



MULTI-CONTROLLER

MODEL SC-F71

COMPACT MULTI-PURPOSE CONTROLLER WITH MC-COS CONTROL FEATURE

Benefits

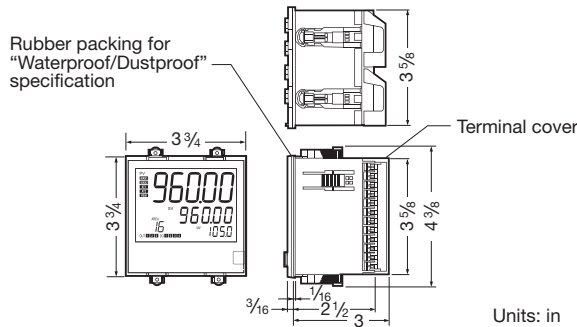
Compact multi-purpose controller for a wide range of operations. Ideal for equipment automation and systems creation in many fields.

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

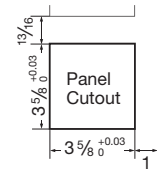
1. High measurement accuracy of 0.1% F.S.
2. Quick and easy to determine PID setting using auto-tune function for excellent stability and responsiveness. Overshoot prevention function.
3. 16 target settings can be stored in memory.
4. 5 digit x 3 row panel clearly displays a variety of information.
5. Up to 4 contacts for event output, up to 3 contacts for transmission output and up to 6 contacts for external input.
6. Measurement input area can accommodate various input signals.
7. Voltage: 100 V – 240 V AC.
8. Conforms with CE marking.



Dimensions



Panel Cutout and Spacing



Panel thickness: 1/16 to 3/8 in

Wiring Terminals

No.	Function	No.	Function	No.	Function
1	AC L	25	—+ Voltage Pulse/Current	13	NO Relay Contact Digital Output 2 (DO 2)
2	100-240V N	26	—- Voltage Pulse/Current	14	NO Relay Contact Digital Output 2 (DO 2)
3	—+ Output 2 (OUT2)	27	(Voltage Free Contact Input)	15	NO Relay Contact Digital Output 3 (DO 3)
4	—- Current Output	28	COM DI 1	16	NO Relay Contact Digital Output 3 (DO 3)
5	—+ Output 1 (OUT1)	29	—- DI 2	17	NO Relay Contact Digital Output 4 (DO 4)
6	—- Current Output	30	—- DI 3	18	NO Relay Contact Digital Output 4 (DO 4)
7		31	—- DI 4	19	
8	NO Relay Contact	32	—- DI 5	20	
9	Contact	33	—- DI 6	21	
10	A Measurement Input 1	34	—- R(A)	22	A Remote Setting Input Measurement
11	B (1) Thermocouple	35	—- R(B)	23	B Input 2 (1) Thermocouple
12	(2) RTD	36	—- SG Communication RS-422A	24	(2) RTD
	(3) Voltage/Current				(3) Voltage/Current

Specifications

Item		Description			
Measurement Input	Measurement Input Types	Thermocouple (TC)	RTD	Voltage	Current
	Effects of Signal Resistance	approx. 0.18 $\mu\text{V}/\Omega$	—	—	—
	Input Line Resistance	—	approx. 0.006%/ Ω of span	—	—
	Input Impedance	1M Ω minimum	—	1M Ω minimum	approx. 50 Ω
	Measurement Accuracy	See "Measurement Accuracy" for details			\pm (0.1% F.S. + 1 digit)
Displays	Number of inputs	2 inputs (Input 2 can be configure for used with two-loop control or remote setting input)			
	Sampling Period	0.05 second for one-loop control, 0.1 second for two-loop control			
	Set Values Display	5 digit 11 segment LED + 5 digit 7 segment LED \times 2 lines			
Settings	Area Display	2 digit 7 segment LED			
	Operation Display	MAN1, MAN2, AT1, AT2, REM, OUT1, OUT2, OUT3, D01, D02, D03, D04, ALM			
Control	Number of Memory Settings	16 memory items			
	Memory Functions	Target setting, soft start time, event set value (and more)			
Output	Control Action Types	<ul style="list-style-type: none"> • PID control with auto-tuning (reverse / forward) • Heating/cooling PID control • Pressure control [MC-COS(R) / MC-VCOS(R)] • Temperature control [MC-COS(R) / MC-VCOS(R)] 			
		Control Output	No. of Contacts	1 or 2 contacts (for heating/cooling PID control or two-loop control)	
	Transmission Output	Output Signal	Current output: 4 to 20 mA or 0 to 20 mA, load resistance: 500 Ω maximum		
		No. of Contacts	2 or 1 contacts (for heating/cooling PID control or two-loop control)		
Event Output	Output Types	Measured values (PV), set values, deviation values, heating control output values, cooling control output values (for heating/cooling PID control only)			
	Output Signal	Current output: 4 to 20 mA or 0 to 20 mA, load resistance: 500 Ω maximum			
	No. of Contacts	4 contacts			
External Input	Analog Setting Input	Output Types	Measurement upper limit, measurement lower limit, deviation upper limit, deviation lower limit		
		Output Signal	1a contact (contact rating (resistive load): 250 V AC (1 A) / 30 V DC (0.5 A))		
	Contact Input	No. of Contacts	1 contact or none (for heating/cooling PID control or two-loop control)		
Communication	Host Communication	Function	Input target setting via external analog signal		
		No. of Contacts	6 or 4 contacts (when communication function selected)		
		Function	RUN/STOP, AUTO/MAN, REM/LOC selection, memory area selection		
	Loader Communication	Interface	Based on RS-422A, EIA standard		
		Protocol	Original communication: ANSI X3.28-1976 subcategory 2.5 A4 compliant MODBUS communication: MODBUS-RTU PLC communication: MAPMAN communication		
		Comm. Speed	2400, 4800, 9600, 19200, 38400, 57600 bps		
		Protocol	Original communication: ANSI X3.28-1976 subcategory 2.5 A4 compliant		
Comm. Speed	38400 bps				
Connectable Devices	1 device				
Connection Method	RKC Instrument Inc. COM-K2 cable (from front panel connector)				
General Specs.	Ambient Temperature Range	14 to 131 $^{\circ}\text{F}$			
	Ambient Humidity Range	5 – 95% RH (non-condensing)			
	Voltage	Rating 100 – 240 V AC (50/60 Hz)			
	Power Consumption	7.4 VA maximum (at 100 V AC), 10.9 VA maximum (at 240 V AC)			
	Effect of Power Outage	No effect for power outage of 20 ms or less (5 ms for current input)			
	Memory Backup	Backed up by non-volatile memory, data storage period approx. 10 years (depending on storage time and environment and operating conditions, etc.)			
	Weight	approx. 11 oz			
Protection Class	IP65 (optional; applicable when front panel cover and loader connector covers are attached)				
Accessories	Terminal covers (2 covers per controller); Rubber packing for "Waterproof/Dustproof" specifications (pre-fitted)				

Measurement Accuracy

Input Types	Input Range	Accuracy
K, J, T, E, U, L ¹⁾	< -148 $^{\circ}\text{F}$	\pm (1.8 $^{\circ}\text{F}$ + 1 digit)
	-148 $^{\circ}\text{F}$ to < 932 $^{\circ}\text{F}$	\pm (0.9 $^{\circ}\text{F}$ + 1 digit)
	\geq 932 $^{\circ}\text{F}$	\pm (0.1% of reading + 1 digit)
N, R, S, PtIII, W5Re/W26Re ²⁾	< 32 $^{\circ}\text{F}$	\pm (3.6 $^{\circ}\text{F}$ + 1 digit)
	32 $^{\circ}\text{F}$ to < 1832 $^{\circ}\text{F}$	\pm (1.8 $^{\circ}\text{F}$ + 1 digit)
	\geq 1832 $^{\circ}\text{F}$	\pm (0.1% of reading + 1 digit)
B ²⁾	< 752 $^{\circ}\text{F}$	\pm (126 $^{\circ}\text{F}$ + 1 digit)
	752 $^{\circ}\text{F}$ to < 1832 $^{\circ}\text{F}$	\pm (2.52 $^{\circ}\text{F}$ + 1 digit)
	\geq 1832 $^{\circ}\text{F}$	\pm (0.1% of reading + 1 digit)
PR40-20 ²⁾	< 752 $^{\circ}\text{F}$	\pm (36 $^{\circ}\text{F}$ + 1 digit)
	752 $^{\circ}\text{F}$ to < 1832 $^{\circ}\text{F}$	\pm (18 $^{\circ}\text{F}$ + 1 digit)
	\geq 1832 $^{\circ}\text{F}$	\pm (0.1% of reading + 1 digit)
Pt100, JPt100	< 392 $^{\circ}\text{F}$	\pm (0.36 $^{\circ}\text{F}$ + 1 digit)
	\geq 392 $^{\circ}\text{F}$	\pm (0.1% of reading + 1 digit)
	0.00 to 90.00 $^{\circ}\text{F}$	\pm (0.18 $^{\circ}\text{F}$ + 1 digit)
Voltage/Current input	\pm (0.1% of span + 1 digit)	

¹⁾ Accuracy is not guaranteed for less than -148 $^{\circ}\text{F}$

²⁾ Accuracy is not guaranteed for less than 752.0 $^{\circ}\text{F}$ for Input type R, S, B, PR40-20 and W5Re/W26ERe

Measurement Input Types & Ranges

Input Types	Input Range	Code	
Thermocouple (TC)	0 – 200 °C	K01	
	0 – 400 °C	K02	
	0 – 600 °C	K03	
	0 – 800 °C	K04	
	0 – 1200 °C	K06	
	0 – 1372 °C	K07	
	-199.9 – +300.0 °C	K08	
	0.0 – 400.0 °C	K09	
	0.0 – 800.0 °C	K10	
	0 – 300 °C	K14	
	-200 – +1372 °C	K41	
	-200.0 – +1372.0 °C	K42	
	0 – 800 °F	KA1	
	0 – 1600 °F	KA2	
	0 – 2502 °F	KA3	
	Type K (EX: CA) [JIS/IEC]		
	Type J (EX: IC) [JIS/IEC]	0 – 200 °C	J01
		0 – 400 °C	J02
		0 – 600 °C	J03
		0 – 800 °C	J04
0.0 – 400.0 °C		J08	
-200.0 – +1200.0 °C		J29	
0 – 800 °F		JA1	
0 – 2192 °F		JA3	
0 – 400 °F		JA6	
Type T (EX: CC) [JIS/IEC]			
-199.9 – +400.0 °C		T01	
-199.9 – +100.0 °C		T02	
-100.0 – +200.0 °C	T03		
-200.0 – +400.0 °C	T19		
Type S [JIS/IEC]	-50 – +1768 °C	S06	
Type R [JIS/IEC]	0 – 1600 °C	R01	
	-50 – +1768 °C	R07	
Type E (EX: CRC) [JIS/IEC]	0 – 800 °C	E01	
Type B [JIS/IEC]	0 – 1800 °C	B03	
Type N [JIS/IEC]	0 – 1300 °C	N02	
Type PLII [NBS]	0 – 1300 °C	A01	
Type W5Re/W26Re [ASTM]	0 – 2300 °C	W03	
Type PR40-20 [ASTM]	0 – 1800 °C	F02	
	0 – 3200 °F	FA2	
Type U [DIN]	-199.9 – +600.0 °C	U01	
Type L [DIN]	0 – 900.0 °C	L04	
RTD	-199.9 – +649.0 °C	D01	
	-100.0 – +100.0 °C	D04	
	-100.0 – +200.0 °C	D05	
	0.0 – 50.0 °C	D06	
	0.0 – 100.0 °C	D07	
	0.0 – 200.0 °C	D08	
	0.0 – 300.0 °C	D09	
	0.0 – 500.0 °C	D10	
	-199.9 – +600.0 °C	D12	
	-200.0 – +200.0 °C	D21	
	0.00 – 50.00 °C	D27	
	-100.00 – +100.00 °C	D34	
	-200.0 – +850.0 °C	D35	
	-199.9 – +999.9 °F	DA1	
	0.0 – 500.0 °F	DA9	
	Type Pt100 [JIS/IEC]		
	0.0 – 200.0 °C	P08	
	-100.00 – +100.00 °C	P29	
	-200.0 – +640.0 °C	P30	
	Voltage/Current	0 – 10 mV DC	101
0 – 100 mV DC		201	
0 – 1 V DC		301	
0 – 5 V DC		401	
0 – 10 V DC		501	
1 – 5 V DC		601	
0 – 20 mA DC		701	
4 – 20 mA DC		801	
-10 – +10 V DC		904	
-5 – +5 V DC		905	
		Programmable range -19999 to +99999	

Pressure Unit & Range Codes

Applicable Valve	Unit	Pressure Sensor Model	Range	Code	
MC-COS	°C / kg/cm ² G	MBS33M	0 – 5.10	001	
			0 – 10.20	002	
			0 – 20.40	003	
		0 – 25.50	004		
		KH15	0 – 5.00	005	
			0 – 10.00	006	
			0 – 20.00	007	
	°C / barg	MBS33M	0 – 5.00	101	
			0 – 10.00	102	
			0 – 20.00	103	
			0 – 25.00	104	
		KH15	0 – 5.00	105	
			0 – 10.00	106	
0 – 20.00			107		
MC-COSR	°F / psig	MBS33M	0 – 72.5	201	
			0 – 145.0	202	
			0 – 290.1	203	
			0 – 362.6	204	
	KH15	0 – 75.0	205		
		0 – 150.0	206		
		0 – 300.0	207		
°C / kPaG	MBS33M	0 – 500	301		
		0 – 1000	302		
		0 – 2000	303		
		0 – 2500	304		
°C / MPaG	MBS33M	0 – 0.500	401		
		0 – 1.000	402		
		0 – 2.000	403		
		0 – 2.500	404		
MC-VCOS	°C / mmHgG	MBS33M	-760 – 2240	A01	
		KH15	-736 – 736	A02	
	°C / mmHg abs	MBS33M	0 – 3000	A13	
		KH15	24 – 1496	A14	
	°C / mbarg	MBS33M	-1013 – 2987	B01	
		KH15	-981 – 981	B02	
	°C / mbar abs	MBS33M	0 – 4000	B13	
		KH15	33 – 1994	B14	
	MC-VCOSR	°C / inHgG	MBS33M	-29.9 – 88.2	C01
		°C / inHg abs	MBS33M	0 – 118.1	C12
		°F / psig	MBS33M	-14.70 – 43.32	D01
			KH15	-14.22 – 14.22	D02
°F / psi abs		MBS33M	0 – 58.02	D13	
		KH15	0.48 – 28.92	D14	
°C / kPaG		MBS33M	-101.3 – 298.7	E01	
°C / kPa abs	MBS33M	0 – 400.0	E12		

Temperature Unit Codes

Applicable Valve	Unit	Code
MC-COS	°C / kg/cm ²	001
	°C / bar	101
	°F / psi	201
MC-COSR	°C / kPa	301
	°C / MPa	401
MC-VCOS	°C / mmHg	A01
	°C / mbar	B01
MC-VCOSR	°C / inHg	C01
	°F / psi	D01
	°C / kPa	E01

Specifications Checksheet

		Code	Remarks																																																												
Model	SC-F71	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> </div>	For boxes in the "code" section to the left, enter the appropriate code from among the specification items below each box.																																																												
	Control Operation Type	<ul style="list-style-type: none"> ● PID control with auto-tuning (Reverse) ● PID control with auto-tuning (Forward) ● Heating/cooling PID control ● 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 (R)-21] ● Pressure control operation [MC-VCOS (R)] ● Temperature control operation [MC-COS (R)-16] ● Temperature control operation [MC-VCOS (R)] 	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-right: 1px dashed black; text-align: center;">F</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">D</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">G</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">2</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">3</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">4</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">5</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">6</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">7</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">8</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> </table>	F						D						G						2						3						4						5						6						7						8					
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Additional Specifications	Communications Function	<ul style="list-style-type: none"> ● None ● RS-422A (4-wire type) 	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-right: 1px dashed black; text-align: center;">N</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black; text-align: center;">4</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> </table>	N						4						Select to match the computer to be connected																																															
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Waterproof/Dustproof	<ul style="list-style-type: none"> ● Waterproof/dustproof (IP65) 	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black; text-align: center;">1</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> </table>		1																																																											
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Initial Settings*	Measurement Input Types & Ranges (PV)	<ul style="list-style-type: none"> ● Thermocouple (TC) ● RTD ● Voltage input ● Current input 	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black; text-align: center;">Range code</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black; text-align: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> </td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> </table>				Range code						<div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div>			Select the type and range code from "Measurement Input Types & Ranges". Values can be changed after the controller has been shipped by changing parameters.																																															
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Pressure/Temperature Sensor Range	Pressure control operation Temperature control operation	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black; text-align: center;">Range code</td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> <tr><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black; text-align: center;"> <div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div> </td><td style="border-right: 1px dashed black;"></td><td style="border-right: 1px dashed black;"></td></tr> </table>				Range code						<div style="border: 1px solid black; width: 20px; height: 20px; margin: 2px;"></div>			Specify the range of the pressure sensor to be connected. Specify the units to be used.																																																
			Range code																																																												
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* 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.

Options

Front panel cover	Clear resin, snap-on type
Sensor power source	OMRON Corporation S8VS-01524, 24 V DC

TLV CORPORATION

13901 South Lakes Drive, Charlotte, NC 28273-6790
 Tel: 704-597-9070 Fax: 704-583-1610
 E-mail: tlv@tlvengineering.com <https://www.tlv.com>
 For Technical Service 1-800 "TLV TRAP"



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

