

## True RMS three-phase three-wire AC voltage transducer

### Instructions

#### CE - VJ31A - \*\*MSK- 0.5

#### 1 Overview

This device is a 3-phase AC voltage isolation transducer. It is applied the principle of electromagnetic isolation, and true RMS measurement. After True-RMS (True-RMS) conversion, it can measure three-phase AC voltage non-sinusoidal alternating signal RMS, isolate and linearly output standard voltage or current signal. The product is widely used in non-standard waveform distortion sine wave real-time signal detection and monitoring.

#### Features:

- Ø Each phase voltage is true RMS measurement;
- Ø High precision, low temperature drift;
- Ø Can rail and screw installation, easy on-site installation;
- Ø High reliability, can be more than 2KV surge.

#### 2 Case Style

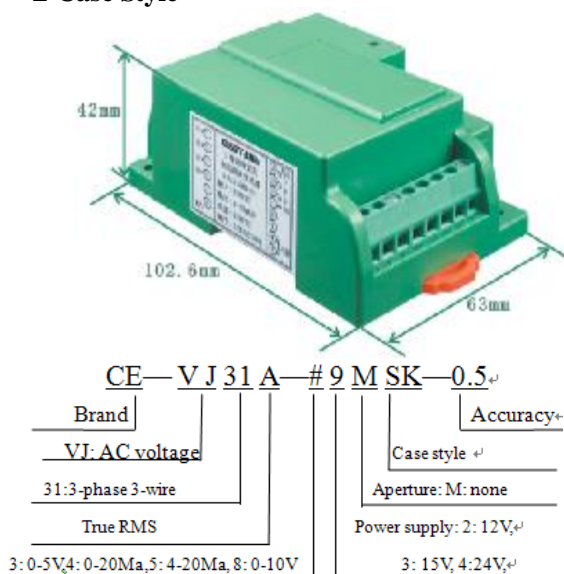


Figure 1, MSK outline

#### 3 Part Number

#### 4 Specifications

Test conditions: auxiliary power: 220VAC, room temperature: 25°C;

Input Range: 0~600VAC;

Output: 0~5VDC, 0~10VDC, 0~20mADC, 4~20mADC;

Power supply: 12VDC, 15VDC, 24VDC;

Accuracy: 0.5;

Load capacity:  $\geq 2K\Omega$  (voltage output),  $\leq 250\Omega$  (current output);

Temperature drift:  $\leq 350\text{ppm}/^\circ\text{C}$ ;

Isolation voltage:  $\geq 2500\text{ VDC}$ ;

Response time:  $\leq 350\text{ ms}$ ;

Rated power consumption: 1W (voltage output); 2W (current output);

Output ripple:  $\leq 10\text{mV}$ ;

Frequency range: 45~65Hz (up to 5K, please specify when ordering);

Surge immunity:

Surge impact immunity:

Power port three  $\pm 2\text{KV}$  (L-N/ $2\Omega$  / integrated wave)

Analog I / O port three  $\pm 2\text{KV}$  (L-N /  $40\Omega$  / integrated wave);

Impulse immunity: input / power port  $\pm 2\text{KV}$ , analog I / O port  $\pm 1\text{KV}$ ;

Input overload capacity: Voltage: 2 times the nominal value;

Operating temperature:  $-10 \sim 60^\circ\text{C}$ ; humidity:  $\leq 95\%$  (no dew);

Storage temperature:  $-55 \sim +65^\circ\text{C}$ ; humidity:  $\leq 95\%$  (no dew).

#### 5 Connections Diagram

(For reference only, the actual application to the product wiring diagram shall prevail)

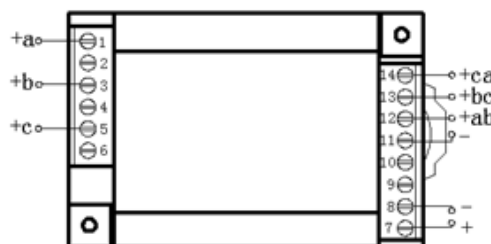


Figure 2, Product wiring diagram of CE-VJ31-MSK/CE-VJ31-8\*MSK voltage output and CE-VJ31-4\*MSK/CE-VJ31-5\*MSK current output.

#### 6 Installations

DIN35 rail mounting or screw mounting, the installation size as shown in Figure 3 (in mm).

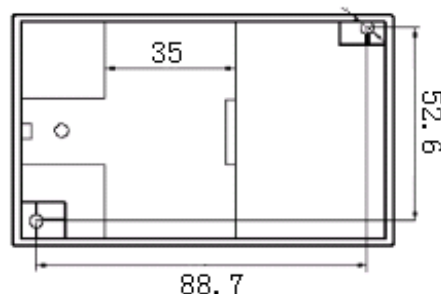


Figure 3, SK outline installation dimensions

#### 7 Product's Service

##### 1 Installation

##### 1.1 DIN rail installation method:

- ① Fix the transducer on the side of the card slot and hook on the

mounting rail;

②Pull the spring pin down;

③Clip the transducer mount on the mounting rail;

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

1.2 Screw mounting method:

①3mm diameter hole in the fixed plate according to the screw hole position shown in Fig. 3;

②Use the screw  $\Phi 3$  to insert into hole and secure it.

2 Products factory has been accurately set according to the "product standard". Apply power after determine the correct wiring.

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.

4 Product supply power requires the isolation voltage  $\geq 2000\text{VAC}$ , AC ripple  $<10\text{mV}$ . Multiple transducers can share a common set of power supplies, 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.

5 The transducers output 0-20mA (or 4-20mA), the RL standard is  $\leq 250\Omega$ , and 0-5V voltage output RL standard is  $\geq 2\text{K}\Omega$ , can guarantee the output accuracy and linearity over the entire rated input range.

## 8 Example of product accuracy level verification

1 According to the definition of the transducer terminal, connect the test circuit as shown.

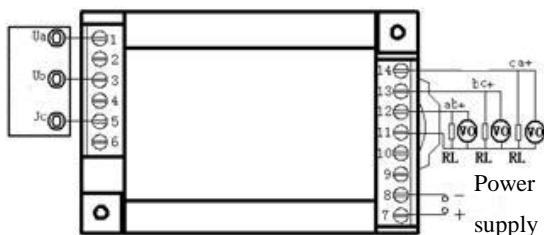


Figure 4, accuracy test wiring diagram of voltage output

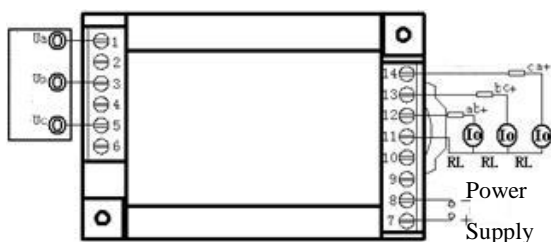


Figure 5, accuracy test wiring diagram of current

**Note:** The voltage output measured with the  $V_o$  table, the current

output measured with the  $I_o$  table;

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

Ø Power supply: nominal  $\pm 5\%$ , ripple  $\leq 10\text{mV}$

Ø Ambient temperature:  $25^\circ\text{C} \pm 5^\circ\text{C}$ ;

Ø Relative humidity: RH (45 ~ 80)%;

Ø The accuracy is 0.05 above of the signal source and measurement instrument.

3 Power preheat 2min;

4 Voltage V input and monitoring methods:

①A high-precision high-voltage meter calibrator can directly input voltage V, and record the meter calibration instrument display data.

②If there is no high-precision voltage meter calibrator, but there is a common meter calibrator, use high-precision multi meter to monitor the output voltage V of the common meter.

5 Assuming the transmitter input is 0-300VAC, the output is 0-5VDC, given any input value V in the transducer range, the theoretical output value ( $V_z$ ) of the transducer is calculated as follows:

$$V_z = V \div 300 \times 5\text{V}$$

If the output is 0-10V, then  $V_d = V \div 300 \times 10\text{V}$ ;

If the output is 4-20mA, then  $I_y = 4 + V \div 300 \times 16\text{mA}$ ;

If the output is 0-20Ma, then  $I_z = V \div 300 \times 20\text{mA}$ .

6 The monitoring table measures the DC voltage output value  $V_o$  or the current output value  $I_o$  and calculates the error between it and the standard value according to the following correspondence formula:

$|V_o - V_z| \leq 25\text{mV}$  is normal, or excessive (0-5V output, 0.5);

$|V_o - V_d| \leq 50\text{mV}$  is normal, or excessive (0-10 output, 0.5);

$|I_o - I_y| \leq 80\mu\text{A}$  is normal, or excessive (4-20mA output, 0.5);

$|I_o - I_z| \leq 100\mu\text{A}$  is normal, or excessive (0-20mA output, 0.5).

7 Repeat 5 and 6 two operations, the resulting error value of each point in each phase is within the specified accuracy range, the transducer accuracy level is qualified

**Note:** and other technical indicators of the verification method detailed consultation with our company.

## 9 Notes

1 Please pay attention to the wiring on product label and the output contact capacity.

2 Transducer for the integrated structure, not removable, and should avoid collision and fall.

3 The transducers are used in environments with strong electromagnetic interference. Standard precaution such as shielding the input and /or output lines should be observed. All lines should be as short as possible. If a group of transducers are mounted together, keep a space more than 10mm between adjacent units.

4 The input value given on the transducer label refers to the rms value of the ac signal.

5 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.

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.

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

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

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.