



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER



Dry Type Transformers

Full Line Catalog

jeffersonelectric.com

LIT901-0917

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

The Transformer Authority

PIONEER TRANSFORMERS: Why us?

Scale

We produce over 100,000 transformers every year. With this high level of production comes buying power, a broad knowledge base and rapid work flow to meet our customers' magnetic needs.

- Purchasing power for economic solutions
- Large engineering staff for quick design turnaround and delivery
- Best delivery of custom options to meet customer deadlines

Pioneer Transformers has a large, constantly expanding product offering, growing with our customers' changing demands.

Highest Standards

Our products are backed by a strict ISO-based quality assurance system. Each unit is thoroughly tested before leaving the plant to ensure proper operation. All products are designed to conform to the appropriate NEMA, ANSI, UL, and CSA standards.

Certifications

Seismic, ABS, UL, CSA, CE, C802



Support

Our application engineers are available toll-free to help customers select the best transformer to meet their needs and assist in answering installation questions.

Customer service representatives are available to assist in placing and tracking orders, expediting shipments and answering order processing questions.

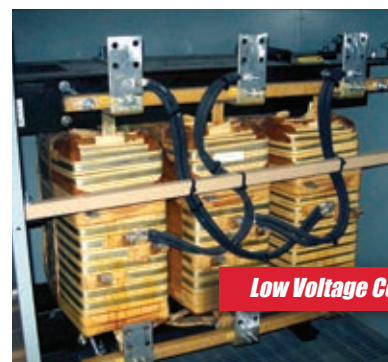
Contact Us

We're ready to help fulfill your transformer needs

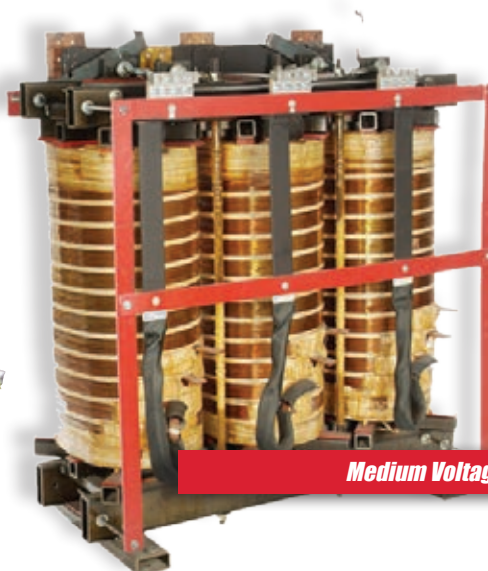
Phone: 800-892-3755

Email: info@jeffersonelectric.com

Website: jeffersonelectric.com



Low Voltage Core & Coil



Medium Voltage



18-Pulse



Filter assembly

Introduction

The information in this catalog is organized to help you find the proper transformer for your application. We've increased the depth and breadth of our offerings so please review the list below to find a transformer to meet your need.

Chapter sections include:

- General product description, specifications, options
- Enclosure figures, catalog number definition
- Representative models with kVA, size, shipping weight or other information
- Wiring diagrams

Table of Contents, printed catalog

Section	Description
1	Single-Phase Ventilated
2	Three-Phase Ventilated
3	Non-Linear Three-Phase
4	Drive Isolation
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6	Industrial Control
7	Single-Phase Encapsulated
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9	Buck-Boost
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12	Medium Voltage
13	Power Quality Harmonic Mitigation / Zig-Zag Harmonic Suppression System (HSS®)



Online only

Go to jeffersonelectric.com/literature to access PDFs of the full catalog and these Reference sections.

Section	Description
14	References Jefferson Electric's Transformers Specifying a Transformer Technical Information Temperature Considerations Safety and Installation Care and Maintenance Troubleshooting Guide Glossary Warranty
15	Appendix Enclosure drawings Wiring and connection diagrams

Product Overview

1 Single-Phase Ventilated

- General purpose
- DOE / C802
- 15 to 667 kVA
- NEMA3R enclosures
- Industrial and commercial applications

2 Three-Phase Ventilated

- General purpose
- DOE / C802
- 15 to 2500 kVA
- NEMA3R enclosures
- Industrial and commercial applications

3 Non-Linear, K-Factor

- Non-linear loads
- DOE / C802
- 15 to 1,000 kVA
- Electrostatic shields
- Meet the load demands of solid state devices including ballast, computers and communication equipment

4 Drive Isolation

- Drive and motor loads
- Standard efficiency / C802
- 3 to 990 kVA
- Meets the demands of AC and DC variable speed drives



Buck-Boost Models

5 Totally Enclosed Non Ventilated

- TENV, industrial applications
- Standard efficiency
- 15 to 500 kVA
- NEMA3R, 4 / 4X / 12 / 12X
- For use in adverse ambient environments

6 Industrial Control Transformers

- Single-phase transformers for industrial control applications
- Standard efficiency
- 50 to 5,000 VA
- For use in industrial and commercial control applications

7 Single-Phase Encapsulated

- General purpose
- Standard efficiency
- 50 VA to 50 kVA
- NEMA3R enclosures
- Lighting, industrial and commercial applications



Ventilated Family



Industrial Control

8 Three-Phase Encapsulated

- General purpose
- Standard efficiency
- 3 to 75 kVA
- NEMA3R enclosures
- Industrial applications

9 Buck-Boost

- General purpose
- Standard efficiency
- Encapsulated autotransformer
- 50 VA to 10 kVA
- Steps voltage up or down to solve over/under voltage problems economically
- Lighting and commercial applications

10 Class I, Division 2

- For use in hazardous conditions
- Encapsulated with electrical grade resin
- 1 to 25 kVA, Single Phase
- 3 to 75 kVA Three Phase
- T3C temperature classification
- NEMA3R enclosures



Encapsulated Transformers

11 18-Pulse

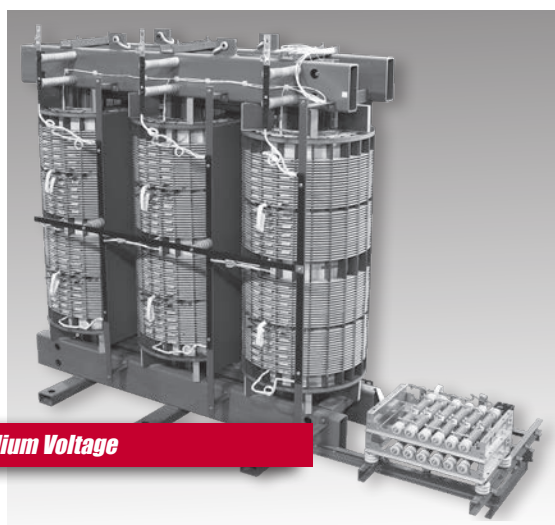
- Special purpose multi-pulse units manufactured to meet specific requirements
- Three-phase, 15 to 500 kVA
- Core and coil
- With or without reactor

12 Medium Voltage

- Medium voltage dry-type
- DOE / C802
- Through 10,000 kVA
- 5 to 35 kV primaries
- Switchgear, traction, mining and marine duty available

13 Power Quality

- Products to mitigate harmonics and non-linear loads
- Harmonic Mitigating/Zig-Zag units to reduce current harmonics
- Harmonic Suppression Systems developed specifically to reduce harmonics and voltage distortion
- DOE / C802
- 15 to 1,500 kVA

**Medium Voltage****Custom Solutions****We design to meet your requirements**

- Power: 50 VA through 10,000 kVA
- Input and output voltages through 35 kV
- Multiple primaries and secondaries, and phase angles
- Frequencies (Hz): 60, 50, 400 or special
- Primary tap configurations
- Core and winding material options
- Specific ambient temperature and temperature rises
- Impedance
- Inrush
- Electrical noise attenuation
- Harmonic content and mitigation
- Rectifier / inverter duty: 6, 12 and 18 pulse configurations
- Altitude
- Reduced sound level
- Forced air cooling
- Efficiency at specified loads
- Environmental requirements
- Enclosure style and color: NEMA1, 3R, 4, 4X, 12, 12X
- Accessories: terminal blocks, fusing, disconnects

Filters, Reactors and Chokes

- Armature chokes and ripple filter assemblies to reduce the audible motor noise produced by DC drives
- Line and load reactors used in power factor control and regeneration

**18-Pulse**

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DRY-TYPE TRANSFORMERS



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Specifying the Correct Transformer

Contact an Application Engineer at 800-892-3755 if you have questions regarding performance, design or installation. You can email them at technical_services@jeffersonelectric.com

- Transformer size is determined by the kVA of the load.
- Load voltage, or secondary voltage, is the voltage needed to operate the load.
- Line voltage, or primary voltage, is the voltage from the source.
- Single-Phase has two lines of AC power.
- Three-Phase has three lines of AC power, each line 120 degrees out of phase with the other two.
- kVA is kilovolt ampere or thousand volt amperes. This is how transformers are rated.

NOTE: If motors are started more than once per hour, increase minimum transformer kVA by 20%.

To determine the size of the transformer you need, use this handy formula, or the chart at the right.

Determine the Load Voltage

Load Voltage =

Determine the Load Current (Amps)

Load Current/Amps =

Determine the Line Voltage

Line Voltage =

Full Load Currents (in Amperes)

Single-Phase Transformers

kVA	120V	208V	240V	277V	480V	600V
.050	.42	.24	.21	.18	.10	.08
.075	.63	.36	.31	.27	.16	.13
.10	.83	.48	.42	.36	.21	.17
.15	1.25	.72	.63	.54	.31	.25
.25	2.08	1.20	1.04	.90	.52	.42
.50	4.16	2.40	2.08	1.8	1.04	.83
.75	6.25	3.60	3.13	2.7	1.56	1.25
1.0	8.3	4.8	4.2	3.6	2.1	1.7
1.5	12.5	7.2	6.2	5.4	3.1	2.5
2.0	16.7	9.6	8.3	7.2	4.2	3.3
3.0	25	14.4	12.5	10.8	6.2	5.0
5.0	41.7	24	20.8	18.0	10.4	8.3
7.5	62.5	36.1	31.2	27	15.6	12.5
10	83.4	48	41.6	36	20.8	16.7
15	125	72	62.5	54	31.2	25
25	208	120	104	90	52	41.7
37.5	312	180	156	135	78	62.5
50	417	240	208	180	104	83.5
75	625	361	312	270	156	125
100	834	480	416	361	208	167
167	1,392	805	698	602	349	279
200	1,667	962	833	722	417	333
250	2,083	1,202	1,042	903	521	417
300	2,500	1,442	1,250	1,083	625	500
333	2,775	1,601	1,388	1,202	694	555

For other single-phase kVA ratings or voltages:

$$\text{Amperes} = \frac{\text{kVA} \times 1000}{\text{Volts}}$$

Size and Select a Transformer

Determine if your application is single-phase or three-phase, and use the correct formula below. The kVA of the transformer should be equal to or greater than the kVA of the load to handle present requirements and to account for future expansion.

Use this chart or go to our online Product Specifier for quick and easy transformer selection.

Transformer Selection Formulas

Single-Phase Transformers

$$\frac{\text{Volts} \times \text{Amps}}{1000} = \text{kVA}$$

Plug your numbers into the formula:

$$\frac{\text{Volts} \times \text{Amps}}{1000} = \text{kVA}$$

Three-Phase Transformers

$$\frac{\text{Volts} \times \text{Amps} \times 1.732}{1000} = \text{kVA}$$

Plug your numbers into the formula:

$$\frac{\text{Volts} \times \text{Amps} \times 1.732}{1000} = \text{kVA}$$

Three-Phase Transformers

kVA	208V	240V	480V	600V
3	8.3	7.2	3.6	2.9
6	16.6	14.4	7.2	5.8
9	25	21.6	10.8	8.7
15	41.6	36.0	18.0	14.4
30	83	72	36	29
45	125	108	54	43
75	208	180	90	72
112.5	312	270	135	108
150	416	360	180	144
225	625	542	271	217
300	830	720	360	290
500	1,390	1,200	600	480
750	2,080	1,800	900	720
1,000	2,776	2,406	1,203	962
1,250	3,470	3,007	1,504	1,203
1,500	4,164	3,609	1,804	1,443
2,000	5,552	4,811	2,406	1,925
2,500	6,940	6,014	3,007	2,406

For other three-phase kVA ratings or voltages:

$$\text{Amperes} = \frac{\text{kVA} \times 1000}{\text{Volts} \times 1.732}$$

15 to 1,650 kVA

Applications

- For general loads, including lighting, industrial and commercial applications

Specifications

- Meets DOE-2016 and C802 standards for energy efficiency
- 60 Hz operation
- Aluminum windings
- 150°C temperature rise
- 220°C insulation class standard
- NEMA3R rated enclosures standard
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Primary taps on most units
- Lugs provided for units up to and including 50 kVA on catalog items

Features, Functions, Benefits

- Large connection compartment for ease of wiring and installation
- Many sizes in stock and available for immediate shipment
- Quiet operation for installation flexibility
- Seismic certification for all units through 250 kVA



Standards

- Meets DOE-2016 standard Part 431, Subpart K for energy efficiency
- Meets NRCAN 2019 requirements, C802.2.18 Standard for energy efficiency
- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

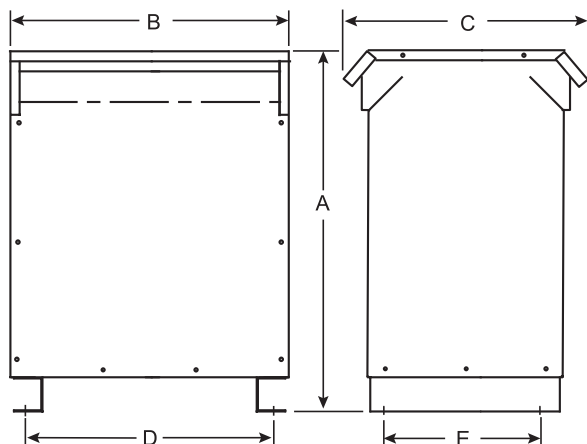
- Other sizes, voltages and temperature rises available
- Copper windings
- CE Marked units available as custom
- Wall brackets available for units up to 75 kVA

Approvals



Enclosure Figure

Figure 24



Wall Mounting Bracket Kits

Part Number	Description	Max Unit Wgt (lbs)
223-7008-030	For 15 kVA units, 150°C rise	250
223-7008-075	For 16 to 75 kVA units, 150°C rise	750

Wall Mounting Bracket Kits with Drip Pans

400-4701-222	For Single Phase units, 15" width	250
400-4701-223	For Single Phase units, 17" width	750
400-4701-224	For Single Phase units, 20" width	750
400-4701-225	For Single Phase units, 22" width	750

Lugs

Part Number	kVA	Primary Lug	Qty	Secondary Lug	Qty
4PT-2007-LUG	15	#14 - 2	2	#2/0 - 6	2
4PT-2017-LUG	25	#14 - 2	2	250MCM - 6	2
4PT-2008-LUG	37.5	#14 - 2	2	350MCM - 6	2
4PT-2009-LUG	50	#2/0 - 6	2	600MCM - 6	2
4PT-2018-LUG†	75	#2/0 - 6	2	600MCM - 6	4

† Must be ordered, not included on stock units

Model Numbers Defined*

421-TXXY-ABC

Single-Phase, Ventilated
Floor Mount

Type

C802 compliant 5

DOE compliant 9

kVA Rating / XX kVA Rating / XX

15	16	112.5	25
20	17	150	26
25	18	167	27
30	19	200	28
37.5	20	225	29
45	21	250	30
50	22	300	31
75	23	333	32
100	24		

Up to 1,650 kVA available as specials

Primary	Secondary	
120x240	120/240	1
208	120/240	2
Custom		3
277	120/240	4
240x480	120/240	5
Specials*		6
120x240	120/240	7
600	120/240	8
Custom		9

Wiring

Aluminum 0

Copper 8

Temperature Rise

150°C 0

115°C 1

80° 8

Shield

No shield 0

Shield 5

*Suffix defined incrementally

⊛ Not all features listed are compatible

Single-Phase General Purpose Transformers – DOE Compliant

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2 @ 2.5% FCAN & 4 @ 2.5% FCBN

240 x 480V — 120/240V										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wiring Diagram	Wall Mounting Bracket Kit
15	421-9165-000	24	27	15	20.5	12.5	11	190	S480F	223-7008-030
25	421-9185-000	24	29	17	22.5	14	13	265	S480F	223-7008-075
37.5	421-9205-000	24	31	20	23.5	16.9	14	330	S480F	223-7008-075
50	421-9225-000	24	32	22	25.5	19	16	465	S480F	223-7008-075
75	421-9235-000	24	34	22	27.5	19	16	555	S480F	223-7008-075
100	421-9245-000	24	36	22	29.5	19	18	690	S480F	n/a
150	421-9265-000	24	55	34	37	31	25	1255	S480F	n/a
167	421-9275-000	24	55	34	37	31	25	1300	S480F	n/a
200	421-9285-000	24	52	35	37	31.5	25	1355	S480F	n/a
250	421-9305-000	24	55	39	44	31.5	25	1690	S480F	n/a
300	421-9315-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S480F	n/a
333	421-9325-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S480F	n/a

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FCBN

600V — 120/240V										
15	421-9168-000	24	27	15	20.5	12.5	11	190	S600E	223-7008-030
25	421-9188-000	24	29	17	22.5	14	13	265	S600E	223-7008-075
37.5	421-9208-000	24	31	20	23.5	16.9	14	330	S600E	223-7008-075
50	421-9228-000	24	32	22	25.5	19	16	405	S600E	223-7008-075
75	421-9238-000	24	34	22	27.5	19	16	620	S600E	223-7008-075
100	421-9248-000	24	36	22	29.5	19	18	725	S600E	n/a
150	421-9268-000	24	55	34	37	31	25	1255	S600E	n/a
167	421-9278-000	24	55	34	37	31	25	1300	S600E	n/a
200	421-9288-000	24	52	35	37	31.5	25	1355	S600E	n/a
250	421-9308-000	24	55	39	44	31.5	25	1690	S600E	n/a
300	421-9318-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S600E	n/a
333	421-9328-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S600E	n/a

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Single-Phase General Purpose Transformers – NRCAN-2019, C802 Compliant

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2 @ 2.5% FCAN & 4 @ 2.5% FCBN

240 x 480V — 120/240V										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wiring Diagram	Wall Mounting Bracket Kit
15	421-5165-000	24	27	15	20.5	12.5	11	190	S480F	223-7008-030
25	421-5185-000	24	29	17	22.5	14	13	265	S480F	223-7008-075
37.5	421-5205-000	24	31	20	23.5	16.9	14	330	S480F	223-7008-075
50	421-5225-000	24	32	22	25.5	19	16	405	S480F	223-7008-075
75	421-5235-000	24	34	22	27.5	19	16	620	S480F	223-7008-075
100	421-5245-000	24	36	22	29.5	19	18	725	S480F	n/a
150	421-5265-000	24	55	34	37	31	25	1255	S480F	n/a
167	421-5275-000	24	55	34	37	31	25	1300	S480F	n/a
200	421-5285-000	24	52	35	37	31.5	25	1355	S480F	n/a
250	421-5305-000	24	55	39	44	31.5	25	1690	S480F	n/a
300	421-5315-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S480F	n/a
333	421-5325-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S480F	n/a

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FCBN

600V — 120/240V										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wiring Diagram	Wall Mounting Bracket Kit
15	421-5168-000	24	27	15	20.5	12.5	11	190	S600E	223-7008-030
25	421-5188-000	24	29	17	22.5	14	13	265	S600E	223-7008-075
37.5	421-5208-000	24	31	20	23.5	16.9	14	330	S600E	223-7008-075
50	421-5228-000	24	32	22	25.5	19	16	405	S600E	223-7008-075
75	421-5238-000	24	34	22	27.5	19	16	620	S600E	223-7008-075
100	421-5248-000	24	36	22	29.5	19	18	725	S600E	n/a
150	421-5268-000	24	55	34	37	31	25	1255	S600E	n/a
167	421-5278-000	24	55	34	37	31	25	1300	S600E	n/a
200	421-5288-000	24	52	35	37	31.5	25	1355	S600E	n/a
250	421-5308-000	24	55	39	44	31.5	25	1690	S600E	n/a
300	421-5318-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S600E	n/a
333	421-5328-000	24	TBD	TBD	TBD	TBD	TBD	TBD	S600E	n/a

See website for additional kVA, copper windings and temperature options.

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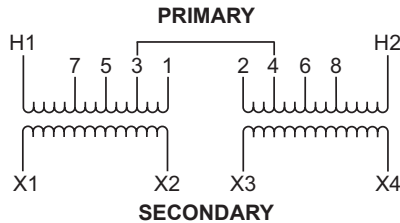
 For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams

S480F Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 120/240 Volts



Connections

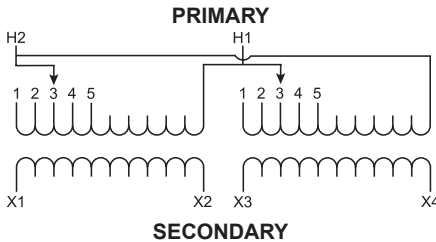
Primary Volts	Jumpers Between Taps Left Coil	Right Coil	Primary Lines Connect To
504	1	2	H1, H2
492	3	2	H1, H2
480	3	4	H1, H2
468	5	4	H1, H2
456	5	6	H1, H2
444	7	6	H1, H2
432	7	8	H1, H2
252	H2, 1	H1, 2	H1, H2
240	H2, 3	H1, 4	H1, H2
228	H2, 5	H1, 6	H1, H2
216	H2, 7	H1, 8	H1, H2

Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S600E Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts
Secondary: 120/240 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2
615	2	H1, H2
600	3	H1, H2
585	4	H1, H2
570	5	H1, H2
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

More wiring diagrams can be found in catalog's appendix, section 15.
Use the "Find a Product" tool on our website for detailed specification sheets.
For further information, contact an Application Engineer at 800-892-3755,
technical_services@jeffersonelectric.com

15 to 2,500 kVA

Applications

- For general loads, including lighting, industrial and commercial applications

Specifications

- Meets DOE-2016 and C802 standards for energy efficiency
- 60 Hz operation
- Aluminum windings
- 150°C temperature rise
- 220°C insulation class standard
- NEMA3R rated enclosures standard
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Primary taps on most units
- Lugs provided for units up to and including 75 kVA on catalog items

Features, Functions, Benefits

- Large connection compartment for ease of wiring and installation
- Many sizes in stock and available for immediate shipment
- Quiet operation for installation flexibility
- Seismic certification for all units through 1,000 kVA



Standards

- Meets DOE-2016 standard Part 431, Subpart K for energy efficiency
- Meets NRCAN 2019 requirements, C802.2.18 Standard for energy efficiency
- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- Other sizes, voltages and temperature rises available
- Copper windings
- CE Marked units available as custom
- Wall brackets available for units up to 75 kVA

Approvals



Enclosure Figures

Figure 22

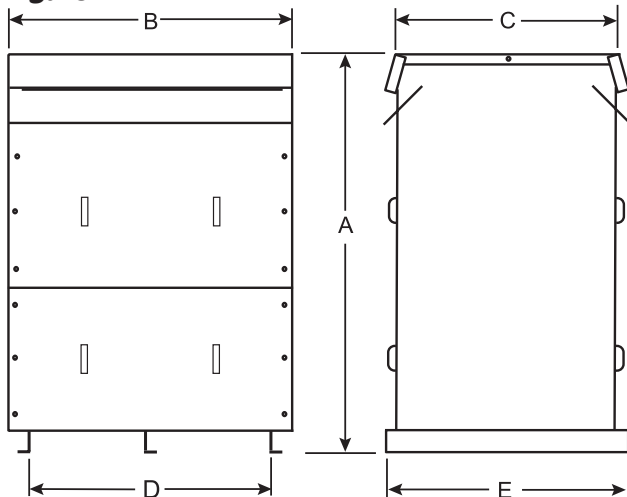
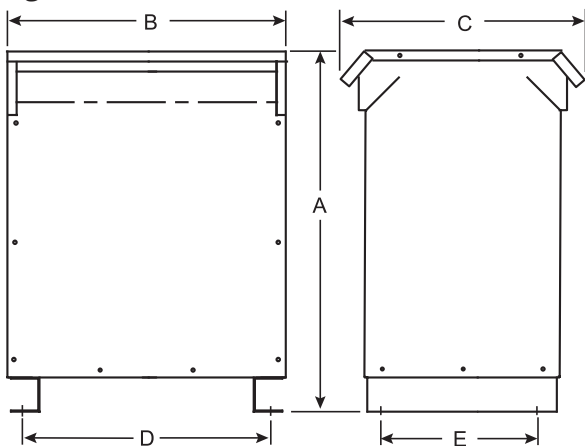


Figure 24



Wall Mounting Bracket Kits

Part Number	Description	Max Unit Wgt (lbs)
223-7008-030	For 15 kVA units, 150°C rise	250
223-7008-075	For 16 to 75 kVA units, 150°C rise	750

Wall Mounting Bracket Kits with Drip Pans

400-4701-226	For Three Phase units, 19" width	750
400-4701-227	For Three Phase units, 22" width	750
400-4701-228	For Three Phase units, 25" width	750
400-4701-229	For Three Phase units, 27" width	750

Lugs

Part Number	kVA	Primary Lug	Qty	Secondary Lug	Qty
4PT-2007-LUG	15	#14 - 2	2	#2/0 - 6	2
4PT-2017-LUG	25	#14 - 2	2	250MCM - 6	2
4PT-2008-LUG	37.5	#14 - 2	2	350MCM - 6	2
4PT-2009-LUG	50	#2/0 - 6	2	600MCM - 6	2
4PT-2018-LUG†	75	#2/0 - 6	2	600MCM - 6	4

† Must be ordered, not included on stock units

Model Numbers Defined*

423-TXXY-ABC

Three-Phase, Ventilated

Type

C802 compliant 5
DOE compliant 9

kVA Rating / XX kVA Rating / XX

15	16	250	30
20	17	300	31
25	18	333	32
30	19	400	33
37.5	20	500	34
45	21	667	35
50	22	750	36
75	23	833	37
100	24	1,000	39
112.5	25	1,250	43
150	26	1,500	47
167	27	2,000	51
200	28	2,500	53
225	29		

Primary

Secondary

208	480Y/277	1
240	208Y/120	2
240	480Y/277	3
480	208Y/120	4
480	480Y/277	5
Special*		6
480	240 w/ 120 CT	7
208	208Y/120	8
600	208Y/120	9

Wiring

Aluminum 0
Copper 8

Temperature Rise

150°C Rise 0
115°C Rise 1
80°C Rise 8

Shields

No shield 0
Shield 5

*Suffix defined incrementally

* Not all features listed are compatible

Three-Phase General Purpose Transformers – DOE compliant

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 15 to 300 kVA: 2 @ 2.5% FCAN & 4 @ 2.5% FCBN • 500 to 1,000 kVA: 2 @ 2.5% FCAN & 2 @ 2.5% FCBN

480V Delta — 208Y/120V

kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt (lbs)	Wiring Diagram	Wall Mounting Bracket Kit
15	423-9164-000	24	22	19	21	15.8	12	240	T480E	223-7008-030
30	423-9194-000	24	25	22	22	18.1	13	360	T480E	223-7008-075
45	423-9214-000	24	28	25	23.5	19.5	14.5	480	T480E	223-7008-075
75	423-9234-000	24	32	27	26	23.5	16	625	T480E	223-7008-075
112.5	423-9254-000	24	38	29	29	25.5	18	875	T480E	n/a
150	423-9264-000	24	42	33	32.5	30	21	1,125	T480E	n/a
225	423-9294-000	24	46	35	37	30.8	25	1,545	T480E	n/a
300	423-9314-000	24	52	35	37	30.8	25	1,895	T480E	n/a
500	423-9344-000	24	60	48	43.5	42	27	3,220	T480M	n/a
750	423-9364-000	22	72	52	44	47	42	4,250	T480M	n/a
1,000	423-9394-000	22	81	66	61	60.5	38.5	6,100	T480M	n/a

480V Delta — 240V Delta / 5% 120V CT

15	423-9167-000 *	24	22	19	21	15.8	12	240	T480G	223-7008-030
30	423-9197-000 *	24	25	22	22	18.1	13	360	T480G	223-7008-075
45	423-9217-000 *	24	28	25	23.5	19.5	14.5	480	T480G	223-7008-075
75	423-9237-000 *	24	32	27	26	23.5	16	625	T480G	223-7008-075
112.5	423-9257-000 *	24	38	29	29	25.5	18	875	T480G	n/a
150	423-9267-000 *	24	42	33	32.5	30	21	1,125	T480G	n/a
225	423-9297-000 *	24	46	35	37	30.8	25	1,545	T480G	n/a
300	423-9317-000 *	24	52	35	37	30.8	25	1,895	T480G	n/a
500	423-9347-000 *	24	60	48	43.5	42	27	3,220	T480N	n/a
750	423-9367-000 *	22	72	52	44	47	42	4,250	T480N	n/a
1,000	423-9397-000 *	22	81	66	61	60.5	38.5	6,100	T480N	n/a

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FCBN

600V Delta — 208Y/120V

15	423-9169-000	24	22	19	21	15.8	12	240	T600G	223-7008-030
30	423-9199-000	24	25	22	22	18.1	13	360	T600G	223-7008-075
45	423-9219-000	24	28	25	23.5	19.5	14.5	480	T600G	223-7008-075
75	423-9239-000	24	32	27	26	23.5	16	625	T600G	223-7008-075
112.5	423-9259-000	24	38	29	29	25.5	18	875	T600G	n/a
150	423-9269-000	24	42	33	32.5	30.0	21	1,125	T600G	n/a
225	423-9299-000	24	46	35	37	30.8	25	1,545	T600G	n/a
300	423-9319-000	24	52	35	37	30.8	25	1,895	T600G	n/a
500	423-9349-000	24	60	48	43.5	42.0	27	3,220	T600G	n/a
750	423-9369-000	22	72	52	44	47.0	42	4,250	T600G	n/a
1,000	423-9399-000	22	81	66	61	60.5	38.5	6,100	T600G	n/a

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

* **CAUTION:** When using the 120V center tap for single-phase applications, the single-phase load should not exceed 5% of the three-phase kVA rating. Connect the X3 "high leg" to the "B" phase per NEC 384-3 (do not use X3 leg for 120V lighting). A separate single-phase transformer should be used if the single-phase load is in excess of 5%. Fuse input side per current NEC requirements.

Three-Phase General Purpose Transformers – NRCAN-2019, C802 Compliant

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 15 to 300 kVA: 2 @ 2.5% FCAN & 4 @ 2.5% FCBN • 500 to 1,000 kVA: 2 @ 2.5% FCAN & 2 @ 2.5% FCBN

480V Delta — 208/120Y

kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt (lbs)	Wiring Diagram	Wall Mounting Bracket Kit
15	423-5164-000	24	22	19	21	15.8	12	240	T480E	223-7008-030
30	423-5194-000	24	25	22	22	18.1	13	360	T480E	223-7008-075
45	423-5214-000	24	28	25	23.5	19.5	14.5	480	T480E	223-7008-075
75	423-5234-000	24	32	27	26	23.5	16	625	T480E	223-7008-075
112.5	423-5254-000	24	38	29	29	25.5	18	875	T480E	n/a
150	423-5264-000	24	42	33	32.5	30	21	1,125	T480E	n/a
225	423-5294-000	24	46	35	37	30.8	25	1,545	T480E	n/a
300	423-5314-000	24	52	35	37	30.8	25	1,895	T480E	n/a
500	423-5344-000	24	60	48	43.5	42	27	3,220	T480M	n/a
750	423-5364-000	22	72	52	44	47	42	4,250	T480M	n/a
1,000	423-5394-000	22	81	66	61	60.5	38.5	6,100	T480M	n/a

480V Delta — 240V Delta / 5% 120V CT

15	423-5167-000 *	24	22	19	21	15.8	12	240	T480G	223-7008-030
30	423-5197-000 *	24	25	22	22	18.1	13	360	T480G	223-7008-075
45	423-5217-000 *	24	28	25	23.5	19.5	14.5	480	T480G	223-7008-075
75	423-5237-000 *	24	32	27	26	23.5	16	625	T480G	223-7008-075
112.5	423-5257-000 *	24	38	29	29	25.5	18	875	T480G	n/a
150	423-5267-000 *	24	42	33	32.5	30	21	1,125	T480G	n/a
225	423-5297-000 *	24	46	35	37	30.8	25	1,545	T480G	n/a
300	423-5317-000 *	24	52	35	37	30.8	25	1,895	T480G	n/a
500	423-5347-000 *	24	60	48	43.5	42	27	3,220	T480G	n/a
750	423-5367-000 *	22	72	52	44	47	42	4,250	T480N	n/a
1,000	423-5397-000 *	22	81	66	61	60.5	38.5	6,100	T480N	n/a

150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FCBN

600V Delta — 208Y/120V

15	423-5169-000	24	22	19	21	15.8	12	240	T600G	223-7008-030
30	423-5199-000	24	25	22	22	18.1	13	360	T600G	223-7008-075
45	423-5219-000	24	28	25	23.5	19.5	14.5	480	T600G	223-7008-075
75	423-5239-000	24	32	27	26	23.5	16	625	T600G	223-7008-075
112.5	423-5259-000	24	38	29	29	25.5	18	875	T600G	n/a
150	423-5269-000	24	42	33	32.5	30	21	1,125	T600G	n/a
225	423-5299-000	24	46	35	37	30.8	25	1,545	T600G	n/a
300	423-5319-000	24	52	35	37	30.8	25	1,895	T600G	n/a
500	423-5349-000	24	60	48	43.5	42	27	3,220	T600G	n/a
750	423-5369-000	22	72	52	44	47	42	4,250	T600G	n/a
1,000	423-5399-000	22	81	66	61	60.5	38.5	6,100	T600G	n/a

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

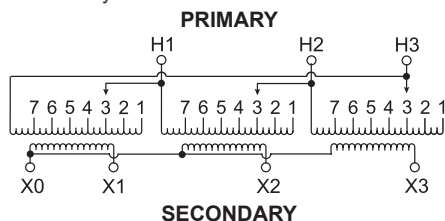
*** CAUTION:** When using the 120V center tap for single-phase applications, the single-phase load should not exceed 5% of the three-phase kVA rating. Connect the X3 "high leg" to the "B" phase per NEC 384-3 (do not use X3 leg for 120V lighting). A separate single-phase transformer should be used if the single-phase load is in excess of 5%. Fuse input side per current NEC requirements.

Wiring Diagrams

T480E Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



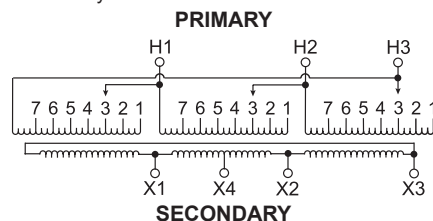
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
444	6	H1, H2, H3
432	7	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T480G Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240 Volts Delta/120 Volts



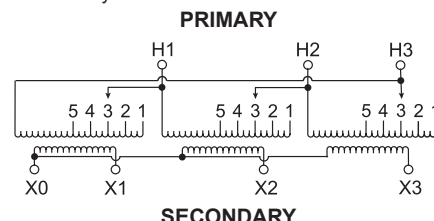
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
444	6	H1, H2, H3
432	7	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
120	X1 and X4 or X2 or X4	
1 phase		

T480M Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



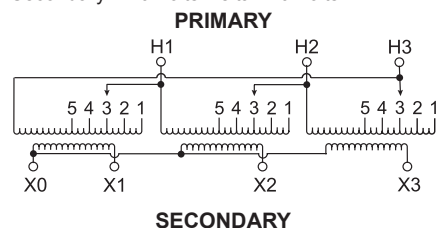
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T480N Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240 Volts Delta/120 Volts



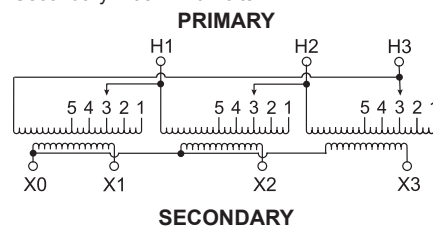
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
120	X1 and X4 or X2 or X4	
1 phase		

T600G Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 208Y/120 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
615	2	H1, H2, H3
600	3	H1, H2, H3
585	4	H1, H2, H3
570	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

More wiring diagrams can be found in catalog's appendix, section 15. Use the "Find a Product" tool on our website for detailed specification sheets. For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

15 to 500 kVA

Applications

- To meet the demands of non-linear loads caused by modern office equipment

Specifications

- K-4, K-13, and K-20 rated units standard
- Meets DOE-2016 and C802 standards for energy efficiency
- 60 Hz operation
- Aluminum windings
- 150°C temperature rise
- 220°C insulation class units
- NEMA3R rated enclosures
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Electrostatic shield
- Primary taps on most units
- Lugs provided for units up to and including 75 kVA on catalog items

Features, Functions, Benefits

- Large connection compartment for ease of wiring and installation
- Many sizes in stock and available for immediate shipment
- Quiet operation for installation flexibility
- Seismic certification for all units



Standards

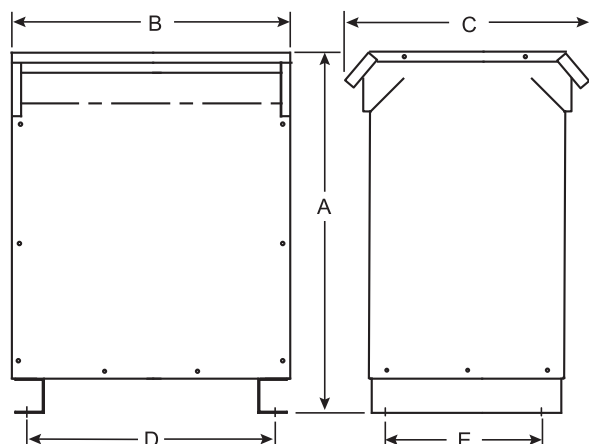
- Meets DOE-2016 standard Part 431, Subpart K for energy efficiency
- Meets NRCAN 2019 requirements, C802.2.18 Standard for energy efficiency
- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- Other sizes, voltages and temperature rises available
- Copper windings
- CE Marked units available as custom
- Wall brackets available for units up to 75 kVA

Approvals



Enclosure Figure**Figure 24****K-factor**

K-factor is a rating devised by Underwriters Laboratories to provide a uniform standard for transformers designed to handle non-linear loads. The more harmonic currents present, the higher the K-factor specified in sizing the transformer.

To calculate the K-factor, multiply the square of the percentage of harmonic current by the square of the harmonic order and add the results. For example, if a load is 60% of the fundamental, 65% of the third harmonic, 30% of the fifth harmonic, and 35% of the seventh harmonic, the resulting K-factor would be 12.42:

$$(.6)^2 1 + (.65)^2 (3)^2 + (.30)^2 (5)^2 + (.35)^2 (7)^2 = 12.42$$

In this example, a transformer with a K-factor of 13 should be specified. The K-factor rating defines the transformer's ability to withstand odd-harmonic currents while operating within its insulation class.

For more information, see catalog Section 13 on Power Quality.

See Lug and Mounting Bracket information on page 3-4.

Model Numbers Defined***424-TXXY-ABC**

**3 Phase Ventilated
Non-Linear Floor Mount**
All models with electrostatic shield

Type

C802 compliant 5
DOE compliant 9

kVA Rating / XX		kVA Rating / XX	
15.0	16	150	26
20	17	167	27
25	18	200	28
30	19	225	29
37.5	20	250	30
45	21	300	31
50	22	333	32
75	23	400	33
100	24	500	34
112.5	25		

Primary Secondary

208	480Y/277	1
240	208Y/120	2
240	480Y/277	3
480	208Y/120	4
480	480Y/277	5
Specials*		6
Not assigned		7
208	208Y/120	8
600	208Y/120	9

Wiring

Aluminum 0
Copper 8

Temperature Rise

150°C Rise 0
115°C Rise 1
80°C Rise 8

K-Factor

K=4 1
K=13 2
K=20 3

* Suffix defined incrementally

⊛ Not all features listed are compatible

Three-Phase General Purpose Non-Linear Transformers – DOE Compliant

Standard Application Voltages • K-13 • Electrostatic Shield
 150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

480V Delta — 208Y/120V • Taps: 2 @ 2.5% FCAN & 4 @ 2.5% FBCN										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wall Mounting Bracket Kit	Wiring Diagram
15	424-9164-002	24	25	22	22	18.1	13	360	223-7008-030	T480E
30	424-9194-002	24	28	25	23.5	19.5	14.5	480	223-7008-075	T480E
45	424-9214-002	24	32	27	26	23.5	16	625	223-7008-075	T480E
75	424-9234-002	24	38	29	29	25.5	18	875	n/a	T480E
112.5	424-9254-002	24	42	33	32.5	30	21	1,125	n/a	T480E
150	424-9264-002	24	46	35	37	30.8	25	1,545	n/a	T480E
225	424-9294-002	24	52	35	37	30.8	25	1,895	n/a	T480E
300	424-9314-002	24	60	48	43.5	42	27	2,905	n/a	T480E
600V Delta — 208Y/120V • Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FBCN										
15	424-9169-002	24	25	22	22	18.1	13	360	223-7008-030	T600G
30	424-9199-002	24	28	25	23.5	19.5	14.5	480	223-7008-075	T600G
45	424-9219-002	24	32	27	26	23.5	16	625	223-7008-075	T600G
75	424-9239-002	24	38	29	29	25.5	18	875	n/a	T600G
112.5	424-9259-002	24	42	33	32.5	30	21	1,125	n/a	T600G
150	424-9269-002	24	46	35	37	30.8	25	1,545	n/a	T600G
225	424-9299-002	24	52	35	37	30.8	25	1,895	n/a	T600G
300	424-9319-002	24	60	48	43.5	42	27	2,905	n/a	T600G

Three-Phase General Purpose Non-Linear Transformers – NRCAN-2019, C802 Compliant

Standard Application Voltages • K-13 • Electrostatic Shield
 150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

480V Delta — 208Y/120V • Taps: 2 @ 2.5% FCAN & 4 @ 2.5% FBCN										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Mounting Kit	Wiring Diagram
15	424-5164-002	24	25	22	22	18.1	13	360	223-7008-030	T480E
30	424-5194-002	24	28	25	23.5	19.5	14.5	480	223-7008-075	T480E
45	424-5214-002	24	32	27	26	23.5	16	625	223-7008-075	T480E
75	424-5234-002	24	38	29	29	25.5	18	875	n/a	T480E
112.5	424-5254-002	24	42	33	32.5	30	21	1,125	n/a	T480E
150	424-5264-002	24	46	35	37	30.8	25	1,545	n/a	T480E
225	424-5294-002	24	52	35	37	30.8	25	1,895	n/a	T480E
300	424-5314-002	24	60	48	43.5	42	27	2,905	n/a	T480E
600V Delta — 208Y/120V • Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FBCN										
15	424-5169-002	24	25	22	22	18.1	13	360	223-7008-030	T600G
30	424-5199-002	24	28	25	23.5	19.5	14.5	480	223-7008-075	T600G
45	424-5219-002	24	32	27	26	23.5	16	625	223-7008-075	T600G
75	424-5239-002	24	38	29	29	25.5	18	875	n/a	T600G
112.5	424-5259-002	24	42	33	32.5	30	21	1,125	n/a	T600G
150	424-5269-002	24	46	35	37	30.8	25	1,545	n/a	T600G
225	424-5299-002	24	52	35	37	30.8	25	1,895	n/a	T600G
300	424-5319-002	24	60	48	43.5	42	27	2,905	n/a	T600G

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

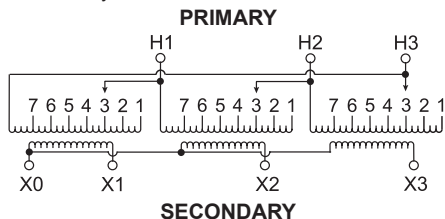


Enclosure Figures

T480E Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



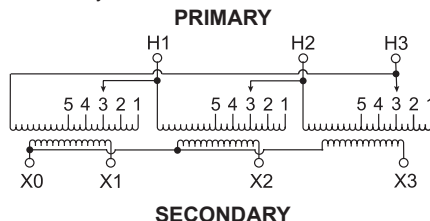
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
444	6	H1, H2, H3
432	7	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120 1 phase	Between X0 and X1 or X2 or X3	

T600G Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 208Y/120 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
615	2	H1, H2, H3
600	3	H1, H2, H3
585	4	H1, H2, H3
570	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120 1 phase	Between X0 and X1 or X2 or X3	

More wiring diagrams can be found in catalog's appendix, section 15.

Use the "Find a Product" tool on our website for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Lugs

Part Number	kVA	Primary Lug	Qty	Secondary Lug	Qty
4PT-2007-LUG	15	#14 - 2	2	#2/0 - 6	2
4PT-2017-LUG	25	#14 - 2	2	250MCM - 6	2
4PT-2008-LUG	37.5	#14 - 2	2	350MCM - 6	2
4PT-2009-LUG	50	#2/0 - 6	2	600MCM - 6	2
4PT-2018-LUG†	75	#2/0 - 6	2	600MCM - 6	4

† Must be ordered, not included on stock units

Wall Mounting Bracket Kits

Part Number	Description	Max Unit Wgt (lbs)
223-7008-030	For 15 kVA units, 150°C rise	250
223-7008-075	For 16 to 45 kVA units, 150°C rise	750

Wall Mounting Bracket Kits with Drip Pans

400-4701-226	For Three Phase units, 19" width	750
400-4701-227	For Three Phase units, 22" width	750
400-4701-228	For Three Phase units, 25" width	750
400-4701-229	For Three Phase units, 27" width	750

3 to 990 kVA

Applications

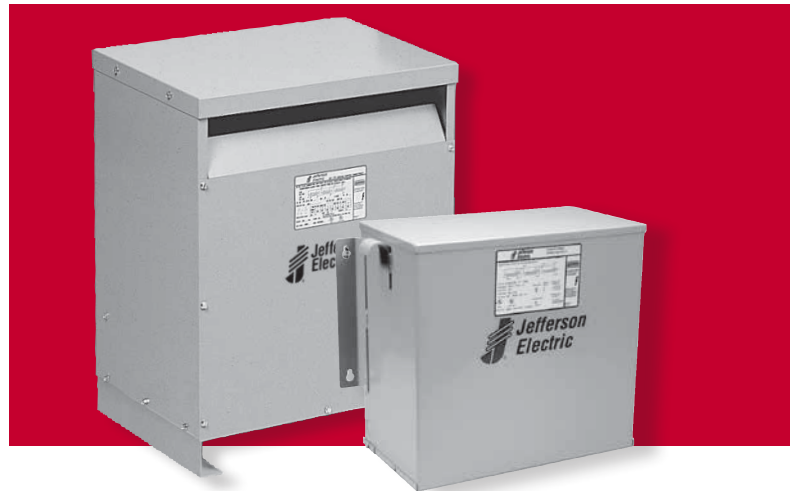
- For industrial and commercial applications with SCR-controlled adjustable speed motor drives, and AC adjustable frequency or DC drives

Specifications

- NEMA1 rated enclosures
- Three-Phase Encapsulated 3 through 11 kVA
- Three-Phase Ventilated 14 through 990 kVA
- 60 Hz operation
- Aluminum windings
- 150°C temperature rise
- 220°C insulation class units
- Electrostatic shield
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Primary taps on most units

Features, Functions, Benefits

- Large connection compartment for ease of wiring and installation
- Complete kVA range to cover standard drive systems
- Internally braced for short circuit stress protection
- Low impedance for better voltage regulation
- Low flux density to minimize core saturation
- Tap arrangements provided to compensate for input voltage variation
- Quiet operation for installation flexibility
- Seismic certification for all units



Standards

- Standard efficiency for US installations
- Meets NRCAN-2019 standards for Canada
- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- 50/60 Hz optional
- Other sizes, voltages and temperature rises available
- Copper windings
- Wall mount brackets available through 75 kVA

Approvals



Enclosure Figures

Figure 4

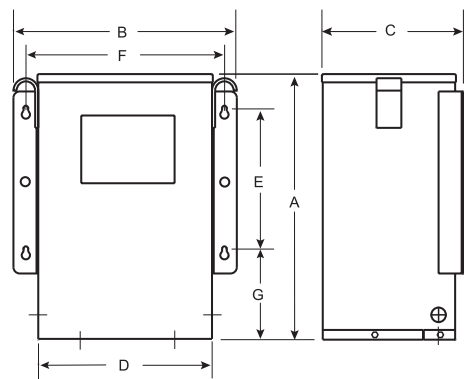
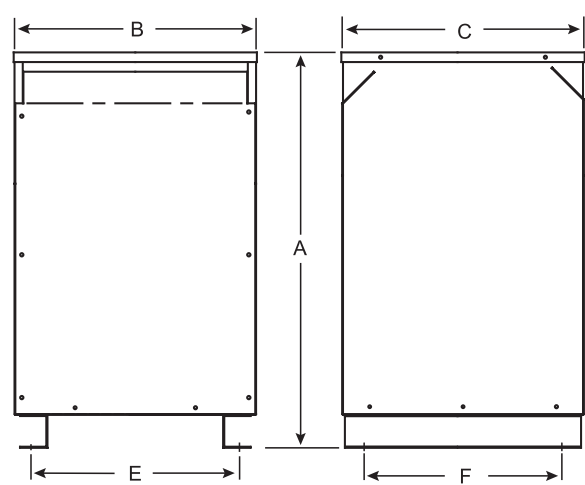


Figure 7



223-7008-030	For 14 to 20 kVA units, 150°C rise	250
223-7008-075	For 27 to 75 kVA units, 150°C rise	750

Drive Selection

To determine the proper size drive isolation transformer, locate the HP of the motors to be operated in the left hand column. The corresponding figure in the right hand column is the recommended transformer kVA. Use the Product Selector on our website to find your model.

2	3
3	6
5	7.5
7.5	11
10	14
15	20
20	27
25	34
30	40
40	51
50	63
60	75
75	93
100	118
125	145
150	175
200	220
250	275
300	330
400	440
500	550

Drive Isolation Transformers

Designed for use with motor drives, the drive isolation transformer must isolate the motor from the line and handle the added loads of the drive-created harmonics. Jefferson Electric's drive isolation transformers are custom engineered for both AC adjustable frequency and DC motor drives. They are specifically designed to accommodate the electrical and mechanical stresses, regenerative current reversals and frequent short circuits inherent in severe drive duty cycles.

Following is a representative list of the models available:

US Standard Efficiency			
Primary	Secondary	Taps	Wiring Diagram
230V Delta	230Y/133V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT CC
230V Delta	460Y/266V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT CG
460V Delta	230Y/133V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT GC
460V Delta	460Y/266V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT GG
575V Delta	230Y/133V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT LC
575V Delta	460Y/266V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT LG
Canadian C802 Compliant			
240V Delta	240Y/139V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT DD
240V Delta	480Y/277V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT DH
480V Delta	240Y/139V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT HD
480V Delta	480Y/277V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT HH
600V Delta	240Y/139V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT MD
600V Delta	480Y/277V	1 @ 5% FCAN & 1 @ 5% FBCN	DIT MH

See website for kVA, copper windings and temperature options.

Use the "Find a Product" tool for detailed specification sheets.

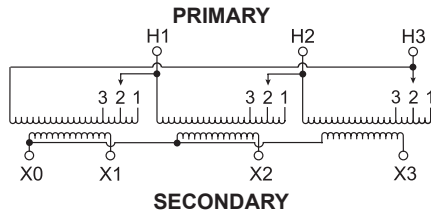
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams US Standard Efficiency

DIT CC Wiring Diagram & Connections

Wiring Diagram

Primary: 230 Volts Delta
Secondary: 230Y/133 Volts



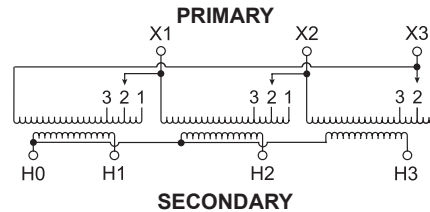
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
242	1	H1, H2, H3
230	2	H1, H2, H3
218	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
230	X1, X2, X3	
133	Between X0 and X1 or X2 or X3	
1 Phase		

DIT CG Wiring Diagram & Connections

Wiring Diagram

Primary: 230 Volts Delta
Secondary: 460Y/266 Volts



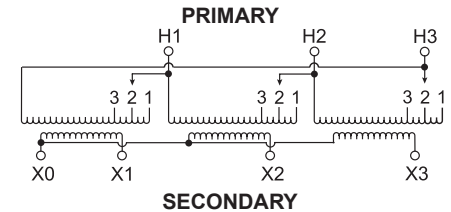
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
242	1	X1, X2, X3
230	2	X1, X2, X3
218	3	X1, X2, X3
Secondary Volts	Secondary Lines Connect To	
460	H1, H2, H3	
266	Between H0 and H1 or H2 or H3	
1 Phase		

DIT GC Wiring Diagram & Connections

Wiring Diagram

Primary: 460 Volts Delta
Secondary: 230Y/133 Volts



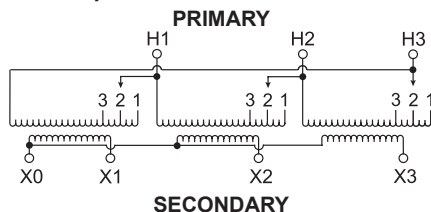
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
483	1	H1, H2, H3
460	2	H1, H2, H3
437	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
230	X1, X2, X3	
133	Between X0 and X1 or X2 or X3	
1 Phase		

DIT GG Wiring Diagram & Connections

Wiring Diagram

Primary: 460 Volts Delta
Secondary: 460Y/266 Volts



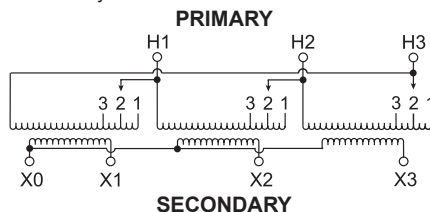
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
483	1	H1, H2, H3
460	2	H1, H2, H3
437	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
460	X1, X2, X3	
266	Between X0 and X1 or X2 or X3	
1 Phase		

DIT LC Wiring Diagram & Connections

Wiring Diagram

Primary: 575 Volts Delta
Secondary: 230Y/133 Volts



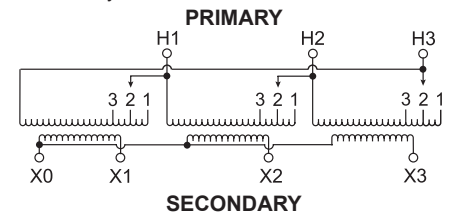
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
604	1	H1, H2, H3
575	2	H1, H2, H3
546	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
230	X1, X2, X3	
133	Between X0 and X1 or X2 or X3	
1 Phase		

DIT LG Wiring Diagram & Connections

Wiring Diagram

Primary: 575 Volts Delta
Secondary: 460Y/266 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
604	1	H1, H2, H3
575	2	H1, H2, H3
546	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
460	X1, X2, X3	
266	Between X0 and X1 or X2 or X3	
1 Phase		

More wiring diagrams can be found in catalog's appendix, section 15.

Use the "Find a Product" tool on our website for detailed specification sheets.

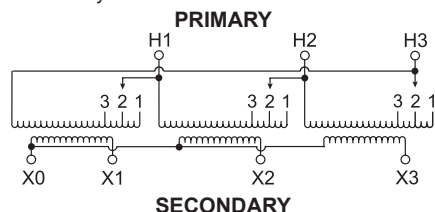
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams Canadian C802 Standard Efficiency

DIT DD Wiring Diagram & Connections

Wiring Diagram

Primary: 240 Volts Delta
Secondary: 240Y/139 Volts



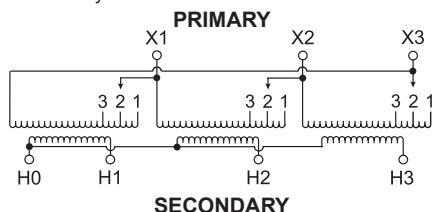
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
252	1	H1, H2, H3
240	2	H1, H2, H3
228	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
139	Between X0 and X1 or X2 or X3	
1 Phase		

DIT DH Wiring Diagram & Connections

Wiring Diagram

Primary: 240 Volts Delta
Secondary: 480Y/277 Volts



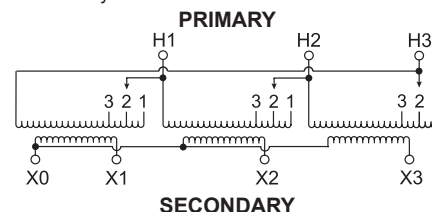
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
252	1	H1, H2, H3
240	2	H1, H2, H3
228	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
480	X1, X2, X3	
277	Between X0 and X1 or X2 or X3	
1 Phase		

DIT HD Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240Y/139 Volts



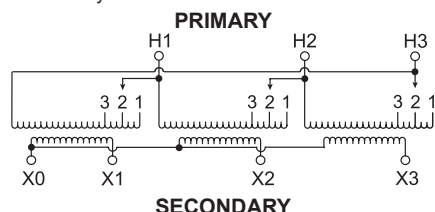
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
480	2	H1, H2, H3
456	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
139	Between X0 and X1 or X2 or X3	
1 Phase		

DIT HH Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 480Y/277 Volts



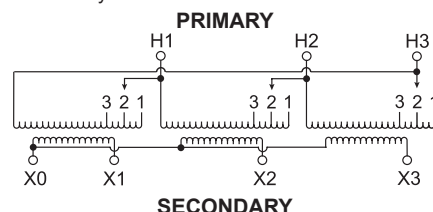
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
480	2	H1, H2, H3
456	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
480	X1, X2, X3	
277	Between X0 and X1 or X2 or X3	
1 Phase		

DIT MD Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 240Y/139 Volts



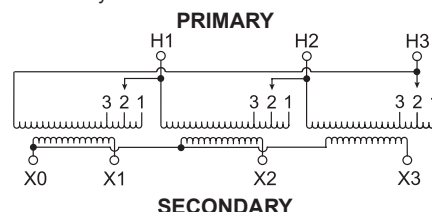
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
600	2	H1, H2, H3
570	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
139	Between X0 and X1 or X2 or X3	
1 Phase		

DIT MH Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 480Y/277 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
600	2	H1, H2, H3
570	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
480	X1, X2, X3	
277	Between X0 and X1 or X2 or X3	
1 Phase		

More wiring diagrams can be found in catalog's appendix, section 15.

Use the "Find a Product" tool on our website for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

15 to 500 kVA

Applications

- Designed for commercial and industrial loads in challenging environments

Specifications

- NEMA3R rated enclosure
- Single Phase units 15 through 100 kVA
- Three Phase units 15 through 500 kVA
- 60 Hz operation
- Aluminum windings
- 150°C temperature rise
- 220°C insulation class units
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Primary taps on most units
- Lugs provided for units up to and including 75 kVA on catalog items

Features, Functions, Benefits

- Large connection compartment with knockouts for ease of wiring and installation
- Completely enclosed for use in harsh environments
- Quiet operation for installation flexibility
- Seismic certification for all units



Standards

- DOE and NRCan-2019 exempt, standard efficiency
- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

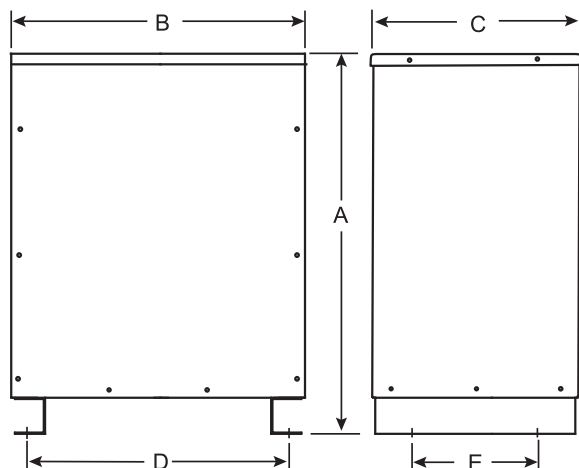
- NEMA4/4X (stainless), 12/12X enclosures
- 50/60 Hz optional
- Other sizes, voltages and temperature rises available
- Copper windings
- Electrostatic shield
- CE Marked units available as custom

Approvals



Three-Phase Enclosure Figure

Figure 23



Enclosure Options

Jefferson Electric can meet NEMA standards or build enclosures to suit your special needs. Contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com.

Frequent variations include:

- NEMA4, 4x, 12 and 12X enclosures
- Stainless steel construction
- Custom colors and materials

Wall Mounting Bracket Kits

Part Number	Description	Max Unit Wgt (lbs)
223-7008-075	For 16 to 30 kVA units, 150°C rise	750

Model Numbers Defined

433-TXXY-ABC

3 Phase
Totally Enclosed Non-Ventilated
 Single Phase units available; see page 5-6 or website for details

Type
 Standard efficiency 6

kVA Rating / XX	kVA Rating / XX	kVA Rating / XX	kVA Rating / XX
15.0 16	150 26		
20 17	167 27		
25 18	200 28		
30 19	225 29		
37.5 20	250 30		
45 21	300 31		
50 22	333 32		
75 23	400 33		
100 24	500 34		
112.5 25			

Primary	Secondary	
208	480Y/277	1
240	208Y/120	2
240	480Y/277	3
480	208Y/120	4
480	480Y/277	5
Specials*		6
480	240 Delta	7
208	208Y/120	8
600	208Y/120	9

Wiring
 Aluminum 0
 Copper 8

Temperature Rise
 150°C Rise 0
 115°C Rise 1
 80°C Rise 8

Shield
 No shield 0
 Shield 5

*Suffix defined incrementally

Three-Phase Totally Enclosed Non-Ventilated Transformers

Commercial & Industrial Loads • 150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 15 to 225 kVA 2 @ 2.5% FCAN & 4 @ 2.5% FBCN / 300 to 500 kVA 2 @ 2.5% FCAN & 2 @ 2.5% FBCN

480V Delta — 208Y/120V										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wall Mounting Bracket Kit	Wiring Diagram
15	433-6164-000	23	25	22	17	17.4	13	310	223-7008-075	T480E
30	433-6194-000	23	32	27	21	23.5	16	585	223-7008-075	T480E
45	433-6214-000	23	38	29	23	25.5	18	775		T480E
75	433-6234-000	23	42	33	26	30	21	1,000		T480E
112.5	433-6254-000	23	46	35	30	30.8	25	1,315		T480E
150	433-6264-000	23	52	35	30	30.8	25	1,660		T480E
225	433-6294-000	23	60	48	33	42	27	2,460		T480E
300	433-6314-000	23	72	52	40	34	42	4,055		T480M
500	433-6344-000	23	81	66	44	60.5	38.5	6,195		T480M
480V Delta — 240V Delta / 5% 120V CT										
15	433-6167-000 *	23	25	22	17	17.4	13	310	223-7008-075	T480G
30	433-6197-000 *	23	32	27	21	23.5	16	585	223-7008-075	T480G
45	433-6217-000 *	23	38	29	23	25.5	18	775		T480G
75	433-6237-000 *	23	42	33	26	30	21	1,000		T480G
112.5	433-6257-000 *	23	46	35	30	30.8	25	1,315		T480G
150	433-6267-000 *	23	52	35	30	30.8	25	1,660		T480G
225	433-6297-000 *	23	60	48	33	42	27	2,460		T480G
300	433-6317-000 *	23	72	52	40	34	42	4,055		T480N
500	433-6347-000 *	23	81	66	44	60.5	38.5	6,195		T480N

Taps: 2 @ 2.5% FCAN & 2 @ 2.5% FBCN

600V Delta — 208Y/120V										
15	433-6169-000	23	25	22	17	17.4	13	310	223-7008-075	T600G
30	433-6199-000	23	32	27	21	23.5	16	585	223-7008-075	T600G
45	433-6239-000	23	38	29	23	25.5	18	775		T600G
75	433-6259-000	23	42	33	26	30	21	1,000		T600G
112.5	433-6259-000	23	46	35	30	30.8	25	1,315		T600G
150	433-6269-000	23	52	35	30	30.8	25	1,660		T600G
225	433-6299-000	23	60	48	33	42	27	2,460		T600G
300	433-6319-000	23	72	52	40	34	42	4,055		T600G
500	433-6349-000	23	81	66	44	60.5	38.5	6,195		T600G
600V Delta — 480Y/277V										
15	TBD	23	25	22	17	17.4	13	310	223-7008-075	T600I
30	TBD	23	32	27	21	23.5	16	585	223-7008-075	T600I
45	TBD	23	38	29	23	25.5	18	775		T600I
75	TBD	23	42	33	26	30	21	1,000		T600I
112.5	TBD	23	46	35	30	30.8	25	1,315		T600I
150	TBD	23	52	35	30	30.8	25	1,660		T600I
225	TBD	23	60	48	33	42	27	2,460		T600I
300	TBD	23	72	52	40	34	42	4,055		T600I
500	TBD *	23	81	66	44	60.5	38.5	6,195		T600I

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

* **CAUTION:** When using the 120V center tap for single-phase applications, the single-phase load should not exceed 5% of the three-phase kVA rating. Connect the X3 "high leg" to the "B" phase per NEC 384-3 (do not use X3 leg for 120V lighting). A separate single-phase transformer should be used if the single-phase load is in excess of 5%. Fuse input side per current NEC requirements.



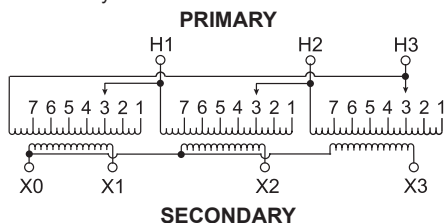
Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Three-Phase Wiring Diagrams

T480E Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



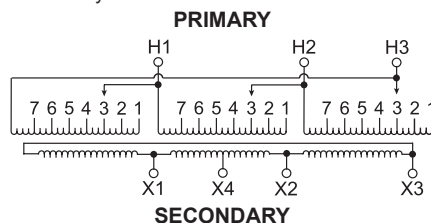
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
444	6	H1, H2, H3
432	7	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T480G Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240 Volts Delta/120 Volts



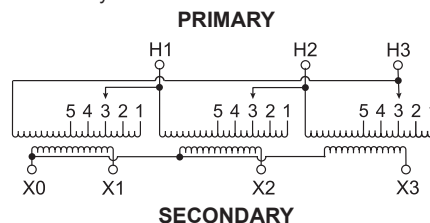
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
444	6	H1, H2, H3
432	7	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
120	X1 and X4 or X2 or X4	
1 phase		

T480M Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



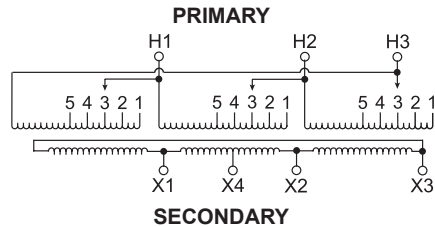
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T480N Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240 Volts Delta/120 Volts

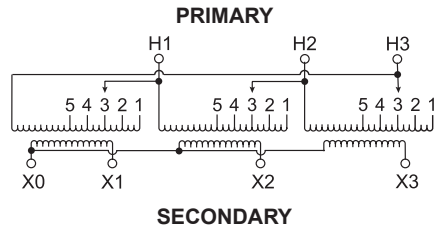


Connections		
Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	
120	X1 and X4 or X2 or X4	
1 phase		

T600G Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 208Y/120 Volts

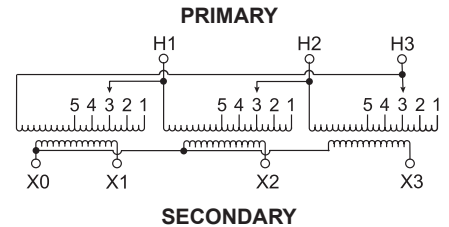


Connections		
Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
615	2	H1, H2, H3
600	3	H1, H2, H3
585	4	H1, H2, H3
570	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T600I Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 480Y/277 Volts



Connections		
Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
615	2	H1, H2, H3
600	3	H1, H2, H3
585	4	H1, H2, H3
570	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
480	X1, X2, X3	
277	Between X0 and X1 or X2 or X3	
1 phase		

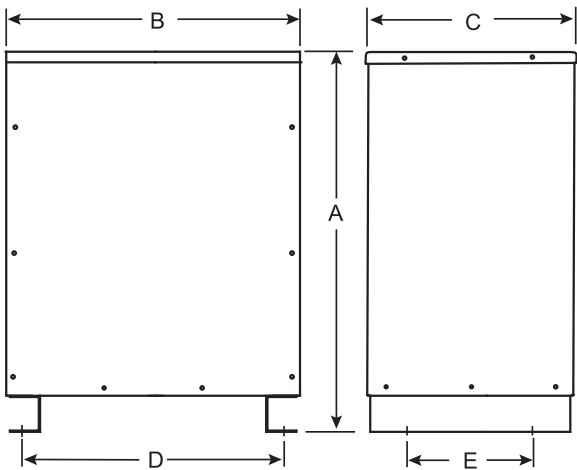
More wiring diagrams can be found in catalog's appendix, section 15.

Use the "Find a Product" tool on our website for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Single-Phase Enclosure Figure

Figure 23



Enclosure Options

Jefferson Electric can meet NEMA standards or build enclosures to suit your special needs. Contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com.

Frequent variations include:

- NEMA4, 4x, 12 and 12X enclosures
- Stainless steel construction
- Custom colors and materials

Wall Mounting Bracket Kits

Part Number	Description	Max Unit Wgt (lbs)
223-7008-075	For 16 to 50 kVA units, 150°C rise	750

Model Numbers Defined

431-TXXY-ABC			
1 Phase			
Totally Enclosed Non-Ventilated			
Three-Phase units available; see page 5-2 or website for details			
Type			
Standard efficiency		6	
kVA Rating / XX		kVA Rating / XX	
15.0	16	45	21
20	17	50	22
25	18	75	23
30	19	100	24
37.5	20		
Primary		Secondary	
120x240		120/240	1
208		120/240	2
Reserved for special items			3
277		120/240	4
240x480		120/240	5
Specials*			6
480		120/240	7
600		120/240	8
Wiring			
Aluminum		0	
Copper		8	
Temperature Rise			
150°C Rise		0	
115°C Rise		1	
80°C Rise		8	
Shield			
No shield		0	
Shield		5	

*Suffix defined incrementally

Single-Phase Totally Enclosed Non-Ventilated Transformers

Commercial & Industrial Loads • 150°C Temperature Rise with 25° Ambient • Aluminum Windings • NEMA3R Enclosures

240x480V — 120/240V • Taps: 2@2.5% FCAN, 4@2.5% FBCN										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wall Mounting Bracket Kit	Wiring Diagram
15	431-6165-000	23	25	22	17	17.4	13	330	223-7008-075	S480F
25	431-6185-000	23	32	27	21	23.5	16	405	223-7008-075	S480F
37.5	431-6205-000	23	38	29	23	25.5	18	535	223-7008-075	S480F
50	431-6225-000	23	42	33	26	30	21	690	223-7008-075	S480F
75	431-6235-000	23	42	33	26	30	21	1,235		S480F
100	431-6245-000	23	46	35	30	30.8	25	2,001		S480F
600V — 120/240V • Taps: 2@2.5% FCAN, 2@2.5% FBCN										
15	431-6168-000	23	25	22	17	17.4	13	330	223-7008-075	S600E
25	431-6188-000	23	32	27	21	23.5	16	405	223-7008-075	S600E
37.5	431-6208-000	23	38	29	23	25.5	18	535	223-7008-075	S600E
50	431-6228-000	23	42	33	26	30	21	690	223-7008-075	S600E
75	431-6238-000	23	42	33	26	30	21	1,235		S600E
100	431-6248-000	23	46	35	30	30.8	25	2,001		S600E

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

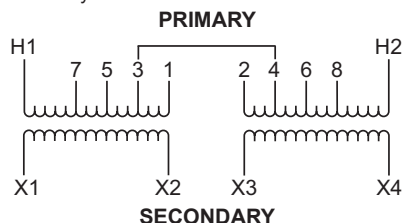
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Single-Phase Wiring Diagrams

S480F Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 120/240 Volts



Connections

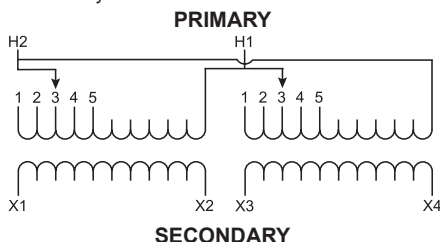
Primary Volts	Jumpers Between Taps Left Coil	Right Coil	Primary Lines Connect To
504	1	2	H1, H2
492	3	2	H1, H2
480	3	4	H1, H2
468	5	4	H1, H2
456	5	6	H1, H2
444	7	6	H1, H2
432	7	8	H1, H2
252	H2, 1	H1, 2	H1, H2
240	H2, 3	H1, 4	H1, H2
228	H2, 5	H1, 6	H1, H2
216	H2, 7	H1, 8	H1, H2

Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S600E Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts
Secondary: 120/240 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2
615	2	H1, H2
600	3	H1, H2
585	4	H1, H2
570	5	H1, H2

Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

More wiring diagrams can be found in catalog appendix, section 15.

Use the "Find a Product" tool on our website for detailed spec sheet.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

50 to 5,000 VA

Applications

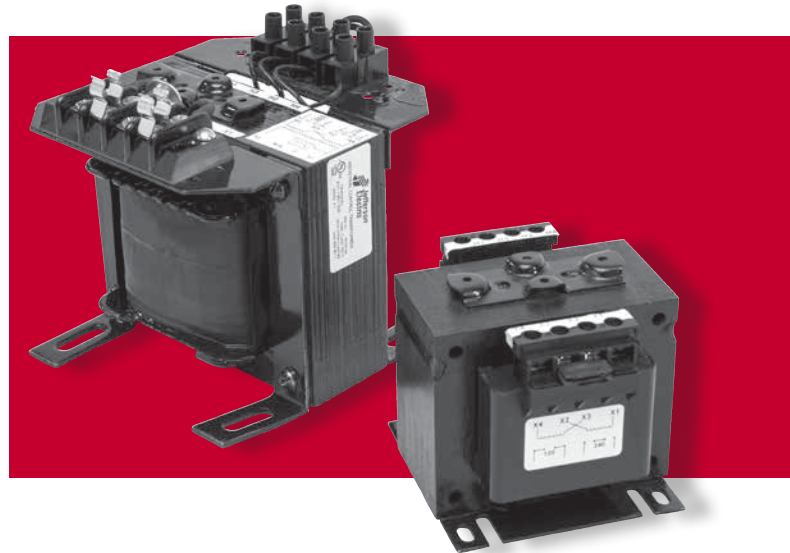
- For commercial and industrial control applications including; control panels, conveyor systems, machine tool equipment, pump systems, and commercial air conditioning applications

Specifications

- Core and coil
- 50/60 Hz operation
- Machine wound copper coils
- Cores of high grade silicon steel
- 55°C temperature rise for 50 – 100 VA, insulation class of 105°C
- 80°C temperature rise for 150 – 750 VA, insulation class of 130°C
- 115°C temperature rise for 1,000 – 5,000 VA, insulation class of 180°C
- Phil-Slot-Hex head terminal screws
- Cores of high quality electrical steel

Features, Functions, Benefits

- Permanently affixed wiring diagram
- Slotted mounting holes for quick and easy mounting
- All units with finger safe terminals (except Group LL)
- Units with secondary fuse blocks are not finger safe unless fuse cover is purchased
- Secondary fuse clips standard on most units. The fuse clip is for a 13/32 x 1-1/2 midjet fuse. The secondary fuse style is a matter of customer preference usually either time delay or fast acting.
- Many sizes in stock and available for immediate shipment
- Units 2,000 VA and less are packaged individually for UPS shipping



Standards

- Built in accordance with ANSI, and UL standards
- UL and cUL listed

Options and Accessories

- Other sizes and voltages available
- Units can be ordered with primary fuse blocks and covers factory installed
- Optional primary fuse block for 13/32 x 1-1/2 class cc rejection fuse available
- CE Marked units available

Approvals



Enclosure Figures

Figure 30

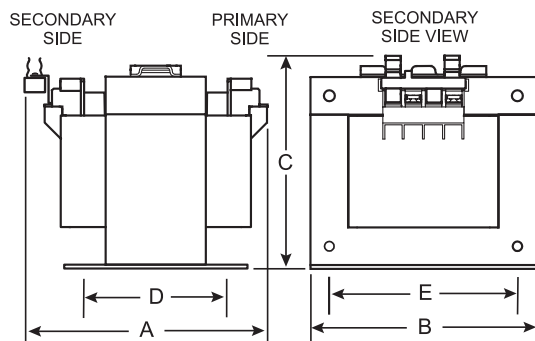
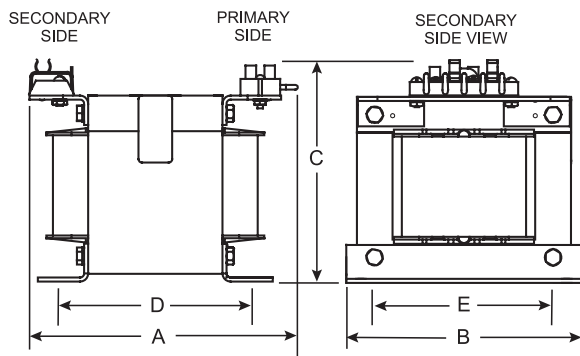


Figure 31



NOTE: Models with catalog numbers ending in “301” do not have a secondary fuseclip

Model Numbers Defined

631-XXYY-ABC

Single-Phase, Encapsulated

kVA Rating / XX	kVA Rating / XX
0.050 11	0.500 19
0.075 12	0.750 20
0.100 13	1.000 21
0.150 14	1.500 22
0.200 15	2.000 23
0.250 16	3.000 24
0.300 17	4.000 25
0.350 18	5.000 26

Primary	Secondary	
none	none	00
220/230/240 x440/460/480	110/115/120	01
240x480	24	02
120x240	24	03
550/575/600	110/115/120	04
277x208	120	05
460x230x208	115	06
230x460x575	95, 115	07
380x400x415	110x220	08
200/208 x220/230/240 x440/460/480	23/24/25, 110/115/120	09
240x480	120x240	10
208-600	85-130	11
220/230/240	110/115/120	12
x440/460/480	x220/230/240	13
240x347x380	120x240	

Variations

Secondary fuseclip included	300
No secondary fuseclip possible	301
Primary fuse kit installed with secondary fuseclip	500
Primary fuse kit installed without secondary fuseclip	501

Industrial Control Transformers

Primary: 220/230/240x440/460/480 V Secondary:110/115/120 V											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Temp Rise	Insulation	Wiring Diagram
0.05	631-1101-300	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group AA
0.075	631-1201-300	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group AA
0.1	631-1301-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group AA
0.15	631-1401-300	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group AA
0.2	631-1501-300	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group AA
0.25	631-1601-300	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group AA
0.3	631-1701-300	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group AA
0.35	631-1801-300	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group AA
0.5	631-1901-300	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group AA
0.75	631-2001-300	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group AA
1	631-2101-300	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group AA
1.5	631-2201-300	31	8.05	7.00	6.02	4.50	6.13	30	115	180°C	Group AA
2	631-2301-300	31	8.80	7.00	6.02	5.13	6.13	38	115	180°C	Group AA
3	631-2401-301	31	7.82	9.00	7.62	4.25	6.50	58	115	180°C	Group AA
5	631-2601-301	31	9.00	9.00	7.62	7.25	7.50	89	115	180°C	Group AA
Primary: 240 x 480 V Secondary: 24 V											
0.05	631-1102-300	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group BB
0.075	631-1202-300	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group BB
0.1	631-1302-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group BB
0.15	631-1402-300	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group BB
0.2	631-1502-300	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group BB
0.25	631-1602-300	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group BB
0.3	631-1702-300	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group BB
0.35	631-1802-300	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group BB
0.5	631-1902-300	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group BB
0.75	631-2002-301	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group BB
Primary: 120 x 240 V Secondary: 24 V											
0.05	631-1103-300	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group CC
0.075	631-1203-300	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group CC
0.1	631-1303-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group CC
0.15	631-1403-300	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group CC
0.2	631-1503-300	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group CC
0.25	631-1603-300	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group CC
0.3	631-1703-300	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group CC
0.35	631-1803-300	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group CC
0.5	631-1903-300	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group CC
0.75	631-2003-301	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group CC

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Industrial Control Transformers

Primary: 550/575/600 V			Secondary: 110/115/120 V								
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Temp Rise °C	Insulation	Wiring Diagram
0.05	631-1104-300	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group EE
0.075	631-1204-300	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group EE
0.1	631-1304-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group EE
0.15	631-1404-300	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group EE
0.2	631-1504-300	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group EE
0.25	631-1604-300	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group EE
0.3	631-1704-300	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group EE
0.35	631-1804-300	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group EE
0.5	631-1904-300	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group EE
0.75	631-2004-300	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group EE
Primary: 208 x 277 V			Secondary: 120 V								
0.05	631-1105-300	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group FF
0.075	631-1205-300	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group FF
0.1	631-1305-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group FF
0.15	631-1405-300	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group FF
0.2	631-1505-300	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group FF
0.25	631-1605-300	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group FF
0.3	631-1705-300	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group FF
0.35	631-1805-300	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group FF
0.5	631-1905-300	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group FF
0.75	631-2005-300	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group FF
Primary: 208 x 230 x 460 V			Secondary: 115 V								
0.05	631-1106-300	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group GG
0.075	631-1206-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group GG
0.1	631-1306-300	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group GG
0.15	631-1406-300	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group GG
0.2	631-1506-300	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group GG
0.25	631-1606-300	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group GG
0.3	631-1706-300	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group GG
0.35	631-1806-300	30	5.60	4.50	4.47	4.75	3.75	15.6	80	130°C	Group GG
0.5	631-1906-300	31	6.25	5.25	5.21	4.75	4.38	21.5	80	130°C	Group GG
0.75	631-2006-300	31	7.00	5.25	5.21	5.38	4.38	30	80	130°C	Group GG
1	631-2106-300	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group GG
1.5	631-2206-300	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group GG
2	631-2306-300	31	8.80	7.00	6.02	5.13	6.13	38	115	180°C	Group GG
3	631-2406-301	31	7.82	9.00	7.62	4.25	6.50	58	115	180°C	Group GG
5	631-2606-301	31	9.00	9.00	7.62	7.25	7.50	89	115	180°C	Group GG
Primary: 230 x 460 x 575 V			Secondary: 95, 115 V								
1	631-2107-301	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group HH
1.5	631-2207-301	31	8.80	7.00	6.02	5.13	6.13	38	115	180°C	Group HH
2	631-2307-301	31	7.82	9.00	7.62	4.25	6.50	58	115	180°C	Group HH
3	631-2407-301	31	9.00	9.00	7.62	7.25	7.50	89	115	180°C	Group HH
5	631-2607-301	31	9.00	9.00	8.74	8.25	7.50	100	115	180°C	Group HH

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Industrial Control Transformers

Primary: 380 x 400 x 415 V Secondary: 110 x 220 V											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Temp Rise °C	Insulation	Wiring Diagram
0.05	631-1108-301	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group II
0.075	631-1208-301	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group II
0.1	631-1308-301	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group II
0.15	631-1408-301	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group II
0.2	631-1508-301	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group II
0.25	631-1608-301	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group II
0.3	631-1708-301	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group II
0.35	631-1808-301	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group II
0.5	631-1908-301	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group II
0.75	631-2008-301	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group II
Primary: 200/208x220/230/240x440/460/480 V Secondary: 23/24/25 (Full Load), 110/115/120 V											
0.05	631-1109-301	30	4.60	3.00	3.46	2.88	2.50	4.2	55	105°C	Group JJ
0.075	631-1209-301	30	4.54	3.75	3.94	2.88	3.13	6.7	55	105°C	Group JJ
0.1	631-1309-301	30	4.54	3.75	3.94	2.88	3.13	6.7	55	105°C	Group JJ
0.15	631-1409-301	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group JJ
0.2	631-1509-301	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group JJ
0.25	631-1609-301	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group JJ
0.3	631-1709-301	31	5.53	5.25	5.66	3.88	4.38	19.2	80	130°C	Group JJ
0.35	631-1809-301	31	5.53	5.25	5.66	3.88	4.38	19.2	80	130°C	Group JJ
0.5	631-1909-301	31	6.25	5.25	5.21	4.75	4.38	21.5	80	130°C	Group JJ
Primary: 240 x 480 V Secondary: 120/240 V											
0.05	631-1110-301	30	3.64	3.00	3.46	2.00	2.50	2.6	55	105°C	Group KK
0.075	631-1210-301	30	4.10	3.00	3.46	2.50	2.50	3.5	55	105°C	Group KK
0.1	631-1310-301	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group KK
0.15	631-1410-301	30	4.54	3.75	3.94	2.88	3.13	6.7	80	130°C	Group KK
0.2	631-1510-301	30	4.37	4.50	4.46	2.50	3.75	8.5	80	130°C	Group KK
0.25	631-1610-301	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group KK
0.3	631-1710-301	30	4.87	4.50	4.47	3.25	3.75	11.3	80	130°C	Group KK
0.35	631-1810-301	30	5.60	4.50	4.47	3.75	3.75	13.6	80	130°C	Group KK
0.5	631-1910-301	31	5.75	5.25	5.21	4.25	4.38	19.2	80	130°C	Group KK
0.75	631-2010-301	31	7.00	5.25	5.21	5.38	4.38	28.1	80	130°C	Group KK
1	631-2110-301	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group KK
1.5	631-2210-301	31	8.05	7.00	6.02	4.50	6.13	30	115	180°C	Group KK
3	631-2410-301	31	7.82	9.00	7.62	4.25	6.50	58	115	180°C	Group KK
Primary: 208-600 V Secondary: 85 - 130 V											
0.05	631-1111-301	30	4.10	3.31	3.46	2.38	2.81	4.2	55	105°C	Group LL
0.1	631-1311-301	30	4.54	3.75	3.94	2.88	3.13	6.7	55	105°C	Group LL
0.15	631-1411-301	30	4.87	4.50	4.47	2.88	3.75	10	80	130°C	Group LL
0.25	631-1611-301	30	5.53	5.25	5.66	3.88	4.38	19.2	80	130°C	Group LL
0.35	631-1811-301	31	6.53	5.25	5.66	4.38	4.38	21.5	80	130°C	Group LL
0.5	631-1911-301	31	7.00	5.25	5.21	5.38	4.38	30	80	130°C	Group LL
0.75	631-2011-301	31	7.05	7.00	6.02	4.00	6.13	28.1	80	130°C	Group LL

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Industrial Control Transformers

Primary: 220/230/240x440/460/480 V Secondary: 110/115/120x220/230/240 V											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Temp Rise °C	Insulation	Wiring Diagram
1	631-2112-301	31	7.00	5.25	5.21	5.38	4.38	28.1	115	180°C	Group MM
1.5	631-2212-301	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group MM
2	631-2312-301	31	8.80	7.00	6.02	5.13	6.13	38	115	180°C	Group MM
3	631-2412-301	31	7.82	9.00	7.62	4.25	6.50	58	115	180°C	Group MM
5	631-2612-301	31	9.00	9.00	7.62	7.25	7.50	89	115	180°C	Group MM
Primary: 240 x 347 x 380 V Secondary: 120/240 V											
1	631-2113-301	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group NN
1.5	631-2213-301	31	7.05	7.00	6.02	4.00	6.13	28.1	115	180°C	Group NN
2	631-2313-301	31	8.80	7.00	6.02	5.13	6.13	38	115	180°C	Group NN
3	631-2413-301	31	7.82	9.00	7.62	4.25	6.50	58	115	180°C	Group NN
5	631-2613-301	31	9.00	9.00	7.62	7.25	7.50	89	115	180°C	Group NN

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

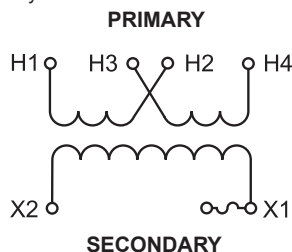
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams

Group AA Wiring Diagram & Connections

Wiring Diagram

Primary: 240/230/220 x 480/460/440 Volts
Secondary: 120/115/110 Volts



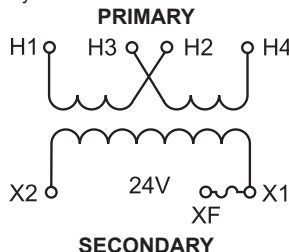
Connections

Primary Volts	Interconnect	Primary Lines Connect To
240/230/220	H1-H3, H2-H4	H1, H4
480/460/440	H2-H3	H1, H4
Secondary Volts		Secondary Lines Connect To
120/115/110		X2, XF

Group BB Wiring Diagram & Connections

Wiring Diagram

Primary: 480 x 240 Volts
Secondary: 24 Volts



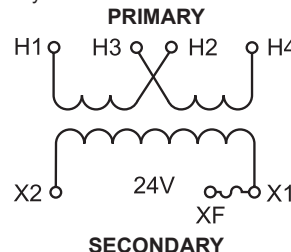
Connections

Primary Volts	Interconnect	Primary Lines Connect To
480	H2-H3	H1, H4
240	H1-H3, H2-H4	H1, H4
Secondary Volts		Secondary Lines Connect To
24		X2, XF

Group CC Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 120 Volts
Secondary: 24 Volts



Connections

Primary Volts	Interconnect	Primary Lines Connect To
240	H2-H3	H1, H4
120	H1-H3, H2-H4	H1, H4
Secondary Volts		Secondary Lines Connect To
24		X2, XF

Use the "Find a Product" tool on our website for detailed specification sheets.

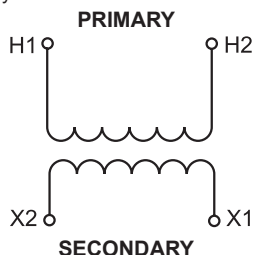
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams

Group EE Wiring Diagram & Connections

Wiring Diagram

Primary: 600/575/550 Volts
Secondary: 120/115/110 Volts



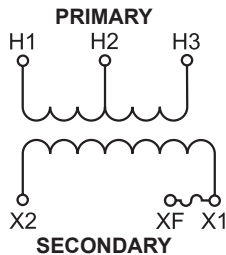
Connections

Primary Volts	Primary Lines Connect To
600/575/550	H1, H2
Secondary Volts	Secondary Lines Connect To
120/115/110	X2, X1

Group FF Wiring Diagram & Connections

Wiring Diagram

Primary: 277 x 208 Volts
Secondary: 120 Volts



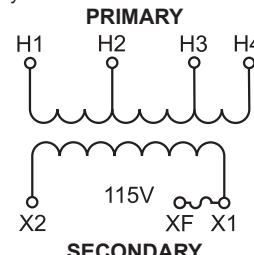
Connections

Primary Volts	Primary Lines Connect To
277	H1, H3
208	H1, H2
Secondary Volts	Secondary Lines Connect To
120	X2, XF

Group GG Wiring Diagram & Connections

Wiring Diagram

Primary: 460 x 230 x 208 Volts
Secondary: 115 Volts



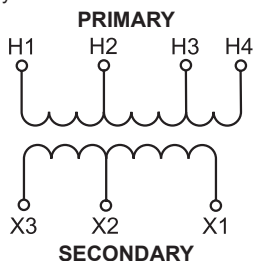
Connections

Primary Volts	Primary Lines Connect To
460	H1, H4
230	H1, H3
208	H1, H2
Secondary Volts	Secondary Lines Connect To
115	X2, XF

Group HH Wiring Diagram & Connections

Wiring Diagram

Primary: 575 x 460 x 230 Volts
Secondary: 115 x 95 Volts



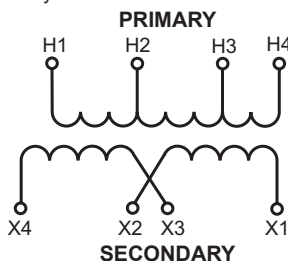
Connections

Primary Volts	Primary Lines Connect To
575	H1, H4
460	H1, H3
230	H1, H2
Secondary Volts	Secondary Lines Connect To
115	X1, X3
95	X1, X2

Group II Wiring Diagram & Connections

Wiring Diagram

Primary: 415 x 400 x 380 Volts
Secondary: 110 x 220 Volts



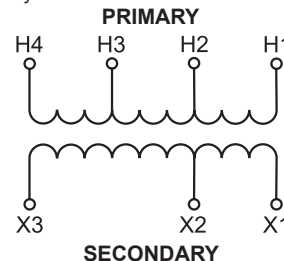
Connections

Primary Volts	Primary Lines Connect To
415	H1, H4
400	H1, H3
380	H1, H2
Secondary Volts	Secondary Lines Connect To
110	X1-X3, X2-X4
220	X2-X3

Group JJ Wiring Diagram & Connections

Wiring Diagram

Primary: 460 x 230 x 208 Volts
Secondary: 115 x 24 Volts



Connections

Primary Volts	Primary Lines Connect To
480/460/440 V	H1, H4
240/230/220 V	H1, H3
208/200 V	H1, H2
Secondary Volts	Secondary Lines Connect To
120/115/110 V	X1, X3
25/24/23 V	X1, X2



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

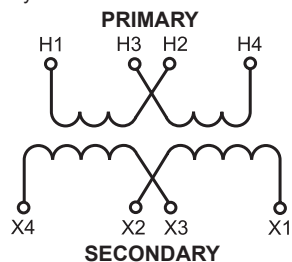
Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Wiring Diagrams

Group KK Wiring Diagram & Connections

Wiring Diagram

Primary: 480 x 240 Volts
Secondary: 120 x 240 Volts



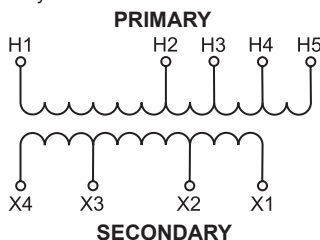
Connections

Primary Volts	Interconnect	Primary Lines Connect To
480	H2-H3	H1, H4
240	H1-H3, H2-H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
120	X1-X3, X2-X4	X1, X4
240	X2-X3	X1, X4

Group LL Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 416 x 480 x 600 Volts
Secondary: 130 x 120 x 99 Volts



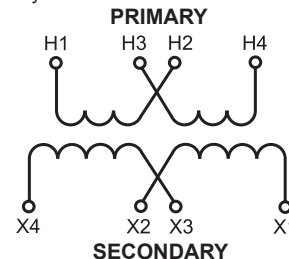
Connections

Primary Volts	Primary Lines Connect To
240/230/220/208	H2, H1
416/400/380	H3, H1
480/460/440	H4, H1
600/575/550/500	H5, H1
Secondary Volts	Secondary Lines Connect To
130/125/120/110	X4, X1
120/115/110/100	X3, X1
99/95/91/85	X2, X1

Group MM Wiring Diagram & Connections

Wiring Diagram

Primary: 480/460/440 x 240/230/220 Volts
Secondary: 120/115/110 x 240/230/220 Volts



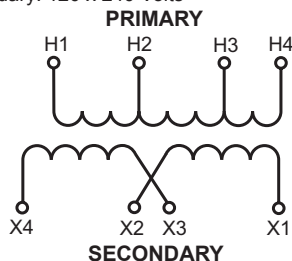
Connections

Primary Volts	Interconnect	Primary Lines Connect To
480/460/440	H2-H3	H1, H4
240/230/220	H1-H3, H2-H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
120/115/110	X1-X3, X2-X4	X2, X4
240/230/220	X2-X3	X1, X4

Group NN Wiring Diagram & Connections

Wiring Diagram

Primary: 380 x 347 x 240 Volts
Secondary: 120 x 240 Volts



Connections

Primary Volts		Primary Lines Connect To
380		H1, H4
347		H1, H3
240		H1, H2
Secondary Volts		Secondary Lines Connect To
120	X1-X3, X2-X4	X1, X4
240	X2-X3	X1, X4

Use the "Find a Product" tool on our website for detailed specification sheets.
For further information, contact an Application Engineer at 800-892-3755,
technical_services@jeffersonelectric.com

Accessories

Item	Catalog Number	Figure	Dimensions	Estimated Shipping Wgt	Description
Primary Fuse Kit (Maximum 1,500 VA)	631-0000-301	16	Adds approx 1.38" to C dimension	0.35 lbs.	Fuse kit for one transformer
Primary Fuse Covers	631-0000-302	17	Adds approx .25" to C dimension (1.65" total with fuse kit)	0.10 lbs.	Cover for one fuse kit
Finger Safe Terminal Covers	631-0000-303	32	Adds approx .25" to C dimension	0.10 lbs.	Covers for one transformer for units larger than 350 VA (not needed on Gen II models shipped as of mid 2019)
Secondary Fuse Cover	631-0000-307		Adds approx .25" to C dimension	0.10 lbs.	Cover for secondary fuse clip, all sizes

Figure 16

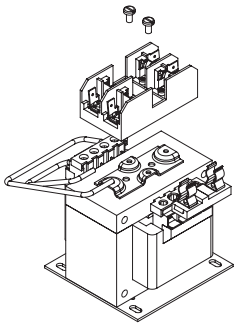


Figure 17

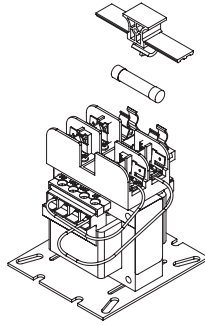
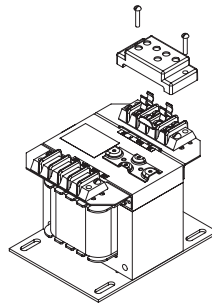


Figure 32



- The optional primary fuse block is for a 13/32 x 1-1/2 class cc rejection fuse. The primary fuse should always have a time delay, slow blow properly sized for the application.
- The standard secondary fuse clip is for a 13/32 x 1-1/2 midget fuse. The secondary fuse style is a matter of customer preference usually either time delay or fast acting.



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

50 VA to 25 kVA

Applications

- For general loads, indoors or out, including lighting, industrial and commercial applications
- Units may be banked for 3-Phase operations
- For transformers to use with submersible fixtures, see page 7-5

Specifications

- NEMA3R-rated enclosures
- 60 Hz operation
- Aluminum windings
- 95°C temperature rise for 0.5 to 1 kVA
135°C temperature rise for 1.5 to 25 kVA
- Encapsulated with electrical grade resin
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Primary taps on some models

Features, Functions, Benefits

- Large connection compartment with knockouts for ease of wiring and installation
- Slotted mounting holes for quick and easy mounting
- Lifting hooks above 5 kVA
- Wall mount design through 25 kVA
- Many sizes in stock and available for immediate shipment
- Quiet operation for installation flexibility
- Seismic qualification certification for all units



Standards

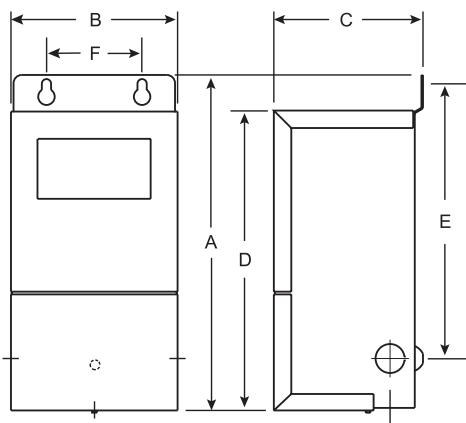
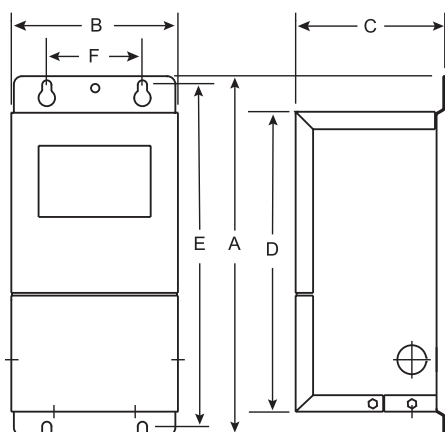
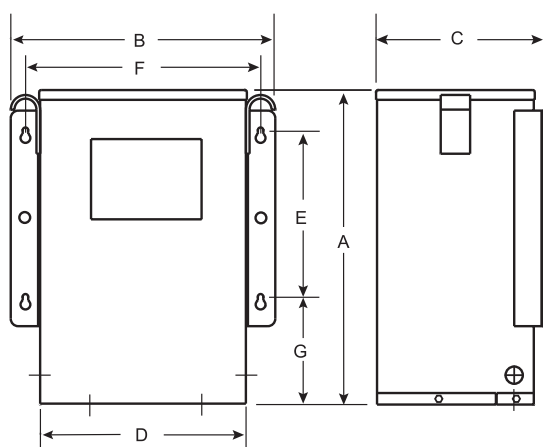
- Built in accordance with NEMA, ANSI, UL and CSA standards
- International units are CE Marked

Options and Accessories

- 50/60 Hz optional
- Other sizes, voltages and temperature rises available
- Copper windings
- CE Marked units available as custom
- Class I Div 2 units available

Approvals



Enclosure Figures**Figure 2****Figure 3****Figure 4****Model Numbers Defined*****411-TXXY-ABC****Single-Phase, Encapsulated
Wall Mount**

Standard 411
International 511

Type

Updated style 1
Class I, Div 2 2

kVA Rating / XX

0.5 05
0.75 06
1.0 07
1.5 08
2.0 09
3.0 10
5.0 11

kVA Rating / XX

6.0 12
7.5 13
9.0 14
10.0 15
15.0 16
20.0 17
25.0 18

Primary

120x240
208
240x480
277
600
Specials*
480

Secondary

120/240 1
120/240 2
120/240 3
120/240 4
120/240 5
120/240 6
120/240 7

Wiring

Default 0
Copper 8

Temperature Rise, Shields

135°C Rise*, no shield 0
135°C Rise*, with shield 1
95°C Rise*, no shield 2
95°C Rise*, with shield 3
80°C Rise*, no shield 4
80°C Rise*, with shield 5
115°C Rise#, no shield 6
115°C Rise#, with shield 7

* 25°C ambient # 40°C ambient

Taps

No taps 0
2@2.5% FCBN 1
2@2.5% FCAN, 2@2.5 FCBN 2
4@2.5% FCBN 3
2@5% FCBN 4
1@5% FCAN, 1@5% FCBN 5
2@5% FCAN, 4@2.5 FCBN 6

* Suffix defined incrementally

⚠ Not all features listed are compatible

Single-Phase Encapsulated General Purpose Transformers

.050 - 1 kVA, 95°C Temperature Rise, 1.5 - 25 kVA, 135°C Temperature Rise

120 x 240V — 120/240V • Taps: None												
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	(G) inches	Est Ship Wgt	Shield	Wiring Diagram
.50	411-0051-120	2	10.2	5.1	4.6	9.1	8.4	2.25		15	YES	S240A
1.0	411-0071-120	2	10.2	5.1	4.6	9.1	8.4	2.25		19	YES	S240A
2.0	411-0091-120	3	12.5	6.7	5.4	10.6	12	2.25		41	YES	S240A
3.0	411-0101-120	3	14.6	7.6	7.2	12.7	14.1	3.5		68	YES	S240A
5.0	411-0111-120	3	14.6	7.6	7.2	12.7	14.1	3.5		93	NO	S240A
7.5	411-0131-120	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	130	NO	S240A
10	411-0151-120	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	155	NO	S240A
15	411-0161-120	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	255	NO	S240A
25	411-0181-120	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	295	NO	S240A
240 x 480V — 120/240V • Taps: None												
0.05	411-0001-000	2	8.1	3.3	3.1	6.8	6.2	2.3		6	YES	S480A
0.10	411-0021-000	2	8.1	3.3	3.1	6.8	6.2	2.3		6	YES	S480A
0.15	411-0031-000	2	8.1	3.3	3.1	6.8	6.2	2.3		6	YES	S480A
0.25	411-0041-000	2	8.1	3.3	3.1	6.8	6.2	2.3		7	YES	S480A
0.50	411-0051-000	2	10.2	5.1	4.6	9.1	8.4	2.3		15	NO	S480A
0.75	411-0061-000	2	10.2	5.1	4.6	9.1	8.4	2.3		18	NO	S480A
1.0	411-0071-000	2	10.2	5.1	4.6	9.1	8.4	2.3		19	NO	S480A
1.5	411-0081-000	3	12.5	6.7	5.3	10.6	12.0	2.3		33	NO	S480A
2.0	411-0091-000	3	12.5	6.7	5.3	10.6	12.0	2.3		41	NO	S480A
3.0	411-0101-000	3	14.6	7.6	7.2	12.7	14.1	3.5		68	NO	S480A
5.0	411-0111-000	3	14.6	7.6	7.2	12.7	14.1	3.5		93		S480A
7.5	411-0131-000	4	16.1	13.5	8.6	10.6	8.3	12.0	5.5	130		S480A
10.0	411-0151-000	4	16.1	13.5	8.6	10.6	8.3	12.0	5.5	155		S480A
15.0	411-0161-000	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	255		S480A
25.0	411-0181-000	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	295		S480A
240 x 480V — 120/240V • Taps: 2-2.5% FCAN + 2-2.5% FCBN												
3.0	411-0104-300	3	14.6	7.6	7.2	12.7	14.1	3.5		68	YES	S480B
5.0	411-0114-300	3	14.6	7.6	7.2	12.7	14.1	3.5		93	YES	S480B
7.5	411-0134-300	4	16.1	13.5	8.6	10.6	8.3	12.0	5.5	130	YES	S480B
10.0	411-0154-300	4	16.1	13.5	8.6	10.6	8.3	12.0	5.5	155	YES	S480B
15.0	411-0164-300	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	255	NO	S480B
25.0	411-0184-300	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	291	NO	S480B

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

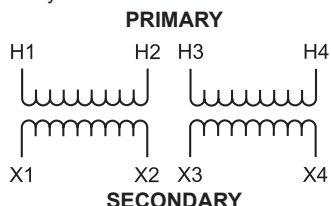
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams

S240A Wiring Diagram & Connections

Wiring Diagram

Primary: 120 x 240 Volts
Secondary: 120/240 Volts



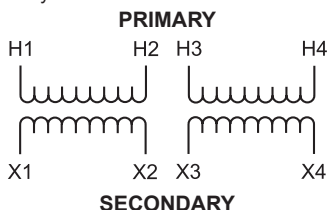
Connections

Primary Volts	Interconnect	Primary Lines Connect To
240	H2 to H3	H1, H4
120	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S480A Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 120/240 Volts



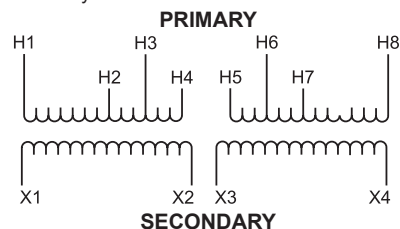
Connections

Primary Volts	Interconnect	Primary Lines Connect To
480	H2 to H3	H1, H4
240	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S480B Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 120/240 Volts



Connections

Primary Volts	Interconnect	Primary Lines Connect To
504	H4 to H5	H1 and H8
492	H3 to H5	H1 and H8
480	H3 to H6	H1 and H8
468	H2 to H6	H1 and H8
456	H2 to H7	H1 and H8
252	H1 to H5 H4 to H8	H1 and H8
240	H1 to H6 H3 to H8	H1 and H8
228	H1 to H7 H2 to H8	H1 and H8
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1 and X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

More wiring diagrams can be found in catalog's appendix, section 15.
Use the "Find a Product" tool on our website for detailed specification sheets.
For further information, contact an Application Engineer at 800-892-3755,
technical_services@jeffersonelectric.com

Pool and Spa Lighting 100-1000 Watts

Applications

- For use with submersible fixtures including swimming pools, water fountains, low voltage circuits near water or other shock hazards
- Transformers themselves are not submersible

Specifications

- NEMA3R-rated enclosures
- 60 Hz operation
- Aluminum windings
- Cores of high quality electrical steel
- Encapsulated with electrical grade resin
- Electrostatic shields
- 12, 13, 14 volt taps to compensate for voltage drop on long electrical runs
- Heat-cured ASA-61 gray powder coat finish

Features, Functions, Benefits

- Resettable power circuit breakers to interrupt if a short or over-voltage occurs
- Wall mount design
- Quiet operation for installation flexibility



Standards

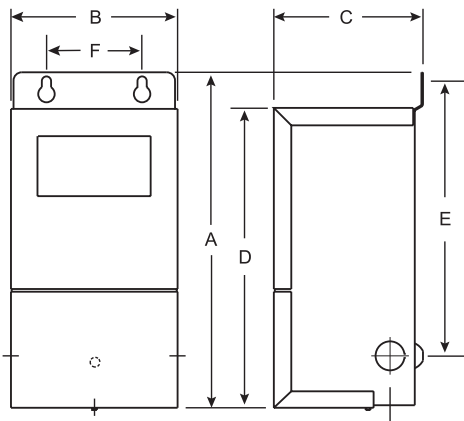
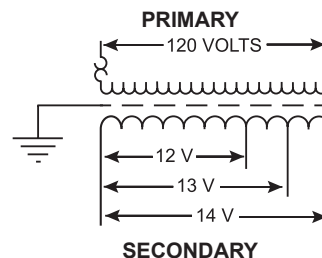
- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- Other sizes, voltages and temperature rises available
- Copper windings
- CE Marked units available as custom

Approvals



Enclosure Figure**Figure 2****Wiring Diagram****S120A Wiring Diagram & Connections****Wiring Diagram****Connections**

Primary Volts	Primary Lines Connect To
120	H1, H2
Secondary Volts	Secondary Lines Connect To
12	± and 12V
13	± and 13V
14	± and 14V

More wiring diagrams can be found in catalog's appendix, section 15. Use the "Find a Product" tool on our website for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Pool & Spa Lighting Transformers

0.1 - 1 kVA, 135°C Temperature Rise

120V — 12/13/14V Encapsulated for submersible fixtures • electrostatic shield

Lamp Watts	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	Est Ship Wgt	Wiring Diagram
100	411-0938-055	2	10.2	5.1	4.6	9.1	8.4	2.25	12.5	S120A
300	411-0939-055	2	10.2	5.1	4.6	9.1	8.4	2.25	13.0	S120A
500	411-0940-055	2	10.2	5.1	4.6	9.1	8.4	2.25	14.0	S120A
1,000	411-0941-055	2	10.2	5.1	4.6	9.1	8.4	2.25	18.0	S120A

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

3 to 75 kVA

Applications

- For general loads, indoors or out, including lighting, industrial and commercial applications

Specifications

- NEMA3R-rated enclosures
- 60 Hz operation
- Aluminum windings
- 135°C temperature rise for 3 to 75 kVA
- Encapsulated with electrical grade resin
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel
- Primary taps on most models

Features, Functions, Benefits

- Large connection compartment with knockouts for ease of wiring and installation
- Slotted mounting holes for quick and easy mounting
- Convenient wall mount design with lifting hooks up to 15 kVA
- 30 to 75 kVA units are floor mount designs
- Many sizes in stock and available for immediate shipment
- Quiet operation for installation flexibility
- Seismic qualification certification for all units



Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- 50/60 Hz optional
- Other sizes, voltages and temperature rises available
- Copper windings
- CE Marked units available as custom
- Class I Div 2 units available

Approvals



Enclosure Figures

Figure 4

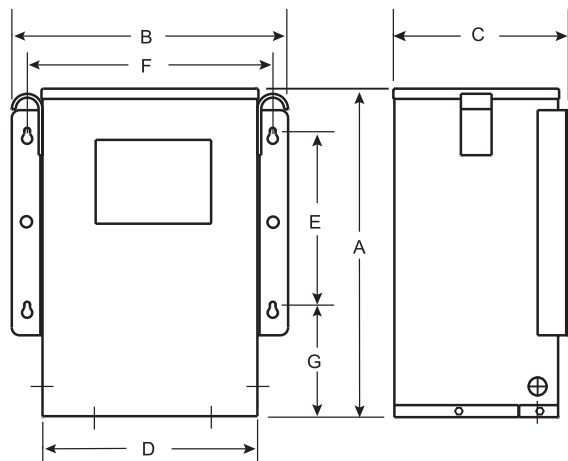
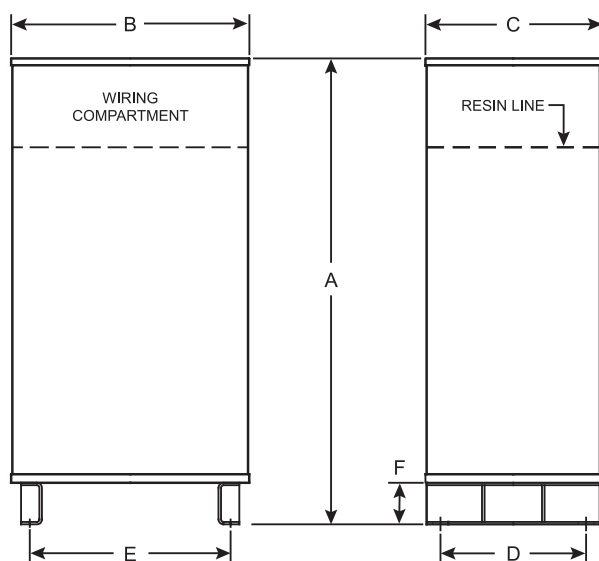


Figure 21



Model Numbers Defined *

413-TXXY-ABC

Three-Phase, Encapsulated			
Standard		413	
50/60 Hz		513	
Type			
Standard		1	
Updated style		3	
Class I, Div 2		2	
kVA Rating / XX		kVA Rating / XX	
3.0	10	20	17
5.0	11	25	18
6.0	12	30	19
7.5	13	37.5	20
9.0	14	45	21
10.0	15	50	22
15.0	16	75	23

Primary	Secondary	
208	480Y/277	1
240	208Y/120	2
240	480Y/277	3
480	208Y/120	4
480	480Y/277	5
Specials*		6
480	240 Delta	7
480	240 Delta	8
600	208Y/120	9
Reserved for special items		0

Wiring	
Default	0
Copper	8

Temperature Rise	
135°C Rise	0
115°C Rise	1
70°C Rise	7
80°C Rise	8
95°C Rise	9

Shields	
No shield	0
Shield	5

* Suffix defined incrementally

☆ Not all features listed are compatible

Three-Phase Encapsulated General Purpose Transformers

135°C Temperature Rise with 25° Ambient • NEMA3R Enclosures • Taps: 2 @ 5% FCBN

480V — 208Y/120V											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	(G) inches	Est Ship Wgt	Wiring Diagram
3	413-1104-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	110	T480A
6	413-1124-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	140	T480A
9	413-1144-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	190	T480A
15	413-1164-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	245	T480A
30	413-3194-000	21	33	23	9.5	7	20.5	3		890	T480A
45	413-3214-000	21	36	25	11	8.5	21.75	3		980	T480A
75	413-1234-000	21	37	25	12.5	10.5	22.5	3		1050	T480A
480V — 240V											
3	413-1107-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	110	T480B
6	413-1127-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	140	T480B
9	413-1147-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	190	T480B
15	413-1167-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	228	T480B
30	413-1197-000	21	33	23	9.5	7	20.5	3		890	T480B
45	413-1217-000	21	36	25	11	8.5	21.75	3		980	T480B
75	413-1237-000	21	37	25	12.5	10.5	22.5	3		1050	T480B
600V — 208Y/120V											
3	413-1109-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	110	T600A
6	413-1129-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	140	T600A
9	413-1149-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	190	T600A
15	413-1169-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	245	T600A
30	413-1199-000	21	33	23	9.5	7	20.5	3		890	T600A
45	413-1219-000	21	36	25	11	8.5	21.75	3		980	T600A
75	413-1239-000	21	37	25	12.5	10.5	22.5	3		1050	T600A
600V — 480Y/277V											
3	413-110B-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	110	T600H
6	413-112B-000	4	13.1	15.1	8.1	12.3	5.3	13.6	5.5	140	T600H
9	413-114B-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	190	T600H
15	413-116B-000	4	15.1	19	9.1	16.1	8.3	17.5	5.1	245	T600H
30	413-119B-000	21	33	23	9.5	7	20.5	3		890	T600H
45	413-121B-000	21	36	25	11	8.5	21.75	3		980	T600H
75	413-123B-000	21	37	25	12.5	10.5	22.5	3		1050	T600H

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

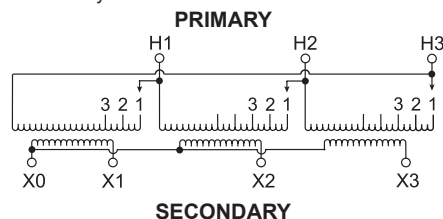
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Enclosure Figures

T480A Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



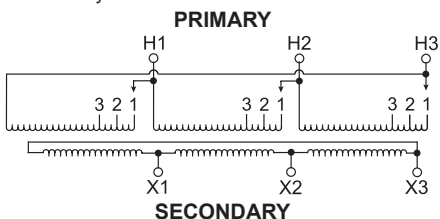
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
480	1	H1, H2, H3
456	2	H1, H2, H3
432	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 Phase		

T480B Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240 Volts Delta



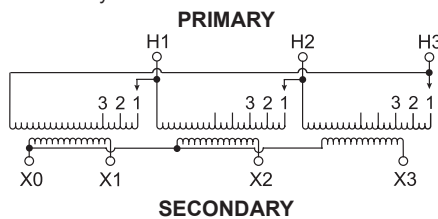
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
480	1	H1, H2, H3
456	2	H1, H2, H3
432	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	

T600A Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 208Y/120 Volts



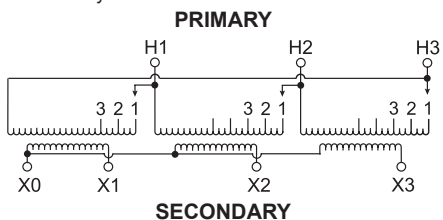
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
600	1	H1, H2, H3
570	2	H1, H2, H3
540	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T600H Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 480Y/277 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
600	1	H1, H2, H3
570	2	H1, H2, H3
540	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
480	X1, X2, X3	
277	Between X0 and X1 or X2 or X3	
1 phase		

More wiring diagrams can be found in catalog's appendix, section 15.
Use the "Find a Product" tool on our website for detailed specification sheets.
For further information, contact an Application Engineer at 800-892-3755,
technical_services@jeffersonelectric.com

50 VA to 10 kVA

Applications

- A comprehensive line of transformers for low voltage applications.
- Economical for stepping voltages up or down
- Solve over/under voltage problems efficiently
- Low voltage lighting applications
- International voltage adaptation

Specifications

- Encapsulated with electrical grade resin
- 60 Hz standard
- Single-phase encapsulated isotransformer / autotransformer
 - 120 x 240V— 12/24V
 - 120 x 240V— 16/32V
 - 240 x 480V— 24/48V
- Three phase autotransformer configurations, using multiple single phase units
- 95°C temperature rise for 0.5 to 1 kVA
135°C temperature rise for 1.5 to 10 kVA
- 180°C insulation class
- NEMA3R-rated enclosures
- Heat-cured ASA-61 gray powder coat finish
- Cores of high quality electrical steel

Features, Functions, Benefits

- Slotted mounting holes for quick and easy installation
- Convenient wall mount design with lifting hooks for units 5 kVA and above
- **NOTE: Buck-Boost transformers do not compensate for fluctuating line voltages**



Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- Other sizes, voltages available
- 50/60 Hz options
- Copper windings
- CE Marked units available as custom

Approvals



Buck-Boost transformers are low voltage isolation transformers that can be connected in an autotransformer arrangement to provide a convenient and economical way to raise or lower single and three-phase voltages from 5-20%. The autotransformer arrangement allows smaller and less expensive Buck-Boost transformers to supply large power loads.

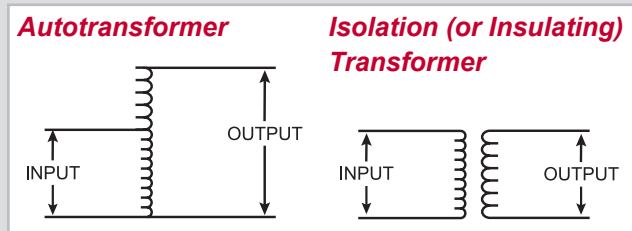
Solve over/under line voltage problems efficiently and economically.

Electrical equipment is manufactured to operate most efficiently when the line voltage is close to the nameplate rating of the equipment. A motor operated at a voltage substantially under its nameplate rating may run constantly on the starting windings, resulting in overheating and possible burn-out. The same motor operated at a voltage substantially over its nameplate rating is subject to excessive heat rise, often higher than the insulation temperature limits, which may eventually cause the motor to burn out.

The difference between an autotransformer and an isolation transformer.

In an autotransformer, the input (or primary) and the output (or secondary) are electrically connected. In an isolation transformer they are completely separated, as shown to the right.

Only a portion of the electrical energy is changed in an autotransformer, the remainder flows directly between the primary and secondary. In an isolation transformer, all the energy is transformed. For these reasons, an autotransformer is smaller, lighter and less costly than a comparable isolation transformer.



Caution: Buck-Boost transformers will not compensate for fluctuating line voltages. They should only be used when line voltage is relatively constant.

Model Numbers Defined*

416-YYXX-ABC

Buck-Boost Models

Primary	Secondary	
120x240	12/24	11
120x240	16/32	12
240x480	24/48	14
120x240	12/24	21
120x240	16/32	22
240x480	24/48	24

kVA Rating

YY = 11, 12, 14	YY = 21, 22, 24
Digit XX kVA	Digit XX kVA
00 0.05	01 7.50
01 0.10	11 10.00
11 0.15	21 15.00
21 0.25	31 20.00
31 0.50	41 25.00
41 0.75	51 30.00
51 1.00	
61 1.50	
71 2.00	
81 3.00	
91 5.00	

Wiring

Default	0
Copper	8

Temperature Rise

135°C	0
115°C	1

Shield

No shield	0
Shield	5

* Not all features listed are compatible

How to Use the Buck-Boost Rapid Selector Charts

You will need the following information:

Line voltage:

This can be determined by measuring the supply line voltage with a voltmeter.

Load voltage:

The voltage at which your equipment was designed to operate. Usually listed on the equipment nameplate.

Load kVA or load amps:

One of these will usually be listed on the nameplate. You do not need both.

Supply line and equipment frequencies:

This will be either 50 or 60 Hertz. The supply line frequency must be the same as the frequency of the equipment to be operated.

Supply line and equipment phase:

Either single-phase or three-phase. The line phase must be the same as the equipment.

The type of electrical configuration:

Delta or Wye.

Follow These Five Easy Steps:

- 1.** Find the appropriate single-phase, three-phase delta or three-phase wye table.
- 2.** Read down the voltage column and find the nearest ratio of required load voltage to line voltage for the application desired. (High and low voltage may be either input or output voltage depending on the circumstances.)
- 3.** Reading horizontally across the line beginning with your application voltage ratio, locate in one of the kVA columns a kVA capacity equal to or larger than your load requirement.
- 4.** Note the two digit number at the top of the kVA column listing the kVA capacity you require.
- 5.** In the catalog number column, add these two digits to the catalog number next to the voltage ratio you found in step one.

Example:

Assume the following information

- 1.** A reasonably constant line voltage of 440 volts.
- 2.** A required equipment voltage of 480 volts.
- 3.** 26.0 kVA load capacity needed.
- 4.** Single-phase line and equipment.

In the voltage column, 437 is closest to our line voltage of 440. The 480 high voltage meets our requirements exactly.

Reading horizontally across this line, find 30.0 kVA, the closest larger kVA to our required 26.0.

Going to the very top of this column, take the two digit number, 81, and add it on the end of the catalog number on the same line as our high/low voltage. The catalog number 416-14, with 81 added on the end, is 416-1481.

NOTE: In this example with input of 440V the actual output will be 483V



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

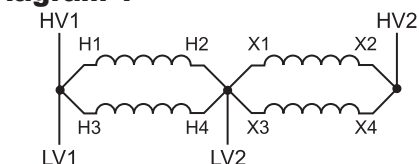
Single-phase kVA capacity of encapsulated Buck-Boost autotransformers

Maximum load capabilities

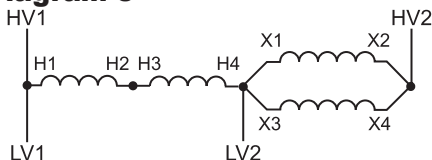
Low Voltage (LV)	High Voltage (HV)	Catalog Number	Load Required *	01 .100 kVA	11 .150 kVA	21 .250 kVA	31 .500 kVA	41 .750 kVA	51 1.0 kVA	61 1.5 kVA	71 2.0 kVA	81 3.0 kVA	91 5.0 kVA	Wiring Diagram
Enclosure Figures				Use Figure 2							Use Figure 3			
95	120	416-12XX	kVA	.37	.56	.94	1.8	2.8	3.7	5.6	7.5	11.2	18.8	2
			AMPS	3.95	5.93	9.89	19.7	29.6	39.5	59.3	79.1	118	197	
100	120	416-11XX	kVA	.50	.75	1.25	2.50	3.7	5.0	7.5	10.0	15.0	25.0	2
			AMPS	5.0	7.5	12.5	25.0	37.0	50.0	75.0	100	150	250	
106	120	416-12XX	kVA	.75	1.12	1.87	3.7	5.6	7.5	11.2	15.0	22.5	37.0	1
			AMPS	7.07	10.5	17.6	34.9	52.8	70.7	105	141	212	349	
109	120	416-11XX	kVA	1.00	1.50	2.50	5.0	7.5	10.0	15.0	20.0	30.0	50.0	1
			AMPS	9.17	13.7	22.9	45.8	68.8	91.7	137	183	275	458	
120	132	416-11XX	kVA	1.10	1.65	2.75	5.5	8.2	11.0	16.5	22.0	33.0	55.0	1
			AMPS	9.17	13.7	22.9	45.8	68.6	91.7	137	183	275	458	
120	136	416-12XX	kVA	.85	1.27	2.12	4.2	6.3	8.5	12.7	17.0	25.5	42.0	1
			AMPS	7.08	10.5	17.6	35.0	52.5	70.8	105	141	212	350	
120	144	416-11XX	kVA	.60	.90	1.50	3.0	4.5	6.0	9.0	12.0	18.0	30.0	2
			AMPS	5.0	7.5	12.5	25.0	37.5	50.0	75.0	100	150	250	
120	152	416-12XX	kVA	.47	.71	1.18	2.3	3.5	4.7	7.1	9.5	14.2	23.0	2
			AMPS	3.91	5.91	9.83	19.1	29.1	39.1	59.1	79.1	118	191	
200	240	416-14XX	kVA	.50	.75	1.25	2.5	3.7	5.0	7.5	10.0	15.0	25.0	2
			AMPS	2.50	3.75	6.25	12.5	18.7	25.0	37.5	50.0	75.0	125	
208	236	416-12XX	kVA	.7	1.10	1.84	3.6	5.5	7.3	11.0	14.7	22.1	36.8	4
			AMPS	3.53	5.28	8.82	17.4	26.4	35.3	52.8	70.7	106	174	
212	240	416-12XX	kVA	.75	1.12	1.87	3.7	5.6	7.5	11.2	15.0	22.5	37	4
			AMPS	3.53	5.28	8.82	17.4	26.4	35.3	52.8	70.7	106	174	
208	230	416-11XX	kVA	.95	1.4	2.3	4.7	7.1	9.5	14.3	19.0	28.6	47.6	4
			AMPS	4.58	6.88	11.4	22.9	34.4	45.8	68.8	91.7	137	229	
218	240	416-11XX	kVA	1.00	1.5	2.5	5.0	7.5	10.0	15.0	20.0	30.0	50.0	4
			AMPS	4.58	6.88	11.4	22.9	34.4	45.8	68.8	91.7	137	229	
225	240	416-12XX	kVA	1.5	2.25	3.75	7.5	11.2	15.0	22.5	30.0	45.0	75.0	3
			AMPS	6.66	10.0	16.6	33.3	49.7	66.6	100	133	200	333	
230	276	416-14XX	kVA	.57	.86	1.43	2.8	4.3	5.7	8.6	11.5	17.2	28.7	2
			AMPS	2.50	3.75	6.25	12.5	18.7	25.0	37.5	45.0	75.0	124	
240	252	416-11XX	kVA	2.1	3.15	5.25	10.5	15.7	21.0	31.5	42.0	63.0	105	3
			AMPS	8.75	13.1	21.8	43.7	65.4	87.5	131	175	262	437	
240	264	416-11XX	kVA	1.1	1.65	2.75	5.5	8.2	11.0	16.5	22.0	33.0	55.0	4
			AMPS	4.58	6.87	11.4	22.9	34.1	45.8	68.7	91.6	137	229	
240	272	416-12XX	kVA	.85	1.27	2.12	4.2	6.3	8.5	12.7	17.0	25.5	42.0	4
			AMPS	3.54	5.29	8.83	17.5	26.2	35.4	52.9	70.8	106	175	
240	288	416-14XX	kVA	.60	.90	1.50	3.0	4.5	6.0	9.0	12.0	18.0	30.0	2
			AMPS	2.5	3.75	6.25	12.5	18.7	25.0	37.5	50.0	75.0	125	
437	480	416-14XX	kVA	1.00	1.50	2.50	5.0	7.5	10.0	15.0	20.0	30.0	50.0	4
			AMPS	2.28	3.43	5.72	11.4	17.1	22.8	34.3	45.7	68.6	114	
457	480	416-14XX	kVA	2.0	3.0	5.0	10.0	15.0	20.0	30.0	40.0	60.0	100	3
			AMPS	4.37	6.56	10.9	21.8	32.8	43.7	65.6	87.5	131	218	
480	504	416-14XX	kVA	2.1	3.15	5.25	10.5	15.7	21.0	31.5	42.0	63.0	105	3
			AMPS	4.37	6.56	10.9	21.8	32.8	43.7	65.6	87.5	131	218	
480	528	416-14XX	kVA	1.1	1.65	2.75	5.5	8.2	11.0	16.5	22.0	33.0	55.0	4
			AMPS	2.29	3.43	5.72	11.4	17.0	22.9	34.3	45.8	68.7	114	

* Load required is based on the high voltage as the load

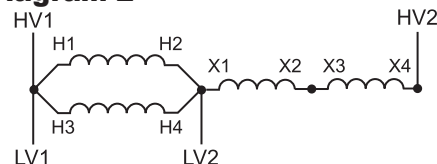
Wiring Diagram 1



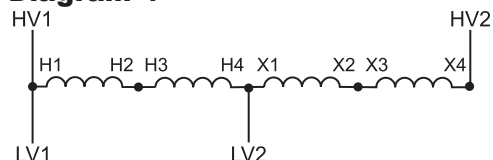
Wiring Diagram 3



Wiring Diagram 2



Wiring Diagram 4



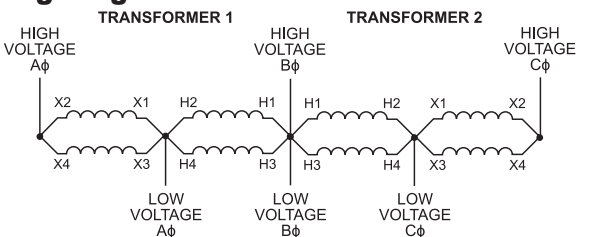
Three-phase kVA capacity of encapsulated Buck-Boost autotransformers connected in open-delta

Maximum load capabilities requiring two Buck-Boost Transformers

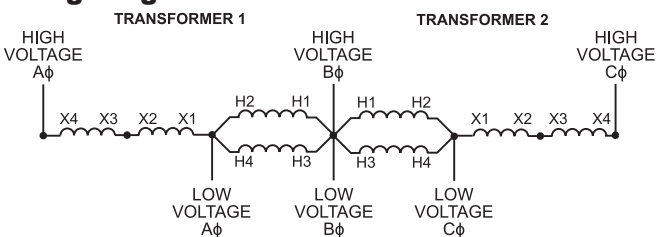
Low Voltage (LV)	High Voltage (HV)	Catalog Number	Load Required *	01 .100 kVA	11 .150 kVA	21 .250 kVA	31 .500 kVA	41 .750 kVA	51 1.0 kVA	61 1.5 kVA	71 2.0 kVA	81 3.0 kVA	91 5.0 kVA	Wiring Diagram
Enclosure Figures				Use Figure 2							Use Figure 3			
200	240	416-14XX	kVA	.86	1.29	2.1	4.3	6.4	8.6	12.9	17.2	25.0	43.0	10
			AMPS	2.1	3.1	5.1	10.3	15.4	20.7	31.0	41.4	60.1	103.4	
208	236	416-12XX	kVA	1.27	1.91	3.1	6.3	9.5	12.7	19.1	25.5	38.2	63.7	12
			AMPS	3.1	4.7	7.6	15.4	23.2	31.1	46.7	62.4	93.4	155.8	
212	240	416-12XX	kVA	1.29	1.94	3.2	6.4	9.7	12.9	19.4	25.8	38.0	64.0	12
			AMPS	3.1	4.7	7.7	15.4	23.3	31.0	46.7	62.1	91.4	154.0	
208	230	416-11XX	kVA	1.65	2.47	4.1	8.2	12.3	16.5	24.7	33.0	49.5	82.5	12
			AMPS	4.1	6.2	10.3	20.6	30.9	41.4	62.0	82.8	124.3	207.1	
218	240	416-11XX	kVA	1.73	2.59	4.3	8.6	12.9	17.3	25.9	34.6	51.0	86.0	12
			AMPS	4.2	6.2	10.3	20.7	31.0	41.6	62.3	83.2	122.7	206.9	
225	240	416-12XX	kVA	2.59	3.89	6.4	12.9	19.4	25.9	38.9	51.9	77.0	129	11
			AMPS	6.2	9.4	15.4	31.0	46.7	62.3	93.6	124.8	185.2	310.3	
229	240	416-11XX	kVA	3.46	5.18	8.6	17.3	25.9	34.6	51.8	69.2	103	173	11
			AMPS	8.3	12.5	20.7	41.6	62.3	83.2	124.6	166.5	247.8	416.2	
230	253	416-14XX	kVA	1.81	2.72	4.5	9.0	13.6	18.1	27.2	36.3	54.0	90.0	9
			AMPS	4.1	6.2	10.3	20.5	31.0	41.3	62.1	82.8	123.2	205.4	
230	276	416-14XX	kVA	0.99	1.49	2.4	4.9	7.4	9.9	14.9	19.9	29.0	49.0	10
			AMPS	2.1	3.1	5.0	10.2	15.5	20.7	31.2	41.6	60.7	102.5	
240	252	416-11XX	kVA	3.64	5.47	9.1	18.2	27.2	36.4	54.7	72.8	109	182	11
			AMPS	8.3	12.5	20.8	41.7	62.3	83.4	125.3	166.8	249.7	417.0	
240	264	416-11XX	kVA	1.9	2.86	4.7	9.5	14.2	19.0	28.6	38.1	57.0	95.0	12
			AMPS	4.2	6.3	10.3	20.8	31.1	41.6	62.5	83.3	124.7	207.8	
240	272	416-12XX	kVA	1.47	2.2	3.6	7.3	11.0	14.7	22.0	29.4	44.1	73.6	12
			AMPS	3.1	4.7	7.6	15.5	23.3	31.2	46.7	62.4	93.6	156.2	
240	288	416-14XX	kVA	1.03	1.55	2.5	5.1	7.7	10.3	15.5	20.7	31.0	51.0	10
			AMPS	2.1	3.1	5.0	10.2	15.4	20.6	31.1	41.5	62.3	102.2	
437	480	416-14XX	kVA	1.73	2.59	4.3	8.6	12.9	17.3	25.9	34.6	51.0	86.0	12
			AMPS	2.1	3.1	5.2	10.3	15.5	20.8	31.2	41.6	61.3	103.4	
457	480	416-14XX	kVA	3.46	5.18	8.6	17.3	25.9	34.6	51.8	69.2	103	173	11
			AMPS	4.2	6.2	10.3	20.8	31.2	41.6	62.3	83.2	123.9	208.1	
480	504	416-14XX	kVA	3.64	5.47	9.1	18.2	27.2	36.4	54.7	72.8	109	183	11
			AMPS	4.2	6.3	10.4	20.8	31.2	41.7	62.7	83.4	124.9	209.6	
480	528	416-14XX	kVA	1.9	2.86	4.7	9.5	14.2	19.0	28.6	38.1	57.0	95.0	12
			AMPS	2.1	3.1	5.1	10.4	15.5	20.8	31.3	41.7	62.3	103.9	

* Load required is based on the high voltage as the load

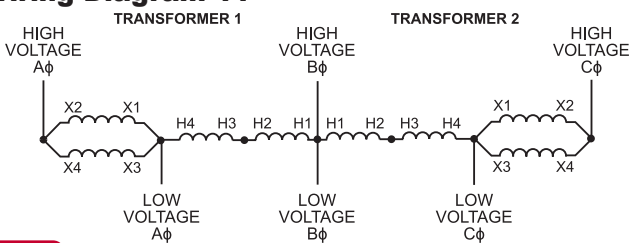
Wiring Diagram 9



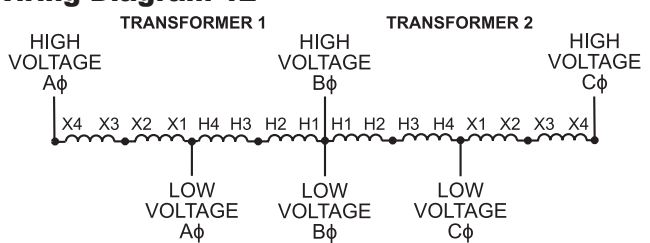
Wiring Diagram 10



Wiring Diagram 11



Wiring Diagram 12



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

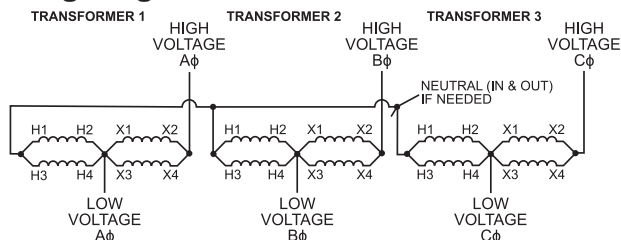
Three-phase kVA capacity of encapsulated Buck-Boost autotransformers connected in Wye

Maximum load capabilities requiring three Buck-Boost Transformers

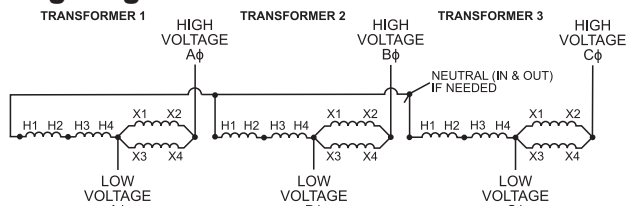
Low Voltage (LV)	High Voltage (HV)	Catalog Number	Load Required *	01 .100 kVA	11 .150 kVA	21 .250 kVA	31 .500 kVA	41 .750 kVA	51 1.0 kVA	61 1.5 kVA	71 2.0 kVA	81 3.0 kVA	91 5.0 kVA	Wiring Diagram
Enclosure Figures				Use Figure 2							Use Figure 3			
164	208	416-12XX	kVA	1.1	1.7	2.8	5.6	8.4	11.2	16.8	22.0	34.0	56.0	6
			AMPS	3.89	5.89	9.79	18.9	29.4	38.9	58.9	78.9	117	197	
173	208	416-11XX	kVA	1.5	2.2	3.7	7.5	11.2	15.0	22.5	30.0	45.5	75.0	6
			AMPS	5.0	7.5	12.5	25.0	37.0	50.0	75.0	100	150	250	
183	208	416-12XX	kVA	2.2	3.3	5.6	11.2	16.8	22.5	33.7	45.0	67.0	112	5
			AMPS	7.07	10.5	17.6	34.9	52.8	70.7	105	141	212	354	
189	208	416-11XX	kVA	3.0	4.5	7.5	15.0	22.5	30.0	45.0	60.0	90.0	150	5
			AMPS	9.17	13.7	22.9	45.8	68.8	91.7	137	183	275	458	
208	229	416-11XX	kVA	3.3	4.9	8.2	16.5	24.7	33.0	49.5	66.0	99.0	165	5
			AMPS	9.17	13.7	22.9	45.8	68.8	91.7	137	183	275	458	
208	235	416-12XX	kVA	2.5	3.8	6.3	12.7	19.1	25.5	38.2	51.0	76.5	127	5
			AMPS	7.08	10.5	17.6	35.0	52.5	70.8	105	141	212	350	
208	249	416-11XX	kVA	1.8	2.7	4.5	9.0	13.5	18.0	27.0	36.0	54.0	90.0	6
			AMPS	5.0	7.5	12.5	25.0	37.5	50.0	75.0	100	150	250	
208	263	416-12XX	kVA	1.4	2.1	3.5	7.1	10.6	14.2	21.4	28.0	42.0	71.0	6
			AMPS	3.91	5.91	9.83	19.1	29.1	39.1	59.1	79.1	118	191	
346	416	416-14XX	kVA	1.5	2.2	3.7	7.5	11.2	15.0	22.5	30.0	45.0	75.0	6
			AMPS	2.5	3.75	6.25	12.5	18.5	25.0	37.5	50.0	75.0	125	
367	416	416-12XX	kVA	2.2	3.3	5.6	11.2	16.8	22.5	33.7	45.0	67.0	112	8
			AMPS	3.53	5.28	8.82	17.4	26.4	35.3	52.8	70.7	106	174	
378	416	416-11XX	kVA	3.0	4.5	7.5	15.0	22.5	30.0	45.0	60.0	90.0	150	8
			AMPS	4.58	6.88	11.4	22.9	34.4	45.8	68.8	91.7	137	229	
390	416	416-12XX	kVA	4.5	6.7	11.2	22.5	33.7	45.0	67.5	90.0	135	225	7
			AMPS	6.66	10.0	16.6	33.3	49.7	66.6	100	133	200	333	
397	416	416-11XX	kVA	6.0	9.0	15.0	30.0	45.0	60.0	90.0	120	180	300	7
			AMPS	8.73	13.1	21.8	43.6	65.5	87.3	131	174	262	436	
398	438	416-14XX	kVA	3.1	4.7	7.8	15.7	23.6	31.5	47.2	63.0	94.0	157	5
			AMPS	4.56	6.82	11.3	22.6	33.9	45.6	68.2	91.3	136	229	
398	478	416-14XX	kVA	1.7	2.5	4.3	8.6	12.9	17.2	25.9	34.0	51.0	86.0	6
			AMPS	2.50	3.75	6.25	12.5	18.7	25.0	37.5	50.0	75.0	125	
416	437	416-11XX	kVA	6.3	9.4	15.7	31.5	47.2	63.0	94.5	126	189	315	7
			AMPS	8.75	13.1	21.8	43.7	65.4	87.5	131	175	262	437	
416	443	416-12XX	kVA	4.8	7.2	12.0	24.0	36.0	48.0	72.0	96.0	144	240	7
			AMPS	6.66	10.0	16.6	33.3	50.0	66.6	100	133	200	333	
416	457	416-11XX	kVA	3.3	4.9	8.2	16.5	24.7	33.0	49.5	66.0	99.0	165	8
			AMPS	4.58	6.87	11.4	22.9	34.1	45.8	68.7	91.6	137	229	
416	471	416-12XX	kVA	2.5	3.8	6.3	12.7	19.1	25.5	38.2	51.0	76.5	127	8
			AMPS	3.54	5.29	8.83	17.5	26.2	35.4	52.9	70.8	106	175	
416	498	416-14XX	kVA	1.8	2.7	4.5	9.0	13.5	18.0	27.0	36.0	54.0	90.0	6
			AMPS	2.5	3.75	6.25	12.5	18.7	25.0	37.5	50.0	75.0	125	

* Load required is based on the high voltage as the load

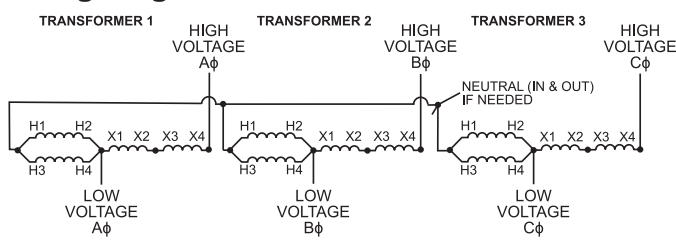
Wiring Diagram 5



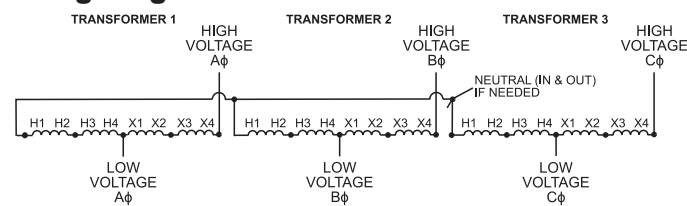
Wiring Diagram 7



Wiring Diagram 6



Wiring Diagram 8



Single-Phase — 600V Class Isolation Transformers

.050 – 1 kVA: 130°C Insulation Class • 1.5 – 10 kVA: 180°C Insulation Class

120 x 240V — 12/24V 60 Hz												
kVA ❖	Catalog Number	Temp Rise	Enclosure Figure	Height (A)	Width (B)	Depth (C)	(D)	(E)	(F)	(G)	Est Ship Wgt	Wiring Diagram
0.05	416-1100-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		4	S240B
0.1	416-1101-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		5	
0.15	416-1111-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		8	
0.25	416-1121-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		6	
0.5	416-1131-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		12	
0.75	416-1141-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		17	
1	416-1151-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		17.8	
1.5	416-1161-000	135	3	12.5	6.69	5.34	10.56	12.0	2.25		26.8	
2	416-1171-000	135	3	12.5	6.69	5.34	10.56	12.0	2.25		33.4	
3	416-1181-000	135	3	14.56	7.56	7.15	12.68	14.12	3.5		62	
5	416-1191-000	135	3	14.56	7.56	7.15	12.68	14.12	3.5		90	
7.5	416-2101-000	135	4	16.12	13.5	8.55	10.62	8.25	12.0	5.5	144	
10	416-2111-000	135	4	16.12	13.5	8.55	10.62	8.25	12.0	5.5	178	
120 x 240V — 16/32V 60 Hz												
kVA ❖	Catalog Number	Temp Rise	Enclosure Figure	Height (A)	Width (B)	Depth (C)	(D)	(E)	(F)	(G)	Est Ship Wgt	Wiring Diagram
0.1	416-1201-000	135	2	8.03	3.31	3.08	6.81	6.19	2.25		5	S240C
0.15	416-1211-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		5	
0.25	416-1221-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		6	
0.5	416-1231-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		15	
0.75	416-1241-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		17	
1	416-1251-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		18	
1.5	416-1261-000	135	3	12.5	6.69	5.34	10.56	12.0	2.25		26.8	
2	416-1271-000	135	3	12.5	6.69	5.34	10.56	12.0	2.25		33.4	
3	416-1281-000	135	3	14.56	7.56	7.15	12.68	14.12	3.5		58	
5	416-1291-000	135	3	14.56	7.56	7.15	12.68	14.12	3.5		95	
7.5	416-2201-000	135	4	16.12	13.5	8.55	10.62	8.25	12.0	5.5	144	
10	416-2211-000	135	4	16.12	13.5	8.55	10.62	8.25	12.0	5.5	178	
240 x 480V — 24/48V 60 Hz												
kVA ❖	Catalog Number	Temp Rise	Enclosure Figure	Height (A)	Width (B)	Depth (C)	(D)	(E)	(F)	(G)	Est Ship Wgt	Wiring Diagram
0.1	416-1401-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		4	S480E
0.15	416-1411-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		5	
0.25	416-1421-000	95	2	8.03	3.31	3.08	6.81	6.19	2.25		6	
0.5	416-1431-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		15	
0.75	416-1441-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		17	
1	416-1451-000	95	2	10.19	5.06	4.59	9.06	8.38	2.25		17.8	
1.5	416-1461-000	135	3	12.5	6.69	5.34	10.56	12.0	2.25		26.8	
2	416-1471-000	135	3	12.5	6.69	5.34	10.56	12.0	2.25		33.4	
3	416-1481-000	135	3	14.56	7.56	7.15	12.68	14.12	3.5		58	
5	416-1491-000	135	3	14.56	7.56	7.15	12.68	14.12	3.5		88	
7.5	416-2401-000	135	4	16.12	13.5	8.55	10.62	8.25	12.0	5.5	144	
10	416-2411-000	135	4	16.12	13.5	8.55	10.62	8.25	12.0	5.5	178	

❖ Also available in 15, 20, 25 and 30 kVA designs

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

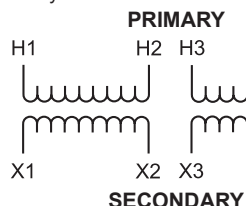
Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Buck-Boost Isolation Transformer Wiring Diagrams

S240B Wiring Diagram & Connections

Wiring Diagram

Primary: 120 x 240 Volts
Secondary: 12/24 Volts



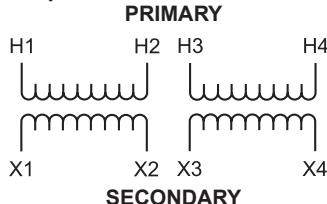
Connections

Primary Volts	Interconnect	Primary Lines Connect To
240	H2 to H3	H1, H4
120	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
24	X2 to X3	X1, X4
12	X1 to X3 X2 to X4	X1, X4

S240C Wiring Diagram & Connections

Wiring Diagram

Primary: 120 x 240 Volts
Secondary: 16/32



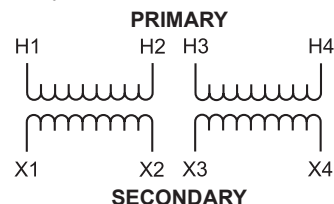
Connections

Primary Volts	Interconnect	Primary Lines Connect To
240	H2 to H3	H1, H4
120	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
32	X2 to X3	X1, X4
16	X1 to X3 X2 to X4	X1, X4

S240E Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 24/48 Volts



Connections

Primary Volts	Interconnect	Primary Lines Connect To
480	H2 to H3	H1, H4
240	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
48	X2 to X3	X1, X4
24	X1 to X3 X2 to X4	X1, X4

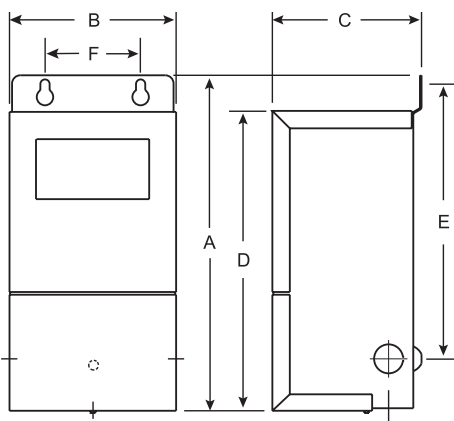
More wiring diagrams can be found in catalog's appendix, section 15.

Use the "Find a Product" tool on our website for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Enclosure Figures

Figure 2



0.050 – 0.250: Single knockout

0.500 – 1.0: Two knockouts

Figure 3

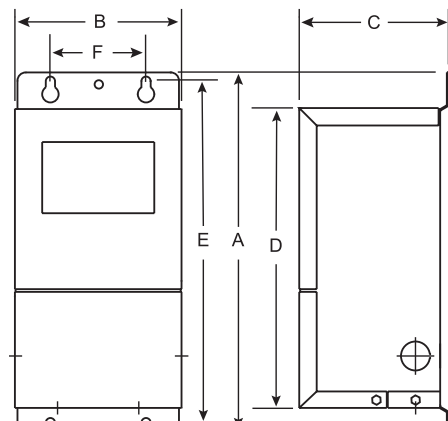
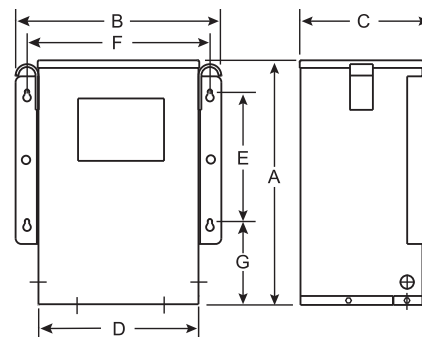


Figure 4



1 to 75 kVA

Applications

- Class I Division 2 units are used in hazardous locations to maintain a safe environment.

Specifications

- Class I Division 2, Groups A, B, C, D
- T3C temperature classification
- 60 Hz operation
- Single Phase: 1 – 25 kVA
- Three Phase: 3 – 75 kVA
- Aluminum windings
- 115°C temperature rise with 40°C ambient
- 180°C insulation class
- Encapsulated with electrical grade resin
- NEMA3R-rated enclosures
- Cores of high quality electrical steel
- Heat-cured ASA-61 gray powder coat finish

Features, Functions, Benefits

- Large connection compartment with knockouts for ease of wiring and installation
- Slotted mounting holes for quick and easy mounting
- Lifting hooks above 5 kVA
- Wall mount design through 25 kVA
- Seismic certification for all units



Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- 50/60 Hz optional
- Other sizes, voltages available
- Copper windings
- 304 or 316 grade stainless steel enclosure to meet corrosion resistance requirements.
- CE Marked units available as custom

Approvals



Enclosure Figures

Figure 2

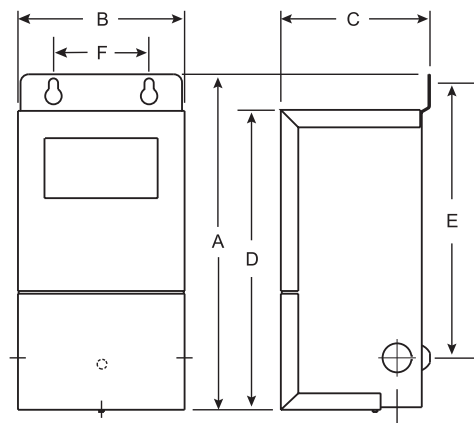


Figure 3

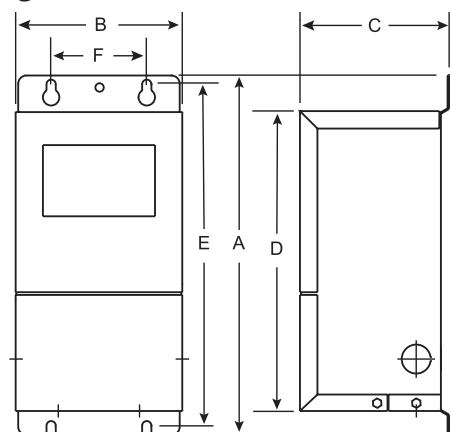
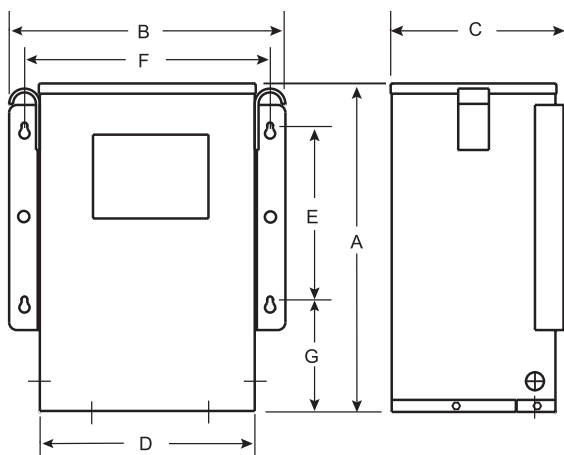


Figure 4



Model Numbers Defined *

411-2XXY-ABC

Single-Phase, Encapsulated
Wall Mount

Standard 411

International 511

Type

Class I, Div 2 2

kVA Rating / XX kVA Rating / XX

0.5 05 6.0 12

0.75 06 7.5 13

1.0 07 9.0 14

1.5 08 10.0 15

2.0 09 15.0 16

3.0 10 20.0 17

5.0 11 25.0 18

Primary Secondary

120x240 120/240 1

208 120/240 2

240x480 120/240 3

277 120/240 4

600 120/240 5

Specials* 6

480 120/240 7

Wiring

Default 0

Copper 8

Temperature Rise, Shields
all models 40°C ambient

135°C Rise, no shield 0

135°C Rise, with shield 1

95°C Rise, no shield 2

95°C Rise, with shield 3

80°C Rise, no shield 4

80°C Rise, with shield 5

115°C Rise, no shield 6

115°C Rise, with shield 7

Taps

No taps 0

2@2.5% FCBN 1

2@2.5% FCAN, 2@2.5 FCBN 2

4@2.5% FCBN 3

2@5% FCBN 4

1@5% FCAN, 1@5% FCBN 5

2@5% FCAN, 4@2.5 FCBN 6

* Suffix defined incrementally

* Not all features listed are compatible

Class I Division 2, Single Phase

115°C Temperature Rise, 40°C ambient

120 x 240V — 120/240V, Taps: None											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	(G) inches	Est Ship Wgt	Wiring Diagram
1.0	411-2071-060	2	10.2	5.1	4.6	9.1	8.4	2.25		19	S240A
2.0	411-2091-060	3	12.5	6.7	5.4	10.6	12	2.25		41	S240A
3.0	411-2101-060	3	14.6	7.6	7.2	12.7	14.1	3.5		68	S240A
5.0	411-2111-060	3	14.6	7.6	7.2	12.7	14.1	3.5		93	S240A
7.5	411-2131-060	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	130	S240A
10.0	411-2151-060	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	155	S240A
15.0	411-2161-060	4	21.1	16.5	10.1	13.7	12.5	15	6.3	255	S240A
25.0	411-2181-060	4	21.1	16.5	10.1	13.7	12.5	15	6.3	295	S240A
208V — 120/240V, Taps: None											
1.0	411-2072-060	2	10.2	5.1	4.6	9.1	8.4	2.3		19	S208A
2.0	411-2092-060	3	12.5	6.7	5.3	10.6	12.0	2.3		41	S208A
3.0	411-2102-060	3	14.6	7.6	7.2	12.7	14.1	3.5		68	S208A
5.0	411-2112-060	3	14.6	7.6	7.2	12.7	14.1	3.5		93	S208A
7.5	411-2132-060	4	16.1	13.5	8.6	10.6	8.3	12.0	5.5	130	S208A
10.0	411-2152-060	4	16.1	13.5	8.6	10.6	8.3	12.5	5.5	155	S208A
15.0	411-2162-060	4	21.1	16.5	10.1	13.7	12.5	15	6.3	255	S208A
25.0	411-2182-060	4	21.1	16.5	10.1	13.7	12.5	15	6.3	295	S208A
240 x 480V — 120/240V • Taps: None											
1.0	411-2073-060	2	10.2	5.1	4.6	9.1	8.4	2.3		19	S480A
2.0	411-2093-060	3	12.5	6.7	5.3	10.6	12.0	2.3		41	S480A
3.0	411-2103-060	3	14.6	7.6	7.2	12.7	14.1	3.5		68	S480A
5.0	411-2113-060	3	14.6	7.6	7.2	12.7	14.1	3.5		93	S480A
7.5	411-2133-060	4	16.1	13.5	8.6	10.6	8.3	12	5.5	130	S480A
10.0	411-2153-060	4	16.1	13.5	8.6	10.6	8.3	12	5.5	155	S480A
15.0	411-2163-060	4	21.1	16.5	10.1	13.7	12.5	15	6.3	255	S480A
25.0	411-2183-060	4	21.1	16.5	10.1	13.7	12.5	15	6.3	295r	S480A

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Class I Division 2, Single Phase

115°C Temperature Rise, 40°C ambient

240 x 480V — 120/240V • Taps: 2 @ 2.5% FCAN + 2 @ 2.5% FCBN											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	(G) inches	Est Ship Wgt	Wiring Diagram
1	411-2073-062	2	10.2	5.1	4.6	9.1	8.4	2.3		19	S480B
2	411-2093-062	3	12.5	6.7	5.3	10.6	12	2.3		41	S480B
3	411-2103-062	3	14.6	7.6	7.2	12.7	14.1	3.5		68	S480B
5	411-2113-062	3	14.6	7.6	7.2	12.7	14.1	3.5		93	S480B
7.5	411-2133-062	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	130	S480B
10	411-2153-062	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	155	S480B
15	411-2163-062	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	255	S480B
25	411-2183-062	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	295	S480B
277V — 120/240V • Taps: 2 @ 2.5% FCBN											
1	411-2074-061	2	10.2	5.1	4.6	9.1	8.4	2.3		19	S277A
2	411-2094-061	3	12.5	6.7	5.3	10.6	12.0	2.3		41	S277A
3	411-2104-061	3	14.6	7.6	7.2	12.7	14.1	3.5		68	S277A
5	411-2114-061	3	14.6	7.6	7.2	12.7	14.1	3.5		93	S277A
7.5	411-2134-061	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	130	S277A
10	411-2154-061	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	155	S277A
15	411-2164-061	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	255	S277A
25	411-2184-061	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	295	S277A
600V — 120/240V • Taps: 2 @ 2.5% FCAN + 2 @ 2.5% FCBN											
1	411-2075-062	2	10.2	5.1	4.6	9.1	8.4	2.3		19	S600A
2	411-2095-062	3	12.5	6.7	5.3	10.6	12.0	2.3		41	S600A
3	411-2105-062	3	14.6	7.6	7.2	12.7	14.1	3.5		68	S600A
5	411-2115-062	3	14.6	7.6	7.2	12.7	14.1	3.5		93	S600A
7.5	411-2135-062	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	130	S600A
10	411-2155-062	4	16.1	13.5	8.6	10.6	8.25	12.0	5.5	155	S600A
15	411-2165-062	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	255	S600A
25	411-2185-062	4	21.1	16.5	10.1	13.7	12.5	15.0	6.3	295	S600A

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

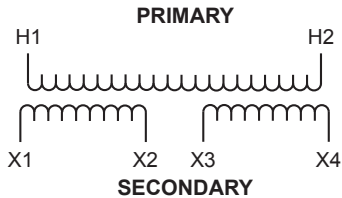
 For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams

S208A Wiring Diagram & Connections

Wiring Diagram

Primary: 208 Volts
Secondary: 120/240 Volts



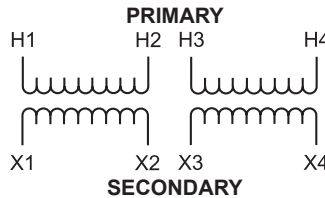
Connections

Primary Volts		Primary Lines Connect To
208		H1, H2
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S240A Wiring Diagram & Connections

Wiring Diagram

Primary: 120 x 240 Volts
Secondary: 120/240 Volts



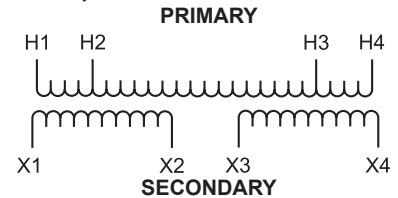
Connections

Primary Volts	Interconnect	Primary Lines Connect To
240	H2 to H3	H1, H4
120	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S277A Wiring Diagram & Connections

Wiring Diagram

Primary: 277 Volts
Secondary: 120/240 Volts



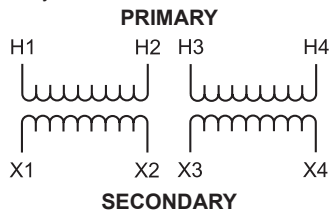
Connections

Primary Volts		Primary Lines Connect To
277		H1, H4
270		H1, H3
263		H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S480A Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 120/240 Volts



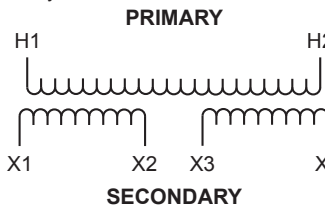
Connections

Primary Volts	Interconnect	Primary Lines Connect To
480	H2 to H3	H1, H4
240	H1 to H3 H2 to H4	H1, H4
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S600A Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts
Secondary: 120/240 Volts



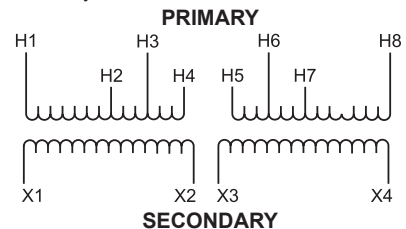
Connections

Primary Volts		Primary Lines Connect To
600		H1, H2
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1, X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

S480B Wiring Diagram & Connections

Wiring Diagram

Primary: 240 x 480 Volts
Secondary: 120/240 Volts



Connections

Primary Volts	Interconnect	Primary Lines Connect To
504	H4 to H5	H1 and H8
492	H3 to H5	H1 and H8
480	H3 to H6	H1 and H8
468	H2 to H6	H1 and H8
456	H2 to H7	H1 and H8
252	H1 to H5 H4 to H8	H1 and H8
240	H1 to H6 H3 to H8	H1 and H8
228	H1 to H7 H2 to H8	H1 and H8
Secondary Volts	Interconnect	Secondary Lines Connect To
240	X2 to X3	X1 and X4
120/240	X2 to X3	X1, X2, X4
120	X1 to X3 X2 to X4	X1, X4

More wiring diagrams can be found in catalog's appendix, section 15.

Use the "Find a Product" tool on our website for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com



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Enclosure Figures

Figure 4

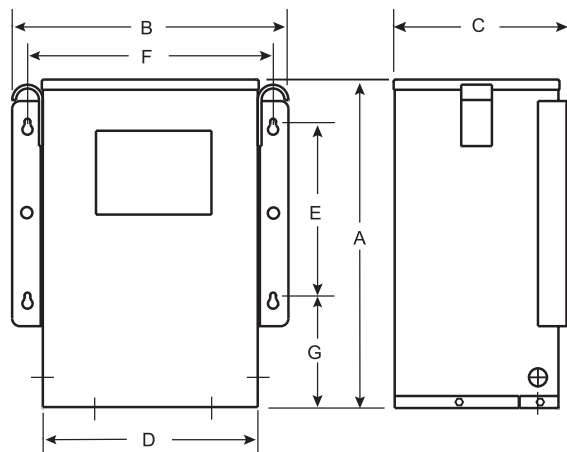
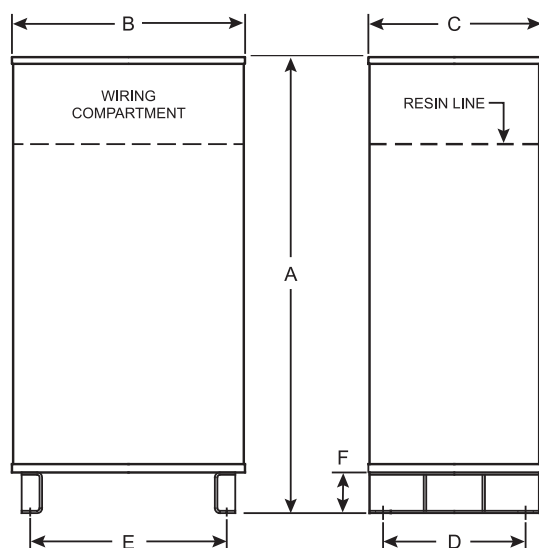


Figure 21



Model Numbers Defined[⊛]

413-2XXY-ABC

Three-Phase, Encapsulated			
Standard		413	
International		513	
Type			
Class I, Div 2		2	
kVA Rating / XX		kVA Rating / XX	
3	10	20	17
5	11	25	18
6	12	30	19
7.5	13	37.5	20
9	14	45	21
10	15	50	22
15	16	75	23

Primary	Secondary	
208	480Y/277	1
240	208Y/120	2
240	480Y/277	3
480	208Y/120	4
480	480Y/277	5
Specials*		6
480	240	7
208	208Y/120	8
600	208Y/120	9

Wiring	
Default	0
Copper	8
Temperature Rise (40°C ambient)	
135°C Rise	0
115°C Rise	1
70°C Rise	7
80°C Rise	8
95°C Rise	9

Shield

Shield	0
No shield	5

* Suffix defined incrementally

⊛ Not all features listed are compatible

Class I Division 2, Three Phase

115°C Temperature Rise, 40°C ambient

208 Volts - 208/120 Volts • Taps: 2 @ 5% FCBN											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	(G) inches	Est Ship Wgt	Wiring Diagram
3	413-2108-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T208H
6	413-2128-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T208H
9	413-2148-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T208H
15	413-2168-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T208H
30	413-2198-010	21	33	23	9.5	7	20.5	3		890	T208H
45	413-2218-010	21	36	25	11	8.5	21.75	3		980	T208H
75	413-2238-010	21	37	25	12.5	10.5	22.5	3		1,050	T208H
208 Volts - 480/277 Volts • Taps: 2 @ 5% FCBN											
3	413-2101-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T208A
6	413-2121-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T208A
9	413-2141-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T208A
15	413-2161-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T208A
30	413-2191-010	21	33	23	9.5	7	20.5	3		890	T208A
45	413-2211-010	21	36	25	11	8.5	21.75	3		980	T208A
75	413-2231-010	21	37	25	12.5	10.5	22.5	3		1,050	T208A
240 Volts - 208Y/120 Volts • Taps: 2 @ 5% FCBN											
3	413-2102-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T240A
6	413-2122-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T240A
9	413-2142-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T240A
15	413-2162-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T240A
30	413-2192-010	21	33	23	9.5	7	20.5	3		890	T240A
45	413-2212-010	21	36	25	11	8.5	21.75	3		980	T240A
75	413-2232-010	21	37	25	12.5	10.5	22.5	3		1,050	T240A
240 Volts - 480/277 Volts • Taps: 2 @ 5% FCBN											
3	413-2103-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T240G
6	413-2123-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T240G
9	413-2143-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T240G
15	413-2163-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T240G
30	413-2193-010	21	33	23	9.5	7	20.5	3		890	T240G
45	413-2213-010	21	36	25	11	8.5	21.75	3		980	T240G
75	413-2233-010	21	37	25	12.5	10.5	22.5	3		1,050	T240G

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Class I Division 2, Three Phase

115°C Temperature Rise, 40°C ambient

480 Volts - 208Y/120 Volts • Taps: 2 @ 5% FCBN											
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	(F) inches	(G) inches	Est Ship Wgt	Wiring Diagram
3	413-2104-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T480A
6	413-2124-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T480A
9	413-2144-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T480A
15	413-2164-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T480A
30	413-2194-010	21	33	23	9.5	7	20.5	3		890	T480A
45	413-2214-010	21	36	25	11	8.5	21.75	3		980	T480A
75	413-2234-010	21	37	25	12.5	10.5	22.5	3		1,050	T480A
480 Volts - 240 Volts • Taps: 2 @ 5% FCBN											
3	413-2107-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T480B
6	413-2127-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T480B
9	413-2147-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T480B
15	413-2167-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T480B
30	413-2197-010	21	33	23	9.5	7	20.5	3		890	T480B
45	413-2217-010	21	36	25	11	8.5	21.75	3		980	T480B
75	413-2237-010	21	37	25	12.5	10.5	22.5	3		1,050	T480B
480 Volts - 480/277 Volts • Taps: 2 @ 5% FCBN											
3	413-2105-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T480C
6	413-2125-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T480C
9	413-2145-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T480C
15	413-2165-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T480C
30	413-2195-010	21	33	23	9.5	7	20.5	3		890	T480C
45	413-2215-010	21	36	25	11	8.5	21.75	3		980	T480C
75	413-2235-010	21	37	25	12.5	10.5	22.5	3		1,050	T480C
600 Volts - 208/120 Volts • Taps: 2 @ 5% FCBN											
3	413-2109-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	110	T600A
6	413-2129-010	4	13.1	15.1	8.1	12.3	5.25	13.6	5.5	140	T600A
9	413-2149-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	190	T600A
15	413-2169-010	4	15.1	19	9.1	16.1	8.25	17.5	5.1	245	T600A
30	413-2199-010	21	33	23	9.5	7	20.5	3		890	T600A
45	413-2219-010	21	36	25	11	8.5	21.75	3		980	T600A
75	413-2239-010	21	37	25	12.5	10.5	22.5	3		1,050	T600A

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

Use the "Find a Product" tool for detailed specification sheets.

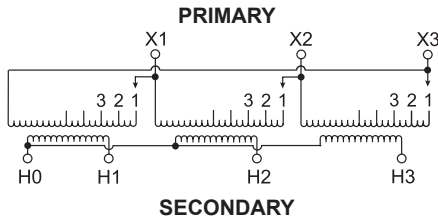
For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Wiring Diagrams

T208A Wiring Diagram & Connections

Wiring Diagram

Primary: 208 Volts Delta
Secondary: 480Y/277 Volts



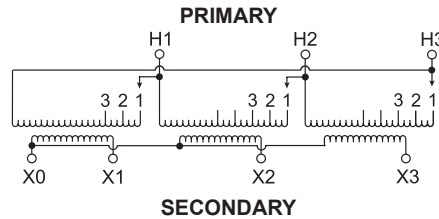
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
208	1	X1, X2, X3
198	2	X1, X2, X3
187	3	X1, X2, X3
Secondary Volts	Secondary Lines Connect To	
480	H1, H2, H3	
277 1 Phase	Between H0 and H1 or H2 or H3	

T208H Wiring Diagram & Connections

Wiring Diagram

Primary: 208 Volts Delta
Secondary: 208Y/120 Volts



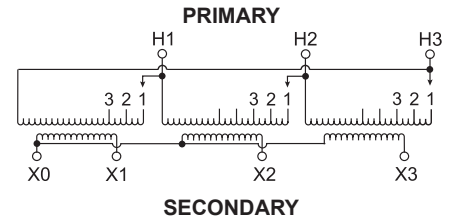
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
208	1	H1, H2, H3
198	2	H1, H2, H3
187	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120 1 Phase	Between X0 and X1 or X2 or X3	

T240A Wiring Diagram & Connections

Wiring Diagram

Primary: 240 Volts Delta
Secondary: 208Y/120 Volts



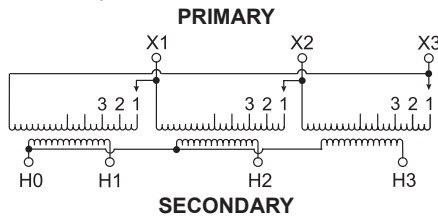
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
240	1	H1, H2, H3
228	2	H1, H2, H3
216	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120 1 Phase	Between X0 and X1 or X2 or X3	

T240G Wiring Diagram & Connections

Wiring Diagram

Primary: 240 Volts Delta
Secondary: 480Y/277 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
240	1	X1, X2, X3
228	2	X1, X2, X3
216	3	X1, X2, X3
Secondary Volts	Secondary Lines Connect To	
480	H1, H2, H3	
277 1 Phase	Between H0 and H1 or H2 or H3	

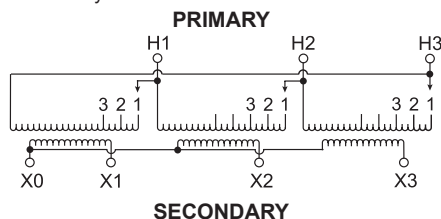
More wiring diagrams can be found in catalog's appendix, section 15.
Use the "Find a Product" tool on our website for detailed specification sheets.
For further information, contact an Application Engineer at 800-892-3755,
technical_services@jeffersonelectric.com

Wiring Diagrams

T480A Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



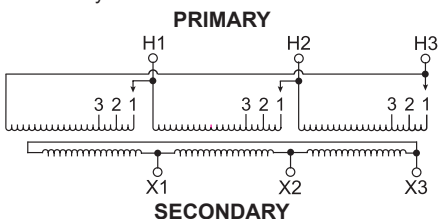
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
480	1	H1, H2, H3
456	2	H1, H2, H3
432	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 Phase		

T480B Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 240 Volts Delta



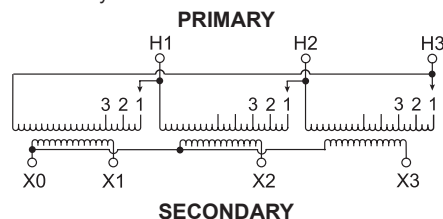
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
480	1	H1, H2, H3
456	2	H1, H2, H3
432	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
240	X1, X2, X3	

T480C Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 480Y/277 Volts



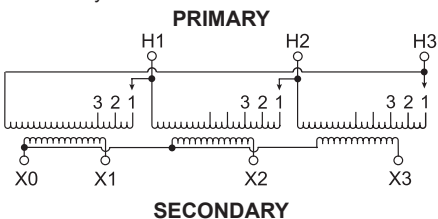
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
480	1	H1, H2, H3
456	2	H1, H2, H3
432	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
480	X1, X2, X3	
277	Between X0 and X1 or X2 or X3	
1 Phase		

T600A Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 208Y/120 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
600	1	H1, H2, H3
570	2	H1, H2, H3
540	3	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

More wiring diagrams can be found in catalog's appendix, section 15.
Use the "Find a Product" tool on our website for detailed specification sheets.
For further information, contact an Application Engineer at 800-892-3755,
technical_services@jeffersonelectric.com

15 to 500 HP

Special purpose multi-pulse magnetics can be manufactured to meet specific requirements of your application. Each autotransformer reduces the harmonic current at the input of the transformer as well as harmonic voltage distortion from non-linear loads applied to the outputs.

Applications

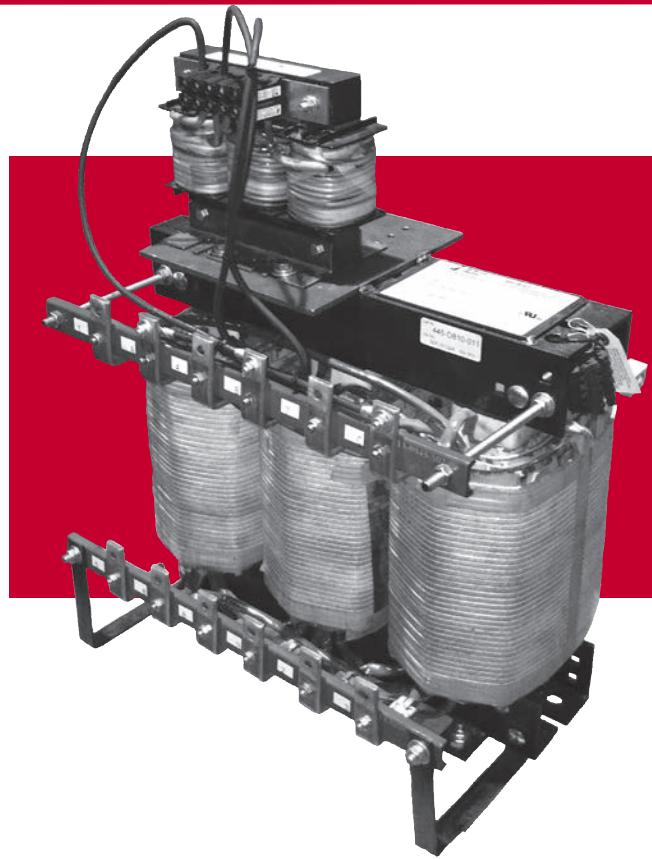
- Multi-pulse units are key in designing systems to mitigate the harmonic distortion generated by variable frequency drives and other digital equipment.
- Frequently used in large projects where harmonics increase heat and power usage. Savings can be generated with the proper application of these specially developed units.
- Typical applications for multi-pulse transformers
 - Water and wastewater treatment facilities
 - HVAC installations
 - Pump lift stations.

Specifications

- Core and coil
- 60 Hz operation
- Three Phase: 15 – 500 kVA
- Aluminum windings
- 150°C temperature rise with 40°C ambient (customer supplied forced air cooling)
- 220°C insulation class
- Cores of high quality electrical steel

Features, Functions, Benefits

- Reduces the neutral current and harmonic distortion generated by triplen harmonics



Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards

Options and Accessories

- 50 Hz
- Copper windings
- Other sizes and temperature rises available
- NEMA1 enclosures

Approvals



Enclosure Figures

Figure 35 without reactor

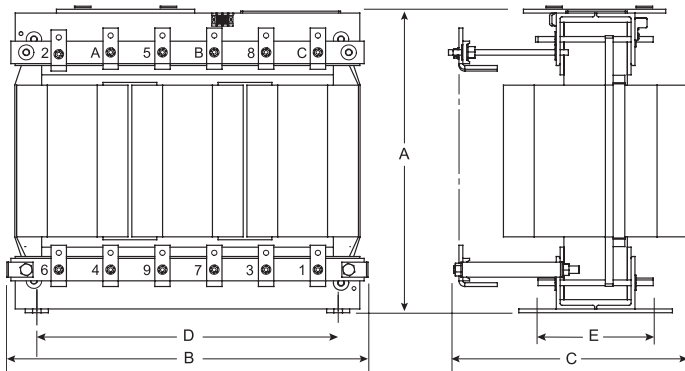
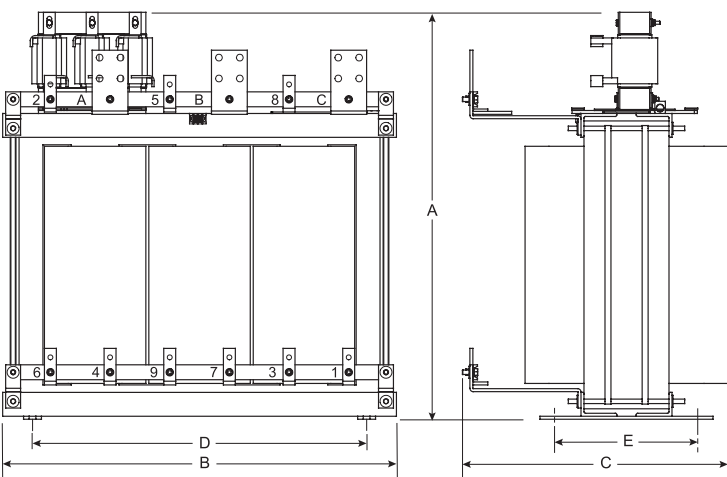


Figure 36 with reactor



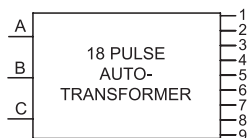
Model Numbers

Model numbers for these units are developed to match unique needs. Contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com for more information.

Wiring Diagrams

18-P A Wiring Diagram & Connections

Wiring Diagram

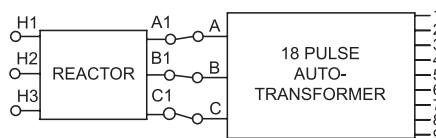


Connections

Primary Volts	Primary Lines Connect To
480	A, B, C
Secondary Volts	Secondary Lines Connect To
421	1-9

18-P B Wiring Diagram & Connections

Wiring Diagram



Connections

Primary Volts	Primary Lines Connect To
480	H1, H2, H3
Secondary Volts	Secondary Lines Connect To
421	1-9

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

18-Pulse Autotransformer

3-Phase, 60 Hz, 480V, Aluminum windings

18-pulse Autotransformer (3 output: 421V) without reactor. Fan assist required

HP / kVA	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wiring Diagram	Air Flow Req'd
15	35	12.75	22.9	12.2	18	6	150	18-P A	300 LFM
20	35	13	21	23	18	6	167	18-P A	300 LFM
25	35	12.7	17.9	12.7	15.9	7.5	207	18-P A	300 LFM
30	35	12.7	17.9	12.7	15.9	7.5	211	18-P A	300 LFM
40	35	15	20.25	14.4	16	6	251	18-P A	300 LFM
50	35	18.5	19.6	12.6	14	5.75	304	18-P A	300 LFM
60	35	16.75	20.1	11.75	14	6.5	400	18-P A	300 LFM
75	35	17.8	20.1	13.25	16.1	6.9	425	18-P A	300 LFM
100	35	20.6	22.9	13.25	18	6.5	450	18-P A	300 LFM
125	35	21.5	22.9	13.6	16	7.5	541	18-P A	300 LFM
150	35	20	23.6	15.5	19.6	7.6	665	18-P A	300 LFM
200	35	22.4	28.3	16	24	8	643	18-P A	300 LFM
250	35	23.6	28.3	16.1	24	8.5	747	18-P A	300 LFM
300	35	38.75	28.1	29	24	9	1,066	18-P A	300 LFM
350	35	39.75	29.25	29	24	10	1,175	18-P A	500 LFM
400	35	26.9	29.75	17.5	25	10	1,357	18-P A	500 LFM
450	35	48.5	32	29	25	10	1,357	18-P A	500 LFM
500	35	51	32.5	29	28	10	1,495	18-P A	500 LFM

18-pulse Autotransformer (3 output: 421V) with reactor. Fan assist required

HP / kVA	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Wiring Diagram	Air Flow Req'd
15	36	17.75	22.9	12.2	18	6	157	18-P B	300 LFM
20	36	25.75	18.75	23	TBD	TBD	182	18-P B	300 LFM
25	36	18.43	17.9	12.7	15.9	7.5	222	18-P B	300 LFM
30	36	18.9	17.9	12.7	15.9	7.5	227	18-P B	300 LFM
40	36	22	20.25	14.4	16	6	276	18-P B	300 LFM
50	36	25.5	19.6	12.6	14	5.75	329	18-P B	300 LFM
60	36	23.75	20.1	11.75	14	6.5	425	18-P B	300 LFM
75	36	26.8	20.1	13.25	16.1	6.9	470	18-P B	300 LFM
100	36	29.6	22.9	13.25	18	6.6	502	18-P B	300 LFM
125	36	30.5	22.9	13.62	16	7.5	596	18-P B	300 LFM
150	36	29	23.6	15.5	19.6	7.6	720	18-P B	300 LFM
200	36	31.4	28.3	16	24	8	713	18-P B	300 LFM
250	36	35.1	23.4	16.1	24	8.5	857	18-P B	300 LFM
300	36	50.1	28.1	29	24	9	1161	18-P B	300 LFM
350	36	51.1	29.25	29	24	10	1275	18-P B	500 LFM
400	36	38.3	29.75	17.5	25	10	1467	18-P B	500 LFM
450	36	59.9	32	29	25	10	1467	18-P B	500 LFM
500	36	62.4	32.5	29	28	10	1615	18-P B	500 LFM

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com
PIONEER
 DRY-TYPE TRANSFORMERS

JEFFERSON
 ELECTRIC

BEMAG
 TRANSFORMER
Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

150 to 10,000 kVA

Applications

- An economical and environmentally friendly alternative to liquid filled for industrial facilities and large commercial applications
- Designed for indoor or outdoor installations
- Wide voltage class range:
 - 5 kV Class: 150 to 10,000 kVA
 - 15 kV Class: 150 to 10,000 kVA
 - 25 kV Class: 300 to 10,000 kVA
 - 35 kV Class: 500 to 10,000 kVA

Specifications

- NEMA1-rated enclosures
- Energy efficient (meets DOE-2016 or C802)
- 60 Hz operation
- Aluminum windings
- 150°C temperature rise, 220°C insulation
- Miter/step lapped core construction

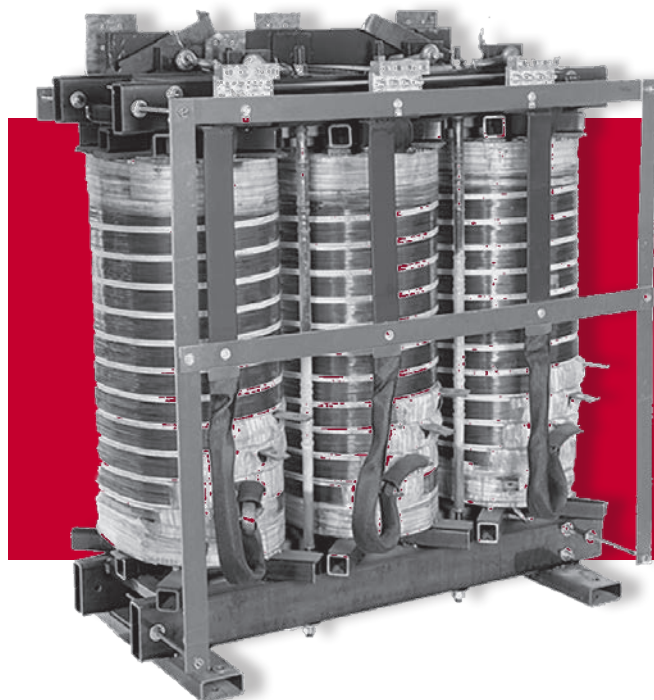
Features, Functions, Benefits

- Custom, application specific designs
- Vacuum Pressure Impregnation process ensures the encapsulant penetrates windings and eliminates air-pockets. This improves mechanical strength and heat dissipation, prolonging the life of the unit.
- Custom terminations

Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards

Approvals



Options and Accessories

- NEMA3R enclosures
- 50/60 Hz optional
- Custom kVA and voltages
- Copper windings
- 80°C and 115°C temperature rise available
- Lightning arrestors
- Neutral grounding resistor
- Digital thermometer and monitor
- Forced air cooling
- Multiple secondaries
- Rectifier, excitation and mining duty
- Non-linear load (K-Factor)
- Kirk Key interlocks
- Enclosure filters
- Space heaters
- Ground bus
- Thermocouples

Coil and Core Construction

Coil

- Coils are layer, disk or section wound depending on the voltage class
- All windings designed with wire or foil conductors to minimize eddy losses and provide the highest short circuit strength
- Multi-section barrel or disk designs to reduce short circuit stress
- Designed to maximize cooling characteristics
- Core and coil isolated with neoprene pads to reduce vibration and noise

Core

- Miter core step lap construction
- Core laminations are free of burrs and stacked minimizing the lamination joint gaps
- Cores are bolted to ensure uniform pressure to minimize noise and maximize durability
- Uniform pressing and stiffness ensure low noise level

Assembling

- The coils are held rigidly in place between high compression insulators for the highest ability to resist short circuit forces
- Low voltage bus bars bolted to the upper and lower core clamps with standoff insulators

- Uniform core lamination, coil compacting and strong mechanical structure ensures low noise level for the transformer during lifetime operation
- Heavy gauge sheet steel enclosures

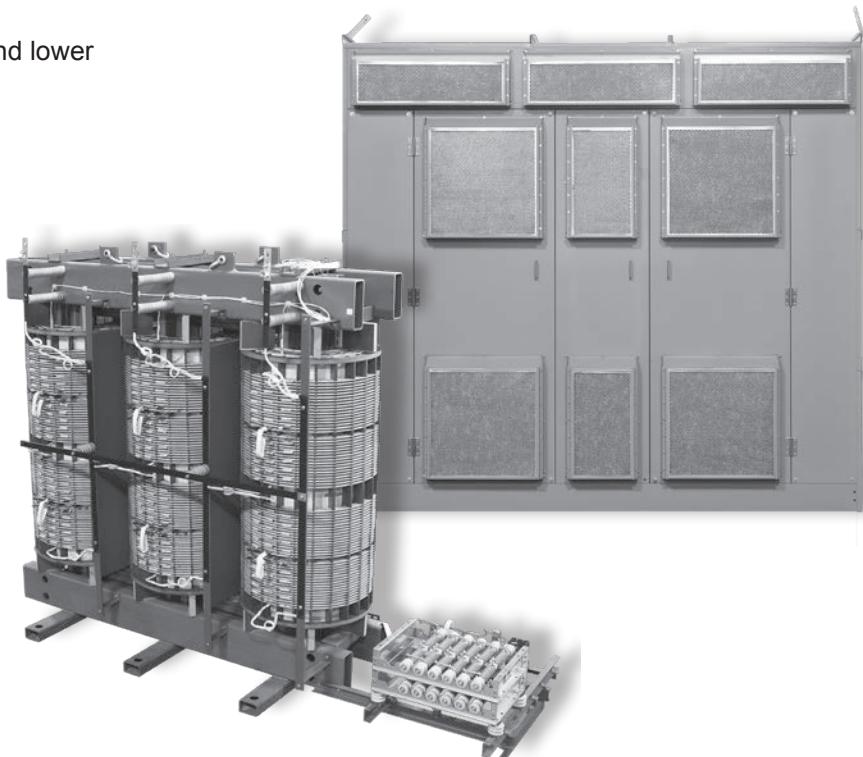
Standard Production Tests

All Power Transformers tested in accordance with the CSA, UL and IEEE standards

- Winding resistance measurements
- Voltage ratio measurements
- Applied and induced voltage test
- Polarity
- Excitation current
- No load losses
- Load loss and impedance voltage
- Tested to UL and CSA standards

Optional Available Tests

- Temperature rise
- Sound level
- Basic impulse level (BIL)
- Partial discharge



Power Transformers

Three Phase • Aluminum Windings

5kV Class — 30 kV/BIL													
kVA	Imp. %	Weight		Dimensions (Enclosure)						Dimensions (Core & Coil)			
		lbs	kg	Height		Width		Depth		Height		Width	
				inch	cm	inch	cm	inch	cm	inch	cm	inch	cm
150	4.0	1,580	718	56	142.2	44	111.8	30	76.2	31	78.7	37	94.0
225	4.5	1,920	873	56	142.2	44	111.8	30	76.2	35	88.9	38	96.5
300	5.0	2,316	2,053	62	157.5	50	127.0	35	88.9	34	86.4	42	106.7
450	5.5	3,104	1,411	62	157.5	50	127.0	35	88.9	35	88.9	44	111.8
500	6.0	3,262	1,583	62	157.5	50	127.0	35	88.9	34	86.4	44	111.8
600	6.0	3,762	1,710	72	182.9	62	157.6	40	101.6	43	109.2	47	119.4
750	6.0	4,506	2,048	72	182.9	62	157.5	40	101.6	43	109.2	50	127.0
1,000	6.5	5,410	2,459	72	182.9	62	157.5	40	101.6	53	133.4	48	121.9
1,500	6.5	6,980	3,173	80	203.2	68	172.7	48	121.9	55	139.7	53	134.6
2,000	7.0	9,700	4,409	80	203.2	80	203.2	54	137.2	58	147.3	61	154.9
15kV Class — 60 kV/BIL													
300	5.5	4,430	2,014	80	203.2	80	203.2	54	137.2	49	124.5	61	154.9
450	6.0	4,950	2,250	80	203.2	80	203.2	54	137.2	51	129.5	64	162.6
500	6.0	5,150	2,341	80	203.2	80	203.2	54	137.2	52	132.1	69	175.3
600	6.0	5,750	2,614	80	203.2	80	203.2	54	137.2	53	134.6	65	165.1
750	6.5	6,600	3,000	90	228.6	90	228.6	60	152.4	52	132.1	72	182.9
1,000	6.5	7,300	3,318	90	228.6	90	228.6	60	152.4	52	132.1	73	185.4
1,500	6.5	9,220	4,191	90	228.6	90	228.6	66	167.6	52	132.1	75	190.5
2,000	7.0	10,500	4,773	100	254.0	100	254.0	66	167.6	62	157.5	75	190.5
2,500	7.0	11,700	5,318	100	254.0	100	254.0	72	182.9	71	180.3	76	193.0
3,000	7.0	12,300	5,591	100	254.0	100	254.0	72	182.9	70	177.8	76	193.0
25kV Class — 125 kV/BIL													
500	6.0	5,813	2,642	80	203.2	100	254.0	60	152.4	54	137.2	73	185.4
600	6.0	6,150	2,795	90	228.6	100	254.0	60	152.4	60	152.4	75	190.5
750	6.5	7,100	3,227	90	228.6	100	254.0	60	152.4	56	142.2	80	203.2
1,000	6.5	8,550	3,886	90	228.6	110	279.4	66	167.6	62	157.5	83	210.8
1,500	6.5	10,500	4,773	90	228.6	110	279.4	72	182.9	62	157.5	87	221.0
2,000	7.0	13,100	5,955	100	254.0	110	279.4	72	182.9	70	177.8	90	228.6
2,500	7.0	14,800	6,727	110	279.4	110	279.4	72	182.9	73	185.4	90	228.6
3,000	7.0	15,800	7,182	120	304.8	110	279.4	72	182.9	80	203.2	90	228.6
4,000	7.0	18,300	8,318	130	330.2	120	304.8	80	203.2	95	241.3	92	233.7

See website for additional kVA, copper windings and temperature options.

Dimensions subject to change without notice. Consult website or factory where dimensions are critical.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Answering Today's Power Challenges

Jefferson Electric is continually updating its product line to remain on the forefront of transformer technology. Electrical harmonics have become a real world problem to many of our customers, especially those with high energy usage and very stable voltage needs. For these customers, we have a solution.

This section of our catalog contains our products line developed to mitigate harmonics.

13-3 HMT / Zig-Zag

13-7 Harmonic Suppression Systems

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

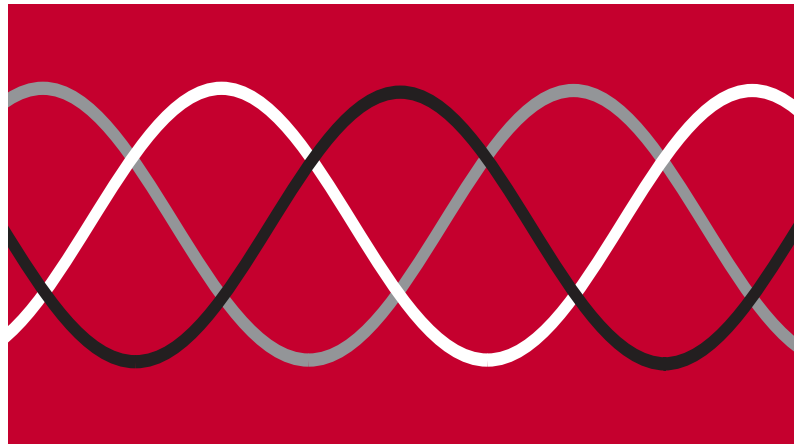
Why Your Existing Transformer May Be Inadequate

Traditional transformers were designed to handle the purely linear electrical loads created by standard lighting and motors. The currents drawn by these loads are sinusoidal in shape, as is the waveshape of the supply voltage. When loads are linear and balanced, as in a typical three-phase system, the neutral current flow is zero. This is because the three-phase currents are 120 degrees out of phase with each other and cancel in the neutral. The sinusoidal current waveshape is the foundation for wire-size calculations, determining how to balance loads to reduce neutral currents, and reducing the size of neutral conductors to reduce material costs.

The Phenomenon of Odd Harmonics

Electronic equipment today is powered by SMSPs (switch mode power supplies) that convert AC current to DC current. SMSPs use rectifiers and capacitors drawing current in sharp bursts which distorts the sinusoidal waveform. It is now non-linear.

Non-linear loads, are rich in odd harmonics (3, 5, 7, etc.), which are multiples of the fundamental 60 Hertz frequency. The major components of harmonic currents in switched mode power supplies are the third and fifth harmonics. The 3rd harmonic current (180Hz) due to the



design of the 3-phase system, is additive in the neutral and can result in a neutral current twice the phase current, even in a balanced system.

How Harmonics Affect Transformers

When odd-harmonic currents are present, winding losses increase. The I^2R , conductor losses, are higher because harmonics increase the current. Stray losses in windings also increase losses due to additional eddy currents circulating within the conductors. The combination of these additional losses generate excess heat in the transformer coils. Transformer insulation systems are designed to accommodate temperature increases due to normal stray losses. However, when required to carry non-linear loads, the heat generated may exceed the designed rating, reducing the life of the transformer and creating the possibility of premature failure.

De-rating is Not the Answer

De-rating a traditional linear transformer to compensate for heat build-up requires higher installation costs and provide poor energy efficiency due to increased core losses.

K-Factor Type of Load

- K-1** Resistance heating
Incandescent lighting
Motors
Transformers
 - Control
 - Distribution
- K-4** Welders
Induction heaters
HID lighting
Fluorescent lighting
Solid state controls
- K-13** Telecommunications equipment
Branch circuits in classrooms and healthcare facilities
- K-20** Mainframe computers
Variable speed drives
Branch circuits with exclusive loads of data processing equipment

Harmonic Mitigation

Harmonic Mitigating Transformers (HMT/Zig-Zag) and K-rated transformers accommodate the flow of the third harmonic current. They dissipate the extra current as heat (I^2R losses) in the transformer.

Because they are so common to our product line, we included K-rated transformers (Chapter 3, Non-Linear Transformers) in our standard catalog.

The Harmonic Mitigating Transformer (HMT / Zig-Zag) line is defined in on the following pages.

Harmonic Suppression

Instead of filtering third harmonic currents from the line after they are generated, our patented Harmonics Suppression System (HSS™) works at the source to prevent the generation of these currents.

The HSS is extremely reliable, is UL certified, and is fully compliant with the National Electrical Code. It is the only harmonic mitigation system that “prevents” the formation of third harmonic currents throughout the electrical distribution system, rather than just “accommodating” these currents after they are formed. It is the only harmonic mitigation system that reduces wasted energy and has an energy payback. It is clearly the technology of choice for solving third harmonic current problems in electrical systems that power multiple computer and electronic loads.

SysteMax™ is a stand alone third harmonic suppression filter that installs on the neutral of an existing distribution transformer. It is sized to the transformer (15 to 1,000 kVA). Enclosure type is UL/NEMA Type 1, steel with ANSI-61 gray paint.

While SysteMax can be installed on any transformer, Harmonics Limited recommends it be placed on at least a high efficiency DOE compliant transformer. If the existing transformer does not meet DOE-2016 specifications then replacement with a TransMax is advised.

TransMax™ is harmonic suppression technology incorporated in a single enclosure with a high efficiency transformer. The basic transformer has a 480V primary, 208Y/120V secondary, with copper or aluminum windings, 115°C rise and electrostatic shielding. Standard sizes range from 30 kVA to 500 kVA. More information can be found in on page 13-7.

GenMax™ addresses issues arising when multiple generators of different pitch are paralleled. Each pitch has a slight variation in the voltage waveform which can cause excessive 3rd harmonic current to flow in the system.

HMT Three-Phase Zig-Zag Transformers

The HMT (Harmonic Mitigating Transformer) is a three phase transformer with 0° or -30° displacement between the primary and the secondary.

An HMT is used to reduce current harmonics on the primary side of a transformer and voltage distortion on the secondary. A single HMT reduces the flow of triplen harmonics, 3rd, 9th, 15th, 21st, etc into the transformer primary. Used together on the same power line a 0° and -30° HMT will also reduce the 5th and 7th harmonics.

These transformers are designed to reduce voltage distortion when powering non-linear loads.

Applications

- For use in environments with non-linear loads such as computers, printers and communication equipment where stable load and operation is necessary
- Medical facilities including hospitals
- Data centers
- Office buildings
- Schools

Specifications

- K-13 standard
- DOE-2016 efficiency
- NEMA3R enclosure
- 3 phase, 60 Hz
- 480V primary
- Zig-Zag secondary design voltage 208Y/120V
- 0° and -30° phase shifts
- 15 – 1,500 kVA range
- Aluminum windings
- 150°C temperature rise
- 220°C insulation class
- Heat-cured ASA-61 gray powder coating finish
- Electrostatic shield
- Cores of high quality electrical steel



Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards
- UL and CSA Listed

Options and Accessories

Consult factory for more information

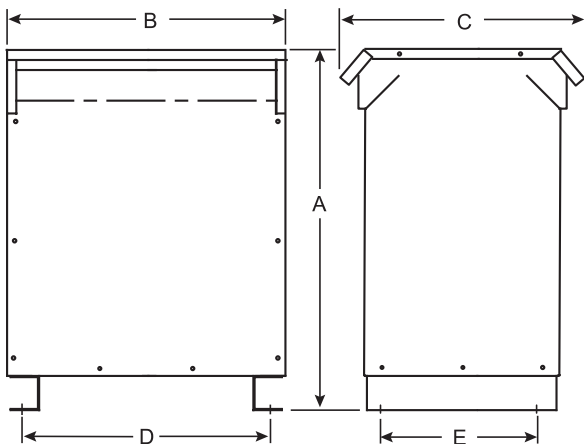
- 50 Hz
- Other sizes, voltages and temperature rises available
- Copper windings
- K-4 and K-20
- Dual electrostatic shields
- 115°C, 80°C temperature rise

Approvals



Enclosure Figures

Figure 24



Mounting Brackets

Part Number	Description	Max Unit Wgt (lbs)
223-7008-030	For 15 kVA units, 150°C rise	250
223-7008-075	For 16 to 50 kVA units, 150°C rise	750

Lugs

Part Number	kVA	Primary Lug	Qty	Secondary Lug	Qty
4PT-2007-LUG	15	#14 - 2	2	#2/0 - 6	2
4PT-2017-LUG	25	#14 - 2	2	250MCM - 6	2
4PT-2008-LUG	37.5	#14 - 2	2	350MCM - 6	2
4PT-2009-LUG	50	#2/0 - 6	2	600MCM - 6	2
4PT-2018-LUG*	75	#2/0 - 6	2	600MCM - 6	4

* Must be ordered, not included on stock units

Model Numbers Defined

424-TXXY-ABC

3 Phase Ventilated
Non-Linear Zig-Zag
All models with electrostatic shield

Enclosure Type
DOE-2016 9

kVA Rating / XX	kVA Rating / XX	kVA Rating / XX	kVA Rating / XX
15.0 16	150 26		
20 17	167 27		
25 18	200 28		
30 19	225 29		
37.5 20	250 30		
45 21	300 31		
50 22	333 32		
75 23	400 33		
100 24	500 34		
112.5 25			

Primary	Secondary	
208	480Y/277	1
240	208Y/120	2
240	480Y/277	3
480	208Y/120	4
480	480Y/277	5
Specials*		6
Not assigned		7
208	208Y/120	8
600	208Y/120	9

Wiring

Aluminum	0
Copper	8

Temperature Rise

150°C Rise	0
115°C Rise	1
80°C Rise	8

Third Harmonic

K=4, Zig-Zag, -30 degrees	4
K=13, Zig-Zag, -30 degrees	5
K=20, Zig-Zag, -30 degrees	6
K=4, Zig-Zag, 0 degrees	7
K=13, Zig-Zag, 0 degrees	8
K=20, Zig-Zag, 0 degrees	9

* Suffix defined incrementally

Three-Phase Harmonic Mitigation (Zig-Zag) Transformers—DOE Compliant

K-13 • Electrostatic Shields • 150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2@2.5% FCAN, 2@2.5% FBCN

480V Delta — 208Y/120V										
kVA	Catalog Number	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	(D) inches	(E) inches	Est Ship Wgt	Mounting Kit	Wiring Diagram
15	424-9164-008	24	25	22	22	17.4	13	310	223-7008-030	T480M
30	424-9194-008	24	28	25	23.5	20.8	14.5	400	223-7008-075	T480M
45	424-9214-008	24	32	27	26	23.5	16	585	223-7008-075	T480M
75	424-9234-008	24	38	29	29	25.5	18	775	n/a	T480M
112.5	424-9254-008	24	42	33	32.5	29.5	21	1,000	n/a	T480M
150	424-9264-008	24	46	35	37	31.5	24	1,530	n/a	T480M
225	424-9294-008	24	52	35	37	31.5	24	1,660	n/a	T480M
300	424-9314-008	24	60	48	43.5	42.0	27	2,460	n/a	T480M
500	424-9344-008	24	72	52	44	35.0	42	3,750	n/a	T480M

Three-Phase Harmonic Mitigation (Zig-Zag) Transformers—C802 Compliant

K-13 • Electrostatic Shields • 150°C Temperature Rise • Aluminum Windings • NEMA3R Enclosures

Taps: 2@2.5% FCAN, 2@2.5% FBCN

600V Delta — 208Y/120V										
15	424-9169-008	24	25	22	22	17.4	13	310	223-7008-030	T600G
30	424-9199-008	24	28	25	23.5	20.8	14.5	400	223-7008-075	T600G
45	424-9219-008	24	32	27	26	23.5	16	585	223-7008-075	T600G
75	424-9239-008	24	38	29	29	25.5	18	775	n/a	T600G
112.5	424-9259-008	24	42	33	32.5	29.5	21	1,000	n/a	T600G
150	424-9269-008	24	46	35	37	31.5	24	1,530	n/a	T600G
225	424-9299-008	24	52	35	37	31.5	24	1,660	n/a	T600G
300	424-9319-008	24	60	48	43.5	42.0	27	2,460	n/a	T600G
500	424-9349-008	24	72	52	44	35.0	42	3,750	n/a	T600G

See website for additional kVA, copper windings and temperature options.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

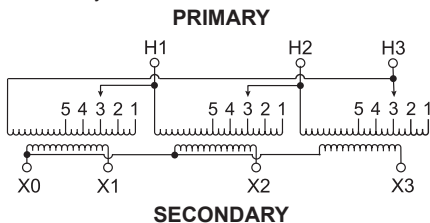
Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Wiring Diagrams

T480M Wiring Diagram & Connections

Wiring Diagram

Primary: 480 Volts Delta
Secondary: 208Y/120 Volts



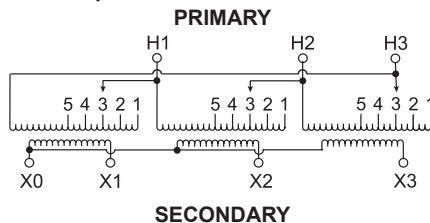
Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
504	1	H1, H2, H3
492	2	H1, H2, H3
480	3	H1, H2, H3
468	4	H1, H2, H3
456	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

T600G Wiring Diagram & Connections

Wiring Diagram

Primary: 600 Volts Delta
Secondary: 208Y/120 Volts



Connections

Primary Volts	On Each Coil Jumper Taps To	Primary Lines Connect To
630	1	H1, H2, H3
615	2	H1, H2, H3
600	3	H1, H2, H3
585	4	H1, H2, H3
570	5	H1, H2, H3
Secondary Volts	Secondary Lines Connect To	
208	X1, X2, X3	
120	Between X0 and X1 or X2 or X3	
1 phase		

More wiring diagrams can be found in catalog's appendix, section 15.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

Solutions for Harmonics in the Power System

The Harmonic Suppression System (HSS™) eliminates the harmful 3rd harmonic current generated by the operation of electronic power supplies. An HSS eliminates the 3rd harmonic current, removing it from the distribution system.

Patented HSS technology allows transformers to be sized to the load. There is no need to de-rate or oversize panels, reducing installation costs and energy consumption and increasing equipment life. ROI can be less than 24 months.

Three Options

SystemMax™ is a stand alone 3rd harmonic suppression filter that is connected to the neutral of an existing distribution transformer. It is sized to the transformer (15 kVA to 1,000 kVA).

TransMax™ is a SystemMax filter incorporated in an enclosure with a high efficiency transformer. The basic transformer is 480V primary, 208Y/120V secondary, with either copper or aluminum windings, 115°C rise and electrostatic shielding. Options include 80°C rise, low noise (-3dB) and 208V primary. Enclosure type is UL/NEMA Type 1, ANSI-61 gray paint. Standard sizes range from 30 kVA to 500 kVA.

GenMax™ is a passive, tuned harmonic suppression system for generators. This new technology allows generators with different winding pitches to operate at full capacity by reducing circulating 3rd harmonic ground currents.

Applications

- Where there is a large amount of computer, printer and communication equipment load, and stable operation is necessary
- Where there are slight differences in the pitch of the paralleled generators
- Medical facilities including hospitals
- Call, data and technology centers
- Office and commercial buildings
- Gaming industry
- Schools



Features, Functions, Benefits

- Patented HSS technology allows transformers to be sized exactly to the load. No need to de-rate or oversize panels.
- Lower installation costs
- Reduced energy consumption
- Longer equipment life
- ROI can be less than 24 months

Standards

- Built in accordance with NEMA, ANSI, UL and CSA standards
- UL and CSA Listed

Options and Accessories

Consult factory for more information

- 50 Hz
- Other sizes, voltages and temperature rises available
- Aluminum windings
- Dual electrostatic shield
- 115°C, 80°C temperature rise

Approvals



Enclosure Figures

Figure 37

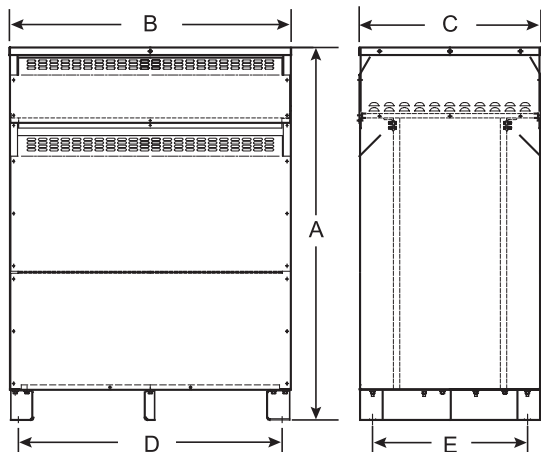


Figure 33

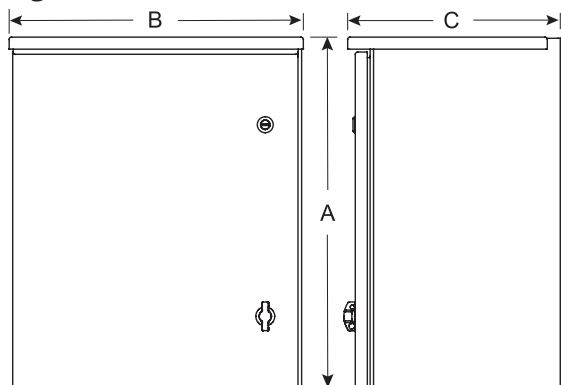
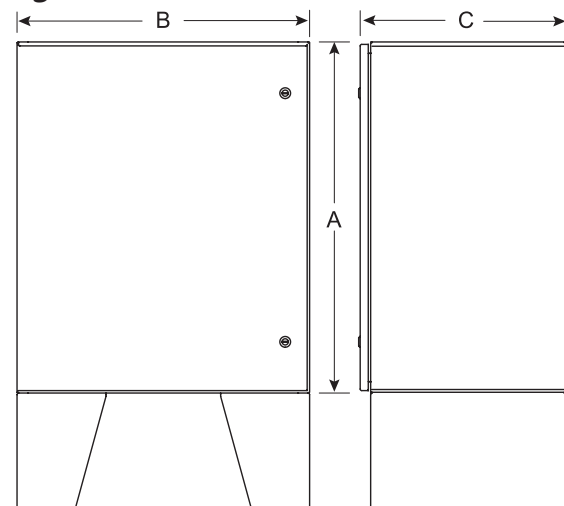


Figure 34



Model Numbers

Model numbers for these units are developed to match unique needs. Contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com for more information.

TransMax™

Three Phase • Harmonic Suppression System + Transformer • Electrostatic Shields
115°C Temperature Rise • Copper Windings • NEMA1 Enclosures

480V Delta — 208Y/120V • Taps: 2@2.5% FCAN, 2@2.5% FBCN, DOE-2016 compliant

kVA	Amp Rating	Catalog Number	Model	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	Est Ship Wgt
30	83	423-4900-130	HLTM030	32	46	24	18	500
45	125	423-4900-131	HLTM045	32	46	24	18	570
75	208	423-4900-132	HLTM075	32	55	28	23	900
112	311	423-4900-133	HLTM112	32	63	28	23	1,200
150	416	423-4900-134	HLTM150	32	63	28	23	1,350
225	625	423-4900-135	HLTM225	32	71	35	30	2,150
300	833	423-4900-136	HLTM300	32	71	35	30	2,475
400	1,108	423-4900-137	HLTM400	32	74	56	36	3,290
500	1,388	423-4900-138	HLTM500	32	74	56	36	4,100

SystemMax™

Three Phase • Harmonic Suppression System • NEMA1 Enclosures

kVA	Amp Rating	Catalog Number	Model	Enclosure Figure	Height (A) inches	Width (B) inches	Depth (C) inches	Est Ship Wgt
30	83	300-4600-140	HLSM0030	33	20	16	15	132
45	125	300-4600-141	HLSM0045	33	20	16	15	147
75	208	300-4600-142	HLSM0075	33	24	20	15	218
112	311	300-4600-143	HLSM0112	33	30	24	15	300
150	416	300-4600-144	HLSM0150	33	30	24	15	327
225	625	300-4600-145	HLSM0225	34	60	30	21	565
300	833	300-4600-146	HLSM0300	34	60	30	21	644
500	1,388	300-4600-148	HLSM0500	34	72	48	25	1,350
750	2,080	300-4600-855	HLSM0750	34	84	60	25	1,960
1,000	2,780	300-4600-856	HLSM1000	34	84	60	25	2,900

* Legs typically add 12 inches to overall height, may vary. Call for exact dimensions if critical.

Housing dimensions subject to change without notice. Consult website or factory where dimensions are critical.

For further information, contact an Application Engineer at 800-892-3755, technical_services@jeffersonelectric.com

GenMax™

GenMax is available for generators from 100kW to 2,000kW (208V, 480V and 600V) with ampacity ratings from 50 to 2,800 amps.

GenMax is sized to the generator, phase current and connected loads.

Consult the factory with your application for a specific recommendation on the GenMax to meet your needs.



PIONEER
DRY-TYPE TRANSFORMERS



JEFFERSON
ELECTRIC

BEMAG
TRANSFORMER

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Jefferson Electric History

1915 – 1920



- Toy and bell ringing transformers
- Sign transformers
- Automotive transformers, regulators, battery switches, ignition coils
- Vibrating coils
- Spark plug and auto lamp testers

1921 – 1930

- Magneto lamp regulators
- Radio transformers
- Oil burner ignition transformers
- Neon sign transformers
- Industrial, commercial, residential and auto fuses; switch and outlet boxes; powerlets



1931 – 1940



- Power circuit transformers
- Airport lighting transformers
- Fluorescent ballasts
- Mercury street lighting transformers (HID)

1941 – 1950

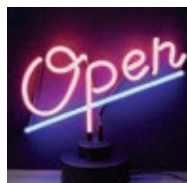
- Radar and gunfire transformers
- Capacitors
- Saf-T Lag fuses
- Golden Hour clocks



1951 – 1960

- Pulse transformers
- Washing machine solenoids
- Machine tool transformers; magnetic amplifiers; saturable reactors

- Three-phase transformers; weather-proof fluorescent ballasts; high ambient mercury ballasts



- Neon window transformers with built-in flasher

1961 – 1970

- crop drier transformer
- 500 kVA transformer; solid state controls for theatre dimmers
- UL approved Class F & Class H high temperature insulation systems



1971 – 1980

- Low voltage lighting transformers
- Buck-Boost transformers
- Medium voltage transformers



1981 – 1990

- Drive isolation transformers
- Non-linear transformers



1991 – 2000

- Harmonic filters
- AC line/load reactors
- Three-phase lighting transformers
- Stackable filters/transformers



- Universal mounting industrial control transformer

2001 – 2010

- Tanning bed transformers
- TP1 efficiency transformers
- Canadian High efficiency certification received
- Encapsulated line expanded to 75kVA
- Ventilated line expanded to 1000kVA
- Seismic approval of transformers
- Totally enclosed non-ventilated units added
- Merger with Pioneer Power Systems

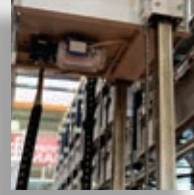
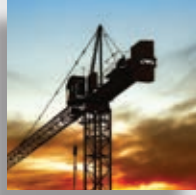


2011 – present

- Class I Division 2 transformers added
- ABS certification obtained
- Medium voltage product line added through 10,000 kVA
- 18 pulse transformers line developed
- DOE-2016 efficiency transition
- Development of harmonic mitigating transformers and patented Harmonic Suppression Systems
- Low voltage ventilated line expanded to 2,500 kVA



The experience and capability to satisfy your unique magnetic needs



● Pioneer Facility

Dry-Type Transformer Division Headquarters
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