Panasonic[®]

INSTRUCTION MANUAL

Ultra High-Speed, High-Accuracy Laser Displacement Sensor **Sensor Head** HL-C201A(E)-SP3, HL-C201A(E)-SP3M

MJF-HI C201ASP3 No 0090-37V

Thank you very much for purchasing Panasonic products. Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product. Kindly keep this manual in a convenient place for quick reference.

⚠ WARNING

- . This product is intended to detect the objects and does not have the control function to ensure safety such as accident prevention. Do not use the product as a sensing device to protect human body.
- Be careful not to directly watch or touch the direct laser beam or reflected laser beam
- The product was developed and manufactured for industrial use.

BEFORE USE

Before using the product, check the sensor head model and contents of packing.



• Sensor head model

Check the model name of product at the top of sensor

Packing

Check that all of the following components are included in the package.

- 1 sensor head unit
- 1 Instruction manual
- · Laser warning labels

[JIS/IEC/KS: 1 set, GB: 1 set (E type only)]

• This product complies with CE Marking when used together with a controller and programmable display unit that are in compliance with CE Marking. Likewise, the product complies with UKCA Marking when used together with a controller and programmable display unit that are in compliance with UKCA Marking.

1 DESCRIPTION

- HL-C201A(E)-SP3, HL-C201A(E)-SP3M displacement sensor head achieves ultra high-speed and high-accurate measurement using linear image sensor as light receiving element to be used on equipment that require high-speed operation with
- The product is used at specular reflection installation.

2 CAUTIONS ON HANDLING LASER LIGHT

• In order to prevent the accident by laser product and protect the users JIS C 6802-2014 "Safety of laser products" was established based on the regulation of IEC (International electrotechnical Commission). This regulation classifies laser products according to the level of hazard, and provides the safety measures for

HL-C201A(E)-SP3, HL-C201A(E)-SP3M are classified as "Class 1 laser products" according to IEC 60825-1-2014 (JIS C 6802-2014) "Safety of laser products"

Laser hazardous class

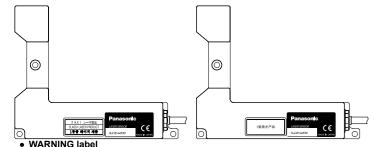
Classification according to IEC 60825-1-2014 (JIS C 6802-2014)

| Class | Model | Description of hazardous evaluation |
|---------|-------------------------------------|---|
| Class 1 | HL-C201A(E)-SP3 HL-C201A(E)-SP3M | Safe under reasonably foreseeable conditions of operation |





<Label position>



. Install the product so the laser beam comes higher or lower than eye level in order

not to watch the beam directly during operation.

- Please contact our company if the system breaks down. It is not equipped with a function that stops laser radiation automatically during disassembling the sensor head. The users therefore may be exposed to laser beam in disassembling the
- When this product is used in China, affix the Chinese warning label (accessory) on the label in the product.
- Do not use the system in the manner other than specified in this Instruction Manual

3 EXPORT REGULATIONS BY JAPANESE GOVERNMENT

- HL-C201A-SP3 and HL-C201A-SP3M are subject to export control regulation by the Foreign Exchange and Foreign Trade Law. Export admission by Japanese government is required before the product is to be exported or brought out of the country. These products are also subject to Article 1.B.3.b.1 of Nuclear Suppliers Group in international export control regime and 2.B.6.b.1 of Wassenaar Arrangement.
- Please follow the export control regulations required.

HL-C201AE-SP3 and HL-C201AE-SP3M (E type) are not subject to export control regulations under the condition that they are used combined with the nonpertinent controller to export control specified by Foreign Exchange and Foreign Trade Law. When they are combined with the pertinent controller to export control, they are subject to the Law. In this case export admission by Japanese government is required before the product is to be exported or brought out of the country.

4 SPECIFICATIONS

| Model No. | | HL-C201A(E)-SP3 | HL-C201A(E)-SP3M | |
|-----------------------------|---------------------------|--|----------------------|--|
| Meas. method | | Specular reflection | | |
| Meas | surement center distance | 15mm | | |
| Meas | surement range (Note 2) | ±1mm | | |
| Beam source | | Red semiconductor laser Class 1 (JIS/IEC/GB/KS) Max output: 0.3mW, Emission Peak wavelength: 658nm | | |
| Beam diameter (Note 3) | | Approx. ø30µm | Approx. 30 × 1,400µm | |
| Beam receiving element | | Linear image sensor | | |
| Reso | plution | 0.04µm / average times: 256, 0.01µm /average times: 4,096 [E type (Note 4) 0.25µm / average times 256] | | |
| Linea | arity | ±0.02%F.S. [E type (Note 5) ±0.025%F.S.] | | |
| Temperature characteristics | | 0.02%F.S./°C | | |
| ndicator | Laser emission | Green LED: Lights up during laser emission. | | |
| Indi | Meas. range | Yellow LED: Near measurement center:ON, within measurement range:Blink, beyond the range:OF | | |
| Protective structure | | IP67 (except connector) | | |
| Pollution degree | | 2 | | |
| Insulation resistance | | 20M ohms or more by 500V DC megger (between all the terminals and enclosure.) | | |
| stand | Commercial Frequency | AC 500V for 1min. (between all the terminals and enclosure.) | | |
| Diek | Impulse | $\pm 1,000V~1.2/50\mu s$ (between all the terminals and enclosure.) | | |
| Vibration resistance | | Endurance: 10 to 55Hz (cycle: 1minute), Resistant amplitude of vibration: 1.5mm, il X, Y, and Z directions for 2 hours | | |
| Shock resistance | | 196m/ s ² in X, Y, and Z directions for 3 times | | |
| Ambi | ient illuminance (Note 6) | 3,000tx or less (illuminance at beam receiving surface using incandescent lamp) | | |
| Ambient temperature | | 0 to +45°C (No dew condensation or icing allowed), At storage: -20 to +70°C | | |
| Ambient humidity | | 35 to 85%RH At storage : 35 to 85%RH | | |
| Ambient Height | | 2,000m or less | | |
| Material | | Main unit case / cover: Die-cast aluminum, Front cover: Glass | | |
| Cable | e length | 0.5m | | |
| Cable | e extension | Extendible to 30m long maximum using the optional extension cable. | | |
| Weight | | Approx. 400g including cable weight | | |
| Applicable regulations | | Compliant with EU Law: EMC Directive / British Legislation: EMC Regulation | | |

- Notes: 1) Measuring conditions are as follows unless otherwise specified; connection with controller, power voltage: 1) Measuring conditions are as follows unless otherwise specified; connection with controller, power voltage: 24V DC, ambient temperature: 20°C, sampling cycle: 40µs, average times:256, at measurement center distance, measurement subject: clear glass, and digital measurement value.
 2) The measurement range is between +0.1 and +1.0mm (in case the sampling cycle is 20µs), or between +0.8 and +1.0mm (in case the sampling cycle is 10µs).
 3) The figure shows the value at measurement center distance. It is determined by 1/e² (approximately 13.5%) of center beam intensity. Due to leak light outside the specified area, the reflectance around the detecting

 - point may be higher than at the point and this may affect the measurement value.
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 4) The minimum resolution of 0.25µm can be achieved if the sensor head is connected to the controller that is not subject to "Foreign Exchange and Foreign Trade Law".

 5) The linearity of ±0.025%F.S. can be achieved if the sensor head is connected to the controller that is not subject to "Foreign Exchange and Foreign Trade Law".

 6) The variation in ambient illuminance is ±0.02%F.S. or less.

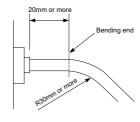
5 CAUTIONS

Connection

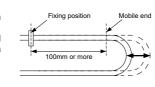
- Turn off the power of controller before connecting or disconnecting the connectors When connecting or disconnecting the connectors, be sure to hold the connector
- area not to apply extra force to the cable Be careful not to touch terminals or to let foreign matter get in the connector after
- disconnecting connectors. . Be careful not to apply force to around the connector of standard cable and ex-
- tension cable. Do not bend the cables near connectors. Failure to do so causes causes disconnection of the cable

Wiring

- Do not run the sensor cable along (bundled in parallel) with other wirings. Keep it at least 100mm away from other wires. Run the cable so it is separate from high voltage and power circuit lines. If it is necessary to run the cable in parallel with them, shield it by running through a grounded electrical conduit.
- Install the product as far away as possible from noise source such as high-voltage lines, high-voltage device, power lines, power device, machines which generate a large starting and stopping surge, welding machines and inverter motor
- Do not pull the cable using a force more than 29.4N when routing the cable with the sensor head and controller fixed. At least 20 mm is required from the cable connection to the bend. The bending radius must be 30 mm or more.
- · When the sensor head is moved around while in use, the cable in the moving part may be damaged. Therefore, use an extension cable for the moving part and, when the extension cable is damaged, immediately replace it. Otherwise, it may result in failure.



- Use only one extension cable for connection between one sensor head and a controller.
- When the sensor head part is moved around while in use, fix the extension cable at a position 100 mm away from the mobile end.



Warming up time

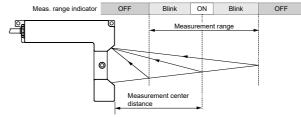
• Allow at least 30 minutes of warming up after turning on the power to ensure the performance of the product

Environment

- The life of the semiconductor laser depends on the ambient temperature during use. WheThis product complies with CE Marking when used together with a controller and programmable display unit that are in compliance with CE Marking. Likewise, the product complies with UKCA Marking when used together with a controller and programmable display unit that are in compliance with UKCA Marking.n using the product near a heat source, take measures to lower the ambient temperature of the sensor head as possible. Mount the sensor on a device having good heat radiation because the sensor itself emits heat
- Water, oil, or fingerprints on the emitter surface and receiver surface of sensor head reflects light. Dust and dirt on them block light. Keep them clean at all times. When cleaning these parts, wipe them off using a soft lint-free cloth or lens clean-
- Install the sensor head so ambient light such as sunlight or light with the same wavelength as laser beam should not enter the light receiver. If high accuracy is required, install a light shielding plate or the like on the sensor head.
- The controller and connectors are not structurally dustproof, waterproof, or corrosion-resistant. Do not use the product underwater or in the rain.
- . Do not use the product in dusty places or that exposed to flammable or corrosive gases, droplet, direct sunlight, severe vibration or impact.

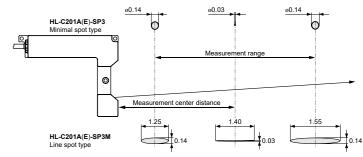
• The product is used at specular reflection installation. Set the "Installation Mode" to Specular Reflection

6 MEASUREMENT RANGE / INDICATOR

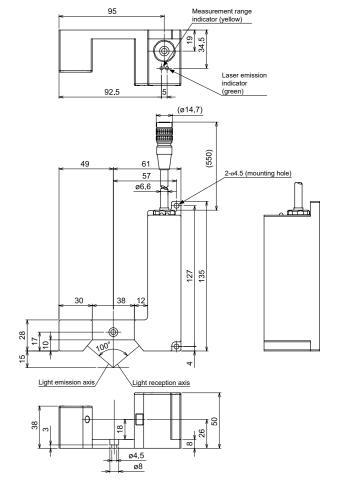


• The measurement range indicator at sampling cycle of 20µs or 10µs lights up at the center of limited measurement range.

7 BEAM DIAMETER (Unit: mm)



8 DIMENSIONS (Unit: mm)



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Panasonic Industrial Devices SUNX Co., Ltd. 2022

September, 2022

PRINTED IN IAPAN