



## MS-2102

## Product Specifications

### Specifications<sup>1</sup>

**Models:** MS-2102, MS-2102-E3, MS-2102-BAC,  
MS-2102-E3-BAC, MS-2102-ETH, MS-2102-E3-ETH

#### Temperature Input

Range: -50 to +500°C (-58 to 932°F)  
Accuracy: ±2°C  
Repeatability: ±1°C  
RTD: Two, 100 ohm platinum, 3-wire RTD  
20 ohms maximum lead resistance

#### Heater Switching

Configuration: Two circuit, single-pole, one SCR per circuit, 800 amp 1 cycle inrush  
Ratings: 85-280Vac, 30A continuous  
Line Frequency: 50 or 60Hz  
Current Measurement: 0.1 to 30A 3%±0.2A  
GF Measurement: 10 to 1000mA 5%±2mA  
Voltage Measurement: 0 to 300Vac 3%±2V (only for heater 1)

#### Control Power

Power Requirement: Control power from heater 1 voltage  
85-280VAC, 10VA max  
Protection: Control power from heater 1 voltage  
protected by 2A fuse  
MOV transient protection

#### Communication

Port: 1 Serial network connection  
Type: RS485  
Protocol: Modbus® RTU.  
Transmission Rate: 600,1200, 2400, 4800, 9600 baud.  
Interconnect: 2-wire, shielded, twisted pair.  
Highway Distance: 4,000 feet without repeater.  
Modules per Highway: 32 Control Modules.

#### BACnet/IP Ethernet Communication

Models: Models with option BAC only  
Gateway: 1 configured & assembled MasterTrace Modbus to  
BACnet/IP gateway, separated from MS-2102 module  
Serial Connection: To be connected to serial ports @ 9600  
baud on modules via RS485 cable  
Ethernet Connection: To be connected to Ethernet network  
via Ethernet cable

#### MODBUS TCP Ethernet Communication

Models: Models with option ETH only  
Gateway: 1 configured & assembled MasterTrace Modbus to  
Modbus TCP gateway, separated from MS-2102 module  
Serial Connection: To be connected to serial ports @ 1200~  
9600 baud on modules via RS485 cable  
Ethernet Connection: To be connected to Ethernet network  
via Ethernet cable

#### Measured Values

Temperature: -50 to 500°C (-58 to 932°F)  
Minimum Temperature: -50 to 500°C (-58 to 932°F)  
Maximum Temperature: -50 to 500°C (-58 to 932°F)  
Heater Current: 0.1 to 30A  
Ground Fault Current: 10 to 1000mA  
Min. Heater Voltage: 85 to 300Vac  
Max. Heater Voltage: 85 to 300Vac  
Power Consumption: 0 to 1,000 MWh  
Operating Cost: 0 to \$1,000,000.00

#### User Interface

Display: 16-character x 2-line LCD display  
Keypad: 9 tactile keys, polyester faceplate  
- Setpoint, measured, status  
- Message Up, Message Down  
- Value Up, Value Down, Reset, Store

Contrast: Adjustable by potentiometer  
Panel Indicators: Power on, Heater on, Communication active, System fail, Process alarm  
Controller parameters switch-protected  
Security:

#### Environment

Approvals: CSA C/US, Class I, Div. 2, Groups A, B, C, D; Class I, Zone 2, Groups IIC; Class II, Div. 2, Groups F & G; Class III  
Operating Temperature: -40°C to +50°C (LCD: -20°C to +50°C)  
Conformal Coating: Boards conformal coated for hostile environments

#### Enclosure

Type: Models with option E3: Nema-4X stainless steel, painted black  
Models without option E3: Nema-4X steel, painted black  
Size: 10"Hx8"Wx6"D  
Features: Quick release latches to open door  
Flat aluminum plate to act as heatsink and mounting flange for mounting on Uni-Strut.  
One 3/4" conduit knockout for power and three 1/2" conduit knockouts for RTD and signal wiring.

#### Alarm Output

Alarm: Programmable for NO or NC contact  
One Mechanical (dry) contact  
Alarm Rating: Mechanical contact: 30Vdc/100mA,  
120Vac/0.52A, 62.5W Max  
Alarm Output: LED Indicator: 5Vdc/50mA

#### Alarm Function

Temperature: High Temp Alarm, Low Temp Alarm  
Current: Low Current Alarm, High Current Alarm  
Ground Fault Current: Ground Fault Current Alarm  
Ground Fault Current Trip  
Voltage: Low Voltage Alarm  
Hardware: Self-Check Failure, Relay Failure, RTD Open, RTD Short

#### User-Definable Options

Heater Status: Enable or Disable  
Heater Name or Tag: 16 Character Alphanumeric  
Temperature Units: °C or °F  
Proportional Control: on or off  
Deadband: 1 to 50°C (2 to 90°F)  
PowerLimit: 0.1 to 30A, off  
TraceCheck: 1 to 24hrs, off  
Temperature Setpoint: -50 to 500°C (-58 to 932°F), off, none  
High Temp Alarm: -50 to 500°C (-58 to 932°F), off  
Low Temp Alarm: -50 to 500°C (-58 to 932°F), off  
High Current Alarm: 0.1 to 30A, off  
Low Current Alarm: 0.1 to 30A, off  
Ground Fault Alarm: 10 to 1000mA, off  
Ground Fault Trip: 10 to 1000mA, off  
Low Voltage Alarm: 85V to 300V, off  
RTD Fail-safe: Heater On or Heater Off  
Override: On or Off  
Alarm Contacts: NO or NC for mechanical contact  
Alarm Light: Alarm on, Alarm off, Flash during alarm then on, Flash during alarm then off

#### Ground Fault

Maximum Trip Time: 7.4 seconds

**1. This is a precise specification for MS2102 controller. For MS2102 panels, there could be some variations.**