

Plug-in Signal Conditioners K-UNIT

DC/TEMPERATURE INPUT LIMIT ALARM
(digital adjustments)

MODEL KS2V/KS2TR

MODEL & SUFFIX CODE SELECTION

■ **DC INPUT TYPE**

MODEL _____ **KS2V-61-□**
 INPUT _____
6 : 1 – 5V DC
 Use a resistor module for a current input.
OUTPUT _____
1 : Relay; SPDT or transfer contact
POWER INPUT _____
AC Power **DC Power**
M2 : 100 – 240V AC **R** : 24V DC

■ **TEMPERATURE INPUT**

MODEL _____ **KS2TR-1-□**
TEMPERATURE SENSOR
 JPt 100, Pt 100, K, E, J, T, B, R, S, PL2, WRe 5-26, N
OUTPUT _____
1 : Relay; SPDT or transfer contact
POWER INPUT _____
AC Power **DC Power**
M2 : 100 – 240V AC **R** : 24V DC

ORDERING INFORMATION

Specify code number and variables.

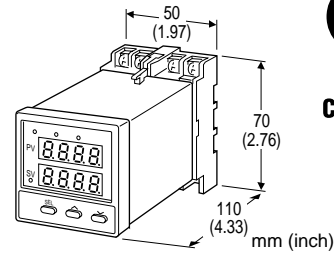
- **Code number** (e.g. KS2V-61-R)

RELATED PRODUCTS

- **Resistor module** (model: REM)
 - 500Ω for 2 – 10mA DC
 - 250Ω for 4 – 20mA DC
 - 100Ω for 10 – 50mA DC

GENERAL SPECIFICATIONS

Construction: panel mounted, plug-in
Connection: M3.5 screw terminals
Housing material: PC-ABS resin (black)
Isolation: input to SET1 to SET2 to power (basic insulation)
Read rate: 0.5 seconds
Input error display: over-range
Programming: front key
Setpoint adjustment (ST1, ST2): -5 to +105%; programmable independently for each setpoint
Hysteresis (HYS1, HYS2): 0 – 102%; programmable independently for each setpoint



Functions & Features

- Providing relay contact closures at preset DC or temperature input levels
- Dual (Hi/Lo) trip
- Front digital displays
- Programmable with front keys

Typical Applications

- Various alarm applications

Temperature sensor types (P-n2): JPt 100, Pt 100, K, E, J, T, B, R, S, WRe 5-26, N

Scaling (P-SL, P-SU): -1999 to 9999

Alarm mode (P-A1, P-A2): programmable independently for each setpoint; See Table below.

Param. Code (P-A1) (P-A2)	Alarm Modes			
	Trip Operation	Set Value	Latching Hold*	Relay & LED Behavior in Tripped Conditions
0	No alarm	—	—	—
1	High	Absolute value	Without	LED ON Coil energized
2	Low	Absolute value	Without	LED ON Coil energized
3	High	Absolute value	With	LED ON Coil energized
4	Low	Absolute value	With	LED ON Coil energized
5	High	Absolute value	Without	LED ON Coil de-energized
6	Low	Absolute value	Without	LED ON Coil de-energized
7	High	Absolute value	With	LED ON Coil de-energized
8	Low	Absolute value	With	LED ON Coil de-energized

*Without latching hold function, the unit is tripped upon starting operation (e.g. at 25°C) when the unit is set to Low alarm (e.g. 100°C).

With the function, the unit is NOT tripped until the temperature goes once above and then below the setpoint (100°C).

Burnout protection (bUm): upscale or downscale
Alarm relay switching delay time (P-d1, P-d2): 1 to 10 sec.; programmable independently for each setpoint
Time constant for the input filter (P-dF): 5.0 to 900.0 seconds (0 – 63%)
Cold junction compensation (RCJ): ON or OFF; for thermocouple input only
Power ON delay (P-d0): 0 to 20 seconds
Front LEDs: red lights turn on in tripped conditions.

INPUT & OUTPUT

■ **DC INPUT:** 1 – 5V DC
Input resistance: 400k Ω minimum
Display accuracy: $\pm 0.5\%$ FS ± 1 digit
Allowable signal source resistance: 1k Ω maximum

■ TEMPERATURE INPUT

• **Thermocouple**
Thermocouple type and temperature range

T/C type	Usable Range in °C	Usable Range in °F
J	0 to 400	32 to 752
J	0 to 800	32 to 1472
K	0 to 400	32 to 752
K	0 to 800	32 to 1472
K	0 to 1200	32 to 2192
R	0 to 1600	32 to 2912
B	0 to 1800	32 to 3272
S	0 to 1600	32 to 2912
T	-199 to 200	-328 to 392
T	-150 to 400	-238 to 752
E	0 to 800	32 to 1472
E	-199 to 800	-328 to 1472
N	0 to 1300	32 to 2372
PL2	0 to 1300	32 to 2372
WRre5-26	0 to 2300	32 to 4172

Input resistance: 1M Ω minimum
Display accuracy: $\pm 0.5\%$ FS ± 1 digit $\pm 3^\circ\text{C}$
 $\pm 1\%$ FS ± 1 digit $\pm 3^\circ\text{C}$ for T, E ($\leq -100^\circ\text{C}$)
 $\pm 5\%$ FS ± 1 digit $\pm 3^\circ\text{C}$ for B (0 – 500°C)
 $\pm 1\%$ FS ± 1 digit $\pm 3^\circ\text{C}$ for R (0 – 400°C)
Cold junction compensation accuracy: $\pm 3^\circ\text{C}$ at 23°C ($\pm 1.8^\circ\text{F}$ at 73.4°F)
Burnout sensing: approx. 0.3 μA
Burnout response: approx. 10 seconds
Allowable signal source resistance: 100 Ω maximum

• RTD

RTD type and temperature range:
Pt 100 (-150 to $+850^\circ\text{C}$ or -238 to $+1562^\circ\text{F}$)
JPt 100 (-150 to $+600^\circ\text{C}$ or -238 to $+1112^\circ\text{F}$)
Display accuracy: $\pm 0.5\%$ FS ± 1 digit
Sensing current: approx. 0.3mA
Maximum leadwire resistance: 20 Ω per wire

■ OUTPUT

• **Relay Contact:** SPDT relays
220V AC @3A ($\cos\phi=1$)
30V DC @3A (resistive load)
electrical life (@1A) 8×10^5 cycles (rate 30/min.)

Caution: N.O. and N.C. contacts could be conductive at the same time. DO NOT connect both contacts at the same time.

Maximum switching voltage: 220V AC or 30V DC

Maximum switching power: 660VA or 55W

Minimum load: 10V DC @1mA

Mechanical life: 2×10^7 cycles with no loads

For maximum relay life with inductive loads, external protection is recommended.

INSTALLATION

Power input

AC: operational voltage range 85 – 264V;
47 – 66 Hz, max. 15VA

DC: operational voltage range 24V $\pm 10\%$;
ripple 10% p-p max., approx. 3W

Operating temperature: -10 to $+50^\circ\text{C}$ (14 to 122°F)

Operating humidity: 30 to 90% RH (non-condensing)

Mounting: panel flush mounting with attached mounting bracket, or DIN rail

Dimensions: W48xH48xD110 mm (1.89"x1.89"x4.33")

Weight: 200 g (0.44 lbs)

PERFORMANCE

Setpoint accuracy: display accuracy $\pm 0.1\%$ FS

Trip point repeatability: included in the setpoint accuracy

Line voltage effect: included in the setpoint accuracy

Insulation resistance: $\geq 50\text{M}\Omega$ with 500V DC
(input to SET1 to SET2 to power)

Dielectric strength: 1500V AC @1 minute
(input to SET1 or SET2 to power)
500V AC @1 minute (SET1 to SET2)

STANDARDS & APPROVALS

CE conformity: EMC Directive (89/336/EEC)

EMI EN55022:1994 Class A

EMS EN50082-1 (EN61000-6-1)

Low Voltage Directive (73/23/EEC)

Installation category II

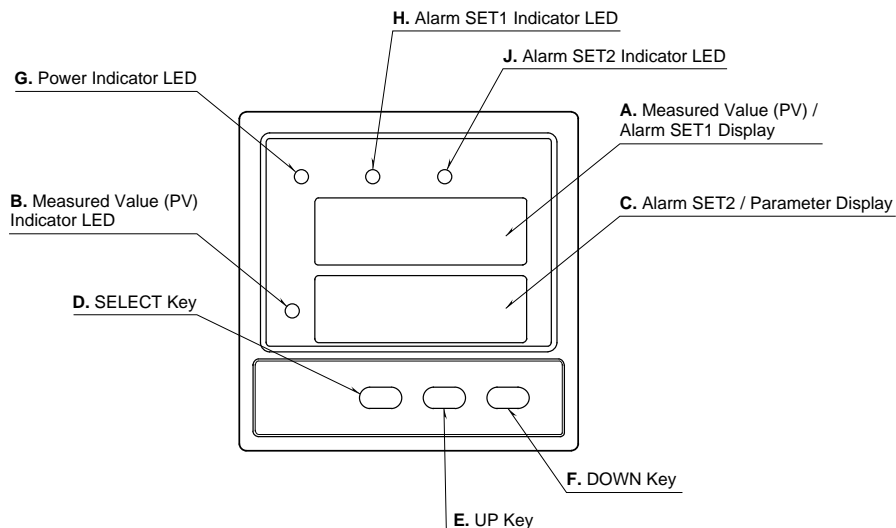
Pollution degree 2

Max. operating voltage 300V

Input to output to power – Basic insulation

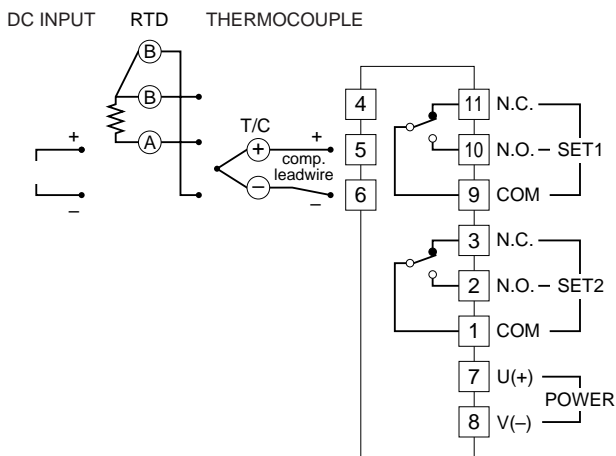
Approval: UL/C-UL (UL 873, CAN/CSA-C22.2 No.24)

FRONT PANEL CONFIGURATION



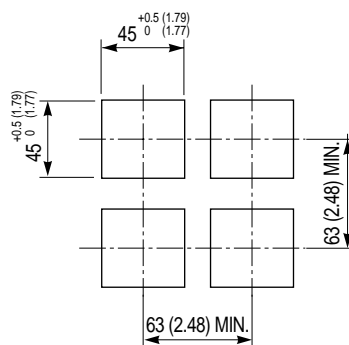
Ref.	Component Name	Function
A	Measured Value (PV) / Alarm SET1 Display	Displaying either of Measured Value (PV) or Alarm Setpoint Value (SET1)
B	Measured Value (PV) Indicator LED	Light turns on when the PV Display (A) displays Alarm Setpoint Value (SET1).
C	Alarm SET2 / Parameter Display	Displaying either of Alarm Setpoint Value (SET2) or parameter type code.
D	SELECT Key	Used for confirming current setpoints and switching between parameter blocks.
E	UP Key	Pressing the key increases display values. They change continuously when it is kept pressed.
F	DOWN Key	Pressing the key decreases display values. They change continuously when it is kept pressed.
G	Power Indicator LED	Light turns on while the power is turned on.
H	Alarm SET1 Indicator LED	Light turns on when the Alarm SET1 is in tripped conditions.
J	Alarm SET2 Indicator LED	Light turns on when the Alarm SET2 is in tripped conditions.

CONNECTION DIAGRAM

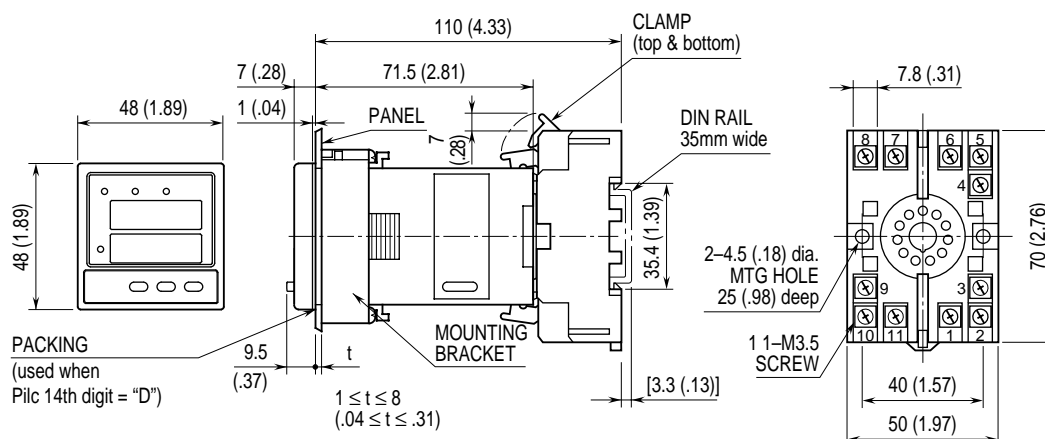


MOUNTING REQUIREMENTS mm (inch)

■ PANEL CUTOUT



EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENT mm (inch)



PARAMETERS

Param. Block	Name	Default setting		Unit	Programmable range	Explanations of function
		KS2V	KS2TR			
1*1	ST1	100.0	1200	Engineering unit*4	-5 to +105 % FS	Alarm setpoint value SET1
	ST2	0.0	0	Engineering unit*4	-5 to +105 % FS	Alarm setpoint value SET2
	PTn	1	1	N/A	1, 2, 3	Display pattern
2*2	HYS1	1.0	1	Deviative engineering unit*4	0 to 102 % FS	Hysteresis for SET1
	HYS2	1.0	1	Deviative engineering unit*4	0 to 102 % FS	Hysteresis for SET2
	P-n2	16	3	N/A	0 to 16	Input type
	P-SL	0.0	0	Engineering unit*4	-1999 to 9999	Scaling, lower range
	P-SU	100.0	1200	Engineering unit*4	-1999 to 9999	Scaling, upper range
	P-dP	1	0	N/A	0, 1 or 0, 1, 2*5	Decimal point position
	P-A1	1	1	N/A	0 to 8	Alarm mode for SET1
	P-A2	2	2	N/A	0 to 8	Alarm mode for SET2
	bUm	H	H	N/A	H, L	Burnout protection (upscale or downscale)
	P-F	°C	°C	N/A	°C, °F	Temperature unit
3*3	P-d1	1	1	Seconds	1 to 10	Switching delay timer for SET1
	P-d2	1	1	Seconds	1 to 10	Switching delay timer for SET2
	P-dF	5.0	5.0	Seconds	5.0 to 900.0*6	Time constant for the input filter
	RCJ	ON	ON	N/A	ON, OFF	Cold junction compensation
	ADJ0	0.0	0	Deviative engineering unit*4	-50 to +50 % FS	User's ZERO adjustment
	ADJS	0.0	0	Deviative engineering unit*4	-50 to +50 % FS	User's SPAN adjustment
	P-d0	0	0	Seconds	0 to 20	Power ON delay time

*1. Pressing SEL key for 3 seconds turn the unit into setting mode for Parameter block 1.

*2. Pressing SEL key for 7 seconds turn the unit into setting mode for Parameter block 2.

*3. Pressing SEL key for 9 seconds turn the unit into setting mode for Parameter block 3.

*4. Parameters set with "Engineering unit" or "Deviative engineering unit" shift according to changes in P-SL or P-SU setting.

*5. 0 or 1 for temperature sensor; 0, 1, 2 for voltage signal. (1 for one-place decimal, 2 for two-place decimal)

*6. Be sure to set at the minimum of 5.0 or a larger value though the unit accepts one smaller than 5.0.

■HOW TO SET PARAMETERS

- 1) Current display
- 2) Press SEL key for a few to several seconds to turn the unit into setting mode.
- 3) Press DOWN key to search for the parameter you need to change.
- 4) Press SEL key once and the parameter item on the display will be replaced with the current setting.
- 5) Press UP / DOWN keys until the setting is changed to the desired value.
- 6) Press SEL key once to register the new value.
- 7) Press SEL key for 3 seconds to return the unit into the display mode (1).