°C
%RH
SHIMADEN

Series SR1 / SR3 / SR4

SHIMADEN DIGITAL CONTROLLER

BASIC FEATURES

- *Multi-input and multi-range performance*
- *Large 20mm bright display (SR3)*
- *Dust and splash proof front panel NEMA4X / IP66*

CE approved
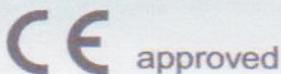
ORDERING INFORMATION

ITEM	CODE		SPECIFICATIONS
SERIES	SR1—		MPU-Based Auto-Tuning PID Digital Controller, DIN H48 x W48 x D111mm
	SR3—		MPU-Based Auto-Tuning PID Digital Controller, DIN H96 x W96 x D111mm
	SR4—		MPU-Based Auto-Tuning PID Digital Controller, DIN H96 x W48 x D111mm
INPUT	8	Multi input	Thermocouple: B, R, S, K, E, J, T, N, PLII, WRe5-26 {U, L (DIN 43710)}
			R.T.D.: Pt100/JPt100
			Voltage(mV): −10~10, 0~10, 0~20, 0~50, 10~50, 0~100mV DC · Scaling possible · Range: −1999~9999
	6		Voltage (V): −1~1, 0~1, 0~2, 0~5, 1~5, 0~10V DC · Span: 10~5000
			Current (mA): 0~20mA DC:(V) 0~5V DC / 4~20mA DC:(V) 1~5V DC (applied via enclosed 250Ω shunt resistor)
CONTROL OUTPUT	Y—		Contact 1a Contact capacity: 240V AC 2.0A/resistive load Proportional cycle: 1~120 seconds
	I—		Current 4~20mA DC Load Resistance: 600Ω max.
	P—		SSR drive voltage 12V ±1.5V DC 30mA max. Proportional cycle:1~120 seconds
	V—		Voltage 0~10V DC Load current: 2mA max.
EVENT OUTPUT		1	Event output (1a) x 2 points, Contact capacity: 240V AC 1A/resistive load
REMARKS		W	Without
		X	With (Please consult before ordering.)

MEASURING RANGE CODES

Type of input		Code	Scaling range					
Thermocouple	B *1	01	0	~	1800	°C	0 ~ 3300 °F
	R	02	0	~	1700	°C	0 ~ 3100 °F
	S	03	0	~	1700	°C	0 ~ 3100 °F
	*3	04	−199.9	~	400.0	°C	−300 ~ 750 °F
	K	05	0.0	~	800.0	°C	0 ~ 1500 °F
		06	0	~	1200	°C	0 ~ 2200 °F
	E	07	0	~	700	°C	0 ~ 1300 °F
	J	08	0	~	600	°C	0 ~ 1100 °F
	T *3	09	−199.9	~	200.0	°C	−300 ~ 400 °F
	N	10	0	~	1300	°C	0 ~ 2300 °F
	PLII *4	11	0	~	1300	°C	0 ~ 2300 °F
	WRe5-26*5	12	0	~	2300	°C	0 ~ 4200 °F
	U *2, *3	13	−199.9	~	200.0	°C	−300 ~ 400 °F
	L *2	14	0	~	600	°C	0 ~ 1100 °F
R.T.D.	Pt100	31	−200	~	600	°C	−300 ~ 1100 °F
		32	−100.0	~	100.0	°C	−150.0 ~ 200.0 °F
		33	−50.0	~	50.0	°C	−50.0 ~ 120.0 °F
		34	0.0	~	200.0	°C	0.0 ~ 400.0 °F
		35	−200	~	500	°C	−300 ~ 1000 °F
	JPt100	36	−100.0	~	100.0	°C	−150.0 ~ 200.0 °F
		37	−50.0	~	50.0	°C	−50.0 ~ 120.0 °F
		38	0.0	~	200.0	°C	0.0 ~ 400.0 °F

Type of input		Code	Scaling range
Voltage (mV)	−10 ~ 10	71	Optional setting of Measuring range is possible by the scaling function as shown below.
	0 ~ 10	72	
	0 ~ 20	73	
	0 ~ 50	74	Scaling range:−1999~9999 count
	10 ~ 50	75	Span: 10~5000 count
	0 ~ 100	76	Lower limit value < Upper limit value
Voltage (V)	−1 ~ 1	81	Position of decimal point
	0 ~ 1	82	: None
	0 ~ 2	83	: Decimal point below digits, 1, 2, 3
	0 ~ 5	84	
	1 ~ 5	85	
	0 ~ 10	86	

Note:*1 Thermocouple B: Accuracy guarantee not applicable Temp. below 400°C.
*2 Thermocouple U, L: DIN 43710
*3 Thermocouple K, T, U: Accuracy guarantee not applicable Temp. below −100.0°C ± (1.0%FS+1digit) & −100.0 ~ 0.0°C± (0.5%FS+1digit)
*4 Thermocouple PLII: Platinel
*5 Thermocouple WRe5-26: ASTM988
*Unless otherwise specified, following setting will be applied for shipment.

Input	Specification/Rating	Measuring range
Multi input	K thermocouple	0.0 ~ 800.0 C
Voltage (V)	0 ~ 10V DC	0.0 ~ 100.0

Control Output	Control Mode
Y	ON-OFF (P=OFF)
I, P, V	PID Control (P=3.0)

SPECIFICATIONS

Model
SR1: 48 x 48 Digital Controller
SR3: 96 x 96 Digital Controller
SR4: 96 x 48 Digital Controller

Display
Digital display: SR1, SR4:(PV)/4 digit 7 segments red LED (H: 11mm)
(SV)/4 digit 7 segments green LED (H: 9.5mm)
SR3: (PV)/4 digit 7 segments red LED (H: 20mm)
(SV)/4 digit 7 segments green LED (H: 13mm)
Display accuracy: ± (0.3%FS + 1 digit) (see "Note" in Measuring Range Codes)
(Excluding cold junction compensation accuracy)
Display accuracy maintaining range:
23°C ± 5°C
Display resolution: Depends on measuring range (0.001, 0.01, 0.1, 1)
Display updating cycle: 0.5 seconds
Action display: 5 LED lamp displays (OUT/EV1/EV2/AT/MAN)

Setting
Setting method: By operating 4 keys (▼), (▲), (ENT), (○)(front panel)
Target value setting range:
Same as measuring range (within setting limitter)
Setting limiter: Individual setting for higher & lower limits are possible within measuring range (Lower limit value < Higher limit value)

Input
Type of input: Selectable from multiple (TC,Pt,mV) and voltage (V)
*Current input 0-20mA DC (Voltage: 0-5V), 4-20mA DC
(Voltage: 1-5V) applied via 250Ω shunt resistor
Thermocouple: B,R,S,K,E,J,T,N,PL II,WRe5-26, {U,L(DIN 43710)}
Input impedance: 500kΩ minimum
External resistance tolerance:
100Ω maximum
Burnout function: Standard feature (up scale)
Cold junction compensation accuracy:
± 1°C (within 23°C ± 5°C)
± 2°C (ambient temperature: 5°C to 45°C)
R.T.D.: Pt100/JPt100, 3-wire type
Amperage: 0.25 mA
Lead wire tolerance: Lead wire tolerance:5Ω max/wire
(3 lead wires should have the same resistance.)
Voltage mV: ~10~10,0~10,0~20,0~50,10~50, 0~100mv DC
(Burnout) Up scale at time of abnormal input
V: ~1~1, 0~1, 0~2, 0~5,1~5, 0~10V DC
Input impedance: 500kΩ minimum
Input scaling function: Scaling possible for voltage (mV,V) or current (mA) input
Scaling range: ~1999~9999 counts
Span: 10~5000 counts
Decimal point: (Position) None, 0.0, 0.00, 0.000
Sampling cycle: 0.5 seconds
PV bias: ~1999~2000 units
PV filter: 0~100 seconds
Isolation: Insulated between input and output (not insulated between input and system)

Control
Control mode: Expert PID control with auto tuning function
Proportional band (P): OFF, 0.1~999.9%(ON-OFF action by OFF)
Integral time (I): OFF, 1~6000 seconds (P or PD action by OFF)
Derivative time (D): OFF, 1~3600 seconds (P or PI action by OFF)
Manual reset: ~50.0~50.0% (Effective when I=OFF)
ON-OFF hysteresis: 1~999 units (Effective when P=OFF)
Proportional cycle: 1~120 seconds (for contact and SSR drive voltage output)

Control output characteristic:
RA (reverse action characteristic)/DA (direct action characteristic) is selectable (Default setting =RA)
*P=OFF by default for contact output, others: PID control
Type of control/rating:
Contact: 1a 240V AC 2A (resistive load)
SSR drive voltage: 12V ±1.5V DC (Max load current 30mA)
Voltage: 0~10V DC (Max load current 2mA)
Current: 4~20mA DC (Max load resistance 600Ω)
Control output resolution: Approx.0.5%(1/200)
Isolation: Output isolated from all

Event output
Number of events: Total 2 points of EV1 and EV2 as standard
Type: Selectable from the following 8 types for EV1 and EV2:
No selection, Higher limit deviation, Lower limit deviation, Outside higher/lower limit deviations, Within higher/lower limit deviations, Higher limit absolute value, Lower limit absolute value, Scaleover
Event setting range: Absolute values: (both higher limit and lower limit): Within measuring range, Deviations: (both higher limit and lower limit): ~1999~2000 units, Higher/lower limit deviations (within/outside): 0~2000 units
Event action: ON-OFF action
Hysteresis: 1~999 units
Standby action: Selectable from the following 4 types
(EV1 and EV2) (1) None. (2) Standby when power is applied. (3) Standby when power is applied and when SV value in execution is changed. (4) Control mode without standby action (No alarm is output at the time of abnormal input).
Output type/rating: Contact (1a x 2 points common)/240V AC 1A (resistive load)
Output updating cycle: 0.5 seconds
Action display: 2 LED lamp displays (EV1/EV2)

General Specifications
Data storage: Non-volatile memory (EEPROM)
Operating conditions: (Ambient temperature) ~10~50 °C
(Ambient humidity) 90%RH or less (no dew condensation)
(Altitude) 2000m from the sea level or lower
(Category) II, (Degree of pollution) 2
Storage temperature: ~20~65°C
Supply voltage: 100-240V AC±10% 50/60Hz
Power consumption: 10VA 240V AC, 6VA 100V AC
Input/noise (Normal mode) 40 dB or higher (50/60 Hz)
removal ratio: (Common mode)120 dB or higher (50/60 Hz)
For Voltage (V) input: 90 dB or higher (50/60 Hz)
Applicable standards: Safety: IEC61010 and EN61010-1
EMC: EN61326 (Class A: Industrial environment)
Insulation resistance: Input/output - power supply: 500V DC 20MΩ or above
Input/output - contact output: 500V DC 20MΩ or above
Dielectric strength: Input/output - power supply: 2300V AC 1 minute
Contact output - power supply: 2300V AC 1 minute
Protective structure: Only front panel has dust-proof and drip-proof structure NEMA4X and IP66
Material / Color of case: PPO resin molding (equivalent to UL94V-1) / Ivory
External dimensions: SR1: H48 x W48 x D111 (Panel depth: 100) mm
SR3: H96 x W96 x D111 (Panel depth: 100) mm
SR4: H96 x W48 x D111 (Panel depth: 100) mm
Mounting: Push-in panel (one-touch mount)
Panel thickness: 1.0~4.0 mm
Panel cutout / Weight: SR1: H45 x W45 mm / Approx. 150 g
SR3: H92 x W92 mm / Approx. 270 g
SR4: H92 x W45 mm / Approx. 190 g

External Dimensions & Panel Cutout
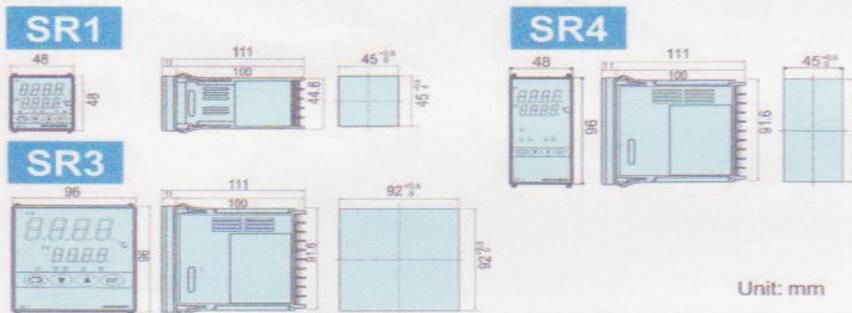
Terminal Arrangement

Unit: mm
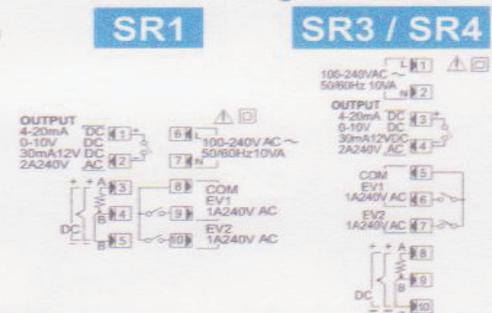
TERMINAL COVER (AVAILABLE SEPARATELY)

Material:PVC, Appearance:transparent, Thickness: 1 mm

Model	Terminal Cover (P/N)	Mounting
SR1	QCR001	One-touch mount
SR3	QCR006	One-touch mount
SR4	QCR004 (Individual Mounting)	Plus screw, B tight, M2.3 x 6 - 2 pcs.
	QCR005 (Tight-lock coupling)	Plus screw, B tight, M2.3 x 6 - 4 pcs.

⚠ Warning • The SR1 / SR3 / SR4 series are designed for the control of temperature, humidity and other physical values for the general industrialequipment. It is not to be used for any purpose which regulates the prevention of serious effects on human life or safety. No warranty, express or implied is valid if used without proper safety measures.

⚠ Caution • If the possibility of loss or damage to your system or property as a result of failure of any part of the process exists, proper safety measures must be made before the instrument is put into use as to prevent the occurrence of trouble.
(The contents of this brochure are subject to change without notice.)