INSTRUCTION MANUAL

for

URAS VIBRATOR

for Three-Phase KEE Series Vibrators
and Single-Phase SEE Series Vibratos

KEE-0.5-2CW	to	KEE-10-2CW	(2 pole models)
KEE-1.5-4BW	to	KEE-12-4CW	(4 pole models)
KEE-3-6BW	to	KEE-18-6CW	(6 pole models)
KEE-5-8BW	to	KEE-20-8BW	(8 pole models)
		And	
SEE-0.5-2CW	to	SEE-3.5-2CW	(2 pole models)

Please furnish this manual to the END-Users

Manufacturer

MURAKAMI SEIKI MFG. CO., LTD.

Sole Agent

URAS TECHNO CO., LTD.

TO OUR CUSTOMER

We thank you for your selection of our Uras Vibrator.
This is a rotary type electric vibrator which produces vibrations by means of centrifugal force of the rotating unbalance weights mounted at both ends of the rotor shaft. The Vibrator is basically different from an ordinary electric motor.

As special care has been taken by the manufacturer in the manufacturing process, the Vibrator should be capable of satisfactory, efficient operation when it is properly used. This manual has been prepared in order to give you sufficient awareness of the vibrators installation, handling, adjustment and maintenance, because without such awareness the vibrator will not be able to perform at its full potential and also its service life will be shortened. During storage,make the following inspection and maintenance every 5 months.

- The Vibrator should be hand-rotated a number of times to prevent the bearings from rusting. If power is available, running it for about 5 minutes with no load is preferable.
- Check coil insulation resistance. 3 MΩ or above is satisfactory. Please read this manual thoroughly before you use the Vibrator.

Thank you

Manufacturer:
MURAKAMI SEIKI MFG. CO., LTD.
—Kitakyushu, Japan

Sole Agent:
URAS TECHNO CO., LTD.
—Kitakyushu, Japan

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Installation and Operating Environment

Ambient(including installation base)temperature : -15℃ to +40℃

Altitude : 1,000 m max.

Relative humidity : 85% max with no condensation

Removal notice

Take care not to catch or pull on the cable or cable gland when removing the Uras Vibrator from it's packaging, as it may be damaged.

1. Receiving

This unit has been put through severe testing at the factory before being shipred.

- Its nameplate rating meets your requirements.
- It has sustained without damage in the transit.
- Fastening bolts and screws are not loosened
- Connect the unit to power, with reference to section 4-3, “Wiring”, in this manual and make a test run to see if it properly starts, runs and stops.

If any part of the unit is damaged or lost, or any defective conditions are found, notify us giving full details and nameplate data.

2. Storage

When Uras Vibrator is not installed immediately, it shall be stored in a clean, dry, indoor place.

If the Uras Vibrator must be stored outdoors, it should be loosely covered with a tarpaulin, plastic cover or similar type of protective cloth to protect it from any precipitation, liquid, dirt, etc.

When the motor-driven vibrator must be stored for a long period of time (up to 2 years at most), ensure that the storage area is at ambient temperature (not less than +5℃) with a relative humidity of not more than 60%.

3. Construction

The grease-lubricated Uras series of vibrators are classified into four types on the basis of vibrating force. Table 1 lists the drawings to be referred to for each type of Uras vibrator.

Table 1

Type	Max. vibrating Force N (kgf)	Motor power [kW]	Full-load current 50/60Hz [A]	Protection	Drawing
KEE-0.5-2CW	500 (50)	40W	0.36/0.30	IP66	Fig.1
-1-2CW	1000 (100)	75W	0.59/0.48		
-2-2CW	2000 (200)	0.15	0.79/0.71		
-3.5-2CW	3500 (350)	0.25	1.4/1.2		Fig.2
-6-2CW	6000 (600)	0.40	1.7/1.7		
-10-2CW	10000 (1000)	0.75	3.1/3.0	IP55	Fig.3
KEE-1.5-4BW	1500 (150)	65W	0.68/0.57	IP66	Fig.2
-3-4CW	3000 (300)	0.13	1.2/0.89		Fig.4
-6-4CW	6000 (600)	0.25	1.6/1.4		
-9-4CW	9000 (900)	0.40	2.2/1.9		
-12-4CW	12000 (1200)	0.60	2.8/2.7		Fig.5
KEE-3-6BW	3000 (300)	0.20	1.5/1.3	IP66	Fig.4
-5-6BW	5000 (500)	0.35	2.3/2.0		
-9-6CW	9000 (900)	0.60	3.8/3.3		Fig.5
-13-6CW	13000 (1300)	0.85	4.7/4.3		
-18-6CW	18000 (1800)	1.20	6.2/5.8		
KEE-5-8BW	5000 (500)	0.40	3.2/2.7	IP66	Fig.4
-10-8CW	10000 (1000)	0.75	6.5/5.1		Fig.5
-20-8BW	20000 (2000)	1.50	9.2/8.2		
SEE-0.5-2CW	500 (50)	30W	0.64/0.54	IP66	Fig.1
-1-2CW	1000 (100)	65W	1.2/1.2		Fig.2
-2-2CW	2000 (200)	0.12	2.2/1.9		
-3.5-2CW	3500 (350)	0.22	3.3/3.1		

Note: The entries in the full-load current column mentioned above are approximate and applied to the supply voltage 200V AC. When the power supply voltage is 400V AC, the full-load current is about half the values given in the table.
The power supply for the SEE single phase 100V AC.

※ IP-55, IP-66 specified by IEC, indicates the type of construction adopted for Uras vibrators, which protects the operator from the vibrator and prevents foreign matter or water from getting inside the vibrator.

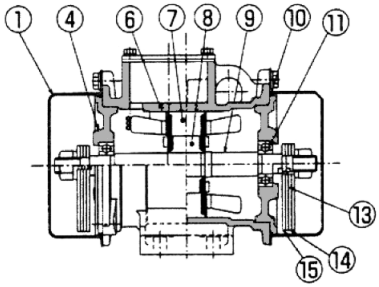


Fig. 1

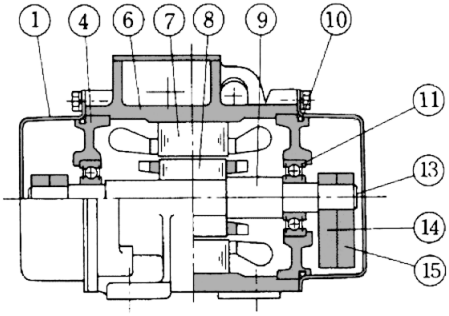


Fig. 2

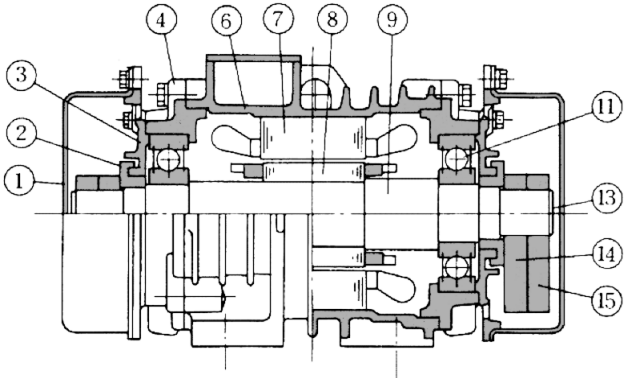


Fig. 3

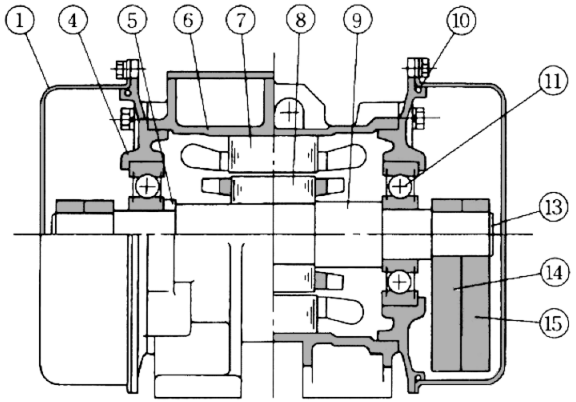


Fig. 4

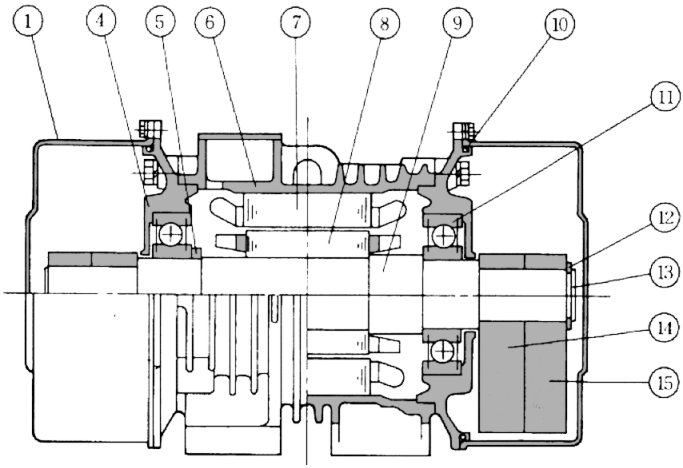


Fig. 5

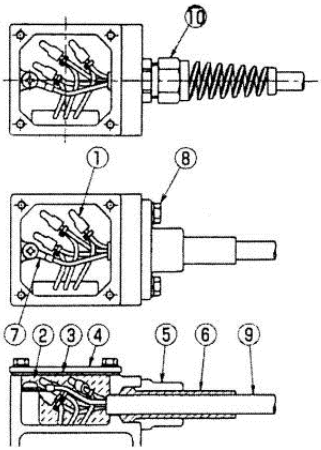
Parts list

No.	Part name	No.	Part name
1	Weight cover	9	Shaft
2	Dust collar	10	Seal ring
3	Bearing cover	11	Ball Bearing
4	Bracket	12	Seal ring
5	Collar	13	Scale plate
6	Frame	14	Fixed weights
7	Stator core	15	Adjustable weights
8	Rotor core		

Construction of Terminal box

Construction of terminal box is as follow.

The terminal box is filled with the Uras compound to protect the lead, and prevent from contact with the metal parts.



1	Crimp contact
2	Uras Compound
3	Rubber gasket
4	T-cover
5	Bell mouth
6	Protective tube
7	Grounding wiring
8	Bell mouth retaining bolt
9	Lead wire
10	Resin cable gland

3-1 Construction (Fig. 1 and 2)

The brackets ④ are tightly fitted into the frame ⑥. Both outer races of the sealed ball bearings ⑪ are tightly fitted into the holes in brackets ④. While the inner race of the ball bearing at the left, viewed from the cable connection opening of the terminal box, is fitted tightly to shaft ⑨, the inner race of the other ball bearing slides into the shaft ⑨.

The vibrators are equipped with seal rings ⑩ between brackets ④ and weight covers ① to protect inside the vibrators.

Both SEE-0.5-2CW, and SEE-1-2CW is employ a capacitor in the terminal box, while KEE-0.5-2CW does not. Fig.1 shows how the stamping weight employed.

SEE and KEE-0.5-2CW vibrators employ a fixed and an adjustable weight at both ends of the shafts ⑨, KEE-1-2CW vibrators employ two fixed and two adjustable weights at each end of the shaft ⑨ and KEE-2-2CW vibrators employ four fixed and four adjustable weights.

3-2 Construction (Fig. 3)

The brackets ④ are tightly fitted into the frame ⑥ and the bearing covers ③. Both outer races of the sealed ball bearings ⑪ are tightly fitted into the holes in brackets ④. While the inner race of the ball bearing at the left, viewed from the cable connection opening of the terminal box, is loosely fitted to the shaft ⑨, the inner race of the other ball bearing is slide fitted into the shaft ⑨.

We supply labyrinth packing to protect the inside from dust, due to their well ventilated structure.

3-3 Construction (Fig. 4 and 5)

The brackets ④ are tightly fitted into the frame ⑥ and the weight covers ①. While both the outer races of the sealed ball bearing ⑪ are closely fitted into the holes in the brackets ④. The inner races are loosely fitted to the shaft ⑨.

The vibrators are equipped with seal rings ⑩ between the brackets ④ and weight covers ① to protect the inside from dust.

4. Installation and operation

When driving a 400V-class Uras Vibrator with an inverter, please install the following:

-suppression filter or reactor on the inverter OR,

-increased insulation class on the Uras Vibrator.

Damage and fire can be caused by the breakdown of the insulation.

4-1 Installation and retightening of screws.

Uras vibrators KEE-18-6CW, -10-8CW and -20-8BW models can be installed in any position. When installing KEE-18-6CW, -10-8CW or -20-8BW models at an angle or vertically, they should be positioned with the snap ring ⑫ side facing down.

The surface roughness of the equipment the vibrator is mounted on should be below 25 S.

Secure the vibrator using flat and spring lock washers to prevent screws from loosening. Even one loose screws can cause an accident.

All securing screws should be retightened after installation, because the initial tightening force will be reduced when the mounting base surface is broken in.

Retighten the securing screws once a week after the vibrator has gone into operation. Even if no loose screws are found when retightening, periodically check for looseness. When a vibrator is reinstalled, treat it as if it has been installed for the first time.

The KEE-2-2CW Uras vibrator must be rigidly fixed with 8.8 type bolts.

Table 2 shows the suitable tightening torque for securing screws.

Table 2

Type	Mounting bolt	Tightening torque N・m (kgf・m)
KEE-0.5-2CW, 1-2CW, 1.5-4BW SEE-0.5-2CW	M8	13 (1.3)
KEE-2-2CW	**M8 (Type 8.8)**	**20 (2.0)**
KEE-3-4CW SEE-1-2CW	M10	25 (2.5)
KEE-3.5-2CW, 6-4CW, 3-6BW SEE-2-2CW	M12	43 (4.3)
KEE-6-2CW, 9-4CW, 5-6BW SEE-3.5-2CW	M16	110 (11)
KEE-10-2CW, 12-4CW, 9-6CW, 5-8BW	M20	220 (22)
KEE-13-6CW, 18-6CW, 10-8CW	M24	370 (37)
KEE-20-8BW	M30	740 (74)

4-2 Wiring

Install the cable carefully so as not to bend it at the cable connection opening to a radius smaller than that indicated in Table 3, to prevent it from being damaged by the vibrator.

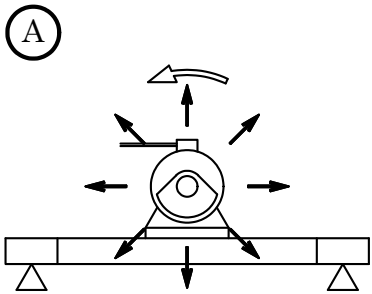
Clamp the cable on a stand insulated against vibration, leaving an extra cable length of 500 to 1,000 mm to let it vibrate freely with the rubber insulator, taking care not to let the cable come into contact with any devices.

Table 3

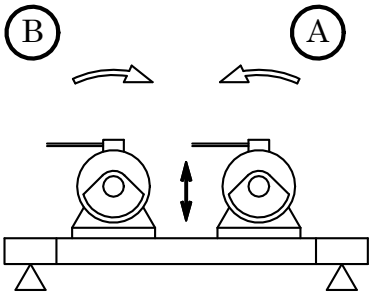
Type	Conductor sectional area and cable dia.	Min. bending radius [mm]
KEE-0.5-2CW 1-2CW 2-2CW 3.5-2CW 6-2CW 1.5-4BW 3-4CW 6-4CW 6-4CW 3-6BW 5-6BW	0.75 mm² ϕ 11.0	90
SEE 0.5-2CW 1-2CW 2-2CW 3.5-2CW		
KEE-10-2CW 12-4CW 9-6CW 13-6CW 18-6CW 5-8BW 10-8CW	1.25 mm² ϕ 11.5	100
KEE-20-8BW	2.0 mm² ϕ 14.4	145

STANDARD

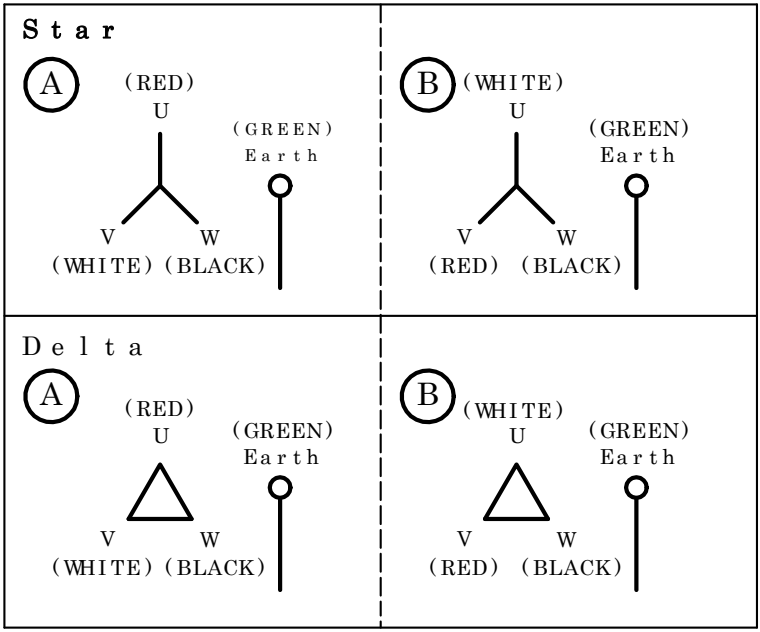
Connecting wires



Vibrating force directed in all directions through 360°, in rotational mode

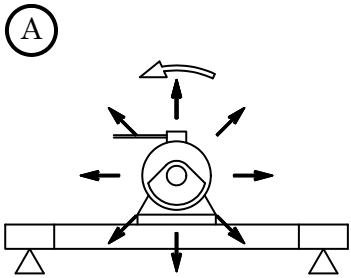


Vibrating force directed in all directions through 360°, in rotational mode

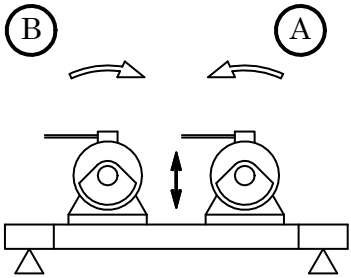


CSA

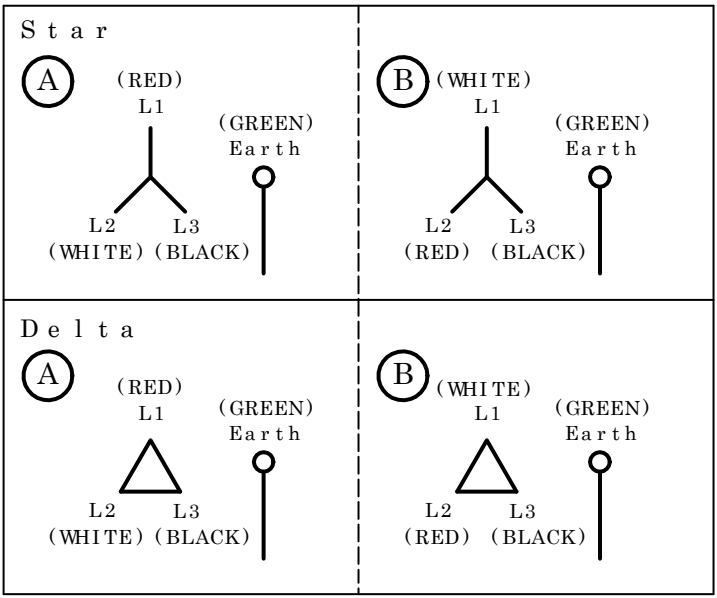
Connecting wires



Vibrating force directed in all directions through 360°, in rotational mode



Vibrating force directed in all directions through 360°, in rotational mode



4-3 Grounding

Ground the green wire, marked E, of the four-core cabtyre, to the vibrator body at the terminal box. For the SEE-0.5-2CW or -1-2CW Uras models, ground the green wire, marked E, of the three-core cabytire.

4-4 Precautions

When the vibrator is used for feeders or screens, the current supplied to the vibrator usually does not exceed the rated value, because the effect of the spring constant and damper coefficient are negligible. However, the current may exceed the rated values depending on the application. In the latter event, adjust the position of the adjustable weights ㉔ to reduce the vibrating force and current below the rated value.

Install an electromagnet switch with a thermal relay to open the power supply circuit when excessive current is supplied to the vibrator.

Set the thermal relay tripping amperes to 100 % of the vibrator rated current.

4-5 Vibrating force adjustment (Construction of Fig.1)

The vibrating force of the Uras vibrators in Fig.6 are adjusted to 38% of the maximum vibrating force with a 50 Hz power supply, equivalent to 54% with a 60 Hz power supply, at the factory. Fig. 7 shows the scales.

It can be adjusted to any desired value by changing the position of adjustable weights ⑮ at both ends of the shaft ⑨. Adjust the vibrating force in the following manner, as required.

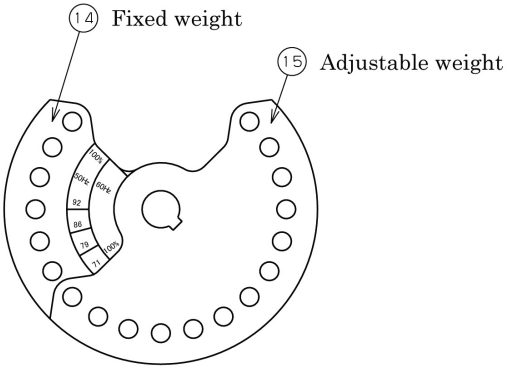


Fig.6

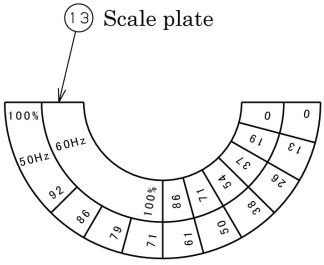


Fig.7

1) Remove the weight cover ① of left and right, using an M6 wrench.

2) Loosen the nuts securing the weights.

Use a wrench to secure the shaft on one side while loosening the nut on the other side.

3) Set the preferred vibrating force (See Photo 1)

Adjust the adjustable weight to align its edge with the desired level on the scale plate.

4) Tighten the adjustable weight securing nut.

・After setting the vibrating force, reverse the steps for loosening the nuts.

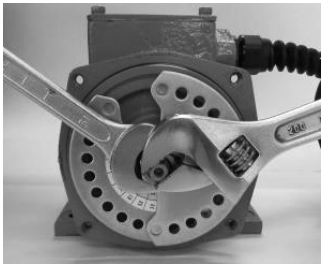


Photo 1

Photo 1 shows the convex set to 71 % for 50 Hz, equivalent to 100 % for 60 Hz

Caution

・Take care not to lose the key 4×4×6L, attached to the shaft.

・The tightening torque for the securing nuts is 32 N・m±2 N・m.

4-6 Vibrating force adjustment (Except Fig.1)

The vibrating force, except for the KEE- and SEE-0.5-2CW, KEE-1-2CW and -2-2CW Uras vibrators, is adjusted to 40 % of the maximum vibrating force for 50 Hz power supply at the factory.

It can be adjusted to any desired value by changing the position of the adjustable weights ⑮ at both ends of the shaft ⑨. Adjust the vibrating force in the following manner, as required.

Loosen the adjustable-weight securing screw, then set the indication dot on the adjustable weight ⑮ to the desired graduation indicated on the scale plate ⑬.

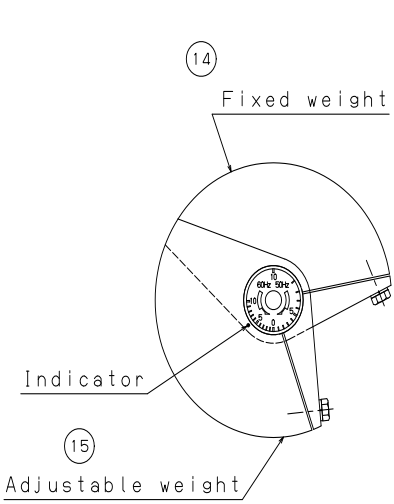


Fig. 8

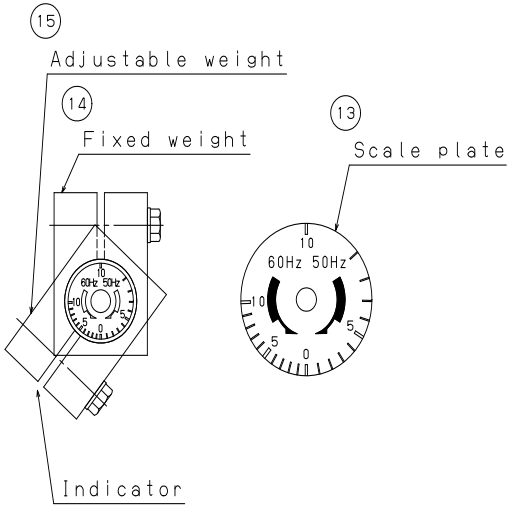


Fig. 9

As shown in Fig. 9, the scale plate ⑬ has 10 graduations, according to which the vibrating force can be adjusted for both 50 and 60 Hz power supplies. Select the graduation according to the power supply frequency.

The larger the figure selected, the greater the vibrating force. Thus when the dot is positioned at 10 of scale plate ⑬, the maximum vibrating force is obtained.

After setting the dot to the desired graduation, tighten the adjustable-weight securing screw, taking care not loosen the fixed weight securing screw.

Fig. 8 shows the dot set to 5 on the 60 Hz side, i.e., the vibrating force is adjusted to 50 % of the 60 Hz maximum vibrating force.

The scale plate ⑬ for eight-pole vibrators with a 60 Hz power supply has only graduations for a 60 Hz power supply, similar to the 50 Hz graduations shown in Fig. 9

Table 4 shows the tightening torque for securing screws of the fixed ⑭ and adjustable weights ⑮

Table 4

Type	Securing bolt	Tightening torque N・m (kgf・m)
SEE-0.5-2C、KEE-0.5-2C KEE-1-2C、KEE-2-2C	M12 (Shaft)	25 (2.5)
SEE-1-2C、SEE-2-2C、SEE-3.5-2C KEE-3.5-2C、KEE-1.5-4B、KEE-3-4C	M6	8 (0.8)
KEE-6-2C、KEE-10-2C	M8	20 (2.0)
KEE-6-4C、KEE-9-4C、KEE-12-4C KEE-3-6B、KEE5-6B、KEE9-6C、KEE-5-8B	M10	40 (4.0)
KEE-13-6C、KEE-18-6C、KEE-10-8C	M12	70 (7.0)
KEE-20-8B	M16	170 (17)

Bolt material : Type 8.8

5. Supplementary explanation to insert Unbalance weight

After overhaul, please install unbalance weights (herein after called "Weights") based on the following procedure. Also, please adjust the vibrating force in the same way. (Ref. photo1 to 4)

5-1 Weights and Scale plates

1) There are four weights in one unit : two fixed and two adjustable weights
2) Scale plates are on both ends of the shaft

5-2 Procedure to install weights

The vibrating force is adjusted to 40 % of the maximum vibrating force with a 50 Hz power supply

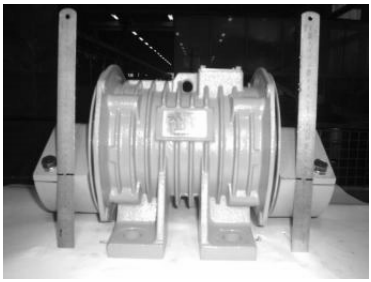
5-2-1 「Photo-1」 attach weights

1) Attach a fixed weight and an adjustable weight on each side of the shaft.
2) Adjust the indicator of the adjustable weight to 10 on the 50 Hz side of scale plates on each side of the shaft and fix them by tightening the clamping bolt.
3) Align the fixed weights on each side with the adjustable weights, then fix them with the clamping bolts.
4) For tightening torque, please refer to the original instruction manual.

「Photo-1」
Installing the fixed and adjustable weights

5-2-2 「Photo-2」 Check the difference between the left and right weights

1) Check the height of the corners of the left and right weights on a horizontal board.
2) If there is a large difference, please repeat 2-1, 2, and readjust the weights.



「Photo-2」
Check the difference between weights

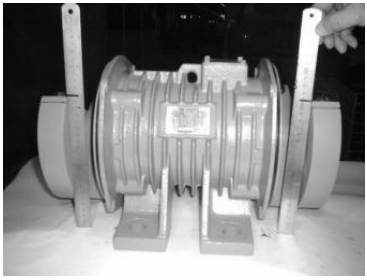
5-2-3 「Photo-3」 Set the vibrating force

1) Loosen the bolts for the adjustable weights.
2) Set the adjustable weights to the same vibrating force.
   Photo 3 shows the vibrating force set for 60Hz at 80%.

「Photo-3」
ex. 60Hz 80% setting

5-2-4 「Photo-4」 Check the difference after securing vibrating force

1) After setting the vibrating force, please check if there is a difference between left and right.
2) When there is a difference, readjust the adjustable weight on one side to match the height of the adjustable weight on the other side.



「Photo-4」
Check the difference of the adjustable weights

6. Bearings and maintenance

The shielded ball bearings filled with Uras grease are used for models as shown in Fig.1 to 5. It is not necessary to supply oil to the bearings. The expected fatigue life of the bearings for 2 pole type is 5,000 hours (min.) and 10,000 hours (min.) for 4, 6, 8 pole types.

Table 5

Type	Bearings (Q'ty × type)	Maintenance
KEE-0.5-2CW	2×6202ZZC4	Grease replenishing is not needed. Replace the bearings when broken.
1-2CW	2×6202ZZC4	
2-2CW	2×6203ZZC4	
3.5-2CW	2×6305ZZC4	
6-2CW	2×6306ZZC4	
10-2CW	2×6407ZZC4	
KEE-1.5-4BW	2×6203ZZC4	
3-4CW	2×6304ZZC4	
6-4CW	2×6306ZZC4	
9-4CW	2×6308ZZC4	
12-4CW	2×6309ZZC4	
KEE- 3-6BW	2×6305ZZC4	
5-6BW	2×6306ZZC4	
9-6CW	2×6308ZZC4	
13-6CW	2×6309ZZC4	
18-6CW	2×6312ZZC4	
KEE- 5-8BW	2×6306ZZC4	
10-8CW	2×6308ZZC4	
20-8BW	2×6312ZZC4	
SEE-0.5-2CW	2×6202ZZC4	
1-2CW	2×6202ZZC4	
2-2CW	2×6303ZZC4	
3.5-2CW	2×6305ZZC4	

7. Disassembly

7-1. Vibrator shown in Fig. 1

Fig.10 shows the disassembly of the vibrators in Fig.1. Follow the process bellow.

(1) Loosen the screws securing the left and right weight cover ①, then remove the weight covers. The weights covers ① are attached to the frame ⑥ by brackets ④.

(2) Loosen the nut securing the fixed ⑭ and adjustable weight ⑮, then remove the fixed and adjustable weights. Disengage the keys from the shaft ⑨.

(3) Applying force at the flange of the frame ⑥, push the end of the shaft ⑨ to remove the brackets ④from the frame.

(4) Remove the ball bearings ⑪ from the brackets ④ using a metal disk with a slightly larger diameter than the diameter of the outer race, holding the outside of the bearings hole in the brackets.

7-2 Vibrators shown in Figs.2, 4 and 5

Figs.11 and 12 show the disassembly of the vibrators shown in Figs.2, 4 and 5, respectively. Follow the process bellow.

(1) Loosen the screws securing the left and right weight covers ①, then remove the weight covers. The weight covers ① of the vibrators shown in Fig.2 are attached to the frame ⑥ by brackets ④.

(2) Remove the snap ring ⑫ if it is provided. Loosen the screws securing the fixed ⑭ and adjustable weights ⑮, then remove the two fixed and two adjustable weights.

(3) Loosen the screws securing the brackets ④ to the frame ⑥, then remove the brackets from the frame by tapping a metal piece with a plastic hammer or wooden mallet, while positioning the metal piece in different positions on the perimeter of the brackets.
Vibrators shown in Fig.2, applying force at the flange of the frame ⑥, push the end of the shaft ⑨ to remove the bracket ④ from the frame.

(4) Remove the ball bearing ⑪ from the bracket ④ using a metal disk with a slightly larger diameter than the diameter of the outer race, holding the outside of the bearing hole in the bracket.

7-3 Vibrators shown in Fig.3

Fig.13 shows the disassembly of the vibrators shown in Fig.3.

Follow the process bellow.

(1) Loosen the screws securing the left and right weight covers ① and remove them.

(2) Loosen the screws securing the fixed weights ⑭ and adjustable weights ⑮ then remove the two fixed and two adjustable weights.

(3) Loosen the screws securing the bearing covers ③ and remove the covers with the dust covers ② by inserting two M8×30mm set screws in the tapped holes of the bearing covers.

(4) Loosen the screws securing the brackets ④ to the frame ⑥, then remove the brackets from the frame by tapping a metal piece with a plastic hammer or wooden mallet, while positioning the metal piece in different positions on the perimeter of the brackets.

(5) Remove the ball bearing ⑪ from the bracket ④ using a metal disk with a slightly larger diameter than the diameter of outer race, holding the outside of the bearing hole in the bracket.

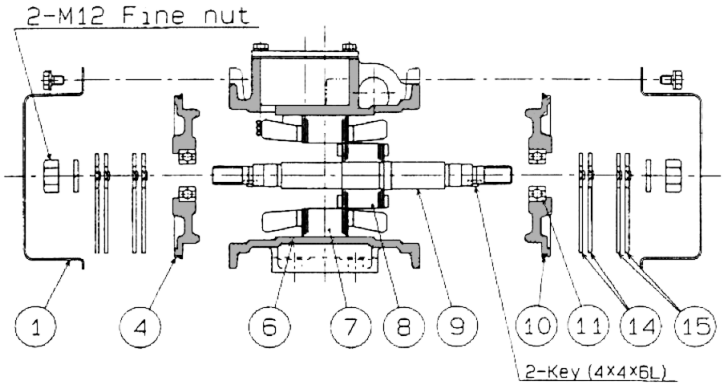


Fig 10

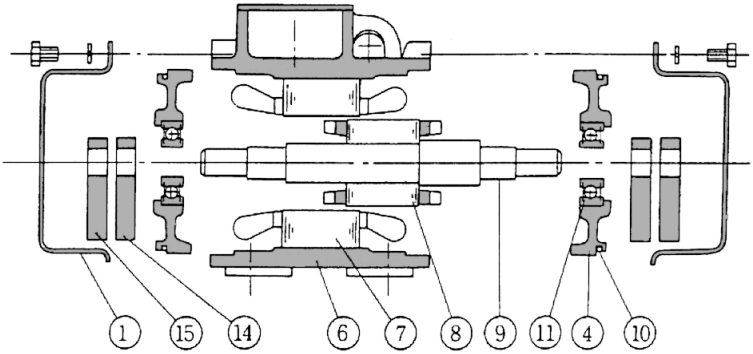


Fig 11

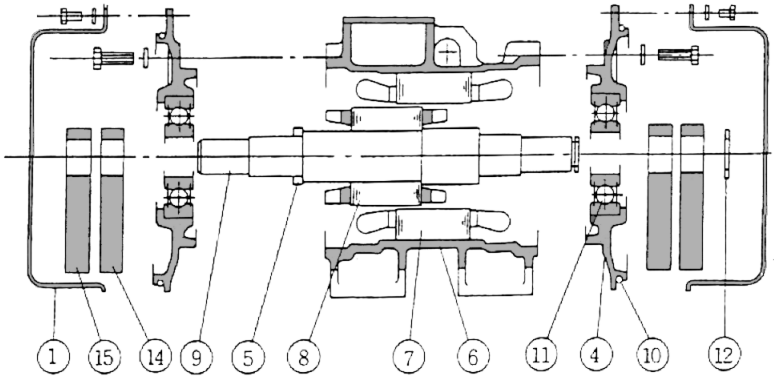


Fig 12

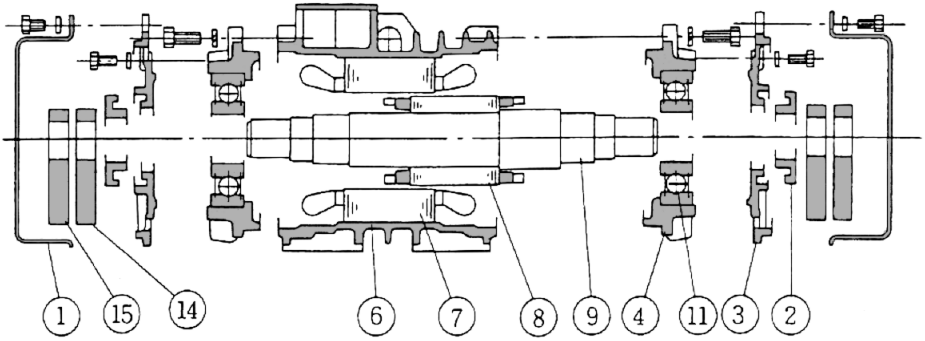


Fig 13

8. Reassembly

Reassemble the vibrator, reversing the steps for disassembly, observing the following precautions.

(1) Gradually press the outer race of the roller bearings ⑪ into the bracket ④ using a metal disk with a slightly smaller diameter than the outer dia. of the outer race, holding the outside of the bearing hole in the bracket.

(2) For vibrators shown in Fig. 1 and 2, first slide-fit the ball bearing on the right, viewed from the cable-connection opening of the terminal box in the following manner :
Place the shaft at the center of the bearing pressed into the bracket, then press the other end of the shaft to insert the shaft into the bearing, holding the inner race.

(3) When pressing the bracket ④ to the frame ⑥, screw the studs into the tapped holes in the frame to align the bolt holes in the bracket and the tapped holes in the frame.
Insert the bracket into the frame using a press or by diagonally tightening the bracket securing screws one sixth of a turn each time, taking care not to damage the bearing.

(4) For vibrators shown in Fig.3, uniformly warm the dust cover ②, which should be shrink fitted onto the shaft ⑨, to 100 ℃ to 120 ℃ in an oil bath. Then quickly attach them to the shaft ⑨ and leave them there until the temperature drops.

9. Bearings and Breaking-in

9-1 Bearings

(1) Use ball bearings with radial gap C4.

(2) Extreme care must be taken not to damage the bearings, because even small defects affect their performance.

(3) Gradually insert the ball bearings in the brackets by pressing the outer race using a metal disk, or by tightening the screws. Never tap the bearings.

(4) Replace the bearings when reassembling the vibrator.

9-2 Breaking-in

After reassembling the vibrator, rotate the shaft 50 to 60 turns by hand with the weights balanced to spread the grease to the inner and outer races and balls.

Adjust the vibrating force to 20 % to 30 % of the maximum value, then break in the vibrator for about 30 minutes.

When breaking in the vibrator, put two-pole Uras vibrators up to 0.4kW on a sponge mat.
For two-pole Uras vibrators with a motor power greater than 0.4kW, or four-pole, six-pole or eight-pole Uras vibrators, suspend it by a spring, or put it on a used tire or a surface plate supported by an elastic material.

At the beginning of the breaking-in process, a current greater than the rated value may be supplied to the vibrator due to the resistance of the grease to spreading. The current will drop to about half the rated value in a short time.

Adjust the vibrating force to the desired value, then install the vibrator.

Running the vibrator with the vibrational force set to less than 20% may cause sliding contact within the bearings, leading to abnormal sound or premature failure of the bearings.

10. Capacitor for Single-phase SEE Uras Vibrator

This vibrator has a capacitor-start induction motor.

Both SEE-0.5-2CW and -1-2CW Uras vibrators have a capacitor in their terminal boxes, while a capacitor box for SEE-2-2CW and -3.5-2CW is separately installed.

Table 6 shows the capacitance of each type of capacitor. Fig. 15 shows the cable connection between the single-phase Uras vibrator and control box.

Table 6

Type	Control Box	Capacitance	Fuse capacity
SEE-0.5-2CW	—	SH220Vac 6 μ F	—
1-2CW	—	SH220Vac 12 μ F	—
2-2CW	KC-C-20T	SH220Vac 20 μ F	8A
3.5-2CW	KC-C-33T	SH220Vac 33 μ F	10A

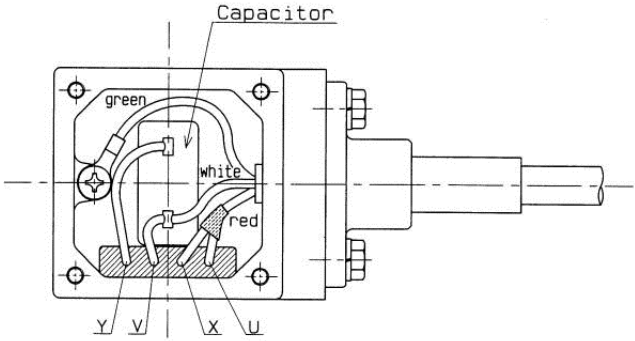
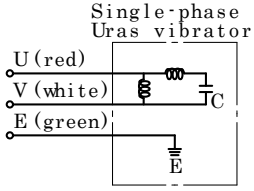
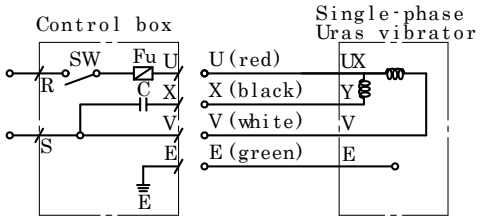


Fig. 14 Construction of Terminal Box
(SEE-0.5-2CW, 1-2CW)



SEE-0.5-2CW, 1-2CW
(black lead not used)



SEE-2-2CW ~ SEE-3.5-2CW

Fig. 15

11. Periodical Inspection and Troubleshooting

11-1 Periodical inspection

Interval	Points to check	Procedures and criteria
Daily	Load current	The load current measured with an ammeter should be less than the rated value.
	Bearing noise	Check the bearing noise using a rod. Bearings should not generate intermittent or metallic noise.
Monthly	Loose screws	Check screws for looseness. Screws should be tightened to the specified torque.
	Cable	Visually inspect the cables, ensuring there is no damage.
Annually	Insulation resistance of stator coil	Insulation resistance across terminals of stator coil, measured with a megger, should be 5MΩ (min.).

11-2 Troubleshooting

Problem	Causes	Inspection procedures	Remedial action
Vibrator won't start	① Two cables of the vibrator or two phases of the coil are broken	Measure the voltage drop across the two phases.	Replace the broken cables or rewind the coil.
The vibrator moans and does not accelerate	② Single phasing	Same as above and check cable for looseness.	Same as above or securely connect the cables.
	③ Ambient temperature is too low or there is an excessive amount of grease	Remove the weight covers (1), then rotate the shaft (14) 30 to 50 turns by hand.	Adjust the vibrating force to from 20 % to 30 % of the maximum value, then break in the vibrator.
Thermal relay is tripped	④ Ambient temperature is too low or there is an excessive amount of grease	Same as above	Same as above
	⑤ Vibrator takes too long to start. (This may be caused by ④ above)	Measure the time required for vibrator to start.	If the vibrator takes five seconds or more to activate with the thermal relay adjusted to 100 % of the rated current, replace the thermal relay with a slow-activation relay.
	⑥ Short circuit between phases of the coil	Compare the resistance between phases of the coil.	If there is a large difference in resistance between the phases of coils, replace the coils.
	⑦ Loose screws	Check screws for looseness.	Tighten screws.
	⑧ Abnormal vibration	Ensure that the vibrator rotates in the correct direction and that the vibrator body is free of defects.	Correct vibrator rotation direction or repair.
	⑨ Load is too large	Measure load current.	Decrease vibrating force
	⑩ Damaged bearing	Rotate the shaft by hand and check that the bearings are not damaged.	Replace the bearing
Abnormal bearing noise	⑪ Damaged raceway surface	Check bearing noise using a rod or bearing checker.	Replace the bearing
Temperature of the vibrator body is too high	⑫ Ambient temperature is too high	Measure ambient temperature.	Decrease ambient temperature to a maximum of 40°
	⑬ A lot of foreign matter has adhered to the vibrator	Check the condition of the foreign matter attached to the vibrator.	Carry out dust prevention measures

12. Guarantee

Besides the provisions specified in the supply contract, the manufacturer guarantees the products for a period of 12(twelve) months from the date of delivery.

For the repaired products which have passed for 1 to 3 years after delivery, the manufacture guarantees for 3(three) months.

This guarantee solely covers free repair or replacement of those parts which, after having been carefully examined by the manufacturer's technical department, are recognized as being defective.

This guarantee excludes the following items.

The damage deriving from:

・negligence, carelessness, incorrect and improper use of the Uras Vibrator, incorrect handling by the operator and incorrect installation,

・natural disasters and

・repair, adjustment and modification performed by anyone except for the manufacturer or a designated service office.

Costs related to damages caused by the Uras Vibrator, including repair, part replacement, and construction work, are also excluded from this guarantee.

WARNING-for mounting motor on an angle or vertically

1. Models with Snap Rings

Note "**BOTTOM SIDE**" as per label on motor.

If motor is not positioned correctly, the adjustable weights may fall and cause injury or damage.

2. Models without Snap Rings

BEWARE when adjusting bottom weights as they may fall when loosened and cause injury or damage.

The specifications listed in the user manual may change without notice due to product design revision.

memo