1. KJ50 Parallel Gray Code Single-Turn Absolute Encoder (Hollow shaft, Thru-hole & Blind-hole)

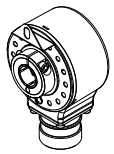
1.1 Introduction:

KJ50 is an economic universal hollow shaft design with compact structure, sturdy and high safety, widely used in industrial automation fields.

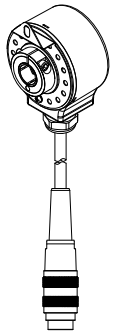
KJ50-T



KJ50-C



KJ50-TE



1.2 Feature:

- Encoder external diameter Ø51mm、thickness 39mm、diameter of shaft up to Ø15mm;
- Adopt non-contact photoelectric principle;
- Multiple electrical interfaces available;
- Gray code parallel output absolute position information;
- Resolution per turn up to 12Bits(4096);
- Reverse polarity protection.

1.3 Application:

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

1.4 Connection:

- Radial cable (STD length 1000mm)
- Radial socket (M23*1 16P male-connector)
- Radial cable with plug (STD length 1000mm, plug M16F-16K)

1.5 Protection:

IP50 & IP65

1.6 Weight:

About 310g

2. Model Selection Guide

2.1 Model composition(select parameters)

KJ50-	T	12	N		B15			-	000
Product model series	Connection method: T=Radial cable C=Radial socket (M23-16P) TE=Radial cable with plug (M16-16P)	Bit(Steps): 5=5bit(32) 6=6bit(64) 7=7bit(128) 8=8bit(256) 8D=8bit(180) 9=9bit(512) 9D=9bit(360) 10=10bit(1024) 10D=10bit(720) 11=11bit(2048) 12=12bit(4096)	Interface (Parallel): N=NPN ❶ NH=NPN❷ P=PNP❶ PH=PNP❷ F=Push-pull❶ FH=Push-pull❷	Count Direction: Blank=clockwise (CW) C=counterclockwise(CCW) W=external control rotation direction (non-contact is CCW; connect to 0V is CW)	Shaft: (B=blind hole) B15=Ø15mm B14=Ø14mm B12=Ø12mm B10=Ø10mm B8=Ø8mm (Q=through hole) Q14=Ø14mm Q12=Ø12mm Q10=Ø10mm Q8=Ø8mm	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement: Blank=❸ D=IP65		Management No.

2. 2 Note

Interface (Parallel):

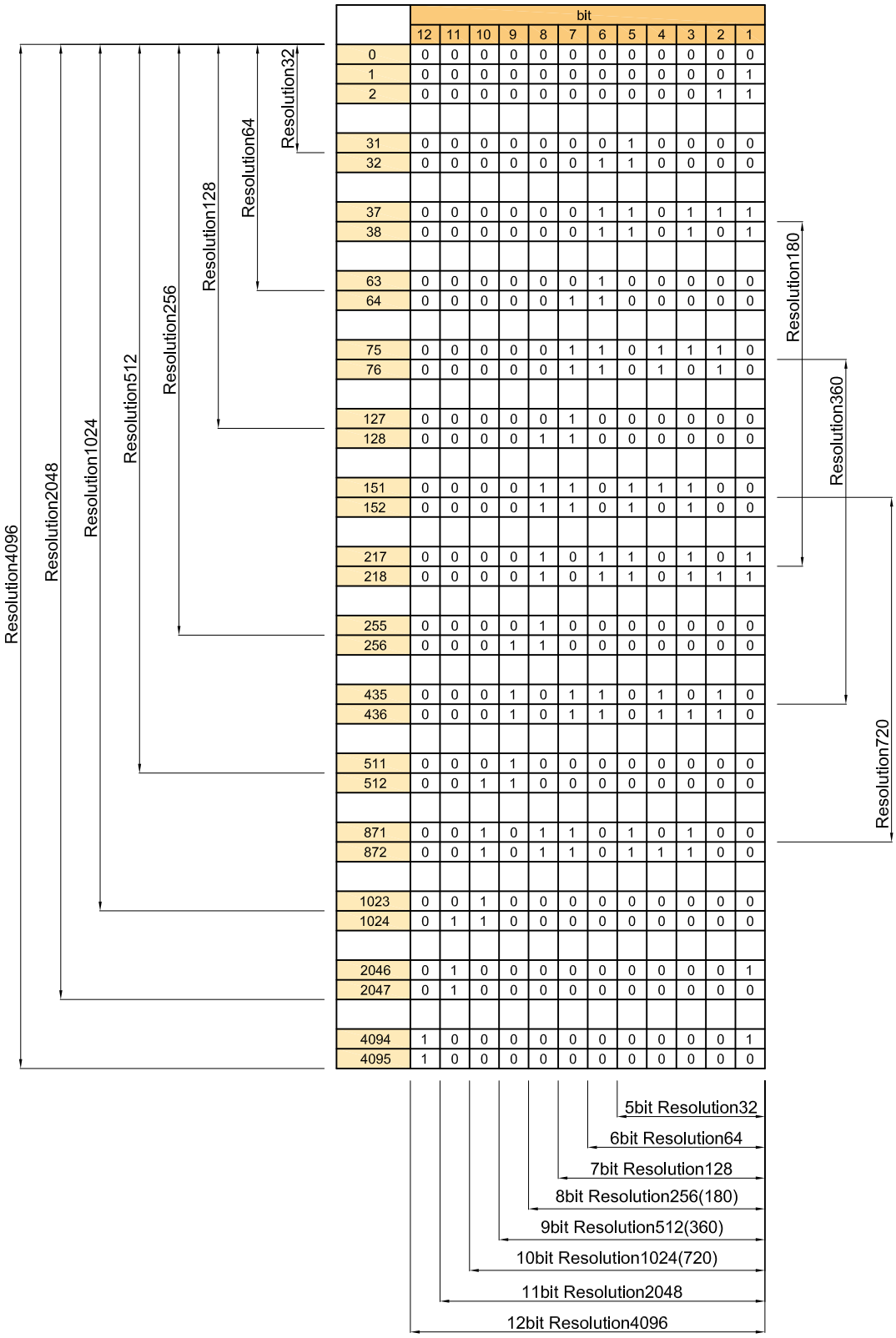
❶. low level effective .

❷. high level effective.

Special requiremen:

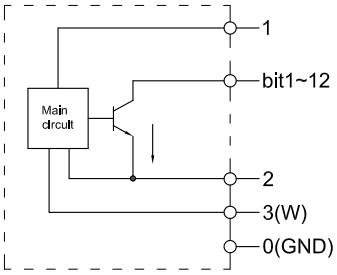
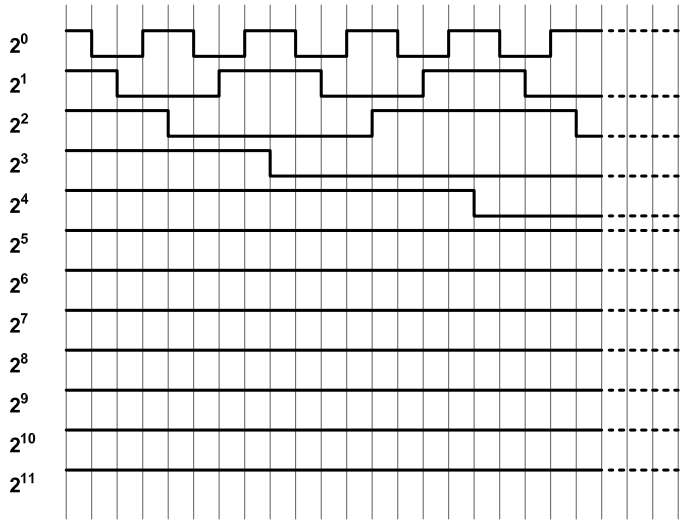
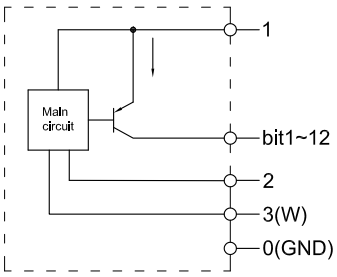
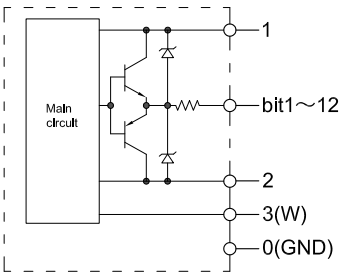
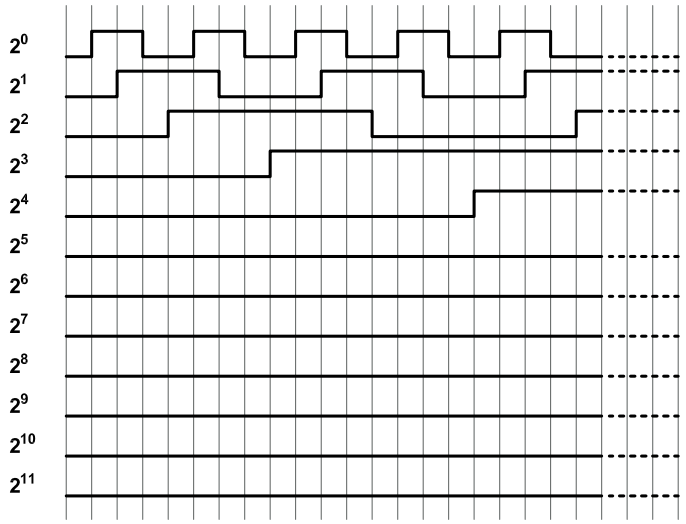
❸. None indicated for IP50 and cable length of 1M, if need to change the length C+number, the longest is 20M (expressed by C20).

3. Resolution Output Table



	bit											
	12	11	10	9	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	1	1
31	0	0	0	0	0	0	0	1	0	0	0	0
32	0	0	0	0	0	0	1	1	0	0	0	0
37	0	0	0	0	0	0	1	1	0	1	1	1
38	0	0	0	0	0	0	1	1	0	1	0	1
63	0	0	0	0	0	0	1	0	0	0	0	0
64	0	0	0	0	0	1	1	0	0	0	0	0
75	0	0	0	0	0	1	1	0	1	1	1	0
76	0	0	0	0	0	1	1	0	1	0	1	0
127	0	0	0	0	0	1	0	0	0	0	0	0
128	0	0	0	0	1	1	0	0	0	0	0	0
151	0	0	0	0	1	1	0	1	1	1	0	0
152	0	0	0	0	1	1	0	1	0	1	0	0
217	0	0	0	0	1	0	1	1	0	1	0	1
218	0	0	0	0	1	0	1	1	0	1	1	1
255	0	0	0	0	1	0	0	0	0	0	0	0
256	0	0	0	1	1	0	0	0	0	0	0	0
435	0	0	0	1	0	1	1	0	1	0	1	0
436	0	0	0	1	0	1	1	0	1	1	1	0
511	0	0	0	1	0	0	0	0	0	0	0	0
512	0	0	1	1	0	0	0	0	0	0	0	0
871	0	0	1	0	1	1	0	1	0	1	0	0
872	0	0	1	0	1	1	0	1	1	1	0	0
1023	0	0	1	0	0	0	0	0	0	0	0	0
1024	0	1	1	0	0	0	0	0	0	0	0	0
2046	0	1	0	0	0	0	0	0	0	0	0	1
2047	0	1	0	0	0	0	0	0	0	0	0	0
4094	1	0	0	0	0	0	0	0	0	0	0	1
4095	1	0	0	0	0	0	0	0	0	0	0	0

4. Output Mode

Interface(Parallel)	Output circuit	Output wave form
OC (NPN)		 **Position: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21.....4095** View from shaft end,rotate direction is clockwise(CW)
OC (PNP)		
Push-pull		 **Position: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21.....4095** View from shaft end,rotate direction is clockwise(CW)

5. Electrical Parameters

Parameter / Interface (Parallel) / Item			OC(NPN)	OC(PNP)	Push-pull	
Supply voltage			DC5V±5%； DC8V-30V±5%		DC5V±5%	DC8V-30V±5%
Allowable ripple			≤3%rms			
Consumption current			100mA Max			
Output code			gray code			
Precision			[360/(resolutionx4)]°			
Top response frequency			100kHz Max		300kHz Max	
Output capacity	Output current	Input	≤30mA		≤±20mA	≤±50mA
		Output	—			
	Output voltage	"H"	—		≥2.5V	≥Vcc-3 VDC
		"L"	≤0.4V		≤0.5V	≤ 1V VDC
	Load voltage		≤DC30V			
Rise & Fall time			Less than 2us (Load resistance 1KΩ、cable length: 2m)			
Output level			Low level available & High level available			
External control of counting direction			"W" brown wire: Leave open (unconnected) for CCW counting; connect to 0V for CW counting			
Insulation strength			AC500V 60s			
Insulation resistance			10MΩ			
Reverse polarity protection			✔			
GND			not connect to encoder			

6. Mechanical Parameters

Diameter of shaft	Ø15mm(blind hole); Ø14mm; Ø12mm; Ø10mm; Ø8mm(stainless steel)
Starting torque	Less than 9.8×10^{-3} N·m
Inertia moment	Less than 6.5×10^{-6} kg·m²
Shaft load	Radial 40N; Axial 30N
Slew speed	≤4000 rpm； IP65≤3000 rpm； IP65≤2000 rpm (Through hole)
Bearing Life	1.5×10^{9} revs at rated load(10000hrs at 2500RPM)
Shell	Die cast aluminum
Weight	About 310g (With package)

7. Environmental Specifications

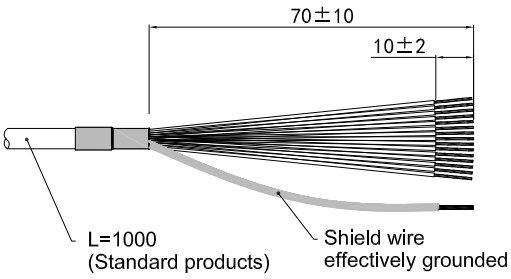
Environmental temperature	Operating:—20～+85°C(repeatable winding cable: -10°C); storage:—25～+90°C
Environmental humidity	Operating and storage：35～85%RH(noncondensing)
Vibration(Endurance)	Amplitude 0.75mm, 10~50Hz, 1h for X,Y,Z direction individually
Shock(Endurance)	49m/s² ,three times for X,Y,Z direction individually
Protection	IP50 & IP65

8. Wiring Table

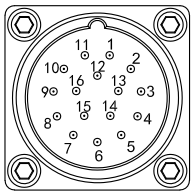
Socket Pin No. & Color	Resolution4096	Resolution2048	Resolution1024 (720)	Resolution512 (360)	Resolution256 (180)	Resolution128	Resolution64	Resolution32
15=R=pink /black	bit1(2^0)	Not connect	←	←	←	←	←	←
14=P=gray /black	bit2(2^1)	bit1(2^0)	Not connect	←	←	←	←	←
13=O=blue /black	bit3(2^2)	bit2(2^1)	bit1(2^0)	Not connect	←	←	←	←
12=N=yellow /black	bit4(2^3)	bit3(2^2)	bit2(2^1)	bit1(2^0)	Not connect	←	←	←
11=M=green /black	bit5(2^4)	bit4(2^3)	bit3(2^2)	bit2(2^1)	bit1(2^0)	Not connect	←	←
10=L=white /black	bit6(2^5)	bit5(2^4)	bit4(2^3)	bit3(2^2)	bit2(2^1)	bit1(2^0)	Not connect	←
9=K=pink	bit7(2^6)	bit6(2^5)	bit5(2^4)	bit4(2^3)	bit3(2^2)	bit2(2^1)	bit1(2^0)	Not connect
8=I=gray	bit8(2^7)	bit7(2^6)	bit6(2^5)	bit5(2^4)	bit4(2^3)	bit3(2^2)	bit2(2^1)	bit1(2^0)
7=H=blue	bit9(2^8)	bit8(2^7)	bit7(2^6)	bit6(2^5)	bit5(2^4)	bit4(2^3)	bit3(2^2)	bit2(2^1)
6=G=yellow	bit10(2^9)	bit9(2^8)	bit8(2^7)	bit7(2^6)	bit6(2^5)	bit5(2^4)	bit4(2^3)	bit3(2^2)
5=F=green	bit11(2^{10})	bit10(2^9)	bit9(2^8)	bit8(2^7)	bit7(2^6)	bit6(2^5)	bit5(2^4)	bit4(2^3)
4=E=white	bit12(2^{11})	bit11(2^{10})	bit10(2^9)	bit9(2^8)	bit8(2^7)	bit7(2^6)	bit6(2^5)	bit5(2^4)
3=D=brown	"W"❶ brown wire: Leave open (unconnected) for CCW counting; connect to 0V for CW counting							
2=C=black	OV							
1=B=red	DC5V & DC8-30V							
0=A=shielding	GND❷							

❶. W=External control of counting direction.
❷. GND No encoder body connected.

Cable connection

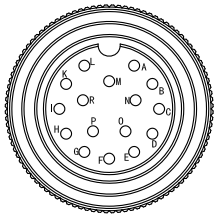


Radial socket connection



M23*1 16P
Male-connector pin Assignment

Radial cable with plug

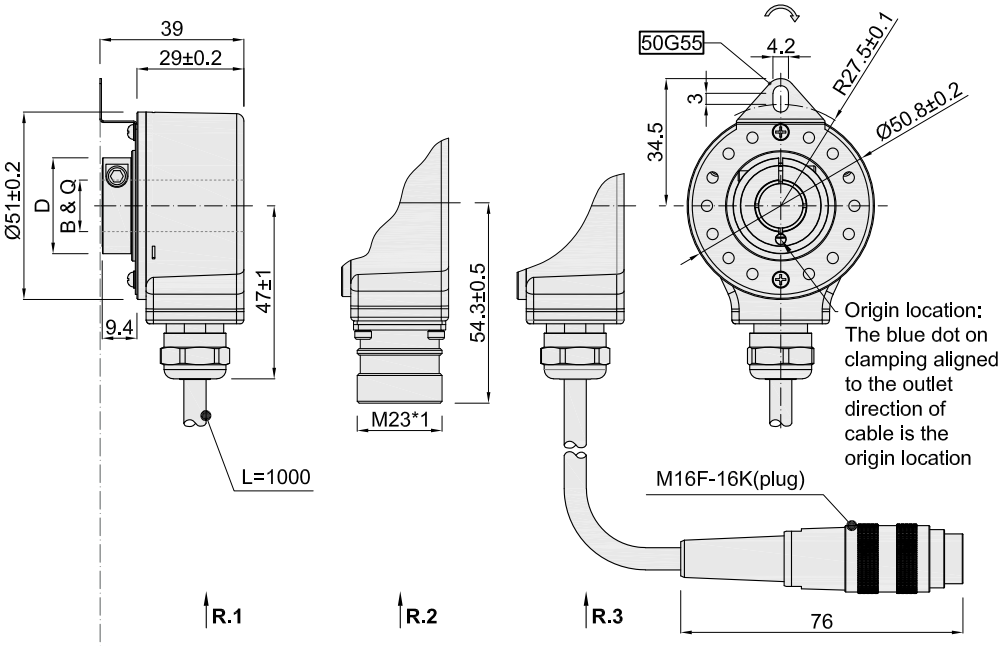


M16F-16K
Male-head pin Assignment

9. Basic Dimensions

9.1 Dimensions

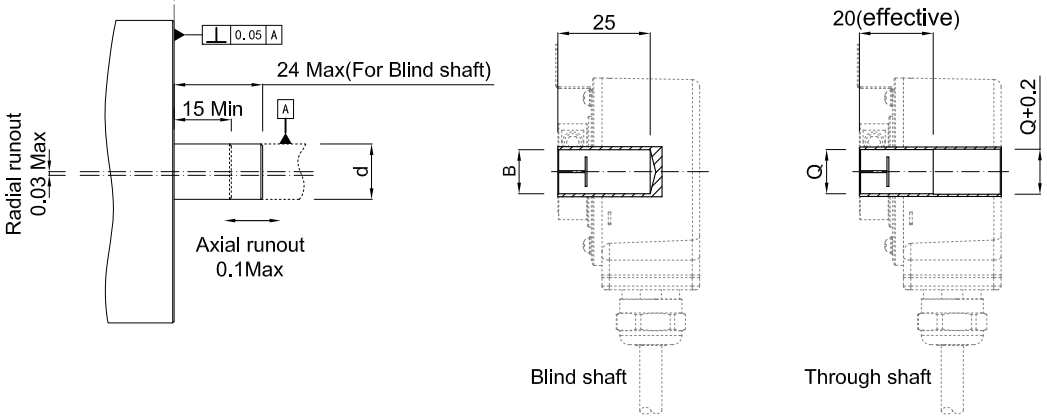
B(Blind -Shaft)	Q(Thru -shaft)	D
Ø8$^{G7}_{(+0.005)}^{(+0.020)}$		Ø24
Ø10$^{G7}_{(+0.006)}^{(+0.024)}$		Ø24
Ø12$^{G7}_{(+0.006)}^{(+0.024)}$		Ø26
Ø14$^{G7}_{(+0.006)}^{(+0.024)}$		Ø28
Ø15$^{G7}_{(+0.006)}^{(+0.024)}$	-	Ø28



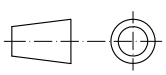
9.2 Assembling requirements

d
Ø8$_{g6}^{(-0.005}_{-0.014)}$
Ø10$_{g6}^{(-0.005}_{-0.014)}$
Ø12$_{g6}^{(-0.006}_{-0.017)}$
Ø14$_{g6}^{(-0.006}_{-0.017)}$
Ø15$_{g6}^{(-0.006}_{-0.017)}$

Mounting screws
Inner hexagon bolt +flat washer Specification: M4*8 Material: stainless steel Quantity: 1



Unit: mm



= Shaft rotation direction of the signal output

R.1 = Radial cable (Standard length 1000mm)

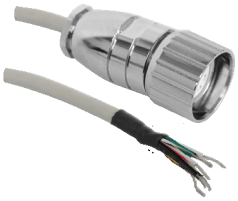
R.2 = Radial socket (M23x1 16P Male-connector)

R.3 = Radial cable with plug (Standard length 1000mm， plug M16F-16K)

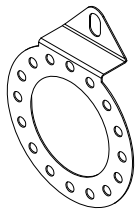
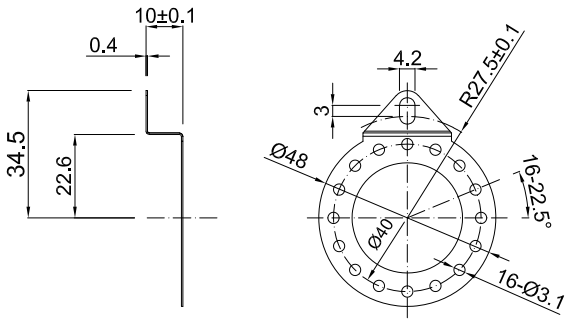
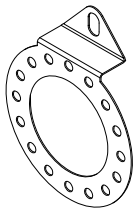
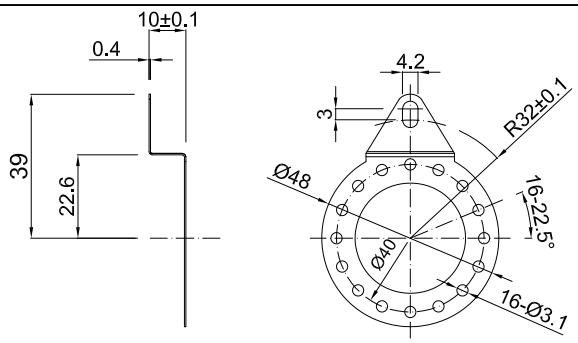
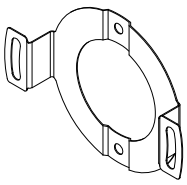
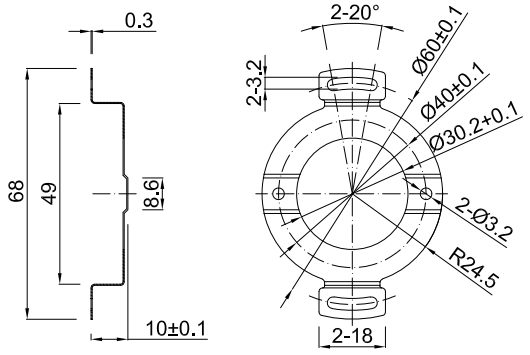
50G55 = Standard spring plate(pls refer to Page 7 for more options)

10. Accessories(Recommended purchase)

10.1 Plug connection

Plug and cable	Brief description	Model	Order No.
	C1=Connection type head A: M23, 16-pin female straight connector; Connection type head B: Bare wire end; Cable length: 1M 15-core with shield,halogen-free PUR	SJ50C1	44400027
	C2=Connection type head A: M23, 16-pin female straight connector; Connection type head B: Bare wire end; Cable length: 2M 15-core with shield,halogen-free PUR	SJ50C2	44400028
	C5=Connection type head A: M23, 16-pin female straight connector; Connection type head B: Bare wire end; Cable length: 5M 15-core with shield,halogen-free PUR	SJ50C5	44400029

10.2 Accessories(Spring plate option)

Shape	Basic Dimensions	Model	Order No.
Standard type  Mounting screws Specification: M4*8 Material: stainless steel Quantity: 1		50G55	03700137
Optional type  Mounting screws Specification: M4*8 Material: stainless steel Quantity: 1		50G64	03700150A
Optional type  Mounting screws Specification: M3*6 Material: stainless steel Quantity: 2		50Z60	03700165

11. Caution

11. 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.

11. 2 Caution for wiring

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

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We reserve the final interpretation right of this specifications,subject to change without notice .