

### 1. KJ38 Absolute Type Parallel Gray Code Output (Hollow Shaft, Blind Hole)

#### 1.1 Introduction:

KJ38 is a small economic universal design, compact, sturdy, high safety, and commonly used in industrial automations.

#### 1.2 Feature:

- Encoder external diameter  $\varnothing 38\text{mm}$ , thickness 38mm, diameter of shaft up to  $\varnothing 5\text{mm}$ ,  $\varnothing 6\text{mm}$ ,  $\varnothing 8\text{mm}$ ;
- Adopt non-contact photoelectric principle;
- Multiple electrical interfaces available;
- Resolution per turn up to 11Bits(2048)

#### 1.3 Application:

Textile, packaging, motor, elevator, CNC and other automation control fields.

#### 1.4 Connection:

- Radial cable (STD length 1M)
- Radial cable with plug (STD length 1M)
- Axial cable (STD length 1M)
- Axial cable with plug (STD length 1M)

#### 1.5 Protection:

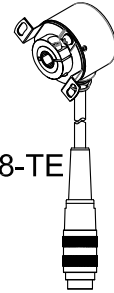
IP50 & IP65

#### 1.6 Weight:

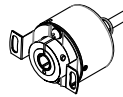
About 140g



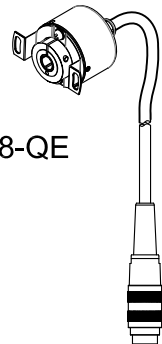
KJ38-T



KJ38-TE



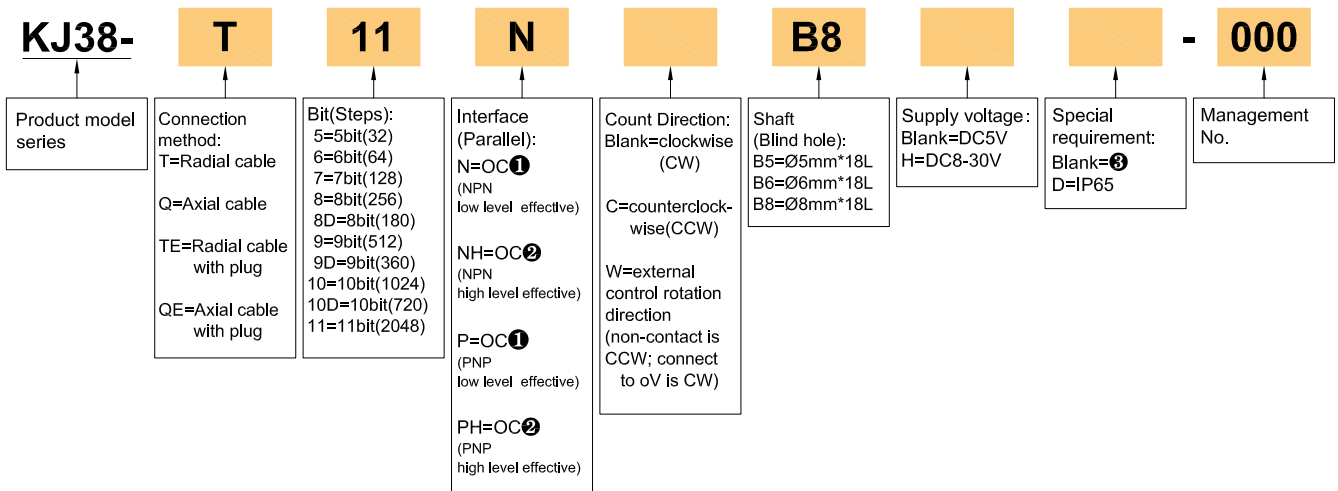
KJ38-Q



KJ38-QE

## 2. Model Selection Guide

### 2.1 Model composition(select parameters)



#### 2.2 Note:

Zero level signal:

- ①. Z signal is low level effective
- ②. Z signal is high level effective

Special requirement:

- ③. None indicated for IP50 and cable length 1M, if need to change the length C+number, the longest is 20M (express by C20)

3. Resolution Output Table

	bit										
	11	10	9	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	1	1
...	...	...	...	...	...	...	...	...	...	...	...
31	0	0	0	0	0	0	1	0	0	0	0
32	0	0	0	0	0	1	1	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
37	0	0	0	0	0	1	1	0	1	1	1
38	0	0	0	0	0	1	1	0	1	0	1
...	...	...	...	...	...	...	...	...	...	...	...
63	0	0	0	0	0	1	0	0	0	0	0
64	0	0	0	0	1	1	0	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
75	0	0	0	0	1	1	0	1	1	1	0
76	0	0	0	0	1	1	0	1	0	1	0
...	...	...	...	...	...	...	...	...	...	...	...
127	0	0	0	0	1	0	0	0	0	0	0
128	0	0	0	1	1	0	0	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
151	0	0	0	1	1	0	1	1	1	0	0
152	0	0	0	1	1	0	1	0	1	0	0
...	...	...	...	...	...	...	...	...	...	...	...
217	0	0	0	1	0	1	1	0	1	0	1
218	0	0	0	1	0	1	1	0	1	1	1
...	...	...	...	...	...	...	...	...	...	...	...
255	0	0	0	1	0	0	0	0	0	0	0
256	0	0	1	1	0	0	0	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
435	0	0	1	0	1	1	0	1	0	1	0
436	0	0	1	0	1	1	0	1	1	1	0
...	...	...	...	...	...	...	...	...	...	...	...
511	0	0	1	0	0	0	0	0	0	0	0
512	0	1	1	0	0	0	0	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
871	0	1	0	1	1	0	1	0	1	0	0
872	0	1	0	1	1	0	1	1	1	0	0
...	...	...	...	...	...	...	...	...	...	...	...
1023	0	1	0	0	0	0	0	0	0	0	0
1024	1	1	0	0	0	0	0	0	0	0	0
...	...	...	...	...	...	...	...	...	...	...	...
2046	1	0	0	0	0	0	0	0	0	0	1
2047	1	0	0	0	0	0	0	0	0	0	0

4. Output Mode

Interface(Parallel)	Output circuit	Output wave form
<p>OC (NPN)</p>		<p>Position: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21.....2047 View from shaft end,rotate direction is clockwise(CW)</p>
<p>OC (PNP)</p>		<p>Position: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21.....2047 View from shaft end,rotate direction is clockwise(CW)</p>

## 5. Electrical Parameters

Parameter Item	Interface (Parallel)	OC(NPN)		OC(PNP)	
Supply voltage		DC5V±5%; DC8V-30V±5%			
Allowable ripple		≤3%rms			
Consumption current		100mA Max			
Encoding type		Gray code			
Precision		[360/(resolutionx4)]°			
Top response frequency		100kHz Max			
Output capacity	Output current	Input	≤30mA		
		Output	—		
	Output voltage	"H"	—		
		"L"	≤0.4V		
	Load voltage	≤DC30V			
Rise & Fall time		Less than 2us (Load resistance 1KΩ、cable length: 2m)			
Output level		Low level available		High level available	
Insulation strength		AC500V 60s			
Insulation resistance		10MΩ			
GND		Not connect to encoder			

## 6. Mechanical Specifications

Diameter of shaft	Ø5mm、Ø6mm、Ø8mm(stainless steel, Blind hole, Depth 18mm)
Starting torque	Less than $9.8 \times 10^{-3}$ N·m
Inertia moment	Less than $6.5 \times 10^{-6}$ kg·m <sup>2</sup>
Shaft load	Radial 30N; Axial 20N
Slew speed	≤3000 rpm; IP65≤2000 rpm
Bearing Life	$1.5 \times 10^9$ revs at rated load(10000hrs at 2500RPM)
Shell	Die cast aluminum
Weight	About 140g (with package)

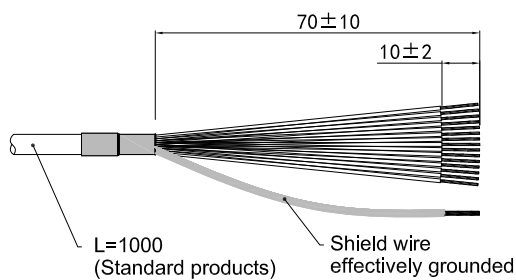
## 7. Environmental Parameters

Environmental temperature	Operating: -20~+85°C(repeatable winding cable: -10°C); storage: -25~+90°C
Environmental humidity	Operating and storage: 35~85%RH(noncondensing)
Vibration(Endurance)	Amplitude 0.75mm, 10~50Hz, 1h for X,Y,Z direction individually
Shock(Endurance)	49m/s <sup>2</sup> , three times for X,Y,Z direction individually
Protection	IP50; IP65

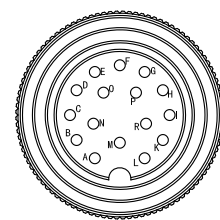
8. Wiring Table

Socket Pin No. & Wire color	Resolution 2048	Resolution 1024 (720)	Resolution 512 (360)	Resolution 256 (180)	Resolution 128	Resolution 64	Resolution 32
14=P=gray/black	bit1(2 <sup>0</sup> )	not connect	←	←	←	←	←
13=O=blue/black	bit2(2 <sup>1</sup> )	bit1(2 <sup>0</sup> )	not connect	←	←	←	←
12=N=yellow/black	bit3(2 <sup>2</sup> )	bit2(2 <sup>1</sup> )	bit1(2 <sup>0</sup> )	not connect	←	←	←
11=M=green/black	bit4(2 <sup>3</sup> )	bit3(2 <sup>2</sup> )	bit2(2 <sup>1</sup> )	bit1(2 <sup>0</sup> )	not connect	←	←
10=L=white/black	bit5(2 <sup>4</sup> )	bit4(2 <sup>3</sup> )	bit3(2 <sup>2</sup> )	bit2(2 <sup>1</sup> )	bit1(2 <sup>0</sup> )	not connect	←
9=K=pink	bit6(2 <sup>5</sup> )	bit5(2 <sup>4</sup> )	bit4(2 <sup>3</sup> )	bit3(2 <sup>2</sup> )	bit2(2 <sup>1</sup> )	bit1(2 <sup>0</sup> )	not connect
8=I=gray	bit7(2 <sup>6</sup> )	bit6(2 <sup>5</sup> )	bit5(2 <sup>4</sup> )	bit4(2 <sup>3</sup> )	bit3(2 <sup>2</sup> )	bit2(2 <sup>1</sup> )	bit1(2 <sup>0</sup> )
7=H=blue	bit8(2 <sup>7</sup> )	bit7(2 <sup>6</sup> )	bit6(2 <sup>5</sup> )	bit5(2 <sup>4</sup> )	bit4(2 <sup>3</sup> )	bit3(2 <sup>2</sup> )	bit2(2 <sup>1</sup> )
6=G=yellow	bit9(2 <sup>8</sup> )	bit8(2 <sup>7</sup> )	bit7(2 <sup>6</sup> )	bit6(2 <sup>5</sup> )	bit5(2 <sup>4</sup> )	bit4(2 <sup>3</sup> )	bit3(2 <sup>2</sup> )
5=F=green	bit10(2 <sup>9</sup> )	bit9(2 <sup>8</sup> )	bit8(2 <sup>7</sup> )	bit7(2 <sup>6</sup> )	bit6(2 <sup>5</sup> )	bit5(2 <sup>4</sup> )	bit4(2 <sup>3</sup> )
4=E=white	bit11(2 <sup>10</sup> )	bit10(2 <sup>9</sup> )	bit9(2 <sup>8</sup> )	bit8(2 <sup>7</sup> )	bit7(2 <sup>6</sup> )	bit6(2 <sup>5</sup> )	bit5(2 <sup>4</sup> )
3=D=brown	W (external control rotation direction: non-contact is CCW; connect to oV is CW)						
2=C=black	OV						
1=B=red	DC5V; DC8-30V						
0=A=shielding	GND						

Cable connection



Cable with plug connection



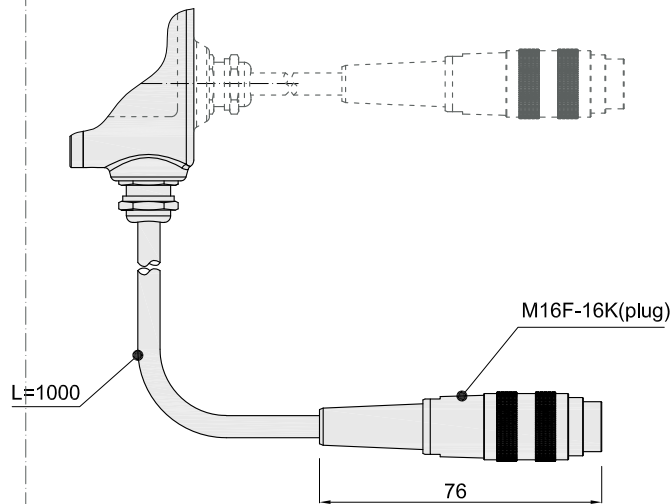
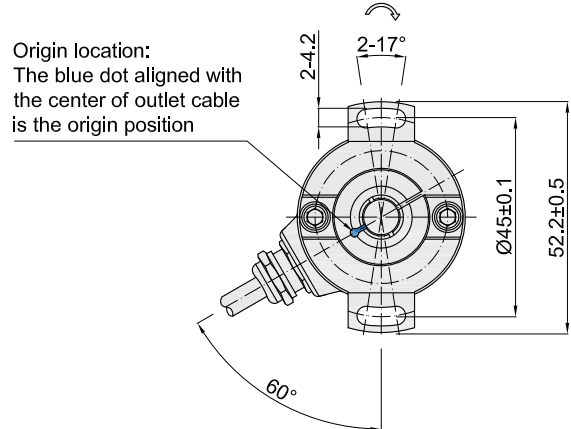
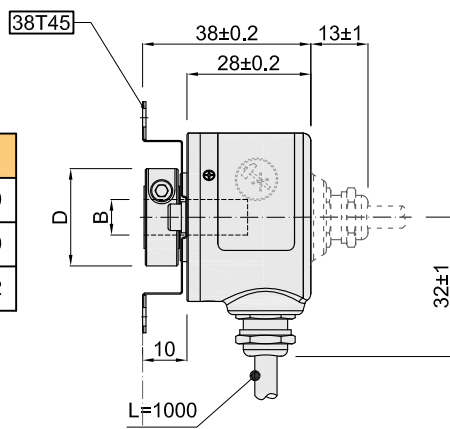
M16F-16K(plug)

Unit: mm

9. Basic Dimensions

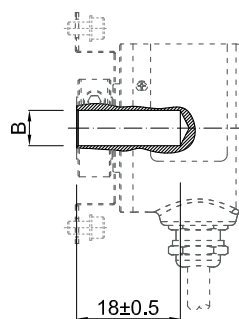
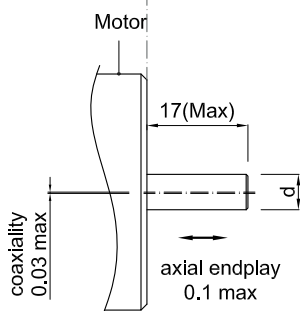
9.1 Dimensions

B(Blind shaft)	D
Ø5 <sup>G7</sup> (+0.016/+0.004)	Ø20
Ø6 <sup>G7</sup> (+0.020/+0.005)	Ø20
Ø8 <sup>G7</sup> (+0.020/+0.005)	Ø22



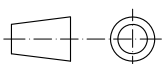
9.2 Specification for mounting shaft

d
Ø5 <sub>g5</sub> <sup>(-0.004/-0.009)</sup>
Ø6 <sub>g5</sub> <sup>(-0.005/-0.011)</sup>
Ø8 <sub>g5</sub> <sup>(-0.005/-0.011)</sup>



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

Unit: mm



↻ = Shaft rotation direction of the signal output

## 10. Caution

### 10.1 About vibration

Vibration act on encoder always cause wrong pulse, so we should pay attention to working place. More pulse per revolution, narrower groovy spacing of grating, more effect to encoder by vibration, when rev is low or stop, vibration act on shaft or main body would cause grating vibrating, so encoder might make wrong pulse.

### 10.2 Caution for wiring

- Use the encoder under the specified supply voltage. Please note that the supply voltage range may drop due to the wiring length.
- Do not put the encoder wiring and other power lines through the same duct, and do not use them by bundling in parallel.
- Please use twisted pair wires for the signal and power wires of encoder.
- Please do not apply excessive force to the cable of encoder, or it will may be damaged.

