

# General Specifications

## VJQ2 Pulse to Analog Converter (Free Range Type)



GS 77J01Q02-01E

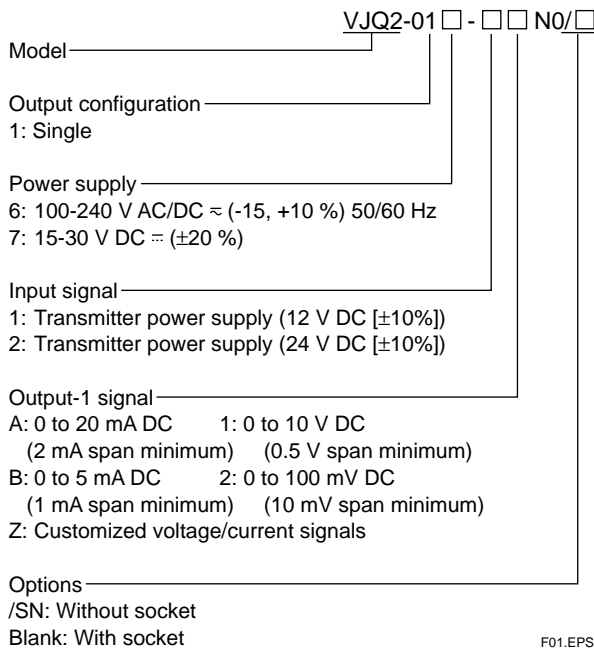
### General

The VJQ2 is a compact, plug-in pulse-to-analog converter that receives pulse-train signal and converts it into isolated DC voltage or DC current signal. The transmitter can receive either voltage pulse, current pulse, voltage-free contact signal or open-collector signal.

The VJQ2 converter features:

- a withstanding voltage of 2000 V AC;
- a switch-selectable input filter for receiving signal carrying a large amount of chatter;
- a wide supply voltage range - supporting both 100 V and 200 V power lines of AC or DC; and
- close side-by-side mounting.

### Model and Suffix Codes



### Items to be specified when ordering

- Model and Suffix Code: e.g. VJQ2-016-1AN0
- Internal load resistance: e.g. 220 Ω
- Input frequency range: e.g. 0 to 2 kHz
- Output current range: e.g. 4 to 20 mA DC

### Input/Output Specifications

Input signal:

	Signal Form
	Voltage-free Contact
ON state input	Contact resistance of 200 Ω maximum
OFF state input	Contact resistance of 100 kΩ minimum

	Signal Form	
	Voltage Pulse	Current Pulse
High level	2 to 50 V DC	2/R <sub>L</sub> to 50/R <sub>L</sub> mA
Low level	-1 to +8 V DC	-1/R <sub>L</sub> to +8/R <sub>L</sub> mA

Voltage pulse amplitude: 2 to 50 V DC  
Maximum allowable input voltage: 58 V DC  
R<sub>L</sub>: Internal load resistor (kΩ)

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Input frequency range: 0 to 10 kHz

where,  $0.1 \text{ Hz} \leq F_{100} \leq 10 \text{ kHz}$  and  $0 \text{ Hz} \leq F_0 < F_{100}$

Accuracy is limited as shown below if the elevation for  $F_0$  is 50% of  $F_{100}$  or greater:

$$\text{Accuracy (\%)} = \frac{F_{100} - F_{100}/2}{F_{100} - F_0} \times 0.1$$

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where,  $F_0$  is the frequency for 0% input and  $F_{100}$  is the frequency for 100% input.

Input resistance: 10 kΩ minimum for contact and voltage pulses

Value of the load resistor for current pulses

Low-level cutoff point: Can be set between 0.01 Hz and  $F_{100}$

For input level below this cutoff point, the transmitter provides an output level equivalent to 0 Hz. If no low-level cutoff point is specified, the product is shipped with the cutoff point set to 0.01 Hz.

Input pulse width: Equal to a value at which the duty ratio is within  $50 \pm 30\%$  for a 100% input.

Minimum power requirement rating for contact input: 15 V DC/15 mA

Input filter: Has an approx. 10 ms time constant, which can be turned on or off at the front panel (turned off at shipment). When the filter is turned on, the upper limit of the input frequency range reduces to 100 Hz (requiring a pulse width of at least 3 ms).

Transmitter power supply: 12 V DC/30 mA or 24 V DC/30 mA (provided with a current limiter to keep the current between 40 and 60 mA)

Internal load resistor ( $R_L$ ):  
 None, 220  $\Omega$ , 510  $\Omega$ , or 1 k $\Omega$   
 (Select either of the three resistor values for  
 current pulse input and select "none" for  
 voltage pulse input.)

Output signal: DC voltage or DC current

Configurable output range:

Output Code	Configurable Range
1	0 to 10 V DC with a span of at least 0.5 V Restrictions apply to the accuracy for span smaller than 2 V or elevation greater than 150%.
2	0 to 100 mV DC with a span of at least 10 mV Restrictions apply to the accuracy for span smaller than 20 mV or elevation greater than 150%.
A	0 to 20 mA DC with a span of at least 2 mA Restrictions apply to the accuracy for span smaller than 8 mA.
B	0 to 5 mA DC with a span of at least 1 mA Restrictions apply to the accuracy for span smaller than 2 mA.
Z	Feasible ranges are as follows: Output voltage: -10 to +10 V DC with a span of at least 10 mA Elevation: -100% to +200%

Current consumption: 146 mA at 24 V DC  
 Power consumption: 4.5 VA at 100 V AC; 6.3 VA at 200  
 V AC

Allowable output load resistance:

Output Code	Output Code
1 10 k $\Omega$ minimum	A $15/I_{100}$ ( $\Omega$ ) maximum
2 250 k $\Omega$ minimum	B $15/I_{100}$ ( $\Omega$ ) maximum
Z 10 k $\Omega$ or 250 k $\Omega$ minimum	

where,  $I_{100}$  is the analog value at 100% output.

Zero and span adjustment: Within  $\pm 10\%$  of span for both  
 zero and span adjustment

## ■ Standard Performance

Accuracy rating:  $\pm 0.1\%$  of span; accuracy is not guaran-  
 teed for output level less than 0.1 mA of the  
 code A output range and output level less than  
 0.025 mA of the code B output range.

Response: [(One period of input pulse)  $\times$  2 + 50 ms] for a  
 63% response (10 to 90% change of range)

Insulation resistance: 100 M $\Omega$  minimum at 500 V DC  
 between input, output, power supply and  
 grounding terminals mutually

Withstanding voltage: 2000 V AC for one minute between  
 input, output, power supply and grounding  
 terminals mutually

Operating temperature range: 0 to 50  $^{\circ}$ C  
 Operating humidity range: 5 to 90% RH (no condensation)  
 Supply voltage range: 100-240 V AC/DC  $\approx$  (-15, +10%)  
 50/60 Hz or 15-30 V DC  $\approx$  ( $\pm 20\%$ )

Effects of power line regulation: Up to  $\pm 0.1\%$  of span for  
 a supply voltage range of 85 to 264 V AC (47  
 to 63 Hz), 85 to 264 V DC or 12 to 36 V DC.

Effects of ambient temperature variations: Up to  $\pm 0.2\%$  of  
 span per 10 $^{\circ}$ C

## ■ Conformance to EMC Standards

Applicable EMC standard: EN61326

CE-certified models mean those which are CE certified on condition that they be operated over a supply voltage range of 15-30 V DC  $\pm$  ( $\pm 20\%$ ) only.

## ■ Mounting and Appearance

Material: ABS resin (casing)

Mounting: Wall mounting, DIN rail mounting, or mounting on a side-by-side multiple mounting base

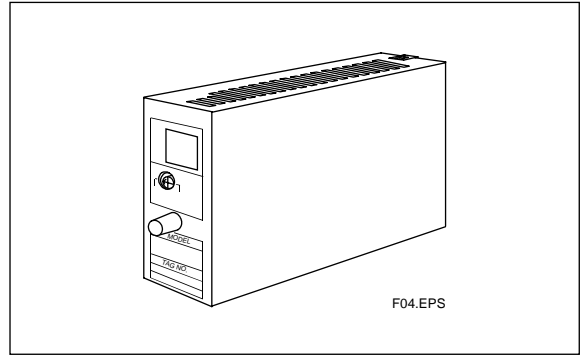
Connection: Terminals with M3 size screws

External dimensions: 76 (H)  $\times$  29.5 (W)  $\times$  124.5 (D) mm

Weight: Main unit = approx. 116 g; socket = approx. 51 g

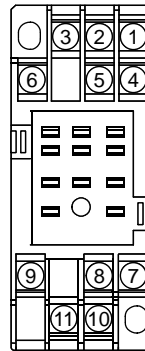
## ■ Accessories

Tag number label: One



Note: A modular jack adapter (part number: E9786WH) is necessary when using a handy terminal with the transmitter.

## ■ Terminal Assignments

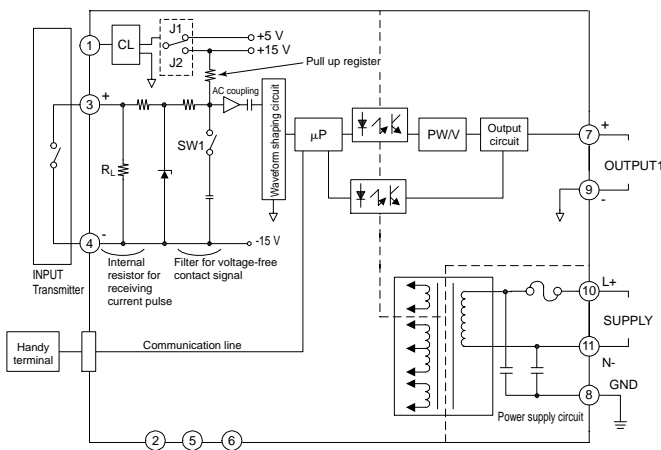


1	INPUT	(PS+)
2	N.C.	
3	INPUT	(+)
4	INPUT	(-)
5	N.C.	
6	N.C.	
7	OUTPUT	(+)
8	GND	
9	OUTPUT	(-)
10	SUPPLY	(L+)
11	SUPPLY	(N-)

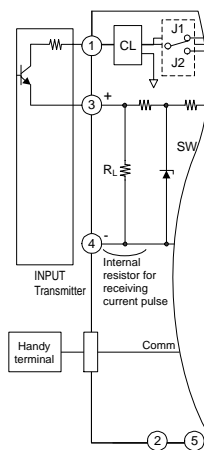
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## ■ Block Diagrams

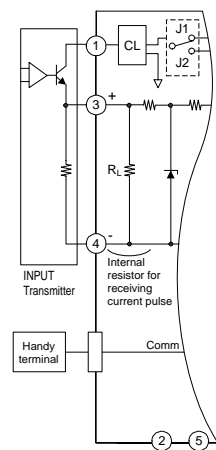
(1) When Receiving Voltage-free Contact Signal or Voltage Pulses (where, terminal 3 is the positive input (+) and terminal 4 is the negative input (-) for voltage pulses)



(2) When Receiving Current Pulse by Running a Transmitter on an Internal Power Supply

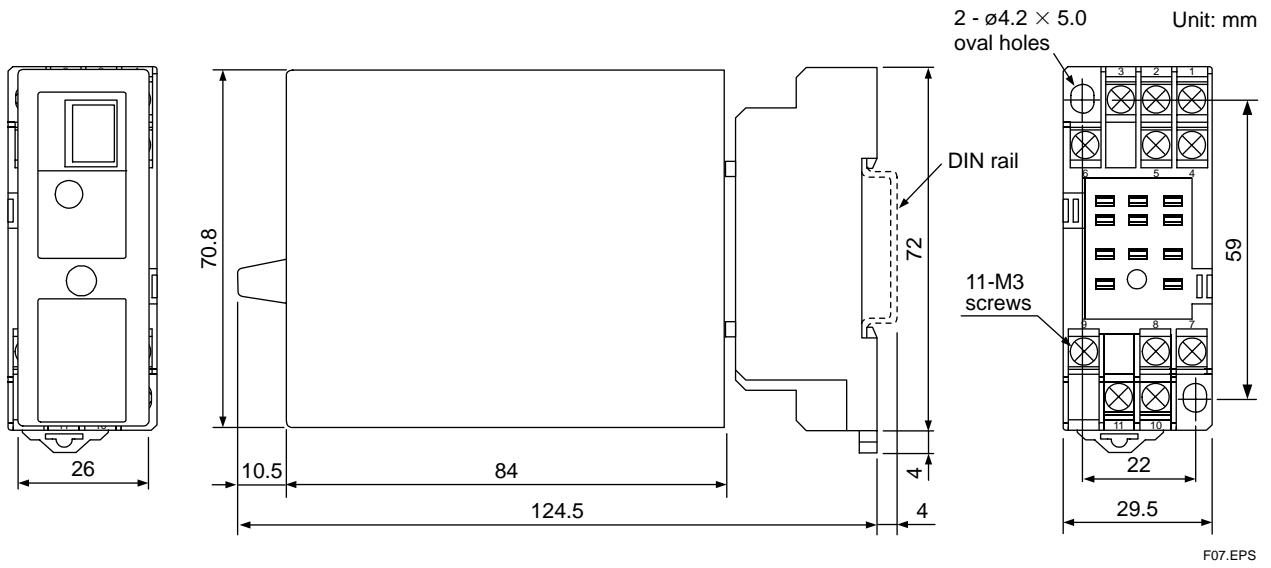


(3) When Receiving Voltage Pulse by Running a Transmitter on an Internal Power Supply



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## External Dimensions



- The information covered in this document is subject to change without notice for reasons of improvements in quality and/or performance.