



Installation Instructions

Tracer™ VV551 VAV Controller

Ship-loose Components

The Tracer VV551 variable air volume (VAV) controller is a field-installed controller for single -duct VAV boxes used in the following applications:

- Space temperature control
- Flow tracking
- Ventilation flow control

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.

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Cautions, Warnings and Notices

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 may also be used to alert against unsafe practices.

NOTICE

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

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Controller Shipment

Note: Visually inspect all parts for obvious defects or damage. All components have been thoroughly inspected before leaving the factory. Any claims for damage incurred during shipment should be filed immediately with the carrier.

Shipment includes one each of:

- VV551 printed circuit board
- Airflow transducer
- Damper control actuator (*optional*)
- Actuator cable

Storage and Operating Specifications

Storage	
Temperature:	-40°F to 185°F (-40°C to 85°C)
Humidity:	Between 5% to 95% (<i>noncondensing</i>)
Operating	
Temperature:	32°F to 140°F (0°C to 60°C)
Humidity:	Between 5% to 95% (<i>noncondensing</i>)
Power:	21-27 Vac, (24 Vac nominal), 50–60 Hz, maximum of 70 VA per controller (<i>which includes output devices</i>)
Mounting weight without customer-supplied control box:	• .63 lbs. (.29 kg.) without actuator • 1.34 lbs. (.61 kg.) with Belimo actuator • 1.88 lbs. (.85 kg.) with Trane actuator

Locating Recommendations

Mount the VV551 controller on the side of the VAV box in a customer-supplied control box (refer to [Figure 1](#)).

Note: The following image is intended as an example and does not reflect an actual customer-supplied control box.

Place it over the damper shaft and secure it to the VAV box.

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Figure 1. Example of a customer-supplied control box



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WARNING

Hazardous voltage!

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

CAUTION

Injury and Equipment Damage

Ensure t hat the 24 Vac transformer is properly grounded. Failure to do so may result in personal injury and/or damage to equipment.

Complete input/output wiring before applying power to the controller. Failure to do so may cause damage to the controller or power transformer due to inadvertent connections to power circuits. Do not share 24 Vac between controllers. Failure to do so may cause controller damage.

Wiring AC Power to the Controller

To connect AC power to the controller:

- Perform wiring as shown in [Figure 2](#).

Wiring the Actuator (Locally Supplied)

To wire the actuator:

1. Locate the supplied actuator cable.
2. Plug in the cable to the actuator 6-pin connector (J1) as shown in [Figure 2](#).

Note: Match receptacle 6 on the cable connector with pin 1 on the board actuator J1 connector.

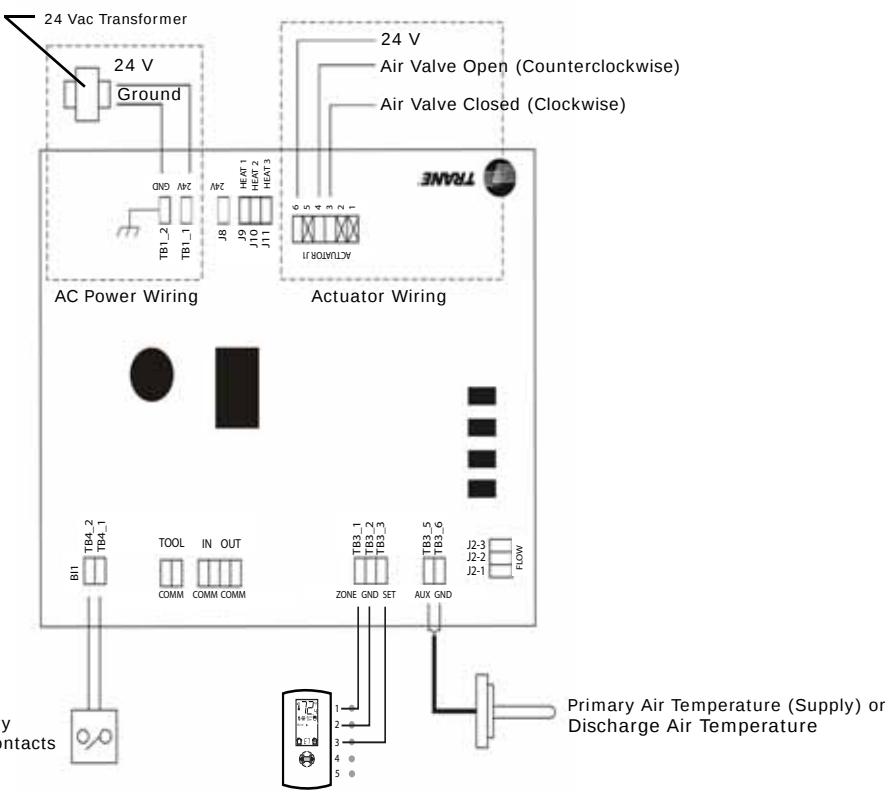
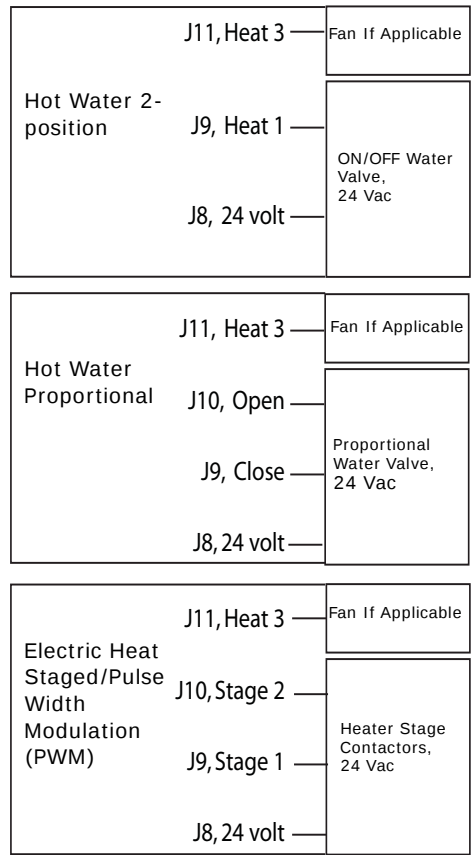
3. Attach the connectors on the actuator cable to the actuator as shown.

Note: The controller operates with floating (tri-state) control. If necessary, the connectors that are attached to the actuator cable leads can be cut off to enable direct connection to the locally supplied actuator wire leads.

Note: Refer to [Figure 2](#). for wiring hot water and electric heat.

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Figure 2. VV551 wiring diagram



Note: Heat 3 represents fans in series or parallel fan powered VAV boxes or Stage 3 local or remote heat in no fan situations.

Wiring Communication Link

The Tracer VV551 VAV controller communicates with the building automation system and with other controllers over a LonTalk® communication link. Comm5 is the Trane implementation of LonTalk® protocol. For instructions on LonTalk® communication wiring, refer to the *Tracer Summit™ V17 Daily Operations Guide*, BMTX-SVU01 or to the installation manual for the applicable building automation system.

Input/Output Terminal Wiring

The input/output wiring terminals for the VV551 controller are a combination of fixed function and application-specific connections. All input/output terminal wiring for the VV551 controller must meet the following requirements:

- All wiring must be in accordance with the National Electrical Code™ (NEC) and local codes
- Use only 18–22 AWG, stranded, tinned-copper, unshielded, twisted-pair wire
- Binary input and output wiring should be a maximum length of 300 ft (100 m)
- Analog input and output wiring should be a maximum length of 300 ft (100 m)
- Do not run input/output wires in the same wire bundle with any A/C power wires
- A pressure sensor can be connected with up to 300 feet of tubing and up to 60 feet of wire

The following tables describe input/output terminals, ratings, and the heat/fan output configurations by application.

Table 1. Inputs and output terminals

Analog Inputs			
Input Description	Terminal	Label	Rating
Space temperature	• TB3_1 • TB3_2	ZONE	10,000 Ω at 77°F (25°C)
Space setpoint	• TB3_2 • TB3_3	SET	1,000 Ω potentiometer
Primary/discharge air temperature	• TB3_5 • TB3_6	AUX	10,000 Ω at 77°F (25°C)
Primary flow	• J2-1 GND • J2-2 signal • J2-3 VDC	FLOW	NA
Binary Input			
input Description	Terminal	Label	Rating
Occupancy/generic	• TB4_1 • TB4_2	BI 1	Powered contact Apply dry contact only 0 Vac = Open 24 Vac = Closed
Binary Outputs			
Binary input	Terminal	Label	Rating
Heat 1	J9	HEAT 1	Triac, 24 Vac, maximum output 12 VA
Heat 2	J10	HEAT 2	Triac, 24 Vac, maximum output 12 VA
Heat 3/fan	J11	HEAT 3	Triac, 24 Vac, maximum output 12 VA
Air valve close	J1-3	ACTUATOR	Triac, 24 Vac, maximum output 12 VA
Air valve open	J1-4	ACTUATOR	Triac, 24 Vac, maximum output 12 VA

Table 2. Heat/fan output configurations by application

				Heat 1	Heat 2	Heat 3	
						No Fan	Series or Parallel
No Reheat				None	None	None	Fan
Hot Water	2-Position	1 Stage Local Reheat		Local Hot Water ON/OFF	None	None	Fan
		1 Stage Remote Heat		Remote Hot Water ON/OFF	None	None	Fan
		2 Stages		Local Hot Water ON/OFF	Remote Hot Water ON/OFF	None	Fan
	Modulating	Local Reheat		Local Hot Water Closed	Local Hot Water Open	None	Fan
		Remote Reheat		Remote Hot Water Closed	Remote Hot Water Open	None	Fan
	Both	Local Reheat		Remote Hot Water Closed	Remote Hot Water Open	Local Hot Water ON/OFF	Fan ^(a)
		Remote Reheat		Local Hot Water Closed	Local Hot Water Open	Local Hot Water ON/OFF	Fan ^(a)
Electric Heat	Local Reheat	PWM	1 Stage	Local PWM Electric Heat Stage 1	None	None	Fan
			2 Stages	Local PWM Electric Heat Stage 1	Local PWM Electric Heat Stage 2	None	Fan
			3 Stages	Local PWM Electric Heat Stage 1	Local PWM Electric Heat Stage 2	Local PWM Electric Heat Stage 3	Fan ^(a)
		Staged	1 Stage	Local Staged Electric Heat 1	None	None	Fan
			2 Stages	Local Staged Electric Heat 1	Local Staged Electric Heat 2	None	Fan
			3 Stages	Local Staged Electric Heat 1	Local Staged Electric Heat 2	Local Staged Electric Heat 3	Fan ^(a)
	Remote Heat			Remote Electric Heat Stage 1	None	None	Fan
	Both	PWM	1 Stage	Local PWM Electric Heat Stage 1	Remote Electric Heat Stage 2	None	Fan
			2 Stages	Local PWM Electric Heat Stage 1	Local PWM Electric Heat Stage 2	Remote Electric Heat Stage 3	Fan ^(a)
		Staged	1 Stage	Local Staged Electric Heat 1	Remote Electric Heat Stage 2	None	Fan
			2 Stages	Local Staged Electric Heat 1	Local Staged Electric Heat 2	Remote Electric Heat Stage 3	Fan ^(a)

(a) When the controller is configured with either a series or parallel fan, Heat 3 is used to control the fan and not the third stage of heat.

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