COMMERCIAL CONSTRUCTION • INDUSTRIAL AUTOMATION

Acme Electric®

FULL LINE PRODUCT CATALOG

ACME ELECTRIC

Leadership in Quality Designed Products And Quality Customer Satisfaction

For over eighty-eight years, Acme Electric has been manufacturing power conversion and power conditioning equipment for use in industrial, commercial and OEM applications. Acme has built its reputation as a true industry leader by providing superior service, quality and technical expertise to the transformer market.

Acme Electric is a full line manufacturer of low voltage (600V and below) dry type distribution transformers, industrial control transformers and power quality equipment. With roughly 1300 catalog sku's, our products cover the full spectrum of applications, from general purpose power distribution in commercial applications, to ultra-efficient transformers used in alternative energy, to transformers that address harmful harmonic conditions generated in today's electrical loads. All of our products are designed, manufactured and verified to exceed the standards established by UL, CSA, CE, NEMA, ANSI and IEEE.

Acme operates out of two main facilities. Our headquarters in Menomonee Falls is home to our engineering and management staff. Our engineers utilize modern computer aided design tools and an in-house test lab to quickly, efficiently and effectively turn around new product designs. The Menomonee Falls facility also houses a power laboratory which provides our engineering team with the ability to test the performance of high efficiency transformers and power quality equipment under user-defined harmonic conditions. This rather unique capability enables us to provide further assurance to our customers that our products are fully qualified to meet the unique challenges of their applications.

Manufacturing takes place in Acme's new state-of-the-art, ISO 9001 production facility in Monterrey, Mexico. With 133,000 square feet of manufacturing space, it contains the staffing, the equipment and the processes indicative of world class, flexible manufacturing operations. The Monterrey facility also houses an in house test lab with certifications from UL, CSA, ISO and TUV. Our manufacturing team is credited with defining and executing the assembly methods and processes that sustain Acme Electric's reputation as the supplier of the highest quality transformers in the industry. And, our on-site quality team takes the lead in ensuring continuous improvement in everything we do.

Once the manufacturing process is complete, our products are shipped to eight regional warehouses in the United States. The location of each warehouse was strategically determined to provide rapid delivery and short lead times to every corner of the contiguous 48 states. And, with nearly 600 stocked part numbers, Acme has what you need when you need it.

Acme's technical support team has over 100 years of combined experience in the electrical industry. Only one phone call away, our technical support team is prepared and ready to help you solve a broad range of challenges. From finding the right solution for your application, to helping you install your brand new transformer, to helping you troubleshoot an electrical phenomenon in your equipment or facility, our technical service team embodies our philosophy that our commitment to the customer does not end with the shipment of product.

ISO 9001:2000 REGISTERED

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SECTION 1

DRY-TYPE DISTRIBUTION TRANSFORMERS

600 Volt Class and Below Single and Three Phase

Transformer Questions & Answers

1. What is a transformer and how does it work?
A transformer is an electrical apparatus designed to convert alternating current from one voltage to another. It can be designed to "step up" or "step down" voltages and works on the magnetic induction principle. A transformer has no moving parts and is a completely static solid state device, which insures, under normal operating conditions, a long and trouble-free life. It consists, in its simplest form, of two or more coils of insulated wire wound on a laminated steel core. When voltage is introduced to one coil, called the primary, it magnetizes the iron core. A voltage is then induced in the other coil, called the secondary or output coil. The change of voltage (or voltage ratio) between the primary and secondary depends on the turns ratio of the two coils.

2. What are taps and when are they used? Taps are provided on some transformers on the high voltage winding to correct for high or low voltage conditions, and still deliver full rated output voltages at the secondary terminals. Standard tap arrangements are at two-and-one-half and five percent of the rated primary voltage for both high and low voltage conditions. For example, if the transformer has a 480 volt primary and the available line voltage is running at 504 volts, the primary should be connected to the 5% tap above normal in order that the secondary voltage be maintained at the proper rating. The standard ASA and NEMA designation for taps are "ANFC" (above normal full capacity) and "BNFC" (below normal full capacity).

3. What is the difference between "Insulating," "Isolating," and "Shielded Winding" transformers?
Insulating and isolating transformers are identical. These terms are used to describe the isolation of the primary and secondary windings, or insulation between the two. A shielded transformer is designed with a metallic shield between the primary and secondary windings to attenuate transient noise. This is especially important in critical applications such as computers, process controllers and many other microprocessor controlled devices. All two, three and four winding transformers are of the insulating or isolating types. Only autotransformers, whose primary and secondary are connected to each other electrically, are not of the insulating or isolating variety.

4. Can transformers be operated at voltages other than nameplate voltages? In some cases, transformers can be operated at voltages below the nameplate rated voltage. In **NO** case should a transformer be operated at a voltage in excess of its nameplate rating, unless taps are provided for this purpose. When operating below the rated voltage, the kVA capacity is reduced correspondingly. For example, if a 480 volt primary transformer with a 240 volt secondary is operated at 240 volts, the secondary voltage is reduced to 120 volts. If the transformer was originally rated 10 kVA, the reduced rating would be 5 kVA, or in direct proportion to the applied voltage.

5. Can 60 Hz transformers be operated at 50 Hz?
ACME transformers rated below 1 kVA can be used on 50 Hz service. Transformers 1 kVA and larger, rated at 60 Hz, should not be used on 50 Hz service, due to the higher losses and resultant heat rise. Special designs are required for this service. However, any 50 Hz transformer will operate on a 60 Hz service.

6. Can transformers be used in parallel? Single phase transformers can be used in parallel only when their impedances and voltages are equal. If unequal voltages are used, a circulating current exists in the closed network between the two transformers, which will cause excess heating and result in a shorter life of the transformer. In addition, impedance values of each transformer must be within 7.5% of each other. For example: Transformer A has an impedance of 4%, transformer B which is to be parallel to A must have an impedance between the limits of 3.7% and 4.3%. When paralleling three phase transformers, the same precautions must be observed as listed above, plus the angular displacement and phasing between the two transformers must be identical.

7. Can Acme Transformers be reverse connected?
ACME dry-type distribution transformers can be reverse connected without a loss of kVA rating, but there are certain limitations. Transformers rated 1 kVA and larger single phase, 3 kVA and larger three phase can be reverse connected without any adverse effects or loss in kVA capacity. The reason for this limitation in kVA size is, the turns ratio is the same as the voltage ratio. Example: A transformer with a 480 volt input, 240 volt output— can have the output connected to a 240 volt source and thereby become the primary or input to the transformer, then the original 480 volt primary winding will become the output or 480 volt secondary. On transformers rated below 1 kVA single phase, there is a turns ratio compensation on the low voltage winding. This means the low voltage winding has a greater voltage than the nameplate voltage indicates at no load. For example, a small single phase transformer having a nameplate voltage of 480 volts primary and 240 volts secondary, would actually have a no load voltage of approximately 250 volts, and a full load voltage of 240 volts. If the 240 volt winding were connected to a 240 volt source, then the output voltage would consequently be approximately 460 volts at no load and approximately 442 volts at full load. As the kVA becomes smaller, the compensation is greater— resulting in lower output voltages. When one attempts to use these transformers in reverse, the transformer will not be harmed; however, the output voltage will be lower than is indicated by the nameplate.

8. Can a Single Phase Transformer be used on a Three Phase source? Yes. Any single phase transformer can be used on a three phase source by connecting the primary leads to any two wires of a three phase system, regardless of whether the source is three phase 3-wire or three phase 4-wire. The transformer output will be single phase.

9. Can Transformers develop Three Phase power from a Single Phase source? No. Phase converters or phase shifting devices such as reactors and capacitors are required to convert single phase power to three phase.

10. How do you select transformers?
(1) Determine primary voltage and frequency.
(2) Determine secondary voltage required.
(3) Determine the capacity required in volt-amperes.

This is done by multiplying the load current (amperes) by the load voltage (volts) for single phase. For example: if the

load is 40 amperes, such as a motor, and the secondary voltage is 240 volts, then 240 x 40 equals 9600 VA. A 10 kVA (10,000volt-amperes) transformer is required. ALWAYS SELECT THE TRANSFORMER LARGER THAN THE ACTUAL LOAD. This is done for safety purposes and allows for expansion, in case more load is added at a later date. For 3 phase kVA, multiply rated volts x load amps x 1.73 (square root of 3) then divide by 1000.

(4) Determine whether taps are required. Taps are usually specified on larger transformers.
(5) Use the selection charts in Section I.

11. What terminations are provided? Primary and Secondary Terminations are provided on ACME Dry-Type Transformers as follows:

No lugs—lead type connection on
0-25 kVA single phase
0-15 kVA three phase
Bus-bar terminations
(drilled to NEMA standards)
37.5-250 kVA single phase
25-500 kVA three phase

12. Can 60 Hz transformers be used at higher frequencies? ACME transformers can be used at frequencies above 60 Hz up through 400 Hz with no limitations provided nameplate voltages are not exceeded. However, 60 Hz transformers will have less voltage regulation at 400 Hz than 60 Hz.

13. What is meant by regulation in a transformer? Voltage regulation in transformers is the difference between the no load voltage and the full load voltage. This is usually expressed in terms of percentage. For example: A transformer delivers 100 volts at no load and the voltage drops to 95 volts at full load, the regulation would be 5%. ACME dry-type distribution transformers generally have regulation from 2% to 4%, depending on the size and the application for which they are used.

14. What is temperature rise in a transformer? Temperature rise in a transformer is the temperature of the windings and insulation above the existing ambient or surrounding temperature.

15. What is "Class" in insulation? Insulation class was the original method used to distinguish insulating materials operating at different temperature levels. Letters were used for different designations. Letter classifications have been replaced by insulation system temperatures in degrees Celsius. The system temperature is the maximum temperature at the hottest spot in the winding (coil). Graphical representations of six insulation systems recognized by Underwriters' Laboratories, Inc. are shown in Figure A. These systems are used by Acme for a large part of the product line.

16. Is one insulation system better than another? Not necessarily. It depends on the application and the cost benefit to be realized. Higher temperature class insulation systems cost more and larger transformers are more expensive to build. Therefore, the more expensive insulation systems are more likely to be found in the larger kVA units.

Referring to Figure A, small fractional kVA transformers use insulation class 130°C. Compound filled transformers use insulation class 180°C. Larger ventilated transformers are designed to use 220°C insulation. All of these insulation systems will normally have the same number of years operating life. A well designed transformer, observing these temperature limits, will have a life expectancy of 20-25 years.

17. Why should Dry-Type Transformers never be over-loaded? Overloading of a transformer results in excessive temperature. This excessive temperature causes overheating which will result in rapid deterioration of the insulation and cause complete failure of the transformer coils.

18. Are temperature rise and actual surface temperature related? No. This can be compared with an ordinary light bulb. The filament temperature of a light bulb can exceed 2000 degrees, yet the surface temperature of the bulb is low enough to permit touching with bare hands.

19. What is meant by "impedance" in transformers? Impedance is the current limiting characteristic of a transformer and is expressed in percentage.

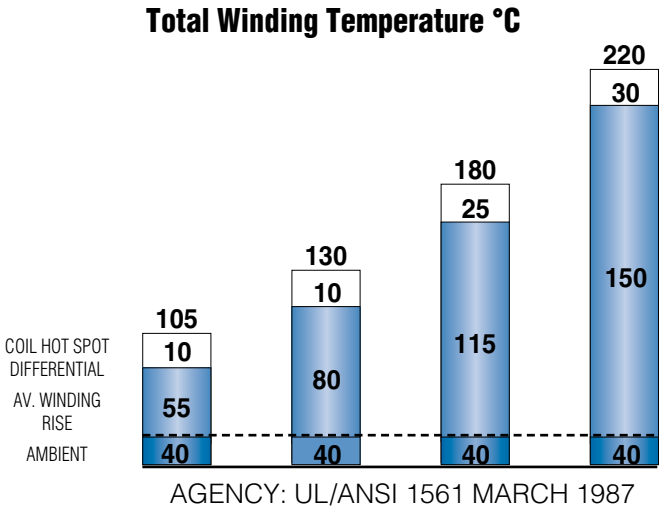


Figure A

20. Why is impedance important? It is used for determining the interrupting capacity of a circuit breaker or fuse employed to protect the primary of a transformer. **Example:** Determine a minimum circuit breaker trip rating and interrupting capacity for a 10 kVA single phase transformer with 4% impedance, to be operated from a 480 volt 60 Hz source.

Calculate as follows:

$$\text{Normal Full Load Current} = \frac{\text{Nameplate Volt Amps}}{\text{Line Volts}} = \frac{10{,}000\ \text{VA}}{480\ \text{V}} =$$

20.8 Amperes

$$\text{Maximum Short Circuit Amps} = \frac{\text{Full Load Amps}}{4\%} = \frac{20.8\ \text{Amps}}{4\%} =$$

520 Amps

The breaker or fuse would have a minimum interrupting rating of 520 amps at 480 volts.

Example: Determine the interrupting capacity, in amperes, of a circuit breaker or fuse required for a 75 kVA, three phase transformer, with a primary of 480 volts delta and secondary of 208Y/120 volts. The transformer impedance (Z) = 5%. If the secondary is short circuited (faulted), the following capacities are required:

$$\text{Normal Full Load Current} = \frac{\text{Volt Amps}}{\sqrt{3} \times \text{Line Volts}} = \frac{75{,}000 \text{ VA}}{\sqrt{3} \times 480 \text{ V}} = 90 \text{ Amps}$$

$$\text{Maximum Short Circuit Line Current} = \frac{\text{Full Load Amps}}{5\%} = \frac{90 \text{ Amps}}{5\%} = 1{,}800 \text{ Amps}$$

The breaker or fuse would have a minimum interrupting rating of 1,800 amps at 480 volts.

NOTE: The secondary voltage is not used in the calculation. The reason is the primary circuit of the transformer is the only winding being interrupted.

21. Can Single Phase Transformers be used for Three Phase applications? **Yes.** Three phase transformers are sometimes not readily available whereas single phase transformers can generally be found in stock. Three single phase transformers can be used in delta connected primary and wye or delta connected secondary. They should never be connected wye primary to wye secondary, since this will result in unstable secondary voltage. The equivalent three phase capacity when properly connected of three single phase transformers is three times the nameplate rating of each single phase transformer. For example: Three 10 kVA single phase transformers will accommodate a 30 kVA three phase load.

22. Does ACME provide "Zig-Zag" Grounding Transformers? **Yes.** Please refer to Page 31 for a special diagram which can be used to connect standard single phase off-the-shelf transformers in a three phase zig-zag manner. This system can be used for either grounding or developing a fourth wire from a three phase neutral. An example would be to change a 480 V — three phase — three wire system to a 480Y/277 V — three phase — four wire system.

23. What color are ACME Dry-Type Transformers?
ASA 61 (NEMA) light gray is used on all enclosed transformers from .050 to 1000 kVA.

24. How do you select a transformer to operate in an ambient higher than 40° centigrade?
When the ambient exceeds 40°C use the following chart for de-rating standard transformers.

Maximum Ambient Temperature	Maximum Percentage of Loading
40°C (104°F)	100%
50°C (122°F)	92%
60°C (140°F)	84%

Instead of ordering custom built transformers to operate in ambients higher than 40°C, it is more economical to use a standard transformer of a larger kVA rating.

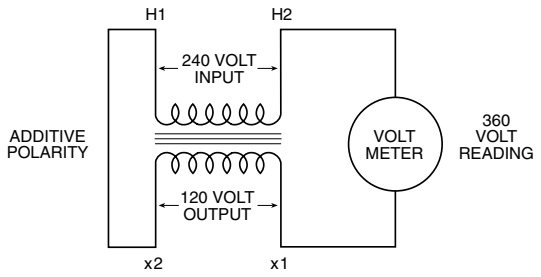
25. Can transformers listed in this catalog be reconnected as autotransformers to increase their kVA rating? Several standard single phase transformers listed in this catalog can be connected as autotransformers. The kVA capacity will be greatly increased when used as an autotransformer, in comparison to the nameplate kVA as an insulating transformer. Examples of autotransformer applications are changing 600 volts to 480 volts in either single phase or three phase; changing 480 volts to 240 volts single or three phase or vice versa; or the developing of a fourth wire (neutral) from a 480 volt three phase three wire system for obtaining 277 volts single phase. This voltage is normally used for operating fluorescent lamps or similar devices requiring 277 volts. For further details showing kVA and voltage combinations for various autotransformer connections refer to Page 30 and 31 in this catalog.

26. Are ACME Transformers shown in this catalog U.L. Listed? All of the transformers, with few exceptions, are listed by Underwriters' Laboratories and have met their rigorous requirements. We are also prepared to have transformers, which are not presently listed, submitted for listing to Underwriters' upon the customer's request. Please contact the factory for details.

27. Is CSA certification available for transformers shown in this catalog? Most ACME transformers shown in this catalog are certified by Canadian Standards Association. They have been designed and tested in accordance with the latest specifications. Please contact the factory if further details are required.

28. What is BIL and how does it apply to transformers listed in this catalog?
BIL is an abbreviation for Basic Impulse Level. Impulse tests are dielectric tests that consist of the application of a high frequency steep wave front voltage between windings, and between windings and ground. The Basic Impulse Level of a transformer is a method of expressing the voltage surge (lightning, switching surges, etc.) that a transformer will tolerate without breakdown. All transformers manufactured in this catalog, 600 volts and below, will withstand the NEMA standard BIL rating, which is 10 KV. This assures the user that he will not experience breakdowns when his system is properly protected with lightning arrestors or similar surge protection devices.

29. What is polarity, when associated with a transformer?
Polarity is the instantaneous voltage obtained from the primary winding in relation to the secondary winding. Transformers 600 volts and below are normally connected in additive polarity — that is, when tested the terminals of the high voltage and low voltage windings on the left hand side are connected together, refer to diagram below. This leaves one high voltage and



one low voltage terminal unconnected. When the transformer is excited, the resultant voltage appearing across a voltmeter will be the sum of the high and low voltage windings. This is useful when connecting single phase transformers in parallel for three phase operations. Polarity is a term used only with single phase transformers.

30. What is exciting current? Exciting current, when used in connection with transformers, is the current or amperes required for excitation. The exciting current on most lighting and power transformers varies from approximately 10% on small sizes of about 1 kVA and smaller to approximately .5% to 4% on larger sizes of 750 kVA. The exciting current is made up of two components, one of which is a real component and is in the form of losses or referred to as no load watts; the other is in the form of reactive power and is referred to as kVAR.

31. Will a transformer change Three Phase to single phase? A transformer will not act as a phase changing device when attempting to change three phase to single phase. There is no way that a transformer will take three phase in and deliver single phase out while at the same time presenting a balanced load to the three phase supply system. There are, however, circuits available to change three phase to two phase or vice versa using standard dual wound transformers. Please contact the factory for two phase applications.

32. Can air cooled transformers be applied to motor loads? This is an excellent application for air cooled transformers. Even though the inrush or starting current is five to seven times normal running current, the resultant lower voltage caused by this momentary overloading is actually beneficial in that a cushioning effect on motor starting is the result. The tables on Pages 11 and 12 illustrate some typical transformer requirements for use with motor applications.

33. How is an Acme Drive Isolation Transformer (DIT) different than a General Purpose Tranformer? DITs, as the name implies, are designed to be used with motor drives (AC and DC) and to provide isolation from the service line. They are specifically designed to withstand the "short circuit like" duty imposed by the firing of the thyristors. Harmonics generated by drives create added loads on the transformer. Therefore, it is important that a transformer of equal or greater kVA to that recommended by the drive manufacturer be installed for a particular motor application.

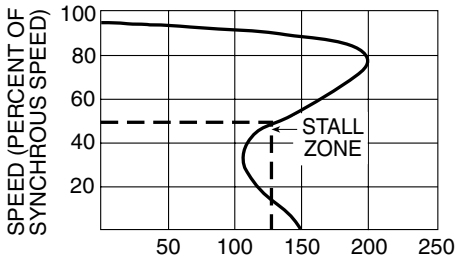
34. How are transformers sized to operate Three Phase induction type squirrel cage motors? The minimum transformer kVA rating required to operate a motor is calculated as follows:

$$\text{Minimum Transformer kVA} = \frac{\text{Running Load Amperes} \times 1.73 \times \text{Motor Operating Voltage}}{1000}$$

NOTE: If motor is to be started more than once per hour add 20% additional kVA.

Care should be exercised in sizing a transformer for an induction type squirrel cage motor as when it is started, the lock rotor amperage is approximately 5 to 7 times the running load amperage. This severe starting overload will result in a drop of the transformer output voltage. When the voltage is low the torque and the horsepower of the motor will drop proportionately to the square of the voltage. For example: If the voltage were to drop to 70% of nominal, then motor horsepower and torque would drop to 70% squared or 49% of the motor nameplate rating.

If the motor is used for starting a high torque load, the motor may stay at approximately 50% of normal running speed as illustrated by the graph below:



SPEED vs TORQUE FOR A TYPICAL THREE PHASE INDUCTION TYPE SQUIRREL CAGE MOTOR

The underlying problem is low voltage at the motor terminals. If the ampere rating of the motor and transformer overcurrent device falls within the motor's 50% RPM draw requirements, a problem is likely to develop. The overcurrent device may not open under intermediate motor ampere loading conditions. Overheating of the motor and/or transformer would occur, possibly causing failure of either component.

This condition is more pronounced when one transformer is used to power one motor and the running amperes of the motor is in the vicinity of the full load ampere rating of the transformer. The following precautions should be followed:

(1) When one transformer is used to operate one motor, the running amperes of the motor should not exceed 65% of the transformer's full load ampere rating.

(2) If several motors are being operated from one transformer, avoid having all motors start at the same time. If this is impractical, then size the transformer so that the total running current does not exceed 65% of the transformer's full load ampere rating.

35. Why are Small Distribution Transformers not used for Industrial Control Applications? Industrial control equipment demands a momentary overload capacity of three to eight times normal capacity. This is most prevalent in solenoid or magnetic contactor applications where inrush currents can be three to eight times as high as normal sealed or holding currents but still maintain normal voltage at this momentary overloaded condition. Distribution transformers are designed for good regulation up to 100 percent loading, but their output voltage will drop rapidly on momentary overloads of this type making them unsuitable for high inrush applications.

Industrial control transformers are designed especially for maintaining a high degree of regulation even at eight times normal load. This results in a larger and generally more expensive transformer. For a complete listing of ACME industrial control transformers, refer to Section V.

36. Can 4-Winding Single Phase Transformer be auto-connected? Yes. There are occasions where 480 volts single phase can be stepped down to 240 volts single phase by autoconnecting a standard 4-winding isolating transformer as shown in Figure 1. If connected in this manner, the nameplate kVA is doubled. For example: A 10 kVA load can be applied to a 5 kVA 4-winding transformer if connected per Figure 1.

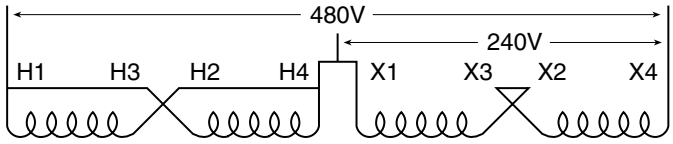


Figure 1

37. What about balanced loading on Three Phases? Each phase of a three phase transformer must be considered as a single phase transformer when determining loading. For example: A 45 kVA three phase transformer with a 208Y/120 volt secondary is to service 4 loads at 120 volts single phase each. These loads are 10 kVA, 5 kVA, 8 kVA,and 4 kVA.

NOTE: that maximum loading on any phase does not exceed 10 kVA. Each phase has a 15 kVA capacity.

$$\frac{45\ \text{kVA}}{3\ \text{phase}} = 15\ \text{kVA per phase}$$

If incorrect method is used, phase B will have an 18 kVA load which is 3 kVA above its normal capacity of 15 kVA and failure will result even though we only have a total load of 27 kVA on a 45 kVA transformer.

Enclosure Definitions

Type 1 Enclosures — are intended for indoor use, primarily to provide a degree of protection against contact with the enclosed equipment.

Type 2 Enclosures — are intended for indoor use, primarily to provide a degree of protection against limited amounts of falling water and dirt.

Type 3R Enclosures — are intended for outdoor use, primarily to provide a degree of protection against falling rain, sleet and external ice formation.

Definitions Pertaining to Enclosures

Ventilated — means constructed to provide for circulation of external air through the enclosure to remove excess heat, fumes or vapors.

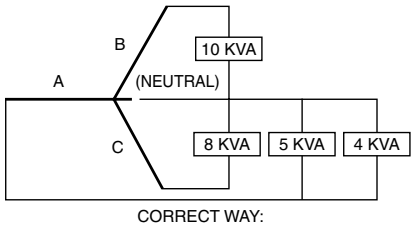
Non-Ventilated — means constructed to provide no intentional circulation of external air through the enclosure.

Indoor Locations — are those areas protected from exposure to the weather.

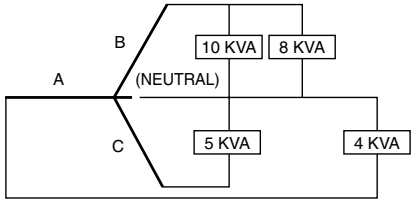
Outdoor Locations — are those areas exposed to the weather.

Hazardous (Classified) Locations — are those areas, which may contain hazardous (classified) materials in sufficient quantity to create an explosion. See Article 500 of The National Electrical Code.

38. What is meant by "Balanced Loading" on Single Phase Transformer applications? Since most single phase transformers have a secondary voltage of 120/240, they will be operated as a three wire system. Care must be taken in properly distributing the load as the transformer secondary consists of 2 separate 120 volt windings. Each 120 volt winding is rated at one-half the nameplate kVA rating. For example: A 10 kVA transformer, 120/240 volt secondary is to service an 8 kVA load at 240 volts and two 1 kVA loads at 120 volts each.

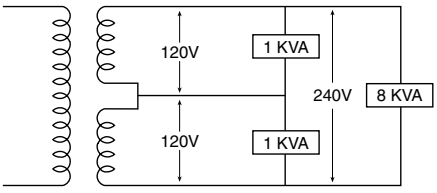


CORRECT WAY:

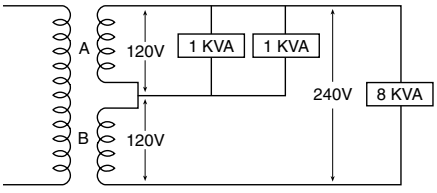


INCORRECT WAY:

If the incorrect method is used, winding A will be loaded at 6 kVA, and winding B will be loaded at 4 kVA. These do total 10 kVA but, since each winding is only rated at 5 kVA (1/2 of nameplate rating), we have an overloaded transformer and a certain failure.



CORRECT WAY:



INCORRECT WAY:

39. What are typical applications for transfomers? ACME transformers should be specified to:

(1) Distribute power at high voltage.

(2) Eliminate double wiring.

(3) Operate 120 volt equipment from power circuits.

(4) Insulate circuits/establish separately derived circuits.

(5) Provide 3-wire secondary circuits.

(6) Buck and Boost (See Section VII).

(7) Provide electrostatic shielding for transient noise protection.

Steps for Selecting the Proper Transformer

SINGLE PHASE LOADS

1. Determine electrical load

A. Voltage required by load.

B. Amperes or kVA capacity required by load.

C. Frequency in Hz (cycles per second).

D. Verify load is designed to operate on a single phase supply.

All of the above information is standard data normally obtained from equipment nameplates or instruction manuals.

2. Determine supply voltage

A. Voltage of supply (source).

B. Frequency in Hz (cycles per second).

The frequency of the line supply and electrical load must be the same. Select single phase transformer designed to operate at this frequency, having a primary (input) equal to the supply voltage and a secondary (output) equal to the voltage required by the load.

3. If the load nameplate expresses a rating in kVA, a transformer can be directly selected from the charts. Choose from a group of transformers with primary and secondary voltages matching those you have just determined.

A. Select a transformer with a standard kVA capacity **equal to or greater than** that needed to operate the load.

B. Primary taps are available on most models to compensate for line voltage variations. (Refer to question #2 in the Transformer Questions and Answers Section on page 6.)

C. When load ratings are given only in amperes, tables 1 and 2 or the following formulas may be used to determine proper kVA size for the required transformer.

(1) To determine **kVA** when volts and amperes are known:

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

(2) To determine **Amperes** when kVA and volts are known:

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

Single Phase Example

Question: Select a transformer to meet the following conditions. Load is single phase lighting using incandescent lamps. Each fixture requires 1.3 amps @ 120 volts, 1 phase, 60 Hz, power factor of unity. The installation requires 52-100 watt fixtures. The desired circuit distributing power to the light fixtures is 120/240 volt, three wire, single phase. The supply voltage is 460 volt, 3 phase.

Answer: Compute the kVA required.

$$\frac{1.3 \text{ amps} \times 120 \text{ volts}}{1000} = .156 \text{ kVA}$$

For each lighting fixture

Always use amps x volts to compute VA, never use lamp wattage. .156 kVA/Fixture x 52 Fixture = 8.11 kVA. The two sizes (kVA) nearest 8.11 kVA are 7.5 kVA and 10 kVA. Use the 10 kVA. This will not overload the transformer and allows some capacity, 1.89 kVA, for future loads. Since the supply is 460 V (not 480 V) use the 456 V tap. This will produce approximately 120 volts on output. If the tap is not used, the output will be 115 V compared to the desired 120 V. Note the transformer selected is single phase but the supply is 480 V, 3 phase. Single phase is obtained by using any 2 wires of the 3 phase supply.

TABLE 1

Full Load Current in Amperes– Single Phase Circuits

kVA	120V	208 V	240V	277V	380V	440V	480V	600V
.050	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1
.100	0.8	0.5	0.4	0.3	0.2	0.2	0.2	0.2
.150	1.2	0.7	0.6	0.5	0.4	0.3	0.3	0.3
.250	2.0	1.2	1.0	0.9	0.6	0.5	0.5	0.4
.500	4.2	2.4	2.1	1.8	1.3	1.1	1.0	0.8
.750	6.3	3.6	3.1	2.7	2.0	1.7	1.6	1.3
1	8.3	4.8	4.2	3.6	2.6	2.3	2.1	1.7
1.5	12.5	7.2	6.2	5.4	3.9	3.4	3.1	2.5
2	16.7	9.6	8.3	7.2	5.2	4.5	4.2	3.3
3	25	14.4	12.5	10.8	7.9	6.8	6.2	5.0
5	41	24.0	20.8	18.0	13.1	11.3	10.4	8.3
7.5	62	36	31	27	19.7	17	15.6	12.5
10	83	48	41	36	26	22.7	20.8	16.7
15	125	72	62	54	39	34	31	25
25	208	120	104	90	65	57	52	41
37.5	312	180	156	135	98	85	78	62
50	416	240	208	180	131	114	104	83
75	625	360	312	270	197	170	156	125
100	833	480	416	361	263	227	208	166
167	1391	802	695	602	439	379	347	278
250	2083	1201	1041	902	657	568	520	416

TABLE 2

Full Load Amperes Single Phase A.C. Motors ①

HORSE-POWER	115 V	208 V	230 V	MIN. TRANS-FORMER KVA
1/6	4.4	2.4	2.2	.53
1/4	5.8	3.2	2.9	.70
1/3	7.2	4.0	3.6	.87
1/2	9.8	5.4	4.9	1.18
3/4	13.8	7.6	6.9	1.66
1	16	8.8	8	1.92
1.5	20	11.0	10	2.40
2	24	13.2	12	2.88
3	34	18.7	17	4.10
5	56	30.8	28	6.72
7.5	80	44	40	9.6
10	100	55	50	12.0

① When motor service factor is greater than 1, increase full load amps proportionally. Example: If service factor is 1.15, increase above amp values by 15%.

$$\textbf{1 Phase kVA} = \frac{\textbf{Volts x Amps}}{\textbf{1000}}$$

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

THREE PHASE LOADS

1. Determine electrical load

A. Voltage required by load.

B. Amperes or kVA required by load.

C. Frequency in Hz (cycles per second).

D. Verify load is designed to operate on three phase.

All the above information is standard data normally obtained from equipment nameplates or instruction manuals.

2. Determine supply voltage

A. Voltage of supply (source).

B. Frequency in Hz (cycles per second).

The frequency of the line supply and electrical load must be the same. A three phase transformer is selected which is designed to operate at this frequency having a primary (input) equal to the supply voltage and a secondary (output) equal to the voltage required by the load.

3. If the load nameplate expresses a rating in kVA, a transformer can be directly selected from the charts. Choose from the group of transformers with primary and secondary voltages matching that which you have just determined.

A. Select a transformer with a standard kVA capacity **equal to or greater than** that needed to operate the load.

B. Primary taps are available on most models to compensate for line voltage variations. (Refer to question #2 in the Transformer Questions and Answers Section on page 6.)

C. When load ratings are given only in amperes, tables 3 and 4 or the following formulas may be used to determine proper kVA size for the required transformer.

(1) To determine three phase **kVA** when volts and amperes are known:

$$\text{Three Phase kVA} = \frac{\text{Volts x Amps x 1.73}}{1000}$$

(2) To determine **Amperes** when kVA and volts are known:

$$\text{Amps} = \frac{\text{3 Phase kVA x 1000}}{\text{Volts x 1.73}}$$

Three Phase Example

Question: Select a transformer to fulfill the following conditions. Load is a three phase induction motor, 25 horsepower @ 240 volts, 60 Hz and a heater load of 4 kilowatts @ 240 volts single phase. The supply voltage is 480Y/277, three phase, 4 wire.

Answer: Compute the kVA required. **Motor**—From table 4 the current is 68 amps.

$$\frac{\text{240 volts x 68 amps x 1.73}}{1000} = 28.2 \text{ kVA}$$

(The kVA can also be obtained from table 4).

Heater — 4 kVA

A three phase transformer must be selected so that any one phase is not overloaded. Each phase should have the additional 4 kVA rating required by the heater even though the heater will operate on one phase only. So, the transformer should have a minimum kVA rating of 28.2 + 4 + 4 + 4 or 40.2 kVA. Refer to the appropriate selection chart. A 480 delta primary—240 delta secondary transformer may be used on a 4 wire, 480Y/277 volt supply. The fourth wire (neutral) is not connected to the transformer. To not overload the transformer, a 45 kVA transformer should be selected.

NOTE: Any two wires of the 240 volts, 3 phase developed by the secondary of the transformer may be used to supply the heater. Any 2 wires of a 3 phase system is single phase.

TABLE 3

Full Load Current in Amperes– Three Phase Circuits

kVA	208 V	240 V	380 V	440 V	480 V	600 V
3	8.3	7.2	4.6	3.9	3.6	2.9
4.5	12.5	10.8	6.8	5.9	5.4	4.3
6	16.6	14.4	9.1	7.8	7.2	5.8
9	25	21.6	13.7	11.8	10.8	8.6
15	41	36	22.8	19.6	18.0	14.4
22.5	62	54	34.2	29	27	21.6
30	83	72	45.6	39	36	28
45	124	108	68.4	59	54	43
75	208	180	114	98	90	72
112.5	312	270	171	147	135	108
150	416	360	228	196	180	144
225	624	541	342	294	270	216
300	832	721	456	392	360	288
500	1387	1202	760	655	601	481
750	2081	1804	1139	984	902	721
1000	2775	2405	1519	1312	1202	962

TABLE 4

Full Load Amperes Three Phase A.C. Motors ①

HORSE-POWER	208 V	230 V	460 V	575 V	MIN. TRANS-FORMER KVA
1/2	2.2	2.0	1.0	0.8	0.9
3/4	3.1	2.8	1.4	1.1	1.2
1	4.0	3.6	1.8	1.4	1.5
2	7.5	6.8	3.4	2.7	2.7
3	10.7	9.6	4.8	3.9	3.8
5	16.7	15.2	7.6	6.1	6.3
10	31	28	14	11	11.2
15	46	42	21	17	16.6
20	59	54	27	22	21.6
25	75	68	34	27	26.6
30	88	80	40	32	32.4
40	114	104	52	41	43.2
50	143	130	65	52	52
60	170	154	77	62	64
75	211	192	96	77	80
100	273	248	124	99	103
125	342	312	156	125	130
150	396	360	180	144	150
200	528	480	240	192	200

① When motor service factor is greater than 1, increase full load amps proportionally. **Example:** If service factor is 1.15, increase above amp values by 15%.

$$\textbf{3 Phase kVA} = \frac{\textbf{Volts x Amps x 1.73}}{\textbf{1000}}$$

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

UL-3R Enclosures

ENCAPSULATED SINGLE PHASE, .05 to .150 kVA

FEATURES

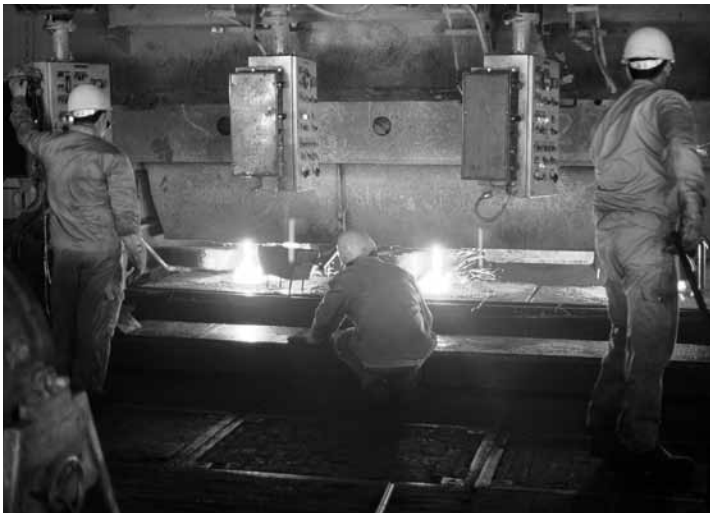
- **UL listed, CSA certified and UL-3R enclosure** meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- **Easy and convenient installation** to meet your requirements, the transformer can be mounted in any position.
- **Long Life** UL class 130°C insulation system. Transformers can be banked for three phase service.
- **Large wiring compartment,** no conduit or pull boxes required. Front access for wiring ease. Wiring compartment remains cool.
- **Completely enclosed** UL-3R enclosure for indoor/outdoor service. Rugged non-ventilated construction.
- **Plenty of knockouts** for multi-directional entry.
- **All copper lead wire terminations.**
- **Ground studs** for use with non-metallic conduit.

ENCAPSULATED SINGLE PHASE, .250 to 25 kVA

- **Installation** keyhole mounting slots for mounting bolts prior to installation. Mounting slots are accessible from the front. Lifting ears are included on 3 to 25 kVA units.
- **Wiring** flexible copper leadwire terminations for easy connections outside the front access wiring compartment. Dual size knockouts in both sides and the bottom of the wiring compartment for greater wiring convenience and flexibility.

FEATURES

- **UL listed, CSA certified and UL-3R enclosures** meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- **Shielded** for cleaner power.
- **Encapsulated and completely enclosed design** electrical grade silica and resin compounds completely enclose the core and coil to seal out all moisture and air. UL Type 3R enclosure for indoor or outdoor service. Encapsulation eliminates corrosion and insulation deterioration.
- **Quiet operation** with sound levels well below NEMA standards.
- **Long life** UL class 155°C insulation system. 115°C rise thru .750 kVA; 180°C insulation system, 115°C rise, 1 kVA and above.



Shielded Power in Many Design Styles

ENCAPSULATED THREE PHASE 3 to 75 kVA

FEATURES

- **UL listed, CSA certified and UL-3R enclosure** meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- **UL Class** 180°C insulation system. 115°C rise.
- **Extra** large front access wiring compartment through 9 kVA; top access through 75 kVA for easier installation and cooler case temperatures.
- **Completely enclosed** — suitable for indoor/outdoor service. Consult selection charts for details. Excellent for dust or lint laden atmosphere.
- **Encapsulated** — electrical grade silica and resin compound completely encloses the core and coil. Encapsulation seals out all moisture and air, eliminating corrosion and insulation deterioration.
- **High efficiency** and excellent regulation.
- **Sound levels** below NEMA standards.
- **Keyhole mounting slots** permit installation of mounting bolts prior to hanging transformer and are accessible from the front. Lifting ears for easy installation.
- **Wiring connections** can be made outside of wiring compartment due to the use of flexible leads.
- **3-9 kVA** provided with dual size knockouts in sides and bottom of wiring compartment.
- **Termination** — copper lead wire.
- **Electrostatic shielding** provided on all 60 Hz isolation transformers.

NOTE: Units above 15 kVA apply to Groups F and K.

316 STAINLESS STEEL TRANSFORMERS

FEATURES

- 3R enclosure.
- Encapsulated construction.
- Single phase: 0.25 – 25 kVA.
  Three phase: 3 – 7.5 kVA.
- Core and Coil assembly completely encapsulated in polyester or epoxy seals out all moisture, eliminating corrosion and deterioration of insulation.
- Electrostatic shielding.

APPLICATIONS

- Harsh industrial locations
- Corrosive chemical exposure
- Waste water treatment facilities
- Coastal or marine applications with high salt mist
- Any application where painted cold roll steel is not adequate

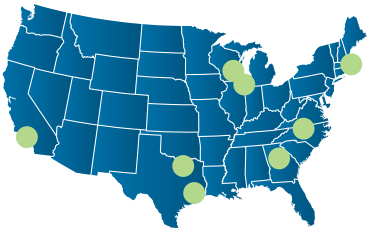
VENTILATED
SINGLE PHASE 37.5 to 250 kVA
THREE PHASE 25 to 1000 kVA

FEATURES

- **With weather shield, UL Type 3R enclosure** type 2 enclosure without weather shield. UL listed and CSA certified.
- **UL Class 220°C** insulation system, 150°C rise.
- **Extra large wiring** compartment for easier installation and cooler case temperatures.
- **NEMA standard bus bar terminals,** no special tools needed to make clearly marked connections. Tap changing easily accomplished with jumpers.
- **Aluminum windings** for increased insulation life, cooler operation, lower losses.
- **Noise and vibration isolating pads** standard to assure **quiet** operation.
- **Large permanently legible nameplates** on front.
- **Single phase units** can be banked for 3 phase service.
- **All units have ground studs** for use with non-metallic conduit.
- **Suitable for wall or "trapeze" mounting**. Wall brackets are available for units up to 50 kVA single and 75 kVA three phase.
- **Other models** are available with class 220°C insulation and either 115°C or 80°C rise operating temperature. Refer to Opti-Miser® Section.
- **Termination** — single phase 37.5 to 100 kVA, copper bus; 167 to 250 kVA, aluminum bus. Three phase 27 to 225 kVA, copper bus; Groups D, G & J 30 to 225 kVA and all 275 to 1000 kVA, aluminum bus.
- **Electrostatic shielding** provided on all 60 Hz isolation transformers. Not available on Groups D1 and G.

TRANSFORMING THE DEFINITION OF CUSTOMER SERVICE

8 Regional Distribution Centers supporting multi-million dollar inventory levels



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SELECTION CHARTS

SINGLE PHASE

GROUP I

240 X 480 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — FOUR WINDINGS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
① .05	T153004	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	W	0.875 (2.2)	NA	1–A
① .10	T153005	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	W	0.875 (2.2)	NA	1–A
① .15	T153006	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	W	0.875 (2.2)	NA	1–A
① .25	T253007S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	0.50-0.75 (1.3-1.9)	NA	2–B
① .50	T253008S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	2–B
① .75	T253009S	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	2–B
1.00	T253010S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	2–B
1.50	T253011S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	2–B
2.00	T253012S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	2–B
3.00	T253013S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	2–C
3.00	T2530134S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	3–C
5.00	T253014S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	2–C
5.00	T2530144S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	3–C
7.50	T2535153S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	4–D
10.00	T2535163S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	4–D
15.00	T2535173S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	4–D
25.00	T2535183S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	4–D
37.50	TP530193S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	280 (127.0)	F②	NA	WSA1	5–E
50.00	TP530203S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	350 (158.8)	F②	NA	WSA1	5–E
75.00	TP530213S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	430 (195.0)	F	NA	WSA3	5–E
100.00	TP530223S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	525 (238.0)	F	NA	WSA4	5–E
167.00	TP530233S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1050 (476.3)	F	NA	WSA5	5–E
250.00	TP530243S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1440 (653.2)	F	NA	WSA5	5–E

Notes: 0.05 through 25.0 kVA encapsulated (exempt from TP1), 37.5 through 250.0 kVA TP1 compliant

GROUP I–316SS

316 STAINLESS STEEL
240 X 480 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — FOUR WINDINGS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
0.25	T253007SS	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	NA	NA	2-B
0.50	T253008SS	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	NA	NA	2-B
0.75	T253009SS	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	NA	NA	2-B
1.00	T253010SS	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	NA	NA	2-B
1.50	T253011SS	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	NA	NA	2-B
2.00	T253012SS	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	NA	NA	2-B
3.00	T253013SS	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	NA	NA	3-C
5.00	T253014SS	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	NA	NA	3-C
7.50	T253515SS	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	NA	NA	4-D
10.00	T253516SS	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	NA	NA	4-D
15.00	T253517SS	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	NA	NA	4-D
25.00	T253518SS	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	NA	NA	4-D

Notes: 0.25 through 25.0 kVA encapsulated (exempt from TP1)

① Suitable for 50/60 Hz.

② Wall mounting brackets are available for these sizes, refer to page 133.

GROUP IA

240 X 480 PRIMARY VOLTS — COPPER WINDINGS — 120/240 SECONDARY VOLTS — FOUR WINDINGS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
7.50	TC535153S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	100 (45.4)	W	0.75-1.25 (1.9-3.2)	NA	4–D
10.00	TC535163S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	120 (54.4)	W	0.75-1.25 (1.9-3.2)	NA	4–D
15.00	TC535173S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	160 (72.6)	W	1.00-1.50 (2.5-3.8)	NA	4–D
25.00	TC535183S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	4–D
37.50	TPC530193S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	295 (133.8)	F ②	NA	WSA1	5–E
50.00	TPC530203S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	378 (172.0)	F ②	NA	WSA1	5–E

Notes: 7.5 through 25.0 kVA encapsulated (exempt from TP1), 37.5 through 50.0 kVA TP1 compliant

GROUP II

NON-VENTILATED TRANSFORMERS — 240 X 480 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — FOUR WINDINGS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
37.50	TE2530193S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	430 (195.0)	F ②	NA	NA	5–H
50.00	TE2530203S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	430 (195.0)	F ②	NA	NA	5–H
75.00	TE2A530213S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	525 (238.0)	F	NA	NA	5–H
100.00	TE1530223S	42.00 (106.7)	40.00 (101.6)	30.00 (76.2)	775 (352.0)	F	NA	NA	5–H

Notes: 37.5 through 100.0 kVA non-ventilated (exempt from TP1)

① Suitable for 50/60 Hz.
② Wall mounting brackets are available for these sizes, refer to page 133.

GROUP IV

600 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — THREE WINDINGS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Page 122
		HEIGHT	WIDTH	DEPTH					
① .05	T153104	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	W	0.875 (2.2)	NA	8–A
① .10	T153105	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	W	0.875 (2.2)	NA	8–A
① .15	T153106	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	W	0.875 (2.2)	NA	8–A
① .25	T253107S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	0.50-0.75 (1.3-1.9)	NA	9–B
① .50	T253108S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	9–B
① .75	T253109S	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	9–B
1.00	T253110S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	9–B
1.50	T253111S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	9–B
2.00	T253112S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	9–B
3.00	T2531131S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	10–C
5.00	T2531141S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	10–C
7.50	T2536151S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	10–D
10.00	T2536161S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	10–D
15.00	T2536171S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	10–D
25.00	T2536181S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	10–D
37.50	TP531193S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	275 (125.0)	F ②	NA	WSA1	11-E
50.00	TP531203S	29.90 (76.0)	28.15 (71.5)	22.37 (56.8)	340 (154.0)	F ②	NA	WSA2	11–E
75.00	TP531213S	35.47 (90.0)	31.90 (81.0)	26.88 (68.3)	430 (195.0)	F	NA	WSA3	11-E
100.00	TP531223S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	525 (238.0)	F	NA	WSA4	11-E
167.00	TP531233S	45.60 (115.8)	39.5 (100.3)	35.5 (90.2)	1050 (476.3)	F	NA	WSA5	11-E

Notes: 0.05 kVA through 25.0 kVA encapsulated (exempt from TP1), 37.5 through 167.0 kVA C802 compliant

GROUP V

208 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — THREE WINDINGS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
37.5	TP536491S	25.48 (64.7)	24.39 (62.0)	19.37 (49.2)	257 (117.0)	F ②	N/A	WSA1	58–E
50.0	TP536503S	25.48 (64.7)	24.39 (62.0)	19.37 (49.2)	340 (154.2)	F ②	N/A	WSA1	17–E
75.0	TP536513S	35.40 (89.9)	31.90 (81.0)	26.88 (68.2)	420 (190.5)	F ②	N/A	WSA3	17–E

Notes: 1.0 kVA through 25.0 kVA encapsulated (exempt from TP1), 37.5 through 75 kVA TP1 compliant

① Suitable for 50/60 Hz.
② Wall mounting brackets are available for these sizes, refer to page 133.

GROUP VII

120/208/240/277 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
1.0	T279740S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	23 (10.4)	W	0.50-0.75 (1.3-1.9)	NA	23–B
1.5	T279741S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	23–B
2.0	T279742S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	37 (16.8)	W	0.50-0.75 (1.3-1.9)	NA	23–B
3.0	T279743S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	23–C
5.0	T279744S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	23–C
7.5	T279745S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	105 (47.6)	W	0.75-1.25 (1.9-3.2)	NA	63–D
10.0	T279746S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	124 (56.2)	W	0.75-1.25 (1.9-3.2)	NA	63–D
15.0	T279747S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	171 (77.6)	W	1.00-1.50 (2.5-3.8)	NA	63–D
25.0	T279748S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	261 (118.4)	W	1.00-1.50 (2.5-3.8)	NA	63–D

GROUP VIII

AUTO-TRANSFORMERS

240 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
1.0	T253060	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	12–B
1.5	T253061	9.68 (24.6)	4.50 (11.4)	4.51 (11.5)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	12–B
2.0	T253062	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	12–B
3.0	T253063	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	12–B
5.0	T253064	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	12–B
7.5	T253065	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	12–C
10.0	T253066	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	12–D
15.0	T253067	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	12–D

GROUP IX

EXPORT MODEL
190/200/208/220 X 380/400/416/440 PRIMARY VOLTS
120/240 SECONDARY VOLTS — 1Ø, 50/60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
*1.0	TF217437S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	14–B
*2.0	TF217439S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	14–B
*3.0	TF249873S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	14–C
*5.0	TF252520S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	14–C
*7.5	TF252794S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	14–D
*10.0	TF252795S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	14–D
*15.0	TF252796S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	14–D
*25.0	TF252797S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	300 (136.0)	W	1.00-1.50 (2.5-3.8)	NA	14–D

* CE Marked

GROUP X

EXPORT MODEL②
190/208/220/240 x 380/416/440/480 PRIMARY VOLTS — 120/240 SECONDARY VOLTS — 1Ø, 50/60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
*1.0	TF279260S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	64–B
*2.0	TF279261S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	64–B
*3.0	TF279262S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	64–C
*5.0	TF279263S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	64–C
*7.5	TF279264S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	64–D
*10.0	TF279265S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	64–D
*15.0	TF279266S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	64–D
*25.0	TF279267S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	300 (136.1)	W	1.00-1.50 (2.5-3.8)	NA	64–D

* CE Marked

GROUP XI

EXPORT MODEL②
190/200/208/220 x 380/400/416/440 PRIMARY VOLTS — 110/220 SECONDARY VOLTS — 1Ø, 50/60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
*1.0	TF279300S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	65–B
*2.0	TF279301S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	65–B
*3.0	TF279302S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	65–C
*5.0	TF279303S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	65–C
*7.5	TF279304S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	65–D

* CE Marked

① Wall mounting brackets are available for these sizes, refer to page 133.

② Maximum exciting current 5% at 50 Hz.

GROUP XII

277/480 PRIMARY VOLTS — 208/277 SECONDARY VOLTS — 1Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
0.25	GP12250S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	12 (5.4)	W	0.50-0.75 (1.3-1.9)	NA	78-B
0.50	GP12500S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	78-B
1.00	GP121000S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	78-B
3.00	GP123000S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	58 (26.3)	W	0.75-1.25 (1.9-3.2)	NA	78-C
5.00	GP125000S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	80 (36.3)	W	0.75-1.25 (1.9-3.2)	NA	78-C
10.00	GP1210000S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	78-D
15.00	GP1215000S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	161 (70.0)	W	1.00-1.50 (2.5-3.8)	NA	79-D

SELECTION CHARTS

THREE PHASE

GROUP A

208 DELTA PRIMARY VOLTS — 480Y/277 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
15.0	T3793671S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.0)	F ①	NA	NA	48–I
30.0	TP793684S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	330 (150.0)	F ①	NA	WSA1	46–E
45.0	TP793694S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	400 (181.0)	F ①	NA	WSA1	46–E
75.0	TP793704S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	530 (240.0)	F ①	NA	WSA2	46–E
112.5	TP793714S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	750 (340.0)	F	NA	WSA3	46–E
150.0	TP793724S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	950 (430.9)	F	NA	WSA4	46–E
225.0	TP793734S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1200 (544.0)	F	NA	WSA4	46–E
300.0	TP793744S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	NA	WSA5	46–E

Notes: 15 kVA unit encapsulated (exempt from TP1), 30 through 300 kVA TP1 compliant

GROUP B

240 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
9.0	T2A533601S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	18–F
15.0	T3533611S	18.86 (48.0)	20.30 (51.6)	9.03 (23.0)	250 (113.0)	F ①	NA	NA	18–I
30.0	TP533624S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	325 (147.0)	F ①	NA	WSA1	19–E
45.0	TP533634S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	350 (158.8)	F ①	NA	WSA1	19–E
75.0	TP533644S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	450 (204.1)	F ①	NA	WSA2	19–E
112.5	TP533654S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	696 (294.8)	F	NA	WSA3	19–E
150.0	TP533664S	41.52 (105.5)	32.90 (84.0)	29.87 (75.9)	978 (412.8)	F	NA	WSA4	19–E
225.0	TP533674S	41.52 (105.5)	32.90 (84.0)	29.87 (75.9)	1200 (544.0)	F	NA	WSA4	19–E

Notes: 9.0 through 15.0 kVA units encapsulated (exempt from TP1), 30 kVA through 225 kVA TP1 compliant

① Wall mounting brackets are available for these sizes, refer to page 133.
② Consult factory for wiring diagram.

GROUP D

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY— 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
3.0	T2A533081S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	21–F
6.0	T2A533091S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	21–F
9.0	T2A533101S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	21–F
15.0	T3533111S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	21–I
30.0	TP533123S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	290 (132.0)	F ①	NA	WSA1	22–E
45.0	TP533133S	25.50 (64.7)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WSA1	22–E
75.0	TP533143S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	500 (226.8)	F ①	NA	WSA2	22–E
112.5	TP533153S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WSA3	22–E
150.0	TP533163S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	970 (440.0)	F	NA	WSA4	22–E
225.0	TP1533173S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1200 (544.0)	F	NA	WSA4	22–E
300.0	TP533183S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	NA	WSA5	22–E
500.0	TP1533193S	57.80 (146.8)	45.60 (115.8)	41.50 (105.4)	2480 (1125.0)	F	NA	WSA7	22–G
750.0	TP1533213S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	3600 (1633.0)	F	NA	WSA6	22–G
1000.0	TP1533222S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	4300 (1950.0)	F	NA	WSA6	80–G

Notes: 3.0 through 15.0 kVA units encapsulated (exempt from TP1), 30.0 through1000.0 kVA TP1 compliant

GROUP D2

480 DELTA PRIMARY VOLTS — COPPER WINDINGS — 208Y/120 SECONDARY VOLTS, 150°C RISE — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
15.0	TC533111S *	18.90 (48.0)	20.30 (51.6)	9.00 (22.9)	245 (111.1)	F ①	NA	NA	21–I
30.0	TPC533123S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	346 (157.0)	F ①	NA	WSA1	22–E
45.0	TPC533133S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	397 (180.1)	F ①	NA	WSA1	22–E
75.0	TPC533143S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	521 (236.3)	F ①	NA	WSA2	22–E
112.5	TPC533153S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	766 (347.5)	F	NA	WSA3	22–E
150.0	TPC533163S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1026 (465.4)	F	NA	WSA4	22–E
225.0	TPC533173S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1300 (589.7)	F	NA	WSA4	22–E
300.0	TPC533183S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1551 (703.5)	F	NA	WSA5	22–E
500.0	TPC533193S	57.80 (146.8)	45.00 (114.3)	41.50 (105.4)	2819 (1278.7)	F	NA	WSA7	22–E

*** NOTE:** TC-53311-1S—Encapsulated, 115° C Rise, 180°C Insulation (TP1 exempt), 30.0 through 500 kVA TP1 compliant

① Wall mounting brackets are available for these sizes, refer to page 133.
② Consult factory for wiring diagram.

GROUP D4

115°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
30.0	TP533121S	29.48 (74.9)	28.15 (71.5)	22.37 (56.8)	360 (163.3)	F ①	NA	WSA2	22-E
45.0	TP533131S	29.48 (74.9)	28.15 (71.5)	22.37 (56.8)	417 (189.2)	F ①	NA	WSA2	22-E
75.0	TP533141S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	536 (243.1)	F ①	NA	WSA3	22-E
112.5	TP533151S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	760 (344.7)	F	NA	WSA4	22-E
150.0	TP533161S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	950 (430.9)	F	NA	WSA4	22-E
225.0	TP533171S	45.59 (115.8)	39.50 (100.3)	35.50 (90.2)	1567 (712.3)	F	NA	WSA5	22-E
300.0	TP533181S	45.59 (115.8)	39.50 (100.3)	35.50 (90.2)	1553 (705.9)	F	NA	WSA5	22-E
500.0	TP533191S	57.84 (146.9)	45.50 (115.6)	41.50 (105.4)	2808 (1276.4)	F	NA	WSA7	22-G

GROUP D5

80°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
30.0	TP533128S	25.49 (64.7)	24.39 (61.9)	19.37 (49.2)	364 (165.1)	F ①	NA	WSA1	22–E
45.0	TP533138S	29.48 (74.9)	28.15 (71.5)	22.37 (56.8)	500 (226.8)	F	NA	WSA2	22–E
75.0	TP533148S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	698 (316.6)	F	NA	WSA3	22–E
112.5	TP533158S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	963 (437.7)	F	NA	WSA4	22–E
150.0	TP533168S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	1145 (520.4)	F	NA	WSA4	22–E

For Copper Wound Transformers Consult Factory

For Additional Low Temperature Rise 115° and 80°C Units Consult Factory

GROUP F

ENCAPSULATED TRANSFORMERS, 115°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
30.0	T3793123S	24.81 (63.0)	27.13 (68.9)	11.14 (28.3)	613 (278.1)	F	NA	NA	22–I
45.0	T3793133S	25.31 (64.3)	30.18 (76.7)	12.76 (32.4)	780 (354.0)	F	NA	NA	22–I
75.0	T3793143S	26.82 (68.1)	34.68 (88.1)	15.25 (38.7)	1126 (511.0)	F	NA	NA	22–I

Notes: 30.0 through 75.0 kVA encapsulated (TP1 exempt)

① Wall mounting brackets are available for these sizes, refer to page 133.

GROUP F – 316 SS

316 STAINLESS STEEL ENCAPSULATED TRANSFORMERS, 115° C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
3.0	T2A53308SS	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	NA	NA	21-F
6.0	T2A53309SS	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	NA	NA	21-F
9.0	T2A53310SS	14.03 (35.6)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	NA	NA	21-F
15.0	T353311SS	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F	NA	NA	21-I
30.0	T379312SS	24.81 (63.0)	27.13 (68.9)	11.14 (28.3)	613 (278.1)	F	NA	NA	22-I
45.0	T379313SS	25.31 (64.3)	30.18 (76.7)	12.76 (32.4)	780 (354.0)	F	NA	NA	22-I
75.0	T379314SS	26.82 (68.1)	34.68 (88.1)	15.25 (38.7)	1126 (511.0)	F	NA	NA	22-I

Notes: 3.0 through 75.0 kVA units encapsulated (TP1 exempt)

GROUP G

480 DELTA PRIMARY VOLTS — 240 DELTA / 120 TAP SECONDARY VOLTS MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY — 3Ø, 60 Hz

kVA②	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
3.0	T2A-533281S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	25–F
6.0	T2A-533291S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	25–F
9.0	T2A-533401S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	25–F
15.0	T3-533411S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	25–I
30.0	TP1533423S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	325 (147.0)	F ①	NA	WSA1	26–E
45.0	TP1533433S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WSA1	26–E
75.0	TP1533443S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	500 (226.8)	F ①	NA	WSA2	26–E
112.5	TP1533453S	35.47 (91.2)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WSA3	26–E
150.0	TP1533463S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1125 (510.0)	F	NA	WSA4	26–E
225.0	TP1533473S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1200 (544.0)	F	NA	WSA4	26–E
300.0	TP1533483S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	NA	WSA5	26–G
500.0	TP1533493S	62.00 (157.5)	54.00 (137.2)	42.00 (106.7)	2675 (1213.0)	F	NA	WSA7	26–G
750.0	TP1533503S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	3408 (1545.8)	F	NA	WSA6	26–G

Notes: 3.0 through 15.0 kVA units encapsulated (TP1 exempt), 30.0 through 750.0 kVA TP1 compliant. 3.0 kVA through 750.0 kVA provided with 120V lighting tap limited to 5% of nameplate rating.

① Wall mounting brackets are available for these sizes, refer to page 133.

GROUP I

480 DELTA PRIMARY VOLTS — 480Y/277 SECONDARY VOLTS MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
15.0	T335000153S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	31–I
30.0	TP35000303S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	325 (147.0)	F ①	NA	WSA2	31–E
45.0	TP135000453S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	400 (181.0)	F ①	NA	WSA2	31–E
75.0	TP35000753S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ①	NA	WSA2	31–E
112.5	TP35001123S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	710 (322.0)	F	NA	WSA3	31–E
150.0	TP35001503S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1155 (524.0)	F	NA	WSA4	31–E
225.0	TP35002253S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1210 (548.8)	F	NA	WSA4	31–E
300.0	TP35003003S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1600 (726.0)	F	NA	WSA5	31–E

Notes: 15.0 kVA unit encapsulated (TP1 exempt), 30.0 through 300.0 kVA TP1 compliant

GROUP J

600 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
3.0	T2A-793301S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	28–F
6.0	T2A-793311S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	28–F
9.0	T2A-793321S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	28–F
15.0	T3-793331S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	28–I
30.0	TP131023S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	325 (147.0)	F ①	NA	WSA1	29–E
45.0	TP131033S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WSA1	29–E
75.0	TP131043S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ①	NA	WSA2	29–E
112.5	TP-131053S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WSA3	29-E
150.0	TP-131063S	41.52 (105.5	32.90 (83.6)	29.87 (75.9)	970 (440)	F	NA	WSA4	29-E
225.0	TP-131073S	41.52 (105.5	32.90 (83.6)	29.87 (75.9)	1200 (544)	F	NA	WSA4	29-E
300.0	TP-130993S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	NA	WSA5	29-E
500.0	TP-131123S	57.84 (146.9)	45.00 (114.3)	41.50 (105.4)	2480 (1125.0)	F	NA	WSA7	29-E
750.0	TP-131133S	62.84 (159.6)	54.00 (137.2)	41.50 (105.4)	3600 (1633.0)	F	NA	WSA6	29-E

Notes: 3.0 through 15.0 kVA encapsulated (TP1 exempt), 30.0 through 75.0 kVA TP1 compliant

① Wall mounting brackets are available for these sizes, refer to page 133.

GROUP M

600 DELTA PRIMARY VOLTS — 480Y/277 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
3.0	T2A795161S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	55–F
6.0	T2A795171S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	55–F
9.0	T2A795181S	14.03 (38.8)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	55–F
15.0	T3795191S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	55–I
30.0	TP795203S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	400 (181.0)	F ①	NA	WSA2	51–E
45.0	TP795213S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	425 (193.0)	F ①	NA	WSA2	51–E
75.0	TP795223S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	700 (318.0)	F ①	NA	WSA2	51–E
112.5	TP795233S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WSA3	51–E
150.0	TP795243S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1125 (510.0)	F	NA	WSA4	51–E

Notes: 3.0 through 15.0 kVA units are encapsulated (TP1 exempt), 30.0 through 150.0 kVA are TP1 compliant

GROUP O

208 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
3.0	T2A792681S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	60–F
6.0	T2A792691S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	60–F
9.0	T2A792701S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	60–F
15.0	T3-792711S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.0)	F ①	NA	NA	60–I
30.0	TP792724S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	WSA1	61–E
45.0	TP792734S	25.48 (64.7)	24.39 (61.9)	19.37 (49.2)	365 (166.0)	F ①	NA	WSA1	61–E
75.0	TP792744S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	500 (227.0)	F ①	NA	WSA2	61–E

Notes: 3.0 through 15.0 kVA units are encapsulated (TP1 exempt), 30.0 through 75.0 kVA units are TP1 compliant

GROUP P

600 DELTA PRIMARY VOLTS — 240 DELTA/120 TAP SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
30.0	TP131423S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	299 (135.6)	F ①	NA	WSA1	69–E
45.0	TP131433S	25.48 (64.7)	24.39 (61.9)	19.37 (49.2)	353 (160.1)	F ①	NA	WSA1	69–E
75.0	TP131443S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	463 (210.0)	F ①	NA	WSA2	69–E

Notes: 30.0 through 75.0 kVA units TP1 compliant

GROUP Q

240 DELTA PRIMARY VOLTS — 480Y/277 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
15.0	T3-796931S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.1)	F ①	NA	NA	70–I
30.0	TP796944S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	330 (149.7)	F ①	NA	WSA1	71–E
45.0	TP796954S	25.48 (64.7)	24.39 (61.9)	19.37 (49.2)	380 (172.4)	F ①	NA	WSA1	71–E
75.0	TP796964S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	455 (206.4)	F ①	NA	WSA2	71–E
112.5	TP796974S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	687 (311.6)	F	NA	WSA3	71–E
150.0	TP796984S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	973 (441.3)	F	NA	WSA4	71–E

Notes: 15 kVA unit encapsulated (TP1 exempt), 30.0 through 150.0 kVA TP1 compliant

① Wall mounting brackets are available for these sizes, refer to page 133.

GROUP T

380 DELTA PRIMARY VOLTS — 220Y/127 SECONDARY VOLTS — 3Ø, 50 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
15.0	T3795511S	20.80 (52.8)	20.90 (53.1)	10.20 (25.9)	435 (197.3)	F	NA	NA	24–I
30.0	T2A795523S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	365 (165.6)	F ①	NA	WSA1	20–E
45.0	T2A795533S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	468 (212.3)	F ①	NA	WSA2	20–E
75.0	T2A795543S	35.47 (90.1)	31.90 (80.0)	26.88 (68.3)	693 (314.3)	F	NA	WSA3	20–E
112.5	T2A795553S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	970 (440.0)	F	NA	WSA4	20–E

Notes: 50 Hz units (TP1 exempt)

GROUP U

440 DELTA PRIMARY VOLTS — 220Y/127 SECONDARY VOLTS — 3Ø, 50 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH					
10.0	TF220105S	18.90 (48.0)	20.30 (51.6)	9.00 (22.9)	245 (111.1)	F ①	NA	NA	73–I
15.0	TF220155S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	291 (132.0)	F ①	NA	WSA1	73–E
25.0	TF220255S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	375 (170.1)	F ①	NA	WSA1	73–E
50.0	TF220505S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	437 (198.2)	F ①	NA	WSA2	73–E

Notes: 50 Hz units (TP1 exempt)

① Wall mounting brackets are available for these sizes, refer to page 133.

GROUP V

190/200/208/220/240 DELTA PRIMARY VOLTS — 400Y/231 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
15.0	T379083S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	300 (136.1)	F ①	NA	NA	75-I
30.0	TP79085S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	511 (231.8)	F ⑤	NA	WSA2	74-E
45.0	TP79087S	25.50 (64.8)	24.39 (62.0)	19.37 (49.2)	540 (244.9)	F ⑤	NA	WSA1	74-E
75.0	TP79088S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	703 (318.9)	F	NA	WSA3	74-E

Notes: 15.0 kVA unit encapsulated (TP1 exempt), 30.0 through 75.0 kVA units TP1 compliant

AUTO-TRANSFORMERS

600 PRIMARY VOLTS — 480 SECONDARY VOLTS — 3Ø, 60 Hz
480 PRIMARY VOLTS — 380 SECONDARY VOLTS — 3Ø, 50/60 Hz ALTERNATE RATING

kVA 600 Pri. 480V Sec.	kVA 480 Pri. 380 Sec.	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
15.0	12.0	T2527031③	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	104 (47.2)	W	NA	NA	56–F
30.0	24.0	T2527051③	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	152 (68.9)	W	NA	NA	56–F
45.0	36.0	T2527071③	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	156 (70.8)	W	NA	NA	56–F
75.0	60.0	T3527101③	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	300 (136.1)	F ①	NA	NA	56–I
112.5	90.0	T2A527121④	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F ⑤	NA	WSA1	57–E
150.0	120.0	T2A527131④	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	350 (158.8)	F ⑤	NA	WSA1	57–E
225.0	180.0	T2A527151④	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ⑤	NA	WSA2	57–E
300.0	240.0	T2A527171④	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	650 (294.8)	F ⑤	NA	WSA2	57–E
450.0	360.0	T2A527181④	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WSA3	57–E
500.0	400.0	T2A527191④	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	790 (358.3)	F	NA	WSA3	57–E

Notes: Auto-Transformers TP1 exempt

① Wall mounting brackets use PL-79911.

② If used on unbalanced loads, these units should only be used on a 4 wire system with the supply neutral connected to the transformer. If used on balanced loads, such as motor loads, then they may be used on a 3 wire system without a neutral or 4th wire.

③ These units are encapsulated with a 115° C temperature rise.

④ These units are ventilated with 150° C temperature rise.

⑤ Wall mounting brackets use PL-79912.

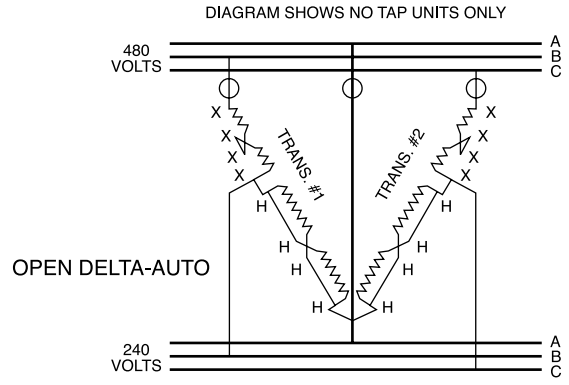
Economical Auto Arrangements

Using two single phase transformers

THREE PHASE

480 PRIMARY (open delta) VOLTS —
240 SECONDARY (open delta) VOLTS — 3Ø, 60 Hz

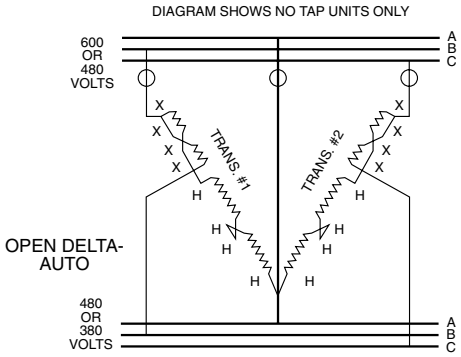
kVA ①	Qty. ②	Catalog No. ③	Primary Full Load Amps	Secondary Full Load Amps	Max. Size Fuse or Breaker
3.0	2	T253010S	3.60	7.20	10
5.0	2	T253011S	6.00	12.00	10
6.0	2	T253012S	7.20	14.40	15
10.0	2	T2530134S	12.00	24.00	15
17.0	2	T2530144S	20.50	40.80	30
26.0	2	T2535153S	31.50	63.00	40
34.0	2	T2535163S	41.00	81.60	60
52.0	2	T2535173S	63.00	125.00	80
86.0	2	T2535183S	104.00	206.30	150
130.5	2	TP530193S	157.00	314.00	200
173.0	2	TP530203S	209.00	418.00	300
259.0	2	TP530213S	312.00	623.00	400
346.0	2	TP530223S	417.00	834.00	600
578.0	2	TP530233S	696.00	1392.00	1000
865.0	2	TP530243S	1041.00	2082.00	1600



⑤ **O** = Fuse Location NEC 450-4, 1990.

600 PRIMARY VOLTS — 480 SECONDARY (open delta) VOLTS — 3Ø, 60 Hz
480 PRIMARY VOLTS — 380 SECONDARY (open delta) VOLTS — 3Ø, 50/60 Hz

Pri. 600V Sec. 480V kVA ①	Pri. Amps	Sec. Amps	Pri. 480V Sec. 380V kVA ①	Pri. Amps	Sec. Amps	Qty ②	Catalog ③ No.④	Max. Size Fuse or Breaker
8.0	7.70	9.60	6.5	7.80	9.60	2	T253010S	15
12.0	11.55	14.40	9.5	11.55	14.40	2	T253011S	15
17.0	16.33	20.41	13.5	16.33	20.41	2	T253012S	25
25.0	24.06	30.01	20.0	24.06	30.01	2	T2530134S	30
43.0	41.38	51.70	34.0	41.38	51.70	2	T2530144S	60
64.0	61.59	77.00	51.0	61.59	77.00	2	T2535153S	80
86.0	82.76	103.44	68.0	82.76	103.44	2	T2535163S	110
129.0	124.13	155.20	103.0	124.13	155.20	2	T2535173S	175
216.0	207.85	259.80	172.0	207.85	259.80	2	T2535183S	300
324.0	311.78	389.70	259.0	311.78	389.70	2	TP530193S	400
433.0	416.67	520.83	346.0	416.67	520.83	2	TP530203S	600
650.0	625.00	781.00	519.0	625.00	781.00	2	TP530213S	800
865.0	833.00	1040.00	692.0	833.00	1051.00	2	TP530223S	1200
1445.0	1391.00	1738.00	1156.0	1391.00	1756.00	2	TP530233S	2000
2164.0	2083.00	2602.00	1731.0	2083.00	2629.00	2	TP530243S	3000



⑤ **O** = Fuse Location NEC 450-4, 1990.

① kVA capacity of three phase autotransformer bank, using two single phase, 60 Hz transformers connected open delta.
② Catalog No. is for 1 transformer, 2 units are required.
③ Can be reverse connected with no change in kVA.
④ For transformer dimensions, refer to appropriate table in section 1, page 17.
⑤ For proper overcurrent protection, refer to Article 450-4 of N.E.C.

The diagrams above are for illustration purposes only. Please contact the factory for construction details.

Each Acme transformer is shipped with detailed wiring diagrams. Refer to nameplate located inside the front cover for specific voltage tap combinations.

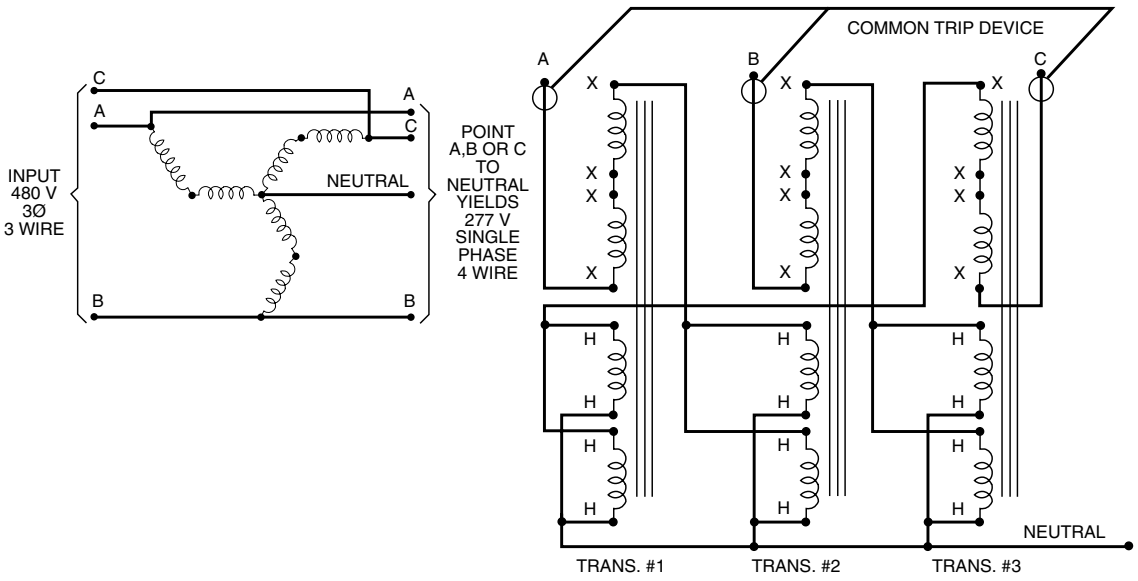
Auto Zig-Zag Grounding Transformers

For developing a neutral from a three phase, 3-wire supply

PRIMARY (INPUT): 480 VOLTS 3Ø, 3 WIRE ① **50/60 Hz** **SECONDARY (OUTPUT): 480Y/277 VOLTS 3Ø, 4 WIRE**

Use 3 Pieces of Type No.④	Available In	Nameplate kVA For Each Tfmr.	No. of Tfmr. Required	Three Phase kVA	Max. Continuous Amp. Load Per Phase (277 Volts)
T253010S	No Taps Only	1.0	3	10.80	12.50
T253011S	No Taps Only	1.5	3	15.60	18.75
T253012S	No Taps Only	2.0	3	20.70	25.00
T2530134S	Taps & No Taps	3.0	3	31.20	37.50
T2530144S	Taps & No Taps	5.0	3	51.90	62.50
T2535153S	With Taps Only	7.5	3	78.00	93.50
T2535163S	With Taps Only	10.0	3	103.80	125.00
T2535173S	With Taps Only	15.0	3	156.00	187.50
T2535183S	With Taps Only	25.0	3	259.50	312.00
TP530193S	With Taps Only	37.5	3	390.00	468.00
TP530203S	With Taps Only	50.0	3	519.00	625.00
TP530213S	With Taps Only	75.0	3	780.00	935.00
TP530223S	With Taps Only	100.0	3	1038.00	1250.00
TP530233S	With Taps Only	167.0	3	1734.00	2085.00

See Footnote ②



O = Fuse Location NEC 450-4, 1990. ③

① Applicable for the above connection only.

② Connection diagram (using 3 pieces of 1 phase, 60 hertz transformers connected zig-zag auto) for developing a neutral (4th wire) from a 3 phase, 3 wire supply.

③ For proper over-current protection, refer to the N.E.C. Article 450-5.

④ For transformer dimensions, refer to appropriate table in section 1, page 17.

Each Acme transformer is shipped with detailed wiring diagrams. Refer to nameplate located inside the front cover for specific voltage tap combinations.

Do You Have a Non-Standard Three Phase Voltage Application?

Many non-standard voltage correction problems can be solved by using standard off-the-shelf single phase transformers. The following is a list of such voltage combinations that can be supplied by the Power Distribution Products Division. Drawings for these products can be downloaded from our website at www.acmepowerdist.com. If you don't find the particular combination you are looking for, contact our technical services department for further assistance at 1-800-334-5214.

THREE PHASE

VOLTAGES		AVAILABLE KVA RANGE	TYPE OF CIRCUIT	ACME DRAWING NO.
INPUT	OUTPUT			
208 Delta	208Y/120	3-75	Isolation	A-125879
208 Delta	208Y/120	3-86	Auto Zig-Zag ①	A-125895
208 Delta	240 Delta/120	1.68-25.2	O.D. ISO	A-700314
208 Delta	240 Delta	3-75	Isolation	A-125880
208 Delta	416Y/240	3-75	Isolation	A-700598
208 Delta	416Y/240	112.5-300	Isolation	A-700591
208Y/120	208Y/120	3-75	Isolation	A-125857
208Y/120	374Y/216	22.5-75	Isolation	A-125883
208Y/120	374Y/216	112.5-750	Isolation	A-102730
208Y/120	480Y/277	3-75	Isolation	B-39881 (pg 2)
240 Delta	208Y/120	3-15	Isolation	A-125855
240 Delta	208Y/120	9-15	Isolation	A-102723
240 Delta	208Y/120	22.5-75	Isolation	A-102722-B
240 Delta	208Y/120	112.5-750	Isolation	A-125856
240 Delta	208Y/120	3-75	Isolation	A-125858
240 Delta	240 Delta	3-75	Isolation	A-125859
240 Delta	240Y/138	10.3-258.75	Auto Zig-Zag ①	A-125896
240 Delta	374Y/216	22.5-75	Isolation	A-125881
240 Delta	374Y/216	112.5-750	Isolation	A-125882
240 Delta	480Y/277	3-75	Isolation	B-39881 (pg 1)
380 Delta	240 Delta	3-75	Isolation	A-700592
380 Delta	240 Delta	112.5-300	Isolation	A-700593
380 Delta	228 Delta	1.4-7.0	O.D. Auto	A-35633
380 Delta	228 Delta	4.2-7.0	O.D. Auto	A-125892
380 Delta	228 Delta	10.4-34.5	O.D. Auto	A-125893
380 Delta	228 Delta	51-227	O.D. Auto	A-125894
380 Delta	416Y/240	3-75	Isolation	A-700599
380 Delta	416Y/240	112.5-300	Isolation	A-700594
380Y/220	240 Delta	3-75	Isolation	A-700600
380Y/220	240 Delta	112.5-300	Isolation	A-700595
416Y/240	440 Delta	3-75	Isolation	A-700602
416Y/240	440 Delta	112.5-300	Isolation	A-700597
416 Delta	240 Delta	3-75	Isolation	A-700601
416 Delta	240 Delta	112.5-300	Isolation	A-700596

VOLTAGES		AVAILABLE KVA RANGE	TYPE OF CIRCUIT	ACME DRAWING NO.
INPUT	OUTPUT			
416Y/240	208Y/120	3-15	Isolation	A-700319
416Y/240	208Y/120	22.5-75	Isolation	A-700322
480 Delta	240 Delta/120	1.68-5.04	O.D. ISO Hi-Leg ①	A-125849
480 Delta	240 Delta/120	3.36	O.D. ISO Hi-Leg ①	A-125850
480 Delta	240 Delta/120	5.04	O.D. ISO Hi-Leg ①	A-125851
480 Delta	240 Delta/120	8.4	O.D. ISO Hi-Leg ①	A-125852
480 Delta	240 Delta/120	12.6-25.2	O.D. ISO Hi-Leg ①	A-125853
480 Delta	240 Delta/120	42	O.D. ISO Hi-Leg ①	A-125854
480 Delta	240 Delta/120	63-266	O.D. ISO Hi-Leg ①	A-111702
480 Delta	240 Delta	1.68-8.4	O.D. ISO	A-32817-B
480 Delta	240 Delta	5.04-8.4	O.D. ISO	A-125872
480 Delta	240 Delta	12.6-42	O.D. ISO	A-125873
480 Delta	240 Delta	63-420	O.D. ISO	A-125874
480 Delta	416Y/240	3-15	Isolation	A-125875
480 Delta	416Y/240	9-15	Isolation	A-125876
480 Delta	416Y/240	22.5-75	Isolation	A-125877
480 Delta	416Y/240	112.5-750	Isolation	A-125878
480 Delta	394Y/228	9-15	Isolation	A-125884
480 Delta	394Y/228	22.5-75	Isolation	A-125885
480 Delta	394Y/228	112.5-750	Isolation	A-125886
600 Delta	208Y/120	3-6	Isolation	A-102758
600 Delta	208Y/120	9-75	Isolation	A-125863
600 Delta	208Y/120	112.5-500	Isolation	A-125864
600 Delta	240 Delta	3-6	Isolation	A-125860
600 Delta	240 Delta	9-75	Isolation	A-125861
600 Delta	240 Delta	112.5-500	Isolation	A-125862
600 Delta	240 Delta/120	1.68-2.52	O.D. ISO Hi-Leg ①	A-125865
600 Delta	240 Delta/120	3.36	O.D. ISO Hi-Leg ①	A-125866
600 Delta	240 Delta/120	5.04-25.2	O.D. ISO Hi-Leg ①	A-125867
600 Delta	240 Delta/120	42	O.D. ISO Hi-Leg ①	A-125868
600 Delta	240 Delta/120	63-168	O.D. ISO Hi-Leg ①	A-125869
600 Delta	240 Delta	1.68-3.36	O.D. ISO	A-33227-A
600 Delta	240 Delta	5.04-42	O.D. ISO	A-125870
600 Delta	240 Delta	63-280	O.D. ISO	A-125871

KEY:
O.D. — Open Delta
ISO — Isolation
AUTO — Autotransformer

① Cannot Be Reverse Connected.

SECTION 2

HARMONIC MITIGATING TRANSFORMERS

Harmonic Mitigating Transformers

Many of today's electronic devices are non-linear loads generating high levels of harmonic currents that are then fed back onto your distribution system. This waveform distortion results in overheating of motors and transformers, increased neutral currents and malfunction/damage to other equipment on the line.

Acme Electric introduces a line of harmonic mitigating transformers that combine the technologies shown in our non-linear load (K-Factor) transformers. Where conventional K-Factor transformers "deal" with harmonics, containing them within the transformer and preventing them from going further upstream; harmonic mitigating transformers eliminate harmonics by pitting them against themselves. This technology not only results in "cleaner power" but also provides the most energy efficient means to deal with harmonic problems.

Available in sizes ranging from 30 thru 225 kVA, with copper windings and a variety of other design options and accessories, Acme harmonic mitigating transformers offer you reduced transformer heat, reduced voltage distortion due to 3rd order harmonics, higher efficiency.

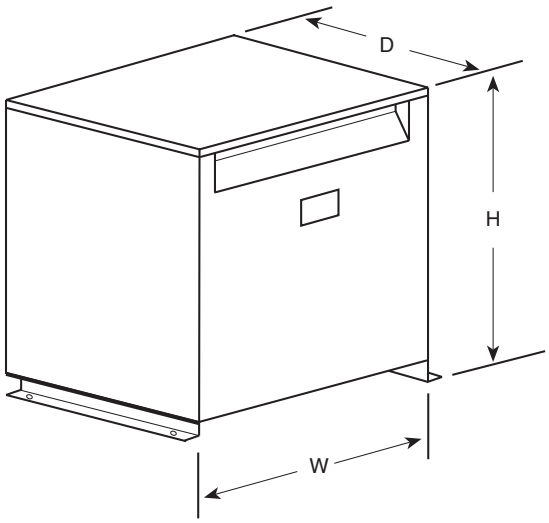
FEATURES

- Unlike K-rated transformers, Harmonic Mitigating transformers actually treat the triplen harmonics in the secondary winding
- Reduce supply voltage flat topping caused by non-linear loads
- Improve overall power factor of supply system
- Suitable for K-Factor loads
- Improved energy efficiency (Meet TP1 at K-1 load)
- Copper conductor construction

APPLICATIONS

- Financial facilities
- Educational facilities
- TV Broadcast facilities
- Office buildings
- Hospitals
- Health care facilities

DIMENSIONAL DRAWING



SELECTION CHARTS

HARMONIC MITIGATING TRANSFORMERS

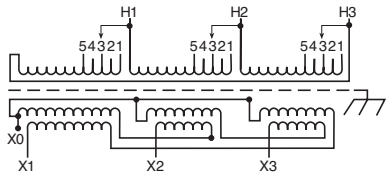
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
30.0	CMT533124S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	535 (242.7)	F①	WSA2	81-E
45.0	CMT533134S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F①	WSA2	81-E
75.0	CMT533144S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	760 (344.7)	F①	WSA3	81-E
112.5	CMT533154S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1180 (535.2)	F	WSA4	81-E
150.0	CMT533164S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1340 (607.8)	F	WSA4	81-E
225.0	CMT533174S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1970 (893.6)	F	WSA4	81-E

MITIGATING TRANSFORMER WIRING DIAGRAM

81

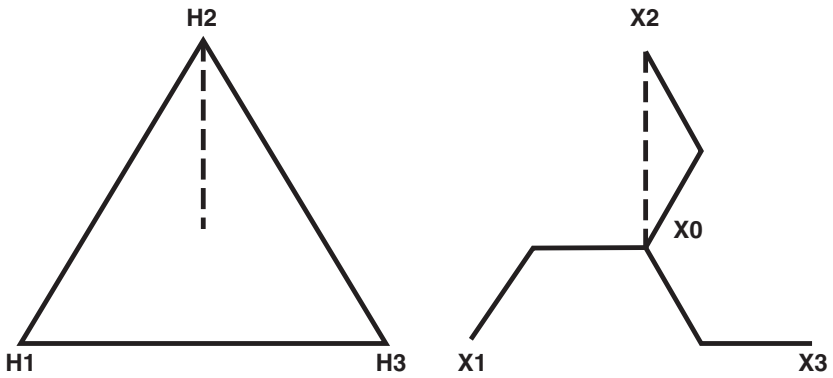
PRIMARY: 480 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2 ½% ANFC, 2, 2 ½% BNFC



Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

Diagram Showing Delta Primary & Zig-Zag Secondary

(Zero degree angular displacement)



Harmonic Mitigating Transformers – How do they work?

They consist of a Delta primary and a Zig-Zag secondary. The Zig-Zag secondary causes a phase shift in the triplen harmonics, which results in a canceling effect. This prevents the triplen harmonic losses from being coupled back into the primary and results in cooler operation and increased energy efficiency.

The Acme Advantages

1. Acme utilizes special winding techniques and "foil" conductors in both its K-Factor and Harmonic Mitigating transformers to minimize the heating effects of harmonic currents.
2. The use of foil conductor increases the dielectric strength of the insulation because one layer is only one turn. Foil also eliminates the effects of axial forces, which can result in failure of wire wound transformers.

NOTES

SECTION 3

NON-LINEAR LOAD ISOLATION® TRANSFORMERS

Special winding techniques minimize eddy current losses. A double sized neutral handles excessive neutral currents. UL Listed for "K" Factor Loads 4, 13 & 20.

Non-Linear Load Isolation® Transformers

FEATURES

- Available in K-factors of 4, 13 and 20. Consult factory for other K-factors.
- 150°C, 115°C and 80°C temperature rise units.
- 10-year limited warranty.
- UL Listed and CSA Certified.
- Available in 480V and 600V primary, 15 through 600 kVA.
- Primary taps: (2) 2 ½% ANFC, (4) 2 ½% BNFC.
- Aluminum windings

Non-linear loads generate high levels of harmonic currents. When supplying power to these loads, a special transformer design is necessary.

Typical non-linear loads include desktop computers, AC variable speed drives, HID lighting, electronic ballasts, inverters and welders. Of these non-linear loads, the major source of harmonic currents is the switch mode power supply found in desktop computers, data processors and other office equipment.

Acme non-linear load isolation transformers use special winding techniques to minimize eddy current losses generated by harmonic currents. A double-sized neutral conductor handles the excessive neutral current found in non-linear load applications.

The amount of harmonics produced by a given load is represented by the term “K” factor. The larger the “K” factor, the more harmonics are present. Linear loads have a “K” factor of 1; switch mode power supplies typically have a “K” factor as high as 20.

Acme non-linear load isolation transformers are shielded for cleaner power and carry the Acme exclusive 10-year limited warranty.

The following guide will help you select the proper transformer when the K-factor is unknown.*

K-Factor/Type of Load

K-1 Resistance heating
Incandescent lighting
Motors
Transformers, control/distribution

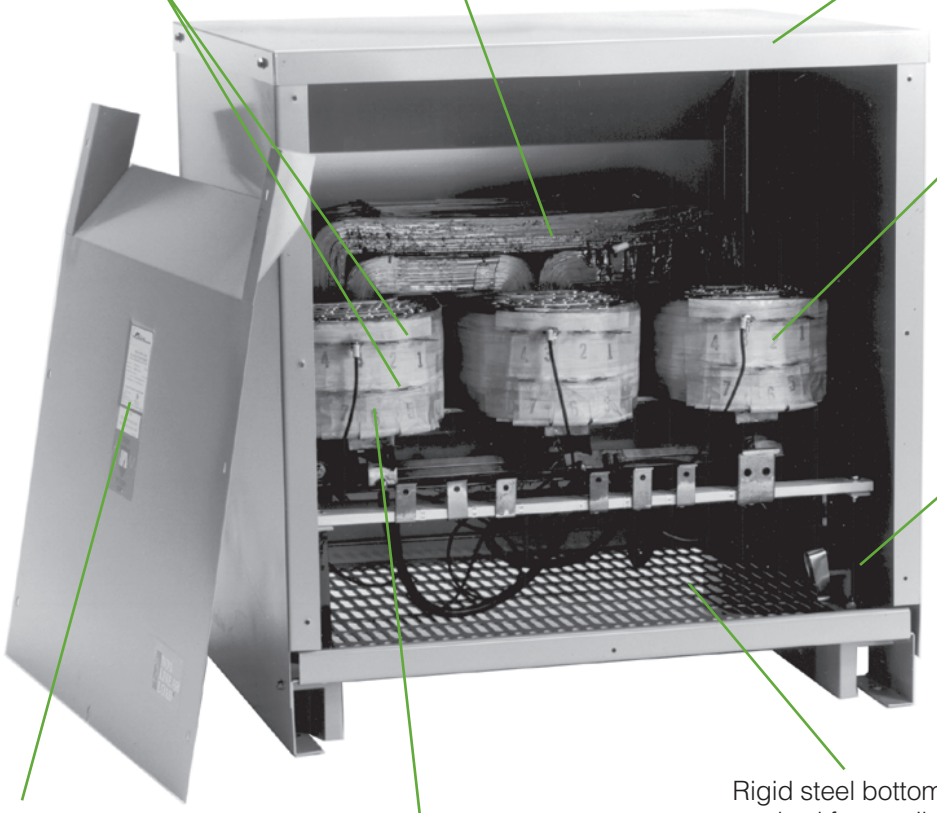
K-4 Welders
Induction heaters
HID lighting
Fluorescent lighting
Solid state controls

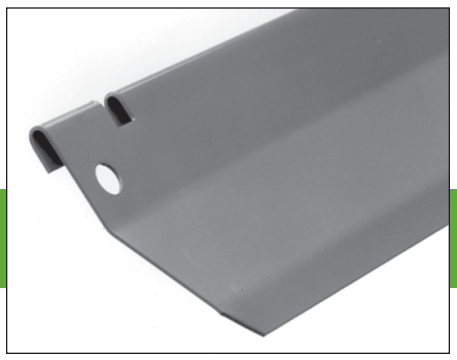
K-13 Telecommunications equipment
Branch Circuits in classrooms and health care facilities

K-20 Main frame computers
Variable speed drives
Branch circuits with exclusive loads of Data Processing equipment
Desktop computers

* These ratings are to be used as a guide only. They may vary from one load equipment manufacturer to another. A Spectrum Analysis is the best source.

Note: Non-sinusoidal and non-linear are synonymous terms relating to the same transformer type.





Weather shields are available from stock and are easily field-installed to make the transformer weather resistant.

Double-sized neutral conductor handles excessive neutral currents

SELECTION CHARTS

THREE PHASE

GROUP A, K FACTOR 20, 150°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH				
15.0	TPNS02533113S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F ①	WSA1	22–E
30.0	TPNS02533123S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	420 (191.0)	F ①	WSA1	22–E
45.0	TPNS02533133S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	575 (261.0)	F	WSA3	22–E
75.0	TPNS02533143S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	620 (281.0)	F	WSA3	22–E
112.5	TPNS02533153S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1200 (544.0)	F	WSA4	22–E
150.0	TPNS02533163S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1700 (771.0)	F	WSA4	22–E
225.0	TPNS02533173S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2165 (982.0)	F	WSA5	22–G

Notes: All TPNS models are TP1 compliant

GROUP B,K FACTOR 13, 150°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH				
15.0	TPNS01533113S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F ①	WSA1	22–E
30.0	TPNS01533123S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	360 (163.0)	F ①	WSA2	22–E
45.0	TPNS01533133S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	440 (200.0)	F ①	WSA2	22–E
75.0	TPNS01533143S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	600 (272.0)	F	WSA3	22–E
112.5	TPNS01533153S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	870 (395.0)	F	WSA4	22–E
150.0	TPNS01533163S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1500 (680.0)	F	WSA4	22–E
225.0	TPNS11533173S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	WSA5	22–E

Notes: All TPNS models are TP1 compliant

GROUP C, K FACTOR 4, 150°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH				
15.0	TPNS00533113S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F ①	WSA1	22–E
30.0	TPNS00533123S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	345 (157.0)	F ①	WSA2	22–E
45.0	TPNS00533133S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	430 (195.0)	F ①	WSA2	22–E
75.0	TPNS00533143S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	560 (254.0)	F	WSA3	22–E
112.5	TPNS00533153S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	875 (397.0)	F	WSA4	22–E
150.0	TPNS00533163S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1550 (703.0)	F	WSA4	22–E
225.0	TPNS10533173S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1600 (725.8)	F	WSA5	22–E

Notes: All TPNS models are TP1 compliant

① Wall mounting brackets are available for these sizes, refer to page 133.

② Dimensions in this section may change and are not to be used for detailed construction purposes. Please contact the factory for certified dimensional drawings.

GROUP H, K FACTOR 13, 115°C RISE

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT	TYPE MTG. W – Wall	WEATHER SHIELD	Wiring Diagrams & Design Figures
		HEIGHT	WIDTH	DEPTH	Lbs. (Kg.)	F – Floor	P/N	Begin on Page 122
30.0	TPNS01533121S	29.90 (75.9)	28.20 (71.6)	22.40 (56.9)	400 (181.0)	F ①	WSA2	22–E
45.0	TPNS01533131S	35.90 (91.2)	31.90 (81.0)	26.90 (68.3)	575 (261.0)	F	WSA3	22–E
75.0	TPNS01533141S	35.90 (91.2)	31.90 (81.0)	26.90 (68.3)	750 (340.0)	F	WSA3	22–E
112.5	TPNS01533151S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	1120 (508.0)	F	WSA4	22–E
150.0	TPNS01533161S	41.50 (105.4)	32.90 (83.6)	29.90 (75.9)	1200 (544.0)	F	WSA4	22–E

Notes: All TPNS models are TP1 compliant

GROUP M, K FACTOR 13, 150°C RISE

208 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 122
		HEIGHT	WIDTH	DEPTH				
15.0	TPNS01792714S	25.50 (64.8)	24.90 (62.0)	19.37 (49.2)	320 (145.1)	F ①	WSA1	61-E
30.0	TPNS01792724S	25.50 (64.8)	24.90 (62.0)	19.37 (49.2)	366 (166.0)	F ①	WSA1	61-E
45.0	TPNS01792734S	29.40 (74.7)	28.15 (71.5)	22.37 (56.8)	522 (236.8)	F ①	WSA2	61-E
75.0	TPNS01792744S	35.40 (89.9)	31.90 (81.0)	26.87 (68.2)	667 (302.6)	F	WSA3	61-E

Notes: All TPNS models are TP1 compliant

Notes: All TPNS models are TP1 compliant

For Additional Low Temperature Rise 115° and 80° Degree Units and Copper Wound Units, Consult Factory

NON-LINEAR LOAD ISOLATION® WIRING DIAGRAMS (Refer to pgs 122-124)

NON-LINEAR LOAD ISOLATION® DESIGN FIGURES (Refer to pg 122)

① Wall mounting brackets are available for these sizes, refer to page 133.

② Dimensions in this section may change and are not to be used for detailed construction purposes. Please contact the factory for certified dimensional drawings.

1. Linear loads
Loads where the current waveform conforms to the waveform of the applied voltage. Or loads where a change in current is directly proportional to a change in applied voltage. For example:

- Resistance heating
- Incandescent lighting
- Water heater

2. Non-linear loads
Loads where the current waveform does not conform to the waveform of the applied voltage. Or loads where a change in current is not proportional to a change in applied voltage. Examples are:

- Computer power supplies
- Motor drives
- Fluorescent lighting

Non-linear loads produce non-sinusoidal current or voltage waveforms.

3. Sinusoidal current or voltage
This term refers to a periodic waveform that can be expressed as the sine of a linear function of time.

4. Non-linear currents or voltages
A waveform of current or voltage which cannot be expressed as the sine of a linear function of time. A non-linear load would result in a non-sinusoidal current or voltage.

5. Harmonic
A sinusoidal waveform with a frequency that is an integral multiple of the fundamental 60 Hz frequency.

60 Hz	Fundamental
120 Hz	2nd Harmonic
180 Hz	3rd Harmonic
240 Hz	4th Harmonic
etc.	

Current waveforms from non-linear loads appear distorted because the non-linear waveform is the result of adding harmonic components to the fundamental current.

6. Triplen harmonics
Odd multiples of the 3rd harmonic (3rd, 9th, 15th, 21st, etc.).

7. Harmonic distortion
Non-linear distortion of a system characterized by the appearance in the output of harmonic currents (voltages) when the input is sinusoidal.

8. Voltage harmonic distortion (VHD)
Voltage harmonic distortion is distortion caused by harmonic currents flowing through the system impedance. The utility power system has relatively low system impedance, and the VHD is very low. But, VHD on the distribution power system can be significant due to its relatively high system impedance.

9. Total harmonic distortion (THD)
The square root of the sum of the squares of all harmonic currents present in the load excluding the 60 Hz fundamental. It is usually expressed as a percent of the fundamental.

10. Root mean squared current (or voltage) RMS
1: The vector sum of the fundamental current and the total harmonic distortion.
2: Square root of the sum of the squared value of the fundamental current and the squared value of the total harmonic distortion.

11. Eddy currents
Currents flowing in a conducting material in the presence of a time varying magnetic field. These currents are in addition to the current drawn by the load.

12. Eddy current losses
Power dissipated due to eddy currents. Includes eddy current losses in the core, windings, case and associated hardware of a transformer.

13. Stray losses
A term used to express the difference between the measured alternating current losses on a transformer and the direct current (DC) losses (I^2R). Stray losses include eddy losses. Stray losses are usually expressed as a percent of the direct current (DC) losses.

14. Per unit value
1: Percent value divided by 100.
2: The ratio of two components of a system.

15. Harmonic spectrum "K" factor
The sum of the product of each harmonic current squared and that harmonic number squared for all harmonics from the fundamental (60 Hz) to the highest harmonic of any measurable consequence. When the "K" factor is multiplied by the stray losses of the transformer, the answer represents the losses in the transformer caused by harmonic currents. When these losses are added to the I^2R losses of the transformer, the total load losses are known. The "K" factor for a linear load without harmonics is one (1).

SECTION 4

DRIVE ISOLATION TRANSFORMERS & AC LINE REACTORS

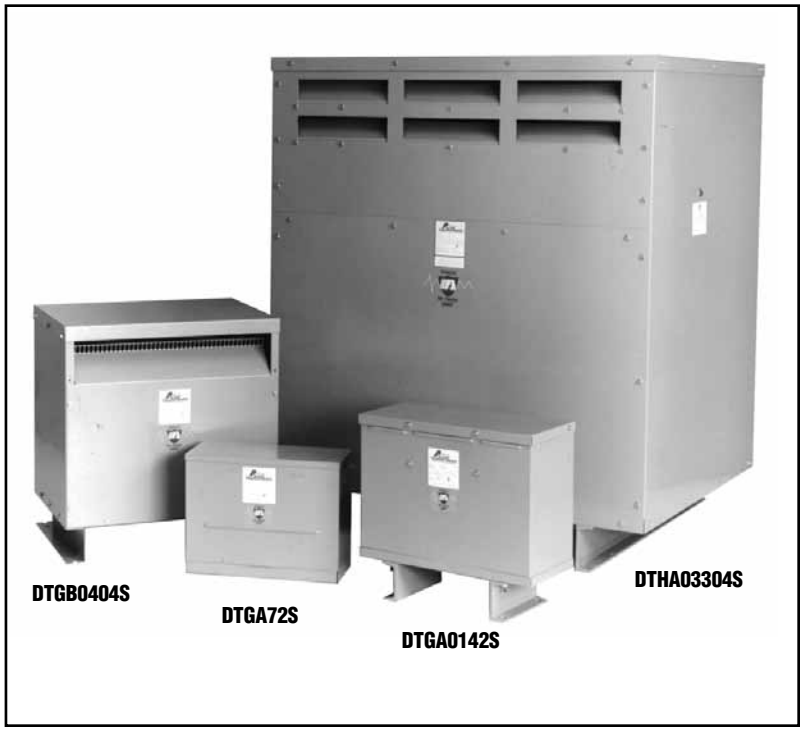
Specifically designed to accommodate the special voltage and kVA sizes unique to AC and DC drive applications. Shielded for extra protection from supply line transients.

AC Line Reactors are designed to protect DC motor drives, AC vaåriable frequency drives and the motors they power.

AC LINE REACTORS

Drive Isolation Transformers

The Acme Drive Isolation Transformers are specifically designed to accommodate the special voltages and kVA sizes unique to AC and DC motor drive applications.



FEATURES

- **UL Type 3R Enclosures with Weather Shield on Ventilated Units (above 20 kVA).** Type 2 Enclosure without weather shield. UL Listed and CSA certified. 7.5–20.0 kVA are encapsulated, UL 3R.
- 3-Phase 60 Hertz.
- 180°C and 220°C insulation systems.
- Encapsulated and ventilated designs. All ventilated units, are of strip wound construction. Acme's reinforced core assemblies enhance quiet operation.
- Nominally 6% impedance.
- Designed for use with AC, adjustable frequency or DC drives.
- Full capacity taps are featured on all units. On 7.5 through 20 kVA units, taps are 1-5% ANFC and 1-5% BNFC. On 27 through 660 kVA units, taps are 2-2 ½% ANFC and 2-2 ½% BNFC.
- Full range of kVA ratings cover all standard drive systems.
- Ample wiring compartment for easy cable entry.
- Optional wall mounting brackets for certain sizes.

Stress relief

Acme uses strip conductors (above 7.5 kVA) instead of wire for a DIT series that easily accommodates the severe electrical and mechanical stresses found in today's AC & DC motor drives. The inherent excellent line isolation of these transformers is further enhanced with the extra protection of Acme's Electrostatic Shield — free in all DIT's.

Lower losses

The harmonic currents generated by AC & DC drives increase eddy current losses (heat) in transformer windings. The thicker the winding conductor, the greater the losses. Acme uses one turn per layer of thin strip conductor which provides lower eddy current losses than comparable wire wound units. Lower losses = cooler operation and longer transformer life.

Reduced short circuit forces

Strip windings minimize axial short circuit forces that can cause mechanical displacement of the windings under fault conditions. For extra protection all designs 7.5 kVA and above use primary and secondary coils of equal axial length. This feature tends to negate axial short circuit forces, further improving transformer life expectancy.

Selection instructions

If you know the motor horse-power, simply follow the drive system manufacturer's recommendation. Or, select the corresponding kVA from the chart at right.

For example, a 40 Hp motor requires a 51 kVA DIT.

H.P.	kVA
5.0	7.5
7.5	11.0
10.0	14.0
15.0	20.0
20.0	27.0
25.0	34.0
30.0	40.0
40.0	51.0
50.0	63.0
60.0	75.0
75.0	93.0
100.0	118.0
125.0	145.0
150.0	175.0
200.0	220.0
250.0	275.0
300.0	330.0
400.0	440.0
500.0	550.0
600.0	660.0

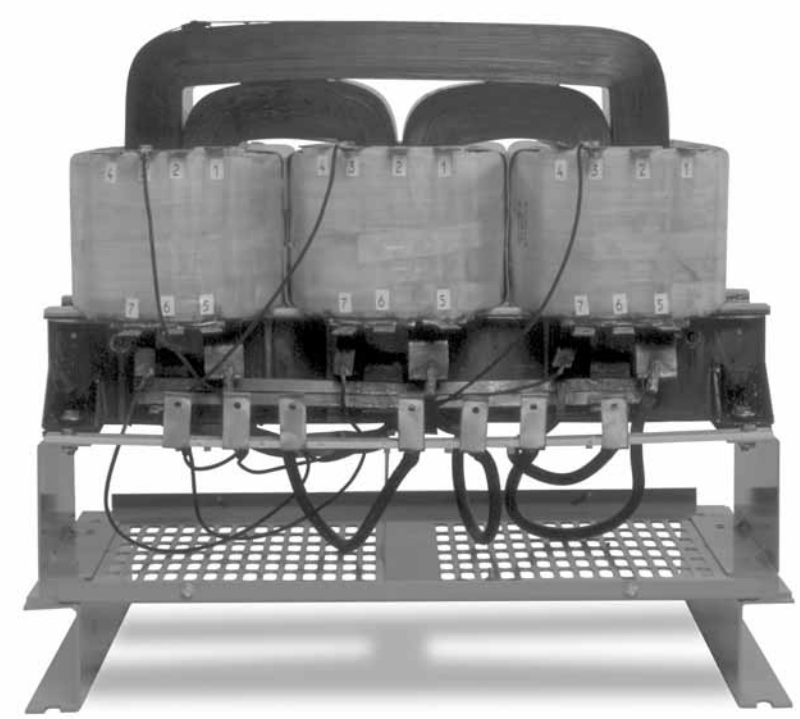
Acme Advantages

Wound Cores and Strip Winding mean lower losses

All Acme DITs above 7.5 kVA are wound with strip windings to ensure the lowest possible eddy current losses. All our DITs use a three leg wound core. This superior design has very low losses and quiet operation. Both of these features combine to significantly reduce losses and operating costs compared to other types of constructions.

Copper terminations provide trouble-free operation

All Acme DITs up to and including 220 kVA have copper terminations. The transition from aluminum strip coil conductors to copper terminations is accomplished by a bonding process known as "Koldwelding™". This process has been used by Acme for over 25 years to provide a trouble-free, permanent bonding of the two metals.



Wound core construction showing all copper terminations

SELECTION CHARTS

GROUP A GROUP B

kVA	Primary 460V Delta Secondary 230Y/133 CATALOG NO.	Primary 460V Delta Secondary 460Y/266 CATALOG NO.	APPROX. DIMENSIONS ③ Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W - Wall F - Floor	WEATHER SHIELD P/N	DIM. DRAWING
7.5	DTGA72S	DTGB72S	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	180 (81.6)	W	NA	F
11.0	DTGA0112S	DTGB0112S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	I
14.0	DTGA0142S	DTGB0142S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	270 (123.0)	F ①	NA	I
20.0	DTGA0202S	DTGB0202S	20.77 (52.8)	20.94 (53.2)	10.18 (25.9)	435 (197.0)	F ①	NA	I
27.0	DTGA0274S (38)	DTGB0274S (35)	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	320 (145.0)	F ②	WSA1	E
34.0	DTGA0344S	DTGB0344S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	340 (154.0)	F ②	WSA1	E
40.0	DTGA0404S	DTGB0404S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	395 (179.0)	F ②	WSA1	E
51.0	DTGA0514S	DTGB0514S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	400 (181.0)	F ②	WSA2	E
63.0	DTGA0634S	DTGB0634S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	550 (250.0)	F ②	WSA2	E
75.0	DTGA0754S	DTGB0754S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	570 (259.0)	F ②	WSA2	E
93.0	DTGA0934S	DTGB0934S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	685 (311.0)	F	WSA3	E
118.0	DTGA01184S	DTGB01184S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	765 (347.0)	F	WSA3	E
145.0	DTGA01454S	DTGB01454S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	990 (449.0)	F	WSA4	E
175.0	DTGA01754S	DTGB01754S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1100 (499.0)	F	WSA4	E
220.0	DTGA02204S	DTGB02204S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1120 (508.0)	F	WSA4	E
275.0	DTGA002754S	DTGB002754S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	E
330.0	DTGA03304S	DTGB03304S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	G
440.0		DTGB04404S	57.84 (146.9)	45.50 (115.6)	41.49 (105.4)	2295 (1043.2)	F	WSA7	G
550.0		DTGB05504S	57.84 (146.9)	45.50 (115.6)	41.49 (105.4)	2580 (1172.7)	F	WSA7	G
660.0		DTGB06604S	62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	3700 (1678.3)	F	WSA6	G
770.0		DTGB07704S	62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	4044 (1838.2)	F	WSA6	G
880.0		DTGB008804S	62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	4230 (1922.7)	F	WSA6	G
990.0		DTGB9902S	62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	4285 (1947.7)	F	WSA6	G

GROUP C GROUP D

kVA	Primary 575V Delta Secondary 230Y/133 CATALOG NO.	Primary 575V Delta Secondary 460Y/266 CATALOG NO.	APPROX. DIMENSIONS ③ Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W - Wall F - Floor	WEATHER SHIELD P/N	DIM. DRAWING
7.5	DTHA72S	DTHB72S	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	180 (81.6)	W	NA	F
11.0	DTHA0112S	DTHB0112S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	I
14.0	DTHA0142S	DTHB0142S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	270 (123.0)	F ①	NA	I
20.0	DTHA0202S	DTHB0202S	20.77 (52.8)	20.94 (53.2)	10.18 (25.9)	435 (197.0)	F ①	NA	I
27.0	DTHA0274S (41)	DTHB0274S (44)	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	320 (145.0)	F ②	WSA1	E
34.0	DTHA0344S	DTHB0344S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	340 (154.0)	F ②	WSA1	E
40.0	DTHA0404S	DTHB0404S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	395 (179.0)	F ②	WSA1	E
51.0	DTHA0514S	DTHB0514S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	400 (181.0)	F ②	WSA2	E
63.0	DTHA0634S	DTHB0634S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	550 (250.0)	F ②	WSA2	E
75.0	DTHA0754S	DTHB754S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	570 (259.0)	F ②	WSA2	E
93.0	DTHA0934S	DTHB0934S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	685 (311.0)	F	WSA3	E
118.0	DTHA01184S	DTHB01184S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	765 (347.0)	F	WSA3	E
145.0	DTHA01454S	DTHB01454S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	990 (449.0)	F	WSA4	E
175.0		DTHB01754S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1100 (499.0)	F	WSA4	E
220.0		DTHB02204S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1120 (508.0)	F	WSA4	E
275.0		DTHB002754S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	E
330.0		DTHB03304S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	G
440.0		DTHB04404S	57.84 (157.5)	45.50 (115.6)	41.49 (105.4)	2580 (1172.7)	F	WSA7	G
550.0		DTHB05504S	57.84 (157.5)	45.50 (115.6)	41.49 (105.4)	2640 (1200.0)	F	WSA7	G
660.0		DTHB006604S	62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	3700 (1678.3)	F	WSA6	G

① Optional wall mounting kits – part # PL 79911 refer to Page 133.
② Optional wall mounting kits – part # PL 79912 refer to Page 133.
③ Dimensions may change and are not to be used for detailed construction purposes. Please contact the factory for certified dimensional drawings.

The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 122.

GROUP E

kVA	PRIMARY 230 Delta SECONDARY 230Y/133 CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) Height	Width	Depth	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	Knockouts Inches (Cm.)	WEATHER SHIELD P/N	DIM. DRAWING
7.5	DTFA72S (62)	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	180 (81.6)	W	NA	NA	F
11.0	DTFA0112S (62)	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	NA	I
14.0	DTFA0142S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	NA	I
20.0	DTFA0202S	20.77 (52.8)	20.94 (53.2)	10.18 (25.9)	435 (197.0)	F ①	NA	NA	I
27.0	DTFA0274S (59)	25.48 (64.8)	24.39 (62.0)	19.40 (49.3)	302 (137.0)	F ②	NA	WSA1	E
34.0	DTFA0344S	25.48 (64.8)	24.39 (62.0)	19.40 (49.3)	330 (150.0)	F ②	NA	WSA1	E
40.0	DTFA0404S	25.48 (64.8)	24.39 (62.0)	19.40 (49.3)	370 (168.0)	F ②	NA	WSA1	E
51.0	DTFA0514S	29.40 (74.7)	28.15 (71.5)	22.40 (56.9)	375 (170.0)	F ②	NA	WSA2	E
63.0	DTFA0634S	29.40 (74.7)	28.15 (71.5)	22.40 (56.9)	495 (225.0)	F ②	NA	WSA2	E
75.0	DTFA0754S	29.40 (74.7)	28.15 (71.5)	22.40 (56.9)	525 (238.0)	F ②	NA	WSA2	E
93.0	DTFA0934S	35.40 (89.9)	31.90 (81.0)	26.90 (68.3)	685 (311.0)	F	NA	WSA3	E
118.0	DTFA01184S	35.40 (89.9)	31.90 (81.0)	26.90 (68.3)	710 (322.0)	F	NA	WSA3	E
145.0	DTFA01454S	41.52 (105.5)	32.90 (83.6)	29.90 (75.9)	980 (445.0)	F	NA	WSA4	E
175.0	DTFA01754S	41.52 (105.5)	32.90 (83.6)	29.90 (75.9)	1110 (504.0)	F	NA	WSA4	E
220.0	DTFA02204S	41.52 (105.5)	32.90 (83.6)	29.90 (75.9)	1120 (508.0)	F	NA	WSA4	E

① Optional wall mounting kits – part # PL 79911 refer to Page 133.
② Optional wall mounting kits – part # PL 79912 refer to Page 133.

The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 155.

DRIVE ISOLATION DESIGN FIGURES (Refer to pg 122)

Windings, Terminations and Construction

KVA	PRIMARY WINDING	SECONDARY WINDING	INSULATION SYSTEM	TERMINATION	CONSTRUCTION ENCLOSURE	CORE
7.5	CU wire	CU wire	180°C	CU wire	Epoxy encapsulated	Wound/distributed gap
11-20	AL foil	AL foil	180°C	CU wire	Epoxy encapsulated	Wound/distributed gap
27-220	AL foil	AL foil	220°C	CU bus	Ventilated	Wound/distributed gap
275-660	AL foil	AL foil	220°C	AL bus	Ventilated	Butt stacked/Step lap

Thermal Switch Kit - PL-79900

Acme Thermal Switch Kits are designed for use with single and three phase drive isolation and distribution transformers. Thermal switch kits are available for a one or three sensor system.

Thermal sensors can be field installed in the transformer winding ducts to detect abnormal temperatures. The thermal sensors are a normally closed contact that opens at 200°C ± 10°C and has a current capacity of 5 amps @ 120V or 2.5 amps @ 240V. This contact can activate any number of different types of alarms or mechanisms that could warn of a potential failure.

KVA	MOUNTING POSITION	ILLUSTRATION
27.0-118.0	Bottom of the case	Figure 1
145-750	Top flange of the core bracket	Figure 2

Figure 1

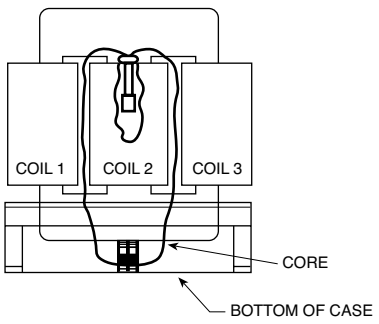
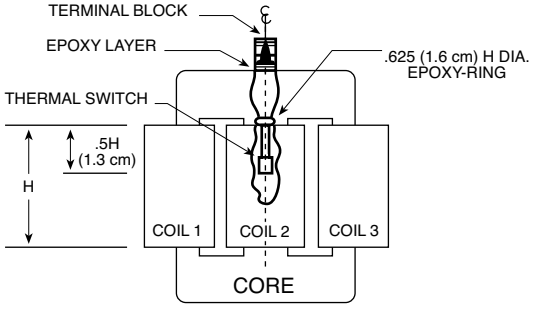


Figure 2



For Information On The Following, Please Contact The Factory

1. Transformers rated primary 230 volts delta, secondary 460Y/266 volts.
2. Low temperature rise units using class 220°C insulation with either 115°C or 80°C rise operating temperature.
3. Totally enclosed non-ventilated units.

AC Line Reactors

Protect your sensitive equipment from harmful line disturbances with Acme AC Line Reactors. AC Line Reactors help prevent equipment failure and downtime, and can add years to the life of your equipment.

Designed to protect DC motor drives, AC variable frequency drives and the motors they power. AC Line Reactors allow Acme to augment the Drive Isolation Transformer package to offer both line and load power quality protection for a wide range of applications.

Our product line features flexible design and ease of installation for use in a variety of applications such as paper machines, process lines, press controls and drive systems, along with tube mills and other sophisticated process equipment. These applications are found in such industries as food and beverage, paper, packaging systems and printing.

FEATURES

- Gapped iron core inductor–designed for optimum performance while providing harmonics compensation.
- Precision wound copper coils–maximum protection from short-circuiting.
- Finger-safe terminal blocks (up to 60 HP).
- Compact design–allows for more flexible installation.
- Amperage ratings of 2 to 600 amps
- Available in 3% and 5% impedance
- Can be used with 208, 240, 480 and 600 volts.
- Covered under Acme's 10-year limited warranty.
- UR and cUR Recognized.
- CE Marked (up to 55 amps)

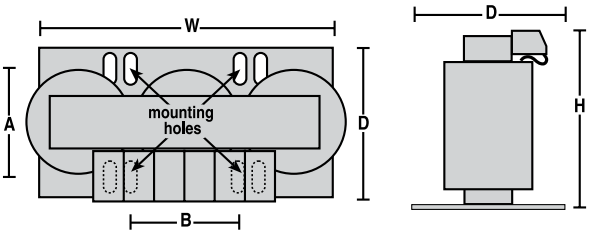
BENEFITS

Protect your motors and motor drives from a variety of power conditioning problems while realizing the following benefits:

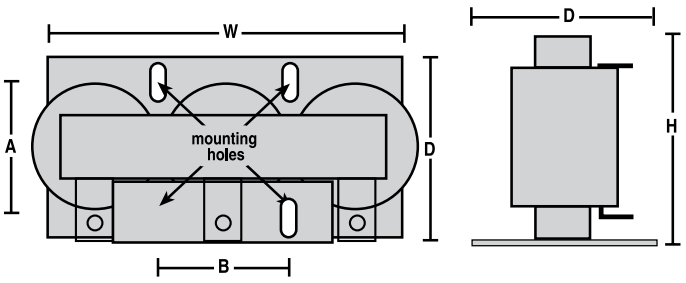
- Protection from damaging voltage drop.
- Elimination of nuisance tripping of drives or circuit breakers.
- Reduction of motor current surges and power line spike currents.
- Improvement in true power factor of capacitor input drives.
- Cooler, quieter operation.
- Reduction of harmonic distortion.
- Longer life for motors and solid state components.

AC LINE REACTORS DIMENSIONAL DRAWINGS

1-60 HP; 2-80 Amp

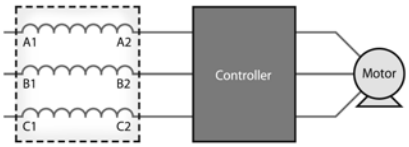


75-500 HP; 110-600 Amp



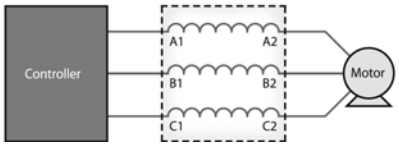
Applying Acme AC Line Reactors

Acme's three-phase AC Line Reactors can be used as an input filter for adjustable speed DC drives and as input or output filters for AC pulse width modulated variable frequency drives. They are bi-directional protective filtering devices and can be applied in a variety of configurations.



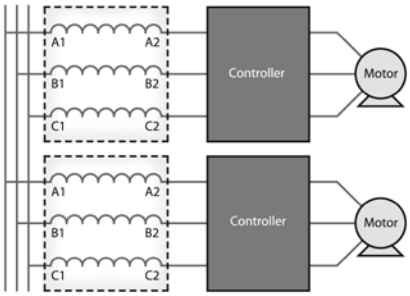
Input to Inverter/Drive

AC Line Reactors protect your sensitive equipment from noise generated by the drive or inverter. They protect the controller from power surges, spikes and harmonic distortion.



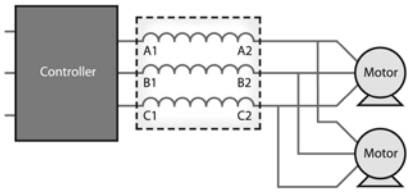
Output of Inverter/Drive

Motors run cooler and quieter with an AC Line Reactor placed between the inverter and motor. This application also reduces dv/dt and protects the controller from short circuits and surges.



Multiple Controllers on a Single Power Line

Each drive or inverter on a single power line requires its own AC Line Reactor in order to provide adequate surge protection, prevent crosstalk and reduce harmonic distortion.



Multiple Motors Controlled by a Single Drive

Multiple motors controlled by a single drive require only one AC Line Reactor between the controller and motors.

SELECTION CHARTS

GROUP B

480 VOLTS, 3% Z, 60 Hz (600 VOLTS, 2.4% Z; 240 VOLTS, 6% Z)

CATALOG NO.	MOTOR * HP	MOTOR * AMP	REACTOR AMP	uH	DIMENSIONS H	DIMENSIONS W	DIMENSIONS D	MOUNTING DIMENSIONS A (Depth)	MOUNTING DIMENSIONS B (Width)	WEIGHT (Lbs/Kg)
ALRB002TBC	1	2.1	2	11027	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB003TBC	1.5	3	3	7351	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB004TBC	2	3.4	4	5513	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB006TBC	3	4.8	6	3676	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB008TBC	5	7.6	8	2757	4.75 (12.1)	6.50 (16.5)	3.75 (9.50)	2.10 (5.3)	2.00 (5.1)	5 (2.3)
ALRB012TBC	7.5	11	12	1838	4.75 (12.1)	6.50 (16.5)	3.75 (9.50)	2.10 (5.3)	2.00 (5.1)	6 (2.7)
ALRB016TBC	10	14	16	1378	4.75 (12.1)	6.50 (16.5)	3.75 (9.50)	2.30 (5.8)	2.00 (5.1)	6 (2.7)
ALRB025TBC	15	21	25	882	4.75 (12.1)	6.50 (16.5)	4.00 (10.2)	2.60 (6.6)	2.50 (6.4)	9 (4.1)
ALRB027TBC	20	27	27	817	4.75 (12.1)	6.50 (16.5)	4.00 (10.2)	2.60 (6.6)	2.50 (6.4)	9 (4.1)
ALRB035TBC	25	34	35	630	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	3.20 (8.1)	2.50 (6.4)	13 (5.9)
ALRB045TBC	30	40	45	490	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	3.20 (8.1)	3.00 (7.6)	14 (6.4)
ALRB055TBC	40	52	55	401	7.00 (17.8)	9.00 (22.9)	4.50 (11.4)	3.50 (8.9)	3.60 (9.1)	22 (10.0)
ALRB080TBC	60	77	80	276	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.60 (9.1)	23 (10.4)
ALRB110CBC	75	96	110	200	7.00 (17.8)	9.00 (22.9)	5.50 (14.0)	3.60 (9.1)	3.60 (9.1)	27 (12.2)
ALRB130CBC	100	124	130	170	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	3.50 (8.9)	3.60 (9.1)	34 (15.4)
ALRB160CBC	125	156	160	138	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	4.20 (10.7)	3.60 (9.1)	36 (16.3)
ALRB200CBC	150	180	200	110	7.00 (17.8)	9.00 (22.9)	8.00 (20.3)	4.20 (10.7)	3.60 (9.1)	55 (24.9)
ALRB250CBC	200	240	250	88	8.50 (21.6)	10.80 (27.4)	8.00 (20.3)	5.70 (14.5)	4.60 (11.7)	74 (33.6)
ALRB300CBC	250	302	300	74	8.50 (21.6)	10.80 (27.4)	8.00 (20.3)	5.20 (13.2)	4.60 (11.7)	85 (38.6)
ALRB360CBC	300	361	360	61	8.50 (21.6)	10.80 (27.4)	8.00 (20.3)	6.20 (15.2)	4.60 (11.7)	105 (47.6)
ALRB420CBC	350	414	420	53	8.50 (21.6)	10.80 (27.4)	8.50 (21.6)	6.20 (15.2)	4.60 (11.7)	113 (51.3)
ALRB480CBC	400	477	480	46	8.50 (21.6)	10.80 (27.4)	8.50 (21.6)	6.70 (17.0)	4.60 (11.7)	119 (54.0)

GROUP C

480 VOLTS, 5% Z, 60 Hz (600 VOLTS, 4% Z; 240 VOLTS, 10% Z)

CATALOG NO.	MOTOR * HP	MOTOR * AMP	REACTOR AMP	uH	DIMENSIONS H	DIMENSIONS W	DIMENSIONS D	MOUNTING DIMENSIONS A (Depth)	MOUNTING DIMENSIONS B (Width)	WEIGHT (Lbs/Kg)
ALRC002TBC	1	2.1	2	18378	3.875 (9.8)	4.25 (10.8)	3.125 (7.9)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRC003TBC	1.5	3	3	12252	3.875 (9.8)	4.25 (10.8)	3.125 (7.9)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRC004TBC	2	3.4	4	9189	3.875 (9.8)	4.25 (10.8)	3.125 (7.9)	2.10 (5.3)	1.44 (3.7)	4 (1.8)
ALRC006TBC	3	4.8	6	6126	4.75 (12.1)	6.50 (16.5)	3.75 (9.5)	2.10 (5.3)	2.00 (5.1)	5 (2.3)
ALRC008TBC	5	7.6	8	4594	4.75 (12.1)	6.50 (16.5)	3.75 (9.5)	2.10 (5.3)	2.00 (5.1)	6 (2.7)
ALRC012TBC	7.5	11	12	3063	4.75 (12.1)	6.50 (16.5)	3.75 (9.5)	2.20 (5.6)	2.00 (5.1)	7 (3.2)
ALRC016TBC	10	14	16	2297	4.75 (12.1)	6.50 (16.5)	4.00 (10.2)	2.60 (6.6)	2.00 (5.1)	9 (4.1)
ALRC025TBC	15	21	25	1470	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	3.00 (7.6)	2.00 (5.1)	13 (5.9)
ALRC027TBC	20	27	27	1361	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	2.80 (7.1)	3.00 (7.6)	13 (5.9)
ALRC035TBC	25	34	35	1050	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.00 (7.6)	23 (10.4)
ALRC045TBC	30	40	45	817	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.00 (7.6)	23 (10.4)
ALRC055TBC	40	52	55	668	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.00 (7.6)	24 (10.9)
ALRC080TBC	60	77	80	459	7.00 (17.8)	9.00 (22.9)	5.75 (14.6)	4.60 (11.7)	3.60 (9.1)	34 (15.4)
ALRC110CBC	75	96	110	334	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	4.20 (10.7)	3.60 (9.1)	56 (25.4)
ALRC130CBC	100	124	130	283	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	4.20 (10.7)	3.60 (9.1)	56 (25.4)
ALRC160CBC	125	156	160	230	7.00 (17.8)	9.00 (22.9)	8.00 (20.3)	4.20 (10.7)	3.60 (9.1)	70 (31.8)
ALRC200CBC	150	180	200	184	8.50 (21.6)	10.80 (27.4)	8.25 (21.0)	5.90 (15.0)	3.60 (9.1)	76 (34.5)
ALRC250CBC	200	240	250	147	8.50 (21.6)	10.80 (27.4)	8.25 (21.0)	6.20 (15.7)	4.60 (11.7)	89 (40.4)
ALRC300CBC	250	302	300	123	10.93 (27.8)	16.50 (41.9)	8.13 (20.7)	6.20 (15.7)	4.60 (11.7)	106 (48.1)
ALRC360CBC	300	361	360	102	10.93 (27.8)	16.50 (41.9)	9.50 (24.1)	8.20 (20.8)	4.60 (11.7)	124 (56.2)
ALRC420CBC	350	414	420	88	10.93 (27.8)	16.50 (41.9)	9.50 (24.1)	8.20 (20.8)	4.60 (11.7)	124 (56.2)
ALRC480CBC	400	477	480	77	10.93 (27.8)	16.50 (41.9)	10.13 (25.7)	8.20 (20.8)	4.60 (11.7)	129 (58.5)
ALRC600CBC	500	590	600	61	10.93 (27.8)	16.50 (41.9)	10.13 (25.7)	8.20 (20.8)	7.20 (18.3)	190 (86.2)

* Motor HP and Amp rated at 480 volts.

SECTION 5

INDUSTRIAL CONTROL TRANSFORMERS

Industrial Control Transformers provide a low and safe control voltage for the operation of electromagnetic devices, such as motor starters, contactors, solenoids and timers … or other loads requiring above average voltage regulation when actuated.

Selecting Industrial Control Transformers

To make the proper transformer selection, the load must be completely analyzed... which involves every electrically energized component in the control circuit.

All electromagnetic control devices have two current requirements; the first to energize the coil; the second to maintain the contact for a definite period of time. The initial energizing of the coil, which takes 5 to 20 milliseconds, requires many times more current than normal. This is referred to as **volt-ampere inrush**... which is immediately followed by the sealed volt-amperes—the amount of current required to hold the contact in the circuit.

Easy, five step selection

1. Determine the voltage and frequency of supply circuit: Example: 460 Volts, 60 Hz.

2. Determine the total inrush VA of the control circuits from the manufacturer's data or the contactor data table. Do not neglect the current requirements of indicating lights and timing devices that do not have an inrush VA but are energized at the same time as the other components in the circuit. Their total VA should be added to the total inrush VA.

3. Refer to the regulation data chart. If the supply circuit voltage (Step 1) is reasonably stable and fluctuates no more than ± 5%, refer to the 90% Secondary Voltage column. If it fluctuates as much as ± 10%, refer to the 95% Secondary Voltage column. Go down the column you have selected until you arrive at the inrush VA closest to, but not less than, the inrush VA of your control circuit.

4. Read to the far left side of the chart and you have selected the continuous nominal VA rating of the transformer needed. The secondary voltage that will be delivered under inrush conditions will be either 85%, 90%, or 95% of the rated secondary voltage—depending on the column selected from the regulation data chart. The total sealed VA of the control circuit must not exceed the nominal VA rating of the transformer selected from the manufacturer's data or the contactor's data table.

TABLE 1. Inrush VA

Nominal VA Rating	Inrush VA @ 20% & 40% Power Factor					
	85% Secondary Voltage		90% Secondary Voltage		95% Secondary Voltage	
	20% P.F.	40% P.F.	20% P.F.	40% P.F.	20% P.F.	40% P.F.
50	362	224	289	179	217	134
75	579	354	462	283	345	211
100	839	522	664	413	489	304
150	1326	842	1003	637	679	431
250	3447	2281	2462	1629	1477	977
300	3894	2618	2812	1890	1731	1163
350	5418	3689	3870	2635	2322	1581
500	6496	4575	4691	3304	2887	2033
750	8377	5811	5913	4102	3449	2393
1000	11329	9005	7789	6191	4248	3377
1500	25519	18803	18013	13273	10508	7742
2000	28178	21600	19372	14850	10566	8100
3000	34797	28391	24562	20041	14328	11690
5000	138500	84542	100000	61058	61550	37574

TABLE 2. Typical Magnetic Motor Starter & Contactor Data ①
60 Hz, 120 Volt, 3-Pole

Contactor		N.E.M.A. Size								
		00	0	1	2	3	4	5		
								A	L	
Allen Bradley	500 Series	—	192	192	240	660	1225	2040	1490	VA Inrush
		—	29	29	29	45	69	110	96	VA Sealed
	K Series	53	110	175	240	580	1000	1950		VA Inrush
		15	20	22	31	43	65	98		VA Sealed
ASEA	Heavy Duty Series	85	85	100	150	490	900	1200		VA Inrush
		9	9	11.5	15	35	55	65		VA Sealed
Furnas		218	218	218	218	310	957	1518		VA Inrush
		25	25	25	25	26	75	116		VA Sealed
General Electric		151	151	151	528	1152	1248	2580		VA Inrush
		24	24	24	60	83	86	191		VA Sealed
Joslyn Clark		210	210	210	210	724	880	1790		VA Inrush
		18	18	18	18	30	39	295		VA Sealed
Siemens-Allis (formerly ITE Gould)		76	76	76	194	365	530	1630		VA Inrush
		12	12	12	21	35	40	110		VA Sealed
Square D		165	245	245	311	700	1185	2970		VA Inrush
		33	27	27	37	46	85	212		VA Sealed
Westinghouse		160	160	160	160	625	625	1700		VA Inrush
		25	25	25	25	50	50	180		VA Sealed
Cutler Hammer (Citation Line)	A1 Series	87	103	103	—	—	—	1158		VA Inrush
		15	20	20	—	—	—	100		VA Sealed
	B1 Series	102	103	103	140	390	1158	1158		VA Inrush
		13	20	20	24	50	100	100		VA Sealed

5. Refer to the specification tables on the following pages to select a transformer according to the required continuous nominal VA and primary/secondary voltages.

① Data is most current at time of printing. Contact individual manufacturer for updates.

TA Series Open Core & Coil Industrial Control Transformers

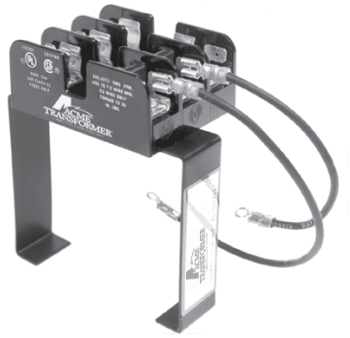
Industrial control transformers are used to reduce supply voltages to 230 V or lower for the operation of electromagnetic devices such as contactors, solenoids, relays, and timers. They are especially designed to accommodate the momentary current inrush caused when electromagnetic components are energized... without sacrificing secondary voltage stability beyond practical limits.

Acme Industrial Control Transformers are dry-type, step-down transformers with the secondary control circuit isolated from the primary line circuit to assure maximum safety.

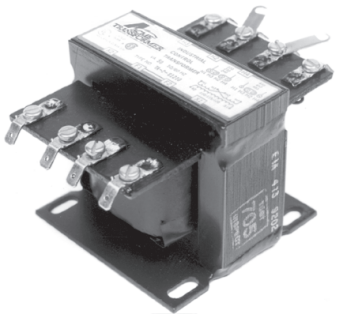
Voltage regulation of Acme Industrial Control Transformers exceeds standards recommended by the National Electrical Manufacturers Association. Secondary circuit voltage drop between no-load and momentary overload remains exceptionally low. This excellent secondary circuit voltage regulation assures reliable operation of electromagnetic components and may permit the use of a smaller and less expensive industrial control transformer.

FEATURES

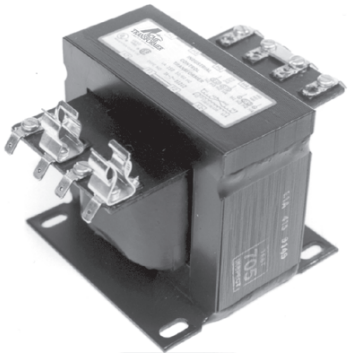
- Constructed with high quality silicon steel lamination to minimize core losses and increase efficiency.
- Designs incorporate precision wound coils for improved regulation.
- Primary fuse blocks and secondary fuse kits available and easily adaptable.
- Series-parallel connecting links save wiring and labor costs.
- Sturdy phenolic terminal panel protects the coil from foreign objects and mechanical damage.
- Copper windings on all groups.
- 130°C Insulation class. 80°C temperature rise.
- Wire retention on both primary and secondary terminals.
- Mounting plate adapts to various mounting dimensions.
- Voltage regulation exceeds NEMA requirements.
- UL Listed, CSA Certified.
- Attractive finish, nameplate, and design features enhance the end product.



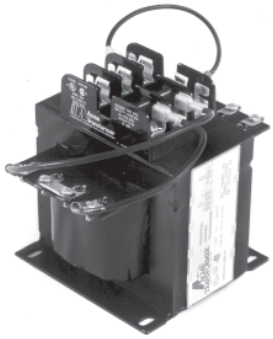
Primary Fuse Kit with Snap-on Secondary Fuse Block



Jumper Link Connections



Secondary Fuse Clips



Integrally Mounted Fuse Blocks

Acme Industrial Control Transformers Meet or Exceed UL, CSA, NEMA & ANSI

Acme Industrial Control Transformers 50 through 5000 VA are UL Listed, File E79947 and CSA certified, File 7357.

Laminations—High-permeability silicon steel continuously annealed to minimize core losses.

Magnet Wire—Copper magnet wire is coated with high temperature-resisting insulating film.

Coils—Precision wound by machine; total turns per coil automatically counted.

Mounting—Heavy steel mounting plates add strength to core construction and provide firm mounting, slotted to facilitate installation.

Terminal Boards—Sturdy phenolic terminal boards.

Sizing Primary Fuses:

Primary Amps < 2, fuse size is 300% of rated primary current.
Primary Amps 2< 9, fuse size is 167% of rated primary current.
Primary Amps ≥ 9, fuse size is 125% of rated primary current.

Sizing Secondary Fuses:

Secondary Amps < 9, fuse size is 167% of rated secondary current.
Secondary Amps ≥ 9, fuse size is 125% of rated secondary current.

TA Series Primary Fuse Kits

Type PL112700 Through PL112705: Using 2 Class CC Dual Element Fuses (not supplied)

- Meets NEC Article 450 and UL-508 requirements.
- For use with class "CC" fuses.
- Eliminates remote mounting of primary overcurrent protection.
- Covered by Acme Electric 10-year limited warranty.

Field installation is fast and easy. Simply loosen the mounting hardware (Fig. 1), slide the bracket over the transformer and re-tighten the mounting hardware. Make the proper connections with the factory furnished jumpers (Fig. 2) and your unit is ready for operation.

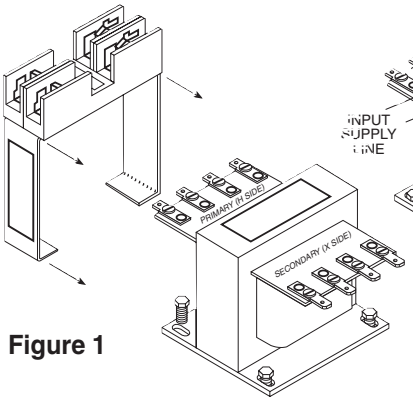


Figure 1

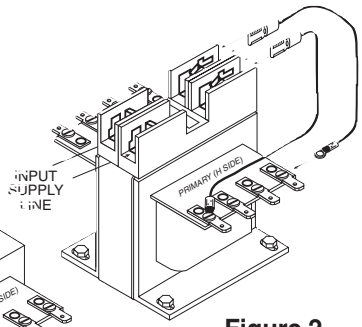
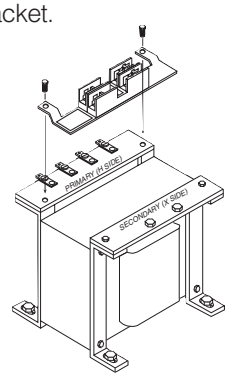


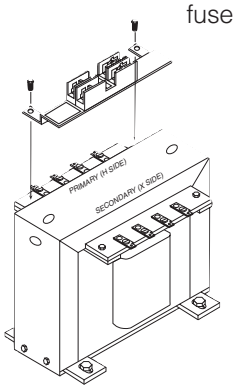
Figure 2

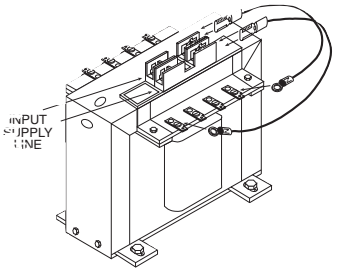
Instructions for TA Series Primary Fuse Kit

Type PL112706 & PL112707: Using 2 Class CC Dual Element Fuses (3000-5000 VA)

1. To mount the primary fuse kit bracket, remove the two 1/4" (.64 cm) sheet metal screws on the terminal panel on the primary (H side) of the transformer.
2. Place the slots in the fuse kit mounting bracket over the holes in the terminal and mounting bracket. To secure the fuse kit, reinsert the two 1/4" (.64 cm) sheet metal screws and tighten securely.
3. Tighten all mounting screws securely–this will secure the mounting bracket.
4. Attach the female quick connect of the jumpers supplied with the fuse kit to male quick connects on the right side of the fuse blocks—one jumper to each of the blocks.
5. Connect the ring terminal of the jumpers to the appropriate screw terminals of the transformers primary (H side). Refer to the transformer name plate for proper terminal connections.
6. Connect primary supply line leads to the screw terminals on the left side of the block—one line lead to each of the fuse blocks.







Primary Fuse Sizing Chart ①

VA	120 V	208 V	230 V	240 V	277 V	380 V	416 V	440 V	460 V	480 V	550 V	600 V
50	1.2	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	1.9	1.0	1.0	1.0	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.4
100	2.5	1.5	1.3	1.3	1.0	0.8	0.8	0.6	0.6	0.6	0.6	0.5
150	3.8	2.0	2.0	1.9	1.5	1.2	1.2	1.0	1.0	1.0	0.8	0.8
250	3.5	3.5	3.5	3.0	3.0	2.0	1.8	1.8	1.5	1.5	1.4	1.2
300	4.0	4.0	4.0	3.5	3.0	2.5	2.5	2.0	2.0	1.9	1.5	1.5
350	5.0	5.0	4.5	4.0	4.0	2.5	2.5	2.5	2.0	2.0	1.9	1.8
500	7.0	4.0	3.5	3.5	5.5	4.0	3.5	3.5	3.5	3.0	3.0	2.5
750	10.0	6.0	5.5	5.0	4.5	6.0	5.5	5.0	5.0	5.0	4.0	4.0
1000	15.0	8.0	7.0	7.0	6.0	4.5	4.0	3.5	3.5	3.5	5.5	5.0
1500	20.0	12.0	12.0	12.0	10.0	7.0	6.0	6.0	5.5	5.5	5.0	4.5
2000	25.0	12.0	15.0	15.0	12.0	9.0	8.0	8.0	7.5	7.0	6.0	6.0
3000	30.0	20.0	20.0	20.0	15.0	15.0	12.0	12.0	12.0	12.0	10.0	9.0
5000	—	30.0	30.0	30.0	25.0	20.0	15.0	15.0	15.0	15.0	12.0	15.0

① Fuse size based on time delay class CC fuses.

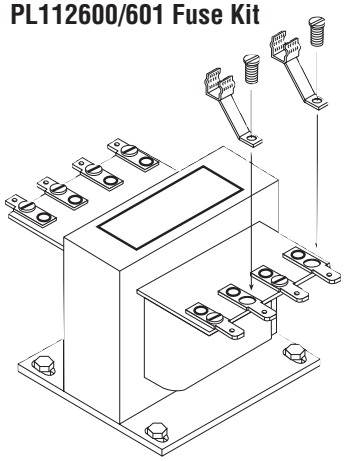
NOTE: Bold lines indicate changes in the percent of rated current used to calculate fuse sizes in accordance with article 450 of the NEC.

TA Series Secondary Fuse Kits

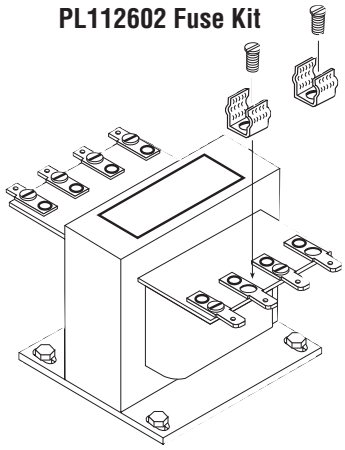
Type PL112600, 601, 602: Use Dual Element Slow-Blow Fuse

- Mount secondary fuse clips on terminals X1 and F or F1 using the screws supplied with the transformer.
- Connect secondary load lines to terminals X2 and F or F2.
- Use dual-element slow-blowing fuses such as Bussmann MFG., Fusetron Type FNM, Littelfuse or Shawmut (not supplied with fuse kits).

PL112600/601 Fuse Kit



PL112602 Fuse Kit



TA Series Instructions for Secondary Fuse Kit

Type PL112603: use dual element slow-blow fuse 13/32" x 1-1/2" (1.0 x 3.8 cm)

1. To attach secondary fuse kit PL-112603 to primary fuse kits PL112700 thru PL112707 snap the secondary single pole fuse block onto the unlabeled side of the primary double pole fuse block. (See Figure 1)
2. Install the fuse kits as instructed under the primary fuse kit instructions on page 54.
3. Select the appropriate pair of jumpers for making the connections between the secondary fuse block and the secondary (X-side) of the transformer.
4. Connect the female quick-connect of the jumpers supplied to one of the male quick-connects of the secondary fuse block - one jumper to each end of the fuse block. (See Figure 2)
5. Connect the ring terminal of the jumpers supplied to screw terminals X1 and F or F1 on the secondary (X-side) of the transformer.
6. Connect secondary load lines to terminals X2 and F or F2.

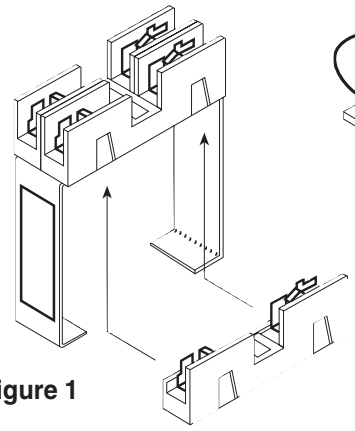


Figure 1

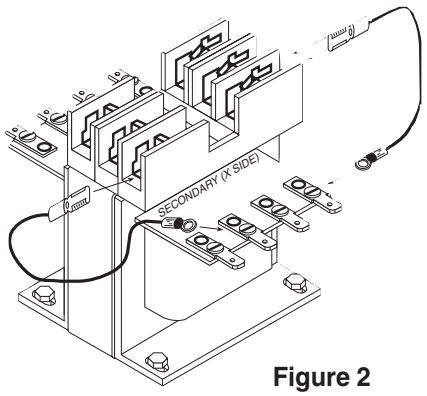
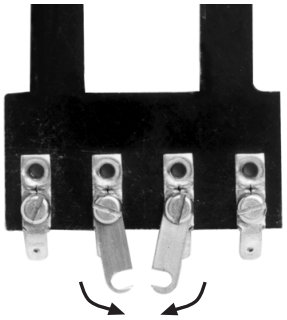


Figure 2

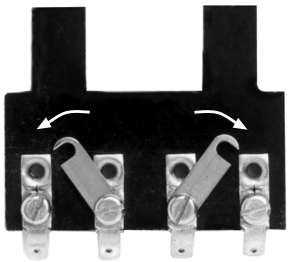
Jumper Link Connections

Group A Series: 240 V parallel: 120 V
Group B Series: 480 V parallel: 240 V
Group F series: 230 V parallel: 115 V
Group I Series: 24 V parallel: 12 V
Group J Series: 480 V & 240 V: 240 V & 120 V
Group K Series: 240 V: 120 V

Exception: 150 VA transformer TA232404 does not have quick connect terminals.



Series Connection



Parallel Connection

TB Series Open Core & Coil Industrial Control Transformers

Acme's TB Series Industrial Control Transformers are especially designed to accommodate the momentary current inrush caused when electromagnetic components are energized... without sacrificing secondary voltage stability beyond practical limits.

Acme's TB Series transformers are dry-type, step-down transformers with the secondary control circuit isolated from the primary line circuit to assure maximum safety.

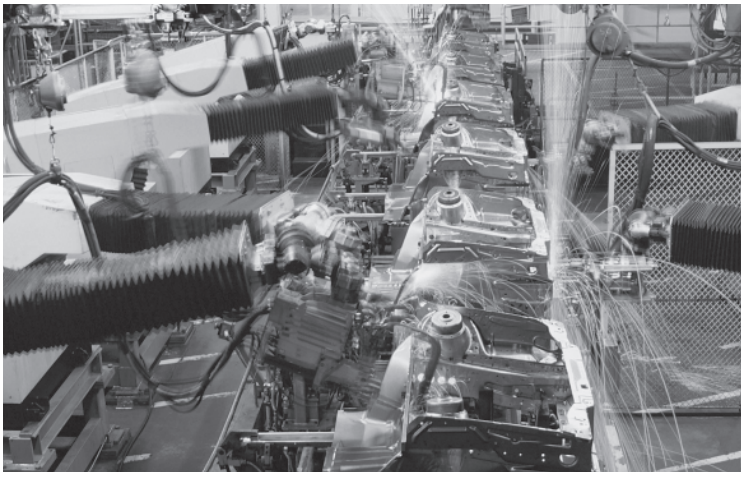
Voltage regulation of Acme's TB Series transformers exceeds standards recommended by the National Electrical Manufacturers Association. Secondary circuit voltage drop between no-load and momentary overload remains exceptionally low. This excellent secondary circuit voltage regulation assures reliable operation of electromagnetic components and may permit the use of a smaller and less expensive industrial control transformer.

FEATURES & BENEFITS

- 600 volt class and below.
- 50–1000 VA, 50/60 Hz.
- 80°C temperature rise, 130°C insulation class.
- Constructed with high quality silicon steel lamination to minimize core losses and increase efficiency.
- Designs incorporate precision split bobbin wound coils for improved regulation.
- Primary fuse blocks and secondary fuse kits available and easily adaptable.
- Series-parallel connecting links save wiring and labor costs.
- Terminal blocks allow full access for ring terminals for easy installation even with solid strand conductors.
- Integrally molded terminal blocks with isolation barriers to prevent arc over.
- Footprint matches TA Series for easy interchangeability.
- Copper windings on all groups.
- Heavy gauge steel mounting plate adapts to various mounting dimensions.
- Voltage regulation exceeds NEMA requirements.
- UL Listed and CSA Certified.
- Meets or exceeds UL, CSA, NEMA, ANSI and OSHA Standards.
- Ten-year limited warranty.

APPLICATIONS

- Motor Starters
- Contactors
- Solenoids
- Timer Circuits
- Relays
- Control Panels
- Robotics



TB Series Primary Fuse Kits

Type PL112700 Through PL112705: Using 2 Class CC Dual Element Fuses (not supplied)

- Meets NEC Article 450 and UL-508 requirements.
- For use with class "CC" fuses.
- Eliminates remote mounting of primary overcurrent protection.
- Covered by Acme Electric 10-year limited warranty.

Field installation is fast and easy. Simply loosen the mounting hardware (Fig. 1), slide the bracket over the transformer and re-tighten the mounting hardware. Make the proper connections with the factory furnished jumpers (Fig. 2) and your unit is ready for operation.

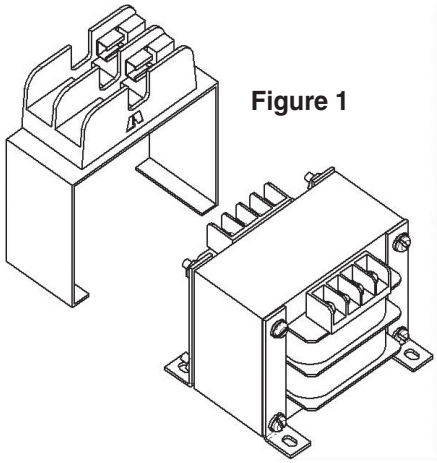


Figure 1

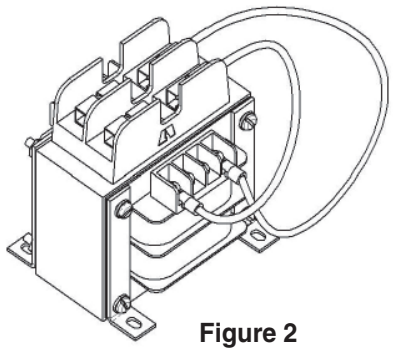


Figure 2

Fuse Kit adds approximately 1.75" to height of unit.

Primary Fuse Sizing Chart ①

VA	120 V	208 V	230 V	240 V	277 V	380 V	416 V	440 V	460 V	480 V	550 V	600 V
50	1.2	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	1.9	1.0	1.0	1.0	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.4
100	2.5	1.5	1.3	1.3	1.0	0.8	0.8	0.6	0.6	0.6	0.6	0.5
150	3.8	2.0	2.0	1.9	1.5	1.2	1.2	1.0	1.0	1.0	0.8	0.8
250	3.5	3.5	3.5	3.0	3.0	2.0	1.8	1.8	1.5	1.5	1.4	1.2
300	4.0	4.0	4.0	3.5	3.0	2.5	2.5	2.0	2.0	1.9	1.5	1.5
350	5.0	5.0	4.5	4.0	4.0	2.5	2.5	2.5	2.0	2.0	1.9	1.8
500	7.0	4.0	3.5	3.5	5.5	4.0	3.5	3.5	3.5	3.0	3.0	2.5
750	10.0	6.0	5.5	5.0	4.5	6.0	5.5	5.0	5.0	5.0	4.0	4.0
1000	15.0	8.0	7.0	7.0	6.0	4.5	4.0	3.5	3.5	3.5	5.5	5.0
1500	20.0	12.0	12.0	12.0	10.0	7.0	6.0	6.0	5.5	5.5	5.0	4.5
2000	25.0	12.0	15.0	15.0	12.0	9.0	8.0	8.0	7.5	7.0	6.0	6.0
3000	30.0	20.0	20.0	20.0	15.0	15.0	12.0	12.0	12.0	12.0	10.0	9.0
5000	—	30.0	30.0	30.0	25.0	20.0	15.0	15.0	15.0	15.0	12.0	15.0

Secondary Fuse Sizing Chart

VA	24 V	85 V	91 V	99 V	100 V	110 V	115 V	120 V	125 V	130 V
50 VA	3.2	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6
75 VA	5.0	1.4	1.2	1.2	1.2	1.0	1.0	1.0	1.0	0.8
100 VA	6.0	1.5	1.5	1.5	1.5	1.5	1.5	1.2	1.2	1.2
150 VA	10.0	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	1.5
250 VA	12.0	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
300 VA	15.0	5.5	5.5	5.0	5.0	4.5	4.5	4.0	4.0	3.5
350 VA	20.0	6.5	6.0	5.5	5.5	5.0	5.0	4.5	4.5	4.5
500 VA	25.0	9.0	9.0	8.0	8.0	7.0	7.0	6.0	6.0	6.0
750 VA	40.0	12.0	12.0	12.0	12.0	10.0	10.0	10.0	10.0	9.0
1000 VA	50.0	15.0	15.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1500 VA	—	25.0	20.0	20.0	20.0	20.0	20.0	15.0	15.0	15.0
2000 VA	—	30.0	30.0	25.0	25.0	25.0	25.0	20.0	20.0	20.0
3000 VA	—	40.0	40.0	40.0	40.0	35.0	35.0	30.0	30.0	30.0
5000 VA	—	70.0	70.0	60.0	60.0	60.0	60.0	50.0	50.0	50.0

① Fuse size based on time delay class CC fuses.

NOTE: Bold lines indicate changes in the percent of rated current used to calculate fuse sizes in accordance with article 450 of the NEC.

TB Series Secondary Fuse Kits

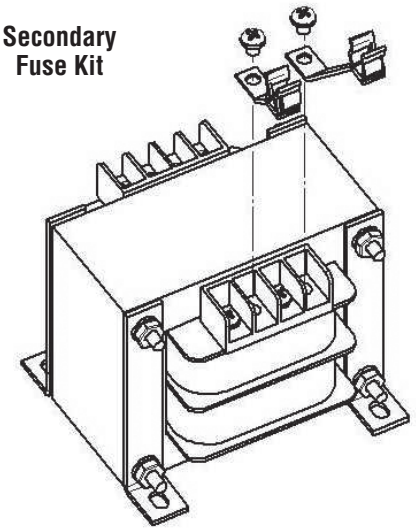
Type PL79924, PL79930, & PL79931: Use Dual Element Slow-Blow Fuse

Catalog Number	VA	Type
PL79924*	50-1000	1/4" x 1-1/4"
PL79930	50-350	13/32" x 1-1/2"
PL79931	500-1000	13/32" x 1-1/2"

- Mount secondary fuse clips on terminals X1 and F or F1 using the screws supplied with the transformer.
- Connect secondary load lines to terminals X2 and F or F2. Use Jumper Link to connect F1 and F2.
- Use dual-element slow-blowing fuses such as Bussmann MFG., Fusetron Type FNM, Littelfuse or Ferraz Shawmut (not supplied with fuse kits).

* PL79924: Use fuse kit on all transformers except 750 & 1000 VA with 24 volt secondary.

Secondary Fuse Kit



Instructions for TB Series Secondary Fuse Kit

Type PL112603: use dual element slow-blow fuse 13/32" x 1-1/2" (1.0 x 3.8 cm)

1. To attach secondary fuse kit PL 112603 to primary fuse kits PL112700 thru PL112705 snap the secondary single pole fuse block onto the unlabeled side of the primary double pole fuse block. (See Figure 1)
2. Install the fuse kits as instructed under the primary fuse kit instructions on page 54.
3. Select the appropriate pair of jumpers for making the connections between the secondary fuse block and the secondary (X-side) of the transformer.
4. Connect the female quick-connect of the jumpers supplied to one of the male quick-connects of the secondary fuse block—one jumper to each end of the fuse block. (See Figure 2)
5. Connect the ring terminal of the jumpers supplied to screw terminals X1 and F or F1 on the secondary (X-side) of the transformer.
6. Connect secondary load lines to terminals X2 and F or F2.

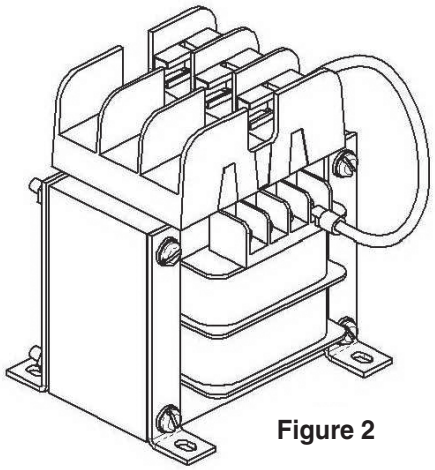


Figure 2

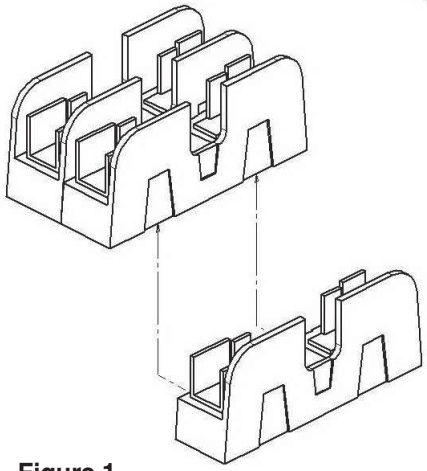


Figure 1

SELECTION CHARTS

GROUP A

120 X 240 PRIMARY VOLTS—12/24 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO. ②	VA RATING	OUTPUT AMPS	APPROX. DIMENSIONS Inches (Cm.) A	B	C	D	E	F	APPROX. SHIP WEIGHT Lbs. (Kg.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE SIZE 24 VOLTS
TB181141 ②	50	2.08	4.23 (10.7)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.13 (5.4)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	3 2/10 amps
TB181142 ②	75	3.13	4.74 (12.0)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.61 (6.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	5 amps
TB181143 ②	100	4.17	4.90 (12.4)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	6 1/4 amps
TB181144 ②	150	6.25	4.78 (12.1)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.63 (6.7)	.22 x .50 (0.6 x 1.3)	6 (2.7)	PL112701	10 amps
TB181146 ②	250	10.42	5.08 (12.9)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.05 (7.7)	.22 x .50 (0.6 x 1.3)	9 (4.1)	PL112702	15 amps
TB181148 ②	350	14.58	6.12 (15.5)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	13 (5.9)	PL112702	20 amps
TB181149 ②	500	20.83	5.90 (15.0)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.19 (10.6)	.31 x .50 (0.8 x 1.3)	16 (7.3)	PL112704	30 amps
TB181150	750	31.25	7.53 (19.1)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	5.25 (13.3)	.31 x .50 (0.8 x 1.3)	24 (10.9)	PL112704	—
TB181151	1000	41.67	7.43 (18.9)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	3.81 (9.7)	.31 x .50 (0.8 x 1.3)	26 (11.8)	PL112705	—

GROUP B

240 X 480, 230 X 460, 220 X 440 PRIMARY VOLTS—120/115/110 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO. ②	VA RATING	OUTPUT AMPS @ 120V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT ① PART NO.	SECONDARY FUSE SIZE 120 VOLTS
TB81210 ②	50	0.42	4.23 (10.7)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.13 (5.4)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	6/10 amp
TB81201 ②	75	0.63	4.74 (12.0)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.61 (6.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	1 amp
TB81211 ②	100	0.83	4.90 (12.4)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	1 1/4 amps
TB81212 ②	150	1.25	5.00 (12.7)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	6 (2.7)	PL112701	*	2 amps
TB81213 ②	250	2.08	4.18 (10.6)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.13 (8.0)	.22 x .50 (0.6 x 1.3)	9 (4.1)	PL112702	*	3 2/10 amps
TB81200 ②	300	2.50	5.57 (14.1)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.13 (8.0)	.22 x .50 (0.6 x 1.3)	10 (4.5)	PL112702	*	4 amps
TB81214 ②	350	2.92	6.32 (16.1)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.83 (9.7)	.22 x .50 (0.6 x 1.3)	12 (5.4)	PL112702	*	4 1/2 amps
TB81215 ②	500	4.17	6.30 (16.0)	5.25 (13.3)	4.47 (11.4)	4.06 (10.3)	3.81 (9.7)	.22 x .50 (0.6 x 1.3)	15 (6.8)	PL112704	*	6 1/4 amps
TB81216 ②	750	6.25	6.65 (16.9)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	5.13 (13.0)	.31 x .50 (0.8 x 1.3)	23 (10.4)	PL112704	*	10 amps
TB81217 ②	1000	8.33	7.58 (19.3)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.69 (9.4)	.31 x .50 (0.8 x 1.3)	25 (11.3)	PL112705	*	12 amps

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 58.
② See chart for integrally mounted fuse block catalog number suffix.

GROUP B (CONTINUED)

240 X 480, 230 X 460, 220 X 440 PRIMARY VOLTS—120/115/110 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO. ②	VA RATING	OUTPUT AMPS @ 120V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT ① PART NO.	SECONDARY FUSE SIZE 120 VOLTS
TA2-81218	1500	12.50	8.80 (22.4)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	5.75 (14.6)	.31 x .50 (0.8 x 1.3)	43 (19.5)	PL112705	PL112601	15 amps
TA2-81219	2000	16.67	9.25 (23.5)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	6.38 (16.2)	.31 x .50 (0.8 x 1.3)	49 (22.2)	PL112705	PL112601	20 amps
TA2-81220	3000	25.00	8.81 (22.4)	7.50 (19.1)	8.34 (21.2)	6.50 (16.5)	7.52 (19.1)	.41 x .81 (1.0 x 2.1)	70 (31.8)	PL112706	—	—
TA281221	5000	41.67	7.52 (19.1)	11.92 (30.3)	9.49 (24.1)	6.75 (17.1)	6.25 (15.9)	.41 x .81 (1.0 x 2.1)	125 (56.7)	PL112707	—	—

⋆ See fusing chart for secondary fuse kits.

Integrally Mounted Fuse Blocks Available:
(See Chart)
GROUP 'A' THROUGH 500 VA
GROUP 'B' THROUGH 2000 VA

ADD SUFFIX TO CATALOG NO.	CONFIGURATION
F2	Factory installed integrally mounted 2-pole primary block
F3	Factory installed integrally mounted 3-pole primary and secondary block (100 VA & larger)
F4	Factory installed 2-pole primary block and secondary fuse clips (50 & 75 VA)

Consult factory for other sizes available.

GROUP C

240/480/600, 230/460/575, 220/440/550 PRIMARY VOLTS—120/100, 115/95, 110/90 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS @ 120V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT ① PART NO.	SECONDARY FUSE SIZE 120 VOLTS
TB81000	50	0.42	4.56 (11.6)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.61 (6.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	6/10 amp
TB81009	75	0.63	4.90 (12.4)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	1 amp
TB81001	100	0.83	5.36 (13.6)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	3.26 (8.3)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112700	*	1 1/4 amps
TB81002	150	1.25	5.00 (12.7)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	3.06 (7.8)	.22 x .50 (0.6 x 1.3)	7 (3.2)	PL112701	*	2 amps
TB81003	250	2.08	5.57 (14.1)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.50 (8.9)	.22 x .50 (0.6 x 1.3)	11 (5.0)	PL112702	*	3 2/10 amps
TB81020	300	2.50	6.48 (16.5)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	15 (6.8)	PL112702	*	4 amps
TB81004	350	2.92	6.48 (16.5)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	15 (6.8)	PL112702	*	4 1/2 amps
TB81005	500	4.17	6.43 (16.3)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.56 (11.6)	.31 x .50 (0.8 x 1.3)	21 (9.5)	PL112704	*	6 1/4 amps
TB81006	750	6.25	7.19 (18.3)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.81 (9.7)	.31 x .50 (0.8 x 1.3)	25 (11.3)	PL112705	*	10 amps
TB81007	1000	8.33	7.96 (20.2)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	4.63 (11.8)	.31 x .50 (0.8 x 1.3)	32 (14.5)	PL112705	*	12 amps
TA281008	1500	12.50	9.46 (24.0)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	6.38 (16.2)	.31 x .50 (0.8 x 1.3)	47 (21.3)	PL112705	PL112601	15 amps
TA253929	2000	16.67	7.90 (20.1)	7.50 (19.1)	7.66 (19.5)	6.50 (16.5)	6.57 (16.7)	.41 x .81 (1.0 x 2.1)	55 (24.9)	PL112706	PL112601	20 amps
TA253930	3000	25.00	7.02 (17.8)	11.92 (30.3)	8.83 (22.4)	6.75 (17.1)	5.75 (14.6)	.41 x .81 (1.0 x 2.1)	75 (34.0)	PL112707	—	—
TA253931	5000	41.67	7.52 (19.1)	11.92 (30.3)	9.49 (24.1)	6.75 (17.1)	6.25 (15.9)	.41 x .81 (1.0 x 2.1)	110 (49.9)	PL112707	—	—

⋆ See fusing chart for secondary fuse kits.

① Secondary Fuse Kit PL-112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 58.
② See chart for integrally mounted fuse block catalog number suffix.

GROUP D

208/240/277/380/480 PRIMARY VOLTS—24 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT ① PART NO.	SECONDARY FUSE SIZE 24 VOLTS
TB81321	50	2.08	4.08 (10.4)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.19 (5.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112701	*	3 2/10 amp
TB81322	75	3.13	4.31 (10.9)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.31 (5.9)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112701	*	5 amps
TB81323	100	4.17	4.52 (11.5)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.63 (6.7)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112701	*	6 1/4 amps
TB81324	150	6.25	4.75 (12.1)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.05 (7.7)	.22 x .50 (0.6 x 1.3)	9 (4.1)	PL112702	*	10 amps
TB81325	250	10.42	5.24 (13.3)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	3.25 (8.3)	.22 x .50 (0.6 x 1.3)	11 (5.0)	PL112702	*	15 amps
TB81326	350	14.58	6.02 (15.3)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.00 (10.2)	.31 x .50 (0.8 x 1.3)	18 (8.2)	PL112704	*	20 amps
TB81327	500	20.83	6.51 (16.5)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.19 (10.6)	.31 x .50 (0.8 x 1.3)	19 (8.6)	PL112704	*	30 amps
TB81328	750	31.25	7.08 (18.0)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.81 (9.7)	.31 x .50 (0.8 x 1.3)	26 (11.8)	PL112705	*	— 33 amps
TB81329	1000	41.67	8.10 (20.6)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	4.63 (11.8)	.31 x .50 (0.8 x 1.3)	33 (15.0)	PL112705	*	—

* See fusing chart for secondary fuse kits.

GROUP E

208/277/380 PRIMARY VOLTS—115/95 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS @ 115V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT ① PART NO.	SECONDARY FUSE SIZE 115 VOLTS
TB81301	50	0.43	4.35 (11.0)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.61 (6.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	6/10 amp
TB81302	75	0.65	4.74 (12.0)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	1 amp
TB81303	100	0.87	4.45 (11.3)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.44 (6.2)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112701	*	1 1/4 amps
TB81304	150	1.30	5.00 (12.7)	3.75 (9.5)	3.84 (9.8)	3.13 (8.0)	3.06 (7.8)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112701	*	2 amps
TB81305	250	2.17	5.68 (14.4)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	13 (5.9)	PL112702	*	3 1/2 amps
TB81306	350	3.04	6.30 (16.0)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	4.75 (12.1)	.22 x .50 (0.6 x 1.3)	18 (8.2)	PL112702	*	5 amps
TB81307	500	4.35	6.22 (15.8)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.56 (11.6)	.22 x .50 (0.6 x 1.3)	20 (9.1)	PL112704	*	7 amps
TB81308	750	6.52	6.82 (17.3)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.69 (9.4)	.31 x .50 (0.8 x 1.3)	24 (10.9)	PL112705	*	10 amps
TB81309	1000	8.70	7.96 (20.2)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	4.44 (11.3)	.31 x .50 (0.8 x 1.3)	31 (14.1)	PL112705	*	12 amps

* See fusing chart for secondary fuse kits.

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 58.
② See chart for integrally mounted fuse block catalog number suffix.

GROUP F

380/440/550/600 PRIMARY VOLTS—115/230 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS @ 115V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE SIZE ② 115 VOLTS
TA254535	50	0.43	4.12 (10.5)	3.75 (9.5)	3.21 (8.2)	3.13 (8.0)	2.19 (5.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112701	6/10 amp
TA254536	100	0.87	4.56 (11.6)	3.75 (9.5)	3.21 (8.2)	3.13 (8.0)	2.31 (5.9)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112701	1 1/4 amps
TA254537	150	1.30	5.00 (12.7)	3.75 (9.5)	3.21 (8.2)	3.13 (8.0)	3.06 (7.8)	.22 x .50 (0.6 x 1.3)	10 (4.5)	PL112701	2 amps
TA254538	250	2.17	5.49 (13.9)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.50 (8.9)	.22 x .50 (0.6 x 1.3)	11 (5.0)	PL112702	3 1/2 amps
TA281197	350	3.04	6.03 (15.3)	4.88 (12.4)	4.15 (10.5)	4.06 (10.3)	4.38 (11.1)	.22 x .50 (0.6 x 1.3)	17 (7.7)	PL112703	5 amps
TA254539	500	4.35	6.76 (17.1)	4.88 (12.4)	4.15 (10.5)	4.06 (10.3)	5.75 (14.6)	.22 x .50 (0.6 x 1.3)	23 (10.4)	PL112703	7 amps
TA281240	750	6.52	7.19 (18.3)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	3.69 (9.4)	.31 x .50 (0.8 x 1.3)	25 (11.3)	PL112705	10 amps
TA281241	1000	8.70	7.77 (19.7)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	4.44 (11.3)	.31 x .50 (0.8 x 1.3)	30 (13.6)	PL112705	12 amps

GROUP G

240/416/480/600; 230/400/460/575; 220/380/440/550; 208/500 PRIMARY VOLTS
99/120/130; 95/115/125; 91/110/120; 85/100/110 SECONDARY VOLTS —1Ø, 50/60 Hz

CATALOG NO.	VA RATING @ 130V	OUTPUT AMPS	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT PART NO.	SECONDARY FUSE SIZE 130 VOLTS
TB32403	50	0.38	4.08 (10.4)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.31 (5.9)	.22 x .50 (0.6 x 1.3)	5 (2.3)	PL112701	NA	6/10 amp
TB32404	150	1.15	4.75 (12.1)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.05 (7.7)	.22 x .50 (0.6 x 1.3)	10 (4.5)	PL112702	NA	1 6/10 amps
TB32405	250	1.92	5.58 (14.2)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	16 (7.3)	PL112702	NA	3 2/10 amps
TB32669	350	2.69	6.23 (15.8)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	5.50 (14.0)	.22 x .50 (0.6 x 1.3)	22 (10.0)	PL112702	NA	4 amps
TB32406	500	3.85	6.40 (16.3)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.69 (9.4)	.22 x .50 (0.6 x 1.3)	23 (10.4)	PL112705	NA	6 1/4 amps
TB54523	750	5.77	7.08 (18.0)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	4.13 (10.5)	.31 x .50 (0.8 x 1.3)	29 (13.2)	PL112705	NA	9 amps
TB54524	1000	7.69	8.56 (21.7)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	4.88 (12.4)	.31 x .50 (0.8 x 1.3)	35 (15.9)	PL112705	NA	12 amps
TA254525	1500	11.54	6.75 (17.1)	7.50 (19.1)	7.66 (19.5)	6.50 (16.5)	5.42 (13.8)	.41 x .81 (1.0 x 2.1)	55 (24.9)	PL112706	PL-112601	20 amps
TA281202	2000	15.39	7.45 (18.9)	7.50 (19.1)	7.66 (19.5)	6.50 (16.5)	6.12 (15.5)	.41 x .81 (1.0 x 2.1)	55 (24.9)	PL112706	PL-112601	25 amps
TA281203	3000	23.08	7.02 (17.8)	11.92 (30.3)	8.83 (22.4)	6.75 (17.1)	5.75 (14.6)	.41 x .81 (1.0 x 2.1)	70 (31.8)	PL112707	—	—
TA281205	5000	38.46	7.52 (19.1)	11.92 (30.3)	9.49 (24.1)	6.75 (17.1)	6.25 (15.9)	.41 x .81 (1.0 x 2.1)	110 (49.9)	PL112707	—	—

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 58.
② Secondary fuse kit application for 115V only.

CONNECTION DETAILS FOR GROUP G

CONNECT TO LINE FOR RESPECTIVE VOLTAGE				OUTPUT VOLTS		
H1-H2	H1-H3	H1-H4	H1-H5	X1-X2	X1-X3	X1-X4
208	—	—	500	85	100	110
220	380	440	550	91	110	120
230	400	460	575	95	115	125
240	416	480	600	99	120	130

GROUP H

208/230/460 PRIMARY VOLTS—115 SECONDARY VOLTS—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS	APPROX. DIMENSIONS INCHES (CM.)						APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.	SECONDARY FUSE KIT ① PART NO.	SECONDARY FUSE SIZE 115 VOLTS
			A	B	C	D	E	F				
TB69300	50	0.43	4.44 (11.3)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.61 (6.6)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	6/10 amp
TB69301	100	0.87	5.21 (13.2)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	3.26 (8.3)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700	*	1 4/10 amps
TB69302	150	1.30	5.10 (13.0)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	3.06 (7.8)	.22 x .50 (0.6 x 1.3)	7 (3.2)	PL112701	*	2 amps
TB69303	250	2.17	5.38 (13.7)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.50 (8.9)	.22 x .50 (0.6 x 1.3)	11 (5.0)	PL112702	*	3 1/2 amps
TB69304	350	3.04	5.90 (15.0)	4.65 (11.8)	4.15 (10.5)	4.06 (10.3)	3.81 (9.7)	.22 x .50 (0.6 x 1.3)	15 (6.8)	PL112702	*	5 amps
TB69305	500	4.35	6.22 (15.8)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.56 (11.6)	.31 x .50 (0.8 x 1.3)	20 (9.1)	PL112704	*	7 amps
TB69306	750	6.52	6.82 (17.3)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.81 (9.7)	.31 x .50 (0.8 x 1.3)	26 (11.8)	PL112705	*	10 amps
TB69307	1000	8.70	7.96 (20.2)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	4.63 (11.8)	.31 x .50 (0.8 x 1.3)	33 (15.0)	PL112705	*	12 amps

* See fusing chart for secondary fuse kits.

GROUP I

600 PRIMARY VOLTS—12/24 SECONDARY VOLTS—1Ø, 60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS @ 12V	APPROX. DIMENSIONS INCHES (CM.)						APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.
			A	B	C	D	E	F		
TA83300	50	4.17	4.13 (10.5)	3.00 (7.6)	2.59 (6.6)	2.50 (6.4)	2.30 (5.8)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700
TA83301	100	8.33	4.90 (12.4)	3.00 (7.6)	2.59 (6.6)	2.50 (6.4)	3.35 (8.5)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700
TA83302	150	12.50	4.92 (12.5)	3.75 (9.5)	3.21 (8.2)	3.13 (8.0)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	6 (2.7)	PL112701
TA83303	250	20.83	5.38 (13.7)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.05 (7.7)	.22 x .50 (0.6 x 1.3)	9 (4.1)	PL112702
TA83304	500	41.67	6.06 (15.4)	4.88 (12.4)	4.15 (10.5)	4.06 (10.3)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	13 (5.9)	PL112703
TA83305	750	62.50	6.43 (16.3)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.00 (10.2)	.31 x .50 (0.8 x 1.3)	21 (9.5)	PL112704
TA83306	1000	83.33	7.30 (18.5)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	3.69 (9.4)	.31 x .50 (0.8 x 1.3)	24 (10.9)	PL112705

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 58.

GROUP J

240 X 480 PRIMARY VOLTS—120/240 SECONDARY VOLTS—1Ø, 60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS @ 120V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.
TB83210	50	0.42	4.13 (10.5)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	2.30 (5.8)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700
TB83212	100	0.83	4.90 (12.4)	3.00 (7.6)	2.70 (6.8)	2.50 (6.4)	3.35 (8.5)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700
TB83213	150	1.25	4.92 (12.5)	3.75 (9.5)	3.40 (8.6)	3.13 (8.0)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	6 (2.7)	PL112701
TB83215	250	2.08	5.38 (13.7)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.05 (7.7)	.22 x .50 (0.6 x 1.3)	9 (4.1)	PL112702
TB83218	500	4.17	6.06 (15.4)	5.25 (13.3)	4.47 (11.4)	4.06 (10.3)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	13 (5.9)	PL112704
TB83219	750	6.25	6.43 (16.3)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	5.30 (13.0)	.31 x .50 (0.8 x 1.3)	21 (9.5)	PL112704
TB83220	1000	8.33	7.34 (18.6)	6.75 (17.1)	5.78 (14.7)	5.75 (14.6)	3.69 (9.4)	.31 x .50 (0.8 x 1.3)	24 (10.9)	PL112705
TA83221	1500	12.50	8.80 (22.4)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	5.02 (12.8)	.31 x .50 (0.8 x 1.3)	43 (19.5)	PL112705
TA83222	2000	16.67	9.15 (23.2)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	5.42 (13.8)	.31 x .50 (0.8 x 1.3)	48 (21.8)	PL112705
TA83223	3000	25.00	7.00 (17.8)	7.50 (19.1)	7.66 (19.5)	6.50 (16.5)	5.55 (14.1)	.41 x .81 (1.0 x 2.1)	51 (23.1)	PL112706
TA83224	5000	41.67	7.06 (17.9)	11.92 (30.3)	8.75 (22.2)	6.75 (17.1)	5.75 (14.6)	.41 x .81 (1.0 x 2.1)	90 (40.8)	PL112707

GROUP K

600 PRIMARY VOLTS—120/240 SECONDARY VOLTS—1Ø, 60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS @ 120V	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (KG.)	PRIMARY FUSE BLOCK PART NO.
TA83310	50	0.42	4.13 (10.5)	3.00 (7.6)	2.59 (6.6)	2.50 (6.4)	2.30 (5.8)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700
TA83311	100	0.83	4.90 (12.4)	3.00 (7.6)	2.59 (6.6)	2.50 (6.4)	3.35 (8.5)	.22 x .50 (0.6 x 1.3)	4 (1.8)	PL112700
TA83312	150	1.25	4.92 (12.5)	3.75 (9.5)	3.21 (8.2)	3.13 (8.0)	2.81 (7.1)	.22 x .50 (0.6 x 1.3)	6 (2.7)	PL112701
TA83313	250	2.08	5.38 (13.7)	4.50 (11.4)	3.84 (9.8)	3.75 (9.5)	3.05 (7.7)	.22 x .50 (0.6 x 1.3)	9 (4.1)	PL112702
TA83314	500	4.17	6.06 (15.4)	4.88 (12.4)	4.15 (10.5)	4.06 (10.3)	4.06 (10.3)	.22 x .50 (0.6 x 1.3)	13 (5.9)	PL112703
TA83315	750	6.25	6.43 (16.3)	5.25 (13.3)	4.47 (11.4)	4.38 (11.1)	4.00 (10.2)	.31 x .50 (0.8 x 1.3)	21 (9.5)	PL112704
TA83316	1000	8.33	7.34 (18.6)	6.75 (17.1)	5.72 (14.5)	5.75 (14.6)	3.69 (9.4)	.31 x .50 (0.8 x 1.3)	24 (10.9)	PL112705

* See fusing chart for secondary fuse kits.

TA & TB SERIES PROTECTIVE DEVICES – Primary Fuse Kits

FUSES ARE NOT INCLUDED. CONSULT CATALOG FOR PROPER FUSE SELECTION.

CATALOG NO.	APPROX. SHIP WEIGHT Lbs. (Kg.)
PL112700	1 (0.5)
PL112701	1 (0.5)
PL112702	1 (0.5)
PL112703	1 (0.5)
PL112704	1 (0.5)
PL112705	1 (0.5)
PL112706	1 (0.5)
PL112707	1 (0.5)

TA SERIES PROTECTIVE DEVICES – Secondary Fuse Kits

FOR USE WITH INDUSTRIAL CONTROL TRANSFORMERS THROUGH 1500 VA.

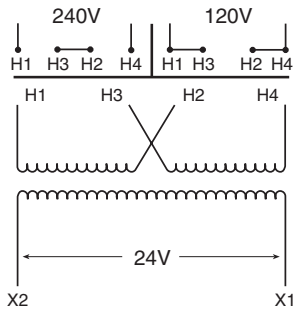
CATALOG NO.	APPROX. SHIP WEIGHT Lbs. (Kg.)
PL112600	0.5 (0.2)
PL112601	0.5 (0.2)
PL112602	1 (0.5)
PL112603	1 (0.5)

TB SERIES PROTECTIVE DEVICES– Secondary Fuse Kits

CATALOG NO.	VA	DESCRIPTION	APPROX. SHIPPING WT. (LBS./KG.)
PL79924		Fuse Kit: Secondary Fuse 1/4" x 1-1/4" w/ARM	1.0 (0.5)
PL79928	50 – 350	Link: Small Jumper Links (Qty. 2)	1.0 (0.5)
PL79929	500 & 750	Link: Large Jumper Links (Qty. 2)	1.0 (0.5)
PL79930	50 – 350	Fuse Kit: Secondary Fuse Midget w/ARM	1.0 (0.5)
PL79931	500 & 1000	Fuse Kit: Secondary Fuse Midget w/ARM	1.0 (0.5)

TA Series Open Core & Coil Wiring Diagrams

Group A



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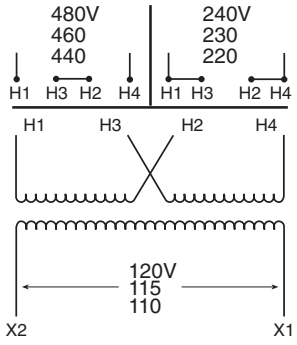

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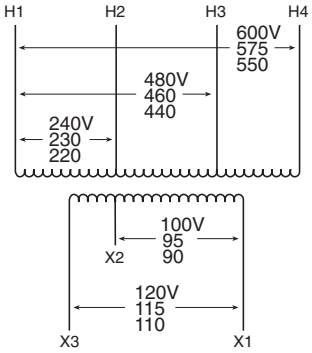

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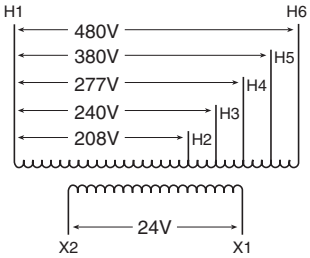

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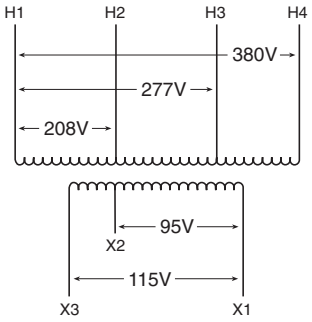

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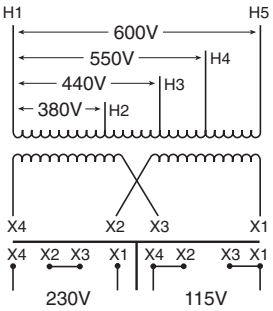

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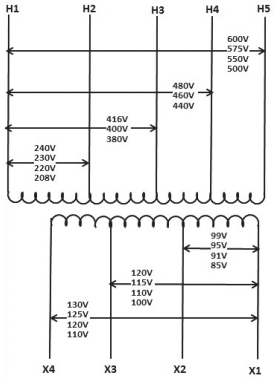

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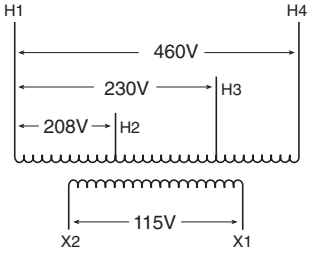
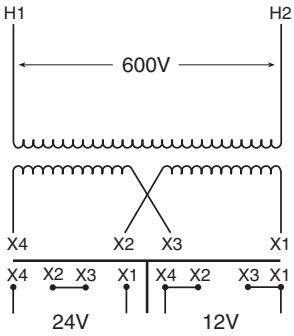


Group I



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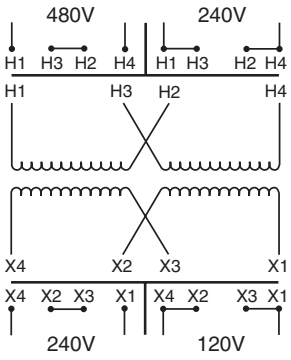

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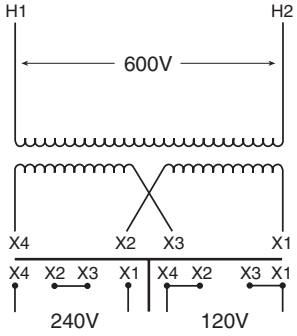
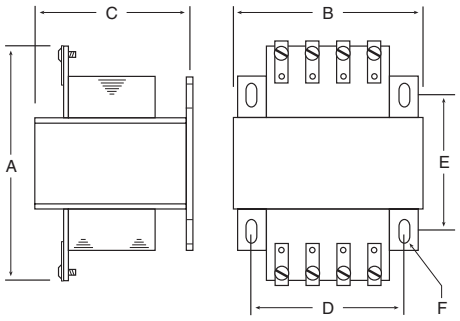
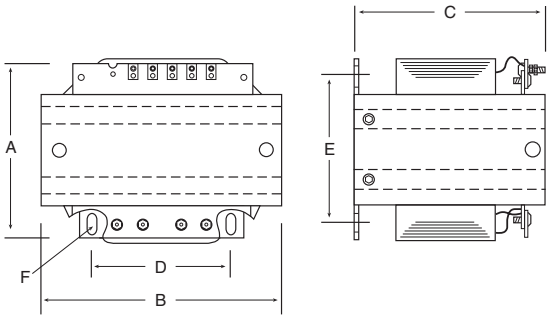


TA Series Open Core & Coil Dimensional Drawings

50 VA Thru 2 kVA

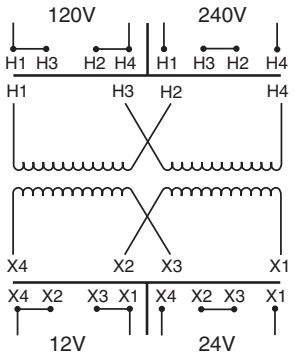


3 & 5 kVA



TB Series Open Core & Coil Wiring Diagrams

Group A



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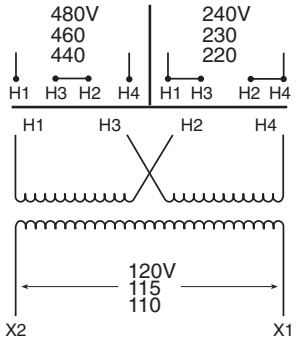

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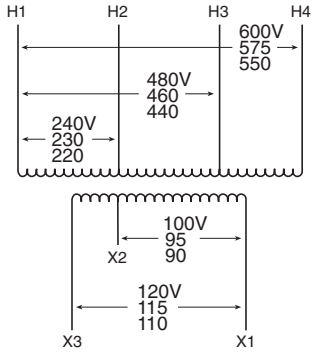
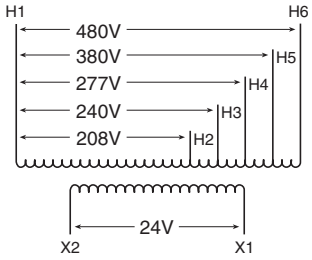
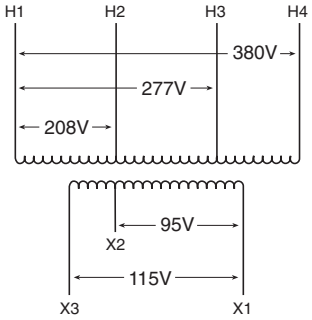


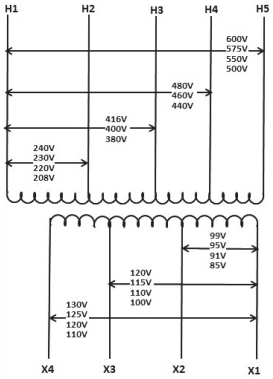
Group D



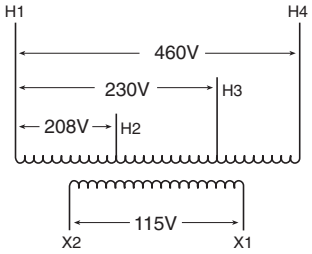
Group E



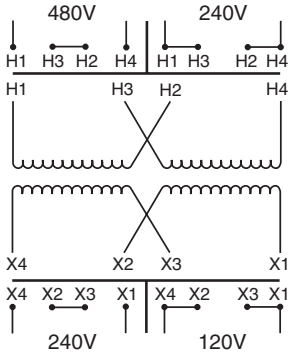
Group G



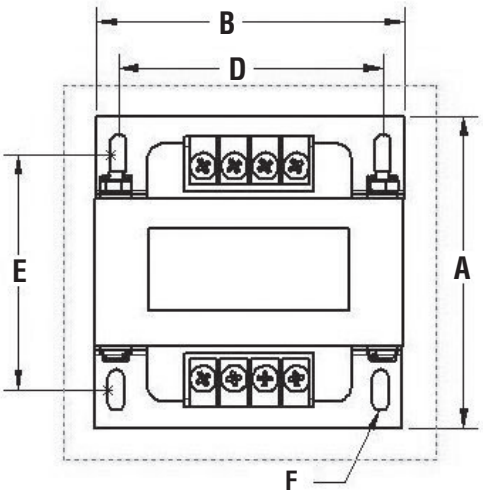
Group H

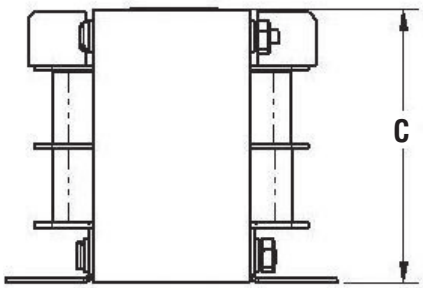


Group J



TB Series Open Core & Coil Dimensional Drawings





Industrial Control Transformers for Harsh Environments

Designed for Control Panels where Internal Installation of Control Transformers is prohibited.

Some specifications require installation of large control transformers, usually 1000 to 5000 VA outside the control cabinet. This means the transformer must be in a sheet metal enclosure instead of the usual open core and coil construction method.

Acme meets this need by providing all of the power, protection, regulation and performance of our standard industrial control transformers in one UL-3R enclosure. These transformers are wound with copper magnet wire, deliver full nameplate capacity, and provide the high regulation required in control applications.

Voltage combinations available are: 240 x 480V primary, 120V secondary and 240/480/600V primary, 120/100V secondary. Ratings available are 1000, 2000, 3000 and 5000 VA. All units are UL listed, CSA certified, and covered by Acme's exclusive 10-year limited warranty.

FEATURES

- Fully encapsulated and enclosed.
- 55°C temperature rise, 155°C insulation.
- Copper windings.
- 1000, 2000, 3000, 5000 and 10000 VA sizes.
- Voltage regulation exceeds NEMA requirements.
- UL and UL-3R listed.
- CSA certified.
- 10-year limited warranty.

GROUP L

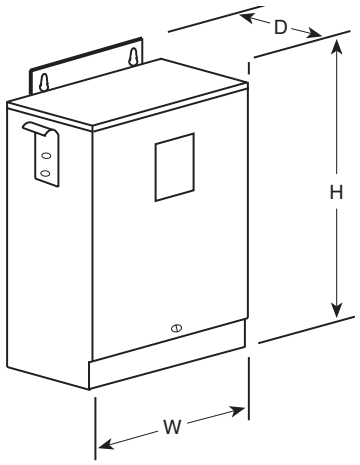
240 x 480 PRIMARY VOLTS—120 SECONDARY VOLTS③—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS	APPROX. DIMENSIONS INCHES (CM.) H	W	D	APPROX. SHIP WEIGHT LBS. (KG.)	ELECTRICAL CONNECTION DIAGRAM ① ②
T181217	1000	8.33	13.10 (33.3)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	B
T181219	2000	16.67	14.77 (37.5)	10.31 (26.2)	7.13 (18.1)	80 (36.3)	B
T181220	3000	25.00	14.77 (37.5)	10.31 (26.2)	7.13 (18.1)	100 (45.4)	B
T181221	5000	41.67	13.85 (35.2)	13.25 (33.7)	10.19 (25.9)	140 (63.5)	B
T181223	10000	83.3	16.47 (41.8)	13.88 (35.3)	12.94 (32.9)	308 (139.7)	B

GROUP M

240/480/600 PRIMARY VOLTS—120/100 Secondary Volts③—1Ø, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS	APPROX. DIMENSIONS INCHES (CM.) H	W	D	APPROX. SHIP WEIGHT LBS. (KG.)	ELECTRICAL CONNECTION DIAGRAM ① ②
T153929	2000	16.67	14.77 (37.5)	10.31 (26.2)	7.13 (18.1)	80 (36.3)	C
T153930	3000	25.00	13.85 (35.2)	13.25 (33.7)	10.19 (25.9)	130 (59.0)	C
T153931	5000	41.67	13.85 (35.2)	13.25 (33.7)	10.19 (25.9)	140 (63.5)	C



Encapsulated 1000 VA–10000 VA

① See page 70 for electrical diagram.

② See page 58 for fuse sizing information.

③ For secondary fuse size, multiply output amps x 1.25.

AE/CE Series Industrial Control Transformers

The Acme Electric AE and CE Series Industrial Control Transformers are designed specifically for machine tool control circuit applications. These transformers have the ability to handle potentially damaging high in-rush currents that occur when electromagnetic components are energized, without sacrificing the required stable output voltage. Designed to meet or exceed the demands of international standards, combined with the full breadth of product offering, the AE and CE Series Transformers from Acme Electric are the ideal solution for your industrial control applications.

FEATURES & BENEFITS

- Epoxy encapsulated design protects core & coil assembly from potentially damaging contaminants.
- Integrally molded terminal blocks with isolation barriers to prevent arc over, terminal blocks allow full access for ring terminals for easy installation and solid termination.
- Heavy gauge steel mounting feet.
- Available factory or field installed fuse blocks provide integral fusing on the primary or primary and secondary.
- Dual labeling for easy product identification when equipped with a fuse block.
- 50-750 VA, 50/60 Hz.
- UL and cUL Listed, CE Marked (CE Series only).
- Ten-year limited warranty.
- 55°C Temperature Rise.
- 105°C Insulation Class.

CE Series for Global Applications

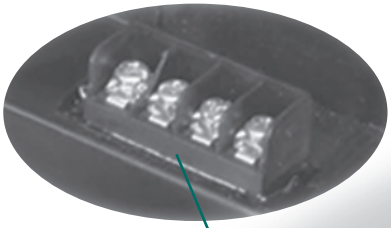
Acme's CE Series Encapsulated Industrial Control Transformers carry the CE mark, indicating it complies with the requirements established by the International Electrotechnical Commission (IEC) for use of control circuit transformers in the countries of the European Union. Regulations that apply to control transformers include Low Voltage Directive 73/23/EEC and Electromagnetic Compatibility (EMC) Directive 89/336/EEC.

Cooler. Cleaner. More Compact.

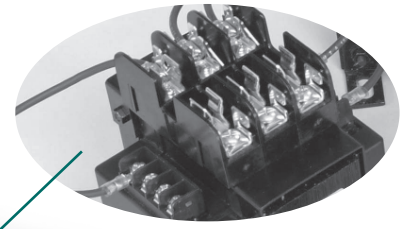
The AE and CE Series design improves the dissipation of the heat away from the core and coil assembly providing cooler operation. In addition, the AE and CE Series industrial control transformers seal the transformer's windings and internal terminations within an epoxy encapsulant encased in a durable thermoplastic end cap, protecting them from potentially damaging moisture, dirt and other ambient contaminants. Furthermore, Acme's compact design helps minimize the mounting footprint, providing more flexibility in applications where space is at a premium.

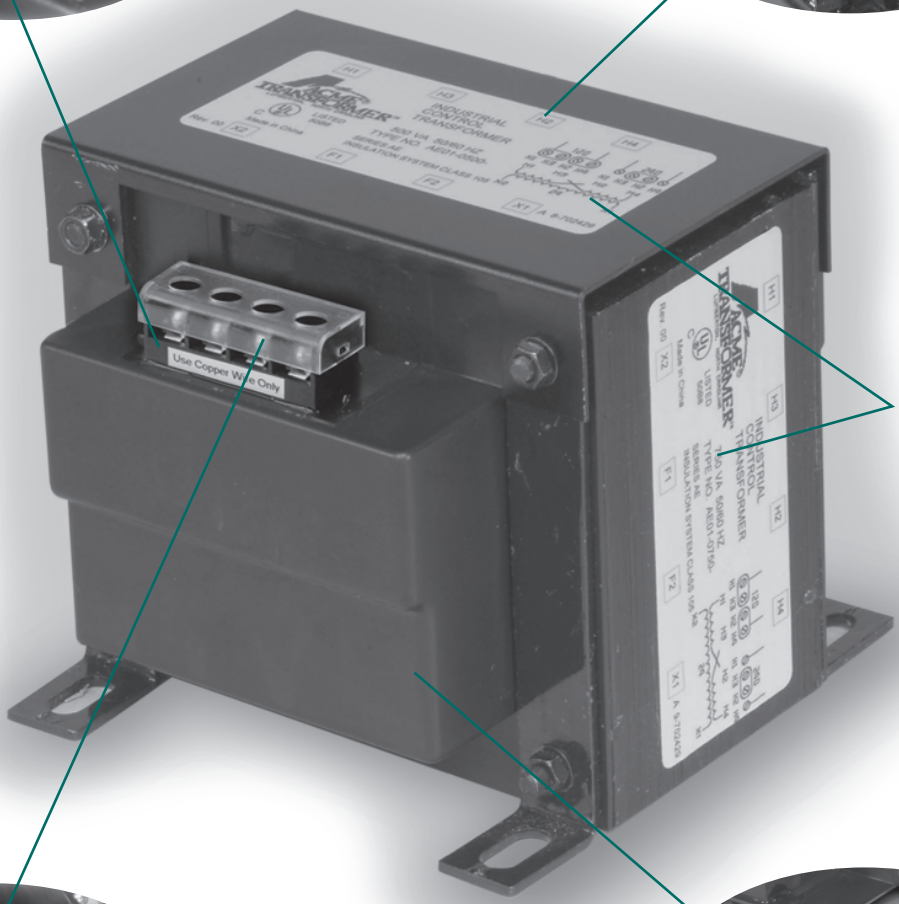
FEATURES

Integrally molded terminal blocks with combination slotted/phillips screws. Isolation barriers protect against arc over while able to accommodate a full ring terminal.

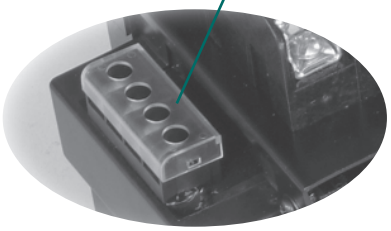


Integrally mounted fuse blocks available in standard and touch-proof (CE Series) style.

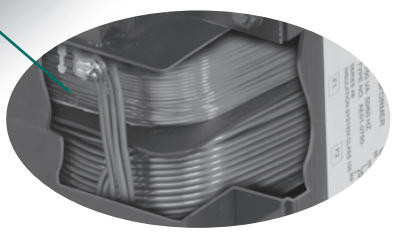




Dual labels for identification of fused modules



CE Series offers touch-proof terminals, isolating live contacts for additional safety.



Epoxy encapsulated copper windings and internal terminations, providing isolation from external contaminants and physical damage.

SELECTION CHARTS

AE SERIES

GROUP I

120 x 240 PRIMARY VOLTS—24 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	AE010050	2.69 (6.8)	3.00 (7.6)	2.81 (7.1)	2.03 (5.1)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.50 (1.1)
75	AE010075	3.22 (8.1)	3.00 (7.6)	2.81 (7.1)	2.53 (6.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	3.50 (1.6)
100	AE010100	3.28 (8.3)	3.41 (8.6)	3.09 (7.8)	2.41 (6.1)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.05 (1.8)
150	AE010150	3.88 (9.8)	3.78 (9.6)	3.41 (8.6)	2.97 (7.5)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	6.50 (2.9)
250	AE010250	4.13 (10.4)	4.50 (11.4)	3.84 (9.7)	2.94 (7.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.25 (4.2)
350	AE010350	5.00 (12.7)	4.50 (11.4)	3.84 (9.7)	3.78 (9.6)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	12.75 (5.8)
500	AE010500	5.53 (14.0)	5.25 (13.3)	4.66 (11.8)	4.16 (10.5)	4.38 (11.1)	.31 x .69 (0.8 x 1.7)	19.00 (8.6)
750	AE010750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 x 1.7)	26.00 (11.8)

GROUP II

200/220/440, 208/230/460, 240/480 PRIMARY VOLTS—23/110, 24/115, 25/120 SECONDARY VOLTS—1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	AE020050	3.28 (8.3)	3.00 (7.6)	2.78 (7.0)	2.25 (5.7)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	3.0 (1.4)
75	AE020075	3.28 (8.3)	3.00 (7.6)	3.09 (7.8)	2.53 (6.4)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
100	AE020100	3.28 (8.3)	3.41 (8.6)	3.41 (8.6)	2.53 (6.4)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
150	AE020150	4.03 (10.2)	3.75 (9.5)	3.41 (8.6)	3.28 (8.3)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	7.0 (3.2)
250	AE020250	4.38 (11.1)	4.50 (11.4)	4.03 (10.2)	3.75 (9.5)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.0 (4.1)
300	AE020300	5.13 (13.0)	4.50 (11.4)	4.97 (12.6)	3.88 (9.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	11.0 (5.0)
350	AE020350	5.25 (13.3)	4.50 (11.4)	4.97 (12.6)	4.16 (10.5)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.0 (5.9)
500	AE020500	6.31 (16.0)	5.25 (13.3)	4.97 (12.6)	5.25 (13.3)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	AE020750	6.81 (17.3)	5.25 (13.3)	4.97 (12.6)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

GROUP III

240 x 480 PRIMARY VOLTS—24 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	AE030050	2.69 (6.8)	3.00 (7.6)	2.81 (7.1)	2.03 (5.1)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.5 (1.1)
75	AE030075	3.22 (8.1)	3.00 (7.6)	2.81 (7.1)	2.53 (6.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	3.5 (1.6)
100	AE030100	3.28 (8.3)	3.41 (8.6)	3.09 (7.8)	2.41 (6.1)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
150	AE030150	3.88 (9.8)	3.84 (9.7)	3.41 (8.6)	2.97 (7.5)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	6.5 (2.9)
250	AE030250	4.13 (10.4)	4.50 (11.4)	3.84 (9.7)	2.94 (7.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.2 (4.2)
350	AE030350	5.00 (12.7)	4.50 (11.4)	3.84 (9.7)	3.78 (9.6)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	12.7 (5.8)
500	AE030500	5.53 (14.0)	5.25 (13.3)	4.66 (11.8)	4.16 (10.5)	4.34 (11.0)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	AE030750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

GROUP VI

240 x 480, 230 x 460, 220 x 440 PRIMARY VOLTS —120/115/110 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	AE060050	2.69 (6.8)	3.00 (7.6)	2.81 (7.1)	2.03 (5.1)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.5 (1.1)
75	AE060075	3.22 (8.1)	3.00 (7.6)	2.81 (7.1)	2.53 (6.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	3.5 (1.6)
100	AE060100	3.28 (8.3)	3.41 (8.6)	3.09 (7.8)	2.41 (6.1)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
150	AE060150	3.88 (9.8)	3.84 (9.7)	3.41 (8.6)	2.97 (7.5)	3.13 (7.5)	.20 x .40 (0.5 x 1.0)	6.5 (2.9)
250	AE060250	4.13 (10.4)	4.50 (11.4)	3.84 (9.7)	2.94 (7.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.2 (4.2)
350	AE060350	5.00 (12.7)	4.50 (11.4)	3.84 (9.7)	3.78 (9.6)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	12.7 (5.8)
500	AE060500	5.53 (14.0)	5.25 (13.3)	4.66 (11.8)	4.16 (10.5)	4.34 (11.0)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	AE060750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.31 (10.9)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

GROUP VII

208/230/460 PRIMARY VOLTS — 115 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	AE070050	2.84 (7.2)	3.00 (7.6)	2.81 (7.1)	2.16 (5.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.6 (1.2)
100	AE070100	3.41 (6.6)	3.41 (8.6)	3.09 (7.8)	2.69 (6.8)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.2 (1.9)
150	AE070150	3.88 (9.8)	3.75 (9.5)	3.41 (8.6)	3.09 (7.8)	3.09 (7.8)	.20 x .40 (0.5 x 1.0)	6.7 (3.1)
250	AE070250	4.16 (10.5)	4.50 (11.4)	4.03 (10.2)	3.28 (8.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.5 (4.3)
350	AE070350	5.19 (13.1)	4.50 (11.4)	4.03 (10.2)	4.38 (11.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	13.4 (6.1)
500	AE070500	5.88 (14.9)	5.25 (13.3)	4.66 (11.8)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	AE070750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

GROUP XII

230/460/575 PRIMARY VOLTS — 95/115 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	AE120050	2.88 (7.3)	3.00 (7.6)	2.81 (7.1)	2.19 (5.5)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.6 (1.2)
100	AE120100	3.59 (9.1)	3.41 (8.6)	3.09 (7.8)	2.88 (7.3)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.2 (1.9)
150	AE120150	3.94 (10.0)	3.78 (9.6)	3.41 (8.6)	3.28 (8.3)	3.09 (7.8)	.20 x .40 (0.5 x 1.0)	6.8 (3.1)
250	AE120250	4.16 (10.5)	4.50 (11.4)	4.03 (10.2)	3.22 (8.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.5 (4.3)
350	AE120350	5.00 (12.7)	4.50 (11.4)	4.03 (10.2)	3.69 (9.3)	4.31 (10.9)	.20 x .40 (0.5 x 1.0)	13.2 (6.0)
500	AE120500	5.84 (14.8)	5.25 (13.3)	4.66 (11.8)	4.66 (11.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.2 (8.7)
750	AE120750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.81 (14.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

SELECTION CHARTS

CE SERIES

GROUP IC

120 x 240 PRIMARY VOLTS — 24 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	CE010050	2.69 (6.8)	3.00 (7.6)	2.81 (7.1)	2.25 (5.7)	2.56 (6.5)	.20 x .40 (0.5 x 1.0)	2.5 (1.2)
75	CE010075	3.22 (8.1)	3.41 (8.6)	2.81 (7.1)	2.25 (5.7)	2.88 (7.3)	.20 x .40 (0.5 x 1.0)	3.5 (1.6)
100	CE010100	3.28 (8.3)	3.75 (9.5)	3.09 (7.8)	2.53 (6.4)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	4.2 (1.9)
150	CE010150	3.88 (9.8)	4.50 (11.4)	3.41 (8.6)	2.53 (6.4)	3.84 (9.7)	.20 x .40 (0.5 x 1.0)	6.6 (3.0)
250	CE010250	4.13 (10.4)	4.50 (11.4)	4.03 (10.2)	3.22 (8.1)	3.84 (9.7)	.20 x .40 (0.5 x 1.0)	9.4 (4.3)
350	CE010350	5.00 (12.7)	5.25 (13.3)	4.03 (10.2)	3.75 (9.5)	4.50 (11.4)	.31 x .69 (0.8 X 1.7)	13.0 (5.9)
500	CE010500	5.50 (13.9)	5.25 (13.3)	4.66 (11.8)	4.28 (10.8)	4.50 (11.4)	.31 x .69 (0.8 X 1.7)	19.1 (8.7)
750	CE010750	7.03 (17.8)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.50 (11.4)	.31 x .69 (0.8 X 1.7)	26.6 (12.1)

GROUP IIC

200/220/440, 208/230/460, 240/480 PRIMARY VOLTS — 23/110, 24/115, 25/120 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	CE020050	3.28 (8.3)	3.28 (8.3)	2.81 (7.1)	2.25 (5.7)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	2.7 (1.2)
100	CE020100	4.03 (10.2)	3.75 (9.5)	3.13 (7.9)	3.22 (8.1)	3.16 (8.0)	.20 x .40 (0.5 x 1.0)	4.3 (1.9)
150	CE020150	4.03 (10.2)	4.50 (11.4)	3.41 (8.6)	2.81 (7.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.8 (3.0)
250	CE020250	4.78 (12.1)	4.50 (11.4)	4.03 (10.2)	4.06 (10.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.7 (4.4)
350	CE020350	5.53 (14.0)	5.25 (13.3)	4.03 (10.2)	4.28 (10.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.5 (6.1)
500	CE020500	7.25 (18.4)	5.25 (13.3)	4.69 (11.9)	6.00 (15.2)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.6 (8.9)
750	CE020750	6.81 (17.3)	5.28 (13.4)	4.69 (11.9)	5.75 (14.6)	4.44 (11.2)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

GROUP IIIC

240 x 480 PRIMARY VOLTS — 24 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	CE030050	3.00 (7.6)	3.00 (7.6)	2.81 (7.1)	2.25 (5.7)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.5 (1.1)
75	CE030075	3.28 (8.3)	3.28 (8.3)	2.81 (7.1)	2.25 (5.7)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	3.5 (1.6)
100	CE030100	3.28 (8.3)	3.75 (9.5)	3.09 (7.8)	2.53 (6.4)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
150	CE030150	3.88 (9.8)	4.50 (11.4)	3.47 (8.8)	2.53 (6.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.5 (2.9)
250	CE030250	4.13 (10.4)	4.50 (11.4)	4.03 (10.2)	3.22 (8.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.2 (4.2)
350	CE030350	5.00 (12.7)	5.25 (13.3)	4.03 (10.2)	3.75 (9.5)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	12.7 (5.8)
500	CE030500	5.53 (14.0)	5.25 (13.3)	4.66 (11.8)	4.28 (10.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	CE030750	7.03 (17.8)	5.25 (13.3)	4.66 (11.8)	5.41 (13.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

GROUP IVC

380/400/415 PRIMARY VOLTS — 110/220 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	CE040050	3.53 (8.9)	3.00 (7.6)	2.81 (7.1)	2.53 (6.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.6 (1.2)
100	CE040100	3.53 (8.9)	3.75 (9.5)	3.22 (8.1)	2.53 (6.4)	3.13 (8.0)	.20 x .40 (0.5 x 1.0)	4.3 (1.9)
150	CE040150	3.53 (8.9)	4.34 (11.0)	3.41 (8.6)	2.53 (6.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.7 (3.0)
250	CE040250	4.03 (10.2)	4.50 (11.4)	4.22 (10.7)	3.22 (8.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.4 (4.3)
350	CE040350	4.91 (12.4)	4.50 (11.4)	4.22 (10.7)	4.06 (10.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	13.0 (5.9)
500	CE040500	6.00 (15.2)	5.25 (13.3)	4.69 (11.9)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	18.8 (8.5)
750	CE040750	6.81 (17.3)	5.25 (13.3)	4.69 (11.9)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

GROUP VC

208, 220/380/440, 230/400/460, 240/416/480 PRIMARY VOLTS — 85/100/110, 91/110/120, 95/115/125, 99/120/130 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	CE050050	4.03 (10.2)	3.41 (8.6)	3.09 (7.8)	2.47 (6.2)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	2.7 (1.2)
150	CE050150	3.88 (9.8)	4.34 (11.0)	3.41 (8.6)	2.88 (7.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.7 (3.0)
250	CE050250	5.13 (13.0)	4.50 (11.4)	4.03 (10.2)	4.38 (11.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.5 (4.3)
350	CE050350	5.91 (15.0)	5.25 (13.3)	4.03 (10.2)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.3 (6.0)
500	CE050500	5.91 (15.0)	5.25 (13.3)	4.66 (11.8)	4.63 (11.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	CE050750	7.09 (18.0)	5.25 (13.3)	4.66 (11.1)	5.81 (14.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

GROUP VIC

240 x 480, 230 x 460, 220 x 440 PRIMARY VOLTS —120/115/110 SECONDARY VOLTS — 1Ø, 50/60 Hz

VA RATING	CATALOG NUMBER	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	MOUNTING SLOT F	APPROX. SHIPPING WT
50	CE060050	3.41 (8.6)	3.00 (7.6)	2.81 (7.1)	2.53 (6.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.6 (1.2)
75	CE060075	3.41 (8.6)	3.28 (8.3)	2.81 (7.1)	2.53 (6.4)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	3.6 (1.6)
100	CE060100	3.41 (8.6)	3.75 (9.5)	3.09 (7.8)	2.53 (6.4)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	4.3 (1.9)
150	CE060150	3.88 (9.8)	4.50 (11.4)	3.47 (8.8)	2.53 (6.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.7 (3.0)
250	CE060250	4.13 (10.4)	4.50 (11.4)	4.03 (10.2)	3.22 (8.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.4 (4.3)
300	CE060300	4.53 (11.5)	4.50 (11.4)	4.03 (10.2)	3.75 (9.5)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	10.9 (4.9)
350	CE060350	5.00 (12.7)	5.25 (13.3)	4.03 (10.2)	3.75 (9.5)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.0 (5.9)
500	CE060500	6.00 (15.2)	5.25 (13.3)	4.66 (11.8)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	18.8 (8.5)
750	CE060750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

FUSE SIZING CHARTS

PRIMARY FUSE SIZING CHARTS

RECOMMENDED RATING FOR CURRENT LIMITING CLASS CC FUSES

VA	120 V	208 V	230 V	240 V	277 V	380 V	416 V	440 V	460 V	480 V	550 V	600 V
50	1.2	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	1.9	1.0	1.0	1.0	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.4
100	2.5	1.5	1.3	1.3	1.0	0.8	0.8	0.6	0.6	0.6	0.6	0.5
150	3.8	2.0	2.0	1.9	1.5	1.2	1.2	1.0	1.0	1.0	0.8	0.8
250	3.5	3.5	3.5	3.0	3.0	2.0	1.8	1.8	1.5	1.5	1.4	1.2
300	4.0	4.0	4.0	3.5	3.0	2.5	2.5	2.0	2.0	1.9	1.5	1.5
350	5.0	5.0	4.5	4.0	4.0	2.5	2.5	2.5	2.0	2.0	1.9	1.8
500	7.0	4.0	3.5	3.5	5.5	4.0	3.5	3.5	3.5	3.0	3.0	2.5
750	10.0	6.0	5.5	5.0	4.5	6.0	5.5	5.0	5.0	5.0	4.0	4.0

NOTE: Bold lines indicate changes in the percent of rated current used to calculate fuse sizes in accordance with article 450 of the NEC.

SECONDARY FUSE SIZING CHARTS

RECOMMENDED RATING FOR CURRENT LIMITING MIDGET FUSES

VA	24 V	85 V	91 V	99 V	100 V	110 V	115 V	120 V	125 V	130 V
50 VA	3.2	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6
75 VA	5.0	1.4	1.2	1.2	1.2	1.0	1.0	1.0	1.0	0.8
100 VA	6.0	1.5	1.5	1.5	1.5	1.5	1.5	1.2	1.2	1.2
150 VA	10.0	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	1.5
250 VA	12.0	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
300 VA	15.0	5.5	5.5	5.0	5.0	4.5	4.5	4.0	4.0	3.5
350 VA	20.0	6.5	6.0	5.5	5.5	5.0	5.0	4.5	4.5	4.5
500 VA	25.0	9.0	9.0	8.0	8.0	7.0	7.0	6.0	6.0	6.0
750 VA	40.0	12.0	12.0	12.0	12.0	10.0	10.0	10.0	10.0	9.0

CONNECTION DETAILS FOR AE05 & CE05

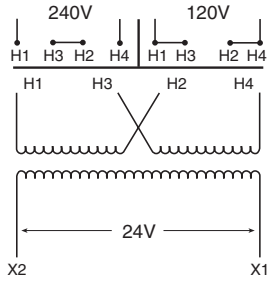
H1-H2	H1-H3	H1-H4	X1-X2	X1-X3	X1-X4
208			85	100	110
220	380	440	91	110	120
230	400	460	95	115	125
240	416	480	99	120	130

FUSE KITS & ACCESSORIES

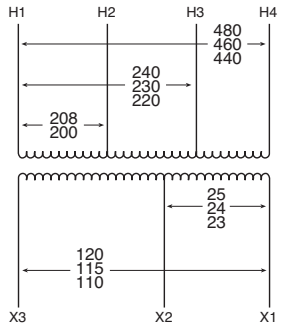
CATALOG NUMBER	VA	DESCRIPTION	APPROX. SHIPPING WT. (Lbs./Kg.)
PL79920	50-750	Fuse Kit: Primary Fuse Block EIC Series (2 Class CC Blocks)	1.0 (0.5)
PL79921	150-750	Fuse Kit: Primary & Secondary Fuse Block EIC Series (2 Class CC and 1 Midget Blocks)	1.0 (0.5)
PL79922	50-750	Fuse Kit: Primary Fuse Block EIC Series CE Listed w/ Covers (2 Class CC Blocks)	1.0 (0.5)
PL79923	150-750	Fuse Kit: Primary & Secondary Fuse Block EIC Series CE Listed w/ Covers (2 Class CC and 1 Midget Blocks)	1.0 (0.5)
PL79924		Fuse Kit: Secondary Fuse 1/4" x 1-1/4" w/ARM	1.0 (0.5)
PL79925	50 – 350	Cover: Small Terminal Covers (Qty. 2)	1.0 (0.5)
PL79926	500 & 750	Cover: Large Terminal Covers (Qty. 2)	1.0 (0.5)
PL79927		Cover: Fuse Block Covers (Qty. 1)	1.0 (0.5)
PL79928	50 – 350	Link: Small Jumper Links (Qty. 2)	1.0 (0.5)
PL79929	500 & 750	Link: Large Jumper Links (Qty. 2)	1.0 (0.5)
PL79930	50 – 350	Fuse Kit: Secondary Fuse Midget w/ARM	1.0 (0.5)
PL79931	500 & 750	Fuse Kit: Secondary Fuse Midget w/ARM	1.0 (0.5)

AE & CE Series Wiring Diagrams

WIRING FOR AE01 & CE01



WIRING FOR AE02 & CE02



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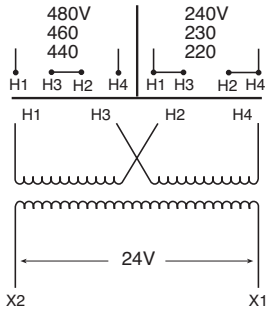
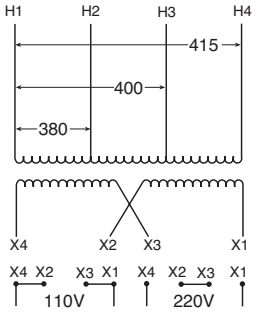


WIRING FOR CE04



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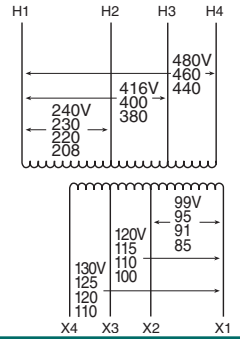
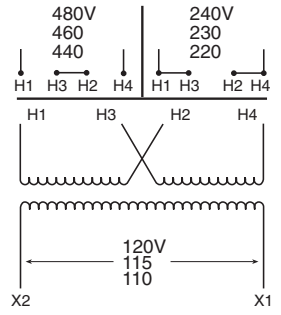
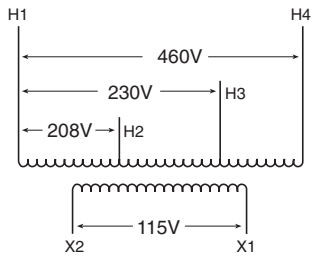


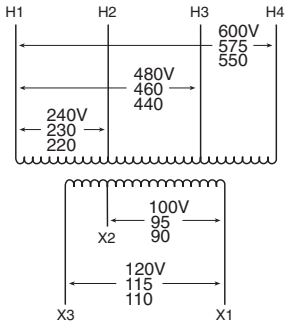
WIRING FOR AE06 & CE06



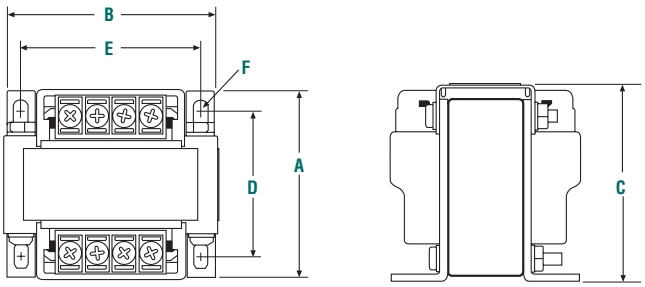
WIRING FOR AE07



WIRING FOR AE12



AE & CE Series Dimensional Drawings

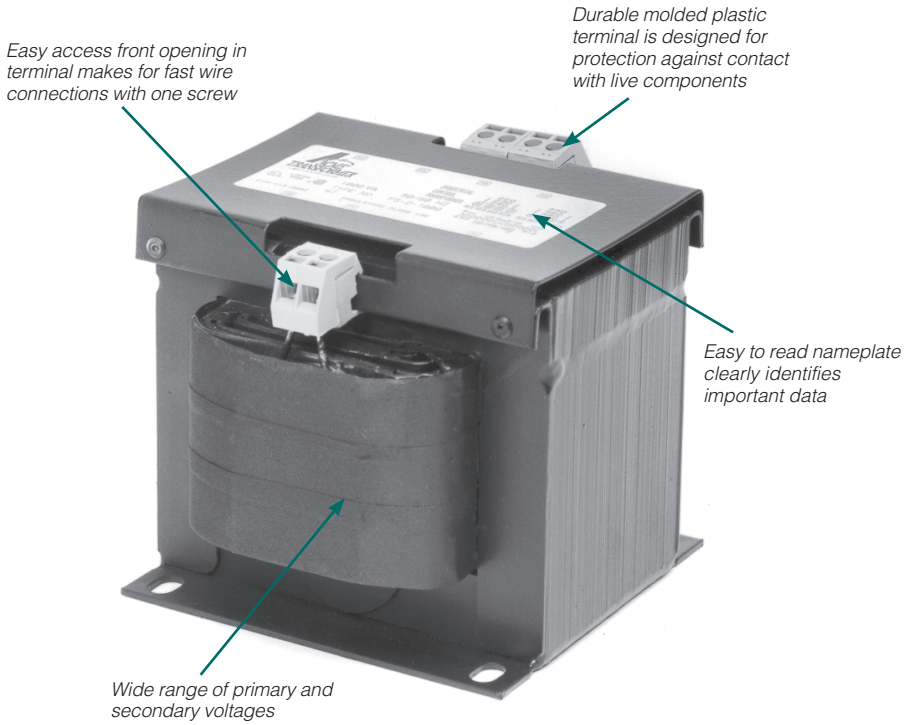


FINGER/GUARD® Industrial Control Transformers

The Acme FINGER/GUARD® line of Touch-Protected Industrial Control Transformers offers the most advanced and versatile design concepts available to the marketplace today.

They are designed to meet Acme's rigid standards for mechanical durability as well as surpass Agency and Industry electrical standards. The FINGER/GUARD® line is designed for all control applications and features integrally installed, durable molded plastic terminations designed to protect against contact with live components. No slip-on plastic covers to be broken, lost or misplaced.

All FINGER/GUARD® products use copper windings, high-permeability silicon steel cores and 130 degree C (Class B) insulation. All FINGER/GUARD® products meet or exceed ANSI, IEC and NEMA standards. They are third party witness tested and are UL Listed (File E79947), CSA Certified (File 7357) and CE Marked (to EN60742)... ON ALL SIZES. The product is suitable for both 50 and 60 Hertz applications and is available in sizes ranging from 50 VA to 3000 VA.



FEATURES

- Constructed with high quality silicon steel lamination to minimize core losses and increase efficiency.
- Designs incorporate precision wound coils for improved regulation.
- Copper windings on all groups.
- 50 VA through 3000 VA sizes, 50/60 Hz.
- 130°C (Class B) Insulation 80°C temperature rise.
- Voltage regulation exceeds NEMA requirements.
- UL Listed, CSA Certified and CE Marked.
- Attractive finish, nameplate, and design features enhance the end product.
- Ten-year limited warranty.
- Smaller, lighter weight design.

CE Marking

(Conformité Européene)

The CE Marking, standing for Conformité Européene, is a European Mark of conformity indicating that a product or system to which it is applied, complies with European law (Directives) regulating a necessary level of protection in Europe with respect to safety, health, environmental and consumer protection; however, it is not intended as a guarantee of quality for the consumer. The CE Marking must be applied to products being placed on the European market. The CE Marking does allow a product to be moved freely within the internal market of the European Union.

The Directives that apply to Control or Power Distribution Transformers are:

- Low Voltage Directive, 73/23/EEC effective January 1, 1997
- Electromagnetic Compatibility (EMC) Directive, 89/336/EEC effective
- January 1, 1996

The stringent testing required to obtain a third party certification mark in many cases is significantly more rigid than domestic requirements. This ensures that not only the Acme FINGER/GUARD® product, but all of our CE Marked products are designed to meet a higher level of safety standards than non-CE Marked products.

All Acme transformers are manufactured in a facility certified by Underwriters Laboratories to ISO-9001.

SELECTION CHARTS

GROUP A

120 X 240 PRIMARY VOLTS—24 SECONDARY VOLTS—50/60 Hz

CATALOG NO.	VA RATING	EUROPEAN* RATING	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (Kg.)
FS150									
FS175									
FS1100									
FS1150									
FS1250									
FS1350									
FS1500									
FS1750									
FS11000	1000	870	4.76 (12.1)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	2.86 (7.3)	.31 x .50 (0.8 x 1.3)	26 (11.8)

Reference Group IC (CE01):
CE Series Industrial Control Transformers
50-750 VA
See Pg 72

GROUP B

240 X 480, 230 X 460, 220 X 440 PRIMARY VOLTS—120/115/110 SECONDARY VOLTS—50/60 Hz

CATALOG NO.	VA RATING	EUROPEAN* RATING	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (Kg.)
FS250									
FS275									
FS2100									
FS2150									
FS2250									
FS2300									
FS2350									
FS2500									
FS2750									
FS21000	1000	870	4.76 (12.1)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	2.86 (7.3)	.31 x .50 (0.8 x 1.3)	26 (11.8)
FS21500	1500	1290	6.01 (15.3)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	4.13 (10.5)	.31 x .50 (0.8 x 1.3)	38 (17.2)
FS22000	2000	1680	6.51 (16.5)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	4.63 (11.8)	.31 x .50 (0.8 x 1.3)	44 (20.0)
FS23000	3000	2465	7.44 (18.9)	7.50 (19.1)	6.68 (17.0)	6.50 (16.5)	6.47 (16.4)	.41 x .81 (1.0 x 2.1)	60 (27.2)

Reference Group VIC (CE06):
CE Series Industrial Control Transformers
50-750 VA
See Pg 73

GROUP C

240/416/480/600; 230/400/460/575; 220/380/440/550; 208/500 PRIMARY VOLTS
99/120/130; 95/115/125; 91/110/120; 85/100/110 SECONDARY VOLTS—50/60 Hz

CATALOG NO.	VA RATING	EUROPEAN* RATING	APPROX. DIMENSIONS INCHES (CM.) A	B	C	D	E	F	APPROX. SHIP WEIGHT LBS. (Kg.)
FS350	50	50	2.59 (6.6)	3.75 (9.5)	3.64 (9.2)	3.13 (8.0)	1.70 (4.3)	.22 x .50 (0.6 x 1.3)	5 (2.3)
FS3150	150	150	3.31 (8.4)	4.50 (11.4)	4.15 (10.5)	3.75 (9.5)	2.18 (5.5)	.22 x .50 (0.6 x 1.3)	8 (3.6)
FS3250	250	250	3.61 (9.2)	4.88 (12.4)	4.46 (11.3)	4.06 (10.3)	2.33 (5.9)	.22 x .50 (0.6 x 1.3)	11 (5.0)
FS3350	350	345	4.69 (11.9)	4.88 (12.4)	4.46 (11.3)	4.06 (10.3)	3.48 (8.8)	.22 x .50 (0.6 x 1.3)	17 (7.7)
FS3500	500	490	4.39 (11.2)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	2.48 (6.3)	.31 x .50 (0.8 x 1.3)	22 (10.0)
FS3750	750	720	5.18 (13.2)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	3.31 (8.4)	.31 x .50 (0.8 x 1.3)	30 (13.6)
FS31000	1000	870	6.18 (15.7)	6.75 (17.1)	6.03 (15.3)	5.75 (14.6)	4.30 (10.9)	.31 x .50 (0.8 x 1.3)	39 (17.7)
FS31500	1500	1290	6.26 (15.9)	7.50 (19.1)	6.68 (17.0)	6.50 (16.5)	5.26 (13.4)	.41 x .81 (1.0 x 2.1)	51 (23.1)
FS32000	2000	1680	7.76 (19.7)	7.50 (19.1)	7.70 (19.6)	6.50 (16.5)	6.75 (17.1)	.41 x .81 (1.0 x 2.1)	66 (29.9)
FS33000	3000	2465	8.88 (22.6)	11.92 (30.3)	8.83 (22.4)	6.75 (17.1)	5.75 (14.6)	.41 x .81 (1.0 x 2.1)	70 (31.8)

FUSE KITS–FOR FINGER/GUARD® INDUSTRIAL CONTROL TRANSFORMERS

CATALOG NO.	DESCRIPTION
PL79905	PRIMARY FUSE KIT FOR CLASS CC FUSES
PL79906	PRIMARY & SECONDARY FUSE KIT FOR CLASS CC PRIMARY FUSES & MIDGET SECONDARY FUSE
PL79907	PRIMARY FUSE KIT FOR MIDGET FUSES
PL79908	PRIMARY & SECONDARY FUSE KIT FOR MIDGET FUSES

* EN60742 requires transformers to pass the temperature rise limits of a 130° C (Class B) insulation system at 6% above the rated supply voltage.

CONNECTION DETAILS FOR GROUP C

CONNECT TO LINE FOR RESPECTIVE VOLTAGE				OUTPUT VOLTS		
H1-H2	H1-H3	H1-H4	H1-H5	X1-X2	X1-X3	X1-X4
208	–	–	500	85	100	110
220	380	440	550	91	110	120
230	400	460	575	95	115	125
240	416	480	600	99	120	130

PRIMARY FUSE SIZING CHARTS

RECOMMENDED RATING FOR CURRENT LIMITING CLASS CC FUSES

VA	120 V	208 V	230 V	240 V	277 V	380 V	416 V	440 V	460 V	480 V	550 V	600 V
50	1.2	0.6	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	1.9	1.0	1.0	1.0	0.8	0.6	0.6	0.6	0.5	0.5	0.4	0.4
100	2.5	1.5	1.3	1.3	1.0	0.8	0.8	0.6	0.6	0.6	0.6	0.5
150	3.8	2.0	2.0	1.9	1.5	1.2	1.2	1.0	1.0	1.0	0.8	0.8
250	3.5	3.5	3.5	3.0	3.0	2.0	1.8	1.8	1.5	1.5	1.4	1.2
300	4.0	4.0	4.0	3.5	3.0	2.5	2.5	2.0	2.0	1.9	1.5	1.5
350	5.0	5.0	4.5	4.0	4.0	2.5	2.5	2.5	2.0	2.0	1.9	1.8
500	7.0	4.0	3.5	3.5	5.5	4.0	3.5	3.5	3.5	3.0	3.0	2.5
750	10.0	6.0	5.5	5.0	4.5	6.0	5.5	5.0	5.0	5.0	4.0	4.0
1000	15.0	8.0	7.0	7.0	6.0	4.5	4.0	3.5	3.5	3.5	5.5	5.0
1500	20.0	12.0	12.0	12.0	10.0	7.0	6.0	6.0	5.5	5.5	5.0	4.5
2000	25.0	12.0	15.0	15.0	12.0	9.0	8.0	8.0	7.5	7.0	6.0	6.0
3000	30.0	20.0	20.0	20.0	15.0	15.0	12.0	12.0	12.0	12.0	10.0	9.0

NOTE: Bold lines indicate changes in the percent of rated current used to calculate fuse sizes in accordance with article 450 of the NEC.

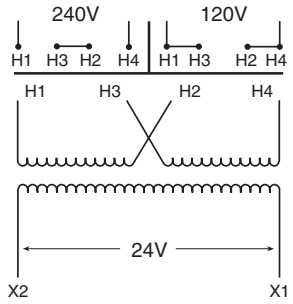
SECONDARY FUSE SIZING CHARTS

RECOMMENDED RATING FOR CURRENT LIMITING MIDGET FUSES

VA	24 V	85 V	91 V	99 V	100 V	110 V	115 V	120 V	125 V	130 V
50 VA	3.2	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6
75 VA	5.0	1.4	1.2	1.2	1.2	1.0	1.0	1.0	1.0	0.8
100 VA	6.0	1.5	1.5	1.5	1.5	1.5	1.5	1.2	1.2	1.2
150 VA	10.0	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	1.5
250 VA	12.0	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
300 VA	15.0	5.5	5.5	5.0	5.0	4.5	4.5	4.0	4.0	3.5
350 VA	20.0	6.5	6.0	5.5	5.5	5.0	5.0	4.5	4.5	4.5
500 VA	25.0	9.0	9.0	8.0	8.0	7.0	7.0	6.0	6.0	6.0
750 VA	40.0	12.0	12.0	12.0	12.0	10.0	10.0	10.0	10.0	9.0
1000 VA	50.0	15.0	15.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1500 VA	—	25.0	20.0	20.0	20.0	20.0	20.0	15.0	15.0	15.0
2000 VA	—	30.0	30.0	25.0	25.0	25.0	25.0	20.0	20.0	20.0
3000 VA	—	40.0	40.0	40.0	40.0	35.0	35.0	30.0	30.0	30.0

FINGER/GUARD® Wiring Diagrams

GROUP A



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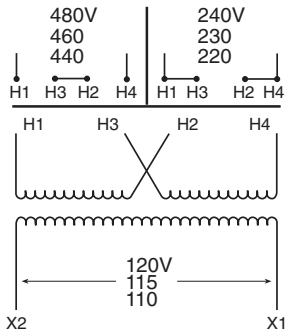

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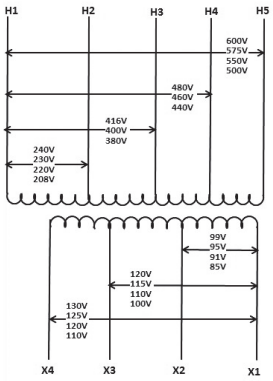
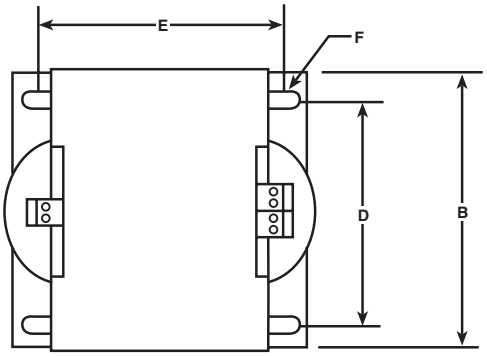
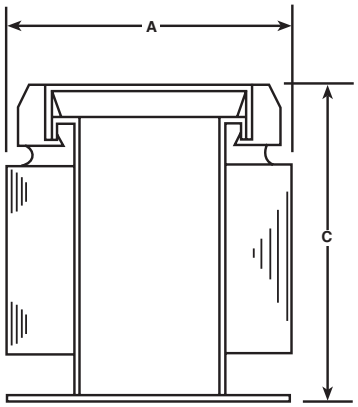


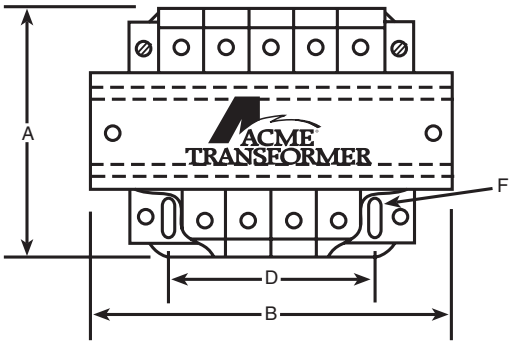
FINGER/GUARD® Dimensional Drawings

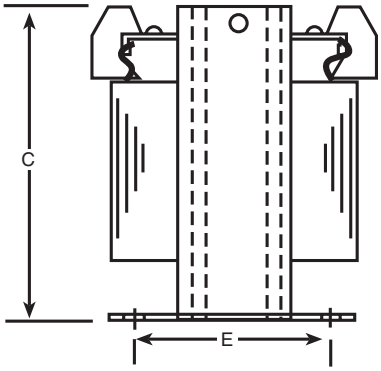
50 VA Thru 2 kVA





3 kVA





NOTES

SECTION 6

LOW VOLTAGE/ LIGHTING TRANSFORMERS

Low Voltage Lighting

A greater selection for your indoor & outdoor low voltage lighting projects

Why Low Voltage?

Acme's Low Voltage Lighting products provide a safe, long lasting, highly reliable power source; a perfect selection for landscape applications as well as interior use.

Low voltage lighting is a creative medium with unlimited application possibilities. Low voltage lighting benefits include:

- Precision beam control
- More light intensity per watt
- Less radiated heat
- Greater efficiency
- Longer life
- Safer to use
- Easy installation
- A high return on end-user investment

Acme Advantages

More value

Acme low voltage transformers are available in a wide range of options and models that are all UL listed for use indoors or outdoors. See inside back cover for warranty details.

More Power

Transformers in ratings of 100 through 1000 W; Group VI Buck–Boost in .05 through 10 kVA.

More convenience

Groups IV, V and VI transformers have copper lead wires for hardwiring. Circuit breakers for instant reset (except pool and spa and Buck–Boost). No fumbling with fuses. Generous wiring compartment, too!

More protection

A full fault current carrying Faraday Shield (except Buck–Boost) prevents 120 volts from reaching the 12 volt side, as required by UL-1571 and UL-1838.

Features & Options

The convenient "Selection Guide" on the facing page provides you with the data you need to select the product that best meets your requirement. Complete product selection data, dimensions and wiring diagrams are contained on the following pages. If you need help in your selection, or if you have questions, just call technical services at 1-800-334-5214.

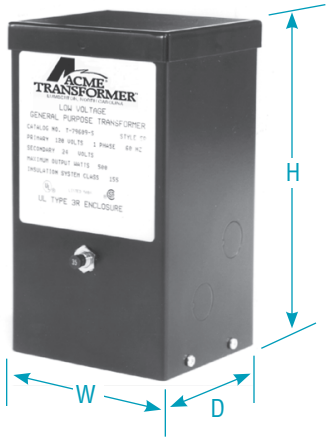
SELECTION GUIDE

	Features/Options		TRANSFORMERS GROUP V 'T1' Catalog No.	TRANSFORMERS GROUP VI Buck–Boost 'T1' and 'T2" Catalog No.
1	Ratings (Watts, VA, kVA)		100 through 1000 VA	.05 through 10 kVA
2	Primary Input		120 Volts or 240 Volts	120 x 240 Volts
3	Secondary Output		12V or 24V	12 x 24 V
4	Hardwired Primary		Yes	Yes
5	Overload Protection:	Primary	Auto Thermal Reset	No
		Secondary	Circuit Breakers	No
6	Output Wiring		Copper Lead Wires	Copper Lead Wires
7	UL Listed		Yes	Yes
8	CSA Certified		Yes	Yes
9	Faraday Shield		Yes	No
10	Product Warranty		10 Years	10 Years
11	UL-3R Indoor/Outdoor Enclosure		No	Yes

Low Voltage General Purpose Transformers

FEATURES

- UL Listed , CSA Certified.
- 100, 150, 300, 600, 750, 1000 VA.
- 1 Phase, 60 Hz, 120 or 240 volt input.
- 12 or 24 volt output.
- Input Auto-Thermal reset switch.
- Output circuit breaker.
- Fully encapsulated core and coil.
- Full fault current carrying Faraday Shield.
- Flexible copper leadwire terminations.
- UL class 180°C insulation system 115°C rise.
- UL Type 2 enclosure.
- Keyhole slotted wall mounting brackets.
- Black finish.
- Bottom access.
- Two 0.875 (2.2 cm) single knockouts each side.
- Two dual 0.875 (2.2 cm) and 1.125 (2.9 cm) knockouts on bottom cover.



GROUP V

120 PRIMARY VOLTS – 12 SECONDARY VOLTS, TWO WINDINGS, 1Ø, 60 Hz

VA	CATALOG NO.	APPROX. DIMENSIONS INCHES (CM.)			APPROX. SHIP WEIGHT LBS. (KG.)	CB RATING	CB STYLE
		HEIGHT	WIDTH	DEPTH			
100	T179600S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	15 AMP	Push To Reset Thermal Breaker
150	T179620S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	20 AMP	Push To Reset Thermal Breaker
300	T179621S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	11 (5.0)	40 AMP	Push To Reset Thermal Breaker
600	T179622S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	15 (6.8)	60 AMP	Magnetic Toggle On/Off Breaker
750	T179603S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	18 (8.2)	75 AMP	Magnetic Toggle On/Off Breaker
1000	T179604S	11.93 (30.3)	5.41 (13.7)	5.20 (13.2)	26 (11.8)	100 AMP	Magnetic Toggle On/Off Breaker

120 PRIMARY VOLTS – 24 SECONDARY VOLTS, TWO WINDINGS, 1Ø, 60 Hz

VA	CATALOG NO.	APPROX. DIMENSIONS INCHES (CM.)			APPROX. SHIP WEIGHT LBS. (KG.)	CB RATING	CB STYLE
		HEIGHT	WIDTH	DEPTH			
100	T179605S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	7 AMP	Push To Reset Thermal Breaker
150	T179623S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	10 AMP	Push To Reset Thermal Breaker
300	T179624S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	11 (5.0)	20 AMP	Push To Reset Thermal Breaker
600	T179625S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	15 (6.8)	40 AMP	Push To Reset Thermal Breaker
750	T179608S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	18 (8.2)	50 AMP	Push To Reset Thermal Breaker
1000	T179609S	11.93 (30.3)	5.41 (13.7)	5.20 (13.2)	26 (11.8)	50 AMP	Magnetic Toggle On/Off Breaker

240 PRIMARY VOLTS – 24 SECONDARY VOLTS, TWO WINDINGS, 1Ø, 60 Hz

VA	CATALOG NO.	APPROX. DIMENSIONS INCHES (CM.)			APPROX. SHIP WEIGHT LBS. (KG.)	CB RATING	CB STYLE
		HEIGHT	WIDTH	DEPTH			
100	T179615S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	7 AMP	Push To Reset Thermal Breaker
150	T179629S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	10 AMP	Push To Reset Thermal Breaker
300	T179630S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	11 (5.0)	20 AMP	Push To Reset Thermal Breaker
600	T179631S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	15 (6.8)	40 AMP	Push To Reset Thermal Breaker
750	T179618S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	18 (8.2)	50 AMP	Push To Reset Thermal Breaker
1000	T179619S	11.93 (30.3)	5.41 (13.7)	5.20 (13.2)	26 (11.8)	50 AMP	Magnetic Toggle On/Off Breaker

Buck-Boost Transformers

The No-Frills Low Voltage Lighting

Buck-Boost Transformers offer a no-frills approach to low voltage lighting. (See Chart Below) A typical Buck-Boost application is 120 volts in and 12 volts out for low voltage lighting or control circuitry. In most applications, this low voltage isolation transformer is field connected as an autotransformer. For more information on Buck-Boost Transformers, refer to the next section in this catalog.

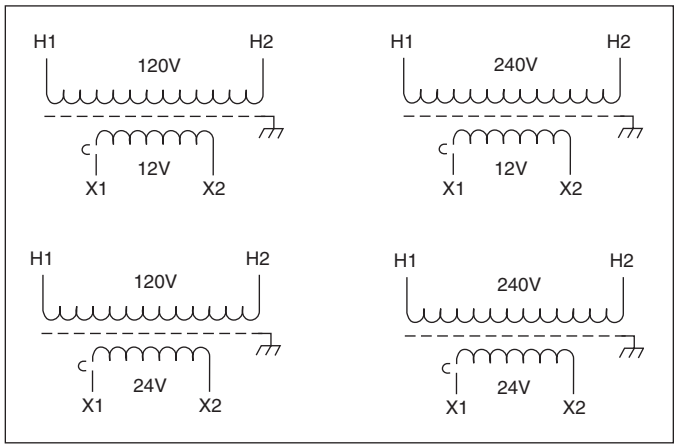
GROUP VI

120 x 240 VOLT INPUT– 12/24 VOLT OUTPUT – 1Ø, 60 Hz

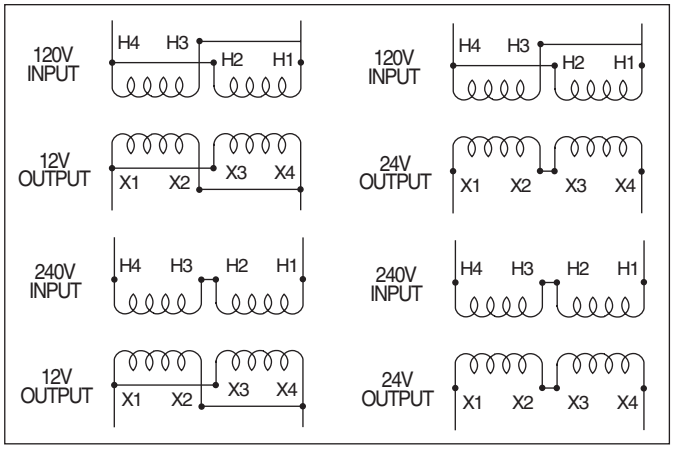
CATALOG NUMBER	INSULATING TRANSFORMER RATING	SECONDARY MAXIMUM CURRENT OUTPUT		APPROX. DIMENSIONS INCHES (CM.)			APPROX. NET WEIGHT LBS. (KG.)
		12V	24V	HEIGHT	WIDTH	DEPTH	
T181047	0.05 kVA	4.16	2.08	6.38 (16.2)	3.19 (8.1)	3.00 (7.6)	4 (1.8)
T181048	0.10 kVA	8.32	4.16	6.62 (16.8)	3.75 (9.5)	3.62 (9.2)	5 (2.3)
T181049	0.15 kVA	12.52	6.25	7.12 (18.1)	3.75 (9.5)	3.62 (9.2)	7 (3.2)
T181050	0.25 kVA	20.80	10.40	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)
T181051	0.50 kVA	41.60	20.80	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)
T181052	0.75 kVA	62.50	31.25	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)
T111683	1.00 kVA	83.20	41.60	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)
T111684	1.50 kVA	125.00	62.50	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)
T111685	2.00 kVA	166.00	83.20	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)
T111686	3.00 kVA	250.00	125.00	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)
T111687	5.00 kVA	416.00	208.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)
T211688	7.50 kVA	625.00	312.50	21.19 (53.8)	13.50 (34.3)	10.84 (27.5)	125 (56.7)
T211689	10.00 kVA	833.00	416.60	21.19 (53.8)	13.50 (34.3)	10.84 (27.5)	160 (72.6)

Low Voltage Lighting Wiring Diagrams

GROUP V



GROUP VI



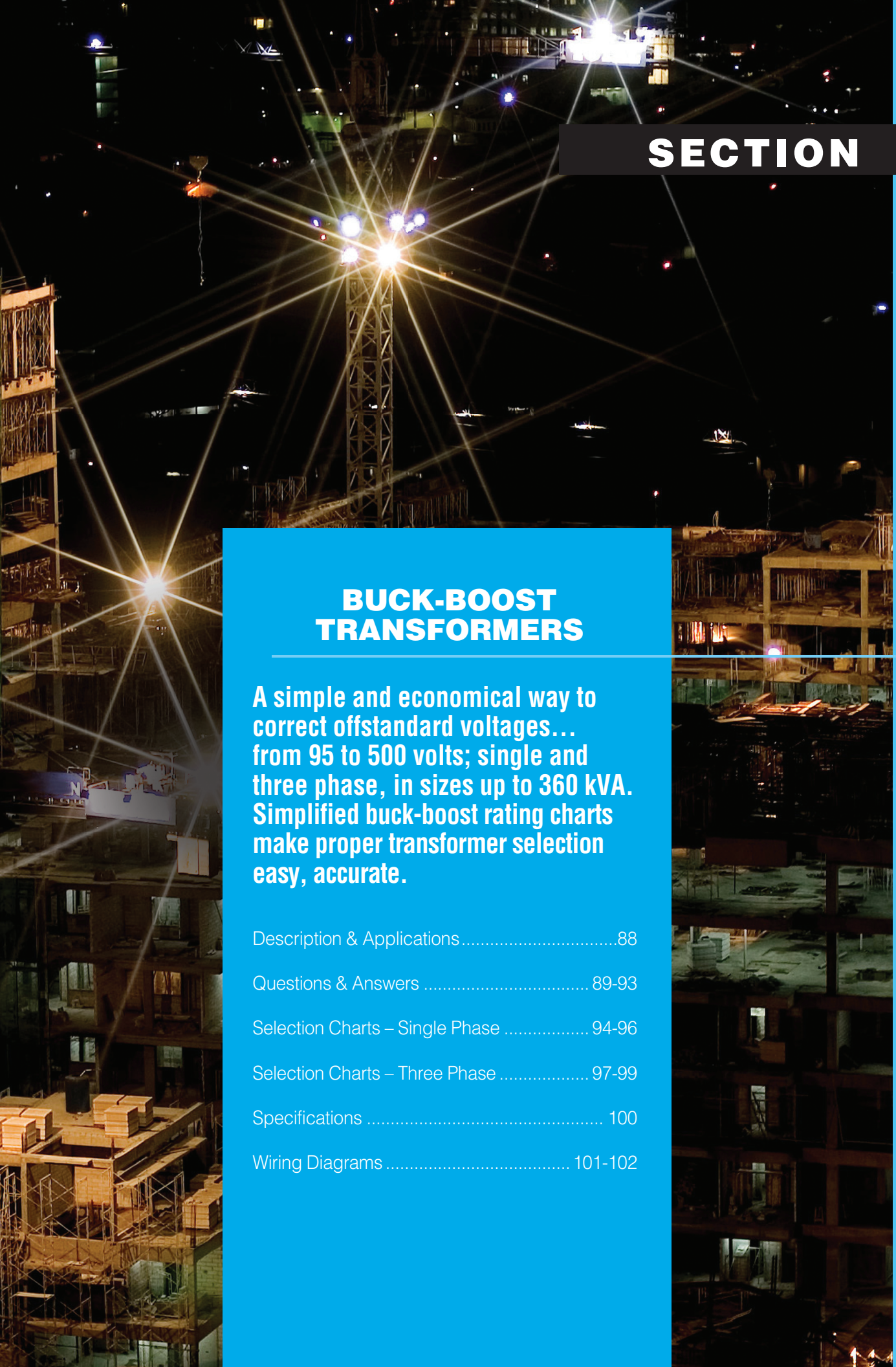
VOLTAGE DROP CHART		
Voltage at Lamp	Life Expectancy of Lamp	% of Rated Candlepower
13.2	2/3 Rated Life	350
12.6	3/4 Rated Life	180
12.0	As Rated	100
11.5	2X Rated Life	80
11.0	3X Rated Life	74
10.5	5X Rated Life	65
10.0	9X Rated Life	50

CABLE SIZE CONSTANT CHART	
Cable Size	Cable Size Constant
#18	1380
#16	2200
#14	3500
#12	7500
#10	11,920
#8	18,960
#6	30,150

VOLTAGE DROP FORMULA

$$X \frac{\text{Total Watts on Cable}}{\text{Length of Run}} = \text{Voltage Drop}$$

Cable Size Constant



SECTION 7

BUCK-BOOST TRANSFORMERS

A simple and economical way to correct offstandard voltages… from 95 to 500 volts; single and three phase, in sizes up to 360 kVA. Simplified buck-boost rating charts make proper transformer selection easy, accurate.

Where Are Buck-Boost Transformers Used?

A typical buck-boost application is 120 volts in, 12 volts out for low voltage lighting or control circuitry. In most applications, this low voltage transformer is field connected as an autotransformer. (See question 2 for the definition of an autotransformer). Buck-boost transformers provide tremendous capabilities and flexibility in kVA sizes and input/output voltage combinations. **Basically you get 75 different transformers... all in one convenient package.**

Other buck-boost applications are, where (A) low supply voltage exists because equipment is installed at the end of a bus system; (B) the supply system is operating at or over its design capacity; and (C) where overall consumer demands may be so high the utility cuts back the supply voltage to the consumer causing a "brownout."

Why Use Buck-Boost Instead of Another Type Transformer ?

Take a look at the advantages and disadvantages of using a buck-boost transformer (autotransformer) compared to a standard isolation transformer of the proper size and voltage combination.

As you can see, the advantages are many, the economies great. Buck-boost transformers are readily available from the stock of your nearest Power Distribution Products Distributor.

ADVANTAGES	DISADVANTAGES
More efficient	No circuit isolation
Smaller & lighter	Cannot create a neutral
5-10 times increase in kVA	Application voltages and kVA don't match the nameplate voltages and kVA
Versatile, many applications	
Lower cost	

T211688 T111683

Proper Voltage Is Critical

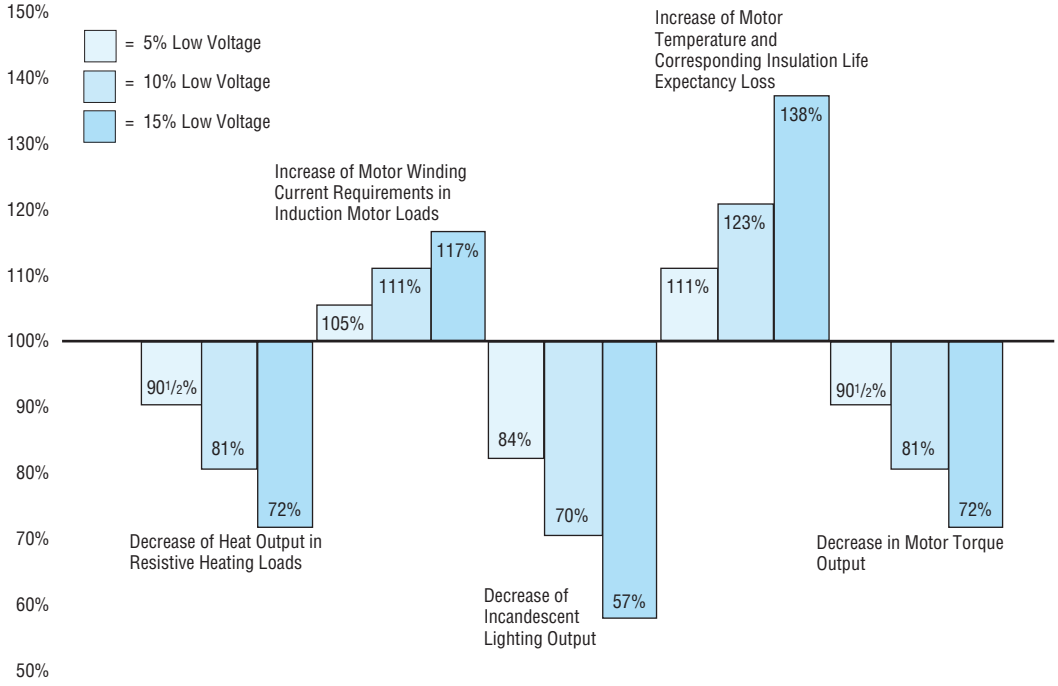
With nearly two-thirds of all electrical loads being A.C. motor loads, maintenance of the proper voltage to that motor is very important. If the supply line voltage is not maintained, motor winding current is increased causing reduced motor torque and escalating motor temperature, all of which results in the rapid loss of insulation life expectancy.

In addition to motor loads, the detrimental effects of low voltage on both resistive heating loads and incandescent lighting output is illustrated in the chart.

Anytime you have a lower than standard voltage, equipment damage and failure can result.

Buck-boost transformers are an economical way to correct this potentially very serious problem. **Anytime** a line voltage change in the 5-20% range is required, a buck-boost transformer should be considered as your first line of defense.

How Low Voltage Affects Various Equipment Operations and Functions



Questions & Answers About Buck-Boost Transformers

1. What is a buck-boost transformer?

Buck-boost transformers are small single phase transformers designed to reduce (buck) or raise (boost) line voltage from 5-20%. The most common example is boosting 208 volts to 230 volts, usually to operate a 230 volt motor such as an air-conditioner compressor, from a 208 volt supply line.

Buck-boosts are a standard type of single phase distribution transformers, with primary voltages of 120, 240 or 480 volts and secondaries typically of 12, 16, 24, 32 or 48 volts. They are available in sizes ranging from 50 volt amperes to 10 kilo-volt amperes.

Buck-boost transformers are shipped ready to be connected for a number of possible voltage combinations.

2. How does a buck-boost transformer differ from an insulating transformer?

A buck-boost transformer **IS** an insulating type transformer when it is shipped from the factory. When it is connected at the job site, a lead wire on the primary is connected to a lead wire on the secondary – thereby changing the transformer's electrical characteristics to those of an autotransformer. The primary and secondary windings are no longer "insulated" and secondary windings are no longer "insulated" and its kVA capacity is greatly increased. Refer to figures 1, 2 and 3.

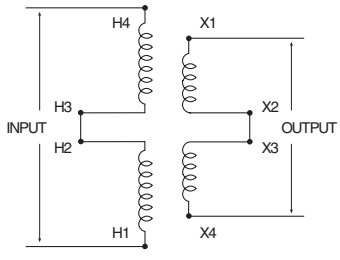


Figure 1. Buck-boost transformer connected as a low voltage insulating transformer (primary and secondary windings shown series connected).

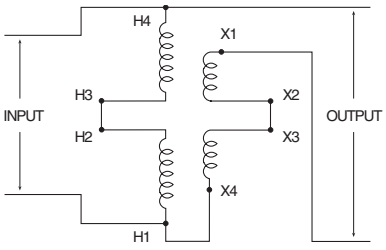


Figure 2. Same buck-boost transformer connected as a boosting autotransformer. The connection from H1 to X4 "converted" the unit to an autotransformer.

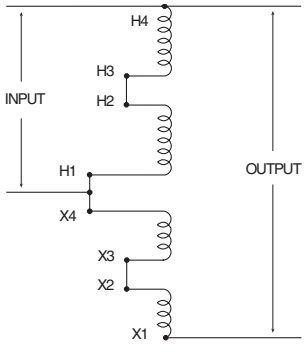


Figure 3. Illustration No. 2 shown with the primary and secondary windings "straightened".

3. What is the difference between a buck-boost transformer and an autotransformer?

When a primary lead wire and secondary lead wire of a buck-boost transformer are connected together electrically, in a recommended voltage bucking or boosting connection, the transformer is in all respects, an autotransformer. However, if the interconnection between the primary and secondary winding is not made, then the unit is an insulating type transformer.

Applications

4. Why are they used?

Electrical and electronic equipment is designed to operate on standard supply voltage. When the supply voltage is constantly too high or too low, (usually more than 55%), the equipment fails to operate at maximum efficiency. A buck and boost transformer is a simple and ECONOMICAL means of correcting this off-standard voltage.

5. What are the most common applications for buck-boost transformers?

Boosting 208V to 230V or 240V and vice versa for commercial and industrial air conditioning systems; boosting 110V to 120V and 240V to 277V for lighting systems; voltage correction for heating systems and induction motors of all types. Many applications exist where supply voltages are constantly above or below normal.

6. Can buck-boost transformers be used to power low voltage circuits?

Yes, low voltage control, lighting circuits, or other low voltage applications requiring either 12V, 16V, 24V, 32V or 48V. The unit is connected as an insulating transformer and the nameplate kVA rating is the transformer's capacity.

(1 kVA) T111683 **(7.5 kVA) T2535153S**

Operation and Construction

7. Why do buck-boost transformers have 4 windings?

To make them versatile! A four winding buck-boost transformer (2 primary and 2 secondary windings) can be connected eight different ways to provide a multitude of voltage and kVA outputs. A two winding (1 primary & 1 secondary) buck-boost transformer can be connected only one way.

8. Will a buck-boost transformer stabilize voltage?

No. The output voltage is a function of the input voltage. If the input voltage varies, then the output voltage will also vary by the same percentage.

Load Data

9. Are there any restrictions on the type of load that can be operated from a buck-boost transformer?

No, there are no restrictions.

10. Why can a buck-boost transformer operate a kVA load many times larger than the kVA rating on its nameplate?

Since the transformer has been auto-connected in such a fashion that the 22V secondary voltage is added to the 208V primary voltage, it produces 230V output.

The autotransformer kVA is calculated:

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

$$kVA = \frac{230\ V \times 41.67\ \text{Amps}}{1000} = 9.58\ kVA$$

The picture to the left illustrates the difference in physical size between the autotransformer of 1 kVA, capable of handling a 9.58 kVA load, and an isolation transformer capable of handling a 7.5 kVA load.

To cite an example... a model T111683 buck-boost transformer has a nameplate kVA rating of 1 kVA, but when it's connected as an autotransformer boosting 208V to 230V, its kVA capacity increases to 9.58 kVA. The key to understanding the operation of buck-boost transformers lies in the fact that the secondary windings are the only parts of the transformer that do the work of transforming voltage and current. In the example above, only 22 volts are being transformed (boosted) — i.e. 208V + 22V = 230V. This 22V transformation is carried out by the secondary windings which are designed to operate at a maximum current of 41.67 amps (determined by wire size of windings).

$$\text{Maximum Secondary Amps} = \frac{\text{nameplate kVA} \times 1000}{\text{secondary volts}}$$

$$\text{Maximum Secondary Amps} = \frac{1.0\ \text{kVA} \times 1000}{24\ V} = \frac{1000\ VA}{24\ V} = 41.67\ \text{amps}$$

11. Can buck-boost transformers be used on motor loads?

Yes, either single or three phase. Refer to the motor data charts in Section I for determining kVA and Amps required by NEMA standard motors.

12. How are single phase and three phase load Amps and load kVA calculated?

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

$$\text{Three phase Amps} = \frac{\text{kVA} \times 1000}{\text{Volts} \times 1.73}$$

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

$$\text{Three phase kVA} = \frac{\text{Volts} \times \text{Amps} \times 1.73}{1000}$$

Three-Phase

13. Can buck-boost transformers be used on three-phase systems as well as single phase systems?

Yes. A single unit is used to buck or boost single phase voltage — two or three units are used to buck or boost three phase voltage. The number of units to be used in a three-phase installation depends on the number of wires in the supply line. If the three-phase supply is 4 wire Y, use three buck-boost transformers. If the 3-phase supply is 3 wire Y (neutral not available), use two buck-boost transformers. Refer to three-phase selection charts.

14. Should buck-boost transformers be used to develop a three-phase 4 wire Y circuit from a three-phase 3 wire delta circuit?

No. A three phase "wye" buck-boost transformer connection should be used only on a 4 wire source of supply. A delta to wye connection does not provide adequate current capacity to accommodate unbalanced currents flowing in the neutral wire of the 4 wire circuit.

3 PHASE CONNECTIONS

INPUT (SUPPLY SYSTEM)	DESIRED OUTPUT CONNECTION	
DELTA 3 wire	WYE 3 or 4 wire	DO NOT USE
OPEN DELTA 3 wire	WYE 3 or 4 wire	DO NOT USE
WYE 3 or 4 wire	CLOSED DELTA 3 wire	DO NOT USE
WYE 4 wire	WYE 3 or 4 wire	OK
WYE 3 or 4 wire	OPEN DELTA 3 wire	OK
CLOSED DELTA 3 wire	OPEN DELTA 3 wire	OK

15. Why isn't a closed delta buck-boost connection recommended?

A closed delta buck-boost auto transformer connection requires more transformer kVA than a "wye" or open delta connection and phase shifting occurs on the output. Consequently the closed delta connection is more expensive and electrically inferior to other three-phase connections.

Connection and Frequency

16. How does the installer or user know how to connect a buck-boost transformer?

The connection chart packed with each unit shows how to make the appropriate connections. These same connection charts are also shown in this section (page 118).

17. Can 60 Hertz buck-boost transformers be used on a 50 Hertz service?

No. Acme buck-boost transformers should be operated only at the frequencies recommended. However, units recommended for 50 cycle operation are suitable for 60 cycle operation but not vice versa.

Selection

18. How do you select a buck-boost transformer?

Refer to the selection steps on page 101 for easy 4-step selection, then go to the charts. Also, pages 12 and 13 are helpful for determining buck-boost kVA when only the H.P. rating of a motor is available.

Nameplate Data

19. Why are buck-boost transformers shipped from the factory as insulating transformers and not preconnected at the factory as autotransformers?

A four winding buck-boost transformer can be auto connected eight different ways to provide a multitude of voltage and kVA output combinations. The proper transformer connection depends on the user's supply voltage, load voltage and load kVA. Consequently, it is more feasible for the manufacturer to ship the unit as an insulating transformer and allow the user to connect it on the job site in accordance with the available supply voltage and requirements of his load.

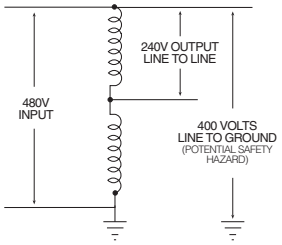
20. Why is the isolation transformer kVA rating shown on the nameplate instead of the autotransformer kVA rating?

The kVA rating of a buck-boost transformer when auto connected depends on the amount of voltage buck or boost. Since the amount of voltage buck or boost is different for each connection, it is physically impossible to show all of the various voltage combinations and attainable kVA ratings on the nameplate. A connection chart showing the various attainable single phase and three-phase connections is packed with each unit.

Safety

21. Do buck-boost transformers present a safety hazard usually associated with autotransformers?

No. Most autotransformers, if they are not of the buck-boost variety, change voltage from one voltage class to another. (Example 480V to 240V) In a system where one line is grounded, the user thinks he has 240V; yet due to the primary and secondary being tied together, it is possible to have 480V to ground from the 240V output. A buck-boost transformer only changes the voltage a small amount, such as 208V to 240V. This small increase does not represent a safety hazard, as compared to a buck of 480V to 240V. Refer to Figure on the following page.



Sound Levels

22. Are buck-boost transformers as quiet as standard isolation transformers?

Yes. However, an auto-connected buck-boost transformer will be quieter than an isolation transformer capable of handling the same load. The isolation transformer would have to be physically larger than the buck-boost transformer, and small transformers are quieter than larger ones. (Example) 1 kVA — 40 db; 75 kVA — 50 db. (db is a unit of sound measure).

Cost and Life Expectancy

23. How does the cost of a buck-boost transformer compare to that of an insulating transformer — both capable of handling the same load?

For the most common buck-boost applications, the dollar savings are generally greater than 75% compared to the use of an insulating type distribution transformer for the same application.

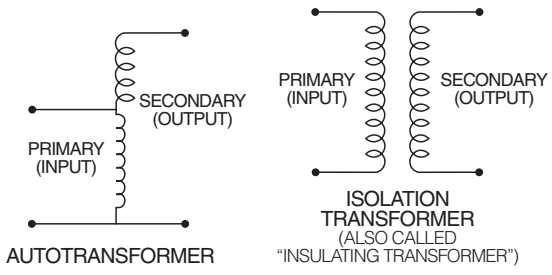
24. What is the life expectancy of a buck boost transformer?

The life expectancy of a buck-boost transformer is the same as the life expectancy of other dry type transformers.

National Electrical Code

25. Your catalog indicates that a buck-boost transformer is suitable for connecting as an AUTOTRANS-FORMER. What is the definition of an autotransformer and how does it differ from an isolation transformer?

An autotransformer is a transformer in which the primary (input) and the secondary (output) are electrically connected to each other. An isolation transformer, also known as an insulating transformer, has complete electrical separation between the primary (input) and the secondary (output). This is illustrated in the drawing below.



An autotransformer changes or transforms only a portion of the electrical energy it transmits. The rest of the electrical energy flows directly through the electrical connections between the primary and secondary. An isolation transformer (insulating transformer) changes or transforms all of the electrical energy it transmits.

Consequently, an autotransformer is smaller, lighter in weight, and less costly than a comparable kVA size insulating transformer.

Please refer to Question 27 for additional information on auto-transformers.

Buck-boost transformers are frequently field-connected as autotransformers.

26. Buck-boost transformers are almost always installed as auto-transformers. Does the N.E.C. (National Electrical Code) permit the use of autotransformers?

Yes. Please refer to N.E.C. Article 450-4, "Autotransformers 600 Volts, Nominal, or Less." Item **(a)** explains how to overcurrent protect an autotransformer; item **(b)** explains that an insulating transformer such as a buck-boost transformer may be field connected as an autotransformer.

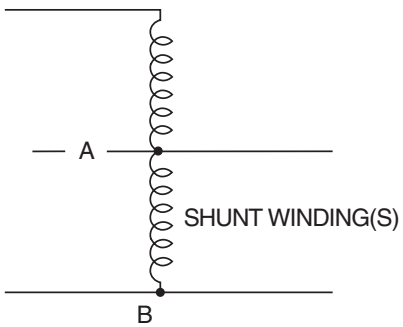
27. When a buck-boost transformer is connected as an autotransformer such as boosting 208V to 230V, the kVA is greatly increased. What is the procedure for determining the size (ampere rating) of the overcurrent protective device such as a fuse or circuit breaker?

The National Electrical Code Article 450-4 addresses overcurrent protection of autotransformers. A copy is reproduced below for easy reference.

450-4. Autotransformers 600 Volts, Nominal, or Less.

(a) Overcurrent Protection. Each autotransformer 600 volts, nominal, or less shall be protected by an individual overcurrent device installed in series with each ungrounded input conductor. Such overcurrent device shall be rated or set at not more than 125 percent of the rated full-load input current of the autotransformer. An overcurrent device shall not be installed in series with the shunt winding (the winding common to both the input and the output circuits) of the autotransformer between Points A and B as shown in Diagram 450-4.

Diagram 450-4



Exception: Where the rated input current of an autotransformer is 9 amperes or more and 125 percent of this current does not correspond to a standard rating of a fuse or non-adjustable circuit breaker, the next higher standard rating described in Section 240-6 shall be permitted. When the rated input current is less than 9 amperes, an overcurrent device rated or set at not more than 167 percent of the input current shall be permitted.

(b) Transformer Field-Connected as an Autotransformer. A transformer field-connected as an autotransformer shall be identified for use at elevated voltage.

28. I have noted the reprint of the N.E.C. (National Electrical Code), Article 450-4 shown in the previous question covering autotransformer overcurrent protection. Could you explain this article in detail by citing an example?

An example of an everyday application is always a good way to explain the intent of the "Code." **Example:** A 1 kVA transformer Catalog No. T111683 has a primary of 120 x 240V and a secondary of 12 x 24V. It is to be connected as an autotransformer at the time of installation to raise 208V to 230V single phase.

When this 1 kVA unit is connected as an autotransformer for this voltage combination, its kVA rating is increased to 9.58 kVA (may also be expressed as 9,580 VA). This is the rating to be used for determining the full load input amps and the sizing of the overcurrent protect device (fuse or breaker) on the input.

$$\text{Full Load Input Amps} = \frac{9{,}580 \text{ Volt Amps}}{208 \text{ Volts}} = 46 \text{ Amps}$$

When the full load current is greater than 9 amps, the overcurrent protective device (usually a fuse or non-adjustable breaker) amp rating can be up to 125 percent of the full load rating of the autotransformer input amps.

$$\text{Max. amp rating of the overcurrent device} = 46 \text{ amps} \times 125\% = 57.5 \text{ amps}$$

The National Electrical Code, Article 450-4 (a) Exception, permits the use of the next higher standard ampere rating of the overcurrent device. This is shown in Article 240-6 of the N.E.C.

$$\text{Max. size of the fuse or circuit breaker} = 60 \text{ amps}$$

Steps for Selecting the Proper Buck-Boost Transformer

You should have the following information before selecting a buck-boost transformer.

Line Voltage — The voltage that you want to buck (decrease) or boost (increase). This can be found by measuring the supply line voltage with a voltmeter.

Load Voltage — The voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.

Load kVA or Load Amps — You do not need to know both — one or the other is sufficient for selection purposes. This information usually can be found on the nameplate of the equipment that you want to operate.

Frequency — The supply line frequency must be the same as the frequency of the equipment to be operated — either 50 or 60 cycles.

Phase — The supply line should be the same as the equipment to be operated — either single or three phase.

Four Step Selection

1. A series of LINE VOLTAGE and LOAD VOLTAGE combinations are listed across the top of each selection chart. Select a LINE VOLTAGE and LOAD VOLTAGE combination from ANY of the charts that comes closest to matching the LINE VOLTAGE and LOAD VOLTAGE of your application.

2. Read down the column you have selected until you reach either the LOAD kVA or LOAD AMPS of the equipment you want to operate. You probably will not find the exact value of LOAD kVA or LOAD AMPS so go to the next higher rating.

3. From this point, read across the column to the far left-hand side and you have found the catalog number of the exact buck-boost transformer you need. Refer to the catalog number listing on page 103 for dimensions.

4. CONNECT the transformer according to the connection diagram specified at the bottom of the column where you selected YOUR LINE VOLTAGE and LOAD VOLTAGE combination. Connection diagrams are found at the end of this section.

This same connection information is packed with each buck-boost transformer.

SELECTION CHARTS

SINGLE PHASE

GROUP I

SINGLE PHASE		BOOSTING								BUCKING					
Line Voltage (Available)		95	100	105	110	189	208	215	220	125	132	230	245	250	252
Load Voltage (Output)		114	120	115	120	208	230	237	242	113	120	208	222	227	240
CAT. NO.															
T181047	Load kVA	0.24	0.25	0.48	0.50	0.43	0.48	0.49	0.50	0.52	0.54	0.47	0.50	0.52	1.02
	Load Amps	2.08	2.08	4.17	4.17	2.08	2.08	2.08	2.08	4.60	4.60	2.28	2.28	2.28	4.37
	Max. Size of Fuse or Breaker	6	6	10	10	6	6	6	6	10	10	6	6	6	10
T181048	Load kVA	0.47	0.50	0.96	1.01	0.87	0.96	0.99	1.01	1.04	1.08	0.95	1.00	1.04	2.04
	Load Amps	4.17	4.17	8.33	8.33	4.17	4.17	4.17	4.17	9.20	9.20	4.56	4.56	4.58	8.75
	Max. Size of Fuse or Breaker	10	10	15	15	10	10	10	10	15	15	10	10	10	15
T181049	Load kVA	0.71	0.75	1.43	1.51	1.30	1.43	1.48	1.51	1.56	1.62	1.42	1.50	1.56	3.00
	Load Amps	6.25	6.25	12.50	12.50	6.25	6.25	6.25	6.25	13.80	13.80	6.86	6.86	6.86	13.10
	Max. Size of Fuse or Breaker	15	15	20	20	15	15	15	15	20	20	15	15	15	15
T181050	Load kVA	1.19	1.25	2.40	2.50	2.16	2.39	2.46	2.52	2.60	2.75	2.37	2.50	2.60	5.10
	Load Amps	10.42	10.40	20.80	20.80	10.40	10.40	10.40	10.40	22.80	22.80	11.40	11.40	11.40	21.80
	Max. Size of Fuse or Breaker	25	25	40	30	15	15	15	15	30	30	15	15	15	30
T181051	Load kVA	2.37	2.50	4.80	5.00	4.33	4.79	4.93	5.04	5.20	5.40	4.47	5.00	5.20	10.20
	Load Amps	20.83	20.83	41.67	41.67	20.83	20.83	20.83	20.83	46.80	46.80	22.80	22.80	22.80	43.70
	Max. Size of Fuse or Breaker	35	35	60	60	30	30	30	30	60	60	30	30	30	60
T181052	Load kVA	3.56	3.75	7.17	7.56	6.50	7.19	7.41	7.56	7.80	8.15	7.10	7.50	7.80	15.30
	Load Amps	31.25	31.25	62.50	62.50	31.25	31.25	31.25	31.25	68.50	69.50	34.40	34.40	34.40	65.50
	Max. Size of Fuse or Breaker	50	50	90	90	45	45	45	45	80	80	40	40	40	80
T111683	Load kVA	4.75	5.00	9.58	10.00	8.66	9.58	9.87	10.00	10.40	10.80	9.50	10.00	10.00	20.40
	Load Amps	41.67	41.67	83.31	83.31	41.67	41.67	41.67	41.67	91.50	91.50	45.80	45.80	45.80	87.50
	Max. Size of Fuse or Breaker	70	70	125	125	60	60	60	60	110	110	60	60	50	110
T111684	Load kVA	7.12	7.50	14.40	15.10	13.00	14.30	14.80	15.10	15.00	16.20	14.24	15.00	15.60	30.60
	Load Amps	62.50	62.50	125.00	125.00	62.50	62.50	62.50	62.50	138.00	138.00	68.60	68.60	68.60	132.00
	Max. Size of Fuse or Breaker	100	100	175	175	90	90	90	90	150	175	80	80	80	175
T111685	Load kVA	9.50	10.00	19.20	20.20	17.30	19.16	19.70	20.10	20.80	21.60	19.00	20.00	20.30	40.80
	Load Amps	83.30	83.30	166.60	166.60	83.30	83.30	83.30	83.30	183.00	183.00	91.60	91.60	91.20	175.00
	Max. Size of Fuse or Breaker	125	125	250	250	125	125	125	125	225	225	110	110	110	225
T111686	Load kVA	14.20	15.00	28.80	30.00	26.00	28.70	29.60	30.30	31.20	32.50	28.50	30.00	31.20	61.00
	Load Amps	125.00	125.00	250.00	250.00	125.00	125.00	125.00	125.00	275.00	275.00	136.80	136.80	136.80	263.00
	Max. Size of Fuse or Breaker	200	200	350	350	175	175	175	175	350	350	175	175	175	350
T111687	Load kVA	23.70	25.00	47.90	50.00	43.30	47.80	49.30	50.30	52.00	54.00	47.40	50.00	52.00	102.00
	Load Amps	208.00	208.00	416.60	416.60	208.00	208.00	208.00	208.00	457.00	457.00	228.00	228.00	228.00	437.00
	Max. Size of Fuse or Breaker	350	350	600	600	300	300	300	300	600	600	300	300	300	600
T211688 ①	Load kVA	35.60	37.50	71.90	75.60	65.00	71.80	74.00	75.60	78.00	81.00	71.00	76.00	78.00	153.00
	Load Amps	312.50	312.50	625.00	625.00	312.50	312.50	312.50	312.50	688.00	688.00	344.00	344.00	344.00	655.00
	Max. Size of Fuse or Breaker	500	500	1000	1000	450	450	450	450	800	800	400	400	400	800
T211689 ①	Load kVA	47.50	50.00	95.80	100.00	86.60	95.80	98.70	101.00	104.00	108.00	95.00	100.00	104.00	204.00
	Load Amps	416.60	416.60	833.30	833.30	416.60	416.60	416.60	416.60	915.00	915.00	458.00	458.00	458.00	875.00
	Max. Size of Fuse or Breaker	700	700	1200	1200	600	600	600	600	1200	1200	600	600	600	1200
See Page 110 For Connection Diagrams		D	D	C	C	H	H	H	H	F	F	I	I	I	E

① See chart on page 101, for number of leads per termination.

NOTE: Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above bold face line are suitable for 50/60 Hz. All applications below bold face line are suitable for 60 Hz only.

With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals as shown in the chart on page 101.

GROUP II

SINGLE PHASE		BOOSTING								BUCKING					
Line Voltage (Available)		95	100	105	208	215	215	220	225	135	240	240	245	250	255
Load Voltage (Output)		120	114	119	240	244	230	235	240	119	208	225	230	234	239
CAT. NO.															
T181054	Load kVA	0.19	0.36	0.37	0.38	0.38	0.72	0.73	0.75	0.42	0.37	0.75	0.77	0.78	0.80
	Load Amps	1.56	3.13	3.13	1.56	1.56	3.13	3.13	3.13	3.54	1.77	3.33	3.33	3.33	3.33
	Max. Size of Fuse or Breaker	6	6	6	6	6	6	6	6	6	3	6	6	6	6
T181055	Load kVA	0.38	0.71	0.74	0.75	0.76	1.44	1.47	1.50	0.84	0.74	1.50	1.53	1.56	1.59
	Load Amps	3.13	6.25	6.25	3.13	3.13	6.25	6.25	6.25	7.08	3.54	6.67	6.67	6.67	6.67
	Max. Size of Fuse or Breaker	10	15	6	6	15	15	15	15	15	6	15	15	15	15
T181056	Load kVA	0.56	1.07	1.12	1.13	1.14	2.16	2.20	2.25	1.26	1.11	2.25	2.30	2.34	2.39
	Load Amps	4.69	9.38	9.38	4.69	4.69	9.38	9.38	9.38	10.63	5.31	10.00	10.00	10.00	10.00
	Max. Size of Fuse or Breaker	10	15	15	10	10	15	15	15	15	6	15	15	15	15
T181057	Load kVA	0.94	1.78	1.86	1.88	1.91	3.59	3.67	3.75	2.11	1.84	3.75	3.83	3.90	3.98
	Load Amps	7.81	15.63	15.63	7.81	7.81	15.63	15.63	15.63	17.71	8.85	16.67	16.67	16.67	16.67
	Max. Size of Fuse or Breaker	15	25	25	15	15	25	25	25	20	15	20	20	20	20
T181058	Load kVA	1.88	3.56	3.72	3.75	3.81	7.19	7.34	7.50	4.21	3.68	7.50	7.67	7.80	7.97
	Load Amps	15.63	31.25	31.25	15.63	15.63	31.25	31.25	31.25	35.42	17.71	33.33	33.33	33.33	33.33
	Max. Size of Fuse or Breaker	25	45	45	25	25	45	45	45	40	20	40	40	40	40
T181059	Load kVA	2.81	5.34	5.58	5.63	5.72	10.78	11.02	11.25	6.32	5.53	11.25	11.50	11.70	11.95
	Load Amps	23.44	46.88	46.88	23.44	23.44	46.88	46.88	46.88	53.13	26.56	50.00	50.00	50.00	50.00
	Max. Size of Fuse or Breaker	40	70	70	40	40	70	70	70	60	30	60	60	60	60
T113073	Load kVA	3.75	7.13	7.44	7.50	7.63	14.38	14.69	15.00	8.43	7.37	15.00	15.33	15.60	15.93
	Load Amps	31.25	62.50	62.50	31.25	31.25	62.50	62.50	62.50	70.83	35.42	66.67	66.67	66.67	66.67
	Max. Size of Fuse or Breaker	50	90	90	50	50	90	90	90	80	40	80	80	80	80
T113074	Load kVA	5.63	10.69	11.16	11.25	11.44	21.56	22.03	22.50	12.64	11.05	22.50	23.00	23.40	23.90
	Load Amps	46.90	93.80	93.80	46.90	46.90	93.80	93.80	93.80	106.30	53.10	100.00	100.00	100.00	100.00
	Max. Size of Fuse or Breaker	80	150	150	70	70	125	125	125	125	60	125	125	125	125
T113075	Load kVA	7.50	14.25	14.88	15.00	15.25	28.75	29.38	30.00	16.86	14.73	30.00	30.67	31.20	31.87
	Load Amps	62.50	125.00	125.00	62.50	62.50	125.00	125.00	125.00	141.70	70.80	133.30	133.30	133.30	133.30
	Max. Size of Fuse or Breaker	100	200	200	90	90	175	175	175	175	80	175	175	175	175
T113076	Load kVA	11.25	21.38	22.31	22.50	22.88	43.13	44.06	45.00	25.29	22.10	45.00	46.00	46.80	47.80
	Load Amps	93.80	187.50	187.50	93.80	93.80	187.50	187.50	187.50	212.50	106.30	200.00	200.00	200.00	200.00
	Max. Size of Fuse or Breaker	150	300	300	150	150	250	250	250	250	125	250	250	250	250
T113077	Load kVA	18.75	35.63	37.19	37.50	38.13	71.88	73.44	75.00	42.15	36.83	75.00	76.67	78.00	79.67
	Load Amps	156.30	312.50	312.50	156.30	156.30	312.50	312.50	312.50	354.20	177.10	333.30	333.30	333.30	333.30
	Max. Size of Fuse or Breaker	250	450	450	225	225	450	450	450	400	200	400	400	400	400
T213078 ①	Load kVA	28.10	53.40	55.80	56.30	57.20	107.80	110.20	112.50	63.20	55.30	112.50	115.00	117.00	119.50
	Load Amps	234.40	468.80	468.80	234.40	234.40	468.80	468.80	468.80	531.30	265.60	500.00	500.00	500.00	500.00
	Max. Size of Fuse or Breaker	400	700	700	350	350	700	700	700	600	300	600	600	600	600
T213079 ①	Load kVA	37.50	71.30	74.40	75.00	76.30	143.80	146.90	150.00	84.30	73.70	150.00	153.30	156.00	159.30
	Load Amps	312.50	625.00	625.00	312.50	312.50	625.00	625.00	625.00	708.30	354.20	666.70	666.70	666.70	666.70
	Max. Size of Fuse or Breaker	500	1000	1000	450	450	1000	1000	1000	800	400	800	800	800	800
See Page 110 For Connection Diagrams		D	C	C	H	H	G	G	G	F	I	E	E	E	E

① See chart on page 101.

NOTE: Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above bold face line are suitable for 50/60 Hz. All applications below bold face line are suitable for 60 Hz only.

With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals as shown in the chart on page 101.

GROUP III

SINGLE PHASE		BOOSTING										BUCKING			
Line Voltage (Available)		230	380	416	425	430	435	440	440	450	460	277	480	480	504
Load Voltage (Output)		277	420	457	467	473	457	462	484	472	483	230	436	456	480
CAT. NO.															
T181061	Load kVA	0.29	0.44	0.48	0.49	0.49	0.95	0.96	0.50	0.98	1.01	0.29	0.50	1.05	1.10
	Load Amps	1.04	1.04	1.04	1.04	1.04	2.08	2.08	1.04	2.08	2.08	1.25	1.15	2.29	2.29
	Max. Size of Fuse or Breaker	3	3	3	3	3	6	6	3	6	6	3	3	6	6
T181062	Load kVA	0.58	0.87	0.95	0.97	0.99	1.90	1.93	1.01	1.97	2.01	0.58	1.00	2.09	2.20
	Load Amps	2.08	2.08	2.08	2.08	2.08	4.17	4.17	2.08	4.17	4.17	2.50	2.29	4.58	4.58
	Max. Size of Fuse or Breaker	6	6	6	6	6	10	10	6	10	10	6	6	10	10
T181063	Load kVA	0.87	1.31	1.43	1.46	1.48	2.86	2.89	1.51	2.95	3.02	0.86	1.50	3.14	3.30
	Load Amps	3.13	3.13	3.13	3.13	3.13	6.25	6.25	3.13	6.25	6.25	3.75	3.44	6.88	6.88
	Max. Size of Fuse or Breaker	10	6	6	6	6	15	15	6	15	15	6	6	15	15
T181064	Load kVA	1.44	2.19	2.38	2.43	2.46	4.76	4.81	2.52	4.92	5.03	1.44	2.50	5.23	5.50
	Load Amps	5.21	5.21	5.21	5.21	5.21	5.21	10.42	5.21	10.42	10.42	6.25	5.73	11.46	11.46
	Max. Size of Fuse or Breaker	15	10	10	10	10	15	15	10	15	15	10	10	15	15
T181065	Load kVA	2.89	4.38	4.76	4.86	4.93	9.52	9.62	5.04	9.83	10.06	2.88	5.00	10.45	11.00
	Load Amps	10.42	10.42	10.42	10.42	10.42	20.83	20.83	10.42	20.83	20.83	12.50	11.46	22.92	22.92
	Max. Size of Fuse or Breaker	20	15	15	15	15	30	30	15	30	30	15	15	30	30
T181066	Load kVA	4.33	6.56	7.14	7.30	7.39	14.28	14.44	7.56	14.75	15.09	4.31	7.49	15.68	16.50
	Load Amps	15.63	15.63	15.63	15.63	15.63	31.25	31.25	15.63	31.25	31.25	18.75	17.19	34.38	34.38
	Max. Size of Fuse or Breaker	25	25	25	25	25	45	45	25	45	45	20	20	45	45
T137920	Load kVA	5.77	8.57	9.52	9.73	9.85	19.04	19.25	10.08	19.67	20.13	5.75	9.99	20.90	22.00
	Load Amps	20.83	20.83	20.83	20.83	20.83	41.67	41.67	20.83	41.67	41.67	25.00	22.92	45.83	45.83
	Max. Size of Fuse or Breaker	35	30	30	30	30	60	60	30	60	60	30	30	60	60
T137921	Load kVA	8.66	13.13	14.28	14.59	14.78	28.56	28.88	15.13	29.50	30.19	8.63	14.99	31.35	33.00
	Load Amps	31.25	31.25	31.25	31.25	31.25	62.50	62.50	31.25	62.50	62.50	37.50	34.38	68.75	68.75
	Max. Size of Fuse or Breaker	50	50	45	45	45	90	90	45	90	90	40	40	90	90
T137922	Load kVA	11.54	17.50	19.04	19.46	19.71	38.08	38.50	20.17	39.33	40.25	11.50	19.98	41.80	44.00
	Load Amps	41.67	41.67	41.67	41.67	41.67	83.33	83.33	41.67	83.33	83.33	50.00	45.83	91.67	91.67
	Max. Size of Fuse or Breaker	70	60	60	60	60	110	110	60	110	110	60	60	110	110
T137923	Load kVA	17.31	26.25	28.56	29.19	29.56	57.13	57.75	30.25	59.00	60.38	17.25	29.98	62.70	66.00
	Load Amps	62.50	62.50	62.50	62.50	62.50	125.00	125.00	62.50	125.00	125.00	75.00	68.80	137.50	137.50
	Max. Size of Fuse or Breaker	100	90	90	90	90	175	175	90	175	175	80	80	175	175
T137924	Load kVA	28.90	43.80	47.60	48.60	49.30	95.20	96.20	50.40	98.30	100.60	28.80	50.00	104.50	110.00
	Load Amps	104.20	104.20	104.20	104.20	104.20	208.30	208.30	104.20	208.30	208.30	125.00	114.60	229.20	229.20
	Max. Size of Fuse or Breaker	175	150	150	150	150	300	300	150	300	300	150	150	300	300
T243570	Load kVA	43.30	65.60	71.40	73.00	73.90	142.80	144.40	75.60	147.50	150.90	43.10	74.90	156.80	165.00
	Load Amps	156.30	156.30	156.30	156.30	156.30	312.50	312.50	156.30	312.50	312.50	187.50	171.90	343.80	343.80
	Max. Size of Fuse or Breaker	250	225	225	225	225	450	450	225	450	450	200	200	450	450
T243571 ①	Load kVA	57.70	87.50	95.20	97.30	98.50	190.40	192.50	100.80	196.70	201.30	57.50	99.90	209.00	220.00
	Load Amps	208.30	208.30	208.30	208.30	208.30	416.70	416.70	208.30	416.70	416.70	250.00	229.20	458.30	458.30
	Max. Size of Fuse or Breaker	350	300	300	300	300	600	600	300	600	600	300	300	600	600
See Page 110 For Connection Diagrams		D	H	H	H	H	G	G	H	G	G	J	I	E	E

① See chart on page 101.

NOTE: Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above bold face line are suitable for 50/60 Hz. All applications below bold face line are suitable for 60 Hz only.

SELECTION CHARTS

THREE PHASE

GROUP I

THREE PHASE		BOOSTING							BUCKING				
Line Voltage (Available)		189Y 109	196Y 113	201Y 116	208Y 120	189	208	220	219	230	250	255	264
Load Voltage (Output)		208	234	240	230	208	230	242	208	208	227	232	240
CAT. NO.													
T181047	Load kVA	1.50	0.84	0.87	1.66	0.75	0.83	0.87	1.58	0.83	0.90	0.92	0.95
	Load Amps	4.17	2.08	2.08	4.17	2.08	2.08	2.08	4.39	2.30	2.29	2.29	2.29
	Max. Size of Fuse or Breaker	10	6	6	10	6	6	6	10	6	6	6	6
T181048	Load kVA	3.00	1.69	1.73	3.32	1.50	1.66	1.75	3.16	1.66	1.80	1.84	1.91
	Load Amps	8.33	4.17	4.17	8.33	4.17	4.17	4.17	8.77	4.61	4.59	4.58	4.58
	Max. Size of Fuse or Breaker	15	10	10	15	10	10	10	15	10	10	10	10
T181049	Load kVA	4.50	2.53	2.60	4.98	2.25	2.49	2.62	4.74	2.49	2.71	2.76	2.86
	Load Amps	12.50	6.25	6.25	12.50	6.25	6.25	6.25	13.16	6.91	6.88	6.87	6.88
	Max. Size of Fuse or Breaker	20	15	15	20	15	15	15	20	15	15	15	15
T181050	Load kVA	7.51	4.22	4.33	8.30	3.75	4.15	4.37	7.90	4.15	4.51	4.60	4.76
	Load Amps	20.83	10.42	10.42	20.83	10.42	10.42	10.42	21.94	11.52	11.47	11.45	11.46
	Max. Size of Fuse or Breaker	30	20	20	30	15	15	15	30	15	15	15	15
T181051	Load kVA	15.01	8.44	8.66	16.60	7.51	8.30	8.73	15.80	8.30	9.02	9.20	9.53
	Load Amps	41.67	20.83	20.83	41.67	20.83	20.83	20.83	43.87	23.04	22.94	22.90	22.92
	Max. Size of Fuse or Breaker	60	35	35	60	30	30	30	60	30	30	30	30
T181052	Load kVA	22.52	12.67	12.99	24.90	11.26	12.45	13.10	23.71	12.45	13.53	13.80	14.29
	Load Amps	62.50	31.25	31.25	62.50	31.25	31.25	31.25	65.81	34.56	34.42	34.35	34.38
	Max. Size of Fuse or Breaker	90	50	50	90	45	45	45	80	40	40	40	40
T111683	Load kVA	30.02	16.89	17.32	33.20	15.01	16.60	17.46	31.61	16.60	18.04	18.40	19.05
	Load Amps	83.33	41.67	41.67	83.33	41.67	41.67	41.67	87.74	46.07	45.89	45.80	45.83
	Max. Size of Fuse or Breaker	125	70	70	125	60	60	60	110	60	60	60	60
T111684	Load kVA	45.03	25.33	25.98	49.80	22.52	24.90	26.20	47.41	24.90	27.06	27.60	28.58
	Load Amps	125.00	62.50	62.50	125.00	62.50	62.50	62.50	131.61	69.11	68.83	68.70	68.75
	Max. Size of Fuse or Breaker	175	100	100	175	90	90	90	175	80	80	80	80
T111685	Load kVA	60.04	33.77	34.64	66.40	30.02	33.20	34.93	63.22	33.20	36.08	36.81	38.11
	Load Amps	166.67	83.33	83.33	167.67	83.33	83.33	83.33	175.48	92.15	91.78	91.59	91.67
	Max. Size of Fuse or Breaker	250	125	125	250	125	125	125	225	110	110	110	110
T111686	Load kVA	90.07	50.66	51.96	99.59	45.03	49.80	52.39	94.83	49.80	54.13	55.21	57.16
	Load Amps	250.00	125.00	125.00	250.00	125.00	125.00	125.00	263.22	138.22	137.67	137.39	137.50
	Max. Size of Fuse or Breaker	350	200	200	350	175	175	175	350	175	175	175	175
T111687	Load kVA	150.11	84.44	86.60	165.99	75.06	82.99	87.32	158.05	82.99	90.21	92.02	95.26
	Load Amps	416.67	208.33	208.33	416.67	208.33	208.33	208.33	438.70	230.37	229.44	228.99	229.17
	Max. Size of Fuse or Breaker	600	350	350	600	300	300	300	600	300	300	300	300
T211688①	Load kVA	225.17	126.66	129.90	248.98	112.58	124.49	130.99	237.07	124.49	135.32	138.02	142.89
	Load Amps	625.00	312.50	312.50	625.00	312.50	312.50	312.50	658.05	345.55	344.16	343.48	343.75
	Max. Size of Fuse or Breaker	1000	500	500	1000	450	450	450	800	400	400	400	400
T211689①	Load kVA	300.22	168.87	173.21	331.98	150.11	165.99	174.65	316.10	165.99	180.42	184.03	190.53
	Load Amps	833.33	416.67	416.67	833.33	416.67	416.67	416.67	877.40	460.74	458.88	457.97	458.33
	Max. Size of Fuse or Breaker	1200	700	700	1200	600	600	600	1200	600	600	600	600
Quantity Required		3	3	3	3	2	2	2	2	2	2	2	2
See Page 102 For Connection Diagrams		A-A	F-F	F-F	A-A	B-B	B-B	B-B	C-C	E-E	E-E	E-E	E-E

① See chart on page 101.

GROUP II

THREE PHASE		BOOSTING					BUCKING					
Line Voltage (Available)		183Y 106	208Y 120	195	208	225	240	245	250	256	265	272
Load Voltage (Output)		208	236	208	240	240	208	230	234	240	234	240
CAT. NO.												
T181054	Load kVA	1.13	1.28	1.13	0.63	1.30	0.56	1.33	1.35	1.39	0.72	0.74
	Load Amps	3.13	3.13	3.13	1.56	3.13	1.56	3.33	3.34	3.33	1.77	1.77
	Max. Size of Fuse or Breaker	6	6	6	3	6	3	6	6	6	3	3
T181055	Load kVA	2.25	2.55	2.25	1.27	2.60	1.13	2.65	2.71	2.77	1.43	1.47
	Load Amps	6.25	6.25	6.25	3.13	6.25	3.13	6.66	6.68	6.67	3.54	3.54
	Max. Size of Fuse or Breaker	15	15	15	6	15	6	15	15	15	6	6
T181056	Load kVA	3.38	3.83	3.38	1.90	3.90	1.69	3.98	4.06	4.16	2.15	2.21
	Load Amps	9.38	9.38	9.38	4.69	9.38	4.69	9.99	10.02	10.00	5.31	5.31
	Max. Size of Fuse or Breaker	15	15	15	10	15	10	15	15	15	10	10
T181057	Load kVA	5.63	6.39	5.63	3.17	6.50	2.81	6.63	6.77	6.93	3.59	3.68
	Load Amps	15.63	15.63	15.63	7.81	15.63	7.81	16.64	16.69	16.67	8.85	8.85
	Max. Size of Fuse or Breaker	25	25	25	15	25	15	20	20	20	15	15
T181058	Load kVA	11.26	12.77	11.26	6.33	12.99	5.63	13.26	13.53	13.86	7.17	7.36
	Load Amps	31.25	31.25	31.25	15.63	31.25	15.63	33.29	33.39	33.33	17.69	17.71
	Max. Size of Fuse or Breaker	45	45	45	25	45	20	40	40	40	20	20
T181059	Load kVA	16.89	19.16	16.89	9.50	19.49	8.44	19.89	20.30	20.78	10.76	11.04
	Load Amps	46.88	46.88	46.88	23.44	46.88	23.44	49.93	50.08	50.00	26.54	26.56
	Max. Size of Fuse or Breaker	70	70	70	35	70	30	60	60	60	30	30
T113073	Load kVA	22.52	25.55	22.52	12.67	25.98	11.26	26.52	27.06	27.71	14.34	14.72
	Load Amps	62.50	62.50	62.50	31.25	62.50	31.25	66.58	66.67	66.67	35.39	35.42
	Max. Size of Fuse or Breaker	90	90	90	45	90	35	80	80	80	40	40
T113074	Load kVA	33.77	38.32	33.77	19.00	38.97	16.89	39.87	40.59	41.57	21.52	22.08
	Load Amps	93.75	93.75	93.75	46.88	93.75	46.88	99.86	100.16	100.00	53.08	53.13
	Max. Size of Fuse or Breaker	150	150	125	70	125	60	125	125	125	60	60
T113075	Load kVA	45.03	51.10	45.03	25.33	51.96	22.52	53.04	54.13	55.43	28.69	29.44
	Load Amps	125.00	125.00	125.00	62.50	125.00	62.50	133.15	133.55	133.33	70.78	70.83
	Max. Size of Fuse or Breaker	200	200	175	90	175	70	175	175	175	80	80
T113076	Load kVA	67.55	76.64	67.55	38.00	77.94	33.77	79.57	81.19	83.14	43.03	44.17
	Load Amps	187.50	187.50	187.50	93.75	187.50	93.75	199.73	200.32	200.00	106.17	106.25
	Max. Size of Fuse or Breaker	300	300	250	150	250	110	250	250	250	125	125
T113077	Load kVA	112.58	127.74	112.58	63.33	129.90	56.29	132.61	135.32	138.56	71.72	73.50
	Load Amps	312.50	312.50	312.50	156.25	312.50	156.25	332.88	333.87	333.33	176.95	176.80
	Max. Size of Fuse or Breaker	450	450	450	225	450	175	400	400	400	200	200
T213078①	Load kVA	166.87	191.61	168.87	94.99	194.86	84.44	198.92	202.97	207.85	107.58	110.42
	Load Amps	468.75	468.75	468.75	234.38	468.75	234.38	499.32	500.80	500.00	265.42	265.63
	Max. Size of Fuse or Breaker	700	700	700	350	700	300	600	600	600	300	300
T213079①	Load kVA	225.17	255.48	225.17	126.66	259.81	112.58	265.22	270.63	277.13	143.44	147.22
	Load Amps	625.00	625.00	625.00	312.50	625.00	312.50	665.76	667.74	666.67	353.90	354.17
	Max. Size of Fuse or Breaker	1000	1000	1000	450	1000	350	800	800	800	400	400
Quantity Required		3	3	2	2	2	2	2	2	2	2	2
See Page 110 For Connection Diagrams		A-A	A-A	G-G	B-B	G-G	D-D	C-C	C-C	C-C	E-E	E-E

①See chart on page 101.

NOTE: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above bold face line are suitable for 50/60 Hz. All applications below bold face line are suitable for 60 Hz only. (2) Connection Diagrams A-A and F-F cannot be reverse connected.

GROUP III

THREE PHASE		BOOSTING								BUCKING							
Line Voltage (Available)		399Y 230	380	430	440	460	460	480	480	440	440	460	460	480	480	500	500
Load Voltage (Output)		480Y 277	420	473	462	506	483	528	504	400	419	438	418	457	436	455	477
CAT. NO.																	
T181061	Load kVA	0.86	0.76	0.85	1.66	0.91	1.74	0.95	1.82	0.79	1.58	1.66	0.83	1.73	0.86	0.90	1.80
	Load Amps	1.04	1.04	1.04	2.08	1.04	2.08	1.04	2.08	1.14	2.18	2.18	1.14	2.18	1.14	1.14	2.18
	Max. Size of Fuse or Breaker	3	3	3	6	3	6	3	6	3	6	6	3	6	3	3	6
T181062	Load kVA	1.73	1.51	1.70	3.33	1.82	3.48	1.90	3.63	1.59	3.17	3.31	1.66	3.46	1.73	1.80	3.61
	Load Amps	2.08	2.08	2.08	4.16	2.08	4.16	2.08	4.16	2.29	4.37	4.37	2.29	4.37	2.29	2.29	4.37
	Max. Size of Fuse or Breaker	6	6	6	10	6	10	6	10	6	10	10	6	10	6	6	10
T181063	Load kVA	2.60	2.27	2.56	4.99	2.73	5.22	2.85	5.45	2.38	4.75	4.97	2.48	5.19	2.59	2.70	5.41
	Load Amps	3.12	3.12	3.12	6.24	3.12	6.25	3.12	6.24	3.43	6.55	6.55	3.43	6.55	3.43	3.43	6.55
	Max. Size of Fuse or Breaker	10	6	6	15	6	15	6	15	6	15	15	6	15	6	6	15
T181064	Load kVA	4.33	3.78	4.26	8.32	4.56	8.70	4.76	9.08	3.96	7.92	8.28	4.14	8.64	4.32	4.51	9.02
	Load Amps	5.20	5.20	5.20	10.40	5.20	10.40	5.20	10.40	5.72	10.92	10.92	5.72	10.92	5.72	5.72	10.92
	Max. Size of Fuse or Breaker	15	10	10	15	10	15	10	15	10	15	15	10	15	10	10	15
T181065	Load kVA	8.60	7.56	8.52	16.64	9.11	17.40	9.51	18.16	7.93	15.85	16.57	8.28	17.29	8.64	9.02	18.04
	Load Amps	10.40	10.40	10.40	20.80	10.40	20.80	10.40	20.80	11.44	21.84	21.84	11.44	21.84	11.44	11.44	21.84
	Max. Size of Fuse or Breaker	20	15	15	30	15	30	15	30	15	30	30	15	30	15	15	30
T181066	Load kVA	12.90	11.34	12.77	24.97	13.67	26.10	14.27	27.24	11.89	23.77	24.85	12.42	25.93	12.96	13.52	27.07
	Load Amps	15.60	15.60	15.60	31.20	15.60	31.20	15.60	31.20	17.16	32.76	32.76	17.16	32.76	17.16	17.16	32.76
	Max. Size of Fuse or Breaker	25	25	25	45	25	45	25	45	20	40	40	20	40	20	20	40
T137920	Load kVA	17.30	15.12	17.03	33.29	18.23	34.80	19.02	36.31	15.85	31.70	33.14	16.57	34.57	17.28	18.03	36.09
	Load Amps	20.80	20.80	20.80	41.60	20.80	41.60	20.80	41.60	22.88	43.68	43.68	22.88	43.68	22.88	22.88	43.68
	Max. Size of Fuse or Breaker	35	30	30	60	30	60	30	60	30	60	60	30	60	30	30	60
T137921	Load kVA	25.90	22.69	25.55	49.93	27.34	52.20	28.53	54.47	23.78	47.55	49.71	24.85	51.86	25.92	27.05	54.13
	Load Amps	31.20	31.20	31.20	62.40	31.20	62.40	31.20	62.40	34.32	65.52	65.52	34.32	65.52	34.32	34.32	65.52
	Max. Size of Fuse or Breaker	50	45	45	90	45	90	45	90	40	80	80	40	80	40	40	80
T137922	Load kVA	34.60	30.25	34.07	66.58	36.46	69.60	38.04	72.63	31.70	63.40	66.27	33.13	69.15	34.56	36.06	72.18
	Load Amps	41.60	41.60	41.60	83.20	41.60	83.20	41.60	83.20	45.76	87.36	87.36	45.76	87.36	45.76	45.76	87.36
	Max. Size of Fuse or Breaker	70	60	60	110	60	110	60	110	60	110	110	60	110	60	60	110
T137923	Load kVA	52.00	45.45	51.18	100.03	54.69	104.57	57.07	109.12	47.63	95.25	99.57	49.77	103.89	51.92	54.18	108.44
	Load Amps	62.50	62.50	62.50	125.00	62.50	125.00	62.50	125.00	68.75	131.25	131.25	68.75	131.25	68.75	68.75	131.25
	Max. Size of Fuse or Breaker	100	90	90	175	90	175	90	175	80	175	175	80	175	80	80	175
T137924	Load kVA	86.10	75.62	85.17	166.44	91.15	174.01	95.11	181.57	79.26	158.50	165.69	82.83	172.87	86.39	90.16	180.44
	Load Amps	104.00	104.00	104.00	208.00	104.00	208.00	104.00	208.00	114.40	218.40	218.40	114.40	218.40	114.40	114.40	218.40
	Max. Size of Fuse or Breaker	175	150	150	300	150	300	150	300	150	300	300	150	300	150	150	300
T243570	Load kVA	129.30	113.43	127.75	249.66	136.72	261.01	142.67	272.36	118.89	237.75	248.53	124.24	259.31	129.59	135.23	270.66
	Load Amps	156.00	156.00	156.00	312.00	156.00	312.00	156.00	312.00	171.60	327.60	327.60	171.60	327.60	171.60	171.60	327.60
	Max. Size of Fuse or Breaker	250	225	225	450	225	450	225	450	200	400	400	200	400	200	200	400
T243571①	Load kVA	173.10	151.25	170.33	332.89	182.29	348.02	190.22	363.15	158.52	317.00	331.37	165.65	345.75	172.78	180.31	360.88
	Load Amps	208.00	208.00	208.00	416.00	208.00	416.00	208.00	416.00	228.80	436.80	436.80	228.80	436.80	228.80	228.80	436.80
	Max. Size of Fuse or Breaker	350	300	300	600	300	600	300	600	300	600	600	300	600	300	300	600
Quantity Required		3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
See Page 110 For Connection Diagrams		F-F	B-B	B-B	G-G	B-B	G-G	B-B	G-G	E-E	C-C	C-C	E-E	C-C	E-E	E-E	C-C

①See chart on page 101.

NOTE: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above bold face line are suitable for 50/60 Hz. All applications below bold face line are suitable for 60 Hz only. (2) Connection Diagrams A-A and F-F cannot be reverse connected.

SPECIFICATIONS ①

GROUP I

120 X 240 PRIMARY VOLTS — 12/24 SECONDARY VOLTS — 60 Hz

CATALOG NUMBER	INSULATING TRANSFORMER RATING	SECONDARY MAXIMUM CURRENT OUTPUT 12 V	24 V	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)	DIMENSIONAL DRAWINGS
T181047	0.05 kVA	4.16	2.08	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	A
T181048	0.10 kVA	8.32	4.16	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	A
T181049	0.15 kVA	12.52	6.25	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	A
T181050	0.25 kVA	20.80	10.40	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	B
T181051	0.50 kVA	41.60	20.80	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	B
T181052	0.75 kVA	62.50	31.25	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)	B
T111683	1.00 kVA	83.20	41.60	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	B
T111684	1.50 kVA	125.00	62.50	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	B
T111685	2.00 kVA	166.00	83.20	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	B
T111686	3.00 kVA	250.00	125.00	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	C
T111687	5.00 kVA	416.60	208.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	C
T211688	7.50 kVA	625.00	312.50	20.81 (52.9)	11.12 (28.2)	10.84 (27.5)	125 (56.7)	D
T211689	10.00 kVA	833.00	416.60	20.81 (52.9)	11.75 (29.8)	11.59 (29.4)	160 (72.6)	D

GROUP II

120 X 240 PRIMARY VOLTS — 16/32 SECONDARY VOLTS — 60 Hz

CATALOG NUMBER	INSULATING TRANSFORMER RATING	SECONDARY MAXIMUM CURRENT OUTPUT 16 V	32 V	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)	DIMENSIONAL DRAWINGS
T181054	0.05 kVA	3.12	1.56	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	A
T181055	0.10 kVA	6.25	3.12	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	A
T181056	0.15 kVA	9.38	4.69	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	A
T181057	0.25 kVA	15.60	7.80	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	B
T181058	0.50 kVA	31.20	15.60	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	B
T181059	0.75 kVA	46.90	23.40	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)	B
T113073	1.00 kVA	62.50	31.20	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	B
T113074	1.50 kVA	93.70	46.90	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	B
T113075	2.00 kVA	125.00	62.50	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	B
T113076	3.00 kVA	187.50	93.80	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	C
T113077	5.00 kVA	312.00	156.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	C
T213078	7.50 kVA	468.00	234.00	20.81 (52.9)	11.12 (28.2)	10.84 (27.5)	125 (56.7)	D
T213079	10.00 kVA	625.00	312.00	20.81 (52.9)	11.75 (29.8)	10.84 (27.5)	160 (72.6)	D

GROUP III

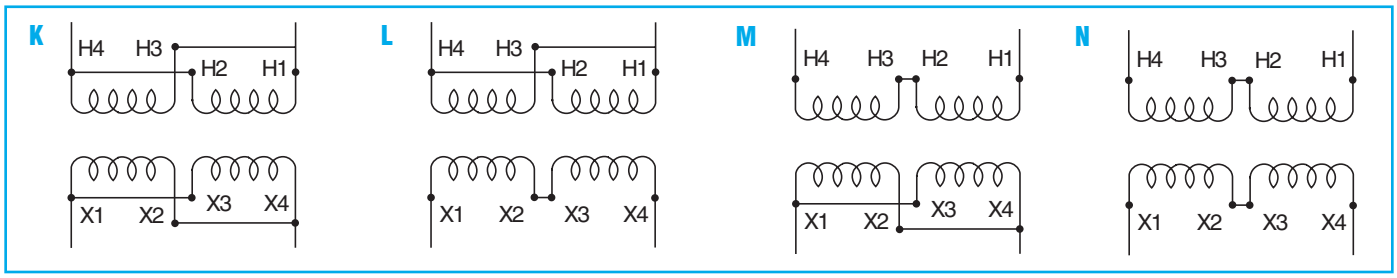
240 X 480 PRIMARY VOLTS — 24/48 SECONDARY VOLTS — 60 Hz

CATALOG NUMBER	INSULATING TRANSFORMER RATING	SECONDARY MAXIMUM CURRENT OUTPUT 24 V	48 V	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)	DIMENSIONAL DRAWINGS
T181061	0.05 kVA	2.08	1.04	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	A
T181062	0.10 kVA	4.16	2.08	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	A
T181063	0.15 kVA	6.24	3.12	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	A
T181064	0.25 kVA	10.40	5.20	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	B
T181065	0.50 kVA	20.80	10.40	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	B
T181066	0.75 kVA	31.20	15.60	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)	B
T137920	1.00 kVA	41.60	20.80	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	B
T137921	1.50 kVA	62.40	31.20	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	B
T137922	2.00 kVA	83.20	41.60	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	B
T137923	3.00 kVA	125.00	62.50	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	C
T137924	5.00 kVA	208.00	104.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	C
T243570	7.50 kVA	312.00	156.00	20.81 (52.9)	11.12 (28.2)	10.84 (27.5)	135 (61.2)	D
T243571	10.00 kVA	416.00	208.00	20.81 (52.9)	11.75 (29.8)	11.59 (29.4)	160 (72.6)	D

① All units have ground studs for use with non-metallic conduit. All sizes of 0.75 kVA and less are suitable for 50/60 Hertz. Additional field wiring box may be required when using units as autotransformers.

LOW VOLTAGE LIGHTING WIRING DIAGRAMS

SINGLE PHASE



GROUP I

Units Rated 120 x 240 V Input: 12/24 V Output		
INPUT	OUTPUT	CONNECTION DIAGRAM
120	12	K
120	24	L
240	12	M
240	24	N

GROUP II

Units Rated 120 x 240 V Input: 16/32 V Output		
INPUT	OUTPUT	CONNECTION DIAGRAM
120	16	K
120	32	L
240	16	M
240	32	N

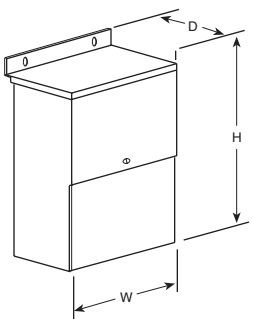
GROUP III

Units Rated 240 x 480 V Input: 24/48 V Output		
INPUT	OUTPUT	CONNECTION DIAGRAM
240	24	K
240	48	L
480	24	M
480	48	N

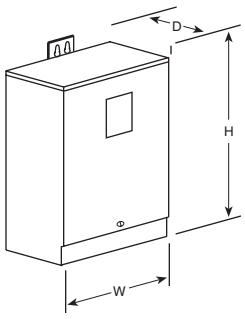
Number of Leads per Termination								
	H1	H2	H3	H4	X1	X2	X3	X4
T213078	1	1	1	1	2	2	2	2
T213079	1	1	1	1	2	2	2	2
T243571	1	1	1	1	2	2	2	2
T211688	1	1	1	1	2	2	2	2
T211689	1	1	1	1	2	2	2	2

All leads with same designation (ex. X1, X1) MUST be joined together for proper operation.

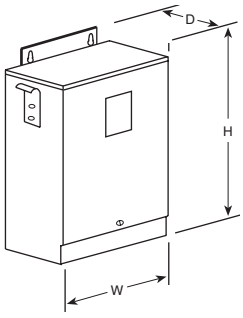
BUCK-BOOST DIMENSIONAL DRAWINGS



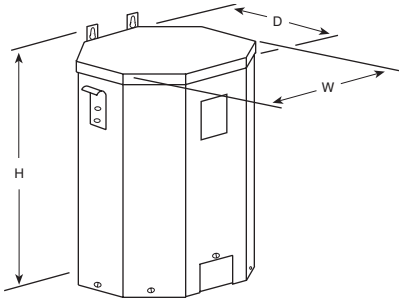
DESIGN A



DESIGN B



DESIGN C



DESIGN D

NOTE: All designs listed above are totally enclosed and suitable for UL 3R outdoor service.

BUCK-BOOST WIRING DIAGRAMS ① — SINGLE PHASE

FIG. C

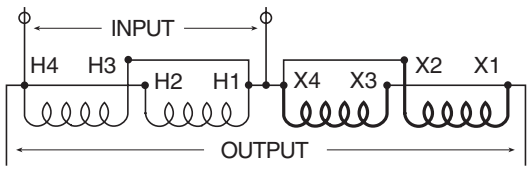


FIG. D

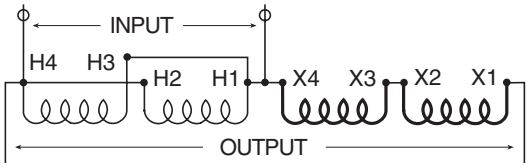


FIG. E

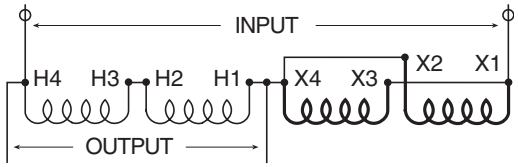


FIG. F

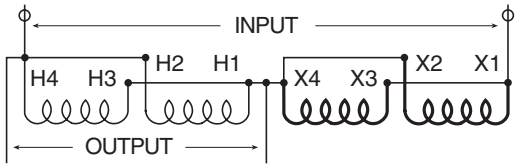


FIG. G

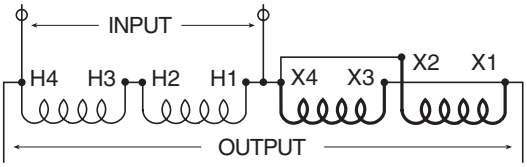


FIG. H

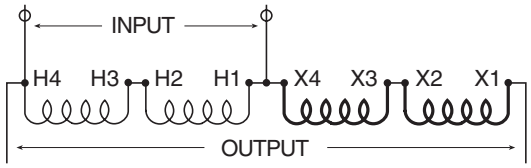


FIG. I

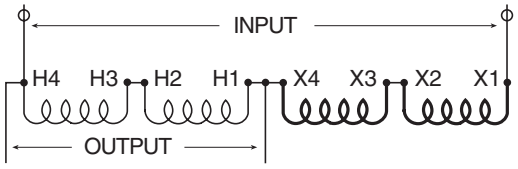
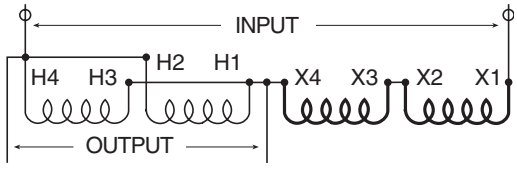


FIG. J



BUCK-BOOST WIRING DIAGRAMS ① — THREE PHASE

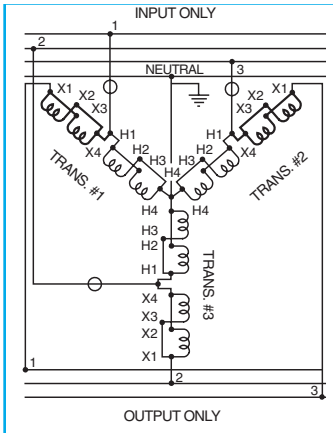


FIG. AA ▯ **WYE**

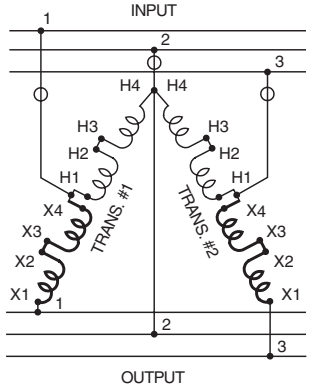


FIG. BB **OPEN DELTA**

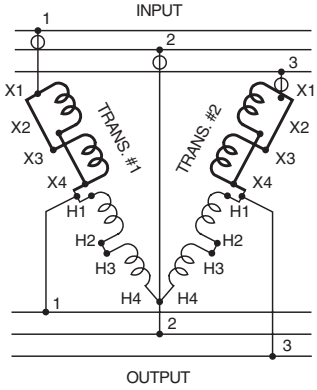


FIG. CC **OPEN DELTA**

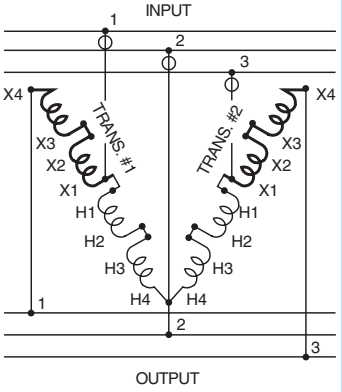


FIG. DD **OPEN DELTA**

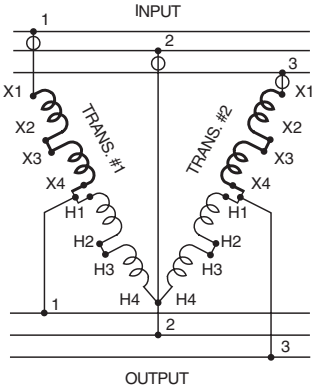


FIG. EE **OPEN DELTA**

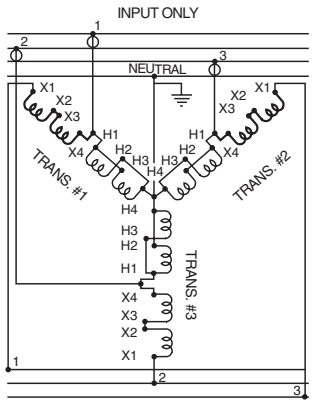


FIG. FF ▯ **WYE**

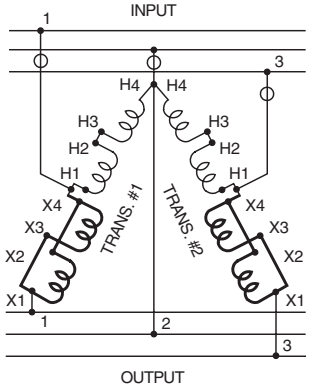
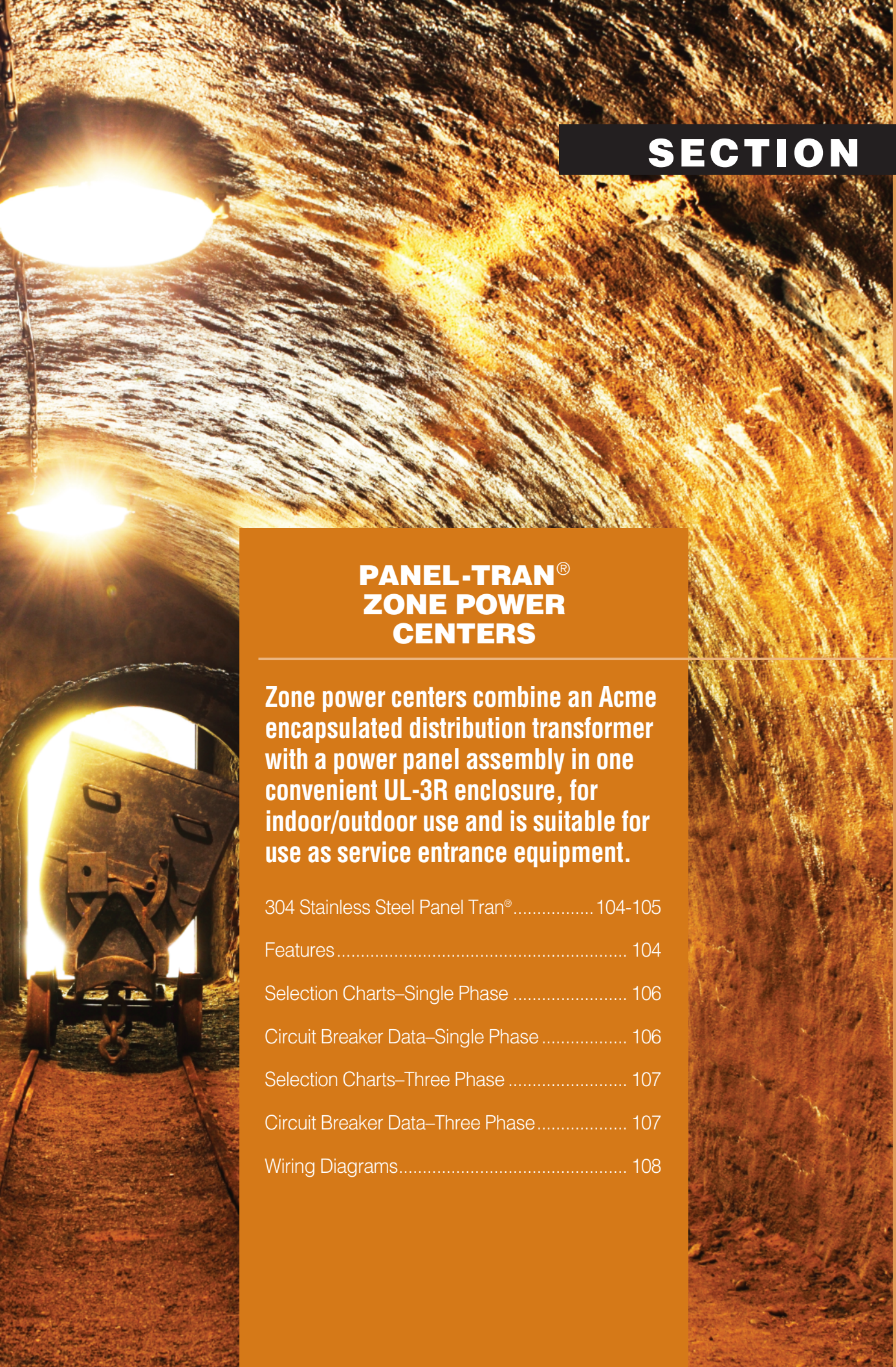


FIG. GG **OPEN DELTA**

① The symbol O used in these connection diagrams indicates where to field install the over-current protective device, typically a fuse or circuit breaker.

② Cannot be reverse connected.

IMPORTANT: Refer to the N.E.C. (National Electrical Code) Article 450-4 for overcurrent protection of an autotransformer. These connection diagrams are packed with each buck-boost transformer. Do not use connections other than those shown above.



SECTION 8

PANEL-TRAN® ZONE POWER CENTERS

Zone power centers combine an Acme encapsulated distribution transformer with a power panel assembly in one convenient UL-3R enclosure, for indoor/outdoor use and is suitable for use as service entrance equipment.

Convenient Package Saves Costs and Space

PT061150005LS

PTBA3150015LS

Acme's Panel-Tran® Power Center is a pre-wired combination of a primary breaker disconnect, dry-type shielded transformer, secondary breaker disconnect and a secondary power panel all in one convenient package.

You save time, space and money by not having to individually assemble, mount and wire these components. Simply add the breakers of your choice and you're ready to go.

FEATURES

- 600 volt class and below
- Single and three phase, 480 and 600 volt primary, 60 Hz
- Primary and secondary main circuit breakers provided
- UL-3R enclosure
- 5 through 25 kVA single phase, 9 through 30 kVA three phase
- Meets or exceeds UL, CSA, NEMA, ANSI and OSHA Standards
- UL Listed and CSA Certified
- Ten-year limited warranty
- Shielded for cleaner power
- Available in 304 stainless steel

304 STAINLESS STEEL PANEL-TRAN®

FEATURES

- 3R Enclosure.
- Abundant knockouts provided.
- Encapsulated construction.
- Single phase: 5 – 25 kVA.
  Three phase: 9 – 30 kVA.

APPLICATIONS

- Harsh industrial locations
- Corrosive chemical exposure
- Waste water treatment facilities
- Coastal or marine applications with high salt spray level
- Any application where painted cold roll steel is not adequate

ELECTRICAL CHARACTERISTICS

SINGLE PHASE

Primary Voltage:
480 Volts; 600 Volts Single Phase, 60 Hz
2 – 5% BNFC taps

Secondary Voltage:
240/120 Volts Single Phase, 60 Hz
Three wire system

kVA's Available:
5, 7.5, 10, 15 and 25 kVA

THREE PHASE

Primary Voltage:
480 Volts Delta; 600 Volts Delta Three Phase, 60 Hz
With 2 – 5% BNFC taps

Secondary Voltage:
208Y/120 Volts Three Phase, 60 Hz
Four wire system

kVA's Available:
9, 15, 22.5 and 30 kVA

Insulation Class:
180°C, UL recognized system, 115°C rise

Regulation:
2 – 3% at unity power factor

UL-3R Enclosures All Panel-Tran® enclosures are UL-3R listed for indoor and outdoor use.

Transformer Assembly Acme totally encapsulated distribution transformers are designed for general purpose indoor/outdoor operation. Panel-Tran® can be installed in a wide variety of atmospheric and environmental conditions. A 180°C, UL recognized insulation system is used.

Panel-Tran® units are electrostatically shielded to provide transient voltage protection at no extra cost.

Panel Assembly The power panel assembly will accommodate one-inch, 1, 2 or 3-pole, common trip, duplex secondary branch circuit breakers and ground fault circuit breakers. Per UL and NEC requirements, the Panel-Tran® assembly comes fully equipped with primary and secondary main circuit breakers. Branch circuit breakers should be obtained from our local distributor once you have established your branch circuit requirements.

Panel-Tran® — Why? Panel-Tran® eliminates the normal tangled masses of secondary circuit feeders and gives your industrial/commercial distribution systems new flexibility. Use your high voltage bus to full advantage by putting power where the problem is. Reduce cost — save space — keep flexible.

Panel-Tran® — Where? Anywhere 120, 208 or 240 volt branch circuits are required. Typically, Panel-Tran® is best applied in situations similar to the following: Powering foreman centers, vending machine areas, factory test set- ups, office buildings, mining applications, assembly lines, portable or temporary power sources, parking lots, small machine set-ups, light industrial areas, warehouses, and numerous other locations. Use where your branch circuits may require future change or expansion.

UL Listed Panel-Tran® has been listed by Underwriters' Laboratories for both indoor and outdoor operation under their unit substation classification, file number E-56936. In addition, Panel-Tran® is UL listed as suitable for use as Service Entrance Equipment.

Meets The NEC Panel-Tran® fully complies with Article 450-3 of the latest edition of the NEC.

Protection A primary main breaker protects the transformer and acts as a disconnect device. This primary main breaker has a high interrupting capacity to handle fault conditions. A secondary main breaker, between the transformer and the panel, is required by the N.E.C.

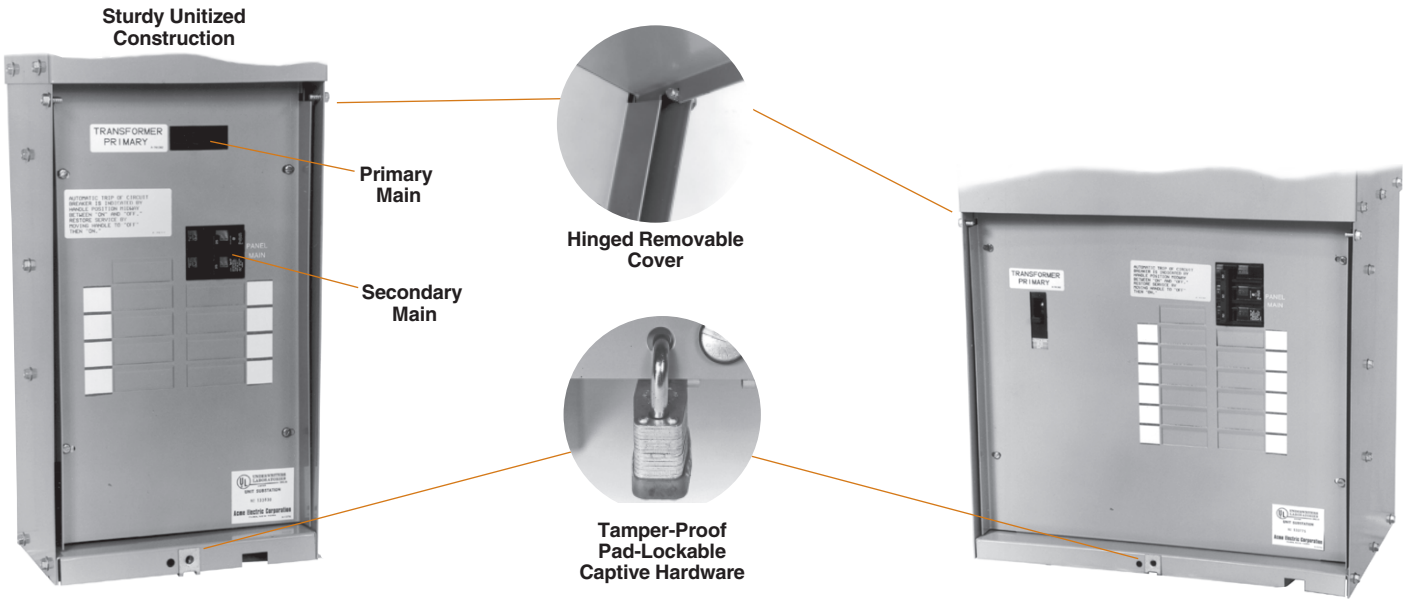
Branch Circuits Typical 1" snap in circuit breakers, regular or duplex, must be field installed. They are not provided with the Panel-Tran® unit. A secondary ground is provided within the wiring compartment for accepting your branch unit. All of the breakers, including the primary main, secondary main, and branch circuit breakers are located in the lower section of the Panel-Tran®. This lower section is protected by a hinged, removable front cover which can be padlocked for safety.

Recommended Branch Breakers We suggest using branch breakers of the same manufacture as the panel in Panel-Tran®. Please contact the factory for the proper branch breaker recommendation.

Acme reserves the right to change breaker and panel manufacturers without notification.

Connections All Panel-Tran® connections will accept copper or aluminum conductor.

FEATURES



SELECTION CHARTS

SINGLE PHASE

GROUP I

480 PRIMARY VOLTS — 240/120 SECONDARY VOLTS — 1Ø, 60 Hz

KVA	CATALOG NO.	MAXIMUM SECONDARY CIRCUITS ① 120 V	240 V	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)
5.0	PT061150005LS	8	4	32.13 (81.6)	13.25 (33.7)	7.63 (19.4)	120 (54.4)
7.5	PT061150007LS	8	4	32.13 (81.6)	15.88 (40.3)	11.00 (27.9)	160 (72.6)
10.0	PT061150010LS	8	4	34.38 (87.3)	15.88 (40.3)	11.00 (27.9)	185 (83.9)
15.0	PT061150015LS	12	6	34.38 (87.3)	17.13 (43.5)	12.38 (31.4)	240 (109.0)
25.0	PT061150025LS	20	10	41.88 (106.4)	17.88 (45.4)	13.50 (34.3)	330 (150.0)

GROUP I – 304 SS

304 STAINLESS STEEL
480 PRIMARY VOLTS — 240/120 SECONDARY VOLTS — 1Ø, 60 Hz

KVA	CATALOG NO.	MAXIMUM SECONDARY CIRCUITS ① 120 V (1-POLE)	240 V (2-POLE)	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)
5.0	PT061150005SS	8	4	32.13 (81.6)	13.25 (33.7)	7.63 (19.4)	120 (54.4)
7.5	PT061150007SS	8	4	32.13 (81.6)	15.88 (40.3)	11.00 (27.9)	160 (72.6)
10.0	PT061150010SS	8	4	34.38 (87.3)	15.88 (40.3)	11.00 (27.9)	185 (83.9)
15.0	PT061150015SS	12	6	34.38 (87.3)	17.13 (43.5)	12.38 (31.4)	240 (109.0)
25.0	PT061150025SS	20	10	41.88 (106.4)	17.88 (45.4)	13.50 (34.3)	330 (150.0)

Circuit Breaker Data②

480 VOLTS TO 240/120 VOLTS

1Ø KVA	480 VOLTS PRIMARY BREAKER	240/120 VOLTS SECONDARY MAIN	MAXIMUM RATING OF SECONDARY BREAKERS
5.0	ED42B025L (25A)	Q225 (25A)	20 amps
7.5	ED42B025L (25A)	Q240 (40A)	30 amps
10.0	ED42B035L (35A)	Q250 (50A)	40 amps
15.0	ED42B050L (50A)	Q270 (70A)	60 amps
25.0	ED42B090L (90A)	Q2125 (125A)	100 amps

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.
② 18,000 Amps RMS Symmetrical Interrupting Capacity.

SELECTION CHARTS

THREE PHASE

GROUP A

480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

KVA	CATALOG NO.	MAX. SECONDARY CIRCUITS ① 1Ø 120 V (1-Pole)	MAX. SECONDARY CIRCUITS ① 3Ø 208 V (3-Pole)	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)
9.0	PTBA3150009LS	12	4	33.75 (85.7)	22.13 (56.2)	7.63 (19.4)	255 (116.0)
15.0	PTBA3150015LS	12	4	35.13 (89.2)	22.13 (56.2)	12.38 (31.4)	385 (175.0)
22.5	PTBA3150022LS	18	6	38.25 (97.2)	30.25 (76.8)	13.38 (34.0)	535 (243.0)
30.0	PTBA3150030LS	24	8	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	680 (308.0)

GROUP A – 304 SS

304 STAINLESS STEEL
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

KVA	CATALOG NO.	MAX. SECONDARY CIRCUITS ① 1Ø 120 V (1-Pole)	MAX. SECONDARY CIRCUITS ① 3Ø 208 V (3-Pole)	APPROX. DIMENSIONS INCHES (CM.) HEIGHT	WIDTH	DEPTH	APPROX. NET WEIGHT LBS. (KG.)
9.0	PTBA3150009SS	12	4	33.75 (85.7)	22.13 (56.2)	7.63 (19.4)	255 (116.0)
15.0	PTBA3150015SS	12	4	35.13 (89.2)	22.13 (56.2)	12.38 (31.4)	385 (175.0)
22.5	PTBA3150022SS	18	6	38.25 (97.2)	30.25 (76.8)	13.38 (34.0)	535 (243.0)
30.0	PTBA3150030SS	24	8	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	680 (308.0)

Circuit Breaker Data②

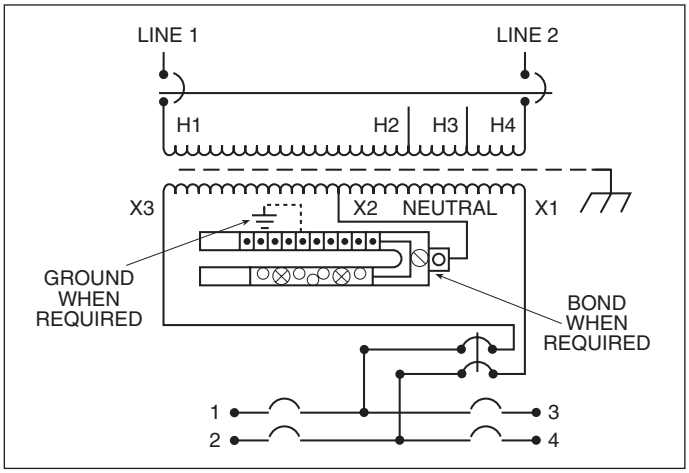
480 VOLTS DELTA TO 208Y/120 VOLTS

3Ø KVA	480 VOLTS PRIMARY BREAKER	208Y/120 VOLTS SECONDARY MAIN	MAXIMUM RATING OF SECONDARY BREAKERS
9.0	ED43B025L (25A)	Q330 (30A)	25 amps
15.0	ED43B040L (40A)	Q350 (50A)	40 amps
22.5	ED43B070L (70A)	Q370 (70A)	60 amps
30.0	ED43B090L (90A)	Q3100 (100A)	80 amps

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.
② 10,000 Amps RMS Symmetrical Interrupting Capacity.

PANEL-TRAN® ZONE POWER CENTERS WIRING DIAGRAMS SINGLE PHASE

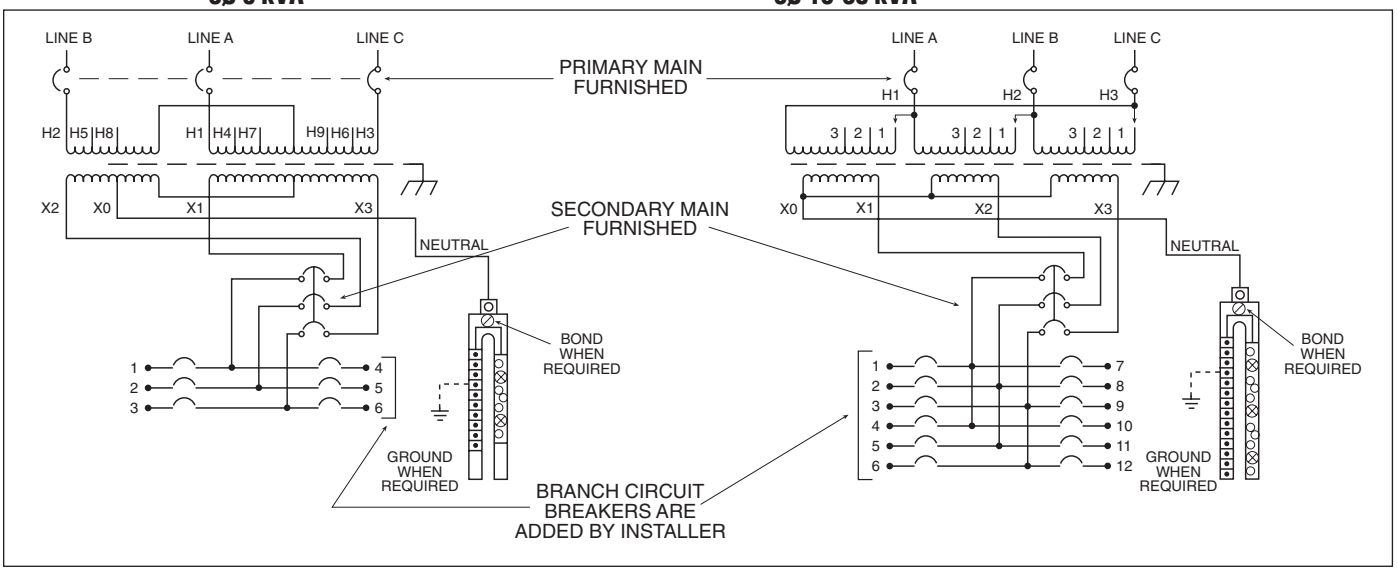
Wiring Diagram 1Ø 5-25 kVA



PANEL-TRAN® ZONE POWER CENTERS WIRING DIAGRAMS THREE PHASE

3Ø 9 kVA

3Ø 15-30 kVA



SECTION 9

AIR CONDITIONING, REFRIGERATION & APPLIANCE TRANSFORMERS

An economical approach to changing world voltages to 115V for operation of air conditioners, refrigeration equipment, appliances, business machines, and related equipment.

Air Conditioning, Refrigeration & Appliance Transformers

The transformers in this section are autotransformers designed to change a wide range of voltages to the standard motor voltages for domestic appliances, air conditioners, and related equipment.

Correcting high or low supply voltage conditions to match the voltage requirements of appliances and equipment aids in safe, efficient operation.

These Acme autotransformers change or correct off-standard voltage that may be the result of:

1. Line supply voltage not matching the appliance motor nameplate voltage, (e.g., supply voltage is 380Y/220V, three phase, four wire. Appliance motor operates on 110 V, single phase. See schematic).

2. Low voltage due to inadequate wiring capacity in the electrical distribution system.

3. Low voltage caused by distribution of power over a long distance.

4. High or low voltages supplied by the utility company.

Standard voltages and frequencies (Hz) vary throughout many countries of the world. Since these autotransformers are suitable for 50/60 Hz (cycle) service, they are applicable in export trade where it is necessary to change to a standard voltage for appliance operation.

These transformers are capable of adjusting voltage only; they can't change the frequency of a supply circuit. However, in most instances, 60 Hz (cycle) equipment can be operated from a 50 Hz supply if the voltage is reduced approximately 8-10%. For example, 115 V, 60 Hz equipment can usually be operated on 50 Hz at 105 V.

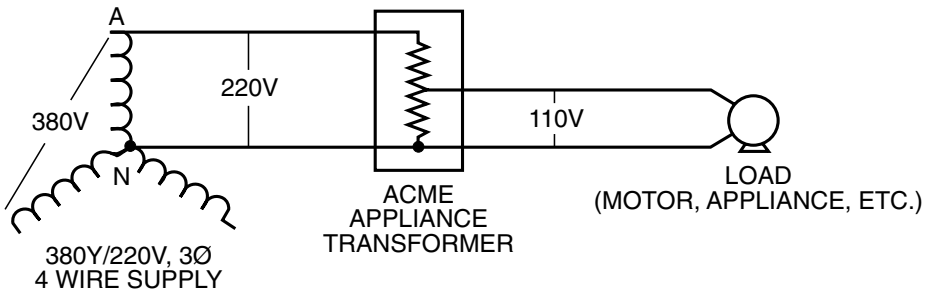
Some common uses for Acme Air Conditioning, Refrigeration and Appliance transformers include adjustment of off-standard voltage to the nominal voltages required to operate:

a) Air conditioners, television receivers, all home appliances.

b) Hermetically sealed refrigeration motors.

c) Individual machine lighting, tool post grinders, fans, convenience outlets for portable lights, power tools.

d) Magnetic contactors, relays, AC motors and similar devices requiring large starting (inrush) currents.



Construction Features

Acme appliance transformers are autotransformers. The input (primary) winding is in electrical series connection with the output (secondary) winding; the input and output are not electrically isolated.

The autotransformer principle is the most economical for appliance applications, since only the difference between input voltage and output voltage is transformed. This results in smaller size, reduced weight and lower cost.

All units are constructed of core lamination processed from annealed electrical grade silicon steel. This improves transformer efficiency by keeping heat losses at a minimum.

Coils are precision machine wound and hand finished. The core and coil combination is impregnated with electrical grade varnish, then heat cured. This provides cool operation and protects the transformer from moisture and contamination. The result is long transformer life.

The transformers in this section will not cause harmonic distortion to voltage or current wave shape.

All transformers in Group C are equipped with a SAFETY grounding feature on both the input and output side.

Connection for ground may be made through lead wires or through plug and receptacle combinations where installed.

All units are manufactured and tested in accordance with National Electrical Manufacturers Association standards.

Some groups are equipped with primary voltage taps which correct for voltage conditions constantly above or below the nominal rating of the supply.

Selection Steps

1. Determine the value of incoming line supply voltage and frequency (50 or 60 Hz).
2. Find the appliance or load equipment voltage rating and amperes from the nameplate or instruction sheet. Multiply the two to obtain VA requirement of the load. If the power requirements are listed only in watts, consider this the same as VA. (Exception: electric discharge lighting such as mercury vapor, fluorescent, etc. should always be sized by volts x amps (VA). If only wattage ratings are known, double this requirement to obtain VA ratings of transformers needed).
3. Add all VA requirements of equipment to obtain total load. (All components must be of same voltage rating).
4. Add 10% for high starting current and overloading to obtain VA size of transformers.
5. Select transformer from charts on following pages using combination of supply voltage (primary), voltage rating of equipment (secondary), load VA rating, and type of connections desired.

Catalog # T160812

Secondary Receptacle

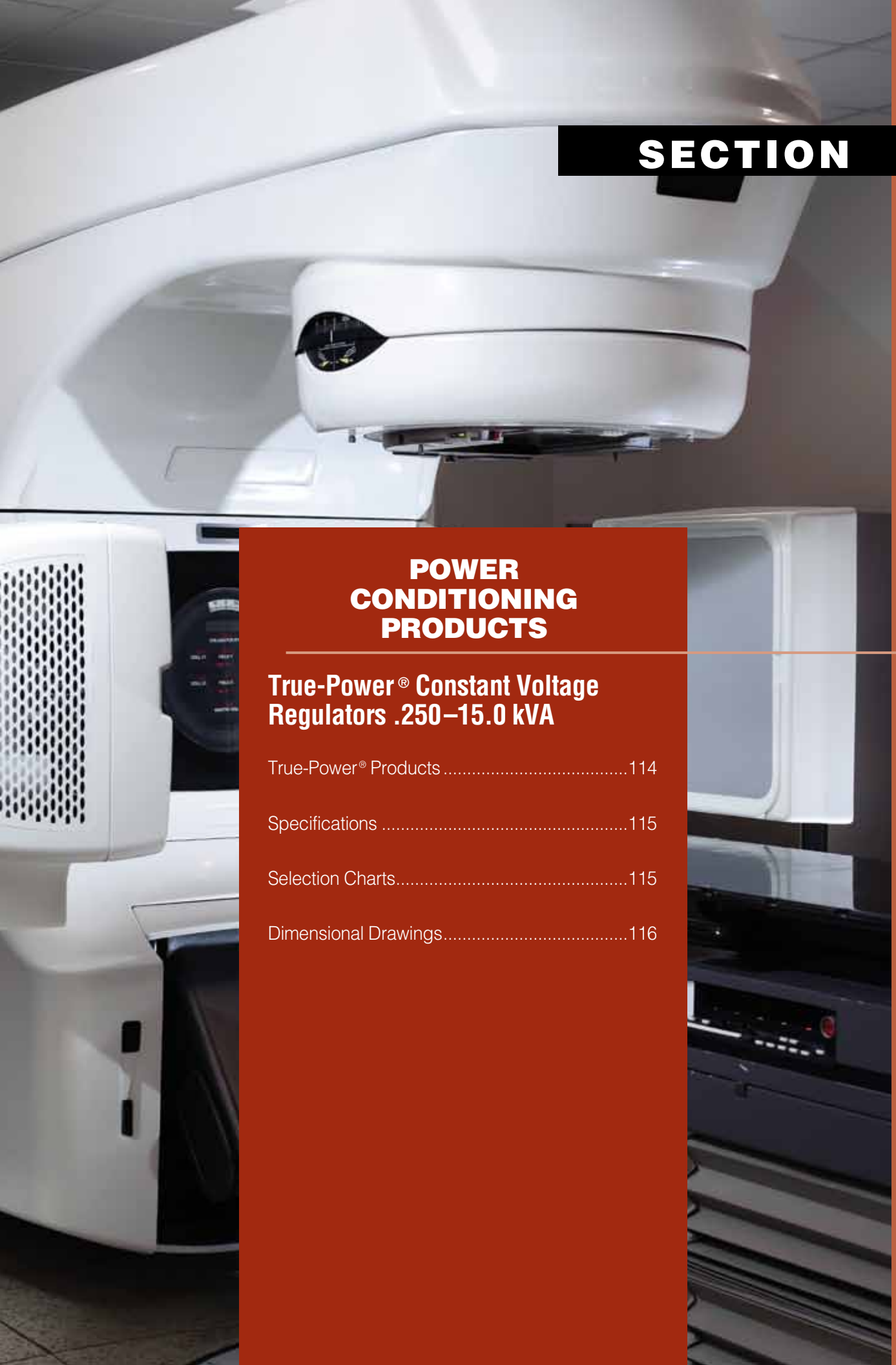
6' (1.8 M) Primary Cord

GROUP C

PRIMARY VOLTS — 200/220/240 SECONDARY VOLTS — 115, 50/60 Hz

CATALOG NO.	VA RATING	OUTPUT AMPS	APPROX. DIMENSIONS INCHES (CM.)			APPROX. SHIP WEIGHT LBS. (KG.)	CONNECTIONS FEET (METERS)
			HEIGHT	WIDTH	DEPTH		
T160830 ①	200	1.74	9.16 (23.3)	3.89 (9.9)	3.67 (9.3)	6 (2.7)	6 (1.8) primary cord and secondary receptacle
T160831 ①	300	2.61	9.16 (23.3)	3.89 (9.9)	3.67 (9.3)	6 (2.7)	6 (1.8) primary cord and secondary receptacle
T160832 ①	400	3.48	9.16 (23.3)	3.89 (9.9)	3.67 (9.3)	8 (3.6)	6 (1.8) primary cord and secondary receptacle
T160833 ①	500	4.35	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	10 (4.5)	6 (1.8) primary cord and secondary receptacle
T160834 ①	1000	8.70	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	14 (6.4)	6 (1.8) primary cord and secondary receptacle
T160835 ①	2000	17.40	11.50 (29.2)	7.81 (19.8)	7.13 (18.1)	27 (12.2)	6 (1.8) primary cord and secondary receptacle

① All models can be reverse connected with input voltage applied to secondary terminals and output voltage available at primary terminals. Do not exceed rating voltages. Transformer VA capacity will remain the same.



SECTION 10

POWER CONDITIONING PRODUCTS

True-Power® Constant Voltage Regulators .250–15.0 kVA

Acme® True-Power® Constant Voltage Regulators

Acme True-Power® products consist of speciality designed ferroresonant transformers. Although ferroresonant transformers have been an economical solution to power problems for many years, it took the skills of Acme's highly regarded engineering staff to refine it to meet today's exacting requirements.

For example, typical ferroresonant transformers have an input limited to 100-130 V. Acme's True-Power® units have an input range of +10/-20% around input voltage nominals of 120/208/240 and 480 volts. At 120 volt input, this relates to 95-130 volts.

The typical ferroresonant transformer has limited electrical noise suppression capability. True-Power® power line conditioners have the following noise attenuation capability:

Common Mode: 120 db
Transverse Mode: 60 db

The typical ferroresonant transformer has an audible hum that can be objectionable in most offices. Acme's True-Power® power line conditioners are encapsulated in epoxy to lower sound levels below ANSI standard C 89.2.

The typical ferroresonant transformer has on output regulation of ± 3% for input line changes only. Acme's True-Power® power line conditioners have an output regulation of ± 3% for input line and load changes, making them suitable for operation at any load condition.

FEATURES

- Reliable, regulated output voltage when input voltage varies, even to brownout levels.
- Extended operation to 65% of nominal when operated at 60% of full load.
- Noise rejection—effectively suppressing transient spikes and surges—120 db common mode and 60 db transverse mode.
- Rapid response to line and load changes—5% variation in 8m sec, 10% variation in 16m sec.
- Hold up time of 3m sec for complete loss of input power.
- Inherent overload and short circuit protection, without thermo protectors, fuses or circuit breakers, for immediate recovery when the overload is removed.
- Sinusoidal output features, less than 3% harmonic distortion, improves input wave forms which have total harmonic distortions of greater than 5%.
- Available in 250 through 15,000 VA in hardwired models.
- Handle multiple primary input voltages.
- Illuminated ON/OFF switch, multiple output receptacles and six foot input power cord on portable units.
- UL Listed.
- CSA Certified

APPLICATIONS

- Industrial Automation and Control Equipment
- Electronic Test Equipment
- Robotics
- X-Ray Eauipment
- Communications Equipment

Product Selection Guide

PROBLEM ENCOUNTERED	Shielded Isolation Transformer	True-Power®	SPS	UPS
Power Failure	—	—	X	X
Widely Varying Source Voltage	—	X	—	X
Brown Outs	—	X	X	X
Switching Of Power Factor Correction Capacitors	X	X	X	X
Distorted Wave Shape Due To Harmonic Content	—	X	—	X
Common-Mode Transients	X	X	—	X
Transverse-Mode Transients	—	X	X	X
Voltage Spikes Due To Proximity Of Welding Equipment Or Certain Medical Diagnostic Equipment	X	X	X	X
Line Distortion Due To Noise Generated From Occasional Lightning Strikes	X	X	X	X
Operation Of Computer Storage Devices Such As Floppy Disks Or Winchester Drives Generates Transients	X	X	X	X

SPECIFICATIONS

Input (Primary)	95-132 VAC (Hardwired) ②
	166-228 VAC
	192-264 VAC
	384-528 VAC
Phase:	1 Phase

Output (Secondary)	120/208/240 VAC (Hardwire)
Load Range	0-100%
Regulation	± 3% for line/load changes
Attenuation	120 db Common Mode Noise 60 db Transverse Mode Noise
Audible Noise	Below ANSI std. C 89.2

SELECTION CHARTS

GROUP II

HARDWIRED MODELS — CONSTANT VOLTAGE REGULATORS
95-132 X 166-228 X 192-264 X 384-528 VOLT PRIMARY — 120/208/240 VOLT SECONDARY — 1Ø, 60 Hz

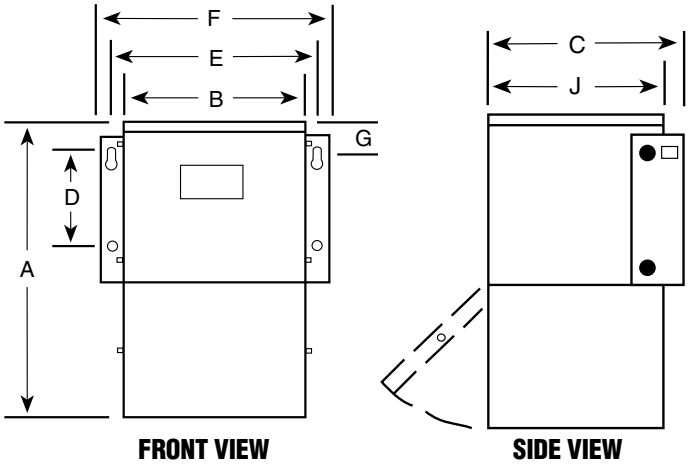
KVA SIZE	CATALOG NUMBER	APPROX. DIMENSIONS③ INCHES (CM.) A HEIGHT	B WIDTH	C DEPTH	D	E	F	G	H	J	TYPE MTG.	APPROX. SHIP WEIGHT LBS. (KG.)	FIGURE	WIRING DIAGRAMS SEE PAGE 147
0.25	T169430	15.50 (39.4)	6.30 (16.0)	5.80 (14.7)	5.63 (14.3)	8.13 (20.7)	9.30 (23.6)	1.2 (3.0)	.41 x .81 (1.0 x 2.1)	5.00 (12.7)	F&W	37 (16.8)	II	16
0.35	T169431	17.00 (43.2)	7.00 (17.8)	7.30 (18.5)	5.63 (14.3)	8.13 (20.7)	9.40 (23.9)	2.3 (5.8)	.41 x .81 (1.0 x 2.1)	6.50 (16.5)	F&W	51 (23.1)	II	16
0.50	T169432	17.00 (43.2)	7.00 (17.8)	7.30 (18.5)	5.63 (14.3)	8.13 (20.7)	9.40 (23.9)	2.3 (5.8)	.41 x .81 (1.0 x 2.1)	6.50 (16.5)	F&W	53 (24.0)	II	16
0.75	T169433	17.00 (43.2)	7.00 (17.8)	7.30 (18.5)	5.63 (14.3)	8.13 (20.7)	9.40 (23.9)	2.3 (5.8)	.41 x .81 (1.0 x 2.1)	6.50 (16.5)	F&W	65 (29.5)	II	16
1.00	T169434	18.50 (47.0)	6.50 (16.5)	8.55 (21.7)	5.63 (14.3)	8.13 (20.7)	9.50 (24.1)	2.3 (5.8)	.41 x .81 (1.0 x 2.1)	7.75 (19.7)	F&W	82 (37.2)	II	16
2.00	T169435	19.00 (48.3)	10.50 (26.7)	10.20 (25.9)	6.00 (15.2)	12.00 (30.5)	13.25 (33.7)	2.3 (5.8)	.44 x .63 (1.1 x 1.6)	9.40 (23.9)	F&W	142 (64.4)	III	16
3.00	T169436	19.00 (48.3)	10.50 (26.7)	10.20 (25.9)	6.00 (15.2)	12.00 (30.5)	13.25 (33.7)	2.3 (5.8)	.44 x .63 (1.1 x 1.6)	9.40 (23.9)	F&W	176 (79.8)	III	16
5.00	T169437	22.00 (55.9)	12.54 (31.9)	12.20 (31.0)	6.00 (15.2)	14.00 (35.6)	15.25 (38.7)	2.3 (5.8)	.44 x .63 (1.1 x 1.6)	11.40 (29.0)	F&W	295 (134.0)	III	16
10.00	T169438	23.06 (58.6)	27.31 (69.4)	24.06 (61.1)	18.00 (45.7)	25.50 (64.8)	—	—	.56 (1.4)	—	F&W①	605 (274.0)	IV	16
15.00	T169439	23.06 (58.6)	40.13 (101.9)	24.06 (61.1)	18.00 (45.7)	38.31 (97.3)	—	—	.56 (1.4)	—	F	880 (399.0)	IV	16

F = Floor W = Wall

① Wall mounting brackets required for this size. Refer to Page 133.
② All hardwired models will accommodate these primary input voltages.
③ Dimensions not suitable for construction. Contact factory.

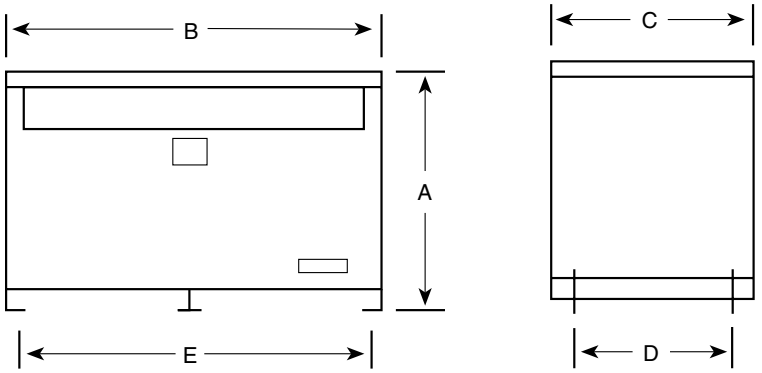
CONSTANT VOLTAGE REGULATORS DIMENSIONAL DRAWINGS

FIGURE II & III

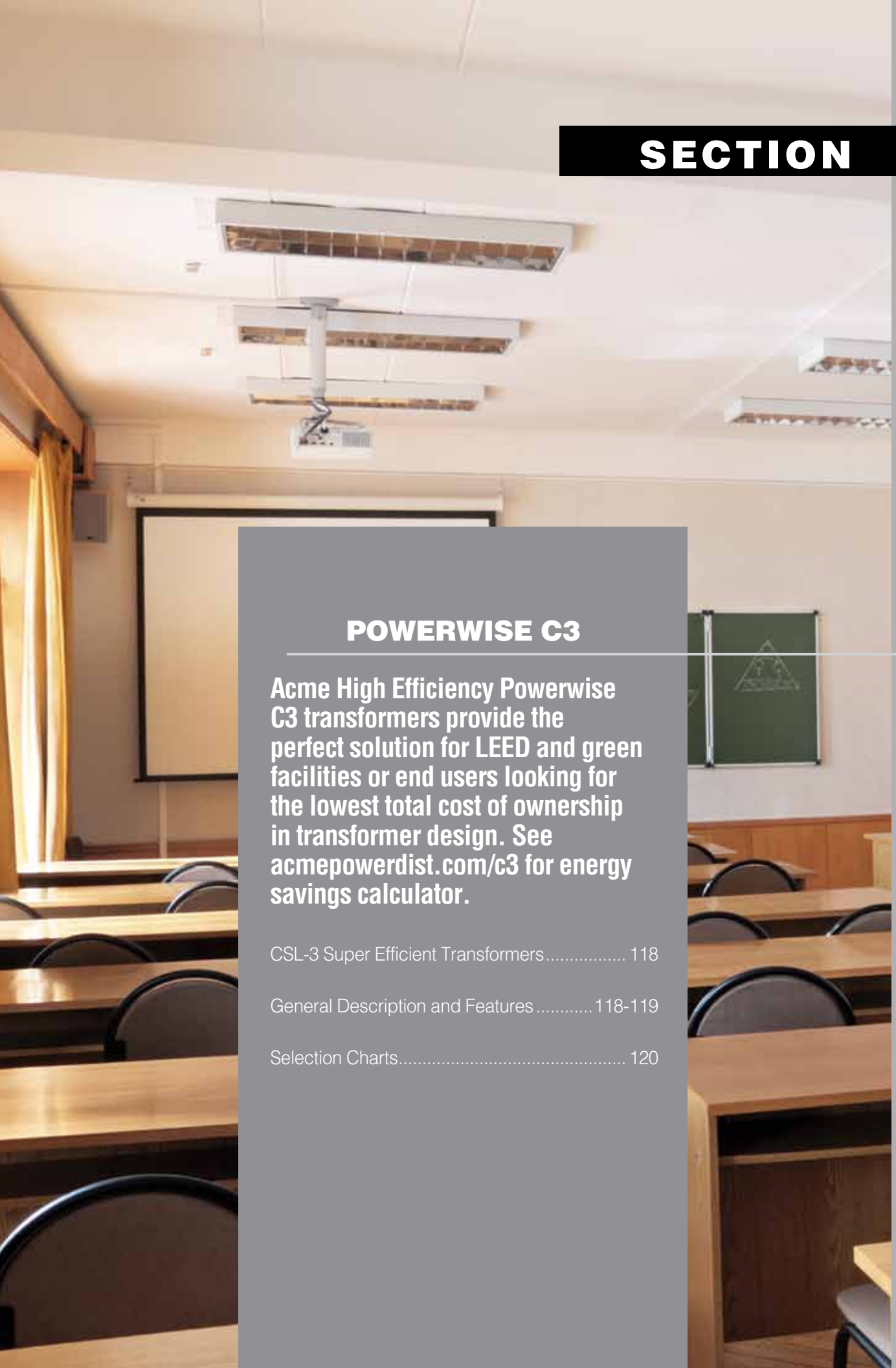


FRONT VIEW SIDE VIEW

FIGURE IV



FRONT VIEW SIDE VIEW



SECTION 11

POWERWISE C3

Acme High Efficiency Powerwise C3 transformers provide the perfect solution for LEED and green facilities or end users looking for the lowest total cost of ownership in transformer design. See acmepowerdist.com/c3 for energy savings calculator.

A New Standard in Transformer Efficiency

In January 2007, the Energy Policy Act of 2005 (EPAct 2005) set the minimum efficiency level (TP1) for transformers. While this standard sets a minimum performance level, transformers rated at TP1 do not provide the greatest efficiency or offer the lowest life cycle cost.

Acme POWERWISE C3 transformers are 30% better performing in efficiency than standard TP1 transformers. Thanks to a more efficient core and higher-grade electrical steel that minimizes losses, these energy-efficient units even exceed the requirements of the US Department of Energy Candidate Standard Level (CSL) 3 performance standard, commonly referred to as "C3."

Depending on the kVA size, this increase in efficiency can save thousands of dollars in energy costs per transformer. Whether you are looking to upgrade your older pre-TP1 transformers or specify the highest-efficiency transformers on your new project, Acme POWERWISE C3 transformers can deliver the power and performance you need.

	15 kVA	30 kVA	45 kVA	75 kVA	112.5 kVA	150 kVA	225 kVA	300 kVA	500 kVA
CSL-3 Efficiency	97.9%	98.3%	98.4%	98.6%	98.7%	98.8%	99.0%	99.0%	99.1%

Within a typical facility, increasing the efficiency of your transformers can provide significant savings in a short period of time. Payback usually occurs within 2.5 to 3.5 years, thanks in large part to our no-load losses. Because no-load losses are present even when the transformers are lightly loaded, they are critical to overall efficiency — and POWERWISE losses are up to 40% less than traditional TP1 designs.

	15 kVA	30 kVA	45 kVA	75 kVA	112.5 kVA	150 kVA	225 kVA	300 kVA
No-Load Loss	70W	90W	130W	160W	240W	280W	370W	550W

EVALUATING TOTAL COST OF OWNERSHIP

Total Cost of Ownership = Initial Cost + Yearly Energy Cost

Cost over the life of the installation should be the most important factor when deciding which technology to use. Since the typical transformer lasts 25 to 30 years, the total life cycle cost far outweighs the initial purchase price of the transformer. The electricity wasted by low initial-cost transformers can amount to millions of wasted kilowatt hours over the operational life of the installation.

TYPICAL APPLICATIONS INCLUDE:

- Educational Facilities (K–12/University)
- Government Buildings
- Manufacturing Facilities
- Office and Commercial Buildings
- Healthcare/Hospital/Medical Office Buildings
- Financial Institutions
- Data Processing Centers
- Wastewater and Sewage Treatment Facilities
- Correctional Facilities
- Industrial Facilities

APPLICATIONS

The Acme POWERWISE C3 transformer is the ideal transformer for commercial environments where energy efficiency is a primary concern. It is a perfect choice for K through 12, college, university, healthcare, governmental and commercial buildings where the total life cycle cost of the facility and its electrical system is a priority.

DESIGN

The Acme POWERWISE C3 sets new standards for efficiency and reliability. Through more efficient core material and higher-grade electrical steel, losses are minimized and performance is maximized. Acme POWERWISE C3 transformers are copper wound, 3-phase common-core, dry type ventilated isolation transformers. Each transformer is meticulously constructed to ANSI/IEEE Standards and is UL and CSA listed.

ENVIRONMENTAL EFFICIENCY

Acme POWERWISE transformers are the most efficient commercially available transformers. Because they generate lower losses, they reduce power drawn from generating stations, resulting in lower greenhouse gas emissions and less smog. The result is a win for the environment and a win in terms of lowest transformer life cycle costs.

WARRANTY

Acme POWERWISE C3 transformers are subjected to rigorous quality electrical and insulation tests in our ISO 9001-certified facility, and they are backed by our 25-year pro-rated warranty.

SPECIFICATIONS

Windings	Copper
Insulation Class	220° C
Degree Rise	115° C or 130° C
Noise Levels	Per NEMA ST-20 -5dB low noise
Rated for 60 Hertz	
K Rating	K-13
Voltage Taps	Voltage Taps: 15 through 500 kVA (2) 2-1/2% ANFC, (4) 2-1/2% BNFC
Neutral Conductor	200% Rated
Electrostatic Shield	Standard
Enclosure	Ventilated NEMA 2 (NEMA 3R available with drip shield)

ADDITIONAL FEATURES & BENEFITS

- Exceeds US DOE CSL-3 efficiency to help you reduce electrical waste and provide sustainability in your electrical design
- Significantly exceeds TP1 efficiency for low operating cost over the life of the transformer
- Optimized design provides maximum reliability and proven performance
- Produced in an ISO 9001 facility to ensure high quality and rigorous testing standards

SELECTION CHARTS

GROUP D6

POWERWISE C3 - 115 C RISE - COPPER WINDINGS
CSL 3 Efficiency (exceeds TP1)
480 DELTA PRIMARY VOLTS - 208Y120 SECONDARY VOLTS - MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY - 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 154
		HEIGHT	WIDTH	DEPTH				
15	TPC3533111S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	350 (158.8)	F	WSA1	22-E
30	TPC3533121S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	385 (174.6)	F	WSA2	22-E
45	TPC3533131S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	455 (206.4)	F	WSA2	22-E
75	TPC3533141S	35.38 (89.9)	31.90 (81.0)	26.88 (68.3)	585 (265.4)	F	WSA3	22-E
112.5	TPC3533151S	41.52 (105.5)	33.06 (84.0)	29.87 (75.9)	1020 (462.7)	F	WSA4	22-E
150	TPC3533161S	41.52 (105.5)	33.06 (84.0)	29.87 (75.9)	1260 (571.5)	F	WSA4	22-E
225	TPC3533171S	41.52 (105.5)	33.06 (84.0)	29.87 (75.9)	1410 (639.6)	F	WSA4	22-E
300	TPC3533181S	45.70 (116.1)	39.50 (100.3)	35.50 (90.2)	1860 (843.7)	F	WSA5	22-E
500	TPC3533191S	62.95 (159.9)	54.00 (137.2)	41.88 (106.4)	3350 (1519.5)	F	WSA7	22-G

GROUP D7

POWERWISE C3 - 130 C RISE - COPPER WINDINGS
CSL 3 Efficiency (exceeds TP1)
480 DELTA PRIMARY VOLTS - 208Y120 SECONDARY VOLTS - MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY - 3Ø, 60 Hz

kVA	CATALOG NO.	APPROX. DIMENSIONS ② Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 154
		HEIGHT	WIDTH	DEPTH				
15.0	TPC3533113S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	350 (158.8)	F	WSA1	22-E
30.0	TPC3533123S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	380 (172.4)	F	WSA2	22-E
45.0	TPC3533133S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	440 (199.6)	F	WSA2	22-E
75.0	TPC3533143S	35.38 (89.9)	31.90 (81.0)	26.88 (68.3)	560 (254.0)	F	WSA3	22-E
112.5	TPC3533153S	41.52 (105.5)	33.06 (84.0)	29.87 (75.9)	1000 (453.6)	F	WSA4	22-E
150.0	TPC3533163S	41.52 (105.5)	33.06 (84.0)	29.87 (75.9)	1220 (553.4)	F	WSA4	22-E
225.0	TPC3533173S	41.52 (105.5)	33.06 (84.0)	29.87 (75.9)	1385 (628.2)	F	WSA4	22-E
300.0	TPC3533183S	45.70 (116.1)	39.50 (100.3)	35.50 (90.2)	1820 (825.5)	F	WSA5	22-E
500.0	TPC3533193S	62.95 (159.9)	54.00 (137.2)	41.88 (106.4)	3250 (1474.2)	F	WSA7	22-G

GENERAL

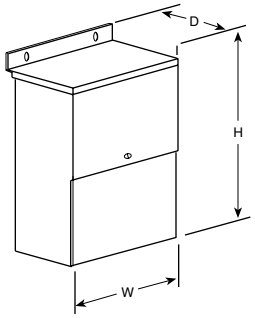
ACME® TRANSFORMER™ GENERAL INFORMATION

Design Figures, Wiring Diagrams, Accessories, Specification Guides, Industry Standards and Alphanumerical Catalog Number Index

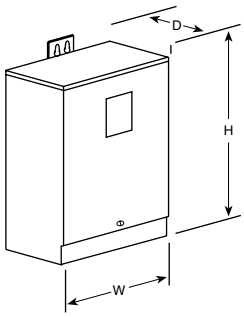
Design Figures

Sections I, II, III & IV

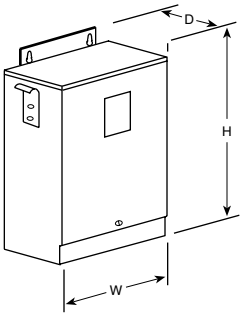
These drawings are for reference only.
Contact factory for certified drawings.



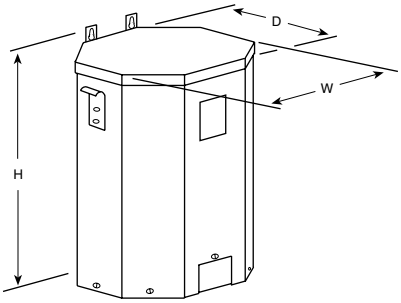
Design A



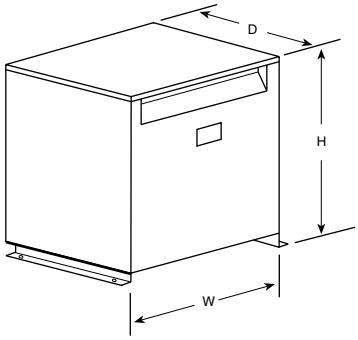
Design B



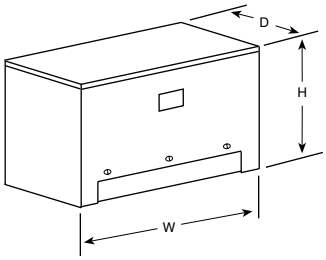
Design C



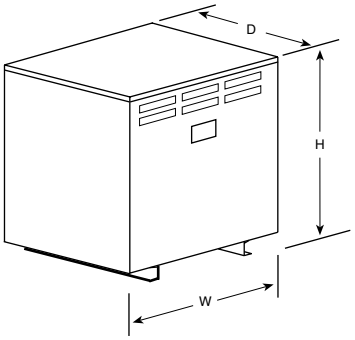
Design D



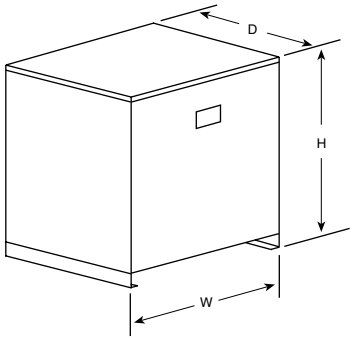
Design E



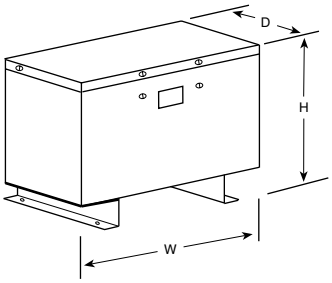
Design F



Design G



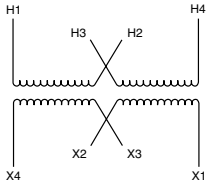
Design H



Design I

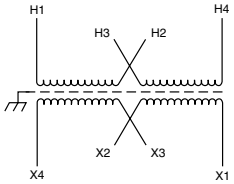
Wiring DiagramsSections I, II, III & IV

1
PRIMARY: 240 X 480
SECONDARY: 120/240
TAPS: None



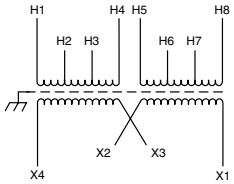
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1-H4	H2 to H3	
240	H1-H3 & H2-H4		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

2
PRIMARY: 240 X 480
SECONDARY: 120/240
TAPS: None



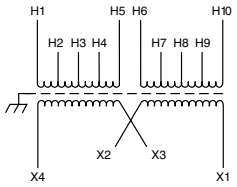
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1-H4	H2 to H3	
240	H1-H3 & H2-H4		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

3
PRIMARY: 240 X 480
SECONDARY: 120/240
TAPS: 2, 2½% ANFC, 2, 2½% BNFC



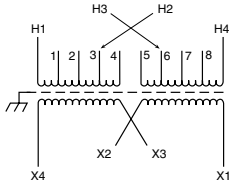
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
252	H1-H8	H1 to H5 H4 to H8	
240	H1-H7	H1 to H5 H3 to H7	
228	H1-H6	H1 to H5 H2 to H6	
504	H1-H8	H4 to H5	
492	H1-H8	H3 to H5	
480	H1-H7	H3 to H5	
468	H1-H7	H2 to H5	
456	H1-H6	H2 to H5	
Secondary Volts			
240		X2 to X3	X1-X4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

4
PRIMARY: 240 X 480
SECONDARY: 120/240
2, 2½% ANFC, 4, 2½% BNFC



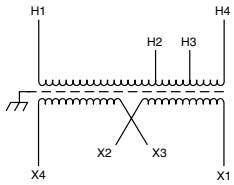
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
216	H1-H10	H1 to H9 H10 to H2	
228	H1-H10	H1 to H8 H10 to H3	
240	H1-H10	H1 to H7 H10 to H4	
252	H1-H10	H1 to H6 H10 to H5	
432	H1-H10	H2 to H9	
444	H1-H10	H3 to H9	
456	H1-H10	H3 to H8	
468	H1-H10	H4 to H8	
480	H1-H10	H4 to H7	
492	H1-H10	H5 to H7	
504	H1-H10	H5 to H6	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X3-X4
120		X1 to X3 X2 to X4	X1-X4

5
PRIMARY: 240 X 480
SECONDARY: 120/240
TAPS: 2, 2½% ANFC, 2, 2½% BNFC



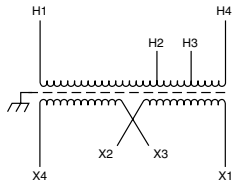
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
216	H1-H4	H1, H3, 8 & H2, H4, 1	
228	H1-H4	H1, H3, 7 & H2, H4, 2	
240	H1-H4	H1, H3, 6 & H2, H4, 3	
252	H1-H4	H1, H3, 5 & H2, H4, 4	
432	H1-H4	H2, 1 & H3, 8	
444	H1-H4	H2, 2 & H3, 8	
456	H1-H4	H2, 2 & H3, 7	
468	H1-H4	H2, 3 & H3, 7	
480	H1-H4	H2, 3 & H3, 6	
492	H1-H4	H2, 4 & H3, 6	
504	H1-H4	H2, 4 & H3, 5	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

6
PRIMARY: 208
SECONDARY: 120/240
TAPS: 2, 5% BNFC



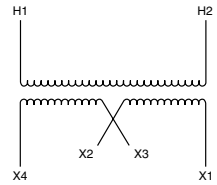
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
208	H1 & H4		
198	H1 & H3		
187	H1 & H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

7
PRIMARY: 277
SECONDARY: 120/240
TAPS: 2, 5% BNFC



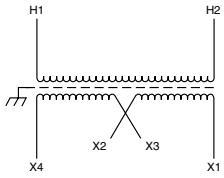
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1 & H4		
263	H1 & H3		
250	H1 & H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

8
PRIMARY: 600
SECONDARY: 120/240
TAPS: None



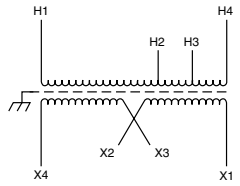
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1-H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

9
PRIMARY: 600
SECONDARY: 120/240
TAPS: None



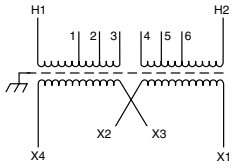
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1-H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

10
PRIMARY: 600
SECONDARY: 120/240
TAPS: 2, 5% BNFC



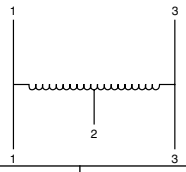
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1-H4		
570	H1-H3		
540	H1-H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

11
PRIMARY: 600
SECONDARY: 120/240
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



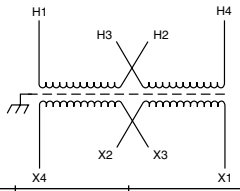
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
540	H1-H2	1-6	
555	H1-H2	1-5	
570	H1-H2	2-6	
585	H1-H2	2-5	
600	H1-H2	3-5	
615	H1-H2	2-4	
635	H1-H2	3-4	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

12
PRIMARY: 240
SECONDARY: 120/240
TAPS: None



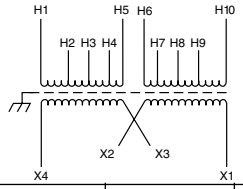
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	1-3		
Secondary Volts			
240			1-3
120			1-2 or 2-3
120/240			1-2-3

13
PRIMARY: 120 x 240
SECONDARY: 120/240
TAPS: None



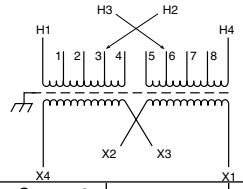
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	H1-H4	H2 to H3	
120	H1-H3 & H2-H4		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

14
EXPORT MODEL
PRIMARY: 190-220 x 380-440
SECONDARY: 120/240



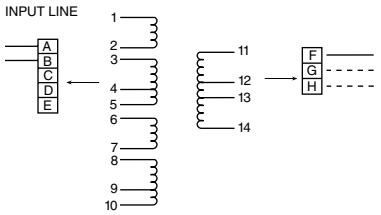
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1 & H7	H1 to H6 H2 to H7	
200	H1 & H8	H1 to H6 H3 to H8	
208	H1 & H9	H1 to H6 H4 to H9	
220	H1 & H10	H1 to H6 H5 to H10	
380	H1 & H7	H2 & H6	
400	H1 & H8	H3 & H6	
416	H1 & H9	H4 & H6	
440	H1 & H10	H5 & H6	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

15 EXPORT MODEL
PRIMARY: 190-220 x 380-440
SECONDARY:120/240



Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1 & H4	H1, H3, 8 & H2, H4, 1	
200	H1 & H4	H1, H3, 7 & H2, H4, 2	
208	H1 & H4	H1, H3, 6 & H2, H4, 3	
220	H1 & H4	H1, H3, 5 & H2, H4, 4	
380	H1 & H4	H2, H3, 1, 8	
400	H1 & H4	H2, H3, 2, 7	
416	H1 & H4	H2, H3, 3, 6	
440	H1 & H4	H2, H3, 4, 5	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

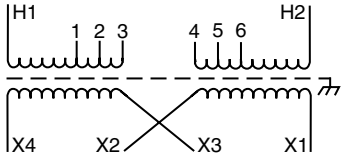
16 POWER LINE CONDITIONER



Input ConnectionsInsulate		& Isolate
Volts	**Connect**	
120	1, 3, 6, 8 to A 2, 5, 7, 10 to B	4, 9
208	1, 6 to A 4, 9 to B 2, 3 to C 7, 8 to D	5, 10
240	1, 6 to A 5, 10 to B 2, 3 to C 7, 8 to D	4, 9
480	1 to A 10 to B 2, 3 to C 5, 6 to D 7, 8 to E	4, 9
Output Connections		**Output Lines To**
Volts	**Connect**	
120	11 to F 12 to G 14 to H	F, G
120/240	11 to F 12 to G 14 to H	F, G, H
208	11 to F 12 to G 13 to H	F, H
240	11 to F 12 to G 14 to H	F, H

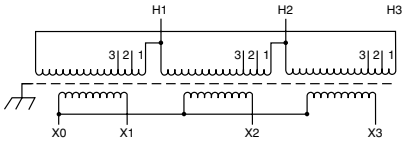
NOTE: To prevent externally shorting, all leads marked "INSULATE" must be individually capped with wire nuts or equivalent. Insulate leads individually!

17 PRIMARY: 208 Volts
SECONDARY: 120/240 Volts
TAPS:



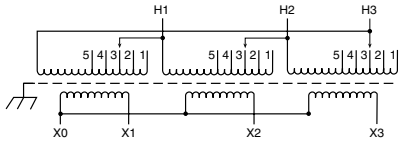
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
218	H1 & H2	3 to 4	
213	H1 & H2	2 to 4	
208	H1 & H2	3 to 5	
203	H1 & H2	2 to 5	
198	H1 & H2	1 to 5	
192	H1 & H2	2 to 6	
187	H1 & H2	1 to 6	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

18 PRIMARY: 240 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 5% BNFC



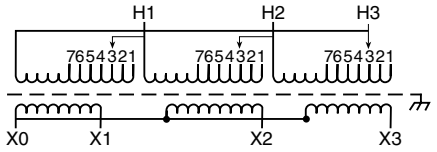
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	H1, H2, H3	1	
228	H1, H2, H3	2	
216	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

19 PRIMARY: 240 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 2, 2½% BNFC



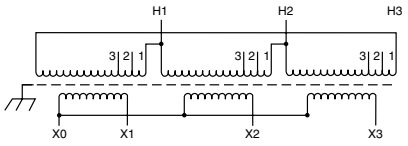
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
252	H1, H2, H3	1	
246	H1, H2, H3	2	
240	H1, H2, H3	3	
234	H1, H2, H3	4	
228	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

20 PRIMARY: 380 Volts Delta
SECONDARY: 220Y/127 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



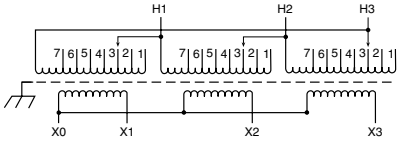
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
399	H1, H2, H3	1	
390	H1, H2, H3	2	
380	H1, H2, H3	3	
371	H1, H2, H3	4	
361	H1, H2, H3	5	
352	H1, H2, H3	6	
342	H1, H2, H3	7	
Secondary Volts			
220			X1, X2,X3
127 1 phase			X1 to X0 X2 to X0 X3 to X0

21
PRIMARY: 480 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 5% BNFC



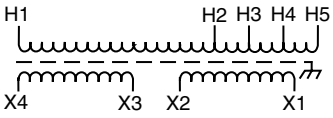
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1, H2, H3	1	
456	H1, H2, H3	2	
432	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

22
PRIMARY: 480 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



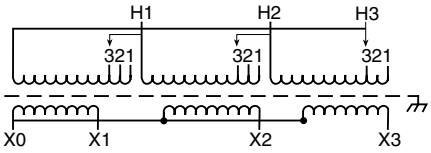
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

23
PRIMARY: 120/208/240/277 Volts
SECONDARY: 120/240 Volts



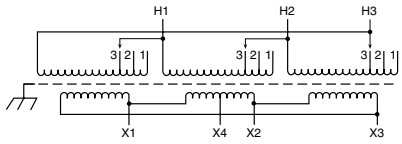
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1, H5		
240	H1, H4		
208	H1, H3		
120	H1, H2		
Secondary Volts			
120		X1 to X3 X2 to X4	X1-X4
120/240		X2 to X3	X1-X2-X4
240		X2 to X3	X1-X4

24
PRIMARY: 380 Volts Delta
SECONDARY: 220Y/127 Volts
TAPS: 2, 5% BNFC



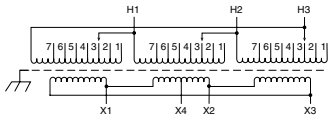
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
380	H1, H2, H3	1	
361	H1, H2, H3	2	
342	H1, H2, H3	3	
Secondary Volts			
220			X1, X2, X3
127 1 phase			X1 to X0 X2 to X0 X3 to X0

25
PRIMARY: 480 Volts Delta
SECONDARY: 240 Volts Delta/120 Volts
TAPS: 2, 5% BNFC



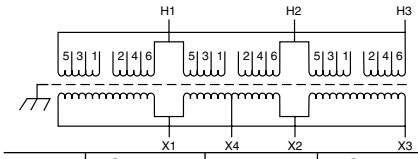
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1, H2, H3	1	
456	H1, H2, H3	2	
432	H1, H2, H3	3	
Secondary Volts			
240			X1, X2, X3
120			X1, X4 or X2, X4

26
PRIMARY: 480 Volts Delta
SECONDARY: 240 Volts Delta/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



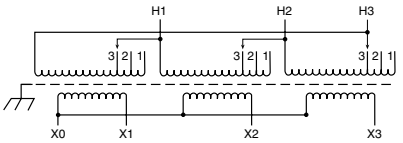
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
240			X1, X2, X3
120			X1, X4 or X2, X4

27
PRIMARY: 480 Volts Delta
SECONDARY: 240 Volts Delta/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



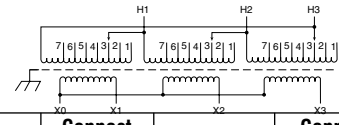
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1 to 2	
492	H1, H2, H3	2 to 3	
480	H1, H2, H3	1 to 4	
468	H1, H2, H3	3 to 4	
456	H1, H2, H3	1 to 6	
444	H1, H2, H3	3 to 6	
432	H1, H2, H3	5 to 6	
Secondary Volts			
240			X1, X2, X3
120			X1, X4 or X2, X4

28
PRIMARY: 600 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 5% BNFC



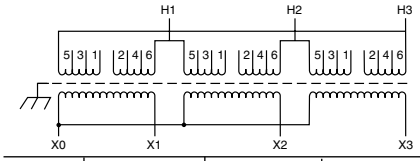
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1, H2, H3	1	
570	H1, H2, H3	2	
540	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

29
PRIMARY: 600 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



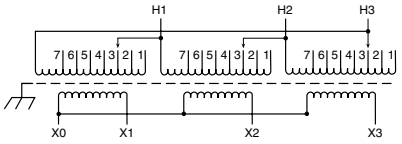
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
555	H1, H2, H3	6	
540	H1, H2, H3	7	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

30
PRIMARY: 600 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



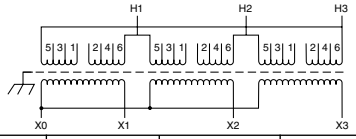
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1 to 2	
615	H1, H2, H3	2 to 3	
600	H1, H2, H3	1 to 4	
585	H1, H2, H3	3 to 4	
570	H1, H2, H3	1 to 6	
555	H1, H2, H3	3 to 6	
540	H1, H2, H3	5 to 6	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

31
PRIMARY: 480 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



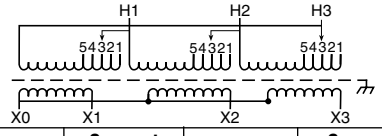
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

32
PRIMARY: 480 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



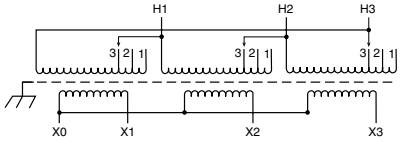
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1 to 2	
492	H1, H2, H3	2 to 3	
480	H1, H2, H3	1 to 4	
468	H1, H2, H3	3 to 4	
456	H1, H2, H3	1 to 6	
444	H1, H2, H3	3 to 6	
432	H1, H2, H3	5 to 6	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

33
PRIMARY: 380 Volts Delta
SECONDARY: 208/120 Volts
TAPS: 2-2½% ANFC and BNFC



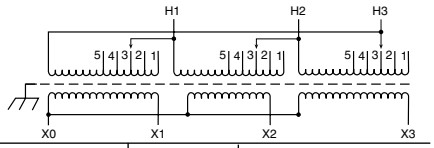
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
399	H1, H2, H3	1	
390	H1, H2, H3	2	
380	H1, H2, H3	3	
371	H1, H2, H3	4	
361	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

34
PRIMARY: 460 Volts Delta
SECONDARY: 460Y/266 Volts
TAPS: 1-5% ANFC and BNFC



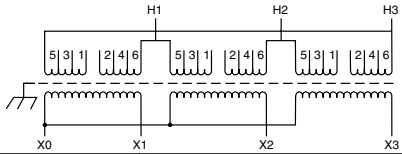
Primary Volts	%	Connect Leads to Tap No.
483	105	1
460	100	2
437	95	3
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

35
PRIMARY: 460 Volts Delta
SECONDARY: 460Y/266 Volts
TAPS: 2-2½% ANFC and BNFC



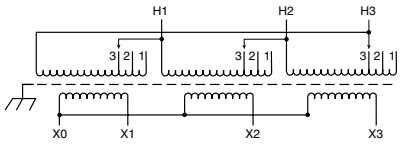
Primary Volts	%	Connect Leads to Tap No.
483	105	1
472	102.5	2
460	100	3
449	97.5	4
437	95	5
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

36
PRIMARY: 460 Volts Delta
SECONDARY: 460Y/266 Volts
TAPS: 2-2½% ANFC and BNFC



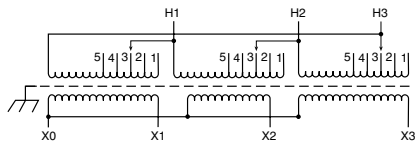
Primary Volts	%	Connect Leads to Tap No.
483	105	1 to 2
472	102.5	2 to 3
460	100	1 to 4
449	97.5	3 to 4
437	95	4 to 5
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

37
PRIMARY: 460 Volts Delta
SECONDARY: 230Y/133 Volts
TAPS: 1-5% ANFC and BNFC



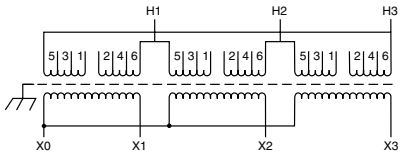
Primary Volts	%	Connect Leads to Tap No.
483	105	1
460	100	2
437	95	3
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

38
PRIMARY: 460 Volts Delta
SECONDARY: 230Y/133 Volts
TAPS: 2-2½% ANFC and BNFC



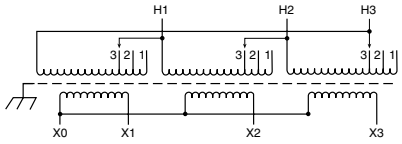
Primary Volts	%	Connect Leads to Tap No.
483	105	1
472	102.5	2
460	100	3
449	97.5	4
437	95	5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

39
PRIMARY: 460 Volts Delta
SECONDARY: 230Y/133 Volts
TAPS: 2-2½% ANFC and BNFC



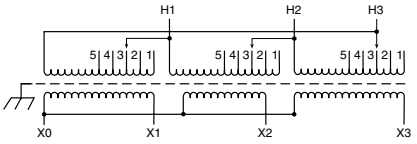
Primary Volts	%	Connect Leads to Tap No.
483	105	1 to 2
472	102.5	2 to 3
460	100	1 to 4
449	97.5	3 to 4
437	95	4 to 5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

40
PRIMARY: 575 Volts Delta
SECONDARY: 230Y/133 Volts
TAPS: 1-5% ANFC and BNFC



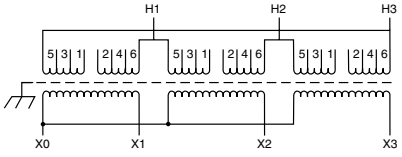
Primary Volts	%	Connect Leads to Tap No.
604	105	1
575	100	2
546	95	3
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

41
PRIMARY: 575 Volts Delta
SECONDARY: 230Y/133 Volts
TAPS: 2-2½% ANFC and BNFC



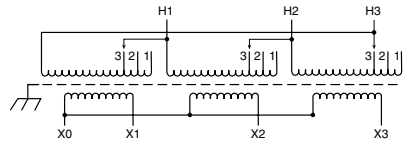
Primary Volts	%	Connect Leads to Tap No.
604	105	1
589	102.5	2
575	100	3
561	97.5	4
546	95	5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

42
PRIMARY: 575 Volts Delta
SECONDARY: 230Y/133 Volts
TAPS: 2-2½% ANFC and BNFC



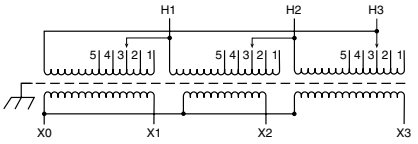
Primary Volts	%	Connect Leads to Tap No.
604	105	1 to 2
589	102.5	2 to 3
575	100	1 to 4
561	97.5	3 to 4
546	95	4 to 5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

43
PRIMARY: 575 Volts Delta
SECONDARY: 460Y/266 Volts
TAPS: 1-5% ANFC and BNFC



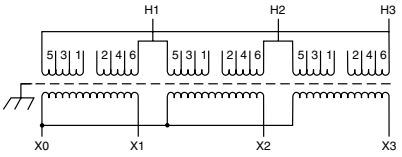
Primary Volts	%	Connect Leads to Tap No.
604	105	1
575	100	2
546	95	3
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

44
PRIMARY: 575 Volts Delta
SECONDARY: 460Y/266 Volts
TAPS: 2-2½% ANFC and BNFC



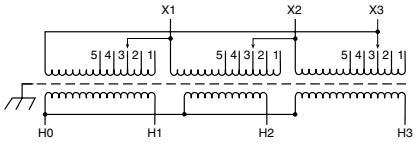
Primary Volts	%	Connect Leads to Tap No.
604	105	1
589	102.5	2
575	100	3
561	97.5	4
546	95	5
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

45
PRIMARY: 575 Volts Delta
SECONDARY: 460Y/266 Volts
TAPS: 2-2½% ANFC and BNFC



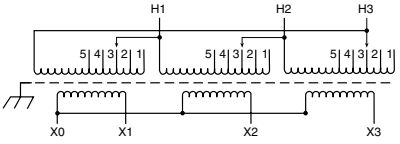
Primary Volts	%	Connect Leads to Tap No.
604	105	1 to 2
589	102.5	2 to 3
575	100	1 to 4
561	97.5	3 to 4
546	95	4 to 5
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

46
PRIMARY: 208 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 2½% ANFC, 2, 2½% BNFC



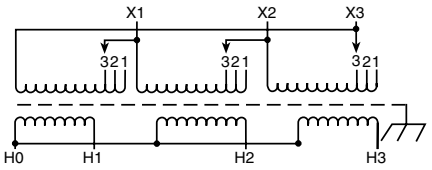
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
218	X1, X2, X3	1	
213	X1, X2, X3	2	
208	X1, X2, X3	3	
203	X1, X2, X3	4	
198	X1, X2, X3	5	
Secondary Volts			
480			H1, H2, H3
277 1 phase			H1 to H0 H2 to H0 H3 to H0

47
PRIMARY: 416 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 2, 2½% BNFC



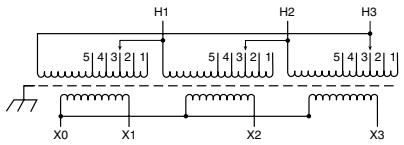
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
437	H1, H2, H3	1	
426	H1, H2, H3	2	
416	H1, H2, H3	3	
406	H1, H2, H3	4	
395	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

48
PRIMARY: 208 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 5% BNFC



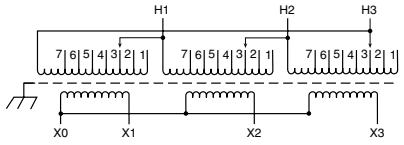
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
208	X1, X2, X3	1	
198	X1, X2, X3	2	
187	X1, X2, X3	3	
Secondary Volts			
480			H1, H2, H3
277 1 phase			H1 to H0 H2 to H0 H3 to H0

49
PRIMARY: 600 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 2, 2½% BNFC



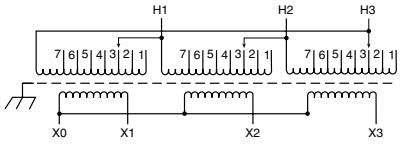
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

50
PRIMARY: 600 Volts Delta
SECONDARY: 380Y/220 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



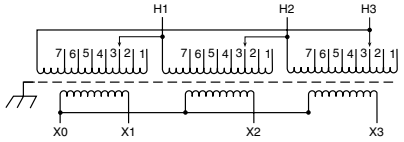
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
555	H1, H2, H3	6	
540	H1, H2, H3	7	
Secondary Volts			
380			X1, X2, X3
220 1 phase			X1 to X0 X2 to X0 X3 to X0

51
PRIMARY: 600 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



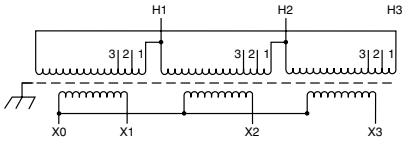
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
555	H1, H2, H3	6	
540	H1, H2, H3	7	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

52
PRIMARY: 600 Volts Delta
SECONDARY: 600Y/347 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



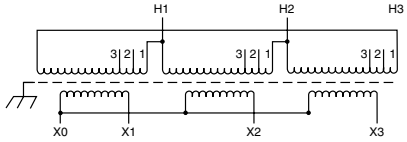
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
555	H1, H2, H3	6	
540	H1, H2, H3	7	
Secondary Volts			
600			X1, X2, X3
347 1 phase			X1 to X0 X2 to X0 X3 to X0

53
PRIMARY: 600 Volts Delta
SECONDARY: 380Y/220 Volts
TAPS: 2, 5% BNFC



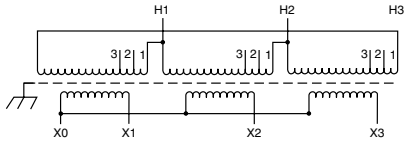
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1, H2, H3	1	
570	H1, H2, H3	2	
540	H1, H2, H3	3	
Secondary Volts			
380			X1, X2, X3
220 1 phase			X1 to X0 X2 to X0 X3 to X0

54
PRIMARY: 600 Volts Delta
SECONDARY: 600Y/347 Volts
TAPS: 2, 5% BNFC



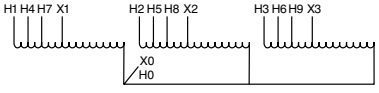
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1, H2, H3	1	
570	H1, H2, H3	2	
540	H1, H2, H3	3	
Secondary Volts			
600			X1, X2, X3
347 1 phase			X1 to X0 X2 to X0 X3 to X0

55
PRIMARY: 600 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 5% BNFC



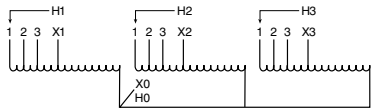
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1, H2, H3	1	
570	H1, H2, H3	2	
540	H1, H2, H3	3	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

56
PRIMARY: 600 Volts
SECONDARY: 480 Volts
TAPS: 2, 5% BNFC



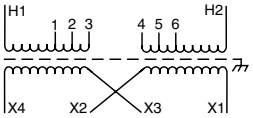
Primary Volts	Alt Rating	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	480	H1, H2, H3		
570	456	H4, H5, H6		
540	432	H7, H8, H9		
Secondary Volts				
480	380			X1, X2, X3
277 1 phase	220 1 phase			X1 to X0 X2 to X0 X3 to X0

57 PRIMARY: 600 Volts SECONDARY: 480 Volts TAPS: 2, 5% BNFC



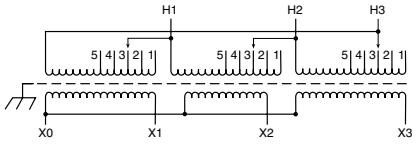
Primary Volts	Alt Rating	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	480	H1, H2, H3	1	
570	456	H1, H2, H3	2	
540	432	H1, H2, H3	3	
Secondary Volts				
480	380			X1, X2, X3
277 1 phase	220 1 phase			X1 to X0 X2 to X0 X3 to X0

58 PRIMARY: 208 Volts SECONDARY: 120/240 Volts TAPS: 2, 5% BNFC



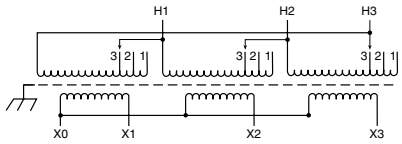
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
208	H1 & H2	3 to 4	
198	H1 & H2	2 to 5	
187	H1 & H2	1 to 6	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

59 PRIMARY: 230 Volts Delta SECONDARY: 230Y/133 Volts TAPS: 2-2½% ANFC and 2-2½% BNFC



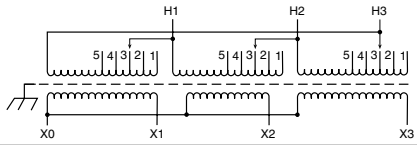
Primary Volts	%	Connect Leads to Tap No.
242	105	1
236	102.5	2
230	100	3
224	97.5	4
219	95	5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

60 PRIMARY: 208 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 2-5% BNFC



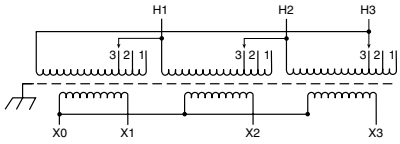
Primary Volts	%	Connect Leads to Tap No.
208	100	1
198	95	2
187	90	3
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 & X0 X2 & X0 X3 & X0

61 PRIMARY: 208 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 2-2½% ANFC and 2-2½% BNFC



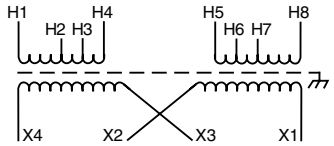
Primary Volts	%	Connect Leads to Tap No.
218	105	1
213	102.5	2
208	100	3
203	97.5	4
198	95	5
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 & X0 X2 & X0 X3 & X0

62 PRIMARY: 230 Volts Delta SECONDARY: 230Y/133 Volts TAPS: 1-5% ANFC and 1-5% BNFC



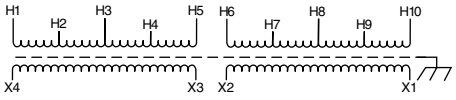
Primary Volts	%	Connect Leads to Tap No.
241	105	1
230	100	2
218	95	3
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

63 PRIMARY: 120/208/240/277 Volts SECONDARY: 120/240 Volts



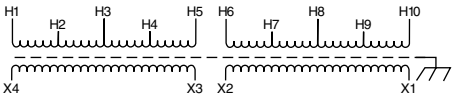
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
120	H1 & H8	H1 to H6 H3 to H8	
208	H1 & H8	H2 to H7	
240	H1 & H8	H3 to H6	
277	H1 & H8	H4 to H5	
Secondary Volts			
240		X2 to X3	X1 & X4
120/240		X2 to X3	X1, X3, X4
120		X1 to X3 X2 to X4	X1 & X4

64 PRIMARY: 190/208/220/240 x 380/416/440/480 Volts SECONDARY: 120/240 Volts



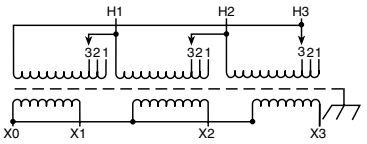
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1& H7	H1 to H6 H2 to H7	
208	H1 & H8	H1 to H6 H3 to H8	
220	H1 & H9	H1 to H6 H4 to H9	
240	H1& H10	H1 to H6 H5 to H10	
380	H1 & H7	H2 to H6	
416	H1 & H8	H3 to H6	
440	H1 & H9	H4 to H6	
480	H1 & H10	H5 to H6	
Secondary Volts			
240		X2 to X3	X1 - X4
120/240		X2 to X3	X1- X2 - X4
120		X1 to X3 X2 to X4	X1 - X4

65 PRIMARY: 190/200/208/220 x 380/400/416/440 Volts SECONDARY: 110/220 Volts



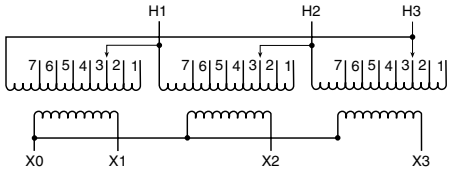
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1 & H7	H1 to H6 H2 to H7	
200	H1 & H8	H1 to H6 H3 to H8	
208	H1 & H9	H1 to H6 H4 to H9	
220	H1 & H10	H1 to H6 H5 to H10	
380	H1 & H7	H2 to H6	
400	H1 & H8	H3 to H6	
415	H1 & H9	H4 to H6	
440	H1 & H10	H5 to H6	
Secondary Volts			
220		X2 to X3	X1-X4
110/220		X2 to X3	X1-X2-X4
110		X1 to X3 X2 to X4	X1-X4

66
PRIMARY: 416 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 5% BNFC



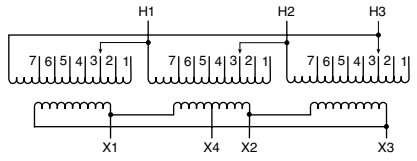
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
437	H1, H2, H3	1	
416	H1, H2, H3	2	
395	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

67
PRIMARY: 480 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2-2½% ANFC, 4, 2½% BNFC



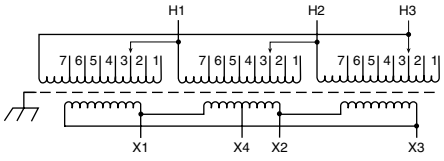
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

68
PRIMARY: 480 Volts Delta
SECONDARY: 240 Volts Delta/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



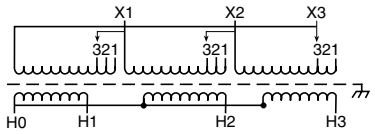
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
240			X1, X2, X3
120			X1, X4, or X2, X4

69
PRIMARY: 600 Volts Delta
SECONDARY: 240 Delta/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



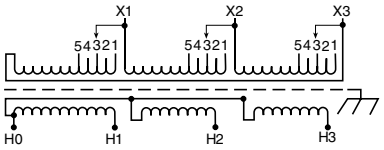
Primary Volts	%	Connect Leads to Tap No.
630	105	1
615	102.5	2
600	100	3
585	97.5	4
570	95	5
555	92.5	6
540	90	7
Secondary Volts		
240		X1, X2, X3
120		X1, X4, or X2, X4

70
PRIMARY: 240 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 5% BNFC



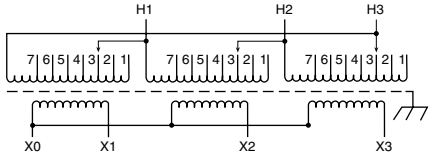
Primary Volts	%	Connect Leads to Tap No.
240	100	1
228	95	2
216	90	3
Secondary Volts		
480		H1, H2, H3
277 1 phase		H1 to H0 H2 to H0 H3 to H0

71
PRIMARY: 240 Volts Delta
SECONDARY: 480Y/277 Volts
TAPS: 2, 2½% ANFC & BNFC



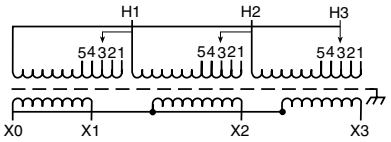
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
252	X1, X2, X3	1	
246	X1, X2, X3	2	
240	X1, X2, X3	3	
234	X1, X2, X3	4	
228	X1, X2, X3	5	
Secondary Volts			
480			H1, H2, H3
277 1 phase			H1 to H0 H2 to H0 H3 to H0

72
PRIMARY: 380 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2½% ANFC, 4, 2½% BNFC



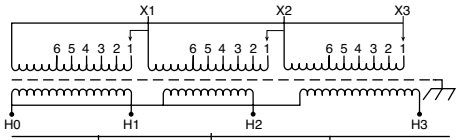
Primary Volts	%	Connect Leads to Tap No.
399	105	1
390	102.5	2
380	100	3
371	97.5	4
361	95	5
352	92.5	6
342	90	7
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 to X0 X2 to X0 X3 to X0

73
PRIMARY: 440 Volts Delta
SECONDARY: 220Y/127 Volts
TAPS: 2, 5% ANFC & BNFC



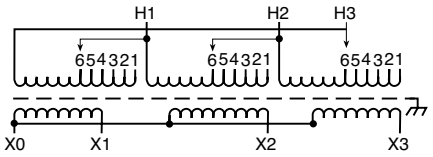
Primary Volts	%	Connect Leads to Tap No.
484	110	1
462	105	2
440	100	3
418	95	4
396	90	5
Secondary Volts		
220		X1, X2, X3
127 1 phase		X1 to X0 X2 to X0 X3 to X0

74
PRIMARY: 190/200/210/220/230/240 Volts Delta
SECONDARY: 400Y/231 Volts



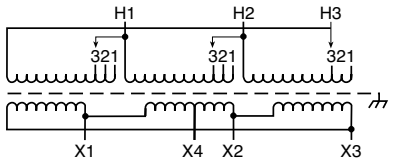
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	X1, X2, X3	1	
230	X1, X2, X3	2	
220	X1, X2, X3	3	
210	X1, X2, X3	4	
200	X1, X2, X3	5	
190	X1, X2, X3	6	
Secondary Volts			
400			H1, H2, H3
231 1 phase			H1 to H0 H2 to H0 H3 to H0

75
PRIMARY: 190/200/210/220/230/240 Volts Delta
SECONDARY: 400Y/231 Volts



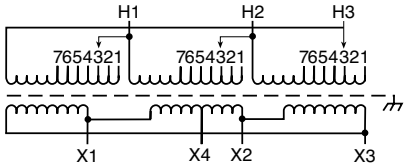
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	H1, H2, H3	1	
230	H1, H2, H3	2	
220	H1, H2, H3	3	
210	H1, H2, H3	4	
200	H1, H2, H3	5	
190	H1, H2, H3	6	
Secondary Volts			
400			X1, X2, X3
231 1 phase			X1 to X0 X2 to X0 X3 to X0

76
PRIMARY: 400 Volts Delta
SECONDARY: 240 Volts Delta/120 Volts
TAPS: 2, 5% BNFC



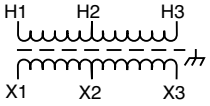
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
400	H1, H2, H3	1	
380	H1, H2, H3	2	
360	H1, H2, H3	3	
Secondary Volts			
240			X1, X2, X3
120			X1 to X4 or X2 to X4

77
PRIMARY: 400 Volts Delta
SECONDARY: 240 Delta/120 Volts
TAPS: 2, 2 ½% ANFC, 4, 2 ½% BNFC



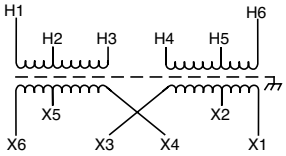
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
420	H1, H2, H3	1	
410	H1, H2, H3	2	
400	H1, H2, H3	3	
390	H1, H2, H3	4	
380	H1, H2, H3	5	
370	H1, H2, H3	6	
360	H1, H2, H3	7	
Secondary Volts			
240			X1, X2, X3
120			X1 to X4 or X2 to X4

78
PRIMARY: 277/480 Volts
SECONDARY: 208/277 Volts
TAPS: NONE



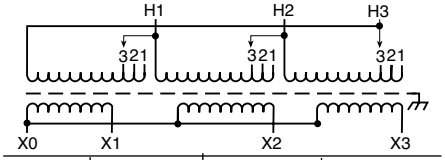
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1 & H2		
480	H1 & H3		
Secondary Volts			
208			X1 to X2
277			X1 to X3

79
PRIMARY: 277/480 Volts
SECONDARY: 208/277 Volts
TAPS: NONE



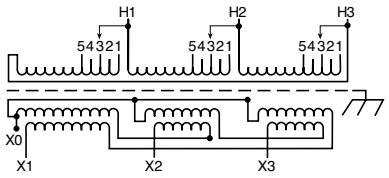
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1 - H5	H2 to H4	
480	H1 - H6	H3 to H4	
Secondary Volts			
208		X2 to X4	X1- X5
277		X3 to X4	X1- X6

80
PRIMARY: 480 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 1-5% ANFC & 1-5% BNFC



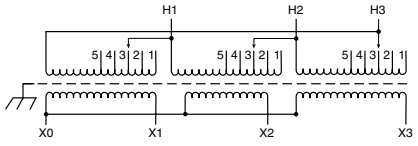
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
480	H1, H2, H3	2	
456	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

81
PRIMARY: 480 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2, 2 ½% ANFC, 2, 2 ½% BNFC



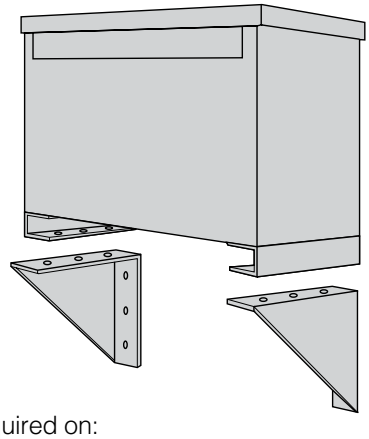
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

82
PRIMARY: 380 Volts Delta
SECONDARY: 208Y/120 Volts
TAPS: 2-2 ½% ANFC and 2-2 ½% BNFC



Primary Volts	%	Connect Leads to Tap No.
399	105	1
390	102.5	2
380	100	3
371	97.5	4
361	95	5
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 to X0 X2 to X0 X3 to X0

Wall Mounting Brackets



Required on:
Ventilated Units:
1Ø, 37.5 and 50 kVA
3Ø, 30, 45 and 75 kVA
Catalog Number: PL-79912

Encapsulated Units:
3Ø dit., 11 kVA — 20 kVA
3Ø std. distribution — 15 kVA
Catalog Number: PL-79911

Wall mounting brackets are not required on:
1Ø units — 25 kVA and below
3Ø units — 9 kVA and below

Standard Taps

The catalog number suffix provides tap information as outlined in chart below:

If the catalog number has no suffix, there are no taps available.

EXAMPLE: T-2-53019-3S
The suffix 3S indicates the unit has two 2.5% (+) ANFC taps and four 2.5% (–) BNFC taps.

Suffix	Tap Arrangement
– 1S	Two 5% (–) BNFC Taps
– 2S	One 5% (+) ANFC Tap and One 5% (–) BNFC Tap
– 3S	Two 2-1/2% (+) ANFC Taps and Four 2-1/2%(–) BNFC Taps
– 4S	Two 2-1/2% (+) ANFC Taps and Two 2-1/2% (–) BNFC Taps
– 5S	Two 5% (+) ANFC Taps and Two 5% (–) BNFC Taps

Thermal Switch Kits

Acme Thermal Switch Kits are designed for use with single and three phase drive isolation and distribution transformers. Thermal switch kits are available for one or three sensor systems.

Thermal sensors can be field or factory installed in the transformer winding ducts to detect abnormal temperatures. The thermal sensors are a normally closed contact that opens at 200°C ± 10°C and has a current capacity of 5 amps @ 120V or 2.5 amps @ 240V. This contact can activate any number of different types of alarms or mechanisms that could warn of a potential failure.

Catalog Number: PL-79900

kVA	Mounting Position	Illustration
27.0 – 220.0	Bottom of the case	Figure 1
275.0 – 750	Top Flange of the Core Bracket	Figure 2

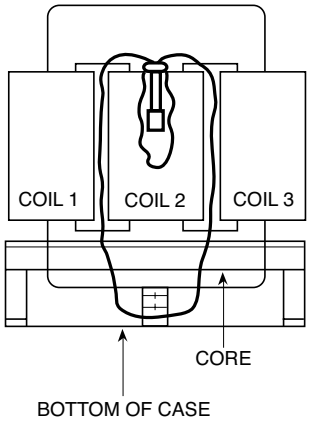


Figure 1

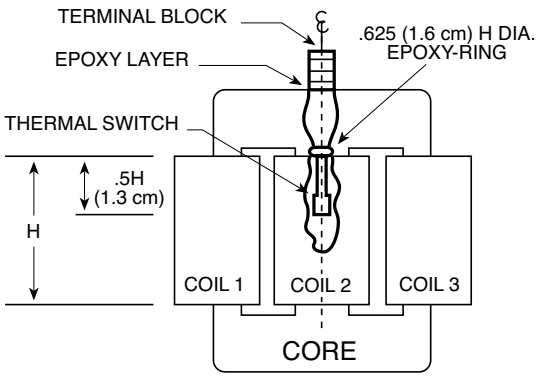


Figure 2

Lug Kits

Acme's mechanical transformer lug kits contain all of the hardware necessary to provide satisfactory transformer terminations. Lug kits are available in sizes from 27 kVA to 660 kVA.

Acme lugs are of the dual rated single pole solderless type, made from high strength aluminum alloy. To provide the best in low contact resistance, all lugs in these kits are plated.

Catalog No.	Transformer kVA Size	Kit Contains			
		Wire Range Al or Cu	Qty	Nuts & Bolts	Qty
Lug 1	37 1/2 1-phase 27 - 45 3-phase	2 -14 250 mcm - 6	8 4	1/4 - 20 X 3/4	8
Lug 2	50 - 75 1-phase 51 - 118 3-phase	250 mcm - 6	12	1/4 - 20 x 3/4 1/4 - 20 x 1 3/4	8 8
Lug 3	100 -167 1-phase 145 - 300 3-phase	250 mcm - 6 600 mcm - 2	3 22	1/4 - 20 x 3/4 3/8 - 16 x 2	3 16
Lug 4	440 - 660 3-phase	600 mcm - 2	29	3/8 - 16 x 2	8

Weather Shields

Catalog No.	Approx. Ship Weight Lbs. (Kg.)
WSA1	6 (2.7)
WSA2	7 (3.2)
WSA3	8 (3.6)
WSA4	8 (3.6)
WSA5	10 (4.5)
WSA6	10 (4.5)
WSA8	7 (3.2)
WSB3	30 (13.6)
WSB4	32 (14.5)

Spare Parts

TOP COVER

CATALOG NO.	APPROX. SHIP WEIGHT Lbs. (Kg.)
SA1701319	14 (6.4)
SA2701319	16 (7.3)
SA3701319	20 (9.1)
SA4701319	34 (15.4)
SA6701319	17 (7.7)

FRONT/REAR PANEL

CATALOG NO.	APPROX. SHIP WEIGHT Lbs. (Kg.)
SA1701321	13 (5.9)
SA2701321	15 (6.8)
SA3701321	21 (9.5)
SA4701321	35 (15.9)
SA7701321	16 (7.3)

SIDE PANEL

CATALOG NO.	APPROX. SHIP WEIGHT Lbs. (Kg.)
SA1701320	11 (5.0)
SA2701320	13 (5.9)
SA3701320	19 (8.6)
SA4701320	34 (15.4)

Specification Guide for Dry Type Distribution Transformers

1.0 Dry Type Transformers:

1.0.0 The following information should be utilized only by trained technical personnel. If you need assistance, please contact Acme's Technical Services Department at 800-334-5214.

1.0.1 Provide dry type, enclosed and ventilated transformers as indicated herein. Transformers shall be Acme or approved equal.

1.0.2 Transformers shall be designed, constructed and rated in accordance with UL, CSA, NEMA, ANSI, IEEE, and OSHA standards.

1.0.3 Transformers rated 27 kVA and larger, single and three phase shall be the ventilated type, incorporating a 220 degree C insulation system and designed not to exceed 150 degree C temperature rise above a 40 degree C ambient under full load conditions. Taps are to be provided on the primary side of the transformer as follows:

(a) 2 - 2.5% above normal full capacity.
4 - 2.5% below normal full capacity.
-or-

(b) 2 - 2.5% above normal full capacity.
2 - 2.5% below normal full capacity.

Alternate 1: 115 degree C rise transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 115 degree C temperature rise above a 40 degree C ambient under full load conditions. In addition, the transformer shall have the ability to carry a continuous 15% overload without exceeding a 150 degree C rise above ambient.

Alternate 2: 80 degree C rise Transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 80 degree C temperature rise above a 40 degree C ambient under full load conditions. In addition, the transformer shall have the ability to carry a continuous 30% overload without exceeding a 150 degree C rise above ambient.

1.0.4 Transformer enclosure finish must be ASA 61 gray powder polyurethane paint. Transformer enclosure temperature shall not exceed 50 degrees C plus the ambient under any condition of loading at any specified temperature rise at or below 150 degrees C.

1.0.5 Transformer enclosure shall be UL/NEMA Type 2 and UL 3R Listed with the addition of a weather shield and shall be so marked on the transformer.

1.0.6 Transformer shall incorporate an electrostatic shield for the attenuation of voltage spikes, line noise, and transients.

1.0.7 Single phase transformers and three phase transformers terminate in copper or aluminum bus bar.

1.0.8 Transformer coils designed and manufactured for increased insulation life, cooler operation, and lower losses.

1.0.9 Transformers must operate at audible sound levels below NEMA Standard ST-20. Sound levels will not exceed the following:

30 - 50 kVA	45 db
51 - 150 kVA	50 db
151 - 300 kVA	55 db
301 - 500 kVA	60 db
501 - 750 kVA	65 db

Transformers must incorporate vibration isolation pads in their construction located between the transformer core and coil assembly and the transformer case. External vibration isolation pads will not be used as they tend to increase audible noise. Transformers shall be floor mounted on a concrete pad. All connections to the transformer will be made by means of flexible metallic conduit.

1.0.10 Transformer enclosure shall be grounded per the National Electric Code.

1.0.11 Transformers shall be dry-type 600 volt class, kVA rating as indicated. Contractor to provide all necessary lugs for all transformers.

1.0.12 Complete shop drawings must be submitted for approval on all dry type transformers.

1.0.13 Typical performance data must be submitted for approval on all transformers. Factory tests must be made in accordance with the latest revisions of ANSI Test Code C57.12.91 for Dry Type Transformers. Performance data provided must contain but not be limited to:

(a) No load losses.
(b) Full load losses.
(c) Polarity and phase rotation.
(d) Impedance at reference temperature.
(e) Efficiencies at 25, 50, 75, and 100% load.
(f) Regulation at 100% and 80% power factor.
(g) Audible sound level.
(h) Dimensions and weight.
(i) Applied potential test.
(j) Induced potential test.
(k) Excitation current.
(l) IR, IX, and IZ percentages.
(m) Reference and ambient temperature.

1.0.14 Warranty: Transformers must be warranted against defects in materials, workmanship, and performance for ten years from date of manufacture.

Specification Guide for Single & Three Phase Encapsulated Transformers

1.0 Dry Type Transformers:

1.0.0 The following information should be utilized only by trained technical personnel. If you need assistance, please contact Acme's Technical Services Department at 800-334-5214.

1.0.1 Provide dry type, enclosed, epoxy encapsulated transformers as indicated and specified herein. Transformers must be Acme or approved equal.

1.0.2 Transformers must be designed, constructed and rated in accordance with UL, CSA, NEMA, ANSI, IEEE, and OSHA standards.

1.0.3 Transformers 3.0 - 75 kVA shall be compound filled, incorporating a 180 degree C insulation system and designed not to exceed a 115 degree C temperature rise above a 40 degree C ambient under full load conditions. Taps are to be provided on the primary side of the transformer. The catalog number suffix will provide the tap information outlined below:

SUFFIX	TAP ARRANGEMENT
- 1S	2-5% BNFC
- 2S	1-5% ANFC & 1-5% BNFC
- 3S	2-2.5% ANFC & 4-2.5% BNFC
- 4S	2-2.5% ANFC & 2-2.5% BNFC
- 5S	2-5% ANFC & 2-5% BNFC

1.0.4 Transformer enclosure finish must be ASA 61 gray powder polyurethane paint.

1.0.5 Transformer enclosure temperature shall not exceed 65 degrees C plus the ambient.

1.0.6 Transformer enclosure shall be UL/NEMA Type 3R and so marked on the transformer.

1.0.7 Transformer shall incorporate an electrostatic shield for the attenuation of voltage spikes, line noise and transients.

1.0.8 Transformer coils are typically wound with aluminum or copper for increased insulation life, cooler operation and lower losses.

1.0.9 All primary tap connections and both primary and secondary phase conductors must be either copper wire or copper bus bar.

1.0.10 Transformers must operate at audible sound levels below ANSI/NEMA Standard ST-20. Sound levels will not exceed the following:

Up to 9 kVA	40 db
10 - 50 kVA	45 db
51 - 150 kVA	50 db

1.0.11 Transformer enclosures shall be grounded per the National Electric Code.

1.0.12 Complete shop drawings must be submitted for approval on all Dry Type Transformers.

1.0.13 Typical performance data must be submitted for approval on all transformers. Factory tests must be made in accordance with the latest revisions of ANSI Test Code C57.12.91 for Dry Type Transformers. Performance data must contain but not be limited to:

- **(a)** No load losses.
- **(b)** Full load losses.
- **(c)** Polarity and phase rotation.
- **(d)** Impedance at reference temperature.
- **(e)** Efficiencies at 25, 75, and 100% load.
- **(f)** Regulation at 100% and 80% power factor.
- **(g)** Audible sound level.
- **(h)** Insulation class and rated temperature rise.
- **(i)** Dimensions and weight.
- **(j)** Applied potential test.
- **(k)** Induced potential test.
- **(l)** Excitation current.
- **(m)** IR, IX, and IZ percentages.
- **(n)** Reference and ambient temperature.

1.0.14 Warranty: Transformer must be warranted against defects in materials, workmanship and performance for ten years from date of manufacture.

Specification Guide for Non-Linear Load Isolation® Transformers

1.0 Dry Type Transformers:

1.0.0 The following information should be utilized only by trained technical personnel. If you need assistance, please contact Acme's Technical Services Department at 800-334-5214.

1.0.1 Provide dry type, enclosed, and ventilated transformers as indicated and specified herein. Transformers must be Acme or approved equal. Transformers must be UL listed for non-sinusoidal current loads of a specified K Factor (UL Standard 1561), CSA certified and labeled as such.

1.0.2 For sizes 15 kVA and larger, low voltage dry transformers will be ventilated type, incorporating a 220 degree C insulation system and designed not to exceed 150 degree C temperature rise above a 40 degree C ambient under full load conditions. Taps will be provided on the primary side of the transformer. There will be 2, 2.5% taps above normal full capacity and 4, 2.5% taps below normal full capacity.

Alternate 1: 115 degree C rise Transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 80 degree C temperature rise above a 40 degree C ambient under full load conditions. In addition, the transformer shall have the ability to carry a continuous 15% overload without exceeding a 150 degree C rise above ambient.

Alternate 2: 80 degree C rise Transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 80 degree C temperature rise above a 40 degree C ambient under full load conditions. In addition, the transformer shall have the ability to carry a continuous 30% overload without exceeding a 150 degree C rise above ambient.

1.0.3 Transformers shall incorporate an electrostatic shield for the attenuation of voltage spikes, line noise, and transients.

1.0.4 Transformers must be designed to handle non-linear loads and the adverse effects of harmonics. Transformer coils will be wound with foil to minimize the heating effects caused by harmonic currents.

1.0.5 Transformers must be able to power non-linear loads with a K-Factor as high as 20.

1.0.6 Transformers must operate at audible sound levels below NEMA ST-20. Sound levels will not exceed the following:

30 - 50 kVA	45 db*
51 - 150 kVA	50 db*
151 - 300 kVA	55 db*
301 - 500 kVA	60 db*

* Sound levels are based on transformers with a K-Factor of 4 and a temperature rise of 150 degrees centigrade.

Enclosed, ventilated transformers must incorporate vibration dampening pads in their construction, located between the transformer core and coil assembly and the transformer case. External vibration dampening pads will not be used on enclosed, ventilated designs as they tend to increase audible noise. Transformers 15 kVA and larger shall be floor mounted on a concrete pad. All connections to the transformer will be made by means of flexible metallic conduit.

1.0.7 Transformers shall incorporate a neutral conductor sized at 2 times rated phase current. Transformer cases shall be grounded per the National Electric Code.

1.0.8 Transformers shall be 60 Hz, 480 or 600 volts delta primary, 208Y/120 volt secondary. kVA rating as indicated. Contractor to provide all necessary lugs for all transformers. Transformer enclosures shall be Type 2 and UL-3R listed with the addition of a weather shield.

1.0.9 Complete shop drawings must be submitted for approval on all dry type transformers.

1.0.10 Typical performance data must be submitted for approval on all transformers. Factory tests must be made in accordance with the latest revisions of ANSI Test Code C57.12.91 for Dry Type Transformers. Performance data must contain but not be limited to:

- **(a)** No load losses.
- **(b)** Full load losses.
- **(c)** Polarity and phase rotation.
- **(d)** Impedance at reference temperature.
- **(e)** Efficiencies at 25, 75, 50 and 100% load.
- **(f)** Regulation at 100% and 80% power factor.
- **(g)** Audible sound level.
- **(h)** Insulation class and rated temperature rise.
- **(i)** Dimensions and weight.
- **(j)** Applied potential test.
- **(k)** Induced potential test.
- **(l)** Excitation current.
- **(m)** IR, IX, and IZ percentages.
- **(n)** Reference and ambient temperature.

1.0.11 Warranty: Transformers must be warranted against defects in materials, workmanship and performance for ten years from date of manufacture.

Specification Guide for Drive Isolation Transformers

1.0 Dry Type Transformers:

1.0.0 The following information should be utilized only by trained technical personnel. If you need assistance, please contact Acme's Technical Services Department at 800-334-5214.

1.0.1 Provide dry type, enclosed, epoxy encapsulated transformers as indicated and specified herein. Transformers shall be designed for use with AC/DC Drive applications and labeled as such.

1.0.2 Transformers shall be designed, constructed and rated in accordance with UL, CSA, NEMA, ANSI, IEEE, and OSHA standards.

1.0.3 Transformers 7.5 - 20 kVA shall be three phase, compound filled, incorporating a 180 degree C insulation system and designed not to exceed a 115 degree C temperature rise above a 40 degree C ambient under full load conditions. Taps are provided on the primary side of the transformer as follows:

(a) 1-5% above normal full capacity.

(b) 1-5% below normal full capacity.

Transformers 27 - 750 kVA shall be the ventilated type, incorporating a 220 degree C insulation system and designed not to exceed a 150 degree C temperature rise above a 40 degree C maximum ambient under full load conditions. Taps are to be provided on the primary side of the transformer as follows:

(a) 2 - 2.5% above normal full capacity.

(b) 2 - 2.5% below normal full capacity.

Alternate 1: 115 degree C rise transformers shall incorporate a 220 degree C insulation system and be designed not to exceed a 115 degree C temperature rise above a 40 degree C maximum ambient under full load conditions.
Alternate 2: 80 degree C rise transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 80 degree C temperature rise above a 40 degree C maximum ambient under full load conditions.

1.0.4 Transformer enclosure finish must be ASA 61 gray powder polyurethane paint. Ventilated transformer enclosure temperature shall not exceed 50 degrees C plus the ambient. Compound filled transformer enclosure temperature shall not exceed 65 degrees C, plus the ambient.

1.0.5 Compound filled transformer enclosure shall be UL/NEMA Type 3R and so marked on the transformer (7.5 - 20 kVA). No weather shield is required. Ventilated transformer enclosure shall be UL/NEMA Type 2 and UL-3R listed with the addition of a weather shield and shall be so marked on the transformer (27 - 750 kVA).

1.0.6 Transformers shall incorporate an electrostatic shield for the attenuation of voltage spikes, line noise, and transients.

1.0.7 Transformers up to 220 kVA shall terminate in copper bus bar or copper wire.

1.0.8 Transformer coils must be wound with aluminum strip conductors for increased insulation life, cooler operation and lower losses.

1.0.9 Transformers must operate at audible sound levels below NEMA standard ST-20. Sound levels will not exceed the following:

up to 9kVA	40 db
10 - 50 kVA	45 db
51 - 150 kVA	50 db
151 - 300 kVA	55 db
301 - 500 kVA	60 db
501 - 750 kVA	65 db

Transformers must incorporate vibration isolation pads in their construction located between the transformer core and coil assembly and the transformer case, (27 - 750 kVA).

External vibration pads should not be used as they tend to increase audible noise. Transformers shall be floor mounted on a concrete pad. All connections to the transformer will be made by means of flexible metallic conduit.

1.0.10 Transformer enclosure shall be grounded per the National Electrical Code.

1.0.11 Transformer voltages shall be as follows:

(a) 460 Delta - 460Y/266
(b) 460 Delta - 230Y/133
(c) 575 Delta - 230Y/133
(d) 575 Delta - 460Y/266
(e) 230 Delta-230Y/133
(f) Other

Transformer shall be 60 Hz. kVA rating as indicated. Contractor to provide all necessary lugs for all transformers.

1.0.12 Complete shop drawings must be submitted for approval on all dry type transformers.

1.0.13 Typical performance data must be submitted for approval on all transformers. Factory tests must be made in accordance with the latest revisions of ANSI Test Code C57.12.91 for Dry Type Transformers. Performance data provided must contain, but not be limited to:

(a) No load losses.
(b) Full load losses.
(c) Polarity and phase rotation.
(d) Impedance at reference temperature.
(e) Efficiencies at 25, 75, 50 and 100% load.
(f) Regulation at 100% and 80% power factor.
(g) Audible sound level.
(h) Insulation class and rated temperature rise.
(i) Dimensions and weight.
(j) Applied potential test.
(k) Induced potential test.
(l) Excitation current.
(m) IR, IX, and IZ percentages.
(n) Reference and ambient temperature.

1.0.14 Warranty: Transformers must be warranted against defects in materials, workmanship and performance for ten years from date of manufacture.

Transformer Industry Standards

Underwriters' Laboratories, Inc. is an independent not for profit organization which tests products for safety.

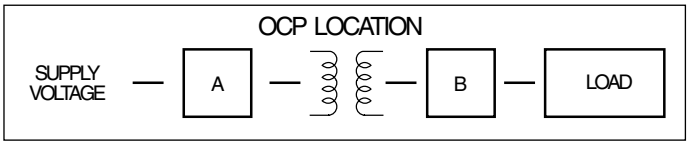
Acme's transformers are designed and manufactured to comply with UL Standard 506, 1561, 1012, or 1062 and carry the applicable UL Listing Label. Because of the continuous product evolutions at Acme, it is best that you contact the factory for the current file and guide numbers associated with the listings.

The Canadian Standards Association is the Canadian counterpart to Underwriters' Laboratories. Acme's transformers are also constructed and rated to comply with CSA Standards C22.2-47 and C22.2-66 and carry the CSA Certification Label.

All of Acme's transformers are manufactured to meet National Electrical Code requirements.

Other Agencies and Standards:
National Electrical Manufacturers Association (NEMA)
ST-20 1992 (R1978)
American National Standards Institute (ANSI)
OSHA
IEEE

Listed Certified



How to overcurrent protect (OCP) 600 volt class transformers and associated wiring

. . . in accordance with the '99 National Electric Code (Articles 450-3(b) and 240-3 (i))

Case	Type of Supply Voltage	Phase	Number of Wires on Secondary	Protection Required	OCP Location	Primary		Secondary	
						Current (AMPS)	OCP (% of rating)	Current (AMPS)	OCP (% of rating)
1	Main	1Ø	2	Primary Only	A	≥9 <9, ≥2 <2	125 ① 167 max. 300 max.	Not Required	
2	Main	1Ø 3Ø	More than 2 Not Applicable	Primary & Secondary ②	A & B	≥9 <9, ≥2 <2	125 ① 167 max. 300 max.	≥9 <9	125 ① 167 max.
3	Feeder Circuit with OCP	1Ø	2	None on Either	—		Not Required		Not Required
4	Feeder Circuit with OCP	1Ø 3Ø	More than 2 Not Applicable	Secondary Only ②	B		Not Required	9 <9	125 ① 167 max.

Acme® Transformer™ Products vs. U/L Insulation Systems & U/L Standards

Acme Construction Style	Acme Catalog Product Name	U/L Standard	U/L Product Category	U/L File Number	U/L Listed Control #	U/L Insulation Number	Insulation System Temp./C	kVA Single Phase	kVA Three Phase
Enclosed	General Purpose and Buck-Boost	506	XPTQ	E79947V1	50B8	B3223	130	.050-.150	N/A
Compound Filled (Encapsulated)	General Purpose Buck-Boost & DIT	506	XPTQ	E79947V1	50B8	X3221 H3221	155 180	.25-5.0 7.5-25.0	3.0-6.0 7.5-75.0
	Panel Tran®	1062	YEFR	E56936V1	N/A	H3180 H3221	180 180	5.0 7.5-25.0	N/A 9.0-30.0
	Swim Pool & Spa	379	HDGV	E111069V1	N/A	H3180	180	0.10-.30	N/A
	Hardwired CVR	1012	QQFU	E86492V1	6B81	B3223 X3221	130 155	.25-3.0 5.0-15.0	N/A N/A
	Portable PLC	1012	QQFU	E86492V1	60B1	B3223	130	.25-2.0	N/A
Open Core & Coil	Industrial Control	506	XPTQ	E79947V1	50B8	B3223	130	.050-5.0	N/A
Air Cooled Ventilated & Non Ventilated	General Purpose Opti-Miser® & DIT	1561	XQNX	E12547V3	542B	C3222	220	37.5-250.0	25-1000
Enclosed	Air Conditioning and Refrigeration Appliance	NONE	NONE	NONE	N/A	NONE	130	.085-2.0	N/A

① % of rated current (or next higher standard rating).

② In cases where the secondary is overcurrent protected, the primary overcurrent protection rating can be no more than 250% (2.5 times) full load amps (shown on above chart). For example, if a 10 kVA, single phase transformer has a 480V primary and a 120/240 secondary, and the secondary is overcurrent protected, maximum primary overcurrent protection rating is 20.8 amps (full load current) x 2.5 (250%) = 52. Therefore, use a standard 50 amp fuse or breaker selected from NEC Section 240-6 (below).

Section 240-6 of the 1999 National Electrical Code. The standard ampere ratings for fuses and inverse time circuit breakers shall be considered 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000 and 6000 amperes. **Exception:** Additional standard ratings for fuses shall be considered 1, 3, 6, 10, and 601. **"Extracted by permission from ANSI/NFPA 70-1999, National Electrical Code®, Copyright®,1999, National Fire Protection Association, Boston, MA."**

Acme Electric–Power Distribution Products Division has never used polychlorinated biphenyls (PCBs) in the manufacture of our quality products.

Alphanumerical Catalog Number Index

This alphanumerical listing of catalog numbers has been prepared to help you locate the appropriate page, when only the catalog number is known. It is arranged in alphanumerical order according to the first letter of the catalog number.

ALPHANUMERICAL CATALOG NUMBER INDEX

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For over eighty-eight years, Acme Electric has been manufacturing Power Conditioning Equipment for use in industrial, commercial and OEM applications. Built on a reputation for superior service, quality and technical expertise in the transformer market, Acme is regarded as a true industry leader.

Dry Type General Purpose Transformers

Acme Electric is a full line manufacturer of low voltage (600V and below) dry type distribution transformers using both copper and aluminum conductor, offering an array of products between 0.05 -1000 KVA.

All Acme products are designed, constructed and rated to meet or exceed the standards established by NEMA, ANSI and IEEE. With few exceptions, all ACME transformers are UL Listed.

K-Factor Transformers

Non-sinusoidal harmonic currents are created by much of today's electronic equipment. In fact, the switch mode power supply found in desktop computers, data processors and other office equipment is a major source of harmonic currents. Other sources include electronic ballasts, variable frequency drives, heating controls and rectifier circuits.

These non-linear loads can cause the transformer's neutral conductor to overheat, requiring special transformer design. Acme's non-linear load isolation transformers use special winding techniques to minimize the eddy current losses generated by harmonic currents. A double-sized neutral conductor handles the excessive neutral current found in non-linear load applications, preventing the transformer from overheating.

Harmonic Mitigating Transformers

Harmonic currents can sometimes cause equipment to malfunction, motors to burn out, circuit breakers to trip, and fuses to blow. In such a case, there is an advantage to specifying a transformer that treats the harmonic anomalies versus simply tolerating them. Acme's Harmonic Mitigating Transformers offer the best solution for combating harmonics associated with non-linear loads.

These foil wound transformers will, by nature, be smaller, more efficient, and have lower eddy current losses than their wire wound counterparts. Acme's Harmonic Mitigating Transformers utilize a time proven zig-zag connection in the secondary circuit that results in a phase shift of the triplen harmonics and causes them to cancel one another. This technology not only results in cooler operation and "cleaner power", but also provides a more energy efficient means of dealing with harmonic problems.

CSL-3 / NEMA Premium Transformers

The Acme POWERWISE C3 sets a new standard for efficiency and reliability. Due to the use of more efficient core material and higher-grade electrical steel, POWERWISE C3 transformers are the most efficient commercially available transformers. With a 30% increase in efficiency performance over standard TP-1 transformers, these energy-efficient units exceed the requirements of the US Department of Energy Candidate Standard Level (CSL) 3 performance standard. POWERWISE C3 transformers achieve the lowest life cycle costs by reducing annual energy costs. Depending on the size of the transformer, this can mean thousands of dollars saved per transformer. And, because they generate lower losses, they reduce power drawn from generating stations, resulting in lower greenhouse gas emissions and less smog.

Acme POWERWISE C3 transformers are copper wound, 3-phase common-core, dry-type ventilated isolation transformers. Each transformer is meticulously constructed to ANSI/IEEE Standards and is UL and CSA listed. The POWERWISE C3 transformer is a perfect choice for K through 12, college, university, healthcare, governmental and commercial buildings where the total life cycle cost of the facility and its electrical system is a priority.

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Peace of mind

Rock-solid power solutions for over 80 years.

Acme Electric®

In today's high-tech environments, it's often the products you don't see that are the most critical to your success. That's why leaders across a broad spectrum of industries look to Acme Electric for power conversion and power conditioning equipment. While our products work quietly behind the scenes, our engineers and researchers are out in front, discovering new ways to deliver power more efficiently in a world ever aware of energy consumption and generation. Join customers around the globe who trust Acme for reliable, efficient solutions in industrial, commercial, and OEM applications.

Acme Electric • N85 W12545 Westbrook Crossing • Menomonee Falls, WI 53051 • Phone: 262.293.1500 • acmetransformer.com

ACME ELECTRIC 10-YEAR LIMITED* WARRANTY

Acme Electric (Acme) warrants to the original purchaser to correct by repair, replacement or refund of original purchase price, at Acme's option, products manufactured and sold by its Power Distribution Products Division, that may fail in service within the applicable period as set forth below, from the date of manufacture provided however, that conditions of operation have been normal at all times, and that the equipment has not been subjected to abnormal stress from such causes as incorrect primary voltage or frequency, improper ventilation or improper use. This warranty is made on the condition that prompt notice of defect is given to Acme in writing within the warranty period, and that Acme's inspection reveals to its satisfaction that the original purchaser's claim is valid under the terms of this warranty. Acme's obligation under this warranty, which is in lieu of all other warranties, express or implied, including the implied warranty of fitness for a particular purpose and merchantability, is limited to replacing or repairing defective products or parts, free of charge, provided they are returned to the factory, or refund of original purchase price, at Acme's option. However, purchased components (except for timers and photocells used in low voltage lighting power supplies) including but not limited to capacitors, circuit breakers, terminal blocks, batteries, fuses and tubes shall not be covered under this warranty. Repairs or replacement deliveries shall not interrupt or prolong the term of this warranty. Acme will not be liable for any special, indirect, consequential or incidental damages, including, without limitation, from loss of use, data, function or profits deriving out of or in connection with the use or performance of the product and shall have no liability for payment of any other damages whether in an action of contract, strict liability or tort. The remedy provided herein states Acme Electric's entire liability and buyer's sole and exclusive remedy here under. Rights may vary in certain states.

***Warranty Period:**
Standard Catalog Transformers — 10-year limited; Low Voltage Lighting Power Supplies, transformer — 10-year limited, True-Power® Power Line Conditioners, — 10-year limited; Custom products — 1 year.

Acme® Transformers™ are Shielded for Cleaner Power – Free!

Shielding is a FREE standard feature. Acme transformers have built-in noise and surge protection provided by internal electrostatic shielding. It's a standard feature on Acme general purpose dry-type transformers.

Acme transformers provide clean power. They provide noise and surge protection for entire feeder and branch circuits, plus every connected load. And, they establish a separately derived circuit and provide a solid single point ground—all essential for cleaner power. Install Acme transformers, and take the most fundamental and cost effective step toward cleaner power.

The more you use, the cleaner your system. The Acme shield constantly works to trap, knockdown and shunt potentially damaging noise and voltage spikes to ground at an average reduction ratio of 100:1. The more Acme shielded transformers you use on the feeder and branch circuits, the cleaner your system becomes. Use two Acme transformers on the same feeder and branch circuits, and get 10,000:1 reduction.

With Acme you get all the extra benefits of cleaner power, absolutely FREE!

Acme Electric®
Shielded for cleaner power™

Acme Electric

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