ENCODER

(1) INCREMENTAL SHAFT ENCODER

859 Series	Data	LFA Series	Data
	·Explosion-proof pulse transmitter. ·Suitable for explosion-proof environmental. ·Tow type:explosion insulation and inherent safety.		·High resolution: 25000P/R. ·Top class output pulse 25000P/R and high speed response 750kHz with an OD of 63.5mm.
CHA-1 Series	Data	ZJE-45 Series	Data
	·Ultra-compact type and hith performance series. ·Outer size φ50×50,shaft diameter φ8×15.		·Smaller type ,general purpose encoder. ·Smaller OD of 63mm,options different disc resolution.
LBJ Series	Data	ZJE-51 Series	Data
	·Ultra-compact type and high performance series. ·Outer size φ50×50,shaft diameter φ8×15.		·Heavy duty encoder. ·Supply voltage:DC 10 30V. ·Suitable for use in a hostile environment.
LEC Series	Data	ZJE-54 Series	Data
	·Ultra-compact type and high performance aeries. ·Outer size φ50×50,shaft diameter φ8×15.		·Heavy duty encoder. ·Supply voltage:DC 10 24V. ·Suitable for use in a hostile environment

LF Series	Data	ZLF-12 Series	Data
	·The 15mm diameter shaft,accepting 49 N radial and axial loading,is capable of 6000 rpm,and has an oil ·seal.The ruggde construction ensures suitability for use in a hostile environment. ·A plug connector allows easy electrical connection and simplicity of maintenance. ·A very suitable encoder for use on machine shafts,and in heavy industry such as iron and paper mills.		·Heavy duty encoder. ·Suitable for use in a hostile environmen
ZLF-26 Series	Data	ZXB-22 Series	Data
	·Heavy duty encoder. ·Suitable for use in a hostile environmen	No image	·Heavy duty encoder. ·Suitable for use in a hostile environmen
ZVZ-9 Series	Data	ZXB-9 Series	Data
	·Miniature encoder. ·Outer size φ33.5×27.2,shaft diameter φ4.9. ·Suitable for magnetic stripe reader.		·Small standard. ·Suitable for elevator.
ZXB-21 Series	Data	ZXL-13 Series	Data
	·Ultra-compact type and high performance series. ·Outer size φ50×50,shaft diameter φ8×15.		·Suitable for Fuel Meter. ·Low price. ·Suply voltage 5 15V.

(2) INCREMENTAL HOLLON-SHAFT ENCODER

LH-S4 Series	Data	ZKT-22A Series	Data
	·Hollow coning shaft encoder. ·Outer size φ75 hollow shaft φ17(coning 1:10). ·Heat resistance, operate temperature max:+100. ·Heat antijamming capacity.		·Hollow shaft diameter of 40 mm. ·Suitable for use in a hostile environment.
LH-S6 Series	Data	ZKT-33C Series	Data
	·Hollow coning shaft encoder. ·Outer size φ70×81. 001:coning 1:10 002:coning 1:10. ·Adopt plate spring connect with user end. ·Gray code,for detecting position of the magnetic poles of an AC motors.	No image	·Hollow shaft encoder. ·Outer size φ120×51,hollow shaft diameter φ38. ·Adopt plate spring connect with user end. ·Suitable for measuring rotation speed and displacement of elevator and motor etc.
ZKD-12 Series	Data	ZKT-7 Series	Data
	·Compact and UVW signals. ·200kHz and line deiver output provide the specifications required for AC servomotors.		·Hollow shaft encoder. ·Outer size φ75×60,hollow shaft diameter φ20×14. ·Adopt plate spring connect with user end. ·Suitable for measuring rotation speed and displacement of elevator and motor etc.
ZKT-18B Series	Data	ZKX-3 Series	Data
	·Hollow shaft encoder. ·Outer size φ50×22,hollow shaft diameter φ6. Adopt plate spring connect with user end. ·Suitable for control elevator door open or shut.		·Hollow shaft diameter of 78mm. ·High response -100kHz at 7200P/R rev.maximum.
ZKT-20 Series	Data	ZKX-6A Series	Data
No image	·Hollow shaft encoder. ·Outer size φ100×43,hollow shaft diameter φ30. ·Adopt plate spring connect with user end. ·Suitable for measuring rotation speed and displacement of elevator and motor etc.		·Ultra-compact type series with an OD of 38mm and half hollow shaft diameter of deep 12mm. ·Supply voltage 5.5 30V.

(3)ABSOLUTE ENCODER

FZX-3 (3A) Series	Data
	·Absolute encoder. ·Dri-proof construction. ·Output Gray code. ·Suitable for textile machine.
FZX-4-256 Series	**Data**
	·Absolute encoder. ·Dri-proof construction. ·Output Gray code. ·Material of disc: glass or metal. ·Suitable for textile machine.
JXW-1 6 Series	**Data**
No image	·Compact absolute encoder(11 bits 14 bits). ·Index signal fixed, single-valued function, high antijamming capacity. ·Output pure binary code.
JXW-7 10 Series	**Data**
No image	Absolute encoder. Dri-proof construction. Output pure binary code or cyclical binary code.
WXJ-7 Series	**Data**
	·Compact,high antijamming capacity absolute encoder. ·Outer pure binary code. ·Type:4.6.8.12 divisions. ·Suitable for automatic tool change of NC machine rotational tool post.

(4) COMPOUND ENCODER

HZX Series	Data
	·Compound encoder. ·Output Signal include: Incremental signal section and absolute signal section .

(5) MANUAL PULSE GENERATOR ENCODER

LGF Series	Data
	·Extra-short body and light weight design pulse generator, only 21mm deep to bact of panel and weighing 270g. ·5-15V DC power supply, with standard line driver output suitable for long-distance transmission. ·Suitable applications for NC machines by providing home position and interruption signal.

(6) COUPLING (Accessories) ENCODER

BL-1 Series	Data
	·Suitable for connect with a flexible between the encoder and the revolutional shaft. ·Fasten method: keyway and double set screw.
BL-2 Series	Data
	·Suitable for connect with a flexible between the encoder and the revolutional shaft. ·Fasten method: keyway and clamp.

A-CHA SERIES

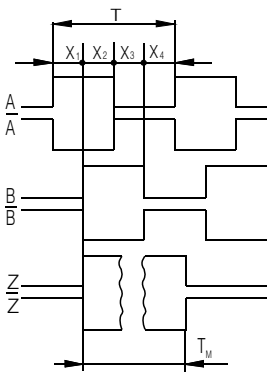
- Small standards model
- Outside diameter 38mm
- High resolution, up to 40000P/R

Explanation of model

A – CHA –□–□ B M □– □ □ □– □m – □

- Upgrade No.
- Model
- Function No.
- 1/10 output pulses per revolution
- Dual square wave in quadrature
- Index signal
- Index length (Black means 1T)
- Pulses No.:1、Glass disk：1~40000P/R
  2、metal disk ： 1~1024P/R
- Supply voltage
- Signal output mode
- Cable length (Unit:m)
- Blank: glass disk
  J : metal disk
- G:Side entry cable
  E:Rear entry cable

Output waveforms and division accuracy



Symmetry:$X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift:$X_n\geq0.125T$(n=1,2,3,4)
Accumulative angle error:≤0.2T
Pitch error:≤0.05T
T=360° /N (N is the number of A&B channel output pulses per revolution.)
Signal width of Z channel:
1、$T_M=1T\pm0.5T$
$T_M=nT\pm1T(n\geq2)$
Positional relationship of Z channel and A&B channels is not specified.
2、$T_M=0.5T\pm0.25T$
$T_M=0.25T\pm0.125T$
The rising edges of Z channel and B channel may alignment.

The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E (Voltage)	5 ± 0.25	≤60	≥3.5	≤0.5	≤500	≤100	0 ~ 300
	5~26		≥Vcc–2.5	≤0.5	≤1500	≤300	
C (Open collector)	5 ± 0.25	≤60					0 ~ 300
	5~26						
F (Complementary)	5 ± 0.25	≤60	≥3.5	≤0.8	≤300	≤200	0 ~ 300
	5~26		≥Vcc–2.5	≤1.0	≤500	≤200	
L、H(Line driver)	5 ± 0.25	≤100	≥2.5	≤0.5	≤200	≤200	0 ~ 300
J(Line driver)	5~26	≤80	≥Vcc–2.5	≤0.5	≤500	≤200	0 ~ 300
A(Line driver)	5~26	≤80	≥Vcc–2.5	≤0.8	≤800	≤200	0 ~ 300

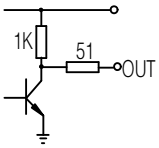
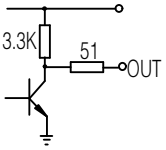
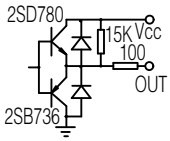
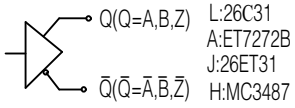
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
5000	1.5×10^{-3}	10000	20	10	4×10^{-8}	0.1

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)²	Vibration resistance (m/S)²	Construction
–30~+85	–35~+95	980(3times each in x、y、z directions, duration 6ms)	49(10~200 Hz,2 hours each in x、y、z directions)	IP54

Output circuit

<table>
<tr><td colspan="2">E(Voltage)</td><td colspan="2">F(Complementary)</td></tr>
<tr><td>5V</td><td>5V–26V</td><td>5V</td><td>5V–26V</td></tr>
<tr><td> 
</td><td> 
</td><td colspan="2"> 
</td></tr>
<tr><td>C(Open collector)</td><td rowspan="2">Line driver</td><td colspan="2" rowspan="2"> 
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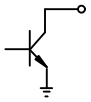
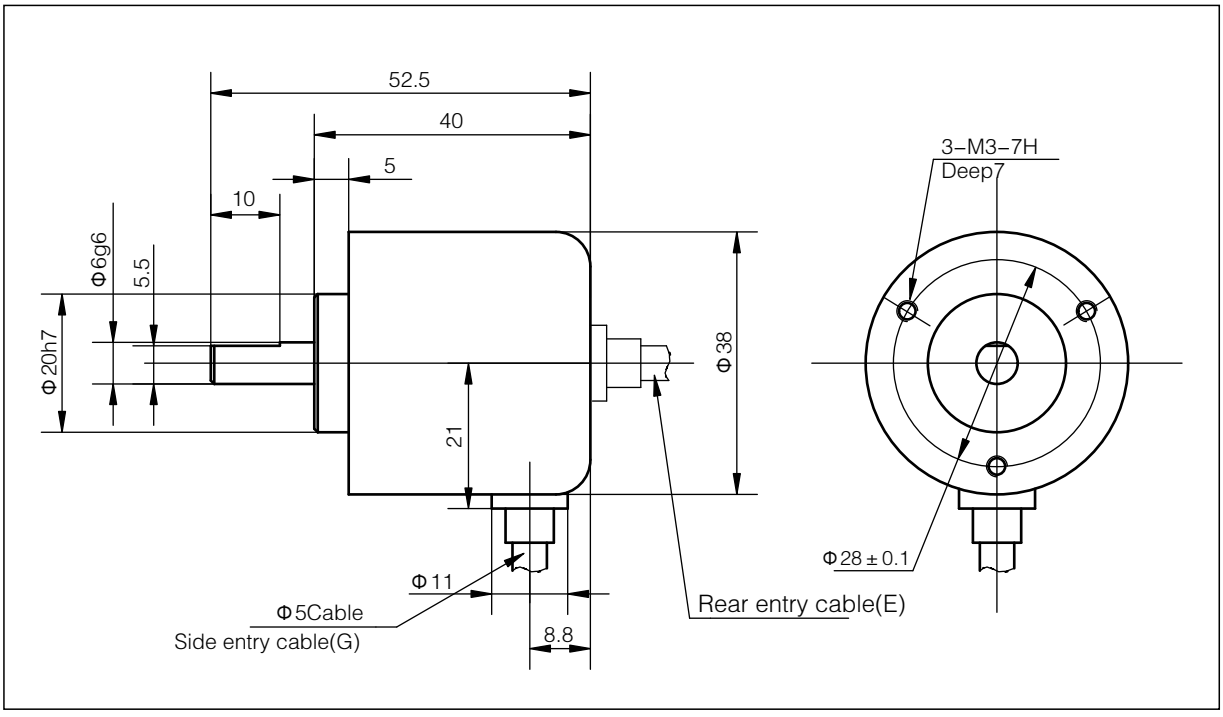
<tr><td>  </td></tr>
</table>

Connection specifications

Output \ Color	White	Black	Red	Green	Yellow	Pink	Blue	Orange	Shield
C、E、F	Vcc	OV	A	B	Z				Body
L、A、J、H	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body

External view



A–LF SERIES

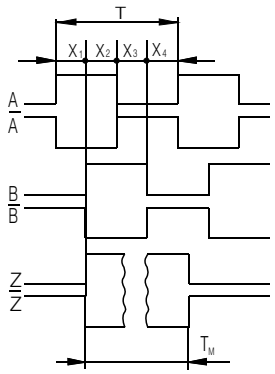
- Suitable for use in poor environments
- Drip–proof construction
- High–speed response

Explanation of model

A – LF – □ B M □ – □ □ □ □m – □

- A: Upgrade No.
- LF: Model
- □: 1/10 output pulses per revolution
- B: Dual square wave in quadrature
- M: Index signal
- □: Index length (Black means 1T)
- □: Pulses No.:Glass disk:1 ~ 8192P/R, Metal disk:1 ~ 512P/R
- □: Supply voltage
- □: Signal output mode
- □m: Cable length (Unit:m)
- □: Blank: glass disk; J : metal disk
- G:Side entry cable
- E:Rear entry cable
- C:Side entry plug
- R:Rear entry plug

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing encoder shaft.

Symmetry:$X_1+X_2=0.5T \pm 0.1T$
$X_2+X_3=0.5T \pm 0.1T$
Phase shift:$X_n \geqslant 0.125T$(n=1,2,3,4)
Division accuracy of signal:
Accumulative angle error$\leqslant$0.2T
Pitch error$\leqslant$0.05T
Signal width of Z channel:
$T_M=1T \pm 0.5T$
Positional relationship of Z channel and A&B channels is not specified.
$T_M=0.5T \pm 0.25T$
$T_M=0.25T \pm 0.125T$
The rising edges of Z channel and B channel may alignment.
T=360° /N
(N is the number of A&B channel output pulses per revolution)

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5 ± 0.25	⩽60	⩾3.5	⩽0.5	⩽500	⩽100	0 ~ 300
	8~30		⩾Vcc–2.5	⩽0.5	⩽1500	⩽300	
C(Open collector)	5 ± 0.25	⩽60					0 ~ 300
	8~30						
F(Complementary)	5 ± 0.25	⩽60	⩾3.5	⩽0.8	⩽300	⩽200	0 ~ 300
	8~30		⩾Vcc–2.5	⩽1.0	⩽500	⩽200	
L、P、DS、HK(Line driver)	5 ± 0.25	⩽100	⩾2.5	⩽0.5	⩽200	⩽200	0 ~ 300
J(Line driver)	10~26	⩽80	⩾Vcc–2.5	⩽0.5	⩽500	⩽200	0 ~ 300
A(Line driver)	10~30	⩽80	⩾Vcc–2.5	⩽0.8	⩽500	⩽200	0 ~ 300
M(Line driver)	5~15	⩽80	⩾Vcc–2.5	⩽0.5	⩽500	⩽200	0 ~ 300
N(Double complementary)	8~30	⩽200	⩾Vcc–2.5	⩽1.0	⩽500	⩽200	0 ~ 300

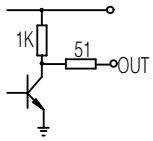
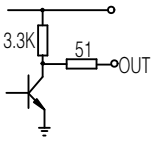
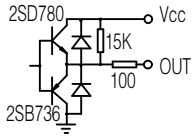
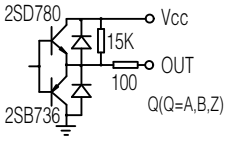
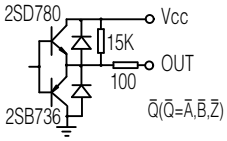
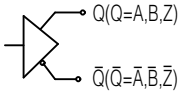
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
6000	5×10^{-2}	50	50	1.3×10^{-5}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance (m/S)²	Shock resistance (m/S)²	Construction	
–20~+85	–30~+95	100(50~2000 Hz 2hours each in x、y、z directions)	980(3times each in x、y、z directions, duration 6ms)	Model C、R	Model G、E
				IP65	IP54

Output circuit

E(Voltage)		F(Complementary)		N(Double complementary)
5V	8V–30V	5V	8V–30V	8V–30V
				 
C(Open collector)	Line driver			
	 L:26LS31 A:ET7272B J:26ET31 M:88C30 P:75183 D:75113 H:3487 K:75114 S:55113			

Connection specifications

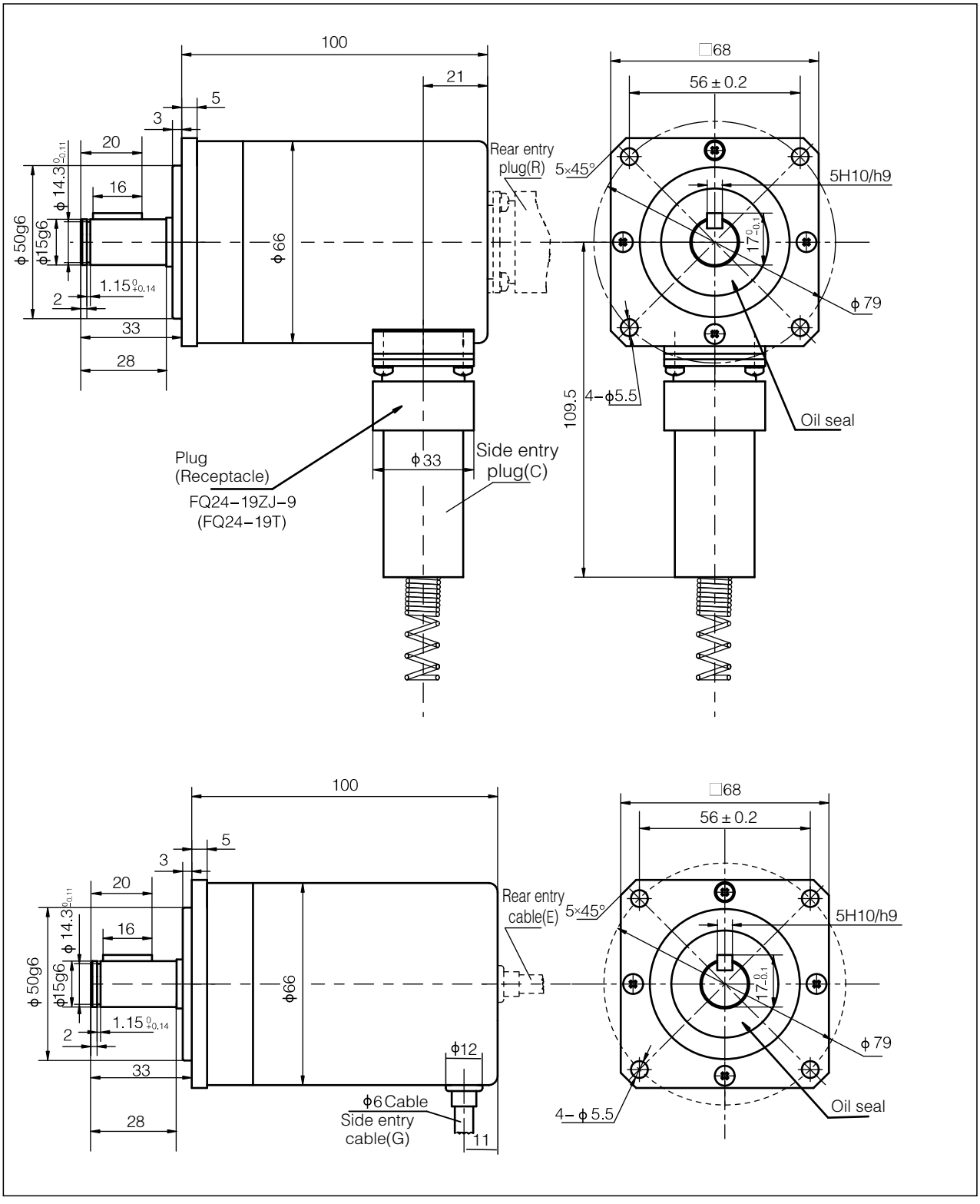
G:Side entry cable E:Rear entry cable

Output \ Color	White	Black	Red	Green	Yellow	Violet	Grey	Pink	Shield
C、E、F	Vcc	OV	A	B	Z				Body
L、P、D、J、A、M、N、H、K、S	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body

C:Side entry plug R:Rear entry plug

Output \ Pin	1	2	3	8	10	12	13	14	15	17
C、E	A	Z	B	Vcc	OV	OV				Body
L、P、D、J、A、M、N、H、K、S	A	Z	B	Vcc	OV	OV	$\overline{A}$	$\overline{Z}$	$\overline{B}$	Body
F	A	Z	B	Vcc	OV	OV	OV	OV	OV	Body

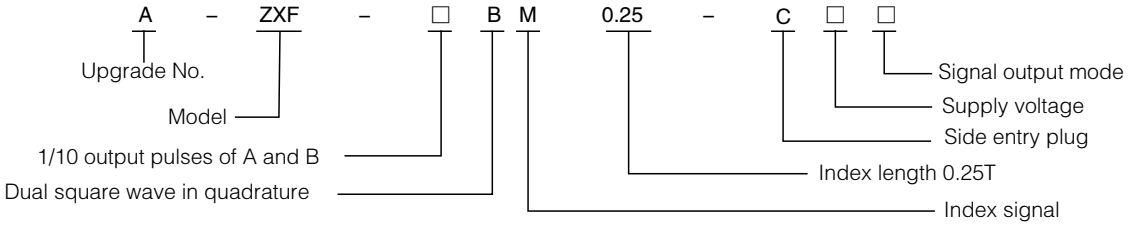
External view



A–ZXF

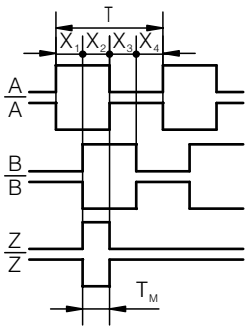
- Reinforced input shaft
  Shat diameter: 15mm
  Slew speed: 6000r/min
- Low–cost
- Suitable for use in poor environments

Explanation of model



Pulses No.：960、983、1000、1016、1024、1056、1080、1152、1200、1250、1257、1270、1280P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry:
$X_1+X_2=0.5T \pm 0.1T$
$X_3+X_4=0.5T \pm 0.1T$
Phase shift:
$X_n \geqslant 0.125T$
n=(1,2,3,4)
Division accuracy of signals:
Accumulative angle error: ⩽0.2T
Pitch error: ⩽0.05T
Signal width of Z channel:
$T_M=0.25T \pm 0.125T$
T=360° /N
(N is the number of A&B channel output pulses per revolution.)

Electrical specifications

Code	Supply voltage DC(V)	Current requirement (mA)	Output mode	Output voltage(V)		Sink current	Min. Load resistance	Rise time	Fall time	Frequency response (kHz)
				V_H	V_L	(mA)	(Ω)	(ns)		
05E	5 ± 0.25	⩽100	E(Voltage)	⩾3.5	⩽0.5			⩽500	⩽100	0~102.4
05C	5 ± 0.25	⩽100	C(Open collector)			⩽40				0~102.4
05F	5 ± 0.25	⩽100	F(Complementary)	⩾3.5	⩽0.8		500	⩽300	⩽200	0~102.4
05L	5 ± 0.25	⩽150	Line driver(AM26LS31)	⩾2.5	⩽0.5			⩽200	⩽200	0~102.4
8~30E	8~30	⩽100	E(Voltage)	⩾Vcc–2.5	⩽0.5			⩽1500	⩽300	0~102.4
8~30C	8~30	⩽100	C(Open collector)			⩽40				0~102.4
8~30F	8~30	⩽100	F(Complementary)	⩾Vcc–2.5	⩽1		500	⩽500	⩽200	0~102.4

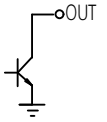
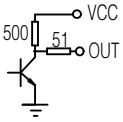
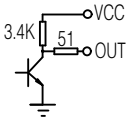
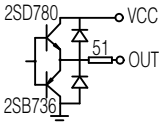
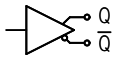
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
6000	5×10^{-2}	10000	50	50	6.5×10^{-6}	Approx0.35

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$	Construction
–30~+70	–40~+80	980(3times each in x、y、z directions, duration 6ms)	98(10~200Hz 2hours each in x、y、z directions)	IP65

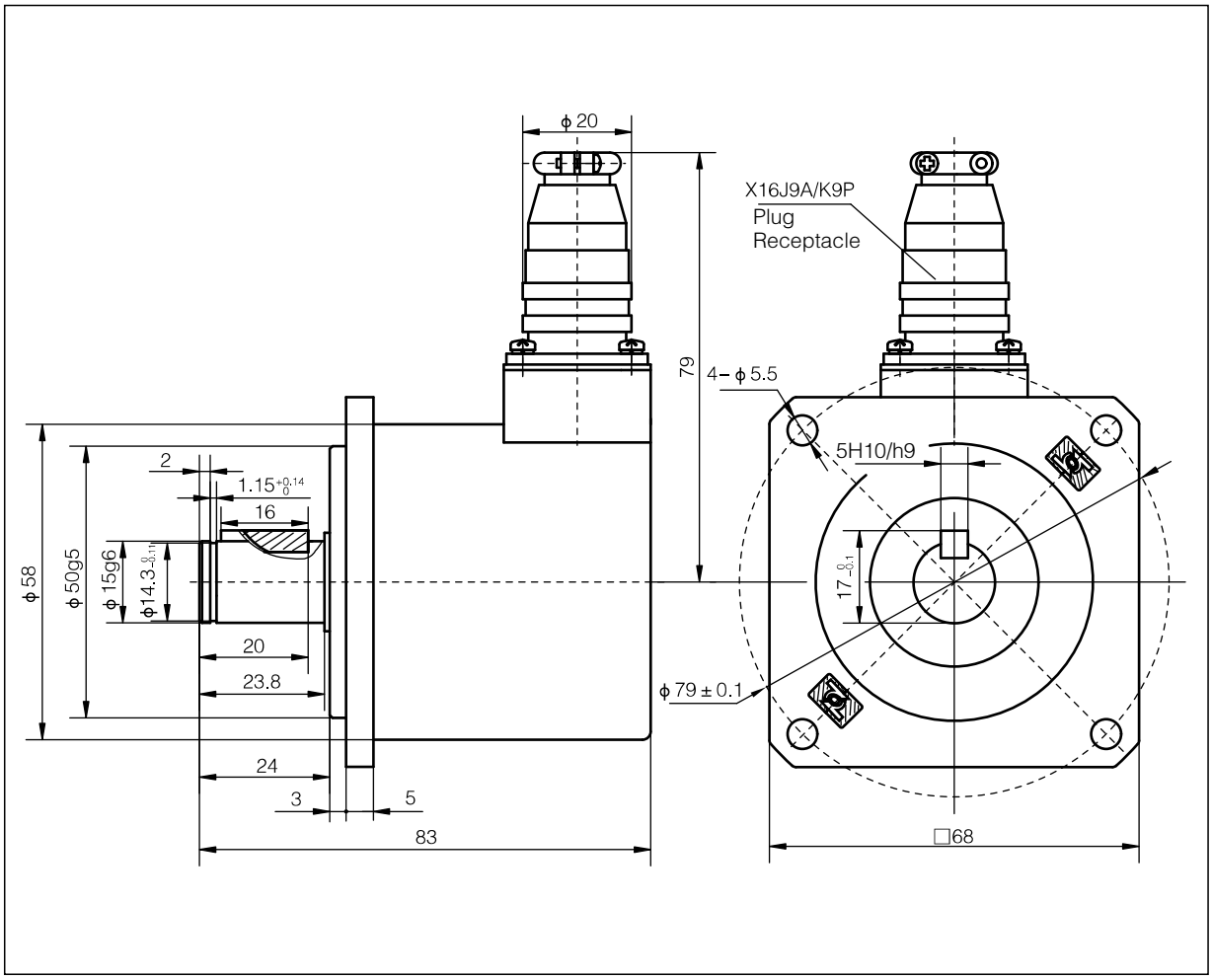
Output circuit

Output	Open collector	E(Voltage)		F(Complementary)	Line driver
	05C、8~30C	05E	8~30E	05F、8~30F	05L
Circuit					 AM26LS31

Connection specifications

Line dirver	Pin	1	2	3	4	5	6	7	8	9
	Signal	Vcc	Z	B	OV	A	$\overline{B}$	$\overline{A}$	$\overline{Z}$	Shield
Others	Pin	1	2	3	4	5	6	7	8	9
	Signal	Vcc	Z	B	OV	A				Shield

External view



A-ZJE-38 SERIES

Incremental Shaft Encoders

- Heavy duty having shaft diameter 8 mm
- Low-cost

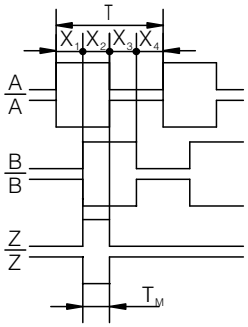
Explanation of model

A-ZJE - 38 - □ B M 0.25 - C □ □

- Upgrade No.
- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Index signal length 0.25T
- Side entry plug
- Supply voltage
- Signal output mode

Pulses No.: 960、983、1000、1016、1024、1056、1080、1152、1200、1250、1257、1270、1280P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry:
$X_1+X_2=0.5T\pm0.1T$
$X_3+X_4=0.5T\pm0.1T$
Phase shift:
$X_n\geqslant0.125T$
n=(1,2,3,4)
Division accuracy of signal:
Accumulative angle error: ≤0.2T
Pitch error: ≤0.05T
Signal width of Z channel:
$T_M=0.25T\pm0.125T$
T=360° /N
(N is the number of A&B channel output pulses per revolution.)

Electrical specifications

Code	Supply voltage DC(V)	Current requirement (mA)	Output mode	Output voltage(V)		Sink current (mA)	Min. load resistance (Ω)	Rise time	Fall time	Frequency response (kHz)
				V_H	V_L			(ns)		
05E	5±0.25	≤100	E(Voltage)	≥3.5	≤0.5			≤500	≤100	0~102.4
05C	5±0.25	≤100	C(Open collector)			≤40				0~102.4
05F	5±0.25	≤100	F(Complementary)	≥3.5	≤0.8		500	≤300	≤200	0~102.4
05L	5±0.25	≤150	Line driver(AM26LS31)	≥2.5	≤0.5			≤200	≤200	0~102.4
8~30E	8~30	≤100	E(Voltage)	≥Vcc-2.5	≤0.5			≤1500	≤300	0~102.4
8~30C	8~30	≤100	C(Open collector)			≤40				0~102.4
8~30F	8~30	≤100	F(Complementary)	≥Vcc-2.5	≤1		500	≤500	≤200	0~102.4

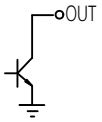
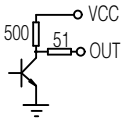
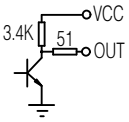
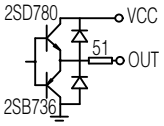
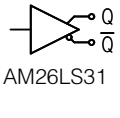
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
6000	2×10^{-3}	10000	40	30	4×10^{-6}	0.3 (No cable)

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$	Construction
–30~+70	–40~+80	980(3times each in x、y、z directions, duration 6ms)	98(10~200Hz 2hours each in x、y、z directions)	IP54

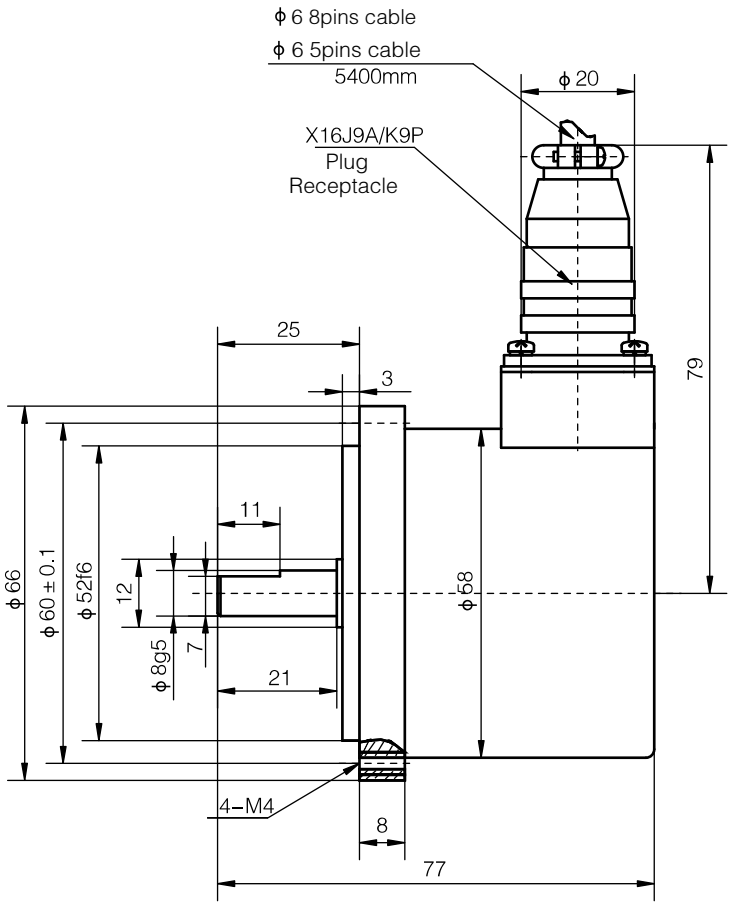
Output circuit

Output	Open collector	E(Voltage)		F(Complementary)	Line driver
	05C、8~30C	05E	8~30E	05F、8~30F	05L
Circuit					 AM26LS31

Connection specifications

Line driver	Pin	1	2	3	4	5	6	7	8	9
	Signal	Vcc	Z	B	OV	A	$\overline{B}$	$\overline{A}$	$\overline{Z}$	Shield
Others	Pin	1	2	3	4	5	6	7	8	9
	Signal	Vcc	Z	B	OV	A				Shield

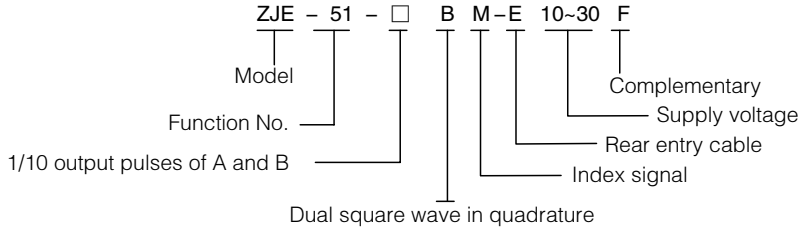
External view



ZJE-51 SERIES

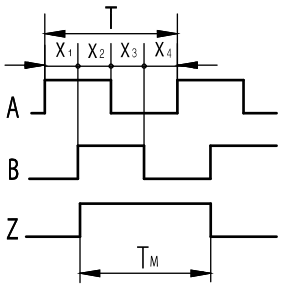
- Suitable for use in poor environments
- Standardized complementary output

Explanation of model



Pulses No.: 6P/R~5400P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry:
$X_1+X_2=0.5T\pm0.1T$
$X_3+X_4=0.5T\pm0.1T$
Phase shift:
$X_n\geqslant0.125T$
n=(1,2,3,4)
Division accuracy of signals:
Accumulative angle error: $\leqslant0.1T$
Pitch error: $\pm0.01T$
Signal width of Z channel:
$T_M=1T\pm0.5T(N\leqslant500)$
$T_M=1°\ \pm30'\ (N>500)$
T=360° /N
(N is the number of A&B channel output pulses per revolution.)

Electrical specifications

Current requirement (mA)	Supply voltage DC(V)	Output voltage(V)		Rise/Fall time	Frequency response (kHz)	Insulation impedance (MΩ)
		V_H	V_L			
=70	10~30	⩾Vcc–2.5	⩽1	<3	0~100	⩾50(AC500V50/ 60Hz1 min.)

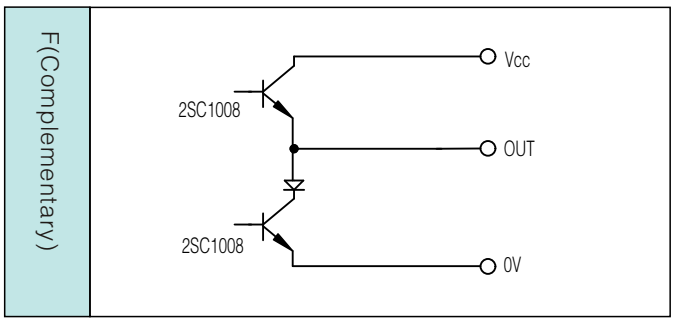
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration ($(rad/s)^2$)
		Radial (N)	Axial (N)		
5000	1×10^{-2}	100	50	1×10^{-5}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction	Weight (kg)
–10~70	–25~+85	49(10–200Hz 2 hours each in x,y,z directions)	980(3times each in x、y、z directions, duration 16ms)	IP65	Approx0.65 (No Cable)

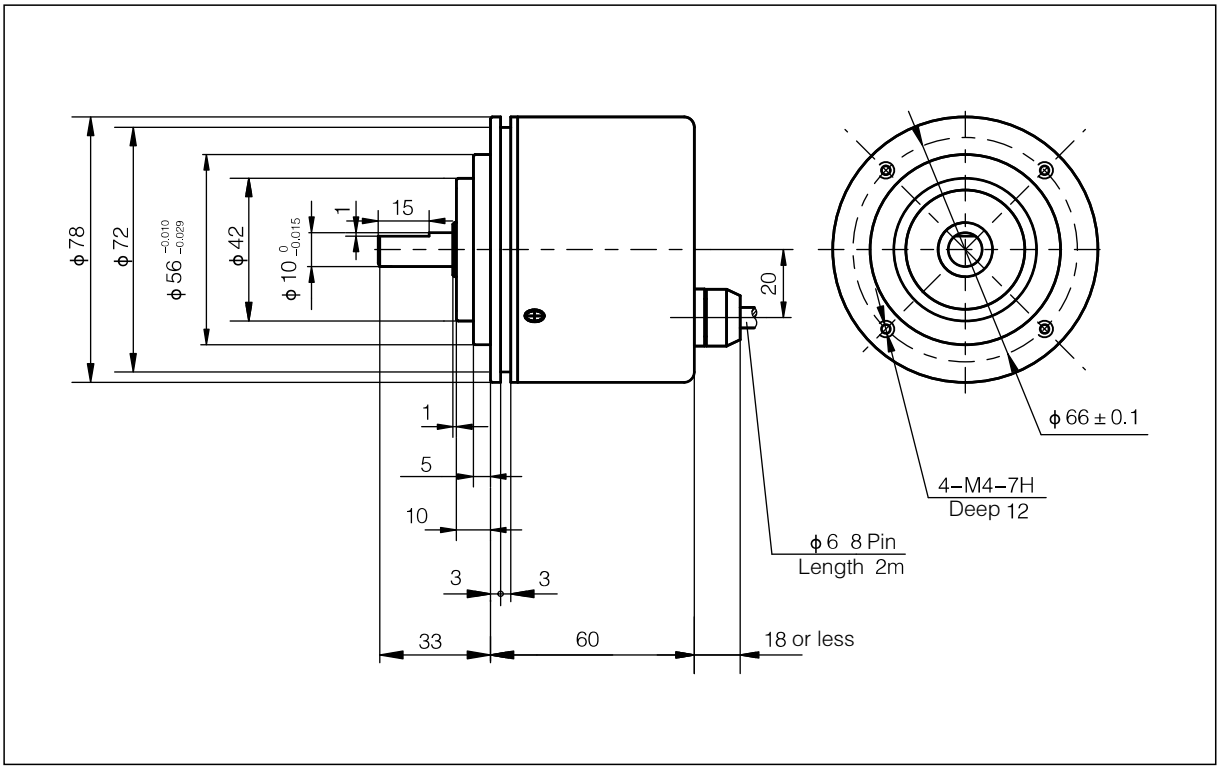
Output circuit



Connection specifications

Color	Red	Black	Green	White	Yellow	Shield
Signal	10~30V	OV	A	B	Z	Body

External view



ZJE-89 SERIES

Incremental Shaft Encoders

- High resolution, up to 8192P/R.
- Drip–proof construction

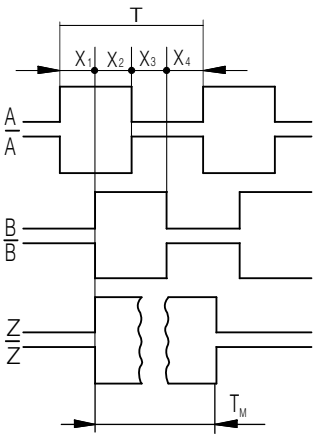
Explanation of model

ZJE－89 － □ B M □ － G □ □ － □m － □

- Model
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Index length (Black means 1T)
- Blank: glass disk
- J : metal disk
- Cable length (Unit: m)
- Signal output mode
- Supply voltage
- Side entry cable

Pulses No.(P/R)：Glass disk:1~8192
Metal disk:1~1024

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry: $X_1+X_2=0.5T\pm0.1T$ $X_3+X_4=0.5T\pm0.1T$
Phase shift: $X_n\geqslant0.125T$ n=(1,2,3,4)
Division accuracy of signals:
Accumulative angle error ⩽0.2T
Pitch error⩽0.05T
Signal width of Z channel:
1、$T_M=1T\pm0.5T$
$T_M=nT\pm1T(n\geqslant2)$
Positional relationship of Z channels and A&B channels is not specified.
2、$T_M=0.5T\pm0.25T$
$T_M=0.25T\pm0.125T$
The rising edges of Z channel and B channel may alignment.
T=360° /N (N is the number of A&B channel output pulses per revolution.)

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5±0.25	⩽60	⩾3.5	⩽0.5	⩽500	⩽100	0~300
	8~26		⩾Vcc−2.5	⩽0.5	⩽1000	⩽300	
C(Open collector)	5±0.25	⩽60	/	/	/	/	0~300
	8~30						
F(Complementary)	5±0.25	⩽60	⩾3.5	⩽0.5	⩽300	⩽200	0~300
	8~30		⩾Vcc−2.5	⩽1.0	⩽500	⩽200	
L(Line driver)	5±0.25	⩽100	⩾2.5	⩽0.5	⩽200	⩽200	0~300
J(Line driver)	8~30	⩽80	⩾Vcc−2.5	⩽0.5	⩽500	⩽200	0~300
A(Line driver)	8~30	⩽80	⩾Vcc−2.5	⩽0.5	⩽800	⩽200	0~300
M(Line driver)	5~15	⩽80	⩾Vcc−2.5	⩽0.5	⩽500	⩽200	0~300

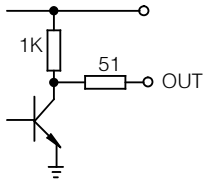
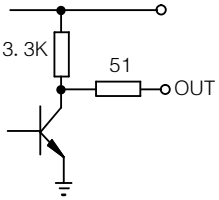
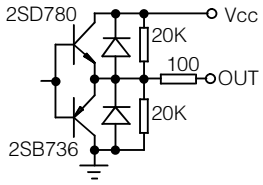
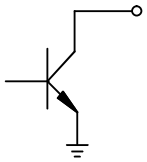
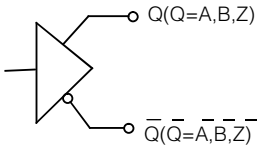
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Moment of inertia (kgm^2)	Max. allowable load		Allowable input angle acceleration (rad/s^2)
			Radial (N)	Axial (N)	
6000	5×10^{-2}	1.5×10^{-6}	50	30	1×10^{4}

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$	Construction
–30~+85	– 40 ~ + 95	500(3times each in x、y、z directions, duration 6ms)	100(50~2000Hz 2hours each in x、y、z directions)	IP65

Output circuit

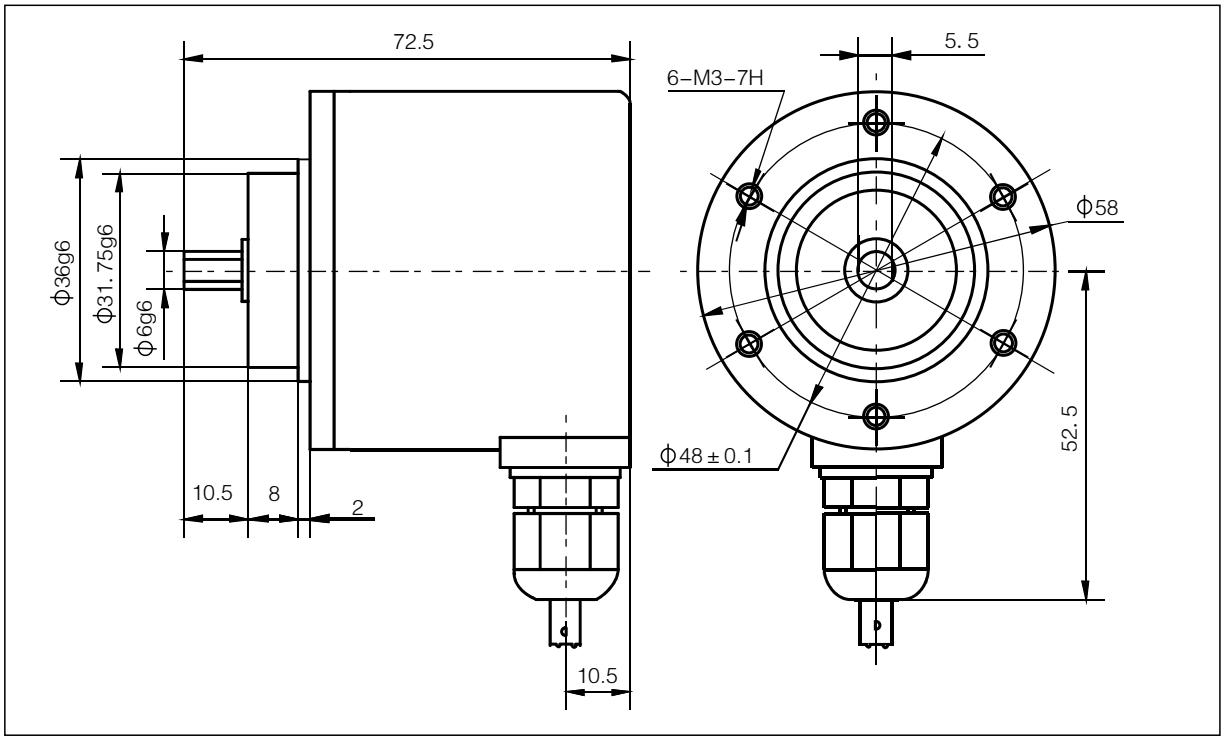
<table>
<tr><td colspan="2">E(Voltage)</td><td colspan="2">F(Complementary)</td></tr>
<tr><td>5V</td><td>8~30V</td><td>5V</td><td>8~30V</td></tr>
<tr><td> 
</td><td> 
</td><td colspan="2"> 
</td></tr>
<tr><td colspan="2">C(Open collector)</td><td colspan="2">Line driver</td></tr>
<tr><td colspan="2">  </td><td colspan="2"> 

L:26C31
A:ET7272B
J:26ET31
M:MM88C30</td></tr>
</table>

Connection specifications

Color	White	Black	Red	Green	Yellow	Pink	Blue	Orange	Shield
C、E、F	Vcc	OV	A	B	Z	—	—	—	Body
L、J、A、M	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body

External view



A-ZXB-21 SERIES

- Drip-proof construction
- High-speed response

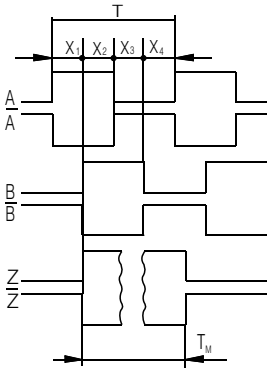
Explanation of model

A – ZXB-21- □ B M □ – E □ □ – □m – □

- Upgrade No. A
- Model ZXB-21
- Function No. 21
- 1/10 output pulses of A and B □
- Dual square wave in quadrature B
- Index signal M
- Index length (Black means 1T) □
- Rear entry cable E
- Supply voltage □
- Signal output mode □
- Cable length (Unit: m) □m
- Blank: glass disk / J : metal disk □

Pulses No.:1、Glass disk：1~40000P/R
2、Metal disk：1~1024P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry:$X_1+X_2=0.5T \pm 0.1T$
$X_2+X_3=0.5T \pm 0.1T$
Phase shift:$X_n \geq 0.125T$(n=1,2,3,4)
Accumulative angle error:≤0.2T
Pitch error:≤0.05T
T=360° /N (N is the number of A&B channel output pulses per revolution.)
Signal width of Z channel:
1、$T_M=1T \pm 0.5T$
$T_M=nT \pm 1T(n \geq 2)$
Positional relationship of Z channels and A&B channels is not specified.
2、$T_M=0.5T \pm 0.25T$
$T_M=0.25T \pm 0.125T$
The rising edges of Z channel and B channel may alignment.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5 ± 0.25	≤60	≥3.5	≤0.5	≤500	≤100	0 ~ 300
	5~26		≥Vcc-2.5	≤0.5	≤1500	≤300	
C(Open collector)	5 ± 0.25	≤60					0 ~ 300
	5~26						
F(Complementary)	5 ± 0.25	≤60	≥3.5	≤0.8	≤300	≤200	0 ~ 300
	5~26		≥Vcc-2.5	≤1.0	≤500	≤200	
L、H(Line driver)	5 ± 0.25	≤100	≥2.5	≤0.5	≤200	≤200	0 ~ 300
J(Line driver)	5~26	≤80	≥Vcc-2.5	≤0.5	≤500	≤200	0 ~ 300
A(Line driver)	5~26	≤80	≥Vcc-2.5	≤0.8	≤800	≤200	0 ~ 300

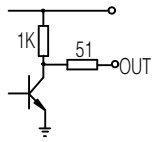
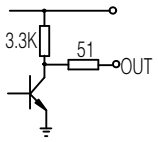
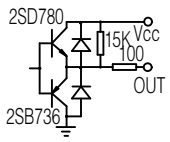
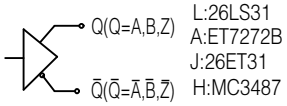
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
5000	1.5×10^{-2}	10000	50	30	4×10^{-7}	0.2

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$	Construction
–30~+85	–40~+100	980(3times each in x、y、z directions, duration 6ms)	49(10~200Hz 2hours each in x、y、z directions)	IP65

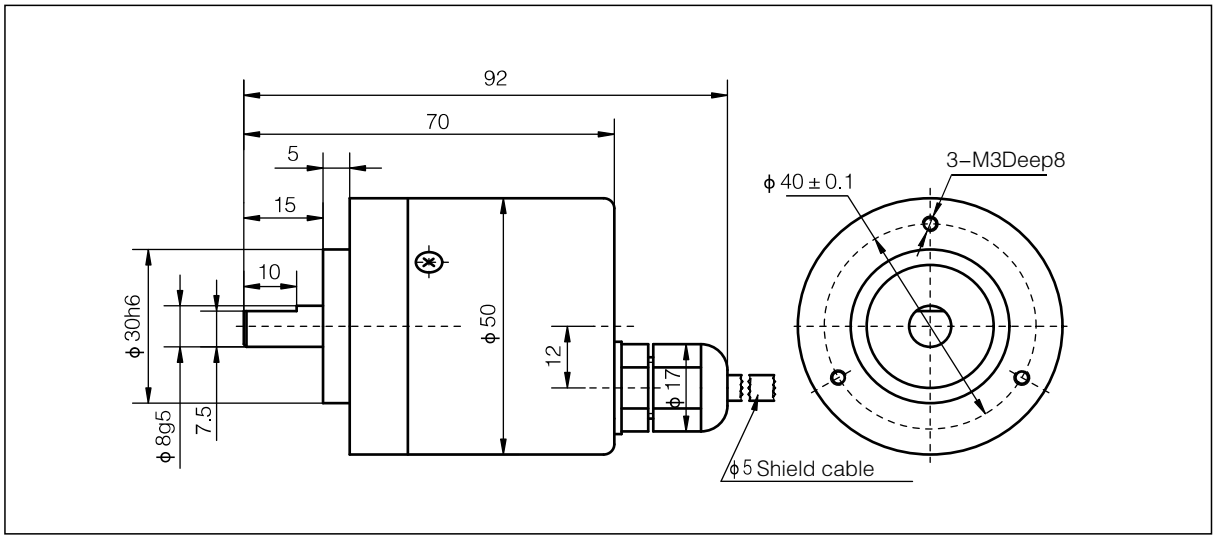
Output circuit

<table>
<tr><td colspan="2">E(Voltage)</td><td colspan="2">F(Complementary)</td></tr>
<tr><td>5V</td><td>5V–26V</td><td>5V</td><td>5V–26V</td></tr>
<tr><td> 
</td><td> 
</td><td colspan="2"> 
</td></tr>
<tr><td>C(Open collector)</td><td rowspan="2">Line driver</td><td colspan="2" rowspan="2"> 
</td></tr>
<tr><td>  </td></tr>
</table>

Connection specifications

Output \ Color	White	Black	Red	Green	Yellow	Pink	Blue	Orange	Shield
E、C、F	Vcc	OV	A	B	Z				Body
L、A、J、H	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body

External view



A–LFA SERIES

- Number of output pulses:80000 and response of 3.5mHz
- Heavy duty having shaft diameter 8 mm and drip–proof construction
- Line driver output available for long–distance transmission

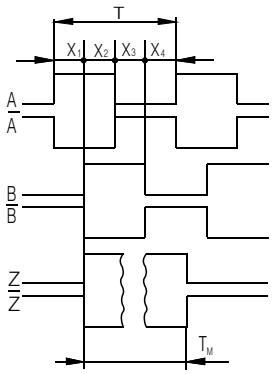
Explanation of model

A LFA – □ B M □–G □ □– □m –□

- A: Upgrade No.
- LFA: Model
- □: 1/10 output pulses of A and B
- B: Dual square wave in quadrature
- M: Index signal
- □: Index length (Black means 1T)
- G: Side entry cable
- □: Supply voltage
- □: Signal output mode
- □m: Cable length (Unit:m)
- □: Blank: glass disk, J : metal disk

Pulses No.:Glass disk:1 ~ 80000P/R
Metal disk:1 ~ 2500P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry:$X_1+X_2=0.5T \pm 0.1T$
$X_2+X_3=0.5T \pm 0.1T$
Phase shift:$X_n \geq 0.125T$(n=1,2,3,4)
Accumulative angle error:≤0.2T(8192P/R or less)
≤0.5T(8192P/R more than)
Pitch error:≤0.05T
T=360° /N (N is the number of A&B channel output pulses per revolution)
Signal width of Z channel:
1、$T_M=1T \pm 0.5 \pm$
$T_M=nT \pm 1T(n \geq 2)$
Positional relationship of Z channel and A&B channels is not specified.
2、$T_M=0.5 \pm 0.25T$
$T_M=0.25T \pm 0.125T$
The rising edges of Z channel and B channel may alignment.
Note:8192P/R upward (No 8192), the width of T_M only 0.25T.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (mHz)
			V_H	V_L			
L(Line driver)	5 ± 0.25	≤100	≥2.5	≤0.5	≤200	≤200	0 ~ 3.5

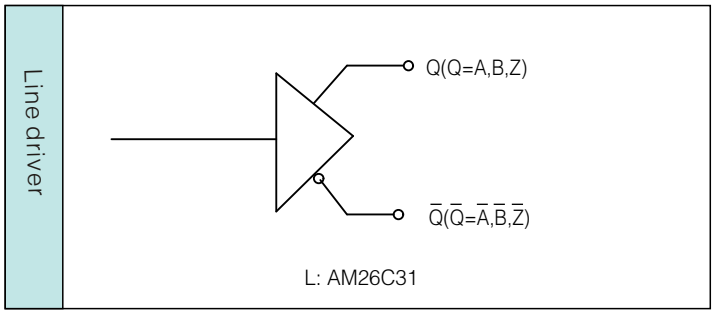
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
6000	4×10^{-2}	50	30	2.8×10^{-6}	10000

■ Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance (m/S)²	Shock resistance (m/S)²	Construction
–30~+85	–40~+95	100(50~2000Hz 2hours each in x、y、z directions)	500(3times each in x、y、z directions, duration 6ms)	IP65(Body) IP52(Bearing)

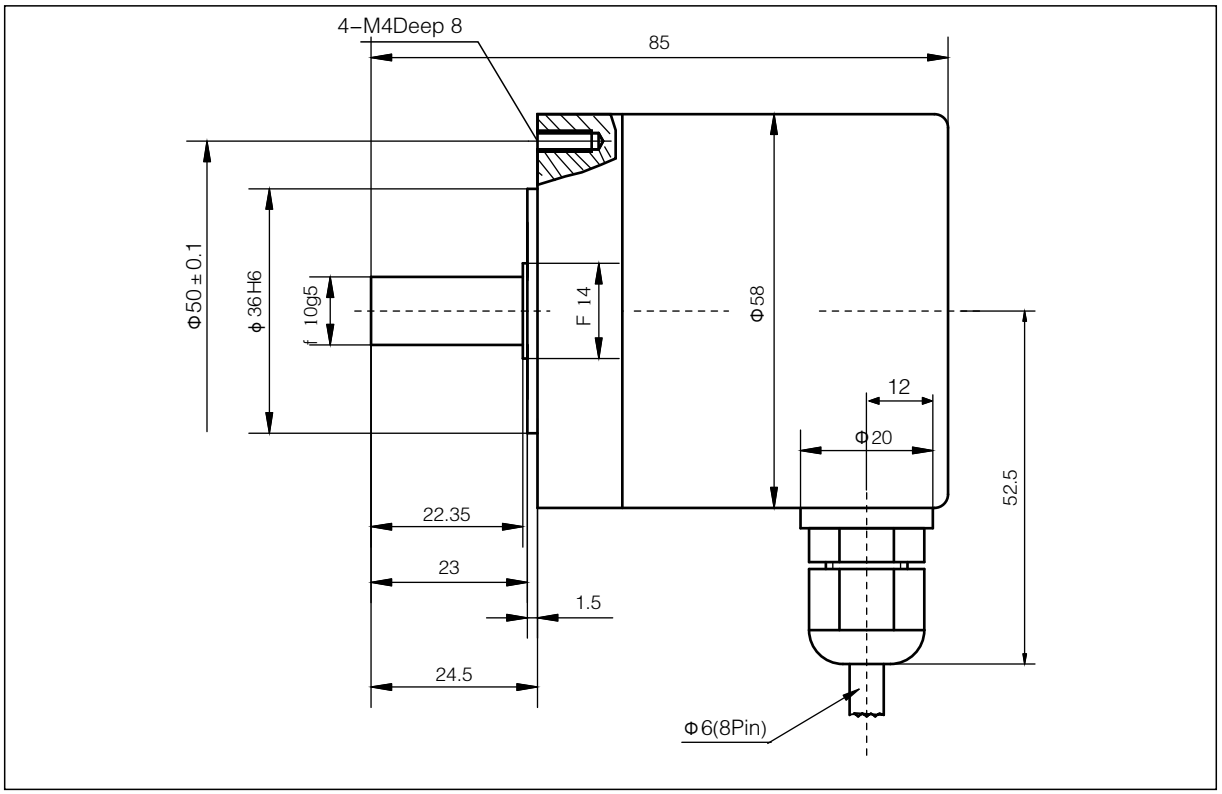
■ Output circuit



■ Connection specifications

Output \ Color	White	Black	Red	Green	Yellow	Violet	Grey	Pink	Shield
05L	+5V	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body

■ External view



ZGD

SERIES

- High slew speed up to 15000r/min
- Most suitable for High slew speed main shaft motor

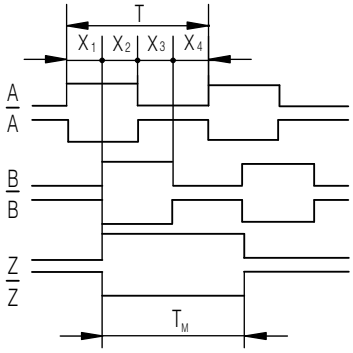
Explanation of model

ZGD – □ B M – G 05 L – □m

- Model
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Side entry cable
- Supply voltage
- Line driver
- Cable length (Unit: m)

Pulses No.(P/R)：1024

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry：$X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift：$X_n\geqslant0.125T$（n=1，2，3，4）
Signal width of Z channel：$T_M=1T\pm0.5T$
Accumulative angle error≤0.2T
Pitch error≤0.1T
T=360°/N
（N is the number of A&B channel output pulses per revolution.）

Electrical specifications

Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
		V_H	V_L			
5±0.25	≤80	≥2.5	≤0.5	≤200	≤200	0~500

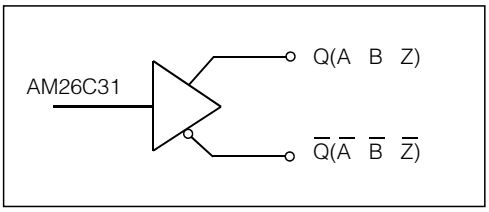
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Moment of inertia (kgm^2)	Max. allowable load		Allowable input angle acceleration ($(rad/s)^2$)
			Radial (N)	Axial (N)	
15000	9.8×10^{-3}	6×10^{-6}	19.6	19.6	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Humidity	Shock resistance (m/S^2)	Vibration resistance (m/S^2)	Construction	Weight (kg)
–30~+115	–40~+125	RH95% or less	98 (3times each in x、y、z directions, duration 6ms)	980 (5~2000Hz 2hours each in x、y、z directions, Amplitude0.5mm)	IP54	<0.2 (No cable)

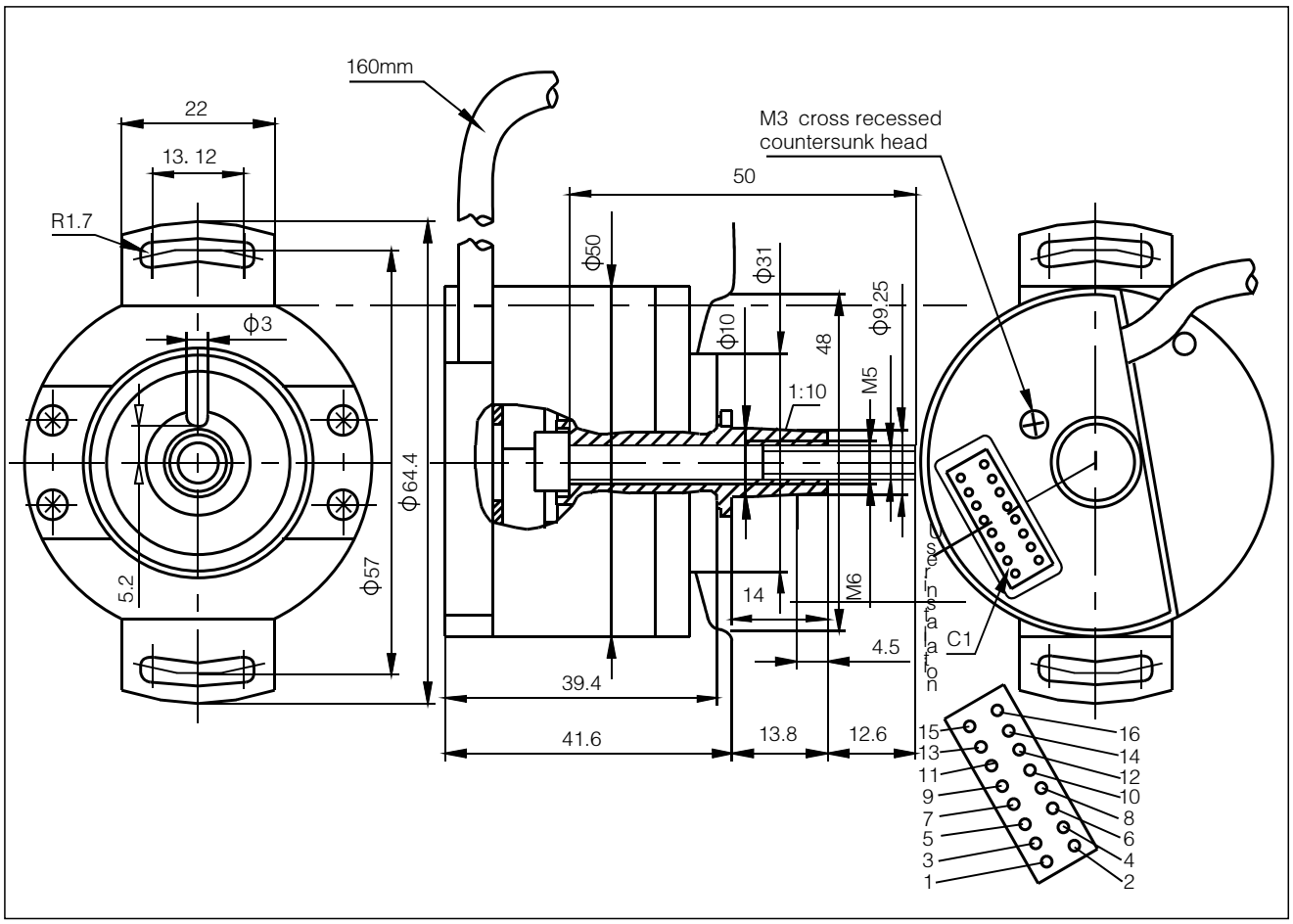
Output circuit



Connection specifications

Signal	Vcc	N/C	GND	N/C	A	N/C	$\overline{A}$	N/c	B	N/C	$\overline{B}$	N/C	Z	N/C	$\overline{Z}$	N/c
C1 Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Color	White	/	Black	/	Red	/	Pink	/	Green	/	Orange	/	Yellow	/	Blue	/

External view



ZVH–4 SERIES

Incremental Shaft Encoders

- Ultra–compact: Outside diameter 25mm
  Shaft diameter 6mm
- Suitable for compact machine & instrument

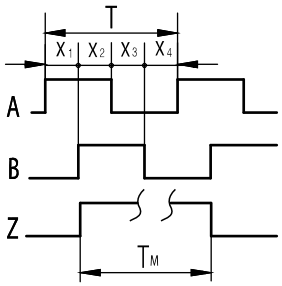
Explanation of model

ZVH – 4 –□ B M –E □ □

- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Rear entry cable
- Supply voltage
- Signal output mode

Pulses No.:60~600P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry: $X_1+X_2=0.5T \pm 0.125T$
$X_2+X_3=0.5T \pm 0.125T$
Phase shift: $X_n \geqslant 0.125T$ (n=1,2,3,4)
Accumulative angle error: ⩽0.2T
Pitch error: ⩽0.05T
T=360° /N (N is the number of A&B channel output pulses per revolution.)
$T_M=1T \pm 0.5T$

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5~26	⩽60	⩾Vcc–1	⩽0.5	2500	500	0～100
C(Open collector)	5~26	⩽60					0～100

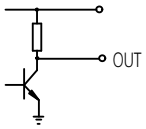
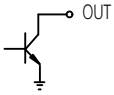
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)	Construction
			Radial (N)	Axial (N)			
10000	1×10^{-3}	10000	4.9	9.8	5×10^{-8}	0.03	IP53

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)²	Vibration resistance (m/S)²
–10~+70	–20~+80	1000(2 times each in x、y、z directions)	100(55~2000Hz, 2hours each in x、y、z directions)

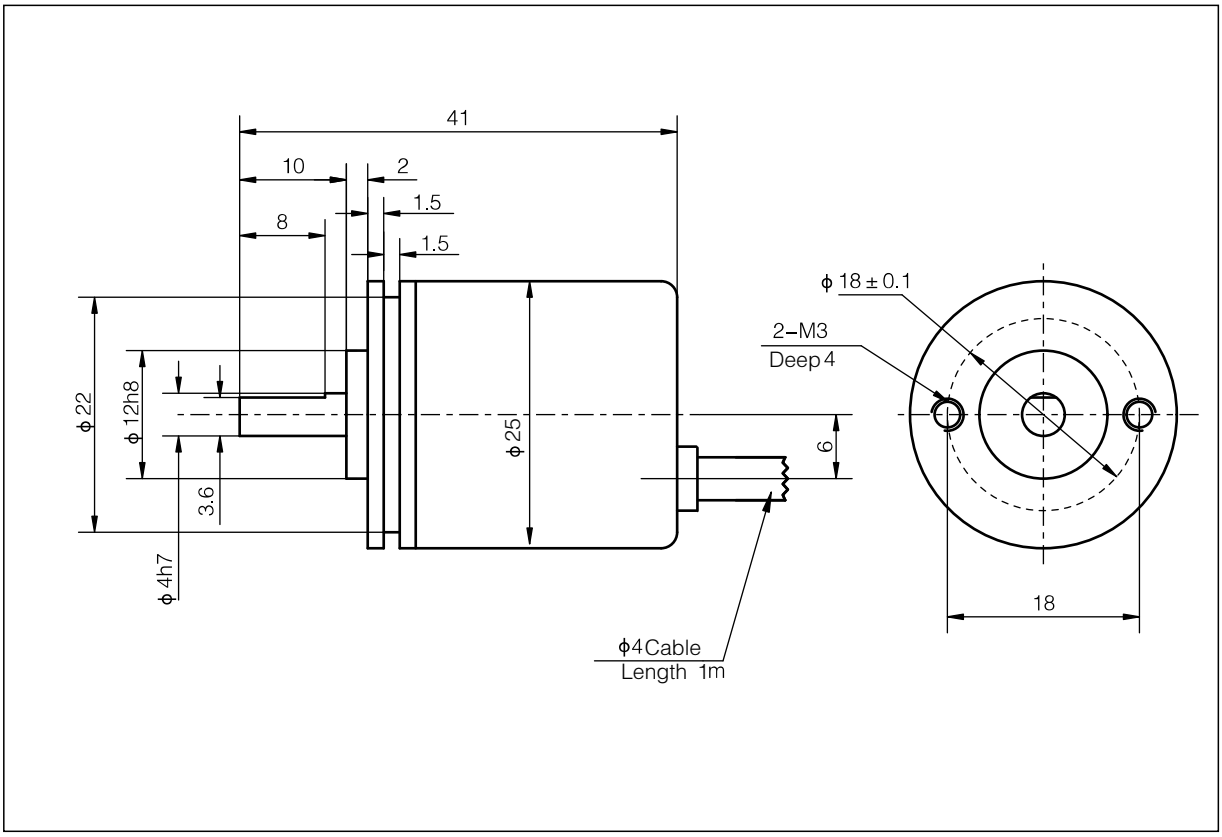
Output circuit

E(Voltage)	C(Open collector)
	

Connection specifications

Color	Red	Black	Blue	White	Yellow	Shield
Output	5~26V	OV	A	B	Z	

External view



ZFL-D 系 列

用途及特点

- ZFL-D型防爆发讯器是按国家防爆电气产品质量监督检验中心审查合格的图样及技术文件生产制造，可广泛用于防爆和非防爆环境中自动测量和自动控制。
- 实心轴、空心轴可选。

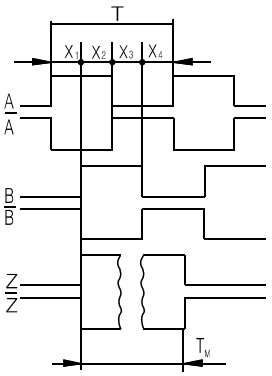
型号说明：

ZFL- D□ -□ -□ B M□-□ □ □-□ m-□

- 产品型号
- 输出轴直径(法兰盘端)
- 止口型号
- A、B路每转输出脉冲数1/10
- A、B两路信号相位差90°
- 零位信号
- 零位信号宽度(宽度为1T时不标注)
- 出线方式
- 电源电压
- 输出型式
- 电缆线长(单位:m)
- 空白:玻璃光栅 J:金属光栅

每转输出脉冲数:1、玻璃光栅：1~5000P/R(可细分至40000P/R)
2、金属光栅：1~1024P/R

输出波形与信号位置精度



上图为从轴端方向看顺时针旋转(CW)时的波形.

波形比:$X_1+X_2=0.5T\pm0.125T$
$X_2+X_3=0.5T\pm0.1T$
相位差:$X_n\geqslant0.125T$(n=1,2,3,4)
周期误差≤0.05T
绝对角度误差:≤0.2T
T=360°/N
(N为A、B路信号每转输出脉冲数)
Z路信号宽度:
1、$T_M=1T\pm0.5T$
$T_M=nT\pm1T$(n≥2)
Z路信号与A、B路信号相位关系不做规定
2、$T_M=0.5T\pm0.25T$
$T_M=0.25T\pm0.125T$
Z路信号上升沿与B路信号上升对齐

电气参数

输出型式	电源电压 DC(V)	消耗电流 (mA)	输出电压(V)		上升时间 (nS)	下降时间 (nS)	响应频率 (kHz)
			V_H	V_L			
E(电压输出)	5±0.25	≤60	≥3.5	≥0.5	≤500	≤100	0~300
	5~26		≥Vcc-2.5	≥0.5	≤1500	≤300	
C(开路输出)	5±0.25	≤60					
	5~26						
F(互补输出)	5±0.25	≤60	≥3.5	≤0.8	≤300	≤200	0~300
	5~26		≥Vcc-25	≤10	≤500	≤200	
L、H(驱动器)	5±0.25	≤100	≥2.5	≤0.5	≤200	≤200	0~300
J(驱动器)	5~26	≤80	≥Vcc-2.5	≤0.5	≤500	≤200	0~300
A(驱动器)	5~26	≤80	≥Vcc-2.5	≤0.8	≤800	≤200	0~300

绝缘阻抗100MΩ以上(DC500V),其余参数在100kHz,带0.5m测试线下测试

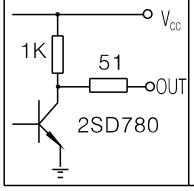
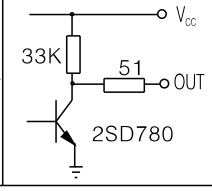
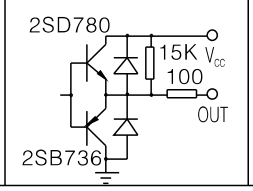
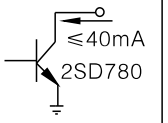
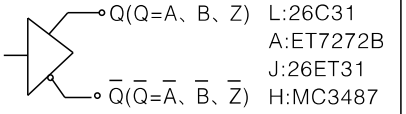
机械参数

最大转数 (r/min)	启动力矩 (25℃) (N·m)	轴最大负载(N)		防护等级
		径向	轴向	
5000	$<5\times10^{-3}$	4.9	4.9	IP52

■ 环境参数

耐振动(m/s^2)	耐冲击(m/s^2)	使用温度(°C)	贮存温度(°C)	相 对 湿 度
49(10~200Hz,x,y,z三个方向各2h)	980(x,y,z三方向各两次,每次持续11ms)	-20~+40	-35~+95	Rh≤85%
周围环境无腐蚀性气体或蒸气,大气压力:0.08~0.1MPa.				

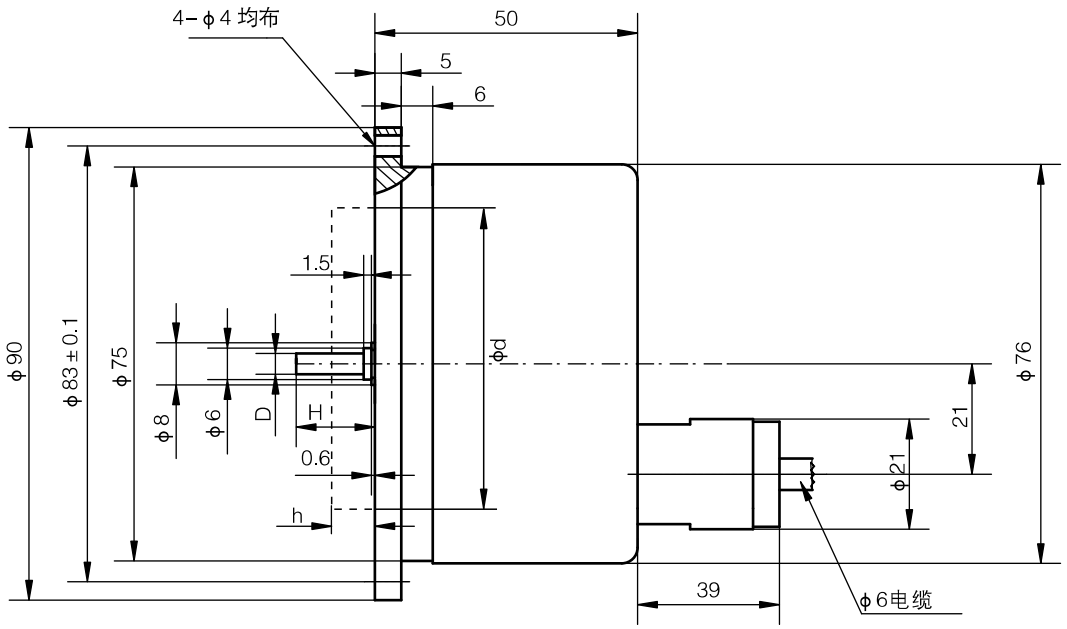
■ 输出电路

E(电压输出)		F(互补输出)		C(开路输出)	驱动器输出
5V	5V~26V	5V	5V~26V		
					

■ 接线表

线色 / 输出 / 信号	白	黑	红	绿	黄	紫	灰	粉	屏蔽
E、F、C	Vcc	OV	A	B	Z				壳
L、A、J、H	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	壳

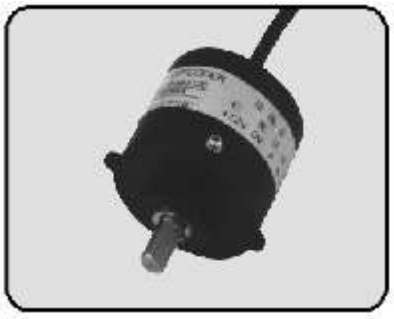
■ 外形图



产品型号	输出轴直径D(mm)	H(mm)
ZFL-D6	φ6f7($^{-0.01}_{-0.022}$)	15
ZFL-D5	φ5f7($^{-0.01}_{-0.022}$)	15
ZFL-D4	φ4f7($^{-0.01}_{-0.022}$)	15

注:1、无止口为基本型
2、止口(φdxh)根据用户要求定制

ZXL–13 SERIES



- Suitable for Fuel Meter
- Low cost

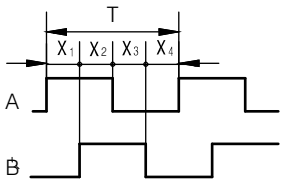
Explanation of model

ZXL–13 –□ B – E □ E (C)

- Model
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Open collector
- Voltage
- Supply voltage
- Rear entry cable

Pulses No.:60P/R,50P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry: $X_1+X_2=0.5T \pm 0.125T$

$X_2+X_3=0.5T \pm 0.125T$

Phase shift: $X_n=0.25T \pm 0.125T$ (n=1,2,3,4)

Accumulative angle error: ≤0.2T

Pitch error: ≤0.05T

T=360° /N (N is the number of A&B channel output pulses per revolution)

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E	5~15	<60	>0.7Vcc	<0.5	1000		<5
C	5~15	<60	>0.7Vcc	<0.5	1000 Load 2K		

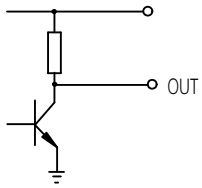
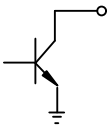
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
200r/min	1×10^{-2}N • m	20N	20N	$1 \times 10^{-6} kgm^2$	10000rad/s^2

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Weight (kg)
−10~+60	−30~+70	50(10~200Hz 2hours each in x、y、z directions)	980(2 times each in x、y、z directions)	0.15kg (No cable)

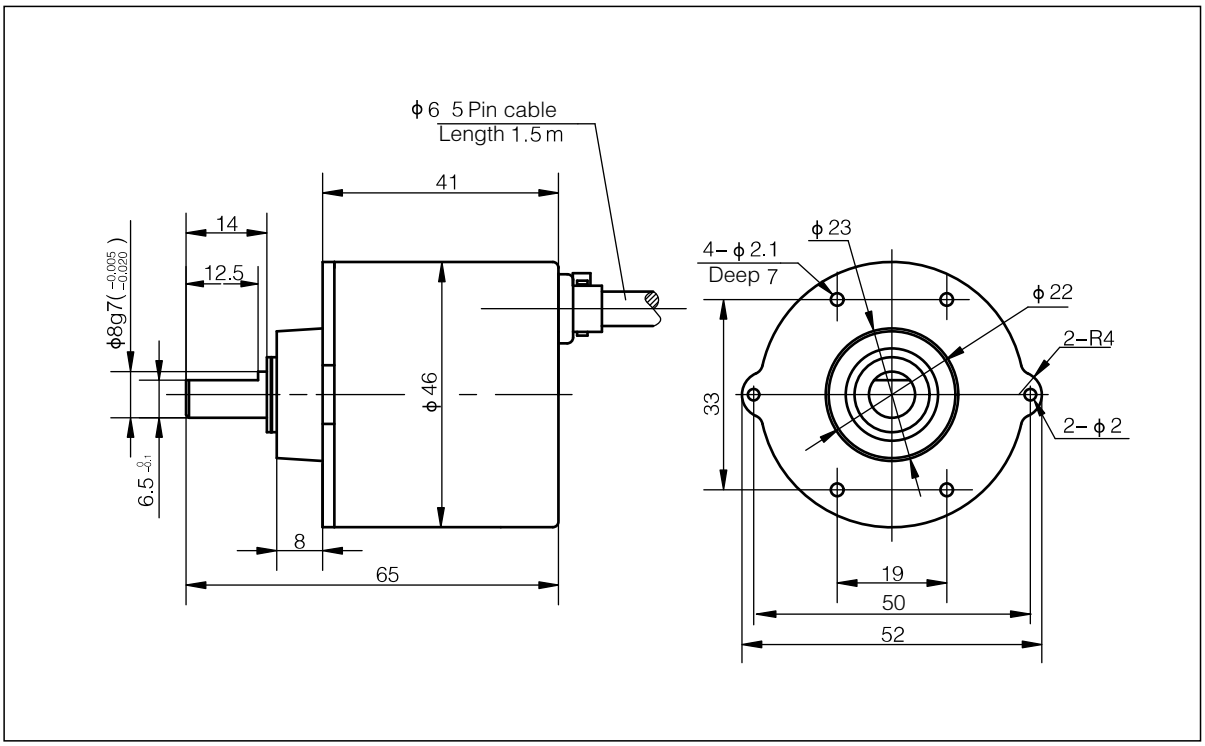
Output circuit

E(Voltage)	C(Open collector)
	

Connection specifications

Color	Red	Green	White	Black
Signal	A	B	5~15V	OV

External view



LGF SERIES

- Manual pulse generator
- Suitable for NC machine by providing home position and interruption signal

Explanation of model

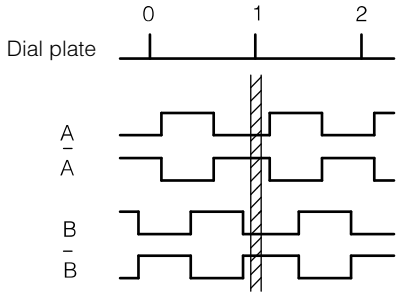
LGF – □ – □

LGF: Model; □: Function No.; □: Output pulses per revolution

Pulses No.: 25、100P/R

Function No.	Supply voltage	Signal output mode
001	5V~15V	Output voltage(1623)
001B	15V~24V	Output voltage(1623)
003	5V	Line Driver(26LS31)
003B	5V	Line Driver(26LS31),with misconnect protection

Output waveforms and division accuracy



Note: Click–stop postion falls within hatched area,pls verify matching with the equipment.

Electrical specifications

Function No.	Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise/Fall time (ns)	Frequency response (kHz)
				V_H	V_L		
001	Voltage	5~15	≤60	≥0.7Vcc	≤0.5	≤1	0~5
001B	Voltage	15~24	≤70	≥0.7Vcc	≤0.5	≤1	0~5
003	Line Driver	5 ± 0.25	≤150	≥2.5	≤0.5	≤0.1	0~5
003B	Line Driver	5 ± 0.25	≤150	≥2.5	≤0.5	≤0.1	0~5

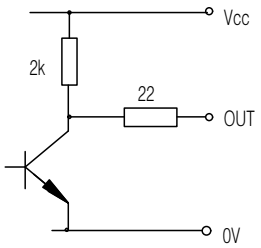
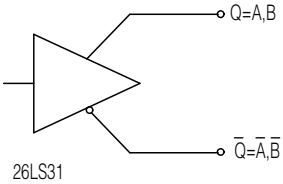
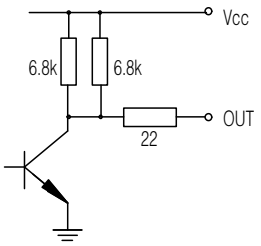
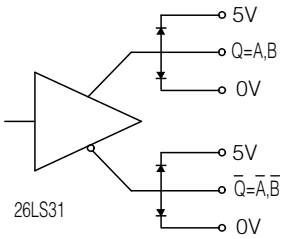
Mechanical specifications

Slew speed (r/min)	Normal rotational speed (r/min)	Dial click life
600	≤200	3×10^5 revolution(200r/min or less)

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Weight (g)
0~+60	–10~+70	Approx270

Output circuit

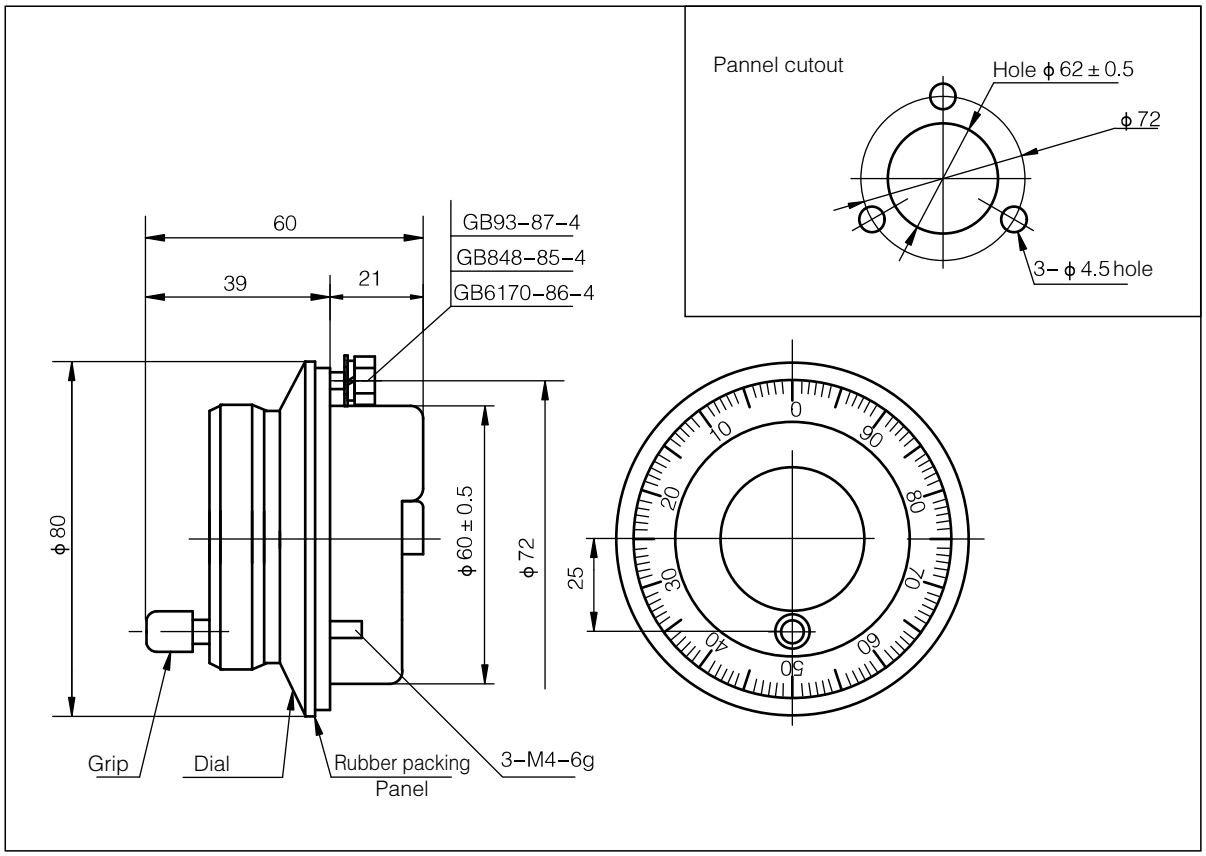
Voltage(001)	Line driver(003)	Voltage(001B)	Line driver(003B)
			

Connection specifications

Voltage(001、001B)				
Terminal No.	1	2	3	4
Signal	Vcc	OV(COM)	A	B

Line Driver(003、003B)						
Terminal No.	1	2	3	4	5	6
Signal	Vcc	OV(COM)	A	$\overline{A}$	B	$\overline{B}$

External view



ZBG–7 SERIES

Manual Pulse Generator

- Manual pulse generator
- Ultra–compact
- Suitable for NC machine by providing home position and interruption signal

Explanation of model

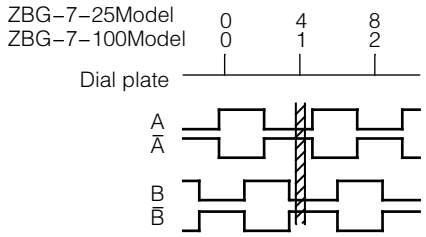
ZBG – 7 – □ – □

Model — ZBG
Sequence No. — 7
Output pulseso. — □
Function No. — □

Pulses No.：25、100P/R

Function No.	Supply voltage	Signal output mode
001	5V~15V	Voltage
002	10V~30V	Voltage
003	5V	Line Driver

Output waveforms and division accuracy



Note: Click–stop postion falls within hatched area,pls verify matching with the equipment.

Electrical specifications

Function No.	Supply voltage DC(V)	Output mode	Current requirement (mA)	Output voltage(V)		Rise/Fall time (ns)	Frequency response (kHz)
				V_H	V_L		
001	5~15(AC component below10%)	Voltage	≤60	≥Vcc–1	≤0.5	≤10	≤5
002	10~30(AC component below10%)	Voltage	≤80	≥Vcc–1	≤0.5	≤1	≤5
003	5±0.25	Line Driver	≤120	≥2.5	≤0.5	≤0.1	≤5

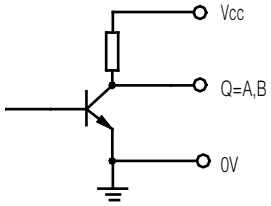
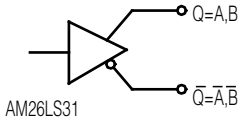
Mechanical specifications

Slew speed (r/min)	Normal rotational speed (r/min)	Dial click life
600r/min	≤200r/min	3×10^5revolution (200r/minor less)

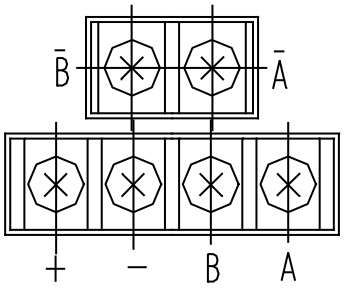
Environment specifications

Operating temperature (℃)	Weight (g)	Construction
– 10~+60	Approx70	IP50

Output circuit

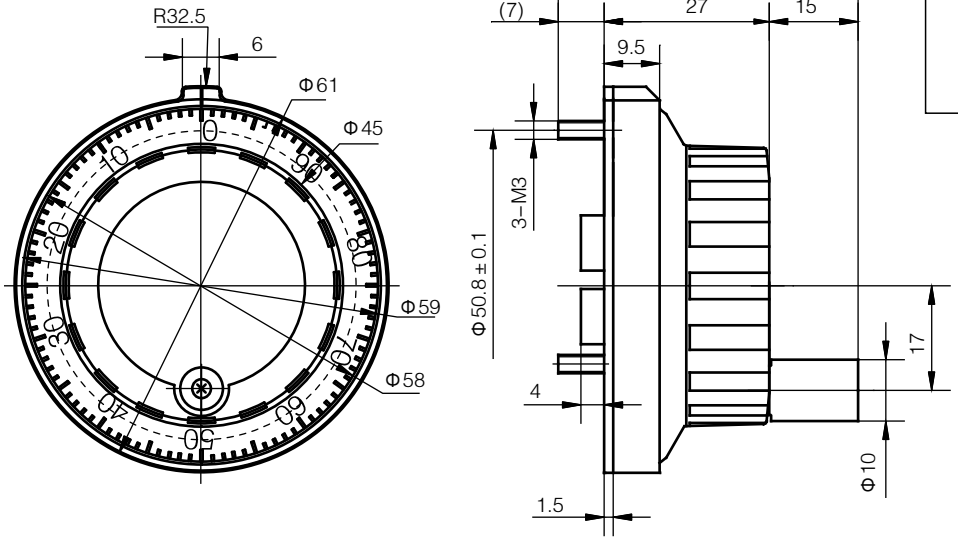
001、002	003
	

Connection specifications

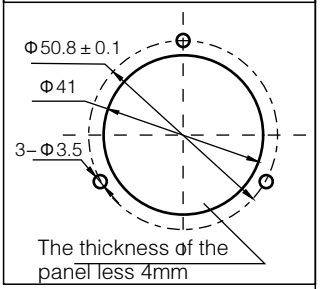


001Model、002Model no A、B Signal

External view



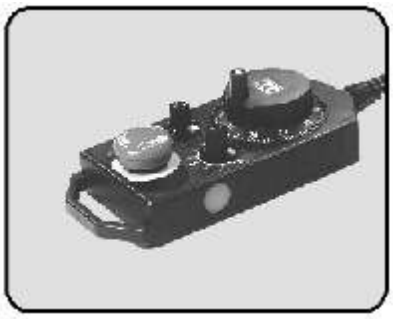
Panel dimension



The thickness of the panel less 4mm

ZSJ

SERIES



Manual Pulse Generator

- Handy Manual pulse generator
- Easy operation at hand
- A wide range of applications available

Explanation of model

ZSJ – □ – □

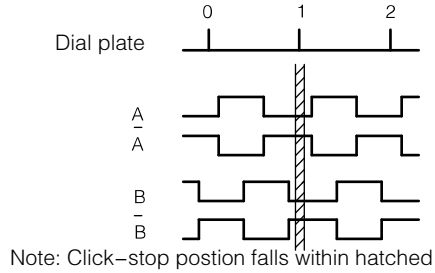
Model

Sequence No.

Function No.

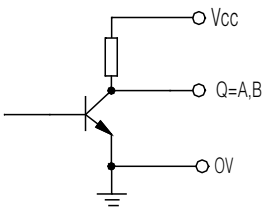
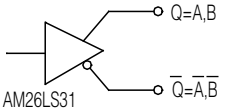
Gradation No.	Pulses No. (P/R)	Axes	Multip–lication	Contact Switch	Shown	Immediately stop	Magnetism	The Max. Length of the cable
	100	6		Starting (Reset)	Yes	Yes	No	3
1	100	6	Yes	Starting (Reset)	Yes	Yes	Yes	3
2	100	6	Yes	Starting (Reset)	Yes	No	Yes	3
2A	100	6	Yes	No	Yes	No	No	3
2B	100	6	Yes	No	Yes	No	Yes	3
2C	100	4	Yes	Starting (Reset)	Yes	No	No	2
3	100	No	No	Quickly enter and retreat	No	No	Yes	3
4	100	3	No	Quickly enter and retreat	No	No	Yes	3
5	100	3	Yes	No	Yes	No	No	3
5A	100	2	Yes	No	Yes	No	No	3
6	25	6	Yes	Starting (Reset)	Yes	Yes	No	3
7	25	6	Yes	No	Yes	No	No	3
8	100	4	Yes	No	Yes	No	Yes	2
8A	100	4	Yes	Starting (Reset)	Yes	No	Yes	3
8B	100	6	Yes	No	Yes	No	No	3
9	25	5	Yes	No	Yes	No	Yes	3
9A	25	4	Yes	No	Yes	No	Yes	3
10	100	6	Yes	Quickly enter and retreat	No	Yes	No	3
10A	100	6	Yes	Forward and Backward	Yes	Yes	No	3

Output waveforms and division accuracy



Note: Click–stop postion falls within hatched area, pls verify matching with the equipment.

Output circuit

001	003
	

Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)	Weight (kg)
600	0.015~0.1	0.25 (No cable)

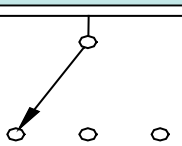
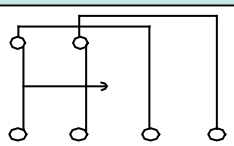
Electrical specifications

Function No.	Supply voltage DC(V)	Insulation impedance (M)	Current requirement (mA)	Output voltage(V)		Rise/Fall time (ns)	Frequency response (kHz)
				V_H	V_L		
001	5~15	⩾20	⩽60	⩾Vcc−1	⩽0.5	⩽1	⩽5
003	5 ± 0.25	⩾20	⩽120	⩾2.5	⩽0.5	⩽0.1	⩽5

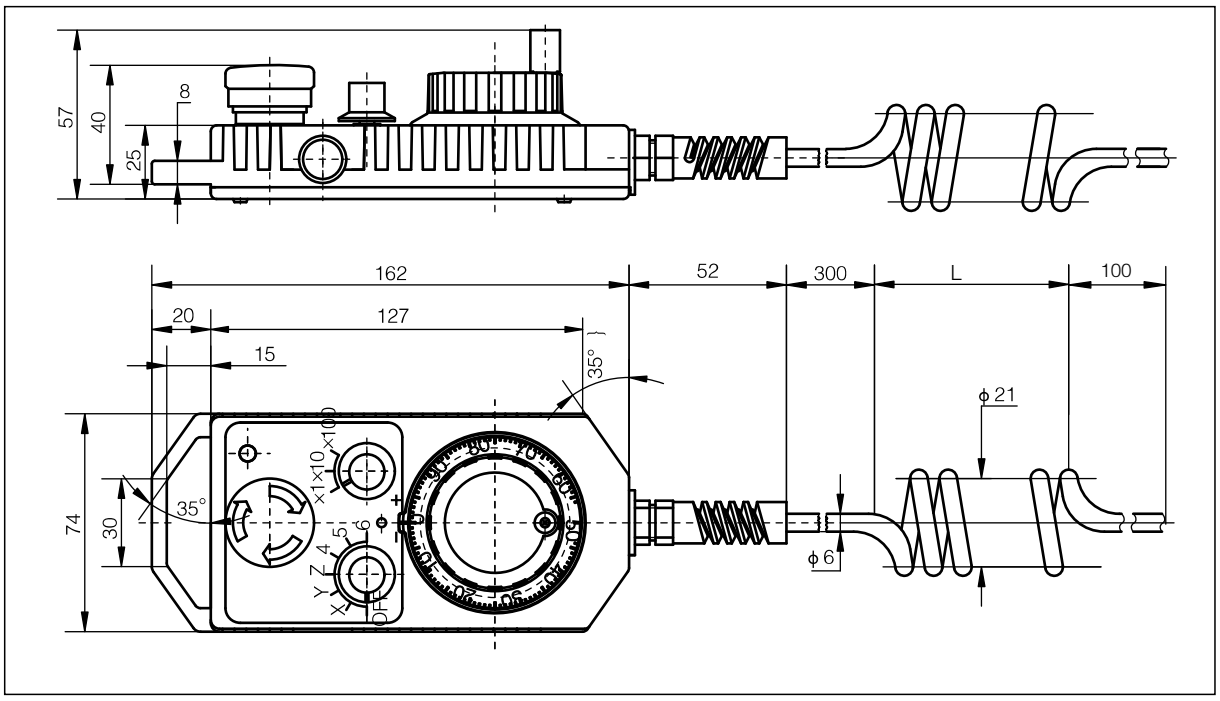
Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Construction
– 10~+60℃	– 20~+70℃	19.6m/S^2 (10~200Hz,2hours each in x,y,z directions)	IP67

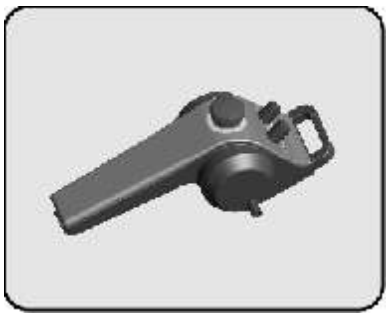
Connection specifications

Axial switch							Multiplication			Starting (Reset)	Shown (LED)		Immediately stop			
																
White / Black	Brown	Yellow / Black	Blue	White / Blue	Violet	White / Violet	Orange / Green	Green	Orange	Orange / Blue	Yellow / Red	White / Red	Orange / Black	Yellow / Blue	Yellow / Violet	Grey
OFF	X	Y	Z	4	5	6	× 1	× 10	× 100	COM	DC 24V	$0V_{LED}$	NC1	NC2	NC1	NC2

External view



ZSJ-13 SERIES



- Handy Manual pulse generator
- Easy operation at hand
- A wide range of applications available

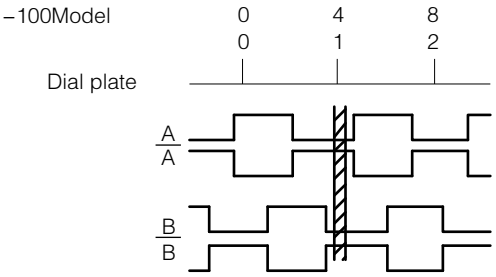
Explanation of model

ZSJ – 13□ – □ – □ – □ – □ – Z□ – B□ – □m

- Model
- Sequence No.
- Blank:No magnet / A:Magnet
- Output pulses of encoder
- Function No. of encoder
- Blank: No contact switch / C:Contact switch
- Pulses No.:25,100P/R
- Helix length
- Multiplication grade No.
- Multiplication switch
- Axes No.
- Axes switch
- Blank: No immediately stop / J:Immediately stop

Output waveforms and division accuracy

ZSJ–13□–25Model
ZSJ–13□–100Model



Note: Click–stop postion falls within hatched area,pls verify matching with the equipment.

Electrical specifications

Function No.	Supply voltage DC(V)	Insulation impedance (M)	Current requirement (mA)	Output voltage(V)		Rise/Fall time (ns)	Frequency response (kHz)
				V_H	V_L		
001	5~15	≥20	≤60	≥Vcc–1	≤0.5	≤10	0~5
003	5±0.25	≥20	≤120	≥2.5	≤0.5	≤0.1	0~5

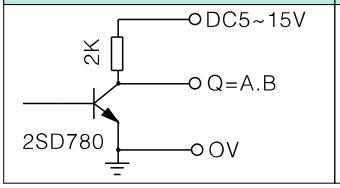
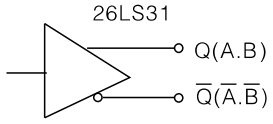
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)	Weight (kg)
600	0.015~0.1	0.3(No magnet and cable)

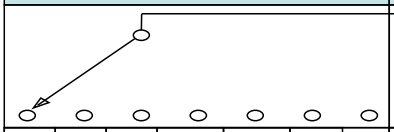
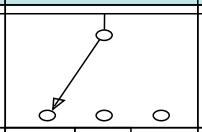
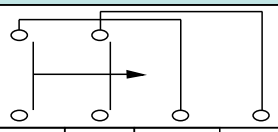
Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Construction
– 10~+60	–20~+70	19.6(10~200Hz 2hours each in x,y,z directions)	IP64

Output circuit:

001	003
	

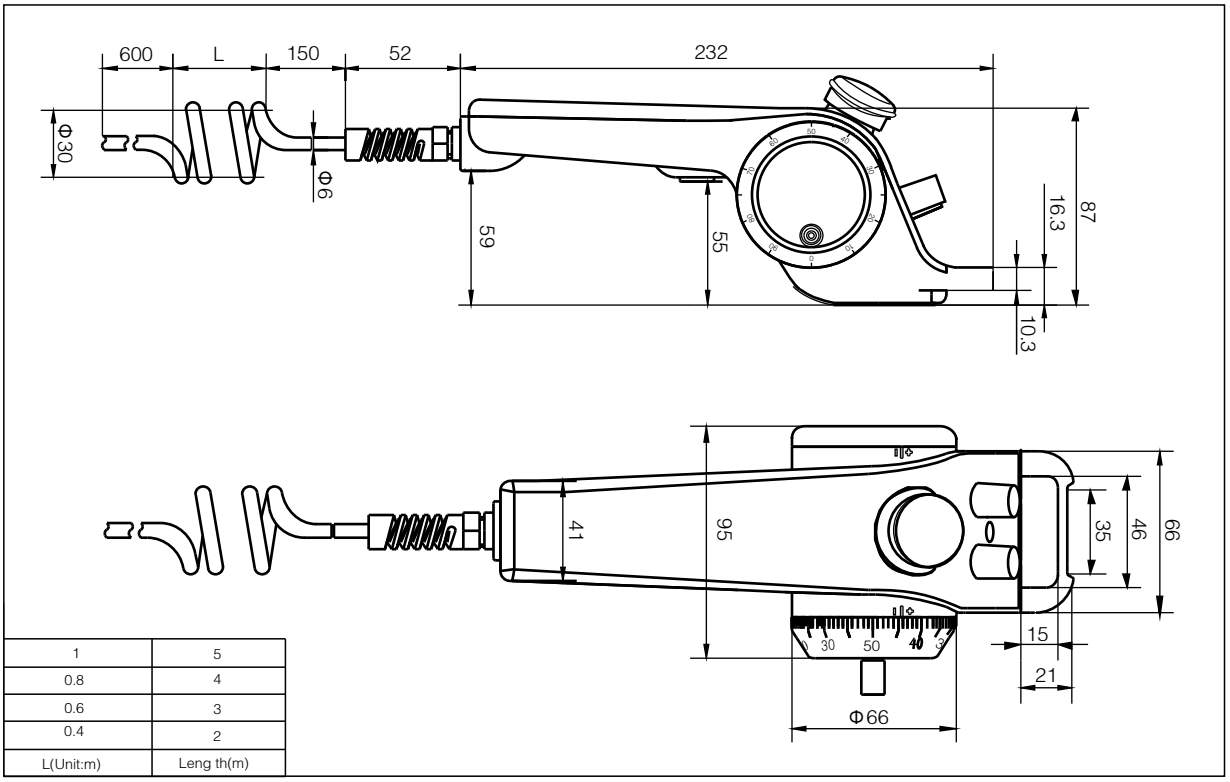
Connection specifications

Axial switch							Multiplication			Starting (Reset)	Shown (LED)		Immediately stop			
																
White / Black	Brown	Yellow / Black	Blue	White / Blue	Violet	White / Violet	Orange / Green	Green	Orange	Orange / Blue	Yellow / Red	White / Red	Orange / Black	Yellow / Blue	Yellow / Violet	Grey
OFF	X	Y	Z	4	5	6	X1	X10	X100	COM	DC 24V	OV_{LED}	NC1	NC2	NC1	NC2

For encoder

Signal \ Color	Red	Black	Yellow	White	Yellow/Green	White/Green
001	Vcc	OV	A	B		
003	Vcc	OV	A	B	$\overline{A}$	$\overline{B}$

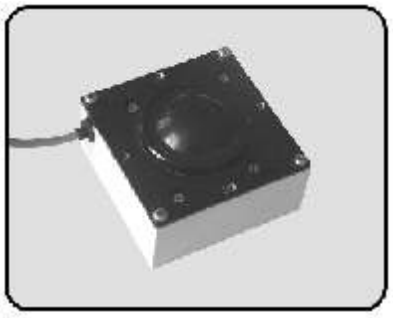
External view



1	5
0.8	4
0.6	3
0.4	2
L(Unit:m)	Leng th(m)

ZQZ–3

SERIES



Manual Pulse Generator

- A simple touch on a ball resolves both X and Y axes, into output pulses.
- Suitable for radar, color graphics, medical scanners etc.

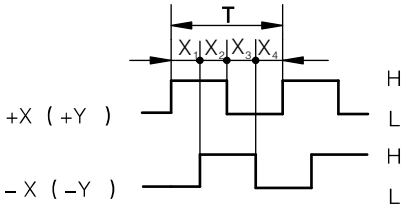
Explanation of model

ZQZ – 3 – □ – □

- Model
- Sequence No.
- 005:Pulses train 006:Dual square wave in quadrature
- Output pulses:170,340,680P/R (Per one rotation of ball)

Output waveforms and division accuracy

006

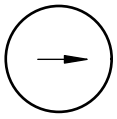
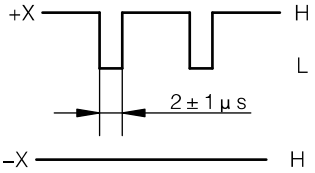
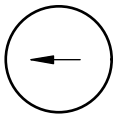
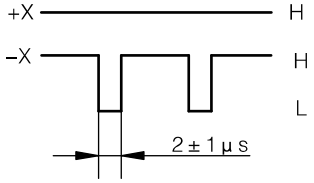
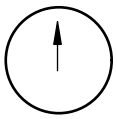
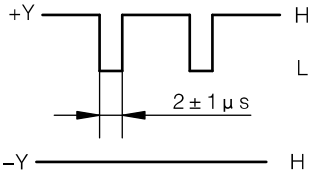
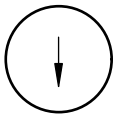
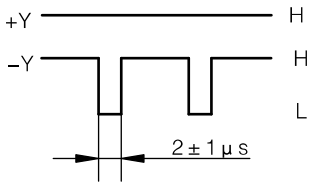


Symmetry:$X_1+X_2=0.5T \pm 0.125T$

$X+X=0.5T \pm 0.125T$

Phase shift:$X_n \geqslant 0.125T$(n=1,2,3,4)

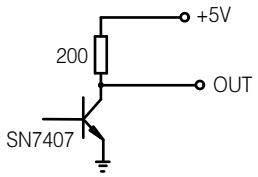
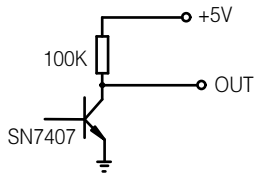
005

The direction of ball rotation	Output waveforms
	
	
	
	

Electrical specifications

Function No.	Supply voltage DC(V)	Current requirement (mA)	Output mode	Output voltage(V)		Insulation impedance (M)	Frequency response (kHz)
				V_L	V_H		
005,006	5 ± 0.5	<150	Voltage	≤0.5	≥2.5	≥100	0~50

Output circuit

Function No.	005	006
Circuit		

Mechanical specifications

Function No.	Speed of ball	Operating force variable	Slant angle	Ball push–pressure
005,006	200r/min	0.2~0.5N	30° less	3Nmax

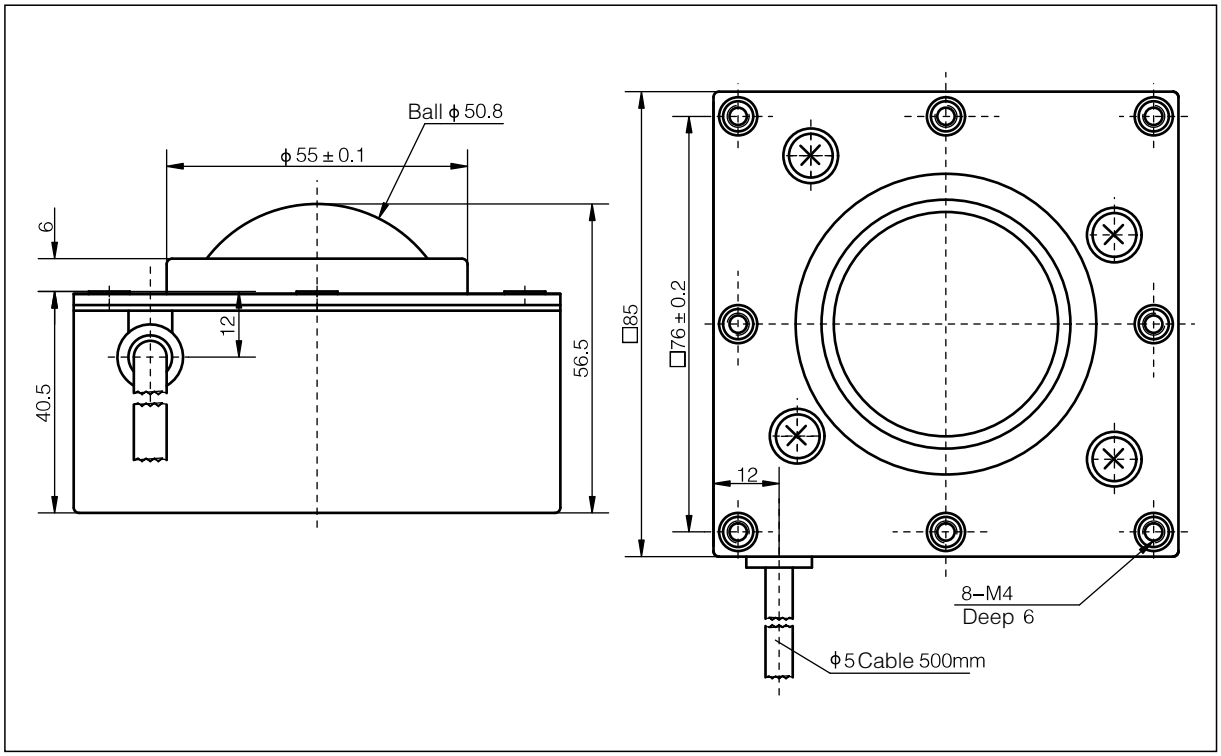
Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Weight (kg)
+5℃~+50℃	–10℃~+60℃	88.2m/s(2 hours each in x、y、z directions, 10~55Hz)	980m/s(2 inx、y、z directions, duration 6ms)	0.5kg

Connection specifications

Function No.	005(Pulses train)					
Color	White	Black	Red	Yellow	Green	Blue
Signal	+5V	OV	+X	–X	+Y	–Y
Function No.	006(Dual square wave in quadrature)					
Color	White	Black	Red	Yellow	Green	Blue
Signal	+5V	OV	XA	XB	YA	YB

External view



A-ZKD-12 SERIES

- Hollow shaft encoder
- Outside diameter 48mm, Shaft diameter 9mm
- UVW signals
- Suitable for servo motors

Explanation of model

A – ZKD – 12 – □ B M / □P – G O5 L – □

- Upgrade No.
- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- The cycle of U,V,W channels
- Side entry cable.
- Supply voltage
- Signal output mode
- Accessories model

Output pulses per revolution:A,B channels:500,1000,1024,2000,2500,3000,4096,5000,6000P/R
The cycle of U,V,W channels:2P,3P,4P.

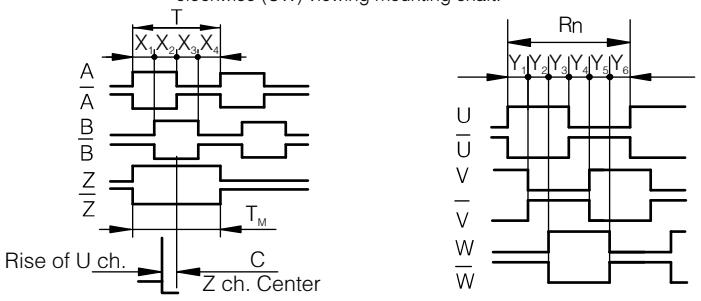
Output waveforms and division accuracy

A、B、Z pitch & phase
Symmetry:
$X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift :
$X_n\geqslant0.15$ (n=1,2,3,4)
Signal width of Z channel:$T_M=1T\pm0.5T$
Division accuracy of signals:
Accumulative angle error of A&B channels :
≤0.2T(≤3000P/R)
≤0.4T(＞3000P/R)
A,BPitch error:≤0.05T(≤3000P/R)
≤0.1T(＞3000P/R)
T=360° /N(N is the number of pulse per revolution)
Z channel and U channel:C=±1°
(Mechanical angle)

U.V.W pitch & phase
R=360° /N_i±1.5°
($N_i$is magnetic pole log)
Phase shift：Y_n=R/6±1.5°
(n=1,2,3,4,5,6)
Positional relationship of A&B channels and U,V,W channels is not specified.

Waveform 1

The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing mounting shaft.

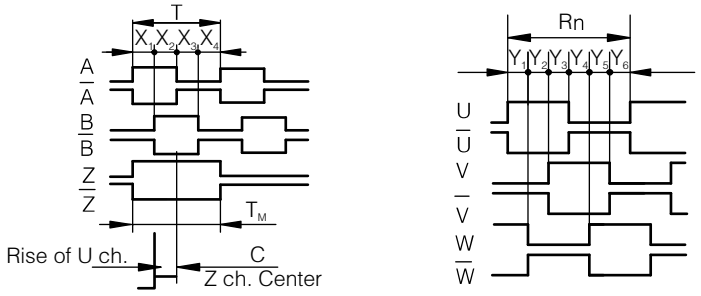


Connection specifications

Signal	5V	A	B	Z	U	V	W	Body
Color	Red	Green	Grey	Yellow	Brown	Cyan	Orange	Shield
Signal	OV	$\overline{A}$	$\overline{B}$	$\overline{Z}$	$\overline{U}$	$\overline{V}$	$\overline{W}$	
Color	Black	White/Green	White/Grey	White/Yellow	White/Brown	White/Cyan	White/Orange	

Waveform 2

The figure shows the waveforms when a shaft is rotated anticlockwise (CCW) viewing mounting shaft.



Connection specifications

Signal	5V	A	B	Z	U	V	W	Body
Color	Red	Grey	Green	Yellow	Brown	Cyan	Orange	Shield
Signal	OV	$\overline{A}$	$\overline{B}$	$\overline{Z}$	$\overline{U}$	$\overline{V}$	$\overline{W}$	
Color	Black	White/Grey	White/Green	White/Yellow	White/Brown	White/Cyan	White/Orange	

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise /fall time(ns)	Frequency response (kHz)	Insulation impedance (MΩ)DC500V
			V_H	V_L			
L(Line driver)	5±0.25	<200	≥2.5	≤0.5	≤200	0~350	≥100

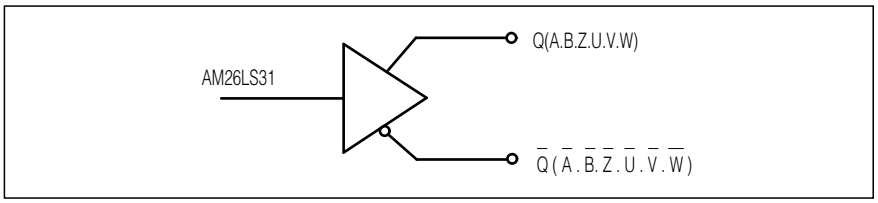
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
6000	5×10^{-3}	10	10	1×10^{-5}	10000

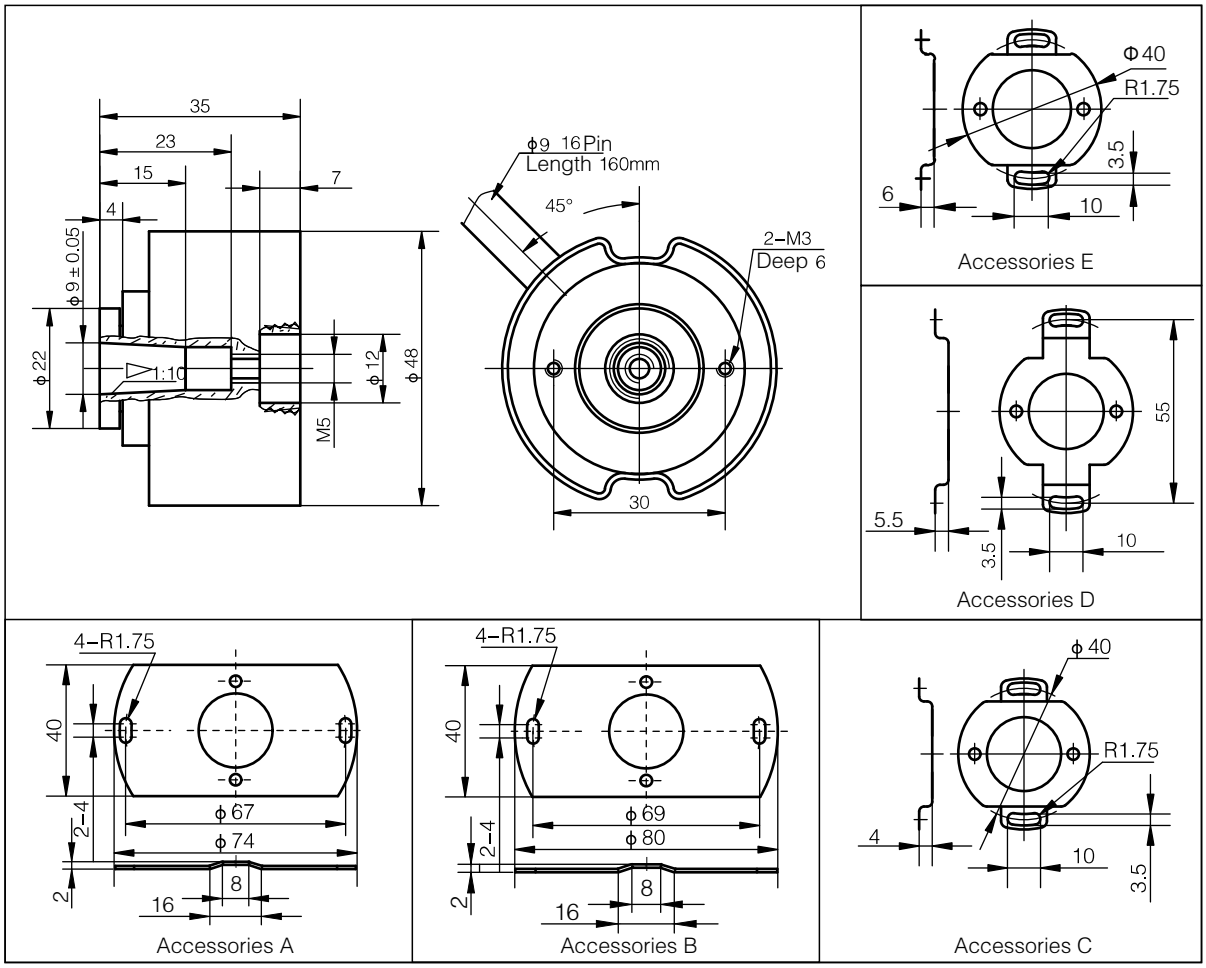
Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Humidity	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction	Weight (kg)
-30~+85	-35~+95	RH85% or less	49(10~200Hz 2 hours each in x、y、z directions)	980(3times each in x、y、z directions, duration 6ms)	IP40	Approx0.3 (No Cable)

Output circuit



External view



ZKD-23 SERIES

- Ultra-compact hollow shaft encoder
- Outside diameter 35mm, Shaft diameter 6mm
- UVW signals
- Suitable for servo motors

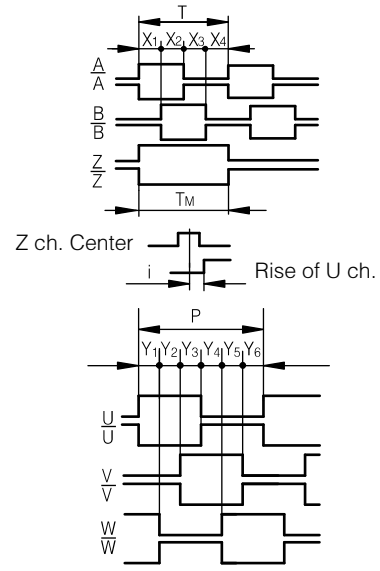
Explanation of model

ZKD – 23 – □ B M / □P – G 05 L – □m

- Model: ZKD
- Function No.: 23
- 1/10 output pulses of A and B: □
- Dual square wave in quadrature: B
- Index signal: M
- Magnetic pole log: □P
- Side entry cable: G
- Supply voltage: 05
- Signal output mode: L
- Cable length (Unit: m): □m

Output pulses per revolution:100~5000P/R
The cycle of U,V,W channels :2P,3P,4P,8P,16P,32P

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry:
$X_1+X_2=0.5T \pm 0.1T$
$X_2+X_3=0.5T \pm 0.1T$
Phase shift : $X_n \geq 0.15T$ (n=1,2,3,4)
Signal width of Z channel: $T_M=1T \pm 0.5T$
Division accuracy of signals:
Accumulative angle error of A&B channels ≤0.2T
Pitch error≤0.05T
T=360° /N (N is the number of pulse per revolution)
P=360° /N ± 1.5°
(N=2,3,4,8,16,32)
Phase shift: Yn=P/6 ± 1.5° (n=1,2,3,4,5,6)
Positional relationship of A&B channels and U,V,W channels is not specified.
Z channel and U channel: i= ± 1° (Mechanical angle)

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise /fall time(ns)	Frequency response (kHz)	Insulation impedance (MΩ)DC500V
			V_H	V_L			
L(Line Driver)	5 ± 0.25	≤250	≥2.5	≤0.5	≤100	0~300	≥100

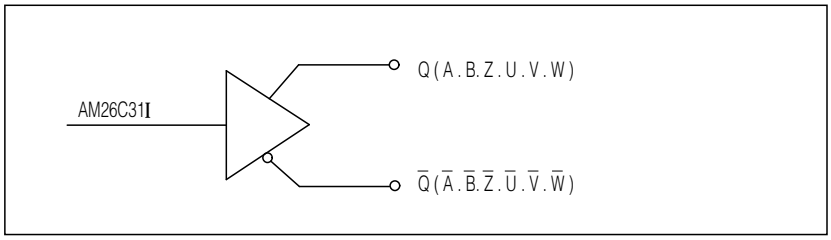
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration ($(rad/s)^2$)
		Radial (N)	Axial (N)		
6000	6×10^{-3}			1×10^{-6}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance (m/S)²	Shock resistance (m/S)²	Construction	Weight (kg)
-30~+85	-40~+100	49(10~200Hz,2 hours each in x、y、z directions)	980(3times each in x、y、z directions, duration 6ms)	IP50	Approx0.2 (No cable)

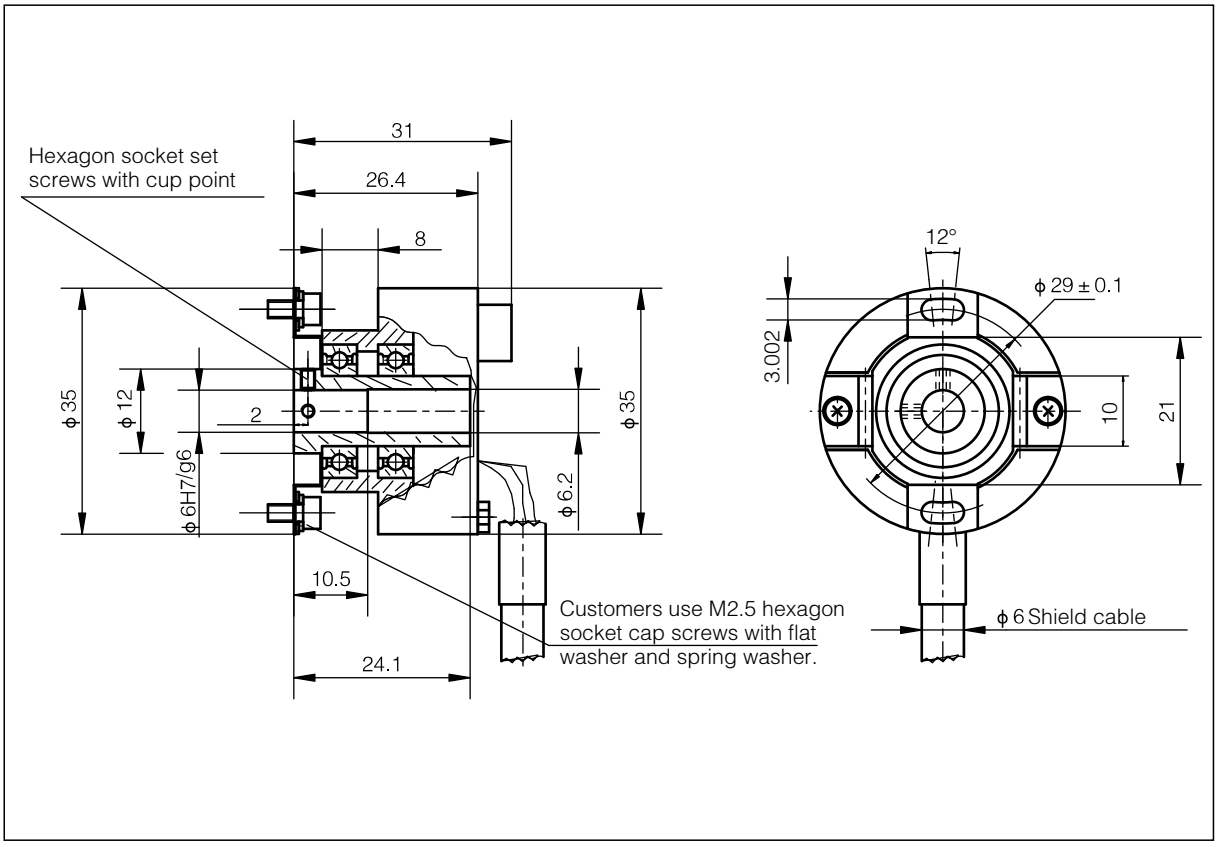
Output circuit



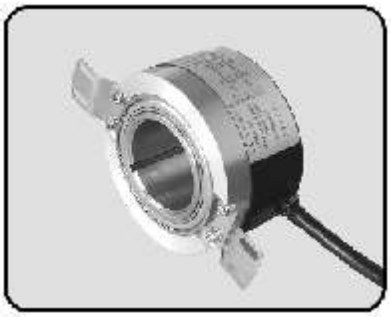
Connection specifications

Signal	5V	A	B	Z	U	V	W	Shield
Color	Red	Green	Grey	Yellow	Brown	Blue	Orange	Bronze net
Signal	OV	$\overline{A}$	$\overline{B}$	$\overline{Z}$	$\overline{U}$	$\overline{V}$	$\overline{W}$	
Color	Black	White/Green	White/Grey	White/Yellow	White/Brown	White/Blue	White/Orange	

External view



A-ZKD-20 SERIES



- Hollow shaft encoder
- Outside diameter 100mm, Shaft diameter 50mm
- Output pulses per revolution 8192
- Suitable for elevator of no engine room

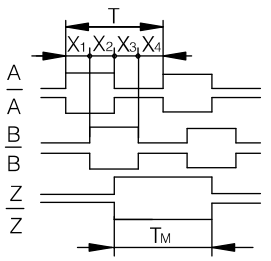
Explanation of model

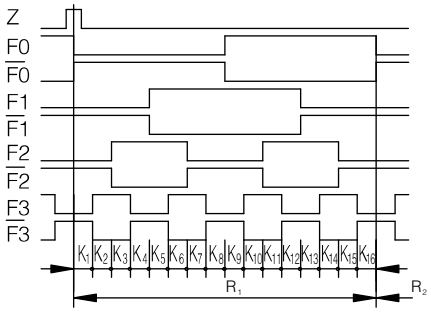
A – ZKD – 20 – □ B M / □P – G □ L □ – □

- Upgrade No.
- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Magnetic pole log
- Side entry cable
- Supply voltage
- Line driver
- Output voltage
- Accessories model

Output pulses per revolution: 8192P/R
F0, F1, F2, F3 magnetic pole log signal period: 6P, 8P, 10P, 11P, 16P, 20P

Output waveforms and division accuracy





Symmetry:
$X_1+X_2=0.5T\pm0.1T$
$X_3+X_4=0.5T\pm0.1T$
Phase shift :
$X_n\geqslant0.125T$ (n=1,2,3,4)
Signal width of Z channel: $T_M=1T\pm0.5T$
Positional relationship of A&B channels and F0,F1,F2, F3 channels is not specified.
The positional relationship of the Z channel center with the fall edge of F0 phase: 0° ± 0.5° (Mechanical angle)
Division accuracy of signals: Accumulative angle error of
A&B channels: ≤0.2T
Pitch error: ≤0.05T
Waveform jitter ≤10%
T=360° /N(N is the number of pulse per revolution)

Pitch R_1~R_6	60°	±0.5°	(6P)				
R_1~R_8	45°	±0.5°	(8P)				
R_1~R_{10}	36°	±0.5°	(10P)				
R_1~R_{11}	33°	±0.5°	(11P)				
R_1~R_{12}	30°	±0.5°	(12P)				
R_1~R_{16}	22.5°	±0.5°	(16P)				
R_1~R_{20}	18°	±0.5°	(20P)				
Phase K_1~K_{16}	3.75°	±0.5°	(6P)	2.8125°	±0.5°	(8P)	
	2.25°	±0 .5°	(10P)	2.0625°	±0.5°	(11P)	
	1.875°	±0.5°	(12P)	1.40625°	±0.5°	(16P)	
	1.125°	±0.5°	(20P)				

The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing mounting shaft.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
12L05	12	≤180	≥2.5	≤0.5	≤200	≤200	0~100

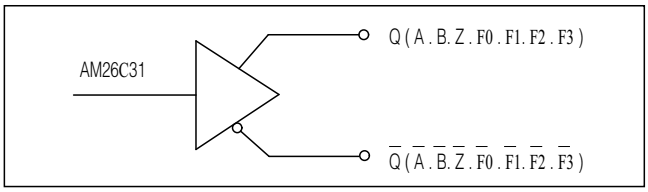
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
1000	6.0×10^{-2}	60	40	6×10^{-2}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Humidity	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction	Weight (kg)
-20~+70	-20~+80	RH85% or less(without condensation)	70(50Hz,3times each in x、y、z directions, duration 6ms,Amplitude0.5mm)	490(3times each in x、y、z directions, duration 15ms)	IP40	<1

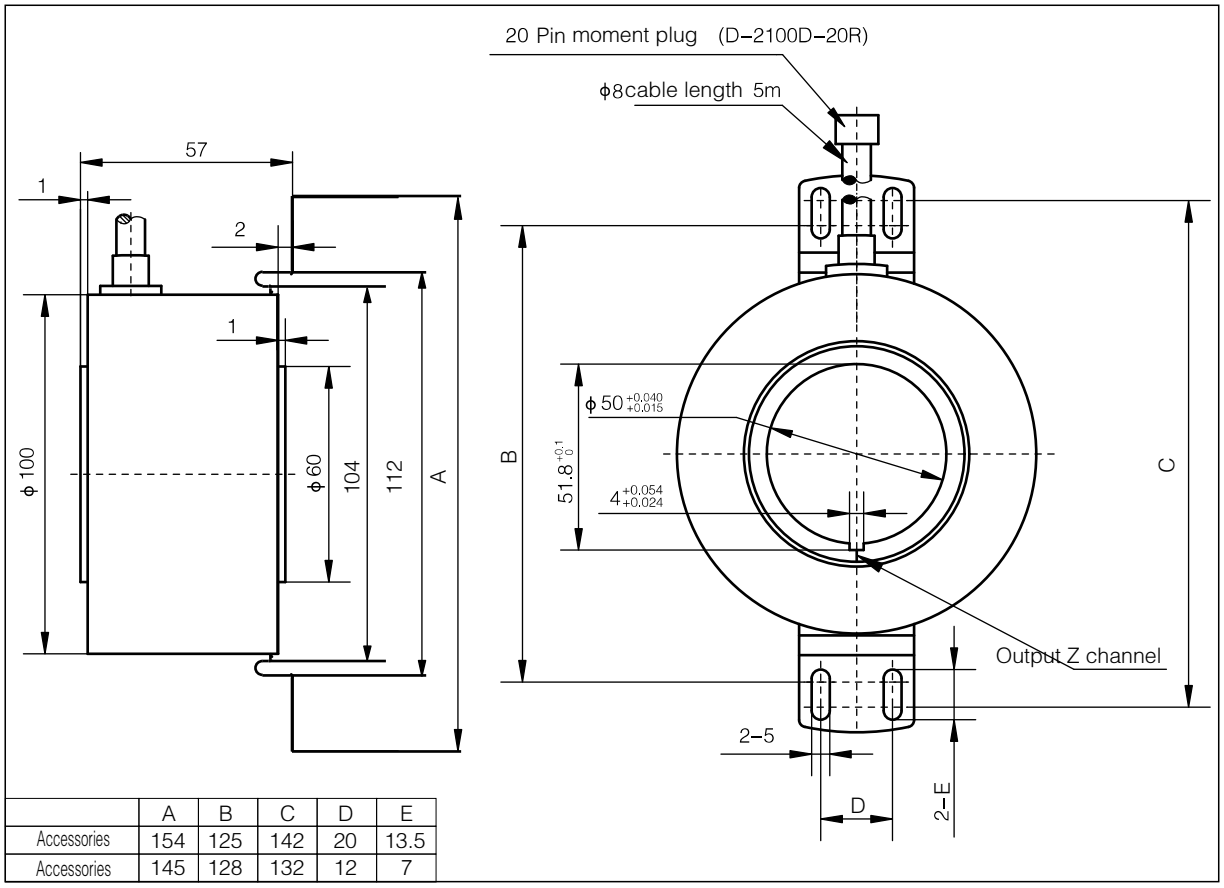
Output circuit



Connection specifications

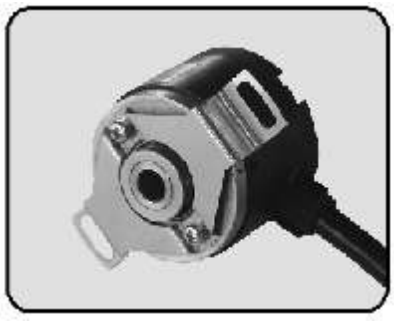
Signal	Vcc	OV	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$	
Color	Red	Red/White	Black	Black/White	Green	Green/White	Yellow	Yellow/White	
Pin	B02	A02	B10	A10	B09	A09	B08	A08	
Signal	F0	$\overline{F0}$	F1	$\overline{F1}$	F2	$\overline{F2}$	F3	$\overline{F3}$	
Color	Brown	Brown/White	Cyan	Cyan/White	Grey	Grey/White	Orange	Orange/White	Shield
Pin	B04	A04	B07	A07	B05	A05	B06	A06	

External view



	A	B	C	D	E
Accessories	154	125	142	20	13.5
Accessories	145	128	132	12	7

ZKD-25 SERIES



Incremental Hollow-shaft Encoders

- Ultra-compact hollow shaft encoder
- Outside diameter 45mm, Shaft diameter 8mm
- Output pulses per revolution 8192
- Suitable for elevator of no engine room

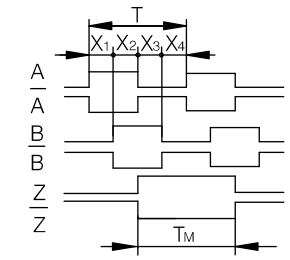
Explanation of model

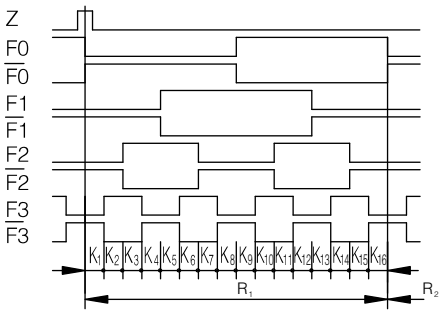
ZKD - 25 - □ B M 0.25/ □P - G □ L □ - □

- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Index length
- Magnetic pole log
- Side entry cable
- Supply voltage
- Line Driver
- Output voltage
- Accessories model

Output pulses per revolution：A,B channels：8192P/R
FO.F1.F2.F3 Magnetic pole log：32P、12P

Output waveforms and division accuracy





Symmetry:$X_1+X_2=0.5T \pm 0.1T$
$X_2+X_3=0.5T \pm 0.1T$
Phase shift :$X_n \geqslant 0.125T(n=1,2,3,4)$
Signal width of Z channel:$T_M=0.25T$
Positional relationship of A&B channels and F0,F1,F2,F3 channels is not specified
The positional relationship of the Z channel center with the fall edge of F0 phase：0° ±0.3° (Mechanical angle)
The positional relationship of the Z channel center with every F phase：±0.3°

Division accuracy of signals:
Accumulative angle error of A&B channels≤0.2T
Pitch error≤0.1T
A.B channels waveform jitter≤10%
T=360° /N(N is the number of pulse per revolution.)
R=360° /N1 ±0.5° (magnetic pole log)
For instance:R_1~R_{12} 30° ±0.5° (12P)
R_1~R_{32} 11.25° ±0.5° (32P)
Phase K_1~K_{16} R/16 ±0.5° (R pitch)
For instance:1.875° ±0.5° (12P)
0.703125° ±0.5° (32P)

The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing mounting shaft.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
12L05	12±1.2	≤180	≥2.5	≤0.5	≤200	≤200	0~100

Insulates resistance10M(put DC 500V between 0V and body), Insulates Withstanding Voltage AC500V, 1min(0V and body),and with the 0.5m line for these test.

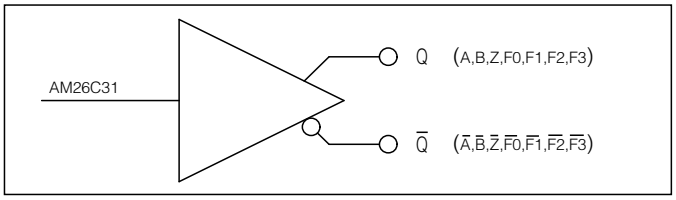
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration (rad/s^2)
		Radial (N)	Axial (N)		
1000	9.8×10^{-3}	49	29.4	6×10^{-4}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Humidity	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$	Construction	Weight (kg)
-20~+70	-20~+80	RH85% or less	70(2 hours each in x、y、z directions Amplitude0.5mml)	490(3times each in x、y、z directions, duration 15ms)	IP40	< 0.2(No cable)

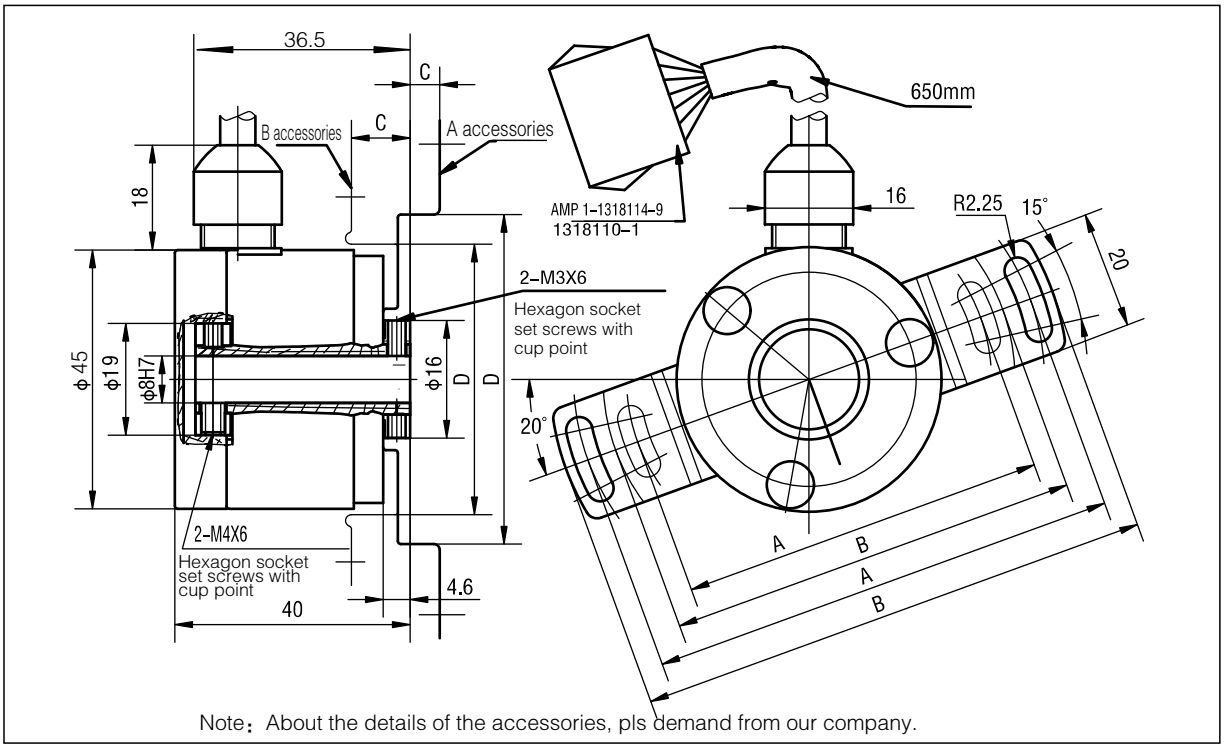
Output circuit



Connection specifications

Signal	Vcc	OV	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$	
Color	Red	Red/White	Black	Black/White	Green	Green/White	Yellow	Yellow/White	
Pin	B02	A02	B10	A10	B09	A09	B08	A08	
Signal	F0	$\overline{F0}$	F1	$\overline{F1}$	F2	$\overline{F2}$	F3	$\overline{F3}$	
Color	Brown	Brown/White	Cyan	Cyan /White	Grey	Grey/White	Orange	Orange/White	Shield
Pin	B04	A04	B07	A07	B05	A05	B06	A06	

External view



Note：About the details of the accessories, pls demand from our company.

A-ZKT-56A

SERIES

Incremental Hollow-shaft Encoders

- Hollow shaft encoder
- Outside diameter 46mm, Shaft diameter 8mm
- Output pulses per revolution 8192
- Suitable for permanent magnet synchronous motorof elevator door

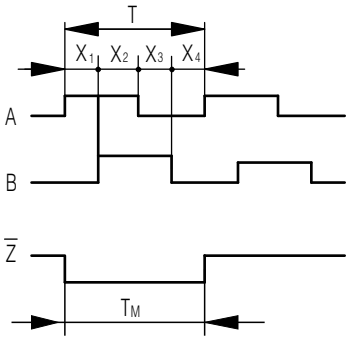
Explanation of model

A－ZKT－56A－□ B M－G □ □

- Upgrade No.
- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Signal output mode
- Supply voltage
- Side entry cable
- Index signal

Output pulses per revolution：1~8192P/R

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry： $X_1+X_2=0.5T\pm0.062T$
$X_2+X_3=0.5T\pm0.062T$
Phase shift： $X_1\geqslant0.19T$
Accumulative angle error≤0.2T
Pitch error≤0.05T
Signal width of Z channel： $T_M=1T\pm0.5T$
T=360° /N(N is the number of pulse per revolution.)

Electrical specifications

Function No.	Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Sink current (mA)	Min. load resistance (Ω)	Rise time (ns)	Fall time (ns)	Frequency response (kHz)
				V_H	V_L					
C	Open collector	8~26	≤60	/	/	≤20	300	/	/	0~30
E	Voltage	8~26	≤60	≥Vcc-2.5	≤0.5	/	/	< 1000	< 1000	0~30

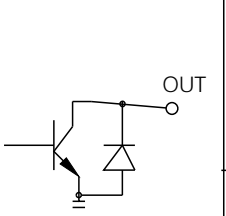
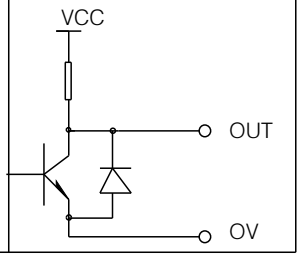
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Moment of inertia (kgm^2)	Max. allowable load		Allowable input angle acceleration $(rad/s)^2$	Weight (kg)
			Radial (N)	Axial (N)		
500	$<5\times10^{-3}$	1×10^{-8}	10	10	10000	< 0.1

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S²)	Vibration resistance (m/S²)
-30~+85	-40~+95	980 (3times each in x、y、z directions, duration 6ms)	100 (10~200Hz, 2 hours each in x、y、z directions)

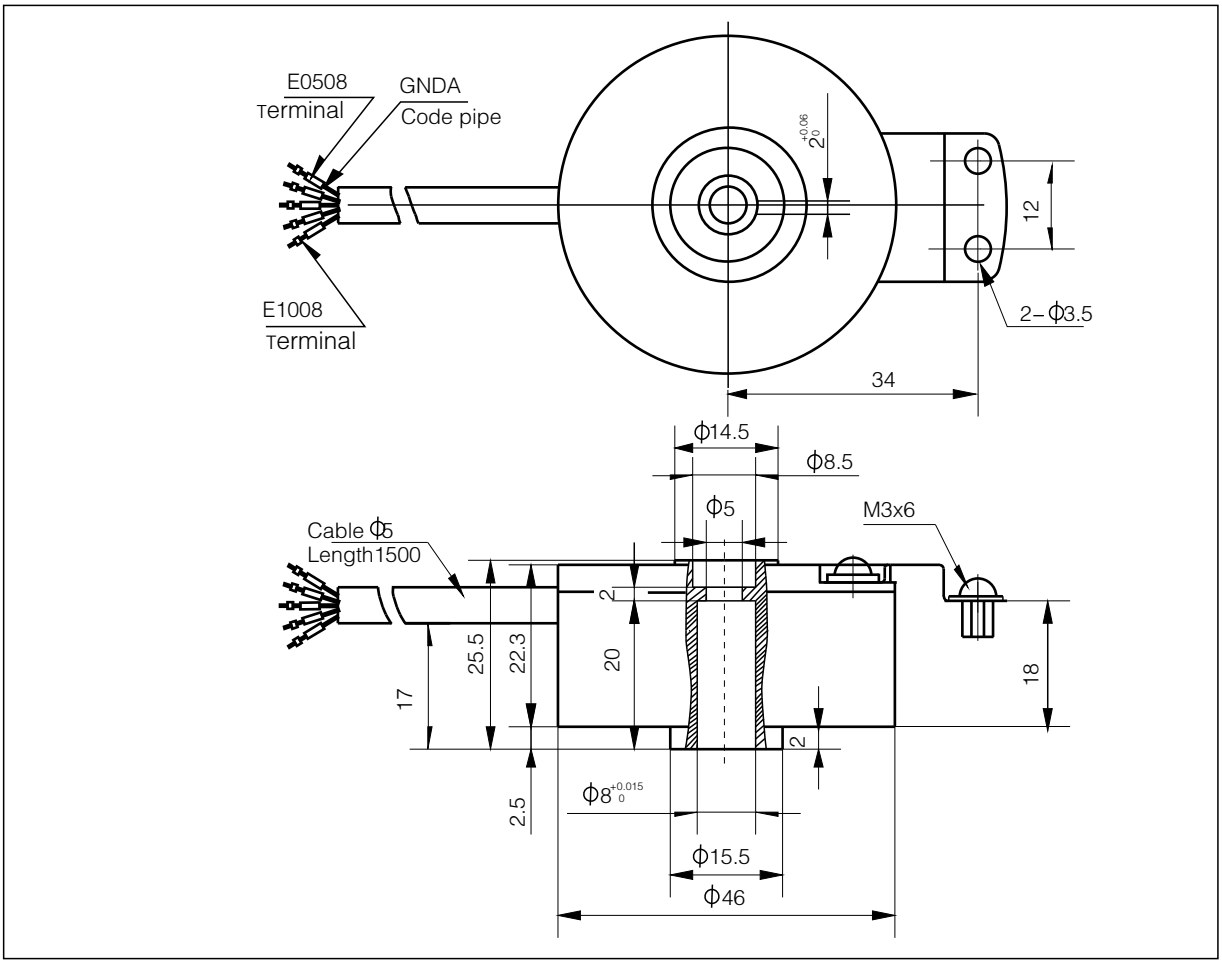
Output circuit

C(Open collector)	E(Voltage)
	

Connection specifications

Signal	Vcc	OV	Body	A	B	$\overline{Z}$
Color	White	Black	Shield	Red	Green	Yellow
Code pipe	+15V	GNDA		PA	PB	PZ

External view



A-ZKT-D100

SERIES

Incremental Hollow-shaft Encoders

- Hollow shaft encoder
- Outside diameter 100mm, Shaft diameter 25~30mm available
- Suitable for elevator

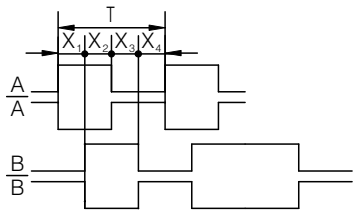
Explanation of model

A – ZKT – D100 H □ – □ B–G R □ □ □ – □

- Upgrade No.
- Model
- O.D code
- O.D diameter
- Hollow shaft code
- Hollow shaft diameter
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- G:Side entry cable R:Rear entry plug
- Supply voltage
- Signal output mode
- Output voltage
- Accessories model

Output pulses per revolution(P/R):512、600、1024.

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mount shaft.

Symmetry:$X_1+X_2=0.5T\pm0.1T$

$X_2+X_3=0.5T\pm0.1T$

Phase shift :$X_n\geqslant0.125T$

Division accuracy of signals:

Accumulative angle error of A&B channels ⩽0.2T

Pitch error ⩽0.05T

$T=360^0/N$(N is the number of pulse per revolution.)

Electrical specifications

Function No.	Supply voltage DC(V)	Current requirement (mA)	Output mode	Output voltage(V)		Sink current (mA)	Min. load resistance (Ω)	Rise time	Fall time	Frequency response (kHz)	Insulating impedance (MΩ)
				V_H	V_L			(μ s)			
05F	5 ± 0.25	< 60	Complementary	⩾3.5	⩽0.8			< 0.3	< 0.2	0~100	⩾100
05L	5 ± 0.25	< 100	Line driver	⩾2.5	⩽0.5			< 0.2	< 0.2	0~100	⩾100
05A	5 ± 0.25	< 80	Line driver	⩾2.5	⩽0.5			< 0.5	< 0.2	0~100	⩾100
8~15A	8~15	< 80	Line driver	⩾Vcc–2.5	⩽0.8			< 0.5	< 0.2	0~100	⩾100
8~15F	8~15	< 60	Complementary	⩾Vcc–2.5	⩽1			< 0.5	< 0.2	0~100	⩾100
7.5~15A	7.5~15	< 200	Line driver	⩾Vcc–2.5	⩽0.4			⩽1.5	⩽1.5	0~51.2	⩾100
7.5~15F	7.5~15	< 55	Complementary	⩾Vcc–2.5	⩽1			⩽1.5	⩽1.5	0~51.2	⩾100

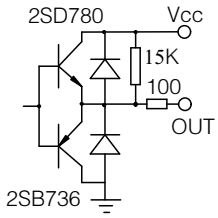
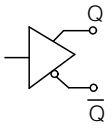
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Moment of inertia (kgm^2)	Max. allowable load		Allowable input angle acceleration (rad/s^2)
			Radial (N)	Axial (N)	
3000	5×10^{-2}	1×10^{-5}	40	20	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance (m/S²)	Shock resistance (m/S²)	Construction	Weight (kg)
0~+60	-20~+80	490 (3times each in x、y、z directions, duration 11ms)	100(10-200Hz, 2 hours each in x、y、z directions)	IP52	Approx0.5 (No Cable)

Output circuit

F	L、A
	

Connection specifications

Side entry cable

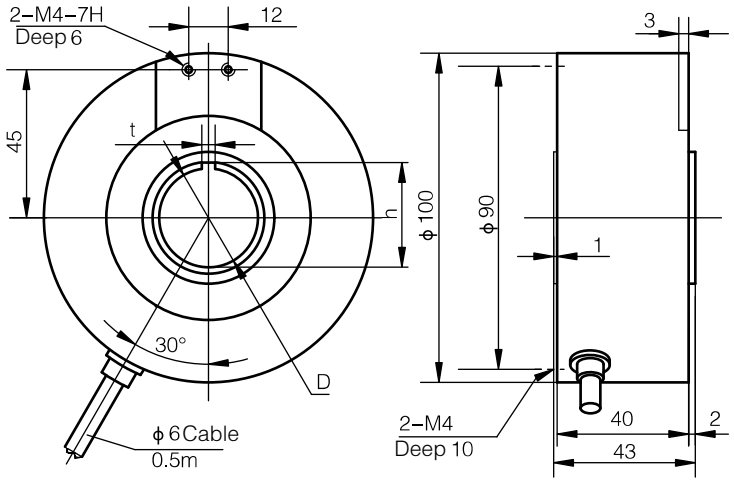
	Signal	Vcc	0V	A	B	$\bar{A}$	$\bar{B}$	Body
F	Color	Red	Black	Green	Blue			Shield
L、A	Color	White	Black	Red	Green	Violet	Grey	Shield

Rear entry plug

Pin	6	1	2	3	4	5	8
R7.5~15A(DAA633D1)	Vcc	0V	A	$\bar{A}$	B	$\bar{B}$	Body andOV
R7.5~15F(DAA633D2)	Vcc	0V	A	-	B	-	Body

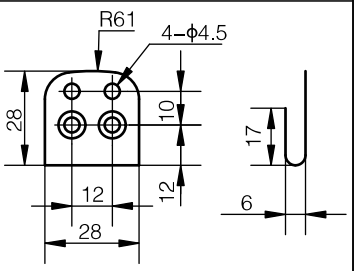
External view

G: Side entry cable.

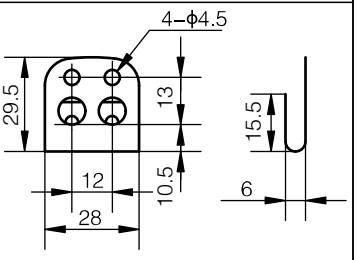


Note: About the details of hollow shaft tolerance of the dia.D ,keyway high h and keyway width t, pls demand from our company.

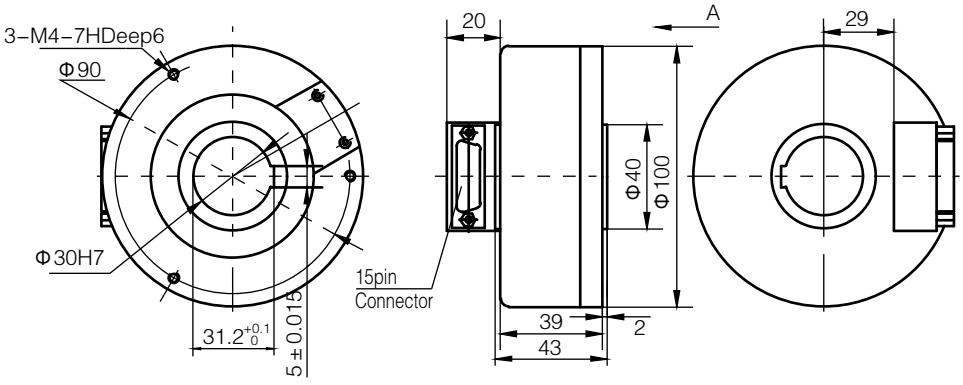
Accessories G



Accessories I



R: Rear entry plug



ZKT-D100B SERIES

- Hollow shaft encoder
- Outside diameter 100mm, Shaft diameter 25~30mm available
- Suitable for elevator

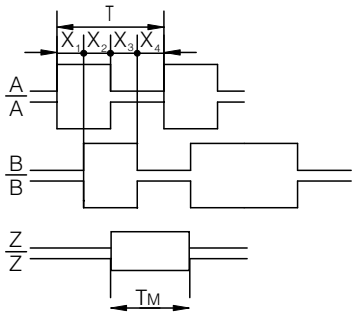
Explanation of model

ZKT – D100 B H □ – □ B M — C (G) □ □ □ – □

- Model
- O.D code
- O.D diameter
- Function diameter
- Hollow shaft code
- Hollow shaft No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Side entry plug
- Side entry cable
- Supply voltage
- Signal output mode
- Output voltage
- Accessories

Output pulses per revolution:512,600,1024P/R
Allowable Pulses No.:231~1024P/R

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing encoder shaft.

Symmetry:$X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift :$X_n\geqslant0.125T(n=1.2.3.4)$
Signal width of Z channel: $T_M=1T\pm0.5T$
Division accuracy of signals:
Accumulative angle error of A&B channels ≤0.2T
Pitch error ≤0.05T
T=360°/N(N is the number of pulse per revolution)

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time	Fall time	Frequency response (kHz)
			V_H	V_L	(ns)		
E(Voltage)	5±0.25	≤60	≥3.5	≤0.5	≤500	≤100	0~100
	8~30		≥Vcc-2.5	≤0.5	≤1500	≤300	
C(Open collector)	5±0.25	≤60					0~100
	8~30						
F(Complementary)	5±0.25	≤60	≥3.5	≤0.8	≤300	≤200	0~100
	8~30		≥Vcc-2.5	≤1.0	≤500	≤200	
L(Line driver)	5±0.25	≤100	≥2.5	≤0.5	≤200	≤200	0~100
A(Line driver)	5±0.25	≤80	≥2.5	≤0.5	≤500	≤200	0~100
	8~26		≥Vcc-2.5	≤0.8			

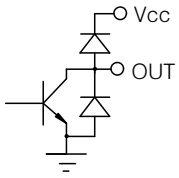
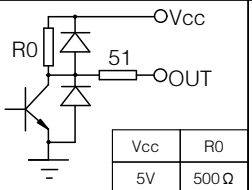
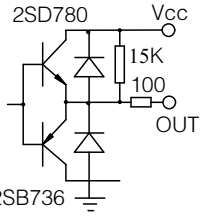
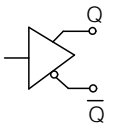
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Moment of inertia (kgm^2)	Max. allowable load		Allowable input angle acceleration (rad/s^2)
			Radial (N)	Axial (N)	
5000	5×10^{-2}	1×10^{-5}	40	20	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)²	Vibration resistance (m/S)²	Construction	Weight (kg)
-30~+85	-35~+95	980 (3times each in x、y、z directions, duration 6ms)	100m/s ² (10-200Hz, 2 hours each in x、y、z directions)	IP52	Approx0.5 (No cable)

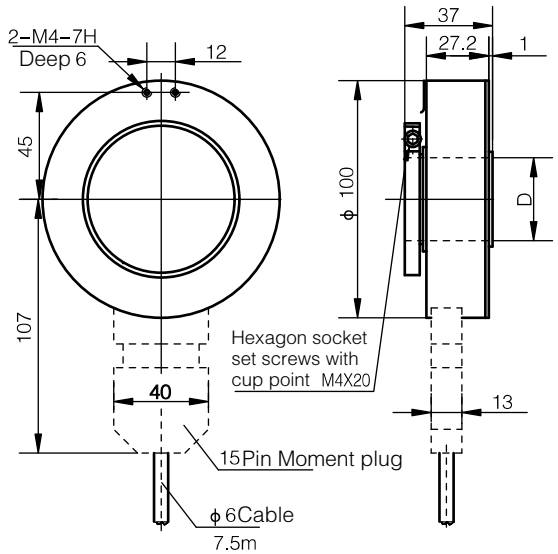
Output circuit

C	E	F	05L,05A,8~26A
	 Vcc / R0: 5V / 500Ω; 8V~30V / 3.4kΩ		 AM26C31(L) 7272B(A)

Connection specifications

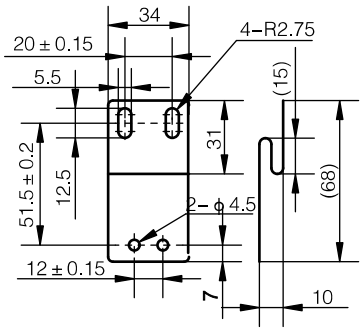
Output mode		Signal	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	G
C.E.F	Z channel	Color	Red	Black	Green	Blue					Shield
		Pin	7	5	4	2					8
	No Z channe	Color	White	Black	Red	Green	Yellow				Shield
		Pin	7	5	4	2	11				8
05L 8~26A,05A		Color	White	Black	Red	Green	Yellow	Violet	Grey	Pink	Shield
		Pin	7	5	4	2	11	13	14	10	8

External view

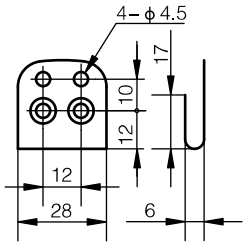


Note: About the details of hollow shaft tolerance of the dia.D, pls demand from our company.

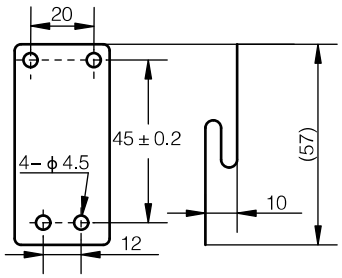
Accessories A



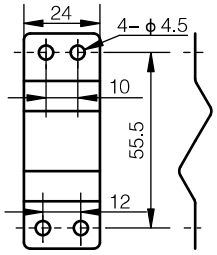
Accessories B



Accessories E



Accessories C



A-ZKT -D120 SERIES

- Hollow shaft encoder
- Outside diameter 120mm, Shaft diameter 20~48mm available
- Suitable for elevator

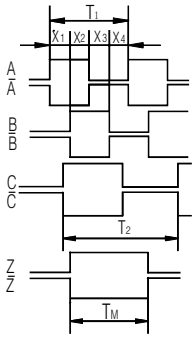
Explanation of model

A – ZKT – D 120 H□– □B M / □– C□□ /□ □

- Upgrade No.
- Model
- O.D code
- O.D diameter.
- Hollow shaft code
- Hollow shaft diameter.
- 1/10 output pulses per revolution
- C channel signal output mode
- C channel supply voltage
- A,B,Z channel signal output mode
- A,B,Z channel supply voltage
- Side entry plug.
- C channel pulses
- Index signal
- Dual square wave in quadrature

C and Z channels can not turn up together, but when the supply voltage and output mode are the same as A,B channels and Z or C channel ,pls indicate once.
Output pulses per revolution:A,B channels：360P/R ~ 7200P/R
C or Z channel：1P/R ~ 64P/R

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry：$X_1+X_2=0.5T \pm 0.1T_1$
$X_3+X_4=0.5T \pm 0.5T_1$
Phase shift：$X_n \geqslant 0.125T_1$ (n=1、2、3、4)
Signal width of Z channel：$T_M=1T_1 \pm 0.5T_1$
Accumulative angle error(A,B channels)$\leqslant 0.2T_1$
Pitch error$\leqslant 0.05T_1$
$T=360^\circ/N_1, T=360^\circ/N_2$
($N_1$is the number of A,B channel pulses per revolution.
$N_2$is the number of C channel pulses per revolution.)
(Z is the index signal width $T_M=1T_1 \pm 0.5T_1$)
Note: C and Z channels can not turn up together.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Sink current (mA)	Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L				
05E	5 ± 0.25	≤60	≥3.5	≤0.5		≤500	≤100	0~100
05D、05L	5 ± 0.25	≤100	≥2.5	≤0.5		≤200	≤200	0~100
05C	5 ± 0.25	≤60	——	——	≤40	——	——	0~100
05F	5 ± 0.25	≤60	≥3.5	≤0.8		≤300	≤200	0~100
8~30E	8~30	≤60	≥Vcc-2.5	≤0.5		≤1500	≤300	0~100
8~30C	8~30	≤60	——	——	≤40	——	——	0~100
8~30F	8~30	≤60	≥Vcc-2.5	≤1		≤500	≤200	0~100
8~30A	8~30	≤120	≥Vcc-2.5	≤1		≤500	≤200	0~100

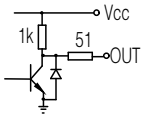
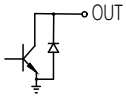
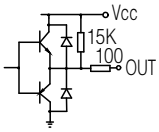
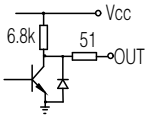
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (25℃) (N.m)	Max. allowable load(N)		Moment of inertia (kgm^2)	Allowable input angle acceleration (rad/s^2)
		Radial	Axial		
3000	5×10^{-2}	60	40	6×10^{-4}	10000

Environment specifications

Operating temperature (°C)	Storage temperature (°C)	Vibration resistance (m/s^2)	Shock resistance (m/s^2)	Construction	Weight (kg)
-20~+85	-30~+95	70(10~200Hz, 2hrs each in X,Y,Z directions, amplitude is 1.5 mm)	198(3 times each in X,Y,Z directions, duration 15 ms)	IP50	1.5kg

Output circuit

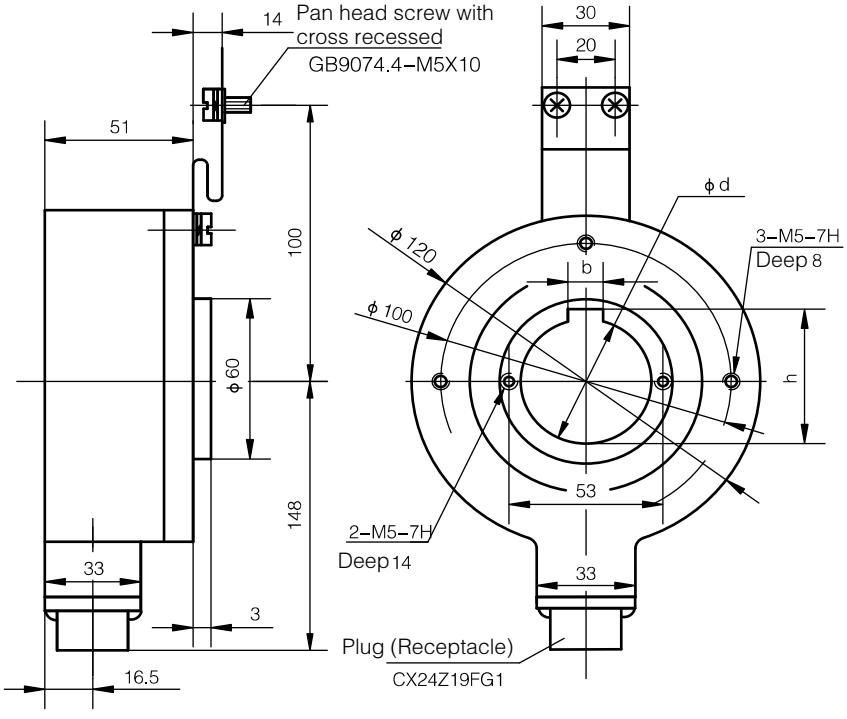
Output	Voltage(05E)	Open collector(C)	Complementary(F)	Driver	Voltage(8~30E)
Circuit				 L:26C31 D:75113 A:ET7272B	

Connection specifications

Signal / Pin code / Output mode	1	2	3	4	5	6	7	8	12
05D,05L,A	Vcc	0V	A	$\bar{A}$	B	$\bar{B}$	C(Z)	$\bar{C}(\bar{Z})$	Shield
C,E,F	Vcc	0V	A	NC	B	NC	C(Z)	NC	Shield

External view

Hollow shaft d	Hollow shaft code	Keyway width b	h
H25	Φ25F7($^{+0.041}_{+0.020}$)	b=6 $^{+0.1}_{+0.05}$	h=28.5 $^{+0.2}_{0}$
H20	ϕ 20F7($^{+0.041}_{+0.020}$)	b=6 $^{+0.078}_{+0.030}$	h=22.8 $^{+0.2}_{0}$
H45A	ϕ 45F7($^{+0.050}_{+0.025}$)		
H48	ϕ 48F7($^{+0.050}_{+0.025}$)	b=10 $^{+0.098}_{+0.040}$	h=51.3 $^{+0.2}_{0}$
H42B	ϕ 42F7($^{+0.050}_{+0.025}$)	b=12 $^{+0.12}_{+0.05}$	h=45.3 $^{+0.2}_{0}$
H40A	ϕ 40F7($^{+0.050}_{+0.025}$)	b=4 $^{+0.054}_{+0.024}$	h=42 $^{+0.2}_{0}$
H38A	ϕ 38F7($^{+0.050}_{+0.025}$)	b=4 $^{+0.054}_{+0.024}$	h=41.3 $^{+0.2}_{0}$
H30A	ϕ 30F7($^{+0.041}_{+0.020}$)	b=5 $^{+0.098}_{+0.040}$	h=33.5 $^{+0.2}_{0}$
H42A	ϕ 42F7($^{+0.050}_{+0.025}$)	b=4 $^{+0.054}_{+0.024}$	h=45.3 $^{+0.2}_{0}$
H28	ϕ 28F7($^{+0.041}_{+0.020}$)	b=8 $^{+0.098}_{+0.040}$	h=31.3 $^{+0.2}_{0}$
H45	ϕ 45F7($^{+0.050}_{+0.025}$)	b=12 $^{+0.12}_{+0.05}$	h=49 $^{+0.2}_{0}$
H42	ϕ 42F7($^{+0.050}_{+0.025}$)	b=12 $^{+0.12}_{+0.05}$	h=45.8 $^{+0.2}_{0}$
H40	ϕ 40F7($^{+0.050}_{+0.025}$)	b=12 $^{+0.12}_{+0.05}$	h=43.3 $^{+0.2}_{0}$
H38	ϕ 38F7($^{+0.050}_{+0.025}$)	b=10 $^{+0.098}_{+0.040}$	h=41.3 $^{+0.2}_{0}$
H35	ϕ 35F7($^{+0.050}_{+0.025}$)	b=10 $^{+0.098}_{+0.040}$	h=38.3 $^{+0.2}_{0}$
H30	ϕ 30F7($^{+0.041}_{+0.020}$)	b=8 $^{+0.098}_{+0.040}$	h=33.3 $^{+0.2}_{0}$



A-ZKX-6 SERIES

- Blind hollow shaft encoder
- Outside diameter 38mm, Shaft diameter 8mm

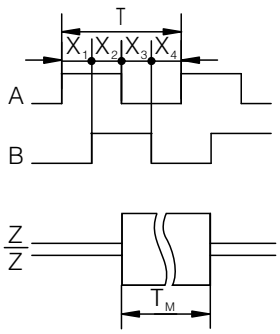
Explanation of model

A - ZKX - 6 - □ B M □ - □ □ □ - □m - □

- Upgrade No.
- Model
- Function No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Blank: Glass disk; J: Metal disk
- Cable length (Unit: m)
- Signal output mode
- Supply voltage
- E:Rear entry cable G:Side entry cable
- Index length (Black means 1T)

Output pulses per revolution(P/R):1.Glass disk: 1~5000P/R(multiplication factor up to40000P/R)
2.Metal disk: 1~1024P/R
3.Index width > 1T: 1000P/R(15T)、500P/R(7.5T)

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry: $X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift : $X_n\geqslant0.125T$(n=1,2,3,4)
Accumulative angle error: ⩽0.2T
Pitch error: ⩽0.05T
T=360° /N (N is the number of pulse per revolution)
Signal width of Z channel
1、$T_M=1T\pm0.5T$
$T_M=nT\pm1T(n\geqslant2)$
Positional relationship of Z channel and A&B channels is not specified.
2、$T_M=0.5T\pm0.25T$
$T_M=0.25T\pm0.125T$
The rising edges of Z channel and B channel may alignment.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5±0.25	⩽60	⩾3.5	⩽0.5	⩽500	⩽100	0~300
	5~26		⩾Vcc-2.5	⩽0.5	⩽1500	⩽300	
C(Open collector)	5±0.25	⩽60					0~300
	5~26						
F(Complementary)	5±0.25	⩽60	⩾3.5	⩽0.8	⩽300	⩽200	0~300
	5~26		⩾Vcc-2.5	⩽1.0	⩽500	⩽200	
L、H(Line driver)	5±0.25	⩽100	⩾2.5	⩽0.5	⩽200	⩽200	0~300
J(Line driver)	5~26	⩽80	⩾Vcc-2.5	⩽0.5	⩽500	⩽200	0~300
A(Line driver)	5~26	⩽80	⩾Vcc-2.5	⩽0.8	⩽800	⩽200	0~300

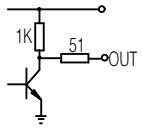
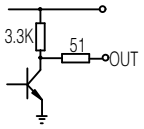
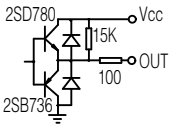
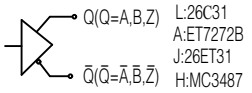
Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$	Construction
-30~+85	-35~+95	980(3times each in x、y、z directions, duration 6ms)	50(10~200Hz,2 hours each in x、y、z directions)	IP54

Mechanical specifications

Max.slew speed (rpm)	Starting torque (N.m)(25℃)	Allowable input angle acceleration (rad/s)^2	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
5000	2×10^{-3}	10000	9.8	9.8	4×10^{-7}	0.12

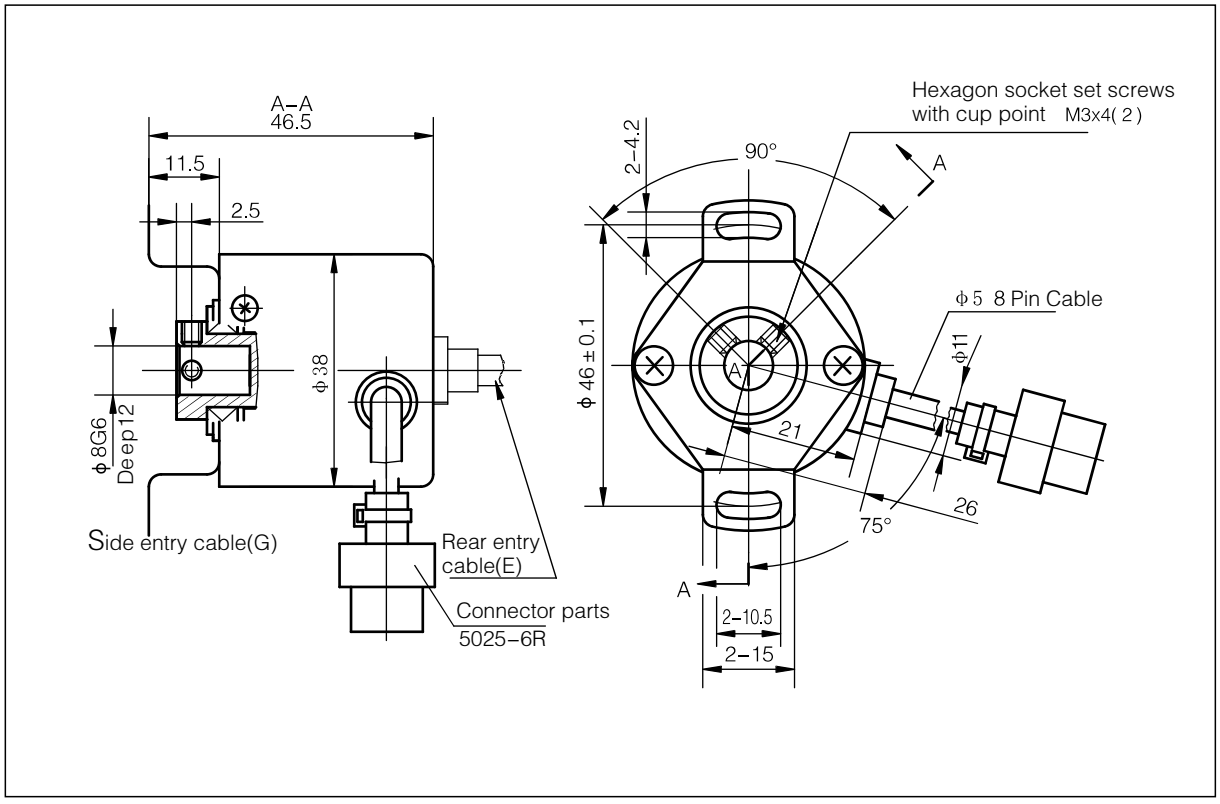
Output circuit

E(Voltage)		F(Complementary)	
5V	5V-26V	5V	5V-26V
			
C(Open collector)	Line driver		
			

Connection specifications

Color	White	Black	Red	Green	Yellow	Pink
Signal	Vcc	OV	A	B	Z	$\bar{Z}$
Pin	4	5	1	6	3	2

External view



ZKX-3B SERIES

- Big size hollow shaft encoder
- Outside diameter 170mm, Shaft diameter 78mm

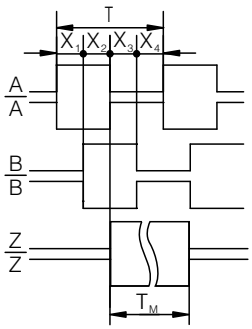
Explanation of model

ZKX – 3B – □ B M – G 05 □

- ZKX – Model
- 3B – Function No.
- □ – 1/10 output pulses of A and B
- B – Dual square wave in quadrature
- M – Index signal
- G – Side entry cable
- 05 – Supply voltage
- □ – Signal output mode

Output pulses per revolution:3800,4000,4500,7200P/R

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry:$X_1+X_2=0.5T \pm 0.125T$

$X_3+X_4=0.5T \pm 0.125T$

Phase shift :$X_n \geqslant 0.125T$(n=1,2,3,4)

Accumulative angle error:≤0.2T

Pitch error:≤0.05T

Signal width of Z channel

$T_M=1T \pm 0.5T$

T=360° /N (N is the number of pulse per revolution.)

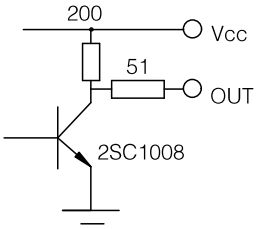
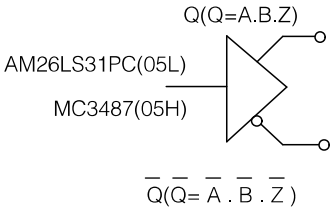
Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
L、H(Line driver)	5±0.25	≤180	≥2.5	≤0.5	≤500	≤500	0~100
E(Voltage)	5±0.25	≤150	≥3.5	≤0.5	≤1000	≤1000	0~100

Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
1300	2×10^{-1}	50	30	4×10^{-7}	10000

Output circuit

E(Voltage)	Line driver
	

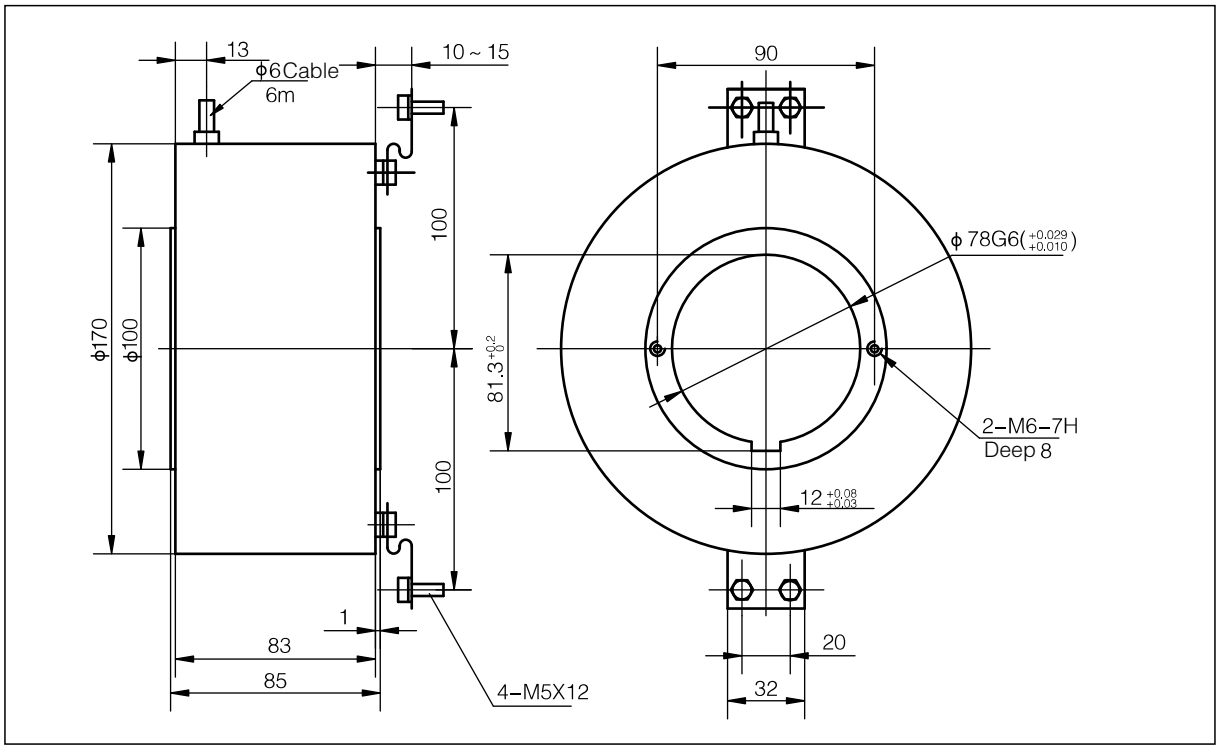
Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)²	Vibration resistance (m/S)²	Construction	Weight (kg)
-10~+60	-30~+70	490(3times each in x、y、z directions, duration 11ms)	50(10-200Hz, 2 hours each in x、y、z directions)	IP50	Approx2 (No Cable)

Connection specifications

05E						05L、05H									
Signal	5V	0V	A	B	Shield	Signal	5V	0V	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$	Shield
Color	White	Black	Red	Green	Bronze net	Color	Brown	White	Green	Yellow	Red	Blue	Grey	Pink	Bronze net

External view



ZKX-3I SERIES

- Hollow shaft encoder
- Outside diameter 170mm, Shaft diameter 30~50mm available
- High resolution, up to 288000P/R.

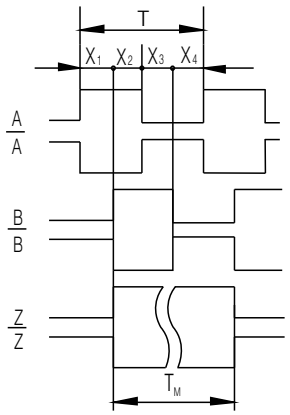
Explanation of model

ZKX – 3I – H □ – □ B M □ – G 05 □ – □m

- Model: ZKX
- Function No.: 3I
- Hollow shaft code: H
- Hollow shaft diameter: □
- 1/10 output pulses of A and B: □
- Dual square wave in quadrature: B
- Index signal: M
- Index length (Black means 1T): □
- Side entry cable: G
- Supply voltage: 05
- Signal output mode: □
- Cable length (Unit: m): □m

Output pulses per revolution(P/R):3200,18000,(multiplication factor up to 288000)

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry: $X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift: $X_n\geqslant0.125T(n=1,2,3,4)$
Accumulative angle error: ≤0.2T
Pitch error: ≤0.05T
T=360° /N(N is the number of pulse per revolution)
Signal width of Z channel:
1、$T_M=1T\pm0.5T$
$T_M=nT\pm1T(n\geqslant2)$
Positional relationship of Z channel and A&B channels is not specified.
2、$T_M=0.5T\pm0.25T$
$T_M=0.25T\pm0.125T$
The rising edges of Z channel and B channel may alignment.

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5±0.25	≤60	≥3.5	≤0.5	≤200	≤100	0~300
	8~30		≥Vcc-2.5	≤0.5	≤1000	≤300	
C(Open collector)	5±0.25	≤60					0~300
	8~30						
F(Complementary)	5±0.25	≤60	≥3.5	≤0.8	≤300	≤200	0~300
	8~30		≥Vcc-2.5	≤1.0	≤500	≤200	
L、H(Line driver)	5±0.25	≤100	≥2.5	≤0.5	≤200	≤200	0~300

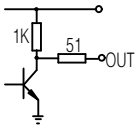
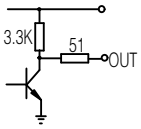
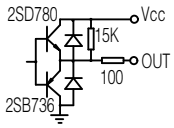
Mechanical specifications

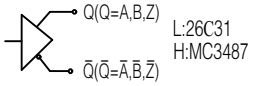
Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Moment of inertia (kgm^2)	Max. allowable load		Allowable input angle acceleration $(rad/s)^2$
			Radial (N)	Axial (N)	
1300	5×10^{-2}	8×10^{-4}	50	30	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S²)	Vibration resistance (m/S²)	Weight (kg)
-10~+60	-30~+70	490 (3times each in x、y、z directions, duration 6ms)	50 (10~200Hz, 2 hours each in x、y、z directions)	2.5 (No cable)

Output circuit

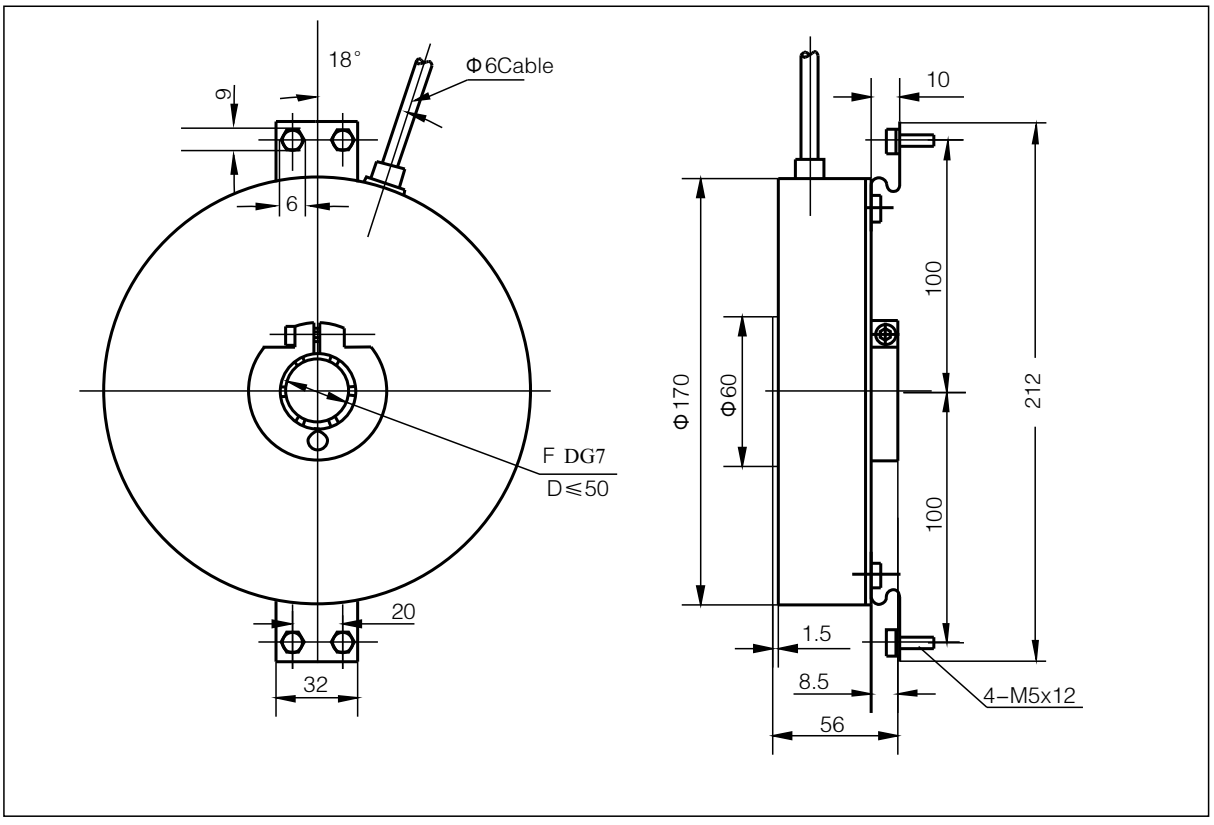
E(Voltage)		F(Complementary)	
5V	5V-30V	5V	5V-30V
			

C(Open collector)	Line driver	
		

Connection specifications

E、C、F							05L.05H									
Signal	Vcc	OV	A	B	Z	Signal	Signal	5V	OV	A	$\overline{A}$	B	$\overline{B}$	Z	$\overline{Z}$	Signal
Color	White	Black	Red	Green	Yellow	Bronze net	Color	Brown	White	Green	Yellow	Red	Blue	Grey	Pink	Bronze net

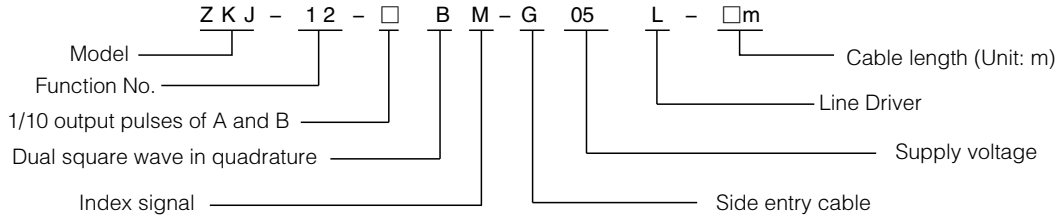
External view



ZKJ-12 SERIES

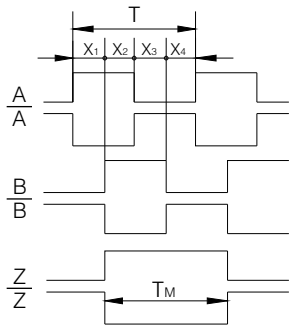
- Blind hollow shaft encoder
- Outside diameter 58mm, Shaft diameter 12mm

Explanation of model



Output pulses per revolution(P/R):1024

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry:
$X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift
$Xn\geqslant0.125T$
(n=1.2.3.4)
Division accuracy of signals
Accumulative angle error: $<0.2T$
Pitch error: $<0.05T$
Signal width of Z channel
$T_M=1T\pm0.5T$
$T=360^\circ/N$
(N is the number of pulse per revolution.)

Electrical specifications

Supply voltage DC(V)	Current requirement (mA)	Output mode	Output voltage(V)		Rise /fall time(ns)	Frequency response (kHz)	Insulation impedance (MΩ)DC500V
			V_H	V_L			
5±0.25	≤100	Line driver	≥2.5	≤0.5	<500	0~100	≥100

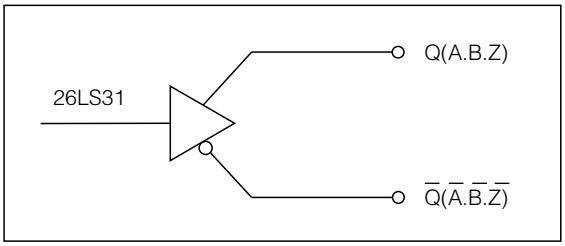
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
5000	1×10^{-2}	40	30	4×10^{-6}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance (m/S)²	Shock resistance (m/S)²	Construction
-10~+70	-20~+80	50 (10~200Hz.2 hours each in x、y、z directions)	490 (3times each in x、y、z directions, duration 6ms)	IP54

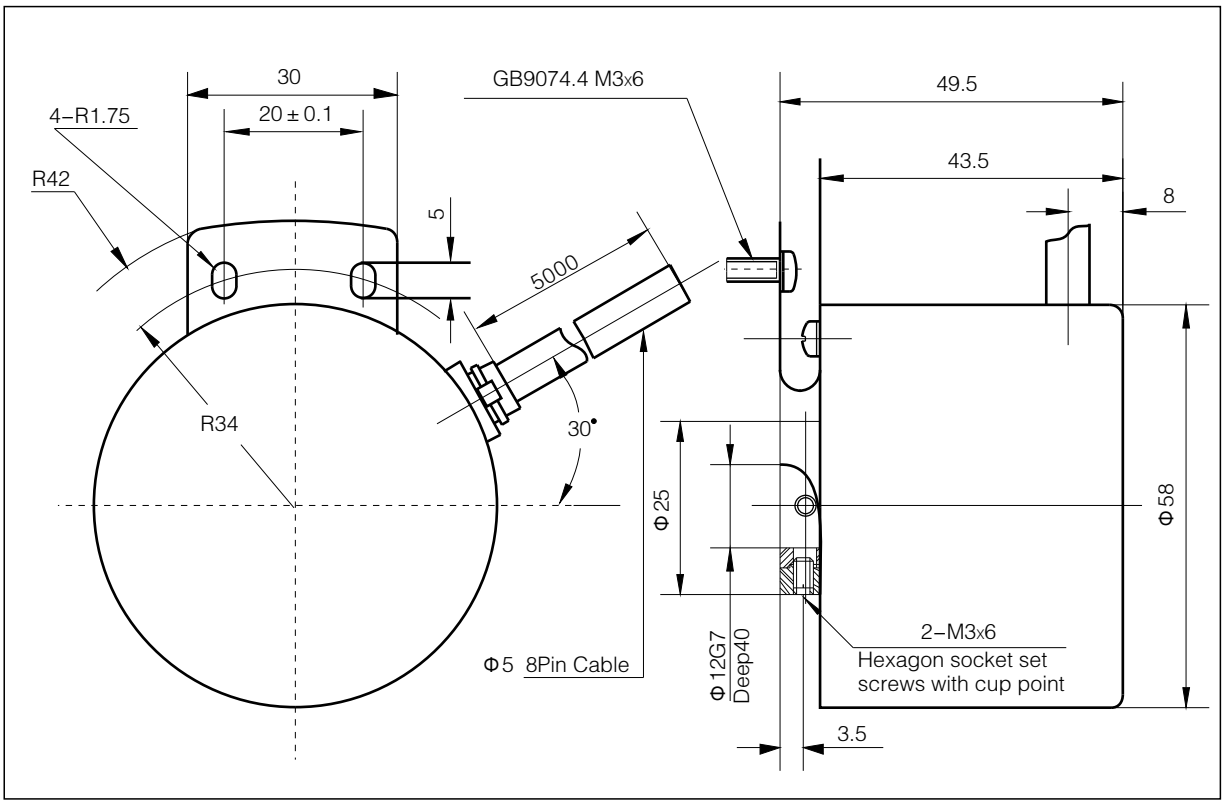
Output circuit



Connection specifications

Signal	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body
Color	White	Black	Red	Green	Yellow	Pink	Blue	Orange	Shield

External view



ZKK-3B SERIES

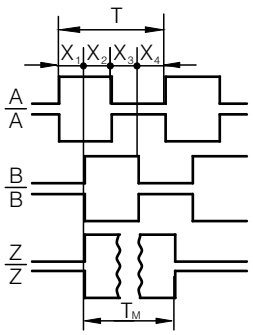
- Hollow shaft encoder
- Outside diameter 58mm, Shaft diameter 12~15mm available
- Suitable for servo motors

Explanation of model

ZKK – 3B–H□–□ B M □– G □ □–□m–□

- Model
- Hollow shaft No.
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Index length (Black means 1T)
- Output pulses per revolution: Glass disk: 1~8192P/R, Metal disk: 1~1024P/R
- Blank: Glass disk; J: Metal disk
- Cable length (Unit: m)
- Signal output mode
- Supply voltage
- Side entry cable

Output waveforms and division accuracy



This figure shows the waveforms when a shaft is rotated clockwise (CW)viewing mounting shaft.

Symmetry: $X_1+X_2=0.5T \pm 0.1T$
$X_2+X_3=0.5T \pm 0.1T$
Phase shift : $X_n \geqslant 0.125T$ n=(1,2,3,4)
Division accuracy of signals: Accumulative angle error ⩽0.2T
Pitch error⩽0.05T
Signal width of Z channel:
$T_M=1T \pm 0.5T$
Positional relationship of Z channel and A&B channels is not specified.
$T_M=0.5T \pm 0.25T$
$T_M=0.25T \pm 0.125T$
The rising edges of Z channel and B channel may alignment.
T=360° /N (N is the number of pulse per revolution.)

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)
			V_H	V_L			
E(Voltage)	5±0.25	⩽60	⩾3.5	⩽0.5	⩽500	⩽100	0~300
	8~30		⩾Vcc-2.5	⩽0.5	⩽1500	⩽300	
C(Open collector)	5±0.25	⩽60					0~300
	8~30						
F(Complementary)	5±0.25	⩽60	⩾3.5	⩽0.8	⩽300	⩽200	0~300
	8~30		⩾Vcc-2.5	⩽1.0	⩽500	⩽200	
L、H(Line driver)	5±0.25	⩽100	⩾2.5	⩽0.5	⩽200	⩽200	0~300
J(Line driver)	5~30	⩽80	⩾Vcc-2.5	⩽0.5	⩽500	⩽200	0~300
A(Line driver)	5~30	⩽80	⩾Vcc-2.5	⩽0.8	⩽800	⩽200	0~300
M(Line driver)	5~15	⩽80	⩾Vcc-2.5	⩽0.5	⩽500	⩽200	0~300

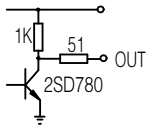
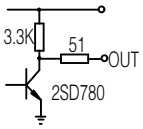
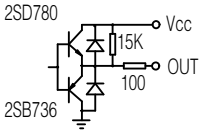
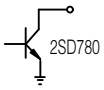
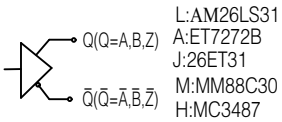
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
3000	5×10^{-2}	30	20	1.5×10^{-6}	10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)²	Vibration resistance (m/S)²	Construction
-20~+85	-40~+95	500(2times each in x、y、z directions, duration 6ms)	100(10~200Hz,2 hours each in x、y、z directions)	IP54

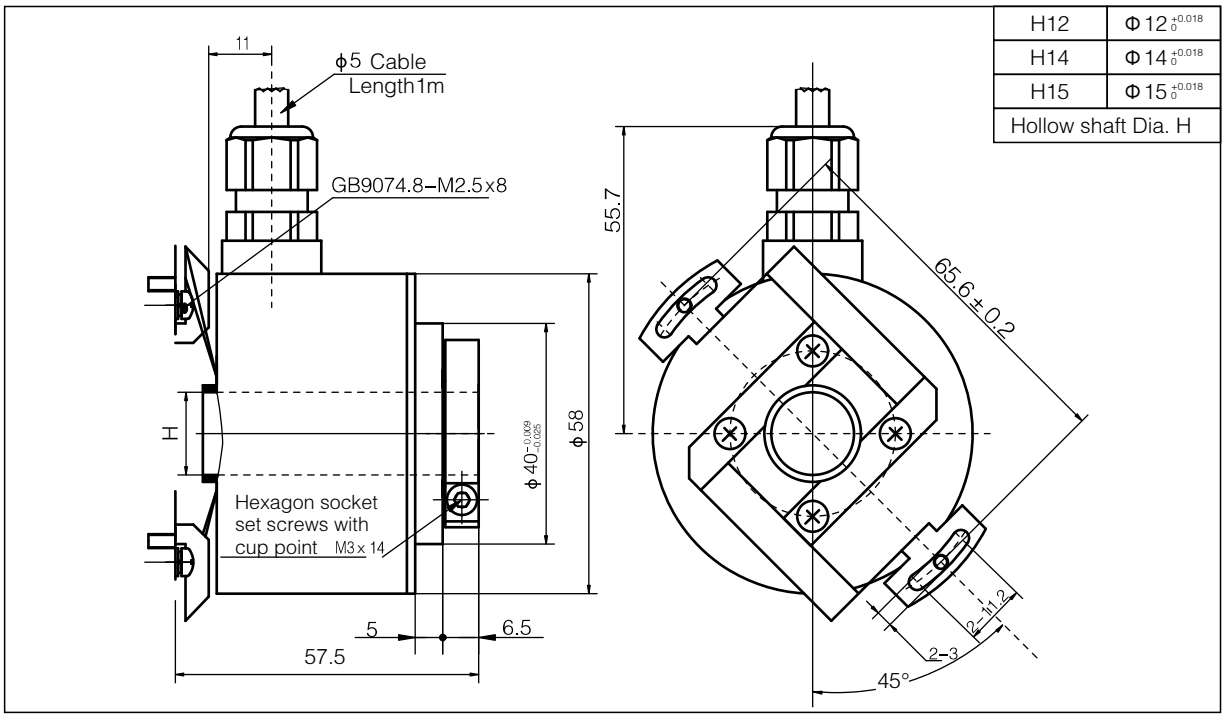
Output circuit

E(Voltage)		F(Complementary)	
5V	8~30V	5V	8~30V
			
C(Open collector)	Line driver		
			

Connection specifications

Output \ Color	White	Black	Red	Green	Yellow	Pink	Blue	Orange	Shield
C、E、F	Vcc	OV	A	B	Z				Body
L、A、J、M、H	Vcc	OV	A	B	Z	$\overline{A}$	$\overline{B}$	$\overline{Z}$	Body

External view



®

ZKD-30-□BM0.25/□P-G05L-□型

光电编码器

使用说明书

中国名牌 CHINA TOP BRAND 2007.9-2010.9

通过ISO9001: 2000 国际质量体系认证

长春禹衡光学有限公司

■ 用途及特点

该产品广泛用于自动控制.自动测量.遥控.计算机技术以及在数控机床上作角度和纵.坐标的测量等,主要用于伺服电机配套

其特点:安装轴为锥轴,定位精度高;壳体后部预留开口,方便用户安装.拆卸;

■ 产品型号及编号

ZKD-30-□ B M 0.25/ □P - G 05 L-□

- 产品型号
- 性能代号
- A.B路信号输出脉冲数的1/10
- 90°相位差二信号
- 零位信号
- 零位长度
- 磁极对数
- 电缆侧出
- 电源电压
- 输出型式
- 附件型号

每转输出脉冲数 :2500P/r

U.V.W信号周期: 2P,3P,4P,5P等

■ 电气参数

输出型式	电源电压 DC(V)	消耗电流 (mA)	输出电压(V)		上升.下降时间 (ns)	响应频率 (KHz)	绝缘阻抗 (MΩ) DC500V
			V_H	V_L			
L (驱动器)	5±0.25	<200	≥2.5	≤0.5	≤200	0～350	≥100

■ 输出型式

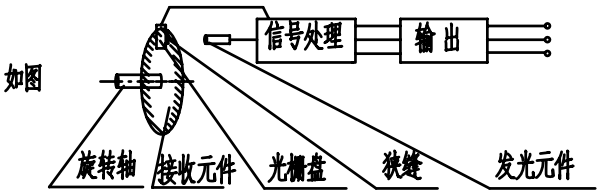
AM26C31 → Q(A.B.Z.U.V.W)

→ $\overline{Q}$($\overline{A}$.$\overline{B}$.$\overline{Z}$.$\overline{U}$.$\overline{V}$.$\overline{W}$)

■ 机械参数

允许最大机械转数 (r/min)	启动力矩 (25°C) (N m)	轴最大负载		转动惯量 ($kg.m^2$)	允许角加速度 (rad/s^2)
		径向 (N)	轴向 (N)		
6000	$5X10^{-3}$	10	10	1×10^{-6}	10000

■ 工作原理



采用圆光栅,经光电转换,将轴的角度位移转换成电脉冲信号.

■ 输出波形与信号位置准确度

A.B.Z周期及相位:

波形比 $X_1+X_2=0.5T\pm0.1T$

$X_2+X_3=0.5T\pm0.1T$

相位差 $X_n \geqslant 0.15T$ (n=1,2,3,4)

Z信号宽: $T_M=0.25T$

信号位置准确度:

A.B相绝对角度误差 ≤ 0.2T

A.B相周期误差 ≤ 0.05T

T= 360°/N (N为每转输出脉冲数)

Z相与U相关系: C=±1°(机械角)

U.V.W周期及相位:

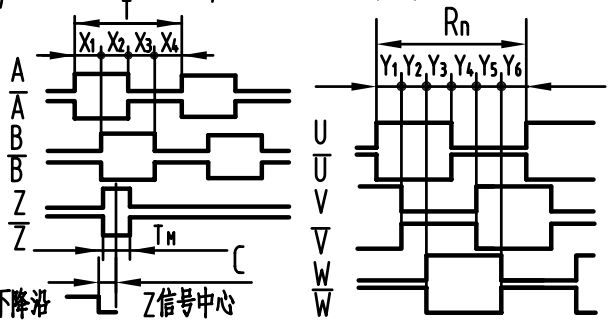
周期: $R=360°/N_1\pm1.5°$ (N_1=磁极对数)

相位差: $Yn=R/6\pm1.5°$ (n=1,2,3,4,5,6)

A.B相与U.V.W相位置不作规定

波形图(1)

从板弹簧方向看, 主轴顺时针旋转(CW)的波形图

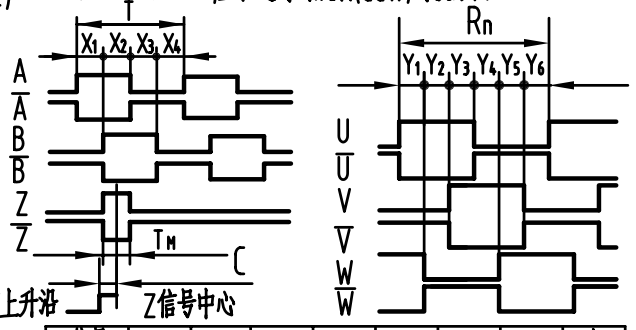


对应接线表

信号	5V	A	B	Z	U	V	W	壳
线色	赤	绿	灰	黄	茶	青	橙	屏蔽
信号	0V	$\overline{A}$	$\overline{B}$	$\overline{Z}$	$\overline{U}$	$\overline{V}$	$\overline{W}$	
线色	黑	白/绿	白/灰	白/黄	白/茶	白/青	白/橙	

波形图(2)

从板弹簧方向看,主轴逆时针旋转(CCW)的波形图



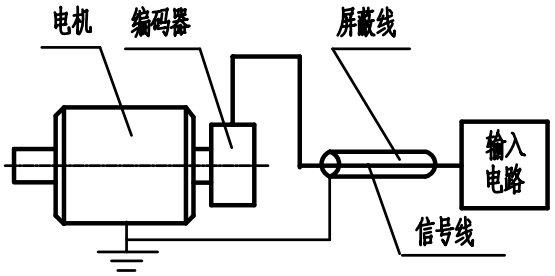
对应接线表

信号	5V	A	B	Z	U	V	W	壳
线色	赤	灰	绿	黄	茶	青	橙	屏蔽
信号	0V	$\overline{A}$	$\overline{B}$	$\overline{Z}$	$\overline{U}$	$\overline{V}$	$\overline{W}$	
线色	黑	白/灰	白/绿	白/黄	白/茶	白/青	白/橙	

■ 环境参数

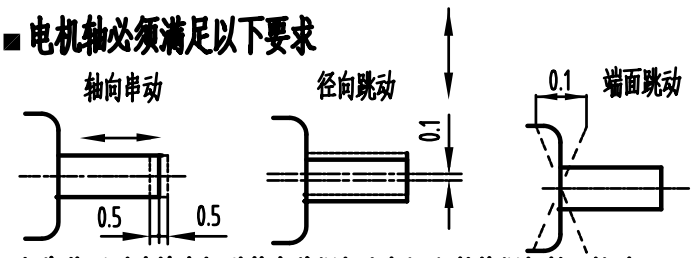
使用温度(℃)	贮存温度(℃)	耐振动	耐冲击	防护等级	重 量
-30～+85	-40～+95	49m/S² 10～200Hz X.Y.Z三方向各2h	980m/S² X.Y.Z三方向各3次,每次6ms	IP40	约0.3kg(电缆除外)

■ 最佳配线方法



请不要将编码器的输出线与动力线等绕在一起或同管传输,
也不宜在配电盘附近使用.

■ 电机轴必须满足以下要求



■ 长期使用后请检查板弹簧安装螺钉和紧固主轴的螺钉是否松动

■ 仪器的成套性

主机 ——— 1台
附件 ——— 1套
包装箱 ——— 1个
使用说明书 ——— 1份
合格证 ——— 1份
装箱单 ——— 1份

附件:板弹簧一个,GB9074.3 M3X6十字槽盘头螺钉与弹性垫圈组合件四个

■ 定货须知

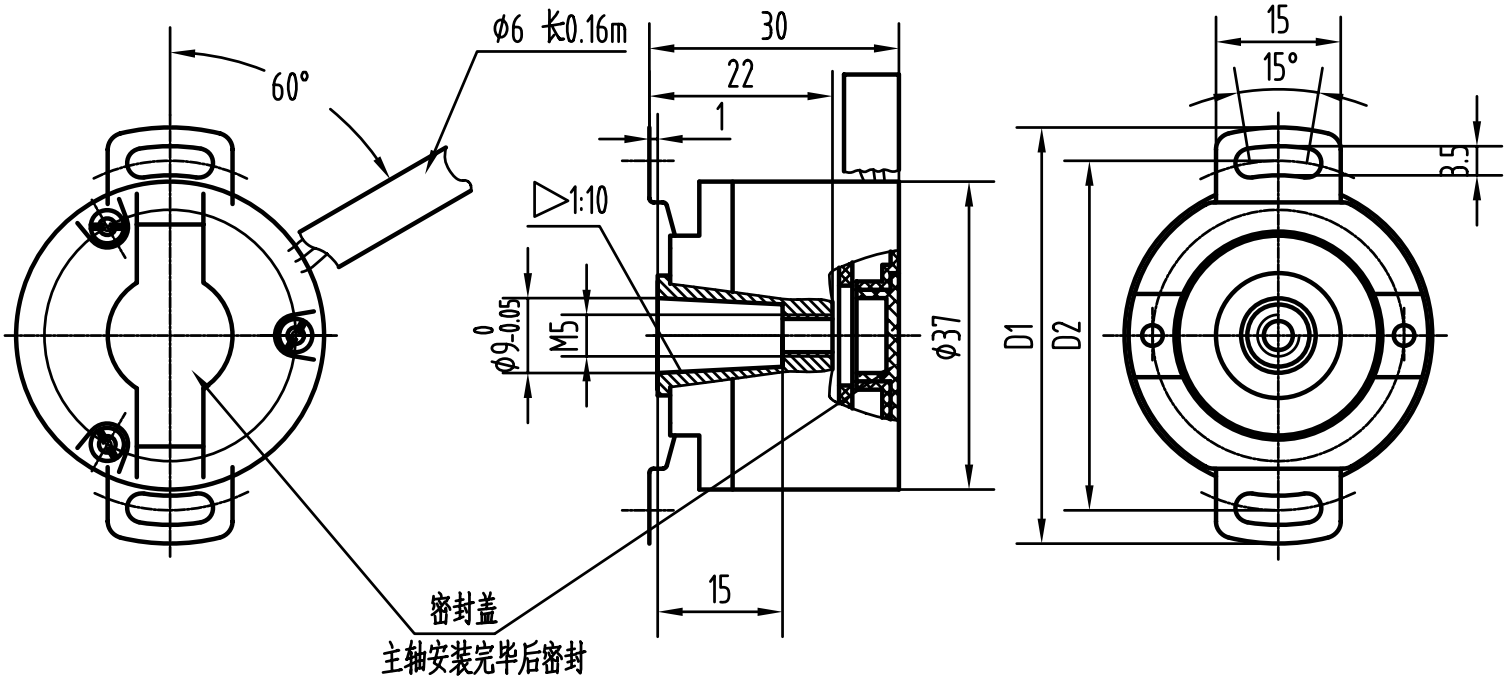
电缆长度如有特殊要求请注明
附件型号请注明,如不注明则按A型附件发货

■ 保修条件

在用户遵守仪器的贮存和使用规则的条件下,从发货之日起十八个月内,产品因质量不良发生损坏或不能正常工作时,本公司将无偿为用户修理或更换产品。

公司地址: 长春市飞跃东路333号
邮　编: 130012
电　话: 0431- 85543700 88684373 88618174
售　后: 0431-85543706
传　真: 0431-88634119
E-mail: sales@yu-heng.cn
网　址: http://www.encoders.com.cn //www.yu-heng .cn

■ 外形图及安装尺寸



附件型号	D1	D2
A	50	42
B	48	40

ZWD-21 SERIES

- Small modular model
- Low cost for no bearings
- Most suitable for DC servo motors

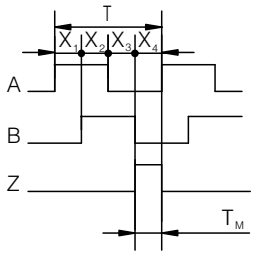
Explanation of model

ZWD – 21 – □ B □

- Model: ZWD
- Function No.: 21
- 1/10 output pulses of A and B: □
- Blank: No Index signal; M: Index signal;
- Dual square wave in quadrature: B

Allowable Pulses No.(P/R) : 100,192, 200, 256, 360, 400, 500, 512, 1024P/R
More then 512P/R: film disk,512P/R or less:Metal disk

Output waveforms and division accuracy



Symmetry: $X_1+X_2=0.5T \pm 0.125T$
$X_2+X_3=0.5T \pm 0.125T$
Phase shift: $X_n \geq 0.125T(n=1,2,3,4)$
Division accuracy of signal:
Accumulative angle error: ≤0.2T
Pitch error: ≤0.05T
T=360° /N(Ni s the number of pulse per revolution.)
$T_M=0.25T \pm 0.125T$

The figure shows the waveforms when a shaft is rotated anticlockwise (CCW) viewing mounting shaft.

Electrical specifications

Supply voltage DC(V)	Current requirement (mA)	Frequency response (kHz)
5 ± 0.5	≤50	0~100

Output mode

Voltage output with 5VTTL(the best wiring way: use 2.7K pull–up resistor),and the rise time may less than 0.5s, the fall time may less than 0.2s.

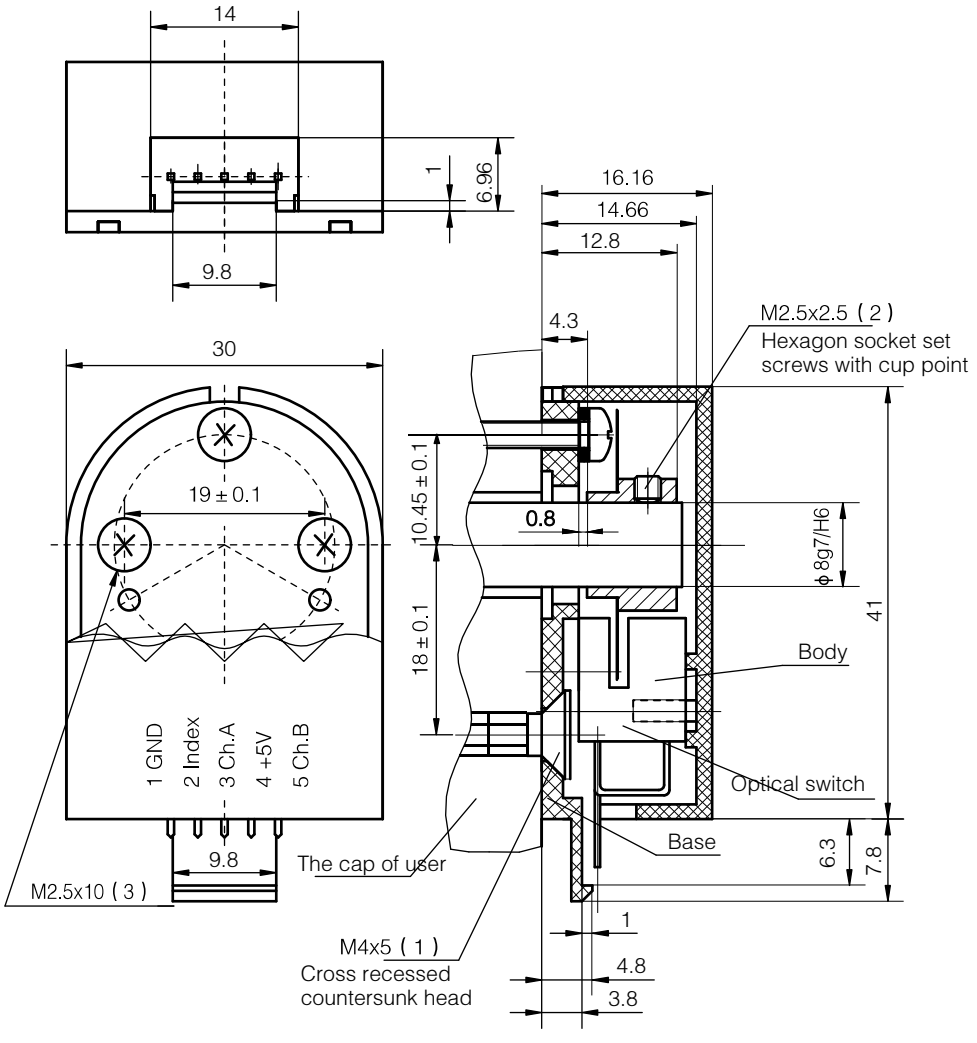
Mechanical specifications

Allowable input angle acceleration $(rad/s)^2$	Moment of inertia (kgm^2)	Weight (kg)
10000	5×10^{-8}	0.015

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Shock resistance $(m/S)^2$	Vibration resistance $(m/S)^2$
–40~+80	–50~+85	1000m/s²(3 times each in x、y、z directions)	100m/s²(55~2000Hz,3 times each in x、y、z directions)

External view



ZWD-27 SERIES

- Small modular model
- low cost for no bearings
- Most suitable for AC servo motor

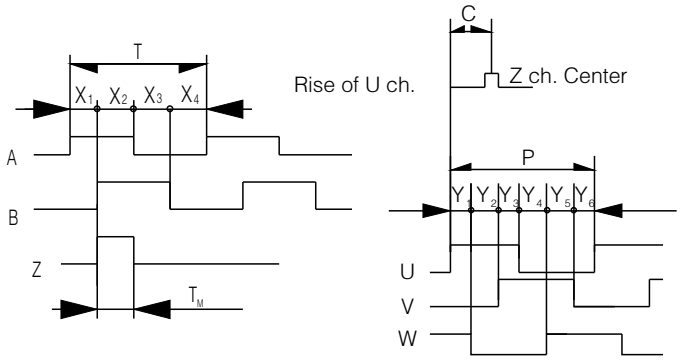
Explanation of model

ZWD–27□–D□–□ BM □ / □P– G 05 E–□m– □–□

- Model
- Function No.
- A:Model A disk assembly
  B:Model B disk assembly
- Motor shaft diameter(Unit: mm)
- 1/10 output pulses of A and B
- Dual square wave in quadrature
- Index signal
- Index length
- motor magnetic pole log
- Side entry cable
- Supply voltage
- Voltage
- Cable length (Unit: m)
- S:Film disk
  J:Metal disk
- Plug model
  Black: no plug

Pulses of A and B:360,720P/R, U,V,W pitch:2P,3P,4P

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated anticlockwise (CCW) viewing mounting shaft.

Symmetry: $X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift: $X_n\geq0.15T(n=1,2,3,4)$
Signal width of Z channel:
$T_M=0.5T\pm0.25T(360P/r)$
Signal width of Z channel:
$T_M=0.25T\pm0.125T(720P/r)$
Division accuracy of signals:
Accumulative angle error of A&B channels≤0.2T
T=360° /N(N is the number of A&B channel output pulses per revolution.)
P=360° /N ± 1.5°
(N_n=2,3,4,motor magnetic pole log)
Phase shift Yn=P/6 ± 1.5° (n=1,2,3,4,5,6)
Positional relationship of A&B channels and U,V,W channels is not specified.
The relationship of the Z channel with the U phase:C= ± 1° (Mechanical angle)

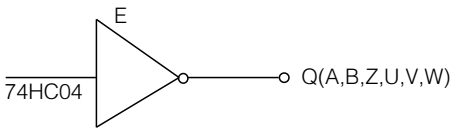
Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise/Fall time (ns)	Frequency response (kHz)	Insulation impedance (MΩ) DC500V
			V_H	V_L			
E (Voltage)	5±0. 25	<20	≥3.5	≤0.5	≤1000	0~60	≥100

Mechanical specifications

Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$	Weight (kg)
1×10^{-8}	10000	0.006(No cable)

Output circuit



Environment specifications

	Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)²	Vibration resistance (m/S)²
Film disk	–20~+60	–30~+70	980(2 times each in x、y、z directions, continue 6ms every times)	500（10~200 Hz，2 hours each in x、y、z directions)
Metal disk	–20~+85	–30~+95		

Connection specifications

M plug（5 shielded cable）：

M plug pin code	13	14	1	3	5	7	9	11	15
Signal	5V	OV	A	B	Z	U	V	W	Shield
Color	White	Black	Red	Light green	Yellow	Light pink	Green	Light blue	Copper net

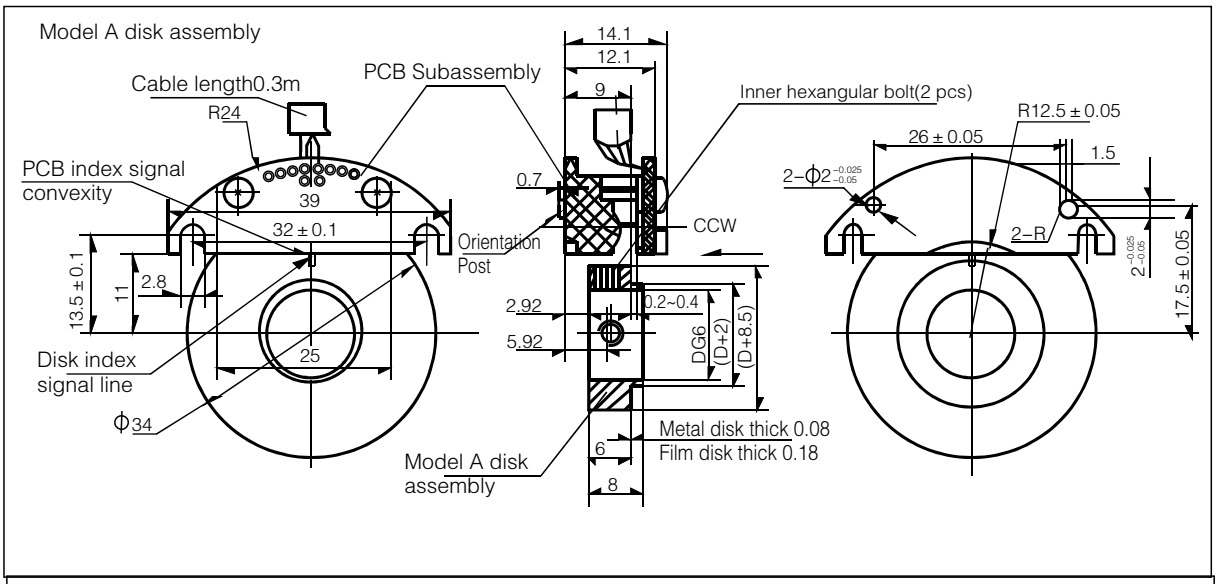
K plug（6shielded cable）：

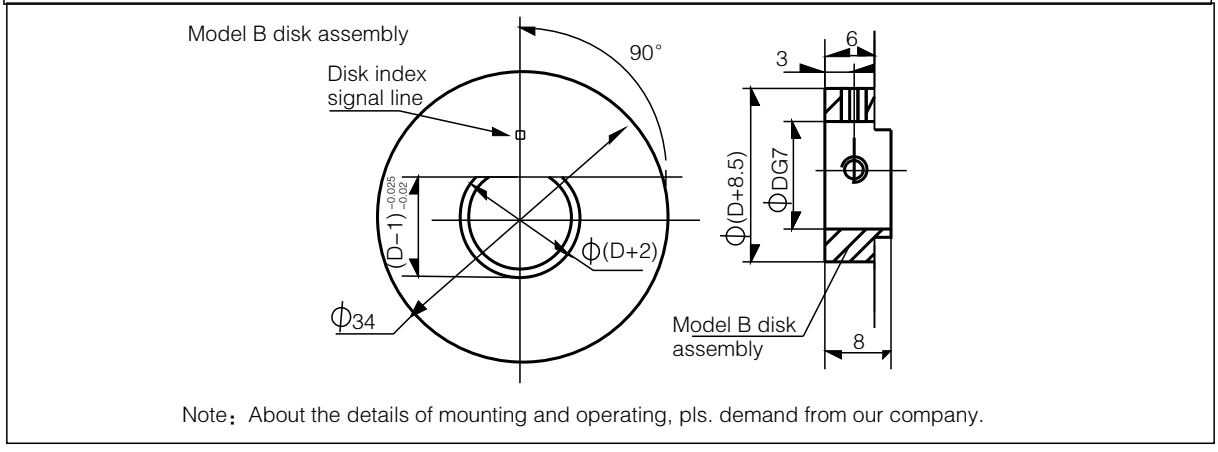
K plug pin code	1	2	7	6	8	3	5	4	
Signal	5V	OV	A	B	Z	U	V	W	Shield
Color	White	Black	Red	Green	Yellow	Violet	Grey	Pink	Copper net

No plug（5 shielded cable）：

Signal	5V	OV	A	B	Z	U	V	W	Shield
Color	White	Black	Red	Green	Yellow	Pink	Blue	Orange	Copper net

External view





Note：About the details of mounting and operating, pls. demand from our company.

A-JXW SERIES

- Compact absolute encoder
- 2048~16384 divisions
- Output pure binary code or Gray code

Explanation of model

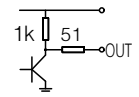
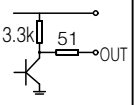
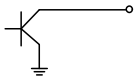
A – JXW – □ – □ □ □ – C □ □

- Upgrade No.
- Model
- Output bit
- Output code: P: Natural Binary coded decimal(BCD); G: Gray code(GC)
- Sampling latch: L: Latch; Blank: None
- Code course (counting direction) F: Clockwise rotation; A: Anticlockwise rotation
- Side entry plug
- Supply voltage
- Signal output mode: E:Voltage; C:Open collector

Main parameter

Bit	No.of divisions	Angular resolution	Measuring	Accuracy
11	2048	360° /2 ^{11}	0° ~360°	± 100"
12	4096	360° /2 ^{12}		
13	8192	360° /2 ^{13}		
14	16384	360° /2 ^{14}		

Output circuit

E(Voltage)		C(Open collector)
5V	8V~30V	5V,8V~30V
		

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Rise time (ns)	Fall time (ns)	Frequency response (kHz)	
			V_H	V_L			Gray code	Natural Binary coded decimal
E (Voltage)	5 ± 0.25	≤60	≥3.5	≤0.5	≤500	≤100	20	10
	8~30	≤100	≥Vcc–2.5		≤1500	≤300		
C (Open collector)	5 ± 0.25	≤60						
	8~30	≤80						

Mechanical specifications

Max.slew speed (rpm)	Starting torque (N.m)(25℃)	Allowable input angle acceleration (rad/s)^2	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
5000	3×10^{-3}	10000	20	10	4×10^{-6}	Approx0.5

Environment specifications

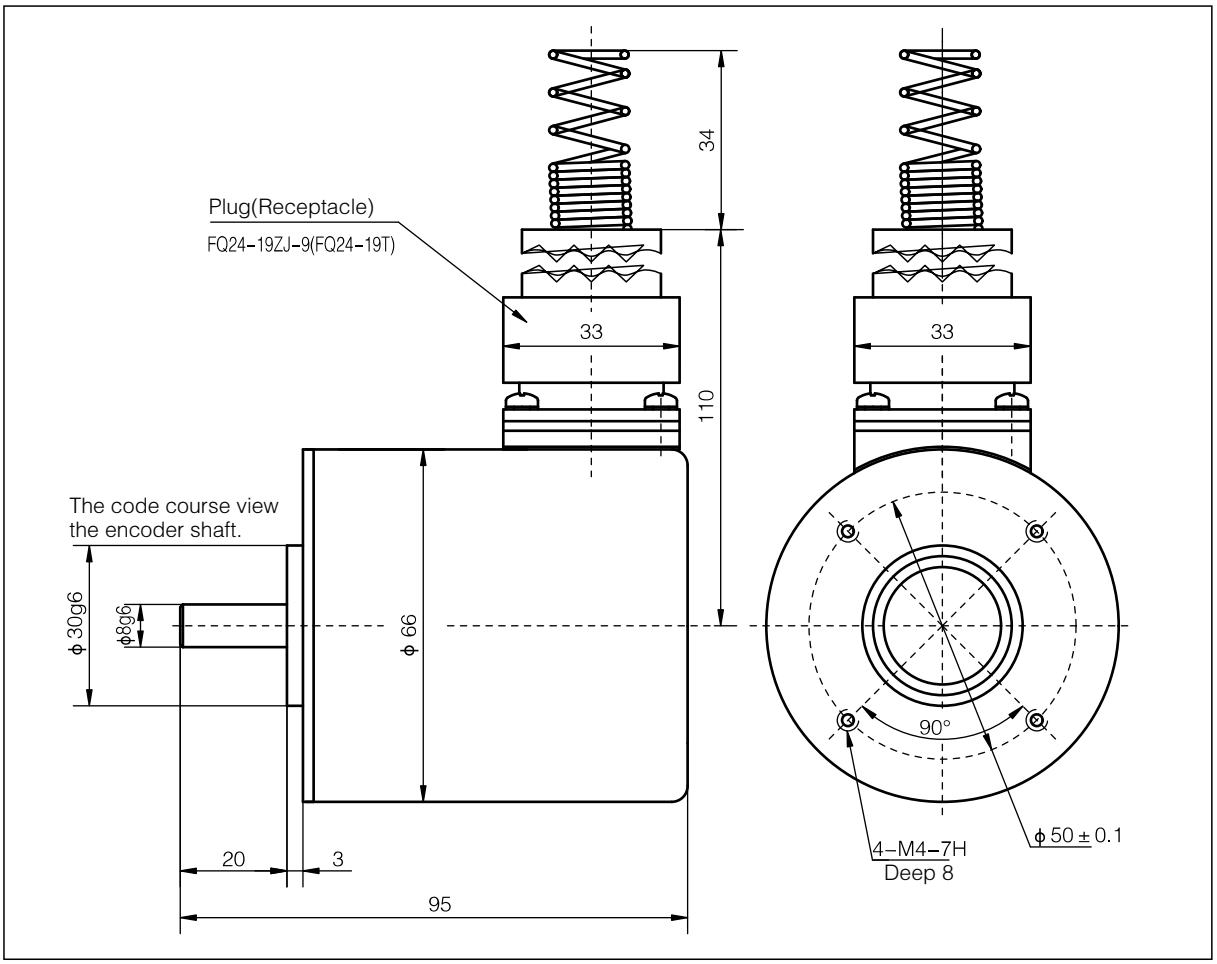
Operating temperature (℃)	Storage temperature (℃)	Shock resistance (m/S)^2	Vibration resistance (m/S)^2	Construction
–25~+85	–35~+100	980(3 times each in x、y、z directions, continue 6ms every times)	98(10~200Hz,2 hours each in x、y、z directions)	IP54

Connection specifications

Signal / Pin / Bit	1	2	3	4	5	6	7	8	9	10
14	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8	2^9
13	——	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8
12	——	——	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7
11	——	——	——	2^0	2^1	2^2	2^3	2^4	2^5	2^6

Signal / Pin / Bit	11	12	13	14	15	16	17	18	19	
14	2^{10}	2^{11}	2^{12}	2^{13}	cp	Body	OV	Vcc	——	
13	2^9	2^{10}	2^{11}	2^{12}						
12	2^8	2^9	2^{10}	2^{11}						
11	2^7	2^8	2^9	2^{10}						

External view

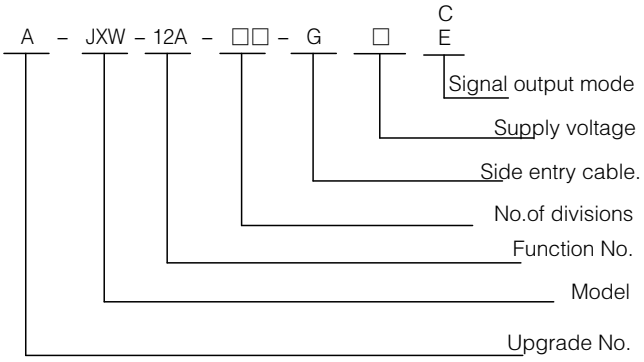


A-JXW-12A

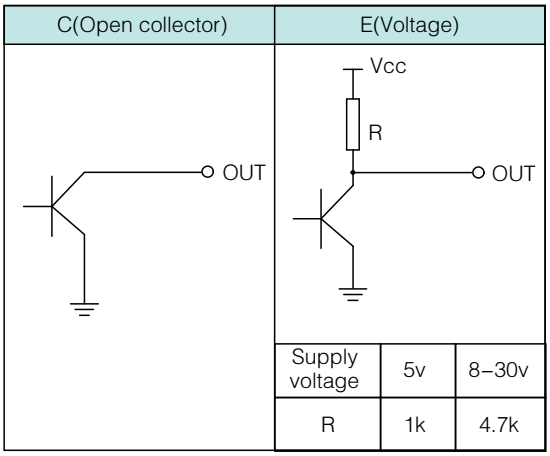
SERIES

- Compact absolute encoder
- 8 bits~11 bits
- Outside diameter 50mm，Shat diameter: 8mm

Explanation of model



Output circuit:



Main parameter

Bit	No.of divisions	Angular resolution	Measuring range	Accuracy
8	256	360° /2 ^{8}	0~360°	± 100″
9	512	360° /2 ^{9}		
10	1024	360° /2 ^{10}		
11	2048	360° /2 ^{11}		

Electrical specifications

Output mode	Supply voltage DC(V)	Output voltage(V)		Current requirement (mA)	Rise time (ns)	Fall time (ns)	Frequency response (kHz)
		V_H	V_L				
E (Voltage)	5 ± 0.25	⩾3.5	⩽0.5	⩽150	⩽500	⩽100	0 ~ 50
	8~30	⩾Vcc–2.5	⩽0.5		⩽1500	⩽300	
C (Open collector)	5 ± 0.25	——	——	⩽150	——	——	0 ~ 50
	8~30						

Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Weight (kg)	Moment of inertia (kgm^2)
		Radial (N)	Axial (N)		
5000	$\leqslant 5\times10^{-3}$	20	10	0.15	3.0×10^{-7}

Environment specifications

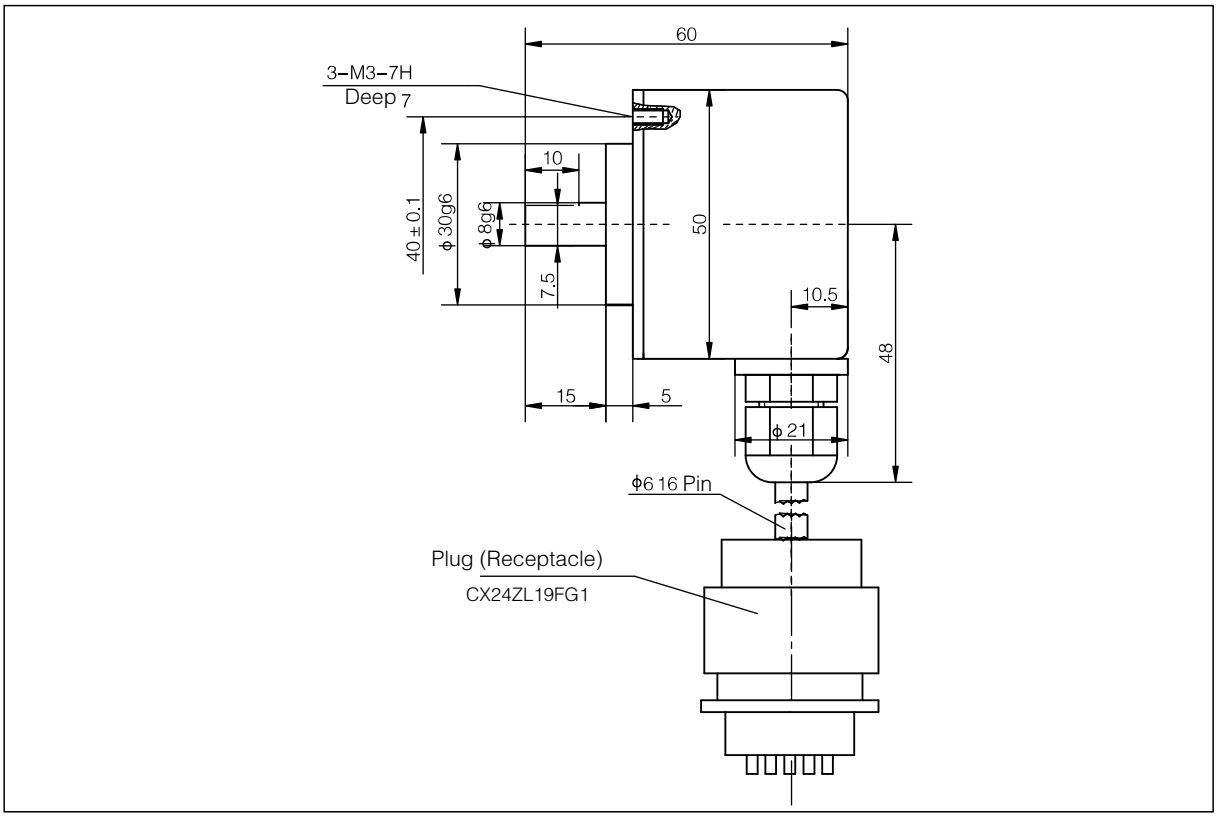
Operating temperature (℃)	Storage temperature (℃)	Humidity(%)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction
–30~+85	–35~+95	⩽85	49(10~200Hz,2 hours each in x,y, z directions)	980(2 times each in x、y、z directions, continue 6ms every times)	Shaft IP54 Body IP65

Connection specifications

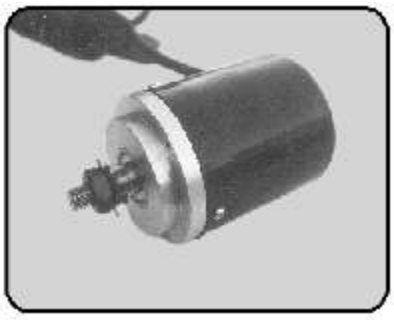
Signal / Pin / Bit	1	2	3	4	5	6	7	8	9
11	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	2^8
10	——	2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7
9	——	——	2^0	2^1	2^2	2^3	2^4	2^5	2^6
8	——	——	——	2^0	2^1	2^2	2^3	2^4	2^5

Signal / Pin / Bit	10	11	12	13	14	15	17	18	19
11	2^9	2^{10}	cp	CN1	CN2	—	OV	Vcc	机壳
10	2^8	2^9							
9	2^7	2^8							
8	2^6	2^7							

External view

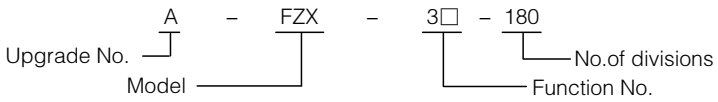


A-FZX-3 SERIES



- Absolute encoder
- Dri-proof construction.
- Most suitable for textile machinery

Explanation of model



Note: The connectors of A-FZX-3,3A and 3B are difference.

Main parameter

No.of divisions	Angular resolution	Output bit	Code course	Measuring range	Accuracy
180	2°	8bits (See attachment)	Anticlockwise rotation,code course descending viewing the encoder shaft.	0° ~360°	± 25′

Electrical specifications

Supply voltage DC(V)	Current requirement (mA)	Sink current(mA)	Frequency response (kHz)	Output logic
8~30	≤60	≤50	0~10	Negative logic ("1" Closed "0"Open)

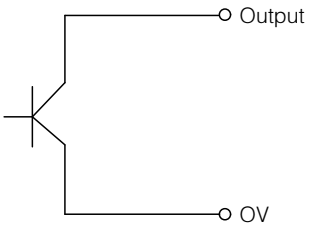
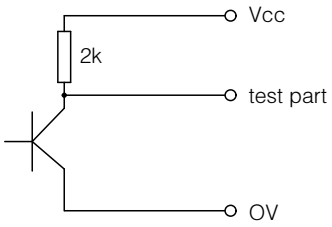
Mechanical specifications

Max.slew speed (rpm)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)	Weight (kg)
			Radial (N)	Axial (N)		
5000	1×10^{-2}	10000	50	50	2×10^{-6}	0.3(No cable)

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Humidity	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction
-30~+85	-40~+100	95%(Temperature: 40 ± 5℃)	98(10~200Hz,2 hours each in x、y、z directions)	980(3times each in x、y、z directions, continue 6ms every times)	IP65

Output circuit

C(Open collector)	Test circuit
	

Output code

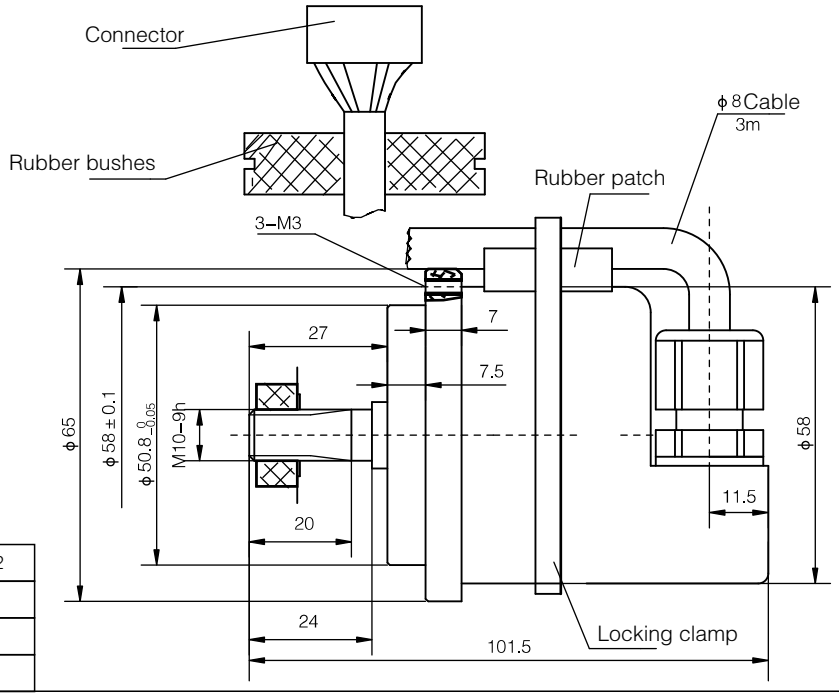
Encoder shaft angle	Output signal							
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
0	0	0	1	1	0	1	0	1
2	0	0	1	1	0	1	0	0
4	0	0	1	1	1	1	0	0
6	0	0	1	1	1	1	0	1
8	0	0	1	1	1	1	1	1
10	0	0	1	1	1	1	1	0
12	0	0	1	1	1	0	1	0
14	0	0	1	1	1	0	1	1
16	0	0	1	1	1	0	0	1
18	0	0	1	1	1	0	0	0
20	0	0	1	0	1	0	0	0

Encoder shaft angle	Output signal							
	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
338	1	0	1	0	1	0	0	0
340	1	0	1	1	1	0	0	0
342	1	0	1	1	1	0	0	1
344	1	0	1	1	1	0	1	1
346	1	0	1	1	1	0	1	0
348	1	0	1	1	1	1	1	0
350	1	0	1	1	1	1	1	1
352	1	0	1	1	1	1	0	1
354	1	0	1	1	1	1	0	0
356	1	0	1	1	0	1	0	0
358	1	0	1	1	0	1	0	1

Connection specifications

Model	Color	White	Pink	Black	Green	Brown	Red	Orange	Yellow	Light blue	Dark blue	Violet	Grey	Shield
	Signal	Vcc	Vcc	OV	OV	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	Body
A–FZX–3	Pin	21	29	23	31	33	25	34	26	35	27	36	28	24
	Connector model：170321–1/172021–2													
A–FZX–3A	Pin	6	14	5	13	11	10	9	3	8	2	7	1	4
	Connector model：173852–1/173630–2													
A–FZX–3B	Pin	3–B	3–D	2–D		1–D	1–B	3–C	3–A	2–C	2–A	1–C	1–A	2–B
	Connector model：178214–1/1–175195–2													

External view



Model	Connector
A–FZX–3B	178214–1/1–175195–2
A–FZX–3A	173852–1/173630–2
A–FZX–3	170321–1/172021–2

FZX-4 SERIES

- Absolute encoder
- Dri-proof construction.
- Most suitable for textile machinery

Explanation of model

FZX – 4□ – 256

- FZX: Model
- 4□: Function No.
- 256: No.of divisions

Main parameter

No.of divisions	Angular resolution	Output bit	Measuring range	Accuracy
256	360° /256	8bits	0° ~360°	± 20′

Electrical specifications

Output mode	Supply voltage DC(V)	Current requirement (mA)	Sink current (mA)	Output code	Rise/Fall time (ns)	Frequency response (kHz)	Output logic
Comple-mentary	10~30	≤150	≤40	Gray code	=2	0~20	Positive logic

Mechanical specifications

Max.slew speed (rpm)	Starting torque (N.m)(25℃)	Allowable input angle acceleration $(rad/s)^2$	Max. allowable load		Moment of inertia (kgm^2)
			Radial (N)	Axial (N)	
5000	2.5×10^{-2}	10000	49	49	4×10^{-6}

Environment specifications

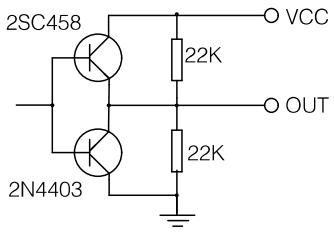
Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$
0~+70	-10~+80	50(10~200Hz,2 hours each in x、y、z directions)	980(3 times each in x、y、z directions, continue 6ms every times)

Connection specifications

Pin code	11	12	10	1	2	3	4	5	6	7	8	
Color	White	Black	Orange	Brown	Red	Pink	Yellow	Green	Blue	Violet	Grey	Shield
Signal	Vcc	OV	C_0	A4	A5	A6	A7	A8	A9	A10	A11	Body
				2^0	2^1	2^2	2^3	2^4	2^5	2^6	2^7	

Output circuit

F(Complementary)

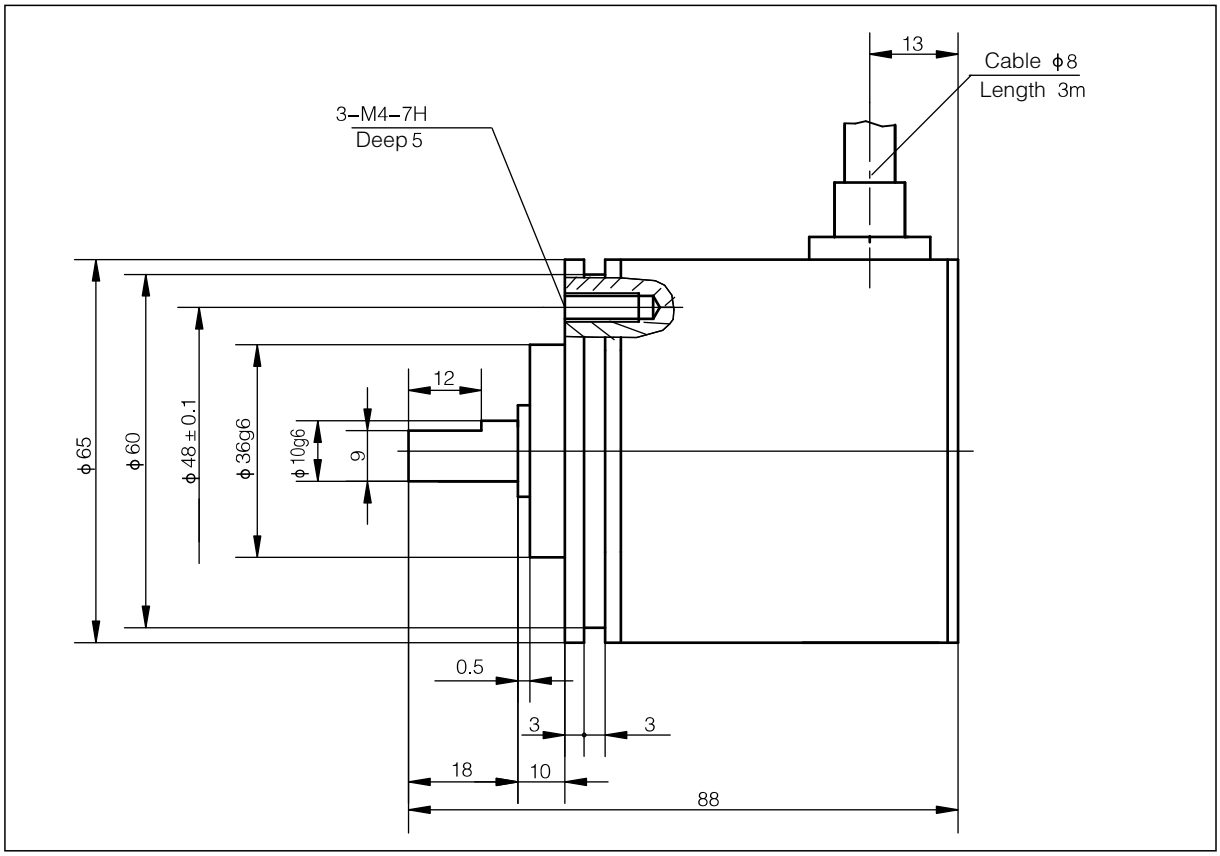


Output code

Encoder shaft angle	Output signal							
	A_{11}	A_{10}	A_9	A_8	A_7	A_6	A_5	A_4
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	1	1
3	0	0	0	0	0	0	1	0
4	0	0	0	0	0	1	1	0
5	0	0	0	0	0	1	1	1
6	0	0	0	0	0	1	0	1
7	0	0	0	0	0	1	0	0
8	0	0	0	0	1	1	0	0
9	0	0	0	0	1	1	0	1
10	0	0	0	0	1	1	1	1

Encoder shaft angle	Output signal							
	A_{11}	A_{10}	A_9	A_8	A_7	A_6	A_5	A_4
245	1	0	0	0	1	1	1	1
246	1	0	0	0	1	1	0	1
247	1	0	0	0	1	1	0	0
248	1	0	0	0	0	1	0	0
249	1	0	0	0	0	1	0	1
250	1	0	0	0	0	1	1	1
251	1	0	0	0	0	1	1	0
252	1	0	0	0	0	0	1	0
253	1	0	0	0	0	0	1	1
254	1	0	0	0	0	0	0	1
255	1	0	0	0	0	0	0	0

External view



HZX-2 SERIES

- Compound encoder
- Output incremental code section and absolute signal section.
- Most suitable for textile machinery

Explanation of model

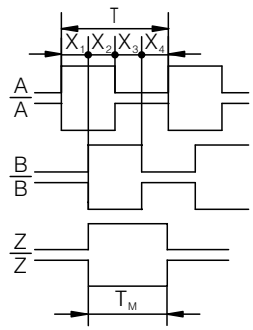
HZX – 2 – □

Model
Function No.
Output pulses of A and B

Absolute signal code section：8bit Gray code
When all absolute code is low, it is index signal center of incremental signal.

Incremental section:
A,B channels，have index signal.
Existing Pulses No.1000P/R

Output waveforms and division accuracy



The figure shows the waveforms when a shaft is rotated clockwise (CW) viewing encoder shaft.

Symmetry:$X_1+X_2=0.5T\pm0.1T$
$X_2+X_3=0.5T\pm0.1T$
Phase shift:$X_n\geqslant0.125T(n=1,2,3,4)$
Index signal:$T_M=1T\pm0.5T$
Division accuracy of signal:
Accumulative angle error ≤0.2T
Pitch error≤0.05
$T=360^\circ/N$
(N is the number of pulse per revolution.)

Electrical specifications

Classify \ Item	Absolute code section	Incremental signal section
Supply voltage DC(V)	10~30	5±0.25
Current requirement (mA)	≤150	≤80
Output mode	Line driver(ET7272B)	Line driver(ET7272B)
Output voltageV_H(V)	≥Vcc–2.5	≥2.5
Output voltageV_L(V)	≤0.8	≤0.5
Rise time (ns)	≤200	≤200
Fall time (ns)	≤200	≤200
Frequency response (kHz)	0~20	0~100
Sink current(mA)	≥40	————
Output logic	Positive logic	————

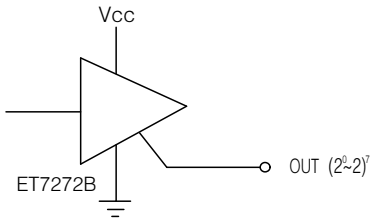
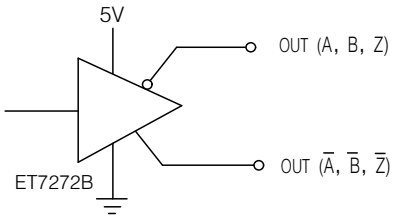
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load	
		Radial (N)	Axial (N)
5000	2.5×10^{-2}	49	49

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Humidity(%)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction
–30~+85	–35~+95	< 85	50(10~200Hz,1 hour each in x、y、z directions)	200(3 times each in x、y、z directions, continue 6ms every times)	IP55

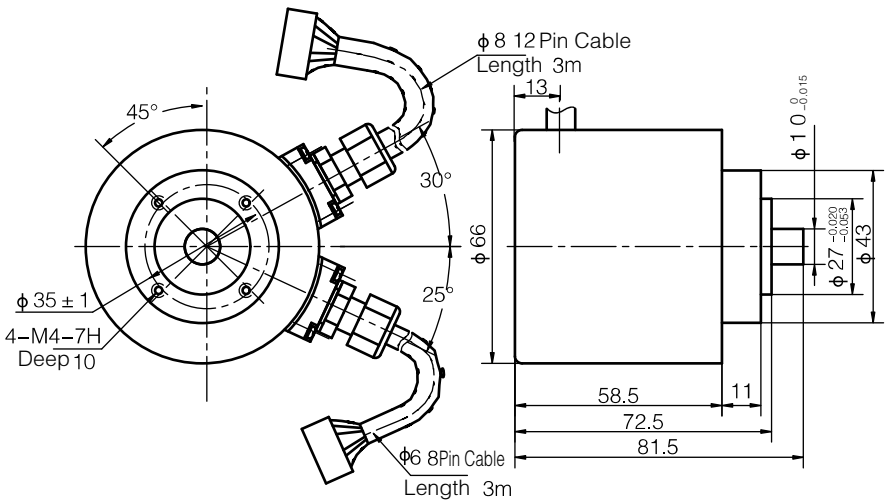
Output circuit

Absolute Code section		Incremental signal section	

Connection specifications

	Pin code	Color	Signal	Pin code	Color	Signal	Pin code	Color	Signal
Absolute code section 11 pins Terminal Φ8 12 pins cable	1	Brown	2^0	5	Green	2^4	10	White	Vcc
	2	Red	2^1	6	Blue	2^5	11	Black	0V
	3	Pink	2^2	7	Violet	2^3		Orange	C_0
	4	Yellow	2^3	8	Grey	2^7			
	C is binary gray code(8bits) C_0 is emptied, to add count when the shaft is rotated clockwise (CW) viewing encoder shaft.								
Incremental signal section 9 pins Terminal Φ6 8pins cable	Pin code	Color	Signal	Pin code	Color	Signal	Pin code	Color	Signal
	1	Red	A	4	Black	OV	7	Pink	$\overline{Z}$
	2	Violet	$\overline{A}$	5	Green	B	8	Yellow	Z
	3	White	5V	6	Grey	$\overline{B}$	9	Shield	G

External view



A-WXJ-7 SERIES

- Absolute encoder
- Dri–proof construction.
- Most suitable for automatic tool change of NC machine rotational tool post.

Explanation of model

A – WXJ – 7 – D□ – □ – □ – G 5–26 F – □m

- Upgrade No.
- Model
- Function No.
- Output shaft dia. (Unit:mm)
- Working position No.
- TP width
- Side entry cable
- Supply voltage
- Complementary
- Cable length (Unit: m)

Main parameter

Working position No.	Measuring range	Accuracy	TP width		Output logic	Counting direction
			D6 Model	D8 Model		
4	0° ~ 360°	± 25'	14°	10°	Positive logic (1:Open) (0:Close)	To add count when the shaft is rotated clockwise (CW) viewing encoder shaft.
5			14°	10°		
6			14°	10°		
8			14°	10°		
12			14°	10°		
16			12°	10°		

Electrical specifications

Supply voltage DC(V)	Current requirement (mA)	Output voltage(V)		Output code	Output mode	Output wave	Frequency response (kHz)
		V_H	V_L				
5 ~ 26	≤60	≥Vcc–2.5	≤1	Natural Binary coded decimal	Comple–mentary	Square wave	0 ~ 1

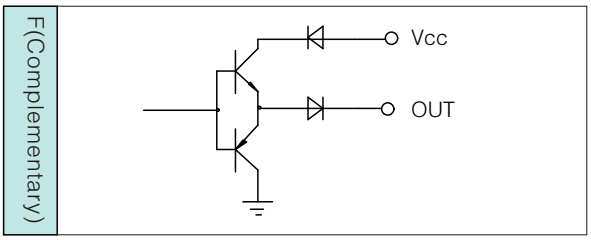
Mechanical specifications

Maximal Slew speed (r/min)	Starting torque (N.m)(25℃)	Max. allowable load		Moment of inertia (kgm^2)	Allowable input angle acceleration $(rad/s)^2$
		Radial (N)	Axial (N)		
5000	$\leq 1.5 \times 10^{-3}$	20	10	$\leq 5 \times 10^{-8}$	≤10000

Environment specifications

Operating temperature (℃)	Storage temperature (℃)	Vibration resistance $(m/S)^2$	Shock resistance $(m/S)^2$	Construction
–20~+85	–30~+95	98(10 ~2000Hz, 2 hours each in x、y、z directions)	980(2 times each in x、y、z directions, continue 6ms every times)	Shaft:IP65
				Body:IP54

Output circuit



Connection specifications

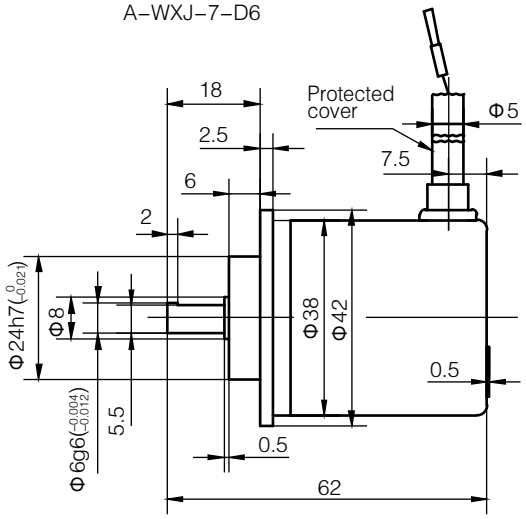
Color	Red	Black	White	Green	Violet	Blue	Yellow	Grey	Shield
Signal	Vcc	0V	TP	2^0	2^1	2^2	2^3	EP	Body

Output logic table

Signal / Working position	TP	2^0	2^1	2^2	2^3	EP
0	1	0	0	0	0	0
1	1	1	0	0	0	1
2	1	0	1	0	0	1
3	1	1	1	0	0	0
4	1	0	0	1	0	1
5	1	1	0	1	0	0
6	1	0	1	1	0	0
7	1	1	1	1	0	1
8	1	0	0	0	1	1
9	1	1	0	0	1	0
10	1	0	1	0	1	0
11	1	1	1	0	1	1
12	1	0	0	1	1	0
13	1	1	0	1	1	1
14	1	0	1	1	1	1
15	1	1	1	1	1	0

External view

A–WXJ–7–D6



A–WXJ–7–D8
Only output shaft is different, the others is the same withA–WXJ–7–D6