

SM39SP Series gear speed sensor

SM39SP Series gear speed sensor is a kind of advanced speed sensor, used for non-contact to detect the speed of gear, with electromagnetic interference resistance strong OC door output plastic square wave signal, through the pull resistance adjustment can be directly connected with TTL, CMOS logic circuit, and speed meter can form speed measurement, control system.

The product adopts the standard round pipe waterproof structure, has the advantages of waterproof, dustproof, oil prevention and other advantages, can work reliably in the harsh environment, suitable for automotive, industrial control and other fields.



1. operational principle:

The SM39SP series gear speed sensor adopts advanced detection technology, which can distinguish each tooth top and tooth valley of the rotary detection surface, and convert it into a periodic square wave of the corresponding rate.

2. technical function:

(I) Basic performance:

1. Rated test distance: 3mm
2. Speed measurement range: 10 r / min (one tooth per turn) ~20,000 r / min (60 teeth per turn)
- 3, output waveform: square wave
4. Duty cycle: 0.5 ± 0.2
- 5, protection function: equipped with power reverse connection protection and output short circuit protection
- 6, working temperature: conventional products $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$, if there are special requirements, please customize, the maximum temperature can reach 150°C

(II) Electrical performance:

model parameter	SM39SP-A	SM39SP-B
Operating Voltage (DCV)	4.5~6	8~26
Static power consumption current (mA)	$\leq 20\text{mA}$	$\leq 28\text{mA}$
Output of leakage current to time (uA)	$\leq 15\text{uA}$ Test condition: Output control voltage =6V	$\leq 20\text{uA}$ Test condition: Output control voltage =24V
Output low-level saturation voltage (V) test condition: Output current is 20 mA	≤ 0.4	≤ 0.1
Rising along time t_r (us)	≤ 1.0	≤ 1.0
Drop line time t_f (us)	≤ 1.0	≤ 1.0
OC door	The maximum control voltage is 6V, and the maximum continuous passing current is 25 mA	High breakdown voltage type, the maximum breakdown voltage is 160V; The maximum continuous passing current of 600 mA;

		Allowed maximum power consumption, 625 mW at 25°C, higher than 25°C, 5 mW / °C
LED work instructions	not have	have

(III) Protective performance:

Waterproof, dustproof and oil-resistant.

(IV) Performance requirements of the tested gear:

- 1, modulus: m 1;
- 2, tooth shape: involute or trapezoidal cylindrical straight teeth;
3. Gear thickness: 3mm;
- 4, gear material: magnetic conductive material

3. direction for use:

(I) Sensor installation

The sensor shall be installed in the correct manner. When fixing, please use two nuts of the sensor on the installation hole. It is not recommended to use non-magnetic conductive materials (copper, aluminum, stainless steel, etc.) and reliable. The sensor should be installed against the teeth, and the distance between the tooth surface and the front end of the sensor should not be greater than the maximum detection distance.

(2) Selection of gear

Because the detection object of the sensor is the gear, so the proper selection of the gear has a great influence on the test.

First, the biggest influence on the detection is the module of the gear. Therefore, it is recommended to choose large modular (m 1) gears if conditions permit. Secondly, the working state of the gear will also have a certain impact. In general, the test gear can be an existing working gear in the machine or a dedicated test gear. The gear can be directly fixed to the shaft under test (shaft drive) or through other gear engagement drive (tooth drive), but the wear of the tooth surface will change the duty cycle of the output waveform. Therefore, in cases of high requirements for the output duty cycle, it is recommended to install a special test gear by shaft drive. In addition, if the rotating shaft has a large radial movement, a small detection distance should be used, and the gear should also be made of high magnetic conductivity material as far as possible.

The actual speed measurement range will vary according to the number of teeth N of the gear, which can be calculated by the following equation:

Lower limit of speed measurement range: $V(\min) = 60 / N$ (rpm), upper limit of speed range: $V(\max) = 1.21,000,000 / N$ (rpm)

(3) Sensor wiring

The product adopts the electromagnetic shielding form of single point grounding, and the sensor shell is connected with the shielding line. The user should connect the screen cover layer to the system at the receiving end. The specific wiring form is shown in Figure (1).

Cable

Indicator

Surface of sensitivity

