

ASM-A-2KV/H-ID ACCELERATION TRANSDUCER INSTRUCTION MANUAL

Thank you for purchasing KYOWA's product ASM-A-2KV/H-ID Acceleration Transducer. Before using the product, please read this Instruction Manual carefully. Also, keep the manual within easy reach so that you can refer to it whenever necessary.

The ASM-A-2KV/H-ID is a TEDS-compatible sensor. The connector plug has TEDS. When using measuring instrument with TEDS function, you are not required to execute the sensitivity registration. For details, see KYOWA Technical Report No. 536.

(TEDS: Transducer Electronic Data Sheets, IEEE1451.4)

1. SAFETY SYMBOLS

Be sure to observe the accompanying precautions in order to safeguard the operator and preserve the performance of the instruments.

	WARNING	Improper operation of the system may result in death or severe injury of the operator.
CAUTION		Improper operation of the system may result in injury of the operator and physical damage of the system.

2. SAFETY PRECAUTIONS

WARNING

- Be sure to mount the product properly.
If the product loosens while using it, the product may be detached or damaged, and operators may be damaged.

3. HANDLING PRECAUTIONS

CAUTION

- This product is extra sensitive to impact. Do not drop, hit, or apply any impact to the product. Avoid impact in excess of its safe overload rating 29420m/s^2 (3000G). Or, the product may be damaged. Take great care to handle it properly.
- Install the product carefully. Or, the frequency response characteristics may be changed. Make sure the product is installed onto the object to be measured perfectly.
When installing, carefully avoid external force such as bending or twisting on the product.
- When the product is installed using adhesive, excessive force due to removing may deform the product's cabinet and resonance of the pressure sensing surface due to the removing impact may damage the product. When removing the product, carefully avoid excessive external forces.
- Do not pull or bend cables too much. Do not bend rubber protectors. Or, it may break cables.
- The product is not waterproof. Take care to avoid water and highly humid (over 85%) environment.

4. SENSITIVE AXIS AND OUTPUT POLARITY

4.1 Sensitive axis

Before installing the ASM-A-2KV/H-ID, check the model. Make sure the sensitive axis is correct. See the figure 4-1 and 4-2.

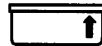
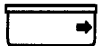
	ASM-A-2KV	ASM-A-2KH
Arrow direction		

Figure 4-1

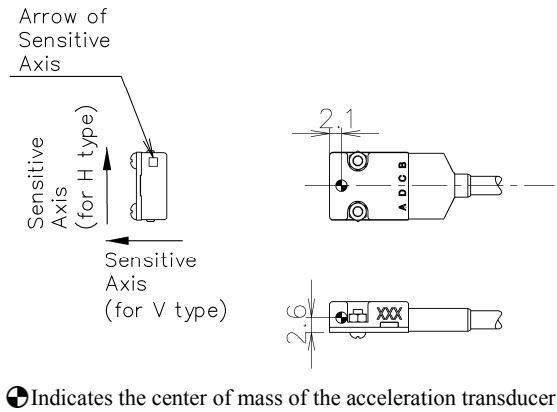


Figure 4-2

4.2 Acceleration and output polarity

The acceleration direction, applied to the ASM-A-2KV/H-ID, and output polarity are as follows. See the figure 4-3 and 4-4.

● ASM-A-2KV-ID

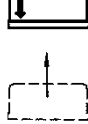
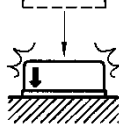
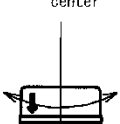
Input conditions	Acceleration	Impact	Rotation
			
Output polarity	(+)	(+)	(+)

Figure 4-3

● ASM-A-2KH-ID

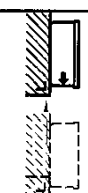
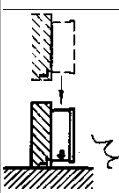
Input conditions	Acceleration	Impact	Rotation
			
Output polarity	(+)	(+)	(+)

Figure 4-4

5. INSTALLATION/REMOVAL

5.1 To install

- (1) Clean the mounting area.
- (2) Also clean the mounting surface of the ASM-A-2KV/H-ID.
- (3) Apply the adhesive agent (CC-33A) lightly on the mounting surface.
See the figure 5-1. Mount the ASM-A-2KV/H-ID on the object to be measured. Press the ASM-A-2KV/H-ID for approx. 30 seconds with fingers.

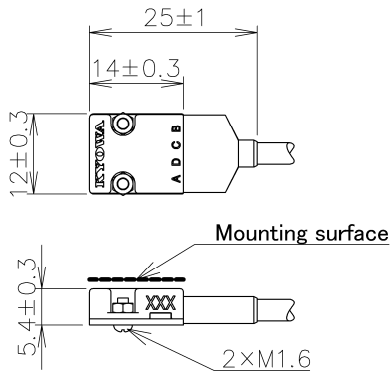


Figure 5-1

5.2 To remove

Remove the ASM-A-2KV/H-ID by using a wrench. See the figure 5-2.

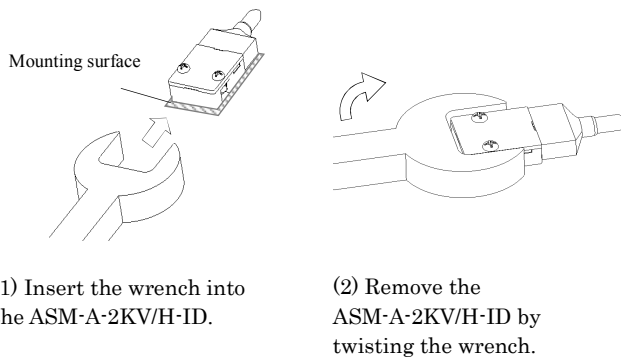


Figure 5-2

6. CONNECTION

6.1 Connect the ASM-A-2KV/H-ID connector plug (3RT01-PE7M) into the strain measuring instrument.

6.2 See the figure 6-1 if necessary.

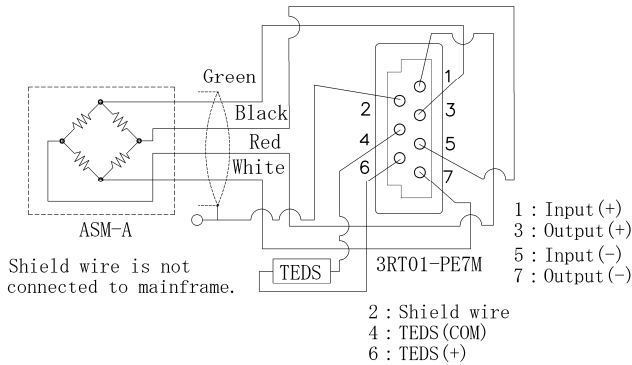


Figure 6-2

CAUTION

- Make sure the bridge excitation is 2 VDC. When the bridge excitation is not 2 VDC, the ASM-A-2KV/H-ID does not meet the specifications. Or, it may cause troubles.
- After the power ON, always preheat the product for approximately 5 minutes.

6.3 Adjust gains on the measuring system. Execute the ZERO balance.

7. MEASUREMENT

7.1 Since the ASM-A-2KV/H-ID is an undamped accelerometer, the frequency response characteristics does not vary with temperature changes. On the other hand, large resonant noise may appear due to the target frequency component.

To measure data without noise, use a low-pass filter with an appropriate cutoff frequency.

CAUTION

- When accelerations of the target vibration are large and frequency components have vibrations 20 kHz or higher, the ASM-A-2KV/H-ID resonates with them. The product may be damaged according to the situation due to the impact in excess of its safe overload rating 29420m/s² (3000G).

* Before measuring data, take the following steps.

- ① Expect the frequency components of the target vibration.
- ② Check the amplitude characteristic based on the figure 7-1.
- ③ Calculate the acceleration and make sure the acceleration is within the rated capacity. Especially before using a low-pass filter, make sure signal outputs are within the pre-set range and within the rated capacity.

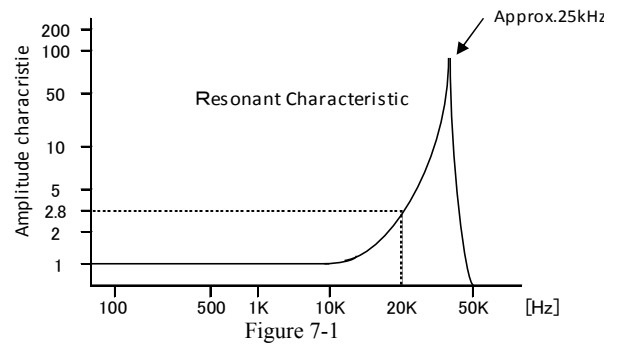


Figure 7-1

[Example]

Suppose the maximum amplitude of the object to be measured is 3000m/s². Based on the figure 7-1, the amplitude characteristic is approx. 2.8 at 20 kHz. Since the maximum acceleration is 3000m/s², the ASM-A-2KV/H-ID receives the acceleration (3000×2.8=8400m/s²) due to the resonance. You are able to use the ASM-A-2KV/H-ID since the acceleration is within the rated capacity.

8. OUTPUT CONVERSION

(Not required when using the TEDS function.)

8.1 Use the calibration constant described on the Test Data Sheet to convert a measured value into an acceleration value.

8.2 When using the measuring instrument, you are able to calculate an acceleration value by using the measured value and calibration constant described on the Test Data Sheet.

$$\text{Acceleration (m/s}^2\text{)} = \frac{\text{Measured value } \varepsilon \times (10^{-6}) \times \text{Calibration constant (m/s}^2\text{)/(1} \times 10^{-6}\text{)}}{1}$$

8.3 When using other types of amplifiers or recorders, accurately measure the bridge excitation. The Test Data Sheet has acceleration, corresponding to the output voltage 1μV, when applying the bridge excitation 1 V. You are able to calculate an acceleration value by them.

$$\text{Acceleration (m/s}^2\text{)} = \frac{\text{Output voltage (}\mu\text{V)}}{\text{Bridge excitation (V)}} \times [\text{Calibration constant (m/s}^2\text{)/(1}\mu\text{V/V)}]$$

9. STORAGE AND MAINTENANCE PRECAUTIONS

9.1 Take care to avoid high and low temperatures, high humidity and vibration.

9.2 If an abnormal initial value or reading appears, measure the input terminal resistance, output terminal resistance, and insulation resistance (100 Mohm or higher). If abnormal resistance is found, the ASM-A-2KV/H-ID may be failure. Contact KYOWA or our representatives.

CAUTION
● Do not disassemble the product, ● Do not apply bridge excitation 5 V or higher between the connector pin No. 4 and 6. ● When measuring the insulation resistance, use a megohmmeter at 50 V.

10. SPECIFICATIONS

Rated capacity	$\pm 19613 \text{ m/s}^2$ ($\pm 2000 \text{ G}$)	
Rated output	6mV/V (12000 $\mu\text{m/m}$) or more	
Nonlinearity	$\pm 1\% \text{ RO}$	
Hysteresis	$\pm 1\% \text{ RO}$	
Input terminal resistance	120 ohm $\pm 20\%$	
Output terminal resistance	120 ohm $\pm 20\%$	
Recommended Excitation Voltage	2 VDC	
Safe Excitation Voltage	2 VDC	
Frequency response range (23°C)	DC to 2.8kHz (Sensitivity deviation: $\pm 5\%$)	
Mounted resonant frequency	25kHz $\pm 30\%$	
Transverse sensitivity	3%RO or less	
Peak-to-peak sensitivity error	1.5%RO or less	
Insulation resistance	100 Mohm or more (50 VDC)	
Safe overload rating	150%	
Safe temperature range	-20 to 60°C	
Compensated temperature range	5 to 40°C	
Temperature effect on zero balance	$\pm 3\% \text{ RO}/^\circ\text{C}$	
Temperature effect on output	-1 to 0%/°C	
Cable	4-conductor (0.05mm ²) vinyl shielded cable, 3.2 diameter by 8 m long terminated with connector plug (3RT01-PE7M)	
Weight	Approx. 4g (excluding cable)	
Accessories	Test data sheet	1
	Warranty	1
	Instruction manual	1

(NOTE)

The units and numerical values in parentheses in the rated capacity column depend on the conventional unit expression just for reference.