# FujiMAC Air Pump Online Manual


Thank you for purchasing the FujiMAC Air Pump.
Be sure to read through this manual before proceeding with operation.

FujiMAC
http://www.fujimacjapan.com/

# Contents

# ■ Before Use

- Check for any problems on the outside of this product.
- Check that all the accessories are included.
  Accessories: Rubber hose, hose band, manual
- Please keep this manual for future reference.
- Read through this manual and ensure you understand how to use and care for this product before proceeding with operation.
- The contents of this section are vital to ensuring safety. Please pay special attention to the following signs.

### ⚠ DANGER

Indicates an extremely hazardous situation that could result in death or serious injury if not avoided.

### ⚠ WARNING

Indicates a potentially hazardous situation that could result in death or serious injury if not avoided.

### ⚠ CAUTION

Indicates a potentially hazardous situation that could result in minor or moderate injury and/or property damage if not avoided.

# ■ Safety Precautions

### ⚠ WARNING

- When this appliance is used by children from 8 years old and older and persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, they must first be made to understand the hazards involved by being given supervision and instruction concerning safe use of the appliance by a person responsible for their safety.
- Supervise children to ensure that they do not play with the appliance.
- Close supervision is necessary when this appliance is used near children.
- If the power cord is damaged and needs replacement, it must be sent to the manufacturer or a service agent to avoid a hazardous situation. Alternatively, it must be replaced by a similarly qualified person.
- Unplug or switch off the appliance before carrying out maintenance.
- This product is an air pump designed to transmit air under water. Do not use this product for any use other than the intended use.
- Do not place flammable materials and/or gas near this appliance. Doing so may result in electric shock or fire.
- If an extended power cord is needed, a suitably sized extension cord should be used. Using a cord that is too small may cause it to overheat. Be sure to choose a suitable extension cord so that it will not be tripped over or pulled.

## ⚠ WARNING — Preventing electrical shock

- Do not try to open or repair this product yourself. Only the retailer from which the purchase was made and trained personnel can provide overhaul and repair services as needed.
- Do not touch the plug with wet hands.
- Do not open the product's cover with the power plug inserted into an outlet.
- Use this product at a higher position than the water level in order to prevent water backflow.
- Do not immerse this product in the water. If the air pump falls in the water, do not reach for it. Unplug this product immediately.
- Carefully check this product before use. Do not plug in the air pump if there is water on any parts not intended to be wet.
- Do not operate this product if it has a damaged cord or plug or if it is malfunctioning or has been dropped or damaged.
- If the plug does not fit fully into the outlet, try switching the orientation of the plug. The plug may not fit into the outlet because the pins of the plug may have different polarities. If the plug still does not fit, contact a qualified electrician. Do not use an extension cord unless the plug can be fully inserted.

## ⚠ CAUTION

- This product will become hot during operation. The bottom of this product will become especially hot during operation, so do not touch it directly with bare hands. Doing so may cause burns and other injuries.
- Do not throw water on this product. Doing so may cause damage to this product or electrical shock.
- Do not lift this product by the filter cover or power cord. Doing so may cause damage to this product and/or injury.

# ■ Installation Manual

- Install this product in a well-ventilated place away from direct sunlight, preferably under a cover.
- Install the air pump in a place that provides easy access for inspection and maintenance.
- Place this product level on a stable surface.
- Connect this product and the pipe by a rubber tube and tighten by a pinchcock.
- Ensure the voltage shown on the label correlates with the mains supply voltage.

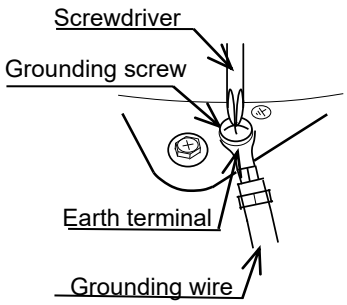
## ⚠ WARNING

- All electrical work must be performed by a licensed electrician.
- Do not place any object on the power cord. Doing so may cause electric shock and/or fire.

## ⚠ CAUTION

- The diaphragms and valve will be damaged by chlorine gas and other fumes. Any hole or gap (i.e., conduit or air pipe) where chlorine gas could pass through to this product must be sealed completely with silicon sealant or other suitable material. (Diaphragm and valve damage is not covered by the warranty.)
- To prevent this product from falling into the water tank, do not install this product directly above the water tank.
- Make sure this product is used in a dry, moisture and dust-free place protected from rain, splashing water, flooding, and snow accumulation.
- Do not install this product under a kitchen fan or where air that includes oil can be taken into this product.
- Avoid installing this product in a bedroom or other places where noises may be a nuisance.
- Install this product above the water level so that water does not flow back by siphoning.
- Ensure that water cannot reach the socket. (Refer to Example of Suggested Installation.)
- This product must be connected to a grounded, metallic, permanent wiring system or an equipment-grounding terminal or lead on the product.
- Be sure to conduct grounding construction work. (Applicable only for 2-pin plugs.)

## Grounding instruction (For 2-pin plugs)




Grounding must be done to avoid the risk of electric shock.

1. Use a grounding wire with a thickness of AWG16 or more.
2. Remove the grounding screw from this product's cover.
3. Connect the grounding wire to this product's cover using the grounding screw and a screwdriver.
4. Make sure the grounding screw is securely tightened and does not move.
5. The grounding wire must be connected to a grounding rod by a qualified electrician.
   *Do not connect it to anything flammable such as a gas pipe.

## ⚠ WARNING

- **Improper grounding may cause electric shock and/or fire**.

## Grounding instruction (For North America)

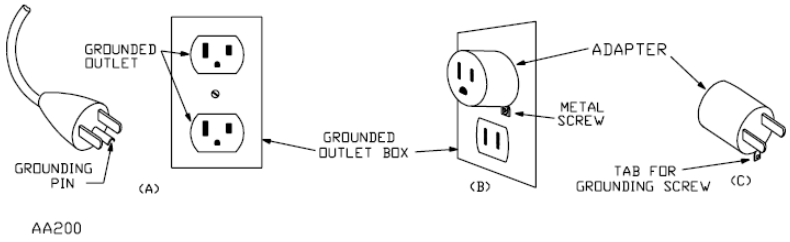
This product must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

⚠WARNING – Improper installation of the grounding plug is able to result in a risk of electric shock. When repair or replacement of the cord or plug is required, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.
Substitution of the signal word "DANGER" for "WARNING" is not prohibited when the risk associated with the product is such that a situation exists which if not avoided will result in death or serious injury.

Check with a qualified electrician or serviceman when the grounding instructions are not completely understood, or when in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.

This product is for use on a nominal 120-V circuit, and has a grounding plug similar to the plug illustrated in sketch A in Figure 1. A temporary adapter similar to the adapter illustrated in sketches B and C may be used to connect this plug to a 2-pole receptacle as shown in sketch B when a properly grounded outlet is not available. The temporary adapter shall be used only until a properly grounded outlet (sketch A) is installed by a qualified electrician. The green colored rigid ear, lug, or similar part extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adapter is used, it must be held in place by a metal screw.

Figure 1
Grounding Method



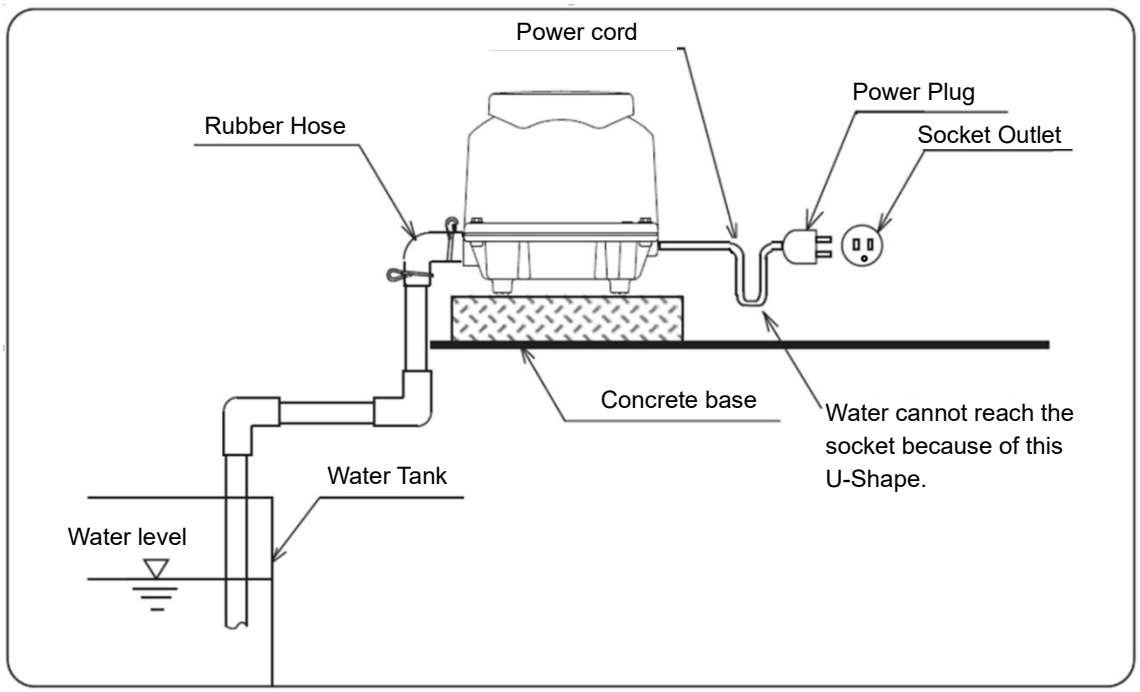
## Extension Cords (For North America)

Use only a 3-wire extension cord that has a 3-blade grounding plug, and a 3-slot receptacle that accepts the plug on the product. Make sure your extension cord is not damaged. When using an extension cord, be sure to use one heavy enough to carry the current your product draws. For lengths less than 50ft, 18AWG extension cords shall be used. An undersized cord results in a drop in line voltage and loss of power and overheating. (NOTE: Table 1 shows the correct size to use depending on cord length and nameplate ampere rating. When in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord.)

Table 1
Minimum Gauge for Extension Cord

| Cord length(ft) | 25 | 50 | 100 | 150 | 200 | 250 | 300 | 400 | 500 |
|---|---|---|---|---|---|---|---|---|---|
| AWG | 18 | 18 | 16 | 14 | 12 | 12 | 10 | 10 | 8 |

### Example of Suggested Installation




# ■ Test Operation

- The water tank (i.e., the purification tank) that is connected to this product must be filled with water up to the prescribed level for the tank before inserting this product's plug into an outlet and starting operation.
- Ensure there is proper aeration after turning on the air pump.
- Ensure that this product is making no abnormal noises or vibrations.

### ⚠ CAUTION

- The recommended working pressure for this product is ±20% of the normal pressure specified on this product's name plate. Check the actual working pressure (back pressure) between this product and the water tank connected to this product. This pressure being outside the recommended range may shorten the service life of the product, so adjust the pressure by changing, for example, the piping.
- The air flow volume will vary depending on the actual voltage. For example, a rated voltage (230-240V) product can be used at 220V, but the air volume will be smaller than when operated at the rated voltage (230–240 V). The air volume will change depending on the back pressure as well.

## ■ Inspection and Maintenance as Required

### ⚠ CAUTION

- Before starting work, disconnect the power plug from the outlet. Do not disconnect the plug by pulling on the cord. Doing so may cause damage to the cord.

### ⚠ WARNING

- This product becomes hot during operation. The bottom of this product becomes especially hot. Do not touch it directly. After disconnecting the power cord plug, check that this product has cooled before opening the cover. Failing to do so may cause burns and other injuries.

#### (1) Air Filter

**⚠ CAUTION**

- Inspect and clean every 3 or 4 months and replace every year.
- To optimize the lifespan of the air filter when used in areas where dust accumulation may be high, frequent maintenance is required. If the air filter gets too dirty, replacement will be necessary. Failing to do so may cause overheating, reduced air volume, and short-term damage to the diaphragm.
- When the filter cover is fixed in place with screws, the recommended tightening torque for theses screws is 1.4 Nm (1 ft-lb). Note that excessive tightening may cause damage to the screws. If there are no screws, ensure that the filter cover is oriented correctly, and then push down on it to firmly fit it in place.

#### (2) Diaphragm/Valve

**⚠ CAUTION**

- Replace the diaphragm/valve every year. Be sure to replace the diaphragm/valve before it becomes damaged.
- If the diaphragm/valve becomes damaged, the auto-stop function will engage (excluding MAC40RII). Do not leave this product in this stopped state, quickly replace the damaged part. Failing to do so may decrease the performance of the purification tank and cause foul odors. The diaphragm and compression chamber assembly are consumable parts and are not covered by the warranty. If necessary, purchase a new part from a retailer.

## (3) Pressure

⚠ **CAUTION**

- The recommended working pressure for this product is ±20% of the normal pressure, which is specified on this product's name plate. Do not perform operation with abnormally high or low pressure. Doing so may cause abnormal heat generation or early diaphragm damage.

## (4) Power Plug

⚠ **WARNING**

- Check at least once a year whether any dirt or dust has built up on the power plug, and be sure to plug into the power point firmly. Dirt/dust accumulation and faulty connections may cause electric shock and/or a fire.

## (5) Auto-Stop Function

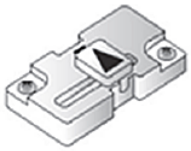
- Make sure to inspect the function every time the diaphragm/valve assembly is replaced. Remove the auto-stop piece and put in the plug to ensure the auto-stop function works properly. After checking, disconnect the plug from the power point and set the auto-stop piece in the right position. (See below.)

⚠ **WARNING**

- Be sure to turn off the power when replacing the diaphragm/valve assembly and/or handling the auto-stop piece. Failing to do so may cause an electric shock.

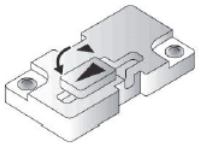
<How to remove the auto-stop piece>

1)



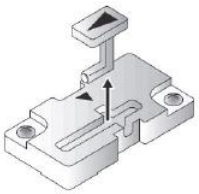
Normal position.

2)



Turn the auto-stop piece and align the ▲ symbol with the slit.

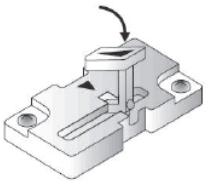
3)



Remove the auto-stop piece from the air pump auto-stop holder.

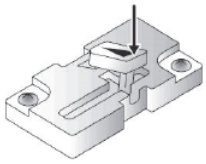
<How to set the auto-stop piece>

1)



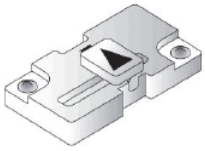
Align the ▲ symbol from the auto-stop piece toward the ▲ symbol on the auto-stop holder and slide the piece into the holder.

2)



Push it in until it clicks.

3)

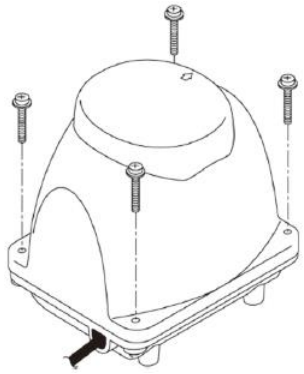


The auto-stop is now ready for use.

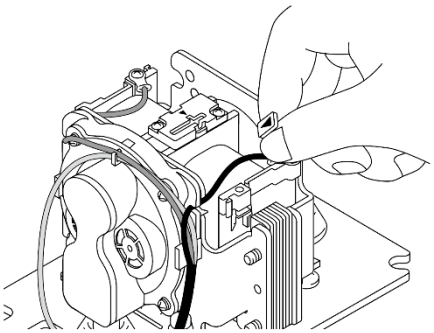
## (6) Diaphragm Replacement Procedure

**Cord wiring may differ from the illustration for some models.**

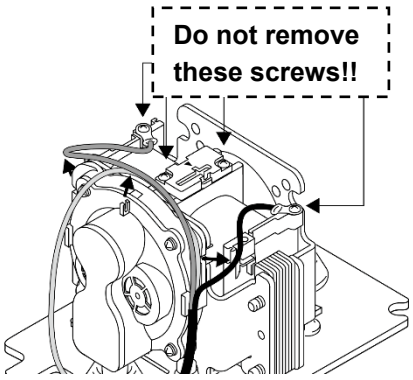
1. Replace the cover bolts using an 8 mm (5/16”) wrench.



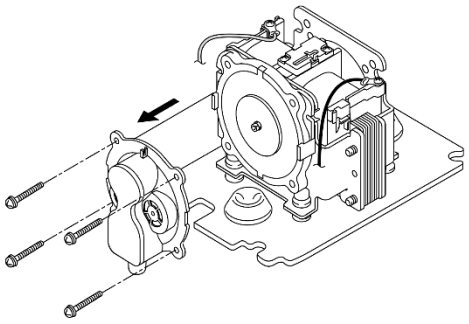
2. Remove the auto-stop piece as instructed under 5. Auto-Stop Function.



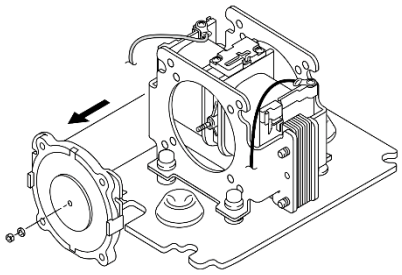
3. Remove the wires from the 3 hooks.
   NOTE: Do not remove the screws.



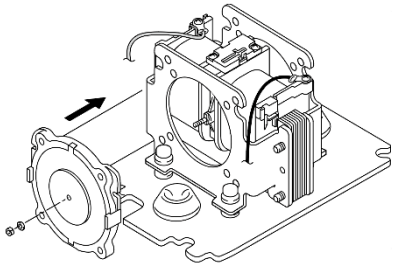

4. Remove the 4 screws from the casing using a Phillips screwdriver.



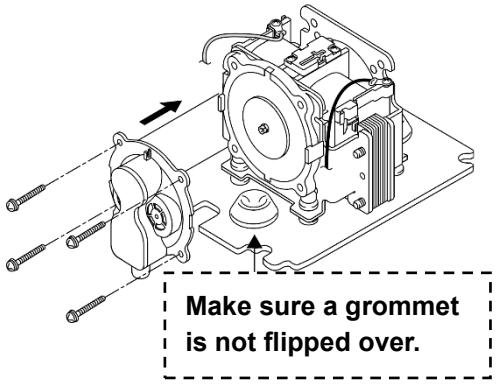
5. Remove the nut and take the diaphragm off the motor body.



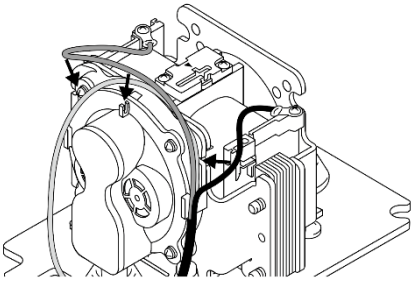
6. Install a new diaphragm using the new provided nut.
   *Tightening torque: Approx. 1 Nm (approx. 0.75 ft-lb)



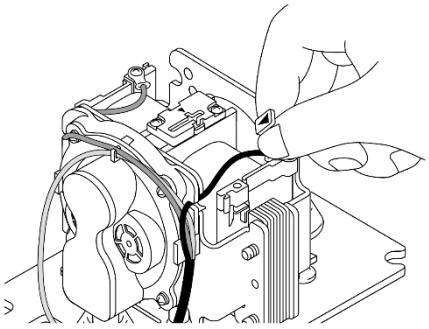
7. Insert the air outlet into the rubber grommet and reattach the casing assembly with the 4 screws.



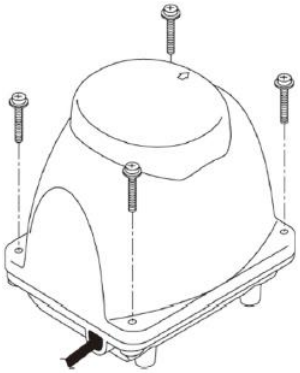

8. Replace the wires in the 3 hooks.



9. Install the auto-stop piece as instructed in the first steps.



10. Tighten the cover bolts using an 8 mm (5/16”) wrench.



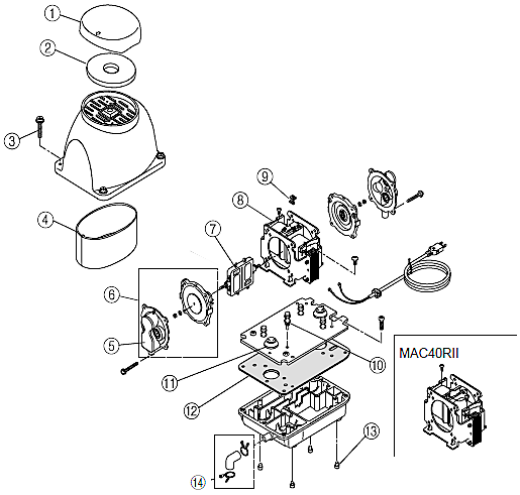
## ⚠ WARNING

Unplug the power cord and be sure to let the air pump cool down before opening the cover.

- Replace both sides of the diaphragm/casing assembly at the same time. If one diaphragm breaks, it generally indicates that the remaining diaphragm is weak and vulnerable to breaking in the near future.
- Replace the diaphragm assembly kit every year.
- Operate the blower to ensure operation is correct after replacing the diaphragms.
- Do not lubricate any internal parts of the air pump.

# ■ Exploded View and Parts List

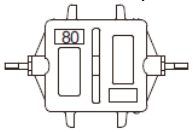
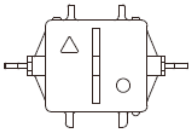
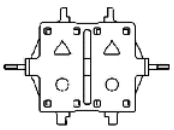
<MAC40RII–120RII>



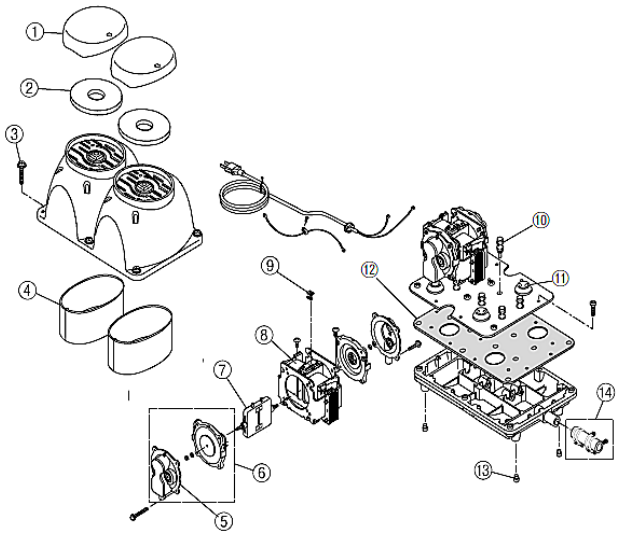

| | Part Number | Item Name | 40RII | 60RII(A) | 80RII(A) | 100RII(A) | 120RII |
|---|---|---|---|---|---|---|---|
| 1 | H612 | N6 Filter cover | ○ | — | — | — | — |
| | H613 | N8 Filter cover | — | ○ | ○ | ○ | ○ |
| 2 | H507 | N6 Air filter | ○ | — | — | — | — |
| | H508 | N8 Air filter | — | ○ | ○ | ○ | ○ |
| 6 | H150K | N6 Diaphragm assembly (with N6 Compression chamber)* | ○ | — | — | — | — |
| | H154K | T10 Diaphragm assembly (with T10 Compression chamber)* | — | ○ | ○ | ○ <Models other than plug type O (AS) > | — |
| | H156K | T11A Diaphragm assembly (with T10 Compression chamber)* | — | — | — | ○ <Plug type O (AS) model> | — |
| | H157K | T30 Diaphragm assembly (with T30 Compression chamber)* | — | — | — | — | ○ |
| 9 | H256K | N6 Auto-stop piece | — | ○ | ○ | ○ | — |
| | H257 | T30 Auto-stop piece | — | — | — | — | ○ |
| 10 | H658 | N6 Shock absorbing rubber (4 pcs.) | ○ | ○ | ○ | ○ | ○ |
| 11 | H821 | N6 Rubber grommet | ○ | ○ | ○ | ○ | ○ |
| 12 | H639 | R10 Tank gasket | ○ | ○ | ○ | ○ | ○ |
| | H638 | N0 Tank gasket | — | — | — | — | — |
| 13 | H659 | N6 Rubber foot (4 pcs.) | ○ | ○ | ○ | ○ | ○ |
| 14 | H812 | A4 Exhaling rubber hose assembly | ○ | ○ | ○ | ○ | — |
| | H820 | Exhaling rubber hose assembly (⌀13 straight) | — | — | ○ | ○ | — |
| | H827 | T10 Different diameter hose assembly (for north America) | ○ | ○ | ○ | ○ | — |
| | H814 | E2 Exhaling rubber hose assembly | — | — | — | — | ○ |

NOTE: After January 2024, the repair parts for MAC100RII<plug type O(AS) model, for Oceania only> will be changed from T10 diaphragm assembly to T11A diaphragm assembly.

<Oscillator direction>

| 60RII(A), 80RII(A) | 100RII(A) | 120RII |
|---|---|---|
| Set “80” mark upward   | Set “△” mark upward  | Set “△” mark upward  |

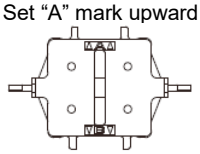
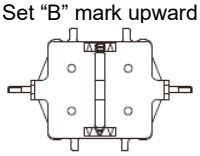
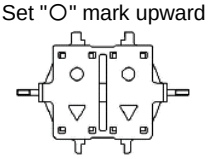
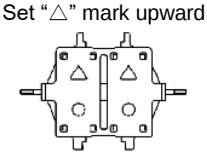
<MAC150RII–300RII>




| | Part Number | Item Name | 150RII | 200RII | 250RII | 300RII (50 Hz) | 300RII (60 Hz) |
|---|---|---|---|---|---|---|---|
| 1 | H612 | N6 Filter cover | — | — | — | — | — |
| | H613 | N8 Filter cover | ○ | ○ | ○ | ○ | ○ |
| 2 | H507 | N6 Air filter | — | — | — | — | — |
| | H508 | N8 Air filter | ○ | ○ | ○ | ○ | ○ |
| 6 | H150K | N6 Diaphragm assembly (with N6 Compression chamber)* | — | — | — | — | — |
| | H154K | T10 Diaphragm assembly (with T10 Compression chamber)* | ○ | ○ | — | — | — |
| | H156K | T11A Diaphragm assembly (with T10 Compression chamber)* | — | — | — | — | — |
| | H157K | T30 Diaphragm assembly (with T30 Compression chamber)* | — | — | ○ | ○ | ○ |
| 9 | H256K | N6 Auto-stop piece | ○ | ○ | — | — | — |
| | H257 | T30 Auto-stop piece | — | — | ○ | ○ | ○ |
| 10 | H658 | N6 Shock absorbing rubber (4 pcs.) | ○ | ○ | ○ | ○ | ○ |
| 11 | H821 | N6 Rubber grommet | ○ | ○ | ○ | ○ | ○ |
| 12 | H639 | R10 Tank gasket | — | — | — | — | — |
| | H638 | N0 Tank gasket | ○ | ○ | ○ | ○ | ○ |
| 13 | H659 | N6 Rubber foot (4 pcs.) | ○ | ○ | ○ | ○ | ○ |
| 14 | H812 | A4 Exhaling rubber hose assembly | — | — | — | — | — |
| | H820 | Exhaling rubber hose assembly (⌀13 straight) | — | — | — | — | — |
| | H827 | T10 Different diameter hose assembly (for north America) | — | — | — | — | — |
| | H814 | E2 Exhaling rubber hose assembly | ○ | ○ | ○ | ○ | ○ |

NOTE: Order 2 sets of the same parts for 1 air pump (MAC150RII–300RII).

<Oscillator direction>

| 150RII | 200RII | 250RII, 300RII (50 Hz) | 300RII (60 Hz) |
|---|---|---|---|
| Set “A” mark upward  | Set “B” mark upward  | Set "○" mark upward  | Set “△” mark upward  |

# ■ Specifications

<AC 230–240V model>

| | | MAC 40RII | MAC 60RII | MAC 80RII | MAC 100RII | MAC 120RII | MAC 150RII | MAC 200RII | MAC 250RII | MAC 300RII (50 Hz) | MAC 300RII (60 Hz) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Air flow volume | L/min | 40 | 60 | 80 | 100 | 120 | 150 | 200 | 250 | 300 | 300 |
| Rated pressure | kPa | 12 | 15 | 15 | 18 | 18 | 20 | 20 | 20 | 20 | 20 |
| Electricity consumption (at rated pressure) | W | 27/28 | 35/38 | 47/51 | 68/80 | 86/101 | 100/125 | 140/159 | 186/226 | 250 | 260 |
| Electricity consumption (at open flow) | W | 36 | 67 | 70 | 90 | 130 | 170 | 205 | 260 | 280 | 350 |
| Rated voltage | V | 230–240 | | | | | | | | | |
| Frequency | Hz | 50/60 | | | | | | | | 50 | 60 |
| Outlet pipe diameter | mm | 18 | | | | 26 | | | | | |
| Weight | kg | 5.0 | | | | | 9.0 | | | | |
| Plug type | | SE / BF / A / O (GB) / O (AS) | | | | | | | SE / BF / A / O (GB) | | |
| Power cord length | m | SE / BF / A / O (GB): 1.5, O (AS): 0.75 | | | | | SE / BF / A: 1.5, O (GB): 2.0, O (AS): 0.75 | | SE / BF: 1.5, A / O (GB): 2.0 | | |
| Country of origin | | Japan | | | | | | | | | |

<AC120V model>

| | | MAC 40RII | MAC 60RII (60RIIA) | MAC 80RII (80RIIA) | MAC 100RII (100RIIA) | MAC 120RII | MAC 150RII | MAC 200RII |
|---|---|---|---|---|---|---|---|---|
| Air flow volume | CFM | 1.4 | 2.1 | 2.8 | 3.5 | 4.2 | 5.3 | 7.1 |
| | L/min | 40 | 60 | 80 | 100 | 120 | 150 | 200 |
| Rated pressure | PSI | 1.7 | 2.2 | 2.2 | 2.6 | 2.6 | 2.9 | 2.9 |
| | kPa | 12 | 15 | 15 | 18 | 18 | 20 | 20 |
| Electricity consumption (at rated pressure) | W | 30 | 37 | 51 | 74 | 93 | 115 | 155 |
| Rated voltage | V | AC 120 | | | | | | |
| Frequency | Hz | 60 | | | | | | |
| Outlet pipe diameter | inch | 0.71” | | | | 1.02” | | |
| | mm | 18 | | | | 26 | | |
| Weight (With alarm unit) | lbs. | 11 | | | | | 20 | |
| | | | (12) | | | | | |
| | kg | 5.0 | | | | | 9.0 | |
| | | | (5.4) | | | | | |
| Plug type | | A | | | | | | |
| Power cord length | inch | 74.02” | | | | | | |
| | mm | 1880 | | | | | | |
| Country of origin | | Japan | | | | | | |

# ■ Operation of Alarm Air Pumps（MAC60RIIA、80RIIA、100RIIA for the U. S.）

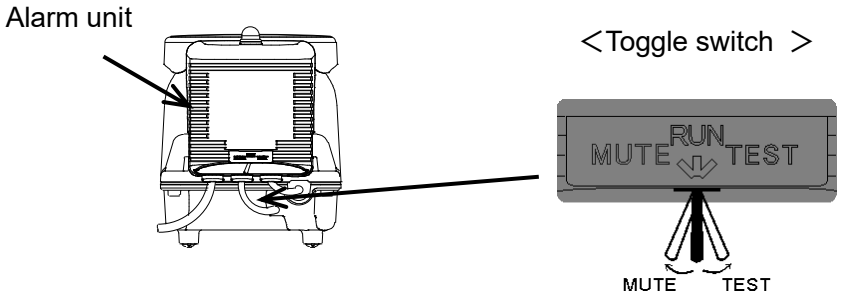
⚠ **WARNING**

- Maintenance of the alarm unit must be performed by a qualified service person.
- Do not disassemble the alarm unit. To prevent risk of electrical shock or alarm unit failure.
- Do not pull on the power cord when moving or carrying. Failure to take this precaution may result in malfunction or electric shock.
- If the alarm shell or lamp is cracked or damaged, immediately unplug it and contact a qualified service person.

⚠ **CAUTION**

- Never lift the pump by the alarm housing as this could result in electric shock or pump damage.

### How to operate the alarm




| | |
|---|---|
| **RUN** | Normal operating position, with treatment tank full to operating level and aeration functioning correctly. |
| **MUTE** | When the aeration system is not functioning correctly the alarm will sound. The MUTE setting will silence the alarm.<br>(BE SURE TO RETURN SWITCH TO RUN AFTER REPAIR) |
| **TEST** | Check audible and visual alarm function by placing switch in test position. |

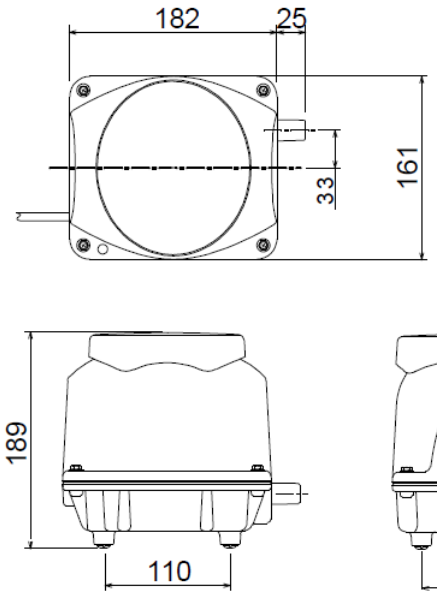
### Specifications (Environment)

| | |
|---|---|
| Temperature Range | -4 °F to 104 °F (-20 ℃ to 40 ℃) |
| Humidity | 90% or less |

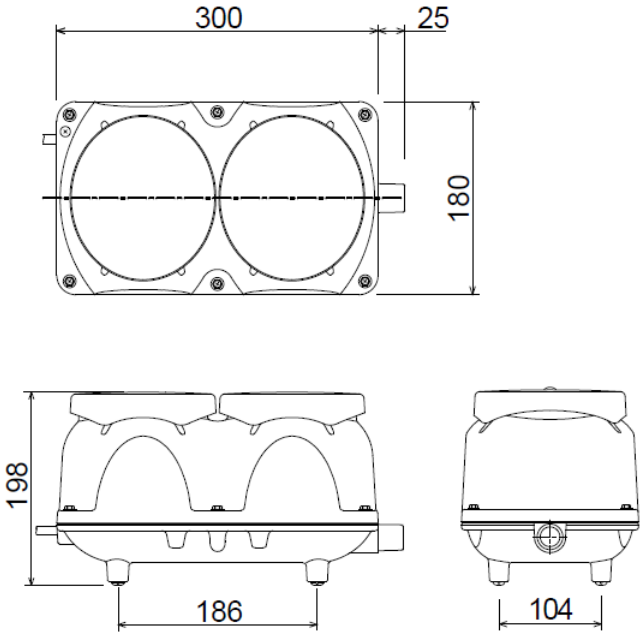
# ■ Overall View

Unit: mm

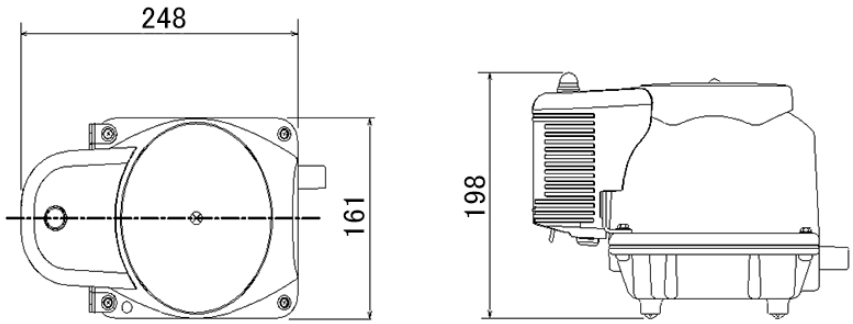
MAC40–120RII




MAC150–300RII




MAC60–100RIIA



# ■ Q&A

**Q1. A newly purchased product does not operate. What are the possible causes?**

A1. Check the following to identify the cause.

- Power is not supplied to the outlet.

  → Check whether power is supplied to the outlet. For example, connect another electrical device to the same outlet.

- The auto-stop has been triggered within the product or one of its parts is damaged.

  → The auto-stop may be triggered due to impact during transportation of the product. Open the cover and check whether the auto-stop is properly set, and check for any damaged parts.

**Q2. The product stopped operating. What are the possible causes?**

A2. Check the following to identify the cause.

- No power supply.

  → Check the outlet and plug. Insert the plug completely.

- The auto-stop has been triggered.

  → The diaphragm/valves are damaged. If damaged, please replace. If not damaged, other possible reasons include auto-stop problems such as poor installation and disconnection due to impact. Check that it has been installed securely.

- No electrical continuity.

  → A part may be disconnected. Perform a continuity check. If there are disconnected parts, request replacements or repairs from a maintenance company.

- The bimetal circuit breaker has been triggered.

  → If the main unit becomes too hot, the bimetal circuit breaker will be triggered, stopping operation of the product. The likely cause is clogging on the discharge or inlet side of the product. Check for closed valves; clogging of the diffuser tube, air filter, and inlet; and similar problems. Remove any clogs that you find.

**Q3. The product is noisy. What are the possible causes?**

A3. Check the following and take action accordingly.

- Rattling is occurring due to, for example, a pebble being caught between the product and the base.

  → Remove all foreign material and place the product so that it does not rattle.

- The screw of a part is loose.

  → Firmly tighten any loose screws.

- Sound is trapped within the installation environment and is resonating. (Refer to the following figure.)

  → Install the product in a different location.

- Sound travels through the pipes.

  → Attach a chamber.

[Examples of Installations That Are Prone to Noise]

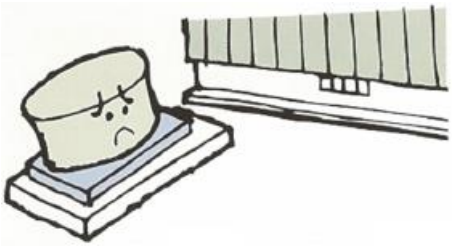
1. Installation in a narrow space between a building and a wall, a space surrounded on three sides, or a space with a ceiling.

The sound is louder on the open side.

2. Installation on a base that is in contact with the foundation of a building (berm).

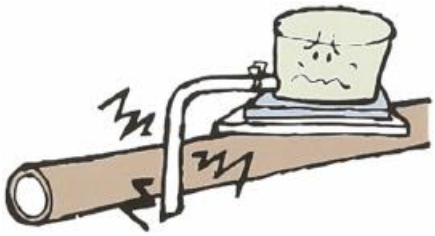
Vibration is more easily transmitted to the building.

3. The installation base is not level.



Vibration of the product increases.

4. Piping to the purification tank is in contact with the foundation of a building or another piping system.



Sound travels through the pipes to the building.

**Q4. The diaphragm/valves broke in a short time. What are the possible causes?**

A4. Check the following to identify the cause.

• Improper discharge pressure.

→ The discharge pressure cannot be too low or too high, as either can lead to the diaphragm being torn quickly. Remove the cause and adjust the discharge pressure to normal pressure ±20%.

| | Too high | | | Too low | |
|---|---|---|---|---|---|
| Cause | Diffuser tube is clogged. | Valve is closed. | Piping is too long. | Piping has damaged/loose parts. | Blower failure. |
| Action | Cleaning/replacement | Valve adjustment | Use piping with a larger diameter. | Repair/correction | Repair |

• The air filter or inlet is clogged.

→ Clogging in the filter prevents air flow, which leads to heat buildup in the solenoid. This heat can quickly damage the diaphragm. Clean or replace the filter.

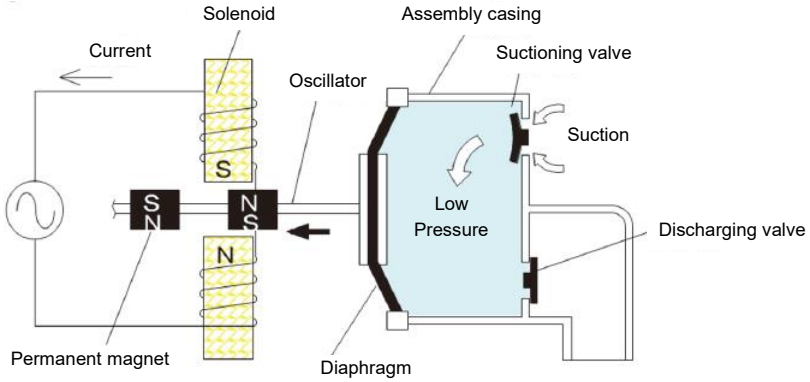
• The unit has suctioned up foreign material such as chlorine gas or oil.

→ Do not place the unit in a location where it can suction up oil or chlorine gas, or where it is exposed to direct sunlight with poor ventilation or to a lot of dust or particles, as this can quickly lead to tearing of the diaphragm. Move the unit to an appropriate location.

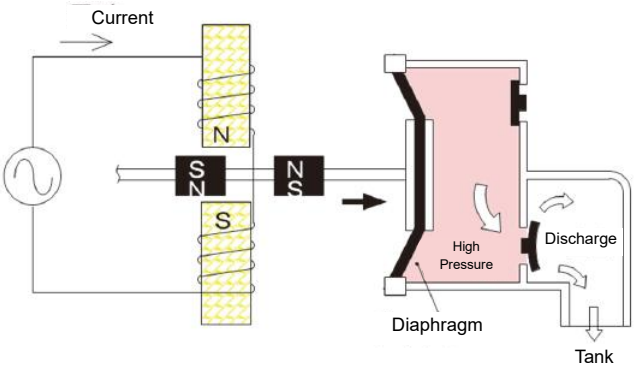
**Q5. What is the working principle of this product?**

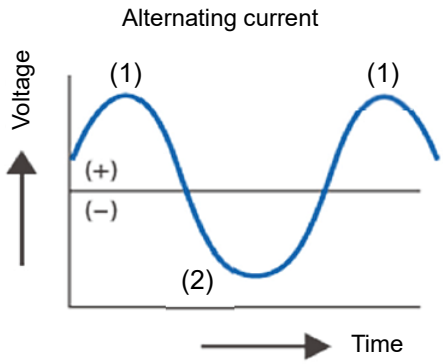
A5. The pump you purchased is a diaphragm pump. This pump works with an electromagnetic linear drive. The pump is driven by two opposing fixed electromagnets and an axially vibrating oscillator rod (equipped with permanent magnets). A diaphragm is attached to the oscillator rod on both sides, which together with the inlet and outlet valves produces the pumping function.

**(1) Suctioning process**




**(2) Discharging process**



# ■ Manufacturer's Warranty Information

**Important**

The original, dated invoice is required to activate your warranty. Please keep your purchase record in a safe place.

- Warranty claims must be submitted to the retailer from which the purchase was made. The manufacturer's warranty period is one (1) year from the date of purchase, although FujiMAC certified distributors may have extended warranty periods. Please contact with the retailer from which the purchase was made to inquire about your warranty.

(1) FujiMAC offers a full replacement warranty for pumps with a factory defect that causes the pump to malfunction or fail within the warranty period.

(2) Please note that the following criteria can be considered reasons to decline warranty replacement.

- Original dated purchase invoice not provided.
- Any failure caused by shipping damage.
- Any failure caused by not following the instructions in the owner's manual.
- Any modification to this product.
- Alteration of any product components with the exception of those required for routine maintenance.
- Any damage caused by direct impact to this product's case or internal components, or by any other rough treatment.
- Any failure or damage caused by natural disasters, flooding, or operation in wet locations, areas with heavy pollution, or with voltage spikes.
- Any failure or damage caused by rodents, ants, or other species.
- Damage caused by siphoning of water flowing from a tank or diffuser tube into this product.
- Failure or damage caused by use outside the rated voltage or frequency.
- Use of this product in such a manner that the operating pressure is greater than that recommended in the owner's manual. (I.e., too great a depth of water, restrictive or undersized piping, too great a distance from this product to the diffuser tube, an incorrect or restrictive diffuser tube, clogging.)

**NOTE:** This warranty covers preplacement of the pump only. Shipping and handling fees are to be paid for by the customer. FujiMAC is not responsible for any indirect damage or expense attributed to use of our product. Examples of indirect damage are not limited to but could include the following: odors; corrosive gas damage; malfunctions and flooding of facilities and/or equipment; disease; loss of living organisms such as fish, coral, and seaweed; and accumulation of any unwanted organisms.

FujiMAC

http://www.fujimacjapan.com/