General **Specifications**

GS 77J01Q17-01E

Model VJQ7

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

Types)

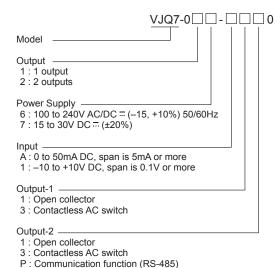
■ General

The VJQ7 is a plug-in type analog to pulse converter that converts DC current or DC voltage signal into isolated transistor-contact pulse or contactless AC switch pulse.

The VJQ7 converter features:

- · Either pulse output, communication function (RS-485), or alarm output (2 relay contacts) is selectable
- Various parameters such as input ranges can be set and modified through a PC (VJ77) or Handy Terminal (JHT200 and the like).

■ Model and Suffix Codes



■ Input

N: No Output-2

Input Signal: DC voltage or DC current signal Input Range:

T: Alarm output (2 relay contacts)

0 to 50mA DC, span is 5mA or more Code A: -10 to +10V DC, span is 0.1V or more Code 1: Input Resistance:

DC current signal: 100Ω (External shunt resistor) DC voltage signal: $1M\Omega$ ($100k\Omega$ when power off)



NTXUL

■ Output

1. Output-1

The operation of Output-1 is same as that of Output-2.

Output signal: Open collector or contactless AC switch Output frequency: 0.001Hz≤F₁₀₀≤2kHz However, 1kHz or less for contactless AC

switch

 $0Hz \le F_0 < F_{100}$

F₀ is 0% of output frequency. is 100% of output frequency. Frequency can be set in increments of 0.00001 (Hz or kHz) within 4 significant

Output range unit: Either Hz or kHz is selectable. Low-level output cutoff point: 0.0001Hz to 100% of output frequency

Maximum permissible load:

Open collector: 30V DC/200mA

Contactless AC switch: 100V AC/200mA

Pulse width type: Either 50% duty, fixed on-state pulse width, or fixed off-state pulse width

is selectable.

Pulse width time: 0.1 to 500ms, settable by 0.1ms Output frequency available for fixed pulse width:

Set value of pulse width (ms) x 2 x 1000[Hz]

The frequency over the above is limited.

2. Output-2

Pulse Output

Same as Output-1 specifications

When either Output-1 or Output-2 is contactless AC switch, output frequency is 1 kHz or less.

Communication Function

This converter 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

Baud rate: 1200, 2400, 4800, 9600 bps

Data length: 8, 7 bit Stop bit: 1. 2 bit

Even parity, odd parity, or none Parity:



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 nonexcitation 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 seconds 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 seconds to setting time to prevent wrong operation)

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

■ Items Available to Be Set

The following items can be set through a PC (VJ77 PCbased parameters setting tool) or Handy Terminal:

Input range, output range unit, output range, lowlevel output cutoff point, output pulse width type, output pulse width 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: ±0.1% of span

However, accuracy is limited in the following case according to the input and output ranges: Accuracy limitation by input range

Input range is -10 to +10 V (H range), span is under 5 V;

accuracy (%)=±0.1% x 5 V / input span [V] Input range is -5 to +5 V (M range), span is under 2.5 V;

accuracy (%)=±0.1% x 2.5 V / input span [V]

Input range is -1 to +1 V (L range), span is under 0.5 V;

accuracy (%)=±0.1% x 0.5 V / input span [V] When current input, apply [input range x input resistance] to the above, and add 0.1% of resistance error.

Accuracy limitation by output range

When $F_{100} \le 1 \text{kHz}$, zero elevation is 50% or more;

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

When
$$F_{100}$$
>1kHz, zero elevation;
Accuracy (%)= $\frac{F_{100}/2}{F_{100}$ - F_0 x 0.2

 $\rm F_{0}$ is 0% of output frequency, $\rm F_{100}$ is 100% output frequency. When both input and output have accuracy limitation, total accuracy is their sum.

Response speed: One cycle of output pulse + 150ms (for 50% duty), 63% response (10 to 90%) Alarm output: 350ms (input change 10 to 90%, alarm setting point 50%, time till alarm output, when alarm delay setting and hysteresis are min.)

Effect of Power Supply Voltage Fluctuation: ±0.1% or less of span for power supply voltage fluctuation of 85 to 264V AC (47 to 63 Hz),/DC, 12 to 36V DC.

Effect of Ambient Temperature Change: ±0.2% or less of span for change of 10°C

■ Safety and EMC Standards

CAN/CSA C22.2 No.61010-1 CSA:

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 ±20% of

the range during testing.

The above standards are compliant with the 15-30 V DC rated power supply specifications only. However, models with contactless AC switch outputs are not compliant.

■ Power Supply and Isolation

Power Supply Rated Voltage:

100 to 240 V AC/DC = 50/60 Hz 15 to 30 V DC =

Power Supply Input Voltage: 100 to 240 V AC/DC ~ (-15, +10%) 50/60 Hz

15 to 30 V DC ··· (±20%)
Power Dissipation: 24 V DC 2.4 W, 110 V DC 2.4 W 100 V AC 4.5 VA, 200 V AC 6.3 VA

Insulation Resistance: 100 MΩ/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 at alarm output

1000 V AC / minute between output-1 and output-2

■ Environmental Conditions

Temperature: 0 to 50 °C

Humidity: 5 to 90% RH (no condensation) Ambient Condition: Avoid installation in such

environments as corrosive gas like sulfide hydrogen, 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 (only when Output-2 is

analog output) mountings

Connection Method: M3 screw terminal

External Dimension: 29.5x76x124.5mm (WxHxD)

Weight: Approx. 170 g

Accessories

Tag Number Label: 1 sheet Range Label: 1 sheet

Shunt Resistor: 1 (when current input is specified)

■ Items to Specify When Ordering

Shipped after setting the input range, output frequency, output range unit, low-level output cutoff point, pulse width type, pulse width time as specified.

- Model and Suffix Code: e.g. VJQ7-026-A110
- Input range: e.g. 4 to 20 mA DC
- Output frequency: e.g. 0 to 10 Hz
- Low cut point (Hz): e.g. 0.0001
- Pulse width type: e.g. Duty of 50%
- * When specifying "Duty of 50%" for pulse width type, the specification of pulse width (ms) is unnecessary.

■ Factory Setting

Factory settings are as follows:

- Input range: 4 to 20mA DC (for current input), or 1 to 5V DC (for voltage output)
- Output frequency: 0 to 10Hz • Low cut point (Hz): 0.0001
- · Pulse width type: fixed on-state pulse width
- Pulse width (ms): 30

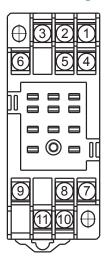
When output-2 is specified as communication output

Address No.:
Baud rate:
Parity:
Data length:
Stop bit:
Protocol:
O1
9600 bps
Even
8 bit
1 bit
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)

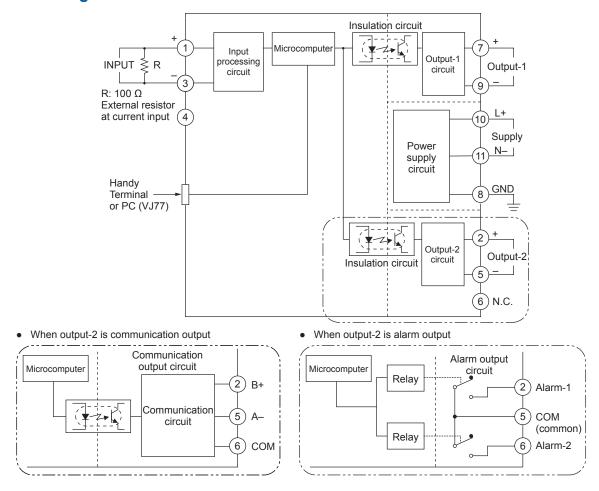
■ Terminal Arrangement



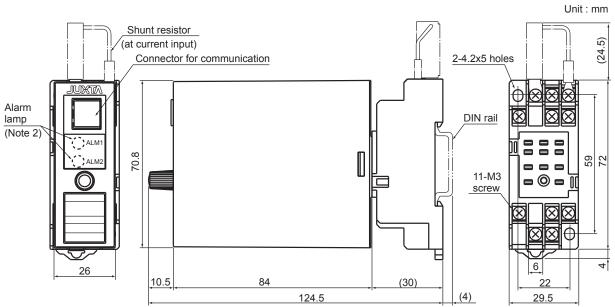
Terminal No.	Signal	Output-2 Analog output	Output-2 Communication output	Output-2 Alarm output
1	Input	(+)		
2	Output-2	(+)	B (+)	ALM1
3	Input	(-)		
4	N.C.			
5	Output-2 (Note 1)	(-)	A (–)	COM
6	Output-2 (Note 1)	N.C.	СОМ	ALM2
7	Output-1	(+)		
8	GND	GND		
9	Output-1	(–)		
10	Supply	(L+)		
11	Supply	(N-)		

Note 1: In case of one output type, output-2 is N.C.

■ Block Diagram



■ External Dimensions



Note 2: Only when output-2 is alarm output