



MULTI-CONTROLLER

MODEL SC-F70

MULTI-PURPOSE CONTROLLER WITH MC-COS CONTROL FEATURE

Features

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

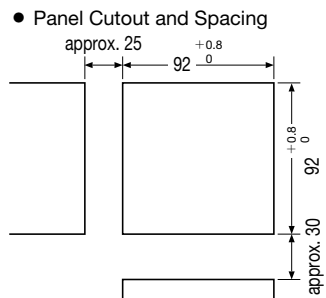
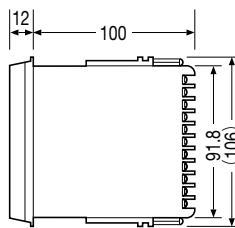
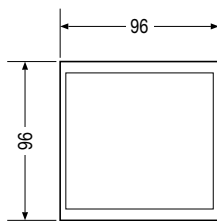
Allows pressure or temperature control when combined with automatic control valve [MC-COS (R)].
 Allows PID action with auto-tuning when combined with pneumatic control valves.
 Allows dual position (ON-OFF) control when combined with ON-OFF valve.

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 contacts for alarm output and 3 contacts for transmission output.
5. Measurement input area can accommodate various input signals.
6. Voltage: 100V - 240V AC.
7. Conforms with CE marking.



Dimensions

(mm)



Wiring Terminals

No.	Function	No.	Function	No.	No.	Function
1	Ground terminal	33	R(A)	22	12	DI1 Contact input terminals
2	100-240V AC Power terminals	34	R(B)	23	13	COM(-) Contact input terminals
3		35	T(A) T(R/A) SD	24	14	DI2 Contact input terminals
4	AL1 Alarm 1/Alarm 2 output terminals	36	T(B) T(R/B) RD	25	15	DI3 Analog input terminals
5	AL2 Alarm 1/Alarm 2 output terminals	37	SG SG	26	16	RSV Analog input terminals
6		38	AO1 +	27	17	IN Input terminals
7	OUT1/AL3 Control output 1 or alarm output 3 terminals	39	4-20mA -	28	18	RTD Input terminals
8	NC Control output 2 or alarm output 4 terminals	40	OUT2/AL4 +	29	19	A Input terminals
9	NO Control output 2 or alarm output 4 terminals	41	NO -	30	20	TC Input terminals
10	OUT1/AO3 Control output 1 or transmission output 3 terminals	42	OUT2/AO2 +	31	21	B Input terminals
11	4-20mA Control output 3 terminals	43	4-20mA -	32		

Specifications

		Thermocouple	RTD	DC Voltage (LOW)	DC Voltage (HIGH)	DC Current	
Measurement Input	Measurement Input Types & Ranges *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 μ V/ Ω	—	—	—	—	
	Input Line Resistance	—	maximum 10 Ω	—	—	—	
	Input Voltage	—	—	within \pm 4V	within \pm 12V	—	
	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% F.S. + 1 digit)					
Cold Junction Compensation Error		approx. \pm 1.0 $^{\circ}$ C within range of 0 $^{\circ}$ C - 50 $^{\circ}$ C					
Sampling Period		0.25 second					
Displays	Set Values Display	4 digit 7 segment LED (orange)					
	Symbol Display	3 digit 7 segment LED (orange)					
	Operation Display	11 LED's indicate operating mode*					
Settings	Setting Range (SV)	Same as measurement input ranges					
	Setting Resolution	0.1 $^{\circ}$ C [$^{\circ}$ F]	0.1 $^{\circ}$ C [$^{\circ}$ F]	Depends on measurement input scaling			
	Memory Area Function	8 memory items					
	Analog Setting Input	Input Values	—	—	0 - 5V, 1 - 5V, 0 - 10V		0 - 20mA, 4 - 20mA
		Input Impedance	—	—	approx. 1M Ω		approx. 250 Ω
Input Accuracy		\pm (input span 0.1% F.S. + 1 digit)					
Input Voltage Range		within \pm 12V					
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 Values 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
Communications	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	0 °C - 50 °C	
	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 · 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 600 g maximum	
	Accessories	1 set of fittings (2)	

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



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				
	Type E (EX-: CRC) [JIS/IEC]	0.0 - 700.0	20				
	Type T (EX-: CC) [JIS/IEC]	0.0 - 400.0	30				
	Type U [DIN]	0.0 - 600.0	40				
	Type L [DIN]	0.0 - 400.0	50				
RTD	JPt 100 [JIS]	0.0 - 300.0 0.0 - 500.0	400 401	0.0 - 600.0 0.0 - 900.0	500 501		
	Pt 100 [JIS/IEC]	○ 0.0 - 300.0	410			0.0 - 600.0 0.0 - 999.9	510 511
		● 0.0 - 600.0	411				
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		*		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, 15-50mm] ● Pressure control operation [MC-COS (R)-16, 65-150mm] ● 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		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	
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			-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 kPa 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 - 5.00 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

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

