

## Plug-in Signal Conditioners K-UNIT

### PULSE ISOLATOR

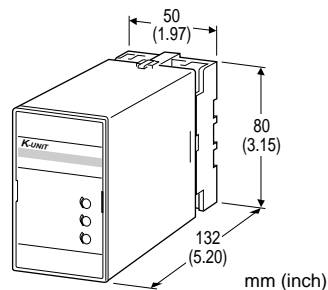
(two isolated outputs; built-in excitation)

#### Functions & Features

- Galvanically isolating pulse rate signals
- Input frequency = output frequency
- Various outputs (relay, open collector and voltage pulses)
- Excitation
- Isolation up to 2000 V AC
- High-density mounting

#### Typical Applications

- Isolating field pulse signals in order to reduce noises
- Changing e.g. dry contact signal to e.g. 5 V signals



## MODEL: KWYPD-[1][2][3][4][5][6]-[7][8]

### ORDERING INFORMATION

- Code number: KWYPD-[1][2][3][4][5][6]-[7][8]
- Specify a code from below for each of [1] through [8].  
(e.g. KWYPD-D4A2M23N-B/Q)
- Use Ordering Information Sheet (No. ESU-2276) for pulse width settings of DC voltage pulse input or one-shot output.
- Specify the specification for option code /Q  
(e.g. /C01/S01)

#### [1] INPUT

- A:** Dry contact
- B:** DC voltage pulse (Specify sensitivity)
- C:** 5 V pulse (sensitivity 2 V)
- D:** 12 V/24 V pulse (sensitivity 5 V)
- H:** Two-wire current pulse

#### [2] EXCITATION

- 1:** 5 V DC / 80 mA
- 4:** 12 V DC / 40 mA

#### [3] OUTPUT 1

- A1:** Open collector (max. frequency 100 kHz)
- A2:** Open collector (max. frequency 10 Hz)
- M1:** 5 V pulse (max. frequency 100 kHz)
- M2:** 5 V pulse (max. frequency 10 Hz)
- N1:** 12 V pulse (max. frequency 100 kHz)
- N2:** 12 V pulse (max. frequency 10 Hz)
- H:** Relay contact (max. frequency 0.5 Hz)

#### [4] OUTPUT 2

Same range availability as Output 1  
(Choose a combination of output 1 and 2 with same max. frequency limit. Output logic of open collector is reversed when open collector and others are mixed.)

#### [5] OUTPUT PULSE WIDTH

- 1:** Equal to the input
- 2:** One-shot output ( $\leq 30$  msec.; std. pulse width 5 msec.)  
(Specify when optional pulse width is required.)  
(10 msec. for relay contact pulse)
- 3:** One-shot output ( $\geq 30$  msec.; std. pulse width 50 msec.)  
(Specify when optional pulse width is required.)

#### [6] OUTPUT LOGIC

- N:** The same as the input
- R:** Inverted

#### [7] POWER INPUT

- AC Power
- B:** 100 V AC
- C:** 110 V AC
- D:** 115 V AC
- F:** 120 V AC
- G:** 200 V AC
- H:** 220 V AC
- J:** 240 V AC
- DC Power
- S:** 12 V DC
- R:** 24 V DC

#### [8] OPTIONS

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

## SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our 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

**Screw terminal:** Chromated steel (standard) or stainless steel

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

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

**Excitation adjustment:** 5 - 12 V DC

**Detecting level adjustments (DC voltage pulse):** 2 - 10 V

**Input pulse sensing:** DC coupled

**Input filter:** Provided with output code A2, M2, N2, H (time constant approx. 1 msec.)

## INPUT SPECIFICATIONS

**Excitation:** Shortcircuit protection; approx. 150 mA at shortcircuit

### ■ Dry Contact

**Max. frequency:** 100 kHz

**Pulse width time requirement:** 5  $\mu$ sec. min. (10 ms for output code A2, M2, N2, H)

**Sensing:** 10 V DC @ 2.5 mA

**ON/OFF level:**

$\geq 5.5$  k $\Omega$  / 5.5 V for OFF

$\leq 1.8$  k $\Omega$  / 4.5 V for ON

■ **Voltage Pulse:** Specify DC offset and amplitude.

**Max. frequency:** 100 kHz

**Pulse width time requirement:** 5  $\mu$ sec. min. (10 ms for output code A2, M2, N2, H)

**Waveform:** Square or sine

**Input impedance:** 10 k $\Omega$  min.

**Input amplitude:** 2 - 50 V<sub>p-p</sub>

**Sensitivity adjustment (threshold level):** 2 - 10 V

**Max. voltage between input terminals:** 50 V

• 5V, 12V, 24V Pulse

**Waveform:** Square or sine

**Input impedance:** 10 k $\Omega$  min.

**Detecting level**

INPUT	5 V PULSE	12 V / 24 V PULSE
$V_H$	$\geq 2.25$ V	$\geq 5.25$ V
$V_L$	$\leq 1.75$ V	$\leq 4.75$ V

■ **Two-wire Current Pulse**

**Max. frequency:** 100 kHz

**Pulse width time requirement:** 5  $\mu$ sec. min. (10 ms

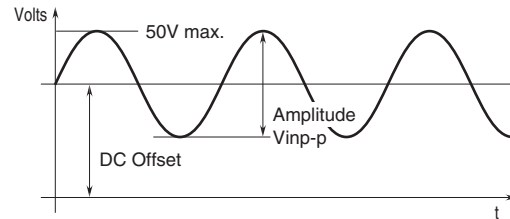
for output code A2, M2, N2, H)

**Input resistance:** Receiving resistor 220  $\Omega$

**Maximum current:**  $\pm 50$  mA

**Hi/Lo level:**  $\leq 5$  mA for Lo,  $\geq 15$  mA for Hi

■ **Voltage pulse waveform**



## OUTPUT SPECIFICATIONS

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

**Maximum frequency:**

Output code A1: 100 kHz with load resistance  $\leq 1$  k $\Omega$

Output code A2: 10 Hz with load resistance  $\leq 1$  k $\Omega$

**Saturation voltage:** 0.5 V DC

■ **Voltage Pulse:** Rating (5 or 12 V)  $\pm 10$  %

**Maximum frequency:** 100 kHz

**Load resistance:** 1.5 k $\Omega$  min. for 5 V, 3 k $\Omega$  min. for 12 V

**L level:**  $\leq 0.5$  V

■ **Relay Contact:** 120 V AC or 30 V DC @ 200 mA (resistive load)

**Maximum switching voltage:** 250 V AC or 30 V DC

**Maximum switching power:** 50 VA or 6 W

**Minimum load:** 5 V DC @ 10 mA

**Maximum frequency:** 0.5 Hz

**Relay life:**

2  $\times 10^7$  cycles (mechanical)

7  $\times 10^6$  cycles (electrical)

## OUTPUT PULSE WIDTH

• **Equal to the Input:** No pulse width conversion (difference between input and output within  $\pm 10$   $\mu$ sec.)

• **One-shot Output:** Constant pulse width  
Output Frequency (Hz) = 500 / (Output Pulse Width (msec.))

**Adjustable pulse width**

**Pulse width max. 30 msec. (code 2):**

1 - 30 msec. adjustable (standard 5 msec.  $\pm 20$  %) for 'Output' code other than 'H'

10 - 30 msec. adjustable (standard 10 msec.  $\pm 20$  %) for 'Output' code 'H'

**Pulse width min. 30 msec. (code 3):** 30 msec. - 1 sec. adjustable (standard 50 msec.  $\pm 20$  %)

## INSTALLATION

### Power input

• **AC:** Operational voltage range: rating  $\pm 10\%$ ,  
50/60  $\pm 2$  Hz, approx. 2.5 VA

• **DC:** Operational voltage range: rating  $\pm 10\%$ ,  
ripple 10 %p-p max., approx. 2 W (80 mA at 24 V)

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

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

**Mounting:** Surface or DIN rail

**Weight:** 400 g (0.88 lb)

## PERFORMANCE

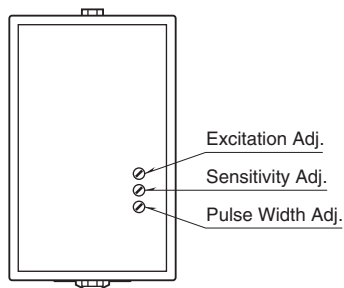
**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

### Dielectric strength:





2000 V AC @1 minute (input to output 1 or output 2 to  
power to ground)

1000 V AC @1 minute (output 1 to output 2)

## EXTERNAL VIEW



**OUTPUT LOGIC**

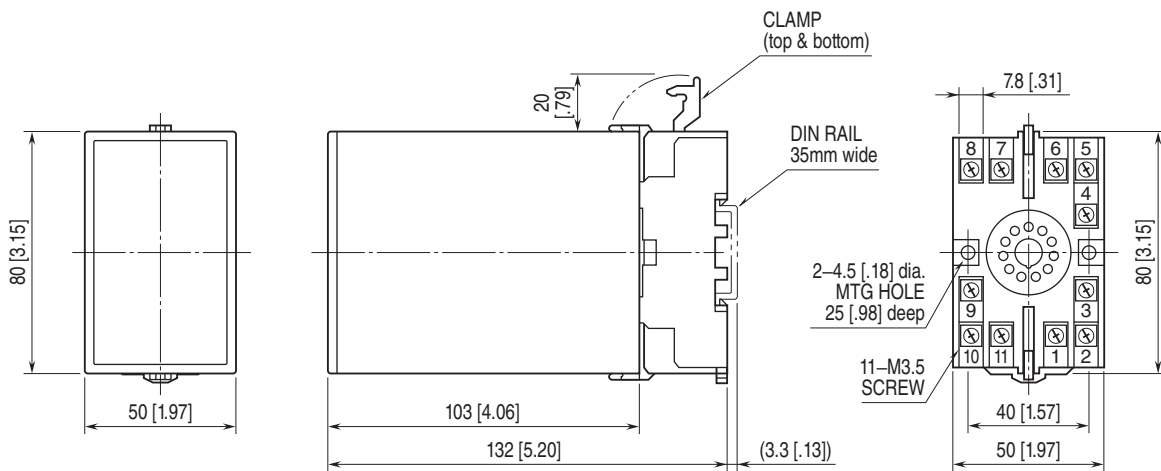
OUTPUT WAVEFORM		INPUT WAVEFORM	VOLTAGE PULSE or 2-WIRE CURRENT PULSE	DRY CONTACT
			H L	OFF ON
NON INVERTED	No pulse width conversion	Voltage pulse	H L	H L
		Open collector or relay contact	OFF ON	OFF ON
	One-shot, detecting input pulse rise 	Voltage pulse	H L	H L
		Open collector or relay contact	OFF ON	OFF ON
	One-shot, detecting input pulse sink 	Voltage pulse	H L	H L
		Open collector or relay contact	OFF ON	OFF ON
INVERTED	No pulse width conversion	Voltage pulse	H L	H L
		Open collector or relay contact	OFF ON	OFF ON
	One-shot, detecting input pulse rise 	Voltage pulse	H L	H L
		Open collector or relay contact	OFF ON	OFF ON
	One-shot, detecting input pulse sink 	Voltage pulse	H L	H L
		Open collector or relay contact	OFF ON	OFF ON

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

 Shades indicate default setting.

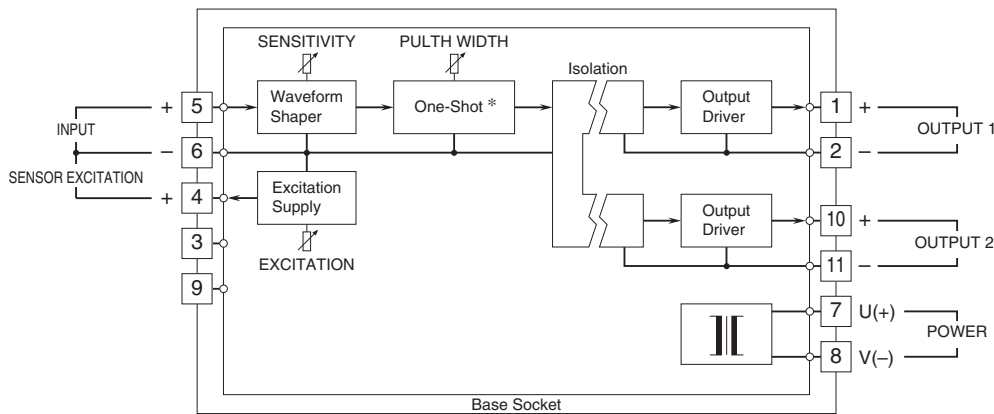
Input pulse rise/sink detected with voltage level

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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

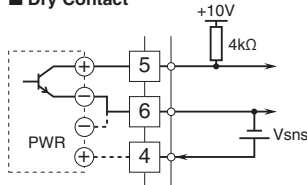
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



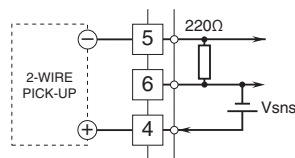
\*Disregard one-shot circuit for output pulse width code "1".

### Input Connection Examples

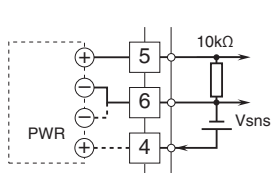
#### ■ Dry Contact



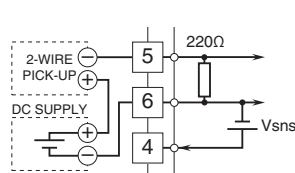
#### ■ 2-Wire Current Pulse • Built-in Excitation



#### ■ Voltage Pulse

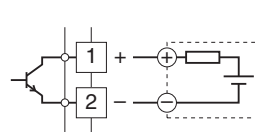


#### • External DC Supply

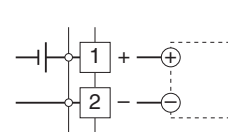


### Output Connection Examples

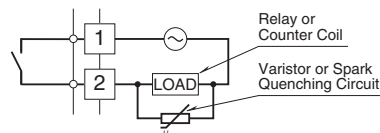
#### ■ Open Collector



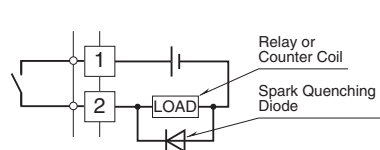
#### ■ Voltage Pulse



#### ■ Relay Contact • AC Powered



#### • DC Powered





Specifications are subject to change without notice.