MULTI-CONTROLLER

MODEL SC-F71

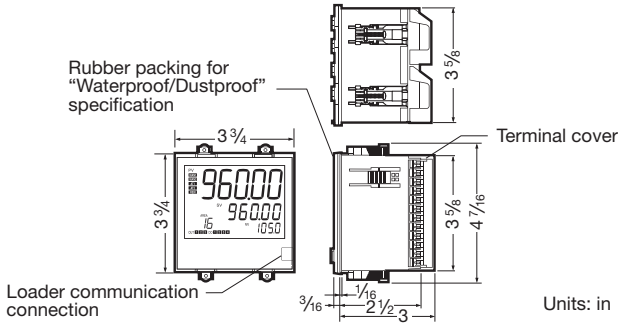
COMPACT MULTI–PURPOSE CONTROLLER WITH MC–COS CONTROL FEATURE

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.

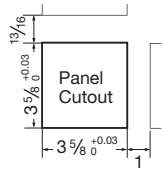
1. High measurement accuracy of 0.1% F.S.
2. Quick and easy to determine PID setting using auto-tune function for excellent stability and responsiveness. Overshoot prevention function.
3. 16 target settings can be stored in memory.
4. 5 digit × 3 row panel clearly displays a variety of information.
5.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



Units: in

• Panel Cutout and Spacing



Panel thickness: 1/16 to 3/8 in

Wiring Terminals

No.	Function
1	AC 100 - 240V L — Power Terminals
2	AC 100 - 240V N — Power Terminals
3	+ — Output 2 (OUT2) Current Output
4	− — Output 2 (OUT2) Current Output
5	+ — Output 1 (OUT1) Current Output
6	− — Output 1 (OUT1) Current Output
7	Output 1 (OUT1) Current Output
8	NO — Relay Contact — Digital Output 1 (DO 1)
9	Relay Contact — Digital Output 1 (DO 1)
10	A — Measurement Input 1 (1) Thermocouple (2) RTD (3) Voltage/Current
11	B — Measurement Input 1 (1) Thermocouple (2) RTD (3) Voltage/Current
12	B — (1) − (2) (3) − Measurement Input 1 (1) Thermocouple (2) RTD (3) Voltage/Current

No.	Function
25	+ — Voltage Pulse/Current — Output 3 (OUT3)
26	− — Voltage Pulse/Current — Output 3 (OUT3)
27	(Voltage Free Contact Input) COM — (Voltage Free Contact Input) COM — Digital Input (DI 1～4) or (DI 1～6)
28	DI 1 — DI 1
29	DI 2 — DI 2
30	DI 3 — DI 3 — Note: Up to 4 contacts if communication function selected
31	DI 4 — DI 4
32	DI 5 — R(A)
33	DI 6 — R(B)
34	SG — Communication RS-422A
35	T(A) — Communication RS-422A
36	T(B) — Communication RS-422A

No.	Function
13	NO — Relay Contact — Digital Output 2 (DO 2)
14	Relay Contact — Digital Output 2 (DO 2)
15	NO — Relay Contact — Digital Output 3 (DO 3)
16	Relay Contact — Digital Output 3 (DO 3)
17	NO — Relay Contact — Digital Output 4 (DO 4)
18	Relay Contact — Digital Output 4 (DO 4)
19	
20	
21	
22	A — Remote Setting Input Measurement Input 2 (1) Thermocouple (2) RTD (3) Voltage/Current
23	B — Measurement Input 2 (1) Thermocouple (2) RTD (3) Voltage/Current
24	B — (1) − (2) (3) − Measurement Input 2 (1) Thermocouple (2) RTD (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)			
	Sampling Period		0.05 second for 1-loop control, 0.1 second for 2-loop control			
Displays	Set Values Display		5 digit 11 segment LED + 5 digit 7 segment LED × 2 lines			
	Area Display		2 digit 7 segment LED			
	Operation Display		MAN1, MAN2, AT1, AT2, REM, OUT1, OUT2, OUT3, D01, D02, D03, D04, ALM			
Settings	Number of Memory Settings		16 memory items			
	Memory Functions		Target setting, soft start time, event set value (and more)			
Control	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)			
		Output Signal	Current output: 4 to 20 mA or 0 to 20 mA, load resistance: 500 Ω maximum			
	Event Output	No. of Contacts	4 contacts			
		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))			
External Input	Analog Setting 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			
	Contact Input	No. of Contacts	6 or 4 contacts (when communication function selected)			
		Function	RUN/STOP, AUTO/MAN, REM/LOC selection, memory area selection			
Communication	Host 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 (* Optional USB adapter and PROTEM-T software required)			
		Comm. Speed	2400, 4800, 9600, 19200, 38400, 57600 bps			
	Loader Communication	Protocol	Original communication: ANSI X3.28-1976 subcategory 2.5 A4 compliant			
		Comm. Speed	38400 bps			
		Connectable Devices	1 device			
		Connection Method	Optional USB adapter: RKC Instrument Inc. COM-KG cable (from front panel connector)			
General Specs.	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 °F	± (1.8 °F + 1 digit)
	–148 °F to < + 932 °F	± (0.9 °F + 1 digit)
	≥ 932 °F	± (0.1% of reading + 1 digit)
N, R, S, PLⅡ, W5Re/W26Re[2)]	< 32 °F	± (3.6 °F + 1 digit)
	32 °F to < 1832 °F	± (1.8 °F + 1 digit)
	≥ 1832 °F	± (0.1% of reading + 1 digit)
B[2)]	< 752 °F	± (126 °F + 1 digit)
	752 °F to < 1832 °F	± (2.52 °F + 1 digit)
	≥ 1832 °F	± (0.1% of reading + 1 digit)
PR40-20[2)]	< 752 °F	± (36 °F + 1 digit)
	752 °F to < 1832 °F	± (18 °F + 1 digit)
	≥ 1832 °F	± (0.1% of reading + 1 digit)
Pt100, JPt100	< 392 °F	± (0.36 °F + 1 digit)
	≥ 392 °F	± (0.1% of reading + 1 digit)
	0.00 to 90.00 °F	± (0.18 °F + 1 digit)
Voltage/Current input	± (0.1% of span + 1 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/W26ERe

Measurement Input Types & Ranges

	Input Types	Input Range	Code
Thermocouple (TC)	Type K (EX: CA) [JIS/IEC]	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 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	Type Pt100 [JIS/IEC]	-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 JPt100 [JIS]	0.0 – 200.0 °C	P08
		-100.00 – +100.00 °C	P29
		-200.0 – +640.0 °C	P30
Voltage/Current	0 – 10 mV DC	Programmable range -19999 to +99999	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

Pressure Unit & Range Codes

Applicable Valve	Unit	Pressure Sensor Model	Range	Code
MC-COS MC-COSR	°C / kg/cm²G	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
	°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 MC-VCOSR	°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
	°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/cm²	001
	°C / bar	101
MC-COSR	°F / psi	201
	°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		□□□-□□□-□□□	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, ½″ - 2″] • Pressure control operation [MC-COS (R)-16, 2½″ - 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	
Additional Specs.	Communications Function	• None • RS-422A (4-wire type)	N 4	Select to match the computer to be connnected
	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	Range code □□	Specify the range of the pressure sensor to be connected.
		Temperature control operation		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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Manufacturer
TLV CO., LTD.
Kakogawa, Japan
is approved by LRQA Ltd. to ISO 9001/14001

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