Gear Speed Sensor

◆ Summary

The sensor adopts the principle of electromagnetic induction to achieve the velocity measurement, It has a large output signal, No need to zoom, Anti-Interference, No external power supply needed, Can be used in harsh environment like Smoke, Oil and Gas, Water Vapors and so on. It can be replaced with the same kind of foreign products. Our products are mainly supplied with steam turbine, We have already imported 3 0 0 M W, 6 0 0 M W supporting units, It is widely used in national defense chemical industry, Textile and other fields.

◆ Technical Data

1. Output Voltage： The modulus of the gear: 4, Number of Teeth: 60, Material: A3, When distance is 1mm, Rotational Speed 1000 rotations/minute, Output＞5V（Valid Values）；Rotational Speed 2000 rotations/minute Output＞10V（Valid Values）；Rotational Speed 3000 rotations/minute, Output＞15V（Valid Values）.
2. Current Resistance ： Low Resistance ： 200Ω～250Ω High Resistance：500Ω～600Ω.
3. Insulation Resistance ： at 500V DC＞50mΩ.
4. Operating Temperature：-20～120℃.
5. Weight：About 100g (does not include the tail lead wire).

◆ Working Principle

Before using make sure the gear is mounted on the shaft for speed measurement（Straight, Helical or Grooved disk gear all can be used）Mount the sensor on the bracket, Adjust the Clarence between the sensor and the gear tooth to be approx. 1mm. When the gear starts rotating with the shaft, According to the principle of electromagnetic induction, a voltage pulse signal is generated at both ends of the internal coil of the sensor, The Z-voltage pulse signal is generated when the axis is rotated, According to the type. f＝Z

Given that：

N= Measured shaft speed in Rotation/Minute, Z= Number of gear teeth.

When the gear tooth number is 60, the rotation of the axis is converted to a voltage pulse signal with frequency of f, and the signal is sent to the corresponding digital speed.

◆ How to Install

Gear Requirements：

Gear Material：All kinds of magnetic steel materials are usable.

Gear Modulus：More than 2

Number of teeth：60

◆ Precautions

1. The metal shield in the sensor output line should be connected to the earth ground
2. Do not use and place it in temperature above 250 ℃ or in strong magnetic field
3. Avoid strong impact during installation and transportation
4. When the measured shaft moves , should pay attention to the appropriate clearance gap, to avoid damage
5. This sensor is designed to be used in harsh environment， After assembly and debugging, the line is sealed， It cannot be repaired

Gear Speed Sensor

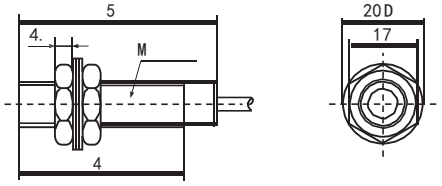
SK - 41900 Series

(Directional Series)

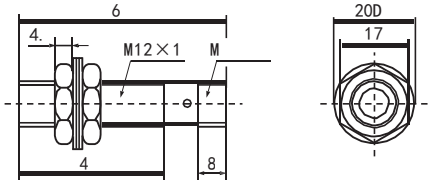


● Dimensions：

Lead Wire Type



Connector Type



● Features：

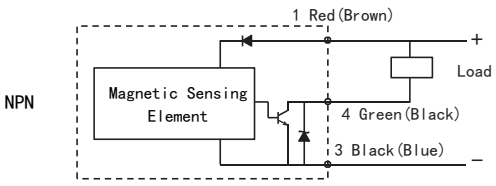
- ◇ It is very sensitive to magnetic metal.
- ◇ It is used for counting, locating and testing on the gears, rack or uneven magnetic metal.
- ◇ Withstand harsh environment, such as oil, water, dust, etc.
- ◇ Excellent resolution and high repeatability.
- ◇ Frequency response，In-between 0 H z ~3 3 K H z can be used.
- ◇ Anti-electromagnetic interference is large.
- ◇ Suitable for MURATA 33H, NO741, 777, 778...Winding head friction roller, spindle, traverse shaft speed probe, (PG1, PG2, PG3 Model No. PA1015A) ; TEIJIN winding head, spindle and the traverse speed probe, (PU2, PU3 and PU4 Model No. EM- 014), high-speed drawing frame and so on.

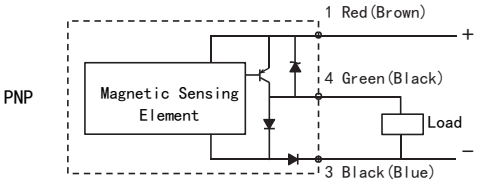
● Model's and Parameters：

Model No. / Parameter	SK-41900/N	SK-41911/P	SK-41914/N/C	SK-41915/P/C
Shape	 Lead wire		 Connector	
Sensing Distance	1.2 mm			
Output Type	NPN	PNP	NPN	PNP
Output Voltage	Low：≤0.3V High：≥90%inV			
Output Current	50 mA			
Operating Voltage	12-30 VDC			
Accuracy	±1 Pulse			
Current Consumption	≤15 mA			
Response Frequency	0Hz~500Hz			
Modulus	Tooth Spacing：≥3.1 mm			
Ambient Temperature T	-25℃~70℃			

Gear Speed Sensor

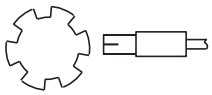
● Output Connection Diagram:

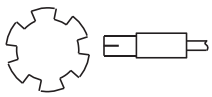




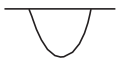
● Application Guideline:

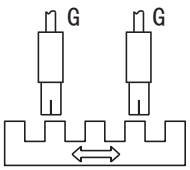
Line Positioning	Inner Curve	Direction	Phase Difference of 90°
Tooth	Positive Phase	G G	G G 90
Groove	Negative Phase		

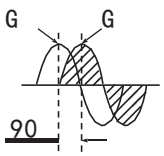












When you need to identify the gear rotating direction, according to the above arrangement, the sensor of G1, G2, the scale line from the center line of the addendum offset + 45 ° and 45 °, the G1, G2 output signal phase difference of 90 °, can identify the direction of rotation.

NPN Output Waveform			PNP Output Waveform		
Output Waveform	High Low		Output Waveform	High Low	
Light	Bright OFF		Light	Bright OFF	
Output Waveform	Low		Output Waveform	Low	
Light	Dim OFF		Light	Di m	
Output Waveform	High Low	G1 G2 90	Output Waveform	High Low	G1 G2 90
Light	Bright OFF		Light	Bright OFF	

◇Because there is permanent magnet inside the sensor, it should be taken care to avoid the collision between the gear and the sensor head and damage the sensor.

◇ The sensor is directional when measured,When used the marking points on the probe should be parallel to the axis of rotation of the measuring object.

◇ If the surrounding electromagnetic interference is large, it is suggested to increase the shielding line, namely the enclosure ground.

Gear Speed Sensor

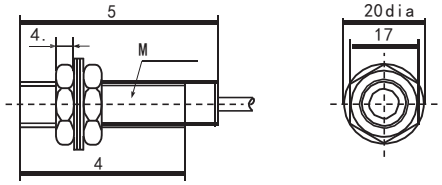
SK - 41920 Series

（Directionless Series）

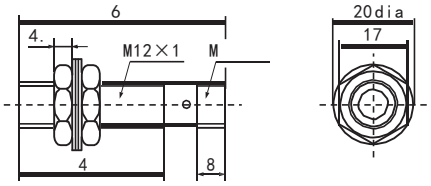


● Dimensions：

Lead Wire Type



Connector Type



● Features：

- ◇ There is no marking and direction requirement when the probe is installed.
- ◇ It is used for counting, locating and testing on the gears, rack or uneven magnetic metal. The tooth spacing of the measured gear can be as small as 1.5-2mm.
- ◇ The output connections are NPN and PNP type.
- ◇ Can withstand harsh environment, such as oil, water, dust, etc.
- ◇ Excellent resolution and high repeatability.
- ◇ Frequency response，In-between 80Hz~33KHz can be used.
- ◇ Anti-electromagnetic interference is large.
- ◇ Suitable for MURATA 33H, NO741, 777, 778...Winding head friction roller, spindle, traverse shaft speed probe, (PG1, PG2, PG3 Model No. PA1015A) ; TEIJIN winding head, spindle and the traverse speed probe, (PU2, PU3 PU4 Model No. EM- 014), high-speed drawing frame and so on；ZHONGLI BKV series high-speed first class winding.

● Model's and Parameters:

Model No. / Parameter	SK-41920	SK-41920C
Shape	 Lead wire	 Connector
Sensing Distance	1.5 mm	
Output Type	NPN、PNP Type	
Output Voltage	Low：≤0.3 V High：≥90% inV	
Output Current	100 mA	
Operating Voltage	12-30 VDC	
Accuracy Measurement	±1 Pulse	
Current Consumption	≤15 mA	
Response Frequency	0Hz~500Hz	
Accuracy	Tooth Spacing：≥1.5 mm	
Ambient Temperature T	-25℃~70℃	

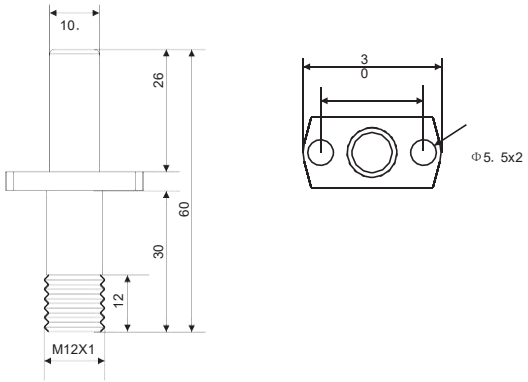
Gear Speed Sensor

SK - 41930 Series

（Directionless series）



● Dimensions：



● Features：

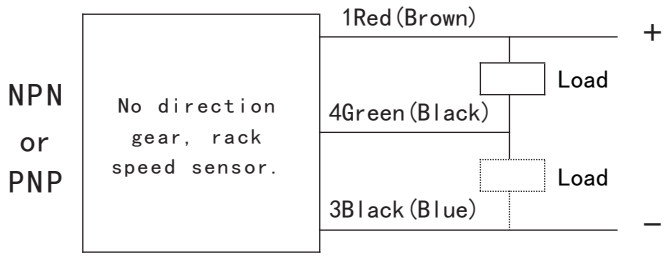
- ◇ There is no engraved markings or directional requirements for probe installation.
- ◇ It is used for counting, locating and testing on the gears, rack or uneven magnetic metal. The tooth spacing of the measured gear can be as small as 1.5-2mm.
- ◇ The output connections are NPN and PNP type.
- ◇ Can withstand harsh environment, such as oil, water, dust, etc.
- ◇ Excellent resolution and high repeatability。
- ◇ Frequency response，In-between 80Hz~33KHz can be used.
- ◇ Large Anti-Electromagnetic interference.
- ◇ Suitable for MURATA 33H, NO741, 777, 778...Winding head friction roller, spindle, traverse shaft speed probe, (PG1, PG2, PG3 Model No. PA1015A) ; TEIJIN winding head, spindle and the traverse speed probe, (PU2, PU3 PU4 Model No. EM- 014), high-speed drawing frame and so on；ZHONGLI BKV series high-speed first class winding.

● Model's and Parameters:

Model No. / Parameter	SK-41930	SK-41930C
Shape	 Lead wire	 Connector
Sensing Distance	1.5 mm	
Output Type	NPN、PNP Type	
Output Voltage	Low：≤0.3V High：≥90%inV	
Output Current	100 mA	
Operating Voltage	12-30 VDC	
Accuracy Measurement	±1 Pulse	
Current Consumption	≤15 mA	
Response Frequency	0Hz~500Hz	
Accuracy	Tooth Spacing：≥1.5 mm	
Ambient Temperature T	-25℃~70℃	

Gear Speed Sensor

● Output Diagram:



● Application Guidance:

◇ Installation:



This product recommends detection gap (between the probe surface and the top of the tooth) is 1 mm ±20 %. When the sensor is installed, the clearance should be adjusted accurately with the plug gauge. To make the output to achieve the best effect, when the gear signal frequency is more than 15k Hz, the radial run-out(for the bounce on gear) of gear installation should be less than 0. 3 mm, when gear signal frequency is less than 15 k Hz, the radial run-out(for the bounce on gear) of gear installation should be less than 0. 1 mm.

Because there is permanent magnet inside the sensor, it should be taken care to avoid the collision between the gear and the sensor head and damage the sensor. There is no direction in sensor measurement.

Note: if the surrounding electromagnetic interference is large, it is suggested that the shielded wire should be properly grounded, and the grounding position shall be on the ground point of the input terminal of the receiving device.