High-density Signal Conditioners 10-RACK

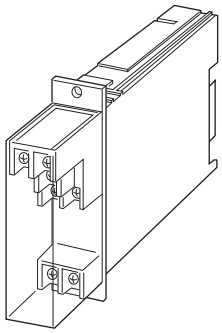
PULSE SCALER

Functions & Features

• Converting pulse rate into convenient engineering unit for display on a totalizing counter or meter

Typical Applications

• Positive displacement flowmeters and turbine flowmeters
• Magnetic tachometers



MODEL: 10PR–[1][2]0–R[3]

ORDERING INFORMATION

• Code number: 10PR-[1][2]0-R[3]
Specify a code from below for each [1] through [3].
(e.g. 10PR-110-R/Q)
• Input frequency range (e.g. 0 – 356.7 Hz)
• Output frequency range (e.g. 0 – 1.00 Hz)
• Specify the specification for option code /Q
(e.g. /C01)

[1] INPUT

1: Dry contact (max. 100 kHz)
2: Voltage pulse (max. 100 kHz)

[2] OUTPUT 1

1: Open collector (max. frequency 20 kHz)
2: 5 V pulse (max. frequency 20 kHz)
3: Relay contact (max. frequency 2 Hz)
4: 24 V pulse (max. frequency 20 Hz)

OUTPUT 2

0: None

POWER INPUT

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

[3] OPTIONS

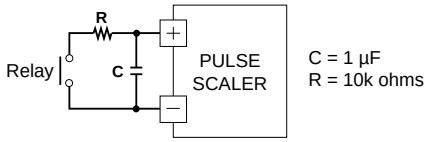
blank: none
/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q

COATING (For the detail, refer to M-System's web site.)
/C01: Silicone coating
/C02: Polyurethane coating
/C03: Rubber coating

CAUTION

1) This unit's output waveform is not uniform due to its scaling method.
2) Use input relays which do not cause chattering (e.g. mercury relays). Other relays could be used only with a CR filter, for 10 Hz at maximum.
3) Use M-System's Model M2PRU instead of this unit in conjunction with the pulse output from M-System's power transducers.



GENERAL SPECIFICATIONS

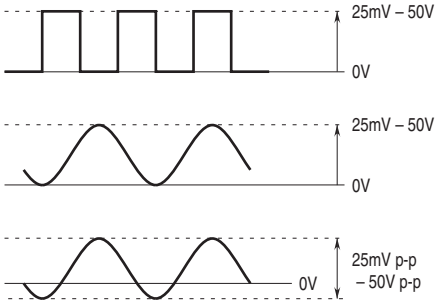
Construction: Rack-mounted; terminal access via screw terminals at the front and via card-edge connector at the rear; terminal cover provided
Connection
Input: M3.5 screw terminals (torque 0.8 N·m)
Output: Card-edge connector and M3.5 screw terminals (torque 0.8 N·m)
Power input: Supplied from card-edge connector
Screw terminal: Nickel-plated steel
Housing material: Flame-resistant resin (black)
Isolation: Input to output to power
Input pulse sensing: Capacitor coupled; detecting pulse rise
Sensitivity adjustment: Single-turn screwdriver adjustment (front); 25 mVp-p – 5 Vp-p
Scaling factor: 0.9999×10^{0} – 0.0001×10^{-6}

INPUT SPECIFICATIONS

■ **Dry Contact**: Mechanical contact or open collector
Max. frequency: 100 kHz
Pulse width time requirement: 5 µsec. min. (20 msec. min. for frequencies ≤ 10 Hz)
Sensing: Approx. 7.5 V DC @ 1 mA

ON/OFF level: ≤ 20 kΩ for ON, ≥ 100 kΩ for OFF
■ **Voltage Pulse**: Square or sine waveforms*
Max. frequency: 100 kHz
Pulse width time requirement: 5 µsec. min. (20 msec. min. for frequencies ≤ 10 Hz)
Input amplitude: 25 mVp-p – 50 Vp-p
Minimum amplitude requirement
•**With duty ratio 50 % ±10 %**
(frequency: amplitude)
0 – 2 kHz: 25 mVp-p
0 – 20 kHz: 50 mVp-p
0 – 40 kHz: 1 Vp-p
0 – 100 kHz: 5 Vp-p
•**With duty ratio other than 50 % ±10 %**
(pulse width: amplitude)
5 µsec.: 5 Vp-p
10 µsec.: 3.5 Vp-p
50 µsec.: 2 Vp-p
100 µsec.: 1 Vp-p
500 µsec.: 0.5 Vp-p
Input impedance: 100 kΩ minimum

*Voltage pulse examples



OUTPUT SPECIFICATIONS

■ **Open Collector**: 50 V DC @ 50 mA (resistive load)
Frequency range: 0 – 20 kHz
ON pulse width: Approx. 30 µsec.
Saturation voltage: 0.6 V DC
■ **Relay Contact**: 120 V AC @ 200 mA (cos ø = 1)
240 V AC @ 100 mA (cos ø = 1)
24 V DC @ 200 mA (resistive load)
Maximum switching voltage: 240 V AC or 30 V DC
Maximum switching power: 24 VA or 4.8 W
Minimum load: 5 V DC @ 10 mA
Frequency range: 0 – 2 Hz
ON pulse width: Approx. 30 msec.
Relay life: ≥ 5×10^7 cycles (mechanical)
≥ 10^5 cycles (electrical)
■ **5 V Pulse**
Frequency range: 0 – 20 kHz
Low pulse width: Approx. 30 µsec.
High level: 5 V ±10 %
Low level: ≤ 0.5 V
Load resistance: 600 Ω minimum
■ **24 V Pulse**
Frequency range: 0 – 20 Hz
High pulse width: Approx. 30 msec.
High level: 24 V ±10 %
Low level: ≤ 0.5 V
Load current: 30 mA max.
Load resistance: 800 Ω minimum

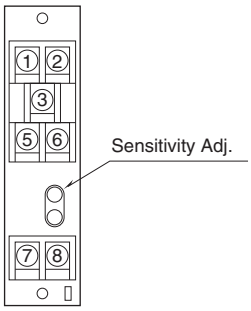
INSTALLATION

Current consumption: Approx. 80 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)

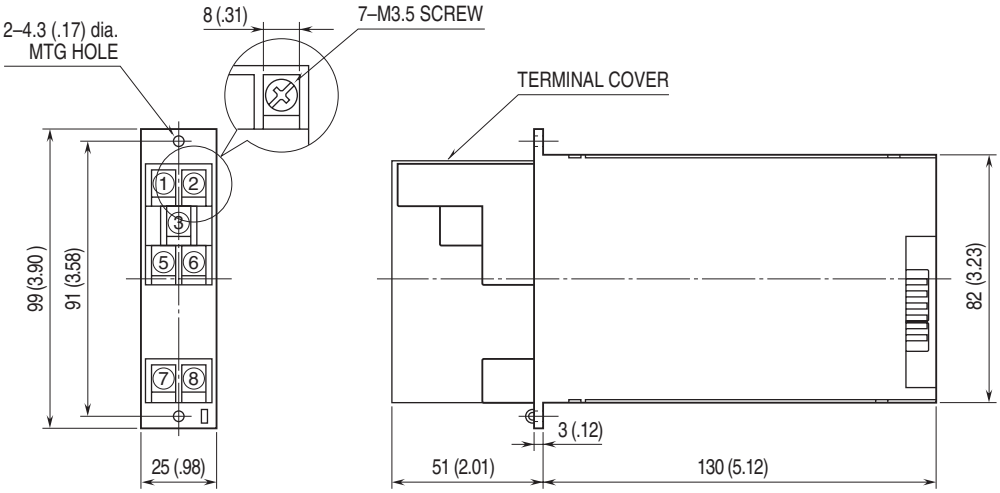
PERFORMANCE

Insulation resistance: ≥ 100 MΩ 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)

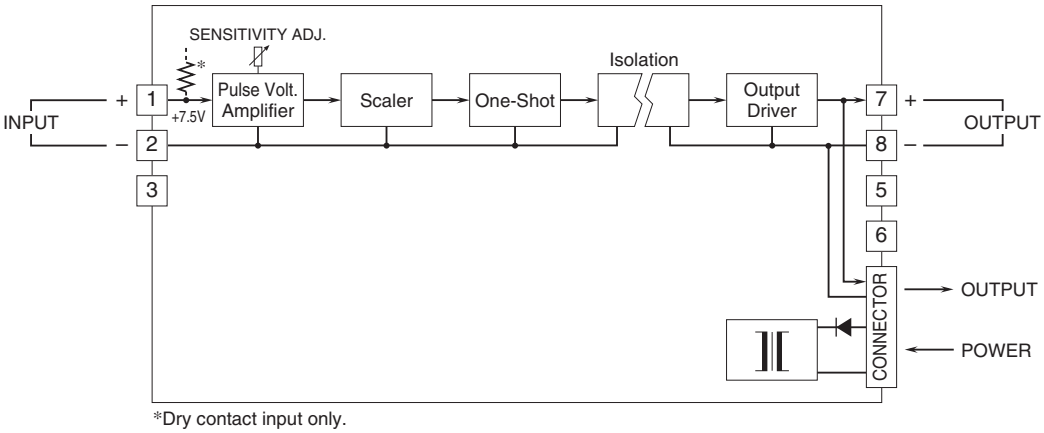
EXTERNAL VIEW



EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



*Dry contact input only.

⚠ Specifications are subject to change without notice.