

1. Absolute Type-Parallel output (Solid Shaft)

1.1 Introduction:

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

1.2 Feature:

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

1.3 Application:

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

1.4 Connection:

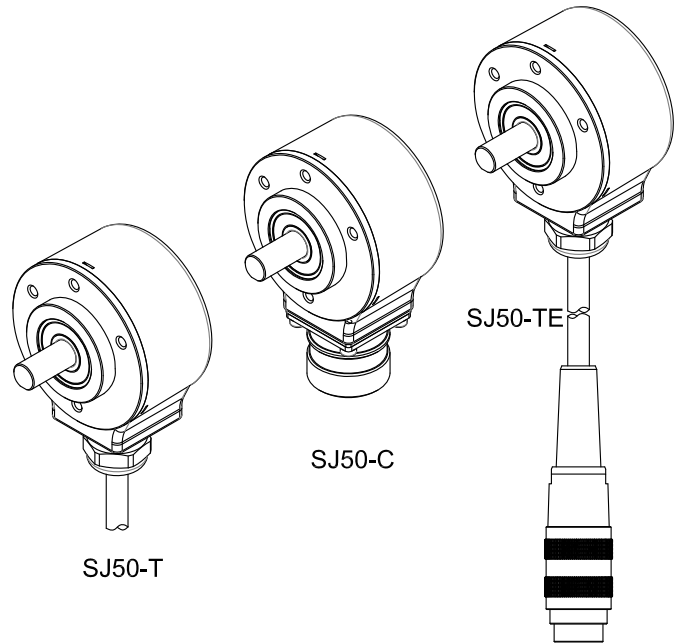
- Radial cable (STD length 1000mm)
- Radial socket (M23*1 16P)
- Radial cable with plug (STD length 1000mm)

1.5 Protection:

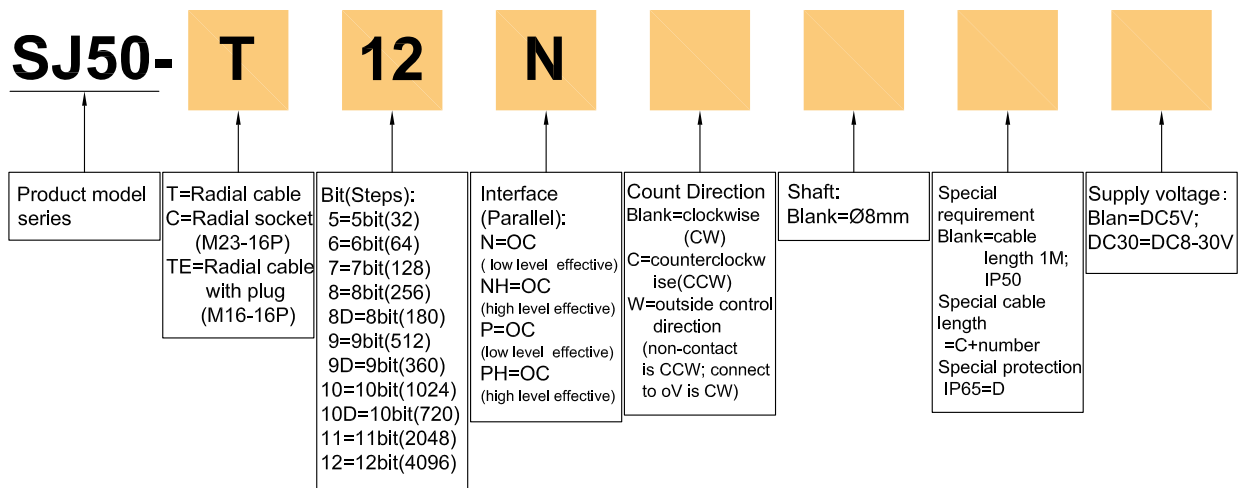
IP50 & IP65

1.6 Weight:

About 300g



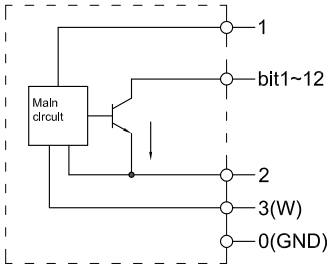
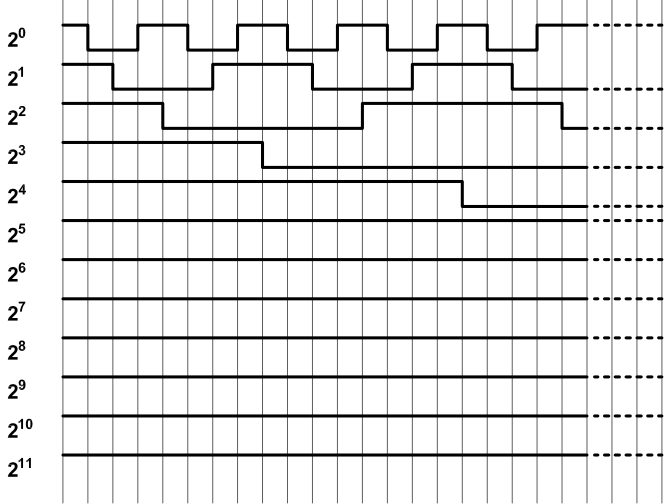
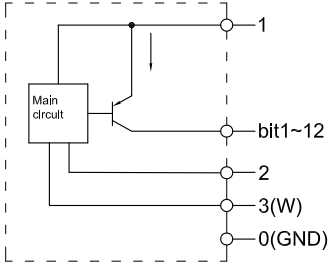
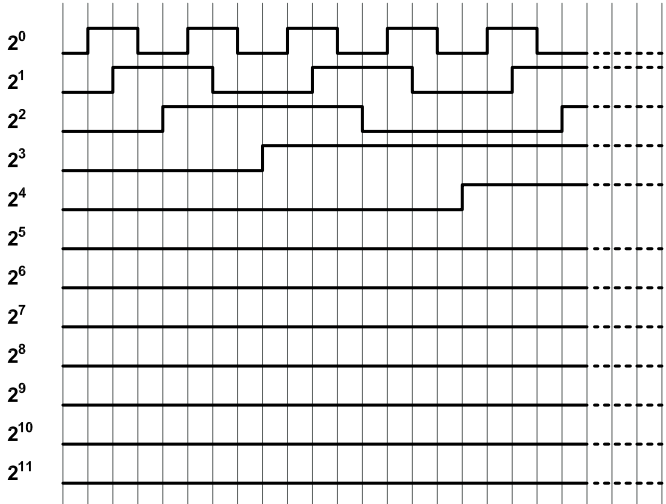
2. Model Selection Guide



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
<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.....4095 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.....4095 View from shaft end,rotate direction is clockwise(CW)</p>

5. Electrical Characteristics

Parameter / Item	Interface (Parallel)	OC(NPN)	OC(PNP)
Supply voltage		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	
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 Characteristics

Shaft	Ø8mm(stainless steel)
Starting torque	Less than 5×10^{-3} N·m
Inertia moment	Less than 3×10^{-6} kg·m ²
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

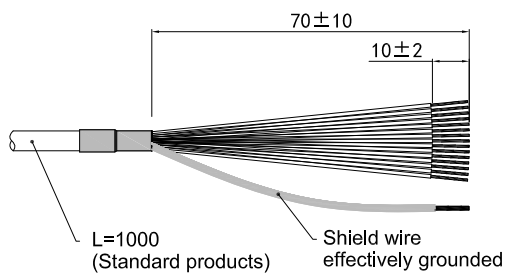
7. Environmental Specifications

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(endure)	Amplitude 0.75mm, 10~50Hz, 1h for X,Y,Z direction individually
Shock(endure)	49m/s ² , three times for X,Y,Z direction individually
Protection	IP50; IP65

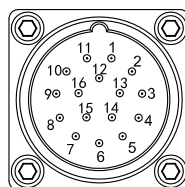
8. Wiring table

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 (outside control 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

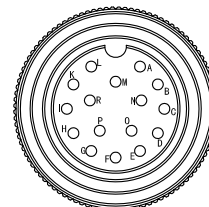


Radial socket connection



M23*1 16P
Male-connector pin Assignment

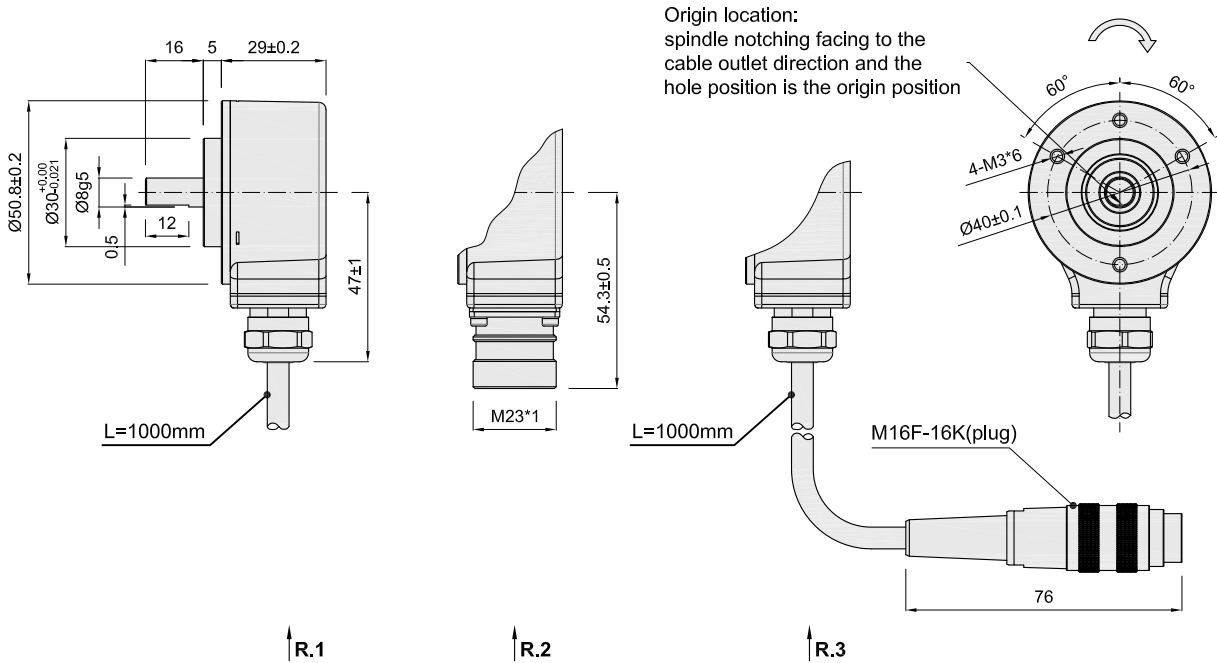
Radial cable with plug



M16F-16K
Male-head pin Assignment

9. Basic Dimensions

9.1 Dimensions

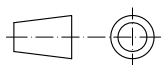


9.2 Assembling requirement



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

Unit: mm



↻ = Shaft rotation direction of the signal output

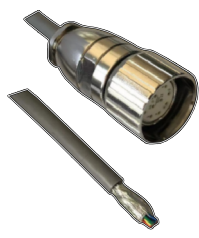
- R.1 = Radial cable (Standard length 1000mm)
- R.2 = Radial socket (M23x1 16P Male-connector)
- R.3 = Radial cable with plug (Standard length 1000mm, plug M16F-16K)

About vibration

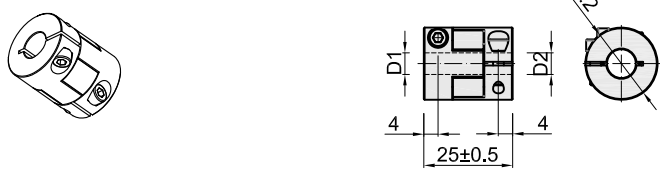
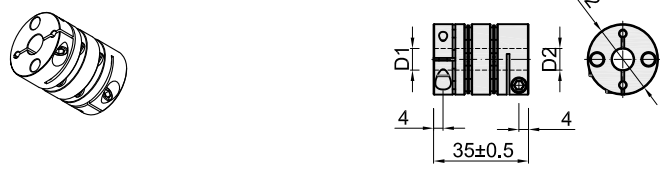
Vibration act on encoder always cause wrong pulse, so we should pay attention to working place. More pulse per revolution, narrower groovy spacing of grating, more effect to encoder by vibration, when rev is low or stop, vibration act on shaft or main body would cause grating vibrating, so encoder might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

10. Accessories(Recommended purchase)

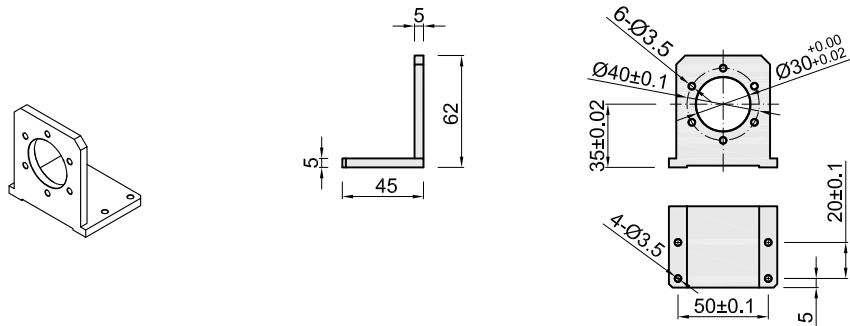
10.1 Plug connection

Plug and cable	Brief description	No.	Order No.
	C01=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	SJ50C01	44400027
	C02=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	SJ50C02	44400028
	C03=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	SJ50C03	44400029

10.2 Coupling

M series oldham coupling (general accuracy, or choose W series for higher accuracy) 6M8 No: 08700038 8M8 No: 08700039 8M10 No: 08700040		Model	D1	D2
		6M8	$\text{Ø}6^{+0.01}_{+0.03}$	$\text{Ø}8^{+0.01}_{+0.03}$
		8M8	$\text{Ø}8^{+0.01}_{+0.03}$	$\text{Ø}10^{+0.01}_{+0.03}$
		8M10		
material: aluminium alloy				
W series plate flexible coupling (high accuracy) 6W8 No: 08700042 8W8 No: 08700043 8W10 No: 08700044		Model	D1	D2
		6W8	$\text{Ø}6^{+0.01}_{+0.03}$	$\text{Ø}8^{+0.01}_{+0.03}$
		8W8	$\text{Ø}8^{+0.01}_{+0.03}$	$\text{Ø}10^{+0.01}_{+0.03}$
		8W10		
material: aluminium alloy				

10.3 Bracket

S50-50L30 No: 03500165	
material: aluminium alloy	