MS-2100 Series

HEAT TRACE CONTROLLERS

NEXTRON

THE BEST IN ADVANCED CONTROL

Nextron's MS-2101 was developed to control a single line of electrical heat tracing based on pipe temperature, measured by one or both of the user-settable, fail-safe RTD inputs. RTD inputs can be configured to operate using one pipe-mounted temperature sensing RTD with the second used as redundant for fail-safe operation. Alternatively, both can be used to control heat tracing based on the highest, lowest, or average of the two readings, or one RTD can be configured to act as a high temperature cut out. In any case, these user-settable configurations allow for the most flexible, cost effective and comprehensive heat trace control.

The MS-2102 is designed for measuring two heat trace circuits and offer the same quality and features of the MS-2101.

Both the MS-2101 and MS-2102 controllers provide ON/OFF Control with adjustable deadband or Proportional Control maximizing the performance and reliability of self-regulating, mineral-insulated and other types of heat trace. The Master override input provides external control for load shedding or ambient temperature override. The PowerLimit feature reduces high in-rush current typical with self-regulating cable applications.

Nextron is a high technology company specializing in the design, production and marketing of industrial temperature control products.

Nextron has taken the system quality and reliability of the MasterTrace controller and designed it into the MS-2100 Series of temperature controllers.

MS-2100 Series Controllers are designed in single point or dual point microprocessor based heat trace controllers for use in Class I, Division 2 / Zone II areas. Nextron's MS-2100 Series provides the control and monitoring you require for any type of heat tracing system in the majority of heat tracing applications.

The Best In Advanced Monitoring

Nextron's MS-2100 Series controllers continuously monitor all important heat trace variables – temperature, heater current, voltage and ground fault levels – detecting and alerting operators of potential problems before they occur avoiding costly frozen pipes or process problems.

All user settable alarm levels are independent of the trip levels and the MS-2100 Series controllers also perform a self-check and monitoring of the RTD's and switches.

To ensure that your heat tracing system operates 24 hours a day, 365 days per year, TraceCheck™ periodically energizes and checks for alarm conditions on all dormant signals.

Energy Management

Operators have many reasons to reduce their environmental impact, yet may be missing substantial opportunities to become greener without making significant investments. Opportunities for energy savings are in perhaps the most obvious of places – the plant.

MS-2100 Series controllers log minimum and maximum values and energy usage providing an opportunity for operators to recognize energy savings in the plant.

NEXTRON

Certified System ISO 9001 QMI-SAI Global

SAI GLOBAL

MS-2101 Product Specifications

TEMPERATURE INPUT

Range:	-50 to +500°C (-58 to 932°F)
Accuracy:	±2°C
Repeatability:	±1°C
RTD:	One dual RTD input, for 100-ohm platinum, 3-wire RTDs, 20 Ohms maximum lead resistance (RTD probes are not included)

HEATER SWITCHING

Configuration:	One dual-pole control 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

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

COMMUNICATIONS

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

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

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 Serial 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:	NEMA-4X steel, painted black
Size:	10"H x 8"W x 6"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 contacts One DC opto-isolated contact One AC triac contact
Alarm Rating:	DC contact: 30Vdc/0.1A, 500mW max
AC contact:	12-240Vac@0.5A max
Alarm Output:	LED Indicator: 5Vdc/50mA

ALARM FUNCTION

Temperature:	High Temperature Alarm Low Temperature 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
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

MS-2102 Product Specifications

TEMPERATURE INPUT

Range:	-50 to +500°C (-58 to 932°F)
Accuracy:	±2°C
Repeatability:	±1°C
RTD:	Two single RTD inputs, for 100-ohm platinum, 3-wire RTDs, 20 Ohms maximum lead resistance (RTD probes are not included)

HEATER SWITCHING

Configuration:	Two single-pole control circuits 800 Amp 1 cycle inrush
Ratings:	120Vac or 277Vac, 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 120Vac or 277Vac, 10VA max
Protection:	Control power from heater 1 voltage protected by 2A fuse MOV transient protection

COMMUNICATIONS

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

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

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 Serial communication active System fail Process alarm
Security:	Controller parameters switch-protected

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 and 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:	NEMA-4X steel, painted black
Size:	10"H x 8"W x 6"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

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Alarm:	Programmable for NO or NC contacts One DC opto-isolated contact One AC triac contact
Alarm Rating:	DC contact: 30Vdc/0.1A, 500mW max
AC contact:	12-240Vac@0.5A max
Alarm Output:	LED Indicator: 5Vdc/50mA

ALARM FUNCTION

Temperature:	High Temperature Alarm Low Temperature 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 50C° (2 to 90F°)
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 each 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

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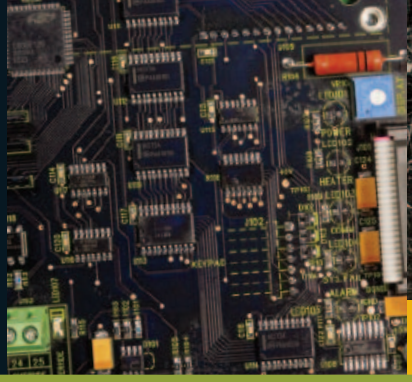
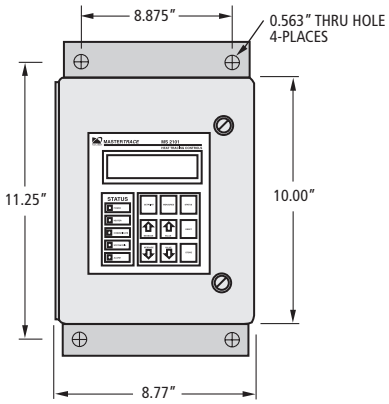
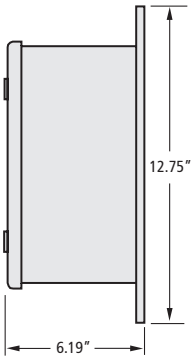


EASY INSTALLATION AND SYSTEM INTERFACING

THE ONLY HEAT TRACE CONTROLLER YOU WILL EVER NEED





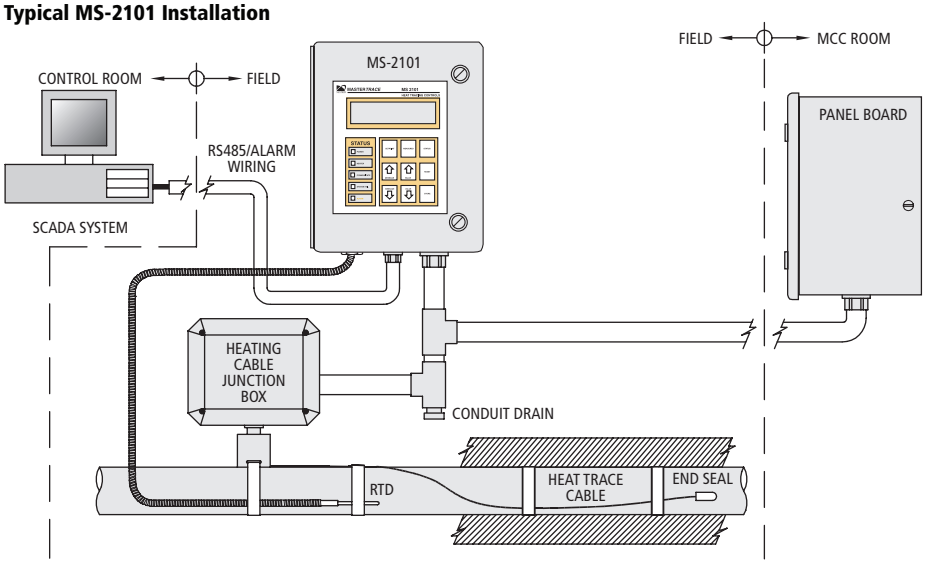
The MS-2101 and MS-2102 come ready to install. Mounted in a rugged NEMA 4X enclosure, no field assembly is required. All come with a solid state alarm contact that can be configured normally open or closed by the user, and an alarm output.

Nextron's MS-2101 and MS-2102 are available with three types of Interface Modules. The Local Interface Module communicates with a single controller and comes mounted on the front door allowing user-friendly interrogation and programming, local or remote. The easy to read 32 character alphanumeric LCD displays alarms identifying the heater circuit by a user defined name – no codes to decipher. The Group Interface Module communicates with multiple controllers up to 1,200 meters (4,000 feet) away.

Our Central Computer Interface is the heart of a plant-wide network using Modbus protocol. The MS-2101 and MS-2102 support one RS 485 serial port to connect to a group interface module or central computer interface.

The advanced features of the MS-2101 and MS-2102 make them the choice for your application. For more information on this and our other products, contact your local Nextron representative.

Typical MS-2101 Installation



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