

## REX-B850 OPL-B



### General Description

The REX-B850 is a multi-loop board type temperature controller with powerful features. 4-, 6- and 8-loop types are available with the dimensions of 145 (W) x 210 (H) x 26 (D) mm. 16 units can be multi-dropped so that maximum 128 loops can be controlled.

The operation panel, OPL-B, can be connected to the REX-B850 without programming. Maximum 128-loop monitoring is possible.

The REX-B850 is suitable for various applications which requires multi-loop control, such as injection machines, re-flow oven, packaging machine, and semiconductor manufacturing equipment.

### Features

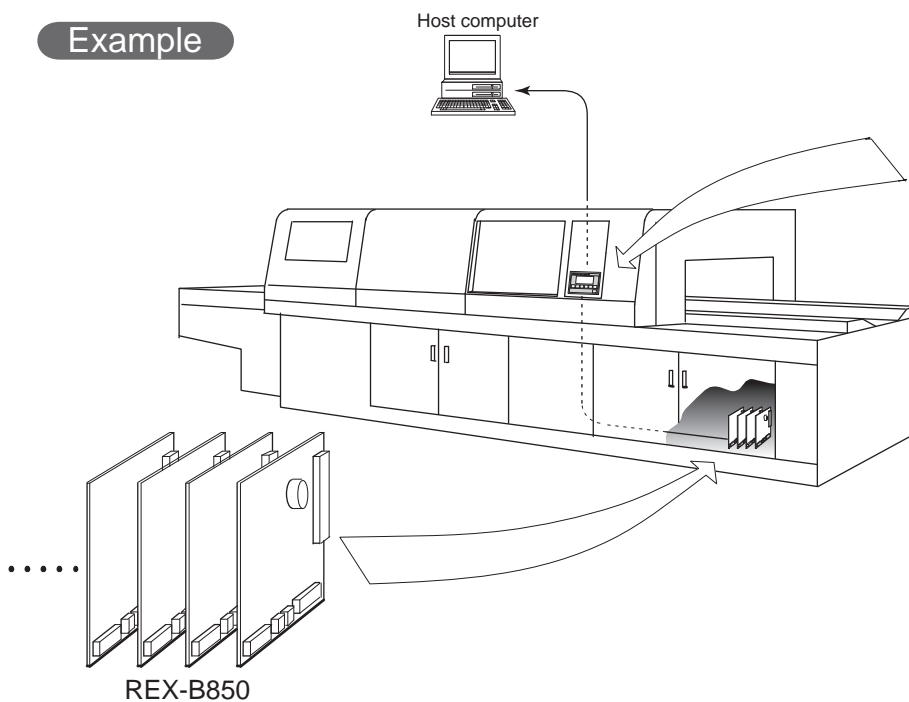
#### <REX-B850>

- ☆ Compact size 145(W) x 210(H) x 26(D)mm
- ☆ 4, 6 or 8 loop control
- ☆ Maximum 128-loop control
- ☆ 8 multi-memory areas (8 sets of SV, PID, alarm SV, etc.)
- ☆ Two alarms
- ☆ Optional heater break alarm
- ☆ Event input function

#### <OPL-B>

- ☆ Compact size 144(W) x 96(H) x 70(D)mm
- ☆ Monitoring maximum 16 units (128 loops) of REX-B850
- ☆ Channel names and alarm message can be set on the screen
- ☆ Interactive simple screen operation

#### Example



OPL-B

REX-B850



## REX-B850 Specifications

### Inputs

*Number of inputs*

4, 6 or 8 points

*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. 20 $\mu$ V/ $\Omega$

Input break action : Up-scale

b) RTD : Pt100 (JIS/IEC), JPt100 (JIS)

Influence of input lead resistance : Up to 10 $\Omega$  per wire

Input break action : Up-scale

*Sampling time*

1 sec

*PV bias*

-5.00 to 5.00% of span

### Performance

*Setting accuracy*

a) Thermocouple :  $\pm$  (0.3% of span + 1 digit)

• Accuracy is not guaranteed between 0 and 400°C (0 and 800°F) for type B input.

b) RTD :  $\pm$  (0.3% of span + 1 digit)

*Insulation resistance*

More than 20M $\Omega$  (500V DC) between measured and ground terminals.

More than 20M $\Omega$  (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) Brilliant PID control with enhanced autotuning.

b) Brilliant PID heat/cool control with enhanced autotuning

• Only 4-channel type is available for heat/cool control.

*Memory area*

8 areas

*Setting method*

Setting via serial communications

*Major setting range*

Set value : Same as input range.

Heat side proportional band : 0.1 to 1000.0% of span

(Zero is not settable for heat/cool control type.)

Cool side proportional band : 0.1 to 1000.0% of span

(Zero is not settable)

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

Derivative time : 0 to 3600sec. (PI action when D=0)

Deadband/Overlap : -10.0 to 10.0% of span

Control response : Slow, medium and fast.

Heat side proportioning cycle time : 1 to 100 sec.

Cool side proportioning cycle time : 1 to 100 sec. (For heat/cool control type)

*Control output*

Open collector output (Transistor sink output)

Load voltage : 12 to 24V DC [Rating]

### Alarms

(Optional)

*Temperature alarm*

a) Setting method : Setting via serial communications

b) Number of alarm : 2 points

c) Alarm action : Process, Deviation, Band

d) Alarm differential gap : 0.00 to 10.00% of span

e) Output : Transistor sink output  
(Load voltage : 12 to 24V DC [Rating])

• Common channel output

• Output is ON when either of the channels goes into the alarm range.

*Heater break alarm*

a) Number of inputs : 8 points (For single-phase heater)

b) CT type : CTL-6-P-N(30A), CTL-12-S56-10L-N(100A)

c) Setting range : 0.0 to 100.0A

d) Accuracy :  $\pm$  0.5% of input value or 2A  
(whichever is larger)

e) Output : Communication data output

### General specifications

*External dimensions (W x H x D)*

145 x 210 x 26mm

*Self-diagnostic function*

RAM check, A/D converter check, Watchdog timer, Adjustment data error check

*Supply voltage*

a) 90 to 264V AC (Including supply voltage variation)

[Rating : 100 to 240V AC] (50/60Hz common use)

b) 21.6 to 26.4V AC (Including supply voltage variation)

[Rating : 24V AC] (50/60Hz common use)

c) 21.6 to 26.4V DC (Ripple rate 10% p-p or less)

[Rating : 24V DC]

*Power consumption*

Less than 9VA for standard AC type

Less than 5VA for 24V AC type

Less than 150mA for 24V DC type

*Effect by power failure*

A power failure of 50msec or less will not affect the control action.

*Operating environments*

0 to 50°C [32 to 122°F], 45 to 85% RH

*Memory backup*

RAM is backed up by a lithium battery.

*Net weight*

Approx. 350g

*Mounting angle*

Do not slant the thermocouple input type controller more than 30° in all directions.

### Communications

*Digital communication*

a) Communication method : RS-422A (4-wire), RS-485 (2-wire), RS-232C (3-wire)

b) Communication speed : 2400, 4800, 9600, 19200 BPS

c) Bit format

Start bit : 1

Data bit : 7 or 8

Parity bit : Without, Odd or Even

Stop bit : 1 or 2

d) Communication code : ASCII(JIS) 7-bit code

# Model and Suffix Code

Specifications	Model and Suffix Code												
Model	REX-B850 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - D <input type="checkbox"/> <input type="checkbox"/> * <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>												
Number of channels	4 channels 6 channels 8 channels	4 6 8											
Control method *1	Brilliant PID control with AT Heat/cool brilliant PID control with AT	F W											
Input type	See range and input code table		<input type="checkbox"/>										
Scale range	See range and input code table			<input type="checkbox"/>	<input type="checkbox"/>								
Control output (OUT1)	Open collector output (Transistor sink output)					D							
Control output (OUT2)	Control action code "F" Open collector output (Transistor sink output)						N D						
Supply voltage	24V DC/AC 100 to 240V AC							3 4					
Alarm 1	See alarm code table								<input type="checkbox"/>				
Alarm 2	See alarm code table									<input type="checkbox"/>			
Current Transformer Input (CT input) *2	Not supplied CTL-6-P-N CTL-12-S56-10L-N											N P S	
Digital communications *3	RS-422A RS-485 RS-232C												4 5 6

**Note**

- \*1 : Heat/cool control is available only for 4-channel type.
- \*2 : CT (Current transformer) for heater break alarm is sold separately.  
CTL-6-P-N (0 to 30A)  
CTL-12-S56-10L-N (0 to 100A)
- \*3: Specify RS-422A for communication with OPL-B.

The connectors and cables should be prepared by customer.  
Regarding recommended manufacturers and model codes of the parts,  
Refer to External Dimensions.

Please specify bit format code.

Code No.	Start bit	Data bit	Parity bit	Stop bit
1	1	7	even	1
2	1	7	odd	1
3	1	7	even	2
4	1	7	odd	2
5	1	8	none	1
6	1	8	none	2

• The bit format can be changed by users after the delivery.

## Range and input code table

### Thermocouple

Input	Code		Range
	W/o DP*1	With DP*2	
K	K : 01	K : 29	0 – 200°C
	K : 02	K : 09	0 – 400°C
	K : 04	K : 10	0 – 800°C
	K : 11	K : 23	0 – 1300°C
	K : 24	K : 30	-50 – 150°C
	K : 25	K : 31	-200 – 200°C
	K : 26	K : 32	-200 – 300°C
	K : 27	K : 33	-200 – 600°C
	K : 28	K : 34	-200 – 1300°C
	K : A1	K : A4	0 – 800°F
	K : A5	K : B4	0 – 2400°F
	J : 01	J : 22	0 – 200°C
	J : 02	J : 08	0 – 400°C
	J : 03	J : 23	0 – 600°C
J : 04	J : 09	0 – 800°C	
J : 06	J : 16	0 – 1200°C	
J : 17	J : 24	-50 – 150°C	
J : 18	J : 25	-200 – 200°C	
J : 19	J : 26	-200 – 300°C	
J : 20	J : 27	-200 – 400°C	
J : 21	J : 28	-200 – 600°C	
J : 15	J : 29	-200 – 1200°C	
J : B3	J : A4	0 – 700°F	
J : B4	J : B2	0 – 1600°F	
J : A5	J : B5	0 – 2100°F	
R : 03	R : 05	0 – 1700°C	
R : A3	R : A4	0 – 3000°F	
S : 03	S : 04	0 – 1700°C	
S : A3	S : A4	0 – 3000°F	
B : 05	B : 06	0 – 1400°C	
B : 03	B : 04	0 – 1800°C	
B : A6	B : A7	0 – 2700°F	
B : A5	B : A8	0 – 3000°F	
E : 09	E : 15	0 – 200°C	
E : 04	E : 07	0 – 400°C	
E : 10	E : 03	0 – 700°C	
E : 02	E : 08	0 – 1000°C	
E : 11	E : 16	-50 – 150°C	
E : 12	E : 17	-200 – 200°C	
E : 13	E : 18	-200 – 300°C	
E : 14	E : 19	-200 – 400°C	
E : 06	E : 20	-200 – 1000°C	
E : A3	E : A6	0 – 1800°F	

Input	Code		Range
	W/o DP*1	With DP*2	
T	T : 09	T : 12	0 – 200°C
	T : 08	T : 06	0 – 400°C
	T : 14	T : 17	-50 – 150°C
	T : 10	T : 13	-200 – 200°C
	T : 15	T : 18	-200 – 300°C
	T : 16	T : 19	-200 – 400°C
	T : A9	T : A7	0 – 700°F
	T : B4	T : B6	-200 – 400°F
	T : B1	T : B3	-300 – 400°F
	T : B5	T : B7	-300 – 700°F
N : 02	N : 05	0 – 1300°C	
N : A1	N : A4	0 – 2300°F	
PLII : A : 01	A : 05	0 – 1300°C	
PLII : A : A3	A : A5	0 – 2300°F	
W5Re : W : 05	W : 06	0 – 1200°C	
W26Re : W : 03	W : 04	0 – 2300°C	
W26Re : W : A5	W : A6	0 – 2200°F	
W26Re : W : A3	W : A7	0 – 3000°F	
U	U : 10	U : 14	0 – 200°C
	U : 05	U : 03	0 – 400°C
	U : 08	U : 04	0 – 600°C
	U : 06	U : 09	-200 – 200°C
	U : 11	U : 15	-200 – 300°C
	U : 12	U : 16	-200 – 400°C
	U : 13	U : 17	-200 – 600°C
	U : A4	U : B1	0 – 1100°F
	U : A6	U : A9	-300 – 400°F
	L : 06	L : 13	0 – 200°C
L : 01	L : 03	0 – 400°C	
L : 07	L : 14	0 – 600°C	
L : 05	L : 04	0 – 900°C	
L : 08	L : 15	-200 – 200°C	
L : 09	L : 16	-200 – 300°C	
L : 10	L : 17	-200 – 400°C	
L : 11	L : 18	-200 – 600°C	
L : 12	L : 19	-200 – 900°C	
L : A2	L : A6	0 – 1600°F	
L : A7	L : A8	-300 – 400°F	

- \*1: W/o DP means no decimal place.
- \*2: With DP means one decimal place.
- Specify the input range code on the column of "With DP" for the input range with one decimal place.

### RTD

Input	Code		Range
	W/o DP*1	With DP*2	
Pt100	D : 23	D : 04	-100 – 110°C
	D : 24	D : 25	-200 – 600°C
	D : B9	D : B1	-150 – 200°F
JPt100	D : C1	D : C2	-200 – 1000°F
	P : 23	P : 04	-100 – 100°C
	P : 24	P : 25	-200 – 500°C

## Alarm code table

Code	Type
N	No alarm
H	Process High
J	Process Low
A	Deviation High

Code	Type
B	Deviation Low
C	Deviation High / Low
D	Band alarm



## OPL-B Specifications

### Display

*Display method*

STN dots matrix liquid crystal display (Transmissivity type)

*Number of pixels*

128(W) x 48(H) dots

*Display area*

90(W) x 36(H)mm

*Color*

Blue mode

*Back light*

Cold fluorescent tube (CFL)

*Contrast adjustment*

Adjustment by the key switch on contrast adjustment screen

*Character*

Alphanumeric, symbol

*Character size*

8 x 16 dots, 16 x 16 dots, 5 x 7 dots

### Setting

*Setting method*

Interactive setting by the front key switch

*Setting parameter*

Set value of B850, mode switch, and initial set up, etc.

*Switch type*

Screen transfer, data setting, mode transfer and display ON/OFF

### Screen scanning function

*Scanning screen*

Operation monitoring screen

*Setting method*

Set on initial setting screen.

*Setting parameters*

- Scan function : ON / OFF
- Scanning time : 1 to 9999 sec.
- Scanning type : Unit change / Item change

### Screen saver function

*Applicable screen*

All screens except an error or alarm message.

*Setting method*

Set on initial setting screen.

*Setting parameters*

- Saver function : ON / OFF
- Setting time : 1 to 99 min

### Digital outputs

*Number of output*

1 point

*Output*

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

### Communications with REX-B850

*Digital communications*

- Communication method : RS-422A (Exclusive cable connection)
- Communication speed : 2400, 4800, 9600 BPS
- Maximum connection : 16 units

### Communications with host computer

*Digital communications*

- Communication method : RS-232C, RS-422A, RS-485
- Communication speed : 2400, 4800, 9600 BPS
- Bit format
  - Start bit : 1
  - Data bit : 7 or 8
  - Parity bit : Without, Odd or Even
  - Stop bit : 1 or 2
- Communication code : ASCII(JIS) 7-bit code

### General specifications

*External dimensions (W x H x D)*

144 x 96 x 70mm

*Self-diagnostic function*

ROM check, RAM check, Backup RAM check, Watchdog timer

*Supply voltage*

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

*Power consumption*

Less than 14VA

*Environmental conditions*

0 to 40°C (32 to 104°F), 45 to 85% RH

*Memory backup*

Backed up by EEPROM.

*Net weight*

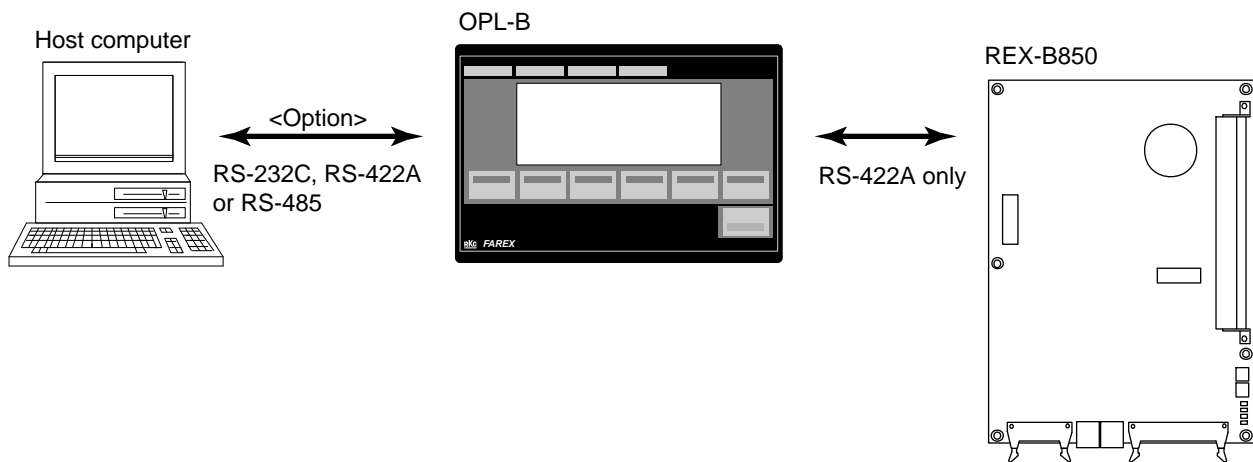
Approx. 700g

# Operation Panel for REX-B850 OPL-B

## Model and Suffix Code

Specifications	Model and Suffix Code	
Model	OPL	- B * <input type="checkbox"/>
Type	Blue mode LCD display for REX-B850	B <input type="checkbox"/>
Communications with host computer	Not supplied	N
	RS-232C	1
	RS-422A	4
	RS-485	5

## Communication



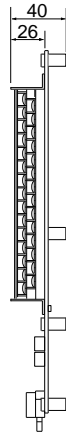
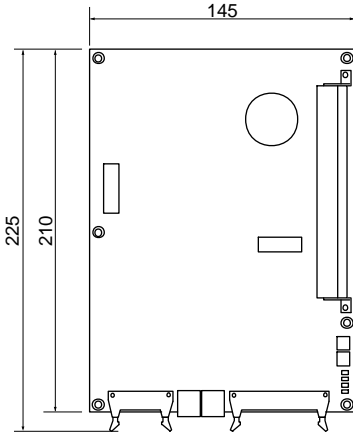
## Cables

Specifications	Model Code
OPL-B ↔ REX-B850	W-BF-02-3000 ( Length : 3 m )
OPL-B ↔ Host computer	W-BF-12-5000 ( Length : 5 m )

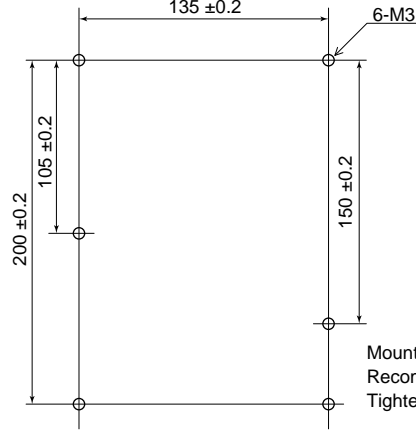


## External Dimensions

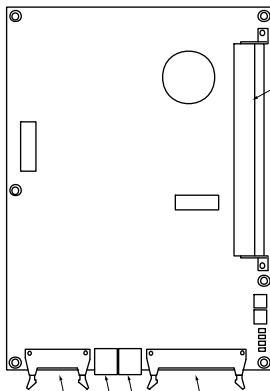
### REX-B850



#### Mounting dimensions



Mounting screw diameter : M3  
Recommended screw length : 20 mm or more  
Tightening torque : 3.5 to 5 kgf·cm



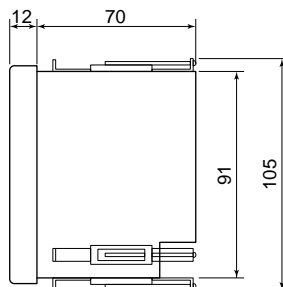
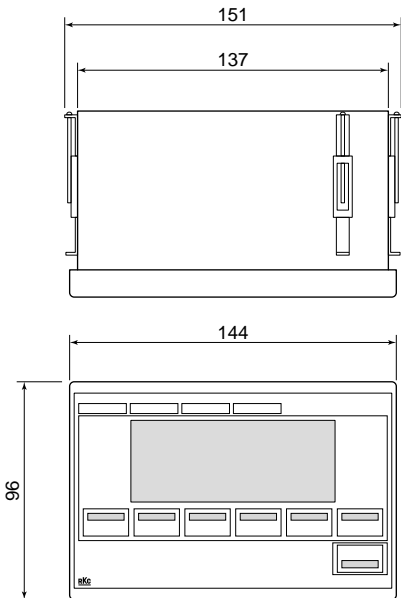
C D E F

- A : Temperature sensor input and power supply terminals
- B : Address switches
- C : Current Transformer input (CT) 16pin connector (AXM216011 : Matsushita Electric Works,Ltd)  
• Recommended connector : AXM1160215 (Matsushita Electric Works,Ltd)
- D : Communication interface modular connector (TM5RE3-66 : HIROSE Co.,Ltd)
- E : Multi-drop interface modular connector (TM5RE3-66 : HIROSE Co.,Ltd)
- F : Control output, Alarm output/FAIL output 26pin connector (AXM226011 : Matsushita Electric Works,Ltd)  
• Recommended connector : AXM1260215 (Matsushita Electric Works,Ltd)

Note : Connection cables and connectors should be prepared by customer.

- The connector and cable for CT connection should be prepared by customer.(Connector for CT)  
Recommended manufacturer : Matsushita Electric Works,Ltd.  
Model code : AXM116415
- The cable and connectors should be prepared by customer. (Connector for communication)  
Recommended manufacturer : Hirose Electric Co., Ltd.  
Model code : TM4P66P01-KSFN[ ] : Cable length  
The plug on one side, and bare wire or spade lug on the other side

### OPL-B



#### Panel cutout

