

°C	Series SD16 & KR16 SHIMADEN DIGITAL INDICATORS
%RH	
SHIMADEN	



BASIC FEATURES

- DIN Size 48 x 96 mm**
- ± 0.3% High Accuracy Indication**
- Large 20 mm bright display**
Make reading from long distance and low light location easier
- Multi-inputs & Multi-ranges**
User selectable Thermocouple, RTD, V, mV and Current inputs
A 250Ω resistor is required across the input terminal for 4-20mA DC
- Inverse scaling possible**
With voltage and current input signals, normal and inverse scaling is possible.
Additionally, normal and inverse scaling is possible for the analog output signals.
- Dust and splash proof front panel**
Equivalent to IP66
- Wide range of optional features**
Alarms, analog output signals and communication interface (RS232C or RS485) available
- A six-point selector switch, (the KR16 series), is available for combined use.**

Display

- Digital display : Process value (PV) 7 segment Red LED 4 digits (H: 20mm)
- Action display : 1 point of parameter display (SET) by green LED
: 1 point of communication display (COM) by green LED
: 2 points of alarm (AL1, AL2) by red LED
- Display accuracy : $\pm(0.3\% \text{ FS} + 1 \text{ digit})$ within measuring range
: Excluding cold junction temperature compensation accuracy in the case of thermocouple input
: $\pm 5\% \text{ FS}$ for temperature below 400°C of thermocouple B
: When the thermocouple [T, U] indication value is $0\sim 100^\circ\text{C}$, $0.5\% \text{ FS}$ and when it is below -100°C , $1\% \text{ FS}$
- Display accuracy range : $23^\circ\text{C} \pm 5^\circ\text{C}$ ($18\sim 28^\circ\text{C}$)
- Display resolution : Depends on measuring range (0.001, 0.01, 0.1, 1)
- Measured value display range : $-10\sim 110\%$ of measuring range (Accuracy guaranteed for value is within measuring range only)
: For R.T.D. input of $-200\sim 600^\circ\text{C}$: $210\sim 680^\circ\text{C}$
: For thermocouple [K] input of $-199.9\sim 800^\circ\text{C}$: $-273.1\sim 900.0^\circ\text{C}$
- Display update cycle : 0.5~5.0 seconds (0.5 steps)
When 0.5 second or more is set, there may occur a difference among the displayed value, the analog output and the communication data.

Setting

- Setting : By four (4) front key switches
- Setting range : Same as measuring range

Input

- Type of input : Three-type multiple input of Thermocouple, R.T.D., Voltage (mV, V)
- Thermocouple : B, R, S, K, E, J, T, N, {U, L (DIN 43710)}, WR5-26
Refer to measuring range code table
- External resistance : 100Ω max.
- Input impedance : $500\text{K}\Omega$ max.
- Burnout : Standard feature (Up-scale)
- Cold junction temperature compensation accuracy : $\pm 1^\circ\text{C}$ ($18\sim 28^\circ\text{C}$ range)
: $\pm 2^\circ\text{C}$ ($5\sim 18^\circ\text{C}$, $28\sim 45^\circ\text{C}$ range)
($\pm 5^\circ\text{C}$ to the negative side of measuring range in case of T and U input)
- R.T.D. : JIS Pt100 Ω 3-wire type
- Amperage : Approx. 0.25mA
- Lead wire tolerable resistance : 5Ω max. / wire (3 lead wire should have same resistance)
When the resistance value of each wire is same
 $0\sim 5\Omega$: 0.05°C , $5\sim 10\Omega$: 0.2°C , $10\sim 20\Omega$: 0.6°C , $20\sim 30\Omega$: 1.4°C max.
- Voltage (mV) : $0\sim 10\text{mV}$ DC
- Voltage (V) : $0\sim 5\text{V}$, $1\sim 5\text{V}$, $0\sim 10\text{V}$ DC
- Input impedance : $500\text{K}\Omega$ min.
- Current : $4\sim 20\text{mA}$ DC
- Input impedance : 250Ω [A shunt resistor (option) needs to be connected to the terminal]
- Input scaling function : Scaling possible for voltage (mV, V) or current (mA) input and inverse scaling possible.
- Scaling range : $-1999\sim 9999$ unit
- Span : $10\sim 5000$ unit
- Position of decimal point : None, 0.0, 0.00, 0.000
- Sampling cycle : 0.5 seconds
- PV bias : ± 200 unit
- PV filter : $0\sim 100$ seconds (0 = without filter)
- Isolation : Between input and analog output

Alarm output (option)

- Number of alarm points : 2 (AL1 and AL2) for both normal open and common
- Alarm type : Selectable from combinations of the following 4 types
: High limit absolute value without inhibit action
: High limit absolute value with inhibit action
: Lower limit absolute value without inhibit action
: Lower limit absolute value with inhibit action
- Alarm setting range : Within measuring range or within full scaling range
- Alarm action : ON-OFF action
- Alarm sensitivity : $1\sim 999$ unit Within measuring range
- Alarm output / rating : Contact 1a (common) / 240V, AC1.5A (resistive load)
- Alarm output update cycle : 0.5 seconds

Analog output (option)

- Analog output type : 0~10mV DC (output resistance: 10Ω)
: 0~10V DC (load current: 1mA max.)
: 4~20mA DC (load resistance: 300Ω max.)
- Output resolution : Approx. 0.03% (1/3000)
- Output accuracy : $\pm(0.3\%FS + 1 \text{ digit})$ of display value
- Output scaling : Within measuring range (inverse scaling possible)
- Output update cycle : 0.5 seconds

Communication (option)

- Communication type : RS-232C, RS-485
- Communication system : Half duplex start-stop synchronized system
- Communication speed : 1200, 2400, 4800, 9600, 19200 bps
- Data bit length : 7 bit even parity 1 stop bit
: 8 bit non parity 1 stop bit
- Communication address : 1~255
- Multi-drop connection : 31 max. (with RS-485)
- Communication delay : 0~50.0 milli-seconds
- Communication code : ASCII code

Others

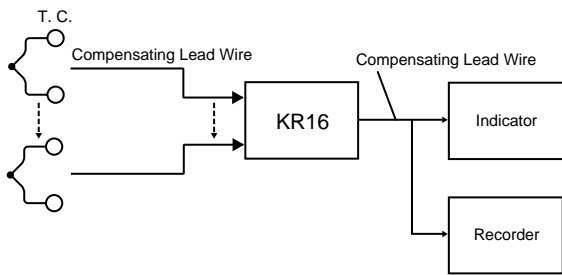
- Data storage : By non volatile memory (EEPROM)
- Ambient conditions for use : -10~50°C/90%R max. (on condition that there is no dew condition)
- Temperature and Humidity : 2000m above sea level or lower
- Height : Category II
- Installation category : Degree 2
- Degree of pollution : 100~240V AC \pm 10%, 50/60Hz
: 24V AC/DC \pm 10% (option)
- Power supply voltage : 11VA (AC) max., 7W (DC) max.
- Power consumption
- Applicable standard : IEC 1010-1 and EN61010-1
- Safety : EN61326
- EMC : (EMC testing Display accuracy: +5% FS)
- Dust proof/Drip proof : IP66 (Complies with the IEC 529-IP66)
- Insulation resistance : Between input/output terminal and power supply terminal:
: 500V DC 20MΩ minimum
: Between input/output terminal and protective conductor terminal
: 500V DC 20MΩ minimum
- Dielectric strength : 1 min. at 2300V AC between input/output terminal and power supply terminal
: 1 min. at 1500V AC between power supply terminal and protective conductor terminal
- Case material : PPO resin molding (equivalent to UL94V-1)
- External dimensions : H48 x W96 x D110 mm
- Mounting : Push-in panel (one-touch mount)
- Panel thickness : 1.0~4.0 mm
- Panel cutout : H45 x W92 mm
- Weight : Approx. 250g

Selector KR16 series

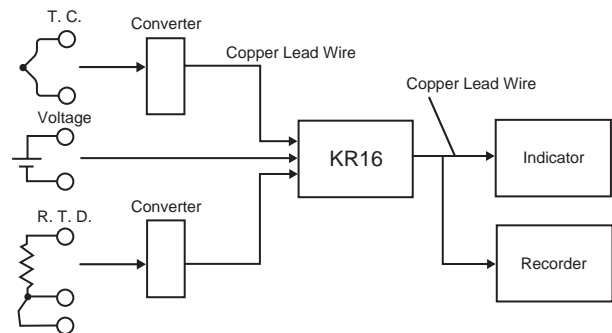
- No. of switching points : 6
- No. of switching circuits : 2
- Switching operation method : Push button switching
- Applicable signal contact rating : DC voltage, current (R.T.D.is not applicable)
- Contact method : Contact slide
- Voltage : 30V DC max.
- Current : 100mA DC max.
- Contact resistance : 300m Ω max.
- Operating ambient temperature range : -10~50°C
- Operating ambient humidity range : 90% RH max.
- Material : PPO resin
- Color : Case : Munsell No. N-1 or compatible
Front Panel: Munsell No. N-1 or compatible
- External dimensions : H48 x W96 x D118 (panel depth: 100) mm
- Panel cutout : H45 x W92 mm
- Mounting : Push-in panel (one-touch mount)
- Panel thickness : 1.0~4.0 mm
- Weight : Approx. 250g

APPLICATION EXAMPLE

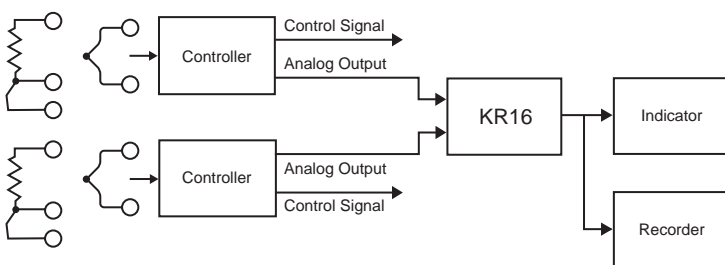
1. Selection of T. C. Switching



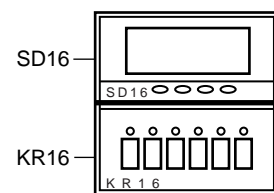
2. Selection of Voltage Switching



3. Selection of Analog Output (Voltage)



4. Installation Example With SD16



ORDERING INFORMATION

Series **SD16**

ITEM	CODE	SPECIFICATIONS
1 SERIES	SD16-	Digital Indicator DIN Size 48 × 96 mm
2 INPUT	4	Current (4~20mA DC) A shunt resistor (option) needs to be connected to the terminal
	8	*Thermocouple B, R, S, K, E, J, T, N, {U, L (DIN 43710)} Multi input *R.T.D. Pt100Ω *Voltage (mV, V) 0~10mV DC, 0~5V DC, 0~10V DC, 1~5V DC
3 POWER SUPPLY	90-	100~240V AC±10% (50/60Hz)
	08-	24V AC ±10% (50/60Hz) / 24V DC ±10%
4 ALARM OUTPUT (OPTION)	0	None
	1	Individual setting, individual output 2 points (1c contact) Contact capacity: 250V AC 1.5A / resistive load
5 ANALOG OUTPUT (OPTION)	0	None
	3	0~10mV DC Output resistance: 10Ω
	4	4~20mA DC Load resistance: 300Ω max.
	6	0~10V DC Load resistance: 1mA max.
6 COMMUNICATION FUNCTION (OPTION)	0	None
	5	RS-485
	7	RS-232C
7 REMARKS	0	Without
	9	With (Please consult before ordering)

MEASURING RANGE CODES

INPUT	TYPE	CODE	RANGE (°C)	RANGE (°F)
THERMOCOUPLE	B	01	0 ~ 1800	0 ~ 3300
	R	02	0 ~ 1700	0 ~ 3100
	S	03	0 ~ 1700	0 ~ 3100
	K	04	-199.9 ~ 800.0	-300 ~ 1500
	K	05	0 ~ 1200	0 ~ 2200
	E	06	0 ~ 700	0 ~ 1300
	J	07	0 ~ 600	0 ~ 1100
	T	08	-199.9 ~ 300.0	-300 ~ 600
	N	09	0 ~ 1300	0 ~ 2300
	*1 U	10	-199.9 ~ 300.0	-300 ~ 600
	*1 L	11	0 ~ 600	0 ~ 1100
	*2 WRe5-26	12	0 ~ 2300	0 ~ 4200
R.T.D.	Pt100Ω	31	-200 ~ 600 *3	-300 ~ 1100
	Pt100Ω	32	-100.0 ~ 100.0	-150.0 ~ 200.0
VOLTAGE	0~10mV	71	Initial value: 0.0~100.0 Scaling setting range: -1999~9999 Span: 10~5000 counts	Thermocouple B, R, S, K, E, J, T, N: JIS/ANSI/IEC *1 Thermocouple U, L: DIN 43710 *2 Thermocouple WRe5-26: Made of Hoskins
	0~ 5V	81		
	1~ 5V	82		
	0~10V	83		
CURRENT	4~20mA	95		

*3: -200.0 ~ 600.0 °C range available. Please specify when ordering.

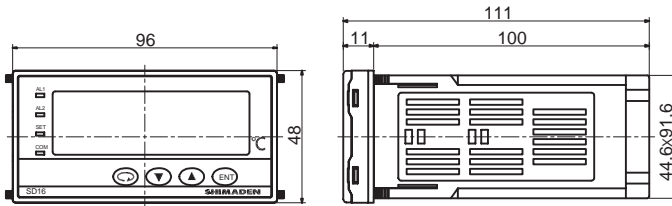
ORDERING INFORMATION

Series **KR16**

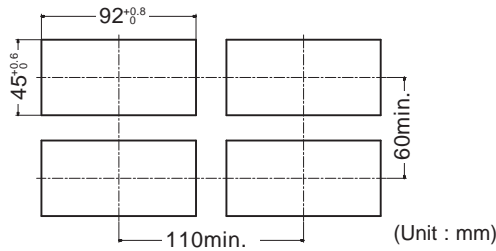
ITEM	CODE	SPECIFICATIONS
1 SERIES	KR16-	Push button six-point selector
2 REMARKS	0	Without
	9	With (Please consult before ordering)

• SD16

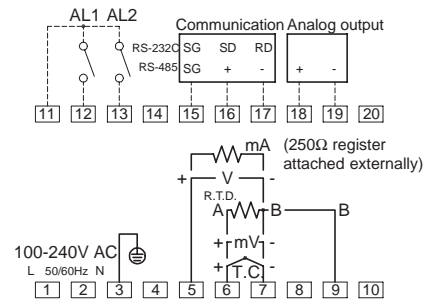
External Dimensions



Panel Cutout

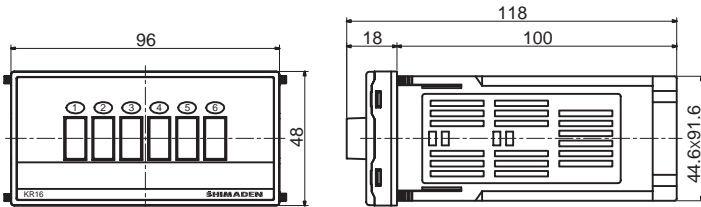


Terminal Arrangement

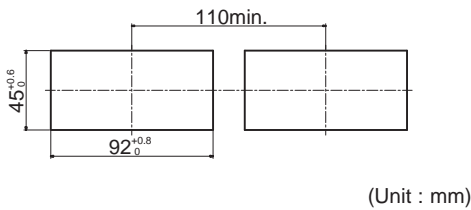


• KR16

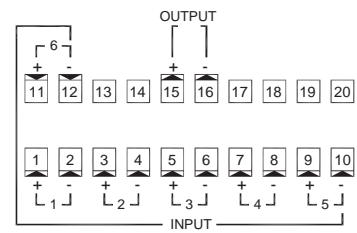
External Dimensions



Panel Cutout

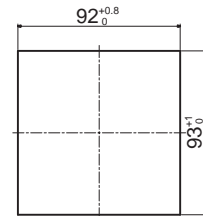


Terminal Arrangement



Panel Cutout

In case installed with SD16



(Unit : mm)

Warning

- The SD16 & KR16 series is designed for the control of temperature, humidity and other physical values of general industrial equipment. (It is not to be used for any purpose which regulates the prevention of serious effects on human life or safety.)

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 so as to prevent the occurrence of trouble.



ISO 9001

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Temperature and Humidity Control Specialists

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