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）

● Panel Cutout and Spacing
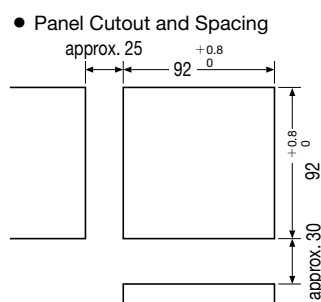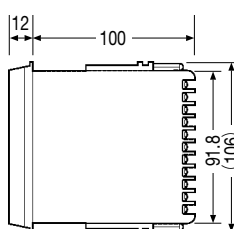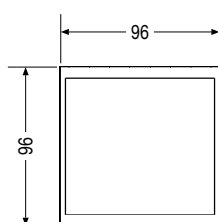
Wiring Terminals

No.	Function		No.	Function		No.	No.	Function	
1	Ground terminal		33	R(A)	Communications terminals	22	12	Di1 / Di1	Contact input terminals
2	Power terminals		34	R(B)		23	13	COM(−)	
3	100-240V AC		35	T(A) T/R(A) SD		24	14	Di2	Contact input terminals
4	AL1 NO	Alarm 1/Alarm 2 output terminals	36	T(B) T/R(B) RD		25	15	Di3	RSV 0-5V, 1-5V, 0-10V, 0-20mA, 4-20mA Analog input terminals
5	AL2 NO		37	SG SG SG		26	16	Di4	
6			38	AO1 + 4-20mA	Transmission output 1 terminals	27	17		Input terminals ①Thermocouple input ②RTD input ③Voltage input (LOW) ④Voltage input (HIGH)/or Current input Output terminals ⑤Sensor power
7	OUT1/AL3 NO	Control output 1 or alarm output 3 terminals	39	−		28	18	IN	
8	NC		40	OUT2/AL4 NO	Control output 2 or alarm output 4 terminals	29	19	RTD A 0-5V 1-5V 0-10V 24V DC	
9			41			30	20	TC B IN 0-10mV 0-100mV 0-1V 0-20mA 4-20mA	
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		
11	−		43	−		32			

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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 μV/Ω	—	—	—	—
	Input Line Resistance		—	maximum 10Ω	—	—	—
	Input Voltage		—	—	within $\pm$ 4V	within $\pm$ 12V	—
	Input Impedance		1MΩ minimum	—	approx. 1MΩ	approx. 1MΩ	approx. 250Ω
	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 °C within range of 0 °C - 50 °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℃ [℉]	0.1℃ [℉]	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. 1MΩ		approx. 250Ω
		Input Accuracy	$\pm$ (input span 0.1% F.S. + 1 digit)				
		Input Voltage Range	within $\pm$ 12V				
Control	Control Action Types		● 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: 600Ω 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: 600Ω 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		● 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		● 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		600Ω 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
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		0 ℃ - 50 ℃
	Ambient Humidity		20 - 85% RH
	Line Voltage Fluctuations		Rated voltage ± 10%
	Power Frequency Fluctuations		Rated value ± 5%
General Specifications	Insulation Resistance		Between measurement terminal and ground: 500V DC/20MΩ minimum Between power terminal and ground: 500V DC/20MΩ 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.

⚠ **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 [℃]	Code	Input Range [℉]	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 0.0 - 600.0	410 411	0.0 - 600.0 0.0 - 999.9	510 511
Voltage (LOW)	0 - 10mV 0 - 100mV 0 - 1V	Arbitrary scaling possible	600 601 602		
Voltage (HIGH)	0 - 5V 1 - 5V 0 - 10V	Arbitrary scaling possible	610 611 612		
Current	0 - 20mA ● 4 - 20mA	Arbitrary scaling possible	700 701		

●: 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	● PID action with auto-tuning	0			Select to match the valve that will be used with the controller.
		● Heating / cooling PID action	1			
		● Pressure control operation ［MC-COS (R)-3］	2			
		● Pressure control operation ［MC-COS (R)-16, 15-50mm］	3			
		● Pressure control operation ［MC-COS (R)-16, 65-150mm］	4			
		● Pressure control operation ［MC-COS-21］	5			
		● Pressure control operation ［MC-VCOS (R) ］	6			
		● Temperature control operation ［MC-COS (R)-16］	7			
		● Temperature control operation ［MC-VCOS (R)］	8			
Additional Specifications	Remote External Input	● None		N		Remote area selection operation is possible when "D" is specified. Remote analog setting operation is possible when "A" is specified.
		● Area selection input (Di 4 contacts)		D		
		● Analog setting input (RSV ＋ Di 1 contact)		A		
	Communications Function	● None			N	Select to match the computer to be connected.
		● RS-232C			1	
		● RS-422A (4-wire type)			4	
		● RS-485 (2-wire type)			5	
Initial Settings*	Measurement Input Types & Ranges	☐ RTD	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.
		☐ Thermocouple (TC)				
		☐ Voltage (low) input				
		☐ Voltage (high) input				
		☐ Current input				
	Types of Remote Analog Setting Input	Current input ☐ 0～20mA ☐ 4～20mA Voltage input ☐ 0～5V ☐ 1～5V ☐ 0～10V				Specify only for models equipped with remote analog setting input.
	Pressure Sensor Range	☐ 0 - 2000 kPaG ☐ 0.00 - 20.40 kg/cm²G ☐ 0 - 1000 kPaG ☐ 0.00 - 10.20 kg/cm²G ☐ 0 - 500 kPaG ☐ 0.00 - 5.10 kg/cm²G ☐ -101.3 - 298.7 kPaG ☐ -760 - 2240 mmHg G ☐ 0 - 400 kPa abs ☐ 0 - 3000 Torr (mmHg) ☐ 0.00 - 20.00 barg ☐ 0.0 - 290.1 psig ☐ 0.00 - 10.00 barg ☐ 0.0 - 145.0 psig ☐ 0.00 - 5.00 barg ☐ 0.0 - 72.5 psig ☐ -1013 - 2987 mbarg ☐ -14.70 - 43.32 psing ☐ 0 - 4000 mbar abs ☐ 0.00 - 58.02 psi abs ☐ 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.

Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

ISO 9001 / ISO 14001

http://www.tlv.com

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Specifications subject to change without notice.