

**Specifications**

**Models:** MS-2101, MS-2101-E3, MS-2101-BAC, MS-2101-BAC1, MS-2101-E3-BAC, MS-2101-E3-BAC1, MS-2101-ETH, MS-2101-ETH1, MS-2101-E3-ETH, MS-2101-E3-ETH1

**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: One circuit, Two-pole, one SCR per phase, 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

**Control Power**

Power Requirement: Control power from heater voltage, 85-280VAC, 10VA max  
 Protection: Control power from heater 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 options BAC/BAC1  
 Gateway: 1 configured & assembled MasterTrace Modbus to BACnet/IP gateway, separated from MS-2101 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  
 Enclosure: FRP enclosure with option BAC1 only

**MODBUS TCP Ethernet Communication**

Models: Models with options ETH/ETH1  
 Gateway: 1 configured & assembled MasterTrace Modbus to Modbus TCP gateway, separated from MS-2101 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  
 Enclosure: FRP enclosure with option ETH1 only

**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 60A  
 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 Alpha numeric 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  
 Security: Controller parameters password protected

**Environment**

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

**Enclosure**

Type: Models with option E3: Nema-4X SS steel, painted black  
 Models without option E3: Nema-4X steel, painted black  
 Size: 0"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: High Voltage Alarm, Low Voltage Alarm  
 Hardware: Self-Check Failure, Switch Shorted, RTD Open, RTD Shorted, Continuity

**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 50C° (2 to 90F°)  
 PowerLimit: 0.1 to 30A, off  
 SoftStart: 10 to 999s, 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  
 High Voltage Alarm: 85V to 300V, off  
 Low Voltage Alarm: 85V to 300V, off  
 RTD Definition: Single, Backup, Highest, Lowest, Average or High Temperature Cutout  
 RTD Fail-safe: Heater On or Heater Off  
 Heat Trace Curve: disable, user, LT3, 5, 8, 10, HLT3, 5, 8, 10, 12, 15, 18, 20  
 Override: On or Off  
 Alarm Contacts: NO or NC for each contact  
 Alarm Light: Alarm on, Alarm off, Flash during alarm then on, Flash during alarm then off

**Ground Fault**

Maximum Trip Time: 3.7 seconds