REX-P24

General Description

The REX-P24 combines compact 1/16th DIN size for panel space reduction with powerful ramp/soak control features that previously have only been available in much larger instruments. This controller 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, three control modes, multi-level PID, autotuning, and Hold, Step, Run and Reset functions.

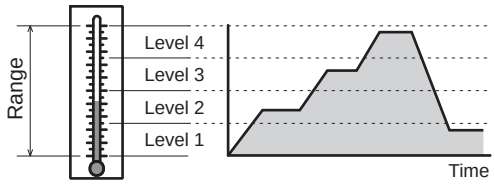
Features

- ☆ Three control modes :
  - Ramp/soak control
  - Fixed set point control
  - Timer temperature control
- ☆ Multi-level PID
- ☆ 16-segment program storage
- ☆ NEMA 4X

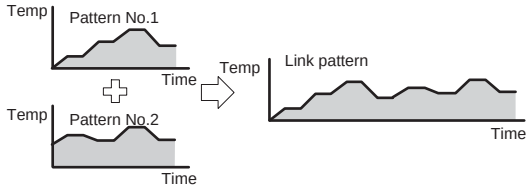
Program Temperature Control Mode

These controllers offer storage of up to four groups of PID variables and the transition from one group to the next is programmable by temperature level. Storage of two program patterns of eight segments per pattern is a standard feature of this instrument. In addition, the two patterns can be easily linked to expand the pattern storage from eight to sixteen segments.

Four sets of PID

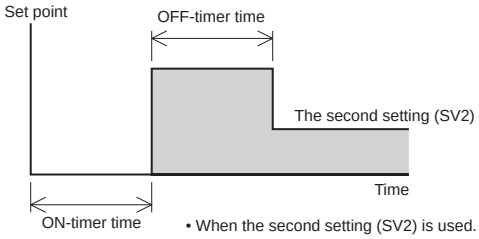


Pattern link



Timer Temperature Control Mode

The timer control function is most useful when there are two set points. This allows the operator to set when to start control, when to stop control at SV1 and change SV1 to SV2. The time is set in hours and minutes.



• When the second setting (SV2) is used.

Fixed Set Point Control Mode

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

Optional Features

- •External contact output
  - Pattern end output
  - Time signal output
  - Alarms
- •External contact input
  - Reset, Run, Hold, Step

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. 0.35μV/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)°C[°F]

PV Ratio
0.1 to 999.9%

Perfomance

Measuring Accuracy
± (0.3% of span + 1 digit)
Cold junction temperature error
Within ±1.5°C (between 0 and 50°C [32 and 122°F])
- Accuracy is not guaranteed between 0 and 400°C (0 and 752°F) for type B input.
- Accuracy is not guaranteed between 0 and 32°F 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 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°C (°F) or 0.0 to 9.9°C (°F)

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°C (°F) or 0.0 to100.0°C (°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 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°C (°F) or 0.0 to 10.0°C (°F)
- 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

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)

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°C [32 to 122°F] , 45 to 85% RH

Memory Backup : RAM back-up by lithium battery

Net Weight
Approx. 180g

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

Compliance with Standards (Optional)

- CE Mark
- UL/cUL Recognized

Model and Suffix Code

Specifications	Model and Suffix Code
Model	REX-P24 (1/16 DIN size) □ □ □−□∗□ □ □−□
Control method	F: PID control with AT (reverse action) D: PID control with AT (direct action) L: Level PID control with AT (reverse action) M: Level PID control with AT (direct action)
Input type	See Input Range Code Table
Scale range	See Input Range Code Table
Control output	M: Relay output V: Voltage pulse 7: DC current : 0 to 20mA 8: DC current : 4 to 20mA
Contact input	N: Not supplied Y: Supplied
Contact output 1	N: No contact output 1 □: See Output Code Table
Contact output 2	N: No contact output 2 □: See Output Code Table
Waterproof / Dustproof (NEMA 4X)	N: Not supplied 1: Waterproof/Dustproof protection

• 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

Output Code Table

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

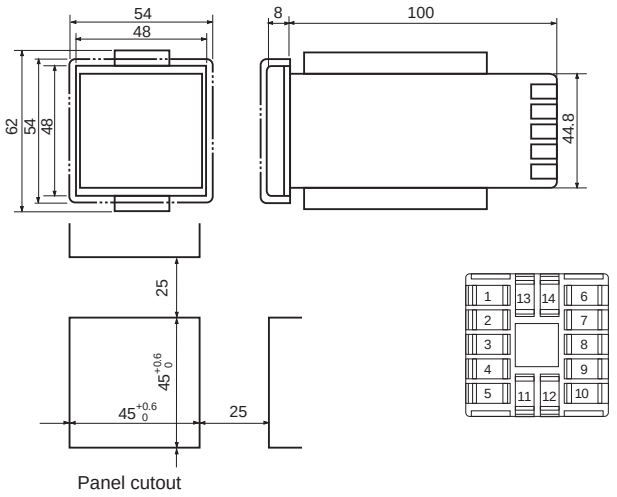
Code	Type
G	Deviation High/Low with Hold
H	Process High
J	Process Low
K	Process High with Hold
L	Process Low with Hold
Q [1]	Deviation High with Re-hold

Code	Type
S [1]	Deviation Low with Re-hold
T [1]	Deviation High/Low with Re-hold
V	Set value High
W	Set value Low
Y	Time signal output
Z	Pattern end/Timer end output

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

External Dimensions and Rear Terminals

Unit : mm



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

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

No.	Description
13 14	Contact input 2 RUN/START

No.	Description
11 12	Contact input 1 RESET/STOP

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