HITACHI

# INSTALLATION MANUAL

## air Home 600

**SPLIT UNIT AIR CONDITIONER**
**OUTDOOR UNIT**

RAC-GJ18WHAA
RAC-GJ24WHAA

HFC R32

① **EN** INSTRUCTION MANUAL

**FOR SERVICE PERSONNEL ONLY**

- Carefully read through the procedures of proper installation before starting installation work.
- The sales agent should inform customers regarding the correct operation of installation.

### Tools Needed For Installation Work

● ⊕⊖ Screwdriver ● Measuring Tape ● Knife ● Saw
● Pipe Cutter ● Hexagonal Wrench Key ( 4/25"(4mm)
● Power Drill (ø2-14/25"(65mm) ~ ø 3-3/20"(80mm))
● Vacuum Pump ● Pliers or Wrench ● Torque Wrench
● Vacuum Pump Adaptor ● Flare Tool ● Gas Leakage Detector ● Manifold Valve ● Charge Hose ● Reammer
● File

**Access the full version of the User Installation Manual by scanning the code. (RAC-GJ18/24WHAA)**

Cooling & Heating

**EE0018833Z rev.0-08/2024**

### ⚠ WARNING

- Flare nut must use a torque wrench without fail. Tighten with the specified tightening torque. If the flare nut is tightened too much, after a long period of time, the flare nut breaks, Gas leakage, stagnation, touching fire, rarely cause ignition.
- Sharp bending of the pipe use the polyethylene rod, bend not crushed the pipe. Gas leakage from the crushed part, stagnation, touching fire, rarely cause ignition.
- Please request your sales agent or qualified technician to install your unit. Water leakage, short circuit or fire may occur if you do the installation work yourself.
- Please observe the instructions stated in the installation manual during the process of installation. Improper installation may cause water leakage, electric shock and fire.
- Make sure that the units are mounted at locations which are able to provide full support to the weight of the units. If not, the units may collapse and impose danger.
- Observe the rules and regulations of the electrical installation and the methods described in the installation manual when dealing with the electrical work. Use power cables approved by the authorities of your country.
- Be sure to use the specified wire for connecting the indoor and outdoor units. Please ensure that the connections are tight after the conductors of the wire are inserted into the terminals. Improper insertion and loose contact may cause over-heating and fire.
- Please use the specified components for installation work. Otherwise, the units may collapse or water leakage, electric shock and fire may occur.
- Be sure to use the specified piping set for R32. Otherwise, this may result in broken copper pipes or faults.
- When installing or removing an air conditioner, only specified refrigerant (R32) shall be allowed, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture may be caused.
- Be sure to ventilate fully if a refrigerant gas leak while at work. If the refrigerant gas comes into contact with fire, a poisonous gas may occur. Be aware that refrigerants may not contain an odour.
- After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.
- Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician. Improper repairs may result in water leakage, electric shock and fire, etc.
- Be sure to install a ground fault circuit interrupter. Failure to install a ground fault circuit interrupter may result in electrical shocks or fire.
- 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.
  Children should be supervised to ensure that they do not play with the appliance.
- Appliance shall be installed in accordance with national wiring regulations.
- Appliance shall be installed in accordance with national wiring regulations and is not intended for use at altitudes 2000m (6561-22/32ft).

### ⚠ WARNING

- Be sure to connect the earth line from the power supply wire to the outdoor unit and between the outdoor and indoor unit. Do not connect the earth line to the gas tube, water pipe, lighting rod or the earth line of the telephone unit. Improper earthing may cause electric shocks.
- When installing the unit, be sure to install the refrigerant pipe before starting the compressor. If the refrigerant pipe is not installed and the compressor is operated with the service valve released, air is sucked and the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.
- The electric cables should neither be reworked nor added. Make sure to use an exclusive circuit breaker. Otherwise fire or electric shock might occur by connection failure, isolation failure or over current.
- Be sure to use only power cables approved from the authorities in your country. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified person in order to avoid a hazard.
- Make sure to connect cables to terminal properly and terminal cover should close firmly. Otherwise, over heating at terminal contact, fire or electric shock might occur.
- Make sure that there is no dust on any connected points of electric cables and fix firmly. Otherwise, fire or electric shock might occur.

### SAFETY PRECAUTION

Read the safety precautions carefully before operating the unit.

Refrigerant Safety Group A2L

This appliance is filled with R32.

- The contents of this section are vital to ensure safety. Please pay special attention to the following sign.
  - ⚠ **WARNING ..... Incorrect methods of installation may cause death or serious injury.**
  - ⚠ **CAUTION ..... Improper installation may result in serious consequence.**
  - **Make sure to connect earth line.**
  - **This sign in the figures indicates prohibition.**

Be sure that the unit operates in proper condition after installation. Explain to customer the proper operation and maintenance of the unit as described in the user' s guide. Ask a customer to keep this installation manual together with the instruction manual.

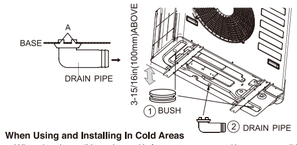
## OUTDOOR UNIT

- Please mount the outdoor unit on stable ground to prevent vibration and increase of noise level.
- Decide the location for piping after sorting out the different types of pipe available.
- Open the side plate by unscrewing the screws as shown beside.


### ⚠ CAUTION

Please make sure to remove all spacers inside the unit.

- Open the Top,Back and Side cover of the unit.
- Pull out the spacers inside. (Spacers are only for transportation purpose). If not remove, vibration and noise will occur.


**When Using and Installing In Cold Areas**

- When the air conditioner is used in low temperature and in snowy conditions, water from the heat exchanger may freeze on the base surface to cause poor drainage. When using the air conditioner in such areas, do not install the bushings. Install the unit high enough off the ground to prevent burying in snow. When using the drain pipe, consult your sales agent.

**Condense water processing of outdoor unit**

- Open the drain hole of bottom plate to drain condense water to ground. To secure distance 800mm or more between drain hole and ground.
- Ensure installation horizontal on outdoor unit and confirm drain the water normally.
- Do not close the drain hole. Condense water will freeze on heat exchanger and bottom plate. Performance degradation or malfunction may occur.
- Do not enter finger and hand from drain hole. There is a heater beside the drain hole. If you touch the heater, you got burned.

※ For more details, refer to the installation Manual for Cold Areas.

**CONDENSED WATER DISPOSAL OF OUTDOOR UNIT**

- There are holes on the base of Ourdoor unit for condensed water to exhaust.
- In order to flow condensed water to the drain, the unit is installed on a stand or a block so that the unit is 3-15/16in(100mm) above the ground as shown figure. Join the drain pipe to one hole.
- At first insert one portion of the hook to the base (Portion A), then pull the drain pipe in the direction shown by the arrow while inserting the hook into the base. After installation, check whether the drain pipe cling to the base firmly.

## THE CHOICE OF MOUNTING SITE

(Please note the following matters and obtain permission from customer before installation).

### ⚠ WARNING

- The outdoor unit must be mounted at a location which can support heavy weight. Otherwise, noise and vibration will increase.

### ⚠ CAUTION

- A circuit breaker must be installed. Without a circuit breaker or fuse the danger of electric shock exists. A main switch with a contact gap of more than 3/25"(3mm) has to be installed in the power supply line to the outdoor unit.
- Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.
- Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit. The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance and may deform and in the worst case, break the plastic parts of the indoor unit.
- Please ensure smooth flow of water when installing the drain hose.
- Piping shall be suitable supported with a maximum spacing of 3-9/32ft (1m) between the supports.
- Selecting the installation location: Suitable location that will reduce the impact from rain and direct sun that may affect the unit performance. Besides that, ventillation must be good and clear of obstruction.
- The air blown out of the unit should not point directly to animals or plants.
- The clearances of the unit from top, left, right and front are specified in figure below. At least three of the above sides must be open air.
- Be sure that the hot air blown out of the unit and noise do not disturb the neighbourhood.
- Do not install at a location where there is flammable gas, steam, oil and smoke.
- The location must be convenient for water drainage.
- Place the outdoor unit and its connection wire at least 3-9/32ft(1m) away from the antenna or signal line of television, radio or telephone. This is to avoid noise interference.
- Do not install outdoor unit facing strong wind direction. It may damage the fan motor.
- Do not install the outdoor unit in a place where small animals may build their nests. If small animal goes inside the unit and touches the electrical parts, failure of the unit, smoke or fire may be caused. Request your customer to keep the surrounding of the unit is clean.
- Safely dispose all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injuries or death by suffocation.
- The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations. Storage package protection should be constructed in such a way that mechanical damage to the equipment inside the package will not cause a leak of the REFRIGERANT CHARGE.

## Transportation and Handling before Installation

Transport the product as close to the installation location as practical before unpacking.

- Handling Method
  When handling the unit, ensure a balance of the unit, check safety and lift it up smoothly.
  (1) Do not remove any packing materials.
  (2) Hang the unit under packing condition with two ropes, as shown in figure below.
- Handling
  If the product has no package to move, please protect it with cloth or paper.

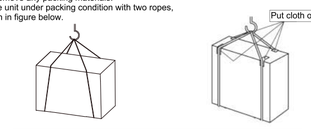


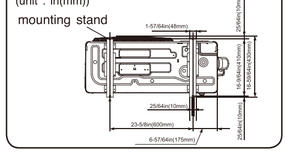

**Figure showing the Installation of Outdoor Unit.**

Names of Outdoor Components

| No. | Item | Qty |
|---|---|---|
| ① | Bush | 2 |
| ② | Drain Pipe | 1 |

Dimension of Mounting Stand of the outdoor unit

(unit : in(mm))




### ⚠ CAUTION

- In case the pipe length is more than the recommended length for chargeless , add refrigerant R32 as below. Do not exceed the maximum pipe length. Please note that the maximum amount of refrigeration should not exceed the data in table below, otherwise it may cause damage to the unit.

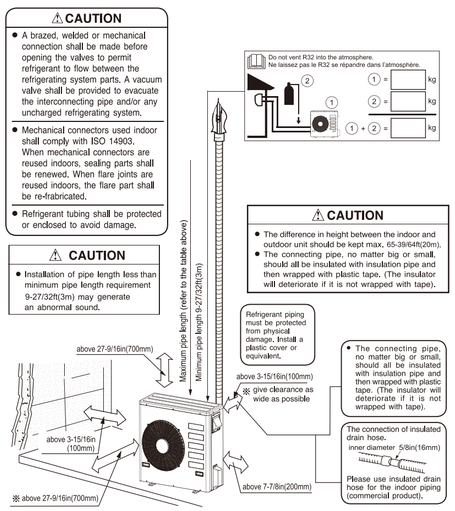
| Model | Max. Pipe ft(m) | Chargeless up to ft(m) | In case the pipe length is more than 15m, add refrigerant R32 according to the table below oz/ft(g/m) | The maximum refrigerant charge (mmax) |
|---|---|---|---|---|
| RAC-GJ18WHAA | 98-27/64ft(30m) | 49-7/32ft(15m) | 0,24oz/ft(22g/m) | 69,13oz (1960g) |
| RAC-GJ24WHAA | 98-27/64ft(30m) | 49-7/32ft(15m) | 0,24oz/ft(22g/m) | 77,59oz (2200g) |

### ⚠ CAUTION

- A brazed, welded or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system.
- Mechanical connectors used indoor shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flare joints are reused indoors, the flare part shall be re-frabricated.
- Refrigerant tubing shall be protected or enclosed to avoid damage.

### ⚠ CAUTION

- Installation of pipe length less than minimum pipe length requirement 9-27/32ft(3m) may generate an abnormal sound.




### ⚠ CAUTION

- The difference in height between the indoor and outdoor unit should be kept max. 65-39/64ft(20m).
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with plastic tape. (The insulator will deteriorate if it is not wrapped with tape).

Refrigerant piping must be protected from physical damage. Install a plastic cover or equivalent.

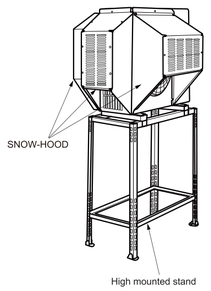
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with plastic tape. (The insulator will deteriorate if it is not wrapped with tape).

The connection of insulated drain hose. inner diameter 5/8in(16mm)

Please use insulated drain hose for the indoor piping (commercial product).

※ If attaching SNOW-HOOD(local sale part), please secure the space of front and left and top side.

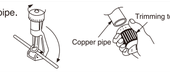
We recommend attaching SNOW-HOOD,install to deep snow region. To prevent blowed monsoon and snow. Please use with high mounted stand, to consider affect of snowfall height and fallen snow from roof. If you can not attach the all round SNOW-HOOD by installation area, attach to the area covered by snow. Especially if filling of snow on backside, capacity of the air conditioner will decrease.




## INSTALLATION OF REFRIGERATING PIPES AND AIR REMOVAL

### 1 Preparation of Pipe

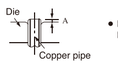
- Use a pipe cutter to cut the copper pipe.




### ⚠ CAUTION

- Jagged edge will cause leakage.
- Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.

- Before flaring, please put on the flare nut.

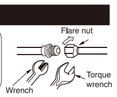

- Recommend to use R32 flaring tool.

| Outer diameter in(mm) | Thickness in(mm) | A in(mm) | | |
|---|---|---|---|---|
| | | Flare tool for | Conventional flare tool | |
| | | R32 Clutch type | Clutch type | Wing nut type |
| ø1/4" (ø6.35) | 1/32 (0.8) | 0~1/64 (0.0~0.5) | 3/64~1/16 (1.0~1.5) | 1/16~5/64 (1.5~2.0) |
| ø1/2" (ø12.70) | 1/32 (0.8) | 0~1/64 (0.0~0.5) | 3/64~1/16 (1.0~1.5) | 1/16~5/64 (1.5~2.0) |
| ø5/8" (ø15.88) | 3/64 (1.0) | 0~1/64 (0.0~0.5) | 3/64~1/16 (1.0~1.5) | 1/16~5/64 (1.5~2.0) |

### 2 Pipe Connection

**CAUTION**

- When removing flare nut from the Indoor unit, please ensure to use proper tooling.
- Prevent pipe from coming in contact with water or working in wet area.




| | | Outer dia.of pipe in(mm) | Torque N.m (kgf.cm)(lbf.ft) |
|---|---|---|---|
| Small dia. side | | 1/4"(6,35) | 13,70 ~ 18,60 (140 ~ 190) (10,08 ~ 13,68) |
| Large dia. side | | 1/2"(12,7) | 44,10 ~ 53,90 (450 ~ 550) (32,40 ~ 39,60) |
| | | 5/8"(15,88) | 49,00 ~ 58,80 (500 ~ 600) (36,00 ~ 43,20) |
| Valve head cap | Small dia. side | 1/4"(6,35) | 19,60 ~ 24,50 (200 ~ 250) (14,40 ~ 18,00) |
| | Large dia. side | 1/2"(12,7) | 29,40 ~ 34,30 (300 ~ 350) (21,60 ~ 25,20) |
| | | 5/8"(15,88) | 29,00 ~ 31,00 (296 ~ 316) (21,31 ~ 22,75) |
| Valve core cap | | | 12,30 ~ 15,70 (125 ~ 160) (8,75 ~ 11,52) |

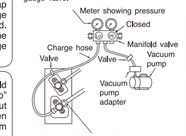
### 3 Removal Of Air From The Pipe And Gas Leakage Inspection

**AIR REMOVAL**

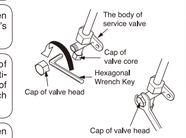
**Procedures of using Vacuum Pump for Air Removal**

1. As shown in right figure, remove the cap of valve core. Then, connect the charge hose. Remove the cap of valve head. Connect the vacuum pump adapter to the vacuum pump and connect the charge hose to the adapter.
2. Fully tighten the "Hi" knob of the manifold valve and completely unscrew the "Lo" knob. Run the vacuum pump for about 10~15 minutes, then completely tighten the "Lo" knob and switch off the vacuum pump.
   After vacuuming, confirm that the needle of the manifold gauge is stable for 3~5 minutes.
3. Remove the charge hose and tighten the cap of valve core. Check the cap's periphery if there is any gas leakage.
4. Completely unscrew the spindle of the service valve (at 2 places) in anti-clockwise direction to allow the flow of refrigerant (using Hexagonal Wrench key).
5. Re-cap the service valve and tighten using wrench. Check the cap's periphery if there is any gas leakage. The task is then completed.

When the meter reaches (-14.65 psi (-101kPa)) during pumping, fully tighten the Manifold gauge valve.




When pumping starts, slightly loosen the flare nut to check of air sucked in, Then tighten the flare nut.



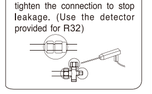

### ⚠ CAUTION

- Prevent moisture from entering pipe connection.
- Refrigerating machine oil not be applied to the outside of the flare.
  When refrigerating oil is applied to the outside of the flare, cracking of the flare nut, destruction of the flare and gas leakage may occur due to the excessive tightening of the flare nut.
- When using the control valve, do not use deteriorated packing. And, do not overtighten the steering wheel. Gas leakage from the service valve part, stagnation, touching fire, rarely cause ignition.

**Gas Leakage Inspection**

Please use gas leakage detector to check if leakage occurs at the connection of Flare nut as shown on the right.

If gas leakage occurs, further tighten the connection to stop leakage. (Use the detector provided for R32)

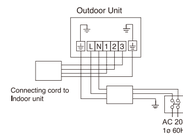


## CONNECTION OF POWER CORD

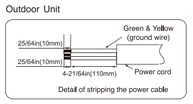
⚠ **WARNING** ● THIS APPLIANCE MUST BE GROUNDED.

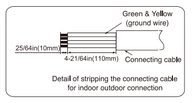
**Procedures of Wiring**

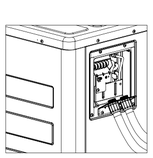
In case that power is supplied from outdoor Unit

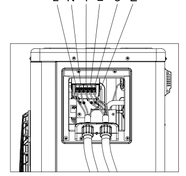



Detail of cutting the connecting cord






### ⚠ WARNING

- The naked part of the wire core should be 25/64in(10mm) and fix it to the terminal tightly. Then try to pull the individual wire to check if the contact is tight. Improper insertion may burn the terminal.
- Be sure to use only power cables approved from the authorities in your country. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified person in order to avoid a hazard.
- Please refer to the following for wire connection to the terminals of the units.
- The cabling must meet the standards of electrical installation.
- There is a AC voltage of 208-230V between the L and N terminals. Therefore, before servicing, be sure to remove the plug from the AC outlet or switch off the main switch.

**Checking for the electric source and the voltage range**

- Before installation, the power source must be checked and necessary wiring work must be completed. To make the wiring capacity proper, use the wire gauge list below for the wiring from house distribution fuse box to the outdoor unit in consideration of the locked rotor current.
- Investigate the power supply capacity and other electrical conditions at the installation location.
  Depending on the model of room air conditioner to be installed, request the customer to make arrangements for the necessary electrical work etc.
  The electrical work includes the wiring work up the outdoor. In localities where electrical conditions are poor, use of a voltage regulation is recommended.

**Wiring Of The Outdoor Unit**

- Please remove the side plate for wire connection.

**WARNING**

- If you cannot close the side cover due to the connecting cord, please tidy up the wiring for spacing at front panel.
- Be sure that the hooks of the side cover is properly fixed to avoid water penetration Otherwise water leakage may occur and this causes short circuit or faults
- The connection cord should not touch to service valve and pipe to avoid possibilities of burn. (It become high temperature in heating operation.)

### ⚠ CAUTION

Note:

- The supply cord of appliances for outdoor use shall be between 4-59/64ft & 9-27/32ft (1.5m & 3m) long and shall be either an EXTRA HARD USAGE or a HARD USAGE CORD.

IMPORTANT

| Model | Circuit Breaker |
|---|---|
| RAC-GJ18WHAA | 32A |
| RAC-GJ24WHAA | |

FOR(Connecting cord-1,2,3,Earth)

| Model | Wire length | Wire cross-section |
|---|---|---|
| RAC-GJ18WHAA | up to 98-27/64ft(30m) | AWG #14 (2,075mm²) |
| RAC-GJ24WHAA | up to 98-27/64ft(30m) | |

FOR(power cord-L,N,Earth)

| Model | Wire cross-section |
|---|---|
| RAC-GJ18WHAA | AWG #12 (3.3mm²) |
| RAC-GJ24WHAA | |

## FINAL STAGE OF INSTALLATION

### 1 Power Source And Operation Test

**Power Source**

### ⚠ CAUTION

- Please use a new socket. Accident may occur due to the use of old socket because of poor contact.
- Please plug in and then remove the plug for 2 ~ 3 times. This is to ensure that the plug is completely plugged into the socket.
- Keep additional length for the power cord and do not render the plug under external force as this may cause poor contact.
- Do not fix the power cord with U-shape nail.

**Operation test**

- Please be sure to measure the supply voltage before operation test.
- Please ensure that the air conditioner is in normal operating condition during the operation test.
  1. Operate with Cooling Mode(in summer) or Heating Mode(in winter).
  2. Press Temperature Button on the remote controller to set the desired temperature to 60°F(16.0°C) for Cooling Mode or 90°F(32.0°C) for Heating Mode.
     Set the desired fan speed to " " (High).
  3. Operate the air conditioner for 20 minutes at least and make sure that the air from the air conditioner is cool or warm.
  4. Press On/Off Button on the remote controller and make sure that the air conditioner stops the operation.
- If the indication lamps of the indoor unit flash with sounding of the buzzer during the operation test, perform a check following the procedures below.

| Indication lamps flashing mode | What to check |
|---|---|
| All indication lamps flash three times repeatedly. | Make sure that the spindles of both service valves are open. (Outdoor fan might operate for near 15 minutes after the operation stop for the protection. For the reoperation at that case, do it after outdoor fan will stop.) |

- Befor the check and the reoperation, reset the power supply by turning off and on the circuit breaker only after
- waiting for at least 5 mintes; or
- pressing the Temporary Switch Button only once while the power is OFF.

### ⚠ CAUTION

- Don't operate for over 5 minutes with the situation that the spindle of the service valve is closed. This will cause the defect.
- Don't operate by Cool Mode or Dry Mode with the door and windows opened, (the room humidity is always above 80%) for a long period of time. Water will condense and drip down occasionally. This will wet your furniture.

- Explain to your customer the proper operation procedures as described in the user' s manual.
- If the indoor unit won't operate, check the cable for correct connection.
- Turn on the lamp in the room where the indoor unit is installed and check the remote controller for normal operation.

### ⚠ WARNING

**BURST HAZARD**
Do not allow air, etc. to get into refrigerant cycle (piping)

**RISK OF EXPLOSION**
Compressor must be stopped before removing refrigerant pipes.
All service valve must be fully closed after pumping down operation.

**WARNING**

- Use the two spanners on the service valve nuts to tighten and loosen so that the service valve will not deform. Gas leak from the crushed part, stagnation, touching fire, rarely cause ignition.

California Proposition 65

**⚠ WARNING** *Proposition 65: This product contains chemicals known to the state of California to cause cancer, birth defects, and other reproductive harm. For more information, go to www.P65Warnings.ca.gov*