



LOW FREQUENCY VIBRATION MOTOR OPERATION MANUAL



EKM1.1—2P · EKM1S—2P

EXEN CORPORATION

☆ SAFETY PRECAUTIONS

- ☆ This product is a vibration motor installed in a small vessel, a chute, and etc. The product should not be used for other intended use.
- ☆ 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.
- ☆ 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)

-  Do not use power supply that is not equipped with earth leakage circuit breaker to this product to prevent electric shock.
-  Be sure to connect the ground wire. Otherwise, you may get an electric shock.
-  When you install it in high places, provide an anti-drop measure. Falling object may cause injury or damage.
-  In the unlikely event that the product falls, be sure to replace it with new one even if there is no abnormality in the appearance of the fall prevention wire.



(To prevent injury or damages)

-  Be sure to operate this product within the voltage specified in the nameplate. Applying a higher voltage may cause burnout of the motor. Burnout may lead to breaking of the insulator thus, electric shock.
-  When using this product, measure the voltage on the secondary side of the power supply equipment and confirm that it is within the rated voltage $\pm 10\%$.
The voltage drop is influenced with the length and size of the cable or the electric wire. When use this product in the distance from the power supply facility, please supply electricity with as thick a short electric wire as possible.
-  This product vibrates.
Be sure to reinforce the installation location to prevent sympathetic vibration.
-  Sympathetic vibration may cause falling product by damaging installation parts and loosening or breaking bolts.
-  When carrying this product, please not have the cable and not hang it. There is a possibility of the cable falling out, and the main body falling and suffering the obstacle and damage.
-  Do not operate the product without the side covers. Otherwise, you may get injury.
-  Be careful to adjust the centrifugal force of the motor installed at tilted place enough so that the weight does not fall.

○ INTRODUCTION

Thank you for purchasing the low frequency vibration motor.

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, safety gloves, safety boots and safety harness, before installing the vibration motor.



Safety helmet



Safety gloves



Safety boots



Safety harness

- Be sure to gain footholds in a safe environment when installing this product.
- Do not connect the cable wrongly. The green wire (E) is the ground wire. A wrong connection may cause an electric shock.
- When checking this product, be sure to disconnect the cable from the power supply. If not, electric shock may occur.
- Be sure to wear a safety harness when installing and inspecting this product at a high place.
- This product reaches high temperature during operation. Be careful not to touch your hands or body carelessly.
- Do not operate the product without the side covers. It may cause a serious accident due to touching rotary parts.



(For longer service life)

- Be sure to install it firmly on the installation location to avoid sympathetic or irregular vibration when installing this product. resonance or irregular vibration may cause loosening bolts or damaging the installation part.
- This product incorporates waterproof structure (IEC Standards IP66 equivalent.) However, do not pour water on it intentionally and do not operate it in water.

IP code	Type	Definition
IP66	Dust-tight	No ingress of dust
	Protected against water jets	Water projected from a nozzle against the enclosure from any direction shall have no harmful effect

- This product is lightweight, please do not move the main body with the cable. It becomes a cause of disconnection.
- Depending on the use condition, the rated current may be exceeded. Since this product does not allow centrifugal force adjustment, do not exceed the rated current by reducing the load or by other means.
- It is recommended to use an over-current protective device in order to automatically protect vibration motor from over-current (larger than the rated current.)

Note : Set the current setting of the over-current protective device to the rated current value.

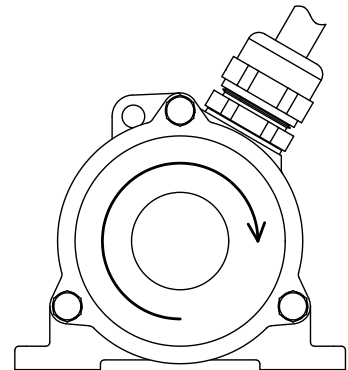
- Please do not use EKM1S-2P with an inverter. If it is used with an inverter, there is a possibility that the capacitor may be damaged.
- When use EKM1S-2P with a generator, use it with a single-phase power supply generator. The capacitor may be damaged if it is used with the single-phase power supply of the multipurpose generator.
- The operating ambient temperature for this product is -15 to 40°C. Using it out of this temperature range may cause an operation failure or breaking of an insulator.

○ INSTALLATION



When installing this product, be sure to disconnect the cable from the power. Otherwise, vibration motor starts suddenly and there is a possibility of causing an unexpected injury. When installing it at a high place, provide an anti-drop measure.

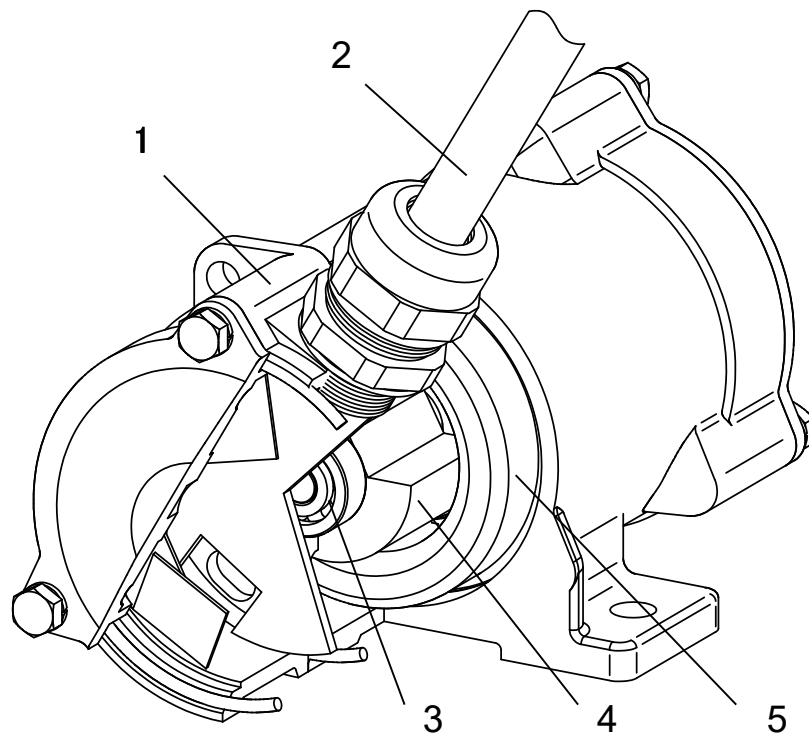
- Before installing this product, make sure the two installation positions machined flat where the motor feet contact. Otherwise, this product or other attached equipment may be damaged due to resonance or irregular vibration.
- When installing this product, be sure to secure it with bolts M6, flat washers, spring washers, and double nuts.
- Concerning the direction of rotation:
 - If EKM1.1-2P puts together red-and-white black of the cable, and RST and connects, it will turn clockwise, seeing the cable on right-hand side. (When change the rotation direction, please replace 1 phase and connect.)
 - EKM1S-2P turns only to a clockwise rotation.



- If this product is installed on a channel steel, be sure to use tapered washers. Otherwise, bolts may bend and break.
- The cable also vibrates during operation. Do not bend the cable at its outlet at a steep angle. If the cable is bent, the bend radius must be at least 55 mm or more.
- Keep the cable away from other machines or objects. Contacting objects causes abrasion or breaking due to vibration. In order to avoid abrasion or breaking, be sure to wrap spiral tube around the cable and secure it in a vibration-free place.
- Use the bolt M6 for mounting of the main unit. Refer to the "Tightening torque table" for the material and tightening torque.

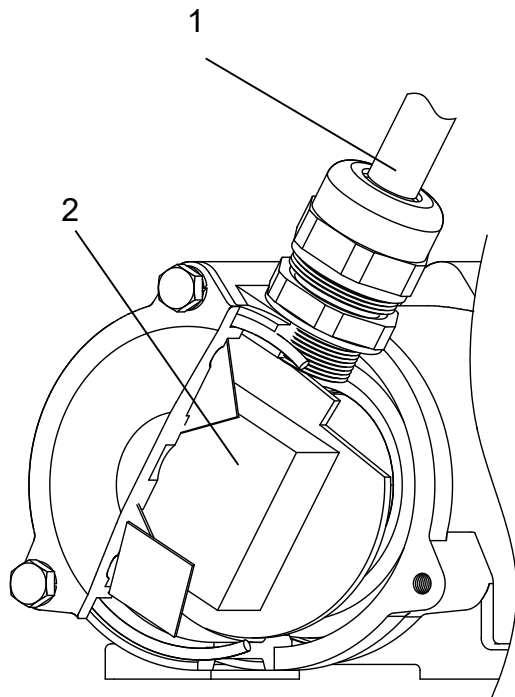
Mounting bolt size	Strength classification (Material)	Tightening torque (N·m)
2—M6	4.6 (SUS SS400)	3.7
	8.8 (S45C)	9.6
	10.9 (SCM435)	13.0

○ NAMES OF PARTS

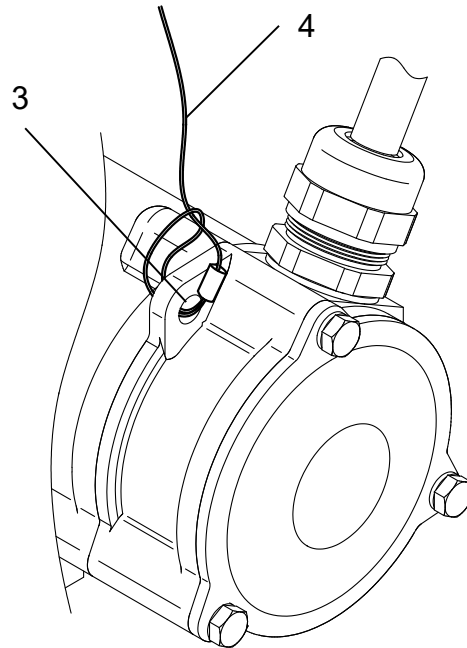


EKM1.1-2P

1	Terminal case	4	Eccentric weight
2	Cable (0.75sq X 4-1m)	5	Stator
3	Bearing	—	—



EKM1S-2P



Safety wire installation method

1	Cable (0.75sq X 3-1m)	3	Safety wire mounting hole (ϕ 5.8)
2	Condenser 2.5 μ F	4	Fall prevention wire

○ INSPECTION

- This product is operated under harsh conditions for the motor. Be sure to perform the following inspection in order to minimize troubles during operation.

 **After starting operation, you need to check tightening bolts and nuts and retighten them once a week. If any loose is not found then, subsequent retightening may be needed monthly.**

Inspection cycle	Inspection point/item	Inspection procedure and evaluation criteria
Daily	Current for load	Rated current is not exceeded
	Bearing sound/ Operation sound	There is no metallic clank nor abnormal noncontiguous sound
	Abnormal heat	Confirmation of operation current (Rated current is not exceeded)
Monthly	Installed condition	Looseness of bolts and nuts (Tighten them with specified torque)
	Cable damage	Visual inspection of abrasion and breaking
Annual	Insulated resistance	Measure with a megger. DC500V/10MΩ at minimum

○ TROUBLESHOOTING

Phenomenon	Cause	Solution
Motor does not Start	Disconnection of stator or cable	Confirmation of electrical connection or winding resistance, part replacement
		Disconnection in a connection part
	Damaged condenser (EKM1S-2P)	Condenser replacement after cause investigation
Protective device is activated	Wrong setting in protective device	Set to 100% of rated current
	Long start-up period	Improve installation environment (-15 to 40°C)
	Overload	Load Reduction
	Bearing failure	Replace the bearing
	Distortion of installation surface	Cancellation of installation surface distortion (correction of level)
Abnormal heat of main unit	Breakage of bearing or lack of lubrication	Replace the bearing
	Disconnection of stator or cable	Check for continuity and winding resistance, Parts change
	Too high ambient temperature	Improve installation environment (-15 to 40°C)

○ SPECIFICATIONS

■ SPECIFICATIONS

Model	Output (W)	Voltage (V)	Frequency (Hz)	Current (A)	Vibration frequency (Hz)	Centrifugal force (kN)	Condenser (μF)	Mounting bolts	Protection class	Mass (kg)
EKM1.1-2P	11	3 ϕ 200	50	0.12	46.5	0.07	—	2-M6	IP66	2.0
			60	0.11	56.7	0.11				
		3 ϕ 220	60	0.12	57.0					
		3 ϕ 380	50	0.05	45.5	0.07				
		3 ϕ 400	50	0.06	46.2	0.07				
			60	0.05	55.5	0.11				
		3 ϕ 415	50	0.06	46.5	0.07				
		3 ϕ 440	60	0.05	56.2	0.11				
EKM1S-2P	10	1 ϕ 100	50	0.26	46.5	0.05	2.5 (250V)	2-M6	IP66	1.8
			60	0.21	56.9	0.07				
		1 ϕ 115	60	0.23	57.8					

Note : Mass of the cable 1m is also included.

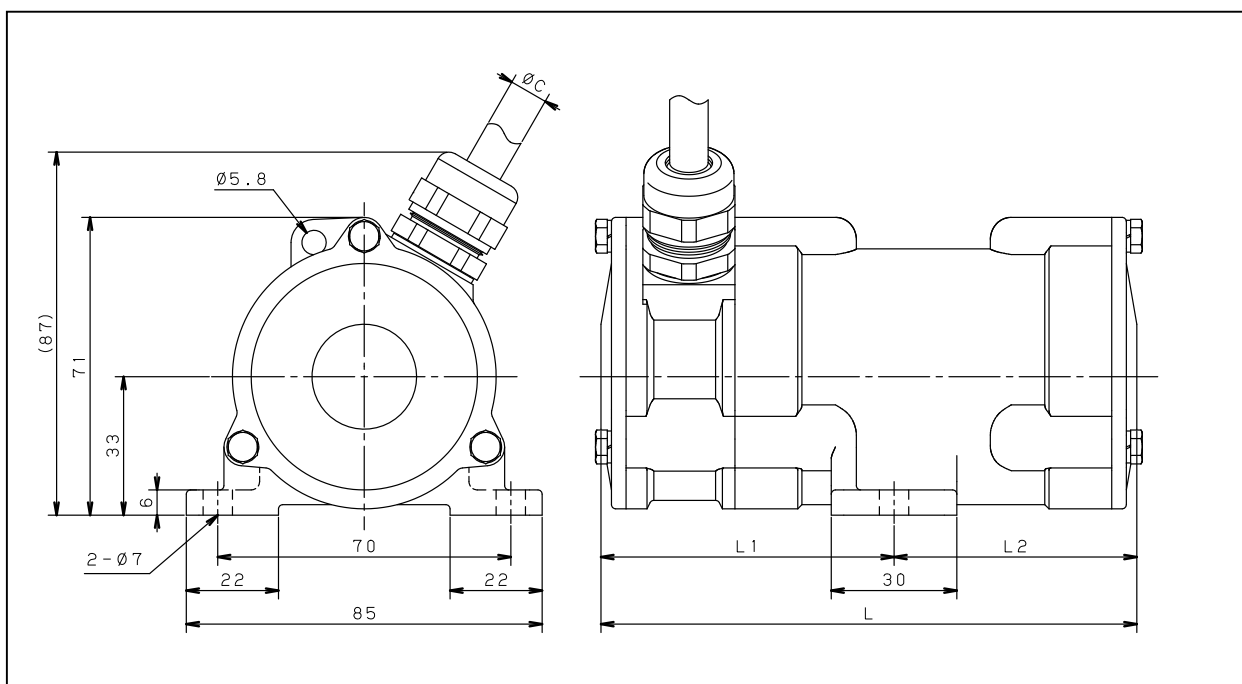
Note : Centrifugal force is fixation because angle adjustment of weight is not available.

■ Dimension

Unit : mm

Model	L1	L2	L	ϕ C
EKM1.1-2P	70	58	128	9.9
EKM1S-2P	61	49	110	9.2

■ Dimension drawing



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