## GS 77J01A05-01E

## ■ General

The VJA5 is a compact, plug-in type distributor that is used in combination with a two-wire type transmitter to calculate the square root of 4 to 20 mA DC input signals from the transmitter and then convert them into isolated DC current or DC voltage signals.

- Supports BARD-800.


## Model and Suffix Codes



Option
/SN: No socket (with socket if not specified)
/CO: Coating *
/FB: Fuse bypass *

* 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

Specify the following when ordering.

- Model and Suffix Code: e.g. VJA5-026-AAAO



## Input/Output Specifications

Input signal: 4 to 20 mA DC signal from two-wire type transmitter
Input resistance: $250 \Omega$
Transmitter power supply: $25.25 \pm 0.25 \mathrm{~V}$ DC (provided with a current limiter to keep the current between 25 and 35 mA )
Allowable conductor resistance (RL): Up to [(20 transmitter's minimum operating voltage) $\mathrm{V} / 0.02 \mathrm{~A}] \Omega$
Maximum allowable input current: 40 mA DC
Input-output characteristics:
$Y=\left(\sqrt{\frac{X-(0 \% \text { of input value })}{\text { Input span }}}\right) \times$ (Output span $)+(0 \%$ of output value $)$ where
$\mathrm{Y}=$ Output signal value $X=$ Input signal value
Lowcut point: $1 \%$ fixed (Lowcut point or less is cramped with straight line proportional to input.)


Output signal: DC voltage or DC current signal
Output variable range: -6 to 106 \% (Both output 1 and output 2)
Allowable load resistance:

| Output-1 <br> Range | Allowable Load <br> Resistance | Output-1 Range | Allowable Load <br> Resistance |
| :---: | :---: | :--- | :---: |
| 4 to 20 mADC | $750 \Omega$ maximum | 0 to 10 mV DC | $250 \mathrm{k} \Omega$ minimum |
| 2 to 10 mADC | $1500 \Omega$ maximum | 0 to 100 mV DC | $250 \mathrm{k} \Omega$ minimum |
| 1 to 5 mADC | $3000 \Omega$ maximum | 0 to 1 V DC | $2 \mathrm{k} \Omega$ minimum |
| 0 to 20 mADC | $750 \Omega$ maximum | 0 to 10 V DC | $10 \mathrm{k} \Omega$ minimum |
| 0 to 16 mADC | $900 \Omega$ maximum | 0 to 5 V DC | $2 \mathrm{k} \Omega$ minimum |
| 0 to 10 mADC | $1500 \Omega$ maximum | 1 to 5 V DC | $2 \mathrm{k} \Omega$ minimum |
| 0 to 1 mADC | $15 \mathrm{k} \Omega$ maximum | -10 to +10 V DC | $10 \mathrm{k} \Omega$ minimum |
| Output-2 <br> Range | Allowable Load <br> Resistance | Output-2 Range | Allowable Load <br> Resistance |
| 4 to 20 mADC | $350 \Omega$ maximum | 1 to 5 V DC | $2 \mathrm{k} \Omega$ minimum |

Output resistance: Current output; $500 \mathrm{k} \Omega$ or more
Voltage output other than below: $1 \Omega$ or less
0 to 10 mV DC, 0 to 100 mV DC: $100 \Omega$ or less
Zero adjustment: -5 to $+5 \%$
Span adjustment: 95 to $105 \%$

## Standard Performance

Accuracy rating: $\pm 0.1 \%$ of span; $\pm 1 \%$ of span for input from $1 \%$ up to $2 \%$; accuracy is not guaranteed for output levels less than $0.5 \%$ of the span of a 0 to X mA output range type.
Response speed: $150 \mathrm{~ms}, 63 \%$ response (10 to 90\%)
Effect of power supply voltage fluctuation: Within the accuracy range of span for power supply voltage fluctuation.
Effect of ambient temperature change: $\pm 0.15 \%$ of span for change of $10^{\circ} \mathrm{C}$

## $\square$ 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 $\pm 20 \%$ 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. "Il" 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:
$100-240 \mathrm{~V} \mathrm{AC} / \mathrm{DC}=50 / 60 \mathrm{~Hz}$ or
15-30 V DC -..
Power supply input voltage:
100-240 V AC/DC $=(-15,+10 \%) 50 / 60 \mathrm{~Hz}$ or $15-30$ V DC..$-( \pm 20 \%)$
Power consumption:
3.2 W at 24 V DC ; 3.1 W at 110 V DC;
6.1 VA at $100 \mathrm{~V} \mathrm{AC} ; 8.3 \mathrm{VA}$ at 200 V AC

Insulation resistance: $100 \mathrm{M} \Omega$ minimum at 500 V DC between input, output-1, output-2, power supply and grounding terminals mutually
Withstanding voltage: 2000 V AC for one minute between input, (output-1 and output-2), power supply and grounding terminals mutually;
1000 V AC for one minute between output-1 and output-2 terminals

## ■ Environmental Conditions

Temperature: -10 to $55^{\circ} \mathrm{C}\left(45^{\circ} \mathrm{C}\right.$ or less for side-byside close installation*)

* If the previous model (style S3.xx earlier) is installed together, the ambient temperature is 0 to $40^{\circ} \mathrm{C}$.
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: $400 \mathrm{~A} / \mathrm{m}$ or less.
Continuous vibration (at 5 to 9 Hz ) Half amplitude of 3 mm or less (at 9 to 150 Hz ) $4.9 \mathrm{~m} / \mathrm{s} 2$ or less, $1 \mathrm{oct} / \mathrm{min}$ for 90 minutes each in the 3 -axis directions.
Impact: $98 \mathrm{~m} / \mathrm{s} 2$ or less, $11 \mathrm{msec}, 3$-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 $70^{\circ} \mathrm{C}$
Temperature change rate: $20^{\circ} \mathrm{C}$ per hour or less
Ambient humidity: 5 to $95 \%$ RH (no condensation)

## ■ Mounting and Appearance

Construction: Compact plug-in type
Material: Modified polyphenylene oxide (casing)
Mounting method: Wall, DIN rail or dedicated VJ mounting base (VJCE) mounting
Connection method: M3 screw terminals
External dimensions:
$76(\mathrm{H}) \times 29.5(\mathrm{~W}) \times 124.5(\mathrm{D}) \mathrm{mm}$
(including a socket)
Weight: Main unit; 100 g or less
Socket; 50 g or less

## - Accessories

Tag number label: 1 sheet

## Customized Signal Specifications

- Output custom specification

Table 1 Manufacturable Ranges

|  | Current Signal | Voltage Signal |
| :--- | :---: | :---: |
| Output range (DC) | 0 to 24 mA | -10 to +10 V |
| Span (DC) | 1 to 24 mA | 10 mV to 20 V |
| Zero elevation | 0 to $200 \%$ | -100 to $+200 \%$ |

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.
- Terminal Assignments


| 1 | Input | $(\mathrm{PS}+)$ |
| :---: | :--- | :--- |
| 2 | Output-2 | $(+)$ |
| 3 | Input | $(-)$ |
| 4 | Input | $(\mathrm{COM})$ |
| 5 | Output-2 | $(-)$ |
| 6 | Do not use |  |
| 7 | Output-1 | $(+)$ |
| 8 | GND |  |
| 9 | Output-1 | $(-)$ |
| 10 | Supply | $(\mathrm{L}+)$ |
| 11 | Supply | $(\mathrm{N}-)$ |

Do not use output-2 for the singleoutput type.

## Block Diagrams

(1) Combination with two-wire type transmitter using external power supply

(2) Example to construct Intrinsically Safe System using Zener Barrier

(3) Combination with two-wire type transmitter using internal power supply


## ■ External Dimensions



