



Digital Temperature Controllers

REX-Century series



The New Century for Multi-Functions with easy operation

General Description

In the recent industrial temperature control applications, PID controllers are used everywhere from simple applications upto advanced applications. Even in a hobby application PID controllers are used. The REX-Century series are high performance controllers with easy key operations. Even an unskilled person can operate it. PID values are easily obtained by autotuning function only at a touch of the button. Our long experience and high technology in the industrial field have made it available.

Features

- 4-digit display and dual alarm system.
- Heat/Cool action for extrusion process (except REX-C100).
- LBA (Loop Break Alarm) and HBA (Heater Break Alarm) as option.
- Application for UL and CSA approval under progress. (REX-C400, C900 only)
- Supply voltage options include 100 to 240V AC, 24V DC and 24V AC.
- Field selectable thermocouple types.
- Two-level operation method (SV level and PID level).

Heat/Cool PID action

The use of heat/cool PID action (deadband function) contributes to energy saving in applications where self-heat exists (example: extruders). On the contrary, the use of overlap function provides stable temperature control in the controlled object with large time constant.

Loop Break Alarm (LBA)

The LBA function starts measuring PV changes at the pre-set intervals after PID calculation value has reached 0% or 100% for detecting heater break and sensor break. Below are examples

When PID calculation value is 100%

If temperature does not increase by 2°C or more within LBA time, LBA turns on.

When PID calculation value is 0%

If temperature dose not decrease by 2°C or more within LBA time, LBA turns on.

*The above examples are for reverse action. For direct action, the LBA action becomes reversed.

*LBA deadband is available to suppress effect by external disturbances.

Heater Break Alarm (HBA)

The HBA function requires a current detector for measuring load current. If the measured value becomes lower than the preset value, alarm is generated.

Specifications

Input

Input

Thermocouple K, J, R, S, B, E, T (IEC/ANSI), N, PLII (NBA) and W5Re/W26Re (ASTM).

RTD Pt100 3-wire system (IEC/DIN)

Effect by external resistance

Approx. 0.35 microV/ohm (T/C input)

Input leadwire resistance

Approx. 0.01 [%/ohm] of reading, but within 10 ohms per lead (RTD input)

Action at input disconnection

UP-scale for both T/C and RTD inputs. DOWN-scale is available for T/C input as option.

Sampling time

0.5 second.

Performance

Setting accuracy

$\pm(0.5\% \text{ of SV} + 1 \text{ digit})$ or $\pm 3^\circ\text{C} [6^\circ\text{F}]$, whichever is larger for T/C input and $\pm(0.5\% \text{ of SV} + 1 \text{ digit})$ or $\pm 0.8^\circ\text{C} [1.6^\circ\text{F}]$, whichever is larger for RTD input.

R, S inputs: $\pm 6^\circ\text{C} [12^\circ\text{F}]$ between 0 to $399^\circ\text{C} [0 \text{ to } 799^\circ\text{F}]$

B input: Accuracy is not guaranteed between 0 to $399^\circ\text{C} [0 \text{ to } 799^\circ\text{F}]$

Display accuracy

Same as setting accuracy

Insulation resistance

More than 20M ohms (500V DC) between input and ground terminals.

More than 20Mohms (500V DC) between power and ground terminals.

Dielectric strength

1000V AC for one minute between input and ground terminals.

1500V AC for one minute between power and ground terminals.

Control

Control action

PID action with autotuning (PV-derivative PID action).

a) Reverse action as standard (Direct action also available).

b) ON/OFF, P, P + I, P + D actions are also configurable. Hysteresis at ON/OFF action is $2^\circ\text{C} [^\circ\text{F}]$

c) Heating proportional band: 1 to span or 0.1 to span (ON/OFF action when P = 0).

Cooling proportional band: 0 to 1000% of heating proportional band.

d) Integral time: 0 to 3600 sec. (P + D action when I = 0)

e) Derivative time: 0 to 3600 sec. (P + I action when D = 0)

f) Anti-Reset Windup (ARW): 1 to 100% of heating proportional band.

g) Heating cycle time: 1 to 100 sec.

h) Cooling cycle time: 1 to 100 sec.

i) Deadband: $-10 \text{ to } +10^\circ\text{C} [^\circ\text{F}]$ or $-10.0 \text{ to } +10.0^\circ\text{C} [^\circ\text{F}]$

Output

a) Relay output: 250V AC 3A (resistive load).

b) Voltage pulse output: 0/12V DC (load resistance more than 600 ohms).

c) Current output: 4 to 20mA DC (load resistance less than 600 ohms).

d) Triac trigger output: For medium capacity triac drive (less than 100A).

Alarm

Temperature alarm

Selectable from deviation high, low, high/low band, and process high, low alarms. Alarm hysteresis $2^\circ\text{C} [^\circ\text{F}]$ or $2.0^\circ\text{C} [^\circ\text{F}]$ as standard.

Heater break alarm

Setting 0.0 to 100.0A. For 0 to 30A range, CTL-6-P-N current detector is recommended. For 0 to 100A range, CTL-12-S56-10L-N is recommended.

Loop break alarm (LBA): LBA time 0.1 to 200.0 minutes. LBA deadband 0 to $9999^\circ\text{C} [^\circ\text{F}]$.

Alarm output

Relay output 250V AC 1A (resistive load). 1a contact.

General Specifications

Supply voltage

a) 85 to 264V AC (50/60Hz) [Rating: 100 to 240V AC]

b) 21.6 to 26.4V AC (50/60Hz) [Rating: 24V AC]

c) 21.6 to 26.4V DC [Ripple less than 10%p-p]

Power consumption

Less than 17VA for standard AC type, less than 7.5VA for 24V AC type and less than 200mA for 24V DC type.

Effect by power failure

Not affected by power failure shorter than 20msec, otherwise reset to the initial state.

Operating environments

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

Memory backup

Non-volatile memory.

Net weight

0.17 kg (REX-C100), 0.26 kg (REX-C400/410),

0.25 kg (REX-C700) and 0.34 kg (REX-C900).



UL recognition (File No. E82331)

Model REX-C100 / C400 / C410 / C700 / C900
(Except triac trigger output)



CSA listing (File No. LR46566)

Model REX-C100 / C400 / C410 / C700 / C900
(Except triac trigger output)



CE Mark

Model REX-C100 / C400 / C410 / C700 / C900
(Except triac trigger output)

Name of Part



- ① PV display unit
- ② SV display unit
- ③ Indicator lamp
- ④ SET key
- ⑤ Cursor shift key
- ⑥ UP/DOWN keys

Model and Suffix Code

Model	Suffix	Description
C100		48 x 48mm size
C400		96 x 48mm size
C410	<input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> * <input type="checkbox"/> <input type="checkbox"/>	48 x 96mm size
C700		72 x 72mm size
C900		96 x 96mm size
Control	F D W *7,8 A *7,8	PID action with AT (reverse action) PID action with AT (direct action) PID heat/cool action with AT (water-cooling) PID heat/cool action with AT (air-cooling)
Input Range		See range and input table
Output (heating)	M V 8 *2 G *1	Relay output Voltage pulse output Current output (4 to 20mA DC) Triac trigger output
Output (cooling) *5	M V 8	Relay output Voltage pulse output Current output (4 to 20mA DC)
Alarm (ALM1)		See alarm table
Alarm (ALM2)		See alarm table *3

How to specify safety standards.

When you specify the models with CE mark-UL/CSA certification, please add the suffix of "/CE" to the model code.

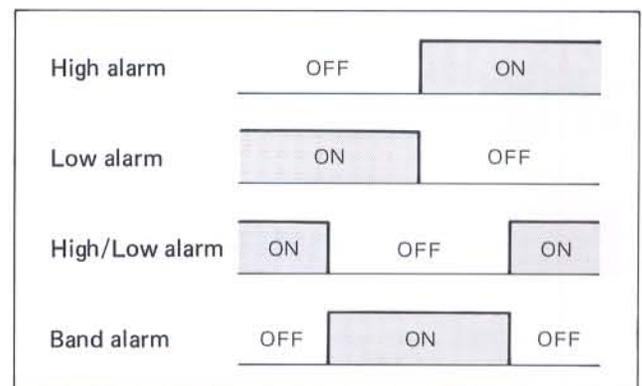
Note

- *1 Triac trigger output and LBA is not available on heat/cool type.
- *2 HBA is not available if current output is specified.
- *3 ALM2 is not available on REX-C100 if triac trigger output is specified.
- *4 Please specify supply voltage.
- *5 Please keep blank for cooling output if it is not required.
- *6 Alarm codes P and S (HBA) are available only on ALM2 (alarm 2).
- *7 Triac trigger output and LBA are not available if heat/cool action is specified.
- *8 Heat/cool action is not available on REX-C100.

Alarm Table

- N No alarm
- A Deviation alarm high
- B Deviation alarm low
- C Deviation alarm high/low
- D Deviation alarm band
- E Deviation alarm high with hold
- F Deviation alarm low with hold
- G Deviation alarm high/low with hold
- H Process alarm high
- J Process alarm low
- K Process alarm high with hold
- L Process alarm low with hold
- R Loop break alarm (LBA)
- P Heater break alarm (HBA) for CTL-6-P-N (30A)
- S Heater break alarm (HBA) for CTL-12-S56-10L-N (100A)

Temperature alarm

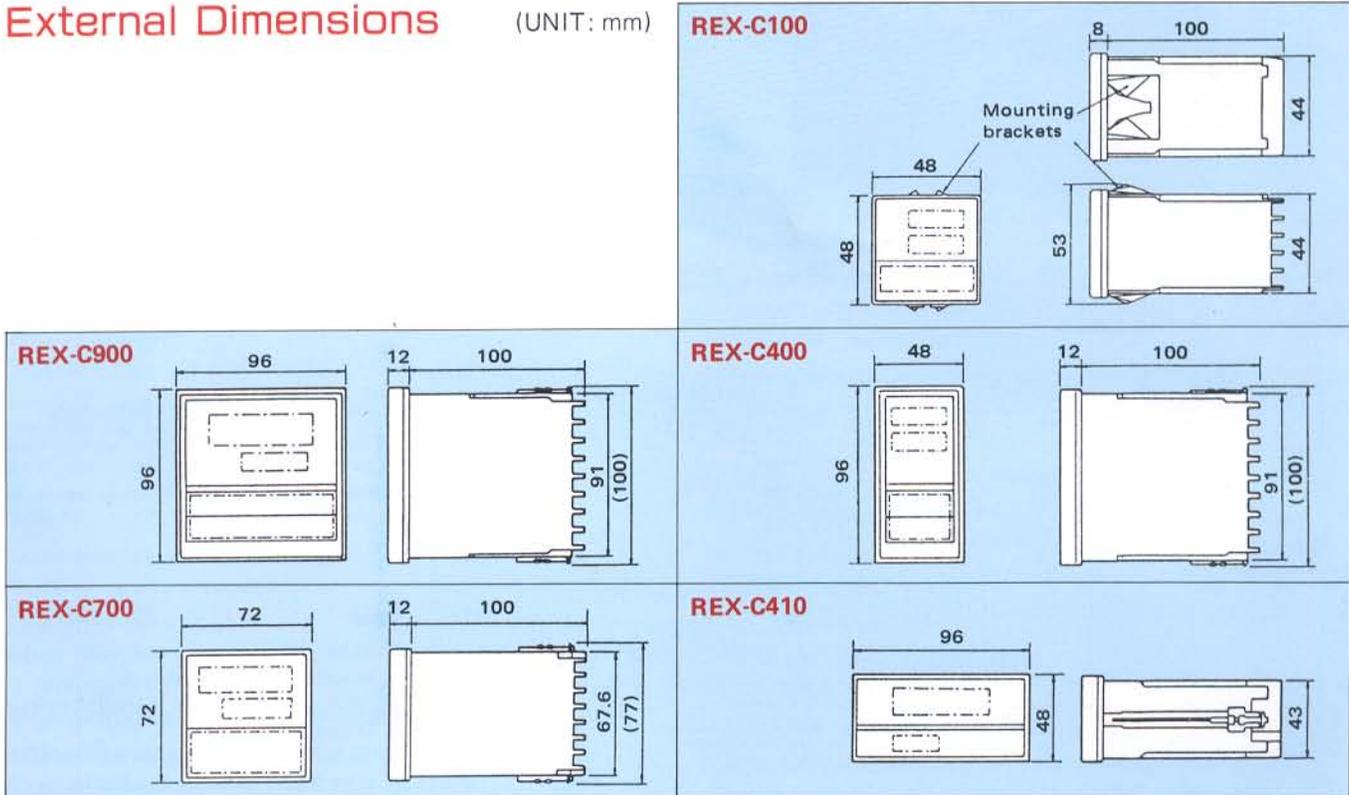


*Alarm type can be programmed in the initial setting mode.
*Process alarm is available with high and low alarms only.

Range and Input

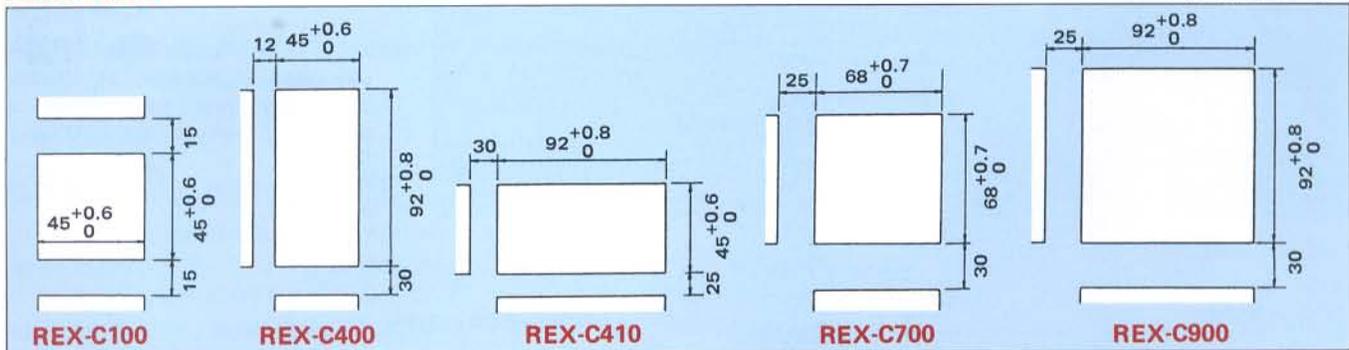
K	K07	0 to 1372°C	KA3	0 to 2502°F	N	N02	0 to 1300°C	NA2	0 to 2372°F
J	J06	0 to 1200°C	JA3	0 to 2192°F	PLII	A02	0 to 1390°C	AA2	0 to 2534°F
R	R02	0 to 1769°C	JA1	0 to 800°F	W5Re/ W26Re	W02	0 to 2320°C	WA1	0 to 4000°F
S	S02	0 to 1769°C	RA2	0 to 3216°F	Pt100	D01	-199.9 to 649.0°C	DA1	-199.9 to 999.9°F
B	B02	0 to 1820°C	SA2	0 to 3216°F	JPt100	P01	-199.9 to 649.0°C		
E	E02	0 to 1000°C	BA2	0 to 3308°F					
T	T01	-199.9 to 400.0°C	EA2	0 to 1832°F					
			TA1	-199.9 to 752.0°F					

External Dimensions (UNIT: mm)



Panel Cutout

(UNIT: mm)



- For proper operation of this precision instrument, please read the instruction manual carefully.
- This instrument is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment affecting human life.
- If there is a possibility of an accident occurring to the system due to breakdown or abnormality of this instrument, please prepare an appropriate independent protection device.
- Delete line above as it is already addressed in first bullet.

Subject to change without notice due to design changes.

RKC® **RKC INSTRUMENT INC.**
(RIKA KOGYO CO.,LTD.)

HEAD OFFICE : 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146-8515 JAPAN
 PHONE : 03-3751-9799 (+ 81 3 3751 9799)
 Email : info@rkcinst.co.jp
 FAX : 03-3751-8585 (+ 81 3 3751 8585)
 http://www.nisiq.net/~rkc-jpn/