



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
- 16 Segment Ramp/Soak Program
- Digital Communications with ChromaSoft™ SpecView® Software Compatibility
- Isolated 12Vdc Power Supply Option
- Operating Ambient up to 150°F
- Three Year Warranty



Description

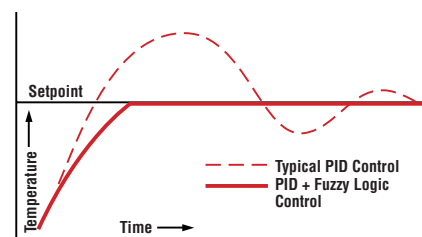
The Chromalox 2104 1/4 DIN Temperature and Process Controller is a low cost, high performance single loop controller that can be used for temperature, flow, pressure and level control applications. With universal sensor inputs and front panel operator setup, one 2104 controller can be easily field configured 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 24Vdc 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

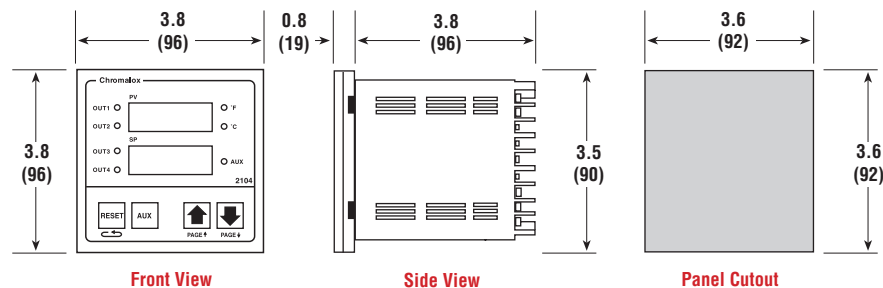
Control Modes	Automatic	On/Off, Proportional (P), PID, PID + Fuzzy Logic, Heat/Cool
Control Adjustments	Control Setpoint	Sensor Range
	Setpoint Limits	Sensor Range
	Deadband	1-100°F
	Proportional Band	Sensor Range
	Manual Reset	-99.9 to +99.9
	Automatic Reset	0-99.99 repeats/min.
	Rate	0-500 sec.
	Output 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	24Vdc nominal at 40mA
	Triac	1 Amp continuous, 10 Amp in-rush, at 120 or 230 Vac
	Current/Voltage	4-20mA into 0-800Ω, field changeable to 1-5Vdc
Output #5 (Optional)	Relay-NO. Form C contact, 5A at 120 or 2.5A at 230 Vac	
Sensor Input Specifications		
		<u>Range °F</u>
	J T/C	-100 to +1400
	K T/C	-300 to +2400
	T T/C	-350 to +750
	E T/C	-100 to +1100
	R T/C	0-3200
	S T/C	0-3200
	B T/C	50-3300
	100Ω Pt RTD (a = 0.00385)	-200 to +1000
	RTD (0.1° res.)	-99.9 to +899.9
	4-20mA	-500 to +5000 (programmable)
	0-5 Vdc	-500 to +5000 (programmable)
	1-5 Vdc	-500 to +5000 (programmable)
		<u>Range °C</u>
	J T/C	-73 to +760
	K T/C	-184 to +1316
	T T/C	-212 to +399
	E T/C	-73 to +593
	R T/C	-18 to +1760
	S T/C	-18 to +1760
	B T/C	10-1816
	100Ω Pt RTD (a = 0.00385)	-128 to +538
	RTD (0.1° res.)	-73.3 to +482.2
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	4-20mA or 1-5Vdc, 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	4-20mA into 0-800Ω load, 1-5Vdc into 100KΩ or greater load
	Selectable via DIP switch
	Range	Programmable for retransmission of Process Variable and Active Setpoint
Isolated DC Power Supply Option	12Vdc, 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, 15vA	
Operating Environment	32-150°F (0-65°C) ambient temperature, relative humidity < 95%, non-condensing	

SINGLE CHANNEL

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 24Vdc 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-24Vdc at 40mA
- TO** Triac-1 Amp at 120 or 230 Vac
- AO** Analog-4-20mA 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 12Vdc, 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