1601E
1/16 DIN Temperature Controller

- **Built-in Programming Port for Remote for OEM Fast Configuration**
- **Programming w/o Internal Hardware Switch**
- **SMART Self-Tuning with Fuzzy Logic**
- **Heat, Cool or Heat/Cool Control Capability**
- **Universal Inputs TC, RTD**
- **Soft Start Power Limiting on Power-Up**
- **Logic Input for Selection of SP1/SP2 or Timer Function**
- **3-Year Warranty**
- **NEMA 4, IP65 Front Face**

Applications

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

Description

The fully field configurable Chromalox model 1601E 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 1601E plug-in design requires only panel cutout, instrument mounting, setpoint adjustment to set up. Additional parameters are programmed via the front pushbuttons or via the Configuration Port.

Configuration Port

Each 1601E has a Configuration Port for remote set up of the controller. This feature allows the 1601E to be programmed from a PC without any connections for power.

Special Control Features

- Heat/Cool Control Features Selection of Cooling Medium and Overlap
- Soft Start-Timed Output Power Limit on Start-Up. Allows a “warm up period” to protect the process and avoid thermal shock on start up
- Control Output “Turn Off” Via Pushbuttons if used during setup or controller becomes a monitor
- Programmable offset of Process Temperature
- Digital Input: Starts timer function remotely or for SP1/SP2 Selection

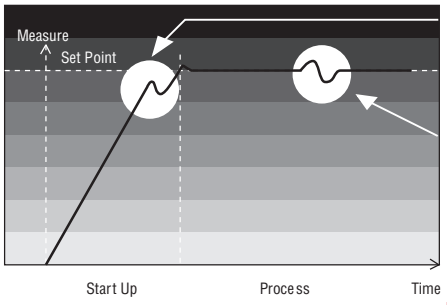
Timer Function

Select; Energy Saving, Cooking, Cooking with End of Cycle Output, Paint Mode, Power Off Mode. The digital input starts the timer function.

SMART Self-Tuning

The model 1601E 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
- 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 log change.

SINGLE CHANNEL

1601E
1/16 DIN Temperature Controller *(cont'd.)*

General Specifications

Front protection: IP 65 and NEMA 4X for indoor locations (when panel gasket is installed)
Dimensions: 1.9" (48mm) x 1.9" (48mm) x 4.13" (105mm) (DIN 43700)
Power supply: 100V to 240V AC 50/60Hz (-15% to + 10% of the nominal value); 24V AC/DC (±10% of the nominal value)
Accuracy: +– 0.3% f.s.v. +–1 digit @ 25˚C ambient
Common mode rejection ratio: 120 dB at 50/60Hz
Normal mode rejection ratio: 60 dB at 50/60Hz
Electromagnetic compatibility and safety requirements: CE directives 89/336/EEC, EN-50081-2 and EN-50082-2 directives 73/23/EEC and 93/68/EEC EN61010-1
Cold junction compensation error: 0.1 ˚C/˚C change in ambient
Temperature: from 0 to 50 ˚C
Storage temperature: from -20 to +85 ˚C
Humidity: from 20% to 85% RH, non condensing

Input Specifications

Thermocouples

Burn out: upscale on open input circuit detection (wires or sensor)
Cold junction: automatic compensation from 0 and 50˚C ambient
Cold junction compensation error: 0.1 ˚C/˚C change in ambient

TC	˚C	˚F
	1601E	1601E
L	0 / 900	0 / 1652
J	0 / 1000	0 / 1832
K	0 / 1370	0 / 2498
N	0 / 1400	0 / 2552
T	0 / 400	0 / 752

RTD

Type: 100Ω RTD, 3 wire
STANDARD RANGES TABLE:

RTD type	˚C	˚F
	1601E	1601E
PT 100	-200 / 800	-328 / 1472
3 wire	-199.9 / 400	——

Digital Input: Dry Contact, 300 ms to see change
Timer: 10 seconds to 90 minutes

Control Action

Algorithm: PID + SMART
Types: - one control output (heating)
- two control outputs (heating and cooling)
Output types: relay or SSR
Proportional band: from 1.0% (heating) or 1.5% (heating and cooling) to 100% of the input span
Hysteresis (dead band): (in On/Off control): from 0.1% to 10.0% of the input span
Integral time: from 1 second to 20 minutes
Derivative time: from 0 to 10 minutes
Integral preload: - one control output, from 0 to 100% of the output range
- two control outputs, from -100% to 100% of the output range
Heating cycle time: from 1 to 200 seconds
Cooling cycle time: from 1 to 200 seconds
Relative cooling gain: from 0.20 to 1.00
Overlap/dead band: from - 20% to 50% of PB

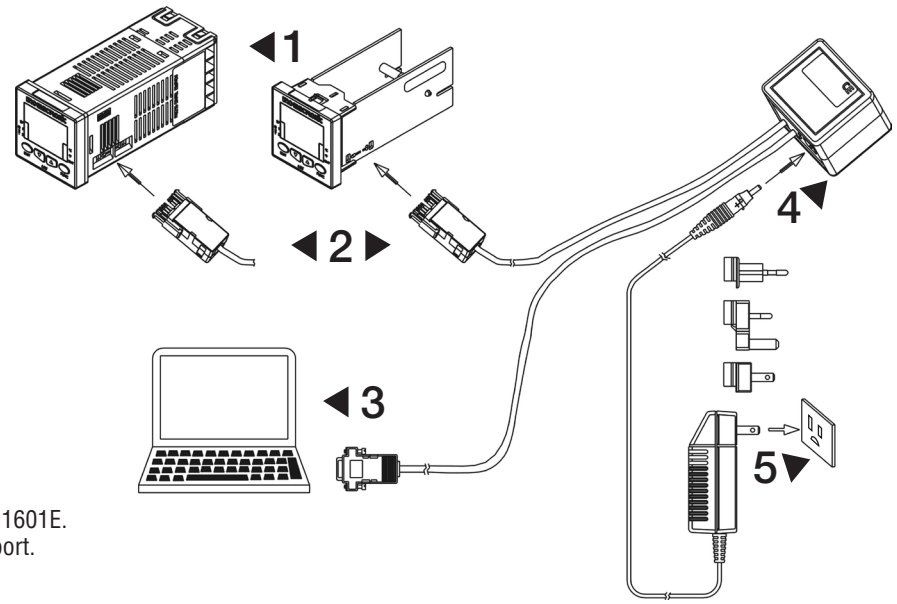
Outputs

Output 1 - Relay **Relay:** SPDT 3A @ 250VAC on resistive load
Output 1 - SSR Drive **Type:** nonisolated, 14VDC @ 20mA max. 24VDC @ 1mA
Output 2 & Output 3 Relay **Relay:** SPST 2A @ 250VAC on resistive load

Alarm

Action: direct or reverse (normally de-energized or normally energized)
Alarm function: field selectable
Process - High or Low, input range
Band Alarm - inside or outside, 0-500 units
Deviation Alarm - High or Low, -199 to 500 units
Reset: Automatic or Manual, Non-Latching or Latching
Inhibit: Enable or Disable, Inhibits on Power Up and Set Point changes
Hysteresis: 0.1 to 10.0% of input span

1601E
Configuration Port & Kit



The 1601E can be connected to the remote Configuration Kit, CNFG-10000. This method of configuration is ideal for OEM's for quick setup and for resellers to easily program a controller for the specific needs of a customer.

Setup is simple:

1. Remove the 1601E from the shipping box or from the case.
2. Snap the push pin connector into the side of the 1601E.
3. Connect the 9 pin connector to the PC's RS232 port.
4. Connect the Power Supply.
5. Download the setup.

The controller doesn't need power. WIRING is Not required. The configuration software can download all the parameters. Special setups can be saved for future downloads.

The Configuration Kit CNFG-10000 consists of the following:
- Configuration Software Windows Based CDROM
- Hardware Connection Assembly
- Power Supply with Standard Wall Plug

The Hardware Connection Assembly has a 9 Pin RS232 connector for hook up to a PC COM Port, a specially designed connector for connection to the 1601E Configuration Port and a connection for the power supply.

Ordering Information

Complete the model number using the matrix provided.

Model	1/16 DIN Temperature Controller
1601E	SMART Self-Tuning, Field Selectable Thermocouple or RTD Inputs, Nema 4X faceplate 4 digit single display

Code	Output 1 - Heat or Cool
1	Relay SPDT, 3A, 250VAC, resistive load
6	SSR drive, 14Vdc at 20mA

Code	Output 2 - Cool or Alarm
0	None
1	Relay SPST, 2A, 250VAC, resistive load

Code	Options
0	None
1	Alarm 2 Relay SPST, 2A 250VAC Resistance Load
2	Logic Input for Timer Function or Switch SP1/SP2

Code	Power Supply
3	100 - 240VAC
5	24 VAC or VDC

Code	
0	Add to complete part number

1601E -	1	1	1	3	0	Typical Model Number

Accessories

Part Number	PCN	Description
CNFG-10000	317614	Remote Configuration Kit
0149-01305	314448	Snubber

In Stock

Model	PCN
1601E-11030	317534
1601E-61030	317542

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