

Thank you for purchasing this product.

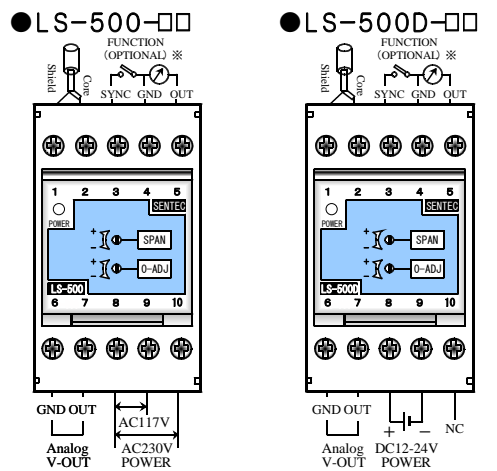
In order to use this specification, fully satisfying it, please use a handling description on looking well.

## 1 SPECIFICATIONS

CONTROLLER	A C-type	LS-500-08	LS-500-1	LS-500-2A	LS-500-2B	LS-500-4A	LS-500-4B	LS-500-5	LS-500-10	
	D C-type	LS-500D-08	LS-500D-1	LS-500D-2A	LS-500D-2B	LS-500D-4A	LS-500D-4B	LS-500D-5	LS-500D-10	
ITEM	SENSOR	HA-30S HA-30YS	HA-50S HA-50YS	HA-80S HA-80YS	HA-101S	HA-141S	HA-225S	HA-162S	HA-222S	
MEASURING RANGE		0~0.8mm	0~1mm	0~2mm		0~3.5mm	0~5mm	0~10mm		
OUTPUT VOLTAGE		0~0.8V	0~1V	0~2V		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) ※6								
OUTPUT IMPEDANCE		52Ω								
STABILITY		CONTROLLER: 0.01% of F.S./°C SENSOR HEAD: 0.02% of F.S./°C ※7								
AMBIENT TEMPERATURE		CONTROLLER: -10~60°C SENSOR HEAD: -20~70°C 85%RH or less, no condensation.								
POWER	AC-type	RATE		AC100V/200V ±15%		50/60Hz				
	DC-type	CONSUMPTION		3VA or less						
FUNCTIONS (OPTIONAL)	SS	RATE		DC12~24V ±15% ripple 10% or less		150mA or less				
		SP								
		F								
		P								
		B								

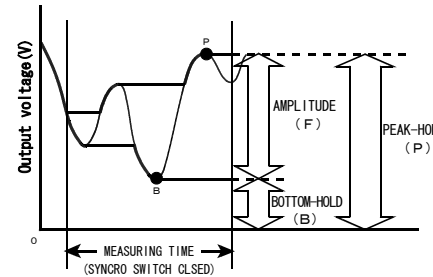
※1: CE-Marking Correspondence article EMC directive (2004/108/EC):EN61000-6-4(EMI), EN61000-6-2(EMS). The test is not applicable to D.C power input ports intended to be permanently connected to cables less than 10m length. Please make into a length of less than 10m the code which connects a controller 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 ask to the marketing department of our company. ※3: It is the case where an adjustment subject is iron. The material of iron of our standard adjustment object are SS400. ※4: When an adjustment object is not iron, LS-500-08 and LS-500D-08 become ±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: Please specify SS type of an option A standard machine is 5kHz(-3dB). ※7: It is the case where the length of coaxial cord the same axle of a sensor head is standard specification (3m), and an adjustment subject is iron. ※8: One option corresponding to each type-mark can be chosen. About an option function: SS (High response): Frequency Response is DC~10kHz (-3dB) ※7. SP (High resolution): Resolution is 0.03% of F.S. (minimum 0.3μm). Frequency Response is DC~1.3kHz (-3dB). P (Peak Hold output): The maximum of an output is outputted from an option terminal by closing a synchronous terminal. B (Bottom Hold output): The minimum of an output is outputted from an option terminal by closing a synchronous terminal. F (Amplitude output): The difference of the maximum and the minimum value outputs from an option terminal by closing a synchronous terminal. ※9: Absolute Output and Hold Output are 1/10 and 0~1V.

## 2 CONNECTION



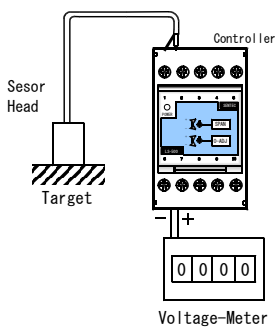
※FUNCTION (OPTIONAL)  
• PEAK-HOLD (P)  
• BOTTOM-HOLD (B)  
• AMPLITUDE (F)  
Only any one is chosen

Note) Although the addition and change after delivery are possible, expense is needed separately. Please ask to a purchase place or the business of our company.



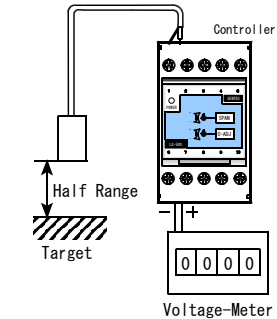
## 3 ADJUSTMENT

### (1) ZERO-Adjustment



Please Contact a sensor at a Target, please turn 0-ADJ so that analog output voltage becomes 0v.

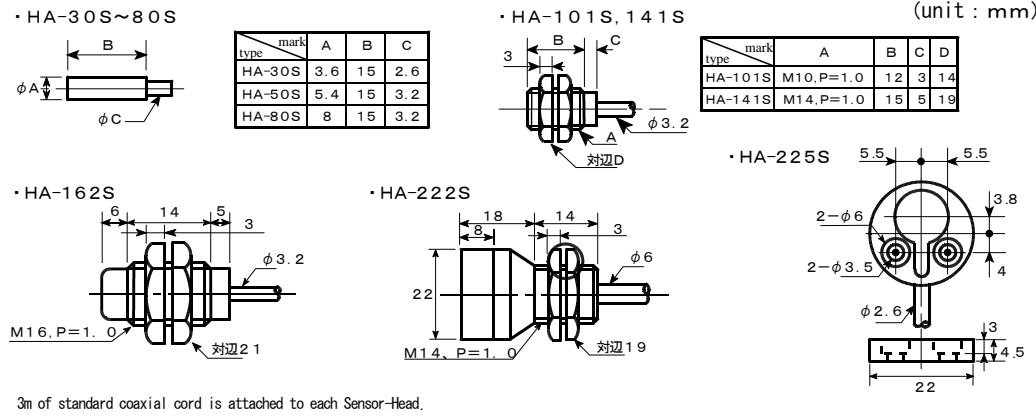
### (2) SPAN-Adjustment



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)

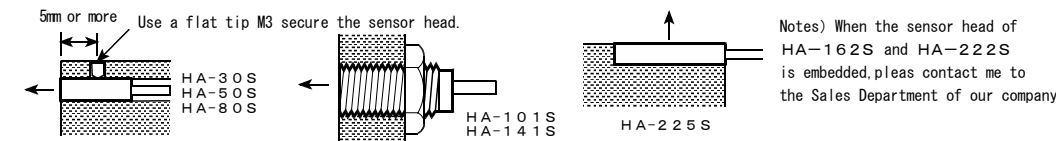
NOTES) Please repeat ZERO-ADJ and SPAN-ADJ 2to3 times.

## 4 SENSOR-HEAD DIMENSIONS



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-222S is embedded, please contact me to the Sales Department of our company.

## 6 CAUTIONS ON USE

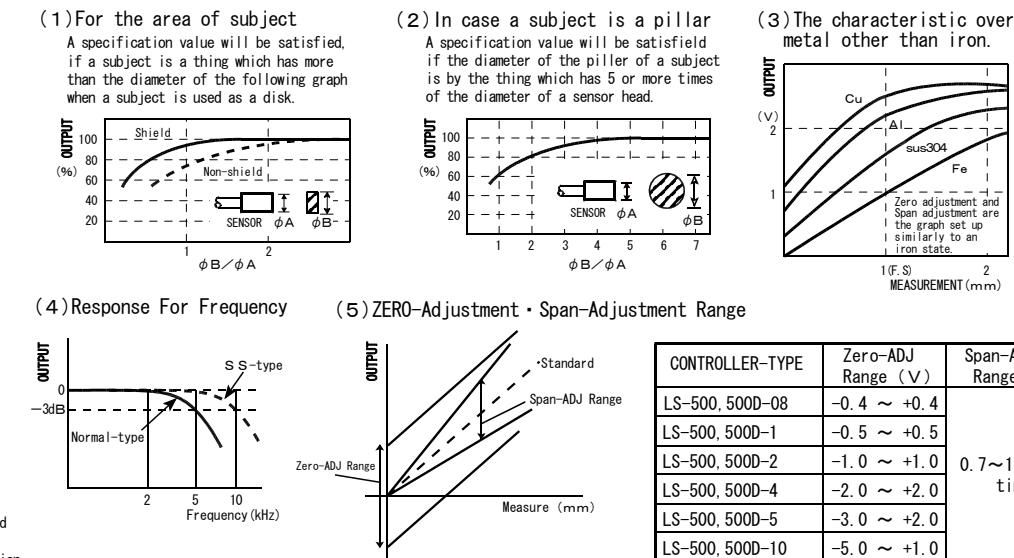
- For a sensor head, other power lines are according to. Please carry out independent wiring.
- Since the controller is adjusted according to the sensor head, use of the sensor head of a different from cannot be performed. Moreover, use which changes cable length cannot be performed, either.
- Since there is fear of mutual interference when using it, making a sensor head approach, please contact me to the Sales Department of our company.

## 10 CHECK LIST

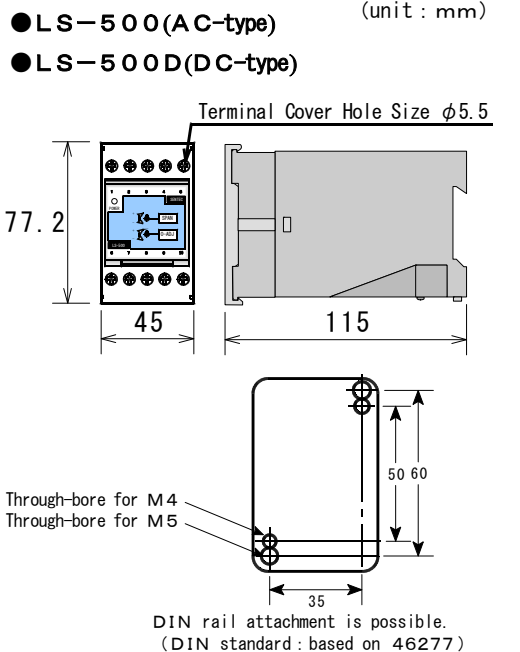
The following symptoms are often mistaken for product failure. Check the following before bringing equipment in for repair.

Symptom	Cause	Countermeasure
●Power display 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. ●Volume of object to be sensed is less than the standard. ●Sensor cord is of inappropriate length.	●Equipment is designed to sense iron; use only for iron. ●See reference data. ●Replace with cord of specified length.
●ZERO-adjust and/or SPAN-adjust not possible.	●Sensor is different from that specified. ●Sensor wire is laid too close to other wires.	●Controller is not compatible with sensor other than that specified. Use appropriate sensor. ●Lay sensor wire separately from other wires.

## 11 REFERENCE DATA



## 7 CONTROLLER DIMENSIONS



## 8 LINEARITY DATA

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

## 12 WARRANTY

- The guarantee of the product is the one to mean the guarantee of this machine unit.
- About the term of a guarantee of a product, I am after-shipment one year.
- It is failure of a product when failure arises according to a manufacturer's responsibility during the above-mentioned term of a guarantee. Repair of a portion or part exchange is performed. However, when it corresponds to below, I will carry out the outside of the scope of a guarantee.
  - 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.
  - When the cause of failure is based on reasons other than supplies.
  - By remodeling or repairing the delivery goods that depend besides our company.
  - When based on the reason which was not able to be foreseen with the technical level at the time of the shipment.
  - In addition, when it is not in the responsibility by the side of a manufacturer with a natural disaster, disaster, etc.
- I 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, I will carry out the outside of the scope of a guarantee.

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URL <http://www.sentec.co.jp/>

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

## 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 according to the wiring method indicated to this book and an instructions manual. A product maybe damaged with faulty wiring. Faulty wiring The breakage and failure to depend 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 do not place a thing in piles on a product. It may change and damage.
  - When opening packing, and you check that it is the product of an order and there are accessories, 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.
  - The data value etc. that have been described in this book and the manual depending on various conditions besides use 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 warning up 30 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 apparatus, and moto, etc.) that generates big serge.
  - 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.
  - Please set up the protection circuit of the arrestor and the serge killer, etc. When the influens of the thunder and serge is thought.
  - 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.