

PID Controllers

Temperature and Process Controls

T2000P



- 1/16 DIN
- NEMA 4X
- Programable Process controller
- Autotune automatically sets PID parameters
- Multiple ramp/soak: Upto 31 programs, 126 segments
- Inputs: Thermocouple, RTD, Analog (0-20mA, 0-5VDC, 0-10VDC)
- Outputs: SSR voltage pulse, relay, Analog (0-20mA, 0-5VDC, 0-10VDC)
- 3rd relay output standard
- RS232 or RS485
- MODBUS RTU protocol
- Three year warranty

Product Description

Programmable profiling temperature and process controller. Easy to view dual 4 digit display readout. Constructed in a rugged NEMA4X waterproof housing (front panel only) in the popular 1/16 DIN size. Various inputs from temperature sensors to analog process inputs and various combinations of outputs including analog outputs and a 3rd relay output standard.

Ordering Key T2016P2 SR R X T 2 XX

Model _____
 Output _____
 3rd output _____
 Not Used _____
 Input _____
 Communication _____
 Not Used _____

Type Selection

Type Selection

Model	Outputs	3rd Output	Not used	Input	Communication	Not use
T2016P2	SR: 6VDC pulse & 2A relay output RR: 2 - 2A relay outputs SS: 2 - 6VDC pulse outputs CR: 4-20mA & 2A relay output CS: 4-20mA & 6VDC pulse output LR: 0-5VDC & 2A relay output LS: 0-5VDC & 6VDC pulse output HR: 0-10VDC & 2A relay output HS: 0-10VDC & 6VDC pulse output	R: 2A relay output	X: not used	T: TC-B,E,J,K,L,N,R,S,T & RTD C: 4-20mA input L: 0-5VDC input H: 0-10VDC input	X: None 2: RS232 4: RS485	XX: not used

General Specifications

Power supply	100-240VAC +/- 10%, 50-60Hz
Display	
Upper display reading	4 digit high brightness green LED 10mm high
Lower display	4 digit high brightness red LED 9mm high
Output indicators	LED output indicators – flashing SP1 square green LED output indicators – SP2 round red
Keypad	3 full travel elastomeric pushbuttons
Approvals	UL, CUL, CE

Input Specifications

Thermocouple	
B	32 to 3275°F (0 to 1800°C)
E	32 to 1112°F (0 to 600°C)
J	32 to 1472°F (0 to 800°C)
K	-58 to 2192°F (-50 to 1200°C)
L	32 to 1472°F (0 to 800°C)
N	-58 to 2192°F (-50 to 1200°C)
R	32 to 2912°F (0 to 1600°C)

Input Specifications (cont'd)

Thermocouple (cont'd)	
S	32 to 2912°F (0 to 1600°C)
T	-273 to 482°F (-200 to 250°C)
Standards	IPTS/68/DIN 43710
CJC rejection	20:1 (0.05%°C) typical
External resistance	100W maximum
(RTD)	
Pt100/RTD (2 or 3 wire)	-273 to 752°F (-200 to 400°C)
Standards	DIN 43760 (100W 0°C/138.5W 100°C Pt)
Bulb current	0.2 mA maximum
Analog process input	0 to 50mV, +/- 0.1% 0-20mA, 4-20mA, +/- 0.1% 0-5V, +/- 0.1%, 0-10V, +/-0.1%

Specifications for Both Thermocouples and RTDs

Calibration accuracy	+/- 0.25% maximum +/- 1°C
Sampling frequency	Input 10Hz, CJC 2 sec.
Common mode rejection	Negligible effect up to 140db, 240V, 50-60Hz
Series mode rejection	60db, 50-60Hz
Temperature coefficient	150ppm/(C maximum)
Reference conditions	22C +/- 2°C, rated voltage after 15 minutes settling time

Output Devices (maximum of two outputs)

SSd (solid state relay driver)	6 VDC, 20mA non-isolated
Relay	Form A SPST, 2A/250VAC resistive load
Analog Output	4-20mA 500Ω max +/- 0.1% full scale typical 0-5Vdc 10mA (500Ω min) +/- 0.1% full scale typical 0-10Vdc 10mA (1KΩ min) +/- 0.1% full scale typical

Housing Specifications

Environmental

Safety	UL873, EN61010, CSA 22.2 No. 1010.1-92
Humidity	Maximum 95%
Altitude	Up to 2000m

Housing Specifications (cont'd)

Installations	Categories II and III
Pollution	Degree II
Protection	NEMA 4X (IP66)
EMC emission	EN50081-1, FCC Rules 15 subpart J Class A
EMC immunity	EN50082-2
Ambient	32 to 122°F (0 to 50°C)
Moldings	Flame retardant polycarbonate
Instrument body	
Model T2016P2	1.76 x 1.76" (44.8 x 44.8mm)
Overall length	4.57" (116mm)
Weight	
T2016P2	6.4 ounces
Dimensions (front fascia)	
Model T2016P2	2.0 x 2.0" (51 x 51mm)
	includes gasket
Sleeve length	4.2" (106.7mm)
	includes gasket

Programmer Functionality

- Up to 31 programs (profiles)
 - Up to 126 segments
 - Unlimited use of event outputs via the 2nd and 3rd outputs
 - Copy/Paste/Edit/Delete functions to simplify program building
 - Call another program as a sub-program segment
 - Up to 999 program loop cycles, or continuous loop cycling
 - Hold back function, to ensure the next segment is not started until the last segment reaches the set-point
 - 3 power fall recovery options, (Hold, Continue or Reset)
 - Front panel interrogation of the program position
 - Memory usage Indication during programming.
- (note: program capacity is a memory function and different types of segment use more/less memory).

Memory Allocation Table

Function	Memory Usage
Ramp	4 Bytes
Ramp with Holdback	5 Bytes
Soak	2 Bytes
Step	3 Bytes
Loops (1 -3)	1 Byte
Loop (4+)	2 Bytes
Call	1 Byte
Event Output	1 Byte
Program Header	1 Byte

Examples

Max. capacity; 351 Bytes, 126 segments per program, 31 programs

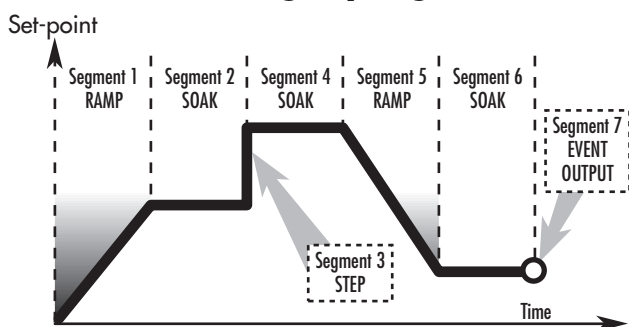
Example 1

(349 Bytes) One program of 116 segments (58 ramps, 58 soaks)

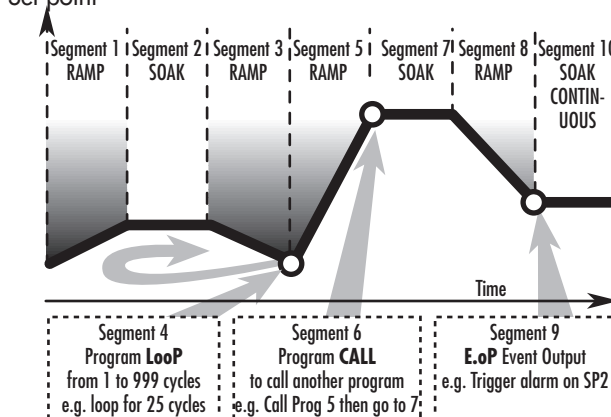
Example 2

(340 Bytes) 4 programs of 28 segments (14 ramps, 14 soaks)

Profile of a single program

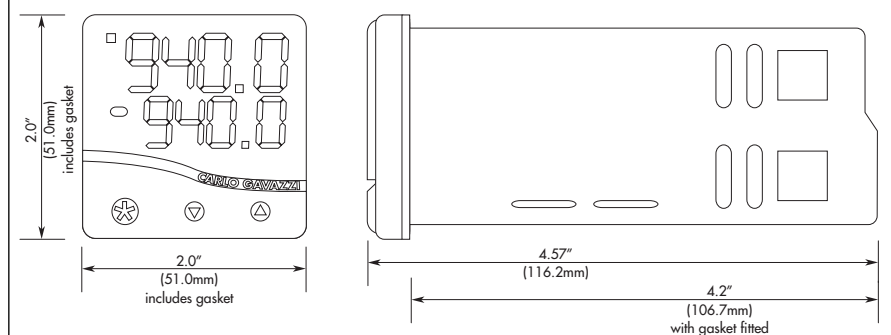


Set-point



Dimensions

T2016P Series



Wiring Diagram

T2016P Series

