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TQG15 Photoelectric Speed Sensor

Product Overview

- Speed sensor based on photoelectric effect
- Flexible selection of channels and electrical isolation of channels
- Contact type speed measurement and a variety of connecting modes for selection

Environmental parameters

Service conditions	
Altitude	≤2500m
Operating temperature	-40℃~+45℃
Relative humidity	≤95% (the average minimum temperature of this month is 25℃)
Impact and shock	meet the installation requirements of class 3 axle in GB/T 21563-2008
Protection grade	IP66

Performance parameter

Electrical Parameters	
Power voltage (Vcc)	DC15×(1±15%)V or DC24×(1±15%)V
Speed measurement range	0rpm~2500rpm
Number of output channels	2/3/4
Number of pulses per revolution	200
Output waveform	Square wave, rise time and fall time are both no more than 10μs
Load resistance	≥3kΩ
High level	≥9V
Low level	≤2V
Duty ratio	50%±20%
Phase difference	90°±45°

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Performance parameter

Electrical Parameters	
No-load power consumption current	≤50mA
Insulation resistance	Insulation resistance measured by 500V megger between each sensor channel and between all channels (including shielded wire) and shell should be no less than 50MΩ
Insulating strength	AC1500V/60Hz/1s
EMC	According to GB/T 24338.4-2009
Protection function	Power polarity protection and output short circuit protection

Mechanical Parameters	
Shell materials	High strength cast aluminium alloy
Shaft elongation	78mm, 95mm, 110mm and 120mm; other specifications can be customized according to user requirements
External dimension	Referring to figure 1, the standard line length is 1400mm, and can be customized according to user requirements
Connector	JL5-14TJ

Overall dimension drawing

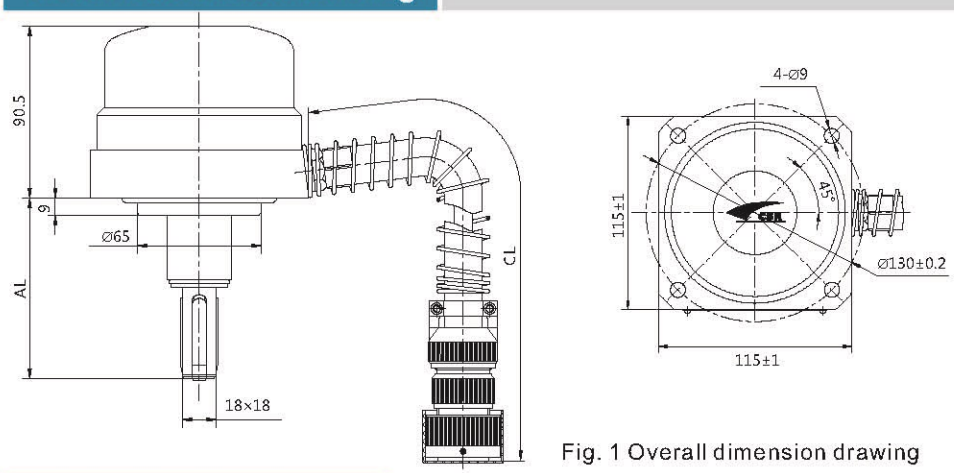

Fig. 1 Overall dimension drawing

Remarks:

1. Axle extensions AL include 78mm. 95mm, 110mm and 120mm axle extensions. Axle extensions of any other sizes can be made upon user's request
2. Length CL of lead-out cables: standard length is 1400mm. Lead-out cables of other length are available upon request

Mechanical Interfaces

The sensor is tightened by four mounting screws (M8 or appropriate specification).

(1) Mounting drawing

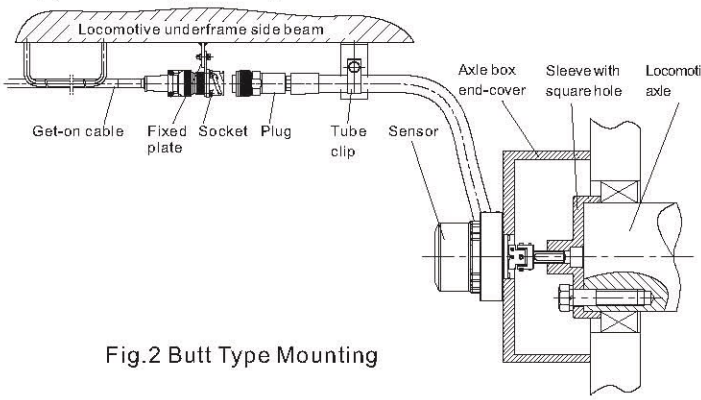

Fig.2 Butt Type Mounting

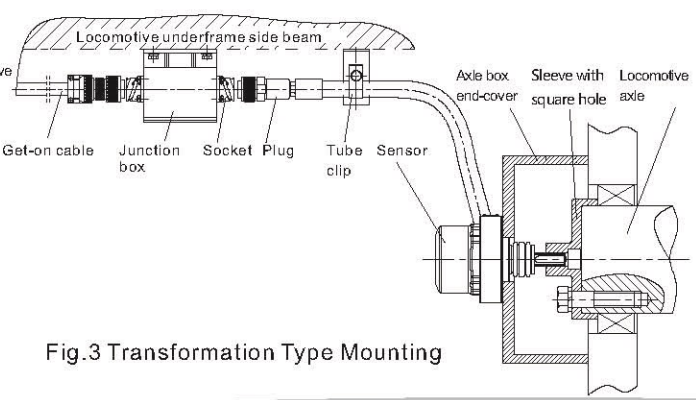

Fig.3 Transformation Type Mounting

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Mechanical Parameters

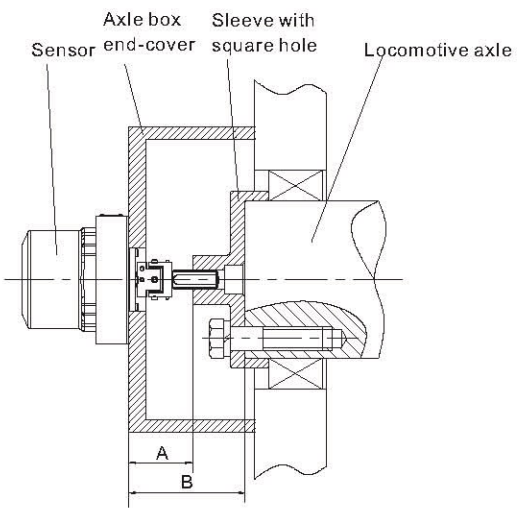


Fig.4 Mounting depth dimension

(2) Mounting depth dimensions

A: Dimension from sensor mounting surface to square-hole seat surface

B: Dimension from sensor mounting surface to square-hole bottom

For dimensions of two end wheels to axle box of 3-axle bogie and end wheels to axle box of 3-axle bogie:

Values of A and B: A=65 mm±5 mm B=120 mm±5 mm

For dimensions of intermediate wheel to axle box of 3-axle bogie (and long-axle sensor is needed in this case):

Values of A and B: A≥70mm B≥130mm

(3) Axle box end cover drilling drawing

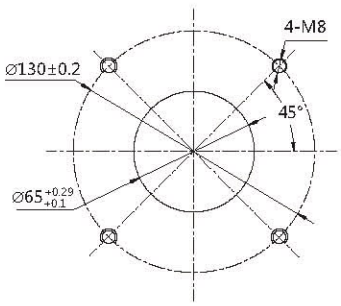


Fig.5 Axle box end cover drilling drawing

(4) Sleeve with square hole

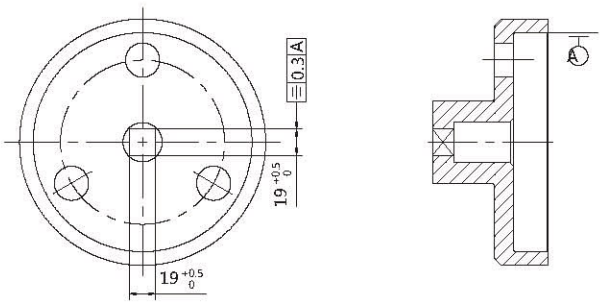
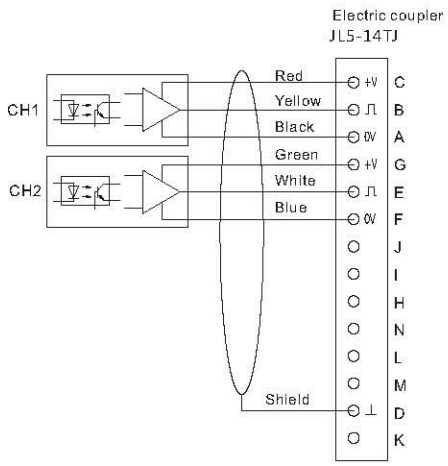
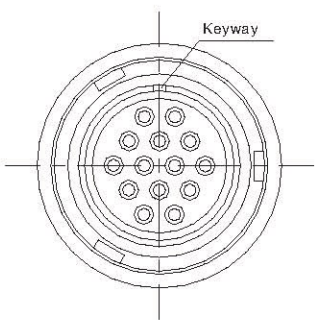


Fig.6 Sleeve with square hole

Electrical wiring diagrams

JI5 Type electric coupler: JL5-14TJ





TQG15B Electric coupler

Fig.7 TQG15B Photoelectric Speed Sensor

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TQG15 Photoelectric Speed Sensor

Electrical wiring diagrams

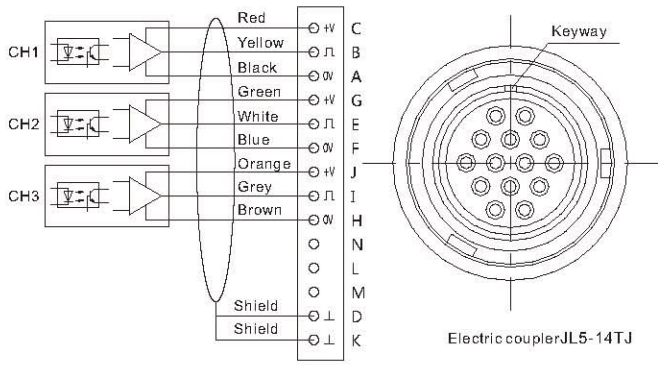

Fig.8 TQG15C Photoelectric Speed Sensor

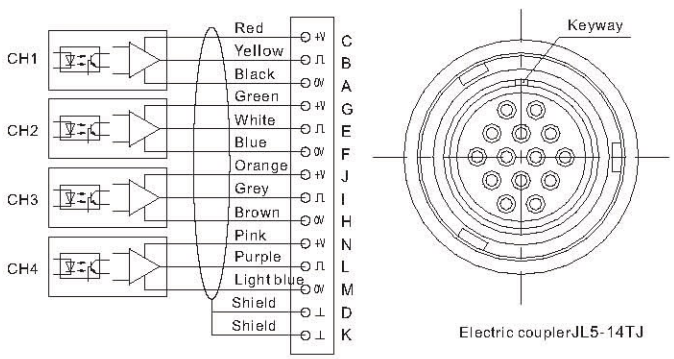

Fig.9 TQG15D Photoelectric Speed Sensor

Mounting Requirements

- Recommended to tighten by M8 bolts;
- Before the sensor is placed into the axle box cover, visual inspection should be carried out on the seat and enclosure of the sensor, universal coupling, cable protective sleeve and electric coupler. The seat and enclosure of the sensor, and universal coupling should have no mechanical defects affecting normal use, electric coupler should have no damages, electric coupler end sleeve does not become relaxed, the pins and bayonet position should comply with the corresponding standards, the cable protective sleeve is in good conditions and there is a good sealing between rubber hose and seat interface;
- Before the sensor is placed into the axle box cover, rotate the output shaft manually, which should rotate steadily and smoothly without any seizing;
- Before the sensor is placed into the axle box cover, turn on the sensor power supply, rotate the output square shaft manually, and if the output level changes, the sensor is normal;
- In order to enable the sensor to operate reliably for a long time, please coat the walls of square hole in the sleeve with a thin layer of grease (which is the same as grease for train wheel bearings), to ensure that the four tongue plates of elastic tenon assembly slide freely in the wheel shaft end holes;
- Wire according to the definition of the electrical interface strictly, make sure of right wiring without short circuit and break circuit;
- Cable laying requirements: sensor conductors and subsequent connecting lines should keep away from large-scale electrical equipment and power lines, and are forbidden to be winded with power lines or transmit in the same pipeline.

Standards

GB/T 2423.1-2008	Environmental testing for electric and electronic products----Part 2: Testing methods Test A:Low temperature (IEC 60068-2-1 : 2007 , IDT)
GB/T 2423.2-2008	Environmental testing for electric and electronic products----Part 2:Testing methods Test B:High temperature (IEC 60068-2-2 : 2007 , IDT)
GB/T 2423.4-2008	Environmental testing for electric and electronic products----Part 2: Testing methods Test Db : Alternating temperature and humidity (IEC 60068-2-30 : 2005 , IDT)
GB 4208-2008	Enclosure protection class (IP code) (IEC 60529:2001 , IDT)
GB/T 24338.4-2009	Rail transit---electromagnetic compatibility Part 3-2: Equipment for rolling stock (IEC62236-2-30:2003,IDT)
GB/T 25119-2010	Rail transit--- electronic devices for rolling stock
TB/T 2760.2-2010	Locomotive speed sensor Part 1: photoelectric speed sensor

Main Application Fields and Achievements

Rail transit signal system (LKJ system)
Main application achievements: largely applied on railway vehicles on domestic trunk lines and branch lines