



2104

1/4 DIN Temperature and Process Controller

- Dual PID & Fuzzy Logic Control
- Control Loop Protection
- Five Outputs-Control, Alarm or Event
- Universal Sensor Inputs: TC, RTD, Voltage and Current
- Switching Power Supply 100-240 Vac or 12-24 Vac/Vdc, 50/60 Hz
- NEMA 4X Front Panel
- 16 Segment Ramp/Soak Program
- Digital Communications with ChromaSoft™ Compatibility
- Isolated 12 Vdc Power Supply Option
- Operating Ambient up to 150°F
- Three Year Warranty



Description

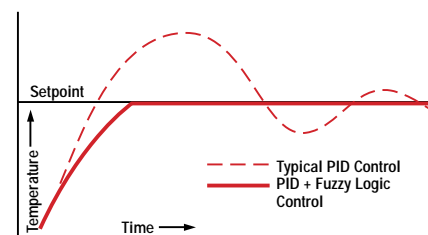
The Chromalox 2104 1/4 DIN Temperature and Process Controller is a low cost, high performance single loop controller that can be used for temperature, flow, pressure and level control applications. With universal sensor inputs and front panel operator setup, one 2104 controller can be easily field configured for a wide variety of applications, and simply reconfigured as application needs change. This makes it an exceptional choice for OEMs and distributors with multiple control needs, manufacturing facilities, testing facilities and testing applications.

Features

- Five (5) Possible Outputs for Single Output or Heat/Cool Control, plus up to three Alarm or Event Outputs.
- Universal Sensor Input accepts thermocouple, RTD or analog signals, provides 24 Vdc Output for loop power.
- Self-Tuning with Fuzzy Logic optimizes PID control and minimizes overshoot.
- Digital Input for remote switching of one of the following:
 - PID1/PID2
 - Remote/Local Setpoint
 - Main/Auxiliary Setpoint
 - Ramp/Soak Operation
 - Manual/Auto Control
 - Alarm Reset for Latching Alarms
- 16 Interval Ramp/Soak Program with guaranteed soak, 3 event outputs and looping.
- Programmable Analog Output and Remote Setpoint Input

- AUX Pushbutton and LED for front panel switching of:
 - PID1/PID2
 - Remote/Local Setpoint
 - Main/Auxiliary Setpoint
 - Ramp/Soak Operation
 - Manual/Auto Control
- Security Code Protection prevents unauthorized access.
- Setpoint Ramp Rate provides Soft Start at powerup, or on setpoint changes, to prevent uneven heating and overshoot.
- Control Loop Protection provides process protection from:
 - Open Sensor
 - Shorted Sensor
 - Sensor Reversed
 - Control Output Open or Shorted
 - Power Control Device Open or Shorted
 - Load Power Missing and Self Diagnostics.

Self-Tuning with Fuzzy Logic



2104 Controller (cont'd.)

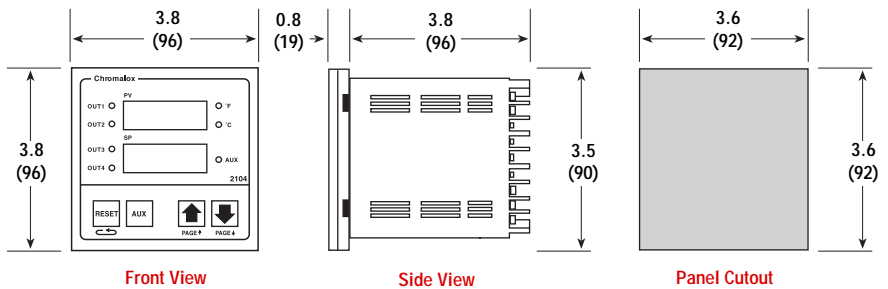
Specifications

Control Modes	Automatic On/Off, Proportional (P), PID, PID + Fuzzy Logic, Heat/Cool																																							
Control Adjustments	Control Setpoint Sensor Range Setpoint Limits Sensor Range Deadband 1-100°F Proportional Band Sensor Range Manual Reset -99.9 to +99.9 Automatic Reset 0-99.99 repeats/min. Rate 0-500 sec. Output Cycle Time 0.0-60.0 sec. Output Limit 0-100% Open Sensor/Out of Range Output ... 0-100% Display Offset -100 to +100°F																																							
Heat/Cool Adjustments	Output Offsets 0-100% Prop. Band Cooling Medium Air, Water or Oil																																							
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, 0-100°F																																							
Control/Alarm Outputs	Total of five (5) Control/Alarm outputs possible Relay Relay-Form A contacts, 1 Amp at 120/230 Vac (resistive load) Solid State Relay Drive 24 Vdc nominal at 40 mA Triac 1 Amp continuous, 10 Amp in-rush, at 120 or 230 Vac Current/Voltage 4-20 mA into 0-800Ω, field changeable to 1-5 Vdc																																							
Output #5 (Optional)	Relay-NO. Form C contact, 5A at 120 or 2.5A at 230 Vac																																							
Sensor Input Specifications	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 20%; text-align: center;">Range °F</th> <th style="width: 20%; text-align: center;">Range °C</th> </tr> </thead> <tbody> <tr><td>J T/C</td><td style="text-align: center;">-100 to +1400</td><td style="text-align: center;">-73 to +760</td></tr> <tr><td>K T/C</td><td style="text-align: center;">-300 to +2400</td><td style="text-align: center;">-184 to +1316</td></tr> <tr><td>T T/C</td><td style="text-align: center;">-350 to +750</td><td style="text-align: center;">-212 to +399</td></tr> <tr><td>E T/C</td><td style="text-align: center;">-100 to +1100</td><td style="text-align: center;">-73 to +593</td></tr> <tr><td>R T/C</td><td style="text-align: center;">0-3200</td><td style="text-align: center;">-18 to +1760</td></tr> <tr><td>S T/C</td><td style="text-align: center;">0-3200</td><td style="text-align: center;">-18 to +1760</td></tr> <tr><td>B T/C</td><td style="text-align: center;">50-3300</td><td style="text-align: center;">10-1816</td></tr> <tr><td>100Ω Pt RTD (α = 0.00385)</td><td style="text-align: center;">-200 to +1000</td><td style="text-align: center;">-128 to +538</td></tr> <tr><td>RTD (0.1° res.)</td><td style="text-align: center;">-99.9 to +899.9</td><td style="text-align: center;">-73.3 to +482.2</td></tr> <tr><td>4-20mA</td><td style="text-align: center;">-500 to +5000 (programmable)</td><td></td></tr> <tr><td>0-5 Vdc</td><td style="text-align: center;">-500 to +5000 (programmable)</td><td></td></tr> <tr><td>1-5 Vdc</td><td style="text-align: center;">-500 to +5000 (programmable)</td><td></td></tr> </tbody> </table>		Range °F	Range °C	J T/C	-100 to +1400	-73 to +760	K T/C	-300 to +2400	-184 to +1316	T T/C	-350 to +750	-212 to +399	E T/C	-100 to +1100	-73 to +593	R T/C	0-3200	-18 to +1760	S T/C	0-3200	-18 to +1760	B T/C	50-3300	10-1816	100Ω Pt RTD (α = 0.00385)	-200 to +1000	-128 to +538	RTD (0.1° res.)	-99.9 to +899.9	-73.3 to +482.2	4-20mA	-500 to +5000 (programmable)		0-5 Vdc	-500 to +5000 (programmable)		1-5 Vdc	-500 to +5000 (programmable)	
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Ramp/Soak Programming	Intervals 16 intervals Loops 1 loop, 0-255 times or continuous Event Outputs Up to 3 Guaranteed Soak Differential Off, 1°F to sensor span Time Units Seconds, Minutes, Hours (1 second to 99.99 hours/segment)																																							
Remote Setpoint Input	Input Signal 4-20 mA or 1-5 Vdc, Field Selectable																																							
Digital Input	Accepts dry-contact closure																																							
Analog Output Option	Assignable Functions Process Variable Output #1 Command Active Setpoint Output #2 Command Output Signal 4-20 mA into 0-800Ω load, 1-5 Vdc into 100KΩ or greater load Selectable via DIP switch Range Programmable for retransmission of Process Variable and Active Setpoint																																							
Isolated DC Power Supply Option	12 Vdc, 50mA Max																																							
Digital Communications (Optional)	RS-232 Single drop, isolated RS-422/485 Multi-drop, isolated, field selectable by switch Baud Rates 1200, 2400, 4800, 9600, 19200 Protocols ASCII Line, Computer Interface																																							
Instrument Power	100-240 Vac, +10%, -15%; 12-24 Vac/Vdc, ± 10%; 50-60 Hz																																							
Operating Environment	32-150°F (0-65°C) ambient temperature, relative humidity < 95%, non-condensing																																							

2104

1/4 DIN Temperature and Process Controller *(cont'd.)*

Dimensions



All Dimensions in Inches (mm)

Ordering Information

Complete the Model Number using the Matrix provided.

In Stock:

Model	PCN
2104-R0000	306510
2104-R0100	306528
2104-R0110	307045
2104-R0120	307053
2104-R0010	306536
2104-R0130	306595
2104-R0150	307192
2104-R0101	307168
2104-T0000	306552
2104-T0100	306560
2104-A0000	306579
2104-A0100	306587
2104-A0130	306608
2104-A0140	307150
2104-RR000	307176
2104-RR100	306616
2104-TT100	306544
2104-TT150	307205
2104-AR100	307061
2104-ST110	307184

In Stock:

Model	PCN
2104 Output Cards	
0149-27106 Relay (SSR)	306624
0149-27105 Triac	306632
0149-27100 Analog(4-20ma)single	306640
0149-27097 Relay/Relay	306659
0149-27099 Triac/Triac	306667
0149-27098 SSR/SSR	306675
0149-27103 Analog/Relay	306683
0149-27104 Analog/Triac	306691
0149-27101 SSR/Relay	306704
0149-27102 SSR/Triac	306712

Model Temperature and Process Controller

2104 Microprocessor-based 1/4 DIN Temperature Controller. Universal Sensor Input accepts Thermocouple, RTD, Current or Voltage Inputs with 24 Vdc Transmitter Power Supply. PID, ON/OFF and Fuzzy Logic Control Capability. One Digital Input, Analog Remote Setpoint, and 16 Segment Ramp/Soak Program.

Code Output #1 - Single Output Control

RO	Relay/SSR Drive (jumper selectable) Relay-NO. Form A Contact, 1A at 120 or 230 Vac SSR Drive-24 Vdc at 40 mA
TO	Triac-1 Amp at 120 or 230 Vac
AO	Analog-4-20 mA or 1-5 Vdc, non-isolated

Outputs #1 & #2 - Heat/Cool Control

RR	Relay/Relay
TT	Triac/Triac
AA	Analog/Analog
SS	SSR Drive/SSR Drive
AR	Analog/Relay
AT	Analog/Triac
SR	SSR Drive/Relay
ST	SSR Drive/Triac

Code Outputs #3 & #4 or Power Supply Option

0	None
1	Dual Relay-Form A contact, 1A at 120 or 230 Vac with shared common terminal
7	Isolated Power Supply 12 Vdc, 50mA

Code Isolated Digital Communications, Output #5 (Alarm/Event Output) and Analog Output Option

0	None
1	RS-422/485 Digital Communications and Output #5
2	RS-232 Digital Communications and Output #5
3	Analog Output Option
4	RS-422/485 Digital Communications, Output #5 and Analog Output Option
5	RS-232 Digital Communications with Output #5, and Analog Output Option

Code Power Supply

0	100-240 Vac
1	12-24 Vac/Vdc

2104 - RO 1 1 0 Typical Model Number