

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)

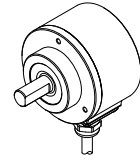
1.5 Protection:

IP65 (Max)

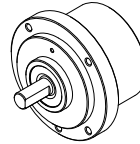
1.6 Weight:

About 420g

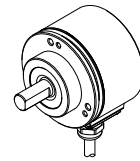
SS58-A



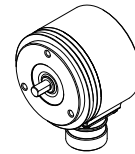
SS58-B



SS58-C

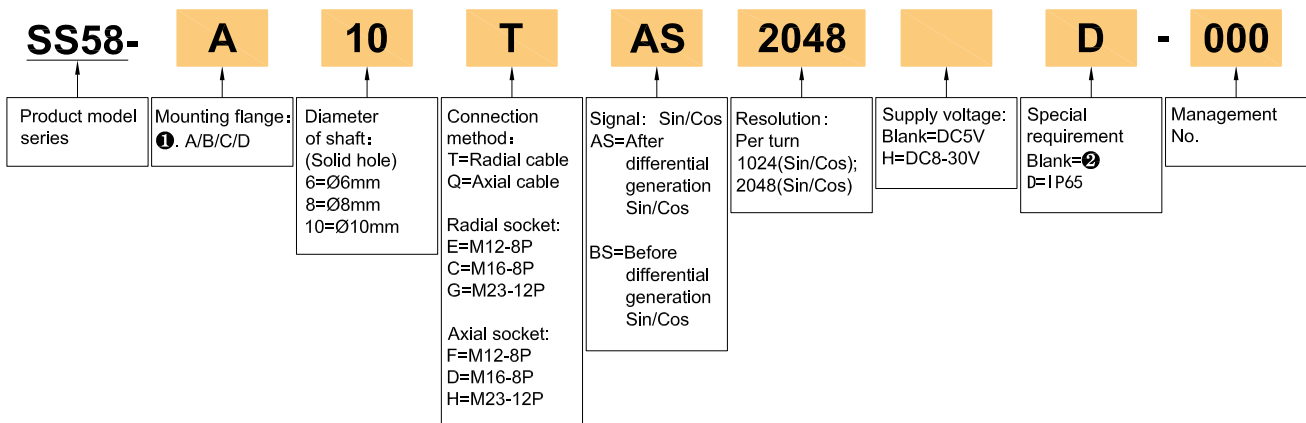


SS58-D



2. Model Selection Guide

Model composition(select parameters)



Mounting flange:

- ①. 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.

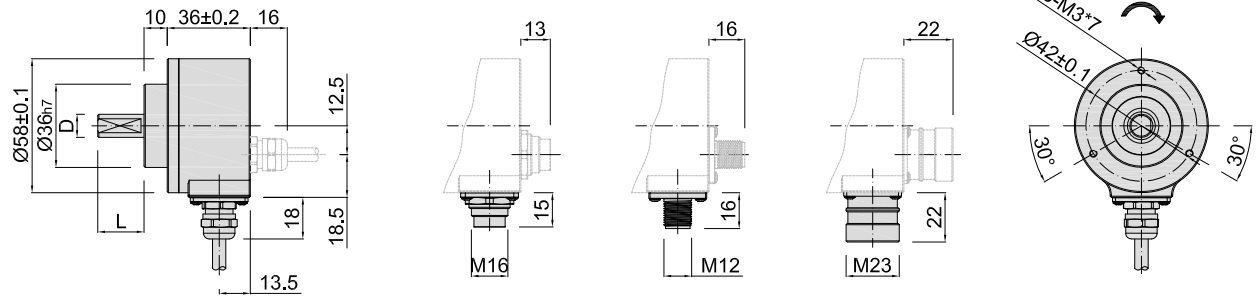
Special requirement:

- ②. IP=50; cable length 1m, if need to change the length C+number, max 100m(indicated by C100).

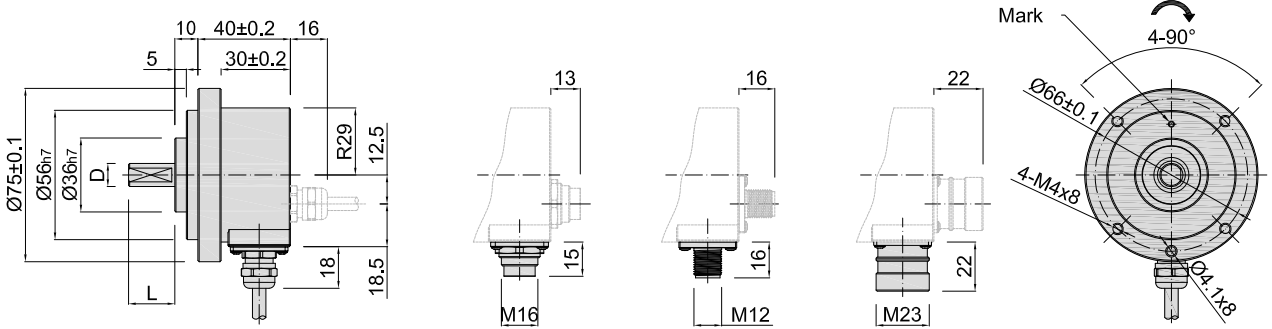
SS58 Sin/Cos

3. Basic Dimensions

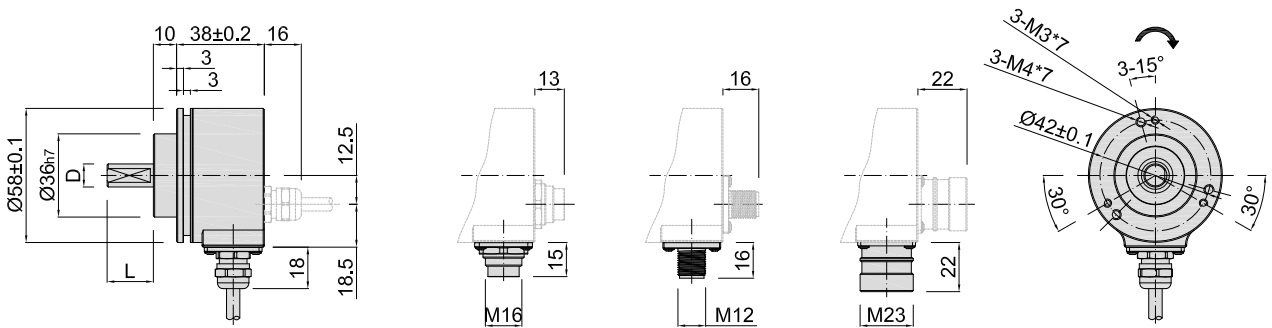
3.1 SS58-A (Basic dimensions)



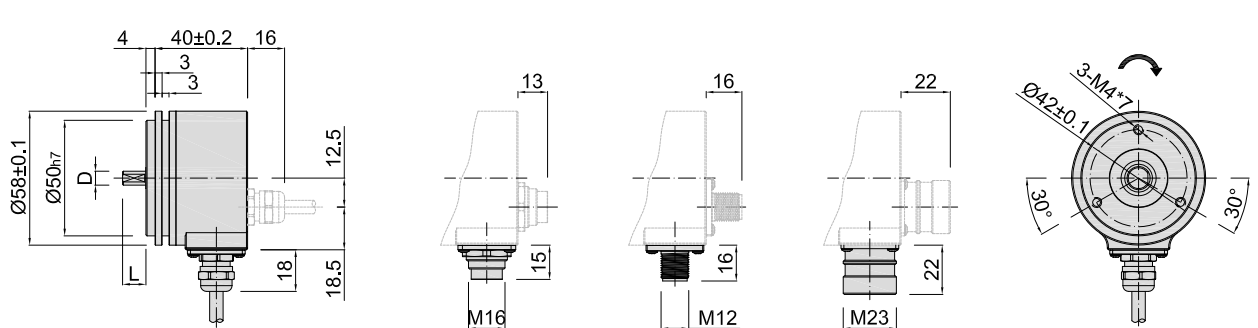
3.2 SS58-B (Basic dimensions)



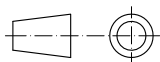
3.3 SS58-C (Basic dimensions)



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 | Ø10 | Ø20 | Ø20 |

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·m ² |
| 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/s ² |
| 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.

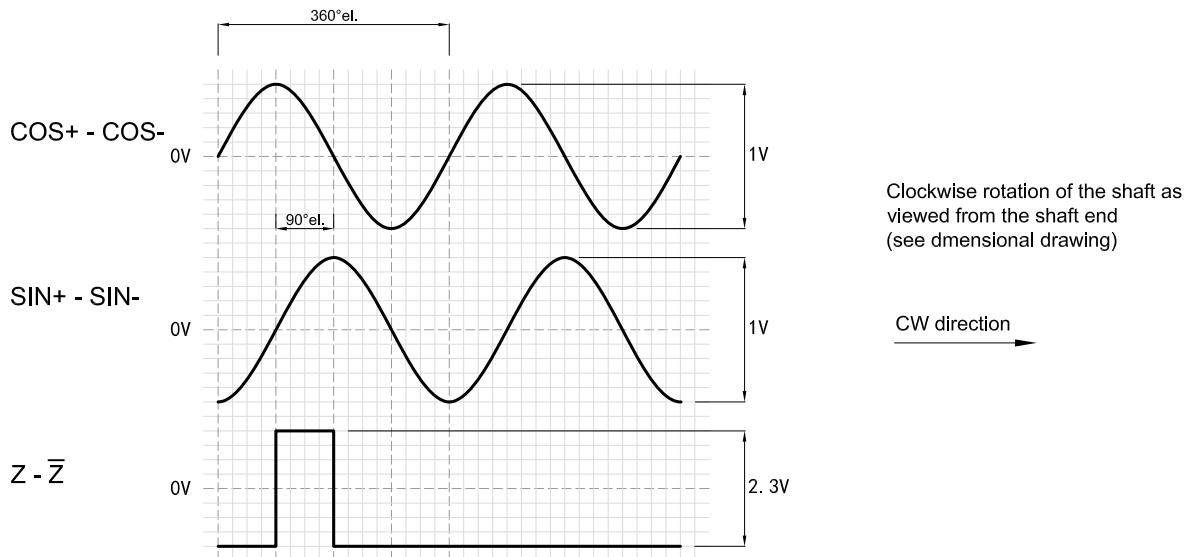
4.4 Environmental Parameters

| | |
|---|------------------------------------|
| 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 |

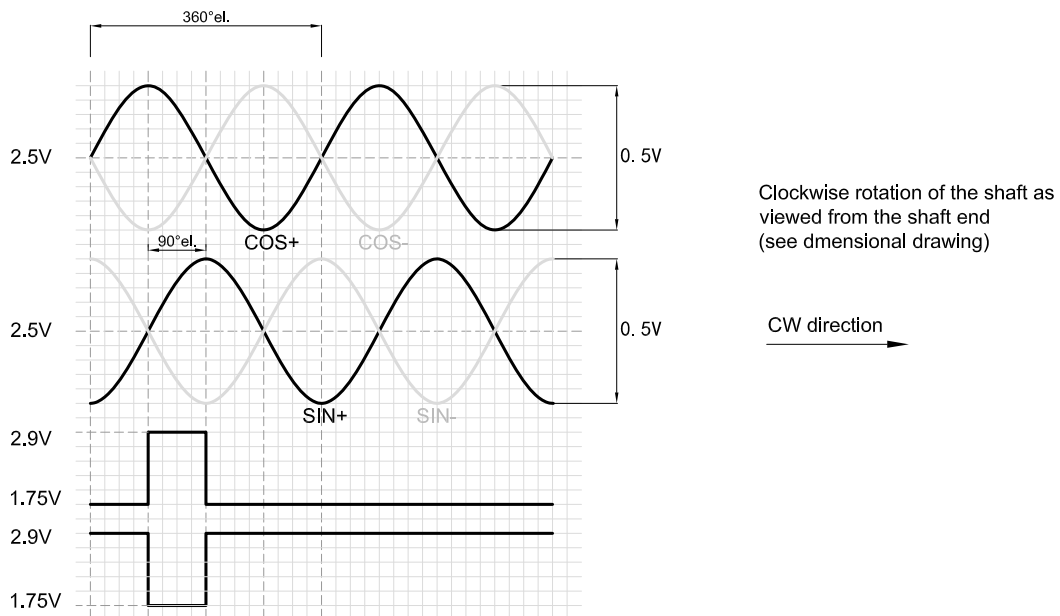
- ❶. Checked during operation using vector length monitoring.
 ❷. Checked during operation using vector length monitoring, including matching plug.

5. Output wave form

5.1 Signal SIN/COS after differential generation


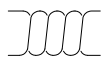




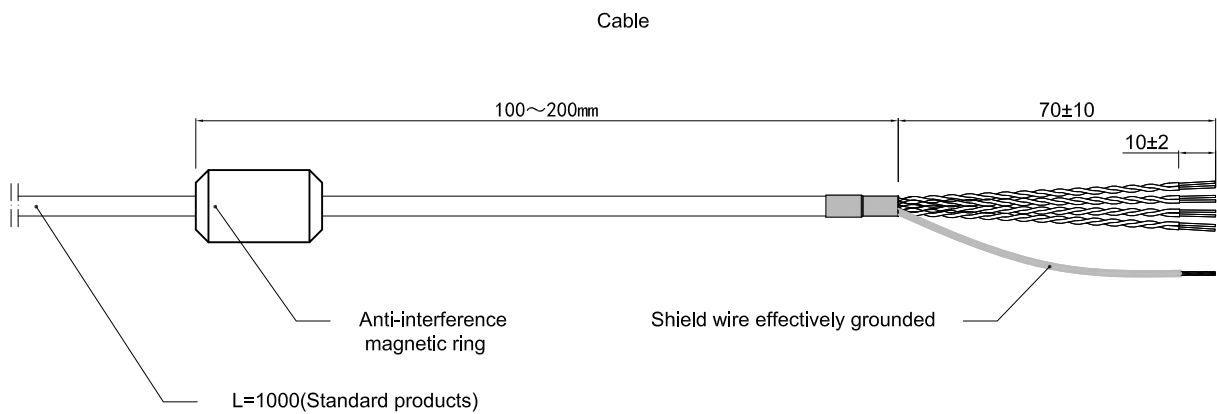
5.2 Signal SIN/COS before differential generation



| 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% | |
| | Z Z̄ | | | | Digital,differential | Low:-1.15V±15%, High:1.15V±15% |
| | | | | | Low:1.75V±15%, High:2.9V±15% | |

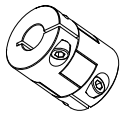
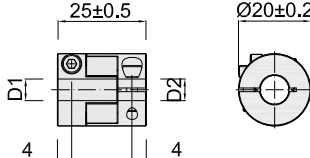

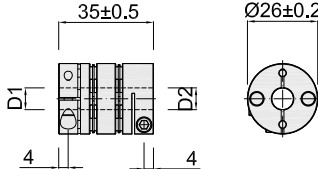
6. Wiring table

| 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 | \bar{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 | | | | | |

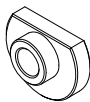
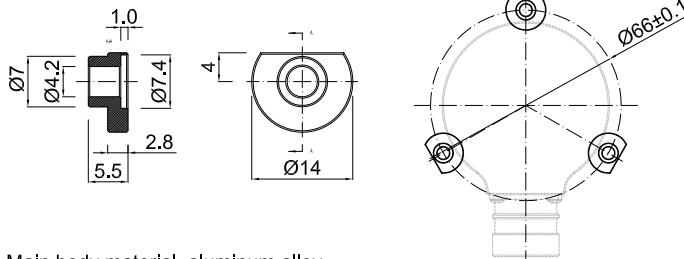


7. Recommended Accessories

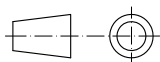
7.1 Coupler

| Coupler | Dimensions | D1 | D2 | Model | Order No. |
|--|--|------------------|-------------------|-------|-----------|
| Cross type: M series  |  <p>Main body material: aluminum alloy</p> | Ø6 ^{G8} | Ø8 ^{G8} | 6M8 | 08700038 |
| | | Ø8 ^{G8} | Ø8 ^{G8} | 8M8 | 08700039 |
| | | Ø8 ^{G8} | Ø10 ^{G8} | 8M10 | 08700040 |
| Diaphragm type: W series  |  <p>Main body material: aluminum alloy</p> | 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. |
|---|--|-------|-----------|
|  <p>3 pcs as a set</p> |  <p>Main body material: aluminum alloy</p> | 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.