



MULTI-CONTROLLER

MODEL SC-F70

MULTI-PURPOSE CONTROLLER WITH MC-COS CONTROL FEATURE

Benefits

Compact multi-purpose controller for a wide range of operations. Ideal for equipment automation and systems creation in many fields.

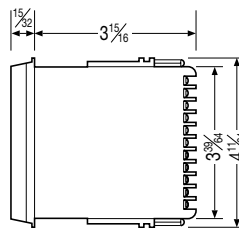
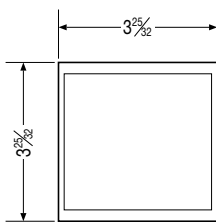
Allows pressure or temperature control when combined with automatic control valve [MC-COS(R)].
 Allows PID action with auto-tuning when combined with pneumatic control valve.
 Allows dual position (ON-OFF) control when combined with ON-OFF valve.

1. High measurement accuracy of 0.1% F.S.
2. Quick and easy to determine PID setting using auto-tune function for excellent stability and responsiveness. Overshoot prevention function.
3. Eight target settings can be stored in memory.
4. Up to 4 alarm outputs and 3 transmission outputs.
5. Measurement input area can accommodate various input signals.
6. Voltage: 100V - 240V AC.
7. Conforms with CE marking.

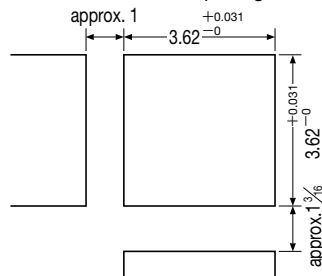


Dimensions

(in)



• Panel Cutout and Spacing



Wiring Terminals

No.	Function
1	Ground terminal
2	100-240V AC
3	Power terminals
4	AL1
5	AL2
6	Alarm 1/Alarm 2 output terminals
7	OUT1/AL3
8	Control output 1 or alarm output 3 terminals
9	
10	OUT1/AO3
11	Control output 1 or transmission output 3 terminals

No.	Function
33	R(A)
34	R(B)
35	T(A)
36	T(B)
37	SG
38	AO1
39	Transmission output 1 terminals
40	OUT2/AL4
41	Control output 2 or alarm output 4 terminals
42	OUT2/AO2
43	Control output 2 or transmission output 2 terminals

No.	Function
22	D11
23	COM (-)
24	Contact input terminals
25	D12
26	D13
27	D14
28	RSV
29	IN
30	RTD
31	TC
32	Input terminals

① Thermocouple input
 ② RTD input
 ③ Voltage input (LOW)
 ④ Voltage input (HIGH) or Current input
 ⑤ Current input and sensor power
 Output terminals
 ⑥ Sensor power

Specifications

		Thermocouple	RTD	DC Voltage (LOW)	DC Voltage (HIGH)	DC Current	
Measurement Input	Measurement Input Types *1	●K ●J ●E ●T ●U ●L	●Pt100 ●JPt100	●0 - 10mV ●0 - 100mV ●0 - 1V	●0 - 5V ●1 - 5V ●0 - 10V	●0 - 20mA ●4 - 20mA	
	Effects of Signal Resistance	approx. 0.2 $\mu\text{V}/\Omega$	—	—	—	—	
	Input Line Resistance	—	maximum 10 Ω	—	—	—	
	Allowable Input Voltage	—	—	within $\pm 4\text{V}$	within $\pm 12\text{V}$	—	
	Allowable Input Impedance	1M Ω minimum	—	approx. 1M Ω	approx. 1M Ω	approx. 250 Ω	
	Display during Input Disconnection	Upscale	Upscale	—	—	—	
	Display during Input Short-Circuit	—	Downscale	—	—	—	
Measurement Accuracy		$\pm (0.1\% \text{ F.S.} + 1 \text{ digit})$					
Cold Junction Compensation Error		approx. $\pm 1.0^\circ\text{C}$ [$^\circ\text{F}$] within range of 32 $^\circ\text{F}$ - 122 $^\circ\text{F}$					
Sampling Period		0.25 second					
Displays	Set and Measurement Values Display	4 digit 7 segment LED (orange)					
	Symbol Display	3 digit 7 segment LED (orange)					
	Operation Display	11 LED's indicate operating mode					
Setting Range (SV)		Same as measurement input ranges					
Settings	Setting Resolution	0.1 $^\circ\text{C}$ [$^\circ\text{F}$]	0.1 $^\circ\text{C}$ [$^\circ\text{F}$]	Depends on measurement input scaling			
	Memory Area Function	8 memory items					
	Analog Setting Input	Input Types	—	—	0 - 5V, 1 - 5V, 0 - 10V		0 - 20mA, 4 - 20mA
		Input Impedance	—	—	approx. 1M Ω		approx. 250 Ω
		Input Accuracy	$\pm (0.1\% \text{ F.S.} + 1 \text{ digit})$				
Input Voltage Range		within $\pm 12\text{V}$					
Control	Control Action Types	<ul style="list-style-type: none"> ●PID action with auto-tuning ●Heating/cooling PID action ●Pressure control [MC-COS(R) / MC-VCOS(R)] ●Temperature control [MC-COS(R) / MC-VCOS(R)] 					
Control Output	Heating (OUT 1) *2	Current Output	Output: 4 - 20mA; Load resistance: 600 Ω maximum; Output accuracy: $\pm 0.1\%$ of span * Selecting relay output for the heating control output sets it to transmission output 3 (AO3).				
		Relay Output	Contact: 1c contact 250V AC, 3A (resistance load) * Selecting current output for the heating control output sets it to alarm output 3 (AL3).				
	Cooling (OUT 2) *3	Current Output	Output: 4 - 20mA; Load resistance: 600 Ω maximum; Output accuracy: $\pm 0.1\%$ of span * Selecting relay output for the cooling control output sets it to transmission output 2 (AO2).				
		Relay Output	Contact: 1a contact 250V AC, 3A (resistance load) * Selecting current output for the cooling control output sets it to alarm output 4 (AL4).				
Alarm Output	Number of Alarm Contacts	<ul style="list-style-type: none"> ●PID action with auto-tuning: When heating control output is set to current output: 4 contacts When heating control output is set to relay output: 3 contacts ●Heating/cooling PID action: When both heating and cooling control output are set to current output: 4 contacts When both heating and cooling control output are set to relay output: 2 contacts When heating control output is set to current output and cooling control output is set to relay output: 3 contacts ●Pressure control: 4 contacts ●Temperature control: 4 contacts 					
	Alarm Types	No alarm, measurement upper limit, measurement lower limit, deviation upper limit, deviation lower limit, deviation upper & lower limits, within deviation range, measurement upper limit with standby, measurement lower limit with standby, deviation upper limit with standby, deviation lower limit with standby, deviation upper/lower limits with standby, input error, FAIL status, control error (for pressure control only)					
	Output *4	Relay contact output 1a contact 250V AC, 1A (resistance load)					
	Alarm Displays	Red surface emitting LEDs (AL1/AL2/AL3/AL4)					
Transmission Output	Number. of Output Contacts	<ul style="list-style-type: none"> ●PID action with auto-tuning: When heating control output is set to current output: 2 contacts When heating control output is set to relay output: 3 contacts ●Heating/cooling PID action: When both heating and cooling control output are set to current output: 1 contact When both heating and cooling control output are set to relay output: 3 contacts When heating control output is set to current output and cooling control output is set to relay output: 2 contacts ●Pressure control: 2 contacts ●Temperature control: 2 contacts 					
	Output Types	Measured values, set values, deviation values, heating control output values, cooling control output values (for heating/cooling PID action only)					
	Output Signals	4 - 20mA DC					
	Load Resistance	600 Ω maximum					
	Output Accuracy	0.1% of span					

*1 Types changeable with jumper switches and PARAMETERS.

*2 Either current output or relay contact output can be specified for heating control output (but set to current output for pressure control or temperature control).

*3 Either current output or relay contact output can be specified for cooling control output: cooling control output only set for heating/cooling PID action.

*4 Specifications shown are for Alarms 1 and 2. Alarm 3 is for heating control output; Alarm 4 is for cooling control output.

Specifications

External Remote Input	Analog Setting Input Types	No. of Contacts	1 analog input contact and 1 no-voltage contact
		Function	Analog input-enters target setting from outside Contact input-MAN/AUT or LOC/REM selection
	Area Selection Contact Input Types	No. of Contacts	4 no-voltage contacts
		Function	Contact input-MAN/AUT selection and area selection, or LOC/REM selection and area selection, or Area selection
Communi- cations	Communications Method	RS-422A: 4-wire type; RS-485: 2-wire type; RS-232C	
	Communications Code	JIS (ASCII) 7-bit code	
Self-Diagnostic Function	Check Items	ROM/RAM check, input value check, CPU power monitoring, watchdog timer	
	Error Displays	FAIL lamp lights up (except during input error)	
	Error Output	When FAIL lamp lights up: all output OFF During input error: action selectable	
Ambient Conditions	Ambient Temperature	32 °F - 122 °F	
	Ambient Humidity	20 - 85% RH	
	Line Voltage Fluctuations	Rated voltage \pm 10%	
	Power Frequency Fluctuations	Rated value \pm 5%	
General Specifications	Insulation Resistance	Between measurement terminal and ground: 500V DC/20M Ω minimum Between power terminal and ground: 500V DC/20M Ω minimum	
	Maximum Allowed Voltage	Between measurement terminal and ground: 1000V AC for 1 minute Between power terminal and ground: 1500V AC for 1 minute	
	Line Voltage	100 - 240V AC, 50/60Hz	
	Power Consumption	13VA at 240V \cdot 10VA at 100V	
	Effect of Power Outage	No effect for power outage of 50 msec or less	
	Memory Backup	Setting data backed up by lithium battery. Service life approximately 10 years *	
	Weight	Approximately 1 lb. 2 oz. maximum	
	Accessories	1 set of fittings (2)	

* Will depend on product storage time, storage environment, operating conditions, etc.



CAUTION

To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

Measurement Input Types & Ranges

	Input Type	Input Range [°C]	Code	Input Range [°F]	Code
Thermocouple (TC)	Type K (EX-: CA) [JIS/IEC]	0.0 - 400.0 0.0 - 800.0	0 1	0.0 - 800.0	200
	Type J (EX-: IC) [JIS/IEC]	0.0 - 400.0 0.0 - 800.0	10 11	0.0 - 700.0	210
	Type E (EX-: CRC) [JIS/IEC]	0.0 - 700.0	20	0.0 - 999.9	220
	Type T (EX-: CC) [JIS/IEC]	0.0 - 400.0	30	0.0 - 700.0	230
	Type U [DIN]	0.0 - 600.0	40	0.0 - 999.0	240
	Type L [DIN]	0.0 - 400.0	50	0.0 - 700.0	250
	RTD	JPt 100 [JIS]	0.0 - 300.0	400	0.0 - 600.0
0.0 - 500.0			401	0.0 - 900.0	501
Pt 100 [JIS/IEC]		○ 0.0 - 300.0	410	0.0 - 600.0	510
		0.0 - 600.0	411	0.0 - 999.9	511
Voltage (LOW)	0 - 10mV	Arbitrary scaling possible	600		
	0 - 100mV		601		
	0 - 1V		602		
Voltage (HIGH)	0 - 5V	Arbitrary scaling possible	610		
	1 - 5V		611		
	0 - 10V		612		
Current	0 - 20mA	Arbitrary scaling possible	700		
	● 4 - 20mA		701		

●: Factory default for pressure control

○: Factory default for all control types other than pressure control

Specifications Checksheet

		Code			Remarks
Model	SC-F70	<input type="text"/>	<input type="text"/>	<input type="text"/>	For boxes in the "code" section at left, enter the appropriate code from among the specification items below each box.
Basic Specifications	Control Operation Type	<ul style="list-style-type: none"> ● PID action with auto-tuning ● Heating / cooling PID action ● Pressure control operation [MC-COS(R)-3] ● Pressure control operation [MC-COS(R)-16, 1/2" - 2"] ● Pressure control operation [MC-COS(R)-16, 2 1/2" - 6"] ● Pressure control operation [MC-COS-21] ● Pressure control operation [MC-VCOS(R)] ● Temperature control operation [MC-COS(R)-16] ● Temperature control operation [MC-VCOS(R)] 	0		Select to match the valve that will be used with the controller.
			1		
Additional Specifications	Remote External Input	<ul style="list-style-type: none"> ● None ● Area selection input (Di 4 contacts) ● Analog setting input (RSV + Di 1 contact) 		N D A	Remote area selection operation is possible when "D" is specified. Remote analog setting operation is possible when "A" is specified.
	Communications Function	<ul style="list-style-type: none"> ● None ● RS-232C ● RS-422A (4-wire type) ● RS-485 (2-wire type) 		N 1 4 5	Select to match the computer to be connected.
Initial Settings*	Measurement Input Types & Ranges	<input type="checkbox"/> RTD <input type="checkbox"/> Thermocouple (TC) <input type="checkbox"/> Voltage (low) input <input type="checkbox"/> Voltage (high) input <input type="checkbox"/> Current input	Range code <input type="text"/>		- Select the type and range code from "Table of Measurement Input Types and Ranges". - Values can be changed after the controller has been shipped by changing jumper switches and PARAMETERS.
	Types of Remote Analog Setting Input	Current input <input type="checkbox"/> 0 - 20mA <input type="checkbox"/> 4 - 20mA Voltage input <input type="checkbox"/> 0 - 5V <input type="checkbox"/> 1 - 5V <input type="checkbox"/> 0 - 10V			Specify only for models equipped with remote analog setting input.
	Pressure Sensor Range	<input type="checkbox"/> 0 - 2000 kPaG <input type="checkbox"/> 0.00 - 20.40 kg/cm ² G <input type="checkbox"/> 0 - 1000 kPaG <input type="checkbox"/> 0.00 - 10.20 kg/cm ² G <input type="checkbox"/> 0 - 500 kPaG <input type="checkbox"/> 0.00 - 5.10 kg/cm ² G <input type="checkbox"/> -101.3 - 298.7 kPaG <input type="checkbox"/> -760 - 2240 mmHg G <input type="checkbox"/> 0 - 400 kPaG abs <input type="checkbox"/> 0 - 3000 Torr (mmHg) <input type="checkbox"/> 0.00 - 20.00 barg <input type="checkbox"/> 0.0 - 290.1 psig <input type="checkbox"/> 0.00 - 10.00 barg <input type="checkbox"/> 0.0 - 145.0 psig <input type="checkbox"/> 0.00 - 05.00 barg <input type="checkbox"/> 0.0 - 72.5 psig <input type="checkbox"/> -1013 - 2987 mbarG <input type="checkbox"/> -14.70 - 43.32 psig <input type="checkbox"/> 0 - 4000 mbar abs <input type="checkbox"/> 0.00 - 58.02 psi abs <input type="checkbox"/> Other: range (-) unit ()			Specify the range of the pressure sensor to be connected (when pressure control has been selected).

* Initial settings can be changed after the controller has been shipped from the factory. When not specified in advance, items are set to their default values before shipment.

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Manufacturer
TLV® CO., LTD.
 Kakogawa, Japan
 is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001/ISO 14001

