



REX-F9000



General Description

The REX-F9000 is a high resolution temperature controller that has been specifically designed for applications where precise process control with three decimal places (0.001°C) is required.

This instrument is easy-to-use and offers versatile functions such as dual loop control, bar-graph display, autotuning, communications, analog outputs and contact inputs.

The REX-F9000 combines a wide range of features with optimum PID values for fast, accurate response to process changes for maximum control performance.

Features

- ☆ High resolution
- ☆ High accuracy
- ☆ Power feed forward function
- ☆ 2-channel control
- ☆ Brilliant PID

High accuracy

Primary industrial applications are semiconductor equipment and laboratory equipment or anywhere that extremely accurate temperature is required.

±0.05°C

High resolution

REX-F9000 has a high resolution of 0.001°C over an input range of 0.000 to 50.000°C.

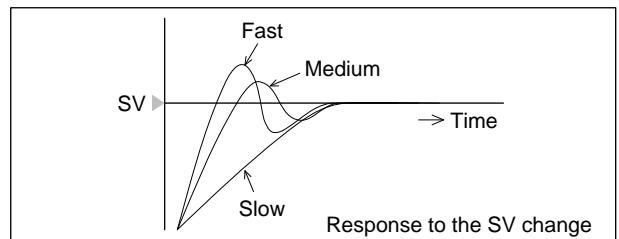
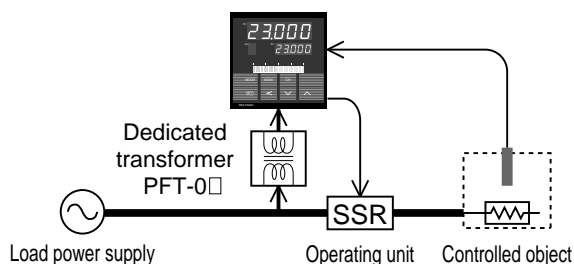
0.001°C

Brilliant PID

The Brilliant PID combines stable control with quick response. On the conventional PID control, there is a conflict between control stability and quick response; response to set point change might be compromised when stability is improved, and stability might be compromised when quick response to SV change is achieved. The Brilliant PID retains optimum PID values for stability while you can choose control response types among "Fast", "Medium", and "Slow". Please set "Fast" type when quick response is necessary. "Slow" type is appropriate to avoid overshooting.

Power feed forward function

The REX-F9000 constantly monitors the electrical load through a dedicated transformer. It then adjusts PID outputs relative to power supply fluctuations to prevent sudden load output changes to the electrical heating elements.



2-channel control

REX-F9000 is able to select 2-channel control specification with high accuracy, high resolution temperature controller.

Digital Temperature Controller REX-F9000

Specifications

Inputs

Number of inputs
1 or 2 points

Input

- RTD : Pt100 (JIS/IEC), JPt100 (JIS)
- 3 or 4 wire system
 - Influence of input lead resistance : Less than 0.04°C (Less than 10Ω per wire)
 - Input break action : Up-scale
 - Input short action : Down-scale

Input range

0.000 to 50.000°C

Sampling time

0.1 sec

PV bias

-19.999 to 19.999°C

Digital filter

0.1 to 100.0 sec (No filter when 0.0 is set)

Performance

Setting accuracy

- a) Temperature : ±0.05°C
- b) Other setting : Within ±0.1% of setting range

Measuring accuracy

±0.05°C (Ambient temperature 23°C ±5°C)

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

Brilliant PID control with autotuning
•Direct / Reverse action (Selectable)

Major setting range

Set value : 0.000 to 50.000°C
Proportional band : 0.001 to 50.000°C
Integral time : 0.1 to 3600.0 sec. (Zero is not settable)
Derivative time : 0.1 to 3600.0 sec. (PI action when D=0)
Control response : 0 (Slow), 1 (Medium), 2 (Fast)
Proportional cycle : 0.1 to 100.0 sec. (Only voltage pulse output)

Control output

Voltage pulse output : 0/12V DC
(Load resistance : More than 600Ω)
4 to 20mA DC
(Load resistance : Less than 600Ω)
• Output resolution : More than 13 bits
• Output impedance : More than 5MΩ

Alarm

Temperature alarm

- a) Number of alarms : 2 points / channel
- b) Type : Deviation High, Low, High/Low, Band Process High, Low Set value High, Low
- c) Setting range : Deviation and band alarm : -19.999 to 19.999°C (Action is not guaranteed in the case of an alarm setting that is outside of the input range.) Process alarm : 0.000 to 50.000°C
- d) Alarm differential gap : 0.000 to 5.000°C
- e) Alarm timer : 0 to 600 sec.

Alarm output

Relay output, Form A contact 250V AC 1A (resistive load)
Energized or de-energized output

Communications

Communication method : RS-485 (2-wire)

Communication speed : 1200, 2400, 4800, 9600, 19200 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

Maximum connection : 31 (Address can be set from 0 to 99.)

Contact input

Number of input : 1 point

Type : RUN/STOP

Input rating : Non-voltage contact input
a) OPEN : 500kΩ or more
b) CLOSE : 10Ω or less

Analog output

(Optional)

Number of outputs : 1 point / channel

Output types : a) Measured value (PV)
b) Deviation (DV)
c) Set value (SV)
d) Manipulated output value (MV)

Output scaling : High limit and low limit are available.

Output resolution : 13 bits or more

Output accuracy : 0.1% of span

Output ripple : 0.1% of span (When resistive load)

NO	Output signal	Output impedance	Allowable load resistance
4	0 - 5 V	Less than 0.1Ω	More than 1kΩ
6	1 - 5 V	Less than 0.1Ω	More than 1kΩ
7	0 - 20mA	Less than 5MΩ	Less than 600Ω
8	4 - 20mA	Less than 5MΩ	Less than 600Ω

Waterproof and dustproof

IP54

•Waterproof and dustproof protection are only effective from the front of a unit when installed on a panel.

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 13VA for standard AC type (at 100V AC)
Less than 19VA for standard AC type (at 240V AC)
Less than 11VA for 24V AC type
Less than 340mA for 24V DC type

Effect by power failure

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

FAIL output

- a) Check item : MCU trouble, MCU supply voltage trouble, watchdog timer, EEPROM error, input circuit trouble, adjustment error, sensor break
- b) Output : Relay output, Form A contact 250V AC 1A (resistive load) Abnormal time open.

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

Memory backup : Backed up by non-volatile memory.

Net weight

Approx. 530g

External Dimensions (W x H x D)

96 x 96 x 100mm

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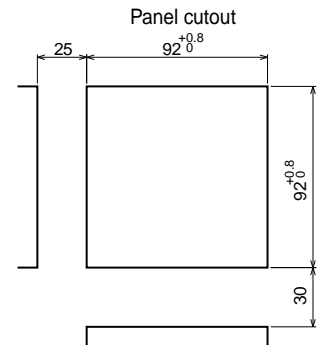
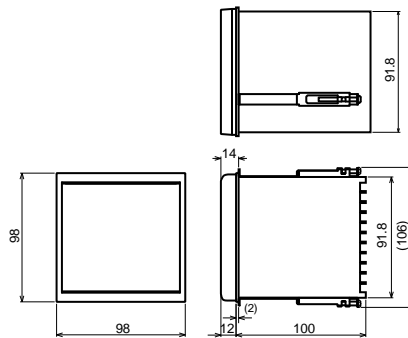
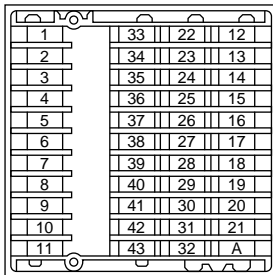
Model and Suffix Code

Specifications	Model and Suffix Code	
Model	F9000	— □ □ □ — □ * □ □ / □
Type	1 channel type 2 channels type	1 2
Control output (CH1)	Voltage pulse output Current output	V 8
Control output (CH2)	Not supplied (1channel type) Voltage pulse output Current output	N V 8
Power supply	24V AC/DC 100 to 240V AC	3 4
Analog output (CH1)	Not supplied 0 to 5V DC 1 to 5V DC 0 to 20mA DC 4 to 20mA DC	N 4 6 7 8
Analog output (CH2)	Not supplied 0 to 5V DC 1 to 5V DC 0 to 20mA DC 4 to 20mA DC	N 4 6 7 8
Power feedback transformer *1	Not supplied Load power supply 100V (100 to 120V AC) Load power supply 200V (200 to 240V AC)	N 1 2

*1 : (N) is selected for replacement of F9000 only.
When ordering transformer for replacement, please specify one of the following model codes.
100 to 120V AC type : **PFT-01**
200 to 240V AC type : **PFT-02**

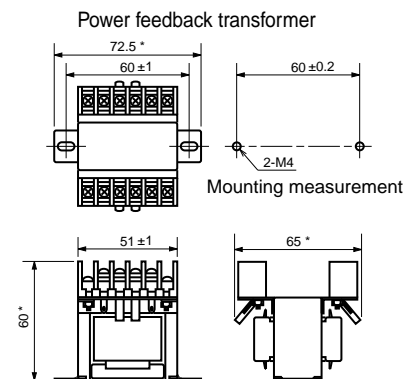
External Dimensions and Rear Terminals

Unit : mm



No.	Description	
1	Ground	Ground
2	AC 100 to 240V	AC DC +
3	AC 24V DC -	Power Supply
4	NO FAIL	FAIL Output
5	DI RUN/STOP	Digital Input
6	SG	Communications
7	RS-485	
8	T/R(A)	Feedback Transformer Input
9	T/R(B)	
10		
11		

No.	Description	
22	12 +	Control Output
23	13 -	
24	14	Alarm Output
25	15 NO	
26	16 NO	
27	17	Measured Input
28	18	
29	19 A'	
30	20 A	
31	21 B	RTD
32	22 B	



* Maximum

No.	Description	
40	AO +	Analog Output
41	AO - For channel 1	
42	AO +	Analog Output
43	AO - For channel 2	