1. SS58 Sin/Cos Optical Encoder (Solid shaft)

1.1 Introduction：

This product is a solid shaft rugged enclosure design, can output 1024 or 2048 Sin/Cos period signal, a variety of mounting flange and collars, protection grade IP65, the product structure is compact, high safety, suitable for high intensity mechanical movement and high resolution segmentation field.

1.2 Feature：

- Encoder external diameter Ø58mm、thickness 36-40mm、diameter of shaft of Ø6mm、Ø8mm、Ø10mm available；
- Various sizes of mounting flanges available;
- Adopt non-contact photoelectric principle;
- Resolution per turn Sin/Cos period 1024 or 2048;
- Reverse polarity protection ;
- Short circuit protection.

1.3 Application：

Motor,elevator,CNC and other automation control fields.

1.4 Connection：

- Cable connection (Standard length 1000mm)
- Socket connection (M12/M16/M23 male socket)

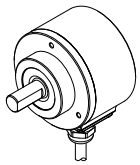
1.5 Protection：

IP65 (Max)

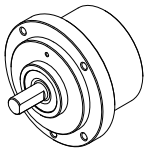
1.6 Weight：

About 420g

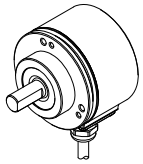
SS58-A



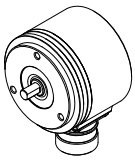
SS58-B



SS58-C



SS58-D



2. Model Selection Guide

Model composition(select parameters)

SS58-	A	10	T	AS	2048		D	-	000
Product model series	Mounting flange：❶. A/B/C/D	Diameter of shaft：(Solid hole) 6=Ø6mm 8=Ø8mm 10=Ø10mm	Connection method：T=Radial cable Q=Axial cable Radial socket: E=M12-8P C=M16-8P G=M23-12P Axial socket: F=M12-8P D=M16-8P H=M23-12P	Signal：Sin/Cos AS=After differential generation Sin/Cos BS=Before differential generation Sin/Cos	Resolution：Per turn 1024(Sin/Cos); 2048(Sin/Cos)	Supply voltage: Blank=DC5V H=DC8-30V	Special requirement Blank=❷ D=IP65		Management No.

Mounting flange：

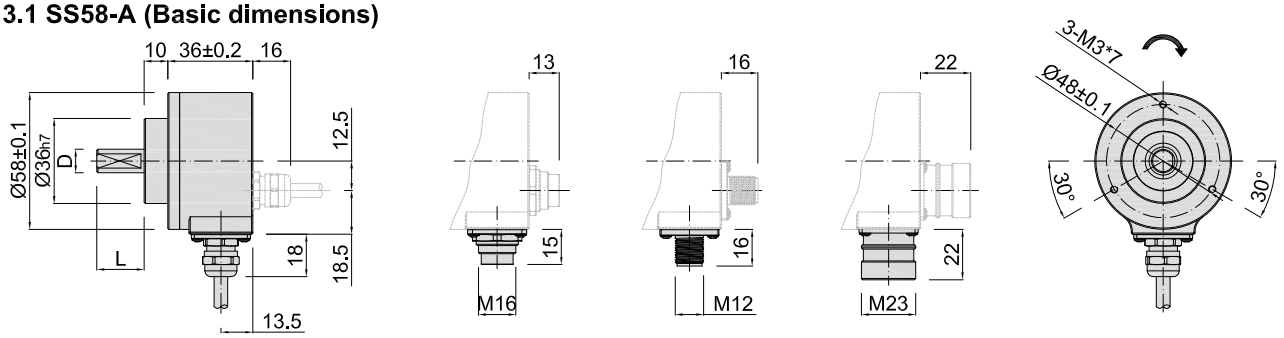
❶. A=Clamping flange，collar Ø36mm，3-M3 PCDØ48mm；
B=Clamping flange，collar Ø56mm，4-M4 PCDØ66mm；
C=Synchro flange，collar Ø36mm，3-M3 & 3-M4 PCDØ48mm；
D=Synchro flange，collar Ø50mm，3-M4 PCD42mm.

Special requirement：

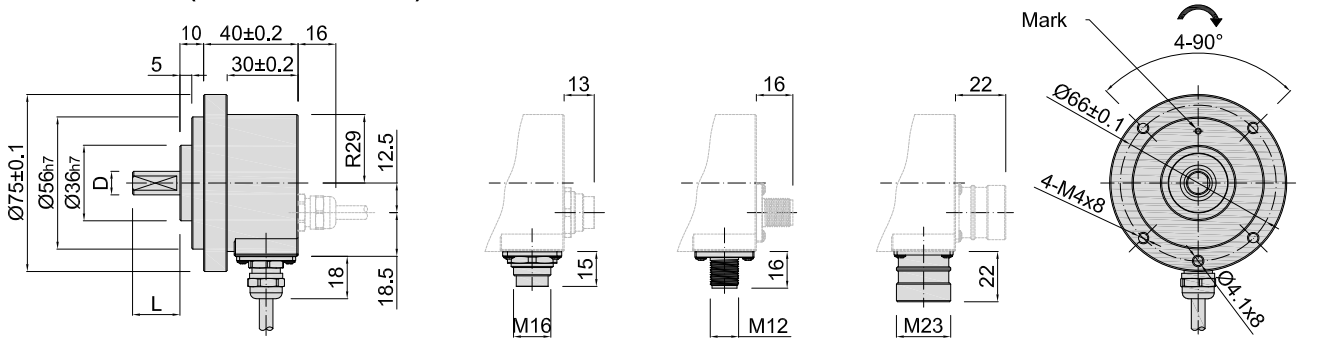
❷. IP=50；cable length 1m，if need to change the length C+number，max 100m(indicated by C100).

3. Basic Dimensions

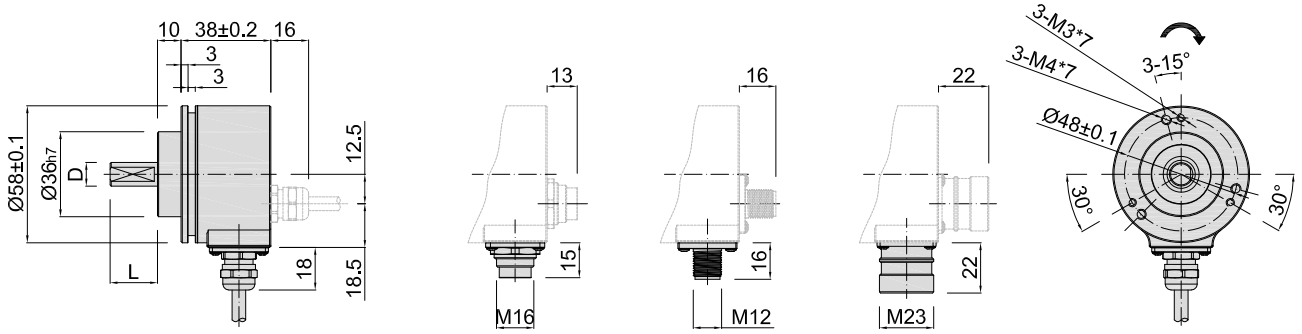
3.1 SS58-A (Basic dimensions)



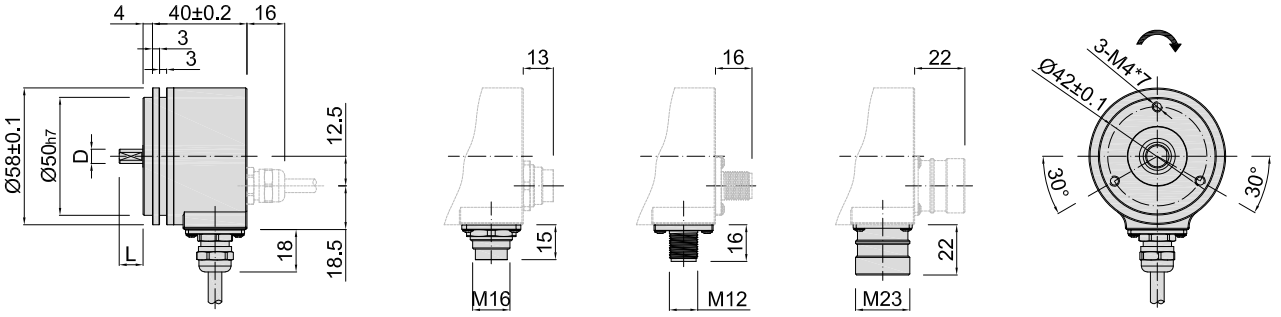
3.2 SS58-B (Basic dimensions)



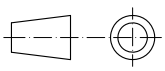
3.3 SS58-C (Basic dimensions)



3.4 SS58-D (Basic dimensions)



Unit：mm



= Direction of shaft rotation for signal output

D(Shaft)	$Ø6_{h7}(^{0}_{-0.015})$	$Ø8_{h7}(^{0}_{-0.015})$	$Ø10_{h7}(^{0}_{-0.018})$
L	10	20	20

4. Technical Parameters

4.1 Performance

Sine/cosine periods per revolution	1024 & 2048
Measuring step	0.3 " Sin/Cos signals are subdivided by 12 bits ❶
Initialization time	50ms ❷
Integral non-linearity	Typ.±45 Winkelsekunden(Loose stator coupling)
Differential non-linearity	±7 Winkelsekunden
Reference signal, number	1
Reference signal, position	90°, electrically,gated with Sinus and Cosinus

❶. Not safety-related.
❷. Valid signals can be read thereafter.

4.2 Electrical Parameters

Communication interface	Incremental
Communication interface detail	Sin/Cos
Connection type	M12 & M16 8pin male socket; M12 & M23 12pin male socket; Cable connection (five options available)
Supply voltage	DC4.5V...5.5V； DC8V...30V
Maximum output frequency	≤200 kHz
Load resistance	≥120Ω
Power consumption max.(without load)	≤0.7 W
Power consumption	Without load
Reverse polarity protection	✔
Protection grade	IP50 & IP65
Short-circuit protection	✔ ❶

❶. Short-circuit to another channel or GND permitted for max.30s.

4.3 Mechanical Parameters

Diameter of shaft	Ø6mm；Ø8mm；Ø10mm available
Shaft material	Stainless steel
Starting torque	at +20°C IP50＜0.05 Nm; IP65＜0.1 Nm
Inertia moment	Less than 3×10^{-6} kg·m²
Shaft load	Radial 60N; Axial 40N
Permissible movement static	±0.3mm (radial) ; ±0.5mm (axial)
Permissible movement dynamic	±0.05mm (radial) ; ±0.1mm (axial)
Max.angular acceleration	≤500,000 rad/s²
Operating speed	$6000min^{-1}$ ❶
Bearing lifetime	$3.6x10^{9}$ ❷
Housing material	Aluminum alloy
Weight	Approx.420g

❶. Allow for self-heating of approx.3.0K per 1000rpm regarding the permissible operating temperature.
❷. On maximum operating speed and temperature.

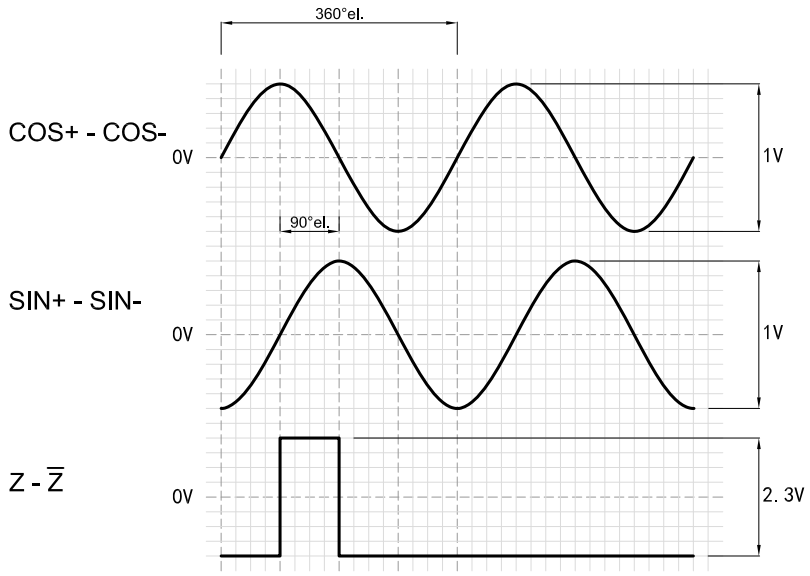
4.4 Environmental Parameters

Shell protection grade	IP65 (Max)
Permissible relative humidity	90°,Condensation not permitted
Operating temperature range	-40°C...+95°C
Storage temperature range	-40°C...+95°C
Resistance to shocks	100g，6ms(EN60068-2-27) ❶
Frequency range of resistance to vibrations	30g，10Hz...1,000Hz(EN60068-2-6) ❷

❶. Checked during operation using vector length monitoring.
❷. Checked during operation using vector length monitoring, including matching plug.

5. Output wave form

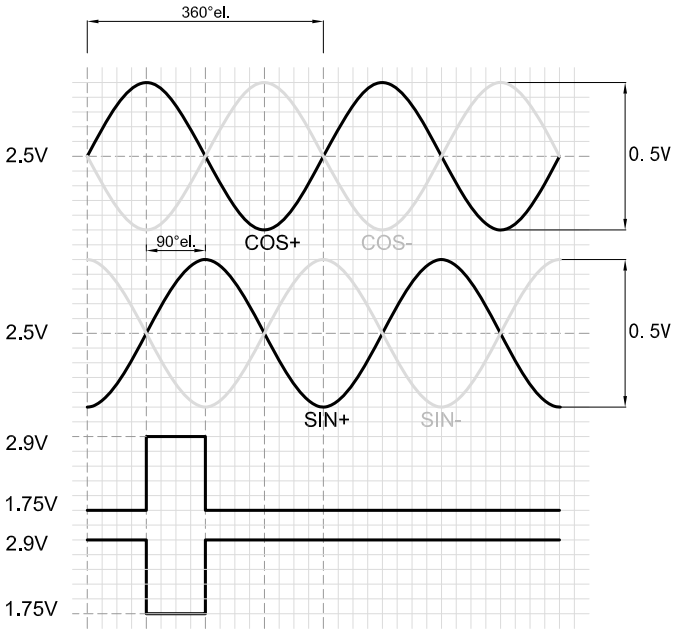
5.1 Signal SIN/COS after differential generation



Clockwise rotation of the shaft as viewed from the shaft end (see dmensional drawing)

CW direction

5.2 Signal SIN/COS before differential generation

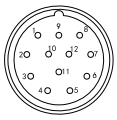


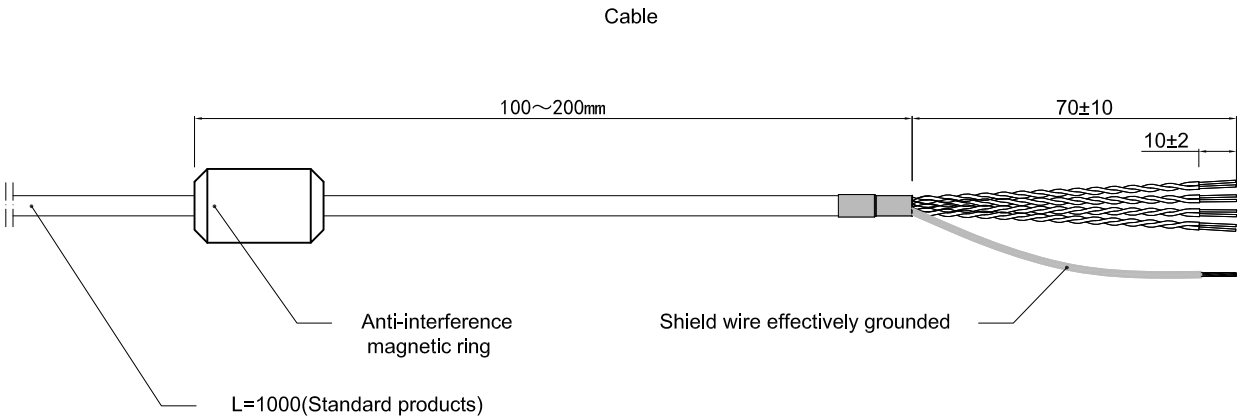
Clockwise rotation of the shaft as viewed from the shaft end (see dmensional drawing)

CW direction

Supply voltage	Signal	Interface signals	Interface signals after differential generation		Interface signals before differential generation	
			Output	Signal offset	Output	Signal offset
DC5V; DC8V...30V	+SIN -SIN +COS -COS	Analog,differential	SIN/COS 1.0 Vss	0V±10%	0.5Vss±20%	2.5V±10%
	Z Z̄	Digital,differential	Low:-1.15V±15%, High:1.15V±15%		Low:1.75V±15%, High:2.9V±15%	

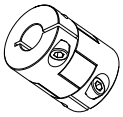
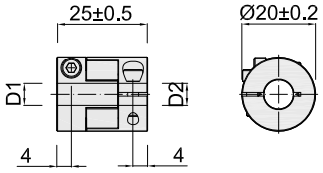
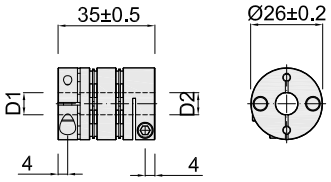
6. Wiring table

						
Socket pin definition (M12 8-pin)	Socket pin definition (M16 8-pin)	Socket pin definition (M23 12-pin)	Wire colors (cable connection)	Signal	Explanation	Twisted wire
1	1	6	White/BK	-COS	Signal wire	
2	2	5	White	+COS	Signal wire	
3	3	1	Green/BK	-SIN	Signal wire	
4	4	8	Green	+SIN	Signal wire	
5	5	4	Yellow/BK	$\overline{Z}$	Signal wire	
6	6	3	Yellow	Z	Signal wire	
7	7	10	Black	Un	Power negative	
8	8	12	Red	Up	Power position	
–	–	9	-	N.C.	Unallocated	
–	–	2	-	N.C.	Unallocated	
–	–	11	-	N.C.	Unallocated	
–	–	7	-	N.C.	Unallocated	
GND	No encoder body connected					

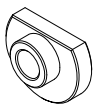
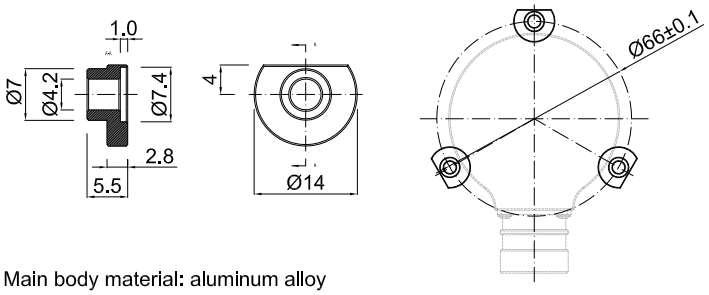


7. Recommended Accessories

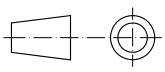
7.1 Coupler

Coupler	Dimensions	D1	D2	Model	Order No.
Cross type: M series 	 Main body material: aluminum alloy	Ø6^{G8}	Ø8^{G8}	6M8	08700038
		Ø8^{G8}	Ø8^{G8}	8M8	08700039
		Ø8^{G8}	Ø10^{G8}	8M10	08700040
Diaphragm type: W series 	 Main body material: aluminum alloy	Ø6^{G8}	Ø8^{G8}	6W8	08700042
		Ø8^{G8}	Ø8^{G8}	8W8	08700043
		Ø8^{G8}	Ø10^{G8}	8W10	08700044

7.2 Mounting cardboard

Mounting cardboard	Dimensions	Model	Order NO.
 3 pcs as a set	 Main body material: aluminum alloy	58C66	03700733

Unit: mm



8. Caution

8.1 Caution for operation

- The working temperature shall not exceed the storage temperature.
- The working humidity shall not exceed the storage humidity.
- Do not use where the temperature changes dramatically and have fog.
- Do not close to corrosive and flammable gas.
- Keep away from dust,salt and metal powder.
- Keep away from places where you will use water, oil, or medicine.
- Undue vibration and shock will impact the encoder.

8.2 Caution for Installation

- Electrical components should not be subjected to excessive pressure, etc., and electrostatic assessment of the installation environment should be conducted.
- Do not close the cable of the motor power to the encoder.
- The FG wire of the motor and mechanical device should be grounded.
- The shielding wire must be effectively grounded since the shielding is not connected to the encoder.

8.3 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.