

## ***Daikin Ductless Service Checklist***

IMPORTANT NOTE: This Checklist does not supersede or substitute for other technical documentation such as Service Manuals, Installation Manuals/Installation Instructions, and/or Operation Manuals, but can be used in conjunction with such documentation. When servicing or maintaining VRV equipment, you should observe all warnings and cautions contained in such documentation.



ONLY PERSONNEL THAT HAVE BEEN TRAINED TO INSTALL, ADJUST, SERVICE OR REPAIR (HEREINAFTER, "SERVICE") THE EQUIPMENT SPECIFIED IN THIS MANUAL SHOULD SERVICE THE EQUIPMENT. THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR ANY INJURY OR PROPERTY DAMAGE ARISING FROM IMPROPER SERVICE OR SERVICE PROCEDURES. IF YOU SERVICE THIS UNIT, YOU ASSUME RESPONSIBILITY FOR ANY INJURY OR PROPERTY DAMAGE WHICH MAY RESULT. IN ADDITION, IN JURISDICTIONS THAT REQUIRE ONE OR MORE LICENSES TO SERVICE THE EQUIPMENT SPECIFIED IN THIS MANUAL, ONLY LICENSED PERSONNEL SHOULD SERVICE THE EQUIPMENT. IMPROPER INSTALLATION, ADJUSTMENT, SERVICING OR REPAIR OF THE EQUIPMENT SPECIFIED IN THIS MANUAL, OR ATTEMPTING TO INSTALL, ADJUST, SERVICE OR REPAIR THE EQUIPMENT SPECIFIED IN THIS MANUAL WITHOUT PROPER TRAINING MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

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### **Judgement:** G=Good

RM=Requires maintenance

RS=Requires service

GMS=Good after maintenance or service

**Note:** Enter NA for items that do not require inspection.

Daikin products are subject to continuous improvements.

Daikin reserves the right to modify product design, specification, and information in this publication without notice and without incurring any obligation.

## General Information & Safety Considerations

- Daikin North America strongly recommends that any individual installing, commissioning or servicing any Daikin VRV system, should first receive comprehensive training at a factory training facility or factory authorized training facility.
- **IMPORTANT NOTE:** This Checklist does not supersede or substitute for other technical documentation such as Service Manuals, Installation Manuals/Installation Instructions, and/or Operation Manuals, but can be used in conjunction with such documentation. When servicing or maintaining VRV equipment, you should observe all warnings and cautions contained in such documentation.
- It is recommended that only Daikin Factory Trained personnel perform maintenance work.
- Always follow local codes.
- Refrigerant gas is heavier than air and displaces oxygen. A leak can result in oxygen displacement.
- Be sure to disconnect the power cable before disassembling the equipment for repair. Follow OSHA lock out tag out procedures. See supplemental information on [page 21](#).
- Working on equipment that is connected to the power supply may cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspection of circuits, do not touch any electrically charged sections of the equipment.
- Do not allow the discharging refrigerant to come in contact with skin as it may cause frostbite.
- If disconnecting the suction or discharge pipes of the compressor, recover the refrigerant completely, and cut the piping using a tubing cutter. NEVER unbraid a brazed joint! If there is refrigerant remaining inside the compressor, the refrigerant or compressor oil may discharge at a high temperature and pressure, possibly causing injury.

## General Installation Considerations

- If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas may generate toxic gases when it contacts flames.
- Be sure to discharge all capacitors completely before conducting repair work. The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. A charged capacitor will cause an electrical shock.
- Do not start or stop the air conditioner by plugging or unplugging the power cable/disconnect.
- Be sure to wear a safety helmet, gloves, and a safety belt when working at a height greater than 6.5 ft. (2 m). Insufficient safety measures may lead to a fall.
- In case of R-410A refrigerant models, be sure to use equipment and tools for the exclusive use of the R-410A refrigerant.
- Do not allow air or any noncondensibles to enter the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and/or injury.
- Be sure to turn OFF the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and may cause injury. Follow OSHA lock out tag out procedures. See supplemental information on [page 21](#).
- Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of non-approved parts or tools may cause an electrical shock, excessive heat generation or fire.

## Equipment Requirements to Perform Proper Maintenance:

- 2-Stage Vacuum Pump
- Micron Gauge (Digital or Analog)
- Multimeter
- Schrader Valve Removal Tools
- Megger Meter
- Hoses
- Flaring Tools
- Common Hand Tools
- Manifold Gauges
- Voltmeter
- Ammeter
- Temperature Probe



Micron gauge

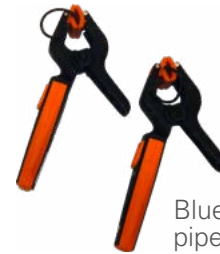


Schraeder Valve removal tool

Vacuum Pump



Megger meter



Bluetooth pipe clamps



Temperature probe



Service Checker



Multimeter



Pressure gauges



Wireless and wired Dchecker



Torque wrenches

Large Tool Bag



## Daikin offers a small and large Tool Bag:

These items can also be purchased individually from your local distributor.

## Customer/Technician Information

Date		Time Arrived		Time Departed	
Customer Name					
Customer Number			Customer Phone		
Customer Email					
Service Address					
Service Company					
Address					
Technician Name					
Technician Phone			Company Phone		
Technician Email					
Building Type		No. of Floors		No. of Outdoor Units	
Brief Description of Equipment Condition					
Other Jobsite Observations					

## 4 Wire Communication Outdoor Residential Unit Inspection

Model name	Unit No.	System name and installation site	Piping length

Item	Method	Standard	Actual measurement	Judge -ment
Compressor	Measure using 500V megger (Measure U, V, and W terminals, and enter the minimum value)	1MΩ min.	Comp. 1 U MΩ V MΩ W MΩ	
Power supply voltage	Measure when unit does not operate and when compressor operates	Within ±10% of rated voltage	L1 to Gnd V L2 to Gnd V L1 to L2 V	
Outdoor unit temperature data	By thermistor thermometer (Wait 15 minutes or more after startup to take measurement)		Outdoor temp. °F	
		< +9°F outdoor temp.	Suction air temp. °F	
		Suction Air Temp + 9°F-18°F	Discharge air temp. °F	
Target disch. compressor temp.	Record from Dchecker	Dchecker measurement	°F	
Actual compressor discharge pipe temp.	By Temperature Clamp/Temperature probe		°F	
Outdoor discharge air temperature	By Temperature Clamp/Temperature probe	27°F to 45°F	°F	
Suction pipe temperature	By Temperature probe	28°F to 50°F (operating conditions effect)	°F	
Inlet Expansion valve temperature	By Temperature probe	Discharge air temp + 27°F ± 14°F		
Super Heat (SH)	Calculation: = suction pipe temp - evaporation temp.	9°F ± 5°F	°F	
Expansion valve pulses	Using Dchecker	Record pulses	pulses	
ΔT	Calculation: = discharge air temp. - suction air temp.	18°F ± 27°F		
Protections	Record from Dchecker	Value of 255 means inactive		

## 4 Wire Communication (Multi Split) Outdoor Residential Unit Inspection

Item	Method	Standard	Actual measurement				Judge -ment
			IDU A	IDU B	IDU C	IDU D	
Liquid pipe temperature	Measure by temperature probe	Navigation controller or service checker	°F	°F	°F	°F	
	Measure with Dchecker		°F	°F	°F	°F	
Gas pipe temperature	Measure by temperature probe	Navigation controller or service checker	°F	°F	°F	°F	
	Measure with Dchecker		°F	°F	°F	°F	
Expansion Valve Pulses	Measure with Dchecker	Record pulses					

**Judgement:** G=Good, RM=Requires maintenance, RS=Requires service, GMS=Good after maintenance or service

**Note:** Enter NA for items that do not require inspection.

## 4 Wire Communication Indoor Residential Unit Inspection (1 of 2)

### Indoor Unit A (Use for single phase indoor unit)

	Model name	Unit No.	System name and installation site	Piping length
Indoor unit A				

Item	Method	Standard	Actual measurement	Judge -ment
Indoor unit temperature data	By thermistor thermometer (Wait approx. 15 minutes after startup to take measurement)	In cooling: $\Delta t = 28.8^{\circ}\text{F}$ or more for single splits  In heating: $\Delta t = 36^{\circ}\text{F}$ or more for multi splits	Suction air temp. °F	
			Discharge air temp. °F	
			Temperature difference $\Delta t$ °F	
Indoor heat exchanger temperature	Record from Dchecker		°F	

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### Indoor Unit B

	Model name	Unit No.	System name and installation site	Piping length
Indoor unit B				

Item	Method	Standard	Actual measurement	Judge -ment
Indoor unit temperature data	By thermistor thermometer (Wait approx. 15 minutes after startup to take measurement)	In cooling: $\Delta t = 28.8^{\circ}\text{F}$ or more for single splits  In heating: $\Delta t = 36^{\circ}\text{F}$ or more for multi splits	Suction air temp. °F	
			Discharge air temp. °F	
			Temperature difference $\Delta t$ °F	
Indoor heat exchanger temperature	Record from Dchecker		°F	

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## 4 Wire Communication Indoor Residential Unit Inspection (2 of 2)

### Indoor Unit C

	Model name	Unit No.	System name and installation site	Piping length
Indoor unit C				

Item	Method	Standard	Actual measurement	Judge -ment
Indoor unit temperature data	By thermistor thermometer (Wait approx. 15 minutes after startup to take measurement)	In cooling: $\Delta t = 28.8^{\circ}\text{F}$ or more for single splits  In heating: $\Delta t = 36^{\circ}\text{F}$ or more for multi splits	Suction air temp. °F	
			Discharge air temp. °F	
			Temperature difference $\Delta t$ °F	
Indoor heat exchanger temperature	Record from Dchecker		°F	

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### Indoor Unit D

	Model name	Unit No.	System name and installation site	Piping length
Indoor unit D				

Item	Method	Standard	Actual measurement	Judge -ment
Indoor unit temperature data	By thermistor thermometer (Wait approx. 15 minutes after startup to take measurement)	In cooling: $\Delta t = 28.8^{\circ}\text{F}$ or more for single splits  In heating: $\Delta t = 36^{\circ}\text{F}$ or more for multi splits	Suction air temp. °F	
			Discharge air temp. °F	
			Temperature difference $\Delta t$ °F	
Indoor heat exchanger temperature	Record from Dchecker		°F	

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## EEV Inspection (Supplement)

### Checkpoint and analysis: Indoor unit side

#### Main malfunctions of indoor unit. (In cooling operation)

#### Ways of checking the EEV.

#### How to check the EEV for internal leakage.

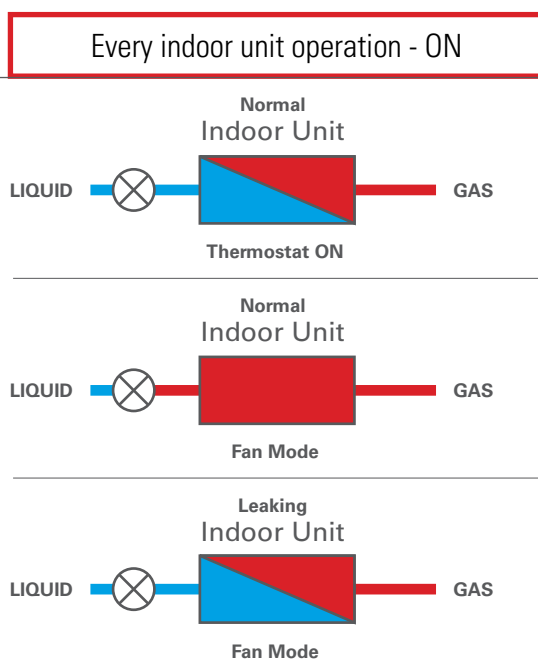
##### Easy checking method

- Some indoor units thermostat-on, the others operate with FAN mode.

#### How to check that the EEV is closed or not.

##### Easy checking method

- After ALL indoor units thermostat-on in cooling operation, if there is an indoor unit that doesn't decrease the pipe temperature, it has a possibility that EEV has a problem. Please measure the pipe temperature.
- Outdoor setting 2-6 is very useful in this time.



If the liquid pipe temperature drops during FAN mode, the EV is leaking. When checking it, it is easier to use the VRV checker. And please check the temperature until the other indoor unit liquid pipe temperatures are over 20 degree.

## Disassembly of EEV

### Check for clean smooth surface





## OSHA Lockout Tagout Procedures

# LOCKOUT/TAGOUT

Lockout / Tagout procedures are designed to isolate or shut off machines and equipment from their power sources before employees perform any servicing or maintenance work.

### Definition:

**Lockout** is the placement of a lockout device on an energy isolation apparatus (circuit breaker, slide gate, line valve, disconnect switch, etc.) to ensure that the energy isolating device and equipment being controlled cannot be operated until the lockout device is removed. A lockout device utilizes a positive means such as a lock (key or combination type) to hold an energy isolating device in a safe position and prevent the energization of a machine or equipment. The lockout device must be substantial enough to prevent removal without use of excessive force or unusual techniques.

**Tagout** is the placement of a tagout device (a tag or other prominent warning device and a means of attachment) on an energy isolation device to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.



### Energy-isolating device

Any mechanical device that physically prevents the transmission or release of energy. These include, but are not limited to, manually operated electrical circuit breakers, disconnected switches, line valves and blocks.

Employees performing maintenance or service on machines or equipment shall observe the following procedures:

- Lockout / Tagout of energy isolating devices shall be performed whenever maintenance or servicing is done on machines or equipment. This shall be done by employees who have received proper training on lockout/tagout procedures from Environmental Health and Safety.
- Employees observing a machine or piece of equipment which is locked or tagged out shall not attempt to start, energize or use that machine or equipment.
- Lockout and Tagout devices shall indicate the identity of the employee who attached the devices.
- Lockout and Tagout devices shall be standardized within the facility.
- If an energy isolating device is not capable of being locked out, a tagout system shall be used.
- Tagout devices shall include warning statements such as "DO NOT ENERGIZE!" or "DO NOT OPERATE!"
- Whenever replacement, major repair, renovation or modification of equipment is performed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device.

*Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.*

### Sources for More Information:

- OSHA 29 CFR 1910.147, 1910.212 and 1910.219.
- ANSI Z244.1-1982, Personal Protection Lockout / Tagout of Energy Sources.
- American National Standards Institute (ANSI)  
25 W. 43rd St., 4th Floor, New York, NY 10036 (212) 542-4900

## Flare Nut Tightening and Torque Specifications

To verify proper flare torque values adjust torque wrench to lowest foot pound value for each flare nut's torque range. Place torque wrench on flare nut and tighten until torque clutch releases.

1/4"	10.4 – 12.7 ft lb
3/8"	24.1 – 29.4 ft lb
1/2"	36.5 – 44.5 ft lb
5/8"	45.6 – 55.6 ft lb



## Internal Lift Pump Float Safety Inspection

Inspect float safety for free movement and the entrance to the pump to be clear of obstructions

