

General Specifications

Model VJA7
Distributor (Multi-function)
(Isolated Single-output and Isolated Dual-output Types)

JUXTA

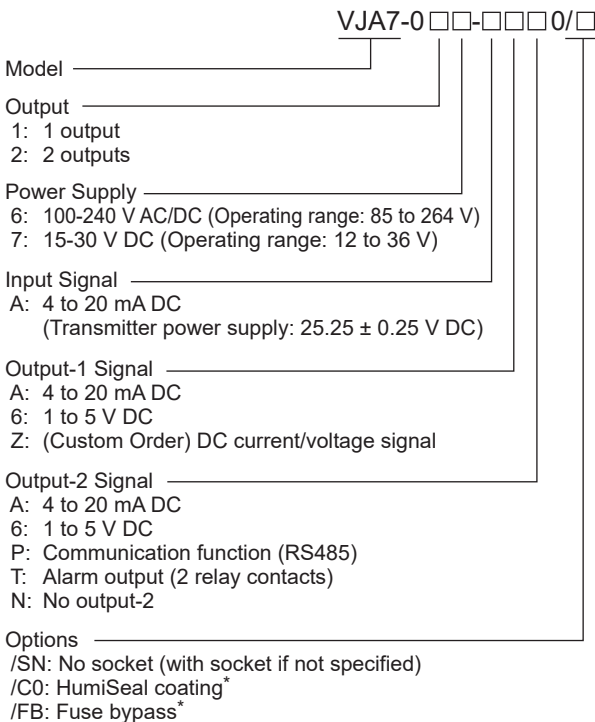
GS 77J01A07-01E

■ General

This plug-in type distributor is used in combination with 2-wire type transmitter and converts 4 to 20 mA DC signal into isolated DC current or DC voltage signal.

- DC voltage signal, DC current signal, communication output (RS485), or alarm output (2 relay contacts) is selectable as output-2.
- Selection of square root extractor and breakpoint linearization (breakpoint setting), I/O adjustment, I/O monitoring, and loop back test can be made using the optional Parameter Setting Tool (VJ77).
- Can be used as a limiter converter when you use a breakpoint linearization function.
- Supports BARD-800.

■ Model and Suffix Codes



* When option code /C0 or /FB is specified, the conformity to the safety and EMC standards is excluded. CE marking is not applicable.

Note 1: "/C0" option: Polyurethane coating. The "/C0" option does not guaranteed the coating effect though it is expected that the corrosion resistance for electric circuit is reinforced. And it is not able to submit coating test data.

Note 2: "/FB" option: The primary power supply fuse is deleted, short circuit and ship it.



■ Ordering Information

Shipped after setting the value of square root extraction, low cut point as specified.

- Model and suffix code: e.g. VJA7-026-AA60
- Square root (required item) : e.g. YES
- Low cut point (%): e.g. 0.5
- * When specifying "Without square root", the specification of low cut point (%) is unnecessary.

■ Factory Default Settings

Factory settings are as follows:

To change the set value, a PC-based Parameter Setting Tool (VJ77) is required.

- Low cut point (%): 0.6
- Linearizer: None
- Software filter: OFF
- Output operating direction: Direct
- **When output-2 is specified as communication output**
 - Address No.: 01
 - Communication rate: 9600 bps
 - Parity: Even
 - Data length: 8 bit
 - Stop bit: 1 bit
 - 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: Energized under alarm condition (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)

Input Specifications

Input Signal: 4 to 20 mA DC from 2-wire transmitter, 1 point

Input Resistance: 250 Ω

Transmitter Power Supply: 25 to 25.5 V DC (with current limit circuit at 25 to 35 mA)

Permissible Conductance Resistance: $RL \leq (20 - \text{transmitter minimum operating voltage}) / 0.02 \text{ A} (\Omega)$

Permissible Input Current: 40 mA or less

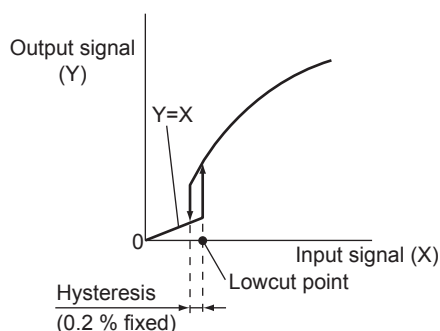
Square Root Extraction Function: Outputted against the result of extracting square root of input.

$$Y = \left(\sqrt{\frac{X - (\text{input } 0 \% \text{ value})}{\text{input span}}} \right) \times (\text{output span}) + (\text{output } 0 \% \text{ value})$$

Lowcut Function: Available only when the square root extraction function is specified.

Setting Range: 0 to 100 % of input, setting available by 0.1 % notch

Output lowcut point or less is cramped with straight line proportional to input.



Input adjustment range: $\pm 1\%$ of span or more (Zero/ Span)

Software filter: OFF, Low, Middle, High (default value: OFF)

When Low, Middle, or High is selected, a first-order filter equivalent to 100 ms, 300 ms, or 1 s is inserted in the input.

Output Specifications

1. Output-1

Output Signal	Output Resistance	Permissible Load Resistance
1 to 5 V DC	1 Ω or less	2 kΩ or more
4 to 20 mA DC	500 kΩ or more	750 Ω or less

• Custom Order Output Signal

2 to 10 mA DC, 1 to 5 mA DC, 0 to 20 mA DC, 0 to 16 mA DC, 0 to 10 mA DC, 0 to 1 mA DC, 0 to 10 mV DC, 0 to 100 mV DC, 0 to 1 V DC, 0 to 10 V DC, 0 to 5 V DC, -10 to +10 V DC

Note: Customized specifications for the output-1 signal within 0 to 20 mA DC or within -10 to +10 V DC comply with safety standards, EMC standards, and environmental standards.

- The above note is limited to the standard specification of output-2.
- Other customized specifications do not conform to these standards.

2. Output -2

• Analog Output

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

Output variable range: -6 to 106 % (Both output 1 and output 2)

Output adjustment: $\pm 10\%$ (Zero/ Span) (Output 1 and output 2)

Break Point Linearization (Output-1/output-2):

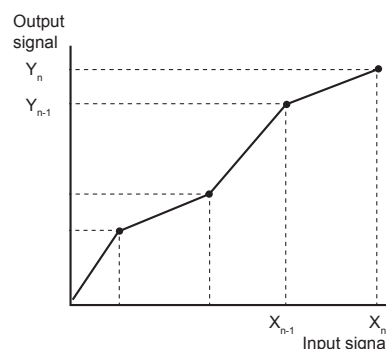
Breakpoint: Up to 32 points (Set a relationship between input and output with % value over the span.)

Allowable setting range of breakpoint: -6 to +106 % (both input and output)

• With 4 significant digits; can be set to the second place of a decimal point.

• Set breakpoints according to the following.
For input: $-6.0 \% \leq X_0 < X_1 < X_2 \dots X_{n-1} < X_n \leq 106.0 \%$

For output: $-6.0 \% \leq Y_0 < Y_n < 106.0 \%$



• Communication Function

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

Standards: EIA RS485

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, 19200, or 38400 bps

Data length: 8, 7 bit

Stop bit: 1, 2 bit

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 personal computer, graphic panel, or UT link module of FA-M3

MODBUS communication: Communication protocol with a personal computer (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: Energized or de-energized under normal condition
 Alarm setting range: 0 to 100 %
 Setting resolution: 0.1 %
 Hysteresis: Set the value added to alarm setting point at alarm release.
 Setting range: 0 to 100 % of input range
 Setting resolution: 0.1 %
 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 becomes 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 excitation, 2 LEDs

■ Items Available to Be Set

The following items can be set through PC-based Parameters Setting Tool (VJ77 sold separately):

Square root extraction, lowcut, address number, communication rate, parity, data length, stop bit, protocol, alarm operating direction, relay operating direction, alarm setting, hysteresis, alarm on-delay, alarm off-delay, output operating direction, linearization, software filter

■ Standard Performance

Accuracy Rating: ± 0.1 % of span

- However, the accuracy is not guaranteed for output levels less than 0.5% of the span of a 0 to X mA output range type.
- For square root extractor input, ± 1 % of span when the input is 2% or less.
- If 1 or more is set for the line segment gain of linearization, multiply the input/output accuracy by the value of line segment gain. Line segment gain (slope) is the maximum value calculated from the following expression.

$$\text{Linearizer gain} = \frac{Y_n - Y_{n-1}}{X_n - X_{n-1}}$$

Response Speed: 150 ms, 63 % response (10 to 90 %)

- Alarm output: 350 ms (input change 10 to 90 %, alarm setting point 50 %, time till alarm output, when alarm delay setting and lockup width are min.)
- If the software filter is on, add the following to the value above: Low: 100 ms, Middle: 300 ms, High: 1 s.

The value of the A and then added to the above-mentioned.

Effect of power supply voltage fluctuation: Within the accuracy range of span for power supply voltage fluctuation.

Effect of Ambient Temperature Change: ± 0.15 % of span for change of 10 °C

■ Safety and EMC Standards

CE:

EMC directive

EN 61326-1 Class A Table 2^{*1} compliance
 EN 61326-2-3 compliance
 EN 61000-3-2 compliance
 EN 61000-3-3 compliance
 EN 55011 Class A Group 1 compliance

Low voltage directive:

EN 61010-1, EN 61010-2-030
 Overvoltage category II^{*2}, Pollution degree 2^{*3},
 Measurement category O (other)

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

CAN/CSA C22.2 No. 61010-2-030
 Overvoltage category II^{*2}, Pollution degree 2^{*3},
 Measurement category O (other)

UL: UL 61010-1 (CSA NRTL/C)

UL 61010-2-030 (CSA NRTL/C)
 Overvoltage category II^{*2}, Pollution degree 2^{*3},
 Measurement category O (other)

RCM: EN 55011 Class A Group 1 compliance

KC: Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance

- *1 The instrument continues to operate at a measurement accuracy of within ± 20 % of the range during testing.
- *2 Overvoltage category II: Describes a number which defines a transient overvoltage condition. Implies the regulation for impulse withstand voltage. "II" applies to electrical equipment which is supplied from the fixed installation like a distribution board.
- *3 Pollution degree 2: Describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs.

However, if optional code /C0 or /FB is specified, the conformity to the safety and EMC standards is excluded.

■ Environment Standard

EU RoHS directive: EN IEC 63000

(However, when option code /C0 or /FB is specified, CE marking is not applicable because the product does not comply with the Safety and EMC standards.)

■ Power Supply and Isolation

- Power Supply Rated Voltage:
100 to 240 V AC/DC \approx 50/60 Hz
15 to 30 V DC $\overline{\text{---}}$
- Power Supply Input Voltage: 100 to 240 V AC/DC
(-15, +10%) 50/60 Hz or 15 to 30 V DC
($\pm 20\%$)
- Power Dissipation: 24 V DC 3.6 W, 110 V DC 3.6 W
100 V AC 6.6 VA, 200 V AC 8.8 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 output-1 and
output-2.

■ Environmental Conditions

- Temperature: -10 to 55 °C (45 °C or less for side-by-
side close installation*)
- * If the previous model (style S3.xx earlier) is
installed together, the ambient temperature is 0 to
40°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.
- Magnetic field: 400 A/m or less.
- Continuous vibration (at 5 to 9 Hz) Half amplitude of
3 mm or less (at 9 to 150 Hz) 4.9 m/s² or
less, 1 oct/min for 90 minutes each in the
3-axis directions.
- Impact: 98 m/s² or less, 11 msec, 3-axis 3 times each
in 6 directions.
- Altitude: 2000 m or less.
- Installation location: Indoors
- Warm-up time: At least 30 minutes after power on.

■ Transport and Storage Conditions

- Ambient temperature: -25 to 70 °C
Temperature change rate: 20 °C per hour or less
Ambient humidity: 5 to 95 %RH (no condensation)

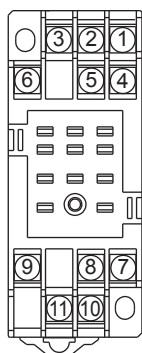
■ Mounting and Dimensions

- Construction: Compact plug-in type
Material: Modified Polyphenylene Oxide (Case
body)
Mounting Method: Wall, DIN rail, or dedicated VJ
mounting base mountings
Connection Method: M3 screw terminal
External Dimension: 29.5x76x124.5 mm (WxHxD)
(with socket)
Weight: Main unit: 100 g or less,
Socket: 50 g or less

■ Standard Accessories

- Tag Number Label: 1 sheet

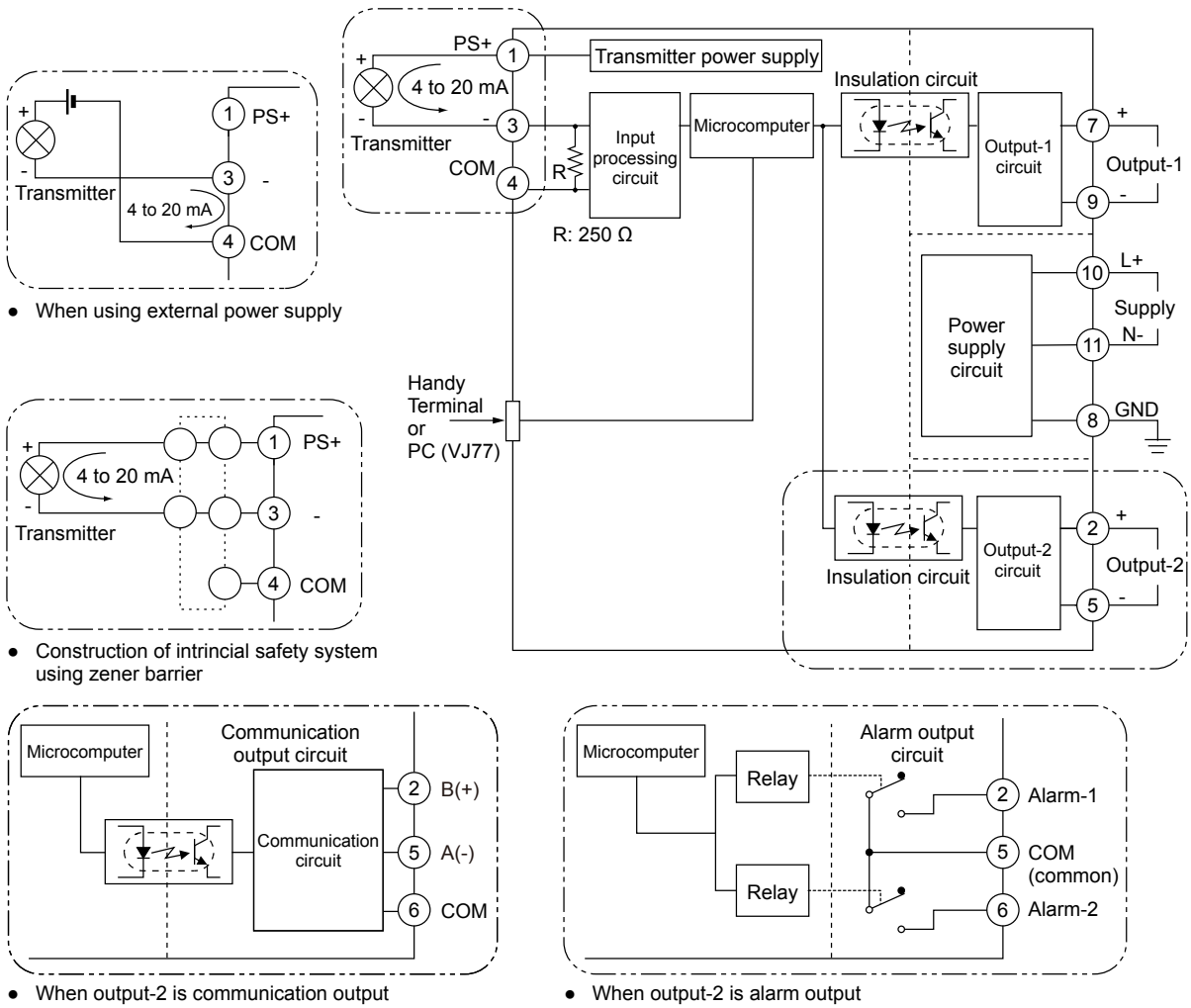
■ Terminal Arrangement



Terminal No.	Signal	Output-2		
		Analog output	Communication output	Alarm output
1	Input		PS+	
2	Output-2	+	B (+)	ALM1
3	Input		-	
4	Input		COM	
5	Output-2	-	A (-)	COM
6	Output-2	Do not use	COM	ALM2
7	Output-1		+	
8	GND		GND	
9	Output-1		-	
10	Supply		L+	
11	Supply		N-	

Note: Do not use output-2 for the single-output type.

Block Diagram



External Dimensions

