

Power-Zone®

Load Center Unit Substations

Class 6020



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Schneider Electric Brands

Power-Zone® Load Center Unit Substations

General Layout Information

BEFORE YOU BEGIN

Please read all of the information on this page before using the interface drawings provided in this catalog.

As with any engineered product, substation standards do change from time to time. The substation layout standards shown on the following pages are the latest that have been produced by the Square D Company, and are current as of the date of publication. When in doubt about any standard shown, please contact your local field sales office. Please note that the dimensions shown here are not for construction.

The interface drawings begin on page 32.

All interfaces are shown with the primary or secondary equipment covered by that particular layout in solid lines, and the transformer is shown in dotted lines. Please note dimensions noted as “min” or “minimum”, which denote the minimum possible dimension of a piece of equipment and requires future clarification on a case-by-case basis either from the transformer tables in this catalog or individual equipment dimensional information in another catalog. Also, reference points marked as “☒” (short for “centerline”), can either represent the *centerline of the actual electrical connection between the transformer and the piece of equipment under consideration* (as is often the case in indoor units) or can represent the *centerline of the hole pattern for the bolts which will hold the two pieces of equipment together* (as is often the case with outdoor units). In either case, for the purposes of this catalog these serve only as convenient points of reference. Primary interfaces are drawn with the primary equipment on the left, and secondary interfaces are drawn with the secondary equipment on the right.

The layout standards in this catalog are covered in this order: primary interfaces are shown first, transformer dimensional information is shown next, and secondary interfaces are shown last. It is therefore recommended that the following procedure be used for a layout:

1. Knowing the primary equipment type, its voltage class (either 600 V, 5 kV, 15 kV, 25 kV, 29 kV or 34 kV) and the transformer type, find the appropriate primary equipment-to-transformer interface, noting the overlap, if any, between the front of the primary equipment and the front of the transformer.
NOTE: Please read all footnotes! They provide valuable information and are necessary because in many instances a substantial amount of information is incorporated into one interface drawing.
2. Find the transformer dimensional information for the transformer in question. Please be sure that the dimensions shown can be applied. The footnotes give a substantial amount of information about situations in which the dimensions shown do not apply. When in doubt, please contact your local field sales office about transformer dimensions.
3. The offset, if any, between the rear of the transformer and the rear of the primary equipment can now be determined.
4. Knowing the secondary equipment type and its voltage class (5 kV or 600 V), find the transformer-to-secondary interface for the secondary equipment in question. For QED switchboards and POWER-ZONE® III and POWER-ZONE 4 Low-Voltage switchgear, please note whether the secondary full-load current is through 4000 A or 4001–5000 A. The overlap, if any, between the transformer front and the secondary equipment front can now be determined, as well as any rear overlap. Please note that because of the complex nature of QED switchboards and POWER-ZONE® III and POWER-ZONE 4 Low-Voltage switchgear, these types of equipment should be laid out using the appropriate layout manual or Quote-to-Cash product selector prior to substation layout. Please contact your local Square D field sales representative for details on this process.
5. The substation layout is now complete. Facing the front of the substation, the primary equipment is on the left, and the secondary equipment is on the right. If the opposite orientation is desired, the layout may be mirror-imaged with no loss of accuracy.



Power-Zone® Load Center Unit Substations General Information

Secondary Unit Substation



- kVA ratings: 225-5000 kVA (higher ratings available)
- Receives power up to 34,500 volts
- Transforms to secondary voltages of 1000 volts and below (step-up applications available)
- Distributes lower voltages to load areas
- Indoor or outdoor construction

Primary Unit Substation



- kVA ratings: 225-10,000 kVA (higher ratings available)
- Receives power up to 34,500 volts
- Transforms to secondary voltages of 1000 volts and above
- Indoor or outdoor construction



Power-Zone® Load Center Unit Substations

General Information

General

The unit substation is a vital piece of equipment to be considered when planning industrial, commercial, and institutional electrical system demands. Square D Company can provide a unit substation to receive up to 34,500 volts, transform this to a lower utilization voltage, and control its distribution to nearby load areas. Square D Company is a single source supplier of both primary and secondary unit substations.

Square D considers the unit substation as a single product that is designed, coordinated, assembled, and tested at different manufacturing locations as multiple self-enclosed pieces of equipment intended for connection at the jobsite. Various combinations of incoming sections, transformer sections, and distribution sections make possible a variety of designs. (See unit substation selection table on page 5).

Both Square D Company's primary unit substations and secondary unit substations are designed, manufactured, and tested in accordance with ANSI C37.121-1989 and other applicable ANSI standards, and the applicable standards of NEMA, UL, and IEEE.

When designing a unit substation, refer to the typical arrangements shown in Section 10 of ANSI C37.121-1989. It is also important to consider the environmental conditions, system conditions, installation conditions, and load requirements as outlined in ANSI C37.121-1989.

A unit substation offers the following operational and economical advantages:

Savings

Medium voltage power is purchased at a lower rate than low voltage power can be purchased. Transformation to the utilization voltage at the load center replaces long, high current low voltage feeder circuits with less expensive primary cable in the distribution system.

Better System Performance

Primary voltage distribution systems feeding load center transformers will minimize system voltage drop and improve voltage regulation. Unit substations also divide the electrical system into independent load areas, which isolates each area from the rest of the system.

Safety

Live parts of all electrical devices are completely enclosed in a grounded steel enclosure. For separate accessibility, internal steel barriers isolate the incoming line, transformer, and low voltage distribution sections from each other. All equipment is designed and built in accordance with the latest NEMA and ANSI standards. UL listing is an available option for some components of the unit substation.

Ease of Installation

The equipment is divided into factory-coordinated shipping sections for ease of handling at the jobsite. Hardware is provided for the connections. Incoming and outgoing connections are accessible for ease of installation.

Ease of Expansion

New unit substations are easily added to primary voltage distribution systems with little effect on the existing equipment. Additional incoming line or low voltage distribution sections can be added to an existing unit substation.

Maintenance

The equipment consists of components designed for minimum maintenance. Refer to operation and maintenance manuals for each section.



Power-Zone® Load Center Unit Substations General Information

Seismic Calculations

Seismic calculations are available for most Square D substation components to show that when anchored as recommended, they will remain anchored during a seismic event. All seismic calculations are made per the Uniform Building Code. For QED Switchboards, seismic calculations are not available, but QED Switchboards have been tested and are seismically qualified up to seismic zone 4 when anchored as recommended (see QED Switchboard Catalog, Class 2742 for details).

Manufacturer's Responsibilities

Unit substations are engineered and manufactured by Square D Company. A single warranty covers the entire unit substation. Square D Company also has a field services division which is available for start-up service along with other services.

Specifications

Specifications for most products offered by Square D can be found at www.squared.com. or contact your local Square D field sales representative for more information. Refer to "Unit Substation Selection Literature" table for specification and catalog class numbers.

Unit Substation Selection Literature

| Equipment Types | Product Specifications | Catalog Class ★ | UL Classification |
|---|------------------------|-----------------|-------------------|
| Unit Substation | 16360-1 | 6020 | — |
| MASTERCLAD Metal-Clad Switchgear | 16340-1 | 6055 | E146027 |
| HVL Metal Enclosed Load Interrupter Switchgear | 16340-2 | 6040 | E140591 |
| HVL/cc | 16340-2.2 | 6045 | E140591 |
| VISI/VAC® Metal Enclosed Vacuum Load Interrupter Switchgear | 16340-3 | 6046 | — |
| Air Terminal Chamber | 16270-2 | See Transformer | — |
| VPI Conventional POWER-DRY™ | 16270-2 | 7420, 7425 | E76470 |
| POWER-CAST® Cast Resin (Primary and Secondary Coils) | 16270-2 | 7310 | E76470 |
| UNI-CAST™ Cast Resin Primary with VPI Secondary Coils | 16270-2 | 7320 | E76470 |
| Liquid Filled – Oil – Silicon – R-Temp® | 16270-2 | 7240 | E206754 |
| I-LINE/I-LINE II Busway | 16450-1 | 5600 | E22182 |
| POWER-ZONE® Metal-Enclosed Busway | 16450-2 | 6090 | E22182 |
| QED 2 & QED 6 Low Voltage Switchboards | 16440-2 | 2742, 2746 | E8681 |
| PZ III LVDO Switchgear | 16430-1 | 6035 | E81602 |
| POWER-ZONE 4 Low Voltage Switchgear | 16430-2 | 6037 | E201954 |
| Model 6 Motor Control Center | 16440-5 | 8998 | E40610 |
| Medium Voltage Motor Control Center | 16440-1 | 8198 | — |

★ See specific catalog class for individual equipment accessories.



Power-Zone® Load Center Unit Substations

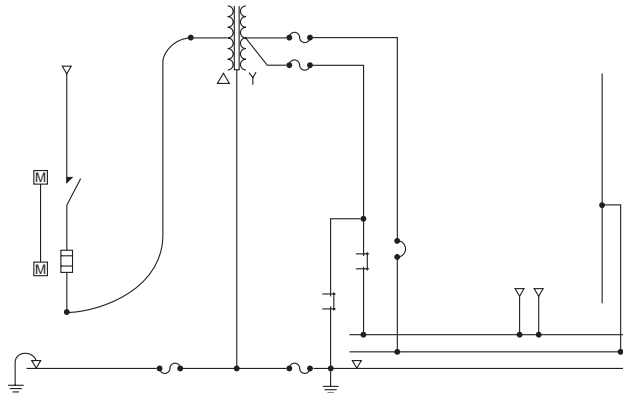
General Information

Standard Product Information

| | |
|----------------------------|--|
| Paint: | ANSI 49 |
| Enclosure Type: | Indoor - NEMA Type 1 Outdoor, non-walk-in - NEMA Type 3R Power Zone Center (Walk-in House) |
| Connections: | High Voltage Windings - Delta Low Voltage Windings - Delta or Wye |
| Common Primary Voltages: | 34.5 kV, 24.9 kV, 13.8 kV, 13.2 kV, 12.47 kV, 7.2 kV, 4.8 kV, 4.16 kV, 2.4 kV, 480 V |
| Common Secondary Voltages: | 4.8 kV, 4.16 kV, 4.16Y/2.4 kV, 2.4 kV, 600 V, 480 V, 480Y/277 V, 208Y/120 V |
| Frequency Rating: | 60 Hz |

NOTE: For additional ratings and application data, refer to the catalog sections referenced in the Unit Substation Selection Table on page 5.

Power-Flow Nameplate



Power-Flow Nameplates are available showing electrical flow through a one line diagram.

An 11x17 (max. size) power-flow nameplate is a replacement for mimic bus on which users usually require the use of paint, tape, or plastic strips. The nameplate consists of a white background with a black core for the lettering and one line. Paint or plastic strips mimic bus is optional.



Power-Zone® Load Center Unit Substations Major Components General Information

METAL-ENCLOSED, TYPE HVL/CC, MEDIUM VOLTAGE LOAD INTERRUPTER SWITCHGEAR

Fusible Interrupter Switch



Nema Type 1
15 kV Indoor Unit

5 and 15 kV Single Bay Section



NEMA Type 3R
15 kV Outdoor Unit with Outer Door Opened

General Description

- Primary and secondary equipment
- UL Listed
- 2.4 to 38 kV
- 600 A continuous current
- Unfused/fused
- Current limiting fuses
- FUSELOGIC blown fuse indication
- Shunt trip
- Indoor and outdoor weatherproof enclosures
- Duplex arrangement available
- Utility/customer metering bay available
- Multiple switch bays for distribution sections
- Designed for future additions

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations

Major Components General Information

METAL-ENCLOSED, TYPE HVL, MEDIUM VOLTAGE LOAD INTERRUPTER SWITCHGEAR

Fusible Interrupter Switch



Nema Type 1
15 kV Indoor Unit

5 and 15 kV Single Bay Section



NEMA Type 3R
15 kV Outdoor Unit with Outer
Door Opened

General Description

- Primary and secondary equipment
- UL Listed (if required; restrictions apply)
- 2.4 to 38 kV
- 600 and 1200 A continuous current
- Unfused/fused
- Current limiting/boric acid fuses
- FUSELOGIC blown fuse indication
- Shunt trip
- Indoor and outdoor weatherproof enclosures
- Single switch bay incoming section
- Duplex arrangement available
- Line selector arrangement available
- Utility/customer metering bay available
- Multiple switch bays for distribution sections
- Designed for future additions

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

METAL-ENCLOSED VISI/VAC®, MEDIUM VOLTAGE

Circuit Interrupter Switchgear



(Door Opened)



(Door Closed)

General Description

- Primary and secondary equipment
- No external arcing — current interruption within vacuum interrupters
- Automatic visible circuit isolation
- Long life — 2500 full-load interruptions
- Shunt-trip mechanism
- Shunt-close mechanism
- Motor operator standard for remote operation
- Protective relaying capability (phase overcurrent, ground fault, phase fault, phase failure, undervoltage, etc.)
- Requires no more floor space than conventional metal-enclosed air switches
- Secondary designed for future addition
- Indoor (NEMA 1) and outdoor (NEMA 3R) enclosures (special enclosures are available)

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

MASTERCLAD™ METAL-CLAD SWITCHGEAR



Typical NEMA Type 1 Switchgear Assembly

General Description

- Primary and secondary equipment
- VR Circuit Breakers
- 5, 15 and 27 kV
- 1200–3000 A
- 250–2000 MVA interrupting capacity
- 60, 95 and 125 kV BIL
- Indoor and outdoor enclosures
- Removable circuit breaker
- Fully compartmentalized construction
- Grounded metal barriers
- Automatic shutters
- Insulated bus
- Mechanical interlocks
- Disconnect type voltage transformers-CPT and VTs
- Low voltage instrument compartment isolated from primary voltage
- Protective relaying and metering

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

POWER-ZONE® 4 LOW VOLTAGE DRAWOUT SWITCHGEAR



Power-Zone 4



Optional Breaker Lifting Device

General Description

- Low Voltage ANSI rated switchgear meets ANSI C37.20.1, ANSI C37.51, NEMA SG-5.
- Individually mounted, ANSI rated, low voltage Masterpact NW power circuit breakers. Circuit Breakers meet ANSI C37.13, ACSI C37.16, ANSI C37.50, NEMA SG-3

Available Circuit Breakers

| | |
|--------------------------------------|--------------|
| Masterpact NW N1, H1, H2, L1 ratings | 800 A Frame |
| Masterpact NW N1, H1, H2, L1 ratings | 1600 A Frame |
| Masterpact NW H1, H2, L1 ratings | 2000 A Frame |
| Masterpact NW H1, H2, L1 ratings | 3200 A Frame |
| Masterpact NW H2, L1 ratings | 4000 A Frame |
| Masterpact NW H2, L1 ratings | 5000 A Frame |

Micrologic microprocessor trip unit enables the user to achieve optimum system selectivity and coordination. Type Basic, A, P, H Micrologic Trip Units

Indoor or outdoor construction (outdoor construction uses POWER-ZONE center enclosure)

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations

Major Components General Information

POWER-ZONE® III LOW VOLTAGE DRAWOUT SWITCHGEAR



Power-Zone III



Optional Breaker Lifting Device

General Description

- Low voltage ANSI rated switchgear meets ANSI C37.20.1, ANSI 37.51, NEMA SG-5
- Individually mounted, ANSI rated, low voltage, power DSII (not fusible) and DSLII (fusible) circuit breakers. Breakers meet ANSI C37.13, ANSI C37.16, ANSI C37.50, NEMA SG-3

Available Circuit Breakers:

| | |
|-------------------------------------|--------------|
| DSII, DSLII-308, DSII-508, DSII-608 | 800 A Frame |
| DSII, DSLII-516, DSII-616 | 1600 A Frame |
| DS-620 | 2000 A Frame |
| DSII, DSLII-632 | 3200 A Frame |
| DSII, DSLII-840 | 4000 A Frame |
| DSII-850 (forced-air cooled) | 5000 A Frame |

- Microprocessor trip device enables the user to achieve optimum system selectivity and coordination. Digitrip 510 standard, Powerlogic Digitrip 810D available
- Breakers are 100% rated, two-step stored energy circuit breakers
- Use as main or feeder devices
- Copper bus systems up to 5000 A
- Integral ground fault protection
- Compartmentalized construction per ANSI C37.20.1
- Optional circuit breaker lifting device mounted on the switchgear
- Indoor or outdoor construction. Outdoor construction uses POWER-ZONE® center enclosure
- Front and rear accessibility
- Rear access required for loadside cable connections
- UL Labeled (optional). UL 1558 for structure, UL 1066 for DSII circuit breakers

For more information, see Unit Substation Selection Literature Table on page 5.



QED POWER-STYLE® SWITCHBOARDS



Incoming Primary Section

General Description

- Used as incoming section of 600 V secondary unit substation (POWER-DRY™ transformer only)
- Available up to 5000 A
- Fixed or Drawout construction
- Main devices:
 - Molded case circuit breakers-M, N, and P frames (2500 A max.)
 - Fusible switch - BOLT-LOC (4000 A max.)
 - Stored Energy Microprocessor Trip circuit breakers-SE (4000 A max.)
 - Masterpact (5000 A max.)
- Ground fault protection and metering available
- Indoor or Outdoor construction
- Front and/or Rear accessibility
- Incoming cable terminations available
- UL Labeled

QED Secondary Mains

General Description

- Used as the secondary main device or six subdivision mains up to 4000 A
- Available up to 5000 A
- Fixed or Drawout construction
- Main devices:
 - Molded case circuit breakers-M, N, and P frames (2500 A max.)
 - Fusible switch - BOLT-LOC (4000 A max.)
 - Stored Energy Microprocessor Trip circuit breakers-SE (4000 A max.)
 - Masterpact (5000 A max.)
- Ground fault protection and metering available
- Indoor or Outdoor construction
- Top or bottom feed
- Front and/or Rear accessibility
- UL Labeled

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations

Major Components General Information

QED DISTRIBUTION SECTION

General Description

- Used as distribution sections in conjunction with QED main devices
- Available in:
 - I-LINE distribution section-group mounted, I-LINE circuit breakers
 - QMB distribution section-group mounted and QMB/QMJ switches
- 3000 A maximum vertical bus
- 5000 A maximum main bus
- 80% or 100% rated circuit breakers available
- Integral zone selective interlocking
- Ground fault protection and metering available
- Single or double row construction
- Indoor or outdoor construction
- Copper or aluminum bus available
- Front and rear accessibility
- UL Labeled

I-LINE Distribution Section



I-LINE Distribution Section

- 63 in. (1600 mm) panel height for 2000 A vertical bus
- 72 in. (1829 mm) panel height for 2000 A Single Row or 3000 A Double Row
- 117 in. (2972 mm) maximum double-row circuit breaker mounting space for 2000 A vertical bus
- 112.5 in. (2858 mm) maximum double-row circuit breaker mounting height for 3000 A vertical bus
- See QED catalog (Class 2742) for circuit breaker mounting restrictions and panel widths

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

QMB/QMJ Distribution Section



QMB Distribution Section

- 3000 A maximum vertical bus rating
- 72 in. (1829 mm) maximum QMB/QMJ switch mounting space
- Switches up to 400 A mount in 36 in. (914 mm) wide section
- Switches 400 A-1200 A mount in 42 in. (1067 mm) wide 2000 A section
- Switches 400 A-1200 A mount in 42 in. (1067 mm) wide 3000 A section

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations

Major Components General Information

POWER-STYLE SWITCHBOARDS

QED-3 Distribution Sections



QED-3 Distribution Sections with QED Main

General Description

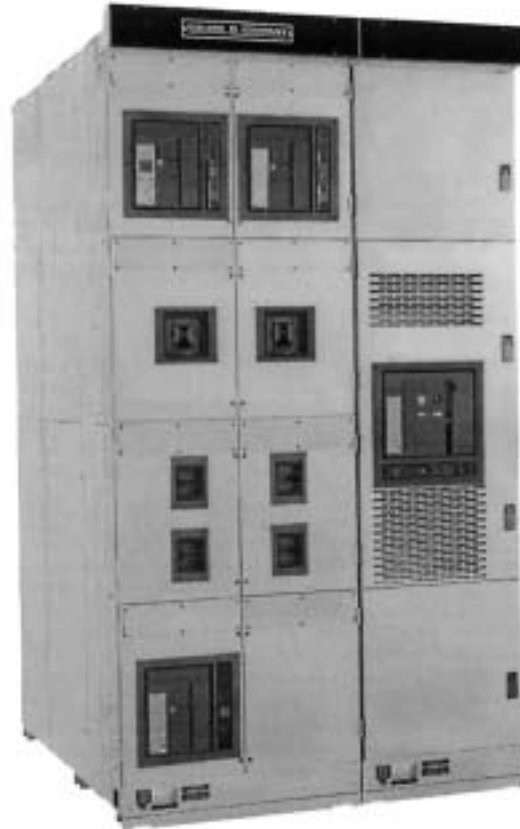
- For use with QED main section
- Individually mounted feeders to 1200 A
- 3000 A maximum vertical bus ratings
- 5000 A maximum main bus
- 80% or 100% rated circuit breakers
- Integral zone selective interlocking available
- Ground fault protection and metering available
- Compartmentalized construction
- Each 24 in. (610 mm) section has four 18 in. (457 mm) compartments for mounting circuit breakers
- Indoor or outdoor construction
- Copper or aluminum bus available
- Rear access required for loadside cable connections
- UL Labeled
- See QED-3 catalog (Class 2743) for circuit breaker mounting restrictions

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

QED-6 Powerstyle Switchboard



QED-6

General Description

- Low Voltage Compartmentalized switchboard built and listed UL891
- Individually mounted Masterpact NW 100% rated 2 step-stored energy circuit breakers
- Rear connected and compartmentalized design
- Front access to all control and communications wiring
- Rated up to 5000 A main circuit breaker or main lugs
- Interrupting ratings available up to 150 kA at 480 V
- Uses Micrologic S, A, P, H trip units
- Ground fault protection and metering available

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations

Major Components General Information

DRY TYPE TRANSFORMERS



General Description

Ratings

| Item | Standard | Optional [■] |
|--------------------------|--|------------------------------------|
| kVA Sizes [▲] | 225-5,000 | — |
| Primary Voltage Classes | 480 V to 35 kV | — |
| Secondary Voltages | 208Y/120, 240 Delta, 480Y/277, 480 Delta, 2400Y/1386, 2400 Delta, 4160Y/2400, 4160 Delta | 600Y/347 600 Delta |
| Basic Impulse Levels | 2.4 kV-20 kV BIL 5.0 kV-30 kV BIL 15.0 kV-60 kV BIL 25.0 kV-125 kV BIL | — 60 kV BIL 95 kV BIL — |
| Winding Temperature Rise | 302 °F (150 °C) | 239 °F (115 °C), 176 °F (80 °C) |
| Impedance | 5.75% for 500 kVA and Above | Yes |
| Insulation System | 428 °F (220 °C) | — |
| Sound Level | Per NEMA ST20 Standard | Lower levels |
| Conductor Material | Aluminum | Copper |
| Forced Air Rating | Increases kVA by 33 1/3% | — |
| Taps | (2) 2 1/2% above and below Primary Voltage (2400 V and above) | Yes |

■ Contact your local Square D field sales representative for information about available options

— Option not available

▲ For specific combinations of kVA sizes with primary and secondary voltages, refer to the Medium Voltage Transformer Specification Guide.

Accessories

- Lightning Arresters
- Provisions for future forced air (FFA)
- Forced air cooling (FA)
- Electronic temperature indicator (Model 98)
- Air terminal chambers (ATC) on primary or secondary
- Strip heaters
- Key interlock
- Indoor or outdoor enclosure
- UL Listing

Special Applications

- UL Listed K-rated units for non-linear loads
- Special ambients or altitudes
- Low sound levels
- 50 Hz requirements
- Electrostatic shielding

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

POWER-CAST® TRANSFORMERS – VACUUM CAST RESIN COILS



General Description

Ratings

| Item | Standard | Optional [■] |
|---|---|--|
| kVA Sizes [▲] | 225-10,000 | — |
| Primary Voltage Classes | 2.4 kV to 35 kV | — |
| Secondary Voltages | 208Y/120, 480Y/277, 480 Delta, 240 Delta 4160Y/2400, 4160 Delta, 480 kV Delta | — |
| Basic Impulse Levels | 2.4 kV-45 kV BIL 5.0 kV-60 kV BIL 15.0 kV-95 kV BIL 25.0 kV-125 kV BIL 34.5 kV-150 kV BIL | 60 kV BIL 75 kV BIL 110 kV BIL 150 kV BIL 200 kV BIL |
| Winding Temperature Rise | 176 °F (80 °C) | 239 °F (115 °C) |
| Impedance | 5.75% ± 7.5% depending on HV, BIL, LV ratings | Yes |
| Insulation System | 302 °F (150 °C) | 365 °F (185 °C) |
| Sound Level | Per NEMA ST20 Standard | Lower levels |
| Conductor Material | Copper | — |
| Forced Air Rating: 500 - 1000 kVA 1000 - 5000 kVA | Increases kVA by 33 1/3% Increases kVA by 50% | — — |
| Taps | (2) 2 1/2% above and below Primary Voltage | Yes |

- Contact your local Square D field sales representative for information about available options
- Option not available
- ▲ For specific combinations of kVA sizes with primary and secondary voltages, refer to the Medium Voltage Transformer Specification Guide.

Accessories

- Lightning arresters
- Provisions for future forced air (FFA)
- Forced air cooling (FA)
- Electronic temperature indicator (Model 98)
- Air terminal chambers (ATC) on primary or secondary
- Key interlocks
- Indoor or outdoor enclosure
- UL listed

Special Applications

- Special ambients or altitudes
- Low sound levels
- 50 Hz requirements
- Electrostatic shielding

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations

Major Components General Information

UNI-CAST™ TRANSFORMERS – PRIMARY COIL – VACUUM CAST RESIN; SECONDARY COIL – VPI



General Description

Ratings

| Item | Standard | Optional ■ |
|-----------------------------------|---|------------------------|
| kVA Sizes ▲ | 500-3,000 | — |
| Primary Voltage Classes | 2.4 kV to 35 kV | — |
| Secondary Voltages | 208Y/120, 480Y/277, 480 Delta, 240 Delta | — |
| Basic Impulse Levels | 2.4 kV-45 kV BIL 5.0 kV-60 kV BIL 15.0 kV-95 kV BIL | Yes |
| Winding Temperature Rise | 212 °F (100 °C) | 176 °F (80 °C) |
| Impedance | 5.75% ± 7.5% depending upon KVA HV, BIL, and LV ratings | Available upon request |
| Insulation System | 365 °F (185 °C) | — |
| Sound Level | Per NEMA ST20 Standard | Lower levels |
| Conductor Material | Aluminum | Copper |
| Forced Air Rating: 500 - 3000 kVA | Increases kVA by 33 1/3% | — |
| Taps | (2) 2 1/2% above and below Primary Voltage | Yes |

- Contact your local Square D Field Sales representative for information about available options
- Option not available
- ▲ For specific combinations of kVA sizes with primary and secondary voltages, refer to the Medium Voltage Transformer Specification Guide.

Accessories

- Lightning arresters
- Provisions for future forced air (FFA)
- Forced air cooling (FA)
- Electronic temperature indicator (Single Phase or Three Phases—Model 98)
- Air terminal chambers (ATC) on primary or secondary
- Key interlocks
- Indoor or outdoor enclosure
- UL listed

Special Applications

- Special ambients or altitudes
- Low sound levels
- 50 Hz requirements
- Electrostatic shielding

For more information, see Unit Substation Selection Literature Table on page 5.



Power-Zone® Load Center Unit Substations Major Components General Information

LIQUID FILLED TRANSFORMERS



General Description

Ratings

| Item | Standard | Optional |
|--------------------------|--|--|
| kVA Sizes | 225-10,000 | — |
| Primary Voltage Classes | 2.5 kV, 5 kV 15 kV, 25 kV, 34.5 kV | — — |
| Secondary Voltages | 208Y/120 500-1 480Y/277, 480 Delta 2.4 kV, 4.16 kV, 4.8 kV | 500 kVA 500-3750 kVA 225-10,000 kVA |
| Basic Impulse Levels | 2.5 kV- 45 kV BIL 5.0 kV- 60 kV BIL 15.0 kV- 95 kV BIL 25.0 kV-125 kV BIL 34.5 kV-150 kV BIL | 60 kV BIL 75 kV BIL 110 kV BIL 150 kV BIL 200 kV BIL |
| Winding Temperature Rise | 149 °F (65 °C) | 131/149 °F (55/65 °C) |
| Coolant | Mineral oil | Silicone, RTemp |
| Impedance | 4.0%-8.0% depending on kVA and LV ratings | — |
| Sound Level | Per NEMA TR-1 Standard | Lower levels |
| Conductor Material | Aluminum | Copper |
| Forced Air Rating: | Increases kVA by 15% 225-2000 kVA Increases kVA by 25% 2500-10000 kVA | — — |
| Taps | (2) 2 1/2% above and below primary voltage | Yes |

NOTE: For specific combinations of kVA sizes with primary and secondary voltages, refer to the Medium Voltage Transformer Specification Guide.

Standard Features

- De-energized tap changer, padlockable
- One inch upper filling plug and filter press connection
- One inch drain valve with sampler
- Dial type thermometer without alarm contacts
- Liquid level gauge without alarm contacts
- Pressure/vacuum gauge, with bleeder connection, without alarm contacts
- Provisions for jacking and lifting
- Pressure relief valve

Accessories

- Alarm contacts for accessory gauges
- Sudden pressure relay (with or without seal-in relay)
- Key interlock on tap changers
- Provisions for mounting grounding resistors
- Surge arresters (high voltage air terminal chamber required-otherwise these must be mounted in switchgear section)
- Provisions for future forced air (FFA)
- Forced air cooling (FA)
- Air terminal chambers on primary or secondary
- UL listed

Special Applications

- Special ambients or altitudes
- 50 Hz requirements

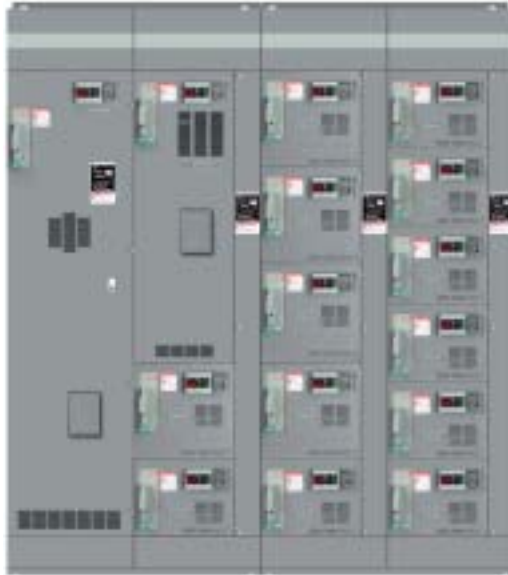
NOTE: For more information, consult product selector, see "General Information" on page 5. Contact your local Square D field sales representative for information on transformer dimensions.



Power-Zone® Load Center Unit Substations

Major Components General Information

MODEL 6 MOTOR CONTROL CENTERS



- Can be utilized on substation secondary with QED switchboard main section
- For system voltages to 600 V
- Horizontal main bus and vertical distribution bus and wireways standard
- 600 A, 800 A, 1200 A, 1600 A, or 2000 A main bus rating
- NEMA Type 1 (non-gasketed) and NEMA Type 1A (front gasketed only)
- NEMA Type 12 (gasketed entrance motor control center)
- Main lugs 600 A-2000 A
- Main Circuit Breaker 110 A-2000 A (high interrupting circuit breakers standard)
- Main Fusible Switch 200 A-2000 A (Class R or L fuses standard)
- NEMA wiring Classes 1 and 2, Types A, B, and C available
- Full-Voltage Non-Reversing, Full Voltage Reversing, Two Speed and Reduced-Voltage Autotransformer combination starter units
- Branch Feeder Circuit Breakers 15 A-1200 A (FA, KA, LA, MA, PA frames)
- Fusible Switch feeder units 30 A-1200 A (class H, R or L fuse clips depending upon current rating)
- Empty mounting units, equipped spaces, distribution transformers and NQOD and NEHB panelboards available

Model 6 Standard Features

- Aluminum and Copper Power Bus
- Steel, and Copper Vertical Ground Bus
- Vertical Wireway Barrier
- Bus Barrier Closing Shutters
- White or Gray Unit Interiors
- MCC Buckets have easy-removal feature

For more information, see Unit Substation Selection Literature Table on page 5.



BUSWAY SYSTEMS



I-LINE/I-LINE II Busway

- I-Line plug-in available from 225 A-600 A with aluminum or copper conductors
- I-Line II plug-in and feeder styles available 800 A-4000 A with aluminum conductors, to 5000 A with copper conductors
- Available up to 600 V
- 3 and 4-pole full neutral configuration
- Sandwich construction to provide superior voltage drop characteristics
- Totally enclosed housing
- Compact size
- Durable electro-deposition epoxy paint finish
- Bus bars insulated using class B rated [266°F (130 °C) vendor certified] materials
- Plated Bus bars
- Dielectric testing 7000 Vdc standard
- One bolt joints with VISI-TITE® torque-indicating bolts (clamping force of over 4000 lb) for ratings less than 2000 A. For ratings higher than 2000 A, two or three bolts are used.
- EZ JOINT PACK® removable single bolt joint package available (with VISI-TITE® torque-indicating bolts)
- I-Line II uses one set of universal tie channels, speeding installation
- Ratings of 200,000 RMS Symmetrical available for 4000 A and 5000 A feeder busway
- Outdoor busway available
- Universal fittings for maximum layout flexibility
- I-LINE II Busway includes integral (50%) ground bus

Power-Zone® Load Center Unit Substations

Major Components General Information

Busway Systems (continued)

100 A Plug-In Busway

- Totally enclosed plug-in busway
- 100 A full load rating
- 3 phase, 4 W 480 V or 3 phase, 3 W 600 V
- Round, electrical grade aluminum or copper conductors
- Optional 50% ground bus
- Molded phenolic insulators between bus bars
- Short-circuit ratings up to 14,000 A symmetrical
- High-pressure spring-type connectors at each joint
- Wrap-around type hangers (UL Listed in edgewise mounting position with 10' hanger spacing) or "C" clamp (UL Listed in flatwise mounting position with busway hung on 5' centers) hangers available

POWER-ZONE® Metal-Enclosed Busway

- Available for indoor or outdoor use
- Custom designed and manufactured
- Available in the following configurations

| Voltage Class | Continuous Current | Momentary KA ASYM |
|---------------|--------------------|-------------------|
| 600 V | 1200-4000 A | 75, 100, 125 |
| 5 and 15 kv | 1200-5000 A | 40 |

- Designed according to ANSI C37.23
- Can be supplied with full round edge plated copper or plated aluminum bus bars
- Insulation for the 5 kV-38 kV bus is fluidized bed epoxy rated at 266 °F (130 °C) 600 V bus bars are not jacketed
- 5 and 15 kV shipping split bus joints are insulated with removable boots
- Bus Supports for 600 V systems are fiberglass, 5 and 15 kV supports are molded using a UL Listed glass reinforced polyester, 38 kV supports are porcelain
- Aluminum housing is standard
- Painted or stainless steel available as optional
- Strip heaters are provided on outdoor construction
- Structural supports are available

For more information, see Unit Substation Selection Literature Table on page 5.



TYPE 36 COMPACT SECTIONAL UNIT SUBSTATION



with HVL/cc Switchgear

... or with HVL Switchgear

General Description

Compact sectional load center unit substations permit easy handling through existing doors and hallways. They can be installed in locations where physical space limitations will not permit the installation of a conventional load center unit substation. Besides having less depth, the compact design requires front access only. The transformer's rectangular barrel wound core and coil and enclosure design (recommended ventilation openings: 12 in. (305mm) minimum clearance).

- Depth of unit substation 37.25 in. (946 mm) with HVL/cc primary
- Depth of unit substation 36 in. (914 mm) with HVL primary
- Indoor enclosure ONLY
- ANSI 49 paint
- Requires front access only

Incoming Primary Load Interrupter Switchgear - HVL/cc or HVL

- UL Listed (If Required)
- 600 A Switch
- Blown Fuse Indication
- Cable connection to transformer
- Unfused or Current-Limiting Fuses Only
- Shunt Trip
- Two cables per phase maximum
- Distribution class surge arresters (optional)
- No instrument transformers or metering
- 12 in. (305 mm) top pullbox required (HVL application only)
- Top or bottom entry

Power-Zone® Load Center Unit Substations Special Applications and Products

Type 36 Compact Sectional Unit Substation (continued)

VPI POWER-DRY™ Transformer Ratings

| Item | Standard | Optional |
|--------------------------|--|---|
| kVA Sizes | 225-750 | — |
| Primary Voltage Classes | 600 V to 15.0 kV | — |
| Secondary Voltages | 208Y/120, 480Y/277, 480 Delta, 600 V Delta -10 kV BIL | |
| Basic Impulse Levels | 5.0 kV-30 kV BIL 15.0 kV-60 kV BIL | — — |
| Winding Temperature Rise | 302 °F (150 °C) | 239 °F (115 °C) [to 750 kVA] 176 °F (80 °C) [to 500 kVA] |
| UL Listed | — | 225 kVA-750 kVA [750 kVA at 302 °F (150 °C) rise only] |

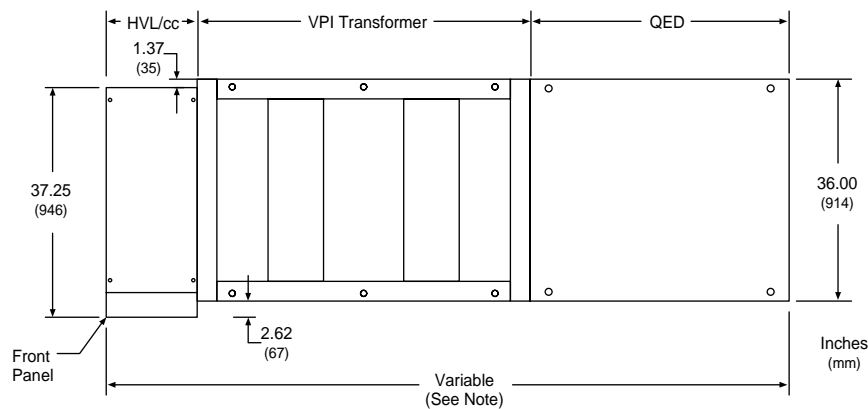
Secondary Main and Distribution Sections - QED-2 Power-Style Switchboard

Main Section

- Fixed mounted main device available up to 2500 A
- Main devices:
 - Molded case circuit breakers - M, N, and P frames
 - Fusible switch - BOLT-LOC
 - Stored-energy electronic trip circuit breakers - SE
- Ground fault protection and metering available
- Top or bottom feed
- UL Labeled
- Keylock optional

Distribution Section

- Available in:
 - I-LINE distribution section - group mounted I-LINE circuit breakers
 - QMB distribution section - group mounted QMB/QMJ switches
- 80% or 100% rated circuit breakers
- Single or double row construction for I-LINE circuit breakers
- Copper or aluminum bus
- UL Labeled
- Provisions for future extension



NOTE: Dimensions marked as "variable" will vary with each equipment width; based on kVA, BIL, primary and secondary voltages.



MODEL III POWER-ZONE®

Package Unit Substation



General Application Data

Model III POWER-ZONE® package unit substations incorporate—into one pre-assembled, unitized module—an HVL/cc or HVL switch, dry-type transformer and molded-case circuit breaker distribution section. All components are manufactured by Square D. The complete package unit substation is engineered and tested as one integral unit by Square D.

The Model III with HVL/cc is only 37.25 in. (946 mm) deep and 90 in. (2286 mm) high, so it will pass through most existing doorways without structural renovation to the building in which it is installed. Total weight is less than 8,000 pounds (3629 kg) and the footprint occupies less than 22 square feet (2.04 m²) of floorspace, for a floor-loading of less than 365 lb./sq. ft. (1782 kg/m²).

The air intake is located at the front bottom; the exhaust is on top of the transformer section, so the unit can be installed against a wall or in a corner without alteration or derating.

Model III POWER-ZONE® package unit substations are ideal for new installations in existing buildings as well as for spot zone distribution in new construction.

Substations are normally shipped as two units, split between the incoming line section and the transformer/low voltage distribution sections. Upon request, they can be provided in one section on a common base.

Model III POWER-ZONE® package unit substations are available in sizes from 75 kVA through 1000 kVA with three phase primary voltages of 2400 V through 13,800 V. When equipped with fan cooling, ratings as high as 667 kVA are available, AA/FA. Secondary voltages of 600 V delta, 480 V delta, 480Y/227, 208Y/120 and 240 V delta are available. ANSI 49 or ANSI 61 paint is available.

Power-Zone® Load Center Unit Substations

Special Applications and Products

- Transformer is built with 428 °F (220 °C) insulation.
- 302 °F (150 °C) rise is available through 1000 kVA
- 239 °F (115 °C) and 176 °F (80 °C) rise are available up to 300 kVA

Ratings

| kVA | Temperature Rise (°C) | Cabinet Width (Dimension A*) |
|-------|-----------------------|------------------------------|
| 75 | 80, 115, 150 | 48 in. (1219 mm) |
| 112.5 | 80, 115, 150 | 48 in. (1219 mm) |
| 150 | 80, 115, 150 | 48 in. (1219 mm) |
| 225 | 80, 115, 150 | 48 in. (1219 mm) |
| 300 | 80, 115, 150 | 48 in. (1219 mm) |
| 500 | 150 | 48 in. (1219 mm) |
| 500 | 80, 115 | 60 in. (1524 mm) |
| 750 | 80, 115, 150 | 60 in. (1524 mm) |
| 1000 | 150 | 60 in. (1524 mm) |

NOTES:

1000 kVA: 115 °C and 80 °C are not available

Dimension A: see Bottom Conduit Entrance diagram below

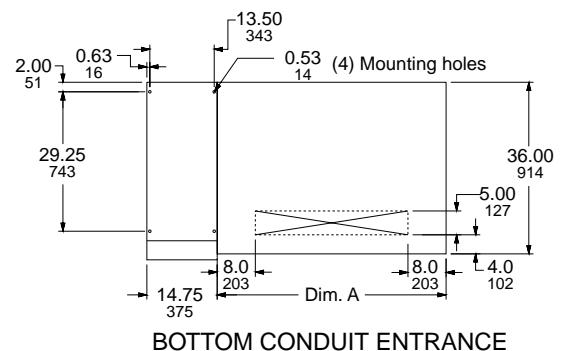
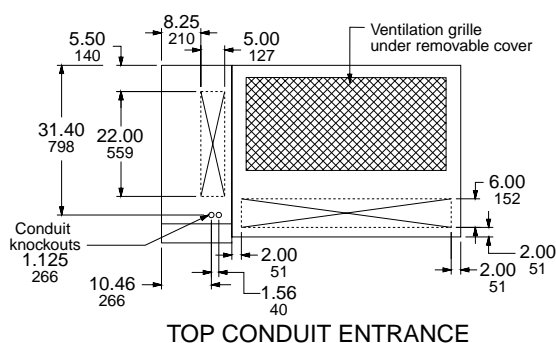
The secondary circuit breaker distribution section is equipped with an I-LINE® distribution panelboard which accepts the time-tested and widely acclaimed plug-on I-LINE family of molded case circuit breakers. Branch circuit breakers as small as 15 A single pole FY or FA frame with 1.5 in. (38 mm) mounting height, to as large as 1200 A NA frame 3-pole breakers with 15 in. (381 mm) mounting height may be installed. ME/NE frame electronic trip breakers and I-LIMITER® high interrupting capacity current limiting circuit breakers may also be used. This section provides 81 in. (2057 mm) of circuit breaker mounting height.

Model III substations allow faster and easier installations. Their compact design allows a greater choice of installation locations. Package substations provide lower cost systems through:

- Service Continuity — Substations located at each load area isolate outages and allow faster trouble-shooting.
- Expansion — Substations divide a system into isolated sections which are unaffected by the addition of new load areas.
- Efficient Performance — Shorter secondary feeders lower power loss and provide better voltage regulation.
- Lower Power Cost — Power is purchased at lower primary rates.
- Lower Equipment Costs — High voltage cable is less expensive than high-current, low voltage feeder circuits. Smaller, less expensive molded case breakers offset the extra transformer cost.

For additional information including layouts, see Bulletin D1-N Class 6010/02, or contact Square D in Monroe, North Carolina at (704) 283-7411.

Conduit Entrance



Power-Zone® Load Center Unit Substations Typical Key Interlock Schemes

Introduction

Key interlocks are an integral part of many unit substations. They are devices that provide a means to limit mechanical movement. They attach to electrical and mechanical devices, such as breakers and switches, to ensure a pre-determined sequence of operations.

Square D Company offers completely coordinated key interlock systems. However, it is not within the primary scope of this catalog to describe all possible combinations of suitable key interlocking schemes. For convenience, some commonly used key interlock schemes are shown in the following pages.

HVL/cc switch applications that require key interlock coordination must adhere to the following conditions:

- only Schneider key interlocks must be used
- LOC applications are not available; one LO and one LC lock will be supplied to accomplish this type of coordination. Apartment-style lock will be required for coordinating equipment.

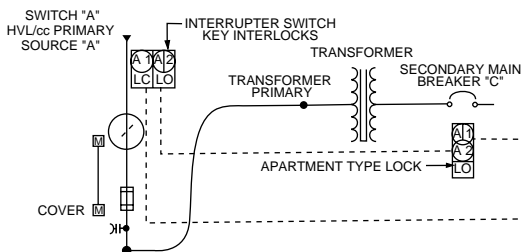
For more detailed descriptions and schematics, please contact your local Square D field sales office.

Legend

- LC= Device is to be locked closed
- LO= Device is to be locked open
- LOC= Device is to be locked open or closed
- ⊕ = Lock cylinder where key is normally held

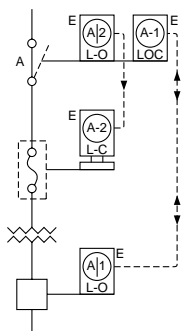
Method 1

- Prevents operation of switch A when breaker C is closed
- permits reclosing of switch A when breaker C is locked open
- permits reclosing of breaker C for servicing when switch A is locked open



Method 2

- Prevents the operation of disconnect switch A when breaker B is closed
- Prevents the opening of the fuse compartment door when the disconnect switch A is closed

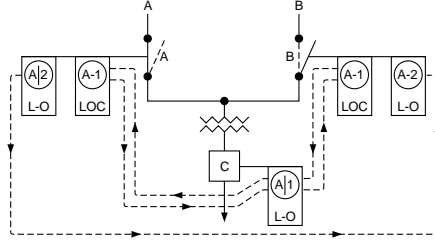


Power-Zone® Load Center Unit Substations

Typical Key Interlock Schemes

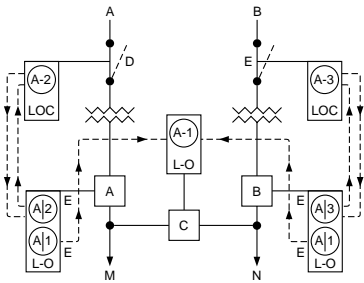
Method 3

- Prevents the paralleling of lines A and B
- Single load, fed from either source
- Prevents the operation of disconnect switches A and B when the breaker C is closed



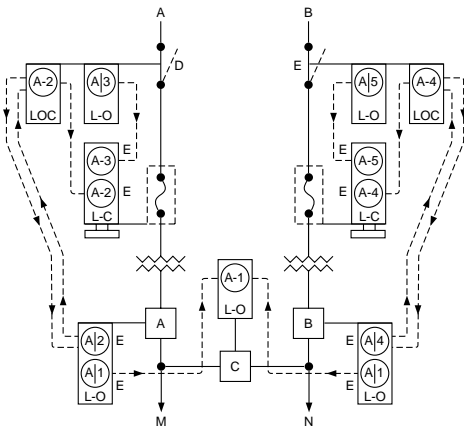
Method 4

- Prevents the paralleling of lines A and B
- Two loads, fed from either source (one tie-breaker)
- Prevents the operation of disconnect switch D when breaker A is closed
- Prevents the operation of disconnect switch E when breaker B is closed



Method 5

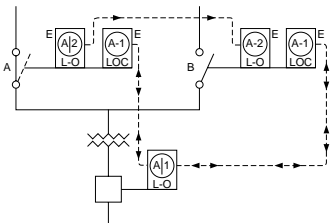
- Prevents paralleling of lines A and B
- Two loads, fed from either source (one tie-breaker)
- Prevents the operation of disconnect switch D when breaker A is closed
- Prevents the operation of disconnect switch E when breaker B is closed
- Prevents the opening of the fuse compartment door when the associated disconnects D or E and breakers A and B are closed



Power-Zone® Load Center Unit Substations Typical Key Interlock Schemes

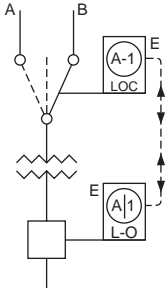
Method 6

- Prevents paralleling lines A and B — requires dropping load when shifting from one source to another
- Prevents closing both interrupter switch A and B at the same time — (permits both interrupter switches to be opened at the same time)
- Prevents operation (open or closed) of either interrupter switch when breaker is closed
- Allows the breaker to be serviced and operated while both interrupter switches are locked open



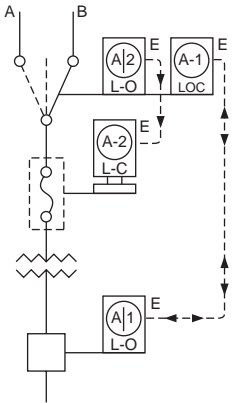
Method 7

- Prevents operation (closed, open or closed) of interrupter switch when breaker is closed
- Allows the breaker to be serviced and operated while the interrupter switch is locked open



Method 8

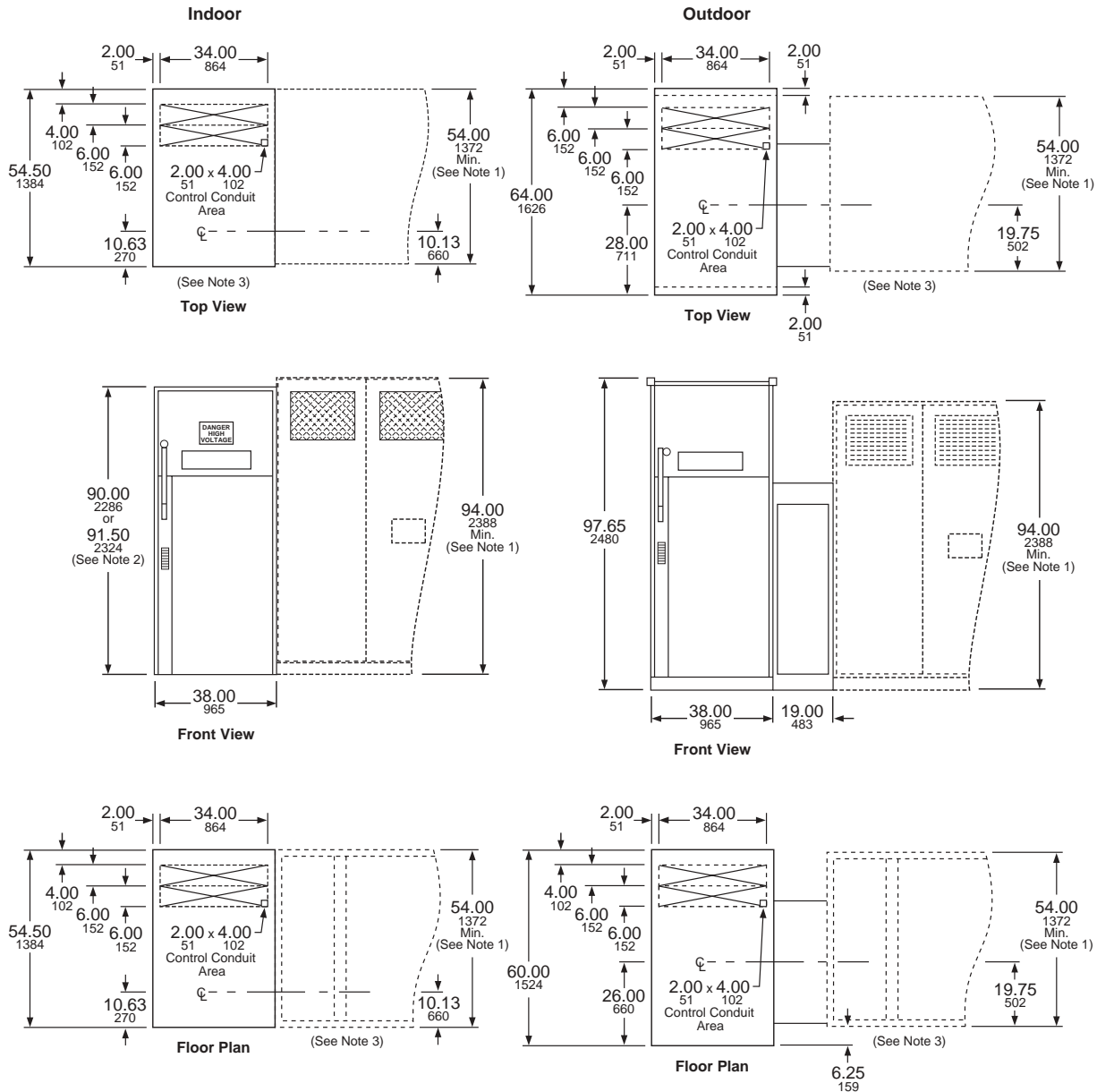
- Prevents operation (closed, open or closed) of the interrupter switch when breaker is closed
- Prevents opening the fuse compartment door when the interrupter switch A is closed
- Prevents closing the interrupter switch until fuse compartment door is locked closed
- Allows the breaker to be serviced and operated while the interrupter switch is locked open



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL/VISI-VAC® SWITCHGEAR — VPI POWER-DRY™ POWER-CAST® AND UNI-CAST™ TRANSFORMERS, PRIMARY CONNECTION

5 and 15 kV



Dual Dimensions: INCHES
Millimeters

Approx. Weights: 1200 lb/545 kg indoor 1400 lb/636 kg outdoor

Notes:

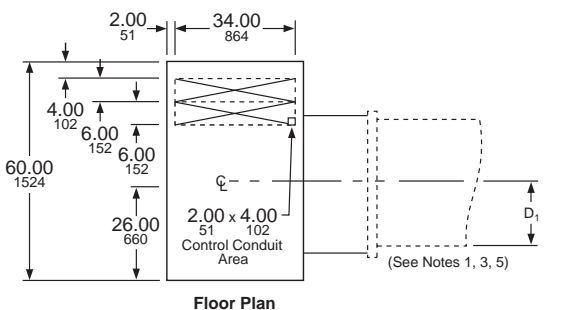
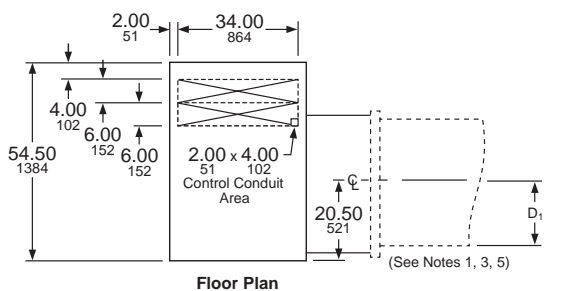
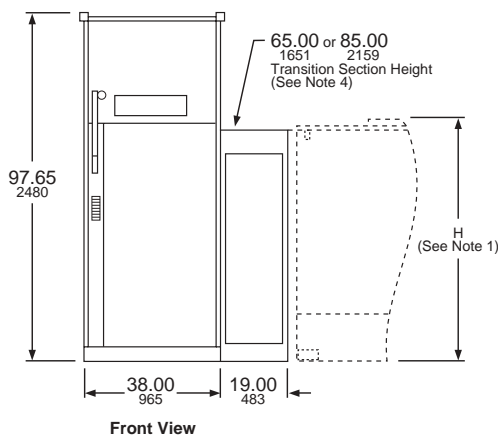
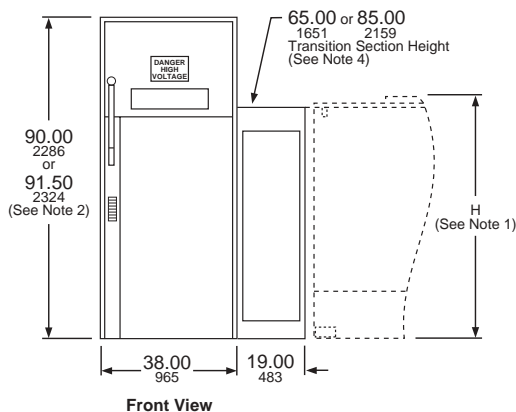
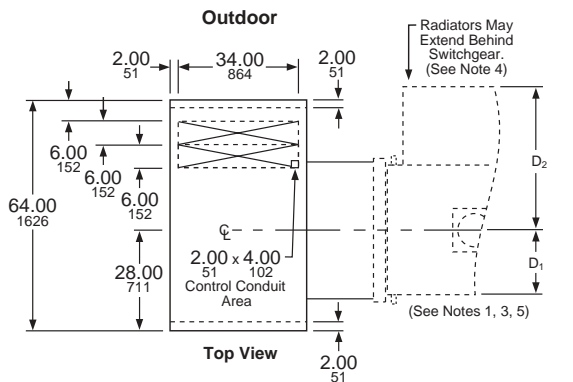
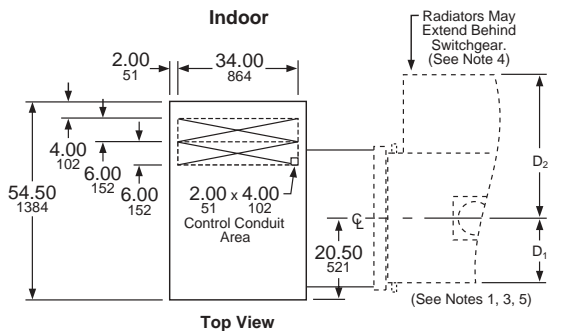
- Transformer dimensions vary depending upon kVA, BIL and temperature rise ratings. See TRANSFORMER section for a table of transformer dimensions. If connection is required to be a hard-bus connection, the minimum depths shown here will increase. Contact your local Square D field sales representative for information on transformer dimensions.
- Extra 1.5 in. (38 mm) in height (91.5 in. (2324 mm) vs. 90 in. (2286 mm)) if 1.5 in. (38 mm) base channel is included in HVL or VISI-VAC.
- Indoor units are 0.5 (13 mm) difference at front, outdoor units are not front-aligned.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL/VISI-VAC® SWITCHGEAR — LIQUID-FILLED TRANSFORMER PRIMARY CONNECTION TO 3750 KVA (SEE NOTE 5)

5 and 15 kV



Dual Dimensions: INCHES
Millimeters

Approx. Weights: 1200 lb/545 kg indoor 1400 lb/636 kg outdoor

Notes:

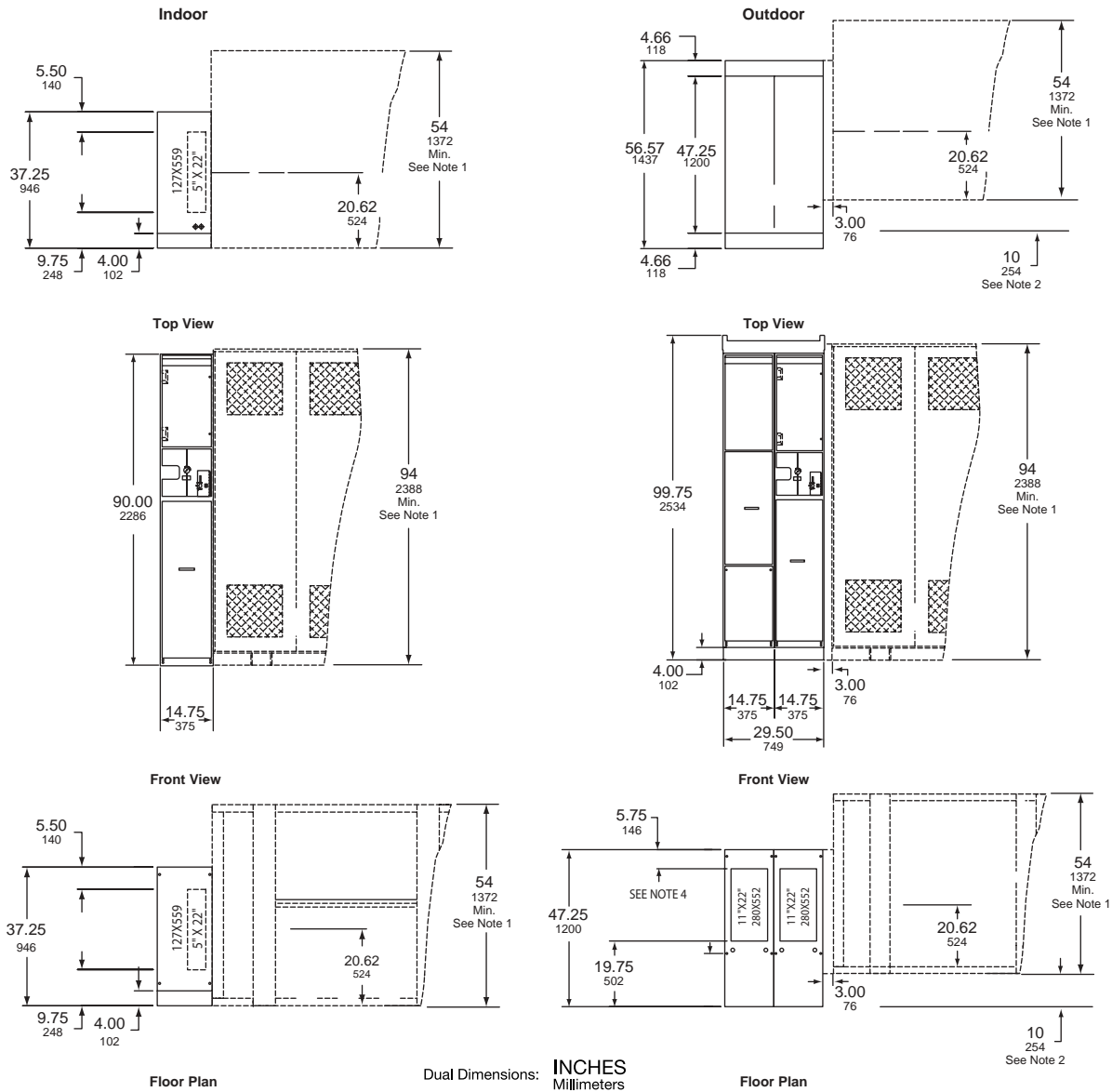
- Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
- Extra 1.5 in. (38 mm) in height (91.5 in. [2324 mm] vs. 90 in. [2286mm]) if 1.5 in. (38 mm) base channel is included in HVL or VISI/VAC®.
- Units are not necessarily front or rear aligned.
- Transition section height is 65 in. (1651mm) if transformer is < or = to 2300 kVA, 85 in. (2159mm) if transformer is > 2500 kVA.
- Dimensions shown here will vary if transformer is over 3750 kVA.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL/CC SWITCHGEAR – VPI POWER-DRY™, POWER-CAST® AND UNI-CAST™ TRANSFORMERS PRIMARY CONNECTION

5 kV and 15 kV



Approx. Weights: 660 lb/300 kg indoor 1285 lb/584 kg outdoor

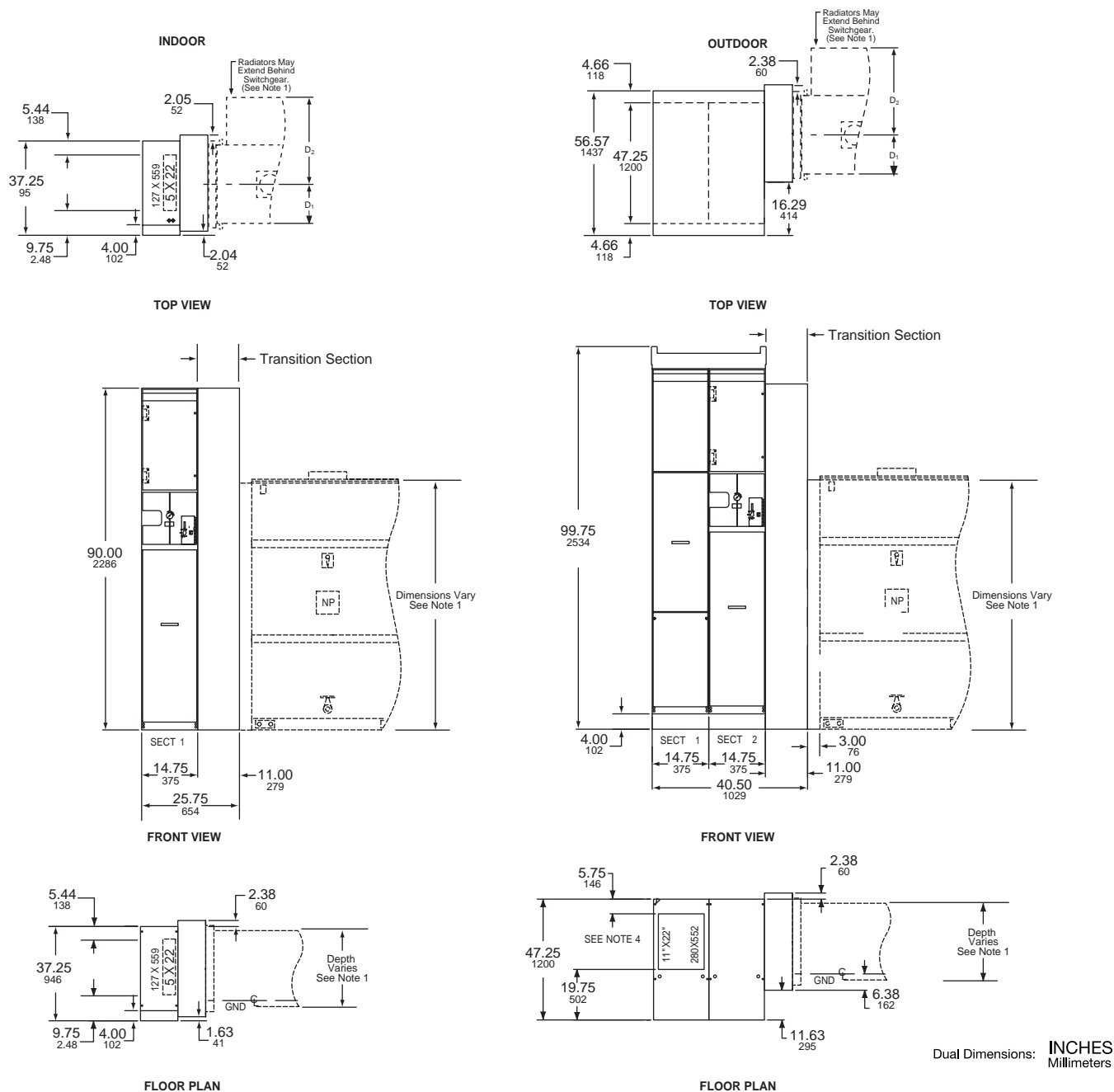
Notes:

1. Transformer dimensions vary depending upon kVA, BIL, and temperature rise ratings. See TRANSFORMER section for table of transformer dimensions.
2. Indoor units are front aligned. Outdoor units are not front or rear-aligned.
3. 14.75 in. (375 mm) width shown. 20 in. (508 mm) and 29.5 in. (749 mm) wide units are available for most applications. Dual fuses or surge arresters > 12 kV require 20 in. (508 mm) wide section. Duplex switches are not available in 29.5 in. (749 mm) wide enclosures.
4. Bus connection to transformer is not available.
5. Top view is conduit location for indoor top cable entry (Application A). Floor plan is conduit location for Indoor/Outdoor bottom cable entry (Application B). Outdoor top cable entry is not available. Contact local your Square D field sales representative for information regarding conduit area for other widths or recommendations.

Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL/CC SWITCHGEAR – LIQUID-FILLED TRANSFORMERS PRIMARY CONNECTION UP TO 3750 KVA (SEE NOTE 6)

5 kV and 15 kV



Approx. Weights: 660 lb/300 kg indoor 1285 lb/584 kg outdoor

Notes:

- Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
- Units are not necessarily front or rear aligned.
- 14.75 in. (375 mm) width shown. 20 in. (508 mm) and 29.5 (749 mm) wide units are available for most applications. Dual fuses or surge arresters > 12 kV require 20 in. (508 mm) wide section. Duplex switches are not available in 29.5 in. (749 mm) wide enclosures.
- Bus connection to transformer is not available.
- Top view is conduit location for indoor top cable entry (Application A). Floor plan is conduit location for Indoor/Outdoor bottom cable entry (Application B). Outdoor top cable entry is not available. Contact your local Square D field sales representative for information regarding conduit area for other widths or recommendations.
- Dimensions shown here will vary if transformer is over 3750 kVA.

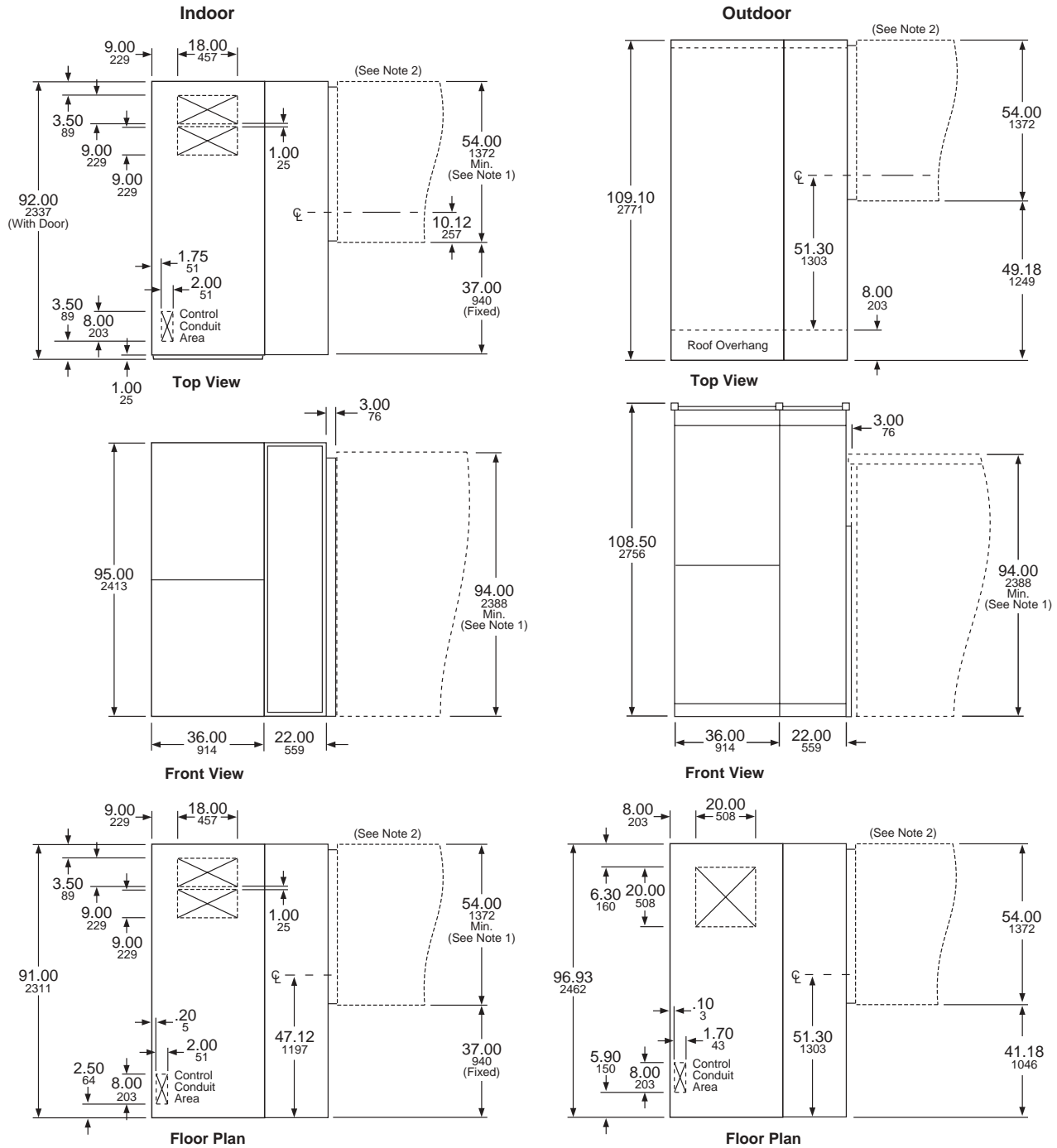


Power-Zone® Load Center Unit Substations

Layout Information - Primary Section

METAL-CLAD SWITCHGEAR — POWER-DRY™, POWER-CAST® AND UNI-CAST™ TRANSFORMERS PRIMARY CONNECTION

5 and 15 kV



Dual Dimensions: INCHES
Millimeters

Approx. Weights (less breakers): 2200 lb/999 kg indoor 2700 lb/1226 kg outdoor
1200 A breaker: 360 lb/163 kg 2000 A breaker: 410 lb/186 kg 3000 A breaker: 480 lb/218 kg

Notes:

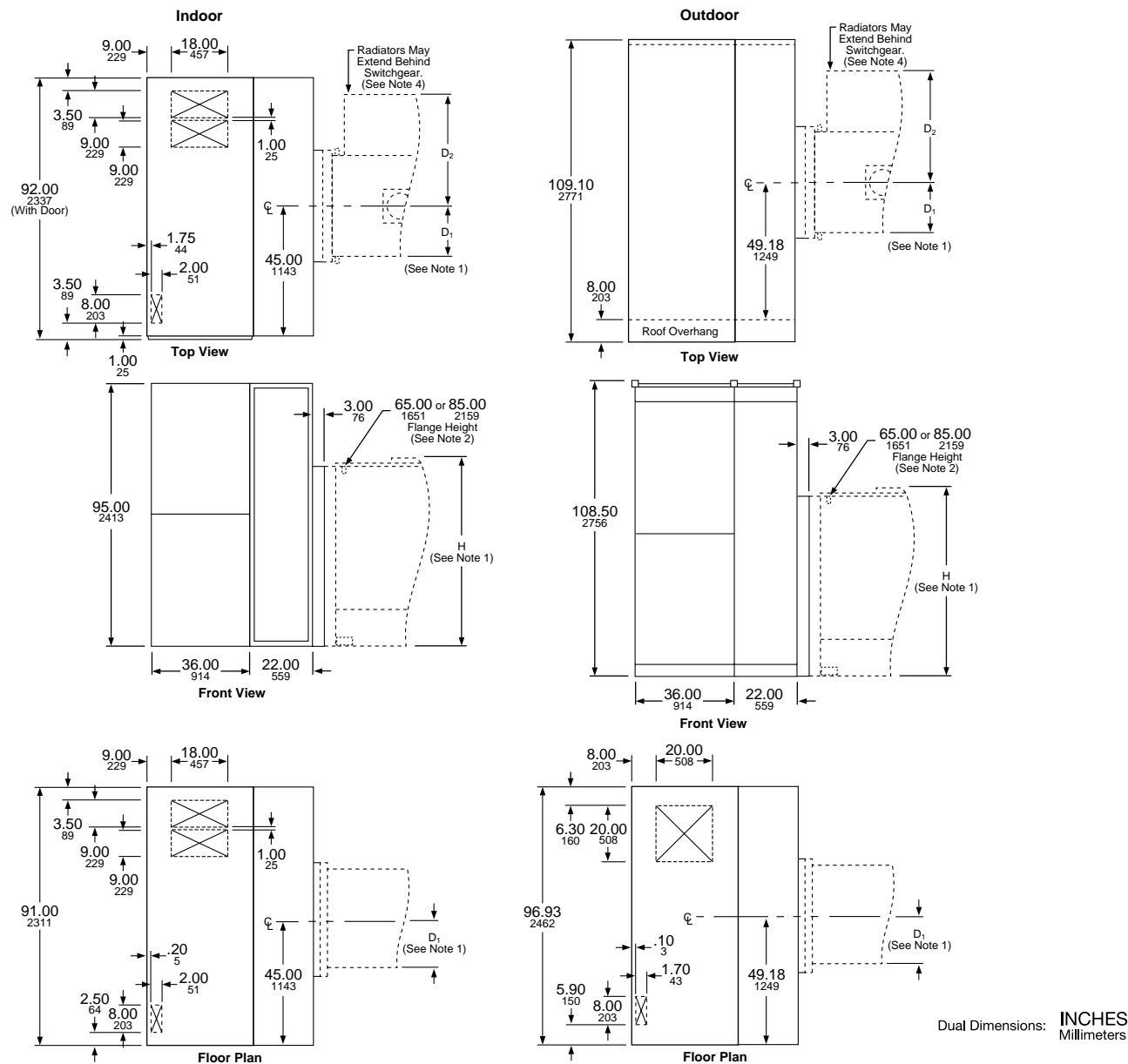
1. Transformer dimensions vary depending upon kVA, BIL and temperature rise ratings. See TRANSFORMER section for a complete table of transformer dimensions.
2. Units are rear-aligned when transformers have the depths shown. For transformers with larger depths, transformer will protrude in rear.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

METAL-CLAD SWITCHGEAR — LIQUID-FILLED TRANSFORMER PRIMARY CONNECTION TO 3750 KVA (SEE NOTE 3)

5 kV and 15 kV



Dual Dimensions: INCHES
Millimeters

Approx. Weights (less breakers): 2200 lb/999 kg indoor 2700 lb/1226 kg outdoor
1200 A breaker: 360 lb/163 kg 2000 A breaker: 410 lb/186 kg 3000 A breaker: 480 lb/218 kg

Notes:

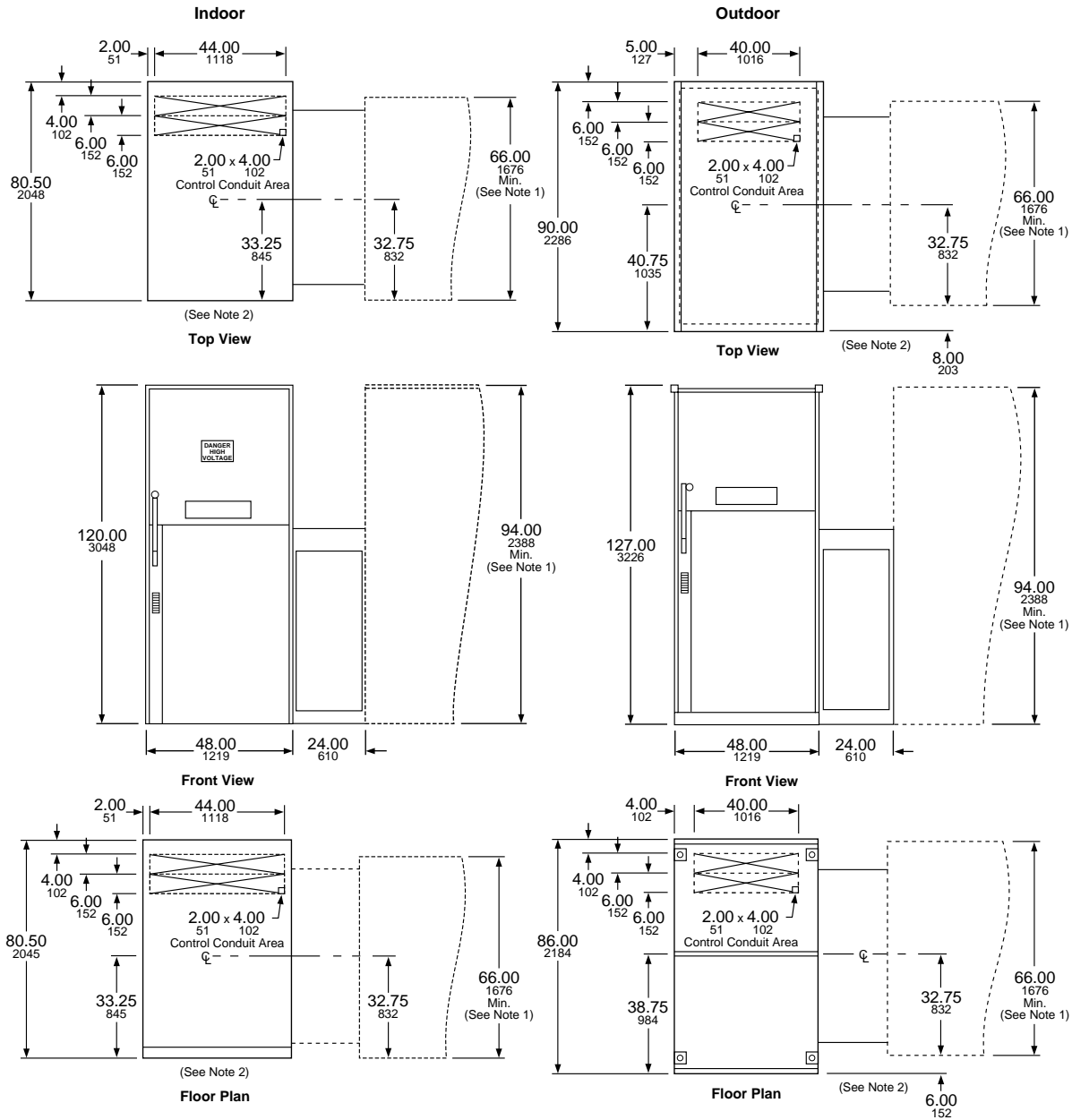
1. Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
2. Flange height is 65 in. if transformer is up to 2500 kVA, 85 in. if transformer is over 2500 kVA.
3. If transformer is over 3750 kVA, variations to the dimensions shown here will be necessary.
4. Units are not necessarily front or rear aligned. Transformer radiators may extend behind switchgear.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL SWITCHGEAR — POWER-DRY™ AND POWER-CAST® TRANSFORMERS PRIMARY CONNECTION

25 kV–29 kV at 125 kV BIL (max.)



Dual Dimensions: INCHES
Millimeters

Approx. Weights: 2000 lb/908 kg indoor 2500 lb/1135 kg outdoor

Notes:

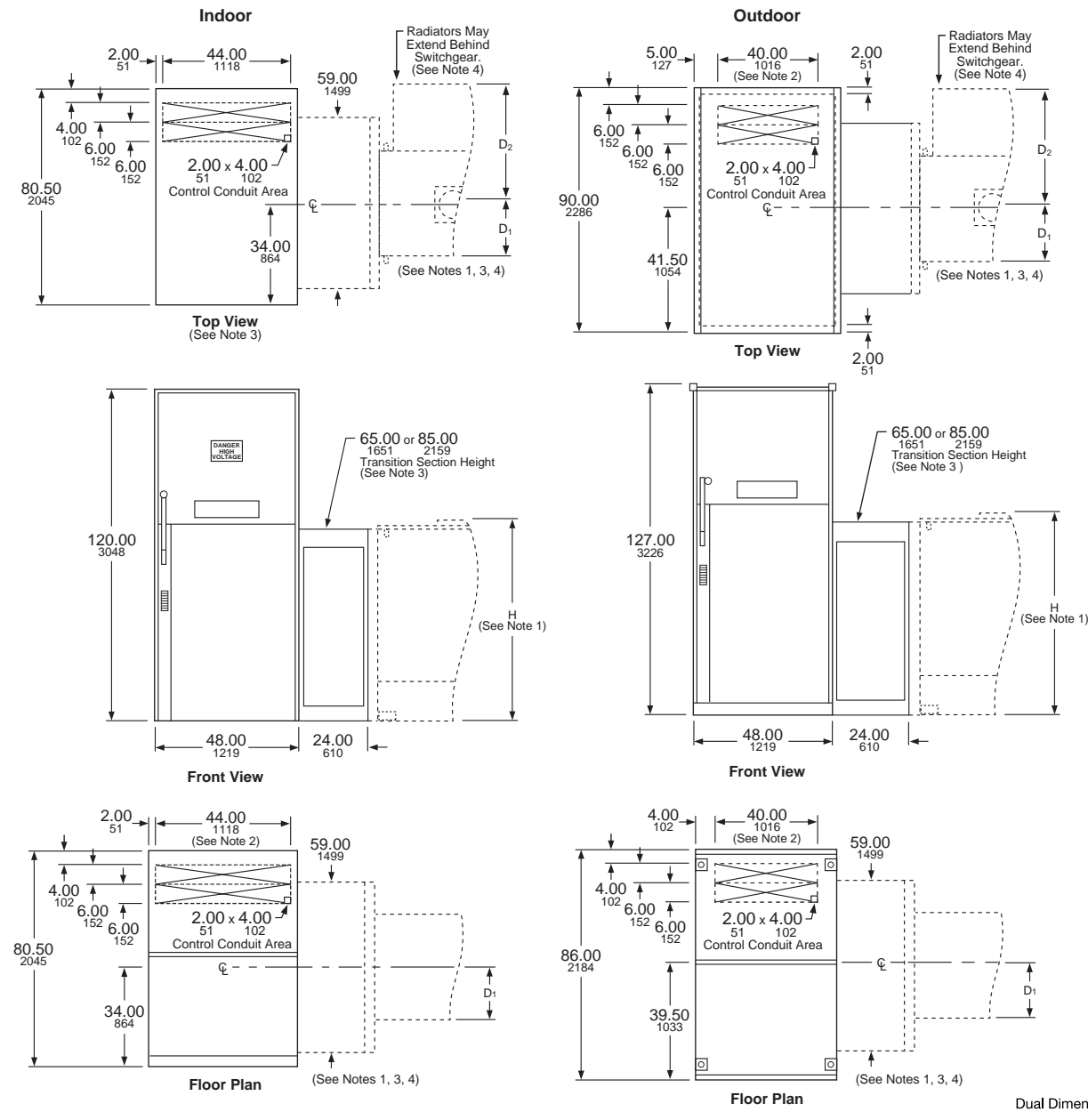
1. Contact your local Square D field sales representative for 25 kV transformer enclosure dimensions.
2. Units are neither front nor rear aligned.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL SWITCHGEAR — LIQUID-FILLED TRANSFORMER PRIMARY CONNECTION TO 3750 KVA (SEE NOTE 4)

25 kV–29 kV at 125 kV BIL (max.)



Dual Dimensions: **INCHES**
Millimeters

Approx. Weights: 2200 lb/908 kg indoor 2700 lb/1135 kg outdoor

Notes:

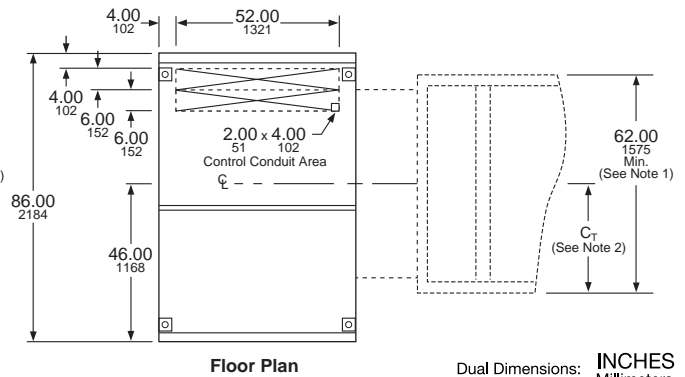
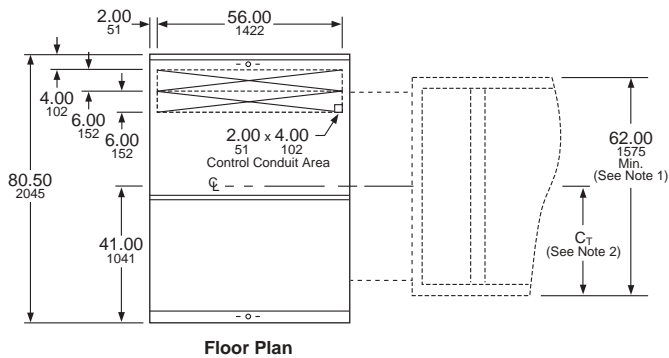
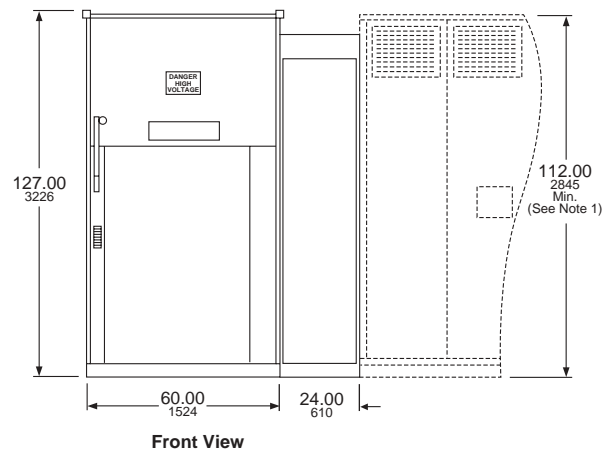
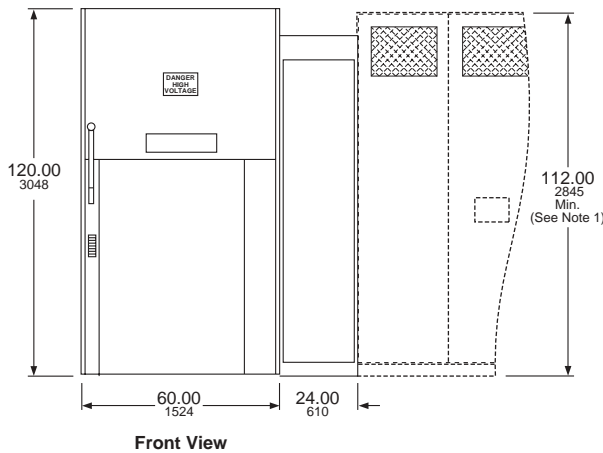
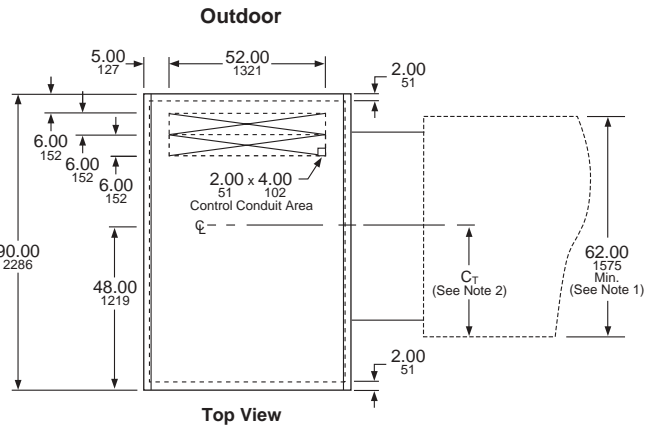
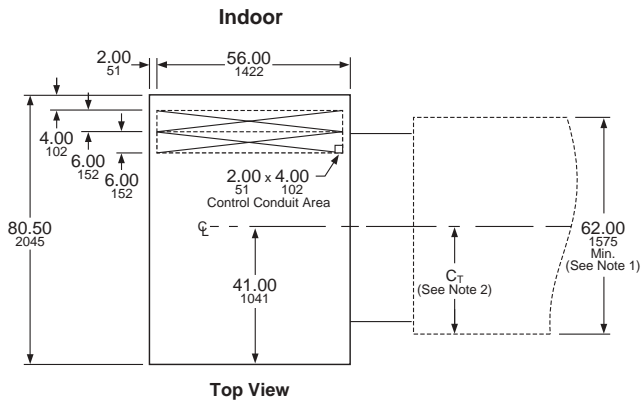
1. Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
2. Units are not necessarily front or rear aligned.
3. Transition section height is 65 in. (1651mm) if transformer is < or = to 2300 kVA, 85 in. (2159mm) if transformer is > 2500 kVA.
4. If transformer is over 3750 kVA, variations to the dimensions shown here will be necessary.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL SWITCHGEAR — POWER-CAST® TRANSFORMER PRIMARY CONNECTION

29 kV–38 kV at 150 kV BIL (max.)



Dual Dimensions: **INCHES**
Millimeters

Approx. Weights: 2200 lb/999 kg indoor 2700 lb/1226 kg outdoor

Distance C_T

POWER-DRY™/POWER-CAST®/UNI-CAST™ Transformer

$$C_T = \frac{\text{Cabinet Depth} + 10.5 \text{ in.}}{2}$$

Notes:

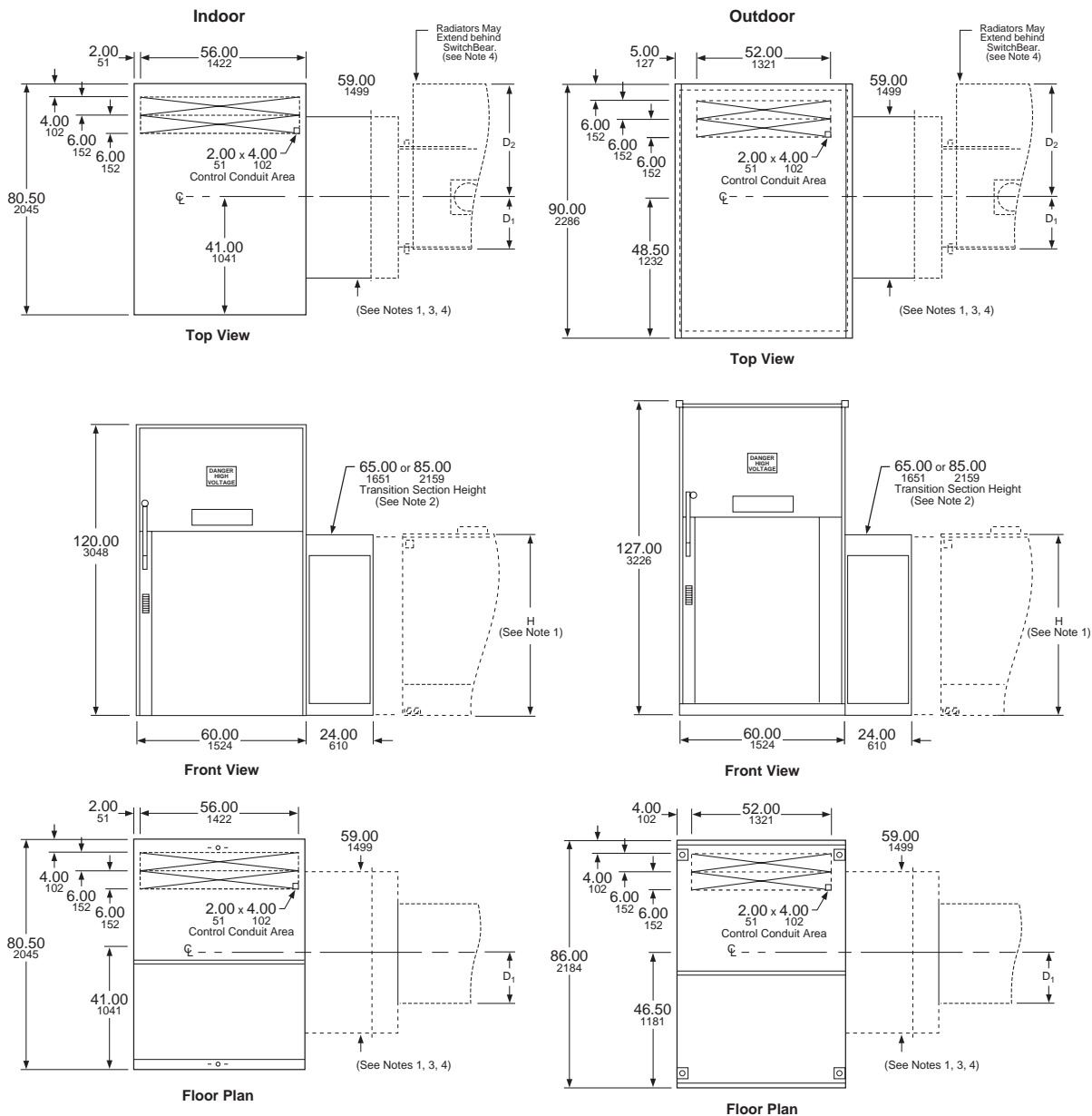
1. Please contact your local Square D field sales representative for 34 kV POWER-CAST® transformer enclosure dimensions.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL SWITCHGEAR — LIQUID-FILLED TRANSFORMER PRIMARY CONNECTION TO 3750 KVA (SEE NOTE 4)

29 kV–38 kV at 150 kV BIL (max.)



Dual Dimensions: INCHES
Millimeters

Approx. Weights: 2200 lb/999 kg indoor 2700 lb/1226 kg outdoor

Notes:

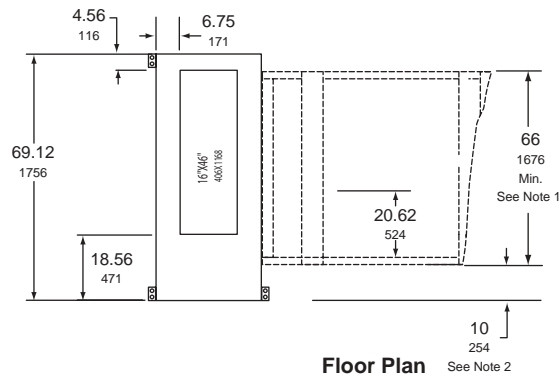
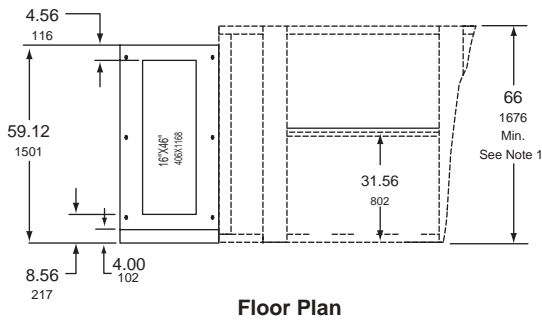
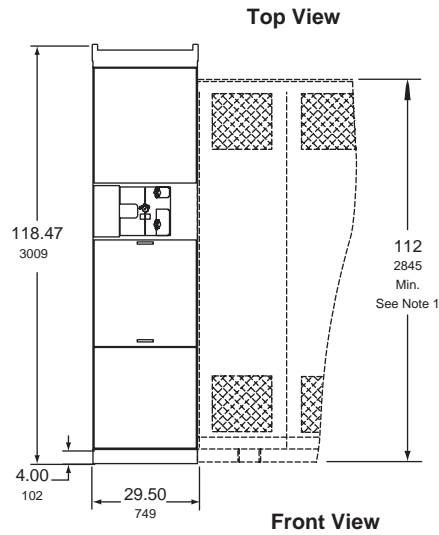
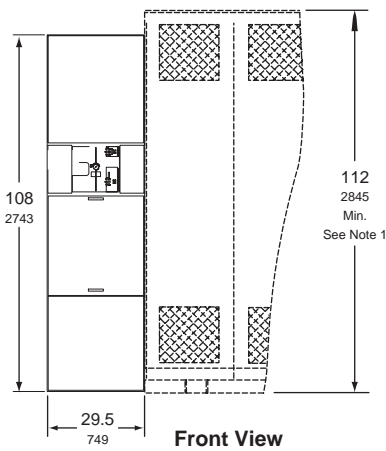
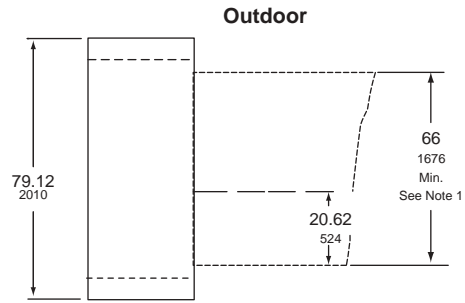
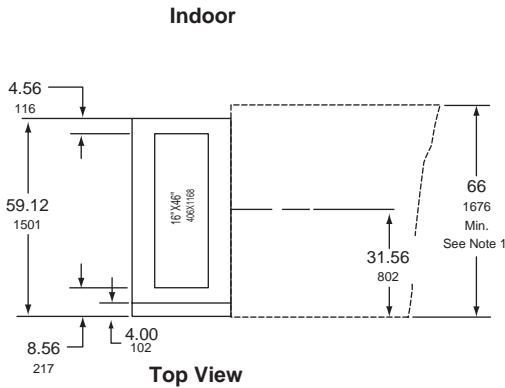
1. Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
2. Transition section height is 65 in. (1651 mm) if transformer is up to 2500 kVA, 85 in. (2159 mm) if transformer is over 2500 kVA.
3. Units are not necessarily front or rear-aligned.
4. If transformer is over 3750 kVA, variations to the dimensions shown here will be necessary.



Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL/CC SWITCHGEAR – VPI POWER-DRY™, POWER-CAST® AND UNI-CAST™ TRANSFORMERS PRIMARY CONNECTION

25.8–38 kV



Approx. Weights: 795 lb/360 kg indoor 1060 lb/480 kg outdoor

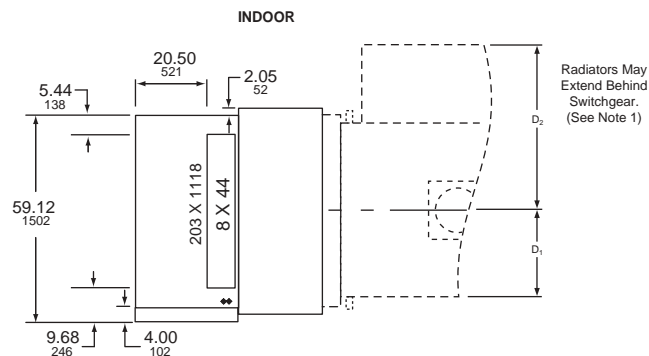
Notes:

1. Transformer dimensions vary depending upon kVA, BIL, and temperature rise ratings. See TRANSFORMER section for table of transformer dimensions.
2. Indoor units are front aligned. Outdoor units are not front or rear-aligned.
3. 29.5 in. (750 mm) width shown. 39.7 in. (1000 mm) wide unit is available for most applications. Dual fuses or surge arresters require a 39.37 in. (1000 mm) wide section. Duplex switches are available.
4. Top view is conduit location for indoor top cable entry (Application A). Floor plan is conduit location for Indoor/Outdoor bottom cable entry (Application B). Outdoor top cable entry is not available. Contact local your Square D field sales representative for information regarding conduit area for other widths or recommendations.

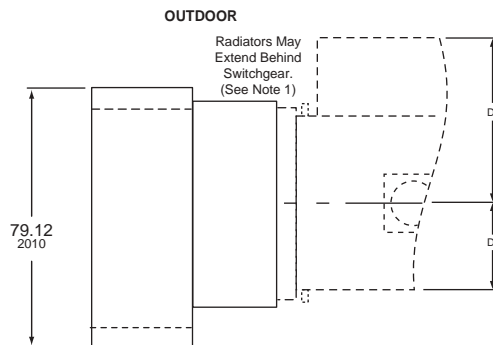
Power-Zone® Load Center Unit Substations Layout Information - Primary Section

HVL/CC SWITCHGEAR – LIQUID-FILLED TRANSFORMERS PRIMARY CONNECTION UP TO 3750 KVA (SEE NOTE 6)

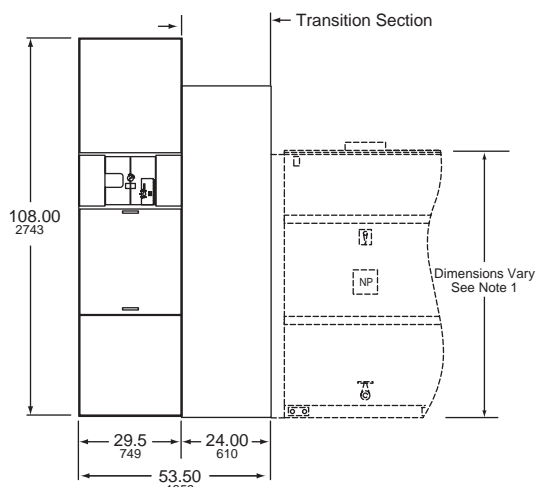
25.8–38 kV



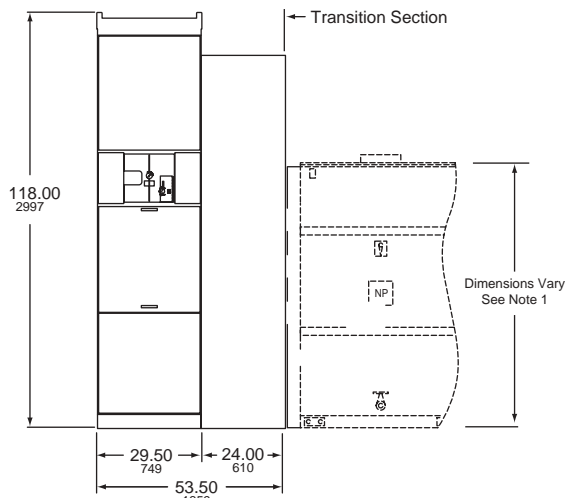
TOP VIEW



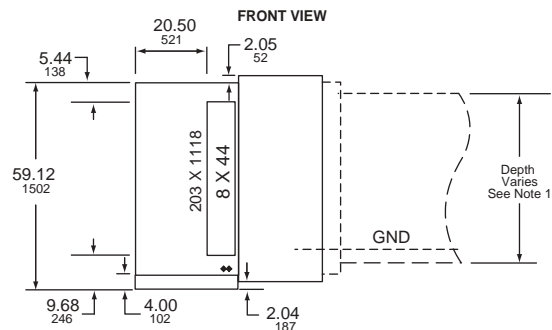
TOP VIEW



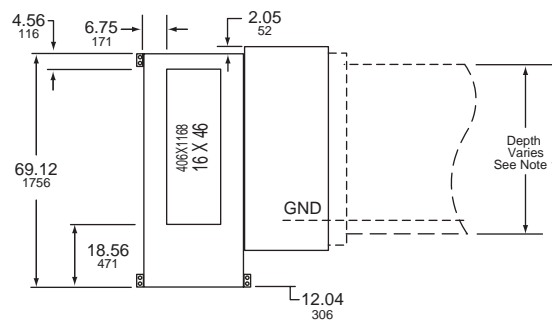
FRONT VIEW



FRONT VIEW



FLOOR PLAN



FLOOR PLAN

Approx. Weights: 1270 lb/595 kg indoor 1740/790 kg outdoor

Notes:

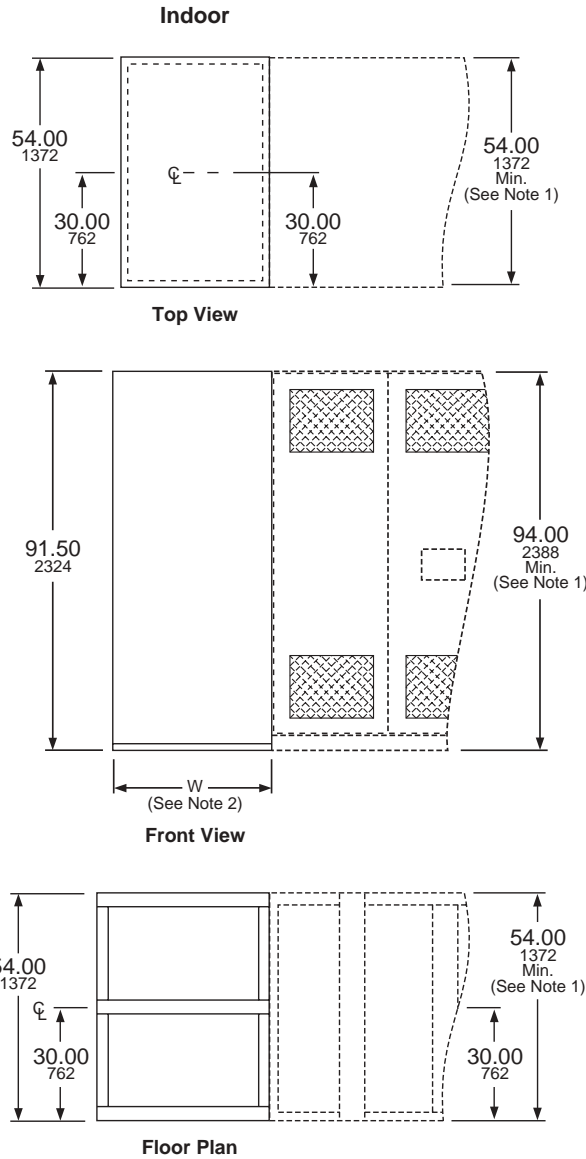
- Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
- Units are not necessarily front or rear aligned.
- 29.5 in. (750 mm) width shown. 39.7 in. (1000 mm) wide unit is available for most applications. Dual fuses or surge arresters require a 39.37 in. (1000 mm) wide section. Duplex switches are available.
- Top view is conduit location for indoor top cable entry (Application A). Floor plan is conduit location for Indoor/Outdoor bottom cable entry (Application B). Outdoor top cable entry is not available. Contact your local Square D field sales representative for information regarding conduit area for other widths or recommendations.



Power-Zone® Load Center Unit Substations
Layout Information - Primary Section

QED SWITCHBOARD — POWER-DRY™, POWER-CAST® AND UNI-CAST™
TRANSFORMER PRIMARY CONNECTION

600 V



Dual Dimensions: **INCHES**
 Millimeters

Weight will vary according to switchboard components.

Notes:

1. Transformer dimensions vary depending upon voltage class, kVA size and BIL rating. See TRANSFORMER section for a complete table of transformer dimensions.
2. Please consult QED layout manual for conduit area dimensions and section width.



Power-Zone® Load Center Unit Substations Layout Information - Transformer Section

INDOOR AND OUTDOOR POWER-DRY™ TRANSFORMERS

600 V, 5 kV, 15 kV, 25 kV and 35 kV

600 V Primary, 10-30 kV BIL

| KVA | 176 °F (80 °C) Temperature Rise | | | | 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---------------------------------|---------------|---------------|----------------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 225 | 94 (2388) | 56 (1422) | 54 (1372) | 2300 (1046) | 94 (2388) | 56 (1422) | 54 (1372) | 2300 (1046) |
| 300 | 94 (2388) | 56 (1422) | 54 (1372) | 3300 (1500) | 94 (2388) | 56 (1422) | 54 (1372) | 3300 (1500) |
| 500 | 94 (2388) | 56 (1422) | 54 (1372) | 4200 (1909) | 94 (2388) | 56 (1422) | 54 (1372) | 4200 (1909) |
| 750 | 94 (2388) | 72 (1829) | 54 (1372) | 5500 (2500) | 94 (2388) | 72 (1829) | 54 (1372) | 5500 (2500) |
| 1000 | 94 (2388) | 84 (2134) | 54 (1372) | 6400 (2909) | 94 (2388) | 72 (1829) | 54 (1372) | 6400 (2909) |
| 1500 | 94 (2388) | 84 (2134) | 54 (1372) | 8300 (3773) | 94 (2388) | 84 (2134) | 54 (1372) | 8300 (3773) |
| 2000 | 94 (2388) | 84 (2134) | 54 (1372) | 10500 (4773) | 94 (2388) | 84 (2134) | 54 (1372) | 10500 (4773) |
| 2500 | 100 (2540) | 108 (2743) | 54 (1372) | 13000 (5909) | 94 (2388) | 96 (2438) | 54 (1372) | 13000 (5909) |
| 3000 | 100 (2540) | 108 (2743) | 54 (1372) | 17100 (7773) | 100 (2540) | 108 (2743) | 54 (1372) | 17100 (7773) |
| 3750 | 100 (2540) | 108 (2743) | 66 (1676) | 22000 (10000) | 100 (2540) | 108 (2743) | 54 (1372) | 22000 (10000) |

5 kV Primary, 30 kV BIL

| KVA | 176 °F (80 °C) Temperature Rise | | | | 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---------------------------------|---------------|---------------|----------------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 225 | 94 (2388) | 56 (1422) | 54 (1372) | 2300 (1046) | 94 (2388) | 56 (1422) | 54 (1372) | 2300 (1046) |
| 300 | 94 (2388) | 56 (1422) | 54 (1372) | 3300 (1500) | 94 (2388) | 56 (1422) | 54 (1372) | 2500 (1134) |
| 500 | 94 (2388) | 56 (1422) | 54 (1372) | 4200 (1909) | 94 (2388) | 56 (1422) | 54 (1372) | 3500 (1587) |
| 750 | 94 (2388) | 72 (1829) | 54 (1372) | 5500 (2500) | 94 (2388) | 56 (1422) | 54 (1372) | 4400 (1995) |
| 1000 | 94 (2388) | 84 (2134) | 54 (1372) | 6400 (2909) | 94 (2388) | 72 (1829) | 54 (1372) | 5800 (2630) |
| 1500 | 94 (2388) | 84 (2134) | 54 (1372) | 8300 (3773) | 94 (2388) | 84 (2134) | 54 (1372) | 6700 (3039) |
| 2000 | 94 (2388) | 84 (2134) | 54 (1372) | 10500 (4773) | 94 (2388) | 84 (2134) | 54 (1372) | 8600 (3900) |
| 2500 | 100 (2540) | 108 (2743) | 54 (1372) | 13200 (5986) | 94 (2388) | 96 (2438) | 54 (1372) | 11200 (5079) |
| 3000 | 100 (2540) | 108 (2743) | 66 (1676) | 18200 (8254) | 100 (2540) | 108 (2743) | 54 (1372) | 16200 (7347) |

15 kV Class - 45 and 60 kV BIL

| KVA | 176 °F (80 °C) Temperature Rise | | | | 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---------------------------------|---------------|---------------|----------------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 225 | 94 (2388) | 56 (1422) | 54 (1372) | 3400 (1546) | 94 (2388) | 56 (1422) | 54 (1372) | 3400 (1546) |
| 300 | 94 (2388) | 56 (1422) | 54 (1372) | 3900 (1773) | 94 (2388) | 56 (1422) | 54 (1372) | 3900 (1773) |
| 500 | 94 (2388) | 72 (1829) | 54 (1372) | 5100 (2318) | 94 (2388) | 56 (1422) | 54 (1372) | 5100 (2318) |
| 750 | 94 (2388) | 72 (1829) | 54 (1372) | 5800 (2636) | 94 (2388) | 72 (1829) | 54 (1372) | 5800 (2636) |
| 1000 | 94 (2388) | 84 (2134) | 54 (1372) | 7300 (3318) | 94 (2388) | 72 (1829) | 54 (1372) | 7300 (3318) |
| 1500 | 94 (2388) | 84 (2134) | 54 (1372) | 9000 (4091) | 94 (2388) | 84 (2134) | 54 (1372) | 9000 (4091) |
| 2000 | 94 (2388) | 96 (2438) | 54 (1372) | 10800 (4909) | 94 (2388) | 84 (2134) | 54 (1372) | 10800 (4909) |
| 2500 | 100 (2540) | 108 (2743) | 54 (1372) | 13500 (6136) | 94 (2388) | 96 (2438) | 54 (1372) | 13500 (6136) |
| 3000 | 100 (2540) | 108 (2743) | 66 (1676) | 18500 (8409) | 100 (2540) | 108 (2743) | 54 (1372) | 18500 (8409) |
| 3750 | 100 (2540) | 108 (2743) | 66 (1676) | 22500 (10227) | 100 (2540) | 108 (2743) | 66 (1676) | 22500 (10227) |
| 5000 | 124 (3150) | 144 (3658) | 66 (1676) | 32600 (14785) | 124 (3150) | 144 (3658) | 66 (1676) | 32600 (14785) |

15 kV Class - 95 kV BIL

| KVA | 176 °F (80 °C) Temperature Rise | | | | 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---------------------------------|---------------|---------------|----------------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 225 | 94 (2388) | 56 (1422) | 54 (1372) | 3800 (1727) | 94 (2388) | 56 (1422) | 54 (1372) | 3800 (1727) |
| 300 | 94 (2388) | 56 (1422) | 54 (1372) | 4600 (2091) | 94 (2388) | 56 (1422) | 54 (1372) | 4600 (2091) |
| 500 | 94 (2388) | 72 (1829) | 54 (1372) | 6000 (2727) | 94 (2388) | 72 (1829) | 54 (1372) | 6000 (2727) |
| 750 | 94 (2388) | 84 (2134) | 54 (1372) | 7400 (3364) | 94 (2388) | 84 (2134) | 54 (1372) | 7400 (3364) |
| 1000 | 94 (2388) | 84 (2134) | 54 (1372) | 8400 (3818) | 94 (2388) | 84 (2134) | 54 (1372) | 8400 (3818) |
| 1500 | 94 (2388) | 96 (2438) | 54 (1372) | 10600 (4818) | 94 (2388) | 96 (2438) | 54 (1372) | 10600 (4818) |
| 2000 | 100 (2540) | 108 (2743) | 54 (1372) | 13100 (5956) | 94 (2388) | 96 (2438) | 54 (1372) | 13100 (5956) |
| 2500 | 100 (2540) | 108 (2743) | 54 (1372) | 14600 (6636) | 100 (2540) | 108 (2743) | 54 (1372) | 14600 (6636) |
| 3000 | 112 (2845) | 132 (3353) | 66 (1676) | 22100 (10046) | 100 (2540) | 108 (2743) | 54 (1372) | 22100 (10046) |
| 3750 | 112 (2845) | 132 (3353) | 66 (1676) | 27100 (12318) | 112 (2845) | 120 (3048) | 66 (1676) | 27100 (12318) |
| 5000 | 112 (2845) | 132 (3353) | 66 (1676) | 32100 (14558) | 112 (2845) | 132 (3353) | 66 (1676) | 32100 (14558) |



Power-Zone® Load Center Unit Substations
Layout Information - Transformer Section

INDOOR AND OUTDOOR POWER-DRY™ TRANSFORMERS (CONTINUED)

25 kV Primary, 125 kV BIL, 600 V Secondary

| KVA | 176 °F (80 °C), 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 500 | 94 (2388) | 96 (2438) | 66 (1676) | 6200 (2818) |
| 750 | 94 (2388) | 96 (2438) | 66 (1676) | 9200 (4182) |
| 1000 | 100 (2540) | 108 (2743) | 66 (1676) | 11500 (5227) |
| 1500 | 100 (2540) | 108 (2743) | 66 (1676) | 13000 (5909) |
| 2000 | 112 (2845) | 120 (3048) | 66 (1676) | 16500 (7500) |
| 2500 | 112 (2845) | 120 (3048) | 78 (1981) | 18000 (8182) |
| 3000 | 112 (2845) | 120 (3048) | 78 (1981) | 23500 (10682) |
| 3750 | 112 (2845) | 132 (3353) | 78 (1981) | 29500 (13409) |
| 5000 | 154 (3912) | 192 (4877) | 84 (2134) | 39500 (17955) |

25 kV Primary, 125 kV BIL, 5 kV Secondary

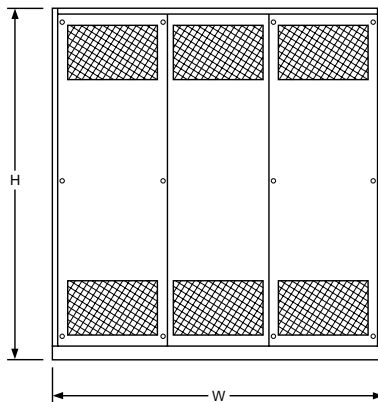
| KVA | 176 °F (80 °C), 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 94 (2388) | 96 (2438) | 78 (1981) | 9200 (4182) |
| 1000 | 100 (2540) | 108 (2743) | 78 (1981) | 11500 (5227) |
| 1500 | 100 (2540) | 108 (2743) | 78 (1981) | 13000 (5909) |
| 2000 | 112 (2845) | 120 (3048) | 78 (1981) | 16500 (7500) |
| 2500 | 112 (2845) | 120 (3048) | 78 (1981) | 18000 (8182) |
| 3000 | 112 (2845) | 132 (3353) | 78 (1981) | 23500 (10682) |
| 3750 | 154 (3912) | 192 (4877) | 84 (2134) | 29500 (13409) |
| 5000 | 154 (3912) | 192 (4877) | 84 (2134) | 39500 (17955) |

35 kV Primary, 150 kV BIL, 600 V Secondary

| KVA | 176°F (80 °C) Temperature Rise | | | | 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|--------------------------------|---------------|---------------|----------------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 124 (3150) | 144 (3658) | 78 (1981) | 9200 (4182) | 124 (3150) | 144 (3658) | 78 (1981) | 9200 (4182) |
| 1000 | 124 (3150) | 144 (3658) | 78 (1981) | 11500 (5227) | 124 (3150) | 144 (3658) | 78 (1981) | 11500 (5227) |
| 1500 | 124 (3150) | 144 (3658) | 78 (1981) | 13000 (5909) | 124 (3150) | 144 (3658) | 78 (1981) | 13000 (5909) |
| 2000 | 124 (3150) | 154 (3912) | 78 (1981) | 16500 (7500) | 124 (3150) | 144 (3658) | 78 (1981) | 16500 (7500) |
| 2500 | 124 (3150) | 154 (3912) | 78 (1981) | 18000 (8182) | 124 (3150) | 144 (3658) | 78 (1981) | 18000 (8182) |
| 3000 | 124 (3150) | 154 (3912) | 78 (1981) | 23500 (10682) | 124 (3150) | 144 (3658) | 78 (1981) | 23500 (10682) |
| 3750 | 136 (3454) | 168 (4267) | 78 (1981) | 29500 (13409) | 124 (3150) | 154 (3912) | 78 (1981) | 29500 (13409) |
| 5000 | 136 (3454) | 168 (4267) | 78 (1981) | 39500 (17955) | 136 (3454) | 168 (4267) | 78 (1981) | 39500 (17955) |

35 kV Primary, 150 kV BIL, 5 kV Secondary

| KVA | 176 °F (80 °C), 239 °F (115 °C) or 302 °F (150 °C) Temperature Rise | | | |
|------|---|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 124 (3150) | 144 (3658) | 78 (1981) | 9200 (4182) |
| 1000 | 124 (3150) | 144 (3658) | 78 (1981) | 11500 (5227) |
| 1500 | 124 (3150) | 144 (3658) | 78 (1981) | 13000 (5909) |
| 2000 | 124 (3150) | 154 (3912) | 78 (1981) | 16500 (7500) |
| 2500 | 124 (3150) | 154 (3912) | 78 (1981) | 18000 (8182) |
| 3000 | 124 (3150) | 154 (3912) | 78 (1981) | 23500 (10682) |
| 3750 | 136 (3454) | 168 (4267) | 78 (1981) | 29500 (13409) |
| 5000 | 136 (3454) | 168 (4267) | 78 (1981) | 39500 (17955) |



Notes:

Primary connections above 530 A must be bus connected. Contact your local Square D field sales representative for information on exact primary case and dimensions. For units in the 5 kV Class with 45 or 60 kV BIL, use dimensions shown in the 15 kV Class.

It is recommended that ventilation openings have a 12 in. (305 mm) minimum clearance from any obstacle to satisfy National Electric Code (NEC) 450-9. All weights are approximate; for copper windings add 25% to weight. Units close-coupled to 4001-5000 A switchgear are 60 in. (1524 mm) deep minimum. Contact your local Square D field sales representative for information on dimensions of units close-coupled to secondary metal-clad switchgear.

Power-Zone® Load Center Unit Substations Layout Information - Transformer Section

INDOOR AND OUTDOOR POWER-CAST® TRANSFORMERS

5 kV, 15 kV, 25 kV and 35 kV Primary (Cable-Connected Only), 600 V Secondary

5 kV, and 15 kV

| KVA | 176 °F (80 °C) Temperature Rise | | | |
|------|---------------------------------|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 500 | 94 (2388) | 72 (1829) | 54 (1372) | 5600 (2545) |
| 750 | 94 (2388) | 84 (2134) | 54 (1372) | 6300 (2864) |
| 1000 | 94 (2388) | 96 (2438) | 54 (1372) | 8350 (3795) |
| 1500 | 94 (2388) | 96 (2438) | 54 (1372) | 11600 (5273) |
| 2000 | 100 (2540) | 108 (2743) | 54 (1372) | 13500 (6136) |
| 2500 | 100 (2540) | 108 (2743) | 54 (1372) | 15950 (7250) |
| 3000 | 112 (2845) | 120 (3048) | 66 (1676) | 18750 (8523) |
| 3750 | 112 (2845) | 120 (3048) | 66 (1676) | 23500 (10682) |
| 5000 | 124 (3150) | 132 (3353) | 78 (1981) | 28000 (12727) |
| 7500 | 124 (3150) | 154 (3912) | 78 (1981) | 37500 (17045) |

25 kV Primary, 125 kV BIL, 600 V Secondary

| KVA | 176 °F (80 °C) or 239 °F (115 °C) Temperature Rise | | | |
|------|--|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 94 (2388) | 84 (2134) | 78 (1981) | 6650 (3023) |
| 1000 | 94 (2388) | 96 (2438) | 78 (1981) | 8700 (3955) |
| 1500 | 100 (2540) | 108 (2743) | 78 (1981) | 11950 (5432) |
| 2000 | 100 (2540) | 108 (2743) | 78 (1981) | 13850 (6295) |
| 2500 | 100 (2540) | 108 (2743) | 78 (1981) | 16300 (7409) |
| 3000 | 112 (2845) | 132 (3353) | 78 (1981) | 19100 (8682) |
| 3750 | 112 (2845) | 132 (3353) | 78 (1981) | 23850 (10841) |

25 kV Primary, 125 kV BIL, 5 kV Secondary

| KVA | 176 °F (80 °C) or 239 °F (115 °C) Temperature Rise | | | |
|-------|--|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 94 (2388) | 84 (2134) | 78 (1981) | 6500 (2955) |
| 1000 | 94 (2388) | 96 (2438) | 78 (1981) | 8550 (3864) |
| 1500 | 100 (2540) | 108 (2743) | 78 (1981) | 11800 (5364) |
| 2000 | 112 (2845) | 120 (3048) | 78 (1981) | 13700 (6227) |
| 2500 | 112 (2845) | 132 (3353) | 78 (1981) | 16150 (7341) |
| 3000 | 112 (2845) | 132 (3353) | 78 (1981) | 18950 (8614) |
| 3750 | 112 (2845) | 132 (3353) | 78 (1981) | 23700 (10773) |
| 5000 | 124 (3150) | 144 (3658) | 80 (2032) | 28000 (12727) |
| 7500 | 136 (3454) | 168 (4267) | 90 (2286) | 37500 (17045) |
| 10000 | 136 (3454) | 168 (4267) | 90 (2286) | 45250 (20568) |

35 kV Primary, 150 kV BIL, 600 V Secondary

| KVA | 176 °F (80 °C) or 239 °F (115 °C) Temperature Rise | | | |
|------|--|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 112 (2845) | 120 (3048) | 66 (1676) | 6650 (3023) |
| 1000 | 112 (2845) | 132 (3353) | 66 (1676) | 8700 (3955) |
| 1500 | 112 (2845) | 132 (3353) | 66 (1676) | 11950 (5432) |
| 2000 | 124 (3150) | 144 (3658) | 66 (1676) | 13850 (6295) |
| 2500 | 124 (3150) | 144 (3658) | 66 (1676) | 16300 (7409) |
| 3000 | 124 (3150) | 154 (3912) | 78 (1981) | 19100 (8682) |
| 3750 | 124 (3150) | 154 (3912) | 78 (1981) | 23850 (10841) |



Power-Zone® Load Center Unit Substations Layout Information - Transformer Section

35 kV Primary, 150 kV BIL, 5 kV Secondary

| KVA | 176 °F (80 °C) or 239 °F (115 °C) Temperature Rise | | | |
|-------|--|---------------|---------------|----------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 112 (2845) | 120 (3048) | 66 (1676) | 6500 (2955) |
| 1000 | 112 (2845) | 132 (3353) | 66 (1676) | 8550 (3864) |
| 1500 | 112 (2845) | 132 (3353) | 66 (1676) | 11800 (5364) |
| 2000 | 124 (3150) | 144 (3658) | 66 (1676) | 13700 (6227) |
| 2500 | 124 (3150) | 144 (3658) | 66 (1676) | 16150 (7341) |
| 3000 | 124 (3150) | 154 (3912) | 78 (1981) | 18950 (8614) |
| 3750 | 124 (3150) | 154 (3912) | 78 (1981) | 23700 (10773) |
| 5000 | 136 (3454) | 168 (4267) | 78 (1981) | 28000 (12727) |
| 7500 | 154 (3912) | 192 (4877) | 84 (2134) | 37500 (17045) |
| 10000 | 154 (3912) | 192 (4877) | 84 (2134) | 45250 (20568) |

Contact your local Square D field sales representative for information on dimensions of transformers deviating from the following characteristics:

3 Phase, 60 Hz

High Voltage: 2.4 kV - 35 kV, 150 kV BIL max.

Low Voltage: 480Y/277, 480 Delta, 208Y/120, 30 kV BIL max., 208Y/120 not available above 1500 kVA
Delta-Delta, Wye-Delta and Delta-Wye connections only

Taps: ± 2 at 2.5% above and below normal

Temp. Rise: Indoor—176 °F (80 °C) over 86 °F (30 °C) ambient; Outdoor— 212 °F (100 °C) ambient

Impedance: 5.75% depending on HV, LV, and BIL ratings

Non-Loss Evaluated Designs

Noise Levels: Per NEMA TR1

Copper Windings and Terminations

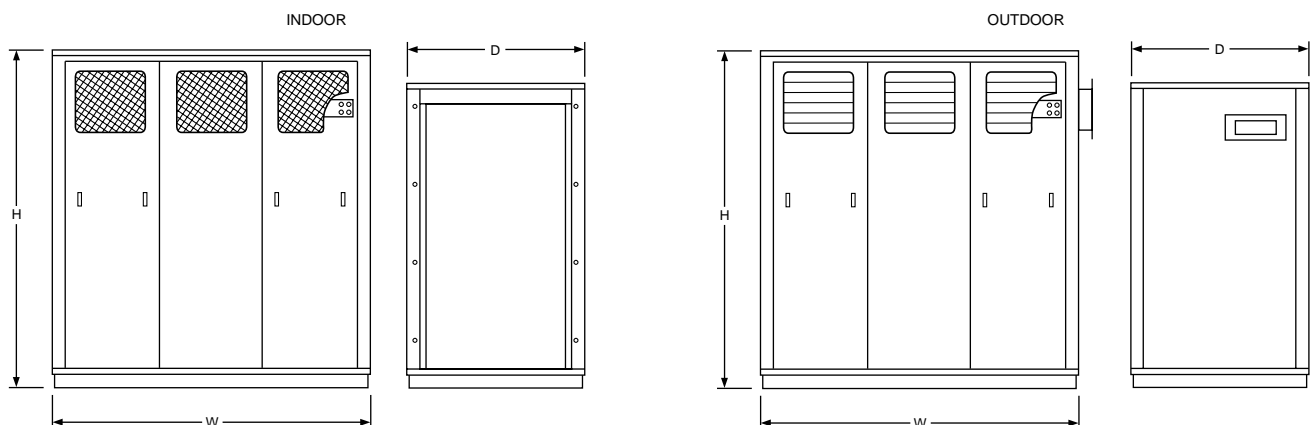
All terminations silver-flashed

Overload capacity: 33.3% or 50% (50% not available for transformers 500 - 750 kVA or above 5000 kVA)

NOTES:

- Primaries rated above 530 A must be bus-connected. Contact your local Square D field sales representative. HVL/cc cable connected only.
- Contact your local Square D field sales representative for information on MASTERCLAD (metal-clad) and HVL (metal-enclosed) secondaries.
- All weights are approximate.
- It is recommended that ventilation openings have 12 in. (305 mm) min. clearance from any obstacle to satisfy NEC 450-9.

Coordinated with HVL, HVL/cc, VISI-VAC, MASTERCLAD primary; QED, POWER-ZONE III, and POWER-ZONE 4 secondary



Power-Zone® Load Center Unit Substations Layout Information - Transformer Section

INDOOR AND OUTDOOR UNI-CAST™ TRANSFORMERS

5 kV and 15 kV Primary (Cable-Connected Only), 600 V Secondary

| KVA | 176 °F (80 °C)/212 °F (100 °C) Temperature Rise | | | |
|------|---|------------------|------------------|-------------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 500 | 94 (2388) | 72 (1829) | 54 (1372) | 4000 (1818) |
| 750 | 94 (2388) | 84 (2134) | 54 (1372) | 5500 (2500) |
| 1000 | 94 (2388) | 84 (2134) | 54 (1372) | 6000 (2727) |
| 1500 | 94 (2388) | 96 (2438) | 54 (1372) | 8000 (3636) |
| 2000 | 94 (2388) | 96 (2438) | 54 (1372) | 10000 (4546) |
| 2500 | 100 (2540) | 108 (2743) | 54 (1372) | 12000 (5456) |
| 3000 | 100 (2540) | 108 (2743) | 66 (1676) | 14000 (6364) |

25 kV Primary, 125 kV BIL, 600 V Secondary

| KVA | 176 °F (80 °C)/212 °F (115 °C) Temperature Rise | | | |
|------|---|------------------|------------------|-------------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 94 (2388) | 96 (2438) | 78 (1981) | 7300 (3811) |
| 1000 | 94 (2388) | 96 (2438) | 78 (1981) | 9000 (4082) |
| 1500 | 100 (2540) | 108 (2743) | 78 (1981) | 12100 (5488) |
| 2000 | 112 (2845) | 120 (3048) | 78 (1981) | 13800 (6260) |
| 2500 | 112 (2845) | 120 (3048) | 78 (1981) | 17700 (8028) |
| 3000 | 112 (2845) | 120 (3048) | 78 (1981) | 17900 (8119) |

35 kV Primary, 150 kV BIL, 600 V Secondary

| KVA | 176 °F (80 °C)/212 °F (115 °C) Temperature Rise | | | |
|------|---|------------------|------------------|-------------------|
| | Height in (mm) | Width in (mm) | Depth in (mm) | Weight lb (kg) |
| 750 | 112 (2845) | 120 (3048) | 66 (1676) | 8700 (220980) |
| 1000 | 112 (2845) | 120 (3048) | 66 (1676) | 10800 (274320) |
| 1500 | 112 (2845) | 120 (3048) | 66 (1676) | 13300 (337820) |
| 2000 | 124 (3150) | 144 (3658) | 66 (1676) | 15500 (393700) |
| 2500 | 124 (3150) | 144 (3658) | 66 (1676) | 18800 (477520) |
| 3000 | 124 (3150) | 144 (3658) | 66 (1676) | 21200 (538480) |

Notes:

- Primaries rated above 530 A must be bus-connected. Contact your local Square D field sales representative.
- All weights are approximate.
- It is recommended that ventilation openings have 12 in. (305 mm) clearance from any obstacle to satisfy NEC 450-9.

Contact your local Square D field sales representative for information on dimensions of transformers deviating from the following characteristics:

3 Phase, 60 Hz

High Voltage: 4160, 12470, 13200 and 13800 V, 95 kV BIL max.

Low Voltage: 480Y/277, 480 Delta, 208Y/120, 10 kV BIL max.

208Y/120 not available above 1000 kVA

Delta-Delta, Wye-Delta and Delta-Wye connections only

Taps: ±2 at 2.5% above and below normal

Temp. Rise: 212 °F (100 °C) over 86 °F (30 °C) ambient

Impedance: 5.75% depending on HV, LV, and BIL ratings

Non-Loss Evaluated Designs

Noise Levels: Per NEMA TR1

Aluminum Windings and Terminations

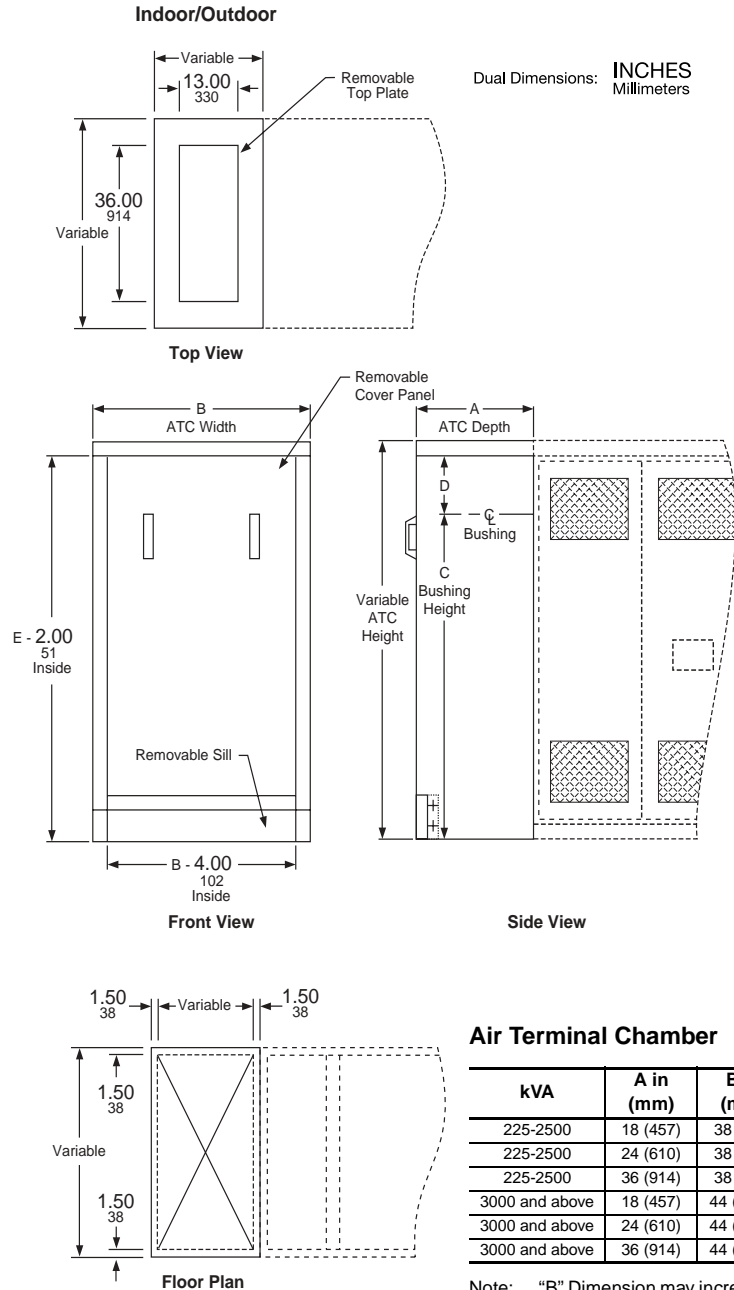
All terminations silver-flashed

Overload capacity: 33 1/3%



Power-Zone® Load Center Unit Substations Layout Information - Transformer Section

POWER-DRY, POWER-CAST® AND UNI-CAST™ TRANSFORMER Air Terminal Chamber



Air Terminal Chamber

| kVA | A in (mm) | B in (mm) | C in (mm) | D in (mm) | E in (mm) |
|----------------|-----------|-----------|-----------|-----------|-----------|
| 225-2500 | 18 (457) | 38 (965) | 55 (1397) | 10 (254) | 67 (1702) |
| 225-2500 | 24 (610) | 38 (965) | 55 (1397) | 10 (254) | 67 (1702) |
| 225-2500 | 36 (914) | 38 (965) | 55 (1397) | 10 (254) | 67 (1702) |
| 3000 and above | 18 (457) | 44 (1118) | 75 (1905) | 10 (254) | 87 (2210) |
| 3000 and above | 24 (610) | 44 (1118) | 75 (1905) | 10 (254) | 87 (2210) |
| 3000 and above | 36 (914) | 44 (1118) | 75 (1905) | 10 (254) | 87 (2210) |

Note: "B" Dimension may increase on certain transformer depending on kVA size and BIL rating. See Layout Information-Transformer section for dimensions beginning on page 45.

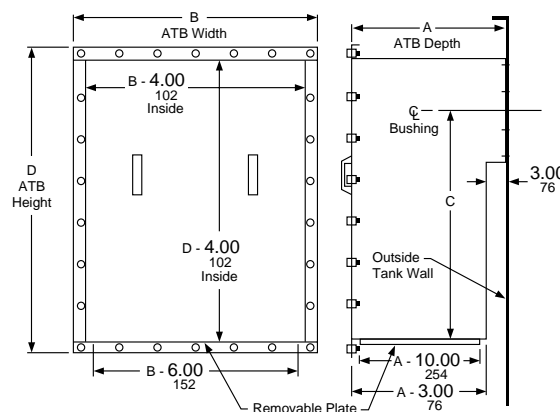
Notes:

1. Standard ATC is end access only. Front and rear access ATC is available but will increase the width of the ATC.
2. Suitable for indoor or outdoor use.
3. Removable top-plate is provided on top-feed applications.
4. Dimensions marked as variable will vary with voltage class, lightning arresters and accessories.

Power-Zone® Load Center Unit Substations Layout Information - Transformer Section

LIQUID-FILLED TRANSFORMER AIR TERMINAL CHAMBERS/BOXES

Primary and Secondary Air Terminal Box



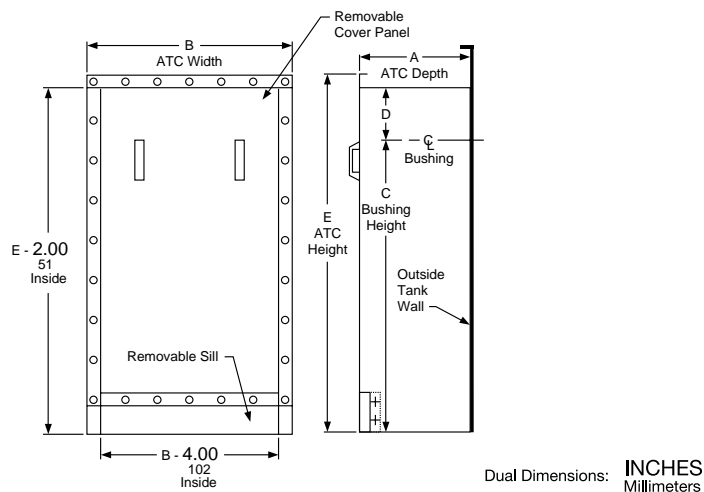
110 BIL and Below (15 kV class)

| kVA | A in (mm) | B in (mm) | C in (mm) | D in (mm) |
|-----------|-----------|-----------|-----------|-----------|
| 225-2500 | 18 (457) | 38 (965) | 29 (734) | 37 (940) |
| 3000-5000 | 24 (610) | 38 (965) | 36 (914) | 44 (1118) |

125 BIL (25 kV class)

| kVA | A in (mm) | B in (mm) | C in (mm) | D in (mm) |
|-----------|-----------|-----------|-----------|-----------|
| 225-2500 | 24 (610) | 38 (965) | 36 (914) | 44 (1118) |
| 3000-5000 | 24 (610) | 38 (965) | 36 (914) | 44 (1118) |

Primary and Secondary Full Length Air Terminal Chamber



110 BIL and Below (15 kV class)

| kVA | A in (mm) | B in (mm) | C in (mm) | D in (mm) | E in (mm) |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 225-2500 | 18 (457) | 38 (965) | 55 (1397) | 10 (254) | 67 (1702) |
| 3000-5000 | 24 (610) | 44 (1118) | 75 (1905) | 10 (254) | 87 (2210) |

125 BIL (25 kV class)

| kVA | A in (mm) | B in (mm) | C in (mm) | D in (mm) | E in (mm) |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 225-2500 | 24 (610) | 38 (965) | 55 (1397) | 10 (254) | 67 (1702) |
| 3000-5000 | 24 (610) | 44 (1118) | 75 (1905) | 10 (254) | 87 (2210) |

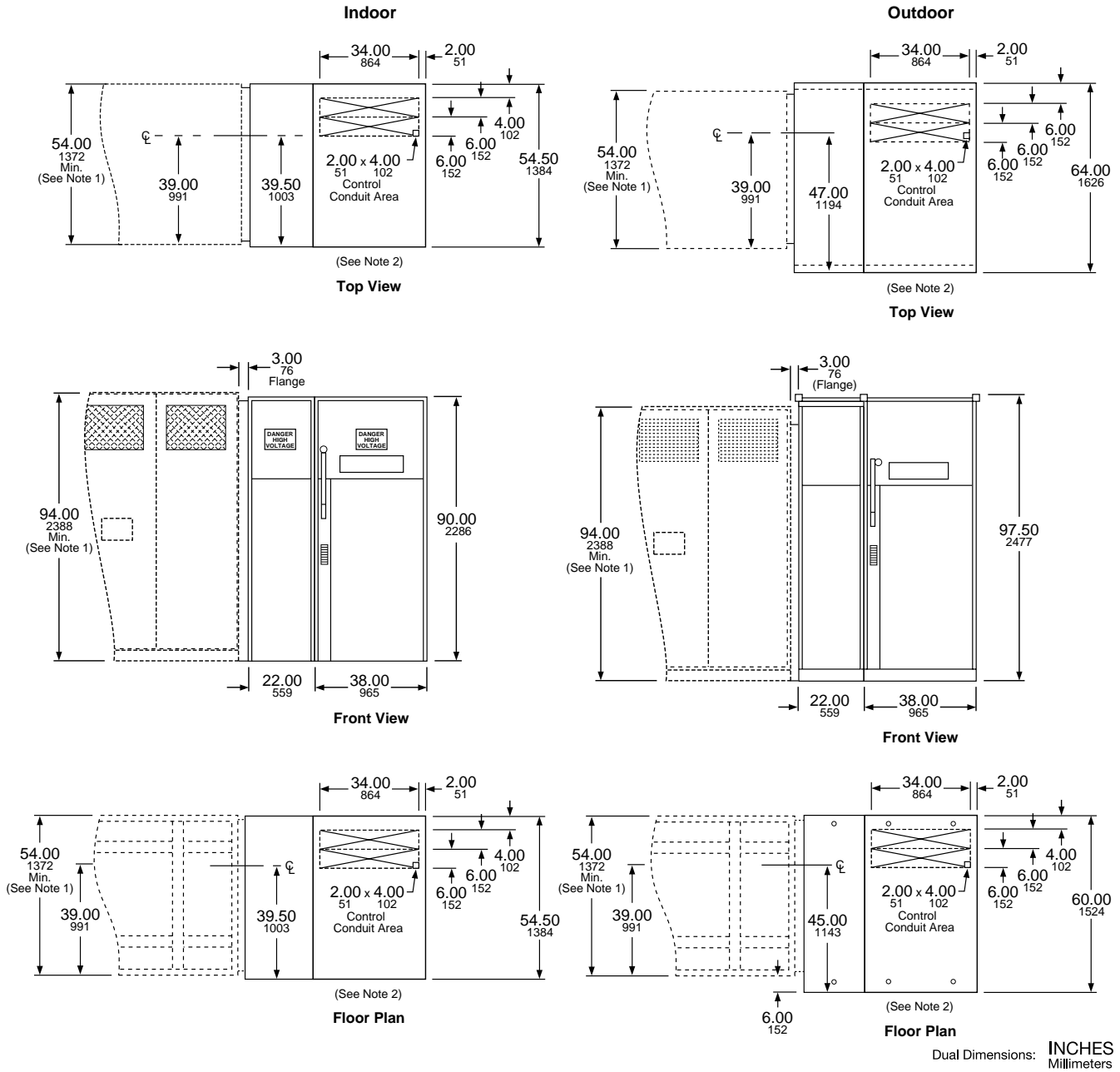
NOTE: Contact your local Square D field sales representative for information on primary or secondary intermediate or station class arresters over 125 BIL.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

VPI POWER-DRY™/POWER-CAST® TRANSFORMER – HVL/VISI-VAC® SWITCHGEAR SECONDARY CONNECTION (3 WIRE SECONDARY ONLY-SEE NOTE 3)

5 kV



Approx. Weights: 1200 lb/545 kg indoor 1400 lb/636 kg outdoor

Notes:

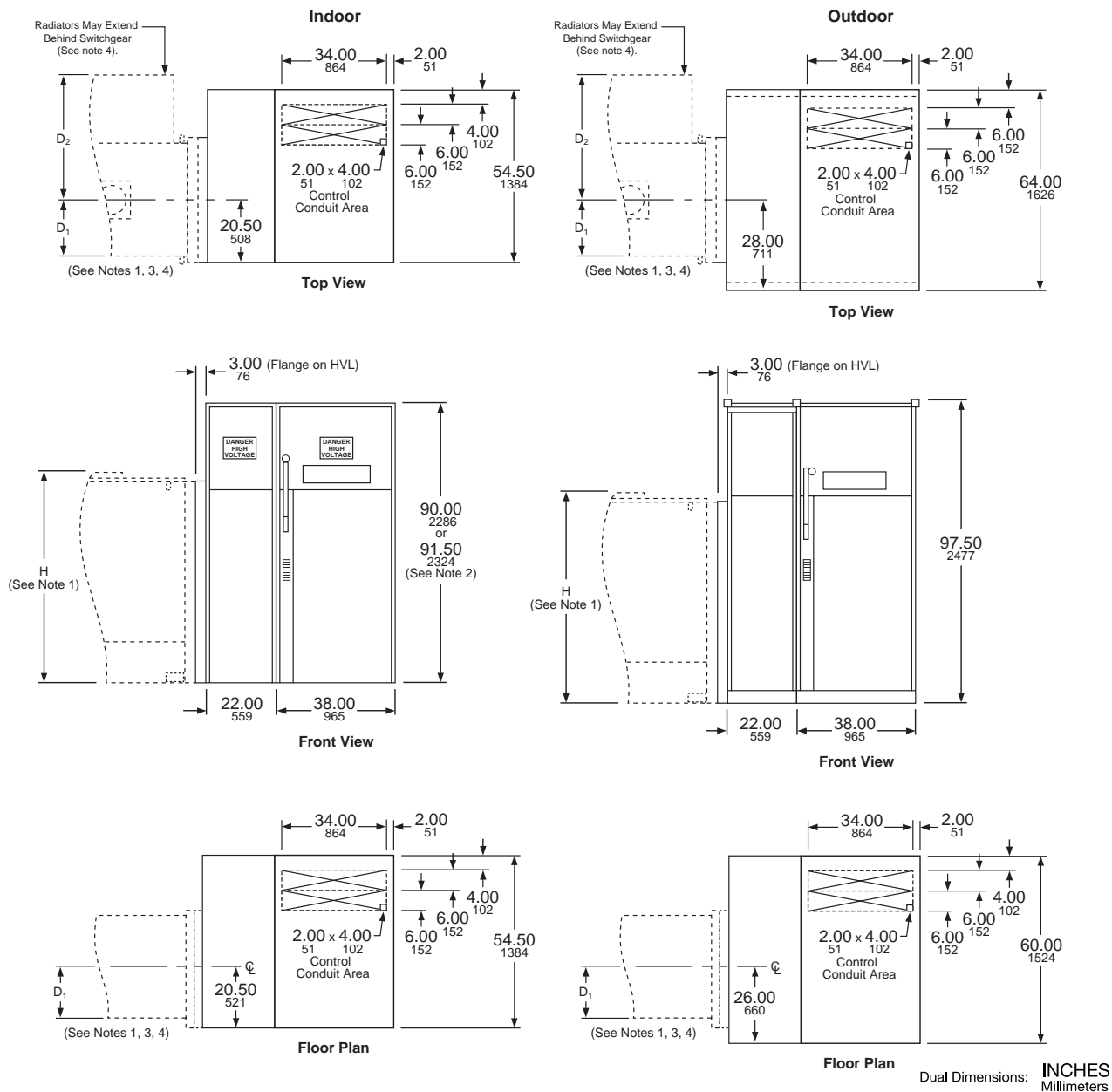
1. Transformer dimensions vary depending upon kVA, BIL and temperature rise ratings. Please contact your local Square D field sales representative for transformer dimensions. Standard transformer dimensions are not available for transformers with 5 kV class secondaries.
2. Indoor units are 0.5 in. (12.7mm) difference and outdoor units have a 6 in. (152 mm) difference in front alignment.
3. Please contact your local Square D field sales representative for 4-wire secondaries.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

LIQUID-FILLED TRANSFORMER – HVL/VISI-VAC® SWITCHGEAR SECONDARY CONNECTION (3-WIRE SECONDARY ONLY-SEE NOTE 5) TO 3750 KVA (SEE NOTE 4)

5 kV



Approx. Weights: 1200 lb/545 kg indoor 1400 lb/636 kg outdoor

Notes:

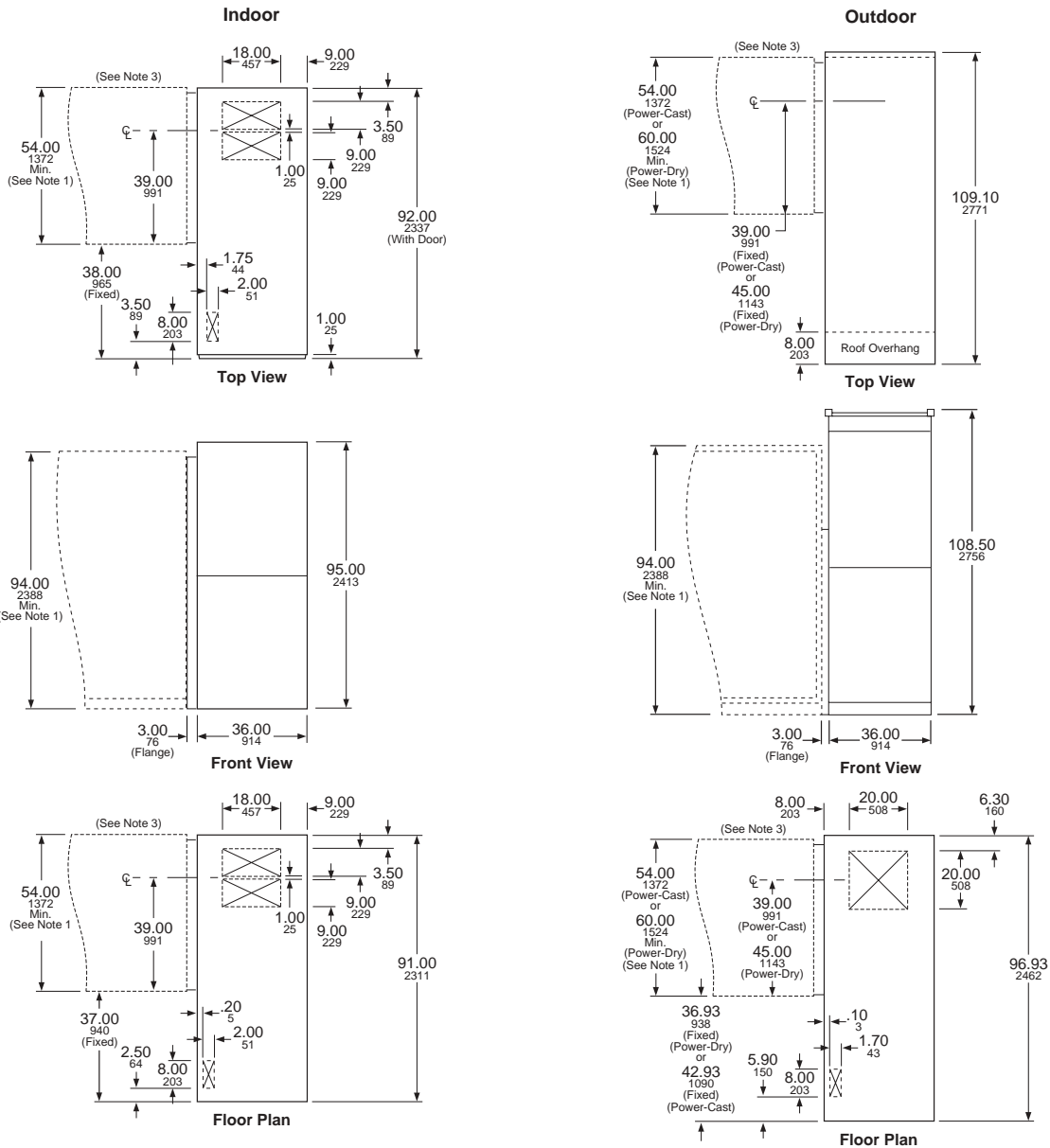
1. Contact your local Square D field sales representative for information on transformer dimensions. Standard liquid-filled transformer dimensions are not available.
2. Extra 1.5 in. (38 mm) in height if base channel is included in HVL/VISI-VAC®.
3. Units are not necessarily front or rear-aligned.
4. If transformer is over 3750 kVA, variations to the dimensions shown here will be necessary.
5. Contact your local Square D field sales representative for information on 4-wire secondaries.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

POWER-DRY™ AND POWER-CAST® TRANSFORMERS METAL-CLAD SWITCHGEAR SECONDARY CONNECTION (3 Wire Secondary Only-See Note 2)

5 kV



Dual Dimensions: INCHES
Millimeters

Approx. Weights (less breakers): 2200 lb/999 kg indoor 2700 lb/1226 kg outdoor
1200 A breaker: 360 lb/163 kg 2000 A breaker: 410 lb/186 kg 3000 A breaker: 480 lb/218 kg

Notes:

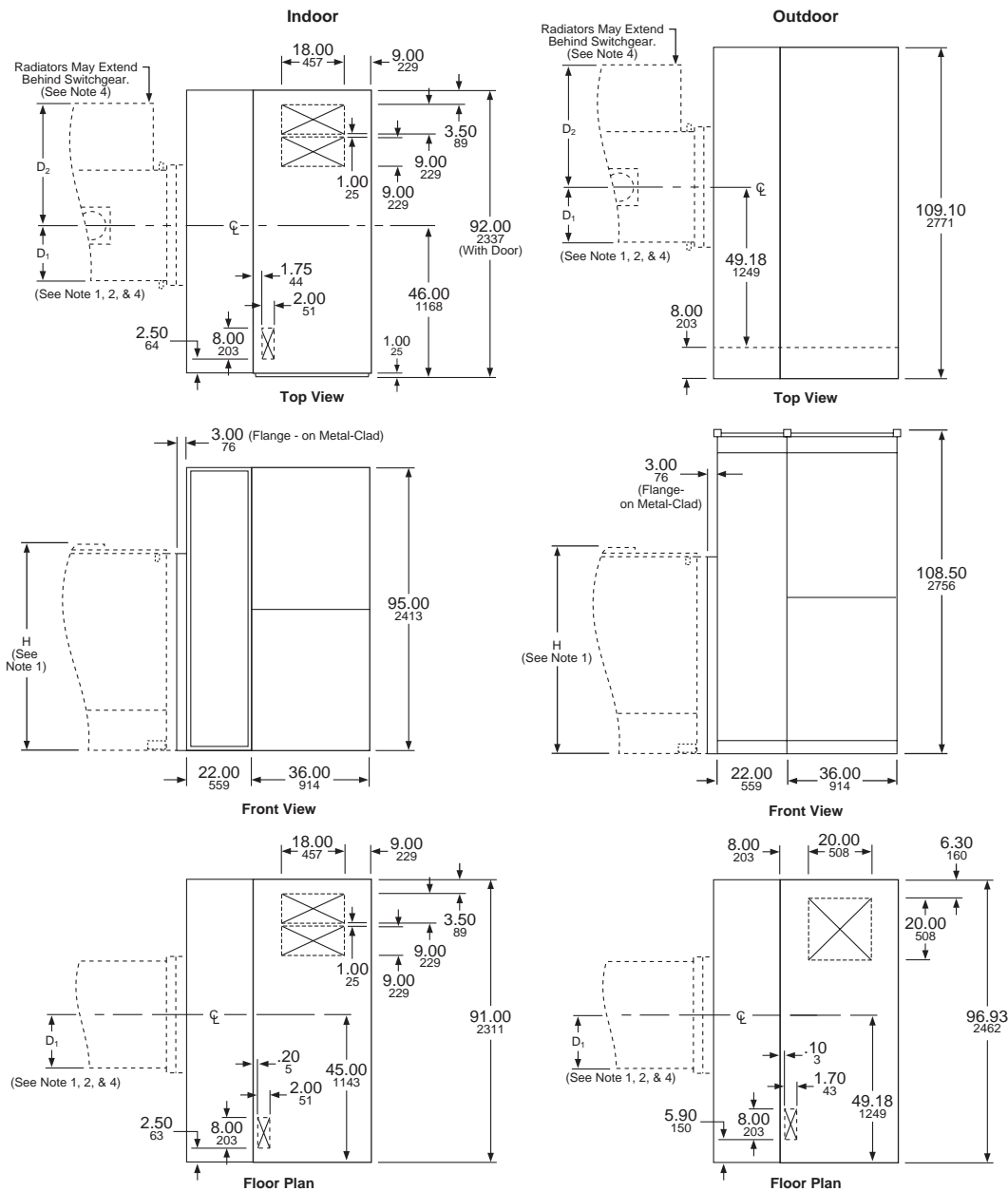
- Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
- Contact your local Square D field sales representative for information on 4-wire secondaries.
- Units will be rear-aligned when units have the depths shown. For transformers with larger depths, transformers will protrude in rear.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

LIQUID-FILLED TRANSFORMER – METAL-CLAD SWITCHGEAR SECONDARY CONNECTION (3 WIRE SECONDARY ONLY-SEE NOTE 2) TO 3750 KVA (SEE NOTE 3)

5 kV



Approx. Weights (less breakers): 2200 lb/999 kg indoor 2700 lb/1226 kg outdoor
1200 A breaker: 360 lb/163 kg 2000 A breaker: 410 lb/186 kg 3000 A breaker: 480 lb/218 kg

Notes:

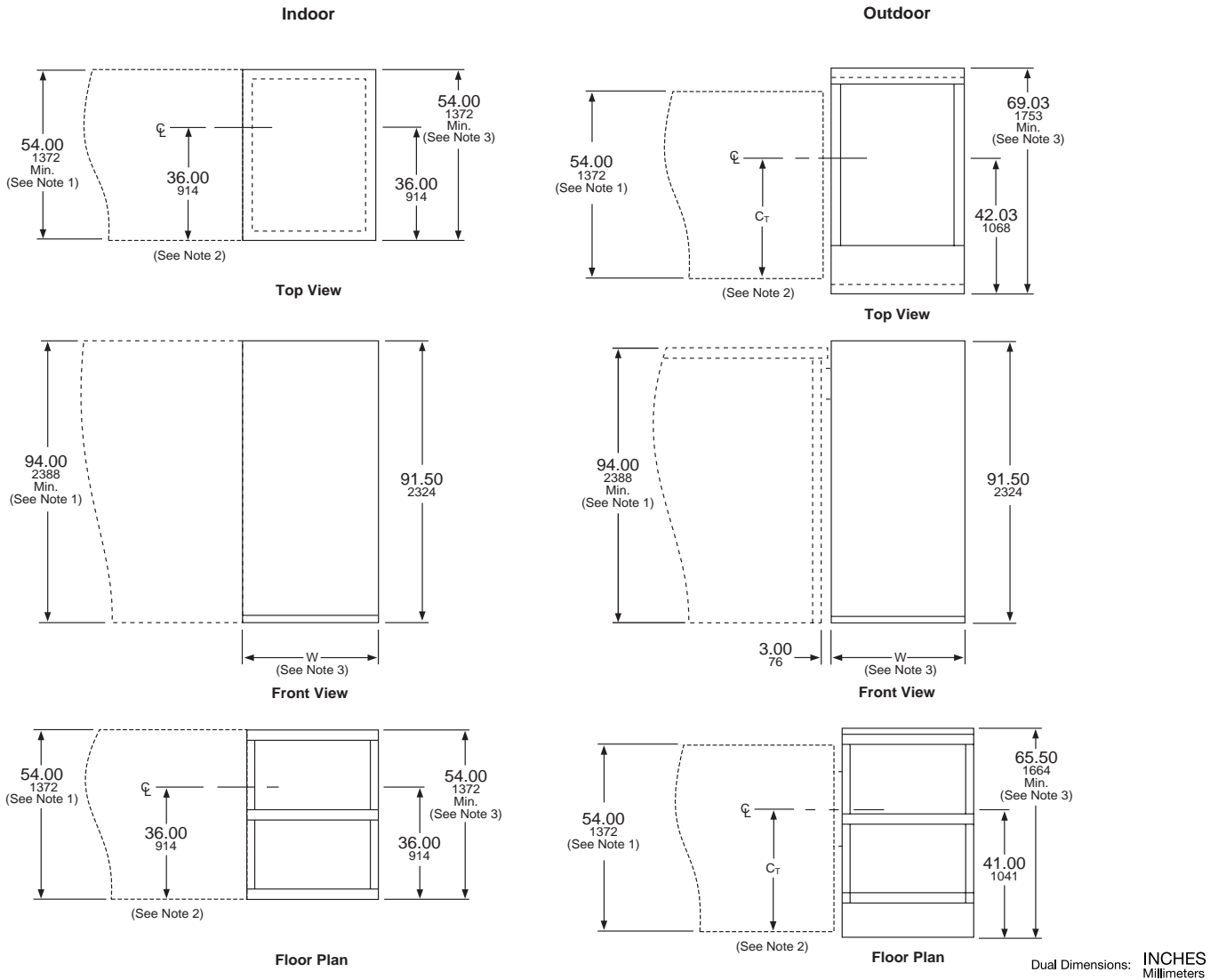
1. Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers with 5 kV secondaries.
2. If transformer is over 3750 kVA, variations to the dimensions shown here will be necessary.
3. Contact your local Square D field sales representative for information on 4-wire secondaries.
4. Units are not necessarily front or rear aligned. Transformer radiators may extend behind switchgear.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

POWER-DRY™, POWER-CAST®, UNI-CAST™ TRANSFORMERS – QED SWITCHBOARD TO 4000 A

Secondary Connection 600 V



Distance C_T

POWER-DRY™/POWER-CAST®/UNI-CAST™ Transformer

$$C_T = \frac{\text{Cabinet Depth} + 9 \text{ in. (229 mm)}}{2}$$

Notes:

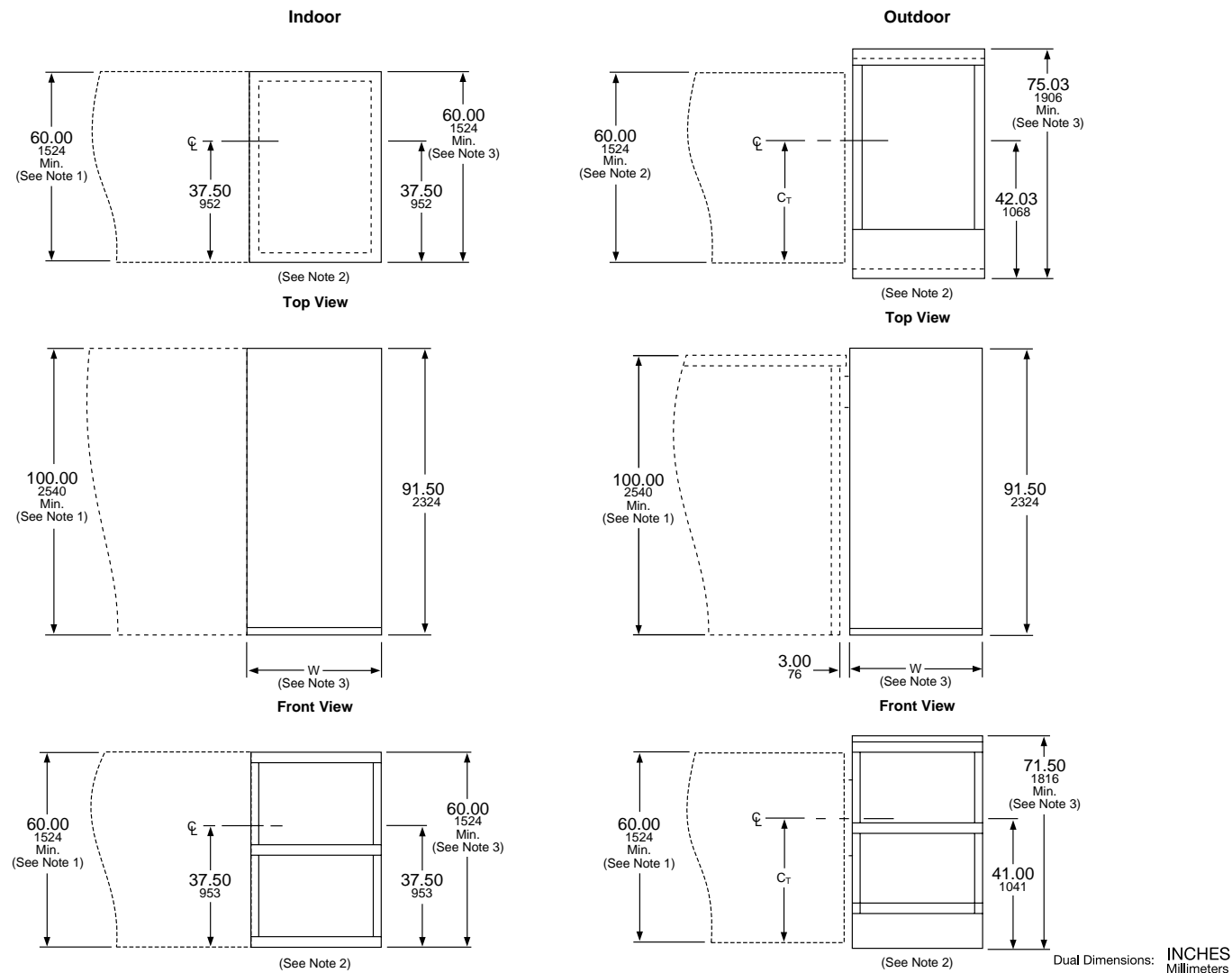
- Transformer dimensions vary depending upon kVA, BIL and temperature rise ratings. See TRANSFORMER section for a complete table of transformer dimensions.
- Indoor units are front-aligned, outdoor units are not necessarily front or rear-aligned. Please see table for the value of distance C_T on outdoor units.
- Please consult QED layout manual or Q2C product selector for conduit area dimensions and cabinet width. Outdoor enclosures are shown with rear covers; add 1.5 in. (38 mm) to the outdoor floor-plan depth and 2 in. (51 mm) to the outdoor top view depth for rear doors. Units with QED-3 secondaries may require a transition section – please contact your local Square D field sales representative for details.
- Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

POWER-DRY™, POWER-CAST®, UNI-CAST™ TRANSFORMERS – QED SWITCHBOARD 4001-5000 A

Secondary Connection 600 V



Distance C_T

POWER-DRY™/POWER-CAST®/UNI-CAST™ Transformer

$$C_T = \frac{\text{Cabinet Depth}}{2} + 10.5 \text{ in. (267 mm)}$$

Notes:

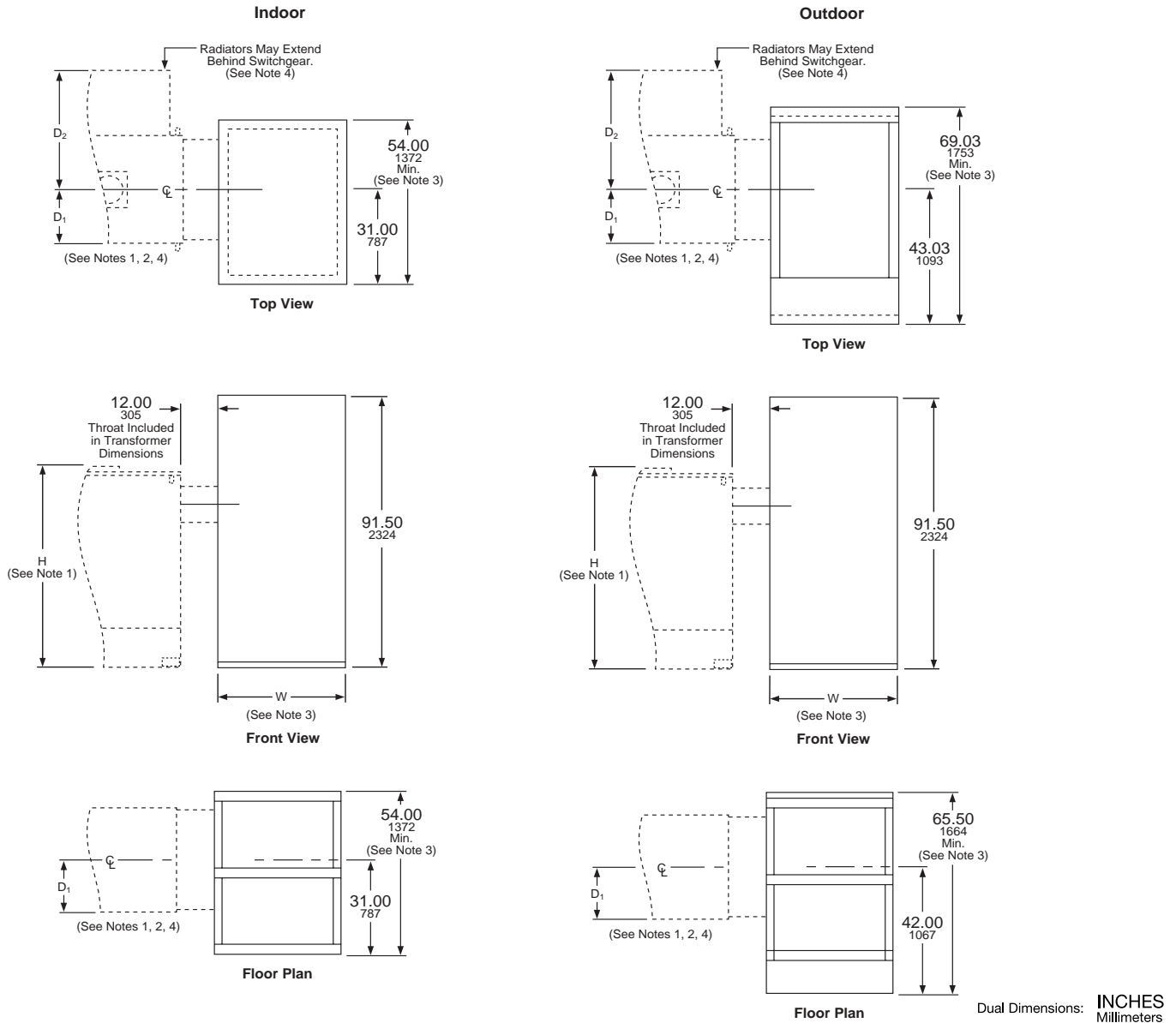
- Transformer dimensions vary depending upon kVA, BIL and temperature rise ratings. See the TRANSFORMER section for a complete table of transformer dimensions (minimum depth is 60 in. [1524 mm]).
- Indoor units are front-aligned, outdoor units are not necessarily front or rear-aligned. Please see table above for the value of distance C_T on outdoor units.
- Please consult QED layout manual or Q2C product selector for conduit area dimensions and cabinet width. Outdoor enclosures are shown with rear covers; add 1.5 in. (38 mm) to the outdoor floor-plan depth and 2 in. (51 mm) to the outdoor top view depth for rear doors. Units with QED3 distribution sections may require a transition section – please contact manufacturing location for details.
- Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

LIQUID FILLED TRANSFORMER TO 3750 KVA (SEE NOTE 4) – QED SWITCHBOARD TO 4000 A

Secondary Connection 600 V



Notes:

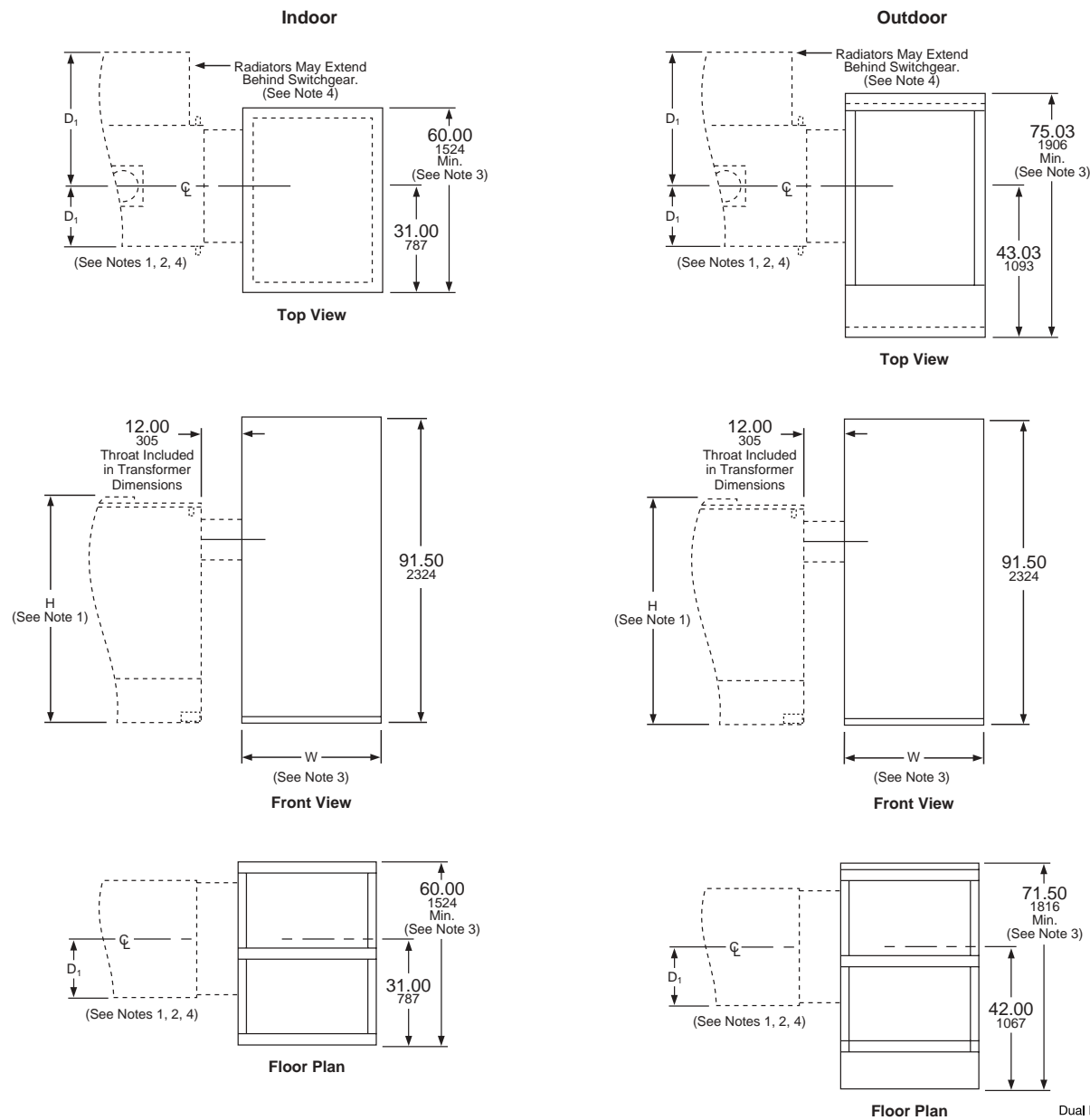
- Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
- Units are not necessarily front- or rear-aligned.
- Please consult QED layout manual or Q2C product selector for conduit area dimensions and cabinet width. Outdoor enclosures are shown with rear covers; add 1.5 in. (38 mm) to the outdoor floor-plan depth and 2 in. (51 mm) to the outdoor top view depth for rear doors. For units with QED-3 distribution sections, a transition section may be necessary – please contact your local Square D field sales representative for details.
- Dimensions shown here may vary if transformer is over 3750 kVA.
- Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

LIQUID-FILLED TRANSFORMER TO 3750 KVA (SEE NOTE 4) – QED SWITCHBOARD 4001 A-5000 A

Secondary Connection 600 V



Notes:

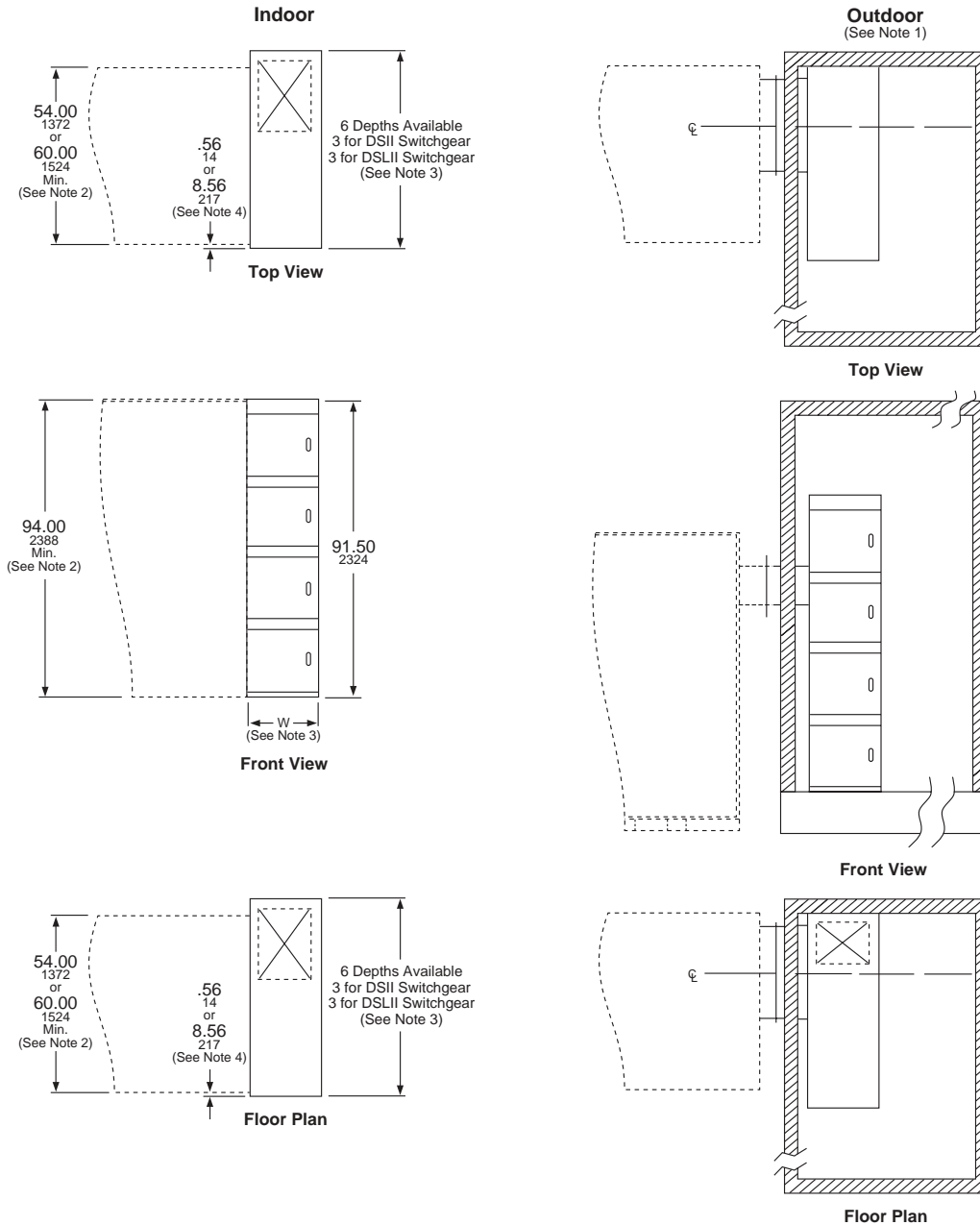
- Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
- Units are not necessarily front- or rear-aligned.
- Please consult QED layout manual or Q2C product selector for conduit area dimensions and cabinet width. Outdoor enclosures are shown with rear covers; add 1.5 in. (38 mm) to the outdoor floor-plan depth and 2 in. (51 mm) to outdoor top view depth for rear doors. A transition section may be necessary – please contact your local Square D field sales representative for details.
- If transformer is over 3750 kVA, slight variations to the dimensions shown here may be necessary.
- Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

POWER-DRY™, POWER-CAST®, UNI-CAST™ TRANSFORMERS – POWER-ZONE III SERIES 2 DRAWOUT SWITCHGEAR

Secondary Connection



Dual Dimensions: INCHES
Millimeters

Notes:

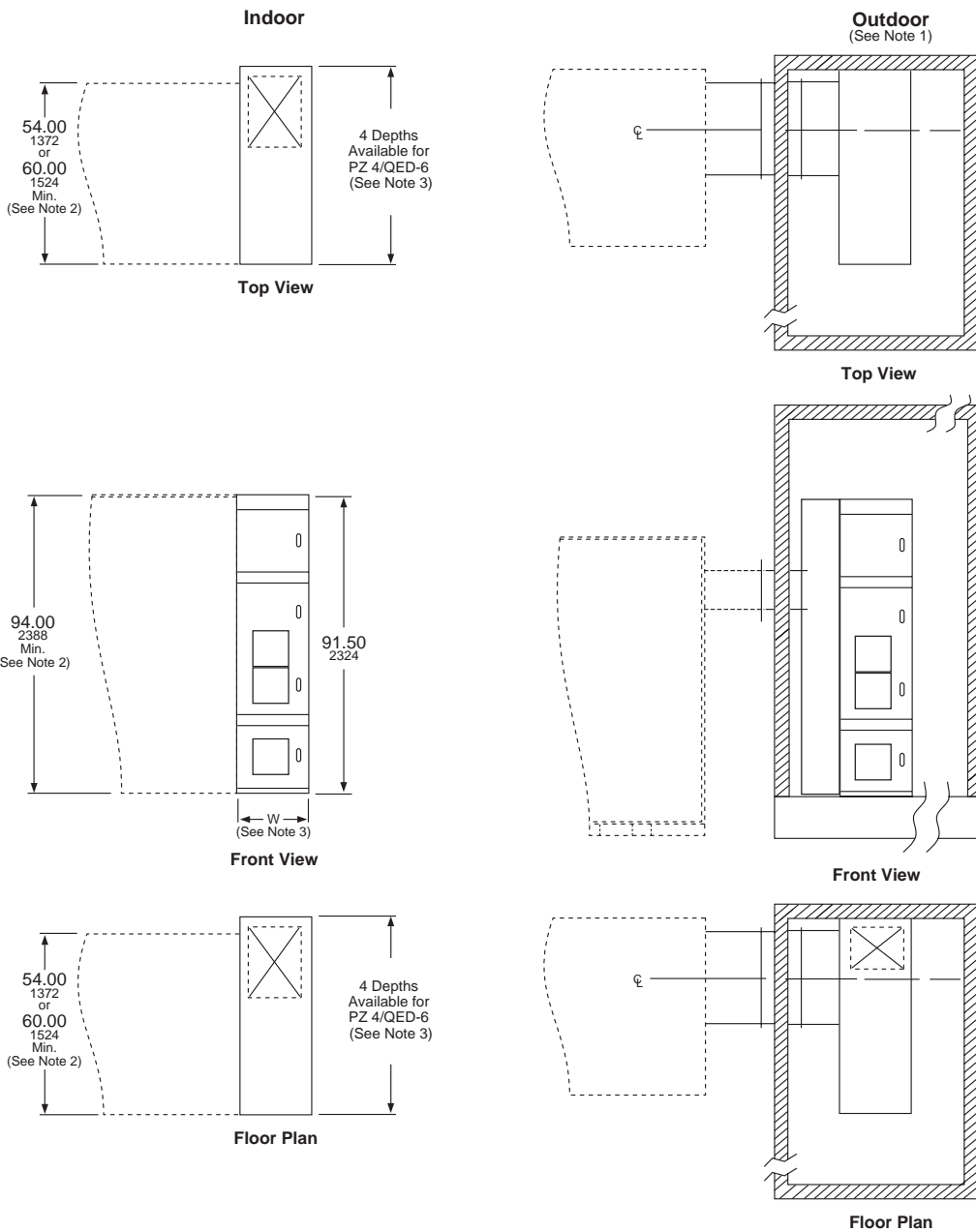
- Outdoor units must be coordinated with POWER-ZONE® NEMA Type 3R walk-in or non-walk-in enclosures on a case-by-case basis. Please consult the POWER-ZONE® Center group in Nashville, TN for details.
- Transformer dimensions may vary depending upon kVA, BIL and temperature rise ratings. See TRANSFORMER section for a complete table of transformer dimensions. Transformers close-coupling to 4001 A-5000 A POWER-ZONE III gear are 60 in. (1524 mm) deep minimum. POWER-CAST®/UNI-CAST™ transformers close-coupling to 4001-5000 A POWER-ZONE III gear will be a minimum of 100 in. (2540 mm) in height.
- Please consult the POWER-ZONE III layout guide or Q2C product selector for conduit area dimensions and cabinet width and depth.
- Larger offset values are for switchgear with DSLII or DSII-840 switchgear.
- Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

POWER-DRY™, POWER-CAST®, UNI-CAST™ TRANSFORMERS – POWER-ZONE 4/QED-6 DRAWOUT SWITCHGEAR

Secondary Connection



Notes:

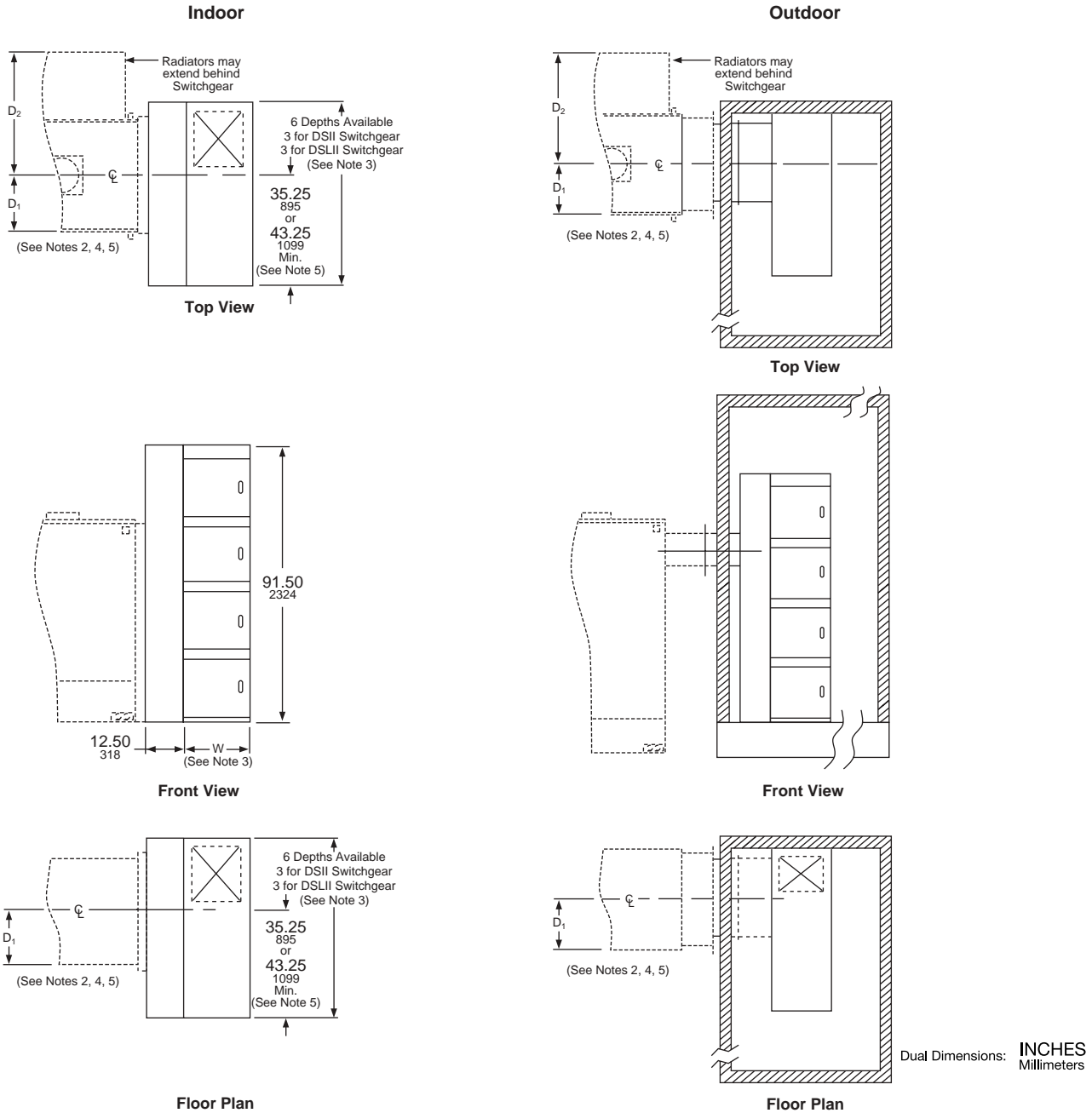
- Outdoor units must be coordinated with POWER-ZONE® NEMA Type 3R walk-in or non-walk-in enclosures on a case-by-case basis. Please consult the POWER-ZONE Center group in Nashville, TN for details.
- Transformer dimensions may vary depending upon kVA, BIL and temperature rise ratings. See TRANSFORMER section for a complete table of transformer dimensions. Transformers close-coupling to 4001 A-5000 A POWER-ZONE 4 gear are 60 in. (1524 mm) deep minimum. POWER-CAST®/UNI-CAST™ transformers close-coupling to 4001-5000 A POWER-ZONE 4 gear will be a minimum of 100 in. (2540 mm) in height.
- Please consult the POWER-ZONE 4 and QED-6 layout guide or Q2C product selector for conduit area dimensions and cabinet width and depth.
- POWER-ZONE 4 and QED-6 transition section inside the POWER-ZONE® house is 12.5 in. (318 mm).
- Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

LIQUID FILLED TRANSFORMER TO 3750 KVA (SEE NOTE 5) – POWER-ZONE III SERIES 2 DRAWOUT SWITCHGEAR

Secondary Connection



Notes:

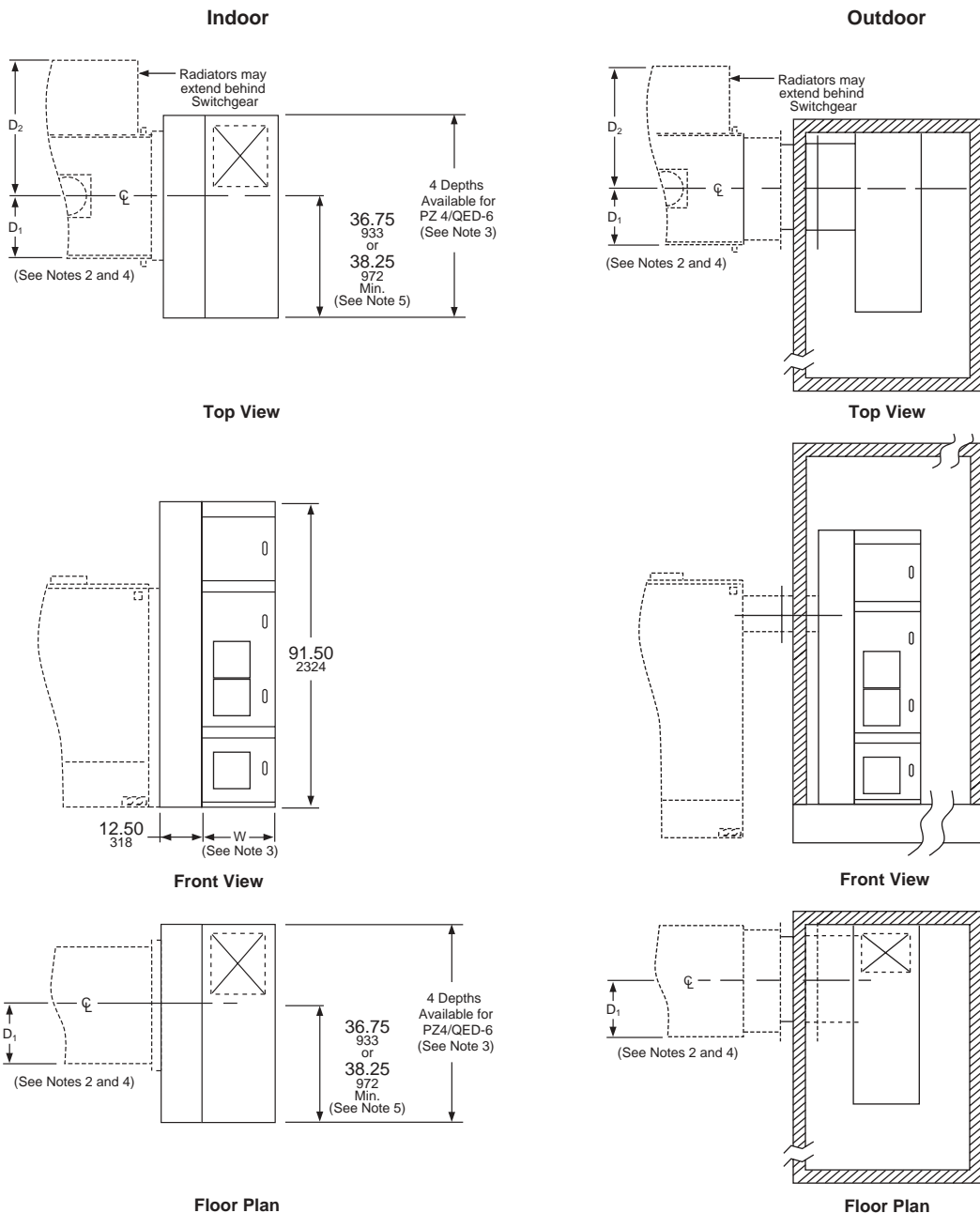
1. Outdoor units must be coordinated with POWER-ZONE® NEMA Type 3R walk-in or non-walk-in enclosures on a case-by-case basis. Please consult the POWER-ZONE® Center group in Nashville, TN for details.
2. Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
3. Please consult the POWER-ZONE III layout guide or Q2C product selector for conduit area dimensions and cabinet width and depth.
4. Larger values shown are for switchgear with DSLII or DSII-840 switchgear.
5. Dimensions shown here may vary for transformers over 3750 kVA.
6. Weight varies according to switchgear components and enclosure construction.



Power-Zone® Load Center Unit Substations Layout Information - Secondary Section

LIQUID FILLED TRANSFORMER TO 3750 KVA (SEE NOTE 5) – POWER-ZONE 4/QED-6 DRAWOUT SWITCHGEAR

Secondary Connection



Dual Dimensions: INCHES
Millimeters

Notes:

1. Outdoor units must be coordinated with POWER-ZONE® NEMA Type 3R walk-in or non-walk-in enclosures on a case-by-case basis. Please consult the POWER-ZONE® Center group in Nashville, TN for details.
2. Contact your local Square D field sales representative for information on transformer dimensions. Standard dimensions are not available for transformers.
3. Please consult the POWER-ZONE 4 and QED-6 layout guide or Q2C product selector for conduit area dimensions and cabinet width and depth.
4. For transformers over 3750 kVA, slight changes to the dimensions shown here may be necessary.
5. For switchgear over 4000 A center line will be 38.25 in.(972 mm) from front.
6. Weight varies according to switchgear components and enclosure construction.



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