

## Plug-in Signal Conditioners K-UNIT

### LOW FREQUENCY TRANSMITTER

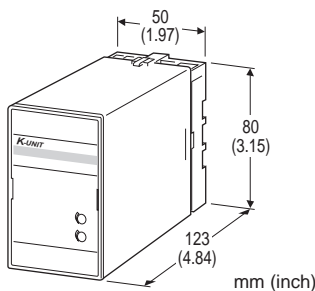
(50 Hz minimum)

#### Functions & Features

- Converting the output from a pulse-type transducer into standard process signal
- Isolation up to 2000 V AC
- High-density mounting

#### Typical Applications

- Positive displacement flowmeters, turbine flowmeters and vortex flowmeters
- Proximity switches



### MODEL: KSP-[1][2]-[3][4]

#### ORDERING INFORMATION

- Code number: KSP-[1][2]-[3][4]
- Specify a code from below for each [1] through [4].  
(e.g. KSP-2A-B/DN/Q)
- Input frequency range (e.g. 0 - 10 kHz)
- Special output range (For codes Z & 0)
- Specify the specification for option code /Q  
(e.g. /C01/S01)

#### [1] INPUT

- 1: Dry contact
- 2: Voltage pulse

#### [2] OUTPUT

##### Current

- A: 4 - 20 mA DC (Load resistance 750  $\Omega$  max.)
- B: 2 - 10 mA DC (Load resistance 1500  $\Omega$  max.)
- C: 1 - 5 mA DC (Load resistance 3000  $\Omega$  max.)
- D: 0 - 20 mA DC (Load resistance 750  $\Omega$  max.)
- E: 0 - 16 mA DC (Load resistance 900  $\Omega$  max.)
- F: 0 - 10 mA DC (Load resistance 1500  $\Omega$  max.)
- G: 0 - 1 mA DC (Load resistance 15 k $\Omega$  max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

#### Voltage

- 1: 0 - 10 mV DC (Load resistance 10 k $\Omega$  min.)
- 2: 0 - 100 mV DC (Load resistance 100 k $\Omega$  min.)
- 3: 0 - 1 V DC (Load resistance 100  $\Omega$  min.)
- 4: 0 - 10 V DC (Load resistance 1000  $\Omega$  min.)
- 5: 0 - 5 V DC (Load resistance 500  $\Omega$  min.)
- 6: 1 - 5 V DC (Load resistance 500  $\Omega$  min.)
- 4W: -10 - +10 V DC (Load resistance 2000  $\Omega$  min.)
- 5W: -5 - +5 V DC (Load resistance 1000  $\Omega$  min.)
- 0: Specify voltage (See OUTPUT SPECIFICATIONS)

#### [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 (multiple selections)

##### Low-end Cutout

- blank: With  
/DN: Without

##### Other Options

- blank: none  
/Q: Option other than the above (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  
**Overrange output:** 0 to 120 % at 1 - 5 V  
**Zero adjustment:** -5 to +5 % (front)  
**Span adjustment:** 95 to 105 % (front)



**Low-end cutout:** 2 to 5 %

(For /DN option, the output signal may fluctuate when the input signal is less than 5 %.)

to power to ground)

## INPUT SPECIFICATIONS

**Frequency range:** 0 - 50 Hz through 10 kHz

**Pulse width (time) requirement:** Duty ratio 20 - 80 % at 100 % input

■ **Dry Contact:** Mechanical contact or open collector

Sensing: Approx. 7.5 V DC @1 mA

ON/OFF level:  $\leq 200 \Omega / 0.6 \text{ V}$  for ON,  $\geq 100 \text{ k}\Omega / 2 \text{ V}$  for OFF

■ **Voltage Pulse:** Square or sine waveforms

**Pulse sensing:** Capacitor coupled; detecting pulse rise

**Input amplitude:** 2 - 50 Vp-p

**Input impedance:** 100 k $\Omega$  min.

## OUTPUT SPECIFICATIONS

■ **DC Current:** 0 - 20 mA DC

**Minimum span:** 1 mA

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 15 V max.

■ **DC Voltage:** -10 - +12 V DC

**Minimum span:** 5 mV

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 10 mA max.; 5 mA for negative voltage output; at  $\geq 0.5 \text{ V}$

## INSTALLATION

**Power input**

•**AC:** Operational voltage range: rating  $\pm 10 \%$ ,  
50/60  $\pm 2$  Hz, approx. 2.5 VA

•**DC:** Operational voltage range: rating  $\pm 10 \%$ ,  
ripple 10% p-p max.; approx. 2.5 W (100 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:** 350 g (0.77 lb)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.3 \%$  (output 10 - 100 %)

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

**Response time:** (0 - 90 %)

Approx. 2 sec. for 0 - 50 Hz

Approx. 1 sec. for 0 - 100 Hz

Approx. 0.5 sec. for 0 - 500 Hz

Approx. 0.5 sec. for 0 - 10 kHz

**Ripple:** 0.2 %p-p max. with input  $\geq 10 \%$

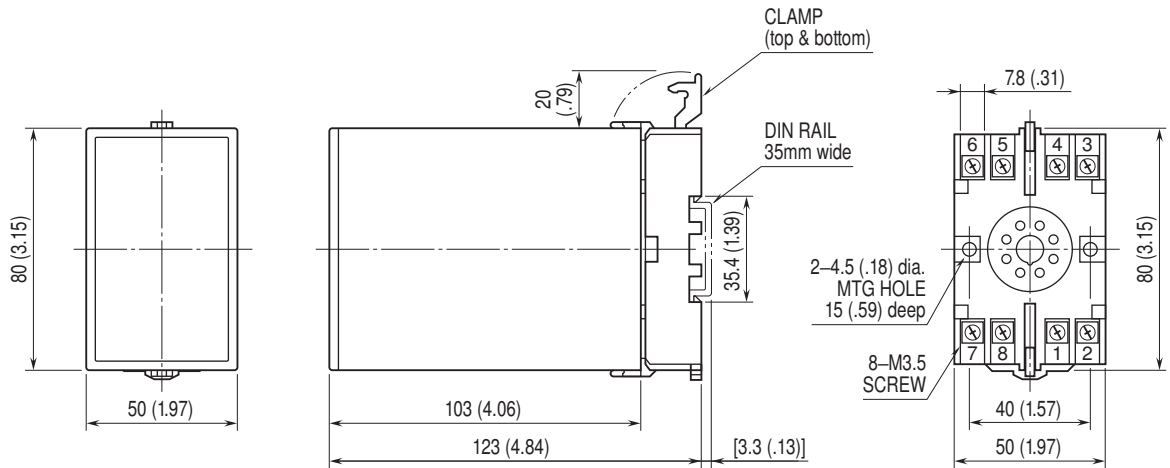
**Line voltage effect:**  $\pm 0.1 \%$  over voltage range

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

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

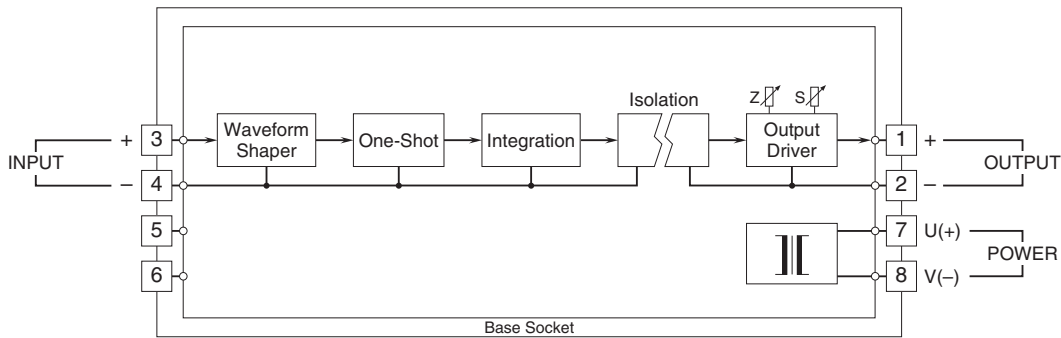


## DIMENSIONS unit: mm (inch)



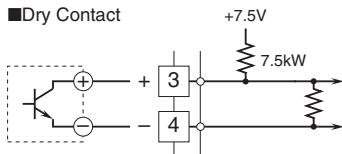
• When mounting, no extra space is needed between units.

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

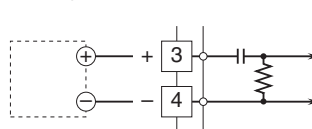


### Input Connection Examples

■ Dry Contact



■ Voltage Pulse



Specifications are subject to change without notice.