Инкрементальные оптические энкодеры ENI58S/58K/50S/38S/38K

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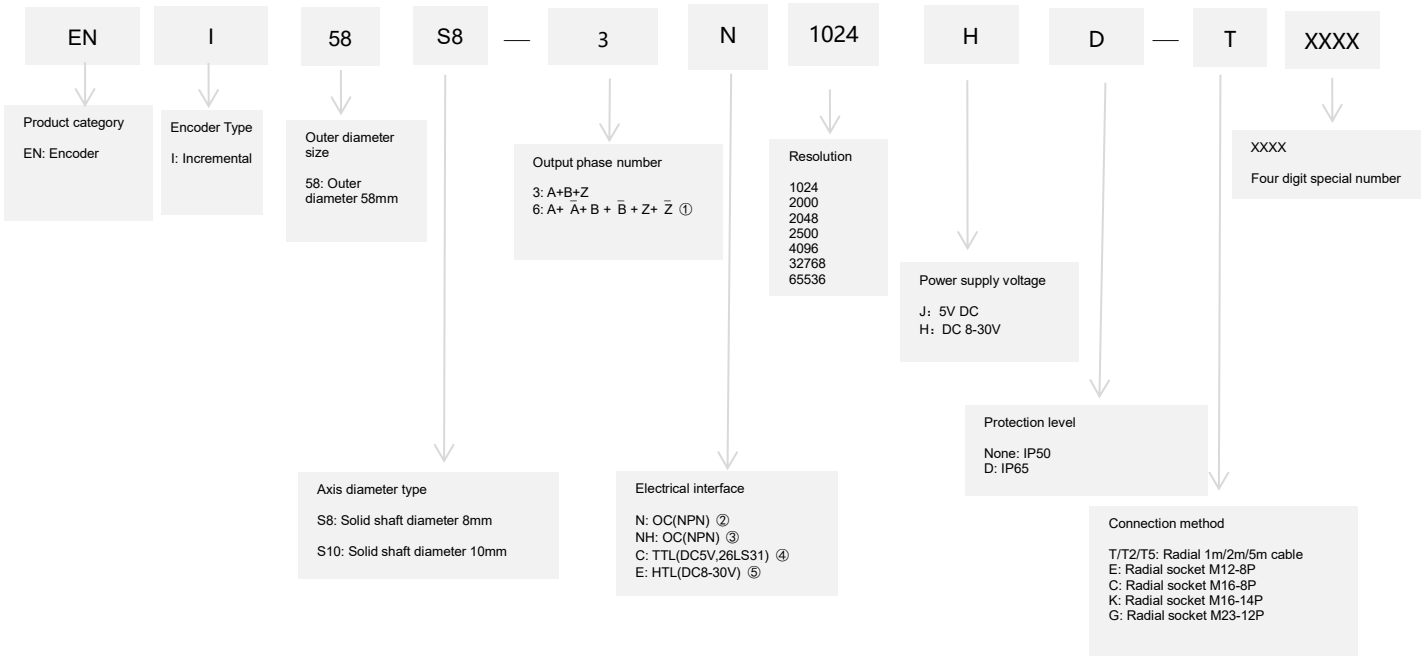
Incremental Optical Encoder **ENI58S** series

Feature

- ◆ Encoder outer cover with a diameter of 58mm and a height of 36-40mm;
- ◆ Available in sizes of 8mm and 10mm;
- ◆ Adopting non-contact photoelectric principle;
- ◆ The highest resolution can reach 65536PPR;
- ◆ Optional alarm/sensing;
- ◆ Polarity reverse protection;
- ◆ Short circuit protection.

Naming rules



① When the output phase number is 6: A+ Ā+ B + B̄ + Z+ Z̄, the electrical interface can only choose C: TTL(DC5V, 26LS31) or E: HTL (DC8-30V).

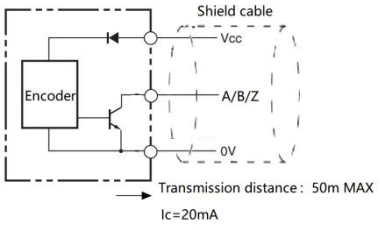
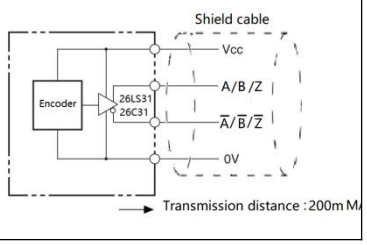
② Z signal is low level active (The recommended resolution is less than 5000PPR).

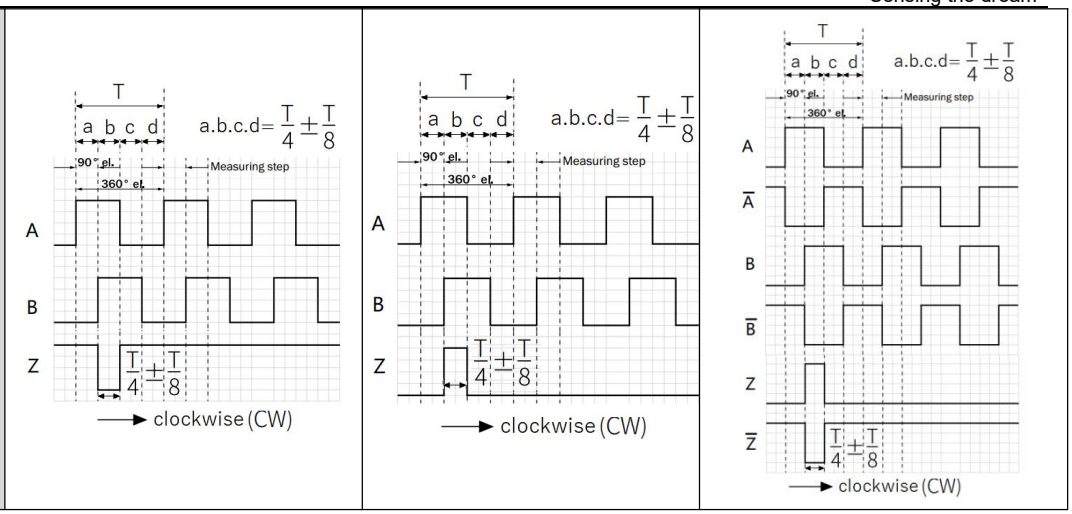
③ Z signal is high level active (The recommended resolution is less than 5000PPR).

④If the electrical interface is TTL(DC5V, 26LS31), the corresponding power supply voltage type can only be 5V DC.

⑤If the electrical interface is HTL(DC8-30V), the corresponding power supply voltage type can only be 8-30V DC.

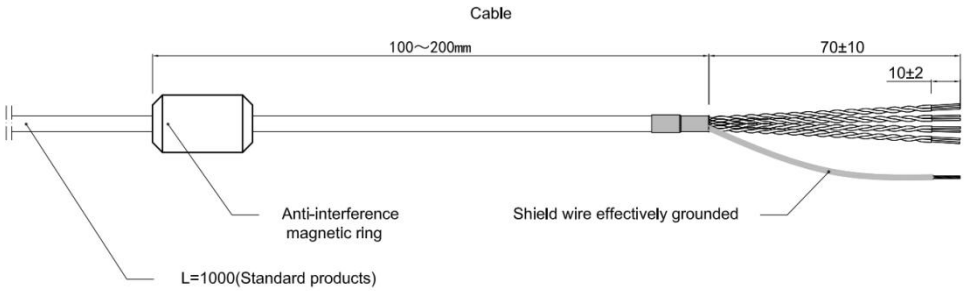
Specification parameters

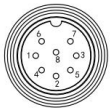
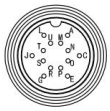
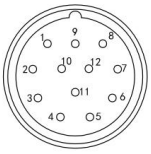
Parameter			OC(N)	OC(NH)	TTL	HTL
Supply voltage			DC+5V±5%；DC8V-30V±5%		DC+5V±5%	DC8-30V±5%
Consumption current			100mA Max		120mA Max	
Allowable ripple			≤3%rms			
Top response frequency			100kHz		300kHz	500kHz
Output capacity	Output current	Input	≤30mA		≤±20mA	≤±50mA
		Output	—			
	Output voltage	"H"	—		≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V		≤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			√①		—	
Phase shift between A & B			90º ±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
GND			Not connect to encoder			
Diameter of shaft			φ8mm; φ10mm available			
Shaft material			Stainless steel			
Starting torque			at+20°℃ IP50<0.05 Nm; IP65<0.1 Nm			
Inertia moment			Less than 3×10^{-6} kg·m²			
Shaft load			Radial 60N; Axial 40N			
Permissible movement static			±0.3mm(radial); ±0.5mm (axial)			
Permissible movement dynamic			±0.05mm (radial); ±0.1mm (axial)			
Max.angular acceleration			≤500,000 rad/s²			
Operating speed			6000 r/min②			
Bearing lifetime			$3.6x10^9$ hrs③			
Housing material			Aluminum alloy			
Weight			Approx.420g			
Shell protection grade			IP65 (Max)			
Permissible relative humidity			90°, condensation not permitted			
Operating temperature range			-40℃…+95℃			
Storage temperature range			-40℃….+95℃			
Resistance to shocks			100g, 6ms (EN60068-2-27) ④			
Frequency range of resistance to vibrations			30g,10Hz…1,000Hz (EN60068-2-6) ⑤			
Output circuit						

Output wave form	

① Short-circuit to another channel or GND (PNP is effective for Up), permitted for max. 30s.
② Allow for self-heating of approx. 3.0K per 1000rpm regarding the permissible operating temperature.
③ On maximum operating speed and temperature.
④ Checked during operation using vector length monitoring.
⑤ Checked during operation using vector length monitoring, including matching plug.

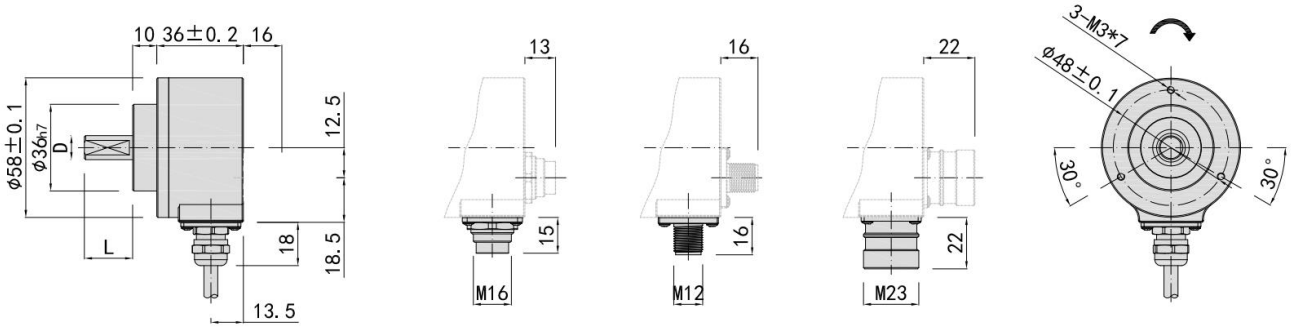
Wiring table



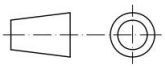
							
E: Radial socket M12-8P	C: Radial socket M16-8P	K: Radial socket M16-14P	G: Radial socket M23-12P	Wire colors (cable connection)	Signal	Explanation	Twisted wire
1	1	A	1	Red	Up	Power positive	
2	2	C	2	Black	Un	Power negative	
3	3	L	3	White	A	Signal wire	
4	4	U	4	White/ BK	Ā	Signal wire	
5	5	J	5	Green	B	Signal wire	
6	6	T	6	Green/ BK	B̄	Signal wire	
7	7	G	7	Yellow	Z	Signal wire	
8	8	S	8	Yellow/ BK	Z̄	Signal wire	
–	–	E	9	Blue	Alarm	Explanation	
–	–	R	10	Pink	Sense VCC	Power positive	
–	–	P	11	Gray	Sense OV	Power negative	
–	–	M	12	_	N.C.	未分配	

-	-	N	-	_	N.C.	未分配	
		0	-	_	N.C	未分配	
GND	Not connect to encoder						

Dimensional drawing



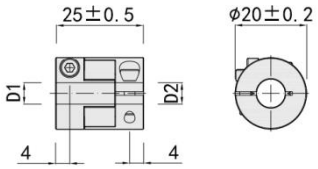
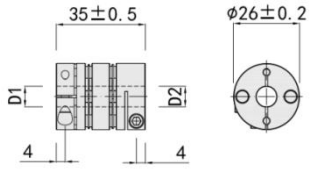
Unit：mm



= Direction of shaft rotation for signal output

D(Shaft diameter)	$\Phi 8_{h7}(^{0}_{-0.015})$	$\varphi 10_{h7}(^{0}_{-0.018})$
L	20	20

Accessories

Coupler	Dimensions	D1	D2	Model
Cross type:M series 	 Main body material:aluminum alloy	Φ6mm	Φ8mm	LB-M0608
		Φ8mm	Φ8mm	LB-M0808
		Φ8mm	Φ10mm	LB-M0810
Diaphragm type:W series 	 Main body material:aluminum alloy	Φ6mm	Φ8mm	LB-W0608
		Φ8mm	Φ8mm	LB-W0808
		Φ8mm	Φ10mm	LB-W0810

Incremental Optical Encoder **ENI38K** series

Feature

- ◆ Encoder external diameter φ38mm, thickness 38mm, diameter of shaft up to φ8mm;
- ◆ Ring locking structure;
- ◆ Adopt non-contact photoelectric principle;
- ◆ Reverse polarity protection;
- ◆ Short circuit protection;
- ◆ Multiple electrical interfaces available;
- ◆ Resolution per turn up to 32768PPR.

Naming rules

EN	I	38	KB6	—	3	N	1024	J	D	—	T	XXXX

- **EN** — Product category: EN: Encoder
- **I** — Encoder type: I: Incremental
- **38** — Size of outside diameter: 38: Outside diameter 38mm
- **KB6** — Axis diameter type: KB6: Blind hole shaft diameter 6mm; KB8: Blind hole shaft diameter 8mm; KQ6: Through shaft diameter 6mm
- **3** — Output phase number: 3: A+B+Z; 6: A+ $\bar{A}$+ B + $\bar{B}$ + Z+ $\bar{Z}$ ①
- **N** — Electrical interface: N: OC(NPN) ②; NH: OC(NPN) ③; C: TTL(DC5V,26LS31) ④; E: HTL (DC8-30V) ⑤
- **1024** — Resolution: 1000, 1024, 2000, 2048, 4096, 32000, 32768
- **J** — Power supply voltage: J: 5V DC; H: DC 8-30V
- **D** — Protection level: None: IP50 protection; D: IP65 protection
- **T** — Connection method: T: Radial 1m cable; T2: Radial 2m cable; T5: Radial 5m cable
- **XXXX** — Four digit special number

① When the output phase number is 6: A+ $\bar{A}$+ B + $\bar{B}$ + Z+ $\bar{Z}$, the electrical interface can only choose C: TTL(DC5V, 26LS31) or E: HTL (DC8-30V).

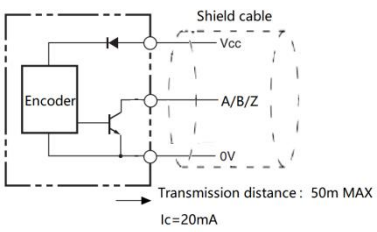
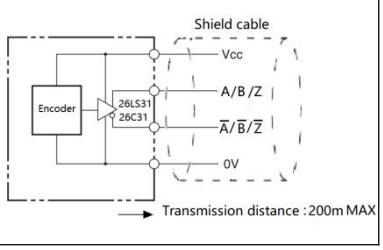
② Z signal is low level active (The recommended resolution is less than 5000PPR).

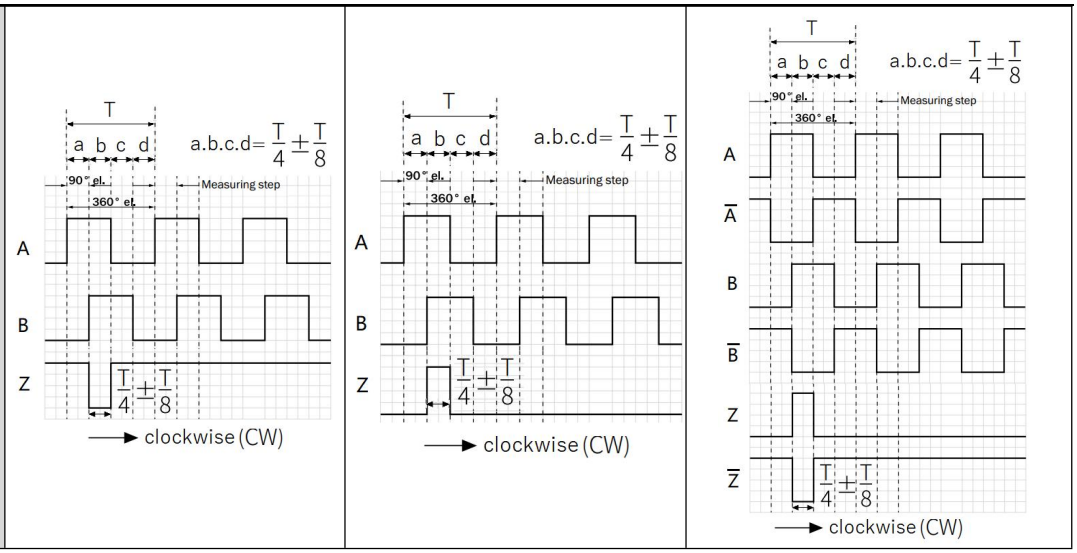
③ Z signal is high level active (The recommended resolution is less than 5000PPR).

④ If the electrical interface is TTL(DC5V, 26LS31), the corresponding power supply voltage type can only be 5V DC.

⑤ If the electrical interface is HTL(DC8-30V), the corresponding power supply voltage type can only be 8-30V DC.

Specification parameters

Parameter			OC(N)	OC(NH)	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			100 kHz		300 kHz	500 kHz
Output capacity	Output current	Input	≤30mA		≤±20mA	≤±50mA
		Output	—			
	Output voltage	"H"	—		≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V		≤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			90º ±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
GND			Not connect to encoder			
Diameter of shaft			φ6mm; φ8mm (optional)			
Starting torque			Less than 9.8×10^{-3}N·m			
Inertia moment			Less than 6.5×10^{-6}kg·m²			
Shaft load			Radial 30N; Axial 20N			
Slew speed			≤6000 rpm(IP50); ≤4000 rpm (IP65)			
Bearing Life			$1.5X10^{9}$ revs at rated load (100000hrs at 2500RPM)			
Shell			Aluminium alloy			
Weight			about 140g			
Environmental temperature			Operating:-20～+90°C (repeatable winding cable:-10°℃); Storage: -25~+95°℃			
Environmental humidity			Operating and storage: 35~85%RH (non-condensing)			
Vibration (Endurance)			Amplitude 0.75mm, 5~55Hz, 2h for X, Y, Z direction individually			
Shock (Endurance)			490m/s²11ms three times for X, Y, Z direction individually			
Protection			IP50; IP65			
Output circuit						

Output wave form	

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

Wiring table

OC(Wiring table for cable connection)

	Supply voltage		Incremental signal		
Wire color	Red	Black	White	Green	Yellow
Function	Up	0V	A	B	Z

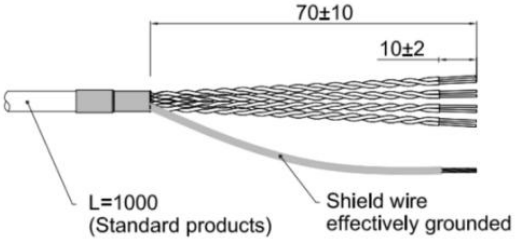
TTL/HTL (Wiring table for cable connection)

	Supply voltage		Incremental signal					
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.

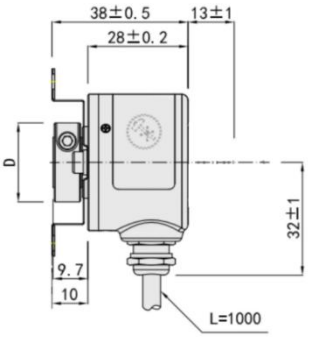
Shield wire is not connected to the internal circuit of encoder

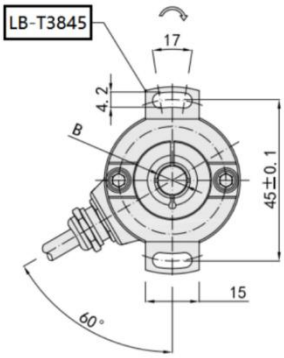
Cable connection



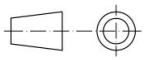
Dimensional drawing

B (Blind shaft)	Q (Through shaft)	D
Φ6mm	Φ6mm	φ20
Φ8mm	/	φ22



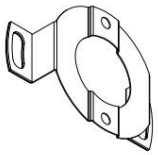
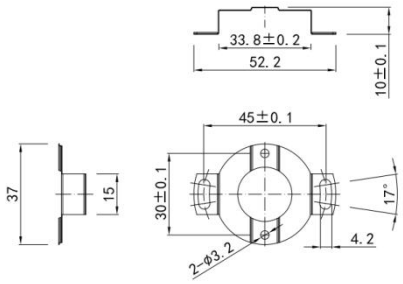
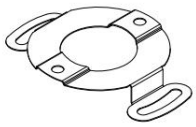
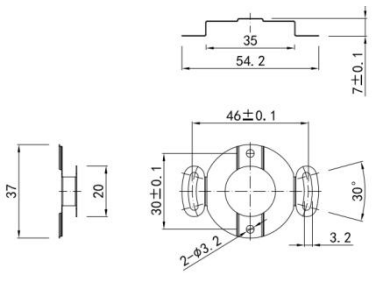


Unit: mm



= Shaft rotation direction of the signal output

Accessories

Spring plate options	Dimensions	Model
		LB-T3845
		LB-T3846

Incremental Optical Encoder **ENI38S** series

Feature

- ◆ Encoder diameter of 38mm, thickness of 28mm, standard shaft diameter of 6mm;
- ◆ Adopting non-contact photoelectric principle;
- ◆ Polarity reverse protection;
- ◆ Short circuit protection;
- ◆ Multiple electrical interfaces are available for selection;
- ◆ The maximum weekly resolution can reach 32768PPR.

Naming rules

EN	I	38	S6	—	3	—	N	1024	J	D	—	T	XXXX

- **EN** — Product category: EN: Encoder
- **I** — Encoder Type: I: Incremental
- **38** — Size of outside diameter: 38: Outside diameter 38mm
- **S6** — Axis diameter type: S6: Solid shaft diameter 6mm
- **3** — Output phase number: 3: A+B+Z; 6: A+ $\bar{A}$+ B + $\bar{B}$ + Z+ $\bar{Z}$ ①
- **N** — Electrical interface: N: OC(NPN) ②; NH: OC(NPN) ③; C: TTL(DC5V, 26LS31) ④; E=HTL (DC8-30V) ⑤
- **1024** — Resolution: 1000, 1024, 2000, 2048, 4096, 32000, 32768
- **J** — Power supply voltage: J：5V DC; H：DC 8-30V
- **D** — Protection level: None: IP50; D: IP65
- **T** — Connection method: T: Radial 1m cable; T2: Radial 2m cable; T5: Radial 5m cable
- **XXXX** — XXXX: Four digit special number

① When the output phase number is 6: A+ $\bar{A}$+ B + $\bar{B}$ + Z+ $\bar{Z}$, the electrical interface can only choose C: TTL(DC5V, 26LS31) or E: HTL (DC8-30V).

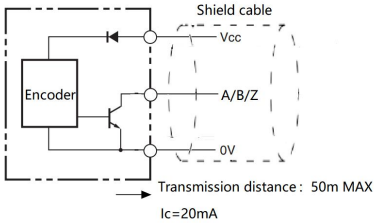
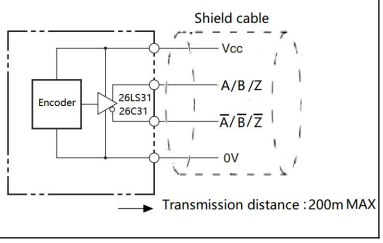
② Z signal is low level active (The recommended resolution is less than 5000PPR).

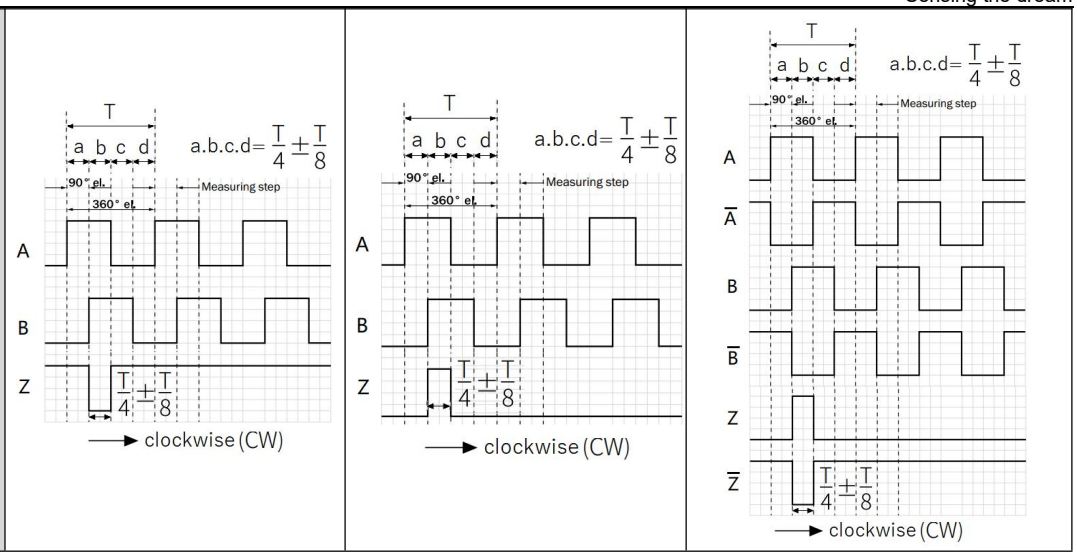
③ Z signal is high level active (The recommended resolution is less than 5000PPR).

④If the electrical interface is TTL(DC5V, 26LS31), the corresponding power supply voltage type can only be 5V DC.

⑤If the electrical interface is HTL(DC8-30V), the corresponding power supply voltage type can only be 8-30V DC.

Specification parameters

Parameter			OC(N)	OC(NH)	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			100 kHz		300 kHz	500 kHz
Output capacity	Output current	Input	≤30mA		≤±20mA	≤±50mA
		Output	—			
	Output voltage	"H"	—		≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V		≤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			90º ±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
GND			Not connect to encoder			
Diameter of shaft			φ6mm; φ8mm (D type, stainless steel material)			
Starting torque			Less than 4.4×10^{-3} N·m			
Inertia moment			Less than 1.5×10^{-6} kg·m²			
Shaft load			Radial 30N; Axial 20N			
Slew speed			≤6000 rpm(IP50); ≤4000 rpm (IP65)			
Bearing Life			$1.5X10^{9}$ revs at rated load (100000hrs at 2500RPM)			
Shell			Aluminium alloy			
Weight			about 120g			
Environmental temperature			Operating:-20～+90°C (repeatable winding cable:-10°℃); Storage: -25~+95°℃			
Environmental humidity			Operating and storage: 35~85%RH (non-condensing)			
Vibration (Endurance)			Amplitude 0.75mm, 5~55Hz, 2h for X, Y, Z direction individually			
Shock (Endurance)			490m/s²11ms three times for X, Y, Z direction individually			
Protection			IP50; IP65			
Output circuit						

Output wave form	

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

Wiring table

OC (Wiring table for cable connection)

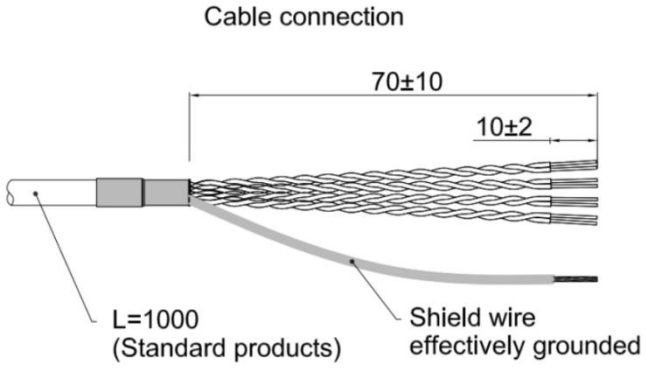
	Supply voltage		Incremental signal		
Wire color	Red	Black	White	Green	Yellow
Function	Up	0V	A	B	Z

TTL/HTL(Wiring table for cable connection)

	Supply voltage		Incremental signal					
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								

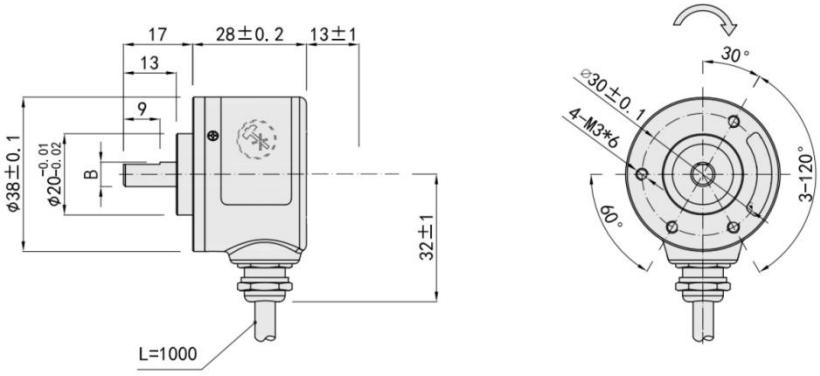
Up=Supply voltage.

Shield wire is not connected to the internal circuit of encoder.

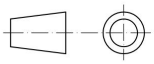


Dimensional drawing

B (D type, solid shaft)
Φ6mm

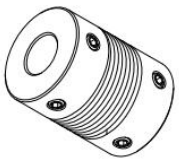
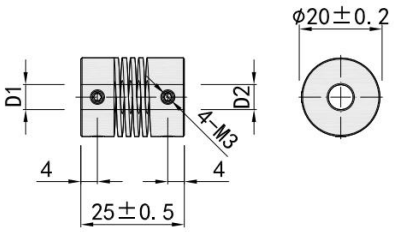
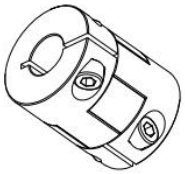
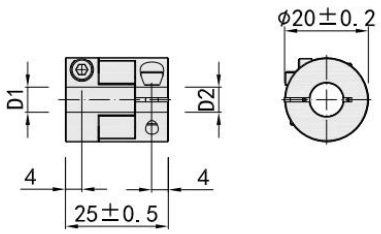


Unit: mm



= Shaft rotation direction of the signal output

Accessories

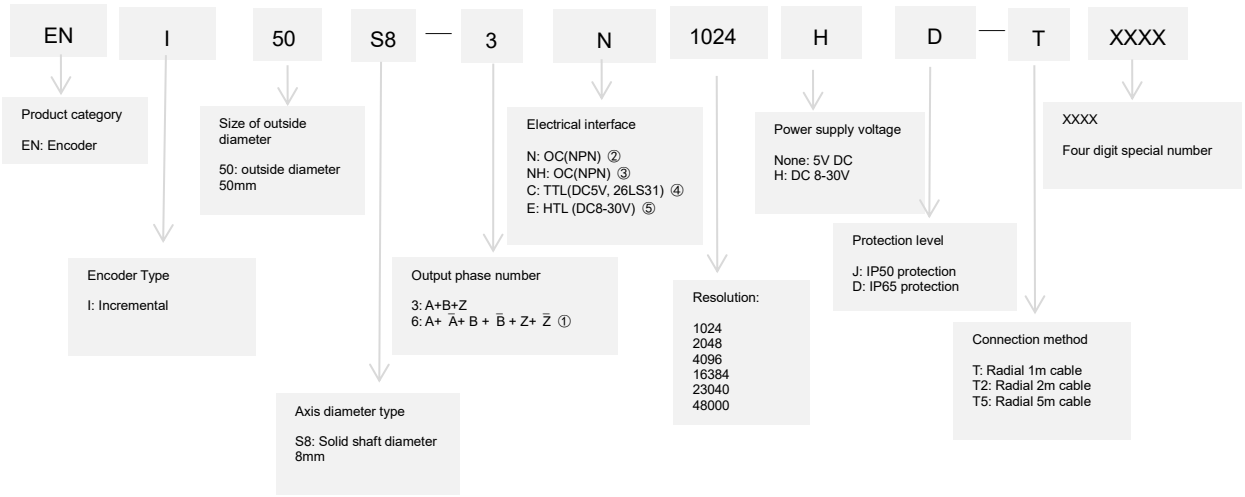
Accessories	Dimensions	D1	D2	Model
Spring type H series coupling 	 Main body material: aluminum alloy	Φ6mm	Φ6mm	LB-H0606
		Φ6mm	Φ8mm	LB-H0608
Crossover type M series coupling 	 Main body material: aluminum alloy	Φ6mm	Φ6mm	LB-M0606
		Φ6mm	Φ8mm	LB-M0608

Incremental encoder **ENI50S** series

Feature

- ◆ Encoder diameter of 50mm, thickness of 30mm, shaft diameter of 8mm (D type);
- ◆ Adopting non-contact photoelectric principle;
- ◆ Polarity reverse protection;
- ◆ Short circuit protection;
- ◆ The resolution can reach up to 48000PPR.

Naming rules



① When the output phase number is 6: A+ Ā+ B + B̄ + Z+ Z̄, the electrical interface can only choose C: TTL(DC5V, 26LS31) or E: HTL (DC8-30V).

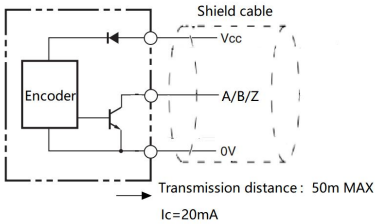
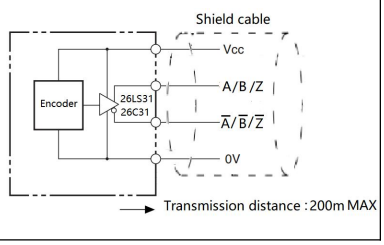
② Z signal is low level active (The recommended resolution is less than 5000PPR).

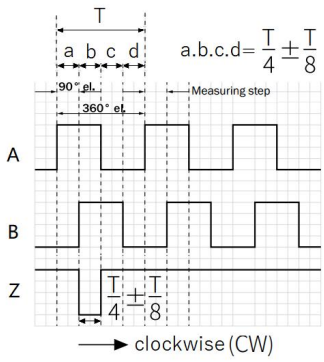
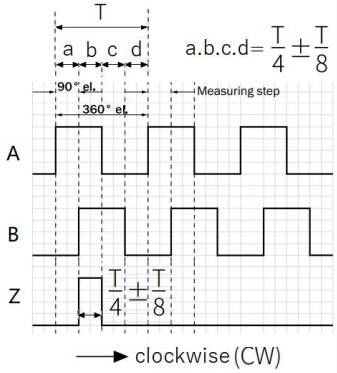
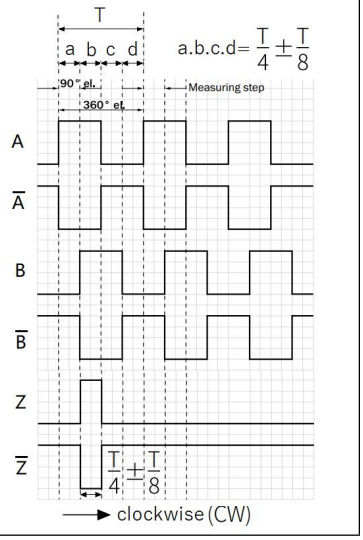
③ Z signal is high level active (The recommended resolution is less than 5000PPR).

④If the electrical interface is TTL(DC5V, 26LS31), the corresponding power supply voltage type can only be 5V DC.

⑤If the electrical interface is HTL(DC8-30V), the corresponding power supply voltage type can only be 8-30V DC.

Specification

Parameter			OC(N)	OC(NH)	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		300kHz	500kHz
Output capacity	Output current	Input	≤30mA		≤±20mA	≤±50mA
		Output	—			
	Output voltage	"H"	—		≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V		≤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			90º ±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
GND			Not connect to encoder			
Diameter of shaft			φ8mm (D type,stainless steel material)			
Starting torque			Less than 5×10^{-3}N·m			
Inertia moment			Less than 3×10^{-6}kgm²			
Shaft load			Radial 40N; Axial 20N			
Slew speed			≤6000 rpm(IP50); ≤4000 rpm (IP65)			
Bearing Life			$1.5X10^{9}$ revs at rated load (100000hrs at 2500RPM)			
Shell			Aluminium alloy			
Weight			about 190g			
Environmental temperature			Operating:-20～+90°C (repeatable winding cable:-10°℃); Storage: -25~+95°℃			
Environmental humidity			Operating and storage: 35~85%RH (non-condensing)			
Vibration (Endurance)			Amplitude 0.75mm, 5~55Hz, 2h for X, Y, Z direction individually			
Shock (Endurance)			490m/s²11ms three times for X, Y, Z direction individually			
Protection			IP50; IP65			
Output circuit						

Output wave form			

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

Wiring table

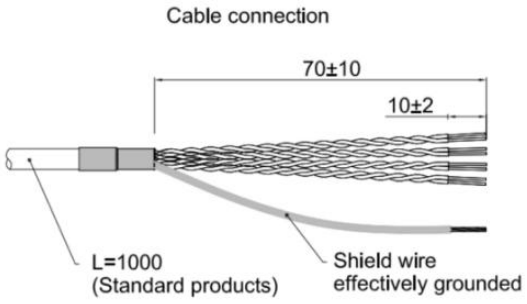
OC(Wiring table for socket and cable connection)

	Supply voltage		Incremental signal		
Wire color	Red	Black	White	Green	Yellow
Function	Up	0V	A	B	Z

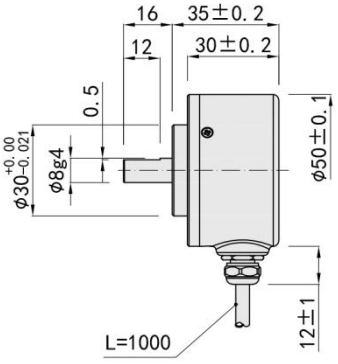
TTL/HTL(Wiring table for socket and cable connection)

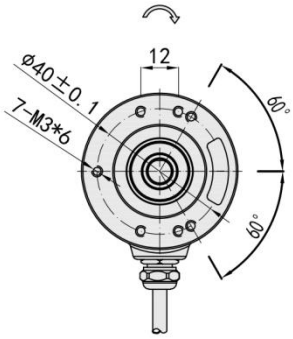
	Supply voltage		Incremental signal					
Wire color	Red	Black	White	White/ BK	Green	Green/ BK	Yellow	Yellow/ BK
Function	Up	0V	A+	A-	B+	B-	Z+	Z-
Twisted-paired cable								

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

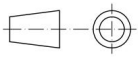


Dimensional drawing



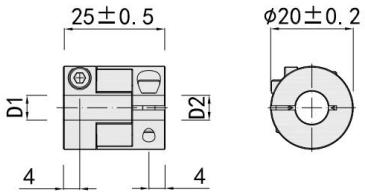
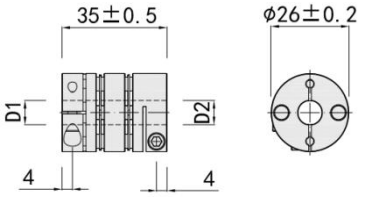


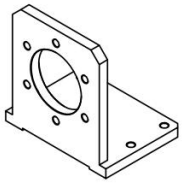
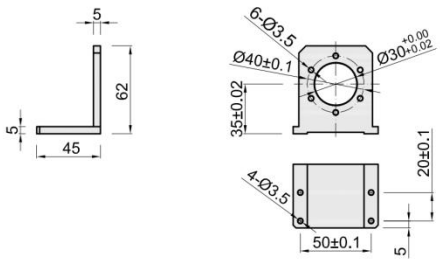
Unit: mm



= Shaft rotation direction of incremental signal output

Accessories

Coupler	Dimensions	D1	D2	Model
Cross type: M series 	 Main body material: aluminum alloy	Φ6mm	Φ8mm	LB-M0608
		Φ8mm	Φ8mm	LB-M0808
		Φ8mm	Φ10mm	LB-M0810
Diaphragm type: W series 	 Main body material: aluminum alloy	Φ6mm	Φ8mm	LB-W0608
		Φ8mm	Φ8mm	LB-W0808
		Φ8mm	Φ10mm	LB-W0810

Mounting bracket	Dimensions	Model
	 Material:aluminum alloy	LB-L5030

Incremental Optical Encoder **ENI58K** series

Feature

- ◆ Encoder diameter of 58mm, thickness of 24& 29mm, maximum shaft aperture of 22mm;
- ◆ Adopting non-contact photoelectric principle;
- ◆ Polarity reverse protection;
- ◆ Short circuit protection;
- ◆ Multiple electrical interfaces available;
- ◆ Resolution can reach up to 57600PPR.

Naming rules

EN	I	58	KB18	—	3	N	1024	H		—	T	XXXX

Product category
EN: Encoder

Encoder type
I: Incremental

Size of outside diameter
58: Outside diameter 58mm

Axis diameter type
KB12 shaft rear clamping, shaft diameter 12mm
KB18 shaft rear clamping, shaft diameter 18mm
KB20 shaft rear clamping, shaft diameter 20mm
KBQ12 shaft front clamping, shaft diameter 12mm
KBQ18 shaft front clamping, shaft diameter 18mm
KBQ20 shaft front clamping, shaft diameter 20mm

Output phase number
3: A+B+Z
6: A+ $\bar{A}$+ B + $\bar{B}$ + Z+ $\bar{Z}$ ①

Electrical interface
N: OC(NPN) ②
NH: OC(NPN) ③
C: TTL(DC5V,26LS31) ④
E: HTL (DC8-30V) ⑤

Resolution
1024
2048
4096
57600

Power supply voltage
J: 5V DC
H: DC 8-30V

Protection level
None: IP50

Connection method
T: Radial 1m cable
T2: Radial 2m cable
T5: Radial 5m cable

XXXX
Four digit special number

① When the output phase number is 6: A+ $\bar{A}$+ B + $\bar{B}$ + Z+ $\bar{Z}$, the electrical interface can only choose C: TTL(DC5V, 26LS31) or E: HTL (DC8-30V).

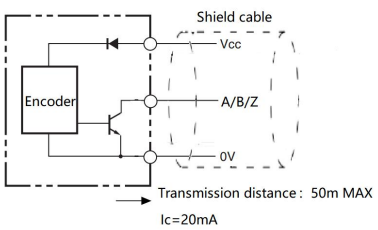
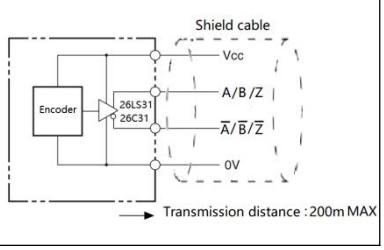
② Z signal is low level active (The recommended resolution is less than 5000PPR).

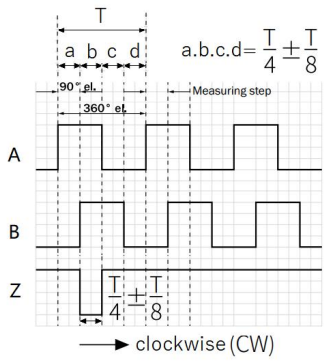
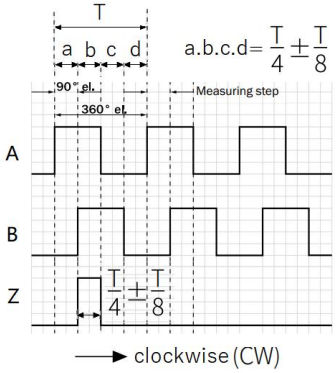
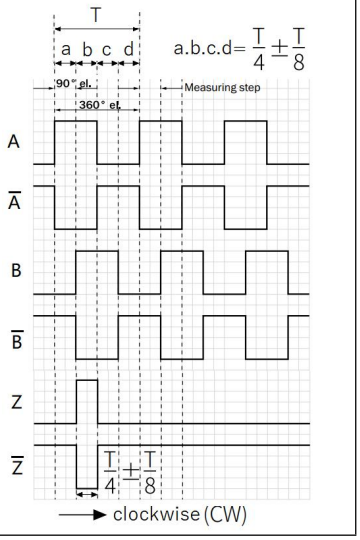
③ Z signal is high level active (The recommended resolution is less than 5000PPR).

④If the electrical interface is TTL(DC5V, 26LS31), the corresponding power supply voltage type can only be 5V DC.

⑤If the electrical interface is HTL(DC8-30V), the corresponding power supply voltage type can only be 8-30V DC.

Specification parameters

Parameter			OC(N)	OC(NH)	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		300kHz	500kHz
Output capacity	Output current	Input	≤30mA		≤±20mA	≤±50mA
		Output	—			
	Output voltage	"H"	—		≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V		≤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			—		√①	
Phase shift between A & B			90º ±10° (frequency in low speed)			
			90°±20° (frequency in high speed)			
GND			Not connect to encoder			
Diameter of shaft			φ18mm; φ20mm (optional)			
Starting torque			Less than 9.8×10^{-3} N·m			
Inertia moment			Less than 6.5×10^{-6} kg·m²			
Shaft load			Radial 50N; Axial 30N			
Slew speed			≤3000 rpm			
Bearing Life			$1.5X10^{9}$ hrs revs at rated load (100000hrs at 2500RPM)			
Shell			Aluminium alloy			
Weight			about 150g			
Environmental temperature			Operating:-20～+85°C (repeatable winding cable: -10°℃); Storage: -20~+90℃			
Environmental humidity			Operating and storage: 35~85%RH (non-condensing)			
Vibration (Endurance)			Amplitude 1.52mm, 5~55Hz, 2h for X, Y, Z direction individually			
Shock (Endurance)			980m/s² 11ms three times for X, Y, Z direction individually			
Protection			IP50			
Output circuit						

Output wave form			

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

② Phase A.B.Z are back of phase U.V.W when power on.

Wiring table

OC(Wiring table for socket and cable connection)

	Supply voltage		Incremental signal		
Wire color	Red	Black	White	Green	Yellow
Function	Up	0V	A	B	Z

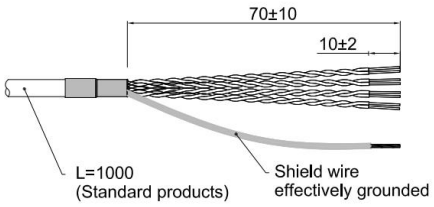
TTL/HTL(Wiring table for socket and cable connection)

	Supply voltage		Incremental signal					
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.

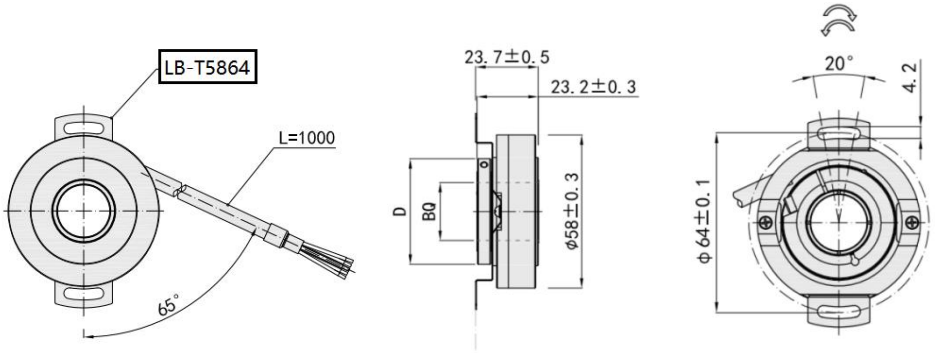
Cable connection



Dimensional drawing

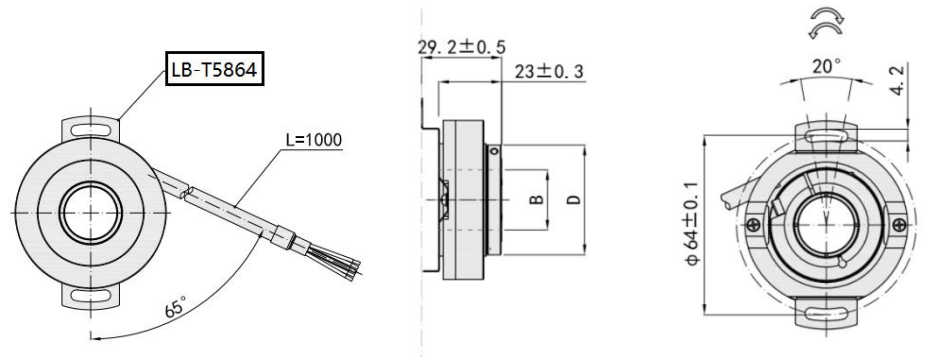
KBQ (clamping ring at prior):

BQ (Shaft)	D
Φ12	Φ35
Φ18	Φ37
Φ20	Φ41

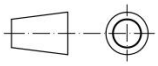


KB (clamping ring at prior):

BQ (Shaft)	D
Φ12	Φ35
Φ18	Φ37
Φ20	Φ41



Unit：mm



= Direction of shaft rotation for incremental signal output

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

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