

EBARA Vibration Sensor

Model PCMSS100V

Instruction manual

CAUTION

Thank you for choosing the EBARA Vibration sensor Model No. PCMSS100V. EBARA takes every caution in manufacturing the product for safe use by the customer. However, improper handling of this sensor may result in inefficient performance and may even result in accident.

This instruction manual explains the proper procedures related to installation, operation and maintenance of the product.

Keep this manual in a safe place where it can be referred to at any time.

To installation personnel:



Be sure to hand over this manual to customers who are associated with pump's operation, maintenance and inspection.

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1 Safety terminology and Symbols












The precautions described below are intended to ensure safe and proper handling of this product and to prevent personal injury and/or damage. Moreover, to clearly indicate the degree of injury, damage and the degree of urgency, the consequences of incorrect handling are classified into “warning” and “caution”. Both are equally important and kindly follow them explicitly.









 CAUTION	Failure to observe the instructions of this manual may be fatal or may cause severe injury.
 WARNING	Failure to observe the instructions of this manual may result in minor injury and/or property damage.
<u>NOTE</u>	Used when special attention or emphasis is required

[Description of graphic symbols]

	Indicates prohibitory action. The specific prohibited instruction is indicated by a picture or text near this symbol.
	Indicates compulsory action. The specific compulsory instruction is indicated by a picture or text near this symbol.

2 Safety Cautions

 Warning	Please do not use it out of the range of specifications such as installation location, power supply, etc. It may result in malfunction of the device, personal injury, electric shock, electric leakage or fire hazard.	
	Only qualified or authorized personnel with sufficient knowledge and skills should handle this product. There is a risk of malfunction or injury.	
	Do not touch the charging part while power is on. There is a risk of electric shock.	
	Do not damage, break, tamper, forcefully bend, pull, twist, tie-up or place heavy objects on the cable. This may cause a fire or electric shock.	
	Make sure to dust the unit periodically. Particularly, dust present on the terminals may generate heat and cause fire hazard.	
	Do not touch the PCB in the unit. There is a risk of electric shock or device malfunction.	
	Repairing or disassembling should be done only by a technician. There is a risk of injury due to electric shock or fire hazard. The improper handling and/or malfunction may trigger personal injury.	
	Be sure to turn off the power switch before inspecting or repairing.	
	Do not place dangerous or flammable items near the unit. There is a risk of fire hazard.	
	If any malfunction is suspected, remove the battery immediately and contact your vendor or us for inspection and repairing. Incorrect handling may cause an accident.	

 Caution	When using this product, be sure to read the instruction manual of the pump. Failure to do so may cause product's malfunction or damage.	
	In order to ensure longevity of the equipment, select a location that is well ventilated and has an optimum atmospheric conditions with little dust, moisture, or salinity. In adverse environments, it may cause electric leakage, electric shock, or fire due to a decrease in insulation of control panel.	
	The unit should be installed in a location that is convenient for maintenance and inspection. Ensure firm attachment, unstable mounting might result in malfunction. For installation location's environment, refer to the product specifications.	
	Do not cover the unit with a blanket, cloth, etc. It may overheat the device and cause a fire.	
	Do not put any other object inside the unit. There is a risk of fire hazard.	
	Do not disassemble the any mechanical part of the unit. There is a risk of personal injury or device failure.	
	Replace consumable parts regularly. For regular inspection or replacement of any parts, contact your vendor or us.	

3 Introduction

1. Product confirmation

(1) Confirm that no damage has occurred during transportation.

2. Certification

(1) Bluetooth®

The **Bluetooth®** word mark and logos are registered trademarks of Bluetooth SIG, Inc. and any use of such marks by EBARA Corporation is licensed. Other trademarks or trade names used are registered under respective owner.

(2) Japan' s regulatory information

This product has built-in radio equipment that has received construction design certification as a radio station for power-saving data communication based on the Radio act of Japan. Registered certification body conducts construction design certification. It examines the quality control method such as design drawing (construction design), manufacturing, etc. regarding whether the specified radio equipment (henceforth referred to as "applied equipment), for which a technical standards conformity certification has been requested, complies with the technical standards.



Type : 2.4GHz band advanced power-saving data communication system.

Model : PCMSS100V

(3) FCC certification information

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:






- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC ID Information is the following.

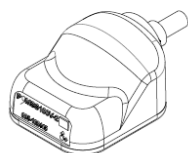
EBARA Pump Condition Monitoring System FCC ID : 2AZCA-PCMSS100V Product Name:EBARA Vibration Sensor Model No:PCMSS100V

4 Specifications

 Warning	When using this product, follow the specifications such as installation location, power supply, etc. Failure to do so may cause product's malfunction, injury, electric shock, electric leakage, or fire.	
	Only engineer or authorized personnel with required knowledge and skills should handle this product. There is a risk of malfunction or injury.	
 Caution	When using this product, be sure to read the instruction manual of the pump. Failure to do so may cause product's malfunction or damage.	

1. Accelerometer Sensor PCMSS100V

Item		Specifications
Measurement	Acceleration (ACC)	Axis : 3 axis (x, y, z) Range : 2G, 4G (Automatic) Sampling frequency : 5.3kHz Meter : rms value , peak value
	Velocity (VEL)	Axis : 3 axis (x, y, z) Range : 2G, 4G (Automatic) Meter : rms value
	Temperature	Range : -40~85°C
FFT Analysis	Analysis points	512 points
	Frequency range	ACC : 10 ~ 2000Hz Vel : 10 ~ 1000Hz
	Frequency resolution	ACC : 10.5Hz Vel : 5.25Hz
Wireless	Method	Bluetooth® 5.0 (Bluetooth® Low Energy)
	Possible number of units for simultaneous connection	2
Environment	Installation Temperature	Indoor : -10 ~ 75 °C Outdoor: -10 ~ 55 °C
	Storage Temperature	-20 ~ 70 °C
	Humidity	85% or less
	Installation location	Elevation : 1000m or less Free of corrosive and explosive gases and vapors.
Input Voltage		DC3.3V



Sensor













Sensor

Top view

Connect to battery unit

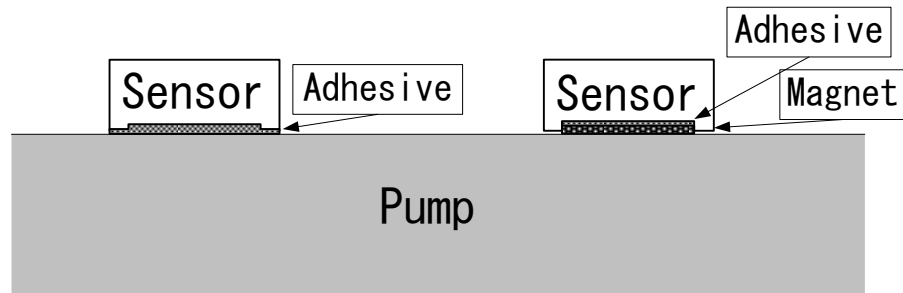
5 Installation

 Warning	Do not touch the charging part while power is on. There is a risk of electric shock.	
	Do not damage, break, tamper, forcefully bend, pull, twist, tie-up or place heavy objects on the cable. This may cause a fire or electric shock.	
	Make sure to dust the unit periodically. Particularly, dust present on the terminals may generate heat and cause fire hazard.	
	Do not touch the PCB in the unit. There is a risk of electric shock or device malfunction.	
 Caution	In order to ensure longevity of the equipment, select a location that is well ventilated and has an optimum atmospheric conditions with little dust, moisture, or salinity. In adverse environments, it may cause electric leakage, electric shock, or fire due to a decrease in insulation of control panel.	
	The unit should be installed in a location that is convenient for maintenance and inspection. Ensure firm attachment, unstable mounting might result in malfunction. For installation location's environment, refer to the product specifications.	
	Do not cover the unit with a blanket, cloth, etc. It may overheat the device and cause a fire.	
	Do not put any other object inside the unit. There is a risk of fire hazard.	

<u>Note</u>	Please dispose unnecessary parts and packing materials according to the rules and regulations.
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1. Mounting method

There are two methods of mounting the sensor, adhesive only or adhesive and magnets.



• Adhesive only

Spray a degreasing agent on the mounting position of the vibration sensor and wipe off the dirt.

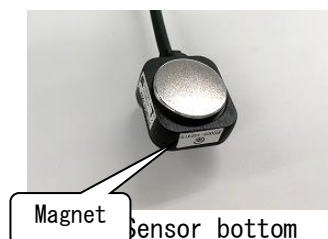
If the mounting position is a non-magnetic metal such as stainless steel or if you want the sensor to be mounted stably for a long time, remove the sensor's magnet and fix it with high-strength adhesive such as a two-component epoxy.

In case of temporary measurement, using Kapton® tape it is possible to mount with an adhesive. The mounting surface can be cleaned using degreasing agent and wiping off the dirt thereafter. After measurement, you can prevent peeling off the pump's paint by peeling off the tape. However, for long-term measurement, it is recommended to mount directly with adhesive.

Note	If you use low-strength adhesive strength, you can't measurement of high frequency acceleration would not be possible.
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• Adhesive & magnet

In order to mount the sensor with magnet, fix the latter to the back of the sensor with adhesive.






Note	<p>If the mounting position is non-magnetic, you cannot use this method.</p> <p>The larger the unevenness and rougher the surface, the more difficult it is to take a stable measurement. Therefore, the mounting surface of the sensor should be as flat as possible.</p> <p>Since magnets rust, this method cannot be used in wet positions. Since magnets are fragile, slow and careful installation is advisable. In order to measure high frequency stably, it is recommended to mount the sensor directly with adhesive.</p>
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2. Mounting Position




- Mount it near the position where you want to detect abnormal vibration.
(Bearing abnormality : near pump casing, motor bearing, etc.)

<Example>

IFW type	FDP type
	
LPD type	
	

6 Maintenance

 Warning	Only engineer or authorized personnel with required knowledge and skills should handle this product. There is a risk of malfunction or injury.	
	Do not touch the charging part while power is on. There is a risk of electric shock.	
	Do not place dangerous or flammable items near the unit. There is a risk of fire hazard.	

 Caution	Do not disassemble any mechanical part of the unit. There is a risk of personal injury or device failure.	
	Replace consumable parts regularly. For regular inspection or replacement of any parts, contact your vendor or us.	

Please note the following points.

1. Daily inspection

- (1) Whether communication between the sensor and the mobile application, “QiDe-Link” is successful and the measured value is normal.

2. Regular inspection

- (1) Rust or corrosion of the metal part and cracks of the resin part.
- (2) Expiry of the useful life of the product.
- (3) Loose screws and metal fittings.

3. Product storage

- (1) Battery may not function as specified owing to its deterioration if stored for a long-time.
- (2) If battery is stored for more than 3 years, it is recommended to replace it.

4. Consumable products

- (1) The useful life of a battery depends on its usage, but usually it is around 2.5 years. If it is stored for more than 3 years, it is recommended to replace it.

Recommended battery



Product	Manufacture
CR123A	Panasonic

N o t e	Please replace the battery as per recommendations.
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7 Trouble shooting

In case of any abnormality of the sensor during its operation, refer to the following and act accordingly. If the issue persists, contact our sales representative (mentioned in the attached sheet).

Trouble case	Cause	Countermeasures
Device name is not displayed	Battery is dead.	Replace battery.
	The sensor is already connected two devices.	Check if there are any connected device around, and disconnect from the devices.
The screen does not appear even if the vibration sensor is tapped on the device list.	Application fails screen transition.	Tap “update” to refresh the screen. After updating, tap the vibration sensor.
Sudden failure to update the measurement data during communication	Communication distance is larger than specified.	Bring it closer to the sensor.
	Poor signal reception environment.	Bring it closer to the sensor. Reduce the number of surrounding wireless devices.
	Abnormal stop of Sensor.	Reinsert or replace battery.
Sudden disconnection of the sensor.	Communication distance is larger than specified.	Bring it closer to the sensor.
	Poor signal reception environment.	Bring it closer to the sensor.
	Bring it closer to the sensor.	Reduce the number of surrounding wireless devices.

	Warning If any malfunction, remove the battery immediately and contact us for inspection and repairing. Incorrect handling may cause an accident.	
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8 Warranty

In case of trouble, please contact EBARA Corporation, EBARA Group Company or authorized distributors/dealers for repair or maintenance.

Note	Please dispose unnecessary parts and packing materials according to the rules and regulations.
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If you have any enquiries, please feel free to contact us.