



Thank you for purchasing this product.

In order to use this specification, fully satisfying it, please use a handling description on looking well.

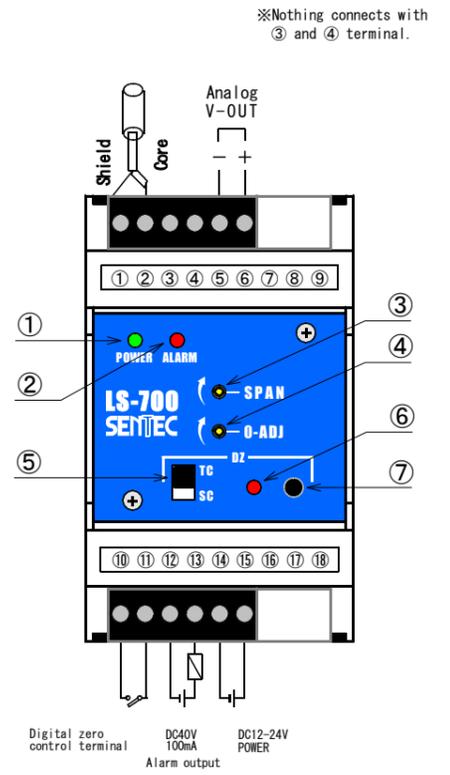
1 SPECIFICATIONS

CONTROLLER	LS-700-08	LS-700-1	LS-700-2A	LS-700-2B	LS-700-4A	LS-700-4B	LS-700-5	LS-700-10
SENSOR	HA-30S	HA-50S	HA-80S	HA-101S	HA-141S	HA-225S	HA-162S	HA-222R
MEASURING RANGE	0~0.8mm	0~1mm	0~2mm	0~3.5mm	0~3.5mm	0~5mm	0~10mm	
OUTPUT VOLTAGE	0~0.8V	0~1V	0~2V	0~3.5V	0~3.5V	0~5V	0~10V	
LINEARITY	±1% of F.S ※4							
RESOLUTION	0.03% of F.S (0.3μm, minimum) ※5							
RESPONSE	DC~10kHz (-3dB)							
OUTPUT IMPEDANCE	52Ω							
STABILITY	CONTROLLER: 0.01% of F.S/°C SENSOR-HEAD: 0.02% of F.S/°C ※6							
AMBIENT TEMPERATURE	CONTROLLER: -10~+60°C SENSOR-HEAD: -20~+70°C							
AMBIENT HUMIDITY	35~85%RH (no condensation)							
POWER	DC12~24V ±10% Ripple 10% or less							
CONSUMPTION	250mA or less							
DIGITAL ZERO FUNCTION	The present output value is made into zero. Error ±0.1% of F.S							
ALARM OUTPUT	Disconnection of a sensor-head or poor connection is detected. (NPN open-collector transistor) ※8							
OPTION	SP (high resolution): 0.03% of F.S (0.3μm, minimum)							

- ※1: CE-Marking Correspondence article EMC directive (2004/108/EC): EN61000-6-4 (EMI), EN61000-6-2 (EMS). The test is not application to D.C power input ports intended to be permanently connected to cables less than in 10m length. Please make into a length of less than 10m the code which connects a controller with a direct-current power supply.
- ※2: There is no compatibility between sensors-head. Change of the length of the code of a sensor changes the characteristic. (The standard length is 3m.) When length is changed, please contact our sales department.
- ※3: It is the case where an adjustment subject is iron. The material of iron of our standard adjustment subject is SS400.
- ※4: When an adjustment object is not iron, The linearity of LS-700-08 is set to of ±2% of F.S.
- ※5: LPF (Low Pass Filter) the static minimum at the time of use—it is resolution Please specify SP type of an option. A standard machine is of F.S 0.1% (1μm of resolution [Minimum]).
- ※6: It is the case where the length of coaxial cord is standard specification (3m), and an adjustment subject is iron.
- ※7: It is chosen whether digital zero are controlled by the digital zero control changeover switch of a panel side with digital zero switch of a panel side, or digital zero terminal performs. When a changeover switch is made into the SC side, it becomes control with digital zero switch, and when it turns on the TC side, it becomes control with digital zero terminal. When controlling digital zero by digital zero switch, once it pushes digital zero switch, the digital zero function will operate, and it will be canceled if it pushes once again. When controlling digital zero by digital zero terminal, it will be canceled, if digital terminal and COM terminal are short-circuited and digital zero function will operate and open. During digital zero functional operation, the digital zero indicator beside digital zero switch lights up.
- ※8: At the time of detection, the alarm indicator of a panel side lights up.

2 CONNECTION

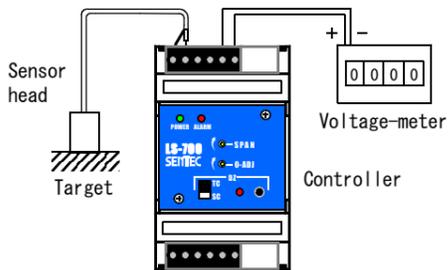
● LS-700-□ □



- ① Power indicator
- ② Alarm indicator
- ③ Span-adjustment trimmer
- ④ Zero-adjustment trimmer
- ⑤ Digital zero control changeover switch
- ⑥ Digital zero indicator
- ⑦ Digital zero switch

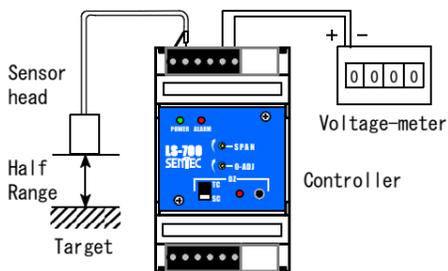
3 ADJUSTMENT

(1) ZERO-Adjustment
(When 0-ADJ is used.)



Please contact a sensor at a target. Please turn 0-ADJ so that analog output voltage becomes 0V.

(2) SPAN-Adjustment

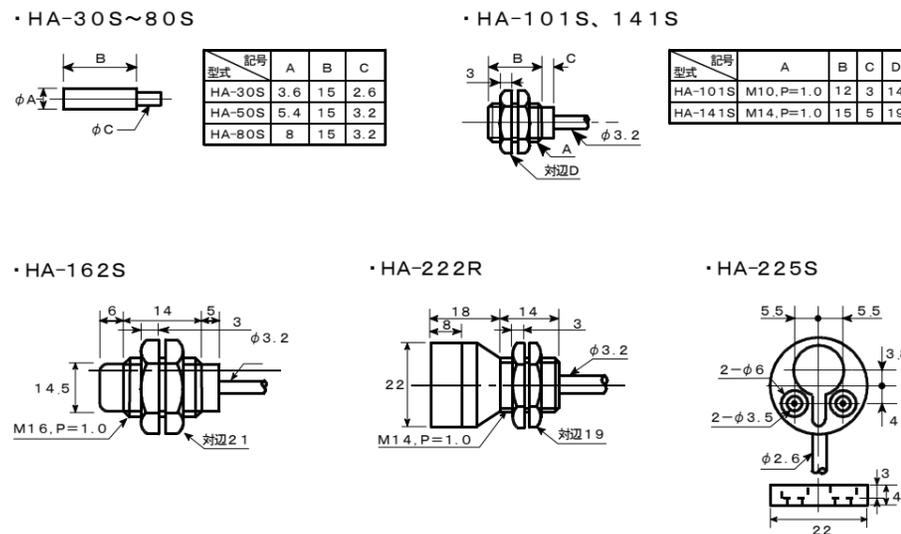


Please set a sensor-head as the distance of the half of the measurement target range. Please rotate SPAN-ADJ so that you may become a voltage value suitable for the distance. (ex 1mm=1.000V)

NOTES) Please repeat ZERO-ADJ and SPAN-ADJ 2to3 times.

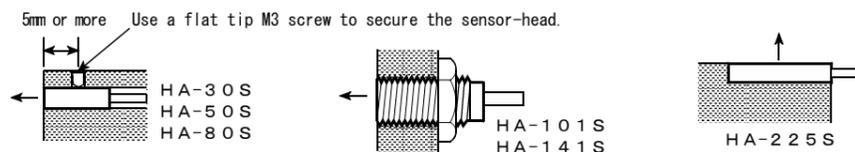
4 SENSOR-HEAD DIMENSIONS

(unit: mm)



3m of standard coaxial cord is attached to each sensor-head.

5 SENSOR-HEAD MOUNTING



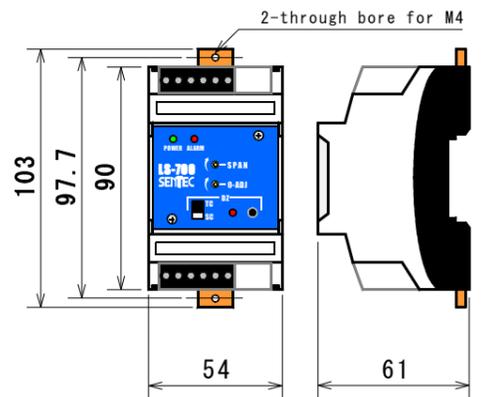
notes) When the sensor-head of HA-162S and HA-222R is embedded, please contact our sales department.

6 CAUTIONS ON USE

- Please carry out independent wiring of the sensor-head aside from other power lines.
- Since the controller is adjusted according to the sensor-head, use which changes other sensor-head and cable length of form cannot be performed.
- Since there is fear of mutual interference when using it, making a sensor-head approach, please contact our sales department.

7 CONTROLLER DIMENSIONS

(unit: mm)



DIN rail attachment is possible. DIN standard: based on 46277

8 LINEARITY DATA

- Please refer to an attached characteristic data sheet. (It is when a part is not appended.)

9 CAUTIONS ON SAFETY

- Warning** If cautions are neglected, a dangerous situation which is connected with a serious disaster is shown.
- Caution** If cautions are neglected, a dangerous situation which is connected with damage on a product is shown.

Warning

- Please do not make reconstruction and decomposition absolute.
- Be careful for there to be no faulty wiring in accordance with the wiring method written in the instruction manual. A product may be damaged with faulty wiring. The breakage and failure by faulty wiring become the outside of the object of a guarantee.
- In case you perform connection, since there is a possibility of receiving an electric shock, please work turning off the power.

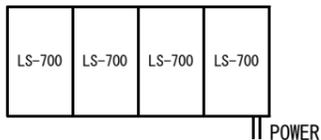
Caution

- Please do not add a big vibration and a shock to a product, or do not make it to topple a product. Moreover, please don't place a thing in piles on a product. It may change and damage.
- When you check that it is a product of an order at the time of unpacking of packing and there are accessories, please be careful enough not to throw away.
- When there are accessories etc., please keep it not to be intermingled.
- When you carry a product, please give treatment carefully.
- Please do not use and keep it under existence of corrosive gas.
- Keep in mind that water will infiltrate into the inside of a product and it will become the cause of breakage if water takes at the time of use and storage.
- When you incorporate and ship a product to apparatus, please protect a product in consideration of the vibration at the time of transportation, or a shock using shock absorbing material etc.
- Indicated data values are measured value under the test atmosphere of our specification, and may differ from the data value of a statement in an instruction manual according to an operating condition and other terms and conditions.
- Please use a suitable tool about attachment of a product and perform attachment which applied to the attachment method correspondingly after attention.
- Please do not use it exceeding the range of the specification.
- Please carry out warming up 20 minutes or more from a power supply injection.
- Nothing should connect with the terminal which is not used.
- Please do not set it up near the device equipment (inverter, high-frequency generating equipment, and motor, etc.) that generates big surge.
- Please separate wiring from a high-tension wire or a power line as much as possible. It becomes the cause of malfunction or failure by a noise.
- When the influence of thunder or surge can be considered, please install protection circuits, such as a surge arrester and a surge killer.
- When you connect loads, such as a relay lamp, please install a protection circuit.
- Please avoid use in the place where a rapid temperature change is caused and the place where the vibration is intense.
- When it installs in a moist place, a product maybe damaged by dew condensation. Please keep dew condensation from occurring in a moist place.

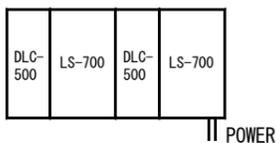
12 CONNECTION BY BUS CONNECTORS

An exclusive DIN rail bus connector (option) is used, and power supply package supply to two or more LS-700 and connection of our option products can be made without wiring. However, since there are notes when connecting, please refer to the following for each connection.

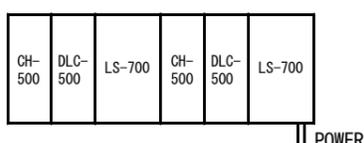
- ① LS-700 multiple connection (power supply package supply)
Four-set simultaneous connection is possible including what wired the power supply. The above-mentioned number is the number it will be whose power supply voltage at DC12V. Wiring of a power supply is possible by every controller.



- ② DLC-500 (digital linear converter) connection
It sees from the front and connects DLC-500 to the left-hand side of LS-700. It shall be one set which was combined with DLC-500, and two-set simultaneous connection is possible. The above-mentioned number of sets is the number of sets at power-supply-voltage DC12V. The input of DLC-500 turns into an output of LS-700. Wiring of a power supply is connected to LS-700. Since there is possibility of the power supply line damage by fire on a substrate when it is connected with DLC-500, please be sure to connect with LS-700.



- ③ DLC-500 and CH-500 (comparator module) connection
It sees from the front, and DLC-500 is connected to the left-hand side of LS-700, and also CH-500 is connected to left-hand side. The combination of three sets shall be one set and two-set simultaneous connection is possible. The above-mentioned number of sets is the number of sets at power-supply-voltage DC12V. The input of DLC-500 turns into an output of LS-700. Wiring of a power supply is connected to LS-700. Since the power supply line on a substrate may be damaged by fire when it is connected with other controllers, please be sure to connect with LS-700.



10 CHECK LIST

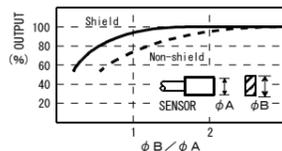
The following symptoms are often mistaken for product failure. Check the following before bringing equipment in for repair.

Symptom	Cause	Countermeasure
● Power indicator does not light after power supply is turned on.	● Power line is unplugged, or power supply terminal plug is defective.	● Plug in power line properly, following instruction display.
● Output voltage does not reach volume described in specifications.	● Object to be sensed is material other than iron.	● Equipment is designed to sense iron. Use only for iron.
	● Volume of subject to be sensed is less than the standard.	● See reference data.
	● Sensor cord is of inappropriate length.	● Replace with cord of specified length.
	● Sensor is different from that specified.	● Controller is not compatible with sensor other than that specified. Use appropriate sensor.
● ZERO-adjust and/or SPAN-adjust not possible.	● Sensor wire is laid too close to other wires.	● Lay sensor wire separately from other wires.

11 REFERENCE DATA

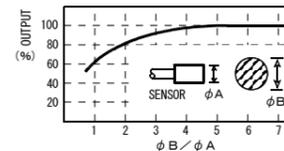
- (1) For the area of subject

A specification value will be satisfied, if a subject is a thing which has more than the diameter of the following graph when a subject is used as a disk.

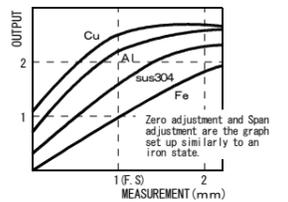


- (2) In case a subject is a pillar

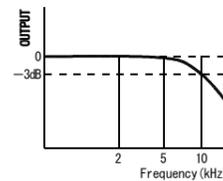
A specification value will be satisfied, if the diameter of the pillar of a subject is by the thing which has 5 or more times of the diameter of a sensor head.



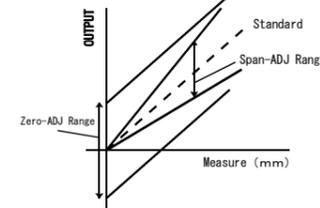
- (3) The characteristic over metal other than iron



- (4) Response For Frequency



- (5) ZERO-Adjustment · Span-Adjustment Range



CONTROLLER-TYPE	Zero-ADJ Range (V)	Span-ADJ Range
LS-700-08	-0.4 ~ +0.4	0.8 ~ 1.2 times
LS-700-1	-0.4 ~ +0.4	
LS-700-2	-0.8 ~ +0.4	
LS-700-4A	-2.0 ~ +0.5	
LS-700-4B	-1.5 ~ +0.8	
LS-700-5	-2.4 ~ +1.0	
LS-700-10	-4.0 ~ +1.0	

※Zero-ADJ Range: When 0-ADJ is used.

13 WARRANTY

- The guarantee of the product is the one to mean the guarantee of this machine unit.
- We will make the term of a guarantee of a product into after-shipment one year.
- When failure arises by a manufacturer's responsibility during the above-mentioned term of a guarantee, repair of the failure portion of a product or component replacement is performed. However, when it corresponds to below, We will carry out the outside of the scope of a guarantee.
 - ① When based on unsuitable condition, environment, handling, and use of those other than the contents checked by the specification value of a product, the specifications exchanged separately, etc.
 - ② When the cause of failure is based on reasons other than supplies.
 - ③ By remodeling or repairing the delivery goods that depend besides our company.
 - ④ When based on the reason which was not able to be foreseen with the technical level at the time of the shipment.
 - ⑤ In addition, when it is not in the responsibility by the side of a manufacturer with a natural disaster, disaster, etc.
- We can do neither conformity in the particular application of this machine, nor compensation of guarantee loss of the secondary value generated with a product. Moreover, they are not a design and the manufactured product for the purpose of the use as which very high reliability and safety are required, and the uses (atomic power, aerospace, infrastructure, medical equipment, etc.) concerning a human life. About the use under such a use and environment, we will carry out the outside of the scope of a guarantee.

SENTEC CO., LTD.
4-4-24, NISHINAKAJIMA, YODOGAWA-KU,
OSAKA 532-0011 JAPAN
Tel. 06 (6304) 8858 Fax. 06 (6302) 0700
URL <http://www.sentec.co.jp/>

★A specification change may be made without a preliminary announcement for the better improvement of a product. Please give me consent and an understanding.