# General Specifications

**GS 77J01A01-01E**

Model VJA1
Distributor
(Isolated Single-output and Isolated Dual-output Types) (with HART Communication: VJA1/H)

JUXTA

## ■ General

*The VJA1 is a compact, plug-in type distributor that is used in combination with a two-wire type transmitter to convert the transmitter's 4 to 20 mA DC signals into isolated DC current or DC voltage signals.*

- HART communication: VJA1/H (option code /H)
  Bi-directional relay of HART communication signals is possible while the field devices and the higher-level device are isolated from each other.
- Supports BARD-800.

## ■ Model and Suffix Codes

VJA1-0 □□ -A □□ 0/ □

Model

Output
1: 1 output
2: 2 outputs

Power supply
6: 100-240 V AC/DC (Operating range: 85 to 264 V)
7: 15-30 V DC (Operating range: 12 to 36 V)

Input signal
A: 4 to 20 mA DC
(Transmitter power supply: 25.25 ± 0.25 V DC)

Output-1 signal
A: 4 to 20 mA DC
B: 2 to 10 mA DC
C: 1 to 5 mA DC
D: 0 to 20 mA DC
E: 0 to 16 mA DC
F: 0 to 10 mA DC
G: 0 to 1 mA DC
1: 0 to 10 mV DC
2: 0 to 100 mV DC
3: 0 to 1 V DC
4: 0 to 10 V DC
5: 0 to 5 V DC
6: 1 to 5 V DC
7: -10 to +10 V DC
Z: Custom order (DC current/voltage signal)
See Table 1.

Output-2 signal
A: 4 to 20 mA DC
6: 1 to 5 V DC
N: No output-2
Z: Custom order (DC current/voltage signal)
See Table 1.

Option
/SN: No socket (with socket if not specified)
/C0: Coating *1
/FB: Fuse bypass *1
/H: With HART communication *2

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

*2 When option code /H is specified, the output-1 signal code is "A" (4 to 20 mA DC) only.

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

- Model and Suffix Codes: e.g. VJA1-026-AAA0

## ■ Input/Output Specifications

Input signal: 4 to 20 mA DC signal from two-wire type transmitter
Input resistance: 250 Ω
Transmitter power supply: 25.25±0.25 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) V/0.02 A] Ω
Maximum allowable input current: 40 mA DC
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 Range | Allowable Load Resistance | Output-1 Range | Allowable Load Resistance |
|---|---|---|---|
| 4 to 20 mA DC | 750 Ω maximum | 0 to 10 mV DC | 250 kΩ minimum |
| 2 to 10 mA DC | 1500 Ω maximum | 0 to 100 mV DC | 250 kΩ minimum |
| 1 to 5 mA DC | 3000 Ω maximum | 0 to 1 V DC | 2 kΩ minimum |
| 0 to 20 mA DC | 750 Ω maximum | 0 to 10 V DC | 10 kΩ minimum |
| 0 to 16 mA DC | 900 Ω maximum | 0 to 5 V DC | 2 kΩ minimum |
| 0 to 10 mA DC | 1500 Ω maximum | 1 to 5 V DC | 2 kΩ minimum |
| 0 to 1 mA DC | 15 kΩ maximum | -10 to +10 V DC | 10 kΩ minimum |
| **Output-2 Range** | **Allowable Load Resistance** | **Output-2 Range** | **Allowable Load Resistance** |
| 4 to 20 mA DC | 350 Ω maximum | 1 to 5 V DC | 2 kΩ minimum |

Note: When using HART communication, observe the allowable load resistance range specified in the HART communication specifications.

Output resistance: Current output; 500 kΩ or more
Voltage output other than below: 1 Ω or less
0 to 10 mV DC, 0 to 100 mV DC
Zero adjustment: −5 to +5%
Span adjustment: 95 to 105%

## ■ HART Communication Specifications

Frequency band: 500 Hz to 10 kHz (-6dB range)
500 Hz to 5 kHz (-3dB range)
Allowable load resistance: 230 to 600 Ω
Communication direction: Bi-directional *
* In a multi-drop connection, the transmitter power supply on the VJA1/H cannot be used.
Maximum number of connectable HART communication devices: 5 *
* HART communication can only be used between the input and Output-1.



GS 77J01A01-01E

8th Edition Apr. 2019 (YK)

**Trademarks:**
HART is a registered trademark of the HART Communication Foundation.

## ■ Standard Performance

Accuracy rating: ±0.1% of span; 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 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: ±0.15 % of span for change of 10 °C

## ■ Safety and EMC Standards

CSA: CSA 22.2 No. 61010-1, installation category II *1, pollution degree 2 *2, and CSA C22.2 No. 61010-2-030
UL: UL61010-1, UL 61010-2-030 (CSA NRTL/C)
CE:
EMC directive
EN 61326-1 compliance, Class A Table 2 *3
EN 61326-2-3 compliance
EN 61000-3-2 compliance
EN 61000-3-3 compliance
EN 55011 Class A Group 1
Low voltage directive:
EN 61010-1, EN 61010-2-030
Installation category II *1
Pollution degree 2 *2
Measurement category O (other)
EMC Regulatory Arrangement in Australia and New Zealand (RCM): EN 55011 Class A, Group 1
KC marking: Electromagnetic wave interference prevention standard, electromagnetic wave protection standard compliance

*1 Installation category (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.

*2 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.

*3 The instrument continues to operate at a measurement accuracy of within ±20% of the range during testing.

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

## ■ Environment Standard

RoHS Directive: EN 50581
(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

Supply rated voltage range: 100-240 V AC/DC ≂ 50/60 Hz or 15-30 V DC ⎓
Supply input voltage range: 100-240 V AC/DC ≂ (−15, +10%) 50/60 Hz or 15-30 V DC ⎓ (±20%)
Power consumption: 3.2 W at 24 V DC ; 3.1 W at 110 V DC; 6.1 VA at 100 V AC; 8.3 VA at 200 V AC
Insulation resistance: 100 MΩ 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 °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 $m/s^2$ or less, 1 oct/min for 90 minutes each in the 3-axis directions.
Impact: 98 $m/s^2$ or less, 11 msec, 3-axis 3 times each in 6 directions.
Altitude: 2000 m or less.
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 Appearance

Construction: Compact plug-in type
Material: Modified polyphenylene oxide (casing)
Mounting method: Wall, DIN rail or dedicated VJ mounting base (VJCE) mounting
* If you install the VJA1/H into a VJCE-011, you cannot directly connect the VJCE-011 to a YOKOGAWA DCS with a KS2 cable (CN1). Connect them through a terminal block (such as the TE16).
Connection method: M3 screw terminals
External dimensions:
76 (H) × 29.5 (W) × 124.5 (D) mm (including a socket)
Weight: Main unit: 100 g or less
Socket: 50 g or less

## ■ Accessories

Tag number label: One

## ■ Customized Signal Specifications

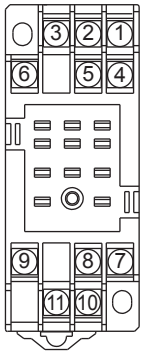
● **Output custom specification**

**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

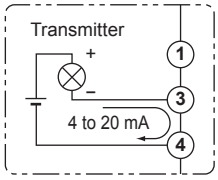



| | | |
|---|---|---|
| 1 | Input | (PS+) |
| 2 | Output-2 | (+) |
| 3 | Input | (−) |
| 4 | Input | (COM) |
| 5 | Output-2 | (−) |
| 6 | Do not use | |
| 7 | Output-1 | (+) |
| 8 | GND | |
| 9 | Output-1 | (−) |
| 10 | Supply | (L+) |
| 11 | Supply | (N−) |

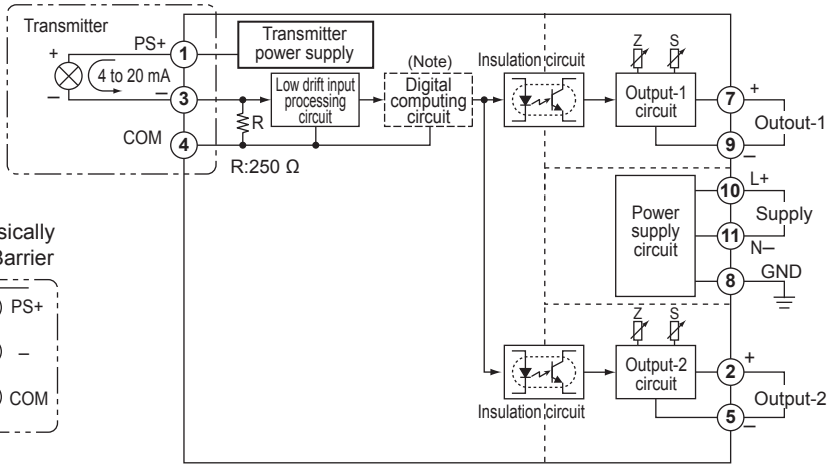
Do not use output-2 for the single-output type.

## ■ Block Diagrams

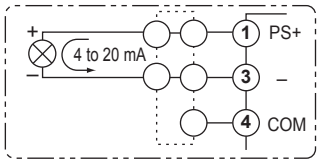
Combination with two-wire transmitter using external power supply




Combination with two-wire transmitter using internal power supply



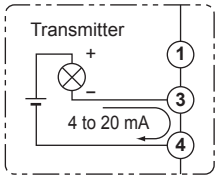

Example to construct Intrinsically Safe System using Zener Barrier



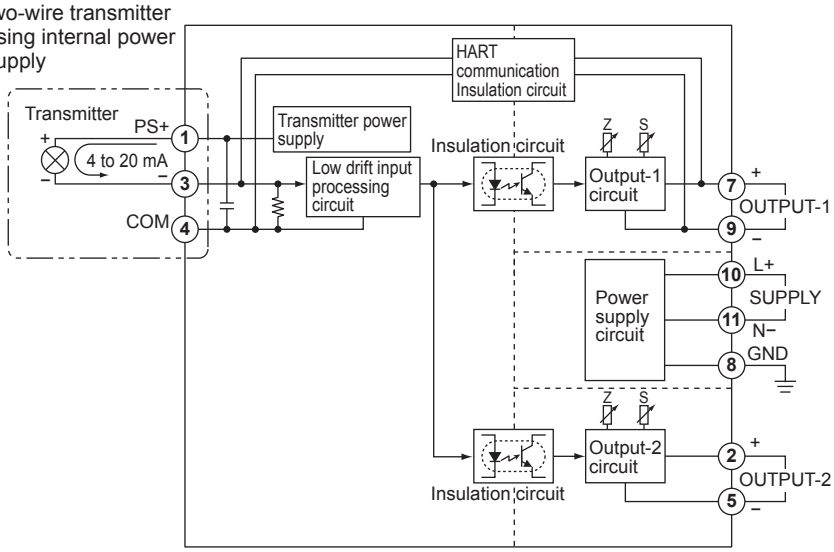

Note: Digital computing circuit is added for the input/output suffix codes other than "A" and "6".

### When option code /H

Combination with two-wire transmitter using external power supply




Combination with two-wire transmitter using internal power supply



## ■ External Dimensions