

3101

1/4 DIN High/Low Limit Controller

- FM Approved High/Low Limit Controller (Pending)
- UL Listed Overtemperature Controller
- One High/Low Limit Control Output
- Two Independent Alarm Outputs
- Universal Sensor Inputs
- NEMA 4X Hosedown Front Panel
- Switching Power Supply
100 to 240 Vac or
12 to 24 Vac/Vdc
- Digital Communications with *ChromaSoft™* Compatibility



◀ FM ▶ Pending

ISO 9001
APPROVED • CERT. NO. A3164

Chromalox®

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Description

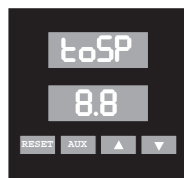
The Chromalox 3101 is a compact, fully programmable high or low limit controller. It is a UL Listed Overtemperature (or Under-temperature) controller, with FM approval pending as a limit controller. With user programmable inputs, outputs and high/low limit features, it is flexible to most any limit control application, and can be easily reconfigured as needed. Sophisticated limit control features include a total time over/under setpoint display and peak (maximum or minimum) process variable display. These valuable 3101 features allow you to determine if process damage has occurred and can help in analyzing the cause if shutdown has occurred.

Peak Temperature Display



The 3101 records and displays the peak process temperature.

Over Setpoint Timer Display

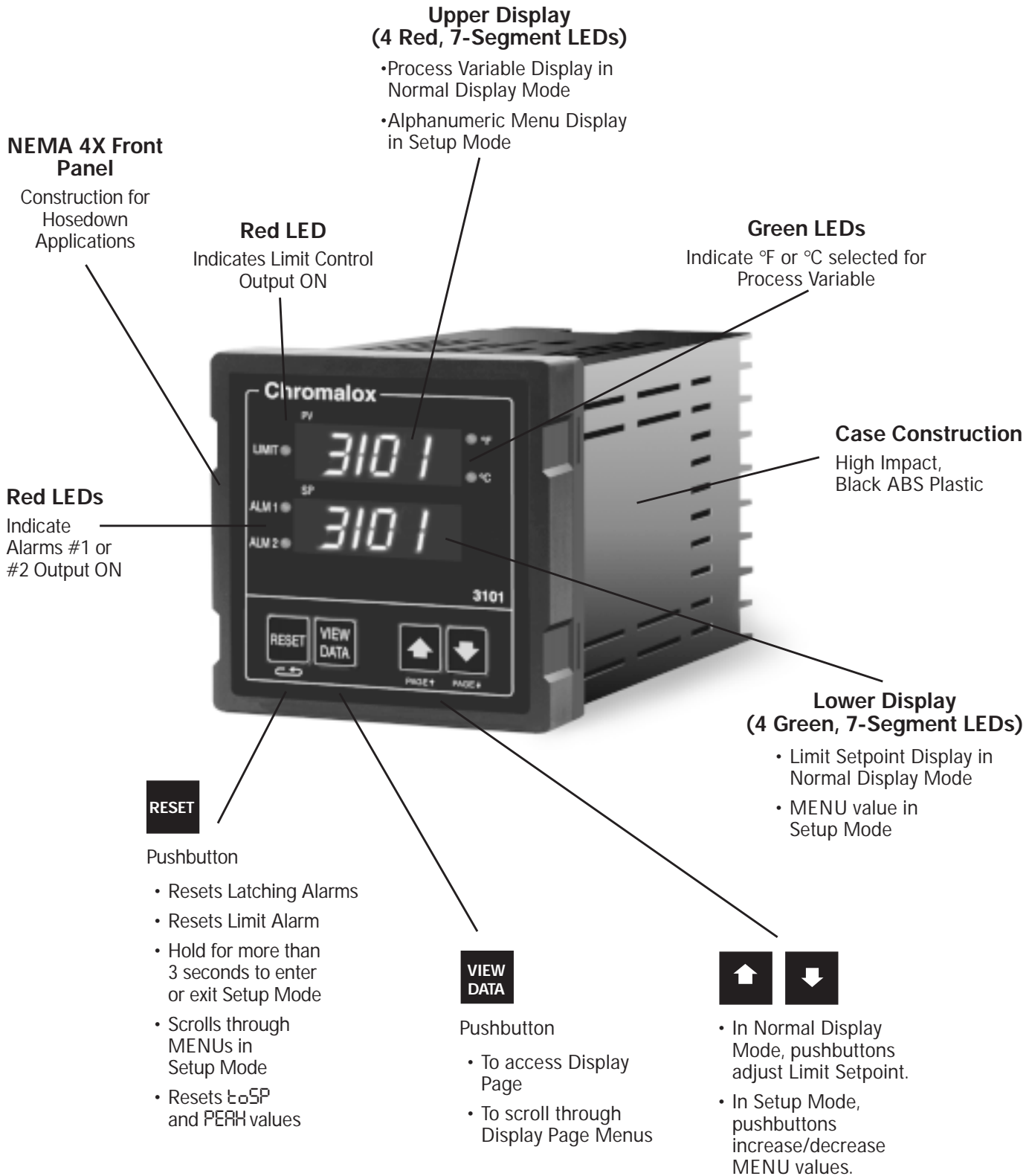


The 3101 is equipped with a timer to record the total process time over setpoint.

Features

- **Control Limit Output** can be programmed for high or low limit control (overtemperature or undertemperature).
- **Two Independent Alarm Outputs, Form C Relays**, can be used to warn of impending out-of-limit process conditions, providing protection for equipment and personnel.
- **Universal Sensor Input** accepts thermocouple, RTD or analog signals.
- **24 Vdc Output** for loop power.
- **Digital Input** available for remote alarm reset.
- **Analog Process Output** option for retransmission of process variable to a remote recorder, computer or other device.
- **Isolated Serial Digital Communications** (RS232, RS485/422) can be used to address from 1 up to 255 Chromalox controllers.
- **Security Code Protection** prevents unauthorized access to programmable control parameters.
- **Operating Ambient** up to 150°F
- **Three Year Warranty**

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Upper Display (4 Red, 7-Segment LEDs)

- Process Variable Display in Normal Display Mode
- Alphanumeric Menu Display in Setup Mode

NEMA 4X Front Panel

Construction for Hosedown Applications

Red LED

Indicates Limit Control Output ON

Green LEDs

Indicate °F or °C selected for Process Variable

Red LEDs

Indicate Alarms #1 or #2 Output ON

Case Construction

High Impact, Black ABS Plastic

Lower Display (4 Green, 7-Segment LEDs)

- Limit Setpoint Display in Normal Display Mode
- MENU value in Setup Mode

RESET

Pushbutton

- Resets Latching Alarms
- Resets Limit Alarm
- Hold for more than 3 seconds to enter or exit Setup Mode
- Scrolls through MENUs in Setup Mode
- Resets \pm SP and PERH values

VIEW DATA

Pushbutton

- To access Display Page
- To scroll through Display Page Menus



- In Normal Display Mode, pushbuttons adjust Limit Setpoint.
- In Setup Mode, pushbuttons increase/decrease MENU values.

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Specifications

Limit Output

Automatic Normally-energized latching relay; relay de-energizes at limit setpoint.
Form C contacts, 5 Amps at 120/230 Vac

Limit Control Adjustments

High/Low Limit Setpoint Sensor Range
Setpoint Limits Sensor Range
Deadband 0 to 100°F
Display Offset -100 to 100°F

Alarm Adjustments

Setpoints High and Low Settings for each Alarm Output
Alarm Types Absolute: High, Low and High/Low
Tracking: +Deviation, -Deviation and +/- Deviation
Relay Action Latching or Non-Latching, Energized or De-Energized
Alarm Deadband Adjustable, 0 to 100°F
Alarm Inhibit On Power-Up, Enabled or Disabled

Alarm Outputs

Relay Form C contacts, 5.0 Amps at 120/230 Vac (resistive)

Sensor Input Field selectable Thermocouple, RTD, Current or Voltage

Input Update Rate 2 Samples per Second

Readout Stability

J, K, E Thermocouple $\pm 1^\circ\text{F}/10^\circ\text{F}$ change in ambient temperature
T Thermocouple $\pm 2^\circ\text{F}/10^\circ\text{F}$ change in ambient temperature for sensor temperature $> -112^\circ\text{F}$
 $\pm 5^\circ\text{F}/10^\circ\text{F}$ change in ambient temperature for sensor temperature $< -112^\circ\text{F}$
R, S, B Thermocouple $\pm 2^\circ\text{F}/10^\circ\text{F}$ change in ambient temperature
RTD $\pm 5^\circ\text{F}/10^\circ\text{F}$ change in ambient temperature
4-20mA, 1-5Vdc $\pm 0.05\%$ of span / 10°F change in ambient temperature

Digital Input Accepts dry-contact closure

Input Specifications

	Range °F	Range °C	Accuracy @ 77°F ambient
J T/C	-100 to 1400	-73 to 760	$\pm 0.2\%$ of sensor span
K T/C	-300 to 2400	-184 to 1316	$\pm 0.2\%$ of sensor span
T T/C	-350 to 750	-212 to 399	$\pm 0.2\%$ of sensor span for PV $> -112^\circ\text{F}$ $\pm 0.4\%$ of sensor span for PV $< -112^\circ\text{F}$
E T/C	-100 to 1100	-73 to 593	$\pm 0.2\%$ of sensor span
R T/C	0 to 3200	-18 to 1760	$\pm 0.4\%$ of sensor span
S T/C	0 to 3200	-18 to 1760	$\pm 0.4\%$ of sensor span
B T/C	50 to 3300	10 to 1816	$\pm 0.4\%$ of sensor span for PV $< 1000^\circ\text{F}$
100 Ω Pt RTD ($\alpha = .00385$)	-200 to 1000	-128 to 538	$\pm 0.2\%$ of sensor span
4-20mA	-500 to 5000 (programmable)		$\pm 0.2\%$ of sensor span
0-5 Vdc	-500 to 5000 (programmable)		$\pm 0.2\%$ of sensor span
1-5 Vdc	-500 to 5000 (programmable)		$\pm 0.2\%$ of sensor span

Transmitter Power

+24 Vdc Output +24 Vdc $\pm 20\%$ at 50mA maximum

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Specifications (continued)

Analog Output (Optional)

Retransmit Function	Process Variable
Output Signal	4-20mA into 0-800 Ω load 1-5 Vdc into 100K Ω Selectable via DIP switch
Range	Programmable over selected sensor span for retransmission of Process Variable
Accuracy	$\pm 0.2\%$ of programmed span, ± 1 LSD

Digital Communications (Optional)

RS-232	Single-drop, isolated
RS-422/485	Multi-drop, isolated, field selectable by switch
Baud rates	1200, 2400, 4800, 9600, 19.2K
Protocols	ASCII Line, Computer Interface

Instrument Power	100 to 240 Vac, +10%, -15%; 50 to 60 Hz; 15 VA 12 to 24 Vac/Vdc, $\pm 20\%$ (optional); 15 VA
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Operating Environment	32 to 150°F (0 to 65°C) ambient temperature, relative humidity less than 95%, non-condensing
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Dimensions

Overall	3.78 x 3.78 x 4.75 inches (96 x 96 x 121 mm)
Depth Behind Projection	4.00 inches (102 mm)
Front Panel Projection	0.75 inches (19mm)

Case Material	High Impact, Black ABS Plastic
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Front Panel	NEMA 4X Construction
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Influence of Line Voltage

Variation	+0.1% of Sensor Span/10% change in nominal line voltage
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Noise Rejection

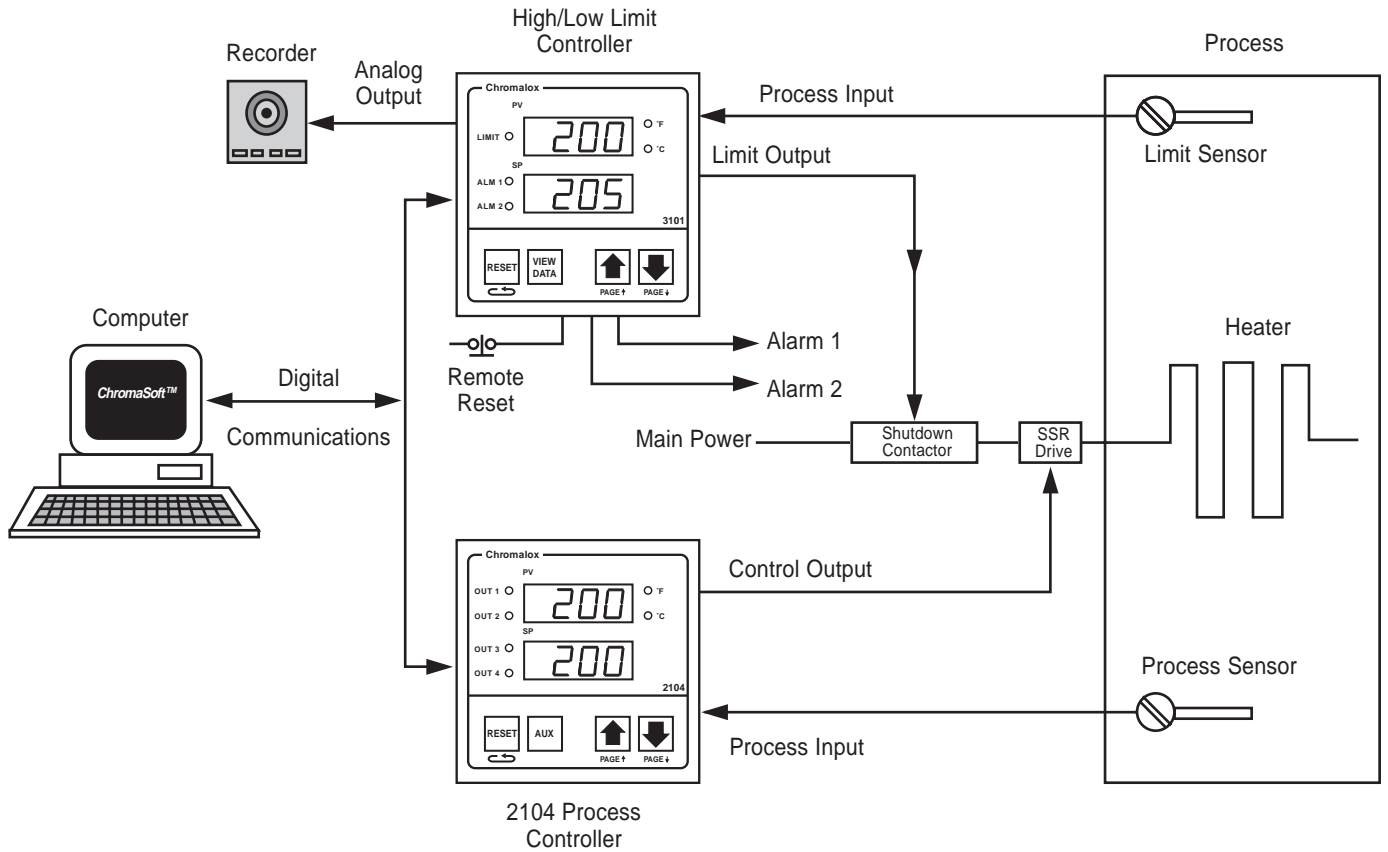
Common Mode Noise	140dB at 60 Hz
Series Mode Noise	+0.1% of Sensor Span with 300mV peak to peak, 50 or 60Hz series mode noise
RFI	Typically less than 0.5% of Sensor Span at distance of 1 meter (3.1 feet) from transmitter (4W, 464Mhz)

Sensor Leadwire Effect

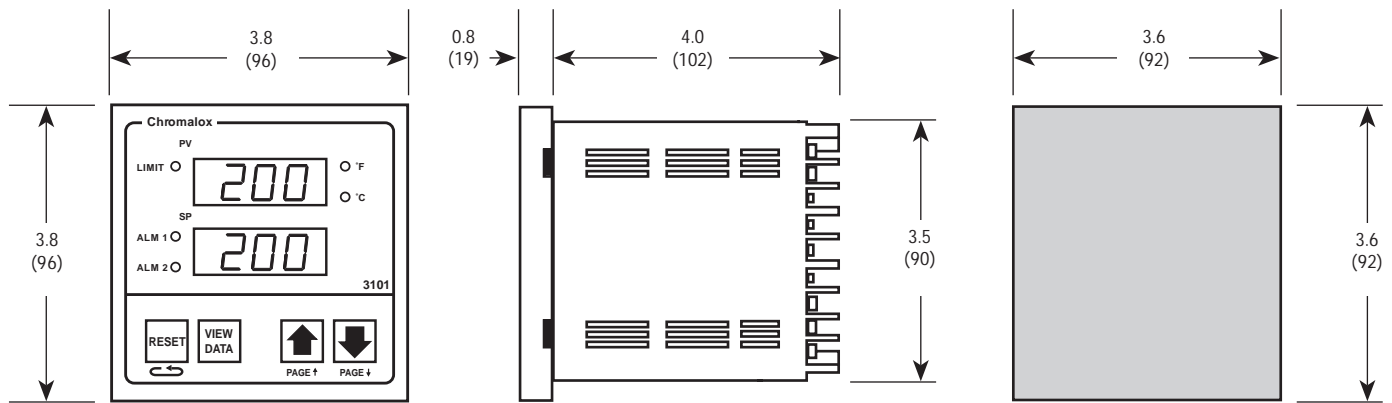
J Thermocouple	+1°F for 1000 Ft. of 18 AWG extension wire
K Thermocouple	+5°F for 1000 Ft. of 18 AWG extension wire
E Thermocouple	+4°F for 1000 Ft. of 18 AWG extension wire
R Thermocouple	+3°F for 1000 Ft. of 18 AWG extension wire
S Thermocouple	+3°F for 1000 Ft. of 18 AWG extension wire
B Thermocouple	+6°F for 1000 Ft. of 18 AWG extension wire
T Thermocouple	+1°F (temperature > -112°F) +2°F (temperature < -112°F)
RTD, 4-20mA, 1-5 Vdc	$\pm 0.1\%$ of Sensor Span/20 Ω balanced leadwire resistance

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Application



Dimensions



Measurements are shown in inches. Millimeters are shown in parentheses.

Panel Cutout

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Ordering Information

Model High/Low Limit Controller

3101 Microprocessor-based 1/4 DIN Programmable High/Low Limit Controller. Universal Sensor Input accepts Thermocouple, RTD, Current or Voltage Inputs, One Digital Input and One Alarm Output.

Code Limit Output #1

1 Relay-Form C Contact, 5A @ 120 or 230 Vac

Code Alarm #1 Output

1 Relay-Form C Contact, 5A @ 120 or 230 Vac

Code Analog Process Output Option

0 None

1 Field selectable 4-20mA or 1-5 Vdc

Code Digital Comm. and Alarm #2 Options

0 None

1 RS422/485 Digital Communications and Alarm #2 Relay-Form C Contact, 5A @ 120 or 230 Vac

2 RS232 Digital Communications and Alarm #2 Relay-Form C Contact, 5A @ 120 or 230 Vac

Code Power Supply

0 100-240 Vac

1 12-24 Vac or Vdc

3101 - 1 1 1 2 0 Typical Model Number

Accessories

ChromaSoft™ Remote Operator Interface Software.....	<u>Part Number</u> SOFT-12000
PC-Based Multidrop Software	