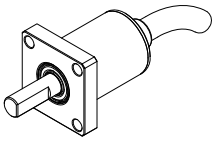
1. S9.6F Incremental Optical Encoder (Solid shaft)

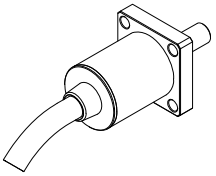
1.1 Introduction:

This product is an ultra-miniature photoelectric encoder with solid shaft flange mounting and incremental pulse signal. It is suitable for micro-sized equipment and industrial automation fields with limited space.



1.2 Feature:

- Encoder external diameter Ø9.6mm、thickness 16.9mm、diameter of shaft Ø3.0mm;
- Flange installation;
- Adopt non-contact photoelectric principle;
- Electrical interface TTL differential signal;
- Resolution per turn up to 5120PPR.



1.3 Application:

Micro equipments, small instruments and other automation control fields.

1.4 Connection:

- Axial cable (standard length 0.5M)

1.5 Protection:

IP50

1.6 Weight:

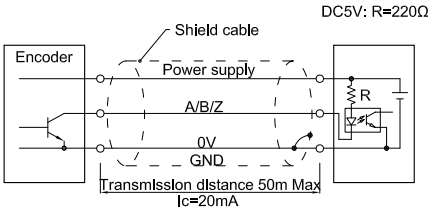
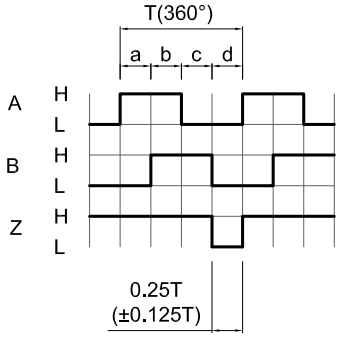
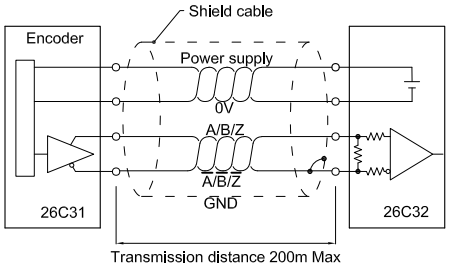
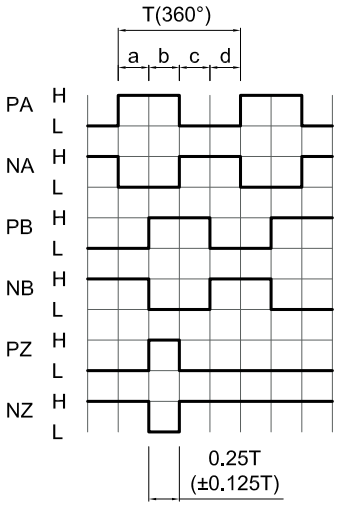
About 15g

2. Model Selection Guide

Model composition(select parameters)

S9.6F-	L	6	C	640	B3		–	000
Product model series	Connection method: L=Axial cable	Output phase: 2=A+B 3=A+B+Z 4=A+$\overline{A}$+B+$\overline{B}$ 6=A+$\overline{A}$+B+$\overline{B}$+Z+$\overline{Z}$	Electrical interface: N=OC(active low) C=TTL	Resolution PPR: 320; 640; 1280; 2560; 5120 (Other resolution can be customized)	Diameter of shaft (D shape): B3=Ø3.0mm	Special specification: No indication =DC5V; Cable length 0.5M; Need to add length C+number		Customer No.

3. Output mode

Electrical interface	Output circuit	Output wave form
OC NPN open collector circuit		 a.b.c.d=$\frac{T}{4}\pm\frac{T}{8}$ Phase A is ahead of B by $\frac{T}{4}\pm\frac{T}{8}$, viewing from shaft end, direction is clockwise rotation. (See dimensional drawings) CW direction Z signal is low level active
TTL (DC5V)		 a.b.c.d=$\frac{T}{4}\pm\frac{T}{8}$ Phase A is ahead of B by $\frac{T}{4}\pm\frac{T}{8}$, viewing from shaft end, direction is clockwise rotation. (See dimensional drawings) CW direction

4. Electrical Parameters

Parameter / Output type / Item			OC	TTL
Supply voltage			DC+5V±5%	
Consumption current			100mA Max	
Allowable ripple			≤3%rms	
Top response frequency			100KHz	200KHz
Output capacity	Output current	Input	≤30mA	≤±20mA
		Output	—	
	Output voltage	"H"	—	≥2.5V
		"L"	≤0.4V	≤0.5V
	Load voltage		≤DC30V	—
Rise & Fall time			Less than 2us(cable length：2m)	≤100ns Less than 1us(Cable length：2m)
Mark to space ratio			45% to 55%	
Phase shift between A & B			90°±10° (frequency in low speed)	
			90°±20° (frequency in high speed)	
GND			Not connect to encoder	

5. Mechanical Specifications

Diameter of shaft	Ø3mm(D shape)
Starting torque	Less than 5×10^{-4}N·m
Inertia moment	Less than 0.3×10^{-6} kg·m²
Shaft load	Radial 2N; Axial 2N
Slew speed	≤5000 rpm
Shell	Aluminium alloy
Weight	about 15g

6. Environmental Parameters

Environmental temperature	Operating:—20～+80°C; Storage:—25～+85°C
Environmental humidity	Operating and storage：35～85%RH(noncondensing)
Vibration(Endurance)	Amplitude 0.75mm,5~50Hz,2h for X,Y,Z direction individually
Shock(Endurance)	49m/s² 11ms three times for X,Y,Z direction individually
Protection	IP50

7. Wiring Table

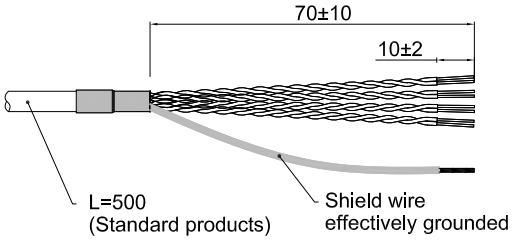
7.1 OC (Wiring table)

	Supply voltage		Incremental signal		
Wire color	Red	Black	White	Green	Yellow
Function	Up	0V	A	B	Z

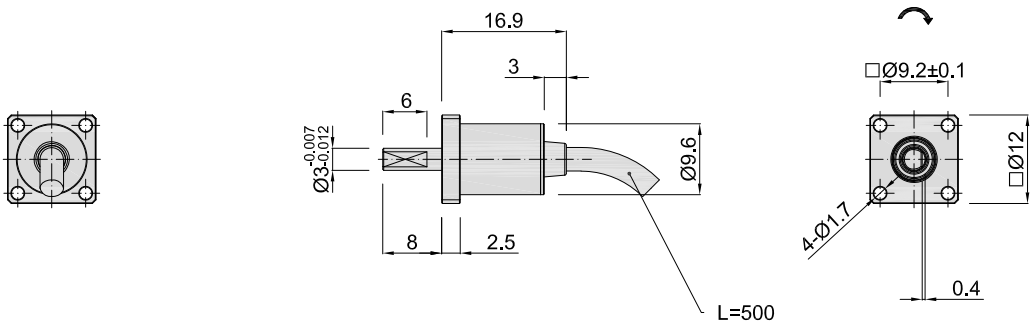
7.2 TTL (Wiring table)

	Supply voltage		Incremental signal					
Wire color	Red	Black	White	White/BK	Green	Green/BK	Yellow	Yellow/BK
Function	Up	0V	A+	A-	B+	B-	Z+	Z-
Twisted-paired cable								

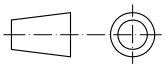
Up=Supply voltage.
Shield wire is not connected to the internal circuit of encoder.



8. Basic Dimensions



Unit: mm



= Shaft rotation direction of the incremental signal output