Installation Guide

Variable Refrigerant Flow (VRF) System

Wired Remote Controller

Model Numbers: TVCTRLTWRWD02T
TVCTRLTWRWD02A

⚠ 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.

March 2017 **VRF-SVN59C-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 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.

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.**

Revision History

Revision C: Updated installation option codes; updated error code information; made minor graphics revisions.

Table of Contents

Pre-installation

Table 1. Components

Wired remote controller	Cable ties (2)	Cable clamps (3)	M4X16 screws (5)	User manual (1)	Installation manual (1)	U terminals (6)
						

Figure 1. Dimensions

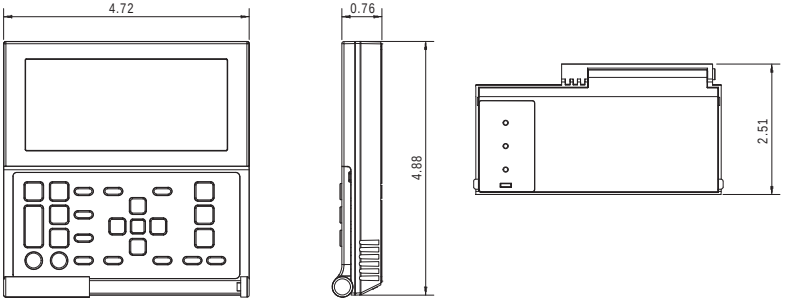
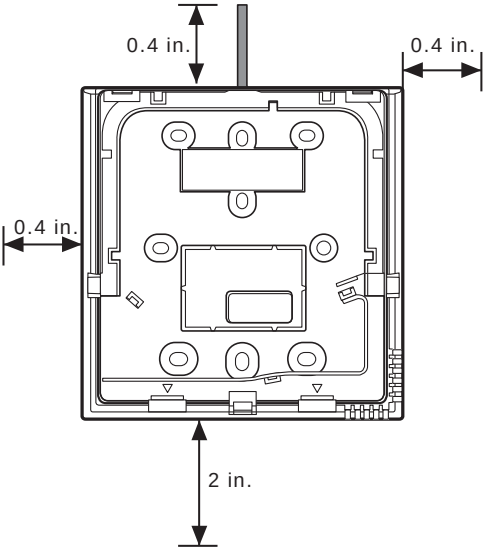
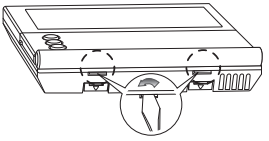


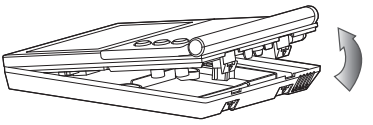
Figure 2. Clearances



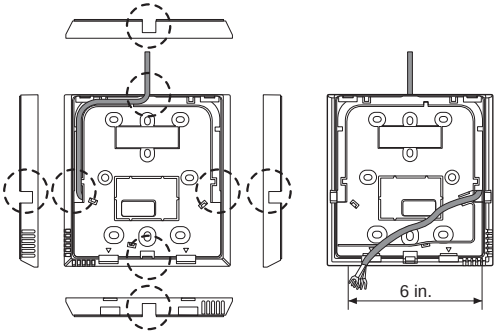
Mounting the Unit

1. Insert a flat head screwdriver into the square groove at the center top of the wired remote controller. Pull up the front cover to separate it from the back cover.

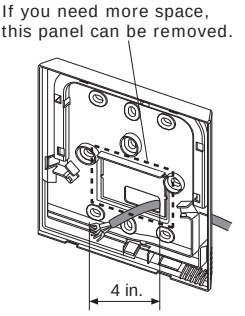




2. Arrange the power cable and the communication cable so that they fit in the housing along the edges of the back cover.

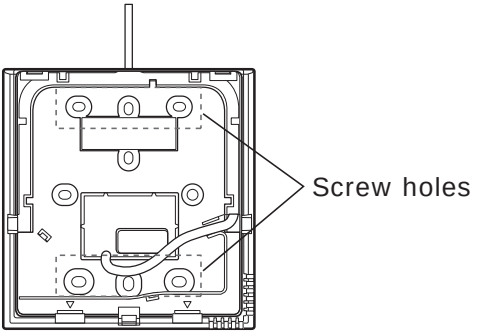


Example with concealed cable



Example with unconcealed cable

3. Firmly secure the back cover of the remote controller to the wall using the three provided screws.



Wiring

Observe the following requirements and precautions when making electrical connections.

⚠ WARNING

Hazardous Voltage!

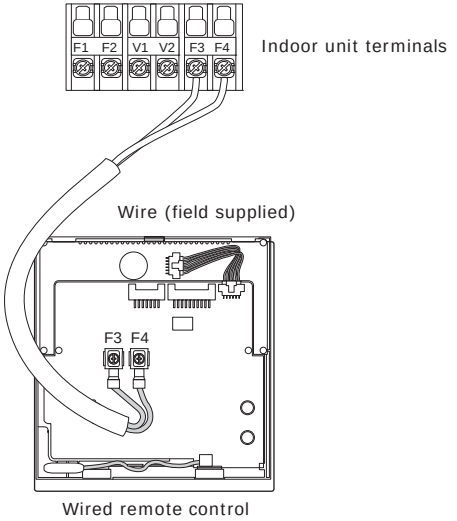
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

- *Make all electrical connections in accordance with electrical codes and ordinances.*
- *If you install the wired remote controller with thermostat wire, remove 12 in. of the cable sheath and install only two of the conductors. The recommended wire size is AWG 18.*
- *Use either the provided U-terminals or U-terminals that match the specifications of those provided.*
- *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.*

Connecting Communication Wiring

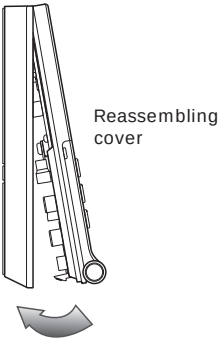
Connect communication wiring to the wired remote controller at terminals F3,F4 and to the indoor unit at terminals F3,F4.

Best Practice: *Maintain consistent polarity with wiring connections (F3 to F3, F4 to F4) to minimize troubleshooting time.*



Reassembling the Device

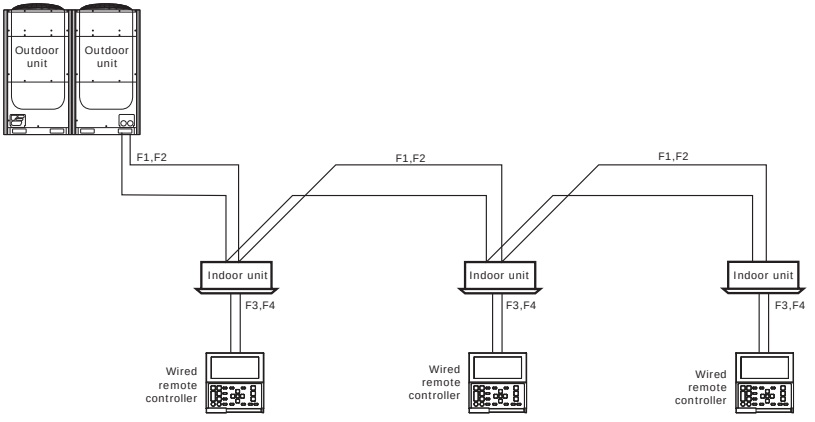
Reassemble the wired remote controller by aligning the front cover with the top of the back cover and then tilting it downward, as show in the figure to the left. After replacing the cover, confirm that no wires are stuck in the gap between the front and back covers.



Wiring for Individual Control

Individual control refers to the use of one wired remote controller for controlling one indoor unit, as shown in Figure 3.

Figure 3. Individual control example



Wiring for Group Control

Group control refers to the use of one wired remote controller to control multiple indoor units.

- *A maximum of 16 indoor units can be controlled as a group.*
- *All indoor units in the group must be connected to a wired remote controller.*

Examples of two different scenarios are shown in Figure 4 and Figure 5.

Figure 4. Group control with multiple indoor units connected to one outdoor unit

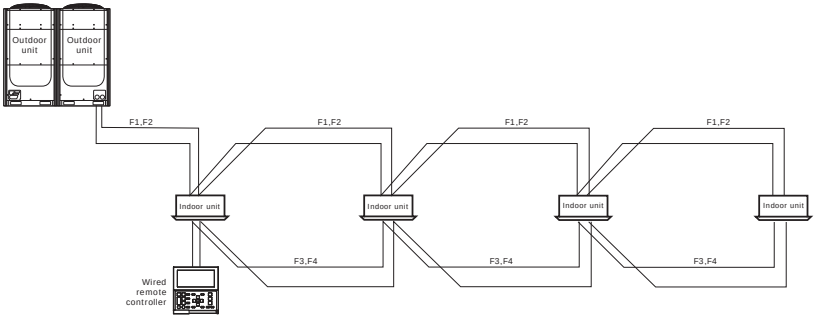
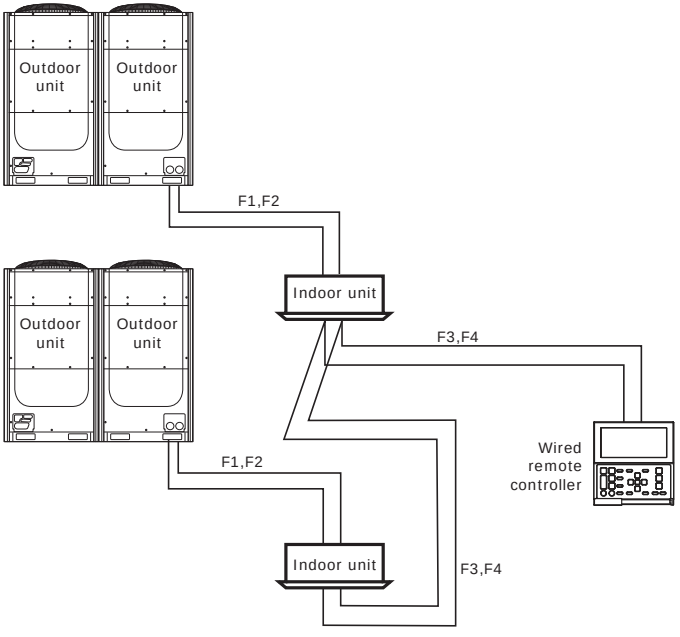


Figure 5. Group control with multiple indoor units connected to different outdoor units

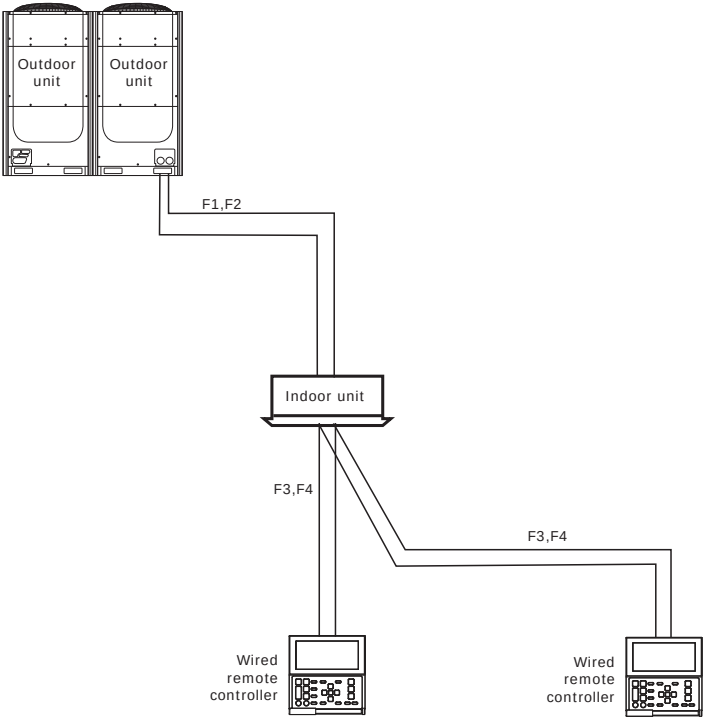


Using Two Wired Remote Controllers for Individual or Group Control

Two wired remote controllers can control one indoor unit or a group of indoor units.

In this application, one wired remote controller must be configured as a master and one wired remote controller must be configured as a slave. (Refer to the Configuration section in the indoor unit manual.)

Figure 6. Two wired remote controllers used for individual or group control



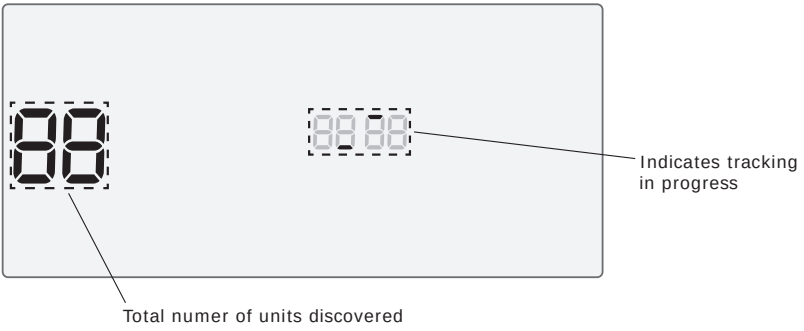
Indoor Unit Tracking

The VRF system uses the term “tracking” for the process of indoor unit discovery and addressing. During tracking, the wired remote controller display flashes to indicate that tracking is in progress. As units are discovered, the display shows the quantity on the left side (see Figure 7).

Note: *If a system has master and slave wired remote controllers, only the master displays the total quantity of discovered units.*

- *When power is applied to a newly installed wired remote controller, the device automatically begins tracking.*
- *To repeat tracking at any time, press the* **Delete** *and* **ESC** *buttons simultaneously for at least 5 seconds.*
- *If the number of connected indoor units is increased or decreased after installation, repeat the tracking process.*

Figure 7. Indoor unit tracking in progress



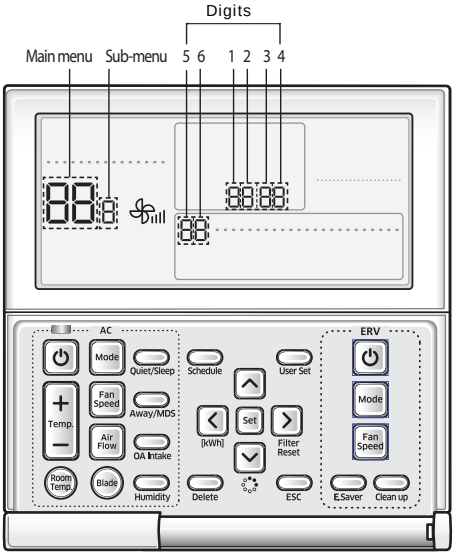
Configuration

To configure or verify installation option settings on a wired remote controller, use the following procedure. Refer to Table 2 for installation option descriptions and corresponding menu codes.

- *If the unit does not support the function,* **NONE** *will be displayed.*
- *In configuration mode, temperature values appear in Celsius.*

1. Press the **Delete** and **Set** buttons simultaneously for > 3 seconds. The main menu will flash "1".

Figure 8. Wired remote controller LCD display



2. Using the up/down arrow buttons, select the appropriate main menu code by referring to Table 2. Press the right arrow button to display the sub-menu.
3. Using the up/down arrow buttons, select the appropriate sub-menu code by referring to Table 2. Press the right arrow button to display the current setting, which represents an installation option.
4. To change the digit 1 option setting, use the up/down arrow buttons. Press the right arrow button to move to digit 2. To change the digit 2 option setting, use the up/down arrow buttons. Repeat this procedure for digits 3–6.
5. To save settings and exit to the sub-menu, press the **Set** button.

Note: *To exit to normal mode without saving settings, press the* ***ESC*** *button.*

Table 2. Installation option settings/values

Main menu code	Sub-menu code	Option description		Digit	Factory default settings	Set digit to...
1	1	Wired remote controller option settings (1)	Cooling/ Heating selection	1	0	0: Cooling/Heating 1: Cooling only
			Use of wireless remote control	2	1	0: Not used, 1: Use
			Master/slave wired remote controller	3	0	0: Master, 1: Slave
			Temperature unit	4	0	0: Celsius (°C), 1: Fahrenheit (°F)
	2	Wired remote controller option settings (2)	Temperature sensor selection	1	0	0: Indoor unit 1: Wired remote controller
			Use of average temperature	2	0	0: Not used, 1: Use
			Use of Auto mode	3	1	0: Not used, 1: Use
			Temperature display	4	0	0: Set temperature 1: Room temperature
			N/A	5	0	Factory set to 0.
	3	Blade setting/checking	Blade 1	1	0	0: Unlock, 1: Lock
			Blade 2	2	0	0: Unlock, 1: Lock
			Blade 3	3	0	0: Unlock, 1: Lock
			Blade 4	4	0	0: Unlock, 1: Lock
	4	N/A			0	Factory set to 0.
	5	Room temperature compensation	Temperature control reference	1,2,3	0	-9–40°C (16–104°F)
			Temperature compensation value	4,5,6	0	-9.9–9.9°C ***Note:*** Increments of 0.1°C.
	6	Number of connected units	Number of indoor units	1,2	—	0 – 16
			Not used	3,4	—	—
	7	Desired temperature increment/ decrement (°C)		1	0	0: 1°C, 1: 0.5°C, 2: 0.1°C
	8	N/A			0	Factory set to 0.
	0	Factory defaults settings ***Note:*** This setting determines what occurs when a system reset is activated.		1	0	0: Reset has no effect on settings 1: Reset changes settings to factory defaults
2	1	Software code		1–6	—	Software code
	2	Software version		1–6	—	Software version

Table 2. Installation option settings/values (continued)

Main menu code	Sub-menu code	Option description		Digit	Factory default settings	Set digit to...
3	1	Indoor unit room temperature		1,2,3	—	Room temperature (°C)
	2	Indoor unit EVAP IN temperature		1,2,3	—	EVAP IN temperature (°C)
	3	Indoor unit EVAP OUT temperature		1,2,3	—	EVAP OUT temperature (°C)
	4	Indoor unit EEV step		1,2,3	—	EEV step
	5	Indoor unit option checking (1)	Use of central control	1	—	0: Not used 1: Use
			Use of drain pump	2	—	0: Not used 1: Use
			Use of electric heater	3	—	0: Not used 1: Use
			Use of hot water coil	4	—	0: Not used 1: Use
	6	Indoor unit option checking (2)	Use of external control	1	—	0: Not used 1: Use
			Use of RPM compensation	2	—	0: Not used 1: Use
			Filter time	3	—	0: 2000 hours 1: 1000 hours
			Heating temperature compensation	4	—	0–2°C 1–5°C
			EEV stop step in heating	5	—	0: 0/80 steps 1: 80 steps
4	1	Indoor unit main address checking		1,2	—	Main address (00–3F, hexadecimal)
		Indoor unit main address setting Setting this option requires outdoor unit reset.		3,4	—	Main address (00–3F, hexadecimal)
		Indoor unit RMC address setting		5,6	—	RMC address (00–FE, hexadecimal)
	2	Indoor unit option setting/checking		1–24 (See note.)	—	Indoor unit option setting
	3	Indoor unit option (1) setting/checking			—	Refer to the “Configuration” section in the indoor unit installation manual for a complete list of installation option settings and codes.
	4	Indoor unit option (2) setting/checking			—	
	7	MCU/Port address setting		1,2,4	—	MCU address (00 to 15) Port address (A to F)

Table 2. Installation option settings/values (continued)

Main menu code	Sub-menu code	Option description		Digit	Factory default settings	Set digit to...
5	1	Not available.			Factory set to 0.	
	2	AHU discharge air temperature setting	Use of discharge air temperature control	1	—	0: Not used 1: Use
			Cooling discharge air temperature	3,4	—	8–18°C (46–64°F) ***Note:*** Increments of 1°C.
			Heating discharge air temperature	5,6	—	30–43°C (86–109°F) ***Note:*** Increments of 1°C.
	3	Fresh duct discharge air temperature checking	Cooling discharge air temperature	1,2	—	15–25°C (59–77°F) ***Note:*** Increments of 1°C.
			Heating discharge air temperature	3,4	—	18–30°C (64–86°F) ***Note:*** Increments of 1°C.
6	N/A				0	Factory set to 0.
7	1	View master setting/checking (F3,F4 line indoor unit master)		123 456	—	Address
	2	N/A			0	Factory set to 0.
	3	Mode master setting/checking (F1,F2 line indoor unit master)	Checking	123 456	—	Address
	4		Setting	1		0: Not used 1: Use 2: Release
0	1	Reset	Factory setting	1	0	0: Not used 1: Reset
	2		Power master reset	1	0	
	3		Addressing reset	1	0	

Note: *There are 24 available digits. The wired remote controller can display only 6 digits at a time. The digits are displayed in 4 groups. Installation option setting codes are displayed with the first digit of the group a constant value—either 0, 1, 2, or 3—as shown in the table below. This value indicates the group that the digits currently being displayed belong to.*

Digit 1	Digit 2	Digit 3	Digit 4	Digit 5	Digit 6
0	*	*	*	*	*
Digit 7	**Digit 8**	**Digit 9**	**Digit 10**	**Digit 11**	**Digit 12**
1	*	*	*	*	*
Digit 13	**Digit 14**	**Digit 15**	**Digit 16**	**Digit 17**	**Digit 18**
2	*	*	*	*	*
Digit 19	**Digit 20**	**Digit 21**	**Digit 22**	**Digit 23**	**Digit 24**
3	*	*	*	*	*

Errors Codes

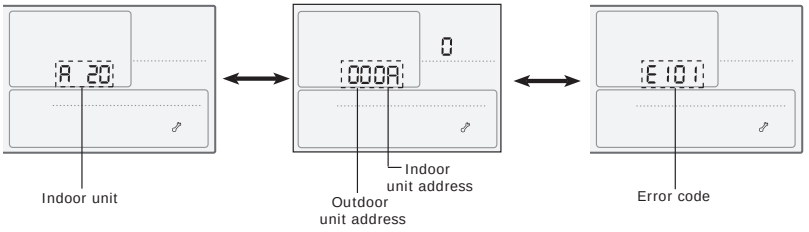
If an error code is generated, the error code appears on the display of the controller.

Note: *For an explanation of error codes, refer to the Technician Utilities Tool (TUT) or the VRF service manual (VRF-SVM046*).*

Indoor/Outdoor Unit Error

The address of the indoor or outdoor unit with the error alternates with the error code on the display. In the example in Figure 9, indoor unit #10, which is connected to outdoor unit #00, has generated error code E101.

Figure 9. Error code example



Note: *Addressing uses hexadecimal numbering:*

Number	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Corresponding hexadecimal address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

Wired Remote Controller Error

If the wired remote controller has an error, only the error code is displayed, as shown in Figure 10.

Figure 10. Example: Error at wired remote controller

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Supersedes VRF-SVN59B-EN (01 Aug 2014)

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