DIGITAL INDICATOR CONTROLLER

MODEL SC-F50

COMPACT MULTI-PURPOSE CONTROLLER

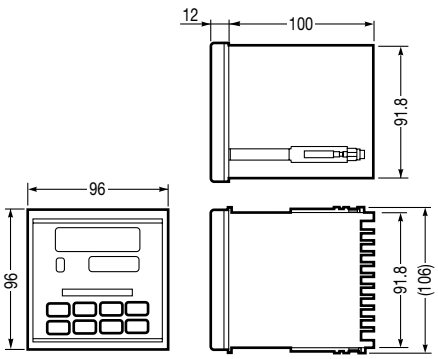
Features

Compact multi-purpose controller for accurate control of temperature, pressure, flow and level. Ideal for equipment automation and systems creation in many fields.

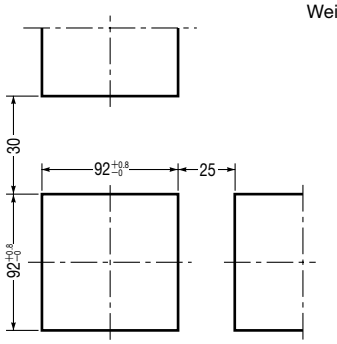
1. High measurement accuracy of 0.1% F.S.
2. Eight target settings can be stored in memory.
3. Uses auto-tuning calculation method for excellent stability and responsiveness.
4. Bar graph shows output status and deviation from setpoint.
5. Allows the addition of alarm output, transmission output and/or remote operation as well as computer communication.
6. With overshoot prevention by a new PID algorithm control.
7. Rated voltage free between 100 and 240V AC.
8. Conforms with CE marking.

Dimensions

Units : mm



●Panel Cutout and Spacing



Weight : 440g

Wiring Terminals

No.	Function		
1	GND	Ground	
2	100-240V AC	Power	
3			
4	COM		
5	NO AL1	Alarm 1	Relay contact output
6	NO AL2	Alarm 2	
7	① COM NO OUT2 ② + −	Control output (OUT2) ① Relay contact output ② Voltage/current output	
8			
9	① COM NO OUT1 NC ② + − OUT1 ③ T2 T1 G	Control output (OUT1) ① Relay contact output ② Voltage/current output ③ Triac trigger output	
10			
11			

No.	Function		
22	COM (−)		
23	1	Area change	Contact input
24	2		
25	4		
26	① SG ② SG ③ SG		
27	SD T/R(A) T(A)	① RS-232C	Communication
28	RD T/R(B) T(B)	② RS-485	
29	R(A)	③ RS-422A	
30	R(B)		
31	+ Ao −	Transmission output	Analog output
32			

No.	Function		
12	DI COM (−)	Mode change	Contact input
13			
14	O	FBR (Y input)	
15	W		
16	C		
17	① + RS −	Remote analog setting input	② CT Heater break current sensor
18			
19	① A ② ③ ④ +	① RTD ② Thermocouple ③ Voltage (Low) ④ Current/Voltage (High)	
20	B +		
21	B −		

Specifications

Item				Description		
Measurement Input	Measurement Input Types (See next page for ranges)	Thermocouple		K (JIS, IEC), J (JIS, IEC),T (JIS, IEC), E (JIS, IEC), R (JIS, IEC), S (JIS, IEC), B (JIS, IEC), N (NBS), L (DIN), U (DIN), PLII (NBS), W5Re/W26Re (ASTM)	Influence of external resistance: approx. 0.2 μV/Ω	
		RTD		Pt100 (JIS/IEC/DIN), JPt100 (JIS)	Allowable lead resistance: 20 Ω maximum	
		Voltage	(LOW)	0 - 10 mV DC, 0 - 100 mV DC, 0 - 1 V DC	Allowable Input Voltage: within ± 4 V	Input Impedance approx. 1 MΩ
			(HIGH)	0 - 5 V DC, 0 - 10 V DC, 1 - 5 V DC	Allowable Input Voltage: within ± 12 V	
		Current		0 - 20mADC, 4 - 20mADC	Input Impedance approx. 50 Ω	
	Measurement Accuracy			± (0.1% F.S. + 1 digit)		
	Cold Junction Temperature Compensation Error			within ± 1℃ (0 ~ 50℃ amb.)		
	Sampling Period			0.25 sec		
Display	Measurement Display			4-digit, 7-segment LED		
	Setting Display			4-digit, 7-segment LED		
	Area No. Display			1-digit, 7-segement LED		
	Operation Status Display			MAN, REM, EXT, COMP, AT, AL1 ~ AL2, FAIL, OUT1, OUT2		
	Bar Graph Display			Selectable from: Deviation value, Operation output, Valve position		
Control Output	Control Action Types			・Two-position (ON/OFF relay) ・PID action with auto-tuning ・Position proportional PID ・Heating.Cooling PID action		
	Signal Type	Current Output		4-20mA DC, 0-20mA DC (allowable load resistance 600 Ω maximum)		
		Voltage Output		0-5V DC, 1-5V DC, 0-10V DC (allowable load resistance 1 kΩ minimum)		
		Voltage Pulse Output		0/12V DC (allowable load resistance 600 Ω minimum)		
		Relay Output		1c contact 250V AC, 3A (resistance load), 1a contact at cooling side when Heating/Cooling PID action		
		Triac Trigger Output		Zero-cross method, effective ON current: 50mA (50℃), 70mA (25℃)		
Target Setting	Number of Memory Settings			8		
	Memory Items			Target set value, PID value, etc.		
Optional		Remote Analog Setting		Possible (See next page for Types of Analog Remote Setting)		
Alarm		Number of Alarms		up to 2		
		Output		Relay contact outputs 1a contact 250 V AC (1A resistance load)		
		Alarm Types		Selectable from: Upper limit, lower limit, upper limit deviation, upper/lower limit deviation, etc.		See table on next page
		Alarm Displays		Red LEDs (AL1/AL2)		
Trans-mission Output		Number of Outputs		1 (See next page for Types of Transmission Output)		
		Output Types		Selectable from: Measured value, Deviation value, Local set value, Remote set value, Control output, Cooling control output, Valve position		
Contact Input		Number of Inputs		1		
		Input Type		Non-voltage contact input		
Communi-cation		Communication Method		EIA RS-422A, EIA RS-485, EIA RS-232C selectable as option (only for Position Proportional PID Action / Contact Input configuration 'None')		
General	Ambient Temperature Range			0 - 50℃		
	Ambient Humidity Range			20 - 85% RH (non-condensing)		
	Voltage			Free between 100 - 240 V AC (50/60Hz)		
	Power Consumption			15 VA maximum		
	Power Interruption Backup			Lithium battery for memory backup (service life 10 years)		

⚠ 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 Types	Input Range [°C]	Code	Input Range [°F]	Code
Thermocouple (TC)	Type K (EX-: CA) [JIS/IEC]	-199.9 - 300.0 °C	K08	0.0 - 800.0 °F	KA4
		0.0 - 400.0 °C	K09	0 - 2400 °F	KA5
		0.0 - 800.0 °C	K10		
		0 -1300 °C	K11		
	Type J (EX-: IC) [JIS/IEC]	-199.9 - 300.0 °C	J07	0.0 - 700.0 °F	JA4
		0.0 - 400.0 °C	J08	0 - 2100 °F	JA5
		0.0 - 800.0 °C	J09		
		0 - 1200 °C	J06		
	Type T (EX-: CC) [JIS/IEC]	-199.9 - 300.0 °C	T05	-199.9 - 400.0 °F	TA6
		0.0 - 400.0 °C	T06	0.0 - 700.0 °F	TA7
	Type E (EX-: CRC) [JIS/IEC]	0.0 - 700.0 °C	E03	0 - 1800 °F	EA3
		0 - 1000 °C	E02		
	Type R [JIS/IEC]	0 - 1700 °C	R03	0 - 3200 °F	RA1
	Type S [JIS/IEC]	0 - 1700 °C	S03	0 - 3200 °F	SA1
	Type B [JIS/IEC]	0 - 1800 °C	B03	0 - 3300 °F	BA3
	Type N [NBS]	0 - 1300 °C	N02	0 - 2300 °F	NA1
	Type L [DIN]	0.0 - 400.0 °C	L03	0 - 1600 °F	LA2
		0.0 - 900.0 °C	L04		
	Type U [DIN]	0.0 - 600.0 °C	U04	0 - 1100 °F	UA4
	Type PLⅡ [NBS]	0 - 1300 °C	A01	0 - 2300 °F	AA3
	Type W5Re/W26Re [ASTM]	0 - 2300 °C	W03	0 - 4200 °F	WA2
RTD	Pt100 [JIS/IEC]	-100.0 - 100.0 °C	D04	-150.0 - 200.0 °F	DB1
		-199.9 - 600.0 °C	D12	-199.9 - 999.9 °F	DB3
	JPt100 [JIS]	-100.0 - 100.0 °C	P04	-150.0 - 200.0 °F	PB1
		-199.9 - 500.0 °C	P11	-199.9 - 900.0 °F	PB2
Voltage* (LOW)	0 - 10mV	0.0 - 100.0%	101		
	0 - 100mV	0.0 - 100.0%	201		
	0 - 1 V	0.0 - 100.0%	301		
Voltage* (HIGH)	0 - 5 V	0.0 - 100.0%	401		
	0 - 10 V	0.0 - 100.0%	501		
	1 - 5 V	0.0 - 100.0%	601		
Current*	0 - 20mA	0.0 - 100.0%	701		
	4 - 20mA	0.0 - 100.0%	801		

The internal hardware configuration has 3 types.
①: Temperature Input (TC + RTD)
②: Voltage Input (Voltage [HIGH] + Voltage [LOW])
③: Current Input (Current + Voltage [LOW])
} Voltage [LOW] can be used in both.

Within each group, the Input Type and Range can be changed by Parameter.

* The range of Voltage [HIGH and LOW] and Current Input can be changed freely.
Factory setting is 0.0 - 100.0%.

1st and 2nd Alarm Types	
Deviation upper limit	A
Deviation lower limit	B
Deviation upper and lower limits	C
Within deviation range	D
Deviation upper limit w. standby	E
Deviation lower limit w. standby	F
Deviation upper/lower limits w. standby	G
Measurement upper limit	H
Measurement lower limit	J
Measurement upper limit w. standby	K
Measurement lower limit w. standby	L
FAIL status	M
Heater break (for 30 A)	P
Heater break (for 100 A)	S
No alarm	N

Alarm types are selectable by parameter.
Heater Break Alarm is selectable only for the 2nd Alarm.

Types of Remote Analog Setting Input		
	None	N
Voltage (LOW)	0 - 10mV	1
	0 - 100mV	2
	0 - 1 V	3
Voltage (HIGH)	0 - 5 V	4
	0 - 10 V	5
	1 - 5 V	6
Current	0 - 20mA	7
	4 - 20mA	8

The Internal hardware configuration of the above 4 groups is different.
The setting input type of each group can be changed by parameter

Contact Input Type	
None	N
Memory Area Switch	1
AUT/MAN Switch	2*
REM/LOC Switch	3
COMP/LOC Switch	4
Memory Switch + AUT/MAN Switch	5*
Memory Switch + REM/LOC Switch	6
Memory Switch + COMP/LOC Switch	7

* 2 and 5 cannot be selected when control action is ON-OFF or Heating/Cooling PID action.

Analog Transmission Output Type		
	None	N
Voltage (LOW)	0 - 10mV	1
	0 - 100mV	2
	0 - 1 V	3
Voltage (HIGH)	0 - 5 V	4
	0 - 10 V	5
	1 - 5 V	6
Current	0 - 20mA	7
	4 - 20mA	8

Specifications Checksheet

			Code											Remarks
Model	SC-F50				–		*		–			–		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	● 2-Position (ON-OFF) ● PID action with auto-tuning ● Heating/cooling PID action ● Position proportional PID action	A F V Y											● When [A] is specified only [M, V, G] of Control Output 1 is selectable. ● When [Y] is specified, only [M] of Control Output 1 is selectable.
	Measure-ment Input Types Ranges [PV]	● Pt100 [-199.9 - 600.0 ˚C] ● TC K [0.0 - 400.0 ˚C] ● Current [4 - 20mA] ● Other ( )		D12 K09 801 ☐										● See "Measurement Input Types & Ranges" for all types.
	Control Output1 [OUT1]	● Relay Contact ● Voltage Pulse ● Triac Trigger ● Voltage [0 - 5V] ● Voltage [0 - 10V] ● Voltage [1 - 5V] ● Current [0 - 20mA] ● Current [4 - 20mA]			M V G 4 5 6 7 8									● When ON-OFF [A] Control Operation is specified, only [M, V, G] of Control Output 1 is selectable. ● When Position Proportional PID [Y] of Control Operation is specified, only [M] of Control Output 1 is selectable.
	Control Output2 [OUT2]	● None (Alarm Control is A, or Y) ● Relay contact ● Voltage Pulse ● Voltage [0 - 5V] ● Voltage [0 - 10V] ● Voltage [1 - 5V] ● Current [0 - 20mA] ● Current [4 - 20mA]				Blank M V 4 5 6 7 8								● Control Output 2 is selectable only when the Control Operation is Heating/Cooling PID [V]. ● Triac Trigger is not selectable In Control Output 2.
Optional Specifications	1st Alarm [AL1]	● None ● Deviation upper limit ● Other ( )					N A ☐							● See "Measurement Input Types & Ranges" for all Alarm types. ● Type of Alarm can be changed after shipment. ● Heater Break Alarm and Remote Setting Input cannot be selected together.
	2nd Alarm [AL2]	● None ● Deviation lower limit ● Other ( )						N B ☐						
	Remote Setting Input [RSV]	● None ● Current [4 - 20mA] ● Other ( )							N 8 ☐					● See "Measurement Input Types & Ranges" for all Input Signal types.
	Contact Input [EXT]	● None ● Memory Area Switching (3 contacts) + REM/LOC Switching (1 contact) ● Other ( )								N 6 ☐				● See "Measurement Input Types & Ranges" for all Contact Input types. Maximum : 4 contacts.
	Analog Transmission Output [AO]	● None ● Current [4 - 20mA] ● Other ( )									N 8 ☐			● See "Measurement Input Types & Ranges" for all Analog Transmission Output types.
	Communi-cation [COM]	● None ● RS-232C ● RS-422A (4 wires) ● RS-485 (2 wires)										N 1 4 5		
	Remarks													

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.