



HIGH FREQUENCY CONCRETE VIBRATOR
INHEADER

FX
FXS
FXB

INSTRUCTION MANUAL

en

We thank you for selecting Mikasa Frequency Vibrator.
For your safe and proper operation, please read this manual and
be always sure to keep it ready for reference.



<http://www.mikasas.com>

102-00803



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1. Introduction

This manual explains the correct operation method and simple inspection and maintenance of FX-E/G, FXS, FXB series inheaders (high frequency vibrators). To make your work efficient and effective by utilizing the excellent performance of this machine, please read this manual before use.

After reading through this manual, please keep this at hand so that you can refer to it whenever you have any questions.

For order of repair parts, parts list, service manual and repair request, please contact a sales store, our sales offices, or MIKASA parts service center.

For our parts list, you can also visit our website at <http://www.mikajas.com> to view MIKASA Web parts list.

Some illustrations shown in this manual might be different from the actual machine due to design change, etc.

2. Use of machine, warning, structure and power transmission

2-1. Use of machine

MIKASA high frequency vibrator (inheader) is a bar type vibrator that is inserted directly into fresh concrete (freshly mixed concrete) to provide vibration for concrete compaction.

For casting of fresh concrete (hereafter "concrete"), the end of the machine, after being inserted in the concrete, gives appropriate vibration directly to the concrete, which helps the concrete fill in the form without any gap and discharges air bubbles contained in the concrete, resulting in finely compacted beautiful finish of concrete with high strength.

If the power cord is extended, the machine can be used easily for concrete casting at deep areas or any location far from the power outlet. Its light weight allows long hours of operation and handling such as moving of the machine easily and safely.

FX-E/G model is widely used for general concrete casting in civil engineering and construction, and is offered in several types with four different vibration head diameters ranging from $\phi 30$ to 60, hose length of either 4m or 6m, and a standard cord length of 15m.

FXS type (one spear type), a spear shape with a long pipe at the vibration part, can hit the target correctly even when working with complicated reinforced concrete. FXB type (Jingu Bang), the one with a hose attached to a short pipe, can be used more easily in smaller space than the one spear type, enabling any work for inaccessible or deeper areas.

2-2. Warning for incorrect purpose and incorrect use

Do not use the machine for purposes other than concrete compacting.

Special power source for high frequency with voltage of 48V and frequency of 200 - 240Hz is required. Do not connect to power source other than this specification. Otherwise, the machine will be damaged, resulting in potential danger of electrification.

Do not hold the vibrating part when working. Vibration disease might occur.

2-3. Structure

High frequency vibrator has a vibration head that generates strong vibration at the end.

Inside the vibration head, high frequency motor is directly connected to the eccentric pendulum that generates vibration by rotation.

This high frequency motor is a three phase induction motor with high frequency power source specification (low voltage: 48V and high frequency: 240Hz).

The wire to run the high frequency motor is connected to the hose that is connected to the vibration head and the pipe, then via the cabtyre cord to the power plug. (*1)

The switchbox for turning on/off the high frequency motor is inside the switch box between the hose and cabtyre cord. (FXS model excluded.)

*1: For FXS model, a pipe is used via the anti-vibration head instead of the hose.

2-4. Power transmission

The power supplied from the special three phase power with voltage of 48V and frequency of 200 - 240Hz runs the high frequency motor inside the vibration head.

The motor rotating at high speed runs directly the eccentric pendulum to cause vibration of the vibration head for concrete compacting. The on/off of the high frequency motor is done by the switch.

3. Warning signs

This manual explains the operation method of F series high frequency vibrators. Please work safely with our product by reading this manual and fully understanding the content.

The (⚠) mark used in this manual and the safety label on the machine are warning signs. For your safety, please follow the rule of warning signs. Each (⚠) warning sign represents danger to people as shown below.

⚠ **DANGER:** Extremely dangerous if the instruction is not followed, resulting in potential accident of death or serious injury.

⚠ **WARNING:** Danger exists if the instruction is not followed, resulting in potential accident of death or serious injury.

⚠ **CAUTION:** Potential for danger exists if the instruction is not followed, resulting in injury accident.

Caution (No ⚠ mark): Potential for physical damage if the instruction is not followed.

4. Cautions for safety

4-1. General cautions

⚠ **WARNING**

- Do not work if one of the following conditions exists.
 - Your body condition is not good because of overwork or illness.
 - When you are under the influence of some medication.
 - When you are drinking.

⚠ **CAUTION**

- Read the operation manual well and work safely by taking correct steps of operation.
 - Prevent the operation of the machine by someone who does not have sufficient knowledge of operation.
- Work in proper work clothes.
 - Always use protective gear (helmet, protective goggles, safety shoes, anti-vibration gloves, etc.) for safe operation of the machine, and wear appropriate work clothe.
 - For outdoor work, rubber gloves and slip-resistant shoes are recommended.
 - Long hair should be covered with a cap or hair cover.
- Please wear noise suppressing device.
 - When doing work that generates high level of noise, wear noise suppressing devices such as ear plugs or ear muffs.
- Check the machine carefully to make sure there is no breakage, crack or deformation.
 - Check also the cabtyre cord to make sure the conducting part is not exposed due to wear or crack. As the cabtyre cord wears relatively quickly, please replace with a new one at early timing. Also check the power outlet and the plug for breakage, deformation, burn or damage at the cord connection area.



CAUTION

- Always check the machine to see if there is any loosened bolt or abnormal part. Operate the machine after making sure the machine is in normal condition.
- The faceplate (operation method, warning information, etc.) on the machine body (inverter, etc.) on the power source side is very important for safe operation of the machine. Clean the machine and always keep the information on the faceplate clearly legible.
- When the information on the faceplate (operation method, warning information, etc.) on the machine is difficult to read, replace it with a new one.
- It is dangerous if young children come into contact with the machine. Use some measure, such as "Do not enter" sign around the work area or proper storage (storage location) of the machine, to prevent children from coming near the machine.
- MIKASA is not responsible for remodeling without manufacturer's permission or accident caused by any use other than [warning for incorrect purpose and incorrect use].

4-2. Cautions before work

WARNING

- Before working, carefully make sure that there is no buried pipe such as electric wire tubes, water pipes or gas pipes in the area where work is to be done.
 - If there are buried objects, the tool might touch them, causing an accident of electrification or electric leak, or gas leakage.
- Always keep the work area clean.
 - Unorganized littered work site is likely to cause accident.
 - When work is done, remove unnecessary machines, iron frames, sheets, and wood pieces that interfere with the work. Try to organize and tidy up the work site.
People might trip over or hose and cord might be caught by unnecessary objects, resulting in accidents.
 - When working in an unstable area such as on reinforcing bars, always put a running board to secure good footing.
- Consider the surrounding condition of work area.
 - Do not use the machine in rain, and when the plug or the outlet of vibrator and extension cord is wet.
 - Keep the work area sufficiently lighted.
 - Do not use the machine in the environment where there is flammable liquid gas nearby.

CAUTION

- Noise prevention rule
 - For noise, there are laws and rules established by the ordinances of each municipality. It is necessary to use the machine at below the specified allowable noise level to prevent noise problem in the vicinity.
Depending on the situation, use noise shielding fence when working.

DANGER

- Please check the followings before using the machine. Check the following items before plugging into the outlet.
 - Check the hose and cord to make sure the conductive part is not exposed due to wear or crack.
Exposed part might cause fire by electrification or short circuit.
 - Check the power source to be used.
 - * Always make sure the power is the one shown on the faceplate. The power source you can use is 48V three phase high frequency power. If the 200V three phase commercial power other than one for high frequency power is directly connected to the machine, the motor coil might be burned out.
 - * If the voltage is low, the current flowing to the motor circuit increases and there arises potential for danger of burnout. Also do not use direct current power. That will result not only in damage of the product but also in accident.

Check of earth leakage breaker.

- * This product uses 48V (safe voltage) high frequency power, and if the main machine using the high frequency power is an inverter, it becomes very dangerous when electric leak occurs. For high frequency power (for inverter, etc.), always use an earth leakage breaker.

⚠ WARNING

- Make sure the switch is turned off.
 - * If the machine is plugged without knowing that the switch turned on, the machine starts to operate unexpectedly, causing an accident. The switch is turned on when it is pressed to the vibration head side, and turned off when pressed to the high frequency power source side.
 - * Always check that the switch can be turned on and off by pressing ON and OFF of the switch.
- Check the assembly of plug and outlet.
 - * Check the vibrator plug and extension cord to make sure they are completely assembled up to the high frequency power source.
- Check of the plug and power outlet.
 - * If you experience looseness when the plug is inserted into the outlet, or if the plug comes off from the outlet, you need some repair.
If used without repair, overheating might occur, resulting in an accident.

⚠ CAUTION

- (Connection) Extension cord
 - * Use an (connection) extension cord that is not damaged.
 - * If the power source is far away from the machine and you need an extension cord, use the one with sufficient size that allows the flow of necessary current, and try to make the length of the cord as short as possible for maximum efficiency and trouble free operation of the machine.
 - * Use an extension cable cord that can accommodate the current higher than the allowable current. (Refer to "How to decide the length of extension cord.")
As the cord gets longer, the voltage becomes lowered in proportion to the length, which results in poor vibrator starting operation and lowering of output.
 - * For outdoor use, use cable cord or cable connection (extension) cord.



⚠ WARNING

- Location to install the motor
 - In case of inverter and converter
 - * Select a stable area that is free of rain or any water entry. If water gets on the outlet or cooling fan, electric leak might occur.

⚠ CAUTION

- In case of engine generator
 - * The exhaust gas from the engine contains harmful gases such as carbon monoxide. Do not run the engine indoor or inside the tunnel where ventilation is poor. During operation, the machine operator and also people and domestic animals around should pay attention to the danger of exhaust gas.



4-3. Cautions during work

WARNING

- Always be alert and pay careful attention to your work.
 - When using the high frequency vibrator, work very carefully with careful attention to the operation method, work method and the surrounding condition.
 - Use your common sense.
 - When you are tired, do not use the machine.

DANGER

- Avoid sudden start.
 - Do not carry the machine with the switch turned on while connected to the power source.
 - Before plugging, make sure that the switch is turned off.

CAUTION

- Do not handle the cord carelessly.
 - Do not pull the cord when trying to unplug it.
 - Do not use the machine by hanging it with the cord.
 - Do not put the cord near heat, oil or sharp corner.
- Caution when moving
 - The hose and cord of the vibrator are long and likely to be caught by reinforcing bars and other interfering objects. Pay attention to the handling of hose and cord when moving the machine.
 - Do not try to pull the vibrator by holding only the cord or hang the machine with the cord. Disconnection or short circuit might occur.

DANGER

- Do not use the high frequency vibrator that cannot be started or stopped by the operation of the switch.
- If you notice abnormal condition of the machine or abnormal noise while using the machine, turn off the switch immediately to stop the machine. Then contact the sales store or the rental store to ask for inspection and repair. Electric leak or fire accident might occur.

CAUTION

- When not used, always turn off the switch.
- Do not use the machine with abnormal posture.
 - Always secure stable footing and keep good balance.
- Prevention of vibration related problem
 - When working with the high frequency vibrator, hold a part with low vibration, which is about more than 1m away from the vibration head. Also wear anti-vibration gloves when working.
 - If working with the machine for a long time (more than 30 min.) by holding a part with high vibration, vibration hazard (white finger disease, etc.) might occur.
- Prevention of burns
 - The vibration head gets hot during operation. Be careful not to get a burn by touching that part. The high frequency vibrator gets cool when inserted into the concrete. Do not do wasteful run of the cylinder in the air.
- In case of an engine generator
 - While the engine is running or immediately after the engine has stopped, the muffler, muffler cover and engine itself get very hot. If your hand or skin touches those parts, burn might occur.
 - When moving the generator, always stop the engine beforehand.

WARNING

- When working at high location, make sure that there is no one underneath. For safe work, use a safety wire to prevent the fall of the machine.



⚠ WARNING

- Do not let children come near the machine.
- Anyone other than the workers should not be allowed to touch the high frequency vibrator and extension cord.
- Do not allow anyone other than the workers to come near the work area.

⚠ CAUTION

- Procedure to stop the machine
- After turning off the high frequency vibrator switch, and then turning off the switch of the motor, unplug the high frequency vibrator. When plugging and unplugging, hold the plug part. Do not try to pull only the cord. Electric leak or wire breakage might occur.



- Caution for storing
- Do not put heavy object (iron frame, etc.) on the high frequency vibrator hose and cord. Wire breakage and other failure might occur.

- Storing of engine generator
- The muffler and engine itself are very hot immediately after the engine stop. Put the sheet cover after the engine cools down. If the sheet cover is placed on the engine before it gets cool, fire might occur.



4-4. Cautions for maintenance

⚠ WARNING

- Before inspection and maintenance work, always turn off the switch and unplug from the power outlet. Condenser such as an inverter will not discharge immediately after the power is shut off. Wait for a few minutes before doing inspection or maintenance.



- Do maintenance work carefully.
- Check the cord regularly, and if damage is detected, contact the sales store for repair.
- Do inspection and maintenance as instructed by the manufacturer for maintaining each part. If the instruction is not followed, accident or machine damage might occur due to poor maintenance.
- If repair is done by someone without proper repair knowledge or skill, the machine will not function properly, and even accident and injury might occur.
- Before doing inspection and maintenance, read the operation manual and service manual carefully to have good understanding. Then do inspection and maintenance work by paying attention to safety.
- If not properly maintained, not only machine damage but also accident involving people might occur.
- When using a connection (extension) cord, check it regularly and if damage is detected, replace it with a new one.
- Keep the holding part dry and clean all the time. Keep the holding part free of oil and grease.
- For fire prevention, use nonflammable wash oil for cleaning of the parts.



- In case of an engine generator,

⚠ WARNING

- Danger of gas poisoning if used indoor or poorly ventilated area. Pay attention to ventilation especially when there is exhaust gas from the engine, or when fuel, wash oil or paint is used.



⚠ CAUTION

- Do inspection and maintenance work after the engine is stopped. If a battery is attached, remove the key switch or the battery cord.

⚠ WARNING

- Do not throw away the engine waste liquid carelessly. It will harm the environment. When disposing, follow the requirements specified by the law

5. Specification

5-1. Specification

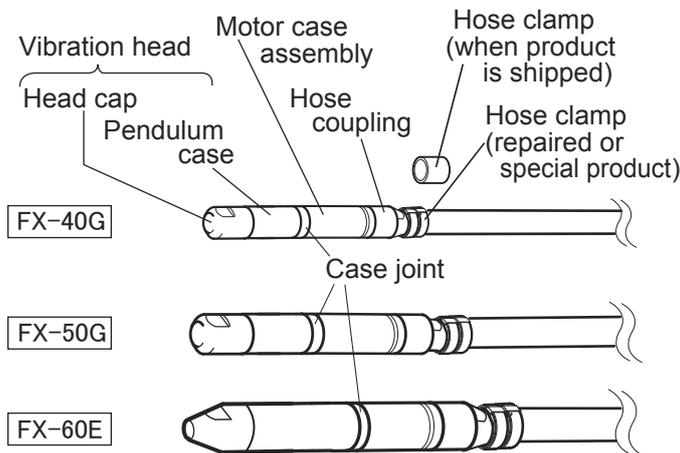
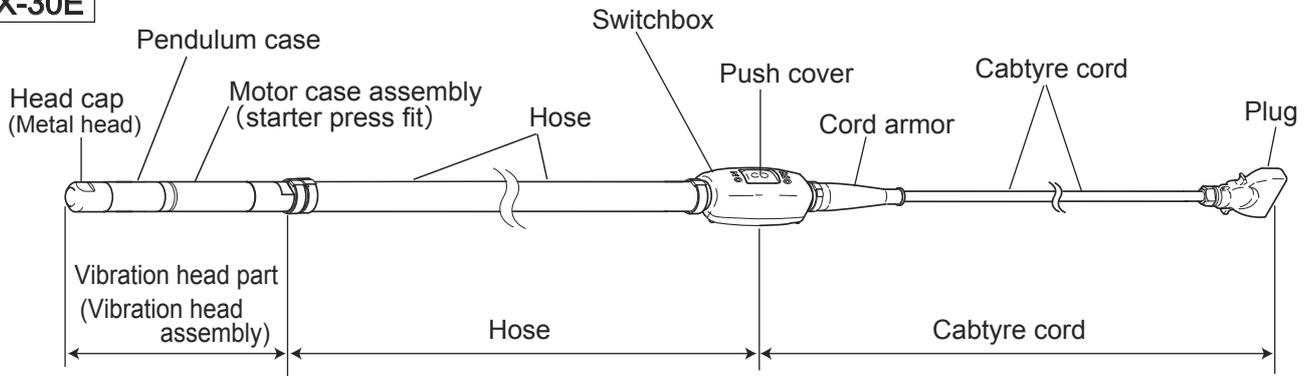
model	vib.head dia. x length (mm)	rubber hose (m)	voltage (V)	cycle (Hz)	input (KVA)	amplitude (mm)	vibration (Hz) [(V.P.M)]	cable length (m)	weight (kg) 4m/6m
FX-30E	32 x 396	4 or 6	48	200/240	0.33	1.8	200/240 [12,000/14,000]	15	9.1/10.3
FX-40G	43 x 396	4 or 6			0.49	1.5		15	12.0/13.7
FX-50G	52 x 413	4 or 6			0.79	1.9		15	14.8/16.5
FX-60E	61 x 485	4 or 6			1.5	2.0		15	18.0/19.9
FXB-30B	32 x 1,728	-			0.33	1.8		-	11.2
FXB-40G	43 x 1,792	-			0.49	1.5		-	15.1
FXS-30B	32 x 2,628	-			0.33	1.8		-	12.0
FXS-40G	43 x 3,412	-			0.49	1.5		-	16.8

Table 1

5-2. Outline drawing (dimension and name of each part)

5-2-1. FX outline drawing

FX-30E

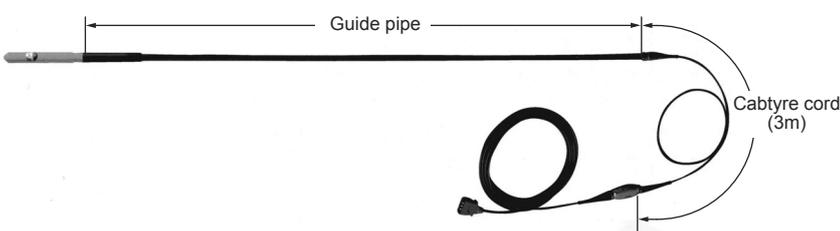


< Additional information >

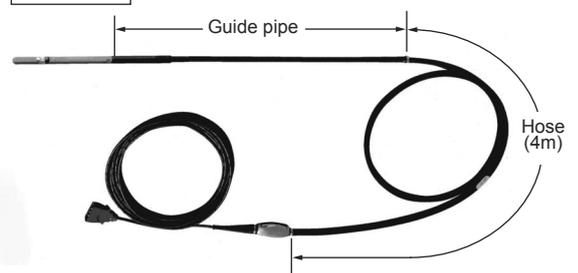
1. Vibration head of FX-30E, 40G, 50G, and 60E models is separated into a head cap and a pendulum case.
2. The thread of the head cap of FX-30E model is male thread. (Pendulum case side is female thread.)
3. The head cap of FX-40G, 50G and 60E is female thread. (Pendulum case side is male thread.)
4. Part name of pendulum case for FX-40G, 50G and 60E models is "vibration head (separate type)". In this manual, the term "pendulum case" is used.
5. "Vibration head" in this manual means an assembly of head cap and pendulum case.
6. "Vibration head assembly" means the assembled parts from the hose to the end in addition to the vibration head and motor.

5-2-2. FXS/FXB outline drawing

FXS-40G



FXB-30B



6. Before operation

6-1. Selection of vibrator

Select the outer diameter (model) of the vibrator to be used and the number of vibrators needed for the work based on the size of slump and rough aggregate (gravels) of the (freshly mixed) concrete (hereafter "fresh concrete") as well as the cast amount and the casting method at the construction and civil engineering site or sand control dam and other dam construction site.

<Guideline of selection>

	Size of coarse aggregate (gravels) (mm)	Slump (cm)	Vibrator outer diameter (Φ)
Construction	20~25	18~22	30~40
Civil engineering	40~60	8~15	40~60
Dam	80~150	3~5	100~150

Table 2

* For a high frequency vibrator (ex.: φ 50), it is verified that the range the vibration for fresh concrete with aggregate of φ40 and slump of 8 cm can eliminate air bubbles (entrapped air) over the range having a diameter of 500mm, which is ten times the diameter of the vibration head (φ50).

For a pump truck generally used to transport fresh concrete at construction work site, prepare two to three sets of vibrators. With one set placed after the pump tube outlet of construction site floor (slab), the second set to fill and compact the discharged fresh concrete into the form, and the third set of small diameter for finish of wall surface with many arranged bars, normally three sets are used at one pump tube location of pump truck.

There are various constructions for civil engineering work site, and each case varies from one another, but the construction procedure is established, such as more than three sets are required for bridge support and other support work.

The above is just a guideline, and for various works ranging from construction work to civil engineering and large scale sand control and other dam construction works, combination of vibrators with necessary diameter has to be selected based on the scale of fresh concrete casting to be done for each case.

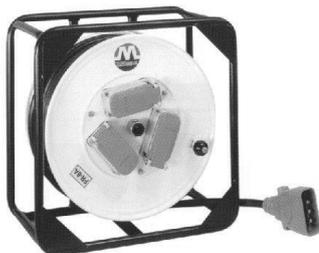
6-2. High frequency vibrator and arrangement of high frequency power source and extension cord

Prepare high frequency power source (inverter, converter, engine generator) for the selected high frequency vibrators. It is necessary to use the required number of units for each model. When using a cable between high frequency power source and vibrator, or between commercial power source (single phase 100V and three phase 200V) and high frequency power source such as an inverter, if the size of the cord is too small, voltage is lowered, resulting in burnout of vibrator motor or weakening of vibration. Therefore, according to the extension

Power distribution board
FQ-3SUS
(Weight: 2.9kg)



Cord reel
FR-5A [5.5mm² x 30m],
(Weight: 24kg)
FR-8A [8mm² x 30m],
(Weight: 27.5kg)



Extension cord
(20m or 30m)



Two-pronged plug



Light, compact and rust resistant stainless steel FQ-3SUS power distribution board is used when many inheaders are used simultaneously. When extending the cord, the cord reel is helpful.

6-3. Inspection before fresh concrete casting

- High frequency vibrator gets cooled after being inserted inside the fresh concrete. Do not run the vibrator in the air needlessly.
- If the plug of the high frequency vibrator is plugged in reverse, the rotation direction of the motor inside can be reversed, but that does not affect the performance of the vibrator. Also, the plug is of the same specification as the commercial product commonly used by each manufacturer. If used with the commercial power source within the work site, change the outlet on the commercial power source side with other outlet. If incorrectly connected, not only the motor burnout but also danger of death or injury by electrification might occur.
- As for the form to be used with the high frequency vibrator, check how well it is tightened and also its strength before casting the fresh concrete.

7. Operation

- Before use, do warm-up run.
 - Under the cold climate, do warm-up for more than 2 - 3 minutes before use.
 - Plug in securely and turn on the switch properly and quickly.
- Leave the switch turned off before work.
- After turning on the switch of the motor, turn on the switch of inheader one by one.
- Quietly insert the vibration head vertically deep into the fresh concrete, and pull it out quietly.
 - In order not to apply excessive vibration, for non-flowing concrete of about 8cm slump, the standard would be; vibration head of $\phi 50$ (FX-50G) to be inserted at an interval of 30 - 50cm for about 15 sec. (less than 30 sec.) To the surface of cast fresh concrete, air bubbles will rise and the mortar changes paste form.

CAUTION

- Before turning off the switch, take out the vibration head from the fresh concrete.
 - When the motor is started with the vibration head in the concrete, the motor might not be able to start if the condition is not good, such as low voltage. Such condition might result in burn out with the switch turned on or the vibrator stuck in the concrete.

CAUTION

- If the machine is left running in the air for a long time, heating of the motor continues, resulting in motor burnout. When work is stopped, turn the switch off.
- Do not immerse the vibrator plug in the concrete.
 - The portion that can be inserted in the concrete is just the vibration head side from the switch box.

CAUTION

- Do not bend the cable cord too much when using. Also, do not put or drop heavy objects on the cord.
- When moving, do not drag the cable cord. Move the machine by holding the vibration head side from the switch.
- To stop, first turn off the inheader switch, then turn off the motor switch.
- At the end of the work, remove the concrete adhered on the vibration head, hose, switch box and cable cord before the concrete solidifies.

7-1. Example of construction work site

7-1-1. Cautions when using FXS/FXB-30B/40G models on wall surface casting.

Never run the machine in principle without the vibration end in the concrete. As for the operation time, it varies slightly depending on the fresh concrete charging position, properties of the concrete, and the sheathing, but in general, for non-flowing fresh concrete with a depth of about 30cm, it is from 15 sec. to less than 30 sec. If water absorbing sheathing is used, vibration time can be extended. When using base concrete with low slump, since the paste content is low, attention has to be paid to wetting.

- The above time is just a guideline, so even within the time mentioned above, if concrete and mortar paste start to leak from the gap of sheathing, you might stop operating. Especially, when fluidizing agent is used and the base slump of 15cm is made to 21 - 22cm, even a small amount of leak may easily cause aggregate separation because the quantity of the mortar in the concrete is small.
- When turbid water (separated water) that has more water content than mortar is leaking from the gap of sheathing, stop the operation because bleeding is occurring.
- Cold joint occurs when concrete is casted after a certain time elapse, such as after lunch break or during non-continuous work, but when fluidizer is used, its effect will be lost in 15 - 30 minutes, and the concrete returns to its original base concrete, resulting in early formation of cold joint.

8. Check procedure of trouble parts

8-1. Inspection of outside

1. Plug

a.Plug insertion part

- If water is on it, wipe off any moisture and dry the part.
- If mortar is attached, clean or replace.

b.Terminal

- If any dust is found on the pin crack (gap), clean it.
- If bended, correct it or replace.
- If broken, replace.
- If the groove of the terminal is closed, use a driver or some other tool to open it. (Fig.1)

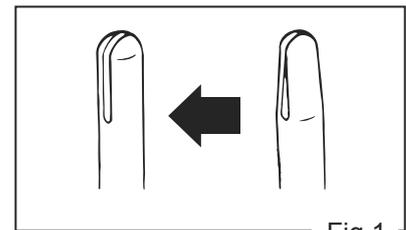


Fig.1

c.Terminal bench (bench)

- If crack or chip is found on the bench, replace it.

2. Cabtyre cord

- If breakage or deterioration is detected, cut that portion or replace (when connecting, use a plug.)

3. Cord armor

- Replace if broken or deteriorated.

4. Switchbox

- If the push covers broken or deteriorated, replace it.
- If the switch box is broken (crack, etc.), replace it.

5. Rubber hose

- If broken or deteriorated/worn, cut that portion or replace.
When reusing, switch the front and back of the hose, which will extend the life.

6. Pendulum case and head cap

- Replace if wear of the outer circumference of the vibration head reaches the maximum wear limit of the dimension (A or B) of Table 3 (for each model).(Fig.2, Table 3)
- For RE model (rubber head type), replace if the rubber part is worn and the inner metal part is exposed.

※ By appearance, replace if the portion to apply a spanner is worn off.

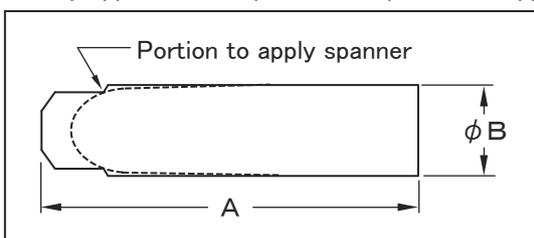


Fig.2

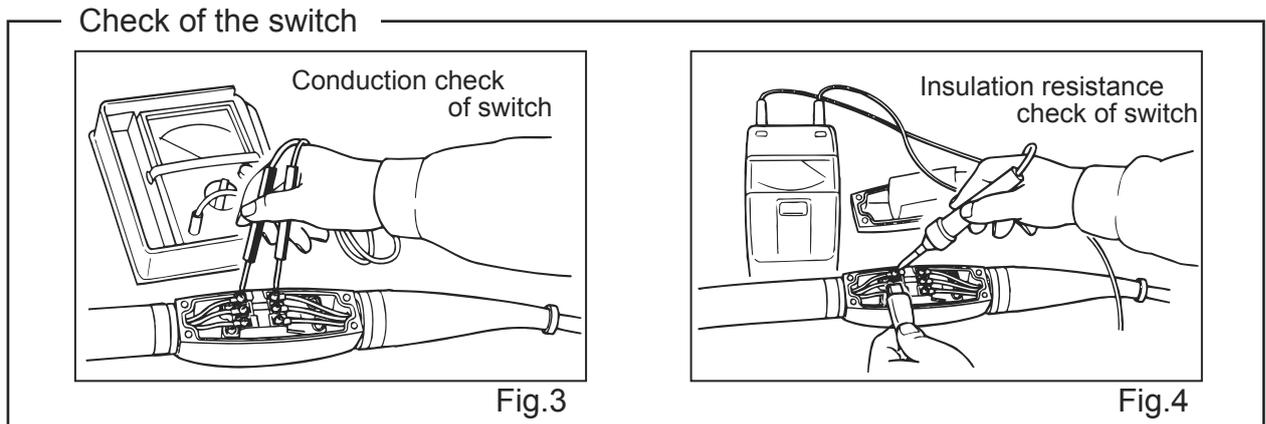
Point Dimension Model	A(mm)		B(φ)	
	Standard dimension	Wear limit	Standard dimension	Wear limit
30E	53	30	32	31
40G	180	175	43	41
50G	196	188	52	50
60E	257	233	61	59

Table 3

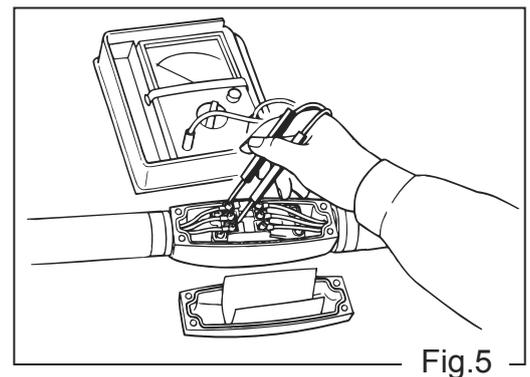
8-2. Inspection of inside

8-2-A. Switch and lead wire

1. Open the switchbox to check if there is water or mortar inside the switchbox.
2. Check for looseness of bolt at the switch terminal.
3. Check conduction of cable cord between the plug and the switch, also check for any short circuit (with the switch turned off.)
4. Check of the switch
 - a. Turn On and Off.
 - b. With the switch turned on, check conduction between terminals. (Fig.3)
 - c. With the switch turned off, check the insulation resistance between the terminals (Fig.4)
 - d. Insulation resistance of switch and switchbox.



5. Check conduction and short circuit of lead wire from the switch to the motor side. (With the switch turned off) (Fig.5)



8-2-B. Vibration head (ASSY)

1. Check the insulation of the motor (with DC500V mega-ohm meter, the allowable insulation resistance is more than 20MΩ) (See the next "9. Check of good parts".)

CAUTION

- If abnormality is detected by the above check, and if the trouble is not corrected, do repair promptly.
- While the inheader is run and vibration is generated, if extreme abnormal noise is heard, that might be due to bearing wear or deformation of vibration head. Repair is needed.

※ For ordering of parts, parts list and repair, please contact the sales store or MIKASA parts service center.

9. Check of good parts (Check confirmation method)

1. Put wet waste over the motor case of the vibration head and run for 15 to 30 sec.
2. After trial run, measure the current with no load.(Table 4)

	Output side voltage 48 - 60V			
	FX-30E	FX-40G	FX-50G	FX-60E
Current	4 - 4.5A or less	6 - 7A or less	9 - 10A or less	17A or less

Table 4

3. Check to see if the vibration is normal (Strength/weakness of vibration and noise, etc.)

4. Insulation resistance test

By DC500V mega-ohm meter, the allowable insulation resistance should be more than 20MΩ.

a. Conduction check (Fig.6)

- With the switch turned on, check conduction between R-S, S-T, and T-R at the plug terminal.
- With the switch turned off, check non-conduction between R-S, S-T, and T-R at the plug terminal.

b. Insulation resistance check (Fig.7)

- With the switch turned on, check the insulation resistance between plug terminal and (A) vibration head assembly and (B) switch box.
- With the switch turned off, check the insulation resistance between R-S, S-T, and T-R at the plug terminal (C).

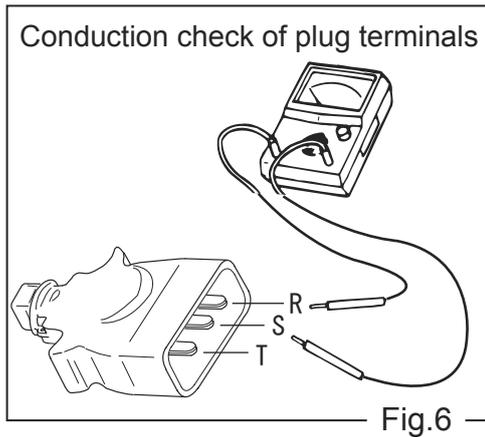


Fig.6

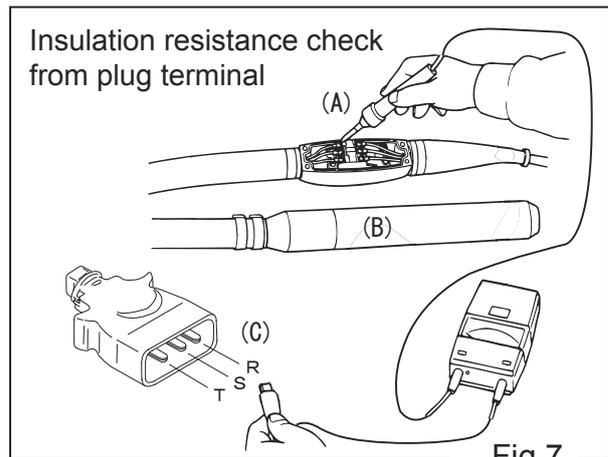


Fig.7

※ Reference

Stator coil resistance (at 20°C)

Model	FX-30E	FX-40G	FX-50G	FX-60E
Resistance	3.5Ω	0.88Ω	0.422Ω	0.189Ω

Table 5

10. Troubleshooting

Phenomenon	Assumed cause	Necessary action
Not vibrating	(1) Wire contact problem	Repair
	(2) Plug problem	Repair or replace
	(3) Cabtyre cord wire breakage or short circuit	Repair
	(4) Lead wire breakage or short circuit	Repair
	(5) Switch problem	Repair or replace
	(6) Bearing breakage	Replace
	(7) Wear at pendulum and rotor joint	Replace
	(8) Stator burnout	Replace
	(9) Power source problem	Replace
Weak vibration or elevated temperature of vibration head	(1) Plug problem	Repair or replace
	(2) Extension cord voltage drop	Adjustment
	(3) Power source voltage low	Adjustment
	(4) Use of commercial bearing causing grease flying out in short time or insufficient clearance.	Replace
	(5) Stator half burn.	Replace
	(6) Insulation problem (stator, switch, etc.) and single phase operation	Repair or replace
	(7) Power source overload (vibrator used more than specified)	Adjustment
	(8) Low temperature	Do warm-up when using at temperature below 10°C
	(9) Bearing problem	Replace
	(10) Contact with rotor and stator	Replace
High noise level	(1) Bearing wear	Replace
	(2) Deformation of vibration head	Replace
	(3) Wear of pendulum and rotor joint part	Replace
	(4) Wear of motor case bearing mating surface (inner race)	Replace
	(5) Wear of case joint bearing mating surface	Replace

Table 6

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