

**Plug-in Signal Conditioners K-UNIT**

**DC ALARM**

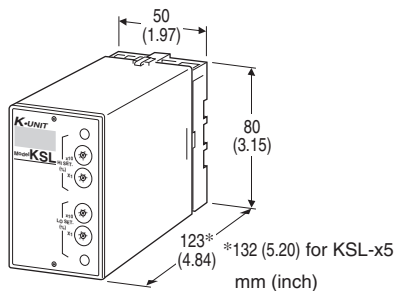
(rotary switch adjustments)

**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 μA DC (Input resistance 1000 Ω)

- K: 0 - 100 μA 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 kΩ min.)
- 15: 0 - 50 mV DC (Input resistance 10 kΩ min.)
- 16: 0 - 60 mV DC (Input resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Input resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Input resistance 1 MΩ min.)
- 4: 0 - 10 V DC (Input resistance 1 MΩ min.)
- 5: 0 - 5 V DC (Input resistance 1 MΩ min.)
- 6: 1 - 5 V DC (Input resistance 1 MΩ min.)
- 4W: -10 - +10 V DC (Input resistance 1 MΩ min.)
- 5W: -5 - +5 V DC (Input resistance 1 MΩ 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.

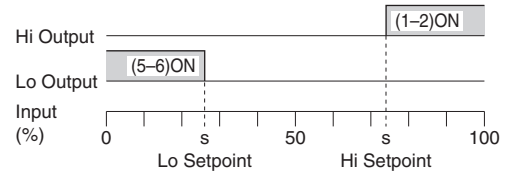
■ **DC Voltage:** -300 - +300 V DC  
**Minimum span:** 10 mV  
**Offset:** Max. 1.5 times span  
**Input resistance**  
 Span 10 - 100 mV :  $\geq 10 \text{ k}\Omega$   
 Span 0.1 - 1 V :  $\geq 100 \text{ k}\Omega$   
 Span  $\geq 1 \text{ V}$  :  $\geq 1 \text{ M}\Omega$

## OUTPUT SPECIFICATIONS

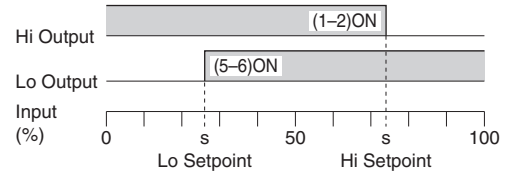
■ **Relay Contact:** 100 V AC @1 A ( $\cos \phi = 1$ )  
 120 V AC @1 A ( $\cos \phi = 1$ )  
 240 V AC @0.5 A ( $\cos \phi = 1$ )  
 30 V DC @1 A (resistive load)  
**Maximum switching voltage:** 380 V AC or 125 V DC  
**Maximum switching power:** 120 VA or 30 W  
**Minimum load:** 5 V DC @10 mA  
**Mechanical life:**  $5 \times 10^7$  cycles  
 For maximum relay life with inductive loads, external protection is recommended.

### Alarm Trip Operation Terminal No. in parentheses

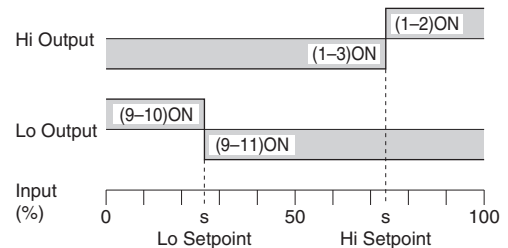
#### • Output Code 2



#### • 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

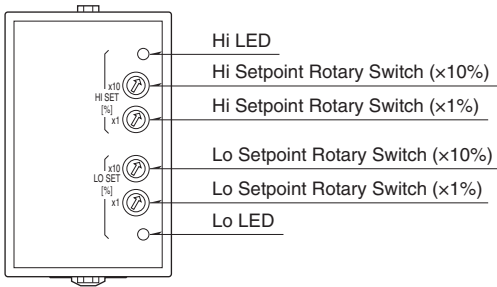
### Power input

- **AC:** Operational voltage range: rating  $\pm 10 \%$ , 50/60  $\pm 2$  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

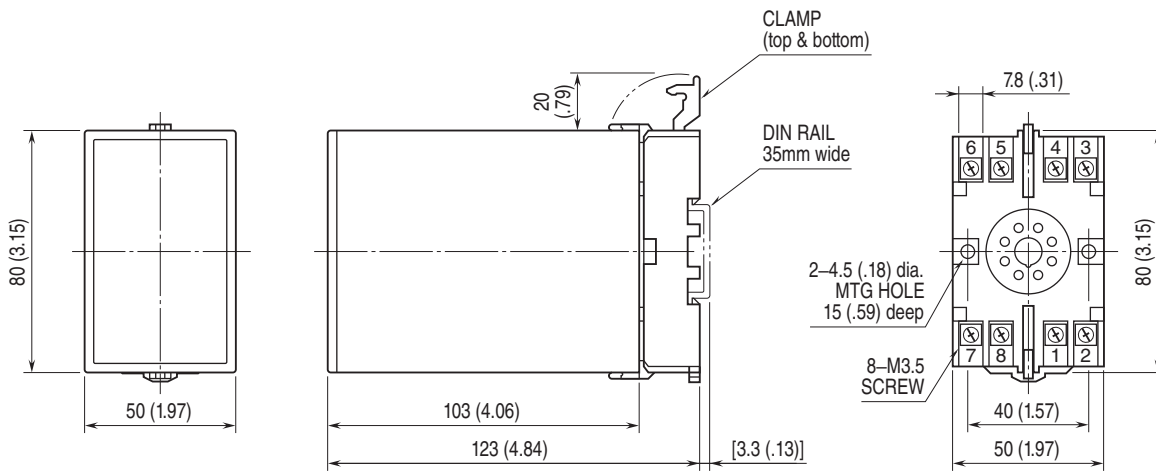
- Setpoint accuracy:**  $\pm 0.5 \%$
- Trip point repeatability:**  $\pm 0.05 \%$
- Temp. coefficient:**  $\pm 0.02 \%/^{\circ}\text{C}$  ( $\pm 0.01 \%/^{\circ}\text{F}$ )
- Response time:**  $0.5 \pm 0.2$  sec. (0 - 100 % at 90 % setpoint)
- Line voltage effect:**  $\pm 0.1 \%$  over voltage range
- 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



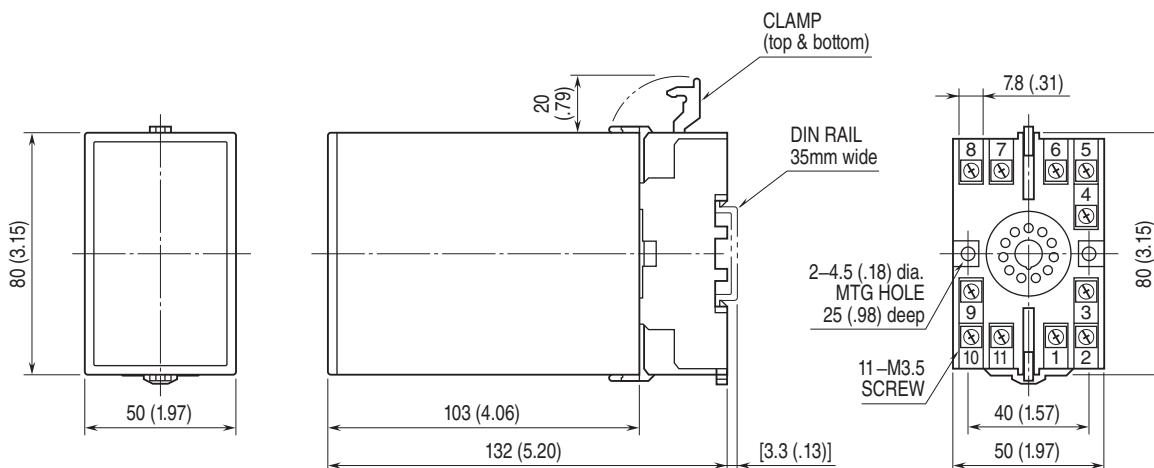
## EXTERNAL DIMENSIONS unit: mm (inch)

### ■OUTPUT CODE: 2, 3



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

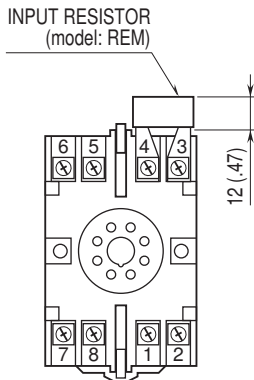
### ■OUTPUT CODE: 5



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

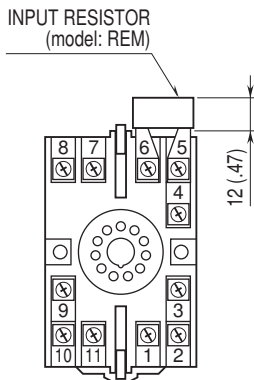
**TERMINAL ASSIGNMENTS unit: mm (inch)**

■ **OUTPUT CODE: 2, 3**



Input shunt resistor attached for current input.

■ **OUTPUT CODE: 5**

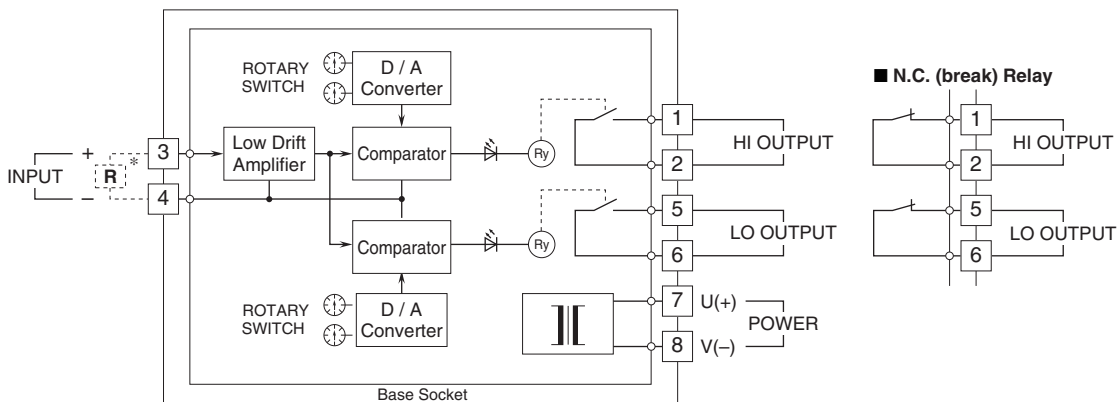


Input shunt resistor attached for current input.

**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**

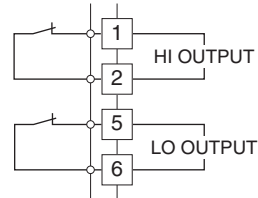
■ **OUTPUT CODE: 2, 3**

■ **N.O. (make) Relay**

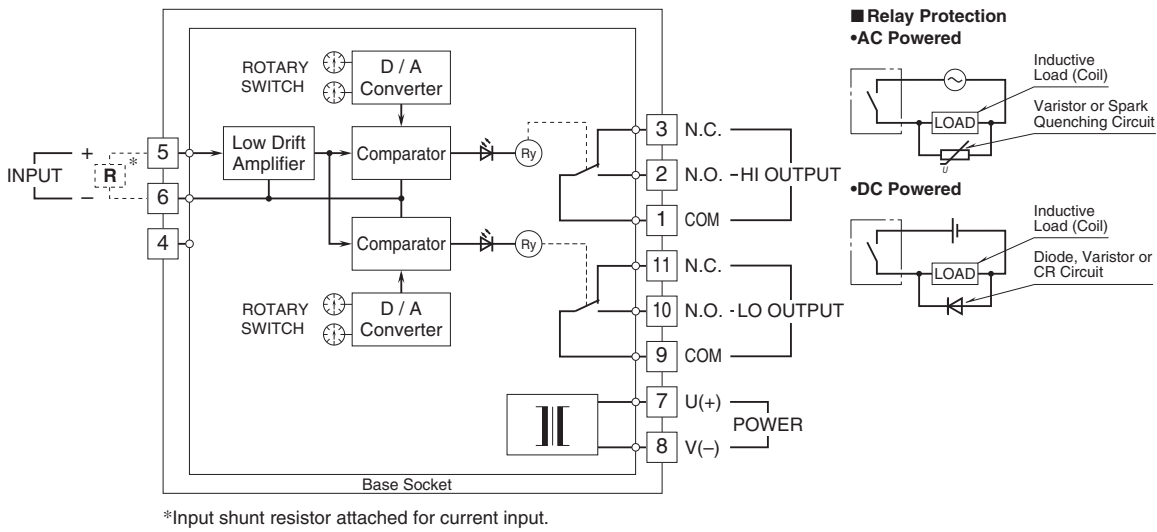


\*Input shunt resistor attached for current input.

■ **N.C. (break) Relay**



## OUTPUT CODE: 5



Specifications are subject to change without notice.