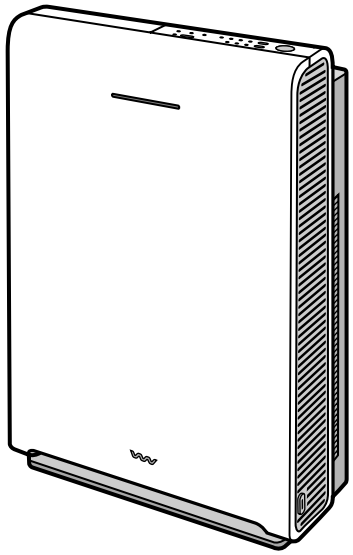
SANYO

FILE No.

SERVICE MANUAL Air Purifier ABC-VW24

Specifications

		HIGH	MIDDLE	LOW
Power source	:	AC Local voltage 50/60Hz		
Power consumption	:	50 W	16 W	8 W
Fan speed	:	1,280 r.p.m.	800 r.p.m.	400 r.p.m.
Air displacement	:	5.1 m^3/min	2.8 m^3/min	1.2 m^3/min
Noise	:	52 dB	37 dB	18 dB
Recommend able space	:	40 m^2		
Filter	:	Hepa filter & Deodorization filter		
Dimensions (WxDxH)	:	340 x 180 x 600 mm		
Net weight	:	7.1 kg		



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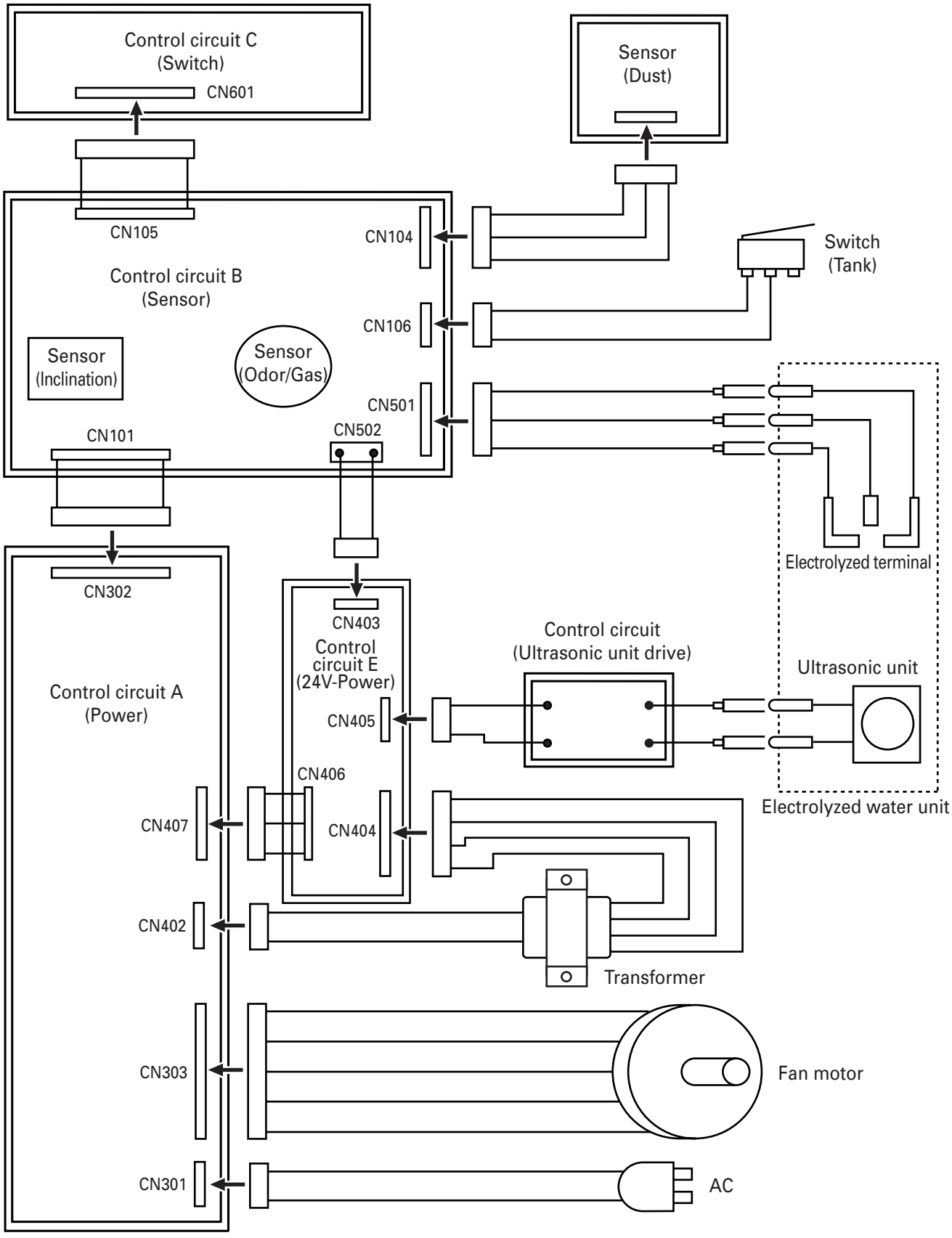
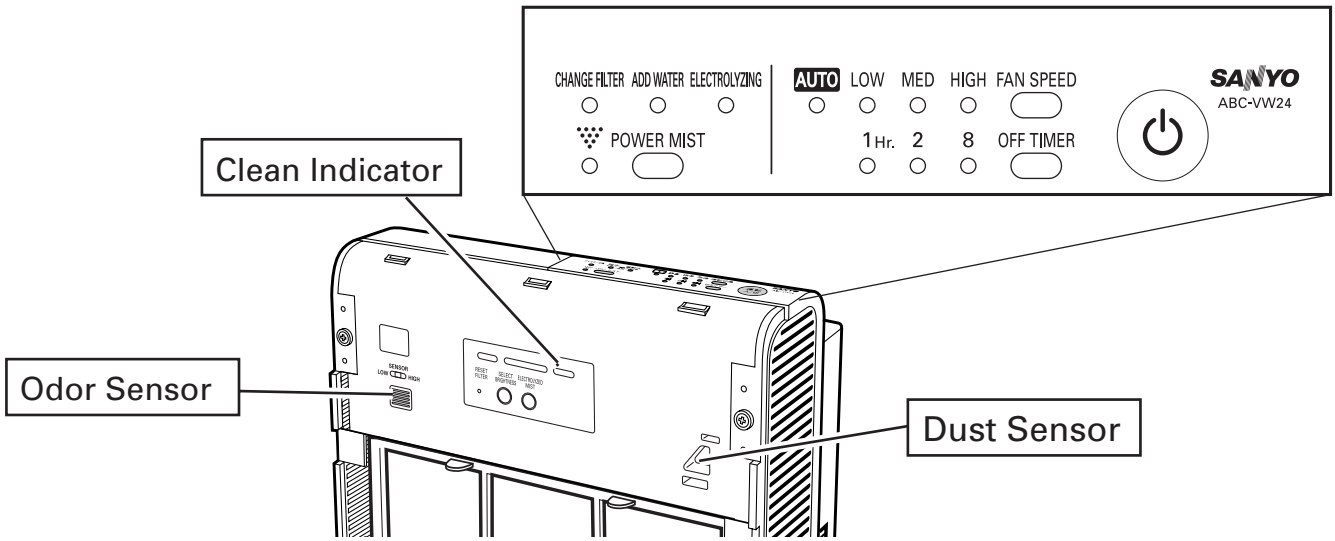

Control circuit C
(Switch)
CN601
Sensor
(Dust)
CN105
CN104
Switch
(Tank)
Control circuit B
(Sensor)
CN106
Sensor
(Inclination)
Sensor
(Odor/Gas)
CN501
CN502
CN101
Electrolyzed terminal
CN302
CN403
Control circuit
(Ultrasonic unit drive)
Control
circuit E
(24V-Power)
Ultrasonic unit
Control circuit A
(Power)
CN405
CN406
CN407
CN404
Electrolyzed water unit
CN402
Transformer
CN303
Fan motor
CN301
AC

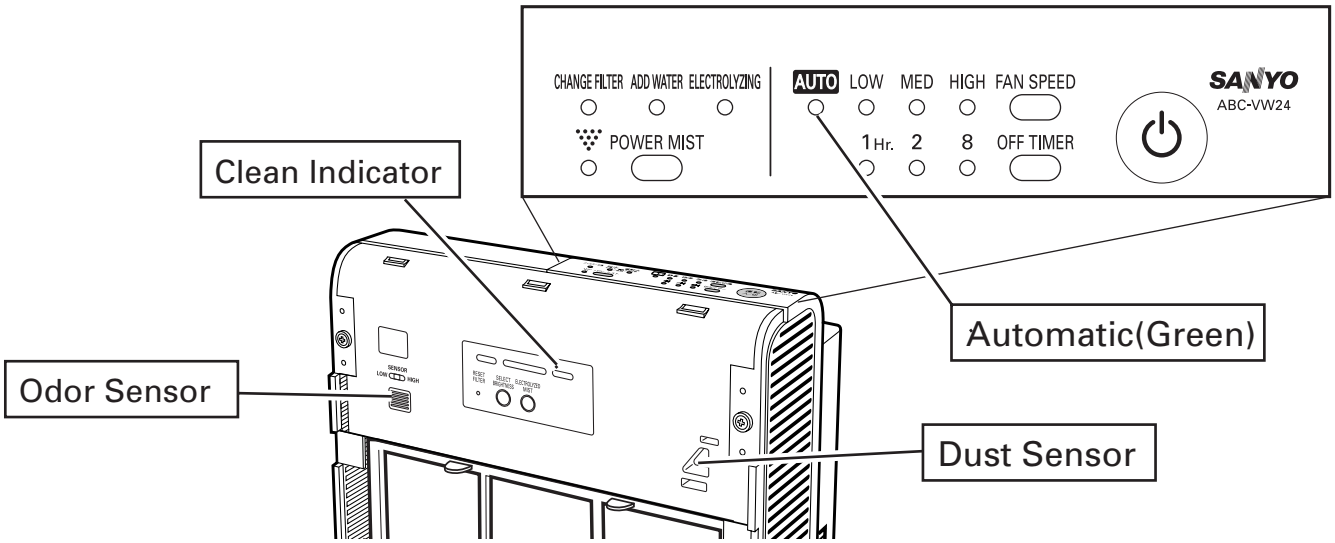


The fan motor operates at 5 levels of airflow (revolution speed) as shown in the chart below.
In manual operation, use the fan speed button to run the fan at the desired speed – low, medium, or high.
The airflow display lamps will light up in accordance with the fan speed selected.
In automatic operation, the fan operates at low, low medium, medium or high medium in accordance with the situation in the room (cleanliness of the air) depending on the operation of the odor sensor and dust sensor.
(When the fan is running automatically, it will not run at high speed.)
<Note> When the fan is running automatically, the airflow display lamps will not light up.
* In older models, when the fan is running automatically, the airflow display lamps light up, but with this model, only the automatic green light lights up and the airflow display lamps do not. (It is not possible to tell at what airflow speed the fan is operating.)

Airflow Speed (Operating Status)		Stop (Automatic)	Low	Low Med	Med	High Med	High
Manual Operation		———	Low	———	Med	———	High
Automatic Operation	Air Cleanliness	Clean ⟷ Contamination severe					
	Clean Sign	Green	Yellow	Yellow	Red	Red	
	Airflow Speed	Stop	Low	Low Med	Med	High Med	
Sterilized and Electrolyzed Mist		Stop	Low	Low	Low	Strong	Strong

<Motor Protection Function>

If the fan is operated at high speed in manual operation with the front cover, pre-filter and filter removed, the revolution speed is dropped slightly for about 1minute and 10 seconds to protect the motor.
(If the motor is operated while the filter, etc., is removed, a large burden is placed on the motor (only at times of high speed operation) so the motor protection function starts to work.)



Even in automatic operation, the odor sensor will not operate soon after the power plug is inserted, but will be inactive for a period of 3 minutes. During this time, the automatic lamp will flash on and off and the fan will operate at low speed. If the automatic lamp changes to being lit up continuously after 3 minutes, the odor sensor will start operation and the fan will run automatically.

The dust sensor will begin operation 5 seconds after the power plug is inserted. Even while the automatic lamp is flashing, if the dust sensor detects something, the fan will operate at medium speed.

When the fan has been switched over to automatic operation, or when the operation button is pressed on more than 3 minutes after inserting the power plug, the fan motor will operate at low speed for 5 minutes in order to stir the air, even if the air in the room is clean. If the sensors detect something during this period, the fan will operate accordingly.

Water electrolyzing and the clean sign will operate at low and green respectively for 5 minutes and then stop (automatic).

Airflow During Automatic Operation

The equipment includes 2 sensors, a dust sensor and an odor sensor. Each of these sensors operates individually, and outputs commands concerning the force of operational airflow individually. (Refer to the sections on the operation of the individual sensors for details.)

The fan will operate at whichever airflow speed is highest in the commands given by the 2 sensors.

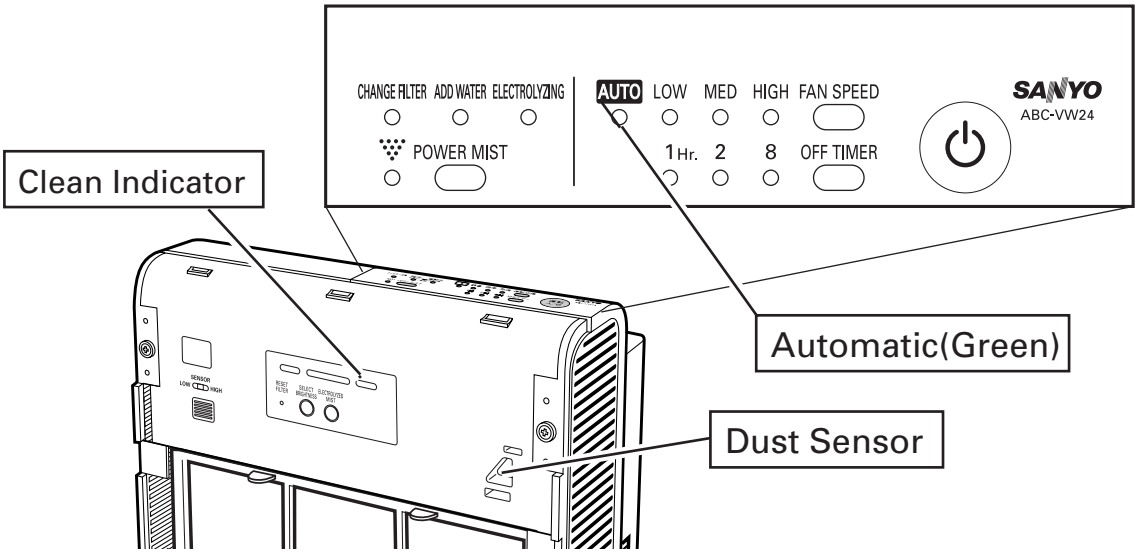
Even when the clean sign and the sterilized and electrolyzed mist are on (the electrolyzing light is lit), the fan will change speed according to the operational situation. (Refer to the fan motor operation list.)

Automatic Operation in Clean Conditions

Regular air stirring

If the air in the room is clean and the fan is in stop (automatic) status continuously, the fan will operate at low speed for a single period of about 5 minutes every hour in order to stir the air in the room regularly and generate a sterilized and electrolyzed mist.

During this time, when the sensors detect that the air in the room is contaminated or that there is dust, or when the operation switch is pressed, the fan will start to run in accordance with the situation.



The Operation of the Dust Sensor

When the dust sensor detects dust or tobacco smoke in the room, the fan will operate automatically at low or medium speed.

When there is a lot of dust, etc., the fan will operate at medium speed, and when there is only a little dust, etc., the fan will operate at low speed. When the air is clean, operation will stop (automatic). (The airflow lamp will not be lit.)

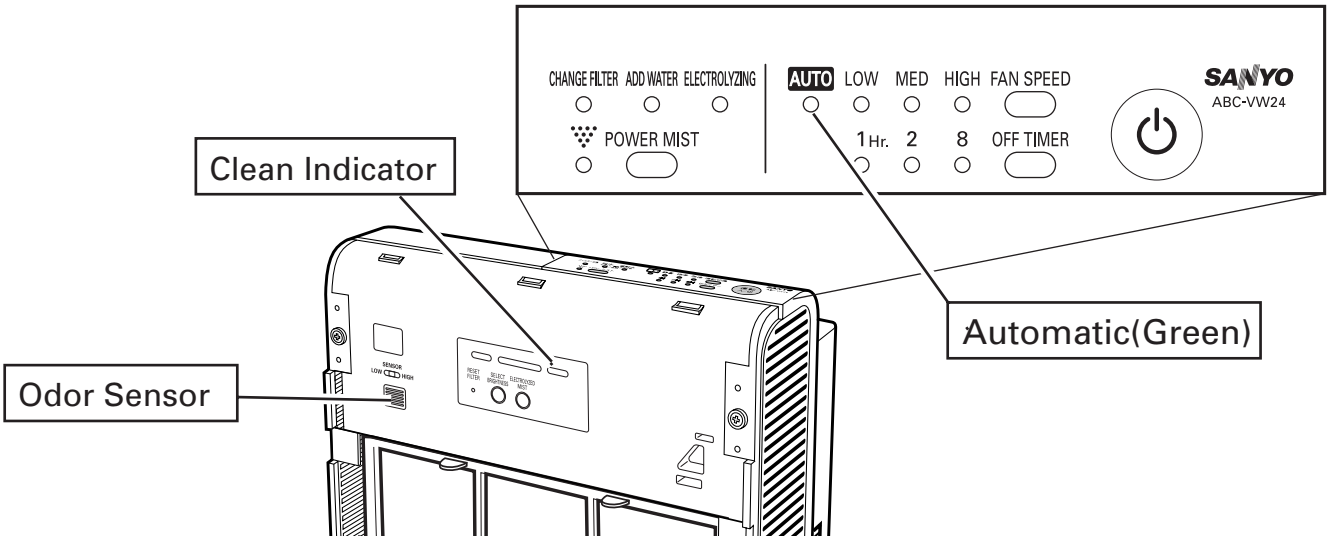
When the dust sensor detects something, the operation of the clean sign and sterilized and electrolyzed mist (when the electrolyzed water lamp is lit) will also change in accordance with operational airflow in accordance with the volume of particles of dust, etc., in the air.

If the sensor's detection level does not change, the fan will step down following the completion of the operating period for each airflow speed and finally stop (automatic). During this process, if the detection level rises, the fan will operate at the airflow speed for that level. (If the sensor's d etection level does not change, the fan will step down in about 4 minutes.)

Even in automatic operation, the dust sensor will not operate soon after the power plug is inserted, but will be inactive for a period of 5 seconds. After that, even while the automatic lamp is flashing, the odor sensor will not operate, but if the dust sensor detects something, the fan will operate at an airflow speed in accordance with the level of dust in the room.

When the fan is switched over to automatic operation, it will operate for 5 minutes at low speed even if the air in the room is clean. At this time, the clean sign (green) will be lit.

Airflow Speed (Operating Status)	Stop (Automatic)	Low	Low Med	Med	High Med	High
Air Cleanliness	Clean ⟷ Contamination severe					
Clean Sign	Green	Yellow	——	Red	——	
Airflow Speed	Stop	Low	——	Med	——	
Sterilized and Electrolyzed Mist	Stop	Low	——	Low	——	



The Operation of the Odor Sensor

When the odor sensor detects contamination of the air, the fan will operate automatically at low, low medium, medium, or high medium speed.

When contamination is severe, the fan will operate at high medium speed, and when contamination is slight, the fan will operate at low speed. When the air is clean, operation will stop (automatic). (The airflow lamp will not be lit.)

When the odor sensor detects something, the operation of the clean sign and sterilized and electrolyzed mist (when the electrolyzed water lamp is lit) will also change in accordance with operational airflow in accordance with the level of contamination of the air.

If the sensor's detection level does not change, the fan will step down following the completion of the operating period for each airflow speed and finally stop (automatic). During this process, if the detection level rises, the fan will operate at the airflow speed for that level. (If the sensor's detection level does not change, the fan will step down in about 2 minutes.)

Even in automatic operation, the odor sensor will not operate soon after the power plug is inserted, but will be inactive for a period of 3 minutes. During this time, the automatic lamp will flash on and off and the fan will operate at low speed. When the automatic lamp changes to being lit up continuously after 3 minutes, the odor sensor will start operation and the fan will operate at an airflow level in accordance with the level of contamination of the air.

When the fan is switched over to automatic operation, it will operate for 5 minutes at low speed even if the air in the room is clean. At this time, the clean sign (green) will be lit.

Airflow Speed (Operating Status)	Stop (Automatic)	Low	Low Med	Med	High Med	High
Air Cleanliness	Clean ⟷ Contamination severe					
Clean Sign	Green	Yellow	Yellow	Red	Red	
Airflow Speed	Stop	Low	Low Med	Med	High Med	
Sterilized and Electrolyzed Mist	Stop	Low	Low	Low	Storng	

The Generation of the Sterilized and Electrolyzed Mist

The electrode on the electrolyzing unit is energized to generate electrolyzed water through electrolysis of the tap water in the tank.

The electrolyzed water is turned into a nano-sized ultra fine mist using an ultrasonic transducer.

This sterilized and electrolyzed mist is then released from the mist outlet into the air, which is stirred around the room by a clean discharge of air.

The Operation of the Sterilized and Electrolyzed Mist

The operation of the sterilized and electrolyzed mist is controlled by removing the front cover and switching the electrolyzed water button on or off, which enables the choice of whether or not to run the water electrolyzing operation (generation of a sterilized and electrolyzed mist.)

While the power mist is operating, the electrolyzed water button is usually on and cannot be turned off.

Under either automatic or manual operation, the sterilized and electrolyzed mist operates in accordance with the airflow speed of the fan motor, as shown in the chart below. The ultrasonic transducer is run at high medium or low medium speed and when it is operating, the electrolyzed water lamp (green) and the electrolyzed water lamp (blue) will be lit.

When the power mist is operating, the ultrasonic transducer is operated in power mode. (Refer to the chart below.)

When the electrolyzing unit and the tank are detached (the tank-attached detection switch will be off), the sterilized and electrolyzed mist will not operate. (The electrolyzed water lamp (green) and the electrolyzed water lamp (blue) will be turned off.)

Airflow Speed (Operating Status)	Stop (Automatic)	Low	Low Med	Med	High Med	High
Manual Operation	——	Low	——	Med	——	High
Automatic Operation	Stop	Low	Low Med	Med	High Med	——
Sterilized and Electrolyzed Mist	Stop	Low	Low	Low	Storng	Storng
Power Mist Operation	——	——	——	Med	High Med	High
Sterilized and Electrolyzed Mist	——	——	——	Power	Power	Power

Low … 0.5 seconds on, 5 seconds off – Intermittent operation of ultrasonic transducer

Storng … 1 second on, 2 seconds off – Intermittent operation of ultrasonic transducer

Power …1 second on, 1 second off – Intermittent operation of ultrasonic transducer

The Operation of Electrode Power Generation

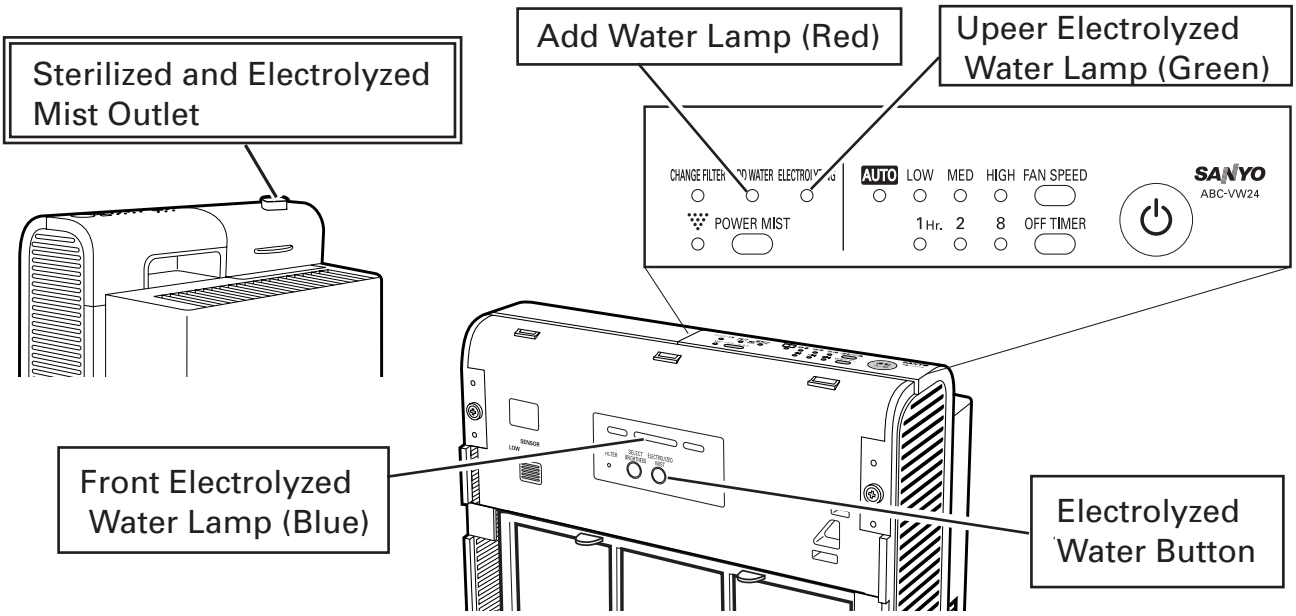
The operation to energize the electrode to create electrolyzed water repeats operation and stopping as shown in the chart below.

Operation of Electrolysis	Operation (1)	Stop	Operation (2)	Stop
Electrolyzing On	4 minute	56 minute	4 minute	56 minute
Electrolyzing Off	4 minute	7 hours 56 minutes	4 minute	7 hours 56 minutes

In operation (1) and operation (2), the polar character of the electrode is reversed.

When the power plug is inserted and the switch first turned on, or when the tank is reset, operation (1) will last 10 minutes the first time it is conducted. Subsequently, the operation/ stop process shown in the chart above will be repeated.

The first occasion of power mist operation will last 30 minutes. Subsequently, the operation/ stop process shown in the chart above will be repeated. (During the 30-minute operation on this first occasion, the polar character during the energizing process is positive for 15 minutes and then switched to negative for 15 minutes.



<General Indication of the Volume of Sterilized and Electrolyzed Mist Released

Manual – (High) About 7cc/hr Continuously for about 31 hours

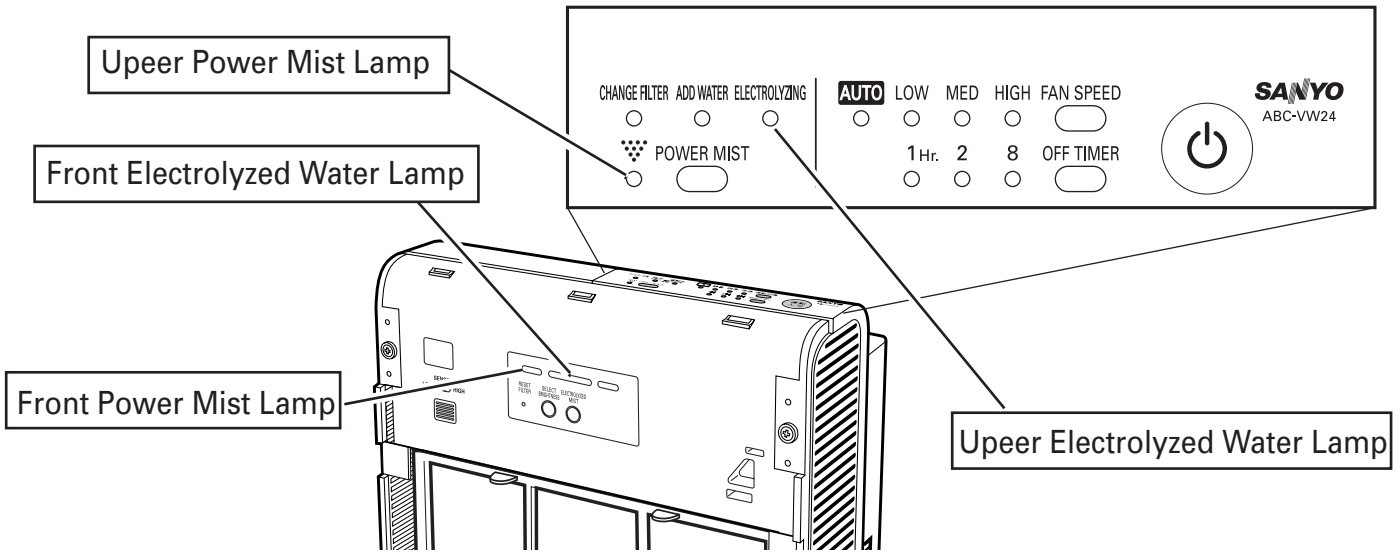
Automatic – (Low) About 0.5cc/hr Continuously for about 440 hours (about 18 days)

*At times of automatic operation, there will be differences in the volume of mist released because each of the sensors will operate according to the situation in the room and the sterilized and electrolyzed mist will be operated in accordance with what the sensors detect.

<Lamp Display and Status Chart>

Electrolyzing	Off	Electrolyzing off Tank setting malfunction (tank-attached detection switch off)
	On	Electrolyzing on <Normal>
	Flashing	When electrolyzing is switched off, the electrode is energized for a 4-minute period once every 8 hours or so for the purpose of purifying the water in the tank. (This is not a malfunction.) *When the equipment is used as normal with electrolyzing on, the processing of the water in the tank makes it sterile, but when electrolyzing is switched off, the water purification process (energizing of the electrode) is run about once every 8 hours in order to avoid neglecting the water in the tank for long periods of time.
Add Water	Off	<Normal>
	On	There is no water left in the tank so please fill the tank with water. Operational error in the electrolyzing unit (open)
	Flashing	The tank setting status has continued unchanged for 21 days. Please change the water. Operational error in the electrolyzing unit (short circuit) *When the same water is used for a long period of time, concentration becomes very high so please change the water in the tank 21 days after the tank has been filled and attached to the main unit. (When the unit is used normally, the water will run out before 21 days and the light will be lit.)

* When the lamp has been lit or is flashing, please wait 15 seconds before resetting the tank.



Operation when Using the Power Mist

In power mist operation, the airflow volume switches automatically as shown in the chart below and after 30 minutes, turns to automatic operation. For operation following this, refer to the section on automatic operation.

When the power mist is in operation, the power mist (green) lamp in the operating section on top of the unit and the power mist (blue) lamp on the front of the unit will be lit. (The airflow volume lamp will not be lit.)

At this time, the electrolyzed water lamp (green) in the operating section on top of the unit and the electrolyzed water lamp (blue) on the front of the unit should both be lit, and when they are off, there is an attachment error with the electrolyzing unit or the water tank.

The sterilized and electrolyzed mist is operated in power mode. (It cannot be selected when electrolyzing is off.)

*The sterilized and electrolyzed mist is generated in a repeated 1 second on, 1 second off intermittent operation.

Any timer period setting will be deleted when power mist operation is turned on, and it is also not possible to set a timer period during power mist operation.

Even during power mist operation, the odor sensor and dust sensor operate individually, and the clean sign is displayed depending on the operation of each sensor.

High → High Med → Med → Auto matic
(5 minutes) (10 minutes) (15 minutes)

Operation Time	5 minutes	10 minutes	15 minutes
Airflow Speed	High	High Med	Med
Sterilized and Electrolyzed Mist	Power	Power	Power

Power ... 1 second on , 1second off - Intermittent operation of ultrasonic transducer

Manual Operation

The unit can be operated at the airflow speed desired – low, medium or high – by using the operation mode button.

Sterilized and electrolyzed mist operation (when the electrolyzing is on) will operate in accordance with the airflow speed setting.

When the speed is set to low or medium, the sterilized and electrolyzed mist will operate at low.

When the speed is set to high, the sterilized and electrolyzed mist will operate at power.

During manual operation, the set airflow display LED will be lit and the unit will operate at that airflow speed, but the odor sensor and dust sensor will operate

clean sign will be displayed in accordance with the operation individually and the of each sensor.

*During low speed operation, the clean sign (red) may be lit up.

The Operation of the Change Filter Lamp

The Change Filter lamp is lit or flashes depending upon the cumulative total of the filter usage period, which is calculated by multiplying the time the motor is operated by coefficients depending on the amount of airflow run through.

*When the unit is operated at high , the period of use of the filter will be about 1/10 that when the unit is operated at low , and when the unit is operated at medium, the period of use of the filter will be about 1/5 that when the unit is operated at low .

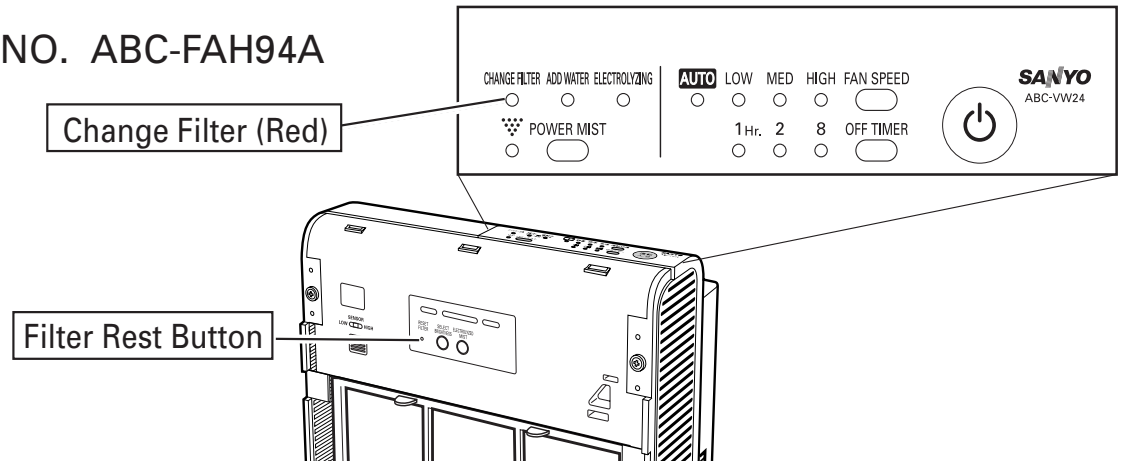
The filter usage period is written onto the IC inside the substrate, and is reset by removing the cover and pressing the filter reset button.

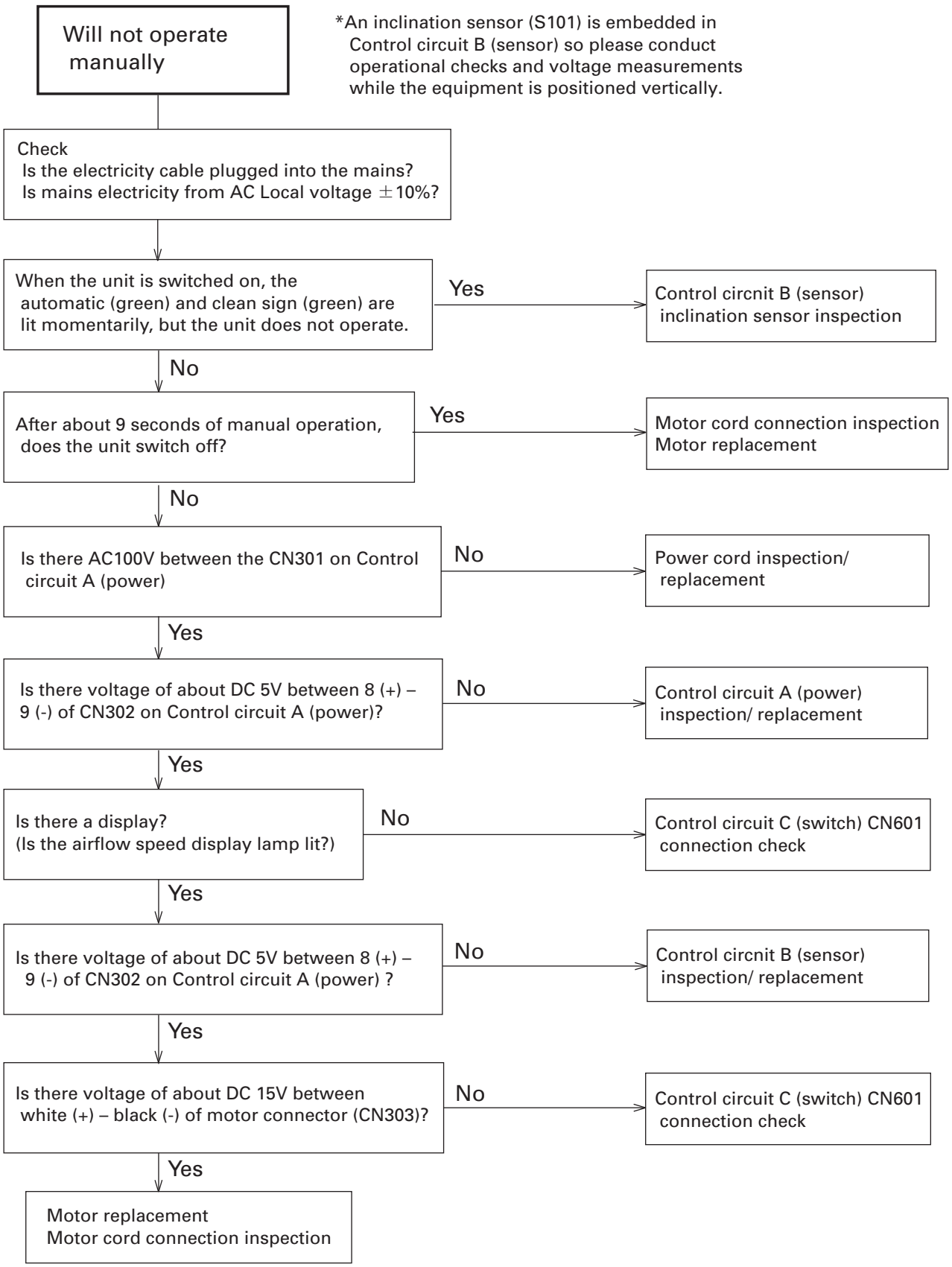
When a new filter has replaced an old one, please press the filter reset button to turn off the change filter lamp and clear the filter usage period.

The timing of the filter change will differ depending on the operational situation and the installation location, but as a rough guide the filter should last 4 years.

For example, if it is supposed that the filter absorbs 5 cigarettes worth of smoke each day, it should last about 4 years.

Filter NO. ABC-FAH94A




Will not operate manually
*An inclination sensor (S101) is embedded in Control circuit B (sensor) so please conduct operational checks and voltage measurements while the equipment is positioned vertically.
Check
Is the electricity cable plugged into the mains?
Is mains electricity from AC Local voltage ±10%?
When the unit is switched on, the automatic (green) and clean sign (green) are lit momentarily, but the unit does not operate.
Yes
Control circnit B (sensor) inclination sensor inspection
No
After about 9 seconds of manual operation, does the unit switch off?
Yes
Motor cord connection inspection
Motor replacement
No
Is there AC100V between the CN301 on Control circuit A (power)
No
Power cord inspection/ replacement
Yes
Is there voltage of about DC 5V between 8 (+) – 9 (-) of CN302 on Control circuit A (power)?
No
Control circuit A (power) inspection/ replacement
Yes
Is there a display?
(Is the airflow speed display lamp lit?)
No
Control circuit C (switch) CN601 connection check
Yes
Is there voltage of about DC 5V between 8 (+) – 9 (-) of CN302 on Control circuit A (power) ?
No
Control circnit B (sensor) inspection/ replacement
Yes
Is there voltage of about DC 15V between white (+) – black (-) of motor connector (CN303)?
No
Control circuit C (switch) CN601 connection check
Yes
Motor replacement
Motor cord connection inspection

Sensors do not detect during automatic operation

Will operate manually?

No → Will not operate manually

Yes

Which sensor is not detecting?

Dust sensor

Odor sensor

Check
Is there anything in the room generating gas?
If there is, make it not generate gas.
E.g.: Paraffin stove, paint, or cosmetics

Ventilate the room

Reconnect power

* Wait until the automatic lamp switches from flashing to lit (about 3 minutes)

Set sensitivity to high and switch on automatic operation

Release gas

* Use a gas lighter

Is the sensor working?

No

Yes

OK

* For automatic operation, refer to "The Operation of the Odor Sensor."

Reconnect power and switch on automatic operation

Shield the dust sensor so that no sunlight or fluorescent light shines directly upon it

Insert a needle into the triangular part of the dust sensor and move it lightly

* Because the dust sensor detects reflected light, insert a pin or office clip that reflects light in the triangular part of the sensor.

Is the sensor working?

Yes

OK

* For automatic operation, refer to "The Operation of the Odor Sensor."

No

Is there about DC 5V between 1 – 4 of the dust sensor connector (CN1)?

No

Control circuit B (sensor) inspection/ replacement

Yes

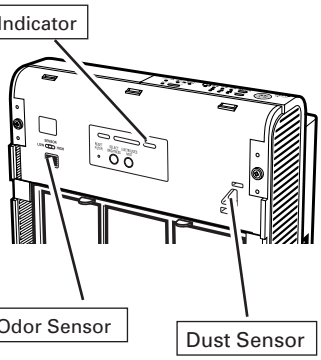
Was there any change in the voltage between 1 – 4 of CN1 when the pin was inserted in the triangular part of the dust sensor and lightly moved?

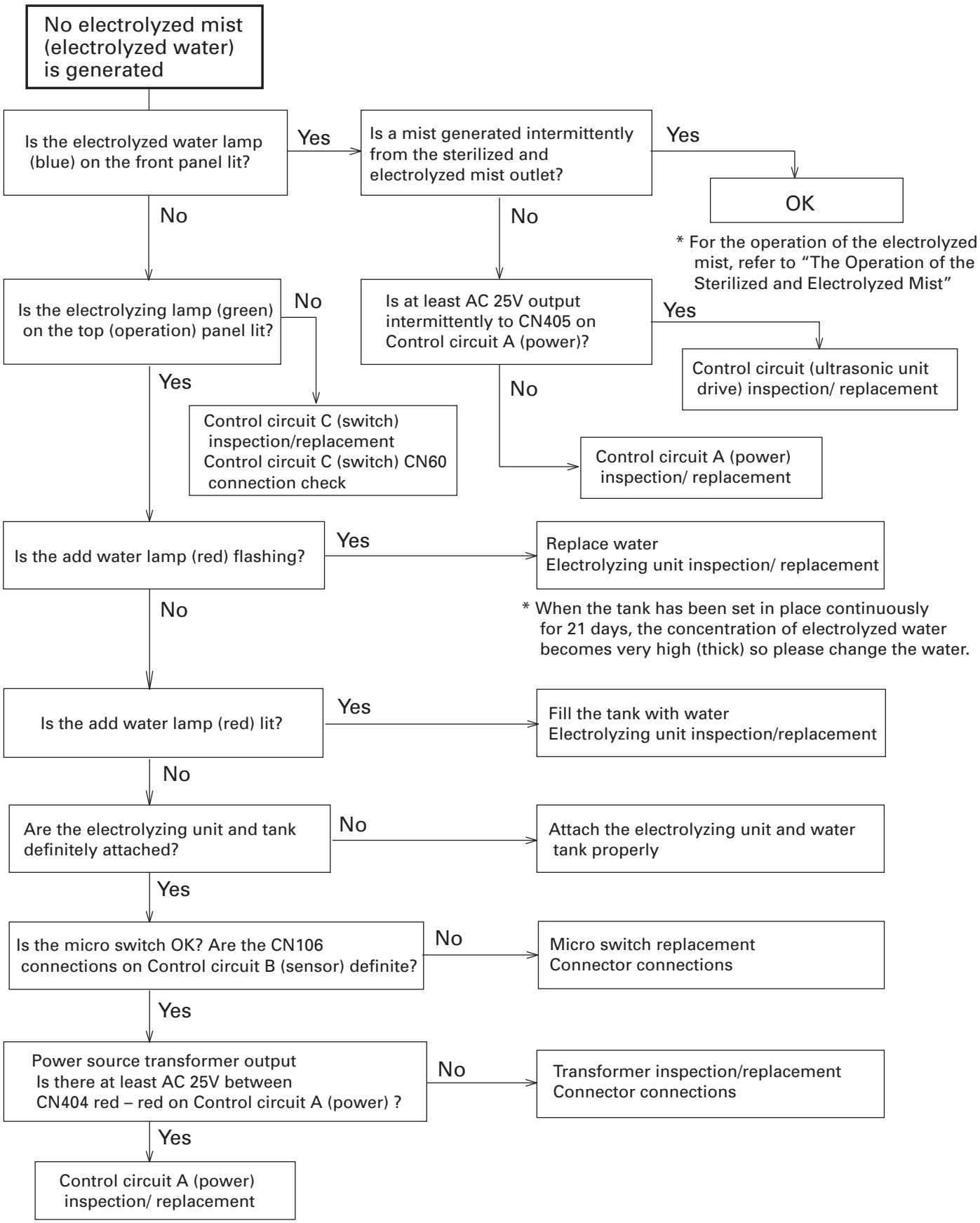
No

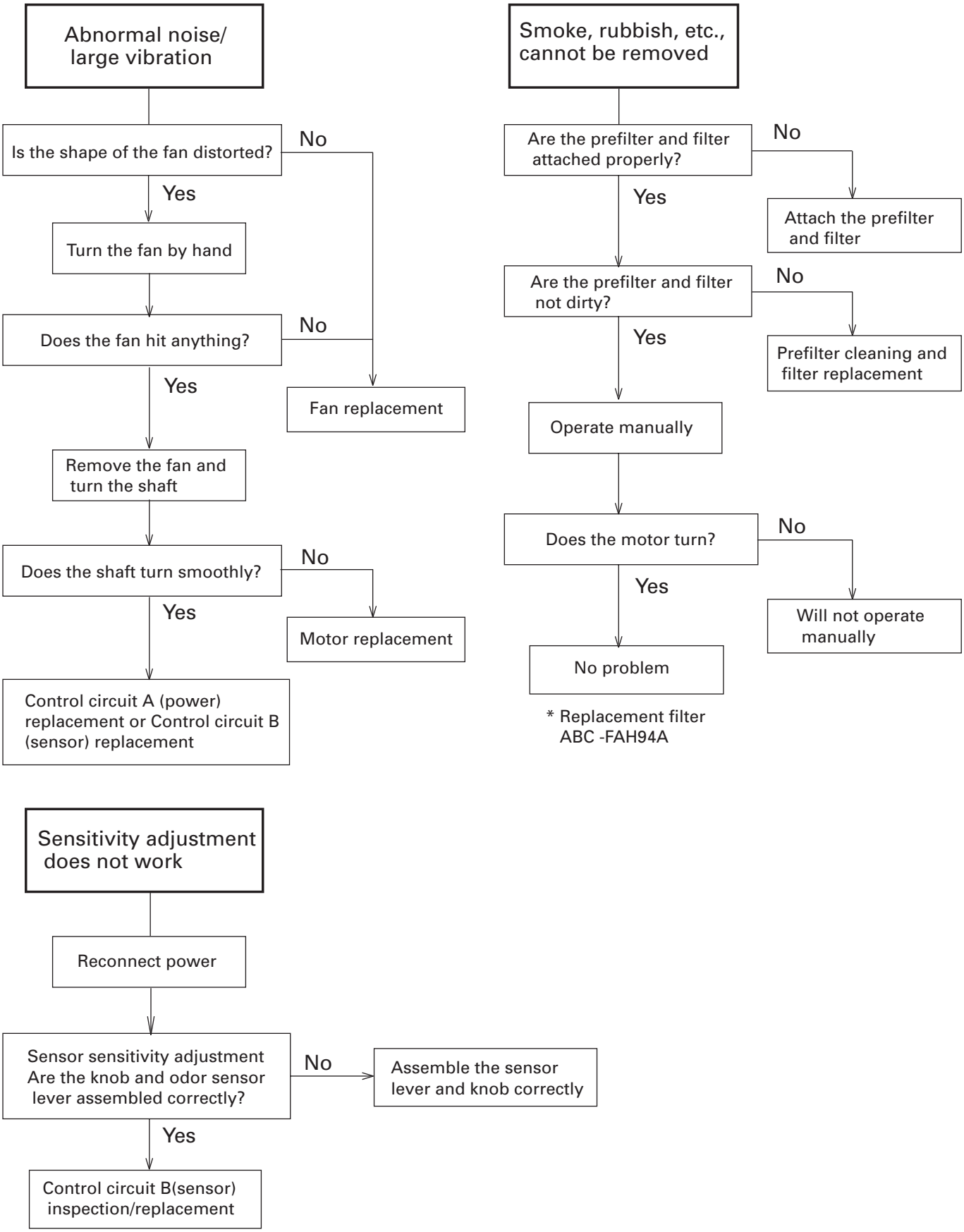
Surveillance sensor inspection/ replacement

Yes

Control circuit B (sensor) inspection/ replacement




No electrolyzed mist (electrolyzed water) is generated
Is the electrolyzed water lamp (blue) on the front panel lit?
Yes
Is a mist generated intermittently from the sterilized and electrolyzed mist outlet?
Yes
OK
* For the operation of the electrolyzed mist, refer to "The Operation of the Sterilized and Electrolyzed Mist"
No
No
Is the electrolyzing lamp (green) on the top (operation) panel lit?
No
Is at least AC 25V output intermittently to CN405 on Control circuit A (power)?
Yes
Control circuit (ultrasonic unit drive) inspection/ replacement
Yes
No
Control circuit C (switch) inspection/replacement
Control circuit C (switch) CN60 connection check
Control circuit A (power) inspection/ replacement
Is the add water lamp (red) flashing?
Yes
Replace water
Electrolyzing unit inspection/ replacement
* When the tank has been set in place continuously for 21 days, the concentration of electrolyzed water becomes very high (thick) so please change the water.
No
Is the add water lamp (red) lit?
Yes
Fill the tank with water
Electrolyzing unit inspection/replacement
No
Are the electrolyzing unit and tank definitely attached?
No
Attach the electrolyzing unit and water tank properly
Yes
Is the micro switch OK? Are the CN106 connections on Control circuit B (sensor) definite?
No
Micro switch replacement
Connector connections
Yes
Power source transformer output
Is there at least AC 25V between CN404 red – red on Control circuit A (power) ?
No
Transformer inspection/replacement
Connector connections
Yes
Control circuit A (power) inspection/ replacement


Abnormal noise/ large vibration
Is the shape of the fan distorted?
No
Yes
Turn the fan by hand
Does the fan hit anything?
No
Yes
Fan replacement
Remove the fan and turn the shaft
Does the shaft turn smoothly?
No
Yes
Motor replacement
Control circuit A (power) replacement or Control circuit B (sensor) replacement
Smoke, rubbish, etc., cannot be removed
Are the prefilter and filter attached properly?
No
Yes
Attach the prefilter and filter
Are the prefilter and filter not dirty?
No
Yes
Prefilter cleaning and filter replacement
Operate manually
Does the motor turn?
No
Yes
Will not operate manually
No problem
* Replacement filter ABC -FAH94A
Sensitivity adjustment does not work
Reconnect power
Sensor sensitivity adjustment Are the knob and odor sensor lever assembled correctly?
No
Assemble the sensor lever and knob correctly
Yes
Control circuit B(sensor) inspection/replacement

(1) How to Remove the Electrolyzing Unit and Filter

1, Remove the lid and remove the electrolyzing unit. Fig - 1
*If any water is spilt, wipe it up.

2, While pushing in the connection buttons on the left and right of the main unit, remove the front cover by pulling it towards you. Fig - 1

3, Remove the prefilter and filter. Fig - 1

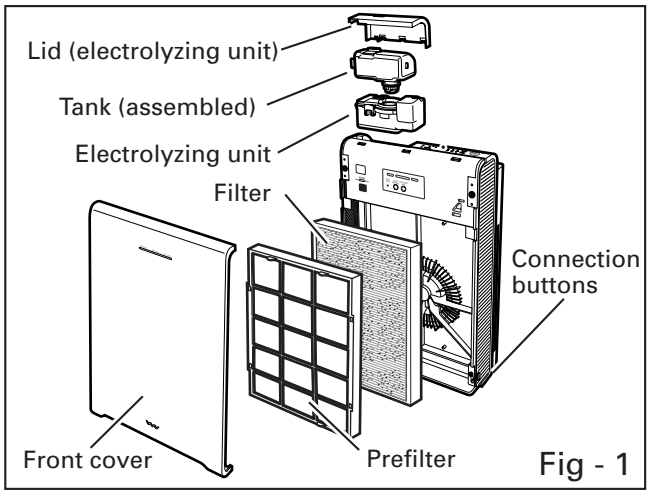


Fig - 1

(2) How to Remove the Case (Back)

1, Remove the louver L setscrew in the tank section and the 2 setscrews in the front section and remove louver L. Photo - 2

2, Remove the 2 louver R setscrews and remove louver R. Photo - 2

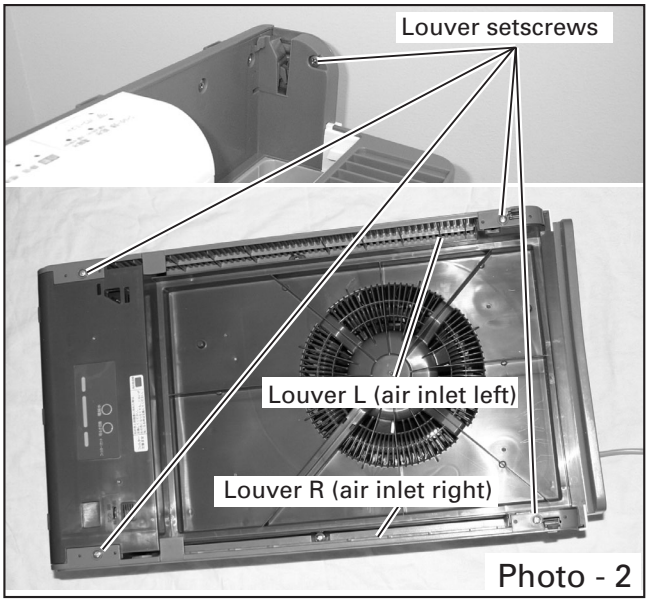


Photo - 2

3, Remove the 2 setscrews on the cord cover in the bottom section and remove the cord cover. Photo - 3

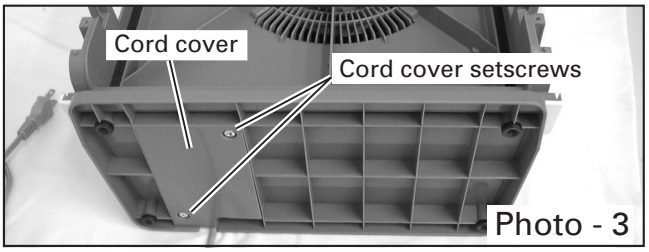


Photo - 3

4, Remove the 6 case (back) setscrews and turn the main unit around. Photo - 4

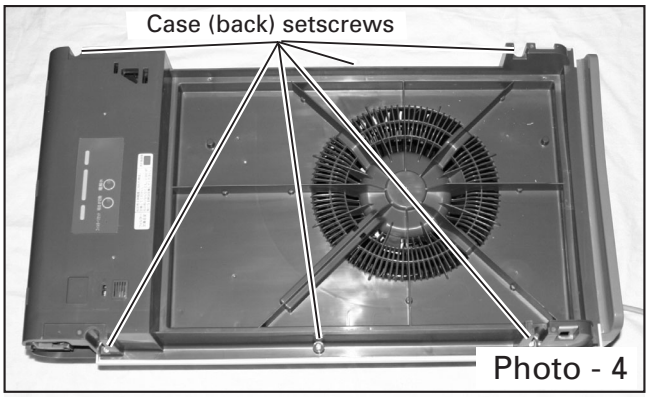


Photo - 4

5, Remove the case (back) setscrew at the handle and the 3 setscrews at air guide A. Photo – 5

6, Lift the bottom section of the case (back) and remove the inset in the top section. Remove the Control circuit C (switch) connection through the gap and then remove the case (back). Photo - 5

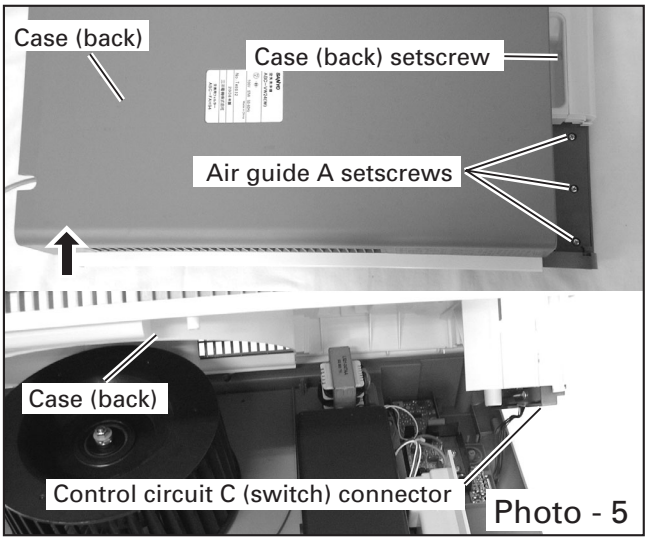
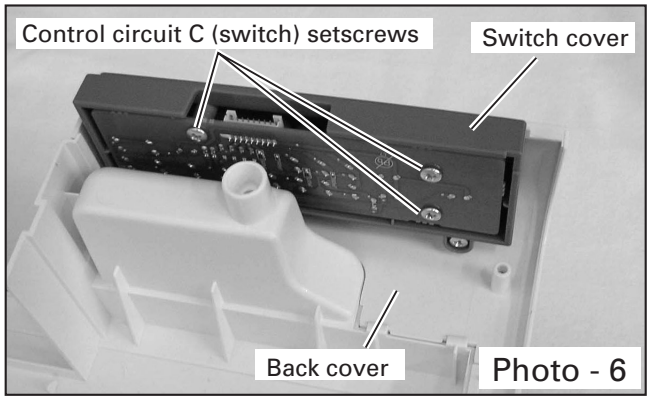


Photo - 5

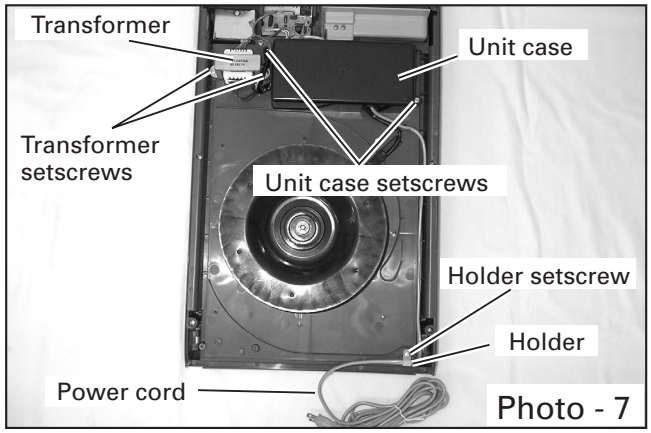
(3) Replacing Control Circuit C (Switch)

1, Remove the upper case and switch cover.
2, Remove the 3 Control circuit C (switch) setscrews and remove Control circuit C (switch). Photo - 6

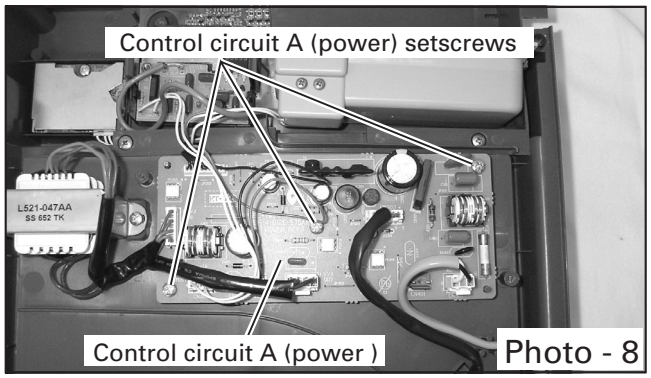


(4) Replacing Control Circuit A (Power)

1, Remove the 2 unit case setscrews and remove the unit case. Photo - 7



2, Remove all of the connectors connected to Control circuit A (power). Photo – 8
3, Remove the 3 Control circuit A (power) setscrews and remove Control circuit A (power). Photo - 8

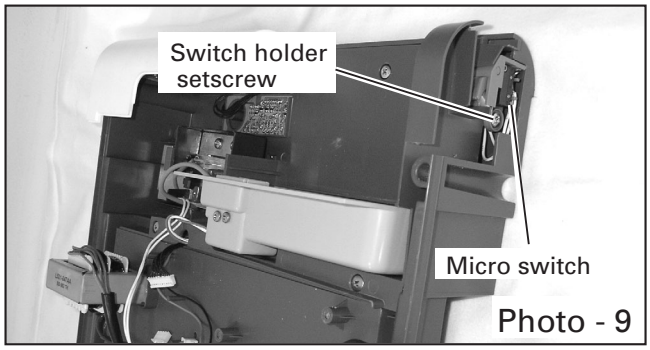


(5) Replacing the Transformer and Power Cord

1, Remove the holder (power cord) setscrew and remove the Power cord. Photo – 7
2, Remove the 2 transformer setscrews and remove the transformer. Photo – 7

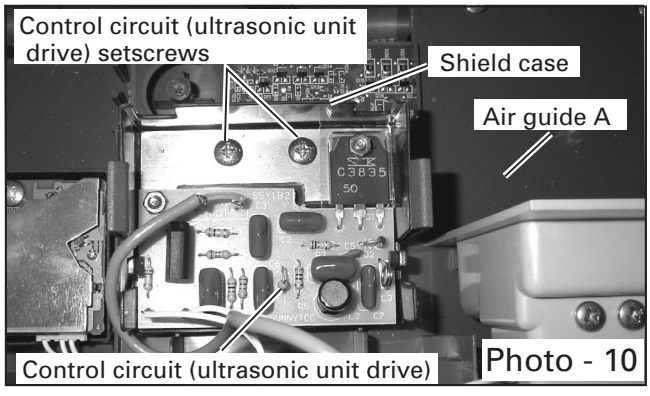
(6) Replacing the Micro Switch

1, Remove the switch holder setscrew. Photo – 9
2, Remove the soldering of the lead wire of the micro switch terminal and remove the micro switch. Photo - 9



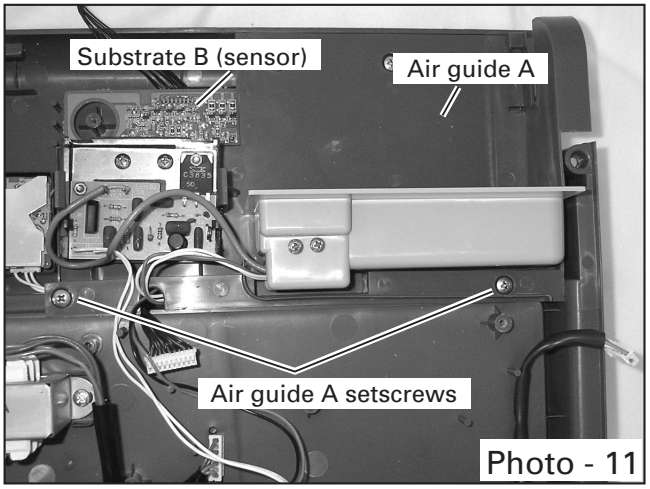
(7) Replacing the Control Circuit (Ultrasonic Unit Drive)

1, Remove the inset of the air guide A nail and remove the shield case from air guide A. Photo – 10
2, Remove the 2 Control circuit (ultrasonic unit drive) setscrews. Photo – 10
3, Remove the soldering of the lead wire of the Control circuit (ultrasonic unit drive) terminal and remove the Control circuit (ultrasonic unit drive). Photo - 10



(8) Replacing Control Circuit B (Sensor)

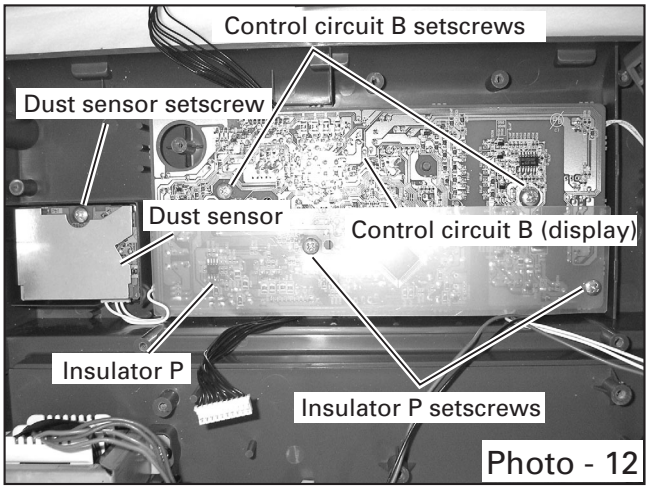
1, Remove the 2 air guide A setscrews and remove air guide A. Photo -11



2, Remove the 2 insulator P setscrews and remove insulator P. Photo – 12

3, Remove the 2 Control circuit B setscrews and remove Control circuit B (sensor). Photo – 12

4, Remove all of the Control circuit B (sensor) connectors. Photo – 12



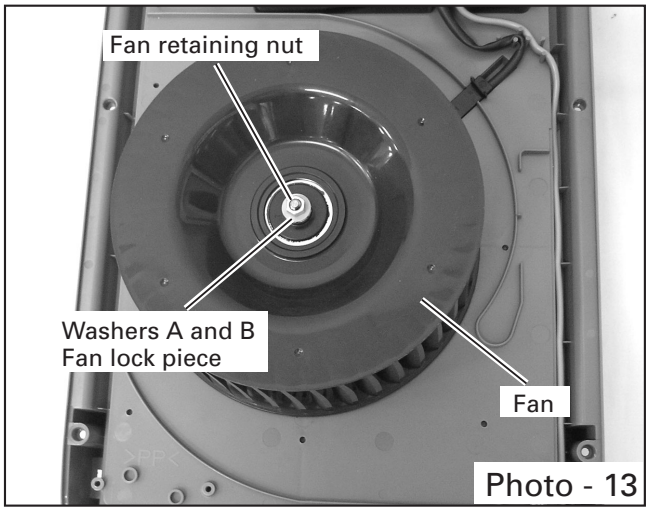
(9) Replacing the Dust Sensor

1, Remove the dust sensor setscrew and remove the dust sensor. Photo - 12

(10) Replacing the Fan Motor

1, Remove the fan retaining nut and remove washers A and B, and the fan lock piece. Photo – 13

2, Pull the fan off the motor shaft. Photo - 13



3, Remove the cord cover and take out the motor cord. Photo – 14

4, Pull washer C off the motor shaft.

5, Remove the 3 motor retainer setscrews and remove the fan motor. Photo - 14