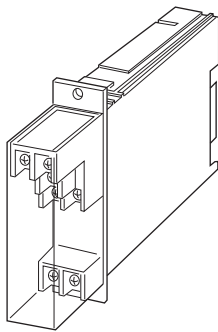


**High-density Signal Conditioners 10-RACK****DC/FREQUENCY CONVERTER****Functions & Features**

- Providing two pulse rate outputs in proportion to DC input signal

**Typical Applications**

- Totalizing applications in combination with a counter

**MODEL: 10AP-[1][2][3]-R[4]****ORDERING INFORMATION**

- Code number: 10AP-[1][2][3]-R[4]
- Specify a code from below for each [1] through [4].  
(e.g. 10AP-621-R/Q)
- Special input range (For codes Z & 0)
  - Output frequency range (e.g. 0 - 500 Hz)
  - Specify the specification for option code /Q  
(e.g. /C01)

**[1] INPUT****Current**

- A:** 4 - 20 mA DC (Input resistance 250 Ω)  
**D:** 0 - 20 mA DC (Input resistance 50 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)  
 ( 0 % input must be 0 mA.)

**Voltage**

- 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)  
 ( 0 % input must be 0 V.)

**[2] OUTPUT 1**

- 1:** Open collector (max. 1 kHz)  
**2:** 5 V pulse (max. 1 kHz)  
**3:** Mercury relay contact (max. 30 Hz)

**[3] OUTPUT 2**

- 0:** None  
**1:** Open collector

**POWER INPUT****DC Power**

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

**[4] OPTIONS**

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

**SPECIFICATIONS OF OPTION: Q****COATING (For the detail, refer to M-System's web site.)**

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

**GENERAL SPECIFICATIONS**

**Construction:** Rack-mounted; terminal access via screw terminals at the front and via card-edge connector at the rear; terminal cover provided

**Connection**

**Input:** M3.5 screw terminals (torque 0.8 N·m)  
**Output:** Card-edge connector and M3.5 screw terminals (torque 0.8 N·m)

**Power input:** Supplied from card-edge connector

**Screw terminal:** Nickel-plated steel

**Housing material:** Flame-resistant resin (black)

**Isolation:** Input to output 1 to output 2 to power

**Overrange output:** Approx. 0 to 120 %

**Zero adjustment:** 0 - 5 % (front)

**Span adjustment:** 95 to 105 % (front)

**INPUT SPECIFICATIONS**

■ **DC Current:** Input resistor incorporated  
 Specify input resistance value for code Z.

( $R \leq 2 W \div [F.S. Current]^2$ )

■ **DC Voltage:** 0 - 300V DC

**Minimum span:** 1V

**Input resistance:** 1 MΩ min.



## OUTPUT SPECIFICATIONS

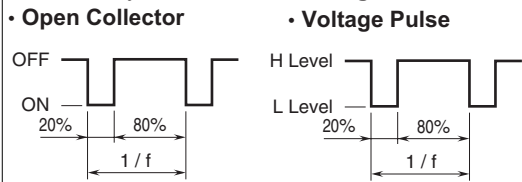
- **Open Collector:** 30 V DC @ 100 mA (resistive load)  
**Frequency range:** 0 - 10 pulses/hour through 1 kHz  
**Saturation voltage:** 0.6 V DC  
**Timer for output 2:** Limits ON time within 75 ±25 msec.  
 (Timer is provided when output 1 is mercury relay contact.)
- **5 V Pulse**  
**Frequency range:** 0 - 10 pulses/hour through 1 kHz  
**Hi level:** 3.0 - 5.5 V  
**Lo level:** ≤ 0.5 V  
**Load resistance:** 250 Ω min.
- **Mercury Relay Contact:** 132 V AC @ 200 mA (cos φ = 1)  
 30 V DC @ 200 mA (resistive load)  
**Frequency range:** 0 - 10 pulses/hour through 30 Hz  
**Timer:** Limits ON time within 75 ±25 msec.  
**Relay life:** ≥ 5 × 10<sup>8</sup> cycles, mechanical  
 ≥ 5 × 10<sup>7</sup> cycles, electrical

## PERFORMANCE in percentage of span

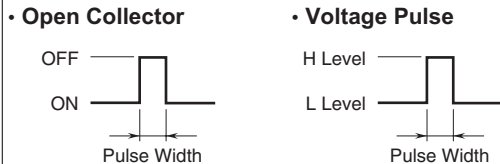
- Accuracy:** ±0.1 %
- Temp. coefficient:** ±0.015 %/°C (±0.008 %/°F)
- Response time:** Approx. 3 sec. (0 - 90 %)
- Line voltage effect:** ±0.1 % over voltage range
- Insulation resistance:** ≥ 100 MΩ with 500 V DC
- Dielectric strength:** 500 V AC @ 1 minute  
 (input to output 1 to output 2 to power)  
 1500 V AC @ 1 minute (input or output or power to ground)

## OUTPUT PULSE WIDTH

- **Frequency less than 500 Hz at 100% input**  
 → Duty ratio 20% (See the figure below)



- **Frequency greater than 500 Hz at 100% input**  
 → See the figure and equation below.



$$\text{Pulse Width [millisec.]} = \frac{1}{2.09 \times 100\% \text{ Frequency [kHz]}}$$

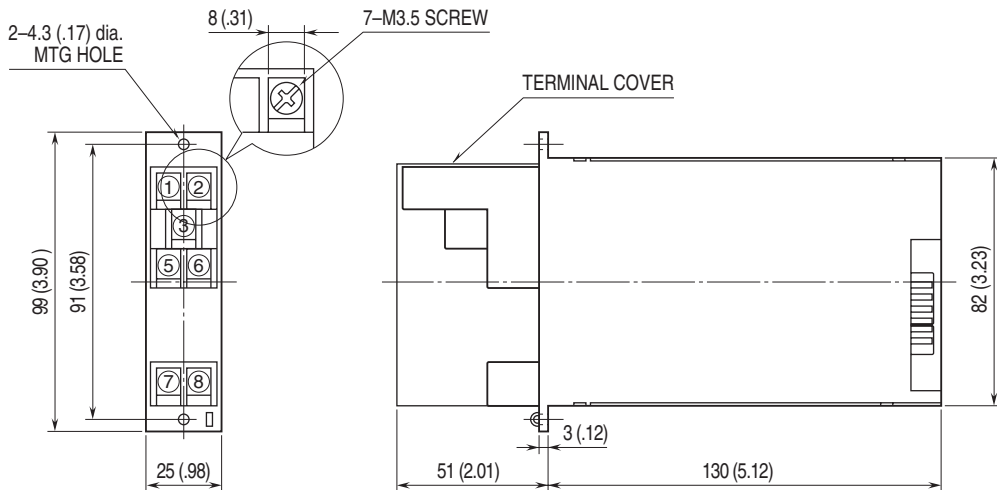
- **Mercury Relay Contact**  
 Frequency less than 4 Hz (100%) → Pulse width time 75 ±25 ms.  
 Frequency greater than 4 Hz (100%) → Duty ratio 20%

## INSTALLATION

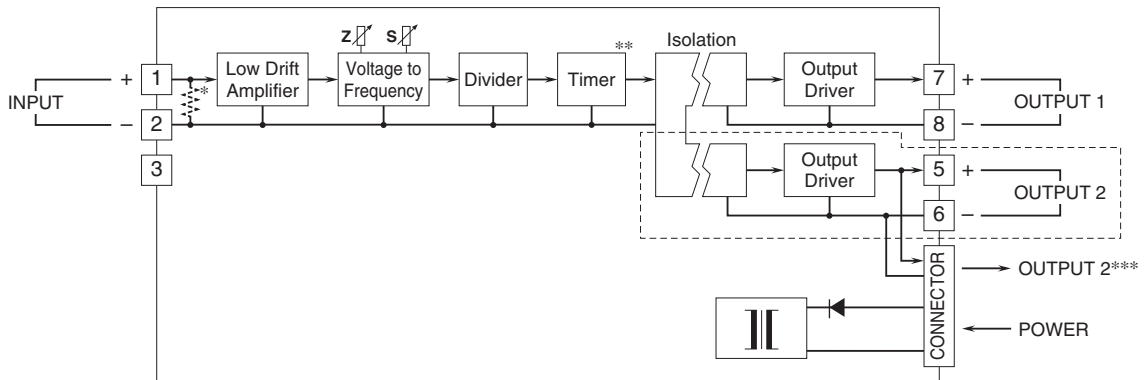
- Current consumption:** Approx. 60 mA
- Operating temperature:** -5 to +55°C (23 to 131°F)
- Operating humidity:** 30 to 90 %RH (non-condensing)
- Mounting:** Standard Rack 10BXx
- Weight:** 200 g (0.44 lb)



**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)**



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



\* Input shunt resistor incorporated for current input.  
 \*\* Provided only with relay contact output.  
 \*\*\*1 output type has the output 1 connected to the card-edge connector in parallel.  
 Remark 1) The section enclosed by broken line is only for 2nd output channel.



Specifications are subject to change without notice.

