Installation, Operation, and Maintenance

VariTrane™
Single-Duct and Fan-Powered Units

All VariTrane VAV models with pneumatic, electronic, DDC controls, and diffusers.

VCCF04 - 24
VCEF04 - 24
VCWF04 - 24

⚠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.

September 2014 **VAV-SVX08E-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-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!

Installing/servicing this unit could result in exposure to electrical, mechanical and chemical hazards.

- **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 Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate MSDS/SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling 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.**

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

⚠ WARNING

Fiberglass Wool!

Product contains fiberglass wool. Disturbing the insulation in this product during installation, maintenance or repair will expose you to airborne particles of glass wool fibers and ceramic fibers known to the state of California to cause cancer through inhalation. Glass wool fibers could result in respiratory, skin or eye irritation.

Introduction

This manual describes the installation of VariTrane™ VAV units with recommended wiring, piping, and mounting of single-duct, dual-duct, fan-powered, low-height terminal units, and diffusers.

See also the following reference documents:

- BAS-SVX40A-EN —Wireless Comm IOM
- BAS-SVX55A-EN — Wireless Comm Network Design Best Practices Guide

Receiving and Handling

VariTrane units are shipped completely assembled with the exceptions of optional attenuators for fan-powered units and accessories.

Upon receiving the equipment, complete the following:

- Locate the nameplate and refer to the model and sales order number and check that the correct units have been delivered.
- Inspect the control enclosures and air valve casing for dents or punctures.
- Verify that all options have been included, such as filters, controls, heating coils, water valves, etc. Also check that the unit voltages agree with the building parameters.
- Manually rotate fan (if applicable) to assure that there are no obstructions within the housing.
- Claims for in-transit damage must be filed immediately with the delivery carrier.
- For hot water re-heat units, check the coil fins and make sure that coils are not damaged.
- Locate and verify that the correct zone sensors are with the order. These will be marked with an orange "Accessories Enclosed" label. Store in a secure location until needed. Accessories lost at the job site are NOT covered by Trane's warranty.
- If a discrepancy occurs between what was ordered and what is received, contact you local Trane representative immediately.
- Read appropriate section in this manual for installation procedures prior to starting equipment.

Upon receiving the equipment, please inspect each unit and components for external or internal damage. Refer to the bill of lading to insure all equipment and accessories have been received. Contact your local Trane sales representative and notify the trucking company immediately of any short ship or damaged equipment.

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Revision History

VAV-SVX08E-EN (16 Sep 2014)

Updated for universal mount project.

VAV-SVX08D-EN (11 Jul 2013)

Updated model number for Sinro valve.

VAV-SVX08D-EN (27 Jun 2013)

Added Bottom Access with Cam Lock configuration and stand alone control information for UCM 4.2, VV550 LonTalk, UC400, UC210 and WCI.

Table of Contents

Model Number Descriptions

Single-Duct Units

Digit 1, 2 — Unit Type

VC = VariTrane Single Duct

Digit 3—Reheat

C = Cooling Only
E = Electric Heat
W = Hot Water Heat

Digit 4—Development Sequence

F = Sixth

Digit 5, 6—Primary Air Valve

04 = 4" inlet (225 cfm)
05 = 5" inlet (350 cfm)
06 = 6" inlet (500 cfm)
08 = 8" inlet (900 cfm)
10 = 10" inlet (1400 cfm)
12 = 12" inlet (2000 cfm)
14 = 14" inlet (3000 cfm)
16 = 16" inlet (4000 cfm)
24 = 24" x 16" inlet (8000 cfm)

Digit 7, 8, 9—Not Used

000= N/A

Digit 10, 11—Design Sequence

** = Factory Assigned

Digit 12, 13, 14, 15—Controls

DD00 Trane Actuator Only and Enclosure
DD01= UCM4 Cooling Only Control
DD02= UCM4 N.C. On/Off Hot Water
DD03= UCM4 Prop. Hot Water
DD04= UCM4 Staged On/Off E-Heat
DD05= UCM4 Pulse Width MOD E-Heat
DD07= UCM4 N.O. On/Off Hot Water
DD11= VV550 DDC Controller - Cooling Only
DD12= VV550 DDC Ctrl to operate N.C. On/Off water valve
DD13= VV550 DDC Ctrl to operate Prop water valve
DD14= VV550 DDC Ctrl - On/Off Electric Heat
DD15= VV550 DDC Ctrl w/Pulse Width Modulation
DD16= VV550 DDC Controller - Ventilation Flow
DD17= VV550 DDC Ctrl to operate N.O. On/Off Water Valve
DD19= VV550 DDC Controller with Flow Tracking
DD20= VV550 DDC Vent Flow cntrl to operate N.C. water valve
DD21= VV550 DDC - Vent Flow w/ On/Off Elec Heat
DD22= VV550 DDC Vent Flow cntrl to operate prop water valve
DD23= VV550 DDC- Basic plus- Local (Electric heat- PWM) Remote (Staged EH)
DD24= VV550 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.C. 2 position)
DD25= VV550 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.O. 2 position)
DD26= VV550 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- Modulating)
DD27= VV550 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- Modulating)
DD28= VV550 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.O. 2-position)
DD29= VV550 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- NC 2-position)
DD30= VV550 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.C. 2-position)
DD31= VV550 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.O. 2-position)
DD32= VV550 DDC-Basic plus- Local (Electric heat- Staged) Remote (Staged EH)
DD33= VV550 DDC Vent Flow cntrl to operate N.O. On/Off water valve
DD41= UC400 DDC-Basic (No water or electric heat)
DD42= UC400 DDC-Basic (Water heat- N.C.- 2 position)
DD43= UC400 DDC-Basic (Water heat- Modulating)
DD44= UC400 DDC-Basic (Electric heat- staged)
DD45= UC400 DDC-Basic (Electric heat- PWM)
DD46= UC400 DDC Ventilation flow- cooling only
DD47= UC400 DDC-Basic (Water heat- N.O.- 2 position)
DD49= UC400 DDC-Flow Tracking (Cooling only)
DD50= UC400 DDC-Ventilation Flow (Water heat- N. C.- 2 position)
DD51= UC400 DDC-Ventilation Flow (Electric heat- staged)
DD52= UC400 DDC-Ventilation Flow (Water heat- Modulating)
DD53= UC400 DDC-Basic plus- Local (Electric heat- PWM) Remote (Staged EH)
DD54= UC400 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.C. 2 position)
DD55= UC400 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.O. 2 position)
DD56= UC400 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- Modulating)
DD57= UC400 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- Modulating)
DD58= UC400 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.O. 2-position)
DD59= UC400 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.C. 2-position)
DD60= UC400 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.C. 2-position)
DD61= UC400 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.O. 2-position)
DD62= UC400 DDC-Basic plus- Local (Electric heat- Staged) Remote (Staged EH)
DD63= UC400 DDC-Ventilation Flow (Water heat- N.O. 2-position)
DD65= UC400 Basic (Electric HeatModulating SCR)
DD66= UC400 Basic plus-Local (Electric heat-Modulating SCR) Remote (Staged EH)
DD67= UC400 Ventilation Flow (Electric heat-Modulating SCR)
DD71= UC210 DDC-Basic (No water or electric heat)
DD72= UC210 DDC-Basic (Water heat- N.C.- 2 position)
DD73= UC400 DDC-Basic (Water heat- Modulating)
DD74= UC210 DDC-Basic (Electric heat- staged)
DD75= UC210 DDC-Basic (Electric heat- PWM)
DD76= UC210 DDC Ventilation flow- cooling only
DD77= UC210 DDC-Basic (Water heat- N.O.- 2 position)
DD79= UC210 DDC-Flow Tracking (Cooling only)
DD80= UC210 DDC-Ventilation Flow (Water heat- N. C.- 2 position)
DD81= UC210 DDC-Ventilation Flow (Electric heat- staged)
DD82= UC210 DDC-Ventilation Flow (Water heat- Modulating)
DD83= UC210 DDC-Basic plus- Local (Electric heat- PWM) Remote (Staged EH)
DD84= UC210 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.C. 2 position)
DD85= UC210 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.O. 2 position)
DD86= UC210 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- Modulating)
DD87= UC210 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- Modulating)
DD88= UC210 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.O. 2-position)
DD89= UC210 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.C. 2-position)
DD90= UC210 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.C. 2-position)
DD91= UC210 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.O. 2-position)
DD92= UC210 DDC-Basic plus- Local (Electric heat- Staged) Remote (Staged EH)
DD93= UC210 Ventilation Flow (Water heat- N.O. 2-position)
DD95= UC210 Basic (Electric HeatModulating SCR)
DD96= UC210 Basic plus-Local

(Electric heat-Modulating SCR) Remote (Staged EH)
DD97= UC210 Ventilation Flow (Electric heat-Modulating SCR)
ENCL= Shaft Only in Enclosure
ENON= Shaft Out Side for Electric Units
FM00= Other Actuator and Control
FM01= Trane Supplied Actuator, Other Ctrl
PC00= N.C. Actuator and Linkage Only
PC04= N.C. with DA Stat, 3000 Series
PC05= N.C. with RA STAT, 3000 Series
PCSS= Normally Closed Special
PN00= N.O. Actuator and Linkage Only
PN04= N.O. 3000 Series, DA STAT
PN05= N.O. 3000 Series, RA STAT
PN11= Auto Dual Min.
PN32= N.O. PNEU Constant Vol.
PN34= N.O. 3000 Series Constant Vol.,RA STAT
PNON= Shaft Out Side for Pneumatic Units
PNSS= Normally Open Special
N.C .= Normally-closed
N.O. = Normally-opened
DA Stat = Direct-acting pneumatic t-stat (by others)
RA Stat = Reverse-acting pneumatic t-stat (by others)
PN = Pneumatic
FM = Factory installation of customer-supplied controller
PVR = Pneumatic Volume Regulator

Digit 16—Insulation

A = 1/2" Matte-faced
B = 1" Matte-faced
D = 1" Foil-faced
F = 1" Double-wall
G = 3/8" Closed-cell

Digit 17 & 18—Not Used

00 = N/A

Digit 19—Outlet Plenum (Connection is Slip & Drive)

0 = None
A = 1 Outlet RH
B = 1 Outlet END
C = 1 Outlet LH
D = 2 Outlets, 1 RH, 1 END
E = 2 Outlets, 1 LH, 1 END
F = 2 Outlets, 1 RH, 1 LH
H = 3 Outlets, 1 LH, 1 RH, 1 END
J = 4 Outlets, 1 LH, 1 RH, 2 END

Note: *See unit drawings for outlet sizes/ damper information.*

Digit 20—Not Used

0 = N/A

Digit 21—Water Coil

0 = None
1 = 1-Row
2 = 2-Row
3 = 3-Row
4 = 4-Row
A = 1-Row Premium
B = 2-Row Premium
C = 3-Row Premium
D = 4-Row Premium

Digit 22—Electrical Connections

F = Flippable (can be flipped in the field for LH or RH connections - VCEF only)
L = Left (Airflow hitting you in the face)
R = Right (Airflow hitting you in the face)
0 = Opposite side connection – coil and control (VCWF only)

Note: *VCCF, VCWF can be flipped in field for opposite-hand connection*

Digit 23—Transformer

0 = None
1 = 120/24 volt (50 VA)
2 = 208/24 volt (50 VA)
3 = 240/24 volt (50 VA)
4 = 277/24 volt (50 VA)
5 = 480/24 volt (50 VA)
6 = 347/24 Volt (50 VA)
7 = 380/24 Volt (50 VA)
8 = 575/24 Volt (50 VA)

Note: *For VCEF units with transformers the VA depends on the staging, control, and contactor type (ranges are 50 VA to 75 VA, for 1 and 3 phase)*

Digit 24—Disconnect Switch

0 = None
W = With

Note: *VCCF, VCWF – Toggle Disconnect; VCEF – Door Interlocking Power Disconnect*

Digit 25—Power Fuse

0 = None
W = With

Digit 26—Electric Heat Voltage

0 = None
A = 208/60/1
B = 208/60/3
C = 240/60/1
D = 277/60/1
E = 480/60/1
F = 480/60/3
G = 347/60/1
H = 575/60/3
J = 380/50/3
K = 120/60/1

Digit 27 - 29—Electric Heat kW

000 = None
010 = 1.0 kW
015 = 1.5 kW
460 = 46.0 kW

Note: *0.5 to 8.0 kW – ½ kW increments*
8.0 to 18.0 kW – 1 kW increments
18.0 to 46.0 kW – 2 kW increments

Digit 30—Electric Heat Stages

0 = None
1 = 1 Stage
2 = 2 Stages Equal
3 = 3 Stages Equal

Digit 31—Electrical Heat Contactors

0 = None
1 = 24-volt magnetic
2 = 24-volt mercury
3 = PE with magnetic
4 = PE with mercury
5 = SCR heat UC400/UC210
6 = SCR heat FMTD/ENCL/DD00
A = 24-volt mercury (left hand)
B = 24-volt mercury (right hand)
C = PE with mercury (left hand)
D = PE with mercury (right hand)

Digit 32 & 33—Not Used

00 = N/A

Digit 34—Actuator

0 = Standard
A = Spring Return (Normally Open)
B = Spring Return (Normally Closed)
C = Belimo Actuator

Digit 35—Sensor Options

0 = Standard (Wired)
1 = Factory Mounted Wireless Receiver (Sensor Accessory)
2 = Wireless Comm Interface Modular FM

Digit 36—Pre-Wired Factory Solutions

0 = None
1 = Factory Mounted DTS
2 = HW Valve Harness
3 = Both DTS & HW Valve Harness
4 = Averaging DTS factory installed in unit (Required for UC210/UC400 with SCR heat)

Digit 37—Bottom Access with Cam Locks

0 = None
1 = Access Left Side Terminal Unit
2 = Access Right Side Terminal Unit
3 = Access Left Side Terminal Unit with Water Connection on Right
4 = Access Right Side Terminal Unit with Water Coil Connection on Left

Model Number Descriptions

Digit 38—Piping Package

0 = None
A = 2-way Automatic Balancing)
B = 3-way Automatic Balancing

Digit 39—Water Valve

0 = None
1 = Proportional, HW Valve, 0.7 Cv
2 = Proportional, HW Valve, 2.7 Cv
3 = Proportional, HW Valve, 6.6 Cv
4 = Proportional, HW Valve, 8.0Cv

Digit 40—Flow Rate

00 = None
A = 0.5 gpm (0.03 l/s)
B = 1.0 gpm (0.06 l/s)
C = 1.5 gpm (0.09 l/s)
D = 2.0 gpm (0.13 l/s)
E = 2.5 gpm (0.16 l/s)
F = 3.0 gpm (0.19 l/s)
G = 3.5 gpm (0.22 l/s)
H = 4.0 gpm (0.25 l/s)
J = 4.5 gpm (0.28 l/s)
K = 5.0 gpm (0.31 l/s)
L = 5.5 gpm (0.35 l/s)
M = 6.0 gpm (0.38 l/s)
N = 6.5 gpm (0.41 l/s)
P = 7.0 gpm (0.44 l/s)
Q = 7.5 gpm (0.47 l/s)
R = 8.0 gpm (0.50 l/s)
S = 9.0 gpm (0.57 l/s)
T = 10.0 gpm (0.63 l/s)
U = 11.0 gpm (0.69 l/s)
V = 12.0 gpm (0.76 l/s)
W = 13.0 gpm (0.82 l/s)
X = 14.0 gpm (0.88 l/s)
Y = 15.0 gpm (0.95 l/s)
Z = 16.0 gpm (1.01 l/s)
1 = 17.0 gpm (1.07 l/s)
2 = 18.0 gpm (1.14 l/s)
3 = 19.0 gpm (1.20 l/s)
4 = 20.0 gpm (1.26 l/s)
5 = 21.0 gpm (1.32 l/s)
6 = 22.0 gpm (1.39 l/s)
7 = 23.0 gpm (1.45 l/s)

Dual-Duct Units

Digit 1, 2, 3—Unit Type
VDD= VariTrane dual-duct

Digit 4—Development Sequence
F = Sixth

Digit 5, 6—Primary Air Valve
05 = 5" inlet (350 cfm)
06 = 6" inlet (500 cfm)
08 = 6" inlet (900 cfm)
10 = 10" inlet (1400 cfm)
12 = 12" inlet (2000 cfm)
14 = 14" inlet (3000 cfm)
16 = 16" inlet (4000 cfm)

Digit 7, 8—Secondary Air Valve
05 = 5" inlet (350 cfm)
06 = 6" inlet (500 cfm)
08 = 8" inlet (900 cfm)
10 = 10" inlet (1400 cfm)
12 = 12" inlet (2000 cfm)
14 = 14" inlet (3000 cfm)
16 = 16" inlet (4000 cfm)

Digit 9—Not Used
0 = N/A

Digit 10, 11—Design Sequence
** = Factory Assigned

Digit 12, 13, 14, 15—Controls
DD00= Trane Actuator Only
DD01= UCM4 Cooling Only Control
DD08= UCM4 Dual Duct Constant Volume
DD11= VV550 DDC Controller - Cooling Only
DD18= VV550 DDC Controller w Constant Volume
DD41= UC400 DDC-Basic (No water or electric heat)
DD48= UC400 DDC-Basic (Constant Volume)
DDSS= Digital Special
ENON= Shaft Out Side for Electric Units
FM00= Other Actuator and Control
FM01= Trane Supplied Actuator, Other Ctrl
PC03= NC Heating Valve, N.O. Cooling Valve
PCSS= Normally Closed Special
PN08= N.O. Heat/Cool Actuators & Linkage Only
PN09= N.O. Heating, N.O. Cooling, w/PVR's
PN10= N.O. Heating, N.O. Cooling, w/PVR's (CV DISCH)
PNON= Shaft Out Side for Pneumatic Units
PNSS= Normally Open Special

Notes:
N.C. = Normally-closed
N.O. = Normally-opened
DA Stat = Direct-acting pneumatic t-stat (by others)
RA Stat = Reverse-acting pneumatic t-stat (by others)
PN = Pneumatic
FM = Factory installation of customer-supplied controller
PVR = Pneumatic Volume Regulator

Digit 16—Insulation
A = 1/2" Matte-faced
B = 1" Matte-faced
D = 1" Foil-faced
F = 1" Double-wall
G = 3/8" Closed-cell

Digit 17—Not Used
0 = N/A

Digit 18—Not Used
0 = N/A

Digit 19—Outlet Plenum (Connection is slip & drive)
0 = none
A = 1 outlet–RH
B = 1 outlet–END
C = 1 outlet–LH
D = 2 outlets–1 RH, 1 END
E = 2 outlets–1 LH, 1 END
F = 2 outlets–1 RH, 1 LH
G = 2 outlets - END
H = 3 outlets–1 LH, 1 RH, 1 END
J = 4 outlets–1 LH, 1 RH, 2 END

Note: *See unit drawings for outlet sizes/ damper information.*

Digit 20—Not Used
0 = N/A

Digit 21—Not Used
0 = N/A

Digit 22—Not Used
0 = N/A

Digit 23—Transformer
0 = None
1 = 120/24 volt (50 VA)
2 = 208/24 volt (50 VA)
3 = 240/24 volt (50 VA)
4 = 277/24 volt (50VA)
5 = 480/24 volt (50 VA)
6 = 347/24 volt (50 VA)
7 = 575/24 volt (50 VA)

Digit 24—Disconnect Switch
0 = None
W = With Toggle

Digit 25—Power Fuse
0 = None
W = With

Digit 26—Not Used
0 = N/A

Digit 27—Not Used
0 = N/A

Digit 28—Not Used
0 = N/A

Digit 29—Not Used
0 = N/A

Digit 30—Not Used
0 = N/A

Digit 31—Not Used
0 = N/A

Digit 32—Not Used
0 = N/A

Digit 33—Special Options
0 = None
X = Varies - Factory Assigned

Digit 34—Actuator
A = Belimo Actuator

Digit 35—Wireless Sensor
0 = Sensor/Receiver Standard
1 = Wireless Sensor/Receiver Mounted

Note: *All sensors selected in accessories*

Digit 36—Duct Temp Sensor
0 = None
1 = With Duct Temp Sensor

Fan-Powered Units

Digit 1, 2—Unit Type

VP = VariTrane Fan-Powered Parallel
VS = VariTrane Fan-Powered Series
LP = VariTrane Fan-Powered Low-Height Parallel
LS = VariTrane Fan-Powered Low-Height Series

Digit 3—Reheat

C = Cooling Only
E = Electric Heat
W = Hot Water Heat

Digit 4—Development Sequence

F = Sixth

Digit 5, 6—Primary Air Valve

05 = 5" inlet (350 max cfm)
06 = 6" inlet (500 max cfm)
08 = 8" inlet (900 max cfm)
10 = 10" inlet (1400 max cfm)
12 = 12" inlet (2000 max cfm)
14 = 14" inlet (3000 max cfm)
16 = 16" inlet (4000 max cfm)
RT = 8" x 14" inlet (1800 max CFM)

Note: *10, 12, 14, 16 Not Available on Low-Height*

Digit 7, 8—Secondary Air Valve

00 = N/A

Digit 9—Fan

P = 02SQ fan (500 nominal cfm)
Q = 03SQ fan (1100 nominal cfm)
R = 04SQ fan (1350 nominal cfm)
S = 05SQ fan (1550 nominal cfm)
T = 06SQ fan (1850 nominal cfm)
U = 07SQ fan (2000 nominal cfm)
V = 08SQ Fan (500 nominal cfm)
W = 09SQ Fan (900 nominal cfm)
X = 10SQ Fan (1800 nominal cfm)

Digit 10, 11—Design Sequence

** = Factory assigned

Digit 12, 13, 14, 15—Controls

DD01= Cooling Only Control
DD02= N.C. On/Off Hot Water
DD03= Prop. Hot Water
DD04= Staged On/Off E-Heat
DD05= Pulse Width Mod of E-Heat
DD07= N.O. On/Off Hot Water
DD11= VV550 DDC Controller - Cooling Only
DD12= VV550 DDC Ctrl w/N.C. On/Off HW Valve
DD13= VV550 DDC Ctrl w/Prop. HW Valve
DD14= VV550 DDC Ctrl - On/Off Electric Heat
DD15= VV550 DDC Ctrl w/Pulse Width Modulation
DD17= VV550 DDC Ctrl w/N.O. On/Off HW Valve
DD23= VV550 DDC- Basic plus- Local (Electric heat- PWM) Remote (Staged EH)
DD28= VV550 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.O. 2-position)
DD29= VV550 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.C. 2-position)
DD30= VV550 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.C. 2-position)
DD31= VV550 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.O. 2-position)
DD32= VV550 DDC-Basic plus- Local (Electric heat- Staged) Remote (Staged EH)
DD41= UC400 DDC-Basic (No water or electric heat)
DD42= UC400 DDC-Basic (Water heat- Normally Closed- 2 position)
DD43= UC400 DDC-Basic (Water heat- Modulating)
DD44= UC400 DDC-Basic (Electric heat- staged)
DD45= UC400 DDC-Basic (Electric heat- PWM)
DD47= UC400 DDC-Basic (Water heat- Normally Opened- 2 position)
DD53= UC400 DDC-Basic plus- Local (Electric heat- PWM) Remote (Staged EH)
DD58= UC400 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.O. 2-position)
DD59= UC400 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.C. 2-position)
DD60= UC400 DDC-Basic plus- Local (Water heat- N.O. 2-position) Remote (Water- N.C. 2-position)
DD61= UC400 DDC-Basic plus- Local (Water heat- N.C. 2-position) Remote (Water- N.O. 2-position)
DD62= UC400 DDC-Basic plus- Local (Electric heat- Staged) Remote (Staged EH)
DD65= Basic (Electric Heat- Modulating SCR)
DD66= Basic plus – Local (Electric heat – Modulating SCR) Remote (Staged EH)
DD71= UC210 DDC-Basic (Cooling only)
DD72= UC210 DDC-Basic (Water heat-nc 2pos)
DD73= UC210 DDC-Basic (Water heat-Modulating)
DD74= UC210 DDC-Basic (Electric heat-staged)
DD75= UC210 DDC-Basic (Electric heat-pwm)
DD77= UC210 DDC-Basic (Water heat-NO 2pos)
DD83= UC210 DDC-Basic+ Local (Electric heat-pwm) Remote (Staged)
DD84= UC210 DDC-Basic+ Local (Water heat Modulating) Remote (Water-NC 2pos)
DD85= UC210 DDC-Basic+ Local (Water heat Modulating) Remote (Water-NO 2pos)
DD86= UC210 DDC-Basic+ Local (Water heat NO 2pos) Remote (Water-Modulating)
DD87= UC210 DDC-Basic+ Local (Water heat NC 2pos) Remote (Water-Modulating)
DD88= UC210 DDC-Basic+ Local (Water heat NO 2pos) Remote (Water-NO 2pos)
DD89= UC210 DDC-Basic+ Local (Water heat NC 2pos) Remote (Water-NC 2pos)
DD90= UC210 DDC-Basic+ Local (Water heat NO 2pos) Remote (Water-NC 2pos)
DD91= UC210 DDC-Basic+ Local (Water heat NC 2pos) Remote (Water-NO 2pos)
DD92= UC210 DDC-Basic+ Local (Electric heat-staged) Remote (Staged)
DD95= UC210 DDC-Ctrl w/Modulating SCR
DD96= UC210 DDC-Space Temp Ctrl w/ Local SCR & Remote Stge Elec Heat
DD00= Trane Actuator Only
ENCL= Shaft Only in Enclosure
ENON= Shaft Out Side for Electric Units
FM00= Other Actuator and Control
FM01= Trane supplied actuator, other control
PN00= N.O. Actuator and Linkage Only
PN05= N.O. 3000 Series, RA Stat
PN51= Pneumatic normally open w/3011,DPS fan
PN52= Pneumatic normally open w/3011, DPM fan
PNON= Shaft Out Side for Pneumatic Units

Notes:

N.C. = Normally-closed
N.O. = Normally-opened
DA Stat = Direct-acting pneumatic t-stat (by others)
RA Stat = Reverse-acting pneumatic t-stat (by others)
PN = Pneumatic
FM = Factory installation of customer-supplied controller
PVR = Pneumatic Volume Regulator

Digit 16—Insulation

A = 1/2″ Matte-faced
B = 1" Matte-faced
D = 1" Foil-faced
F = 1" Double-wall
G = 3/8″ Closed-cell

Digit 17—Motor Type

D = PSC Motor
E = High-efficiency motor (ECM)

Digit 18—Motor Voltage

1 = 115/60/1
2 = 277/60/1
3 = 347/60/1
4 = 208/60/1
5 = 230/50/1

Digit 19—Outlet Connection

1 = Flanged
2 = Slip & Drive

Digit 20—Attenuator

0 = No Attenuator
W = With Attenuator

Digit 21—Water Coil

0 = None
1 = 1-Row–Plenum inlet installed RH
2 = 2-Row–Plenum inlet installed RH
3 = 1-Row–Discharge installed, LH
4 = 1-Row–Discharge installed, RH
5 = 2-Row–Discharge installed, LH
6 = 2-Row–Discharge installed, RH1
A = 1-Row–Premium water coil inlet
B = 2-Row–Premium water coil inlet
C = 1-Row–Premium hot coil on discharge, LH
D = 1-Row–Premium hot coil on discharge, RH
E = 2-Row–Premium hot coil on discharge, LH
F = 2-Row–Premium hot coil on discharge, RH

Note: *1- and 2-row not available with Low-Height*

Digit 22—Electrical Connections

L = Left (Airflow hitting you in the face)
R = Right (Airflow hitting you in the face)
W = Narrow Corridor LH, Hi-Volt Inlet Facing
X = Narrow Corridor RH, Hi-Volt Inlet Facing

Note: *(W & X) Fan Powered Series Only*

Digit 23—Transformer

0 = N/A (provided as standard)

Digit 24—Disconnect Switch

0 = None
W = With
Electric Reheat w/ door interlocking power disconnect, Cooling Only and Water Reheat w/ toggle disconnect

Digit 25—Power Fuse

0 = None
W = With

Digit 26—Electric Heat Voltage

0 = None
A = 208/60/1
B = 208/60/3
C = 240/60/1
D = 277/60/1
E = 480/60/1
F = 480/60/3
G = 347/60/1
H = 575/60/3
J = 380/50/3
K = 120/60/1

Note: *K not available with Low Height*

Digit 27, 28, 29—Electric Heat kW

000 = None
050 = 0.5 kW
010 = 1.0 kW
015 = 1.5 kW
260 = 26.0 kW

Note: *Electric Heat Voltage -*
0.5 to 8.0 kW–½ kW increments
8.0 to 18.0 kW –1 kW increments
18.0 to 46.0 kW–2 kW increments

Digit 30—Electric Heat Stages

0 = None
1 = 1 Stage
2 = 2 Stages Equal
3 = 3 Stages Equal

Note: *3 not available with Low Height*

Digit 31—Contactors

0 = None
1 = 24-volt magnetic
2 = 24-volt mercury
3 = PE with magnetic
4 = PE with mercury
5 = SCR heat UC400
6 = SCR heat FMTD/ENCL/DD00

Note: *SCR cannot be selected with the following configuration:*

- KW > 10, 208 volt 3 phase, Low Height
- KW > 22, 480 volt 3 phase, Low Height
- Voltage = 575 volt

Digit 32—Airflow Switch

0 = None
W = With

Digit 33—Not Used

0 = N/A

Digit 34—Actuator

0 = Standard
A = Belimo actuator

Digit 35—Wireless Sensors

0 = None
1 = Factory Mounted Wireless Receiver (Sensor Assembly)
2 = Wireless Comm Interface Modular FM

Note: *All sensors selected in accessories*

Digit 36—Pre-Wired Factory Solutions

0 = None
1 = Factory Mounted DTS
2 = HW Valve Harness
3 = Both DTS & HW Valve Harness

Digit 37—Bottom Access

0 = None
W = Access Left Side of Terminal Unit

Digit 38—Piping Package

0 = None
A = 2-way Automatic Balancing)
B = 3-way Automatic Balancing

Digit 39—Water Valve

0 = None
1 = Proportional, HW Valve, 0.7 Cv
2 = Proportional, HW Valve, 2.7 Cv
3 = Proportional, HW Valve, 6.6 Cv
4 = Proportional, HW Valve, 8.0Cv

Digit 40—Flow Rate

0 = None
A = 0.5 gpm (0.03 l/s)
B = 1.0 gpm (0.06 l/s)
C = 1.5 gpm (0.09 l/s)
D = 2.0 gpm (0.13 l/s)
E = 2.5 gpm (0.16 l/s)
F = 3.0 gpm (0.19 l/s)
G = 3.5 gpm (0.22 l/s)
H = 4.0 gpm (0.25 l/s)
J = 4.5 gpm (0.28 l/s)
K = 5.0 gpm (0.31 l/s)
L = 5.5 gpm (0.35 l/s)
M = 6.0 gpm (0.38 l/s)
N = 6.5 gpm (0.41 l/s)
P = 7.0 gpm (0.44 l/s)
Q = 7.5 gpm (0.47 l/s)
R = 8.0 gpm (0.50 l/s)
S = 9.0 gpm (0.57 l/s)
T = 10.0 gpm (0.63 l/s)
U = 11.0 gpm (0.69 l/s)
V = 12.0 gpm (0.76 l/s)
W = 13.0 gpm (0.82 l/s)

Unit Information

Single-Duct Units

The basic unit consists of a sheet metal casing with an air valve, which is used to modulate the air being delivered into the occupied zone. The unit is designed to modulate either cooling or heating air between the temperatures of 40°F and 140°F. Air enters the air valve through the round or rectangular inlet and exits into the sheet metal casing to be distributed to the zone either through integral round outlets in the casing or through rectangular duct attached to the discharge of the unit.

The basic unit can also be ordered with factory-mounted electric or hot water heating coils attached to the discharge. See Figure 2, p. 11.

These re-heat units are used primarily to reheat air-to-zone temperature when the load in the occupied space is low.

Primary air is modulated through the VariTrane air valve by rotating the damper blade. All air valves have a round/ rectangular inlet for easy fit-up with incoming duct work.

Typical Single-Duct Units

Figure 1. Typical single duct unit — VCCF

Figure 2. Typical single duct unit — VCWF

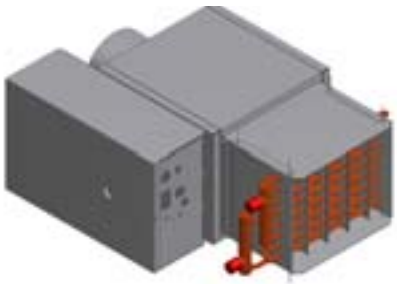


Figure 3. Typical single duct unit — VCEF

Dual-Duct Units

Dual-duct units provide two air valves: one as heating primary air and the other as cooling primary air. Both discharge into the common outlet, which leads to the zone being controlled. See Figure 4, p. 11.

Units are provided with a slip and drive rectangular duct connection or can be ordered with integral outlet plenum.

Sequencing of hot and cold air valve is dependent on job requirements. One typical control is valves working in conjunction to respond to zone temperature.

When the cooling valve becomes fully closed or reaches a specified minimum, the heating valve will begin to modulate or vice versa. The typical result is that air flowing to the zone varies from maximum down to a minimum and back up to maximum as load varies and controls would cause one air valve to close and the other to open.

Another typical application is when the unit provides a constant volume to the zone. When the zone sensor is tied directly to the heating valve, it will modulate the heating valve according to the zone temperature.

When the heating valve is fully closed or there is a call for cooling in the zone, the cooling valve will be at constant supply. As the space becomes too cool, the heating valve will modulate open, decreasing the cooling valve flow. The typical result is that the air flowing into the zone stays at a constant flow whether the unit is heating or cooling.

Figure 4. Typical dual-duct unit: VDDF

Fan-Powered and Fan-Powered Low-Height Units

VariTrane fan-powered and low-height fan-powered units can be either parallel or series, with or without re-heat. (SeeFigure 5, p. 12 thru Figure 8, p. 12.)

Typical Fan-Powered Units

Figure 5. Parallel fan-powered terminal unit (top) & series fan-powered terminal units (bottom)

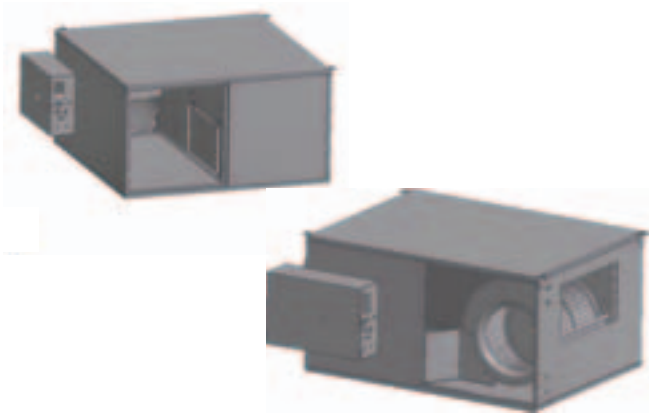


Figure 6. Low height series: LSCF (top) & low height series: LSWF (bottom)

Figure 7. Low height series: LSEF (top) & low height parallel: LPCF (bottom)

Figure 8. Low height parallel: LPWF (top) & low height parallel: LPEF (bottom)

The fan on a series unit runs continuously whenever the main air handler unit is in operation. There are various options for starting the fan. The fan can be started three ways: 1) remotely, 2) by a duct pressure switch, or 3) by a combination of both. The particular fan control method may vary from unit to unit, depending upon job needs.

Typically, heater is off while air valve modulates primary air and responds to zone temperature. If zone temperature decreases to the point where a decrease in primary air will not maintain the desired temperature, the re-heat will be activated to increase the temperature of the discharge air.

On a parallel unit, the VariTrane air valve delivers primary cooling air to the unit outlet. When the space temperature decreases beyond air valve control, the fan is turned on as the first stage of heat. The fan delivers plenum air from above the occupied space to the unit outlet, which is mixed with primary air and delivered to the occupied space.

Note: *Either the fan, the air valve, or both can deliver airflow into the occupied space. In order to prevent primary airflow from exiting through the fan when the fan is not running on a parallel unit, a back draft damper is provided. When the fan is not running, the efficiency of this system is the same as a standard single-duct VAV unit.*

Typically, the control systems applied to parallel units cause the air valve to close to zero or a minimum flow before the fan is activated. After the fan is activated, the optional heat will be activated upon further reduction in zone temperature. Therefore, minimal primary air is mixed with the heated air.

VariTrane fan-powered unit fan sizes 02SQ–05SQ and 08SQ–10SQ were performance tested at .12 in. w.g. and sizes 06SQ and 07SQ were tested at .15 in. w.g. Units are not designed to operate unducted and below these tested static pressures.

Note: *Fan-powered units are available with rectangular discharge connection only. The optional heater is mounted on the discharge of the unit. Hot water coils are connected to either the plenum inlet or on the discharge on parallel units, and to the discharge of series units.*

Unit Installation

⚠WARNING

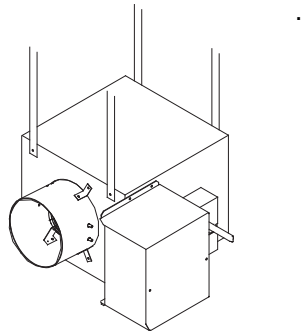
Proper Structural Support Required!

Ceiling structure must be strong enough to support the weight of the unit. If unsure, check with a structural engineer. Refer to Table 1, p. 24 thru Table 6, p. 26 for unit weights. Failure to ensure proper structural ceiling support could result in unit failing from its location which could result in death or serious injury.

Due to their weight, the VAV terminal units should be suspended from the uppermost ceiling, independent of the false ceiling grid. Suspension devices are to be supplied by the installer. Units must be installed level and upright. Failure to level the unit properly may prevent proper operation of the controls and/or terminal unit. Units are not designed to be installed vertically. Consequently, this will also void the UL ratings and any warranty on the unit.

Single-Duct

Figure 9. Single-duct hanging recommendations



Depending upon the size and weight of the single-duct unit, it may be capable of being supported by the ductwork that is connected to it. No hanger brackets are provided on these units since the unit should be supported by means of a hanger strap. The hanger strap should be secured directly to the unit casing as shown in Figure 9, p. 13.

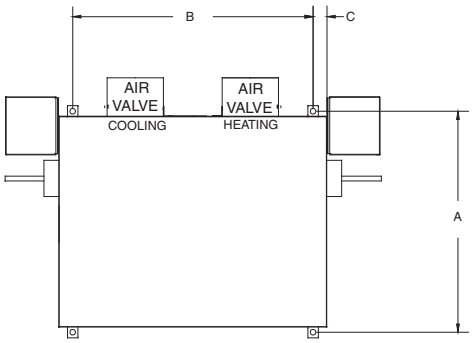
For cooling only single-duct units or single-duct units with hot water coil, the unit may be rotated 180° for opposite side connections.

For units with electric heat, the unit can be flipped to either RH or LH connection orientation if model number digit 22 Electrical Connections = F.

Dual-Duct

Dual-duct units should be supported by either hanger straps or by using a threaded rod in conjunction with the hanger brackets that are provided on the unit. See Figure 10, p. 13.

Figure 10. Dual-duct hanger bracket locations



Inlet Size	A	B	C
5" thru 10"	23.154" (588 mm)	25.25" (641 mm)	1.376" (35 mm)
12" thru 16"	25.154" (639 mm)	37.25" (946 mm)	1.376" (35 mm)

Fan-Powered (Standard and Low-Height)

Fan-powered units should be supported by either hanger straps or by using a threaded rod in conjunction with the hanger brackets that are provided on the unit. Care should be exercised to insure that the hanging straps do not block the side access panel. See Figure 11, p. 16 thru Figure 18, p. 22.

Duct Connections

All VariTrane units should be provided with a minimum of 1.5-duct diameters of straight duct prior to the inlet of the unit. It is recommended that at least 48 inches of straight duct be provided from the discharge of the units prior to any take-offs or transitions.

Important: *This is a requirement for electric heat fan-powered units used in applications with 100% downward discharge.*

Note: *In order to maintain good air distribution over the elements and not create turbulence which could cause a limit cutout there should be four feet of ductwork, consistent of the discharge dimensions of the heater. downstream of the reheat coil prior to any diffuser takeoffs for VariTrane™ electric coils.*

1. After all connections are made, check that the entire ductwork system is airtight. In some high-pressure systems, duct sealer may be necessary.

   Note: *All inlet duct on the VAV boxes are sized approximately 1/8" smaller in diameter than the nominal size in order to allow the incoming duct to slide over the inlet of the VAV box.*

2. Provide insulation around the entire inlet collar (all the way to the unit casing).

Note: *Use caution not to damage the flow tubes when making ductwork connections or insulating.*

3. Cut "slits" in the insulation for the flow tubes and secure with duct tape.
4. If the unit is to be installed in a location with high humidity, external insulation around the heating coil should be installed as required.

Water Coil Connections

Note: *The following coils have 3/8" OD water coil piping connections.*

- *Single Duct 1-row coils (inlet sizes 05, 05, 06, 08 or 10 only)*
- *Low Height Parallel Inlet 1-row*
- *Low Height Parallel Discharge 1-row*

All others require a 7/8" OD water coil piping connections.

Note:

1. If necessary, you can change the coil connection from left-handed to right-handed (and vice-versa) by disconnecting the coil from the unit and rotating the coil "like a steering wheel" 180°.

   Note: *Exception - Coil connection cannot be changed on parallel fan powered unit with hot water coil on plenum inlet.*

2. Use port at the bottom for inlet and top for outlet on single row coils. For multirow coils, always plumb in counter flow orientation.
   - Water inlet is always on the airflow downstream side of the hot water coil.
   - Water outlet is always on the upstream side of the hot water coil.
3. Care should be taken to properly support the water coil piping connections while connecting the adjoining pipe.
4. It is recommended that piping to the water coil should be done after field-mounted controls, external insulation, and ductwork connections have been completed.

Important: *Do not connect water valve or pipe extensions to the water coil connections unless supported.*

Unit Accessibility

- Single-duct and dual-duct units provided with hot water reheat have an access panel located on the side of the water coil. All other single-duct and dual-duct units are provided without access, as all functioning components are external to the unit.
- Fan-powered terminals are provided with a sliding side access.
- Low-height terminal units have a removable bottom panel.

Clearances

For proper service, it is recommended that at least 36" of side clearance be provided to service and access single-duct and dual-duct terminals units.

- Fan-powered VAV units have a plenum inlet that must be clear of obstructions. Allow at least 36" of clearance in front of the side access and plenum opening.
- Low-height fan-powered terminals require the same plenum clearance requirement that applies to the standard fan-powered units. However the access to the internal components is located on the bottom of the unit.

It is also recommended that 6" of clearance be provided to the top and bottom of all the units.

Note: *The minimum clearance for controls and heater controls should be 36" for all models except units with 575-volt electric heaters, which require 48" of clearance. NEC and/or local codes override all clearance requirements.*

Actuator Mounting

Important: *When installing or replacing the actuator tighten the actuator set screw per the manufacturer's instructions. Failure to follow the manufacturer's specifications may result in unit malfunction.*

Trane offers a factory-mounted actuator with a 90-second drive time. The actuator drives 1 degree per second. A field-installed actuator may be used if desired. The actuator shaft has a ½-inch diameter and is designed to travel clockwise to close the damper and counter-clockwise to open the damper. There is an indicator on the end of the actuator shaft that can be used to determine the position of the damper.

Stand Alone UCM 4.2

When there is no communication to the UCM control and the unit is in the stand alone mode the control action is determined by the auxiliary temperature sensor located on TB3-5 and TB3-6 terminals on the UCM board. In order for the auxiliary sensor to determine the control action (heat, cool) it must be located in the supply duct. The auxiliary temperature is then compared to the zone temperature. If the supply air temperature is 10 degrees above the zone temperature, then the control action will be heat. If the supply air temperature is less than or equal to the zone temperature, then the control action will be cool. If the supply air temperature is between the zone temperature and the zone temperature + 10°F (5.5°C)(zone temperature < supply air temperature < zone temperature + 10°F) (5.5°C), the control action remains the same and the UCM controls to the minimum flow set point. If an auxiliary sensor is not installed the UCM will retain the last control action in effect.

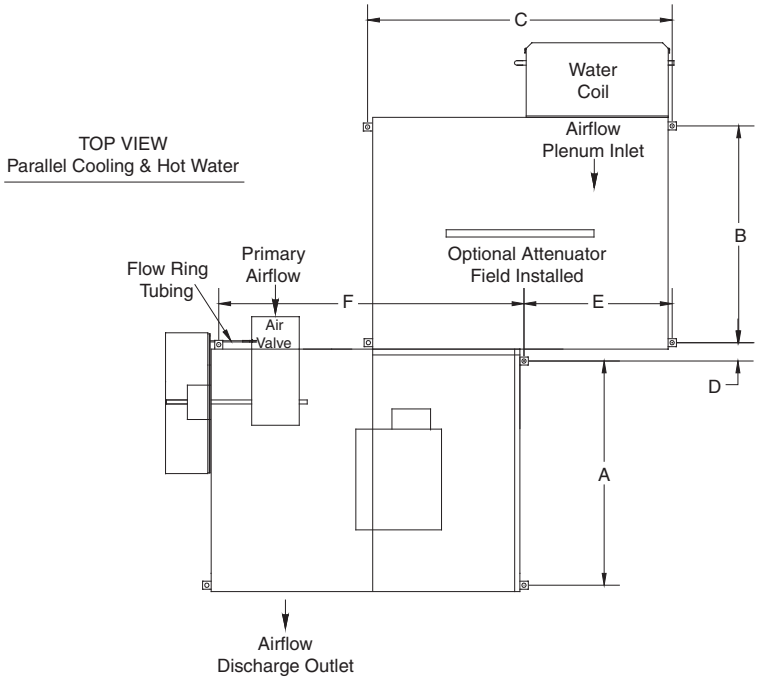
Stand Alone VV550 LonTalk™ Control

When there is no communication to the VV550 control and the unit is in the stand alone mode the control action is determined by the auxiliary temperature sensor located on TB3-5 and TB3-6 terminals on the VV550 board. The control must also be configured through the "Inputs Tab" of Analog Input 4 as "Primary Supply Air Sensor". In order for the auxiliary sensor to determine the control action (heat, cool) it must be located in the supply inlet of the duct. The auxiliary temperature is then compared to the zone temperature. If the supply air temperature is 10 degrees above the zone temperature, then the control action will be heat. If the supply air temperature is less than or equal to the zone temperature, then the control action will be cool. If the supply air temperature is between the zone temperature and the zone temperature + 10°F (5.5°C)(zone temperature < supply air temperature < zone temperature + 10°F) (5.5°C), the control action remains the same and the UCM controls to the minimum flow set point. If an auxiliary sensor is not installed the UCM will retain the last control action in effect.

Stand Alone UC400

When there is no communication to the UC400 control and the unit is in the stand alone mode the control action is determined by the auxiliary temperature sensor located on AI5 terminals on the UC400 control. This input may have to be changed from AI4 (Discharge Air Input) as wired from the factory. In order for the auxiliary sensor to determine the control action (heat, cool) it must be located in the supply inlet of the duct. The auxiliary temperature is then compared to the zone temperature. If the supply air temperature is 10 degrees above the zone temperature, then the control action will be heat. If the supply air temperature is less than or equal to the zone temperature, then the control action will be cool. If the supply air temperature is between the zone temperature and the zone temperature + 10°F (5.5°C)(zone temperature < supply air temperature < zone temperature + 10°F) (5.5°C), the control action remains the same and the UCM controls to the minimum flow set point. If an auxiliary sensor is not installed the UCM will retain the last control action in effect.

Figure 11. Parallel hanger bracket locations sizes



FAN SIZE	A	B	C	D	E	F
02SQ	26.75" (679 mm)	26.75" (679 mm)	41.154" (1041 mm)	3.25" (83 mm)	20.00" (508 mm)	38.95" (989 mm)
03SQ, 04SQ, 05SQ	29.75" (756 mm)	26.75" (679 mm)	41.154" (1041 mm)	3.25" (83 mm)	20.00" (508 mm)	38.95" (989 mm)
06SQ, 07SQ	36.75" (933 mm)	26.75" (679 mm)	41.154" (1041 mm)	3.25" (83 mm)	20.00" (508 mm)	38.95" (989 mm)

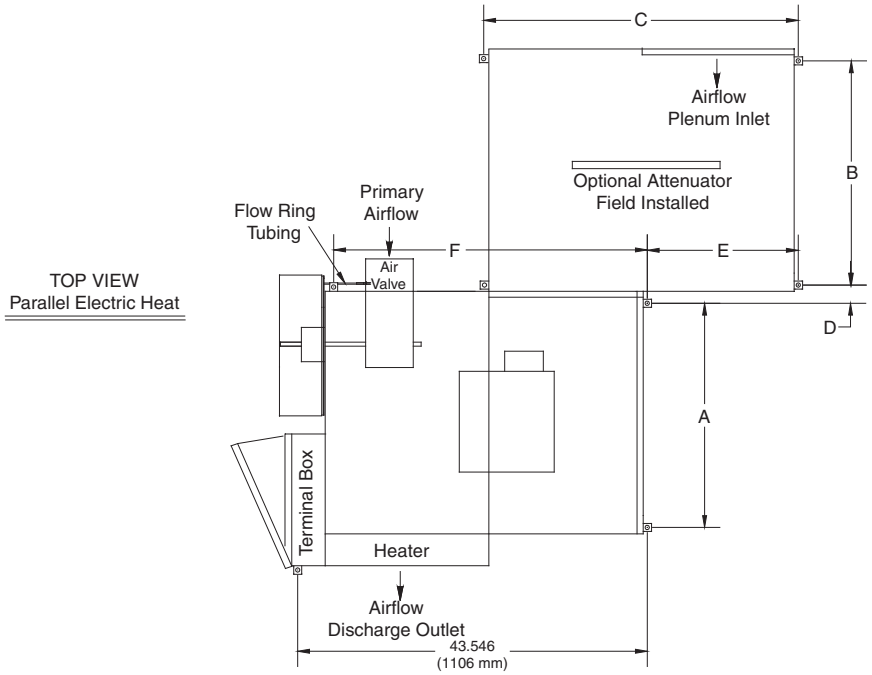
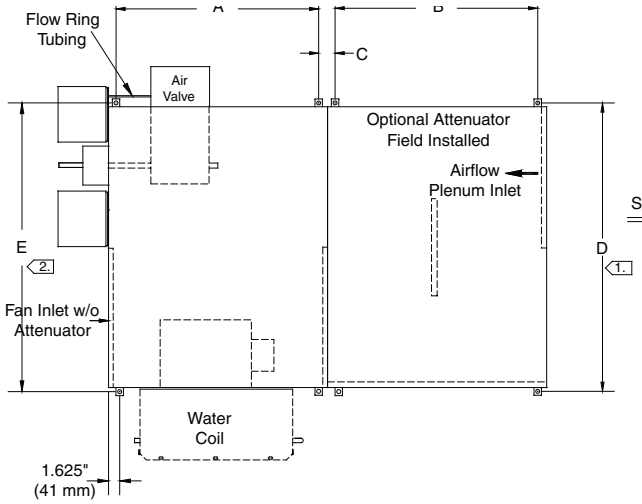


Figure 12. Series hanger bracket locations



FAN SIZE	A	B	C	D	E	F (Elec. Heat Only)	G (Elec. Heat Only)	J (Elec. Heat Only)
02SQ	18.75" (476 mm)	26.75" (679 mm)	3.25" (83 mm)	41.154" (1041 mm)	35.154 (740 mm)	20.132" (511 mm)	53.750" (1365 mm)	19.00" (483 mm)
03SQ, 04SQ	20.75" (527 mm)	26.75" (679 mm)	3.25" (83 mm)	41.154" (1041 mm)	41.154" (1041 mm)	23.875 (606 mm)	59.750" (1517 mm)	19.00" (483 mm)
05SQ	26.75" (679 mm)	26.75" (679 mm)	3.25" (83 mm)	41.154" (1041 mm)	41.154" (1041 mm)	28.966" (736 mm)	59.750" (1517 mm)	19.00" (483 mm)
06SQ, 07SQ	27.25" (692 mm)	26.75" (679 mm)	3.25" (83 mm)	41.154" (1041 mm)	41.154" (1041 mm)	29.875" (759 mm)	58.250" (1479 mm)	17.50" (445 mm)

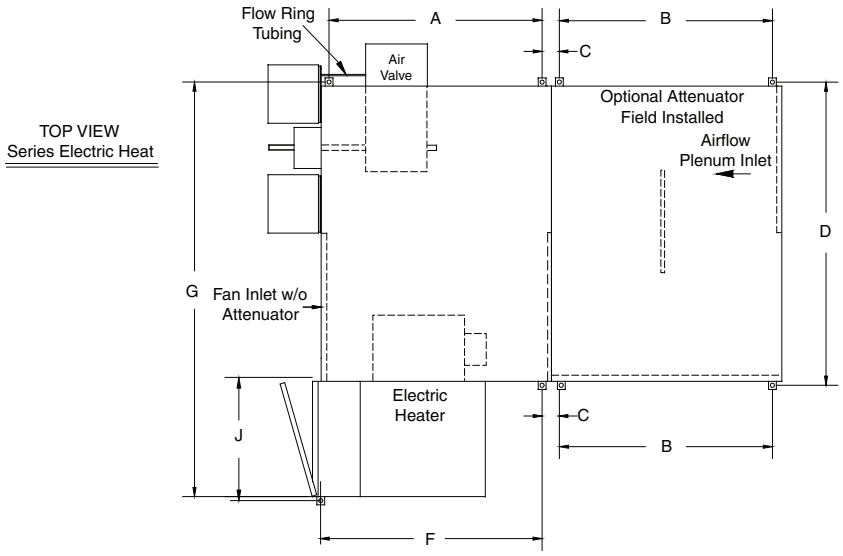
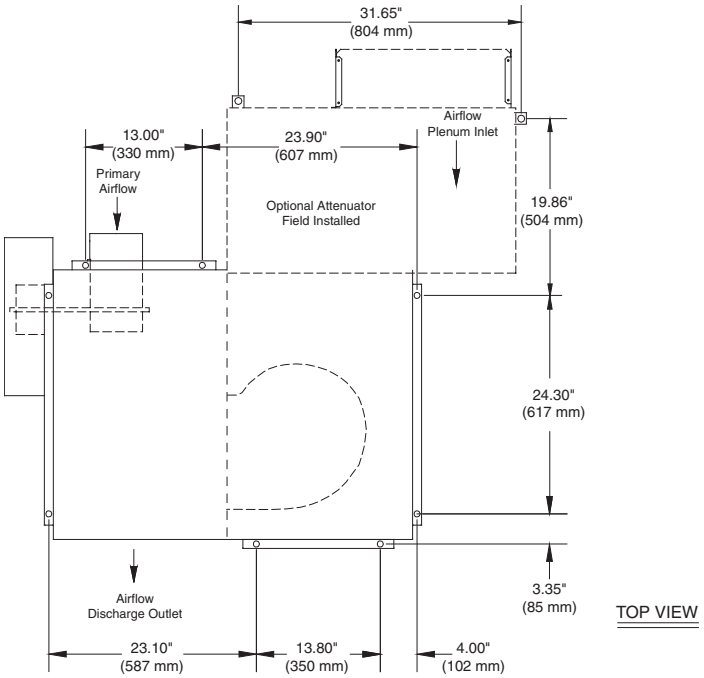


Figure 13. Low-height parallel 08SQ/09SQ w/hot water or electric heat



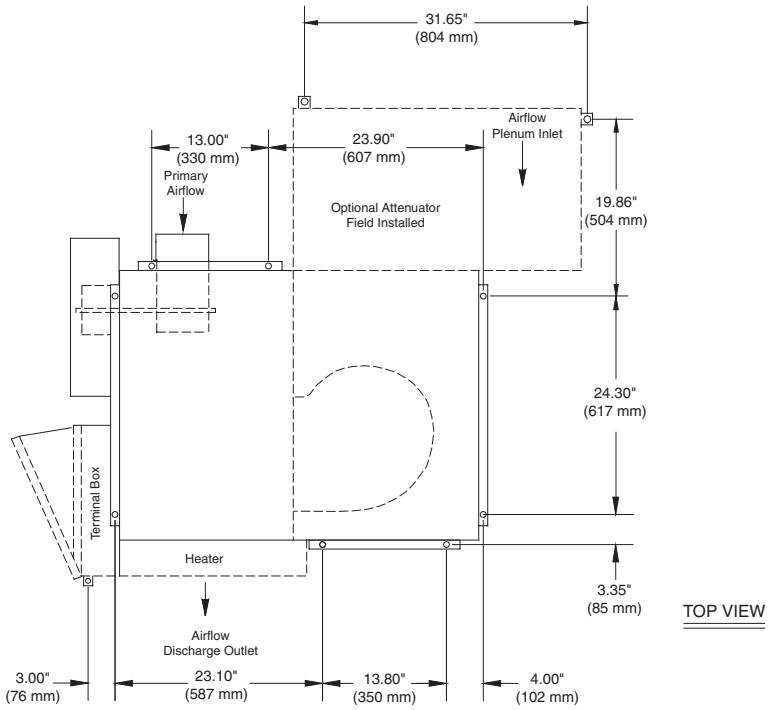


Figure 14. Low-height parallel 10SQ

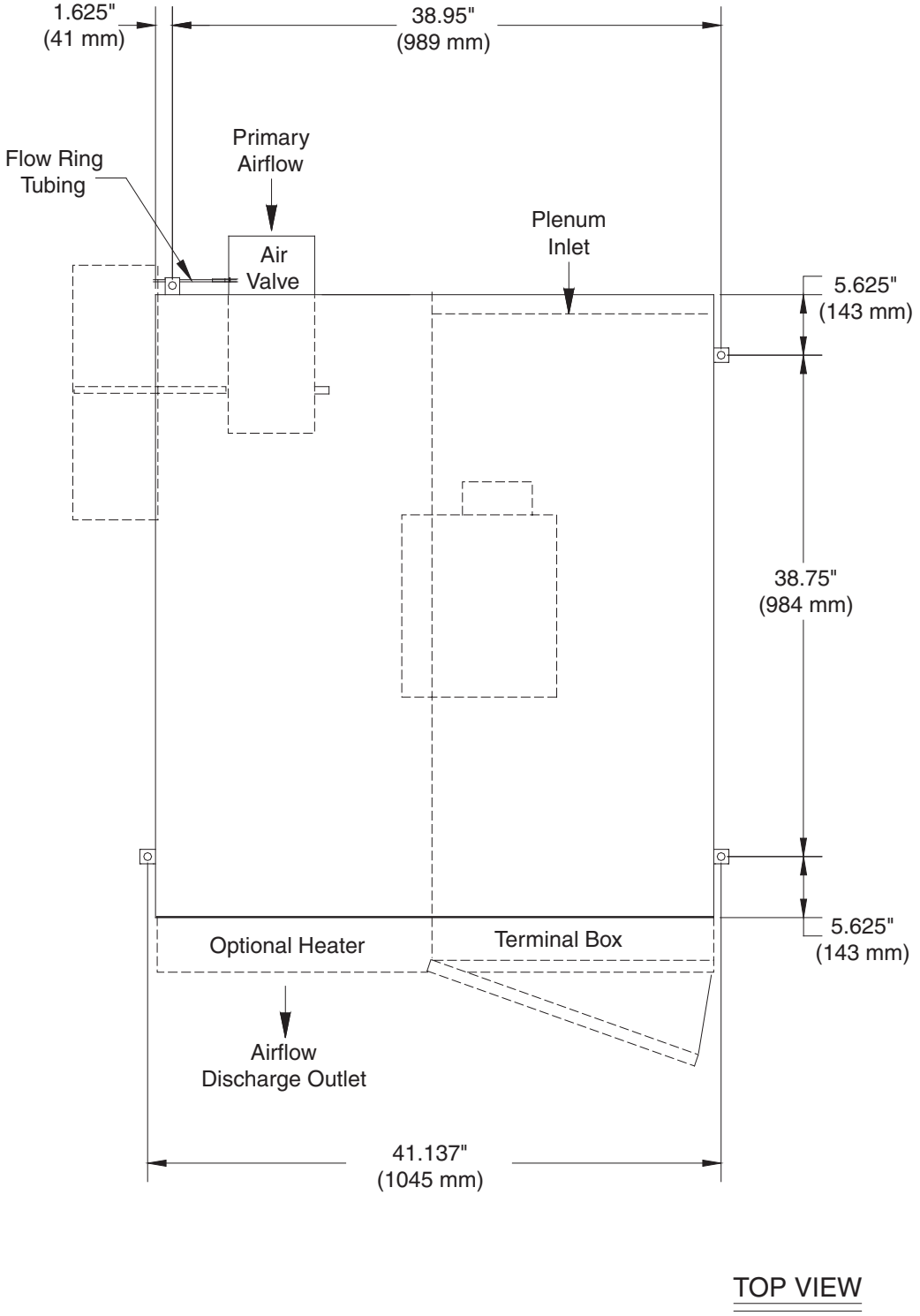


Figure 15. Low-height series 08SQ/09SQ w/hot water or electric heat

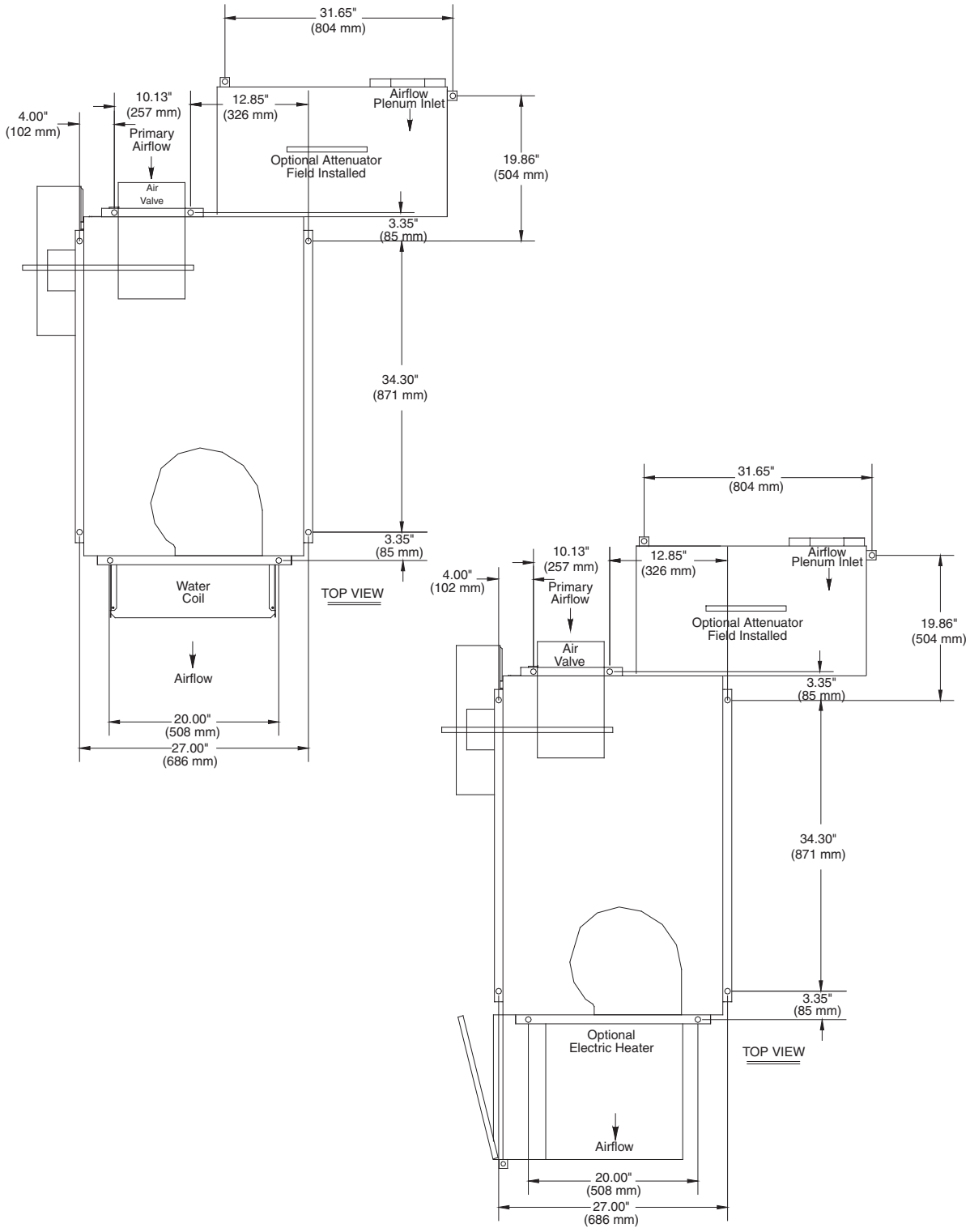
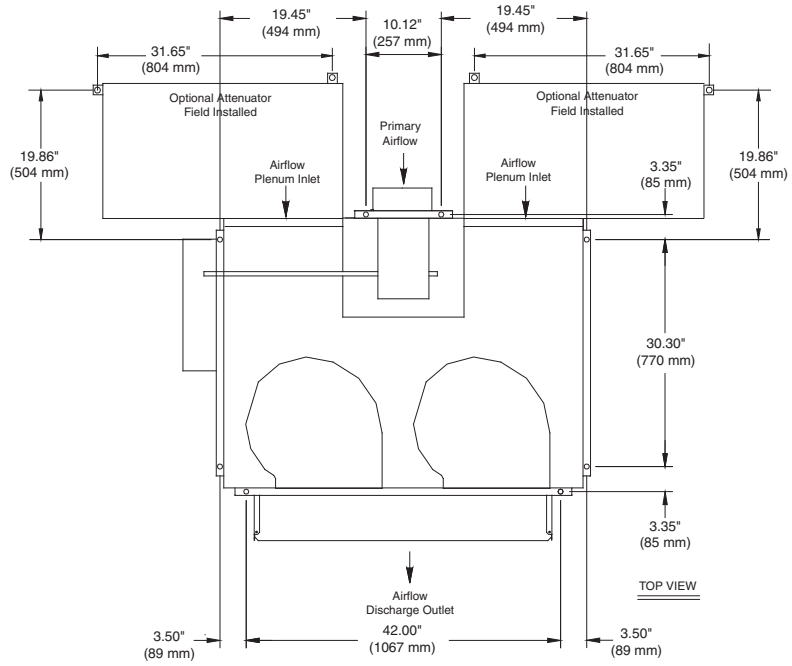


Figure 16. Low-height series 10SQ w/hot water or electric heat



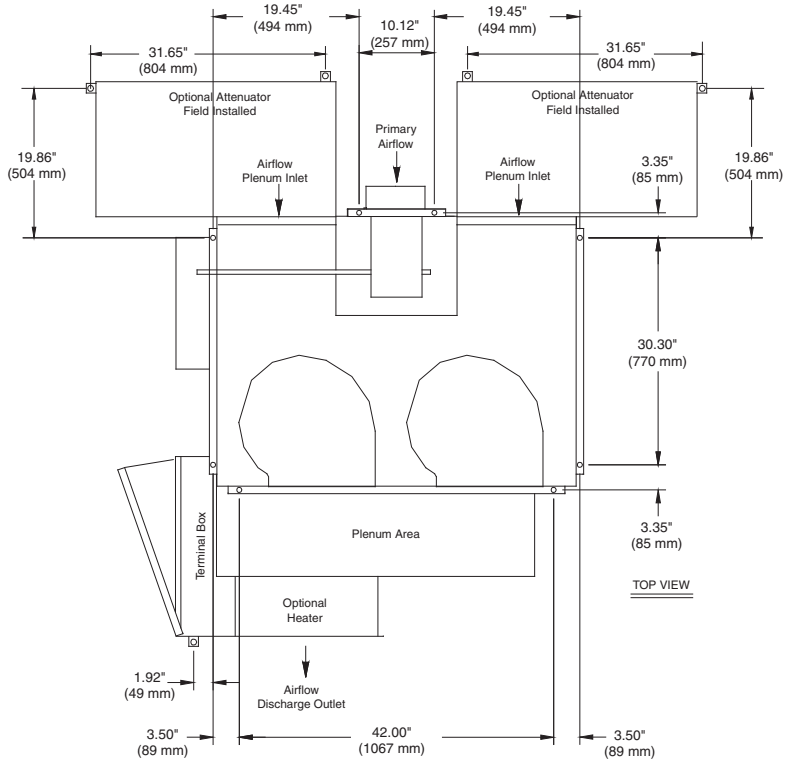
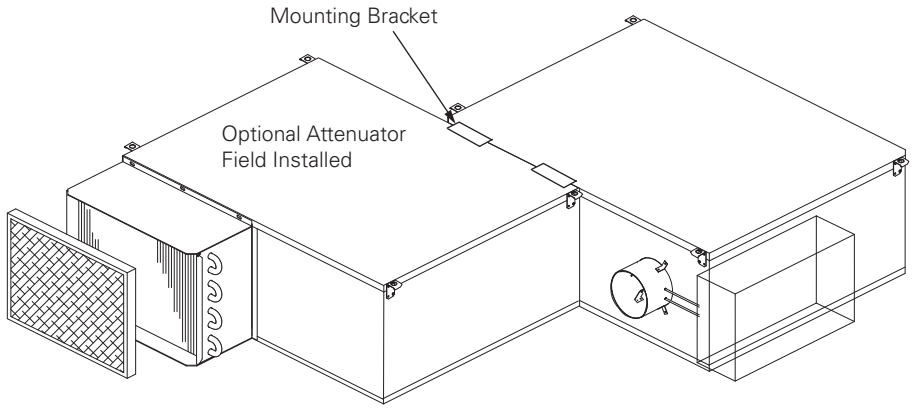


Figure 17. Attenuator installation - parallel units

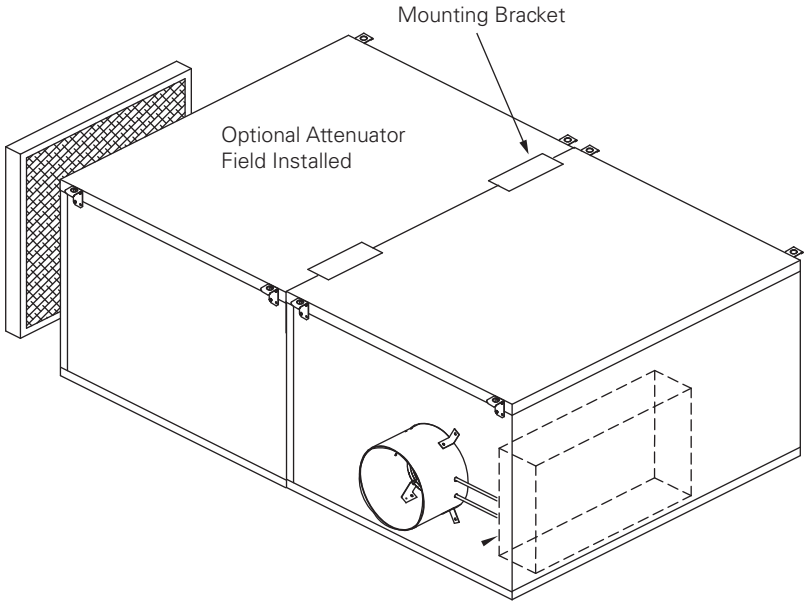
1. Attach attenuator as shown with provided mounting brackets.



Note: Bottom bracket not shown. Bottom bracket to be installed in same orientation on bottom of unit.

Figure 18. Attenuator installation - series units

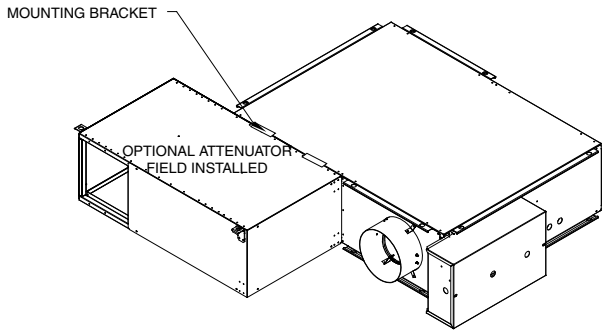
1. Attach attenuator as shown with provided mounting brackets.



Note: Bottom bracket not shown. Bottom bracket to be installed in same orientation on bottom of unit.

Figure 19. Attenuator installation - low-height parallel units

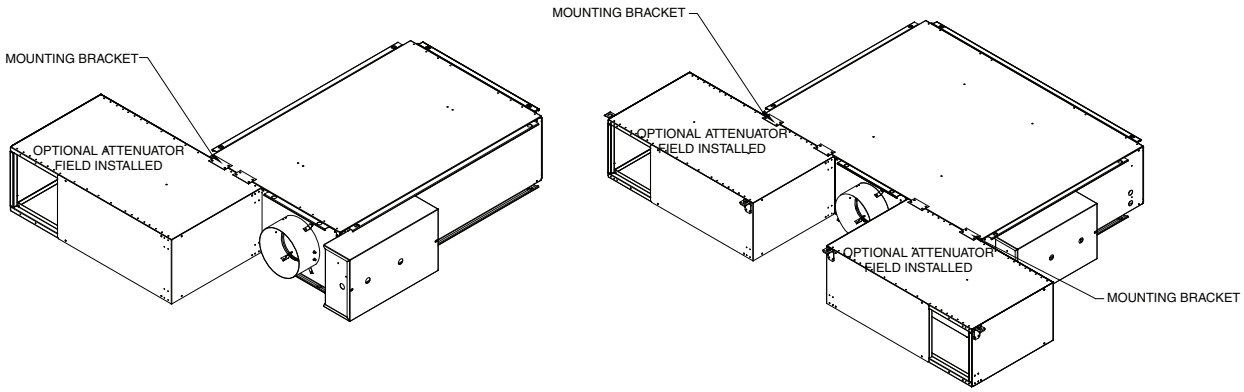
1. Attach attenuator to unit as shown with provided mounting brackets.



Notes: Bottom bracket not shown. Bottom bracket to be installed in same orientation on bottom of unit.

Figure 20. Attenuator installation - low-height series units

1. Attach attenuator to unit as shown with provided mounting brackets.



Note: Bottom bracket not shown. Bottom bracket to be installed in same orientation on bottom of unit.

Bottom Access

An optional bottom access can be provided in the casing of fan powered series or parallel terminal unit. See Figure 21.

The 22 ga. door is lined with 1" 26 ga. dual wall insulation and thermally lined with 1" – 1 lb. density fiberglass insulation with a 3.85 R-value.

Each door includes 4 to 6 cam locs that are used to secure the door to the casing.

The cam loc engages a metal encapsulated frame on the unit that encloses the unit insulation to prevent air erosion.

The cam loc engagements are interlocked using a flat head screwdriver. Once unlocked the entire door assembly can be removed for access.

Figure 21. Bottom access

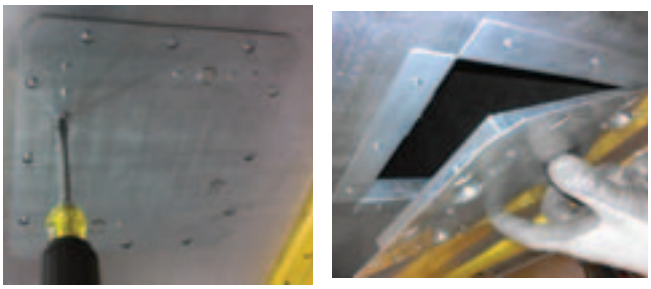


Table 1. Single-duct units

Unit Size	VCCF (lbs/kg)	VCCF w/ Dual Wall (lbs/kg)	VCEF (lbs/kg)	VCEF w/ Dual Wall (lbs/kg)	VCWF 1-Row (lbs/kg)	VCWF 2-Row (lbs/kg)	VCWF 3-Row (lbs/kg)	VCWF 4-Row (lbs/kg)	VCWF 1-Row w/ Dual Wall (lbs/kg)	VCWF 2-Row w/ Dual Wall (lbs/kg)	VCWF 3-Row w/ Dual Wall (lbs/kg)	VCWF 4-Row w/ Dual Wall (lbs/kg)
4	16/7	19/9	38/17	48/22	21/10	22/10	23/11	24/11	24/11	25/11	26/12	27/12
5	16/7	19/9	38/17	48/22	21/10	22/10	23/11	24/11	24/11	25/11	26/12	27/12
6	16/7	19/9	38/17	48/22	21/10	22/10	22/10	24/11	24/11	25/11	25/11	27/12
8	16/7	20/9	38/17	49/22	21/10	24/11	24/11	26/12	25/11	28/13	28/13	30/14
10	22/10	27/12	46/21	60/27	29/13	32/15	32/15	36/16	34/15	37/17	37/17	41/19
12	27/12	34/15	52/24	68/31	37/17	40/18	41/19	45/20	43/20	47/21	48/22	52/24
14	32/15	41/19	60/27	80/36	44/20	48/22	51/23	55/25	53/24	57/26	60/27	64/29
16	35/16	46/21	69/31	91/41	49/22	54/24	56/25	61/28	60/27	65/29	67/30	72/33
24	52/24	63/29	84/38	106/48	70/32	77/35	76/35	82/37	81/37	88/40	87/40	93/42

Table 2. Dual-duct units

Unit Size	VDDF (lbs/kg)	VDDF w/Dual Wall (lbs/kg)
0505	54/24	68/31
0506	54/24	68/31
0606	54/24	68/31
0508	55/25	68/31
0608	55/25	69/31
0510	56/25	69/31
0808	56/25	70/32
0610	56/25	70/32
0810	57/26	70/32
1010	61/28	74/34
0612	57/26	70/32
0812	58/26	71/32
1012	59/27	72/33
1212	60/27	84/38
0814	78/35	102/46
1014	79/36	103/47
1214	80/36	104/47
1414	81/37	105/48
0816	79/36	103/47
1016	80/36	104/47
1216	81/37	105/48
1416	82/37	105/48
1616	83/38	106/48

Table 3. Parallel fan-powered units

Unit Size	VPCF (lbs/kg)	VPCF w/Dual Wall (lbs/kg)	VPEF (lbs/kg)	VPEF w/Dual Wall (lbs/kg)	VPWF 1-Row (lbs/kg)	VPWF 2-Row (lbs/kg)	VPWF 1-Row w/Dual Wall (lbs/kg)	VPWF 2-Row w/Dual Wall (lbs/kg)	VPxF Attenuator (lbs/kg)
0502SQ	81/37	115/52	110/550	144/65	92/42	95/43	126/57	129/59	46/21
0602SQ	80/36	114/52	109/49	143/65	91/41	94/43	125/57	128/58	46/21
0603SQ	83/38	117/53	112/51	146/66	105/48	108/49	139/63	142/64	48/22
0802SQ	81/37	115/52	110/50	144/65	92/42	95/43	126/57	129/59	46/21
0803SQ	83/38	117/53	112/51	146/66	105/48	108/49	139/63	142/64	48/22
0804SQ	84/38	118/54	113/51	147/67	106/48	109/49	140/64	143/65	48/22
1002SQ	82/37	116/53	111/50	145/66	93/42	96/44	127/58	130/59	46/21
1003SQ	84/38	118/54	113/51	147/67	106/48	109/49	140/64	143/65	48/22
1004SQ	85/39	119/54	114/52	148/67	107/49	110/50	141/64	144/65	48/22
1005SQ	98/44	132/60	128/58	162/73	120/54	123/56	154/70	157/71	48/22
1006SQ	114/52	148/67	144/65	178/81	127/58	130/59	161/73	164/74	54/24
1007SQ	122/55	156/71	152/69	186/84	135/61	138/63	169/77	172/78	54/24
1203SQ	85/39	119/54	114/52	148/67	107/49	110/50	141/64	144/65	48/22
1204SQ	86/39	120/54	115/52	149/68	108/49	111/50	142/64	145/66	48/22
1205SQ	99/45	133/60	129/59	163/74	121/55	124/56	155/70	158/72	48/22
1206SQ	115/52	149/68	145/66	179/81	128/58	131/59	162/73	165/75	54/24
1207SQ	123/56	157/71	153/69	187/85	136/62	139/63	170/77	173/78	54/24
1404SQ	87/39	121/55	116/53	150/68	109/49	112/51	143/65	146/66	48/22
1405SQ	100/45	134/61	130/59	164/74	122/55	125/57	156/71	159/72	48/22
1406SQ	116/53	150/68	146/66	180/82	129/59	132/60	163/74	166/75	54/24
1407SQ	124/56	158/72	154/70	188/85	137/62	140/64	171/78	174/79	54/24
1606SQ	117/53	151/68	147/67	181/82	130/59	133/60	164/74	167/76	54/24
1607SQ	125/57	159/72	155/70	189/86	138/63	141/64	172/78	175/79	54/24

Table 4. Series fan-powered

Unit Size	VSCF (lbs/kg)	VSCF w/Dual Wall (lbs/kg)	VSEF (lbs/kg)	VSEF w/Dual Wall (lbs/kg)	VSWF 1-Row (lbs/kg)	VSWF 2-Row (lbs/kg)	VSWF 1-Row w/Dual Wall (lbs/kg)	VSWF 2-Row w/Dual Wall (lbs/kg)	VSxF Attenuator (lbs/kg)
0402SQ	78/35	93/42	104/47	119/54	85/39	87/39	100/45	102/46	46/21
0502SQ	78/35	93/42	104/47	119/54	85/39	87/39	100/45	102/46	46/21
0602SQ	77/35	92/42	103/47	118/54	84/38	86/39	99/45	101/46	46/21
0603SQ	76/34	100/45	105/48	129/59	88/40	92/42	112/51	116/53	48/22
0604SQ	87/39	111/50	116/53	140/64	99/45	103/47	123/56	127/58	48/22
0802SQ	79/36	94/43	105/48	120/54	86/39	88/40	101/46	103/47	46/21
0803SQ	77/35	101/46	106/48	130/59	89/40	93/42	113/51	117/53	48/22
0804SQ	88/40	112/51	117/53	141/64	100/45	104/47	124/56	128/58	48/22
1002SQ	81/37	96/44	107/49	122/55	88/40	90/41	103/47	105/48	46/21
1003SQ	80/36	104/47	109/49	133/60	92/42	96/44	116/53	120/54	48/22
1004SQ	91/41	115/52	120/54	144/65	103/47	107/49	127/58	131/59	48/22
1005SQ	92/42	116/53	121/55	145/66	104/47	108/49	128/58	132/60	48/22
1006SQ	104/47	133/60	135/61	164/74	119/54	124/56	148/67	153/69	54/24
1007SQ	117/53	146/66	148/67	177/80	132/60	137/62	161/73	166/75	54/24
1203SQ	82/37	106/48	111/50	135/61	94/43	98/44	118/54	122/55	48/22
1204SQ	92/42	116/53	121/55	145/66	104/47	108/49	128/58	132/60	48/22
1205SQ	94/43	118/54	123/56	147/67	106/48	110/50	130/59	134/61	48/22
1206SQ	105/48	134/61	136/62	165/75	120/54	125/57	149/68	154/70	54/24
1207SQ	118/54	147/67	149/68	178/81	133/60	138/63	162/73	167/76	54/24
1404SQ	93/42	117/53	122/55	146/66	105/48	109/49	129/59	133/60	48/22
1405SQ	96/44	120/54	125/57	149/68	108/49	112/51	132/60	136/62	48/22
1406SQ	106/48	135/61	137/62	166/75	121/55	126/57	150/68	155/70	54/24
1407SQ	119/54	148/67	150/68	179/81	134/61	139/63	163/74	168/76	54/24
1606SQ	107/49	136/62	138/63	167/76	122/55	127/58	151/68	156/71	54/24
1607SQ	120/54	149/68	151/68	180/82	135/61	140/64	164/74	169/77	54/24

Table 5. Low-height parallel units

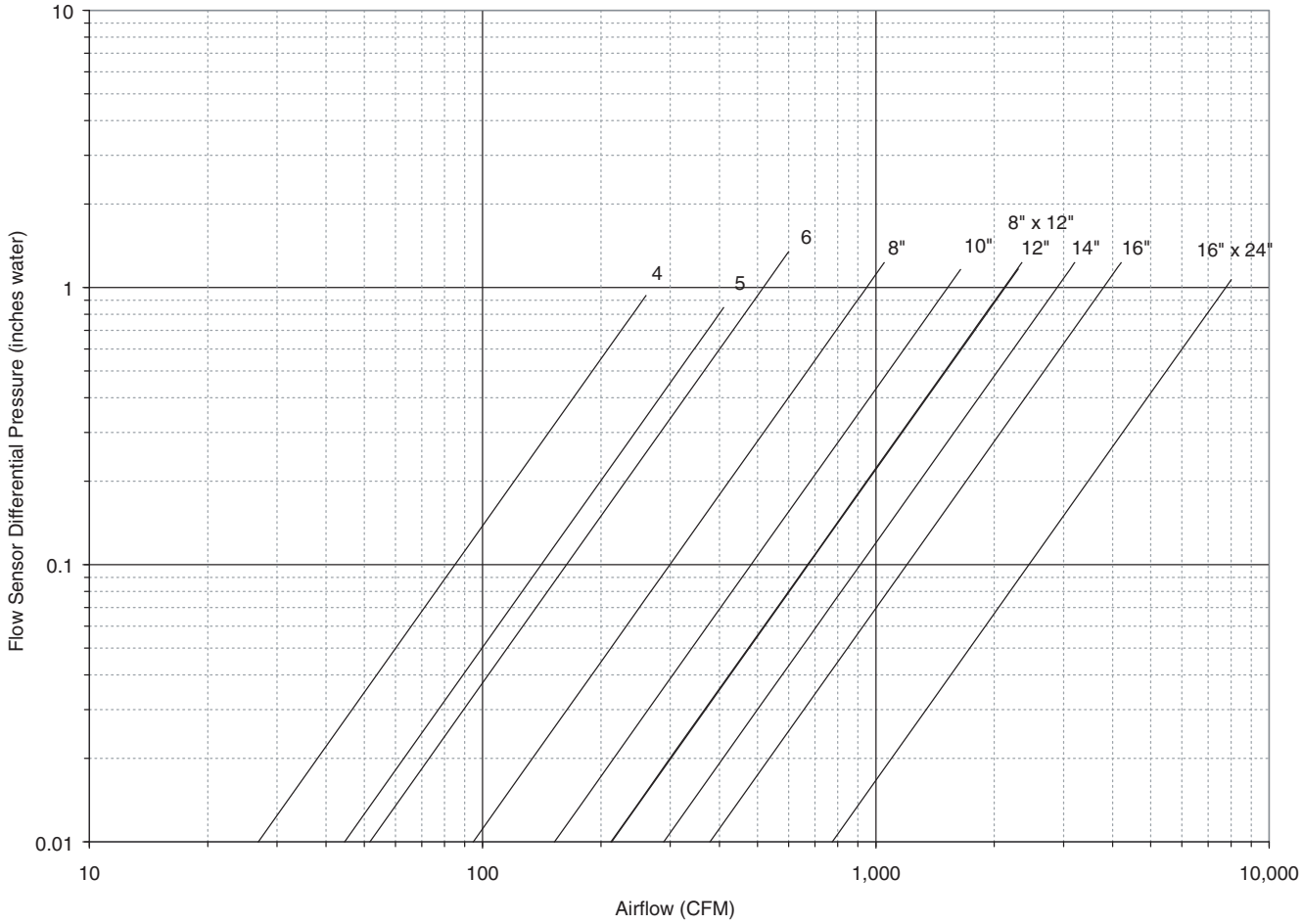
Unit Size	LPCF (lbs/kg)	LPCF w/ Dual Wall (lbs/kg)	LPEF (lbs/kg)	LPEF w/ Dual Wall (lbs/kg)	LPWF 1-Row (lbs/kg)	LPWF 2-Row (lbs/kg)	LPWF 1-Row w/ Dual Wall (lbs/kg)	LPWF 2-Row w/ DualWall (lbs/kg)	LPxF Attenuator (lbs/kg)
0508SQ	69/31	89/40	84/38	104/47	78/35	81/37	98/44	101/46	10/5
0608SQ	68/31	88/40	83/38	103/47	77/35	80/36	97/44	100/45	10/5
0609SQ	73/33	93/42	88/40	108/49	82/37	85/39	102/46	105/48	10/5
0808SQ	69/31	89/40	84/38	104/47	78/35	81/37	98/44	101/46	10/5
0809SQ	74/34	94/43	89/40	109/49	83/38	86/39	103/47	106/48	10/5
0810SQ	90/41	110/50	105/48	125/57	99/45	102/46	119/54	122/55	10/5
14RT09SQ	83/38	103/47	98/44	118/54	92/42	95/43	112/51	115/52	10/5
14RT10SQ	97/44	117/53	112/51	132/60	106/48	109/49	126/57	129/59	10/5

Table 6. Low-height series units

Unit Size	LSCF (lbs/kg)	LSCF w/ Dual Wall (lbs/kg)	LSEF (lbs/kg)	LSEF w/ Dual Wall (lbs/kg)	LSWF 1-Row (lbs/kg)	LSWF 2-Row (lbs/kg)	LSWF 1-Row w/ Dual Wall (lbs/kg)	LSWF 2-Row w/ Dual Wall (lbs/kg)	LSxF Attenuator (lbs/kg)
0508SQ	71/32	86/39	86/39	101/45	80/36	82/37	95/43	97/44	10/5
0608SQ	70/32	85/39	85/39	100/45	79/36	81/37	94/43	96/44	10/5
0609SQ	80/36	95/43	95/43	110/50	89/40	91/41	104/47	106/48	10/5
0808SQ	71/32	86/39	86/39	101/46	80/36	82/37	95/43	97/44	10/5
0809SQ	81/37	96/44	96/44	111/50	90/41	92/42	105/48	107/49	10/5
0810SQ	95/43	120/54	120/54	145/66	111/50	115/52	136/62	140/64	20/9
14RT09SQ	90/41	105/48	105/48	120/54	99/45	101/46	114/52	116/53	10/5
14RT10SQ	105/48	130/59	130/59	155/70	121/55	125/57	146/66	150/68	20/9

Unit Setup

Figure 22. Flow sensor ΔP vs. airflow delivery



Fan Motor Amperage

Table 7. Maximum ECM fan motor amperage (FLA)

Fan Size	HP VAC	115 VAC	277 VAV
Parallel / Series 03SQ	1/3	4.5	2.4
Parallel / Series 04SQ	1/2	6.5	3.5
Parallel / Series 05SQ	1	10.1	5.4
Parallel / Series 06SQ	1	9.5	5.1
Low-height Parallel / Series 08SQ	1/2	2.0	1.1
Low-height Parallel / Series 09SQ	1/2	6.7	3.6
Low-height Series 10SQ	2 x 1/2	7.5	4.0

Table 8. Maximum PSC fan motor amperage (FLA)

Fan Size	HP VAC	115 VAC	277 VAV	347 VAC	208
Parallel/Series 02SQ	1/8	1.6	0.7	.7	-
Parallel/Series 03SQ	1/3	4.3	1.6	1.4	-
Parallel/Series 04SQ	1/3	5.5	2.0	1.8	-
Parallel/Series 05SQ	1/2	6.7	2.4	2.2	-
Parallel/Series 06SQ	1/2	-	3.8	3.3	4.6
Parallel/Series 07SQ	1	-	4.7	3.8	6.6
Low-height Parallel/ Series 08SQ	1/3	5.5	2.5	1.8	-
Low-height Parallel/ Series 09SQ	1/3	5.5	2.5	1.8	-
Series Low-height 10SQ	2 x 1/8	11.0	5.0	3.5	-
Parallel Low-Height 10SQ	2 x 1/8	9.4	3.5	3.0	

(SCR) Motor Speed Control Adjustment Procedure.

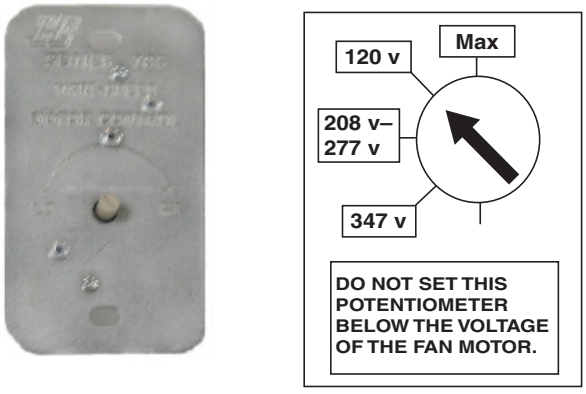
In order to make units more convenient and efficient to balance, an SCR (silicone control rectifier) is provided as standard on all fan-powered units.

The SCR is located on the side of the fan control box. To adjust the speed of the motor, the external knob must be rotated either clockwise or counterclockwise depending on the desired speed adjustment.

There is an internal potentiometer (Figure 23, p. 28) setting on the SCR controller that can be accessed by removing the control box cover. This internal potentiometer is set at the factory to the specific motor voltage.

It may be necessary to adjust this in the field depending on the building's power factor.

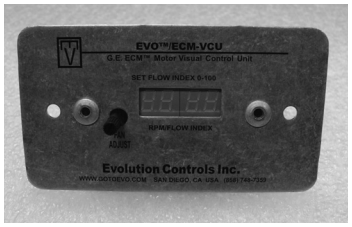
Figure 23. SCR (L) & internal potentiometer (R)



Note: *Do not set this potentiometer below the voltage of the fan motor.*

Electrically Commutated Motor (ECM)

Figure 24. ECM control board



Trane offers an energy efficient ECM motor as a motor option. Balancing of an ECM motor is accomplished through electronic control adjustments on the ECM control board (see Figure 24, p. 28). Potentiometer settings for a multitude of CFM settings are given in Table 9, p. 29 thru Table 21, p. 41. Other potentiometer settings can be determined either by interpolating from these tables or by using the following equation:

CFMsetting = CFMmin + {(Potentiometer Setting) x [(CFMmax - CFMmin)/100]}

There is an LED on the ECM control board, which will blink one time for every 100 CFM of motor setting. For example, the LED on a unit set for 790 CFM will blink 7 times. The LED on a unit set for 800 CFM will blink 8 times.

Note: *This feature only verifies that the CFM is set properly. This feature does not indicate at what speed the motor is actually running.*

The ECM must be "load tested." In other words, the fan must be connected to properly test the ECM.

Table 9. VPxF 03SQ ECM CFM

Motor Min CFM: 160 Motor Max CFM: 1085		
CFM	**L/sec**	**% Setting**
160	76	1
170	80	2
179	84	3
188	89	4
198	93	5
207	98	6
216	102	7
226	107	8
235	111	9
244	115	10
254	120	11
263	124	12
272	129	13
282	133	14
291	137	15
300	142	16
310	146	17
319	151	18
328	155	19
338	159	20
347	164	21
356	168	22
366	173	23
375	177	24
385	181	25
394	186	26
403	190	27
413	195	28
422	199	29
431	204	30
441	208	31
450	212	32
459	217	33
469	221	34
478	226	35
487	230	36
497	234	37
506	239	38
515	243	39
525	248	40
534	252	41
543	256	42
553	261	43
562	265	44
571	270	45
581	274	46
590	278	47
599	283	48
609	287	49
618	292	50
627	296	51
637	300	52
646	305	53
655	309	54
665	314	55

Table 9. VPxF 03SQ ECM CFM (continued)

Motor Min CFM: 160 Motor Max CFM: 1085		
CFM	**L/sec**	**% Setting**
674	318	56
683	323	57
693	327	58
702	331	59
711	336	60
721	340	61
730	345	62
739	349	63
749	353	64
758	358	65
767	362	66
777	367	67
786	371	68
795	375	69
805	380	70
814	384	71
823	389	72
833	393	73
842	397	74
852	402	75
861	406	76
870	411	77
880	415	78
889	419	79
898	424	80
908	428	81
917	433	82
926	437	83
936	442	84
945	446	85
954	450	86
964	455	87
973	459	88
982	464	89
992	468	90
1001	472	91
1010	477	92
1020	481	93
1029	486	94
1038	490	95
1048	494	96
1057	499	97
1066	503	98
1076	508	99
1085	512	100

Table 10. VPxF 04SQ ECM CFM

Motor Min CFM: 220 Motor Max CFM: 1510		
CFM	**L/sec**	**% Setting**
220	104	1
233	110	2
246	116	3
259	122	4
272	128	5
285	135	6
298	141	7
311	147	8
324	153	9
337	159	10
350	165	11
363	171	12
376	178	13
389	184	14
402	190	15
415	196	16
429	202	17
442	208	18
455	215	19
468	221	20
481	227	21
494	233	22
507	239	23
520	245	24
533	251	25
546	258	26
559	264	27
572	270	28
585	276	29
598	282	30
611	288	31
624	294	32
637	301	33
650	307	34
663	313	35
676	319	36
689	325	37
702	331	38
715	338	39
728	344	40
741	350	41
754	356	42
767	362	43
780	368	44
793	374	45
806	381	46
819	387	47
832	393	48
845	399	49
859	405	50
872	411	51
885	417	52
898	424	53
911	430	54
924	436	55

Table 10. VPxF 04SQ ECM CFM (continued)

Motor Min CFM: 220 Motor Max CFM: 1510		
CFM	**L/sec**	**% Setting**
937	442	56
950	448	57
963	454	58
976	461	59
989	467	60
1002	473	61
1015	479	62
1028	485	63
1041	491	64
1054	497	65
1067	504	66
1080	510	67
1093	516	68
1106	522	69
1119	528	70
1132	534	71
1145	540	72
1158	547	73
1171	553	74
1184	559	75
1197	565	76
1210	571	77
1223	577	78
1236	584	79
1249	590	80
1262	596	81
1275	602	82
1288	608	83
1302	614	84
1315	620	85
1328	627	86
1341	633	87
1354	639	88
1367	645	89
1380	651	90
1393	657	91
1406	663	92
1419	670	93
1432	676	94
1445	682	95
1458	688	96
1471	694	97
1484	700	98
1497	706	99
1510	713	100

Table 11. VPxF 05SQ ECM CFM

Motor Min CFM: 280 Motor Max CFM: 1850		
CFM	**L/sec**	**% Setting**
280	132	1
296	140	2
312	147	3
327	155	4
343	162	5
359	170	6
375	177	7
391	184	8
407	192	9
423	199	10
438	207	11
454	214	12
470	222	13
486	229	14
502	237	15
518	244	16
534	252	17
549	259	18
565	267	19
581	274	20
597	282	21
613	289	22
629	297	23
645	304	24
661	312	25
676	319	26
692	327	27
708	334	28
724	342	29
740	349	30
756	357	31
772	364	32
787	372	33
803	379	34
819	387	35
835	394	36
851	402	37
867	409	38
883	417	39
898	424	40
914	431	41
930	439	42
946	446	43
962	454	44
978	461	45
994	469	46
1009	476	47
1025	484	48
1041	491	49
1057	499	50
1073	506	51
1089	514	52
1105	521	53
1120	529	54
1136	536	55

Table 11. VPxF 05SQ ECM CFM (continued)

Motor Min CFM: 280 Motor Max CFM: 1850		
CFM	**L/sec**	**% Setting**
1152	544	56
1168	551	57
1184	559	58
1200	566	59
1216	574	60
1231	581	61
1247	589	62
1263	596	63
1279	604	64
1295	611	65
1311	619	66
1327	626	67
1342	634	68
1358	641	69
1374	649	70
1390	656	71
1406	664	72
1422	671	73
1438	678	74
1454	686	75
1469	693	76
1485	701	77
1501	708	78
1517	716	79
1533	723	80
1549	731	81
1565	738	82
1580	746	83
1596	753	84
1612	761	85
1628	768	86
1644	776	87
1660	783	88
1676	791	89
1691	798	90
1707	806	91
1723	813	92
1739	821	93
1755	828	94
1771	836	95
1787	843	96
1802	851	97
1818	858	98
1834	866	99
1850	873	100

Table 12. VPxF 06SQ ECM CFM

Motor Min CFM: 530 Motor Max CFM: 2100		
CFM	**L/sec**	**% Setting**
530	250	1
546	258	2
562	265	3
577	273	4
593	280	5
609	287	6
625	295	7
641	302	8
657	310	9
673	317	10
688	325	11
704	332	12
720	340	13
736	347	14
752	355	15
768	362	16
784	370	17
799	377	18
815	385	19
831	392	20
847	400	21
863	407	22
879	415	23
895	422	24
911	430	25
926	437	26
942	445	27
958	452	28
974	460	29
990	467	30
1006	475	31
1022	482	32
1037	490	33
1053	497	34
1069	505	35
1085	512	36
1101	520	37
1117	527	38
1133	535	39
1148	542	40
1164	549	41
1180	557	42
1196	564	43
1212	572	44
1228	579	45
1244	587	46
1259	594	47
1275	602	48
1291	609	49
1307	617	50
1323	624	51
1339	632	52
1355	639	53
1370	647	54
1386	654	55

Table 12. VPxF 06SQ ECM CFM (continued)

Motor Min CFM: 530 Motor Max CFM: 2100		
CFM	**L/sec**	**% Setting**
1402	662	56
1418	669	57
1434	677	58
1450	684	59
1466	692	60
1481	699	61
1497	707	62
1513	714	63
1529	722	64
1545	729	65
1561	737	66
1577	744	67
1592	752	68
1608	759	69
1624	767	70
1640	774	71
1656	782	72
1672	789	73
1688	796	74
1704	804	75
1719	811	76
1735	819	77
1751	826	78
1767	834	79
1783	841	80
1799	849	81
1815	856	82
1830	864	83
1846	871	84
1862	879	85
1878	886	86
1894	894	87
1910	901	88
1926	909	89
1941	916	90
1957	924	91
1973	931	92
1989	939	93
2005	946	94
2021	954	95
2037	961	96
2052	969	97
2068	976	98
2084	984	99
2100	991	100

Table 13. VSxF 03SQ ECM CFM

Motor Min CFM: 200 Motor Max CFM: 1100		
CFM	**L/sec**	**% Setting**
200	94	1
209	99	2
218	103	3
227	107	4
236	112	5
246	116	6
255	120	7
264	124	8
273	129	9
282	133	10
291	137	11
300	142	12
309	146	13
318	150	14
327	154	15
336	159	16
346	163	17
355	167	18
364	172	19
373	176	20
382	180	21
391	185	22
400	189	23
409	193	24
418	197	25
427	202	26
436	206	27
446	210	28
455	215	29
464	219	30
473	223	31
482	227	32
491	232	33
500	236	34
509	240	35
518	245	36
527	249	37
536	253	38
546	257	39
555	262	40
564	266	41
573	270	42
582	275	43
591	279	44
600	283	45
609	287	46
618	292	47
627	296	48
636	300	49
646	305	50
655	309	51
664	313	52
673	318	53
682	322	54
691	326	55

Table 13. VSxF 03SQ ECM CFM (continued)

Motor Min CFM: 200 Motor Max CFM: 1100		
CFM	**L/sec**	**% Setting**
700	330	56
709	335	57
718	339	58
727	343	59
736	348	60
745	352	61
755	356	62
764	360	63
773	365	64
782	369	65
791	373	66
800	378	67
809	382	68
818	386	69
827	390	70
836	395	71
845	399	72
855	403	73
864	408	74
873	412	75
882	416	76
891	420	77
900	425	78
909	429	79
918	433	80
927	438	81
936	442	82
945	446	83
955	451	84
964	455	85
973	459	86
982	463	87
991	468	88
1000	472	89
1009	476	90
1018	481	91
1027	485	92
1036	489	93
1045	493	94
1055	498	95
1064	502	96
1073	506	97
1082	511	98
1091	515	99
1100	519	100

Table 14. VSxF 04SQ ECM CFM

Motor Min CFM: 275 Motor Max CFM: 1500		
CFM	**L/sec**	**% Setting**
275	130	1
288	136	2
300	142	3
312	147	4
325	153	5
337	159	6
350	165	7
362	171	8
374	177	9
387	183	10
399	188	11
411	194	12
424	200	13
436	206	14
449	212	15
461	218	16
473	223	17
486	229	18
498	235	19
510	241	20
523	247	21
535	253	22
548	258	23
560	264	24
572	270	25
585	276	26
597	282	27
609	288	28
622	293	29
634	299	30
646	305	31
659	311	32
671	317	33
684	323	34
696	328	35
708	334	36
721	340	37
733	346	38
745	352	39
758	358	40
770	363	41
783	369	42
795	375	43
807	381	44
820	387	45
832	393	46
844	399	47
857	404	48
869	410	49
882	416	50
894	422	51
906	428	52
919	434	53
931	439	54
943	445	55

Table 14. VSxF 04SQ ECM CFM (continued)

Motor Min CFM: 275 Motor Max CFM: 1500		
CFM	**L/sec**	**% Setting**
956	451	56
968	457	57
980	463	58
993	469	59
1005	474	60
1018	480	61
1030	486	62
1042	492	63
1055	498	64
1067	504	65
1079	509	66
1092	515	67
1104	521	68
1117	527	69
1129	533	70
1141	539	71
1154	544	72
1166	550	73
1178	556	74
1191	562	75
1203	568	76
1215	574	77
1228	579	78
1240	585	79
1253	591	80
1265	597	81
1277	603	82
1290	609	83
1302	615	84
1314	620	85
1327	626	86
1339	632	87
1352	638	88
1364	644	89
1376	650	90
1389	655	91
1401	661	92
1413	667	93
1426	673	94
1438	679	95
1451	685	96
1463	690	97
1475	696	98
1488	702	99
1500	708	100

Table 15. VSxF 05SQ ECM CFM

Motor Min CFM: 350 Motor Max CFM: 2050		
CFM	**L/sec**	**% Setting**
350	165	1
367	173	2
385	181	3
402	190	4
419	198	5
436	206	6
453	214	7
470	222	8
488	230	9
505	238	10
522	246	11
539	254	12
556	263	13
573	271	14
591	279	15
608	287	16
625	295	17
642	303	18
659	311	19
676	319	20
694	327	21
711	335	22
728	344	23
745	352	24
762	360	25
779	368	26
797	376	27
814	384	28
831	392	29
848	400	30
865	408	31
882	416	32
900	425	33
917	433	34
934	441	35
951	449	36
968	457	37
985	465	38
1003	473	39
1020	481	40
1037	489	41
1054	498	42
1071	506	43
1088	514	44
1106	522	45
1123	530	46
1140	538	47
1157	546	48
1174	554	49
1192	562	50
1209	570	51
1226	579	52
1243	587	53
1260	595	54
1277	603	55

Table 15. VSxF 05SQ ECM CFM (continued)

Motor Min CFM: 350 Motor Max CFM: 2050		
CFM	**L/sec**	**% Setting**
1295	611	56
1312	619	57
1329	627	58
1346	635	59
1363	643	60
1380	651	61
1398	660	62
1415	668	63
1432	676	64
1449	684	65
1466	692	66
1483	700	67
1501	708	68
1518	716	69
1535	724	70
1552	732	71
1569	741	72
1586	749	73
1604	757	74
1621	765	75
1638	773	76
1655	781	77
1672	789	78
1689	797	79
1707	805	80
1724	814	81
1741	822	82
1758	830	83
1775	838	84
1792	846	85
1810	854	86
1827	862	87
1844	870	88
1861	878	89
1878	886	90
1895	895	91
1913	903	92
1930	911	93
1947	919	94
1964	927	95
1981	935	96
1998	943	97
2016	951	98
2033	959	99
2050	967	100

Table 16. VSxF 06SQ ECM CFM

Motor Min CFM: 700 Motor Max CFM: 2500		
CFM	**L/sec**	**% Setting**
700	330	1
718	339	2
737	348	3
755	356	4
773	365	5
791	373	6
809	382	7
827	391	8
846	399	9
864	408	10
882	416	11
900	425	12
918	433	13
937	442	14
955	451	15
973	459	16
991	468	17
1009	476	18
1027	485	19
1046	493	20
1064	502	21
1082	511	22
1100	519	23
1118	528	24
1137	536	25
1155	545	26
1173	554	27
1191	562	28
1209	571	29
1227	579	30
1246	588	31
1264	596	32
1282	605	33
1300	614	34
1318	622	35
1336	631	36
1355	639	37
1373	648	38
1391	656	39
1409	665	40
1427	674	41
1446	682	42
1464	691	43
1482	699	44
1500	708	45
1518	717	46
1536	725	47
1555	734	48
1573	742	49
1591	751	50
1609	759	51
1627	768	52
1646	777	53
1664	785	54
1682	794	55

Table 16. VSxF 06SQ ECM CFM (continued)

Motor Min CFM: 700 Motor Max CFM: 2500		
CFM	**L/sec**	**% Setting**
1700	802	56
1718	811	57
1736	820	58
1755	828	59
1773	837	60
1791	845	61
1809	854	62
1827	862	63
1846	871	64
1864	880	65
1882	888	66
1900	897	67
1918	905	68
1936	914	69
1955	922	70
1973	931	71
1991	940	72
2009	948	73
2027	957	74
2046	965	75
2064	974	76
2082	983	77
2100	991	78
2118	1000	79
2136	1008	80
2155	1017	81
2173	1025	82
2191	1034	83
2209	1043	84
2227	1051	85
2245	1060	86
2264	1068	87
2282	1077	88
2300	1085	89
2318	1094	90
2336	1103	91
2355	1111	92
2373	1120	93
2391	1128	94
2409	1137	95
2427	1146	96
2445	1154	97
2464	1163	98
2482	1171	99
2500	1180	100

Table 17. LPxF 08SQ ECM CFM

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
100	47	1
103	49	2
107	50	3
111	52	4
114	54	5
118	56	6
121	57	7
125	59	8
129	61	9
132	62	10
136	64	11
140	66	12
143	68	13
147	69	14
151	71	15
154	73	16
158	75	17
162	76	18
165	78	19
169	80	20
172	81	21
176	83	22
180	85	23
183	87	24
187	88	25
191	90	26
194	92	27
198	93	28
202	95	29
205	97	30
209	99	31
212	100	32
216	102	33
220	104	34
223	105	35
227	107	36
231	109	37
234	111	38
238	112	39
242	114	40
245	116	41
249	117	42
253	119	43
256	121	44
260	123	45
263	124	46
267	126	47
271	128	48
274	129	49
278	131	50
282	133	51
285	135	52
289	136	53
293	138	54
296	140	55

Table 17. LPxF 08SQ ECM CFM (continued)

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
300	142	56
303	143	57
307	145	58
311	147	59
314	148	60
318	150	61
322	152	62
325	154	63
329	155	64
333	157	65
336	159	66
340	160	67
344	162	68
347	164	69
351	166	70
354	167	71
358	169	72
362	171	73
365	172	74
369	174	75
373	176	76
376	178	77
380	179	78
384	181	79
387	183	80
391	184	81
394	186	82
398	188	83
402	190	84
405	191	85
409	193	86
413	195	87
416	196	88
420	198	89
424	200	90
427	202	91
431	203	92
435	205	93
438	207	94
442	209	95
445	210	96
449	212	97
453	214	98
456	215	99
460	217	100

Table 18. LPxF 09SQ ECM CFM

Motor Min CFM: 250 Motor Max CFM: 1025		
CFM	**L/sec**	**% Setting**
250	118	1
258	122	2
265	125	3
273	129	4
281	133	5
289	136	6
297	140	7
305	144	8
312	147	9
320	151	10
328	155	11
336	159	12
344	162	13
352	166	14
359	170	15
367	173	16
375	177	17
383	181	18
391	184	19
399	188	20
406	192	21
414	196	22
422	199	23
430	203	24
438	207	25
446	210	26
453	214	27
461	218	28
469	221	29
477	225	30
485	229	31
493	232	32
500	236	33
508	240	34
516	244	35
524	247	36
532	251	37
540	255	38
547	258	39
555	262	40
563	266	41
571	269	42
579	273	43
587	277	44
594	281	45
602	284	46
610	288	47
618	292	48
626	295	49
634	299	50
641	303	51
649	306	52
657	310	53
665	314	54
673	317	55

Table 18. LPxF 09SQ ECM CFM (continued)

Motor Min CFM: 250 Motor Max CFM: 1025		
CFM	**L/sec**	**% Setting**
680	321	56
688	325	57
696	329	58
704	332	59
712	336	60
720	340	61
727	343	62
735	347	63
743	351	64
751	354	65
759	358	66
767	362	67
774	365	68
782	369	69
790	373	70
798	377	71
806	380	72
814	384	73
821	388	74
829	391	75
837	395	76
845	399	77
853	402	78
861	406	79
868	410	80
876	414	81
884	417	82
892	421	83
900	425	84
908	428	85
915	432	86
923	436	87
931	439	88
939	443	89
947	447	90
955	450	91
962	454	92
970	458	93
978	462	94
986	465	95
994	469	96
1002	473	97
1009	476	98
1017	480	99
1025	484	100

Table 19. LSxF 08SQ ECM CFM

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
100	47	1
103	49	2
107	50	3
111	52	4
114	54	5
118	56	6
121	57	7
125	59	8
129	61	9
132	62	10
136	64	11
140	66	12
143	68	13
147	69	14
151	71	15
154	73	16
158	75	17
162	76	18
165	78	19
169	80	20
172	81	21
176	83	22
180	85	23
183	87	24
187	88	25
191	90	26
194	92	27
198	93	28
202	95	29
205	97	30
209	99	31
212	100	32
216	102	33
220	104	34
223	105	35
227	107	36
231	109	37
234	111	38
238	112	39
242	114	40
245	116	41
249	117	42
253	119	43
256	121	44
260	123	45
263	124	46
267	126	47
271	128	48
274	129	49
278	131	50
282	133	51
285	135	52
289	136	53
293	138	54
296	140	55

Table 19. LSxF 08SQ ECM CFM (continued)

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
300	142	56
303	143	57
307	145	58
311	147	59
314	148	60
318	150	61
322	152	62
325	154	63
329	155	64
333	157	65
336	159	66
340	160	67
344	162	68
347	164	69
351	166	70
354	167	71
358	169	72
362	171	73
365	172	74
369	174	75
373	176	76
376	178	77
380	179	78
384	181	79
387	183	80
391	184	81
394	186	82
398	188	83
402	190	84
405	191	85
409	193	86
413	195	87
416	196	88
420	198	89
424	200	90
427	202	91
431	203	92
435	205	93
438	207	94
442	209	95
445	210	96
449	212	97
453	214	98
456	215	99
460	217	100

Table 20. LSxF 09SQ ECM CFM

Motor Min CFM: 240 Motor Max CFM: 950		
CFM	**L/sec**	**% Setting**
240	113	1
247	117	2
255	120	3
262	123	4
269	127	5
276	130	6
283	134	7
290	137	8
298	140	9
305	144	10
312	147	11
319	151	12
326	154	13
333	157	14
341	161	15
348	164	16
355	167	17
362	171	18
369	174	19
376	178	20
384	181	21
391	184	22
398	188	23
405	191	24
412	195	25
419	198	26
427	201	27
434	205	28
441	208	29
448	211	30
455	215	31
462	218	32
470	222	33
477	225	34
484	228	35
491	232	36
498	235	37
505	239	38
513	242	39
520	245	40
527	249	41
534	252	42
541	255	43
548	259	44
556	262	45
563	266	46
570	269	47
577	272	48
584	276	49
592	279	50
599	283	51
606	286	52
613	289	53
620	293	54
627	296	55

Table 20. LSxF 09SQ ECM CFM (continued)

Motor Min CFM: 240 Motor Max CFM: 950		
CFM	**L/sec**	**% Setting**
635	299	56
642	303	57
649	306	58
656	310	59
663	313	60
670	316	61
678	320	62
685	323	63
692	327	64
699	330	65
706	333	66
713	337	67
721	340	68
728	343	69
735	347	70
742	350	71
749	354	72
756	357	73
764	360	74
771	364	75
778	367	76
785	371	77
792	374	78
799	377	79
807	381	80
814	384	81
821	387	82
828	391	83
835	394	84
842	398	85
850	401	86
857	404	87
864	408	88
871	411	89
878	415	90
885	418	91
893	421	92
900	425	93
907	428	94
914	431	95
921	435	96
928	438	97
936	442	98
943	445	99
950	448	100

Table 21. LSxF 10SQ ECM CFM

Motor Min CFM: 400 Motor Max CFM: 1800		
CFM	**L/sec**	**% Setting**
400	189	1
414	196	2
428	202	3
443	209	4
457	216	5
471	222	6
485	229	7
499	236	8
513	242	9
527	249	10
542	256	11
556	262	12
570	269	13
584	276	14
598	282	15
612	289	16
626	296	17
641	302	18
655	309	19
669	316	20
683	322	21
697	329	22
711	336	23
725	342	24
740	349	25
754	356	26
768	362	27
782	369	28
796	376	29
810	382	30
824	389	31
838	396	32
853	402	33
867	409	34
881	416	35
895	422	36
909	429	37
923	436	38
937	442	39
952	449	40
966	456	41
980	462	42
994	469	43
1008	476	44
1022	482	45
1036	489	46
1051	496	47
1065	502	48
1079	509	49
1093	516	50
1107	523	51
1121	529	52
1135	536	53
1150	543	54
1164	549	55

Table 21. LSxF 10SQ ECM CFM (continued)

Motor Min CFM: 400 Motor Max CFM: 1800		
CFM	**L/sec**	**% Setting**
1178	556	56
1192	563	57
1206	569	58
1220	576	59
1234	583	60
1249	589	61
1263	596	62
1277	603	63
1291	609	64
1305	616	65
1319	623	66
1333	629	67
1348	636	68
1362	643	69
1376	649	70
1390	656	71
1404	663	72
1418	669	73
1432	676	74
1447	683	75
1461	689	76
1475	696	77
1489	703	78
1503	709	79
1517	716	80
1531	723	81
1545	729	82
1560	736	83
1574	743	84
1588	749	85
1602	756	86
1616	763	87
1630	769	88
1644	776	89
1659	783	90
1673	789	91
1687	796	92
1701	803	93
1715	809	94
1729	816	95
1743	823	96
1758	829	97
1772	836	98
1786	843	99
1800	850	100

Wiring Diagrams

Note: *See programming guides listed below for detailed wiring information on the following:*

UCM 4.2: *VAV-SVX01*-EN* ***UC400:*** *VAV-SVX07*-EN* ***VV550:*** *VAV-SVP01*-EN*

Heaters with Contactors

Figure 25. Single-duct units (typical of single phase voltages - 1 leg)

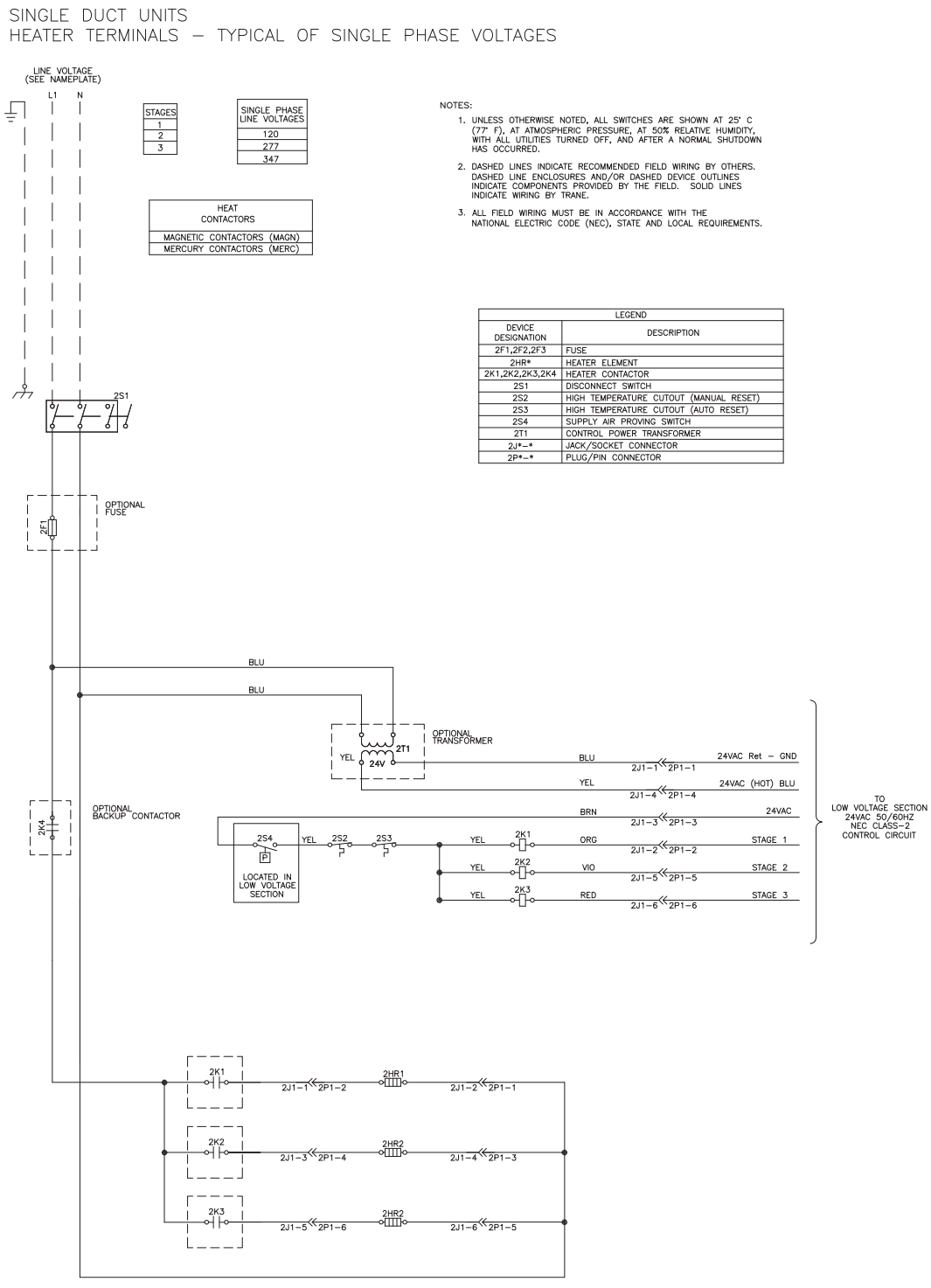


Figure 26. Single-duct units (typical of single phase voltages - 2 leg)

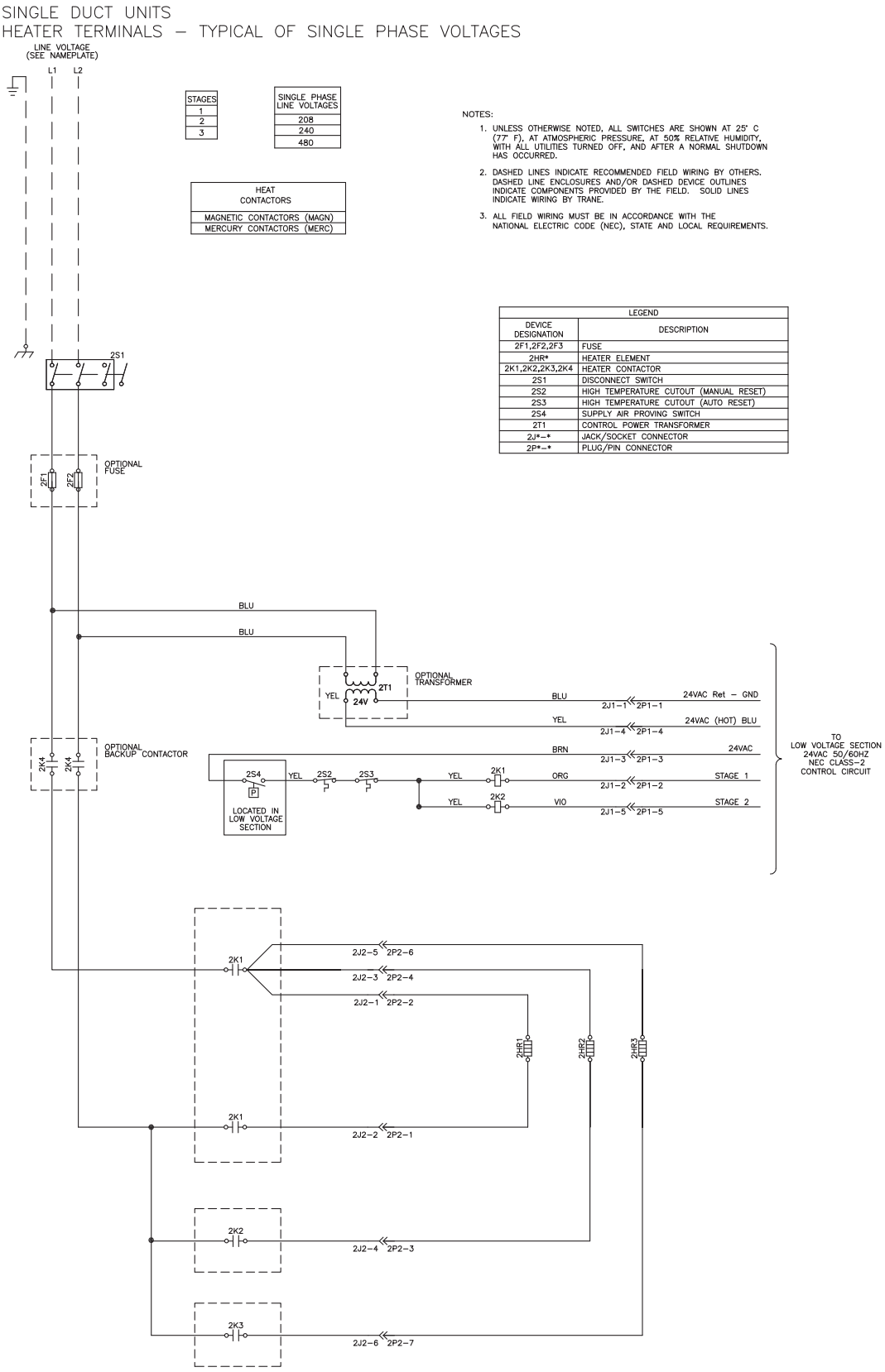


Figure 27. Single-duct units (typical of three phase voltages)

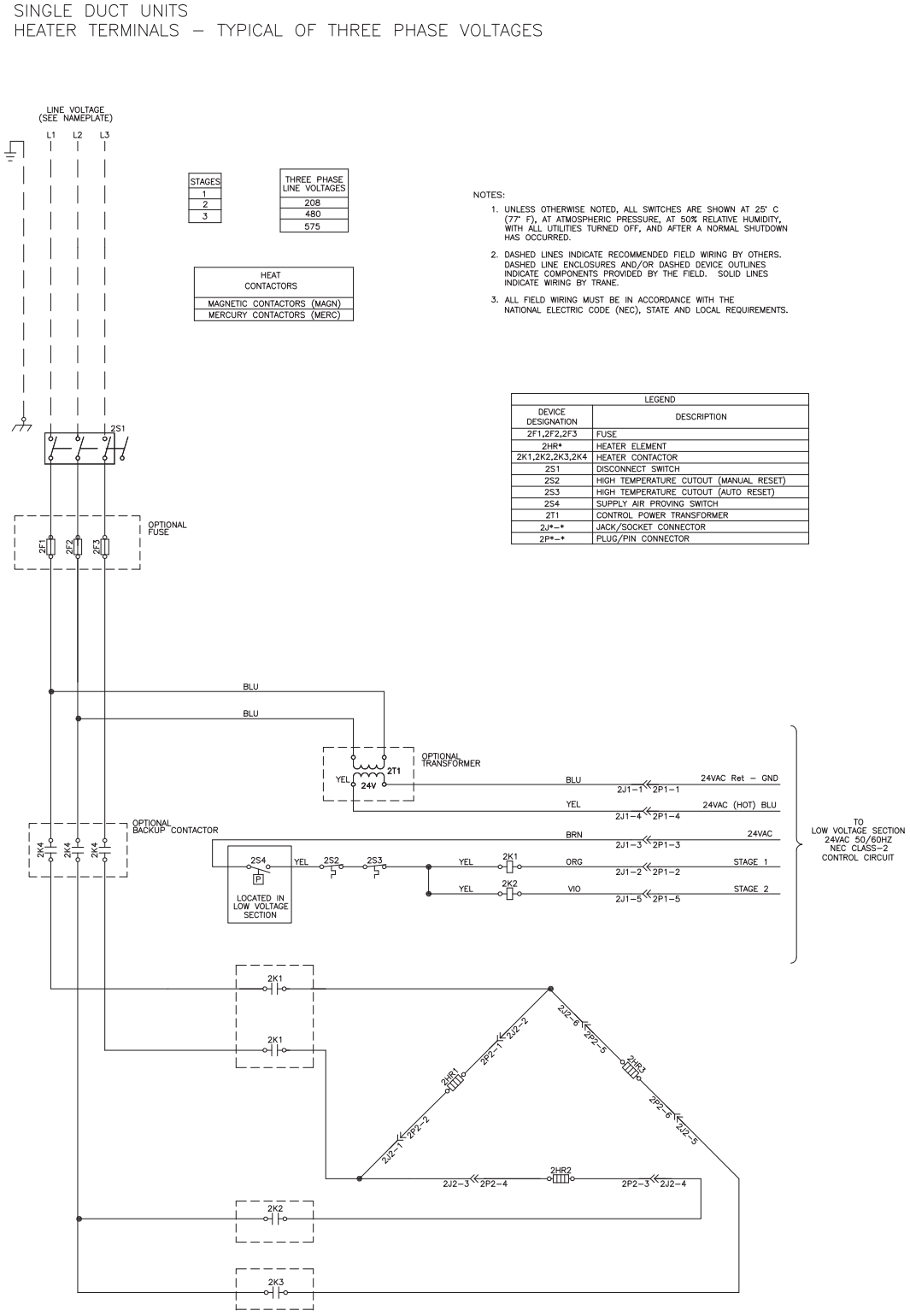


Figure 28. Fan-powered units (electronic or DDC/UCM)

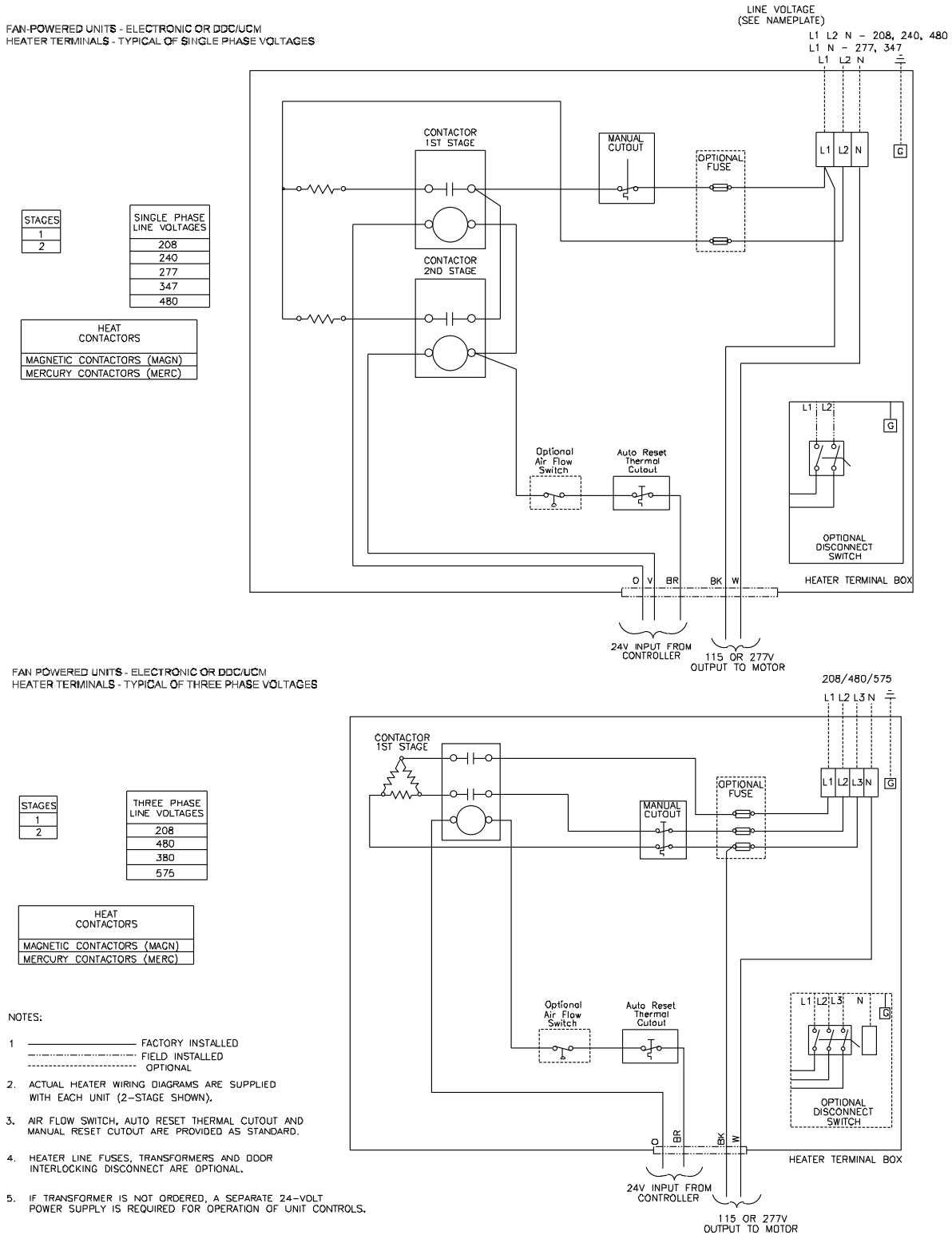


Figure 29. Fan-powered units (pneumatic controls)

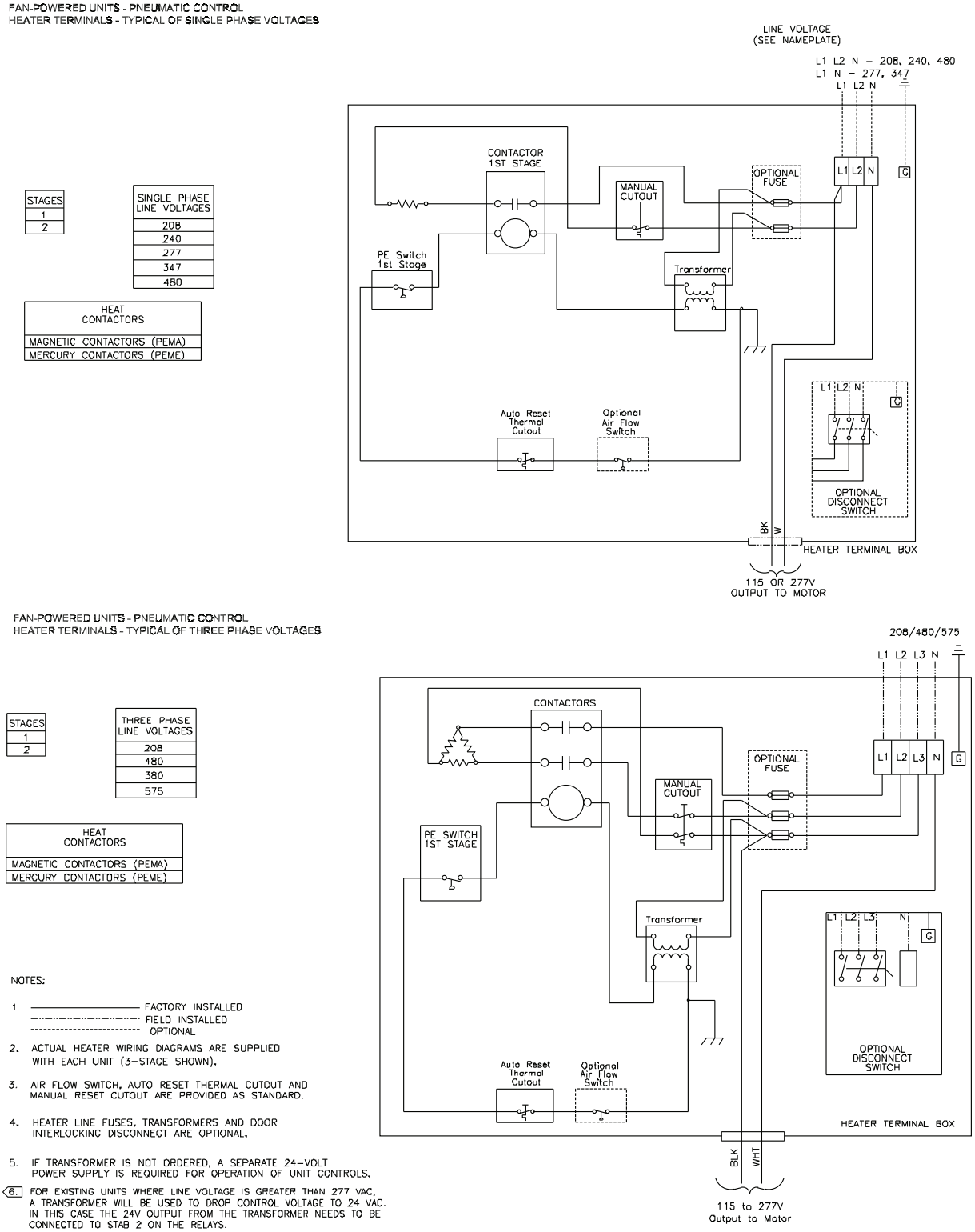
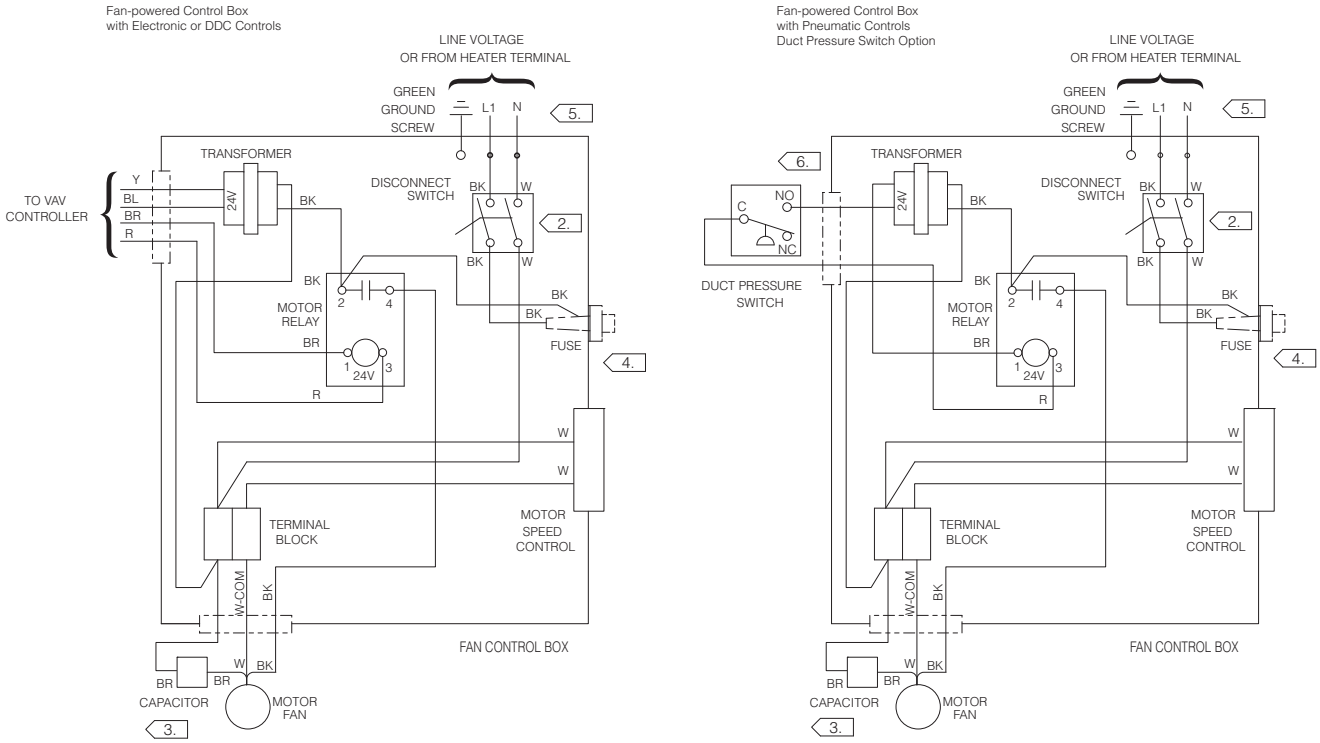
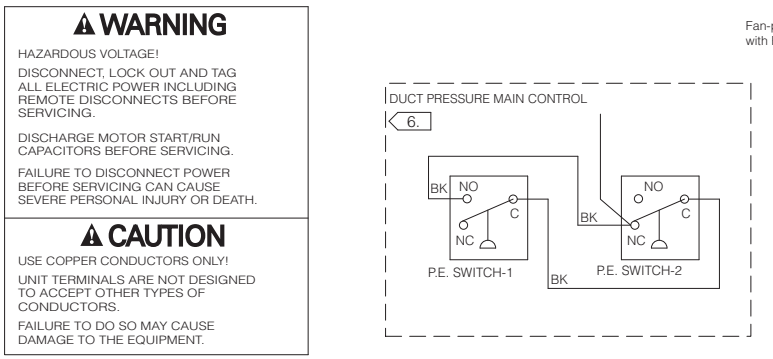
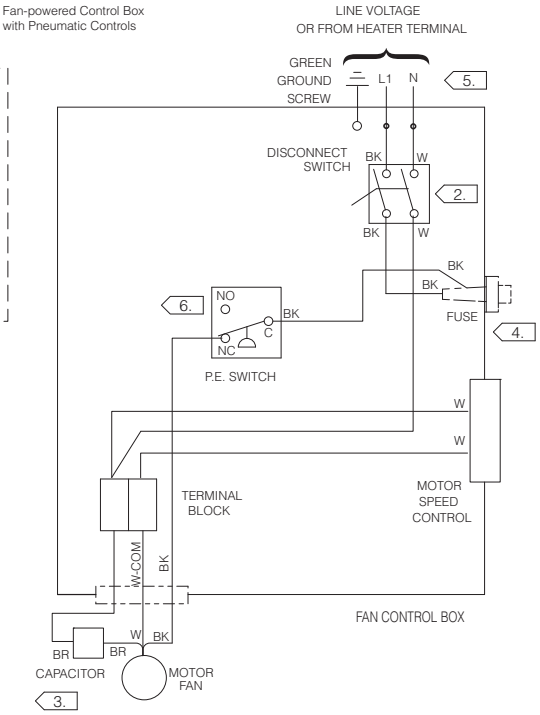


Figure 30. Fan-powered control boxes







NOTES:

1. ———— FACTORY INSTALLED
   - - - - - - - - - BY OTHERS
   - - - - - - - - - - OPTIONAL OR ALTERNATE CIRCUITRY

2. DISCONNECT SWITCH, FUSE, & SCR ARE LOCATED EXTERNAL TO CONTROL BOX.

3. CAPACITOR IS INSTALLED ON FAN HOUSING.

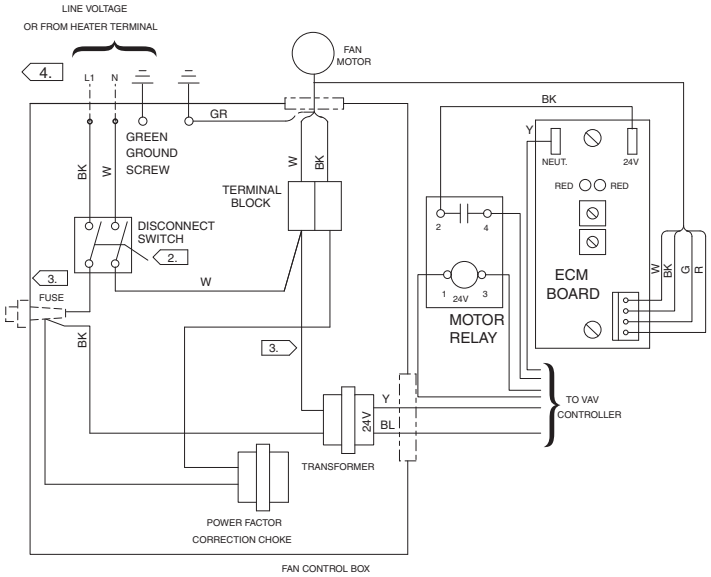
4. FUSE IS OPTIONAL.

5. DETERMINED BY MOTOR VOLTAGE ON ORDER. VOLTAGE FOUND ON UNIT NAMEPLATE.

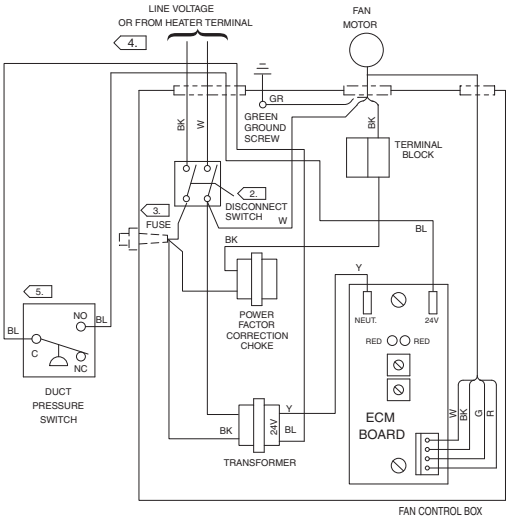
6. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

Figure 31. Fan-powered units with ECM

Fan-powered Control Box w/ ECM with Electronic or DDC Controls
(Depending on the size of the unit, the ECM board may or may not be located in the fan control box.)



Fan-powered Control Box w/ ECM with Pneumatic Controls
Duct Pressure Switch Option



⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT, LOCK OUT AND TAG ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

DISCHARGE MOTOR START/RUN CAPACITORS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

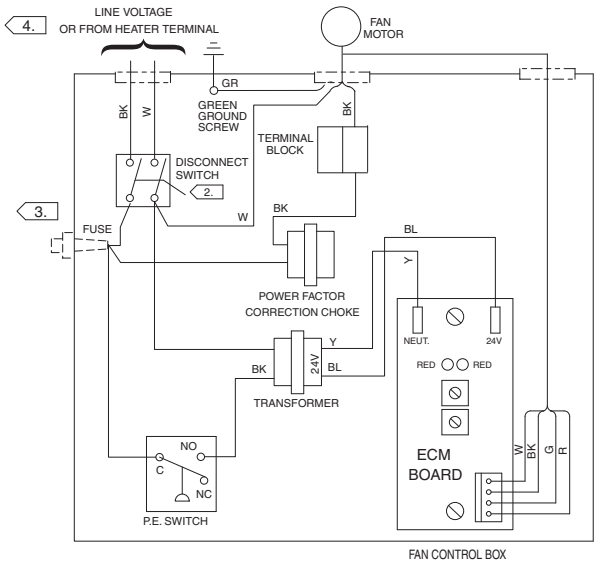
⚠ CAUTION

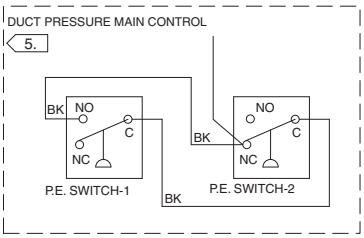
USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

Fan-powered Control Box with Pneumatic Controls





NOTES:

1. ———— FACTORY INSTALLED
   - - - - - - - - - BY OTHERS
   - - - - - - - - - - OPTIONAL OR ALTERNATE CIRCUITRY

2. DISCONNECT SWITCH, FUSE, & SCR ARE LOCATED EXTERNAL TO CONTROL BOX.

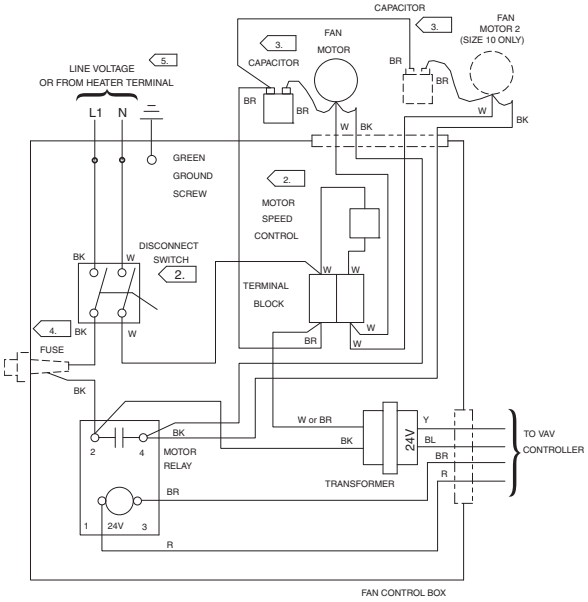
3. FUSE IS OPTIONAL.

4. DETERMINED BY MOTOR VOLTAGE ON ORDER. VOLTAGE FOUND ON UNIT NAMEPLATE.

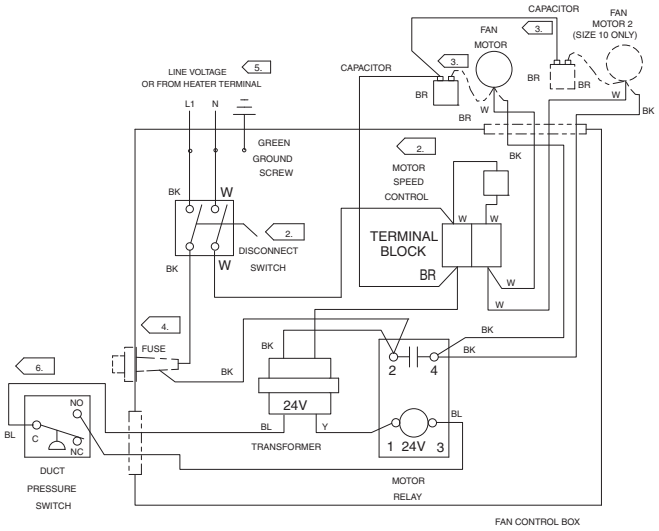
5. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

Figure 32. Fan-powered low-height units

Fan-Powered Low-Height Control Box with Electronic or DDC Controls



Fan-Powered Low-Height Control Box with Pneumatic Controls
Duct Pressure Switch Option



⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT, LOCK OUT AND TAG ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

DISCHARGE MOTOR START/RUN CAPACITORS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

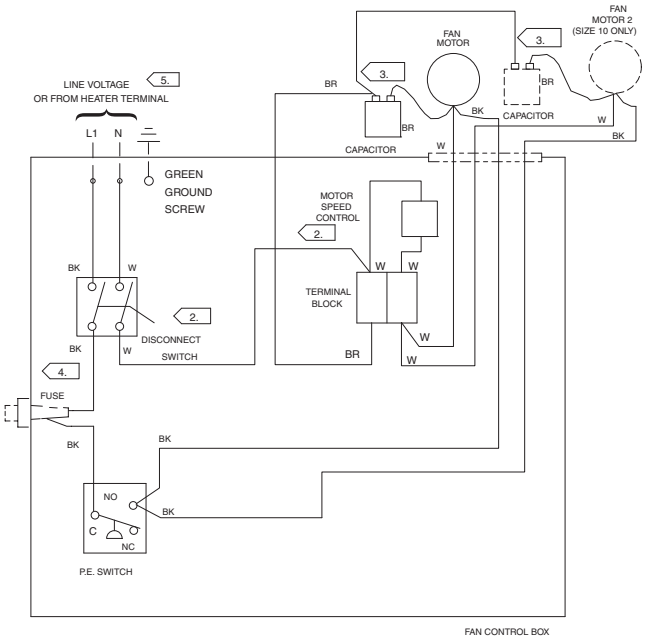
⚠ CAUTION

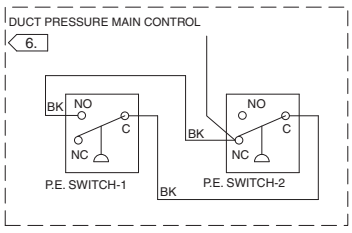
USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

Fan-Powered Low-Height Control Box with Pneumatic Controls





NOTES:

1. ———— FACTORY INSTALLED
   - - - - - - - - - BY OTHERS
   ---–---–--- OPTIONAL OR ALTERNATE CIRCUITRY

2. DISCONNECT SWITCH, FUSE, & SCR ARE LOCATED EXTERNAL TO CONTROL BOX.

3. CAPACITOR IS INSTALLED ON FAN HOUSING.

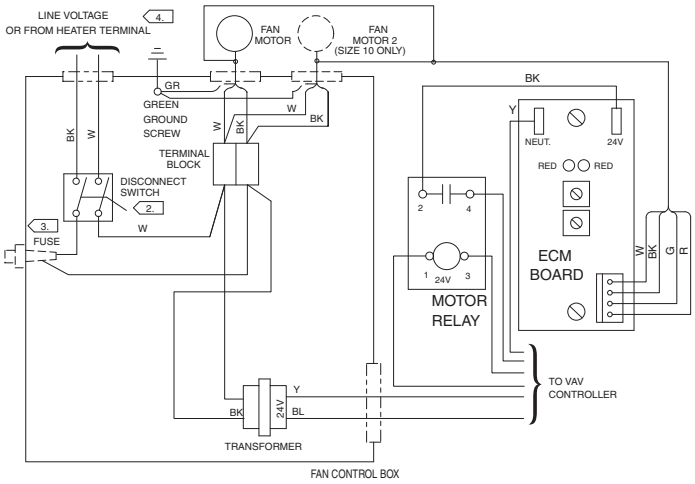
4. FUSE IS OPTIONAL.

5. DETERMINED BY MOTOR VOLTAGE ON ORDER. VOLTAGE FOUND ON UNIT NAMEPLATE.

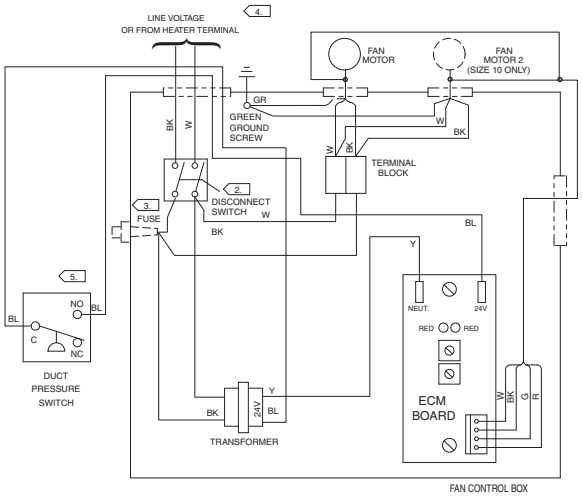
6. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

Figure 33. Fan-powered low-height units with ECM

Fan-Powered Low-Height Control Box w/ ECM with Electronic or DDC Controls
(Depending on the size of the unit, the ECM board may or may not be located in the fan control box.)



Fan-Powered Low-Height Control Box w/ ECM with Pneumatic Controls
Duct Pressure Switch Option



⚠ WARNING

HAZARDOUS VOLTAGE!

DISCONNECT, LOCK OUT AND TAG ALL ELECTRIC POWER INCLUDING REMOTE DISCONNECTS BEFORE SERVICING.

DISCHARGE MOTOR START/RUN CAPACITORS BEFORE SERVICING.

FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

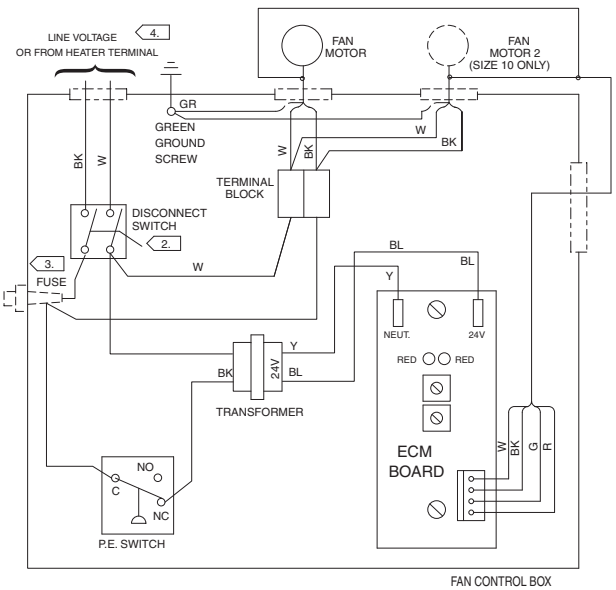
⚠ CAUTION

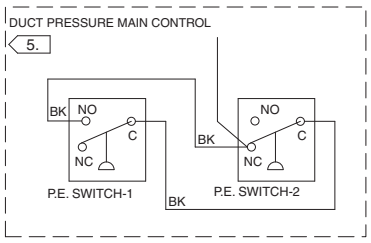
USE COPPER CONDUCTORS ONLY!

UNIT TERMINALS ARE NOT DESIGNED TO ACCEPT OTHER TYPES OF CONDUCTORS.

FAILURE TO DO SO MAY CAUSE DAMAGE TO THE EQUIPMENT.

Fan-Powered Low-Height Control Box w/ ECM with Pneumatic Controls





NOTES:

1. ———— FACTORY INSTALLED
   - - - - - - - - BY OTHERS
   ---·--·--- OPTIONAL OR ALTERNATE CIRCUITRY

2. DISCONNECT SWITCH, FUSE, & SCR ARE LOCATED EXTERNAL TO CONTROL BOX.

3. FUSE IS OPTIONAL.

4. DETERMINED BY MOTOR VOLTAGE ON ORDER. VOLTAGE FOUND ON UNIT NAMEPLATE.

5. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

Maintenance

Periodic maintenance of the VariTrane product is minimal, but necessary for efficient operation. Routine maintenance consists of inspecting/replacing the air filters of the fan-powered terminals.

Motors

Both the PSC (permanent split capacitor) and the ECM (Electrically Commutated Motor) require no lubrication during its normal life of operation.

Fan Wheel

Periodically, the fan wheel should be inspected for dirt or debris and cleaned as necessary.

Filter

The filter on fan-powered terminals will need to be inspected/replaced routinely depending on the environmental conditions of the plenum.

Filter Change Out

- To remove the filter, turn each of the filter retaining clips 90° (CW or CCW)
- Remove the filter and replace with new filter of the same frame size.
- Return the filter clips to their retainng position by turning them 90° (CW or CCW) back to their original position.

Water Coil

Water coils should be inspected and the fins should be cleaned periodically.

Water coils have been provided with an access panel as standard to assist with inspection and cleaning.

Fan Motor Replacement

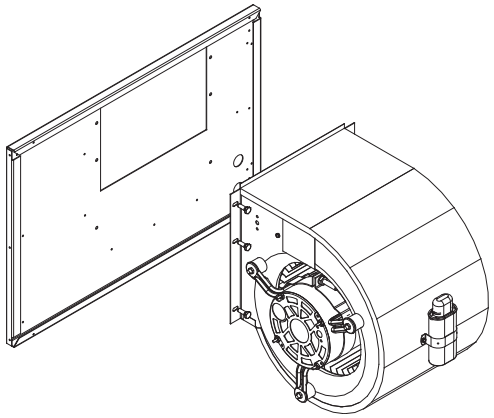
⚠WARNING

Hazardous Voltage w/Capacitors!

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 cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

For additional information regarding the safe discharge of capacitors, see PROD-SVB06A-EN.

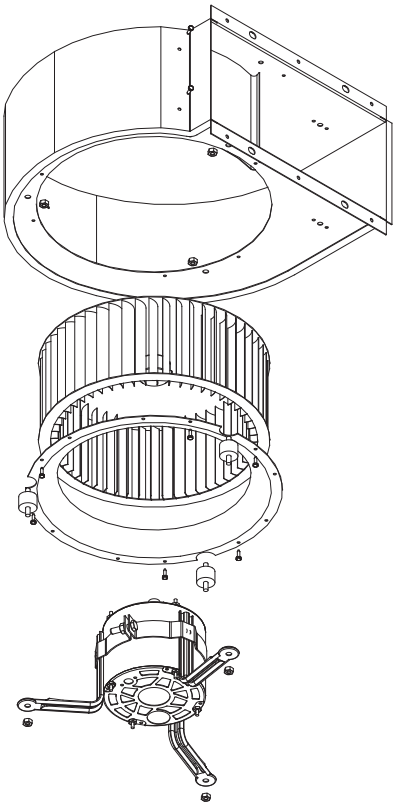
Figure 34. Standard motor removal



Standard height fan-powered series and parallel fan motors are replaceable through the filter opening and the standard sliding side access panel. To access the fan motor, the fan housing must be detached by removing the mounting bolts that hold the housing to the fan board. Removing the entire housing allows the fan motor, fan housing, and fan wheel to be re-aligned on a workbench or floor and prevent any possible fan wheel rubbing that may occur. Removing the housing will provide access to the motor shaft set screw that holds the fan wheel to the motor shaft.

The low-height fan assembly was designed with an inlet ring that assists with removal of the fan motor. To access the fan motor assembly, the bottom panel must be removed. The inlet ring is held in place by six bolts and three motor mount bolts. Remove these bolts and the motor and fan wheel will come out of the fan housing.

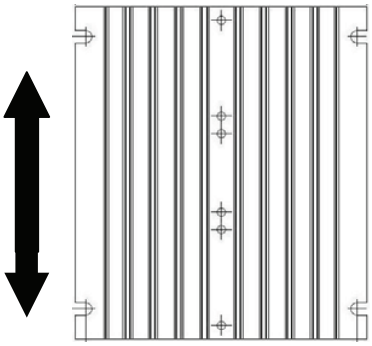
Figure 35. Low-height motor removal



SCR Assembly

SCR solid state relays are used to switch a single heater stage on and off. An intelligent (Master) relay is used for all single phase applications. For three phase applications, a Master-Slave configuration is used to switch two legs of three phase power to the heater stage. The Master Relay controls one leg independently, and provides a control signal to the Slave Relay, which controls the second leg.

Figure 36. Typical heat sink fin orientation



Every Master or Master/Slave relay combination is mounted on a heat sink to prevent the relays from overheating during normal operation. The SCR assembly must always be mounted with the heat sink fins oriented vertically (See Figure 36, p. 52), with a minimum clearance of ½" on all sides of the heat sink for cooling. Where additional cooling slots are provided in the heater, the VAV unit must be mounted with a minimum of 1" clearance in front of the slots.

When the 0-10 VDC control voltage is present at the Master relay in both single and three phase applications, an "ON" indicating LED light on the Master relay will blink continually (approximately 0.5 seconds on, 1.0 seconds off). If the load side voltage is also present at the relay(s), the Master relay LED and the Slave relay LED blink rate will increase as the control signal increases. When the control signal reaches a maximum of 10VDC, all LEDs will be lit continuously, indicating that the relays are full-open and continuously conducting. If the control signal is present in three phase applications while the load side voltage is not, only the Master relay LED will light and the blink rate will be constant.

If the SCR assembly does not appear to be functioning properly, verify that all required voltages are present and all that all wiring is properly connected. If all these conditions are verified, and the SCR LED(s) does not light and/or the SCR relay(s) does not conduct, the entire SCR heat sink assembly should be changed out. Individual Master or Slave relays should not be replaced.

Installation of Diffusers

General

All units must be installed upright and level as indicated by the arrow on the side of the units. Return air slots should be placed perpendicular and offset to the slot diffusers to avoid short-circuiting of air distribution patterns.

Place the unit in its approximate final position and check that it is upright and level. For **single-slot units**, engage the back of the diffuser over the t-bar with an edge and both ends resting on the t-bar. For **double-slot units**, slide the unit over the t-bar. For **center-notch units**, place diffuser over the t-bar, straddling it across a t-bar and resting on the units ends.

If the unit has a fire damper, make sure that the damper is still fully open. Diffuser discharge must always be flush with the ceiling tiles to assure the proper airflow (Coanda effect).

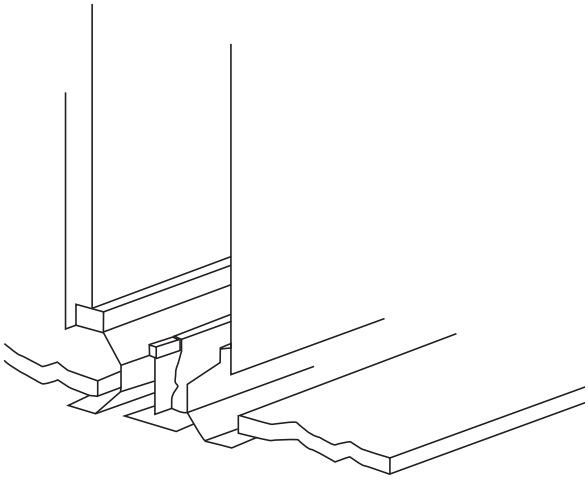
Diffusers require specific installation information when mounting to a desired ceiling type. Select the ceiling type that closely matches the job site application and use the following procedures.

T-Bar Ceiling

Finish installation of the diffuser in t-bar ceiling. (See Figure 37, p. 53.) Follow these procedures before the ceiling construction is completed.

1. Position the diffuser at each end resting directly on the structural t-bar for support and the t-bar fitting into the channel provided at the unit discharge air throw.
2. A ceiling tile support flange is provided on each side of the discharge slot of the unit. Trim ceiling tile approximately 1½ inches each to allow for width of discharge slot. For revealed edge ceilings, tile must be cut in a “Z” pattern.
3. Install ceiling tiles in usual manner with cut edges resting on the flanges of the air slot.

Figure 37. Diffuser installation in t-bar ceiling



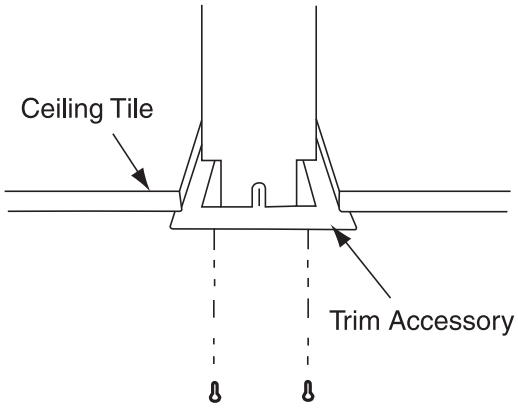
Concealed Spline Ceiling

Follow these procedures to finish installation of control and satellite diffusers and concealed spline for suspension ceilings before completing the ceiling construction (Figure 38, p. 53).

Place the units in their approximate final positions. If using the trim angle diffuser, its slots must be even with the spline level. If applying the trim accessory, the bottom of the diffuser must be level with the finished ceiling.

If installing the trim accessory, insert the trim into the ceiling opening from below and engage the diffuser slot to the trim t-bar structure. With bottom flange of trim accessory against the ceiling, and using the pre-drilled holes in the flange as a guide, drill holes in the flange of the diffuser. Join the diffuser and trim accessory with self-taping sheet metal.

Figure 38. Diffuser with trim accessory installation in concealed spline ceiling



Drywall/Plaster Ceiling

Finish installation of diffusers in plaster ceiling. Follow these procedures before completing the ceiling construction (Figure 39, p. 54).

NOTICE:

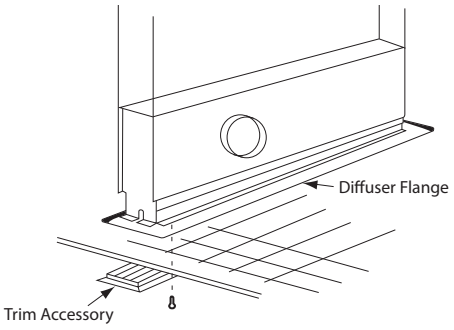
Equipment Damage!

Do not install trim frame into ceiling using screws. When diffuser is placed on the trim frames, it will pull out.

1. Suspend the units above the intended ceiling level and their approximate horizontal positions and finish running flexible ductwork.
2. After drywall and/or plaster is installed, cut openings to receive the diffuser air outlets. Also, allow for access openings to complete installation and service of the unit.
3. Slide the trim accessory up and into the ceiling opening. Using the rim accessory as a template, drill four guide holes in the lip of the diffuser slot. Lower unit onto trim frame and attach with sheet metal screws.

Note: *The bottom of the throat section must be parallel to the ceilings for proper air distribution.*

Figure 39. Diffuser with trim accessory installation in plaster ceiling



Plaster trim frame attaches with 2–4 tension clips on the side of the diffuser.

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