VA
- Any external power supply used should comply with a Class 2 or SELV rating

Isolated Serial Communications

- All modules ship with standard bus protocol for configuration and communication with all EZ-ZONE controllers
- Optional EIA 485, Modbus[®] RTU

Calibration Accuracy

• ±0.1% of span, ±1°C. See user manual for details.

Universal Input

- Thermocouple, grounded or ungrounded sensors
- >20MΩ input impedance
- Max. of 2kΩ source resistance
- RTD 2-wire, platinum, 100Ω and 1000Ω @ 32°F (0°C) calibration to DIN curve (0.00385Ω/Ω/°C)
- Process, 0-20mA @100 $\Omega,$ or 0-10VDC @ 20k Ω input impedance; scalable, 0-50mV

Thermistor Input

- 0 to 40kΩ, 0 to 20kΩ, 0 to 10kΩ, 0 to 5kΩ
- $2.252k\Omega$ and $10k\Omega$ base at $77^{\circ}F$ ($25^{\circ}C$)

Digital Input

- Update rate 10Hz
- Max. input 36VDC at 3mA
- Min. high state 3VDC at 0.25mA

Dry Contact Input

- Update rate 10Hz
- Min. open resistance 10kΩ, max. closed resistance 50Ω

Output Hardware

- 6 digital inputs/outputs:
 - Switched dc, max. 20VDC @ 40mA, 12VDC @ 80mA
 - Open collector, max. 32VDC @ 1.5A, max. 8A per 6 outputs combined
- Electromechanical relay, Form A, 5A, 24 to 240VAC or 30VDC max., resistive load, 100,000 cycles at rated load, requires a min. load of 20mA at 24V, 125VA pilot duty

High-Density Scanner Module Ordering Information

Requires 24 to 28VAC/VDC power supply, includes communication port for configuration with EZ-ZONE configurator and PC.

Part N	Part Number													
1	3	4	5	6	7	8		9	10	1) 12				
	EZ-ZONE Rail Scanner Connector Slot Slot Slot Slo								Enhanced	Additional				
Moun		Style	Α	В	D	E	O	otion	Options	Options				
RM	S		-				-	Α						
4														
A =														
F = S =	Front screw Custom	connector					R		4 universal inp without contro	buts (T/C, RTD 2-wire, 0-10VDC, 0-20mA) bl loops				
5			Slot A				Р	= 4	4 thermistor ir	nputs without control loops				
B =	4 universal i				$0.20m\Lambda$		J			relay 5A, Form A				
к =	without cont		RTD 2-wire,	0-10000,	0-20MA)		C = 6 digital I/O							
P =	4 thermistor		out control lo	pops			B = 1 digital input and 2 mechanical relays, 4A							
6			Slot B				10			Enhanced Options				
A =	None						А		Standard Bus					
R =	4 universal i		RTD 2-wire,	0-10VDC,	, 0-20mA)		1	=	Standard Bus	and Modbus® RTU 485 (user-selectable)				
P =	without cont 4 thermistor		out control la	2005			11 (12)		Additional Options				
							Firi	mwa	are, Overlays	, Parameter Settings				
7			Slot D				AA		Standard					
A =										connectors hardware only for the entered				
R =	Dart number													
P =	4 thermistor	inputs with	out control l	oops										
J =	4 mechanic	al relay 5A, I	Form A											
C =	6 digital I/O													

Access Module Specifications (RMA)

(Select an RMA module for communication protocol options, datalogging and automatic configuration backup.) Line Voltage/Power

- Power consumption: 4 W, 9VA
- Any external power supply used should comply with a Class 2 or SELV rating

Isolated Serial Communications

- All modules ship with standard bus protocol for configuration and communication connection to all EZ-ZONE products
- Additional Communication Options
- EIA 232/485, Modbus® RTU
- EtherNet/IP™, Modbus® TCP, 10 BASE-T/100 BASE-TX
- DeviceNet[™]
- PROFIBUS DP (future option, contact factory)
- USB, controller recognized as a device

Note: If an access module is present, all other modules must have Modbus[®] disabled in order to achieve communications with all of the modules.

USB

- USB 1.1 device only
- Mini USB connector type
- Recognized as a mass storage device

Real Time Clock with Battery Backup

- Accuracy (typical): +/- 30ppm at 77°F (25°C)
- +30/-100ppm overtemperature operating range

Access Module Ordering Information

- Battery type and typical lifetime rating: 10 years at 77°F (25°C)
- Lithium battery used, recycle properly

Data Logging

- 200 points
- File storage on-board module
- Common separated value (CSV) file type
- Export files via removable SD micro memory card or USB communications port

Memory Card

- Removable SD micro card
- 2G SD memory card provided, also accepts other storage space amounts
- -4 to 185°F (-20 to 85°C) ambient rating, non-volatile memory
- Information access to configuration files and the ability to store module auto-configuration settings and datalog files if options have been ordered

Auto-configuration File Backup

- · Limited memory can support up to four modules
- · Limited memory is fixed on board
- Unlimited memory can support up to 16 modules
- Unlimited memory utilizes removable SD micro card option

Note: All module parameters are backed up in memory except for USER SET 1 and USER SET 2 parameter settings and address.

Part Number 12 9 10 (11) (12) (7) **EZ-ZONE** Ramp/ Soak Connector Style Future Comms. Future Additional Rail Mount Access Module Options Options Options Options Functions RM Α Α AA **Connector Style** Right angle screw connector (standard) A = = Front screw connector (slots B and E only) S Custom = **Future Options** 5 А Standard = **Communications Options** limit downtime. A 2 = None Modbus® RTU 232/485 = EtherNet/IP™, Modbus®/TCP DeviceNet™ 3 = 5 = 6 PROFIBUS DP = **Ramp/Soak Functions** 7 = None Α = Battery backup and real time clock for profile ramp and soak В ⁽⁸⁾ System Configuration and Data Logging Options Unlimited

Requires 24 to 28VDC power supply, includes communication port for configuration with EZ-ZONE configurator and PC.

Limited Auto-Auto-Configuration Configuration Mobile File Backup File Backup Data Order **USB** "Device for Up to for Up to 16 **On-Board** (2G SD 4 Modules Option Communication Modules Data Logging Card) А \checkmark В \checkmark \checkmark Y \checkmark \checkmark \checkmark D 1 \checkmark \checkmark \checkmark

USB Device Configuration: USB access to configuration files (and data log files if data logging option is ordered) stored via on-board SD memory card. PC access to product via standard bus protocol.

Auto-Configuration Backup: Limited fixed on board memory can support backing up configuration files for a maximum of four modules. The unlimited option utilizes a SD memory card to enable configuration file backup for up to 16 modules. Feature can be used for cloning configuration files to multiple modules or for easy field replacement to limit downtime.

Data Logging: Data log files stored on 2G SD memory card. Data files can be exported via USB communication port transfer or removing SD card into external card reader. Watlow reserves the right to ship a larger memory amount at any point in time.

Mobile Data: Transfer configuration files (and data logging files if data logging option is ordered) via removable SD memory card.

11 12	Additional Options									
Firmware, Overlays, Parameter Settings										
AA =	Standard									
	Replacement connectors hardware only, for the entered part number. Additional cost for the model can be disregarded as you are only ordering replacement connectors									
12 =	Class 1, Div. 2 (not available with integrated limit controller or mechanical relay options)									
XX =	Custom									

Compatible Accessories

Specifications for Basic Remote User Interface (RUI) EZKB

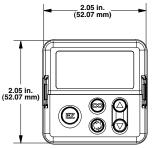
Operator Interface

- Dual 4 digit, 7 segment LED displays
- Forward, backward, up and down keys plus a customer programmable function key - EZ key
- Typical display update rate: 1Hz
- Agency approved to IP65/NEMA 4X
- Standard bus ships with all units. Options: EIA 232/485 Modbus[®] RTU, EtherNet/IP[™]/TCP Modbus[®] or DeviceNet[™], PROFIBUS DP

Line Voltage/Power

- 100 to 240VAC, +10/-15%; (85-264VAC) 50/60Hz, ±5%
- 24VAC/VDC, +10/-15%; 50/60Hz, ±5%





Basic RUI

Front View

Depth Dimensions for RUI: long case 4 in. (101.6 mm), short case 2.33 in. (59.10 mm)

EZ-ZONE Configurator Software



The EZ-ZONE configurator software is used to set up Watlow EZ-ZONE products in one simple process. It works without requiring the purchase of any communication options because it uses the standard bus communications protocol that is included with all EZ-ZONE products. EZ-ZONE configurator can be used for on-line and off-line configurations and downloading previously saved setups. It is available as a FREE download at www.watlow.com.

SpecView

SpecView



SpecView from Watlow is designed for industrial users and includes 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.

Operator Interface Terminals (OIT)



Silver Series touchscreen operator interface terminals provide a customizable user interface and log and graph data for Watlow controllers and other devices. A Silver Series operator interface terminal, paired with Watlow controllers, is the perfect solution for industrial processes or machine control applications.

Accessories (continued)

Power Supplies

- AC/DC power supply converter 90-264VAC to 24VDC volts.
- P/N 0847-0299-0000 31 W
- P/N 0847-0300-0000 60 W
- P/N 0847-0301-0000 91 W

EZ-ZONE RM Product Documentation

- User's manual electronic DVD P/N 0601-0001-0000
- Table of manuals in various languages (see below)

User Documentation	RMC	RMH	RML	RME	RMS	RMA
English	0600-0070-0000	0600-0074-0000	0600-0075-0000	0600-0073-0000	0600-0071-0000	0600-0072-0000
German	0600-0070-0001	0600-0074-0001	0600-0075-0001	0600-0073-0001	0600-0071-0001	0600-0072-0001
Japanese	0600-0070-0002	0600-0074-0002	0600-0075-0002	0600-0073-0002	0600-0071-0002	0600-0072-0002
Korean	0600-0070-0003	0600-0074-0003	0600-0075-0003	0600-0073-0003	0600-0071-0003	0600-0072-0003
French	0600-0070-0004	0600-0074-0004	0600-0075-0004	0600-0073-0004	0600-0071-0004	0600-0072-0004
Italian	0600-0070-0005	0600-0074-0005	0600-0075-0005	0600-0073-0005	0600-0071-0005	0600-0072-0005
Spanish	0600-0070-0006	0600-0074-0006	0600-0075-0006	0600-0073-0006	0600-0071-0006	0600-0072-0006
Chinese	0600-0070-0007	0600-0074-0007	0600-0075-0007	0600-0073-0007	0600-0071-0007	0600-0072-0007

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Modbus[®] is a registered trademark of Schneider Automation Incorporated. DeviceNet™ and EtherNet/IP™ are trademarks of Open DeviceNet Vendors Association.

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