



# MULTI-CONTROLLER

## MODEL SC-F70

### Features

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

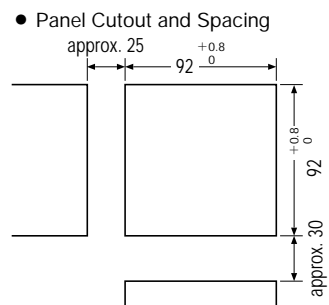
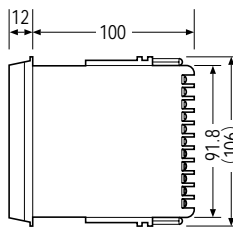
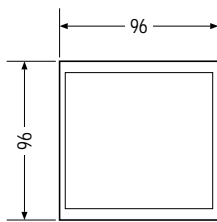
Allows pressure or temperature control when combined with automatic control valve [MC-COS (R)].  
 Allows PID action with auto-tuning when combined with pneumatic control valves.  
 Allows dual position (ON-OFF) control when combined with ON-OFF valve.

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: 100 V - 240 V 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	D1 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) RS-422A SD	24	14	D2 Contact input terminals
4	AL1 NO Alarm 1/Alarm 2 output terminals	36	T(B) T/R(B) RS-485 RD	25	15	D3 Analog input terminals
5	AL2 NO	37	SG SG RS-232C	26	16	D4 Analog input terminals
6		38	AO1 + 4-20mA	27	17	IN Input terminals
7	OUT1/AL3 NO Control output 1 or alarm output 3 terminals	39	AO2 - 4-20mA	28	18	IN Input terminals
8	OUT2/AL4 NC Control output 2 or alarm output 4 terminals	40		29	19	IN Input terminals
9		41		30	20	IN Input terminals
10	OUT1/AO3 + 4-20mA Control output 1 or transmission output 3 terminals	42	OUT2/AO2 + 4-20mA Control output 2 or transmission output 2 terminals	31	21	IN Input terminals
11		43		32	21	IN Input terminals

## 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 $\mu$ V/ $\Omega$	—	—	—	—	
	Input Line Resistance	—	maximum 10 $\Omega$	—	—	—	
	Input Voltage	—	—	within $\pm$ 4V	within $\pm$ 12V	—	
	Input Impedance	1 M $\Omega$ minimum	—	approx. 1 M $\Omega$	approx. 1 M $\Omega$	approx. 250 $\Omega$	
	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 - 5 V, 1 - 5 V, 0 - 10 V		0 - 20 mA, 4 - 20 mA
		Input Impedance	—	—	approx. 1 M $\Omega$		approx. 250 $\Omega$
Input Accuracy		$\pm$ (input span 0.1% F.S. + 1 digit)					
Input Voltage Range		within $\pm$ 12 V					
Control	Control Action Types	<ul style="list-style-type: none"> <li>● PID action with auto-tuning</li> <li>● Heating/cooling PID action</li> <li>● Pressure control [MC-COS(R) / MC-VCOS(R)]</li> <li>● Temperature control [MC-COS(R) / MC-VCOS(R)]</li> </ul>					
Control Output	Heating (OUT 1) *2	Current Output	Output: 4 - 20 mA; Load resistance: 600 $\Omega$ 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 250 V AC, 3 A (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 - 20 mA; Load resistance: 600 $\Omega$ 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 250 V 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"> <li>● 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</li> <li>● 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</li> <li>● Pressure control: 4 contacts</li> <li>● Temperature control: 4 contacts</li> </ul>					
	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 250 V 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"> <li>● 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</li> <li>● 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</li> <li>● Pressure control: 2 contacts</li> <li>● Temperature control: 2 contacts</li> </ul>					
	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 - 20 mA DC					
	Load Resistance	600 $\Omega$ 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: 500 V DC/20 M $\Omega$ minimum Between power terminal and ground: 500 V DC/20 M $\Omega$ minimum	
	Maximum Allowed Voltage	Between measurement terminal and ground: 1000 V AC for 1 minute Between power terminal and ground: 1500 V AC for 1 minute	
	Line Voltage	100 - 240 V AC, 50/60 Hz	
	Power Consumption	13 VA at 240 V • 10 VA at 100 V	
	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	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 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	510
		● 0.0 - 600.0	411	0.0 - 999.9	511
Voltage (LOW)	0 - 10 mV	Arbitrary scaling possible	600		
	0 - 100 mV		601		
	0 - 1 V		602		
Voltage (HIGH)	0 - 5 V	Arbitrary scaling possible	610		
	1 - 5 V		611		
	0 - 10 V		612		
Current	0 - 20 mA	Arbitrary scaling possible	700		
	● 4 - 20 mA		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"> <li>● PID action with auto-tuning</li> <li>● Heating / cooling PID action</li> <li>● Pressure control operation [MC-COS (R)-3]</li> <li>● Pressure control operation [MC-COS (R)-16, 15 - 50 mm]</li> <li>● Pressure control operation [MC-COS (R)-16, 65 - 150 mm]</li> <li>● Pressure control operation [MC-COS-21]</li> <li>● Pressure control operation [MC-VCOS (R) ]</li> <li>● Temperature control operation [MC-COS (R)-16]</li> </ul>	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"> <li>● Area selection input (Di 4 contacts)</li> <li>● Analog setting input (RSV + Di 1 contact)</li> </ul>		D		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"> <li>● None</li> <li>● RS-232C</li> <li>● RS-422A (4-wire type)</li> <li>● RS-485 (2-wire type)</li> </ul>		A	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 <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 - 20 mA <input type="checkbox"/> 4 - 20 mA Voltage input <input type="checkbox"/> 0 - 5 V <input type="checkbox"/> 1 - 5 V <input type="checkbox"/> 0 - 10 V				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 <sup>2</sup> G <input type="checkbox"/> 0 - 1000 kPaG <input type="checkbox"/> 0.00 - 10.20 kg/cm <sup>2</sup> G <input type="checkbox"/> 0 - 500 kPaG <input type="checkbox"/> 0.00 - 5.10 kg/cm <sup>2</sup> 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"/> 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

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

ISO 9001/ISO 14001

