Plug-in Signal Conditioners K-UNIT

PULSE ISOLATOR

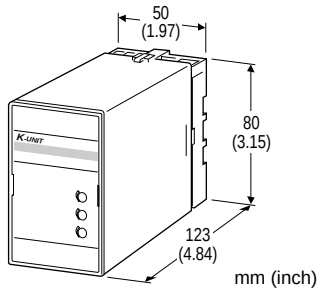
(built-in excitation)

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: KYPD–[1][2][3][4][5]–[6][7]

ORDERING INFORMATION

- Code number: KYPD-[1][2][3][4][5]-[6][7]

Specify a code from below for each of [1] through [7].
(e.g. KYPD-D4A23N-B/Q)

- Use Ordering Information Sheet (No. ESU-1369) 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

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 PULSE WIDTH

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

[5] OUTPUT LOGIC

N: The same as the input
R: Inverted

[6] 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

[7] 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

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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 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 µsec. min. (10 ms for output code A2, M2, N2, H)
Sensing: 10 V DC @ 2.5 mA
ON/OFF level:
≥ 5.5 kΩ /5.5 V for OFF
≤ 1.8 kΩ /4.5 V for ON

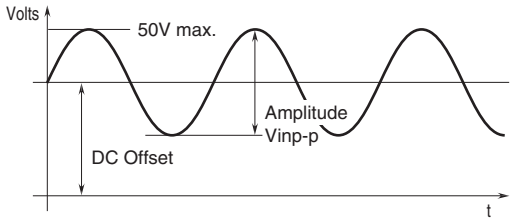
■ **Voltage Pulse:** Specify DC offset and amplitude.
Max. frequency: 100 kHz
Pulse width time requirement: 5 µsec. min. (10 ms for output code A2, M2, N2, H)
Waveform: Square or sine
Input impedance: 10 kΩ min.
Input amplitude: 2 – 50 Vp-p
Sensitivity adjustment (threshold level): 2 – 10 V
Max. voltage between input terminals: 50 V

• 5V, 12V, 24V Pulse
Waveform: Square or sine
Input impedance: 10 kΩ min.
Detecting level

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

■ **Two-wire Current Pulse**
Max. frequency: 100 kHz
Pulse width time requirement: 5 µsec. min. (10 ms for output code A2, M2, N2, H)
Input resistance: Receiving resistor 220 Ω
Maximum current: ± 50 mA
Hi/Lo level: ≤ 5 mA for Lo, ≥ 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 ≤ 1 kΩ
OUtput code A2: 10 Hz with load resistance ≤ 1 kΩ
Saturation voltage: 0.5 V DC

■ **Voltage Pulse:** Rating (5 or 12 V) ± 10 %
Maximum frequency: 100 kHz
Load resistance: 1.5 kΩ min. for 5 V, 3 kΩ min. for 12 V
L level: ≤ 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:
2×10^7 cycles (mechanical)
7×10^6 cycles (electrical)

OUTPUT PULSE WIDTH

•**Equal to the Input:** No pulse width conversion (difference between input and output within ±10 µsec.)
• **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. ±20 %) for 'Output' code other than 'H'
10 – 30 msec. adjustable (standard 10 msec. ±20 %) for 'Output' code 'H'
Pulse width min. 30 msec. (code 3): 30 msec. – 1 sec. adjustable (standard 50 msec. ±20 %)

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INSTALLATION

Power input

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

•**DC**: Operational voltage range: rating ±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

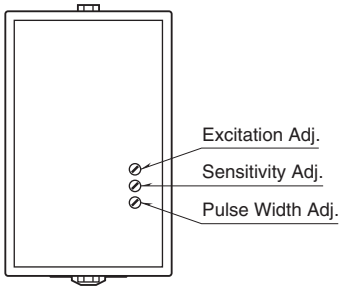
Weight: 400 g (0.88 lb)

PERFORMANCE

Insulation resistance: ≥ 100 MΩ with 500 V DC

Dielectric strength: 2000 V AC @1 minute (input to output to power to ground)

EXTERNAL VIEW



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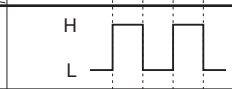
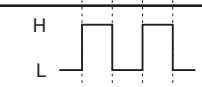
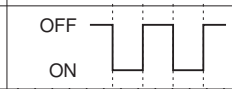
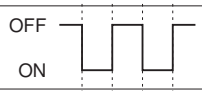
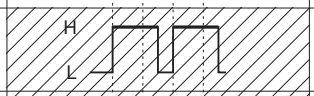
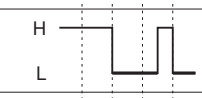
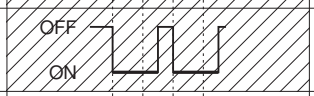
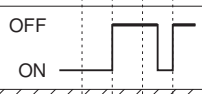
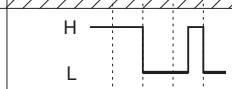
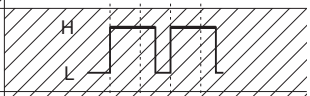
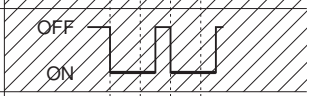
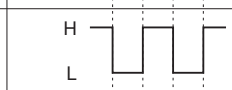
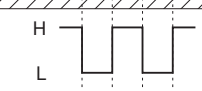
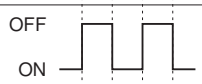
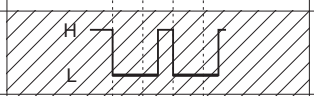
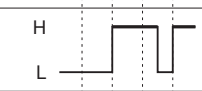
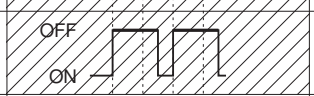
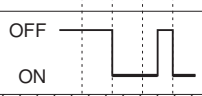
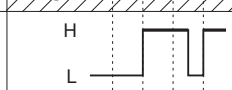
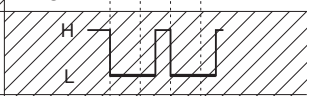
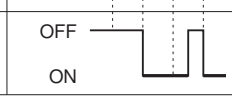
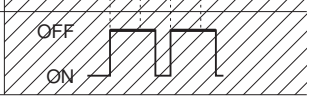
OUTPUT LOGIC

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		
		Open collector or relay contact		
	One-shot, detecting input pulse rise 	Voltage pulse		
		Open collector or relay contact		
	One-shot, detecting input pulse sink 	Voltage pulse		
		Open collector or relay contact		
INVERTED	No pulse width conversion	Voltage pulse		
		Open collector or relay contact		
	One-shot, detecting input pulse rise 	Voltage pulse		
		Open collector or relay contact		
	One-shot, detecting input pulse sink 	Voltage pulse		
		Open collector or relay contact		

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

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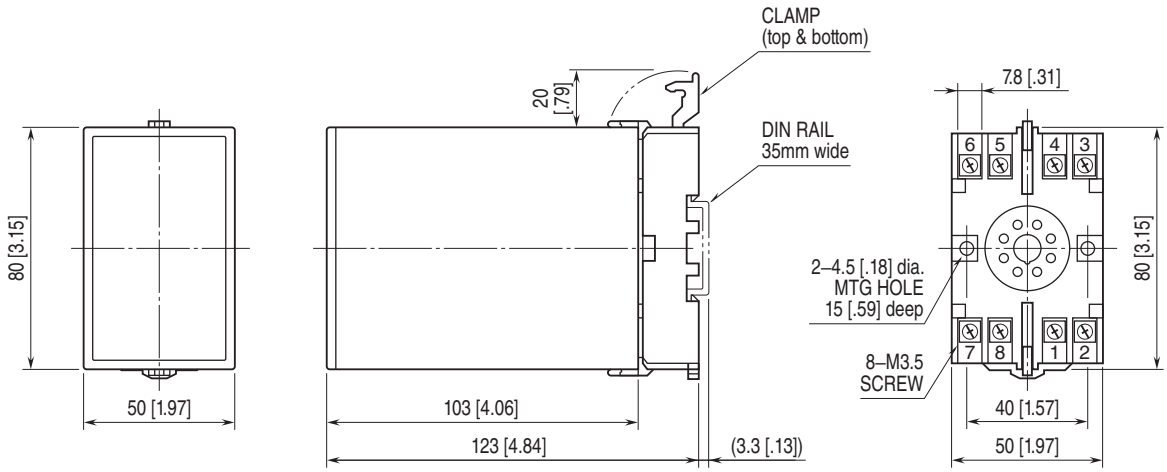
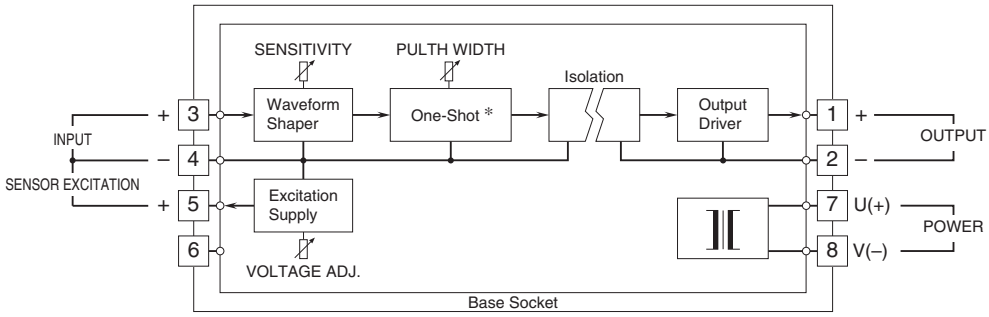
EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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

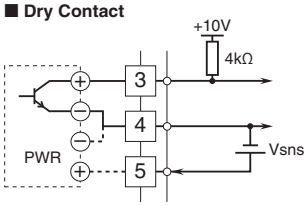
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



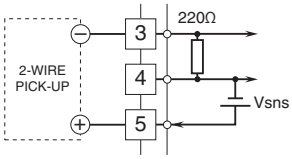
*Provided only when the one-shot output is specified.

Input Connection Examples

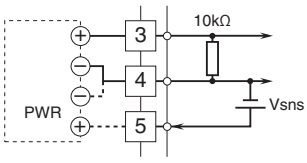
■ **Dry Contact**



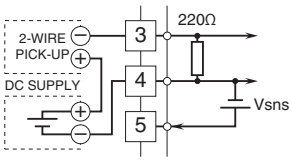
■ **2-Wire Current Pulse**
• **Built-in Excitation**



■ **Voltage Pulse**

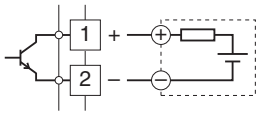


• **External DC Supply**

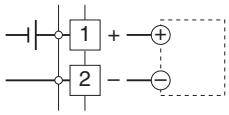


Output Connection Examples

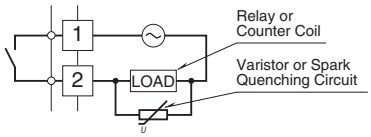
■ **Open Collector**



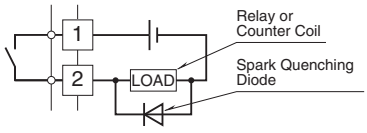
■ **Voltage Pulse**



■ **Relay Contact**
• **AC Powered**



• **DC Powered**



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⚠ Specifications are subject to change without notice.

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