

Power frequency transducer

Instructions

CE-F03-*4MS*-0.5

1 Overview

This device is a isolation transducer of power frequency signal detection. Using the optocoupler isolation and convert the input frequency signal into a linear output of 0 ~ 5V, 0 ~ 20mA, 4 ~ 20mA and other standard signals. This product uses two isolation methods that the input and output are isolated from the power supply. A variety range of input and output can be option, and built-in function switch free to choose. The product is simple to install, can be widely used in communications, electricity, railways, industrial control and other fields.

Features

- Ø There are 7 ranges to freely choose in the frequency range of 40Hz-75Hz.
- Ø Wide DC power supply: +11V ~ +28V;
- Ø With free selection function of 0-5V or 1-5V, 0-20mA or 4-20mA; can be freely set the zero output;
- Ø Using digital technology, high stability, accuracy up to 0.2%;

2 Case Style



Figure 1: product appearance of MS1 case with +11~+28V power supply

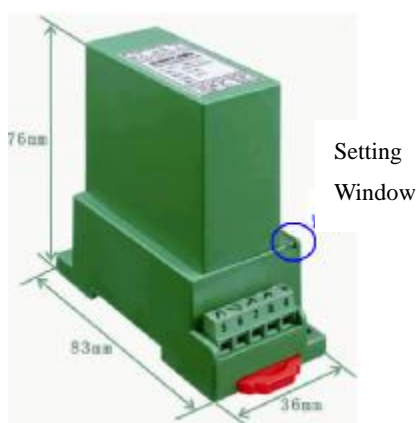


Figure 2: product appearance of MS3 case with +220V power supply

3 Part Number

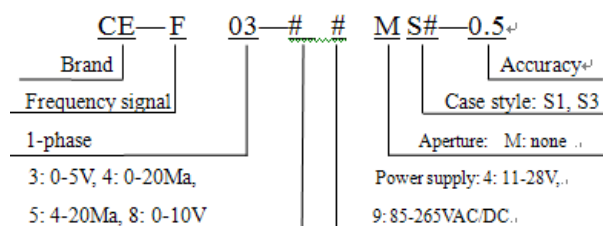


Figure 3, Product Selection Guide

4 Specifications

Power supply: DC +11V ~ +28V, AC/DC 85V ~ 265V;

Rated power consumption: <1.7W;

Input range: frequency: 40Hz ~ 75Hz

Amplitude: 0-500V (amplitude change of 10%-120%);

Note: The products are with seven ranges of 40-60 / 40-70 / 45-55 / 45-65 / 45-75 / 50-70 / 55-65Hz that can be freely selectable;

Output: 0-5V, 0-20mA, 1-5V, 4-20mA and 0-10V;

The zero point of voltage or current output can be set freely;

Accuracy class: 0.5;

Load capacity: voltage output $\geq 500\Omega$,

Current output $\leq 300\Omega$ (24V power supply can reach 800 Ω);

Temperature drift: <250ppm/°C;

Isolation voltage: DC 2500V;

Response time: ≤ 100 ms;

Rated power consumption: <1.7W

Output ripple: <10mV;

Frequency range: 40Hz ~ 75Hz

Surge immunity:

Input / Power Ports Four 4KV (L-N / 2 Ω / complex);

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

Impulse immunity: input / power port ± 2 KV, analog I/O port ± 1 KV;

Input overload capacity: continuous overload: 120%; short-term overload: 2 times the rated voltage input value for 1 second;

Operating temperature: -30°C ~ +70°C;

Storage conditions: -40°C ~ +70°C.

5 Connections Diagram

Figure 4, wiring diagram of +11V ~ +28V power supply

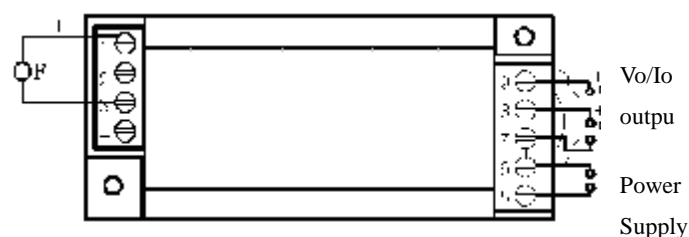


Figure 4

Figure 5, wiring diagram of 220V power supply

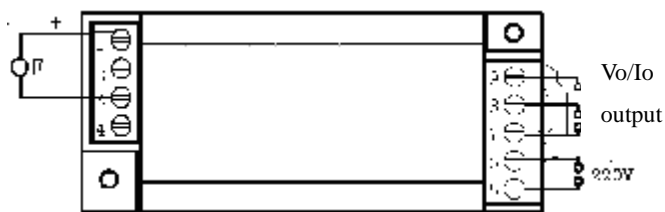


Figure 5

6 Installations

Rail mounting dimensions: 35mm; screws installation size: 73X26.8mm; as shown in Figure 6 (in mm). °

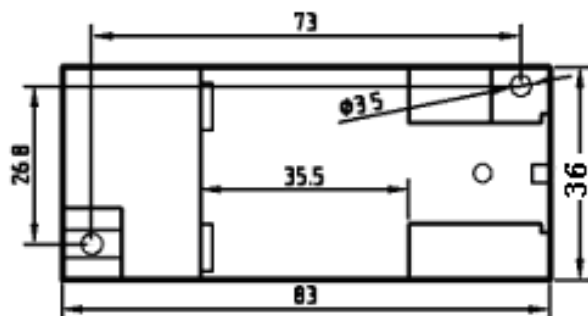


Figure 6: Mounting dimensions

7 Function Settings

As shown in Figure 1 (Figure 2) to open the product shell on the settings window, there is a four-digit DIP switch, bit 4 sets the output zero to 0V (0mA) or 1V (4mA) as shown in Figure 7.

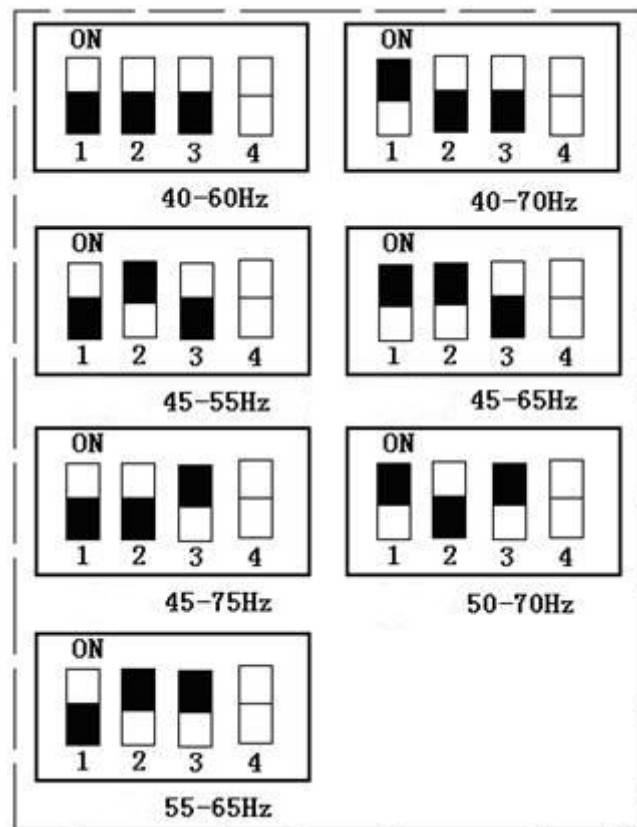


Figure 7, input range setting

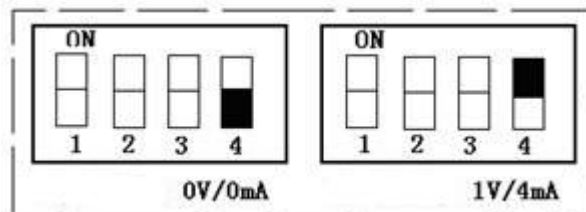


Figure 8 Output zero setting

8 Example of product accuracy level verification

1 According to the definition of the transducer terminals to connect the test circuit as shown in figure 9.

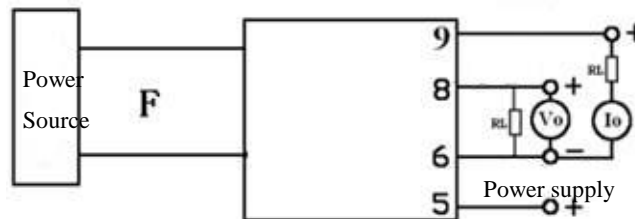


Figure 9 accuracy test wiring diagram voltage / current output

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

3 Power preheat 2min;

4 Assuming the transmitter input frequency range is 40-60Hz, the output is 0-5VDC, given any input value F in the transducer range, the theoretical output value (Vz) of the transducer is calculated as follows:

$$V_z = (F - 40) \div (60 - 40) \times 5V$$

If the output is 4-20mA, then $I_z = 4 + (F - 40) \div (60 - 40) \times 16\text{mA}$;

If the output is 0-20mA, then $I_z = (F - 40) \div (60 - 40) \times 20\text{mA}$;

Note: 40Hz is for zero input.

5 The monitoring meter measures the DC voltage output value Vo or the current output value Io.

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

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

| Io - Iz | $\leq 100\mu\text{A}$ is normal, or excessive (0-20mA output, 0.5);

6 Repeat the NO.4 operation, the resulting point value is | Vo - Vz | $\leq 25\text{mV}$ or | Io - Iz | $\leq 80\mu\text{A}$ (100 μA), the transducer accuracy level is qualified.

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

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. 6;
- ② Use 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 $\geq 1\text{K}\Omega$, can guarantee the output accuracy and linearity over the entire rated input range.

10 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 $+75\text{ }^{\circ}\text{C}$. 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.