

# 72mm SQUARE DIN SIZE

C-1800-E2

○ Single Loop DDC Controller

○ Digital Setting Digital Indicating Temperature Controller

■ REX-C72F PID action(with autotuning function)

■ MF-72A ON/OFF action

■ MF-72B Proportional action

# REX-C72 SERIES

# MF-72 SERIES

*A compact device provides optimum control  
by PID constant autotuning, Model REX-C72*



## ■ FEATURES

### REX-C72

- 72-mm square DIN-sized controller with standard auto tuning function, available for the first supply to the market.
- Front-flat keys are effective in preventing electrostatic noise.
- Thermocouple type (K or J) can be selected by internal selector.
- Internal switch provides direct or reverse action.
- Selection between °C/°F.
- Double structured error-safe system.
- Dust inhibiting flat front panel.

### MF-72

- 72-mm square DIN-sized controller uses digital setting and digital display.
- Large easy-to-read digital display.

## ■ APPLICATION

Electric heaters for bagging and packing machines, drying oven, scientific instruments, plastic molding machines.

# **RKC** RKC INSTRUMENT INC.

# REX-C72

## COMPONENT NAMES



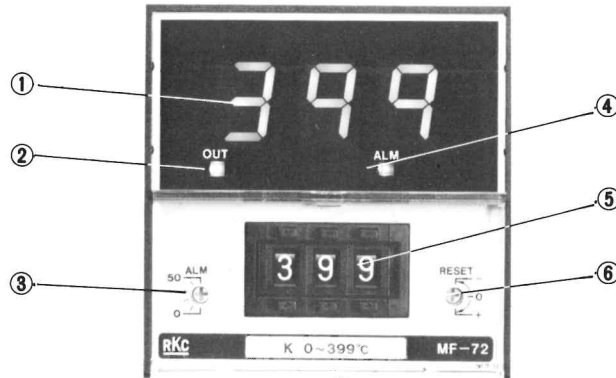
- ① Auto tuning indicator
- ② Control output action indicating lamp (green)
- ③ Alarm output action indicating lamp (red)
- ④ Keypad
- ⑤ Measured value (PV) display
- ⑥ Set-point (SV) display

## STANDARD SPECIFICATIONS

<b>Input</b>	<p>: Thermocouple types K, J, T, R, S, E and B (ANSI/JIS) N, PLII (NBS), W5Re/W26Re (Hoskins) [Only instruments with input types K and J have built-in input selector function as standard.]</p> <p>External resistance effect; Approx. <math>0.2\mu\text{V}/\Omega</math> (Calculate the effect depending on input types.)</p> <p>RTD; Pt100<math>\Omega</math> (DIN/JIS) three-wire system Input conductor resistance effect; Approx. <math>0.02^\circ\text{C}/\Omega</math> (per wire) or less (However, input conductor resistance needs not to be adjusted up to <math>10\Omega</math> per wire.)</p> <p>DC voltage; 0 to 10mV, 0 to 100mV (Input impedance <math>1\text{M}\Omega</math>) 0 to 1V, 0 to 5V and 1 to 5V (Input impedance <math>1\text{M}\Omega</math>)</p> <p>DC current; 4 to 20mA (input impedance <math>250\Omega</math>) *Standard range of DC voltage and current inputs is 0.0 to 100.0 (%). However, for ranges other than the above, contact us.</p>	<p>Voltage/current input; Within <math>\pm 0.3\%</math> of full span. Proportional band and ARW; <math>\pm(0.3\%</math> of set value + 1 digit) Integral and derivative times and cycle; <math>\pm 0.3\%</math> of set value Alarm setting; <math>\pm(0.3\%</math> of set value + 1 digit) : <math>1^\circ\text{C}</math> (<math>1^\circ\text{F}</math>), <math>0.1^\circ\text{C}</math> (<math>0.1^\circ\text{F}</math>) or 1 sec. : Digital, 7-segment, LED, 4- or 3-digit numerics (Red or green. See model and suffix code list.)</p> <p>Setting resolution Measured value (PV) display</p> <p>Display range : See standard ranges.</p> <p>Display accuracy : Thermocouple input; <math>\pm(0.3\%</math> of display value + 1 digit) or <math>\pm 2^\circ\text{C}</math> (<math>\pm 4^\circ\text{F}</math>), whichever is larger. Input R, S 0 to <math>199^\circ\text{C}</math> (0 to <math>399^\circ\text{F}</math>); <math>\pm 4^\circ\text{C}</math> (<math>\pm 8^\circ\text{F}</math>) 200 to <math>1600^\circ\text{C}</math> (400 to <math>3200^\circ\text{F}</math>); <math>\pm(0.3\%</math> of the display value + 1 digit) or <math>\pm 2^\circ\text{C}</math> (<math>\pm 4^\circ\text{F}</math>), whichever is larger. Input B 0 to <math>399^\circ\text{C}</math>; Out of accuracy guaranteed range 400 to <math>1800^\circ\text{C}</math>; <math>\pm(0.3\%</math> of display value + 1 digit) or <math>\pm 2^\circ\text{C}</math> RTD input; <math>\pm(0.3\%</math> of display value + 1 digit) or <math>\pm 0.8^\circ\text{C}</math> (<math>\pm 1.6^\circ\text{F}</math>), whichever is larger.</p>
<b>Operation at burnout</b>	<p>: Thermocouple, RTD, 0~10mV and 0~100mV inputs; Up scale ("u" appears on the PV display highest digit.)</p>	<p>Display resolution : PV value . . . <math>1^\circ\text{C}</math> (<math>1^\circ\text{F}</math>), <math>0.1^\circ\text{C}</math> (<math>0.1^\circ\text{F}</math>) SV value . . . <math>1^\circ\text{C}</math> (<math>1^\circ\text{F}</math>), <math>0.1^\circ\text{C}</math> (<math>0.1^\circ\text{F}</math>) or 1 sec.</p>
<b>Setting method</b>	<p>: Voltage/current input; Down scale : By keypad (Data lock switch and hidden keys are incorporated as standard.)</p>	<b>Control action</b> : See model and suffix code list.
<b>Setting display</b>	<p>: Digital, 7-segment, LED, 4-digit numerics (Red or orange. See model and suffix code list.) The following SV characters appear digit by digit on LED. Blank: Main setting H : Upper-limit alarm setting L : Lower-limit alarm setting P : Proportional band R : Anti-reset windup (ARW) I : Integral time D : Derivative time C : Cycle Zero suppression function available.</p>	<b>Set value storage</b> : Set values are stored in non-volatile memory during power-OFF and reset automatically when the power is turned ON. <b>Alarm action</b> : See model and suffix code list. <b>Output</b> : Control output; See model and suffix code list. Alarm output; Relay contact 250V AC, 2A (resistive load)
<b>Setting range</b>	<p>: See standard ranges.</p>	<b>Power supply voltage</b> : 100/110V AC and 200/220V AC or 110/120V AC and 220/240V AC (Common to 50/60 Hz)
<b>Setting accuracy</b>	<p>: Thermocouple input; <math>\pm(0.3\%</math> of set value + 1 digit) or <math>\pm 2^\circ\text{C}</math> (<math>\pm 4^\circ\text{F}</math>), whichever is larger. Input R, S 0 to <math>199^\circ\text{C}</math> (0 to <math>399^\circ\text{F}</math>); <math>\pm 4^\circ\text{C}</math> (<math>\pm 8^\circ\text{F}</math>) 200 to <math>1600^\circ\text{C}</math> (400~<math>3200^\circ\text{F}</math>); <math>\pm(0.3\%</math> of set value + 1 digit) or <math>\pm 2^\circ\text{C}</math> (<math>\pm 4^\circ\text{F}</math>), whichever is larger. Input B 0 to <math>399^\circ\text{C}</math>; Out of accuracy guaranteed range 400 to <math>1800^\circ\text{C}</math>; <math>\pm(0.3\%</math> of set value + 1 digit) or <math>\pm 2^\circ\text{C}</math> RTD input; <math>\pm(0.3\%</math> of set value + 1 digit) or <math>\pm 0.8^\circ\text{C}</math> (<math>\pm 1.6^\circ\text{F}</math>), whichever is larger.</p>	<b>Allowable voltage variations</b> : Within $\pm 10\%$ of rated voltage <b>Allowable ambient temperature</b> : 0 to $50^\circ\text{C}$ (32 to $122^\circ\text{F}$ ) <b>Relative humidity</b> : 45 to 85% RH <b>Power consumption</b> : 5 VA or less <b>Weight</b> : Approx. 0.55kg (1.2 lb) <b>Dimensions</b> : 72 x 72 x 130mm (H x W x D) (2.83 x 2.83 x 5.12 inches)

# MF-72

## COMPONENT NAMES



- ① Measured value (PV) display
- ② Control output action indicating lamp (green)
- ③ Alarm setter
- ④ Alarm output action indicating lamp (red)
- ⑤ Set value (SV) setter
- ⑥ Manual reset

## STANDARD SPECIFICATIONS

<b>Input</b>	: Thermocouple types K, J, E, R and S (ANSI/JIS) and N (NBS) Allowable external resistance needs not to be adjusted up to 100Ω. RTD Pt 100Ω (DIN/JIS) three-wire system Input conductor resistance needs not to be adjusted up to 10Ω per wire.	<b>Display accuracy</b>	: Within ±(0.3% of full scale +1 digit) (However, for ±99.9°C; ±(0.3% of full span +1 digit))
<b>Operation at burnout</b>	: Up scale	<b>Display resolution</b>	: 1°C (1°F) or 0.1°C
<b>Setting method</b>	: By digital switch on the front	<b>Control action</b>	: See model and suffix code list.
<b>Setting range</b>	: See standard ranges.	<b>Alarm action</b>	: See model and suffix code list.
<b>Setting accuracy</b>	: Within ±0.5% of full scale (However, for ±99.9°C; ±0.5% of full span)	<b>Output</b>	: Control output; See model and suffix code list. Alarm output; Relay contact 250V AC, 2A (resistive load) 1 "A" contact
<b>Setting resolution</b>	: 1°C (1°F) or 0.1°C	<b>Power supply voltage</b>	: 100/110V AC and 200/220V AC or 110/120V AC and 220/240V AC (common to 50/60 Hz)
<b>Measured value (PV) display</b>	: Digital, 7-segment LED, 4-, 3½- or 3-digit numerics (Red or green. See model and suffix code list.) Display flashes for an input less than -0°C (except for ±99.9°C) Zero suppression function available.	<b>Allowable voltage variations</b>	: Within ±10% of rated voltage
<b>Display range</b>	: See standard ranges.	<b>Allowable ambient temperature</b>	: 0 to 50°C (32 to 122°F)
		<b>Relative humidity</b>	: 45 to 85% RH
		<b>Power consumption</b>	: 4VA or less
		<b>Weight</b>	: Approx. 0.5kg (1.1 lb)
		<b>Dimensions</b>	: 72 x 72 x 130mm (H x W x D) (2.83 x 2.83 x 5.12 inches)

# REX-C72

## MODEL AND SUFFIX CODE

Model code	Suffix code	Description
REX-C72	F □ □ -□ □ □	72mm square DIN-sized single loop DDC controller
Control action	F	PID action with auto tuning function Proportional band (P): Within main setting range (ON/OFF action at P=0) Integral time (I): 1 to 3600 sec. (Integral action OFF at I=0) Derivative time (D): 1 to 3600 sec. (Derivative action OFF at D=0) Cycle (T): 1 to 99 sec. Anti-reset windup (ARW): Within main setting range
Alarm action * (ON/OFF action) Relay contact output 250V AC, 2A Resistive load (1 "A" contact)	1 2 3 4 32	No alarm action provided. Upper-limit deviation setting (Direct action): Within plus side deviation setting range from main setting Lower-limit deviation setting (Reverse action): Within minus side deviation setting range from main setting Upper-and lower limit independent deviation setting (Direct/reverse action), common output: Within plus and minus side deviation setting ranges from main setting Upper-and lower limit independent deviation setting (Direct/reverse action), independent output: Within plus and minus side deviation setting ranges from main setting
Input	C R V I	Thermocouple types K, J, T, R, S, B, E, N, PLII W5Re/W26Re RTD Pt100Ω three-wire system DC voltage: 0 to 10mV, 0 to 100mV (input impedance 1MΩ) 0 to 1V, 0 to 5V, 0 to 10V, 1 to 5V (input impedance 1MΩ) DC current: 4 to 20mA (input impedance 250Ω)
Output	M V R	Relay contact output: 250V AC, 3A (Resistive load, 1 "C" contact) SSR drive output: 0/12V DC (Load resistance, 800Ω or more) Current output: 4 to 20mA DC (Load resistance, 600Ω or less)
Hold function	No mark H	No hold function With hold function
LED numeric color	*R *G	Setting (red) and measured value (red) Set values (orange) and measured value (green)

## STANDARD RANGES (SETTING AND DISPLAY)

	Input	Ranges
Thermocouple	ANSI/JIS K	0~400°C, 0~800°C, 0~1200°C, 0~1200°C, 0~800°F, 0~1600°F, 0~2500°F
	ANSI/JIS J	0~400°C, 0~800°C, 0~1000°C, 0~800°F, 0~1600°F
	ANSI/JIS R, S	0~1600°C, 0~3200°F
	ANSI/JIS T	-200.0~+350.0°C, -100.0~+200.0°C, 0.0~+350.0°C -200.0~+100.0°F, -100.0~+200.0°F, -100.0~+400.0°F, 0.0~450.0°F
	ANSI/JIS B	400~1800°C
	ANSI/JIS E	0~800°C, 0~1600°F
	NBS N	0~1200°C, 0~2300°F
	NBS PLII	0~1200°C, 0~2300°F
	HOSKINS W5Re/W26Re	0~2000°C
RTD Pt100	DIN/JIS	-200.0~+200.0°C, -100.0~+50.0°C, -100.0~100.0°C, -100.0~+200.0°C 0.0~50.0°C, 0.0~100.0°C, 0.0~200.0°C, 0.0~300.0°C, 0.0~500.0°C
	DIN (Convert from °C)	-200.0~+200.0°F, -200.0~+100.0°F, -100.0~+100.0°F, -100.0~+300.0°F, -100.0~+500.0°F, 0.0~500.0°F
DC voltage	0 ~ 10mV	0.0 ~ 100.0%  * However, for ranges other than the above, please contact us.
	0 ~ 100mV	
	0 ~ 1 V	
	0 ~ 5 V	
	0 ~ 10 V	
	1 ~ 5 V	
DC current	4 ~ 20mA	

# MF-72

## MODEL AND SUFFIX CODE

Model code	Suffix code					Description
MF-72	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	72mm square DIN-sized digital setting digital display temperature controller
Control action	A					ON/OFF action: Hysteresis width depends on range. Proportional action: Proportional band depends on range. Manual reset function available.
	B					
Alarm action (ON/OFF action) Relay contact output 250V AC, 2A Resistive load (1 "a" contact)	1					No alarm action provided.
	2					Upper-limit deviation setting (Direct action): Plus side deviation setting from main setting.
	3					Lower-limit deviation setting (Reverse action): Minus side deviation setting from main setting.
	4					Upper-and lower-limit common deviation setting (Direct/reverse action), common relay, common output: Plus and minus side deviation settings from main setting.
	40					Upper-and lower-limit deviation range setting: Plus and minus side deviation settings from main setting.
	7					Lower-limit deviation setting (Direct action): Minus side deviation setting from main setting.
	8					Upper-limit deviation setting (Reverse action): Plus side deviation setting from main setting
Input	C					Thermocouple types K, J, E, R and S (ANSI/JIS) and N (NBS) RTD Pt100Ω (DIN/JIS) three-wire system
	R					
Output	M					Relay contact output: 250V AC, 3A (Resistive load) 1 "C" contact Cycle . . . 20 sec.
	V					SSR drive output: 0/12V DC (Load resistance 800Ω or more) Cycle . . . 2 sec.
	R					Current output: 4 to 20mA DC (Load resistance 600Ω or less)
Hold function	No mark					No hold function
	H					With hold function (Alarm output is suspended until the input exceeds the alarm set point initially.)
LED numeric color				*R		Red
				*G		Green

The alarm hold function can be added to alarm action (4). (Please specify.)

## STANDARD RANGES (SETTING AND DISPLAY)

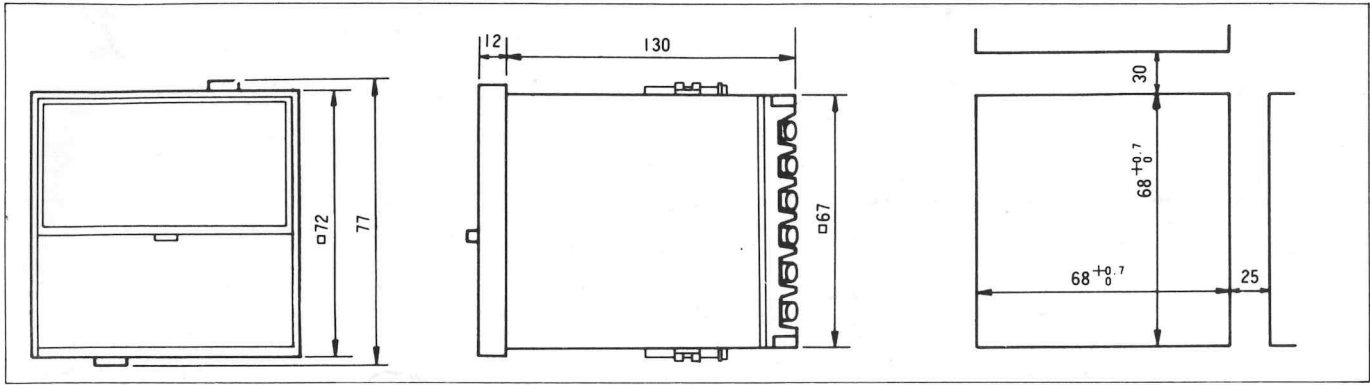
Input		Range	Alarm action*1 setting range	Hysteresis width (ON/OFF action)	Proportional band (Propor- tional action)	Hysteresis width (Alarm action)
Thermocouple	ANSI/JIS K, J	0~ 399°C, 0~799°C	0~□ 50°C	1.2°C	12°C	Within 2°C
	ANSI/JIS E	0~ 799°C				
	ANSI/JIS K	0~1199°C *2				
	NBS N	0~1299°C *2	0~□100°C	2.4°C	24°C	Within 4°C
	ANSI/JIS R, S	600~1599°C *2				
	ANSI K, J	0~ 799°F	0~□ 50°F	1.2°F	12°F	Within 2°F
		0~1599°F *2				
		0~1499°F *2				
		ANSI E	0~1999°F	0~□100°F	2.4°F	24°F
0~2499°F *2						
ANSI K	800~3199°F *2	0~□200°F	4.8°F	48°F	Within 8°F	
RTD	DIN/JIS Pt100Ω	-99.9~ 99.9°C	0~□ 25°C	0.6°C	6°C	Within 1°C
		0~ 499°C	0~□ 50°C	1.2°C	12°C	Within 2°C

\*1 Signs entered into □ in the sub-setting range column are (+) for upper-limit setting, (-) for lower-limit setting and (±) for upper-and-lower limit setting depending on sub-action setting.

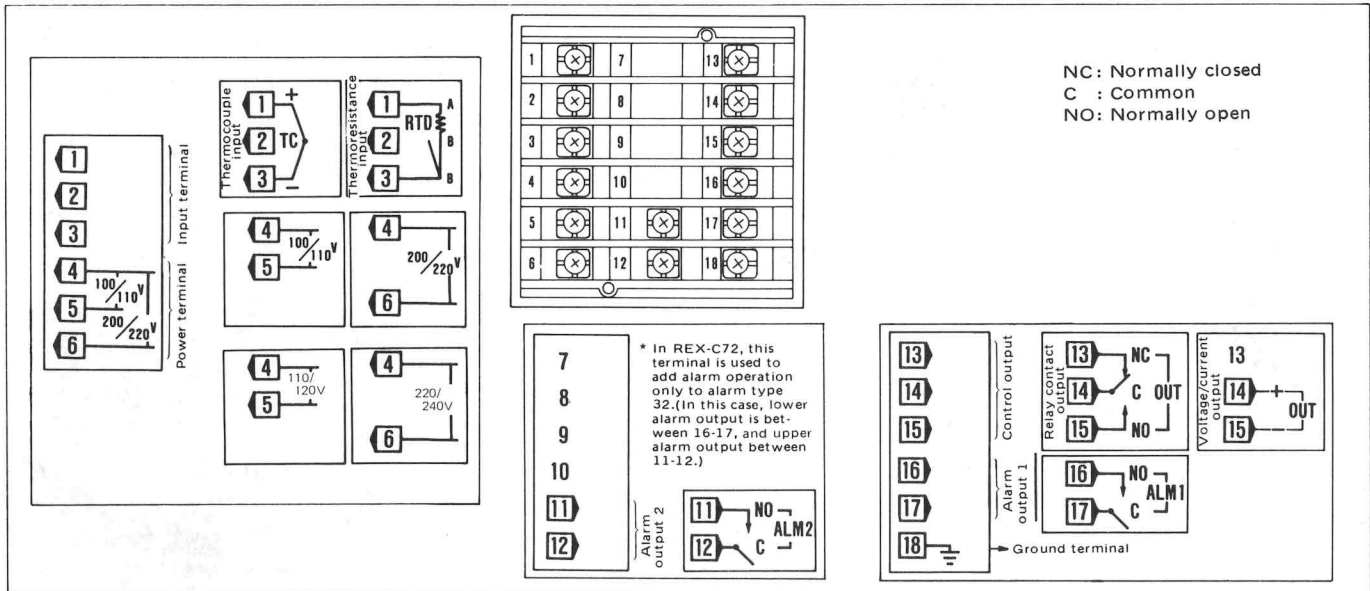
\*2 The setter rotates up to 1999, 2999 or 3999, but setting beyond the setting range may actuate the setting limiter.

## DIMENSIONS AND PANEL CUT

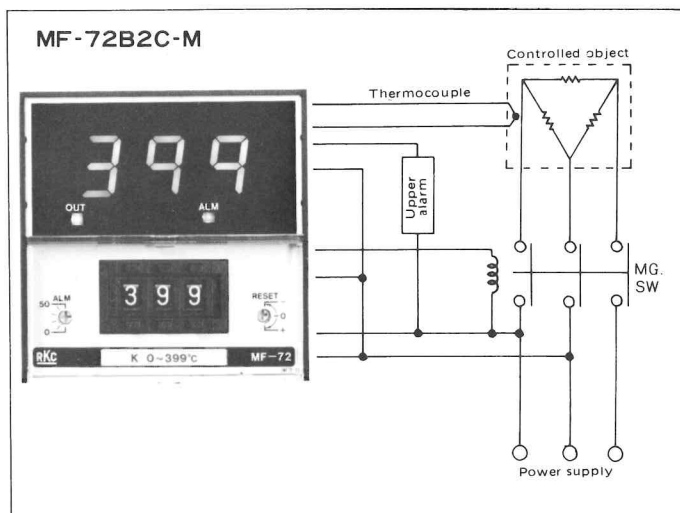
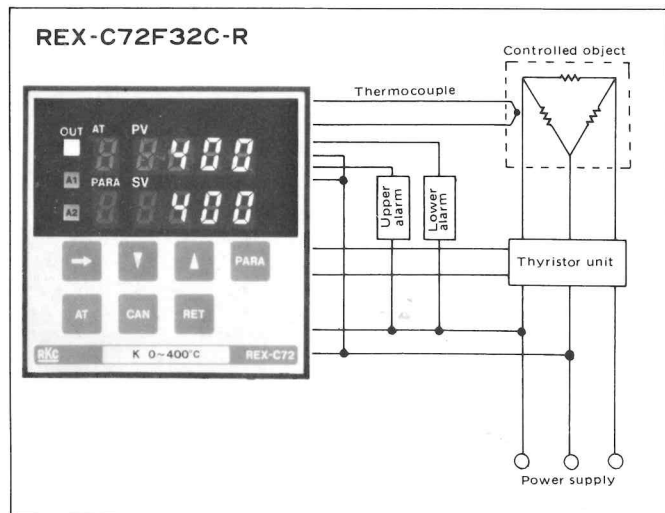
(Unit: mm)



## REAR SIDE TERMINALS



## EXTERNAL WIRING EXAMPLES



Subject to change without notice due to design changes.

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