

Plug-in Signal Conditioners M-UNIT

ENCODER SPEED TRANSMITTER

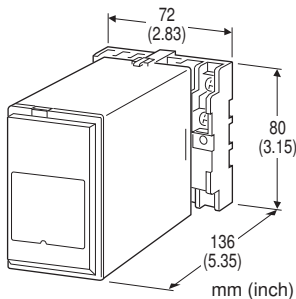
(field-programmable; built-in excitation)

Functions & Features

- Converts a two-phase forward and reverse rotation pulse signal with 90 degree phase difference into a forward and reverse speed signal
- Built-in excitation
- Field-selectable input type and range
- Isolation up to 2000 V AC
- High-density mounting

Typical Applications

- Measuring moving speed of a machine with a rotary encoder



MODEL: JRP2-[1][2]-[3]

ORDERING INFORMATION

- Code number: JRP2-[1][2]-[3]
- Specify a code from below for each [1] through [3].
(e.g. JRP2-76-K)
- Special output range (For codes Z & 0)
 - Use Ordering Information Sheet (No. ESU-1577). Factory setting (indicated below) will be used if not otherwise specified.

Factory Setting

Input type: Open collector
Pulse amplitude: ----
Pulse sensing: DC coupled
Noise filter: Low
Detecting level: (Detecting voltage in the internal circuit)
1 V (5 V excitation)
2 V (12/24 V excitation)
Frequency range: 0 - 1 kHz
Input zero frequency: 0 Hz
Input span frequency: 1 kHz
Low-end cutout: 0 Hz
Low-end cutout deadband: 0.01 kHz

Alarm setpoint: 100 %
Alarm deadband: 1.00 %
Alarm mode: High alarm
Linearization: Without

INPUT - Field-selectable

Open collector
Voltage pulse
RS-422 line driver pulse
Two inputs (phase A and B) are required for adequate operation of the this unit.

[1] EXCITATION

1: 5 V DC @ 120 mA
4: 12 V DC @ 60 mA
7: 24 V DC @ 25 mA

[2] OUTPUT

Current

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

Voltage

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

[3] POWER INPUT

AC Power

K: 85 - 132 V AC

DC Power

S: 12 V DC
R: 24 V DC
V: 48 V DC
P: 110 V DC

RELATED PRODUCTS

- JX configurator connection kit (model: JXCON)
- Programming Unit (model: PU-2x)

GENERAL SPECIFICATIONS

Construction: Plug-in
Connection: M3.5 screw terminals
Housing material: Flame-resistant resin (black)
Isolation: Input to DC output to alarm output to power
Overrange output: Approx. -15 to +115 % at 1 - 5 V
Zero adjustment: -5 to +5 % (front)
Span adjustment: 95 to 105 % (front)
Alarm mode: High or Low
Alarm setpoint: -15 - +115 %
Alarm deadband: 0 - 20 %
Input monitor (PL1): Red LED blinks according to the input phase A.
Input monitor (PL2): Red LED blinks according to the input phase B.
Excitation adjustment: 5V or 12V DC
Software programming: Programming unit (model: PU-2x) used to set the input frequency range, zero and span, low-end cutout, alarm, fine output adj., linearization, etc. (Refer to the users manual of JXCON for the adjustments configurable with JXCON.)
Adjustments: With DIP and Rotary switches.

- Input Type
- Noise Filter
- Pulse amplitude

(Refer to the instruction manual for details)
Modular jack: Connecting the PU-2x
Low-end cutout: Specify frequency (When the low-end cutout is set to 0 Hz, the deadband is not valid.)

INPUT SPECIFICATIONS

Excitation: Shortcircuit protection; approx. 440 mA (max.) at shortcircuit
Maximum frequency: 200 kHz
Frequency ranges: 0 - 0.01 Hz through 100 kHz
 Note: Choose 100 kHz range to set the zero/span frequencies greater than 100 kHz.
Minimum span: 10 % of the selected frequency range
Minimum pulse width time requirement: 2.5 μ sec. for both ON and OFF

■ **Open Collector**
Input requirements (Excitation: Sensing)
 5 V: Approx. 4 V / 1.0 mA
 12 V: Approx. 9 V / 2.3 mA
 24 V: Approx. 16 V / 4.7 mA
ON resistance: \leq 200 Ω
OFF resistance: \geq 200 k Ω
Detecting level:
 1 V (5 V excitation)
 2 V (12/24 V excitation)
 (Detecting voltage in the internal circuit. For open collector input, be sure to re-adjust the voltage back to 1 V (5 V

excitation) or 2 V (12/24 V excitation) if it has been changed for other input types.)

Detecting pulse edge: OFF (input monitor LED ON) to ON (LED OFF)

■ Voltage Pulse

Waveform: Square or sine

Input impedance: 10 k Ω min.

Pulse amplitude: 0.1 - 100 Vp-p

Max. voltage between input terminals: 50 V

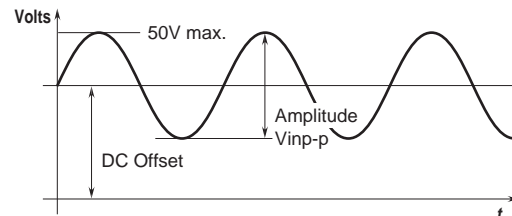
Detecting level: 0 - 5 V (factory setting: 2 V)
 (Detecting voltage in the internal circuit.)

Detecting pulse state: A pulse rise detected when the input voltage goes above the detecting level (input monitor LED ON); a pulse sink detected when it goes below the level (LED OFF).

■ RS-422 Line Driver Pulse

Receiver: Conforms to RS-422

■ Voltage pulse waveform



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 V

■ **Alarm Output:** Relay contact

Rated load: 125 V AC @ 0.5 A ($\cos \theta = 1$)

30 V DC @ 0.5 A (resistive load)

Maximum switching voltage: 250 V AC or 125 V DC

Maximum switching power: 62.5 VA or 60 W

Minimum load: 10 mV DC @ 1 mA

Mechanical life: 5×10^7 cycles (300 cycles/minute)

For maximum relay life with inductive loads, external protection is recommended.

INSTALLATION

Power input

• **AC:** Operational voltage range 85 - 132 V, 47 - 66 Hz, approx. 7 VA

•DC: Operational voltage range: Rating $\pm 10\%$, or 85 - 150 V for 110 V rating; ripple 10 %p-p max.; Approx. 4 W (140 mA at 24 V)

Operating temperature: -5 to +60°C (23 to 140°F)

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

Mounting: Surface or DIN rail

Weight: 350 g (0.77 lbs)

PERFORMANCE in percentage of span

Accuracy: Input accuracy + output accuracy

Output accuracy: $\pm 0.05\%$ of the output range

Input accuracy: $\pm 0.05\%$ of the selected freq. range

The input accuracy is inversely proportional to the input span, except fixed to $\pm 0.05\%$ with $[\text{Freq. Range} / \text{Span}] \leq 1$.

[Example] Open collector input, 0 - 50 kHz

Selected Freq. Range (100 kHz) / Input Span (50 kHz) \times
Accuracy 0.05 % + Output Accuracy 0.05 % = $\pm 0.15\%$

Alarm setpoint accuracy: $\pm 0.1\%$

Temp. coefficient: $\pm 0.015\%/^{\circ}\text{C}$ ($\pm 0.008\%/^{\circ}\text{F}$)

Response time (0 - 90 %)

≤ 1 Hz range: two pulse cycles

≥ 10 Hz range: 0.5 sec. + one pulse cycle

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

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

Dielectric strength:

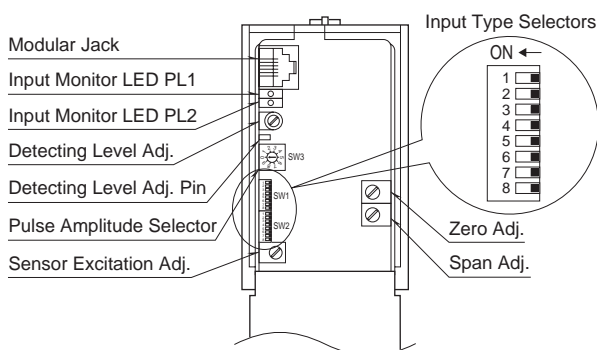
2000 V AC @ 1 minute (input to DC output to power)

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

2000 V AC @ 1 minute (circuit to ground)

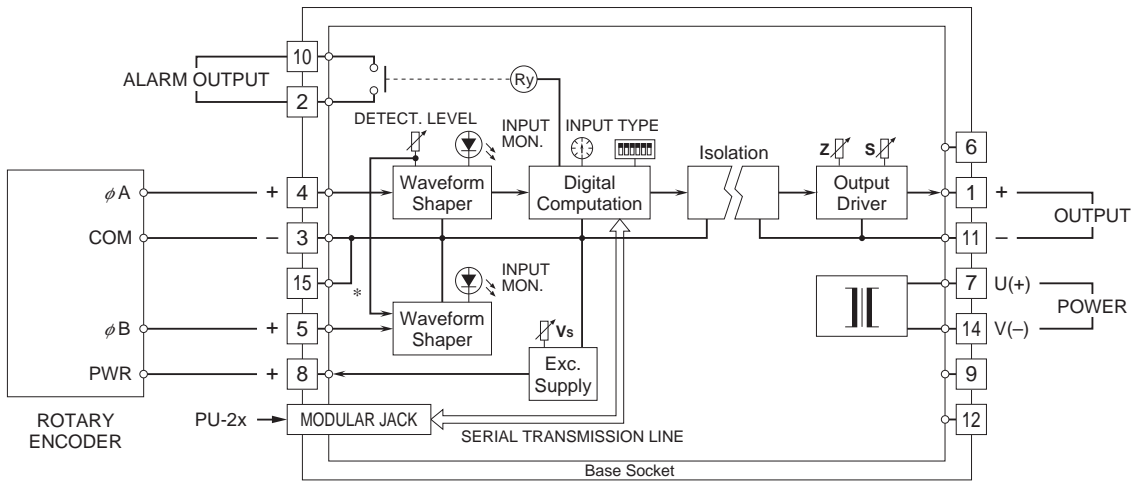
EXTERNAL VIEW

Refer to the instruction manual for the setting procedure.

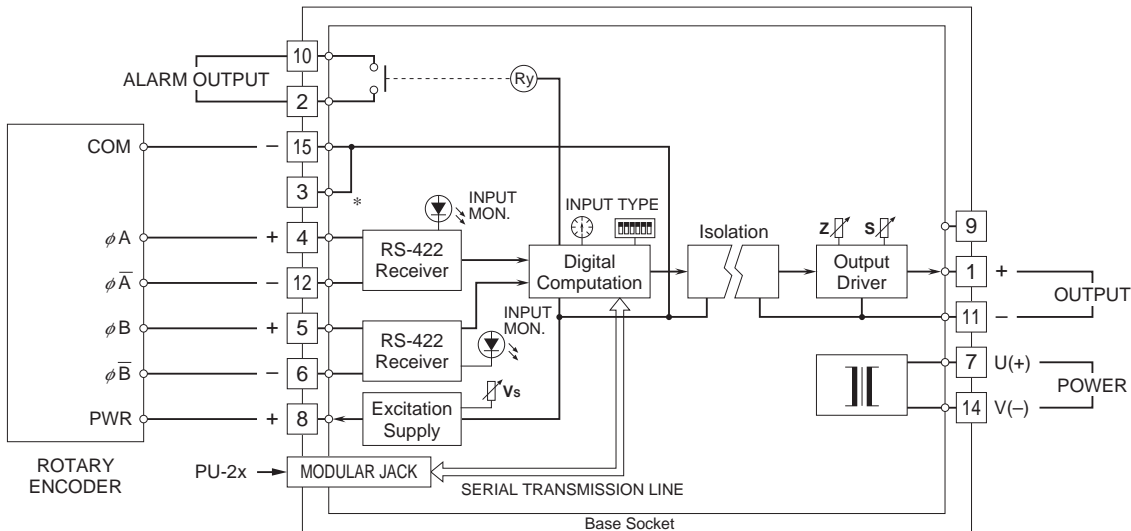


SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

■ OPEN COLLECTOR or VOLTAGE PULSE INPUT



■ RS-422 LINE DRIVER INPUT



*Terminals 3 and 15 are internally connected.
The rotary encoder's COM terminal can be connected to either one.



Specifications are subject to change without notice.