

Plug-in Signal Conditioners M-UNIT

PULSE ISOLATOR
(built-in excitation; rotary encoder use)

MODEL **RPPD**

MODEL & SUFFIX CODE SELECTION

RPPD-□□□□□□□□

MODEL _____
 INPUT 1 _____
 A : Dry contact
 B : Voltage pulse (Specify sensitivity)
 C : 5V pulse (sensitivity 2V)
 D : 12V/24V pulse (sensitivity 5V)
 H : Two-wire current pulse
 J : RS-422 line driver pulse
 INPUT 2 _____

Must be the same code as the one chosen for Input 1.

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

Excitation is not provided with input code J, but select code 1.

OUTPUT 1 _____
 A : Open collector (max. frequency 100 kHz)
 M : 5V pulse (max. frequency 100 kHz)
 N : 12V pulse (max. frequency 100 kHz)
 P : 24V pulse (max. frequency 50 kHz)
 H : High power photo MOSFET relay (max. 20 Hz)
 J : RS-422 line driver pulse (max. 100 kHz)

Refer to the table to the right for available output combinations.

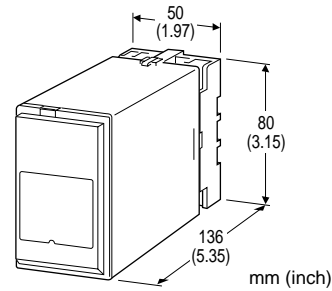
OUTPUT 2 _____
 A : Open collector (max. frequency 100 kHz)
 M : 5V pulse (max. frequency 100 kHz)
 N : 12V pulse (max. frequency 100 kHz)
 P : 24V pulse (max. frequency 50 kHz)
 J : RS-422 line driver pulse (max. 100 kHz)

Refer to the table to the right for available output combinations.

OUTPUT PULSE WIDTH _____
 1 : Equal to the input
 3 : One-shot output* (std. pulse width 50 ms)
 *Specify when optional pulse width is required.

OUTPUT LOGIC (both Output 1 & 2) _____
 N : The same as the input
 R : Inverted
 POWER INPUT _____

AC Power DC Power
 K : 85 – 132V AC S : 12V DC
 R : 24V DC
 V : 48V DC
 P : 110V DC



Functions & Features

- Galvanically isolating two pulse rate signals from a rotary encoder
- Various outputs (relay, open collector, voltage pulses and RS-422 line driver)
- Different I/O specs can be specified
- Converting RS-422 line driver input into an open collector pulse
- Excitation
- Isolation up to 2000V AC
- High-density mounting

Typical Applications

- Isolating field pulse signals in order to reduce noises

OUTPUT COMBINATIONS

The table below shows the selectable type of Output 1 for each Output 2 type.

With the Output 2 other than code A, the Output 1 must be the same type.

OUTPUT 2	OUTPUT 1
A	A, M, N, P, H
M	M
N	N
P	P
J	J

ORDERING INFORMATION

Specify code number and variables. Use Ordering Information Sheet (No. ESU-1693). Default setting will be used if not otherwise specified.

- Code number (e.g. RPPD-DD4AA1N-K)
- Output pulse width (e.g. 75 msec.)

GENERAL SPECIFICATIONS

Construction: plug-in
Connection: M3.5 screw terminals
Housing material: flame-resistant resin (black)
Isolation: input 1 or input 2 or sensor exc. to output 1 or output 2 to power
Input pulse sensing: DC coupled standard
Input monitor LED
 PL1: red LED blinks according to input 1.
 PL2: red LED blinks according to input 2.
Excitation adjustment: 5 – 24V DC (front)
DIP SW1 & SW2: used for input spec. setting
Sensitivity adjustments: V_H pot. for Hi level; V_L pot. for Lo level

INPUT & OUTPUT

INPUT

Max. frequency: 100 kHz
Excitation: shortcircuit protection; approx. 440mA at shortcircuit
Pulse width time requirement: 5 μ sec. min.

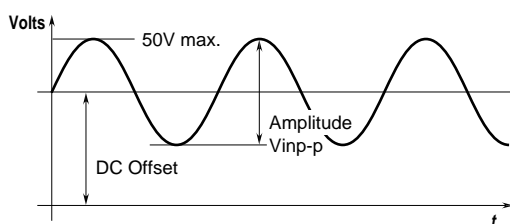
•Dry Contact

EXC. CODE	SENSING	AMPLITUDE	
		OFF	ON
1	5V / 0.5mA	$\geq 2.25V / 8.2k\Omega$	$\leq 1.75V / 5.3k\Omega$
4	12V / 1.2mA	$\geq 2.25V / 2.3k\Omega$	$\leq 1.75V / 1.7k\Omega$
7	24V / 2.4mA	$\geq 2.25V / 1k\Omega$	$\leq 1.75V / 0.8k\Omega$

Sensing voltage means the excitation supply to the sensor and the current value indicates that at shortcircuit. Amplitude voltage means the threshold used to determine ON or OFF status of the pulses and the resistance values indicated that of the sensor.

•Voltage Pulse: Specify DC offset and amplitude.

Waveform: square or sine
Input impedance: 10k Ω minimum
Input amplitude: 0.5 – 50V p-p
Max. voltage between input terminals: 50V



•5V, 12V, 24V Pulse

Waveform: square
Input impedance: 10k Ω minimum
Detecting level

INPUT	5V PULSE	12V / 24V PULSE
V_H	2.25V	5.25V
V_L	1.75V	4.75V

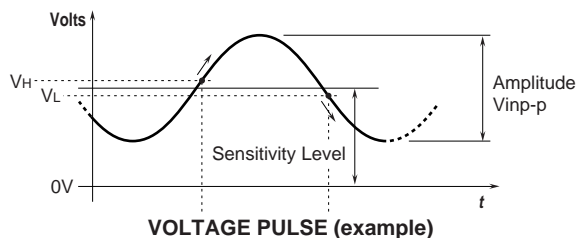
$V_H - V_L \geq 500mV$

•Two-wire Current Pulse

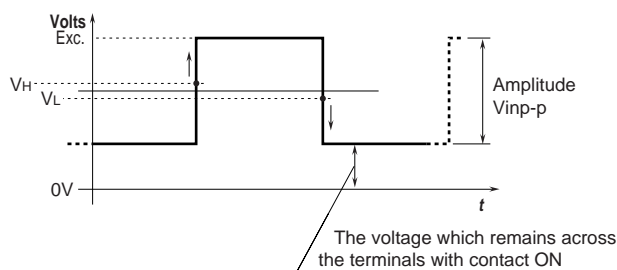
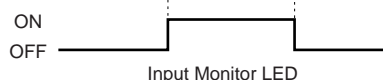
Input resistance: receiving resistor 100 Ω
Input range: 0 – 25mA
Input amplitude: $\leq 9.5mA$ for Lo, $\geq 14.5mA$ for Hi

•RS-422 Line Driver Pulse

Receiver: conforms to RS-422



VOLTAGE PULSE (example)



DRY CONTACT (example)

Specifications subject to change without notice.

■OUTPUT

• **Open Collector:** 50V DC @50mA (resistive load)

Maximum frequency: 100 kHz

• **Voltage Pulse:** rating (5, 12 or 24V) $\pm 10\%$

Maximum frequency: 100 kHz (50 kHz for 24V)

Load resistance: 1.2k Ω minimum

• **High Power Photo MOSFET Relay:** 120V AC or
120V DC @200mA (resistive load)

Maximum frequency: 20 Hz

Rise time: 5 milliseconds

Sink time: 3 milliseconds

ON resistance: 3 Ω

• **RS-422 Line Driver Pulse:** conforms to EIA/TIA-
422-B

■OUTPUT PULSE WIDTH

• **Equal to the Input:** no pulse width conversion;
difference by the length of response time

• **One-shot Output:** preset pulse width $\pm 20\%$;
Pulse rise or sink detection mode can be
chosen when ordering. The output is de-
layed by the response time. Refer to "Out-
put Logic" in Page 5 and choose either
mode considering I/O phase relation (50
msec. standard).

Optional pulse width: 30 μ sec. – 300 msec.

INSTALLATION

Power input

AC: operational voltage range 85 – 132V, 47 –
66 Hz, approx. 5.5VA

DC: rating $\pm 10\%$, or operational voltage range
85 – 150V for 110V rating
(ripple 10% p-p max.)
approx. 3.3W (140mA at 24V)

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

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

Mounting: surface or DIN rail

Dimensions: W50×H80×D136 mm (1.97"×3.15"×5.35")
See General Spec. Sheet Figure C-1.

Weight: 200 g (0.44 lbs)

Terminal assignment: See General Spec. Sheet Figure D-1.

PERFORMANCE

Response time

Open collector or voltage pulse: the output is de-
layed at both pulse rise and fall by 4 μ sec.
each. The delay could be much longer for
certain types of load for open collector.

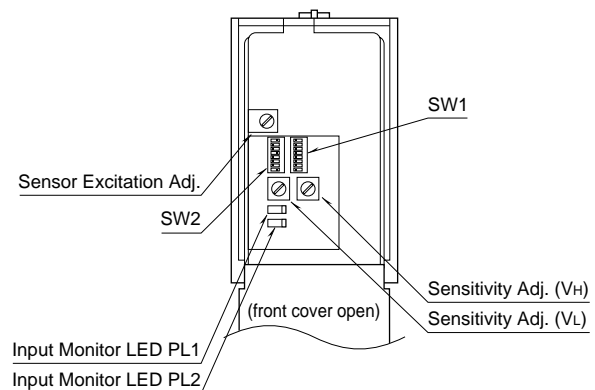
High power photo MOSFET relay: the output is
delayed by 10 msec. at the rise, by 3 msec.
at the fall.

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

Dielectric strength: 2000V AC @1 minute

(input to output to power to ground)

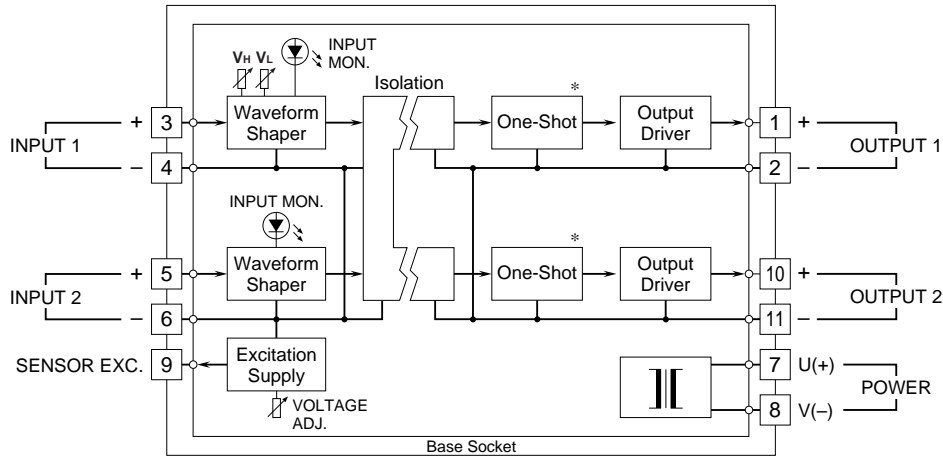
FRONT PANEL CONFIGURATION



There is no need of hardware adjustment
for RS-422 line driver pulse input.
Unnecessary switches or LEDs are not provided.

Remark: This unit is factory calibrated according to the
Ordering Information. If you need to change hardware set-
ting, refer to the instruction manuals of the transmitter.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

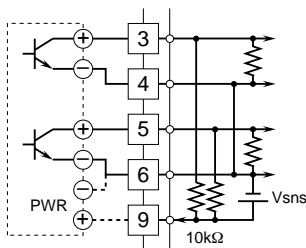


*Deleted with no pulse width conversion type.

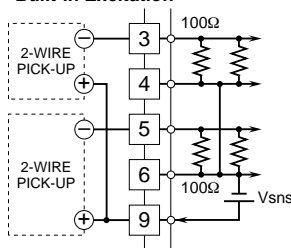
Remark: With 24V excitation and dry contact input, the voltage across the terminals 3 – 4, 5 – 6, divided in the waveform shaper, is of approx. 16V.

Input Connection Examples

■ **Dry Contact**

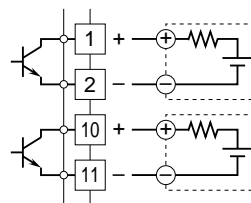


■ **2-Wire Current Pulse**
• **Built-in Excitation**

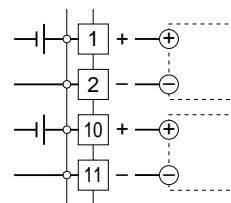


Output Connection Examples

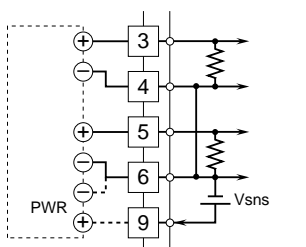
■ **Open Collector**



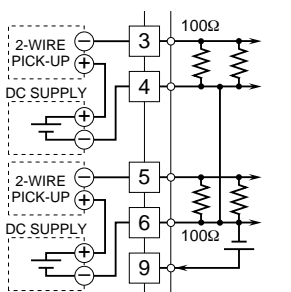
■ **Voltage Pulse**



■ **Voltage Pulse**

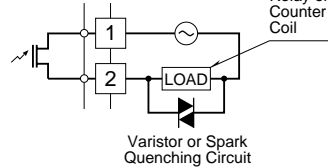


■ **External DC Supply**

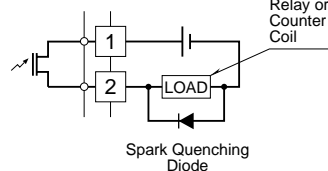


■ **Power Photo MOSFET Relay**

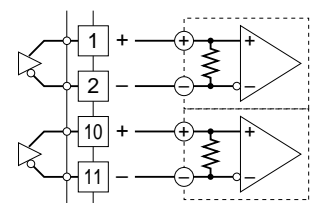
• **AC Powered**



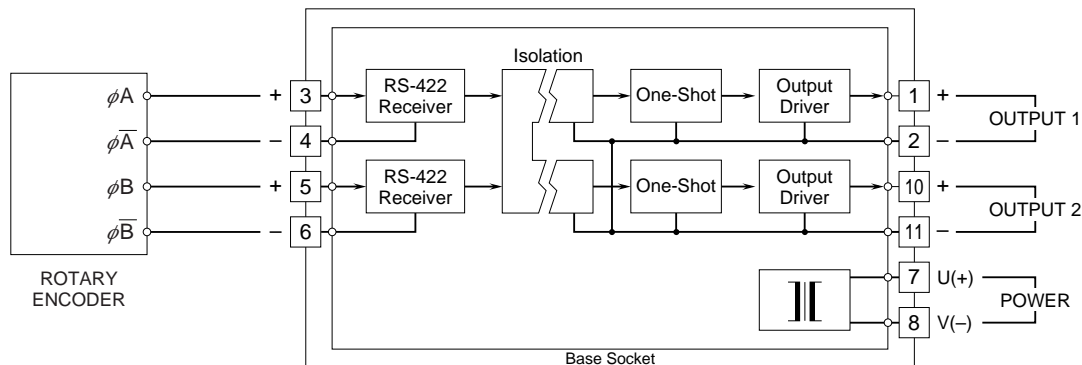
• **DC Powered**



■ **RS-422 Line Driver Pulse**



■ **RS-422 LINE DRIVER INPUT**



Sensor excitation not provided for RS-422 line driver input.

OUTPUT LOGIC

OUTPUT WAVEFORM		INPUT WAVEFORM	VOLTAGE PULSE, 2-WIRE CURRENT PULSE or RS-422 LINE DRIVER PULSE	DRY CONTACT
			H L	OFF ON
VOLTAGE PULSE or RS-422 LINE DRIVER PULSE	Non Inverted	No pulse width conversion	H L	H L
		One-shot, detecting input pulse rise 	H L	H L
		One-shot, detecting input pulse drop 	H L	H L
	Inverted	No pulse width conversion	H L	H L
		One-shot, detecting input pulse rise 	H L	H L
		One-shot, detecting input pulse drop 	H L	H L
OPEN COLLECTOR or PHOTO MOSFET RELAY	Non Inverted	No pulse width conversion	OFF ON	OFF ON
		One-shot, detecting input pulse rise 	OFF ON	OFF ON
		One-shot, detecting input pulse drop 	OFF ON	OFF ON
	Inverted	No pulse width conversion	OFF ON	OFF ON
		One-shot, detecting input pulse rise 	OFF ON	OFF ON
		One-shot, detecting input pulse drop 	OFF ON	OFF ON

The pulse width in one-shot means the bold lined section of a pulse waveform.

*Pulse rise for RS-422 line driver pulse can not be detected.