



MULTI-CONTROLLER

MODEL SC-F71

COMPACT MULTI-PURPOSE CONTROLLER WITH MC-COS CONTROL FEATURE

Benefits

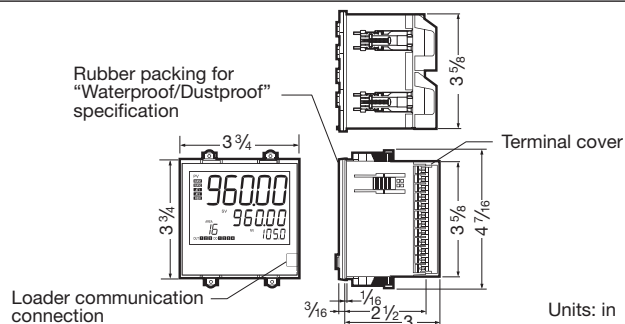
Compact multi-purpose controller for a wide range of operations. Ideal for equipment automation and systems creation in many fields.

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.

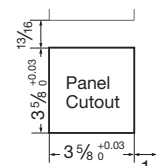
1. High measurement accuracy of 0.1% F.S.
2. Quick and easy to determine PID setting using auto-tune function for excellent stability and responsiveness. Overshoot prevention function.
3. 16 target settings can be stored in memory.
4. 5 digit × 3 row panel clearly displays a variety of information.
5. 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.
9. Loader communication connection available on front panel. Requires optional USB adapter.



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) COM	15	NO Relay Contact Digital Output 3 (DO 3)
4	—- Current Output	28	—○ 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 Digital Output 1 (DO 1)	32	—○ DI 5	20	
9	NC Relay Contact	33	—○ DI 6	21	
10	A Measurement Input 1	34	— SG Communication RS-422A	22	A Remote Setting Input Measurement Input 2
11	+ B (1) Thermocouple (2) RTD	35	— T(A)	23	+ B (1) Thermocouple (2) RTD
12	(1) - B (2) - (3) Voltage/Current	36	— T(B)	24	(1) - B (2) - (3) Voltage/Current

Specifications

Item			Description			
Measurement Input	Measurement Input Types		Thermocouple (TC)	RTD	Voltage	Current
			See next page for ranges			
	Effects of Signal Resistance		approx. 0.18 μV/Ω	—	—	—
	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 ± (0.1% F.S. + 1 digit)			
	Number of inputs		2 inputs (Input 2 can be configured for used with 2-loop control or remote setting input)			
Displays	Sampling Period		0.05 second for 1-loop control, 0.1 second for 2-loop control			
	Set Values Display		5 digit 11 segment LED + 5 digit 7 segment LED × 2 lines			
	Area Display		2 digit 7 segment LED			
Settings	Operation Display		MAN1, MAN2, AT1, AT2, REM, OUT1, OUT2, OUT3, D01, D02, D03, D04, ALM			
	Number of Memory Settings		16 memory items			
Control	Memory Functions		Target setting, soft start time, event set value (and more)			
	Control Operation Types		● PID control with auto-tuning (reverse / direct) ● Heating/cooling PID control ● Pressure control [MC-COS(R) / MC-VCOS(R)] ● Temperature control [MC-COS(R) / MC-VCOS(R)]			
Output	Control Output	No. of Contacts	1 or 2 contacts (for heating/cooling PID control or 2-loop control)			
		Output Signal	Current output: 4 to 20 mA or 0 to 20 mA, load resistance: 500 Ω maximum			
	Transmission Output	No. of Contacts	2 or 1 contacts (for heating/cooling PID control or 2-loop control)			
		Output Types	Measured values (PV), set values, deviation values, heating control output values, cooling control output values (for heating/cooling PID control only)			
	Event Output	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)			
		Function	Input target setting via external analog signal			
Communication	Host Communication	No. of Contacts	6 or 4 contacts (when communication function selected)			
		Function	RUN/STOP, AUTO/MAN, REM/LOC selection, memory area selection			
		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 (* Optional USB adapter and PROTEM-T software required)			
	Loader 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			
General Specs.	Connection Method	Optional USB adapter: RKC Instrument Inc. COM-KG cable (from front panel connector)				
	Ambient Temperature Range		14 to 131 °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⁾	$< -148^{\circ}\text{F}$	$\pm (1.8^{\circ}\text{F} + 1 \text{ digit})$
	-148°F to $< +932^{\circ}\text{F}$	$\pm (0.9^{\circ}\text{F} + 1 \text{ digit})$
	$\geq 932^{\circ}\text{F}$	$\pm (0.1\% \text{ of reading} + 1 \text{ digit})$
N, R, S, Pt100, W5Re/W26Re ²⁾	$< 32^{\circ}\text{F}$	$\pm (3.6^{\circ}\text{F} + 1 \text{ digit})$
	32°F to $< 1832^{\circ}\text{F}$	$\pm (1.8^{\circ}\text{F} + 1 \text{ digit})$
	$\geq 1832^{\circ}\text{F}$	$\pm (0.1\% \text{ of reading} + 1 \text{ digit})$
B ²⁾	$< 752^{\circ}\text{F}$	$\pm (126^{\circ}\text{F} + 1 \text{ digit})$
	752°F to $< 1832^{\circ}\text{F}$	$\pm (2.52^{\circ}\text{F} + 1 \text{ digit})$
	$\geq 1832^{\circ}\text{F}$	$\pm (0.1\% \text{ of reading} + 1 \text{ digit})$
PR40-20 ²⁾	$< 752^{\circ}\text{F}$	$\pm (36^{\circ}\text{F} + 1 \text{ digit})$
	752°F to $< 1832^{\circ}\text{F}$	$\pm (18^{\circ}\text{F} + 1 \text{ digit})$
	$\geq 1832^{\circ}\text{F}$	$\pm (0.1\% \text{ of reading} + 1 \text{ digit})$
Pt100, JPt100	$< 392^{\circ}\text{F}$	$\pm (0.36^{\circ}\text{F} + 1 \text{ digit})$
	$\geq 392^{\circ}\text{F}$	$\pm (0.1\% \text{ of reading} + 1 \text{ digit})$
	0.00 to 90.00 $^{\circ}\text{F}$	$\pm (0.18^{\circ}\text{F} + 1 \text{ digit})$
Voltage/Current input		$\pm (0.1\% \text{ of span} + 1 \text{ digit})$

¹⁾ Accuracy is not guaranteed for less than -148°F

²⁾ Accuracy is not guaranteed for less than 752.0°F for Input type R, S, B, PR40-20 and W5Re/W26Re

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
	0 – 200 °C	J01
	0 – 400 °C	J02
	0 – 600 °C	J03
	0 – 800 °C	J04
	0.0 – 400.0 °C	J08
RTD	-200.0 – +1200.0 °C	J29
	0 – 800 °F	JA1
	0 – 2192 °F	JA3
	0 – 400 °F	JA6
	-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]	S06
	0 – 1600 °C	R01
	-50 – +1768 °C	R07
	Type E (EX: CRC) [JIS/IEC]	E01
	0 – 1800 °C	B03
	0 – 1300 °C	N02
	Type PLII [NBS]	A01
	Type W5Re/W26Re [ASTM]	W03
	0 – 1800 °C	F02
	0 – 3200 °F	FA2
	Type U [DIN]	U01
	-199.9 – +600.0 °C	U01
Voltage/Current	0 – 900.0 °C	L04
	-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
	0.0 – 200.0 °C	P08
	-100.00 – +100.00 °C	P29
	-200.0 – +640.0 °C	P30
	0 – 10 mV DC	101
Voltage/Current	0 – 100 mV DC	201
	0 – 1 V DC	301
	0 – 5 V DC	301
	0 – 10 V DC	401
	1 – 5 V DC	501
	0 – 20 mA DC	601
	4 – 20 mA DC	701
	-10 – +10 V DC	801
	-5 – +5 V DC	904
	-5 – +5 V DC	905

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

Specifications Checksheet

Code		Remarks	
Model	SC-F71	For boxes in the "code" section to the left, enter the appropriate code from among the specification items below each box.	
Basic Specifications	Control Operation Type • PID control with auto-tuning (Reverse) • PID control with auto-tuning (Direct) • 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)] F D G 2 3 4 5 6 7 8 <td></td>		
Additional Specs.	Communications Function • None • RS-422A (4-wire type) N 4	Select to match the computer to be connected	
	Waterproof/Dustproof • Waterproof/dustproof (IP65)	1	
Initial Settings*	Measurement Input Types & Ranges (PV) • Thermocouple (TC) • RTD • Voltage input • Current input	Range code	Select the type and range code from "Measurement Input Types & Ranges". Values can be changed after the controller has been shipped by changing parameters.
	Pressure/ Temperature Sensor Range Pressure control operation Temperature control operation	Range code	Specify the range of the pressure sensor to be connected. Specify the units to be used.

* 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
USB communication adapter*	RKC Instrument Inc. COM-KG-4N, 5 ft (with RKC W-BV-05-1500)

* No CE marking.

Data Management Tool PROTEM-T

Functions	Verify and set SC-F71 set values Log trend data Create complete set value lists Back-up set values
Operating System	Windows 10 (64-bit)/11

For details and to download, see TLV website. Optional USB adapter required for communication with SC-F71.

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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

ISO 9001
ISO 14001

TLV® CO., LTD.

Kakogawa, Japan

is approved by LRQA Ltd. to ISO 9001/14001

