Installation, Operation, and Maintenance

VariTrane™ Variable Air Volume (VAV) Terminal Units; Shutoff and Fan-Powered

Chilled Water Sensible Cooling Terminal Units

Single-Duct

VCCF
VCEF
VCWF

Dual-Duct
VDDF

Fan-Powered

VPCF
VPEF
VPWF
VSCF
VSEF
VSWF

Fan-Powered Low Height

LPCF
LPEF
LPWF
LSCF
LSEF
LSWF

Chilled Water Sensible Cooling Terminal Units

LDCF
LDEF
LDWF

⚠ 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.

April 2017

VAV-SVX08G-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 and HCFCs such as saturated or unsaturated HFCs and HCFCs.

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 according to local rules. For the USA, 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/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE 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.**

⚠ WARNING

Follow EHS Policies!

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

- **All Ingersoll Rand personnel must follow Ingersoll Rand Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. All policies can be found on the BOS site. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Ingersoll Rand personnel should always follow local regulations.**

⚠ WARNING

Fiberglass Wool!

Exposition to glass wool fibers without all necessary PPE equipment could result in cancer, respiratory, skin or eye irritation, which could result in death or serious injury. 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.
You MUST wear all necessary Personal Protective Equipment (PPE) including gloves, eye protection, a NIOSH approved dust/mist respirator, long sleeves and pants when working with products containing fiberglass wool.

Precautionary Measures:

- **Avoid breathing fiberglass dust.**
- **Use a NIOSH approved dust/mist respirator.**
- **Avoid contact with the skin or eyes. Wear long-sleeved, loose-fitting clothing, gloves, and eye protection.**
- **Wash clothes separately from other clothing; rinse washer thoroughly.**
- **Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator.**

First Aid Measures:

- **Eye Contact - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.**
- **Skin Contact - Wash affected areas gently with soap and warm water after handling.**

About This Manual

This manual describes the installation of with recommended wiring, piping, and mounting of single-duct, dual-duct, fan-powered, and low-height VAV terminal units, and chilled water sensible coil terminal units.

See also the following reference documents:

- BAS-SVX40-EN —Wireless Comm IOM
- BAS-SVX55-EN — Wireless Comm Network Design Best Practices Guide
- BAS-SVX62*-EN — Tracer® UC210 Programmable Variable-Air-Volume (VAV) Box Controller
- VAV-SVX07*-EN — Tracer® UC400 Programmable BACnet® Controller for VAV Units
- VAV-SVP01*-EN — VAV VV550 LonTalk® Controller
- VAV-SVX01*-EN — VAV-UCM 4.2 IOM
- VAV-SVX02*-EN — VariTrane™ Pneumatic Controls

Receiving and Handling

These units are shipped completely assembled with the exceptions of optional attenuators for fan-powered units, outlet duct temperature sensors on non-VCEF products, water valves, 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 the Trane 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.

Read this manual thoroughly before operating or servicing this unit.

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Trademarks

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Revision History

- Added DS02 chilled water sensible cooling terminal unit sizes.
- Added controls description for dual duct units, including UC400, VV550 and UCM.
- Updated model number descriptions.

Table of Contents

Model Numbers

Single-Duct VAV 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 Elec Heat
DD05 = UCM4 Pulse Width MOD Elec Heat
DD07 = UCM4 N.O. On/Off Hot Water
DD11 = VV550 DDC Controller, Cool 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 Control l to Operate N.C. Water Valve
DD21 = VV550 DDC - Vent Flow w/ On/Off Elec Heat

Digit 12, 13, 14, 15 — Controls (continued)

DD22 = VV550 DDC Vent Flow control to operate prop water valve
DD23 = VV550 DDC- Basic plus- Local (Electric heat-PWM) Remote
DD24 = VV550 DDC-Basic plus- Local (Water heat- Modulating)
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 = VVV550 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 control 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)

Digit 12, 13, 14, 15 — Controls (continued)

DD56 = VV550 DDC Vent Flow control to operate prop water valve
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 Heat Modulating 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 = UC210 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)

Digit 12, 13, 14, 15 — Controls (continued)

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 Heat Modulating 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 = UC210 DDC Ventilation flow- cooling only
PCSS = UC210 DDC-Basic (Water heat- N.O.- 2 position)
PN00 = UC210 DDC-Flow Tracking (Cooling only)
PN04 = UC210 DDC-Ventilation Flow (Water heat- N. C.- 2 position)
PN05 = N.C. with RA STAT, 3000 Series
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 Open
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 Controllers
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 = Not Applicable

Digit 19— Outlet Plenum (Slip-and-Drive Connection

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

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

Digit 20— Not Used

0 = Not Applicable

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 = Able to Flip for LH/RH Connections (VCEF Only)
L = Left, Airflow hits in face
R = Right, Airflow hits in face
0 = Opposite side connection, coil and control (VCWF Only)

Note: *VCCF/VCWF can be flipped in field for opposite connections.*

Digit 23— Transformer

0 = None
1 = 120/24V, 50VA
2 = 208/24V, 50VA
3 = 240/24V, 50VA
4 = 277/24V, 50VA
5 = 480/24V, 50VA
6 = 347/24V, 50VA
7 = 380/24V, 50VA
8 = 575/24V, 50VA

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, 28, 29 — Electric Heat kW

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

Notes:

- *0.5 to 8.0 kW in 1/2 kW increments*
- *8.0 to 18.0 kW in 1 kW increments*
- *18.0 to 46.0 kW in 2 kW increments*

Digit 30 — Electric Heat Stages

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

Digit 31 — Electric Heat Contactors

0 = None
1 = 24V Magnetic
2 = 24V Mercury
3 = PE w/Magnetic
4 = PE w/Mercury
5 = SCR Heat; UC400/UC210
6 = SCR Heat; FMTD/ENCL/DD00
A = 24V Mercury Left Hand
B = 24V Mercury Right Hand
C = PE w/Mercury Left Hand
D = PE 2/Mercury Right Hand

Digit 32, 33— Not Used

00 = Not Applicable

Digit 34 — Actuator

0 = Standard
A = Spring Return, Normally Open
B = Spring Return, Normally Closed
C = Belimo™ Actuator
G = Trane Analog Actuator (UC210 or UC400 only)

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 UC210/UC400 w/SCR Heat)
5 = Analog HW Valve, field provided

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 w/Water Connection Right Side
4 = Access Right Side Terminal Unit w/Water Connection Left Side

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 8.0 Cv

Digit 40 — Flow Rate

00 = No Heat
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, 019 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

Digit 40 — Flow Rate (continued)

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 VAV 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 = 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 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 = Not applicable

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, Cool Only
DD18 = VV550 DDC Controller with Constant Volume
DD41 = UC400 DDC Basic, No Water or Electric Heat
DD48 = UC400 DDC Basic, Constant Volume
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 and Linkage Only
PN09 = N.O. Heating, N.O. Cooling, w/PVR
PN10 = N.O. Heating, N.O. Cooling, w/PVR (CV Discharge)
PNON = Shaft Outside for Pneumatic Units
PNSS = Normally Open Special

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 = Not Applicable

Digit 18— Not Used

0 = Not Applicable

Digit 19 — Outlet Plenum (Slip-and-Drive Connection)

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

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

Digit 20— Not Used

0 = Not Applicable

Digit 21— Not Used

0 = Not Applicable

Digit 22— Not Used

0 = Not Applicable

Digit 23 — Transformer

0 = None
1 = 120/24V, 50VA
2 = 208/24V, 50VA
3 = 240/24V, 50VA
4 = 277/24V, 50VA
5 = 480/24V, 50VA
6 = 347/24V, 50VA
7 = 575/24V, 50VA

Digit 24— Disconnect Switch

0 = None
W = With Toggle

Digit 25 — Power Fuse

0 = None
W =With

Digit 26 — Not Used

0 = Not Applicable

Digit 27 — Not Used

0 = Not Applicable

Digit 28 — Not Used

0 = Not Applicable

Digit 29 — Not Used

0 = Not Applicable

Digit 30— Not Used

0 = Not Applicable

Digit 31 — Not Used

0 = Not Applicable

Digit 32 — Not Used

0 = Not Applicable

Digit 33 — Special Options

0 = None
X =Varies, Factory Assigned

Digit 34 — Actuator

0 = Standard
A = Belimo™ Actuator
G = Trane Analog Actuator

Digit 35 — Wireless Sensor

0 = Sensor/Receiver Standard
1 =Wireless Sensor/Receiver Mounted
3 = Trane Air-Fi™ Wireless Communication Interface

Note: *All sensors selected in accessories.*

Digit 36 — Duct Temperature Sensor

0 = None
1 =With Duct Temperature Sensor

Fan-Powered VAV Units Model Number Descriptions

Digit 1, 2— Unit Type

VP = VariTrane™ Fan-Powered Parallel
VS = VariTrane™ Fan-Powered Series
VP = 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 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)
RT = 8" x 14" inlet (1800 cfm)

Note: *1, 12, 14, and 16 not available on low height units.*

Digit 7, 8— Secondary Air Valve Used

00 = N/A

Digit 9 — Fan

P = 02SQ Fan (500 nom cfm)
Q =03SQ Fan (1100 nom cfm)
R = 04SQ Fan (1350 nom cfm)
S = 05SQ Fan (1550 nom cfm)
T =06SQ Fan (1850 nom cfm)
U = 07SQ Fan (2000 nom cfm)
V = 08SQ Fan (500 nom cfm)
W = 09SQ Fan (900 nom cfm)
X = 10SQ Fan (1800 nom 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 Elec Heat
DD05 = Pulse Width Mod of Elect Heat

Digit 12, 13, 14, 15 — Controls (continued)

DD07 = N.O. On/Off Hot Water
DD11 = VV550 DDC Controller, Cooling Only
DD12 = VV550 DDC-Control w/N.C. On/Off HW Valve
DD13 = VV550 DDC-Control w/Prop. Hw Valve
DD14 = VV550 DDC-Control On/Off Electric Heat
DD15 = VVV550 DDC-Control w/Pulse Width Modulation
DD17 = VVV550 DDC-Control w/N.O On/Off HW Valve
DD23 = VVV550 DDC-Basic Plus, Local (Elec Heat, PWM) Remote (Staged EH)
DD28 = VV550 DDC-Basic plus- Local(Water Electric- 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 control 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)
DD47 = UC400 DDC-Basic (Water heat- N. O.- 2 position)
DD53 = UC400 DDC-Basic plus- Local (Electric heat- PWM) Remote (Staged EH)
DD58 = UC400 DDC-Basic plus- Local (Water heat- Modulating) Remote (Water- N.O. 2 position)
DD59 =UC400 DDC-Basic plus Local (Water heat- Modulating) Remote (Water- N.C. 2 position)
DD60 = VV550 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)

Digit 12, 13, 14, 15 — Controls (continued)

DD65 = UC400 Basic (Electric Heat Modulating SCR)
DD66 = UC400 Basic plus-Local (Electric heat-Modulating SCR) Remote (Staged EH)
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)
DD77 = UC210 DDC-Basic (Water heat- N. O.- 2 position)
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)
DD95 =UC210 Basic (Electric Heat Modulating SCR)
DD96 = UC210 Basic plus-Local (Electric heat-Modulating SCR) Remote (Staged EH)
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 Ctrl

Digit 12, 13, 14, 15 — Controls (continued)
PN00 = N.O. Actuator and Linkage Only
PN05 = N.O. with RA STAT, 3000 Series
PN51 = Pneumatic N.O. w/3011, DPS Fan
PN52 = Pneumatic N.O. w/3011, DPM Fan
PNON = Shaft Out Side for Pneumatic Units

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 = 208/50/1

Digit 19— Outlet Connection

1 = Flanged
2 = Slip–and-Drive Connection

Digit 20— Attenuator

0 = None
W = With

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 RH
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 hits in face
R = Right, Airflow hits in face
W = Narrow Corridor LH, High Voltage, Inlet Facing
X = Narrow Corridor RH, High Voltage, Inlet Facing

Note: *Digits W and X, fan-powered series only.*

Digit 23— Transformer

0 = Not Applicable

Digit 24 — Disconnect Switch

0 = None
W = With

Note: *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: *Digit K not available wit low height.*

Digit 27, 28, 29— Electric Heat kW

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

Notes:

- *0.5 to 8.0 kW in 1/2 kW increments*
- *8.0 to 18.0 kW in 1 kW increments*
- *18.0 to 46.0 kW in 2 kW increments*

Digit 30 — Electric Heat Stages

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

Note: *Digit 3 not available with low height.*

Digit 31 — Electric Heat Contactors

0 = None
1 = 24V Magnetic
2 = 24V Mercury
3 = PE w/Magnetic
4 = PE w/Mercury
5 = SCR Heat; UC400
6 = SCR Heat; FMTD/ENCL/DD00

Notes: *SCR cannot be selected with the following:*

- *kW>10,208V, 3Ph, Low Height*
- *kW>22,480V, 3Ph, Low Height*
- *Voltage = 575V*

Digit 32— Air Switch

0 = Not Applicable
W = With

Digit 33— Not Used

0 = Not Applicable

Digit 34 — Actuator

0 = Standard
A = Belimo™ Actuator

Digit 35 — Wireless Sensors

0 = None
1 = Factory-mounted Wireless Receiver (Sensor Accessory)
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 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 8.0 Cv

Digit 40 — Flow Rate

00 = No Heat
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, 019 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

Chilled Water Sensible Cooling Terminal Units

Digit 1, 2— Unit Type

LD = Chilled Water Sensible Cooling Terminal Units

Digit 3— Heating

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 max cfm)
05 = 5" inlet (350 max cfm)
06 = 6" inlet (500 max cfm)
08 = 8" inlet (900 max cfm)
RT = 8x14‟ inlet (1800 max cfm)

Digit 7, 8— Secondary Air Valve

00 = N/A

Digit 9 — Fan

A = DS01 Fan (700 max cfm)
B = DS02 Fan (1300 max cfm)

Digit 10, 11— Design Sequence

**** = Factory Assigned

Digit 12, 13, 14, 15 — Controls

DD00 = Trane Actuator Only
ENCL = Shaft Only in Enclosure
FM00 = Other Actuator and Control
FM01 = Trane Supplied Actuator, Other Control
SC41 = UC400 DDC — Sensible Cooling — Basic (no water or electric heat)
SC43 = UC400 DDC — Sensible Cooling — Basic (water heat, modulating)
SC44 = UC400 DDC — Sensible Cooling — Basic (electric heat, staged)
SC62 = UC400 DDC — Sensible Cooling — Basic plus Local (electric heat — staged), remote (staged)
SC65 = UC400 DDC — Sensible Cooling — Basic (electric heat, modulating SCR)
SC66 = UC400 DDC — Sensible Cooling — Basic plus Local (electric heat — modulating SCR), remote (staged)

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

E = High—efficiency Motor (ECM)

Digit 18 — Motor Voltage

1 = 115/60/1
2 = 277/60/1

Digit 19 — Outlet Connection

1 = Flanged
2 = Slip–and-Drive Connection

Digit 20 — Attenuator

0 = No Attenuator
W = With Attenuator

Digit 21 — Water Coil

0 = None
3 = 1 Row, Discharge Installed, LH
4 = 1 Row, Discharge Installed, RH
5 = 2 Row, Discharge Installed, LH
6 = 2 Row, Discharge Installed, RH
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

Digit 22 — Control, Heat Connections

F = Flippable Left and Right Hand

Digit 23 — Unit Filter

0 = Construction Throw-away Filter
8 = MERV 8 Filter

Digit 24 — Disconnect Switch

0 = None
W = With

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

Digit 27, 28, 29 — Electric Heat kW

000 = None
005 = 0.5 kW
010 = 1.0 kW
015 = 1.5 kW
200 = 20.0 kW

Notes:

- *0.5 to 8.0 kW in 1/2 kW increments*
- *8.0 to 18.0 kW in 1 kW increments*
- *18.0 to 20.0 kW in 2 kW increments*

Digit 30 — Electric Heat Stages

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

Digit 31 — Electric Heat Contactors

0 = None
1 = 24V Magnetic
5 = SCR Heat, UC400
6 = SCR Heat, FM00/ENCL/DD00

Digit 32 — Airflow Switch

0 = None
W = With

Digit 33 — Not Used

0 = Not Applicable

Digit 34 — Actuator

0 = Standard
A = Belimo™ Actuator

Digit 35 — Wireless Sensors

0 = None
1 = Factory-mounted Wireless Receiver (Non-Communicating)
3 = Air-Fi™ Wireless Communications

Note: *All sensors selected in accessories.*

Digit 36 — Pre-wired Factory Solutions

0 = None
1 = Discharge Temperature Sensor (DTS)
2 = Hot Water (HW) Valve Harness
3 = DTS and HW Valve Harness
7 = Chilled Water (CW) Valve Harness
8 = CW and HW Valve Harness
B = DTS with CW Valve Harness
C = DTS with CW and HW Valve Harness

Digit 37 — Not Used

0 = Not Applicable

Digit 38 — Not Used

0 = Not Applicable

Digit 39 — Not Used

0 = Not Applicable

Digit 40 — Not Used

0 = Not Applicable

Digit 41 — Sensible Cooling Coil

2 = 2–Row Standard Cooling Coil
4 = 4–Row Standard Cooling Coil
6 = 6–Row Standard Cooling Coil

Digit 42 — Chilled Water Coil Connections
D = Cooling Coil Connections at Unit Discharge End
V = Cooling Coil Connections at Air Valve End

Unit Information

Single Duct VAV 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 40°F and 140°F (4.44°C and 60°C). 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.

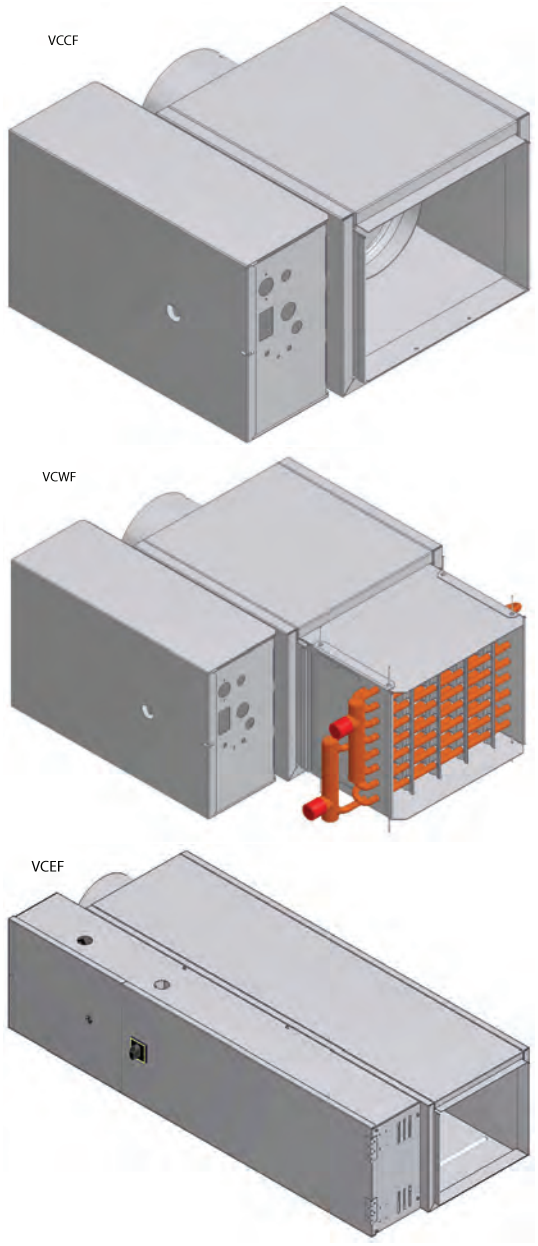
The basic unit can also be ordered with factory-mounted electric or hot water heating coils attached to the discharge.

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 VAV Units

Figure 1. Typical single duct unit; VCCF VCWF, VCEF



Dual-Duct VAV 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 .

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.

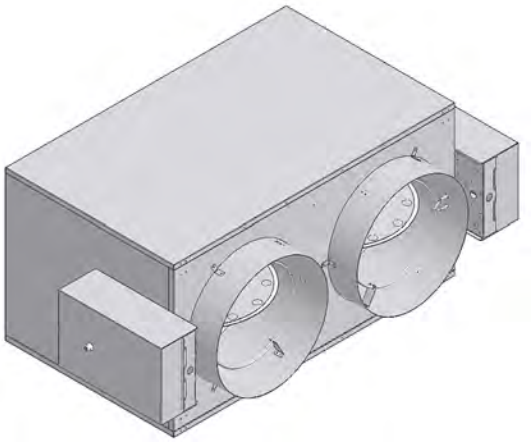
Another typical application is when the unit provides a constant volume to the zone. When the zone sensor is tied directly to the heating valve, it will modulate the heating valve according to the zone temperature.

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.

Factory-installed Trane unit controls available include;

- UC400 — one required per unit
- VV550 — two required per unit
- UCM — two required per unit

Figure 2. Typical dual-duct unit; VDDF



Fan-Powered/Fan-Powered Low-Height VAV Units

VariTrane™ fan-powered and low-height fan-powered units can be either parallel or series, with or without re-heat. Refer to the following figures.

Typical Fan-powered Units

Figure 3. Parallel fan-powered terminal unit (top) & series fan-powered terminal units (bottom)

Figure 4. Low height series: LSCF (top) & low height series: LSWF (bottom)

Figure 5. Low height series: LSEF (top) & low height parallel: LPCF (bottom)

Figure 6. 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 three (3) methods to start the fan: 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 without ducts 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.*

Chilled Water Sensible Cooling Terminal Units

Chilled water sensible cooling terminal units are available with or without re-heat. Refer to the following figures.

Figure 7. Chilled water sensible cooling unit

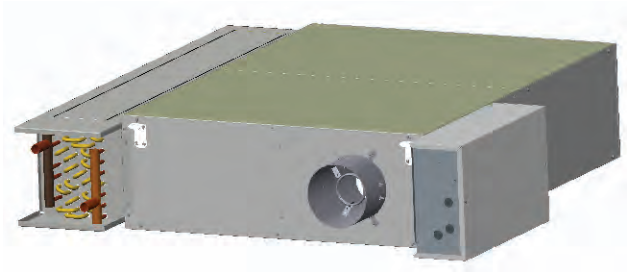


Figure 8. Chilled water sensible cooling unit with hot water coil

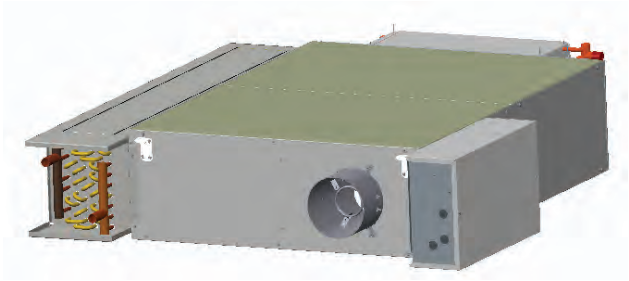
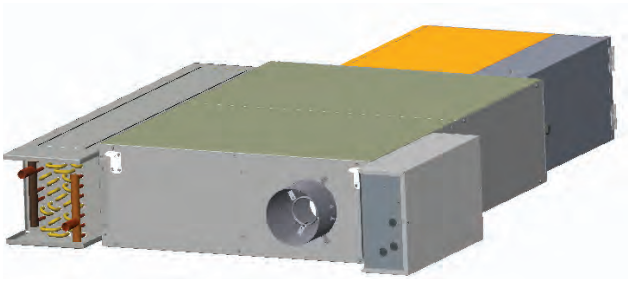


Figure 9. Chilled water sensible cooling unit with electric heat



The function of the Trane chilled water sensible cooling terminal units is a little different than traditional VAV Terminal Units. These terminal units are part of a **system** that uses a dedicated outdoor-air unit to distribute outdoor air to an air valve on each terminal unit to meet the ventilation requirements of the zone. Each terminal unit is also equipped with a cooling coil mounted on the plenum inlet. Recirculated air from the

plenum (or directly from the occupied space) is drawn in through this cooling coil by the local fan. This cooled air is then mixed with the conditioned (cooled, dehumidified, heated, or humidified) outdoor air from the dedicated OA unit, and distributed through the downstream ductwork to the zone.

In most applications, the water supplied to this local cooling coil is controlled to a temperature above the dew point in the zone. This avoids moisture in the air from condensing on the coil, so it operates dry and provides only sensible cooling. All the dehumidification must then be provided by the dedicated outdoor-air unit. Trane chilled water sensible cooling terminal units are built with a drip pan located beneath the cooling coil, with a moisture sensor installed in it, to detect and prevent any moisture from getting on the ceiling beneath the units or into the occupied space below. These terminal units can be configured with either a hot water coil or electric heater mounted at the unit discharge.

Unit Installation

⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

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.

For additional information regarding the safe discharge of capacitors, see PROD-SVB06*-EN.

⚠ WARNING

Proper Structural Support Required!

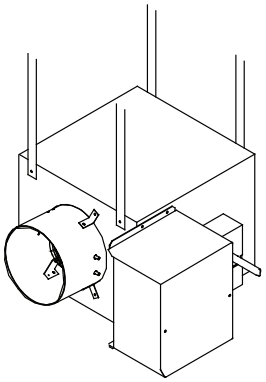
Failure to ensure proper structural ceiling support could result in unit falling from its location which could result in death or serious injury.

Ceiling structure must be strong enough to support the weight of the unit and any accessories. If unsure, check with a structural engineer.

Due to their weight, the VAV terminal units should be suspended from the uppermost ceiling, independent of the false ceiling grid. See "Weights," p. 27 for unit weights. 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 U.L. ratings and any warranty on the unit.

Single-Duct VAV Units

Figure 10. Single-duct hanging recommendations



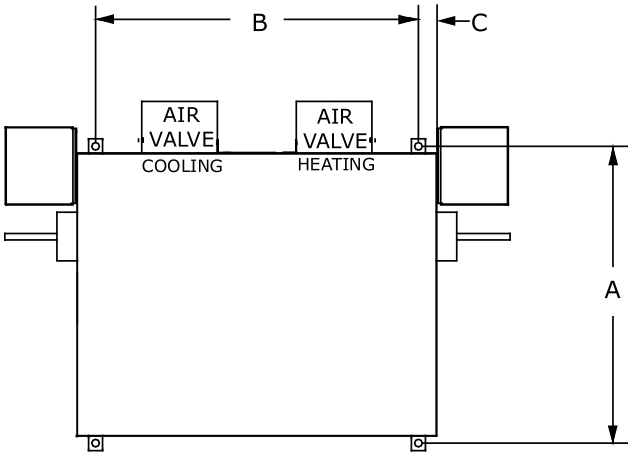
Depending upon the size and weight of the single-duct unit, it may be capable of being supported by the ductwork that is connected to it. No hanger brackets are provided on these units since the unit should be supported by means of a hanger strap. The hanger strap should be secured directly to the unit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

- 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 VAV Units

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.

Figure 11. Dual-duct hanger bracket locations



TOP VIEW

Table 1. Dual duct VAV unit hanger location dimensions

Inlet Size (in)	A		B		C	
	in	mm	in	mm	in	mm
5 thru 10	23.15	588	25.25	641	1.38	35
12 thru 16	23.15	588	37.25	946	1.38	35

Fan-Powered VAV Units and Chilled Water Sensible Cooling Terminal Units

Fan-powered (standard and low-height) and chilled water sensible cooling terminal 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. Refer to the following figures.

Bracket Locations — Fan Powered

Note: *For all attenuator installations, the bottom bracket is not shown in each figure. Install the bottom bracket with the same orientation as the bottom of the unit.*

Figure 12. Parallel hanger bracket location sizes

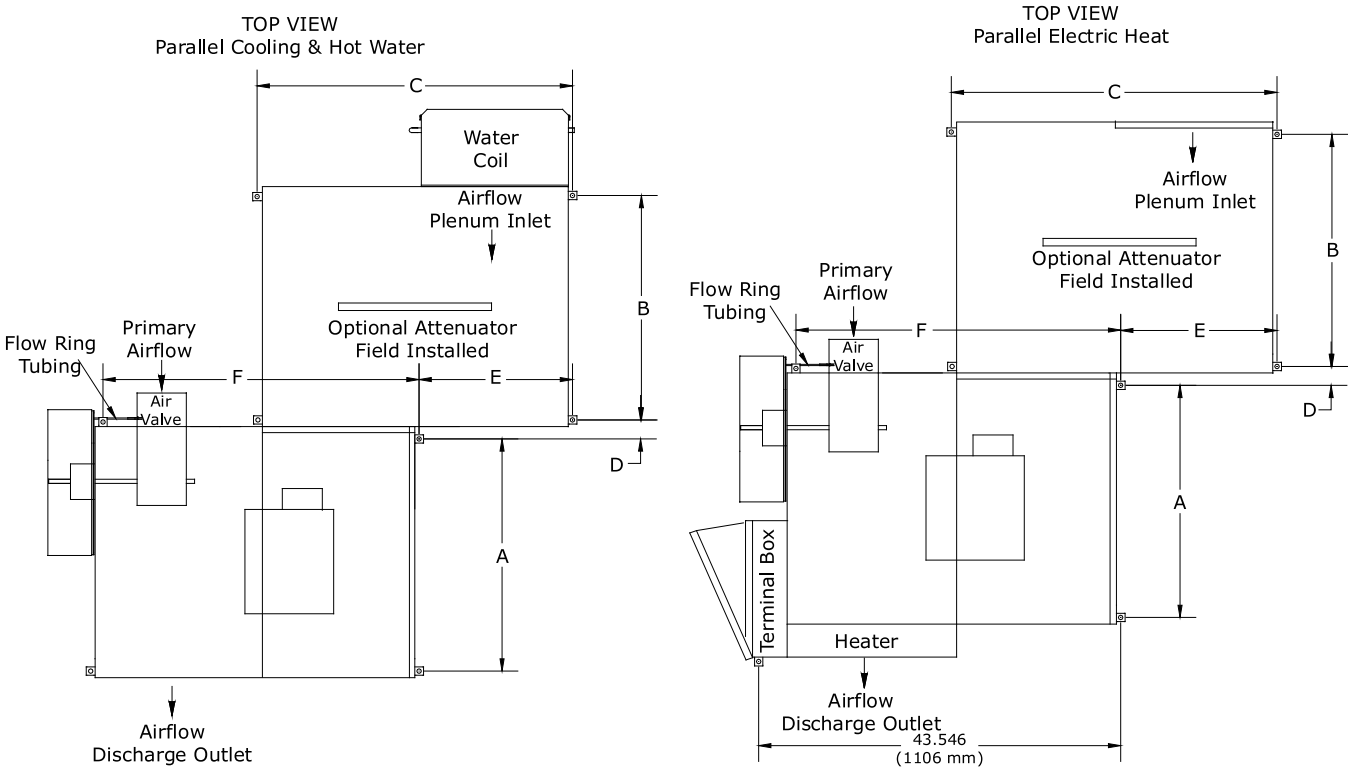


Table 2. Parallel hanger bracket location dimensions

Fan Size	A		B		C		D		E		F	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
02SQ	26.75	679	26.75	679	41.2	1041	3.25	83	20.0	508	38.95	989
03SQ, 04SQ, 05SQ	29.75	756	26.75	679	41.2	1041	3.25	83	20.0	508	38.95	989
06SQ	36.75	933	26.75	679	41.2	1041	3.25	83	20.0	508	38.95	989

Figure 13. Series hanger bracket locations

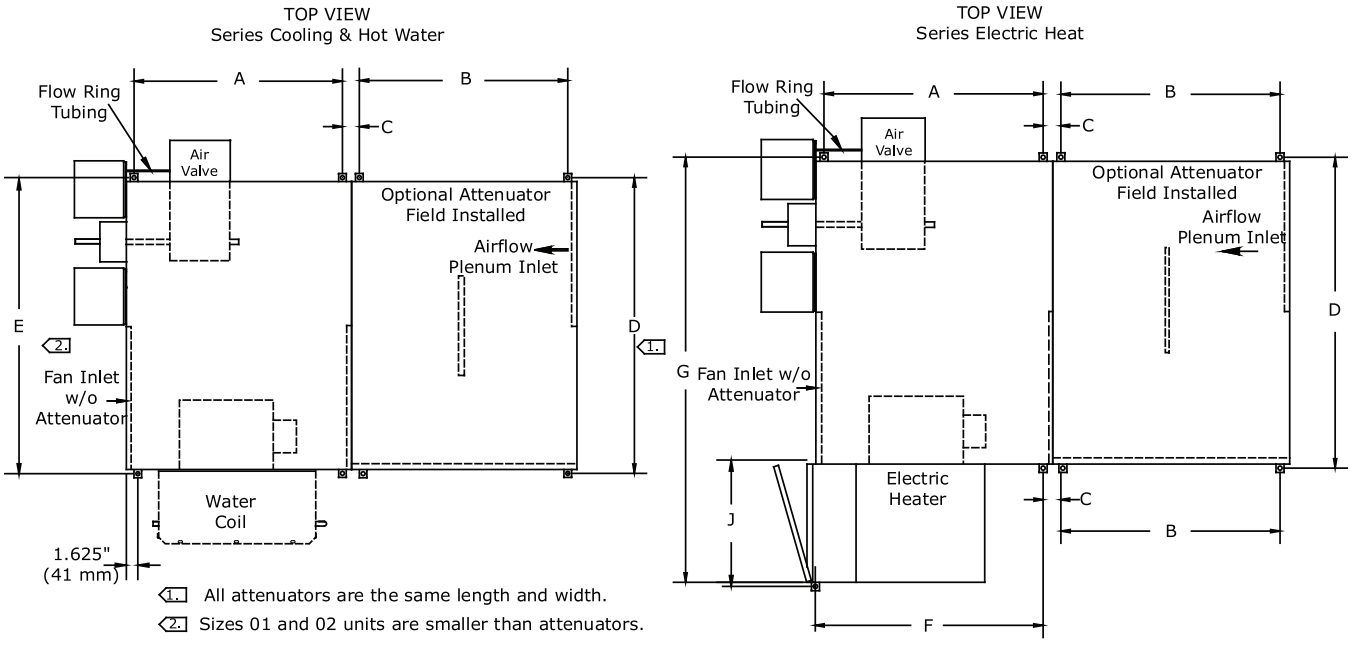


Table 3. Series hanger bracket location dimensions

Fan Size	A		B		C		D		E	
	in	mm	in	mm	in	mm	in	mm	in	mm
02SQ	18.75	476	26.75	679	3.25	83	41.2	1041	35.2	740
03SQ, 04SQ	20.75	527	26.75	679	3.25	83	41.2	1041	41.2	1041
05SQ	26.75	679	26.75	679	3.25	83	41.2	1041	41.2	1041
06SQ, 07SQ	27.25	692	26.75	679	3.25	83	41.2	1041	41.2	1041

Table 4. Series hanger bracket location dimensions — electric heat only

Fan Size	F		G		H	
	in	mm	in	mm	in	mm
02SQ	20.13	511	53.75	1365	19.0	483
03SQ, 04SQ	23.88	606	59.75	1517	19.0	483
05SQ	28.97	736	59.75	1517	19.0	483
06SQ, 07SQ	29.88	759	58.25	1479	17.5	445

Figure 14. Low-height parallel 08SQ/09SQ w/hot water or electric heat

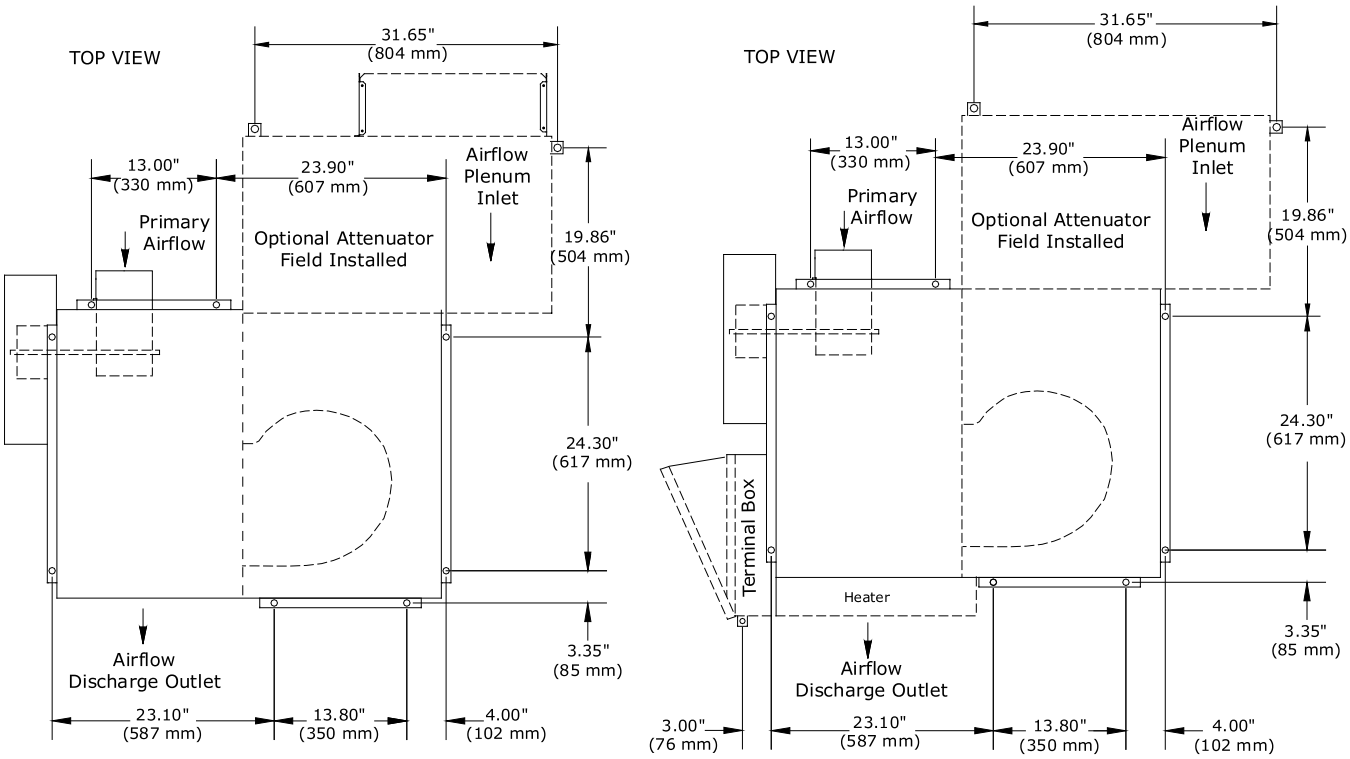


Figure 15. Low–height parallel 10SQ

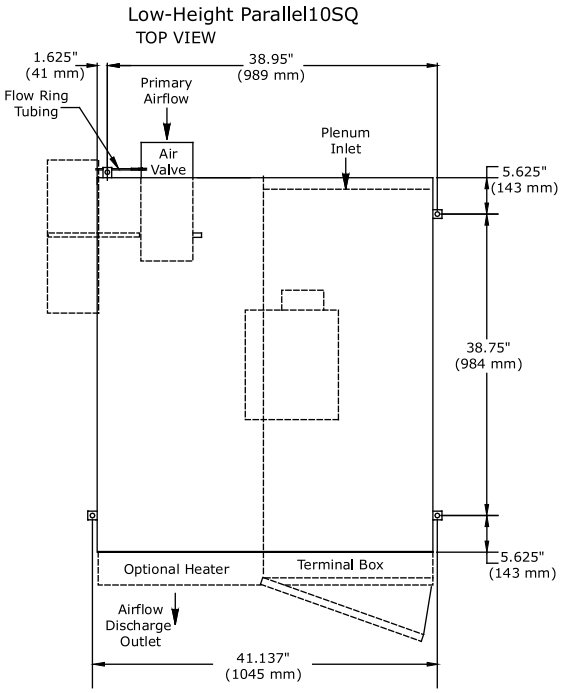


Figure 16. Low-height series 08SQ/09SQ w/hot water or electric heat

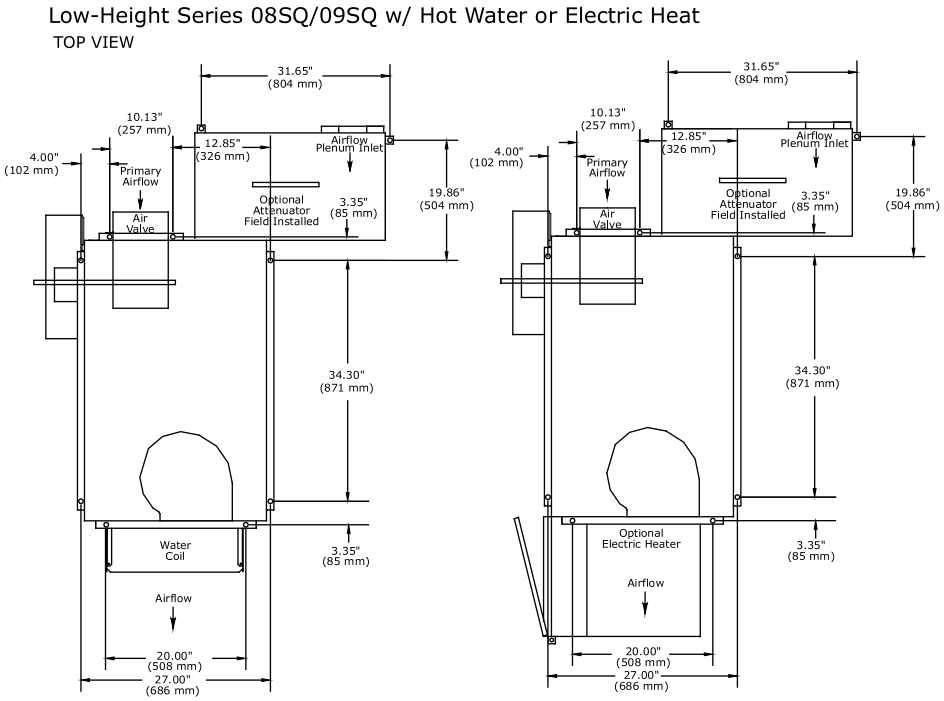
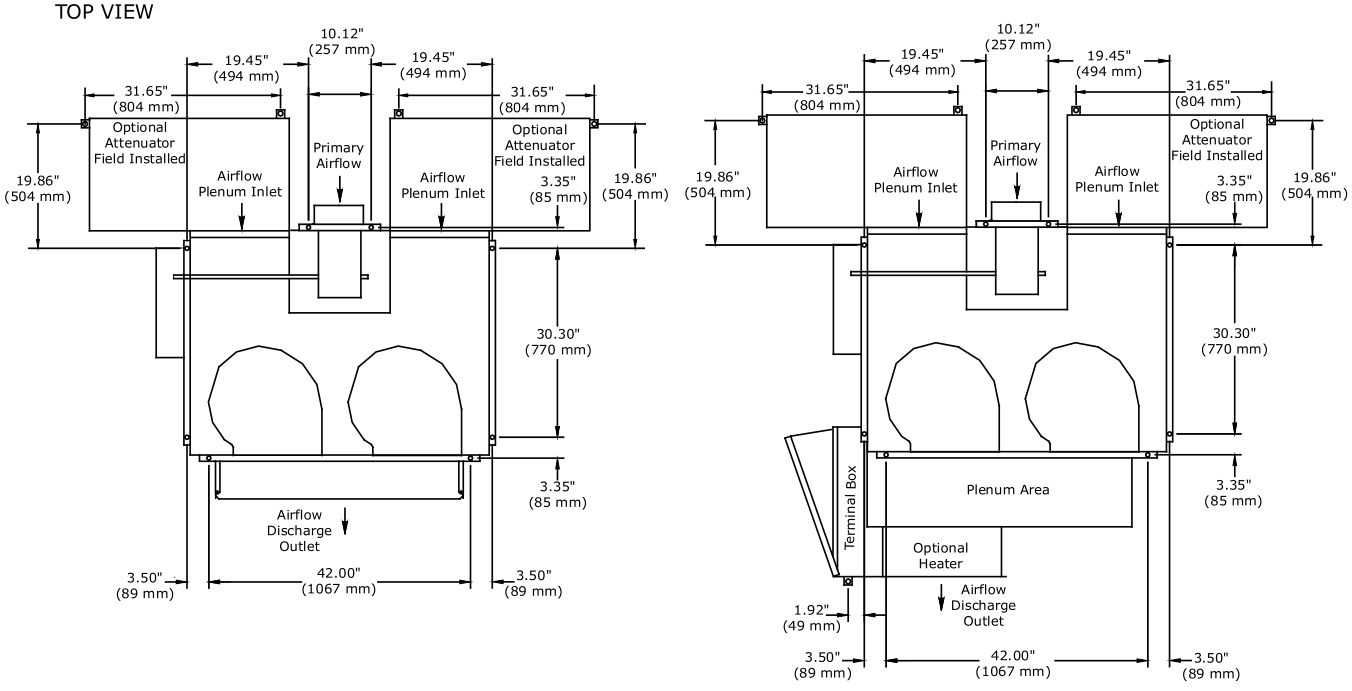


Figure 17. Low-height series 10SQ w/hot water or electric heat



For installations in figures below, attach attenuator with provided mounting brackets as shown.

Figure 18. Attenuator for parallel units

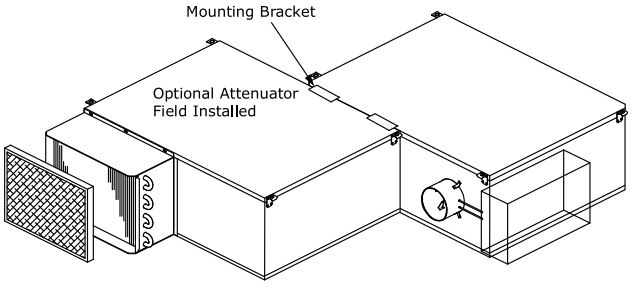


Figure 19. Attenuator for series units

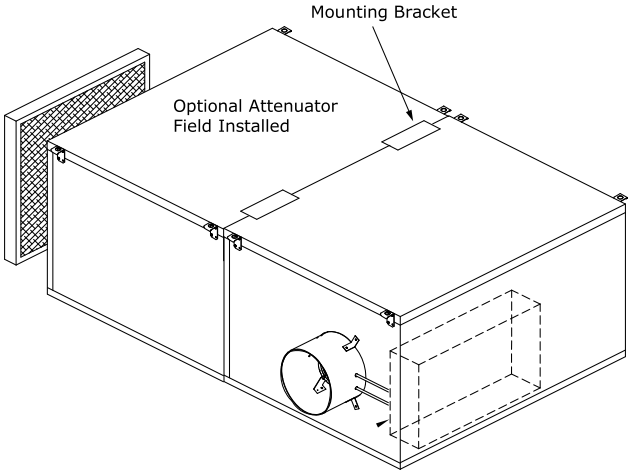


Figure 20. Attenuator for low-height parallel units

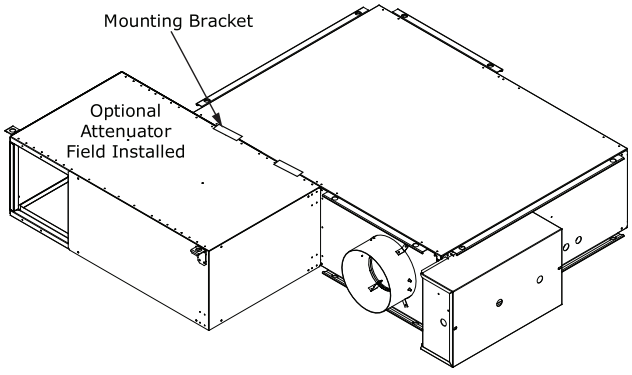
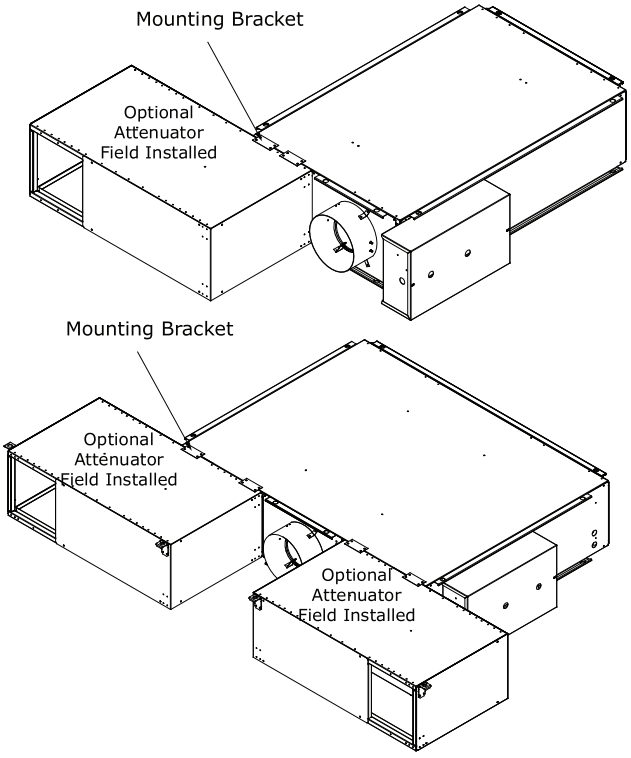


Figure 21. Attenuator for low-height series units



Bracket Locations
Chilled Water Sensible Cooling Terminal Units

Figure 22. Bracket locations — cooling only unit, and unit with hot water coil

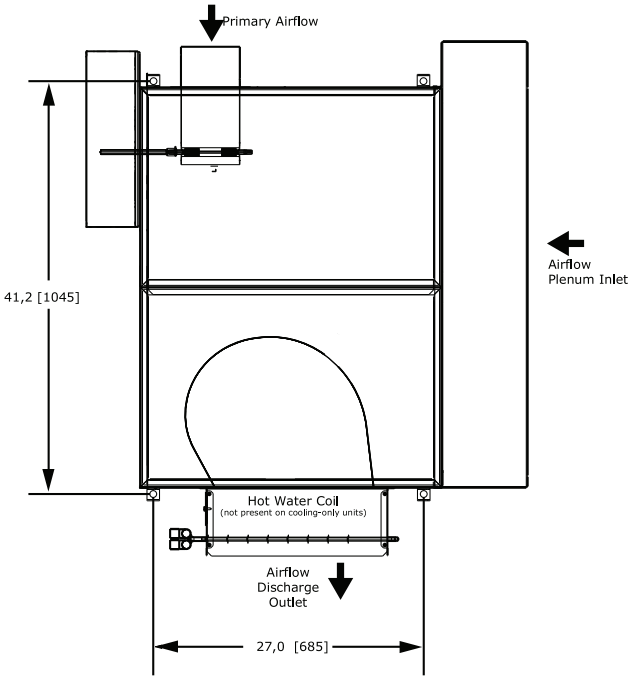
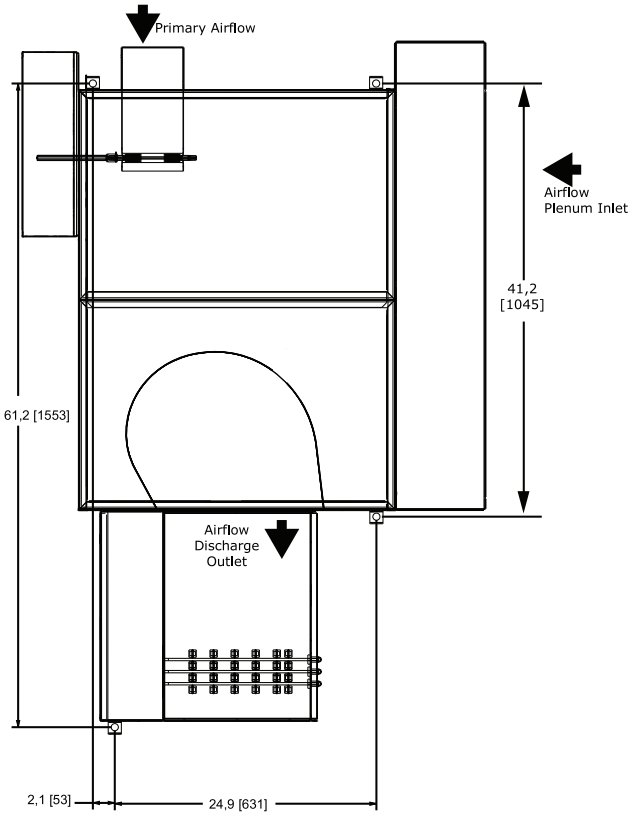


Figure 23. Bracket locations — electric heat unit



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.*

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 0.125" 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

Notes: *The following coils have 0.375" 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 0.875" OD water coil piping connections.

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: *The exception is that the 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 multi-row 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.*

Mounting Actuator

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°F per second. A field-installed actuator may be used if desired. The actuator shaft has a 0.5 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 Units

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, upstream of the VAV unit. 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 duct, upstream of the VAV unit. 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 temperature sensor to determine the control action (heat, cool) it must be located in the supply duct, upstream of the VAV unit. The auxiliary temperature is then compared to the zone temperature. If the supply air temperature is 10°F 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 UC400 controls to the minimum flow set point. If an auxiliary sensor is not installed the UC400 will retain the last control action in effect.

Stand-alone UC210

When there is no communication to the UC210 control and the unit is in the stand-alone mode the control action is determined by the auxiliary temperature sensor located on AI3 terminals on the UC210 control. From the factory, this input is configured for discharge air temperature and needs to be field reconfigured as supply air temperature using Tracer® TU. In order for the auxiliary temperature sensor that is configured for supply air temperature to determine the control action (heat, cool) it must be located in the supply duct, upstream of the VAV unit. The supply air temperature is then compared to the zone temperature. If the supply air temperature is 10°F 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 UC210 controls to the minimum flow set point. If an auxiliary temperature sensor is not installed and configured for supply air temperature, the UC210 will retain the last control action in effect.

Bottom Access

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

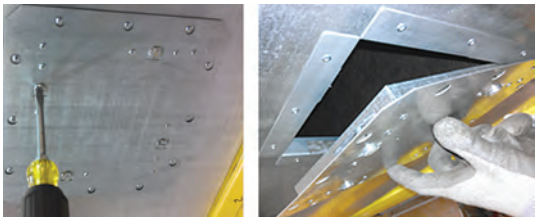
The 22-gauge door is lined with 1”, 26-gauge, dual wall insulation and thermal lined with 1” – 1 lb. density fiberglass insulation with a 3.85 R-value.

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

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

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

Figure 24. Bottom access



Weights

Table 5. Single-duct units — lb/kg

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

Table 6. Dual-duct units — lb/kg

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

Table 7. Parallel fan-powered units — lb/kg

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

Table 8. Series fan–powered units — lb/kg

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

Table 9. Low height parallel units — lb/kg

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

Table 10. Low–height series units — lb/kg

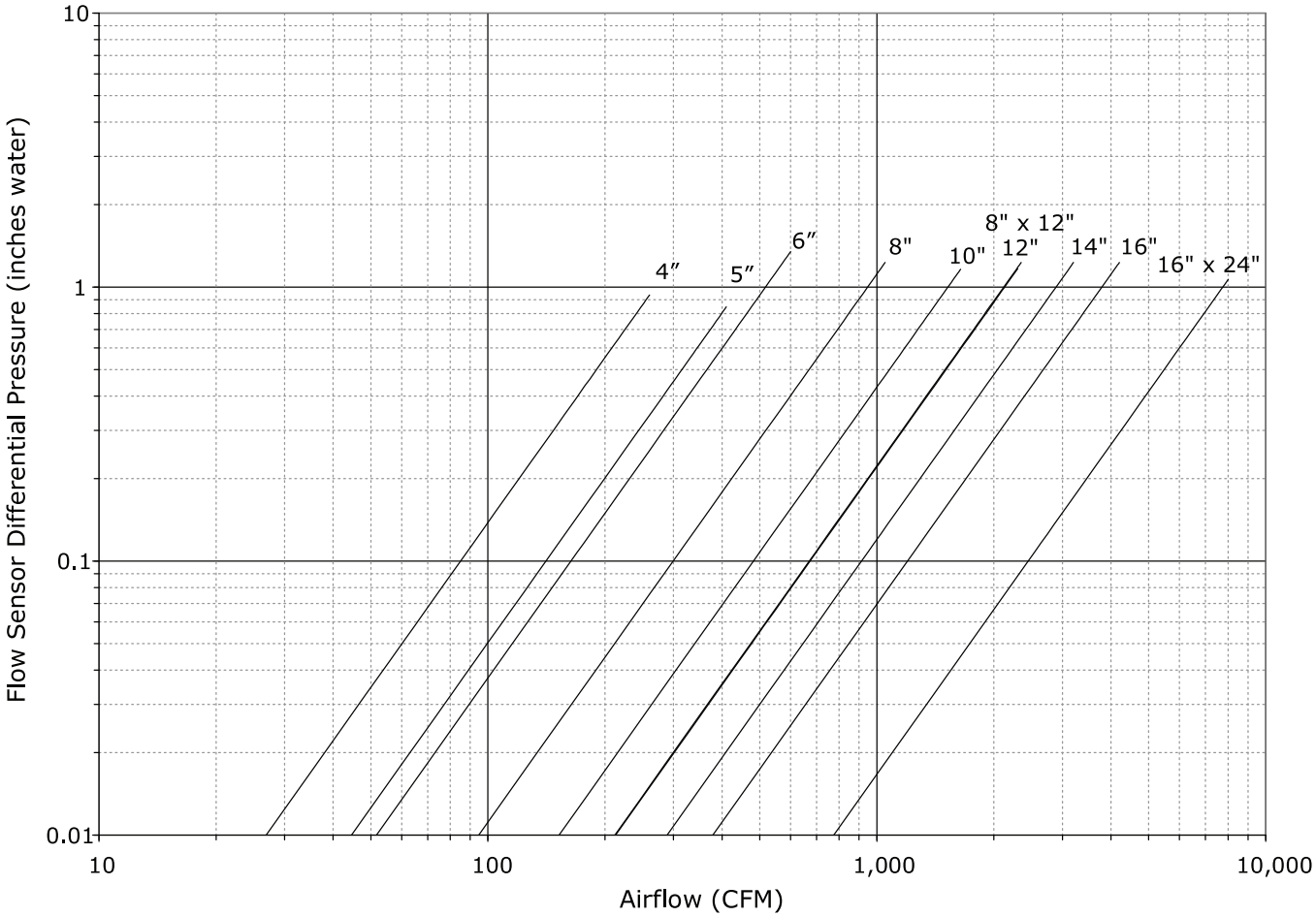
	Single Wall				Dual Wall				
			LSWF				LSWF		LSxF
Unit Size	LSCF	LSEF	1 Row	2–Row	LSCF	LSEF	1 Row	2–Row	Attenuator
0508SQ	71/32	86/39	80/36	82/37	86/39	101/45	95/43	97/44	10/5
0608SQ	70/32	85/39	79/36	81/37	85/39	100/45	94/43	96/44	10/5
0609SQ	80/36	95/43	89/40	91/41	95/43	110/50	104/47	106/48	10/5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

Table 11. Chilled water sensible coil terminal units — lb/kg

	Single Wall				Dual Wall			
			LDWF				LDWF	
Unit Size	LDCF	LDEF	1 Row	2–Row	LDCF	LDEF	1 Row	2–Row
DS01	126/57	144/65	135/61	137/62	146/66	164/75	155/70	157/71
DS02	125/57	143/65	131/59	135/61	148/67	166/75	154/70	158/72

Unit Setup

Figure 25. Flow sensor ΔP vs. airflow delivery



Fan Motor Amperage

Table 12. 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
Chilled Water Sensible Cooling Terminal Units DS01	3/4	5.1	2.8

Table 13. 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	

Adjusting the SCR Motor Speed Control

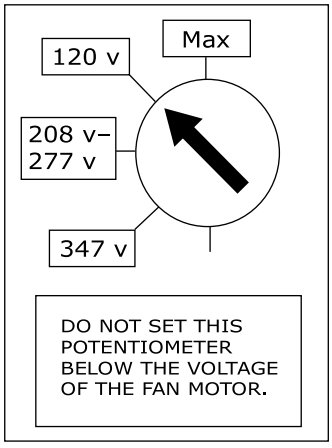
In order to make units more convenient and efficient to balance, an SCR (silicone control rectifier) is provided as standard on all fan-powered units.

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 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 power factor.

Figure 26. SCR (top) & internal potentiometer (bottom)



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

Electrically Commutated Motor (ECM)

Figure 27. 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. The following tables provide potentiometer settings. 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 seven (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 14. VPxF 03SQ ECM CFM

Motor Min CFM: 160 **Motor Max CFM: 1085**		
CFM	**L/sec**	**% Setting**
160 170 179 188 198	76 80 84 89 93	1 2 3 4 5
207 216 226 235 244	98 102 107 111 115	6 7 8 9 10
254 263 272 282 291	120 124 129 133 137	11 12 13 14 15

Table 14. VPxF 03SQ ECM CFM (continued)

Motor Min CFM: 160 Motor Max CFM: 1085		
CFM	**L/sec**	**% Setting**
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
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

Table 14. VPxF 03SQ ECM CFM (continued)

Motor Min CFM: 160 Motor Max CFM: 1085		
CFM	**L/sec**	**% Setting**
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 15. 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

Table 15. VPxF 04SQ ECM CFM (continued)

Motor Min CFM: 220 Motor Max CFM: 1510		
CFM	**L/sec**	**% Setting**
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
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

Table 15. VPxF 04SQ ECM CFM (continued)

Motor Min CFM: 220 Motor Max CFM: 1510		
CFM	**L/sec**	**% Setting**
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 16. 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

Table 16. VPxF 05SQ ECM CFM (continued)

Motor Min CFM: 280 Motor Max CFM: 1850		
CFM	**L/sec**	**% Setting**
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
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

Table 16. VPxF 05SQ ECM CFM (continued)

Motor Min CFM: 280 Motor Max CFM: 1850		
CFM	**L/sec**	**% Setting**
1787	843	96
1802	851	97
1818	858	98
1834	866	99
1850	873	100

Table 17. 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

Table 17. VPxF 06SQ ECM CFM (continued)

Motor Min CFM: 530 Motor Max CFM: 2100		
CFM	**L/sec**	**% Setting**
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
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 18. 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
700	330	56
709	335	57
718	339	58
727	343	59
736	348	60

Table 18. VSxF 03SQ ECM CFM (continued)

Motor Min CFM: 200 Motor Max CFM: 1100		
CFM	**L/sec**	**% Setting**
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 19. 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

Table 19. VSxF 04SQ ECM CFM (continued)

Motor Min CFM: 275 Motor Max CFM: 1500		
CFM	**L/sec**	**% Setting**
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
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

Table 19. VSxF 04SQ ECM CFM (continued)

Motor Min CFM: 275 Motor Max CFM: 1500		
CFM	**L/sec**	**% Setting**
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 20. 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

Table 20. VSxF 05SQ ECM CFM (continued)

Motor Min CFM: 350 Motor Max CFM: 2050		
CFM	**L/sec**	**% Setting**
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
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

Table 20. VSxF 05SQ ECM CFM (continued)

Motor Min CFM: 350 Motor Max CFM: 2050		
CFM	**L/sec**	**% Setting**
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 21. 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

Table 21. VSxF 06SQ ECM CFM (continued)

Motor Min CFM: 700 Motor Max CFM: 2500		
CFM	**L/sec**	**% Setting**
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
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

Table 21. VSxF 06SQ ECM CFM (continued)

Motor Min CFM: 700 Motor Max CFM: 2500		
CFM	**L/sec**	**% Setting**
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 22. 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

Table 22. LPxF 08SQ ECM CFM (continued)

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
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
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 23. 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
680	321	56
688	325	57
696	329	58
704	332	59
712	336	60

Table 23. LPxF 09SQ ECM CFM (continued)

Motor Min CFM: 250 Motor Max CFM: 1025		
CFM	**L/sec**	**% Setting**
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 24. 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

Table 24. LSxF 08SQ ECM CFM (continued)

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
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
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

Table 24. LSxF 08SQ ECM CFM (continued)

Motor Min CFM: 100 Motor Max CFM: 460		
CFM	**L/sec**	**% Setting**
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 25. 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

Table 25. LSxF 09SQ ECM CFM (continued)

Motor Min CFM: 240 Motor Max CFM: 950		
CFM	**L/sec**	**% Setting**
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
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

Table 25. LSxF 09SQ ECM CFM (continued)

Motor Min CFM: 240 Motor Max CFM: 950		
CFM	**L/sec**	**% Setting**
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 26. 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

Table 26. LSxF 10SQ ECM CFM (continued)

Motor Min CFM: 400 Motor Max CFM: 1800		
CFM	**L/sec**	**% Setting**
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
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

Table 26. LSxF 10SQ ECM CFM (continued)

Motor Min CFM: 400 Motor Max CFM: 1800		
CFM	**L/sec**	**% Setting**
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

Table 27. LDxF DS01 ECM

Motor Min CFM: 100 Motor Max CFM: 700		
CFM	**L/sec**	**% Setting**
100	47	0
106	50	1
112	53	2
118	56	3
124	58	4
130	61	5
136	64	6
142	67	7
148	70	8
154	73	9
160	75	10
166	78	11
172	81	12
178	84	13
184	87	14
190	89	15
196	92	16
202	95	17
208	98	18
214	101	19
220	104	20
226	106	21
232	109	22
238	112	23
244	115	24
250	118	25
256	121	26
262	123	27
268	126	28
274	129	29
280	132	30
286	135	31
292	138	32
298	140	33
304	143	34
310	146	35
316	149	36
322	152	37
328	154	38
334	157	39
340	160	40

Table 27. LDxF DS01 ECM (continued)

Motor Min CFM: 100 Motor Max CFM: 700		
CFM	**L/sec**	**% Setting**
346	163	41
352	166	42
358	169	43
364	171	44
370	174	45
376	177	46
382	180	47
388	183	48
394	186	49
400	188	50
406	191	51
412	194	52
418	197	53
424	200	54
430	203	55
436	205	56
442	208	57
448	211	58
454	214	59
460	217	60
466	219	61
472	222	62
478	225	63
484	228	64
490	231	65
496	234	66
502	236	67
508	239	68
514	242	69
520	245	70
526	248	71
532	251	72
538	253	73
544	256	74
550	259	75
556	262	76
562	265	77
568	268	78
574	270	79
580	273	80
586	276	81
592	279	82
598	282	83
604	284	84
610	287	85
616	290	86
622	293	87
628	296	88
634	299	89
640	301	90
646	304	91
652	307	92
658	310	93
664	313	94
670	316	95
676	318	96
682	321	97
688	324	98
694	327	99
700	330	100

Table 28. LDxF DS02 ECM

Motor Min CFM: 500 Motor Max CFM: 1300		
CFM	**L/sec**	**% Setting**
500	236	0
508	239	1
516	243	2
524	247	3
532	251	4
540	254	5
548	258	6
556	262	7
564	266	8
572	269	9
580	273	10
588	277	11
596	281	12
604	284	13
612	288	14
620	292	15
628	296	16
636	300	17
644	303	18
652	307	19
660	311	20
668	315	21
676	318	22
684	322	23
692	326	24
700	330	25
708	333	26
716	337	27
724	341	28
732	345	29
740	349	30
748	352	31
756	356	32
764	360	33
772	364	34
780	367	35
788	371	36
796	375	37
804	379	38
812	382	39
820	386	40
828	390	41
836	394	42
844	398	43
852	401	44
860	405	45
868	409	46
876	413	47
884	416	48
892	420	49
900	424	50
908	428	51
916	431	52
924	435	53
932	439	54
940	443	55
948	447	56
956	450	57
964	454	58
972	458	59
980	462	60

Table 28. LDxF DS02 ECM (continued)

Motor Min CFM: 500 Motor Max CFM: 1300		
CFM	**L/sec**	**% Setting**
988	465	61
996	469	62
1004	473	63
1012	477	64
1020	480	65
1028	484	66
1036	488	67
1044	492	68
1052	495	69
1060	499	70
1068	503	71
1076	507	72
1084	511	73
1092	514	74
1100	518	75
1108	522	76
1116	526	77
1124	529	78
1132	533	79
1140	537	80

Table 28. LDxF DS02 ECM (continued)

Motor Min CFM: 500 Motor Max CFM: 1300		
CFM	**L/sec**	**% Setting**
1148	541	81
1156	544	82
1164	548	83
1172	552	84
1180	556	85
1188	560	86
1196	563	87
1204	567	88
1212	571	89
1220	575	90
1228	578	91
1236	582	92
1244	586	93
1252	590	94
1260	593	95
1268	597	96
1276	601	97
1284	605	98
1292	609	99
1300	612	100

Wiring Diagrams

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

- *UCM 4.2: VAV-SVX01*-EN*
- *UC400: VAV-SVX07*-EN*
- *UC210: BAS-SVX62*-EN*
- *VV550: VAV-SVP01*-EN*

Wiring — Heater Terminals with Contactors

Figure 28. Wiring — single-duct units, single phase voltages, with backup, 1 leg

SINGLE DUCT UNITS - WITH BACKUP
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES-1 LEG

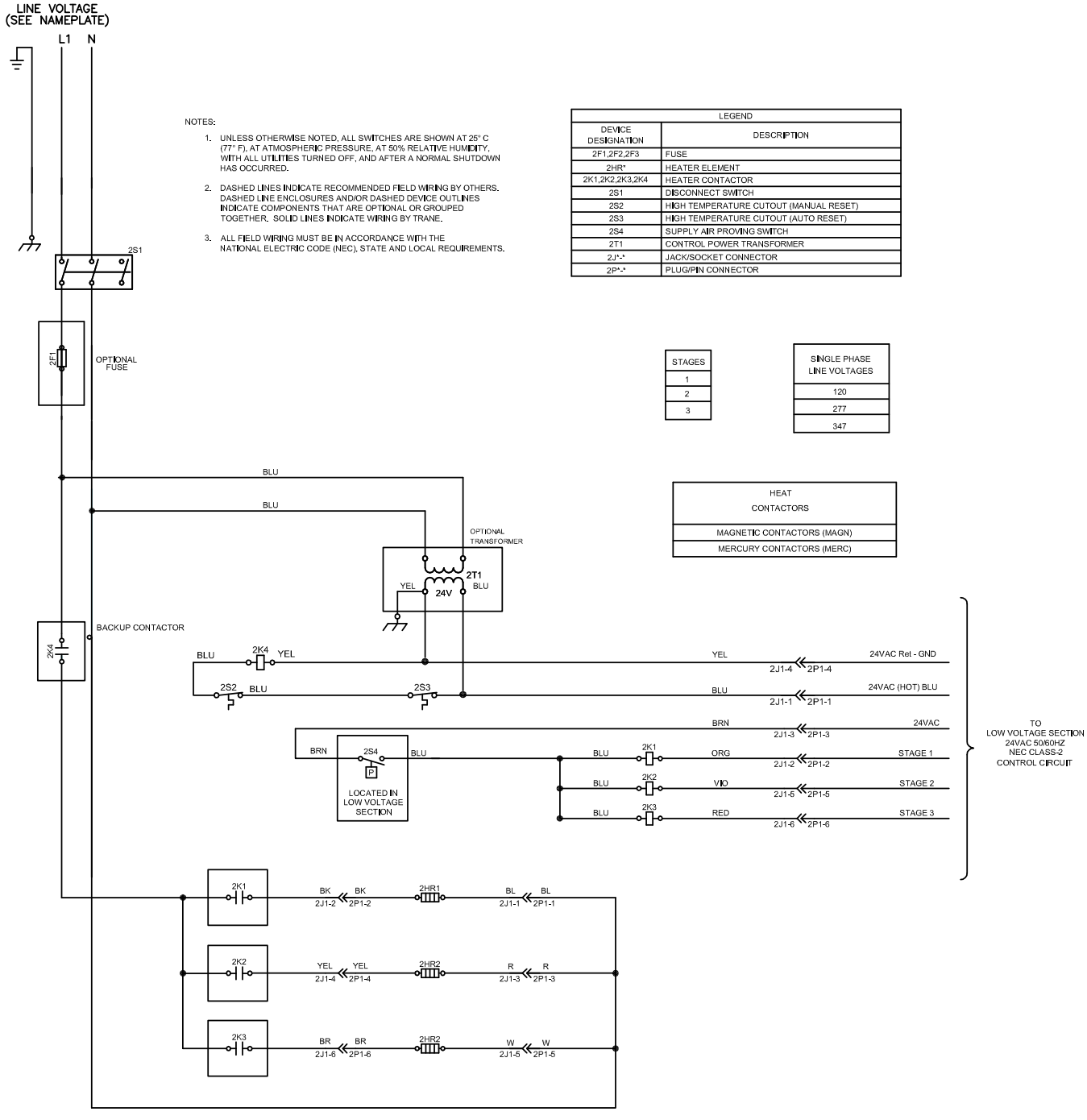


Figure 29. Wiring — single-duct units, single phase voltages, with backup, 2 leg

SINGLE DUCT UNITS - WITH BACKUP
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 2 LEG

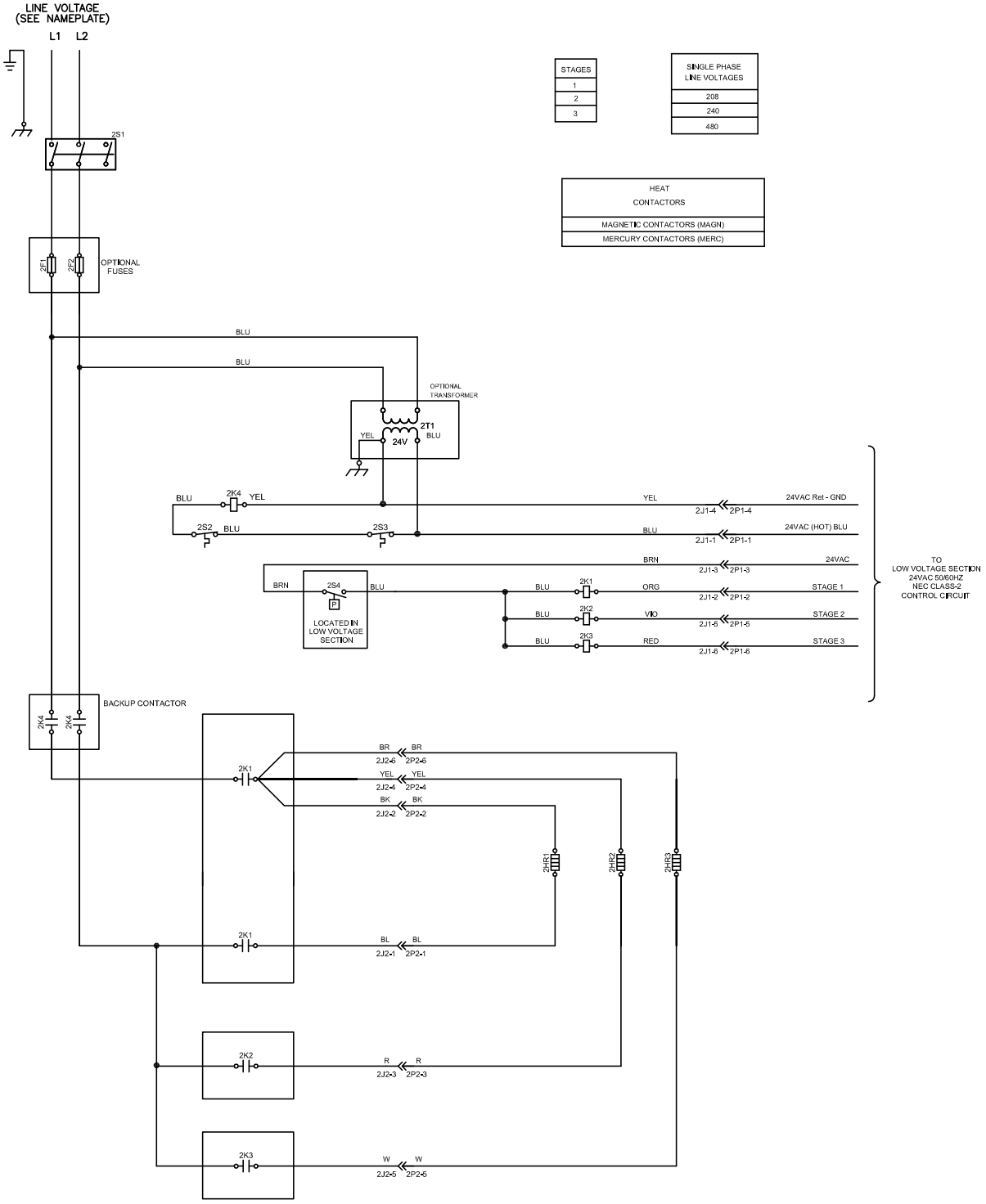


Figure 30. Wiring — single-duct units, single phase voltages, no backup, 1 leg

SINGLE DUCT UNITS - TRANE CONTROLS (NO BACKUP)
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES-1 LEG

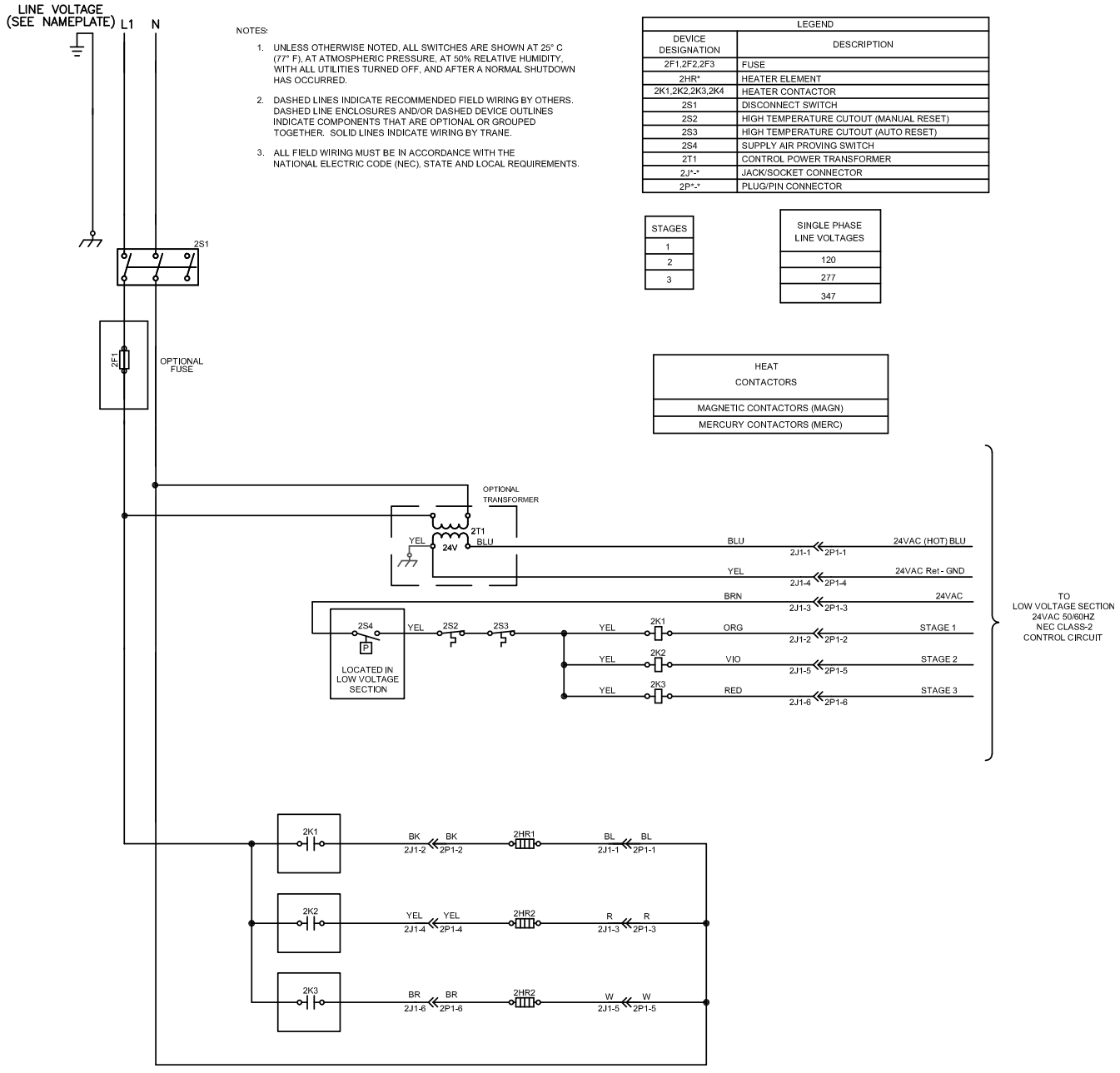


Figure 31. Wiring — single-duct units, single phase voltages, no backup, 2 leg

SINGLE DUCT UNITS - TRANE CONTROLS (NO BACKUP)
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 2 LEG

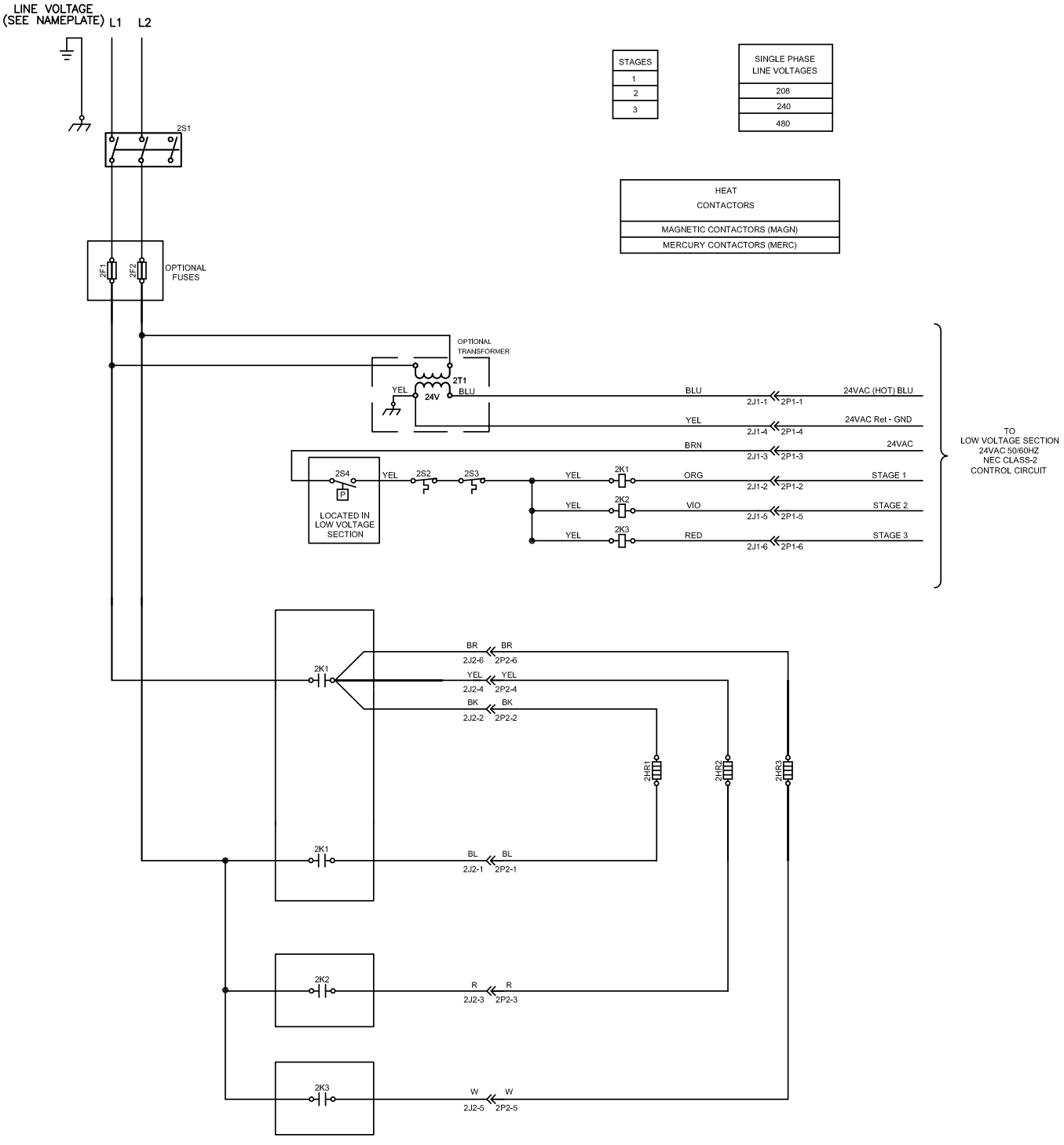
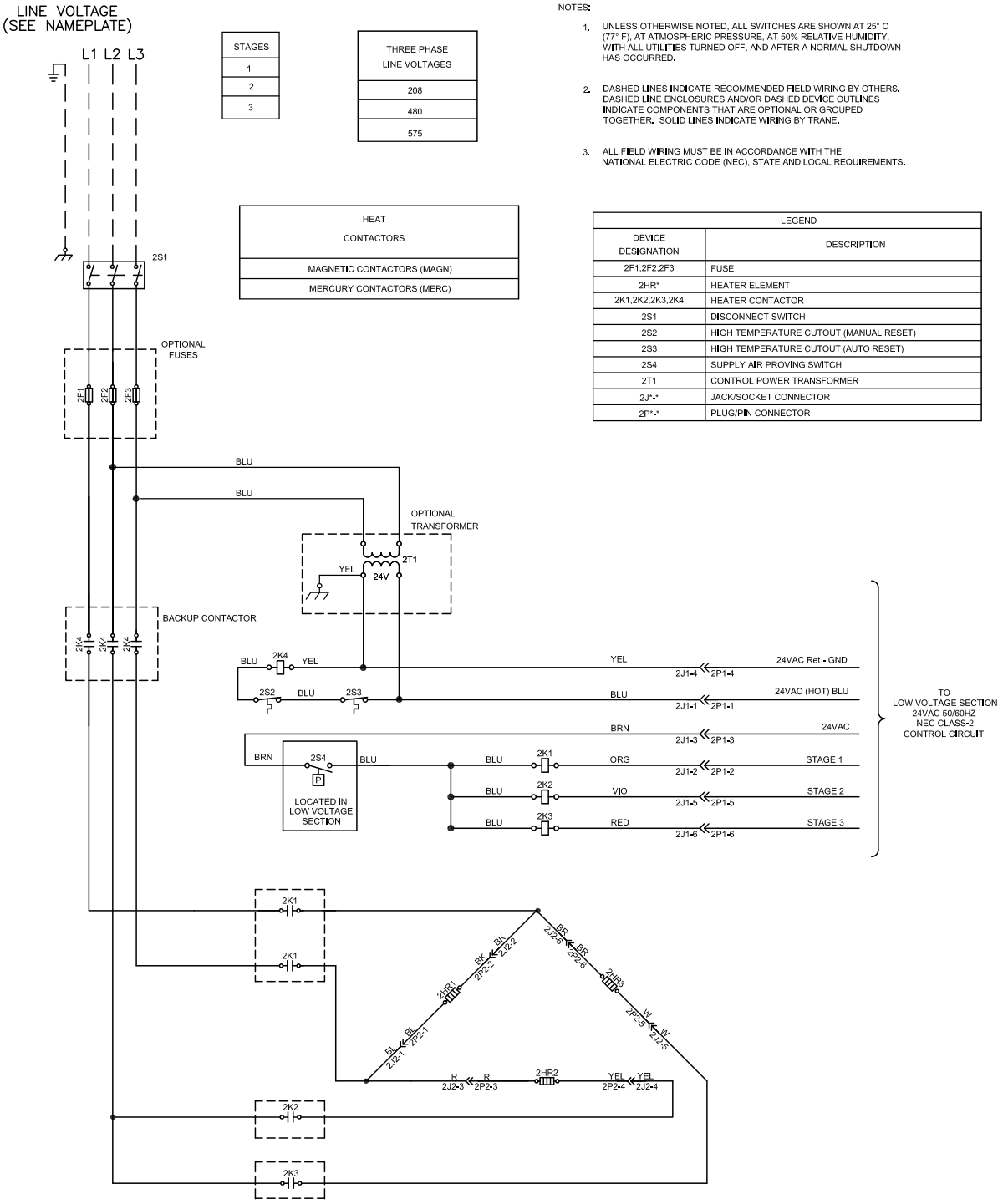


Figure 32. Wiring — single-duct units, 3– phase voltages, backup

SINGLE DUCT UNITS - WITH BACKUP
HEATER TERMINALS - TYPICAL OF THREE PHASE VOLTAGES



NOTES:

1. UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25° C (77° F), AT ATMOSPHERIC PRESSURE, AT 50% RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF, AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS THAT ARE OPTIONAL OR GROUPED TOGETHER. SOLID LINES INDICATE WIRING BY TRANE.
3. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS.

STAGES
1
2
3

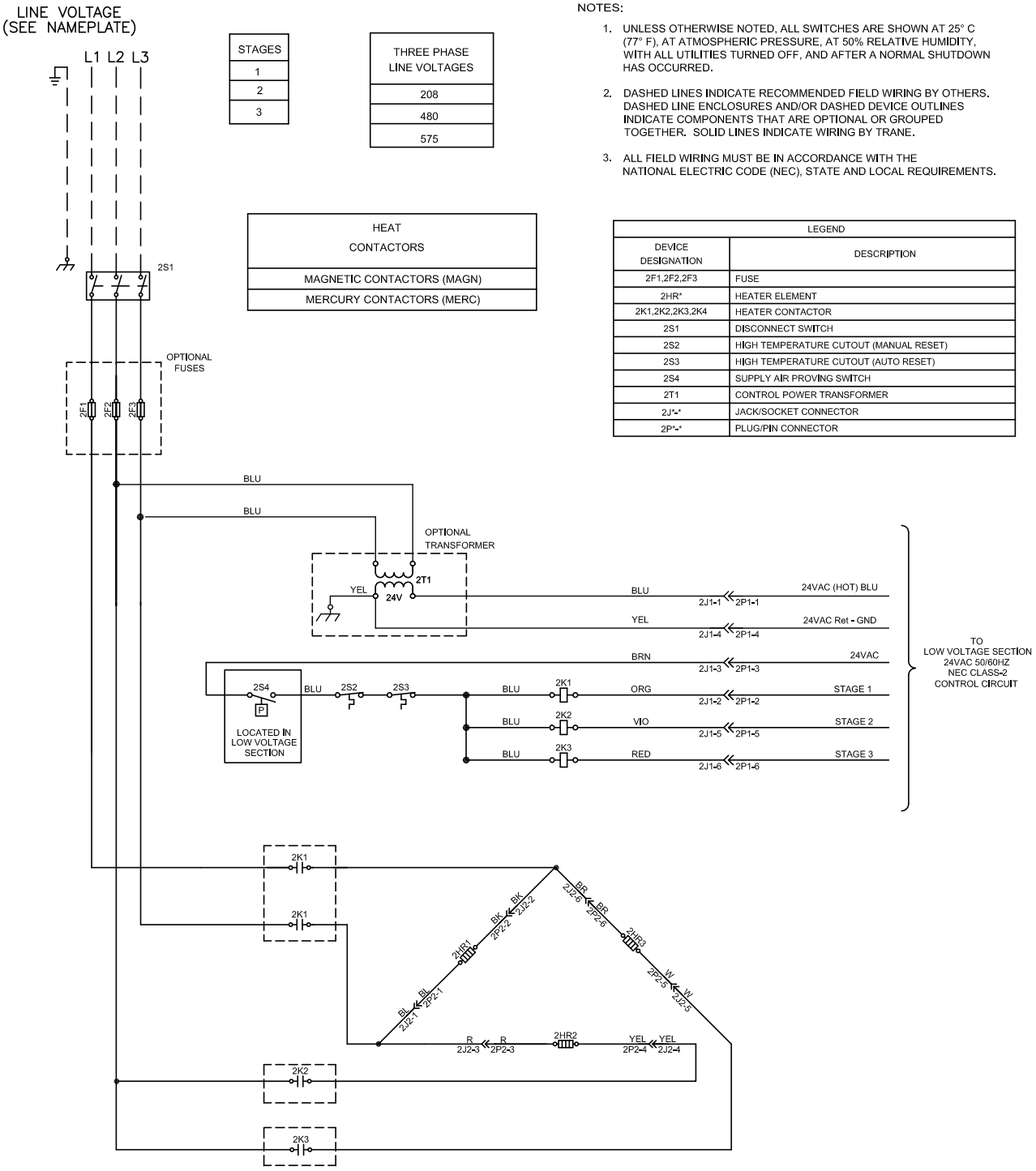
THREE PHASE LINE VOLTAGES
208
480
575

HEAT CONTACTORS
MAGNETIC CONTACTORS (MAGN)
MERCURY CONTACTORS (MERC)

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
2F1,2F2,2F3	FUSE
2HR*	HEATER ELEMENT
2K1,2K2,2K3,2K4	HEATER CONTACTOR
2S1	DISCONNECT SWITCH
2S2	HIGH TEMPERATURE CUTOUT (MANUAL RESET)
2S3	HIGH TEMPERATURE CUTOUT (AUTO RESET)
2S4	SUPPLY AIR PROVING SWITCH
2T1	CONTROL POWER TRANSFORMER
2J*-*	JACK/SOCKET CONNECTOR
2P*-*	PLUG/PIN CONNECTOR

Figure 33. Wiring — single-duct units, 3–phase voltages, no backup

SINGLE DUCT UNITS - TRANE CONTROLS (NO BACKUP)
HEATER TERMINALS - TYPICAL OF THREE PHASE VOLTAGES



STAGES
1
2
3

THREE PHASE LINE VOLTAGES
208
480
575

HEAT CONTACTORS
MAGNETIC CONTACTORS (MAGN)
MERCURY CONTACTORS (MERC)

NOTES:

1. UNLESS OTHERWISE NOTED, ALL SWITCHES ARE SHOWN AT 25° C (77° F), AT ATMOSPHERIC PRESSURE, AT 50% RELATIVE HUMIDITY, WITH ALL UTILITIES TURNED OFF, AND AFTER A NORMAL SHUTDOWN HAS OCCURRED.
2. DASHED LINES INDICATE RECOMMENDED FIELD WIRING BY OTHERS. DASHED LINE ENCLOSURES AND/OR DASHED DEVICE OUTLINES INDICATE COMPONENTS THAT ARE OPTIONAL OR GROUPED TOGETHER. SOLID LINES INDICATE WIRING BY TRANE.
3. ALL FIELD WIRING MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), STATE AND LOCAL REQUIREMENTS.

LEGEND	
DEVICE DESIGNATION	DESCRIPTION
2F1,2F2,2F3	FUSE
2HR*	HEATER ELEMENT
2K1,2K2,2K3,2K4	HEATER CONTACTOR
2S1	DISCONNECT SWITCH
2S2	HIGH TEMPERATURE CUTOUT (MANUAL RESET)
2S3	HIGH TEMPERATURE CUTOUT (AUTO RESET)
2S4	SUPPLY AIR PROVING SWITCH
2T1	CONTROL POWER TRANSFORMER
2J*-*	JACK/SOCKET CONNECTOR
2P*-*	PLUG/PIN CONNECTOR

Figure 34. Wiring — single-duct units, SCR, single phase voltages, 1 leg

SINGLE DUCT UNITS - SCR
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 1 leg

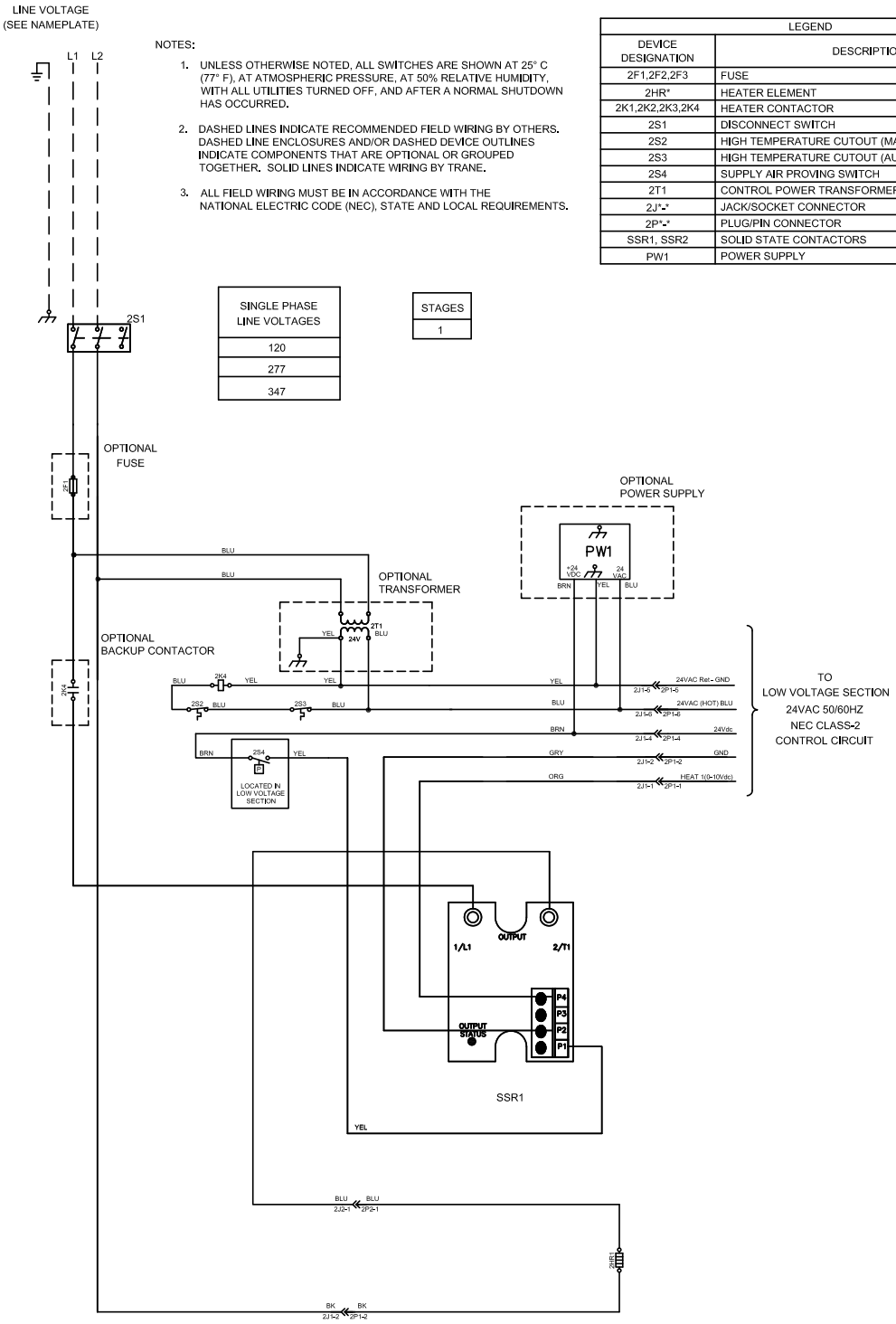


Figure 35. Wiring — single-duct units, SCR, single phase voltages, 2 legs

SINGLE DUCT UNITS - SCR
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 2 leg

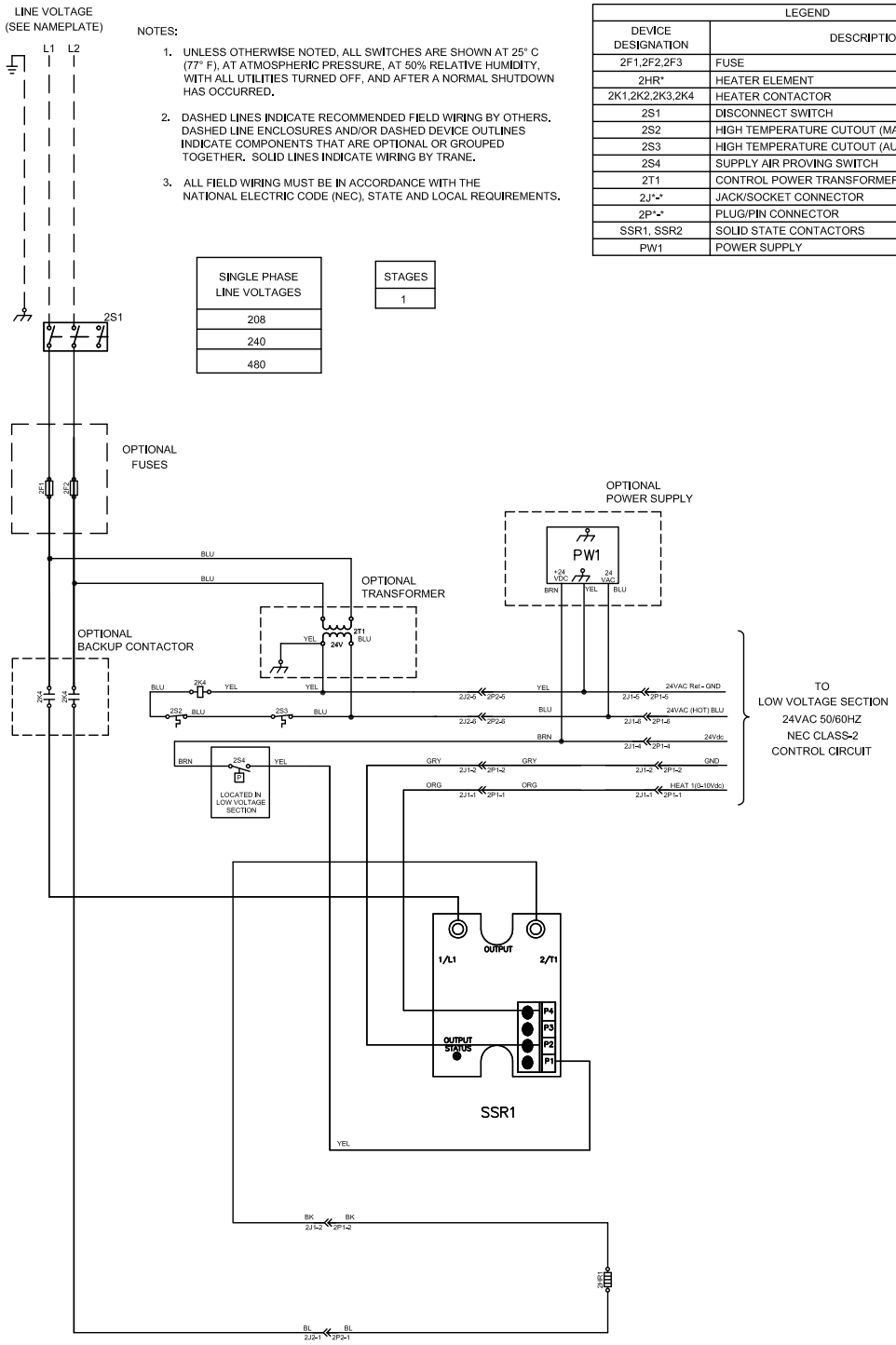


Figure 36. Wiring — single-duct units, SCR, 3–phase voltages

SINGLE DUCT UNITS - SCR
HEATER TERMINALS - TYPICAL OF THREE PHASE VOLTAGES

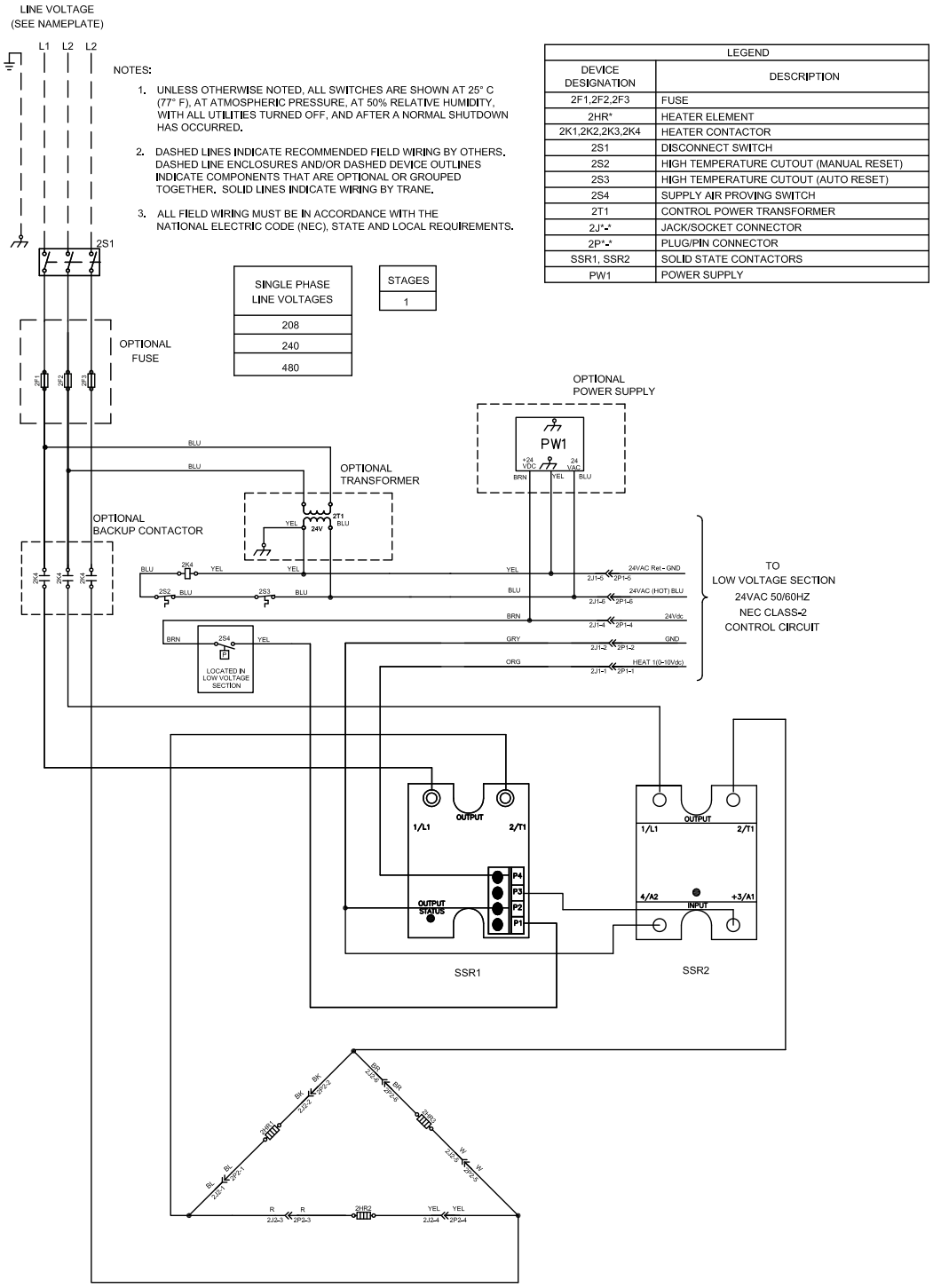


Figure 37. Wiring — fan—powered units, single phase voltages, 1 leg

FAN-POWERED UNITS
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 1 LEG

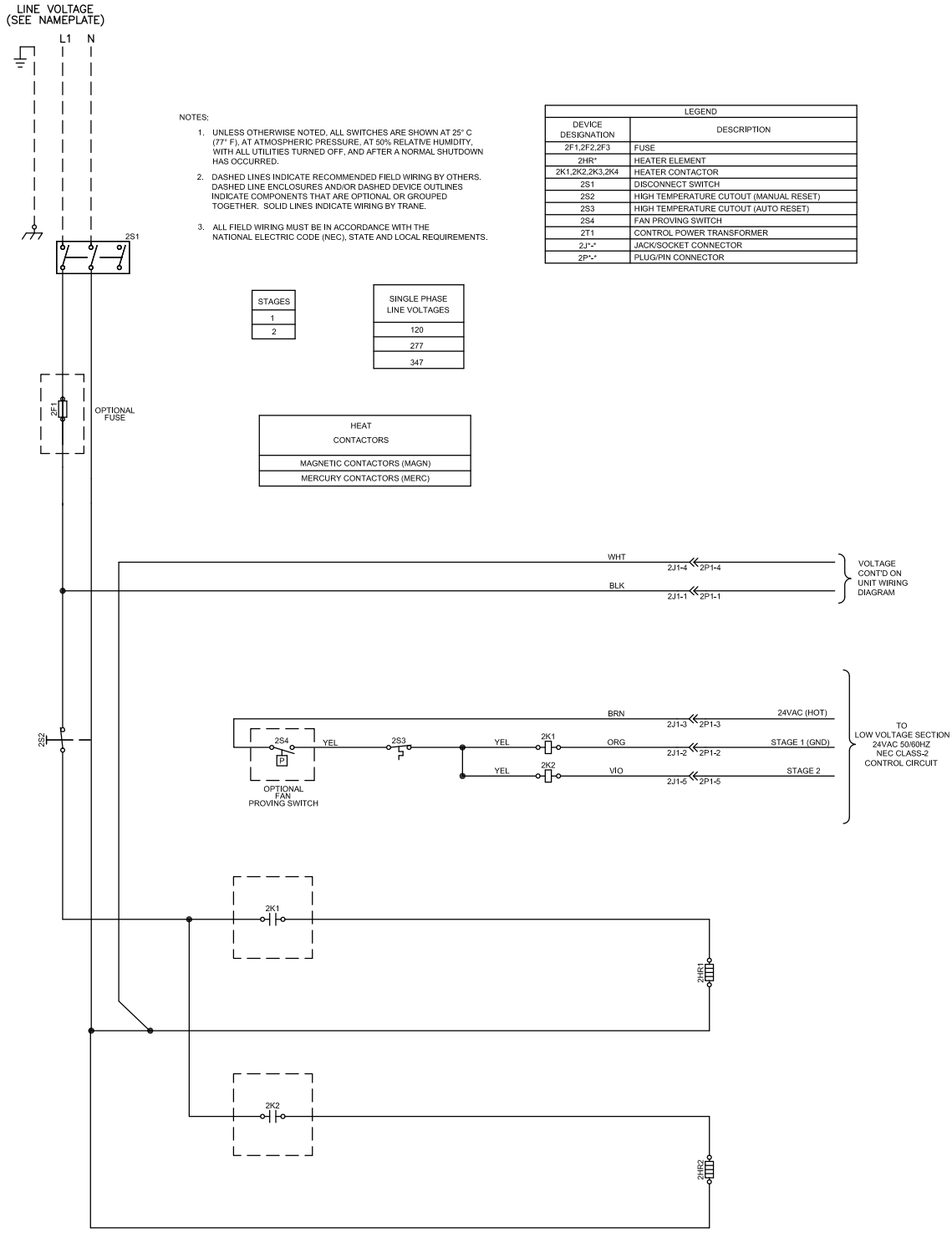


Figure 38. Wiring — fan—powered units, single phase voltages, 2 legs

FAN-POWERED UNITS
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 2 LEG

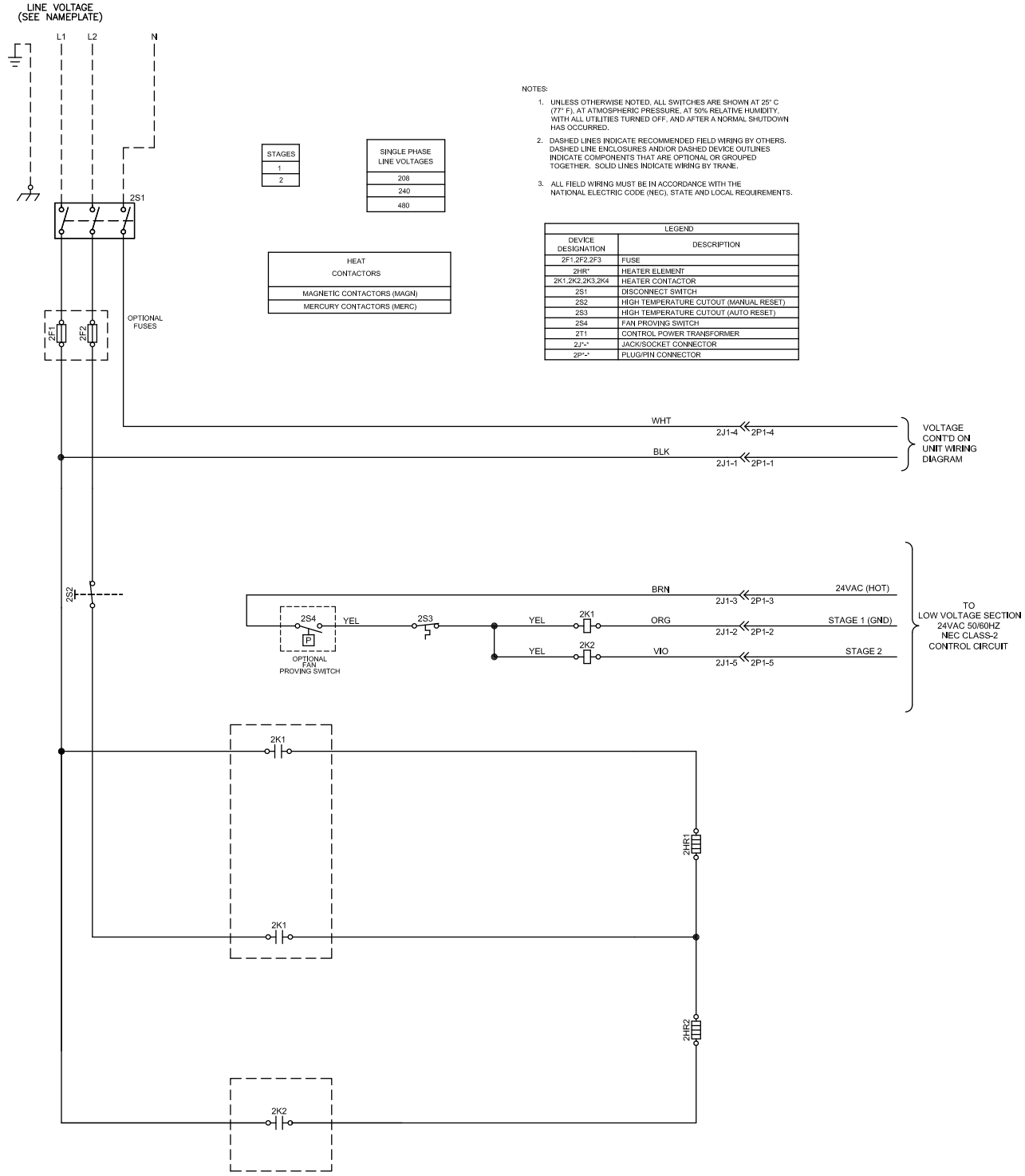


Figure 39. Wiring — fan—powered units, 3–phase voltages

FAN-POWERED UNITS
HEATER TERMINALS - TYPICAL OF THREE PHASE VOLTAGES

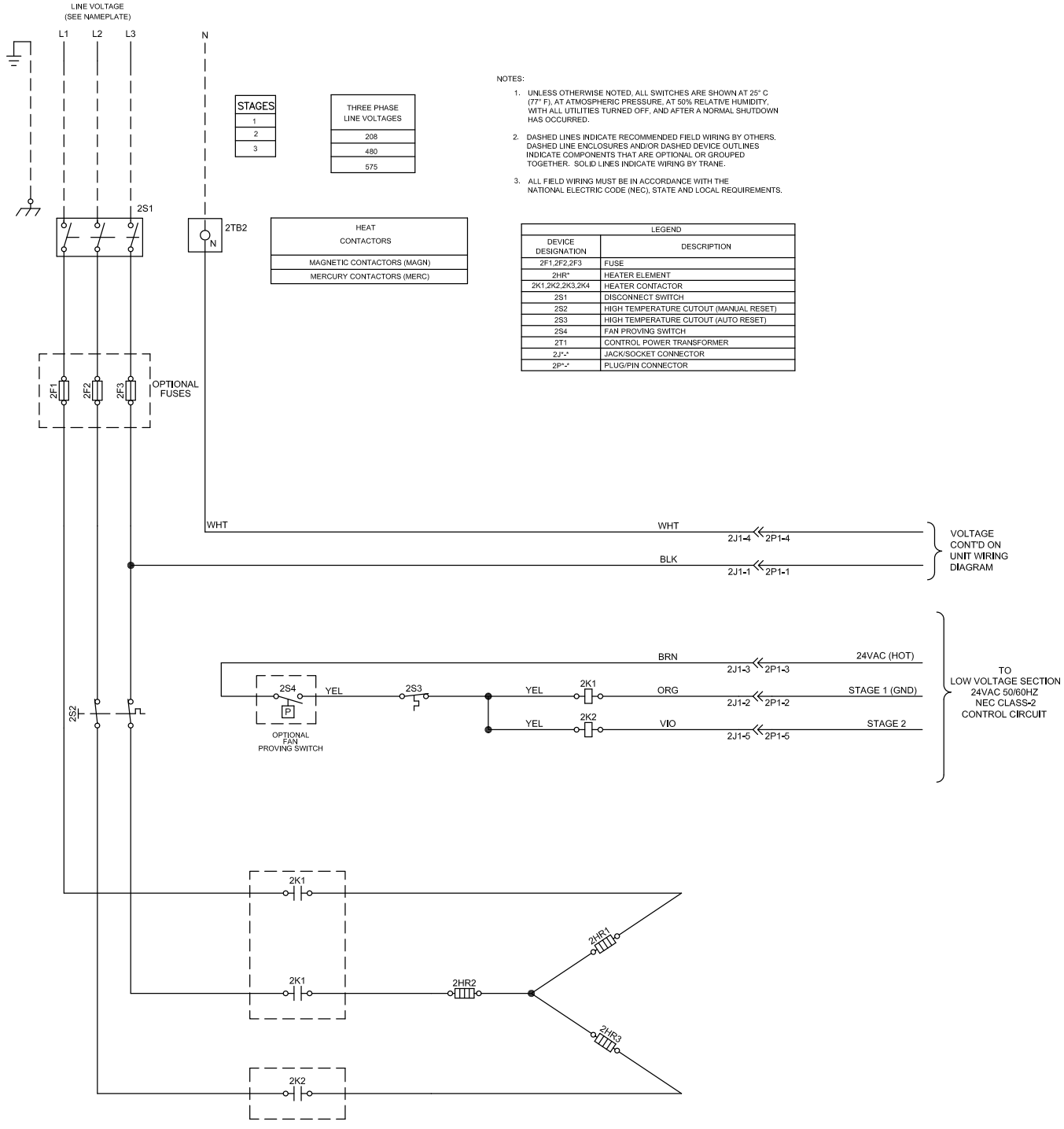


Figure 40. Wiring — fan—powered units, pneumatic, single phase voltages, 1 leg

FAN-POWERED UNITS - PNEUMATIC CONTROLS
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 1 LEG

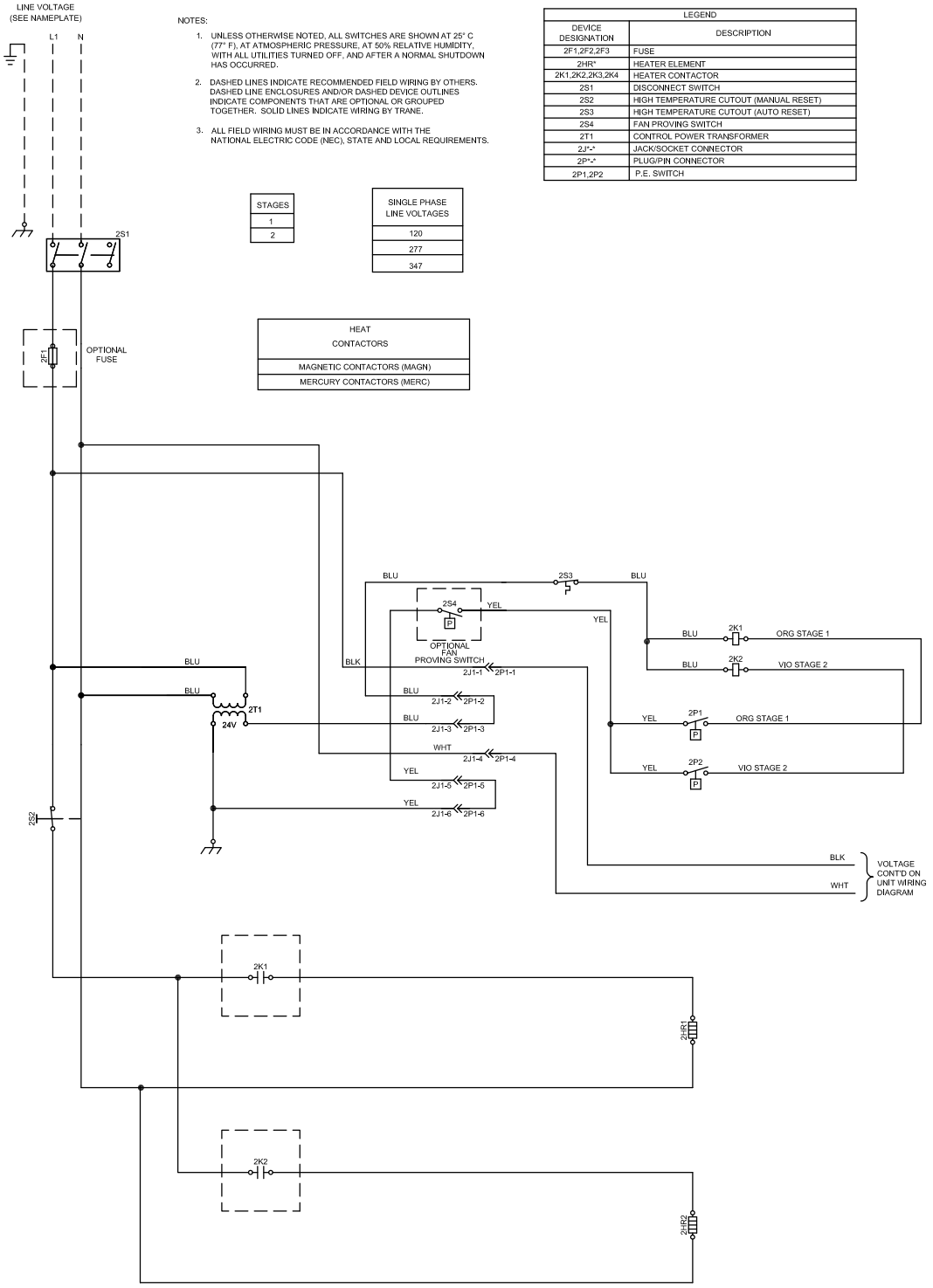


Figure 41. Wiring — fan—powered units, pneumatic, single phase voltages, 2 legs

FAN-POWERED UNITS - PNEUMATIC CONTROLS
HEATER TERMINALS - TYPICAL OF SINGLE PHASE VOLTAGES - 2 LEG

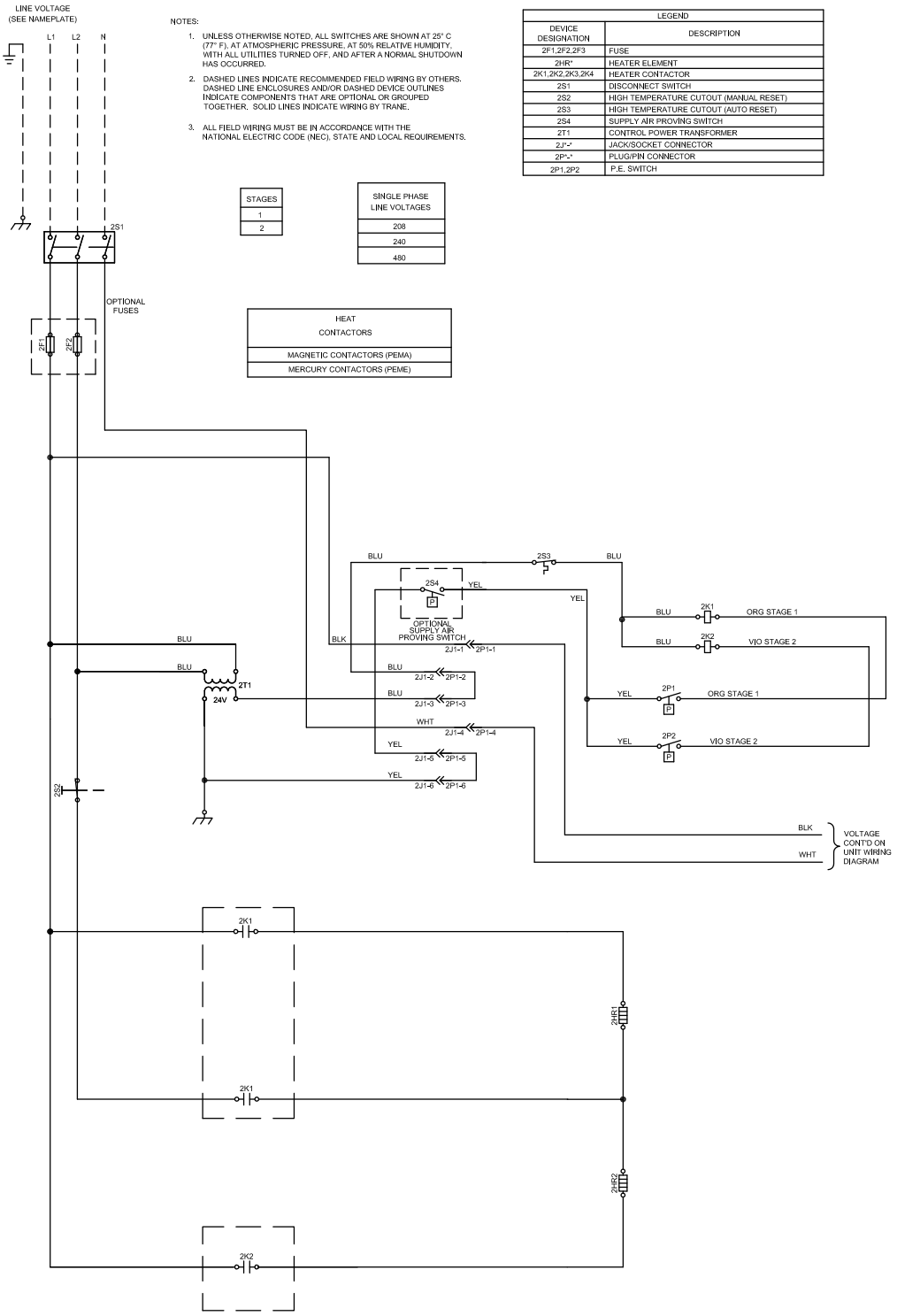
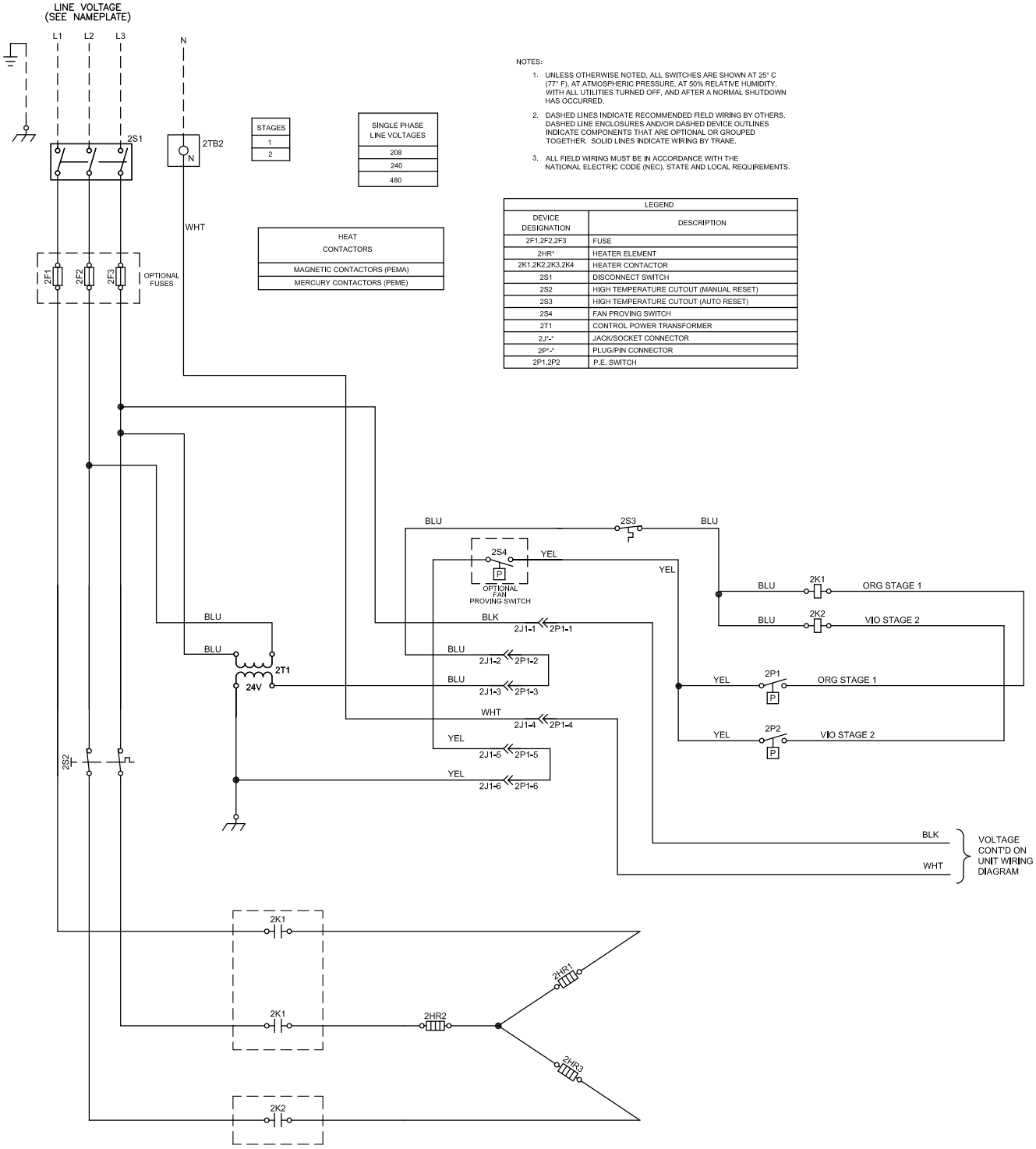


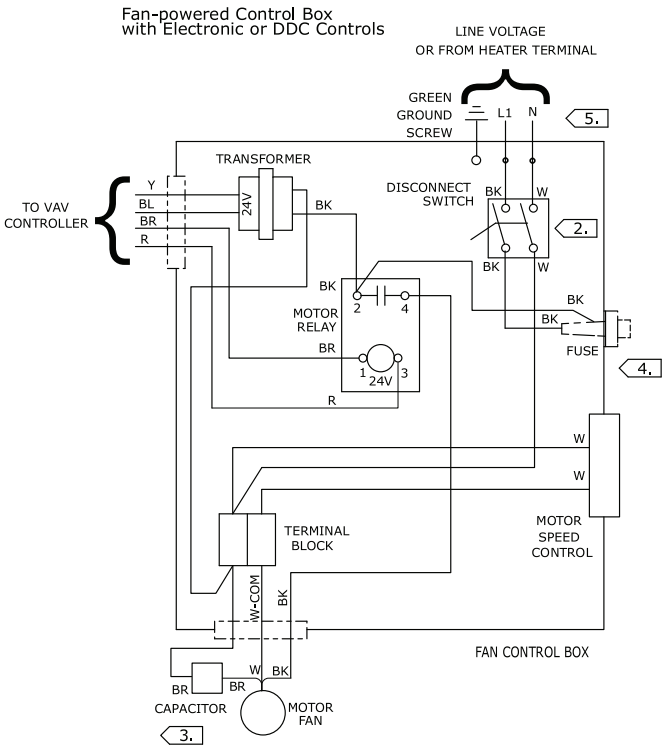
Figure 42. Wiring — fan—powered units, pneumatic, 3–phase voltages

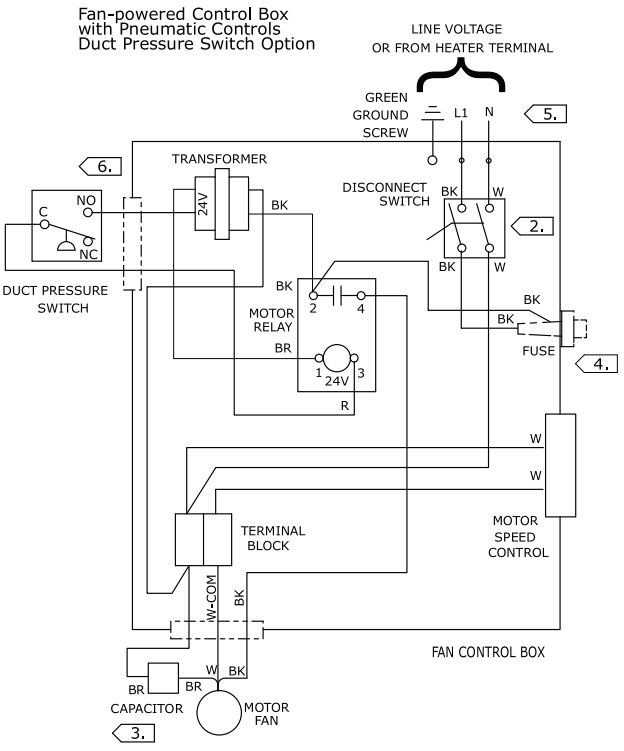
FAN-POWERED UNITS - PNEUMATIC CONTROL
HEATER TERMINALS - TYPICAL OF THREE PHASE VOLTAGES



Control Box Wiring

Figure 43. Fan-powered control boxes





⚠ WARNING

HAZARDOUS VOLTAGE!

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

DISCHARGE MOTOR START/RUN CAPACITORS BEFORE SERVICING.

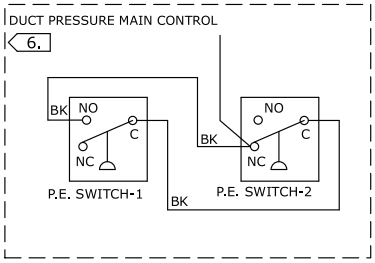
FAILURE TO DISCONNECT POWER BEFORE SERVICING CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

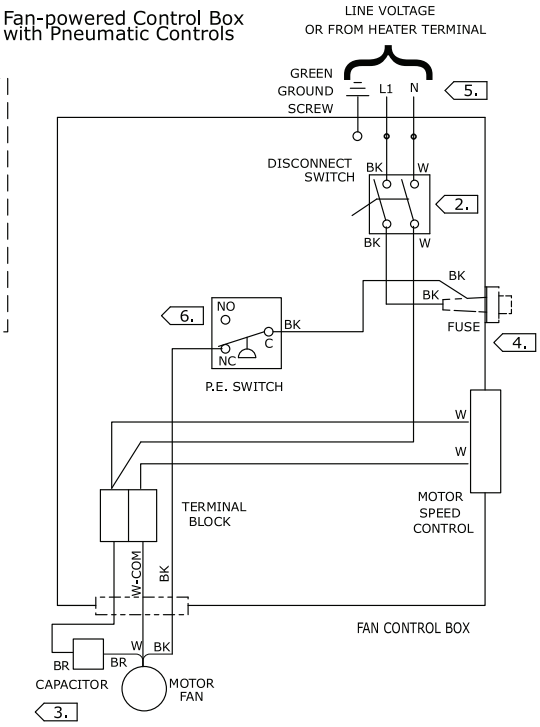
⚠ CAUTION

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.





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.

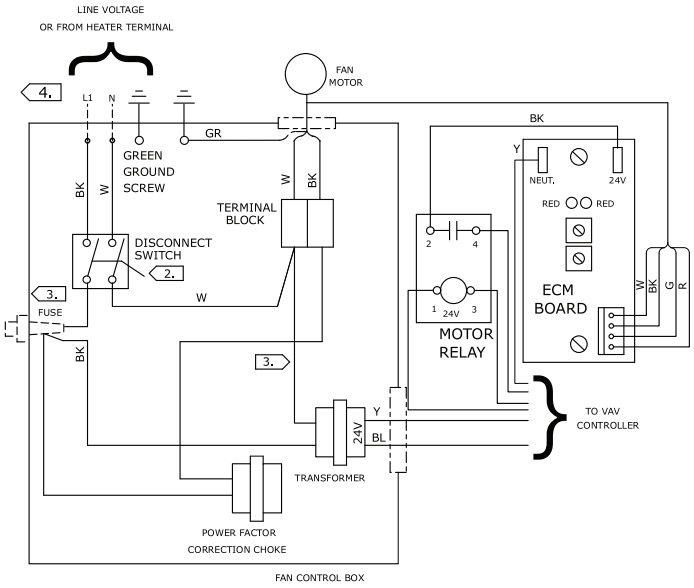
4. FUSE IS OPTIONAL.

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

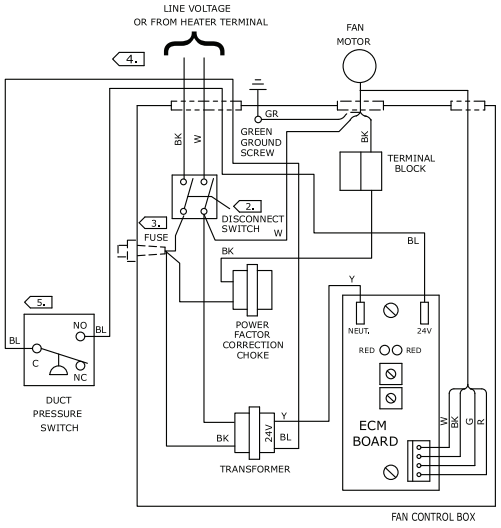
6. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

Figure 44. 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.

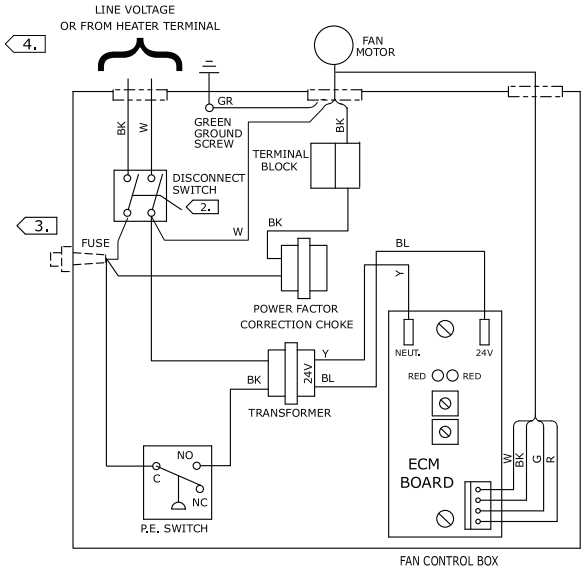
⚠ CAUTION

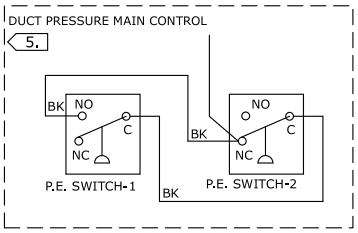
USE COPPER CONDUCTORS ONLY!

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.

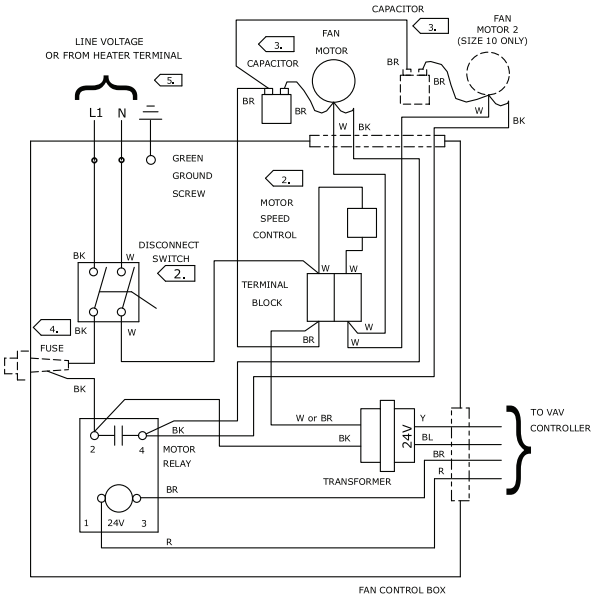
3. FUSE IS OPTIONAL.

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

5. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

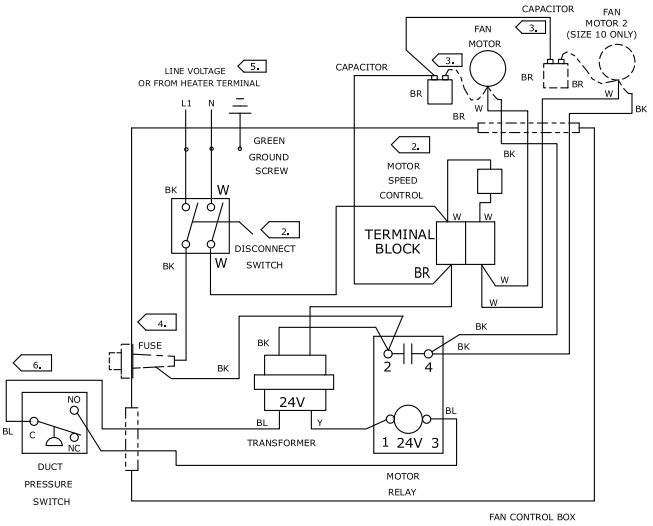
Figure 45. Fan-powered low-height units

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.

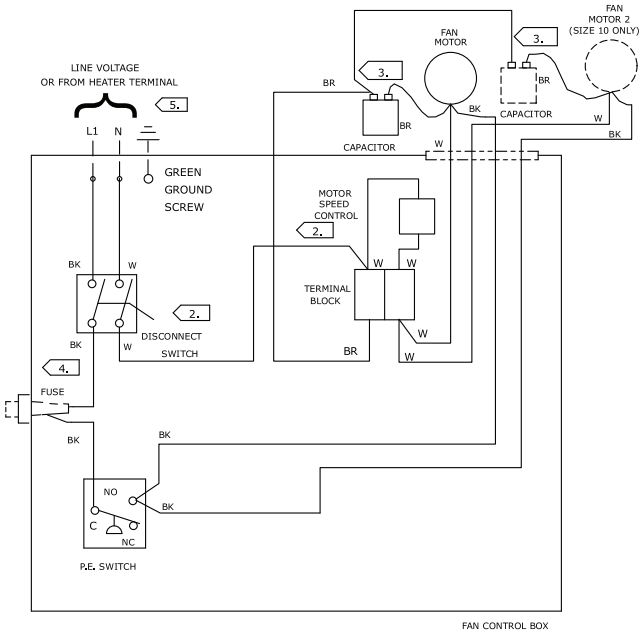
⚠ CAUTION

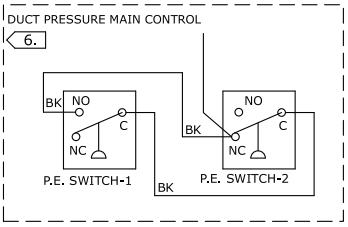
USE COPPER CONDUCTORS ONLY!

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



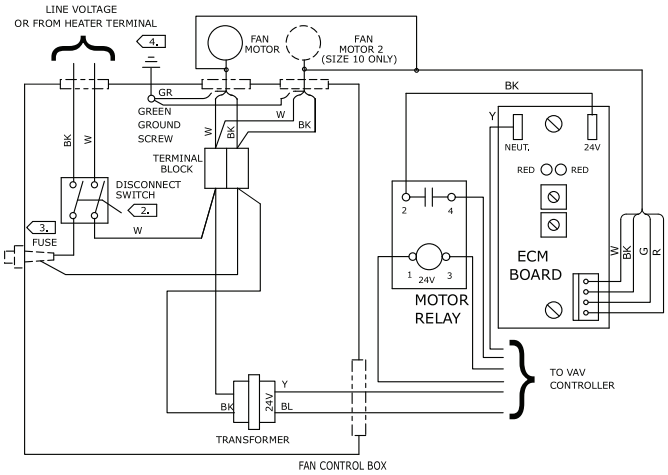


NOTES:

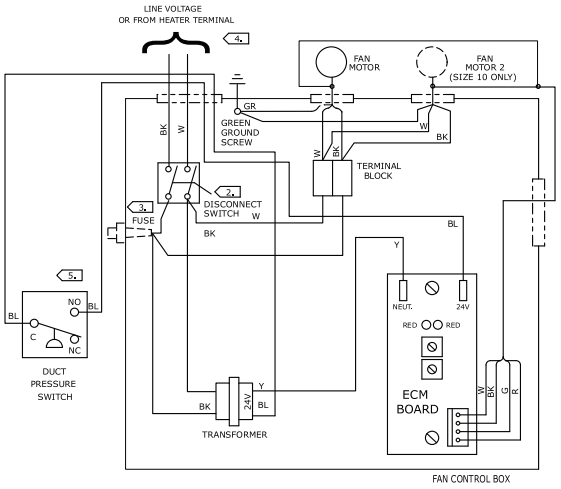
1. ———— FACTORY INSTALLED
   ---------- BY OTHERS
   ---------- OPTIONAL OR ALTERNATE CIRCUITRY
2. DISCONNECT SWITCH, FUSE, & SCR ARE LOCATED EXTERNAL TO CONTROL BOX.
3. CAPACITOR IS INSTALLED ON FAN HOUSING.
4. FUSE IS OPTIONAL.
5. DETERMINED BY MOTOR VOLTAGE ON ORDER. VOLTAGE FOUND ON UNIT NAMEPLATE.
6. FOR SERIES FAN POWERED TERMINAL UNITS ONLY.

Figure 46. 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.

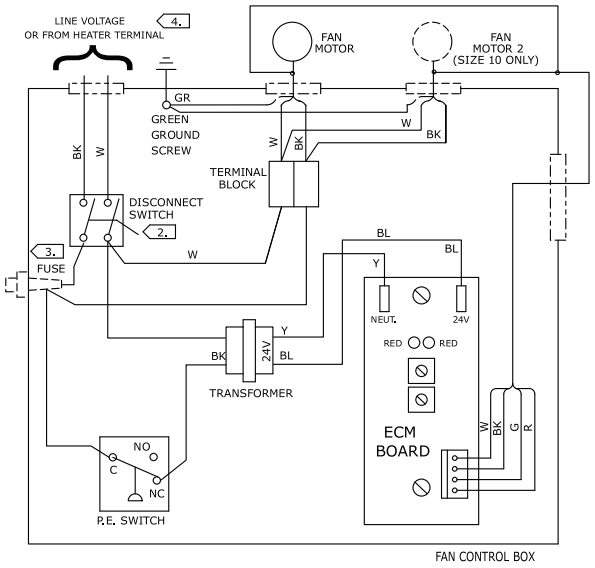
⚠ CAUTION

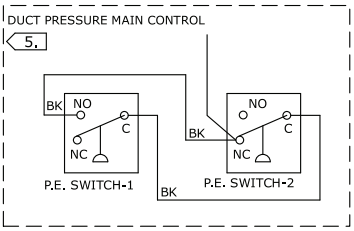
USE COPPER CONDUCTORS ONLY!

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 Permanent Split Capacitor(PSC) and the Electrically Commutated Motor (ECM) require no lubrication during its normal life of operation.

Fan Wheel

Routinely inspect the fan wheel for dirt or debris and cleaned as necessary.

Filter

Routinely inspect and/or replace the filter on fan-powered terminals 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 retaining position by turning them 90° (CW or CCW) back to their original position.

Water Coil

- Periodically inspect water coils and clean fins.
- Water coils are provided with an access panel as standard to assist with inspection and cleaning.

Fan Motor Replacement

⚠ WARNING

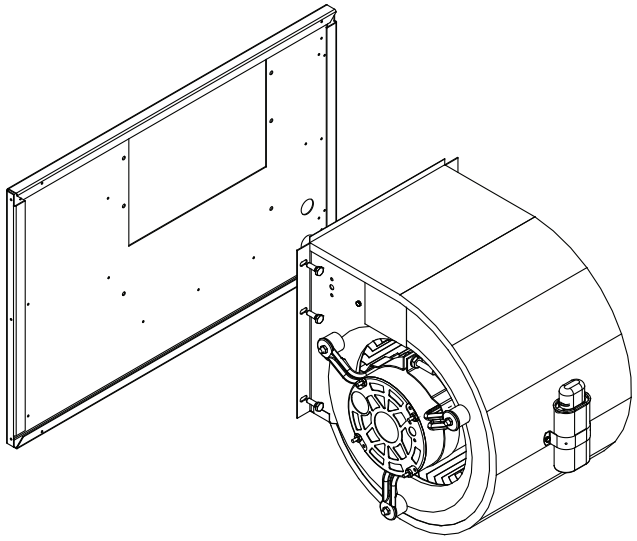
Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

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.

For additional information regarding the safe discharge of capacitors, see PROD-SVB06*-EN.

Figure 47. Standard motor removal

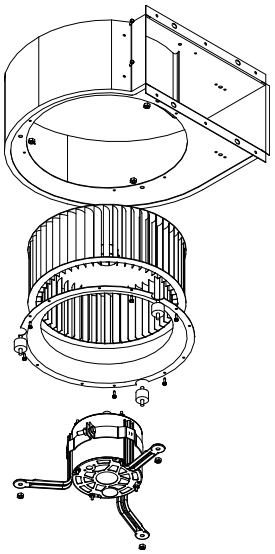


Standard height fan-powered series and parallel fan motors are replaceable through the filter opening and the standard sliding side access panel. To access the fan motor, the fan housing must be detached by removing the mounting bolts that hold the housing to the fan board. Removing the entire housing 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 (6) bolts and three motor mount bolts. Remove these bolts to release the motor and fan wheel from the fan housing.

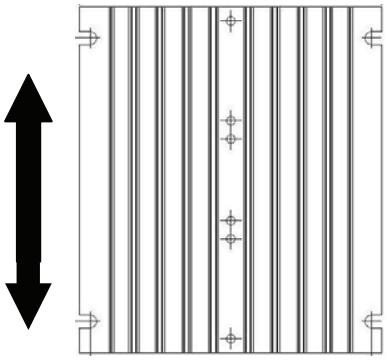
Figure 48. Low-height motor removal



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 49. 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 above) with a minimum clearance of 0.5" 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 does not light and/or the SCR relay does not conduct, the entire SCR heat sink assembly should be changed out. Individual Master or Slave relays should not be replaced.

Notes

Ingersoll Rand (NYSE: IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands — including Club Car®, Ingersoll Rand®, Thermo King® and Trane® — work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a global business committed to a world of sustainable progress and enduring results.




ingersollrand.com

VAV-SVX08G-EN 23 Apr 2017
Supersedes VAV-SVX08F-EN (February 2017)