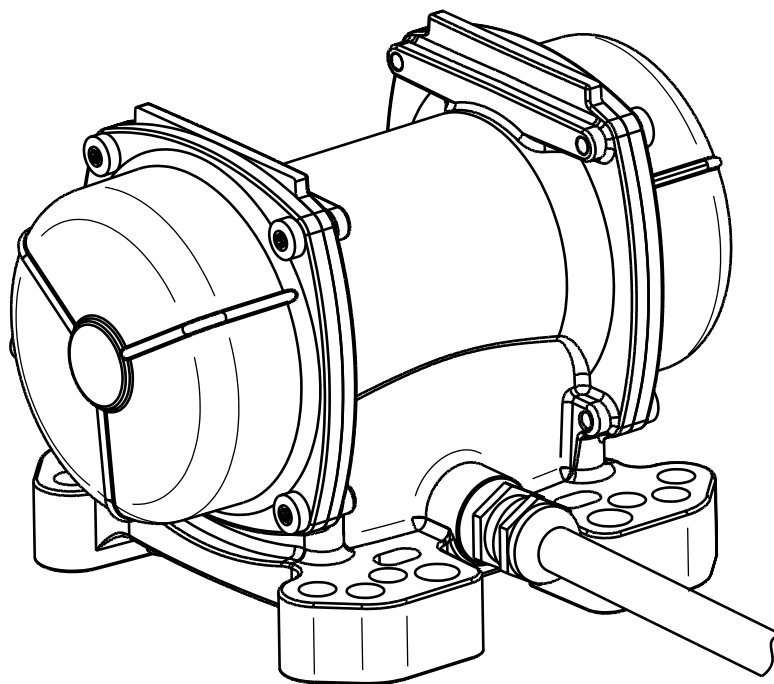




DC POWER SUPPLY VIBRATION MOTOR EVCC DC24V SERIES OPERATION MANUAL



EVCC 3-100 / 200

EXEN CORPORATION

☆ SAFETY PRECAUTIONS

- ☆ This product is a vibration motor to be mounted to general industrial equipment etc. Do not use the vibration motor 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.
- ☆ 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.

 WARNING

(To prevent death)

-  Please do not use this product in explosive or corrosive environments, in the presence of flammable gases, locations subjected to splashing water, or near combustibles. Otherwise, it may cause a fire or injury.
-  Do not disassemble or modify the motor and drive board. It may cause injury.
-  Be sure to keep the input voltage within the rated range. If not, it may cause a fire.
-  Please turn off the power during blackout. Otherwise, at the time of power recovery, a motor may start suddenly and it may cause injury and machine damage.
-  When you install it in high places, provide an anti-drop measure. Falling object may cause injury or damage.
-  In case of falling object, be sure to replace a wire for preventing drop even if there is no abnormality in appearance.

 CAUTION

(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.
-  This product vibrates.
When installing this product, select a position that does not resonate and install it securely.
-  Sympathetic vibration may cause falling product by damaging installation parts and loosening or breaking bolts.
-  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.
-  Do not touch the motor directly for a while after driving or stopping operation. The high temperature of the motor surface causes burn.

○ INTRODUCTION

Thank you for purchasing the DC power supply 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 the product 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.
- 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.
- When adjusting eccentric weights, please turn off the power in advance. Otherwise, it may cause injury.
- When transporting this product, check its mass and use a hoisting attachment with a load rating of more than or equal to the mass. Otherwise, you may get injury by falling vibration motor.



(For longer service life)

- Be sure to install it firmly on the installation location to avoid sympathetic or irregular vibration when installing this product. Sympathetic 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

- When transferring or loading this product into the back of a car, lift the motor with both hands. Do not hang or pull this product by the cable. The cable may be damaged.
- Depending on the use condition, the rated current may be exceeded. In this case, adjust the eccentric weight angle (to lower the centrifugal force) so that the rated current is not exceeded.
- The operating ambient temperature for this product is 0 to 40°C. Using it out of this temperature range may cause an operation failure or breaking of an insulator.
- When abnormalities occur, please stop operation immediately. Otherwise, it may cause a fire, an electric shock, or injury.

○ INSTALLATION



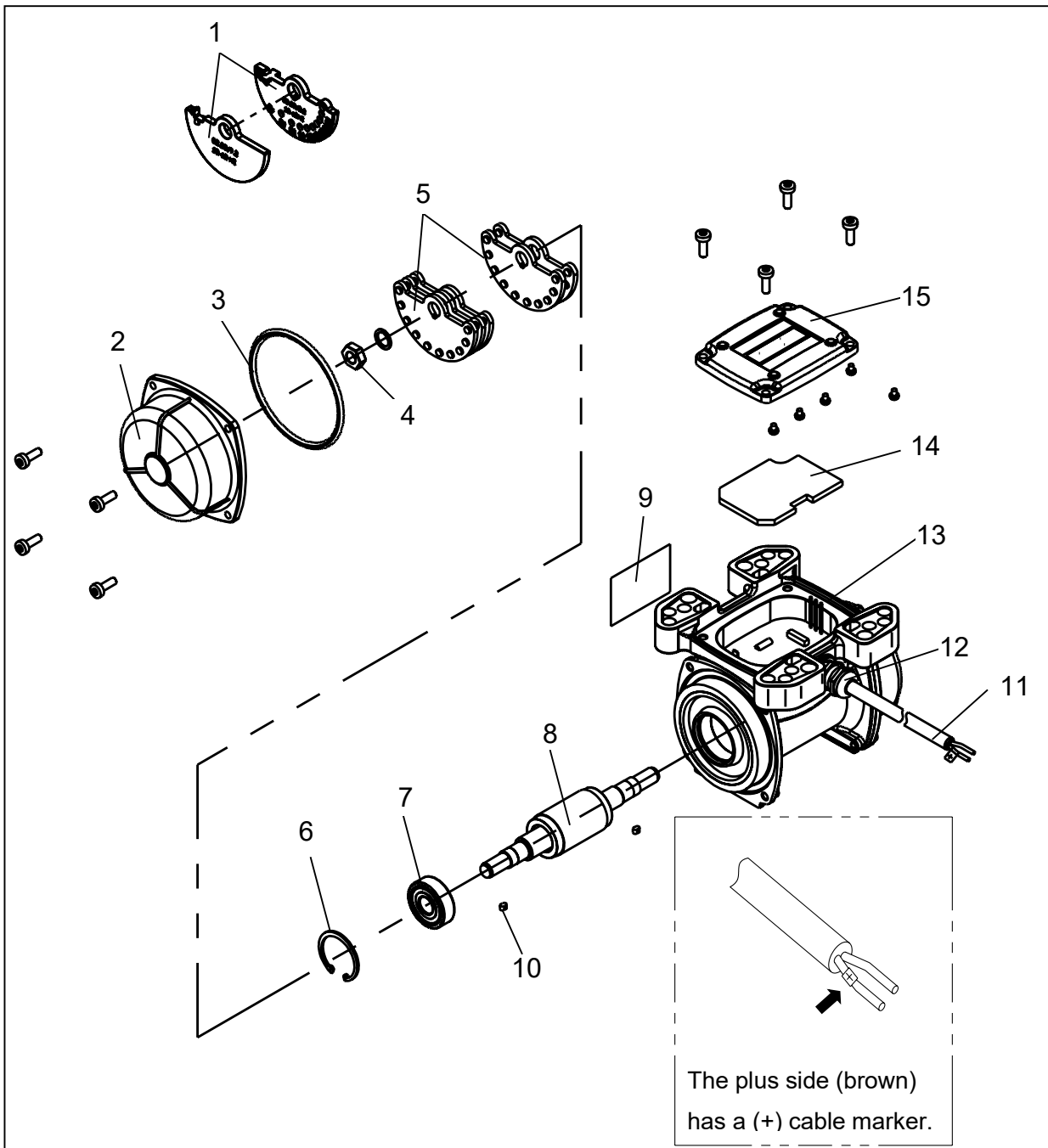
When installing this product, be sure to disconnect the cable from the power. Otherwise, vibration motor starts suddenly and there is a possibility of causing an unexpected injury. When installing it at a high place, provide an anti-drop measure.

- Before installing this product, make sure the four installation positions machined flat where the motor feet contact. Otherwise, this product or other attached equipment may be damaged due to sympathetic or irregular vibration.
- Please do not put combustibles near the circumference of a motor. Otherwise, it causes a fire or a burn.
- While driving the motor, make sure to attach the cover. Operation without the covers may cause injury.
- When installing this product, be sure to secure it with high-tensile strength bolts, flat washers, spring washers, and double nuts.
- Only one loose bolt may cause an unexpected accident due to falling of the motor or breaking of the motor.
- 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 75 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.
- For the size of attaching bolts and the tightening torque, see the "Tightening torque Table" below.

■ Tightening torque table High-tensile strength bolt (Strength type 10.9)

Bolt size	M8	M10	M12
Tightening torque (N·m)	31	62	109

○ NAMES OF PARTS



1	Casting weights	8	Rotor
2	Side cover	9	Nameplate
3	O-ring	10	Key
4	Fixing nut	11	Cable
5	Plate-type eccentric weights	12	Cable gland nut
6	Snap ring	13	Motor case
7	Bearing	14	Packing

○ ADJUSTING CENTRIFUGAL FORCE OF ECCENTRIC WEIGHT

⚠ **Before adjusting the centrifugal force of the weights, be sure to disconnect the cable from the power socket. Otherwise, you may get an electric shock due to unexpected movement.**

- If sympathetic vibration occurs in the main unit or the rated current is exceeded, adjust the centrifugal force by the weight angle.
- Loosen the fixing nut and adjust the centrifugal force by sliding the adjustment weight (outer.)
- Make sure to check that the weight angles (direction of the eccentric weight) on both sides of the main body are symmetrical.

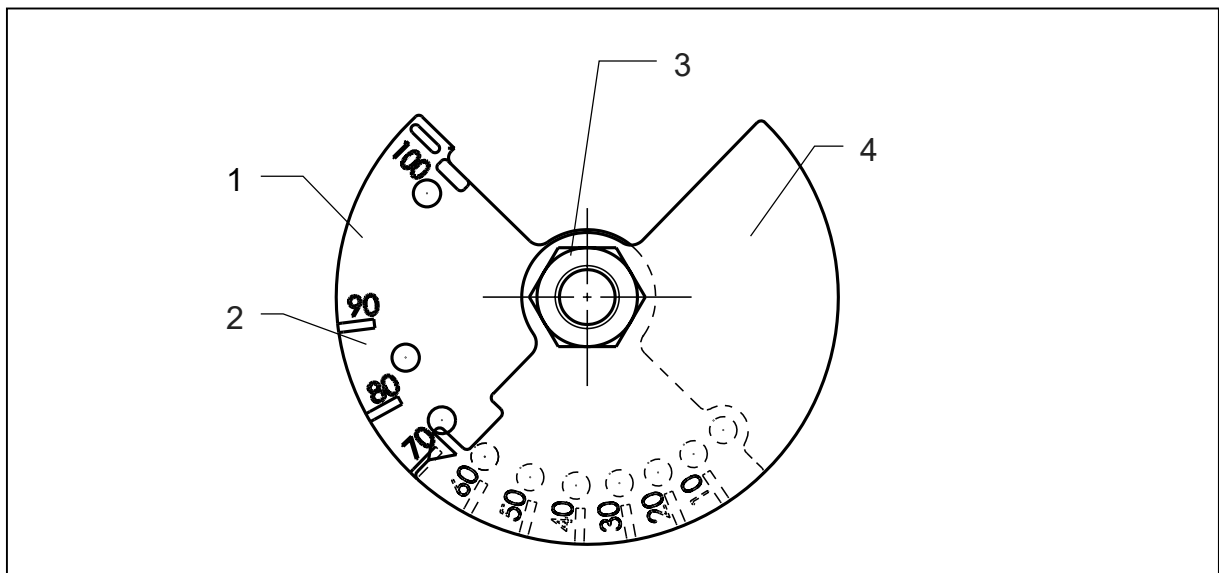
■ Casting weight with a scale attachment.

1. Slide the adjustment weight according to the scale number on the fixed weight and fix it with a fixing nut.

Fixed weight: M13 P1

Tightening torque: 30 N·m

2. At the time of factory shipment, the product is adjusted to the specified position shown below (at 70% on the scale.)



▶ 1. Fixed weight (Inner) 2. Scale 3. Fixing nut 4. Adjustment weight (Outer)

■ Correspondence of centrifugal efficiency between weight angle and frequency

Weight scale (%)	100	90	80	70	60	50	40	30	20	10	0
	Maximum centrifugal contrast efficiency (%)										
	100	90	80	70	60	50	40	30	20	10	0

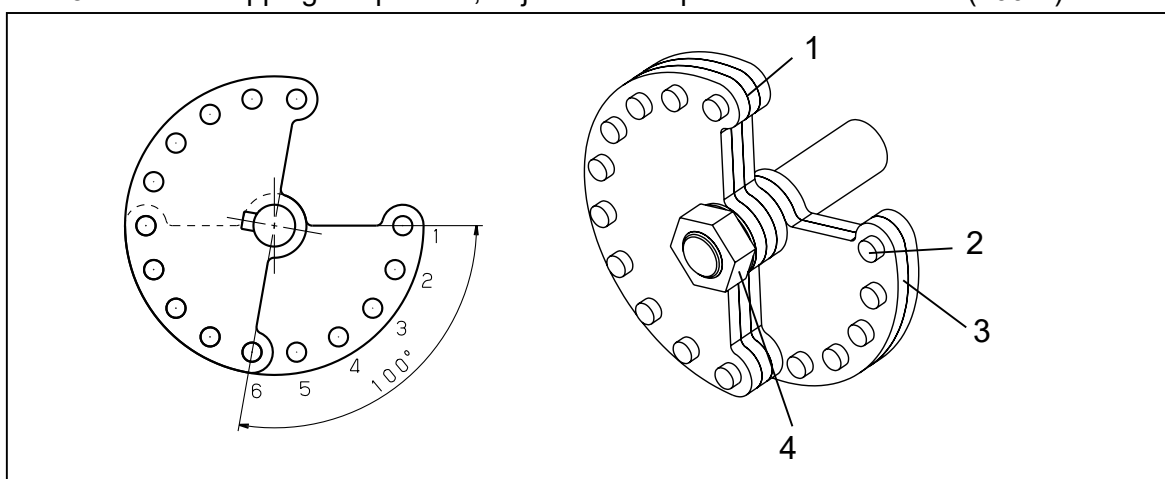
【Position at the factory shipment】

■ Plate-type eccentric weights

1. If the adjustment weight is more than one, adjust all of them at the same angle.
2. Align the concavity of the adjustment weight with the convex portion of the fixed weight and fix with the fixing nut.

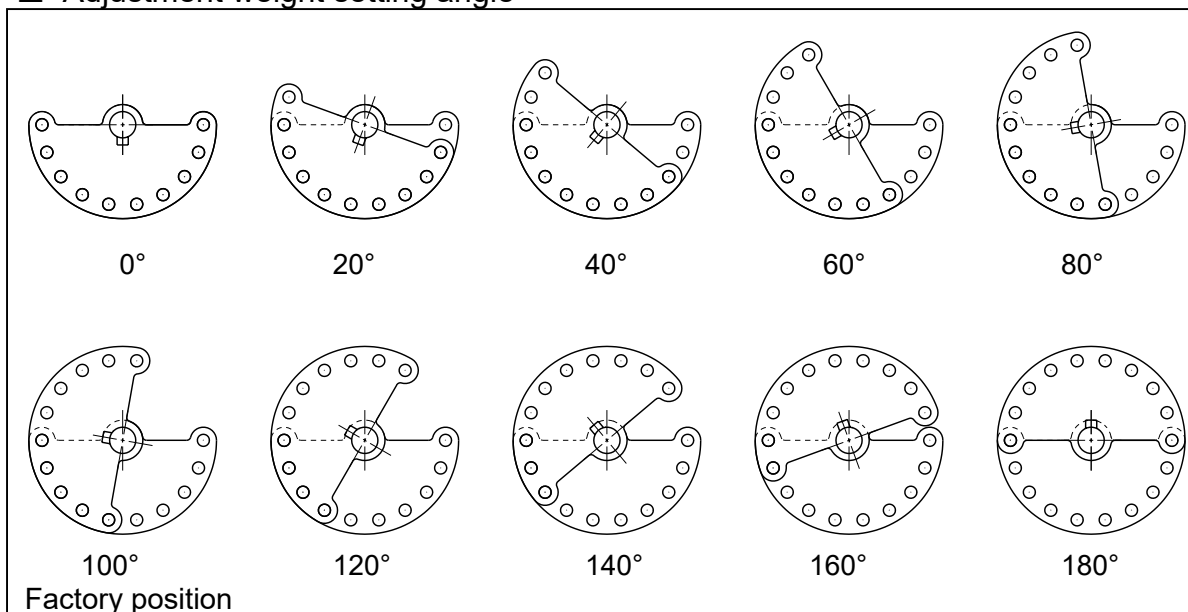
Tightening torque: 30 N·m

3. When shipping the product, adjust it to the position shown below (100 °.)



- ▶ 1. Adjustment weight 2. Fixed weight protrusion 3. Fixed weight 4. Fixing nut

■ Adjustment weight setting angle



■ Correspondence of centrifugal efficiency between weight angle and frequency

EVCC	Weight QTY Adjustment/ Fixed	Weight angle / Maximum centrifugal contrast efficiency (%)									
		0°	20°	40°	60°	80°	100°	120°	140°	160°	180°
3-100	1/2	100	99.0	95.0	88.0	80.0	69.0	58.0	47.0	37.0	33.0
3-200	3/2	100	99.0	94.0	87.0	78.0	66.0	53.0	39.0	26.0	20.0

【Position at the factory shipment】

○ HOW TO REPLACE BEARINGS



Before replacing the bearings, be sure to disconnect the cable from the power socket, remove the motor from the installation part, and place it on a workbench for task. Otherwise, you may get an electric shock or injury.

- Replacement and maintenance procedures for bearings vary depending on bearing type and motor model. Also, bearing replacement, a "Bearing replacement manual" is available.

■ Bearing replacement cycle

If abnormal heat, abnormal sound such as metallic clank, or increase of the current value occurs during operation, there can be something wrong with bearings. Dismount the cases from the main unit to replace the bearings.

Bearing replacement cycle (reference): 5,000 hours

Note : The replacement cycle depends on the usage conditions such as weight angle and environment around the machine.

○ 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.

- It takes about 5 seconds from turning on the power to operation start.

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
Monthly	Installed condition	Looseness of bolts and nuts (Tighten them with specified torque)
	Cable damage	Visual inspection of abrasion and breaking

○ TROUBLESHOOTING

Phenomenon	Cause	Solution
Motor does not start	Disconnection of connecting part	Replacement of a stator or cable
	Difference in wiring	Opposite insert direction of plus and minus
	Insufficient battery voltage	Secure 24VDC
Protective device is activated	Wrong setting in protective device	Set to the rated current
	Poor installation	Tighten bolts. Elimination of installation surface distortion
	Overload	Reduce load or adjusting centrifugal force
	Bearing failure	Replace the bearing
	Distortion of installation surface	Correct distortion
	Improper fitting	Replace the bearings or bearing cases
Abnormal heat of main unit	Damage or lack of lubrication	Replace the bearing
	Too high ambient temperature	Improve installation environment (0 to 40°C)
Vibration is weak	Unbalance of left and right weights	Balance the angles (bilateral symmetry.)

○ SPECIFICATION

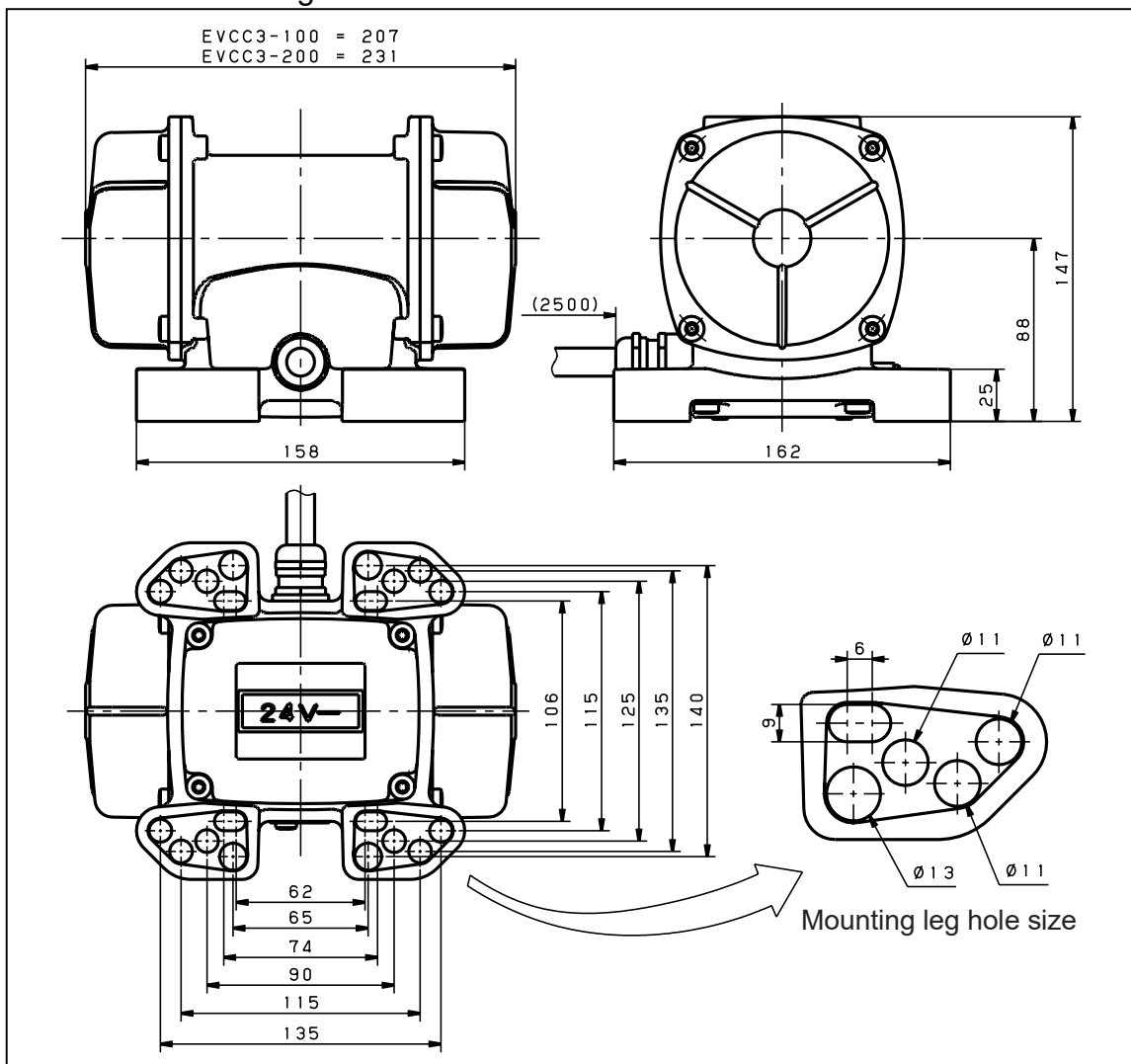
■ Specification

Model	Voltage (V)	Output (W)	Current (A)	Frequency (Hz)	Maximum centrifugal force (kN)	Mass (kg)
EVCC 3-100	DC 24	116	4.0	50	1.19	6.1
EVCC 3-200	DC 24	116	4.0	50	2.07	6.7

Note : This product has polarity. Connect the brown wire to the plus (+) side.

Note : It takes about 5 seconds from turning on the power to operation start.

■ Dimension drawing



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