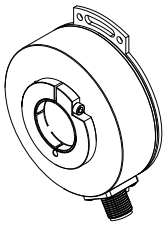
1. K77 Incremental Optical Encoder (Through hole)

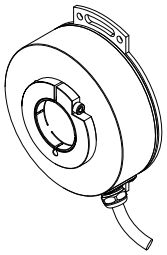
1.1 Introduction：

K77 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.

K77-C



K77-T



1.2 Feature:

- Encoder external diameter Ø77mm, thickness 31mm, 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

1.4 Connection:

- Radial socket (M12 8pin male socket)
- Radial cable (standard length 1000mm)

1.5 Protection:

IP65

1.6 Weight:

About 400g

2. Model Selection Guide

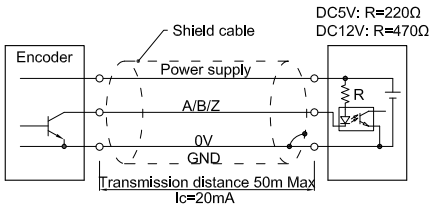
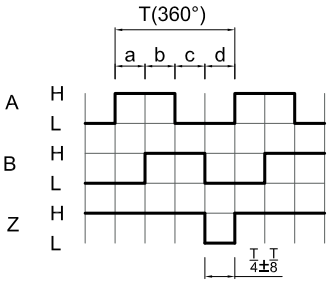
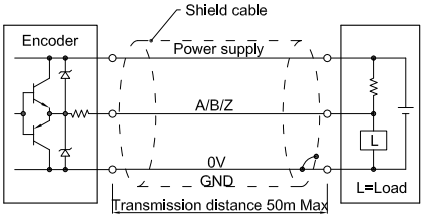
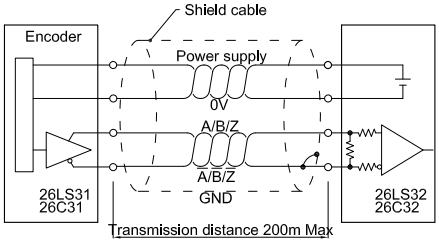
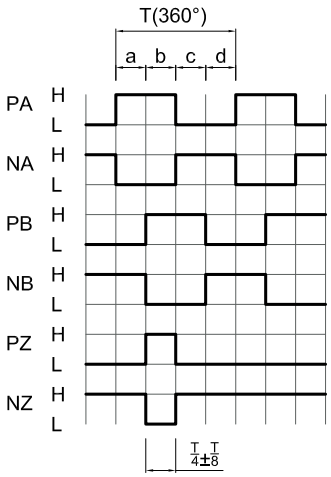
2.1 Model composition(select parameters)

K77-	C	6	C	1024	Q25	
Product model series	Connection method C=Radial socket M12 (8pin male socket) T=Radial cable	Output phase 3=A+B+Z (Wiring is shown in Table 1) 6=A+$\bar{A}$+B+$\bar{B}$+Z+$\bar{Z}$ (Wiring is shown in Table 2)	Electrical interface N=OC(NPN) F=Push-pull C=TTL (26LS31 DC5V) L=TTL (26C31 DC5V) E=HTL(DC8-30V)	Resolution:(PPR) 500； 512； 1024； 1000； 2048； 2000； 2500； 4000； 4096； 5000； 8000； 8192； 10000	Diameter of shaft (through hole) Q25=Ø25mm Q30=Ø30mm Other shaft diameter can be customized (max Ø30mm)	Special requirement Blank=IP65 Radial cable 1m Change cable length=C+number (max 100m)

2.2 Please consult with sales for confirmation of customized products(Refer to parameters that are not in the model selection guide)

- Shaft can be customized(Max Ø30mm)
- Cable length can be customized(Standard product 1000mm)
- Resolution can be customized(Max 65536PPR)
- Installation size can be customized(Spring plate)

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 the front of encoder,direction is counterclockwise rotation (See dimensional drawings) CCW 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 the front of encoder,direction is counterclockwise rotation (See dimensional drawings) CCW direction

4. Electrical Characteristics

Parameter / Electrical interface / Item			OC	Push-pull	TTL	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		200KHz	300KHz
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%			
Phase shift between A & B			90°±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
Origin motion			Low level available		—	
GND			not connect to encoder			

5. Mechanical Characteristics

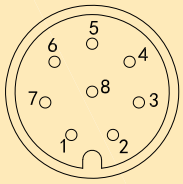
Diameter of shaft	Ø25mm; Ø30mm(stainless steel)
Starting torque	Less than 80×10^{-3} N·m
Inertia moment	Less than 100×10^{-6} kg·m²
Shaft load	Radial 70N; Axial 50N
Slew speed	≤3000 rpm
Shell material	Aluminium alloy
Weight	about 400g

6. Environmental Specifications

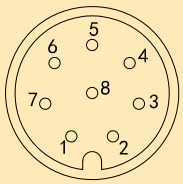
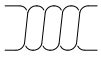
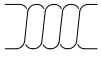
Environmental temperature	Operating:—20～+85°C(repeatable winding cable: -10°C); Storage:—25～+90°C
Environmental humidity	Operating and storage: 35～85%RH(noncondensing)
Vibration(endure)	Amplitude 0.75mm,5～55Hz,2h for X,Y,Z direction individually
Shock(endure)	1960m/s²,11ms three times for X,Y,Z direction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

7. Wiring table

7.1 Table 1

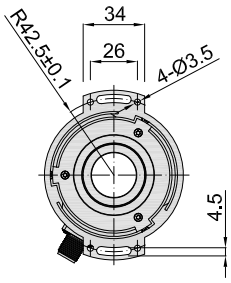
Socket pin number (M12 8Pin male socket)		Function	Wire color (cable connection)	Explanation
	1	Up	Red	Power supply Positive terminal
	2	Un	Black	Power supply negative terminal
	3	A	White	A (one turn pulse signal)
	4	-	-	Unallocated
	5	B	Green	B (one turn pulse signal)
	6	-	-	Unallocated
	7	Z	Yellow	Z(zero signal)
	8	-	-	Unallocated
	GND	GND	GND	No encoder body connected

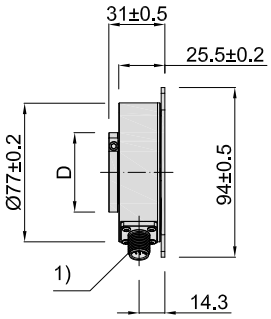
7.2 Table 2

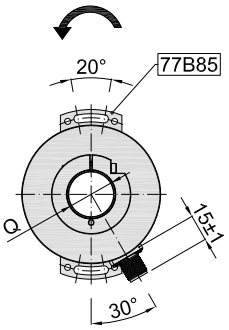
Socket pin number (M12 8Pin male socket)		Function	Wire color (cable connection,Twisted pair)		Explanation
	1	Up	Red		Power supply
	2	Un	Black		
	3	A	White		A (one turn pulse signal)
	4	$\overline{A}$	White/BK		
	5	B	Green		B (one turn pulse signal)
	6	$\overline{B}$	Green/BK		
	7	Z	Yellow		Z(zero signal)
	8	$\overline{Z}$	Yellow/BK		
	GND	GND	GND	GND	No encoder body connected

8. Basic Dimensions

8.1 K77-C(Radial socket connection)



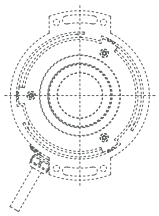


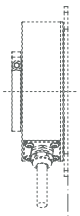


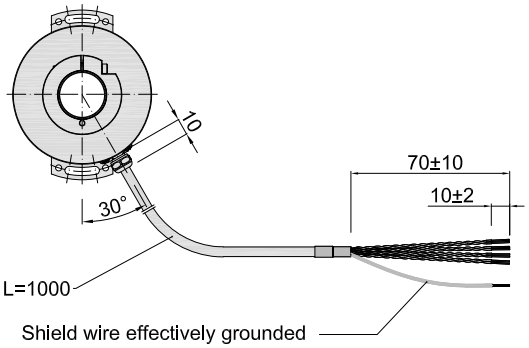
This side is the front of the encoder

Q(diameter of shaft)	D
$Ø25^{G7}_{(+0.007)}^{(+0.028)}$	Ø44
$Ø30^{G7}_{(+0.007)}^{(+0.028)}$	Ø46

8.2 K77-T(Radial cable connection)



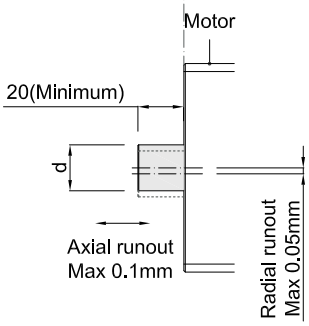


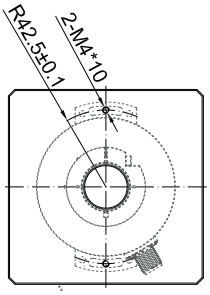


9. Assembly requirements

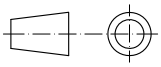
d
$Ø25_{g6}^{(-0.007}_{-0.020)}$
$Ø30_{g6}^{(-0.007}_{-0.020)}$

Mounting screws
Inner hexagon bolt
+flat washer
Specification: M4*10
Material: stainless steel
Quantity: 2





Unit: mm



77B85 = Mounting spring plate(stainless steel)

= Shaft rotation direction of the signal output

1) = M12 8Pin male socket

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. Recommended Accessories

Plug and cable	Brief description	No.	Order No.
	C01=Connection type head A: M12, 8-pin female straight connector; Connection type head B: M12, 8-pin male straight connector; Cable length: 2M 8-core with shield,halogen-free PUR	K77C01	44400001
	C02=Connection type head A: M12, 8-pin female straight connector; Connection type head B: M12, 8-pin male straight connector; Cable length: 5M 8-core with shield,halogen-free PUR	K77C02	44400002
	C03=Connection type head A: M12, 8-pin female straight connector; Connection type head B: Bare wire end; Cable length: 1M 8-core with shield,halogen-free PUR	K77C03	44400003
	C04=Connection type head A: M12, 8-pin female straight connector; Connection type head B: Bare wire end; Cable length: 2M 8-core with shield,halogen-free PUR	K77C04	44400004
	C05=Connection type head A: M12, 8-pin female straight connector; Connection type head B: Bare wire end; Cable length: 5M 8-core with shield,halogen-free PUR	K77C05	44400005