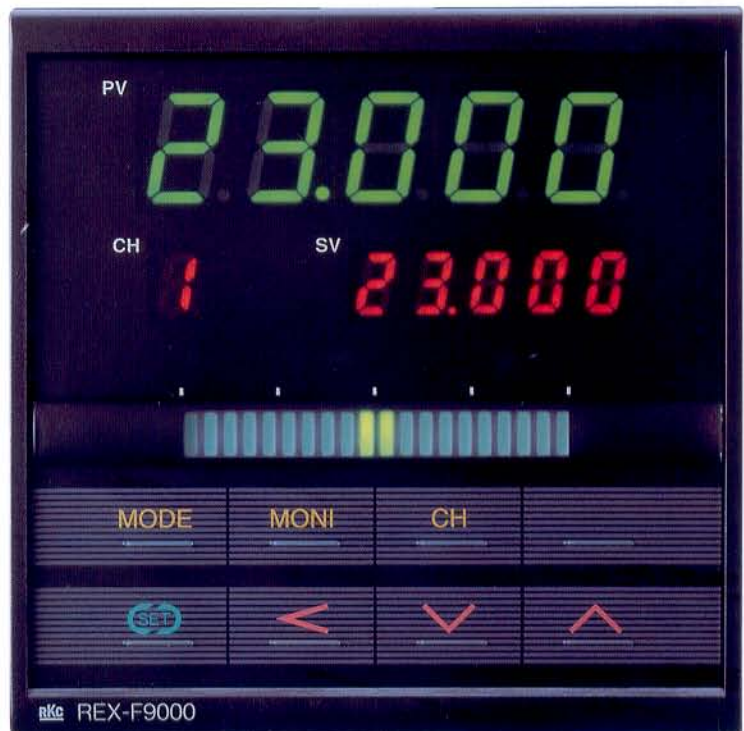


CONTROLLER

REX-F9000

High Resolution Digital Controller



Actual Size



RKC® RKC INSTRUMENT INC.

REX-F9000

High resolution, precise temperature control

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.



1 channel

2 channels

High Accuracy

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

$\pm 0.05^\circ\text{C}$

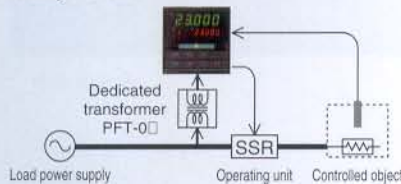
High Resolution

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

0.001°C

Power Feed Forward Function

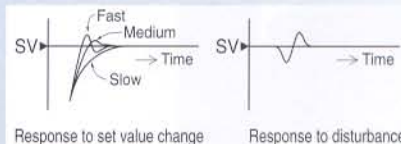
The REX-F9000 constantly monitors the electrical load through a dedicated transformer. It then adjusts PID outputs relative to power supply fluctuations to prevent sudden load output changes to the electrical heating elements.



High Stability

Brilliant PID

The Brilliant PID control allows three response types to a set point change: Fast, Medium and Slow while keeping the optimum PID constant for process stability.



★ Applications ★

Semiconductor Manufacturing Equipment

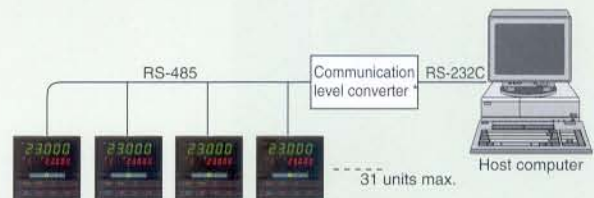
In the semiconductor manufacturing process, an aligner requires advanced temperature control. The REX-F9000 with the capability of extremely high accuracy, resolution and stability is most suitable for the temperature control of the stepper.

For various type of experiments

Temperature stability in laboratory conditions is indispensable for accurate experiments. The REX-F9000 has been designed to provide the highest level of accuracy and stability under these conditions.

Communication functions

The REX-F9000 has RS-485 communications and can be connected to a host computer with multi-drop connection. Up to 31 REX-F9000s can be connected to a host computer for single location accessibility. The REX-F9000 is also compatible with ladder communication protocol for direct communication with a PLC.



* Recommended product: CD485/V-F
(Manufactured by DATA LINK CO., LTD)

Specifications

Input

Number of inputs	1 or 2 points
Input	RTD * : Pt100(JIS/IEC), JPt100(JIS) * 3 or 4 wire system
Input range	0.000 - 50.000°C
Sampling time	0.1 sec
Influence of input lead	Less than 0.04°C (Less than 10Ω per wire)
Action at input break	Up scale
Action at input short circuit	Down scale
PV bias	-19.999 - 19.999°C
Digital filter	0.1 - 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
Input display accuracy	±0.05°C (Ambient temperature 23°C ±5°C)
Insulation resistance	More than 20MΩ (500V DC) between measured and ground terminal More than 20MΩ (500V DC) between power and ground terminal
Withstand voltage	1000V AC for one minute between measured and ground terminal 1500V AC for one minute between power and ground terminal 2300V AC for one minute between power and measured terminal

Control

Control method	Brilliant PID control with autotuning Direct/Reverse action (Selectable)
Control computing cycle	0.1 sec
Setting range	a) Set value (SV) : 0.000-50.000°C b) Proportional band : 0.001-50.000°C c) Integral time : 0.1-3600.0 sec d) Derivative time : 0.1-3600.0 sec (PI action when 0 is set) e) Control response parameter : 0 (Slow), 1 (Medium), 2 (Fast) f) Proportional cycle : 0.1-100.0 sec (Only voltage pulse output)
Control output	a) Voltage pulse output : 0/12V DC (Load resistance : More than 600Ω) b) Current output : 4-20mA DC (Load resistance : Less than 600Ω) Output resolution : More than 13 bit Output impedance : More than 5 MΩ
Output limiter	Possible high and low limit set up.

Alarm Output

Number of alarms	2 points/channel
Alarm types	a) Deviation high alarm b) Deviation low alarm c) Deviation high / low alarm d) Band alarm e) Process high alarm f) Process low alarm (Hold action can be programmed on all the above.) g) Set value high alarm h) Set value low alarm
Setting range	a) Deviation and band alarm : -19.999-19.999°C (Action is not guaranteed in the case of an alarm setting that is outside of the input range.) b) Process alarm : 0.000-50.000°C
Differential gap	0.000-5.000°C
Alarm timer	0-600 sec
Alarm method	Energized or de-energized output
Output	Relay contact output 250V AC 1A (Resistive load) Form a

Digital Communications

Communication standard	RS-485 Conformity (2-wire)
Protocol	ANSI X3.28 (1976) 2.5 A4 or ladder communication
Communication method	Half-duplex multidrop connection
Synchronous method	Asynchronous method
Communication speed	1200BPS, 2400BPS, 4800BPS, 9600BPS, 19200BPS (Selectable)
Bit configuration	a) Start bit : 1 b) Data bit : 7 or 8 c) Parity bit : odd, even or without d) Stop bit : 1 or 2 (b-d selectable)
Maximum connection	32 (Address can be set from 0 to 99.)

Contact Input

Number of points	1 point
Contact input type	RUN/STOP
Input rating	Non voltage contact input a) OPEN : 500kΩ or more b) CLOSE : 10Ω or less

Analog Output (Option)

Number of points	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 bit 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

General Specifications

Dustproof and waterproof protection	IP54 (Dustproof and waterproof protection are only effective from the front of a unit when installed on a panel.)
Supply voltage	a) AC type: 85 to 264V AC (50/60Hz) Including power voltage fluctuation (100 to 240V AC rating) b) 24V AC type: 21.6 to 26.4V AC Including power voltage fluctuation (24V AC rating) c) 24V DC type: 21.6 to 26.4V DC Including power voltage fluctuation (24V DC rating)
Power consumption	a) AC type: Less than 13 VA (at 100V AC) Less than 19 VA (at 240V AC) b) 24V AC type: Less than 11 VA c) 24V DC type: Less than 340 mA
Momentary power failure	Not affected by power failure less than 20 msec.
Memory backup	Backed up by non-volatile memory. Date retaining period : Approx 10 years
FAIL output	Check item: MCU trouble, MCU supply voltage trouble, watchdog timer, EEPROM error, input circuit trouble, adjustment error, sensor break Output: Relay contact output 250V AC 1A Form 1a (Resistive Load) Abnormal time open Display: FAIL - LED light on.
Ambient temperature	0 to 50°C
Ambient humidity	45 to 85% RH Non-condensing
Net weight	Approx. 530 g
External dimensions	96 x 96 x 100 mm (W x H x D)
Environment	Should be free of corrosive and flammable gas and dust.
Other conditions	Free from external noise, vibration, shock and exposure to direct sunlight.

Compliance with Standards

CE Marked
UL Recognized
CSA Certified

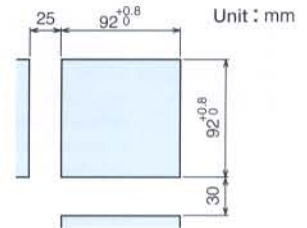
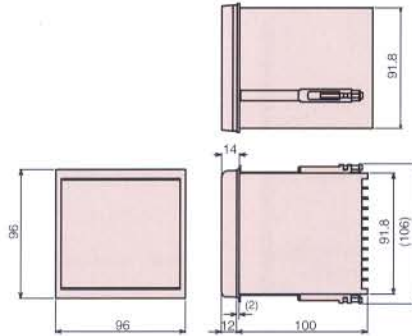
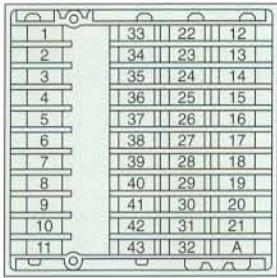


Model and Suffix Code

Specifications	Model and Suffix Code								
	F9000	—	□	□	□	—	□	* □	□ / □
Type	1 channel type 2 channel 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 *	Not supplied Load power supply 100V (100 to 120V AC) Load power supply 200V (260 to 240V AC)	..... ..... .....						N 1 2	

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

Rear terminal, external and panel cutout dimensions

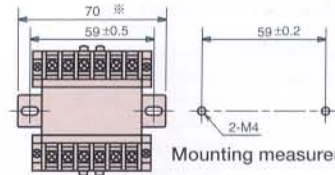


No.	Description	
1	Ground	Ground
2	AC 100 to 240V	AC 24V +
3	DC 24V	DC 24V -
4	NO	FAIL
5	DI	RUN/STOP
6	SG	RS-485
7	T/R(A)	RS-485
8	T/R(B)	RS-485
9		Power Feedback Transformer Input
10		
11		

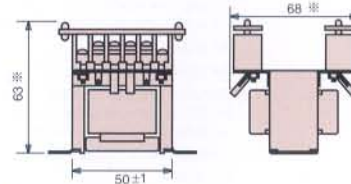
No.	Description	
22	12	Control Output
23	13	Control Output
24	14	Alarm Output
25	15	Alarm Output
26	16	Alarm Output
27	17	Measured Input
28	18	Measured Input
29	19	Measured Input
30	20	Measured Input
31	21	Measured Input
32	22	Measured Input

No.	Description	
40	AO	For channe 1
41	AO	For channe 1
42	AO	For channe 2
43	AO	For channe 2

Power feedback transformer



Mounting measurement



※ Maximum



- Before operating this product, read the instruction manual carefully to avoid incorrect operation.
- This product is intended for use with industrial machines, equipment test and measuring equipment. It is not designed for use with medical equipment.
- If it is possible that an accident may occur as a result of the failure of the product or some other abnormality, an appropriate independent protection device must be installed.
- When installing this product, avoid the following:
 - Direct exposure to sunlight.

- Ambient temperature lower than 0°C or higher than 50°C.
- Areas subject to high humidity. Ambient humidity should not be lower than 45% or higher than 85%RH.
- Direct contact with water.
- Corrosive environments.
- Hazardous areas containing explosive or flammable gases.
- Vibration or shock.
- Areas subject to electrical noise caused by inductive interference, static electricity or magnetic fields.

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