

LOSSNAY

# HANDBOOK

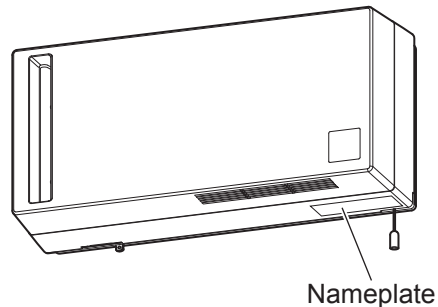
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## MODELS

**VL-50S2-E**

**VL-50ES2-E**

**VL-50SR2-E**



## Filter (Optional)

**P-50F2-E**

**P-50HF2-E**

## Pipe (Optional)

**P-50P-E**

**P-50PJ-E**

## Hood (Optional)

**P-50VSQ5-E**

**Warning:**

Repair work must be performed by the manufacturer, its service agent or a similarly qualified person in order to avoid hazards.









**MITSUBISHI ELECTRIC CORPORATION**

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# 1. Safety precautions

- Read the following precautions thoroughly before the maintenance, and then inspect and repair the product in a safe manner.
- The types and levels of danger that may arise if the product is handled incorrectly are described with the warning symbols shown below.

 <b>Warning</b>		Improper handling of the product may result in serious injury or death.	
<p>◇ <b>Electric shock</b> If you must inspect the circuitry while the power is on, do not touch the live parts.</p> <p>(Failure to observe this warning may result in electric shock.)</p>	 Caution against electric shock	<p>◇ <b>Turn off the power supply</b> Be sure to unplug the power cord, or shut off the circuit breaker before disassembling the unit for repair.</p> <p>(Failure to observe this warning may result in electric shock.)</p>	 Be sure to follow this instruction.
<p>◇ <b>Modification is prohibited</b> Do not modify the unit.</p> <p>(Failure to observe this warning may result in electric shock, fire and/or injury.)</p>	 Prohibited	<p>◇ <b>Use proper parts and tools</b> For repair, be sure to use the parts listed in the parts catalog of the applicable model and use the proper tools.</p> <p>(Failure to observe this warning may result in electric shock, fire and/or injury.)</p>	 Be sure to follow this instruction.
<p>◇ <b>Proper electric work</b> Use the electric wires designated for electric work, and conduct electric work in accordance with your local electric work regulations and the installation manual.</p> <p>(Improper connection or wiring installation may result in electric shock and/or fire.)</p>	 Be sure to follow this instruction.	<p>◇ <b>Replace damaged and/or degraded parts</b> Be sure to replace the power cord and lead wires if they are damaged and/or degraded.</p> <p>(Failure to observe this warning may result in electric shock and/or fire.)</p>	 Be sure to follow this instruction.
		<p>◇ <b>Check insulation</b> Upon completing repair work, always measure the insulation resistance. Verify that it is at least 10 MΩ (with a 500 V DC insulation resistance tester), and then turn on the power.</p> <p>(Inadequate insulation may result in electric shock.)</p>	 Be sure to follow this instruction.

 <b>Caution</b>		Improper handling of the product may result in slight injury or damage to properties including buildings and equipment.	
<p>◇ <b>Caution for injury</b> Do not work at a location where you do not have a sure footing.</p> <p>(Failure to observe this caution may result in a fall.)</p>	 Prohibited	<p>◇ <b>Wear gloves</b> Wear a pair of gloves when servicing.</p> <p>(Failure to observe this caution may result in injury to your hands from sharp metal or other edges.)</p>	 Be sure to follow this instruction.

## Notes for servicing

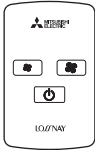


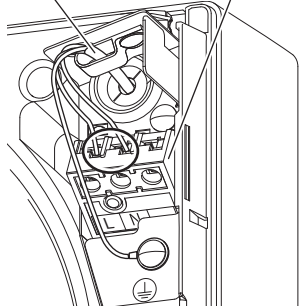
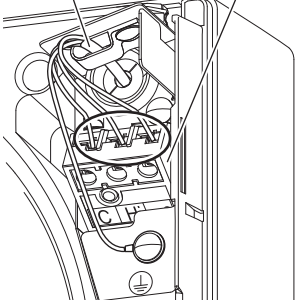
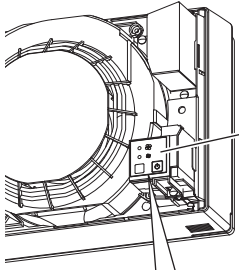
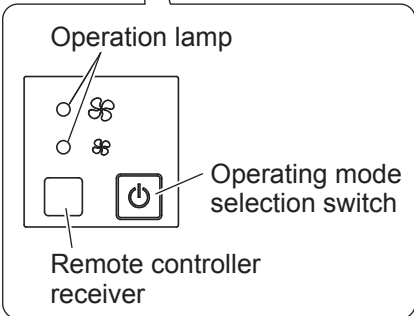
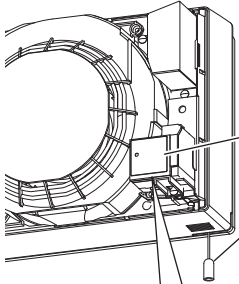
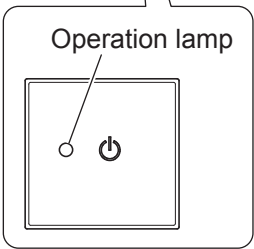
- Make sure that an earth leakage breaker and an overload protection device are installed, if they are not installed, recommend the customer to install one.
- Make sure that the product operates properly upon completion of repair. Clean the product and the surrounding area, and then notify the customer of the completion of repair.

# Precautions for soldering

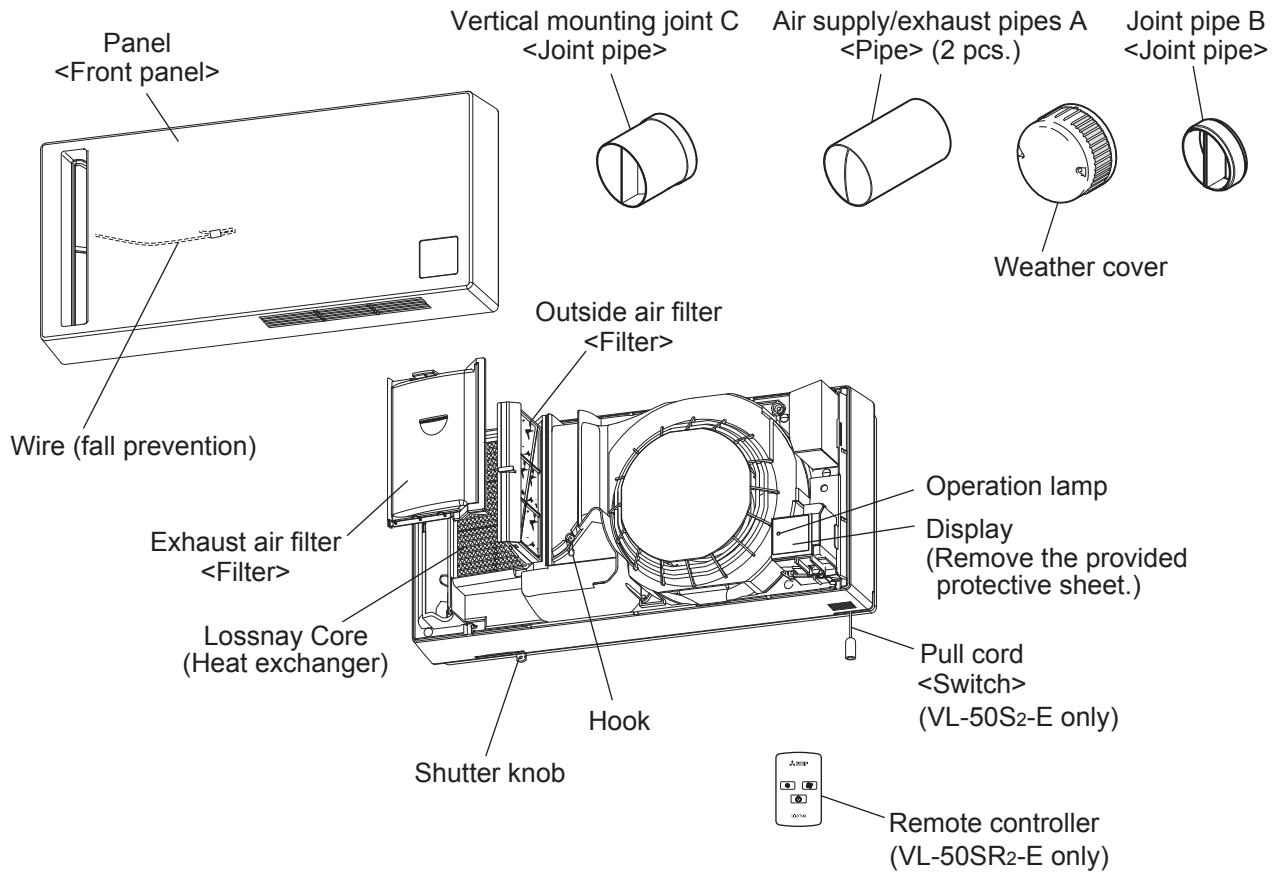
Lead-free solder is used for the circuit boards of this product, and "Pb Solder" is marked on the circuit boards. Observe the following precautions.

- When making repairs on these circuit boards, lead-free solder must be used.
- Make sure to use dedicated soldering irons to lead-free solder. (Do not use soldering irons that are used for Sn-Pb [tin-lead] eutectic solder)
- It is recommended to use soldering irons having power consumption of 40 W or more.

## 2. Changed points

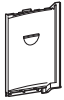
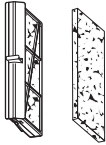
Item	New model		Previous model	
	VL-50SR2-E		VL-50S2-E	VL-50ES2-E
Operation means	Remote controller 		Pull cord switch	Control switch (Wall switch)
Shape of main circuit board	 80x129 mm		 80x80 mm	
Wiring for terminal block	Two wires Power cable Terminal block 		Three wires Power cable Terminal block 	
Display	 Display 		 Display Pull cord (VL-50S2-E only) 	

### 3. Names and functions of components




Note:  
The names in the angle brackets < > show the part names in the parts catalog.

#### \* About the filters

* About the filters			Features
Exhaust air filter		For Exhaust air	The filter prevents clogging of the internal components.
Outside air filter	 (Replacement filter: P-50F2-E)	For Supply air	When Lossnay takes in outside air to a room, the filter collects dust, sand, pollen or the likes from outside air. Note: Some fine particles or tiny insects may pass through the filter. The high performance filter is recommended for higher collecting effect.

Outside air filter can be replaced with the following high performance filter.

High performance filter (Optional parts)	 (P-50HF2-E)	For Supply air	The filter collects dust more efficiently than the outside air filter.
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## 4. Specifications

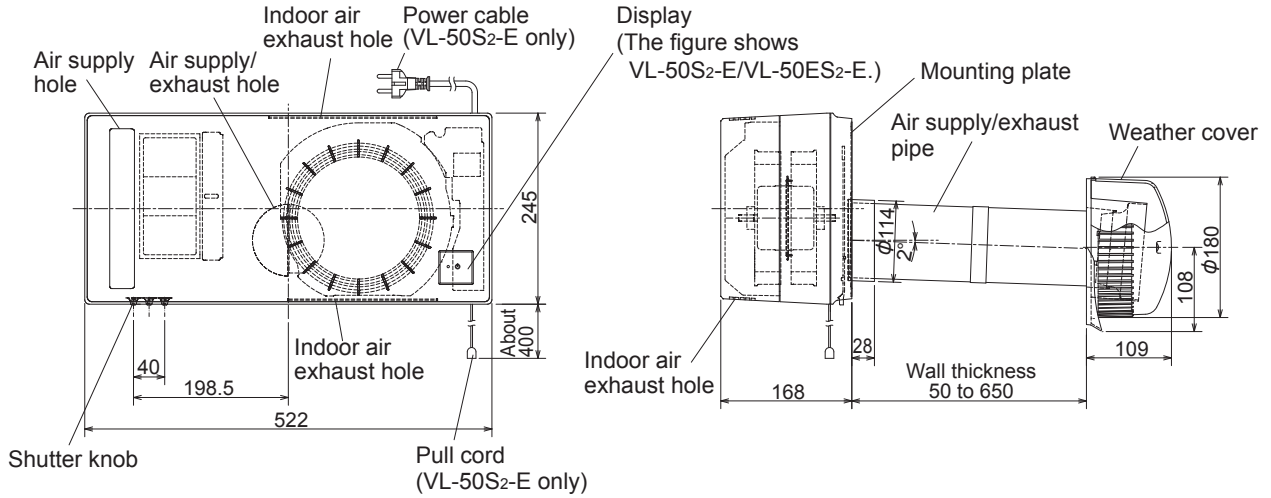
Model	Supply voltage (V)	Frequency (Hz)	Notch	Power consumption (W)	Air volume (m <sup>3</sup> /h)	Temperature exchange efficiency (%)	Noise (dB)	Weight (kg)		
VL-50S <sub>2</sub> -E VL-50ES <sub>2</sub> -E	220	50	HI	19	51	70	36.5	6.2		
			LO	4	15	86	14			
	230	50	HI	20	52.5	69	37			
			LO	4.5	16	85	15			
	240	50	HI	21	54	68	37.5			
			LO	5	17	84	15.5			
	220	60	HI	21	54	68	37.5			
			LO	5.5	17	84	15.5			
	VL-50SR <sub>2</sub> -E	220	50	HI	19	51	70		36.5	6.2
				LO	4.5	15	86		14	
230		50	HI	20	52.5	69	37			
			LO	5	16	85	15			
240		50	HI	21	54	68	37.5			
			LO	5.5	17	84	15.5			
220		60	HI	21	54	68	37.5			
			LO	6	17	84	15.5			

\* Noise values may be higher than those listed depending on the structure of the room.

# 5. Outside dimensions

VL-50S2-E, VL-50ES2-E, VL-50SR2-E

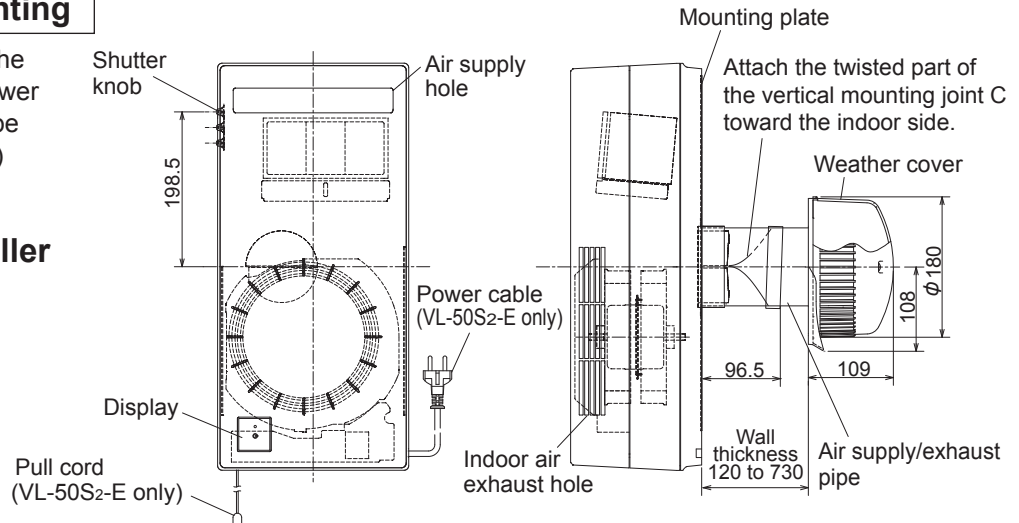
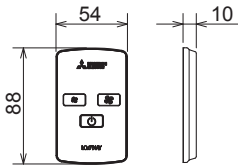
## For horizontal mounting



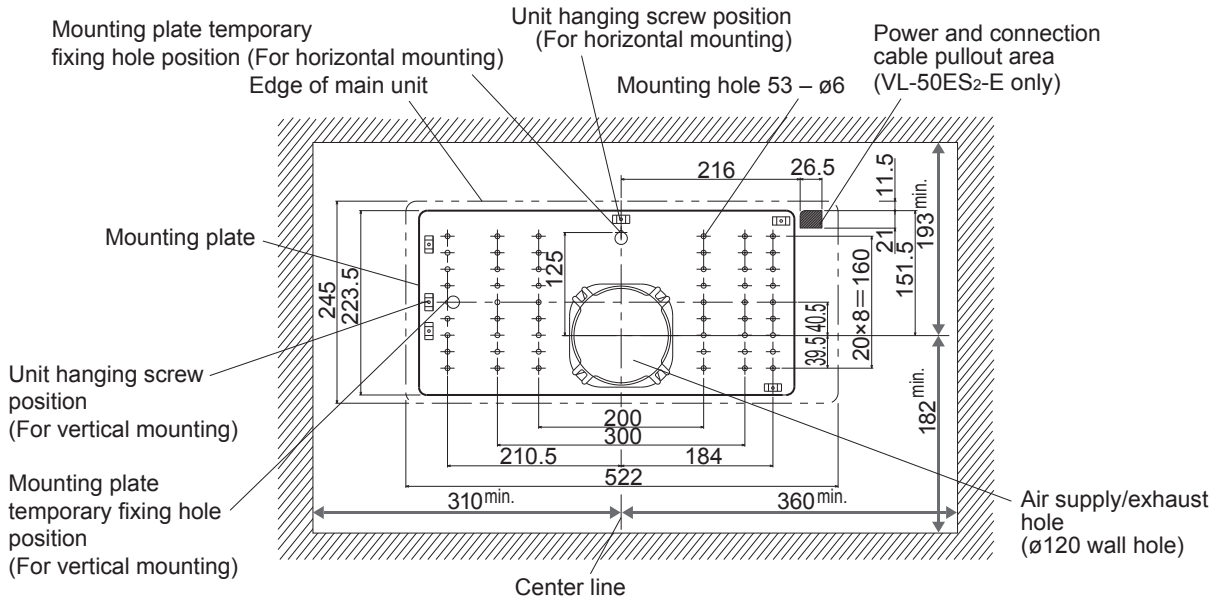
## For vertical mounting

\* For vertical mounting, the display comes to the lower side. (The unit cannot be mounted upside down.)

### Remote controller (VL-50SR2-E only)



### Mounting position diagram (seen from inside)



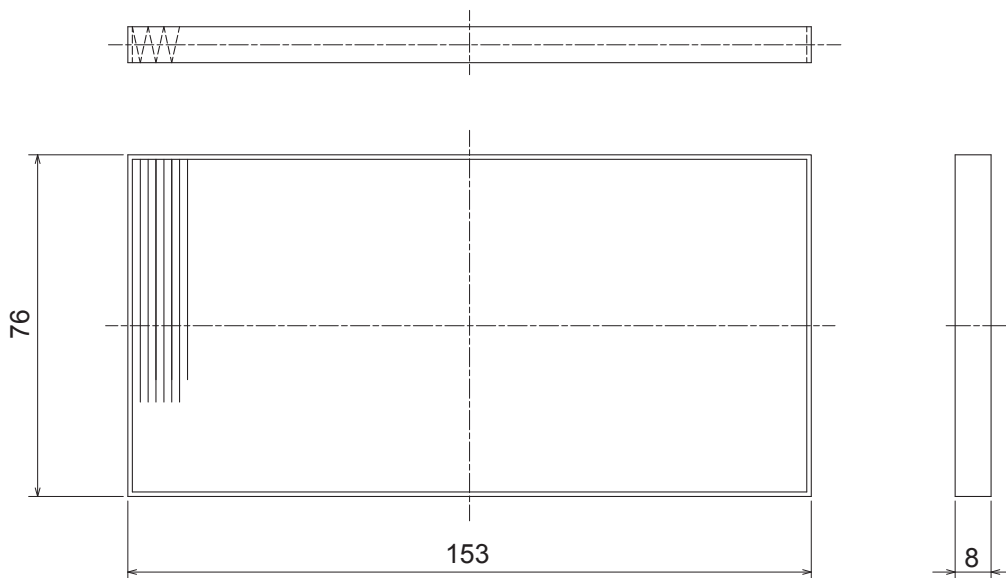
Unit (mm)

P-50F<sub>2</sub>-E



Unit (mm)

P-50HF<sub>2</sub>-E



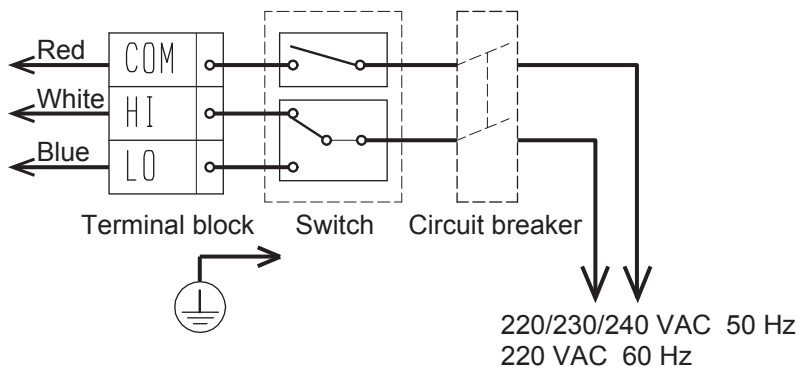
Unit (mm)



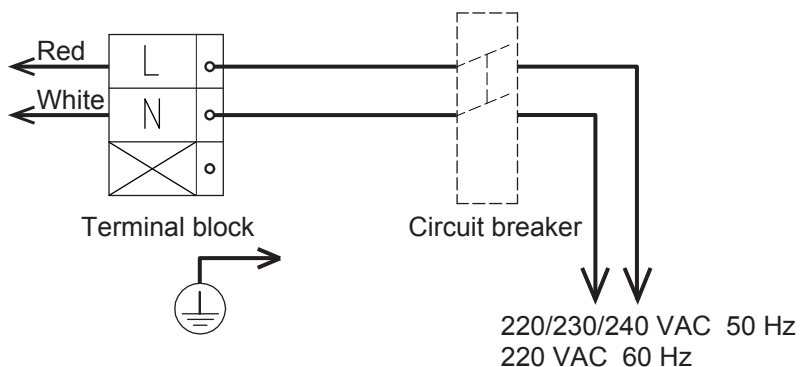
# 6. Electrical wiring diagrams

## (1) Switch wiring diagrams

VL-50ES<sub>2</sub>-E



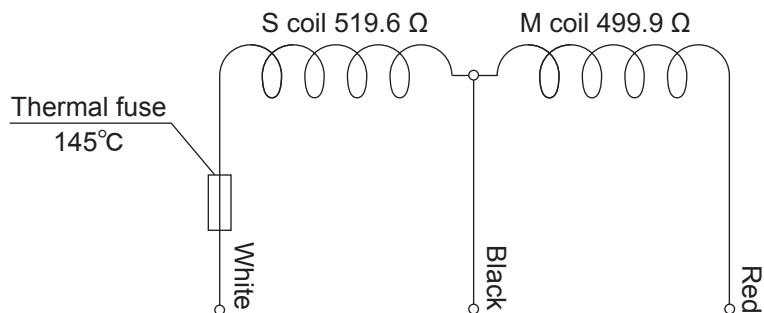
VL-50SR<sub>2</sub>-E



## (2) Motor coil diagram

VL-50S<sub>2</sub>-E, VL-50ES<sub>2</sub>-E, VL-50SR<sub>2</sub>-E

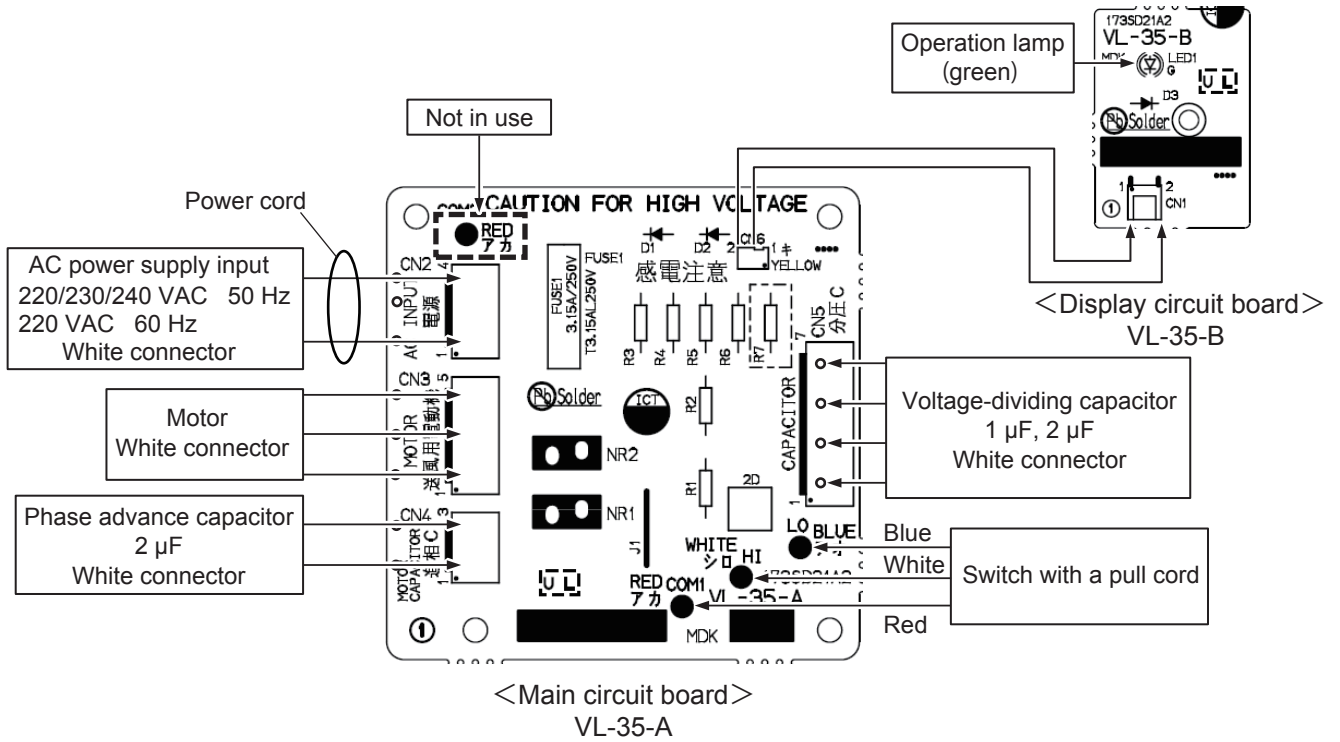
※ Coil resistance at a temperature of 30°C



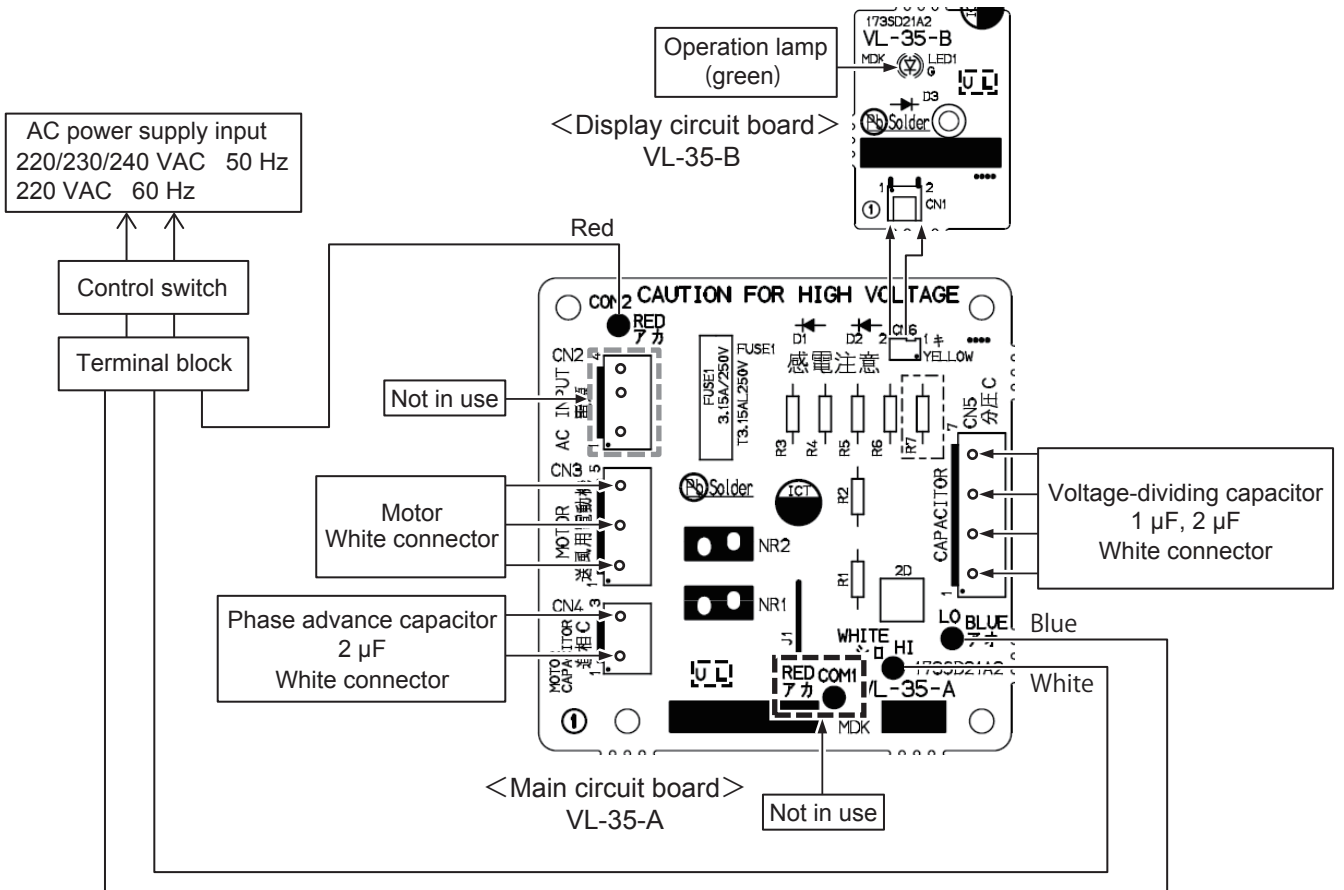
# 7. Circuit board diagrams

## ● Circuit board diagrams and check points

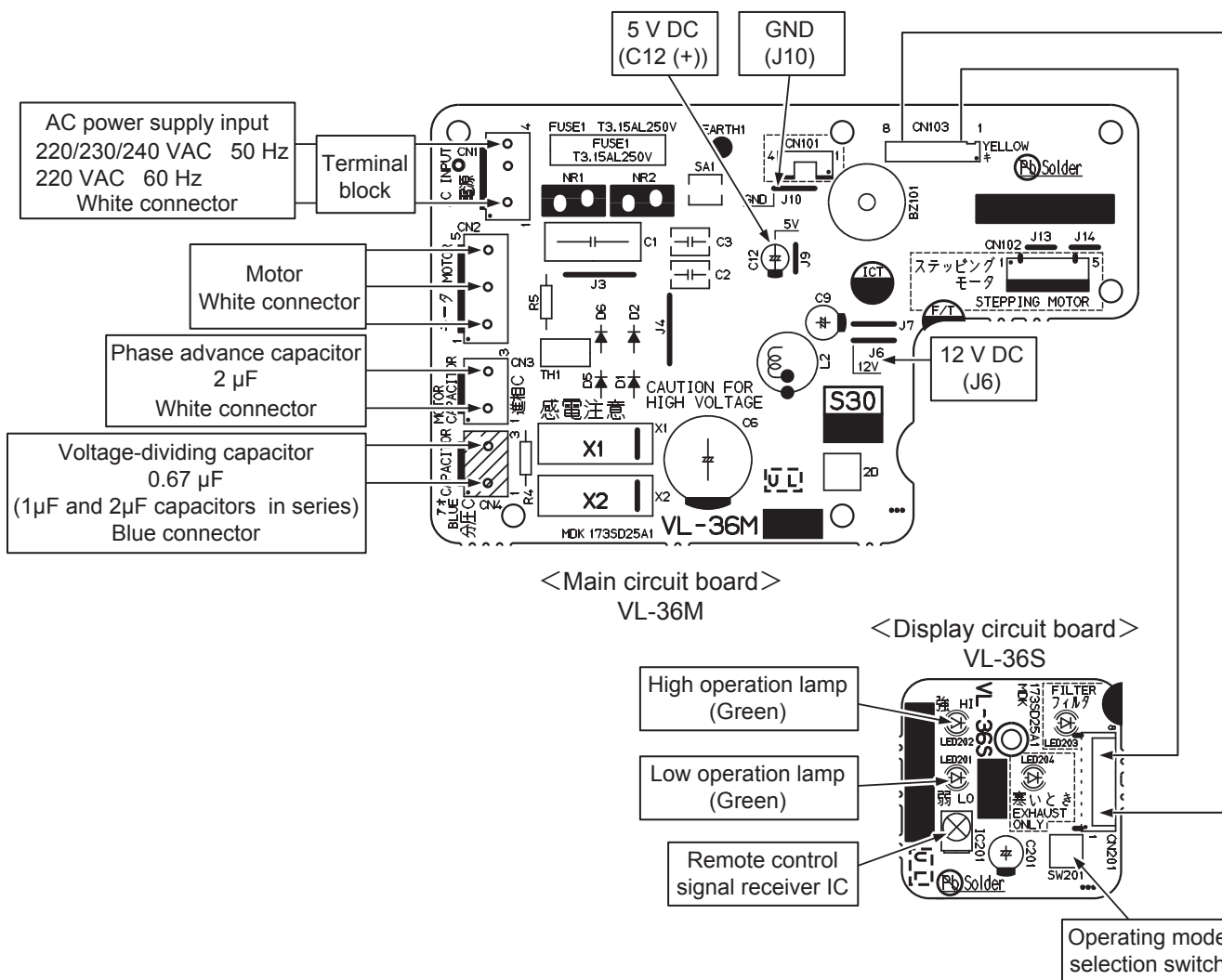
### (1) VL-50S2-E (Pull cord type)



### (2) VL-50ES2-E (Wall switch type)



### (3) VL-50SR2-E (Remote controller type)



## 8. Principles of operation

### (1) VL-50S2-E (Pull cord type)

- Operating mode (fan speed) can be switched from HI (High) to LO (Low) to OFF by using the switch with a pull cord.

<Lighting status of the operation lamp under each operating mode>

Operating mode of the fan	OFF	HI	LO
Operation lamp (LED1)	Off	Lit	Lit

### (2) VL-50ES2-E (Wall switch type)

- Operating mode (fan speed) can be switched by using the control switch. Operations may vary depending on the switches installed.

220/230/240 V is applied between HI and COM2 → HI (High)

220/230/240 V is applied between LO and COM2 → LO (Low)

<Lighting status of the operation lamp under each operating mode>

Operating mode of the fan	OFF	HI	LO
Operation lamp (LED1)	Off	Lit	Lit

### (3) VL-50SR2-E (Remote controller type)

- Operating mode (fan speed) can be selected from HI (High), LO (Low), and Power ON/OFF by using the remote controller.
- Operating mode (fan speed) can be switched from HI (High) to LO (Low) to OFF by using the operating mode selection switch on the main unit.

<Lighting status of the operation lamps under each operating mode>

Operating mode of the fan	OFF	HI	LO
Operation lamp (LED201)	Off	Off	Lit
Operation lamp (LED202)	Off	Lit	Off

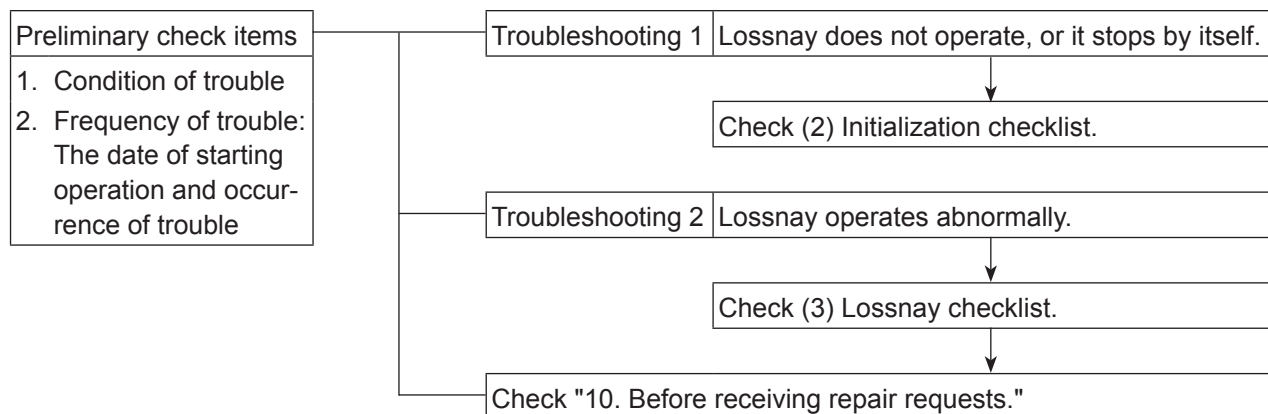
# 9. Troubleshooting

## ■ Work precautions

- When servicing, be sure to recreate the malfunction two or three times before starting repairs.
  - When servicing, always take care to keep proper footing.
  - Before starting the service, always unplug the power cord from the outlet, or turn off the circuit breaker when no power cord plug is provided. Sufficient care must be taken to avoid electric shock or injury.
  - Make sure to connect the power supply wires correctly.
  - When removing the circuit board, always hold it at both ends and remove carefully so as not to apply force to the surface mounted parts.
  - When removing the circuit board, be careful of the metal edges on the board.
  - When removing or inserting the connectors for the circuit board, hold the entire housing section. Never pull on the lead wires.
  - When circuit board failure is considered to be a cause, check closely for any broken section on the copper foil patterns, burning or discoloration of parts.
  - After replacing a circuit board, make sure to restore the same settings as before the replacement.
- \* The part names in the text are standardized with the part names in the parts catalog. (There are some exceptions.)

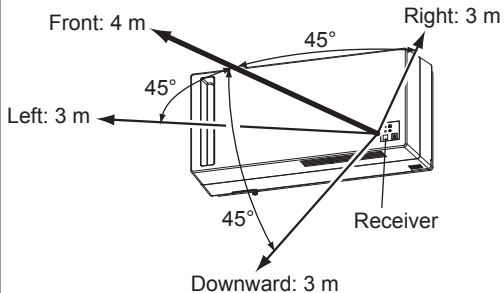
## (1) Service Flowchart

After checking the preliminary check items below, follow troubleshooting 1 and 2 for servicing.



## (2) Initialization checklist

Troubleshooting 1 Lossnay does not operate, or it stops by itself.

No.	Error	Cause	Action
1	Lossnay does not operate.	<VL-50S <sub>2</sub> -E> • Is the power plug connected to the power source of the rated voltage? <VL-50ES <sub>2</sub> -E, VL-50SR <sub>2</sub> -E> • Is the rated voltage 220/230/240 VAC supplied to the terminal block?	Supply the rated voltage 220/230/240 VAC. If a power failure has occurred, wait for power failure recovery. Check that the circuit breaker is ON.
		<VL-50ES <sub>2</sub> -E, VL-50SR <sub>2</sub> -E> Are there any poor connections of the terminal block?	Connect the lead wires securely.
		<VL-50S <sub>2</sub> -E, VL-50SR <sub>2</sub> -E> Is the following power supply connector on the main circuit board securely connected? VL-50S <sub>2</sub> -E: CN2 VL-50SR <sub>2</sub> -E: CN1	Connect the connector securely.
		Is the current fuse on the main circuit board blown?	If the current fuse is blown, determine the cause of the failure (abnormal voltage application or wrong connection), and eliminate the cause. Then, replace the main circuit board together with the display circuit board.
		Are there any problems with the main circuit board or display circuit board?	Diagnose the problems of the circuit boards by checking the Basic checklist for the major components (Table 1). (See page 16.)
		<VL-50S <sub>2</sub> -E> Is the power cord properly plugged into the wall outlet?	Plug the power cord properly.
		<VL-50S <sub>2</sub> -E> Is the switch with a pull cord turned ON?	Turn ON the switch with a pull cord.
		<VL-50SR <sub>2</sub> -E> Is the battery exhausted?	Replace it with a commercially available lithium battery (CR2025).
		<VL-50SR <sub>2</sub> -E> • Is the remote controller operated at the position too far away from the main unit? • Is the remote controller case installed outside the remote control signal receiving range?	The remote control signal receiving range is shown below. 
		2	Lossnay stops by itself.
Are there any problems with the main circuit board or display circuit board?	Diagnose the problems of the circuit boards by checking the Basic checklist for the major components (Table 1). (See page 16.)		

### (3) Lossnay checklist

Troubleshooting 2	Lossnay operates abnormally.
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No.	Error	Cause	Action
1	The shutters do not open or close.	Is there any foreign matter or obstruction around the shutters?	Remove it.
		Are the shutters detached from guide rails of the casing?	Attach the shutters properly.
2	The fans do not rotate.	Are the following connectors on the main circuit board securely connected ? VL-50S <sub>2</sub> -E, VL-50ES <sub>2</sub> -E: CN3, CN4, CN5 VL-50SR <sub>2</sub> -E: CN2, CN3, CN4	Connect the connectors securely.
		Do the fan blades touch other components?	Check for any abnormal area. Replace any abnormal or defective parts.
		Is there any foreign matter around the fans?	Remove it.
		Are there any problems with the motor?	Diagnose the problems of the motor by checking the Basic checklist for the major components (Table 1). (See page 16.)
		Is the voltage 220/230/240 V AC output from the main circuit board?	Disconnect the following motor connector to check the output voltage. VL-50S <sub>2</sub> -E, VL-50ES <sub>2</sub> -E: CN3 VL-50SR <sub>2</sub> -E: CN2 (See page 16.)
3	The fans do not stop.	<VL-50S <sub>2</sub> -E> Do the fans continue operating even if the switch with a pull cord is turned OFF?	If the fans do not stop operating, replace the switch.
4	Operating mode (fan speed) cannot be switched.	<VL-50S <sub>2</sub> -E> Is the switch with a pull cord caught on some components?	Eliminate the cause of catching.
		<VL-50S <sub>2</sub> -E> Does the switch with a pull cord work properly?	Operate the switch to check whether it obtains click feeling. → If there are any problems, replace the switch.
		Are there any problems with the main circuit board or display circuit board?	Diagnose the problems of the circuit boards by checking the Basic checklist for the major components (Table 1). (See page 16.)
5	An unusual noise comes from the fans.	Is there any foreign matter around the fans?	Remove it.
		Are there any odd feelings when rotating the fan?	If there are any odd feelings, replace the motor.
		Does the motor generate abnormal noise?	Diagnose the problems of the motor by checking the Basic checklist for the major components (Table 1). (See page 16.)
		Are the Lossnay core and filters properly installed? (Check the installation directions and positions.)	Install the Lossnay core and filters properly.
6	The operation lamp does not illuminate.	Is the LED on the display circuit board tilted?	Attach the LED case cover so that the LED is positioned in the hole of the LED case cover.
		Is the following connector on the display circuit board securely connected? VL-50S <sub>2</sub> -E, VL-50ES <sub>2</sub> -E: CN1 VL-50SR <sub>2</sub> -E: CN201	Connect the connector securely.
		Are there any problems with the main circuit board or display circuit board?	Diagnose the problems of the circuit boards by checking the Basic checklist for the major components (Table 1). (See page 16.)

No.	Error	Cause	Action
7	The front panel cannot be closed.	Are the Lossnay core and filters properly installed? (Check the installation directions and positions.)	Install the Lossnay core and filters properly.
8	Cold air or wind comes into the room.	Are the shutters being kept open when the fans are stopped?	Move the shutter knob to the CLOSE position.

Basic checklist for the major components (Table 1)

No.	Components	Judging instructions								
1	Motor	<p>Check the coil resistance.            Disconnect the following connector from the main circuit board, and then measure the resistance between the motor lead wires.            VL-50S<sub>2</sub>-E, VL-50ES<sub>2</sub>-E: CN3            VL-50SR<sub>2</sub>-E: CN2            See Chapter 6. (2) Motor coil diagram (page 9) for the resistance values.            In the case of an open circuit or short circuit, replace the motor.</p>								
2	Switch with a pull cord (VL-50S <sub>2</sub> -E only)	<p>Remove the switch from the main unit. Measure the resistance at the weld for the wire connection on the backside of the switch.            If the resistance differs from the values listed below, replace the switch.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Color of wires</th> <th>Operating mode (fan speed)</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>Red - White</td> <td>High</td> <td rowspan="2">Short-circuited</td> </tr> <tr> <td>Red - Blue</td> <td>Low</td> </tr> </tbody> </table>	Color of wires	Operating mode (fan speed)	Resistance	Red - White	High	Short-circuited	Red - Blue	Low
Color of wires	Operating mode (fan speed)	Resistance								
Red - White	High	Short-circuited								
Red - Blue	Low									
3	Display circuit board	<p>[1] Check the appearance.</p> <ul style="list-style-type: none"> <li>• Check whether the circuit name is proper.              VL-50S<sub>2</sub>-E, VL-50ES<sub>2</sub>-E: VL-35-B              VL-50SR<sub>2</sub>-E: VL-36S</li> <li>• Check if any parts are damaged.</li> <li>• Check if any parts are stained with sticking liquid or the like.</li> <li>• Check if the solder is cracked.</li> <li>• Check if the circuit board is cracked.</li> </ul> <p>[2] Check the operating mode selection switch (VL-50SR<sub>2</sub>-E only)</p> <ul style="list-style-type: none"> <li>• Are the connectors CN201 on the display circuit board and CN103 on the main circuit board securely connected?</li> <li>• If the operating mode selection switch does not work, even though the remote controller is operable, replace the display circuit board together with the main circuit board.</li> </ul> <p>If any of the above items is not satisfied, replace the display circuit board together with the main circuit board.</p>								
4	Main circuit board	<p>[1] Check the appearance.</p> <ul style="list-style-type: none"> <li>• Check whether the circuit name is proper.              VL-50S<sub>2</sub>-E, VL-50ES<sub>2</sub>-E: VL-35-A              VL-50SR<sub>2</sub>-E: VL-36M</li> <li>• Check if any parts are damaged.</li> <li>• Check if any parts are stained with sticking liquid or the like.</li> <li>• Check if the solder is cracked.</li> <li>• Check if the circuit board is cracked.</li> <li>• Check if the varistors NR1 and NR2 are damaged.              (If they are damaged, it is due to application of an abnormal voltage. (Wrong installation work))</li> </ul>								



No.	Components	Judging instructions
4	Main circuit board	<p>[2] Check the motor drive.</p> <ul style="list-style-type: none"> <li>• Motor: Measure the voltage between the pins of the following connector. VL-50S<sub>2</sub>-E, VL-50ES<sub>2</sub>-E: CN3 VL-50SR<sub>2</sub>-E: CN2</li> </ul> <p>At high fan speed output: Between 1 and 5 pins: 220/230/240 V AC ± 5 V At low fan speed output: Between 1 and 5 pins: 80 V AC or more For details of the above checkpoints, see Chapter 7. Circuit board diagrams.</p> <p>If any of the above items is not satisfied, replace the main circuit board together with the display circuit board.</p>
5	Remote controller (VL-50SR <sub>2</sub> -E only)	<ul style="list-style-type: none"> <li>• Check if the battery is old. (Battery voltage 2.9 V or more is required.)</li> <li>• If the remote controller does not work, even though the operating mode selection switch is operable, the remote controller might be broken. (Take a digital photo of the transmitter part on the remote controller to check whether infrared rays are emitted from the remote controller.)</li> </ul>

## 10. Before receiving repair requests

Frequently asked question	Response
The incoming air feels cold.	Has the outside air temperature dropped? If the outside air temperature has dropped, switch the operating mode to "Exhaust only mode," or stop the operation and close the shutters.
When switching the operating mode or adjusting the shutter knob, there is a noise inside the product.	This sound is the operation sound of the motor or shutters in the product. It is not a malfunction.
The product does not operate.	[1] The power plug is almost detached from the wall outlet. (VL-50S <sub>2</sub> -E only) [2] The circuit breaker on the distribution board is OFF. [3] A power failure has occurred.
The operation sound becomes louder.	[1] If the front panel or the filters are almost detached (or tilted), reinstall them properly. [2] If the shutters are closed, adjust the shutter knob to the OPEN position. [3] If the filters are clogged, clean them in accordance with the operating instructions.
The air volume is low.	If the filters are clogged, clean them in accordance with the operating instructions.
No air is coming from the product. Not much air is coming from the product.	If the shutters are closed, adjust the shutter knob to the OPEN position.
The front panel cannot be closed.	If Lossnay core and filters are not properly installed, reinstall them properly. (For example, a component is out of position or inserted backwards.)
When adjusting the shutter knob, there is a noise inside the product.	This sound is the operation sound of the shutters in the product. It is not a malfunction.
Cold air or wind comes in more than usual when the product is stopped.	If the shutters are being kept open, adjust the shutter knob to the CLOSE position.
Operation sensitivity of the remote controller is low. (VL-50SR <sub>2</sub> -E only)	[1] Check if the battery is weak. (Replace it with a commercially available lithium battery (CR2025).) [2] Check if the remote controller is operated at the position too far away from the product, or at the improper angle. (See page 14.) [3] Operation sensitivity of the infrared remote controller can be affected by strong light such as sunlight or room illumination. It is not a malfunction. [4] Electromagnetic waves can affect the operation sensitivity at the locations in close proximity of electronic devices such as a television. It is not a malfunction.

# 11. Service inspection list

Location	Inspection Item	Check Result
Electric wiring	Are the power lead wires securely connected to the terminal block? (VL-50ES <sub>2</sub> -E and VL-50SR <sub>2</sub> -E only)	
	Is the wiring correct?	
Appliance	Is the product securely mounted?	
	Does Lossnay operate as described in the operating Instructions when operating the switch?	
	Is the fan rotating?	
	Are the connectors securely connected?	
	Do the shutters work?	
	Does Lossnay operate without abnormal vibration or noise?	

# 12. Overhauling procedures

## ■ Work precautions

- Before replacing parts, follow the instructions described in the troubleshooting.
- When servicing, always keep proper footing.
- When servicing, always unplug the power cord from the outlet, or turn off the circuit breaker. Pay sufficient attention to avoid electric shock or injury.
- Always connect the power wires properly.
- Pay attention not to drop the parts or components.
- After completing repairs, check that the product operates properly.
- \* Always wear a pair of gloves when servicing.
- \* The part names in the text are standardized with the part names in the parts catalog. (There are some exceptions.)

## 12-1 VL-50S<sub>2</sub>-E, VL-50ES<sub>2</sub>-E

### (1) Turn off the power.

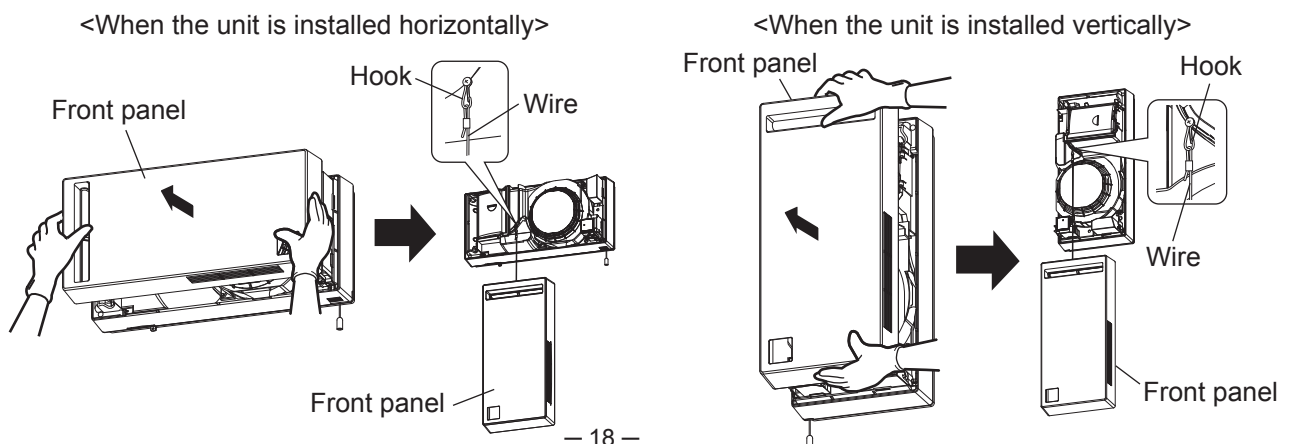
- [1] Stop the operation by turning off the switch.
- [2] Turn off the circuit breaker on the distribution board, or unplug the power cord.

### (2) Remove the front panel.

- [1] Hold both ends of the front panel, and pull it forward.
- [2] Suspend the detached front panel by using the wire.

#### Precautions

- When removing the front panel from the main unit, hold the hook to disengage the wire.
- Do not shake the suspended front panel. (The wallpaper could be damaged.)



### (3) Dismount the main unit.

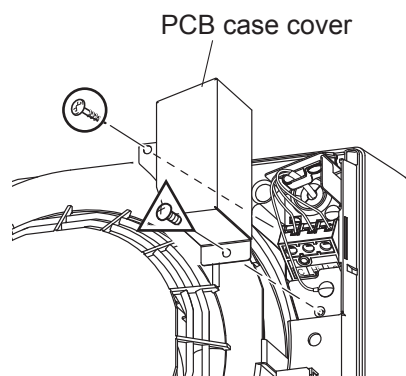
#### For VL-50ES<sub>2</sub>-E

[1] Remove the PCB case cover.

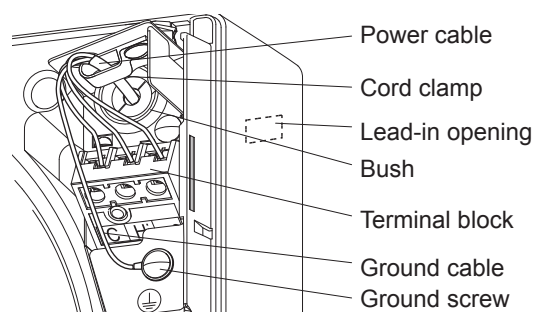
Unscrew the screws (one PTT screw 4×8, indicated by ○, and one PP screw 3×8, indicated by △).

**Reassembly precaution**

**Tightening torque for the screws: 1.1 N·m**



[2] Disconnect the power cable and ground cable from the main unit.



#### For both models

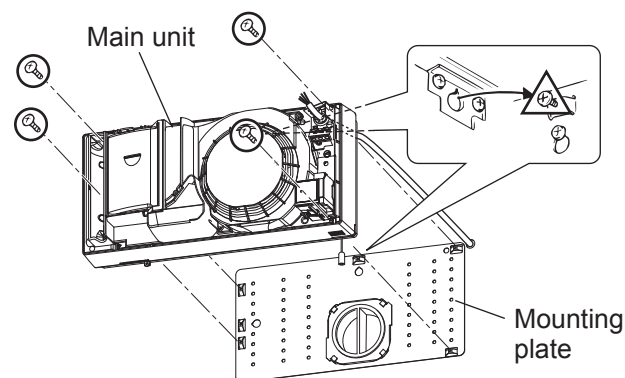
[3] Unscrew the screws (four special screws 4×10.5, indicated by ○), and dismount the main unit.

**Precaution**

**Pay attention to unhook the main unit from the unit fixing screw (one special screw 4×10.5, indicated by △) on the mounting plate.**

**Reassembly precaution**

**Tightening torque for the screws: 1.1 N·m**

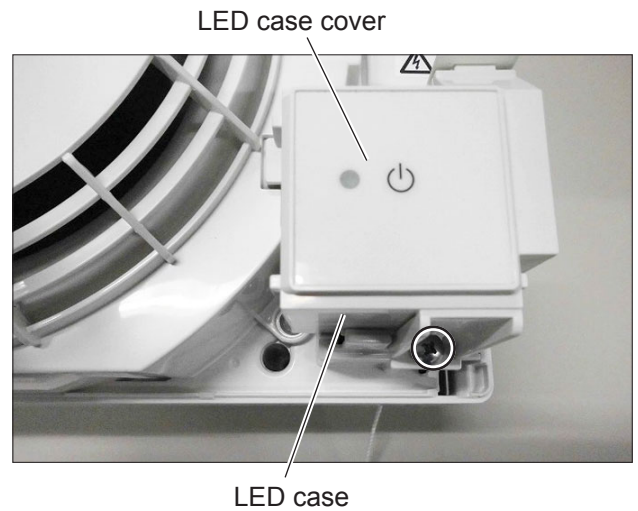


\* The figure shows VL-50ES<sub>2</sub>-E.

#### (4) Remove the display circuit board (VL-35-B).

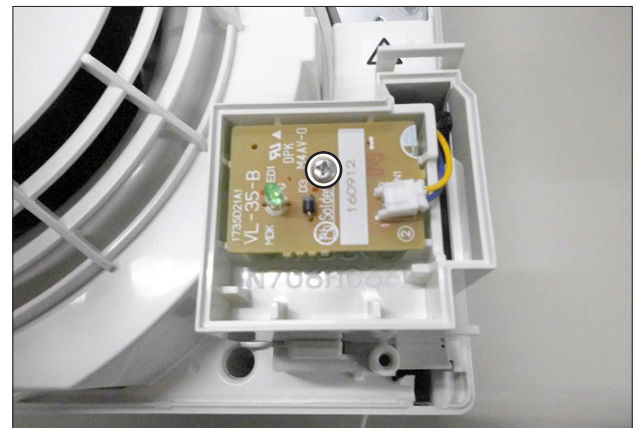
- [1] Unscrew the screw (one PTT screw 4x12, indicated by ○), and remove the display circuit board parts together with the LED case cover and LED case.

**Reassembly precaution**  
Tightening torque for the screw: 1.1 N·m



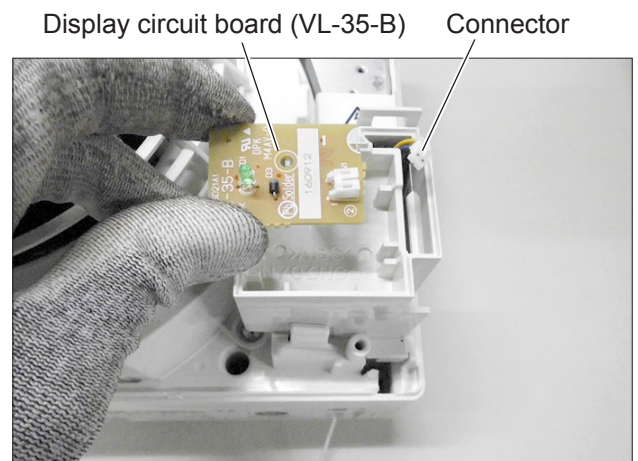
- [2] Remove the LED case cover, and unscrew the screw (one PPT screw 3x8, indicated by ○).

**Reassembly precaution**  
Tightening torque for the screw: 0.7 N·m



- [3] Disconnect the connector from the display circuit board, and remove the circuit board (VL-35-B).

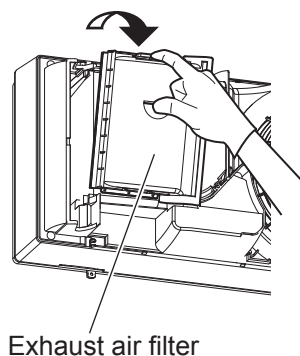
**Reassembly precaution**  
Securely connect the connector to the display circuit board.



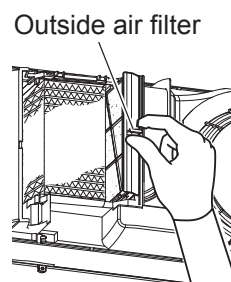
## (5) Remove the Lossnay core and filters.

[1] Remove the exhaust air filter from the main unit.

- Hold the filter as shown in the figure.
- Unhook the top part of the filter, and pull forward to remove it.

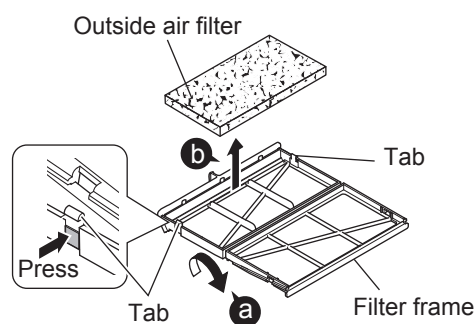


[2] Hold the knob of the outside air filter to pull it out, and remove it from the main unit.

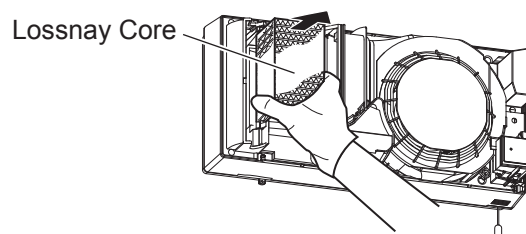


[3] Remove the outside air filter from the filter frame.

- Press the tabs (two locations) to open the filter frame.
- Remove the outside air filter.

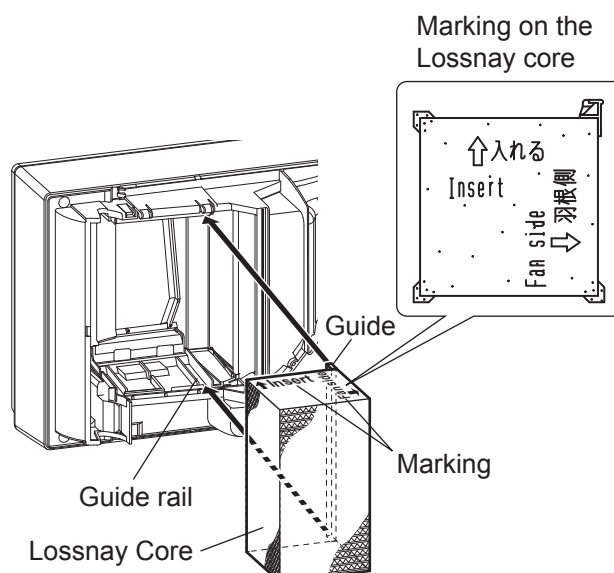


[4] Pull out the Lossnay core.



### Reassembly precautions

- When installing the Lossnay core, pay attention not to curl the packing.
- Deeply insert the Lossnay core.
- Reinstall the Lossnay core as before.
- \* To install the Lossnay core in the correct direction, check the marking on the Lossnay core: "↑ Insert" and "↓ Fan side."
- \* Insert the guide of the Lossnay core into the guide rails of the main unit.



## (6) Remove the fan guard and fan casing (front).

- [1] Unscrew the screws (three PTT screws 4x25, indicated by ○), and remove the fan guard.

**Reassembly precaution**

Tightening torque for the screws: 1.1 N·m

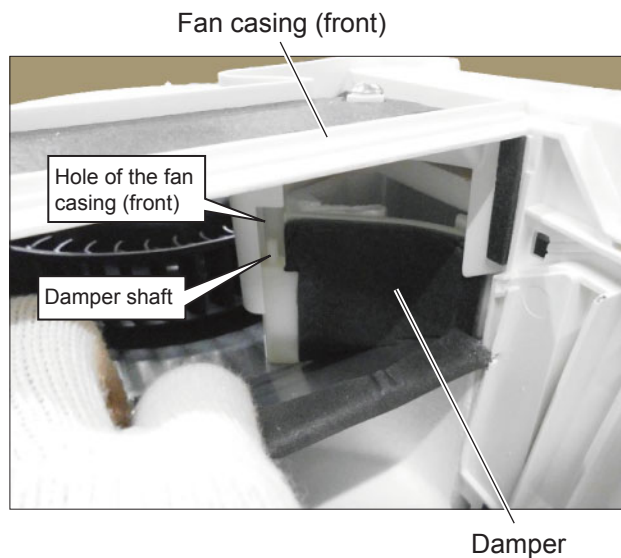
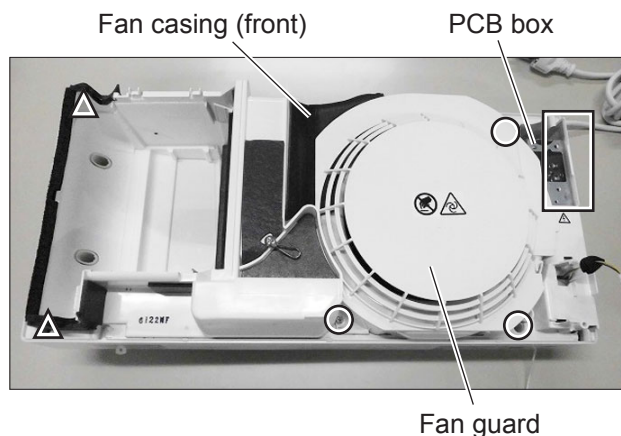
- [2] Unscrew the screws (two PTT screws 4x14, indicated by △), and remove the fan casing (front).

**Reassembly precautions**

- When attaching or removing the fan casing (front), make sure to prevent it from contacting with the part of the PCB box indicated by □.
- Tightening torque for the screws: 1.1 N·m

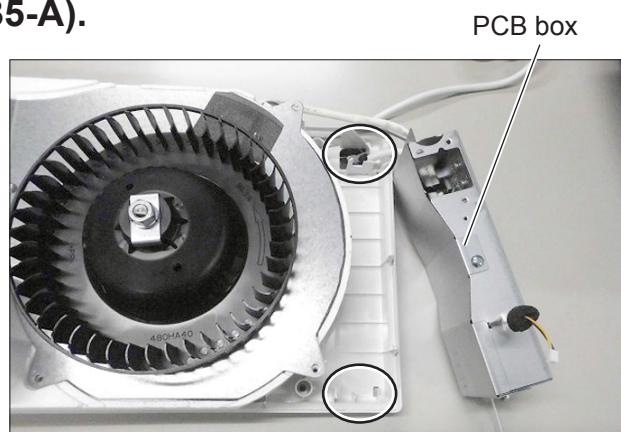
**Reassembly precaution**

When attaching the fan casing (front), fit its hole onto the damper shaft that is assembled on the fan casing.



## (7) Remove the main circuit board (VL-35-A).

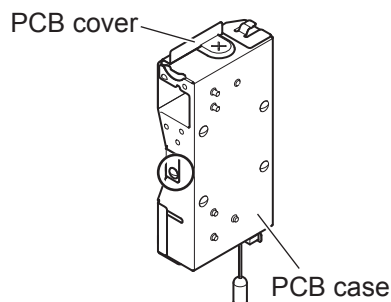
- [1] Disengage the PCB box from the hook parts of the casing (two locations, indicated by ○).



- [2] Unscrew the screw (one PT screw 4x8, indicated by ○), and remove the PCB cover.

**Reassembly precaution**

Tightening torque for the screw: 1.1 N·m

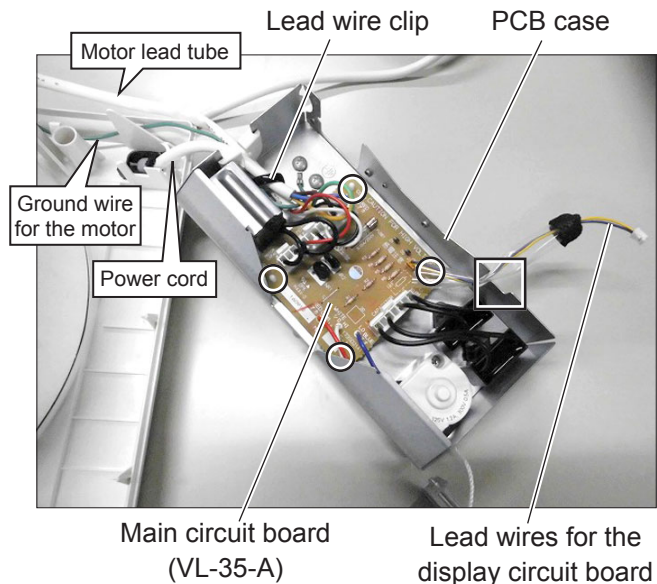


\* The figure shows VL-50S2-E.

[3] Remove the rivets (four pieces, indicated by ○), and remove the main circuit board (VL-35-A).

**Reassembly precautions**

- Fasten the motor lead tube, ground wire for the motor, and power cord with the lead wire clip.
- Make sure that the lead wires for the display circuit board come out from the cutout of the PCB case (indicated by □).

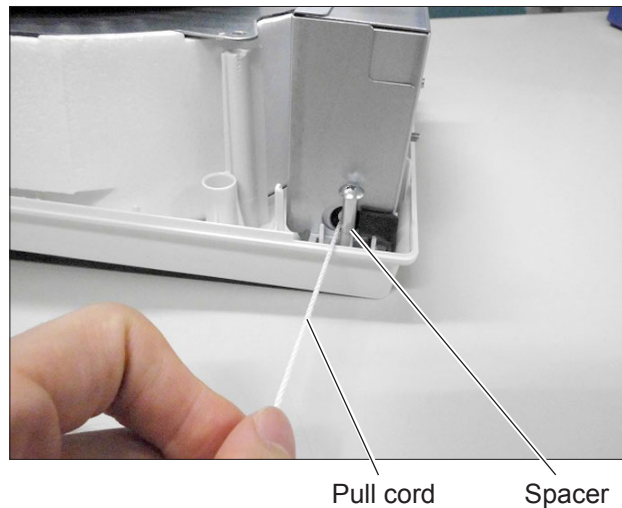


\* The figure shows VL-50S2-E.

**For VL-50S2-E**

**Reassembly precaution**

The pull cord for the switch must be drawn out to the left side of the spacer as shown in the picture.



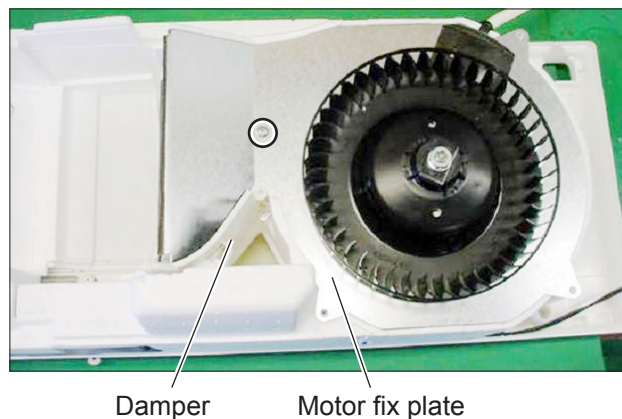
## (8) Remove the centrifugal fans and motor.

[1] Remove the damper.

[2] Unscrew the clamping screw for the motor fix plate (one PTT screw 4x12, indicated by ○).

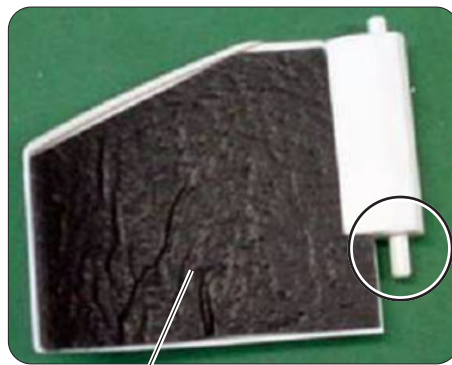
**Reassembly precaution**

Tightening torque for the screw: 1.1 N·m

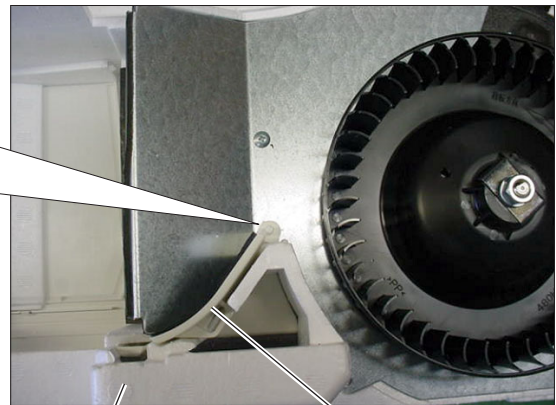


### Reassembly precautions

- Attach the damper to the fan casing so that the damper shaft is not tilted.
- Insert the protrusion of the damper shaft (indicated by ○) into the hole of the fan casing (front). (See page 22.)



Damper



Fan casing

Damper

- [3] Remove the special nut (M8) and tab washer (one each, indicated by ○), and remove the centrifugal fan together with the special washer (8) (one each, indicated by □).

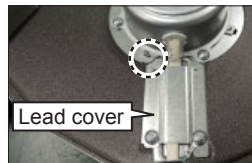
### Reassembly precaution

Tightening torque for the nut: 2.0 N·m

- [4] Unscrew the screws (two PTT screws 4x10, indicated by △), and remove the lead cover.

### Reassembly precautions

- Insert the lead cover under the motor when attaching it. (Indicated by ○)



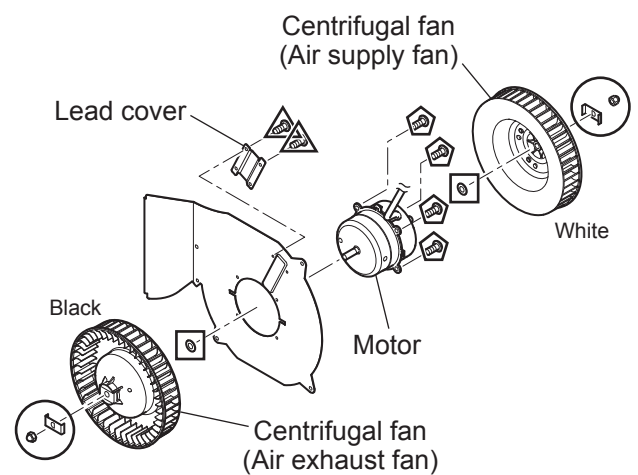
Lead cover

- Tightening torque for the screws: 1.6 N·m

- [5] Unscrew the screws (four PTT screws 4x10, indicated by ◊), and remove the motor.

### Reassembly precaution

Tightening torque for the screws: 1.6 N·m

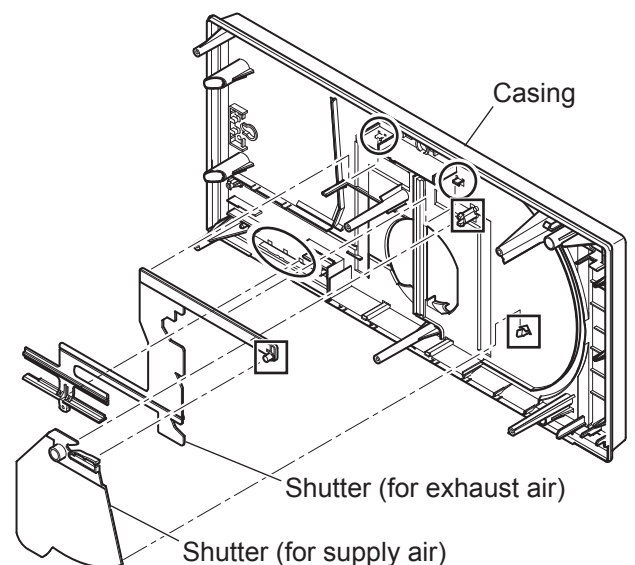


## (9) Remove the shutters.

- Remove the shutters (for supply/exhaust air) from the casing.

### Reassembly precautions

- Make sure that the shutter (for exhaust air) is securely hooked on the claws and hollows of the casing. (Three locations, indicated by ○)
- Make sure that the shutter (for supply air) is securely hooked on the claws and protrusions of the casing and shutter (for exhaust air). (Three locations, indicated by □)



## \* When reassembling

- Reassemble the unit in the reverse order of disassembly.
- After reassembly, always make a test run to make sure that the unit operates properly.



## 12-2 VL-50SR2-E

### (1) Turn off the power.

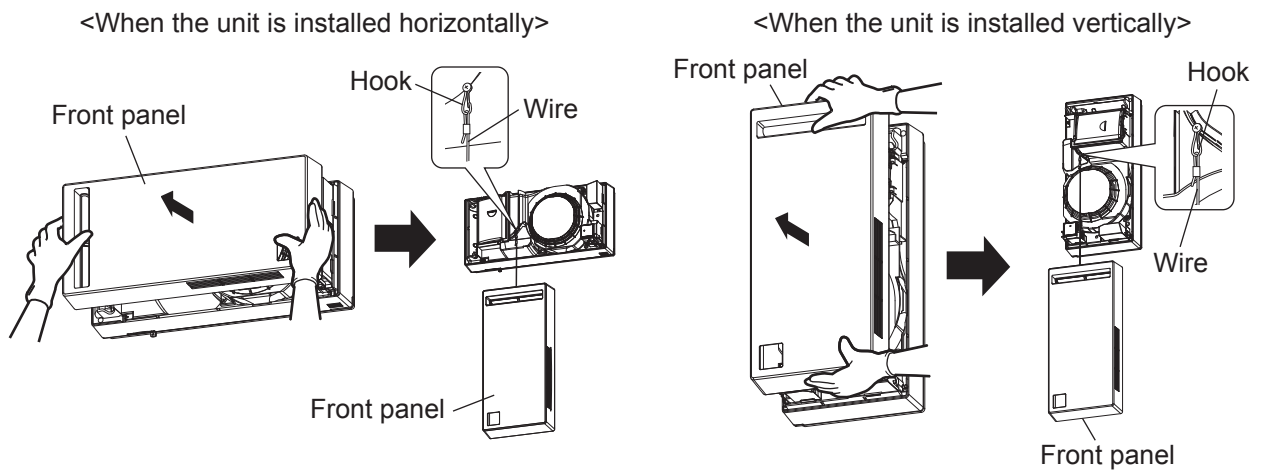
- [1] Stop the operation.
- [2] Turn off the circuit breaker on the distribution board.

### (2) Remove the front panel.

- [1] Hold both ends of the front panel, and pull it forward.
- [2] Suspend the detached front panel by using the wire.

#### Precautions

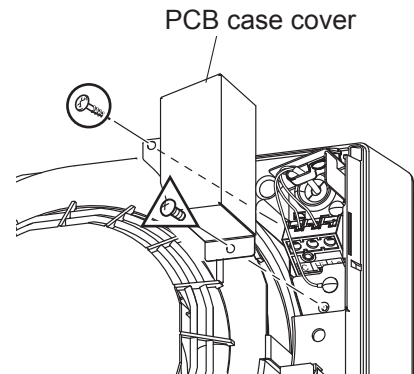
- When removing the front panel from the main unit, hold the hook to disengage the wire.
- Do not shake the suspended front panel. (The wallpaper could be damaged.)



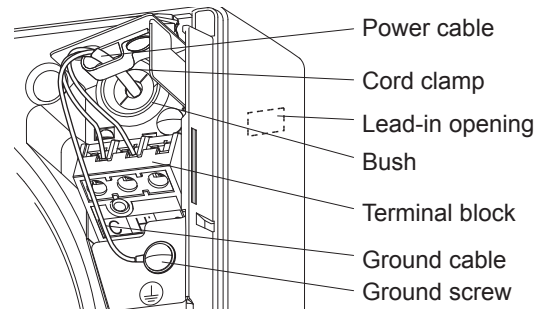
### (3) Dismount the main unit.

- [1] Remove the PCB case cover.  
Unscrew the screws (one PTT screw 4×8, indicated by ○, and one PP screw 3×8, indicated by △).

Reassembly precaution  
Tightening torque for the screws: 1.1 N·m



- [2] Disconnect the power cable and ground cable from the main unit.



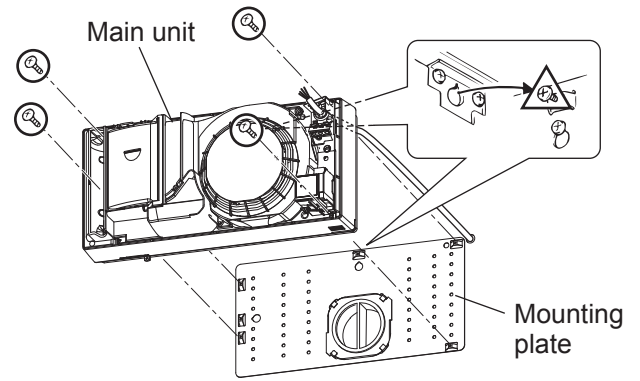
- [3] Unscrew the screws (four special screws 4x10.5, indicated by ○), and dismount the main unit.

**Precaution**

Pay attention to unhook the main unit from the unit fixing screw (one special screw 4x10.5, indicated by △) on the mounting plate.

**Reassembly precaution**

Tightening torque for the screws: 1.1 N·m

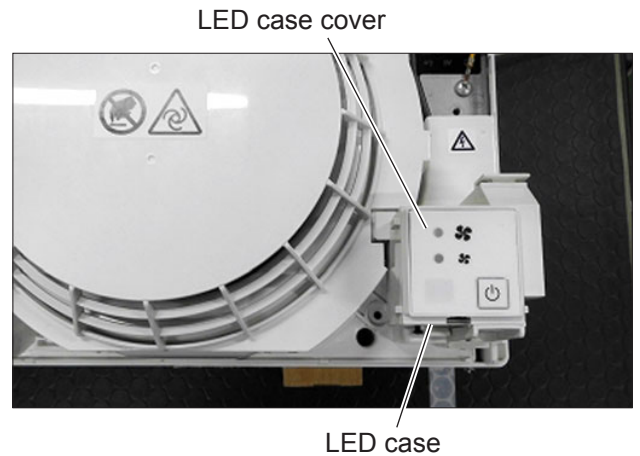


#### (4) Remove the display circuit board (VL-36S).

- [1] Unscrew the screw (one PTT screw 4x12, indicated by ○), and remove the display circuit board parts together with the LED case cover and LED case.

**Reassembly precaution**

Tightening torque for the screw: 1.1 N·m



- [2] Remove the LED case cover, and unscrew the screw (one PPT screw 3x8, indicated by ○).

**Reassembly precaution**

Tightening torque for the screw: 0.7 N·m

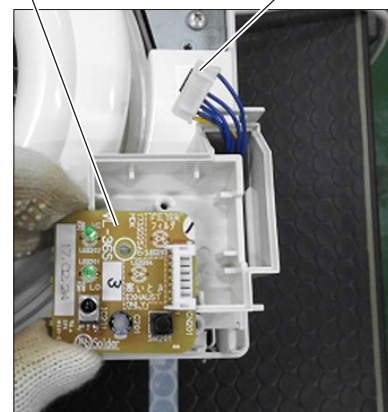


- [3] Disconnect the connector from the display circuit board, and remove the circuit board (VL-36S).

**Reassembly precaution**

Securely connect the connector to the display circuit board.

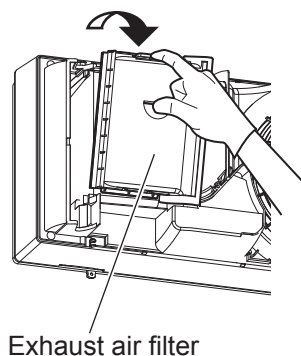
Display circuit board (VL-36S) Connector



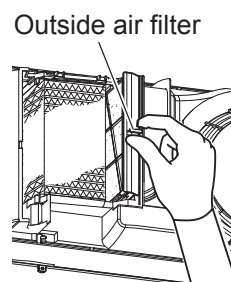
## (5) Remove the Lossnay core and filters.

[1] Remove the exhaust air filter from the main unit.

- a. Hold the filter as shown in the figure.
- b. Unhook the top part of the filter, and pull forward to remove it.

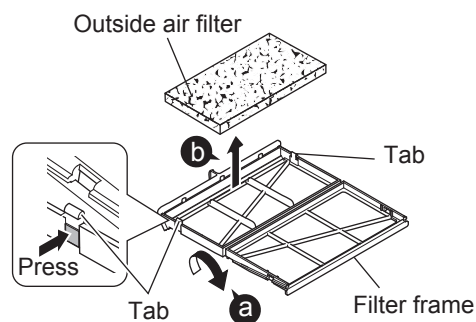


[2] Hold the knob of the outside air filter to pull it out, and remove it from the main unit.

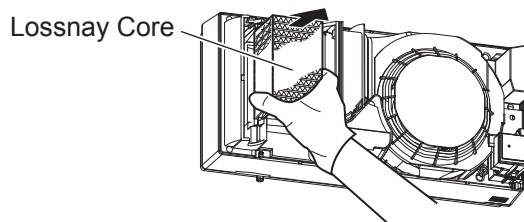


[3] Remove the outside air filter from the filter frame.

- a. Press the tabs (two locations) to open the filter frame.
- b. Remove the outside air filter.

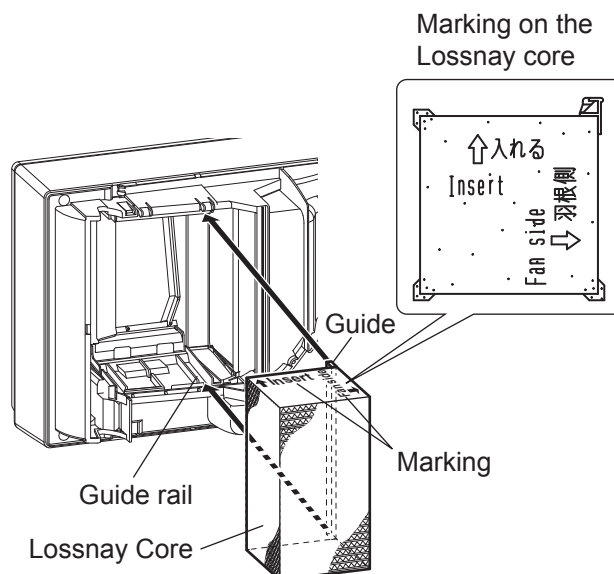


[4] Pull out the Lossnay core.



### Reassembly precautions

- When installing the Lossnay core, pay attention not to curl the packing.
- Deeply insert the Lossnay core.
- Reinstall the Lossnay core as before.
- \* To install the Lossnay core in the correct direction, check the marking on the Lossnay core: "↑ Insert" and "↓ Fan side."
- \* Insert the guide of the Lossnay core into the guide rails of the main unit.



## (6) Remove the fan guard and fan casing (front).

- [1] Unscrew the screws (three PTT screws 4x25, indicated by ○), and remove the fan guard.

### Reassembly precaution

Tightening torque for the screws: 1.1 N·m

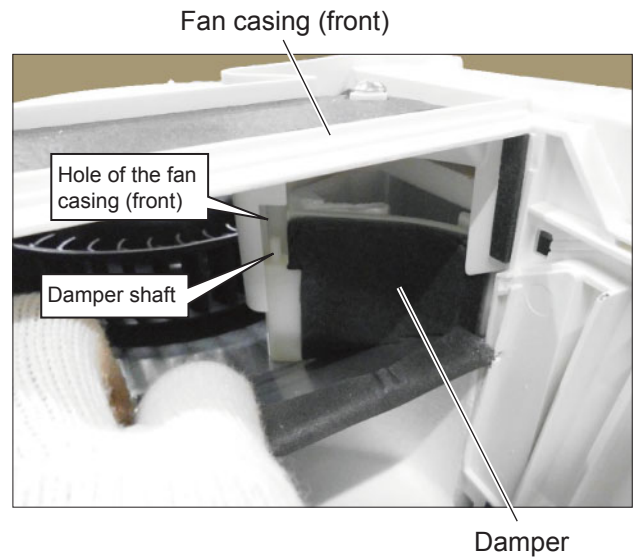
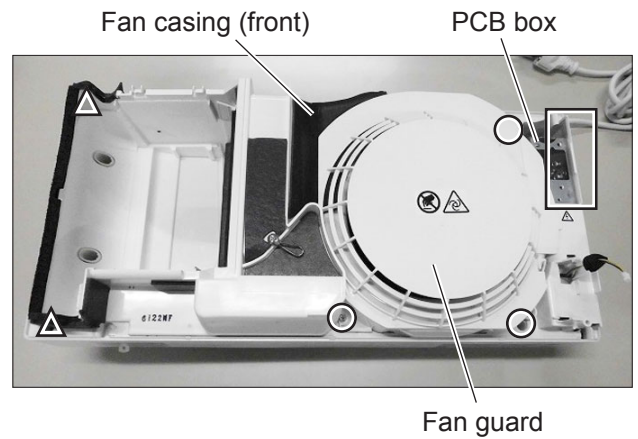
- [2] Unscrew the screws (two PTT screws 4x14, indicated by △), and remove the fan casing (front).

### Reassembly precautions

- When attaching or removing the fan casing (front), make sure to prevent it from contacting with the part of the PCB box indicated by □.
- Tightening torque for the screws: 1.1 N·m

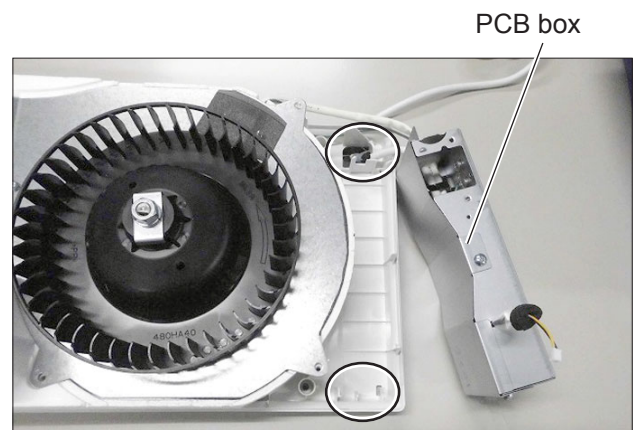
### Reassembly precaution

When attaching the fan casing (front), fit its hole onto the damper shaft that is assembled on the fan casing.



## (7) Remove the main circuit board (VL-36M).

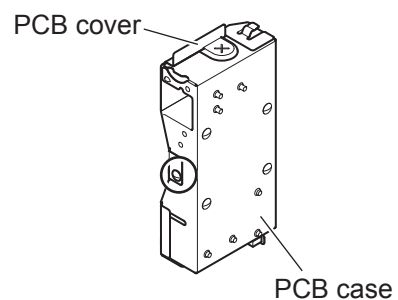
- [1] Disengage the PCB box from the hook parts of the casing (two locations, indicated by ○).



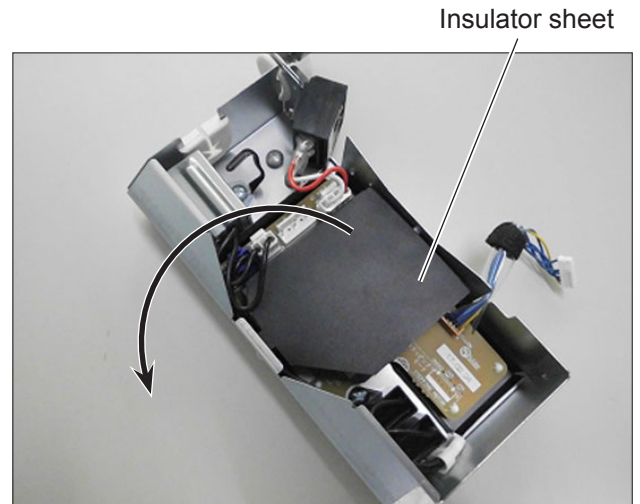
- [2] Unscrew the screw (one PT screw 4x8, indicated by ○), and remove the PCB cover.

### Reassembly precaution

Tightening torque for the screw: 1.1 N·m

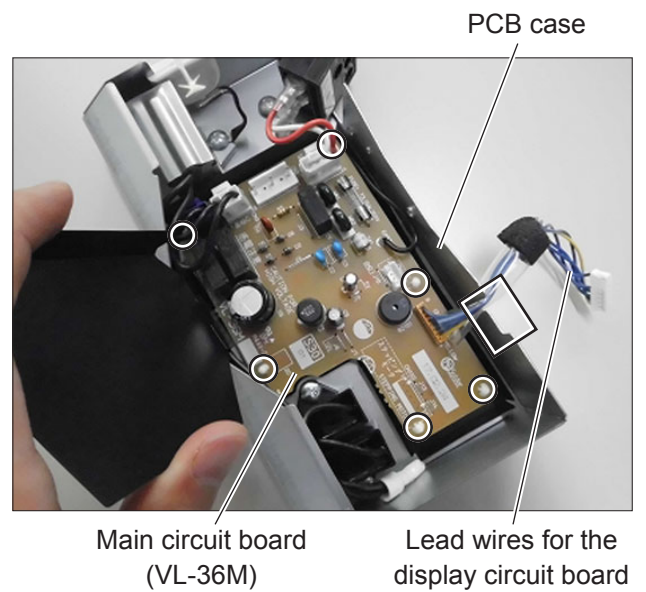


[3] Turn over the insulator sheet

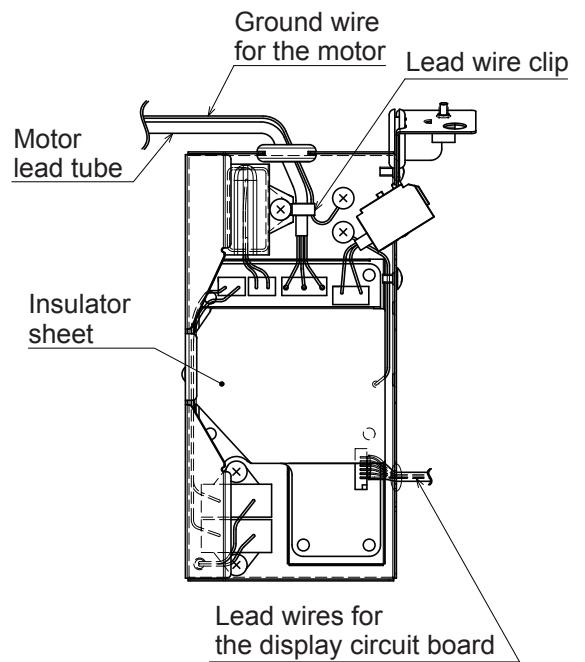


[4] Remove the rivets (six pieces, indicated by ○), and remove the main circuit board (VL-36M).

**Reassembly precaution**  
Make sure that the lead wires for the display circuit board come out from the cutout of the PCB case (indicated by □).



**Reassembly precaution**  
Fasten the motor lead tube and ground wire with the lead wire clip.

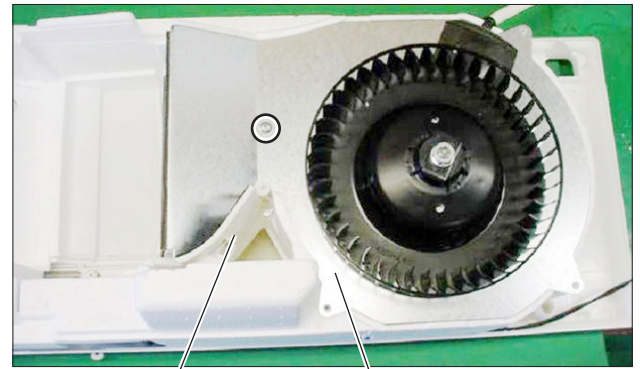


## (8) Remove the centrifugal fans and motor.

- [1] Remove the damper.
- [2] Unscrew the clamping screw for the motor fix plate (one PTT screw 4x12, indicated by ○).

### Reassembly precaution

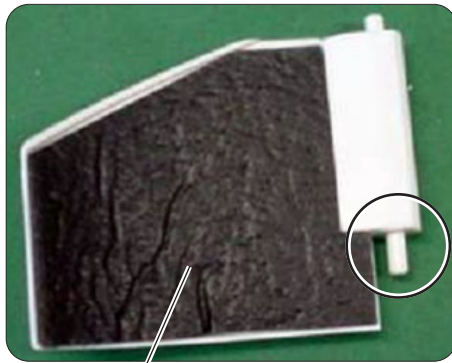
Tightening torque for the screw: 1.1 N·m



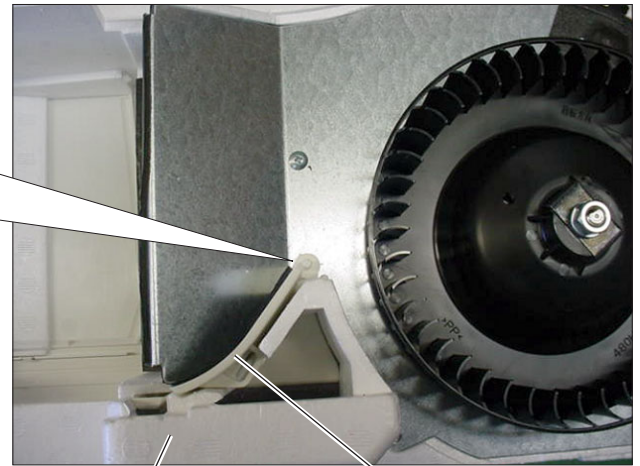
Damper Motor fix plate

### Reassembly precautions

- Attach the damper to the fan casing so that the damper shaft is not tilted.
- Insert the protrusion of the damper shaft (indicated by ○) into the hole of the fan casing (front). (See page 28.)



Damper



Fan casing Damper

- [3] Remove the special nut (M8) and tab washer (one each, indicated by ○), and remove the centrifugal fan together with the special washer (8) (one each, indicated by □).

### Reassembly precaution

Tightening torque for the nut: 2.0 N·m

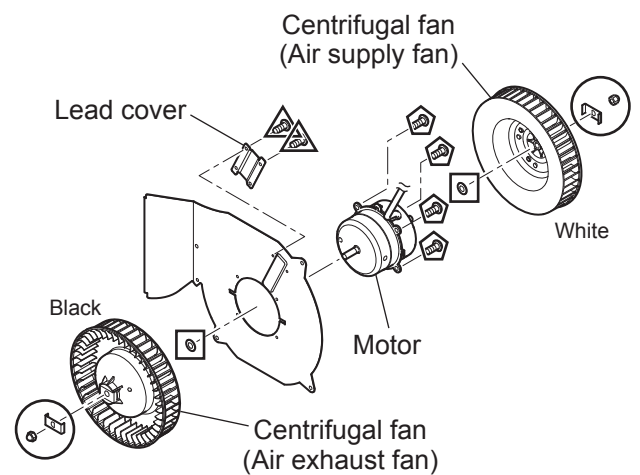
- [4] Unscrew the screws (two PTT screws 4x10, indicated by △), and remove the lead cover.

### Reassembly precautions

- Insert the lead cover under the motor when attaching it. (Indicated by ○)



- Tightening torque for the screws: 1.6 N·m



- [5] Unscrew the screws (four PTT screws 4x10, indicated by ◇), and remove the motor.

### Reassembly precaution

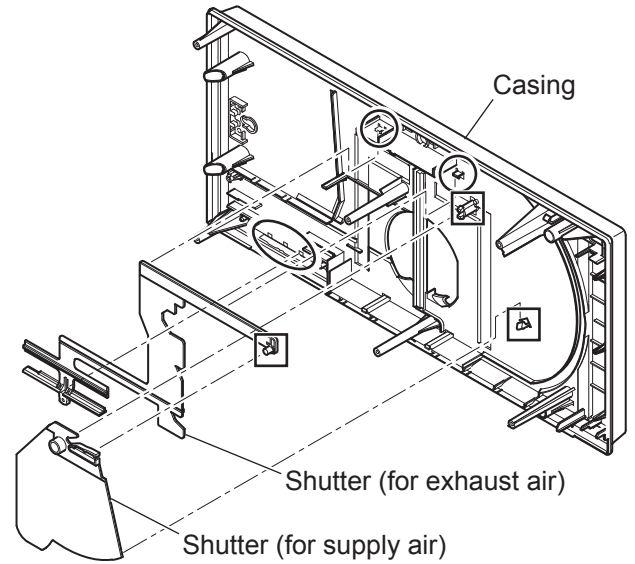
Tightening torque for the screws: 1.6 N·m

## (9) Remove the shutters.

- Remove the shutters (for supply/exhaust air) from the casing.

### Reassembly precautions

- Make sure that the shutter (for exhaust air) is securely hooked on the claws and hollows of the casing. (Three locations, indicated by ○)
- Make sure that the shutter (for supply air) is securely hooked on the claws and protrusions of the casing and shutter (for exhaust air). (Three locations, indicated by □)





## \* When reassembling

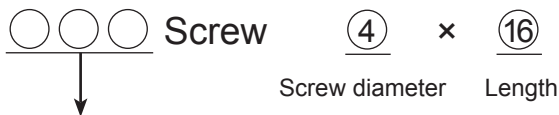
- Reassemble the unit in the reverse order of disassembly.
- After reassembly, always make a test run to make sure that the unit operates properly.

# 13. Parts catalog

## Please note the following when using the parts catalog.

1. When ordering parts, always indicate the part number, part name, and the number of parts required.
2. It may take time for you to receive the parts. Make an inquiry about a rush order.
3. Specifications may be subject to change without notice.
4. Parts marked with  and  are critical for safety.
5. To maintain safety and performance, always replace the parts with the parts prescribed.
6. When replacing the parts to which the nameplate is attached, remove the nameplate and attach it to the new parts.

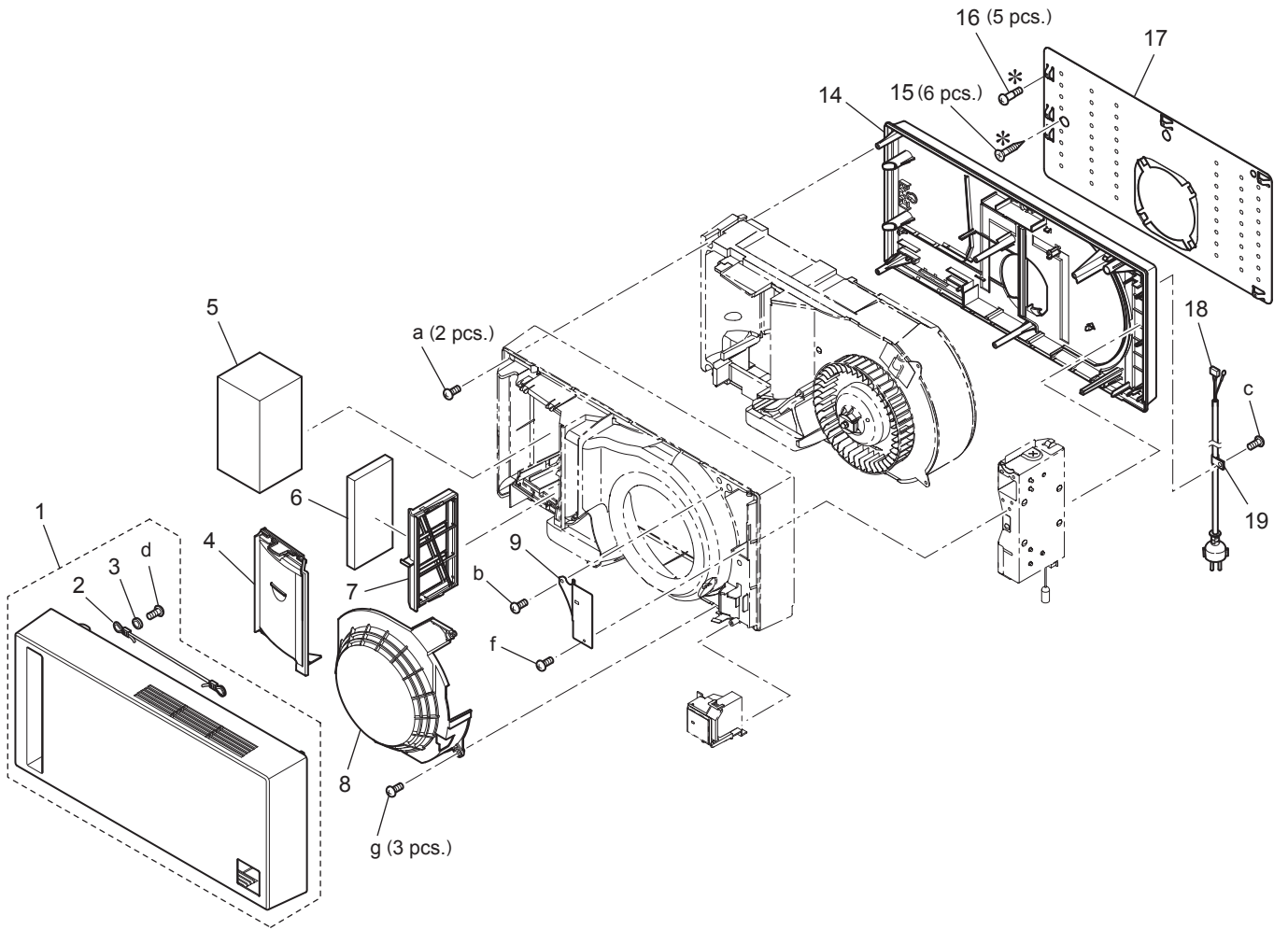
### Description of screw abbreviations



Abbreviation	Description
PC screw	Cross recess flat head machine screw
PRC screw	Cross recess oval head machine screw
PP screw	Cross recess pan head machine screw
SW · PP screw	Cross recess pan head screw with spring washer
PPT screw	Cross recess tapping screw
PCT screw	Cross recess flat head tapping screw
PTT screw	Cross recess truss head tapping screw
PT screw	Cross recess truss head machine screw
SET screw	Slotted head stop screw
SQ · SET screw	Square head stop screw
P · SET screw	Pan head stop screw
PMT screw	Primer truss head screw
HS · SET screw	Hexagon head stop screw
P · R · W screw	Cross recess round wood screw
P · C · W screw	Cross recess flat head wood screw
P · R · C · W screw	Cross recess round and flat wood screw
R · W screw	Slotted round wood screw
PW · PP screw	Cross recess pan head screw with small washer
SW-PW · PP screw	Cross recess pan head machine screw with spring washer and flat washer



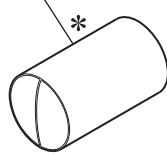
# VL-50S2-E



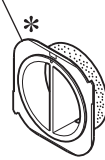
<Standard screws>

Symbol	Screw name
a	PTT screw 4x14
b	PTT screw 4x8
c	PTT screw 4x12
d	PTT screw 3x8
e	PTT screw 4x12
f	PP screw 3x8
g	PTT screw 4x25

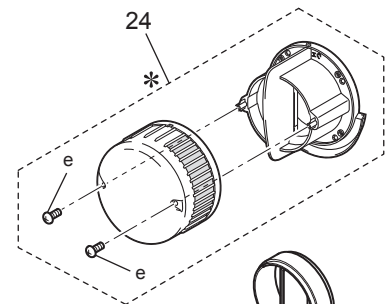
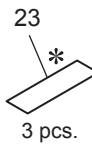
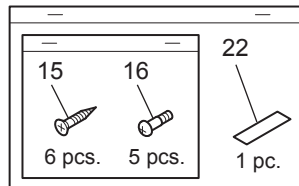
20 (2 pcs.)



21



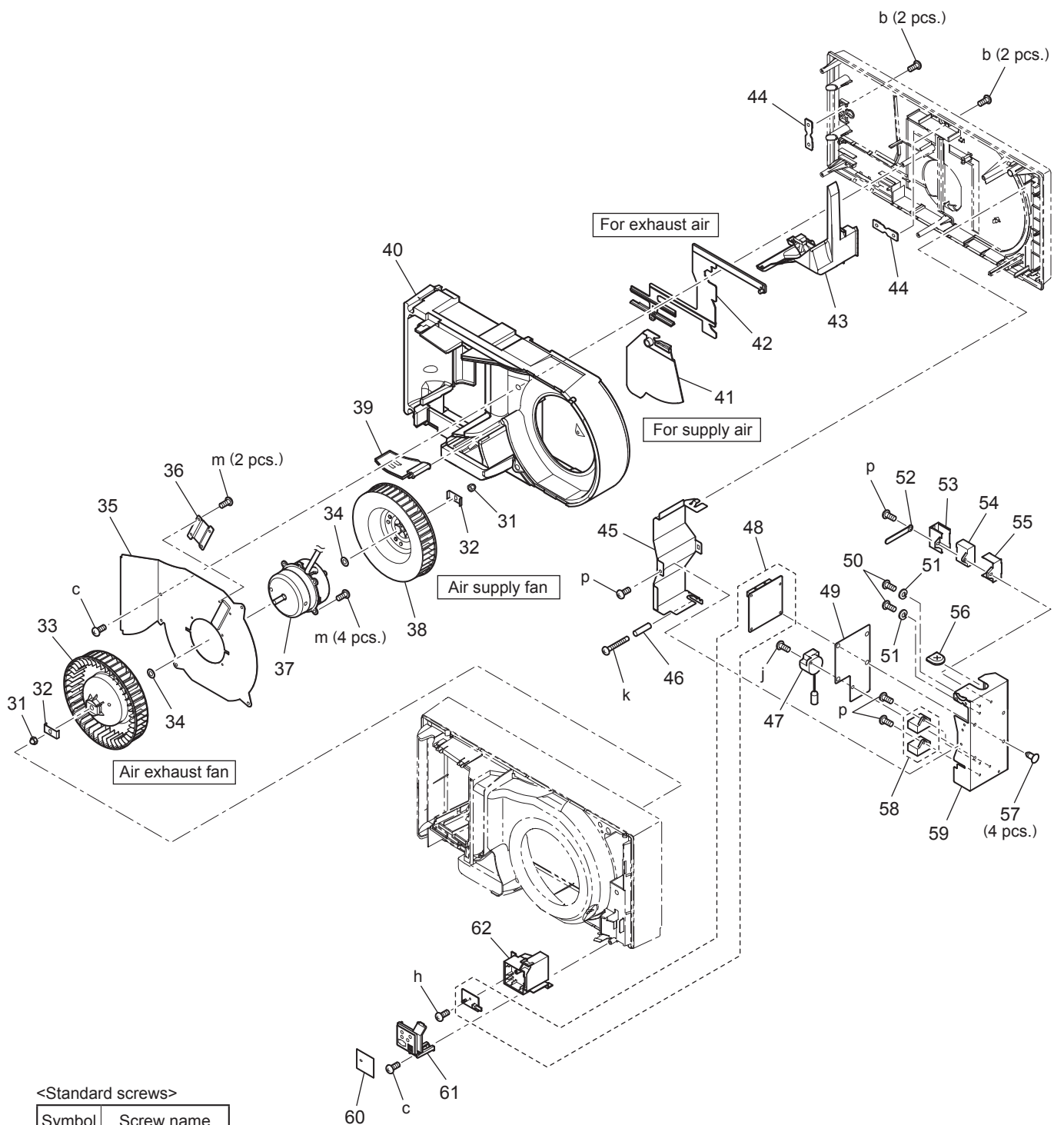
\*



\* shows accessory parts.

# VL-50S2-E

No.	Name of part	Parts No.	Q'ty pcs/unit	Critical for safety	Remarks
1	Front panel	W36 005 719	1		
2	Wire	W36 005 343	1		
3	Special washer (3)	W00 000 167	1		
4	Filter	W36 005 717	1	⚠	Exhaust air
5	Lossnay core	W36 005 710	1	⚠	
6	Filter	W36 005 718	1	⚠	Supply air
7	Filter frame	W36 005 720	1		Supply air
8	Fan guard	W36 005 721	1		
9	PCB case cover	W36 005 706	1		
14	Casing	W36 005 830	1		
15	Special screw 3.5x32	W00 000 048	6		
16	Special screw 4x10.5	W00 000 206	5		
17	Mounting plate	W36 005 704	1		
18	Power cord	W36 005 220	1	⚠	3200mm
19	Cord clip	W00 000 260	1		
20	Pipe	W36 005 313	2		(Air supply/Exhaust)
21	Flange	W36 005 722	1		
22	Flange Packing	W36 005 723	1		153X5mm
23	Aluminium tape	W36 005 389	3		450mm
24	Weather cover	W36 005 724	1		
25	Joint pipe	W36 005 314	1		
26	Joint pipe	W36 005 707	1		



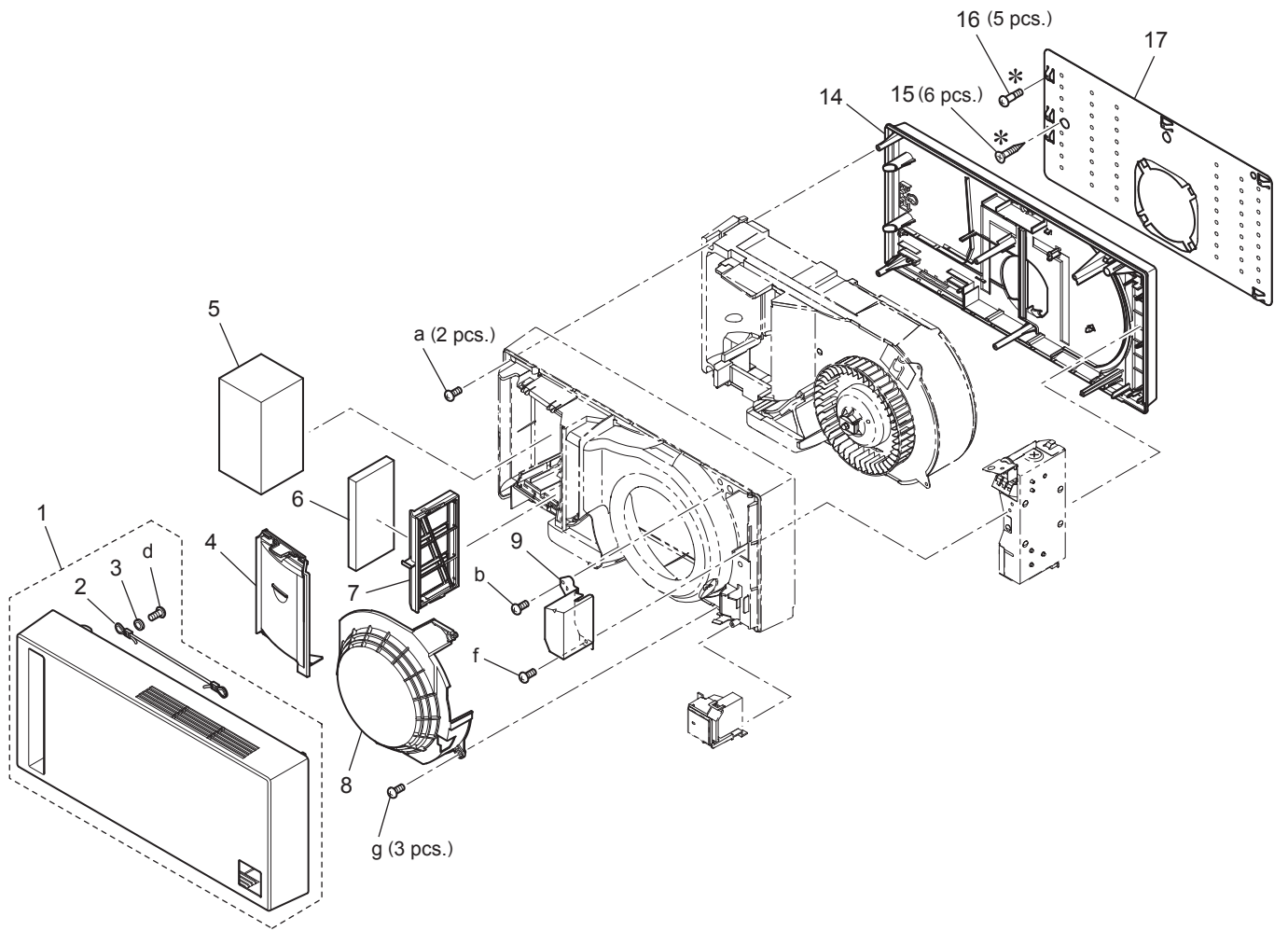
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Symbol	Screw name
b	PTT screw 4x8
c	PTT screw 4x12
h	PTT screw 3x8
j	PP screw 4x10
k	PTT screw 4x30
m	PTT screw 4x10
p	PT screw 4x8

## VL-50S2-E

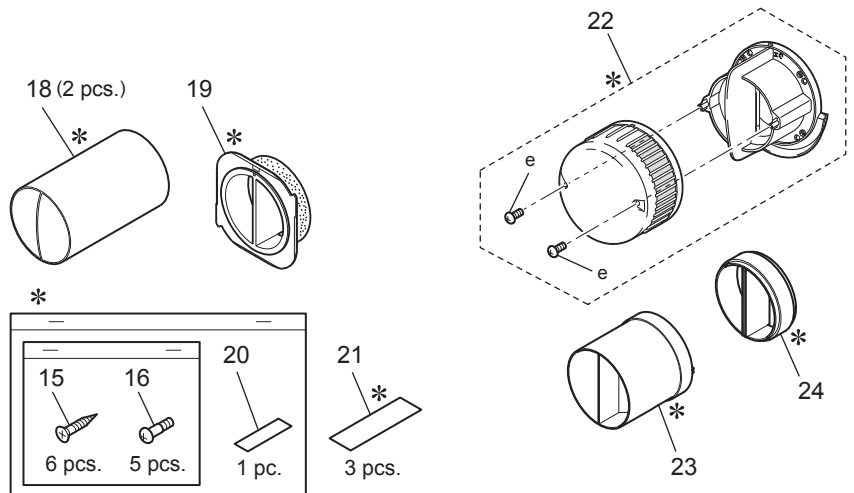
No.	Name of part	Parts No.	Q'ty pcs/unit	Critical for safety	Remarks
31	Special nut (M8)	W00 000 069	2		
32	Tab washer	W00 000 079	2		
33	Centrifugal fan	W36 005 480	1	⚠	φ 170·Black
34	Special washer (8)	W00 000 148	2		φ 16 (Outer dia.)
35	Motor fix plate	W36 005 705	1		
36	Lead cover	W36 005 708	1		
37	Motor	W36 005 453	1	⚠	
38	Centrifugal fan	W36 005 481	1	⚠	φ 170·Natural
39	Damper	W36 005 715	1		
40	Fan casing	W36 005 831	1		
41	Shutter	W36 005 716	1		
42	Shutter	W36 005 725	1		
43	Drain pan	W36 005 726	1		
44	Fix piece	W36 005 345	2		
45	PCB cover	W36 005 709	1		
46	Spacer	W00 000 168	1		
47	Switch	W36 001 255	1	⚠	With a pull cord
48	Circuit board	W36 005 727	1	⚠	VL-35-A·35-B
49	Insulator sheet	W36 005 390	1	⚠	
50	PT screw 4x6 BS	W00 000 008	2		
51	Spring washer (4)	W00 000 077	2		
52	Lead wire clip	W00 000 238	1		
53	Capacitor cover	W82 003 652	1		
54	Capacitor	W36 005 231	1	⚠	2.0 μF·250 VAC
55	Capacitor case	W82 003 653	1		
56	Cord bush	W00 000 225	1		
57	Spacer	W00 000 169	4		
58	Capacitor assembly	W36 005 232	1	⚠	1.0 μF/2.0 μF
59	PCB case	W36 005 711	1		
60	Decoration sheet	W36 005 369	1		
61	LED case cover	W36 005 712	1		
62	LED case	W36 005 713	1		

# VL-50ES2-E



<Standard screws>

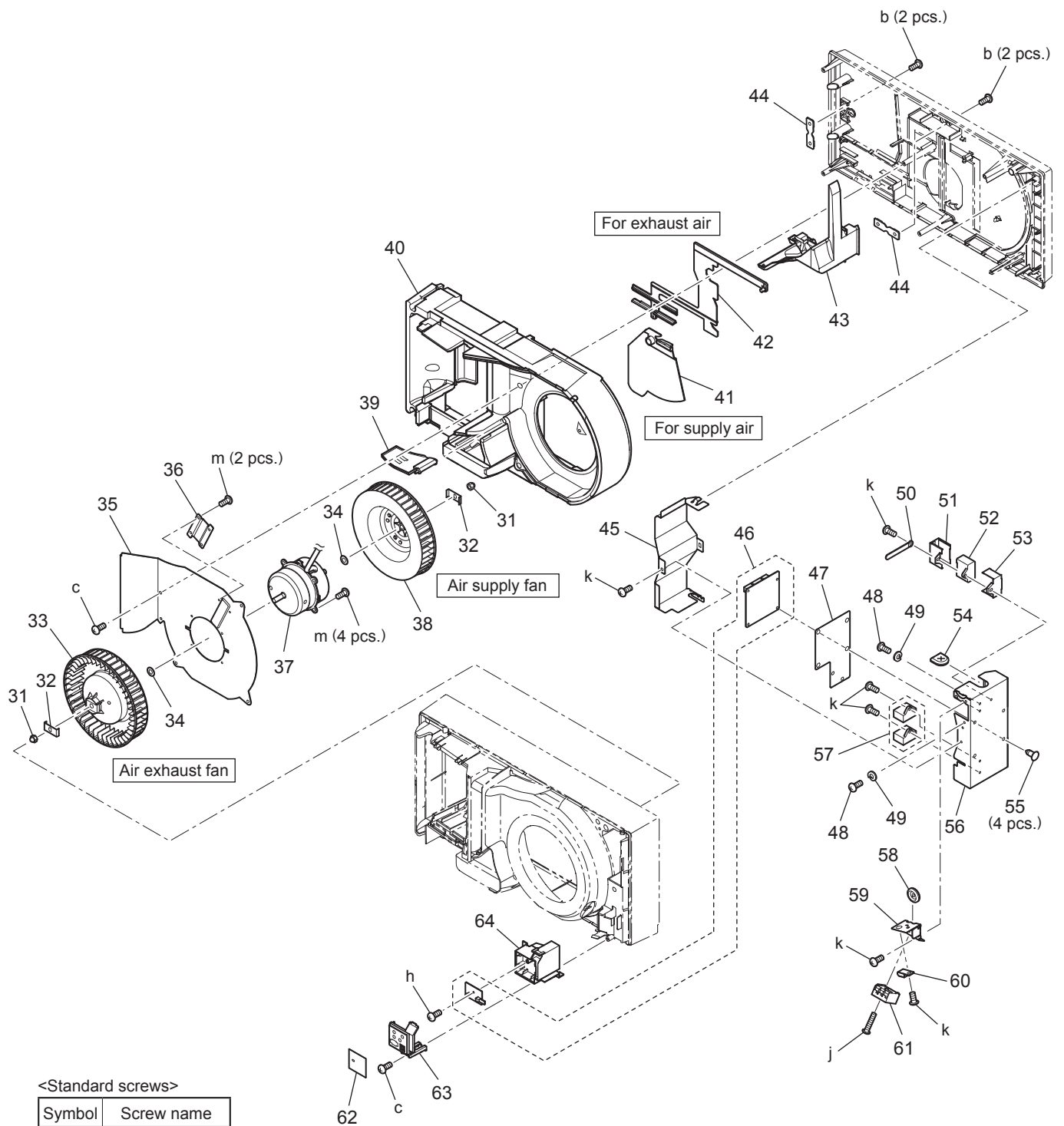
Symbol	Screw name
a	PTT screw 4x14
b	PTT screw 4x8
c	PTT screw 4x12
d	PTT screw 3x8
e	PTT screw 4x12
f	PP screw 3x8
g	PTT screw 4x25



\* shows accessory parts.

## VL-50ES2-E

No.	Name of part	Parts No.	Q'ty pcs/unit	Critical for safety	Remarks
1	Front panel	W36 005 719	1		
2	Wire	W36 005 343	1		
3	Special washer (3)	W00 000 167	1		
4	Filter	W36 005 717	1	⚠	Exhaust air
5	Lossnay core	W36 005 710	1	⚠	
6	Filter	W36 005 718	1	⚠	Supply air
7	Filter frame	W36 005 720	1		Supply air
8	Fan guard	W36 005 721	1		
9	PCB case cover	W36 005 714	1		
14	Casing	W36 005 832	1		
15	Special screw 3.5x32	W00 000 048	6		
16	Special screw 4x10.5	W00 000 206	5		
17	Mounting plate	W36 005 704	1		
18	Pipe	W36 005 313	2		(Air supply/Exhaust)
19	Flange	W36 005 722	1		
20	Flange packing	W36 005 723	1		153X5mm
21	Aluminium tape	W36 005 389	3		450mm
22	Weather cover	W36 005 724	1		
23	Joint pipe	W36 005 314	1		
24	Joint pipe	W36 005 707	1		



<Standard screws>

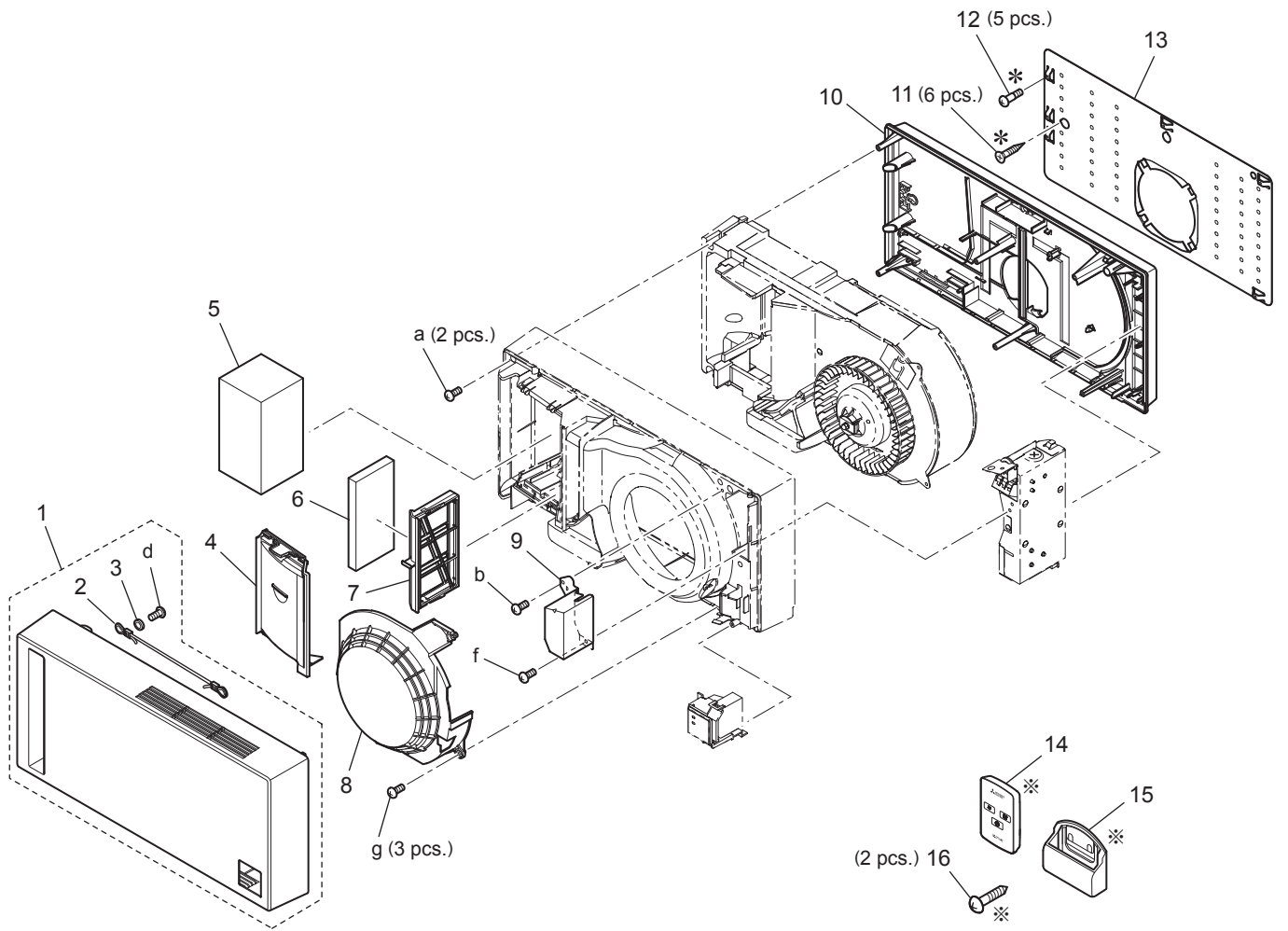
Symbol	Screw name
b	PTT screw 4x8
c	PTT screw 4x12
h	PTT screw 3x8
j	PP screw 3x20
k	PT screw 4x8
m	PTT screw 4x10

## VL-50ES2-E

No.	Name of part	Parts No.	Q'ty pcs/unit	Critical for safety	Remarks
31	Special nut (M8)	W00 000 069	2		
32	Tab washer	W00 000 079	2		
33	Centrifugal fan	W36 005 480	1	⚠	φ 170·Black
34	Special washer (8)	W00 000 148	2		φ 16 (Outer dia.)
35	Motor fix plate	W36 005 705	1		
36	Lead cover	W36 005 708	1		
37	Motor	W36 005 453	1	⚠	
38	Centrifugal fan	W36 005 481	1	⚠	φ 170·Natural
39	Damper	W36 005 715	1		
40	Fan casing	W36 005 831	1		
41	Shutter	W36 005 716	1		
42	Shutter	W36 005 725	1		
43	Drain pan	W36 005 726	1		
44	Fix piece	W36 005 345	2		
45	PCB cover	W36 005 709	1		
46	Circuit board	W36 005 727	1	⚠	VL-35-A·35-B
47	Insulator sheet	W36 005 390	1	⚠	
48	PT screw 4x6 BS	W00 000 008	2		
49	Spring washer (4)	W00 000 077	2		
50	Lead wire clip	W00 000 238	1		
51	Capacitor cover	W82 003 652	1		
52	Capacitor	W36 005 231	1	⚠	2.0 μF·250 VAC
53	Capacitor case	W82 003 653	1		
54	Cord bush	W00 000 225	1		
55	Spacer	W00 000 169	4		
56	PCB case	W36 005 728	1		
57	Capacitor assembly	W36 005 232	1	⚠	1.0 μF/2.0 μF
58	Bush	W00 000 276	1		
59	TB fix plate	W36 005 729	1		
60	Cord clip	W00 000 233	1		
61	Terminal block	W36 001 242	1	⚠	3P
62	Decoration sheet	W36 005 369	1		
63	LED case cover	W36 005 712	1		
64	LED case	W36 005 713	1		

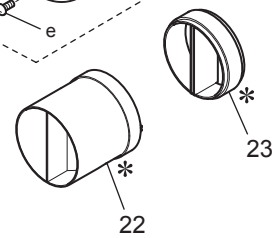
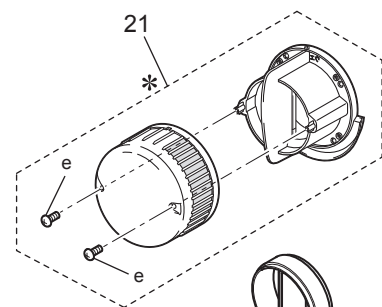
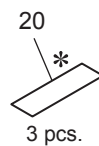
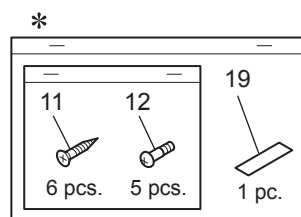
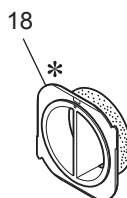
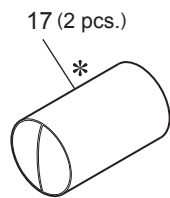


# VL-50SR2-E



<Standard screws>

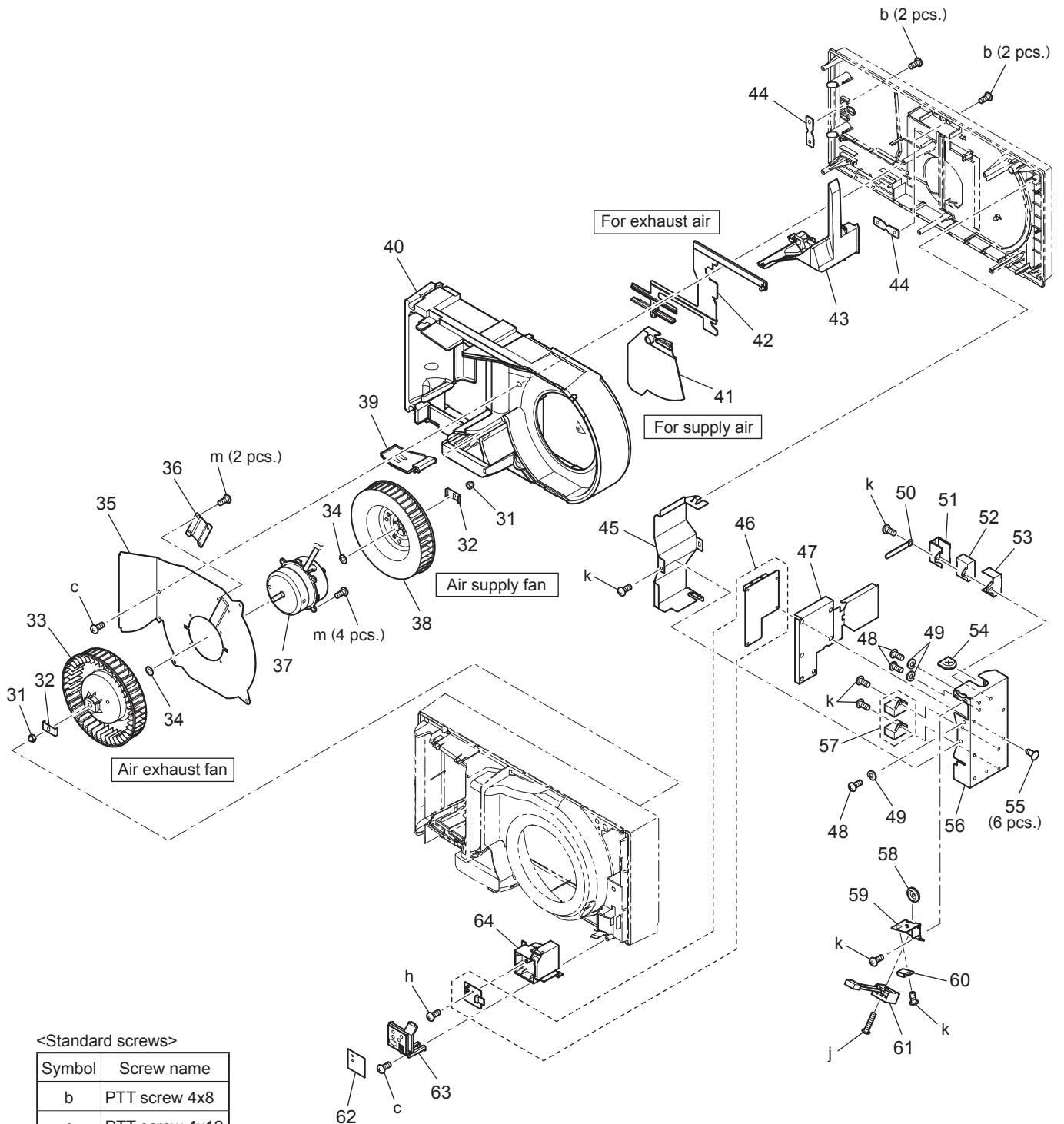
Symbol	Screw name
a	PTT screw 4x14
b	PTT screw 4x8
c	PTT screw 4x12
d	PTT screw 3x8
e	PTT screw 4x12
f	PP screw 3x8
g	PTT screw 4x25



\* shows accessory parts.

## VL-50SR2-E

No.	Name of part	Parts No.	Q'ty pcs/unit	Critical for safety	Remarks
1	Front panel	W36 005 719	1		
2	Wire	W36 005 343	1		
3	Special washer (3)	W00 000 167	1		
4	Filter	W36 005 717	1	⚠	Exhaust air
5	Lossnay core	W36 005 710	1	⚠	
6	Filter	W36 005 718	1	⚠	Supply air
7	Filter frame	W36 005 720	1		Supply air
8	Fan guard	W36 005 721	1		
9	PCB case cover	W36 005 714	1		
10	Casing	W36 005 832	1		
11	Special screw 3.5x32	W00 000 048	6		
12	Special screw 4x10.5	W00 000 206	5		
13	Mounting plate	W36 005 704	1		
14	Remote controller	W36 005 171	1	⚠	
15	Controller case	W36 000 572	1		
16	PRW screw 4.5x20	W00 000 030	2		
17	Pipe	W36 005 313	2		(Air supply/Exhaust)
18	Flange	W36 005 722	1		
19	Flange packing	W36 005 723	1		153X5mm
20	Aluminium tape	W36 005 389	3		450mm
21	Weather cover	W36 005 724	1		
22	Joint pipe	W36 005 314	1		
23	Joint pipe	W36 005 707	1		



## VL-50SR2-E

No.	Name of part	Parts No.	Q'ty pcs/unit	Critical for safety	Remarks
31	Special nut (M8)	W00 000 069	2		
32	Tab washer	W00 000 079	2		
33	Centrifugal fan	W36 005 480	1	⚠	φ 170·Black
34	Special washer (8)	W00 000 148	2		φ 16 (Outer dia.)
35	Motor fix plate	W36 005 705	1		
36	Lead cover	W36 005 708	1		
37	Motor	W36 005 453	1	⚠	
38	Centrifugal fan	W36 005 481	1	⚠	φ 170·Natural
39	Damper	W36 005 715	1		
40	Fan casing	W36 005 831	1		
41	Shutter	W36 005 716	1		
42	Shutter	W36 005 725	1		
43	Drain pan	W36 005 726	1		
44	Fix piece	W36 005 345	2		
45	PCB cover	W36 005 709	1		
46	Circuit board	W36 005 730	1	⚠	VL-36M·36S
47	Insulator sheet	W36 005 391	1	⚠	
48	PT screw 4x6 BS	W00 000 008	3		
49	Spring washer (4)	W00 000 077	3		
50	Lead wire clip	W00 000 238	1		
51	Capacitor cover	W82 003 652	1		
52	Capacitor	W36 005 231	1	⚠	2.0 μF·250 VAC
53	Capacitor case	W82 003 653	1		
54	Cord bush	W00 000 225	1		
55	Spacer	W00 000 169	6		
56	PCB case	W36 005 731	1		
57	Capacitor assembly	W36 005 233	1	⚠	1.0 μF/2.0 μF
58	Bush	W00 000 276	1		
59	TB fix plate	W36 005 729	1		
60	Cord clip	W00 000 233	1		
61	Terminal block	W36 005 234	1	⚠	3P·With leads
62	Decoration sheet	W36 005 370	1		
63	LED case cover	W36 005 712	1		
64	LED case	W36 005 713	1		