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

General Description

The REX Century series is the high performance PID controller with easy-to-use.
Heat/cool control and two alarms including heater break alarm and loop break alarm are available. The REX Century series is available in five DIN sizes from 1/16 DIN to 1/4 DIN.

Features

- ☆ Heat/cool control for extrusion process (except for REX-C100)
- ☆ Heater break alarm (single or three-phase) and loop break alarm
- ☆ CE marked, UL approved and CSA certified
- ☆ Power supply selection among 100 to 240VAC, 24VDC and 24VAC

Heat/cool control

The heat/cool PID controller has heat and cool outputs for use where process-generated heat exists. The controller allows the input of overlap or deadband settings which can contribute to energy savings.

Heater break alarm (HBA)

The HBA function monitors the load via an external current transformer*1 and detects failures in the control circuit such as heater breaks and the failure of a mechanical or solid state relay. When the control output is on and the load current drops below the HBA set value, the heater break alarm is activated. Conversely, when the control output is off and the load current still exists, the heater break alarm is turned on.
HBA for three phases is available. Please contact RKC for details.

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

Loop break alarm (LBA)

The control loop break alarm (LBA) monitors and protects an entire temperature control system. The LBA detects heater break, 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 LBA 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.

Specifications

Inputs

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. 0.01[%/Ω] 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
±(0.5% of reading + 1 digit) or ±3℃ (6℉) whichever is larger
R, S inputs: ±6℃ (12℉) between 0 and 399℃ (0 and 799℉)
• Accuracy is not guaranteed between 0 and 399℃ (0 and 799℉) for type B.
b) RTD
±(0.5% of reading + 1 digit) or ±0.8℃ (1.6℉) whichever is larger
c) DC voltage and DC current
±(0.5% of span + 1 digit)

Insulation resistance
More than 20MΩ (500V DC) between measured and ground terminals
More than 20MΩ (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℃ (℉) as standard
(Factory set value)
Cool-side proportional band: 0 to 1000% of heat-side proportional band
(Heat/cool ON/OFF action when Pc=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℃ (℉) or -10.0 to 10.0℃ (℉)
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 : 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℃ (℉) or 2.0℃ (℉) 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 : ± 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 ℃[℉] or 100% of span
(OFF when LBA deaband = 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 spccifications

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

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

Effect by power failure
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℃ [32 to 122℉] , 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

Model and Suffix Code

Specifications	Model and Suffix Code
Model	C100 (48 x 48mm size) C400 (48 x 96mm size) C410 (96 x 48mm size) C700 (72 x 72mm size) C900 (96 x 96mm size)
Control method	PID control with AT (reverse action) F PID control with AT (direct action) D Heat/cool PID with AT (Water cooling type) • Except REX-C100 *1 W Heat/cool PID with AT (Air cooling type) • Except REX-C100 *1 A
Input type	See range and input code table
Scale range	See range and input code table
Control output (OUT1)	Relay contact output M Voltage pulse output V DC current output : 4 to 20mA *2 8 Triac trigger output *3 G
Control output (OUT2)	Control action : F, D Relay contact output M Voltage pulse output V DC current output : 4 to 20mA 8 No symbol
Alarm 1	No alarm N See alarm code
Alarm 2	No alarm N See alarm code

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 marked, UL approved and CSA certified products, please add the suffix of "CE" to the end of the model code.

Range and input code table

Thermocouple input

Input	Code	Range
K	K 01	0 – 200℃
	K 02	0 – 400℃
	K 03	0 – 600℃
	K 04	0 – 800℃
	K 05	0 – 1000℃
	K 06	0 – 1200℃
	K 07	0 – 1372℃
	K 13	0 – 100℃
	K 14	0 – 300℃
	K 20	0 – 500℃
	K A1	0 – 800℉
	K A2	0 – 1600℉
	K A3	0 – 2502℉
	K A9	20 – 70℉
J	J 01	0 – 200℃
	J 02	0 – 400℃
	J 03	0 – 600℃
	J 04	0 – 800℃
	J 05	0 – 1000℃
	J 06	0 – 1200℃
	J A1	0 – 800℉
	J A2	0 – 1600℉
	J A3	0 – 2192℉
	J A6	0 – 400℉
R	R 01	0 – 1600℃
	R 02	0 – 1769℃
	R 04	0 – 1350℃
	R A1	0 – 3200℉
	R A2	0 – 3216℉
S	S 01	0 – 1600℃
	S 02	0 – 1769℃
	S A1	0 – 3200℉
	S A2	0 – 3216℉
B	B 01	400 – 1800℃
	B 02	0 – 1769℃
	B A1	800 – 3200℉
	B A2	0 – 3308℉

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

• Type B input : Accuracy is not guaranteed between 0 and 399℃ (0 and 799℉)

RTD input

Input	Code	Range
Pt100	D 01	-199.9 – 649.0℃
	D 02	-199.9 – 200.0℃
	D 03	-100.0 – 50.0℃
	D 04	-100.0 – 100.0℃
	D 05	-100.0 – 200.0℃
	D 06	0.0 – 50.0℃
	D 07	0.0 – 100.0℃
	D 08	0.0 – 200.0℃
	D 09	0.0 – 300.0℃
	D 10	0.0 – 500.0℃
	D A1	-199.9 – 999.9℉
	D A2	-199.9 – 400.0℉
	D A3	-199.9 – 200.0℉
	D A4	-199.9 – 100.0℉
	D A5	-100.0 – 300.0℉
	D A6	0.0 – 100.0℉
	D A7	0.0 – 200.0℉
	D A8	0.0 – 400.0℉
	D A9	0.0 – 500.0℉
JPt100	P 01	-199.9 – 649.0℃
	P 02	-199.9 – 200.0℃
	P 03	-100.0 – 50.0℃
	P 04	-100.0 – 100.0℃
	P 05	-100.0 – 200.0℃
	P 06	0.0 – 50.0℃
	P 07	0.0 – 100.0℃
	P 08	0.0 – 200.0℃
	P 09	0.0 – 300.0℃
	P 10	0.0 – 500.0℃

Voltage and Current input

Input	Code	Range
0 – 5V DC	4 01	0.0 – 100.0 (Fixed)
1 – 5V DC	6 01	0.0 – 100.0 (Fixed)
0 – 20mA DC	7 01	0.0 – 100.0 (Fixed)
4 – 20mA DC	8 01	0.0 – 100.0 (Fixed)

Alarm 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
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])

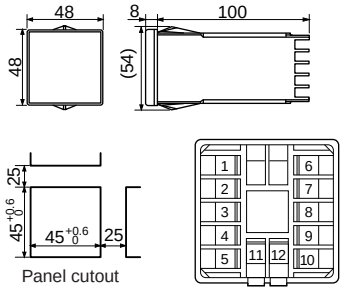
Supply voltage

100 - 240V AC
24V AC
24V DC

External Dimensions and Rear Terminals

(Unit : mm)

REX-C100



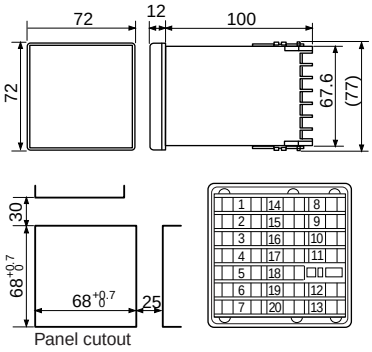
No.	Description	
1	Alarm 1 NO	Alarm output
2		
3	Alarm 2 NO	Relay contact output
4	T2 T1	Control Output (1) Relay contact output (2) Voltage DC/Current DC (3) Triac trigger output
5	G	

• Use 6.2mm or less solderless terminal.

No.	Description	
6	AC 100 to 240V	Power supply
7	AC 24V / DC+ 24V –	
8	A B	Measured input (1) Thermocouple (2) RTD (3) Voltage/Current
9		
10	B	

No.	Description	
11	CT	CT input for heater break alarm / Current transformer input
12		

REX-C700



No.	Description	
1		Ground
2	AC 100 to 240V / AC 24V / DC+ 24V –	Power supply
3		
4	PID Control (OUT1) C NO NC T2 T1 G	Heat/cool PID Control: Cool (OUT2), Heat (OUT1)
5		Control Output (1) Relay contact output (2) Voltage DC/Current DC (3) Triac trigger output
6		
7		

• Solderless terminal

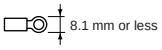
Use the lug suitable for a screw of M3.

• For terminal No. 1 to 10 (Power terminals, Alarm terminals and Output terminals)

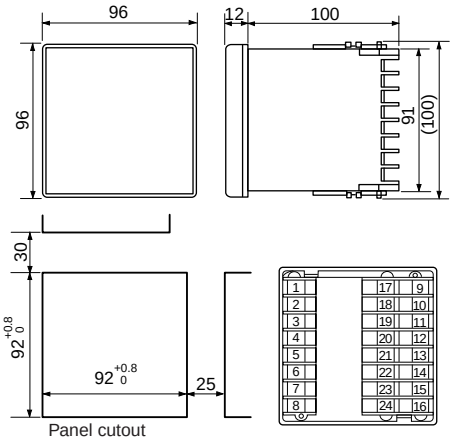
No.	Description	
8		Alarm output
9	Alarm 1 NO	Relay contact output
10	Alarm 2 NO	
11	B A	Measured input (1) Thermocouple (2) RTD (3) Voltage/Current
12		
13		

No.	Description	
19	CT	CT input for heater break alarm / Current transformer input
20		

• For terminal No. 11 to 13 (Input terminals)



REX-C900

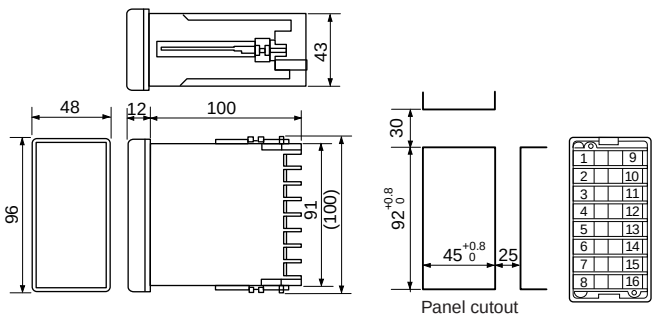


No.	Description	
1		Ground
2	AC 100 to 240V / AC 24V / DC+ 24V –	Power supply
3		
4		
5	PID Control (OUT1) C NO NC T2 T1 G	Heat/cool PID Control: Cool (OUT2), Heat (OUT1)
6		Control Output (1) Relay contact output (2) Voltage DC/Current DC (3) Triac trigger output
7		
8		

• Use 6.2mm or less solderless terminal.

No.	Description	
9		Alarm output
10	Alarm 1 NO	Relay contact output
11	Alarm 2 NO	
12	CT	CT input for heater break alarm / Current transformer input
13		
14	B A	Measured input (1) Thermocouple (2) RTD (3) Voltage/Current
15		
16		

REX-C400



REX-C410