Confidential

ROBOTIC CLEANER
SERVICE MANUAL

CAUTION

BEFORE SERVICING THE UNIT, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

MODEL: VR6640**

MFL67646556_Rev00. 03252019

Table of Contents

Product Specifications

■ Main Unit

ITEM	LG Robot Cleaner
MODEL	VR664****
Battery (Fully Charging)	Li-PB, DC 16.8V
Power Consumption	15W(Normal) / 58W(Turbo)
Charging Time	3 hours
Use Time	Approx. 100 minutes (based on general wooden floor)
Traveling Velocity	0.35 m/s
Cleaning Mode	zigzag cleaning / Cell by Cell Cleaning / My Space Cleaning / Spot Cleaning
Weight	3kg
External Dimensions	340mm x 340mm x 89mm
Accessary	Home station / remote controller / Filter / Cleaning Brush / Brush
Main Function	Turbo Mode / Learning Mode / Obstacle Sensing / Anti-Plunge function / Scheduled Cleaning / Error Displaying / Navigation / Auto/Manual Recharging / Corner Clean / Voice Messaging / Map Drawing / Spot Cleaning / Repeat Cleaning / My Space Cleaning / Zigzag Cleaning

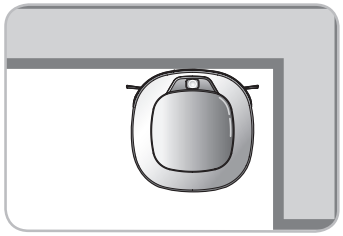
■ Home Station(Adapter)

ITEM	Home Station
Model	VR650
Rating	230 V, 50 Hz
Power Consumption	23W
Output Voltage/Current	DC 17.1V / 1.7 A

■ Remote Controller

ITEM	AKB73616019(Option)
Battery	DC 3V(AAA, 2ea)
Type	Infra Red(38kHz)
Operating Range	5m
Size(WxLxH)	45 X 22 X 115 mm

Features

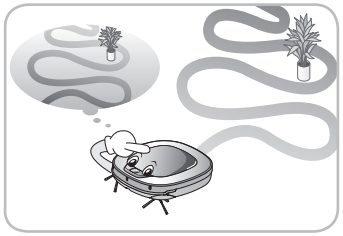


Corner Master

By having adopted a brand new concept design that is appropriate for walls, the Robot Cleaner's cleaning performance is incredibly efficient.

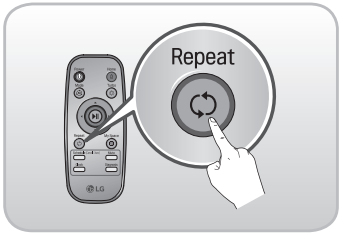
My Space Mode

By commanding it to clean a particular area, the Robot Cleaner quickly cleans that desired area.



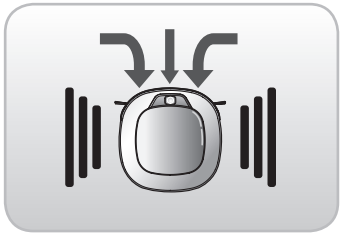
Learning Mode

The Robot Cleaner is capable of memorizing the cleaning environment via its Smart Operation feature for smarter cleaning.



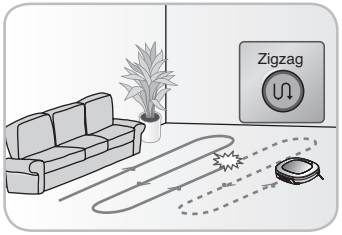
Repeat Cleaning

The Robot Cleaner will continuously clean until the battery runs out.



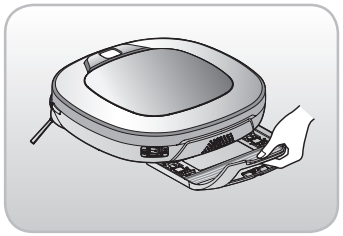
Turbo Mode

In the Turbo mode, the Robot Cleaner operates the suction motor and the brushes at a greater speed giving cleaner results.
When selected, the "Turbo" mode is automatically activated on carpets, which enables the Robot Cleaner to run more efficiently.



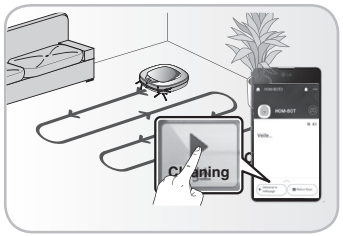
Location Search Function

If the Robot Cleaner is moved from a spot while operating, the device will automatically search for the previous location and return to the spot from where it was interrupted.



Drawer Mop Plate (Option)

The "Drawer mop plate" makes it much easier for users to fit and remove the mop without having to turn over the device.

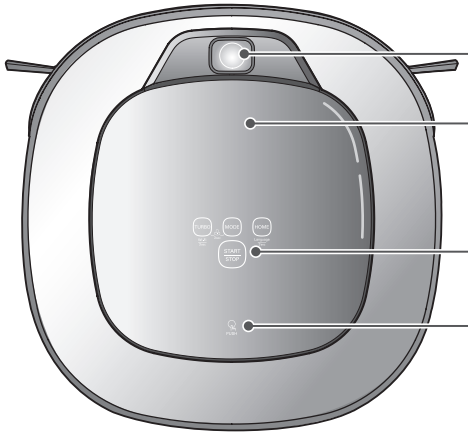


Smartphone application description

You can control the Robot Cleaner from your smartphone.

Structure and Name of Each Part – Robot Cleaner

Plan view



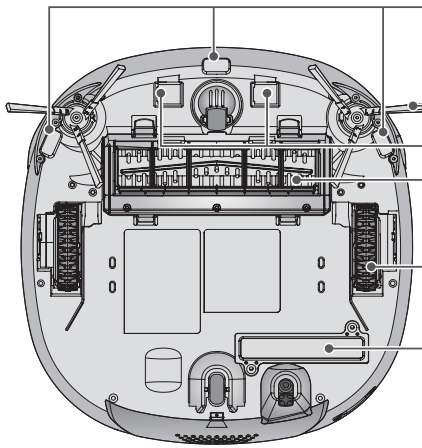
Upper camera sensor

Dust bin cover

Display & function buttons

Dust bin compartment release button

Bottom view



Cliff detection sensors

Side brush

Charging terminals

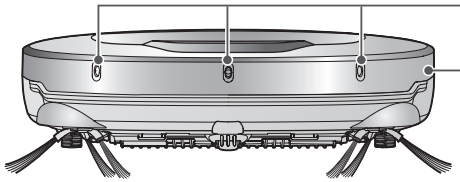
Brush

Wheel

Battery housing

Сенсор нижней камеры

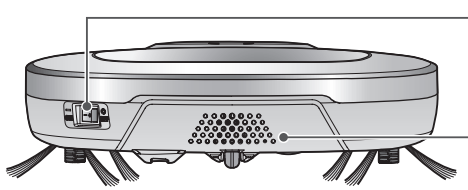
Front view



Ultrasonic sensors

Obstacle detecting sensor window
Detecting sensors of home station & Receiving sensors of remote controller

Rear view



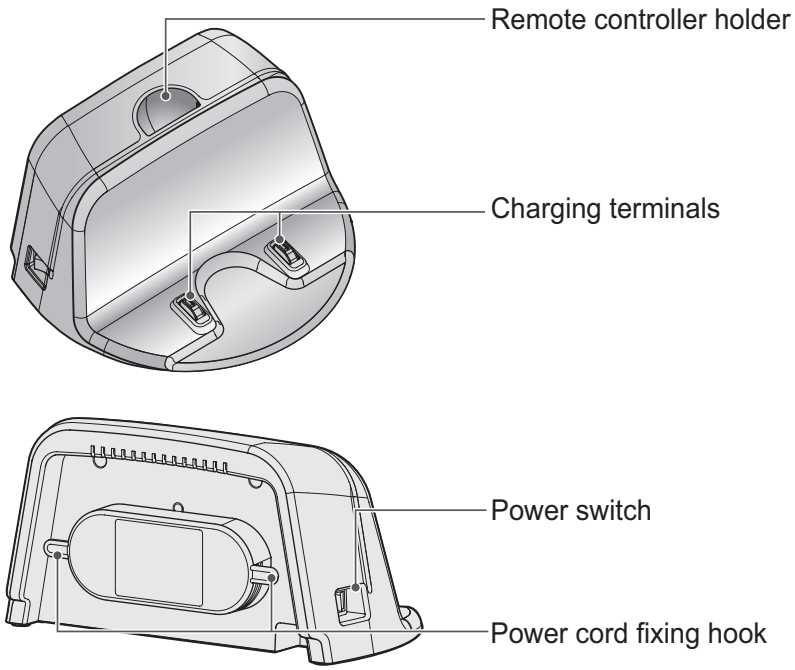
Main Power switch

Ventilation port

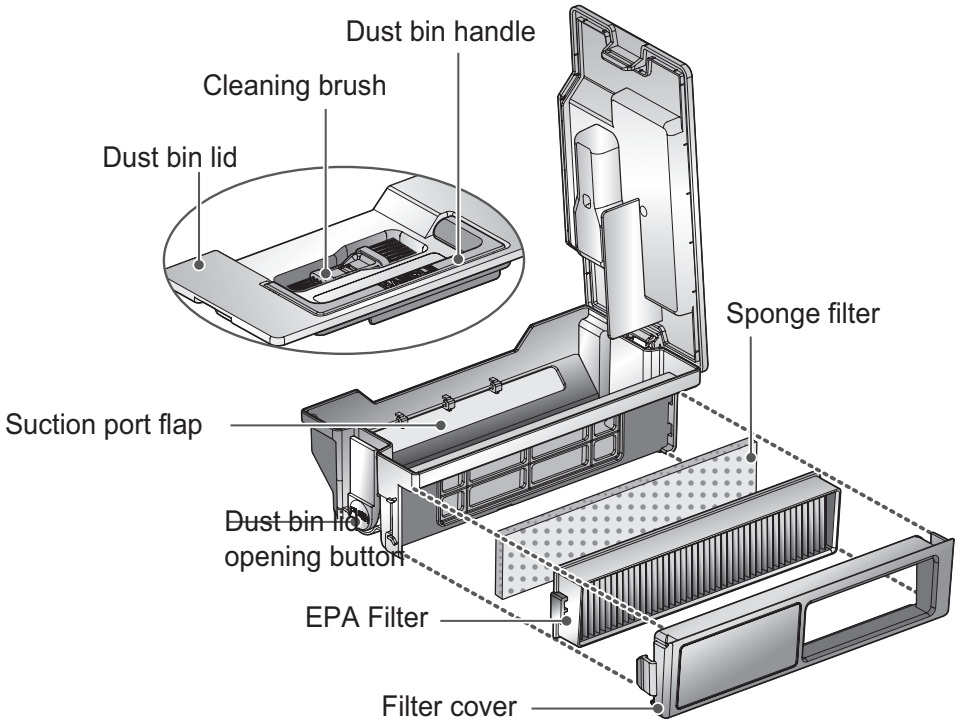
► **Figures can be different from actual objects.**

Part Description – Home station / Dust bin

Home station



Dust bin



► **Figures can be different from actual objects.**

correctly to prevent any unexpected risk of injury or damage.

Basic safety precautions

After reading this manual, please keep it in an easily accessible location.

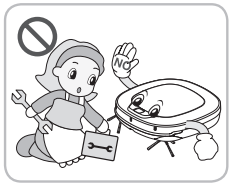
⚠	This is the safety alert symbol. This symbol alerts you to potential hazards that can result in property damage and/or serious bodily harm or death.
⚠ **WARNING**	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠ WARNING

1. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
2. Children should be supervised to ensure that they do not play with the appliance.
3. If the supply cord is damaged, it must be replaced by LG Electronics Service Agent in order to avoid a hazard
4. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance must not be made by children without supervision.

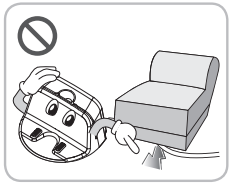
Cautions and Methods during the Usage

⚠ WARNING



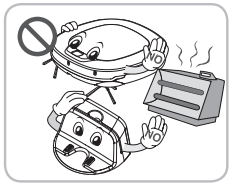
For your safety, do not remove the battery from the Robot Cleaner. If you need to replace the battery of the Robot Cleaner, take it to the nearest authorized LG Electronics service center or dealer for assistance.

Failure to follow this warning can cause fire or product failure.



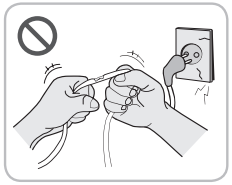
Make sure the power cord of the home station is not crushed under a heavy object or damaged by contact with sharp objects.

Failure to follow this warning can cause electric shock, fire or product failure. If the power cord is broken, do not plug it in. Take the product to an LG Electronics Authorised service repairer.



Do not place the home station and the Robot Cleaner near a heating device.

Doing so can cause product deformation, fire, or product failure.

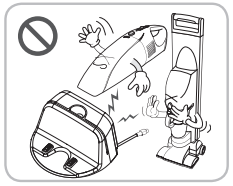


Do not force the power plug to bend. Do not use the power plug when it has been damaged or loosened.

Doing so can cause fire or product failure.

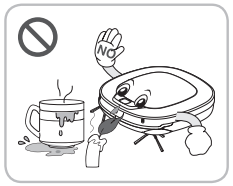
Do not touch the power plug with wet hands.

Doing so can cause electric shock.



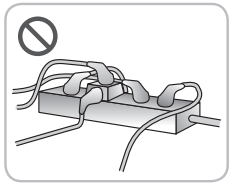
Never use the Robot Cleaner with a battery and/or home station from any other product than the Robot Cleaner.

Doing so can cause fire or product failure.



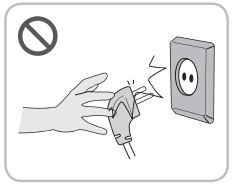
Do not use the Robot Cleaner when candles or fragile objects are placed on the floor.

Doing so can cause fire or product failure.



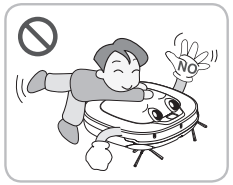
Always use a dedicated power outlet with a 10 amp rating.

If multiple appliances are connected to an outlet simultaneously, they can generate enough heat to cause a fire.



When pulling out the home station power plug, always pull it out by grabbing the plug, not the cord. When pulling out the power plug, do not to touch the prongs with your fingers.

Doing so can cause an electric shock.

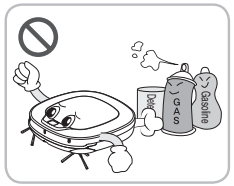


Do not allow children or pets to play with or rest upon the Robot Cleaner at any time. Do not use the Robot Cleaner while an object is hanging from it.

Doing so can cause injury or product damage.

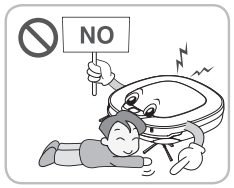
Cautions and Methods during the Usage

⚠ WARNING



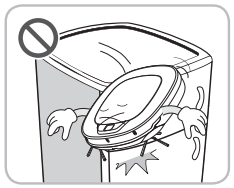
Do not spray or use inflammable materials, surfactants, or drinking water in the vicinity of the Robot Cleaner.

Doing so can cause fire or product failure.
* Inflammable materials: gasoline, thinner, etc.
* Surfactant: detergent, articles for bath, etc.



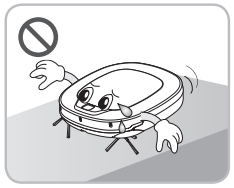
Do not insert any part of the body, such as a hand or foot, below the brush or wheels of the Robot Cleaner while in use.

Doing so can cause injury or product damage.



Do not operate the Robot Cleaner on narrow and high furniture such as a wardrobe, refrigerator, desk, table, etc.

Doing so can cause injury, product failure or damage which is not covered by the warranty.



Do not activate the device on a floor that has more than a 10 degree incline.

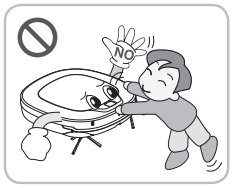
The device may not work properly.

Turn the power supply off immediately if any abnormal sound, odor, or smoke is generated from the Robot Cleaner by removing it from the home station and turning off the main switch on the rear side of the unit.

Failure to do so can cause fire or product failure.

Do not operate the Robot Cleaner in a room where a child is sleeping.

Doing so can cause injury or product damage.



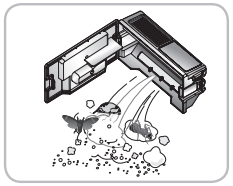
Do not leave Children or pets near the Robot Cleaner unsupervised.

Doing so can cause injury or product damage.

⚠ **This product is intended for indoor domestic home use and should not be used in mobile applications. it should not be used in commercial applications such as workshops or garages or around indoor swimming pools, etc.**

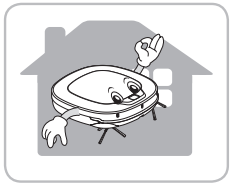
Cautions and Methods during the Usage

⚠ CAUTION



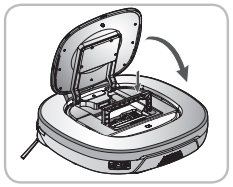
Frequently empty the dust bin and maintain its cleanliness.

The dust collected in the dust bin can trigger allergies and may contain harmful insects. it should be cleaned after each use.



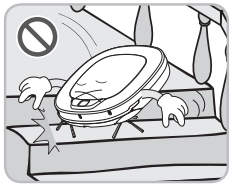
Use the Robot Cleaner indoors only.

Using it outdoors can cause product failure and irreparable damage to the unit.



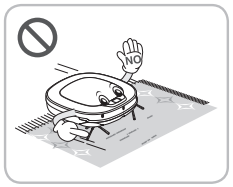
Close the cover of the dust bin on the main unit before starting cleaning.

If the cover is not closed, it can cause injury or product damage.



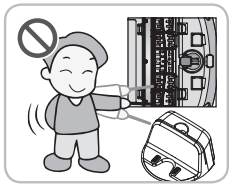
DO NOT use the Robot Cleaner around a banister, staircase or any other dangerous place.

Doing so could cause injury or damage to the unit.



In rare cases, the Robot Cleaner's brush can damage carpet. If this happens, immediately stop the cleaning operation.

When a carpet has long tassels, the tassels can be damaged.

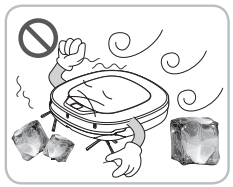


Do not let the main unit and charging terminal of the home station come into contact with metallic objects.

Doing so can cause product failure.

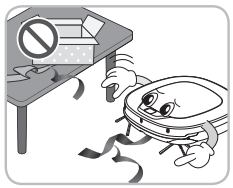
Do not drop the Robot Cleaner or subject it to strong impacts.

Doing so can cause injury or product failure not covered by the warranty.



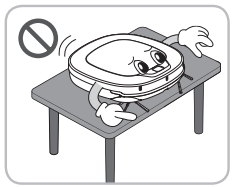
Do not expose the Robot Cleaner to cold temperatures (less than -5 ˚C) for a long period of time.

Doing so can cause product failure.



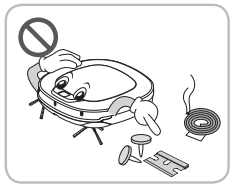
Remove any cables or string from the floor before starting.

Cable or string can get tangled in the wheels of Robot Cleaner and cause product failure or the cord of an appliance can be disconnected.



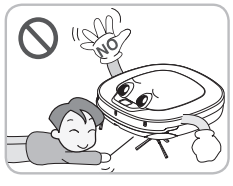
Make sure the Robot Cleaner is not put on a table or desk, with the power ON.

It may result in an injury or damage to the product.



Do not allow the Robot Cleaner to sweep up liquids, blades, thumb tacks, sharp objects or ashes, hot or cold. etc.

These items can cause product failure or damage.



Do not put sharp objects into the opening of the Robot Cleaner's ultrasonic sensors.

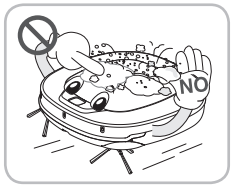
Doing so can cause product failure.

Cautions and Methods during the Usage

⚠ CAUTION

Do not put water, detergent, etc. into or onto the Robot Cleaner.

Doing so can cause product failure. Do not put any water or detergent on the Robot Cleaner. If liquids get inside of the Robot Cleaner, turn off the power supply and contact an LG Electronics sales agent or customer care center.

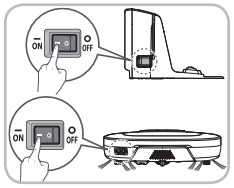


Do not use the Robot Cleaner when the dust bin is completely full.

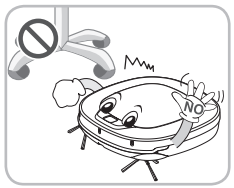
Doing so can cause product failure.

If the floor is wet or has wet spots, wipe them up before using the Robot Cleaner. Do not use the Robot Cleaner on a wet surface.

Doing so can cause product failure.

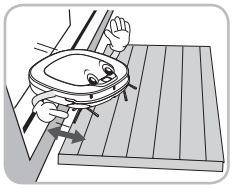


To save energy when the Robot Cleaner is not in use for longer periods, turn off the power switch, and turn on the power switch again just prior to using the Robot cleaner again.



When the robot cleaner is operating, it may hit the chair leg, desk leg, table leg or other narrow pieces of furniture.

For quicker and better cleaning, place the dining chairs on top of the dining table.



NOTE: Very low thresholds will allow the Robot cleaner to go over them and perhaps into an undesirable location. Make sure that all the doors of the rooms that are not to be cleaned are closed. Oddly shaped and sized thresholds can cause the cleaner to become stuck. This is not a malfunction.

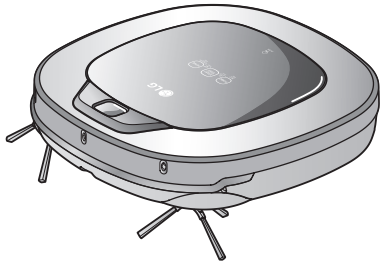
Tip

Check the following items before use:

- Empty the dust bin after each operation or prior to it filling up.
- Remove any cables or long strings from the floor.
- Remove any moisture from the floor before cleaning.
- Close the cover of the dust bin before cleaning.
- Remove fragile or unnecessary objects from the room to be cleaned. For example, remove expensive ceramics and valuables from the floor.
- Confirm whether the battery has sufficient power, and if it is low, recharge it.
- Close the doors of any room that you do not want the Robot Cleaner to enter. During cleaning, the Robot Cleaner may enter another room and continue cleaning.
- Do not use this product in the room where a child is sleeping alone. The child can be hurt or woken.
- Remove towels, foot towel or any other thin cloth from the floor as they can get caught by the brush.
- Before starting the device, it's better to remove carpets that are thicker than 20 mm as they may cause it to malfunction.
- Please close any balcony doors as the wheels may get stuck while cleaning.
- Please install the mop board since climbing low heights, such as bottom of a standing electric fan, may cause damage to the robot cleaner.
- Connecting to a wireless router without proper security setup may cause security issues.
- If security is set up internally for your organization, it may affect connection therein.
- All batteries/accumulators should be disposed separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
- For more detailed information about disposal of Your old batteries/accumulators, please contact Your city office, waste disposal service or the shop where You purchased the product.
- All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
- For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.
- In the case of a floor with high brightness contrast such as marble, the recognition rate of the bottom sensor may be lower, and the robot cleaner may operate abnormally

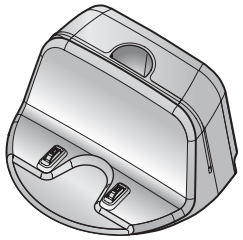
Cautions and Methods during the Usage

INCLUDED WITH PRODUCT

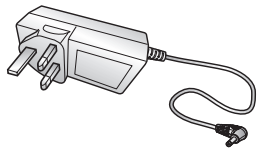


Robot Cleaner

Remote controller

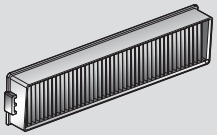


Home station

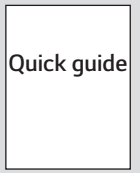


Adapter

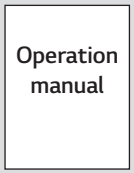
► Figures can be different from actual objects.



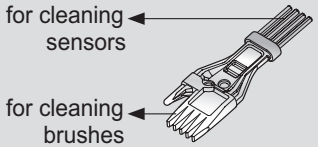
Dust bin filter (spare)
(option)



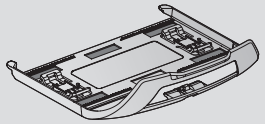
Quick guide



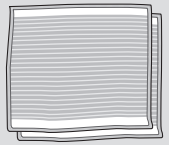
Operation manual



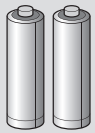
Cleaning Tool
(It's on the dust bin cover)



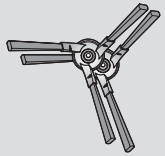
Mop plate
(some models only)



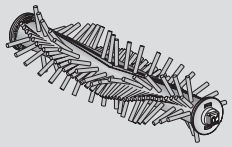
Ultra microfiber mop
(2 pieces) (some models only)



Batteries for remote controller
(2 units of AAA size)



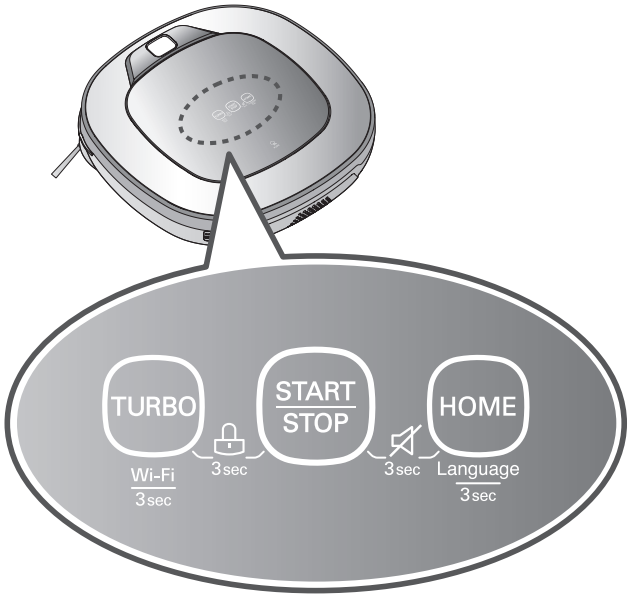
Side brush (2 pieces)
(some models only)



Pet Brush
(some models only)

Cautions and Methods during the Usage

BUTTON FUNCTIONS – ROBOT CLEANER



TURBO	• If the button is pressed, ‘Turbo Mode’ will be set with a voice confirmation. • If the button is pressed whilst in ‘Turbo Mode’, it will be canceled.
START/STOP	• Used to turn the power on from Standby, start or stop cleaning. • If the button is pressed whilst the unit is powered ON, it will start cleaning. • If button is pressed during the cleaning, it will stop the cleaning. • If the button is pressed for about 2 sec. whilst the power is ON, the power will be returned to Standby. • If the button is pressed in 'Smart Diagnosis' mode, it will end the diagnosis.
HOME	• Used to return the Robot Cleaner back to the home station for charging. • If cleaning is finished or the battery is low, the Robot Cleaner will return to the Home Station by itself to recharge its battery.
BUTTON(KEY) LOCK ON/OFF	• Pressing the ‘TURBO' and 'START/STOP' button for 3 seconds will activate or deactivate the Lock function. • If 'Lock' is ON, a voice announcement "Key lock has already been set" will be heard each time a button is pressed.
Voice Alert On/Off	• Press and hold both the 'START/STOP' and HOME button on the main unit for 3 sec. to turn ON/OFF the Voice Alert. • Voice Alert On/Off is not displayed as the product icon.
Language	• Pressing the ‘HOME’ button for 3 seconds will change the language for the voice message. • You cannot use this function with the button on the remote controller.
Product registration (Wi-Fi)	• Press and hold down the Turbo button for 3 seconds to activate the registration mode with a voice message. • This mode is for registering the product to Robot Cleaner over Wi-Fi.

BUTTON FUNCTIONS – REMOTE CONTROLLER

Power
Pressing this button will turn the power on from Standby or the power will be returned to Standby while the power is ON.

Mode
Changes the Cleaning Mode of the Robot Cleaner to ZigZag Mode.

Directional button
This button enables Manual Operation and selection of an area in 'My Space cleaning' mode.

Repeat
This button allows activating or deactivating 'Repeat Cleaning' mode.

Home
Used to recharge the Robot Cleaner by making it return to the Home Station.

Turbo
Used to activate or deactivate 'Turbo' mode.

Start/Stop button
Pressing the button will Start or Stop the Robot Cleaner.

My Space
Used to put the Robot Cleaner in 'My Space clean' mode.

Mute
Used to activate or deactivate 'Mute' mode.

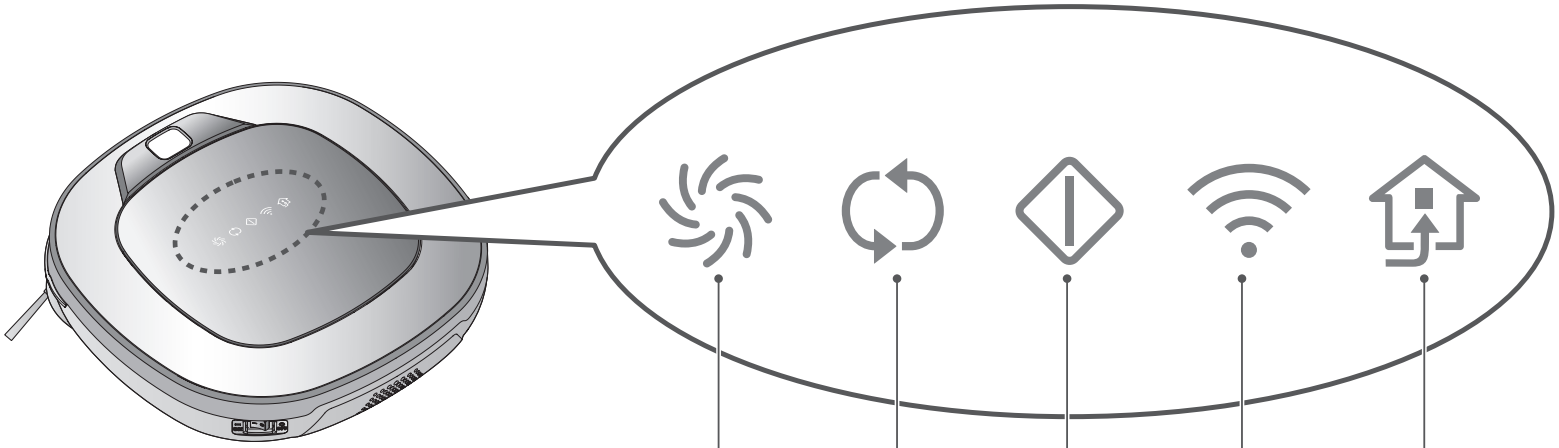
Diagnosis
Used to run Smart Diagnosis.
Available only when Robot Cleaner is recharging.

Tip

- With the machine's power OFF, the Remote Controller will not work.
- To turn the power ON/OFF, use the 'START/STOP' button on the upper section of the Robot Cleaner or 'Power' button on the Remote Controller.
- The 'Mode' and 'My Space' button can only be used after stopping the Robot Cleaner or whilst it is charging on the Home station.

Cautions and Methods during the Usage

DISPLAY STATUS INFORMATION



Turbo Mode icon
This indicates the settings for Turbo Mode.

Repeat Mode icon
This indicates the settings for Repeat Mode.

Operational Status icon
This indicates the operational status of Hombot.

Remote connection Icon
Displayed when the smartphone connect to Robot Cleaner.

Homing icon
This indicates the conditions of Homing and Charging.

Cautions and Methods during the Usage

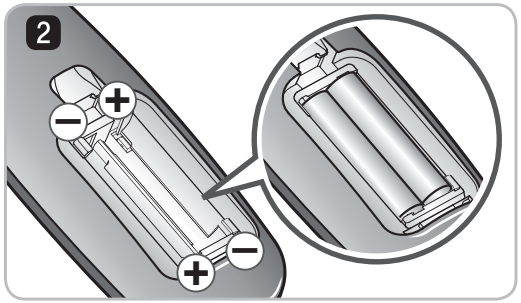
BEFORE YOU START

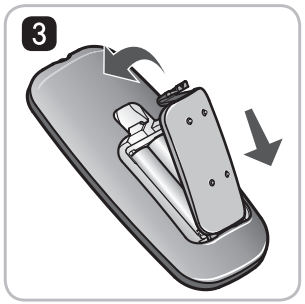
Check these items before cleaning

- Do not use this device in a room where a child is left alone. The child could be injured.
- Remove fragile or unnecessary objects from the room to be cleaned.
  Especially, remove expensive ceramics and valuables from the floor.
- Close the cover of the dust bin compartment before cleaning.
- Remove any moisture that might be on the floor.
- Remove cables, strips, towels, mats etc. from the floor so they will not get tangled in the brushes.
- Confirm whether the battery charge is sufficient, and if it is low, recharge it.
- Empty the dust bin before or after each clean, or before it becomes full.
- Close the doors of any room that you do not want the Robot Cleaner to enter.
  During cleaning, the Robot Cleaner may enter another room and continue cleaning.
- When the mop is attached, Robot Cleaner will not be able to go over thresholds of 5 mm or higher.
  If you are not planning to use the mop for cleaning, remove the mop before using Robot Cleaner.
- Before starting the device, it's better to remove carpets that are thicker than 20 mm as they may cause it to malfunction.
- Please close any balcony doors as the wheels may get stuck while cleaning.
- In the case of a floor with high brightness contrast such as marble, the recognition rate of the bottom sensor may be lower, and the robot cleaner may operate abnormally.
- Do not attach an object to the sensor of the product (may hamper the driving of the product).

Loading the remote controller battery

1. Open the battery cover by lifting the rear hook of the remote controller.
2. Insert two AAA batteries, checking for +, - nodes while loading.
3. Close the battery cover completely so that the batteries will not fall out.





Precautions while using the remote control

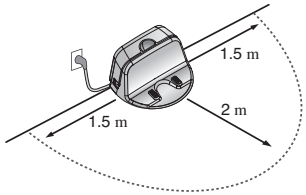
- Only press one button at a time.
- Do not drop or subject it to any impact.
- Do not store it near devices that give off heat, fire or hot air.
- Certain fluorescent lamps, such as the three band radiation lamp, can interfere with the activation of the remote control.
  Therefore, use it as far away as possible from such lamps.
- If the remote control is far from the Robot Cleaner when activated, it may fail to operate properly.
  Use the remote within 3 m of the Robot Cleaner if possible.

Cautions and Methods during the Usage

OVERVIEW

1 Install the home station. (p15)

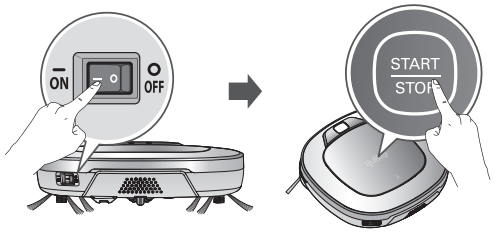
Insert the power cord plug into an outlet and locate the station against a wall.
If power is not supplied to the home station, the Robot Cleaner will not charge.



2 Turn on the power supply of the Robot Cleaner. (p16)

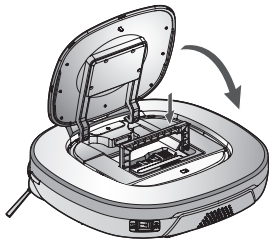
Turn ON the power switch on the rear-left of Robot Cleaner, and press the 'START/STOP' button on the top or press the 'Power' button on the Remote controller.

※ If the power supply is not turned on, refer to page 16.



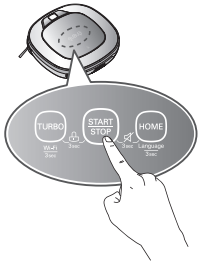
3 Check the dust bin.

Check the cleanness of the dust bin before starting cleaning and close the dust bin compartment cover on the main unit.



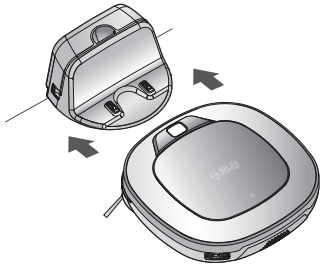
4 Start cleaning. (p17)

Press the START/STOP button (or ' ⏯ ' button on the Remote Controller) once again while the Robot Cleaner is turned on. You will hear an announcement of the cleaning mode and cleaning will begin once the Robot Cleaner has reversed and turned around.



5 Automatic charge. (p18)

The Robot Cleaner will self-diagnose and automatically return to the home station to recharge before the complete discharge of the battery.
It takes approximately three hours to charge the battery.



6 Use the cleaning mode and auxiliary functions. (p19~22)

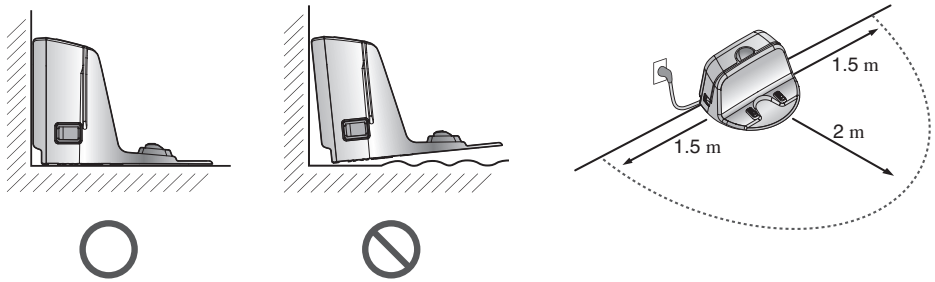
Use the buttons on Robot cleaner and Remote Controller to use each cleaning mode and supporting features For Cleaning Mode, you can choose among ZigZag, My Space, and Repeat; for secondary features, Manual and Microfibre Mop.

< Warning > When the Robot Cleaner is operated with the dust bin compartment lid left open, it can cause an injury or serious damage to the product.

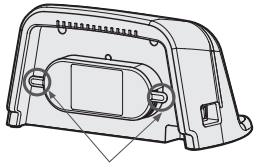
Cautions and Methods during the Usage

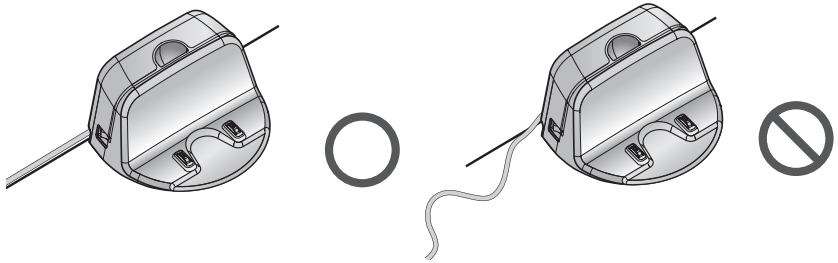
How to Install the Home Station

1. Position the home station against a wall on hard level flooring to prevent sliding during docking.
   Remove objects within 1.5 m to the right and left side and within 2 m to the front.

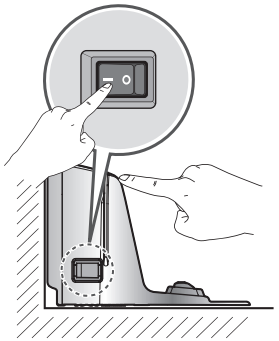


2. Plug the power cord into an outlet.
   Wrap the remaining power cord around the fixed hook on the back side of the home station or along the wall surface so that the travel path of the Robot Cleaner will not be obstructed.

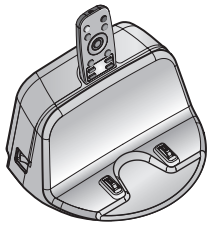

Fixing hook of power cord



3. Fix the home station against the wall so that it does not move.
   Then turn on the power switch.



4. When the remote controller is not used, store it in the remote controller holder on the home station.



Tip

- Always keep the home station plugged in when in use. If the home station is not plugged in, the Robot Cleaner will not return to the station to charge automatically.

< Warning > Do not operate the Robot Cleaner if the Home Station has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped. To avoid electrical hazards, the cord must be replaced by LG Electronics, Inc. or a qualified service person.

How to Use Main Body Operation Buttons and Remote Controller

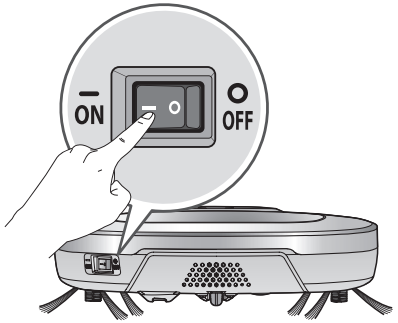
Turning on the main power supply

Make sure the Power Switch is on at the rear-left of the Robot Cleaner.

If the power is OFF, turn the switch ON.

※ When turning on the power switch, do not press or touch any button located on the upper section of the Robot Cleaner. Button operations can be delayed.

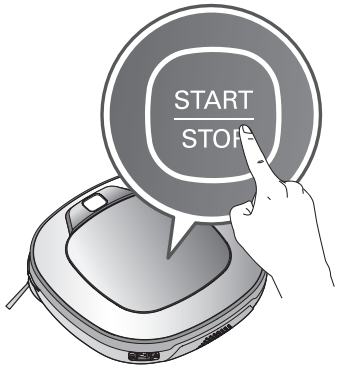
※ Turn off the power switch if the Robot Cleaner is not used for a long period of time in order to protect the battery. The Robotic Cleaner cannot charge if the main switch is in the "OFF" position.



Turning on from Stand By power.

With the Standby power of the Robot Cleaner OFF, press 'START/STOP' button for 1 second until a "Ting" sound is heard or press 'Power' button on the remote controller. In about 10 seconds, the power will be on and a melody will sound.

※ If 10 minutes elapse without the Robot Cleaner having being given an active command after being turned on, the power will automatically return to Standby again.



Turning off the power supply

Press and hold the START/STOP button for two seconds or Power button on the remote controller while the Robot Cleaner is turned on. A melody will sound when the power is turned off.

Tip

- If the power cannot be turned on, do the following.
  - Turn the main power switch OFF, wait 5 seconds then ON again.
  - Press the ‘START/STOP’ button or press 'Power' button on the remote controller after the main power switch has been turned on again.
  - If the power is not turned on or if there is no display but only the “Ting” sound, put the Robot Cleaner manually on to the home station as the battery may be flat.

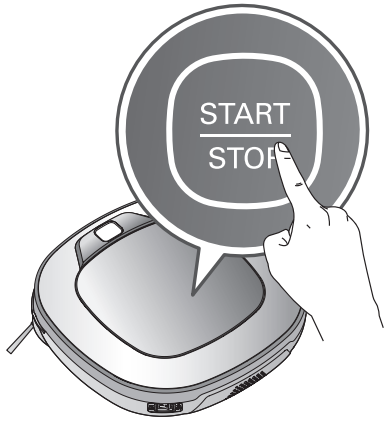
How to Use Main Body Operation Buttons and Remote Controller

Using the buttons on the Robot Cleaner

After the Robot Cleaner main power switch is turned on, press the START/STOP button to begin cleaning. A melody will sound and cleaning will begin.

Press the START/STOP button during the cleaning cycle to stop cleaning.

※ When the 'START/STOP' button is pressed while the power supply of the Robot Cleaner is in Standby, the power will be turned on. Press the 'START/ STOP' button one more time to start cleaning.



Using the remote controller

After the Robot Cleaner is turned on press the ' ⏯ ' button on the remote controller. A melody will sound and cleaning will begin. Press the ' ⏯ 'button during the cleaning cycle to stop cleaning.

※ When the power is off, press the 'Power' button on the remote controller to turn the power on.

※ During cleaning, collisions can happen when the sensor cannot detect objects because of their shape (Thin chairs and table legs, furniture corner). When this happens, the internal impact detecting sensor will react by using a backward motion.

※ If the Robot Cleaner is set to start cleaning at a location away from the home station, put the Robot Cleaner on a flat floor in order to prevent a malfunction of the obstacle detecting sensor. In addition, start cleaning from a location where there are no obstacles . For example, curtains or walls must be 30cm from the Robot Cleaner.

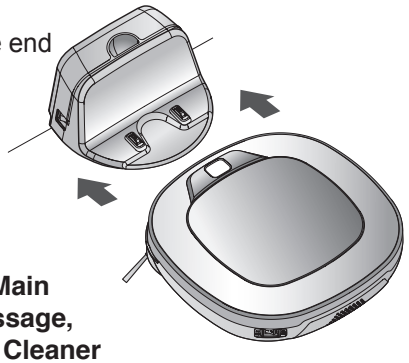
Tip

For best results:

- Briefly scan the area to be cleaned for big and small objects that will cause difficulty for the Robot Cleaner.
- If cleaning is started when the Robot Cleaner is at the home station, the device can rapidly be returned to the home station as the current home position has been accurately read.
- When the mop plate is installed, to prevent a 2nd contamination from the contaminated mop, it will not go over door sills of 5 mm or higher.

How to Use Main Body Operation Buttons and Remote Controller

Automatic charging



The Robot Cleaner returns to the home station at the end of a cleaning cycle or when its battery is running low.

※ If 10 minutes elapse without the Robot Cleaner moving or the battery is too low, the power will be automatically turned OFF.

※ **Do NOT turn OFF the Main Power Switch as the battery will not be recharged.**
If the machine is returned manually with the Main Power Switch OFF, it announces an error message, "Main power switch on the back of the Robot Cleaner is turned off. Please turn the switch on."

※ In the event that the unit returns to the Home Station due to a low battery during the cleaning, cleaning will be started, after recharging, from the nearest place of the area which has not been cleaned before. (Page 19)

※ If Robot Cleaner is unable to dock to the home station on its first attempt, it will try again until it docks successfully.

※ When Robot Cleaner has completed all areas that it can clean, it will return to the home station even when the battery level is not low.

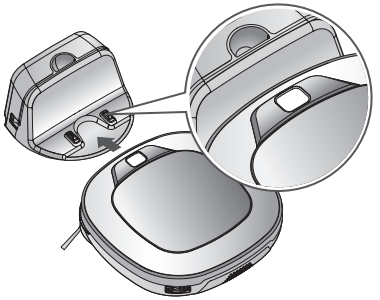
Manual charging

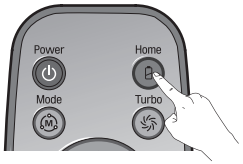
You can manually charge the battery prior to using the Robot Cleaner for the first time or to charge the battery during cleaning.

Method 1. Attach the Robot Cleaner to the home station by aligning to the front side of the home station. A melody sound will be generated along with an audio message to start charging.

※ **If a voice message, "Main power switch on the back of the Robot Cleaner is turned off. Please turn the switch on." is announced repeatedly, then turn on the Main Power Switch.**

Method 2. When the 'HOME' button of the remote control or the Robot Cleaner is pressed, charging will be prompted by automatically generating a searching signal and returning the Robot Cleaner to the home station.





※ **If the Robot Cleaner did not start cleaning from the home station or if the Robot Cleaner is manually charged by pressing the Home button, it may take slightly longer to find the home station.**

※ If the Robot Cleaner is within 10 cm of the front of the charging terminal while the power is turned on from Standby, it will automatically be returned to the home station and charging will begin.

Tip

Take the following precautions when using the home station:

- If foreign material is caught on the charging terminal, charging may not be activated. Wipe the terminal from time to time with a dry cloth after the power plug is disconnected.(p46)
- To prevent electric shock or damage to the home station, do not touch the charging terminal with any metallic objects.
- To avoid fire or electric shock, never disassemble or modify the home station.
- Do not to place the Robot cleaner, the home station or power plug near a heating source.

How to Use Main Body Operation Buttons and Remote Controller

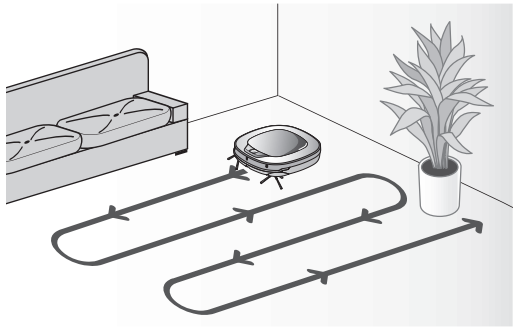
Zigzag Cleaning

In ‘Zigzag’ mode, Robot Cleaner repeats a zigzag operation to clean each and every spot in the cleaning area.

If you need to quickly clean an area choose ‘Zigzag’ mode.

Press ‘Mode’ button on Remote Controller or main unit to select ‘Zigzag’ mode and press ' ⏯ ' button.

※ **Factory release default setting is 'Zigzag'.**

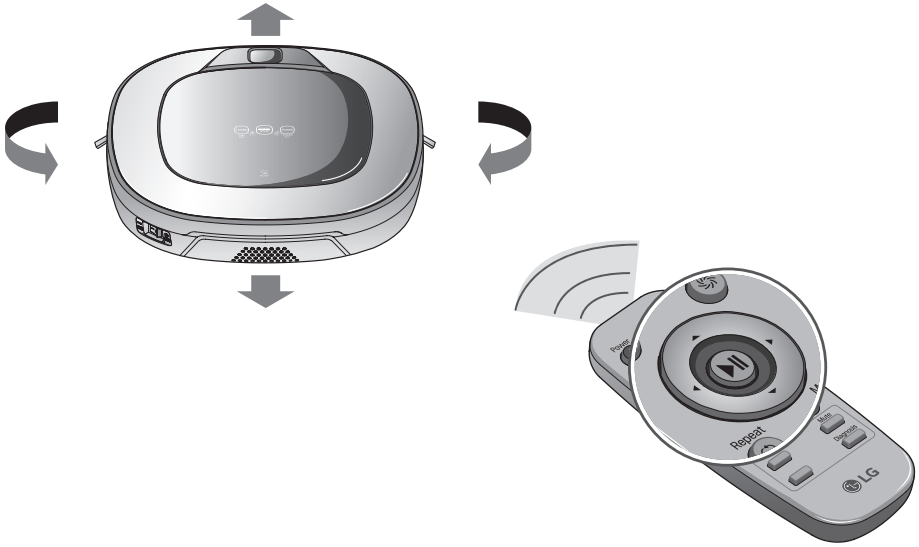


Manual Cleaning

By pressing a direction key on the Remote Controller, you can move the Robot Cleaner manually.

Robot Cleaner will clean the area, by pressing the forward/backward/left/right buttons accordingly on the keypad of the remote control.

While in 'Manual' mode, the robot cleaner will run into obstacles placed behind it if the backward key on the remote is pressed or held down.

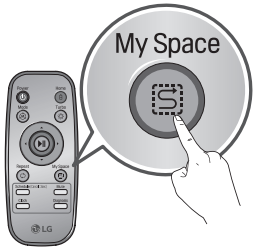


How to Use Main Body Operation Buttons and Remote Controller

My Space Cleaning

Pressing 'My Space' on the Remote Controller will set the My Space cleaning mode with a voice message.

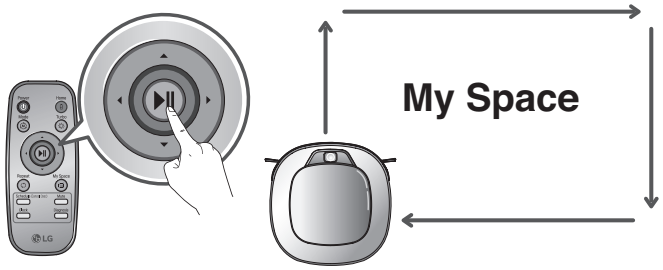
For cleaning of particular spaces, select this mode.



The 1st stage:

Use the Remote Controller to manually set the parameters of each cleaning block.

※ This cleaning mode will be accepted when the distance of the start and end position is less than 1 m in area.

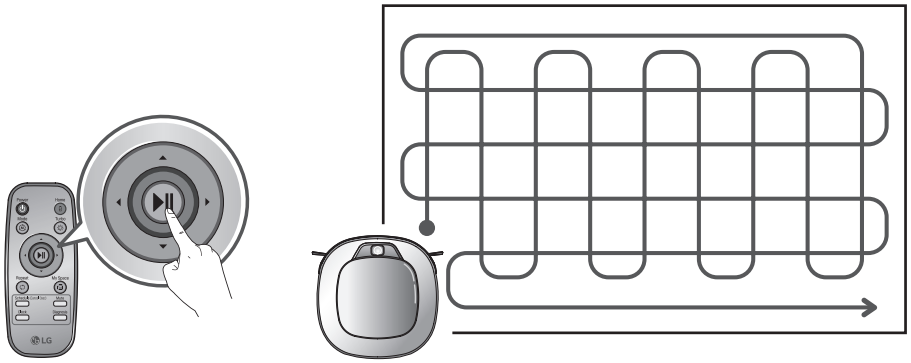


The 2nd stage:

Pressing the '⏯' button will then make the Robot Cleaner clean the manually outlined area by itself.

※ Upon failure to correctly outline a zone, a voice will announce, which says "Area does not meet the specified conditions. Please continue to make specified area for cleaning process."
Use the Remote Controller to assign a zone, again.

※ Upon completion of cleaning for all selected areas, the Robot Cleaner will resume the cleaning mode (Zigzag or Cell by Cell) which it was last set to.



Tip

- While recharging, you cannot activate ‘My Space’ mode.
- To change the cleaning mode while the Robot Cleaner is in operation, press '⏯'button first then select a cleaning mode. The cleaning will then start from the begining..

How to Use Main Body Operation Buttons and Remote Controller

Turbo Mode

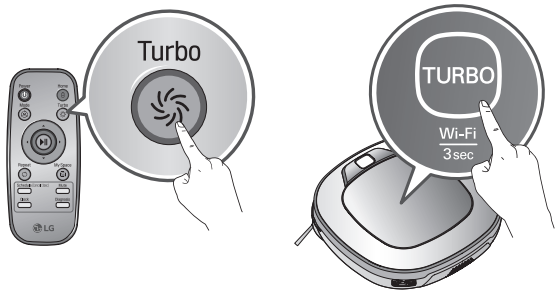
Pressing the 'Turbo' button on the Remote Controller or main unit will activate 'Turbo' mode, with a voice message.

While in 'Turbo' mode, pressing the same button will cancel 'Turbo' mode, with a voice message.

In 'Turbo' mode, Robot Cleaner runs more intensely for a powerful clean. Turbo mode will reduce the battery duration.

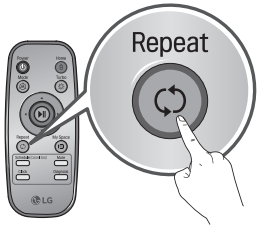
※ <Turbo Mode (Floor Master Function)>

'Turbo mode' will automatically operate when the Robot Cleaner cleans carpets.



Repeat Mode

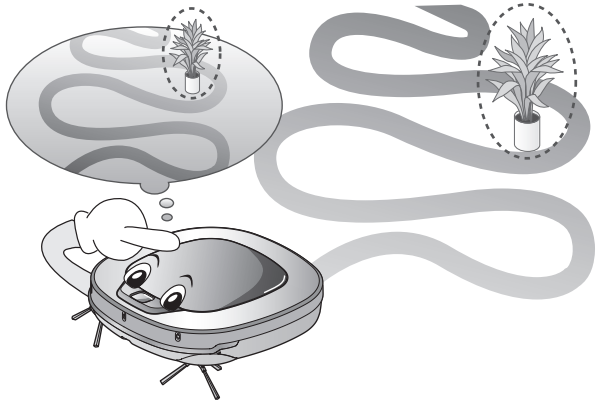
Pressing 'Repeat' button on Remote Controller will activate 'Repeat' mode, with a voice message.
While in 'Repeat' mode, pressing the same button will cancel 'Repeat' mode, with a voice message.
In 'Repeat' mode, Robot Cleaner repeats the cleaning in progress until the battery runs out without returning to the home station.



Learning Mode

The Robot Cleaner is capable of memorising the cleaning environment through its Learning mode for an intelligent cleaning operation.

※ 'Learning Mode' is available only when the machine starts cleaning from the Home Station.



Tip

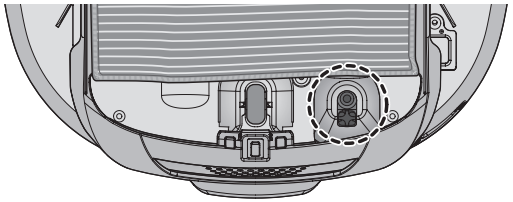
- Precautions with Smart Operation
  - This Learning mode enables memorizing locations with obstacles to help bypass them.
    Robot Cleaner memorizes every aspect of the environment it was subjected to from when it started cleaning from the Home Station to the moment it finishes its course.
- Robot Cleaner learns new conditions again when the location of Home Station has been changed.
- If the learning mode is accepted, a voice message will say "Environment has been studied by learning process."

How to Use Main Body Operation Buttons and Remote Controller

MOP CLEANING (OPTION)

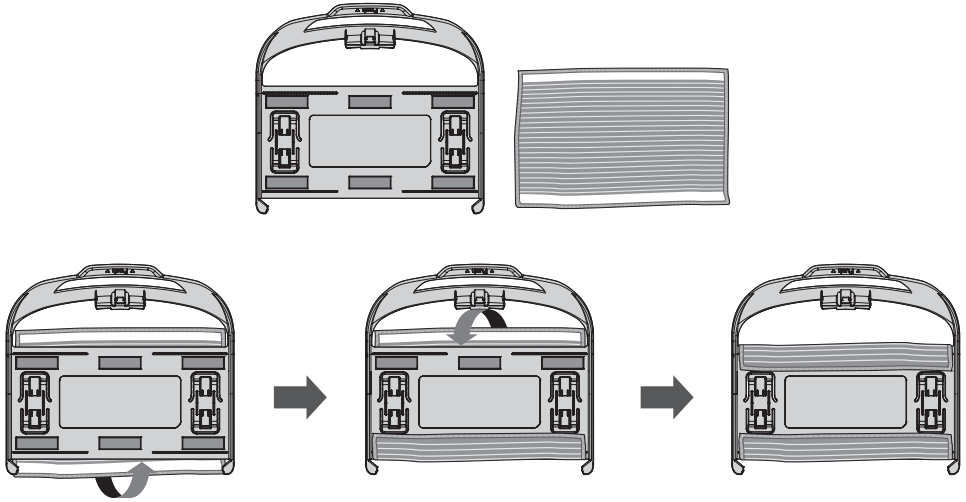
By attaching the ultra microfiber mop, you can effectively use the Robot Cleaner to remove dust on hard floor surfaces.

When the mop plate is attached, the Robot Cleaner will not climb on to carpets or over thresholds, in order to prevent transferring dirt from the mop.



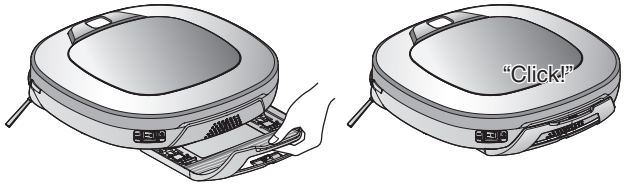
For mop cleaning, mount the mop and mop plate to the Robot Cleaner according to the following instructions:

1. Attach the ultra microfiber mop to the Velcro of the mop plate as shown in the figure.

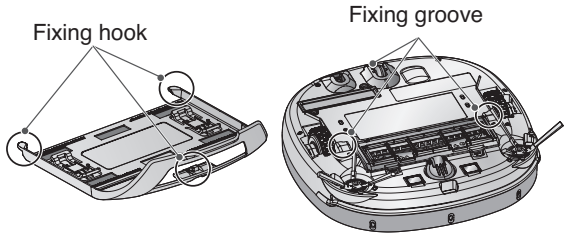


2. Firmly slide the Mop Plate into the furrows until you hear a 'click' sound.

※ 'Note that, if the Mop Plate is not secured correctly, it may separate during the cleaning.



3. It is essential that the fixing hooks on the Mop Plate align correctly on to the fixing grooves on the underside of the cleaner.



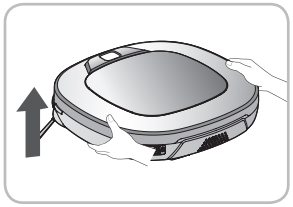
Tip

- To avoid odors, wash any foreign material or dust off the mop after cleaning is completed.
- To avoid staining floors, do not use the ultra microfiber mop to clean when dirt is contaminated with liquids such as coffee or ink.
- To avoid damage to carpets from the Velcro or dirt transfer from the mop, do not attempt to clean the carpet while the mop plate or mop is attached.
- Keep the ultra microfiber mop dry. Do not use it on wet surfaces.
  If there is moisture on the floor, it can interfere with the navigation and damage the unit.
- Smart Diagnosis feature is not available, when the Mop Plate is attached.

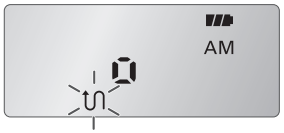
How to Use Main Body Operation Buttons and Remote Controller

The Robot Cleaner remembers its location while cleaning.
If the user moves the Robot Cleaner while it is operating, it will search for the location it was moved from by using its navigational location search function before continuing to clean.

※ The navigating function will be activated after the Robot Cleaner adequately recognizes the cleaning environment.



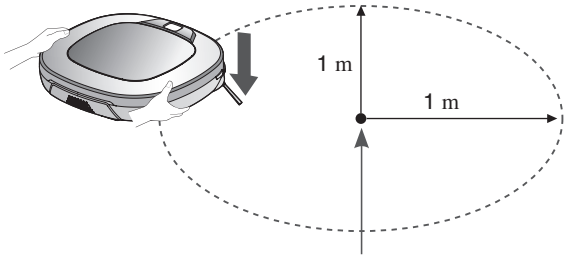
Change location



When the location search function is activated, the cleaning mode of the status indicator will flash

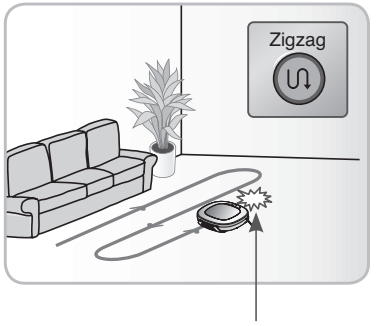
Manual Relocation.

1. With the power off, locate the Robot Cleaner near the location where it was originally moved from.
   ※ The location search is more effective when the Robot Cleaner is closer to the location where it was moved from.
   ※ If it is moved from its original cleaning position by more than 1 m, it becomes difficult for the Robot Cleaner to search for it's previous location.

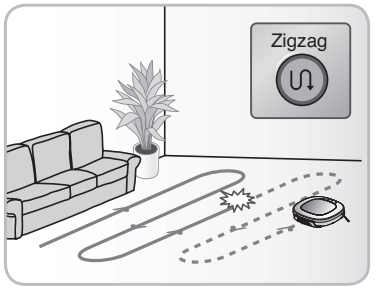


Location of incident

2. Press the START/STOP button on the Robot Cleaner or ' ⏯ ' button on the remote controller.
   Robot Cleaner will then start the location search function along with an audio guide.
   ※ When the location search is successfully completed, it will continue cleaning from where it was moved.
   If the location search fails, it will start again from the beginning.



Location of incident



Tip

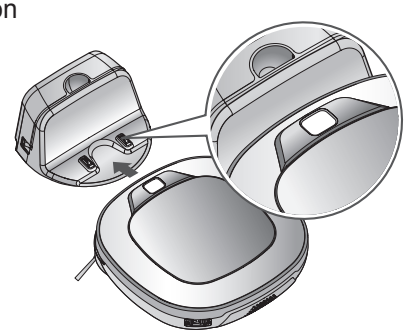
- If the power is turned off after the location search function is set, the location search function will be canceled.
- Location search will be more effective when the Robot Cleaner is closer to the location where it was moved from.

How to Use Main Body Operation Buttons and Remote Controller

Robot Cleaner uses this Smart Diagnosis feature to run a self-diagnosis.
If any irregularity is found from the diagnosis, please contact the local LG Electronics service center.

※ **During Smart Diagnosis, the Robot Cleaner will move about within a 50 cm radius. So, make sure no objects are in the way within a 1 m radius around the Home Station, before starting Smart Diagnosis.**

1. Smart Diagnosis will operate when the main power switch of the Robot cleaner and the Home station are turned on, and the unit docked on the Home station.
   ※ **Smart Diagnosis is only possible when the Robot Cleaner is attached to the Home Station.**
2. Press 'Diagnosis' button on the Remote Controller, then the process will start with a voice message which says "Robot Cleaner smart diagnosis will be started.
   Please step away and clear around 1 meter around the home station."
   ※ **If the Mop Plate is attached, the process will not be activated.**



3. When the Smart Diagnosis has successfully finished, Robot Cleaner will return back to the Home Station and inform the result through a voice message. After the voice message, pressing the 'HOME' button on the Remote Controller or main unit will allow the voice message to be repeated. To terminate the diagnosing process, press the ' ⏯ ' button on the Remote Controller or main unit.

※ **After the Smart Diagnosis voice message, the Robot Cleaner will start recharging after 1 minute.**

※ **If an error is detected with any of the Sensors whilst in Smart Diagnosis, a voice message will announce, and the unit will not return to the home station.**

Tip

- Be careful not to touch the Robot Cleaner or disturb its operation before Smart Diagnosis is complete. If it is accidently interrupted, turn the main power switch OFF then ON again to resume the diagnosis.
- Smart Diagnosis will not be activated in each of the following cases. In each case, check the problem and try again.
  - Robot Cleaner is detached from Home Station
  - Battery level is insufficient
  - No Dust Bin Filter is fitted.
  - Mop Plate is attached

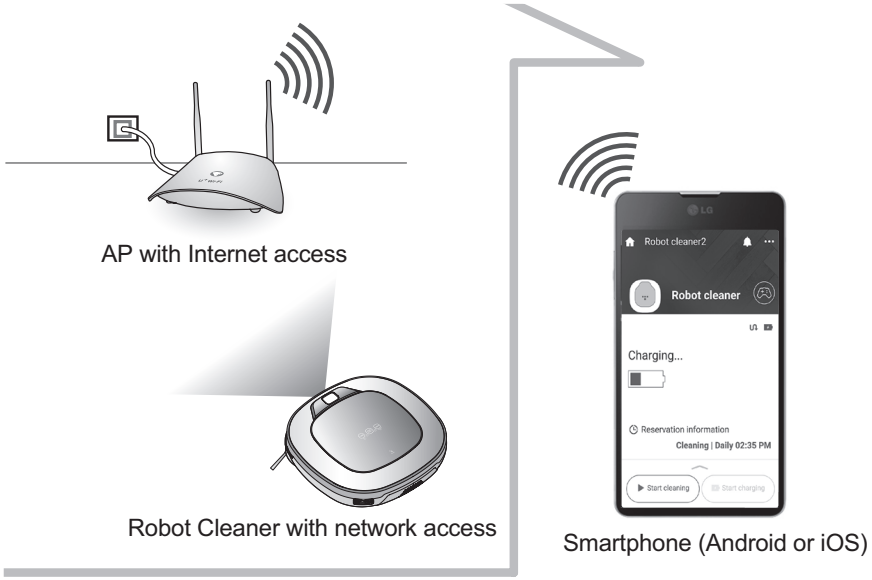
How to Use Main Body Operation Buttons and Remote Controller

If a voice message is announced after Smart Diagnosis, refer to the following table to take proper actions.

Voice message	Measures (for reference)
Robot Cleaner smart diagnosis will be started. Please step away and clear around 1 meter around the home station.	Clear any object within a 1 m radius around Home Station, and stay back until the diagnosis is complete.
Smart diagnosis can start when it is being charged. Please dock Robot Cleaner to the home station to charge.	Move Robot cleaner to the Home Station to recharge it.
No defect found during diagnosis.	
Diagnosis mode cannot be operated due to a low battery. Please try again after the battery is charged.	Try the Smart Diagnosis again after recharging the battery.
Please check if the dust bin is installed with the filter.	Open the Dust Bin Cover and examine the bin.
Charging cannot be done due to a problem in infrared sensor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
Charging cannot be done due to a problem in ultrasonic sensor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
Charging cannot be done due to a problem in the cliff detection sensors on the bottom. Please clean the sensors.	Clean the three Cliff Sensors on the bottom at the front of the unit.
Please wipe the lower camera sensor on the right bottom of the Robot Cleaner.	Clean the lens of Camera Sensor on the bottom-right.
Please wipe the obstacle detecting sensor window on the left and right side of the Robot Cleaner.	Clean the lens of the Obstacle Sensors on both the left and right hand sides.
A problem has been found on the Gyro Sensor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
Please check for dirt on the left wheel.	Check for foreign materials on the left wheel.
Please check for dirt on the right wheel.	Check for foreign materials on the right wheel.
A problem has been found on the left wheel sensor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
A problem has been found on the right wheel sensor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
Please check the brushes for obstructions.	Check for any foreign material stuck in the Brush.
A problem has been found in the suction motor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
A problem has been found in the acceleration sensor.	Run Smart Diagnosis again and, if the same message is announced, contact an LG Electronics service center.
In order to listen to the smart diagnosis result again, please press the charging button. To stop, please press the stop button.	If you need to repeat the diagnosis result, press the 'Home' button, or press '⏯' button to finish the diagnosis.
Smart diagnosis mode will be turned off.	
Please try smart diagnosis again after turning the main power switch off and on from the back of Robot Cleaner. If the problem continues, please contact LG Electronics customer care.	
Smart Diagnosis mode cannot be operated with mop plate being attached. Please try again after removing it.	Run Smart Diagnosis again after removing the Mop Plate.
Smart diagnosis has failed to operate. Please try it again after turning off and on the main power switch on the back of the Robot Cleaner.	Turn the main power switch OFF and then ON again to resume the diagnosis. Do NOT touch the robot or disturb its operation until the diagnosis is complete.

SMART APPLICATION FUNCTION

You can control the Robot Cleaner from your smartphone.
The "Smart ThinQ" application provides the following functions:
• **Simple Control, Cleaning Diary, Schedule Cleaning, Smart Diagnosis**



What to check before using the product

Some models and OS versions may restrict the use, or render the application inoperable from the smartphone.

Special characters in the ID of the router may hamper product connection or registration.

Recommended specification
• Android: Higher than 4.1.2(Jelly Bean)
• iOS : Higher than iOS 8 (iPhone5)
• Screen resolution : 1920x1080

※ Connecting to the Wireless Access Point without proper security setup may cause security issues.
※ If security is set up internally for your organization, it may affect connection therein.
※ The Application (App) under use can be changed anytime without notice in order to improve the quality of the product.

Installing the Robot Cleaner application

Smart ThinQ
[Robot Cleaner application]

1. Search "Smart ThinQ" in Google Play or App Store.
2. Download and install the "Smart ThinQ" application.

Tip

- The "Smart ThinQ" application requires an Android OS with a version higher than 4.1.2(Jelly Bean) for the smart control function.
- The "Smart ThinQ" application cannot be used on a tablet devise or a desk top or laptop computer.
- For successful product registration, the name of your Wi-Fi access point (SSID) must include only English letters and numbers.
- The robot cleaner supports 2.4 GHz Wi-Fi networks only.

Signing up for membership

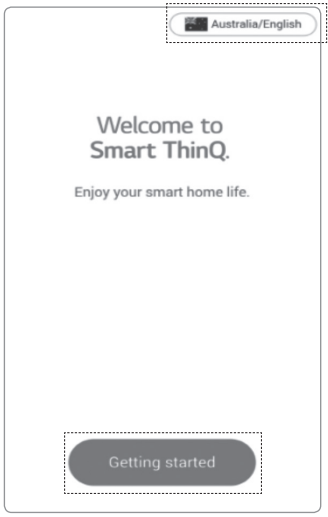
You need to subscribe your personal login ID on the server to control the Robot Cleaner from your smartphone.

1. The [Startup Screen] opens when you run the "Smart ThinQ" application. Click "Sign in".
2. You can sign up with the [Create account] button on the "sign in screen" page. Fill the Blanks on [create account screen] page to create account.
3. If you have successfully created an account, try to sign in on the “Sign in” page after receiving an authentication sign in e-mail.

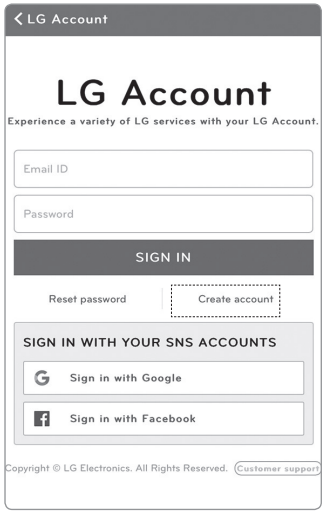
※ Don’t change ‘Australia/English’ in the [Startup Screen] page. If you change it, you will not be able to register your robot cleaner that you purchased in Australia. If it is set to another country, change it to Australia/English.

※ You can also sign in with google and facebook at the [Log in screen] page.

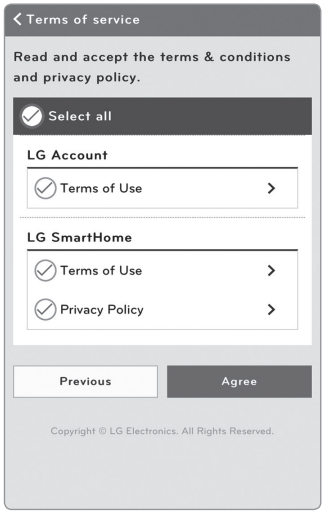
※ Check the product registration method according to the Smart Phone OS. Some screens may look different from the actual app screen.



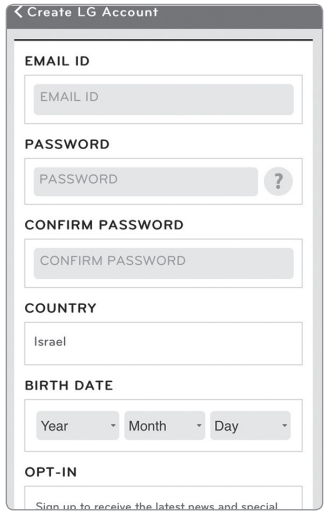
[Startup screen]



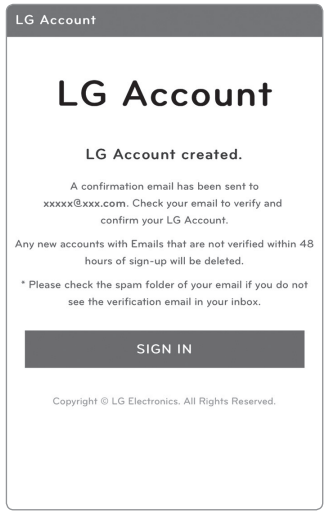
[Sign in screen1]



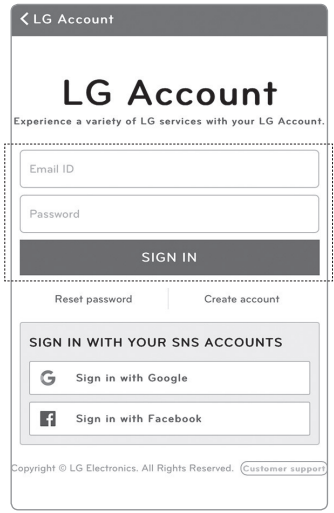
[Terms of service]



[Create Account]



[Confirm email]



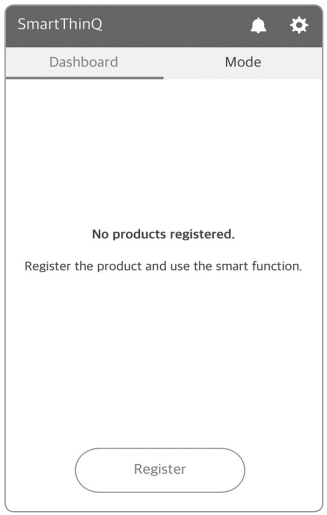
[Sign in screen2]

SMART APPLICATION FUNCTION

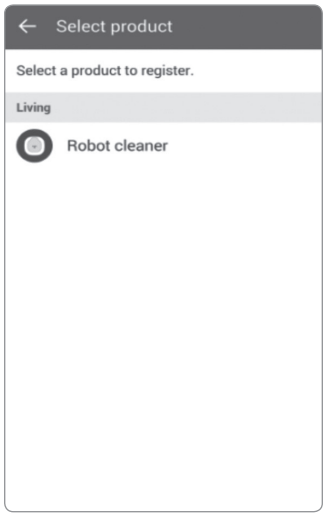
How to register the product

You will need to register the product on the application to control the Robot Cleaner from your smartphone. Add your Robot Cleaner to the app with the Tag On feature to use the Smart function.

1. The [Startup Screen] opens when you run the "Smart ThinQ" application. Click the “Register product” Button.
2. Select Robot cleaner on [Select Product Screen].
3. Proceed to add your Robot Cleaner on to your smartphone via Wi-Fi.



[Start-up screen]



[Select Product screen]

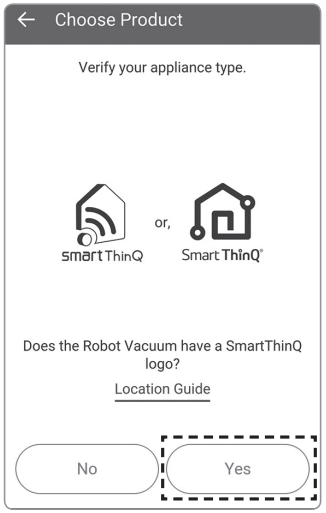
Tip

- To help reduce problems during registration, place the robot cleaner near the router and make sure there are no obstacles between the router and the robot cleaner.
- Replacing the router, changing its security settings, or changing the router settings on the app, will require the Robot cleaner to be reregistered.
  You can change the router information in the product network on the setting page.
- Wait for approximately 5 minutes after replacing the router or changing its security settings, as it may take some time for the changed setting to be recognized.

Wi-Fi / Register product (Android)

Product registration can be done using the "Wi-Fi" function for Robot cleaner.

1. Check whether the "Smart ThinQ" mark is printed or not.
   If there is a “Smart ThinQ” mark on the product, press the "Yes" button.



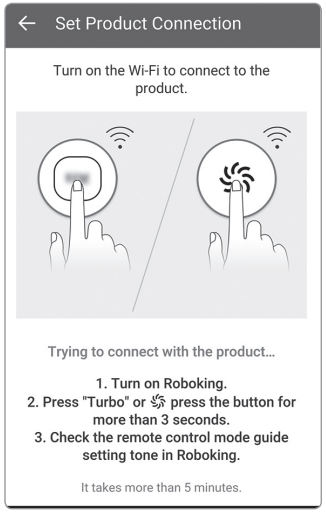
[Product category]

Tip

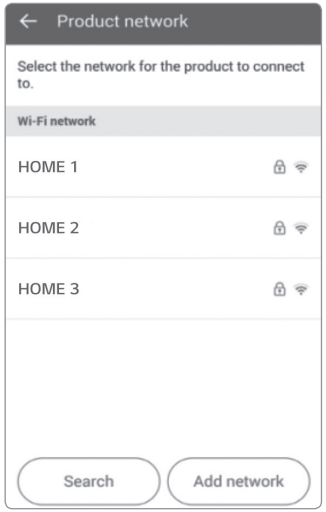
- Registering the product is required for the initial connection only; you can then connect to the Robot Cleaner thereafter without having to repeat this process.

Product network / Register product (Android)

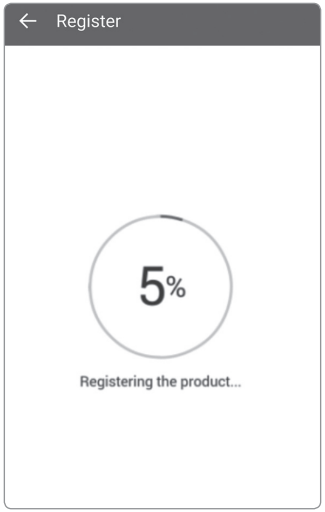
1. Long-press the "TURBO" button on Roboking for 3 seconds.
   The [Select AP(Wi-Fi)] screen will open soon.
2. By selecting your AP on the "Wi-Fi network" list, you will automatically be directed to the product registration mode.
3. After registration is complete, the [Dashboard] screen will open.
4. With the network function enabled on the Robot Cleaner, press “Robot cleaner image" to connect to Robot Cleaner.



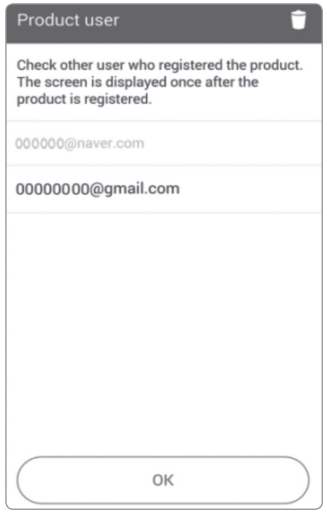
[Press the 'TURBO' button]



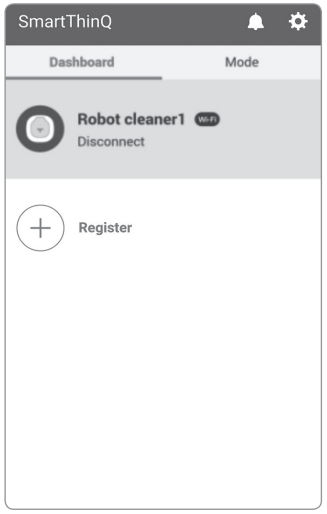
[Select AP(Wi-Fi)]



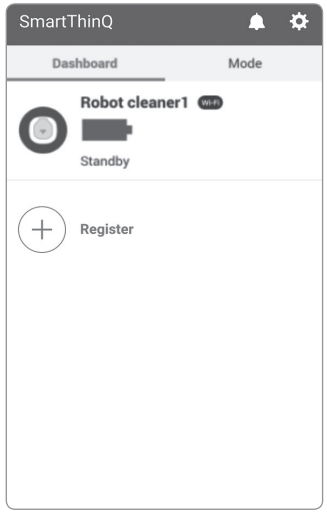
[Register product]



[Registered user list]



[Product selection screen - when connection unavailable]



[Product selection screen - when connection available]

Tip

- With the network function enabled on the Robot Cleaner, press “Access" to connect to the Robot Cleaner.
- The robot cleaner supports 2.4 GHz Wi-Fi networks only.
- Special characters in the ID of the router may hamper product connection or registration.
- Turn off the Mobile Data of Smart Phone, connect to the Internet via Wi-Fi at home, and register the product.

How to register the product (iOS)

You will need to register the product on the application to control the Robot Cleaner from your smartphone. Add your Robot Cleaner to the app with the Wi-Fi feature to use the Smart function.

1. The [Startup Screen] opens when you run the "Smart ThinQ" application. Click the “Register product” Button.
2. Proceed to add your Robot Cleaner on to your smartphone via Wi-Fi Registration.
3. Check whether the "Smart ThinQ" mark is printed or not.
   If there is a “Smart ThinQ” mark on the product, press the "Yes" button.

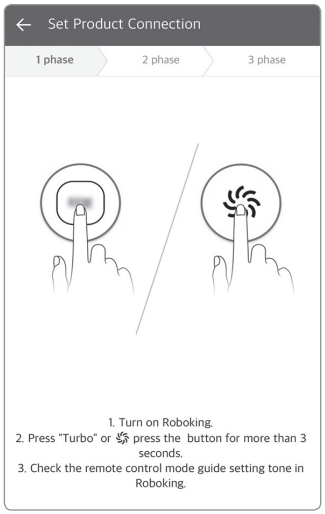
[Product category]

Tip

- To help reduce problems during registration, place the robot cleaner near the router and make sure there are no obstacles between the router and the robot cleaner.
- Replacing the router, changing its security settings, or changing the router settings on the app, will require the Robot cleaner to be reregistered.
  You can change the router information in the product network on the setting page.
- Wait for approximately 5 minutes after replacing the router or changing its security settings, as it may take some time for the changed setting to be recognized.

Product network / Register product (iOS)

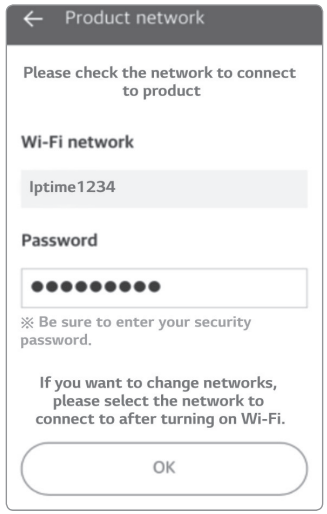
1. Please long-press the “TURBO” button for 3 seconds while the Robot cleaner is turned on.
   The [Select 'LG_HOMBOT_REG~' Wi-Fi] screen will open soon.
2. Please turn on the “Wi-Fi connection” function in iPhone “Settings.”
3. Please press the “Check connection” button on the App screen after connecting to “LG_HOMBOT_ REG~” in the Wi-Fi list.
4. After checking the network, please enter the network ID and password to connect to the product.



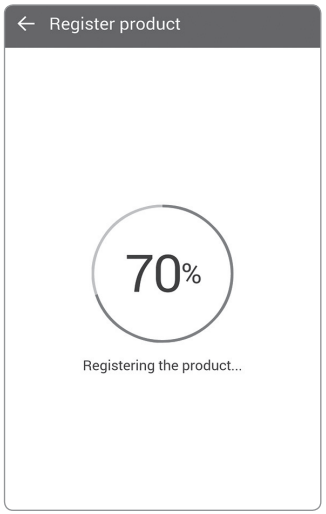
[Press ‘TURBO’ button]

[Select ‘LG_HOMBOT_REG~’ Wi-Fi]

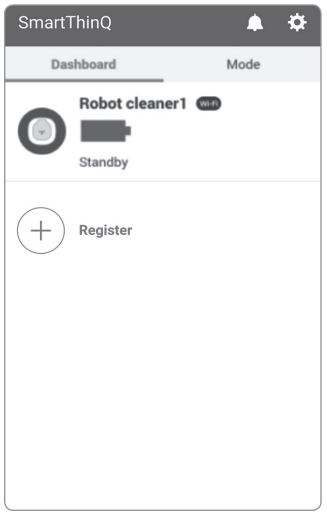
[Check connections]



[Select network]



[Product registration]



[Product selection screen - when connection available]

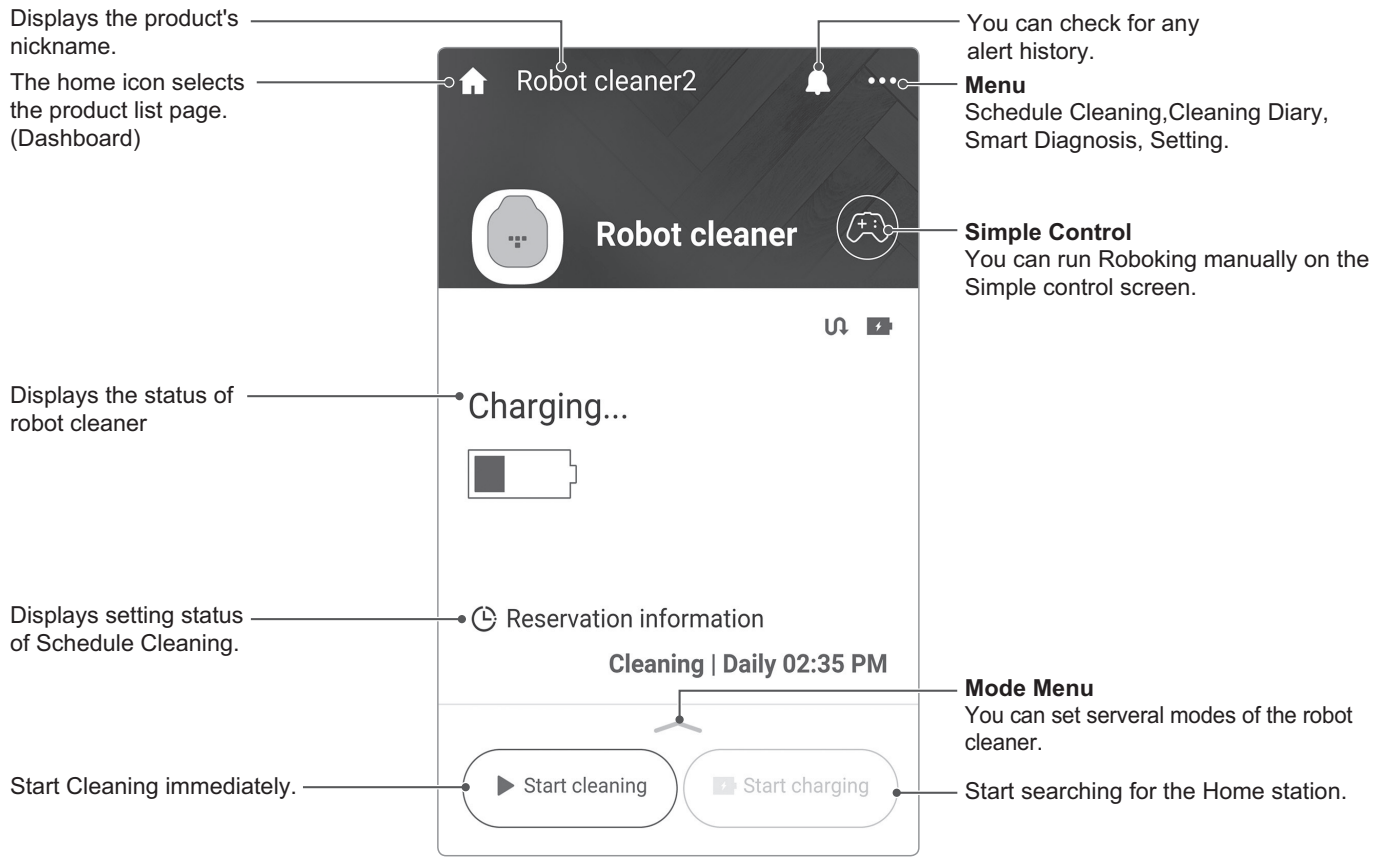
Tip

- With the network function enabled on the Robot Cleaner, press “Access” to connect to the Robot Cleaner.
- The robot cleaner supports 2.4 GHz Wi-Fi networks only.
- Special characters in the ID of the router may hamper product connection or registration.
- In the case of iPhone, turn off mobile data as follows:
  “Option” → “Cellular” → Turn off Cellular Data

SMART APPLICATION FUNCTION

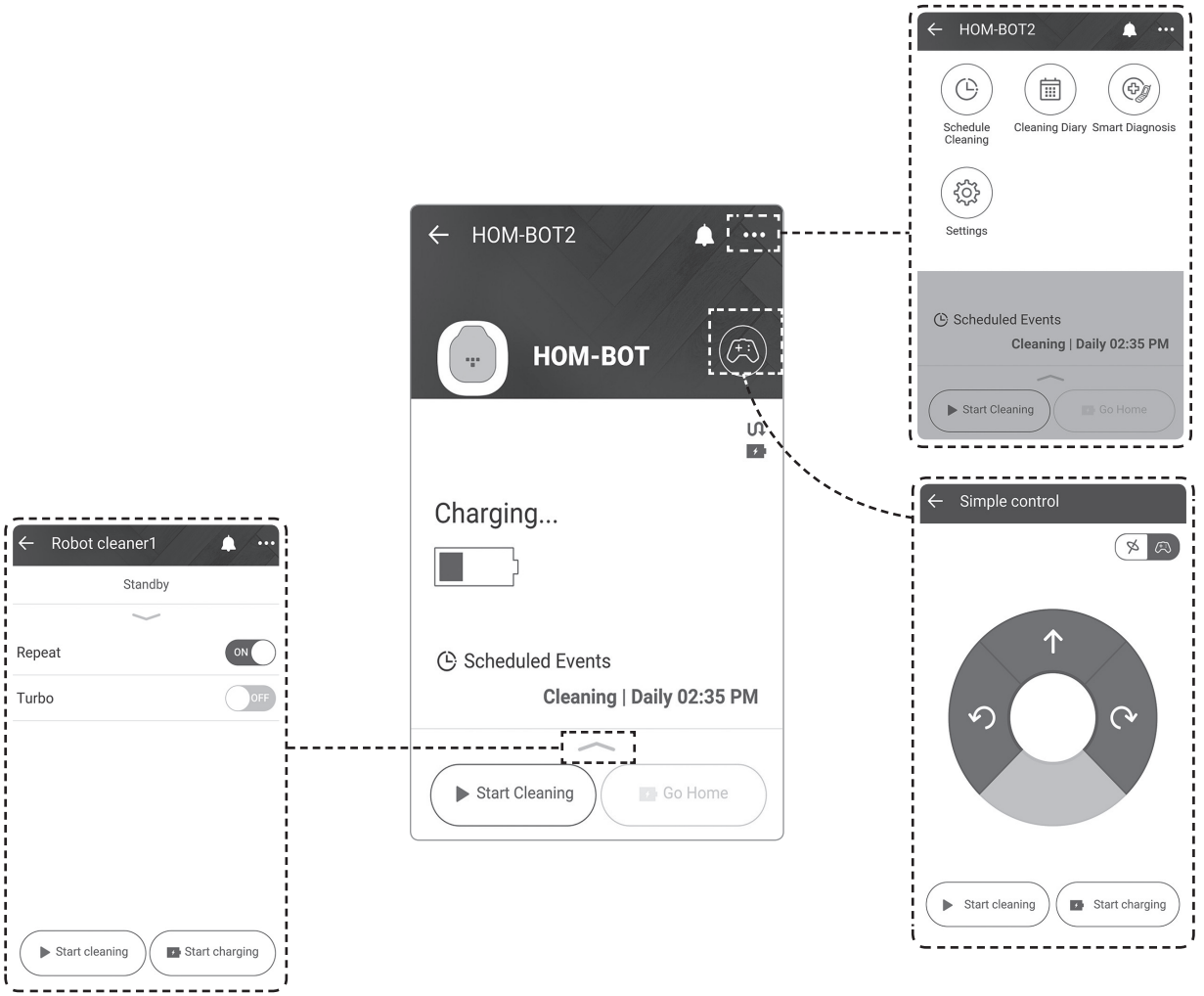
Startup screen of application

The following screen will open when you connect to the Robot Cleaner for the first time from the "Smart ThinQ" application:



SMART APPLICATION FUNCTION

Startup screen of application



Mode Menu
Repeat mode, Turbo mode.

Menu
Schedule Cleaning, Cleaning Diary, Smart Diagnosis, Setting.

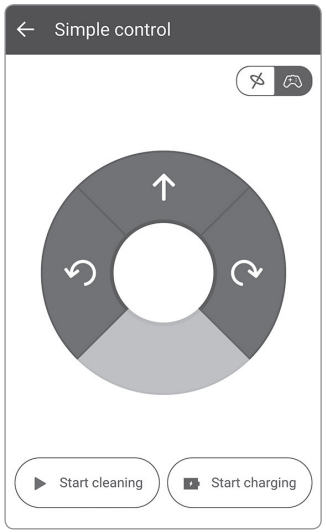
Simple Control
You can run Roboking manually on the Simple control screen. In addition, you can start cleaning or self navigate it back to the docking station by pressing the "Start Cleaning" or "Start Charging" button.

Simple Control

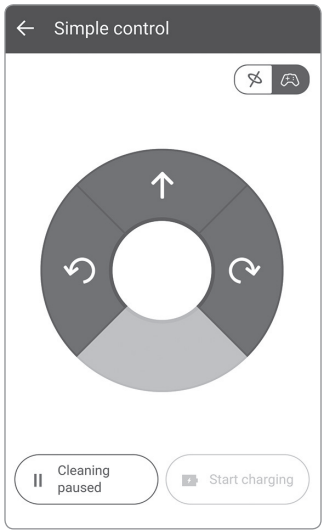
You can operate the Roboking manually on the Simple control screen. In addition, you can start cleaning or self navigate it back to the docking station by pressing the "Start Cleaning" or "Start Charging" button.
'The "Start Cleaning" button will change to the "Cleaning paused" button once cleaning has begun.
'The "Start Charging" button will change to the "Stop" button during its return to the docking station.

Tip

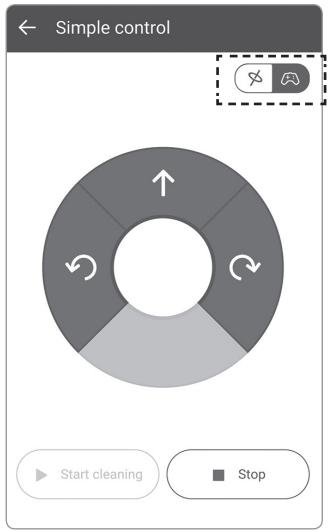
- Pressing the "Change Gyro" button allows operation of the Simple control by tilting the smartphone.



[Simple control screen]

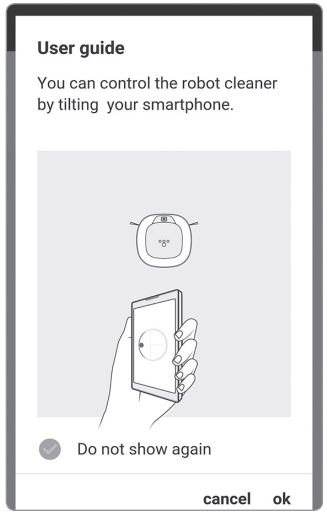


[Screen during cleaning]

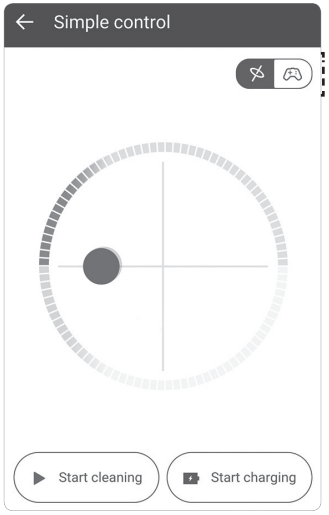


[Moving to the Home station]

You can control the robot cleaner by tilting your smartphone.



[tilting control Guide]



[tilting control]

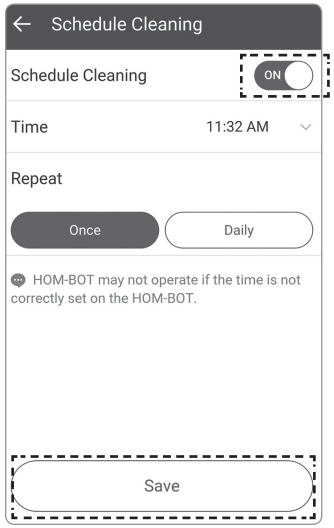
Menu – Schedule Cleaning

You can schedule the time you want the Robot Cleaner to start cleaning.

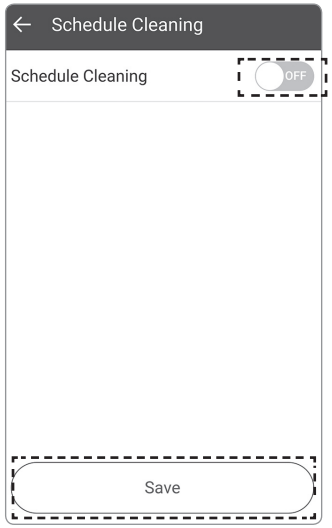
To set up Schedule cleaning, toggle across the Schedule cleaning key to turn it on or off in the Schedule cleaning menu. After enabling Schedule cleaning, set up the time and repetition, and then click "Save" to complete scheduling.

Tip

- The Schedule cleaning menu on the application has the same function as that of the remote control.
- Setting up or starting Schedule cleaning can only be done whilst the Robot Cleaner is charging.



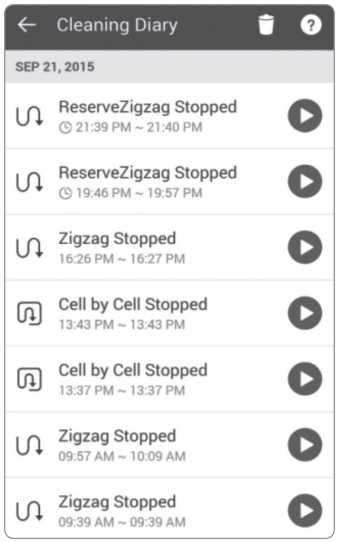
[With Schedule cleaning on]



[With Schedule cleaning off]

Menu – Cleaning Diary

You can view the diary to find out when the Robot Cleaner did the cleaning.
Cleaning Diary records information such as date, mode, and the start and completion times of each cleaning.
Click Play button on the right of the completed cleaning list; an active cleaning map of that particular cleaning event will appear.

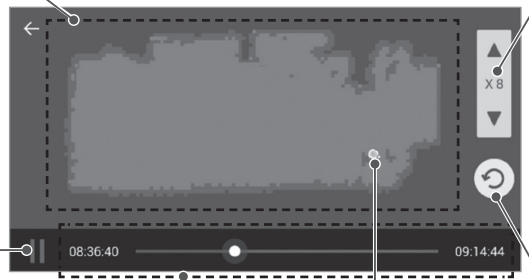


[Cleaning Diary]

The cleaning map shows an animated map of the Robot Cleaner in cleaning mode; you can control the playback speed or rotate the map.

Map
Map drawn by Robot Cleaner while cleaning the area. Colors show the areas it could not reach because of obstacles or walls as well as where it completed cleaning.

[Cleaning map]



Controlling the playback speed
You can control the playback speed of the cleaning animation.
Each click of the triangle button will accelerate the playback speed from X1 to 2X, 4X, 8X, and 16X.

Playback / Stop button of cleaning animation
This starts or stops the animation of the Robot Cleaner in cleaning mode.
It changes to a Stop button while the animation is being played.

Rotate Map
Each click of this button will rotate the map 90 degrees clockwise.

Time of starting/ cleaning completion.

Robot Cleaner location
Location of the Robot Cleaner when it started cleaning

Tip

- The Cleaning Diary list shows the 20 most recent cleaning sessions.
- If charging was required during a session, the charging time is included in the completed cleaning time. The displayed message will indicate the sequence that occurred.
  (Eg.) After recharging, Zigzag finished
- If cleaning was interrupted by pressing the "Charge" button, only a map up to that exact point will be drawn.
  (Eg.) Zigzag Stopped
- A cleaning diary list entry may say "Stopped" if the cleaning was interrupted and the Robot Cleaner did not return back to the Home Station within 10 minutes after cleaning stopped, or if the power turns off due to an error.
- If power is turned off manually, or any button on the Robot Cleaner is pressed during cleaning, the session may not be logged in the list.

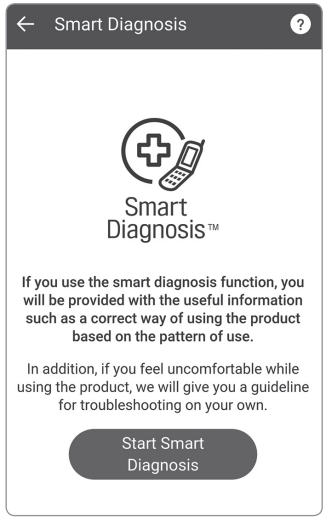
Menu – Smart Diagnosis

The Robot Cleaner can self-diagnose with the Smart Diagnosis function.

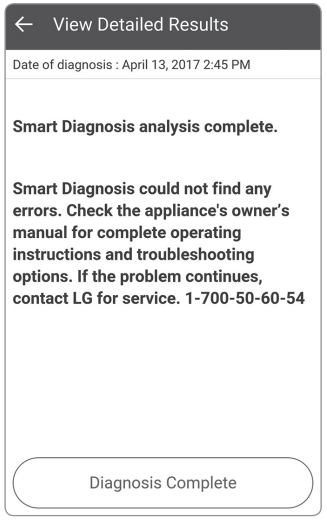
Click "Start Smart Diagnosis" whilst the Robot Cleaner is charging.
Be sure to resolve any issue identified in the diagnosis by taking a corresponding measure. If the symptom persists, contact the customer service center of LG Electronics.

Tip

- Smart Diagnosis on the application provides the same function as that of the remote control. Refer to pages 24 and 25 for details on Smart Diagnosis.
- Smart Diagnosis can only be activated whilst the Robot Cleaner is charging.



[Smart Diagnosis]



[Smart Diagnosis result]

SMART APPLICATION FUNCTION

Menu – Setting

You can check or change the current information set up on Robot Cleaner.

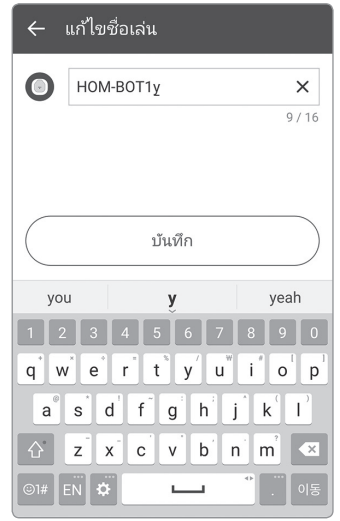
Click Voice gender to change the voice of the Robot Cleaner to male or female.

Click Product nickname to change the current nickname of the Robot Cleaner; a pop-up where you can enter a new nickname opens (up to 10 characters allowed including English, Korean and numeric).

You can check the current software version of the Robot Cleaner and the latest version. If the current software is not the latest, please update it. Refer to the details on "Software Update."
Basic Information shows the current version of the application and open source license information.

[Setting 1]

[Setting 2]



[Edit nickname]

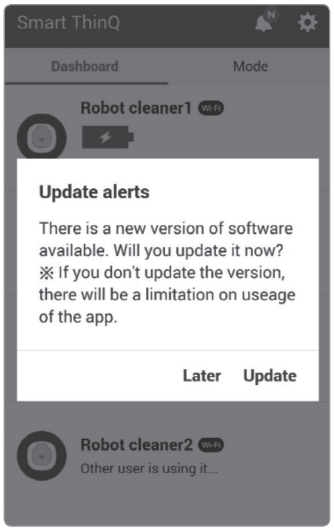
Misc. 1 - Software update

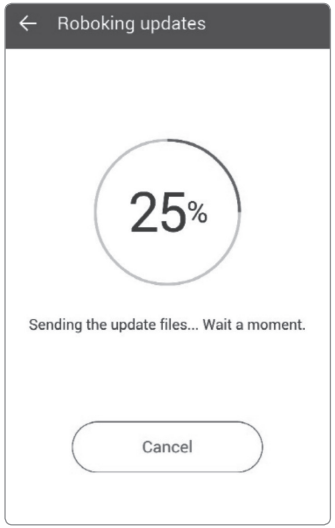
The network-enabled model of the Robot Cleaner can update the software automatically via the application.

1. Make sure that the "Smart ThinQ" application is up to date on the Play Store.(Unless you update the app to the latest version, software update will not be available.)
2. f a new version is available upon connecting to the Robot Cleaner, an update will start.
3. A new software file is downloaded to the Robot Cleaner when the updating starts.
4. When download is completed, the update will be started after tansmitting files to the Robot Cleaner.
5. The Robot Cleaner will turn off and on again automatically in the process, and updating will resume.
6. A voice message saying that update is completed will be announced when the update is done.
   The Robot Cleaner will turn off and on again to apply the updated software.

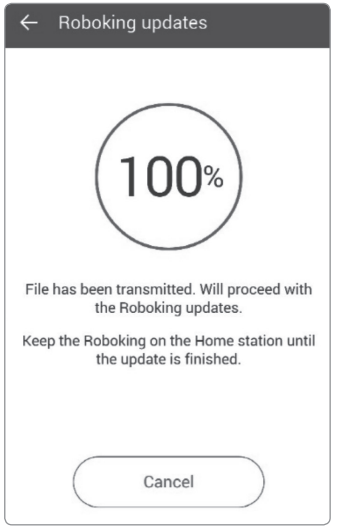
Tip

- Software update can only be done whilst the Robot Cleaner is charging.
- Software updates will only be done if there is sufficient battery level.
  Ensure that the battery is fully charged before engaging any software update.





[Software file download window]

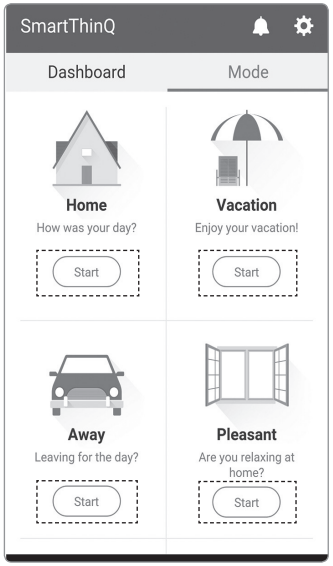


[Updating Robot Cleaner]

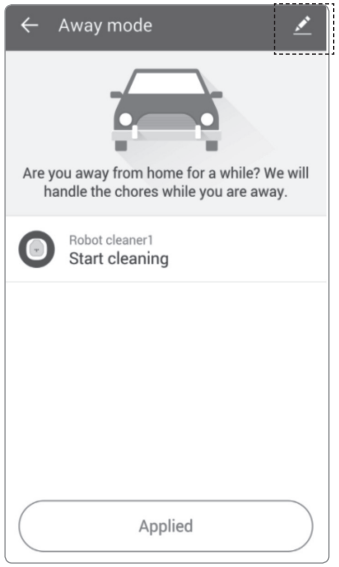
Misc. 2 - Mode

You can order to robot cleaner simply without connection with robot cleaner through Mode function.
Mode function has total 4 functions. If you push ‘Applied’ button, Robot cleaner will act according to Mode like below.

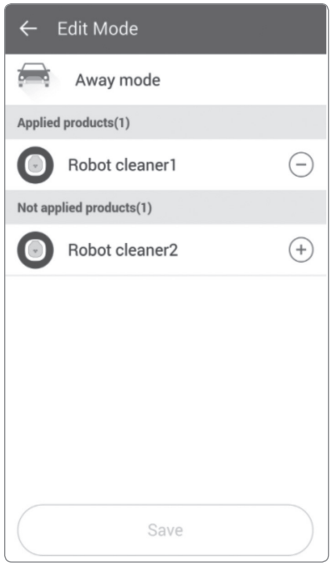
Going-home mode : start searching home station
Away mode : start cleaning
Sleeping mode : start searching home station



[Mode]



[Away mode]



[Edit mode]

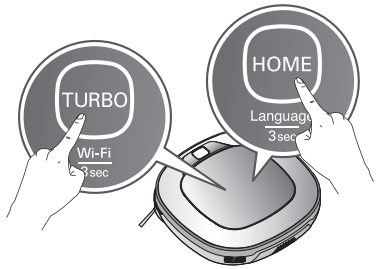
※ If more than one Robot cleaner is registered, only one of them can be set by the mode function.
In the event that there are 2 registered Robot cleaners, the first Registered one will be the one set by the mode function.
You can change which of the Robot Cleaners will be set by the mode function by editing them. [Edit mode] (You can enter Edit mode by pressing the pencil image.)

Product Info Initialization

Product info initialization

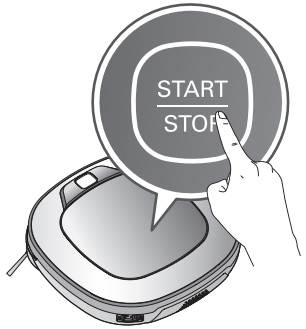
If you happen to sell a used Robot Cleaner, or if would like to initialize information set up on the product, run Initialization.

1. Press and hold down the "Turbo" and "Home" buttons for 3 seconds with the power on; all displays will then be lit with a "ding" sound.



2. Press "Start/Stop" to initialize the product; power will be turned off.

3. Pressing "Start/Stop" again will turn Robot Cleaner on with a melody.



※ Any dispute between seller and buyer is an issue between the two parties.
LG Electronics provides a product initialization function to restore the unit back to the original factory settings.

Tip

- Initialization returns the following information as factory default setting.
  - Cleaning Diary
  - Smart Diagnosis record
  - Nickname
  - Learned cleaning information

Technical Descriptions of the Parts

■ Suction Motor(BLDC)

제조사: Nidec

Motor	Model Name	20N
	Type	BLDC
	Rated Voltage[V]	14 V
	RPM(No load)	19,200
	RPM(Load)	13,000 (10mN* m)
	Lifespan[Hr]	1000 Hr
Fan Assy.	Fan Type	3D
	RPM9Normal Mode)	8,500
	RPM(Turbo Mode)	14,000
	Power Consumption[W](Normal)	15
	Power Consumption[W](Turbo)	18

No.	Parts	Material or Type	UL		Manufacture
			Grade	File NO.	
1	Bearing Bush	SECC	-	-	NIPONN STEEL&SUMITOMO METAL CORRORATION
2	Sleeve Bearing	Sintered Metal	-	-	PORITE CO., LTD
3	Washer	PEEK	94HB	E41429	Sumitomo Bakelite
				E161131	VICTREX
4	Stopper	PET	94VTM-2	E86511	TORAY
5	Washer	PET	94VTM-2	E86511	TORAY
6	Mounting Plate	SECC	-	-	JFE Steel Corporation, NIPONN STEEL & SUMITOMO METAL CORPORATION
7	Insulation sheet	NID	-	-	Nichiei Kakoh Co., Ltd.
		G9953RP	-	-	SONY CID
8	PCB	FR-4	94V-0	E162822	Shanghai YKC Co., Ltd.
9	Connector	20022WR-05	94V-0	E108706	Yeon HO Electronics Co., Ltd.
10	Stator lamination	35A250/35A440	-	-	JFE Steel Corporation
11	Copper wire	FBWMBAU	F TYPE	E135754	Sumitomo Electric Winted Co., Ltd
		SEUW-N	F TYPE	E135754	
		SF.B.LOCK	F TYPE	E339330	FURUKAWA MAGNET WIRE Co., Ltd
		SF.BY(L)	F TYPE	E339330	
		UEW-Y	F TYPE	E164502	Guangdong Rosen Super Micreo-Wire
12	Shaft	SUS420, 3Cr13	-	-	KANXIANG YIYONG STAINLESS STEEL Valbruna Stainless Steel COGNE Dongbei Special Steel
13	Magnet	Nd-Fe-B	-	-	Epson, Chengdu Galaxy, Sky Surpass, Highmag
14	Rotor Holder	SECC	-	-	KOBE STEEL, LTD. NIPONN STEEL & SUMITOMO METAL CORPORATION

■ Agitator Motor

Manufacturer: STANDARD

ITEMS 项目	CONDITIONS 条件	SPECIFICATIONS 规格
1.0 **STANDARD OPERATING CONDITION** 标准使用状态		
1.1 RATED VOLTAGE 额定电压	DC constant power supply between motor terminal 在马达及端子间使用直流电稳定电源	12.0V
1.2 OPERATING VOLTAGE RANGE 使用电压范围		10.0 V ~ 14.0 V
1.3 RATED LOAD 额定负载	Pulley load 滑轮负载	3.5 mN.m ≒ 35.7 gf.cm
1.4 DIRECTION OF ROTATION 旋转方向	View point: Shaft output direction 视点:输出轴方向	CCW & CW
1.5 OPERATING TEMP./HUMID. RANGE 使用温度/湿度範圍		-10 ℃ ~ 60 ℃ 5 %RH ~ 95 %RH
1.6 STORAGE TEMP./HUMID. RANGE 保存温度/湿度範圍		-10 ℃ ~ 60 ℃ 5 %RH ~ 95 %RH
2.0 **TESTING CONDITION** 测定状态		
2.1 POWER SUPPLY 电源		DC onstant power supply 直流电稳压电源
2.2 MOTOR MOUNTING POSITION 马达安装姿势		Shaft output side w/ any direction 输出轴全方向放置
2.3 TEMPERATURE/HUMIDITY 温度/湿度		10 ℃ ~ 30 ℃ 5 %RH ~ 95 %RH Refer to JIS standard (20°C±2°C, 65%±5%) in case of problems 如有疑问，按JIS标准作准(20°C±2°C，65%±5%)
2.4 DIRECTION OF ROTATION 旋转方向	View point: Shaft output direction 视点:输出轴方向	CCW
3.0 **ELECTRICAL CHARACTERISTICS** 电气特性	General 通用	
3.1 NO LOAD CURRENT 无负载电流	30~60sec run-in period before measurement taken 测试前作30~60秒间的初期运转	155 mA (MAX.)
3.2 NO LOAD SPEED 无负载转速		9600 rpm ± 15%
3.3 RATED LOAD CURRENT 额定负载电流		550 mA (MAX.)
3.4 RATED LOAD SPEED 额定负载转速		8300 rpm ± 15%
3.5 STALL CURRENT 停动电流	Based on measurement at two different load (3.5mN.m & 13mN.m) 2点法（3.5mN.m &13mN.m)	3.8 A (MAX.)
3.6 STALL TORQUE 停動扭矩		23 mN.m (min.)
3.7 INSULATION RESISTANCE 絕緣抵抗	Applied between motor housing and terminal without failure 应用于馬達大殼及端子之間, 無異常	10 MΩ 500 V DC 1 minute 1 分钟
3.8 DIELECTRIC STRENGTH 耐电压	Between motor terminal and motor metal housing 马达端子与大壳之间	50~60Hz Ac600V 2mA 1 second 1 秒
3.9 PERFORMANCE CURVE 参考线图		RP365-ST-1895
4.0 **MECHANICAL CHARACTERISTICS** 机械特性		
4.1 SHAFT END PLAY 轴向间隙		0.05 mm ~ 0.25 mm
4.2 MOTOR COMPOSITION 马达结构		DWG NO. 图番号 ZP-R365ST-012
4.3 EXTERNAL APPEARANCE 外观	Eye sight verification 目视判定	DWG NO. 图番号 WG-R365T-T10

■ Wheel Motor

Manufacturer: STANDARD

DOCUMENT NO. 文件编号 SQJ-BF24-008

ITEMS 项目	CONDITIONS 条件	SPECIFICATIONS 规格
1.0 **STANDARD OPERATING CONDITION** 标准使用状态		
1.1 RATED VOLTAGE 额定电压	DC constant power supply between motor terminal 在马达及端子间使用直流电稳定电源	12.0V
1.2 OPERATING VOLTAGE RANGE 使用电压范围		10.0 V ~ 14.0 V
1.3 RATED LOAD 额定负载	Pulley load 滑轮负载	2.3 mN.m ≒ 23.5 gf.cm
1.4 DIRECTION OF ROTATION 旋转方向	View point: Shaft output direction 视点:输出轴方向	CCW & CW
1.5 OPERATING TEMP./HUMID. RANGE 使用温度/湿度范围		-10 ℃ ~ 60 ℃ 5 %RH ~ 95 %RH
1.6 STORAGE TEMP./HUMID. RANGE 保存温度/湿度范围		-10 ℃ ~ 60 ℃ 5 %RH ~ 95 %RH
2.0 **TESTING CONDITION** 测定状态		
2.1 POWER SUPPLY 电源		DC onstant power supply 直流电稳压电源
2.2 MOTOR MOUNTING POSITION 马达安装姿势		Shaft output side w/ any direction 输出轴全方向放置
2.3 TEMPERATURE/HUMIDITY 温度/湿度		10 ℃ ~ 30 ℃ 5 %RH ~ 95 %RH Refer to JIS standard (20°C±2°C, 65% ±5%) in case of problems 如有疑问，按JIS标准作准(20°C±2°C, 65%±5%)
2.4 DIRECTION OF ROTATION 旋转方向	View point: Shaft output direction 视点:输出轴方向	CCW
3.0 **ELECTRICAL CHARACTERISTICS** 电气特性	General 通用	
3.1 NO LOAD CURRENT 无负载电流	30~60sec run-in period before measurement taken 测试前作30~60秒间的初期运转	110 mA (MAX.)
3.2 NO LOAD SPEED 无负载转速		7100 rpm ± 15%
3.3 RATED LOAD CURRENT 额定负载电流		270 mA (MAX.)
3.4 RATED LOAD SPEED 额定负载转速		6500 rpm ± 15%
3.5 STALL CURRENT 停动电流	Based on measurement at two different load (2.3mN.m & 7.5mN.m)	1.7 A (MAX.)
3.6 STALL TORQUE 停動扭矩	2点法（2.3mN.m &7.5mN.m)	13 mN.m (min.)
3.7 INSULATION RESISTANCE 絕緣抵抗	Applied between motor housing and terminal without failure 应用于馬達大較及端子之間, 無異常	10 MΩ 500 V DC 1 minute 1 分钟
3.8 DIELECTRIC STRENGTH 耐电压	Between motor terminal and motor metal housing 马达端子与大壳之间	50~60Hz Ac600V 2mA 1 second 1 秒
3.9 PERFORMANCE CURVE 参考线图		RS365-ST-12115
4.0 **MECHANICAL CHARACTERISTICS** 机械特性		
4.1 SHAFT END PLAY 轴向间隙		0.05 mm ~ 0.25 mm
4.2 MOTOR COMPOSITION 马达结构		DWG NO. 图番号 ZP-R365ST-014
4.3 EXTERNAL APPEARANCE 外观	Eye sight verification 目视判定	DWG NO. 图番号 WG-R365T-T13

■ IR Sensor

Manufacturer: SHARP

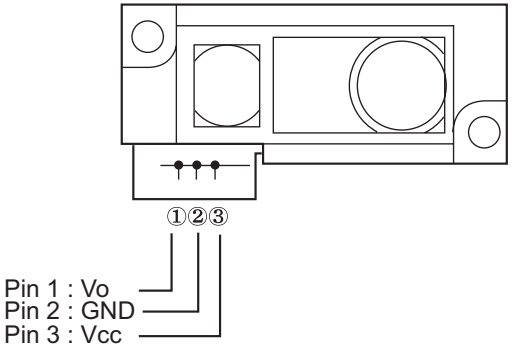
Model Name	GP2Y051SK0F
Operation Voltage	DC 4.5V ~ 5.5V
Measurable Distance	2 ~ 15 cm
Connector Voltage Output (L=30)	Min = 0.25 / Typ = 0.4 / Max = 0.55 (V)
Minimum/Maximum Distance Voltage Difference	Min = 1.95 / Typ = 2.25 / Max = 2.55 (V)
Average Current Supply	Typ = 12 / Max = 22 (mA)

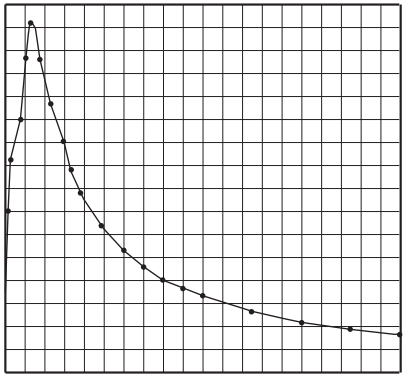
(Ta=25°C, Vcc=5V)

Parameter	Symbol	Ratings	Unit	Remark
Supply voltage	Vcc	-0.3 to +7	V	-
Output terminal voltage	Vo	-0.3 to Vcc+0.3	V	-
Operation temperature	Topr	-10 to +60	°C	-
Storage temperature	Tstg	-40 to +70	°C	-

Operating supply voltage

Symbol	Rating	Unit	Remark
Vcc	4.5 to 5.5	V	-

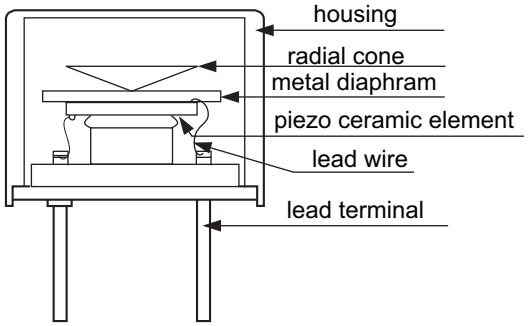


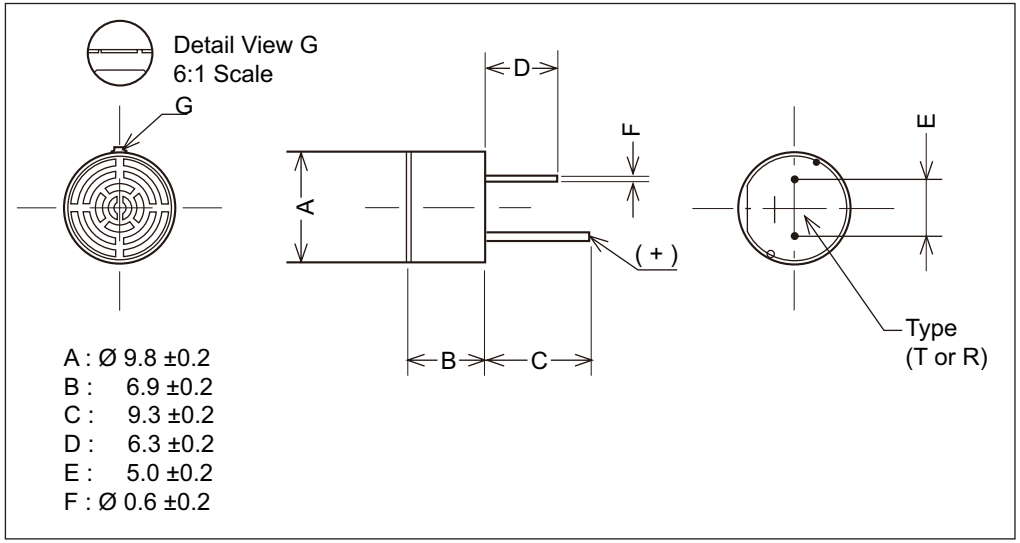


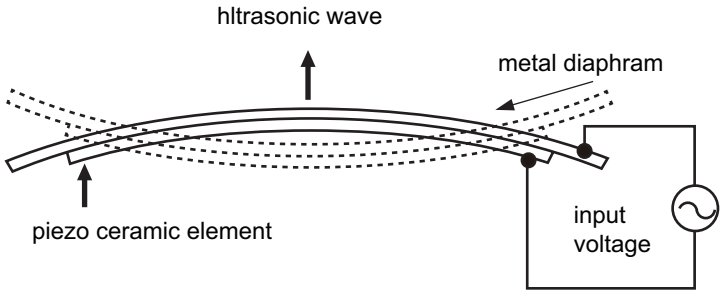
■ Ultrasonic Sensor

Manufacturer: SensorTech

Category	Specification	Remark
Applied frequency	40 ± 1	
Transmission Sound Pressure Level	122.00 ~ 123.16	0dB = 0.02mPa, 10Vrms, 30cm
Reception Sensitivity	-58.06 ~ -54.54	0dB = 10V/Pa, 30cm
Angle of Beam Spread	90 ± 10°	-6 dB down angle
Capacitance	2100±20%	@1KHz
Max Input Voltage	20Vrms	
Operation Temperature Range	-30 ~ 80	
Storage Temperature Range	-40 ~ 85	







■ Battery

Manufacturer: LG Chem

1. General

1.1 Scope

This Specifi cation describes es the requirern ents for the battery pack, LGE HIT-I (EAC62218205) supplied by LG Chern, included rechargeable lithiurn ion battery and battery management system, The battery management system consists mainly of protection fuel gauging unit.

1.2 Cell type and configuration

1.2.1 Battery Type

Cell Type	Cell Capacity	Cell Configuration	Battery Pack Capacity
ICR18650HE2	2450m Ah	1P4S	2290m Ah

* 1P 4S(1 in parallel and 4 in series of 4 cell pack assembly)

1.2.2 The battery pack consists of 4 cells combines with and protection & fuel gauging control circuit

1.3 Name and Model

1.3.1 LGE Part No: EAC62218205

1.3.2 LGC Part Number: EKC18650HE 2-OHITTI

1.4 Label

Label drawing and artwork to be supplied by LGE. UL mark must be labeled.

■ Battery

2.1 Electrical Spec

No	Item	Test Method and Condition	Crite ria
1	Standard charge	Charging the pack initially with constant current at 1250mA and then with constant voltage at 16.8V till charge current declines to 100mA	
2	Rated Capacity	The capacity means the discharge capacity of the pack, which is measured with discharge current of 500mA with 12.0V cut-off voltage after standard charge	≥ 23.9Wh (2290mAh)
3	Cycle Life	Charge : 16.6V, 1.6A, 200mA cut off Charge rest : 10min Discharge : 38W to 14V Discharge rest: 10min Cycle times : 500times	Residual capacity ≥ 80%
4	Self-discharge	After the standard charging, storied the pack under the condition at the 25 for 30 days, then measured the capacity with 0.5C till 12.0V	Residual capacity ≥ 85%
5	Initial impedance	Internal resistance measured at AC 1kHz after 100% charge	≥ 160mΩ
6	Shipping voltage	As of ahipment	14.2~14.7V (within 1 month after pack build)
7	Temperature Characteristics	1. Charge: Standard charge at 23± 5. 2. Capacity: comparison at each temperature, measured with constant discharge current 0.2C with 12.0V cut-off. Percentage as an index of the capacity compared with 100% at 25.	

■ Cautions during the handling of Battery

3. Handling and Cautions

3.1 Disassembly: Never disassemble the battery pack. If the pack is damaged and short circuit is caused by conductive material inflow, overcurrent will flow and there is a risk of device damage or heat generation.

3.2 Handling: It may cause the falling out of soldered area or welded area, so be careful during the handling of the battery pack.

3.3 Short circuit: Be careful of the short circuit of the batter pack. If there is a short circuit in the batter pack, over-current will flow and there is a risk of device damage or heat generation. Do not expose it to heat.

3.4 Exposure to moist environment: Do not use the battery pack in a moist state. The current leakage by the moist of the insulating material inside the pack may cause degradation of the performance.

3.5 Recharging station: Use only the recharging station specified for this battery pack. Using other recharging station other the specification may cause heat generation, flame, or an explosion.

Safety Cautions and Verifications During the Repair

1. Make sure to convert the power to “Off” state when you check, disassemble, or repair the cleaning robot.
   (Turn off the power button at the left backside of the main body.)

2. The circuits used in the cleaning robot are sensitive to static electricity, so repair in an environment without static electricity.
   (Wear antistatic gloves and sleepers.)

3. During the electricity applied inspection of the circuit, do not have pin or coin contact with the recharging part.

4. Make sure to use the designated parts for replacement parts during the repair.

5. Use appropriate tools for repair.

6. Make sure to check the damage of the power cable, etc. before the repair.
   If the sheath is peeled or if there is a short circuit, make sure to firmly connect it and wrap it with insulation tape.

7. Check the parts with problems using the diagnosis program before and after the repair.

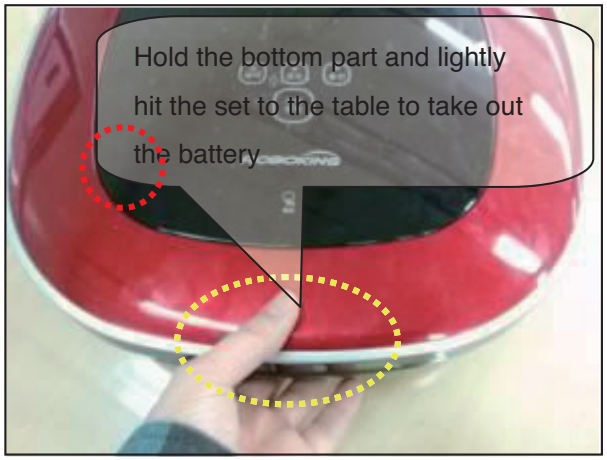
8. Check if the upper part and lower part of the main body are completely combined.
   (It may cause degradation of the suction power or noise generation. Especially, check the handling of the lead line.)

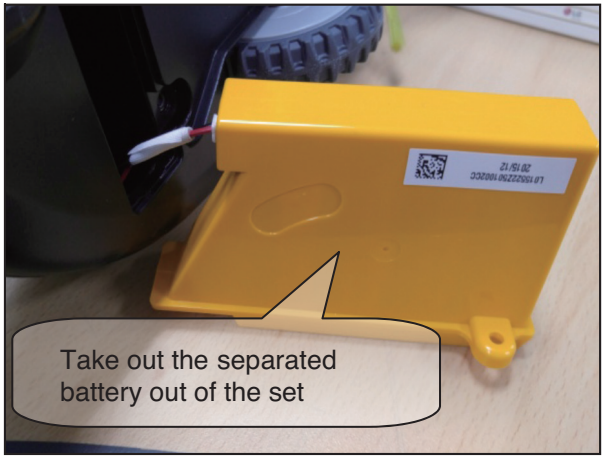
9. Make sure to carry out the insulation test of the motor.
   (It is OK if it is 5㏀ or more between the impeller cover of the motor and the power connector.)

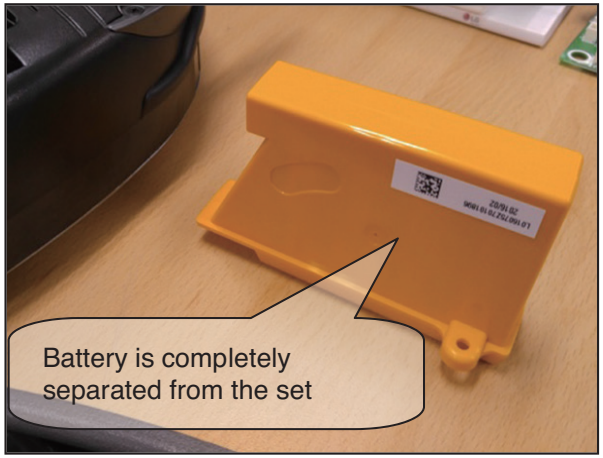
How to Disassemble/Assemble Major Parts

■ Battery Disassembly

Make sure to disassemble the battery before the disassembly/assembly work.
After setting power switch to OFF, then unscrew two battery screws by using a (+) driver and disassemble the battery.

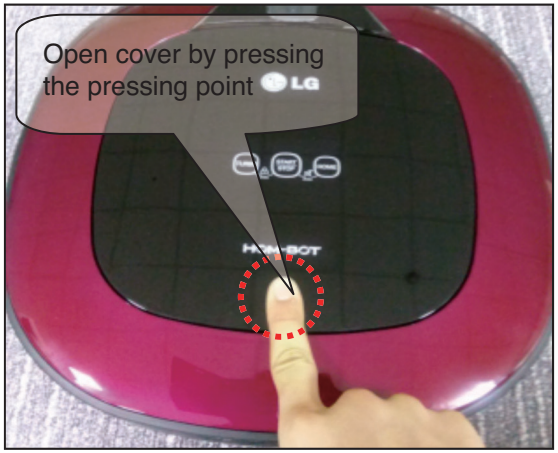




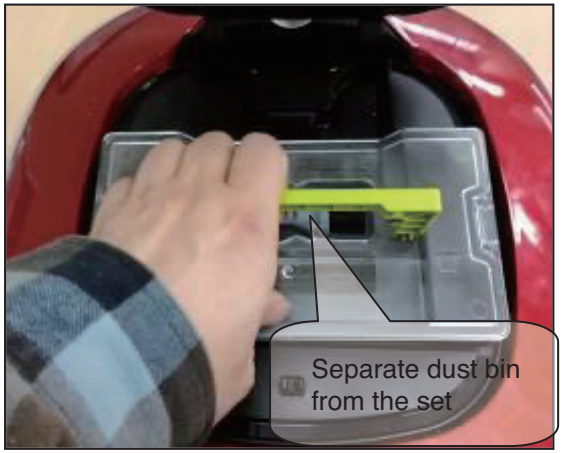


How to Disassemble/Assemble Major Parts

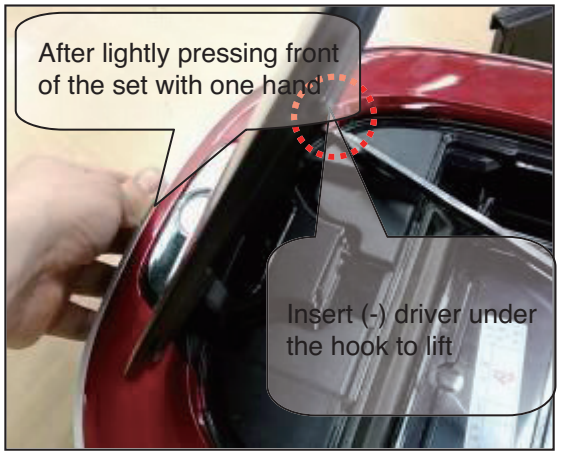
■ Cover Assembly



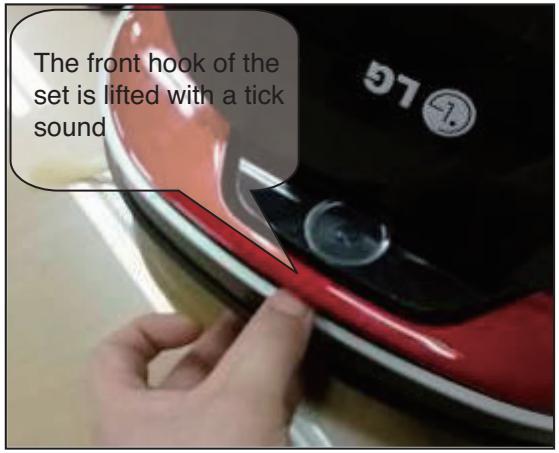
1. Open COVER



2. Take out Dust Bin



3. Separate DÉCOR COVER



3. Separate DÉCOR COVER

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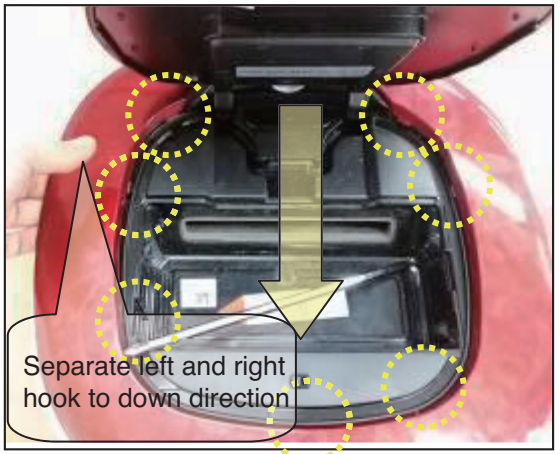
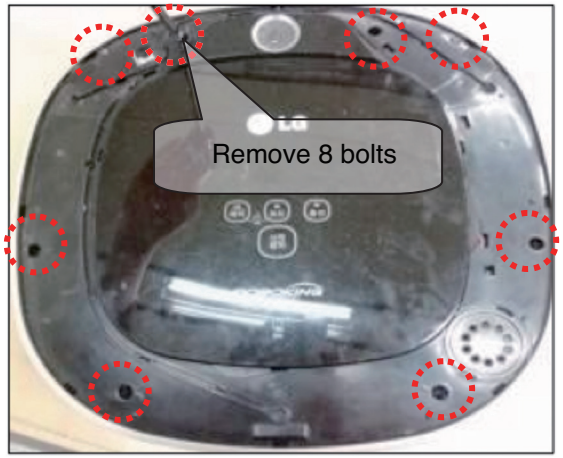


3. Separate DÉCOR COVER

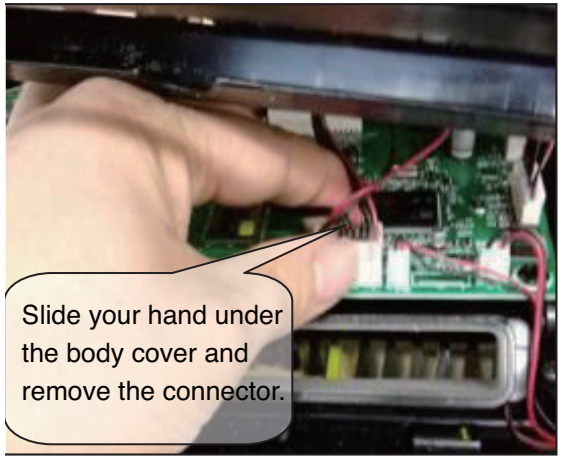
How to Disassemble/Assemble Major Parts

3. Separate DÉCOR COVER

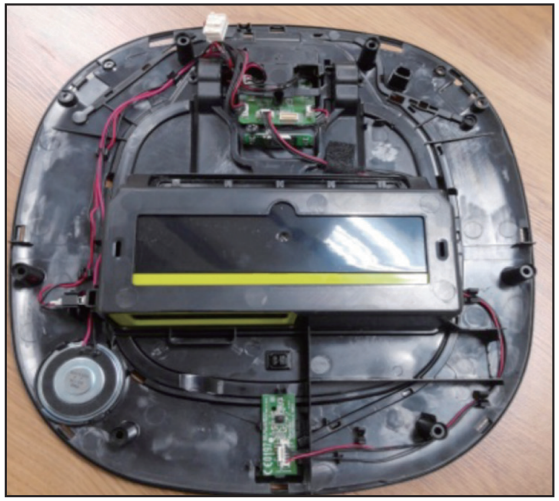


3. Separate DÉCOR COVER

4. Separate BODY COVER

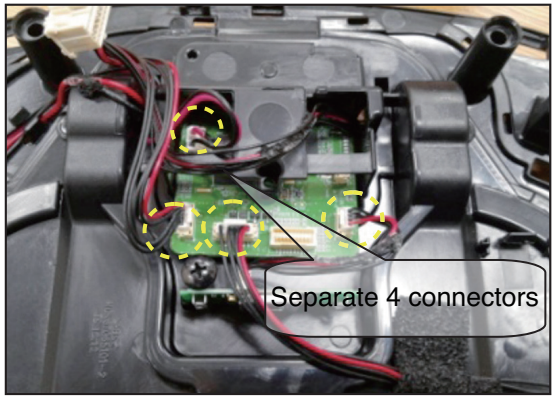


4. Remove the body cover.(2)

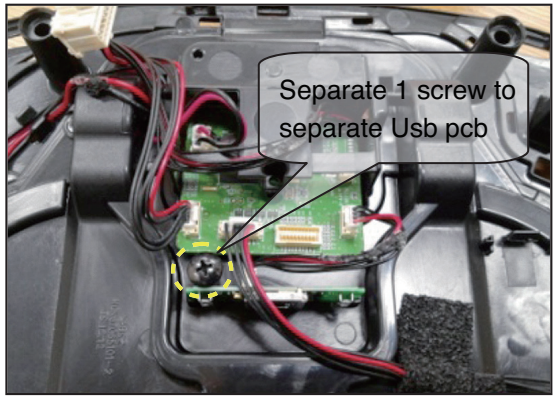


5. Cover assembly is removed.

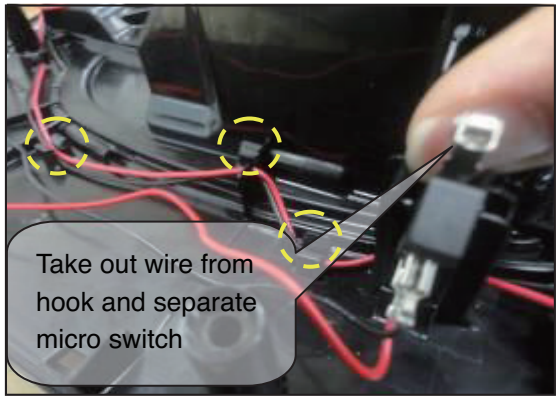
How to Disassemble/Assemble Major Parts



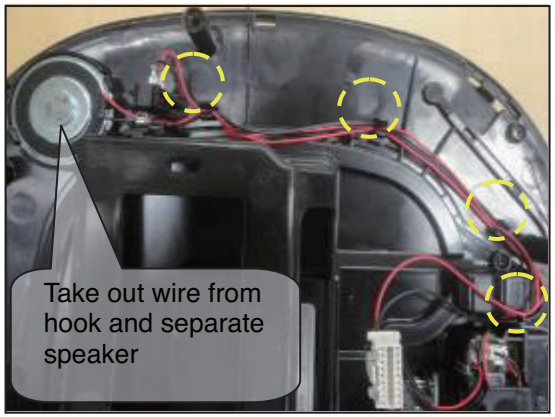
6. Separate VISION BOARD wire



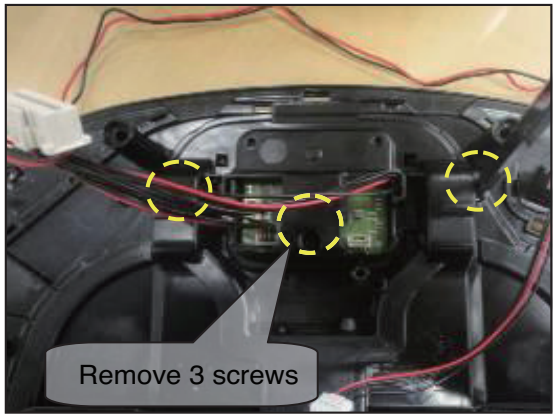
7. Separate Wi-Fi Module after loosening a screw



8. Separate Dust Bin Sensor Switch



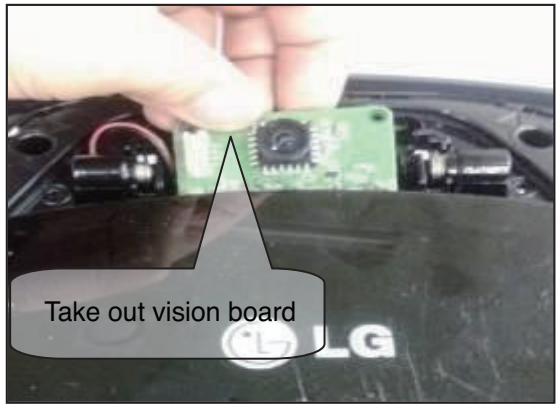
9. Separate Speaker



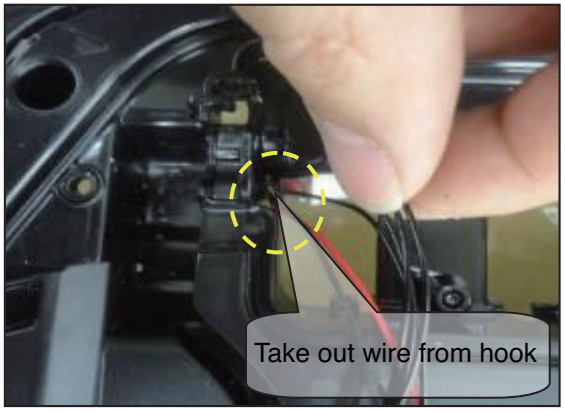
10. Separate WINDOW GLASS

11. Separate WINDOW GLASS

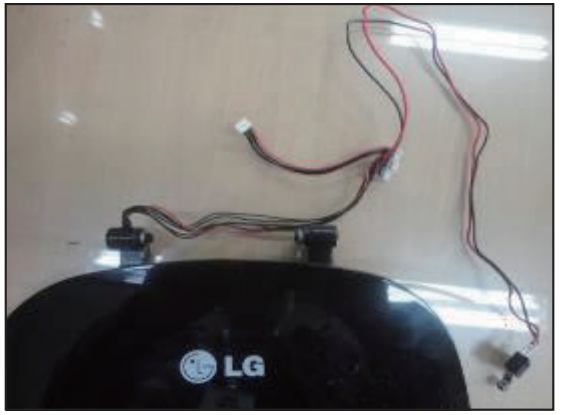
How to Disassemble/Assemble Major Parts



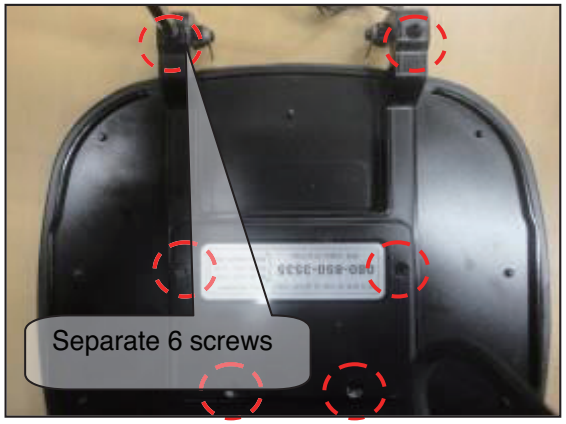
12. Separate VISION BOARD



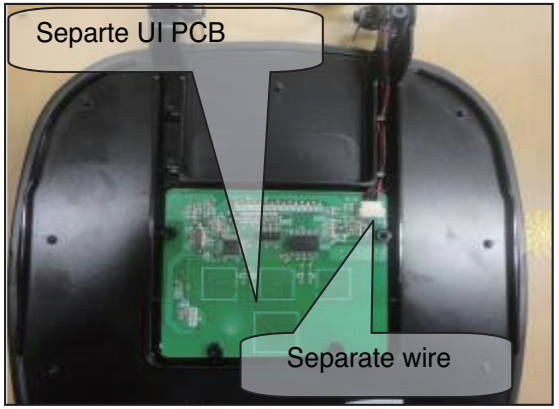
13 . Separate TOP COVER ASS'Y



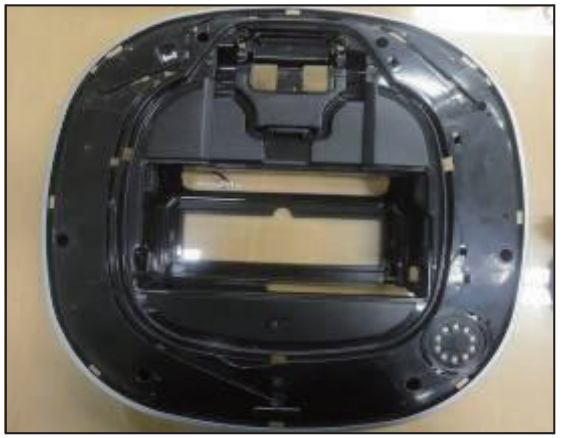
14. After TOP COVER ASS'Y is separated



15. Separate HOLDER

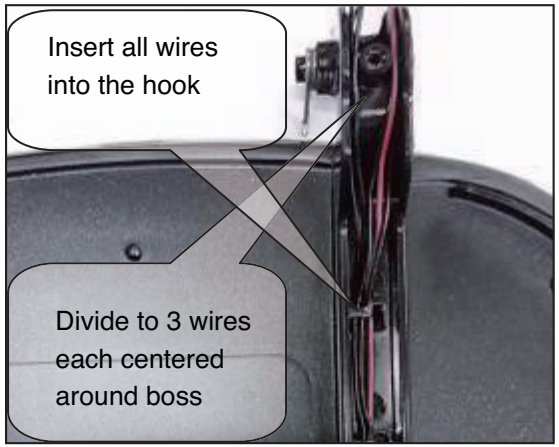


16. Separate UI PCB, wire

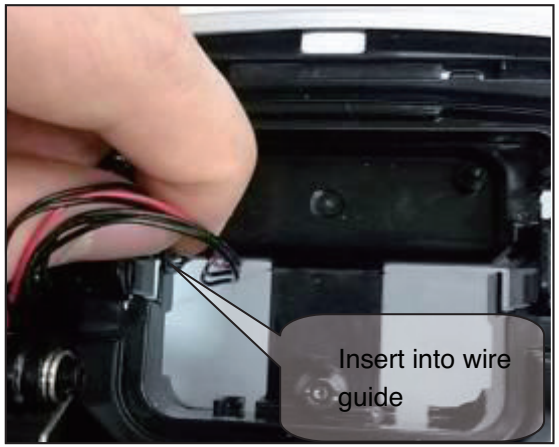


17. After INNER COVER is separated

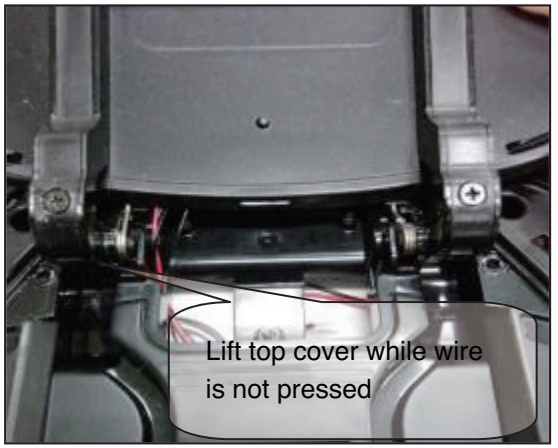
■ Cautions during Top Cover reassembly



During the assembly, wire may be imprinted, so insert into the hook to divided to groups of 3

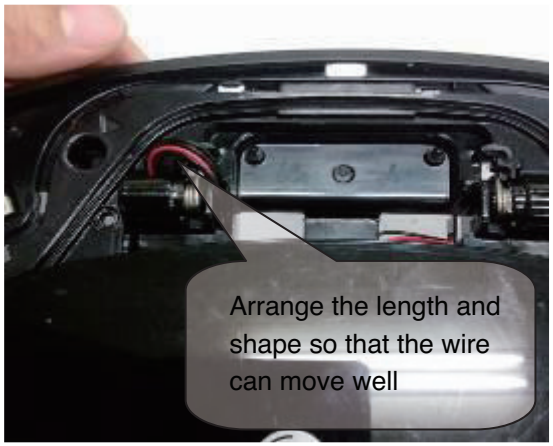


If it is not inserted in to the guide, wire may be pressed by the vision board and disconnected



Arrange the wires not to be stuck in the top cover and lock spring to top cover

Assembly by pressing the ends of both springs using (-) driver

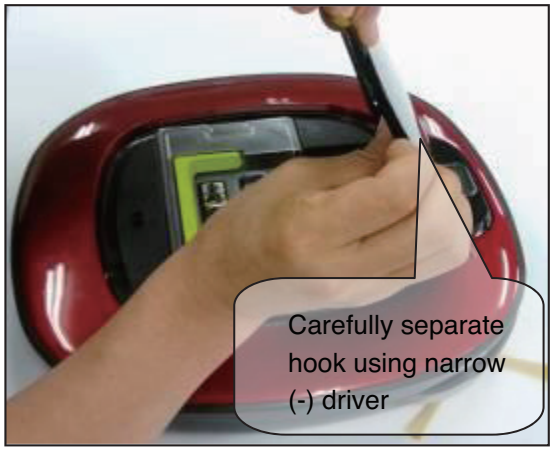


Arrange well after top cover assembly so that the wire can move well

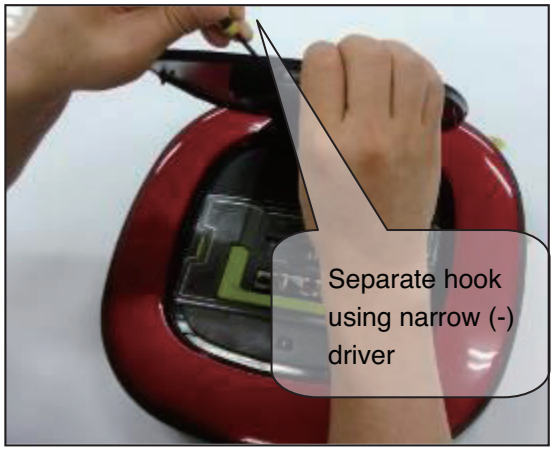
How to Disassemble/Assemble Major Parts

■ Window viewing disassembly

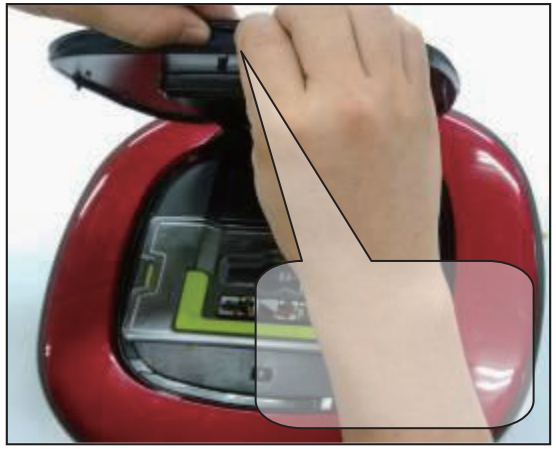
1. Separte left hook
   (Be careful not to break)



2. Separate right hook
   (Be careful not to break)

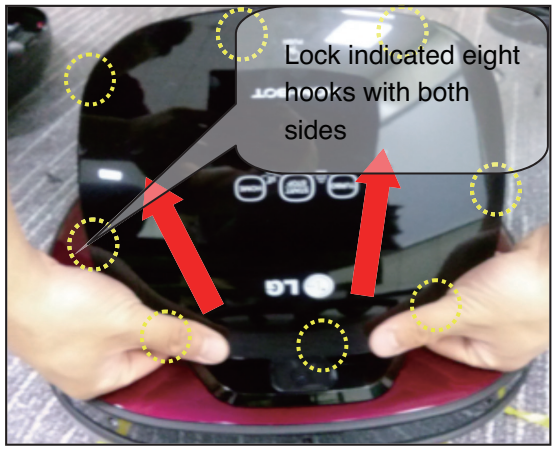


3. Separate center hook
   (Be careful not to break)



4. Separate WINDOW VIEWING (1)

5. Separate WINDOW VIEWING (2)

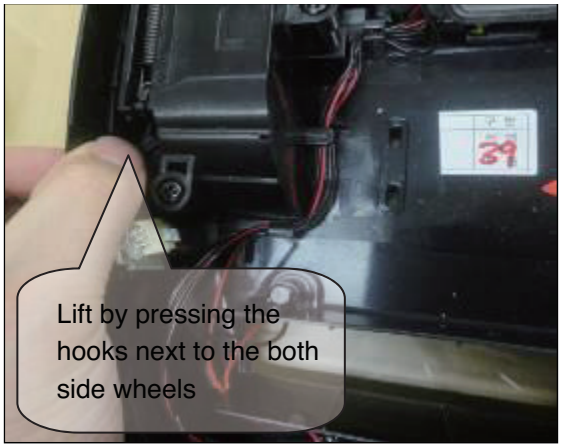


6. Reassemble WINDOW VIEWING

How to Disassemble/Assemble Major Parts

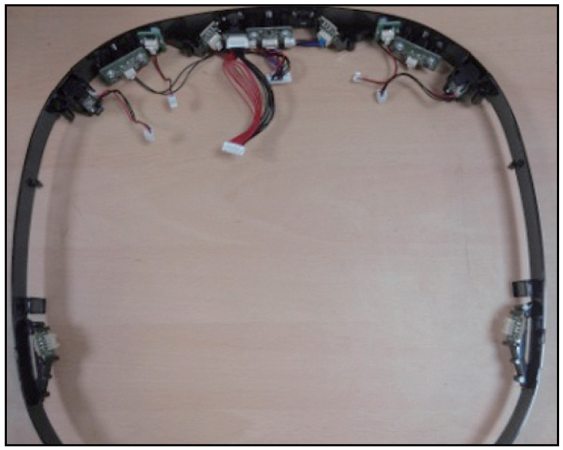
■ Base Assembly

1. Shape of BASE ASSEMBLY

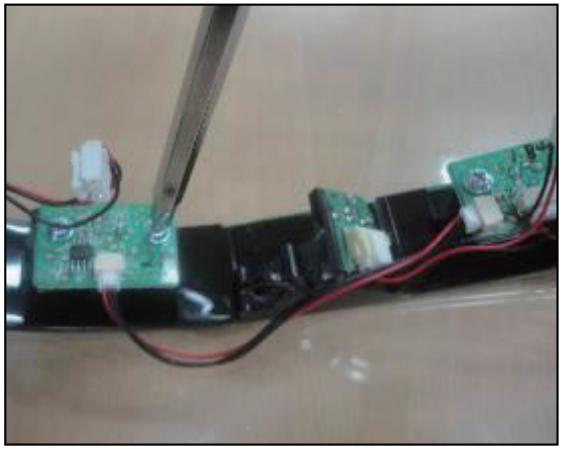


2. Separate WINDOW LED

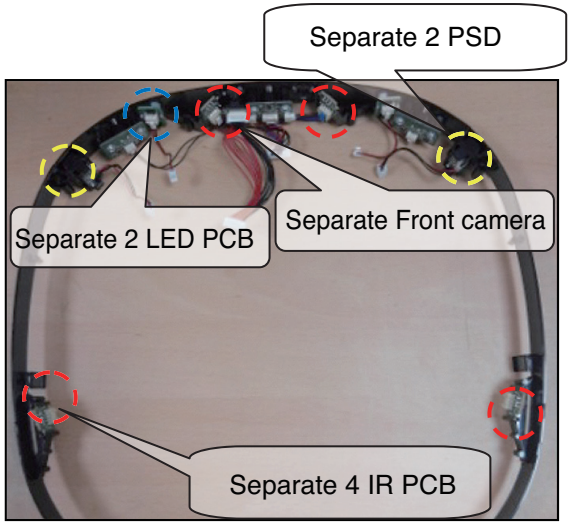
2. Separate WINDOW LED



2. After WINDOW LED is separated

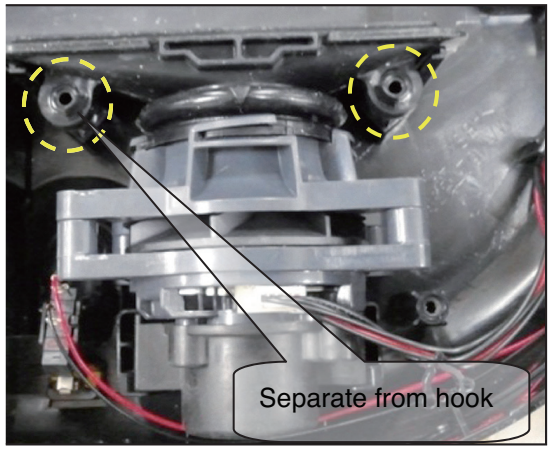


3. Separate Ultrasonic Sensor

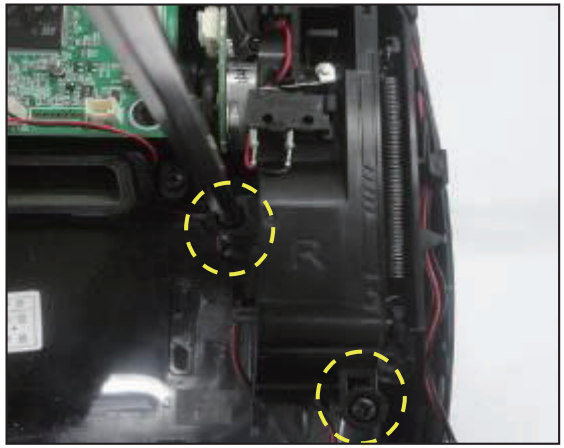


4. Separate IR PCB, PSD sensor, Front camera

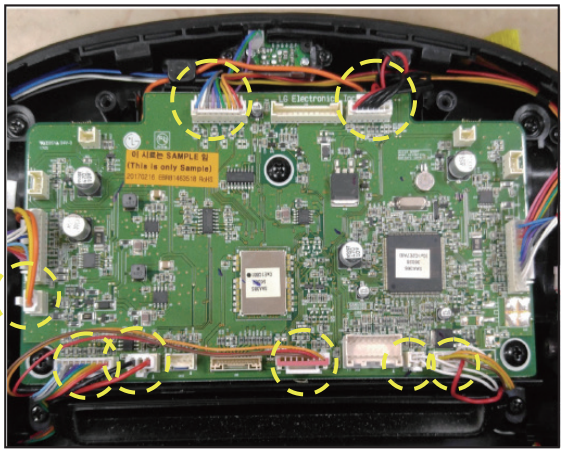
How to Disassemble/Assemble Major Parts



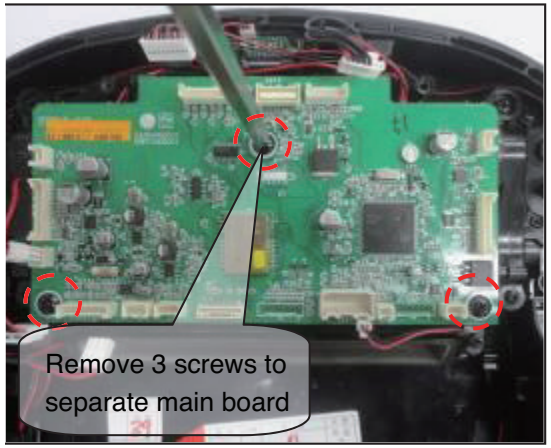
5. Separate SUCTION module



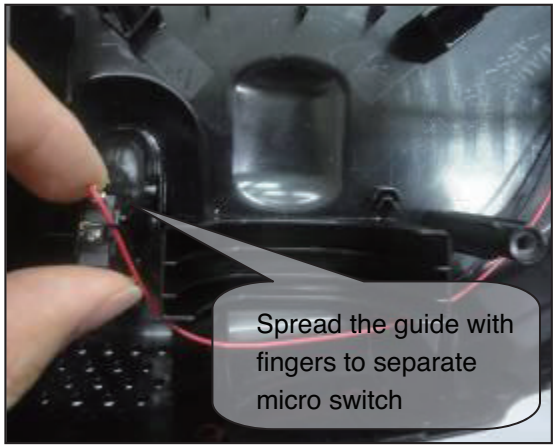
6. Separate both side WHEEL ASS'Y



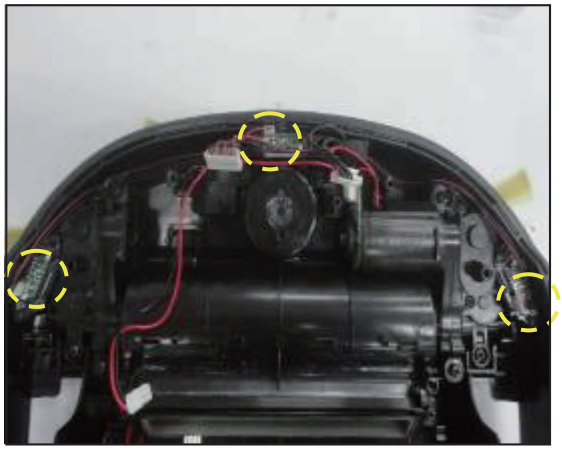
7. Separate main board connector



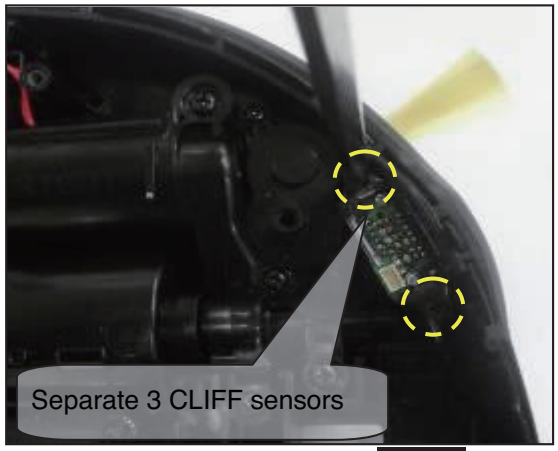
8. Separate main board



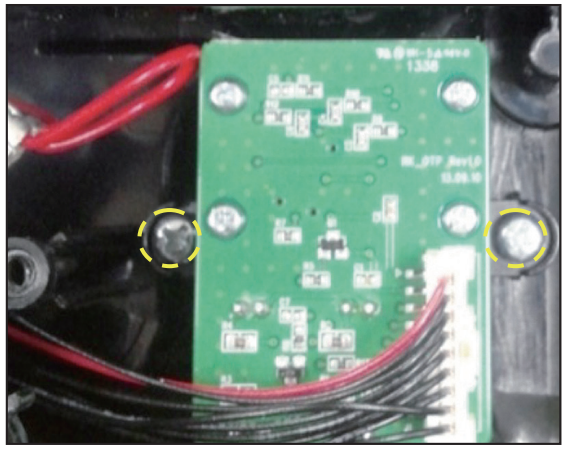
9. Separate MOP sensor wire



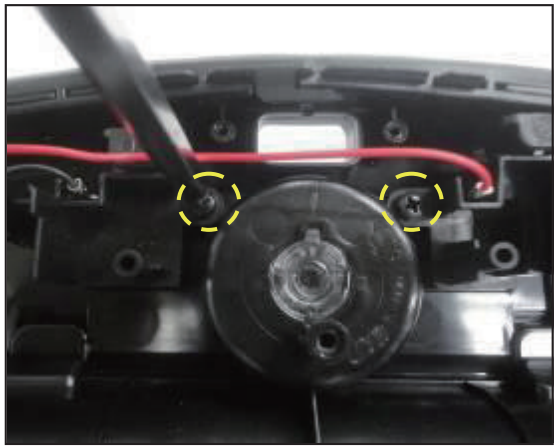
10. Separate CLIFF sensor wire



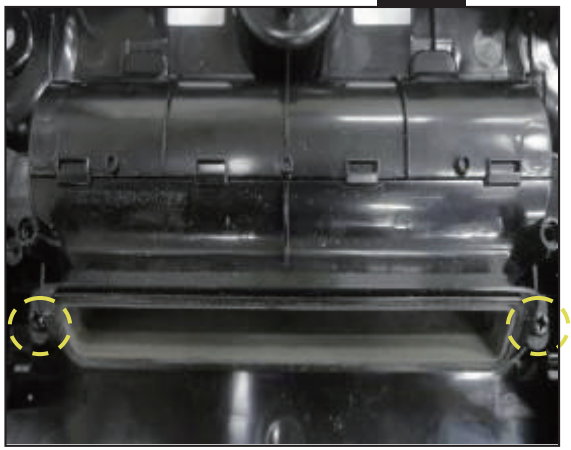
11. Separate CLIFF senso



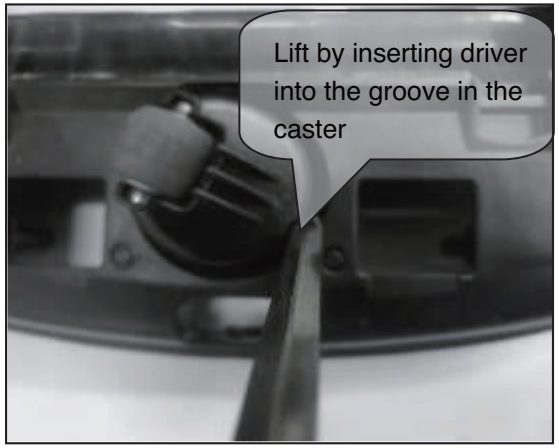
12. Separate OFS sensor



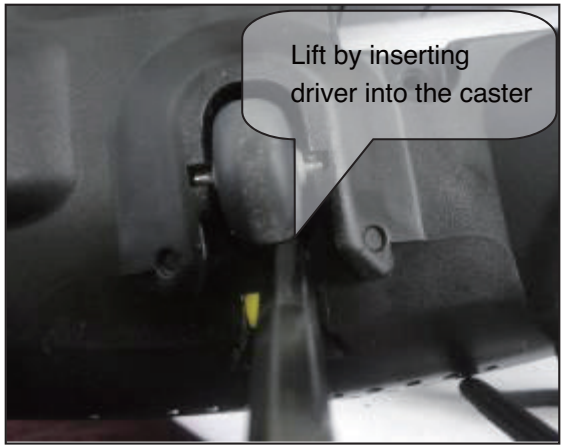
13. Separate recharging connector



14. Separate AIR guide



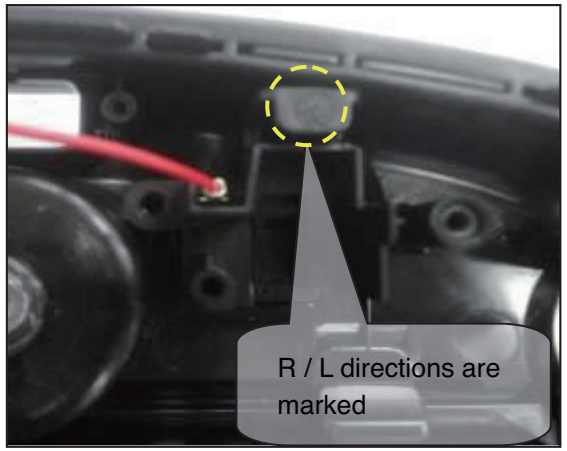
15. Separate front caster



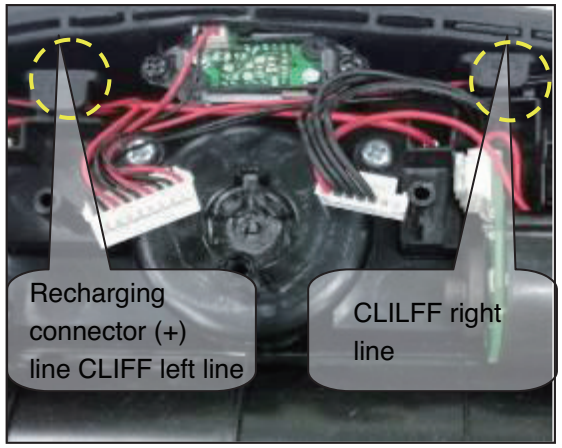
16. Separate rear caster

■ Cautions during Base assembly reassembly

Assemble power switch according to the assembly directions and be careful for the dust prevention cap not to be taken off during the assembly.

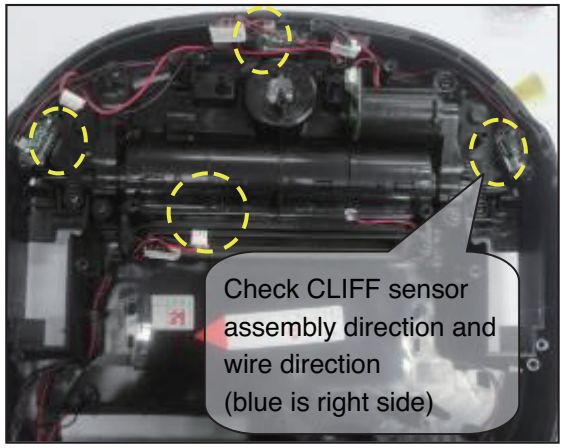


Connector CONTACT has R / L markings, so assemble according to the directions

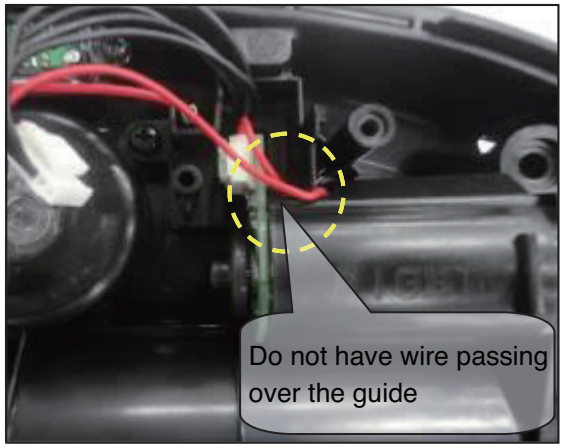


Assemble hamess in the connector CONTACT guide to prevent assembly defect.

First insert the connector, and then assemble CLIFF to minimize the insufficient insertion of the connector during the assembly.

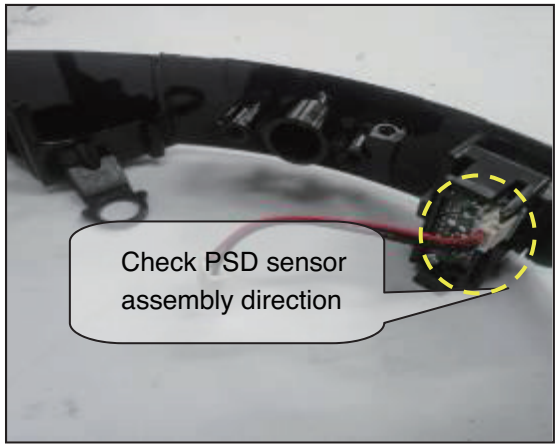


Assemble both side CLIFF to have the connector to be at the bottom, and the central CLIFF to be at the left side

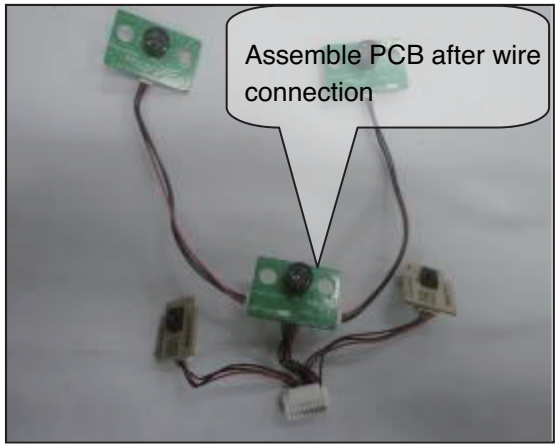


If wire is over the guide, it may be pressed by the main board during the assembly, and it may cause short circuit.

How to Disassemble/Assemble Major Parts

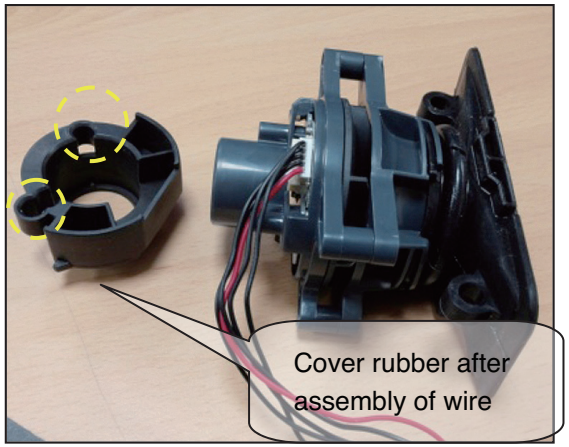


First insert the connector, and assemble both sides PSD for the connector to be at the top

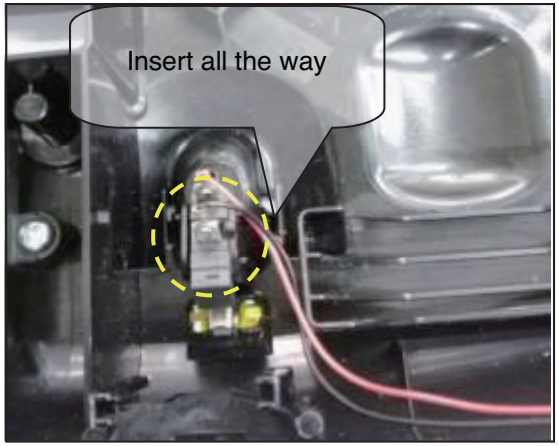


Assemble after inserting all connectors before the assembly of front IR and ultrasonic.

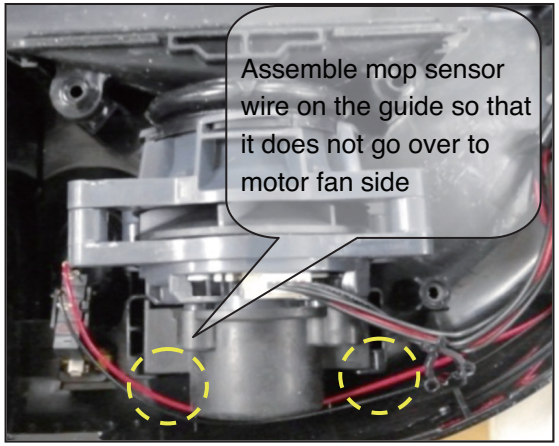
During the assembly of WINDOW LED in BASE, be careful not to have the rear IR wire pressed



After pushing in wire into rubber, assemble TP sensor fully in the guide, and insert connector,

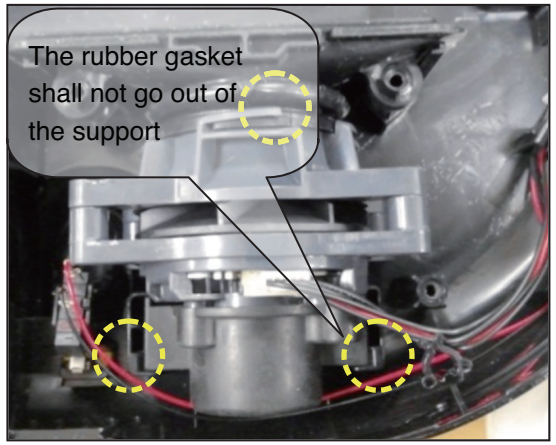


If it is not properly inserted, the mop sensor function will not work properly, so check whether it works after the assembly



If the wire touches the fan, it causes abnormal noise, so firmly fix to the guide.

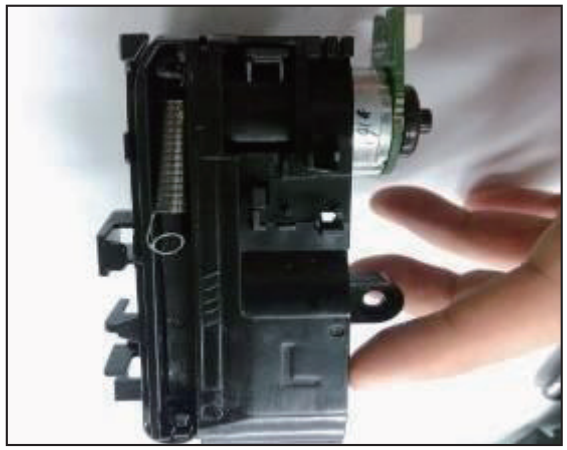
How to Disassemble/Assemble Major Parts



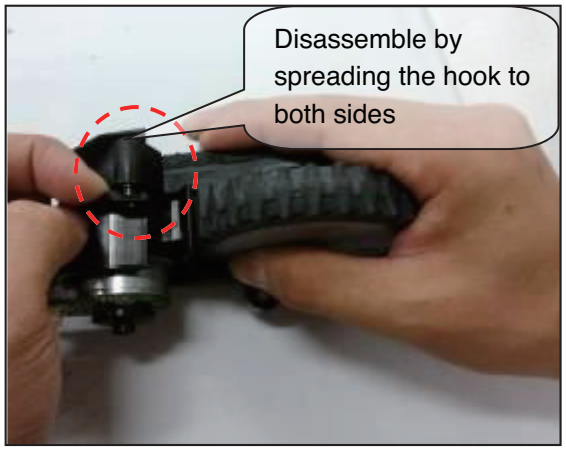
Assemble the marked part to face upward, and assemble rubber gasket inside the support

How to Disassemble/Assemble Major Parts

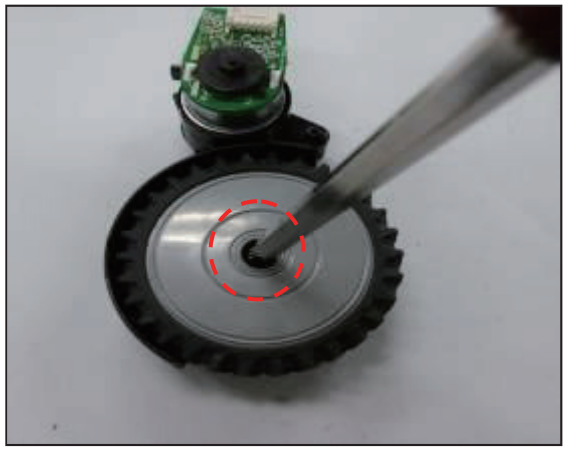
■ Separate Wheel



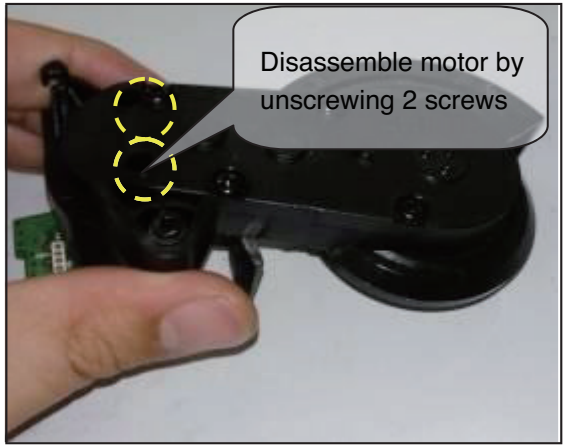
1. Separate harness and spring



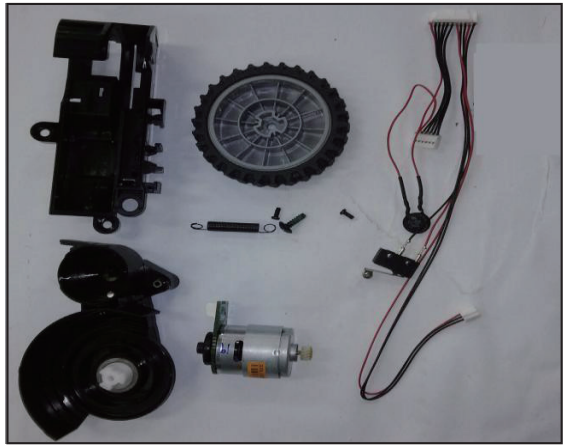
2. Separate COVER WHEEL



3. Separate WHEEL



4. Disassemble Motor

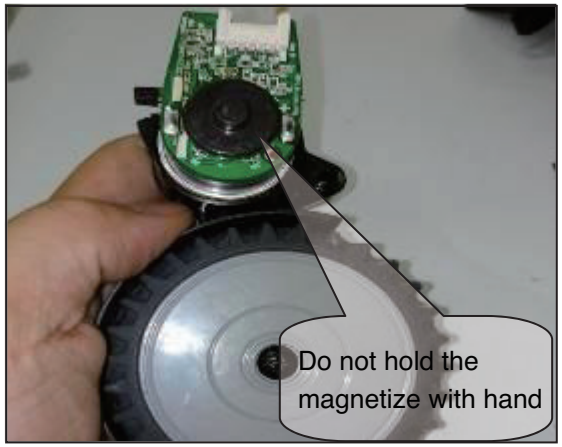


5. When WHEEL is disassembled

How to Disassemble/Assemble Major Parts

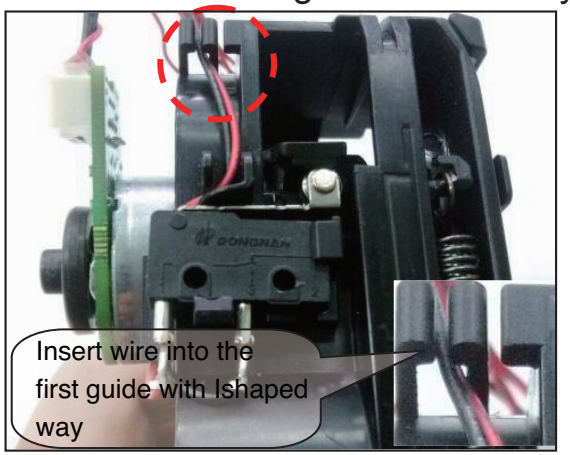
■ Cautions during the reassembly of the Wheel

After inserting motor in the COVER, rotate left and right to assemble according to the 3 holes of the motor and the COVER

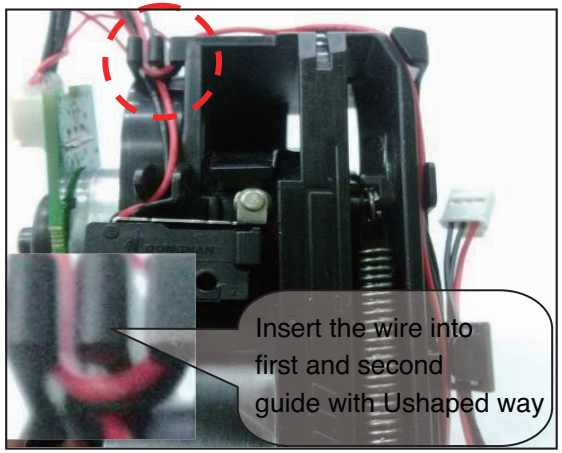


Do not impose unnecessary force on motor PCB or magnetize during the reassembly.

■ Cautions during the reassembly of the Wheel Wire

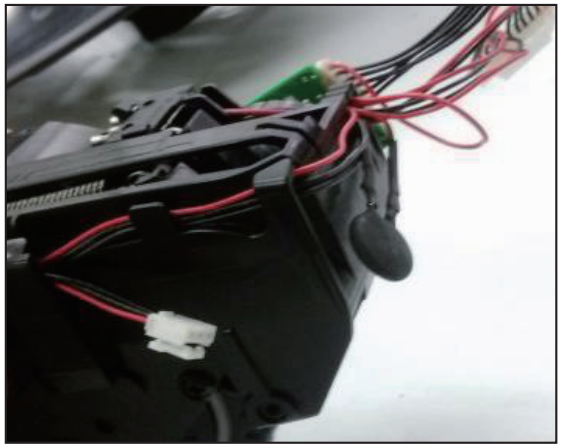


First, insert 2-line wire into the guide after assembly the micro switch



Insert IR signal wire into first and second guide with u-shaped way and wheel cover guide consecutively

How to Disassemble/Assemble Major Parts



Insert NTC wire into wheel cover guide with U-shaped way and then arrange the NTC part.

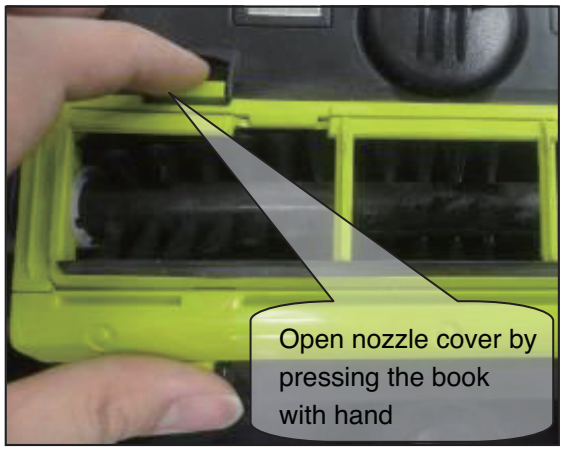
Fasten the wire and NTC with attaching EPDM not to be taken off from wheel assembly

How to Disassemble/Assemble Major Parts

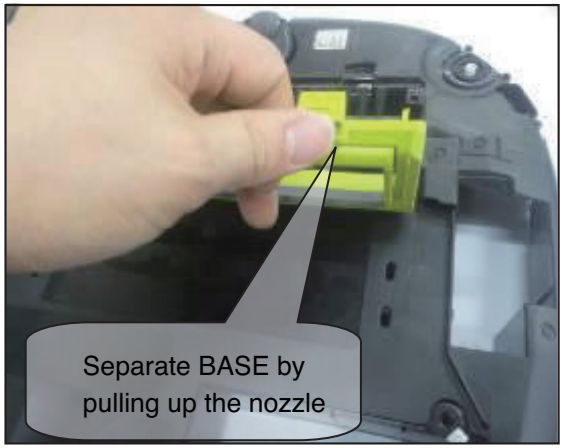
■ Separate Agitator

1. Separate SIDE brush

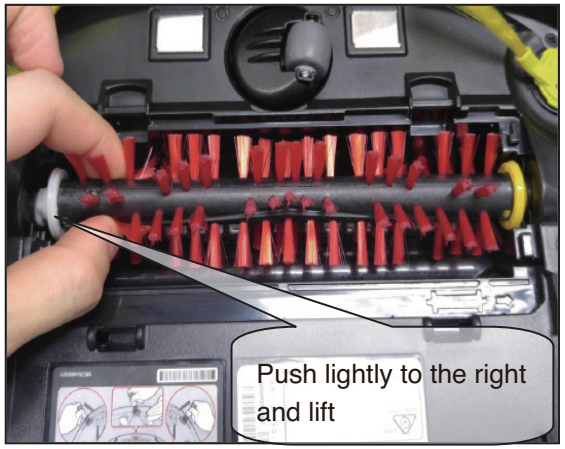
2. Separate COVER DÉCOR



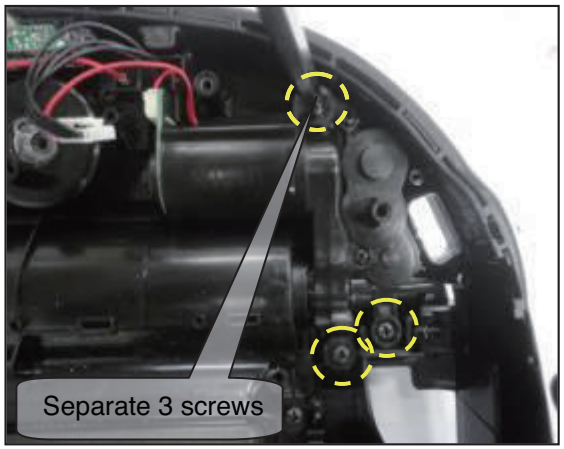
3. Separate BASE ASS'Y nozzle



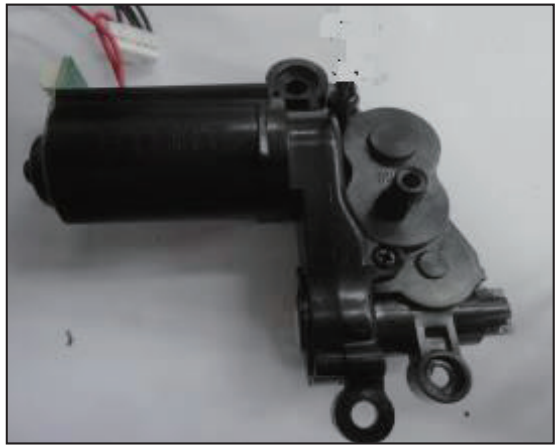
4. Separate BASE ASS'Y nozzle



5. Separate agitator brush



6. Separate agitator motor ASS'Y

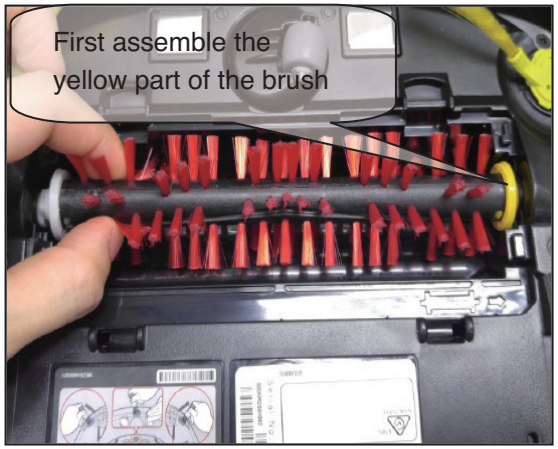


7. Right side agitator motor ASS'Y

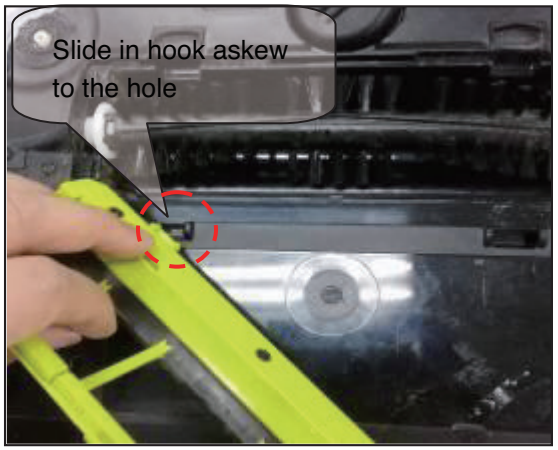
8. Left agitator motor ASS'Y

How to Disassemble/Assemble Major Parts

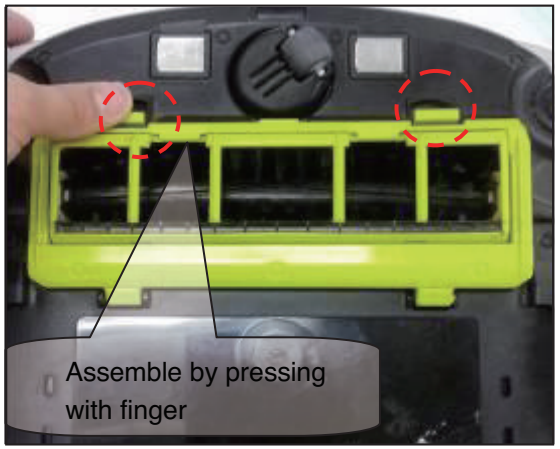
■ Cautions during the reassembly of Nozzle cover



First insert the yellow part, push the bar all the way to the right, and then assemble the left part.



First assemble the left hook

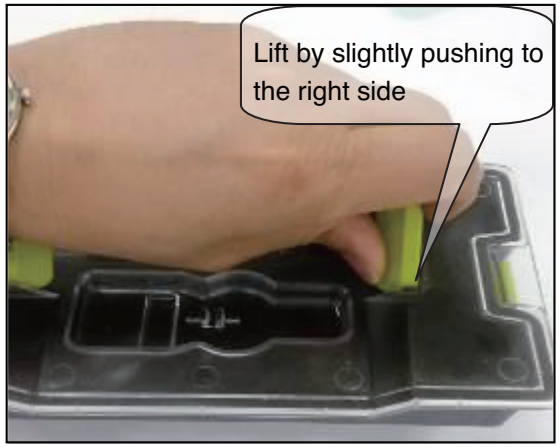


Assemble by pressing the upper side hook with a finger

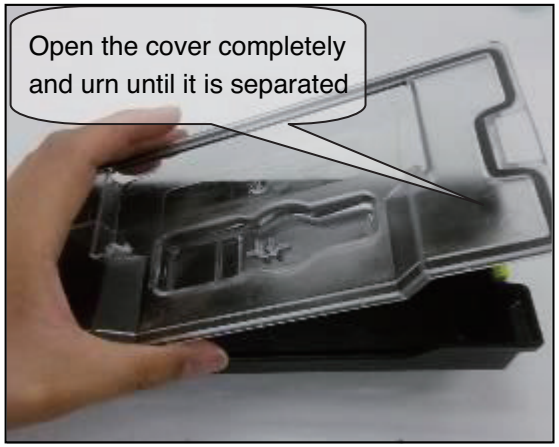
Assemble the hook by pressing hard the right side hook with palm

How to Disassemble/Assemble Major Parts

■ Separate TANK ASS'Y DUST

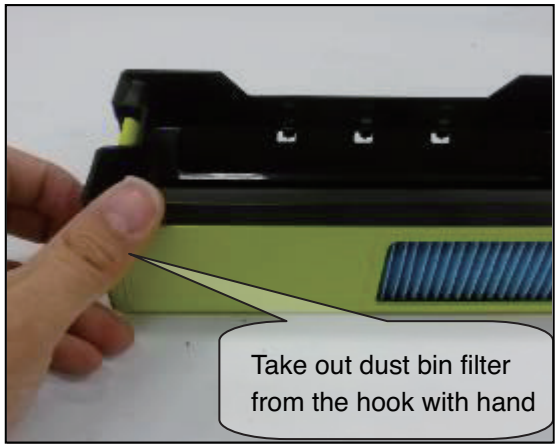


1. Separate handle

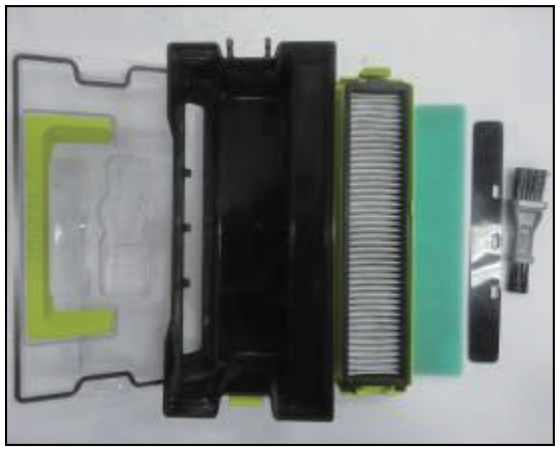


2. Separate dust bin cover

3. Separate PLATE COVER



4. Disassemble dust bin filter

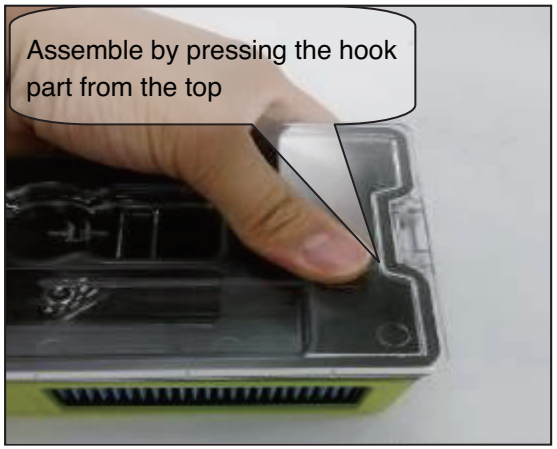


5. Dust bin deal drawing

How to Disassemble/Assemble Major Parts

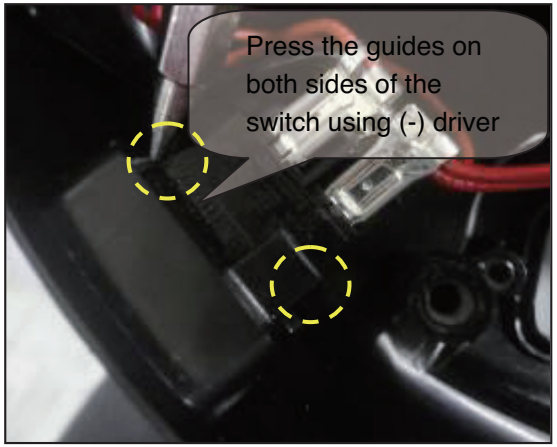
■ Cautions during reassembly of TANK ASS'Y DUST

Place the cover on the dust bin, and assemble by pressing the left part of the cover with hand

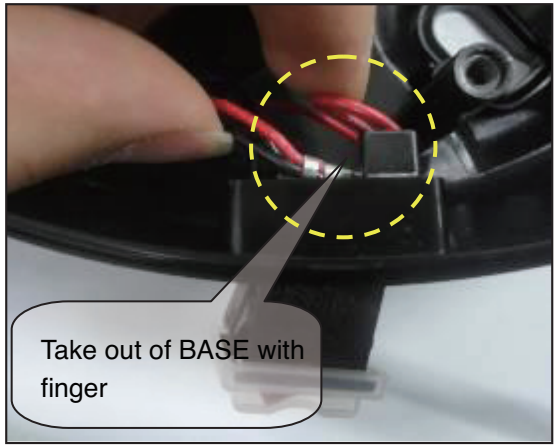


When you lightly hit the right part of the cover, it will be inserted.

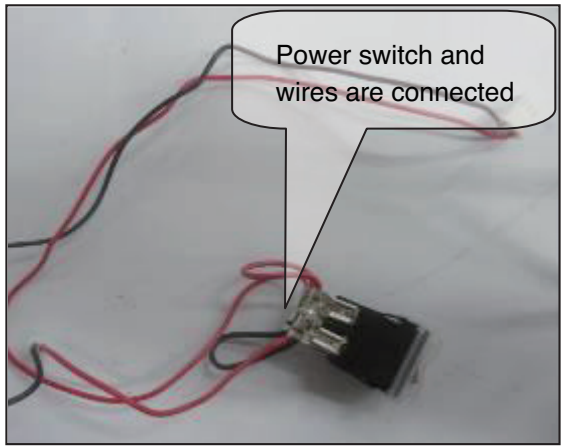
■ Separate power switch ASS'Y



1. Separate power switch (1)

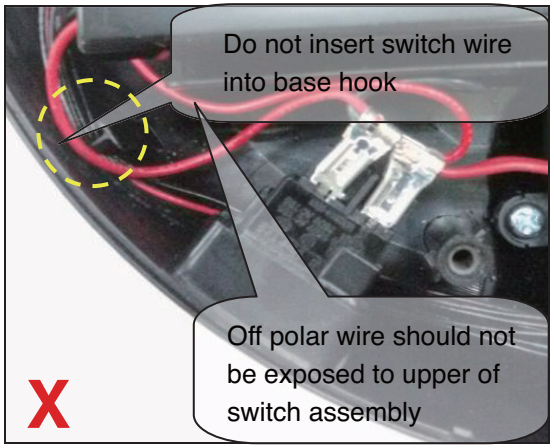


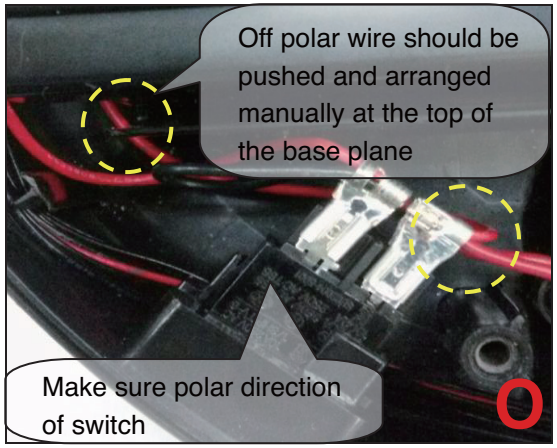
2. Separate power switch (2)



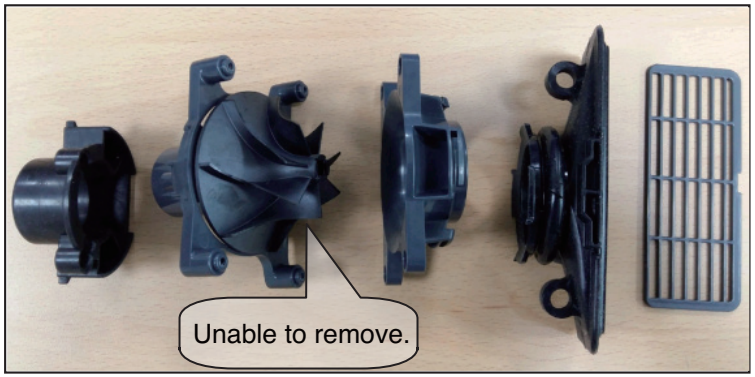
3. Separate power switch (3)

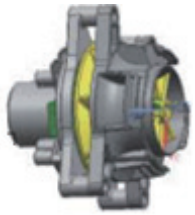
How to Disassemble/Assemble Major Parts





■ Suction module disassembly

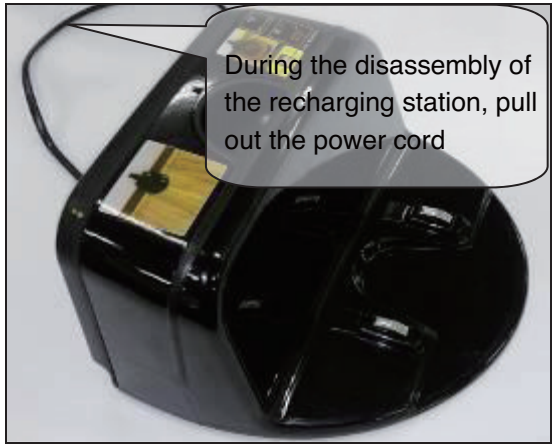




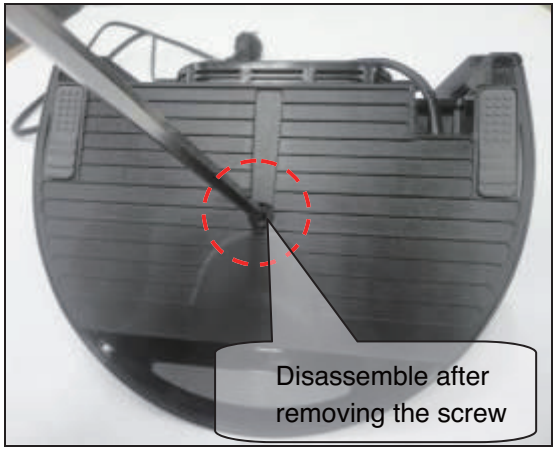
Do not remove motor, fan and motor case behind the diagram on the right.

How to Disassemble/Assemble Major Parts

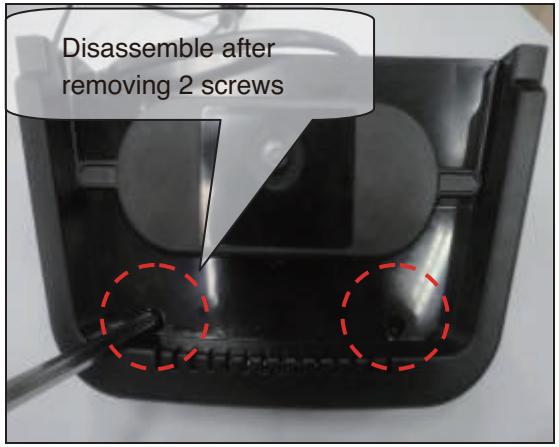
■ Separate power switch ASS'Y



1. Disassemble power cord from condenser

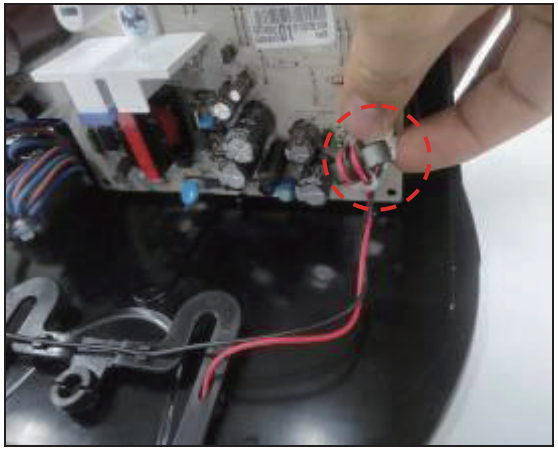


2. Disassemble BODY BASE

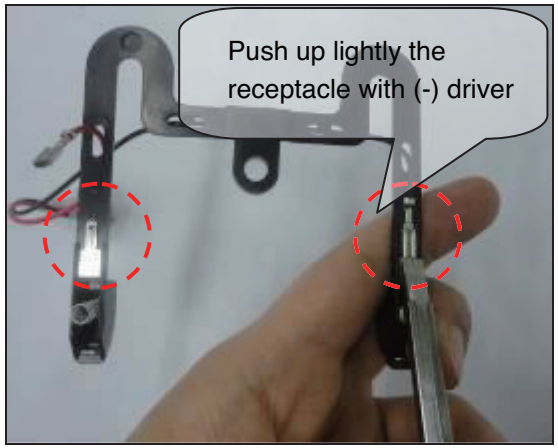


3. Disassemble COVER BODY

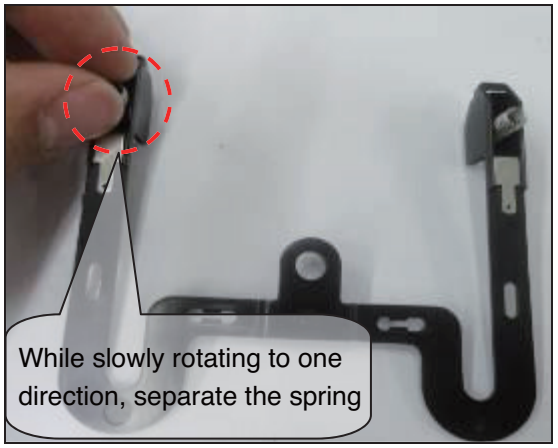
4. Disassemble COVER FRONT



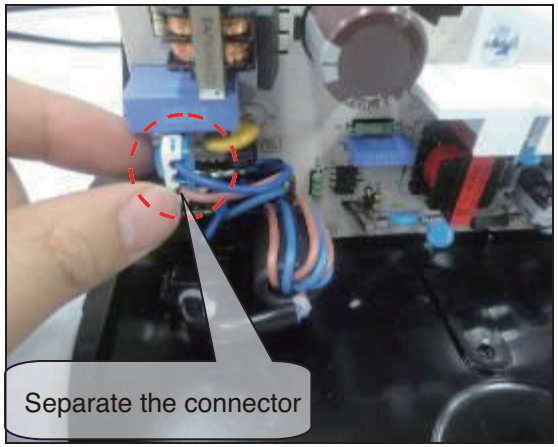
5. Separate connector



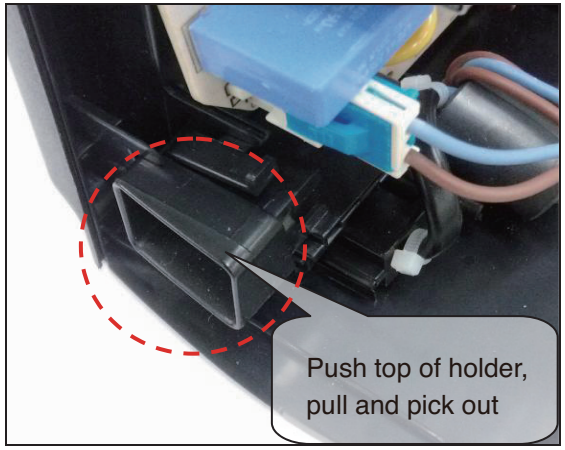
6. Separate wire



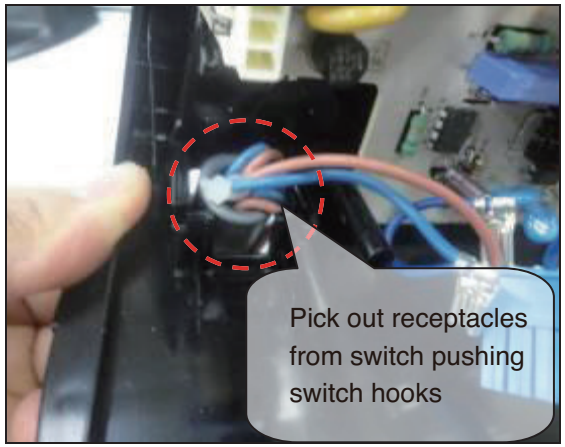
7. Separate spring



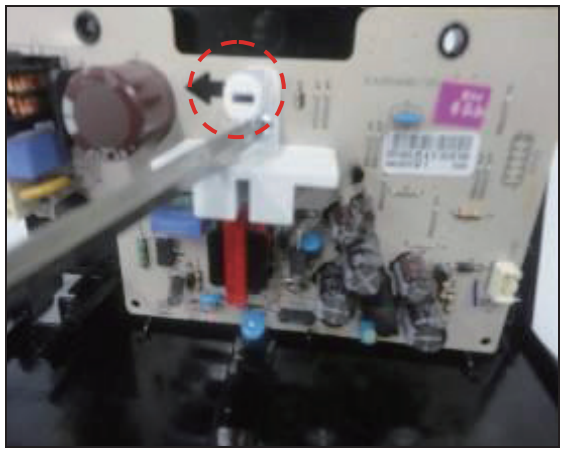
8. Separate power cord (1)



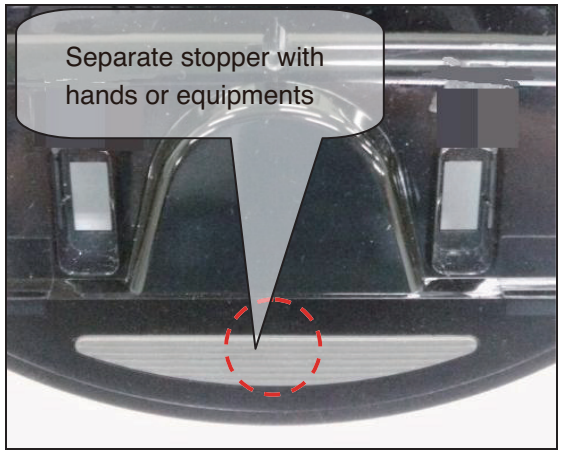
8. Separate power cord (2)



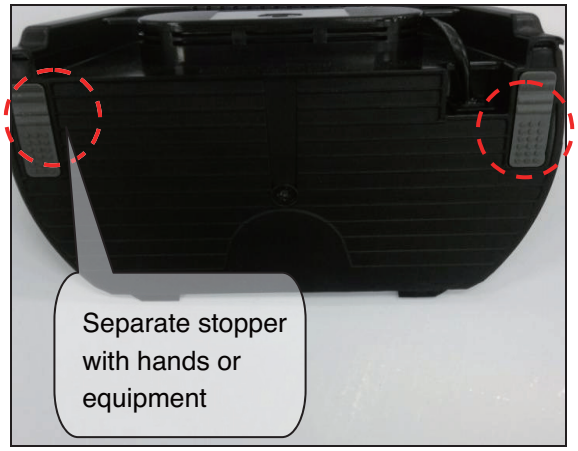
8. Separate power cord (3) (switch-applied)



9. Separate PLATE GUIDE and PCB

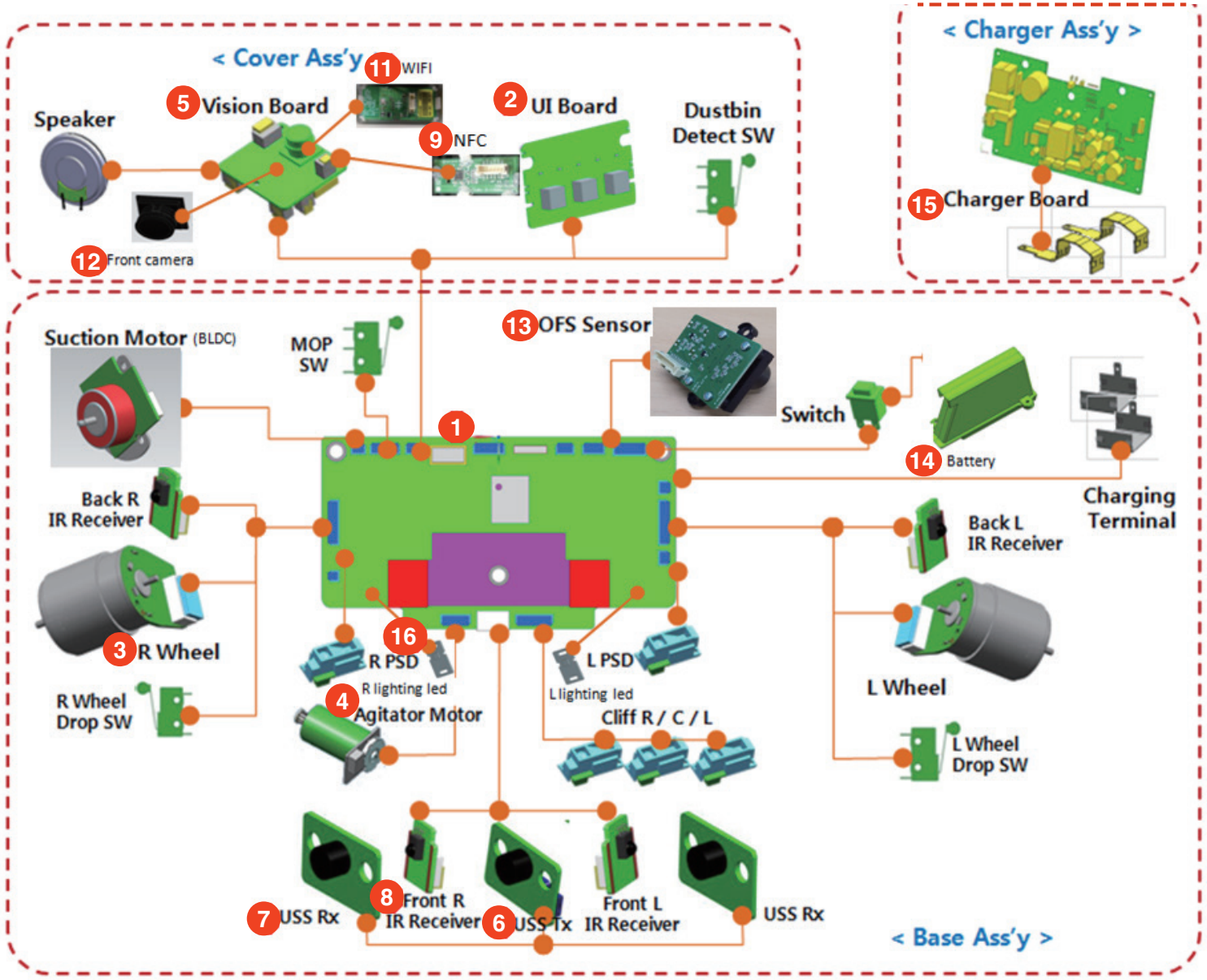


10. Separate STOPPER(1)



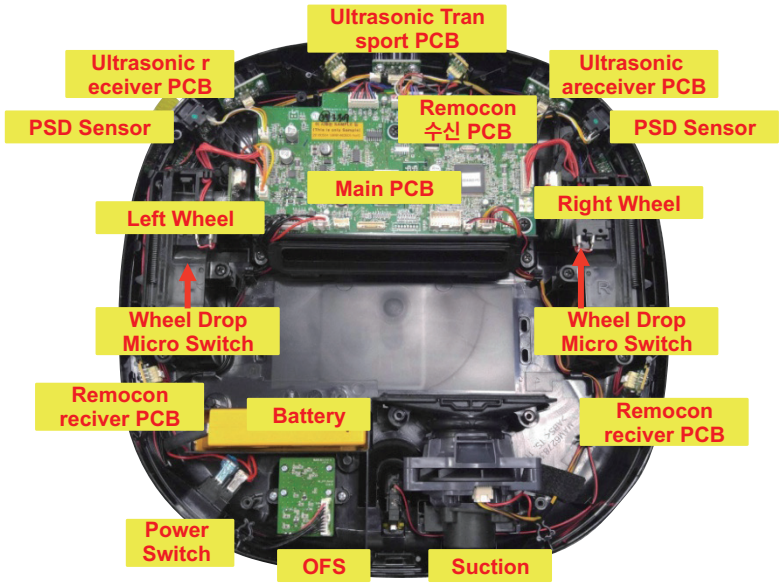
10.Separate STOPER(2)

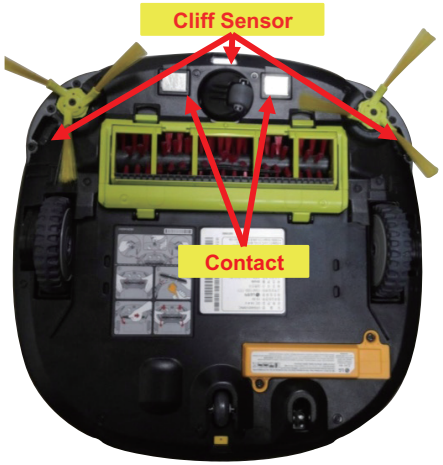
Cabling Diagram



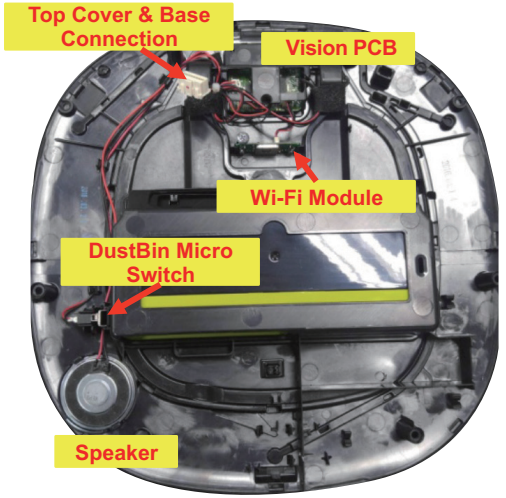
Types of Defects and the Countermeasures

Description
Base





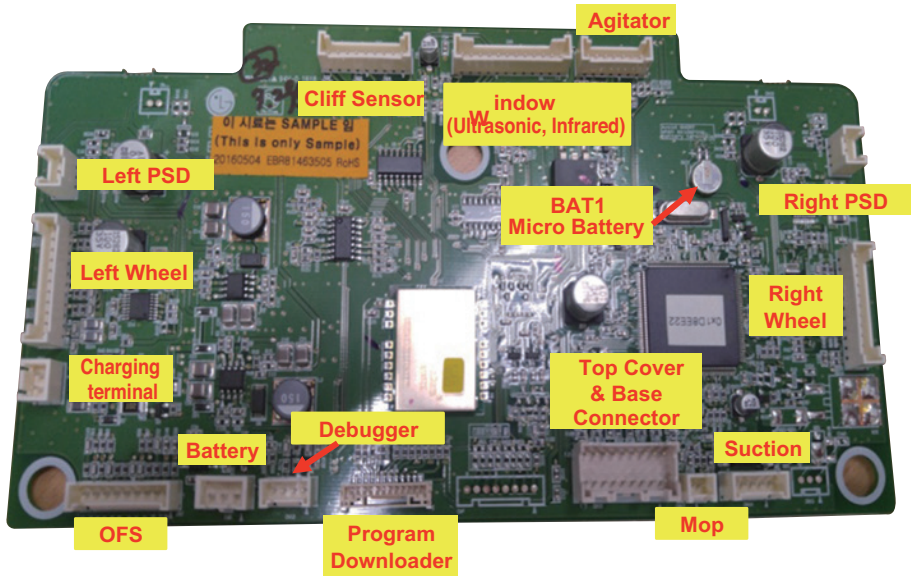
Description
Top Cover



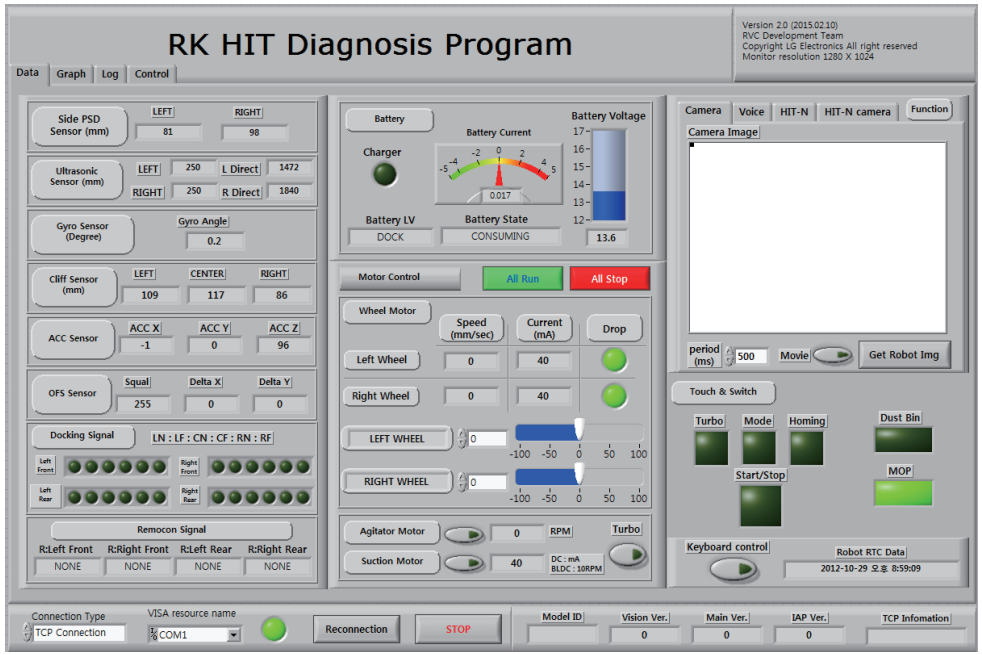
Types of Defects and the Countermeasures

PCB Connection

Main PCB



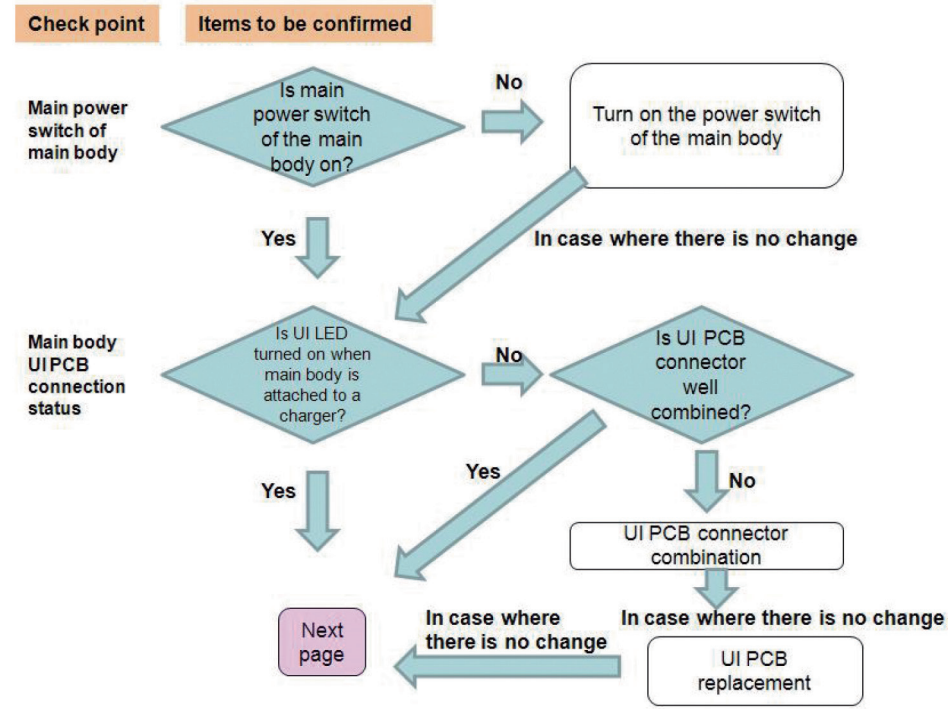
RK HIT DEFECT DIAGNOSIS PROGRAM(R-MANAGER, DEBUGGER)

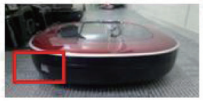


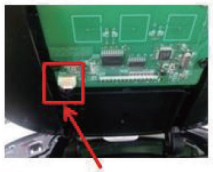
Types of Defects and the Countermeasures

Power defect

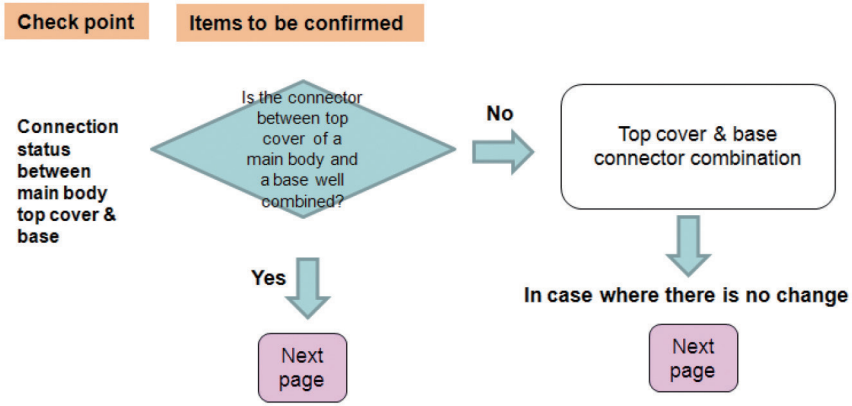
In case where display is not turned on when touching power

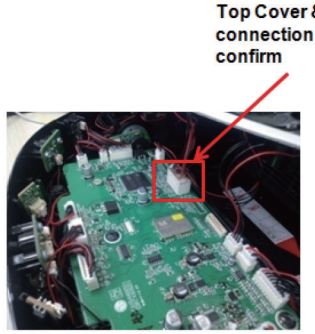






Power defect





Types of Defects and the Countermeasures

Power defect

Check point

Main body battery connection status confirm

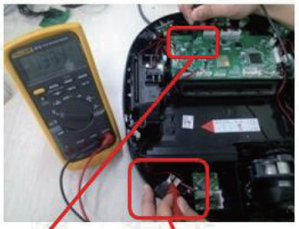
Items to be confirmed

Is the voltage of a battery 13.6V ~ 16.8V?

Yes

Next page

(+) Main power switch terminal
(-) Main PCB C90 left side terminal



C90 left side

Main power switch check point

No

Is the voltage of battery single item 13.6V ~ 16.8V ?

No

Battery replace ment

Yes

Is the resistance of main power switch of the main body short?

Yes

Next page

No

Main power switch replacement

(+) Main power switch terminal
(-) Main PCB CN6 number 1 pin

Power defect

Check point

Main body main PCB confirm

Items to be confirmed

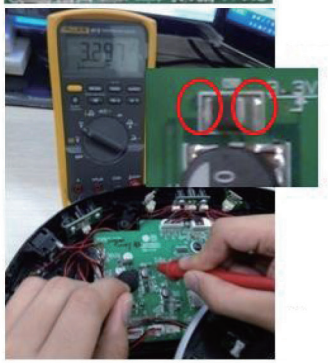
Is 3.3V of main PCB normally output when power is on?

Yes

Is 5V of main PCB normally output when power is on?

Yes

Normal
※ In case where there is a problem : Sub PCB confirm is required



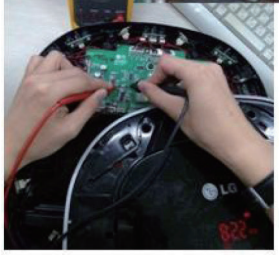
(+) Main PCB C90 right side terminal
(-) Main PCB C90 left side terminal

No

Try again after replacing main PCB

No

Try again after replacing main PCB

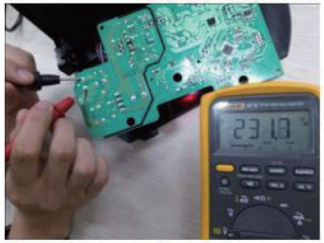


(+) Main PCB C91 right side terminal
(-) Main PCB C91 left side terminal

Charge defect

In case where charger power LED is not turned on

Check point	Items to be confirmed
Charger PCB AC input confirm	Is AC input voltage 220~230Vac?



(+) CN1 number 1 pin
(-) CN1 number 3 pin

Yes

Charger PCB replacement

No

Is charger power cord a normal product?

Yes

Normal product

No

Power cord replacement

Charge defect

In case where the charge display and sound are not output when the main body is placed on a charger

Check point	Items to be confirmed
Charge terminal foreign body confirm	Are the charger charge terminal and main body charge terminal clean?

No

Try again after removing foreign bodies of charge terminal

Yes

Charger charge terminal voltage confirm	Is charger terminal voltage 4.5V ~ 5.5V ?

Yes

Next page

No

Are charger and main body charge terminal single item normal?

No

Charge terminal connector replacement

Yes

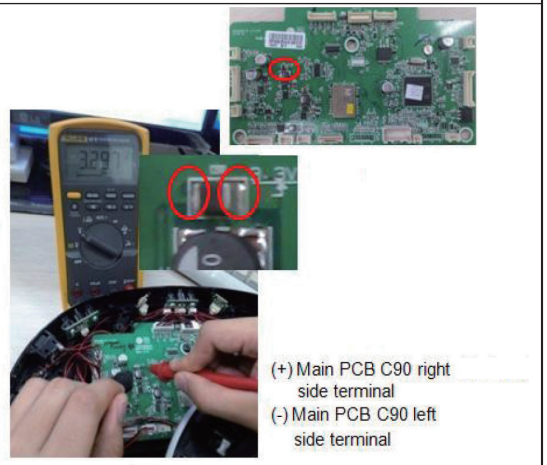
Types of Defects and the Countermeasures

Charge defect

Check point | **Items to be confirmed**

Main body main PCB confirm

Is 3.3V of main PCB normally output when power is on?



(+) Main PCB C90 right side terminal
(-) Main PCB C90 left side terminal

Yes

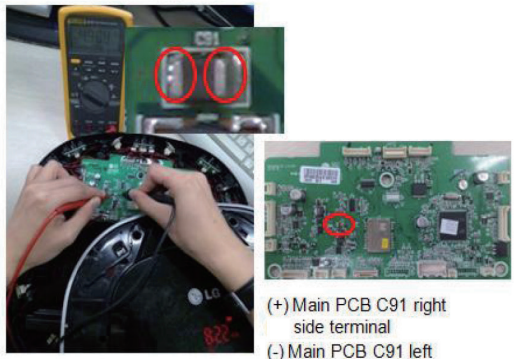
No

Try again after replacing main PCB

Is 5V of main PCB normally output when power is on?

Yes

Main PCB replacement



(+) Main PCB C91 right side terminal
(-) Main PCB C91 left side terminal

No

Try again after replacing main PCB

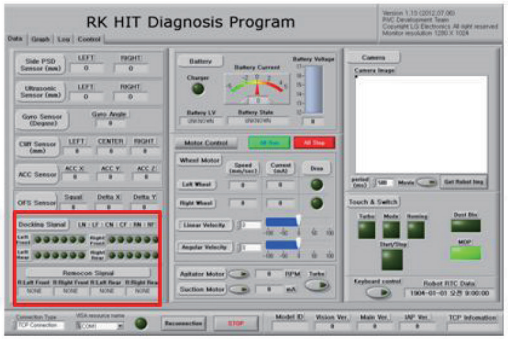
Charge defect

In case where the main body does not docking on a charger

Check point | **Items to be confirmed**

Docking signal confirm

Is the docking signal on debugger received?



No

Charger dispatch part confirm

Is the docking signal of charger correctly dispatched?

Possible to confirm that the light of infrared rays sensor is blinking when the reception part of charge PCB is filmed by a camera

Yes

Next page

Main body reception part confirm

No

Try again after replacing charger PCB

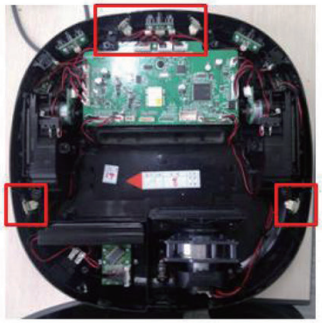
Types of Defects and the Countermeasures

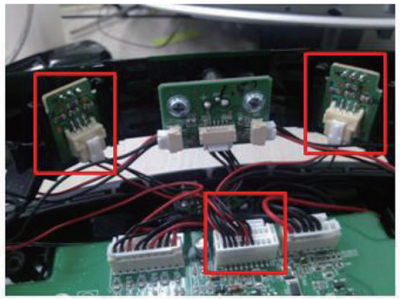
Charge defect

Check point | **Items to be confirmed**

Remote controller reception part PCB confirm

Is PCB connector of a remote controller part normally combined? → **No** → Try again after recombining of the connector





Yes

Try again after replacing IR PCB

In case where there is no change

Try again after replacing main PCB

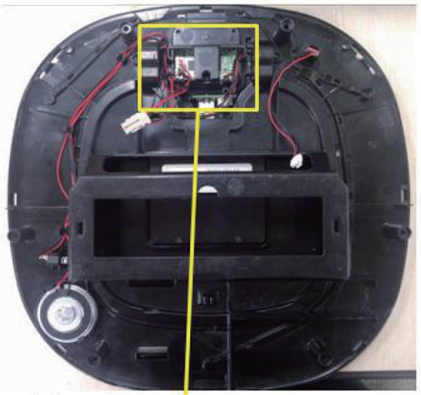
Booting defect

In case where display is indicated but the main body is not correctly booting

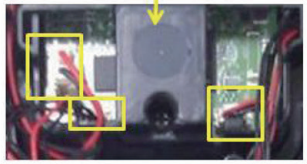
Check point | **Items to be confirmed**

Main body Vision PCB connection status confirm

Is top cover vision PCB connector correctly combined? → **No** → Try again after combining of vision connector



Top cover



Yes

Vision PCB replacement

Types of Defects and the Countermeasures

Time indication defect

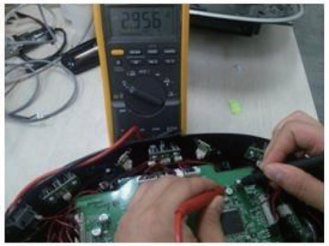
In case where time is indicated as 12:00 whenever main body is booting

Check point

Main body main PCB micro battery voltage confirm

Items to be confirmed

Is the voltage of both ends of BAT1 of main PCB 2.8V ~ 3.3V when a main power switch of the main body is on?



(+) Main PCB BAT1 left side terminal
(-) Main PCB BAT1 right side terminal

BAT1 : Micro battery

No

BAT1 replacement (Soldering)

Yes

Main PCB replacement

Rotating at the same place

In case where the main body is rotated at the same place when cleaning starts or in the middle of cleaning

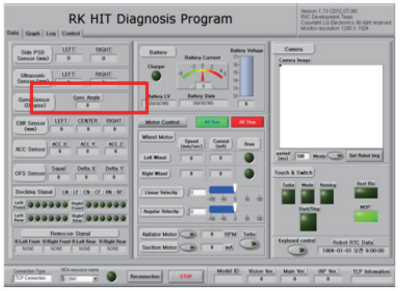
※ Begin after removing all the barriers within 1m of surrounding when inspecting

Check point

Main body ultrasonic waves confirm

Items to be confirmed

Is debugger value 250 when there is no barrier?



No

Is the connector well combined?

No

Connector combination

In case where there is no change

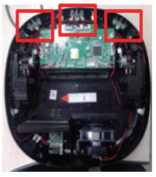
Ultrasonic waves PCB replacement

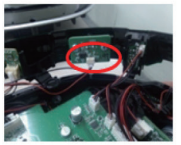
Yes

Is the value continuously changed when there is a barrier?

Yes

Ultrasonic waves sensor is normal





In case where there is no change

Main PCB replacement

Types of Defects and the Countermeasures

Circle around the same place / barrier sensing complaint_Untrasonic waves sensor confirm

In case where the main body is not be able to go out of a certain area when cleaning starts or in the middle of cleaning

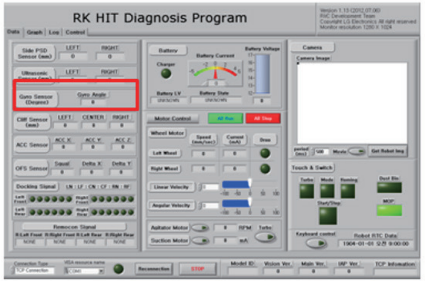
※ Begin after removing all the barriers within 1m of surrounding when inspecting

Check point

Main body ultrasonic waves confirm

Items to be confirmed

Is debugger value 250 when there is no barrier?



No

Is the connector well combined?

No

Connector combination

In case where there is no change

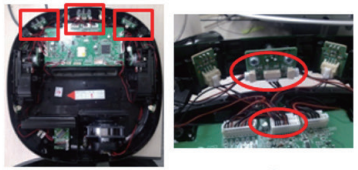
Ultrasonic waves PCB replacement

Yes

Is the value continuously changed when there is a barrier?

Yes

Ultrasonic waves sensor is normal



In case where there is no change

Main PCB replacement

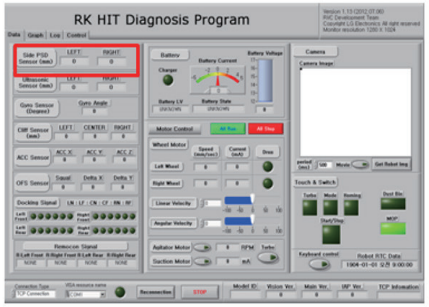
Circle around the same place / barrier sensing complaint_Position sensor (PSD) confirm

Check point

Main body position sensor (PSD) confirm

Items to be confirmed

Is position sensor debugger value 150 when there is no barrier?



No

Is the connector well combined?

Yes

Next page

No

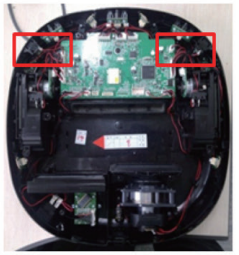
Connector combination

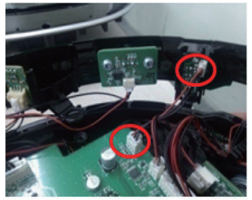
Yes

Is the value continuously changed when there is a barrier?

No

Next page





Yes

PSD sensor is normal

Types of Defects and the Countermeasures

Circle around the same place / barrier sensing complaint_Position sensor (PSD) confirm

Check point

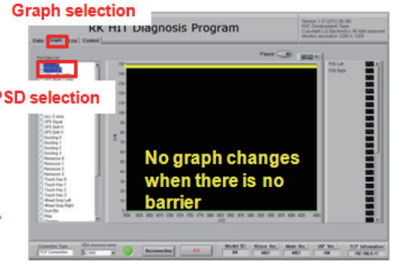
Main body position sensor (PSD) confirm

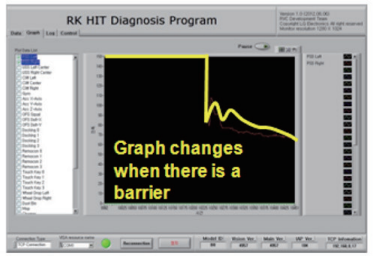
Items to be confirmed

Is noise observed on a debugger graph?

Graph selection

PSD selection





※ Normal: Read only barrier value without noise

Yes

Is the noise observed when re-measured after taking off position sensor only?

No

Window band replacement

In case where there is no change

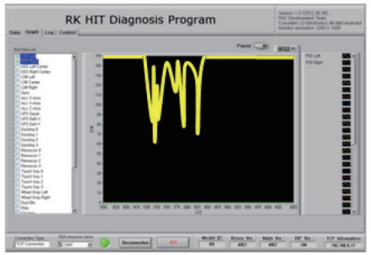
Main PCB replacement

Yes

Position sensor replacement

In case where there is no change

Main PCB replacement



※ Abnormal: Observe noise

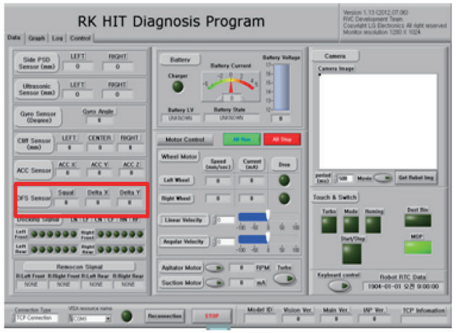
Circle around the same place / barrier sensing complaint_OFS sensor confirm

Check point

Main body OFS sensor confirm

Items to be confirmed

Is OFS squal value is under 40 when power is on?



No

Is Delta X changed when operating forward?

Yes

OFS sensor is normal

No

OFS Sensor replacement

Yes

OFS Sensor replacement

In case where there is no change

Main PCB replacement

Types of Defects and the Countermeasures

Circle around the same place / barrier sensing complaint_Acceleration sensor confirm

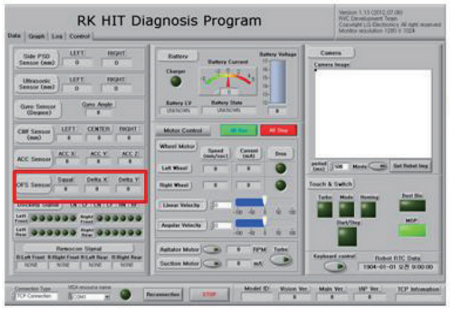
Check point

Main body acceleration sensor confirm

Items to be confirmed

Are the acceleration s of (Acc) X, Y, and Z values 0, 0, and 100, respectively when power is on?

※ Allow errors of ±10 of each value

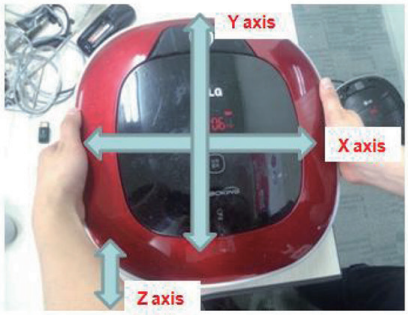


No → Main PCB replacement

Yes → Is the corresponded sensor value changed when shaking in X, Y, Z axis?

No → Main PCB replacement

Yes → Acceleration sensor is normal



Circle around the same place / barrier sensing complaint_Cliff sensor confirm

Check point

Main body cliff sensor confirm

Items to be confirmed

Isn't side brush of main body blocked the sensor?

No → Try again after exposing of cliff sensor window by moving side brushes

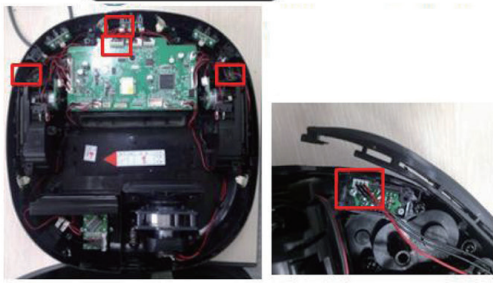
Yes → Is each initial value of cliff sensor L,C,R 30~35 ?

No → Is cliff sensor connector well combined?

No → Connector combination

Yes → Next page

Yes →



Cliff sensor : Indication part 3 unit parts
Main Connector : 1 unit part

Types of Defects and the Countermeasures

Non operating button

In case where power is not turned by touching even → Move to the power defect items

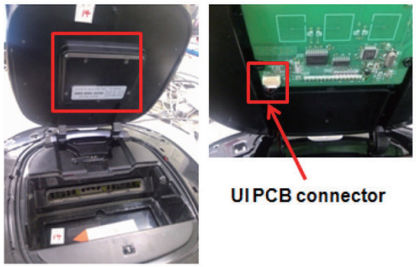
In case where the display is indicated but the button is not input after power is on

Check point | **Items to be confirmed**

Main body UI PCB connection status confirm

Is UI PCB connector well combined?

No → UI PCB connector combination and confirm



UI PCB connector

Yes → UI PCB replacement

In case where there is no change → Main PCB replacement

Wheel error

In case of delivering a message of wheel error while driving

Check point | **Items to be confirmed**

Wheel module foreign body confirm

Are foreign bodies inserted to the wheel module?

Yes → Try again after removing the foreign bodies of wheel module

No

Wheel drop confirm

Is an indication on the debugger changed when repeating the Wheel Drop motion?

Normal

Drop status

Yes

No → Micro switch replacement

In case where there is no change → Main PCB replacement

Confirm non-load current of wheel module

Is non-loaded current of wheel module 8~10 on a debugger?

No → Wheel module replacement

※ Speed when driving straight : 50

Yes → Wheel module is normal

Types of Defects and the Countermeasures

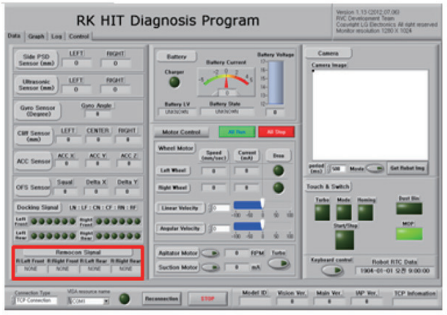
Remote controller reception part defect

In case where remote controller reception does not operate

Check point | **Items to be confirmed**

Remote controller reception part confirm

Is the indicated value on the debugger changed when operating the remote controller?



No → Is the connector combined normally?

- Yes → Remote controller reception part PCB replacement
- No → Try again after re-combining of the connection

In case where there is no change

Main PCB replacement

YES → Remote controller reception part is normal

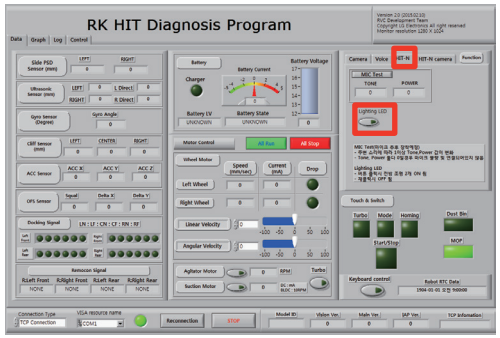
Error in lighting LED

Check Point

Check the lighting LED panel.

Checklist

Does the lighting LED on the main body turn on when you connect to the app (home guard operation excluded) or turn on the LED in the diagnosis program?



No → Is the connector connected properly?

- No → Connector Reconnect and retry.
- Yes → Replace the lighting LED PCB.

If it didn't change anything:

Replace the Main PCB.

YES → The lighting LED is working.

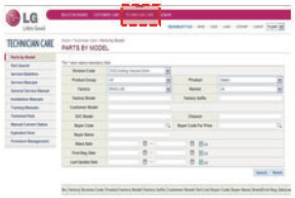
How to Use R-Manager RK diagnosis program

Lab view runtime installation

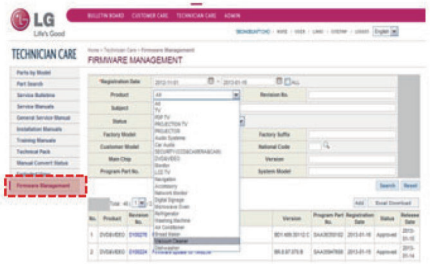
1. Lab view run time installation

Lab view run time 2010 should be installed in order to implement R-manager.
Download the lab view run time program in the server and then install as an order below

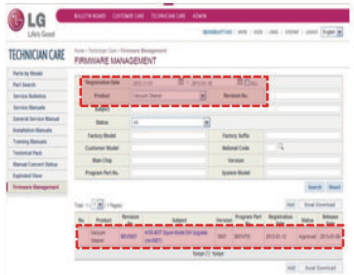
http://biz.lgservice.com
① Input employee number and pw



② Select TECHNICIAN CARE of SITE LINK on top



③ Select Firmware Management of SITE LINK on left



④ Check the Registration Date and Product ('Vacuum Cleaner') and Click the Search button)

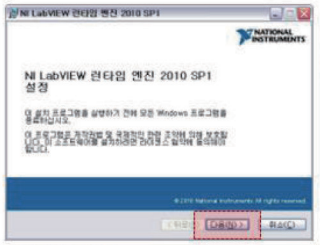
⑤ Select the program from a list and save in attached file USB
(Use the formatted USB that is only for updating)

* R-manager program
- LVRTE2010min.exe
- visa462runtime.exe
- R-Manager.exe

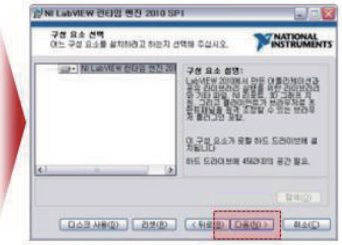
Lab view runtime installation

1. Lab view run time 2010 installation

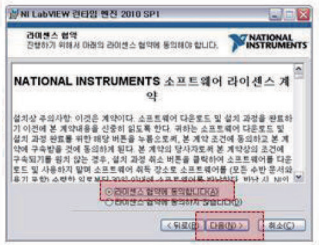
① Unzip



② Click next

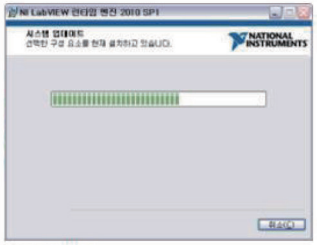


③ Click next

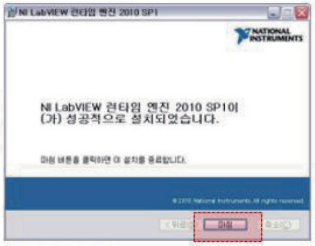


④ Make an agreement with the license and then click next

⑤ Click next



⑥ Waiting



⑦ Click next

How to Use R-Manager RK diagnosis program

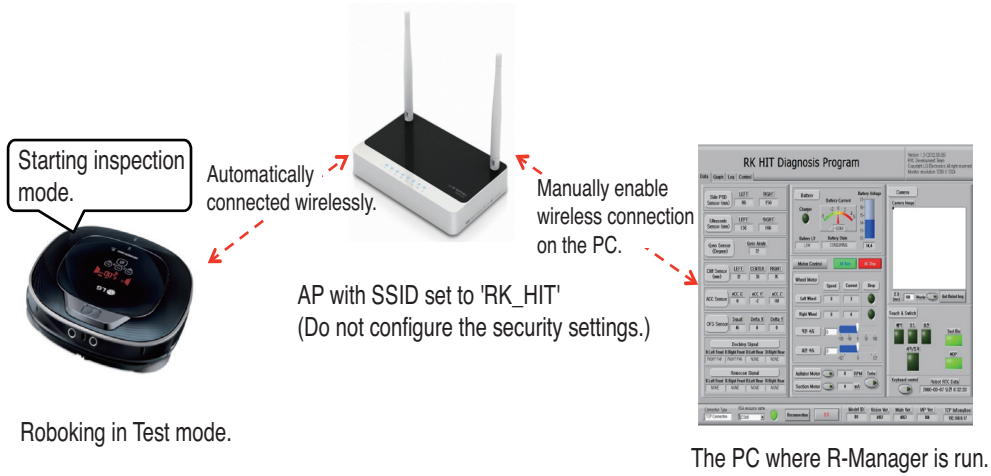
Lab view run time installation

1. Lab view run time 2010 installation

How to use the R-Manager RK diagnosis program.

2. Method of connecting to the R-Manager RK diagnosis program.

2.1.1 TCP connection environment settings



Roboking in Test mode.

The PC where R-Manager is run.

VR6480VMNC

※ The difference between the VR6480VMNC and other models.
- Other models: Test mode starts automatically when the USB dongle is connected, and Normal mode starts when the dongle is removed.
- VR6480VMNC : You must manually change to Test mode because the USB dongle is always connected inside the product.
(See how to change to Test mode in the TCP Connection Method section.)

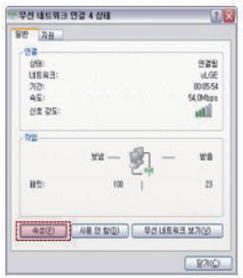
Applies only to VR6480 Ser, VR6370 Ser, VR6680 Ser

How to Use R-Manager RK diagnosis program

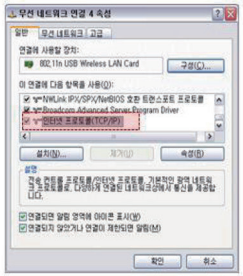
R-Manager RK diagnosis program use method

2.R-Manager RK diagnosis program connection method

2.1.1 TCP connection method (1)

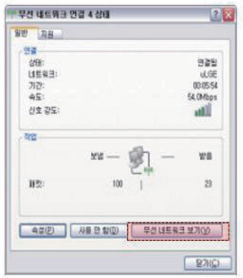


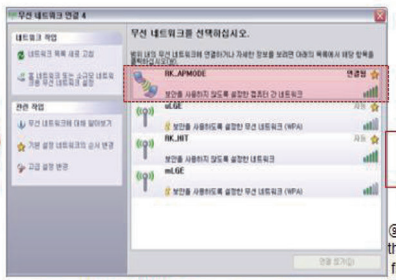
⑤ Set a wireless IP of the PC that will be connected to a robot



⑥ Select internet protocol (TCP/IP)

⑦ **IP address** : 192.168.0.110
Serve net mask : 255.255.255.0





⑧ Connect to **RK_APMOD** in a wireless network connection status setting window

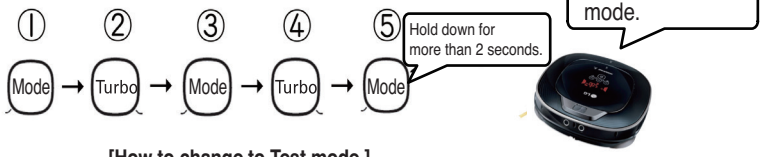
⑨ Automatically connect to the set when confirming the program connection (**TCP Connection**) as a figure below after implementing R-Manager program. In case of no connection after pressing **Reconnection** button, re-implementing from ④

Applies only to VR6480 ser. and VR6680 ser.

How to use the R-Manager RK diagnosis program.

2.Method of connecting to the R-Manager RK diagnosis program.

2.1.1 TCP connection method



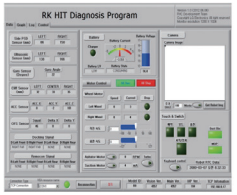
[How to change to Test mode.]

① Turn on the power.

② Press the upper buttons. Turn off and back on the main unit, and you'll get the voice message saying, "Starting Test mode." (Ready to connect to the diagnosis program.)

③ Turn off and back on the main unit, and you'll get the voice message saying, "Starting Test mode." (Ready to connect to the diagnosis program.)

[How to connect to the diagnosis program.]



④ Press the Set Time+Turbo+Set Time on the remote control.

⑤ You're now connected to the diagnosis program.

Applies only to VR6480 ser. and VR6680 ser.

How to Use R-Manager RK diagnosis program

How to use the R-Manager RK diagnosis program.

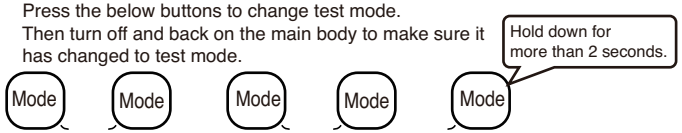
2.Method of connecting to the R-Manager RK diagnosis program.

2.1.3 Configure product settings after the test.

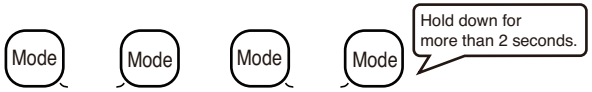
Roboking needs to be turned to Normal mode after test is completed.

Roboking in Test mode.

1.Normal Mode->Test Mode (Change to JIG Test mode)
Press the below buttons to change test mode.
Then turn off and back on the main body to make sure it has changed to test mode.



2.Test Mode->Normal Mode (Change to Normal Mode)
Press the below buttons to change normal mode.
Then turn off and back on the main body to make sure it has changed to Normal mode.



[How to switch back from Test mode to Normal mode.]

① Hold down the main body button (Mode+Turbo+Mode+Turbo+Mode) for more than 2 seconds, and you'll get the After the voice message,

② Hold down the main body button (Mode+Turbo+Mode+Turbo+Mode) for more than 2 seconds, and you'll get another voice message saying, "One-touch connection is completed."

※ Precautions
- Since the user cannot connect to the Roboking from the app while the product is in Test mode,
- make sure to switch back to Normal mode after the test.
  How to check: If you get the message saying, "Starting Test mode."
  after you turn off and back on the power back on. the Roboking is in Test mode.

Applies only to VR6480 ser. and VR6680 ser.

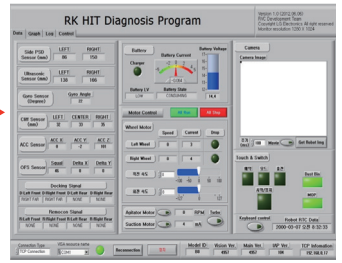
How to use the R-Manager RK diagnosis program.

2. Method of connecting to the R-Manager RK diagnosis program. (Directly connect to the robot)

2.1.1 TCP connection environment settings

Roboking in Test mode.

Directly connect the robot to the PC.
Try this when there is no router.



The PC where R-Manager is run.

VR6480VMNC

※ The difference between the VR6480VMNC and other models.
- Other models: Test mode starts automatically when the USB dongle is connected, and Normal mode starts when the dongle is removed.
- VR6480VMNC : You must manually change to Test mode because the USB dongle is always connected inside the product.

(See how to change to Test mode in the TCP Connection Method section.)

Applies only to VR6480 Ser, VR6370 Ser, VR6680 Ser

How to Use R-Manager RK diagnosis program

R-Manager RK diagnosis program use method

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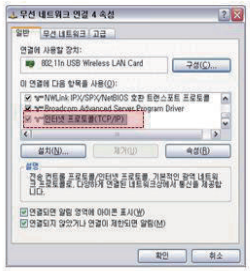
2. R-Manager RK diagnosis program connection method

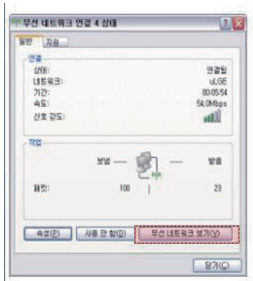
2.1. TCP connection method (2)

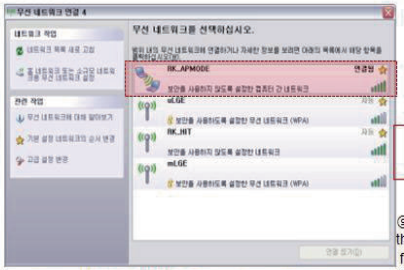
⑤ Set a wireless IP of the PC that will be connected to a robot



⑥ Select internet protocol (TCP/IP)

⑦ **IP address** : 192.168.0.110
Serve net mask : 255.255.255.0





⑧ Connect to **RK_APMOD** in a wireless network connection status setting window

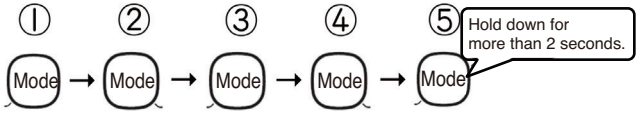
⑨ Automatically connect to the set when confirming the program connection (**TCP Connection**) as a figure below after implementing R-Manager program. In case of no connection after pressing **Reconnection** button, re-implementing from ④

How to use the R-Manager RK diagnosis program.

LG Life's Good

2.Method of connecting to the R-Manager RK diagnosis program. (Directly connect to the robot)

2.1.1 TCP connection method(2)

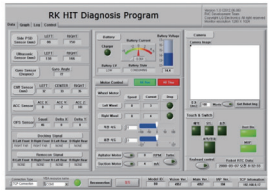


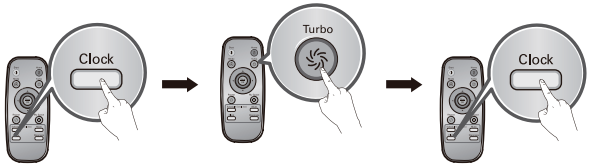
[How to change to Test mode.]

① Turn on the power.

② Press the upper buttons.Turn off and back on the main unit, and you'll get the voice message saying, "Starting Test mode." (Ready to connect to the diagnosis program.)

③ Turn off and back on the main unit, and you'll get the voice message saying, "Starting Test mode." (Ready to connect to the diagnosis program.)





⑤ You're now connected to the diagnosis program.

[How to connect to the diagnosis program.]

④ Press the Set Time+Turbo+Set Time on the remote control.

Applies only to VR6480 ser. and VR6680 ser.

How to Use R-Manager RK diagnosis program

How to use the R-Manager RK diagnosis program.

2.Method of connecting to the R-Manager RK diagnosis program.
(Directly connect to the robot)

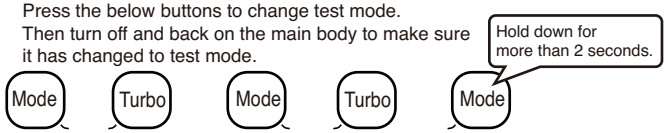
2.1.3 Configure product settings after the test.

Roboking needs to be turned to Normal mode after test is completed.

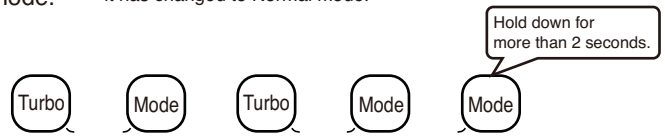
Starting inspection mode.

Roboking in Test mode.

1.Normal Mode->Test Mode (Change to JIG Test mode)
Press the below buttons to change test mode.
Then turn off and back on the main body to make sure it has changed to test mode.



2.Test Mode->Normal Mode (Change to Normal Mode)
Press the below buttons to change normal mode.
Then turn off and back on the main body to make sure it has changed to Normal mode.



[How to switch back from Test mode to Normal mode.]

Hold down the main body button (Mode+Turbo+Mode+Turbo+Mode) for more than 2 seconds, and you'll get the After the voice message,

Hold down the main body button (Mode+Turbo+Mode+Turbo+Mode) for more than 2 seconds, and you'll get another voice message saying, "One-touch connection is completed."

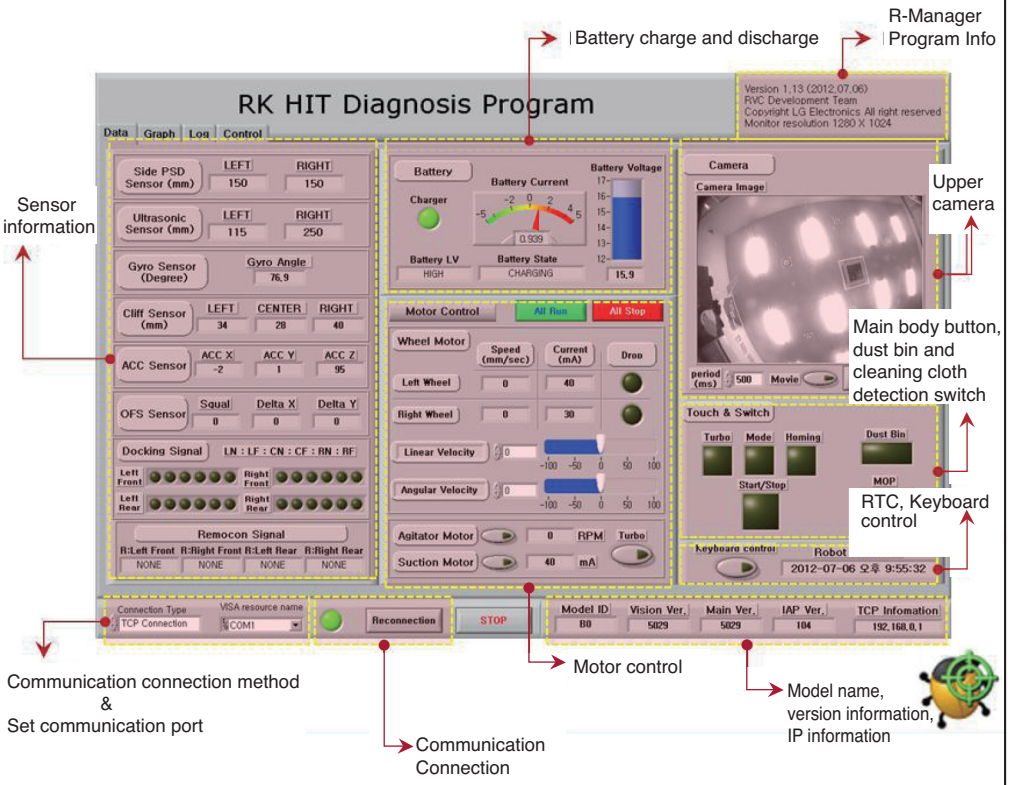
※ Precautions
- Since the user cannot connect to the Roboking from the app while the product is in Test mode, make sure to switch back to Normal mode after the test.
- How to check: If you get the message saying, "Starting Test mode." after you turn off and back on the power back on. the Roboking is in Test mode.

Applies only to VR6480 ser. and VR6680 ser.

How to use the R-Manager RK diagnosis program.

2. How to use the R-Manager RK diagnosis program.

2.1. R-manager Program(Main Screen)



R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.1. Communication connection method & communication port setting

➢ Connection Type
- TCP connection : Wireless LAN card use.
- UART connection : Serial cable use.

➢ VISA resource name
- Communication port setting button when UART connection is selected as a connection type

➢ Communication connection
- Green light is on when connection is activated

2.1.2. Model name, vision information, TCP information

➢ Model ID
- B0 : VR627xLVM Ser., VR626xLVM Ser.

➢ Vision Ver.
- Vision board (Upper part camera) program version

➢ Main Ver.
- Main board program version (Note* : Should be the same number with vision ver.)

➢ IAP Ver.
- Main board boot loader version

➢ TCP Information
- IP information of robot

R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.3. Sensor information

*** Side PSD sensor [mm] – Side PSD sensor**

➢ Function : Wall drive / Map Building

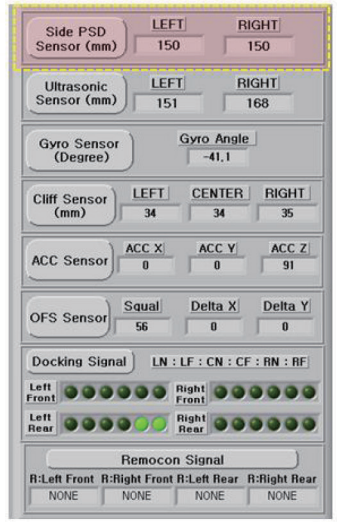
➢ Sense distance : 20~ 150 mm

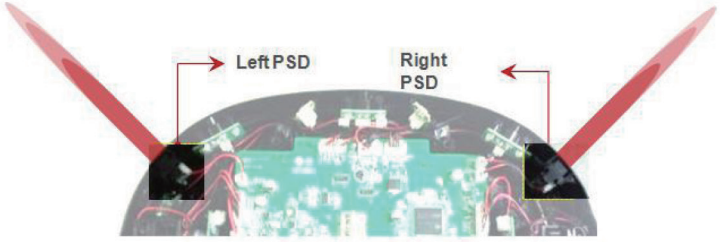
➢ In case where there is no barrier : 150 mm

➢ Sensor characteristic

Advantage : Possible to calculate the straight distance to the barrier and position accurately

Disadvantage : Narrow sense range and greatly influenced by external light interference (외란광)





R-Manager RK diagnosis program use method

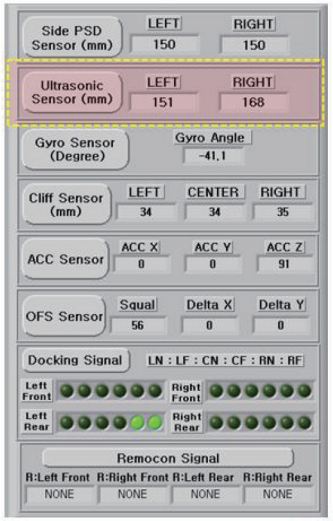
2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.3. Sensor information

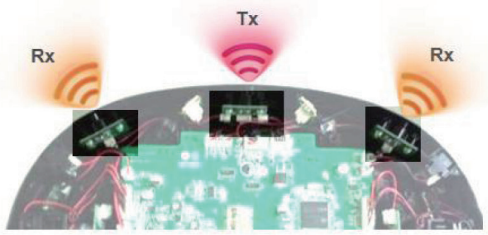
*** Ultrasonic sensor [mm] – Ultrasonic sensor**

- Function: Barrier sense / Wall drive
- Sense distance: 50 ~250 mm
- In case where there is no barrier : 250 mm
- Sensor characteristic

Advantage – Possible to sense a wide range with a small amount of sensors

Disadvantage – Difficult to sense thin and angulated barriers such as legs of a desk and a chair





Tx: Transmitter (Transmission part)

Rx: Receiver (Reception part)

R-Manager RK diagnosis program use method

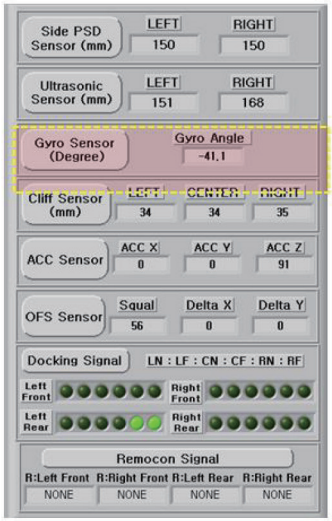
2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.3. Sensor information

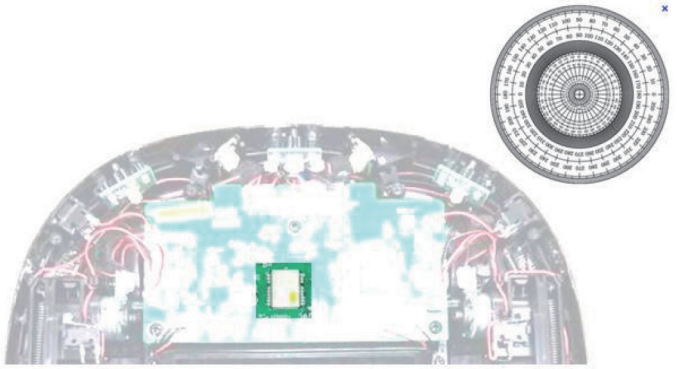
*** Gyro Sensor [mm] – Angle sensor**

- Function: Angle measurement
- Operation range: -180.0 ~ 180.0 (Degree)
- Initial value : 0 (CW: Clock wise - / CCW: Counter clock wise +)
- Sensor characteristic

Advantage – Correct the straight drive by measuring relative angles

Disadvantage – Not resistant to temperature changes and external shock



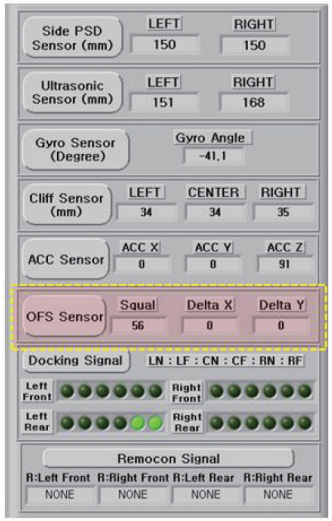


R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.3. Sensor information

*** Cliff sensor - Doorsill/ cliff sensor**

- Function: Measure the relative migration distance of a main body
- Principle of sensor: Measure the migration distance and direction by taking an image of the floor surface image (3x3mm) every once in a while
- SQUAL: The number of characteristic dot of an floor image that can be used in calculation of the amount of migration
- Sensor characteristic
  Advantage – Possible to measure the actual migration distance of a main body /Correct errors caused by slipping
  Disadvantage – Decline performance on a floor without patterns/ mis-operation caused by dust

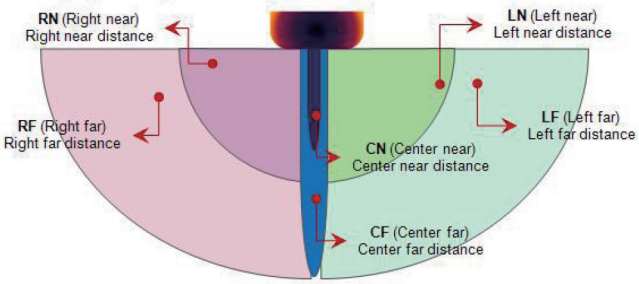


- SQUAL use range
  In case of more than 40 → Use a migration value to position correction
  In case of more than 23 → Use when judging a stuck sense of a main body
  In case of less than 23 → OFS sensor should not be used

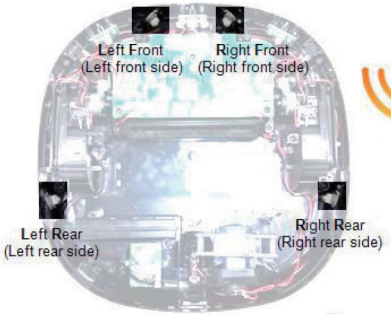
R-Manager RK diagnosis program use method

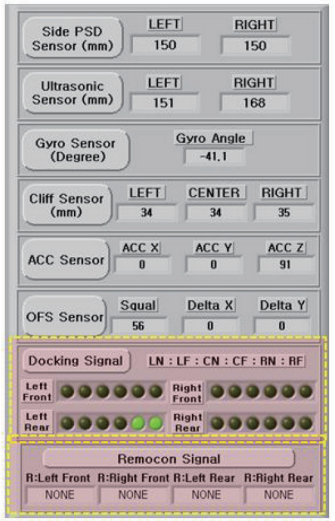
2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.3. Sensor information

✓ **Docking signal range**



✓ **Automatic charge induction signal/ Place sensors sense remote controller signal**



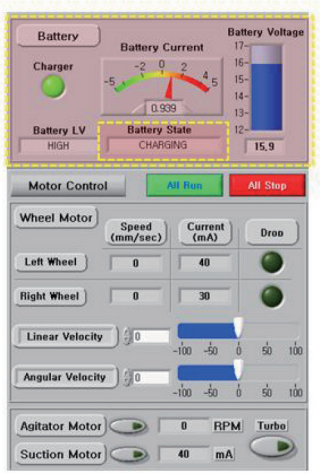


R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.4. Charge & discharge regarding batteries

*** Battery management system – Battery management**

- Voltage range: 12.7V ~16.8V
- Residual quantity level of a battery
  - High : More than 70%
  - Middle: 40% ~ 70%
  - Low : 20% ~
  - Dock: 5% ~20%
  - LB (Low battery): Under 5%
- Current range
  - When discharging: Average current 200~400mA
    Motor derive 900 ~1100mA
  - When charging: 300 ~ 1100 mA
- Charger terminal contact confirm (Contact)
  When contacting a charger, docking signal occurrence is blocked
- Battery state confirm (Battery State)
  - CONSUMING: Waiting
  - CHARGER CONTACT: Charge terminal connection
  - CHARGING : Charging
  - CHARGING COMPLETE : Charge completion
  - SWITCH ERROR : Main power switch of a main body is off

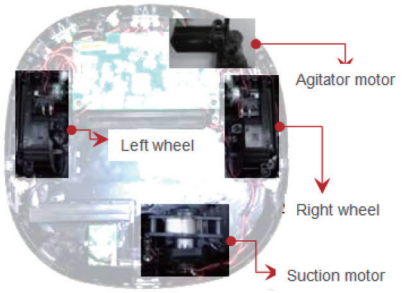


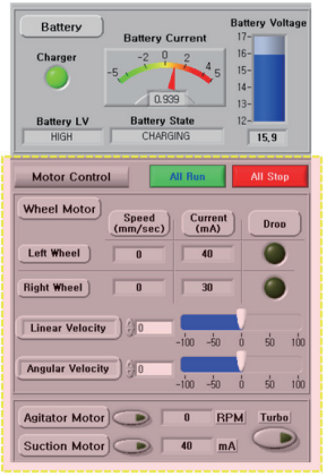
R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.5. Control regarding motors

*** Motor control – Motor control**

- Wheel motor (Left/ right wheel motor)
  Straight drive speed / rotation speed: Straight drive/ rotation speed [mm/sec] of a main body by wheel rotation
  Speed :The current wheel speed [mm/sec] measured by wheel motor encoder
  Current (Current): Wheel motor use current [10mA]
  Drop (Wheel drop sense): Whether or not a wheel drop sense switch is operated
- Agitator motor (Agitator motor)
  Agitator motor speed (RPM) – Error occurrence in case where less than 1000RPM
- Suction motor (Suction motor)
  Suction motor current (10mA) –When a motor is stuck, current is increased drastically
- All run / All stop (Whole motor control)
  Whole motor (Agitator, suction, wheel) is on/off with a currently set speed
- Turbo
  Agitator RPM : 1000 → 1200 RPM
  Suction motor : 8500 → 10000 RPM





R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.6. Upper part camera

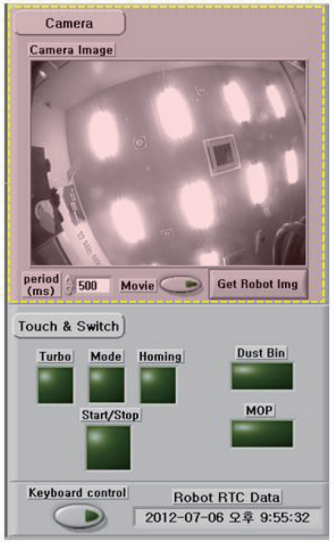
*** Ceiling vision sensor – Upper part camera**

➢ Camera image confirm

Get Robot Img : Image capture

Movie button : Take images periodically which is set (Should be minimum 500ms)

CV-SLAM
Position detection and mapping A are performed at the same time from an image of ceiling



R-Manager RK diagnosis program use method

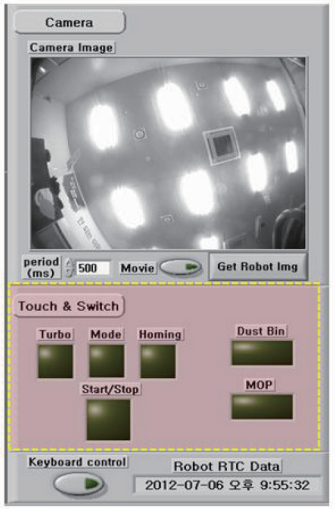
2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.7. Infrared light reception & micro SW

*** On / off switch check – Switch type inspection**

➢ Cover touch button (Upper part touch button)

➢Dust bin sense switch

➢Mop sense switch

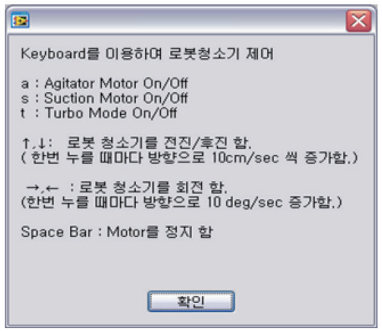


R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Main screen)
2.1.8. RTC, keyboard control

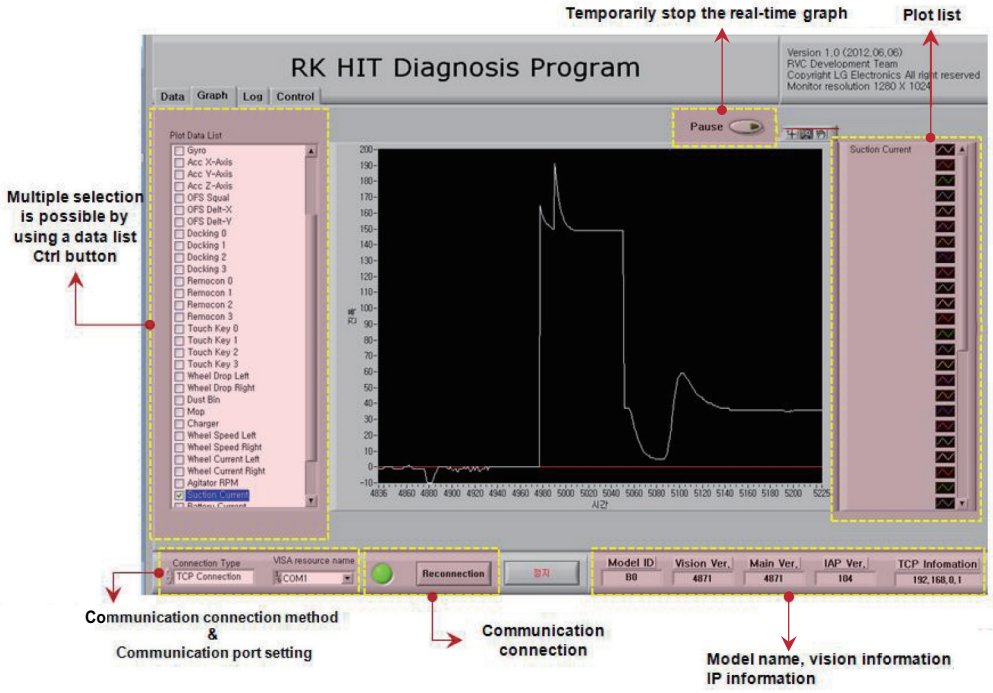
*** PC keyboard control / RTC time –Computer keyboard control / main body set time**

- **a** : Agitator motor on / off
- **s** : Suction motor on / off
- **t** : Turbo mode on / off
- ↑, ↓ : Reverse speed control before setting
  Set speed is accelerated/ decelerated by 10 cm/sec when clicking
- ‹ , › : Set left and right rotation speed control
  Set speed is accelerated/ decelerated by 10 deg/sec when clicking
- **Space bar** : All motor off



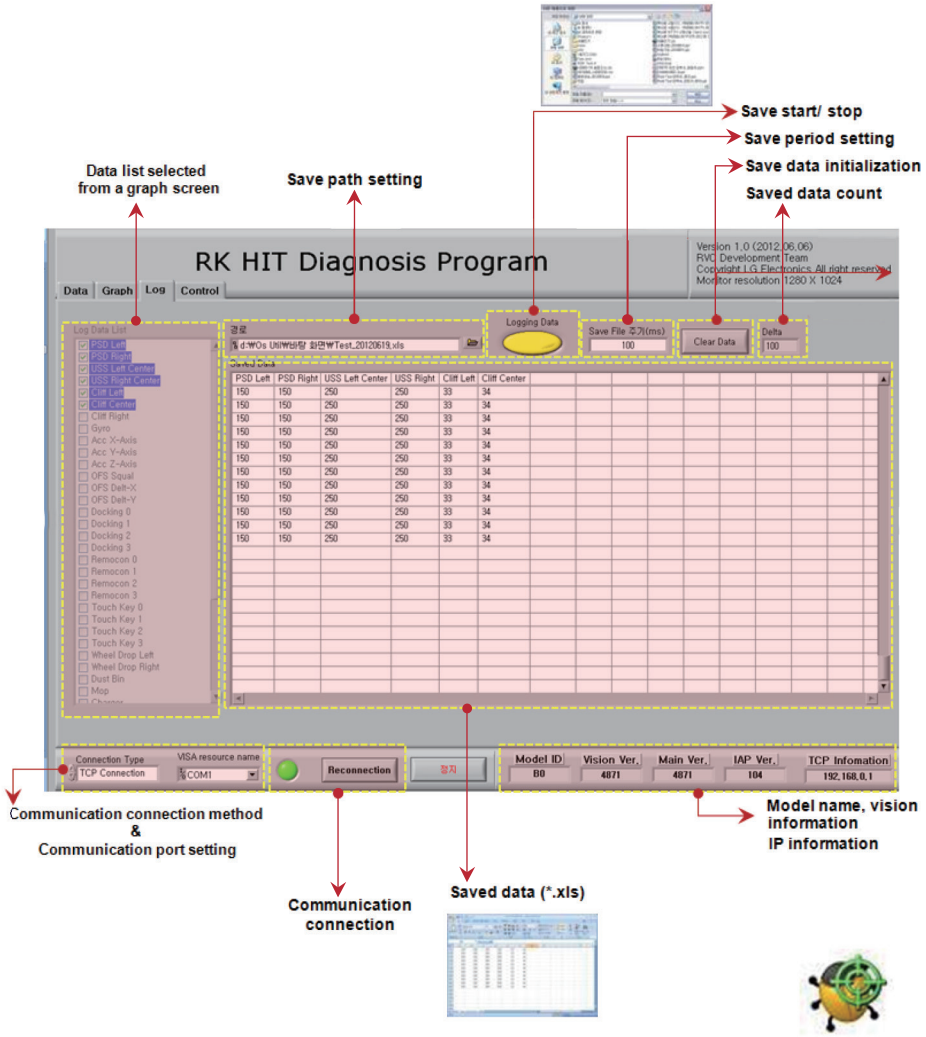
R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Graph screen)



R-Manager RK diagnosis program use method

2. R-Manager RK diagnosis program use method
2.1. R-manager program (Log screen)



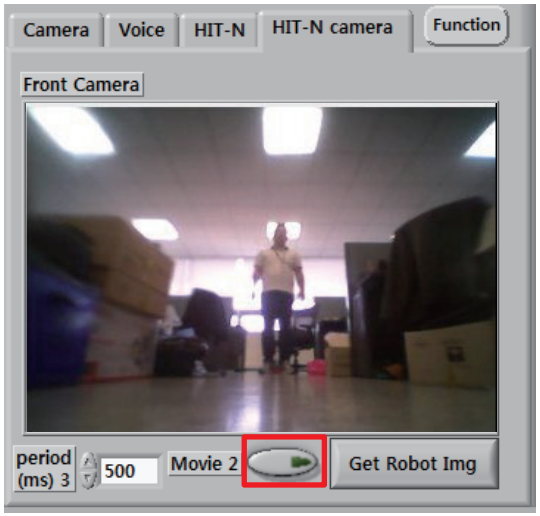
How to use the R-Manager RK diagnosis program.

2.R-Manager RK diagnosis program use method
2.2. R-manager Program
2.1.6. Front camera

Check the camera video

Get Robot Img : Image capture
Movie2 Button : Retrieve movie at the set interval
Set the run time to at least 500ms.

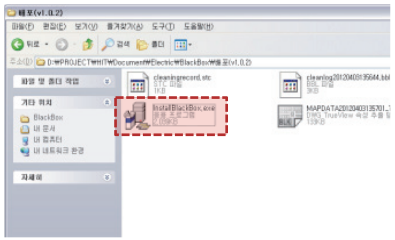
※ You can watch the video taken by the front camera through App Home View.



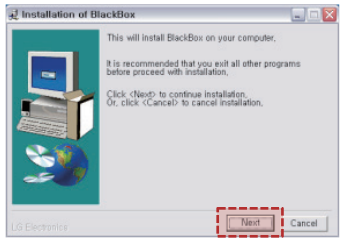
Black box viewer manual

1. Black box viewer installation method

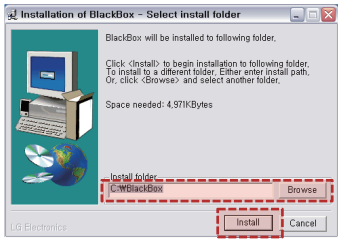
Download Black Box Install file from a server (http://biz.lgservice.com=> GCSC) and then install as an order below



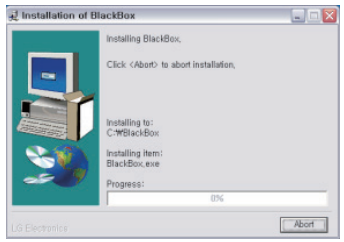
① Perform install program



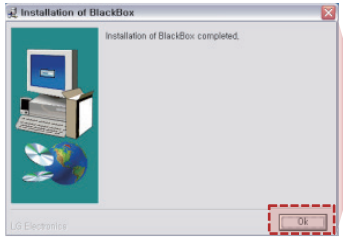
② Click **Next**



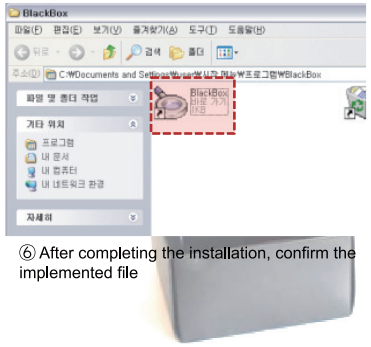
③ Select the path which black box viewer program is installed and then click **Install** button



④ Install progress status



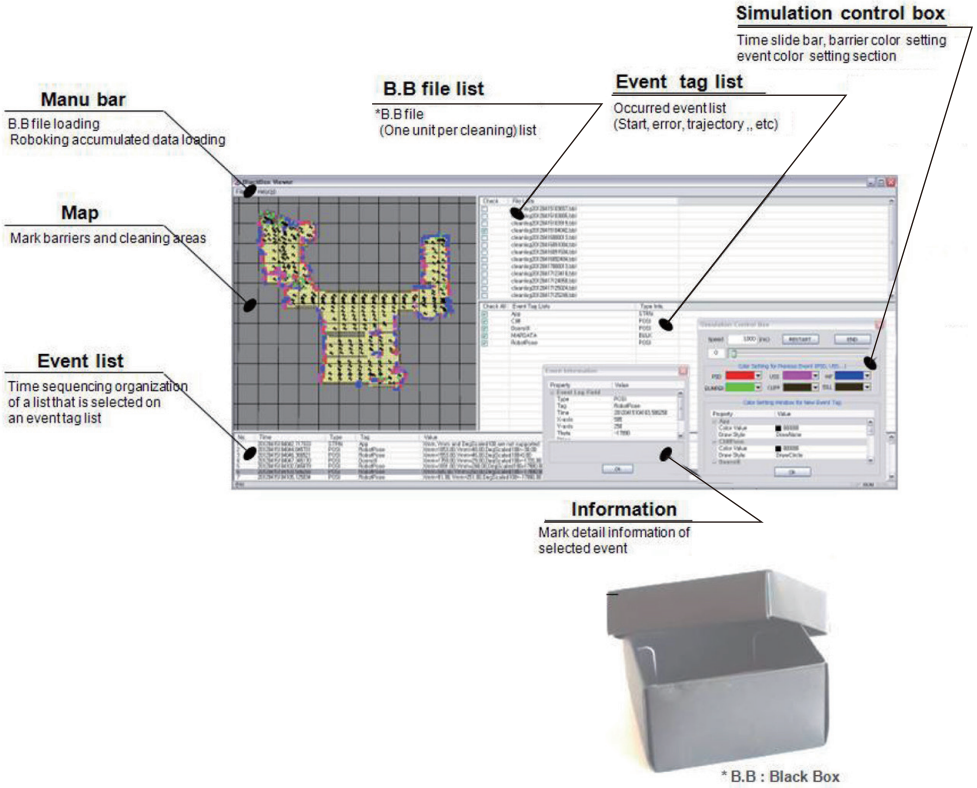
⑤ Click install end **OK** button



⑥ After completing the installation, confirm the implemented file

Black box viewer manual

2. Black box viewer explanation



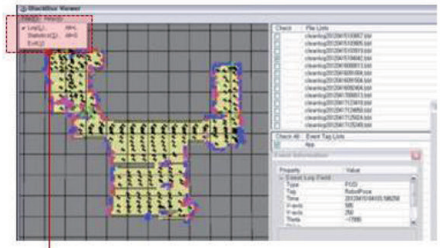
* B.B : Black Box

How to Use Black Box Viewer

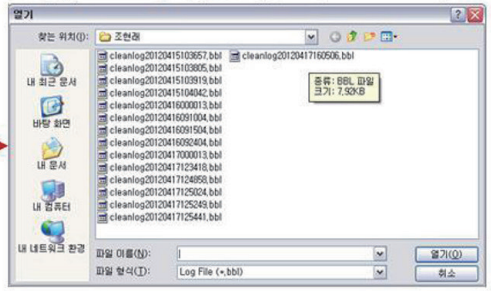
Black box viewer manual

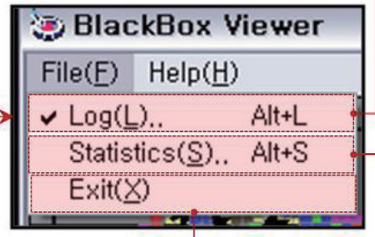
LG Life's Good

2. Black box viewer explanation
2.1. Manu Bar



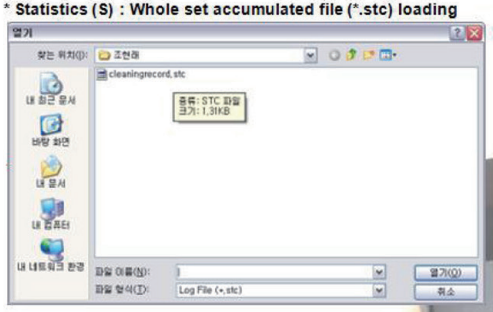
* Log (L) : B/.B file (*.ddl) loading,
multiple selection is possible

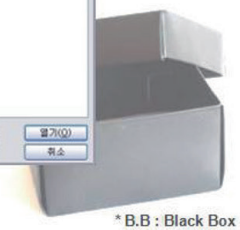




Program end

* Statistics (S) : Whole set accumulated file (*.stc) loading





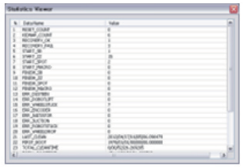
* B.B : Black Box

Black box viewer manual

LG Life's Good

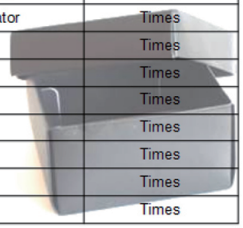
2. Black box viewer explanation
2.1. Manu bar
Statistics (S) : Whole set accumulated file (*.stc) data list (1)

Statistics viewer screen



Confirm accumulated data of
Roboking since outgoing

No.	Indication	Error classification	Indication method
1	RESET_COUNT	Accumulated number of reset occurrence	Times
2	KIDNAP_COUNT	Accumulated number of kidnap occurrence	Times
3	RECOVERY_OK	Accumulated number of kidnap success	Times
4	RECOVERY_FAIL	Accumulated number of kidnap failure	Times
5	START_SB	Accumulated number of meticulous cleaning mode start	Times
6	START_ZZ	Accumulated number of zigzag mode start	Times
7	START_SPOT	Accumulated number of intense cleaning mode start	Times
8	START_MACRO	Accumulated number of designated area mode start	Times
9	FINISH_SB	Accumulated number of meticulous cleaning completion	Times
10	FINISH_ZZ	Accumulated number of zigzag cleaning completion	Times
11	FINISH_SPOT	Accumulated number of intense cleaning completion	Times
12	FINISH_MACRO	Accumulated number of designated area cleaning completion	Times
13	ERR_DUSTBIN	Accumulated number of dust bin error occurrence	Times
14	ERR_ROBOTLIFT	Accumulated number of main body lifting error occurrence	Times
15	ERR_LWHEELSTUCK	Accumulated number of stuck error occurrence on left wheel	Times
16	ERR_RWHEELSTUCK	Accumulated number of stuck error occurrence on right wheel	Times
17	ERR_AGITATOR	Accumulated number of stuck error on main body floor agitator	Times
18	ERR_SUCTION	Accumulated number of stuck error on suction motor	Times
19	ERR_ROBOTSTUCK	Accumulated number of stuck error on main body	Times
20	ERR_WHEELDROP	Accumulated number of wheel lifting error	Times
21	ERR_ENCODER_L	Accumulated number of left wheel encoder error	Times
22	ERR_ENCODER_R	Accumulated number of right wheel encoder error	Times
23	ERR_MOTOR_L	Accumulated number of left motor short error	Times
24	ERR_MOTOR_R	Accumulated number of right motor short error	Times



Black box viewer manual

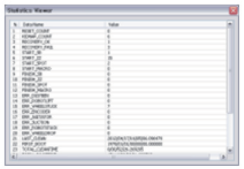
LG Life's Good

2. Black box viewer explanation

2.1. Manu bar

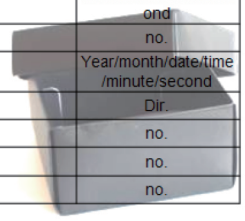
Statistics (S) : Whole set accumulated file (*.stc) data list (2)

Statistics viewer screen



Confirm accumulated data of Roboking since outgoing

No.	Indication	Error classification	Indication method
25	ERR_MOTOR_RCV	Accumulated number of motor short sense trial	Times
26	START_RESERV	Accumulated number of reserved cleaning start	Times
27	VOICE_COMEHERE	[Voice] Accumulated number of "Come here Roboking "	Times
28	VOICE_START	[Voice] Accumulated number of "Roboking cleaning start"	Times
29	VOICE_PAUSE	[Voice] Accumulated number of " Roboking"	Times
30	VOICE_SPOT	[Voice] Accumulated number of "Intense cleaning"	Times
31	VOICE_HOMING	[Voice] Accumulated number of " Roboking charge"	Times
32	VOICE_WAIT	[Voice] Accumulated number of "Roboking wait"	Times
33	CURRENTBUMPING	Accumulated number of wheel bumping occurrence	Times
34	LAST_CLEAN	Last cleaning time	Year/month/date/time /minute/second
35	FIRST_BOOT	First booting time	Year/month/date/time /minute/second
36	TOTAL_CLEANTIME	Accumulated time of total cleaning	Date/time/minute/sec ond
37	TOTAL_RUNTIME	Accumulated time of total power on	Date/time/minute/sec ond
38	TOTAL_CARPET	Accumulated time of carpet cleaning	Date/time/minute/sec ond
39	VER_REVISION	Vision program version	no.
40	VER_REV_DATE	Update date	Year/month/date/time /minute/second
41	VER_REPOSITORY	svn path	Dir.
42	VER_BOOTLOADER	Mainboard Bootloader version	no.
43	VER_MAINSW	Mainboard program version	no.
44	MODEL_NO	Model number (0xB0)	no.



Black box viewer manual

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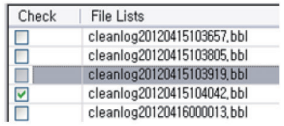
2. Black box viewer explanation

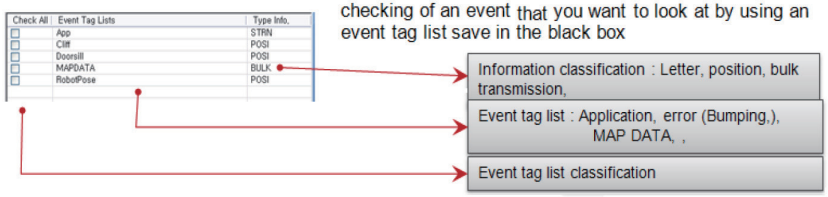
2.2. B.B file lists



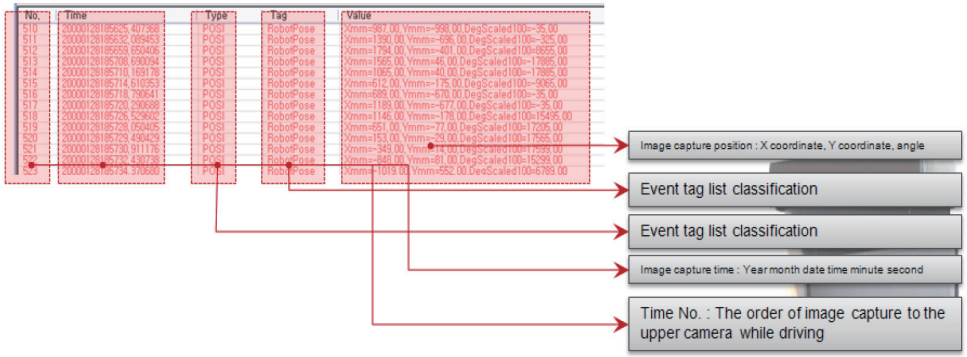
- Black box list saved in the Roboking
  => It is saved with a file of
  cleanlog year month date time minute second.bbl

2.3. Event tag lists

- The event list will be organized in a time sequencing as checking of an event that you want to look at by using an event tag list save in the black box



2.4. Event list



- Event list defined in the event tag of B.B file is organized in a time sequencing.

*** Coordinate starting point is (550.0, 50, 0°)**

When double clicking while playing, directly move to the correspond position

Black box viewer manual

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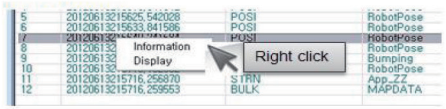
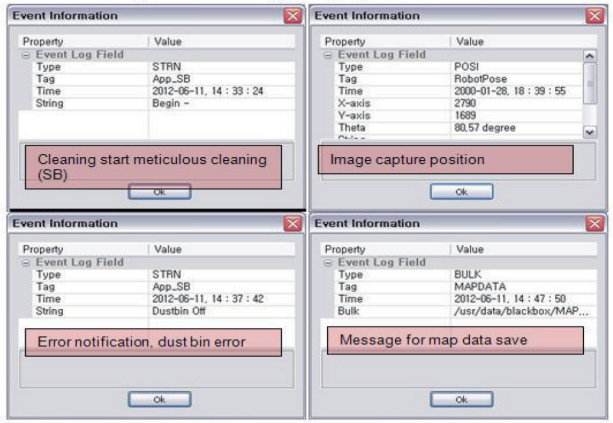
2. Black box viewer explanation

2.5. Information

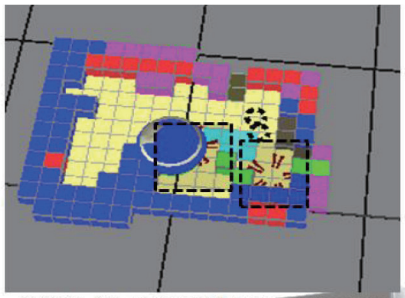


When clicking information (Example)



- Possible to see the details of correspond event list
  => Event type, tag, occurrence time, coordinate, angle event explanation

When clicking display



- Indicate the correspond event on the map

Black box viewer manual

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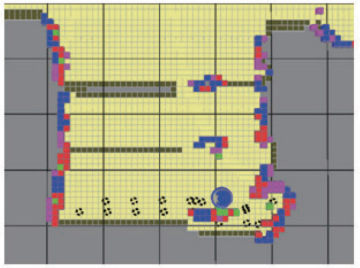
2. Black box viewer explanation

2.6. Map



- Driving information saved in B.B can be confirmed visually
- Debugging can be done by confirming the event (Cliff, doorsill)
- Each color can be set and confirmed in the simulation control box
- Classified three areas (Cleaning area/ non-cleaning area/barrier)

2.7. Simulation control box

Possible to set regarding map
- Possible to play and stop based upon an event list content
- Possible to set color and shape of occurred event

How to Use Black Box Viewer

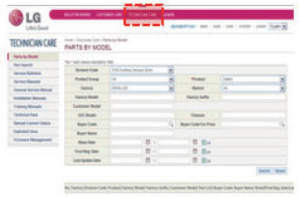
Black box viewer manual

3. Black box viewer use method

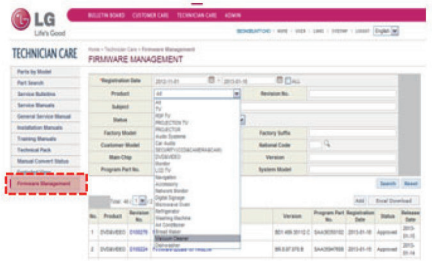
3.1. Program download for black box data upload

Black box save implementation script should be downloaded from the server

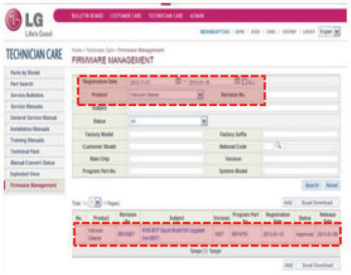
http://smile.lge.com
① Input employee number and pw



② Select TECHNICIAN CARE of SITE LINK on top

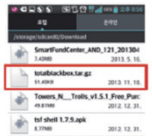


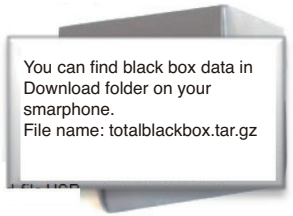
③ Select Firmware Management of SITE LINK on left



④ Check the Registration Date and Product ('Vacuum Cleaner') and Click the Search button)

⑤ Select he progran from a list and Install the file on smartphone





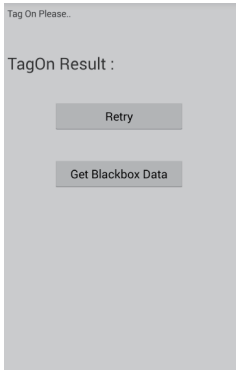
Black box viewer manual

3.How to use the Black Box Viewer.

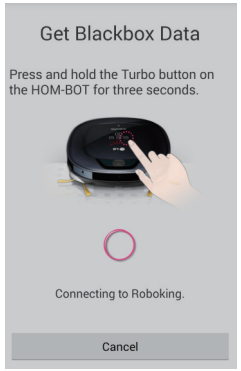
3.1.2 Download Black Box Data.

Download Black Box Data.

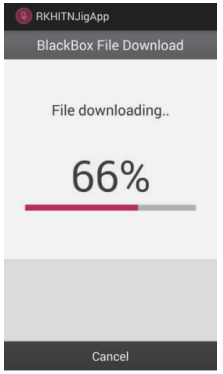
①Turn on the main body.
(Starts in Normal mode.)



② Start the JIG app and then click the Extract Black Box Data button.



③ The file will be downloaded after connecting to the robot.



④ The file will be downloaded after connecting to the robot.

※ 주의 사항
• 검사 모드인 상태에서는 고객이 앱으로 로보킹에 접속을 할 수가 없기 때문에, 반드시 검사 후에는 일반모드로 변경해 주어야 한다.

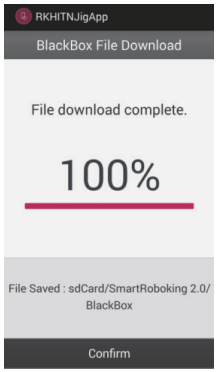
Applies only to VR6480 ser. and VR6680 ser.

Black box viewer manual

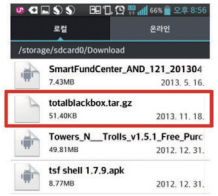
3.How to use the Black Box Viewer.

3.1.2 Download Black Box Data.

Download Black Box Data.



⑤ Click confirm after the file is downloaded.

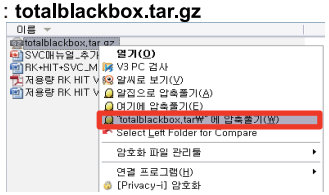


⑥ Check the downloaded file in the external memory stage of the smartphone.

File Name : **totalblackbox.tar.gz**

⑦ Check the totalblackbox.tar.gz file and move it to the PC.

⑧ Unzip the file and then check the Black Box Data.

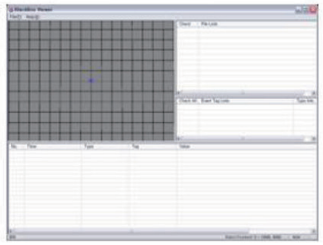


Applies only to VR6480 ser. and VR6680 ser.

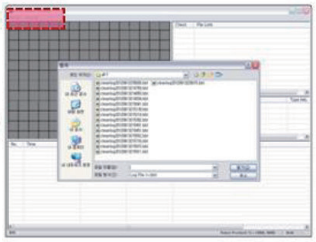
Black box viewer manual

3. Black box viewer use method

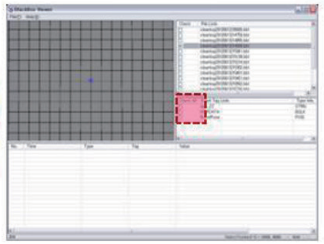
3.1. Program download for black box data upload



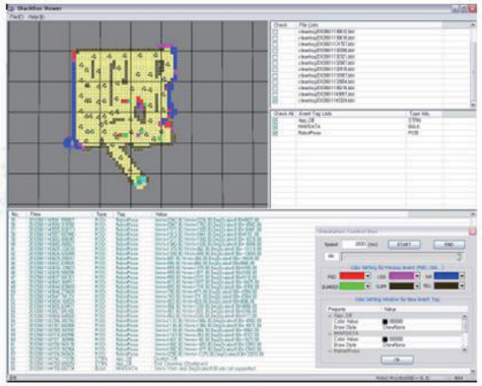
① Black box viewer program implementation



② Click File -> Log and load log file



③ Click the list which you want to look at on the check box of the event tag list



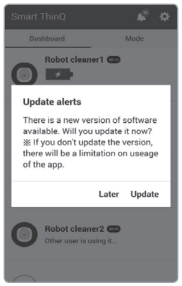
④ Upload completion
Debugging by using the loaded file
=> Find out the error type and position
=> Improve robot key use environment for users

⑤ Implement start/end/color selection by using a simulation control box

Program upgrade method

1.Software update

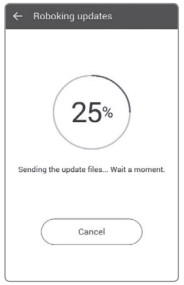
The network-enabled model of the Robot Cleaner can update the software automatically via the application.



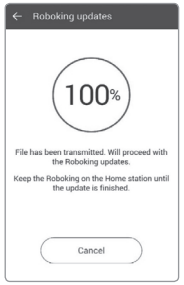
1. Make sure that the "Smart ThinQ" application is up to date on the Play Store.
   (Unless you update the app to the latest version, software update will not be available.)
2. If a new version is available upon connecting to the Roboking, an update will start.

- Software update can only be done whilst the Roboking is charging.
- Software updates will only be done if there is sufficient battery level. Ensure that the battery is fully charged before engaging any software update.

3. A new software file is downloaded to the Roboking when the updating starts.
4. When download is completed, the update will be started after tansmitting files to the Roboking.
5. The Roboking will turn off and on again automatically in the process, and updating will resume.
6. A voice message saying that update is completed will be announced when the update is done. The Roboking will turn off and on again to apply the updated software.



[Software file download window]



[Updating Roboking]

Applies only to VR6480 Ser, VR6680 Ser

Program upgrade method(3)

2.Program version confirm method

Program version is informed by voice when pressing the order listed below using a remote controller
(ex) In case where version is 1234 "One two three four")

Turbo	Turbo	Mode change	Mode change
Mode change	Turbo	Turbo	
Stop	Stop	Stop	

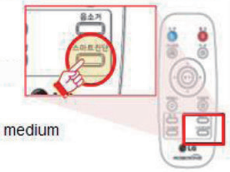
How to Use Black Box Viewer

Smart diagnosis

1. Smart diagnosis perform

• Function that the problematic information of main parts such as sensor and motor of the main body is found out itself and guides customers with a method to take action via voice

Operation condition : Press "Smart diagnosis" button on the remote controller while charging



*** Smart diagnosis start condition**

- While charging the charger
- In status of non-installation of mop (Prevention sensor misjudgment)
- In status of installation of dust bin
- Minimum battery status is more than medium
- In status of non-lifted wheels

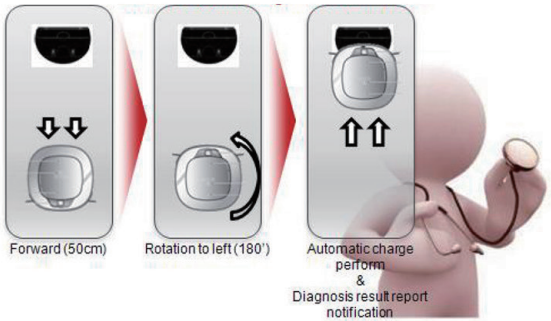
*** If a reservation is set, the reservation is canceled and then the diagnosis starts**

※ When there is no operation for a minute after a voice message guidance, it automatically returns to the charge mode

※ In case where there is any problem in barrier sense sensor, ultrasonic sensor, cliff sense sensor, only voice message is provided without returning to the charger and then the smart diagnosis function ends.

2. Diagnosis result voice message repetition function and diagnosis mode removal

- Diagnosis result voice message can be repeated as much as the users want (Implement by pressing the charge key)
-Diagnosis mode removal is possible using a stop key only

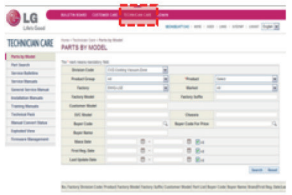


Program upgrade

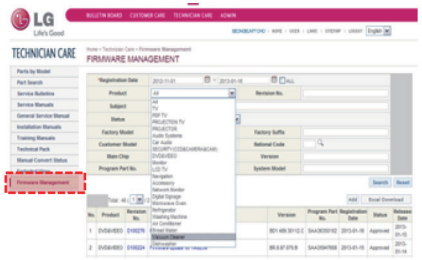
1. Use program download method

The file to upgrade should be downloaded from the server and then upgrades as an order below

http://smile.lge.com
① Input employee number and pw



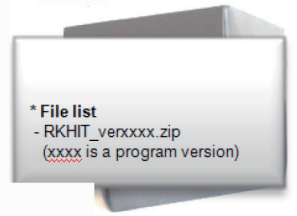
② Select TECHNICIAN CARE of SITE LINK on top



③ Select Firmware Management of SITE LINK on left

④ Check the Registration Date and Product ('Vacuum Cleaner') and Click the Search button)

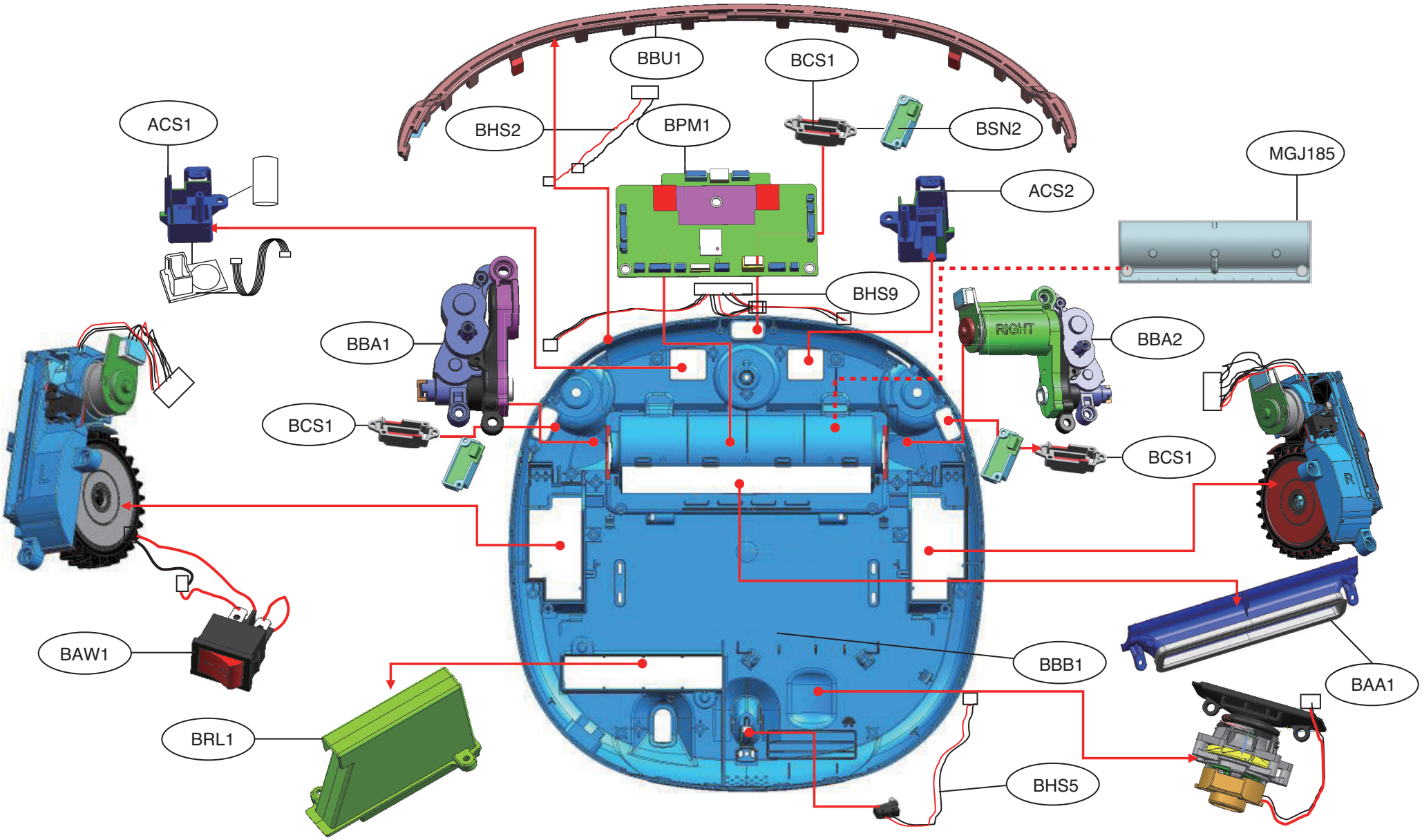
⑤ Select the program from a list and save in attached file USB (Use the formatted USB that is only for updating)



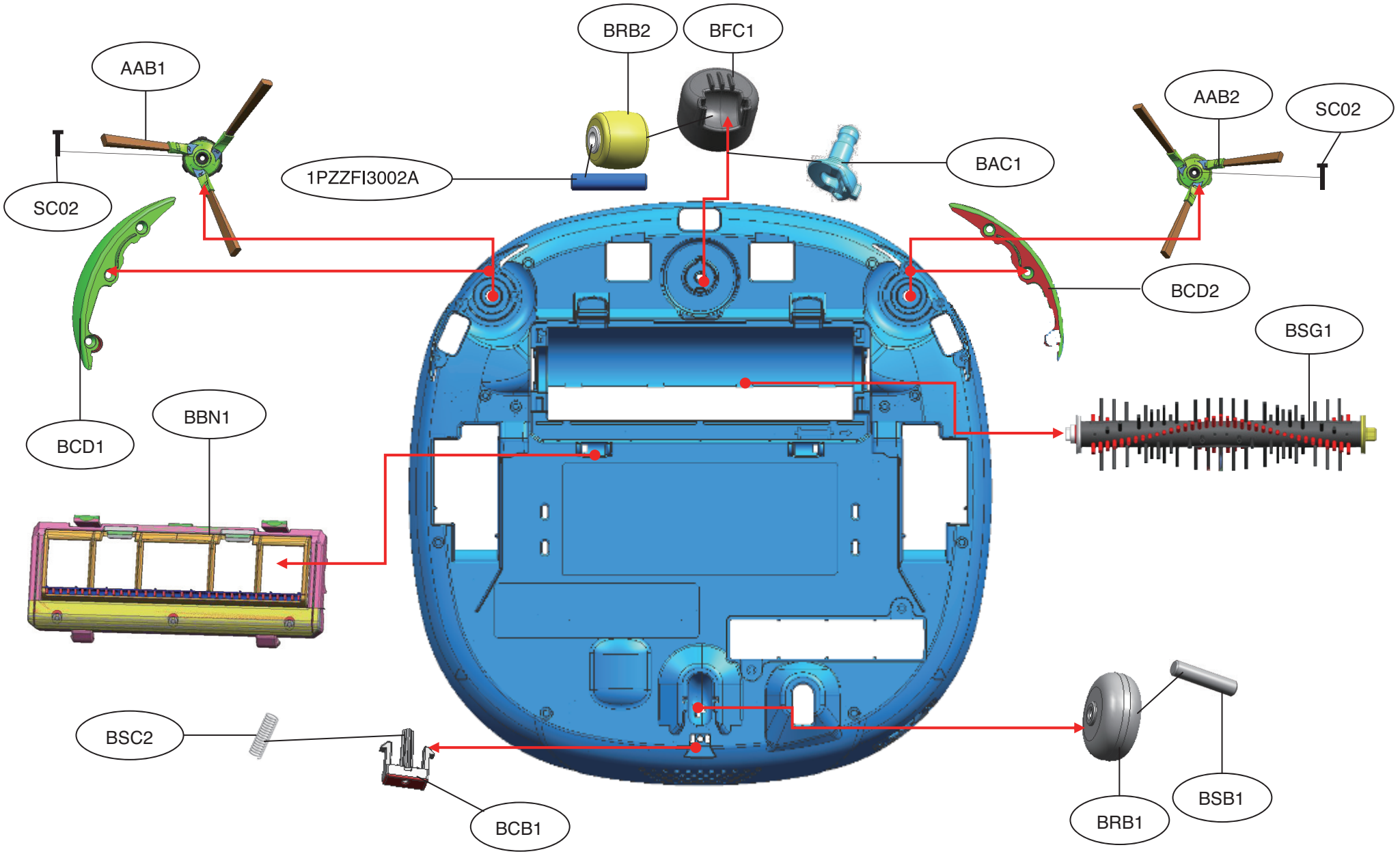
*** File list**
- RKHIT_verxxxx.zip
(xxxx is a program version)

Deal Drawing of the Structure

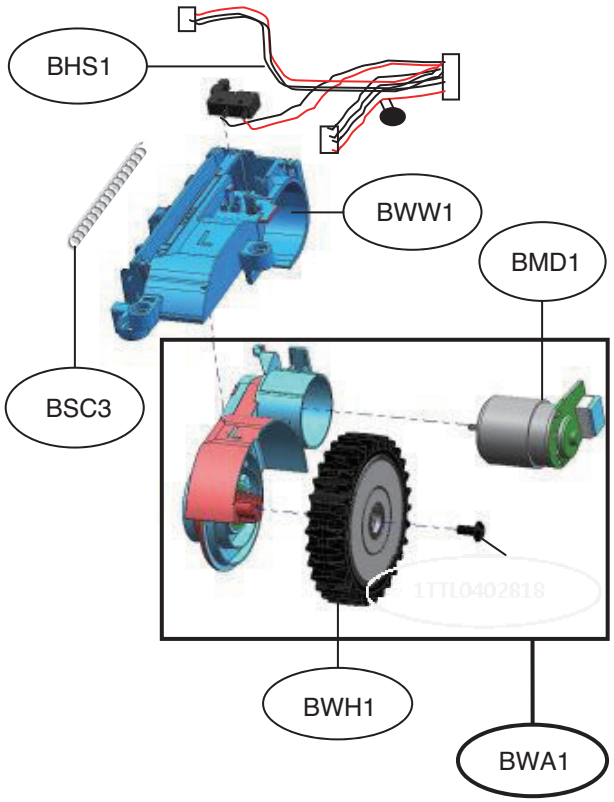
■ VR6640 - Base Assembly

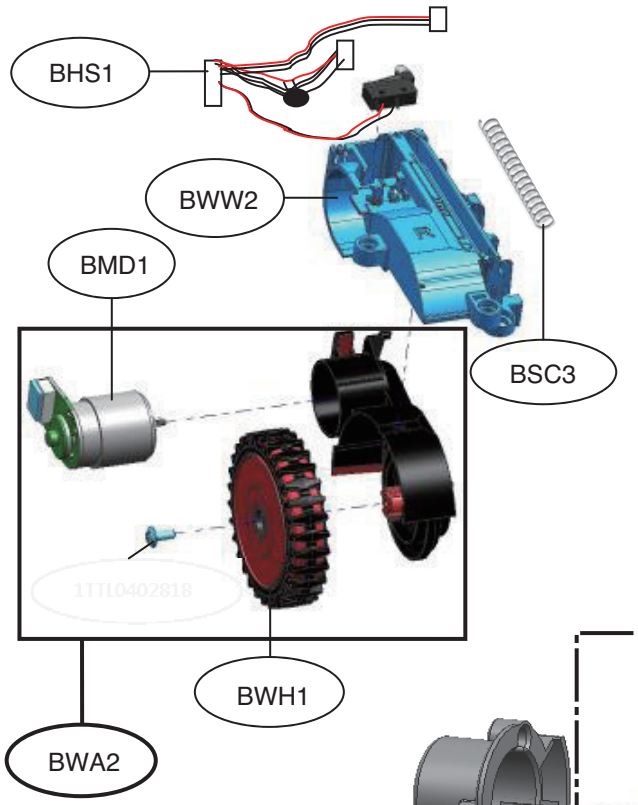


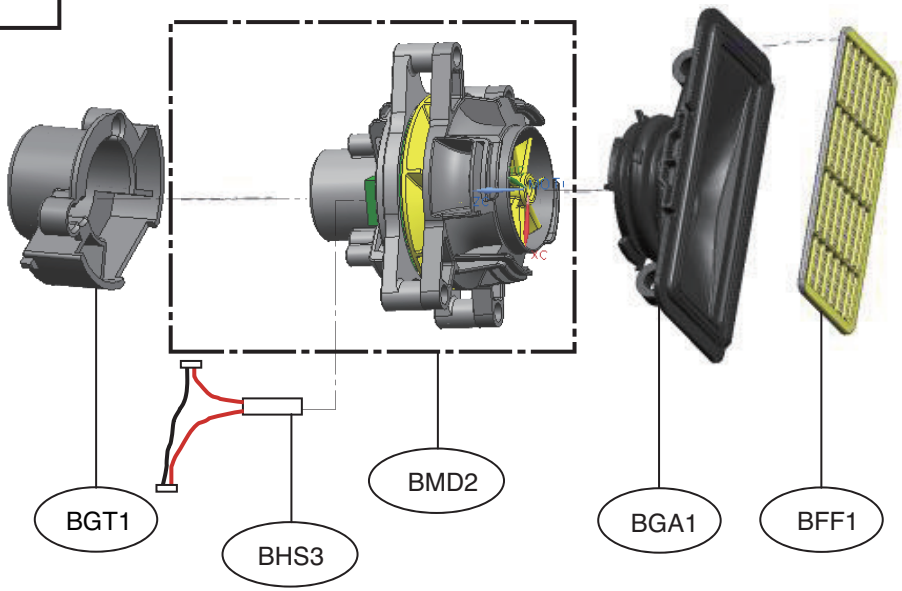
Deal Drawing of the Structure



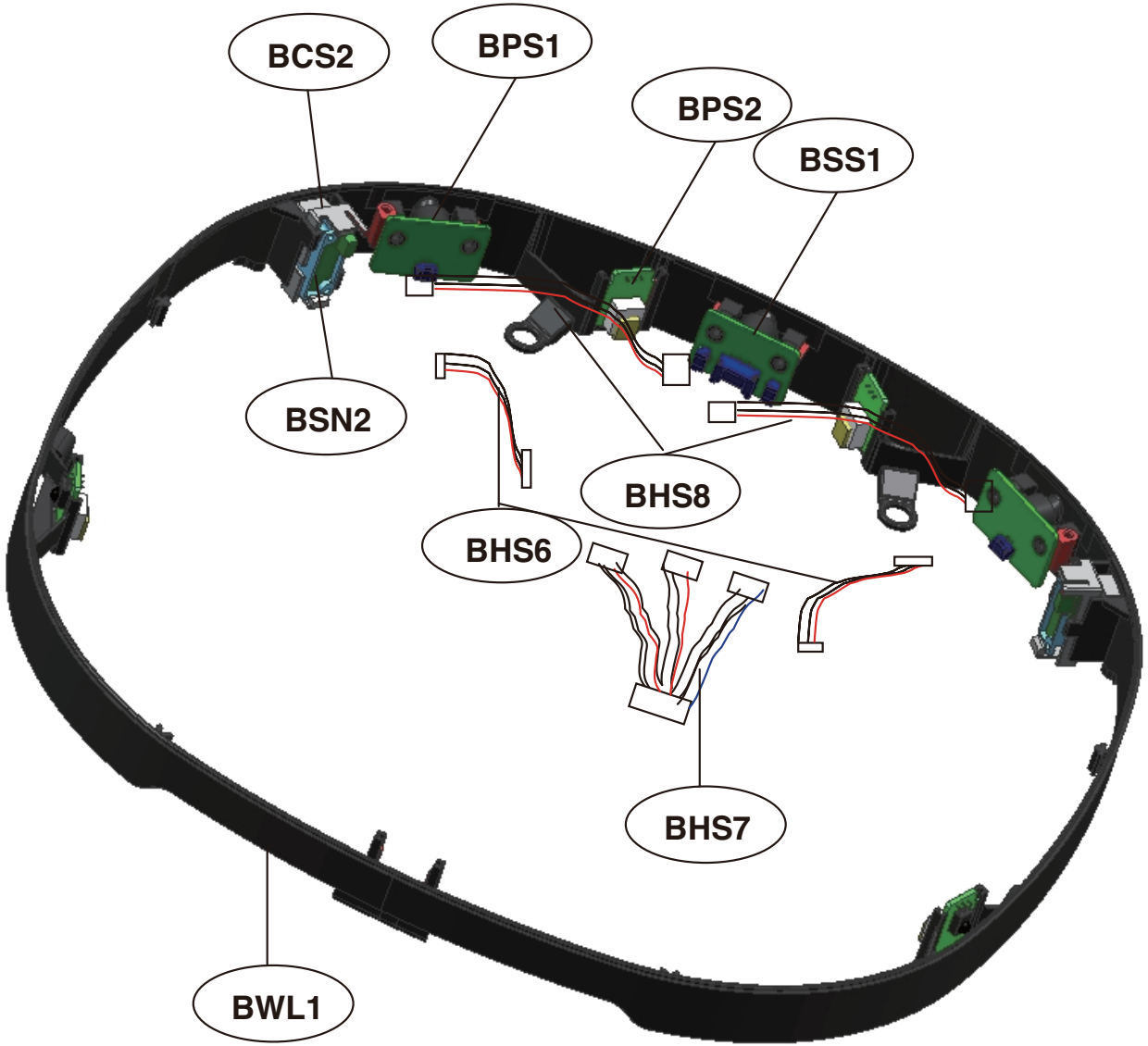
Deal Drawing of the Structure





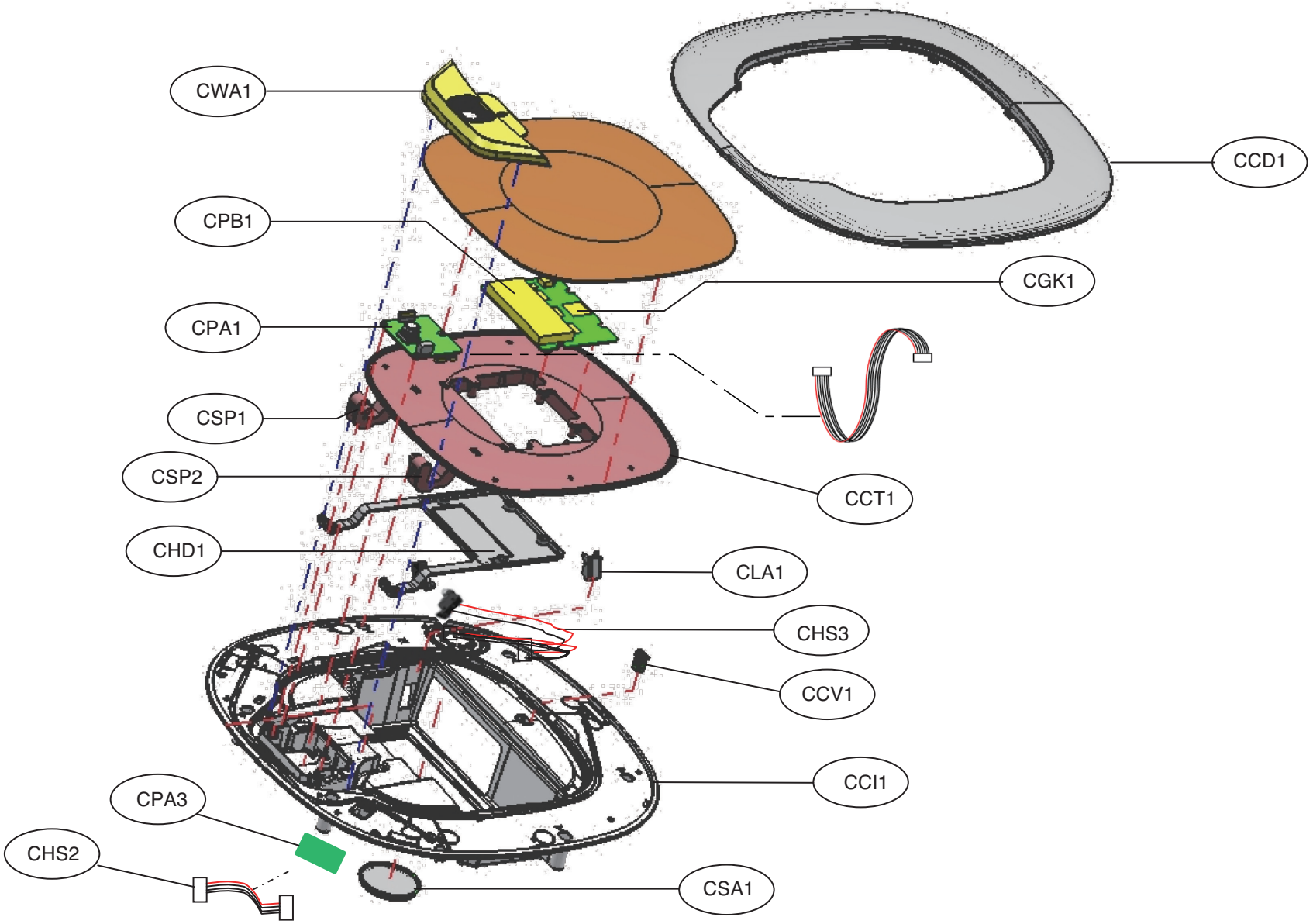


Deal Drawing of the Structure



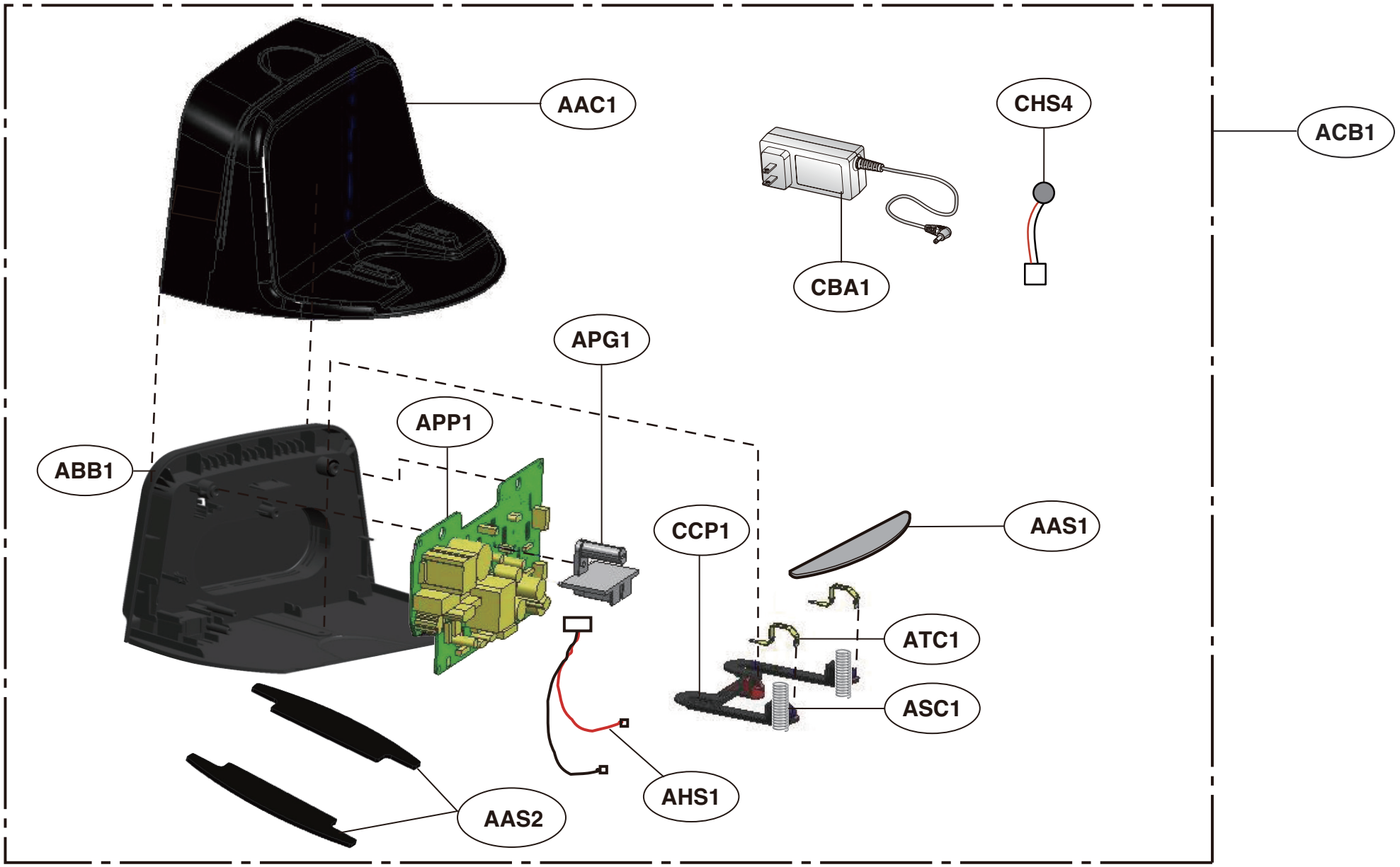
Deal Drawing of the Structure

■ Cover Assembly



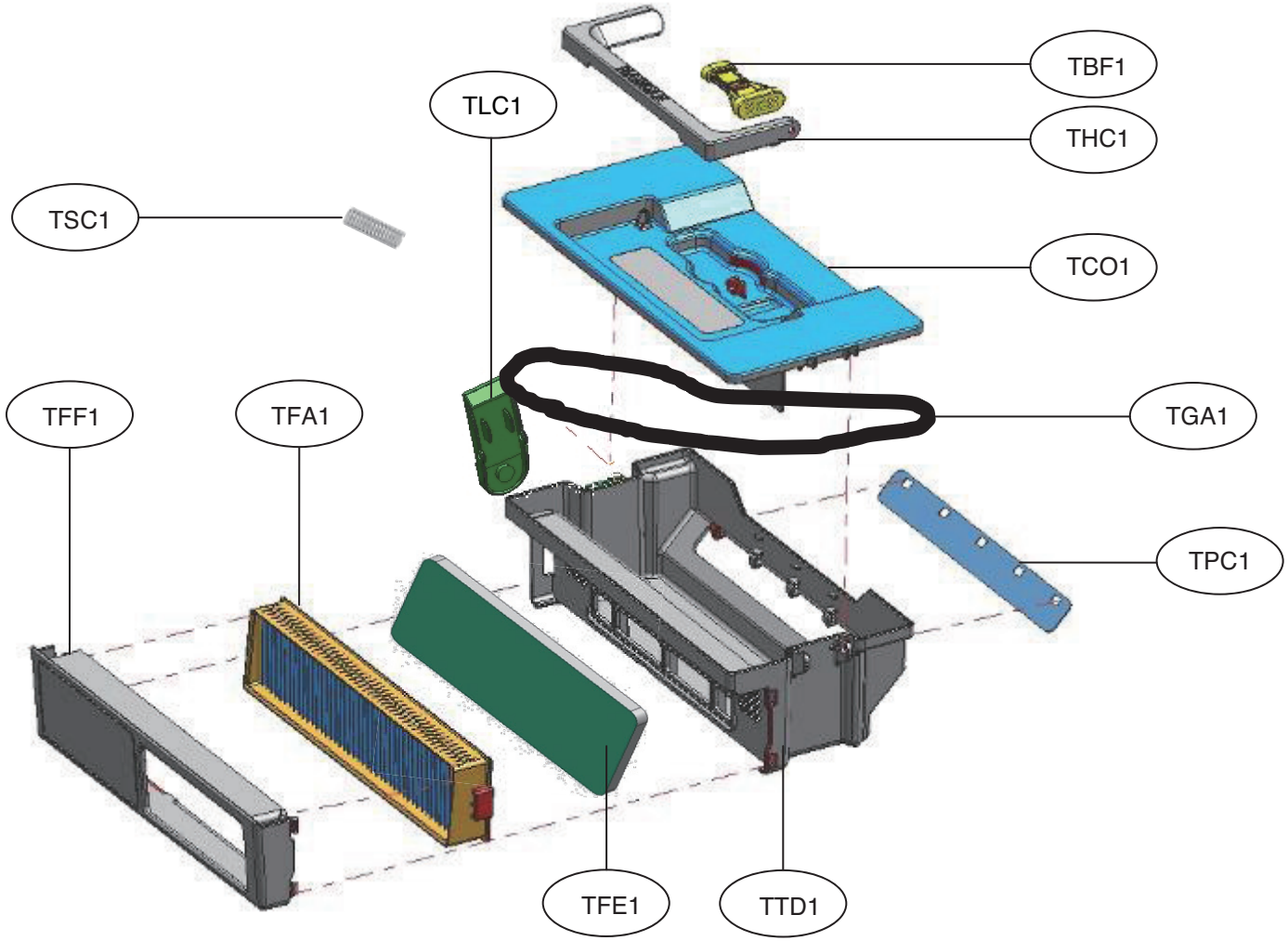
Deal Drawing of the Structure

■ Charger, Assembly



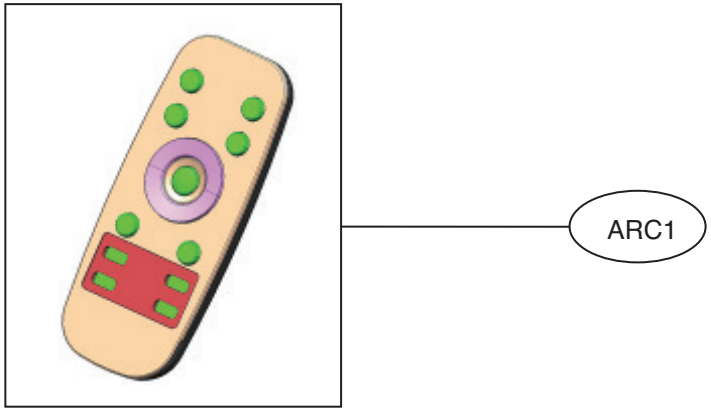
Deal Drawing of the Structure

■ Tank Assembly, Dust



Deal Drawing of the Structure

■ Remote Controller Assembly

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