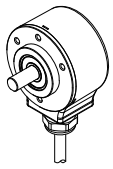
1. SJ50 Parallel Gray Code Single-Turn Absolute Encoder (Solid Shaft)

1.1 Introduction:

SJ50 is a small economic universal design, compact, sturdy, high safety, and commonly used in industrial automations fields.

SJ50-T



1.2 Feature:

- Encoder external diameter Ø51mm、thickness 29mm、diameter of shaft Ø8mm (D type);
- Adopt non-contact photoelectric principle;
- Multiple electrical interfaces available;
- Resolution per turn up to 12Bits(4096);
- Reverse polarity protection.

SJ50-C



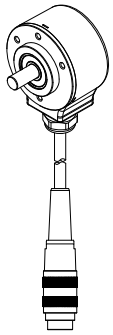
1.3 Application:

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

1.4 Connection:

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

SJ50-TE



1.5 Protection:

IP50 & IP65

1.6 Weight:

About 300g

2. Model Selection Guide

2.1 Model composition(select parameters)

SJ50-	T	12	N		B8			-	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=counterclock-wise(CCW) W=external control rotation direction (non-contact is CCW; connect to 0V is CW)	Diameter of shaft (D type): B8=Ø8mm	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement: Blank=❸ D=IP65		Management No.

2. 2 Note

Interface (Parallel):

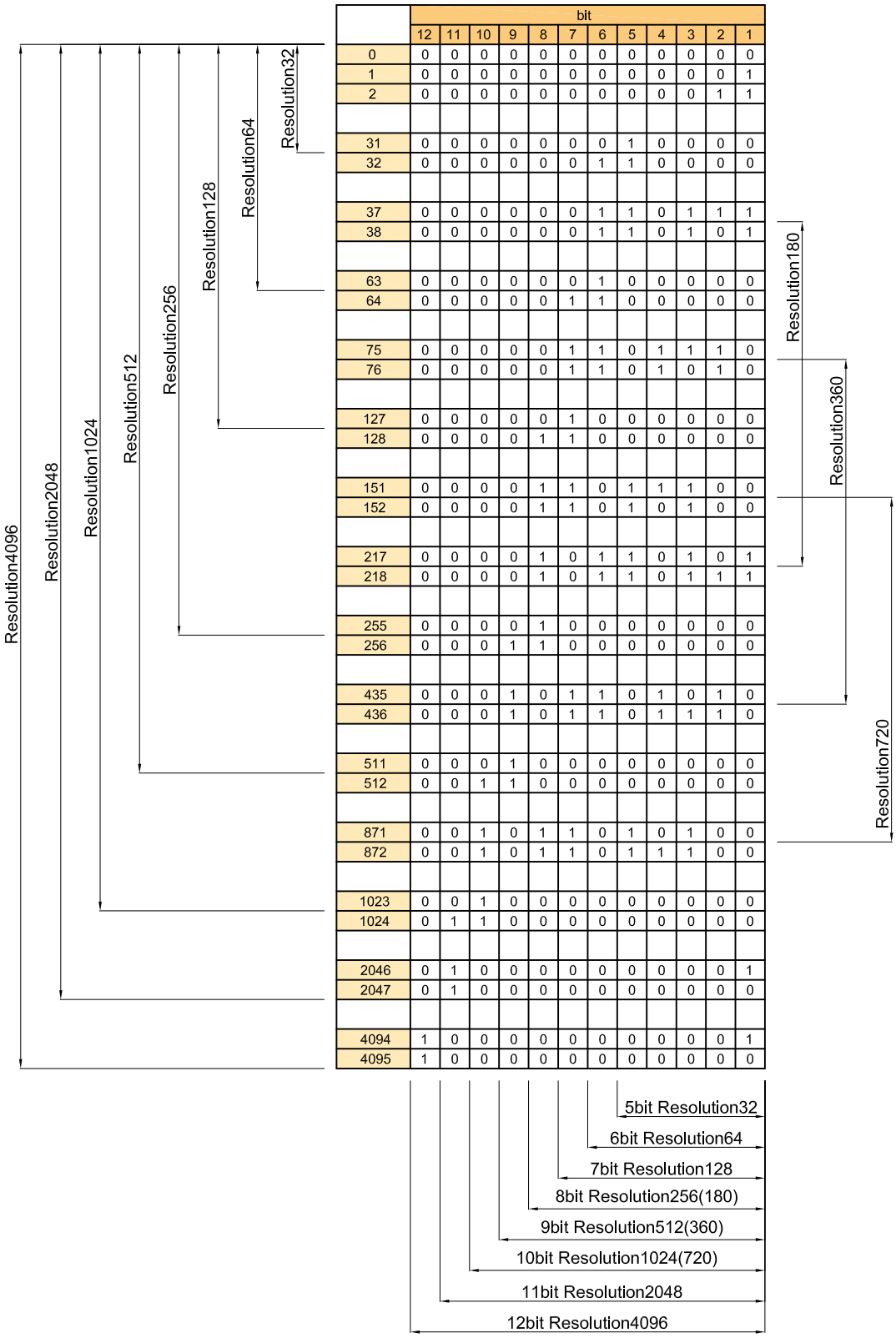
❶. low level effective .

❷. high level effective.

Special requiremen:

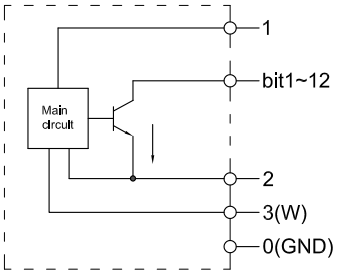
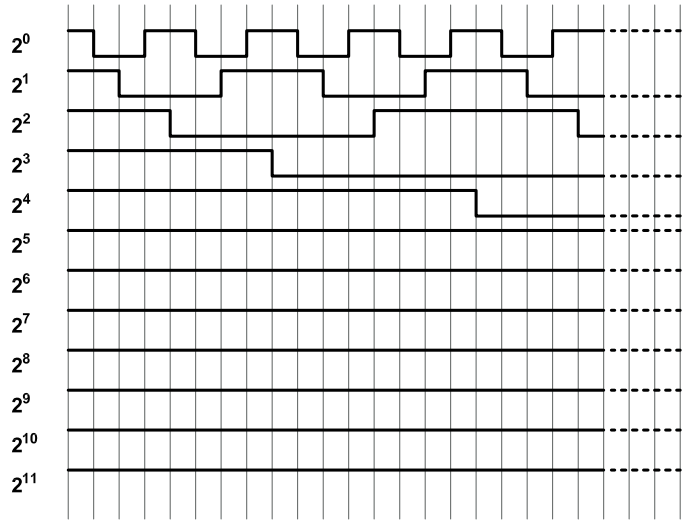
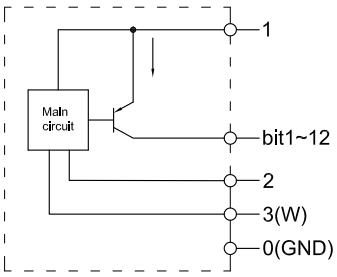
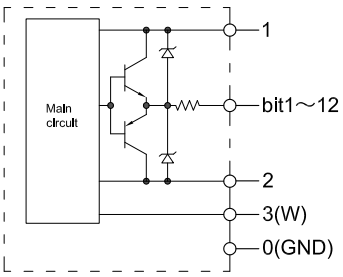
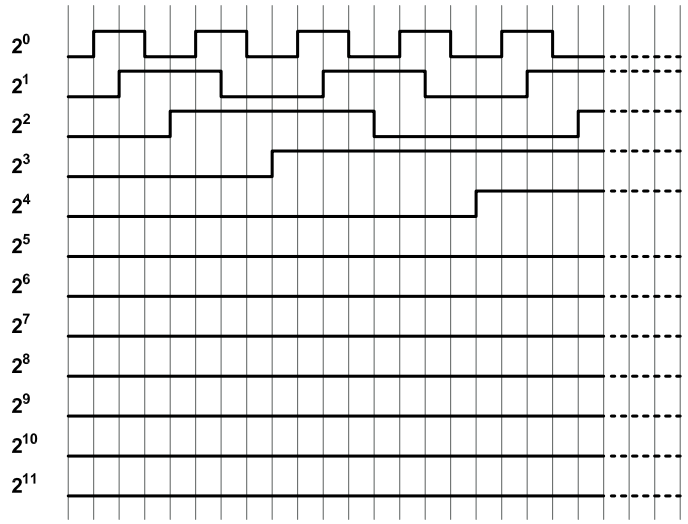
❸. None indicated for IP50 and cable length of 1M, if need to change the length C+number, the longest is 20M (expressed by C20).

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 Specifications

Diameter of shaft	Ø8mm(stainless steel)
Starting torque	Less than 5×10^{-3} N·m
Inertia moment	Less than 3×10^{-6} kg·m²
Shaft load	Radial 50N; Axial 30N
Slew speed	≤4000 rpm； IP65≤3000 rpm
Bearing Life	1.5×10^{9} revs at rated load(10000hrs at 2500RPM)
Shell	Die cast aluminum
Weight	About 300g

7. Environmental Parameters

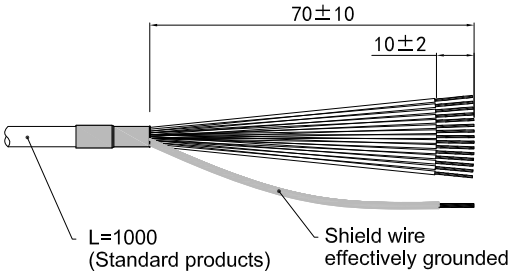
Environmental temperature	Operating:—20～+85°C(repeatable winding cable: -10°C); storage:—25～+90°C
Environmental humidity	Operating and storage：35～85%RH(noncondensing)
Vibration(Endurace)	Amplitude 0.75mm, 10~50Hz, 1h for X,Y,Z direction individually
Shock(Endurance)	49m/s² ,three times for X,Y,Z direction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

8. Wiring Table

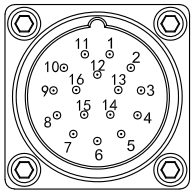
Socket Pin No. & Color	Resolution4096	Resolution2048	Resolution1024 (720)	Resolution512 (360)	Resolution256 (180)	Resolution128	Resolution64	Resolution32
15=R=pink /black	bit1(2^0)	Not connect	←	←	←	←	←	←
14=P=gray /black	bit2(2^1)	bit1(2^0)	Not connect	←	←	←	←	←
13=O=blue /black	bit3(2^2)	bit2(2^1)	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

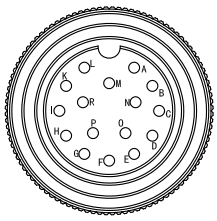


Radial socket connection



M23*1 16P
Male-connector pin Assignment

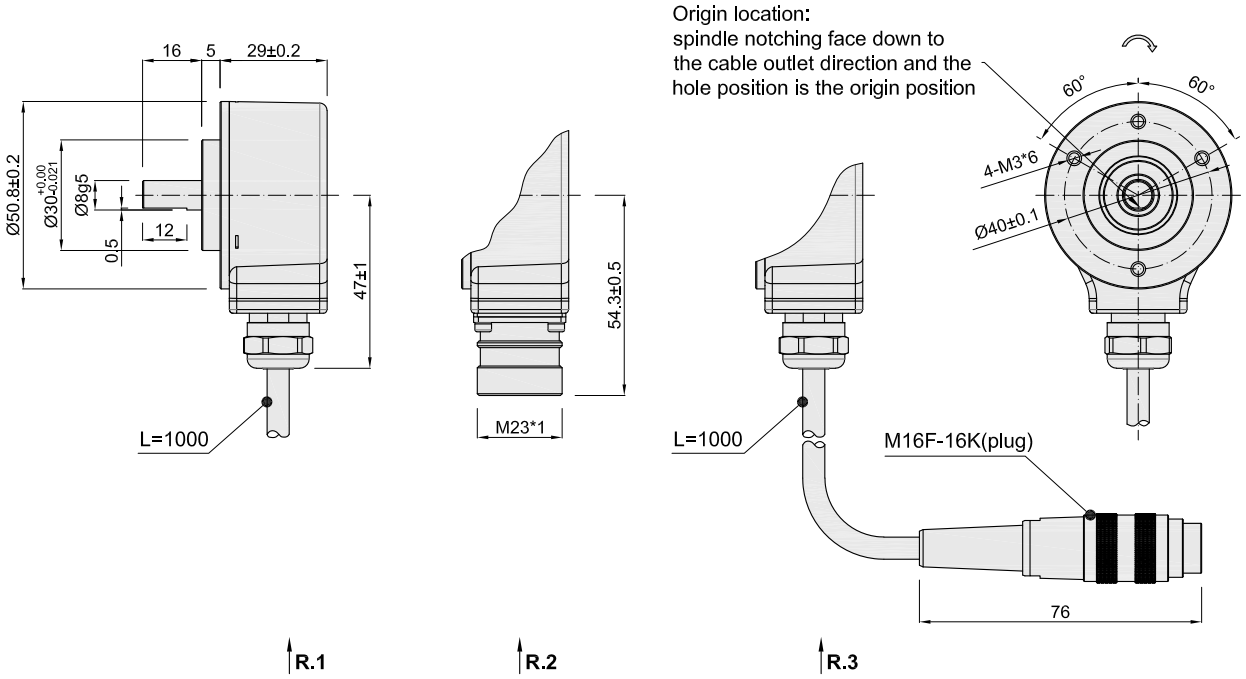
Radial cable with plug



M16F-16K
Male-head pin Assignment

9. Basic Dimensions

9.1 Dimensions

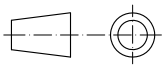


9.2 Assembling requirements



Notice : The radial runout of motor shaft should be less than 0.03, and the angle shoud be less than 1.0°.

Unit: mm



= Shaft rotation direction of the signal output

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

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

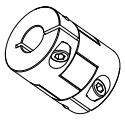
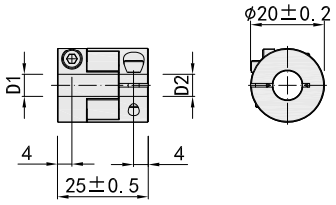
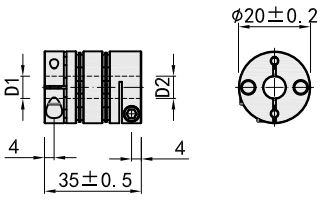
R.3 = Radial cable with plug (Standard length 1000mm， plug M16F-16K)

10. Accessories(Recommended purchase)

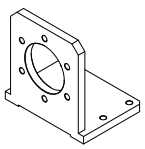
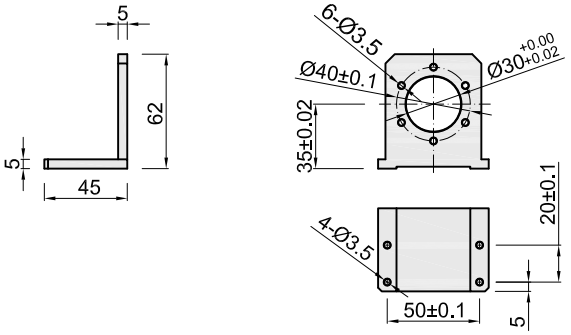
10.1 Plug connection

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 Coupling

Coupling	Dimensions	D1	D2	Model	Order No.
Oldham coupling: M series 	 material：aluminium alloy	Ø6G8	Ø8G8	6M8	08700038
		Ø8G8	Ø8G8	8M8	08700039
		Ø8G8	Ø10G8	8M10	08700040
Plate flexible coupling: W series 	 material：aluminium alloy	Ø6G8	Ø8G8	6W8	08700042
		Ø8G8	Ø8G8	8W8	08700043
		Ø8G8	Ø10G8	8W10	08700044

10.3 Bracket

Bracket	Dimensions	Model	Order No.
 material: aluminium alloy		S50-50L30	03500165

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 .