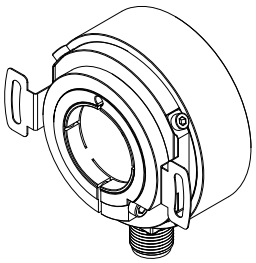
1. KP58 Incremental Optical Encoder (Hollow Shaft, Through Hole)

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 fields.

KP58-C



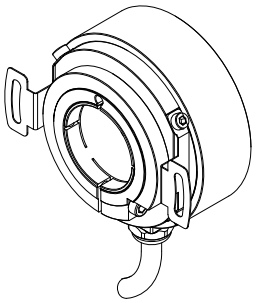
1.2 Feature:

- 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 1M)
- Radial socket (M12*1 8pin male connector)

1.5 Protection:

IP65

1.6 Weight:

About 180g

2. Model Selection Guide

2.1 Model composition(select parameters)

KP58-	T	6	C	1024	Q25			-	000
Product model series	Connection method: C=Radial socket (M12 8pin male connector) T=Radial cable	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 P=OC(PNP)❶ PH=OC(PNP)❷ V=Voltage❷ VL=Voltage❶ F=Push-pull❶ FH=Push-pull❷ 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	Shaft: (through hole) Q14=Ø14mm Q18=Ø18mm Q20=Ø20mm Q22=Ø22mm Q24=Ø24mm Q25=Ø25mm	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement: Blank=❸	Management No.

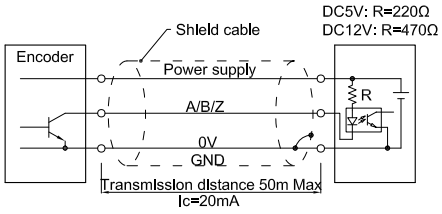
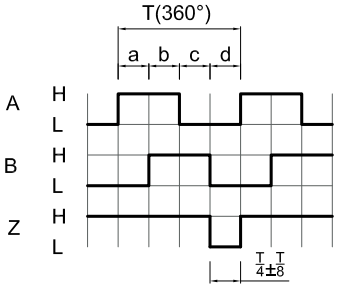
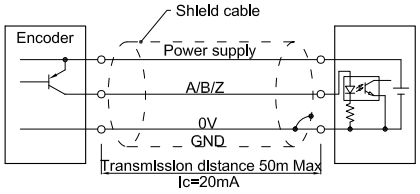
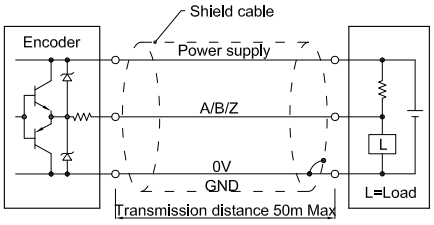
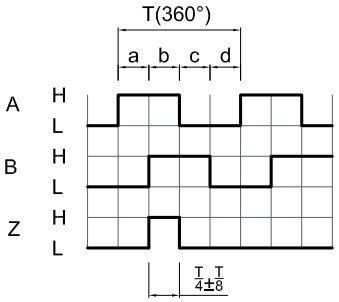
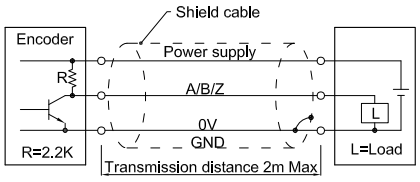
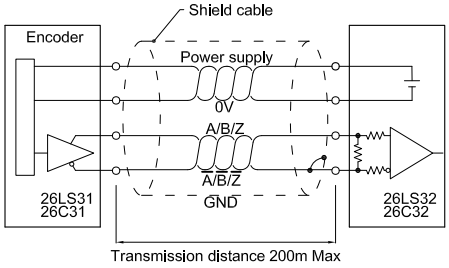
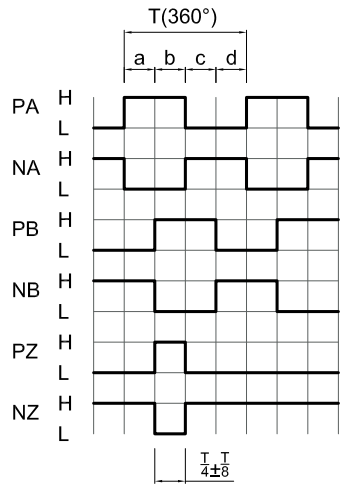
2. 2 Note

❶. Z signal is low level active.

❷. Z signal is high level active.

❸. None indicated for IP65 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
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 Parameters

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			—		✔❶		
Phase shift between A & B			90°±10° (frequency in low speed)				
			90°±20° (frequency in high speed)				
GND			Not connect to encoder				

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

5. Mechanical Specifications

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 Parameters

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)

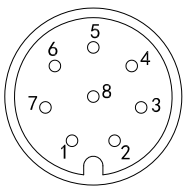
	Supply voltage		Incremental signal					
Socket pin definition	1	2	3	4	5	6	7	8
Wire color	Red	Black	White	/	Green	/	Yellow	/
Function	Up	0V	A	/	B	/	Z	/

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

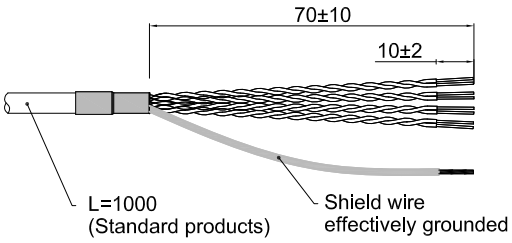
	Supply voltage		Incremental signal					
Socket pin definition	1	2	3	4	5	6	7	8
Wire color	Red	Black	White	White/BK	Green	Green/BK	Yellow	Yellow/BK
Function	Up	0V	A+	A-	B+	B-	Z+	Z-
Twisted-paired cable								

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

M12 8pin male connector
pin distribution diagram



Cable connection

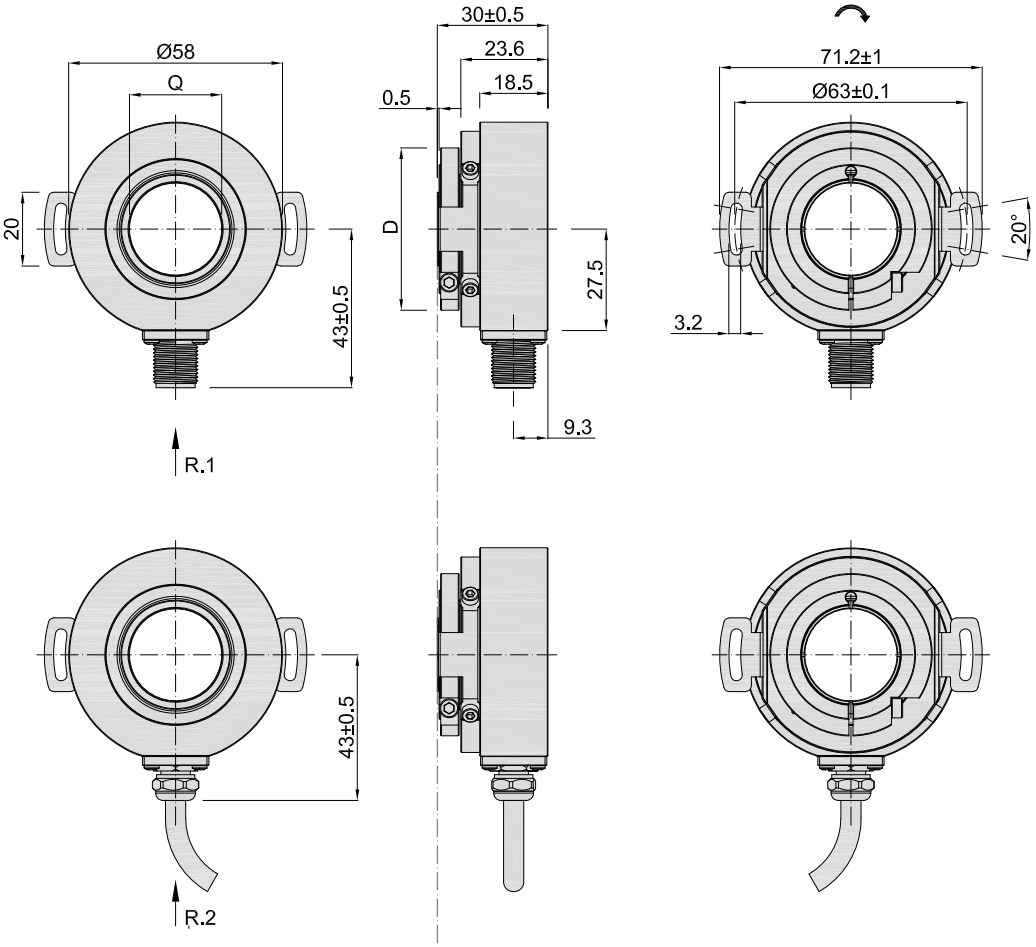


Unit: mm

8. Basic Dimensions

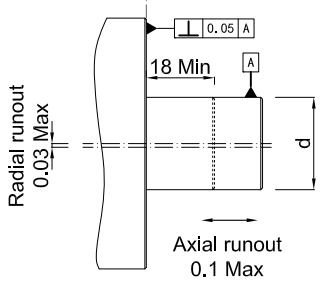
8.1 Dimensions

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



8.2 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)

9. Recommended Accessories

Plug and cable	Brief description	No.	Order No.
	C2C=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	K77C2C	44400001
	C5C=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	K77C5C	44400002
	C1=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	K77C1	44400003
	C2=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	K77C2	44400004
	C5=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	K77C5	44400005

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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