



通用技术国测时栅
GENERTEC GUOCE TIME GRATING



NANOMETER TIME-GRATING DISPLACEMENT SENSOR

STRIVE FOR GLOBAL LEADING PRECISION DISPLACEMENT
MEASUREMENT SOLUTION PROVIDER.

GENERTEC GUOCE TIME GRATING TECHNOLOGY CO.,LTD.

CONTENTS

01 ABOUT US

| | |
|---|-------|
| Company profile | 01 |
| Introduction of nanometer time-grating technology | 02~04 |
| Our advantages | 05 |

02 PRODUCT CATEGORY

| | |
|---|-------|
| 1. Angular time-grating displacement sensor | 06 |
| Introduction of split absolute angular time-grating displacement sensor | 07 |
| Parameters of split absolute angular time-grating displacement sensor | 08~09 |
| RAE106 split absolute angular time-grating displacement sensor | 10 |
| RAE128 split absolute angular time-grating displacement sensor | 11 |
| RAE170 split absolute angular time-grating displacement sensor | 12 |
| RAE230 split absolute angular time-grating displacement sensor | 13 |
| RAE360 split absolute angular time-grating displacement sensor | 14 |
| RAN075 split absolute angular time-grating displacement sensor | 15 |
| RAN125 split absolute angular time-grating displacement sensor | 16 |
| RAU200 ultra-high split absolute angular time-grating displacement sensor | 17 |
| 2. Linear time-grating displacement sensor | 18 |
| LAU closed absolute linear displacement sensor | 19~20 |
| LIN exposed incremental linear displacement sensor | 21~23 |

03 APPLICATION SCENARIOS & BEST PRACTICES

| | |
|--|-------|
| Application scenarios & best practices | 24~26 |
|--|-------|

04 APPENDIX

| | |
|--|----|
| Line sequence diagram & LED mounting instruction | 27 |
|--|----|

COMPANY PROFILE



通用技术集团国测时栅科技有限公司
GENERTEC GUOCE TIME GRATING TECHNOLOGY CO.,LTD.



ESTABLISHED IN
2021



OWN PATENTS
50+



CLIENTS
100+



NATIONAL RESEARCH
PROJECTS 70+



R&D LABORATORY
1000m²

Genertec Guoce Time Grating Technology Co., Ltd. (here in after referred to as "Guoce Time Grating"), located in the Western (Chongqing) Science City, High-tech District, Chongqing, China, was established jointly by China General Technology (Group) Holding Co., Ltd. and Chongqing University of Technology in April 2021.

Guoce Time Grating strives to break through the core technology in the field of precision displacement measurement as well as develops "Nanometer Time-grating +" key functional components and intelligent equipment with nanometer time-grating technology as the core competitiveness.

The comprehensive R&D strength of Guoce Time Grating is strong, bringing together first-class experts engaged in precision manufacturing industry. Among them, medium and high-end technical talents accounted for 77%. In addition, it is equipped with precision laboratory, application testing laboratory, reliability testing laboratory, modern industrial plants, ultra-precision laboratories dedicated to nanometer time-grating research, class 100,000 dust-free workshops and the highest-precision facilities and instruments, building a high-level R&D technology innovation platform.

Looking ahead, Guoce Time Grating will adhere to the business philosophy of "Integrity, Innovation, Improvement", continuously optimize the business operation model, keep developing new products with core nanometer time-grating technology, striving to become the world's leading provider of precision displacement measurement solutions.

INTRODUCTION OF NANOMETER TIME-GRATING TECHNOLOGY

THOUGHT PROPOSAL

Time is currently the physical quantity with the highest measurement accuracy for human being , six orders of magnitude higher than space. In the International System of Units, "meter" is defined in terms of time, and the highest length datum is traced back to time.

In 1996, Professor Peng Donglin initially proposed the new idea of "Building a high-speed uniform motion as time reference and achieving displacement measurement through time comparison ", the original academic idea of "Using time pulses to form a reference for space displacement measurement"and the significant invention of "Time-grating Sensing" gradually formed.

Generally speaking, it is to observe each other in two coordinate systems, and the difference in position (displacement) of one side is shown as the difference in time observed by the other side.



Professor Peng Donglin accepted the award at the Great Hall of the People in Beijing, China.

TECHNOLOGY DEVELOPMENT

Professor Liu Xiaokang and his team have continuously iterated the time-grating sensing technology. In 2010, they proposed to use an electric field that changes orthogonal to construct an equivalent spatial domain motion as a motion reference system which was called "Nanometer Time-grating" . By simplifying and optimizing the transfer process of time reference, scientifically shortening the length of the time reference transfer chain and improving the uniform velocity of the motion reference system, the measurement accuracy has improved and the leap of precision from millimeter to micron to nanometer has gradually realized.

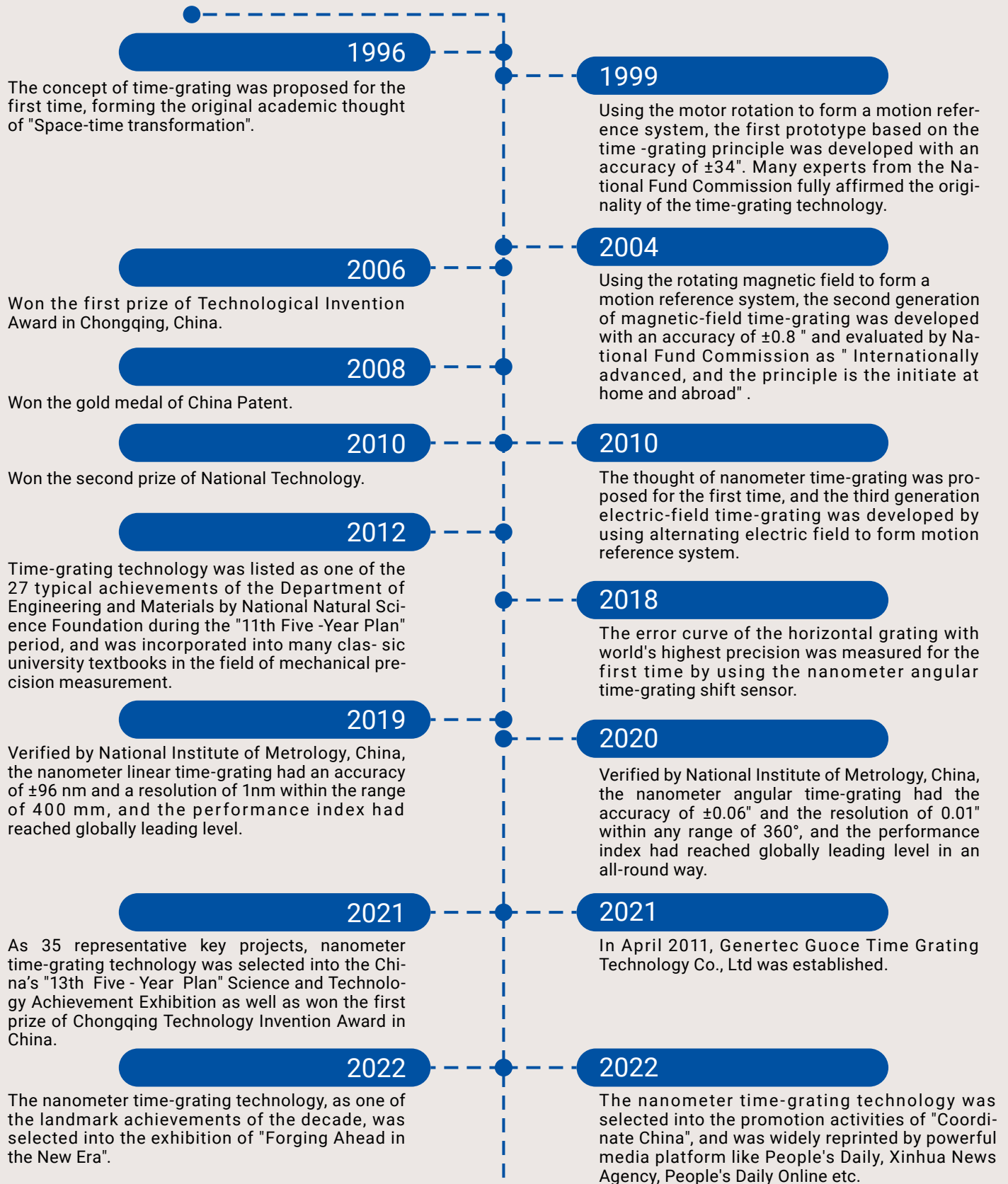


Professor Liu Xiaokang accepted the award at the Chongqing Science and Technology Award Conference in China.



Time-grating displacement measurement technology was selected into the China's "13th Five-Year Plan" Science and Technology Innovation Achievement Exhibition.

TIME GRATING DEVELOPMENT HISTORY



OUR ADVANTAGES



EXCELLENT
PERFORMANCE



QUICK SERVICE
RESPONS



SHORT
DELIVERY TIME



HIGH COST
PERFORMANCE



CUSTOMIZED
DEVELOPMENT



SECURE
SUPPLY CHAIN

ANGULAR TIME-GRATING DISPLACEMENT SENSOR

SPLIT ABSOLUTE ANGULAR
TIME-GRATING DISPLACEMENT SENSOR

- RAE(High Precision) Series
- RAN(Narrow Band) Series
- RAU(Ultra-high Precision) Series

INTRODUCTION OF SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR



Split structure

The product is composed of a rotor and a stator. Both the stator and rotor support spigot positioning and screw fixation which is easy to mount.






Strong environmental adaptability

The non-contact sensing method with electric field coupling can better adapt to the harsh environment such as oil, dust, shock and vibration.

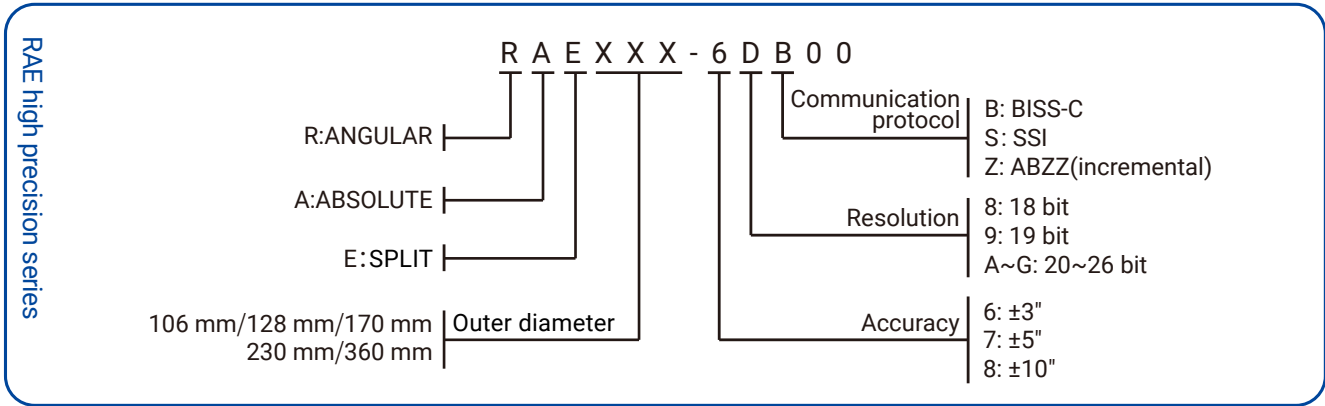


Absolute measurement

Direct access to absolute position information after power-on or restart and don't need to return to datum which is more convenient and efficient.

| Series | RAE (high precision) | RAN (narrow band) | RAU (ultra-high precision) |
|-------------------------|--|--|---|
| Accuracy | $\pm 3''/\pm 5''/\pm 10''$ | $\pm 5''/\pm 10''/\pm 15''$ | $\pm 1''/\pm 2''$ |
| Resolution | 18-26 bit | 18-26 bit | 26-28 bit |
| Outer diameter | 106 mm/128 mm/170 mm/ 230 mm/360 mm | 75 mm/125 mm | 200 mm |
| Communication protocol | BISS-C/SSI/ABZ(incremental) | BISS-C/SSI | BISS-C/SSI |
| LED to support mounting | Support | Unsupport | Unsupport |
| Outlook |  |  |  |
| Application scenarios | machine tool rotary tables / servo motors / direct drive motors / precision optical instruments / gear measuring machines etc | | |
| Main characteristics | Standard accuracy is $\pm 3''/\pm 5''$, high measurement accuracy and good stability; Non-contact, large hollow structure design, and the through-hole allows mechanical structures, cables, and gas paths to pass through. | Narrow ring width design, the larger size of the medium space is convenient for mechanical structure, cable, gas path to pass through. | Ultra-high measurement accuracy, up to $\pm 1''$; Good protection effect, with protective shell (optional), it can be better applied to complex working environment. |

PARAMETERS OF SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR



Parameters of RAE series

Basic parameters | RAE106-1000 | RAE128-1000 | RAE170-1000 | RAE230-1000 | RAE360-1000

| | |
|-----------------------|---------------|
| Accuracy | ±3"/±5"/±10"① |
| Repeatability | 1.5"/2.5" |
| Resolution | 18-26 bit |
| Measurement range | 0-360° |
| Speed | 3000 r/min② |
| Standard Cable length | 1 m③ |

Technical parameters

| Outer diameter/Inner diameter/Thickness④ (mm) | 106/36/17 | 128/58.75/17 | 170/90/19 | 230/140/22.5 | 360/280/23.5 |
|---|-----------|--------------|-----------|--------------|--------------|
| Weight of Rotor | 80 g | 110 g | 210 g | 350 g | 760 g |
| Weight of Stator | 190 g | 220 g | 370 g | 750 g | 1300 g |
| LED to support mounting | Support | | | | |

Electrical parameters

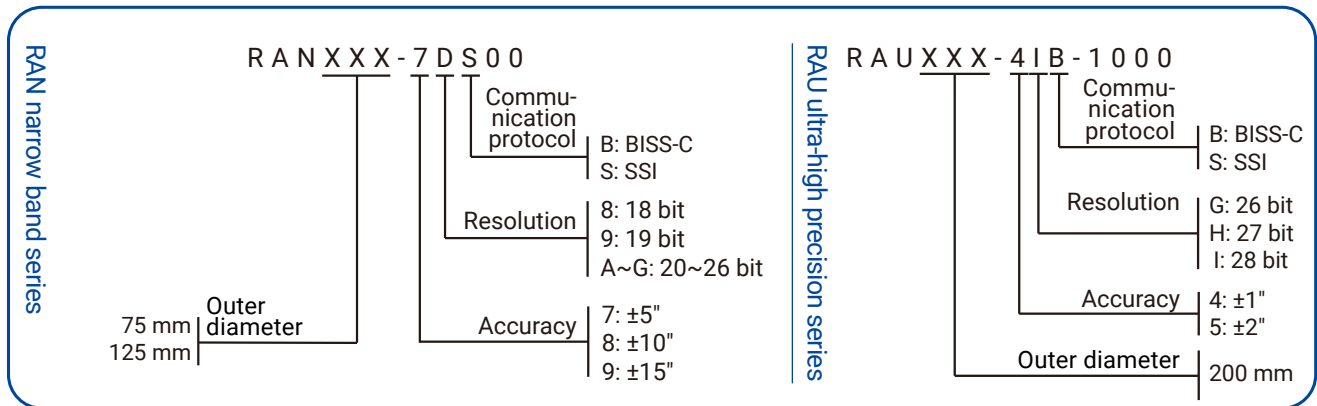
| | |
|------------------------|-----------------------------|
| Supply voltage | 5 V DC±10% |
| Operating current | 200 mA |
| Communication protocol | BISS-C/SSI/ABZ(incremental) |

Environmental test

| | |
|----------------------------|-----------------------------|
| Operating temperature | -20°C~70°C |
| Humidity | 0~80%RH non-condensing |
| IP rating (stator & rotor) | IP67 |
| IP rating (connector) | IP40 |
| EMC | IEC 61000-6-2/IEC 61000-6-4 |
| Shock | 100 G |
| Vibration | 10 G |

Note: ①Please contact us for other precision requirement; ②Please contact us for higher speed requirement; ③Please contact us for other cable requirement; ④Referring to the thickness at the optimum installation clearance.

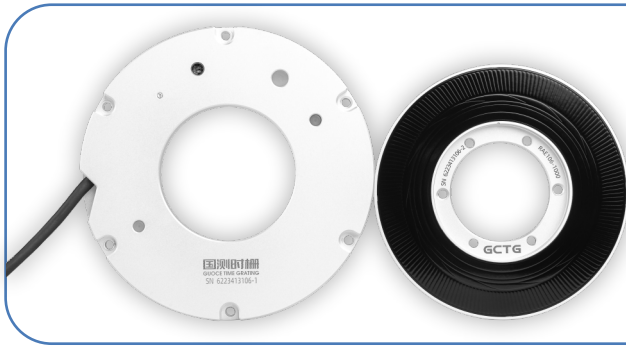
PARAMETERS OF SPLIT ABSOLUTE TIME-GRATING ANGULAR DISPLACEMENT SENSOR



| Parameters of RAN series | | Parameters of RAU series | |
|---|-----------------------------|--------------------------|------------------------------|
| Basic parameters | RAN075 | RAN125 | RAU200 |
| Accuracy | ±5"/±10"/±15" | | ±1"/±2" |
| Repeatability | 2.5"/4" | | 0.5"/1" |
| Resolution | 18-26 bit | | 26-28 bit |
| Measurement range | 0-360° | | 0-360° |
| Speed | 3000 r/min① | | 750 r/min① |
| Standard cable length | 1 m② | | 1 m② |
| Technical parameters | | | |
| Outer diameter/Inner diameter/Thickness③ (mm) | 75/25/15.8 | 125/75/15.8 | 200/100/21.5 (36,Adding lid) |
| Weight of Rotor | 55 g | 110 g | 260 g |
| Weight of Stator | 90 g | 180 g | 610 g |
| LED to support mounting | Unsupport | | Unsupport |
| Electrical parameters | | | |
| Supply voltage | 5 V DC±10% | | 5 V DC±10% |
| Operating current | 180 mA | | 300 mA |
| Communication protocol | BISS-C/SSI | | BISS-C/SSI |
| Environmental test | | | |
| Operating temperature | -20°C~70°C | | -20°C~70°C |
| Humidity | 0~80%RH non-condensing | | 0~80%RH non-condensing |
| IP rating (stator & rotor) | IP67 | | IP67 |
| IP rating (connector) | IP40 | | IP40 |
| EMC | IEC 61000-6-2/IEC 61000-6-4 | | IEC 61000-6-2/IEC 61000-6-4 |
| Shock | 100 G | | 100 G |
| Vibration | 10 G | | 10 G |

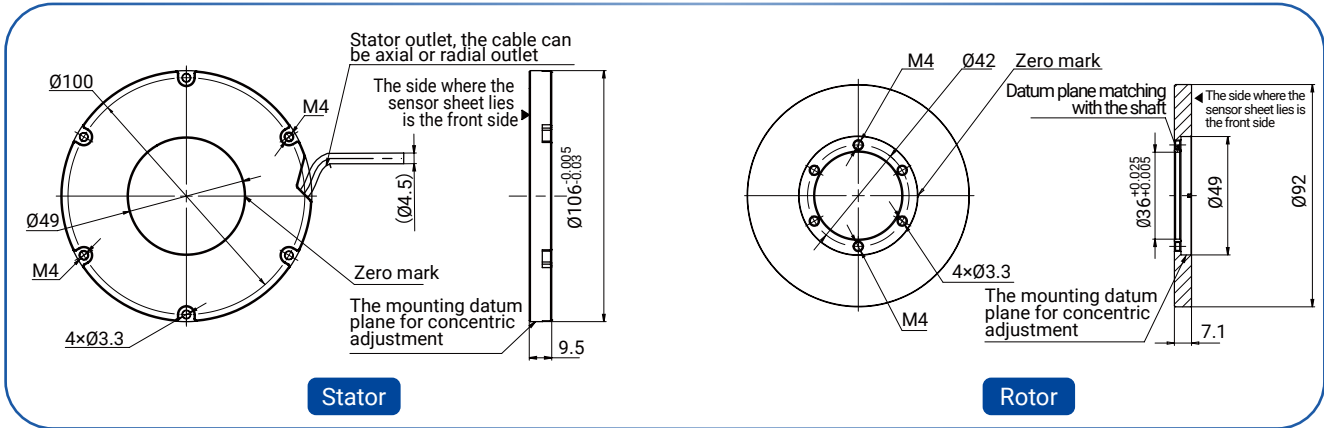
Note:①Please contact us for higher speed requirement; ②Please contact us for longer cable requirement; ③Referring to the thickness at the optimum installation clearance.

RAE106 SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

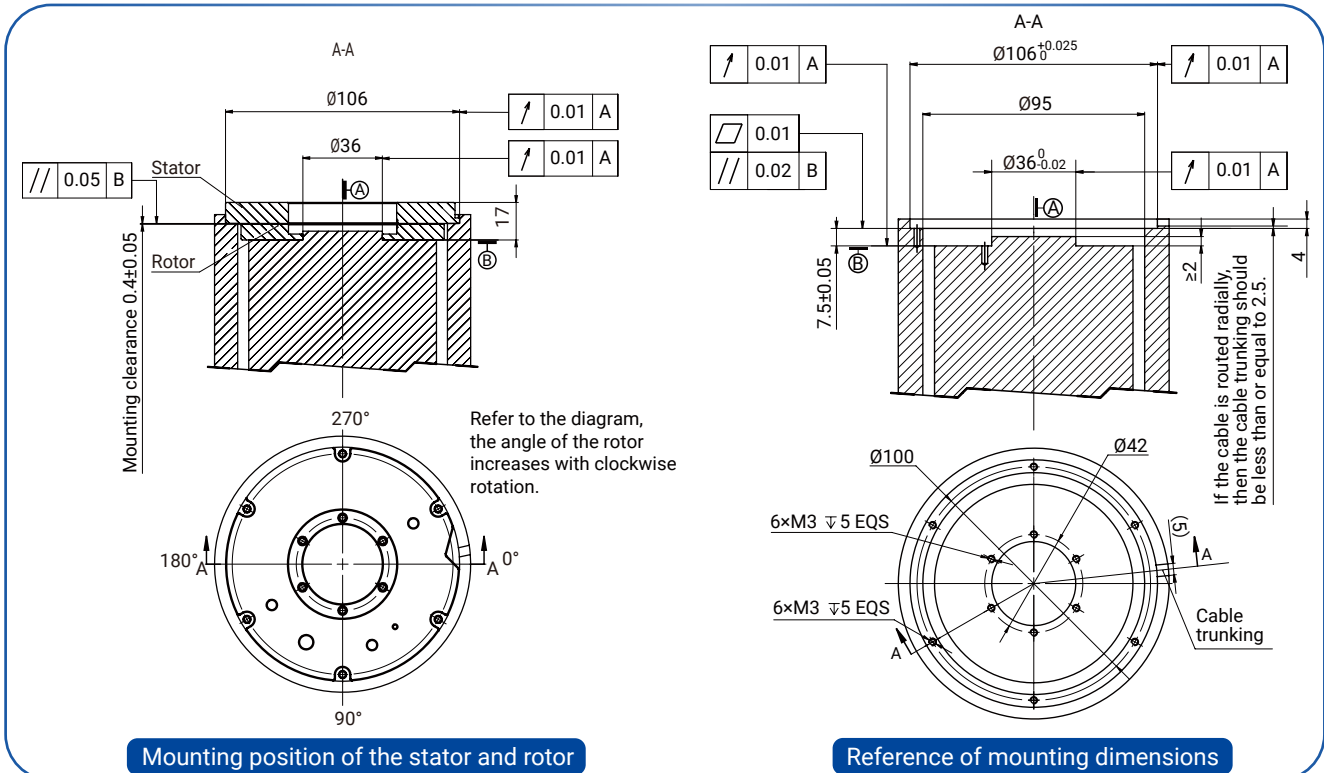


- Outer diameter/Inner diameter/ Thickness (mm): 106/36/17
- Accuracy: $\pm 3''/\pm 5''/\pm 10''$
- Repeatability: 1.5''/2.5''
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI/ ABZ(incremental)
- LED to support mounting

Mechanical dimensions of the stator and rotor



Mounting Diagram



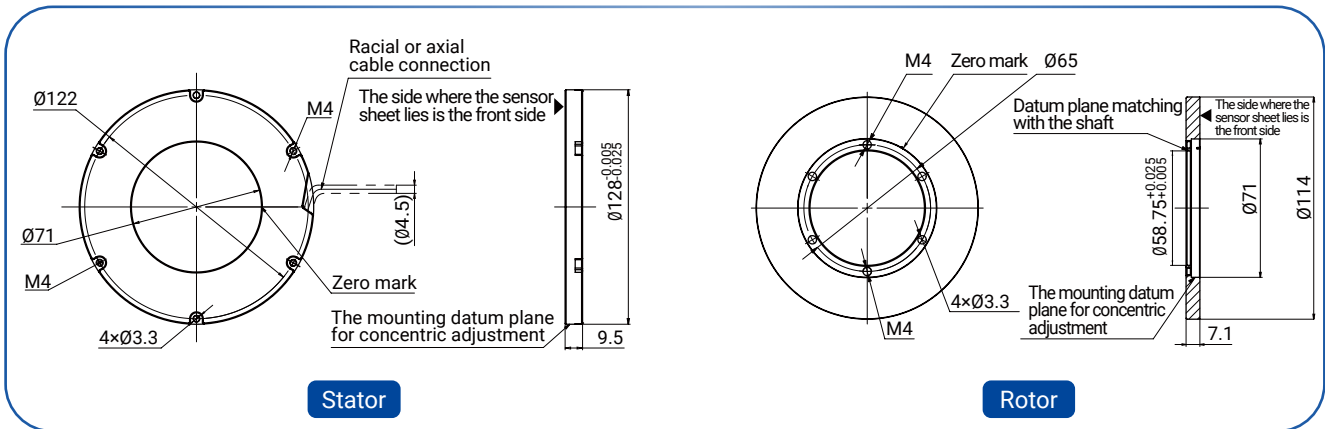
Note: ① The test ambient temperature of the above dimensions is 20±2°C. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test; ④ When using ABZ(incremental) protocol, if the direction of motor rotation is opposite to the direction of the sensor, please switch the A and B sequences lines.

RAE128 SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

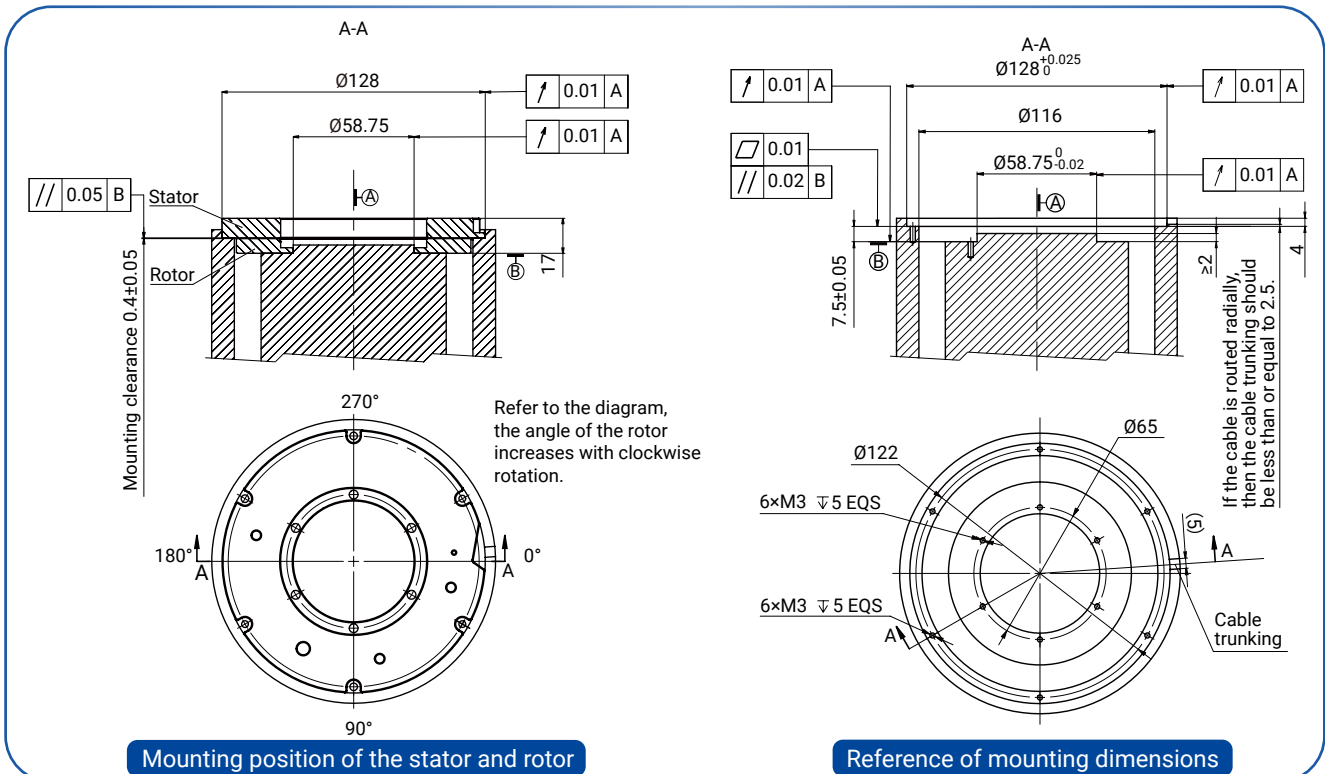


- Outer diameter/Inner diameter/ Thickness (mm): 128/58.75/17
- Accuracy: $\pm 3''/\pm 5''/\pm 10''$
- Repeatability: 1.5"/2.5"
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI/ ABZ(incremental)
- LED to support mounting

Mechanical dimensions of the stator and rotor



Mounting Diagram



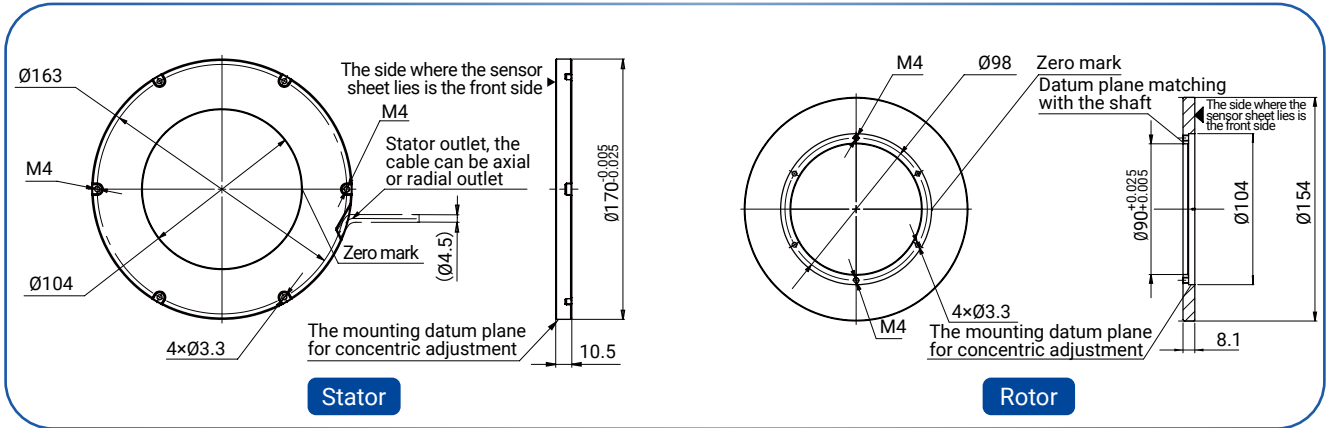
Note: ① The test ambient temperature of the above dimensions is 20±2°C. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test; ④ When using ABZ(incremental) protocol, if the direction of motor rotation is opposite to the direction of the sensor, please switch the A and B sequences lines.

RAE170 SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

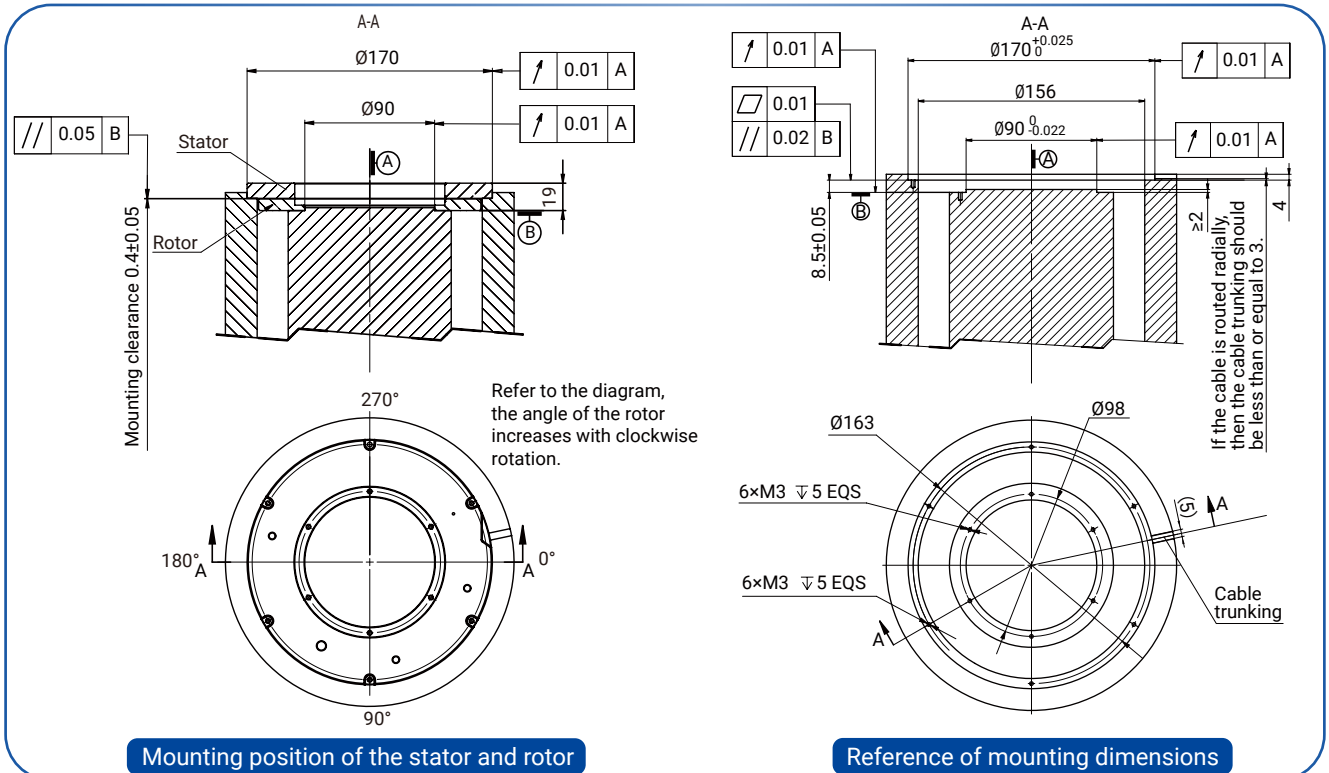


- Outer diameter/Inner diameter/ Thickness (mm): 170/90/19
- Accuracy: $\pm 3''/\pm 5''/\pm 10''$
- Repeatability: 1.5''/2.5''
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI/ ABZ(incremental)
- LED to support mounting

Mechanical dimensions of the stator and rotor



Mounting Diagram



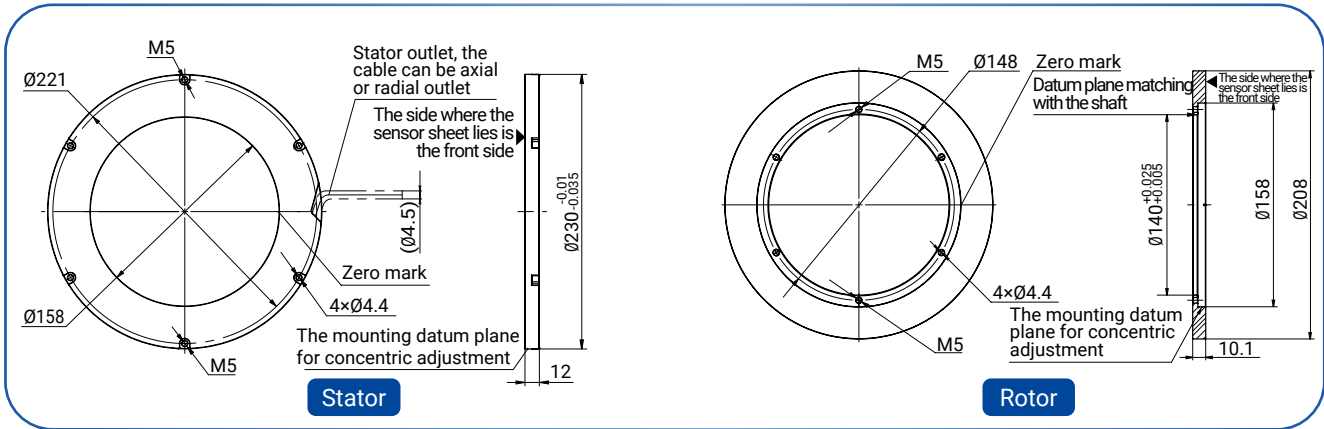
Note: ① The test ambient temperature of the above dimensions is $20\pm 2^{\circ}\text{C}$. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test; ④ When using ABZ(incremental) protocol, if the direction of motor rotation is opposite to the direction of the sensor, please switch the A and B sequences lines.

RAE230 SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

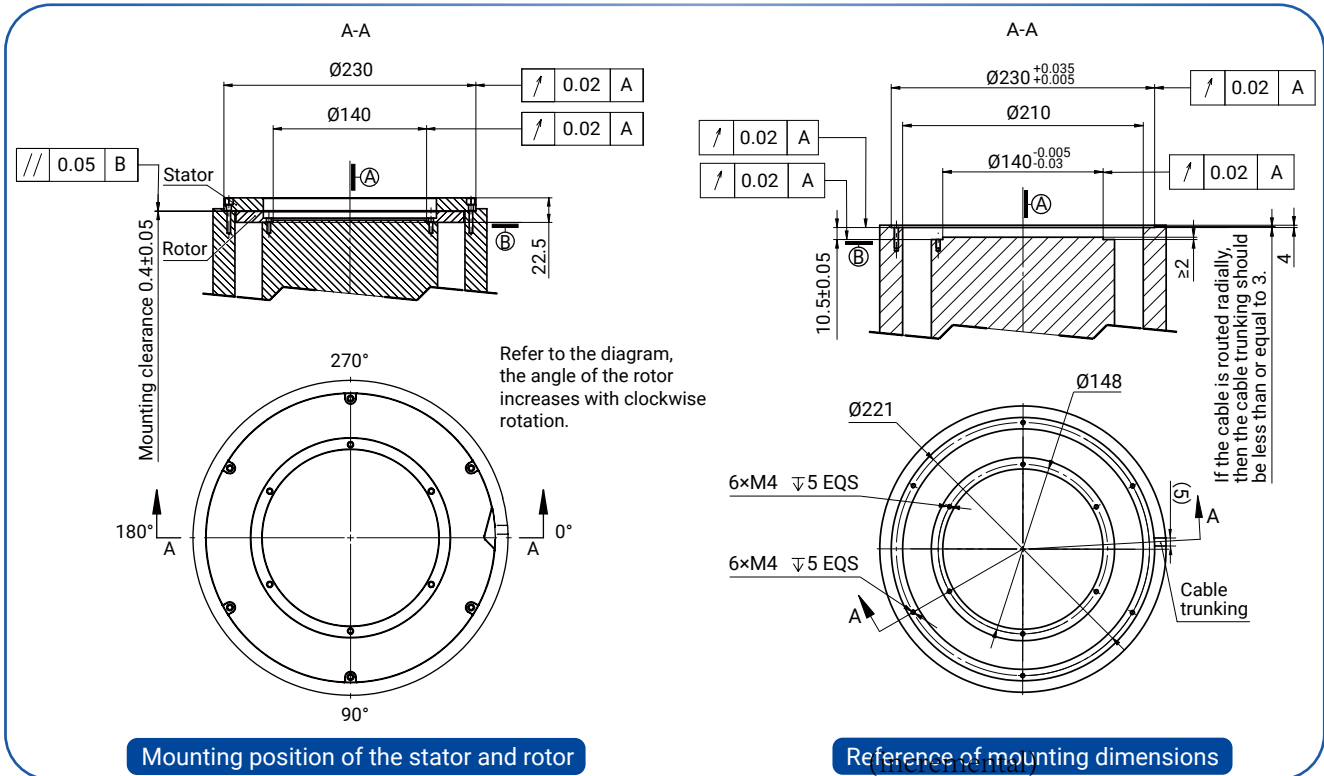


- Outer diameter/Inner diameter/ Thickness (mm): 230/140/22.5
- Accuracy: $\pm 3''/\pm 5''/\pm 10''$
- Repeatability: 1.5''/2.5''
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI/ ABZ(incremental)
- LED to support mounting

Mechanical dimensions of the stator and rotor



Mounting Diagram



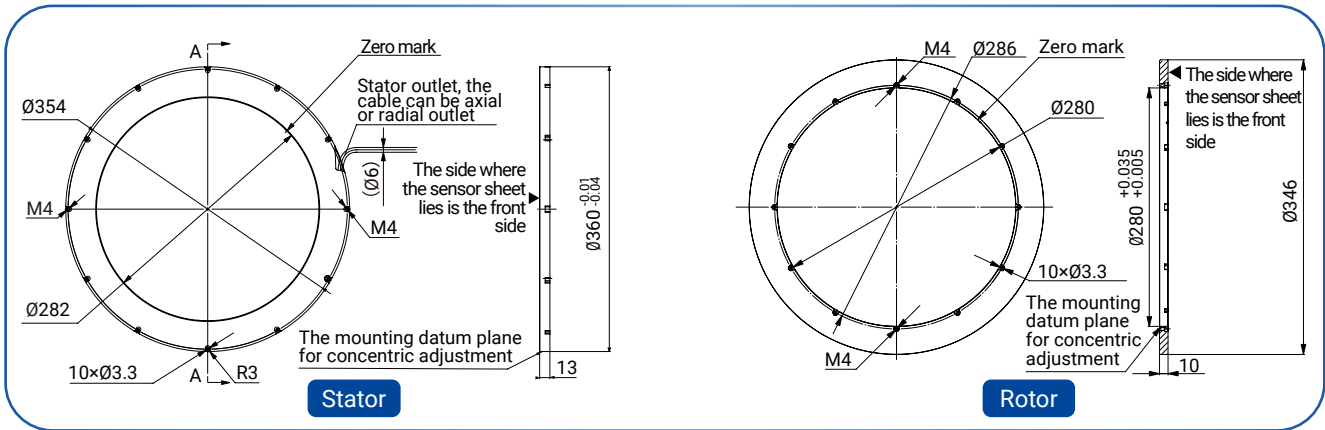
Note: ① The test ambient temperature of the above dimensions is $20\pm 2^{\circ}\text{C}$. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test; ④ When using ABZ(incremental) protocol, if the direction of motor rotation is opposite to the direction of the sensor, please switch the A and B sequences lines.

RAE360 SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

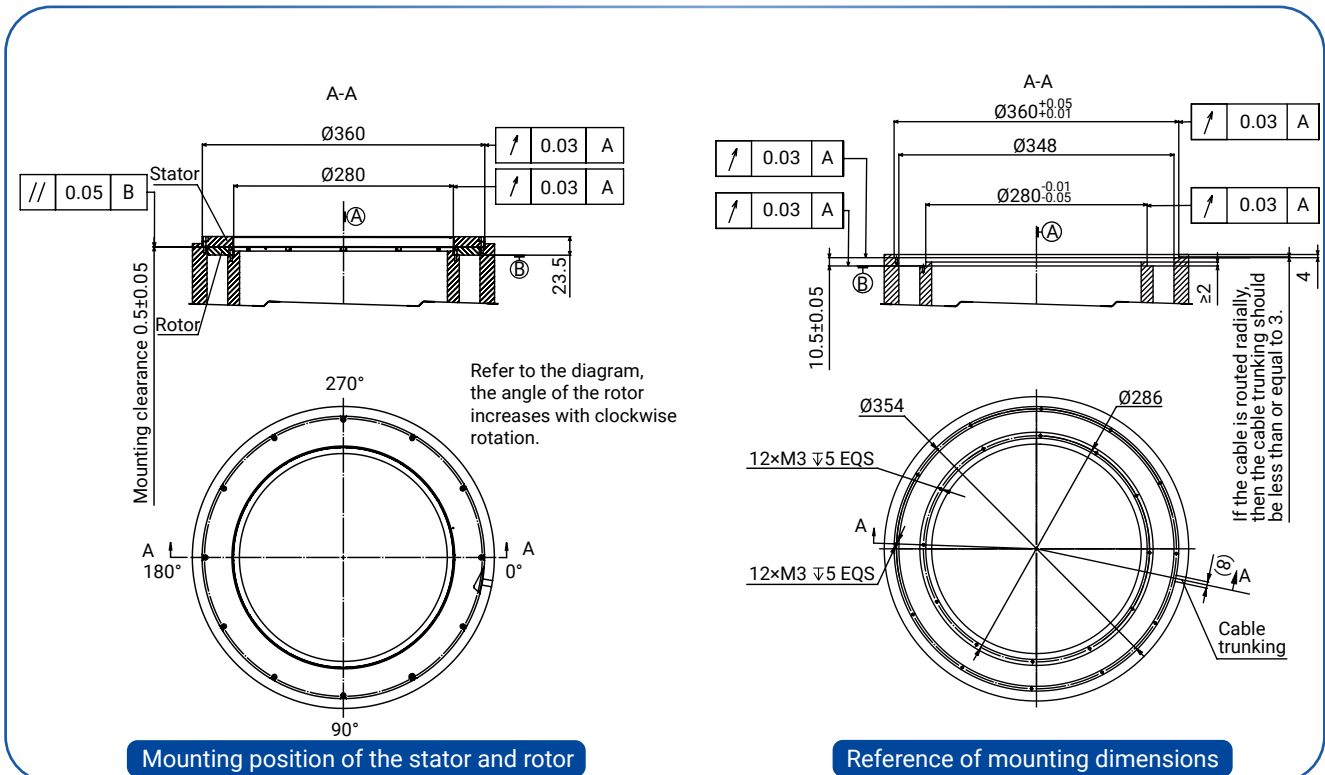


- Outer diameter/Inner diameter/ Thickness (mm): 360/280/(23.5)
- Accuracy: $\pm 3''/\pm 5''/\pm 10''$
- Repeatability: 1.5''/2.5''
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI/ ABZ(incremental)
- LED to support mounting

Mechanical dimensions of the stator and rotor



Mounting Diagram



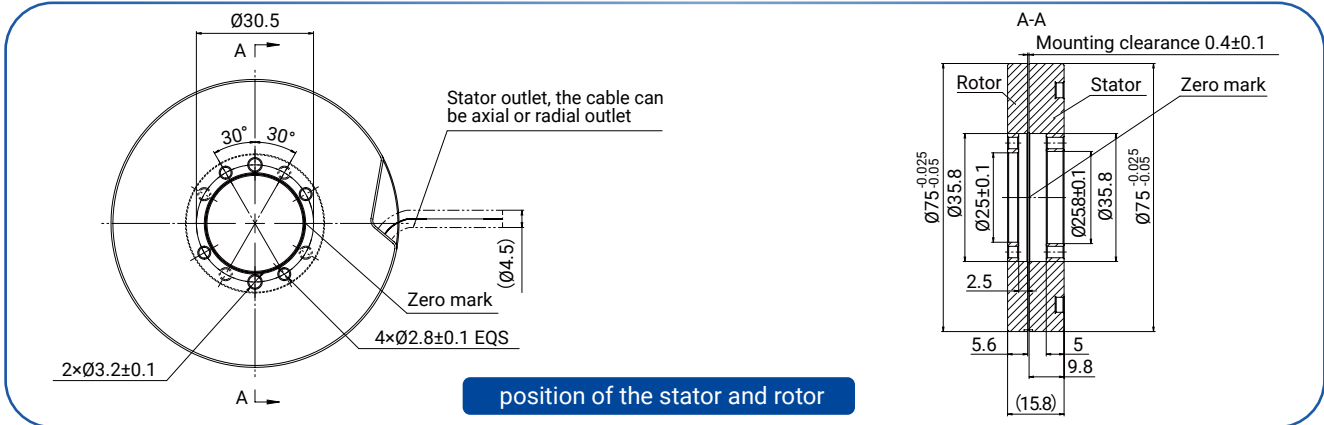
Note: ① The test ambient temperature of the above dimensions is $20\pm 2^{\circ}\text{C}$. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test; ④ When using ABZ(incremental) protocol, if the direction of motor rotation is opposite to the direction of the sensor, please switch the A and B sequences lines.

RAN075 SPLIT ABSOLUTE TIME-GRATING ANGULAR DISPLACEMENT SENSOR



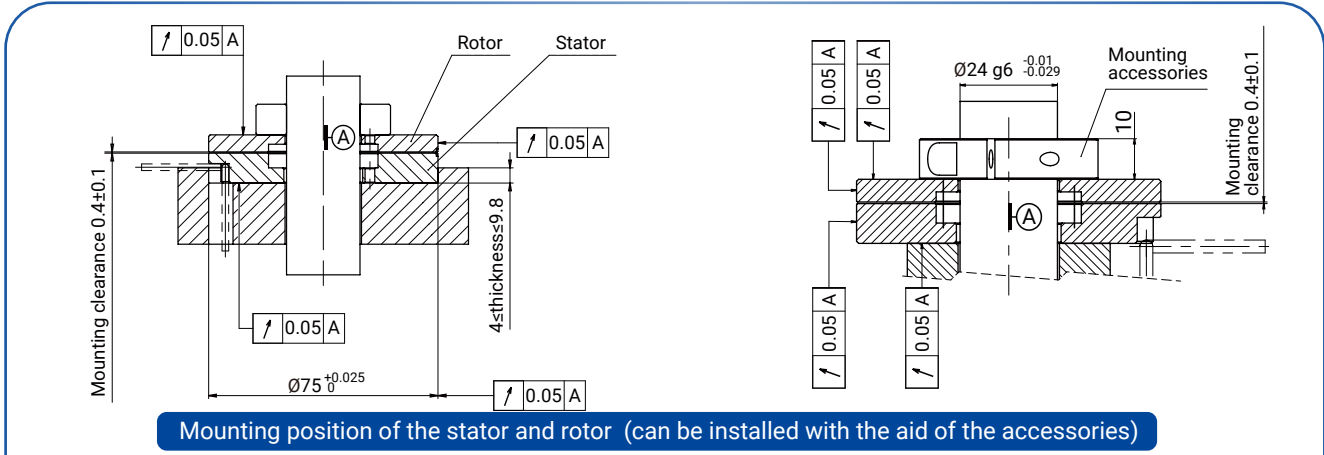
- Outer diameter/Inner diameter/ Thickness (mm): 75/23/(15.8)
- Accuracy: $\pm 5''/\pm 10''/\pm 15''$
- Repeatability: 2.5"/4"
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI

Mechanical dimensions of the stator and rotor

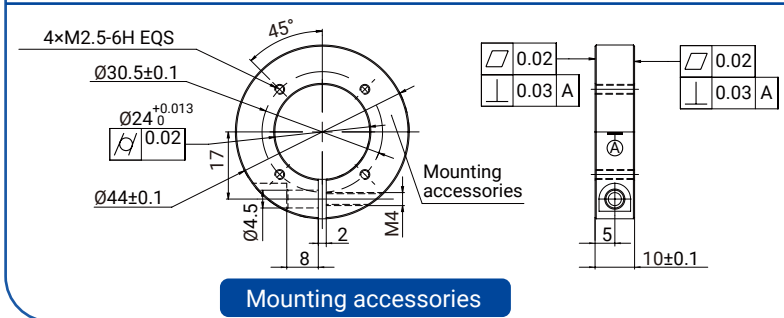


position of the stator and rotor

Mounting Diagram



Mounting position of the stator and rotor (can be installed with the aid of the accessories)



Mounting accessories

Mounting instructions

1. Each of the stator and the rotor is fastened with four M2.5 screws, and the clearance should be within the range of 0.4mm \pm 0.1mm;
2. to ensure the measurement accuracy, the stator mounting seat and the rotor mounting shaft should be matched according to the requirements of the drawing ;
3. installation accessories can be selected or homemade, drawing details can be communicated with our company.

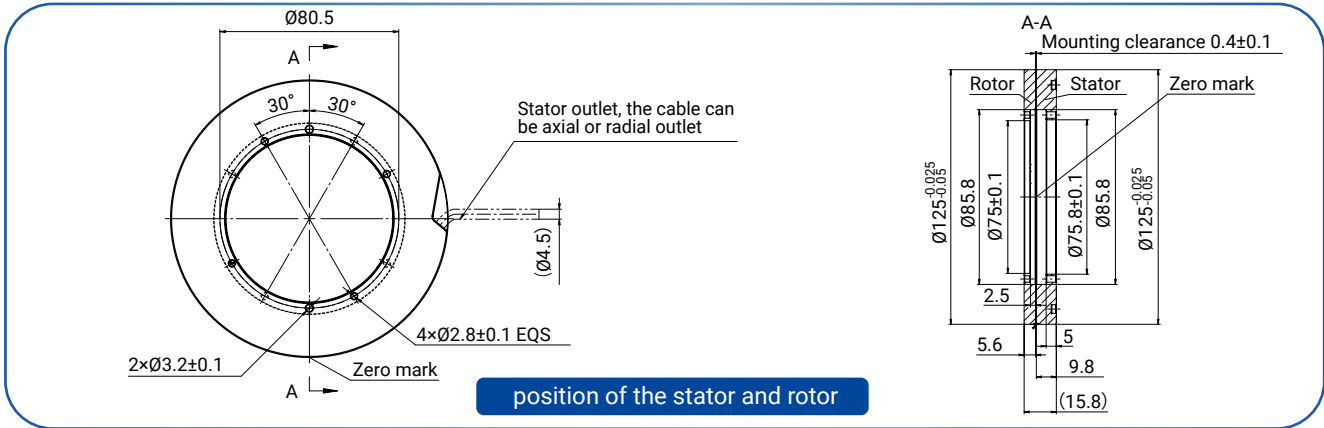
Note: ① The test ambient temperature of the above dimensions is 20 \pm 2°C. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test.

RAN125 SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

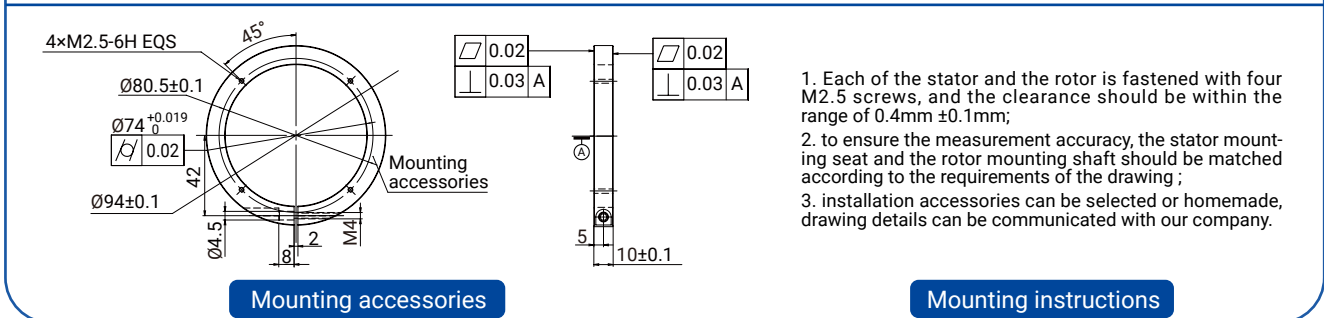
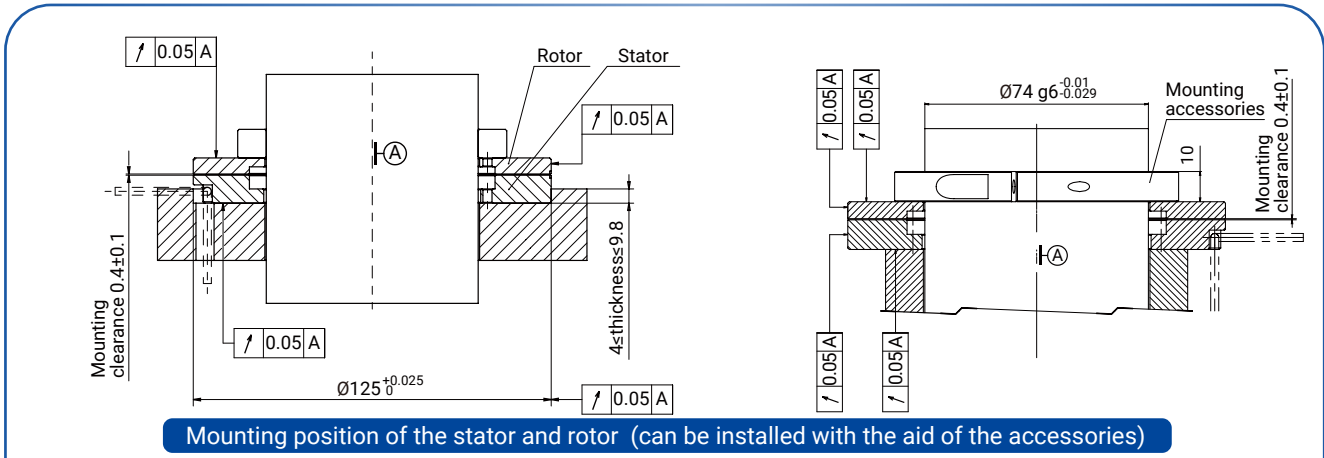


- Outer diameter/Inner diameter/ Thickness (mm): 125/75/(15.8)
- Accuracy: $\pm 5''/\pm 10''/\pm 15''$
- Repeatability: 2.5"/4"
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI

Mechanical dimensions of the stator and rotor



Mounting Diagram



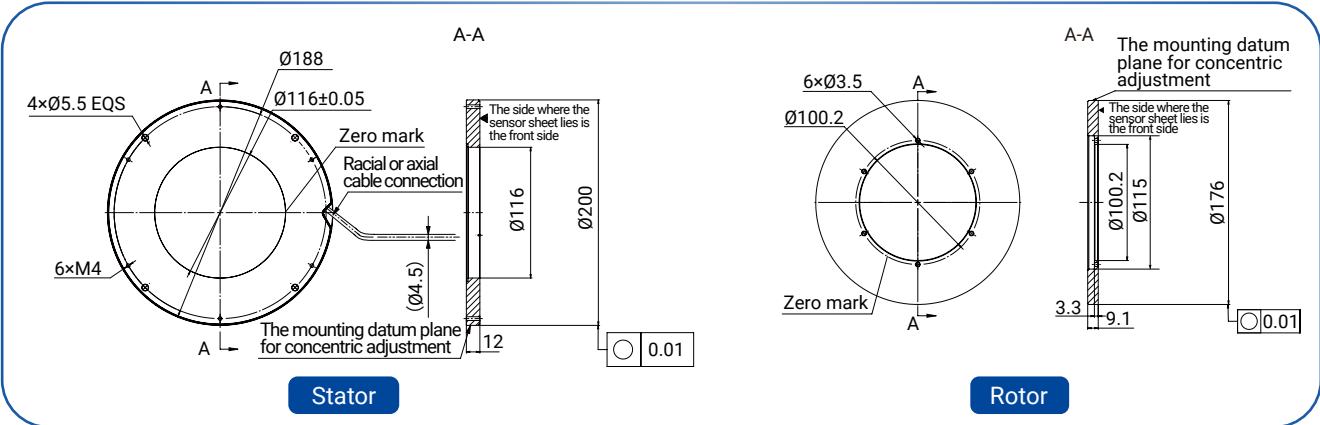
Note: ① The test ambient temperature of the above dimensions is 20 \pm 2°C. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test.

RAU200 HIGH PRECISION SPLIT ABSOLUTE ANGULAR TIME-GRATING DISPLACEMENT SENSOR

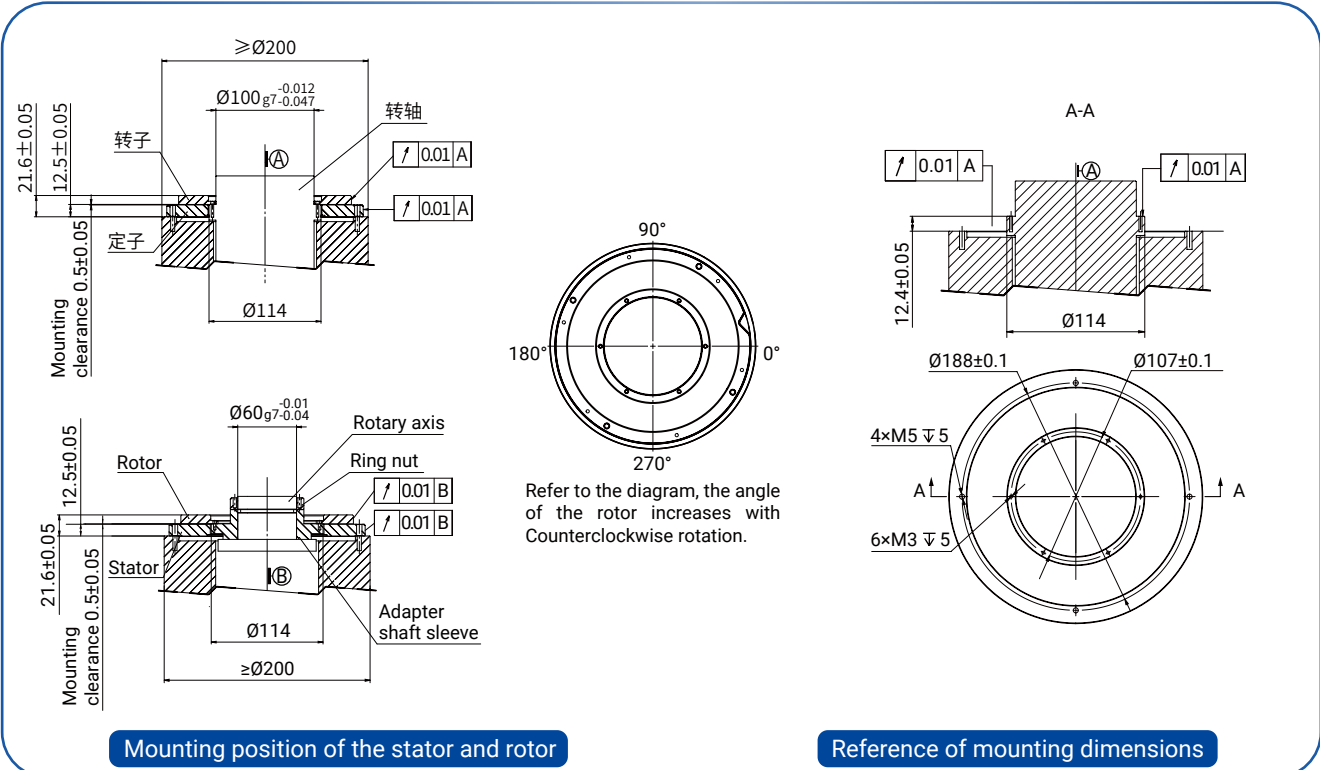


- Outer diameter/Inner diameter/ Thickness (mm): 200/100/21.5
- Accuracy: $\pm 1''/\pm 2''$
- Repeatability: $0.5''/1''$
- Resolution: 18-26 bit
- Communication protocol: BISS-C/SSI/ ABZ(incremental)

Mechanical dimensions of the stator and rotor



Mounting Diagram



Note: ① The test ambient temperature of the above dimensions is $20\pm 2^{\circ}\text{C}$. Please pay attention to the influence of temperature changes on the dimensions; ② Please apply thread-locking adhesive when install screws to improve the firmness; ③ If the processing accuracy of the fixture is not up to the requirements, it is suggested to install while using dial indicator to test; ④ When using ABZ(incremental) protocol, if the direction of motor rotation is opposite to the direction of the sensor, please switch the A and B sequences lines.

LINEAR TIME-GRATING DISPLACEMENT SENSOR



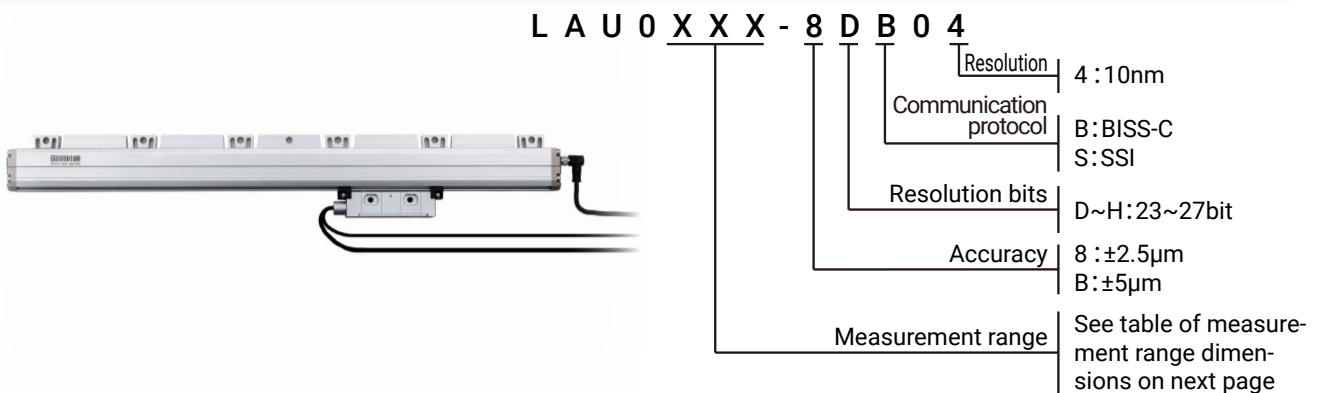
LAU CLOSED ABSOLUTE LINEAR TIME-GRATING
LIN EXPOSED INCREMENTAL LINEAR TIME-GRATING

LAU-2000 CLOSED ABSOLUTE LINEAR TIME-GRATING DISPLACEMENT SENSOR



LAU-2000 Series

- **High measurement accuracy:** The measuring accuracy is $\pm 2.5 \mu\text{m}/\pm 5 \text{m}$ and has absolute positioning ability;
- **Good protection effect:** The scale is covered by the aluminum alloy housing in all directions, which can effectively avoid cutting fluid, metal debris, dust.
- **Easy installation:** The installation accessory has initially adjusted the relative position relationship between the scale and the mover. It only needs to align the scale matrix with the machine guide, fix the scale and the mover respectively, and then fine-tunes which is convenient to mount.
- **Mainly apply to:** High-end CNC machine tools, precision instruments, semiconductor manufacturing, automatic production equipment, etc.



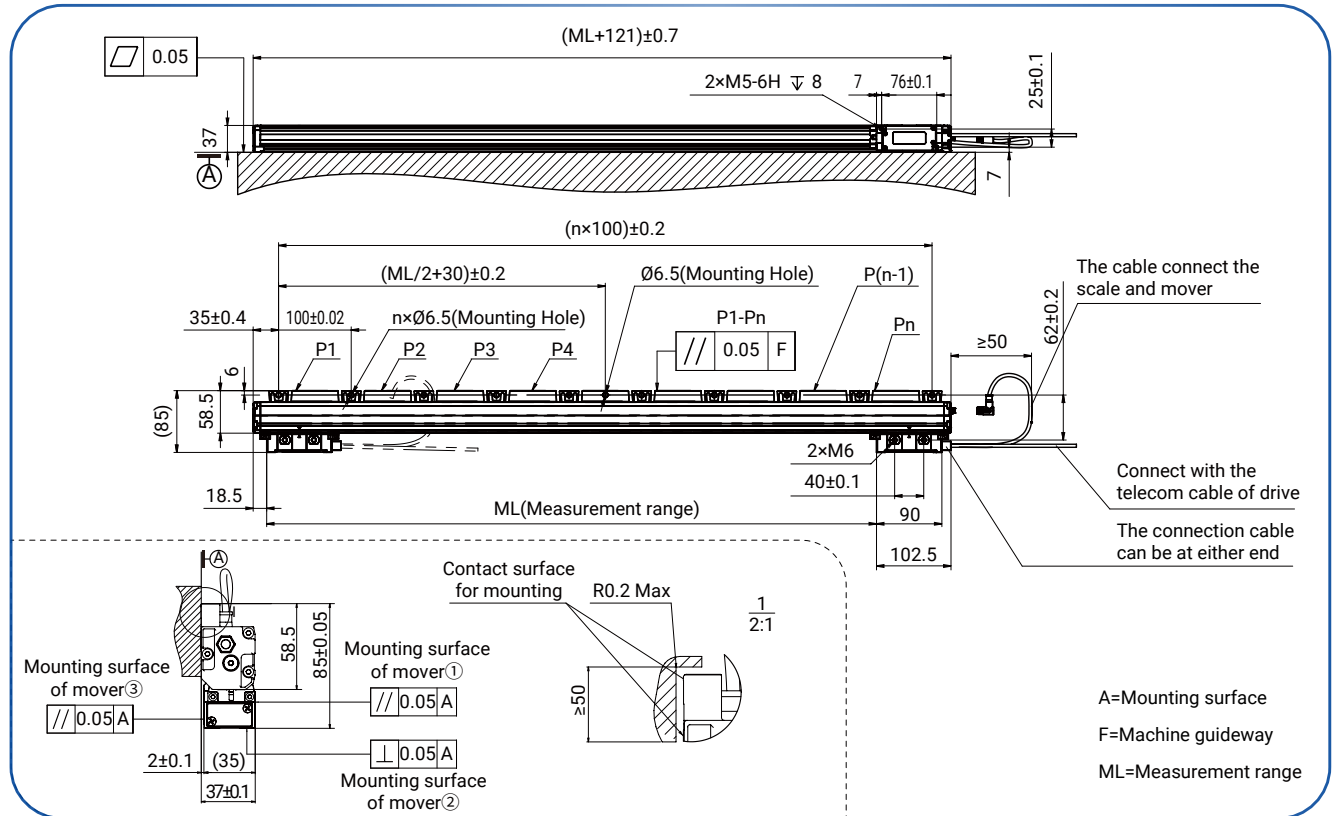
Parameters of LAU-2000 series

| Basic parameters | LAU-2000 |
|------------------------|--|
| Accuracy | $\pm 2.5 \mu\text{m}/\pm 5 \mu\text{m}$ |
| Repeatability | $1 \mu\text{m}/2.5 \mu\text{m}$ |
| Resolution | 10 nm |
| Measurement range | 140 mm~840 mm ^① |
| Standard cable length | 5 m ^② |
| Technical parameters | |
| Width*Height | 37 mm*85 mm |
| Supply voltage | |
| Supply voltage | 5 V DC $\pm 10\%$ |
| Operating current | 240 mA |
| Communication protocol | BISS-C/SSI/RS485 |
| Environmental test | |
| Operating temperature | 0°C~50°C |
| Humidity | 0~80% non-condensing |
| IP rating | IP53 when not ventilated, IP64 when ventilated |
| EMC | IEC 61000-6-2/IEC 61000-6-4 |
| Shock | 100 G |
| Vibration | 10 G |

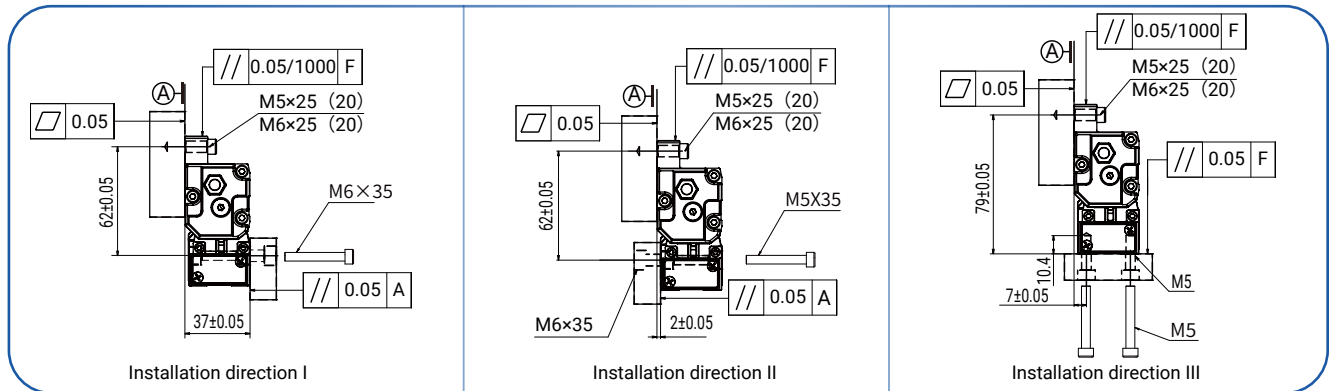
Note: ①See table of measurement range dimensions on next page; ②Please contact us for other cable requirement.

LAU MECHANICAL MECHANISM AND MOUNTING DIAGRAM

Mechanical mechanism & Mounting Diagram



Installation directions and requirements



Comparison table of measurement range and length

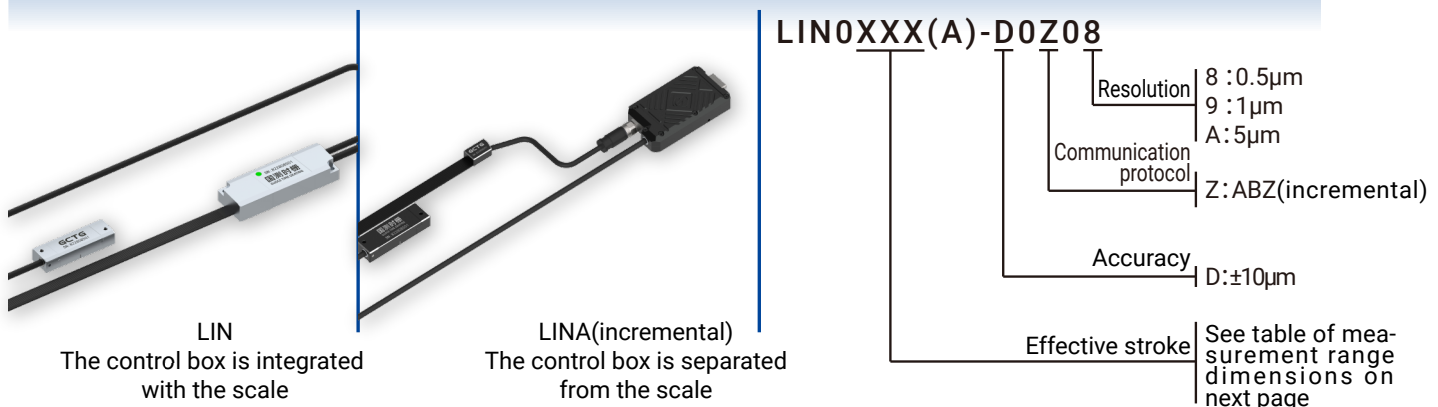
| | | | | | | | | |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Total length (mm) | 261 | 361 | 461 | 561 | 661 | 761 | 861 | 961 |
| Measurement range (mm) | 140 | 240 | 340 | 440 | 540 | 640 | 740 | 840 |
| Mounting hole n | 3 | 5 | 5 | 7 | 7 | 9 | 9 | 11 |

Note: The test ambient temperature of the above dimensions is 20±2°C. Please pay attention to the influence of temperature changes on the dimensions.

LIN EXPOSED INCREMENTAL LINEAR TIME-GRATING DISPLACEMENT SENSOR

LIN series

- **Adjustable Zero:** Adopt incremental measurement method with zero point module and the zero point position can be customized.
- **Compact and small structure:** It is mainly composed of scale and mover and the size is small which is suitable to use in the narrow space.
- **Diverse and convenient mounting methods:** The scale is mounted by back-adhesive, the mover is installed by screws. In addition, the product is equipped with LED to assist mounting.
- **Easy to clean:** Stains on the scale surface are easy to wipe.
- **Mainly apply to:** Manual machine tools, semi-automatic production lines, linear motion platforms, measuring microscopes and other equipment.



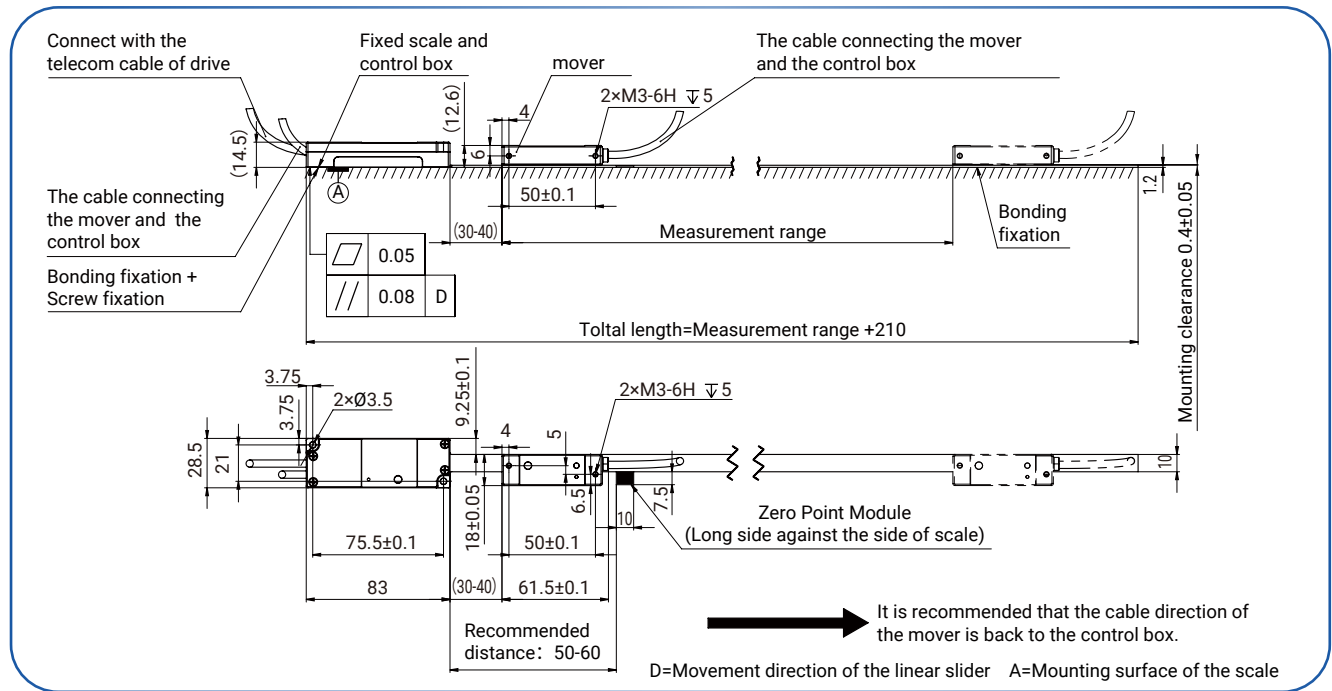
Parameters of LIN series

| Basic parameters | LIN | LINA |
|-----------------------------|-----------------------------|----------------------------|
| Accuracy | ±10 µm | |
| Repeatability | 5 µm | |
| Resolution | 0.5 µm/1 µm/5 µm | |
| Measurement range | 150 mm~750 mm ^① | 150 mm~750 mm ^② |
| Standard cable length | 2 m ^③ | |
| Technical parameters | | |
| Width*Height | 28.5 mm*14.5 mm | 18 mm*12.6 mm |
| Supply voltage | | |
| Supply voltage | 5 V DC±10% | |
| Operating current | 210 mA | |
| Communication protocol | ABZ(incremental) | |
| Environmental test | | |
| Operating temperature | 0°C~70°C | |
| Humidity | 0~80% non-condensing | |
| IP rating | IP40 | |
| EMC | IEC 61000-6-2/IEC 61000-6-4 | |
| Shock | 100 G | |
| Vibration | 10 G | |

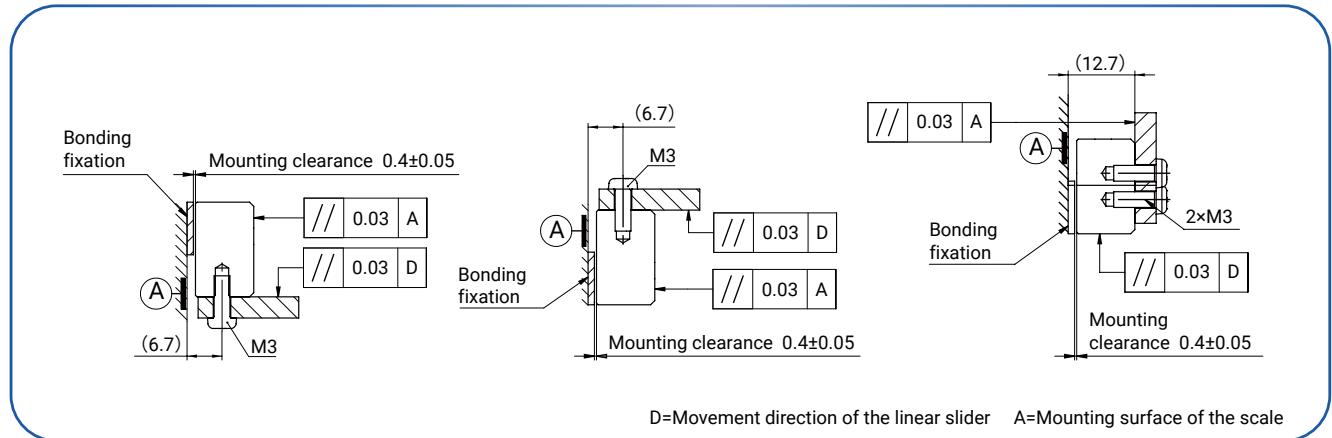
Note: ①See table measurement range and length dimensions on page 22; ②See table measurement range and length dimensions on page 23; ③Please contact us for longer cable requirement.

LINEAR MECHANICAL MECHANISM AND MOUNTING DIAGRAM

Mechanical mechanism & Mounting Diagram



Installation mode of mover



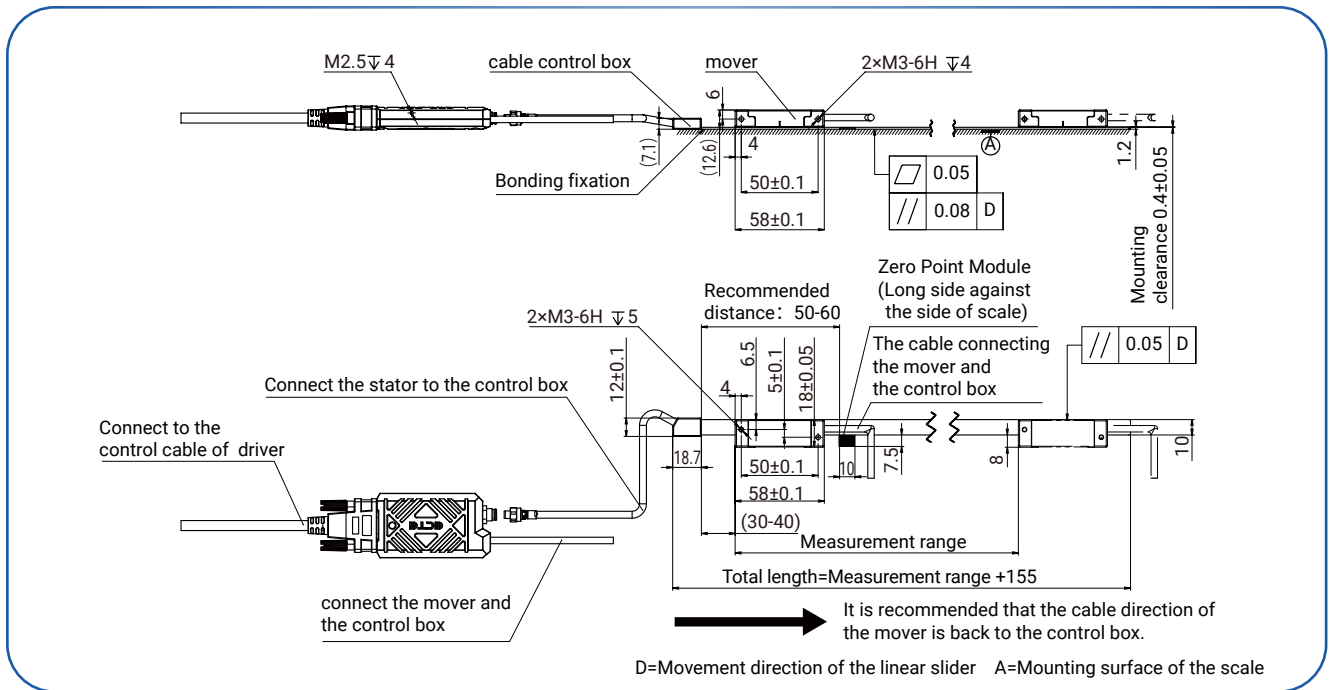
Comparison table of measurement range and length

| | | | | | | | | | | | | | |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Total length(mm) | 360 | 410 | 460 | 510 | 560 | 610 | 660 | 710 | 760 | 810 | 860 | 910 | 960 |
| Measurement range (mm) | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 |

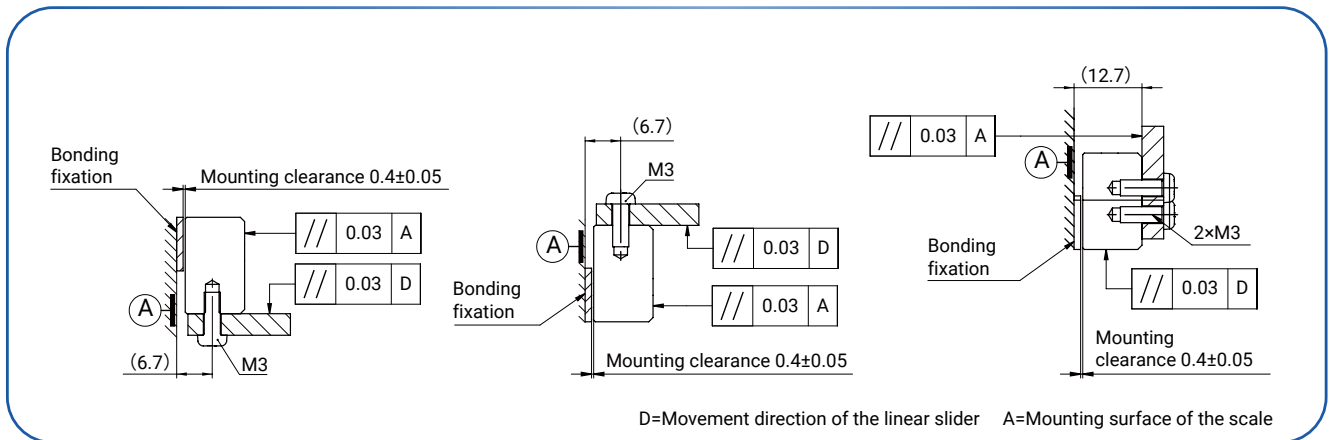
Note: The test ambient temperature of the above dimensions is 20±2°C. Please pay attention to the influence of temperature changes on the dimensions.

LINA MECHANICAL MECHANISM AND MOUNTING DIAGRAM

Mechanical mechanism & Mounting Diagram



Installation mode of mover



Comparison table of measuring stroke and length

| Total length(mm) | 305 | 355 | 405 | 455 | 505 | 555 | 605 | 655 | 705 | 755 | 805 | 855 | 905 |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Measurement range (mm) | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 |

Note: The test ambient temperature of the above dimensions is 20±2°C. Please pay attention to the influence of temperature changes on the dimensions.

APPLICATION SCENARIOS & BEST PRACTICES

■ CNC machine tool

The CNC machine tool moves the workpiece or cutter according to the preset parameters through the system loaded with the control program, so as to realize the complex, precise and flexible parts processing, which itself has a series of precision requirements in the structural assembly and mechanical transmission.

Displacement sensor is the key functional component of CNC machine tool, which directly determines the performance of the machine. In order to further improve the performance of CNC machine tool, a high-performance time-grating displacement sensor is added to the moving shaft to get a full closed loop control with position feedback, so as to realize high precision, high efficiency and high quality parts machining.

CNC machine tool spindle | CNC machine tool rotary table
CNC machine tool swing head | CNC indexing turntable Linear axis (X /Y /Z axis)



Case study

A machine tool manufacturer

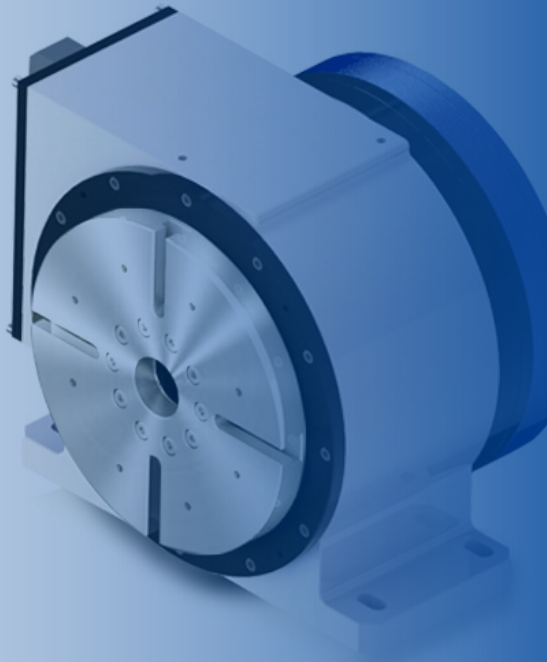
Challenge:

In order to improve the accuracy and performance of the parts processing, it is necessary to install a linear displacement sensor on the X axis for cutter grinder to provide accurate position feedback. Due to the fact that the processing site is full of solid and liquid pollutants such as cutting fluid, metal debris, dust, etc., higher requirements are put forward for the anti-pollution ability of products. The grating scale client previously used was manufactured by a globally leading company, but it required to be cleaned or replaced regularly which resulted in high maintenance costs and the unexpected damage occurred just over a month.

Application effect:

Apply our LAU-240 enclosed absolute linear time-grating into the grinding machine, which can effectively resist the invasion of all kinds of solid and liquid pollutants and has strong anti-pollution ability. In the same harsh processing environment, the stable operation has been more than half a year, during which the processing accuracy has always been maintained within the range of $\pm 1 \mu\text{m}$, meeting client's demands for high-performance processing effect and reliable long-time and operation.

APPLICATION SCENARIOS & BEST PRACTICES



■ Motor and motor module

With the continuous development of industrial automation and intelligence, the control accuracy and dynamic performance of equipment such as motor and turntables are increasingly required. Motor and motor module are important executive function parts of automated production, testing, equipment assembly, itself has a certain positioning accuracy in the open-loop control state. In addition, rapid placement and stable operation are also the core requirements.

By connecting nanometer time-grating displacement sensors with control system, more accurate, faster and stable angle or position control can be achieved by implementing parameter matching of the position loop or speed loop, which meets the diversified demands of end users.

Direct-drive linear motor | Direct-drive rotating motor | Servo motor



Case study

An automation equipment provider

Challenge:

In order to pursue high processing accuracy, client needs to reduce response time and raise response speed without adjusting the rigidity of the direct drive motor. The client initially used a Japanese sensor, but the response time always can't meet the demand.

Application effect:

Application effect: In response to the demand of sensor with high response performance by client, Guoce Time-grating adhered to the principle of high-speed, high-quality and efficient service, set up a special team to carry out technical research and technical tackling continuously and provided on-site support. Finally, <20 ms response time RAE106 split absolute angular time-grating product was successfully developed which the performance has caught up with global leading brands. With strong R&D capabilities, professional and efficient technical support services, Guoce Time-grating stood out among all competitors and won the recognition from the client.

APPLICATION SCENARIOS & BEST PRACTICES

■ Measuring Instrument

In the field of displacement measurement, the modern measuring instruments are required to have excellent measurement performance, as well as high equipment integration, good flexibility and strong adaptability with increasingly complex shape of the tested object, non-standard size, and the extreme volume.

The time-grating displacement sensor can enable and enhance the efficiency of high-end measuring instruments, such as online measurement of straight line and angle can be realized by combining with the acquisition and analysis software and specific functions can be provided according to different application scenarios, including high precision, high resolution, high repeatability, etc.



Gear measuring machine | Coordinate measuring machine | Cylindricity meter



Case study

Leading manufacturers of measuring instruments and precision tools in China

Challenge:

The measurement data of the gear measurement center of client required to be based on the data measured by the angular displacement sensor, so high measurement accuracy of the sensor is required like $\pm 3''$ and above. Although an international brand can meet the accuracy requirement, the price is high, the delivery time is long and the service timeliness is poor.

Application effect:

Guoce time grating provided with $\pm 3''$ RAE170 split absolute angular time-grating displacement sensor which perfectly realized detection function of gear measuring center. In order to meet the demand of fast delivery, we shortened time of demand docking, prototype testing and product delivery into less than one month, and impressed the client with our high quality and efficient service. At the same time, it saved nearly 30% of the procurement cost for client, therefore the production cost is saved accordingly.

APPLICATION SCNARIOS & BEST PRACTICES



■ Other application scenarios

With the continuous progress of precision measurement technology, it is playing an increasingly important role in emerging fields such as new energy, smart medical treatment, industrial automation. For example, high-precision displacement sensors can be used for wind power generation by providing real-time detection and feedback control of the rotation speed and angle of heavy-load fans, or for medical assistance robots or robotic arms to assist medical workers to complete complex, trifling, precise and stable operations.

Guoce time-grating will focus on the R&D and manufacturing of precision displacement measurement, enabling to upgrade traditional industries, reducing costs and increasing productivity for popular industries, and making a little contribution for the emerging industries, striving to become a strong backing of high-end equipment enterprises.

New energy | Smart medical care | Industrial automation



Case study

A high-tech research institute in China

Challenge:

In response to the national strategy and industry development trend, the client had an urgent demand for local brand to resist supply chain risks and reduce procurement costs. The client used an international brand of steel ring rotary sensor on the turntable, not only the delivery time is long, the price is high, and the quality problem that the mover is vibrated down occurred.

Application effect:

Guoce Time-grating actively responded to client's demand and provided with Chinese-made RAN125 split absolute angular time-grating. According to feedback, the product operated stably and maintained good performance in the environment with extreme vibration shock. In addition to the reliable product performance, we also help the client achieve the goal of local brand in the field of high-precision displacement measurement through highly competitive prices, fast and timely delivery, professional and reliable service.

LINE SEQUENCE DIAGRAM & LED MOUNTING INSTRUCTION

| Line sequence diagram | | | |
|-----------------------|--|---|--|
| Color | BISS-C/SSI (6-conductor shielded cable) | ABZ for angular time-grating displacement sensor (8-conductor shielded cable) | ABZ for enclosed linear time-grating displacement sensor (8-conductor shielded cable) |
| Red | 5V | | |
| Black | GND | | |
| Grey | D- | A- | A+ |
| White | D+ | A+ | A- |
| Green | C- | B+ | B+ |
| Blue | C+ | B- | B- |
| Orange | / | Z- | Z- |
| Yellow | / | Z+ | Z+ |

Note: Cable shield should be connected to the driver housing.

| LED Mounting Instruction of RAE Series | | | |
|--|---------------------------------------|---------------------|------------------------|
| Red light | Green light | Mounting condition | Operation condition |
| Quick flash | Light off | Too small clearance | Can't operate properly |
| Light off | Quick flash | Normal clearance | Can operate well |
| Light off | Light on (Best mounting clearance) | | |
| Light off | Slow flash | | |
| Slow flash | Light off | Excessive clearance | Can't operate properly |

Note: The LED indicator is used to observe the mounting clearance as reference. It is recommended to strictly follow the installation diagram.

| LED Mounting Instruction of LIN Series | | |
|--|---------------------|------------------------|
| Green light status | Mounting condition | Operation condition |
| Light flashing slowly | Too small clearance | Can't operate properly |
| Light on (Best mounting clearance) | Normal clearance | Can operate well |
| Light off | Excessive clearance | Can't operate properly |

Note: The LED indicator is used to observe the mounting clearance as reference. It is recommended to strictly follow the installation diagram.



通用技术国测时栅
GENERTEC GUOCE TIME GRATING

☎ TEL:023-81908968

🌐 WEBSITE:<http://gctg.cn>

📍 ADDRESS:Western (Chongqing) Science City, High-tech District, Chongqing, China



company
website



Wechat
account