Panasonic® **INSTRUCTION MANUAL**

Contact-Type Digital Displacement Sensor / Sensor Head Air-Driven Type HG-S□-AC

MJE-HGSAC No.0074-51V

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

- Never use this product as a device for personnel protection.
- When using devices for personnel protection, use products that meet the laws and standards for personnel protection that apply in each region or country, such as OSHA, ANSI and IEC.

This document provides a brief summary of mounting and other related information.
For detailed information, refer "**our web site (https://panasonic.net/id/pidsx/global) "**

1 STANDARDS AND REGULATIONS

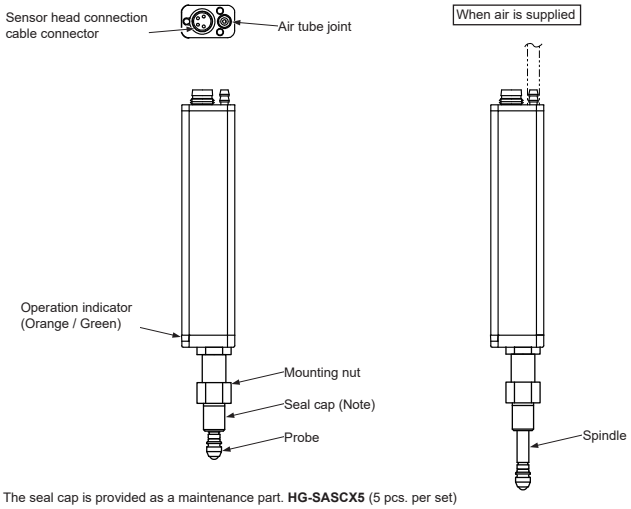
- This product conforms to the standards and regulations below.

<European Directives>
EMC Directive CE

2 CONTENTS OF PACKAGE

☐ Sensor head	1 pc.
☐ Mounting nut	1 pc.
☐ Sensor head fastening wrench	1 pc.
☐ Air tube clamp	1 pc.
☐ Instruction Manual (English / Japanese, Chinese / Korean)	1 pc. each
☐ General Information for Safety, Compliance, and Instructions(23 languages)	1 pc.

3 DESCRIPTION OF PARTS



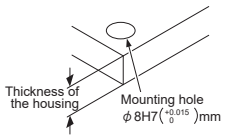
Note: The seal cap is provided as a maintenance part. **HG-SASCX5** (5 pcs. per set)

4 MOUNTING

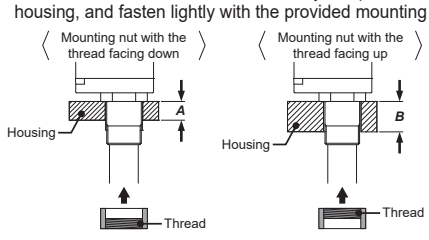
Mounting on the housing

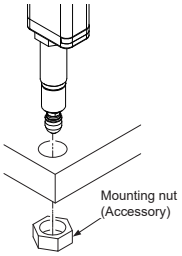
- Note that the mounting direction of the provided mounting nut differs according to the thickness of the housing.

1. Open a hole in the housing in which the sensor head will be mounted



2. Insert the sensor head into the hole you opened in the housing, and fasten lightly with the provided mounting nut.

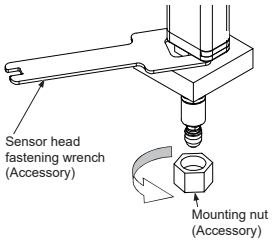




	Thickness of the housing	
	A	***B***
HG-S1010-AC, **HG-S1110-AC**	6.5 to 10mm	10 to 12.5mm

Note: Please use within a the thickness of the housing range of 6.5~12.5mm.

3. Fasten the sensor head.
Tighten the mounting nut with a wrench while holding the sensor head in place with the sensor head fastening wrench as shown.Tighten to a torque of 12.5N·m or less.

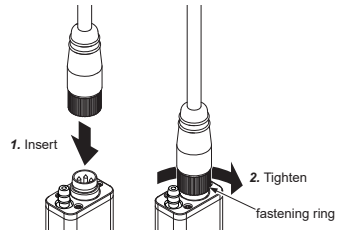


Connecting the sensor head connection cable

- When attaching the connector, make sure it is firmly tightened. If loose, the connector may come off and cause an error.
- When disconnecting, always make sure that the fastening ring has been completely loosened before pulling out the cable.Risk of damage if you pull the cable with excessive force (15N or more) with the fastening ring tightened.
- Sensor head connection cables with an L-shaped connector cannot be used.

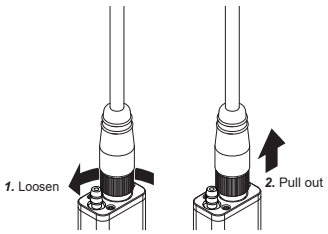
How to connect

1. Insert the sensor head connection cable into the connector for the sensor head connection cable on the sensor head.
2. Turn the fastening ring on the sensor head cable in the direction shown to firmly tighten the ring.



How to remove

1. Turn the fastening ring on the sensor head cable in the direction shown to loosen the ring.
2. Grasp each connector on the sensor head connection cable and pull out to remove.

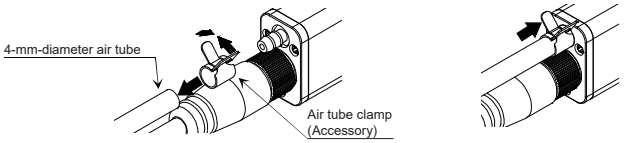


Connecting the air tube

- When connecting the air tube, firmly secure it with the air tube clamp provided. If the air tube is used without inserting or securing it properly, there is a danger that the air tube may come off while it is being used.

How to connect

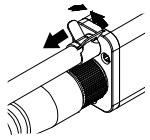
1. While loosening the air tube clamp, slide it from the tip of the air tube and then release it when it reaches halfway through the tube.
2. Insert the tip of the air tube until it reaches the root of the joint on the sensor head.
3. Move the air tube clamp and secure the tip of the air tube.



How to disconnect

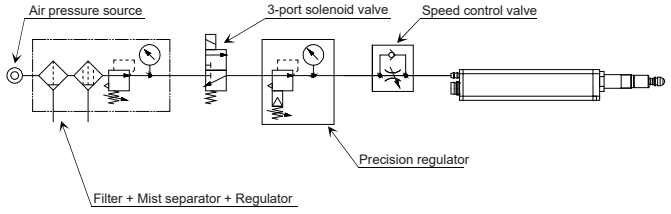
1. While loosening the air tube clamp, move it halfway through the air tube.
2. Grasp the sensor head and pull out the air tube.

Note: Take care not to lose the air tube clamp.



5 AIR CIRCUIT (RECOMMENDED)

- Create an air circuit like the one (recommended) shown in the figure below and, if necessary, adjust the speed of the spindle with the speed control valve.

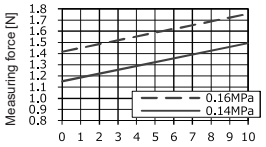


Notes: 1) Supply clean air (free from moisture, oil, dust, or other foreign objects) to this product.
2) Air pressure may decrease, depending on the length of the air pipe from the air supply source or any pneumatic components (such as needle valves, speed controllers, or mini-filters) that are added. Take care to ensure that air pressure supply to the product is sufficient. Select pneumatic components suitable for the supplied air pressure.
3) The 3-port solenoid valve and speed control valve have their respective mounting directions. Mount each valve in their correct direction by referring to the above diagram.
4) A filter with a rated filtration of 5 μm or less and a mist separator with a rated filtration of 0.3 μm or less are recommended.

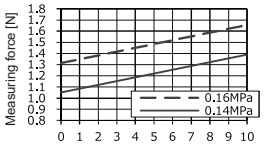
6 SPECIFICATIONS

Type		General purpose		High precision	
Model No. (Note 2)		HG-S1010-AC		HG-S1110-AC	
			With no seal cap mounted		With no seal cap mounted
Position detection method		Optical absolute linear encoder method			
Measurement range		10mm (Note 3)			
Stroke		10.5mm or more (Note 3)			
Measuring force (Note 4)	Downward mount	(Note 5)	(Note 5)	(Note 5)	(Note 5)
	Upward mount	(Note 5)	(Note 5)	(Note 5)	(Note 5)
	Side mount	(Note 5)	(Note 5)	(Note 5)	(Note 5)
Resolution		0.5μm		0.1μm	
Sampling cycle		1ms			
Indication accuracy (P-P)	Full range	2.0μm or less		1.0μm or less	
	Limited range	1.0μm or less (any 60μm)		0.5μm or less (any 60μm)	
Operation indicator		Equipped (2-color LED: Orange, green)			
Working pressure range		0.14 to 0.16MPa	0.035 to 0.045MPa	0.14 to 0.16MPa	0.035 to 0.045MPa
Capacity to resist pressure		0.2MPa			
Usable fluid		Dry air (Dew point temperature: -10°C or lower)			
Applicable tube		Outside diameter: 4mm / Inside diameter: 2.5mm			
Protective structure (Note 6)		IP67(IEC)	—	IP67(IEC)	—
Contamination level		2			
Elevation		2,000m or lower (Note 8)			
Mechanical life (Note 7)		30 million times or more (typical value)			
Tip deviation amount		35μm (typical value)			
Grounding method		Capacitor grounding			
Insulation resistance		100MΩ or more at 250VDC			
Hot swap function		Incorporated			
Ambient temperature		-10 to +55°C (No dew condensation or icing allowed), Storage: -20 to +60°C			
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH			
Material		Body: Zinc, Holder: Stainless steel, Spindle: Tool steel, Probe: Ceramic (Note 9)			
Weight (main unit only)		Approx. 80g			

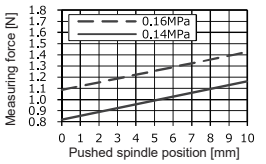
Notes: 1) Measured at an ambient temperature of +20°C, unless otherwise specified.
2) Connect an **HG-S** series controller (manufactured in or after February 2019).
3) The position that represents "0" as an absolute value is a position where the spindle is pushed further down from the bottom dead point by 0.1mm or more. The term "stroke" indicates the total stroke length from the bottom dead point to the top dead point.
4) Measuring force changes with the air pressure used. Removing the seal cap enables the product to be used as the low measuring force type. For details on how to remove the seal cap, refer to "8 **MAINTENANCE**".
5) For the relationship between supplied air pressure and measuring force or between measuring force and pushed spindle position, see the figures below. For upward mount without a seal cap, subtract 0.2N from the measuring force. For side mount, subtract 0.1N from the measuring force. The following figures are only typical examples, and these relationships differ depending on the assembly accuracy of the product or the abrasion status of sealing materials.



<Downward mount (typical example)>

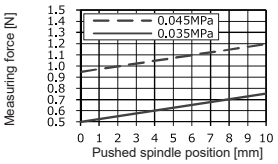


<Side mount (typical example)>



<Upward mount (typical example)>

● When no seal cap is mounted



<Downward mount (typical example)>

6) Protective structure is not applicable when the sealing portions have deteriorated or become damaged. The protection level is zero when the seal cap is removed.
7) Typical value in a clean environment with no contact with dust or liquids such as water and oil.
The sealing material (O-ring) for the seal cap must be replaced at appropriate intervals. For approximate replacement intervals, refer to "How to replace the seal cap" in "8 **MAINTENANCE**".
8) Do not use or store this product in environments where ambient air is pressurized to an air pressure higher than the atmospheric pressure at an altitude of 0 m.
9) The probe is also available as an option.

7 CAUTIONS

The special sensor head **HG-S**□ is designed to be used with the controller **HG-SC**□. If used with other than the special sensor controller option, the specifications will not be met and product malfunctioning or damage may occur.

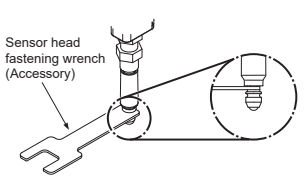
- This device has been developed / produced for industrial use only.
- Do not use this product outside the range of the specifications. Risk of an accident and product damage. There is also a risk of a noticeable reduction of service life.
- Deviations may occur in the measured value at the bottom dead point. Do not use the bottom dead point as a reference. The position where the spindle is pushed further down from the bottom dead point by 0.1mm or more must be used as the reference point.
- Do not wire in parallel with a high-voltage line or power line, or run through the same conduit. Risk malfunctioning due to induction.
- Do not use the product during the initial transient time after the special controller **HG-SC**□ is turned ON.
- Do not apply stress such as excessive bending or pulling to the extracted part of a cable.
- When attaching the sensor head connection cable to this product, do not apply force to the product.
- Only one joint (optional) can be installed to one sensor head.
- This product is suitable for indoor use only.
- Avoid dust, dirt, and steam.
- Do not use this sensor in places where it may come in contact with corrosive gases, ozone, or other harmful gases.
- Ensure that the product does not come into contact with organic solvents such as thinner.
- Ensure that the product does not come into contact with strong acid or alkaline.
- Ensure that the product does not come into contact with oil or grease.
- This product cannot be used in an environment containing flammable or explosive gases.
- Performance may not be satisfactory in a strong electromagnetic field.
- This product is a precision device. Do not drop or otherwise subject to shock. Risk of product damage.
- Mount the sensor unit perpendicular to the measured surface. Mounting the sensor unit obliquely may not only result in measurement error but also significantly shorten its service life.
- Do not allow excessive horizontal force to be applied to the spindle.This may cause reduced accuracy and durability.
- Mount a pressure-reducing valve to use the product within the allowable working pressure range. Excessive pressure may result in failure or damage.
- Do not use air containing foreign objects (such as carbon powder or dust), water, or oil. Doing so may result in electric shock or failure. To prevent such problems, take appropriate measures such as mounting air filters or mist separators.
- Before performing maintenance, inspection, or cleaning, always shut off air supply completely and check that the pressure inside the product and piping is zero. Failure to do so may result in accidents or failures due to air pressure.
- When the product becomes unusable or unneeded, dispose of the product appropriately as industrial waste.
- Never attempt to disassemble, repair, or modify the product.

8 MAINTENANCE

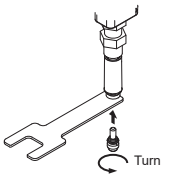
How to replace the probe

- Always secure the spindle to prevent rotation before replacing the probe. Risk of product damage if an excessive torque (0.2N·m or more) is applied to the spindle.
- If the seal cap is scratched or damaged during probe replacement, the specifications of the protective structure may not be satisfied.

1. Turn the probe screw in the direction of the arrow and remove the probe from the spindle. When turning the probe screw, hold the cut face of the spindle with the provided sensor head fastening wrench to prevent the spindle from turning.
Hold the sensor head fastening wrench in place, and turn only the probe.



2. Attach the new probe to the spindle. The tightening torque should be 0.4N·m or less. Make sure that the probe does not come OFF.
When turning the probe screw, hold the cut face of the spindle with the provided sensor head fastening wrench to prevent the spindle from turning.
Hold the sensor head fastening wrench in place, and turn only the probe.

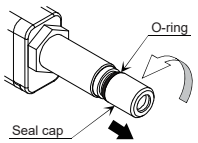


How to replace the seal cap

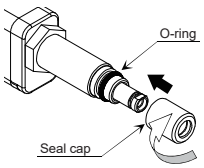
Replace the seal cap at appropriate intervals according to the deterioration status of the sealing material.
Replace the seal cap when the number of sliding operations reaches approximately five million.

- When removing or mounting the seal cap, always remove the product from the housing.
- When removing or mounting the seal cap, stop supplying air.
- To prevent problems, replace the seal cap before the internal O-ring becomes worn.

How to remove
1. Remove the probe.
2. While pulling the seal cap, expose the edge of the O-ring.
3. Loosen the seal cap by rotating it in the direction indicated by the arrow.
4. After loosening the seal cap completely, pull it out.
5. Finally, remove the O-ring.



How to mount
1. Mount the O-ring in the specified position.
2. Slide the seal cap onto the spindle and move it to a position where it can rotate at no load.
3. Push in the seal cap while rotating it in the direction indicated by the arrow.



Note: Check that the O-ring does not protrude.

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