Low Voltage Transformers
Sealed, General Purpose, Dry Type

Class 7400

Catalog
7400CT9601R4/08
08

CONTENTS

Description	**Page**
Introduction	3
Resin-Filled Transformers	4
Export Model Transformers	8
Stainless Steel Enclosures	9
Enclosure Diagrams and Accessories	10
Wiring Diagrams	17
Application Data	18
Specifications	22

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SQUARE D

Introduction

As the industry leading designer, manufacturer, and supplier of low voltage, general purpose transformers, Schneider Electric has the expertise necessary to meet your increased demands by providing reliable products and outstanding support services.

Single Phase

Three Phase

Single Phase

Sealed Transformers

Resin-Filled Transformers

Resin-filled general purpose transformers are epoxy encapsulated. The enclosure has no openings, making resin-filled transformers ideal for use indoor or outdoor where airborne particles or contaminants could be detrimental to operation. The core-and-coil assembly is embedded in an epoxy resin compound and wall mounted for maximum protection. These units can be used outdoors without accessories. Units are UL Listed and CSA Certified.

Public Law 109-58, the 2005 Energy Act, mandates that distribution transformers be energy efficient. However, resin-filled units are not included in this law; they are listed in Section (35)(B)(ii) as “a transformer that is designed to be used in a special purpose application and is unlikely to be used in general purpose application, such as ... sealed and non-ventilating transformer...”

Three-Phase Resin-Filled Transformers

kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps[a]
480 V Delta Primary to 208Y/120 V Secondary 60 Hz						
3	3T2F	12C	4 on page 17	125	115	2–5% FCBN
6	6T2F	12C		150	115	2–5% FCBN
9	9T2F	14C		265	115	2–5% FCBN
15	15T2F	14C		335	115	2–5% FCBN
30	30T2F	16C	8 on page 17	775	115	2–5% FCBN
480 V Delta Primary to 240 V Delta Secondary 60 Hz						
3	3T5F	12C	5 on page 17	125	115	2–5% FCBN
6	6T5F	12C		150	115	2–5% FCBN
9	9T75F	14C	6 on page 17	265	115	4–2.5% FCBN
15	15T75F	14C		335	115	4–2.5% FCBN
600 V Delta Primary to 208Y/120 Volts Secondary 60 Hz						
3	3T7F	12C	4 on page 17	125	115	2–5% FCBN
6	6T7F	12C		150	115	2–5% FCBN
9	9T7F	14C		265	115	2–5% FCBN
15	15T7F	14C		335	115	2–5% FCBN
30	30T7F	16C	8 on page 17	775	115	2–5% FCBN

[a] (FCBN) Full Capacity Taps Below Normal, where noted.

Single-Phase Resin-Filled Transformers

kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps[a]
240 x 480 V Primary to 120/240 V Secondary 60 Hz						
0.050	50SV1A	1A	1 on page 17	4.2	55	—
0.100	100SV1A	2A		4.5	55	—
0.150	150SV1A	3A		6.2	55	—
0.250	250SV1B	4A		10.5	80	—
0.500	500SV1B	5A		13.8	80	—
0.750	750SV1F	6A		15.5	115	—
1	1S1F	7A		21.2	115	—
1.5	1.5S1F	8A		30.1	115	—
2	2S1F	9A		39.1	115	—
3	3S1F	10A		55.2	115	—
5	5S1F	13B		115	115	—
7.5	7S1F	13B		150	115	—
10	10S1F	13B		165	115	—
480 V Primary to 120/240 V Secondary 60 Hz						
3	3S40F	10A	7 on page 17	55.2	115	2–5% FCBN
5	5S40F	13B		115	115	2–5% FCBN
7.5	7S40F	13B		150	115	2–5% FCBN
10	10S40F	13B		165	115	2–5% FCBN
15	15S40F	15B		320	115	2–5% FCBN
25	25S40F	15B		385	115	2–5% FCBN
600 V Primary to 120/240 V Secondary 60 Hz						
0.050	50SV51A	1A	2 on page 17	4.2	55	—
0.100	100SV51A	2A		4.5	55	—
0.150	150SV51A	3A		6.2	55	—
0.250	250SV51B	4A		10.5	80	—
0.500	500SV51B	5A		13.8	80	—
0.750	750SV51F	6A		15.5	115	—
1	1S51F	7A		21.2	115	—
1.5	1.5S51F	8A		30.1	115	—
2	2S51F	9A		39.1	115	—
3	3S4F	10A	7 on page 17	55.2	115	2–5% FCBN
5	5S4F	13B		115	115	2–5% FCBN
7.5	7S4F	13B		150	115	2–5% FCBN
10	10S4F	13B		165	115	2–5% FCBN
120x240 V Primary to 120/240 V Secondary 60 Hz						
1	1S6F	7A	1 on page 17	21.2	115	—
1.5	1.5S6F	8A		30.1	115	—
2	2S6F	9A		39.1	115	—
3	3S6F	10A		55.2	115	—
5	5S6F	13B		115	115	—
7.5	7S6F	13B		150	115	—
10	10S6F	13B		165	115	—

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Single-Phase Resin-Filled Transformers *(continued)*

kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps[a]
208 V Primary to 120/240 V Secondary 60 Hz						
1	1S7F	7A	2 on page 17	21.2	115	—
1.5	1.5S7F	8A		30.1	115	—
2	2S7F	9A		39.1	115	—
3	3S7F	10A		55.2	115	—
3	3S60F	10A	7 on page 17	55.2	115	2–5% FCB
5	5S7F	13B	2 on page 17	115	115	—
5	5S60F	13B	7 on page 17	115	115	2–5% FCB
7.5	7S7F	13B	2 on page 17	150	115	—
7.5	7S60F	13B	7 on page 17	150	115	2–5% FCB
10	10S7F	13B	2 on page 17	165	115	—
10	10S60F	13B	7 on page 17	165	115	2–5% FCB
15	15S60F	15B		320	115	2–5% FCB
25	25S60F	15B		385	115	2–5% FCB
240 V Primary to 120/240 Secondary 60 Hz						
3	3S62F	10A	7 on page 17	55.2	115	2–5% FCB
5	5S62F	13B		115	115	2–5% FCB
7.5	7S62F	13B		150	115	2–5% FCB
10	10S62F	13B		165	115	2–5% FCB
15	15S62F	15B		320	115	2–5% FCB
25	25S62F	15B		385	115	2–5% FCB
277 V Primary to 120/240 V Secondary 60 Hz						
1	1S8F	7A	2 on page 17	21.2	115	—
1.5	1.5S8F	8A		30.1	115	—
2	2S8F	9A		39.1	115	—
3	3S8F	10A		55.2	115	—
3	3S61F	10A	7 on page 17	55.2	115	2–5% FCB
5	5S8F	13B	2 on page 17	115	115	—
5	5S61F	13B	7 on page 17	115	115	2–5% FCB
7.5	7S8F	13B	2 on page 17	150	115	—
7.5	7S61F	13B	7 on page 17	150	115	2–5% FCB
10	10S8F	13B	2 on page 17	165	115	—
10	10S61F	13B	7 on page 17	165	115	2–5% FCB
15	15S61F	15B		320	115	2–5% FCB
25	25S61F	15B		385	115	2–5% FCB
480 V Primary to 208 V Secondary 60 Hz						
1	1S72F	7A	3 on page 17	21.2	115	—
1.5	1.5S72F	8A		30.1	115	—
2	2S72F	9A		39.1	115	—
3	3S72F	10A		55.2	115	—
5	5S72F	13B		115	115	—
7.5	7S72F	13B		150	115	—
10	10S72F	13B		165	115	—

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Single-Phase Resin-Filled Transformers *(continued)*

kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps[a]
240 V Primary to 208 V Secondary 60 Hz						
1	1S1723F	7A	3 on page 17	21.2	115	—
1.5	1.5S1723F	8A		30.1	115	—
2	2S1723F	9A		39.1	115	—
3	3S1723F	10A		55.2	115	—
5	5S1723F	13B		115	115	—
7.5	7S1723F	13B		150	115	—
10	10S1723F	13B		165	115	—
480 V Primary to 277 V Secondary 60 Hz						
1	1S78F	7A	3 on page 17	21.2	115	—
1.5	1.5S78F	8A		30.1	115	—
2	2S78F	9A		39.1	115	—
3	3S78F	10A		55.2	115	—
5	5S78F	13B		115	115	—
7.5	7S78F	13B		150	115	—
10	10S78F	13B		165	115	—
208 V Primary to 277 V Secondary 60 Hz						
1	1S1292F	7A	3 on page 17	21.2	115	—
1.5	1.5S1292F	8A		30.1	115	—
2	2S1292F	9A		39.1	115	—
3	3S1292F	10A		55.2	115	—
5	5S1292F	13B		115	115	—
7.5	7S1292F	13B		150	115	—
10	10S1292F	13B		165	115	—

[a] (FCBN) Full Capacity Taps Below Normal, where noted.

Export Model Transformers

Export model transformers are designed to accommodate voltage systems world-wide.

In addition to being UL Listed and CSA Certified, export model transformers 10kVA and smaller are certified by TUV (file no. E9571881.01) to meet EN standard EN60-742. Original equipment is eligible for the “CE” mark if transformer components meet the EN60-742 standard.

Single-Phase Export Model Transformers[a]

kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps
190/200/208/220 x 380/400/416/440 V Primary to 110/220 V Secondary 50/60 Hz						
1[b]	1S67F	9A	9 on page 17	21.2	115	—
2	2S67F	11A		39.1	115	—
3	3S67F	11A		55.2	115	—
5	5S67F	13B		135	115	—
7.5	7S67F	13B		165	115	—
10	10S67F	13B		165	115	—
380/400/415 V Primary to 120/240 V Secondary 50/60 Hz						
1[b]	EN1S71F50HZ	7A	7 on page 17	22.8	115	yes
1.5	EN1.5S71F50HZ	8A		32.4	115	yes
2	EN2S71F50HZ	9A		42.0	115	yes
3	EN3S71F50HZ	10A		59.3	115	yes
5	EN5S71F50HZ	13B		123.6	115	yes
7.5	EN7S71F50HZ	13B		161.3	115	yes
10	EN10S71F50HZ	13B		177.4	115	yes

[a] Units are UL Listed and CSA Certified. Eligible for the CE mark; contact the factory for details.

[b] 0.750 kVA EN rating.

Stainless Steel Enclosures

Stainless steel enclosures provide better corrosion resistance than standard painted enclosures. Schneider Electric offers an entire line of resin-filled transformers. They are available with #316 stainless steel enclosures to meet demands for extra protection in environments where harsh chemicals or corrosive materials such as acids, food products, gasoline, organic solvents, or salt water are present.

Square D® brand transformers with #316 stainless steel have a higher nickel content than #304 stainless steel, making them even more resistant to harsh environments.

Units are painted with standard ANSI 49 gray and have a NEMA Type 3R rating. Additional voltages are available. Contact your local Schneider Electric representative for details. NEMA 4X enclosures are also available; contact your local Schneider Electric representative for price and availability.

Three-Phase Stainless Steel Enclosures

kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps[a]
480 V Primary to 208Y/120 V Secondary 60 Hz						
3	3T2FSS	12C	4 on page 17	125	115	2–5% FCBN
6	6T2FSS	12C		150	115	2–5% FCBN
9	9T2FSS	14C		265	115	2–5% FCBN
15	15T2FSS	14C		335	115	2–5% FCBN
30	30T2FSS	16C	8 on page 17	775	115	2–5% FCBN

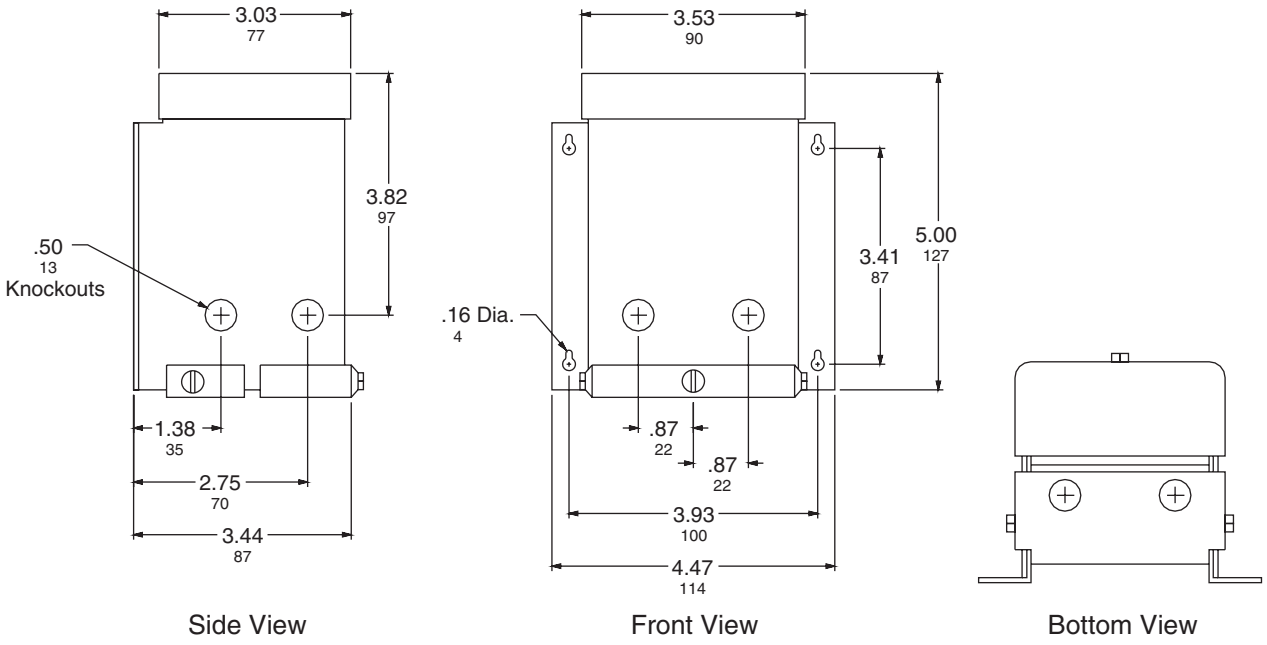
[a] (FCBN) Full Capacity Taps Below Normal, where noted.

Single-Phase Stainless Steel Enclosures

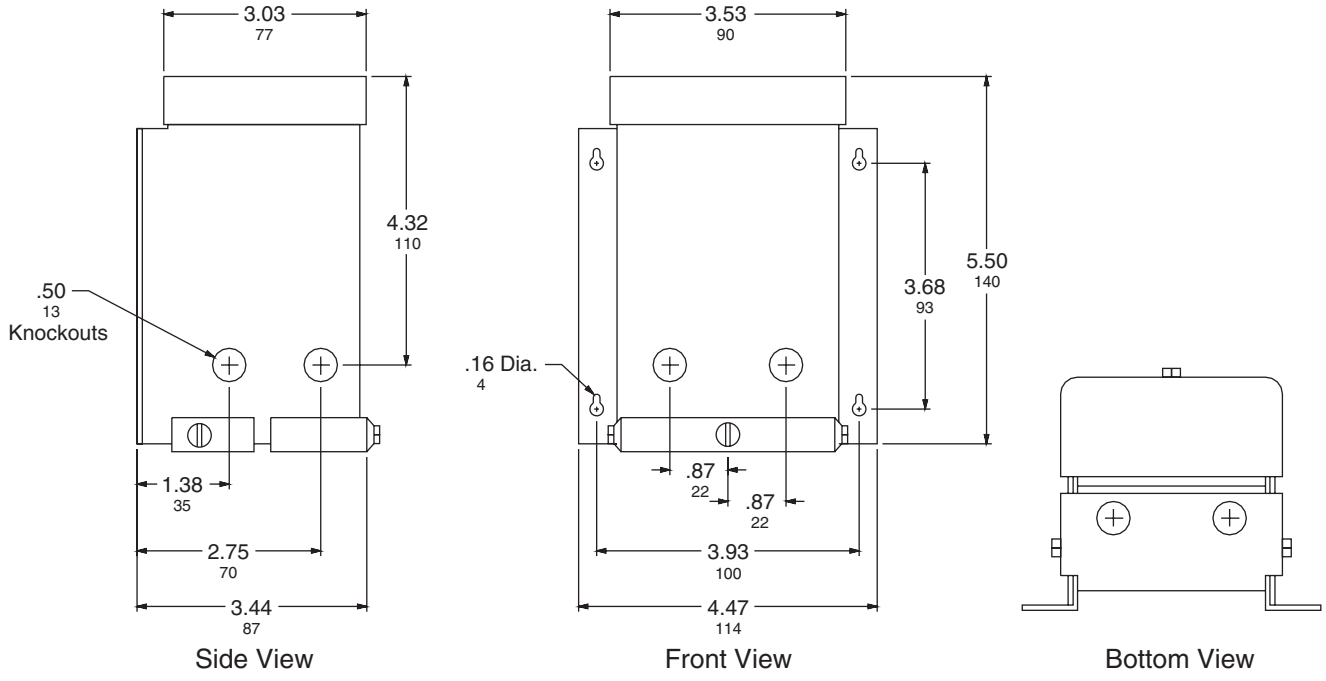
kVA	Part Number	Enclosure (Refer to pages 10–16)	Wiring Diagram	Weight (lbs)	°C Rise	Full Capacity Taps[a]
240 x 480 V Delta Primary to 120/240 V Secondary 60 Hz						
1	1S1FSS	7A	1 on page 17	21	115	—
1.5	1.5S1FSS	8A		30	115	—
2	2S1FSS	9A		39	115	—
3	3S1FSS	10A		55.2	115	—
5	5S1FSS	13B		115	115	—
7.5	7S1FSS	13B		150	115	—
10	10S1FSS	13B		165	115	—
15	15S1FSS	15B		320	115	—
25	25S1FSS	15B		385	115	—
480 V Delta Primary to 120/240 V Secondary 60 Hz						
3	3S40FSS	10A	7 on page 17	55.2	115	2–5% FCBN
5	5S40FSS	13B		115	115	2–5% FCBN
7.5	7S40FSS	13B		150	115	2–5% FCBN
10	10S40FSS	13B		165	115	2–5% FCBN
15	15S40FSS	15B		320	115	2–5% FCBN
25	25S40FSS	15B		385	115	2–5% FCBN

[a] (FCBN) Full Capacity Taps Below Normal, where noted.

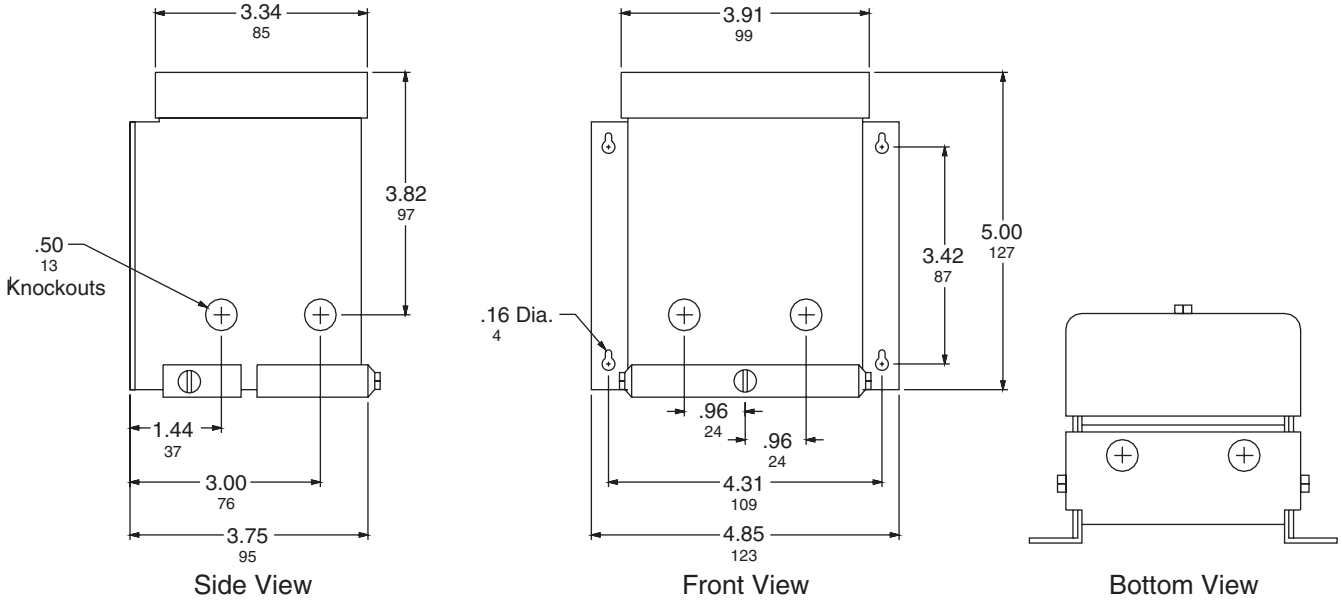
Enclosure Diagrams and Accessories



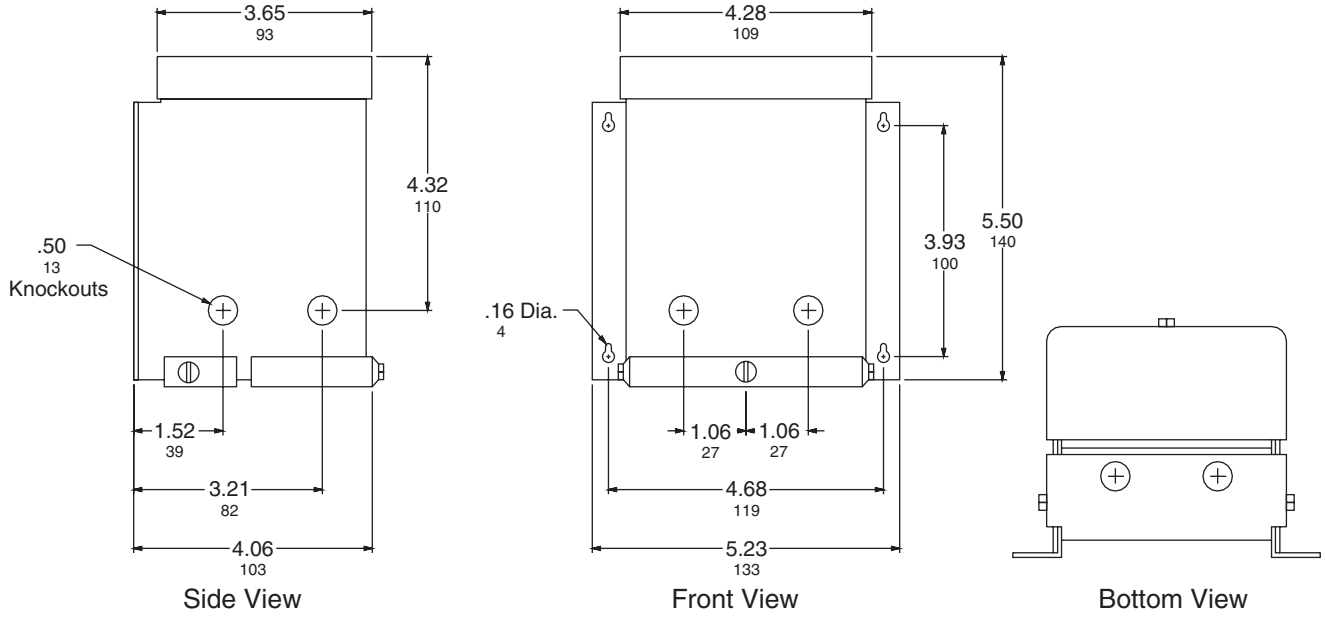
Enclosure 1A—General Purpose Transformer: 0.05 kVA—120/240 V Secondary Current



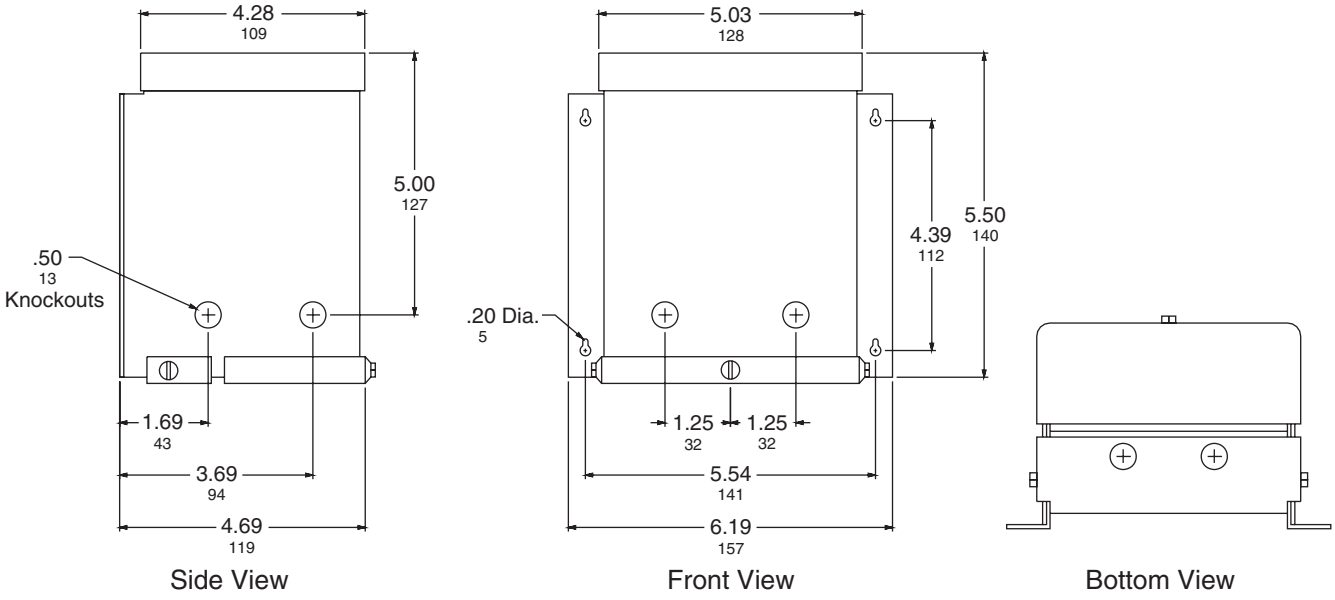
Enclosure 2A—General Purpose Transformer: 0.10 kVA—120/240 V Secondary Current



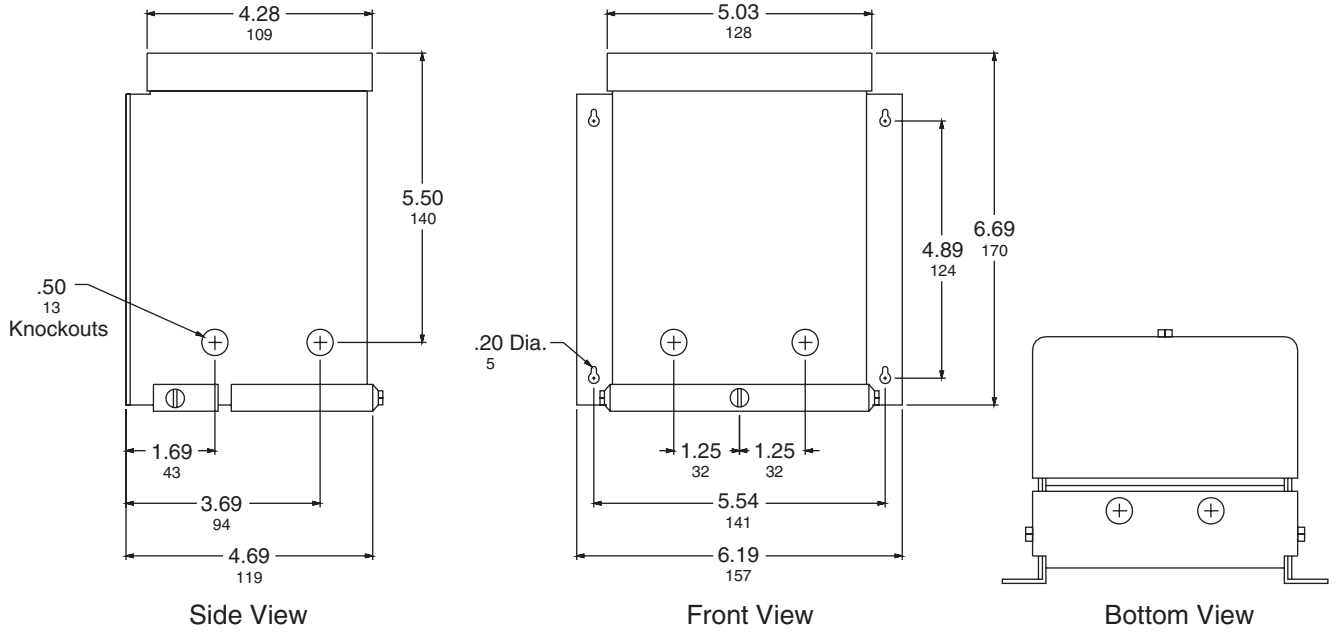
Enclosure 3A—General Purpose Transformer: 0.15 kVA—120/240 V Secondary Current



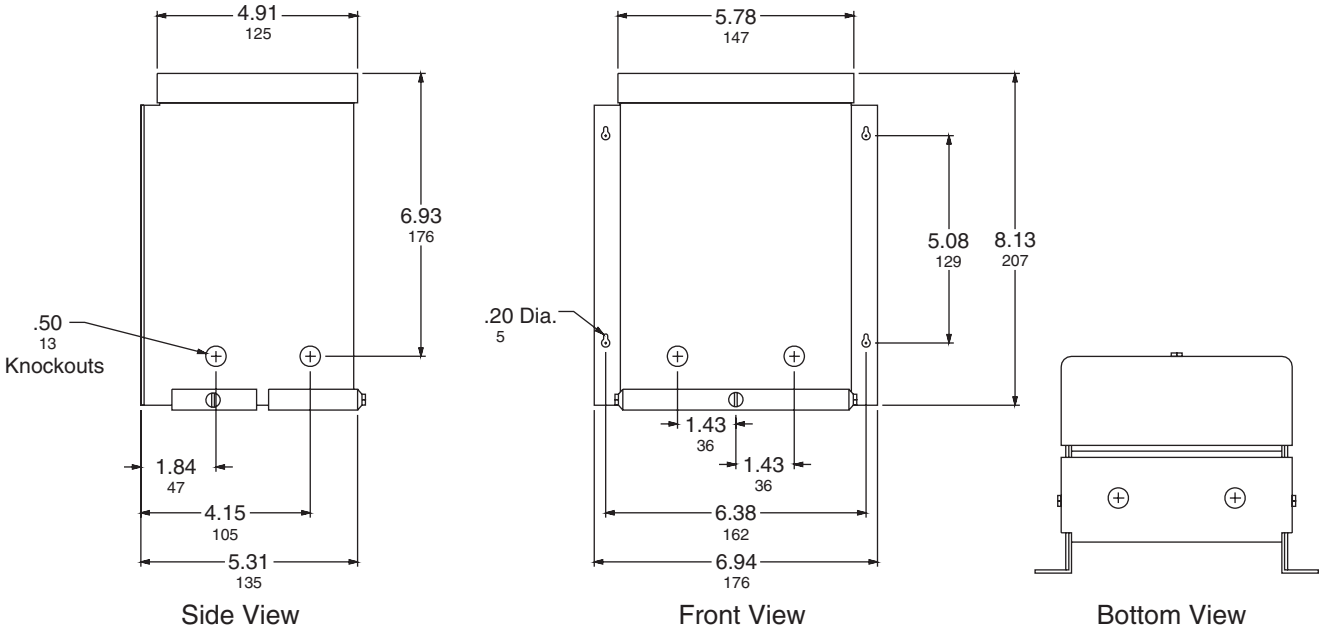
Enclosure 4A—General Purpose Transformer: 0.25 kVA—120/240 V Secondary Current



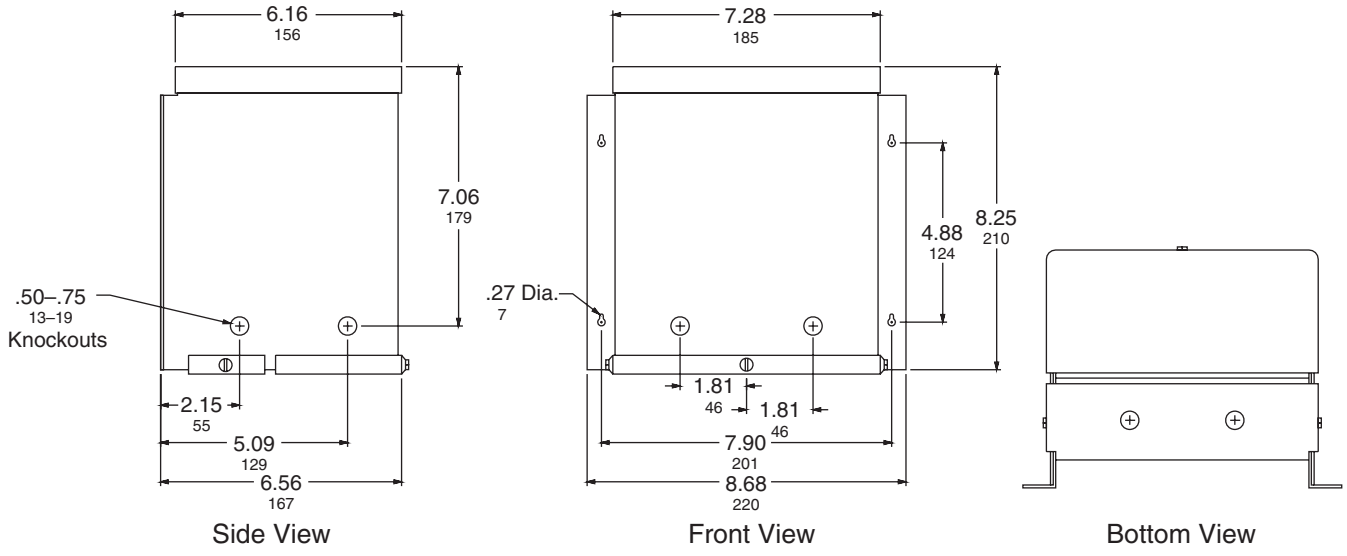
Enclosure 5A—General Purpose Transformer: 0.50 kVA—120/240 V Secondary Current



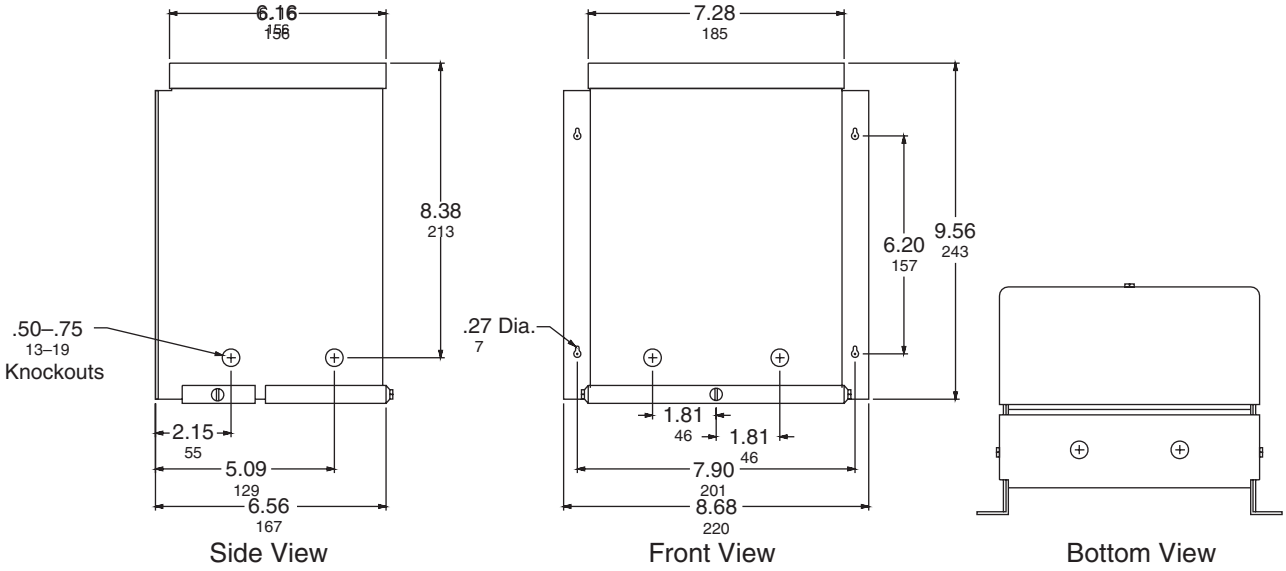
Enclosure 6A—General Purpose Transformer: 0.75 kVA—120/240 V Secondary Current



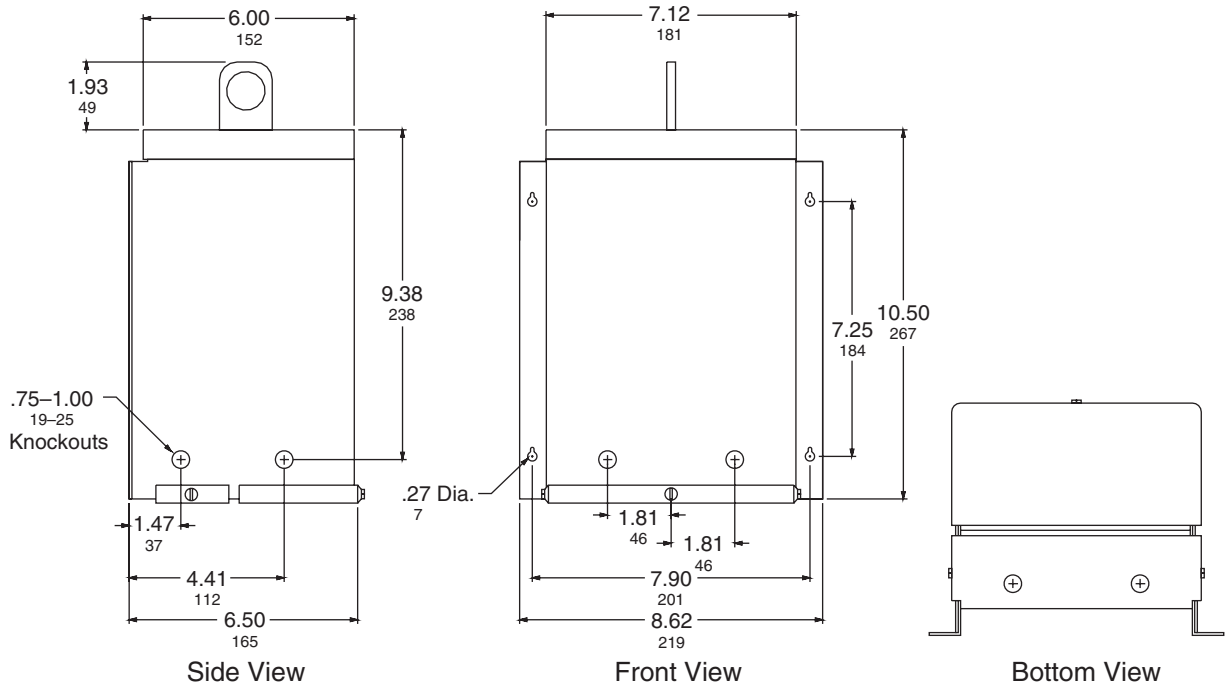
Enclosure 7A—General Purpose Transformer: 1.00 kVA—120/240 V Secondary Current



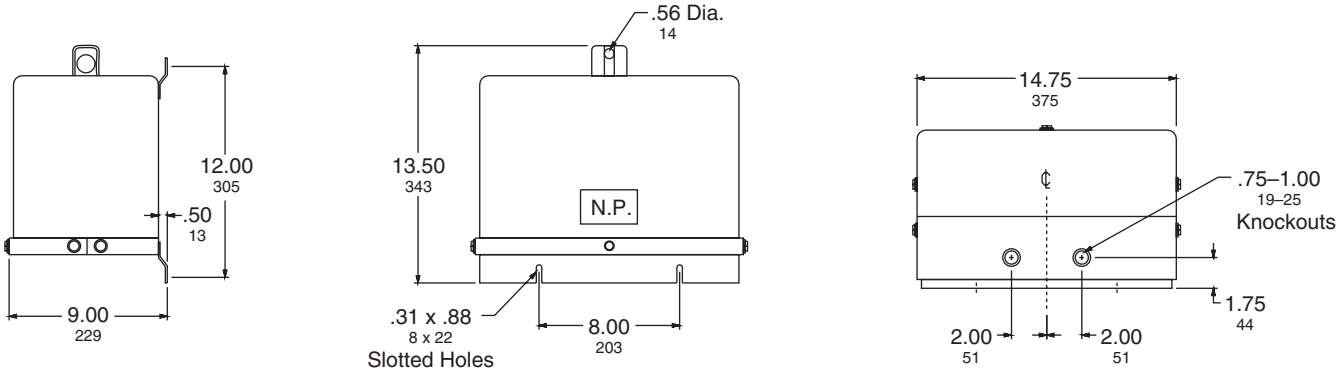
Enclosure 8A—General Purpose Transformer: 1.50 kVA—120/240 V Secondary Current



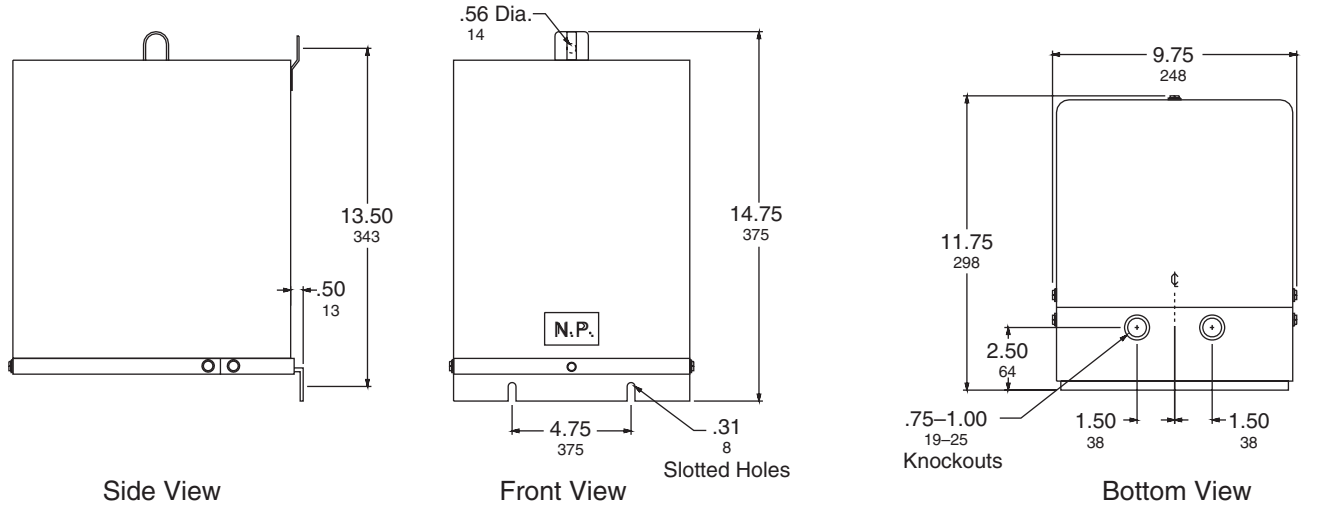
Enclosure 9A—General Purpose Transformer: 2.00 kVA—120/240 V Secondary Current



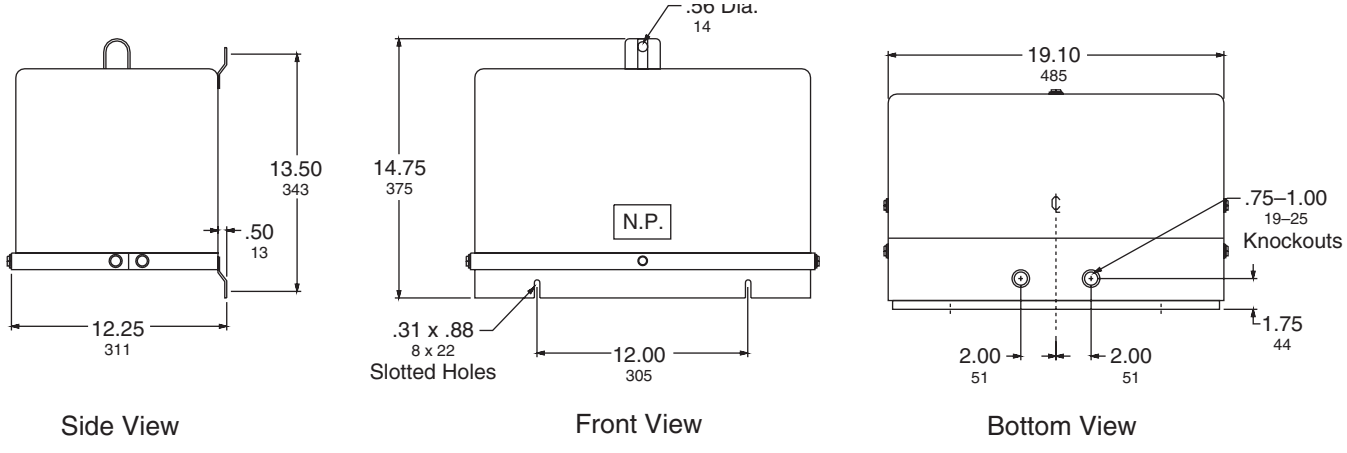
Enclosure 10A—General Purpose Transformer: 3.00 kVA—120/240 V Secondary Current



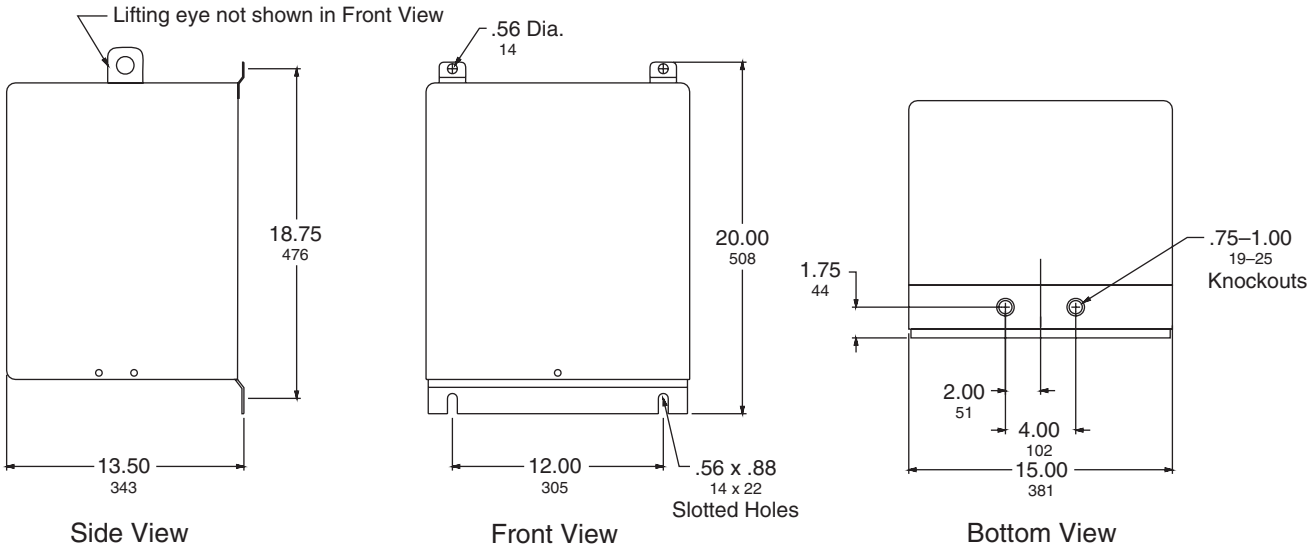
Enclosure 12C—Dry Type Transformer: 3.00–6.00 kVA—Encapsulated NEMA Type 3R



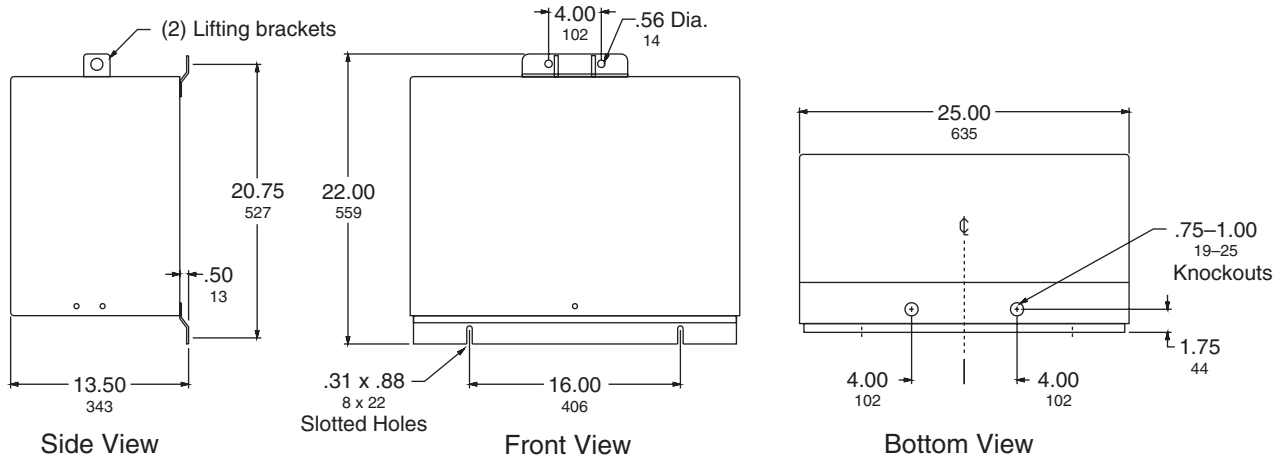
Enclosure 13B—General Purpose Transformer: 5.00–10.00 kVA—120/240 V Secondary Current



Enclosure 14C—Dry Type Transformer: 9.00–15.00 kVA—Encapsulated NEMA Type 3R



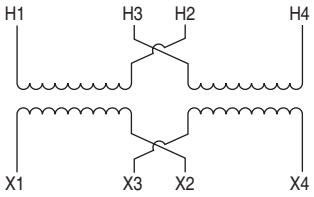
Enclosure 15B—General Purpose Transformer—Encapsulated NEMA Type 3R



Enclosure 16C—Dry Type Transformer: 30.00 kVA—Encapsulated NEMA Type 3R

Wiring Diagrams

1



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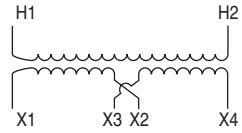

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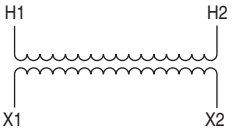

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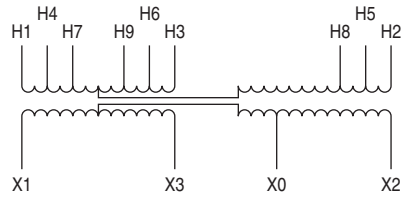

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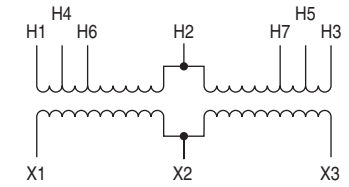

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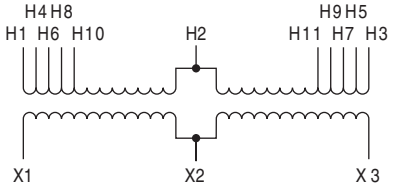

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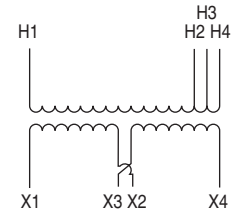

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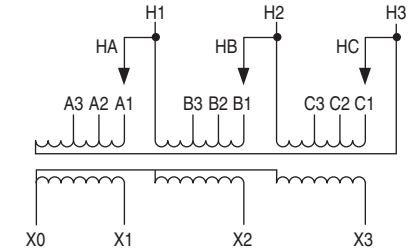

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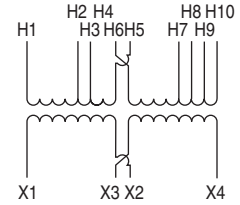


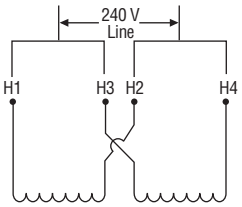
Application Data

NOTE: For transformers with non-standard kVA ratings, increase the size to the next largest standard rating.

Single-Phase Connections—240 x 480 to 120/240 V

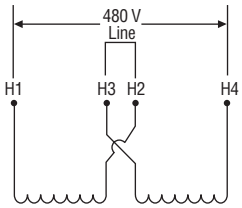
Primary Connections

240 V Service



Connect H1 and H3
Connect H2 and H4
Connect lines to H1-H3 and H2-H4

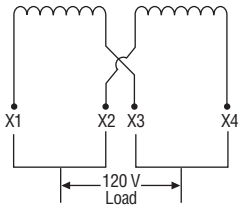
480 V Service



Connect H3 and H2
Connect H1 and H4
Connect lines to H1 and H4

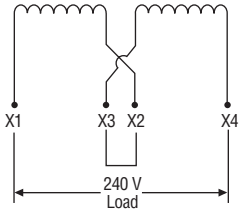
Secondary Connections

120 V 2-Wire Circuit



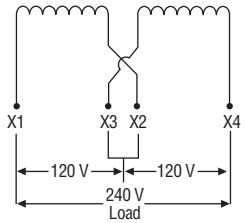
Connect X1 and X3
Connect X2 and X4
Connect Load to X1-X3 and X2-X4

240 V 2-Wire Circuit



Connect X3 and X2
Connect Load to X1 and X4

120/240 V 3-Wire Circuit

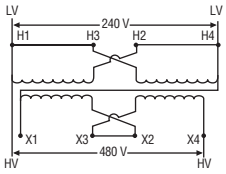


The junction of X3-X2 may be used as the neutral of a 3-wire system and must be bonded to the nearest earth ground per NEC requirements.

The following diagrams show special ways that standard 240 x 480-120/240 single phase transformers can be connected for special applications.

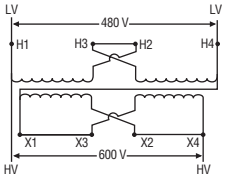
Single Unit Connected as Auto Transformer
240V to 480V
kVA Capacity = 2 x Nameplate kVA

$$\frac{\text{Load kVA}}{2} = \text{kVA Rating of Transformer Required}$$



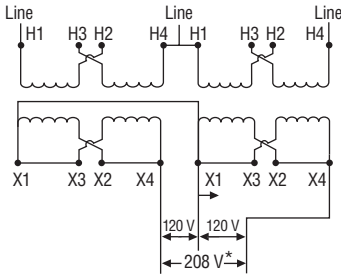
Single Unit Connected as Auto Transformer
480V to 600V
kVA Capacity = 5 x Nameplate kVA

$$\frac{\text{Load kVA}}{5} = \text{kVA Rating of Transformer Required}$$



Two unit transformers connected in “Hoppy Hookup” for single phase lighting and single phase power loads from three phase supply.

This connection allows changeover of existing single phase service to three phase service without changing existing lighting panels or secondary neutrals. The neutral current will be the same as with the original single phase service rather than increasing by the factor of 1.73 (= $\sqrt{3}$).



** Secondary voltage is 120/208 V, 3-wire only, NOT 120/240 V, 3-wire.*

NOTE: The primary common current will be the $\sqrt{3}$ x the current in the other two lines.

For 480 V primary—Connect H2 to H3 in each unit

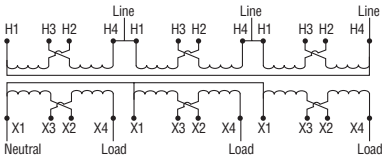
For 240 V primary—Connect H3 to H1 and H2 to H4 in each unit

Secondary kVA capacity = Total nameplate kVA of both transformers

Three Phase Connections

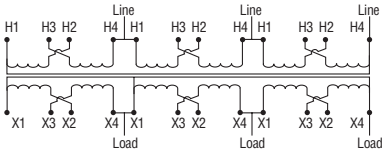
NOTE: For transformers with non-standard kVA ratings, increase the size to the next largest standard rating, using single phase 240 x 480 to 120/240.

Three Units Connected Delta-Wye



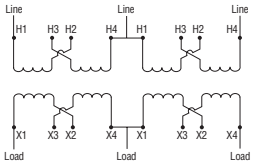
- For 480 V Delta primary—Connect H3 to H2 in each phase
- For 240 V Delta primary—Connect H3 to H1 and H2 to H4 in each phase
- For 416Y/240 V secondary—Connect X3 to X2 in each phase
- For 208Y/120 V secondary—Connect X3 to X1 and X2 to X4 in each phase
- Three phase kVA capacity = Total kVA of three units

Three Units Connected Delta-Delta



- For 480 V Delta primary—Connect H3 to H2 in each phase
- For 240 V Delta primary—Connect H3 to H1 and H2 to H4 in each phase
- For 240 V Delta secondary—Connect X3 to X2 in each phase
- For 120 V Delta secondary—Connect X3 to X1 and X2 to X4 in each phase
- Three phase kVA capacity = Total kVA of three units

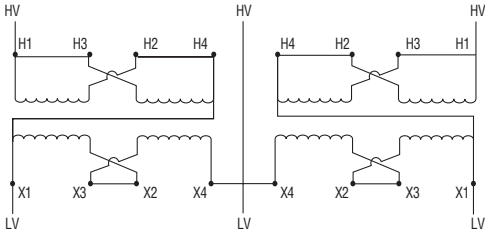
Two Units Connected Open-Delta



$$\frac{\text{Load kVA}}{1.73} = \text{kVA of Each Single Phase Unit}$$

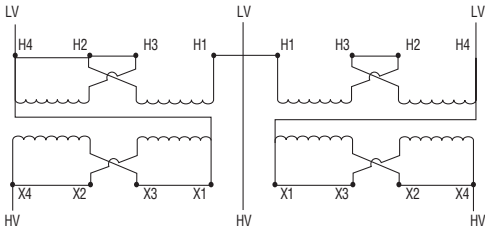
- For 480 V Delta primary—Connect H3 to H2 in each phase
- For 240 V Delta primary—Connect H3 to H1 and H2 to H4 in each phase
- For 240 V Delta secondary—Connect X3 to X2 in each phase
- For 120 V Delta secondary—Connect X3 to X1 and X2 to X4 in each phase
- Three Phase kVA capacity = Total kVA of Two units x 0.86

Two Units Connected as Open Delta Auto Transformer for Three Phase Operation for 240–480 or 480–240
kVA Capacity = (Total kVA of Both Units x 2) x .86



$$\frac{\text{Load kVA}}{3.44} = \text{kVA of Each Single Phase Unit}$$

Two Units Connected as Open-Delta Auto Transformer for Three Phase Operation for 600–480, 480–600, 480–380, or 380–480



kVA Capacity: 480–600; 600–480

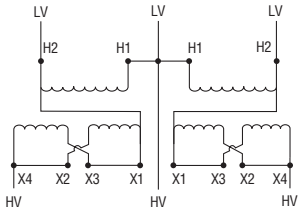
$$\frac{\text{Load kVA}}{8.6} = \text{kVA of Each Single Phase Unit}$$

kVA Capacity: 480–380; 380–480

$$\frac{\text{Load kVA}}{6.88} = \text{kVA of Each Single Phase Unit}$$

Two Units Connected as Open-Delta Auto Transformer for Three Phase Operation for 575–480 or 480–400

The following diagram shows special ways that standard 600–120/240 single phase transformers can be connected for special applications.



kVA Capacity: 575–480

$$\frac{\text{Load kVA}}{8.3} = \text{kVA of Each Single Phase Unit}$$

kVA Capacity: 480–400

$$\frac{\text{Load kVA}}{6.92} = \text{kVA of Each Single Phase Unit}$$

Specifications

Dry Type Resin Encapsulated Transformers (Sealed)

Part 1 General

1.01 Section Includes

A. Dry-type resin encapsulated distribution transformers with primary and secondary voltages up to 600 V, and capacity ratings from 3–30 kVA.

NOTE: Paragraphs and words marked in [ ] are alternates. Select only one.

1.02 References

A. NFPA 70 - National Electrical Code
B. NEMA ST20
C. UL 1561

1.03 Submittals

A. Suppliers asking consideration as an approved equal shall submit complete, warranted performance data and physical dimensions for similar transformers. Data shall be submitted for each size specified, and shall be received by the consultant engineer no less than 10 days prior to the bid due date for consideration.

1.04 Standards

A. Transformers shall be listed by Underwriters Laboratories.
B. Transformers shall conform to the requirements of ANSI/NFPA 70.
C. Transformers are to be manufactured and tested in accordance with NEMA ST20.

Part 2 Products

2.01 Manufacturers

A. Transformers shall be as manufactured by Schneider Electric or an approved equal.
B. Approved manufacturers shall be registered firms in accordance with ISO 9001:1994 SIC 3612 (US); which is the design and manufacture of low voltage dry type power, distribution and specialty transformers.

2.02 Ratings Information

A. All insulating materials are to exceed NEMA ST20 standards and be rated for a 180 °C UL-component-recognized insulation system.
B. Transformers shall be [115 °C] [80 °C] temperature rise above 40 °C ambient. [80 °C] rise transformers shall be capable of carrying a continuous 15% overload without exceeding 115 °C rise in a 40 °C ambient. Transformers 25 kVA and larger shall have a minimum of four 2.5% full capacity primary taps. Exact voltages and taps are to be as designated on the plans or the transformer schedule.
C. The maximum temperature of the top of the enclosure shall not exceed a 65 °C rise above a 40 °C ambient.
D. The transformer(s) shall be rated as indicated in the following schedule:

Identification Number(s)
kVA Rating
Voltages
Phase
Frequency

2.03 Construction

A. All cores are to be constructed of high-grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point.

B. Terminations shall consist of wire leads with a minimum insulation rating of 125 °C.

C. The transformer enclosures shall be non-ventilated and be fabricated of heavy gauge, sheet steel construction The entire enclosure shall be finished using a continuous process consisting of degreasing, cleaning, and phosphatizing by electrostatic deposition of polymer polyester powder coating, with a baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use. The coating color shall be ANSI 49.

2.04 Sound Levels

A. Sound levels shall be warranted by the manufacturer not to exceed the following:

kVA Rating	dB Level
0–9	37
10–30	42
31–50	45
51–150	50
151–225	55

NOTE: Lower sound levels may be desirable for critical areas such as hospitals, schools, or office areas. Contact your local Schneider Electric representative for specific recommendations.

2.05 Optional Accessories

A. [Provide #316 stainless steel enclosure]

B. [Provide #304 stainless steel enclosure]

C. [Label for Class 1 Division 2, Temperature Class T3]

Part 3 Execution

3.01 Installation

A. Not used

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04/2008