



MICROPROCESSOR BASED MINIATURE CONTROLLERS

PID PROFILE CONTROLLER

MODEL A4446



A4446
PID PROFILE CONTROLLER

DESCRIPTION

The Model A4446 Autotune PID profile Controller is available for a variety of industrial inputs and generates a control output with a PID control algorithm. The PID values can be entered manually or by autotuning. The four ramp and four soak facility can be used in profile control.

The process value is conditioned and read by a microcontroller. The microcontroller computes the error between the set value and the (actual) process value, The rate at which the process is approaching the set value and the Integral of the error. All these values are multiplied by the Proportional, Derivative and Integral constants respectively and summed up to generate the control output. The duty cycle of the output is varied depending on the output power required.

The second output can be configured as an alarm with special functions or as a manual / automatic soak timer or as a cooling control with off time delay for compressor applications. All parameters are protected by password protection and keypad lockout. The non volatile memory is used to store all parameters. The (optional) RS232 link can be used to program the controller remotely from a PC. Or alternately it can be used to in a DCS system.

SALIENT FEATURES

- AUTOTUNE PID PROFILE CONTROLLER
- FOUR RAMP FOUR SOAK FUNCTION
- CONTROLLER AND TIMER OUTPUTS
- SEPARATE PV & SV INDICATION
- HEAT / COOL WITH OFF DELAY
- DELAYED ON / OFF, OR PULSED TIMER
- PROGRAMMABLE SIGNAL FILTER
- WATCHDOG PROTECTION
- PASSWORD PROTECTION & KEY LOCKOUT
- KEYPAD ZERO & SPAN CALIBRATION
- NON VOLATILE MEMORY
- 12 V PULSE / E M RELAY OUTPUTS

APPLICATIONS

The A4446 Autotune PID profile process controller is used to control Industrial process parameters like temperature, pressure, level etc.

The controller is used to control the Temperature of heat treatment furnaces, ovens oil fired boilers etc. very precisely and in a controlled fashion. It can also be used for other engineering processes like Pressure and Level with suitable conditioners.

The 4 Ramp and 4 Soak facility can be used for nitriding annealing, hardening, tempering and in stress relief applications in metallurgy. It is also useful in hydrogenation. The two outputs can be used where heating and cooling (Compressor/Blower) control is used as in thermal test chambers. The Cooler dead band, off-time delay and upper limit protects the compressor. The second output can also be used as an alarm with a variety of special functions like latch, latch-hold and hold. It can be reset from the keypad. The second output can also be used as a Timer with a variety of triggering options and output actions. The combination of a temperature controller and a timer in the same enclosure, is useful in the plastic processing industry.

SPECIFICATIONS :

DIMENSIONAL DETAILS :

INPUT

Input sources (specify)

T/C, RTD, mV or mA

Operating & setpoint range

As per table

Input sampling time

20 mS (50 samples / sec)

Ambient temp. effect

Automatic CJC for T/Cs

Sensor linearisation

Multisegment computation

RTD input types

2, 3 or 4 wire sensor

Lead wire compensation

Automatic for 3 / 4 wire RTD

Digital signal filtering

Selectable time constants

Zero & span calibration

Keypad programmable

CONTROL & OUTPUT 1

Control configuration mode

PID control only

Control functions

Autotune / Ramp1-4 & Soak 1-4

Main control output modes

Heat / Cool

Output control action

Forward / Reverse

Proportional band

0001 - 9999 PV units

Integral time limits

0 - 1000 seconds

Derivative time limits

0 - 1000 seconds

Cycle time

0.0 - 100.0 seconds

OUTPUT 2

Auxiliary O/P configuration

Cooler / Alarm / Timer mode

Cooler off - time delay

0 - 300 seconds

Cooler dead band range

-1999 to +1000 PV units

Alarm output options

High, Low & Deviation

Alarm special functions

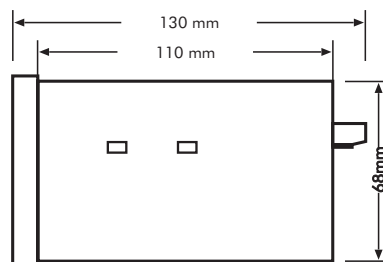
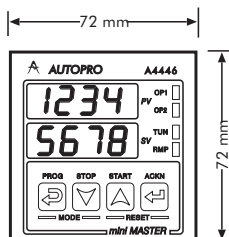
Latched / Hold / Hold & latched

Timer modes

Delayed On / Off / Pulsed

Timer setpoint range

0 - 999.9 minutes



Enclosure : T72 (Panel mounting) Cutout : 68 X 68 mm

INDICATION

PV & SV display

Separate 4 digit 10.2 mm LED

Status indication

O/P1, O/P2, Tune & Ramp

SETUP & SECURITY

Setup memory

Non-volatile EEPROM

Setpoint security

Keypad lockout

System security

Watchdog protection

Programme security

User-set password protection

Sensor fail output state

Programmable On or Off

COMMUNICATION (optional)

Serial communication standard

RS232 or RS485 option

Baud rate selection

1K2 / 2K4 / 4K8 / 9K6 / 19K2 baud

Serial transmission delay

1 to 9999 seconds

Data acquisition & logging

On PC by serial link

GENERAL

Power supply *

230 V AC \pm 10 % 50 Hz

Power consumption

4 VA (nom.)

Operating temp.

05 $^{\circ}$ - 50 $^{\circ}$ C Ambient

Terminals

Suitable for 1.5 mm² wire

Enclosure

T72 : 72 (H) x 72 (W) x 125 (D) mm

ORDERING INFORMATION

MODEL A4446 / IXX - 0A - PP

IXX

I : A : RTD (standard)

B : Thermocouple

C : Millivolt

D : Milliamps

XX	Input	Range $^{\circ}$ C	Accuracy
01	RTD1	-150 to + 600	\pm 0.2%
02	RTD2	-150.0 to + 600.0	\pm 0.2%
J	J	0 to + 750	\pm 2
K	K	-200 to + 1200	\pm 2
R	R	0 to + 1750	\pm 2
S	S	0 to + 1750	\pm 2
T	T	-100 to + 400	\pm 2
B	B	0 to + 1800	\pm 2
E	E	-200 to + 900	\pm 2
N	N	-250 to + 1300	\pm 2
11	mV	0 - 100 mV	\pm 0.1%
21	mA	4 - 20 mA	\pm 0.1%
U1		User specified	

OA : Output actuation

41 : 6 Amp EM Relay (standard)

42 : 12 volt DC pulse @ 30 mA

PP : Power supply

51 : 230 V AC \pm 10 % 50 Hz (standard)

52 : 110 V AC \pm 10 % 50 Hz

53 : 24 V DC nominal (10-30 V)

* This controller is also available in Weather proof / Flame proof Enclosures.

* for other options check ordering information or consult factory.

AUTOPRO

Factory : 117, Manish Industrial Estate No. 3, Vasai Road (E), Dist.: Thane, MAH, 401 210 .

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☆ AUTOPRO IS THE FIRST NAME FOR THE LAST WORD IN INNOVATIVE INSTRUMENTATION ☆

Due to our policy of continuous improvement all specifications are subject to change without notice.

w.e.f. 01-04-2005

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