



**48TJE004-014**  
**48TJF004-012**

## Single-Package Rooftop Heating/Cooling Units

# User's Information Manual

### NOTE TO INSTALLER

This manual should be left with the equipment owner.

### FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

### ⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency, or the gas supplier.

### FOR YOUR SAFETY

#### WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

### ⚠ WARNING

Before performing recommended maintenance, be sure main power switch to unit is turned off. Electrical shock could cause personal injury.

Your rooftop combination heating/cooling unit is equipped with an automatic direct spark ignition and induced draft combustion blower.

### ⚠ WARNING

Do not attempt to light by hand; personal injury may result.

### TO LIGHT UNIT

### ⚠ DANGER

1. Do not turn off the electrical power to unit without first turning off the gas supply.
2. Before attempting to start the gas heating section, familiarize yourself with all the procedures that must be followed.

If you do not follow these instructions exactly, a fire or explosion may result. Property damage, injury, or loss of life could occur.

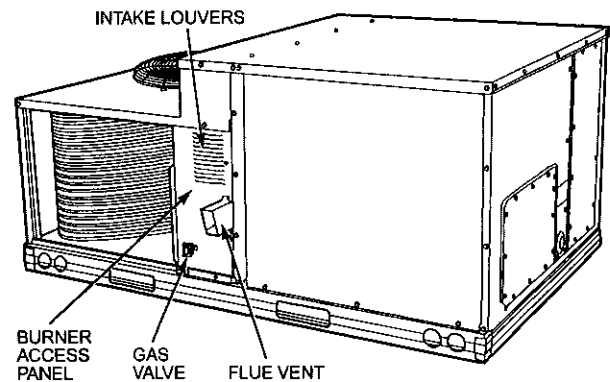


Fig. 1A — Gas Valve Location (Sizes 004-007)

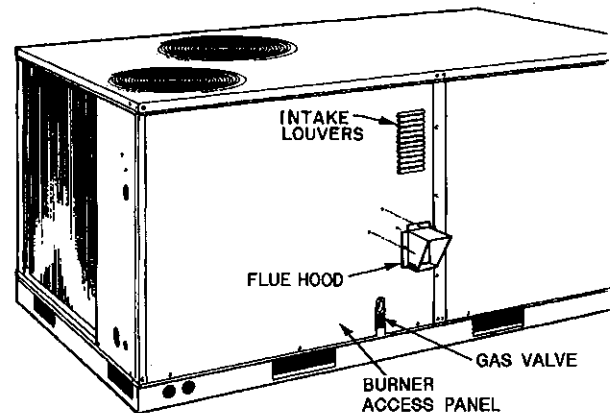


Fig. 1B — Gas Valve Location (Sizes 008-014)

See Fig. 1A and 1B for location of gas valve. Refer to Fig. 2 while proceeding with the following steps.

**Step 1** — Set room thermostat to the lowest temperature setting and set SYSTEM switch to HEAT or AUTO position.

**Step 2** — Close the manual gas valve.

**Step 3** — Turn off the electrical supply to the unit.

**Step 4** — Remove the burner access panel.

**Step 5** — Move the control on the gas valve to the OFF position and wait 5 minutes.

**Step 6** — Move control on gas valve to ON position.

**Step 7** — Replace the burner access panel.

**Step 8** — Turn on the electrical supply to unit.

**Step 9** — Open the manual gas valve.

**Step 10** — Set room thermostat selector slightly above room temperature to start unit. The induced-draft combustion air fan will start. Main gas valve will open and main burners should ignite within 5 seconds. If the burners do not light, there is a 22-second delay before another 5-second try. If the burner still does not light, the time delay is repeated. If the burner does not light within 15 minutes, there is a lock-out. If burners still do not light, call for service.

**Step 11** — Set the temperature selector on room thermostat to desired setting.

#### **▲ WARNING**

If the main burners fail to light, or the blower fails to come on, shut down gas heating section and call your dealer for service. Failure to follow these requirements could result in serious personal injury.

#### **TO SHUT UNIT OFF**

#### **▲ WARNING**

1. Do not turn off the electrical power to unit without first turning off the gas supply.
2. Never attempt to manually light the main burners on unit with a match, lighter, or any other flame. If the electric sparking device fails to light the main burners, refer to the following shutdown procedures, then call your dealer as soon as possible.

Failure to follow these procedures can result in serious fire or personal injury.

Refer to Fig. 3 while proceeding with the following steps.

**Step 1** — Set room thermostat to lowest temperature setting and set SYSTEM switch to OFF position.

**Step 2** — Close the external manual gas valve.

**Step 3** — Turn off the electrical power supply to unit.

**Step 4** — Remove the burner access panel.

**Step 5** — Move the control on the gas valve to the OFF position.

**Step 6** — Replace the burner access panel.

**Step 7** — If unit is being shut down because of a malfunction, call your dealer as soon as possible.

If unit is being shut down because the heating season has ended, restore electrical power to the unit to ensure operation of the cooling system during the cooling season.

Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the unit before shutting off the electrical supply.

Do not use this unit if any part has been under water. Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.

#### **MAINTAINING YOUR UNIT**

All maintenance should be handled by skilled, experienced personnel. Your dealer can help you establish a standard procedure.

For your safety, keep the area around the unit clear and free of combustible materials, gasoline, and other flammable liquids and vapors.

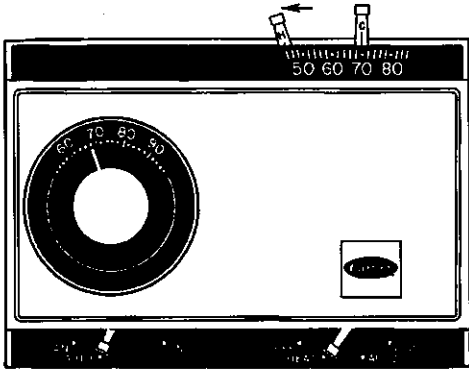
To ensure proper functioning of the unit, flow of combustion and ventilating air must not be prevented from reaching the unit. Clearance of at least 3 ft on size 004-007 units and 4 ft on size 008-014 units on the flue and condenser sides and 6 in. on all other sides is required. A clearance of 5 ft is required above the condenser discharge.

#### **ROUTINE MAINTENANCE AND CARE FOR THE EQUIPMENT OWNER**

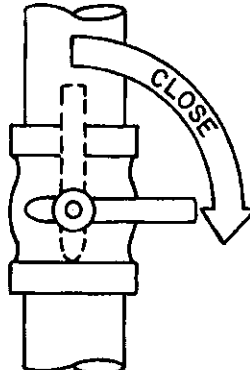
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#### **▲ WARNING**

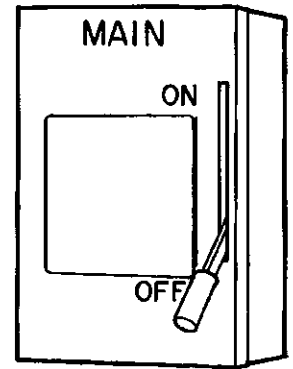
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2. Do not turn off electrical power to this unit without first turning off the gas supply.
3. When removing access panels or performing maintenance functions inside your unit, be aware of sharp sheet metal parts and screws. Although special care has been taken to reduce sharp edges inside the unit, be extremely careful when handling parts or reaching into the unit.



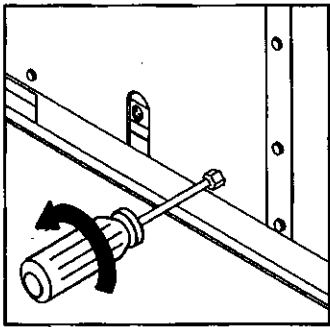
STEP 1



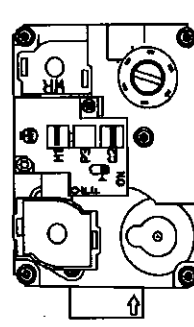
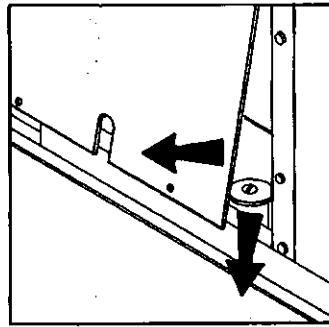
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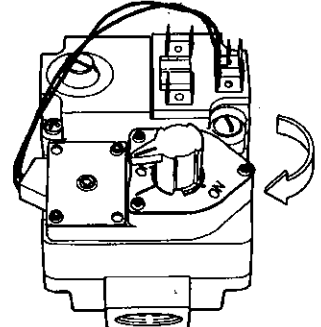
STEP 3



STEP 4

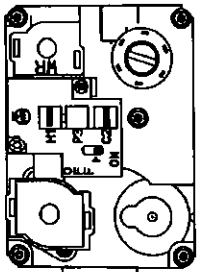


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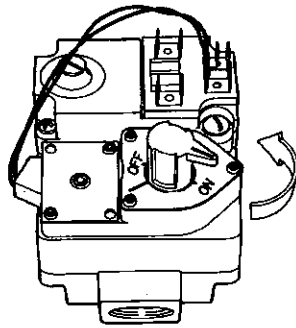


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STEP 5

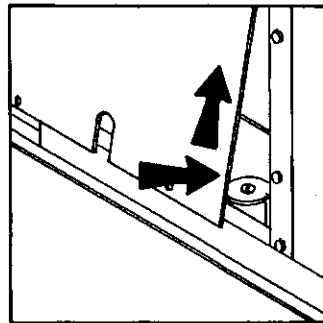


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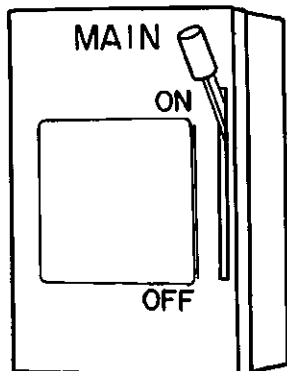
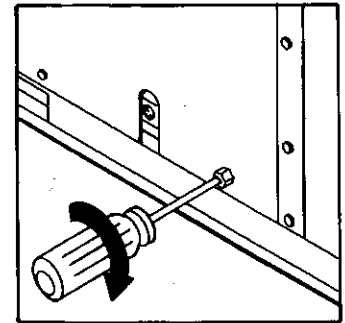


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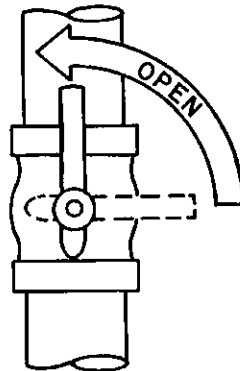
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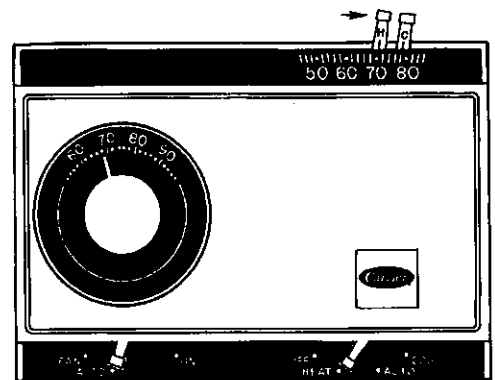
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STEP 8

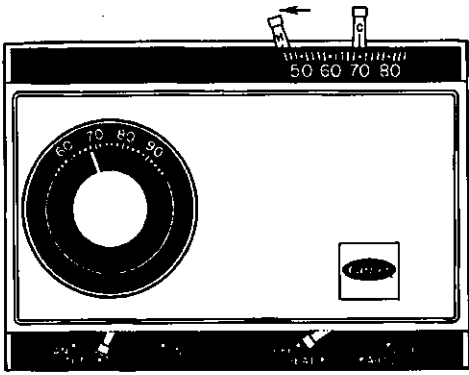


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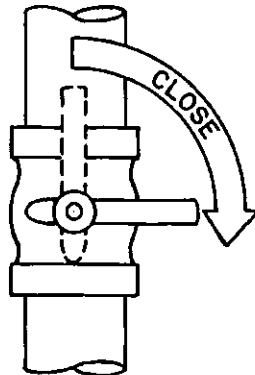


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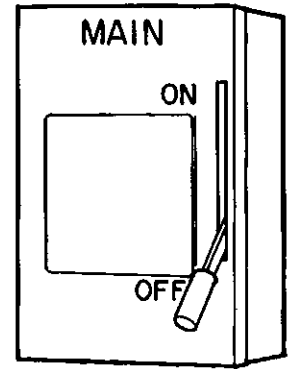
Fig. 2 — To Light Unit



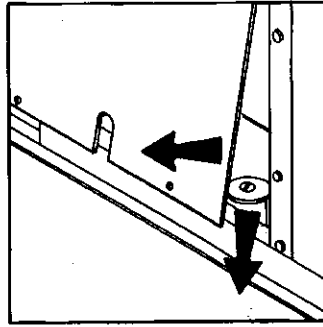
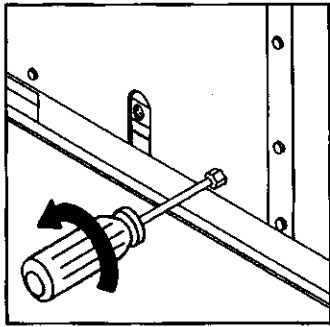
STEP 1



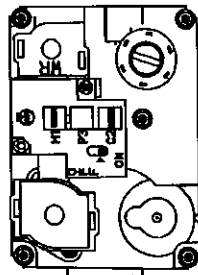
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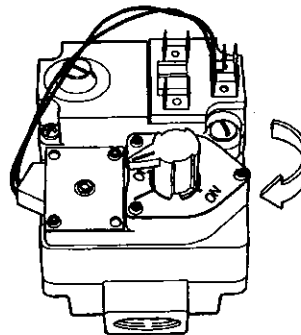
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STEP 4

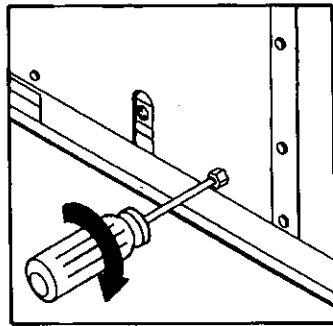
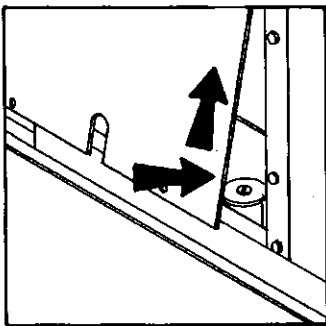


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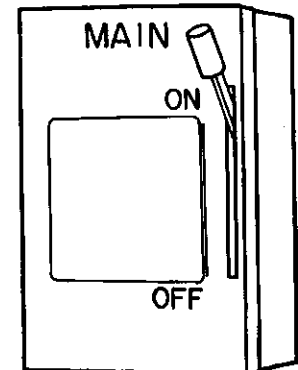


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STEP 5



STEP 6



STEP 7

Fig. 3 — To Shut Unit Off

**Air Filter(s)** — Air filter(s) should be checked at least every 3 or 4 weeks and changed or cleaned when necessary. Table 1 indicates the correct filter size for your unit. See Fig. 4 for filter access door location.

To replace or inspect filters:

1. Lift up and remove filter access panel.
2. While holding filter, tilt upper filter rack.
3. Remove filters by pulling up and out toward you from the track.
4. Inspect or replace filters.
5. Return filters to filter track. Note direction of airflow arrows on filter frame.
6. Replace filter access panel.

If you have difficulty in locating your air filter, or if you have questions concerning proper filter maintenance, contact your dealer for instructions. When replacing your unit filters, always use the same size and type of filter that was originally supplied by the installer.

Units with outdoor air capability have a cleanable filter for the outdoor air. This filter should be checked annually and cleaned as necessary with steam or hot water and a mild detergent. Do not use throwaway filters in place of cleanable filters.

**▲ WARNING**

Never operate your unit without filters in place. Failure to heed this warning may result in damage to the blower motor and/or compressor. An accumulation of dust and lint on internal parts of your unit can cause loss of efficiency and, in some cases, fire.

**Table 1 — Indoor-Air Filter Data**

UNIT SIZE 48TJ	INDOOR-AIR FILTERS (Throwaway Fiberglass)	
	QUANTITY	SIZE (in.)
004-007	2	16 x 25 x 2
008,009	4	16 x 20 x 2
012,014	4	20 x 20 x 2

NOTE: Replacement filters should be UL (Underwriters' Laboratories) certified or equivalent.

**Heat Exchanger** — To ensure dependable and efficient heating operation, the heat exchanger should be checked by a qualified maintenance person before each heating season, and cleaned when necessary. This checkout should not be attempted by anyone not having the required expertise and equipment to do the job properly. Checking and/or cleaning the heat exchanger involves removing the gas controls assembly and the flue collector box cover and, when completed, reinstalling the gas controls assembly for proper operation. Also, the flue collector box cover must be replaced correctly so that a proper seal is maintained. Contact your dealer for the required periodic maintenance.

**Fans, Belts and Fan Motor** — Periodically check the condition of the fan wheels and housings, belt tension and fan motor shaft bearings. No lubrication of condenser or evaporator fan bearings or motors is required or recommended.

**Evaporator and Condenser Coils** — Cleaning of the coils should be done by qualified service personnel. Contact your dealer for the required annual maintenance.

**Condensate Drain** — The drain pan and condensate drain line should be checked and cleaned at the same time the cooling coils are checked by your dealer.

**Compressor** — All compressors are factory supplied with a normal charge of the correct type refrigeration-grade oil in them and should not require additional oil.

**Condenser Fan**

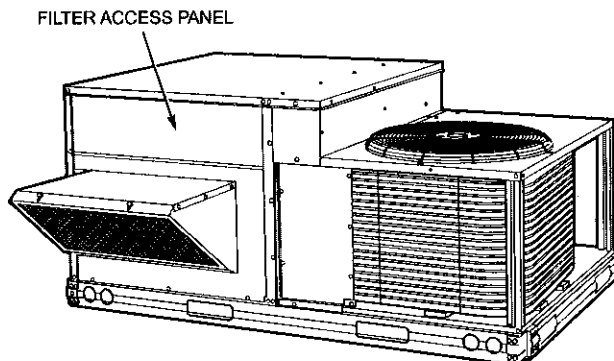
**▲ WARNING**

Do not poke sticks, screwdrivers, or any other object into revolving fan blades. Severe bodily injury may result.

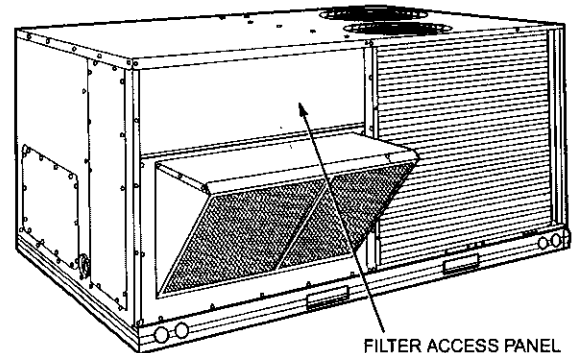
The fan must be kept free of all obstructions to ensure proper cooling. Contact your dealer for any required service.

**Electrical Controls and Wiring** — Electrical controls are difficult to check without proper instrumentation; therefore, if there are any discrepancies in the operating cycle, contact your dealer and request service.

**Refrigerant Circuit** — The refrigerant circuit is difficult to check for leaks without the proper equipment; therefore, if inadequate cooling is suspected, contact your local dealer for service.



48TJ004-007



48TJ008-014

**Fig. 4 — Typical Filter Access Panel Location**

**Combustion Area and Vent System** — The combustion area and vent system should be visually inspected before each heating season. The normal accumulation of dirt, soot, rust, and scale can result in loss of efficiency and improper performance if allowed to build up.

**⚠ CAUTION**  
 If your unit makes an unusual or especially loud noises during heating, shut down the heating section and call your dealer.

See Fig. 1A, 1B and 5 and proceed as follows to inspect the combustion area and power-venting system of your unit.

1. Turn off gas supply to your unit.
2. Turn off electrical power to your unit.
3. Remove burner access panel.
4. Using a flashlight, carefully inspect the burner areas for dirt, soot, or scale.

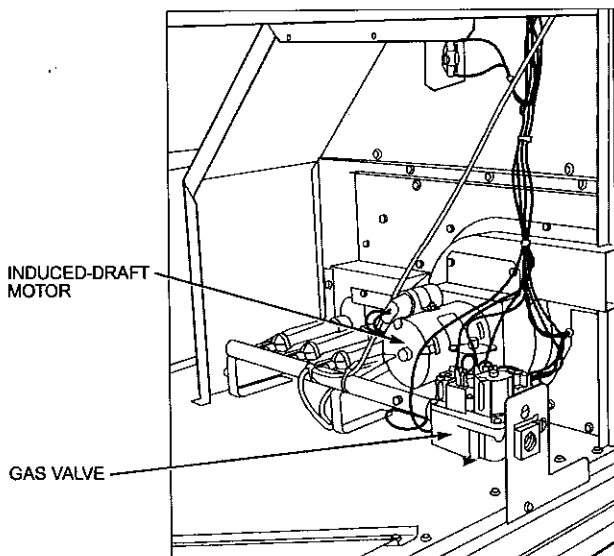
**⚠ CAUTION**  
 If dirt, soot, rust, or scale accumulations are found, call your dealer and do not operate your heating section.

5. When you have completed your inspection, follow the start-up procedures in this manual to restore your unit to operation.
6. Observe unit heating operation.

**⚠ WARNING**  
 Components in heat section may be hot after unit has been started up. When observing flame, be careful not to get too close to or touch heating components. Serious personal injury may result.

Watch the burner flame to see if it is bright blue. If you observe a suspected malfunction or that the burner flame is not bright blue, call your dealer.

7. Replace burner access panel.



**Fig. 5 — Typical Heat Section Detail  
 (Size 004-007 Shown)**

**Unit Panels** — After performing any maintenance or service on the unit, be sure all panels are securely fastened in place to prevent rain from entering unit cabinet and to prevent disruption of the correct unit airflow pattern.

**REGULAR DEALER MAINTENANCE**

In addition to the type of routine maintenance you might be willing to perform, your unit should be inspected regularly by a properly trained service technician. An inspection (preferably each year, but at least every other year) should include the following:

1. Inspection of all flue product passages — including the burner, heat exchanger, and flue collector box.
2. Inspection of all combustion- and ventilation-air passages and openings.
3. Close inspection of all gas pipes leading to and inside your unit.
4. Inspection, and if required, cleaning of the condenser and evaporator coils.
5. Inspection, and if required, cleaning of the condensate drain pan and trap.
6. Inspection and cleaning of blower wheel housing and motor.
7. Inspection of all supply- and return-air ducts for leaks, obstructions, and insulation integrity. Any problems found should be resolved at the time of inspection.
8. Inspection of the unit base for cracks, gaps, etc., which may cause a hazardous condition.
9. Inspection of the unit casing for signs of deterioration.
10. Inspection of all electrical wiring and components to ensure proper connection.
11. Inspection for leaks in the refrigerant circuit. Pressure-check to determine appropriate refrigerant charge.
12. Inspection and cleaning of fan wheels and housings, belt tension, and fan motor and shaft bearings.
13. Operational check of the unit to determine working conditions. Repair or adjustment should be made at the time of inspection.

Your servicing dealer may offer an economical service contract that covers seasonal inspections. Ask for further details.

Complete Service Instructions can be found in the unit Installation, Start-Up and Service Instructions.



# User's Information Manual

## NOTE TO INSTALLER

This manual should be left with the equipment owner.

**WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliance.
  - Do not touch any electrical switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

### ▲ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency, or the gas supplier.

### ▲ WARNING

Before performing recommended maintenance, be sure main power switch to unit is turned off and lockout tag is installed. Electrical shock could cause personal injury.

Your rooftop combination heating/cooling unit is equipped with an automatic direct spark ignition and induced draft combustion blower.

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Do not attempt to light by hand; personal injury may result.

## TO LIGHT UNIT

### ▲ DANGER

1. Do not turn off the electrical power to unit without first turning off the gas supply.
2. Before attempting to start the gas heating section, familiarize yourself with all the procedures that must be followed.
3. Never attempt to manually light the main burners on unit with a match, lighter, or any other flame. If the electric sparking device fails to light the main burners, refer to the following shutdown procedures, then call your dealer as soon as possible.

If you do not follow these instructions exactly, a fire or explosion may result. Property damage, injury, or loss of life could occur.

See Fig. 1A and 1B for location of gas valve. Refer to Fig. 2 while proceeding with the following steps.

**Step 1** — Set room thermostat to the lowest temperature setting and set SYSTEM switch to HEAT or AUTO. position.

**Step 2** — Close the manual gas valve.

**Step 3** — Turn off the electrical supply to the unit and install lockout tag.

**Step 4** — Remove the burner access panel.

**Step 5** — Move the control on the gas valve to the OFF position and wait 5 minutes.

**Step 6** — Move control on gas valve to ON position.

**Step 7** — Replace the burner access panel.

**Step 8** — Turn on the electrical supply to unit.

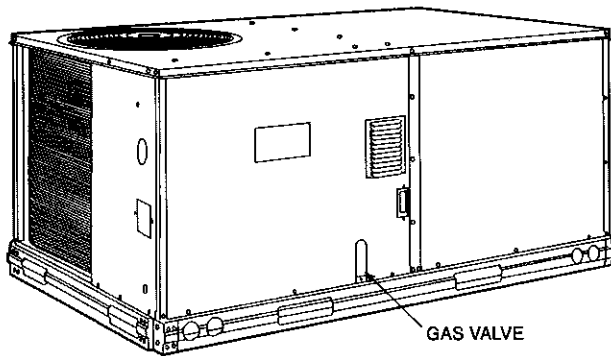
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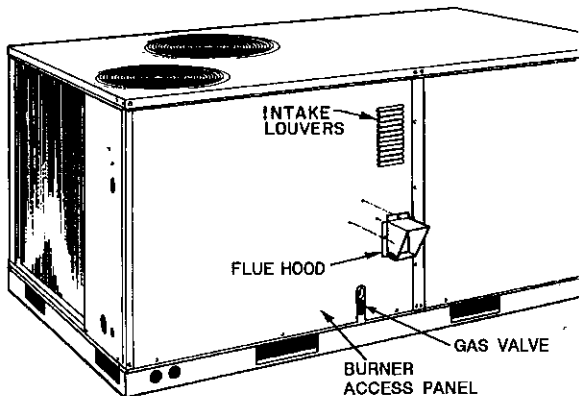
**Step 11** — Set the temperature selector on room thermostat to desired setting.

### ▲ WARNING

If the main burners fail to light, or the blower fails to come on, shut down gas heating section and call your dealer for service. Failure to follow these requirements could result in serious personal injury.



**Fig. 1A — Gas Valve Location (Sizes 004-007)**



**Fig. 1B — Gas Valve Location (Sizes 008-014)**

### TO SHUT UNIT OFF

#### ▲ WARNING

Do not turn off the electrical power to unit without first turning off the gas supply.

Failure to follow this procedure can result in serious fire or personal injury.

Refer to Fig. 3 while proceeding with the following steps.

**Step 1** — Set room thermostat to lowest temperature setting and set SYSTEM switch to OFF position.

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All maintenance should be handled by skilled, experienced personnel. Your dealer can help you establish a standard procedure.

For your safety, keep the area around the unit clear and free of combustible materials, gasoline, and other flammable liquids and vapors.

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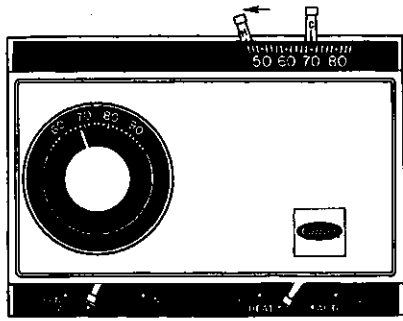
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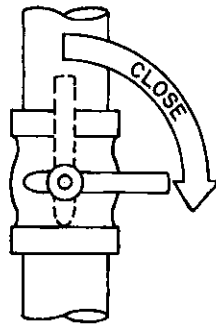
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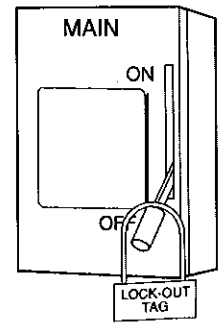




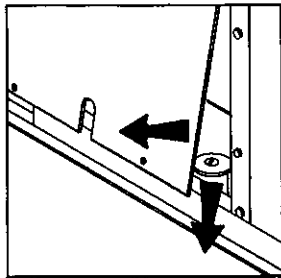
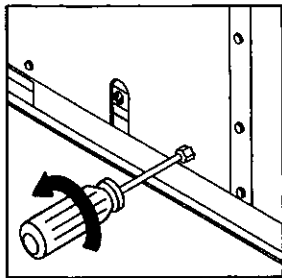
STEP 1



STEP 2

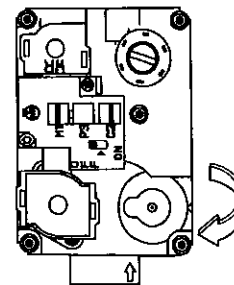


STEP 3



STEP 4

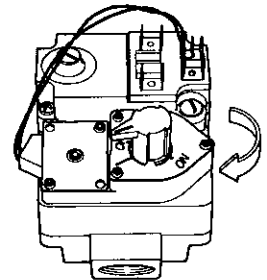
ONE-STAGE VALVE



ONE STAGE

- 48TFD,TMD005-009
- 48TFE,TME004-007
- 48TFF,TFM004-006 (single phase)
- 48TFG,TMG005,006
- 48TFH,TMH004-006
- 48TFK,TMK004-006
- 48TFL,TML005,006
- 48TFM,TMM004-006
- 48TFN,TMN004-006

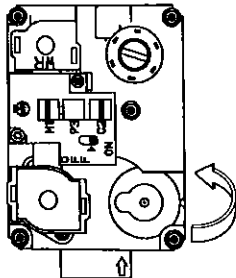
TWO-STAGE VALVE



TWO STAGE

- 48TFF,TFM004-006 (3 phase)
- 48TFD,TMD012, 014
- 48TFE,TME008-014
- 48TFF,TFM007-014

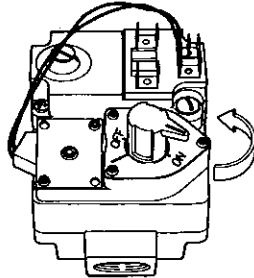
ONE-STAGE VALVE



ONE STAGE

- 48TFD,TMD005-009
- 48TFE,TME004-007
- 48TFF,TFM004-006 (single phase)
- 48TFG,TMG005,006
- 48TFH,TMH004-006
- 48TFK,TMK004-006
- 48TFL,TML005,006
- 48TFM,TMM004-006
- 48TFN,TMN004-006

TWO-STAGE VALVE

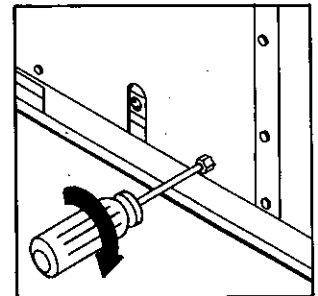
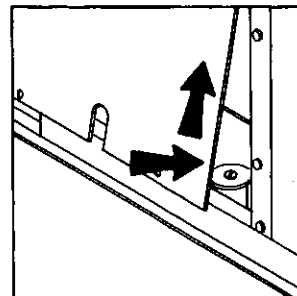


TWO STAGE

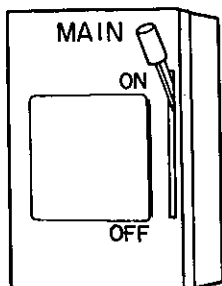
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- 48TFD,TMD012, 014
- 48TFE,TME008-014
- 48TFF,TFM007-014

STEP 6

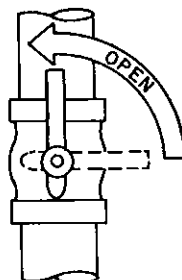
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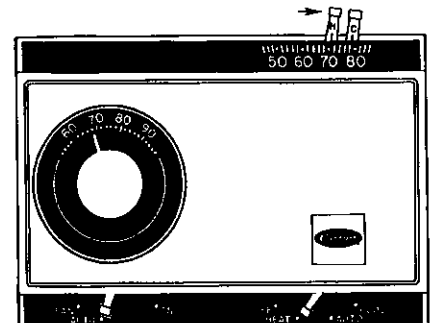
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STEP 8



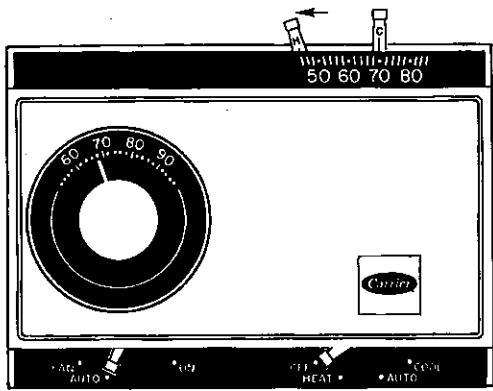
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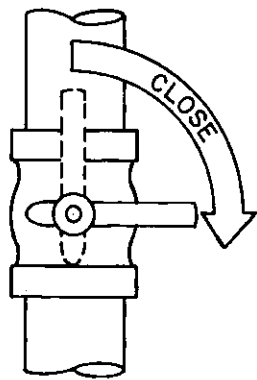
STEP 10

Fig. 2 — To Light Unit

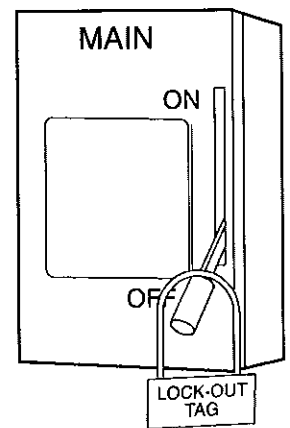




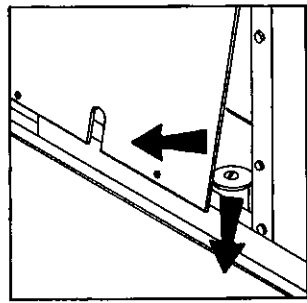
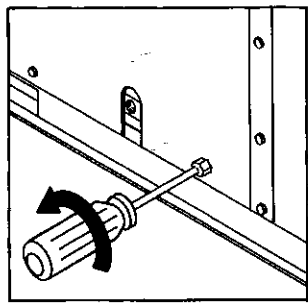
STEP 1



STEP 2

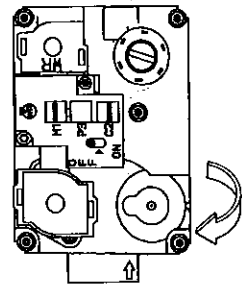


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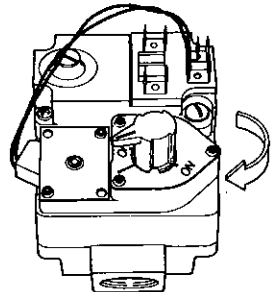
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ONE-STAGE VALVE



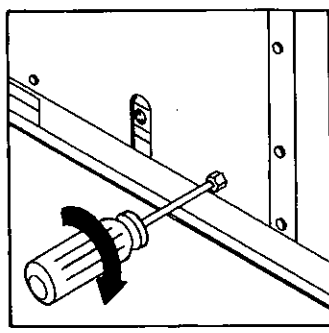
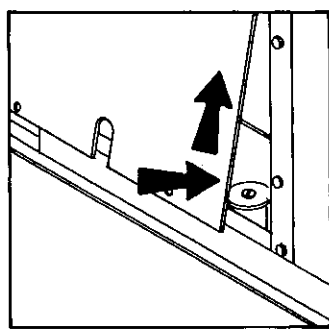
- ONE STAGE  
 48TFD,TMD005-009  
 48TFE,TME004-007  
 48TFF,TMF004-006 (single phase)  
 48TFG,TMG005,006  
 48TFH,TMH004-006  
 48TFK,TMK004-006  
 48TFL,TML005,006  
 48TFM,TMM004-006  
 48TFN,TMN004-006

TWO-STAGE VALVE

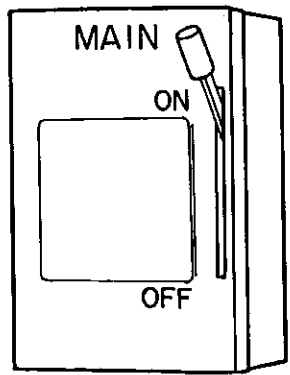


- TWO STAGE  
 48TFF,TMF004-006 (3 phase)  
 48TFD,TMD012, 014  
 48TFE,TME008-014  
 48TFF,TMF007-014

STEP 5



STEP 6



STEP 7

Fig. 3 — To Shut Unit Off

**Air Filter(s)** — Air filter(s) should be checked at least every 3 or 4 weeks and changed or cleaned when necessary. Table 1 indicates the correct filter size for your unit. See Fig. 4 for filter access door location.

To replace or inspect filters:

1. Lift up and remove filter access panel.
2. While holding filter, tilt upper filter rack.
3. Remove filters by pulling up and out toward you from the track.
4. Inspect or replace filters.
5. Return filters to filter track. Note direction of airflow arrows on filter frame.
6. Replace filter access panel.

If you have difficulty in locating your air filter, or if you have questions concerning proper filter maintenance, contact your dealer for instructions. When replacing your unit filters, always use the same size and type of filter that was originally supplied by the installer.

Units with outdoor air capability have a cleanable filter for the outdoor air. This filter should be checked annually and cleaned as necessary with steam or hot water and a mild detergent. Do not use throwaway filters in place of cleanable filters.

**▲ WARNING**

Never operate your unit without filters in place. Failure to heed this warning may result in damage to the blower motor and/or compressor. An accumulation of dust and lint on internal parts of your unit can cause loss of efficiency and, in some cases, fire.

**Table 1 — Indoor-Air Filter Data**

UNIT SIZE 48TF, TM	INDOOR-AIR FILTERS (Throwaway Fiberglass)	
	Quantity	Size (In.)
004-007	2	16 x 25 x 2
008, 009	4	16 x 20 x 2
012, 014	4	20 x 20 x 2

NOTE: Replacement filters should be UL (Underwriters' Laboratories) certified or equivalent.

**Heat Exchanger** — To ensure dependable and efficient heating operation, the heat exchanger should be checked by a qualified maintenance person before each heating season, and cleaned when necessary. This checkout should not be attempted by anyone not having the required expertise and equipment to do the job properly. Checking and/or cleaning the heat exchanger involves removing the gas controls assembly and the flue collector box cover and, when completed, reinstalling the gas controls assembly for proper operation. Also, the flue collector box cover must be replaced correctly so that a proper seal is maintained. Contact your dealer for the required periodic maintenance.

**Fans, Belts and Fan Motor** — Periodically check the condition of the fan wheels and housings, belt tension and fan motor shaft bearings. No lubrication of condenser or evaporator fan bearings or motors is required or recommended.

**Evaporator and Condenser Coils** — Cleaning of the coils should be done by qualified service personnel. Contact your dealer for the required annual maintenance.

**Condensate Drain** — The drain pan and condensate drain line should be checked and cleaned at the same time the cooling coils are checked by your dealer.

**Compressor** — All compressors are factory supplied with a normal charge of the correct type refrigeration-grade oil in them and should not require additional oil.

**Condenser Fan**

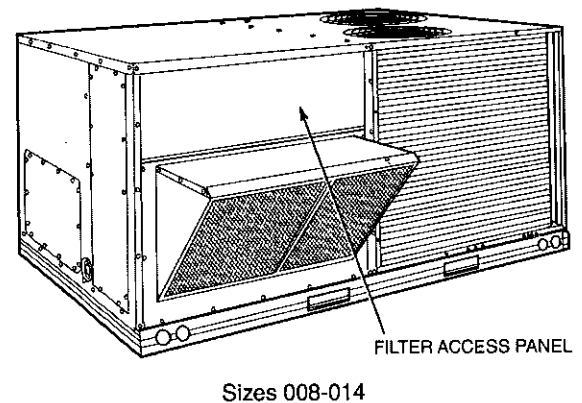
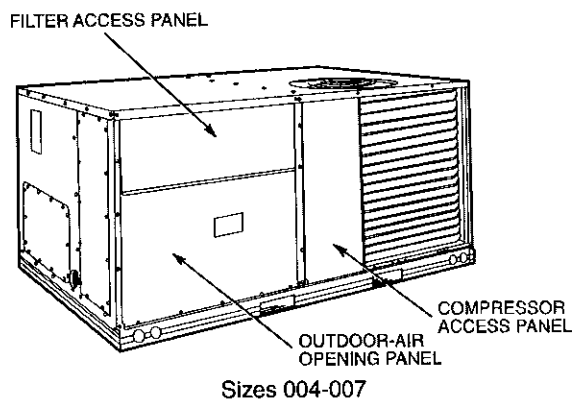
**▲ WARNING**

Do not poke sticks, screwdrivers, or any other object into revolving fan blades. Severe bodily injury may result.

The fan must be kept free of all obstructions to ensure proper cooling. Contact your dealer for any required service.

**Electrical Controls and Wiring** — Electrical controls are difficult to check without proper instrumentation; therefore, if there are any discrepancies in the operating cycle, contact your dealer and request service.

**Refrigerant Circuit** — The refrigerant circuit is difficult to check for leaks without the proper equipment; therefore, if inadequate cooling is suspected, contact your local dealer for service.



**Fig. 4 — Typical Filter Access Panel Location**

**Combustion Area and Vent System** — The combustion area and vent system should be visually inspected before each heating season. The normal accumulation of dirt, soot, rust, and scale can result in loss of efficiency and improper performance if allowed to build up.

**▲ CAUTION**

If your unit makes an unusual or especially loud noises during heating, shut down the heating section and call your dealer.

See Fig. 1A, 1B and 5 and proceed as follows to inspect the combustion area and power-venting system of your unit.

1. Turn off gas supply to your unit.
2. Turn off electrical power to your unit.
3. Remove burner access panel.
4. Using a flashlight, carefully inspect the burner areas for dirt, soot, or scale.

**▲ CAUTION**

If dirt, soot, rust, or scale accumulations are found, call your dealer and do not operate your heating section.

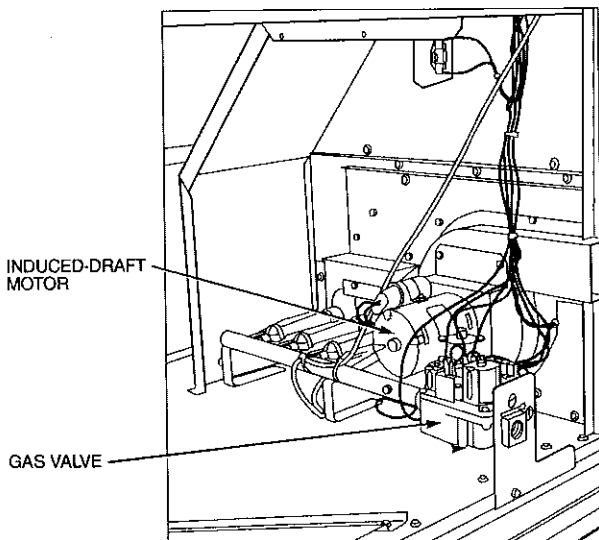
5. When you have completed your inspection, follow the start-up procedures in this manual to restore your unit to operation.
6. Observe unit heating operation.

**▲ WARNING**

Components in heat section may be hot after unit has been started up. When observing flame, be careful not to get too close to or touch heating components. Serious personal injury may result.

Watch the burner flame to see if it is bright blue. If you observe a suspected malfunction or that the burner flame is not bright blue, call your dealer.

7. Replace burner access panel.



**Fig. 5 — Typical Heat Section Detail  
(Size 004-007 Shown)**

**Unit Panels** — After performing any maintenance or service on the unit, be sure all panels are securely fastened in place to prevent rain from entering unit cabinet and to prevent disruption of the correct unit airflow pattern.

**REGULAR DEALER MAINTENANCE**

In addition to the type of routine maintenance you might be willing to perform, your unit should be inspected regularly by a properly trained service technician. An inspection (preferably each year, but at least every other year) should include the following:

1. Inspection of all flue product passages — including the burner, heat exchanger, and flue collector box.
2. Inspection of all combustion- and ventilation-air passages and openings.
3. Close inspection of all gas pipes leading to and inside your unit.
4. Inspection, and if required, cleaning of the condenser and evaporator coils.
5. Inspection, and if required, cleaning of the condensate drain pan and trap.
6. Inspection of all supply- and return-air ducts for leaks, obstructions, and insulation integrity. Any problems found should be resolved at the time of inspection.
7. Inspection of the unit base for cracks, gaps, etc., which may cause a hazardous condition.
8. Inspection of the unit casing for signs of deterioration.
9. Inspection of all electrical wiring and components to ensure proper connection.
10. Inspection for leaks in the refrigerant circuit. Pressure-check to determine appropriate refrigerant charge.
11. Inspection and cleaning of fan wheels and housings, belt tension, and fan motor, shaft bearings, and pulley alignment.
12. Operational check of the unit to determine working conditions. Repair or adjustment should be made at the time of inspection.

Your servicing dealer may offer an economical service contract that covers seasonal inspections. Ask for further details.

Complete Service Instructions can be found in the unit Installation, Start-Up and Service Instructions.

## BEFORE YOU CALL FOR SERVICE, CHECK FOR PROBLEMS THAT CAN BE EASILY SOLVED

If insufficient heating or cooling is suspected:

( ) Check for sufficient airflow. Check the air filter for dirt. Check for blocked return- or supply-air grilles. Be sure they are open and unobstructed. If these checks do not reveal the cause, call your servicing dealer.

If your unit is not operating at all, check the following list for easy solutions:

( ) Check to be sure that your thermostat temperature selector is set above the indoor temperature during the heating season, or below the indoor temperature during the cooling season. Be sure the SYSTEM switch is in the proper HEAT, COOL or AUTO position and not in the OFF position.

( ) Is the electrical supply switch ON? Are any fuses blown, or has the circuit breaker tripped?

( ) During the heating season, check the external manual shut-off valve. Is this lever parallel with the pipe, indicating that the valve is open? Or is the lever at a right angle, indicating that the valve is closed? If closed, has the gas been shut off for safety reasons? Otherwise, you may open the valve and follow the start-up procedures listed in this manual.

NOTE: Before proceeding with the next check, turn OFF the electrical power supply to the unit. Remove the control access door.

( ) During the heating season, check the control dial on the gas valve. Is it in the ON position? If it is not, be sure it has not been turned off for safety reasons. If no safety hazards are present, follow the start-up procedures in this manual.

( ) If your unit still fails to operate, call your servicing dealer for troubleshooting and repairs. Specify the model and serial numbers of your unit. (Record them in this manual in the space provided.) If the dealer knows exactly which unit you have, he may be able to offer suggestions over the phone, or save valuable time through knowledgeable preparation for the service call.

### IN CASE OF TROUBLE

If, after performing the above, unit performance is unsatisfactory, shut off the unit and call your dealer.

Dealer's Name \_\_\_\_\_

Telephone No. \_\_\_\_\_

Unit Model \_\_\_\_\_

# CARRIER CORPORATION



## IF YOUR UNIT DOES NOT WORK, FOLLOW THESE STEPS IN ORDER:

- FIRST:** Contact the installer. You may find his name on the product or in your Homeowner's Packet. If his name is not known, call your builder if yours is a new residence.
- SECOND:** Contact the nearest CARRIER distributor. (See telephone yellow pages.)
- THIRD:** Contact:  
CARRIER CORPORATION  
Consumer Relations Department  
P.O. Box 4808  
Syracuse, New York 13221  
Phone: 1-800-CARRIER (227-7437)

Model No. \_\_\_\_\_ Unit Serial No. \_\_\_\_\_  
Date of Installation \_\_\_\_\_ Installed by \_\_\_\_\_  
Name of Owner \_\_\_\_\_ Address of Installation \_\_\_\_\_

## Outdoor Cooling or Heating-Cooling Product (Units Smaller Than 185,000-Btuh Cooling Capacity) Limited Warranty

**ONE-YEAR WARRANTY**—This CARRIER CORPORATION (herein after referred to as 'COMPANY') product is warranted to be free from defects in material and workmanship under normal use and maintenance for a period of one year from the date of original installation whether or not actual use begins on that date. A new or remanufactured part, at the COMPANY'S sole option, to replace any defective part will be provided without charge for the part itself; PROVIDED the defective part is returned to our distributor through a qualified servicing dealer. The replacement part assumes the unused portion of the warranty.

**THIS WARRANTY DOES NOT INCLUDE LABOR OR OTHER COSTS** incurred for diagnosing, repairing, removing, installing, shipping, servicing or handling of either defective parts or replacement parts or complete unit. Such costs may be covered by a separate warranty provided by the installer.

**EXTENDED 4-YEAR WARRANTY ON COMPRESSOR ONLY**—During the second through fifth years after the date of original installation, the COMPANY further warrants the compressor against defects in material or workmanship under normal use and maintenance. A new or remanufactured compressor, at the COMPANY'S sole option, will be provided under the same conditions as stated in the ONE-YEAR WARRANTY.

**EXTENDED 4-YEAR WARRANTY ON GAS-FIRED HEAT EXCHANGER ONLY**—During the second through fifth years after the date of original installation, the COMPANY further warrants the gas-fired heat exchanger against defects in material or workmanship under normal use and maintenance. A new or remanufactured heat exchanger, at the COMPANY'S sole option, will be provided under the same conditions as stated in the ONE-YEAR WARRANTY.

**THESE EXTENDED WARRANTIES DO NOT INCLUDE LABOR OR OTHER COSTS** incurred for diagnosing, repairing, removing, installing, shipping, servicing or handling of either defective parts or replacement parts.

THESE WARRANTIES APPLY ONLY TO PRODUCTS IN THEIR ORIGINAL INSTALLATION LOCATION AND BECOME VOID UPON REINSTALLATION.

**LIMITATIONS OF WARRANTIES**—ALL IMPLIED WARRANTIES (INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY) ARE HEREBY LIMITED IN DURATION TO THE PERIOD FOR WHICH THE LIMITED WARRANTY IS GIVEN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE MAY NOT APPLY TO YOU. THE EXPRESSED WARRANTIES MADE IN THIS WARRANTY ARE EXCLUSIVE AND MAY NOT BE ALTERED, ENLARGED, OR CHANGED BY ANY DISTRIBUTOR, DEALER, OR OTHER PERSON WHATSOEVER.

ALL WORK UNDER THE TERMS OF THIS WARRANTY SHALL BE PERFORMED DURING NORMAL WORKING HOURS. ALL REPLACEMENT PARTS, WHETHER NEW OR REMANUFACTURED, ASSUME AS THEIR WARRANTY PERIOD ONLY THE REMAINING TIME PERIOD OF THIS WARRANTY.

### THE COMPANY WILL NOT BE RESPONSIBLE FOR:

1. Normal maintenance as outlined in the installation and servicing instructions or owner's manual including coil cleaning, filter cleaning and/or replacement and lubrication.
2. Damage or repairs required as a consequence of faulty installation, misapplication, abuse, improper servicing, unauthorized alteration or improper operation.
3. Failure to start due to voltage conditions, blown fuses, open circuit breakers or other damages due to the inadequacy or interruption of electrical service.
4. Damage as a result of floods, winds, fires, lightning, accidents, corrosive environments or other conditions beyond the control of the COMPANY.
5. Parts not supplied or designated by the COMPANY, or damages resulting from their use.
6. COMPANY products installed outside the continental U.S.A., Alaska, Hawaii and Canada.
7. Electricity or fuel costs or increases in electricity or fuel costs from any reason whatsoever including additional or unusual use of supplemental electric heat.
8. ANY SPECIAL INDIRECT OR CONSEQUENTIAL PROPERTY OR COMMERCIAL DAMAGE OF ANY NATURE WHATSOEVER. Some states do not allow the exclusion of incidental or consequential damages, so the above limitation may not apply to you.

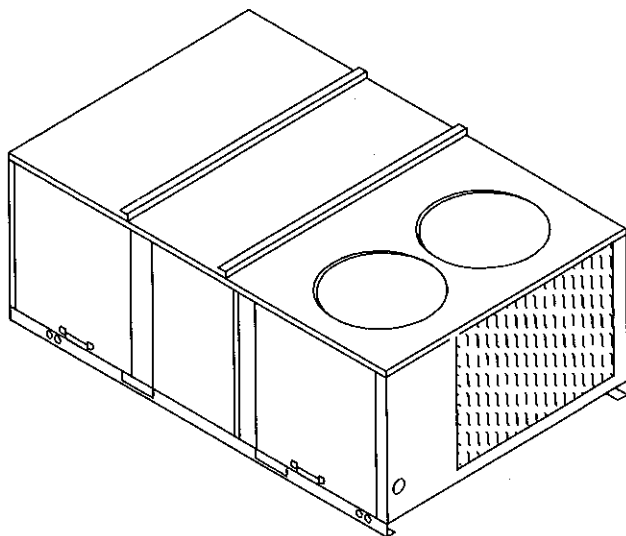
This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Catalog No. 530-098

Effective on product manufactured after July 1, 1987. Supersedes any other warranty certificates supplied with the product.

# Installation, Operation, and Maintenance

**Packaged Electric/Electric**  
12½–25 Tons



**Model Number**  
**RT-SVX25D**

## **⚠ SAFETY WARNING**

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

May 2011

**RT-SVX25D-EN**


# Warnings, Cautions and Notices

**Warnings, Cautions and Notices.** Note that warnings, cautions and notices appear at appropriate intervals throughout this manual. Warnings are provided to alert installing contractors to potential hazards that could result in personal injury or death. Cautions are designed to alert personnel to hazardous situations that could result in personal injury, while notices indicate a situation that may result in equipment or property-damage-only accidents.

Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

**ATTENTION:** Warnings, Cautions and Notices appear at appropriate sections throughout this literature. Read these carefully.

 **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**NOTICE:** Indicates a situation that may result in equipment or property-damage only accidents.

## Overview of Manual

**Note:** One copy of this document ships inside the control panel of each unit and is customer property. It must be retained by the unit's maintenance personnel.

This booklet describes proper installation, operation, and maintenance procedures for air cooled systems.

By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized.

It is important that periodic maintenance be performed to help assure trouble free operation. A maintenance schedule is provided at the end of this manual.

Should equipment failure occur, contact a qualified service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

### Important Environmental Concerns!

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs such as HCFCs and HFCs.

### Responsible Refrigerant Practices!

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.



**⚠ WARNING**

**Personal Protective Equipment (PPE) Required!**

Installing/servicing this unit could result in exposure to electrical, mechanical and chemical hazards.

- Before installing/servicing this unit, technicians **MUST** put on all Personal Protective Equipment (PPE) recommended for the work being undertaken. **ALWAYS** refer to appropriate MSDS sheets and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate MSDS sheets and OSHA guidelines for information on allowable personal exposure levels, proper respiratory protection and handling recommendations.
- If there is a risk of arc or flash, technicians **MUST** put on all Personal Protective Equipment (PPE) in accordance with NFPA70E or other country-specific requirements for arc/flash protection **PRIOR** to servicing the unit.

Failure to follow recommendations could result in death or serious injury.

**⚠ WARNING**

**Grounding Required!**

Follow proper local and state electrical code on requirements for grounding. Failure to follow code could result in death or serious injury.

**⚠ WARNING**

**Ground Wire!**

All field-installed wiring must be completed by qualified personnel. All field-installed wiring must comply with NEC and applicable local codes. Failure to follow this instruction could result in death or serious injuries.

**⚠ WARNING**

**Contains Refrigerant!**

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.

**⚠ WARNING**

**Hazardous Voltage w/Capacitors!**

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

Note: For additional information regarding the safe discharge of capacitors, see PROD-SVB06A-EN or PROD-SVB06A-FR.

### **WARNING**

#### **Damage From Ultraviolet (UV) Lights!**

The manufacturer does not recommend field installation of ultraviolet lights its equipment for the intended purpose of improving indoor air quality. High intensity C-band ultraviolet light is known to severely damage polymer (plastic) materials and poses a personal safety risk to anyone exposed to the light without proper personal protective equipment. Polymer materials commonly found in HVAC equipment that may be susceptible include insulation on electrical wiring, fan belts, thermal insulation, various fasteners and bushings. Degradation of these materials can result in serious damage to the equipment.

The manufacturer accepts no responsibility for the performance or operation of our equipment in which ultraviolet devices were installed outside of the manufacturer's factory or its approved suppliers.

### **WARNING**

#### **R-410A Refrigerant under Higher Pressure than R-22!**

The unit described in this manual uses R-410A refrigerant which operates at higher pressures than R-22 refrigerant. Use **ONLY** R-410A rated service equipment or components with this unit. For specific handling concerns with R-410A, please contact your local Trane representative.

Failure to use R-410A rated service equipment or components could result in equipment or components exploding under R-410A high pressures which could result in death, serious injury, or equipment damage.

### **NOTICE:**

#### **Roof Damage!**

System contains oil and refrigerant under high pressure. Roofs should be protected from exposure to oils and refrigerant in the system. If rooftop is not protected damage to the roof could occur.

## **Unit Nameplate**

A Mylar unit nameplate is located on the unit's corner support next to the control box. It includes the unit model number, serial number, electrical characteristics, refrigerant charge, as well as other pertinent unit data.

## **Compressor Nameplate**

The nameplate for the compressors are located on the side of the compressor.

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# Model Number Descriptions

All products are identified by a multiple character model number that precisely identifies a particular type of unit. An explanation of the alphanumeric identification code is provided. Its use will enable the owner/operator, installing contractors, and service engineers to define the operation, specific components, and other options for any specific unit.

When ordering replacement parts or requesting service, be sure to refer to the specific model number and serial number printed on the unit nameplate.

## Digit 1, 2 – Product Type

TC = Packaged Cooling, Electric Heat  
TF = With Factory Installed Options

## Digit 3 – Airflow Configuration

D = Downflow  
H = Horizontal

## Digit 4, 5, 6 – Nominal Gross Cooling Capacity (MBh)

150 = 12½ Tons Standard Efficiency  
151 = 12½ Tons High Efficiency  
180 = 15 Tons Standard Efficiency  
181 = 15 Tons High Efficiency  
210 = 17½ Tons Standard Efficiency  
211 = 17½ Tons High Efficiency  
240 = 20 Tons Standard Efficiency  
241 = 20 Tons High Efficiency  
300 = 25 Tons Standard Efficiency  
301 = 25 Tons High Efficiency

## Digit 7 – Major Design Sequence

E = Round Tube Plate Fin Type Condenser Coils  
F = Microchannel Type Condenser Coils

## Digit 8 – Voltage Selection

3 = 208-230/60/3  
4 = 460/60/3  
D = 400/50/3  
T = 380/60/3  
W = 575/60/3

## Digit 9, 10 – Factory Installed Options

00 = No Factory Installed Options  
0A = Factory-Installed Economizer  
0B = Oversized Motor  
0C = Downflow Economizer/Oversized Motor  
0F = Trane Communications Interface (TCI)  
0G = Downflow Economizer/TCI  
0H = Thermal Expansion Valve  
0J = Oversized Motor/Thermal Expansion Valve  
0K = Downflow Economizer/Oversized Motor/Thermal Expansion Valve  
0L = Factory-Installed Economizer/Thermal Expansion Valve  
0M = Reheat Coil  
0N = Downflow Economizer/Reheat Coil  
0P = Oversized Motor/Reheat Coil  
0R = Downflow Economizer/Oversized Motor/Reheat Coil

## Digit 11 – Minor Design Sequence

## Digit 12 – Service Digit

# Maintenance

Make sure all personnel are standing clear of the unit before proceeding. The system components will start when the power is applied.

## Fan Belt Adjustment—Belt Drive Units

### **WARNING**

#### **Rotating Components!**

**During installation, testing, servicing and troubleshooting of this product it may be necessary to measure the speed of rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks. Failure to follow all safety precautions when exposed to rotating components could result in death or serious injury.**

The fan belts must be inspected periodically to assure proper unit operation.

Replacement is necessary if the belts appear frayed or worn. Units with dual belts require a matched set of belts to ensure equal belt length.

When removing or installing the new belts, do not stretch them over the sheaves. Loosen the belts using the belt tension adjustment bolts on the motor mounting base.

Once the new belts are installed, using a Browning or Gates tension gauge (or equivalent) illustrated in Figure 20, p. 45; adjust the belt tension as follows;

1. To determine the appropriate belt deflection;
  - a. Measure the center-to-center shaft distance (in inches) between the fan and motor sheaves.
  - b. Divide the distance measured in Step 1a by 64; the resulting value represents the amount of belt deflection that corresponds to the proper belt tension.
2. Set the large O-ring on the belt tension gauge at the deflection value determined in Step 1b.
3. Set the small O-ring at zero on the force scale of the gauge plunger.
4. Place the large end of the gauge at the center of the belt span; then depress the gauge plunger until the large O-ring is even with the top of the next belt or even with a straightedge placed across the fan and motor sheaves.

Refer to Table 10, p. 45.

5. Remove the belt tension gauge. The small O-ring now indicates a number other than zero on the plunger's force scale. This number represents the force (in pounds) required to give the needed deflection.
6. Compare the "force" scale reading (Step 5) with the appropriate "force" value listed in Table 10, p. 45. If the "force" reading is outside the range, readjust the belt tension.

**Note:** Actual belt deflection "force" must not exceed the maximum "force" value shown in Table 10, p. 45.

7. Recheck the belt tension at least twice during the first 2 to 3 days of operation. Belt tension may decrease until the new belts are "run in".

Figure 20. Belt tension gauge

$$\text{Deflection} = \frac{\text{Belt Span (in)}}{64}$$

$$\text{Deflection} = \frac{\text{Belt Span (mm)}}{152}$$

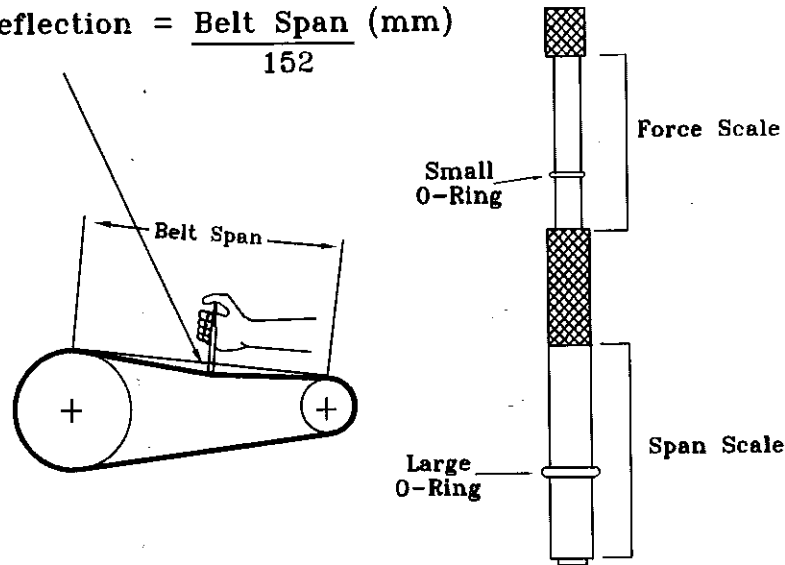


Table 10. Belt tension measurement and deflection ranges

Belts Cross Section	Small P.D Range (in.)	Deflection Force (lb)					
		Super Gripbelts (in.)		Gripnotch (in.)		Steel Cable Gripbelts (in.)	
		Min.	Max.	Min.	Max.	Min.	Max.
A	3.0-3.6	3	4 1/2	3 7/8	5 1/2	3 1/4	4
	3.8-4.8	3 1/2	5	4 1/2	6 1/4	3 3/4	4 3/4
	5.0-7.0	4	5 1/2	5	6 7/8	4 1/4	5 1/4
B	3.4-4.2	4	5 1/2	5 3/4	8	4 1/2	5 1/2
	4.4-5.6	5 1/8	7 1/8	6 1/2	9 1/8	5 3/4	7 1/4
	5.8-8.8	6 3/8	8 3/4	7 3/8	10 1/8	7	8 3/4

Belts Cross Section	Small P.D Range (mm)	Deflection Force (kg)					
		Super Gripbelts (mm)		Gripnotch (mm)		Steel Cable Gripbelts (mm)	
		Min.	Max.	Min.	Max.	Min.	Max.
A	13.3-16.0	13.3	20.0	17.2	24.5	14.5	17.8
	16.9-21.4	15.6	22.2	20.0	27.8	16.7	21.1
	22.0-31.1	17.8	24.5	22.2	30.6	18.9	23.4
B	15.1-18.7	17.8	24.5	25.6	35.6	20.0	24.5
	19.6-24.9	22.8	31.7	28.9	40.6	25.6	32.3
	25.8-39.1	28.4	38.9	32.8	45.0	31.1	38.9

### Monthly Maintenance

Before completing the following checks, turn the unit OFF and lock the main power disconnect switch open.

#### **WARNING**

#### **Hazardous Voltage!**

**Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.**

Failure to disconnect power before servicing can cause severe personal injury or death.

### Filters

- Inspect the return air filters. Clean or replace them if necessary. Refer to the unit Service Facts for filter information.

### Return Air Smoke Detector Maintenance

Airflow through the unit is affected by the amount of dirt and debris accumulated on the indoor coil and filters.

To insure that airflow through the unit is adequate for proper sampling by the return air smoke detector, complete adherence to the maintenance procedures, including recommended intervals between filter changes, and coil cleaning is required.

Periodic checks and maintenance procedures must be performed on the smoke detector to insure that it will function properly.

For detailed instructions concerning these checks and procedures, refer to the appropriate section(s) of the smoke detector Installation and Maintenance Instructions provided with the literature package for this unit.

### Cooling Season

- Check the unit's drain pans and condensate piping to ensure that there are no blockages.
- Inspect the evaporator and condenser coils for dirt, bent fins, etc. If the coils appear dirty, clean them according to the instructions described in "Coil Cleaning," p. 47.
- Manually rotate the condenser fan(s) to ensure free movement and check motor bearings for wear. Verify that all of the fan mounting hardware is tight.
- Inspect the F/A-R/A damper hinges and pins to ensure that all moving parts are securely mounted. Keep the blades clean as necessary.
- Verify that all damper linkages move freely; lubricate with white grease, if necessary.
- Check supply fan motor bearings; repair or replace the motor as necessary.
- Check the fan shaft bearings for wear. Replace the bearings as necessary.
- Check the supply fan belt. If the belt is frayed or worn, replace it. Refer to "Fan Belt Adjustment—Belt Drive Units," p. 44 for belt replacement and adjustments.
- Verify that all wire terminal connections are tight.
- Remove any corrosion present on the exterior surfaces of the unit and repaint these areas.
- Generally inspect the unit for unusual conditions (e.g., loose access panels, leaking piping connections, etc.).
- Make sure that all retaining screws are reinstalled in the unit access panels once these checks are complete.

- With the unit running, check and record the: ambient temperature; compressor suction and discharge pressures (each circuit); superheat (each circuit); Record this data on an "operator's maintenance log" like the one shown in Table 11, p. 50. If the operating pressures indicate a refrigerant shortage, measure the system superheat. For guidelines, refer to "Compressor Start-Up," p. 40.

**Note:** Do NOT release refrigerant to the atmosphere! If adding or removing refrigerant is required, the service technician must comply with all federal, state and local laws.

### Heating Season

- Inspect the unit's air filters. If necessary, clean or replace them.
- Check supply fan motor bearings; repair or replace the motor as necessary.
- Inspect both the main unit control panel and heat section control box for loose electrical components and terminal connections, as well as damaged wire insulation. Make any necessary repairs.
- Verify that the electric heat system operates properly.

### Coil Cleaning

Regular coil maintenance, including annual cleaning, enhances the unit's operating efficiency by minimizing: compressor head pressure and amperage draw; evaporator water carryover; fan brake horsepower, due to increase static pressure losses; airflow reduction.

At least once each year, or more often if the unit is located in a "dirty" environment, clean the evaporator and condenser coils using the instructions outlined below. Be sure to follow these instructions as closely as possible to avoid damaging the coils.

#### Microchannel (MCHE) Coils

##### **NOTICE:**

##### **Coil Damage!**

**DO NOT use any detergents with microchannel condenser coils. Use pressurized water or air ONLY with pressure no greater than 600psi. Failure to do so could result in coil damage.**

Due to the soft material and thin walls of the MCHE coils, the traditional field maintenance method recommended for Round Tube Plate Fin (RTPF) coils does not apply to microchannel coils.

Moreover, chemical cleaners are a risk factor to MCHE due to the material of the coil. The manufacturer does not recommend the use of chemical cleaners to clean microchannel coils. Using chemical cleaners could lead to warranty claims being further evaluated for validity and failure analysis.

The recommended cleaning method for microchannel condenser coils is pressurized water or air with a non-pinpoint nozzle and an ECU of at least 180 with pressure no greater than 600 psi. To minimize the risk of coil damage, approach the cleaning of the coil with the pressure washer aimed perpendicular to the face of the coil during cleaning.

#### Round Tube Plate Fin (RTPF) Coils

To clean refrigerant coils, use a soft brush and a sprayer (either a garden pump-up type or a high-pressure sprayer). A high-quality detergent is also required for round tube plate fin coils; suggested brands include "SPREX A.C.," "OAKITE 161," "OAKITE 166" and "COILOX." If the detergent selected is strongly alkaline (pH value exceeds 8.5), add an inhibitor.

**Note:** Do NOT use any detergents with microchannel condenser coils. Pressurized water or air ONLY.



### **WARNING**

#### **Hazardous Pressures!**

**Coils contain refrigerant under pressure. When cleaning coils, maintain coil cleaning solution temperature under 150°F to avoid excessive pressure in the coil. Failure to follow these safety precautions could result in coil bursting, which could result in death or serious injury.**

1. Remove enough panels from the unit to gain access to the coil. Remove the access panel from the roof located next to the rear condenser fan.
2. Protect all electrical devices such as motors and controllers from any over spray.
3. Straighten any bent coil fins with a fin comb.
4. For round tube straight fin coils, mix the detergent with water according to the manufacturer's instructions. If desired, heat the solution to 150°F maximum to improve its cleansing capability.

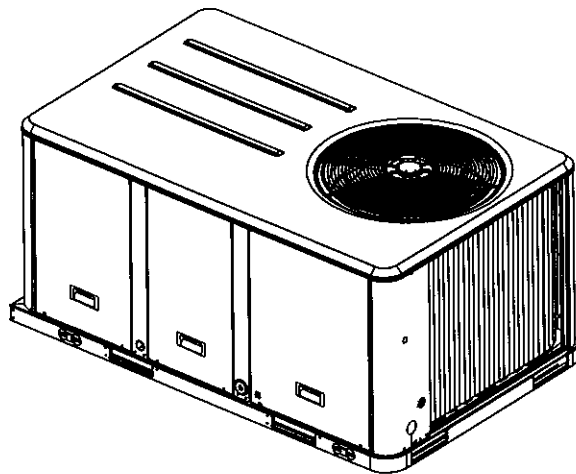
Do not heat the detergent-and-water solution above 150°F. Hot liquids sprayed on the exterior of the coil will raise the coil's internal pressure and may cause it to burst. Failure to follow proper procedures can result in personal illness or injury or severe equipment damage.

**Note:** Do NOT use any detergents with microchannel condenser coils. Pressurized water or air ONLY.

5. Pour the cleaning solution into the sprayer. If a high-pressure sprayer is used:
  - a. Do not allow sprayer pressure to exceed 600 psi.
  - b. The minimum nozzle spray angle is 15 degrees.
  - c. For round tube plate fin coils, maintain a minimum clearance of 6" between the sprayer nozzle and the coil. For microchannel condenser coils, optimum clearance between the sprayer nozzle and the microchannel coil is 1"–3".
  - d. Spray the solution perpendicular (at 90 degrees) to the coil face.
6. Spray the leaving-airflow side of the coil first; then spray the opposite side of the coil. For round tube plate fin coils, allow the cleaning solution to stand on the coil for five minutes.
7. Rinse both sides of the coil with cool, clean water.
8. Inspect both sides of the coil; if it still appears to be dirty, repeat Step 6 and Step 7.
9. Reinstall all of the components and panels removed in Step 1 and any protective covers installed in Step 2.
10. For round tube plate fin coils, use a fin comb to straighten any coil fins which were inadvertently bent during the cleaning process.
11. Restore the unit to its operational status and check system operation.

# Installation, Operation, and Maintenance

## Packaged Rooftop Air Conditioners Precedent™ - Electric/Electric 3 - 10 Ton, 60 Hz



THC036E - THC120E  
THC092F

### SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

April 2011

**RT-SVX22G-EN**


# Warnings, Cautions and Notices

**Warnings, Cautions and Notices.** Note that warnings, cautions and notices appear at appropriate intervals throughout this manual. Warnings are provided to alert installing contractors to potential hazards that could result in personal injury or death. Cautions are designed to alert personnel to hazardous situations that could result in personal injury, while notices indicate a situation that could result in equipment or property-damage-only accidents.

Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

**ATTENTION:** Warnings, Cautions and Notices appear at appropriate sections throughout this literature. Read these carefully.

 **WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

**NOTICE:** Indicates a situation that could result in equipment or property-damage-only accidents.

## Important Environmental Concerns!

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs such as HCFCs and HFCs.

## Responsible Refrigerant Practices!

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

## Overview of Manual

**Note:** One copy of this document ships inside the control panel of each unit and is customer property. It must be retained by the unit's maintenance personnel.

This booklet describes proper installation, operation, and maintenance procedures for air cooled systems. By carefully reviewing the information within this manual and following the instructions, the risk of improper operation and/or component damage will be minimized.

It is important that periodic maintenance be performed to help assure trouble free operation. A maintenance schedule is provided at the end of this manual. Should equipment failure occur, contact a qualified service organization with qualified, experienced HVAC technicians to properly diagnose and repair this equipment.

**⚠ WARNING**

**Personal Protective Equipment (PPE) Required!**

Installing/servicing this unit could result in exposure to electrical, mechanical and chemical hazards.

- Before installing/servicing this unit, technicians **MUST** put on all Personal Protective Equipment (PPE) recommended for the work being undertaken. **ALWAYS** refer to appropriate MSDS and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to appropriate MSDS and OSHA guidelines for information on allowable personal exposure levels, proper respiratory protection and handling recommendations.
- If there is a risk of arc or flash, technicians **MUST** put on all Personal Protective Equipment (PPE) in accordance with NFPA70E or other country-specific requirements for arc/flash protection **PRIOR** to servicing the unit.

Failure to follow recommendations could result in death or serious injury.

**⚠ WARNING**

**Contains Refrigerant!**

System contains oil and refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.

**⚠ WARNING**

**Hazardous Voltage w/Capacitors!**

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

**⚠ WARNING**

**Equipment Damage From Ultraviolet (UV) Lights!**

The manufacturer does not recommend field installation of ultraviolet lights in its equipment for the intended purpose of improving indoor air quality. High intensity C-band ultraviolet light is known to severely damage polymer (plastic) materials and poses a personal safety risk to anyone exposed to the light without proper personal protective equipment. Polymer materials commonly found in HVAC equipment that may be susceptible include insulation on electrical wiring, fan belts, thermal insulation, various fasteners and bushings. Degradation of these materials could result in serious damage to the equipment.

The manufacturer accepts no responsibility for the performance or operation of our equipment in which ultraviolet devices were installed outside of the manufacturer's factory or its approved suppliers.

**NOTICE:**

**Roof Damage!**

System contains oil and refrigerant under high pressure. Roofs should be protected from exposure to oils and refrigerant in the system. If rooftop is not protected damage to the roof could occur.

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# Maintenance

## Fan Belt Adjustment - Belt Drive Units

### **⚠ WARNING** **Rotating Components!**

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

The fan belts must be inspected periodically to assure proper unit operation.

Replacement is necessary if the belts appear frayed or worn. Units with dual belts require a matched set of belts to ensure equal belt length.

When removing or installing the new belts, do not stretch them over the sheaves. Loosen the belts using the belt tension adjustment bolts on the motor mounting base.

Once the new belts are installed, using a Browning or Gates tension gauge (or equivalent) illustrated in Figure 54, p. 67; adjust the belt tension as follows;

1. To determine the appropriate belt deflection;
  - a. Measure the center-to-center shaft distance (in inches) between the fan and motor sheaves.
  - b. Divide the distance measured in Step 1a by 64; the resulting value represents the amount of belt deflection that corresponds to the proper belt tension.
2. Set the large O-ring on the belt tension gauge at the deflection value determined in Step 1b.
3. Set the small O-ring at zero on the force scale of the gauge plunger.
4. Place the large end of the gauge at the center of the belt span; then depress the gauge plunger until the large O-ring is even with the top of the next belt or even with a straightedge placed across the fan and motor sheaves. Refer to Figure 9.
5. Remove the belt tension gauge. The small O-ring now indicates a number other than zero on the plunger's force scale. This number represents the force (in pounds) required to give the needed deflection.
6. Compare the "force" scale reading (Step 5) with the appropriate "force" value listed in Table 7. If the "force" reading is outside the range, readjust the belt tension.

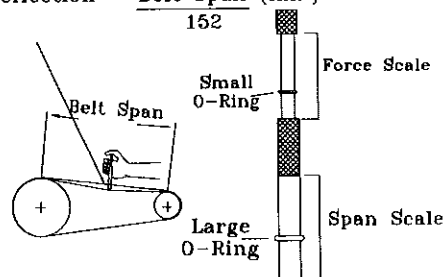
**Note:** Actual belt deflection "force" must not exceed the maximum "force" value shown in Figure 54, p. 67.

7. Recheck the belt tension at least twice during the first 2 to 3 days of operation. Belt tension may decrease until the new belts are "run in".

**Figure 54. Belt tension gauge**

$$\text{Deflection} = \frac{\text{Belt Span (in)}}{64}$$

$$\text{Deflection} = \frac{\text{Belt Span (mm)}}{152}$$



**Table 11. Belt tension measurement and deflection**

Belts Cross Section	Small P.D Range	Deflection Force (Lbs.)					
		Super Gripbelts		Gripnotch		Steel Cable Gripbelts	
		Min.	Max.	Min.	Max.	Min.	Max.
A	3.0 - 3.6	3	4 1/2	3 7/8	5 1/2	3 1/4	4
	3.8 - 4.8	3 1/2	5	4 1/2	6 1/4	3 3/4	4 3/4
	5.0 - 7.0	4	5 1/2	5	6 7/8	4 1/4	5 1/4
B	3.4 - 4.2	4	5 1/2	5 3/4	8	4 1/2	5 1/2
	4.4 - 5.6	5 1/8	7 1/8	6 1/2	9 1/8	5 3/4	7 1/4
	5.8 - 8.8	6 3/8	8 3/4	7 3/8	10 1/8	7	8 3/4

## Monthly Maintenance

### **WARNING** Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Before completing the following checks, turn the unit OFF and lock the main power disconnect switch open.

### Filters

Inspect the return air filters. Clean or replace them if necessary. Refer to the unit Service Facts for filter information.

### Return Air Smoke Detector Maintenance

Airflow through the unit is affected by the amount of dirt and debris accumulated on the indoor coil and filters. To insure that airflow through the unit is adequate for proper sampling by the return air smoke detector, complete adherence to the maintenance procedures, including recommended intervals between filter changes, and coil cleaning is required.

Periodic checks and maintenance procedures must be performed on the smoke detector to insure that it will function properly. For detailed instructions concerning these checks and procedures, refer to the appropriate section(s) of the smoke detector Installation and Maintenance Instructions provided with the literature package for this unit.

### Cooling Season

- Check the unit's drain pans and condensate piping to ensure that there are no blockages.
- Inspect the evaporator and condenser coils for dirt, bent fins, etc. If the coils appear dirty, clean them according to the instructions described in "Coil Cleaning" later in this section.
- Manually rotate the condenser fan(s) to ensure free movement and check motor bearings for wear. Verify that all of the fan mounting hardware is tight.
- Inspect the F/A-R/A damper hinges and pins to ensure that all moving parts are securely mounted. Keep the blades clean as necessary.
- Verify that all damper linkages move freely; lubricate with white grease, if necessary.
- Check supply fan motor bearings; repair or replace the motor as necessary.



- Check the fan shaft bearings for wear. Replace the bearings as necessary.
- Check the supply fan belt. If the belt is frayed or worn, replace it. Refer to the "Fan Belt Adjustment" section for belt replacement and adjustments.
- Verify that all wire terminal connections are tight.
- Remove any corrosion present on the exterior surfaces of the unit and repaint these areas.
- Generally inspect the unit for unusual conditions (e.g., loose access panels, leaking piping connections, etc.).
- Make sure that all retaining screws are reinstalled in the unit access panels once these checks are complete.
- With the unit running, check and record the: ambient temperature; compressor suction and discharge pressures (each circuit); superheat (each circuit);
- Record this data on an "operator's maintenance log" like the one shown in Table 12, p. 72. If the operating pressures indicate a refrigerant shortage, measure the system superheat. For guidelines, refer to the "Compressor Start-Up" section.

**Important:** *Do not release refrigerant to the atmosphere! If adding or removing refrigerant is required, the service technician must comply with all federal, state and local laws.*

### Heating Season

- Inspect the unit's air filters. If necessary, clean or replace them.
- Check supply fan motor bearings; repair or replace the motor as necessary.
- Inspect both the main unit control panel and heat section control box for loose electrical components and terminal connections, as well as damaged wire insulation. Make any necessary repairs.
- Verify that the electric heat system operates properly.

### Coil Cleaning

Regular coil maintenance, including annual cleaning, enhances the unit's operating efficiency by minimizing: compressor head pressure and amperage draw; evaporator water carryover; fan brake horsepower, due to increase static pressure losses; airflow reduction.

At least once each year, or more often if the unit is located in a "dirty" environment, clean the evaporator and condenser coils using the instructions outlined below. Be sure to follow these instructions as closely as possible to avoid damaging the coils.

**Note:** *For units equipped with hail guards follow removal procedure listed below.*

#### **Hail Guard Removal**

- Unlatch hail guard.
- Pull the top of the hail guard outward until the fastener studs are free of the retaining nuts.
- Lift the hail guard from the lower retaining bracket and set aside.

To clean refrigerant coils, use a soft brush and a sprayer (either a garden pump-up type or a high-pressure sprayer). A high-quality detergent is also required; suggested brands include "SPREX A.C.," "OAKITE 161," "OAKITE 166" and "COILOX." If the detergent selected is strongly alkaline (ph value exceeds 8.5), add an inhibitor.

### Microchannel (MCHE) Coils

#### **NOTICE:**

#### **Coil Damage!**

**DO NOT use any detergents with microchannel condenser coils. Use pressurized water or air ONLY with pressure no greater than 600psi. Failure to do so could result in coil damage.**

Due to the soft material and thin walls of the MCHE coils, the traditional field maintenance method recommended for Round Tube Plate Fin (RTPF) coils does not apply to microchannel coils.

Moreover, chemical cleaners are a risk factor to MCHE due to the material of the coil. The manufacturer does not recommend the use of chemical cleaners to clean microchannel coils. Using chemical cleaners could lead to warranty claims being further evaluated for validity and failure analysis.

The recommended cleaning method for microchannel condenser coils is pressurized water or air with a non-pinpoint nozzle and an ECU of at least 180 with pressure no greater than 600 psi. To minimize the risk of coil damage, approach the cleaning of the coil with the pressure washer aimed perpendicular to the face of the coil.

**Note:** For more details on Microchannel coil cleaning, please refer to bulletin RT-SVB83\*-EN.

### Round Tube Plate Fin (RTPF) Coils

#### **WARNING**

#### **Hazardous Chemicals!**

**Coil cleaning agents can be either acidic or highly alkaline. Handle chemical carefully. Proper handling should include goggles or face shield, chemical resistant gloves, boots, apron or suit as required. For personal safety refer to the cleaning agent manufacturer's Materials Safety Data Sheet and follow all recommended safe handling practices. Failure to follow all safety instructions could result in death or serious injury.**

1. Remove enough panels from the unit to gain access to the coil.
2. Protect all electrical devices such as motors and controllers from any over spray.
3. Straighten any bent coil fins with a fin comb.
4. Mix the detergent with water according to the manufacturer's instructions. If desired, heat the solution BUT DO NOT EXCEED 150°F maximum to improve its cleansing capability.

#### **WARNING**

#### **Hazardous Pressures!**

**Coils contain refrigerant under pressure. When cleaning coils, maintain coil cleaning solution temperature under 150°F to avoid excessive pressure in the coil. Failure to follow these safety precautions could result in coil bursting, which could result in death or serious injury.**

5. Pour the cleaning solution into the sprayer. If a high-pressure sprayer is used:
  - a. do not allow sprayer pressure to exceed 600 psi.
  - b. the minimum nozzle spray angle is 15 degrees.
  - c. maintain a minimum clearance of 6" between the sprayer nozzle and the coil.
  - d. spray the solution perpendicular (at 90 degrees) to the coil face.
6. Spray the leaving-airflow side of the coil first; then spray the opposite side of the coil. Allow the cleaning solution to stand on the coil for five minutes.
7. Rinse both sides of the coil with cool, clean water.
8. Inspect both sides of the coil; if it still appears to be dirty, repeat Steps 6 and 7.

9. Reinstall all of the components and panels removed in Step 1 and any protective covers installed in step 2.

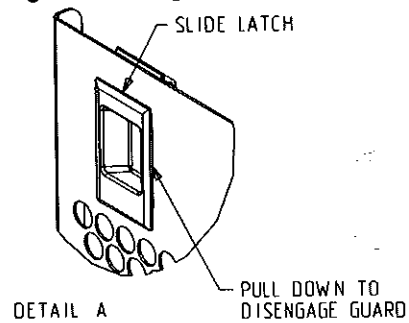
**Note:** For units equipped with hail guards follow reinstallation procedure listed below.

**Hail Guard Reinstallation**

10. To reinstall the hail guard, locate the bottom of the hail guard in the lower bracket and secure it to the upper unit bracket with the attached fasteners.

**Note:** Secure hail guard latches.

Figure 55. Hail guard



11. Restore the unit to its operational status and check system operation.

## Annual Maintenance

Clean and repaint any corroded surface.

## Final Process

For future reference, you may find it helpful to record the unit data requested in the blanks provided.

Complete Model Number: \_\_\_\_\_  
Unit Serial Number: \_\_\_\_\_  
Wiring Diagram Numbers (from unit control panel): \_\_\_\_\_  
Connections: \_\_\_\_\_  
Schematics: \_\_\_\_\_