

REX-C100
REX-C400
REX-C410
REX-C700
REX-C900



General Description

The Century Series controllers are designed for precise control performance at the most reasonable cost. Available in five DIN sizes, these instruments are recognized for their solid reliability and ease-of-use. This Series features dual displays, autotuning, PID algorithm, field-selectable °C/°F, reverse or direct action and a full range of temperature alarms.

Features

- ☆ Heat/Cool Control
- ☆ Standard autotuning
- ☆ Heater and loop break alarm
- ☆ Numerous control outputs
- ☆ Field-configurable thermocouples

Heat/Cool Control

The Heat/Cool PID control features heat and cool outputs for use where process-generated heat exists. This allows the input of overlap or deadband settings which contribute to energy savings. (Not available on REX-C100)

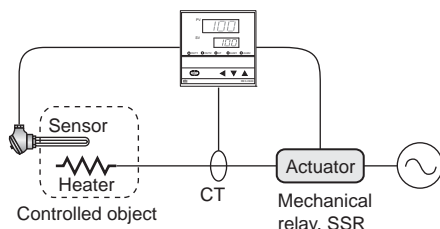
Heater Break Alarm (Optional)

The heater break alarm (HBA) detects a fault in heating or cooling circuit and displays actual amperage on the front panel. If the measured value becomes lower than the preset value, the alarm is activated.

The HBA function requires a current detector for measuring and monitoring the current load.

HBA for three phase is available. Contact RKC for details.

- Current transformer : CTL-6-P-N (0 to 30A),
 CTL-12-S56-10L-N (0 to 100A)



Loop Break Alarm (Optional)

The control loop break alarm (LBA) monitors and protects an entire temperature control system. The LBA detects heater breaks, thermocouple or RTD failures, short circuits, or the failure of an operating device such as a mechanical or solid state relay.

When the PID computed value reaches 100% and the temperature does not respond in a set time, the loop break alarm is activated. Conversely, when the PID value reaches 0% and the temperature does not respond accordingly, the loop break alarm is turned on. In this example, the LBA uses reverse action to control heat. For cool control, the LBA action is reversed and becomes direct. LBA deadband is available to suppress the influence of external disturbances.

Standard Features

The Century Series offers full PID Control, autotuning on demand, °C/°F, Reverse or Direct action, PV Bias, anti-reset windup and operator lock-out function. Twelve different field-configurable thermocouple types inputs, RTD, DC milliamp or voltage inputs as well as relay, voltage pulse, 4-20 mA and triac trigger outputs are available.



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. $0.01[\%/\Omega]$ of reading
• Maximum 10Ω per wire
 - Input break action : Up-scale
- c) DC voltage : 0 to 5V, 1 to 5V (0.0 to 100.0% fixed)
 - Input break action : Down-scale
- d) DC current : 0 to 20mA, 4 to 20mA (0.0 to 100.0% fixed)
 - Input break action : Down-scale

Sampling Time

0.5 sec

Performance

Measuring Accuracy

- a) Thermocouple
 - $\pm(0.5\%$ of reading + 1 digit) or $\pm 3^\circ\text{C}$ (6°F) whichever is larger
 - R, S inputs: $\pm 6^\circ\text{C}$ (12°F) between 0 and 399°C (0 and 799°F)
 - Accuracy is not guaranteed between 0 and 399°C (0 and 799°F)

for

- type B.
- b) RTD
 - $\pm(0.5\%$ of reading + 1 digit) or $\pm 0.8^\circ\text{C}$ (1.6°F) whichever is larger
- c) DC voltage and DC current
 - $\pm(0.5\%$ of span + 1 digit)

Insulation Resistance

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

Dielectric Strength

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

Control

Control Method

- a) PID control with autotuning
 - Available for reverse and direct action (Specify when ordering.)
- b) Heat/Cool PID control with autotuning (Not available on REX-C100)
 - Available for air and water cooling type (Specify when ordering.)

Major Setting Range

Setting range : Same as input range.
Heat-side proportional band: 1 to span or 0.1 to span
(ON/OFF action when P=0)
• Differential gap at ON/OFF action is 2°C ($^\circ\text{F}$) as standard
(Factory set value)
Cool-side proportional band: 0 to 1000% of heat-side proportional band
(Heat/Cool ON/OFF action when $P_c=0$)
Integral time : 0 to 3600sec. (PD action when I=0)
Derivative time : 0 to 3600sec. (PI action when D=0)
Anti-reset windup (ARW) : 1 to 100% of heat-side proportional band
Deadband/overlap : -10 to 10°C ($^\circ\text{F}$) or -10.0 to 10.0°C ($^\circ\text{F}$)
Proportional cycle : 1 to 100 sec.

Control Output

Relay output : Form C contact, 250V AC 3A (resistive load)
(Form A contact : REX-C100)
Voltage pulse output : 0/12V DC
(Load resistance : More than 600Ω)
Current output : 4 to 20mA DC
(Load resistance : Less than 600Ω)
Triac trigger output : Zero-cross method for medium capacity
triac drive (less than 100A)
• Not available on Heat/Cool PID type.

Alarms

(Optional)

Temperature Alarm

- a) Number of alarm : 2 points (Maximum)
- b) Alarm action : Deviation High, Low, High/Low, Band
Process High, Low
- c) Alarm differential gap : 2°C ($^\circ\text{F}$) or 2.0°C ($^\circ\text{F}$) as standard.

Heater Break Alarm (For single phase)

- a) Number of inputs : 1point
- b) CT type : CTL-6-P-N(30A), CTL-12-S56-10L-N(100A)
- c) Display range : 0.0 to 100.0A
- d) Accuracy : $\pm 5\%$ of input value or 2A
(whichever is larger)

• Output from Alarm 2 terminal.

Control Loop Break Alarm (LBA)

- a) LBA time setting : 0 to 7200 sec.
- b) LBA deadband : 0 to 999°C ($^\circ\text{F}$) or 100% of span
(OFF when LBA deadband = 0)

• Not available for triac trigger output type.
• Not available for heat/cool type.

Alarm Output

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

General Specifications

Supply Voltage

- a) 85 to 264V AC (Including supply voltage variation)
[Rating : 100 to 240V AC] (50/60Hz common)
- b) 21.6 to 26.4V AC (Including supply voltage variation)
[Rating : 24V AC] (50/60Hz common)
- c) 21.6 to 26.4V DC (Ripple rate 10% p-p or less)
[Rating : 24V DC]

Power Consumption

Less than 17VA for standard AC type
Less than 7.5VA for 24V AC type
Less than 200mA for 24V DC type

Power Failure Effect

A power failure of 20msec or less will not affected the control action.
If power failure of more than 20msec occurs, controller will restart.

Operating Environment : 0 to 50°C [32 to 122°F] , 45 to 85% RH

Memory Backup : Backed up by non-volatile memory.

Net Weight

REX-C100 : Approx. 170g
REX-C400 : Approx. 260g
REX-C410 : Approx. 260g
REX-C700 : Approx. 250g
REX-C900 : Approx. 340g

External Dimensions (W x H x D)

REX-C100 : 48 x 48 x 100mm
REX-C400 : 48 x 96 x 100mm
REX-C410 : 96 x 48 x 100mm
REX-C700 : 72 x 72 x 100mm
REX-C900 : 96 x 96 x 100mm

Compliance with Standards (Optional)

- CE Mark
- UL/cUL Recognized



• Triac trigger output type and triac output are not CE Mark or UL/cUL Recognized.

Digital Temperature Controller CENTURY Series



Model and Suffix Code

Specifications	Model and Suffix Code																	
Model	C100 (1/16 DIN size) C400 (1/8 DIN Vertical size) C410 (1/8 DIN Horizontal size) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> * <input type="checkbox"/> <input type="checkbox"/> C700 (3/16 DIN size) C900 (1/4 DIN size)																	
Control method	PID control with AT (reverse action) PID control with AT (direct action) Heat/Cool PID with AT (Water cooling type) 1 • Not available on REX-C100 Heat/Cool PID with AT (Air cooling type) 1 • Not available on REX-C100							F	D	W	A							
Input type	See Range and Input Code Table																	
Scale range	See Range and Input Code Table																	
Control output (OUT1)	Relay contact output Voltage pulse output DC current output : 4 to 20mA 2 Triac trigger output 3							M	V	8	G							
Control output (OUT2)	Control action : F, D Relay contact output Voltage pulse output DC current output : 4 to 20mA							No symbol			M	V	8					
Alarm 1	No alarm See Alarm Code Table										N							
Alarm 2	No alarm See Alarm Code Table																	N

Note

- 1 Triac trigger output and LBA are not available on Heat/Cool type.
- 2 HBA is not available if current output is specified.
- 3 Alarm 2 is not available for REX-C100 if triac trigger output is specified.

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

Range and Input Code Table

Thermocouple (Field-programmable)

Input	Code	Range
K	K : 01	0 - 200°C
	K : 02	0 - 400°C
	K : 03	0 - 600°C
	K : 04	0 - 800°C
	K : 05	0 - 1000°C
	K : 06	0 - 1200°C
	K : 07	0 - 1372°C
	K : 13	0 - 100°C
	K : 14	0 - 300°C
	K : 20	0 - 500°C
	K : A1	0 - 800°F
	K : A2	0 - 1600°F
	K : A3	0 - 2502°F
	K : A9	20 - 70°F
J	J : 01	0 - 200°C
	J : 02	0 - 400°C
	J : 03	0 - 600°C
	J : 04	0 - 800°C
	J : 05	0 - 1000°C
	J : 06	0 - 1200°C
	J : A1	0 - 800°F
R	R : 01	0 - 1600°C
	R : 02	0 - 1769°C
	R : 04	0 - 1350°C
S	S : 01	0 - 1600°C
	S : 02	0 - 1769°C
	S : A1	0 - 3200°F
B	B : 01	400 - 1800°C
	B : 02	0 - 1769°C
	B : A1	800 - 3200°F
	B : A2	0 - 3308°F

Input	Code	Range
E	E : 01	0 - 800°C
	E : 02	0 - 1769°C
	E : A1	0 - 1600°F
N	N : 01	0 - 1832°F
	N : 02	0 - 1200°C
	N : A1	0 - 1300°C
T	T : 01	0 - 2300°F
	T : A1	0 - 2372°F
	T : 02	-199.9 - 400.0°C
	T : 03	-199.9 - 100.0°C
	T : 04	-100.0 - 200.0°C
	T : A1	0.0 - 350.0°C
	T : A2	-199.9 - 752.0°F
	T : A3	-100.0 - 200.0°F
	T : A4	-100.0 - 400.0°F
	T : A5	0.0 - 450.0°F
W5Re /W26Re	W : 01	0 - 2000°C
	W : 02	0 - 2320°C
	W : A1	0 - 4000°F
PL II	A : 01	0 - 1300°C
	A : 02	0 - 1390°C
	A : 03	0 - 1200°C
U	A : A1	0 - 2400°F
	A : A2	0 - 2534°F
	U : 01	-199.9 - 600.0°C
	U : 02	-199.9 - 100.0°C
	U : 03	0.0 - 400.0°C
	U : A1	-199.9 - 999.9°F
L	U : A2	-100.0 - 200.0°F
	U : A3	0.0 - 999.9°F
	L : 01	0 - 400°C
	L : 02	0 - 800°C
	L : A1	0 - 800°F
	L : A2	0 - 1600°F

RTD (Field-programmable)

Input	Code	Range
Pt100	D : 01	-199.9 - 649.0°C
	D : 02	-199.9 - 200.0°C
	D : 03	-100.0 - 50.0°C
	D : 04	-100.0 - 100.0°C
	D : 05	-100.0 - 200.0°C
	D : 06	0.0 - 50.0°C
	D : 07	0.0 - 100.0°C
	D : 08	0.0 - 200.0°C
	D : 09	0.0 - 300.0°C
	D : 10	0.0 - 500.0°C
	D : A1	-199.9 - 999.9°F
	D : A2	-199.9 - 400.0°F
	D : A3	-199.9 - 200.0°F
	D : A4	-199.9 - 100.0°F
	D : A5	-100.0 - 300.0°F
	D : A6	0.0 - 100.0°F
	D : A7	0.0 - 200.0°F
	D : A8	0.0 - 400.0°F
	D : A9	0.0 - 500.0°F
JPT100	P : 01	-199.9 - 649.0°C
	P : 02	-199.9 - 200.0°C
	P : 03	-100.0 - 50.0°C
	P : 04	-100.0 - 100.0°C
	P : 05	-100.0 - 200.0°C
	P : 06	0.0 - 50.0°C
	P : 07	0.0 - 100.0°C
	P : 08	0.0 - 200.0°C
	P : 09	0.0 - 300.0°C
	P : 10	0.0 - 500.0°C

Voltage and Current

Input	Code	Range
0 - 5V DC	4 : 01	0.0 - 100.0 (Fixed)
1 - 5V DC	6 : 01	0.0 - 100.0 (Fixed)
0 - 20mADC	7 : 01	0.0 - 100.0 (Fixed)
4 - 20mADC	8 : 01	0.0 - 100.0 (Fixed)

- Field programmable among following input group
- a) 0 - 5V, 1 - 5V
- b) 0 - 20mA, 4 - 20mA

1 Type B input : Accuracy is not guaranteed between 0 and 399°C (0 and 799°F)

Alarm 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
G	Deviation High/Low with Hold

Code	Type
H	Process High
J	Process Low
K	Process High with Hold
L	Process Low with Hold
R	Loop break alarm (LBA)
P	Heater break alarm (CTL-6P-N) 30A
S	Heater break alarm (CTL-12-S56-10L-N) 100A

Supply Voltage

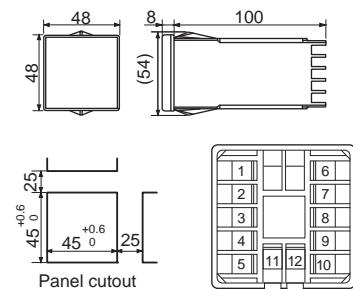
100 - 240V AC	24V AC	24V DC
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Digital Temperature Controller CENTURY Series

External Dimensions and Rear Terminals

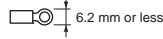
(Unit : mm)

REX-C100



No.	Description
1	Alarm output
2	Relay contact output
3	Relay contact output
4	Control Output

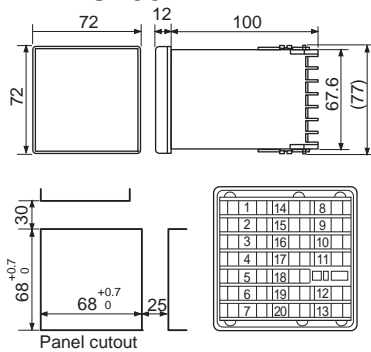
• Use 6.2mm or less solderless terminal.



No.	Description
6	Power supply
7	Power supply
8	Measured input
9	Measured input
10	Measured input

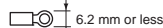
No.	Description
11	Current transformer input
12	Current transformer input

REX-C700

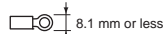


No.	Description
1	Ground
2	Power supply
3	Power supply
4	Control Output
5	Control Output
6	Control Output
7	Control Output

• Use 6.2mm or less solderless terminal.
No. 1-10 (Power, Alarm and Output terminals)



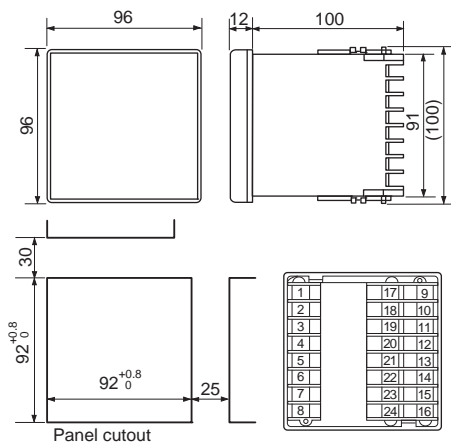
• Use 8.1mm or less solderless terminal.
No. 11-13 (Input terminals)



No.	Description
8	Alarm output
9	Relay contact output
10	Relay contact output
11	Measured input
12	Measured input
13	Measured input

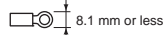
No.	Description
19	Current transformer input
20	Current transformer input

REX-C900



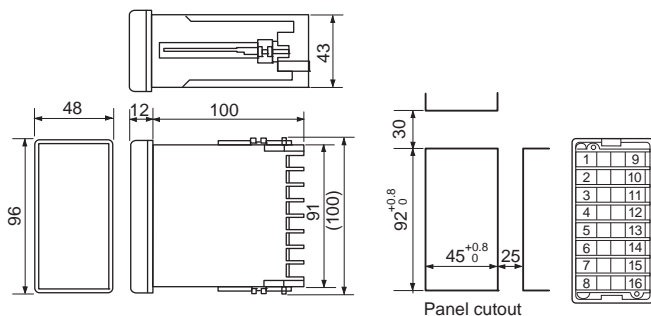
No.	Description
1	Ground
2	Power supply
3	Power supply
4	Control Output
5	Control Output
6	Control Output
7	Control Output
8	Control Output

• Use 8.1mm or less solderless terminal.



No.	Description
9	Alarm output
10	Relay contact output
11	Relay contact output
12	Current transformer input
13	Current transformer input
14	Measured input
15	Measured input
16	Measured input

REX-C400



REX-C410

