

General Specifications

GS 77J01Q08-01E

Model VJQ8
Pulse to Analog Converter (Multi-function)
(Isolated Single-output and Isolated Dual-output Types)

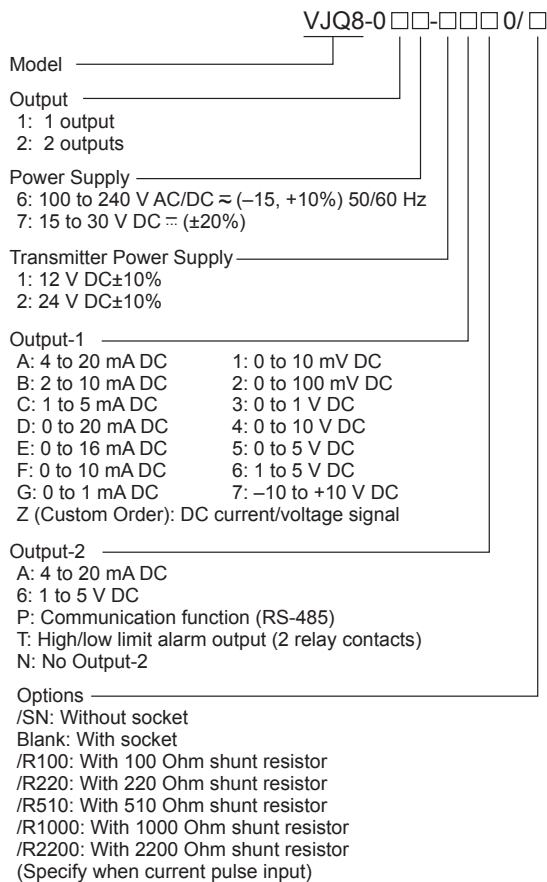
JUXTA

General

This plug-in type pulse to analog converter receives contact pulse, voltage pulse, or current pulse from the field and converts the signal into isolated DC current or voltage signals.

- Output-2 can be selected from DC voltage signal, DC current signal, communication function (RS-485), or alarm output (2 relay contacts).
- Various parameters such as input range can be set and modified using a PC (VJ77) or Handy Terminal (JHT200 and the like).
- A pulse integration function that converts integrated flow value (average pulse frequency) through specified sampling time into analog signals is provided.

Model and Suffix Codes



Input

Input signal: 2-wire type ON/OFF contact, voltage pulse, current pulse (transmitter power supply available) or 3-wire type voltage pulse (transmitter power supply available).

Input frequency: $0.1 \text{ Hz} \leq F_{100} \leq 100 \text{ kHz}$ and

$$0 \text{ Hz} \leq F_0 \leq F_{100}$$

Where F_0 is 0% of and F_{100} is 100% of input frequency.

F can be set in increments of 0.00001 (Hz or kHz) within 4 significant digits.

Input range unit: Selectable from Hz and kHz

Input signal type:

	Non-voltage contact	
	ON input	OFF input
	Contact resistance of 200 Ω or less	
	Contact resistance of 100 Ω or more	
	Voltage pulse	Current pulse
High level (OFF input)	2 to 50 V DC	(2V/R _L) to (50V/R _L) mA DC
Low level (ON input)	-1 to +8 V DC	(-1V/R _L) to (8V/R _L) mA DC
Pulse width	2 to 50 V DC	(2V/R _L) to (50V/R _L) mA DC

Maximum permissible input voltage: 58 V DC or less

Maximum permissible input current

External shunt resistance [Ω]	Permissible input current [mA]
100	50
220	40
510	25
1000	20
2200	12

Note1: Transmitter power supply use.
Permissible input current is 30mA maximum.

Lowcut point: 0.01 Hz to 100% of input frequency

Input resistance:

Contact or voltage pulse; 15 k Ω or more
Current pulse; external shunt resistor of selected options code

Minimum input pulse width:

30 μ s for less than 10 kHz of input frequency
30% of pulse interval for 10 kHz or more of input frequency

Contact input signal rated supply: 15 V DC/15 mA or more

Input filter: Approx. 10ms of time constant
 On setting: input frequency is 100Hz less (input pulse width is 3ms or more.)
 On/off can be set by communication function

Transmitter power supply: 12 V DC \pm 10% (4 to 30 mA output) or 24 V DC \pm 10% (4 to 30 mA output)
 (with current limit circuit at 50 mA)

Pulse count point: Turning point from Off input to On input

Input conversion mode: Can be selected from F/V conversion or pulse integration

F/V conversion: Converts 0 to 100% of frequency inputs into 0 to 100% analog outputs

Pulse integration: Calculates average frequency from integrated pulse counts for preset sampling time, then converts 0 to 100% of frequency inputs into 0 to 100% analog outputs

Sampling mode: Can be selected from AUTO or MANUAL

Sampling time: 0.1 to 100 sec in increments of 0.1 sec
 However when in AUTO mode, sampling time is not preset, but is forcibly determined as follows:
 0.1 sec when F_{100} is 1 kHz or more;
 $(1/F_{100}) \times 100$ sec when F_{100} is more than 1 Hz and less than 1 kHz; and
 100 sec when F_{100} is 1 Hz or less.
 Where F_{100} is 100% of input frequency.

Output response: Sampling time + 100 ms

■ Output

1. Output-1

Output Signal	Output Resistance	Permissible Load Resistance
4 to 20 mA DC	500 k Ω or more	750 Ω or less
2 to 10 mA DC		1500 Ω or less
1 to 5 mA DC		3000 Ω or less
0 to 20 mA DC		750 Ω or less
0 to 16 mA DC		900 Ω or less
0 to 10 mA DC		1500 Ω or less
0 to 1 mA DC		15 k Ω or less
0 to 10 mV DC	100 Ω or less	250 k Ω or more
0 to 100 mV DC		
0 to 1 V DC	1 Ω or less	2 k Ω or more
0 to 10 V DC		10 k Ω or more
0 to 5 V DC		2 k Ω or more
1 to 5 V DC		2 k Ω or more
-10 to +10 V DC		10 k Ω or more

2. Output -2

● Analog Output

Output Signal	Output Resistance	Permissible Load Resistance
1 to 5 V DC	1 Ω or less	2 k Ω or more
4 to 20 mA DC	500 k Ω or more	350 Ω or less

● Communication Function

This transmitter can be connected to a PC, graphic panel, YOKOGAWA programmable controller FA-M3, or programmable controllers of other manufacturers.

Standards: EIA RS-485

Maximum number of connectable units: 31 units

Maximum communication distance: 1200 m

Communication method: 2-wire half duplex, start-stop synchronization, non-procedural

Communication rate: 1200, 2400, 4800, 9600 bps

Data length: 8, 7 bits

Stop bit: 1, 2 bits

Parity: Even parity, odd parity, or none

Communication protocol: PC-link, PC-link with SUM, MODBUS ASCII, MODBUS RTU, or LADDER

PC-link communication: Communication protocol with a PC, graphic panel, UT link module of FA-M3

MODBUS communication: Communication protocol with a PC (SCADA).

Ladder communication: Communication protocol with ladder communication module of FA-M3 and programmable controller of other manufacturers

● Alarm Output

Signal type: Relay contact

Output signal: N. O. contact output (contact ON at excitation) 2 points, COM common

Contact capacity: 30 V DC, 1 A

Alarm operating direction: High limit alarm or low limit alarm

Relay operating direction setting: Excitation or non-excitation at normal status

Alarm setting range: 0 to 100% of input range

Setting resolution: 0.1%, 4 significant digits

Hysteresis setting range: 0 to 100% of input range

Setting resolution: 0.1%, 4 significant digits

Alarm on-delay setting: Delay time from alarm condition completion to output

(Ex. Outputted when alarm status

continues for 1 second or more after input value is over alarm point in case of set value "1 second.")

Setting range: 0 to 999 seconds

Setting resolution: 1 second (however, add about 0.2 second to setting time to prevent wrong operation)

Alarm off-delay setting: Delay time from alarm normal condition completion to output

(Ex. Released when normal status continues for 2 seconds or more after input value comes back to normal status from alarm status in case of set value "2 seconds.")

Setting range: 0 to 999 seconds

Setting resolution: 1 second (however, add about 0.2 second to setting time to prevent wrong operation)

Alarm operation display: Front LED lights at alarm, 2 LEDs

● Zero and Span adjustment:

Output Zero adjustment: \pm 5%

Output Span adjustment: \pm 10% of Span

Output Span adjustment: \pm 5% of Span

(Output-1 Signal; -10 to +10 V DC)

■ Items Available to Be Set

The following items can be set via a PC (VJ77 PC-based parameters setting tool) or Handy Terminal (JHT200 and the like):

Conversion mode, range units, input frequency, lowcut points, input filter, sampling mode, sampling time, address number, baud rate, parity, data length, stop bit, protocol, alarm operating direction, relay operating direction, alarm setting, hysteresis, alarm on-delay and alarm off-delay

■ Standard Performance

Accuracy rating: $\pm 0.1\%$ of span

However, accuracy is not guaranteed for output level less than 0.5% of the span of a 0 to X mA output range type. accuracy is limited when F_0/F_{100} is 50% or more.

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

F_0 : 0% input frequency

F_{100} : 100% input frequency

Response speed: 2 intervals of input pulse + 100 ms
63% response (10% to 90%) when in F/V conversion mode

Effect of power supply voltage fluctuation: $\pm 0.1\%$ or less of span for power supply voltage fluctuation of 85 to 264 V AC (47 to 63 Hz)/DC and 12 to 36 V DC

Effect of ambient temperature change: $\pm 0.2\%$ or less of span for change of 10 °C

■ Safety and EMC Standards

CSA: CAN/CSA C22.2 No.61010-1
Overvoltage category I, Pollution degree 2, Measurement category O(other)

UL: UL 61010-1
Overvoltage category I, Pollution degree 2, Measurement category O(other)

RCM: EN 55011 Class A Group 1 compliance

KC: Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance.
The instrument continues to operate at a measurement accuracy of within $\pm 20\%$ of the range during testing.

The above standards are compliant with the 15-30 V DC rated power supply specifications only.

■ Power Supply and Isolation

Power Supply Rated Voltage:
100 to 240 V AC/DC \approx 50/60 Hz
15 to 30 V DC \approx

Power Supply Input Voltage: 100 to 240 V AC/DC \approx
(-15, +10%) 50/60 Hz
15 to 30 V DC \approx ($\pm 20\%$)

Power Dissipation:

one-output type	24 V DC	3.3 W
	110 V DC	3.3 W
	100 V AC	6.2 VA
	200 V AC	8.1 VA
two-output type	24 V DC	4.1 W
	110 V DC	4.1 W
	100 V AC	7.0 VA
	200 V AC	9.0 VA

Insulation Resistance: 100 M Ω /500 V DC between input, output-1, output-2, power supply and ground mutually

Withstand Voltage: 2000 V AC / minute between input, (output-1, output-2), power supply, and ground mutually
1000 V AC / minute between input and output-2 when alarm output
1000 V AC / minute between output-1 and output-2

■ Environmental Conditions

Temperature: 0 to 50 °C (0 to 40°C when 2 current-output is selected and side-by-side close installation.)

Humidity: 5 to 90% RH (no condensation)

Ambient Condition: Avoid installation in such environments as corrosive gas like hydrogen sulfide, dust, sea breeze and direct sunlight.

Altitude: 2000 m or less.

Installation location: Indoors

■ Mounting and Appearance

Construction: Compact plug-in type

Material: Modified Polyphenylene Oxide (Case body)

Mounting Method: Wall, DIN rail, or dedicated VJ mounting base mountings (only when output-2 is analog output.)

Connection Method: M3 screw terminal

External Dimension: 29.5x76x124.5mm (WxHxD)

Weight: Approx. 170 g

■ Standard Accessories

Tag number label:1

Range label: 1

Shunt resistor: 1 (when optional code shunt resistor is specified)

■ Items to Specify When Ordering

The conversion mode, range units, input frequency, lowcut point, input filter on/off setting, sampling mode and sampling time are set as specified before shipment.

- Model and suffix codes: e.g. VJQ8-026-1AA0
- Conversion mode: e.g. F/V conversion
- Input frequency: e.g. 0 to 10 Hz
- Low cut point (Hz): e.g. 0.01
- Input filter: e.g. OFF
- * When specifying F/V conversion, the specifications of sample mode, sample time are unnecessary.

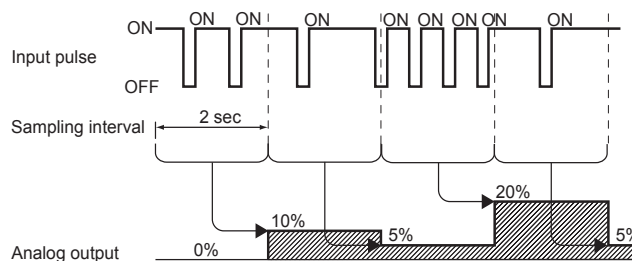
■ Factory Setting

Factory settings are as follows:

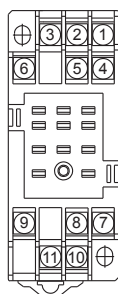
- Conversion mode: F/V conversion
- Input frequency: 0 to 10 Hz
- Low cut point (Hz): 0.01
- Input filter: Off
- Sampling mode: AUTO
- Sample time: 10
- **When output-2 is specified as communication output**
 - Address No.: 01
 - Baud rate: 9600 bps
 - Parity: Even
 - Data length: 8 bits
 - Stop bit: 1 bits
 - Protocol: PCLINK
- **When output-2 is specified as alarm output**
 - Alarm operating direction: High limit alarm (alarm-1), low limit alarm (alarm-2)
 - Relay operating direction: Excitation at alarm (alarm-1 / 2)
 - Alarm setting: 100% (alarm-1), 0% (alarm-2)
 - Hysteresis: 3% (alarm-1 / 2)
 - Alarm on-delay: 0 second (alarm-1 / 2)
 - Alarm off- delay: 0 second (alarm-1 / 2)

■ Timing Chart of Pulse Integration Operation

This timing chart shows an example of the integration operation where input frequency is 0 to 10 Hz and sampling time is 2 sec.



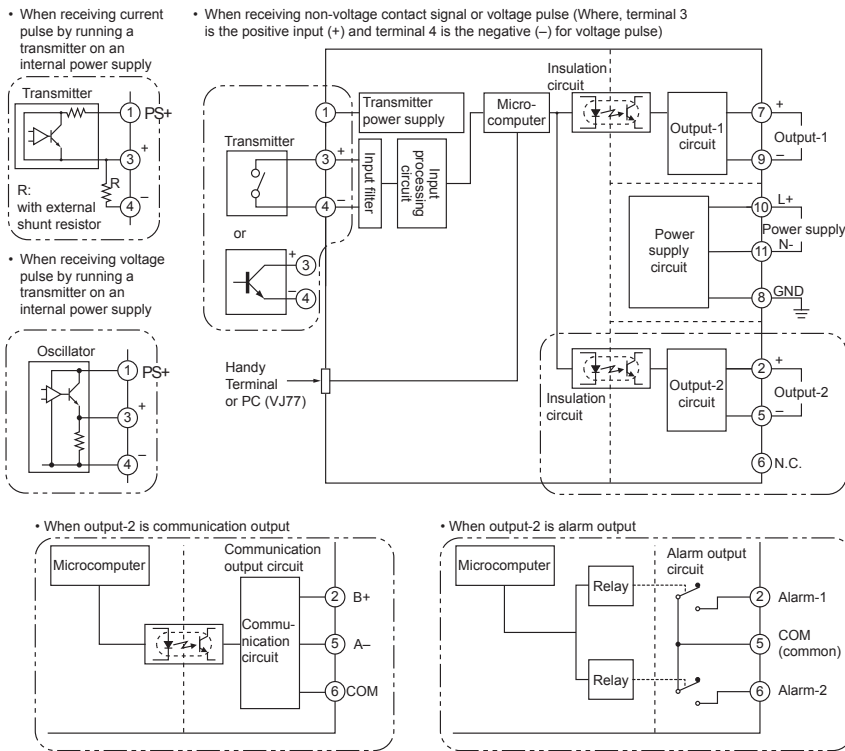
■ Terminal Arrangement



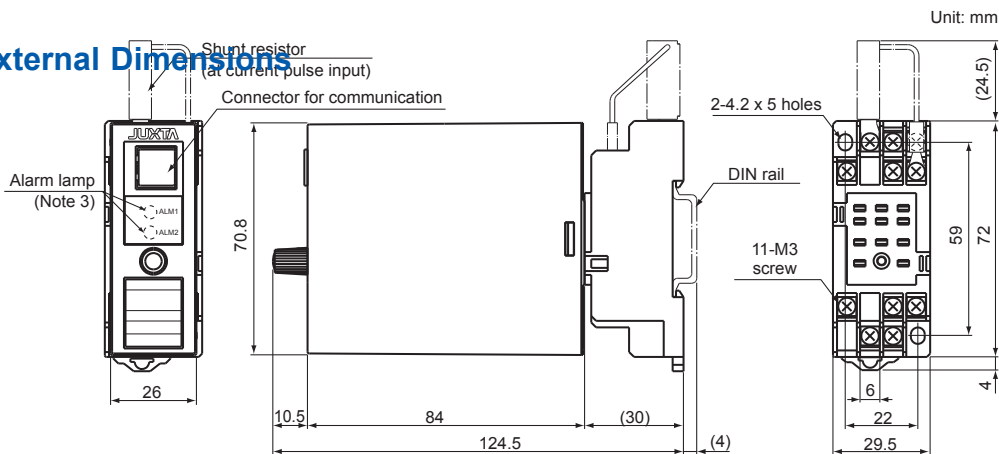
Terminal No.	Signal	Output-2 analog output	Output-2 communication output	Output-2 alarm output
1	Input		(PS+)	
2	Output-2	(+)	B (+)	ALM1
3	Input		(+)	
4	Input		(-)	
5	Output-2	(-)	A (-)	COM
6	Output-2	Not connected	COM	ALM2
7	Output-1		(+)	
8	GND		GND	
9	Output-1		(-)	
10	Power supply		(L+)	
11	Power supply		(N-)	

Note 2: With the one-output type, terminals for Output-2 are not connected.

Block Diagram



External Dimensions



Note 3: Only when output-2 is alarm output.