

## Single-phase power factor transducer CE-C02-\*\*\*S3-0.5

## Three-phase power factor transducer CE-C03-\*\*\*S3-0.5

### Instructions

#### 1 Overview

This device is an electrical isolation transducer of single-phase or three-phase power factor measurement. Its input signal is completely isolated from the output signal. Through the internal switch can be switched to single-phase or three-phase power factor measurement, also can be switched to single-phase power measurement, when single-phase measurement of the input signal is without sub-direction. The product can be widely used in electric power, communications, railway, industrial control and other fields.

#### Features:

- Ø True RMS measurement, the accuracy is better than 0.5;
- Ø The product has a active and three-phase power factor measurement function;
- Ø Unipolarity measurement without sub-direction, can automatically identify the phase;
- Ø Output 0-5V, 1-5V, 0-20mA and 4-20mA are free to choose;
- Ø Can be freely set inductive, capacitive polarity measurement;
- Ø Wide power supply, compatible with 12V/24V power supply;
- Ø Built-in function switch can be set freely

#### 2 Case Style

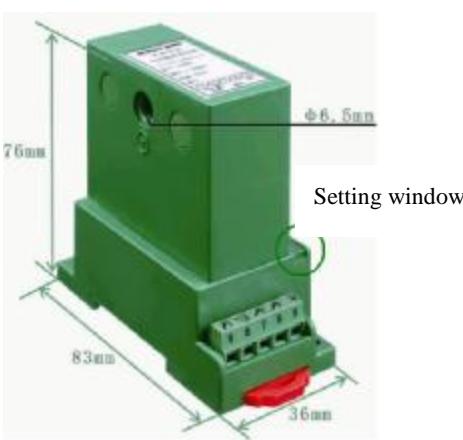
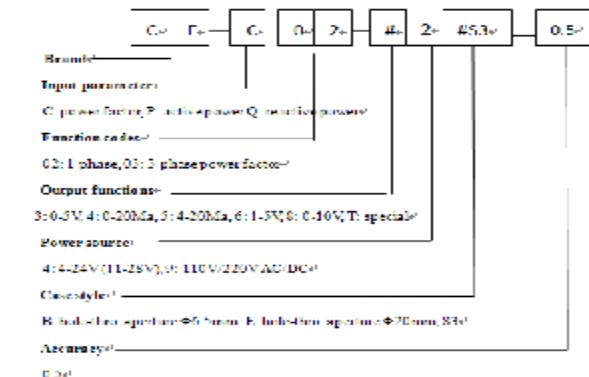


Figure 1, appearance of the product

Rail installation size: 35mm;

Screw mounting size: 73X26.8mm;

#### 3 Part Number



Note: C03 for single-phase products are to measure three-phase power factor;

#### 4 Specifications

Power supply: DC +11V~+28V (power consumption<60mA), AC/DC 220V;

Input range: voltage AC: 0~500V; current AC: 0~30A;

Power factor 0~1 (no polarity); 0.01L~1~0.01C (bipolarity); 0.5L~1~0.5C (bipolarity);

Output: 0-5V/1-5V/0-20mA/4-20mA or

2.5±2.5V/3±2V/10±10mA/12±8mA;

Output ripple: <10mV;

Working temperature: -10 ~ 60 °C;

Accuracy class: 0.5 (with reference error);

Temperature drift: <200ppm /°C;

Isolation voltage: DC 2500V;

Load capacity: voltage output ≥ 1kΩ, current output ≤ 300Ω;

Response time: ≤ 250 mS;

Input overload capacity:

Continuous overload: 120%; short-term overload,

2 times the rated voltage input value, the application of 1 second;

20 times the rated current input, the application of 1S.

Rated power consumption: <1.5W;

Frequency response range: 45Hz-400Hz;

Surge immunity:

Power port four 4KV (L-N / 2Ω / integrated wave),

Output port two 2KV (L-N / 40Ω / integrated wave);

Burst immunity: None;

Storage conditions: -40 ~ +70 °C.

#### 5 Connections Diagram

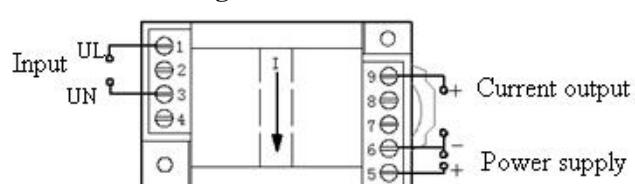


Figure 2, wiring diagram of dc power supply of C02/C03 products

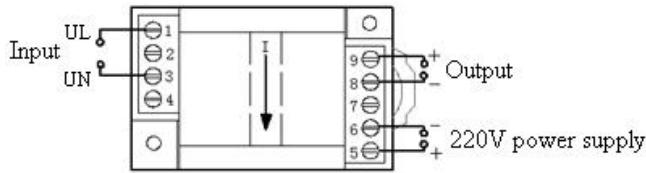


Figure 2, wiring diagram of dc power supply 110V/220V of C02/C03 products

Note: for the input of C03 products, terminal NO.1 is connected to the voltage of phase B, terminal NO. 3 is connected to the voltage of phase C, and the input current is connected to phase A.

## 6 Input/output graphs

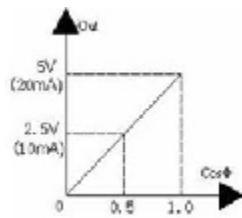


Fig.4, no polarity

0-5V (0-20mA) output

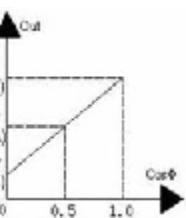


Fig.5 no polarity

1-5V (4-20mA) output

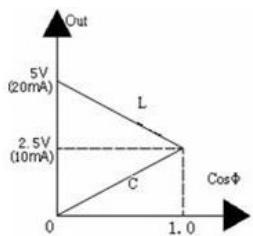


Fig.6, bipolarity

2.5±2.5V(10±10mA) output

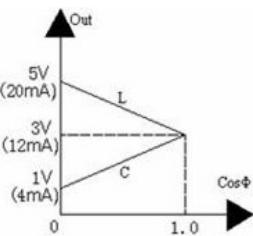
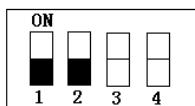


Fig.7, bipolarity

3±2V(12±8mA) output

## 7 Function Settings

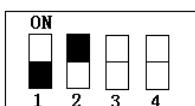
As shown in Figure 1 to open the product shell on the settings window, there is a four-digit DIP switch, bit 1 and 2 set the output of transmitter function, bit 3 sets the output zero to 0V (0mA) or 1V (4mA), bit 4 sets for polarity and polarity measurement to distinguish inductive capacitive. Switch status function specific settings are as follows:



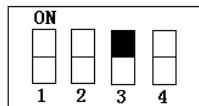
Power factor output (default)



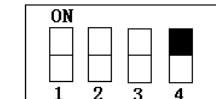
Active power output



Reactive power factor



The zero is set as 1V or 4mA, when the zero is off, it is 0 output.



Capacitive measurement, when

unplug, it is nonpolar nature

## 8 Installations

DIN35 rail-mounted or screw-mounted installation, the installation size is as shown below.

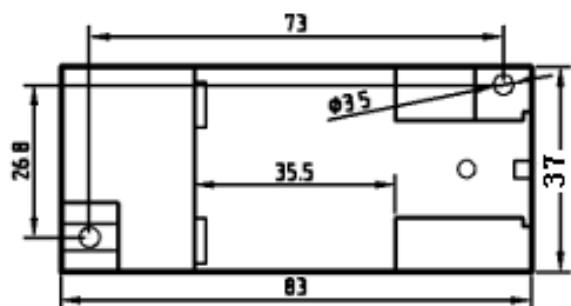


Figure 13 Mounting dimensions

## 9 Product's Service

### 1 Installation

#### 1.1 DIN rail installation method:

- ①The transducer fixed 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:

- ①4mm diameter hole in the fixed plate according to the position of the screw hole shown in Fig. 13;
- ② Use the screw Φ3.5 to insert into hole and secure it.

2 Product 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  $\geq 1K\Omega$ , can guarantee the output accuracy and linearity over the entire rated input range.

## 10 Example of product accuracy level verification

1 According to the definition of the transducer terminals to connect the test circuit.

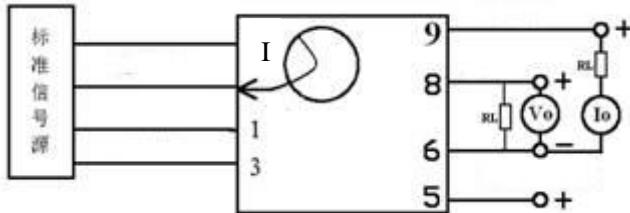


Figure 14, test wiring diagram of accuracy of voltage or current output

**Note:** The voltage output is measured with a voltmeter and the current output is measured with an Io meter.

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

- ◆ Power supply: nominal  $\pm 5\%$ , ripple  $\leq 10mV$ ;
- ◆ Ambient temperature:  $25^{\circ}C \pm 5^{\circ}C$ ;
- ◆ Relative humidity: RH (45 ~ 80)%;
- ◆ The accuracy of the signal source and measurement instrument is 0.05% above.

3 Power preheat 2min;

4 Using high-precision power signal source to input the value of voltage and current and the corresponding phase, and record the display data of calibrator, in order to ensure the veracity of the accuracy, please enter voltage and current signals more than 20% of the product rang. The current can be input using the ampere-turn method.

5 Example for conversion relationship of output and measured value: ( $V_o$  is voltage output,  $C$  is power factor)

If the output is 0-5V, then  $C = V_o \div 5V$ ;

If the output is 4-20mA, then  $C = (I_o - 4 mA) \div 16mA$ ;

If the output is 0-2.5V-5V more than 2.5V, a advance power factor and inductive load,  $C = (5V - V_o) \div 2.5V$ . When output is less than 2.5V, a lagging power factor and capacitive load,  $C = V_o \div 2.5V$ ;

If the output is 0-4mA-20mA, when output 12mA, a advance power factor and inductive load,  $C = (20 mA - I_o) \div 8 mA$ ; when output less than 12 mA, a lagging power factor and capacitive load,  $C = (I_o - 4 mA) \div 8 mA$ .

6 The monitoring meter measures the DC voltage output value  $V_o$  or the current output value  $I_o$ .

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

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

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

7 Repeat the NO.4 and NO.5 operations, the resulting point value  $|V_o - V_z| \leq 25mV$  or  $|I_o - I_z| \leq 80\mu A$  (100 $\mu A$ ), the accuracy level of transducer is qualified.

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

## 11 Notes

1 Please pay attention to the power supply information on the product label, and the power supply used grade of the transducer, otherwise it will cause the product to be damaged.

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 transmitter, otherwise the company will no longer provide the product "three guarantees" (replacement, return, repair) services.

8 The transducers use flame-retardant ABS plastic shell package. which limit temperature is  $+75^{\circ}C$ . 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.