Ramp/Soak Temperature Controller REX-P24

REX-P24

General Description

The REX-P24 is user-friendly and economical ramp/soak controller packed in 1/16 DIN size.
The REX-P24 has three modes, ramp/soak control with 2 patterns and 8 segments, control with timer function, and fixed set point control.
The mode can be selected by key operation.
The REX-P24 is well suited for dryers, thermostat chambers, electric or small bench furnaces, ovens, and textile machinery.

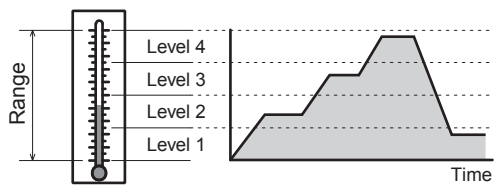
Features

☆ Three control modes: ramp/soak, control with timer, fixed set point
☆ 2 patterns and 8 segments (ramp/soak mode)
☆ Timer function for control start and control stop, and 2 set points
☆ Four sets of PID

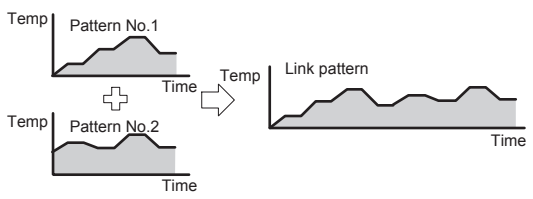
Program temperature control mode

2 patterns with 8 segments can be stored. Patterns can be linked so that 16-segment program is possible.
The REX-P24 can store four sets of PID. This is useful when the characteristics of the control object varies with temperature.

Four sets of PID

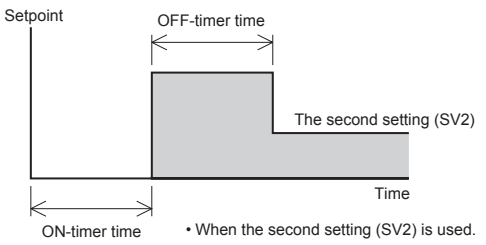


Pattern link



Control with timer function

Timer function is useful in combination with 2 set points.
This allows you to set when to start control, when to stop control at SV1 and change SV1 to SV2. The time is set by hours and minutes.



Fixed set point control mode

The REX-P24 can be used as a simple single loop controller. This function is useful in combination with other control modes, especially when testing machines.

Specifications

Inputs

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. 0.35μV/Ω
- Input break action : Up-scale

b) RTD : Pt100 (JIS/IEC), JPt100 (JIS)
- Influence of input lead resistance : Approx. 0.0075%/Ω of reading
  • Maximum 10Ω per wire
- Input break action : Up-scale

Sampling time
0.5 sec

PV bias
-1999(-199.9) to 9999(999.9)℃[℉]

PV ratio
0.1 to 999.9%

Perfomance

Measuring accuracy
± (0.3% of span + 1 digit)
Cold junction temperature error
Within ±1.5℃ (between 0 and 50℃ [32 and 122℉])
- Accuracy is not guaranteed between 0 and 400℃ (0 and 752℉) for type B input.
- Accuracy is not guaranteed between 0 and 32℉ for type N, PLII and W5Re/W26Re.

Segment time accuracy
Within ±0.02% of reading

Other setting
Within ±0.5% of span

Insulation resistance
More than 20MΩ (500V DC) between measured terminals and ground
More than 20MΩ (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 (Possible to link, 8 segments x 2 patterns)
Program repeat :	1 - 999 times or continuous
Level setting :	See input range
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℃ (℉) or 0.0 to 9.9℃ (℉) at going up or down

Timer

Timer methods
a) Control start delay timer
b) Control stop timer
c) Control start delay/stop timer

Timer setting
00 hr 00 min to 99 hr. 59 min

Second set value (SV2)
SV2 is the control set value used after the Off-timer time reaches 0. (SV2 can be off.)

Control

Control method
a) PID control with autotuning

Major setting range

Setting range :	Same as input range.
Proportional band :	1(0.1) to setting range (ON/OFF action when P=0)
Integral time :	1 to 3600sec.(PD action when I=0)
Derivative time :	1 to 3600sec.(PI action when D=0)
Differential gap :	0 to 100℃ (℉) or 0.0 to100.0℃ (℉) (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 A contact, 250V AC 3A (resistive load)
Voltage pulse output :	0/12V DC (Load resistance : More than 600Ω)
Current output :	0 to 20mA or 4 to 20mA DC (Load resistance : Less than 600Ω)

Options

Contact output function
Number of points : 2 points
a) Tempeature alarm
Alarm action
Deviation high, low, high/low, band, and process high, low alarms
Set value high, low
Alarm differential gap : 0 to 10℃ (℉) or 0.0 to 10.0℃ (℉)
- Hold function can be programmed.

b) Pattern end output (Ramp/soak mode)
Setting time : 00 hr 00 min to 99 hr. 59 min
c) Time signal output (Ramp/soak mode)
Setting time : 00 hr 00 min to 99 hr. 59 min
Storage pattern : 2 patterns
d) Time-up output (Timer mode)
Setting time : 00 hr 00 min to 99 hr. 59 min

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

External contact input
Type of control mode

a) Fixed set point control mode :	STOP, START
b) Ramp/soak mode :	RESET, RUN
c) Timer mode :	RESET, START
Input method :	Non voltage contact input
OPEN : 500kΩ or more	
CLOSE : 10Ω or less	

General specifications

External Dimensions (W x H x D)
48 x 48 x 100mm

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

Power consumption
Less than 6 VA (100 to 240V AC)

Effect by power failure
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℃ [32 to 122℉] , 45 to 85% RH

Memory backup : RAM back-up by lithium battery

Net weight
Approx. 180g

Model and Suffix Code

Specifications	Model and Suffix Code
Model	REX-P24 □ □ □–□ ✳ □ □ □–□
Control method	PID control with AT (reverse action) F PID control with AT (direct action) D Level PID control with AT (reverse action) L Level PID control with AT (direct action) M
Input type	See input range code table □
Scale range	See input range code table □
Control output	Relay output M Voltage pulse V DC current : 0 to 20mA 7 DC current : 4 to 20mA 8
Contact input	Not supplied N Supplied Y
Contact output 1	No contact output 1 N See contact output code table □
Contact output 2	No contact output 2 N See contact output code table □
Waterproof / dustproof (NEMA4X)	Not supplied N Waterproof / dustproof spec. (Dedicated cover is used.) Y

■ For REX-P24 with CE mark, UL and CSA approval, please add the suffix of "/CE" at the end of the model code.

Input range code

Thermocouple

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

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

Input	Code	Range
PLII	A 02	0 – 1390℃
	A A2	0 – 2534℉
W5Re /W26Re	W 02	0 – 2320℃
	W A4	0 – 4208℉
U	U 08	0 – 600℃
	U A4	0 – 1100℉
L	L 05	0 – 900℃
	L A2	0 – 1600℉

RTD

Input	Code	Range
JPt100	P 20	-199.9 – 510.0℃
	P B6	-199.9 – 950.0℉
Pt100	D 20	-199.9 – 660.0℃
	D A1	-199.9 – 999.9℉

Contact output code

Code	Type
A	Deviation High
B	Deviation Low
C	Deviation High/Low
D	Deviation band
E	Deviation High with hold
F	Deviation Low with hold

Code	Type
G	Deviation High/Low with hold
H	Process High
J	Process Low
K	Process High with hold
L	Process Low with hold
Q	Deviation High with re-hold *

Code	Type
S	Deviation Low with re-hold *
T	Deviation High/Low with re-hold *
V	Set value High
W	Set value Low
Y	Time signal output
Z	Pattern end/Timer end output

* *Alarm re-hold function* : The alarm becomes effective after it has first entered non-alarm range, when alarm set values are changed.

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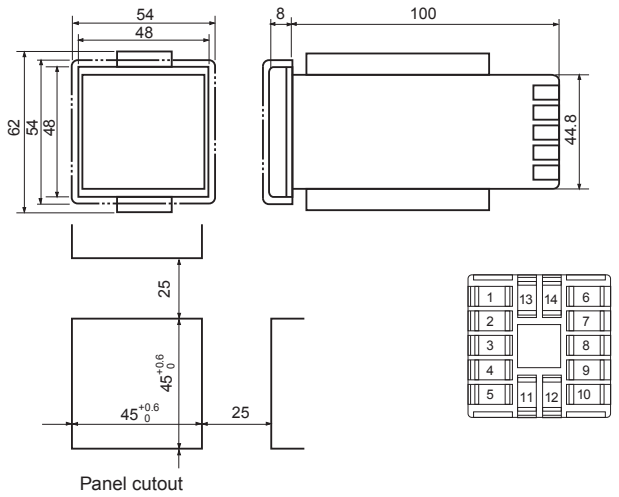
External Dimensions and Rear Terminals

Unit : mm



No.	Description	
1		External output
2	NO DO 1	Relay contact output
3	NO DO 2	
4	(1) (2)+	Control output (1) Relay contact output (2) Voltage/Current
5	−	

No.	Description	
6	AC	Power supply
7	100 to 240V	
8	A	Measured input (1) TC input (2) RTD input
9	+ B	
10	− B (1) (2)	

No.	Description	
13	−	Contact input 2
14	+	

No.	Description	
11	−	Contact input 1
12	+	

* Double-dotted line shows the front cover conforming to NEMA 4X.
The panel thickness shall be 1 to 10 mm.