

Plug-in Signal Conditioners K-UNIT

DC ALARM

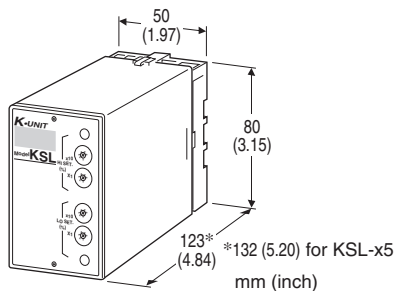
(rotary switch adjustments)

Functions & Features

- Providing relay contact closures at preset DC input levels
- Dual (Hi/Lo) trip
- Rotary switch setpoint adjustments
- Enclosed relays
- Relays can be powered 110 V DC
- Isolation up to 2000 V AC
- High-density mounting

Typical Applications

- Annunciator
- Various alarm applications



MODEL: KSL-[1][2]-[3][4]

ORDERING INFORMATION

- Code number: KSL-[1][2]-[3][4]
- Specify a code from below for each of [1] through [4].
(e.g. KSL-62-B/Q)
- Special input range (For codes Z & 0)
- Specify the specification for option code /Q
(e.g. /C01/S01)

[1] INPUT

Current

- A: 4 – 20 mA DC (Input resistance 250 Ω)
- A1: 4 – 20 mA DC (Input resistance 50 Ω)
- B: 2 – 10 mA DC (Input resistance 500 Ω)
- C: 1 – 5 mA DC (Input resistance 1000 Ω)
- D: 0 – 20 mA DC (Input resistance 50 Ω)
- E: 0 – 16 mA DC (Input resistance 62.5 Ω)
- F: 0 – 10 mA DC (Input resistance 100 Ω)
- G: 0 – 1 mA DC (Input resistance 1000 Ω)
- H: 10 – 50 mA DC (Input resistance 100 Ω)
- J: 0 – 10 μ A DC (Input resistance 1000 Ω)

- K: 0 – 100 μ A DC (Input resistance 1000 Ω)
- GW: -1 – +1 mA DC (Input resistance 1000 Ω)
- FW: -10 – +10 mA DC (Input resistance 100 Ω)
- Z: Specify current (See INPUT SPECIFICATIONS)

Voltage

- 1: 0 – 10 mV DC (Input resistance 10 k Ω min.)
- 15: 0 – 50 mV DC (Input resistance 10 k Ω min.)
- 16: 0 – 60 mV DC (Input resistance 10 k Ω min.)
- 2: 0 – 100 mV DC (Input resistance 100 k Ω min.)
- 3: 0 – 1 V DC (Input resistance 1 M Ω min.)
- 4: 0 – 10 V DC (Input resistance 1 M Ω min.)
- 5: 0 – 5 V DC (Input resistance 1 M Ω min.)
- 6: 1 – 5 V DC (Input resistance 1 M Ω min.)
- 4W: -10 – +10 V DC (Input resistance 1 M Ω min.)
- 5W: -5 – +5 V DC (Input resistance 1 M Ω min.)
- 0: Specify voltage (See INPUT SPECIFICATIONS)

[2] OUTPUT

- 2: Relay; N.O. or make contact
- 3: Relay; N.C. or break contact
- 5: Relay; SPDT or transfer contact

[3] POWER INPUT

AC Power

- B: 100 V AC
- C: 110 V AC
- D: 115 V AC
- F: 120 V AC
- G: 200 V AC
- H: 220 V AC
- J: 240 V AC

DC Power

- S: 12 V DC
- R: 24 V DC

[4] OPTIONS

- blank: none
- /Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to M-System's web site.)

- /C01: Silicone coating
- /C02: Polyurethane coating
- /C03: Rubber coating

TERMINAL SCREW MATERIAL

- /S01: Stainless steel

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3.5 screw terminals

Screw terminal: Chromated steel (standard) or stainless steel

Housing material: Flame-resistant resin (black)

Isolation: Input to output to power

Setpoint adjustments: 10-position rotary switches (front); 0 – 99 % independently; 1 % increments

Hysteresis (deadband): 1 – 2.5 %

Front LEDs: Red LEDs turn on when the coils are energized.

Power ON timer: Relays de-energized for approx. 2 seconds after power is turned on.

INPUT SPECIFICATIONS

■ DC Current:

Shunt resistor attached to the input terminals (0.5 W)
Specify input resistance value for code Z.

■ **DC Voltage:** -300 – +300 V DC

Minimum span: 10 mV

Offset: Max. 1.5 times span

Input resistance

Span 10 – 100 mV : $\geq 10 \text{ k}\Omega$

Span 0.1 – 1 V : $\geq 100 \text{ k}\Omega$

Span $\geq 1 \text{ V}$: $\geq 1 \text{ M}\Omega$

OUTPUT SPECIFICATIONS

■ **Relay Contact:** 100 V AC @1 A ($\cos \phi = 1$)

120 V AC @1 A ($\cos \phi = 1$)

240 V AC @0.5 A ($\cos \phi = 1$)

30 V DC @1 A (resistive load)

Maximum switching voltage: 380 V AC or 125 V DC

Maximum switching power: 120 VA or 30 W

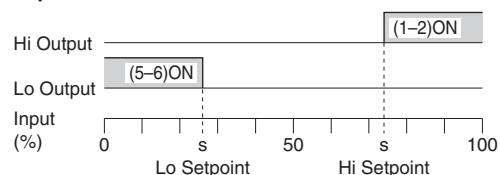
Minimum load: 5 V DC @10 mA

Mechanical life: 5×10^7 cycles

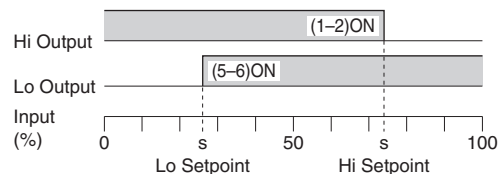
For maximum relay life with inductive loads, external protection is recommended.

Alarm Trip Operation Terminal No. in parentheses

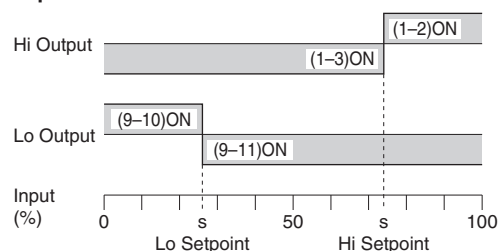
• Output Code 2



• Output Code 3



• Output Code 5



Trip Operation in Power Failure

- Output Code 2: both relays turn OFF
- Output Code 3: both relays turn ON
- Output Code 5: Terminals 1 – 3, 9 – 11 turn ON

INSTALLATION

Power input

• **AC:** Operational voltage range: rating $\pm 10 \%$, 50/60 ± 2 Hz, approx. 2 VA

• **DC:** Operational voltage range: rating $\pm 10 \%$, ripple 10 %p-p max., approx. 2 W (80 mA at 24 V)

Operating temperature: -5 to +55°C (23 to 131°F)

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

Mounting: Surface or DIN rail

Weight: 400 g (0.88 lb)

PERFORMANCE in percentage of span

Setpoint accuracy: $\pm 0.5 \%$

Trip point repeatability: $\pm 0.05 \%$

Temp. coefficient: $\pm 0.02 \%/^{\circ}\text{C}$ ($\pm 0.01 \%/^{\circ}\text{F}$)

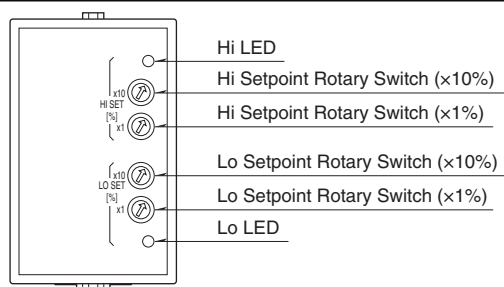
Response time: 0.5 ± 0.2 sec. (0 – 100 % at 90 % setpoint)

Line voltage effect: $\pm 0.1 \%$ over voltage range

Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC

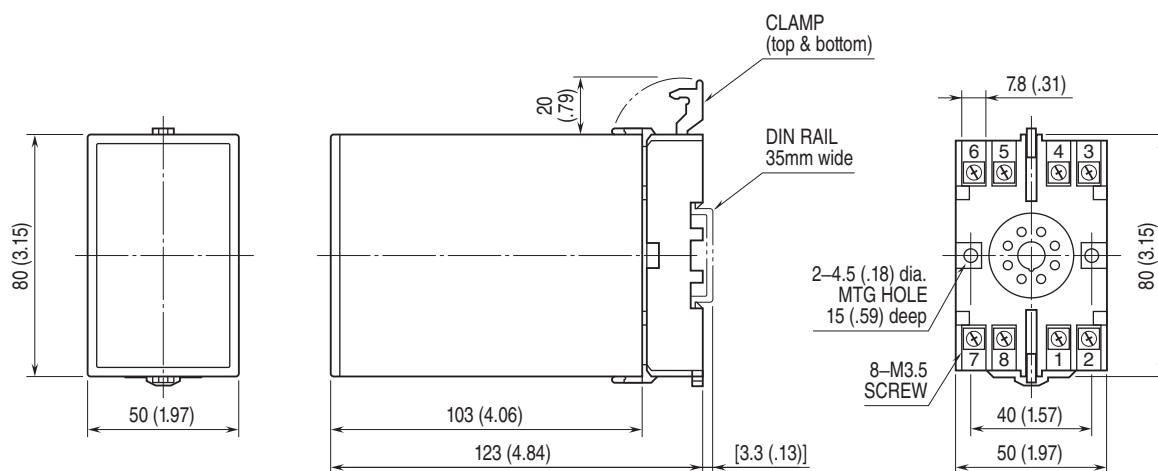
Dielectric strength: 2000 V AC @1 minute (input to output to power to ground)

EXTERNAL VIEW



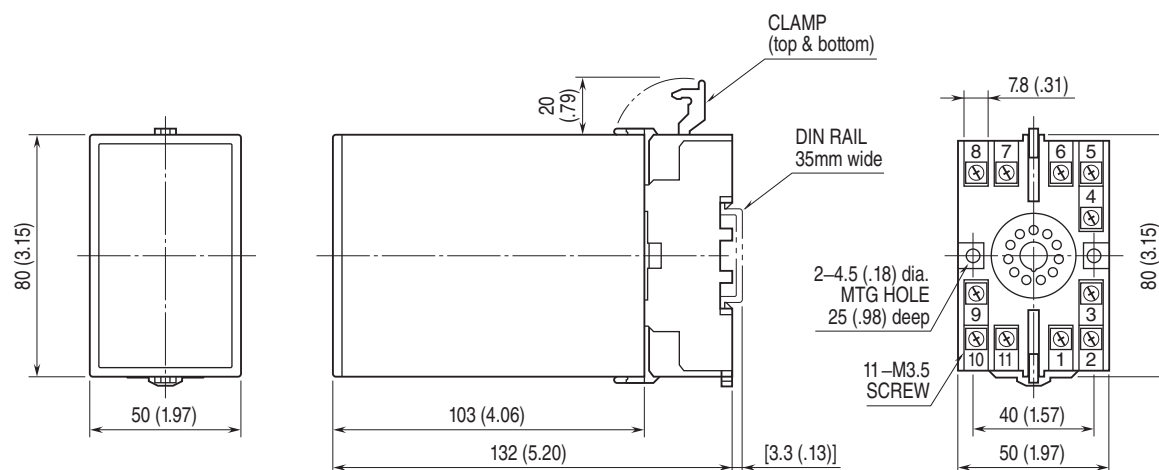
EXTERNAL DIMENSIONS unit: mm (inch)

■OUTPUT CODE: 2, 3



• When mounting, no extra space is needed between units.

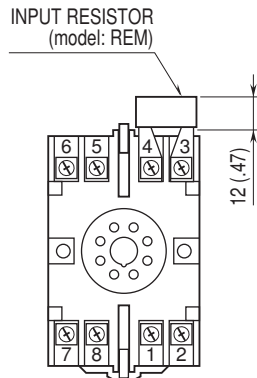
■OUTPUT CODE: 5



• When mounting, no extra space is needed between units.

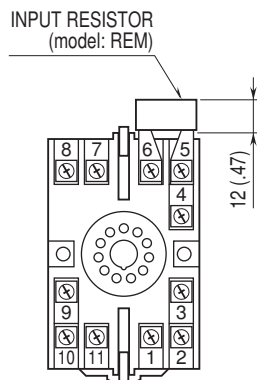
TERMINAL ASSIGNMENTS unit: mm (inch)

■ OUTPUT CODE: 2, 3



Input shunt resistor attached for current input.

■ OUTPUT CODE: 5

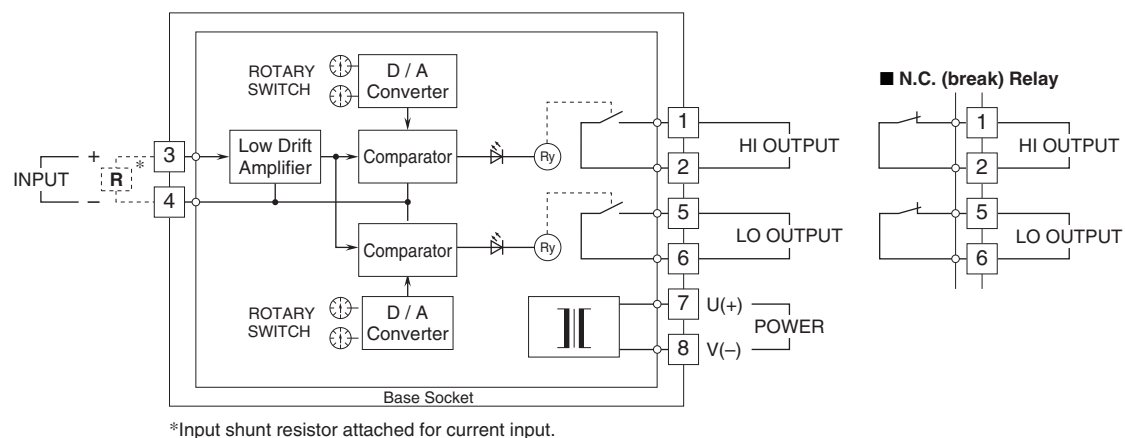


Input shunt resistor attached for current input.

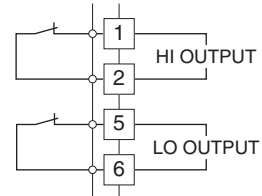
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

■ OUTPUT CODE: 2, 3

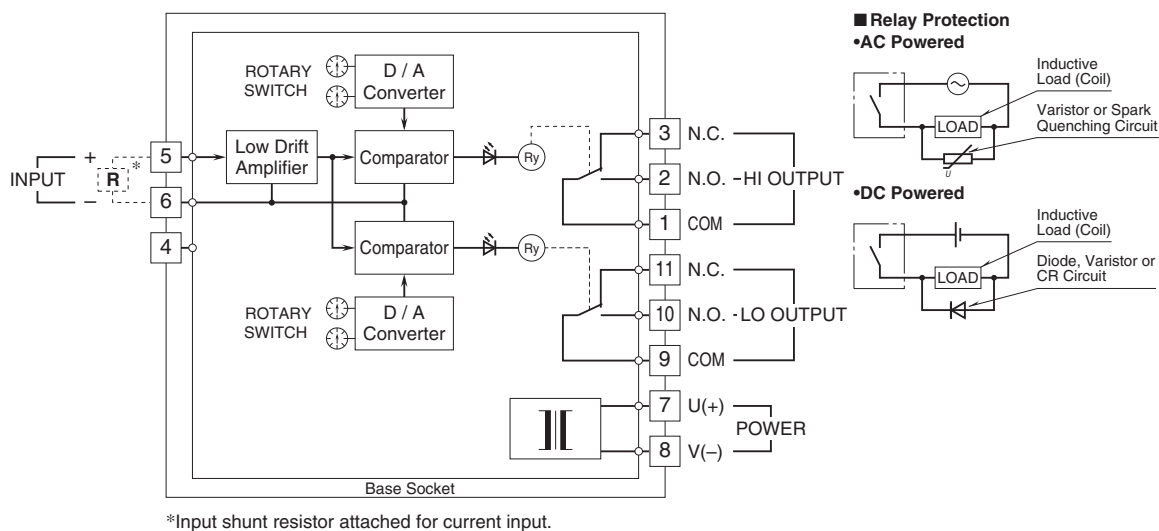
■ N.O. (make) Relay



■ N.C. (break) Relay



■OUTPUT CODE: 5



Specifications are subject to change without notice.