

1600

Model 1601 1/16 DIN Temperature Controller

- 3-Digit Display
- SMART Self-Tuning with Fuzzy Logic
- NEMA 4X Faceplate
- Soft Start Power Limiting on Power-Up
- Universal Inputs TC, RTD
- Switching Power Supply from 100 to 240V, 50/60 Hz
- IEC 801-4 Noise Immunity
- 3-Year Warranty
- CSA Pending



Chromalox[®]

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



Description

The fully field configurable Chromalox model 1601 1/16 DIN controller combines advanced hardware design and sophisticated electronic control technology into a compact, reliable 1/16 DIN package.

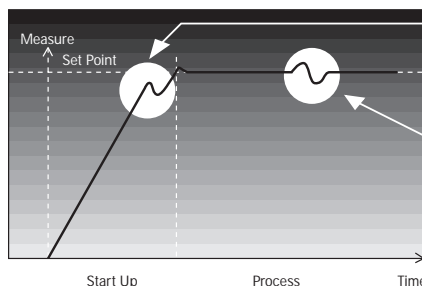
Easy to Install and Operate

The 1601 plug-in design requires only panel cutout, instrument mounting, setpoint and alarm setpoint adjustment to set up.

SMART Self-Tuning

The model 1601 meets the application needs of operators with or without skills in temperature processes and PID control. SMART self-tuning automatically adjusts the controller to rapidly respond to all process changes. 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



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.

Special Control Features

- Soft Start-Timed Output Power Limit on Start-Up
- Control Output "Turn Off" Via Pushbuttons
- Programmable offset of Process Temperature

Applications

- Rubber production, polymerization and synthetic fibers plants
- Packaging and packing equipment
- Fermentation equipment, reactors for chemical and pharmaceutical industries
- Food industries
- Environmental chambers and refrigeration

1601 Temperature Controller

ISO 9001 Certified

Quality Construction and Reliability

Manufactured with SMT and verified with long burn-in times and temperature cycling, the 1601 is guaranteed for reliability and long, maintenance-free service.

NEMA 4X

Front Faceplate

Display

(3 Green 7-Segment LEDs)

For process temperature and set points. During configuration, shows the programmed value of selected parameter.

Indicators

Red LEDs

ALM

Alarm condition exists

OUT

Load output is on

Indicators

Red LEDs

SP

Setpoint displayed

SMART

SMART tuning is active

Programming Security Levels

Access to programmed parameters is protected by 4 security levels:

- Level 1 Set point and SMART self-tuning
- Level 2 All control parameters and alarm setpoint
- Level 3 Main configuration level
- Level 4 Special functions configuration

Large Target Pushbuttons Simplify Operator Adjustments



Enables SMART self-tuning. During configuration, scrolls back parameters without storing them.



Decrease/Increase Parameter Values



Scrolls parameter display forward and stores previous parameter value.

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

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

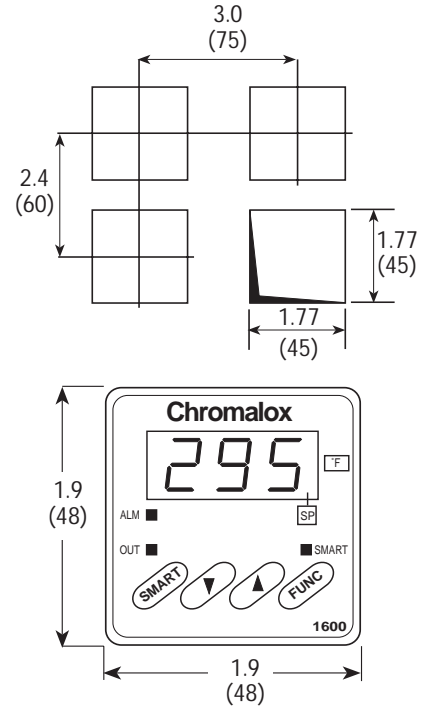
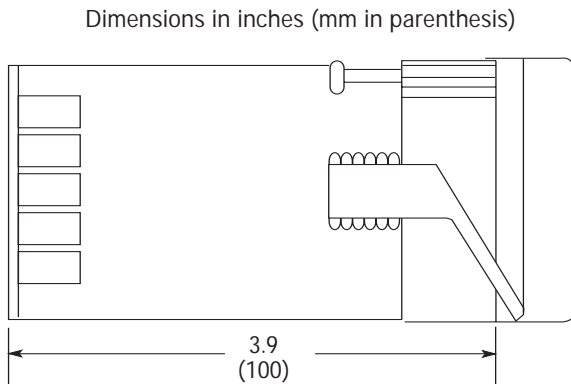
1601 Temperature Controller

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		
	Automatic Reset/Integral	1.2 seconds to 20 minutes		
	Rate/Derivative	0 to 9 minutes, 59 seconds		
	Output Cycle Time	1 to 200 seconds		
Outputs				
Output #1	One (1) Heat or Cool Output			
	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	Alarm Output			
	Relay	Normally open SPST contact rated 1.0 Amps at 250 Vac (resistive load)		
Alarm Features				
Alarm Functions	Field Selectable	Process Alarm Deviation Alarm Band Alarm		
Alarm Types	Field Selectable	High / Low for Process Alarm Outside / Inside for Band Alarm Inhibit on Power-Up and Set Point Changes		
Relay Action (Programmable)	Normally energized or normally de-energized			
Alarm Deadband	0.1 to 10.0% of instrument sensor range			
Input Specifications				
Sensor Type	Range*	Accuracy (@ 25°C)		
	°F	°C		
Thermocouple	J	0 to 999	0 to 800	±0.3% of sensor span
	K	0 to 999	0 to 999	±0.3% of sensor span
	L	0 to 999	0 to 800	±0.3% of sensor span
	N	0 to 999	0 to 999	±0.3% of sensor span
RTD	100 ohm Pt	-	-19.9 to 99.9	±0.3% of sensor span
	100 ohm Pt	-199 to 999	-199 to 500	±0.3% of sensor 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 or Vdc 5 VA nominal power consumption			
Operating Environment	30 to 130°F (0 to 55°C) ambient temperature with relative humidity from 20% to 85% non-condensing			
Physical Specifications	1/16 DIN, 1.89 x 1.89 inches (48mm x 48mm), 3.9 inches deep (100mm) Panel cutout 1.77 x 1.77 inches (45mm x 45mm), 0.5 lbs. (200 grams)			

1601 Temperature Controller

Dimensions



Ordering Information

Model 1/16 DIN Temperature Controller

1601 SMART Self-Tuning, 2 Outputs (Control/Alarm), 3-Digit Display, Field Selectable Universal Thermocouple or RTD Inputs, Programmable Alarms, IEC 801-4 Noise Immunity, NEMA 4X Faceplate.

Code Output 1 - Heat or Cool

- 1 Relay, 3 Amps at 250 Vac (Resistive)
- 6 SSR Drive, 14 Vdc at 20 mA

Code Output 2 - Alarm

- 1 Relay, 1 Amp at 250 Vac (Resistive Load)

Code

- 0 Add to Complete Model Number

Code Power Supply

- 3 100 to 240 Vac
- 5 24 Vac/dc

Code

- 0 Add to complete model number

1601 - 6 1 0 3 0 Typical Model Number