8000

Model 8003 1/8 DIN Temperature Controller

PDS 8003

- Dual 3-Digit Display of Process and Setpoint
- SMART Self-Tuning with Fuzzy Logic
- Heat/Cool Control Capability
- Soft Start Power Limiting on Power Up
- Universal Inputs TC, RTD
- Programmable Ramp on Set Point Changes
- Switching Power Supply from 100 to 240V, 50/60 Hz
- IEC 801-4 Noise Immunity
- 3-Year Warranty
- UL Pending

Description

The fully field configurable Chromalox model 8003 1/8 DIN controller combines advanced hardware design and sophisticated electronic control technology into a compact, reliable 1/8 DIN package.

Easy to Install and Operate

The 8003 plug-in design requires only panel cutout, instrument mounting, setpoint and alarm setpoint adjustment to set up.

SMART Self-Tuning

The model 8003 meets the application needs of operators with or without skills in temperature processes and PID control. You simply push the SMART pushbutton and the controller self-adjusts automatically and rapidly to all process changes - load changes, setpoint changes and more. Sophisticated control features include:

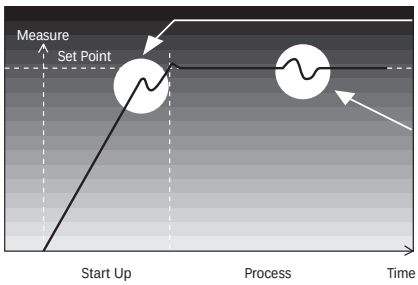
- Start-up and continuous in-process tuning
- Continuous self-tuning without artificial upset
- Proprietary control algorithm using fuzzy logic/artificial intelligence concepts
- Proven maximum suppression of overshoot

Special Control Features

- Programmable Ramp on Setpoint Changes to Allow Even Heating
- Heat/Cool Control Features Selection of Cooling Medium and Overlap
- Control Output "Turn-Off" Via Pushbuttons
- Soft Start-Timed Output Power Limit on Start-Up

Applications

- Polymerization and synthetic fibers plants
- Packaging and packing equipment
- Extrusion lines, coextrusion lines, plastic films and injection presses
- Rubber production plants
- Fermentation equipment, reactors for chemical and pharmaceutical industries
- Food industries
- Environmental chambers and refrigeration



During Start-Up

the SMART self-tuning function calculates the control parameters to optimize the rise to setpoint.

During Process

SMART updates the control parameters as needed to respond to setpoint changes or a load change

Chromalox®

Telephone: 615-793-3900 • FAX: 615-793-3563

EMERSON®

8003 Temperature Controller

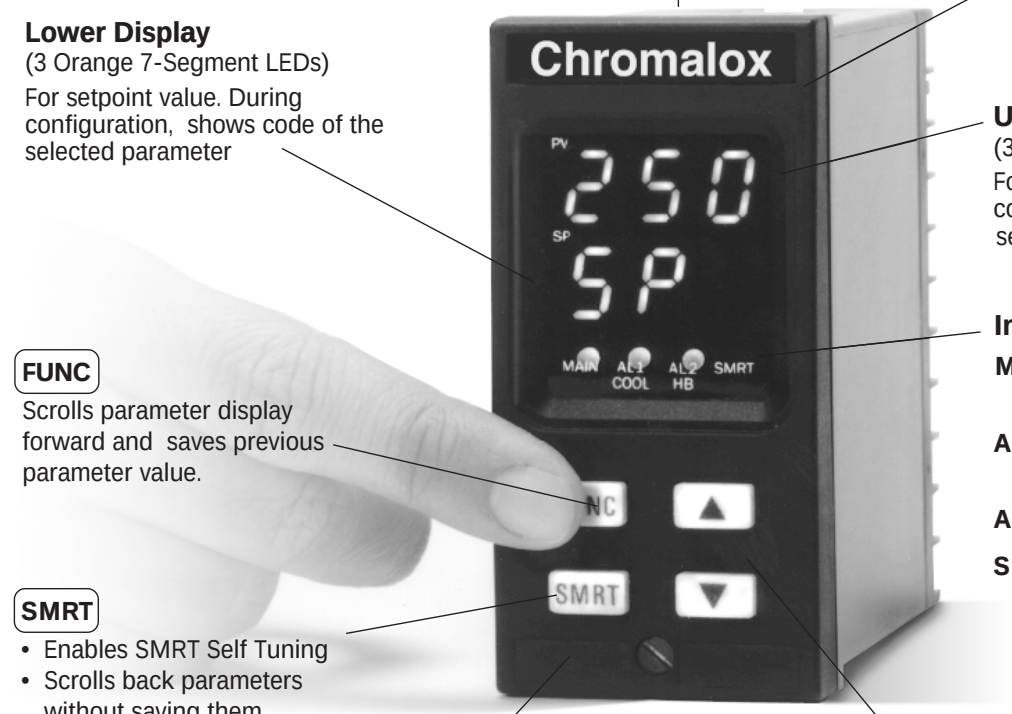
ISO 9001 Certified
Quality Construction and Reliability

Manufactured with SMT and verified with long burn-in times and temperature cycling, the 8003 is guaranteed for reliability and long, maintenance-free service.

IP54 Splashproof
Front Faceplate

Lower Display
(3 Orange 7-Segment LEDs)
For setpoint value. During configuration, shows code of the selected parameter

Upper Display
(3 Green 7-Segment LEDs)
For process temperature. During configuration, shows the selected parameter value.



Indicators Red LEDs

MAIN	Main Control Output is on
AL1/COOL	Cooling Output is on or Alarm 1 is on
AL2	Alarm 2 is on
SMRT	SMART tuning is active

FUNC
Scrolls parameter display forward and saves previous parameter value.

SMRT
- Enables SMRT Self Tuning
- Scrolls back parameters without saving them

Programming Security Levels

Access to programmed parameters is protected by 4 security levels:

Level 1	Setpoint and SMART self-tuning
Level 2	All control parameters and alarm setpoint with optional user defined security code
Level 3	Main configuration level
Level 4	Special functions configuration

Large Target Pushbuttons Simplify Operator Adjustments

- Decrease/Increase Parameter Values
- Press together to reinitiate default control parameters

Chromalox® • 1382 Heil Quaker Boulevard • Lavergne, Tennessee 37086 • Telephone: 615-793-3900 • FAX 615-793-3563

8003 Temperature Controller

Specifications

Control Modes	Field Selectable	On/Off PID SMART	
Control Adjustments	Control Set Point	Instrument sensor range	
	Deadband	0.1 to 10.0% of sensor input range	
	Proportional Band	1.0 to 99.9% of sensor input range	(1.5% to 99.9% if Heat/Cool control, 0.0% if On/Off control)
	Automatic Reset/Integral	1.2 seconds to 20 minutes	
	Rate/Derivative	0 to 9 minutes, 59 seconds	
	Output Cycle Time	1 to 200 seconds	
Heat/Cool Parameters	Relative Gain	0.20 to 1.00 (Air, Water or Oil)	
	Overlap	-20 to 50% of Proportional Band	

Outputs

Output #1	Heat Output	Jumper Selectable
	Relay	Normally open SPDT contact rated 3.0 Amps at 250 Vac (resistive load)
	SSR Drive	Transistor output of 24 Vdc max at 1 mA, 14Vdc +/- 20% at 20 mA. Maximum load 700 ohms protected against accidental short circuit
Output #2	Cool or Alarm Ouput	Jumper Selectable
	Relay	Normally open SPST contact rated 2.0 Amps at 250 Vac (resistive load)
	SSR Drive	Transistor output of 24 Vdc max at 1 mA, 14Vdc +/- 20% at 20 mA. Maximum load 700 ohms protected against accidental short circuit
Output #3 (option)	Alarm	Alarm Output
	Relay	Normally open SPST contact rated 2.0 Amps at 250 Vac (Resistive)

Alarm Features

Functions	Field Selectable	Process Alarm Deviation Alarm Band Alarm
Types	Field Selectable	High / Low for Process Alarms Outside / Inside for Band Alarms Inhibit on Power-Up or Setpoint Changes

Relay Action (programmable) ..... Normally energized, normally de-energized

Alarm Deadband ..... 0.1 to 10.0% of instrument sensor range

Input Specifications

Sensor Type		Range* ˚F	˚C	Accuracy
Thermocouple	J	0 to 999	0 to 800	±0.2% of span
	K	0 to 999	0 to 999	±0.2% of span
	L	0 to 999	0 to 800	±0.2% of span
	N	0 to 999	0 to 999	±0.2% of span
RTD	100 ohm Pt	-	-19.9 to 99.9	±0.2% of span
	100 ohm Pt	-199 to 999	-199 to 500	±0.2% of span

*Field Programmable for ˚C or ˚F

Line Impedance ..... 100 ohms maximum for thermocouple input. Less than 20 ohms per wire for RTD input

Input Sampling ..... 500 milliseconds typical

Instrument Power ..... 100 to 240 Vac, +10%, -15%, 50 to 60 Hz, 24 Vac/Vdc
5 VA nominal power consumption

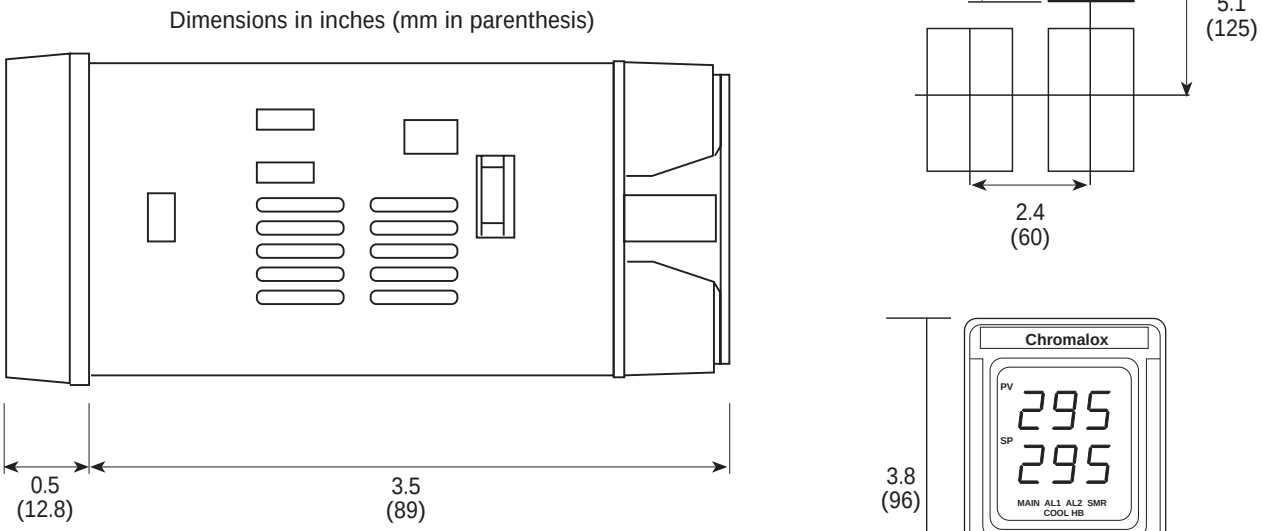
Operating Environment ..... 30 to 120˚F (0 to 50˚C) ambient temperature with relative humidity from 20% to 85% non-condensing

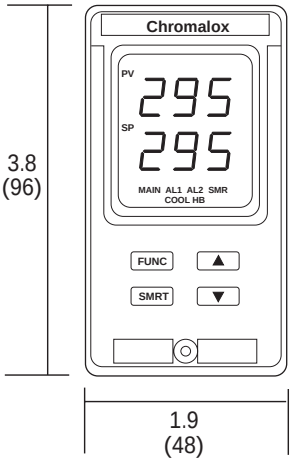
Physical Specifications ..... 1/8 DIN, 1.89 x 3.78 inches (48mm x 96mm), 3.5 inches deep (89mm)
Panel cutout 1.77 x 3.62 inches (45mm x 92mm), 0.7 lbs. (300 grams)

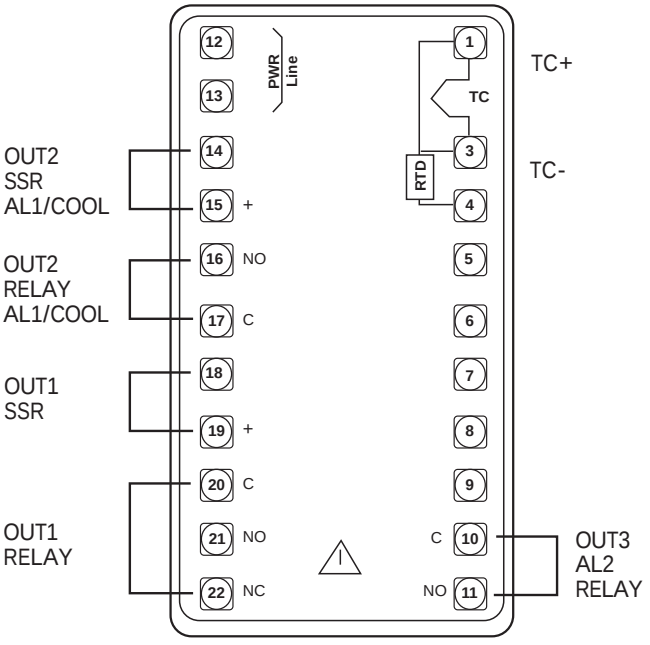
Chromalox® • 1382 Heil Quaker Boulevard • Lavergne, Tennessee 37086 • Telephone: 615-793-3900 • FAX 615-793-3563

8003 Temperature Controller

Dimensions



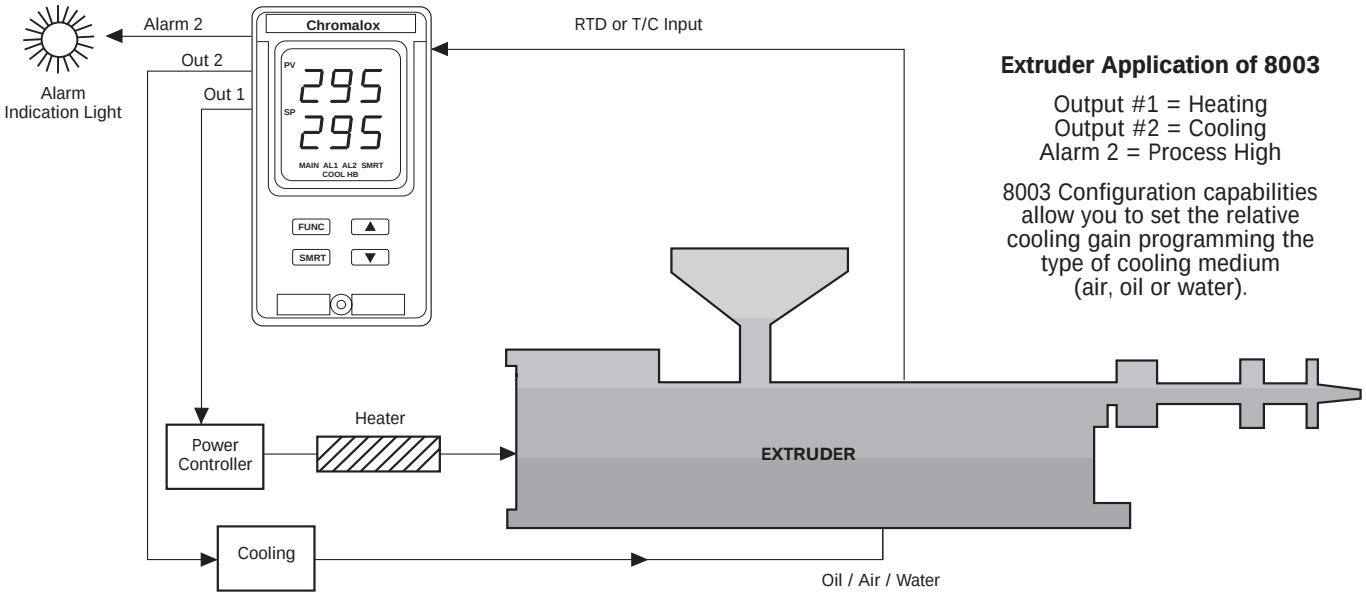




Rear Terminal Connections

8003 Temperature Controller

Applications



Extruder Application of 8003

Output #1 = Heating
Output #2 = Cooling
Alarm 2 = Process High

8003 Configuration capabilities allow you to set the relative cooling gain programming the type of cooling medium (air, oil or water).

Features

Output Disable Function

Simple front panel operation to turn off control output.

- Applications where it is desirable to disconnect load power during set-up
- Applications that require temperature monitoring only, no control needed

Programmable Advanced Alarm Functions for Each Alarm

- Alarm inhibit on power-up or setpoint change
- High, Low, Band or Deviation alarm modes
- Adjustable deadband
- Normally Energized/Normally De-Energized Relay Contacts

Soft Start on Power-Up

Allows you to program a “warm up period” to protect the process and avoid thermal shock on startup.

- Limits control output power 0 to 100%
- The limit is activated below a threshold setpoint temperature
- Program the soft start time interval 1 to 100 minutes or infinite

Control Output Maximum Rate of Change

Slows the output signal response when process demands change significantly, avoiding overshoot and undershoot.

- Control output rate of change may be set from 1% to 10% per second

Ramp on Setpoint Change

Prevents overshoot/undershoot of process temperature when setpoint is changed.

- Programmable Ramp 1-100˚/minute

8003 Temperature Controller

Ordering Information

Model **1/8 DIN Temperature Contoller**

8003 SMART Self-Tuning, 2 Outputs (Heat/Cool or Control/Alarm), Dual 3-Digit Display of Process and Setpoint, Field Selectable Universal Thermocouple, RTD, Programmable Alarms, IEC 801-4 Noise Immunity, IP54 Splashproof Faceplate.

Code **Output 1 - Heat or Cool**

1 SPDT Relay, 3 Amps at 250 Vac (Resistive) or SSR Drive, 14V @ 20mA, Jumper Selectable

Code **Output 2 - Cool or Alarm**

1 Relay, 2 Amps at 250 Vac (Resistive) or SSR Drive, 14V @ 20mA, Jumper Selectable

Code **Output 3 - Alarm**

0 None
1 Alarm #2, 2 Amps at 250 Vac (Resistive load)

Code **Power Supply**

3 100/240 Vac
5 24 Vac/dc

Code

0 Add to complete model number

8003	**-**	**1**	**1**	**1**	**3**	**0**	**Typical Model Number**