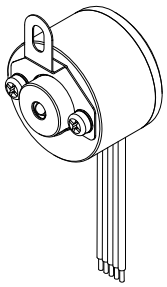
1. Incremental Optical Encoder (Hollow shaft- Blind hole)

1.1 Introduction:

K18 is a micro hollow shaft optical encoder with compact structure and high reliability, widely used in small equipment and industrial automation fields with space constraints.

K18-J



1.2 Feature:

- Encoder external diameter Ø18mm、thickness 12.1mm、diameter of shaft Ø2.5mm;
- Adopt non-contact photoelectric principle;
- Multiple electrical interfaces available;
- Resolution per turn up to 16384PPR.

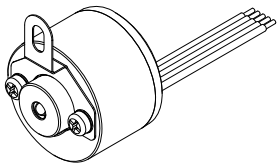
1.3 Application:

Bill counting machines, printers, micro motors, small instruments and other automation control fields.

1.4 Connection:

- Radial alignment (standard length 0.15M)
- Axial alignment (standard length 0.15M)

K18-L



1.5 Protection:

IP40

1.6 Weight:

about 25g

2. Model Selection Guide

2.1 Model composition(select parameters)

K18- | **J** | **3** | **N** | **1024** | | | | **-** **000**

Product model series	Connection interface: J=Radial alignment; L=Axial alignment	Output phase: 1=A; 2=A+B; 3=A+B+Z; 4=A+$\overline{A}$+B+$\overline{B}$; 6=A+B+Z +$\overline{A}$+$\overline{B}$+$\overline{Z}$	Electrical interface: N=OC(NPN)❶; NH=OC(NPN)❷; L=TTL (DC5V, 26C31)	Resolution PPR: 36; 50; 60; 100; 200; 250; 256; 300; 360; 400; 500; 512; 720; 800; 1000; 1024; 1440; 1600; 2000; 2048; 2880; 3200; 4000; 4096; 5760; 6400; 8000; 8192; 11520; 12800; 16000; 16384	Diameter of shaft: No indication =Ø2.5mm (Depth 8mm)	Supply voltage: Blank=DC5V	Special requirement: Blank=❸	Management No.

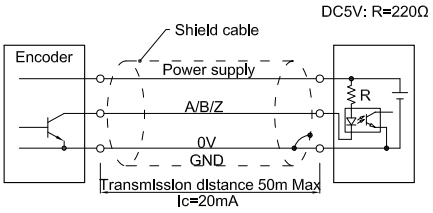
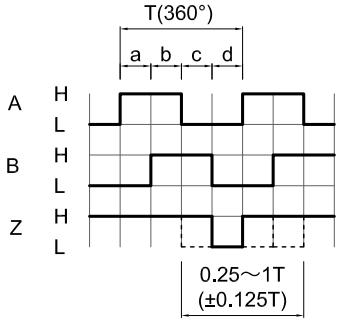
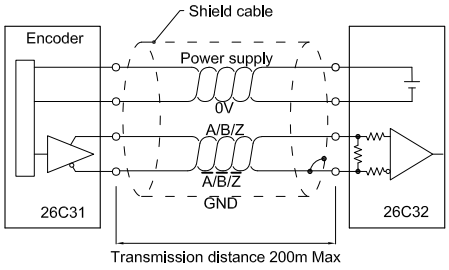
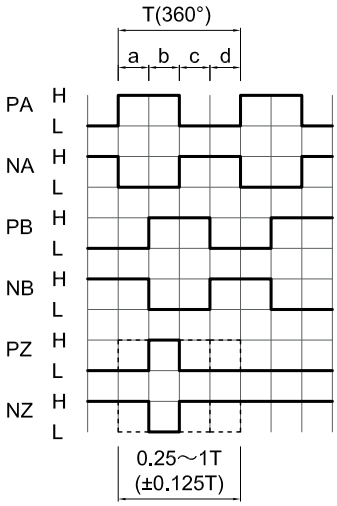
2. 2 Note

❶. Z signal is low level active.

❷. Z signal is high level active.

❸. None indicated for IP40 and cable length of 0.15M, if need to change the length C+number, the longest is 100M (expressed by C100). For the specific length of use, pls refer to page 2 of the provision of output circuit.

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 / Item \ Output type			OC	TTL
Supply voltage			DC+5V±5%	
Consumption current			100mA Max	
Allowable ripple			≤3%rms	
Top response frequency			100KHz	300KHz
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	Ø2.5mm Depth 8mm(Stainless steel material)
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 25g

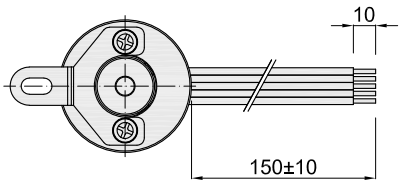
6. Environmental Specifications

Environmental temperature	Operating:—10～+70°C; Storage:—15～+75°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	IP40

7. Wiring Table

7.1 OC (Wiring table)

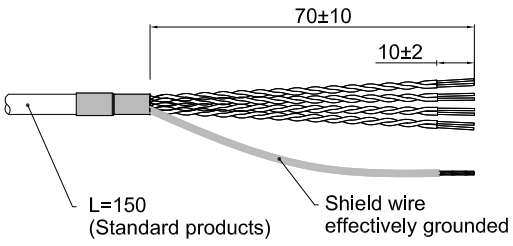
	Supply voltage		Incremental signal		
Wire color	Red	Black	White	Green	Yellow
Function	Up	0V	A	B	Z



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.

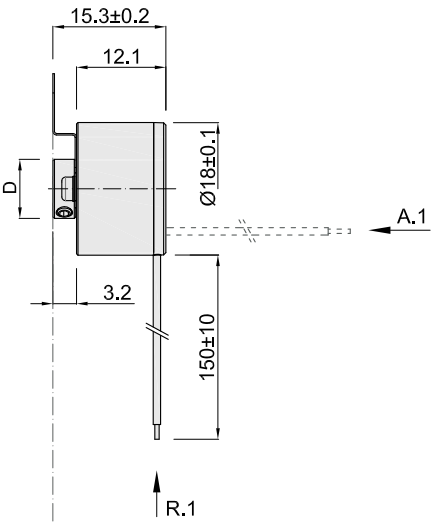


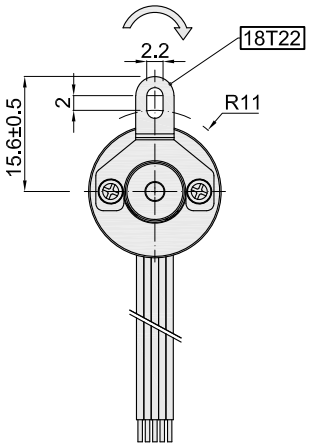
Unit: mm

8. Basic Dimensions

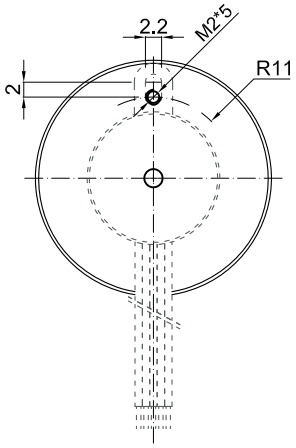
8.1 Dimensions

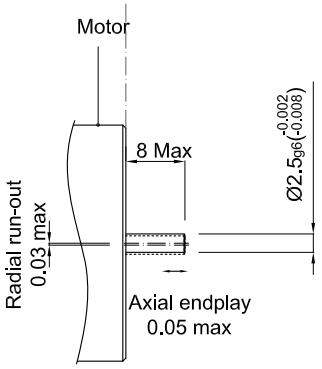
B(Shaft)	D
$Ø2.5^{G7(+0.012)}_{(+0.002)}$	Ø8

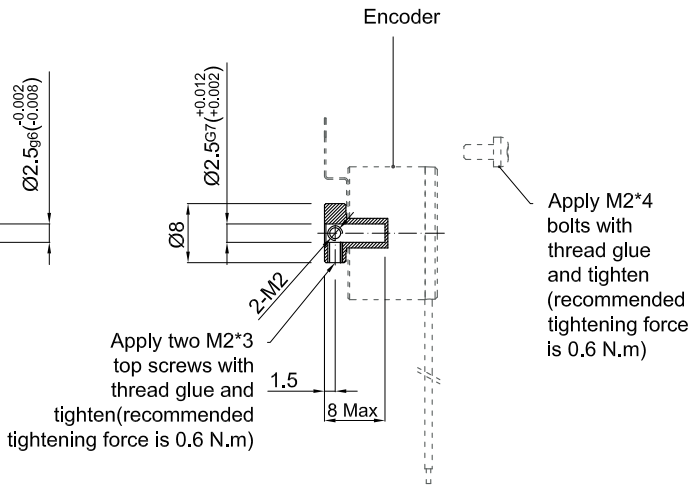




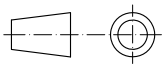
8.2 Installation requirements







Unit: mm



= Shaft rotation direction of incremental signal output
R.1 = Radial alignment(standard length 150mm)
A.1 = Axial alignment (standard length 150mm)
18T22 = Mounting spring plate model

About vibration

Vibration act on encoder always cause wrong pulse, so we should pay attention to working place.More pulse per revolution, narrower groovy spacing of grating, more effect to encoder by vibration, when rev is low or stop, vibration act on shaft or main body would cause grating vibrating, so encoder might make wrong pulse.

9. Accessories

18T22
No: 03700144