



HIGH FREQUENCY 48V SERIES SPIRAL VIBRATOR OPERATION MANUAL



HBM40AXS • 40AXS-R

HBM50AXS • 50AXS-R

EXEN CORPORATION

☆ SAFETY PRECAUTIONS

- ☆ This product is a vibrator for compacting concrete. Do not use the vibrator for any other purpose.
- ☆ Be sure to read and understand this operation manual carefully before using the product so that it can be operated safely and efficiently. Improper machine use may result in injury or machine failure. Keep this manual for further reference.
Also, read the operation manual of power supply equipment carefully.
- ☆ The following symbols are DANGER, WARNING, and CAUTION instruction for the use of this product so that the product will not cause harm or damage to users or others.



DANGER

【DANGER】 indicates an imminent dangerous situation which may lead to death or serious injury.



WARNING

【WARNING】 refers to a hazard that may cause death or serious injury.



CAUTION

【CAUTION】 refers to a hazard that may cause minor or moderate injury.



(To prevent death)

- ⚠ Never use this product with a commercial power supply.
Using commercial power supply could burn the motor, break the insulation and thus causing electric shock.
- ⚠ This product should be always used with a power supply (inverter and generator) with ground fault circuit interrupter for preventing electric shock.



(To prevent injury or damages)

- ⚠ The business operator making use of this concrete vibrator has to manage working hours and must make efforts to prevent worker's health impairment comes from vibration.
Refer to the "Vibration total value" (page 18) section for the details about the vibration strength of the vibrator.
Observe the relevant legal requirements and guidelines of the country where the vibrator is used.
- ⚠ Do not operate the head assembly in the air.
When operating it in the air, the vibrator reaches 100°C or higher in a few minutes, and you may get burned upon touching it.
- ⚠ The head assembly becomes hot during operation. After use, be careful not to touch it.
There is a risk of being burned.
- ⚠ When using the vibrator near feet or in places that are not very deep, concrete may be splattered around. Use face protection (safety glasses and mask) to protect your eyes and mouth. Please wear hearing protector when working in noisy places.



Wear face protector



Wear hearing protection

- ⚠ Do not swing the head assembly by holding the hose or cable. There is a possibility that this could cause injury or damages to objects nearby.

○ INTRODUCTION

Thank you for purchasing this high frequency 48V spiral vibrator.

Be sure to read this operation manual before use.

Be sure to read and understand this operation manual carefully before using the product until it can be operated safely and efficiently. Handle and maintain it appropriately for safety operation.

Keep this manual for further reference.

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○ SAFETY



(For personal protection during operation)

- Put on a safety helmet, anti-vibration gloves, safety boots, hearing protection, face protection (safety glasses and mask), and safety harness before using the vibrator.



Safety helmet



Anti-vibration gloves



Safety boots



Hearing protection



Face protector



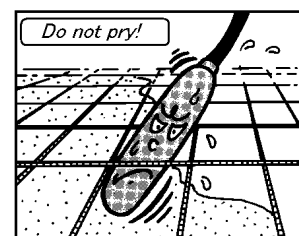
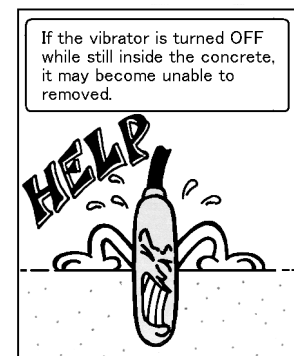
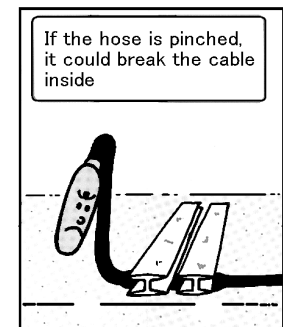
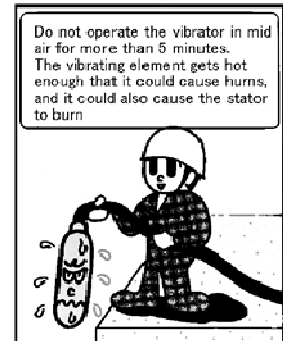
Safety harness

- Since this product has a long hose, there is a risk of injury by stumbling or making a false step if the hose gets caught on rebar during work or moving, or movement is limited by putting something on the hose. Also, if the product is left in an area where people pass by when work is suspended, it may catch someone's foot and cause someone to fall or be injured. Be careful when handling hoses and cables.
- Ensure a footboard is placed when work on bad footing area such as on a rebar.
- If the product stops suddenly, turn the power switch "OFF" and remove the plug from the power supply equipment.
If not, the cable could burn causing damage to the power supply equipment.



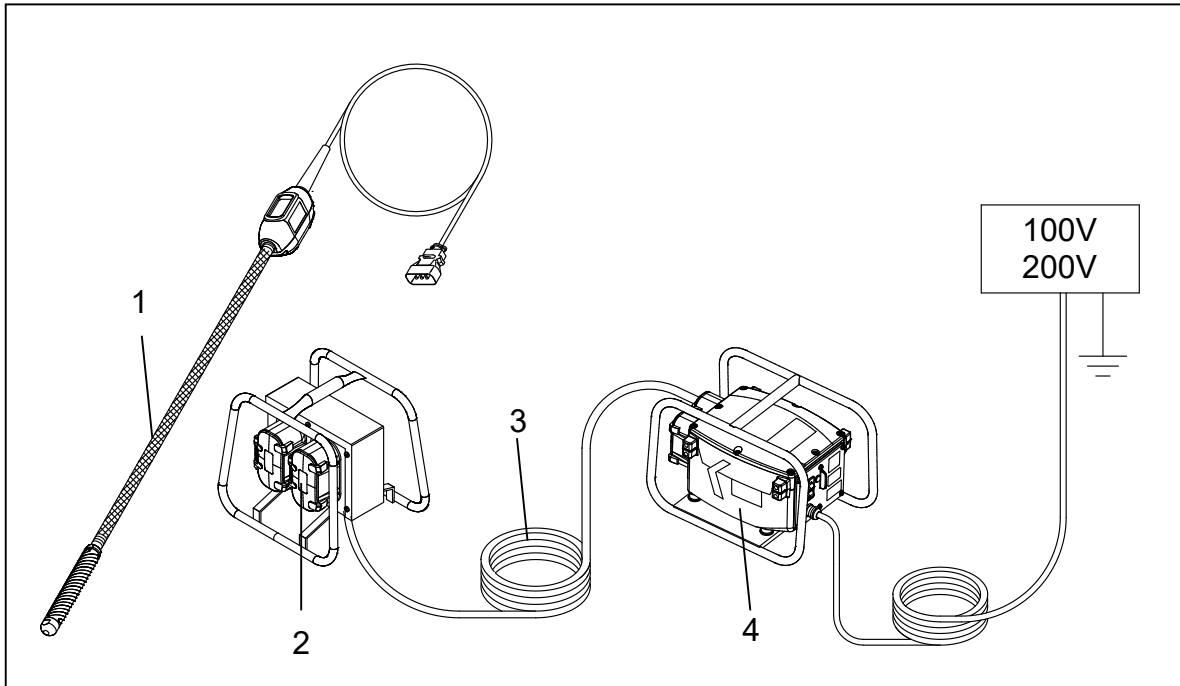
(For longer service life)

- The head assembly of this product is cooled by insertion into ready-mixed concrete. Thus, do not use it outside the ready-mixed concrete (i.e. in the air). There is a possibility that the motor could burn out.
- Do not place or drop any heavy objects on the cable or hose. It may damage the cable and cause a malfunction.
- The power switch should be turned "ON/OFF" only when the head assembly is not inserted in the ready-mixed concrete. If the power is turned "OFF" while the vibrator is in the ready-mixed concrete, you may not be able to remove the head assembly. Forcibly pulling it out may cause injury.
- Do not pry or twist the vibrator among the rebar or the formwork with the head assembly. Otherwise the head assembly may become abraded and burns the motor.



- The head assembly of this product should not be operated on hard surfaces such as hardened concrete or steel plate. There is a possibility that the bearings could burn, and the rotor could break.
- Do not pull or suspend the cable from anything when placing concrete or moving. Otherwise, the plug may come off or the cable may be damaged, causing malfunction.
- In order that the plug terminals always make good contact, remove any dirt or rust from them before inserting the plug into the outlet.
Poor plug contact is one of the main causes of the motor burning.
- If the vibrator is to be used at a location separated from the power supply equipment, an extension cable should be used.
Refer to Table-1 (page 7) for details about the size of the extension cable and the operable length.
- The number of usable units varies with the capacity of the power supply equipment (inverter and generator.) Refer to "NUMBER OF VIBRATOR UNITS THAT CAN USE" to avoid overloading.

○ SELECTING AN EXTENSION CABLE



▶ 1. Vibrator 2. Option 3. Extension cable 4. Power supply equipment

Table-1

(Unit : m)

Model	Cable size				
	3.5mm ²	5.5mm ²	8.0mm ²	14mm ²	22mm ²
HBM40AXS/-R	60	100	140	250	400
HBM50AXS/-R	30	60	80	150	200

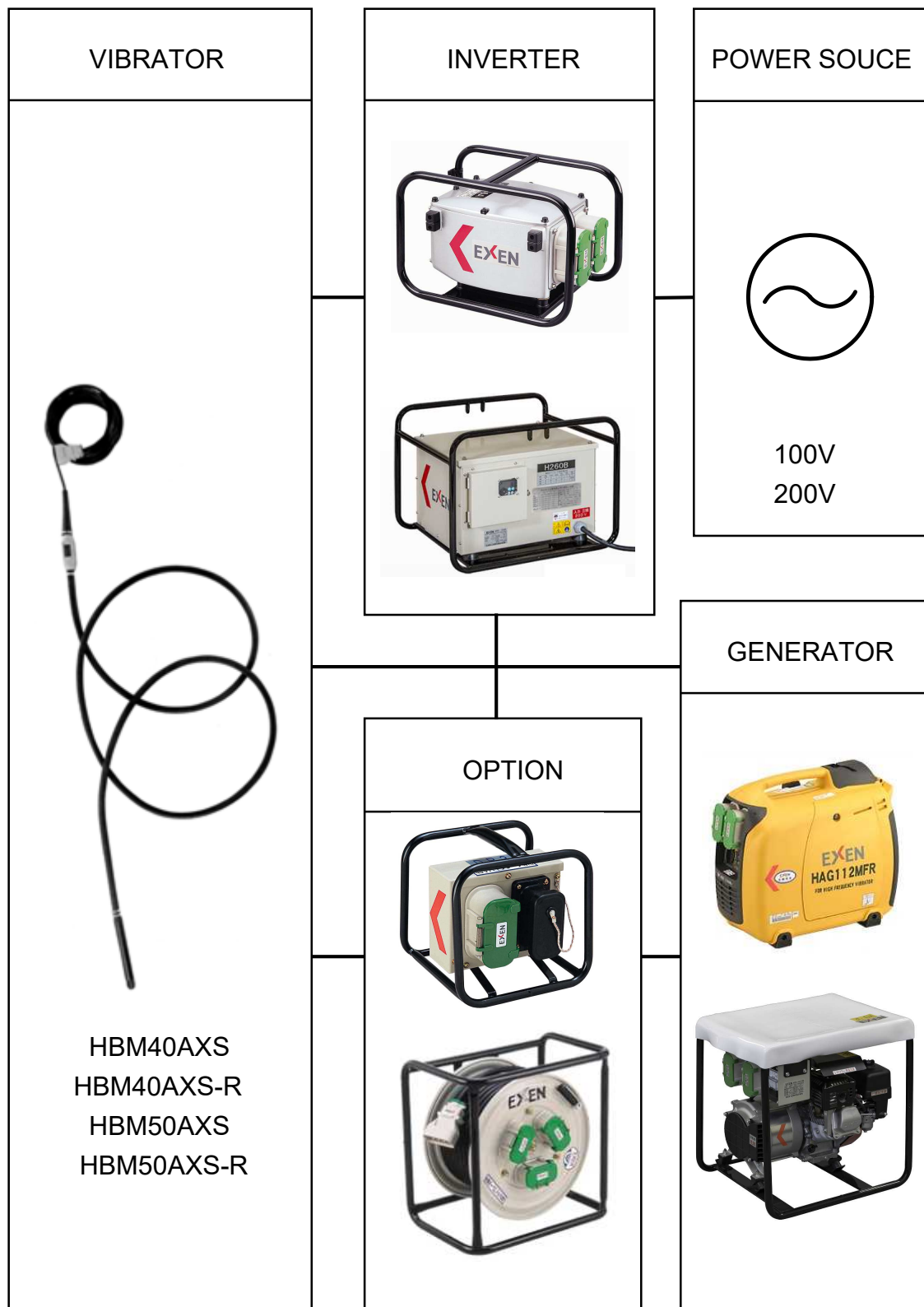
○ NUMBER OF VIBRATOR UNITS THAT CAN USE

Table-2

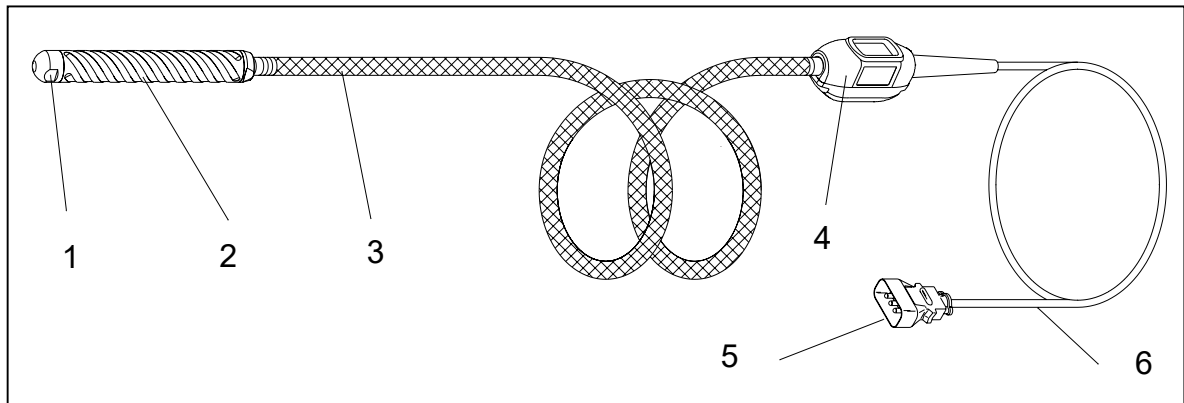
Model		HBM (Inner vibrator)	
		ϕ 40	ϕ 50
Inverter	HC111B (RC)	1	1
	HC113B	2	1
	HC116B	3	2
	HC230A/B	6 (5)	4 (3)
	H260B	13 (12)	8 (6)
Generator	HAG112MF HAG112MFR	2	1
	HAG122MF HAG122MH	4	2
	HAG136MF HAG134MHA	7 (6)	4 (3)

Note : The values in the parentheses () in the table are estimates of the number of vibrator that can be used when the vibrators are simultaneously and continuously used under overload conditions.

○ SYSTEM CONFIGURATION



○ NAMES OF PARTS



1	Vibrator cap	4	Three pole double throw switch
2	Head assembly	5	Plug
3	Hose	6	Cable

Note : For AXS, the type of vibrator cap is a round.

Note : For AXS-R, vibrator cap is with rubber.

○ PRODUCT FEATURE AND ROTATIONAL DIRECTION CHECK

This product can control the rotation direction of the motor by switching the phase of the three-phase induction motor with three pole double throw (three position rocker) switch (ON, OFF, ON).

For this reason, it is a new concrete vibrator that you can select different vibration propagation by switching the rotation direction according to the concrete conditions.

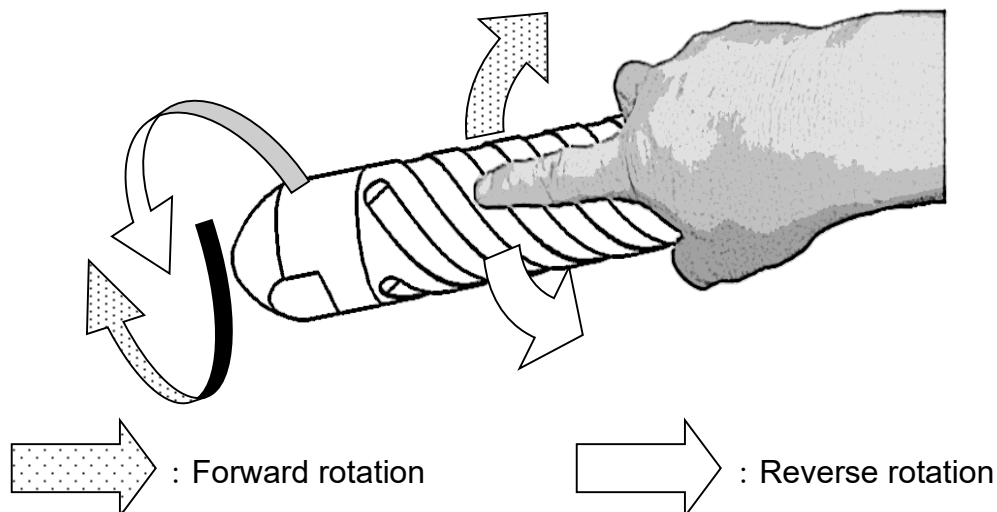
In order to operate this product efficiently on site, it is recommended to recognize the rotation direction of the motor that which switch position is forward or reverse.

Next, we will explain how to check the rotation direction.

■ How to check the rotation direction

As shown in the figure, hold the head assembly gently with hands and start operation of the concrete vibrator.

Then, if you move the index finger to the right, it will become "**forward rotation**". If the left, it becomes "**reverse rotation**".



Note : The concrete vibrator has a built-in three-phase induction motor.

As one of the features, changing the phase switches the rotation direction of the motor.

For this reason, changing the EP plug (outlet) changes the rotational direction.

○ OPERATIONS

- The vibrator can be safely and comfortably operated if one person operates the head assembly and another person operates the "ON/OFF" switch.

1. Make sure that the vibrator switch is "OFF".

2. Start the power supply equipment.

Note : Read the operation manual for operation of the power supply equipment unit.

3. Insert the vibrator plug into the power outlet on the power supply equipment.

4. Make sure that the clips on the cover of the outlet case are securely fastened to the plug, so that it can come out.

5. Hold the vibrator hose so that the head assembly is suspended.

6. After preparation has been completed (by sending a sign to the person operating the switch), turn the vibrator switch "ON".

Note : Hold the hose at where vibration transmission is small.

7. Check the rotational direction depending of the switch position.

Note : See "PRODUCT FEATURE AND ROTATIONAL DIRECTION CHECK"

8. Insert the vibrator perpendicularly into the concrete at a pitch in the effective compacting range.

Note : The effective compacting range for the vibrator is an area that has a diameter approximately 10 times the diameter of the head assembly.

9. After the vibrator has been inserted into the concrete as far as it will go, operate it until the mortar uniformly comes to the surface and has a luster to it, then move on to the next location.

Note : Placing the vibrator at one point for a long time may cause aggregate separation.

Note : Fill coarse aggregate uniformly. If coarse aggregate separation occurs during concrete placement, refill coarse aggregate uniformly and apply vibration again.

Note : When applying vibration to slope, move vibrator lower to upper to avoid coarse aggregate or mortar separation.

10. When pulling up the vibrator, pull it up slowly so that no holes remain.

11. After work has been completed (by sending a sign to the person who operating the switch), turn the vibrator switch "OFF".

12. Remove the plug from power supply equipment.

Note : Unfasten the clips on the cover of the outlet case and remove the plug.

13. Turn "OFF" the power supply equipment.

○ CLEANING AFTER USE

○ After use, the vibrator should be cleaned well and then neatly bundled.

1. Remove concrete from the head assembly, hose, switch case, and cables before it hardens.
2. Remove any dust or concrete from the outlet on the power supply equipment and from the vibrator plug.
3. Wind up the hose and cable so that the loop diameter is about 50 cm, and then tie it in two or three places. This makes it easier to carry.

When carrying the hose and cable, place an arm through wound up loop and the hose and cable on the shoulder. So that both hands are free. It becomes easy to carry.

○ INSPECTION

- Before carrying the vibrator to the worksite and also after use, be sure to check the following. It will greatly help prevent problems during operation.
 - 1. Is there any wear, cracks, or loose components on the head assembly?
 - 2. Is there any wear, damage, or scratches on the hose?
 - 3. Is the switch case deformed or are any of the rubber parts broken?
 - 4. Are there any wear or cracks on the cable?
 - 5. Is there any dirt or rust on the plug terminals?
 - 6. Can the switch be turn "ON" and "OFF" properly?
 - 7. Is the insulation resistance value correct?
(DC500V, 20MΩ or more)
 - 8. Is the vibrator operation sound normal during operation?
(It is normal if there is regular and continuous sound.)

○ REPLACEMENT PERIOD FOR CONSUMABLES

○ Consumables should be replaced periodically according to the below table.

Consumables	Replacement period. (visual and auditory check)	Replacement frequency (in hours))
Head assembly	Determined wear status (visual)	300 - 500
Vibrator cap		
Bearing	Determined by the noise during operation (auditory)	400 - 500
Hose	Determined by wear or scratches (visual)	Upon found

Note : The above replacement time of consumable parts is a rough guide. Because it depends on usage, we recommend replacing consumables at earlier than the above.

○ TROUBLESHOOTING

Phenomenon	Sign	Cause	Solution
Vibrator operates	Noise (metallic or other noise)	Bearing abnormality (Rough, Worn)	Replace the bearings
	Low vibration	Stator abnormality	Replace the stator
Vibrator does not start	Humming noise	Open phase	Repair it
		Stator abnormality	Replace the stator
		Bearing abnormality (Locking/Broken)	Replace the bearings
	No sound	Burned stator	Replace the stator
		Broken cable	Repair or replace the cable

○ SPECIFICATIONS

■ Specification

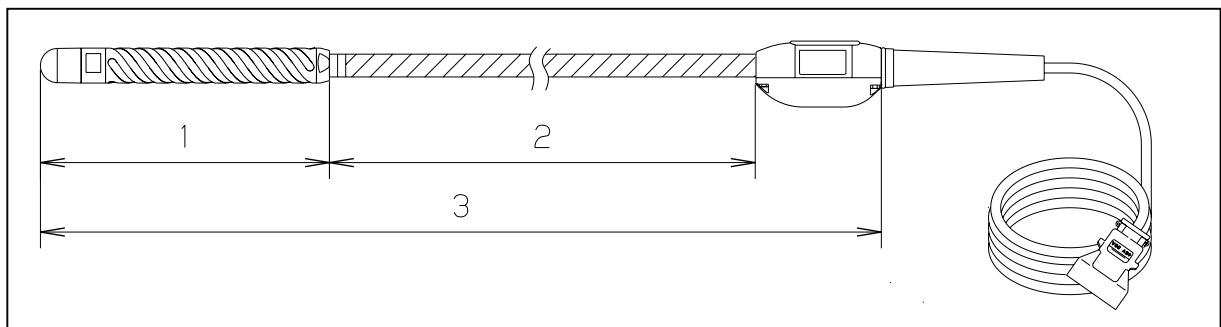
Model	Output (W)	Voltage (V)	Current (A)	Cycle (Hz)	Frequency (Hz)	Total length (mm)	Head Length Diameter x Length (mm)	Length of external hose Diameter x Length (mm)	Mass (kg)			
HBM40AXS	250	48	5.5	200/240	200/240	6,464	43×310	33×6000	11.7			
HBM40AXS-R						6,509	43×355		12.0			
HBM50AXS	400		9.0			6,514	52×360	36×6000	15.7			
HBM50AXS-R									6,554	52×400	16.0	
Note : External cable (15 m) is also included in the mass.												

■ Vibration total value

Model	Vibration total value (m/s ²)
HBM40AXS	3.4
HBM40AXS - R	Less than 2.5
HBM50AXS	5.8
HBM50AXS - R	3.1

Note : Vibration total value is a value that uses the measuring instrument based on ISO 5349-1, and it was measured by the method found in ISO 5349-2.

■ Dimension drawing



▶ 1. Head length 2. Hose length 3. Total length

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