

68 mm Diameter Incremental Rotary Encoders



E68 Series PRODUCT MANUAL

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Features

- Ø 68 mm housing, Ø 15 mm solid shaft
- High-strength shaft (radial load: 20 kgf, thrust load: 10 kgf)
- 180 kHz response frequency
- Radial connector type
- Various resolutions: 500, 600, 1024 pulses per revolution
- Power supply: 5 VDC \pm 5%
- IP65 protection structure (IEC standard)

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- \triangle symbol indicates caution due to special circumstances in which hazards may occur.

\triangle Warning Failure to follow instructions may result in serious injury or death.

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime / disaster prevention devices, etc.)**
Failure to follow this instruction may result in personal injury, economic loss or fire.
- 02. Do not use the unit in the place where flammable / explosive / corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**
Failure to follow this instruction may result in explosion or fire.
- 03. Install on a device panel to use.**
Failure to follow this instruction may result in fire.
- 04. Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
- 05. Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.
- 06. Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.

\triangle Caution Failure to follow instructions may result in injury or product damage.

- 01. Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
- 02. Do not short the load.**
Failure to follow this instruction may result in fire.
- 03. Do not use the unit near the place where there is the equipment which generates strong magnetic force or high frequency noise and strong alkaline, strong acidic exists.**
Failure to follow this instruction may result in product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'.
Otherwise, it may cause unexpected accidents.
- 5 VDC \equiv power supply should be insulated and limited voltage / current or Class 2, SELV power supply device.
- For using the unit with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground the shield wire to the F.G. terminal.
- Ground the shield wire to the F.G. terminal.
- When supplying power with SMPS, ground the F.G. terminal and connect the noise canceling capacitor between the 0 V and F.G. terminals.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- For Line driver unit, use the twisted pair wire which is attached seal and use the receiver for RS-422A communication.
- Check the wire type and response frequency when extending wire because of distortion of waveform or residual voltage increment etc. by line resistance or capacity between lines.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000 m
 - Pollution degree 2
 - Installation category II

Cautions during Installation

- Install the unit correctly with the usage environment, location, and the designated specifications.
- Do not load overweight on the shaft.

Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

E68 ① ② - ③ - ④ - ⑤ - ⑥

① Shaft type

S: Shaft type

② Shaft outer diameter

15: Ø 15 mm

③ Resolution

Number: Refer to resolution in 'Specifications'

④ Output phase

6: A, \bar{A} , B, \bar{B} , Z, \bar{Z}

⑤ Control output

L: Line driver output

⑥ Power supply

5: 5 VDC $\pm 5\%$

Product Components

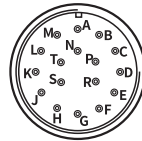
- Product (+ bracket)
- Instruction manual
- Key

Connections

- Unused wires must be insulated.
- The metal case and shield cable of encoders must be grounded (F.G.).
- E and H terminals, K and M terminals are connected internally.
- For more information, contact the manufacture of the socket.
- Connector model.: MS3102A20-29P, socket model.: MS3106A20-29S (Straight Type), Manufacture: Yeonhab precision Co. LTD.

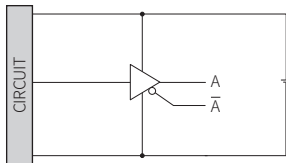
Pin	Function	Pin	Function
A	OUT A	K, M	GND
B	OUT Z	N	OUT \bar{A}
C	OUT B	P	OUT \bar{Z}
D, F, G, J, L, S	-	R	OUT \bar{B}
E, H	+V	T	Shield (F.G.)

• Pin layout



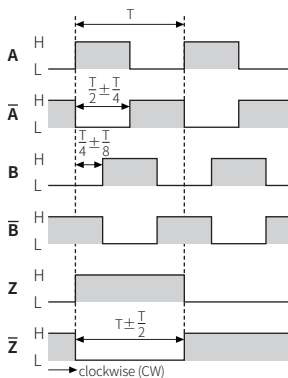
Inner Circuit

- Output circuits are identical for all output phase.



Output Waveform

- The rotation direction is based on facing the shaft, and it is clockwise (CW) when rotating to the right.
- Phase difference between A and B: $\frac{T}{4} \pm \frac{T}{8}$ ($T = 1$ cycle of A)



Specifications

Model	E68S15-□-6-L-5
Resolution	500 / 600 / 1,024 PPR model
Control output	Line driver output
Output phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
Inflow current	≤ 20 mA
Residual voltage	≤ 0.5 VDC \equiv
Outflow current	≤ -20 mA
Output voltage	≥ 2.5 VDC \equiv
Response speed ⁰¹⁾	≤ 0.5 μ s
Max. response freq.	180 kHz
Max. allowable revolution ⁰²⁾	6,500 rpm
Starting torque	≤ 0.15 N m
Allowable shaft load	Radial: ≤ 20 kgf, Thrust: ≤ 10 kgf
Unit weight	≈ 550 g
Certification	RoHS

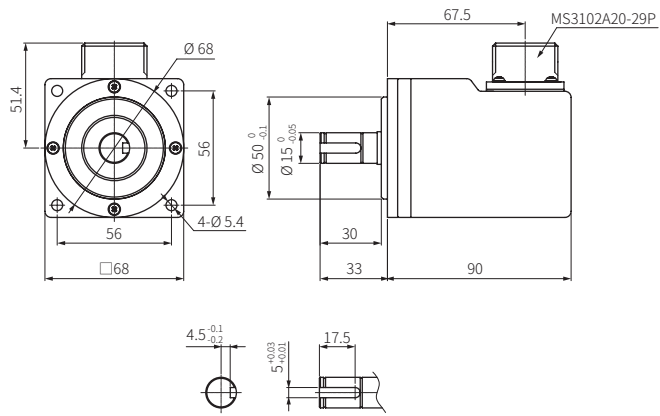
01) Based on cable length: 1 m, I sink: 20 mA

02) Select resolution to satisfy Max. allowable revolution \geq Max. response revolution
 (max. response revolution (rpm) = $\frac{\text{max. response frequency}}{\text{resolution}} \times 60$ sec)

Power supply	5 VDC $\equiv \pm 5\%$ (ripple P-P: $\leq 5\%$)
Current consumption	≤ 50 mA (no load)
Insulation resistance	≥ 100 M Ω (500 VDC \equiv megger)
Dielectric strength	Between the charging part and the case: 750 VAC ~ 50 / 60 Hz for 1 min.
Vibration	1 mm double amplitude at frequency 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	≤ 50 G
Ambient temp.	-10 to 70 $^{\circ}$ C, storage: -25 to 85 $^{\circ}$ C (no freezing or condensation)
Ambient humi.	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection rating	IP65 (IEC standard)
Connection	Radial connector type
Connector spec.	1-1/4-18UNEF-2A plug type (MS3102A20-29P, Yeonhab precision Co. LTD.)

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.



■ Key

