Single phase true RMS AC voltage transducer

CE-VJ03A-**MS*-0.5

1. Overview

This device is a kind of single phase true RMS measurement AC voltage isolation transducer, adopts the principle of electromagnetic isolation, sample the single phase AC voltage, after the true RMS conversion, can measure the RMS of single phase AC voltage non-sinusoidal alternating signal, isolated and linear output standard voltage or current signal, this product is widely used in the real-time detection/monitoring of waveform distortion non-standard sine wave scene signals, telecommunication, electricity, railways, field of industrial control.

Features:

- Small size, convenient to use;
- High precision, low temperature drift;
- High reliability;
- Can be customized according to customer specific requirements.

2. Case Style

Figure 1, MS3 style

Figure 2, MS2 style

3. Part Number

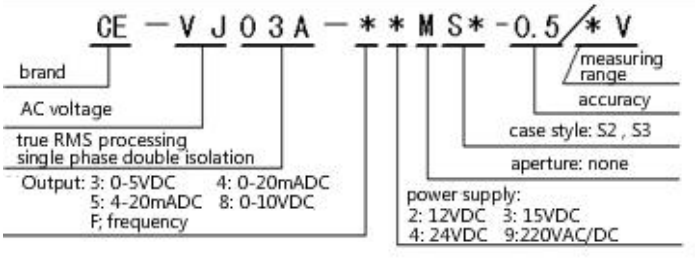

Figure 3, product model selection table

4. Specifications

* Test conditions: auxiliary power supply: +12V
  room temperature: 25℃.
* Input range: 0~1~500V;
* Output: 0-5V, 0-10V、0-20mA, 4-20mA, 0-5kHz etc.;
* Auxiliary power supply: +12VDC,+15VDC,+24VDC,
  85-265VAC/DC;
* Accuracy: class 0.5;
* Load capacity: ≥2KΩ (voltage output)
  ≤250Ω (current output);
* Temperature drift: 300ppm/℃;
* Isolation voltage: 2500 V DC;
* Response time: ≤400 mS;
* Rated power consumption: voltage <0.5W, current<1W;
* Frequency range: 45Hz-400Hz; (1% deviation for 1KHz)
* Surge impact immunity:
  Power port three–level ±2KV (L-N/2Ω/ integrated wave)
  Analog I/O port three-level ±2KV (L-N/40Ω/integrated wave);
* Impulse immunity: Input / power port ±2KV
  Analog I /O port±1KV

*Input overload capacity: 20 times of the measured current nominal value（exert one second, repeat five times, interval 300S;

* Operating condition: Temperature: -10~60℃;

Humidity: ≤95% (No dew)

* Storage condition: -40~+70℃;

5. Connections diagram

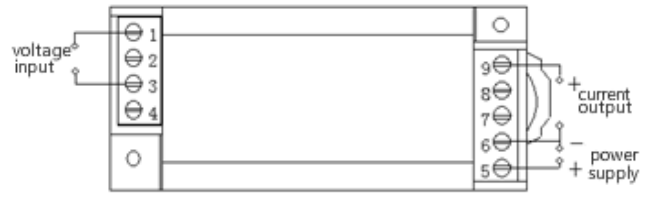

Figure 4, CE-VJ03A-4*MS*/ VJ03A-5*MS* connection diagram with current output

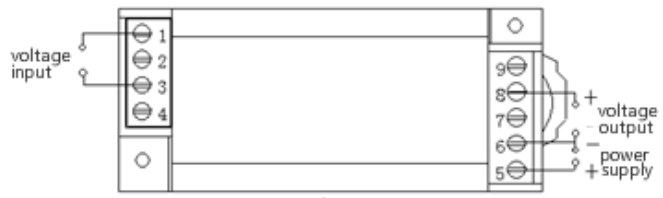

Figure 5, CE-VJ03A-3*MS*/ VJ03A-8*MS* connection

diagram with voltage output

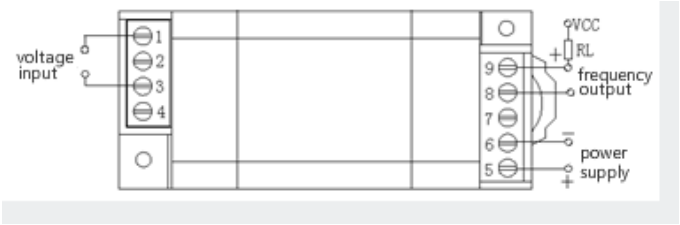

Figure 6, CE-VJ03A-F*MS* connection diagram with frequency output (24Vpull up voltage RL suggests 5K; 12Vpull up voltage RL suggests 3K)

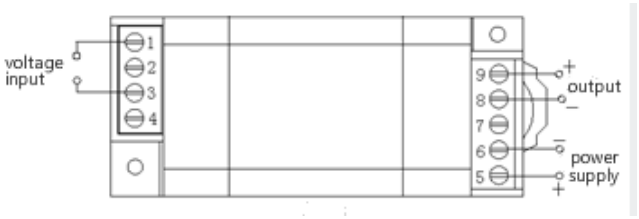

Figure 7, CE-VJ03A-*9MS* connection diagram of AC power supply product

6. Mounting Diagram

DIN35rail mounting size: card slot width 35.5mm;

Screw mounting size: 73 mm×26.8mm;

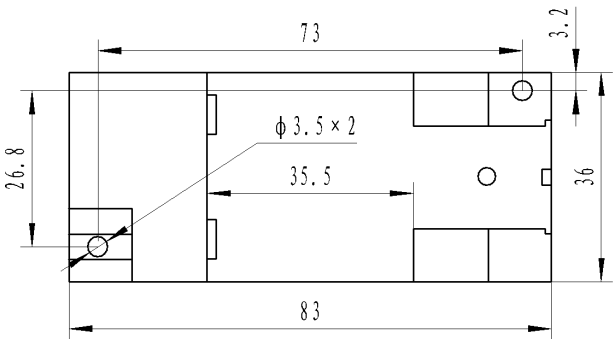

Figure 8, MS3 style installation dimension

7 Product's Service

7.1 DIN rail installation method:

① The transducer fixed on the side of the card slot and hook on the mounting rail;

② Pull the spring pin down（as show in the bottom of figure1 the red spring pin）;

③ Clip the transducer mount on the mounting rail;

④ Release the spring pin and clip the transmitter on the mounting rail.

7.2 Screw mounting method:

①M3 screw hole in the fixed plate according to the screw hole position shown in Figure 8;

②Use the M3 screw to insert into hole and fix it.

7.3 The maximum wire diameter of the terminal block is 2mm (16-26AWG). Remove the 4mm ~ 5mm insulation layer from the end of the mounting wire and insert it into the terminal block. Then tighten the screw.

7.4 Product supply power requires the isolation voltage ≥ 2000VAC, AC ripple <10mV. Multiple transducers can share a common set of power supply, but the power circuit can no longer be used to drive relays and other can produce spikes in the load, in order to avoid interference signal transmission to the transducer.

7.5 The transducers current output is 0-20mA (or 4-20mA), load resistance R_L≤250Ω, and 0-5V voltage output load resistance R_L ≥2KΩ, can guarantee the output accuracy and linearity over the entire rated input range.

8. Example of product accuracy level verification

8.1 According to the transducer terminal definition to connect the circuit as shown:

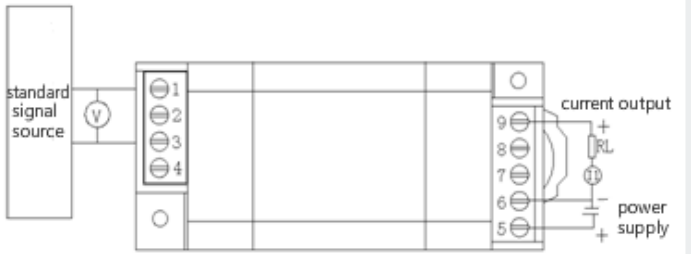

Figure 9, accuracy test wiring diagram of current output

Note: voltage output load resistance parallel in pin8 to output

8.2 The test shall be carried out under the following environmental conditions:

◆Power supply: nominal ± 5%, ripple ≤ 10mV;

◆Ambient temperature: 25 ℃ ± 5 ℃;

◆Relative humidity: RH (45 ~ 80)%;

◆The accuracy of the signal source and measuring instrument is 0.05 class above.

8.3 Power preheat 2min;

8.4 Voltage V input and monitoring methods:

①A high-precision voltage meter directly output voltage V, and record the display data of the meter calibration instrument.

②No high-precision voltage instrument calibrator, but there is a ordinary high-precision instrument calibrator. Use high-precision multimeter to monitor the output voltage V of the ordinary instrument calibrator.

8.5 Suppose transducer's input is 0-300VAC,output is 0-5VDC,any given input value V within the range of the transducer, then the expected theoretical output value of the transducer (Vz) is calculated in the following formula:

$$Vz = V \div 300 \times 5V$$

If output is 0-10V, then Vd = V÷300×10V;

If output is 4-20mA, then Iy = 4+ V÷300×16mA;

If output is 0-20mA, then Iz = V÷300×20mA;

8.6 Measure the DC voltage output value Vo or current output value Io with a monitoring table, and calculate the deviation between them and standard value according to below corresponding formula:

$|Vo-Vz| \leq 25mV$ is normal, otherwise exceeding (0-5V output, class 0.5);

$|Vo-Vd| \leq 50mV$ is normal, otherwise exceeding (0-10V output, class 0.5);

$|Io-Iy| \leq 80uA$ is normal, otherwise exceeding (4-20mA output, class 0.5);

$|Io-Iz| \leq 100uA$ is normal, otherwise exceeding (0-20mA output, class 0.5);

8.7 Repeat operations 8.5 and 8.6, average deviation of all the get points are within the given precision limitation, then the accuracy of the transducer is qualified.

Note: please consult with our company for the verification method of other technical indicators.

9. Notes

9.1 Please pay attention to the power supply information on the product label, and the power supply grade used by the transducer, otherwise it will cause damage to the product.

9.2 Integrated structure of the transducer, non-removable, and should avoid collision and fall.

9.3 The transducers are used in environments with strong electromagnetic interference. Please pay attention to the shielding of the input and /or output lines. If a group of transducers are mounted together, keep a space more than 10mm between adjacent units.

9.4 The input value showed on the transducer label refers to the RMS value of the AC signal.

9.5 Can only use the effective terminal of the transducer. The other terminals may be connected with the internal circuit of the transducer, and can't be used for other purposes.

9.6 Transducer has a certain anti-lightning ability, but when the transducer input and output feeders exposed to extreme bad environments, must be taken lightning protection measures.

9.7 Don't damage or modify the product label and logo. Don't disassemble or modify the transmitter, otherwise the company will no longer provide the product "three guarantees" (replacement, returns, repair) services.

9.8 The transducers use flame-retardant ABS plastic shell package. which limit temperature tolerance is +75 ℃. The shell will be deformed with high-temperature baking, and will affect product performance. Do not use or store the product near the heat source. Do not bake the product in a high-temperature oven.

9.9 When measuring the voltage or current with the multi meter pen, please screw the terminal screw in the end, otherwise it may not measure the voltage or current output value. The terminal block wiring wire diameter ≤ 1.4mm, otherwise it may cause terminal screw slipped.