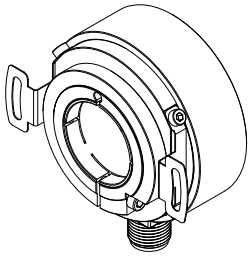
1. KP58 Incremental Optical Encoder (Hollow shaft,Through hole)

1.1 Introduction:
KP58 is a robust large bore through shaft design with wide operating temperature, high protection grade and high safety, commonly used in industrial automation.

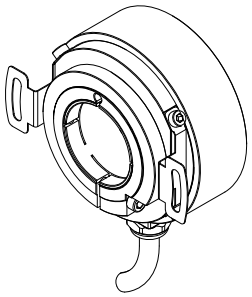
KP58-C



1.2 Feature:
- Encoder external diameter Ø58mm、thickness 30mm、diameter of shaft up to Ø25mm;
- Ring locking structure;
- Adopt non-contact photoelectric principle;
- Multiple electrical interfaces available;
- Reverse polarity protection;
- Short circuit protection;
- Resolution per turn up to 5000PPR.

1.3 Application:
Robotics, textile, packaging, motor, CNC and other automation control fields.

KP58-T



1.4 Connection:
- Radial cable (STD length 1000mm)
- Radial socket (M12*1 8pin male connector)

1.5 Protection:
IP65

1.6 Weight:
About 180g

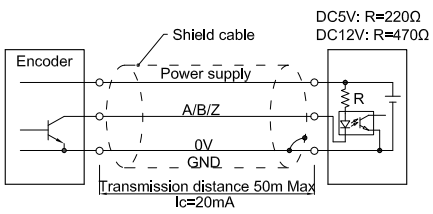
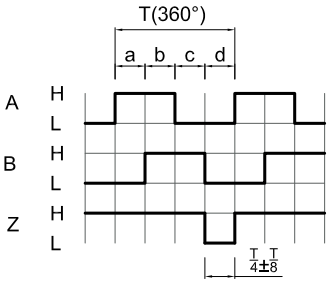
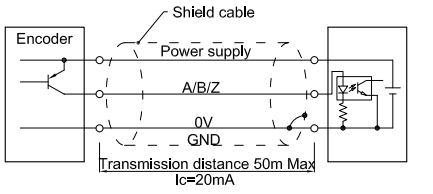
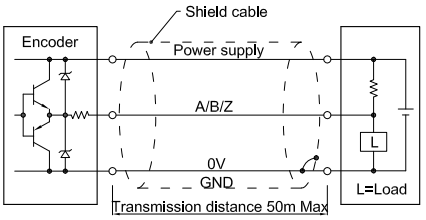
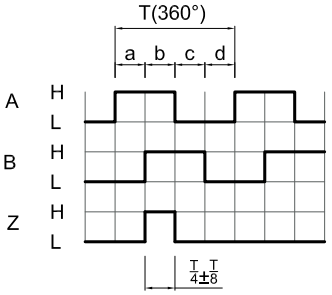
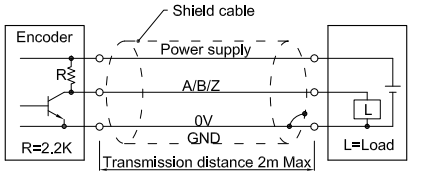
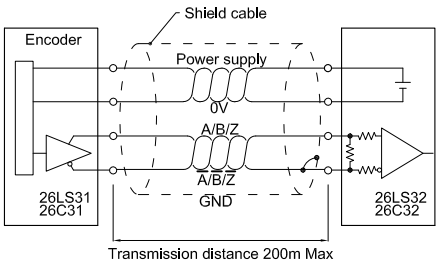
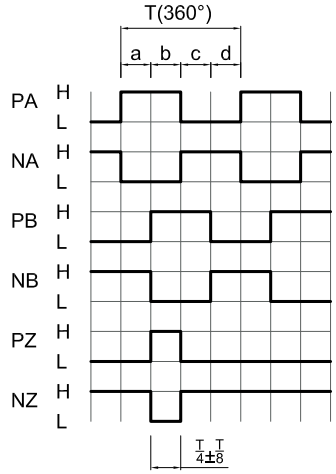
2. Model Selection Guide

KP58- | **T** | **6** | **E** | **1024** | **Q25** | **　**

- Product model series
- Connection interface:
  C=Radial socket (M12 8pin male connector)
  Radial cable:
  T=Radial cable
- Output phase:
  1=A
  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(NPN)①
  NH=OC(NPN)②
  P=OC(PNP)③
  PH=OC(PNP)④
  V=Voltage⑤
  VL=Voltage⑥
  F=Push-pull⑦
  FH=Push-pull⑧
  C=TTL (DC5V,26LS31)
  L=TTL (DC5V,26C31)
  E=HTL(DC8-30V)
- Resolution PPR:
  100; 200;
  250; 400;
  500; 512;
  1000; 1024;
  1250; 2000;
  2048; 2500;
  4000; 4096;
  5000
- Diameter of shaft: (through hole)
  Q14=Ø14mm
  Q18=Ø18mm
  Q20=Ø20mm
  Q22=Ø22mm
  Q24=Ø24mm
  Q25=Ø25mm
- Special specifications:
  No indication=⑨

2. 2 Note
①③⑥⑦. Z signal is low level active.
②④⑤⑧. Z signal is high level active.
⑨. IP=65；Cable length 1m，if you need to change the length C+number，max 100m(indicated by C100), please refer to page 2 for the specific length used for the 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
OC PNP open collector circuit		
Push-pull		 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 high level active
Voltage		
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

4. Electrical Characteristics

Parameter / Output type / Item			OC	Voltage	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	Load resistance 2.2K	≤30mA	≤±20mA	≤±50mA
		Output	—		≤10mA		
	Output voltage	"H"	—	—	≥[(Supply voltage) -2.5V]	≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V	≤0.7V(less than 20mA)	≤0.4V(30mA)	≤0.5V	≤ 1V VDC
	Load voltage		≤DC30V	—		—	
Rise & Fall time			Less than 2us(cable length：2m)			≤100ns Less than 1us(Cable length：2m)	
Insulation strength			AC500V 60s				
Insulation resistance			10MΩ				
Mark to space ratio			45% to 55%				
Reverse polarity protection			✔				
Short-circuit protection			—		✔①		
Phase shift between A & B			90°±10° (frequency in low speed)				
			90°±20° (frequency in high speed)				
GND			Not connect to encoder				

① Short-circuit to another channel or GND permitted for max 30s.

5. Mechanical Characteristics

Diameter of shaft	Ø14mm; Ø18mm; Ø20mm; Ø22mm; Ø24mm; Ø25mm(stainless steel)
Starting torque	Less than 12×10^{-3}N·m
Inertia moment	Less than 11×10^{-6} kg·m²
Shaft load	Radial 30N; Axial 20N
Slew speed	≤3000 rpm
Bearing Life	$1.5X10^{9}$ revs at rated load(100000hrs at 2500RPM)
Shell	Aluminium alloy
Weight	about 180g

6. Environmental Specifications

Environmental temperature	Operating:—40～+95°C(repeatable winding cable: -10°C); Storage:—40～+95°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)	490m/s² 11ms three times for X,Y,Z direction individually
Protection	IP65

7. Wiring table

7.1 OC/Voltage/Push-pull (Wiring table for socket connection and cable connection)

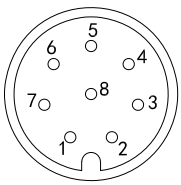
	Supply voltage		Incremental signal					
Pin Male connector	1	2	3	4	5	6	7	8
Wire color	Red	Black	White	/	Green	/	Yellow	/
Function	Up	0V	A	/	B	/	Z	/

7.2 TTL/HTL (Wiring table for socket connection and cable connection)

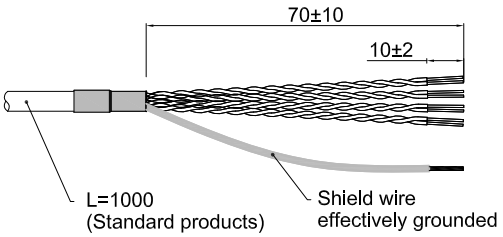
	Supply voltage		Incremental signal					
Pin Male connector	1	2	3	4	5	6	7	8
Wire color	Red	Black	White	White/BK	Green	Green/BK	Yellow	Yellow/BK
Function	Up	0V	A+	A-	B+	B-	Z+	Z-
Twisted-paired cable								

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

M12 8pin male connector
pin distribution diagram

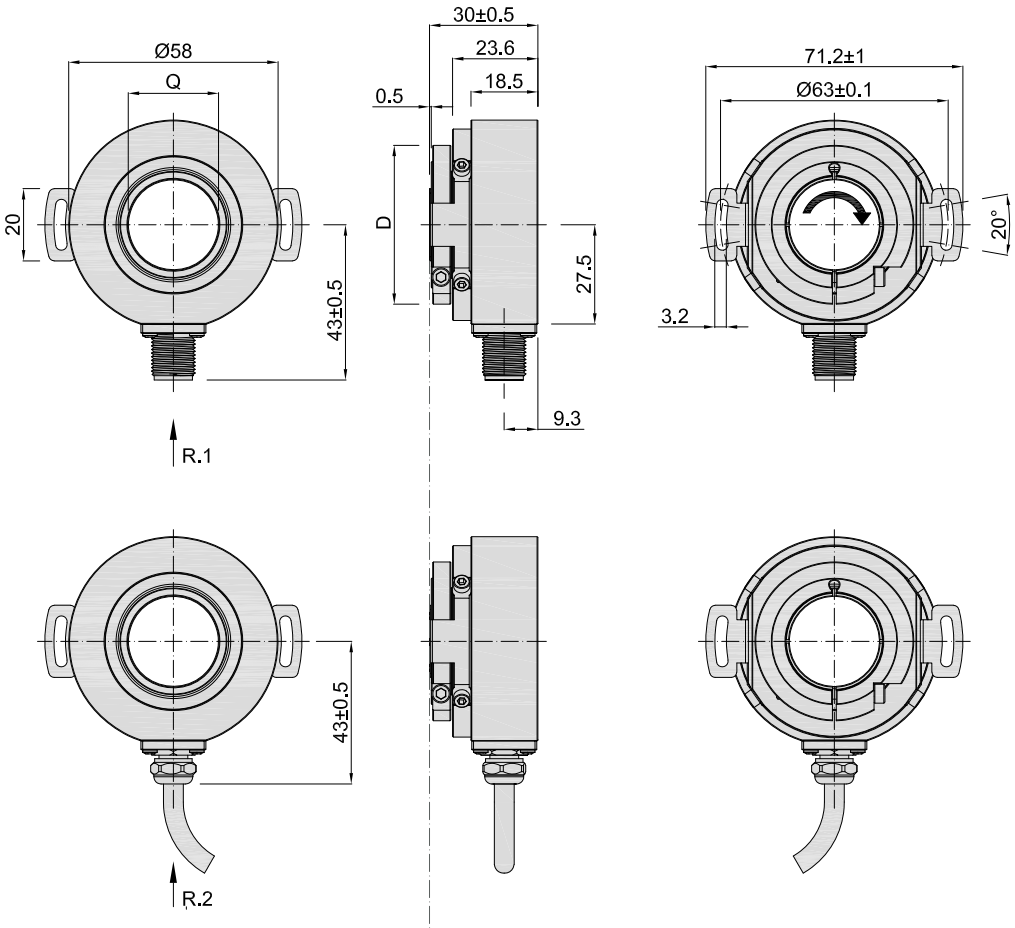


Cable connection



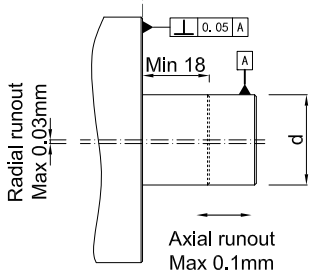
8. Basic dimensions

Q(Shaft)	D
Ø14$^{G7}_{(+0.006)}^{(+0.024)}$	Ø35
Ø18$^{G7}_{(+0.007)}^{(+0.028)}$	Ø37
Ø20$^{G7}_{(+0.007)}^{(+0.028)}$	Ø41
Ø22$^{G7}_{(+0.007)}^{(+0.028)}$	Ø41
Ø24$^{G7}_{(+0.007)}^{(+0.028)}$	Ø44
Ø25$^{G7}_{(+0.007)}^{(+0.028)}$	Ø44



9. Specification for mounting shaft

Mounting screws
Inner hexagon bolt +flat washer Specification: M3*6 Material: stainless steel Quantity: 2



d
Ø14$_{g6}^{(-0.006)}_{(-0.017)}$
Ø18$_{g6}^{(-0.007)}_{(-0.020)}$
Ø20$_{g6}^{(-0.007)}_{(-0.020)}$
Ø22$_{g6}^{(-0.007)}_{(-0.020)}$
Ø24$_{g6}^{(-0.007)}_{(-0.020)}$
Ø25$_{g6}^{(-0.007)}_{(-0.020)}$

Unit: mm

= Shaft rotation direction of the signal output
R. 1 = Radial socket(M12x1 8pin male connector)
R. 2 = Radial cable (standard length 1000)

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

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