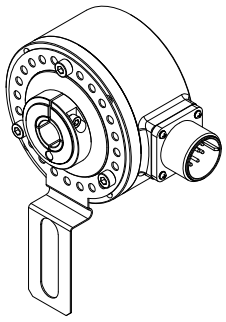
1. PGK96 Incremental Optical Encoder (Through shaft)

1.1 Introduction:

PGK96 is a heavy duty through shaft design with a variety of electrical interfaces and resolutions available. Highest protection grade IP67 with solid structure and high safety, widely used in industrial and mining environmental fields.

PGK96-C



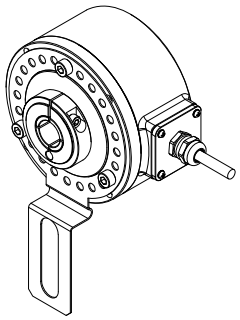
1.2 Feature:

- Encoder external diameter Ø96mm、thickness 63.5mm、diameter of shaft up to Ø30mm, robust and miniaturized;
- Adopt non-contact photoelectric principle;
- Reverse polarity protection;
- Short circuit protection;
- Multiple electrical interfaces available;
- Resolution per turn up to 65536PPR.

1.3 Application:

Servo motor, elevator, motor, packaging machinery, CNC and other automation control fields.

PGK96-T



1.4 Connection:

- Radial socket
- Cable connection (standard length 1M)

1.5 Protection:

IP67

1.6 Weight:

About 1100g

2. Model Selection Guide

2.1 Model composition(select parameters)

PGK96-	C	6	C	1024	Q30			-	000
Product model series	Connection interface: C=Radial socket (M28-10pin male socket) 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) E=HTL (DC8-30V) L=TTL (DC5V, 26C31)	Resolution PPR: Resolution 1000; 1024; 2000; 2048; 2500; 4000; 4096; 5000; 8000; 8192; 10000; 16000; 16384; 32000; 32768; 64000; 65536 Resolution can be customized	Shaft: Q14=Ø14mm QA=Ø15.875mm Q25=Ø25mm Q28=Ø28mm Q30=Ø30mm Not in the parameter list, less than Ø30 can be customized	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement: Blank=❸		Management No.

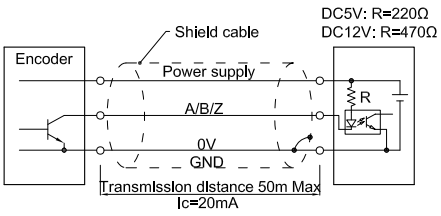
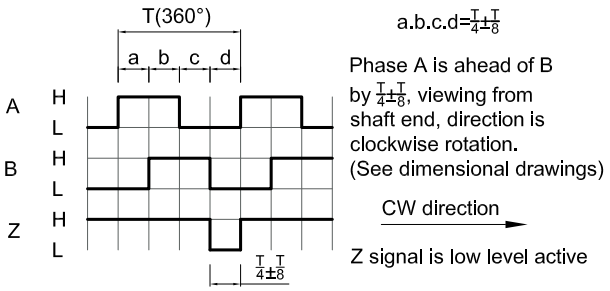
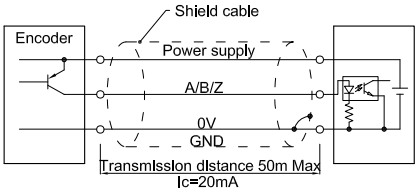
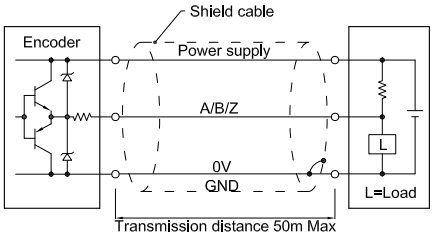
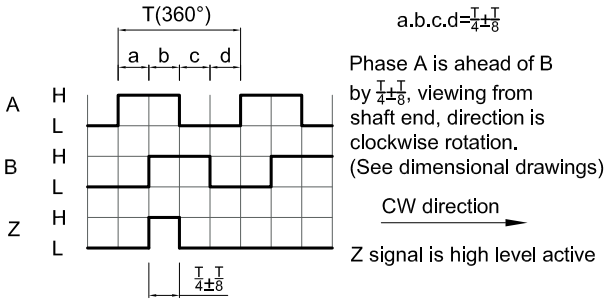
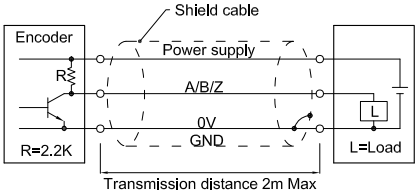
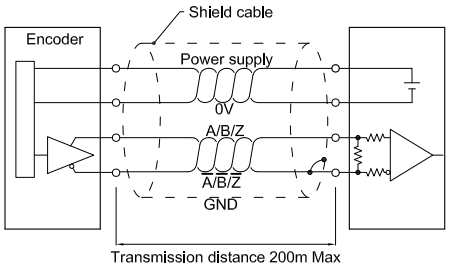
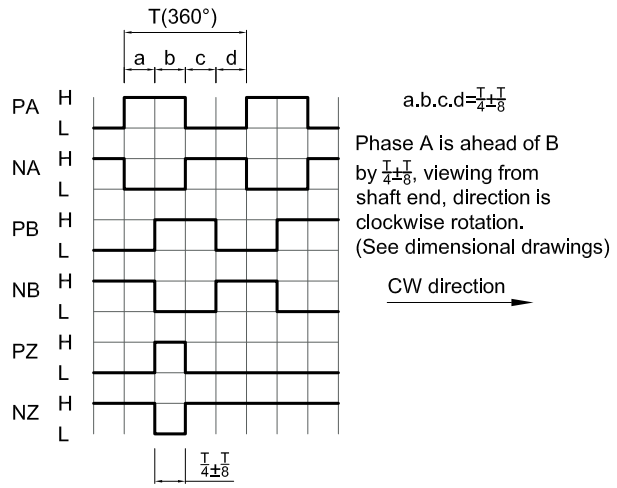
2. 2 Note

❶. Z signal is low level active.

❷. Z signal is high level active.

❸. None indicated for IP67, 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 and 3 of the provision of output circuit.

3. Output Method

Electrical interface	Output circuit	Output wave form
OC NPN open collector circuit		
OC PNP open collector circuit		
Push-pull		
Voltage		
TTL (DC5V) HTL (DC8-30V)		

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			500KHz	800KHz
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)			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.

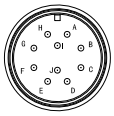
5. Mechanical Specifications

Diameter of shaft	Ø14mm、Ø15.875mm、Ø25mm、Ø28mm、Ø30mm (Stainless steel，through shaft)
Starting torque	Less than 70×10^{-3}N·m
Inertia moment	Less than 90×10^{-6} kg·m²
Shaft load	Radial 50N；Axial 30N
Slew speed	≤3000 rpm (shaft diameter＜Ø18mm)；≤2000 rpm (shaft diameter＞Ø20mm)
Bearing Life	$1.5X10^{9}$ revs at rated load(100000hrs at 2500RPM)
Shell	Aluminum alloy
Weight	about 1100g

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)	1960m/s² 11ms three times for X,Y,Z direction individually
Protection	IP67

7. Wiring Table

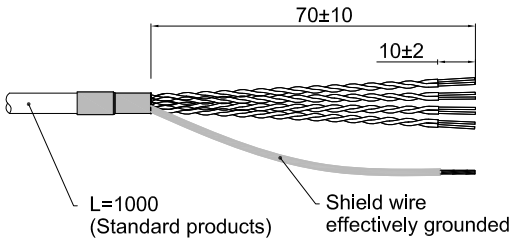


MS3102A18-1P-10

Socket pin definition (M28 10-pin)	Wire colors (cable connection)	Signal	Explanation	Twisted wire for differential
D	Red	Up	Power positive	
F	Black	Un	Power negative	
A	White	A	Signal wire	
H	White/BK	$\overline{A}$	Signal wire	
B	Green	B	Signal wire	
I	Green/BK	$\overline{B}$	Signal wire	
C	Yellow	Z	Signal wire	
J	Yellow/BK	$\overline{Z}$	Signal wire	
E	-	N.C.	Unallocated	
G	-	N.C.	Unallocated	
GND	GND	No connect to encoder		

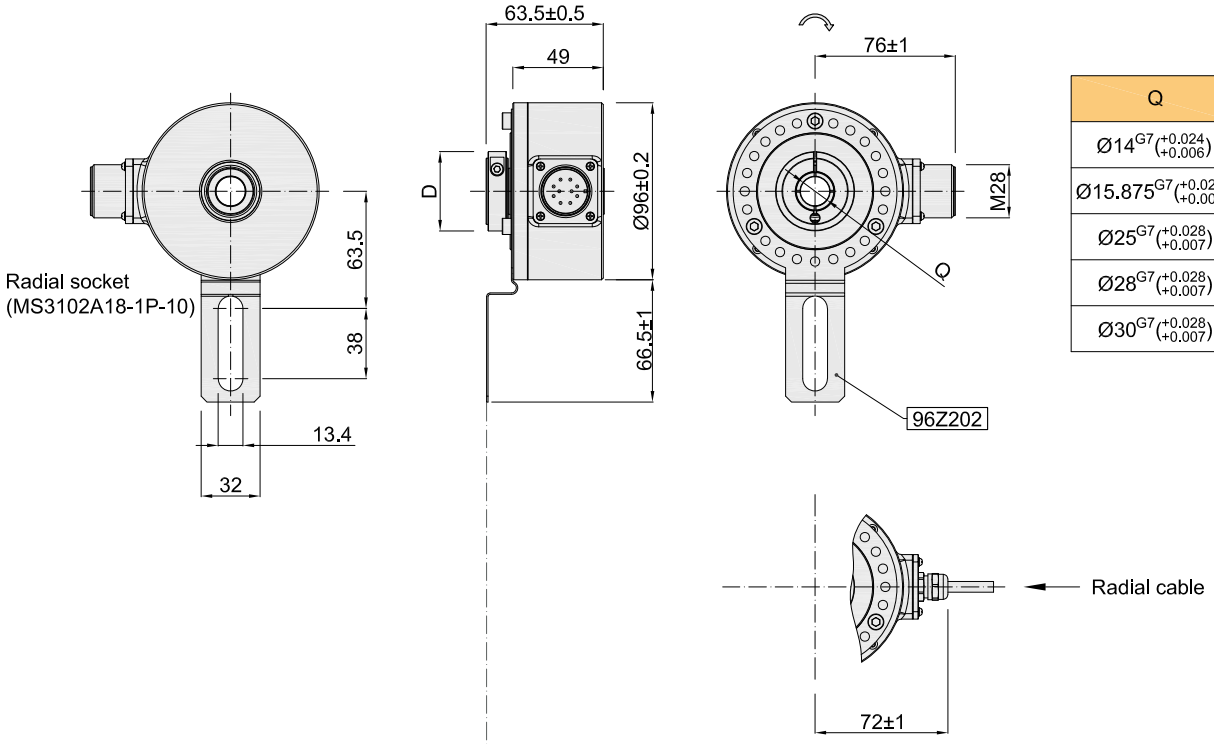
Up=Supply voltage.
Shield wire is not connected to the internal circuit of encoder.

Cable connection



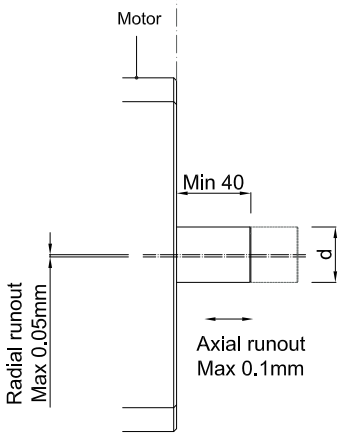
8. Basic Dimensions

8.1 Dimensions



Q	D
$Ø14^{G7}_{(+0.006)}$	Ø43
$Ø15.875^{G7}_{(+0.006)}$	Ø43
$Ø25^{G7}_{(+0.007)}$	Ø54
$Ø28^{G7}_{(+0.007)}$	Ø54
$Ø30^{G7}_{(+0.007)}$	Ø54

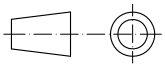
8.2 Mounting shaft requirements



d
$Ø14_{g6}(^{-0.006}_{-0.017})$
$Ø15.875_{g6}(^{-0.006}_{-0.017})$
$Ø25_{g6}(^{-0.007}_{-0.020})$
$Ø28_{g6}(^{-0.007}_{-0.020})$
$Ø30_{g6}(^{-0.007}_{-0.020})$

Mounting screws
Inner hexagon bolt +flat washer Specification: M12*10 Material: stainless steel Quantity: 1

Unit: mm



96Z202 = Mounting spring plate(stainless steel)

= Shaft rotation direction of the signal output

9. Recommended Accessories（Customer Purchase Options）

Plug and cable	Brief description	No.	Order No.
MS3106A18-1S-10 	C1=Connection type head A: M28, 10-pin female straight connector; Connection type head B: Bare wire end; Cable length: 1M 8-core with shield,halogen-free PUR	PGK96C1	44400045
	C2=Connection type head A: M28, 10-pin female straight connector; Connection type head B: Bare wire end; Cable length: 2M 8-core with shield,halogen-free PUR	PGK96C2	44400046
	C5=Connection type head A: M28, 10-pin female straight connector; Connection type head B: Bare wire end; Cable length: 5M 8-core with shield,halogen-free PUR	PGK96C5	44400047

10. Caution

10.1 Caution for operation

- The working temperature shall not exceed the storage temperature.
- The working humidity shall not exceed the storage humidity.
- Do not use where the temperature changes dramatically and have fog.
- Do not close to corrosive and flammable gas.
- Keep away from dust,salt and metal powder.
- Keep away from places where you will use water, oil, or medicine.
- Undue vibration and shock will impact the encoder.

10.2 Caution for Installation

- Electrical components should not be subjected to excessive pressure, etc., and electrostatic assessment of the installation environment should be conducted.
- Do not close the cable of the motor power to the encoder.
- The FG wire of the motor and mechanical device should be grounded.
- The shielding wire must be effectively grounded since the shielding is not connected to the encoder.

10.3 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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