HITACHI

Your Daily Guide to Reliable VRF Operation

Regular Maintenance Instruction for VRF Systems

NEW 2026

Bosch Home Comfort Japan, Inc.
www.hitachiaircon.com

Bosch Home Comfort Group is a trademark
Licensee of Hitachi, Ltd.

ADDRESS
New Pier Takeshiba South Tower
1-16-1, Kaigan Minato-ku, Tokyo 105-0022, JAPAN
Tel: +81-3-6721-5567

SOURCE OF CONTENTS
Inspection and Maintenance Guideline of VRF systems
(The Japan Refrigeration and Air Conditioning Industry Association), 2008

ISSUED BY
Global Product Marketing Department
Bosch Home Comfort Japan, Inc.

Chart for Inspection & Maintenance

These charts define the scope of periodic inspections for Hitachi VRF systems under standard operating conditions, including recommended inspection cycles and guidelines for parts replacement. If the equipment is subject to legal requirements—such as regulations under the Building Control Law concerning sanitary environments—inspection and maintenance must comply with those regulations.
For preventive maintenance, the periodic inspection cycle is indicated as the **“Inspection Cycle.”** The anticipated timing for **“Cleaning and Adjustment”** or **“Parts Replacement and Repair”**—based on periodic inspection results—is shown as the **“Maintenance Cycle.”** Cleaning and adjustment are intended to prevent deterioration of Hitachi VRF components and maintain system performance, while parts replacement and repair are scheduled based on predicted operating hours or usage periods until components approach their wear-out range. These intervals may vary depending on the specific Hitachi VRF model and configuration. For detailed inspection and maintenance procedures, refer to Hitachi technical documents and service manuals.



Your Daily Guide to Reliable VRF Operation

VRF systems have transformed comfort and efficiency in modern buildings. As these systems age, proper maintenance becomes essential—not only to ensure reliability and extend service life, but also to save energy and support a sustainable future.

This guideline is designed to help you keep your VRF systems performing at their best. Inside, you'll find standard recommendations for inspection points and cycles. Since product specifications may differ, please refer to official technical documents from Hitachi Cooling & Heating and contact our service team for tailored guidance.

Table of Contents

VRF Systems	Page 03
5 Reasons Why Regular Maintenance Matters	Page 05
For Inspection and Maintenance	Page 07
Definition of Service Life	Page 07
Service Life of VRF Systems	Page 08
Chart for Inspection & Maintenance	Page 09
Support App: airCloud Tap	Page 17
Cautions	Page 19

VRF Systems

Delivering precise comfort control, energy efficiency, and design flexibility. With centralized and remote management, operation and maintenance are simplified. Hitachi provides sustainable, future-ready HVAC solutions powered by cutting-edge technology and lifecycle tools.



Outdoor Unit

Top Flow

9th Generation



High Efficiency Type

air365 Max Pro

Heat Pump
Heat Recovery



Standard Type

air365 Max

Heat Pump
Heat Recovery
Cooling Only
For Hot/Cold environment
For High-ambient



Large Capacity Type

air365 Max Plus

Heat Pump

8th Generation



Standard Type

SET FREE Σ

Heat Pump
Cooling Only
Heat Recovery
For Hot/Cold environment

Modular Side Flow



air365 SideSmart

Heat Pump

Side Flow



air365 Mini Lite

Heat Pump



air365 Mini

Heat Pump



SET FREE mini

Heat Pump

Water Source VRF



Heat Pump
Heat Recovery

Indoor Concealed Centrifugal VRF



Heat Pump

Indoor Unit

Cassette

— Consistent air reaching every corner of a room. —

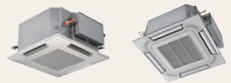
4-way Cassette



RCI-FSRP
RCI-FSKDN1Q

Silent-Iconic

4-way Cassette Compact



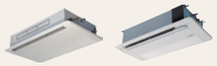
RCIM-FSRE
RCIM-HBUSQ

2-way Cassette



RCD-FSR
RCD-FSKDNQ

1-way Cassette



RCS-FSR
RCIS-FSKDNQ

Ducted

— The ultimate invisibility. —

High ESP



RPI-FSR
RPIH-HNAUN1Q
RPIH-HNDUSQ

Medium ESP



RPIM-FSR
RPIM-HNAUN1Q

Low ESP



RPIL-HNAUN1Q

Compact



RPIZ-HNATN1Q
RPIZ-HNDTS1Q

Mounted & Concealed

— Minimal installation or retrofit works. —

Wall Moutned



RPK-FSRM
RPK-HNBUSQ

Floor/Ceiling Convertible



RPFC-FSNQ

Ceiling Suspended



RPC-FSR

Floor Exposed



RPF-FSN2E

Floor Concealed



RPFI-FSN2E
RPFI-FSNQ

IAQ (Indoor Air Quality)

All Fresh Air Unit



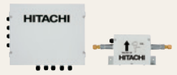
Conditioned fresh air through integrated coils.

Total Heat Exchanger



Energy recovery ventilation for efficient comfort.

DX-Kit



Integrate VRF with existing AHU systems.

Aqtiv-Ion Kit



Convert ducted units into air purifiers.

Controllers & IoT Solution

Centralized Controller

air Cloud Pro



Cloud-basis

Central Station EX



For large-scale building

Central Station EZ



For medium-scale building

Central Station mini



For small-scale building

Touch-screen



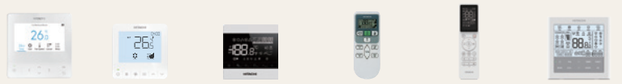
CCS-160R1DQ

Desktop version



CCS-H160H2C3YMQ

Individual Controller



PC-ARFG2
PC-ARC
HCWA10NEGQ
PC-AWR
PC-LH8QE
PC-P1HMQ

Supporting App & Software

air Cloud Tap



For installation & maintenance

air Cloud Select



For system selection

5 Reasons Why Regular Maintenance Matters

Regular maintenance is essential for cost efficiency, comfort, and safety.

Here are five key benefits:

1. Reduce running costs

Regular maintenance (periodic inspection and preventive maintenance) helps reduce operating costs. If air filters and heat exchangers are left uncleaned, pressure in the refrigeration cycle rises, causing higher power consumption during heating.

In some cases, systems ran for about four years without maintenance, leading to severe performance loss. As shown in Figure 1, power consumption was roughly **40% higher** compared to systems cleaned regularly.

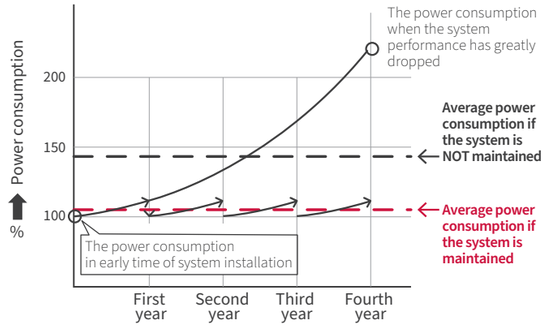


Figure 1: The increased power consumption due to the omitted system maintenance

(Power consumption during heating operation: simulated increase due to rise in high pressure.)

2. Extend service life

Regular maintenance—periodic inspection and preventive care—reduces unexpected failures and extends service life. VRF systems contain components like blowers and electrical parts that gradually deteriorate.

Figure 2 shows the “bathtub curve”: failure rates are high in the first year (initial failures), then stabilize (accidental failures), and rise again after long-term use (wear-out failures).

As shown in Figure 3, systems without maintenance deteriorate faster, reaching their usage limit sooner. Preventive maintenance significantly extends service life.

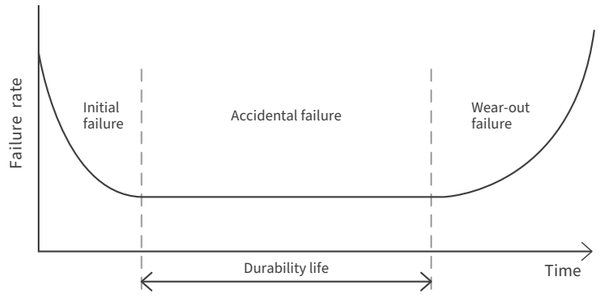


Figure 2: Trend of parts failure rate

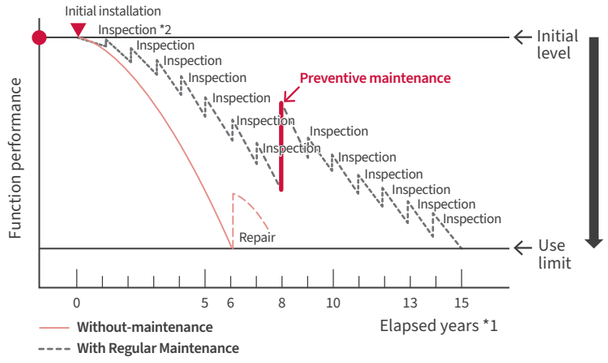


Figure 3: Concept of extension of service life

*1 The elapsed years are shown based on the typical system operation such as 10 operation hours per day and 2,500 operation hours per year under normal operating conditions (without frequent system startup and shutdown).

*2 This inspection includes the maintenance which is required for inspection.

3. Prevent failures

Air conditioning system abnormalities (or failures) can often be predicted through periodic diagnostics. By performing these checks, you can keep the VRF system running and prevent major issues while maintaining only essential parts. Remote monitoring is now also available.

4. Maintain comfort

Heat exchanger dirt builds up gradually and is hard to notice. As dirt accumulates, cooling and heating capacity decrease. If left unchecked, the air conditioning may stop working, and components like the fan motor and compressor can suffer damage. This can lead to abnormal noise, unpleasant odors, and overall comfort degradation. Thus periodic inspections are essential.

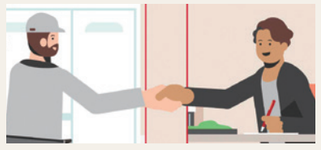
5. Ensure safety

The above issues relate to operation, but safety is equally important. To ensure safe use, periodically inspect electrical components, check for gas leaks, and verify the operation of safety devices. Always keep the equipment in good condition through expert inspections.



Together, these practices support long-term system performance, ensuring expected energy savings and maximizing service life.

Regular Maintenance = **Periodic Inspection** + **Preventive Maintenance**



Regular maintenance not only prevents failures but also keeps the system efficient, ensures consistent comfort for customers, and builds trust for long-term success.

Periodic inspection, carried out at scheduled intervals, helps reduce running costs by addressing potential issues before they become expensive.

Preventive maintenance extends asset life and reduces downtime by repairing or replacing components proactively.

For Inspection and Maintenance

To establish an inspection and maintenance contract for your Hitachi VRF system, certain system information is required. Providing complete and accurate details ensures smooth equipment inspection and maintenance without omissions. Please prepare and share the following information with the service contractor:

(a) Date of VRF system installation and test run

(b) Comprehensive list of VRF system components (including type and quantity of indoor units, outdoor units, external controllers, humidifiers, and electric heaters)

(c) Documentation showing system configuration and layout, such as installation plan views and piping diagrams for the VRF system

(d) System operation details, including any special operating patterns (e.g., 24-hour operation) and other relevant conditions

Definition of Service Life

Service life refers to the period from when equipment begins operation until it becomes no longer operable. In reliability terms, this is called the lifetime.
The service life can be defined in several ways, and its value varies depending on the chosen definition.

Table 1: Various definitions of service life

Service life	Explanation
Physical service life (Breakdown life)	The service life which is determined by the degradation or wear over time, and in this period the equipment can be maintained in the operable conditions without excessive degradation of functions and performance for the purpose of use. This period applies to the non-repair equipment and parts.
Economical service life (durability life, useful life)	The service life which is determined by economic factors, and this is the period until failure rate increase significantly and the maintenance cost raises, or the operation cost raises due to the dropped performance and it becomes economically unprofitable. This period applies to the repair equipment.
Social service life	The period until the current equipment becomes significantly disadvantage or difficult to use because new equipment spread and the current equipment becomes obsolete in its functions, performance, appearance and others or due to the change of the supply state of the energy used or the change of the other social demands such as pollution.
Legal service life	The period specified by Ministerial Ordinance for the depreciation of fixed assets.

Service Life of VRF Systems

The service life of VRF systems depends on the factors listed below.
In order to secure the expected service life, take the following notes.

Table 2: Factors affecting on the service life of VRF systems

Service life

See the following paragraph for the definition of service life. There are three types of service life. They are (1) physical service life which is determined by the deterioration over time and wear, (2) economical service life which is determined by increase maintenance cost due to increased failure rate or the increased of operating cost due to the dropped performance, and (3) social service life which is determined by the aging and obsolescence of equipment or the change of social demands (such as environmental issues and energy issues). These types of service life are estimate to be 6 to 15years respectively, assuming that the VRF system is operated for 10 hours a day and 25,000 hours a year under normal use conditions without frequent start and stop of the power supply. For details, refer to the inspection and maintenance standards of each product. The service life becomes short if:

- When the power supply is started and stopped frequently.
- When the operation time is long, such as 24 hours operation or ice heat storage operation at factory or convenience store.
- When using in a high temperature or high humidity, or in the environment where temperature or humidity changes excessively.
- When there is significant distortion of the power supply voltage waveform, significant unbalance of interphase voltage, and periodic surge superposition.

Also, if the VRF system is installed in the following atmosphere, the service life may become short greatly. Please consult the service center for selection of a special specification model and taking appropriate actions.

- If the VRF system is used in severe environments where dusts, salt (such as salt damage area), toxic gas (such as sulfide gas in hot spring area), and oil mist (such as factory and restaurant)

Note: The service life shown here does not mean the warranty years of the equipment.

Legal service life (Serviced life of depreciable assets)

• Electrical equipment: Cooling or heating equipment	6 years
• Cooling and heating equipment: Refrigerator output 22kW or less	13 years
: Others	15 years

Factors affecting on the service life

- Reliability of VRF system parts and the system reliability
- Design of VRF system parts which satisfies the target failure life and service life
- Parts that require periodic replacement. Maintenance design that requires parts replacement based on the results of periodic inspection.

Expected use conditions	Appropriate field installation work	Appropriate preventive maintenance (inspection and maintenance standards)
Facility design, Use environment	Installation work, Refrigerant piping, Electrical work	Inspection, Cleaning and adjustment, Replacement during failure, Periodic replacement

Explanation

Expected use conditions	Appropriate field installation work	Appropriate preventive maintenance (inspection and maintenance standards)
Follow the conditions of use described in the instruction manuals and technical documents.	Follow the notes on construction work instructed by the instruction manuals and technical documents. Also, check the construction results by conducting a test run.	Refer to "Chart" which shows the inspection and maintenance guideline of typical and major parts of VRF system.

Note

1) Please note that if you deviate from the use conditions of VRF system specified, the reliability of the parts that make up the equipment may drop and the service life may become short.
2) The VRF system is completed as a system after performing the installation, refrigerant piping, electric and other works in the field and used.
As the failure life and service life of the equipment greatly depend on the quality level of field installation work, follow the installation work standards.

Guidelines for Inspection and Maintenance of Key VRF System Components

Indoor Unit



Explanation of symbols

- ● Cleaning or adjustment based on the inspection results.
- ▲ Repairing or parts replacement when there is an abnormality after the inspection.
- ◆ Periodic replacement (consumable parts).

Chart 1-A

Part name		Periodic inspection: Inspection points	Inspection method	Criteria (Guide)	Maintenance points	Preventive maintenance *: Inspection cycle	Maintenance cycle (Use time/period)	Elapsed years (2)	Remarks
Structural parts	Decorative panel (design part)	• Check for dirt and scratches.	Visual inspection	• No excessive dirt, scratches, or deformation.	• Clean with a neutral detergent and paint by repair painting.	Every year before the cooling season	8 years	Random failure ▲ Wear-out failure	Parts to be cleaned
	Inlet and Outlet air grills	• Visually check for dirt and scratches. • Check the operation of outlet air grill louver.	Visual inspection	• No excessive scratches or deformation.	• Repair or replace if deformed or damaged. • Replace bearings, motors, etc. if operation is abnormal.		8 years	Random failure ● Wear-out failure	
	Frame, bottom plates	• Check for rusts and peeling of insulating materials. • Check for peeling and floating of coating film	Visual inspection	• No excessive rusts and damage to insulating materials.	• Repair and adhere the insulating materials if peeled off. • Paint it by repair painting		8 years	Random failure ▲ Wear-out failure	Parts to be cleaned
	Vibration insulation rubber	• Check for rubber deterioration and hardening.	Visual and auditory inspection	• No adverse effect on the anti-vibration function.	• Replace if deteriorated or hardened.		10 years	Random failure ▲ Wear-out failure	
Blower system parts	Filter	• Visual check for clogging and damage.	Visual inspection	• The filter material shall be seen through. • No breakage or deformation.	• Clean it if dirty. • Replace it if broken.	Every week(5)	5 years	Random failure ◆ Random failure ◆ Random failure ◆	Consumable parts
	Fan and fan casing	• Visual check for runout and balance. • Checking for dust adhesion and appearance.	Visual inspection	• Not in state of excessive runout. • No excessive rust and deformation.	• Replace if there is excessive runout or imbalance. • Clean with a brush or wash with water if a lot of dust adheres.	Every year before the cooling season	13 years	Random failure ● Wear-out failure	
	Fan motor	• Check for an abnormal noise. • Measurement of insulation resistance	Auditory inspection 500V megohmmeter	• No abnormal noise is generated. • 1M ohm or more.	• Replace bearing if its noise is large. • Replace motor if its insulation resistance is below 1M ohm.		20,000 hrs	Random failure ▲ Wear-out failure	
	Fan belt	• Periodic inspection for wear, scratches, and looseness, etc.	Visual and auditory inspection Belt tension check	• No excessive wear or abnormal noise. • The amount of belt deflection shall meet the product's judgment criteria.	• Replace the parts periodically.		5,000 hrs	◆ ◆ ◆ ◆ ◆ ◆ ◆	Consumable parts
	Bearing	• Periodic lubrication is required.	Auditory inspection	• No abnormal noise is generated.	• Replace the parts periodically.		15,000 hrs	Random failure ◆ Random failure ◆ Random failure	Consumable parts
	Auto louver motor	• Insulation resistance, abnormal noise generated	500V megohmmeter Auditory inspection	• 1M ohm or more, no abnormal noise is generated.	• Replace if insulation resistance is below 1M ohm.		20,000 hrs	Random failure ▲ Wear-out failure	
Drain system parts	Drain pan	• Check for clogging and drain water flow. • Check for peeling and floating of coating film.	Visual inspection	• No drainage clogging. • No excessive rust or holes.	• Clean the drain pan, and check its inclination. • Repair coating or replace the drain pan depending of the degree.	Every year before the cooling season	8 years	Random failure ▲ Wear-out failure	Parts to be cleaned
	Drain pump	• Check the drainage status. • Check for clogging and dirt on the water supply and drainage hole. • Insulation resistance	Visual inspection 500V megohmmeter	• Drainage is normal. • No clogging or dirty. • 1M ohm or more.	• Replace if the water drainage is poor. • Clean if clogged or dirty. • Replace if insulation resistance is below 1M ohms.		20,000 hrs	Random failure ▲ Wear-out failure	
	Dew condensation preventing heater	• Check the insulation resistance and appearance.	500V megohmmeter Visual inspection	• 1M ohm or more, and no abnormality.	• Replace if insulation resistance is below 1M ohm.		20,000 hrs	Random failure ▲ Wear-out failure	
	Float switch	• Operation check	Multimeter	• On-Off operation is normal.	• Replace if the operation failure occurs.		20,000 hrs	Random failure ▲ Wear-out failure	

Note

1): Random failure is an unexpected and sudden failure that may occurs before the wear progress within the service life of parts/equipment, and it is difficult to take technical measures. At present, we can only take measures based on the statistical handling.

2): *The elapsed years in the chart is assumed to be 10 operation hours per day and 2,500 operation hours per year under normal operating conditions without frequent start and stop. Please check at the time of maintenance contract as it depends on the operating conditions.

3): ◢ is a diagram that predicts the time when the wear-out failure begins and shows the tendency of the failure rate to increase with the elapsed time

4): The filter inspection period is basically once a week, however the degree of dirt varies depending on the type of filter and the use environment, so perform the inspection at arbitrary cycle according to the use environment.

[Main parts and assemblies of indoor unit] Indoor and outdoor categories are assumed to be for VRF systems.

Guidelines for Inspection and Maintenance of Key VRF System Components

Indoor Unit



Explanation of symbols

- ● Cleaning or adjustment based on the inspection results.
- ▲ Repairing or parts replacement when there is an abnormality after the inspection.
- ◆ Periodic replacement (consumable parts).

Chart 1-B

	Part name	Periodic inspection: Inspection points	Inspection method	Criteria (Guide)	Maintenance points	Preventive maintenance *: Inspection cycle	Maintenance cycle (Use time/period)	Elapsed years (2): 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Remarks
Refrigerant system parts	Air heat exchanger	• Check for clogging and damage. • Gas leakage	Visual inspection Gas detector	• No clogging or damage. • No leak detection.	• Clean the air inlet side if clogged. • Repair or replace it if a gas leakage is detected.	Every year before the cooling season	**5 years**	Random failure ● Random failure ● Random failure ● Random failure ● ●	Parts to be cleaned Due to atmospheric dirt
	Piping in VRF system	• Resonance, contact and corrosion of piping in VRF system • Resonance and contact of capillary tubes	Visual inspection	• No abnormal resonance, noise, and corrosion. • No abnormal resonance and contact wear.	• Repair or replace the piping if excessively corroded. • Repair or replace the piping if excessively worn.		**20,000 hrs**	Random failure ▲ Wear-out failure	
	Electronic expansion valve	• Operation check • Operation sound check at power On/Off (Pressure check).	Tactile inspection Auditory and tactile inspection	• Feeling the refrigerant circulation. • There is operational sound and temperature change.	• Replace if locked.		**20,000 hrs**	Random failure ▲ Wear-out failure	
	Solenoid valves, 4-way valves, etc.	• Operation of solenoid valves, 4-way valves, etc., insulation performance. • Corrosion and abnormal noise	500V megohmmeter Visual and auditory inspection	• 1M ohm or more. • No abnormal noise and corrosion.	• Replace if insulation resistance is below 1M ohm.		**20,000 hrs**	Random failure ▲ Wear-out failure	
Electric/ electronic parts	Electrical box (including the inverter)	• Check the circuit insulation resistance. • Check for loose terminals and connectors.	500V megohmmeter Screw driver inspection, visual inspection	• 1M ohm or more. • There is no looseness in the connection part. • No foreign matter accumulation. • No abnormal display.	• Clean with a brush if a lot of dust adheres. • Replace if insulation resistance is below 1M ohm. • Retighten if there is looseness, and reinsert.	Every year before the cooling season	**25,000 hrs**	Random failure ▲ Wear-out failure	
	Switching power transformer	• Output voltage measurement	Multimeter	• The output voltage shall be within the specified value.	• Replace if there is a voltage abnormality.		**10 years**	Random failure ▲ Wear-out failure	
	Temperature sensor humidistat	• Open, short circuit, grounding fault, appearance check	Multimeter, visual inspection	• Shall be the specified resistance value. • No cracking and discoloration.	• Replace in case of disconnection or short circuit.		**5 years**	Random failure ▲ Wear-out failure	
	Remote control switch	• Controllability check by operation.	Visual inspection	• LCD displays according to an operation.	• Replace when control followability or display failure.		**25,000 hrs**	Random failure ▲ Wear-out failure	
Additional function parts	Electric heater for auxiliary heating	• Appearance of heat generating part, damage to safety device. • Check the insulation resistance. • Adhesion of dust	Visual inspection 500V megohmmeter	• No damage or deformation. • 1M ohm or more. • No dust adhesion.	• Replace if damaged or deformed. • Replace if insulation resistance is below 1M ohm. • Clean it if there is dust.	Every year before the heating season	**8 years**	Random failure ▲ Wear-out failure	
	High-performance filter	• Check for clogging. • Appearance	Visual inspection	• No significant clogging in a short period. • No deformation or damage.	• Replace the filter if clogged. • Replace if deformed or damaged. • Replace periodically.	Every year before the cooling season	**1 year**	◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆ ◆	Consumable parts

Note

1): Random failure is an unexpected and sudden failure that may occurs before the wear progress within the service life of parts/equipment, and it is difficult to take technical measures. At present, we can only take measures based on the statistical handling.

2): *The elapsed years in the chart is assumed to be 10 operation hours per day and 2,500 operation hours per year under normal operating conditions without frequent start and stop. Please check at the time of maintenance contract as it depends on the operating conditions.

3): ◢ is a diagram that predicts the time when the wear-out failure begins and shows the tendency of the failure rate to increase with the elapsed time

4): The filter inspection period is basically once a week, however the degree of dirt varies depending on the type of filter and the use environment, so perform the inspection at arbitrary cycle according to the use environment.

[Main parts and assemblies of indoor unit] Indoor and outdoor categories are assumed to be for VRF systems.

Guidelines for Inspection and Maintenance of Key VRF System Components

Outdoor Unit



Explanation of symbols

- ● Cleaning or adjustment based on the inspection results.
- ▲ Repairing or parts replacement when there is an abnormality after the inspection.
- ◆ Periodic replacement (consumable parts).

Chart 2-A

Part name		Periodic inspection: Inspection points	Inspection method	Criteria (Guide)	Maintenance points	Preventive maintenance *: Inspection cycle	Maintenance cycle (Use time/period)	Elapsed years (2)	Remarks
Structural parts	Guard parts	• Check for peeling or floating of coating film. • Check for scratches and cracks in the resin parts.	Visual inspection	• No excessive rust, scratches and cracks, etc.	• Painting with repair paint. • Replace if there is damage such as scratches or cracks.	Every year before the cooling season	8 years	Random failure ▲ Wear-out failure	Parts to be cleaned
	Frame, bottom plates	• Check for rusts and peeling of insulating materials. • Check for peeling or floating of coating film.	Visual inspection	• No excessive rusts and damage to insulating materials.	• Repair and adhere the insulating materials if peeled off. • Paint it by repair painting		8 years	Random failure ▲ Wear-out failure	Parts to be cleaned
	Vibration insulation rubber	• Check for rubber deterioration and hardening.	Visual and auditory inspection	• No adverse effect on the anti-vibration function.	• Replace if deteriorated or hardened.		10 years	Random failure ▲ Wear-out failure	
Blower system parts	Fan and fan casing	• Visual check for runout and balance. • Checking for dust adhesion and appearance.	Visual inspection	• Not in state of excessive runout. • No excessive rust and deformation.	• Replace if there is excessive runout or imbalance. • Clean with a brush or wash with water if a lot of dust adheres.	Every year before the cooling season	10 years	Random failure ● Wear-out failure	
	Fan motor	• Check for an abnormal noise. • Measurement of insulation resistance	Auditory inspection 500V megohmmeter	• No abnormal noise is generated. • 1M ohm or more.	• Replace the bearing if its noise is large. • Replace the motor if its insulation resistance is below 1M ohm.		20,000 hrs	Random failure ▲ Wear-out failure	
	Bearing	• Periodic lubrication is required.	Auditory inspection	• No abnormal noise is generated.	• Replace the parts periodically.		15,000 hrs	Random failure ◆ Random failure ◆ Random failure	Consumable parts
Refrigerant system parts	Compressor	• Sound and vibration when startup, run and stop. • Check the insulation resistance (after energizing for the specified time of each product) • Looseness of terminals, contact of wirings	Visual, auditory and tactile inspection 500V megohmmeter Screw driver inspection, visual inspection	• No abnormal noise and vibration. • 1M ohm or more. • No looseness and contact.	• Replace if abnormal. • Replace if insulation resistance is below 1M ohm. • Retighten. Correct the wiring route.	Every year before the cooling season	20,000 hrs	Random failure ▲ Wear-out failure	
	Air heat exchanger	• Check for a clogging and damage. • Gas leakage	Visual inspection Gas detector	• No clogging or damage. • No leak detection.	• Clean the air inlet side if clogged. • Repair or replace it if a gas leakage is detected.		5 years	Random failure ● Random failure ● Random failure ● Random failure ● ● ●	Parts to be cleaned Due to atmospheric dirt
	(Water heat exchanger)	• Water amount, water temperature • Gas leakage • Water leakage • Check the water quality	Thermometer, flow meter and differential pressure Gas detector Visual inspection Water quality investigation	• Within the range of use of the product. • No leak detection. • No leakage. • Standard value of each product.	• Valve adjustment and operation setting value adjustment. • Repair or replace it if a gas leakage is detected. • Repair or replace it if water leaks. • Water quality control		5 years	Random failure ● Random failure ● Random failure ●	Parts to be cleaned Depends on the water quality used.
	Piping in VRF system	• Resonance, contact and corrosion of piping in VRF system • Resonance and contact of capillary tubes	Visual inspection	• No abnormal resonance, noise, and corrosion. • No abnormal resonance and contact wear.	• Repair or replace the piping if excessively corroded. • Repair or replace the piping if excessively worn.		20,000 hrs	Random failure ▲ Wear-out failure	
	Electronic expansion valve	• Operation check • Operation sound check at power On/Off (Pressure check).	Tactile inspection Auditory and tactile inspection	• Feeling the refrigerant circulation. • There is operational sound and temperature change.	• Replace if locked.		20,000 hrs	Random failure ▲ Wear-out failure	
	Solenoid valves, 4-way valves, etc.	• Operation of solenoid valves, 4-way valves, etc., insulation performance. • Corrosion and abnormal noise	500V megohmmeter Visual and auditory inspection	• 1M ohm or more. • No abnormal noise and corrosion.	• Replace if insulation resistance is below 1M ohm.		20,000 hrs	Random failure ▲ Wear-out failure	
	Pressure Vessels	• Corrosion of accumulators, oil separators, etc.	Visual inspection	• No abnormal corrosion.	• Repair painting if the corrosion occurs.		20,000 hrs	Random failure ▲ Wear-out failure	

Note

1): Random failure is an unexpected and sudden failure that may occurs before the wear progress within the service life of parts/equipment, and it is difficult to take technical measures. At present, we can only take measures based on the statistical handling.

2): *The elapsed years in the chart is assumed to be 10 operation hours per day and 2,500 operation hours per year under normal operating conditions without frequent start and stop. Please check at the time of maintenance contract as it depends on the operating conditions.

3): ◢ is a diagram that predicts the time when the wear-out failure begins and shows the tendency of the failure rate to increase with the elapsed time

4): The filter inspection period is basically once a week, however the degree of dirt varies depending on the type of filter and the use environment, so perform the inspection at arbitrary cycle according to the use environment.

[Main parts of outdoor unit] Indoor and outdoor categories are assumed to be for VRF systems.

Guidelines for Inspection and Maintenance of Key VRF System Components

Outdoor Unit



Explanation of symbols

- ● Cleaning or adjustment based on the inspection results.
- ▲ Repairing or parts replacement when there is an abnormality after the inspection.
- ◆ Periodic replacement (consumable parts).

Chart 2-B

Part name			Periodic inspection: Inspection points	Inspection method	Criteria (Guide)	Maintenance points	Preventive maintenance *: Inspection cycle	Maintenance cycle (Use time/period)	Elapsed years (2) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Remarks
Refrigerant system parts	Protection device (Security parts)	Pressure cut-off device	• Operating pressure, gas leakage, insulation resistance	Pressure gauge and others	• Operate at the set value. • Comply with the provisions of laws and regulations.	• Replace if it does not operate within the allowable installation value range.	Every year before the cooling season	25,000 hrs	Random failure ▲ Random failure	
		Fusible plug	• Appearance check (Soluble alloy bulge)	Visual inspection	• The fusible alloy shall be at the normal position.	• Replace if the fusible alloy bulges from its normal position.		15,000 hrs	Random failure ▲ Random failure ▲ Random failure	
Electric/ electronic parts	Crankcase heater		• Continuity check • Measurement of insulation resistance • Appearance check	Multimeter 500V megohmmeter Visual inspection	• There is continuity. • 1M ohm or more. • No abnormality.	• Replace if there is no continuity. • Replace if insulation resistance is below 1M ohm.		8 years	Random failure ◆ Random failure	Consumable parts
	Freezing preventing heater		• Continuity check • Check the insulation resistance and appearance.	Multimeter 500V megohmmeter Visual inspection	• There is continuity. • 1M ohm or more, no abnormality.	• Replace if there is no continuity. • Replace if insulation resistance is below 1M ohm.		20,000 hrs	Random failure ▲ Wear-out failure	
	Electrical box (including the inverter)		• Check the circuit insulation resistance. • Check for loose terminals and connectors.	500V megohmmeter Screw driver inspection, visual inspection	• 1M ohm or more. • There is no looseness in the connection part.	• Clean with a brush if a lot of dust adheres. • Replace if insulation resistance is below 1M ohm. • Retighten there is looseness, and reinsert.		25,000 hrs	Random failure ▲ Wear-out failure	
		Electrolytic capacitor	• Capacitor (electrolytic) appearance.	Visual inspection	• No liquid leakage and deformation.	• Replace if there is liquid leakage, deformation, etc.				
		Smoothing capacitor	• Measurement of capacitance and insulation resistance. • Appearance check.	Capacitance meter 500V megohmmeter Multimeter	• Not less than the specified capacity. • 1M ohm or more.	• Replace the parts periodically. • Replace if insulation resistance is below 1M ohm.		10 years	Random failure ◆ Random failure	Consumable parts
		Terminal board	• Looseness of terminal screws, dirt accumulation.	Screw driver inspection, visual inspection	• No looseness. • No foreign matter accumulation.	• Retighten if there is looseness. • Clean with a brush if accumulated foreign matter adheres.	Every year before the cooling season	25,000 hrs	Random failure ▲ Wear-out failure	
		Electric parts (including circuit boards)	• Check the HIC board short circuit. • Visual check for foreign matter adhesion to circuit boards. • Self-inspection mode, appearance check	Multimeter Visual inspection	• Shall be at the specified resistance value. • No foreign matter accumulation. • No abnormal display.	• Replace if the resistance value is not specified. • Clean with a brush if accumulated foreign matter adheres. • Repair or replace the parts.		25,000 hrs	Random failure ▲ Wear-out failure	
	Pressure sensor, temperature sensor		• Open, short circuit, grounding fault, appearance check	Multimeter, visual inspection	• Shall be at the specified resistance value. • No cracking and discoloration.	• Replace in case of disconnection or short circuit.		5 years	Random failure ▲ Wear-out failure	
	Switches (including FFB, ELB)	Magnetic switch Overcurrent relay Auxiliary relays	• Appearance and operation check • Degradation of contact	Visual inspection	• No deformation. • Shall operate as setting, no deformation. • No deformation and discoloration.	• Replace in case of operation failure, deformation, or discoloration.		25,000 hrs	Random failure ▲ Wear-out failure	
	Switching power transformer		• Measurement of output voltage	Multimeter	• The output voltage shall be within the specified value.	• Replace if there is a voltage abnormality.		10 years	Random failure ▲ Wear-out failure	
	Cooling fan		• Insulation resistance, abnormal noise generation.	500V megohmmeter, auditory inspection	• 1M ohm or more, no abnormal noise.	• Replace if insulation resistance is below 1M ohm. • Replace if the fan is locked.		20,000 hrs	Random failure ▲ Wear-out failure	
	Fuse		• Appearance check	Visual inspection	• No deformation and discoloration.	• Replace the fuse at a cutoff time.		10 years	Random failure ◆ Random failure	Consumable parts
(Strainer (for water))			• Check for a clogging.	Visual inspection	• No dirt and clogging.	• Clean	Every year before the cooling season	10 years	Random failure ▲ Wear-out failure	Parts to be cleaned Depends on the water quality used.

Note

1): Random failure is an unexpected and sudden failure that may occurs before the wear progress within the service life of parts/equipment, and it is difficult to take technical measures. At present, we can only take measures based on the statistical handling.

2): *The elapsed years in the chart is assumed to be 10 operation hours per day and 2,500 operation hours per year under normal operating conditions without frequent start and stop. Please check at the time of maintenance contract as it depends on the operating conditions.

3): ◢ is a diagram that predicts the time when the wear-out failure begins and shows the tendency of the failure rate to increase with the elapsed time

4): The filter inspection period is basically once a week, however the degree of dirt varies depending on the type of filter and the use environment, so perform the inspection at arbitrary cycle according to the use environment.

[Main parts of outdoor unit] Indoor and outdoor categories are assumed to be for VRF systems.

airCloud Tap — Your Next-Generation VRF Support Tool

UX DESIGN AWARDS product 2022



How does airCloud Tap works?



1. Activate the NFC function on the equipment.
2. Open the **airCloud Tap** app and tap the HVAC unit with your phone to read the current settings.
3. Edit the desired settings on your phone.
4. Tap the equipment again to apply the new settings.

Check airCloud Tap instruction video!

How to use CHECK MENU for controllers from airCloud Tap!



YouTube Watch Now!

How to Activate TEST RUN from airCloud Tap!



YouTube Watch Now!

What you can do with airCloud Tap **air365 Max outdoor units**

Home Menu	Function Menu	Read(R) / Write(W)	User Role: Facility Manager	Installer	Authorized Service	Saved Settings
Installation Settings	Ref. Cycle No. Setting	R/W	×	✓	✓	-
	Outdoor Unit No. Setting	R/W	×	✓	✓	-
	High Static Pressure Mode Setting	R/W	×	✓	✓	✓
	Low Ambient Cooling Mode Setting	R/W	×	✓	✓	✓
	Fan Speed Adjustment Invalid Setting	R/W	×	✓	✓	✓
	Power Supply Voltage Setting	R/W	×	×	✓	✓
	Indoor Unit Fan Restriction Setting	R/W	×	✓*1	✓*1	✓
Test Run	Cooling/Heating Test Run *2	R/W *2	×	✓*1*2	✓*1*2	*2
	Forced Defrost	W	×	✓*1	✓*1	-
Check Menu	Operation Data Check *2	R *2	×	✓*1*2	✓*1*2	*2
	Connecting Information	R	×	✓*1	✓*1	-
	Cause of Alarm Code Information	R	×	✓*1	✓*1	-
	Operation Data Before Alarm *2	R *2	×	✓*1*2	✓*1*2	*2
	Abnormal Code History Information	R	×	✓*1	✓*1	-
Saved Settings	Edit Saved Settings	-	×	✓	✓	-
	Write Copied Settings	W	×	✓	✓	-
	Export Saved Settings	-	×	✓	✓	-

*1 Only outdoor unit A can be set

*2 May not work with some Samsung Galaxy phone models / ✓ Indicates this item is operable

ODU MODEL LIST :

RAS-*JNCBLI ; RAS-***HNCCLI ; RAS-***NCBLW ; RAS-***HNCCLW ; RAS-***RNCCLW ; RAS-***RNCBLW ; RAS-***RNCCLW ; RAS-080RNCCLW ; RAS-***RNCCRW.**

What you can do with airCloud Tap **wired room controllers**

Home Menu	Function Menu	Read(R) / Write(W)	airPoint Room 700
Service & Installation	Function Selection	R/W	✓*2
	External Input/output		✓*2
	Contact Information		✓*1
	Hotel Mode		✓
	Temperature Range Restriction		✓
	Dual Setpoint		✓
	Main/Sub Display		✓
	Thermistor Selection		✓
	Thermistor Calibration in Controller		✓
	Auto-Restart: auto turn ON (d1)		✓*2
	Auto-Restart: follow latest status from before outage (d3)		✓*2
	Hi Fan Speed (C5)		✓*2
	Lock Function		✓
	Fan Speed at Cooling Thermo-OFF		✓*2
	Fan Speed at Heating Thermo-OFF		✓*2
	Cancel preheating control	W	✓
	Power Up	R/W	✓
Test Run	Mode	W	✓
	Test Time		✓
	Start/Stop Test Run		✓
Check Menu	Alarm History	R	✓
	Product Info *5		✓
	Check 1		✓*3
	Check 2		✓*3
	Check PCB of the Units		✓*4
Saved Settings	Edit Saved Settings	–	✓
	Write Copied Settings	W	✓

*1 Only English and numbers can be registered.

*2 If multiple indoor units are connected, individual settings are not possible.

*3 Selection of the indoor unit on the Check Menu screen on the Wired Remote Controller is required.

*4 Selection of the indoor unit on the result of check PCB of the units on the Wired Remote Controller is required.

*5 May not work with some Samsung Galaxy phone models

Cautions

Although some notes are given on [Chart for Inspection & Maintenance], the particular important notes are written below. As the inspection and maintenance works may vary depending on the product used, perform those works by referring to the technical documents and various instruction manuals of the product. Also, consult the service agency for technical support.

1. Cleaning the heat exchanger

High technical knowledge is required for washing inside of VRF system. If the customer cleans inside of VRF system by own, or if the cleaning solvent is selected incorrectly or it is cleaned incorrectly, water leakage and electric parts failure may occur due to the damage of internal parts.

Consult the service agency for cleaning inside of VRF system.

It may be required to clean inside of VRF system so that the customer can save the electricity after the VRF system has been operated for several seasons. The general method for cleaning inside of VRF system is to remove dirt from the heat exchanger, but the high technical knowledge is required to select the cleaning method, cleaning agents, and their handling and processing.

If the cleaning agent is selected incorrectly or if the inside of VRF system is cleaned incorrectly, the cleaning agent may remain inside of the VRF system and it may damage resin parts and cause an insulation failure, and the VRF system itself may fail to operate. In the worst case, a smoke or a fire may result.

INSTRUCTIONS TO SUPPLIERS:

- Protect the electric parts, fan motor, drain pan, electric heater and others from cleaning agents.
- Select an appropriate cleaning agent which does not attack the resin material (plastic).
- Do not perform the high-temperature and high-pressure steam cleaning that may damage resin parts.
- Wash inside of VRF system sufficiently so that the dirt does not clog in the drainage.

2. Inspection and maintenance during on-season and off-season

On-season

- Carry out the energization for the time specified by each product before operating the VRF system.
- Clean the air filter.
- Check that there are no safety defects such as the ground wire being disconnected.
- Check to see that the inlet and outlet of both indoor and outdoor units are not blocked.
- Check that the drain hose is not disconnected or not clogged, and that the water is drained.

Off-season

- Dry inside of the indoor unit by the ventilation operation.
- Drain the water if there is a possibility of water freezing in the ice heat storage unit or water-cooled heat source unit.
- Turn the power switch off when operation of the VRF system is stopped for a long time.

3. Measures to remove the dirt which may cause clogging in the drainage passage such as drain pan

Clean the drainage passage of VRF system if necessary during periodic inspection.
If you plan to use a slime-preventing agent, please consult an authorized Hitachi service center.
If the correct preventive agent is not selected and used, the internal parts such as drain pan and drain pump may be damaged, causing water leakage or failure of electric parts.

4. Management of Water Quality

Follow the water quality standards recommended for cooling water, chilled water, heating water, and make-up water for each Hitachi product. For thermal storage tanks, adhere to the standard values specified for the product. Failure to maintain proper water quality may result in corrosion of heat exchangers and water circuits, water leakage, gas leakage caused by excessive scale formation, and overall performance deterioration.





