Installation, Operation, and Maintenance

Trane Rental Services

Vertical Air Conditioning Units

⚠ 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.

August 2023 **SRV-SVX05D-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠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.

Important 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 according to local rules. For the USA, 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

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

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Overview

This document covers the vertical air conditioning units (VTU) available to rent from Trane Rental Services for temporary cooling solutions. This includes VTU technical information, start-up information, and unit maintenance.

The information contained in this IOM is provided to ensure the safe installation and operation of the equipment and its surroundings and is to be used as a reference for each VTU to aid in determining unit size, power requirements, or lifting requirements. If additional information regarding a particular unit is required, contact Trane Rental Services.

Contact Trane Rental Services for availability of equipment (including ancillary items: electrical cable, flexible duct, etc.) prior to proceeding with securing the rental equipment. Equipment is available on a first-come, first-serve basis, but can be reserved with a signed rental agreement.

Units Affected

RSVT0010F0XX - 10 ton vertical air conditioning unit

RSTV0020F0XX - 20 ton vertical air conditioning unit

RSVT0030F0XX - 30 ton vertical air conditioning unit

Note: *Where XX represents the unique inventory number.*

⚠WARNING

Live Electrical Components!

Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.
When it is necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks.

⚠WARNING

Failure to follow state/local codes could result in death or serious injuries!

All vertical air conditioning units should be installed per the National Electric Code (NEC) and/or applicable state/local codes.

General Information

The vertical air conditioning units (VTU) can be used in free blow or ducted applications. When used in free blow applications (for example: through the wall of a tent), duct connectors on the top and front of the unit must be removed. Refer to the installation section of this manual for instructions.

Each unit includes a clamp on the top and each side for installation in the wall of a tent for a special event application.

Accessories such as flexible duct, electrical cable, supply and return air duct adapters, and condenser discharge duct adapters are available upon request.

Table 1. General unit information

Model		10 ton	20 ton	30 ton
Manufacturer		United Cool Air	United Cool Air	United Cool Air
Refrigerant	Type	RSVT0010F0AA - F0AF - R-22	RSVT0020F0AA - F0AN - R-22	R-410A
		RSVT0010F0AG and later - R-410A	RSVT0020F0AO and later - R-410A	
	Charge per circuit			
	R-22 units	7 lb	18 lb 4 oz	N/A
	R-410A units	12 lb 5 oz	18 lb	18 lb 4 oz
Compressor	Type	Scroll	Scroll	Scroll
	Quantity	2	2	2
	Nominal Tons	5	10	15
	Hot Gas Bypass	No	Yes	Yes
Evaporator Airflow	Orientation	Horizontal	Horizontal	Horizontal
	Nominal Airflow (cfm)	4,000	8,000	12,000
	Max Static Discharge Pressure	1.0 in ESP	1.0 in ESP	1.0 in ESP
Supply Air Connection (s)	Type	Grille or Duct	Grille or Duct	Grille or Duct
	Quantity	2	2	2
	Size (in.)	12	20	20
Return Air connection (s)	Type	Grille or Duct	Grille or Duct	Grille or Duct
	Quantity	2	2	2
	Size (in.)	12	20	20
Evaporator Coil	Rows	4	4	4
	Face Area (sq ft)	9	13.33	22.6
	FPI	12	10	12
Condenser Coil	Rows	4	4	6
	Face Area (sq ft)	11.25	20	23.2
	FPI	12	12	12
Filter	Type	Permanent Cleanable	Permanent Cleanable	Permanent Cleanable
	Quantity	1	2	2
	Dimensions (in.)	14 x 55 x 0.5	40 x 24 x 0.5	43.5 x 37.5 x 0.5

Table 2. Cooling capacity (MBh)

Model	Entering Air Temp		Temperature °F (air over condenser)	
			95°F	
	DB	WB	Total	Sensible
10 ton	80	67	118	86.3
20 ton	80	67	238	175
30 ton	80	67	360	264

Notes:
1. Capabilities are gross values and are not adjusted for motor heat.
2. Max Ambient Temp is 105 °F.

Table 3. Electric heat air temperature rise

Model	Heater kW	Total MBh	Temperature Rise (°F)
10 ton	30	102.4	23.6
20 ton	45	153.5	17.7
30 ton	45	153.5	11.8

Note: Air temperature rise = (kW x 3413)/(scfm x 1.085)

Table 4. Weights and dimensions

Model	Length	Width	Height	Weight
10 ton Vertical Unit	5 ft 2 in.	3 ft	6 ft 11 in.	1,345 lb
10 ton Vertical Unit w/ supply and return duct connectors	5 ft 2 in.	3 ft 11 in.	7 ft 2 in.	1,415 lb
20 ton Vertical Unit	7 ft 7 in.	3 ft	8 ft	2,105 lb
20 ton Vertical Unit w/ supply and return duct conenctors	7 ft 7 in.	3 ft 11 in.	9 ft	2,245 lb
30 ton Vertical Unit (shipping weight, w/o plenum)	100 in.	46 in.	101 in.	3,580 lb
Fork Pocket Dimensions	---	7 in.	3 in.	---

Note: Add 17 inches to the unit width and 50 pounds to the unit weight for condenser discharge duct connections (10 and 20 ton units).

Dimensional Data

Figure 1. 10 ton vertical air conditioning unit (shown in free blow configuration)

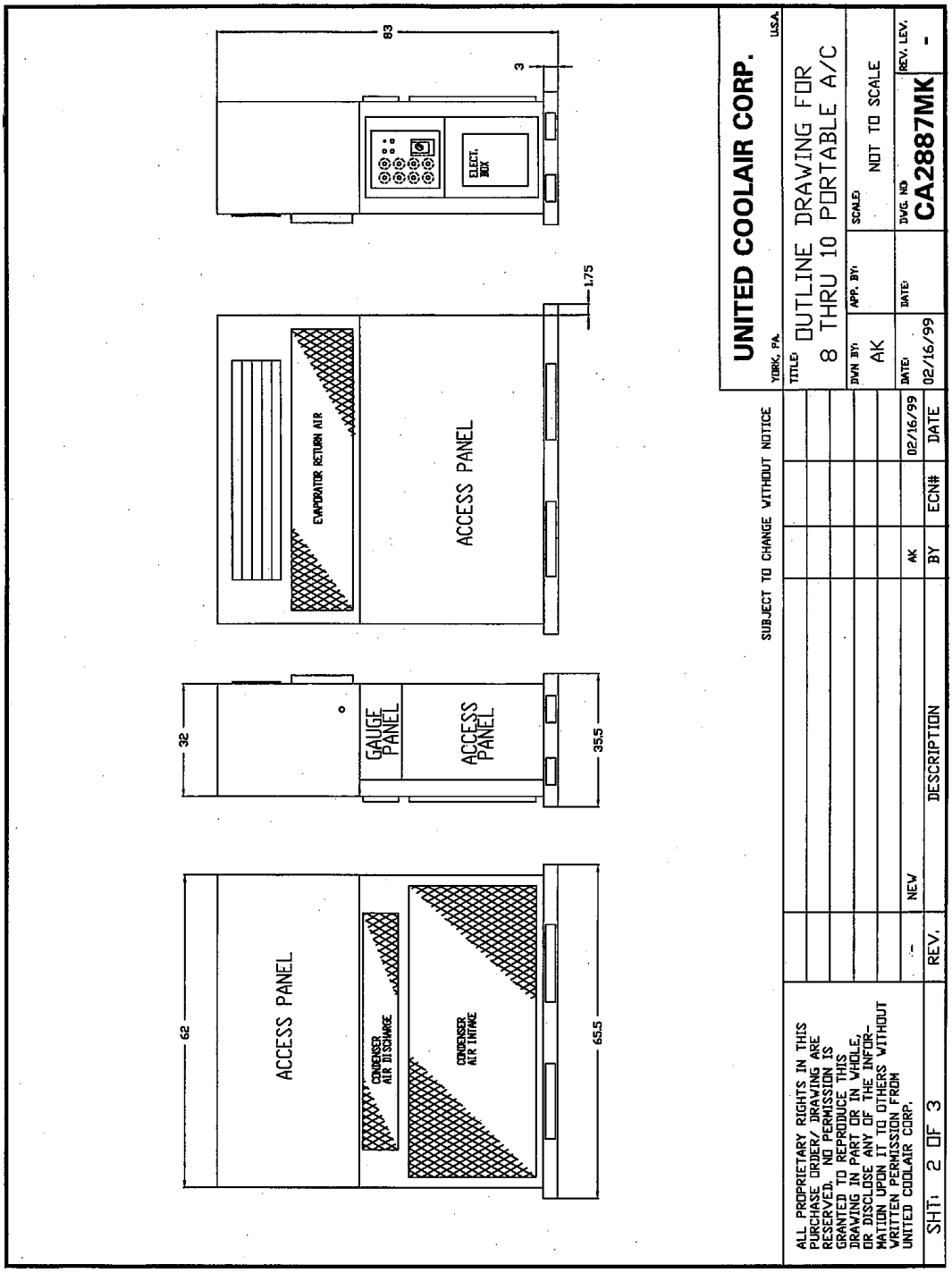


Figure 2. 20 ton vertical air conditioning unit (shown in free blow configuration)

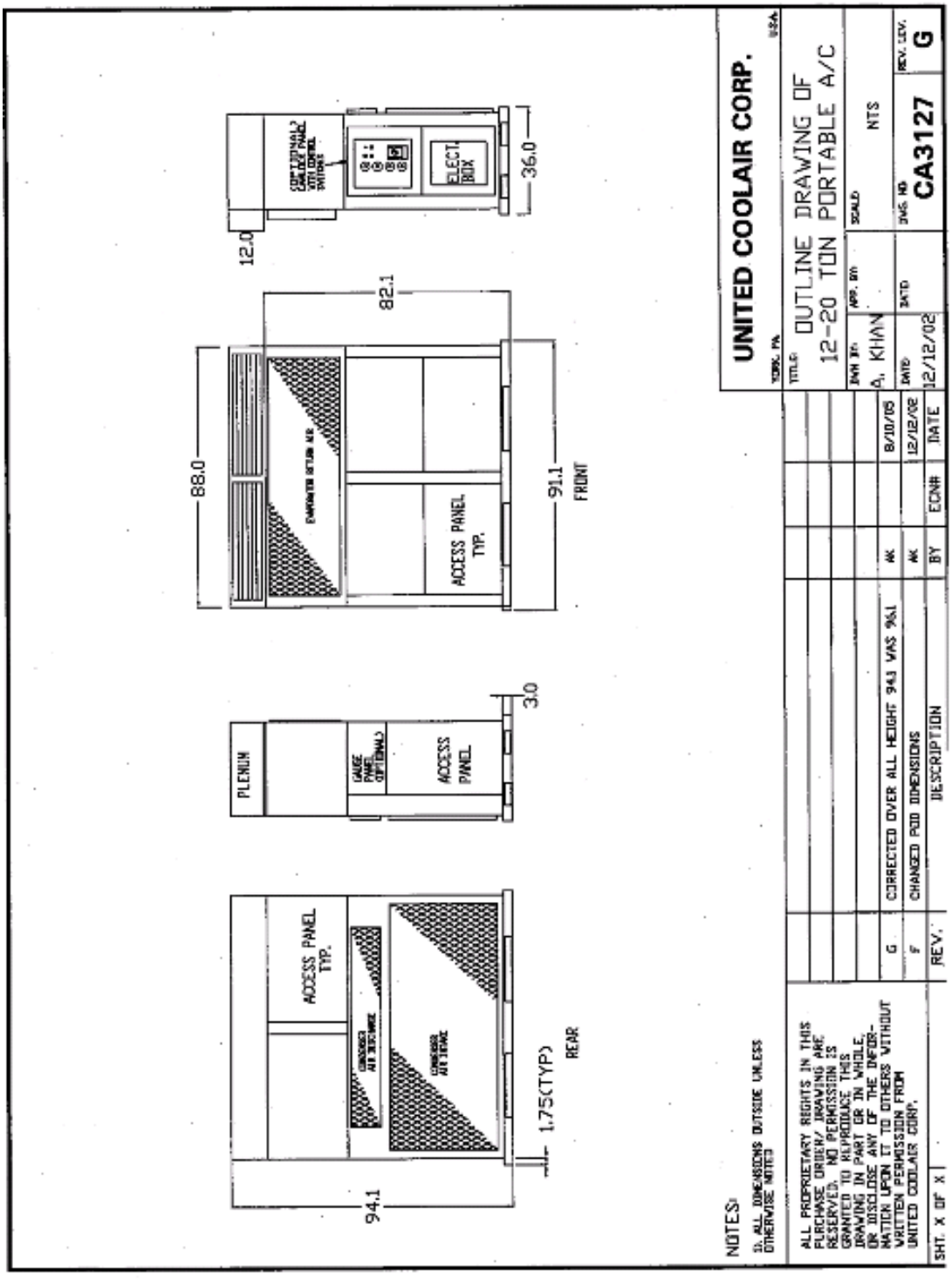


Figure 3. 30 ton vertical air conditioning unit (shown in free blow configuration)

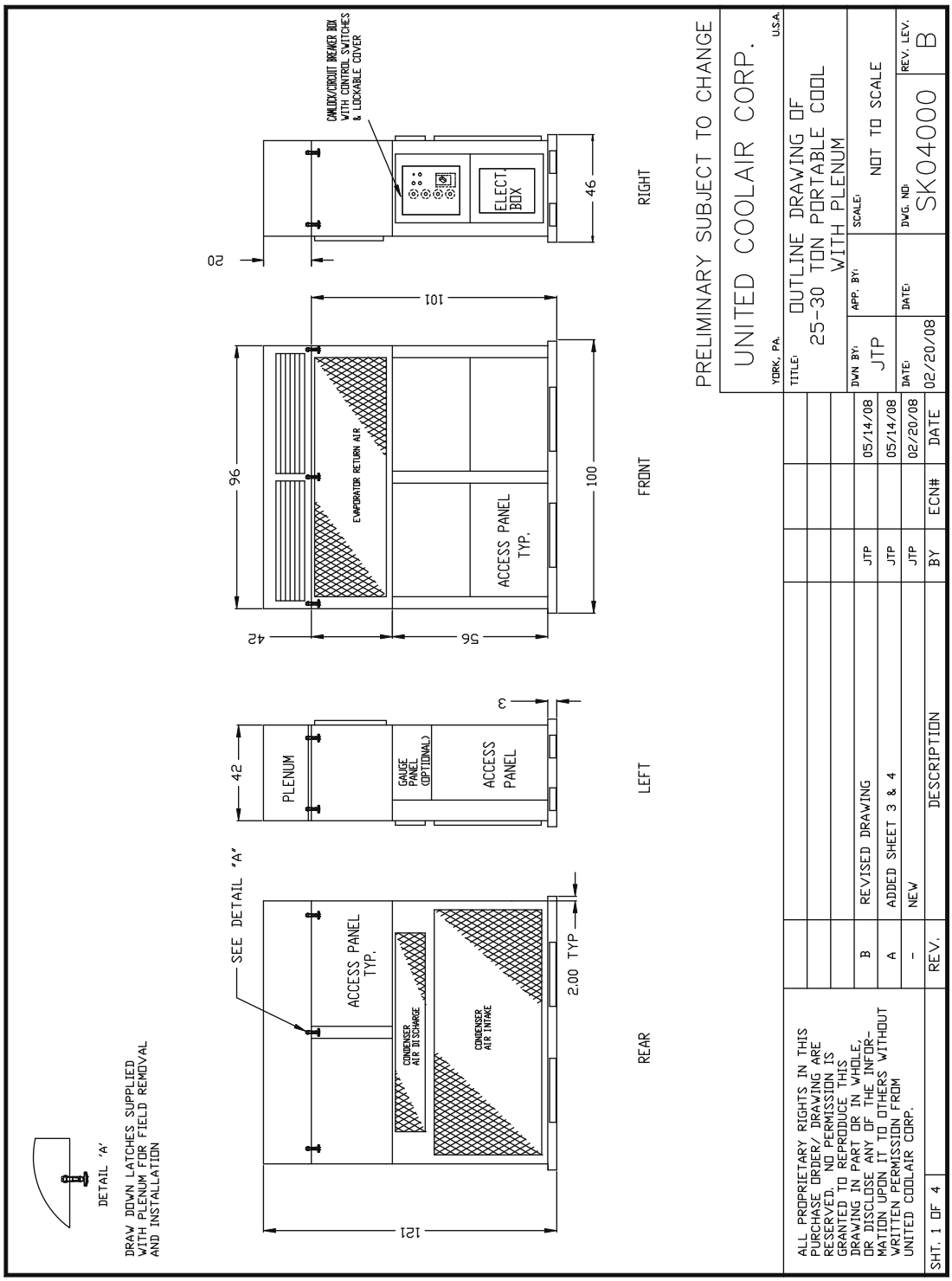
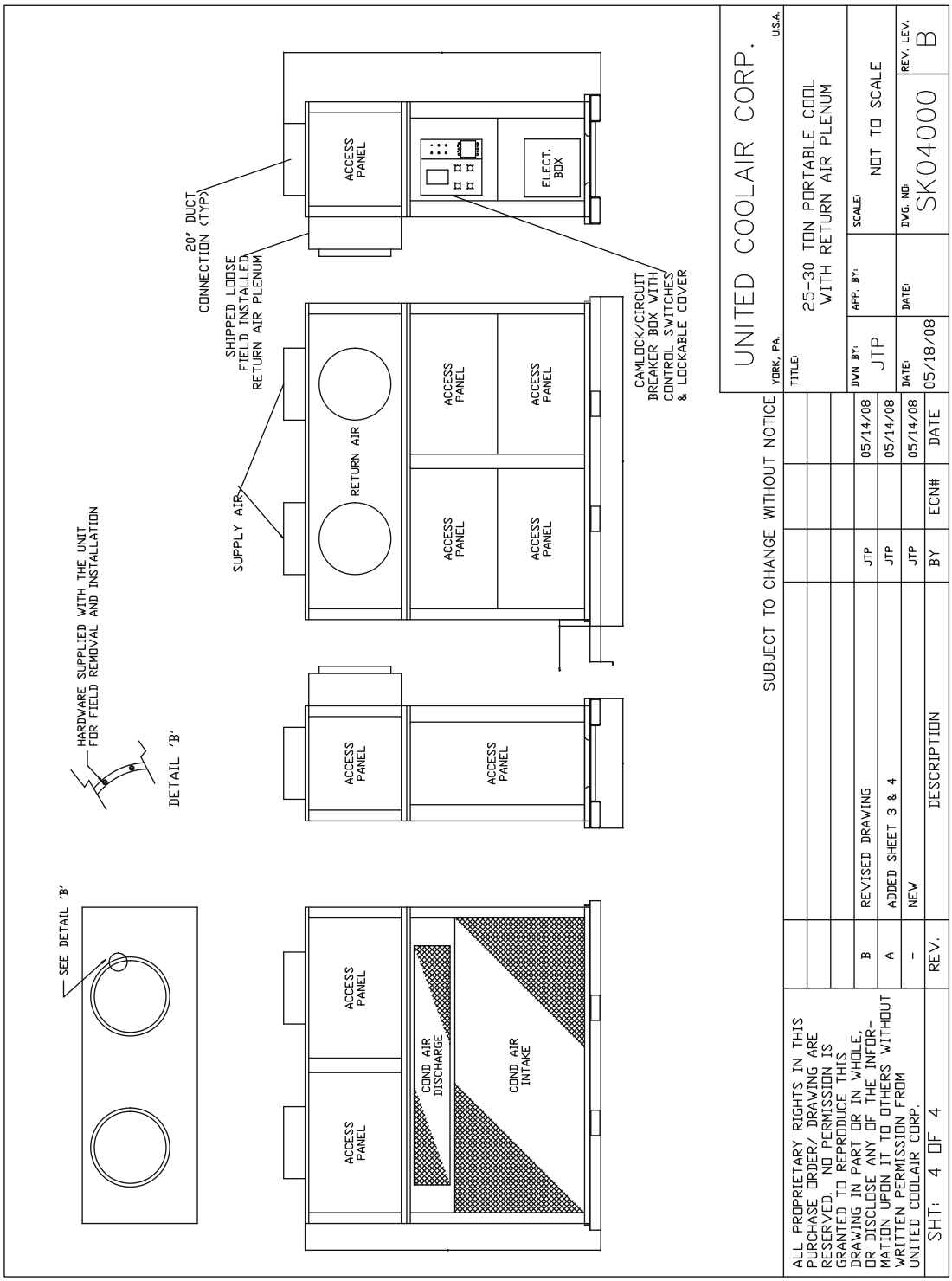


Figure 4. 30 ton vertical air conditioning unit (shown in ducted application configuration)



Installation

1. Confirm unit is level.
2. Connect the condensate drain line to the unit, see Figure 5. A kazoo tube with a 3/4-inch NPT connection is shipped loose with the unit.
3. Run hose from the condensate drain connection to the desired disposal location and attach the kazoo tube to the end of the hose.

Notes:

- *The kazoo tube acts as a condensate trap and is required.*
- *To avoid replacement fees, all panels/grills/connectors must be returned with unit when project is completed.*

Figure 5. Tent clamps and condensate kazoo tube drain

4. Connect electrical cables to color coded cam-type electrical connections.

   Use the four pin cam-type connectors with the spring loaded covers when connecting one unit to the source power, see Figure 6.

   The four sleeve cam-type connectors (behind the white hinged panel) should only be used when connecting units in series.

Figure 6. Cam-type electrical connections - pin connectors

Applications Using Optional Flexible Duct

Note: *Supply and return duct connectors ship with unit and are available separately.*

Evaporator Supply and Return Duct Connections

10 and 20 Ton:

1. Using supply air grille mounting screws, remove the patch plate from the top of the unit and attach to the front of the unit where the supply air grille was located. See Figure 7 and Figure 8.

   Note: *The existing mounting locations for the supply air grille are the same for the patch plate.*

Figure 7. Top of unit - patch plate

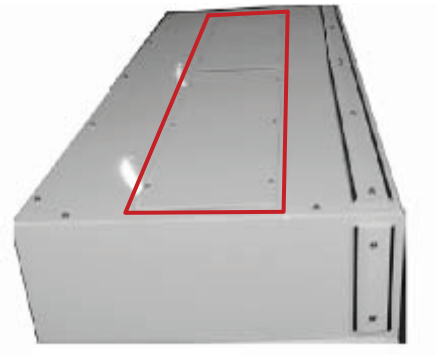
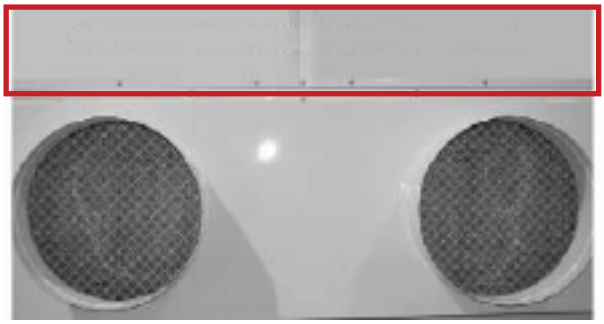


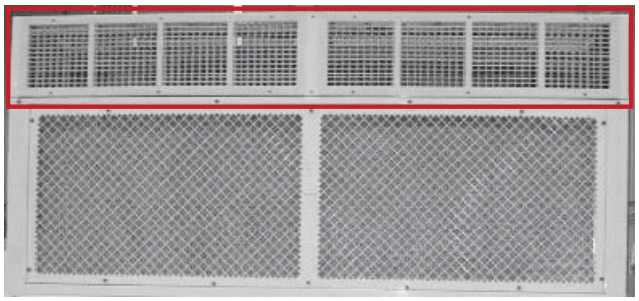
Figure 8. Supply air grille - patch plate



2. Remove the supply air grille and mounting screws. See Figure 9.

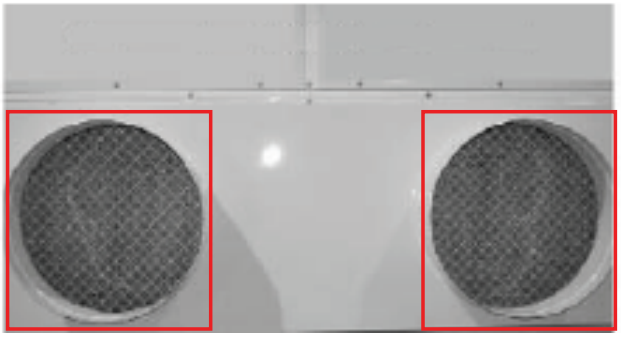
   Store the grille for future use.

Figure 9. Supply air grille



3. Install the return air duct connector on the front of the unit.

Figure 10. Return air duct connector



4. Install the supply air duct connector on the top of the unit.
5. Install the optional flexible ducting by sliding the end of the duct section over the end of the duct connector collar.
6. Secure the duct by tightening the hose clamp at the end of the duct section.

30 Ton:

1. Remove the mounting screws securing the two weatherproof covers from the top of the unit. See Figure 11.

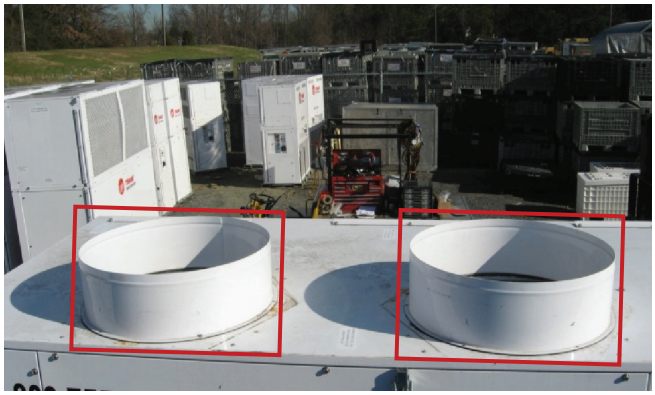
   Store the covers for future use.

Important: *Covers must be reinstalled before shipping/ storing.*

Figure 11. Weatherproof covers

2. Install two supply air duct connectors on the top of the unit using the screws from the weather-proofing covers. See Figure 12.

Figure 12. Supply air duct connectors



3. Remove the mounting screws and the return air grilles from the front of the unit. See Figure 13.

   Store the return air grilles for future use.

Important: *The grilles must be reinstalled before shipping.*

Figure 13. Return air grilles

4. Attach return air connector plenum to the front of the unit where the grilles were previously located.
5. Secure the optional flexible duct to connectors by tightening the hose clamp at the end of the duct section.

Condenser Discharge Duct Connection

The condenser duct connector is available separately but can be shipped with the unit on request.

10 Ton:

1. Remove the condenser discharge grille mounting hardware and store the grille.

Note: *The existing mounting locations for the discharge grille will be the same for the discharge box.*

2. Attach the condenser discharge box using the condenser discharge grill mounting hardware.
3. Install the optional flexible ducting by sliding the end of the duct section over the end of the duct connector collar.
4. Secure the duct by tightening the hose clamp at the end of the duct section.

20 Ton:

1. Remove the condenser discharge grille mounting hardware and the top two screws of the condenser coil guard. Store the discharge grille.

Note: *The existing mounting locations for the discharge grille will be the same for the discharge box.*

The bottom flange of the condenser discharge box will be located behind the top tabs of the condenser coil guard.

2. Attach the condenser discharge box using the condenser discharge grill mounting hardware.
3. Slide the end of the duct section over the end of the duct connector collar.
4. Secure the duct by tightening the hose clamp and the end of the duct section.

30 Ton:

There are currently no condenser discharge plenums available from Trane Rental Services.

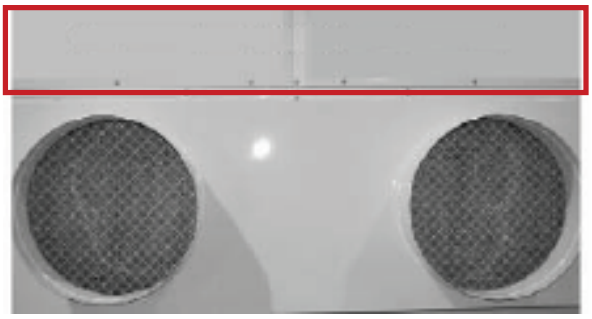
For Free Blow Applications

10 and 20 Ton:

1. Remove the screws connecting the return air duct connector (if installed). See Figure 14.

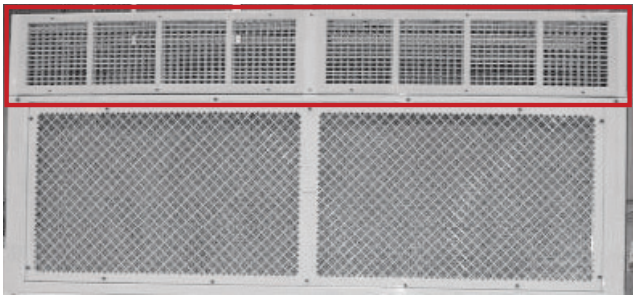
   Store duct adapter and screws for future use.
2. Remove the screws connecting the patch plate (if installed). See Figure 14.
3. Set the patch plate aside. It will be installed on top of the unit after the top supply air duct adapter is removed.

Figure 14. Top of unit - patch plates



4. Install the supply air grille (if installed). See Figure 15. Use the same Phillips head screws that were previously used to attach the patch plate shown in Figure 14.

Figure 15. Supply air grille



5. Remove the screws connecting the supply air duct connector to the top of the unit.

   The supply duct connector, front edge is held in place by the tent clamps on the top of the unit.
6. Loosen the tent clamps using a 7/16-inch wrench to remove the supply air duct connector.

   Store the duct connector and hardware for future use.
7. Install the patch plates on the top of the unit. See Figure 14.

30 Ton:

1. Remove the mounting screws and the two weather-proofing covers from the top of the unit (if installed). See Figure 11.

   Store the covers for future use. These must be reinstalled before shipping/storage.

2. Install the supply air plenum/grilles shown in Figure 16 using the draw down latches shown in Figure 17 and Figure 18.

⚠WARNING

Heavy Objects!

Failure to properly lift unit could result in death or serious injury or possible equipment or property only damage. Use a forklift of suitable capacity to move the unit.

Notes:

- *There are five draw down latches used to secure the supply air plenum correctly.*
- *Fork pockets are located on the top of the supply air plenum for forklift use.*

3. Remove the screws connecting the return air duct connector plenum to the front of the unit (if installed).
4. Install the return air grilles to the front of the unit. See Figure 13.

Figure 16. Supply air plenum for free blow applications

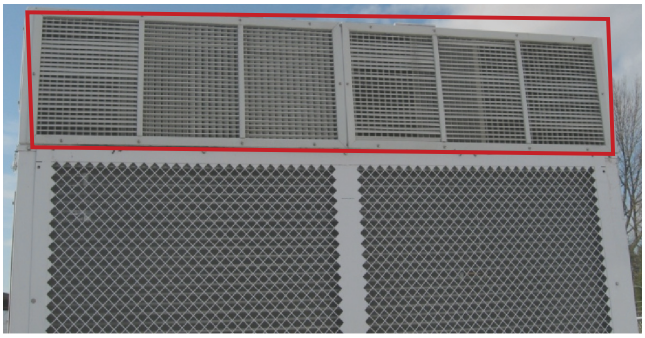


Figure 17. Draw down latch for supply air plenum

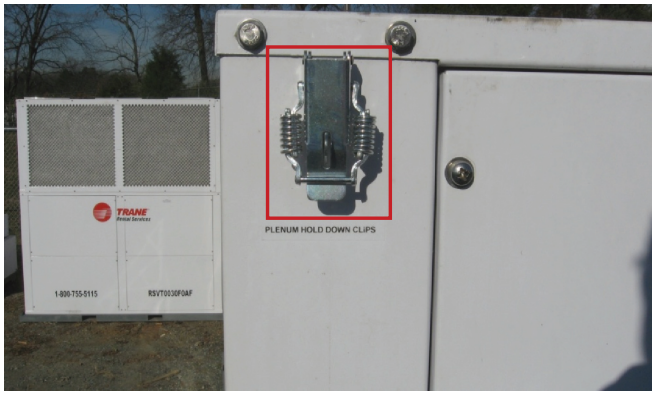
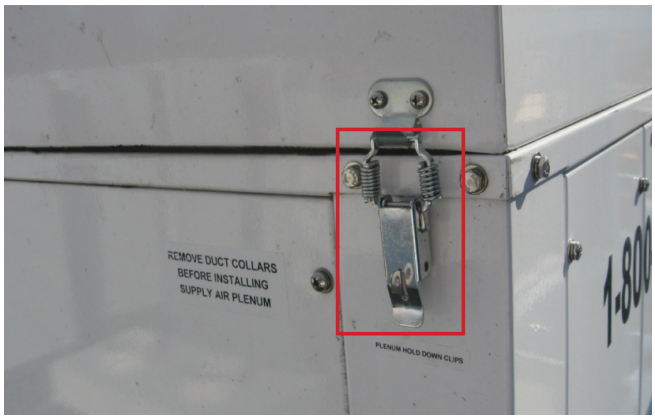


Figure 18. Draw down latch after plenum installation



Tent Wall Installation

Verify tent sidewall and unit height prior to selecting a unit for free blow configuration.

1. Loosen tent clamps on top and sides of unit. See Figure 19.
2. Carefully slide the tent material under the tent clamps on each side and top of the unit.
3. Tighten down the tent clamps using a $^{7}/_{16}$ inch wrench.

NOTICE

Do not over torque tent clamp bolts!

This could permanently damage the tent clamps rendering them ineffective. Clamps would need to be replaced at a cost to whoever incorrectly torqued the bolts.

Figure 19. Tent clamps and condensate kazoo tube drain

Rigging

Each vertical air conditioning unit has forklift pockets on all sides.

⚠WARNING

Heavy Objects!

Failure to properly lift unit could result in death or serious injury or possible equipment or property only damage. Use a forklift of suitable capacity to move the unit.

Figure 20. 20 ton vertical air conditioning unit and forklift pockets

Electrical Information

Vertical air conditioning units are 460V, 3-phase, 60 Hz. Each unit has eight color coded cam-type electrical connections. When connecting one unit to a power source, the pin cam-type connections on the right side should be used. The left side, sleeve cam-type connections, located behind the hinged panel, are only used when connecting multiple units to one power source. Connect several units in series. Electrical cable (2/0 or 4/0) is available as an accessory.

NOTICE

Do Not Exceed Amp Rating!

When connecting multiple units in series do not exceed amp rating of cable used. Exceeding amp ratings could cause permanent damage to the electrical cables.

Figure 21. Color coded (black, red, blue, and green) cam-type electrical connections

Table 5. Electrical information

Model	10 ton	20 ton	30 ton
Circuit Breaker	Yes	Yes	Yes
Minimum Circuit Ampacity (MCA)	51	78.8	87.2
Maximum Overcurrent Protection (MOP)	55	80	110
Minimum Circuit Ampacity (MCA) - cooling only	29.8	56.2	87.2
Maximum Overcurrent Protection (MOP) - cooling only	40	80	110
Compressors	2	2	2
Compressor LRA (each)	62	125	173
Compressor RLA (each)	10	19.2	26.9
Evaporator Blower Motor (hp)	2	5	10
Evaporator Flower FLA	3.1	6.5	13.2
Condenser Blower Motor (hp)	3	5	10
Condenser Blower FLA	4.2	6.5	13.2
Heater Stages	2	2	2
Heater kW each stage	15 + 15	15 + 30	15 + 30
Heater Amperage (total)	37.7	56.5	56.5

Note: Subject to change without notice. Please refer to nameplate on rental machine during installation.

Start-Up

1. To supply power to the unit, switch the unit breaker **ON**.

Figure 22. Unit circuit breaker

⚠WARNING

Risk of Electrocution!

Failure to follow instructions below could result in death or serious injury.
DO NOT use any tools (i.e. screwdriver, pliers, etc.) across the terminals to check for power. You MUST use a CAT III or IV voltmeter rated per NFPA 70E.

2. Verify proper sequencing of the input power per the phase indicator light. If the light is lit, change any two of the conductors (excluding the ground wire) **at the power source.**

Important: *Do not change wiring internal to the unit.*

3. When the circuit breaker and the **POWER** toggle switch is **ON**, the evaporator blower will run continuously.

   Note: *The system can be controlled manually or by use of a thermostat.*

Manual Operation

1. On the control panel there are five toggle switches (see Figure 23).
   - Power Switch
   - Thermostat Override Switch
   - Mode Switch
   - Manual Cooling Switch
   - Manual Heating Switch

Figure 23. Unit toggle switches and phase indicator light

2. Flip the **MODE** toggle switch to **COOL** or **HEAT**.
3. If the **THERMOSTAT OVERRIDE** toggle switch is **ON**, **SYSTEM 1 & 2 COOLING** mode must be controlled by the **MANUAL COOLING** or **MANUAL HEATING** toggle switch.
4. Flip the **MANUAL COOLING** or **MANUAL HEATING** toggle switch to **SYSTEM 1** or **SYSTEM 1 & 2** to energize the cooling or heating mode.

Important: *The **MANUAL COOLING** and **MANUAL HEATING** toggle switches have a center off position. This will not allow cooling or heating to energize when the **THERMOSTAT OVERRIDE** toggle switch is **ON**.*

Notes:

- ***MANUAL COOLING** and **MANUAL HEATING** cannot run simultaneously. Verify the unused switch is set to the center **OFF** position.*
- *In order to prevent **System 1 and 2** compressors from energizing simultaneously, there is a built-in five minute time delay.*

Thermostat Operation

1. Flip the **THERMOSTAT OVERRIDE** toggle switch to **OFF**.
2. Flip the **MODE** toggle switch to **HEAT** or **COOL**.

Note: *The system is controlled by a two stage cool/two stage heat non-programmable thermostat. This thermostat is mounted on top of the electrical control box. See Figure 24.*

3. Set the thermostat settings on the thermostat to the desired setting.

   System 1 and **System 2** compressors will then turn on when there is a call for cooling.

4. When the space temperature rises approximately 1°F above the setting the system will turn **ON**.

   The differential between stages is approximately 2°F.

   The equipment will not cycle more than six times per hour in the cooling mode.

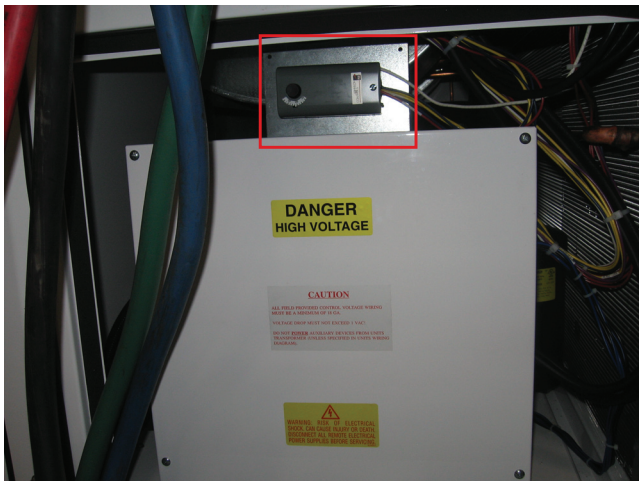
Note: *In order to prevent **System 1 and 2** compressors from energizing simultaneously, there is a built-in five minute time delay.*

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Figure 24. Unit thermostat



Maintenance

The motor and blower bearings are permanently lubricated and should not require maintenance.

The condenser and evaporator fans are belt driven. The drive belts should be routinely examined for wear and correct tension. An incorrectly tensioned belt can cause bearing wear or slippage. The belt can be tensioned by loosening the adjusting nut, sliding the motor until the belt is properly tensioned, and re-tightening the adjusting nut. A properly tensioned belt has approximately 1 to 1.5 inch of movement when both legs of the belt are pressed in, midway between the pulley and the sheave.

Each unit is provided with cleanable filters that are installed in the evaporator return air section. The return air grille must be removed to gain access to the filters. Check filters periodically to verify that the filters are clean. The filters can be cleaned by rinsing the filters with water. Apply a new coating of adhesive to restore the filter characteristics.

Notes

Trane - by Trane Technologies (NYSE: TT), a global climate innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

SRV-SVX05D-EN 08 Aug 2023
Supersedes SRV-SVX05C-EN (Jul 2021)