



TRANE®

Installation

Unit Control Module (UCM) 4.2 Retrofit Model VAV

Models

"A" and later Design Sequence

VAV

July 2005

VAV-IN-24



Notice

NOTICE:

Warnings and Cautions appear at appropriate sections throughout this manual. 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.

CAUTION – Indicates a situation that may result in equipment or property-damage-only accidents.

General

The purpose of this installation manual is to provide application, functional and calibration information for the Trane Retrofit package. Examples and charts are provided to enhance the understanding of this information.

Introduction

The DDC/VAV retrofit kit consists of the UCM control assembly, a Honeywell™ or Belimo™ actuator (both optional), and various accessories such as zone sensors, transformers, flow sensors, etc. This manual is intended to show how to apply, install and configure the DDC/VAV Retrofit kit. It is intended to provide information specific to the VAV retrofit. Refer to VAV-SVX01C-EN for complete DDC/VAV system wiring, installation and programming instructions.

Applications

The retrofit kit may be applied to pneumatic terminals by replacing the pneumatic actuator with an electric actuator or electrically controlled terminals by either using the existing electric actuator or by replacing it with one provided by Trane.

The kit may be used on existing shutoff, shutoff hot water reheat, shutoff with up to three stages of electric heat, and fan powered (both parallel and series) cooling only, hot water, and electric reheat units.

Note: Fan powered units have only two stages of reheat available.

Dual duct units may also be retrofitted using two sets of controllers. The kit has also been applied to constant volume reheat systems where the retrofit kit is used to control duct coils.

The kit has been tested on VAV terminals of several major manufacturers. It is mandatory for unit to have an external shaft to function properly with the direct coupled actuators offered.

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Hardware

UCM 4.2 Retrofit Kit

The UCM 4.2 retrofit kit is available in three basic kits.

- Retrofit Kit with a Honeywell actuator
- Retrofit Kit with a Belimo actuator
- Retrofit Kit with no actuator

The kit may also be ordered in a pressure dependent version on a special basis. Both the Belimo and Honeywell actuators are direct coupled actuators.

Honeywell Actuator

Key benefits and features of the Honeywell actuator are:

- Selectable 45°, 60°, and 90° angles of rotation
- 35-inch-pound torque capacity
- 3/8-inch to 1/2-inch shaft size capability
- 90-second drive time over 90° rotation
- Magnetic coupled motor provides 45-inch-pounds stall
- 2 VA at 24-volts power consumption
- Manual clutch to disengage the actuator from the motor

Belimo Actuator

The Belimo actuator's principle benefit is flexibility. Belimo is designed with the following features:

- Direct coupled with universal clamp fitting shaft sizes, 3/8-inch to 1/2-inch shaft size.
- Manual clutch to disengage the actuator from the motor
- Motor reversing switch to change rotation
- Adjustable mechanical stops
- 35-inch-pounds torque capacity
- 3 VA at 24-volts power consumption
- 95-second run time

Control Assembly

The actual control assembly consists of UCM and Delta P transducer mounted in a sheet metal enclosure. The accessories offered with the kit are zone sensors with the same options as Trane DDC/VAV: flow bars for use with units without a flow sensor and control power transformers.

Installation

⚠ WARNING

Hazardous Service Procedures!

The maintenance and Trouble Shooting procedures recommended in this section of the manual could result in exposure to electrical, mechanical or other potential safety hazards. Always refer to the safety warnings provided throughout this manual concerning these procedures. When possible, disconnect all electrical power including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks. Failure to follow all of the recommended safety warnings provided, could result in death or serious injury.

⚠ WARNING

Hazardous Voltage!

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 can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Pre-Installation

The existing unit controls will require removal prior to installing the UCM 4.2 retrofit kit. This includes pneumatic actuators, volume regulators and any miscellaneous auxiliary controls.

The communications power and zone sensor wiring should be pulled to the unit. The wiring procedures and guidelines used are outlined in the VAV-SVX01C-EN manual.

CAUTION

Local and N.A.C. electrical codes should be observed when installing the UCM 4.2 retrofit kit.

Control Box Mounting

The next phase is to begin the installation of the kit. The controller should be mounted at any convenient location on the existing unit. Keep in mind the controller must be mounted in a vertical plane to the flow transducer will function properly. In a typical installation, the controller is mounted on one side of the unit, and the actuator on the other side due to space limitations. However, Trane's controller may be mounted on the ductwork adjacent to the terminal unit. The only requirement is the flow sensor tubing cannot exceed 10-feet.

Actuator Installation

When installing the actuator, the convention of the damper rotation is assumed as:

- Clockwise rotation of the damper shaft will close the damper.
- Counterclockwise rotation of the damper shaft will open the damper

All of the wiring diagrams assume this convention, Figure 1.

⚠ WARNING

Hazardous Voltage!

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Actuator Installation

To install the actuator, slip the actuator over the shaft of the damper and use a sheet metal screw to secure the actuator to the base of the terminal unit. Rotate both the actuator and damper shaft fully clockwise and ensure that the damper is fully closed. When the damper is fully closed, tighten the set screws of the actuator onto the damper shaft.

When following the clockwise-closed convention, wiring terminations for the actuator are shown in Table 1.

Table 1:

UCM 4.2	Actuator	Color Code	Function
TB4-1	COM	White	Hot
TB4-2	CCW	Black	Open
TB4-3	CW	Red	Closed

The actuator is now configured for clockwise operation (with the actuator closing the damper). If the damper is a 90° rotating damper, the actuator will close the damper.

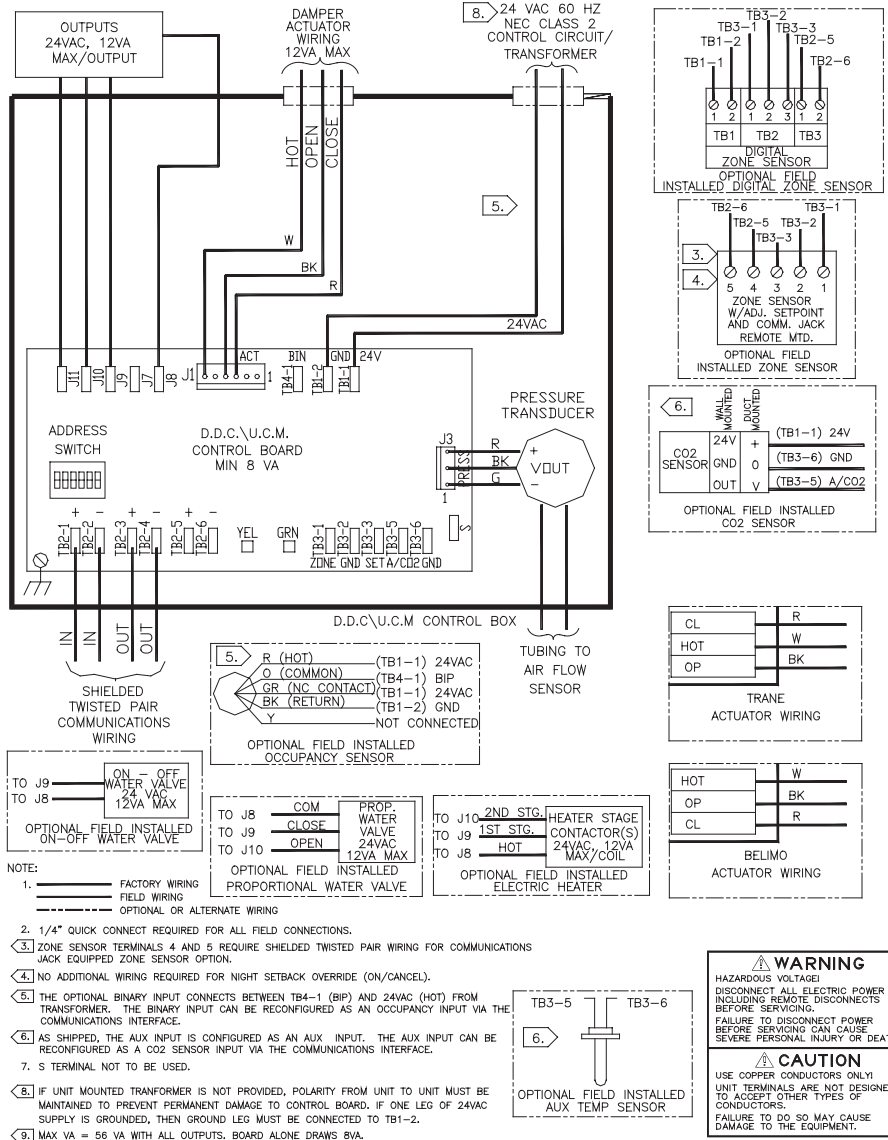
Note: If the damper angle of rotation is counterclockwise to close, follow the above procedure except reverse the open and closed wires at the actuator terminal block.

Commissioning

Commissioning

For commissioning and configuration, contact the local Trane service technician, or refer to VAV-SVX01C-EN.

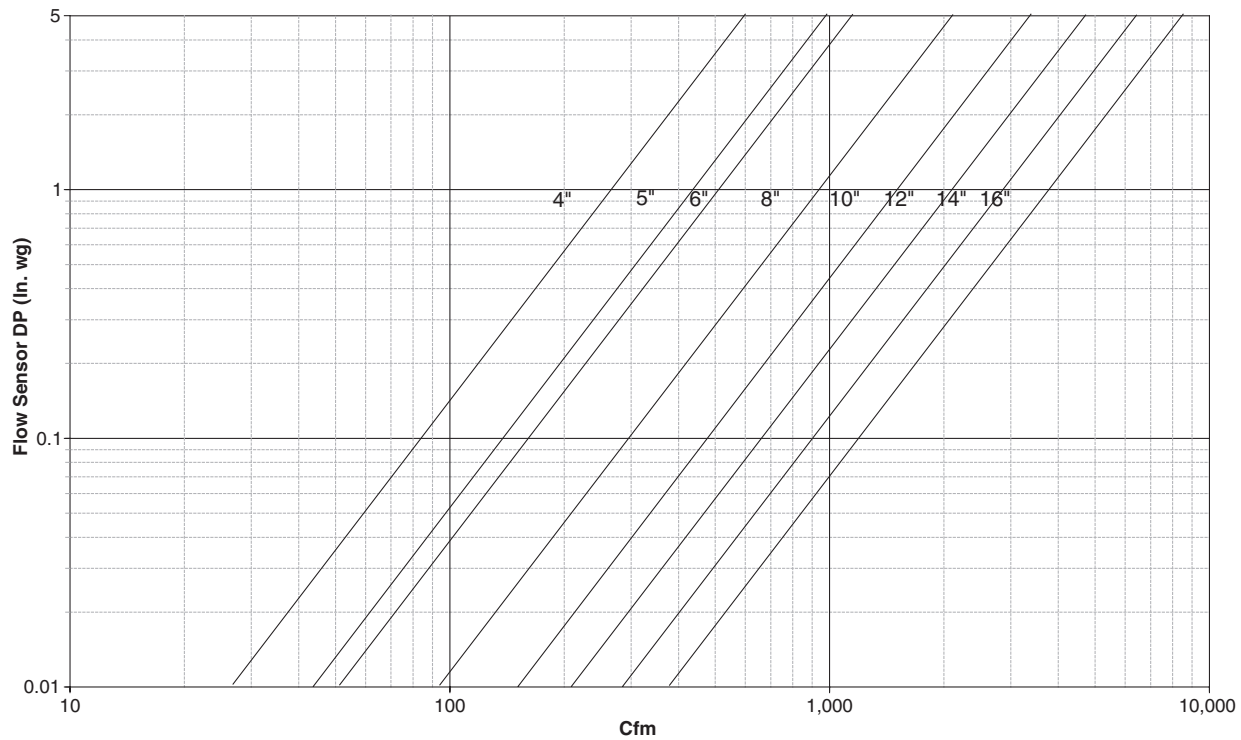
Figure 1: UCM 4.2 Wiring Diagram



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Commissioning

Figure 2: Sensor signal vs. airflow delivery



Note:
Refer to manufacturer of competitive terminal for Delta P vs. airflow delivery.



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