

## Space-saving Plug-in Signal Conditioners H-UNIT

### DC/FREQUENCY CONVERTER

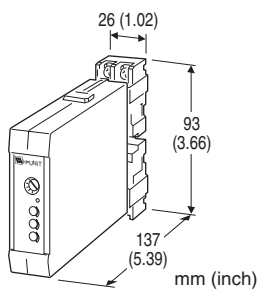
(selectable range)

#### Functions & Features

- Providing a pulse rate output in proportion to DC input signal
- Frequency range adjustable with a front-mounted 16-position rotary switch and potentiometer
- Low-end cutout adjustable
- Highdensity mounting

#### Typical Applications

- Totalizing applications in combination with a counter



## MODEL: HAPU-[1]1-[2][3]

### ORDERING INFORMATION

- Code number: HAPU-[1]1-[2][3]
- Specify a code from below for each of [1] through [3]. (e.g. HAPU-61-R/Q)
- Special input range (For codes Z & 0)
- Output frequency range (e.g. 0 - 100 Hz)
- 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)
- Z: Specify current (See INPUT SPECIFICATIONS)

#### Voltage

- 1: 0 - 10 mV DC (Input resistance 100 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.)
- 0: Specify voltage (See INPUT SPECIFICATIONS)

### OUTPUT

- 1: Open collector (max. frequency 10 kHz)

### [2] POWER INPUT

#### DC Power

- S: 12 V DC  
(Operational voltage range 12 V ±10 %, ripple 10 %p-p max.)
- R: 24 V DC  
(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

### [3] 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 (torque 0.8 N·m)
- Screw terminal:** Nickel-plated steel (standard) or stainless steel
- Housing material:** Flame-resistant resin (black)
- Isolation:** Input to output to power
- Zero adjustment:** 0 - 5 % (front)
- Span adjustment:** 50 - 100 % of range (front)
- Output frequency adjustment:** Preselecting range with a rotary switch and fine control with span adjustment (50 - 100 %)
- Low-end cutout:** 0 to 10 % (front); a red LED assists in adjusting the cutout point; turns on during the cutout.

### 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 (Input Span: Input Resistance)

10 - 100 mV : 10 k ( $\Omega$  minimum)  
 0.1 - 1 V : 100 k  
 $\geq 1$  V : 1 M

## OUTPUT SPECIFICATIONS

### ■ Open Collector

**Frequency range:** 0 - 10 kHz

**Rating:** 50V DC @ 50 mA (resistive load)

**ON pulse width:** 0.5 sec. max. (varies according to the frequency)

**Saturation voltage:** 0.6 V DC

### ■ FREQUENCY RANGES

SW No.	SPAN RANGE	
	MIN. (50%)	MAX. (100%)
0	0 - 5 kHz	0 - 10 kHz
1	0 - 2.5 kHz	0 - 5 kHz
2	0 - 1.25 kHz	0 - 2.5 kHz
3	0 - 625 Hz	0 - 1.25 kHz
4	0 - 312 Hz	0 - 625 Hz
5	0 - 156 Hz	0 - 312 Hz
6	0 - 78 Hz	0 - 156 Hz
7	0 - 39 Hz	0 - 78 Hz
8	0 - 20 Hz	0 - 39 Hz
9	0 - 10 Hz	0 - 20 Hz
A	0 - 5 Hz	0 - 10 Hz
B	0 - 2.5 Hz	0 - 5 Hz
C	0 - 1.25 Hz	0 - 2.5 Hz
D	0 - 36 pulses/min.	0 - 1.25 Hz
E	0 - 18 pulses/min.	0 - 36 pulses/min.
F	0 - 9 pulses/min.	0 - 18 pulses/min.

## INSTALLATION

**Current consumption:**  $\leq 70$  mA

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

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

**Mounting:** Surface or DIN rail; Standard Rack Mounting

Frame BX-16H available

**Weight:** 200 g (0.44 lb)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 0.25$  %

**Temp. coefficient:**  $\pm 0.05$  %/°C ( $\pm 0.03$  %/°F)

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

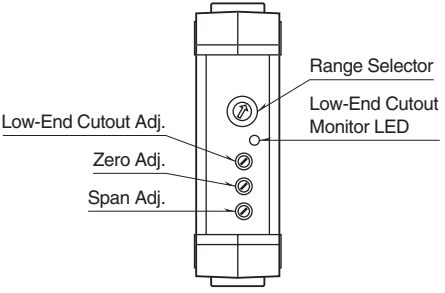
**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

**Dielectric strength:** 500 V AC @ 1 minute

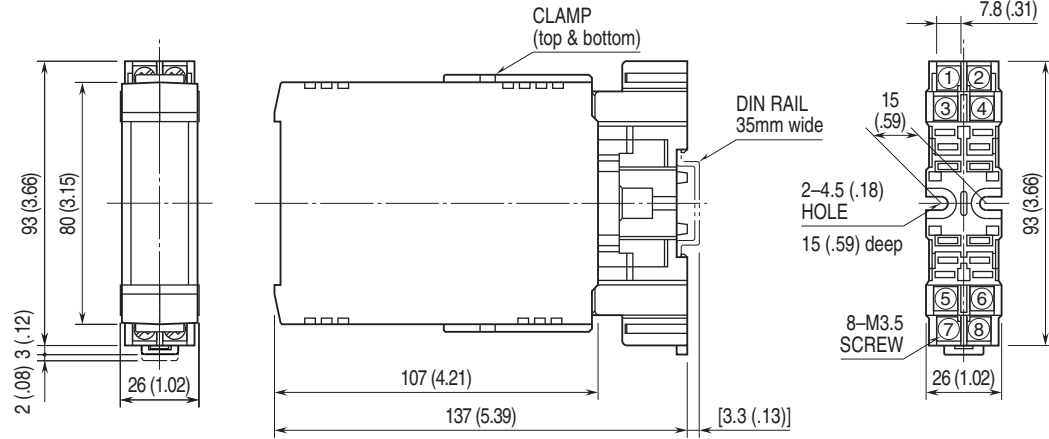
(input to output to power)

1500 V AC @ 1 minute (input or output or power to ground)

**EXTERNAL VIEW**

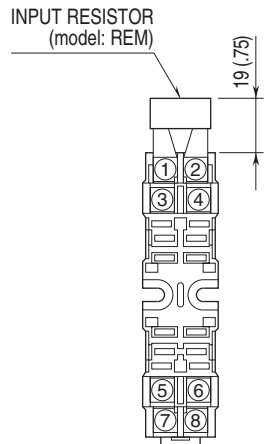


**EXTERNAL DIMENSIONS unit: mm (inch)**



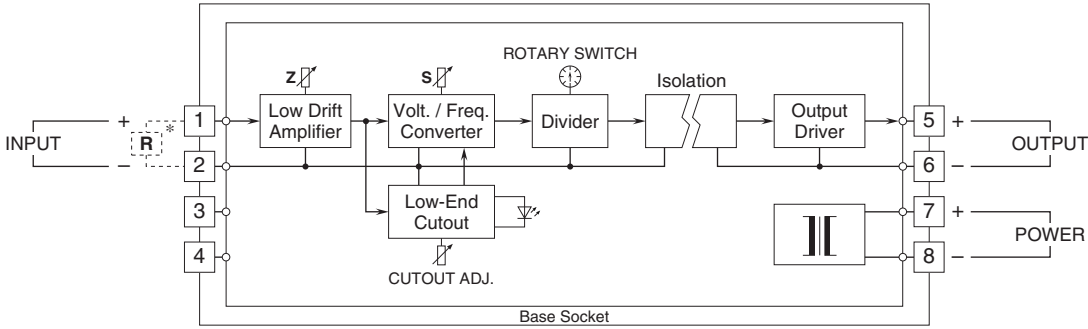
•When mounting, no extra space is needed between units.

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



Input shunt resistor attached for current input.

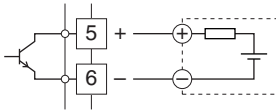
**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\*Input shunt resistor attached for current input.

**Output Connection Examples**

■ Open Collector



Specifications are subject to change without notice.