



## REX-P48 REX-P96



## General Description

The REX-P48/96 are powerful programmable ramp/soak controllers that can store up to two program patterns of eight segments per pattern with a 0.3% accuracy. The two patterns can be linked to expand the pattern storage from eight to sixteen segments. These instruments have an easy-to-use front panel designed for both setting functions and data entry. Standard features include at-a-glance program monitoring, multi-level PID, autotuning, Hold, Step, Run and Reset functions and three control modes.

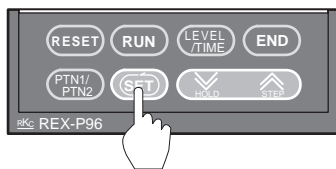
Optional features include temperature alarms, Heat, Cool or Heat/Cool control, external contact input, pattern end output and retransmission output. These instruments are designed for dryers, thermostat chambers, electric furnaces, ovens and textile machinery, or any process requiring time-based temperature control.

## Features

- ☆ Easy-to-use front panel
- ☆ 16-segment program storage
- ☆ Fixed set point control
- ☆ Multi-level PID

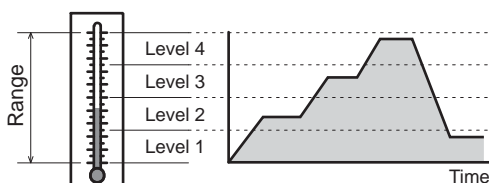
### Easy-to-Use Front Panel

The REX-P48/96 ramp/soak controllers have an easy-to-use front panel that can be used for both setting and data entry. Each key is clearly marked to identify the specific function to eliminate operator error when entering or changing patterns.



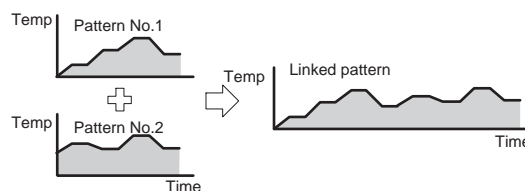
### Multi-Level PID

These controllers offer storage of up to four groups of PID variables and the transition from one group to the next is programmable.



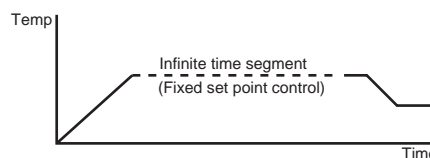
### Pattern Link Function

Storage of two program patterns of eight segments per pattern is a standard feature of these instruments. In addition, the two patterns can be easily linked to expand the pattern storage from eight to sixteen segments.



### Fixed Set Point Control

By setting a soak segment to infinite time, the controller may be used as a fixed set point controller.



### Optional Features

- Pattern end output
- Time signal output
- Retransmission output
- External contact input
  - Reset, Run, Hold, Step
- Heat/Cool PID control

# Ramp/Soak Temperature Controller REX-P48/96



## Specifications

### Input

#### Input (Universal input)

- a) Thermocouple : K, J, R, S, B, E, T, N (JIS/IEC), PLII (NBS)  
W5Re/W26Re (ASTM), U, L (DIN)
- Influence of external resistance : Approx.  $0.35\mu\text{V}/\Omega$
  - Input break action : Up-scale
- b) RTD : Pt100 (JIS/IEC), JPt100 (JIS)
- Influence of input lead resistance : Approx.  $0.0075\%/ \Omega$  of reading  
Maximum  $10\Omega$  per wire
  - Input break action : Up-scale

#### Sampling Time

0.5 sec

#### PV Bias

-1999 (-199.9) to 9999 (999.9)°C [°F]

#### PV Ratio

0.001 to 9.999

### Performance

#### Measuring Accuracy

- ± (0.3% of span + 1 digit)
- Cold junction temperature error  
Within  $\pm 1.5^\circ\text{C}$  (between 0 and  $50^\circ\text{C}$  [32 and  $122^\circ\text{F}$ ])
- Accuracy is not guaranteed between 0 and  $400^\circ\text{C}$  (0 and  $752^\circ\text{F}$ ) for type B input.
- Accuracy is not guaranteed between 0 and  $32^\circ\text{F}$  for Type N, PLII and W5Re/W26Re.

#### Segment Time Accuracy

Within  $\pm 0.02\%$  of reading

#### Other Setting

Within  $\pm 0.5\%$  of span

#### Insulation Resistance

More than  $20\text{M}\Omega$  (500V DC) between measured terminals and ground  
More than  $20\text{M}\Omega$  (500V DC) between power terminals and ground

#### Dielectric Strength

1000V AC for one minute between measured terminals and ground  
1500V AC for one minute between power terminals and ground

### Program

**Storage Program Pattern :** Max. 2 patterns (8 segments per pattern)

**Storage Segments :** Max. 16 segments when linking 2 patterns of 8 segments each.

**Program Repeat :** 1 - 999 times or continuous

**Level Setting :** See Input Range Code Table

**Time Setting :** 00 hr 00 min to 99 hrs 59 min

**PID Constant Section :** 4 levels (For level PID control)

**Start Mode :** Zero start or PV start (selectable)

**Wait Zone :** Up, down 0 to  $99^\circ\text{C}$  ( $^\circ\text{F}$ ) or 0.0 to  $9.9^\circ\text{C}$  ( $^\circ\text{F}$ )

### Control

#### Control Method

- a) PID control with autotuning  
b) Heat/Cool PID control with autotuning

#### Major Setting Range

Setting range : Same as input range.  
Heat side proportional band : 1(0.1) to setting range  
(ON/OFF action when  $P=0$ )  
Cool side proportional band : 1 to 1000% of heat side proportional band  
Integral time : 1 to 3600sec.(P + D action when  $I=0$ )  
Derivative time : 1 to 3600sec.(P + I action when  $D=0$ )  
Differential gap : 0 to  $100^\circ\text{C}$  ( $^\circ\text{F}$ ) or 0.0 to  $100.0^\circ\text{C}$  ( $^\circ\text{F}$ )  
(When used with ON/OFF action)  
Output limiter High : -5.0 to +105.0%  
Output limiter Low : -5.0 to +105.0%

#### Control Output

Relay output : Form C contact, 250V AC 3A (resistive load)  
Voltage pulse output : 0/12V DC  
(Load resistance : More than  $600\Omega$ )  
Current output : 0 to 20mA or 4 to 20mA DC  
(Load resistance : Less than  $600\Omega$ )

### Alarms

#### Temperature Alarm (Optional)

- a) Number of alarms : 2 points  
b) Alarm action  
Deviation High, Low, High/Low, Band, and Process High, Low alarms, Set value High, Low (In contrast to the Process High or Low alarm, the set value High or Low alarm is activated when the programmed set value goes over or under a preset value.)  
c) Alarm differential gap : 0 to  $10^\circ\text{C}$  ( $^\circ\text{F}$ ) or 0.0 to  $10.0^\circ\text{C}$  ( $^\circ\text{F}$ )  
• Hold function and re-Hold function can be added to deviation High Low and High/Low.  
• Energized/de-energized alarm (selectable)

#### Alarm Output

Relay output, Form A contact 250V AC 1A (resistive load)

### Options

#### External Contact Input

Type : RESET, RUN, HOLD, STEP  
Input method : Non-voltage contact input  
OPEN :  $500\text{k}\Omega$  or more  
CLOSE :  $10\Omega$  or less

#### Time Signal Output

Setting range : 00 hr 00 min to 99 hr. 59 min  
Storage pattern : 2 times/pattern  
Output : 1 point  
Relay contact output, 250V AC 1A (resistive load)  
• When "Pattern end output" is selected, "Time signal output" is not available.

#### Pattern End Output

Setting range : 00 hr 00 min to 99 hr. 59 min  
Output : 1 point  
Relay contact output, 250V AC 1A (resistive load)  
• When "Time signal output" is selected, "Pattern end output" is not available.

#### Retransmission Output

Number of outputs : 1 point  
Output signal : 0 to 10mV, 0 to 100mV DC  
(Load resistance : More than  $20\text{k}\Omega$ )  
0 to 1V, 0 to 5V, 0 to 10V, 1 to 5V DC  
(Load resistance : More than  $1\text{k}\Omega$ )  
0 to 20mA, 4 to 20mA DC  
(Load resistance : Less than  $600\Omega$ )  
Output type : Measured value (PV), Set value (SV), Manipulated output value (MV)

### General Specifications

#### Supply Voltage

90 to 264V AC (Including power supply voltage variation)  
[Rating : 100 to 240V AC] (50/60Hz common)

#### Power Consumption

Less than 9VA (100 to 240V AC)

#### Power Failure Effect

A power failure of 20ms or less will not affect the control action.  
If the power failure is shorter than 2 seconds, the autotuning function (if used) will be canceled but the program continues. If the power failure is longer than 4 seconds, the controller returns to its initial status (start mode).

**Operating Environments :** 0 to  $50^\circ\text{C}$  [32 to  $122^\circ\text{F}$ ], 45 to 85% RH

**Memory Backup :** RAM back-up by lithium battery

#### Net Weight

P48 : Approx. 300g  
P96 : Approx. 400g

#### External Dimensions (W x H x D)

P48 : 48 x 96 x 100mm  
P96 : 96 x 96 x 100mm

### Compliance with Standards (Optional)

- CE Mark
- UL/cUL Recognized



# Ramp/Soak Temperature Controller REX-P48/96



## Model and Suffix Code

Specifications	Model and Suffix Code											
Model	REX-P48 (1/8 DIN size) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> * <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>											
Control method	PID reverse control with AT PID direct control with AT Level PID reverse control with AT Level PID direct control with AT Heat/Cool PID control Heat/Cool level PID control						F	D	L	M	W	V
Input type	See Input Range Code Table <input type="checkbox"/>											
Scale range	See Input Range Code Table <input type="checkbox"/>											
Control output (OUT1)	Relay output Voltage pulse DC current : 0 to 20mA DC current : 4 to 20mA						M	V	7	8		
Control output (OUT2)	Control action : F, D, L, M Relay output Voltage pulse DC current : 0 to 20mA DC current : 4 to 20mA						No symbol		M	V	7	8
Alarm 1	No alarm See Alarm Code Table <input type="checkbox"/>											
Alarm 2	No alarm See Alarm Code Table <input type="checkbox"/>											
Contact input	Not supplied Supplied <input type="checkbox"/> N Y											
Output function	Not supplied Pattern end output Time signal output N 1 2											
Analog output	Not supplied See Analog Output Code Table <input type="checkbox"/>											

• For CE Mark and UL/cUL Approved products, add the suffix of "CE" to the end of the model code.

### Input Range Code Table

Thermocouple (Field-programmable)

Input	Code	Range
K	K : 22	-199.9 – 999.9°C
	K : 16	-200 – 1372°C
	K : B2	-199.9 – 999.9°F
	K : B3	-330 – 2500°F
J	J : 14	-199.9 – 999.9°C
	J : 15	-200 – 1200°C
	J : A9	-199.9 – 999.9°F
	J : B1	-330 – 2192°F
T	T : 01	-199.9 – 400.0°C
	T : A1	-199.9 – 752.0°F

Input	Code	Range
R	R : 02	0 – 1769°C
	R : A2	0 – 3216°F
S	S : 02	0 – 1769°C
	S : A2	0 – 3216°F
B	B : 02	0 – 1820°C
	B : A2	0 – 3308°F
E	E : 06	-200 – 1000°C
	E : A5	-330 – 1832°F
N	N : 02	0 – 1300°C
	N : A2	0 – 2372°F

Input	Code	Range
PLII	A : 02	0 – 1390°C
	A : A2	0 – 2534°F
W5Re W26Re	W : 02	0 – 2320°C
	W : A4	0 – 4208°F
U	U : 08	0 – 600°C
	U : A4	0 – 1100°F
L	L : 05	0 – 900°C
	L : A2	0 – 1600°F

RTD (Field-programmable)

Input	Code	Range
JPt100	P : 20	-199.9 – 510.0°C
	P : B6	-199.9 – 950.0°F
Pt100	D : 20	-199.9 – 660.0°C
	D : A1	-199.9 – 999.9°F

### Alarm Code Table

Code	Type
A	Deviation High
B	Deviation Low
C	Deviation High/Low
D	Band Alarm
E	Deviation High with Alarm Hold
F	Deviation Low with Alarm Hold
G	Deviation High/Low with Alarm Hold
H	Process High

Code	Type
J	Process Low
K	Process High with Alarm Hold
L	Process Low with Alarm Hold
Q <sup>1</sup>	Deviation High with Alarm Re-hold
S <sup>1</sup>	Deviation Low with Alarm Re-hold
T <sup>1</sup>	Deviation High/Low with Alarm Re-hold
V	Set value High
W	Set value Low

### Analog Output Code Table

Code	Type
1	0 – 10mV DC
2	0 – 100mV DC
3	0 – 1V DC
4	0 – 5V DC
5	0 – 10V DC
6	1 – 5V DC
7	0 – 20mA DC
8	4 – 20mA DC

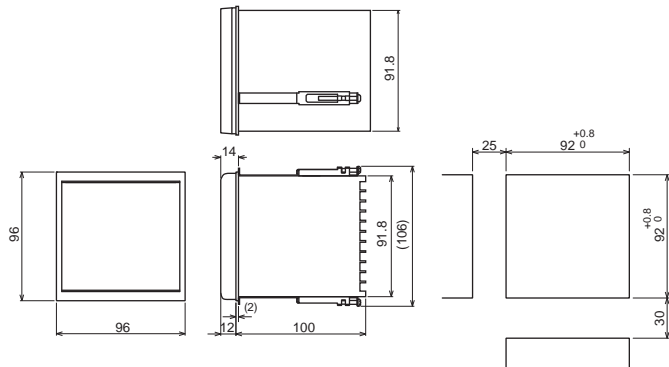
<sup>1</sup> On alarm Re-hold function : The alarm will become effective after it has first entered non-alarm range, when alarm set values are changed.

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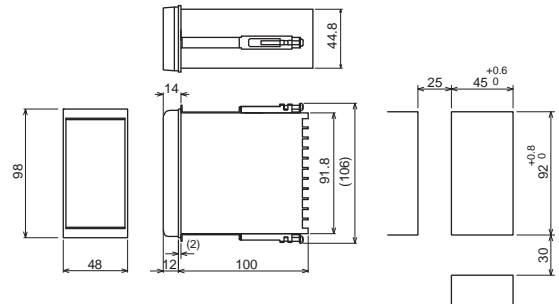


## External Dimensions and Rear Terminals

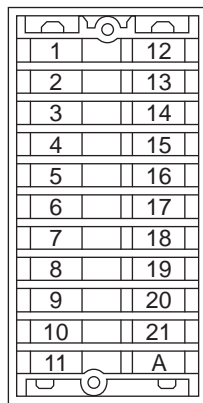
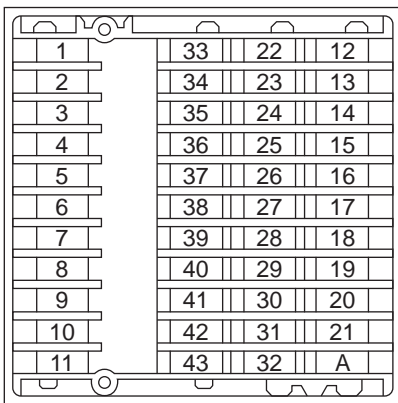
REX-P96



REX-P48



Unit : mm



No.	Description
1	AC 100 to 240V Power supply
2	
3	Alarm output Time signal, Pattern end signal output
4	Alarm 1
5	Alarm 2
6	TS or END Relay contact output
7	(1) C → (2) Control output : OUT2 (1) Relay contact output (2) Voltage DC/Current DC
8	→ Control output : OUT1 (1) Relay contact output (2) Voltage DC/Current DC
9	(1) C → (2) Control output : OUT1 (1) Relay contact output (2) Voltage DC/Current DC
10	→ Control output : OUT1 (1) Relay contact output (2) Voltage DC/Current DC
11	NC → Control output : OUT1 (1) Relay contact output (2) Voltage DC/Current DC

No.	Description
12	→+ Analog output
13	→- Analog output
14	DI COM Contact input
15	→ RESET RESET
16	→ RUN RUN
17	→ STEP STEP
18	→ HOLD HOLD
19	A Measured input (1) Thermocouple (2) RTD
20	→ B Measured input (1) Thermocouple (2) RTD
21	→ B Measured input (1) Thermocouple (2) RTD
A	