# Installation

## Variable Refrigerant Flow (VRF) System
Mode Control Unit (MCU)

**Models: 4MCUCUY6NCE000**
**4MCUCUY4NCE000**
**4MCUCUY2NCE000**

January 2015     **VRF-SVN42B-EN**     Ingersoll Rand

# 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.

### 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.

### 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. 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 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 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 PPE in accordance with NFPA 70E or other country-specific requirements for arc flash protection, PRIOR to servicing the unit.

## Copyright

## Trademarks

# Table of Contents

# Preparing for Installation

## Components

Use the illustrations below to identify the components included with the mode control unit (MCU) kit.
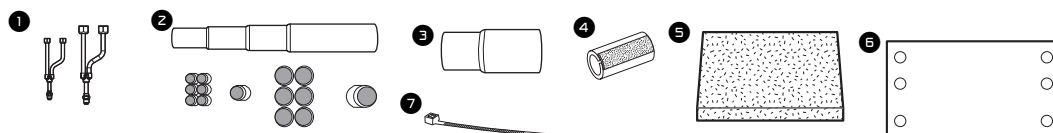
| ❶ Y-connectors:<br>One 3/8 in. (9.52 mm)<br>One 5/8 in. (15.88 mm) | ❷ Pipe socket | ❸ Drain socket |
|---|---|---|
| ❹ Pipe insulation | ❺ Base insulation | ❻ Template |
| ❼ Cable ties | | |

## Indoor Unit Compatibility and Maximum Quantities

**Figure 1.  Indoor unit compatibility**

| Outdoor Unit | MCU | Indoor Unit |
|---|---|---|
| 4TVP***<br>4TVR*** | 4MCUCUY6NCE000<br>4MCUCUY4NCE000 | 4TVB***<br>4TVC***<br>4TVD***<br>4TVE***<br>4TVL***<br>4TVW***<br>4TVX***<br>4TVA0036–0048***<br>4TVM0024–0048*** |
| | 4MCUCUY2NCE000 | 4TVA0076–0096<br>4TVC0036–0048<br>4TVD0036–0048<br>4TVL0036–0048<br>4TVM0036–0060 |
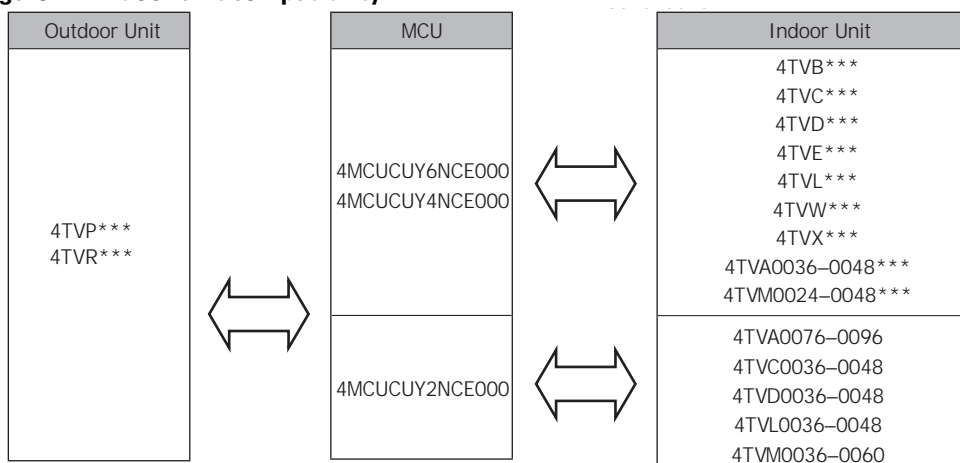
**Table 1.  Maximum indoor unit quantities and capacity**

| | 4MCUCUY6NCE000 | 4MCUCUY4NCE000 | 4MCUCUY2NCE000 |
|---|---|---|---|
| MCU models[a] | | | |
| Maximum number of connectable indoor units | 6 | 4 | 2 |
| Maximum capacity of the connectable indoor units | 180 MBH | 120 MBH | 192 MBH |

(a) Internal EEV not included with MCU kits.

# Noise Mitigation Guidelines

A significant amount of noise can be generated during MCU operation. To reduce noise impact of the MCU, use the following guidelines:

- Do not install the unit in ceilings of rooms that require a low noise level, such as bedrooms, libraries, hospitals, and offices.

- Ideal locations are hallways or similar areas where some noise is tolerable. Even in these areas, soundproofing should be installed within the ceilings and walls that are between the MCU and the sensitive areas.

- If possible, select an installation location where nearby walls have natural soundproofing qualities, such as bricks or cement.

- A ceiling used for MCU installation should be coated with a high-quality texturing to aid in muffling the sound.

- Drill piping holes no larger than necessary. Block the gap between pipe and hole with insulation to minimize noise.

- Do not install the unit into a hanging ("false") ceiling because of the lack of noise insulation in this type of ceiling.

*Note:* *If the Low Temperature Cooling Range Expansion option is selected, the system will operate in cooling mode throughout the year. In this mode, the noise of the MCU may become louder during the winter season, making noise reduction very important.*

# Space Requirements

> ⚠️ **CAUTION**
>
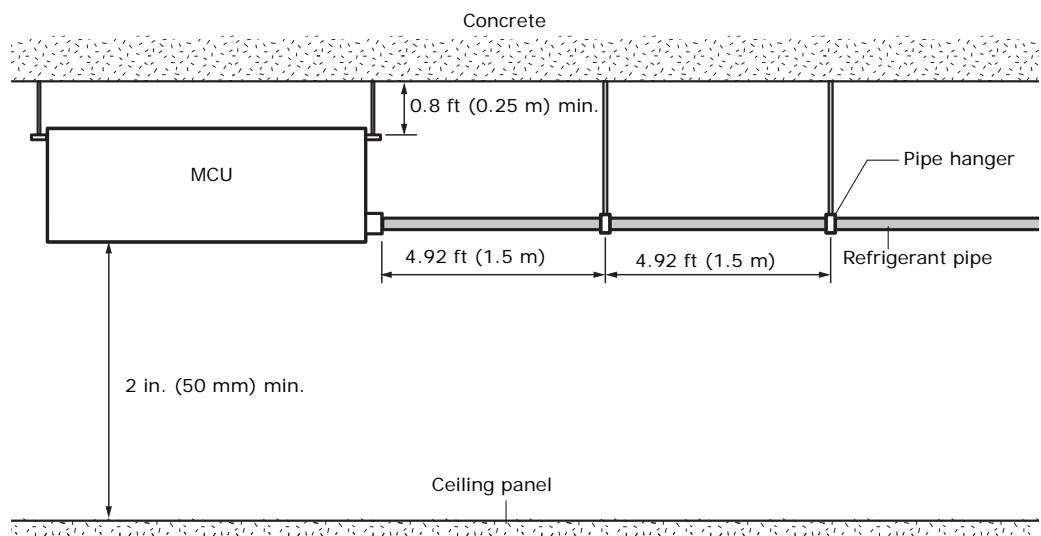> **Avoid equipment damage and personal injury!**
>
> **Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each of the attached suspension bolts.**
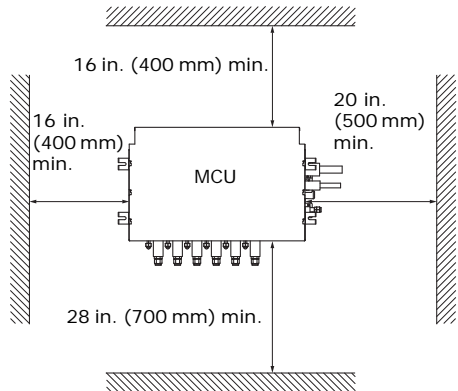
Select a location that can support the weight of the MCU and the indoor unit and that has strong vibration resistance and no slope.

Follow the space requirements given in the following illustration: /

Ensure that the minimum service clearances exist:



16 in. (400 mm) min.

20 in. (500 mm) min.

16 in. (400 mm) min.

MCU

28 in. (700 mm) min.

# Unit Installation

Follow the installation guidelines and procedures in this section.

| | 4MCUCUY6NCE000 | 4MCUCUY4NCE000 | 4MCUCUY2NCE000 |
|---|---|---|---|
| Example installations | | | |
| Indoor unit installation | **Indoor unit capacity ≤ 48 MBH**<br>• For indoor unit capacity < 36 MBH: Connect the indoor unit liquid and gas pipes to a single MCU port.<br>• For indoor unit capacity of 36 to 48 MBH: Join two MCU ports (liquid and gas) with supplied Y-joint and connect to indoor unit.<br>**Note:** For continuous cooling at ambient conditions of 5°F (−15°C), join two adjacent MCU ports with supplied Y-joint and connect to indoor unit with capacity ≤ 48 MBH. | | **Indoor unit capacity ≥ 36 MBH**<br>• Indoor unit capacity of 36 to 96 MBH: Join two MCU ports (liquid and gas) with supplied Y-joint and connect to indoor unit.<br>**Note:** Used only with indoor units with capacity of 36 MBH and greater. |

• If the length of suspension bolt is more than 4.92 ft (1.5 m), use vibration-preventive measures.

• If necessary, create an opening in the false ceiling that allows access to the unit to perform required operations.

• If attaching the unit from a ceiling, use suspension bolts.

• Make sure that all four corners are attached and that nuts and washers are used.

• Use care to make sure the units is not installed upside down.

To mount the unit:

1. Place the template on the spot where the unit is to be installed and mark the holes.

***Note:*** *Since the template is made of paper, it may shrink or stretch slightly due to temperature or humidity. Before drilling holes, verify proper dimensions between the marks.*
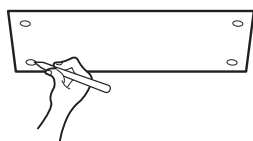
2. Determine the appropriate type of suspension bolts and anchors according to the ceiling type. Insert bolt anchors into existing ceiling supports (A) or construct a suitable support (B).

**A**

Concrete

Pre-poured anchor

Drill hole for anchor

Field-supplied suspension bolts (M10 or 3/8 in.)

**B**

Ceiling support
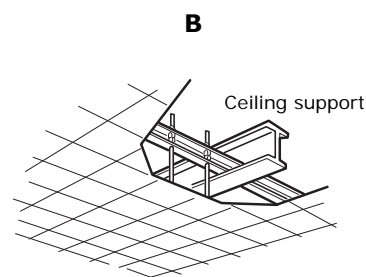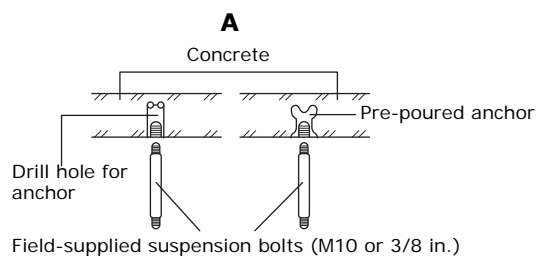
3. Install the suspension bolts at all four locations. Refer to the following illustrations.

**Unit: inches (mm)**

30.08 (764) between suspension bolts

8.82 (224)

8.82 (224)

Fasten nuts securely

Washers, isolators, or spacers

Washers
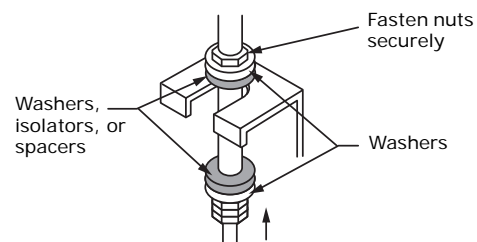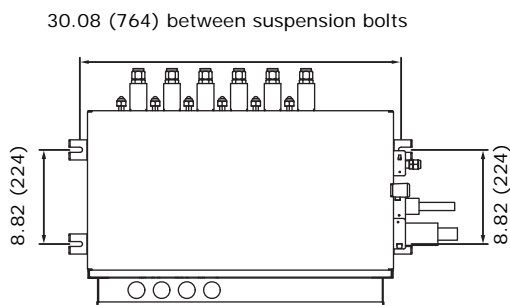
# Refrigerant Pipes

Follow the recommendations and procedures for refrigerant pipe selection and installation using the manual that is appropriate for the system type:

- For air-source systems, refer to VRF-SVN34*-EN.
- For water-source systems, refer to VRF-SVN070*-EN.

# Installing Refrigerant Piping

> ### ⚠ WARNING
>
> **Hazard of Explosion and Deadly Gases!**
>
> **Failure to follow all proper safe refrigerant handling practices could result in death or serious injury. Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids.**

> ### NOTICE:
>
> **System Component Damage!**
>
> **Do not remove the seal caps from refrigerant connections, or open the service valves until prepared to braze refrigerant lines to the connections. Excessive exposure to atmosphere (> 5 min.) may allow moisture or dirt to contaminate the system, damaging valve seals and causing ice formation in system components.**

> ### NOTICE
>
> **System Failure!**
>
> **If brazing is used for pipe connections, a nitrogen purge is required to prevent the formation of copper oxides inside the piping. Failure to follow this procedure could damage the system.**

For piping installation:

1. Cut or extend field-supplied piping as needed. To extend pipes, braze or using flared pipe connections (not supplied).
2. Make sure that pipes are free of dirt, debris, and moisture, and do not leak.
3. Connect piping.
   - Use brazed or use flared pipe connections as indicated in Figure 2.
   - When using Y-joint to connect the indoor unit to an MCU, connect the Y-joint to the MCU in series, as shown in Figure 3.

**Figure 2.   Connecting refrigerant piping to the MCU**

**Side view**

**Pipe connections to outdoor unit**

Liquid    Gas

Ø1-1/8 (28.58)

Ø3/4 (19.05)

Ø1/2 (12.7)

**Pipe connections to indoor unit**

Gas pipe (flare)

Liquid pipe (flare)

**Top view**

**Pipe connections to outdoor unit**

Low pressure gas pipe connection (brazing)

High-pressure gas pipe connection (brazing)

Liquid pipe connection (flare)

**Pipe connections to indoor unit**

Ø3/8 (9.52)

Ø5/8 (15.88)

Liquid pipe (flare)

Gas pipe (flare)

**Figure 3.   Connect Y-joint in series to MCU**

Indoor #1    Indoor #2
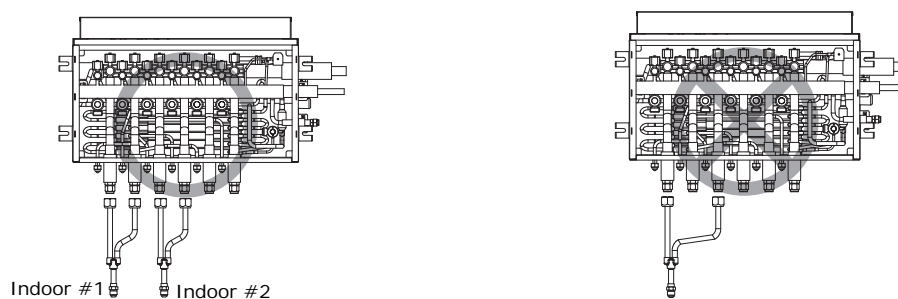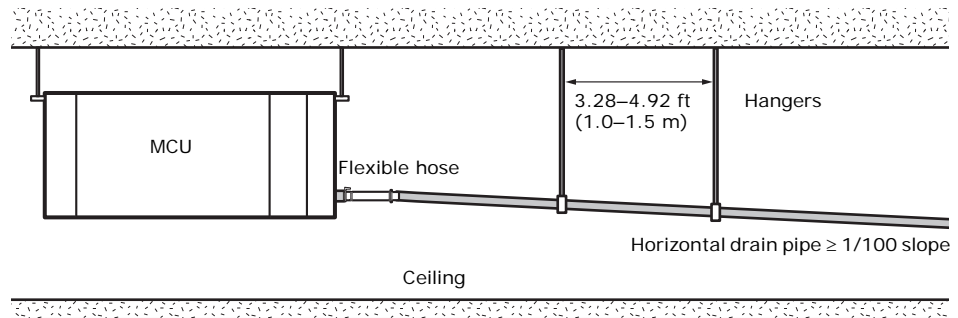
## Installation Examples
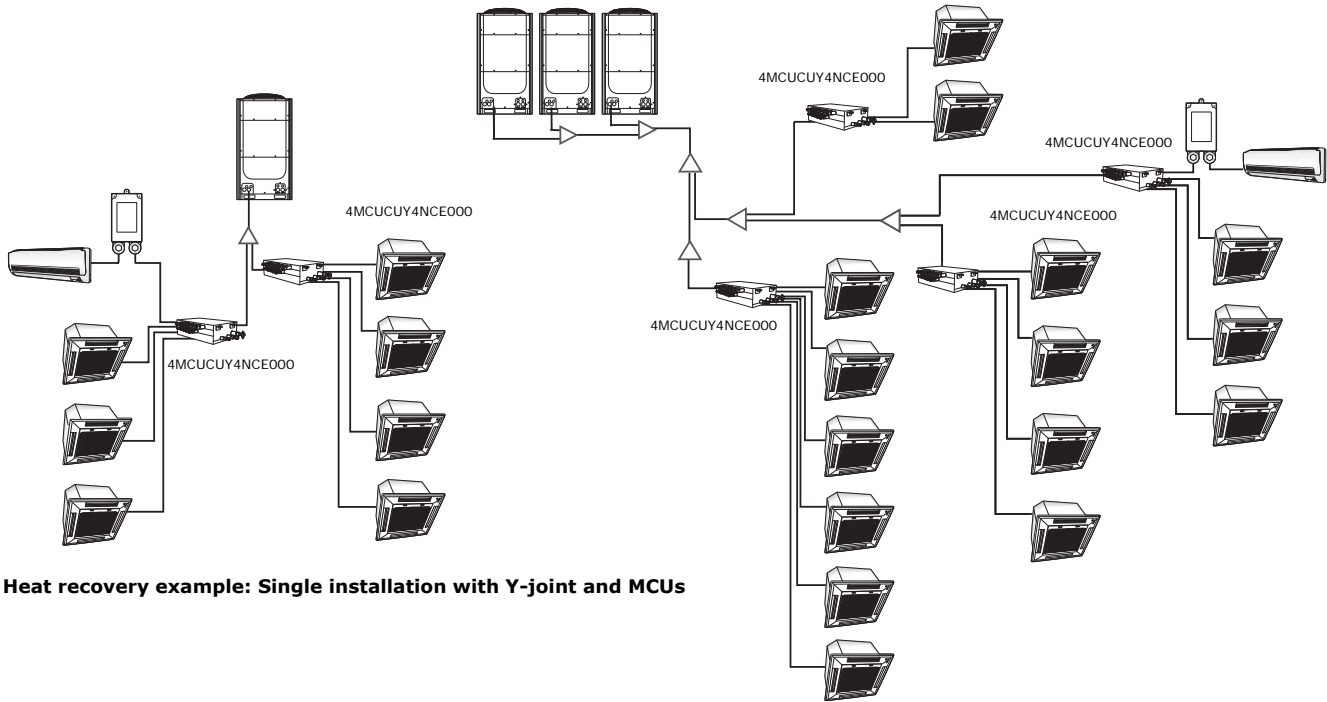


**Heat recovery example: Single installation with Y-joint and MCUs**

**Heat recovery example: Module installation with Y-joints and MCUs**

# Installing Condensate Drainage

Install the drain pipe as indicated in the illustration.



**Note:**  Install a U-trap at the end of the drain pipe to prevent unpleasant odors.

# Electrical Wiring

Observe the following precautions when making electrical connections.

| ⚠ 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.** |

| *NOTICE* |
|---|
| **Use Copper Conductors Only!** |
| **Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors could result in equipment damage.** |

- Make all electrical connections in accordance with electrical codes and ordinances.
- Select the power cable in accordance with relevant local and national regulations.
- Wire size must comply with local and national code.
- Use grade H07RN-F or H05RN-F power cable.
- Connect the power cable into the power cable terminal and fasten it with a clamp.
- Unbalanced power must be maintained within 10% of supply rating among whole indoor units.
- Significantly unbalanced power may shorten the life of the system. If the unbalanced power is greater than 10% of supply rating, the unit will stop and an error code will be generated.
- Connect the power cable to the auxiliary circuit breaker. An all-pole disconnection from the power supply must be incorporated in the fixed wiring (1/8 in. [3 mm]).
- All wiring must be protected from weather and damage.
- Maintain a distance of 2 in. (50 mm) or more between power and communication cables to prevent interference.
- Maintain a voltage drop of less than 10% between the power source and the unit(s).
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.
  Tightening torque for M4 screws: 0.86–1.06 lbf·ft (12.0–14.7 kgf·cm).
- After making a knockout hole, apply rust-preventive paint to the bare metal around the hole.
- Secure the cable conduit to the outdoor knockout using the proper connector and bushing.

# Power

Supply 208–230 V power separately to MCU through terminals L and N. Refer to Figure 4.

# Communication

Connection the communication cable indoor units and outdoor unit to terminals F1 and F2. Refer to Figure 4.

**Figure 4. MCU wiring terminal connections**



Example 1                                                                 Example 2

L, N: Power
F1, F2: Communication
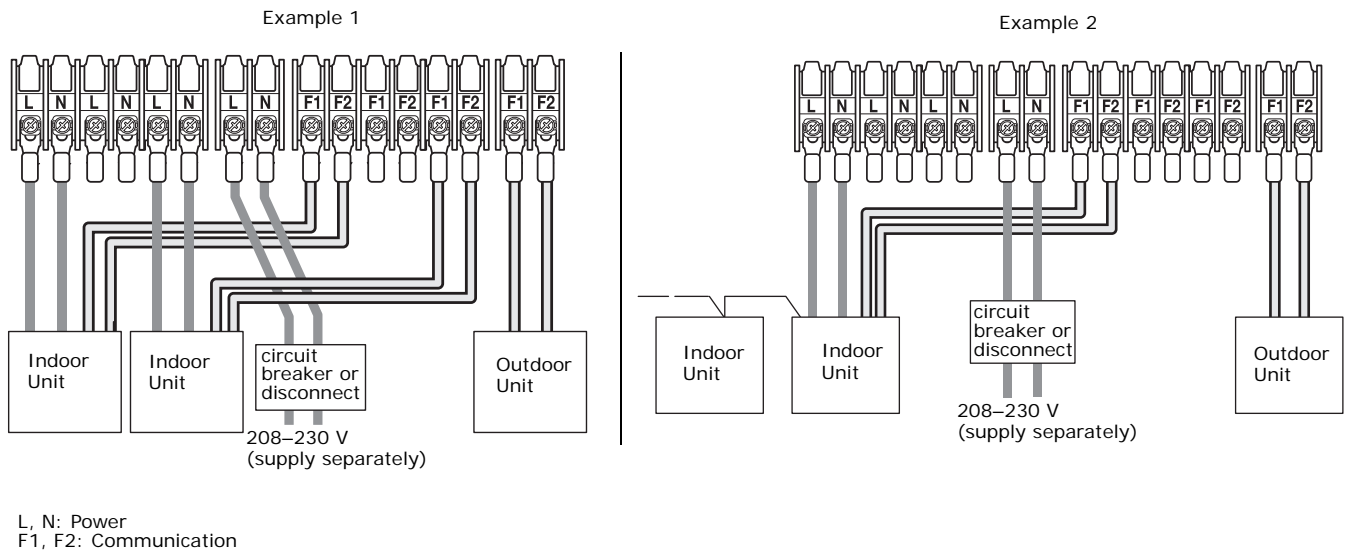
# Control System

Figure 5 shows the MCU circuit board with control components identified.

| ⚠ WARNING |
|---|
| **Hazardous Voltage!**<br>**Before making contact with the inverter circuit board, wait for at least 15 minutes after powering down the outdoor unit to allow the unit to fully discharge high DC voltage. Failure to allow the high DC voltage to discharge completely could result in death or serious injury.** |

**Figure 5.  MCU circuit board**
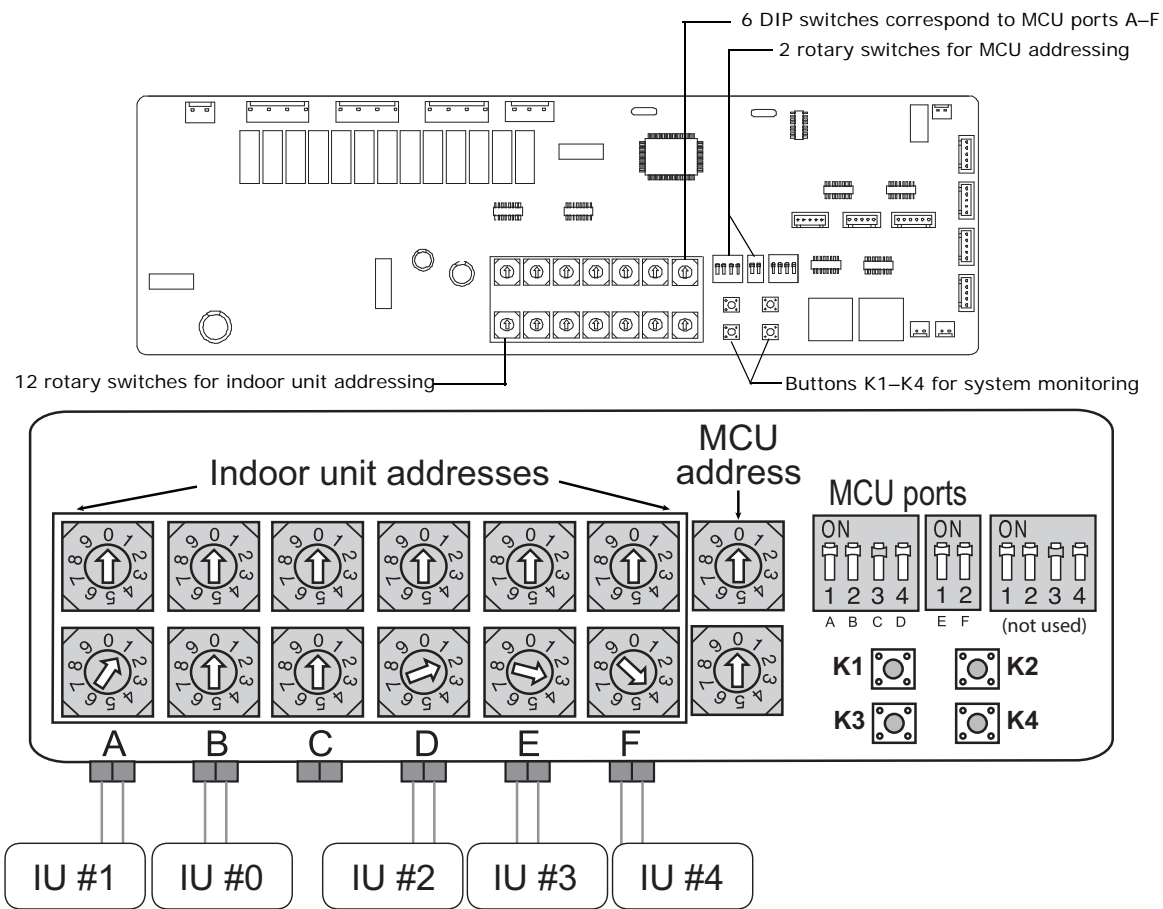
# MCU Port Settings

On the MCU control board, set DIP switches A–F for MCU ports (Figure 5) to **On/Off** to correspond to the MCU ports A–F **connected/not connected** to indoor units (see Figure 6 for port identification).

**Figure 6.   MCU ports identified**



**4MCUCUY6NCE000**

**4MCUCUY4NCE000
4MCUCUY2NCE000**

F
E
D
C
B
A

D
C
B
A
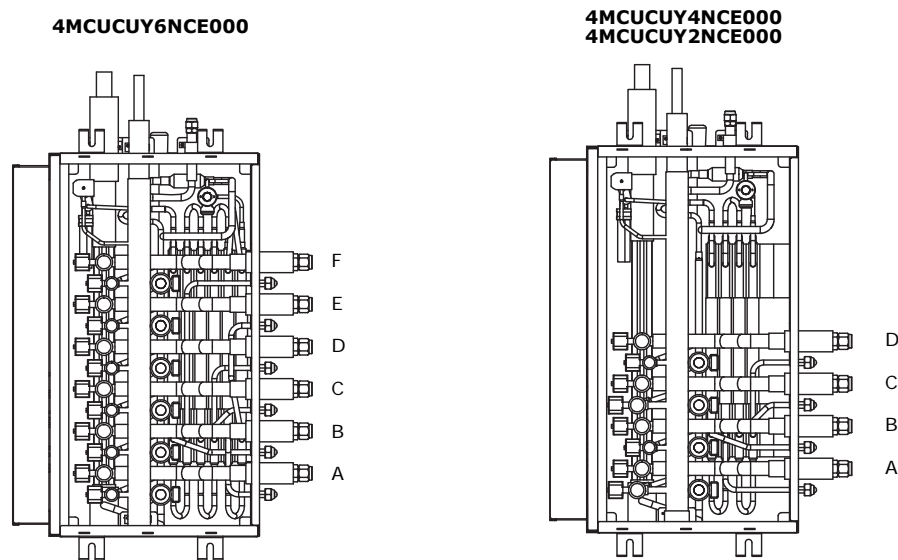
**Note:**  Ports A–F correspond to MCU port DIP switches A–F on the MCU control board.
Set DIP switch to **Off** if MCU port is not connected to an indoor unit.

If a Y-joint is used to connect two ports to a single indoor unit, set the two DIP switches corresponding to those ports to **On** (see Figure 7).

**Figure 7.   Example of DIP switch settings for an MCU connected to indoor units with Y-joints**



F
E
D
C
B
A

MCU control board

MCU ports  (not used)

ON   ON   ON
1 2 3 4   1 2   1 2 3 4
A B C D   E F
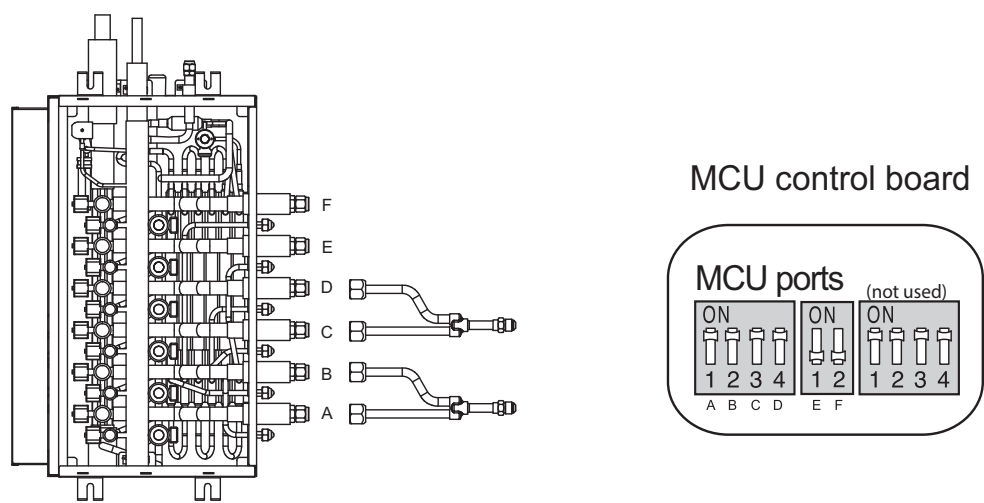
# Quantity Settings

On the outdoor unit control board, set SW51 and SW52 to the quantity of connected indoor units. Set SW57 to the quantity of connected MCUs (see Figure 8).

**Figure 8.  Outdoor unit control board:
Rotary switches for quantity of connected indoor units and MCUs**



# Address Settings

On the MCU control board (see Figure 9):

• Set each pair of indoor unit address rotary switches to match the address of the indoor unit connected to the correponding port (letters A–F on the MCU control board match ports A–F on the MCU).
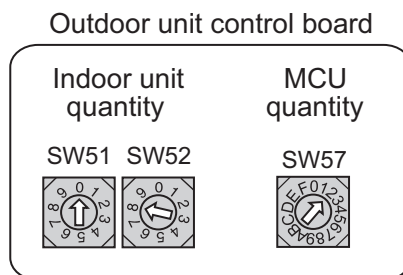
• Set the MCU address rotary switches to a unique address for each connected MCU.

**Figure 9.  MCU control board: Address rotary switches**
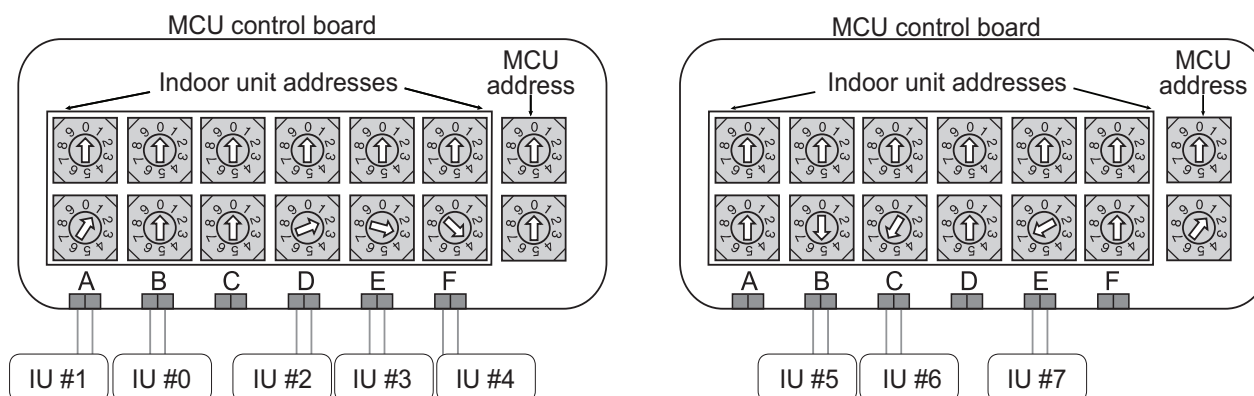


For an MCU connected to an indoor unit by Y-joint (36–48 MBH), two pairs of indoor unit rotary switches are used for setting the indoor unit address. Set each pair to the same address according to Y-joint port connections. For example, for the indoor unit connected by Y-joint to ports A and B (see Figure 10, p. 16), set pairs A and B on the MCU control board to the same address.

**Figure 10. Example of indoor unit addressing when Y-joints are used**
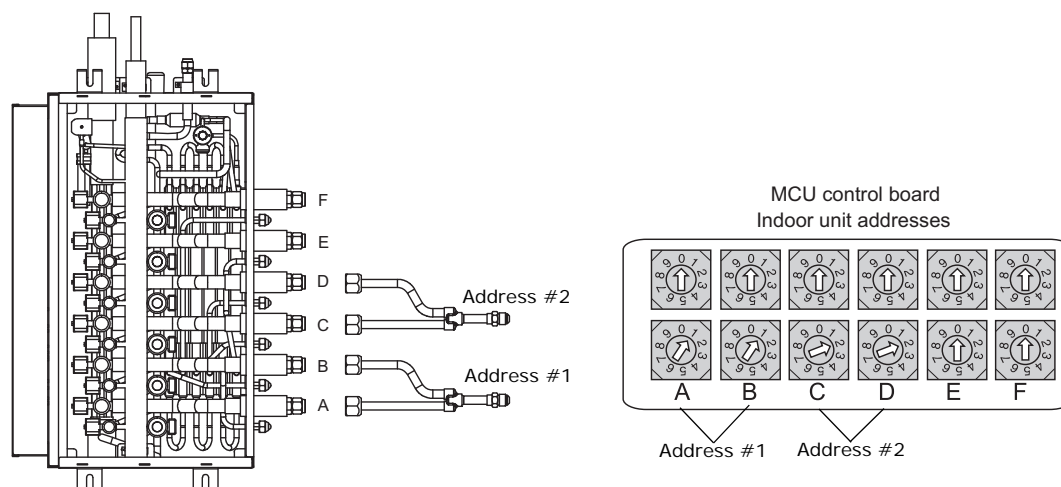


**Monitoring System Settings**

**Figure 11. MCU control board: Buttons K1, K2, K4**



Button K1 is used to monitor MCU status. Table 2 shows the settings that correspond to each K1 button press, and provides an example for each setting.

**Table 2. Button K1: MCU status**

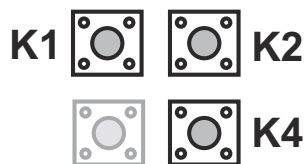| Number of times button K1 is pressed | Setting | 7-segment display examples | | | | Explanation |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | |
| 1 | MCU address | 0 | Blank | 0 | 0 | MCU address 0 |
| | | | Blank | 0 | 1 | MCU address 1 |
| | | | Blank | 0 | 2 | MCU address 2 |
| | | | Blank | 1 | 1 | MCU address 11 |
| | | | Blank | 1 | 5 | MCU address 15 |
| 2 | Mode switching EEV1 step | 1 | 4 | 8 | 0 | Example) 480 steps |
| 3 | Mode switching EEV2 step | 2 | 4 | 8 | 0 | Example) 480 steps |
| 4 | Mode switching EEV3 step | 3 | 4 | 8 | 0 | Example) 480 steps |
| 5 | Mode switching EEV4 step | 4 | 4 | 8 | 0 | Example) 480 steps |
| 6 | Mode switching EEV5 step | 5 | 4 | 8 | 0 | Example) 480 steps |
| 7 | Mode switching EEV6 step | 6 | 4 | 8 | 0 | Example) 480 steps |
| 8 | Subcooler EEV step | 7 | 4 | 8 | 0 | Example) 480 steps |
| 9 | Subcooler-in sensor temperature | 8 | — | 0 | 1 | Example) 30.2°F (-1°C) |
| | | | Blank | 1 | 0 | Example) 50.0°F (10°C) |

**Table 2.  Button K1: MCU status (continued)**

| Number of times button K1 is pressed | Setting | 7-segment display examples | | | | Explanation |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| 10 | Subcooler-out sensor temperature | 9 | — | 0 | 1 | Example) 30.2°F (-1°C) |
| | | | Blank | 1 | 0 | Example) 50.0°F (10°C) |
| 11 | On/Off for solenoid valve A_C[a], A_H[b] | A | — | Cool: On:1 Off:0 | Heat: On:1 Off:0 | — |
| 12 | On/Off for solenoid valve B_C, B_H | B | | | | |
| 13 | On/Off for solenoid valve C_C, C_H | C | | | | |
| 14 | On/Off for solenoid valve D_C, D_H | D | | | | |
| 15 | On/Off for solenoid valve E_C, E_H | E | | | | |
| 16 | On/Off for solenoid valve F_C, F_H | F | | | | |
| 17 | On/Off for liquid by pass solenoid valve | G | Blank | 0 | N | Example) On |
| | | | 0 | F | F | Example) Off |
| 18 | Version | 8 | A | 2 | 0 | Example) October 20, 2008 |
| 19 | End of K1 display | | | | | |

(a)  *_C: Cooling solenoid valve at port*. Applies to button K1 pressed 11–17 times.
(b)  *_H: Heating solenoid valve at port*. Applies to button K1 pressed 11–17 times.

Button K2 is used to display indoor unit addresses. Table 3 provides details and examples.

**Table 3.  Button K2: Indoor unit address**

| Number of times button K2 is pressed | Displayed setting | 7-segment display examples | | | | Explanation |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| 1 | Address of indoor unit connected to port A | A | - | 0 | 0 | Indoor unit address at port is "0" |
| 2 | Address of indoor unit connected to port B | B | - | 0 | 3 | Indoor unit address at port B is "3" |
| 3 | Address of indoor unit connected to port C | C | - | 0 | 6 | Indoor unit address at port C is "6" |
| 4 | Address of indoor unit connected to port D | D | - | 0 | 9 | Indoor unit address at port D is "9" |
| 5 | Address of indoor unit connected to port E | E | - | 1 | 1 | Indoor unit address at port E is "11" |
| 6 | Address of indoor unit connected to port F | F | - | 1 | 5 | Indoor unit address at port F is "15" |
| 7 | End of K2 display | | | | | |

Button K4 is used to manually test electronic solenoid valves. Refer to Table 4.

*Note:* *During the test, the valve operates according to the number of times K4 is pressed, irrespective of the indoor unit operating mode.*

**Table 4.    Button K4: Manual electronic solenoid valve test**

| Number of times button K4 is pressed | Setting | 7-segment display | | | |
|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** |
| 1 | A_C valve ON, other valves Off | P | A | 1 | 0 |
| 2 | A_H valve ON, other valves Off | P | A | 0 | 1 |
| 3 | B_C valve ON, other valves Off | P | B | 1 | 0 |
| 4 | B_H valve ON, other valves Off | P | B | 0 | 1 |
| 5 | C_C valve ON, other valves Off | p | C | 1 | 0 |
| 6 | C_H valve ON, other valves Off | P | C | 0 | 1 |
| 7 | D_C valve ON, other valves Off | P | D | 1 | 0 |
| 8 | D_H valve ON, other valves Off | P | D | 0 | 1 |
| 9 | E_C valve ON, other valves Off | P | E | 1 | 0 |
| 10 | E_H valve ON, other valves Off | P | E | 0 | 1 |
| 11 | F_C valve ON, other valves Off | P | F | 1 | 0 |
| 12 | F_H valve ON, other valves Off | P | F | 0 | 1 |
| 13 | Liquid b/p valve ON, other valves Off | P | S | 0 | 1 |
| 14 | Liquid b/p valve ON, other valves Off | P | Communication data display | | |
| **Note:** To return to normal operation, push button K1 once. | | | | | |

# Commissioning

After installing the MCU, check each item listed below to make sure it has been completed. Details about each item can be found in this manual or in the outdoor unit manual (VRF-SVN34).

| Item | Check |
|---|---|
| Leak test has been completed successfully. | |
| The MCU has been securely installed so that there is no danger of falling or of vibration. | |
| Pipes and pipe connections have been insulated properly. | |
| Refrigerant R-410A has been charged. | |
| Electrical wiring: Ensure that prescribed wiring has been used and supplied power per local codes. | |
| Power and communication wiring function properly. | |
| MCU has been installed correctly (right side up). | |
| Electrical grounding has been properly installed per local code. | |
| Clearances between walls, ceiling concrete, and ceiling panels have been complied with. | |
| Hangers support piping at intervals of 4.92 ft (1.5 m). | |
| Additional refrigerant has been correctly calculated and charged. | |

# Warranty for VRF Systems and Related Accessories

**Products Covered.** This warranty is extended by Trane U.S., Inc. ("Company") and applies to all VRF systems and accessories for these products which are sold by the Company and applied in accordance with Company specifications.

## Basic Warranty

The warrantor warrants for a period of 12 months from the initial start-up or 18 months from date of shipment, whichever is less, against failure due to defects in material and manufacture and that it has the capacities and ratings set forth in Company's catalogs and bulletins ("Warranty").

If the following conditions are met, the warrantor extends this basic warranty period to five (5) years from date of start-up:

• The system is designed using an approved application tool (VRF Select).
• The system is installed by a contractor who has successfully completed a Company factory training course.
• A verified commissioning report from the Company VRF Commissioning Tool is submitted.

## Exclusions and Limitations

Exclusions from this Warranty include damage or failure arising from: wear and tear; corrosion, erosion, deterioration; modifications made by others to the Equipment; repairs or alterations by a party other than Company that adversely affects the stability or reliability of the Equipment; vandalism; neglect; accident; adverse weather or environmental conditions; abuse or improper use; improper installation; commissioning by a party other than Company; unusual physical or electrical or mechanical stress; operation with any accessory, equipment or part not specifically approved by Company; refrigerant not supplied by Company; and/or lack of proper maintenance as recommended by Company. Company shall not be obligated to pay for the cost of lost refrigerant or lost product. Company's obligations and liabilities under this Warranty are limited to furnishing replacement equipment or parts, at its option, FCA (Incoterms 2000) factory or warehouse (f.o.b. factory or warehouse for US domestic purposes) at Company-designated shipping point, freight-allowed to Company's warranty agent's stock location, for all non-conforming Company-manufactured Equipment (which have been returned by Customer to Company. Returns must have prior written approval by Company and are subject to restocking charge where applicable. Equipment, material and/or parts that are not manufactured by Company are not warranted by Company and have such warranties as may be extended by the respective manufacturer. **COMPANY MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, REGARDING PREVENTION OF MOLD/MOULD, FUNGUS, BACTERIA, MICROBIAL GROWTH, OR ANY OTHER CONTAMINATES.** No warranty liability whatsoever shall attach to Company until Customer's complete order has been paid for in full and Company's liability under this Warranty shall be limited to the purchase price of the Equipment shown to be defective. EXCEPT FOR COMPANY'S WARRANTY EXPRESSLY SET FORTH HEREIN, COMPANY DOES NOT MAKE, AND HEREBY EXPRESSLY DISCLAIMS, ANY WARRANTIES, EXPRESS OR IMPLIED CONCERNING ITS PRODUCTS, EQUIPMENT OR SERVICES, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF DESIGN, MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR OTHERS THAT ARE ALLEGED TO ARISE FROM COURSE OF DEALING OR TRADE.

Additional warranty protection is available on an extra-cost basis and must be in writing and agreed to by an authorized signatory of the Company. Additional terms and conditions of warranty coverage are applicable for refrigeration equipment. If you wish further help or information concerning this warranty, contact: Trane—Warrantor, 2701 Wilma Rudolph Blvd., Clarksville, TN 37040.

The manufacturer optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, the manufacturer offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.IRCO.com.

The manufacturer has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

We are committed to using environmentally conscious print practices that reduce waste.

**Ingersoll Rand**