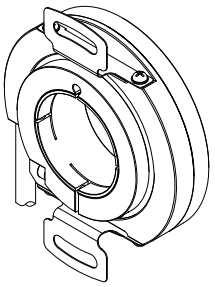
1. K66 Incremental Optical Encoder (Through shaft)

1.1 Introduction：

K66 is an ultra-thin mechanical flexible connection design, the product is compact, highly integrated, easy to install, and can solve the user' s high environmental requirements and installation problems in limited space.

Q
(clamping ring at prior)



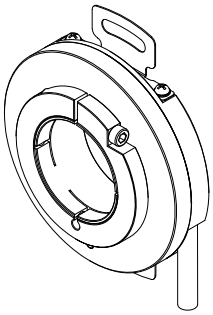
1.2 Feature:

- Encoder external diameter Ø66mm, thickness 18.5mm, diameter of shaft up to Ø30mm, achieve ultra-thin miniaturization
- Ring locking mounting structure
- Adopt non-contact photoelectric principle
- Resolution up to 10000PPR

1.3 Application:

Motor,CNC and other industrial automation

B
(clamping ring at rear)



1.4 Connection:

- Radial cable (standard length 1M)

1.5 Protection:

IP50

1.6 Weight:

About 180g

2. Model Selection Guide

2.1 Model composition(select parameters)

K66-	J	6	C	1024	Q30			-	000
Product model series	Connection method: J=Radial cable	Output phase: 1=A 2=A+B 3=A+B+Z (See Table 1 for wiring diagram) 4=A+$\overline{A}$+B+$\overline{B}$ 6=A+B+Z +$\overline{A}$+$\overline{B}$+$\overline{Z}$ (See Table 2 for wiring diagram) For servo motor: 6=Less wiring type (See Table 3 for wiring diagram) 12=A/$\overline{A}$/B/$\overline{B}$/Z/$\overline{Z}$/U/$\overline{U}$/V/$\overline{V}$/W/$\overline{W}$ (See Table 4 for wiring diagram)	Electrical interface: N=OC(NPN)❶ NH=OC(NPN)❷ F=Push-pull❶ FH=Push-pull❷ C=TTL (DC5V,26LS31) E=HTL (DC8-30V) L=TTL (DC5V, 26C31)	Resolution:(PPR) 500； 512； 1024； 1000； 2048； 2000； 2500； 4000； 4096； 5000； 8000； 8192； 10000 For servo motor: Resolution/pole 1000/6, /8; 1024/6, /8; 2048/6, /8; 2500/6, /8; 4096/6, /8; 5000/6, /8	Diameter of shaft (Through) : clamping ring at prior: Q25=Ø25mm Q28=Ø28mm Q30=Ø30mm clamping ring at rear: B25=Ø25mm B28=Ø28mm B30=Ø30mm Other shaft diameter can be customized (max Ø30mm)	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement: Blank=❸		Management No.

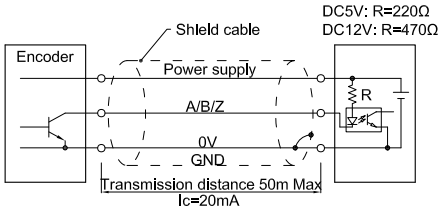
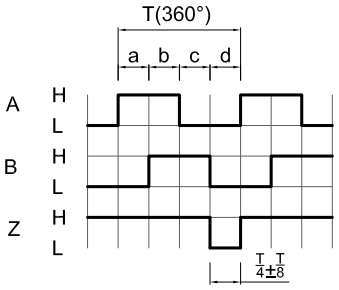
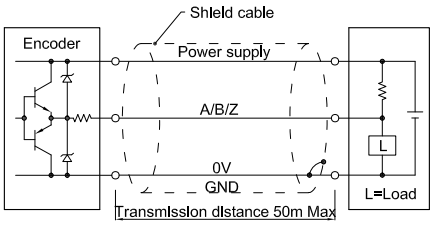
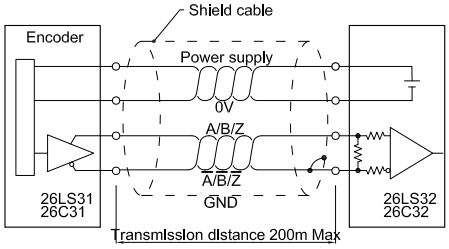
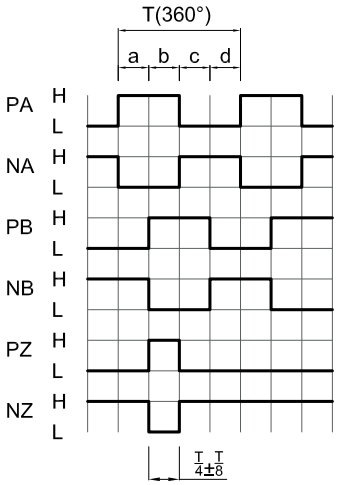
2. 2 Note

❶. Z signal is low level active.

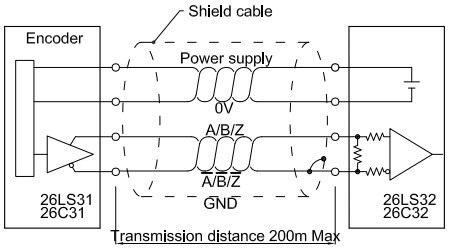
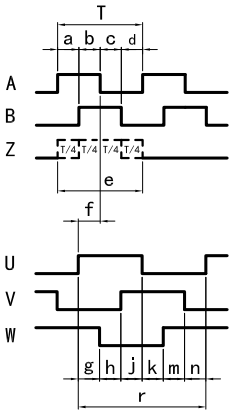
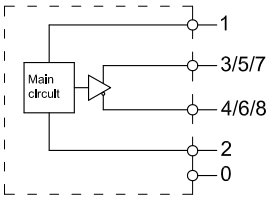
❷. Z signal is high level active.

❸. None indicated for IP50 and cable length of 1M, 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=T/4±T/8 Phase A is ahead of B by T/4±T/8, viewing from shaft end, direction is clockwise rotation. (See dimensional drawings) CW direction Z signal is low level active
F (Push-pull)		
TTL (DC5V) HTL (DC8-30V)		 a.b.c.d=T/4±T/8 Phase A is ahead of B by T/4±T/8, viewing from shaft end, direction is clockwise rotation. (See dimensional drawings) CW direction

3.2 For servo motor(with UVW）

Electrical interface	Output circuit	Output wave form
TTL (DC5V)		
TTL (DC5V) (Less wiring type)		Reverse signal not shown

26LS31, 26C31
Transmission distance 200m Max

No.	Function / Color	Mode 1	2	3
3	white	HZ	U	A
4	white/ black	HZ	$\overline{U}$	$\overline{A}$
5	green	HZ	V	B
6	green/ black	HZ	$\overline{V}$	$\overline{B}$
7	yellow	HZ	W	Z
8	yellow/ black	HZ	$\overline{W}$	$\overline{Z}$
1	red	DC+5V		
2	black	OV		
0	shielding	GND		

pole	g.h.j.k.m.n	r
6	20±1°	120°
8	15±1°	90°

Symbol signification

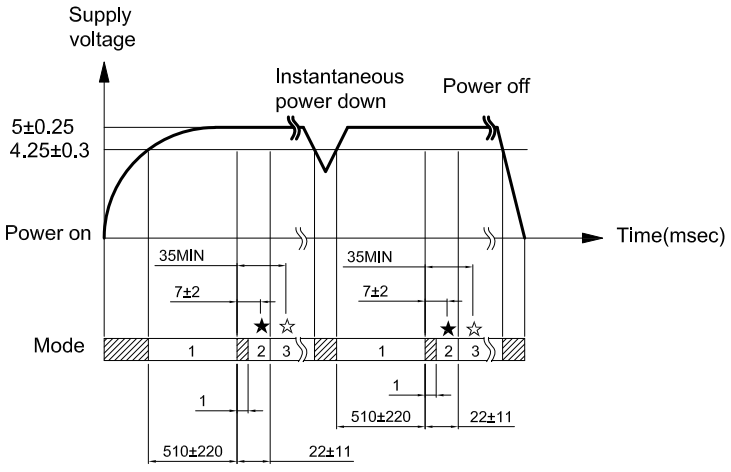
★: indicate position of UVW channel
☆: position to start counting ABZ channel
▨: non-using zone
HZ: high impedance

$a.b.c.d=\frac{T}{4}\pm\frac{T}{8}$
$e=T\pm\frac{T}{2}$
f: center of phase Z to rise point of phase U,that is ±1°

CCW direction ⟶

Viewed from shaft end when installing.
(See dimensional drawings)

Timing Chart



4. Electrical Parameters

Parameter / Electrical Interface / Item			OC	Push-pull	TTL	TTL (Less wiring type)	HTL
Supply voltage			DC+5V±5%；DC8V-30V±5%		DC+5V±5%		DC8-30V±5%
Consumption current			100mA Max		120mA Max		
Allowable ripple			≤3%rms				
Top response frequency			100KHz		300KHz		500KHz
Output capacity	Output current	Input	≤30mA	≤30mA	≤±20mA		≤±50mA
		Output	—	≤10mA			
	Output voltage	"H"	—	≥[(Supply voltage)-2.5V]	≥2.5V		≥Vcc-3 VDC
		"L"	≤0.4V	≤0.4V(30mA)	≤0.5V		≤ 1V VDC
	Load voltage		≤DC30V	—	—		
Rise & Fall time			Less than 2us(cable length: 2m)		Less than 1us (Cable length: 2m)		≤100ns
Insulation strength			AC500V 60s				
Insulation resistance			10MΩ				
Mark to space ratio			45% to 55%				
Reverse polarity protection			✔				
Short-circuit protection			—		✔❶		
Phase shift between A & B			90°±10° (frequency in low speed)				
			90°±20° (frequency in high speed)				
Delay motion time ❷			—			510±220ms	—
GND			not connect to encoder				

❶ Short-circuit to another channel or GND permitted for max.30s.
❷ Phase A.B.Z are back of phase U.V.W when power on.

5. Mechanical Specifications

Diameter of shaft	Ø25mm; Ø28mm; Ø30mm(stainless steel)
Starting torque	Less than 50×10^{-3} N·m
Inertia moment	Less than 70×10^{-6} kg·m²
Shaft load	Radial 40N; Axial 30N
Slew speed	≤5000 rpm
Shell material	Aluminium alloy
Weight	about 180g

6. Environmental Parameters

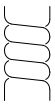
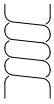
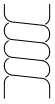
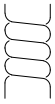
Environmental temperature	Operating:—20～+85°C(repeatable winding cable: -10°C); Storage:—25～+90°C
Environmental humidity	Operating and storage: 35～85%RH(noncondensing)
Vibration(Endurance)	Amplitude 0.75mm,5～55Hz,2h for X,Y,Z direction individually
Shock(Endurance)	1960m/s²,11ms three times for X,Y,Z direction individually
Protection	IP50

7. Wiring Table

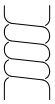
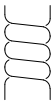
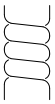
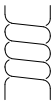
- Wiring table 1

Wire color	White	Green	Yellow	Red	Black
Function	A	B	Z	Up	Un

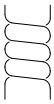
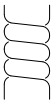
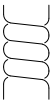
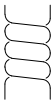
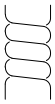
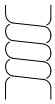
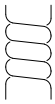
- Wiring table 2

Wire color	White	White/BK	Green	Green/BK	Yellow	Yellow/BK	Red	Black
Function	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$	Up	Un
Twisted-paired cable								

- Wiring table 3 (less wiring type)

Wire color		White	White/BK	Green	Green/BK	Yellow	Yellow/BK	Red	Black
No.		3	4	5	6	7	8	1	2
Mode	1	HZ	HZ	HZ	HZ	HZ	HZ	Up	Un
	2	U	$\overline{U}$	V	$\overline{V}$	W	$\overline{W}$		
	3	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$		
Twisted-paired cable									

- Wiring table 4

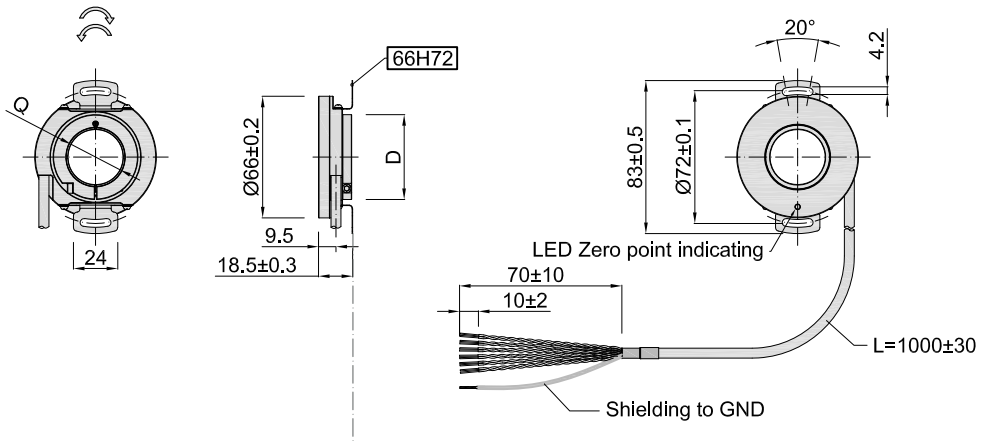
Wire color	Blue	Blue/BK	Grey	Grey/BK	Pink	Pink/BK	Yellow	Yellow/BK	Green	Green/BK	White	White/BK	Red	Black
Function	U	$\overline{U}$	V	$\overline{V}$	W	$\overline{W}$	Z	$\overline{Z}$	B	$\overline{B}$	A	$\overline{A}$	Up	Un
Twisted-paired cable														

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

8. Basic Dimensions

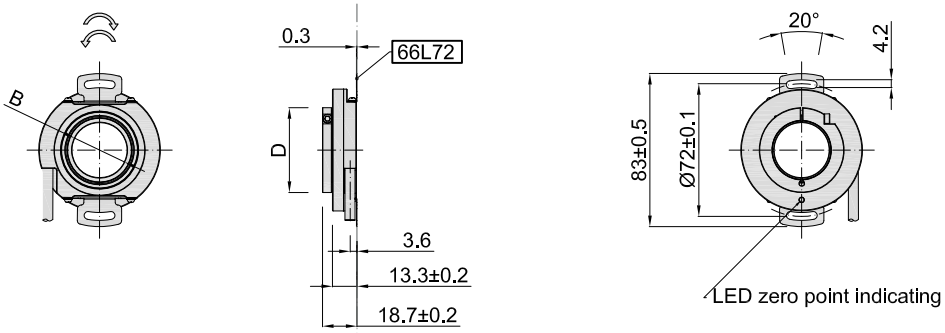
8.1 Q(clamping ring at prior)

Q(Shaft)	D
Ø25$^{G7}_{(+0.007)}^{(+0.028)}$	Ø44
Ø28$^{G7}_{(+0.007)}^{(+0.028)}$	Ø46
Ø30$^{G7}_{(+0.007)}^{(+0.028)}$	Ø46



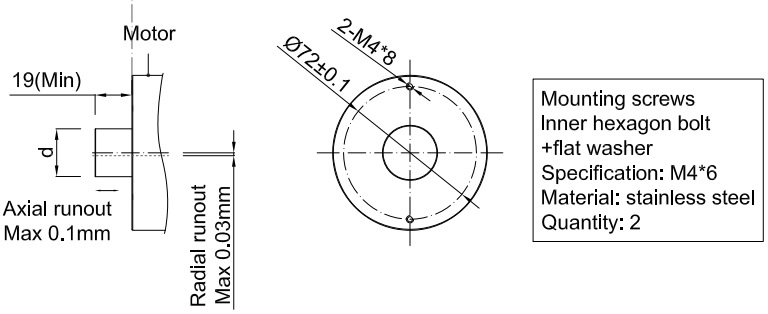
8.2 B(clamping ring at rear)

B(Shaft)	D
Ø25$^{G7}_{(+0.007)}^{(+0.028)}$	Ø44
Ø28$^{G7}_{(+0.007)}^{(+0.028)}$	Ø46
Ø30$^{G7}_{(+0.007)}^{(+0.028)}$	Ø46



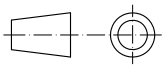
9. Assembly requirements

d
Ø25$_{g6}^{(-0.007}_{-0.020)}$
Ø28$_{g6}^{(-0.007}_{-0.020)}$
Ø30$_{g6}^{(-0.007}_{-0.020)}$



Mounting screws
Inner hexagon bolt
+flat washer
Specification: M4*6
Material: stainless steel
Quantity: 2

Unit: mm



= Shaft rotation direction of the signal output

= Direction of shaft rotation for servo motor-specific signal output

66H72 = Install spring plate model

66L72 = Install spring plate model

10. Caution

10. 1 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.

10. 2 Caution for wiring

- Use the encoder under the specified supply voltage. Please note that the supply voltage range may drop due to the wiring length.
- Do not put the encoder wiring and other power lines through the same duct, and do not use them by bundling in parallel.
- Please use twisted pair wires for the signal and power wires of encoder.
- Please do not apply excessive force to the cable of encoder, or it will may be damaged.

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