Acme Electric Corporation

Power Distribution Products Division

AN ACTUANT COMPANY

4815 West Fifth Street

Lumberton, NC 28358

(910) 738-1121 Inside NC

(800) 334-5214 Outside NC

(910) 739-0024 Fax

**www.acmepowerdist.com**

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ACME ELECTRIC CORPORATION

PDPD-01

# ACME ELECTRIC CORPORATION

## POWER DISTRIBUTION PRODUCTS

PDPD-01
REVISION 02/ 06

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Acme Electric, Power Distribution Products' Catalog contains many new products for your power distribution and control applications. To receive individual catalogs on several of our product lines, email kmccoin@acmepower.com.

To make your selection process easier, this catalog is divided into ten product sections. Selection charts in each section are also color coded:

Section color + white bars = 1Ø transformers

Section color + gray bar = 3Ø transformers

To find a product in the catalog when only the catalog number is known, a complete alpha-numerical catalog number index with page number listing is provided, beginning on page 164.

Wiring diagrams, design figures and accessories for standard distribution transformers (Sections I-IV) begin on page 146.

Some of the most frequently asked questions about transformers and their answers can be found in Section I begining on page 6. If you have additional questions before or after purchase of any products supplied by Power Distribution Products, feel free to contact our Technical Services Department at 1-800-334-5214.

Thank you for selecting Acme Power Distribution Products.

Dimensions in the tables are approximated and subject to change. Certified drawings for construction purposes will be provided upon request.

# Leadership in Quality Designed Products And Quality Customer Satisfaction

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.


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.

Headquartered in Lumberton, North Carolina, Acme Electric has over 170,000 square ft. of manufacturing in two plants; a 130,000 square ft. facility in Lumberton and a 45,000 square ft. facility in Mexico.

Acme's product offering covers the full spectrum of applications, from commercial general power distribution and high harmonic conditions to specific industrial motor drive/factory automation systems, to low voltage landscape lighting applications.

As an active member of the Rockwell Automation Encompass Program, National Electrical Manufacturers Association (NEMA) and IEEE, Acme Electric markets its approximately 1,500 products through a selective network of full line independent, regional, national and international electrical distributors that are recognized in the industry as being best in class.

## Manufacturing Capabilities

To meet the demands of the customer base, while maintaining a competitive edge, strategically, Acme has focused on being a high quality, responsive, low cost manufacturer. All Acme products are designed, constructed and rated to meet or exceed the standards established by UL, CSA, CE, NEMA, ANSI and IEEE.

In 1997, Acme became certified in the Demand Flow Technology (DFT), in doing so, the cycle time for manufacturing a transformer has been reduced to 8-10 days. This flexible process allows Acme the ability to provide standard and custom product, with the responsiveness required from a manufacturer in today's just in time environment.

The Lumberton, North Carolina facility serves as Acme's headquarters and primary manufacturing location. The Lumberton plant manufactures both air-cooled and encapsulated transformers covering the full range of Acme's offering in standard and custom designs. This facility also has 30,000 sq. ft of warehouse area that serves as the company's central distribution center.

In 1999, Acme began its manufacturing expansion with the opening of a facility in Monterrey, Mexico. This plant focuses on many of the smaller KVA and industrial control transformers that are sold throughout the entire Acme Electric customer base. In 2003, Acme further expanded its manufacturing resources with a strategic partnership in China.

In August 2004, we acquired Amveco Magnetics, Inc., Houston, TX. Amveco is a world leader in toroidal power transformers. Amveco designs and manufacturers toroidal power transformers, standard and custom inductors, current transformers and auto-transformers. Most of the products manufactured by Amveco are custom designed, with the use of proprietary CAD program and an experienced Engineering Department. Amveco's knowledgable customer service representatives provide promt, reliable and quality customer service to all customers. Amveco is an ISO-9001 registered company and the transformers use only flame-retardant material (UL 94V2). These transformers carry a lifetime warranty and are recognized to several UL standard CSA certified, and TUV for medical applications. Amveco expanded our global presence by including a joint venture in India.

## Custom/OEM Product Capabilities

In addition to the full line of standard product offerings, Acme is positioned to supply special products to meet specific customer requirements. With an OEM oriented end user customer base, an experienced Design Engineering Department utilizes software dedicated to core and coil electrical design, combined with new state of the art parametric technology mechanical design software.

With these design tools, Acme provides customers with rapid turnaround of designs and prototypes of custom products. These custom designs range from special KVA, voltage combinations and performance characteristics to special mounting configurations/ footprints, enclosures and terminations.

## Commitment to Quality

Acme Electric has earned the reputation for the manufacture of high quality products backed by superior customer service. To demonstrate this commitment to quality Acme Electric is an ISO 9000 certified manufacturer and has recently adopted a company wide Six Sigma philosophy of continuous improvement.

As an ISO 9000 Certified Manufacturer, Acme Electric has adopted a specific, proven quality management system. The Lumberton, NC facility has been ISO Certified since 1995 and in May of 2003 upgraded to the new ISO 9001-2000 Standard. This certification expands beyond manufacturing to also include customer service. The Mexico and China facilities operate under the same practices of ISO 9001-2000.

In 2002, Acme Electric made a commitment to the Six Sigma philosophy. The result is a core team of certified black belt and green belt project champions, who work in conjunction with the Acme Management Team and Quality Council to be the driving force behind Acme's doctrine and goal of continuous improvement.

This philosophy involves all aspects of Acme's business (both manufacturing and in the office) and is having a direct impact on Acme's pledge to meet and exceed the expectations of our customers.

ISO 9001:2000 REGISTERED

With this commitment to quality, Acme has positioned itself to be the premiere supplier of quality products and service to meet the demanding needs of today's marketplace, while adapting to the dynamic changes of tomorrow.

SECTION 1

# DRY-TYPE DISTRIBUTION TRANSFORMERS

## 600 Volt Class and Below Single and Three Phase



**NOTE:** Design figures, wiring diagrams and accessories begin on page 146.

# 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 (10,000

volt-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.

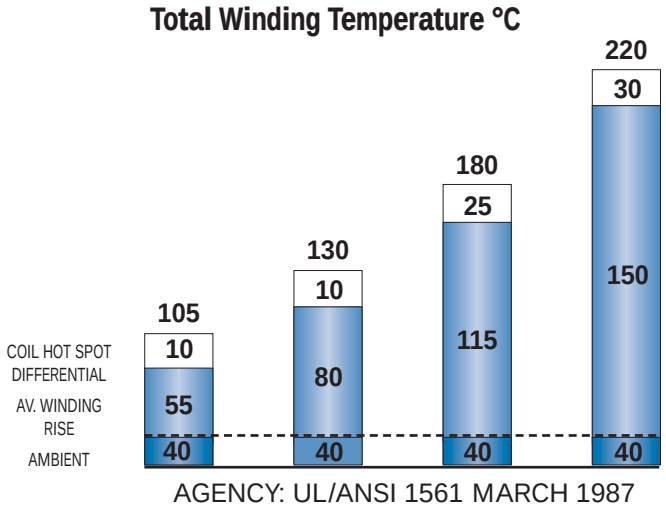



**Figure A**

**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 500 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.

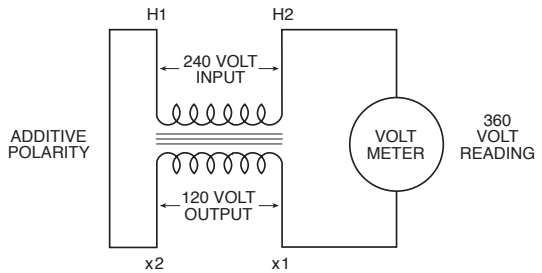
**25. Can transformers listed in this catalog be reconnected as autotransformers to increase their KVA rating?** Several standard single phase transformers listed in this catalog can be connected as autotransformers. The KVA capacity will be greatly increased when used as an autotransformer, in comparison 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 Transformer?** 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.

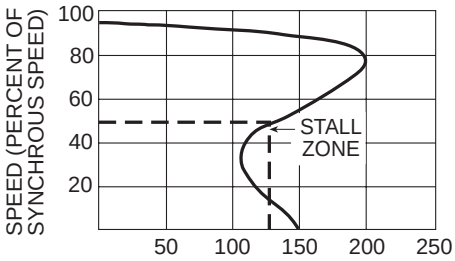
**34. How are transformers sized to operate Three Phase induction type squirrel cage motors?** The minimum transformer KVA rating required to operate a motor is calculated as follows:

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

**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:




TORQUE (PERCENT OF FULL LOAD TORQUE)
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.

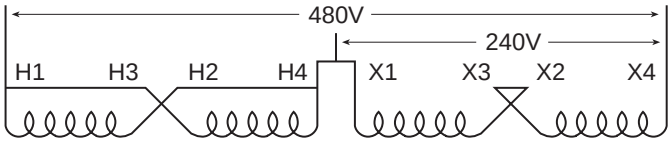



**Figure 1**

**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.

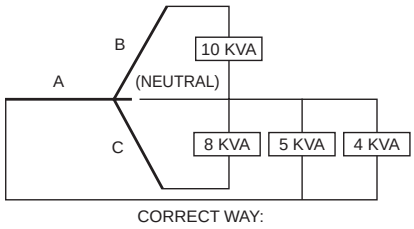
**Non-Ventilated** — means constructed to provide no intentional circulation of external air through the enclosure.

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

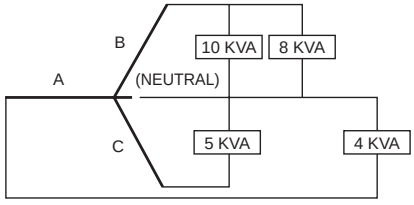
**Outdoor Locations** — are those areas exposed to the weather.

**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.

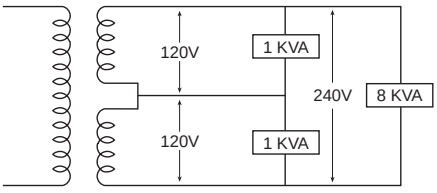



CORRECT WAY:

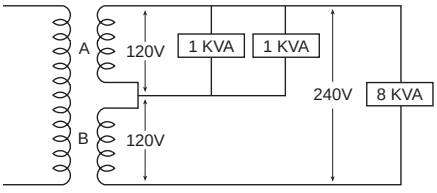



INCORRECT WAY:

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 transformers?** 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 | 208V | 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.

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

(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

## SINGLE PHASE, .05 to .150 KVA


### FEATURES

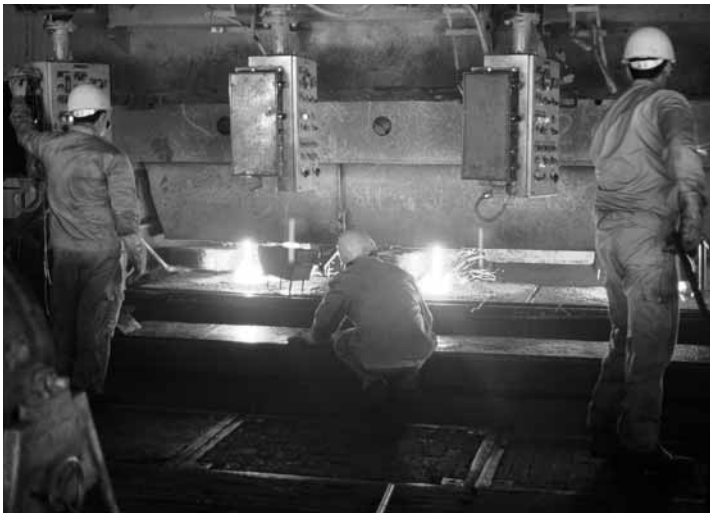
- **UL listed, CSA certified and UL-3R enclosure** meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- **Easy and convenient installation** to meet your requirements, the transformer can be mounted in any position.
- **Long Life** UL class 130°C insulation system. Transformers 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.

## 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

## 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.

NEW

## 316 STAINLESS STEEL TRANSFORMERS

### FEATURES

- 3R enclosure.
- Comply with NEC Class 1, Division 2, when installed per NEC 501-2 (b).
- 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

## 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; 275 to 1000 KVA, aluminum bus.
- **Electrostatic shielding** provided on all 60 Hz isolation transformers.
- **Electrostatic shielding** not available on Groups D1 and G1.

NEW

## LN SERIES
## LOW NOISE TRANSFORMERS

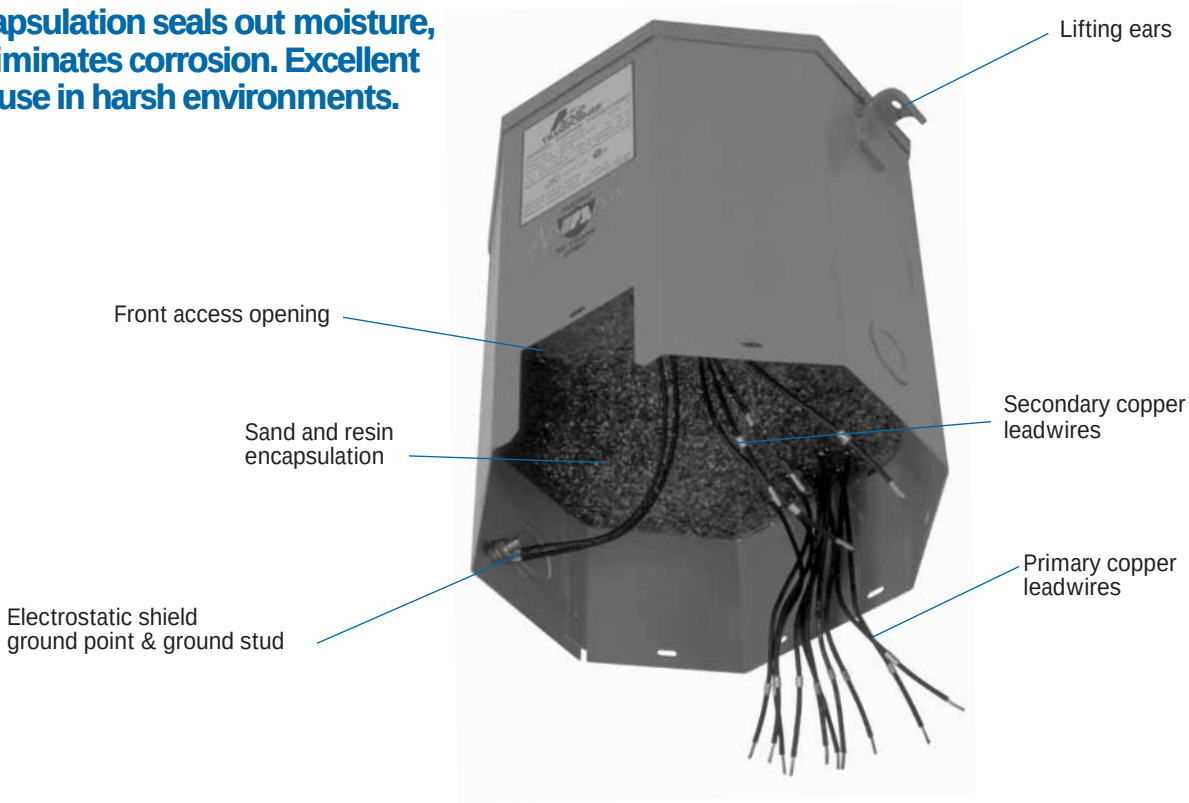
### FEATURES

- 3 db below NEMA standard (LN3).
- Contact factory for 5 db below.
- Encapsulated construction.
- Three phase: 30 – 225 KVA, 480 Delta to 208Y/120.
  30 – 225 KVA, 480 Delta to 208Y/120.
- NEMA TP1 option available (contact factory).
- Aluminum windings standard.
- Copper windings available (contact factory).
- NEMA 2 enclosures (3R with weather shield).
- 220°C Insulation with 150°C Rise.
- Electrostatic shielding.

### APPLICATIONS

- Theaters
- Hospitals
- Educational facilities
- Office buildings
- Any application where transformers need to be installed in or near occupied areas
- Churches
- Libraries

## Resin Encapsulation seals out moisture, dirt and eliminates corrosion. Excellent choice for use in harsh environments.




## Wound Core construction for lower losses and quiet operation.

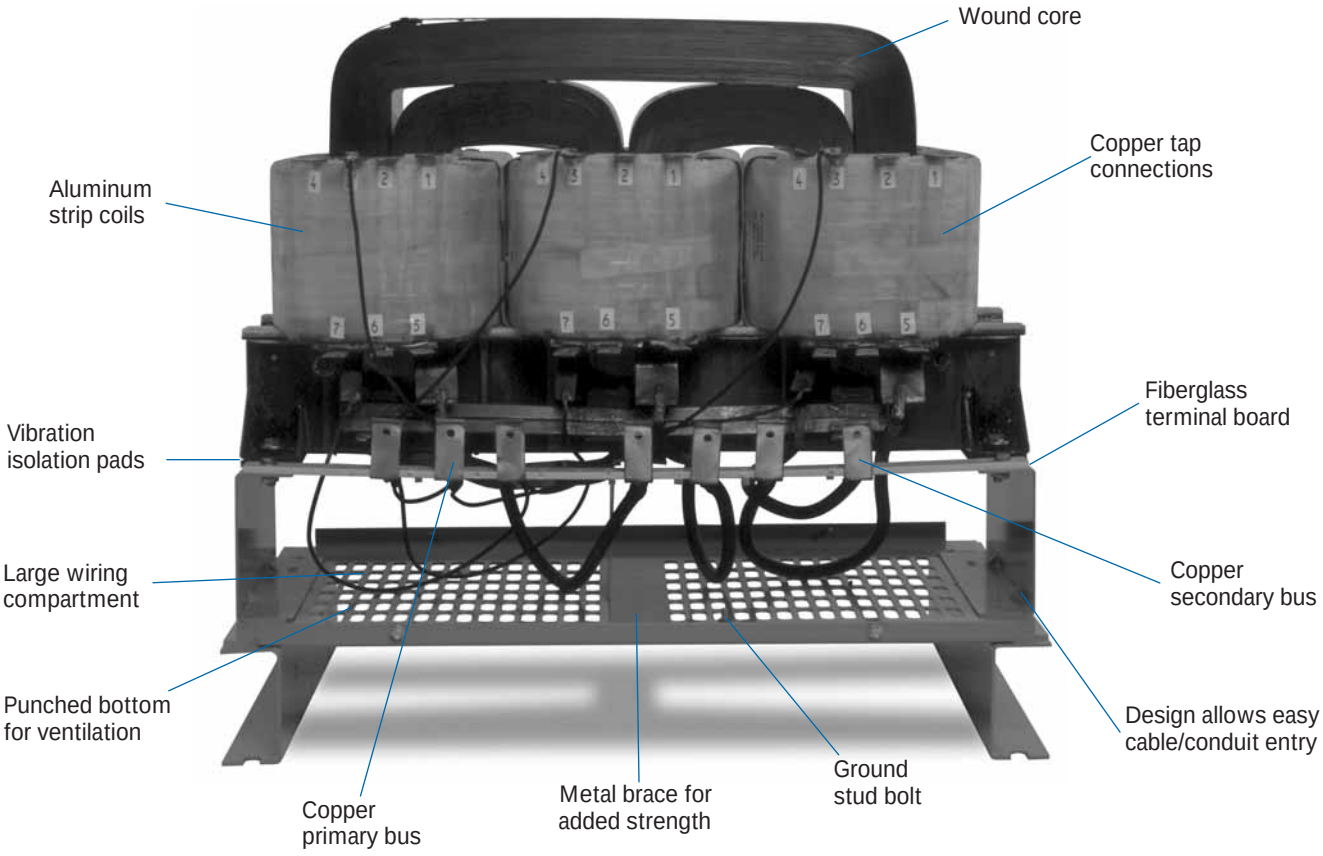



*Photo representative of Drive Isolation Transformer*

**NOTE:** These photographs are for illustration purposes only. Please contact factory for construction details.

## 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.) 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| ① .05 | T-1-53004 | 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 | T-1-53005 | 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 | T-1-53006 | 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 | T-2-53007-S | 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 | T-2-53008-S | 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 | T-2-53009-S | 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 | T-2-53010-S | 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 | T-2-53011-S | 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 | T-2-53012-S | 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 | T-2-53013-S | 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 | T-2-53013-4S | 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 | T-2-53014-S | 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 | T-2-53014-4S | 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 | T-2-53515-3S | 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 | T-2-53516-3S | 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 | T-2-53517-3S | 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 | T-2-53518-3S | 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 | T-2-53019-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 280 (127.0) | F② | NA | WS-A-1 | 5–E |
| 50.00 | T-2-53020-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 350 (158.8) | F② | NA | WS-A-1 | 5–E |
| 75.00 | T-2-53021-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 430 (195.0) | F | NA | WS-A-3 | 5–E |
| 100.00 | T-2A-53022-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 525 (238.0) | F | NA | WS-A-4 | 5–E |
| 167.00 | T-1-53023-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1050 (476.3) | F | NA | WS-A-5 | 5–E |
| 250.00 | T-2-53024-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1440 (653.2) | F | NA | WS-A-5 | 5–E |

NEW

### 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.) 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | T-2-53007-SS | 8.68 (22.0) | 4.08 (10.4) | 3.88 (9.9) | 10 (4.5) | W | NA | NA | 2-B |
| 0.50 | T-2-53008-SS | 9.06 (23.0) | 4.37 (11.1) | 4.20 (10.7) | 15 (6.8) | W | NA | NA | 2-B |
| 0.75 | T-2-53009-SS | 9.68 (24.6) | 4.75 (12.1) | 4.50 (11.4) | 19 (8.6) | W | NA | NA | 2-B |
| 1.00 | T-2-53010-SS | 10.50 (26.7) | 5.50 (14.0) | 5.13 (13.0) | 24 (10.9) | W | NA | NA | 2-B |
| 1.50 | T-2-53011-SS | 11.62 (29.5) | 5.50 (14.0) | 5.13 (13.0) | 30 (13.6) | W | NA | NA | 2-B |
| 2.00 | T-2-53012-SS | 13.00 (33.0) | 5.50 (14.0) | 5.13 (13.0) | 38 (17.2) | W | NA | NA | 2-B |
| 3.00 | T-2-53013-SS | 11.50 (29.2) | 10.31 (26.2) | 7.13 (18.1) | 55 (24.9) | W | NA | NA | 3-C |
| 5.00 | T-2-53014-SS | 14.38 (36.5) | 10.31 (26.2) | 7.13 (18.1) | 75 (34.0) | W | NA | NA | 3-C |
| 7.50 | T-2-53515-SS | 15.19 (38.6) | 13.50 (34.3) | 10.84 (27.5) | 115 (52.2) | W | NA | NA | 4-D |
| 10.00 | T-2-53516-SS | 15.19 (38.6) | 13.50 (34.3) | 10.84 (27.5) | 125 (56.7) | W | NA | NA | 4-D |
| 15.00 | T-2-53517-SS | 16.94 (43.0) | 14.12 (35.9) | 11.59 (29.4) | 170 (77.1) | W | NA | NA | 4-D |
| 25.00 | T-2-53518-SS | 18.44 (46.8) | 16.13 (41.0) | 13.34 (33.9) | 250 (113.0) | W | NA | NA | 4-D |

① Suitable for 50/60 Hz.

② Wall mounting brackets are available for these sizes, refer to page 157.

## 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.) | | | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 7.50 | TC-53515-3S | 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 | TC-53516-3S | 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 | TC-53517-3S | 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 | TC-53518-3S | 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 | TC-53019-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 295 (133.8) | F② | NA | WS-A-1 | 5–E |
| 50.00 | TC-53020-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 378 (172.0) | F② | NA | WS-A-1 | 5–E |
| 75.00 | TC-53021-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 468 (212.3) | F | NA | WS-A-3 | 5–E |
| 100.00 | TC-53022-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 768 (348.4) | F | NA | WS-A-4 | 5–E |

## 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.) | | | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 37.50 | TE-2-53019-3S | 35.47 (90.1) | 31.90 (81.0) | 26.90 (68.3) | 430 (195.0) | F② | NA | NA | 5–H |
| 50.00 | TE-2-53020-3S | 35.47 (90.1) | 31.90 (81.0) | 26.90 (68.3) | 430 (195.0) | F② | NA | NA | 5–H |
| 75.00 | TE2A-53021-3S | 35.47 (90.1) | 31.90 (81.0) | 26.90 (68.3) | 525 (238.0) | F | NA | NA | 5–H |
| 100.00 | TE-1-53022-3S | 42.00 (106.7) | 40.00 (101.6) | 30.00 (76.2) | 775 (352.0) | F | NA | NA | 5–H |

## GROUP III

### 120 X 240 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-3-53040-S | 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 | 13–B |
| 1.5 | T-3-53041-S | 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 | 13–B |
| 2.0 | T-3-53042-S | 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 | 13–B |
| 3.0 | T-3-53043-S | 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 | 13–C |
| 5.0 | T-3-53044-S | 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 | 13–C |
| 7.5 | T-3-53545-S | 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 | 13–D |
| 10.0 | T-3-53546-S | 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 | 13–D |
| 15.0 | T-3-53547-S | 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 | 13–D |
| 25.0 | T-3-53548-S | 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 | 13–D |

① Suitable for 50/60 Hz.
② Wall mounting brackets are available for these sizes, refer to page 157.

## 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 Begin on Page 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| ① .05 | T-1-53104 | 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 | T-1-53105 | 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 | T-1-53106 | 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 | T-2-53107-S | 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 | T-2-53108-S | 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 | T-2-53109-S | 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 | T-2-53110-S | 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 | T-2-53111-S | 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 | T-2-53112-S | 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 | T-2-53113-1S | 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 | T-2-53114-1S | 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 | T-2-53615-1S | 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 | T-2-53616-1S | 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 | T-2-53617-1S | 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 | T-2-53618-1S | 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 | T-2-53119-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 275 (125.0) | F ② | NA | WS-A-1 | 11-E |
| 50.00 | T-2-53120-3S | 29.90 (76.0) | 28.15 (71.5) | 22.37 (56.8) | 340 (154.0) | F ② | NA | WS-A-2 | 11–E |
| 75.00 | T-2-53121-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 420 (191.0) | F | NA | WS-A-3 | 11–E |
| 100.00 | T-2A-53122-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 525 (238.0) | F | NA | WS-A-4 | 11–E |
| 167.00 | T-1-53123-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 700 (318.0) | F | NA | WS-A-5 | 11–E |

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-53140-1S | 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 | 6–B |
| 1.5 | T-2-53141-1S | 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 | 6–B |
| 2.0 | T-2-53142-1S | 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 | 6–B |
| 3.0 | T-2-53143-1S | 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 | 6–C |
| 5.0 | T-2-53144-1S | 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 | 6–C |
| 7.5 | T-2-53645-1S | 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 | 6–D |
| 10.0 | T-2-53646-1S | 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 | 6–D |
| 15.0 | T-2-53647-1S | 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 | 6–D |
| 25.0 | T-2-53648-1S | 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 | 6–D |
| 37.5 | T-2-53649-1S | 25.48 (64.7) | 24.39 (62.0) | 19.37 (49.2) | 257 (117.0) | F ② | N/A | WS-A-1 | 58–E |
| 50.0 | T-2-53650-3S | 25.48 (64.7) | 24.39 (62.0) | 19.37 (49.2) | 340 (154.2) | F ② | N/A | WS-A-1 | 17–E |
| NEW 75.0 | T-2-53651-3S | 35.40 (89.9) | 31.90 (81.0) | 26.88 (68.2) | 420 (190.5) | F ② | N/A | WS-A-3 | 17–E |

① Suitable for 50/60 Hz.
② Wall mounting brackets are available for these sizes, refer to page 157.

## GROUP VI

### 277 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-53170-1S | 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 | 7–B |
| 1.5 | T-2-53171-1S | 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 | 7–B |
| 2.0 | T-2-53172-1S | 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 | 7–B |
| 3.0 | T-2-53173-1S | 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 | 7–C |
| 5.0 | T-2-53174-1S | 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 | 7–C |
| 7.5 | T-2-53675-1S | 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 | 7–D |
| 10.0 | T-2-53676-1S | 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 | 7–D |
| 15.0 | T-2-53677-1S | 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 | 7–D |
| 25.0 | T-2-53678-1S | 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 | 7–D |

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-79740-S | 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 | T-2-79741-S | 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 | T-2-79742-S | 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 | T-2-79743-S | 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 | T-2-79744-S | 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 | T-2-79745-S | 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 | T-2-79746-S | 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 | T-2-79747-S | 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 | T-2-79748-S | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-53060 | 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 | T-2-53061 | 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 | T-2-53062 | 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 | T-2-53063 | 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 | T-2-53064 | 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 | T-2-53065 | 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 | T-2-53066 | 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 | T-2-53067 | 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 VI

### 277 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-53170-1S | 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 | 7–B |
| 1.5 | T-2-53171-1S | 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 | 7–B |
| 2.0 | T-2-53172-1S | 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 | 7–B |
| 3.0 | T-2-53173-1S | 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 | 7–C |
| 5.0 | T-2-53174-1S | 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 | 7–C |
| 7.5 | T-2-53675-1S | 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 | 7–D |
| 10.0 | T-2-53676-1S | 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 | 7–D |
| 15.0 | T-2-53677-1S | 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 | 7–D |
| 25.0 | T-2-53678-1S | 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 | 7–D |

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-79740-S | 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 | T-2-79741-S | 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 | T-2-79742-S | 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 | T-2-79743-S | 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 | T-2-79744-S | 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 | T-2-79745-S | 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 | T-2-79746-S | 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 | T-2-79747-S | 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 | T-2-79748-S | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 1.0 | T-2-53060 | 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 | T-2-53061 | 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 | T-2-53062 | 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 | T-2-53063 | 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 | T-2-53064 | 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 | T-2-53065 | 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 | T-2-53066 | 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 | T-2-53067 | 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 |

NEW

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 0.25 | GP12-250-S | 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 | GP12-500-S | 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 | GP12-1000-S | 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 | GP12-3000-S | 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 | GP12-5000-S | 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 | GP12-10000-S | 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 | 79D |
| 15.00 | GP12-15000-S | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | T-3-79367-1S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 245 (111.0) | F ① | NA | NA | 48–I |
| 30.0 | T-2-79368-4S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 330 (150.0) | F ① | NA | WS-A-1 | 46–E |
| 45.0 | T-2-79369-4S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 400 (181.0) | F ① | NA | WS-A-1 | 46–E |
| 75.0 | T-2-79370-4S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 530 (240.0) | F ① | NA | WS-A-2 | 46–E |
| 112.5 | T-2-79371-4S | 35.47 (90.1) | 31.90 (81.0) | 26.90 (68.3) | 750 (340.0) | F | NA | WS-A-3 | 46–E |
| 150.0 | T-2-79372-4S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 950 (430.9) | F | NA | WS-A-4 | 46–E |
| 225.0 | T-2-79373-4S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1200 (544.0) | F | NA | WS-A-4 | 46–E |
| 300.0 | T-3-79374-4S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | NA | WS-A-5 | 46–E |
| 500.0 | T-2-79376-2S | 57.80 (146.8) | 45.00 (114.3) | 41.50 (105.4) | 3500 (1588.0) | F | NA | WS-A-7 | ② G |

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 9.0 | T-2A-53360-1S | 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 | T-3-53361-1S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (23.0) | 250 (113.0) | F ① | NA | NA | 18–I |
| 30.0 | T-3-53362-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 325 (147.0) | F ① | NA | WS-A-1 | 19–E |
| 45.0 | T-3-53363-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 350 (158.8) | F ① | NA | WS-A-1 | 19–E |
| 75.0 | T-3-53364-4S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 450 (204.1) | F ① | NA | WS-A-2 | 19–E |
| 112.5 | T-2A-53365-4S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 696 (294.8) | F | NA | WS-A-3 | 19–E |
| 150.0 | T-2-53366-4S | 41.52 (105.5) | 32.90 (84.0) | 29.87 (75.9) | 978 (412.8) | F | NA | WS-A-4 | 19–E |
| 225.0 | T-2-53367-4S | 41.52 (105.5) | 32.90 (84.0) | 29.87 (75.9) | 1200 (544.0) | F | NA | WS-A-4 | 19–E |

① Wall mounting brackets are available for these sizes, refer to page 157.
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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-53308-1S | 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 | T-2A-53309-1S | 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 | T-2A-53310-1S | 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 | T-3-53311-1S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.0) | F ① | NA | NA | 21–I |
| 25.0 | T-3-53393-3S | 25.48 (64.7) | 24.39 (61.9) | 19.37 (49.2) | 290 (132.0) | F ① | NA | WS-A-1 | 22–E |
| 30.0 | T-3-53312-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 290 (132.0) | F ① | NA | WS-A-1 | 22–E |
| 37.5 | T-3-53394-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 400 (181.0) | F ① | NA | WS-A-1 | 22–E |
| 45.0 | T-3-53313-3S | 25.50 (64.7) | 24.39 (61.9) | 19.37 (49.2) | 400 (181.0) | F ① | NA | WS-A-1 | 22–E |
| 50.0 | T-3-53403-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 475 (216.0) | F ① | NA | WS-A-2 | 22–E |
| 75.0 | T-3-53314-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 500 (226.8) | F ① | NA | WS-A-2 | 22–E |
| 112.5 | T-2A-53315-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 750 (340.0) | F | NA | WS-A-3 | 22–E |
| 150.0 | T-3-53316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 970 (440.0) | F | NA | WS-A-4 | 22–E |
| 225.0 | T-3-53317-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1200 (544.0) | F | NA | WS-A-4 | 22–E |
| 300.0 | T-3-53318-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | NA | WS-A-5 | 22–E |
| 500.0 | T-2-53319-3S | 57.80 (146.8) | 45.60 (115.8) | 41.50 (105.4) | 2480 (1125.0) | F | NA | WS-A-7 | 22–G |
| 750.0 | T-2-53321-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | NA | WS-A-6 | 22–G |
| 1000.0 | T-1-53322-2S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4300 (1950.0) | F | NA | WS-A-6 | 80–G |

NEW

## GROUP DI

### 480 DELTA PRIMARY VOLTS –– SHIELDED UNITS –– 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | T-79804-3S | 29.59 (75.2) | 25.15 (63.9) | 22.50 (57.2) | 360 (163.3) | F | NA | WS-A-8 | 22–E |
| 45.0 | T-79805-3S | 29.59 (75.2) | 25.15 (63.9) | 22.50 (57.2) | 430 (195.0) | F | NA | WS-A-8 | 22–E |
| 75.0 | T-79806-3S | 29.59 (75.2) | 25.15 (63.9) | 22.50 (57.2) | 530 (240.4) | F | NA | WS-A-8 | 22–E |
| *112.5 | T-79807-3 | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 630 (285.8) | F | NA | WS-A-3 | 67–E |

* Non-Shielded Unit

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | TC-53311-1S* | 18.90 (48.0) | 20.30 (51.6) | 9.00 (22.9) | 245 (111.1) | F ① | NA | NA | 21–I |
| 30.0 | TC-53312-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 346 (157.0) | F ① | NA | WS-A-1 | 22–E |
| 45.0 | TC-53313-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 397 (180.1) | F ① | NA | WS-A-1 | 22–E |
| 75.0 | TC-53314-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 521 (236.3) | F ① | NA | WS-A-2 | 22–E |
| 112.5 | TC-53315-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 766 (347.5) | F | NA | WS-A-3 | 22–E |
| 150.0 | TC-53316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1026 (465.4) | F | NA | WS-A-4 | 22–E |
| 225.0 | TC-53317-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1300 (589.7) | F | NA | WS-A-4 | 22–E |
| 300.0 | TC-1-53318-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1551 (703.5) | F | NA | WS-A-5 | 22–E |
| 500.0 | TC-53319-3S | 57.80 (146.8) | 45.00 (114.3) | 41.50 (105.4) | 2819 (1278.7) | F | NA | WS-A-7 | 22–E |

* **NOTE:** TC-53311-1S—Encapsulated, 115° C Rise, 180°C Insulation

① Wall mounting brackets are available for these sizes, refer to page 157.
② Consult factory for wiring diagram.

NEW

## GROUP D3

### LOW NOISE (minus 3db)

### 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | LN3-53312-3S | 29.48 (74.9) | 28.15 (71.5) | 22.37 (56.8) | 360 (163.3) | F ① | NA | WS-A-2 | 22-E |
| 45.0 | LN3-53313-3S | 29.48 (74.9) | 28.15 (71.5) | 22.37 (56.8) | 417 (189.2) | F ① | NA | WS-A-2 | 22-E |
| 75.0 | LN3-53314-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 536 (243.1) | F ① | NA | WS-A-3 | 22-E |
| 112.5 | LN3-53315-3S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 760 (344.7) | F | NA | WS-A-4 | 22-E |
| 150.0 | LN3-53316-3S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 950 (430.9) | F | NA | WS-A-4 | 22-E |
| 225.0 | LN3-53317-3S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1256 (569.7) | F | NA | WS-A-4 | 22-E |

## GROUP E

### NON-VENTILATED TRANSFORMERS

### 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | TE-2-53312-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 425 (193.0) | F ① | NA | NA | 22–H |
| 45.0 | TE-2-53313-3S | 35.47 (90.1) | 31.90 (81.0) | 26.90 (68.3) | 575 (261.0) | F | NA | NA | 22–H |
| 75.0 | TE-2-53314-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 965 (438.0) | F | NA | NA | 22–H |
| 112.5 | TE-3-53315-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1450 (658.0) | F | NA | NA | 22–H |

## 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.) | | | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | T-3-79312-3S | 24.81 (63.0) | 27.13 (68.9) | 11.14 (28.3) | 613 (278.1) | F | NA | NA | 22–I |
| 45.0 | T-3-79313-3S | 25.31 (64.3) | 30.18 (76.7) | 12.76 (32.4) | 780 (354.0) | F | NA | NA | 22–I |
| 75.0 | T-3-79314-3S | 26.82 (68.1) | 34.68 (88.1) | 15.25 (38.7) | 1126 (511.0) | F | NA | NA | 22–I |

NEW

## 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-53308-SS | 10.38 (26.4) | 12.37 (31.4) | 7.47 (19.0) | 75 (34.0) | W | NA | NA | 21-F |
| 6.0 | T-2A-53309-SS | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | 140 (63.5) | W | NA | NA | 21-F |
| 9.0 | T-2A-53310-SS | 14.03 (35.6) | 17.77 (45.1) | 11.52 (29.3) | 180 (81.6) | W | NA | NA | 21-F |
| 15.0 | T-3-53311-SS | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.0) | F | NA | NA | 21-I |
| 30.0 | T-3-79312-SS | 24.81 (63.0) | 27.13 (68.9) | 11.14 (28.3) | 613 (278.1) | F | NA | NA | 22-I |
| 45.0 | T-3-79313-SS | 25.31 (64.3) | 30.18 (76.7) | 12.76 (32.4) | 780 (354.0) | F | NA | NA | 22-I |
| 75.0 | T-3-79314-SS | 26.82 (68.1) | 34.68 (88.1) | 15.25 (38.7) | 1126 (511.0) | F | NA | NA | 22-I |

① Wall mounting brackets are available for these sizes, refer to page 157.

## 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

| KVA ② | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-53328-1S | 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 | T-2A-53329-1S | 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 | T-2A-53340-1S | 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 | T-3-53341-1S | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.0) | F ① | NA | NA | 25–I |
| 30.0 | T-3-53342-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 325 (147.0) | F ① | NA | WS-A-1 | 26–E |
| 45.0 | T-3-53343-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 400 (181.0) | F ① | NA | WS-A-1 | 26–E |
| 75.0 | T-3-53344-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 500 (226.8) | F ① | NA | WS-A-2 | 26–E |
| 112.5 | T-2A-53345-3S | 35.47 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 750 (340.0) | F | NA | WS-A-3 | 26–E |
| 150.0 | T-3-53346-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1125 (510.0) | F | NA | WS-A-4 | 26–E |
| 225.0 | T-3-53347-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1200 (544.0) | F | NA | WS-A-4 | 26–E |
| 300.0 | T-3-53348-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | NA | WS-A-5 | 26–G |
| 500.0 | T-1-53349-3S | 62.00 (157.5) | 54.00 (137.2) | 42.00 (106.7) | 2675 (1213.0) | F | NA | WS-B-3 | 27–G |
| 750.0 | T-2-53350-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3408 (1545.8) | F | NA | WS-A-6 | 26–G |

NEW

## GROUP GI

### 480 DELTA PRIMARY VOLTS –– SHIELDED UNITS –– 240 DELTA / 120 TAP 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | T-79844-3S | 29.59 (75.2) | 25.15 (63.9) | 22.50 (57.2) | 365 (165.6) | F | NA | WS-A-8 | 26–E |
| 45.0 | T-79845-3S | 29.59 (75.2) | 25.15 (63.9) | 22.50 (57.2) | 460 (208.7) | F | NA | WS-A-8 | 26–E |
| 75.0 | T-79846-3S | 29.59 (75.2) | 25.15 (63.9) | 22.50 (57.2) | 530 (240.4) | F | NA | WS-A-8 | 26–E |
| *112.5 | T-79847-3 | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 630 (285.8) | F | NA | WS-A-3 | 68–E |

* Non-Shielded Unit

NEW

## GROUP G2

### LOW NOISE (minus 3 db)

### 480 DELTA PRIMARY VOLTS –– 240 DELTA / 120 TAP 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | LN3-53342-3S | 29.48 (74.9) | 28.15 (71.5) | 22.37 (56.8) | 360 (163.3) | F ① | NA | WS-A-2 | 26-E |
| 45.0 | LN3-53343-3S | 29.48 (74.9) | 28.15 (71.5) | 22.37 (56.8) | 417 (189.2) | F ① | NA | WS-A-2 | 26-E |
| 75.0 | LN3-53344-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 536 (243.1) | F ① | NA | WS-A-3 | 26-E |
| 112.5 | LN3-53345-3S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 800 (362.9) | F | NA | WS-A-4 | 26-E |
| 150.0 | LN3-53346-3S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 950 (430.9) | F | NA | WS-A-4 | 26-E |
| 225.0 | LN3-53347-3S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1256 (569.7) | F | NA | WS-A-4 | 26-E |

① Wall mounting brackets are available for these sizes, refer to page 157.
② 3 KVA through 500 KVA provided with 120V lighting tap limited to 5% of nameplate rating.

## GROUP H

### NON-VENTILATED TRANSFORMERS
### 480 DELTA PRIMARY VOLTS –– 240 DELTA/ 120 TAP 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | TE-3-53342-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 600 (272.0) | F ① | NA | NA | 26–H |
| 45.0 | TE-2-53343-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 750 (340.0) | F | NA | NA | 26–H |
| 75.0 | TE-2-53344-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1125 (510.0) | F | NA | NA | 26–H |
| 112.5 | TE-3-53345-3S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1150 (522.0) | F | NA | NA | 26–H |

## 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.) | | | 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | T-3-3500015-3S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.0) | F ① | NA | NA | 31–I |
| 30.0 | T-2A-3500030-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 325 (147.0) | F ① | NA | WS-A-1 | 31–E |
| 45.0 | T-2A-3500045-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 400 (181.0) | F ① | NA | WS-A-1 | 31–E |
| 75.0 | T-3-3500075-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 600 (272.0) | F ① | NA | WS-A-2 | 31–E |
| 112.5 | T-2A-3500112-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 710 (322.0) | F | NA | WS-A-3 | 31–E |
| 150.0 | T-2A-3500150-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1155 (524.0) | F | NA | WS-A-4 | 31–E |
| 225.0 | T-2A-3500225-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1210 (548.8) | F | NA | WS-A-4 | 31–E |
| 300.0 | T-3-3500300-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1600 (726.0) | F | NA | WS-A-5 | 31–E |
| 500.0 | TTBD-3500500-3S | 62.00 (157.5) | 54.00 (137.2) | 42.00 (106.7) | 2620 (1188.0) | F | NA | WS-B-3 | 32–G |

## GROUP J

### 600 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-79330-1S | 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 | T-2A-79331-1S | 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 | T-2A-79332-1S | 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 | T-3-79333-1S | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.0) | F ① | NA | NA | 28–I |
| 30.0 | T-13102-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 325 (147.0) | F ① | NA | WS-A-1 | 29–E |
| 45.0 | T-13103-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 400 (181.0) | F ① | NA | WS-A-1 | 29–E |
| 75.0 | T-13104-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 600 (272.0) | F ① | NA | WS-A-2 | 29–E |

## GROUP K

### ENCAPSULATED TRANSFORMERS, 115° C RISE
### 600 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | T-3-79334-3S | 24.81 (63.0) | 27.13 (68.9) | 11.14 (28.3) | 613 (278.1) | F | NA | NA | 29–I |
| 45.0 | T-3-79335-3S | 25.31 (64.3) | 30.18 (76.7) | 12.76 (32.4) | 780 (354.0) | F | NA | NA | 29–I |
| 75.0 | T-3-79336-3S | 26.82 (68.1) | 34.68 (88.1) | 15.25 (38.7) | 1126 (511.0) | F | NA | NA | 29–I |

① Wall mounting brackets are available for these sizes, refer to page 157.

## GROUP M

### 600 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-79516-1S | 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 | T-2A-79517-1S | 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 | T-2A-79518-1S | 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 | T-3-79519-1S | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.0) | F ① | NA | NA | 55–I |
| 30.0 | T-2A-79520-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 400 (181.0) | F ① | NA | WS-A-2 | 51–E |
| 45.0 | T-2A-79521-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 425 (193.0) | F ① | NA | WS-A-2 | 51–E |
| 75.0 | T-3-79522-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 700 (318.0) | F ① | NA | WS-A-2 | 51–E |
| 112.5 | T-2A-79523-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 750 (340.0) | F | NA | WS-A-3 | 51–E |
| 150.0 | T-2-79524-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1125 (510.0) | F | NA | WS-A-4 | 51–E |

## GROUP 0

### 208 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-79268-1S | 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 | T-2A-79269-1S | 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 | T-2A-79270-1S | 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 | T-3-79271-1S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 245 (111.0) | F ① | NA | NA | 60–I |
| 30.0 | T-2-79272-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 300 (136.0) | F ① | NA | WS-A-1 | 61–E |
| 45.0 | T-2-79273-4S | 25.48 (64.7) | 24.39 (61.9) | 19.37 (49.2) | 365 (166.0) | F ① | NA | WS-A-1 | 61–E |
| 75.0 | T-2-79274-4S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 500 (227.0) | F ① | NA | WS-A-2 | 61–E |
| 112.5 | T-2-79275-4S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 700 (318.0) | F | NA | WS-A-3 | 61–E |
| 150.0 | T-2-79276-4S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 970 (440.0) | F | NA | WS-A-4 | 61–E |
| 225.0 | T-2-79277-4S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1200 (544.0) | F | NA | WS-A-4 | 61–E |

## GROUP P

### 600 DELTA PRIMARY VOLTS –– 240 DELTA/120 TAP 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 30.0 | T-13142-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 299 (135.6) | F ① | NA | WS-A-1 | 69–E |
| 45.0 | T-13143-3S | 25.48 (64.7) | 24.39 (61.9) | 19.37 (49.2) | 353 (160.1) | F ① | NA | WS-A-1 | 69–E |
| 75.0 | T-13144-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 463 (210.0) | F ① | NA | WS-A-2 | 69–E |

## GROUP Q

### 240 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | T-3-79693-1S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 245 (111.1) | F ① | NA | NA | 70–I |
| 30.0 | T-2-79694-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 330 (149.7) | F ① | NA | WS-A-1 | 71–E |
| 45.0 | T-2-79695-4S | 25.48 (64.7) | 24.39 (61.9) | 19.37 (49.2) | 380 (172.4) | F ① | NA | WS-A-1 | 71–E |
| 75.0 | T-2-79696-4S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 455 (206.4) | F ① | NA | WS-A-2 | 71–E |
| 112.5 | T-2-79697-4S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 687 (311.6) | F | NA | WS-A-3 | 71–E |
| 150.0 | T-2-79698-4S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 973 (441.3) | F | NA | WS-A-4 | 71–E |

① Wall mounting brackets are available for these sizes, refer to page 157.

## GROUP R

### 380 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 3.0 | T-2A-79708-4S | 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 | 33–F |
| 6.0 | T-2A-79709-4S | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | 120 (54.4) | W | 0.75-1.25 (1.9-3.2) | NA | 33–F |
| 9.0 | T-2A-79710-4S | 14.03 (36.0) | 17.77 (45.1) | 11.52 (29.3) | 175 (79.4) | W | 0.75-1.25 (1.9-3.2) | NA | 33–F |
| 15.0 | T-3-79711-4S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 245 (111.1) | F ① | NA | NA | 33–I |
| 30.0 | T-3-79712-3S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 295 (133.8) | F ① | NA | WS-A-1 | 72–E |
| 45.0 | T-3-79713-3S | 25.48 (64.7) | 24.39 (61.9) | 19.37 (49.2) | 353 (160.1) | F ① | NA | WS-A-1 | 72–E |
| 75.0 | T-3-79714-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 457 (207.3) | F ① | NA | WS-A-2 | 72–E |
| 112.5 | T-2A-79715-3S | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 679 (308.0) | F | NA | WS-A-3 | 72–E |

## GROUP T

### 380 DELTA PRIMARY VOLTS –– 220Y/127 SECONDARY VOLTS –– 3Ø, 50/60 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | T-3-79551-1S | 20.80 (52.8) | 20.90 (53.1) | 10.20 (25.9) | 435 (197.3) | F | NA | NA | 24–I |
| 30.0 | T-2A-79552-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 365 (165.6) | F ① | NA | WS-A-1 | 20–E |
| 45.0 | T-2A-79553-3S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 468 (212.3) | F ① | NA | WS-A-2 | 20–E |
| 75.0 | T-2A-79554-3S | 35.47 (90.1) | 31.90 (80.0) | 26.88 (68.3) | 693 (314.3) | F | NA | WS-A-3 | 20–E |
| 112.5 | T-2A-79555-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 970 (440.0) | F | NA | WS-A-4 | 20–E |
| 150.0 | T-2-79556-3S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1100 (499.0) | F | NA | WS-A-4 | 20–E |
| 225.0 | T-3-79557-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1600 (725.7) | F | NA | WS-A-5 | 20–E |

## GROUP U

### 440 DELTA PRIMARY VOLTS –– 220Y/127 SECONDARY VOLTS –– 3Ø, 50/60 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 10.0 | TF-22010-5S | 18.90 (48.0) | 20.30 (51.6) | 9.00 (22.9) | 245 (111.1) | F ① | NA | NA | 73–I |
| 15.0 | TF-22015-5S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 291 (132.0) | F ① | NA | WS-A-1 | 73–E |
| 25.0 | TF-22025-5S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 375 (170.1) | F ① | NA | WS-A-1 | 73–E |
| 50.0 | TF-22050-5S | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 437 (198.2) | F ① | NA | WS-A-2 | 73–E |
| 100.0 | TF-220100-5S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 725 (328.9) | F | NA | WS-A-4 | 73–E |
| 200.0 | TF-220200-5S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1025 (464.9) | F | NA | WS-A-5 | 73–E |
| 250.0 | TF-220250-5S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1600 (725.8) | F | NA | WS-A-5 | 73–E |
| 300.0 | TF-220300-5S | 57.84 (146.9) | 45.50 (115.6) | 41.50 (105.4) | 1700 (771.12) | F | NA | WS-A-7 | 73–G |
| 500.0 | TF-220500-5S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 2418 (1096.8) | F | NA | WS-A-6 | 73–G |

① Wall mounting brackets are available for these sizes, refer to page 157.

NEW

## GROUP V

### 190/200/208/220/240 DELTA PRIMARY VOLTS –– 400Y/231 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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | T-3-79083-S | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 300 (136.1) | F ① | NA | NA | 75-I |
| 20.0 | T-2A-79084-S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 500 (226.8) | F ⑤ | NA | WS-A-2 | 74-E |
| 30.0 | T-2A-79085-S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 511 (231.8) | F ⑤ | NA | WS-A-2 | 74-E |
| 45.0 | T-2A-79087-S | 25.50 (64.8) | 24.39 (62.0) | 19.37 (49.2) | 540 (244.9) | F ⑤ | NA | WS-A-1 | 74-E |
| 75.0 | T-2A-79088-S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 703 (318.9) | F | NA | WS-A-3 | 74-E |

NEW

## GROUP W

### 400 DELTA PRIMARY VOLTS –– 240 DELTA/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 146 |
|---|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | T-3-79068-1S | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 250 (113.4) | F ① | NA | N/A | 76-I |
| 30.0 | T-3-79069-3S | 25.48 (64.7) | 24.39 (62.0) | 19.37 (49.2) | 300 (136.1) | F ⑤ | NA | WS-A-1 | 77-E |
| 45.0 | T-3-79070-3S | 25.48 (64.7) | 24.39 (62.0) | 19.37 (49.2) | 365 (165.6) | F ⑤ | NA | WS-A-1 | 77-E |
| 75.0 | T-3-79071-3S | 29.40 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 475 (215.5) | F ⑤ | NA | WS-A-2 | 77-E |

## AUTO-TRANSFORMERS ②

### 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.) | | | 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 146 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | HEIGHT | WIDTH | DEPTH | | | | | |
| 15.0 | 12.0 | T-2-52703-1③ | 15.21 (38.6) | 19.25 (48.9) | 7.37 (18.7) | 104 (47.2) | W | NA | NA | 56–F |
| 30.0 | 24.0 | T-2-52705-1③ | 15.21 (38.6) | 19.25 (48.9) | 7.37 (18.7) | 152 (68.9) | W | NA | NA | 56–F |
| 45.0 | 36.0 | T-2-52707-1③ | 15.21 (38.6) | 19.25 (48.9) | 7.37 (18.7) | 156 (70.8) | W | NA | NA | 56–F |
| 75.0 | 60.0 | T-3-52710-1③ | 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 | T-2A-52712-1④ | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 325 (147.0) | F ⑤ | NA | WS-A-1 | 57–E |
| 150.0 | 120.0 | T-2A-52713-1④ | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 350 (158.8) | F ⑤ | NA | WS-A-1 | 57–E |
| 225.0 | 180.0 | T-2A-52715-1④ | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 600 (272.0) | F ⑤ | NA | WS-A-2 | 57–E |
| 300.0 | 240.0 | T-2A-52717-1④ | 29.41 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 650 (294.8) | F ⑤ | NA | WS-A-2 | 57–E |
| 450.0 | 360.0 | T-2A-52718-1④ | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 750 (340.0) | F | NA | WS-A-3 | 57–E |
| 500.0 | 400.0 | T-2A-52719-1④ | 35.47 (90.1) | 31.90 (81.0) | 26.88 (68.3) | 790 (358.3) | F | NA | WS-A-3 | 57–E |

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.

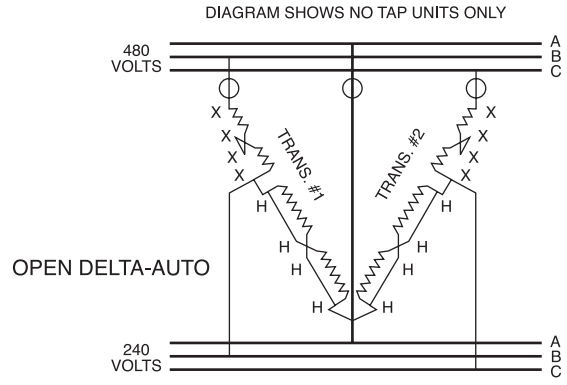
# Economical Auto Arrangements

## Using two single phase transformers

### THREE PHASE

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

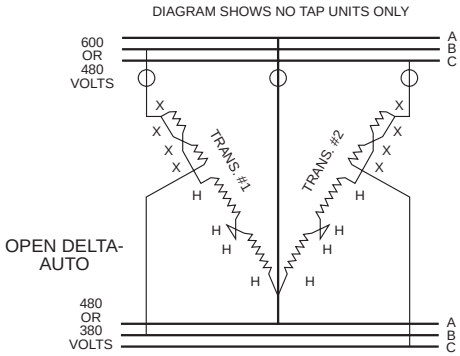
| KVA ① | Qty. ② | Catalog No. ③ | Primary Full Load Amps | Secondary Full Load Amps | Max. Size Fuse or Breaker |
|---|---|---|---|---|---|
| 3.0 | 2 | T-2-53010-S | 3.60 | 7.20 | 10 |
| 5.0 | 2 | T-2-53011-S | 6.00 | 12.00 | 10 |
| 6.0 | 2 | T-2-53012-S | 7.20 | 14.40 | 15 |
| 10.0 | 2 | T-2-53013-4S | 12.00 | 24.00 | 15 |
| 17.0 | 2 | T-2-53014-4S | 20.50 | 40.80 | 30 |
| 26.0 | 2 | T-2-53515-3S | 31.50 | 63.00 | 40 |
| 34.0 | 2 | T-2-53516-3S | 41.00 | 81.60 | 60 |
| 52.0 | 2 | T-2-53517-3S | 63.00 | 125.00 | 80 |
| 86.0 | 2 | T-2-53518-3S | 104.00 | 206.30 | 150 |
| 130.5 | 2 | T-2-53019-3S | 157.00 | 314.00 | 200 |
| 173.0 | 2 | T-2-53020-3S | 209.00 | 418.00 | 300 |
| 259.0 | 2 | T-2-53021-3S | 312.00 | 623.00 | 400 |
| 346.0 | 2 | T-2A-53022-3S | 417.00 | 834.00 | 600 |
| 578.0 | 2 | T-1-53023-3S | 696.00 | 1392.00 | 1000 |
| 865.0 | 2 | T-1-53024-3S | 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 | T-2-53010-S | 15 |
| 12.0 | 11.55 | 14.40 | 9.5 | 11.55 | 14.40 | 2 | T-2-53011-S | 15 |
| 17.0 | 16.33 | 20.41 | 13.5 | 16.33 | 20.41 | 2 | T-2-53012-S | 25 |
| 25.0 | 24.06 | 30.01 | 20.0 | 24.06 | 30.01 | 2 | T-2-53013-4S | 30 |
| 43.0 | 41.38 | 51.70 | 34.0 | 41.38 | 51.70 | 2 | T-2-53014-4S | 60 |
| 64.0 | 61.59 | 77.00 | 51.0 | 61.59 | 77.00 | 2 | T-2-53515-3S | 80 |
| 86.0 | 82.76 | 103.44 | 68.0 | 82.76 | 103.44 | 2 | T-2-53516-3S | 110 |
| 129.0 | 124.13 | 155.20 | 103.0 | 124.13 | 155.20 | 2 | T-2-53517-3S | 175 |
| 216.0 | 207.85 | 259.80 | 172.0 | 207.85 | 259.80 | 2 | T-2-53518-3S | 300 |
| 324.0 | 311.78 | 389.70 | 259.0 | 311.78 | 389.70 | 2 | T-2-53019-3S | 400 |
| 433.0 | 416.67 | 520.83 | 346.0 | 416.67 | 520.83 | 2 | T-2-53020-3S | 600 |
| 650.0 | 625.00 | 781.00 | 519.0 | 625.00 | 781.00 | 2 | T-2-53021-3S | 800 |
| 865.0 | 833.00 | 1040.00 | 692.0 | 833.00 | 1051.00 | 2 | T-2A-53022-3S | 1200 |
| 1445.0 | 1391.00 | 1738.00 | 1156.0 | 1391.00 | 1756.00 | 2 | T-1-53023-3S | 2000 |
| 2164.0 | 2083.00 | 2602.00 | 1731.0 | 2083.00 | 2629.00 | 2 | T-1-53024-3S | 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.**

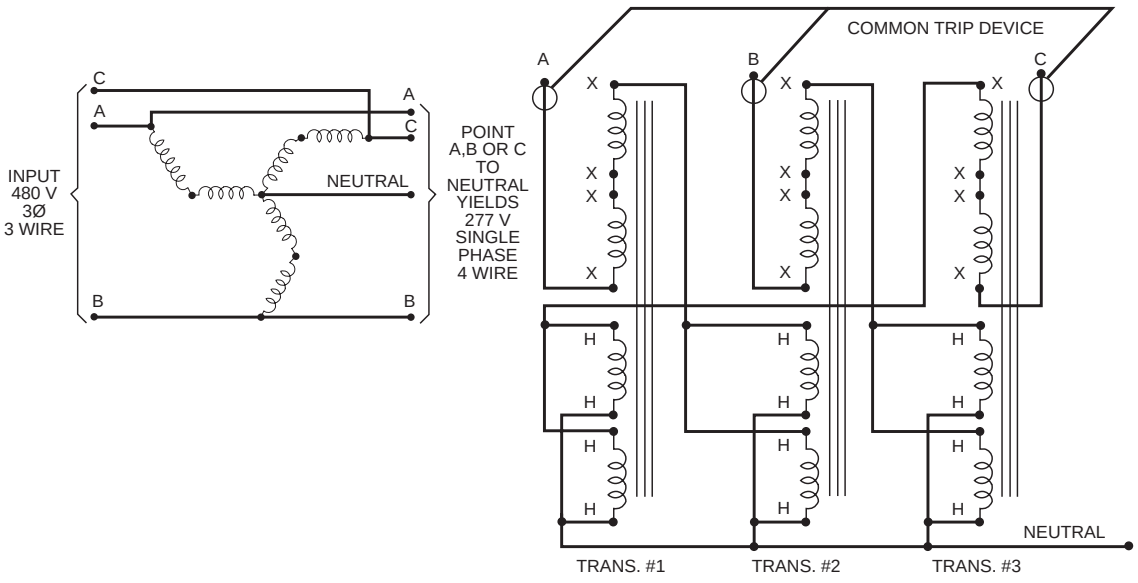
# Auto Zig-Zag Grounding Transformers

## 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) |
|---|---|---|---|---|---|
| T-2-53010-S | No Taps Only | 1.0 | 3 | 10.80 | 12.50 |
| T-2-53011-S | No Taps Only | 1.5 | 3 | 15.60 | 18.75 |
| T-2-53012-S | No Taps Only | 2.0 | 3 | 20.70 | 25.00 |
| T-2-53013-4S | Taps & No Taps | 3.0 | 3 | 31.20 | 37.50 |
| T-2-53014-4S | Taps & No Taps | 5.0 | 3 | 51.90 | 62.50 |
| T-2-53515-3S | With Taps Only | 7.5 | 3 | 78.00 | 93.50 |
| T-2-53516-3S | With Taps Only | 10.0 | 3 | 103.80 | 125.00 |
| T-2-53517-3S | With Taps Only | 15.0 | 3 | 156.00 | 187.50 |
| T-2-53518-3S | With Taps Only | 25.0 | 3 | 259.50 | 312.00 |
| T-2-53019-3S | With Taps Only | 37.5 | 3 | 390.00 | 468.00 |
| T-2-53020-3S | With Taps Only | 50.0 | 3 | 519.00 | 625.00 |
| T-2-53021-3S | With Taps Only | 75.0 | 3 | 780.00 | 935.00 |
| T-2A-53022-3S | With Taps Only | 100.0 | 3 | 1038.00 | 1250.00 |
| T-1-53023-3S | 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 3

NEW

# HARMONIC MITIGATING TRANSFORMERS



# 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.**



**NOTE:** Dimension drawings, connection diagrams and accessories begin on page 146.

NEW

# 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.

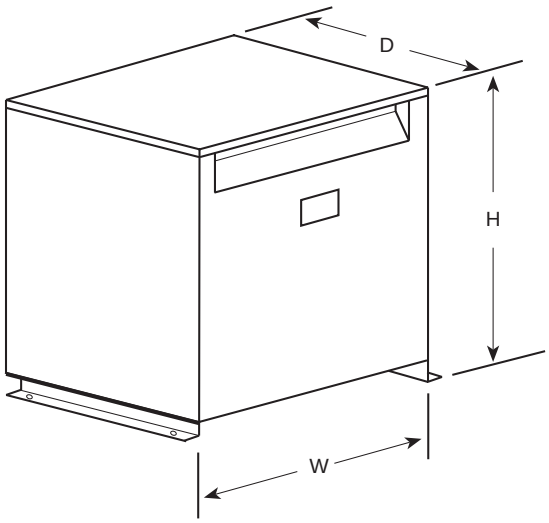
## FEATURES

- 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

NEW

### HARMONIC MITIGATING TRANSFORMERS

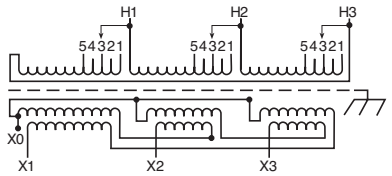
**480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS**

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 30.0 | CMT-53312-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 535 (242.7) | F① | WS-A-2 | 81-E |
| 45.0 | CMT-53313-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 600 (272.2) | F① | WS-A-2 | 81-E |
| 75.0 | CMT-53314-4S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 760 (344.7) | F① | WS-A-3 | 81-E |
| 112.5 | CMT-53315-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1180 (535.2) | F | WS-A-4 | 81-E |
| 150.0 | CMT-53316-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1340 (607.8) | F | WS-A-4 | 81-E |
| 225.0 | CMT-53317-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1970 (893.6) | F | WS-A-4 | 81-E |

## MITIGATING TRANSFORMER WIRING DIAGRAM

**81**

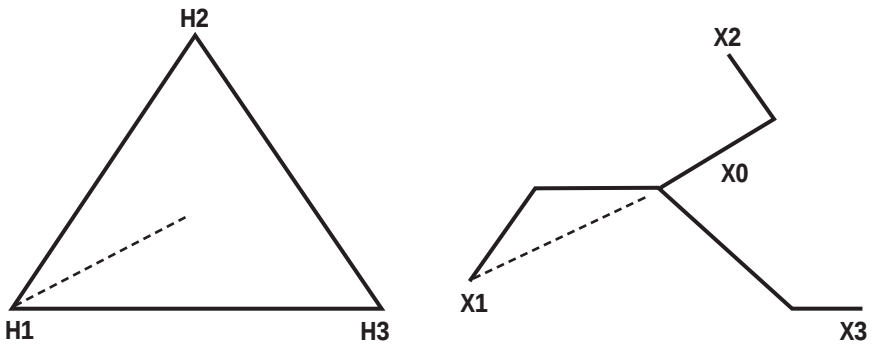
**PRIMARY: 480 Volts Delta**
**SECONDARY: 208Y/120 Volts**
**TAPS: 2, 2 ½% ANFC, 2, 2½% BNFC**




| 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 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>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.

# 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) 2½% ANFC, (4) 2½% BNFC.
- Aluminum and copper 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.

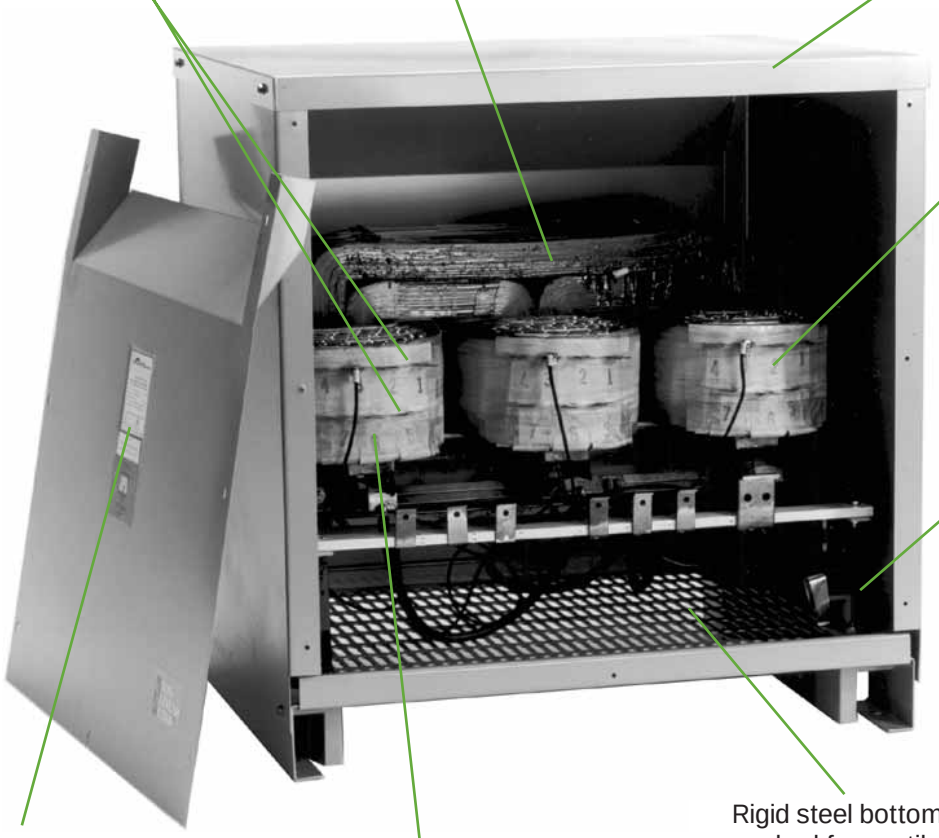
The following guide will help you select the proper transformer when the K-factor is unknown.*

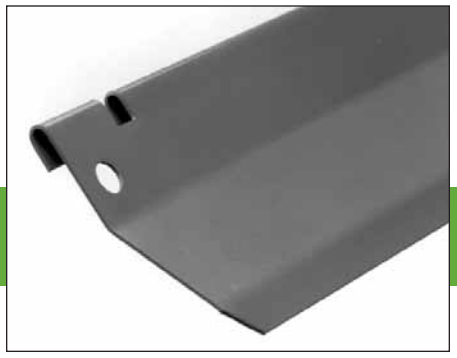
## K-Factor/Type of Load

| | |
|---|---|
| K-1 | Resistance heating<br>Incandescent lighting<br>Motors<br>Transformers, control/distribution |
| K-4 | Welders<br>Induction heaters<br>HID lighting<br>Fluorescent lighting<br>Solid state controls |
| K-13 | Telecommunications equipment<br>Branch Circuits in classrooms and health care facilities |
| K-20 | Main frame computers<br>Variable speed drives<br>Branch circuits with exclusive loads of Data Processing equipment<br>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.) 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NS10-0253311-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS10-0253312-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 420 (191.0) | F ① | WS-A-1 | 22–E |
| 45.0 | NS10-0253313-3S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 575 (261.0) | F | WS-A-3 | 22–E |
| 75.0 | NS10-0253314-3S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 620 (281.0) | F | WS-A-3 | 22–E |
| 112.5 | NS10-0253315-3S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1200 (544.0) | F | WS-A-4 | 22–E |
| 150.0 | NS10-0253316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1700 (771.0) | F | WS-A-4 | 22–E |
| 225.0 | NS10-0253317-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2165 (982.0) | F | WS-A-5 | 22–G |
| 300.0 | NS10-0253318-3S | 62.10 (157.7) | 54.00 (137.2) | 41.50 (105.4) | 2750 (1247.0) | F | WS-A-6 | 22–G |
| 500.0 | NS10-0253319-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | 22–G |

### 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.) 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NS75-0153311-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS75-0153312-3S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 360 (163.0) | F ① | WS-A-2 | 22–E |
| 45.0 | NS75-0153313-3S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 440 (200.0) | F ① | WS-A-2 | 22–E |
| 75.0 | NS75-0153314-3S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 600 (272.0) | F | WS-A-3 | 22–E |
| 112.5 | NS75-0153315-3S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 870 (395.0) | F | WS-A-4 | 22–E |
| 150.0 | NS75-0153316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1500 (680.0) | F | WS-A-4 | 22–E |
| 225.0 | NS75-1153317-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | WS-A-5 | 22–E |
| 300.0 | NS75-0153318-3S | 45.60 (115.8) | 39.60 (100.6) | 35.50 (90.2) | 2200 (998.0) | F | WS-A-5 | 22–G |
| 500.0 | NS75-0153319-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | 22–G |

### 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.) 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NS25-0053311-3S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS25-0053312-3S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 345 (157.0) | F ① | WS-A-2 | 22–E |
| 45.0 | NS25-0053313-3S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 430 (195.0) | F ① | WS-A-2 | 22–E |
| 75.0 | NS25-0053314-3S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 560 (254.0) | F | WS-A-3 | 22–E |
| 112.5 | NS25-0053315-3S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 875 (397.0) | F | WS-A-4 | 22–E |
| 150.0 | NS25-0053316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1550 (703.0) | F | WS-A-4 | 22–E |
| 225.0 | NS25-1053317-3S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1600 (725.8) | F | WS-A-5 | 22–E |
| 300.0 | NS25-0053318-3S | 45.60 (115.8) | 39.60 (100.6) | 35.50 (90.2) | 2200 (998.0) | F | WS-A-5 | 22–G |
| 500.0 | NS25-0053319-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3550 (1610.0) | F | WS-A-6 | 22–G |

① Wall mounting brackets are available for these sizes, refer to page 157.

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 G, K FACTOR 20, 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 Lbs. (Kg.) | TYPE MTG. W – Wall F – Floor | WEATHER SHIELD P/N | Wiring Diagrams & Design Figures Begin on Page 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NS10-0253311-1S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 290 (132.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS10-0253312-1S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 375 (170.0) | F ① | WS-A-1 | 22–E |
| 45.0 | NS10-0253313-1S | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 680 (308.0) | F | WS-A-3 | 22–E |
| 75.0 | NS10-0253314-1S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 970 (440.0) | F | WS-A-4 | 22–E |
| 112.5 | NS10-0253315-1S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1140 (517.0) | F | WS-A-4 | 22–E |
| 150.0 | NS10-1253316-1S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | WS-A-5 | 22–E |
| 225.0 | NS10-0253317-1S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2225 (1009.0) | F | WS-A-5 | 22–G |
| 300.0 | NS10-0253318-1S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | 22–G |

## 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 Lbs. (Kg.) | TYPE MTG. W – Wall F – Floor | WEATHER SHIELD P/N | Wiring Diagrams & Design Figures Begin on Page 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NS75-0153311-1S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS75-0153312-1S | 29.90 (75.9) | 28.20 (71.6) | 22.40 (56.9) | 400 (181.0) | F ① | WS-A-2 | 22–E |
| 45.0 | NS75-0153313-1S | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 575 (261.0) | F | WS-A-3 | 22–E |
| 75.0 | NS75-0153314-1S | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 750 (340.0) | F | WS-A-3 | 22–E |
| 112.5 | NS75-0153315-1S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1120 (508.0) | F | WS-A-4 | 22–E |
| 150.0 | NS75-0153316-1S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1200 (544.0) | F | WS-A-4 | 22–E |
| 225.0 | NS75-0153317-1S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2225 (1009.0) | F | WS-A-5 | 22–G |
| 300.0 | NS75-0153318-1S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | 22–G |

## GROUP I, K FACTOR 4, 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 Lbs. (Kg.) | TYPE MTG. W – Wall F – Floor | WEATHER SHIELD P/N | Wiring Diagrams & Design Figures Begin on Page 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NS25-0053311-1S | 25.48 (64.7) | 24.39 (62.0) | 19.37 (49.2) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS25-0053312-1S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 345 (157.0) | F ① | WS-A-1 | 22–E |
| 45.0 | NS25-0053313-1S | 29.90 (75.9) | 28.20 (71.6) | 22.40 (56.9) | 425 (193.0) | F ① | WS-A-2 | 22–E |
| 75.0 | NS25-0053314-1S | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 575 (261.0) | F | WS-A-3 | 22–E |
| 112.5 | NS25-0053315-1S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1125 (510.0) | F | WS-A-4 | 22–E |
| 150.0 | NS25-0053316-1S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1140 (517.0) | F | WS-A-4 | 22–E |
| 225.0 | NS25-1053317-1S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | WS-A-5 | 22–E |
| 300.0 | NS25-0053318-1S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2225 (1009.0) | F | WS-A-5 | 22–G |
| 500.0 | NS25-0053319-1S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | 22-G |

① Wall mounting brackets are available for these sizes, refer to page 157.

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 J, K FACTOR 20, 80° C RISE

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

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 30.0 | NS10-0253312-8S | 35.41 (89.9) | 31.90 (81.0) | 26.87 (68.2) | 575 (261.0) | F | WS-A-3 | 22–E |
| 45.0 | NS10-0253313-8S | 35.41 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 790 (358.0) | F | WS-A-3 | 22–E |
| 75.0 | NS10-0253314-8S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1000 (454.0) | F | WS-A-4 | 22–E |
| 112.5 | NS10-1253315-8S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | WS-A-5 | 22–E |
| 150.0 | NS10-01253316-8S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2225 (1009.0) | F | WS-A-5 | 22–G |
| 225.0 | NS10-0253317-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3525 (1599.0) | F | WS-A-6 | 22–G |
| 300.0 | NS10-0253318-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4300 (1950.0) | F | WS-A-6 | ③ G |

## GROUP K, K FACTOR 13, 80° C RISE

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

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NS75-0153311-8S | 25.50 (64.8) | 24.40 (62.0) | 19.40 (49.3) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS75-0153312-8S | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 575 (261.0) | F | WS-A-3 | 22–E |
| 45.0 | NS75-0153313-8S | 35.90 (91.2) | 31.90 (81.0) | 26.90 (68.3) | 590 (267.6) | F | WS-A-3 | 22–E |
| 75.0 | NS75-0153314-8S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 970 (440.0) | F | WS-A-4 | 22–E |
| 112.5 | NS75-0153315-8S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1140 (517.0) | F | WS-A-4 | 22–E |
| 150.0 | NS75-0153316-8S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2225 (1009.0) | F | WS-A-5 | 22–G |
| 225.0 | NS75-0153317-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3525 (1599.0) | F | WS-A-6 | 22–G |
| 300.0 | NS75-0153318-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3650 (1655.6) | F | WS-A-6 | 22–G |
| 500.0 | NS75-0153319-8S | 62.84 (159.6) | 54.00 (137.2) | 41.50 (105.4) | 4300 (1950.0) | F | WS-A-6 | 22-G |

## GROUP L, K FACTOR 4, 80° C RISE

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

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NS25-0053311-8S | 25.50 (64.8) | 24.40 (62.0j) | 19.40 (49.3) | 325 (147.0) | F ① | WS-A-1 | 22–E |
| 30.0 | NS25-0053312-8S | 25.48 (64.7) | 24.40 (62.0) | 19.37 (49.2) | 425 (193.0) | F | WS-A-2 | 22–E |
| 45.0 | NS25-0053313-8S | 35.40 (89.9) | 31.90 (81.0) | 26.87 (68.2) | 600 (272.0) | F ① | WS-A-3 | 22–E |
| 75.0 | NS25-0053314-8S | 41.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 970 (440.0) | F | WS-A-4 | 22–E |
| 112.5 | NS25-0053315-8S | 41.50 (105.4) | 32.90 (83.6) | 29.90 (75.9) | 1140 (517.0) | F | WS-A-4 | 22–E |
| 150.0 | NS25-1053316-8S | 49.59 (126.0) | 39.50 (100.3) | 35.50 (90.2) | 1550 (703.0) | F | WS-A-5 | 22–E |
| 225.0 | NS25-0053317-8S | 49.59 (126.0) | 39.50 (100.3) | 35.50 (90.2) | 2225 (1009.0) | F | WS-A-5 | 22–G |
| 300.0 | NS25-0053318-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3525 (1599.0) | F | WS-A-6 | 22–G |
| 500.0 | NS25-0053319-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | 22-G |

## 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.) 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NS75-0179271-4S | 25.50 (64.8) | 24.90 (62.0) | 19.37 (49.2) | 320 (145.1) | F ① | WS-A-1 | 61-E |
| 30.0 | NS75-0179272-4S | 25.50 (64.8) | 24.90 (62.0) | 19.37 (49.2) | 366 (166.0) | F ① | WS-A-1 | 61-E |
| 45.0 | NS75-0179273-4S | 29.40 (74.7) | 28.15 (71.5) | 22.37 (56.8) | 522 (236.8) | F ① | WS-A-2 | 61-E |
| 75.0 | NS75-0179274-4S | 35.40 (89.9) | 31.90 (81.0) | 26.87 (68.2) | 667 (302.6) | F | WS-A-3 | 61-E |
| 112.5 | NS75-0179275-4S | 42.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 936 (424.6) | F | WS-A-4 | 61-E |
| 150.0 | NS75-0179276-4S | 42.52 (105.5) | 32.90 (83.6) | 29.87 (75.9) | 1210 (548.9) | F | WS-A-4 | 61-E |

① Wall mounting brackets are available for these sizes, refer to page 157.
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.
③ Consult factory for wiring diagrams.

## GROUP N, K FACTOR 20, 150° C RISE

### COPPER NON-LINEAR
### 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 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 30.0 | NC10-0253312-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 365 (165.6) | F ① | WS-A-1 | 22-G |
| 45.0 | NC10-0253313-3S | 25.48 (64.7) | 24.39 (91.9) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-G |
| 75.0 | NC10-0253314-3S | 29.40 (74.4) | 28.15 (71.5) | 22.40 (56.9) | 656 (298.0) | F | WS-A-2 | 22-G |
| 112.5 | NC10-0253315-3S | 35.40 (89.9) | 31.90 (81.0) | 26.70 (67.8) | 910 (413.0) | F | WS-A-3 | 22-G |
| 150.0 | NC10-0253316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1358 (616.0) | F | WS-A-4 | 22-G |
| 225.0 | NC10-1253317-3S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1770 (803.0) | F | WS-A-5 | 22-G |
| 300.0 | NC10-0253318-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

## GROUP O, K FACTOR 13, 150° C RISE

### COPPER NON-LINEAR
### 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 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NC75-0153311-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 346 (157.0) | F ① | WS-A-1 | 22-E |
| 30.0 | NC75-0153312-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 365 (165.6) | F ① | WS-A-1 | 22-E |
| 45.0 | NC75-0153313-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 75.0 | NC75-0153314-3S | 29.40 (74.4) | 28.15 (71.5) | 22.40 (56.9) | 633 (287.0) | F | WS-A-2 | 22-E |
| 112.5 | NC75-0153315-3S | 35.40 (89.9) | 31.90 (81.0) | 26.70 (67.8) | 910 (413.0) | F | WS-A-3 | 22-E |
| 150.0 | NC75-0153316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1358 (616.0) | F | WS-A-4 | 22-E |
| 225.0 | NC75-1153317-3S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1770 (803.0) | F | WS-A-5 | 22-E |
| 300.0 | NC75-1153318-3S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2301 (1044.0) | F | WS-A-5 | 22-G |
| 500.0 | NC75-0153319-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

## GROUP P, K FACTOR 4, 150° C RISE

### COPPER NON-LINEAR
### 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 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NC25-0053311-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 346 (157.0) | F ① | WS-A-1 | 22-E |
| 30.0 | NC25-0053312-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 365 (165.6) | F ① | WS-A-1 | 22-E |
| 45.0 | NC25-0053313-3S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 75.0 | NC25-0053314-3S | 29.40 (74.4) | 28.15 (71.5) | 22.40 (56.9) | 633 (287.0) | F | WS-A-2 | 22-E |
| 112.5 | NC25-0053315-3S | 35.40 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 892 (405.0) | F | WS-A-3 | 22-E |
| 150.0 | NC25-0053316-3S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1205 (547.0) | F | WS-A-4 | 22-E |
| 225.0 | NC25-1053317-3S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1554 (705.0) | F | WS-A-5 | 22-G |
| 300.0 | NC25-1053318-3S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1957 (888.0) | F | WS-A-5 | 22-G |
| 500.0 | NC25-0053319-3S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

① Wall mounting brackets are available for these sizes, refer to page 157.
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 Q, K FACTOR 20, 115° C RISE

### COPPER NON-LINEAR

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

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 30.0 | NC10-0253312-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 45.0 | NC10-0253313-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 455 (206.0) | F ① | WS-A-1 | 22-E |
| 75.0 | NC10-0253314-1S | 35.40 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 892 (405.0) | F | WS-A-3 | 22-E |
| 112.5 | NC10-0253315-1S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1358 (616.0) | F | WS-A-4 | 22-E |
| 150.0 | NC10-1253316-1S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1770 (803.0) | F | WS-A-5 | 22-G |
| 225.0 | NC10-1253317-1S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2301 (1044.0) | F | WS-A-5 | 22-G |
| 300.0 | NC10-0253318-1S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

## GROUP R, K FACTOR 13, 115° C RISE

### COPPER NON-LINEAR

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

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 15.0 | NC75-0153311-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 346 (157.0) | F ① | WS-A-1 | 22-E |
| 30.0 | NC75-0153312-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 365 (166.0) | F ① | WS-A-1 | 22-E |
| 45.0 | NC75-0153313-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 455 (206.0) | F ① | WS-A-1 | 22-E |
| 75.0 | NC75-0153314-1S | 35.40 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 892 (405.0) | F | WS-A-3 | 22-E |
| 112.5 | NC75-0153315-1S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1205 (547.0) | F | WS-A-4 | 22-E |
| 150.0 | NC75-1153316-1S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1554 (705.0) | F | WS-A-5 | 22-G |
| 225.0 | NC75-1153317-1S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1957 (888.0) | F | WS-A-5 | 22-G |
| 300.0 | NC75-0153318-1S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

## GROUP S, K FACTOR 4, 115° C RISE

### COPPER NON-LINEAR

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

| 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 146 |
|---|---|---|---|---|---|---|---|---|
| 30.0 | NC25-0053312-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 365 (166.0) | F ① | WS-A-1 | 22-E |
| 45.0 | NC25-0053313-1S | 25.48 (64.7) | 24.39 (61.9) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 75.0 | NC25-0053314-1S | 29.40 (74.4) | 28.15 (71.5) | 22.40 (56.9) | 656 (298.0) | F | WS-A-2 | 22-E |
| 112.5 | NC25-0053315-1S | 35.40 (89.9) | 31.90 (81.0) | 26.70 (67.8) | 910 (413.0) | F | WS-A-3 | 22-E |
| 150.0 | NC25-0053316-1S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1358 (616.0) | F | WS-A-4 | 22-E |
| 225.0 | NC25-1053317-1S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1770 (803.0) | F | WS-A-5 | 22-G |
| 300.0 | NC25-1053318-1S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1957 (888.0) | F | WS-A-5 | 22-G |
| 500.0 | NC25-0053319-1S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

① Wall mounting brackets are available for these sizes, refer to page 157.

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 T, K FACTOR 20, 80° C RISE

### COPPER NON-LINEAR

**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 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NC10-0253311-8S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 346 (157.0) | F ① | WS-A-1 | 22-E |
| 30.0 | NC10-0253312-8S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 45.0 | NC10-0253313-8S | 29.40 (74.7) | 28.15 (71.5) | 22.40 (56.9) | 633 (287.0) | F ① | WS-A-2 | 22-E |
| 75.0 | NC10-0253314-8S | 35.40 (89.9) | 31.90 (81.0) | 26.70 (67.8) | 910 (413.0) | F | WS-A-3 | 22-E |
| 112.5 | NC10-0253315-8S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1358 (616.0) | F | WS-A-4 | 22-E |
| 150.0 | NC10-1253316-8S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1770 (803.0) | F | WS-A-5 | 22-G |
| 225.0 | NC10-0253317-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 3525 (1598.9) | F | WS-A-6 | 22-G |
| 300.0 | NC10-0253318-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

## GROUP U, K FACTOR 13, 80° C RISE

### COPPER NON-LINEAR

**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 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NC75-0153311-8S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 346 (157.0) | F ① | WS-A-1 | 22-E |
| 30.0 | NC75-0153312-8S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 45.0 | NC75-0153313-8S | 29.40 (74.7) | 28.15 (71.5) | 22.40 (56.9) | 633 (287.0) | F ① | WS-A-2 | 22-E |
| 75.0 | NC75-0153314-8S | 35.40 (89.9) | 31.90 (81.0) | 26.70 (67.8) | 910 (413.0) | F | WS-A-3 | 22-E |
| 112.5 | NC75-0153315-8S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1358 (616.0) | F | WS-A-4 | 22-E |
| 150.0 | NC75-1153316-8S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1770 (803.0) | F | WS-A-5 | 22-G |
| 225.0 | NC75-1153317-8S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2301 (1044.0) | F | WS-A-5 | 22-G |
| 300.0 | NC75-0153318-8S | 62.80 (159.5) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

## GROUP V, K FACTOR 4, 80° C RISE

### COPPER NON-LINEAR

**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 146 |
|---|---|---|---|---|---|---|---|---|
| | | HEIGHT | WIDTH | DEPTH | | | | |
| 15.0 | NC25-0053311-8S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 346 (157.0) | F ① | WS-A-1 | 22-E |
| 30.0 | NC25-0053312-8S | 25.48 (64.7) | 24.39 (62.0) | 19.40 (49.3) | 445 (202.0) | F ① | WS-A-1 | 22-E |
| 45.0 | NC25-0053313-8S | 29.40 (74.4) | 28.15 (71.5) | 22.40 (56.9) | 633 (287.0) | F ① | WS-A-2 | 22-E |
| 75.0 | NC25-0053314-8S | 35.40 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 892 (405.0) | F | WS-A-3 | 22-E |
| 112.5 | NC25-0053315-8S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1205 (547.0) | F | WS-A-4 | 22-E |
| 150.0 | NC25-1053316-8S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 1554 (705.0) | F | WS-A-5 | 22-G |
| 225.0 | NC25-1053317-8S | 45.59 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2301 (1044.0) | F | WS-A-5 | 22-G |
| 300.0 | NC25-0053318-8S | 62.80 (159.4) | 54.00 (137.2) | 41.50 (105.4) | 4230 (1918.7) | F | WS-A-6 | 22-G |

① Wall mounting brackets are available for these sizes, refer to page 157.

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.

NON-LINEAR LOAD ISOLATION® WIRING DIAGRAMS (Refer to pgs 147-156)

NON-LINEAR LOAD ISOLATION® DESIGN FIGURES (Refer to pg 146)

# Definition of Terms

## 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 variable frequency drives and the motors they power.




**NOTE:** Design figures, connection diagrams and accessories begin on page 146.

# 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.

DTGB-040-4S

DTGA-7-2S

DTGA-014-2S

DTHA-0330-4S

## 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 |

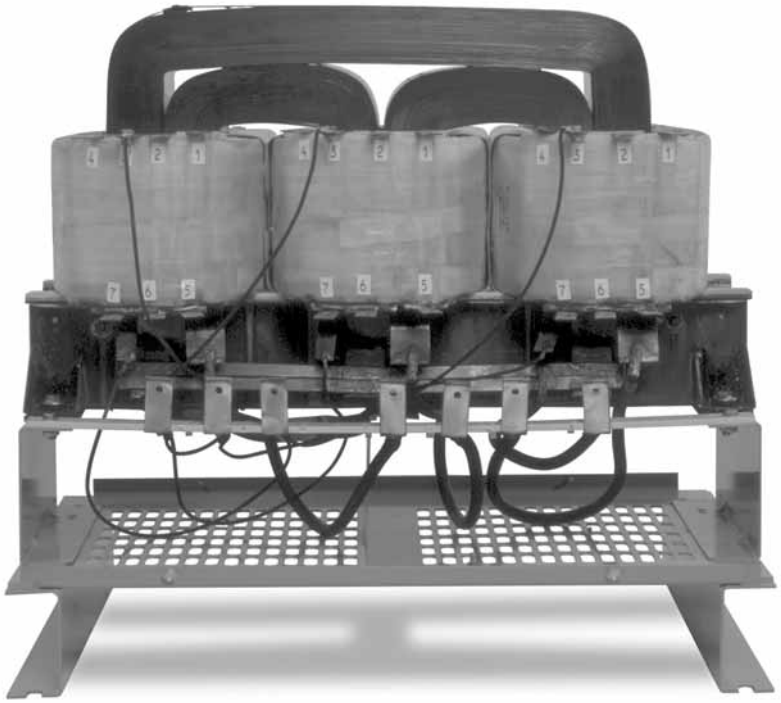
# Acme Advantages

## 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 | DTGA-7-2S or TS ④ (37) | DTGB-7-2S or TS ④ (34) | 15.21 (38.6) | 19.25 (48.9) | 7.37 (18.7) | 180 (81.6) | W | NA | F |
| 11.0 | DTGA-011-2S or TS ④ (37) | DTGB-011-2S or TS ④ (34) | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 265 (120.0) | F | NA | I |
| 14.0 | DTGA-014-2S or TS ④ (37) | DTGB-014-2S or TS ④ (34) | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 270 (123.0) | F | NA | I |
| 20.0 | DTGA-020-2S or TS ④ (37) | DTGB-020-2S or TS ④ (34) | 20.77 (52.8) | 20.94 (53.2) | 10.18 (25.9) | 435 (197.0) | F | NA | I |
| 27.0 | DTGA-027-4S (38) | DTGB-027-4S (35) | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 320 (145.0) | F ② | WS-A-1 | E |
| 34.0 | DTGA-034-4S | DTGB-034-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 340 (154.0) | F ② | WS-A-1 | E |
| 40.0 | DTGA-040-4S | DTGB-040-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 395 (179.0) | F ② | WS-A-1 | E |
| 51.0 | DTGA-051-4S | DTGB-051-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 400 (181.0) | F ② | WS-A-2 | E |
| 63.0 | DTGA-063-4S | DTGB-063-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 550 (250.0) | F ② | WS-A-2 | E |
| 75.0 | DTGA-075-4S | DTGB-075-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 570 (259.0) | F ② | WS-A-2 | E |
| 93.0 | DTGA-093-4S | DTGB-093-4S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 685 (311.0) | F | WS-A-3 | E |
| 118.0 | DTGA-0118-4S | DTGB-0118-4S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 765 (347.0) | F | WS-A-3 | E |
| 145.0 | DTGA-0145-4S | DTGB-0145-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 990 (449.0) | F | WS-A-4 | E |
| 175.0 | DTGA-0175-4S | DTGB-0175-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1100 (499.0) | F | WS-A-4 | E |
| 220.0 | DTGA-0220-4S | DTGB-0220-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1120 (508.0) | F | WS-A-4 | E |
| 275.0 | DTGA-00275-4S | DTGB-00275-4S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2090 (948.0) | F | WS-A-5 | E |
| 330.0 | DTGA-0330-4S | DTGB-0330-4S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2090 (948.0) | F | WS-A-5 | G |
| 440.0 | DTGA-440-4S (39) | DTGB-440-4S (36) | 62.00 (157.5) | 54.00 (137.2) | 42.00 (106.7) | 2625 (1191.0) | F | WS-B-3 | G |
| 550.0 | DTGA-550-4S | DTGB-550-4S | 64.00 (162.6) | 60.00 (152.4) | 42.00 (106.7) | 3000 (1361.0) | F | WS-B-4 | G |
| 660.0 | DTGA-660-4S | DTGB-660-4S | 64.00 (162.6) | 64.00 (162.6) | 42.00 (106.7) | 3700 (1678.0) | F | WS-B-5 | G |
| 770.0 | | DTGB-770-4S (35) | 62.84 (159.61) | 54.00 (137.2) | 41.50 (105.4) | 3600 (1633.0) | F | WS-A-6 | G |
| 880.0 | | DTGB-0880-4S | 62.84 (159.61) | 54.00 (137.2) | 41.50 (105.4) | 3816 (1730.9) | F | WS-A-6 | 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 | DTHA-7-2S or TS ④ (40) | DTHB-7-2S or TS ④ (43) | 15.21 (38.6) | 19.25 (48.9) | 7.37 (18.7) | 180 (81.6) | W | NA | F |
| 11.0 | DTHA-011-2S or TS ④ (40) | DTHB-011-2S or TS ④ (43) | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 265 (120.0) | F | NA | I |
| 14.0 | DTHA-014-2S or TS ④ (40) | DTHB-014-2S or TS ④ (43) | 18.86 (47.9) | 20.30 (51.6) | 9.03 (22.9) | 270 (123.0) | F | NA | I |
| 20.0 | DTHA-020-2S or TS ④ (40) | DTHB-020-2S or TS ④ (43) | 20.77 (52.8) | 20.94 (53.2) | 10.18 (25.9) | 435 (197.0) | F | NA | I |
| 27.0 | DTHA-027-4S (41) | DTHB-027-4S (44) | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 320 (145.0) | F ② | WS-A-1 | E |
| 34.0 | DTHA-034-4S | DTHB-034-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 340 (154.0) | F ② | WS-A-1 | E |
| 40.0 | DTHA-040-4S | DTHB-040-4S | 25.50 (64.8) | 24.39 (61.9) | 19.37 (49.2) | 395 (179.0) | F ② | WS-A-1 | E |
| 51.0 | DTHA-051-4S | DTHB-051-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 400 (181.0) | F ② | WS-A-2 | E |
| 63.0 | DTHA-063-4S | DTHB-063-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 550 (250.0) | F ② | WS-A-2 | E |
| 75.0 | DTHA-075-4S | DTHB-075-4S | 29.90 (75.9) | 28.15 (71.5) | 22.37 (56.8) | 570 (259.0) | F ② | WS-A-2 | E |
| 93.0 | DTHA-093-4S | DTHB-093-4S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 685 (311.0) | F | WS-A-3 | E |
| 118.0 | DTHA-0118-4S | DTHB-0118-4S | 35.90 (91.2) | 31.90 (81.0) | 26.88 (68.3) | 765 (347.0) | F | WS-A-3 | E |
| 145.0 | DTHA-0145-4S | DTHB-0145-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 990 (449.0) | F | WS-A-4 | E |
| 175.0 | DTHA-0175-4S | DTHB-0175-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1100 (499.0) | F | WS-A-4 | E |
| 220.0 | DTHA-0220-4S | DTHB-0220-4S | 41.52 (105.5) | 32.90 (83.6) | 29.88 (75.9) | 1120 (508.0) | F | WS-A-4 | E |
| 275.0 | DTHA-00275-4S | DTHB-00275-4S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2090 (948.0) | F | WS-A-5 | E |
| 330.0 | DTHA-0330-4S | DTHB-0330-4S | 45.60 (115.8) | 39.50 (100.3) | 35.50 (90.2) | 2090 (948.0) | F | WS-A-5 | G |
| 440.0 | DTHA-440-4S (42) | DTHB-440-4S (45) | 62.00 (157.5) | 54.00 (137.2) | 42.00 (106.7) | 2625 (1191.0) | F | WS-B-3 | G |
| 550.0 | DTHA-550-4S | DTHB-550-4S | 64.00 (162.6) | 60.00 (152.4) | 42.00 (106.7) | 3000 (1361.0) | F | WS-B-4 | G |
| 660.0 | DTHA-660-4S | DTHB-660-4S | 64.00 (162.6) | 64.00 (162.6) | 42.00 (106.7) | 3700 (1678.0) | F | WS-B-5 | G |

① Optional wall mounting kits – part # PL 79911 refer to Page 157.

② Optional wall mounting kits – part # PL 79912 refer to Page 157.

③ Dimensions may change and are not to be used for detailed construction purposes. Please contact the factory for certified dimensional drawings.

④ For factory added thermal protection, 7.5 thru 20.0 KVA change suffix '-2S' to '-TS'.

**The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 146.**

## 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 | DTFA-7-2S (62) | 15.21 (38.6) | 19.25 (48.9) | 7.37 (18.7) | 180 (81.6) | W | NA | NA | F |
| 11.0 | DTFA-011-2S (62) | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 265 (120.0) | F | NA | NA | I |
| 14.0 | DTFA-014-2S | 18.86 (48.0) | 20.30 (51.6) | 9.03 (22.9) | 265 (120.0) | F | NA | NA | I |
| 20.0 | DTFA-020-2S | 20.77 (52.8) | 20.94 (53.2) | 10.18 (25.9) | 435 (197.0) | F | NA | NA | I |
| 27.0 | DTFA-027-4S (59) | 25.48 (64.8) | 24.39 (62.0) | 19.40 (49.3) | 302 (137.0) | F ② | NA | WS-A-1 | E |
| 34.0 | DTFA-034-4S | 25.48 (64.8) | 24.39 (62.0) | 19.40 (49.3) | 330 (150.0) | F ② | NA | WS-A-1 | E |
| 40.0 | DTFA-040-4S | 25.48 (64.8) | 24.39 (62.0) | 19.40 (49.3) | 370 (168.0) | F ② | NA | WS-A-1 | E |
| 51.0 | DTFA-051-4S | 29.40 (74.7) | 28.15 (71.5) | 22.40 (56.9) | 375 (170.0) | F ② | NA | WS-A-2 | E |
| 63.0 | DTFA-063-4S | 29.40 (74.7) | 28.15 (71.5) | 22.40 (56.9) | 495 (225.0) | F ② | NA | WS-A-2 | E |
| 75.0 | DTFA-075-4S | 29.40 (74.7) | 28.15 (71.5) | 22.40 (56.9) | 525 (238.0) | F ② | NA | WS-A-2 | E |
| 93.0 | DTFA-093-4S | 35.40 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 685 (311.0) | F | NA | WS-A-3 | E |
| 118.0 | DTFA-0118-4S | 35.40 (89.9) | 31.90 (81.0) | 26.90 (68.3) | 710 (322.0) | F | NA | WS-A-3 | E |
| 145.0 | DTFA-0145-4S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 980 (445.0) | F | NA | WS-A-4 | E |
| 175.0 | DTFA-0175-4S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1110 (504.0) | F | NA | WS-A-4 | E |
| 220.0 | DTFA-0220-4S | 41.52 (105.5) | 32.90 (83.6) | 29.90 (75.9) | 1120 (508.0) | F | NA | WS-A-4 | E |

① Optional wall mounting kits – part # PL 79911 refer to Page 157.
② Optional wall mounting kits – part # PL 79912 refer to Page 157.
**The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 146.**

## DRIVE ISOLATION DESIGN FIGURES (Refer to pg 146)

## 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 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.

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

**Figure 1**

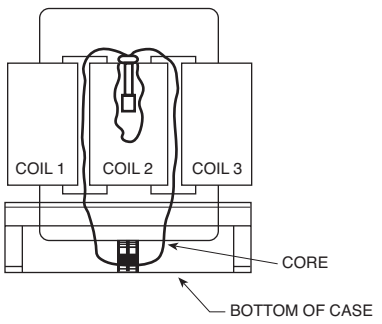
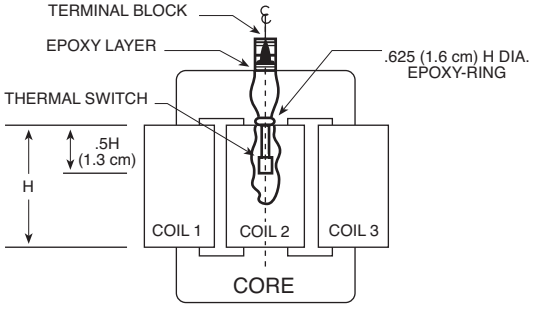



**Figure 2**



# 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 famous 10-year limited warranty.
- UR and cUR Recognized.
- CE Marked (up to 55 amps)

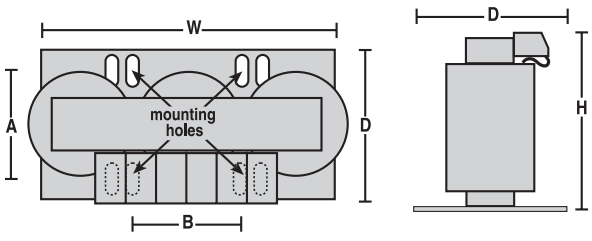
## BENEFITS

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

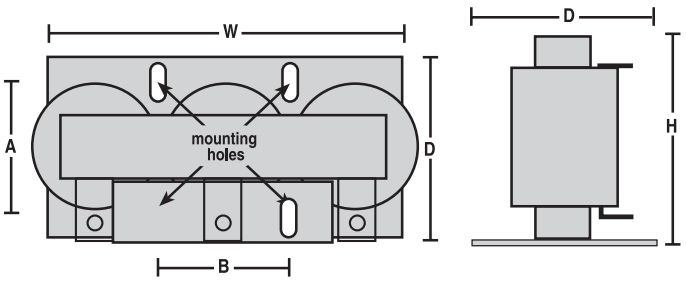
- Protection from damaging voltage drop.
- Elimination of nuisance tripping of drives or circuit breakers.
- Reduction of motor current surges and power line spike currents.
- Improvement in true power factor of capacitor input drives.
- Cooler, quieter operation.
- Reduction of harmonic distortion.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

## AC LINE REACTORS DIMENSIONAL DRAWINGS

**1-60 HP; 2-80 Amp**

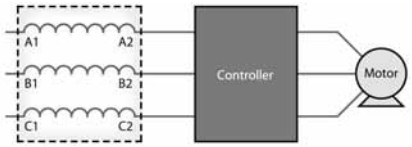



**75-500 HP; 110-600 Amp**



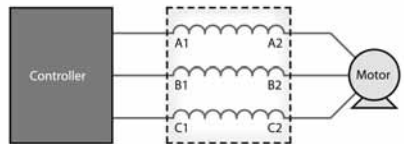
# Applying Acme AC Line Reactors

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.



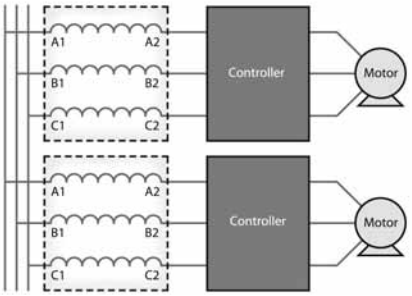

## Input to Inverter/Drive

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.



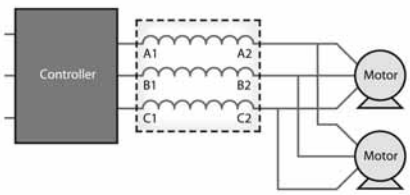

## Output of Inverter/Drive

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) |
|---|---|---|---|---|---|---|---|---|---|---|
| ALRB-002TBC | 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) |
| ALRB-003TBC | 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) |
| ALRB-004TBC | 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) |
| ALRB-006TBC | 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) |
| ALRB-008TBC | 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) |
| ALRB-012TBC | 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) |
| ALRB-016TBC | 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) |
| ALRB-025TBC | 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) |
| ALRB-027TBC | 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) |
| ALRB-035TBC | 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) |
| ALRB-045TBC | 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) |
| ALRB-055TBC | 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) |
| ALRB-080TBC | 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) |
| ALRB-110CBC | 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) |
| ALRB-130CBC | 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) |
| ALRB-160CBC | 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) |
| ALRB-200CBC | 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) |
| ALRB-250CBC | 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) |
| ALRB-300CBC | 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) |
| ALRB-360CBC | 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) |
| ALRB-420CBC | 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) |
| ALRB-480CBC | 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) |
| ALRB-600CBC | 500 | 590 | 600 | 37 | 10.93 (27.8) | 16.50 (41.9) | 8.13 (20.7) | 6.50 (16.5) | 7.20 (18.3) | 121 (54.9) |

## 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| ALRC-002TBC | 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) |
| ALRC-003TBC | 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) |
| ALRC-004TBC | 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) |
| ALRC-006TBC | 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) |
| ALRC-008TBC | 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) |
| ALRC-012TBC | 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) |
| ALRC-016TBC | 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) |
| ALRC-025TBC | 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) |
| ALRC-027TBC | 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) |
| ALRC-035TBC | 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) |
| ALRC-045TBC | 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) |
| ALRC-055TBC | 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) |
| ALRC-080TBC | 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) |
| ALRC-110CBC | 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) |
| ALRC-130CBC | 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) |
| ALRC-160CBC | 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) |
| ALRC-200CBC | 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) |
| ALRC-250CBC | 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) |
| ALRC-300CBC | 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) |
| ALRC-360CBC | 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) |
| ALRC-420CBC | 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) |
| ALRC-480CBC | 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) |
| ALRC-600CBC | 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.

# Encapsulated AC Line Reactors

Acme's Encapsulated AC Line Reactors are designed to protect DC motor drives and AC variable frequency drives or motors— with one important difference. These line reactors are completely enclosed, so the unit can be mounted outside the control panel.

Ideal for applications such as process lines, paper machines, casters, tube mills, tire assembly, laminators, press controls and drive systems. Acme's Encapsulated AC Line Reactors immerse the core and coil assembly in an electrical grade silica and resin compound that seals out moisture and potential corrosives. These Line Reactors are housed in a NEMA 3R Enclosure suitable for indoor or outdoor applications. What's more, these encapsulated line reactors are extremely convenient to install. They can be floor or wall mounted and front access makes wiring easy.

## FEATURES

- UL Type 3R enclosure.
- Available with stainless steel enclosure.
- Versatile mounting options to meet special application requirements.
- Large wiring compartment remains cool.
- No conduit or pull boxes needed.
- Front access to compartment simplifies wiring.
- Flexible copper leadwire terminates outside wiring compartment for quick connections.
- Dual-size knockouts in both sides and bottom of compartment for added flexibility in wiring.
- Ground studs for use with non-metallic conduit.
- UL and cUL Listed, CE Marked.
- Backed by Acme's 10-year limited warranty.

## BENEFITS

- Completely enclosed design provides protection against corrosion and insulation deterioration in washdown and harsh environment.
- Easy to install and wire.
- Protects against a whole range of power conditioning problems.
- Eliminates motor failure due to poor power quality.
- Reduces downtime.
- Extends the life of your equipment.

## ENCAPSULATED AC LINE REACTORS DIMENSIONAL DRAWINGS

**Diagram A**

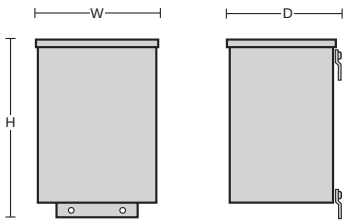



**Diagram B**

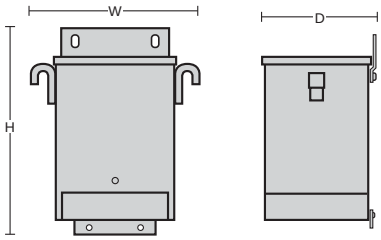
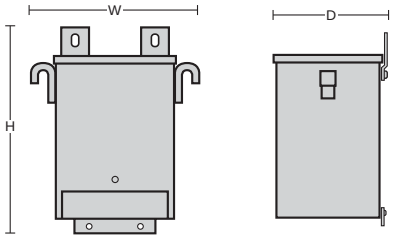



**Diagram C**




* All units are available with stainless steel enclosures–consult factory.
** Motor HP and Amp rated at 480 volts.

# SELECTION CHARTS

## GROUP B

### ENCAPSULATED AC LINE REACTORS*
**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 | DIMENSIONAL DRAWINGS | WEIGHT (lbs/kg) |
|---|---|---|---|---|---|---|---|---|---|
| ALRB-002LWE | 1 | 2.1 | 2 | 11027 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRB-003LWE | 1.5 | 3 | 3 | 7351 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRB-004LWE | 2 | 3.4 | 4 | 5513 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRB-006LWE | 3 | 4.8 | 6 | 3676 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRB-008LWE | 5 | 7.6 | 8 | 2757 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 24 (10.9) |
| ALRB-012LWE | 7.5 | 11 | 12 | 1838 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 24 (10.9) |
| ALRB-016LWE | 10 | 14 | 16 | 1378 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 25 (11.3) |
| ALRB-025LWE | 15 | 21 | 25 | 882 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 28 (12.7) |
| ALRB-027LWE | 20 | 27 | 27 | 817 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 28 (12.7) |
| ALRB-035LWE | 25 | 34 | 35 | 630 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 32 (14.5) |
| ALRB-045LWE | 30 | 40 | 45 | 490 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 33 (15.0) |
| ALRB-055LWE | 40 | 52 | 55 | 401 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 73 (33.1) |
| ALRB-080LWE | 60 | 77 | 80 | 276 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 75 (34.0) |
| ALRB-110LWE | 75 | 96 | 110 | 200 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 78 (35.4) |
| ALRB-130LWE | 100 | 124 | 130 | 170 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 85 (38.6) |
| ALRB-160LWE | 125 | 156 | 160 | 138 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 87 (39.5) |

## GROUP C

### ENCAPSULATED AC LINE REACTORS*
**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 | DIMENSIONAL DRAWINGS | WEIGHT (lbs/kg) |
|---|---|---|---|---|---|---|---|---|---|
| ALRC-002LWE | 1 | 2 | 2 | 18378 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRC-003LWE | 1.5 | 3 | 3 | 12252 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRC-004LWE | 2 | 4 | 4 | 9189 | 9.68 (24.6) | 4.75 (24.6) | 4.5 (11.4) | A | 10 (4.5) |
| ALRC-006LWE | 3 | 6 | 6 | 6126 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 24 (10.9) |
| ALRC-008LWE | 5 | 8 | 8 | 4594 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 24 (10.9) |
| ALRC-012LWE | 7.5 | 12 | 12 | 3063 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 26 (11.8) |
| ALRC-016LWE | 10 | 16 | 16 | 2297 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 28 (12.7) |
| ALRC-025LWE | 15 | 25 | 25 | 1470 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 32 (14.5) |
| ALRC-027LWE | 20 | 27 | 27 | 1361 | 11.5 (29.2) | 10.31 (26.2) | 7.13 (18.1) | B | 32 (14.5) |
| ALRC-035LWE | 25 | 35 | 35 | 1050 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 74 (33.6) |
| ALRC-045LWE | 30 | 45 | 45 | 817 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 75 (34.0) |
| ALRC-055LWE | 40 | 55 | 55 | 668 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 75 (34.0) |
| ALRC-080LWE | 60 | 80 | 80 | 459 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 85 (38.6) |
| ALRC-110LWE | 75 | 110 | 110 | 334 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 107 (48.5) |
| ALRC-130LWE | 100 | 130 | 130 | 263 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 107 (48.5) |
| ALRC-160LWE | 125 | 160 | 160 | 230 | 11.83 (30.0) | 14.17 (36.0) | 8.82 (22.4) | C | 121 (54.9) |

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 PL-112700 Through PL-112705: 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.

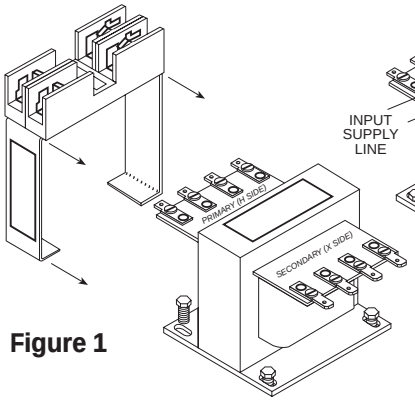



**Figure 1**

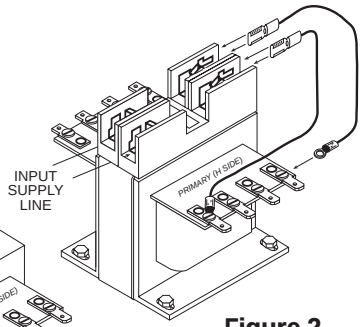
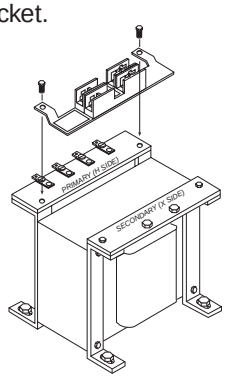


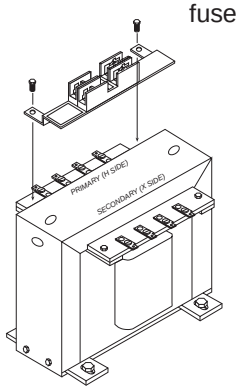

**Figure 2**

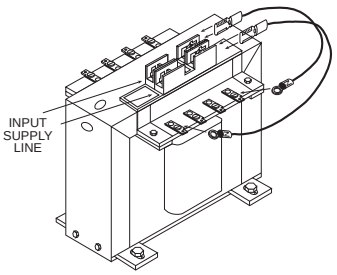
# Instructions for TA Series Primary Fuse Kit

## Type PL-112706 & PL-112707: 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 Chart①

| 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.

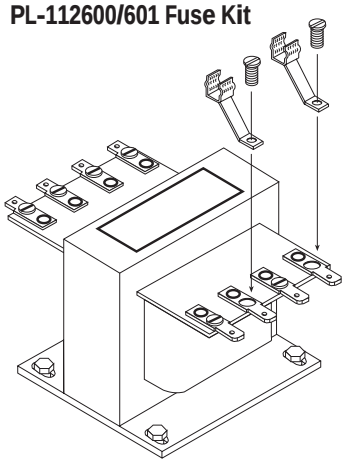
**NOTE:** Bold lines indicate changes in the percent of rated current used to calculate fuse sizes in accordance with article 450 of the NEC.

# TA Series Secondary Fuse Kits

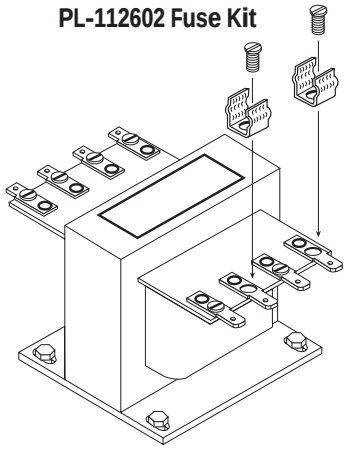
## Type PL-112600, 601, 602: Use Dual Element Slow-Blow Fuse

- 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).

**PL-112600/601 Fuse Kit**



**PL-112602 Fuse Kit**



# TA Series Instructions for Secondary Fuse Kit

## Type PL-112603: 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 PL-112700 thru PL-112707 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 75.
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.

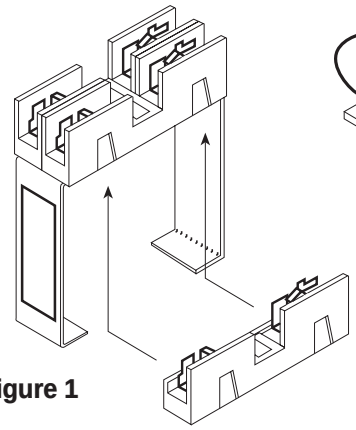


**Figure 1**

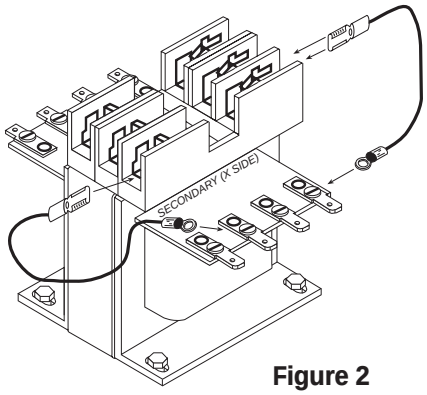


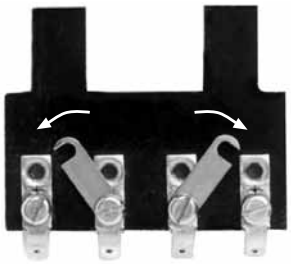

**Figure 2**

## 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 TA-2-32404 does not have quick connect terminals.

**Series Connection**



**Parallel Connection**

NEW

# 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.

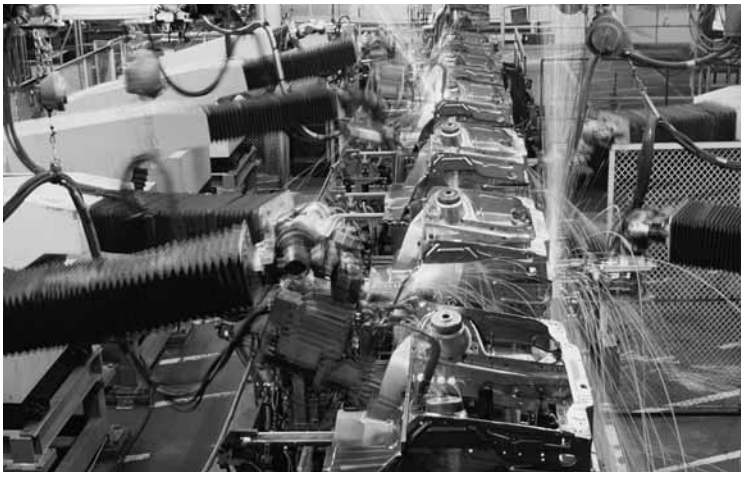
Voltage regulation of Acme's TB Series transformers exceeds standards recommended by the National Electrical Manufacturers Association. Secondary circuit voltage drop between no-load and momentary overload remains exceptionally low. This excellent secondary circuit voltage regulation assures reliable 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



NEW

# TB Series Primary Fuse Kits

## Type PL-112700 Through PL-112705: 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.

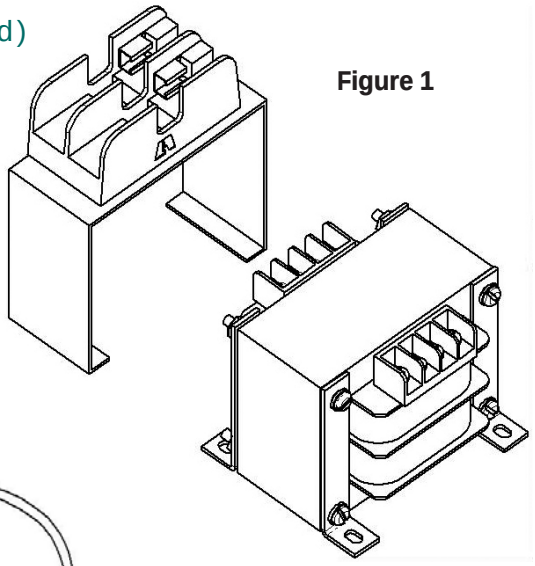


Figure 1

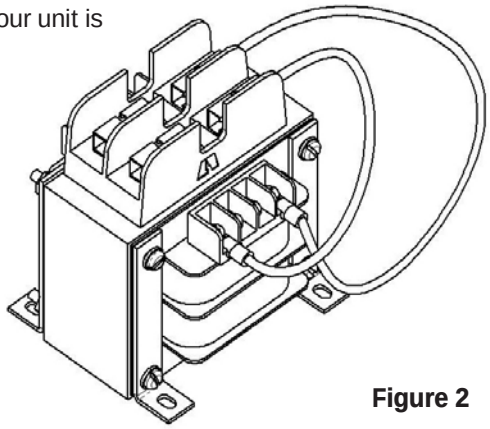


Figure 2

## Primary Fuse Sizing Chart①

| 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.

NEW

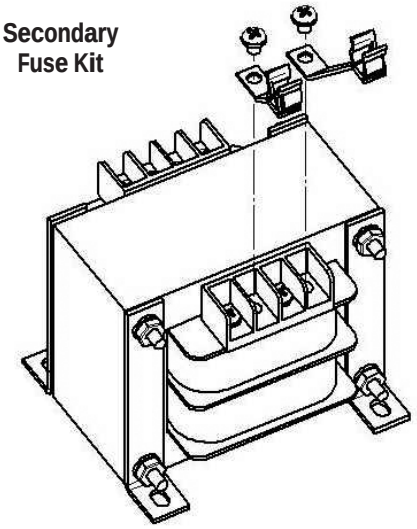
# TB Series Secondary Fuse Kits

## Type PL-79924, PL-79930, & PL-79931: Use Dual Element Slow-Blow Fuse

| Catalog Number | VA | Type |
|---|---|---|
| PL-79924* | 50-1000 | 1/4" x 1-1/4" |
| PL-79930 | 50-350 | 13/32" x 1-1/2" |
| PL-79931 | 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).

* PL-79924: Use fuse kit on all transformers except 750 & 1000 VA with 24 volt secondary.




NEW

# Instructions for TB Series Secondary Fuse Kit

## Type PL-112603: 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 PL-112700 thru PL-112705 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 70.
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.

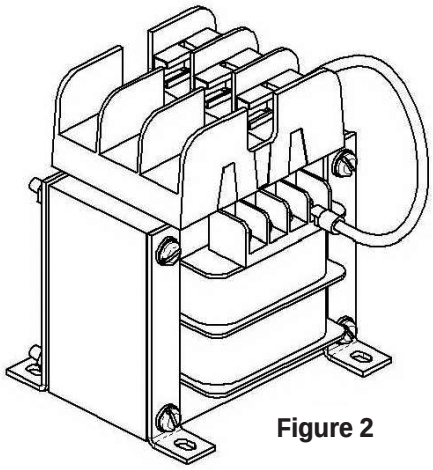


Figure 2

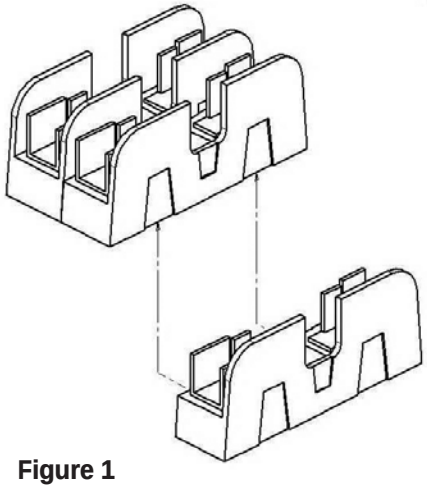


Figure 1

# SELECTION CHARTS

NEW

## GROUP A

### 120 X 240 PRIMARY VOLTS — 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 KIT ① PART NO. | SECONDARY FUSE SIZE 24 VOLTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TB-81141 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) | PL-112700 | * | 3 2/10 amps |
| TB-81142 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) | PL-112700 | * | 5 amps |
| TB-81143 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) | PL-112700 | * | 6 1/4 amps |
| TB-81144 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) | PL-112701 | * | 10 amps |
| TB-81146 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) | PL-112702 | * | 15 amps |
| TB-81148 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) | PL-112702 | * | 20 amps |
| TB-81149 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) | PL-112704 | * | 30 amps |
| TB-81150 | 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) | PL-112704 | * | — |
| TB-81151 | 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) | PL-112705 | * | — |

* See fusing chart for secondary fuse kits.

NEW

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TB-81210 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) | PL-112700 | * | 6/10 amp |
| TB-81201 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) | PL-112700 | * | 1 amp |
| TB-81211 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) | PL-112700 | * | 1 1/4 amps |
| TB-81212 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) | PL-112701 | * | 2 amps |
| TB-81213 ② | 250 | 2.08 | 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) | 9 (4.1) | PL-112702 | * | 3 2/10 amps |
| TB-81200 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) | PL-112702 | * | 4 amps |
| TB-81214 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) | PL-112702 | * | 4 1/2 amps |
| TB-81215 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) | PL-112704 | * | 6 1/4 amps |
| TB-81216 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) | PL-112704 | * | 10 amps |
| TB-81217 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) | PL-112705 | PL-112601 | 12 amps |

① Secondary Fuse Kit PL-112603 may be substituted for PL-112600 thru PL-112602 when Primary Fuse Kit is used. See page 71.
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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TA-2-81218 | 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) | PL-112705 | PL-112601 | 15 amps |
| TA-2-81219 | 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) | PL-112705 | PL-112601 | 20 amps |
| TA-2-81220 | 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) | PL-112706 | — | — |
| TA-2-81221 | 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) | PL-112707 | — | — |

⁎ See fusing chart for secondary fuse kits.

### Integrally Mounted Fuse Blocks Available:

**(See Chart)**

**GROUP 'A' THROUGH 500 VA**

**GROUP 'B' THROUGH 1000 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TB-81000 | 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) | PL-112700 | * | 6/10 amp |
| TB-81009 | 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) | PL-112700 | * | 1 amp |
| TB-81001 | 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) | PL-112700 | * | 1 1/4 amps |
| TB-81002 | 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) | PL-112701 | * | 2 amps |
| TB-81003 | 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) | PL-112702 | * | 3 2/10 amps |
| TB-81020 | 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) | PL-112702 | * | 4 amps |
| TB-81004 | 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) | PL-112702 | * | 4 1/2 amps |
| TB-81005 | 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) | PL-112704 | * | 6 1/4 amps |
| TB-81006 | 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) | PL-112705 | * | 10 amps |
| TB-81007 | 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) | PL-112705 | * | 12 amps |
| TA-2-81008 | 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) | PL-112705 | PL-112601 | 15 amps |
| TA-2-53929 | 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) | PL-112706 | PL-112601 | 20 amps |
| TA-2-53930 | 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) | PL-112707 | — | — |
| TA-2-53931 | 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) | PL-112707 | — | — |

⁎ See fusing chart for secondary fuse kits.

① Secondary Fuse Kit PL-112603 may be substituted for PL-112600 thru PL-112602 when Primary Fuse Kit is used. See page 71.
② See chart for integrally mounted fuse block catalog number suffix.

NEW

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TB-81321 | 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) | PL-112701 | * | 3 2/10 amp |
| TB-81322 | 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) | PL-112701 | * | 5 amps |
| TB-81323 | 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) | PL-112701 | * | 6 1/4 amps |
| TB-81324 | 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) | PL-112702 | * | 10 amps |
| TB-81325 | 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) | PL-112702 | * | 15 amps |
| TB-81326 | 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) | PL-112704 | * | 20 amps |
| TB-81327 | 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) | PL-112704 | * | 30 amps |
| TB-81328 | 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) | PL-112705 | * | — 33 amps |
| TB-81329 | 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) | PL-112705 | * | — |

* See fusing chart for secondary fuse kits.

NEW

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TB-81301 | 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) | PL-112700 | * | 6/10 amp |
| TB-81302 | 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) | PL-112700 | * | 1 amp |
| TB-81303 | 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) | PL-112701 | * | 1 1/4 amps |
| TB-81304 | 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) | PL-112701 | * | 2 amps |
| TB-81305 | 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) | PL-112702 | * | 3 1/2 amps |
| TB-81306 | 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) | PL-112702 | * | 5 amps |
| TB-81307 | 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) | PL-112704 | * | 7 amps |
| TB-81308 | 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) | PL-112705 | * | 10 amps |
| TB-81309 | 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) | PL-112705 | * | 12 amps |

* See fusing chart for secondary fuse kits.

① Secondary Fuse Kit PL-112603 may be substituted for PL-112600 thru PL-112602 when Primary Fuse Kit is used. See page 71.
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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TA-2-54535 | 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) | PL-112701 | 6/10 amp |
| TA-2-54536 | 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) | PL-112701 | 1 1/4 amps |
| TA-2-54537 | 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) | PL-112701 | 2 amps |
| TA-2-54538 | 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) | PL-112702 | 3 1/2 amps |
| TA-2-81197 | 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) | PL-112703 | 5 amps |
| TA-2-54539 | 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) | PL-112703 | 7 amps |
| TA-2-81240 | 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) | PL-112705 | 10 amps |
| TA-2-81241 | 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) | PL-112705 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW TB-32403 | 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) | PL-112701 | NA | 6/10 amp |
| NEW TB-32404 | 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) | PL-112702 | NA | 1 6/10 amps |
| NEW TB-32405 | 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) | PL-112702 | NA | 3 2/10 amps |
| NEW TB-32669 | 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) | PL-112702 | NA | 4 amps |
| NEW TB-32406 | 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) | PL-112705 | NA | 6 1/4 amps |
| NEW TB-54523 | 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) | PL-112705 | NA | 9 amps |
| NEW TB-54524 | 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) | PL-112705 | NA | 12 amps |
| TA-2-54525 | 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) | PL-112706 | PL-112601 | 20 amps |
| TA-2-81202 | 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) | PL-112706 | PL-112601 | 25 amps |
| TA-2-81203 | 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) | PL-112707 | — | — |
| TA-2-81205 | 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) | PL-112707 | — | — |

① Secondary Fuse Kit PL-112603 may be substituted for PL-112600 thru PL-112602 when Primary Fuse Kit is used. See page 71.
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 |

NEW

## 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 | | | | |
| TB-69300 | 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) | PL-112700 | * | 6/10 amp |
| TB-69301 | 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) | PL-112700 | * | 1 4/10 amps |
| TB-69302 | 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) | PL-112701 | * | 2 amps |
| TB-69303 | 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) | PL-112702 | * | 3 1/2 amps |
| TB-69304 | 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) | PL-112702 | * | 5 amps |
| TB-69305 | 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) | PL-112704 | * | 7 amps |
| TB-69306 | 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) | PL-112705 | * | 10 amps |
| TB-69307 | 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) | PL-112705 | * | 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 | | |
| TA-83300 | 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) | PL-112700 |
| TA-83301 | 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) | PL-112700 |
| TA-83302 | 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) | PL-112701 |
| TA-83303 | 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) | PL-112702 |
| TA-83304 | 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) | PL-112703 |
| TA-83305 | 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) | PL-112704 |
| TA-83306 | 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) | PL-112705 |

① Secondary Fuse Kit PL-112603 may be substituted for PL-112600 thru PL-112602 when Primary Fuse Kit is used. See page 71.

## 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. |
|---|---|---|---|---|---|---|---|---|---|---|
| NEW TB-83210 | 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) | PL-112700 |
| NEW TB-83212 | 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) | PL-112700 |
| NEW TB-83213 | 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) | PL-112701 |
| NEW TB-83215 | 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) | PL-112702 |
| NEW TB-83218 | 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) | PL-112703 |
| NEW TB-83219 | 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) | PL-112704 |
| NEW TB-83220 | 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) | PL-112705 |
| TA-83221 | 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) | PL-112705 |
| TA-83222 | 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) | PL-112705 |
| TA-83223 | 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) | PL-112706 |
| TA-83224 | 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) | PL-112707 |

## 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. |
|---|---|---|---|---|---|---|---|---|---|---|
| TA-83310 | 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) | PL-112700 |
| TA-83311 | 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) | PL-112700 |
| TA-83312 | 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) | PL-112701 |
| TA-83313 | 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) | PL-112702 |
| TA-83314 | 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) | PL-112703 |
| TA-83315 | 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) | PL-112704 |
| TA-83316 | 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) | PL-112705 |

* 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.) |
|---|---|
| PL-112700 | 1 (0.5) |
| PL-112701 | 1 (0.5) |
| PL-112702 | 1 (0.5) |
| PL-112703 | 1 (0.5) |
| PL-112704 | 1 (0.5) |
| PL-112705 | 1 (0.5) |
| PL-112706 | 1 (0.5) |
| PL-112707 | 1 (0.5) |

### TA SERIES PROTECTIVE DEVICES – Secondary Fuse Kits

**FOR USE WITH INDUSTRIAL CONTROL TRANSFORMERS THROUGH 1500 VA.**

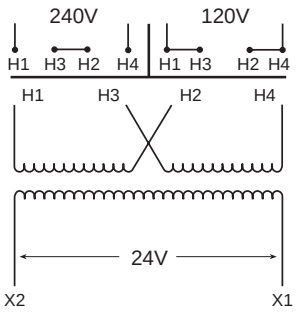
| CATALOG NO. | APPROX. SHIP WEIGHT Lbs. (Kg.) |
|---|---|
| PL-112600 | 0.5 (0.2) |
| PL-112601 | 0.5 (0.2) |
| PL-112602 | 1 (0.5) |
| PL-112603 | 1 (0.5) |

### TB SERIES PROTECTIVE DEVICES– Secondary Fuse Kits

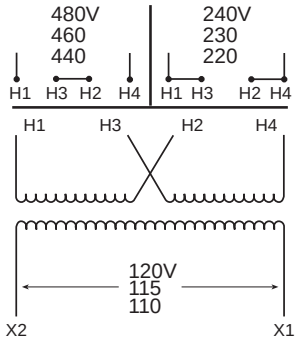
| CATALOG NO. | VA | DESCRIPTION | APPROX. SHIPPING WT. (LBS./KG.) |
|---|---|---|---|
| PL-79924 | | Fuse Kit: Secondary Fuse 1/4" x 1-1/4" w/ARM | 1.0 (0.5) |
| PL-79928 | 50 – 350 | Link: Small Jumper Links (Qty. 2) | 1.0 (0.5) |
| PL-79929 | 500 & 750 | Link: Large Jumper Links (Qty. 2) | 1.0 (0.5) |
| PL-79930 | 50 – 350 | Fuse Kit: Secondary Fuse Midget w/ARM | 1.0 (0.5) |
| PL-79931 | 500 & 1000 | Fuse Kit: Secondary Fuse Midget w/ARM | 1.0 (0.5) |

# TA Series Open Core & Coil Wiring Diagrams

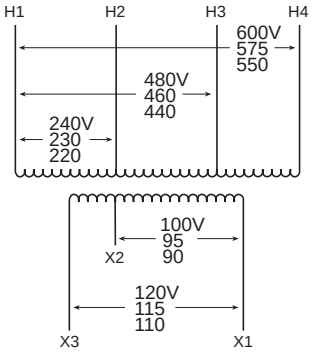
## Group A



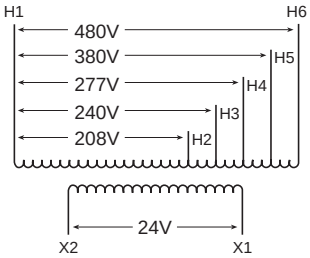

## Group B



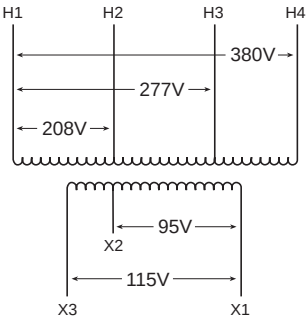

## Group C




## Group D




## Group E

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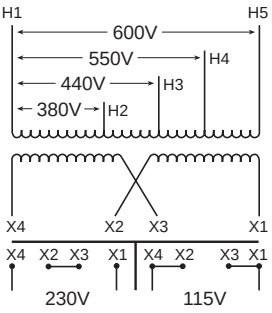
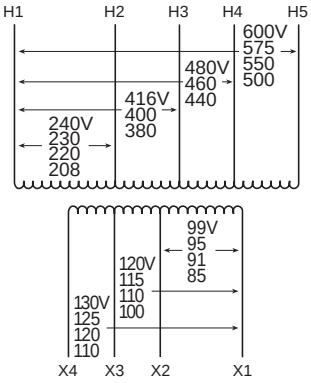
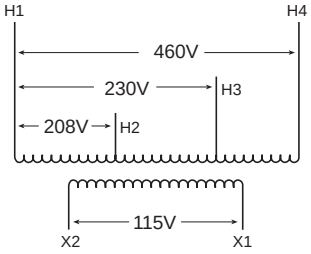


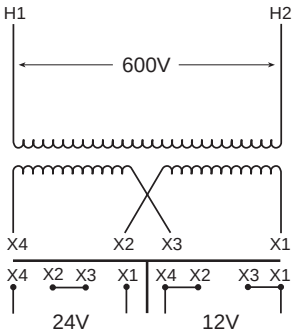

## Group G



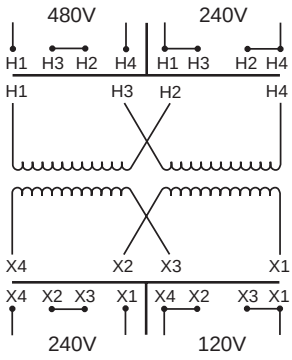

## Group H



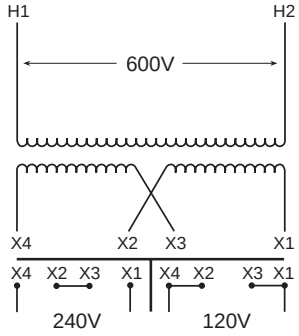

## Group I




## Group J

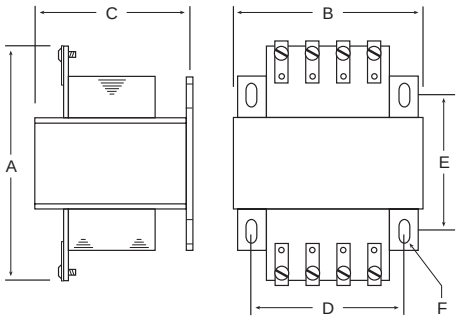



## Group K

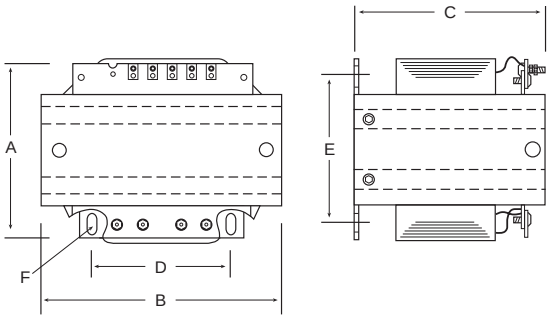



# TA Series Open Core & Coil Dimensional Drawings

## 50 VA Thru 2 KVA



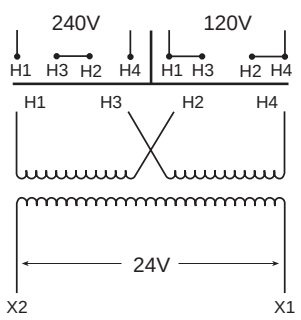

## 3 & 5 KVA



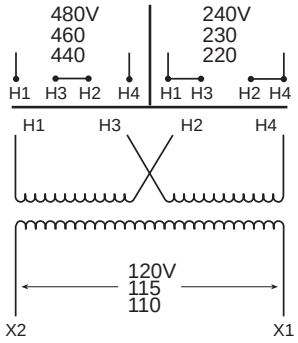
NEW

# TB Series Open Core & Coil Wiring Diagrams

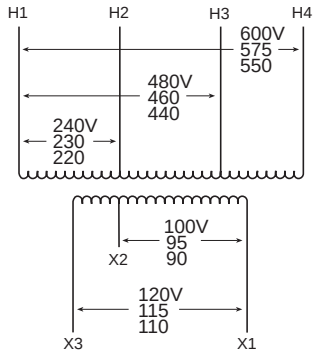
## Group A



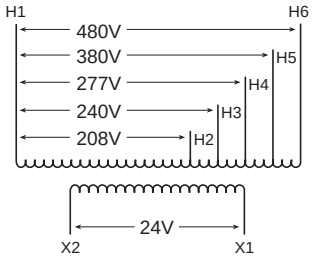

## Group B



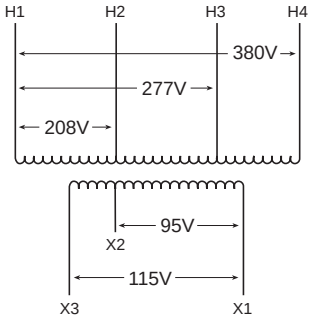

## Group C



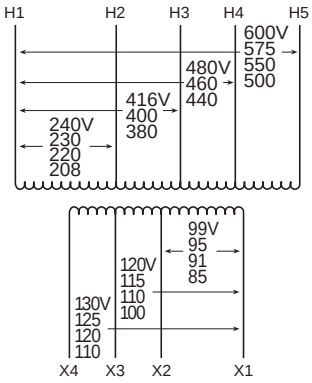

## Group D



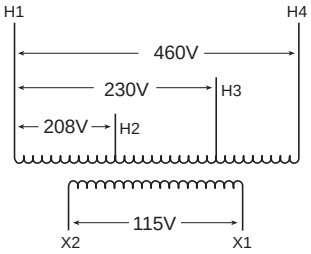

## Group E



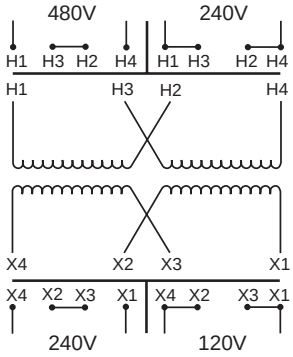

## Group G




## Group H

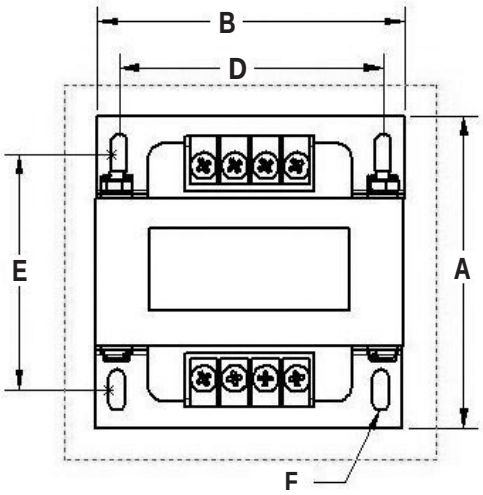


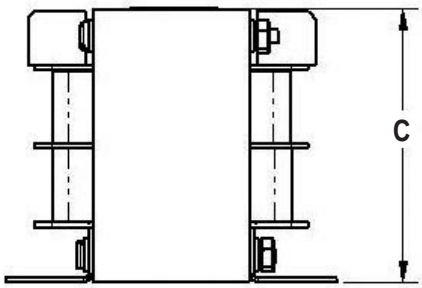

## Group J




NEW

# 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

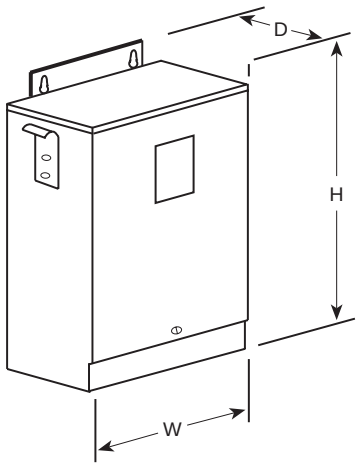
### 240 x 480 PRIMARY VOLTS—120 SECONDARY VOLTS③ —1Ø, 50/60 Hz

| CATALOG NO. | VA RATING | OUTPUT AMPS | APPROX. DIMENSIONS INCHES (CM.) H | W | D | APPROX. SHIP WEIGHT LBS. (KG.) | ELECTRICAL CONNECTION DIAGRAM ① ② |
|---|---|---|---|---|---|---|---|
| T-1-81217 | 1000 | 8.33 | 13.10 (33.3) | 10.31 (26.2) | 7.13 (18.1) | 55 (24.9) | B |
| T-1-81219 | 2000 | 16.67 | 14.77 (37.5) | 10.31 (26.2) | 7.13 (18.1) | 80 (36.3) | B |
| T-1-81220 | 3000 | 25.00 | 14.77 (37.5) | 10.31 (26.2) | 7.13 (18.1) | 100 (45.4) | B |
| T-1-81221 | 5000 | 41.67 | 13.85 (35.2) | 13.25 (33.7) | 10.19 (25.9) | 140 (63.5) | B |
| T-1-81223 | 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 Volts ③ — 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 |
|---|---|---|---|---|---|---|---|
| T-1-53929 | 2000 | 16.67 | 14.77 (37.5) | 10.31 (26.2) | 7.13 (18.1) | 80 (36.3) | C |
| T-1-53930 | 3000 | 25.00 | 13.85 (35.2) | 13.25 (33.7) | 10.19 (25.9) | 130 (59.0) | C |
| T-1-53931 | 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 72 for electrical diagram.

② See page 66 for fuse sizing information.

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

# NEW 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.

## Cooler. Cleaner. More Compact.

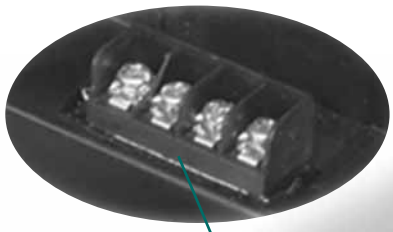
The AE and CE Series design improves the dissipation of the heat away from the core and coil assembly providing cooler operation. In addition, the AE and CE Series industrial control transformers seal the transformer's windings and internal terminations within an epoxy encapsulant encased in a durable 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.

## CE Series for Global Applications

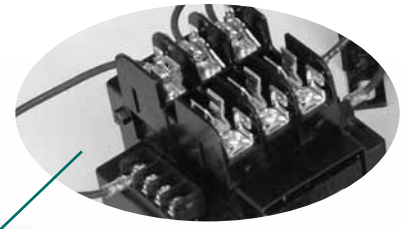
Acme's CE Series Encapsulated Industrial Control Transformers carry the CE mark, indicating it complies with the requirements established by the International Electrotechnical Commission (IEC) for use of control circuit transformers in the countries of the European Union. Regulations that apply to control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

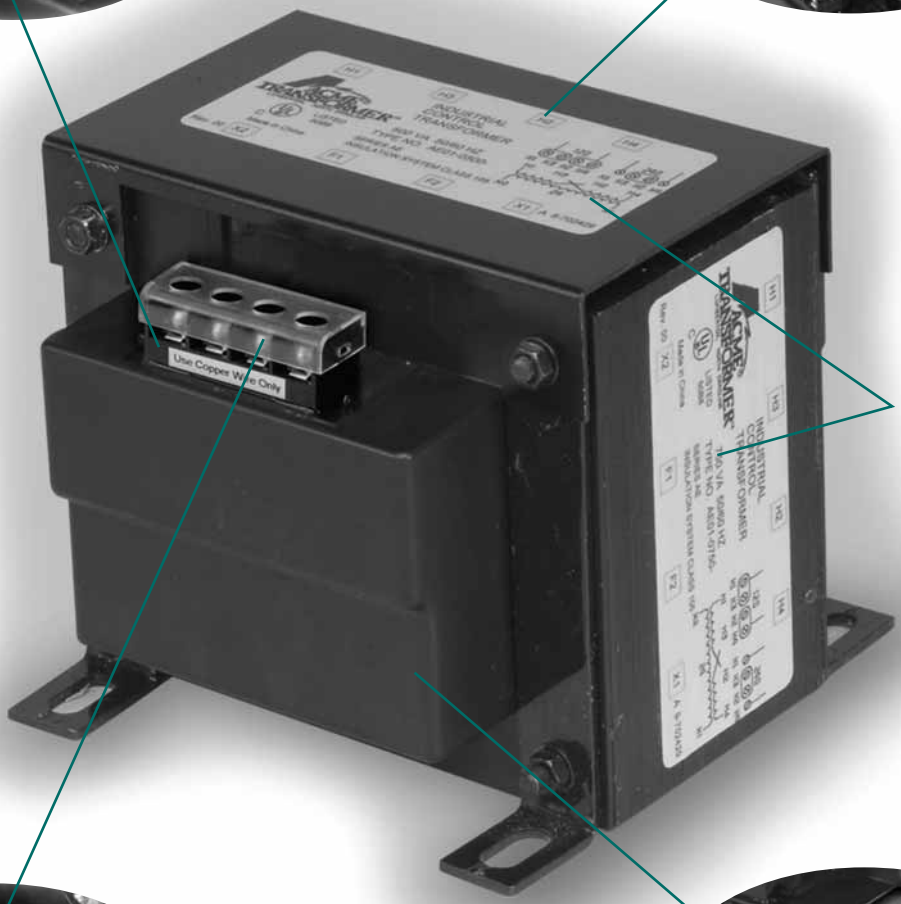
## FEATURES

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

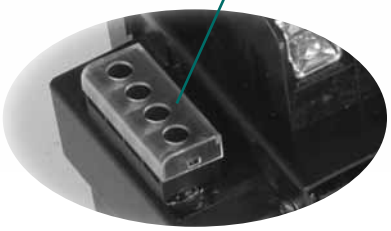


Integrally mounted fuse blocks available in standard and touch-proof (CE Series) style.






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

NEW

### 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 | AE01-0050 | 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 | AE01-0075 | 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 | AE01-0100 | 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 | AE01-0150 | 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 | AE01-0250 | 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 | AE01-0350 | 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 | AE01-0500 | 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 | AE01-0750 | 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) |

NEW

### 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 | AE02-0050 | 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 | AE02-0075 | 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 | AE02-0100 | 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 | AE02-0150 | 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 | AE02-0250 | 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 | AE02-0300 | 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 | AE02-0350 | 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 | AE02-0500 | 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 | AE02-0750 | 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) |

NEW

### 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 | AE03-0050 | 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 | AE03-0075 | 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 | AE03-0100 | 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 | AE03-0150 | 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 | AE03-0250 | 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 | AE03-0350 | 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 | AE03-0500 | 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 | AE03-0750 | 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) |

NEW

## 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.) | | | | | MOUNTING SLOT | APPROX. SHIPPING WT |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| 50 | AE06-0050 | 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 | AE06-0075 | 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 | AE06-0100 | 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 | AE06-0150 | 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 | AE06-0250 | 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 | AE06-0350 | 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 | AE06-0500 | 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 | AE06-0750 | 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) |

NEW

## GROUP VII

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

| VA RATING | CATALOG NUMBER | APPROX. DIMENSIONS INCHES (CM.) | | | | | MOUNTING SLOT | APPROX. SHIPPING WT |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| 50 | AE07-0050 | 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 | AE07-0100 | 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 | AE07-0150 | 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 | AE07-0250 | 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 | AE07-0350 | 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 | AE07-0500 | 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 | AE07-0750 | 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) |

NEW

## GROUP XII

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

| VA RATING | CATALOG NUMBER | APPROX. DIMENSIONS INCHES (CM.) | | | | | MOUNTING SLOT | APPROX. SHIPPING WT |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| 50 | AE12-0050 | 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 | AE12-0100 | 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 | AE12-0150 | 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 | AE12-0250 | 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 | AE12-0350 | 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 | AE12-0500 | 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 | AE12-0750 | 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

NEW

### 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 | CE01-0050 | 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 | CE01-0075 | 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 | CE01-0100 | 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 | CE01-0150 | 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 | CE01-0250 | 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 | CE01-0350 | 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 | CE01-0500 | 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 | CE01-0750 | 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) |

NEW

### 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 | CE02-0050 | 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 | CE02-0100 | 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 | CE02-0150 | 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 | CE02-0250 | 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 | CE02-0350 | 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 | CE02-0500 | 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 | CE02-0750 | 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) |

NEW

### 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 | CE03-0050 | 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 | CE03-0075 | 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 | CE03-0100 | 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 | CE03-0150 | 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 | CE03-0250 | 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 | CE03-0350 | 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 | CE03-0500 | 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 | CE03-0750 | 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) |

NEW

## 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 | CE04-0050 | 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 | CE04-0100 | 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 | CE04-0150 | 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 | CE04-0250 | 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 | CE04-0350 | 4.91 (12.4) | 4.50 (11.4) | 4.22 (10.7) | 4.06 (10.3) | 4.38 (11.1) | .20 x .40 (0.5 x 1.0) | 13.0 (5.9) |
| 500 | CE04-0500 | 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 | CE04-0750 | 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) |

NEW

## 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 | CE05-0050 | 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 | CE05-0150 | 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 | CE05-0250 | 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 | CE05-0350 | 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 | CE05-0500 | 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 | CE05-0750 | 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) |

NEW

## 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 | CE06-0050 | 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 | CE06-0075 | 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 | CE06-0100 | 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 | CE06-0150 | 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 | CE06-0250 | 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 | CE06-0300 | 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 | CE06-0350 | 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 | CE06-0500 | 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 | CE06-0750 | 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

| | 120 V | 208 V | 220 V | 230 V | 240 V | 380 V | 400 V | 416 V | 440 V | 460 V | 480 V | 500 V | 550 V | 575 V | 600 V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 VA | 1.25 | 0.60 | 0.60 | 0.60 | 0.60 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.25 | 0.25 | 0.25 |
| 75 VA | 1.80 | 1.00 | 1.00 | 0.80 | 0.80 | 0.50 | 0.50 | 0.50 | 0.50 | 0.40 | 0.40 | 0.40 | 0.40 | 0.30 | 0.30 |
| 100 VA | 2.50 | 1.40 | 1.25 | 1.25 | 1.25 | 0.75 | 0.75 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.50 | 0.50 | 0.50 |
| 150 VA | 3.50 | 2.00 | 2.00 | 1.80 | 1.80 | 1.13 | 1.13 | 1.00 | 1.00 | 0.80 | 0.80 | 0.80 | 0.80 | 0.75 | 0.75 |
| 250 VA | 3.20 | 3.50 | 3.20 | 3.20 | 3.00 | 1.80 | 1.80 | 1.80 | 1.60 | 1.60 | 1.50 | 1.50 | 1.25 | 1.25 | 1.25 |
| 300 VA | 4.00 | 4.00 | 4.00 | 3.50 | 3.50 | 2.25 | 2.25 | 2.00 | 2.00 | 1.80 | 1.80 | 1.80 | 1.60 | 1.50 | 1.50 |
| 350 VA | 4.50 | 5.00 | 4.50 | 4.50 | 4.00 | 2.50 | 2.50 | 2.50 | 2.25 | 2.25 | 2.00 | 2.00 | 1.80 | 1.80 | 1.60 |
| 500 VA | 6.25 | 4.00 | 3.50 | 3.50 | 3.20 | 3.50 | 3.50 | 3.50 | 3.20 | 3.20 | 3.00 | 3.00 | 2.50 | 2.50 | 2.50 |
| 750 VA | 10.00 | 6.00 | 5.60 | 5.00 | 5.00 | 5.60 | 5.60 | 5.00 | 5.00 | 4.50 | 4.50 | 4.50 | 4.00 | 3.50 | 3.50 |

**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

| | 24 V | 85 V | 91 V | 95 V | 99 V | 100 V | 110 V | 115 V | 120 V | 125 V | 130 V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 VA | 2.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.25 |
| 75 VA | 3.00 | – | – | – | – | – | 0.75 | 0.75 | 0.75 | – | – |
| 100 VA | 5.00 | – | – | – | – | – | 1.00 | 1.00 | 1.00 | – | – |
| 150 VA | 6.00 | 2.00 | 2.00 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.00 |
| 250 VA | 12.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| 300 VA | – | – | – | – | – | – | 3.00 | 3.00 | 3.00 | – | – |
| 350 VA | 15.00 | 5.00 | 4.00 | 4.00 | 4.00 | 4.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 500 VA | 25.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 4.00 |
| 750 VA | 35.00 | 10.00 | 10.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 6.00 | 6.00 | 6.00 |

## CONNECTION DETAILS FOR AE05 & CE05

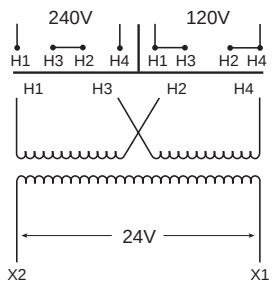
| H1-H2 | H1-H3 | H1-H4 | X1-X2 | X1-X3 | X1-X4 |
|---|---|---|---|---|---|
| 208 | | | 85 | 100 | 110 |
| 220 | 380 | 440 | 91 | 110 | 120 |
| 230 | 400 | 460 | 95 | 115 | 125 |
| 240 | 416 | 480 | 99 | 120 | 130 |

## FUSE KITS & ACCESSORIES

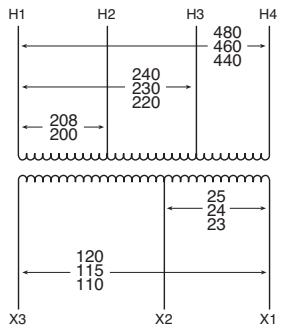
| CATALOG NUMBER | VA | DESCRIPTION | APPROX. SHIPPING WT. (Lbs./Kg.) |
|---|---|---|---|
| PL-79920 | 50-750 | Fuse Kit: Primary Fuse Block EIC Series (2 Class CC Blocks) | 1.0 (0.5) |
| PL-79921 | 150-750 | Fuse Kit: Primary & Secondary Fuse Block EIC Series (2 Class CC and 1 Midget Blocks) | 1.0 (0.5) |
| PL-79922 | 50-750 | Fuse Kit: Primary Fuse Block EIC Series CE Listed w/ Covers (2 Class CC Blocks) | 1.0 (0.5) |
| PL-79923 | 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) |
| PL-79924 | | Fuse Kit: Secondary Fuse 1/4" x 1-1/4" w/ARM | 1.0 (0.5) |
| PL-79925 | 50 – 350 | Cover: Small Terminal Covers (Qty. 2) | 1.0 (0.5) |
| PL-79926 | 500 & 750 | Cover: Large Terminal Covers (Qty. 2) | 1.0 (0.5) |
| PL-79927 | | Cover: Fuse Block Covers (Qty. 1) | 1.0 (0.5) |
| PL-79928 | 50 – 350 | Link: Small Jumper Links (Qty. 2) | 1.0 (0.5) |
| PL-79929 | 500 & 750 | Link: Large Jumper Links (Qty. 2) | 1.0 (0.5) |
| PL-79930 | 50 – 350 | Fuse Kit: Secondary Fuse Midget w/ARM | 1.0 (0.5) |
| PL-79931 | 500 & 750 | Fuse Kit: Secondary Fuse Midget w/ARM | 1.0 (0.5) |

## AE & CE Series Wiring Diagrams

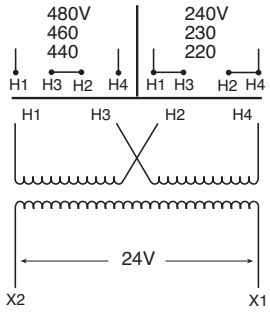
### WIRING FOR AE01 & CE01



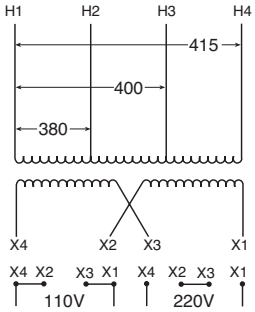

### WIRING FOR AE02 & CE02



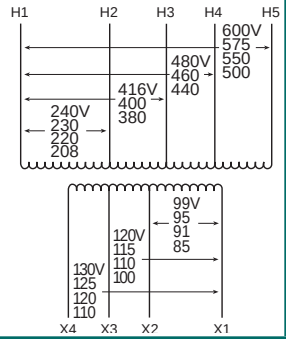

### WIRING FOR AE03 & CE03



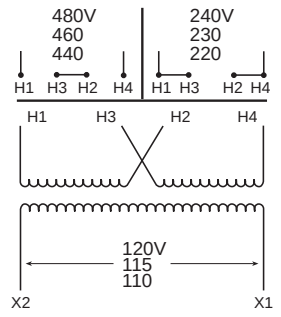

### WIRING FOR CE04



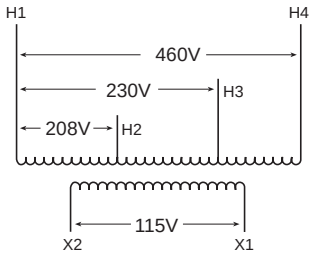

### WIRING FOR AE05 & CE05



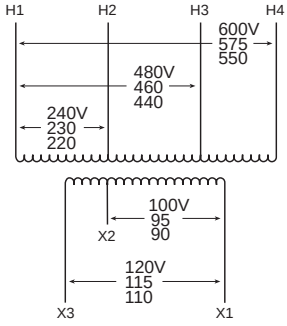

### WIRING FOR AE06 & CE06



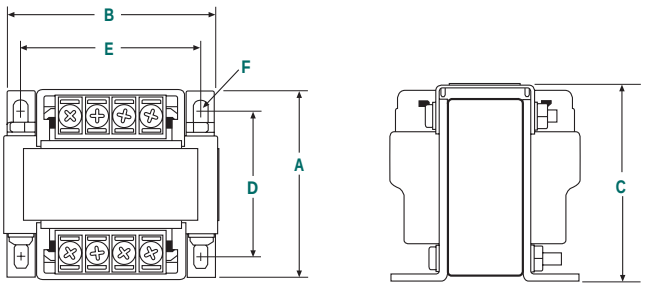

### WIRING FOR AE07




### WIRING FOR AE12




## AE & CE Series Dimensional Drawings



# FINGER/GUARD® Industrial Control Transformers

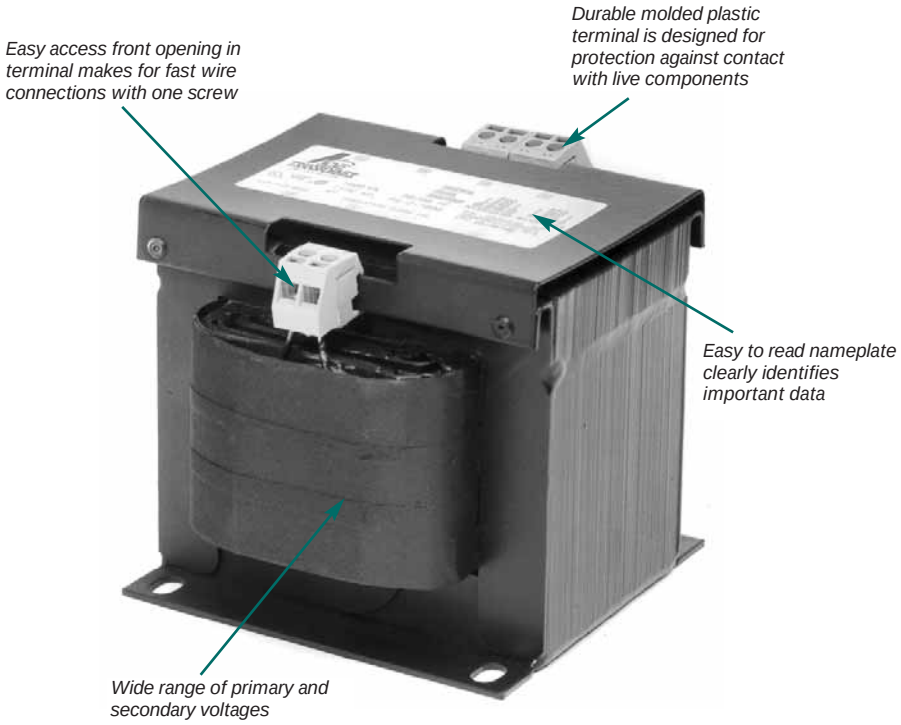
The Acme FINGER/GUARD® line of Touch-Protected Industrial Control Transformers offers the most advanced and versatile design concepts available to the marketplace today.

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.) |
|---|---|---|---|---|---|---|---|---|---|
| FS-1-50 | | | | | | | | | |
| FS-1-75 | | | | | | | | | |
| FS-1-100 | | | | | | | | | |
| FS-1-150 | | | | | | | | | |
| FS-1-250 | | | | | | | | | |
| FS-1-350 | | | | | | | | | |
| FS-1-500 | | | | | | | | | |
| FS-1-750 | | | | | | | | | |
| FS-1-1000 | 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 84**

## 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.) |
|---|---|---|---|---|---|---|---|---|---|
| FS-2-50 | | | | | | | | | |
| FS-2-75 | | | | | | | | | |
| FS-2-100 | | | | | | | | | |
| FS-2-150 | | | | | | | | | |
| FS-2-250 | | | | | | | | | |
| FS-2-300 | | | | | | | | | |
| FS-2-350 | | | | | | | | | |
| FS-2-500 | | | | | | | | | |
| FS-2-750 | | | | | | | | | |
| FS-2-1000 | 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) |
| FS-2-1500 | 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) |
| FS-2-2000 | 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) |
| FS-2-3000 | 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 85**

## 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.) |
|---|---|---|---|---|---|---|---|---|---|
| FS-3-50 | 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) |
| FS-3-150 | 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) |
| FS-3-250 | 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) |
| FS-3-350 | 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) |
| FS-3-500 | 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) |
| FS-3-750 | 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) |
| FS-3-1000 | 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) |
| FS-3-1500 | 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) |
| FS-3-2000 | 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) |
| FS-3-3000 | 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 |
|---|---|
| PL-79905 | PRIMARY FUSE KIT FOR CLASS CC FUSES |
| PL-79906 | PRIMARY & SECONDARY FUSE KIT FOR CLASS CC PRIMARY FUSES & MIDGET SECONDARY FUSE |
| PL-79907 | PRIMARY FUSE KIT FOR MIDGET FUSES |
| PL-79908 | 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

| | 120 V | 208 V | 220 V | 230 V | 240 V | 380 V | 400 V | 416 V | 440 V | 460 V | 480 V | 500 V | 550 V | 575 V | 600 V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 VA | 1.25 | 0.60 | 0.60 | 0.60 | 0.60 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.25 | 0.25 | 0.25 |
| 75 VA | 1.80 | 1.00 | 1.00 | 0.80 | 0.80 | 0.50 | 0.50 | 0.50 | 0.50 | 0.40 | 0.40 | 0.40 | 0.40 | 0.30 | 0.30 |
| 100 VA | 2.50 | 1.40 | 1.25 | 1.25 | 1.25 | 0.75 | 0.75 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.50 | 0.50 | 0.50 |
| 150 VA | 3.50 | 2.00 | 2.00 | 1.80 | 1.80 | 1.13 | 1.13 | 1.00 | 1.00 | 0.80 | 0.80 | 0.80 | 0.80 | 0.75 | 0.75 |
| 250 VA | 3.20 | 3.50 | 3.20 | 3.20 | 3.00 | 1.80 | 1.80 | 1.80 | 1.60 | 1.60 | 1.50 | 1.50 | 1.25 | 1.25 | 1.25 |
| 300 VA | 4.00 | 4.00 | 4.00 | 3.50 | 3.50 | 2.25 | 2.25 | 2.00 | 2.00 | 1.80 | 1.80 | 1.80 | 1.60 | 1.50 | 1.50 |
| 350 VA | 4.50 | 5.00 | 4.50 | 4.50 | 4.00 | 2.50 | 2.50 | 2.50 | 2.25 | 2.25 | 2.00 | 2.00 | 1.80 | 1.80 | 1.60 |
| 500 VA | 6.25 | 4.00 | 3.50 | 3.50 | 3.20 | 3.50 | 3.50 | 3.50 | 3.20 | 3.20 | 3.00 | 3.00 | 2.50 | 2.50 | 2.50 |
| 750 VA | 10.00 | 6.00 | 5.60 | 5.00 | 5.00 | 5.60 | 5.60 | 5.00 | 5.00 | 4.50 | 4.50 | 4.50 | 4.00 | 3.50 | 3.50 |
| 1000 VA | 12.00 | 8.00 | 7.50 | 7.00 | 6.25 | 4.00 | 4.00 | 4.00 | 3.50 | 3.50 | 3.20 | 3.20 | 5.00 | 5.00 | 5.00 |
| 1500 VA | 20.00 | 12.00 | 10.00 | 10.00 | 10.00 | 6.25 | 6.25 | 6.00 | 5.60 | 5.00 | 5.00 | 5.00 | 4.50 | 4.00 | 4.00 |
| 2000 VA | 25.00 | 15.00 | 12.00 | 12.00 | 12.00 | 8.00 | 8.00 | 8.00 | 7.50 | 7.00 | 6.25 | 6.25 | 6.00 | 5.60 | 5.00 |
| 3000 VA | 30.00 | 20.00 | 20.00 | 20.00 | 20.00 | 12.00 | 12.00 | 12.00 | 10.00 | 10.00 | 10.00 | 10.00 | 9.00 | 8.00 | 8.00 |

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

## RECOMMENDED RATING FOR CARTRIDGE FUSES WITH FERRULE CONTACTS

| | 120 V | 208 V | 220 V | 230 V | 240 V | 380 V | 400 V | 416 V | 440 V | 460 V | 480 V | 500 V | 550 V | 575 V | 600 V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 VA | 1.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 75 VA | 1.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 100 VA | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 150 VA | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 250 VA | 4.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 300 VA | 4.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 350 VA | 4.00 | 4.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 500 VA | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| 750 VA | 8.00 | 6.00 | 6.00 | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| 1000 VA | 12.00 | 6.00 | 6.00 | 6.00 | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 1500 VA | 16.00 | 10.00 | 10.00 | 10.00 | 8.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 2000 VA | 25.00 | 12.00 | 12.00 | 12.00 | 12.00 | 8.00 | 8.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 |
| 3000 VA | 32.00 | 20.00 | 20.00 | 20.00 | 16.00 | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 |

## SECONDARY FUSE SIZING CHARTS

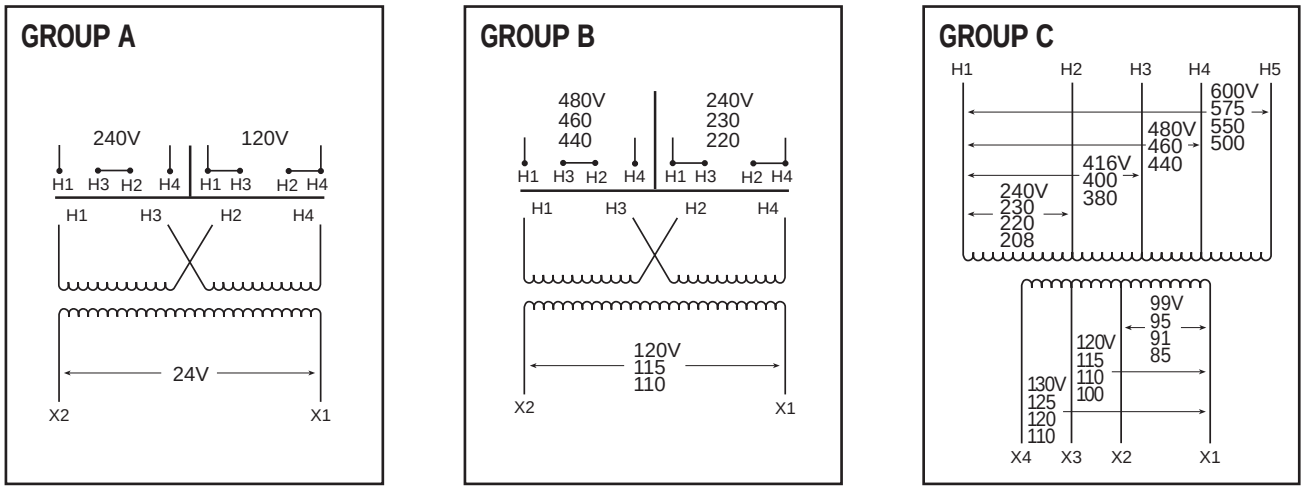
### RECOMMENDED RATING FOR CURRENT LIMITING MIDGET FUSES

| | 24 V | 85 V | 91 V | 95 V | 99 V | 100 V | 110 V | 115 V | 120 V | 125 V | 130 V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 VA | 2.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.25 |
| 75 VA | 3.00 | – | – | – | – | – | 0.75 | 0.75 | 0.75 | – | – |
| 100 VA | 5.00 | – | – | – | – | – | 1.00 | 1.00 | 1.00 | – | – |
| 150 VA | 6.00 | 2.00 | 2.00 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.00 |
| 250 VA | 12.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| 300 VA | – | – | – | – | – | – | 3.00 | 3.00 | 3.00 | – | – |
| 350 VA | 15.00 | 5.00 | 4.00 | 4.00 | 4.00 | 4.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 |
| 500 VA | 25.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 5.00 | 5.00 | 5.00 | 5.00 | 4.00 |
| 750 VA | 35.00 | 10.00 | 10.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 6.00 | 6.00 | 6.00 |
| 1000 VA | 50.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 10.00 | 10.00 | 10.00 | 10.00 | 8.00 |
| 1500 VA | – | 20.00 | 20.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 12.00 |
| 2000 VA | – | 25.00 | 25.00 | 25.00 | 25.00 | 25.00 | 20.00 | 20.00 | 20.00 | 20.00 | 15.00 |
| 3000 VA | – | 40.00 | 40.00 | 35.00 | 35.00 | 35.00 | 30.00 | 30.00 | 30.00 | 30.00 | 25.00 |

### RECOMMENDED RATING FOR CARTRIDGE FUSES WITH FERRULE CONTACTS

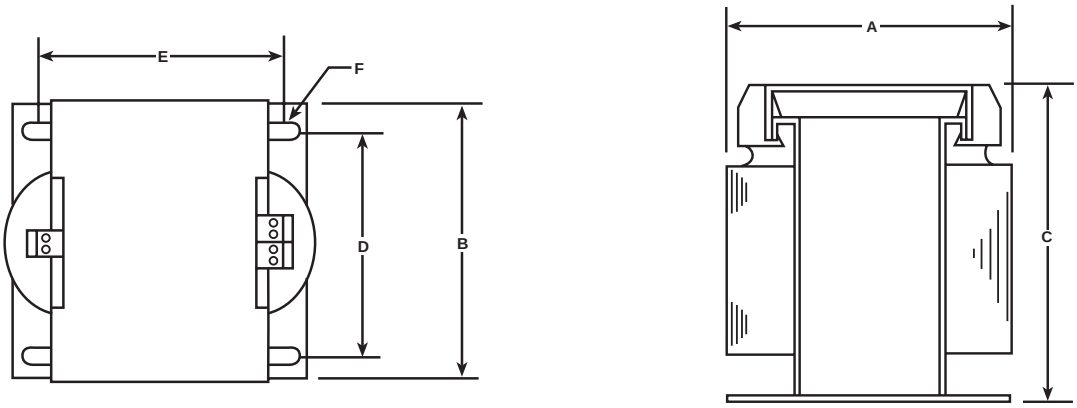
| | 24 V | 85 V | 91 V | 95 V | 99 V | 100 V | 110 V | 115 V | 120 V | 125 V | 130 V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 VA | 4.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 75 VA | 4.00 | – | – | – | – | – | 1.00 | 1.00 | 1.00 | – | – |
| 100 VA | 6.00 | – | – | – | – | – | 1.00 | 1.00 | 1.00 | – | – |
| 150 VA | 8.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| 250 VA | 12.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 2.00 |
| 300 VA | – | – | – | – | – | – | 4.00 | 4.00 | 4.00 | – | – |
| 350 VA | 16.00 | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 500 VA | 25.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 6.00 | 4.00 |
| 750 VA | 32.00 | 10.00 | 10.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 6.00 |
| 1000 VA | 50.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 10.00 | 10.00 | 10.00 | 10.00 | 8.00 |
| 1500 VA | – | 20.00 | 20.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 12.00 |
| 2000 VA | – | 25.00 | 25.00 | 25.00 | 25.00 | 25.00 | 20.00 | 20.00 | 20.00 | 20.00 | 16.00 |
| 3000 VA | – | 40.00 | 40.00 | 32.00 | 32.00 | 32.00 | 32.00 | 32.00 | 32.00 | 25.00 | 25.00 |

## FINGER/GUARD® Wiring Diagrams

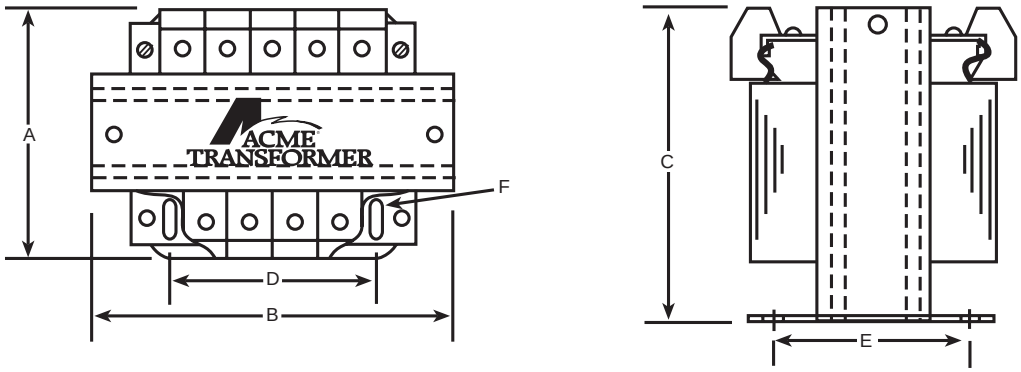



## FINGER/GUARD® Dimensional Drawings

### 50 VA Thru 2 KVA




### 3 KVA



SECTION 6

# LOW VOLTAGE LIGHTING TRANSFORMERS & POWER SUPPLIES

**Superior low voltage protection. UL-Listed from 100 to 1500 watts. Heavy industrial grade design for a long, trouble-free life. UL-3R indoor/outdoor. Faraday shields are standard. Optional circuit breakers and line cords available. New units with photocell and 24-hour timer.**

# Low Voltage Lighting Power Supplies

**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

## Greater selection

Acme offers one of the largest selections of low voltage lighting transformers in the industry. The addition of our premium line (Group I) that includes a photocell and 24-hour timer and the versatile Group V transformers gives the landscape architect or contractor almost unlimited application possibilities. Please use the convenient Selection Guide on the facing page to aid in your selection.

## More value

Acme low voltage transformers and power supplies 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

Power supplies are available in ratings of 100 through 1500 W and transformers in ratings of 100 through 1000 W; Group VI Buck–Boost in .05 through 10 KVA.

## More convenience

Screw lug output terminals on Group I, II and III power supplies provide fast low voltage connections — regardless of transformer location. Just slip your wires into the lug and tighten— there's no wrapping the wire around a screw post. 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 | | POWER SUPPLIES GROUP I 'TLVA' Catalog No. | POWER SUPPLIES GROUPS II & III 'TLV' and 'T' Catalog No. | TRANSFORMERS GROUP IV Pool and Spa 'T' and 'T-1' Catalog No. | TRANSFORMERS GROUP V 'T-1' Catalog No. | TRANSFORMERS GROUP VI Buck–Boost 'T-1' and 'T-2" Catalog No. |
|---|---|---|---|---|---|---|---|
| 1 | Ratings (Watts, VA, KVA) | | 100 through 600 Watts | 100 through 1500 Watts | 100, 300 and 500 Watts | 100 through 1000 VA | .05 through 10 KVA |
| 2 | 24 Hour Timer and Photocell | | Standard on all units | No | No | No | No |
| 3 | Primary Input | | 120 Volts | 120 Volts | 120 Volts | 120 Volts or 240 Volts | 120 x 240 Volts |
| 4 | Secondary Output | | Selection of 12V or dual 12/24 V units | Selection of 12V or dual 12/24 V units | 12, 13, 14 V taps provided | 12V or 24V | 12 x 24 V |
| 5 | Primary Line Cord with Plug | | Standard 6' | Optional 6' through 500 W | No | No | No |
| 6 | Hardwired Primary | | NA | Optional | Yes | Yes | Yes |
| 7 | Overload Protection: | Primary | Auto Thermal Reset through 300 W | Auto Thermal Reset through 250 W | Auto Thermal Reset | Auto Thermal Reset | No |
| | | Secondary | Circuit Breaker (s) | Optional Circuit Breakers (Group II) | No | Circuit Breakers | No |
| 8 | Output Wiring | | Screw Lug Terminals | Screw Lug Terminals | Copper Lead Wires | Copper Lead Wires | Copper Lead Wires |
| 9 | Tap Switch 12V–11,12,13V or 12/24V–11/22, 12/24, 13/26 | | Standard on all Units | No | No | No | No |
| 10 | On–Off–Auto Switch | | Standard on all units | No | No | No | No |
| 11 | UL Listed | | Yes | Yes | Yes ③ | Yes | Yes |
| 12 | CSA Certified | | No | No | No | Yes | Yes |
| 13 | Faraday Shield | | Yes | Yes | Yes | Yes | No |
| 14 | Product Warranty | | 10 Years ① | 10 Years | 10 Years | 10 Years | 10 Years |
| 15 | UL-3R Indoor/Outdoor Enclosure | | Yes | Yes | Yes ② | No | Yes |

① Timer and Photocell limited to 3 years.

② Standard Pool and Spa enclosure is painted cold-rolled steel. Stainless steel enclosure is available.

③ UL listed for use with low voltage submersible lights.

# How To Size Your Power Supply

## Easy Two-Step Selection

**1.** Add the total lamp wattage of each circuit you plan to use.
**For example:** if you have 2 circuits, each with four 25 watt lamps, your total wattage is: 2 circuits x 4 lamps = 8 lamps x 25 watts = 200 watts.

**2.** Go to the appropriate selection chart. The catalog number identifies the power supply size and output voltage (see example below). You won't find the exact 200 watts needed, so go to the next highest catalog number TLV-25012-S. This leaves you 50 watts of reserve power available for other low voltage applications. See chart below for recommended wire sizes and voltage drop.

If you use a power supply with a dual 12/24 volt secondary, each 12 volt circuit is rated at one half the total power supply wattage. Example: A TLV-25024-SC has two 12 volt 125 watt output circuits. Refer to "Interpreting Power Supply Catalog Numbers" for further explanation of catalog numbers.

### Dimmer Notice

Only use dimmers designed and rated for **magnetic** loads.

Consult the dimmer manufacturer for recommendations regarding your lighting application.

## Interpreting Power Supply Catalog Numbers (Groups I, II, III)

### GROUP I

TLVA – 100 12 – S C

- Power Supply with Breaker(s) Timer, Photocell
- 100 Watts
- 12 Volt Output
- Shielded
- Line Cord (Standard)

### GROUP II

TLV – 100 24 – S C

- Power Supply with Breaker(s)
- 100 Watts
- 24 Volt Output
- Shielded
- Optional Line Cord

### GROUP III

T – 250 24 – S

- Power Supply without Breaker(s)
- 250 Watts
- 24 Volt Output
- Shielded

## Recommended Wire Size & Voltage Drop ①

### 12 VOLT SYSTEM

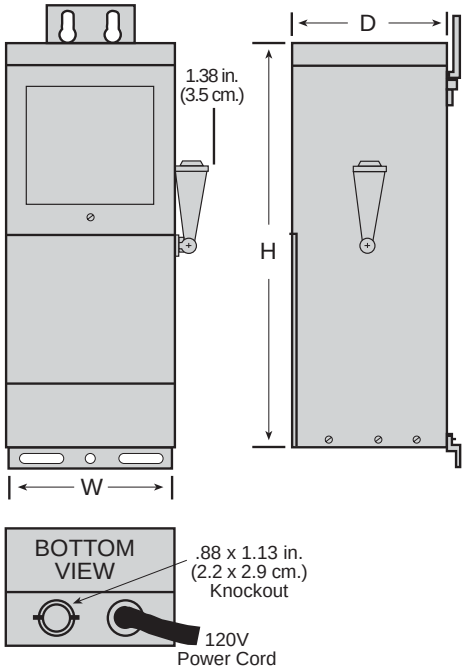
| Wire Size (Gauge) | WATTS (VA) Per Circuit | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 | 420 | 440 | 460 | 480 | 500 |
| | Maximum Secondary Wire Length in Feet (Meters) | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 75 (22.9) | 37 (11.3) | 25 (7.6) | 19 (5.8) | 15 (4.8) | 12 (3.7) | 11 (3.4) | 9 (2.7) | 8 (2.4) | 7 (2.1) | 7 (2.1) | 6 (1.8) | 6 (1.8) | 5 (1.5) | 5 (1.5) | 5 (1.5) | 4 (1.2) | 4 (1.2) | 4 (1.2) | 4 (1.2) | 4 (1.2) | 3 (0.9) | 3 (0.9) | 3 (0.9) | 3 (0.9) |
| 12 | 118 (36.0) | 59 (18.0) | 39 (11.9) | 30 (9.1) | 24 (7.3) | 20 (6.1) | 17 (5.2) | 15 (4.6) | 13 (4.0) | 12 (3.7) | 11 (3.4) | 10 (3.0) | 9 (2.7) | 8 (2.4) | 8 (2.4) | 7 (2.1) | 7 (2.1) | 7 (2.1) | 6 (1.8) | 6 (1.8) | 6 (1.8) | 5 (1.5) | 5 (1.5) | 5 (1.5) | 5 (1.5) |
| 10 | 188 (57.3) | 94 (28.7) | 63 (19.2) | 47 (14.5) | 38 (11.6) | 31 (9.4) | 27 (8.2) | 24 (7.3) | 21 (6.4) | 19 (5.8) | 17 (5.2) | 16 (4.9) | 14 (4.3) | 13 (4.0) | 13 (4.0) | 12 (3.7) | 11 (3.4) | 10 (3.0) | 10 (3.0) | 9 (2.7) | 9 (2.7) | 9 (2.7) | 8 (2.4) | 8 (2.4) | 8 (2.4) |
| 8 | 299 (91.1) | 149 (45.4) | 100 (30.5) | 75 (22.9) | 60 (18.3) | 50 (15.2) | 43 (13.1) | 37 (11.3) | 33 (10.1) | 30 (9.1) | 27 (8.2) | 25 (7.6) | 23 (7.0) | 21 (6.4) | 20 (6.1) | 19 (5.8) | 18 (5.5) | 17 (5.2) | 16 (4.9) | 15 (4.6) | 14 (4.3) | 14 (4.3) | 13 (4.0) | 12 (3.7) | 12 (3.7) |
| 6 | 476 (145.1) | 238 (72.5) | 159 (48.5) | 119 (36.3) | 95 (29.0) | 79 (24.1) | 68 (20.7) | 60 (18.3) | 53 (16.2) | 48 (14.6) | 43 (13.1) | 40 (12.2) | 37 (11.3) | 34 (10.4) | 32 (9.8) | 30 (9.1) | 28 (8.5) | 26 (7.9) | 25 (7.6) | 24 (7.3) | 23 (7.0) | 22 (6.7) | 21 (6.4) | 20 (6.1) | 19 (5.8) |

### 24 VOLT SYSTEM

| Wire Size (Gauge) | WATTS (VA) Per Circuit | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 | 420 | 440 | 460 | 480 | 500 |
| | Maximum Secondary Wire Length in Feet (Meters) | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 150 (49.7) | 75 (22.9) | 50 (15.2) | 37 (11.3) | 30 (9.1) | 25 (7.6) | 21 (6.4) | 19 (5.8) | 17 (5.2) | 15 (4.6) | 14 (4.3) | 12 (3.7) | 12 (3.7) | 11 (3.4) | 10 (3.0) | 9 (2.7) | 9 (2.7) | 8 (2.4) | 8 (2.4) | 7 (2.1) | 7 (2.1) | 7 (2.1) | 7 (2.1) | 6 (1.8) | 6 (1.8) |
| 12 | 237 (92.2) | 118 (36.0) | 79 (24.1) | 59 (18.0) | 47 (14.3) | 39 (11.9) | 34 (10.4) | 30 (9.1) | 26 (7.9) | 24 (7.3) | 22 (6.7) | 20 (6.1) | 18 (5.5) | 17 (5.2) | 16 (4.9) | 15 (4.6) | 14 (4.3) | 13 (4.0) | 12 (3.7) | 12 (3.7) | 11 (3.4) | 11 (3.4) | 10 (3.0) | 10 (3.0) | 9 (2.7) |
| 10 | 376 (114.6) | 188 (57.3) | 125 (38.1) | 94 (28.7) | 75 (22.9) | 63 (19.2) | 54 (16.5) | 47 (14.3) | 42 (12.8) | 38 (11.6) | 34 (10.4) | 31 (9.4) | 29 (8.8) | 27 (8.2) | 25 (7.6) | 24 (7.3) | 22 (6.7) | 21 (6.4) | 20 (6.1) | 19 (5.8) | 18 (5.5) | 17 (5.2) | 16 (4.9) | 16 (4.9) | 15 (4.6) |
| 8 | 597 (182.0) | 299 (91.1) | 199 (60.7) | 149 (45.4) | 119 (36.3) | 100 (30.5) | 85 (26.0) | 75 (22.9) | 66 (20.1) | 60 (18.3) | 54 (16.5) | 50 (15.2) | 46 (14.0) | 43 (13.1) | 40 (12.2) | 37 (11.3) | 35 (10.7) | 33 (10.1) | 31 (9.4) | 30 (9.1) | 28 (8.5) | 27 (8.2) | 26 (7.9) | 25 (7.6) | 24 (7.3) |
| 6 | 952 (290.1) | 476 (145.1) | 317 (96.7) | 238 (72.5) | 190 (57.9) | 159 (48.5) | 136 (41.5) | 119 (36.3) | 106 (32.3) | 95 (29.0) | 87 (26.5) | 79 (24.1) | 73 (22.3) | 68 (20.7) | 63 (19.2) | 60 (18.3) | 56 (17.1) | 53 (16.2) | 50 (15.2) | 48 (14.6) | 45 (13.7) | 43 (13.1) | 41 (12.5) | 40 (12.2) | 38 (11.6) |

① Charts are based on SPT-3 wire and a maximum .63 voltage drop at the end of the run. Many applications allow a 2.5 voltage drop.

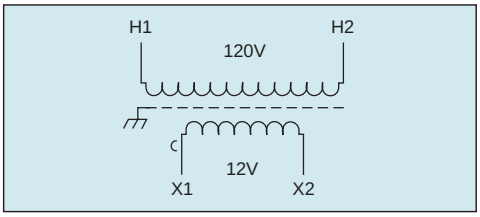
# Low Voltage Lighting Power Supplies with 24-Hour Timer & Photocell

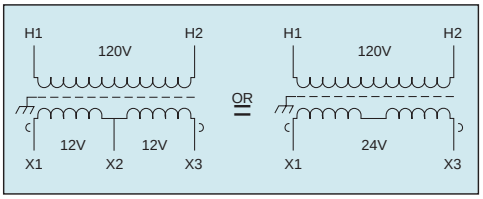

## FEATURES

- 100, 150, 300, 600 Watt Models.
- 120V Primary, 12V or 12/24 V Secondary, 60 Hz.
- Fully encapsulated core and coil.
- 24-hour timer and photocell.
- Wall mounting brackets included.
- UL Listed.
- Screw lug terminals for ease of wiring.
- Deadfront terminal cover for added safety.
- 3-Position on-off-auto switch for versatility.
- Removable front cover, generous wiring space.
- 6' power cord with grounded plug.
- Voltage regulation switch for 11, 12 or 13 volts.
- Overload protection on primary and secondary sides.
- 10-year limited product warranty (3-years on timer/photocell).
- Faraday shielded for greater safety.

## WIRING DIAGRAMS




**12V Units**




**12/24 V Units**

## SELECTION GUIDE

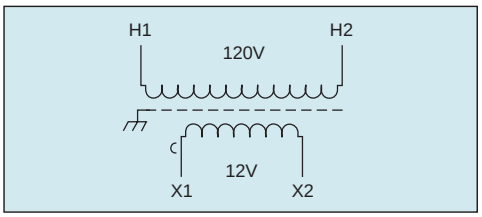
### GROUP I

| WATTS | 120V INPUT 12V OUTPUT | 120V INPUT 12/24V OUTPUT ① | APPROX. DIMENSIONS ② INCHES (CM.) | | | APPROX. SHIP WEIGHT |
|---|---|---|---|---|---|---|
| | CATALOG NO. | CATALOG NO. | HEIGHT | WIDTH | DEPTH | LBS. (KG.) |
| 300 | TLVA-30012-SC | TLVA-30024-SC | 19.00 (48.3) | 4.62 (11.7) | 4.25 (10.8) | 14 (6.4) |
| 600 | TLVA-60012-SC | TLVA-60024-SC | 19.00 (48.3) | 4.62 (11.7) | 4.25 (10.8) | 18 (8.2) |

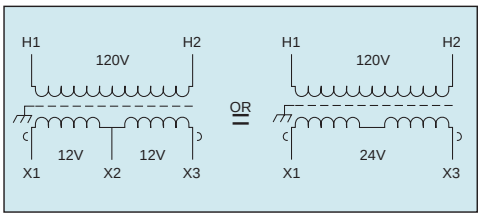
① 12/24V denotes a three wire circuit, one 24V output or two 12V outputs. Each 12V is rated at one half the nameplate wattage.
② Dimensions not suitable for construction purposes. Contact factory for certified drawings.

# Power Supply Specifications, Dimensions & Selection


## WIRING DIAGRAMS




**12V Units**




**12/24 V Units**

## SELECTION GUIDE

### GROUP II

**WITH LOW VOLTAGE CIRCUIT BREAKERS ③**

| Watts | WITHOUT LINE CORD: 120 Volt Input 12 Volt Output UL-506 Listed | WITHOUT LINE CORD: 120 Volt Input 12/24 Volt Output ④ UL-506 Listed | WITH LINE CORD: 120 Volt Input 12 Volt Output UL-1012 Listed | Approx. Dimensions ⑤ Inches (Cm.) | | | Approx. Ship Weight |
|---|---|---|---|---|---|---|---|
| | Catalog No. | Catalog No. | Catalog No. | Height | Width | Depth | Lbs. (Kg.) |
| 100 | TLV-10012-S ① | TLV-10024-S ① | TLV-10012-SC ① | 13.00 (33.0) | 3.91 (9.9) | 3.98 (10.1) | 9 (4.1) |
| 150 | TLV-15012-S ① | TLV-15024-S ① | TLV-15012-SC ① | 13.00 (33.0) | 3.91 (9.9) | 3.98 (10.1) | 9 (4.1) |
| 250 | TLV-25012-S ① | TLV-25024-S ① | TLV-25012-SC ① | 13.00 (33.0) | 3.91 (9.9) | 3.98 (10.1) | 12 (5.4) |
| 500 | TLV-50012-S ② | TLV-50024-S ① | TLV-50012-SC ② | 14.00 (35.6) | 4.66 (11.8) | 4.60 (11.7) | 17 (7.7) |
| 750 | TLV-75012-S ② | TLV-75024-S ① | — | 14.00 (35.6) | 4.66 (11.8) | 4.60 (11.7) | 20 (9.1) |
| 1000 | TLV-100012-S ② | TLV-100024-S ② | — | 15.35 (39.0) | 5.41 (13.7) | 5.23 (13.3) | 28 (12.7) |
| 1500 | — | TLV-150024-S ② | — | 15.35 (39.0) | 5.41 (13.7) | 5.23 (13.3) | 35 (15.9) |

### GROUP III

**WITHOUT LOW VOLTAGE CIRCUIT BREAKERS**

| Watts | WITHOUT LINE CORD: 120 Volt Input 12 Volt Output UL-506 Listed | WITHOUT LINE CORD: 120 Volt Input 12/24 Volt Output ④ UL-506 Listed | Approx. Dimensions ⑤ Inches (Cm.) | | | Approx. Ship Weight |
|---|---|---|---|---|---|---|
| | Catalog No. | Catalog No. | Height | Width | Depth | Lbs. (Kg.) |
| 100 | T-10012-S | T-10024-S | 13.00 (33.0) | 3.91 (9.9) | 3.98 (10.1) | 9 (4.1) |
| 150 | T-15012-S | T-15024-S | 13.00 (33.0) | 3.91 (9.9) | 3.98 (10.1) | 9 (4.1) |
| 250 | T-25012-S | T-25024-S | 13.00 (33.0) | 3.91 (9.9) | 3.98 (10.1) | 12 (5.4) |
| 500 | T-50012-S | T-50024-S | 14.00 (35.6) | 4.66 (11.8) | 4.60 (11.7) | 17 (7.7) |
| 750 | T-75012-S | T-75024-S | 14.00 (35.6) | 4.66 (11.8) | 4.60 (11.7) | 20 (9.1) |
| 1000 | T-100012-S | T-100024-S | 15.35 (39.0) | 5.41 (13.7) | 5.23 (13.3) | 28 (12.7) |
| 1500 | — | T-150024-S | 15.35 (39.0) | 5.41 (13.7) | 5.23 (13.3) | 35 (15.9) |

① Push to reset Thermal Breaker.

② Magnetic Breaker Toggle On/Off.

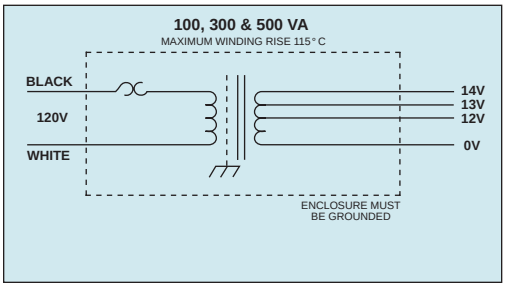
③ Low voltage circuit breakers are for protection only and are not to be used as an on/off switch for 100 and 150 watt 12 volt units or on 100, 150 and 250 watt 12/24 volt units.

④ 12/24 volt output denotes a three-wire circuit, one 24 volt output or two 12 volt outputs. Each 12 volt output is rated at 1/2 nameplate wattage.

⑤ Dimensions not for construction purposes. Contact factory for certified drawings.

# Pool & Spa Specifications Dimensions & Selection


## WIRING DIAGRAMS




## GROUP IV

**120 VOLT INPUT — 12, 13 OR 14 VOLT OUTPUT — 1Ø, 60 Hz**

| VA RATING | COLD - ROLLED STEEL ENCLOSURE CATALOG NO. ① | STAINLESS STEEL ENCLOSURE CATALOG NO. ① | APPROX. DIMENSIONS INCHES (CM.) HEIGHT | WIDTH | DEPTH | APPROX. SHIP. WEIGHT LBS. (KG.) | KNOCKOUT SIZE IN. (CM.) | CURRENT (MAX. AMPS) | PRIMARY LDS. 2 PCS. OF # | SECONDARY LDS. 4 PCS. OF # |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | T-1-79101-SL | T-79101-SL | 8.40 (21.3) | 3.50 (8.9) | 4.83 (12.3) | 7 (3.2) | Two Single .875 (2.2) | 8.3 | 14 CU | 12 CU |
| 100 | T-1-79101-SR | T-79101-SR | 8.40 (21.3) | 3.50 (8.9) | 4.83 (12.3) | 7 (3.2) | | | | |
| 300 | T-1-79203-SL | T-79203-SL | 8.40 (21.3) | 4.22 (10.7) | 5.50 (14.0) | 12 (5.4) | Two Single .875 (2.2) | 25.0 | 14 CU | 12 CU |
| 300 | T-1-79203-SR | T-79203-SR | 8.40 (21.3) | 4.22 (10.7) | 5.50 (14.0) | 12 (5.4) | | | | |
| 500 | T-1-79105-SL | T-79105-SL | 10.00 (25.4) | 4.41 (11.2) | 5.66 (14.4) | 15 (6.8) | Two Single .875 (2.2) | 41.6 | 14 CU | 10 CU |
| 500 | T-1-79105-SR | T-79105-SR | 10.00 (25.4) | 4.41 (11.2) | 5.66 (14.4) | 15 (6.8) | | | | |

## GUIDE CHART ②

**For Selecting Secondary Voltage Tap To Be Used With Various Wire Sizes For Given Distances Between Transformer And Lamps**

| DISTANCE FT. (M.) FROM TRANSFORMER TO LAMPS FOR 100 WATT LOAD | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wire Size (Gauge) | Less Than 30 (9.1) | 30 (9.1) | 60 (18.3) | 90 (27.4) | 120 (36.6) | 150 (45.7) | 180 (54.9) | 210 (64.0) | 240 (73.2) | 270 (82.3) | 300 (91.4) |
| 14 | 12V | 13V | 14V | Use Larger Wire Size | | | | | | | |
| 12 | 12V | 13V | 13V | 14V | Use Larger Wire Size | | | | | | |
| 10 | 12V | 13V | 13V | 14V | 14V | Use Larger Wire Size | | | | | |
| 8 | 12V | 12V | 12V | 13V | 13V | 13V | 14V | 14V | 14V | Use Larger Wire Size | |

| DISTANCE FT. (M.) FROM TRANSFORMER TO LAMPS FOR 300 WATT LOAD | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wire Size (Gauge) | Less Than 10 (3.0) | 10 (3.0) | 20 (6.1) | 30 (9.1) | 40 (12.2) | 50 (15.2) | 60 (18.3) | 70 (21.3) | 80 (24.4) | 90 (27.4) | 100 (30.5) | 110 (33.5) | 120 (36.6) |
| 12 | 12V | 13V | 13V | 14V | Use Larger Wire Size | | | | | | | | |
| 10 | 12V | 12V | 13V | 13V | 14V | 14V | Use Larger Wire Size | | | | | | |
| 8 | 12V | 12V | 12V | 13V | 13V | 13V | 14V | 14V | 14V | Use Larger Wire Size | | | |
| 6 | 12V | 12V | 12V | 12V | 13V | 13V | 13V | 13V | 14V | 14V | 14V | 14V | 14V |

| DISTANCE FT. (M.) FROM TRANSFORMER TO LAMPS FOR 500 WATT LOAD | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wire Size (Gauge) | Less Than 10 (3.0) | 10 (3.0) | 20 (6.1) | 30 (9.1) | 40 (12.2) | 50 (15.2) | 60 (18.3) | 70 (21.3) | 80 (24.4) | 90 (27.4) | 100 (30.5) | 110 (33.5) | 120 (36.6) |
| 10 | 12V | 13V | 14V | 14V | Use Larger Wire Size | | | | | | | | |
| 8 | 12V | 12V | 13V | 13V | 14V | Use Larger Wire Size | | | | | | | |
| 6 | 12V | 12V | 13V | 13V | 13V | 14V | 14V | 14V | Use Larger Wire Size | | | | |
| 4 | 12V | 12V | 12V | 12V | 13V | 13V | 13V | 13V | 14V | 14V | 14V | 14V | 14V |

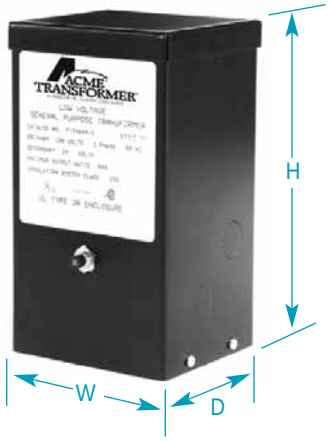
① Suffix – SL denotes primary cable entry from left side, low voltage right side. Suffix – SR denotes primary cable entry from right side, low voltage left side. All units have auto-thermal reset.

② Confirm tap selection by measurement of voltage at lamp terminals when all of the lamps are operating.

# 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 | T-1-79600-S | 9.01 (22.9) | 4.08 (10.4) | 3.88 (9.9) | 7 (3.2) | 15 AMP | Push To Reset Thermal Breaker |
| 150 | T-1-79620-S | 9.01 (22.9) | 4.08 (10.4) | 3.88 (9.9) | 7 (3.2) | 20 AMP | Push To Reset Thermal Breaker |
| 300 | T-1-79621-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 11 (5.0) | 40 AMP | Push To Reset Thermal Breaker |
| 600 | T-1-79622-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 15 (6.8) | 60 AMP | Magnetic Toggle On/Off Breaker |
| 750 | T-1-79603-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 18 (8.2) | 75 AMP | Magnetic Toggle On/Off Breaker |
| 1000 | T-1-79604-S | 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 | T-1-79605-S | 9.01 (22.9) | 4.08 (10.4) | 3.88 (9.9) | 7 (3.2) | 7 AMP | Push To Reset Thermal Breaker |
| 150 | T-1-79623-S | 9.01 (22.9) | 4.08 (10.4) | 3.88 (9.9) | 7 (3.2) | 10 AMP | Push To Reset Thermal Breaker |
| 300 | T-1-79624-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 11 (5.0) | 20 AMP | Push To Reset Thermal Breaker |
| 600 | T-1-79625-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 15 (6.8) | 40 AMP | Push To Reset Thermal Breaker |
| 750 | T-1-79608-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 18 (8.2) | 50 AMP | Push To Reset Thermal Breaker |
| 1000 | T-1-79609-S | 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 | T-1-79615-S | 9.01 (22.9) | 4.08 (10.4) | 3.88 (9.9) | 7 (3.2) | 7 AMP | Push To Reset Thermal Breaker |
| 150 | T-1-79629-S | 9.01 (22.9) | 4.08 (10.4) | 3.88 (9.9) | 7 (3.2) | 10 AMP | Push To Reset Thermal Breaker |
| 300 | T-1-79630-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 11 (5.0) | 20 AMP | Push To Reset Thermal Breaker |
| 600 | T-1-79631-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 15 (6.8) | 40 AMP | Push To Reset Thermal Breaker |
| 750 | T-1-79618-S | 11.68 (29.7) | 4.66 (11.8) | 4.57 (11.6) | 18 (8.2) | 50 AMP | Push To Reset Thermal Breaker |
| 1000 | T-1-79619-S | 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 Alternative

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.

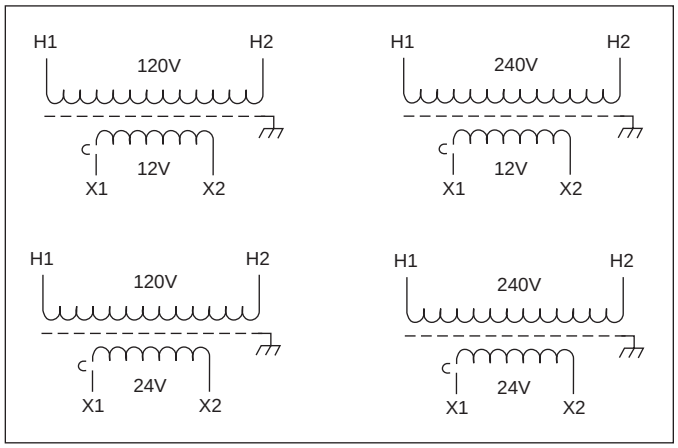
## GROUP VI

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

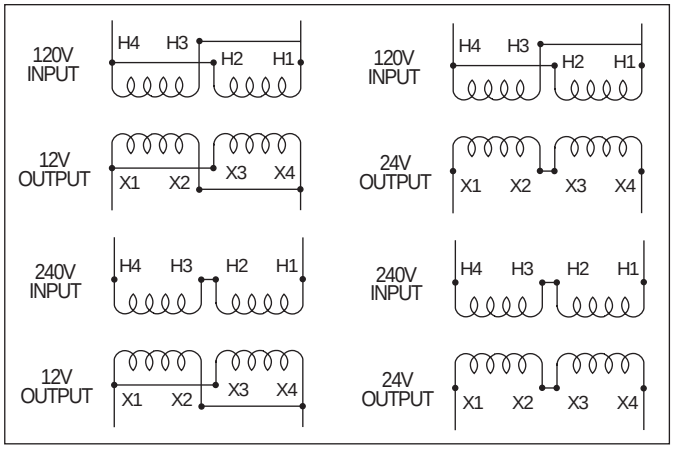
| CATALOG NUMBER | INSULATING TRANSFORMER RATING | SECONDARY MAXIMUM CURRENT OUTPUT | | APPROX. DIMENSIONS INCHES (CM.) | | | APPROX. NET WEIGHT LBS. (KG.) |
|---|---|---|---|---|---|---|---|
| | | 12V | 24V | HEIGHT | WIDTH | DEPTH | |
| T-1-81047 | 0.05 KVA | 4.16 | 2.08 | 6.38 (16.2) | 3.19 (8.1) | 3.00 (7.6) | 4 (1.8) |
| T-1-81048 | 0.10 KVA | 8.32 | 4.16 | 6.62 (16.8) | 3.75 (9.5) | 3.62 (9.2) | 5 (2.3) |
| T-1-81049 | 0.15 KVA | 12.52 | 6.25 | 7.12 (18.1) | 3.75 (9.5) | 3.62 (9.2) | 7 (3.2) |
| T-1-81050 | 0.25 KVA | 20.80 | 10.40 | 8.68 (22.0) | 4.08 (10.4) | 3.88 (9.9) | 10 (4.5) |
| T-1-81051 | 0.50 KVA | 41.60 | 20.80 | 9.06 (23.0) | 4.37 (11.1) | 4.20 (10.7) | 15 (6.8) |
| T-1-81052 | 0.75 KVA | 62.50 | 31.25 | 9.68 (24.6) | 4.75 (12.1) | 4.51 (11.5) | 19 (8.6) |
| T-1-11683 | 1.00 KVA | 83.20 | 41.60 | 10.50 (26.7) | 5.50 (14.0) | 5.13 (13.0) | 24 (10.9) |
| T-1-11684 | 1.50 KVA | 125.00 | 62.50 | 11.62 (29.5) | 5.50 (14.0) | 5.13 (13.0) | 30 (13.6) |
| T-1-11685 | 2.00 KVA | 166.00 | 83.20 | 13.00 (33.0) | 5.50 (14.0) | 5.13 (13.0) | 38 (17.2) |
| T-1-11686 | 3.00 KVA | 250.00 | 125.00 | 11.50 (29.2) | 10.31 (26.2) | 7.13 (18.1) | 55 (24.9) |
| T-1-11687 | 5.00 KVA | 416.00 | 208.00 | 14.38 (36.5) | 10.31 (26.2) | 7.13 (18.1) | 75 (34.0) |
| T-2-11688 | 7.50 KVA | 625.00 | 312.50 | 21.19 (53.8) | 13.50 (34.3) | 10.84 (27.5) | 125 (56.7) |
| T-2-11689 | 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

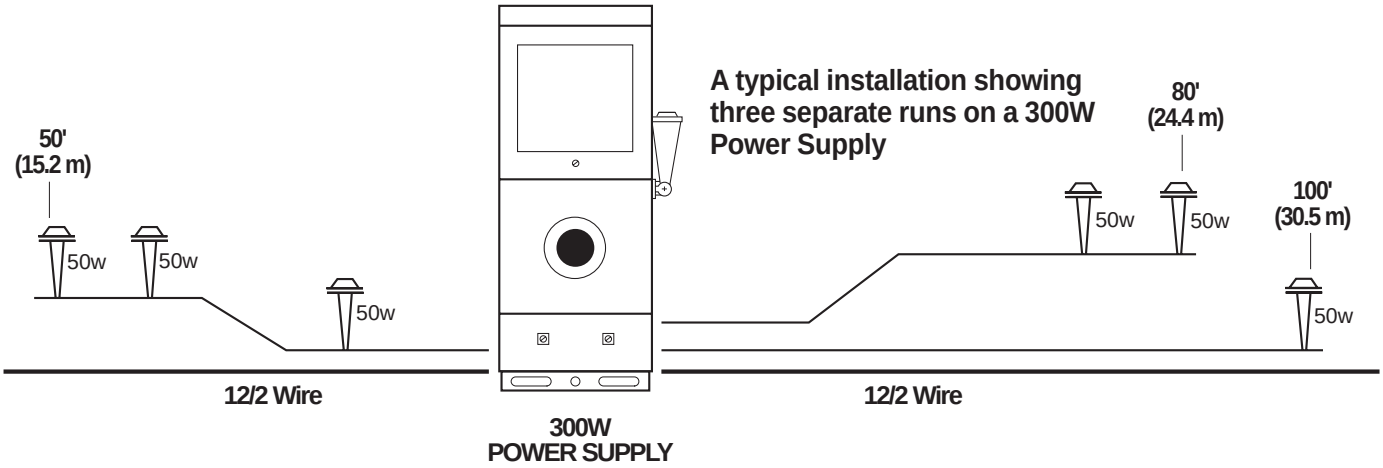


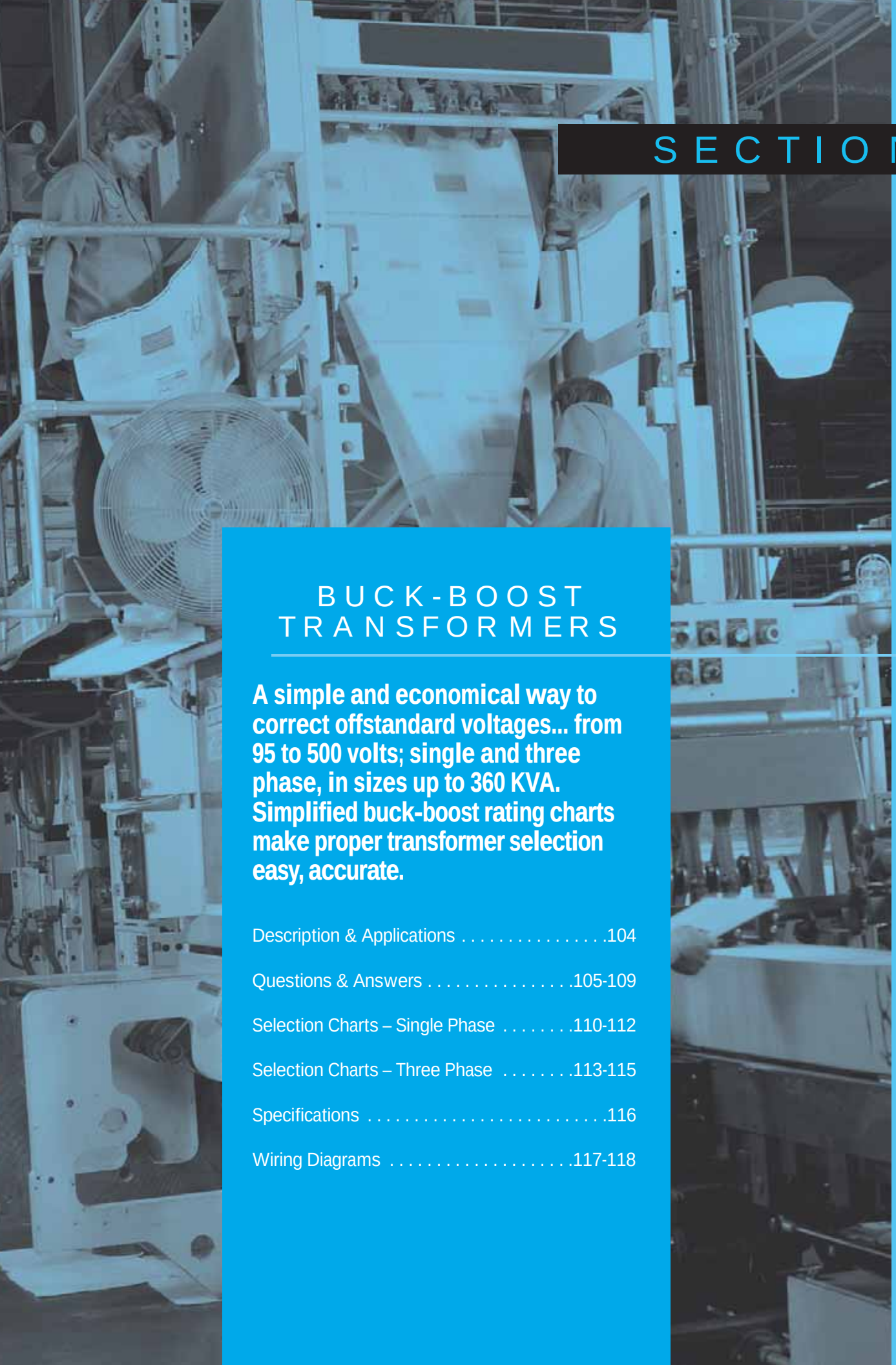

| VOLTAGE DROP CHART | | |
|---|---|---|
| Voltage at Lamp | Life Expectancy of Lamp | % of Rated Candlepower |
| 13.2 | 2/3 Rated Life | 350 |
| 12.6 | 3/4 Rated Life | 180 |
| 12.0 | As Rated | 100 |
| 11.5 | 2X Rated Life | 80 |
| 11.0 | 3X Rated Life | 74 |
| 10.5 | 5X Rated Life | 65 |
| 10.0 |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

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





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 | |

T-2-11688 T-1-11683

## Proper Voltage Is Critical

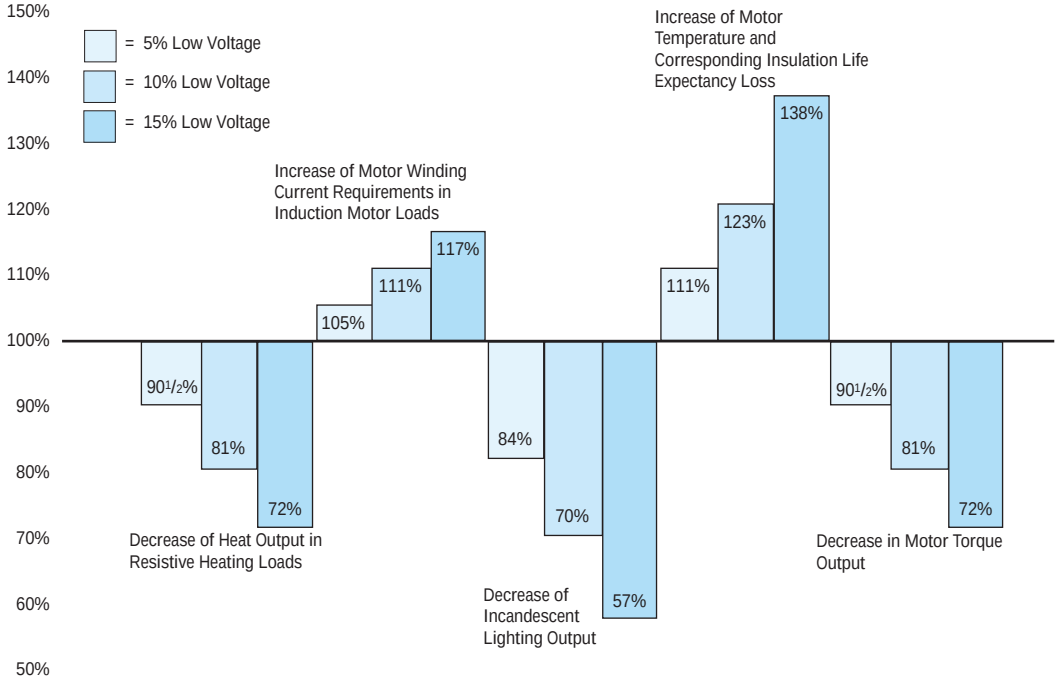
With nearly two-thirds of all electrical loads being A.C. motor loads, maintenance of the proper voltage to that motor is very important. If the supply line voltage is not maintained, motor winding current is increased causing reduced motor torque and escalating motor temperature, all of which results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

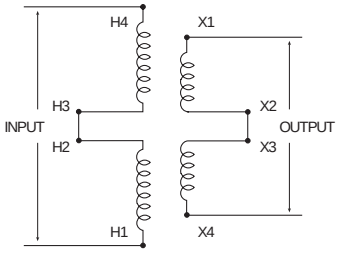



**Figure 1. Buck-boost transformer connected as a low voltage insulating transformer (primary and secondary windings shown series connected).**

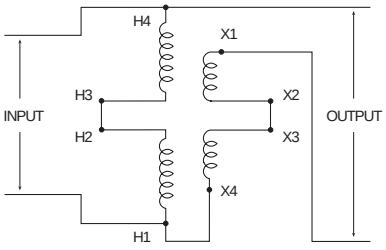



**Figure 2. Same buck-boost transformer connected as a boosting autotransformer. The connection from H1 to X4 "converted" the unit to an autotransformer.**

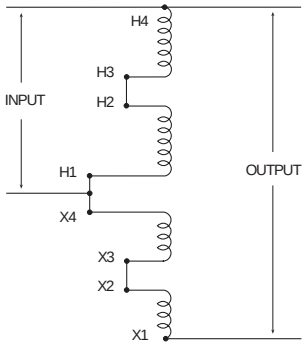



**Figure 3. Illustration No. 2 shown with the primary and secondary windings "straightened".**

### 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) T-1-11683** **(7.5 KVA) T-2-53515-3S**

## 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:

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

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

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 T-1-11683 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).

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

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

### 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 109 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.

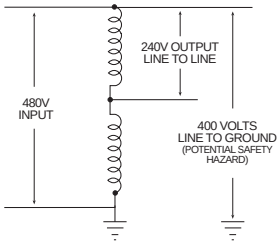
### 20. Why is the isolation transformer KVA rating shown on the nameplate instead of the autotransformer KVA rating?

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.

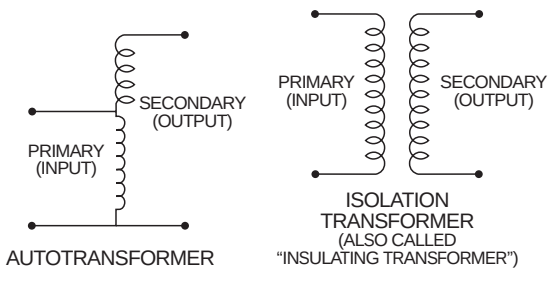
### 24. What is the life expectancy of a buck boost transformer?

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 autotransformers.

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 over-current protect an autotransformer; item **(b)** explains that an insulating transformer such as a buck-boost transformer may be field connected as an autotransformer.

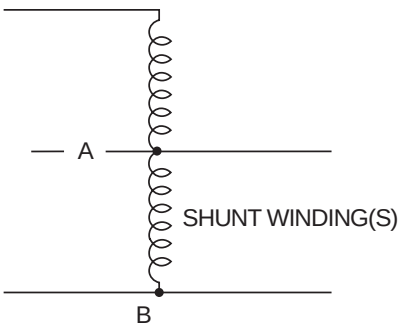
### 27. When a buck-boost transformer is connected as an autotransformer such as boosting 208V to 230V, the KVA is greatly increased. What is the procedure for determining the size (ampere rating) of the over-current protective device such as a fuse or circuit breaker?

The National Electrical Code Article 450-4 addresses over-current 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. T-1-11683 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 116 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. | | | | | | | | | | | | | | | |
| T-1-81047 | 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 |
| T-1-81048 | 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 |
| T-1-81049 | 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 |
| T-1-81050 | 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 |
| T-1-81051 | 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 |
| T-1-81052 | 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 |
| T-1-11683 | 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 |
| T-1-11684 | 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 |
| T-1-11685 | 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 |
| T-1-11686 | 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 |
| T-1-11687 | 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 |
| T-2-11688 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 |
| T-2-11689 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 118 For Connection Diagrams | | D | D | C | C | H | H | H | H | F | F | I | I | I | E |

① See chart on page 117, 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 117.

## 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. | | | | | | | | | | | | | | | |
| T-1-81054 | 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 |
| T-1-81055 | 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 |
| T-1-81056 | 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 |
| T-1-81057 | 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 |
| T-1-81058 | 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 |
| T-1-81059 | 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 |
| T-1-13073 | 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 |
| T-1-13074 | 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 |
| T-1-13075 | 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 |
| T-1-13076 | 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 |
| T-1-13077 | 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 |
| T-2-13078 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 |
| T-2-13079 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 118 For Connection Diagrams | | D | C | C | H | H | G | G | G | F | I | E | E | E | E |

① See chart on page 117.

**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 117.**

## 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. | | | | | | | | | | | | | | | |
| T-1-81061 | 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 |
| T-1-81062 | 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 |
| T-1-81063 | 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 |
| T-1-81064 | 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 |
| T-1-81065 | 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 |
| T-1-81066 | 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 |
| T-1-37920 | 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 |
| T-1-37921 | 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 |
| T-1-37922 | 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 |
| T-1-37923 | 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 |
| T-1-37924 | 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 |
| T-2-43570 | 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 |
| T-2-43571 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 118 For Connection Diagrams | | D | H | H | H | H | G | G | H | G | G | J | I | E | E |

① See chart on page 117.

**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. | | | | | | | | | | | | | |
| T-1-81047 | 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 |
| T-1-81048 | 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 |
| T-1-81049 | 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 |
| T-1-81050 | 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 |
| T-1-81051 | 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 |
| T-1-81052 | 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 |
| T-1-11683 | 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 |
| T-1-11684 | 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 |
| T-1-11685 | 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 |
| T-1-11686 | 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 |
| T-1-11687 | 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 |
| T-2-11688 ① | 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 |
| T-2-11689 ① | 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 118 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 117.

**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 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. | | | | | | | | | | | | |
| T-1-81054 | 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 |
| T-1-81055 | 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 |
| T-1-81056 | 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 |
| T-1-81057 | 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 |
| T-1-81058 | 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 |
| T-1-81059 | 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 |
| T-1-13073 | 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 |
| T-1-13074 | 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 |
| T-1-13075 | 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 |
| T-1-13076 | 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 |
| T-1-13077 | 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 |
| T-2-13078① | 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 |
| T-2-13079① | 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 118 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 |

① See chart on page 115.

**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. | | | | | | | | | | | | | | | | | |
| T-1-81061 | 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 |
| T-1-81062 | 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 |
| T-1-81063 | 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 |
| T-1-81064 | 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 |
| T-1-81065 | 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 |
| T-1-81066 | 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 |
| T-1-37920 | 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 |
| T-1-37921 | 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 |
| T-1-37922 | 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 |
| T-1-37923 | 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 |
| T-1-37924 | 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 |
| T-2-43570 | 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 |
| T-2-43571① | 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 118 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 |

① See chart on page 115.

**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 | | APPROX. DIMENSIONS INCHES (CM.) | | | APPROX. NET WEIGHT LBS. (KG.) | DIMENSIONAL DRAWINGS |
|---|---|---|---|---|---|---|---|---|
| | | 12 V | 24 V | HEIGHT | WIDTH | DEPTH | | |
| T-1-81047 | 0.05 KVA | 4.16 | 2.08 | 6.41 (16.3) | 3.14 (8.0) | 3.05 (7.7) | 4 (1.8) | A |
| T-1-81048 | 0.10 KVA | 8.32 | 4.16 | 7.16 (18.2) | 3.89 (9.9) | 3.67 (9.3) | 5 (2.3) | A |
| T-1-81049 | 0.15 KVA | 12.52 | 6.25 | 7.16 (18.2) | 3.89 (9.9) | 3.67 (9.3) | 7 (3.2) | A |
| T-1-81050 | 0.25 KVA | 20.80 | 10.40 | 8.68 (22.0) | 4.08 (10.4) | 3.88 (9.9) | 10 (4.5) | B |
| T-1-81051 | 0.50 KVA | 41.60 | 20.80 | 9.06 (23.0) | 4.37 (11.1) | 4.20 (10.7) | 15 (6.8) | B |
| T-1-81052 | 0.75 KVA | 62.50 | 31.25 | 9.68 (24.6) | 4.75 (12.1) | 4.51 (11.5) | 19 (8.6) | B |
| T-1-11683 | 1.00 KVA | 83.20 | 41.60 | 10.50 (26.7) | 5.50 (14.0) | 5.13 (13.0) | 24 (10.9) | B |
| T-1-11684 | 1.50 KVA | 125.00 | 62.50 | 11.62 (29.5) | 5.50 (14.0) | 5.13 (13.0) | 30 (13.6) | B |
| T-1-11685 | 2.00 KVA | 166.00 | 83.20 | 13.00 (33.0) | 5.50 (14.0) | 5.13 (13.0) | 38 (17.2) | B |
| T-1-11686 | 3.00 KVA | 250.00 | 125.00 | 11.50 (29.2) | 10.31 (26.2) | 7.13 (18.1) | 55 (24.9) | C |
| T-1-11687 | 5.00 KVA | 416.60 | 208.00 | 14.38 (36.5) | 10.31 (26.2) | 7.13 (18.1) | 75 (34.0) | C |
| T-2-11688 | 7.50 KVA | 625.00 | 312.50 | 20.81 (52.9) | 11.12 (28.2) | 10.84 (27.5) | 125 (56.7) | D |
| T-2-11689 | 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 | | APPROX. DIMENSIONS INCHES (CM.) | | | APPROX. NET WEIGHT LBS. (KG.) | DIMENSIONAL DRAWINGS |
|---|---|---|---|---|---|---|---|---|
| | | 16 V | 32 V | HEIGHT | WIDTH | DEPTH | | |
| T-1-81054 | 0.05 KVA | 3.12 | 1.56 | 6.41 (16.3) | 3.14 (8.0) | 3.05 (7.7) | 4 (1.8) | A |
| T-1-81055 | 0.10 KVA | 6.25 | 3.12 | 7.16 (18.2) | 3.89 (9.9) | 3.67 (9.3) | 5 (2.3) | A |
| T-1-81056 | 0.15 KVA | 9.38 | 4.69 | 7.16 (18.2) | 3.89 (9.9) | 3.67 (9.3) | 7 (3.2) | A |
| T-1-81057 | 0.25 KVA | 15.60 | 7.80 | 8.68 (22.0) | 4.08 (10.4) | 3.88 (9.9) | 10 (4.5) | B |
| T-1-81058 | 0.50 KVA | 31.20 | 15.60 | 9.06 (23.0) | 4.37 (11.1) | 4.20 (10.7) | 15 (6.8) | B |
| T-1-81059 | 0.75 KVA | 46.90 | 23.40 | 9.68 (24.6) | 4.75 (12.1) | 4.51 (11.5) | 19 (8.6) | B |
| T-1-13073 | 1.00 KVA | 62.50 | 31.20 | 10.50 (26.7) | 5.50 (14.0) | 5.13 (13.0) | 24 (10.9) | B |
| T-1-13074 | 1.50 KVA | 93.70 | 46.90 | 11.62 (29.5) | 5.50 (14.0) | 5.13 (13.0) | 30 (13.6) | B |
| T-1-13075 | 2.00 KVA | 125.00 | 62.50 | 13.00 (33.0) | 5.50 (14.0) | 5.13 (13.0) | 38 (17.2) | B |
| T-1-13076 | 3.00 KVA | 187.50 | 93.80 | 11.50 (29.2) | 10.31 (26.2) | 7.13 (18.1) | 55 (24.9) | C |
| T-1-13077 | 5.00 KVA | 312.00 | 156.00 | 14.38 (36.5) | 10.31 (26.2) | 7.13 (18.1) | 75 (34.0) | C |
| T-2-13078 | 7.50 KVA | 468.00 | 234.00 | 20.81 (52.9) | 11.12 (28.2) | 10.84 (27.5) | 125 (56.7) | D |
| T-2-13079 | 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

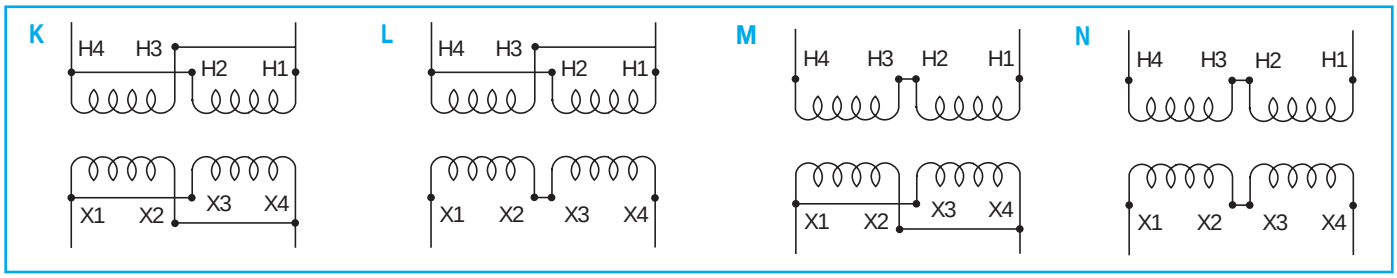
**240 X 480 PRIMARY VOLTS — 24/48 SECONDARY VOLTS — 60 Hz**

| CATALOG NUMBER | INSULATING TRANSFORMER RATING | SECONDARY MAXIMUM CURRENT OUTPUT | | APPROX. DIMENSIONS INCHES (CM.) | | | APPROX. NET WEIGHT LBS. (KG.) | DIMENSIONAL DRAWINGS |
|---|---|---|---|---|---|---|---|---|
| | | 24 V | 48 V | HEIGHT | WIDTH | DEPTH | | |
| T-1-81061 | 0.05 KVA | 2.08 | 1.04 | 6.41 (16.3) | 3.14 (8.0) | 3.05 (7.7) | 4 (1.8) | A |
| T-1-81062 | 0.10 KVA | 4.16 | 2.08 | 7.16 (18.2) | 3.89 (9.9) | 3.67 (9.3) | 5 (2.3) | A |
| T-1-81063 | 0.15 KVA | 6.24 | 3.12 | 7.16 (18.2) | 3.89 (9.9) | 3.67 (9.3) | 7 (3.2) | A |
| T-1-81064 | 0.25 KVA | 10.40 | 5.20 | 8.68 (22.0) | 4.08 (10.4) | 3.88 (9.9) | 10 (4.5) | B |
| T-1-81065 | 0.50 KVA | 20.80 | 10.40 | 9.06 (23.0) | 4.37 (11.1) | 4.20 (10.7) | 15 (6.8) | B |
| T-1-81066 | 0.75 KVA | 31.20 | 15.60 | 9.68 (24.6) | 4.75 (12.1) | 4.51 (11.5) | 19 (8.6) | B |
| T-1-37920 | 1.00 KVA | 41.60 | 20.80 | 10.50 (26.7) | 5.50 (14.0) | 5.13 (13.0) | 24 (10.9) | B |
| T-1-37921 | 1.50 KVA | 62.40 | 31.20 | 11.62 (29.5) | 5.50 (14.0) | 5.13 (13.0) | 30 (13.6) | B |
| T-1-37922 | 2.00 KVA | 83.20 | 41.60 | 13.00 (33.0) | 5.50 (14.0) | 5.13 (13.0) | 38 (17.2) | B |
| T-1-37923 | 3.00 KVA | 125.00 | 62.50 | 11.50 (29.2) | 10.31 (26.2) | 7.13 (18.1) | 55 (24.9) | C |
| T-1-37924 | 5.00 KVA | 208.00 | 104.00 | 14.38 (36.5) | 10.31 (26.2) | 7.13 (18.1) | 75 (34.0) | C |
| T-2-43570 | 7.50 KVA | 312.00 | 156.00 | 20.81 (52.9) | 11.12 (28.2) | 10.84 (27.5) | 135 (61.2) | D |
| T-2-43571 | 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

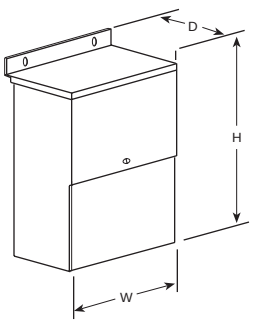
| Units Rated 120 x 240 V Input: 16/32 V Output | | |
|---|---|---|
| INPUT | OUTPUT | CONNECTION DIAGRAM |
| 120 | 16 | K |
| 120 | 32 | L |
| 240 | 16 | M |
| 240 | 32 | N |

### GROUP III

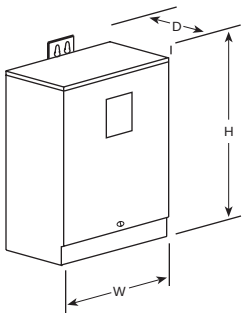
| Units Rated 240 x 480 V Input: 24/48 V Output | | |
|---|---|---|
| INPUT | OUTPUT | CONNECTION DIAGRAM |
| 240 | 24 | K |
| 240 | 48 | L |
| 480 | 24 | M |
| 480 | 48 | N |

| Number of Leads per Termination | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | H1 | H2 | H3 | H4 | X1 | X2 | X3 | X4 |
| T-2-13078 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| T-2-13079 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| T-2-43571 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| T-2-11688 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| T-2-11689 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| All leads with same designation (ex. X1, X1) MUST be joined together for proper operation. | | | | | | | | |

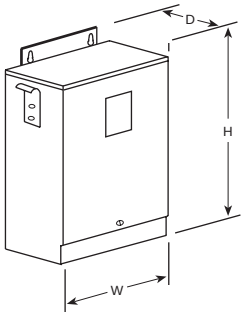
## BUCK-BOOST DIMENSIONAL DRAWINGS



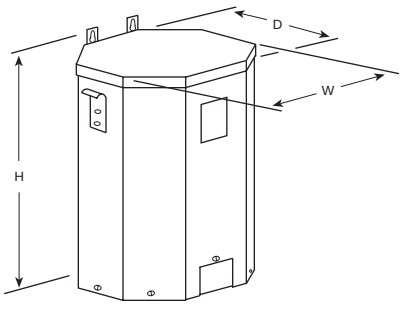

DESIGN A




DESIGN B




DESIGN C




DESIGN D

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

## BUCK-BOOST WIRING DIAGRAMS① — SINGLE PHASE

**FIG. C**

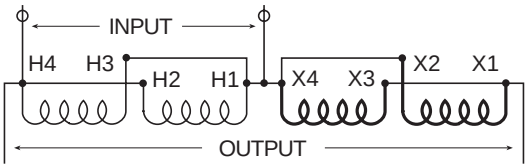



**FIG. D**

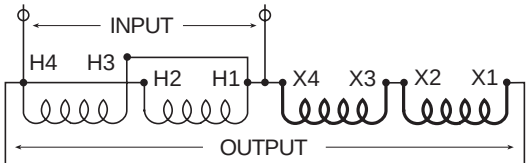



**FIG. E**

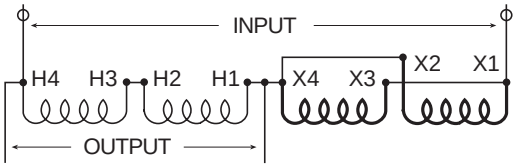



**FIG. F**

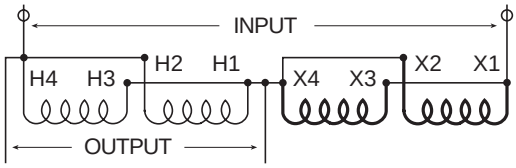



**FIG. G**

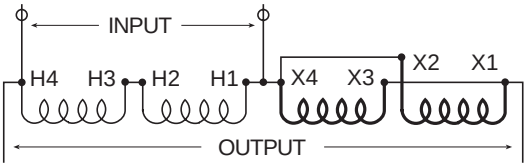



**FIG. H**

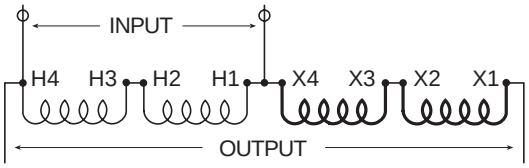



**FIG. I**

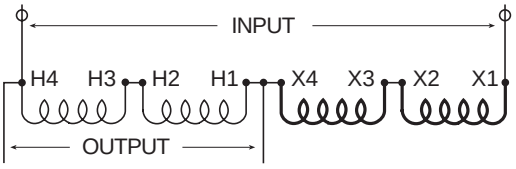
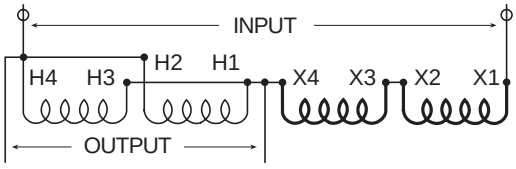



**FIG. J**




## BUCK-BOOST WIRING DIAGRAMS① — THREE PHASE

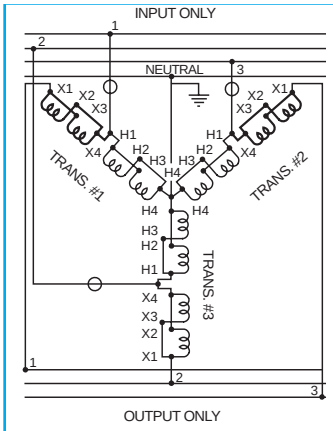



FIG. AA ② **WYE**

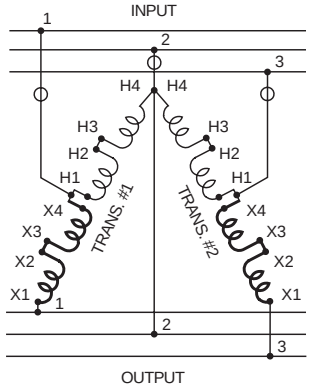



FIG. BB **OPEN DELTA**

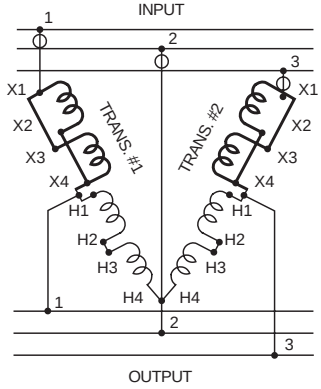



FIG. CC **OPEN DELTA**

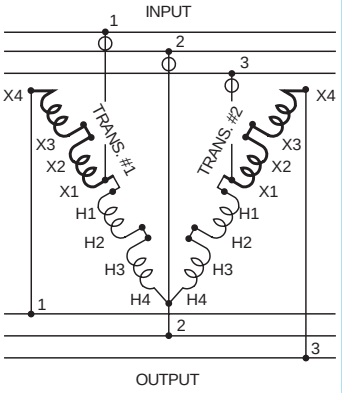



FIG. DD **OPEN DELTA**

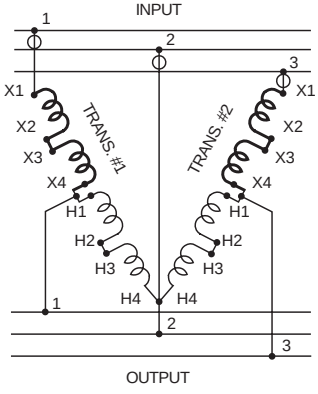



FIG. EE **OPEN DELTA**

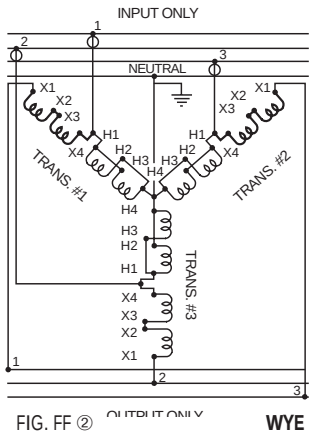



FIG. FF ② **WYE**

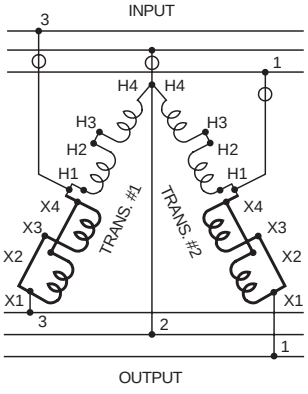



FIG. GG **OPEN DELTA**

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


PT-06-1150005-LS


PT-BA-3150015-LS

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

NEW

## 304 STAINLESS STEEL PANEL-TRAN®

### FEATURES

- 3R Enclosure.
- Abundant knockouts provided.
- Comply with NEC Class 1, Division 2, Group A-D when installed per NEC 501-2 (b).
- 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, U.L. 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, U.L. 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 U.L. 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.

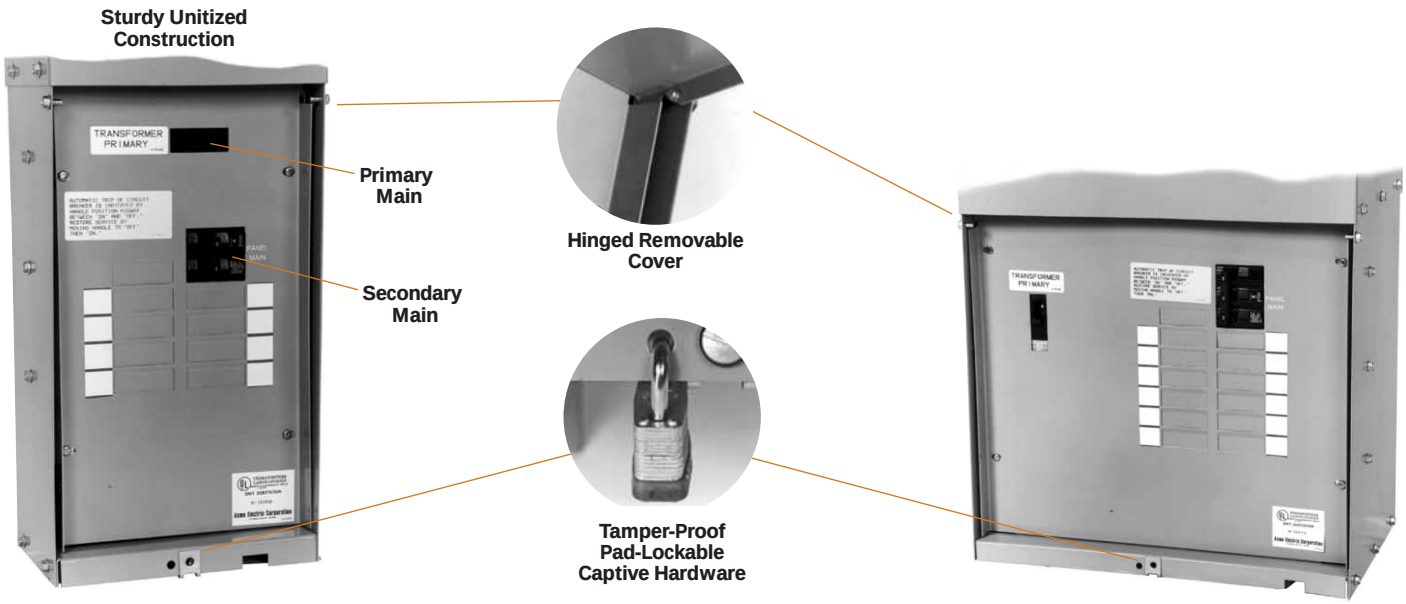
**Branch Circuits** Typical 1" snap in circuit breakers, regular or duplex, must be field installed. They are not provided with the Panel-Tran® unit. A secondary ground is provided within the wiring compartment for accepting your branch unit. All of the breakers, including the primary main, secondary 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 (1-POLE) | 240 V (2-POLE) | APPROX. DIMENSIONS INCHES (CM.) HEIGHT | WIDTH | DEPTH | APPROX. NET WEIGHT LBS. (KG.) |
|---|---|---|---|---|---|---|---|
| 5.0 | PT-06-1150005-LS | 8 | 4 | 32.13 (81.6) | 13.25 (33.7) | 7.63 (19.4) | 120 (54.4) |
| 7.5 | PT-06-1150007-LS | 8 | 4 | 32.13 (81.6) | 15.88 (40.3) | 11.00 (27.9) | 160 (72.6) |
| 10.0 | PT-06-1150010-LS | 8 | 4 | 34.38 (87.3) | 15.88 (40.3) | 11.00 (27.9) | 185 (83.9) |
| 15.0 | PT-06-1150015-LS | 12 | 6 | 34.38 (87.3) | 17.13 (43.5) | 12.38 (31.4) | 240 (109.0) |
| 25.0 | PT-06-1150025-LS | 20 | 10 | 41.88 (106.4) | 17.88 (45.4) | 13.50 (34.3) | 330 (150.0) |

NEW

### 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 | PT06-1150005-SS | 8 | 4 | 32.13 (81.6) | 13.25 (33.7) | 7.63 (19.4) | 120 (54.4) |
| 7.5 | PT06-1150007-SS | 8 | 4 | 32.13 (81.6) | 15.88 (40.3) | 11.00 (27.9) | 160 (72.6) |
| 10.0 | PT06-1150010-SS | 8 | 4 | 34.38 (87.3) | 15.88 (40.3) | 11.00 (27.9) | 185 (83.9) |
| 15.0 | PT06-1150015-SS | 12 | 6 | 34.38 (87.3) | 17.13 (43.5) | 12.38 (31.4) | 240 (109.0) |
| 25.0 | PT06-1150025-SS | 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 | PTBA-3150009-LS | 12 | 4 | 33.75 (85.7) | 22.13 (56.2) | 7.63 (19.4) | 255 (116.0) |
| 15.0 | PTBA-3150015-LS | 12 | 4 | 35.13 (89.2) | 22.13 (56.2) | 12.38 (31.4) | 385 (175.0) |
| 22.5 | PTBA-3150022-LS | 18 | 6 | 38.25 (97.2) | 30.25 (76.8) | 13.38 (34.0) | 535 (243.0) |
| 30.0 | PTBA-3150030-LS | 24 | 8 | 43.75 (111.1) | 33.00 (83.8) | 13.75 (34.9) | 680 (308.0) |

NEW

### 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 | PTBA-3150009-SS | 12 | 4 | 33.75 (85.7) | 22.13 (56.2) | 7.63 (19.4) | 255 (116.0) |
| 15.0 | PTBA-3150015-SS | 12 | 4 | 35.13 (89.2) | 22.13 (56.2) | 12.38 (31.4) | 385 (175.0) |
| 22.5 | PTBA-3150022-SS | 18 | 6 | 38.25 (97.2) | 30.25 (76.8) | 13.38 (34.0) | 535 (243.0) |
| 30.0 | PTBA-3150030-SS | 24 | 8 | 43.75 (111.1) | 33.00 (83.8) | 13.75 (34.9) | 680 (308.0) |

## Circuit Breaker Data②

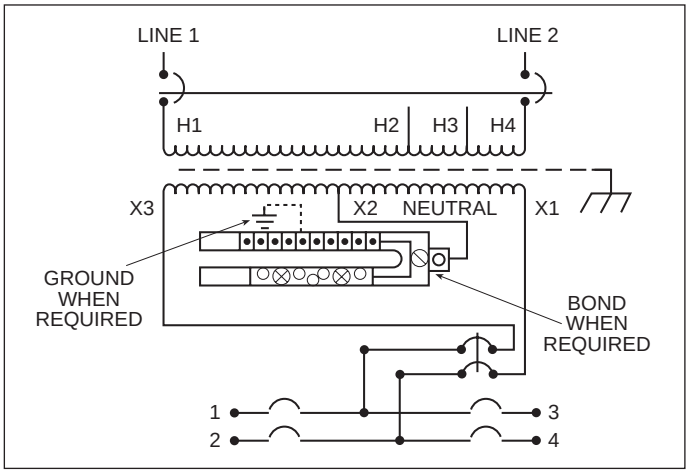
#### 480 VOLTS DELTA TO 208Y/120 VOLTS

| 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

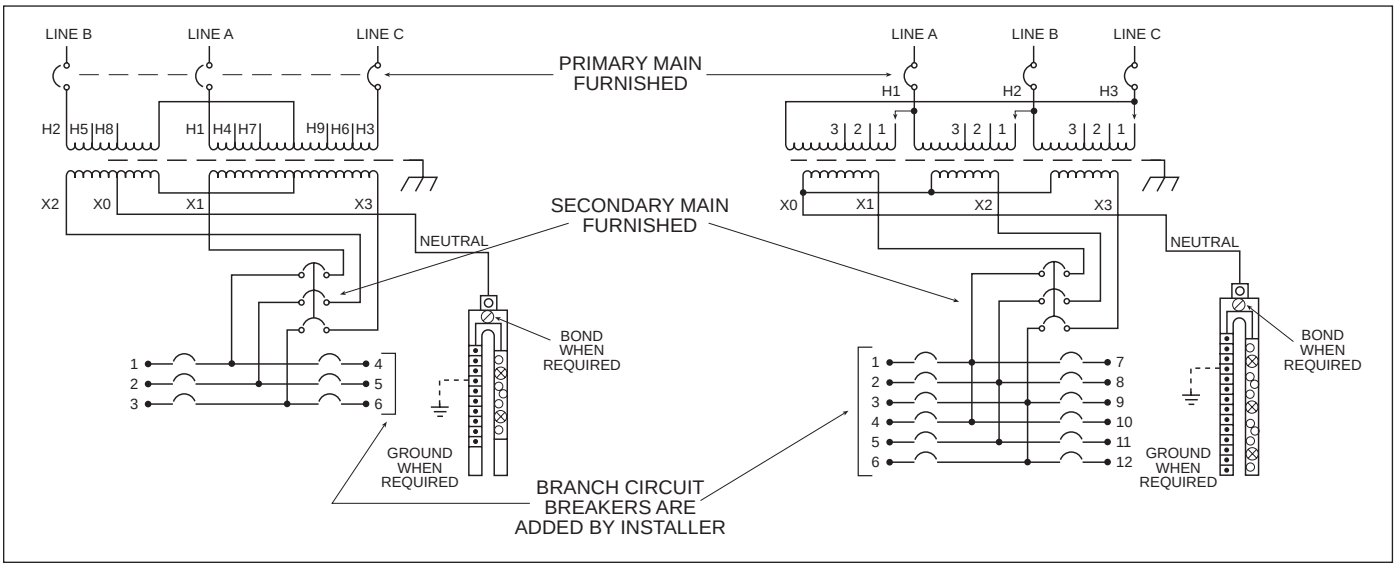
### Wiring Diagram 1Ø 5-25 KVA




## 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 or 230V 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.

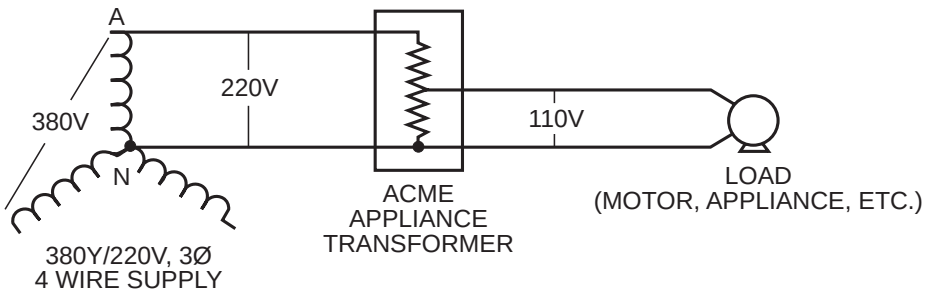
Some common uses for Acme Air Conditioning, Refrigeration and Appliance transformers include adjustment of off-standard voltage to the nominal voltages required to operate:

**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 Groups A and 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 # T-1-60812


Secondary Receptacle

6' (1.8 M) Primary Cord

## GROUP A


### PRIMARY VOLTS — 95/105/115/125/200/220/240/260 SECONDARY VOLTS — 105 @ 50 Hz, 115 @ 60 Hz

| CATALOG ① NO. | VA RATING | OUTPUT AMPS | APPROX. DIMENSIONS INCHES (CM.) HEIGHT | WIDTH | DEPTH | APPROX. SHIP WEIGHT LBS. (KG.) | CONNECTIONS FEET (METERS) |
|---|---|---|---|---|---|---|---|
| T-1-60800 ② | 350 | 3.04 | 9.16 (23.3) | 3.89 (9.9) | 3.67 (9.3) | 8 (3.6) | 6 (1.8) primary cord and secondary receptacle |
| T-1-60801 ② | 550 | 4.78 | 9.68 (24.6) | 4.75 (12.1) | 4.51 (11.5) | 10 (4.5) | 6 (1.8) primary cord and secondary receptacle |
| T-1-60802 ② | 750 | 6.51 | 9.68 (24.6) | 4.75 (12.1) | 4.51 (11.5) | 11 (5.0) | 6 (1.8) primary cord and secondary receptacle |

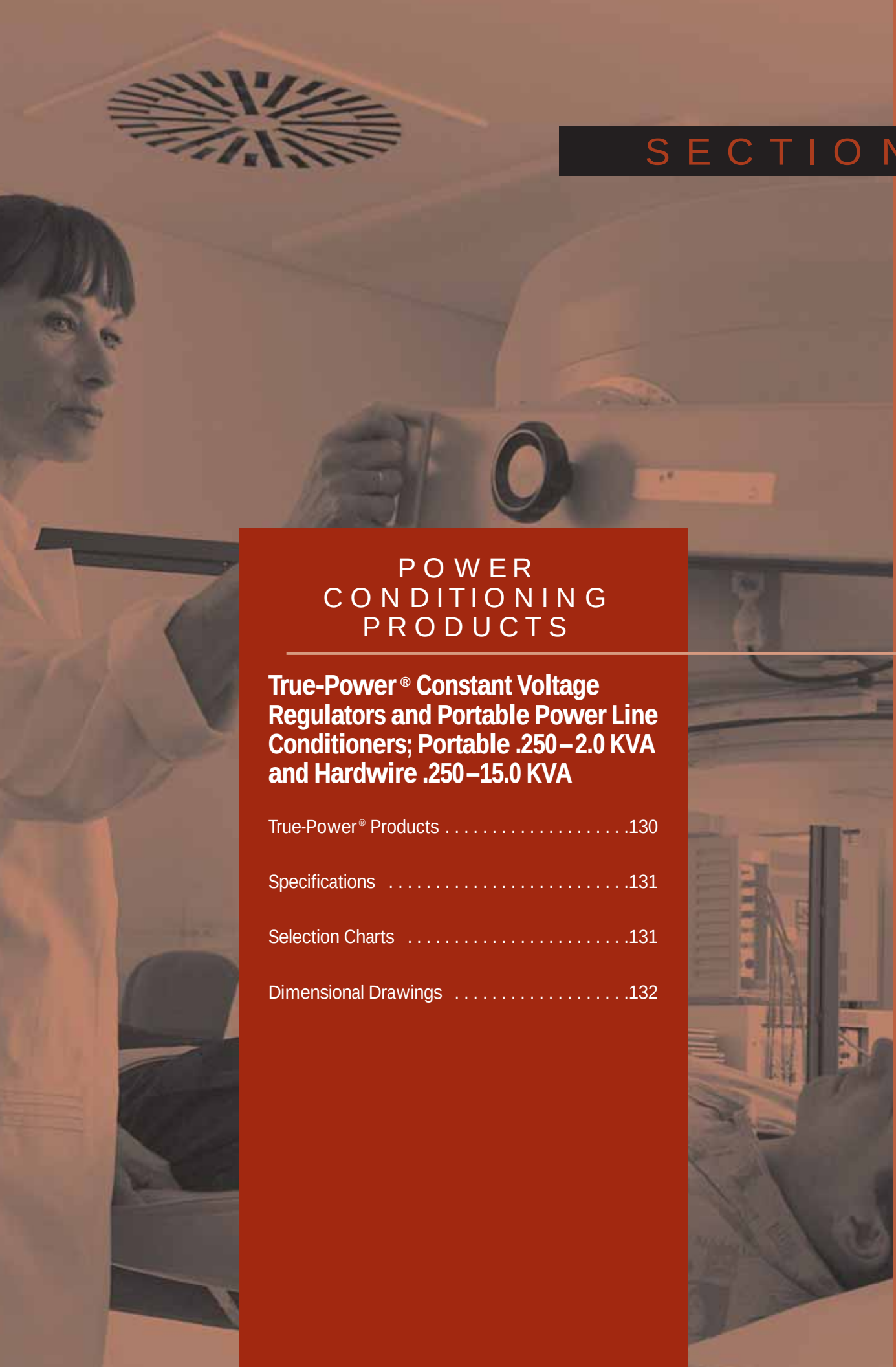
## GROUP C


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

| CATALOG NO. | VA RATING | OUTPUT AMPS | APPROX. DIMENSIONS INCHES (CM.) HEIGHT | WIDTH | DEPTH | APPROX. SHIP WEIGHT LBS. (KG.) | CONNECTIONS FEET (METERS) |
|---|---|---|---|---|---|---|---|
| T-1-60830 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 |
| T-1-60831 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 |
| T-1-60832 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 |
| T-1-60833 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 |
| T-1-60834 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 |
| T-1-60835 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.

② Electrical Tap Connections — Do not exceed +5% of nominal voltage without changing taps.



SECTION 10

# POWER CONDITIONING PRODUCTS

## True-Power® Constant Voltage Regulators and Portable Power Line Conditioners; Portable .250–2.0 KVA and Hardwire .250–15.0 KVA

# Acme® True-Power® Power Line Conditioners

The average computer installation, representing mini-computer, workstations or personal computers, experiences an average of 100 power disturbances each month. These disturbances can cause equipment malfunction, loss of memory and inaccurate data, and in the worst cases complete failure of these delicate electronic devices. Computer installation manuals recommend dedicated service lines, but these are expensive to install, offer minimal future flexibility and do not provide total protection of the equipment. Acme offers a complete line of Power Protection Equipment. Refer to the "Product Selection Guide" for the product that best meets your requirements.

**Note:** This section of the general catalog contains complete specification and selection information on Acme's True-Power® power line conditioners.

## APPLICATIONS

- Computers and Data Processing Equipment
- Point of Sale Terminals
- Electronic Test Equipment
- X-Ray Equipment
- Critical Lighting Applications
- Programmable Controllers
- Security Systems
- Microprocessor Controls
- Communications Equipment
- Photographic Equipment
- Regulated DC Power Supplies
- Electronic Cash Registers
- Robotics
- Numerical Controls

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 and portable models.
- Hardwired models will 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 (Hardwire models).

## 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 (Portable) |
| | 95-132 VAC (Hardwired) ② |
| | 166-228 VAC |
| | 192-264 VAC |
| | 384-528 VAC |
| **Phase:** | 1 Phase |

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

## SELECTION CHARTS

### GROUP I

**PORTABLE MODELS — POWER LINE CONDITIONERS**
**95-132 VOLT PRIMARY — 120 VOLT SECONDARY — 1Ø, 60 Hz**

| KVA SIZE | CATALOG NUMBER | APPROX. DIMENSIONS INCHES (CM.) A HEIGHT | B WIDTH | C DEPTH | D | E | TYPE MTG. | APPROX. SHIP WEIGHT LBS. (KG.) | FIGURE | ELECTRICAL CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.25 | PLC-85000 | 8.13 (20.7) | 6.31 (16.0) | 11.38 (28.9) | 5.25 (13.3) | 5.69 (14.5) | P | 29 (13.2) | E | Two, ea. outlet rated 15A max. |
| 0.50 | PLC-85001 | 9.13 (23.2) | 7.50 (19.1) | 13.63 (34.6) | 6.38 (16.2) | 7.19 (18.3) | P | 45 (20.4) | E | Two, ea. outlet rated 15A max. |
| 0.75 | PLC-85002 | 10.94 (27.8) | 7.50 (19.1) | 15.63 (39.7) | 6.38 (16.2) | 7.19 (18.3) | P | 60 (27.2) | E | Two, ea. outlet rated 15A max. |
| 1.00 | PLC-85003 | 10.94 (27.8) | 10.69 (27.2) | 17.63 (44.8) | 8.31 (21.1) | 10.88 (27.6) | P | 72 (32.7) | E | Three, ea. outlet rated at 15A max. |
| 2.00 | PLC-85004 | 12.50 (31.8) | 11.44 (29.1) | 20.19 (51.3) | 9.75 (24.8) | 12.25 (31.1) | P | 135 (61.2) | E | Three, ea. outlet rated at 15A max. |

P = Portable

### 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**

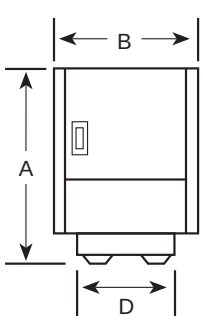
| KVA SIZE | CATALOG NUMBER | APPROX. DIMENSIONS③ INCHES (CM.) A HEIGHT | B WIDTH | C DEPTH | D | E | F | G | H | J | TYPE MTG. | APPROX. SHIP WEIGHT LBS. (KG.) | FIGURE | WIRING DIAGRAMS SEE PAGE 147 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.25 | T-1-69430 | 15.50 (39.4) | 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 | T-1-69431 | 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 | T-1-69432 | 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 | T-1-69433 | 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 | T-1-69434 | 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 | T-1-69435 | 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 | T-1-69436 | 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 | T-1-69437 | 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 | T-1-69438 | 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 | T-1-69439 | 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

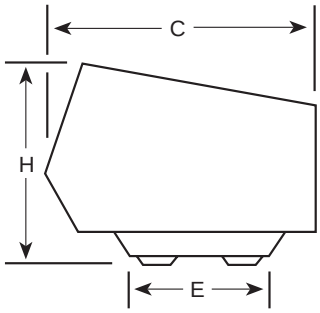
① Wall mounting brackets required for this size. Refer to Page 157.
② All hardwired models will accommodate these primary input voltages.
③ Dimensions not suitable for construction. Contact factory.

## CONSTANT VOLTAGE REGULATORS DIMENSIONAL DRAWINGS

FIGURE I


FRONT VIEW

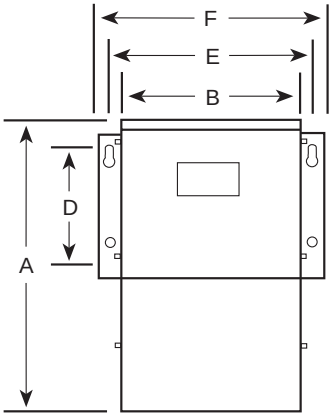



SIDE VIEW

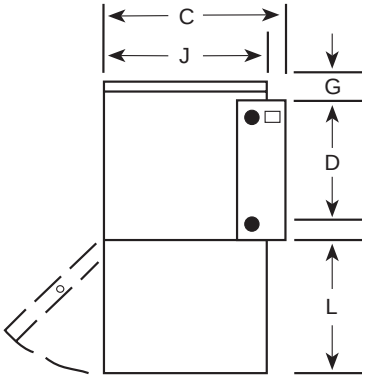
## POWER LINE CONDITIONERS DIMENSIONAL DRAWINGS

FIGURE II & III



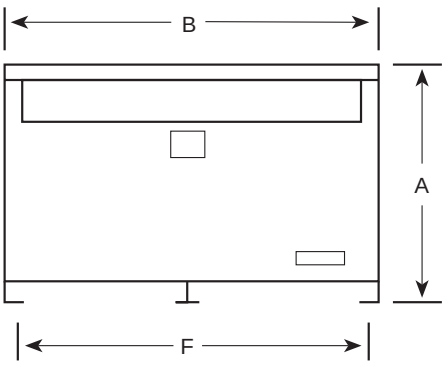



FRONT VIEW

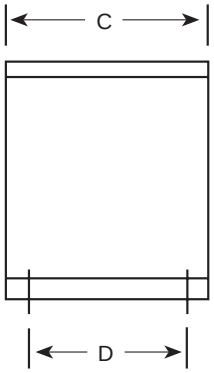



SIDE VIEW

FIGURE IV




FRONT VIEW




SIDE VIEW

# DC POWER SUPPLIES

**A leading source of high quality linear and switch mode power supplies in enclosed and open frame styles.**

## DR Series Mounted Power Supplies



## Unregulated Linear Power



## Regulated Linear Power

# DIN-Rail Mounted Power Supplies

## DR Series 1.3 to 40 Amps

Acme's new flagship line of DR Series DC power supplies are an innovative solution to a vast array of control applications. Designed to provide optimal performance with a minimal impact on installation time and space.

Available in single and three phase models, from 1.3 to 40 Amps (31-960 watts) these new power supplies provide the convenience of DIN-rail mounting up to 10 Amp for a toolless installation and the versatility of a standard auto-ranging input to cover the most applications with the fewest models. The slim "book" profile greatly reduces the amount of space taken up on the DIN-rail and within the overall control cabinet. The fully enclosed design is touch proof and CE compliant to meet international specifications and meet the Power Factor Correction requirements of EN61000-3-2. All units are UL 508 listed and can be used at full-rated power.

## Solution Ease

The DR families auto-ranging input feature provides you the versatility of using one power supply to address input voltages from 90-265 volts for single phase applications and 360-550 on three phase applications automatically–no adjustments required during installation.

## Space Saving

All the Acme Electric "DR Series" power supplies have been designed in a compact, slim book profile package compatible with other modules mounted in the control panel.

## Installation Made Easy

All housings up to 10 Amps conveniently snap onto standard 35 mm DIN-rail assuring permanent mounting without the use of any tools. The 20 and 40 Amp housings are provided with keyholes for mounting directly to the back panel for easy installation while still benefiting from the slim book profile for maximum use of space.

### FEATURES

- Fully enclosed, low profile design
- Touchsafe
- Reduced installation time
- Pluggable connections
- Fast, easy wiring connections
- Simplifies troubleshooting effort
- DIN-rail Mounted
- Mounts on standard DIN-rail
- No tools required
- Local output indication
- Primary switching technology
- Two-year limited warranty

### INDUSTRIES

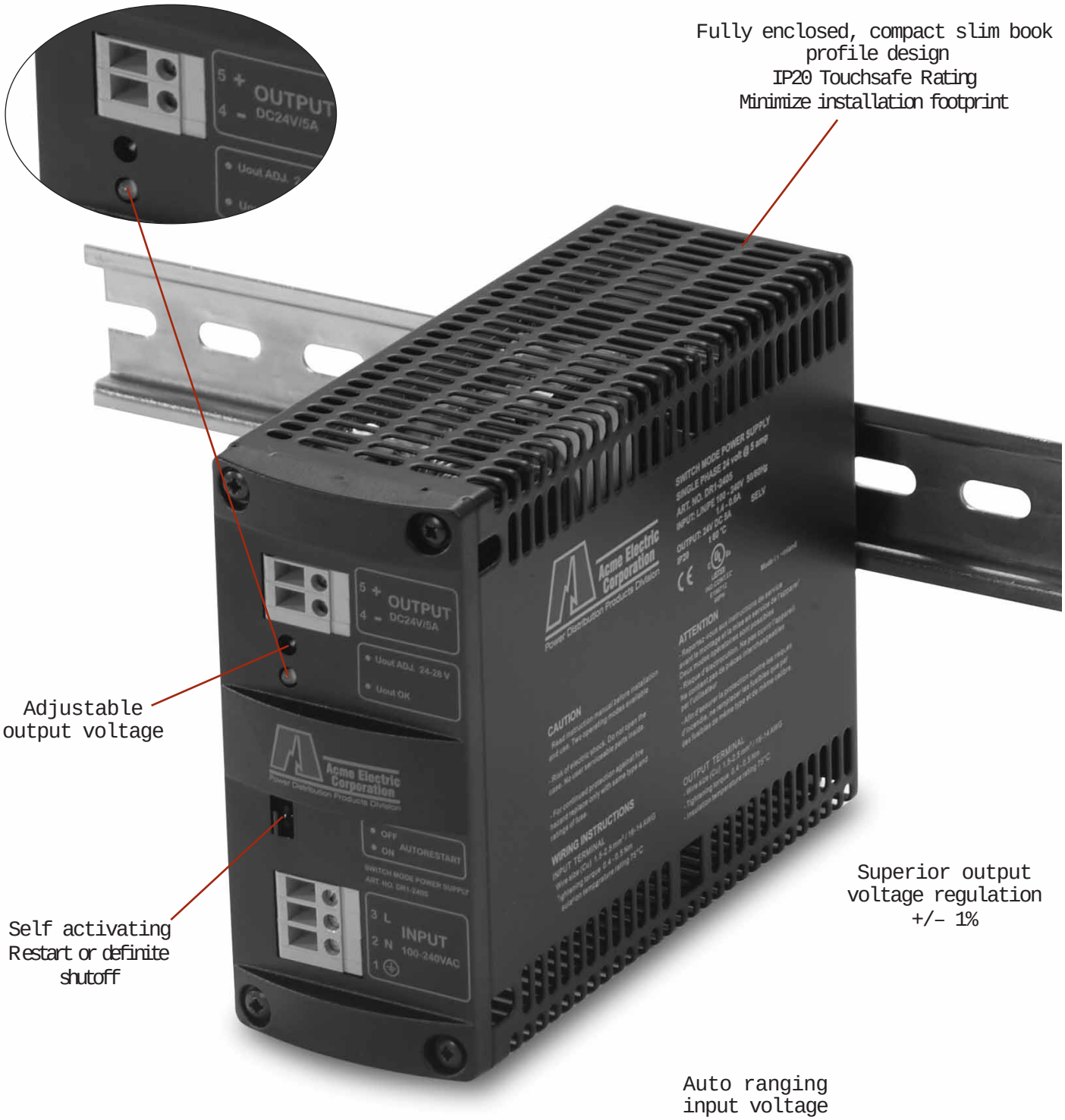
- Automotive
- Machine tool
- Material handling
- Packaging
- Food processing
- Panel builders
- Automation

### APPLICATIONS

- Programmable Logic Controllers
- CNC Equipment
- Microprocessor Circuits
- Digital and Analog Instrumentation
- Industrial Control Applications

Local output status indication
When the LED is lit, 24 volt
DC output power is functional

Fully enclosed, compact slim book
profile design
IP20 Touchsafe Rating
Minimize installation footprint




Adjustable
output voltage

Self activating
Restart or definite
shutoff

Superior output
voltage regulation
+/– 1%

Auto ranging
input voltage
No adjustments required

# SELECTION GUIDES

## SINGLE PHASE

| Catalog No. | Amp Rating | Voltage Range AC | Voltage Range DC | Frequency | Output Voltage | Mtbf (Life) | Efficiency | UL/CUL | CE |
|---|---|---|---|---|---|---|---|---|---|
| DR1-24013 | 1.3 | 94-264 | – | 50/60 Hz | 24 VDC | > 17 years | 89% typ. | YES | YES |
| DR1-24025 | 2.5 | 90-265 | 110-300 | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 85% typ. | YES | YES |
| DR1-2405 | 5 | 90-265 | 90-300 | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 88% typ. | YES | YES |
| DR1-2410 | 10 | 90-265 | 90-300 | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 88% typ. | YES | YES |
| DR1-2420 | 20 | 90-265 | 90-300 | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 88% typ. | YES | YES |

## THREE PHASE

| Catalog No. | Amp Rating | Voltage Range AC | Voltage Range DC | Frequency | Output Voltage | Mtbf (Life) | Efficiency | UL/CUL | CE |
|---|---|---|---|---|---|---|---|---|---|
| DR3-2405 | 5 | 3x360-550 | – | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 90% typ. | YES | YES |
| DR3-2410 | 10 | 3x360-550 | – | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 90% typ. | YES | YES |
| DR3-2420 | 20 | 3x360-550 | – | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 90% typ. | YES | YES |
| DR3-2440 | 40 | 3x360-550 | – | 50/60 Hz | 24 VDC (24-28 adj) | > 17 years | 91% typ. | YES | YES |

## SINGLE PHASE

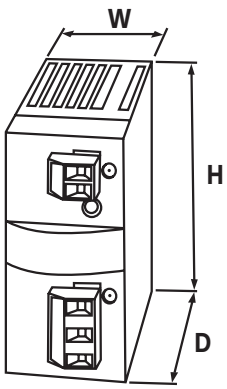
| Catalog No. | APPROX. DIMENSIONS INCHES (Cm) H | D | W | WEIGHT LBS (Kg) |
|---|---|---|---|---|
| DR1-24013 | 2.99 (7.6) | 2.91 (7.4) | 1.50 (3.8) | 0.33 (0.1) |
| DR1-24025 | 4.23 (10.7) | 3.84 (9.7) | 1.65 (4.2) | 0.99 (0.4) |
| DR1-2405 | 4.53 (11.5) | 5.94 (15.1) | 2.13 (5.4) | 1.65 (0.7) |
| DR1-2410 | 5.00 (12.7) | 8.03 (20.4) | 2.68 (6.8) | 3.31 (1.5) |
| DR1-2420 | 8.23 (20.9) | 9.17 (23.3) | 3.31 (8.4) | 5.95 (2.7) |

## THREE PHASE

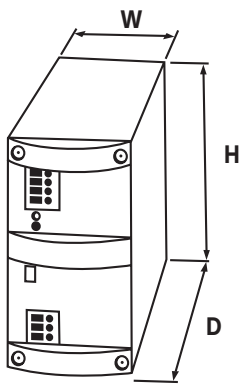
| Catalog No. | APPROX. DIMENSIONS INCHES (Cm) H | D | W | WEIGHT LBS (Kg) |
|---|---|---|---|---|
| DR3-2405 | 5.00 (12.7) | 7.01 (17.8) | 2.68 (6.8) | 2.87 (1.3) |
| DR3-2410 | 5.00 (12.7) | 7.01 (17.8) | 2.68 (6.8) | 2.87 (1.3) |
| DR3-2420 | 8.23 (20.9) | 8.94 (22.7) | 3.31 (8.4) | 5.07 (2.3) |
| DR3-2440 | 9.53 (24.2) | 10.63 (27.0) | 4.17 (10.6) | 9.92 (4.5) |

# DR SERIES DIMENSIONAL DRAWINGS

**1.3 Amps**




**Single & Three Phase**
**2.5-40 Amps**



# DR Duplex Receptacle

## DESCRIPTIONS

Packaged in a touch-proof enclosure to eliminate the possibility of accidental shock. The universal mounting foot allows the outlet box to be mounted either vertically or horizontally in your panel. Touch-proof screw terminal block provides a reliable connection.

## FEATURES

- DIN-rail mount duplex receptacle
- Vertical or horizontal mounting
- Snap on foot provides fast installation or can be fixed with screws in control cabinet
- Fits on 35 mm wide DIN-rail
- Ground prong reversed for greater protection
- Screw terminal connection via touch-proof terminal blocks
- Available with GFI (Ground Fault Interrupting)
- UR Recognized

## APPLICATIONS

- Test & Diagnostic Equipment
- Computers/Printers
- Power Tools
- Soldering Iron
- Displays
- Lighting
- Fan

## GENERAL SPECIFICATIONS

### Technical Data

Rated Voltage . . . . . .120 V AC
Rated Current . . . . . .15 or 20 AMPS
Maximum Wire Size . . . . . .#10 AWG

### Housing Data

Color . . . . . .Black
Material . . . . . .PVC V01550
Maximum Temperature . . . . . .40° C

### Dimensions

Length . . . . . .5.32 in. (135 mm)
Width . . . . . .2.95 in. (75 mm)
Depth . . . . . .2.56 in. (65 mm)

## DR Duplex Receptacle Selection Chart

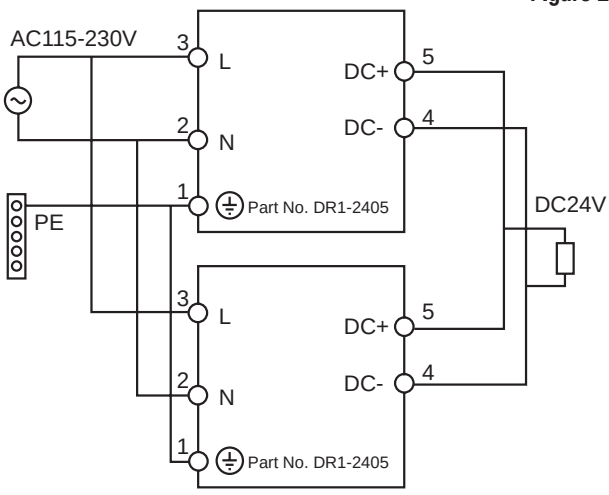
| AMP | CATALOG NUMBER | APPROX. SHIP WEIGHT LBS (Kg) |
|---|---|---|
| 15 | DRR-15 | .41 (.19) |
| 15 | DRR-15GFI | .46 (.21) |
| 20 | DRR-20 | .41 (.19) |
| 20 | DRR-20GFI | .46 (.21) |

# Redundancy Applications

## For critical load applications redundancy may be required

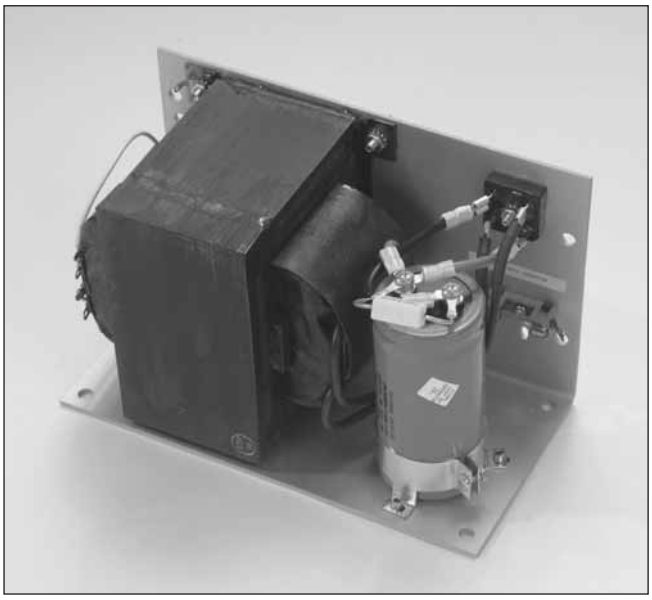
All the DR Series power supplies can be connected in parallel for redundancy, so if one power supply fails, there is adequate power reserve in the remaining unit to continue supporting the critical load (Reference Figure 1).

**Figure 1**



# Unregulated Linear Power Supplies

## Blackline Series 100 Watts to 750 Watts Bulk DC Linear Power



The "Blackline" series of Bulk DC power supplies have high surge current capability, floating output, thermal dissipation, and computer grade capacitors — all in an open frame construction. Units are UL recognized.

### FEATURES

- High Surge Current Capabilities
- MTBF to 500,000 hours per MIL 217E
- Maximum efficiency to 90%
- UL recognized to UL 1950
- FCC Level B EMI
- Floating output
- High quality transformer
- Open-frame construction
- Thermal dissipation
- Computer-grade capacitors
- Recognized to UL

| CATALOG NO. | TYPICAL VDC OUTPUT (@ 115 VAC IN) NO LOAD | HALF LOAD | FULL LOAD | AMPS FULL LOAD |
|---|---|---|---|---|
| 100B7HA | 10.6 | 8.8 | 7.9 | 10.0 |
| 100B12HA | 14.8 | 12.9 | 11.7 | 7.0 |
| 100B20HA | 23.3 | 20.8 | 19.3 | 5.0 |
| 100B24HA | 30.6 | 27.5 | 25.4 | 3.5 |
| 100B48HA | 56.3 | 51.0 | 47.9 | 1.8 |
| 200B7HA | 12.3 | 9.5 | 8.2 | 20.0 |
| 200B12HA | 15.4 | 12.5 | 11.3 | 15.0 |
| 200B20HA | 26.8 | 22.5 | 20.3 | 10.0 |
| 200B24HA | 34.4 | 29.5 | 27.1 | 7.5 |
| 200B48HA | 58.9 | 48.2 | 46.5 | 4.0 |
| 500B24HA | 31.0 | 28.4 | 26.7 | 20.0 |
| 500B48HA | 59.7 | 50.2 | 47.8 | 10.0 |
| 750B24HA | 33.3 | 27.7 | 25.5 | 30.0 |
| 750B48HA | 58.5 | 49.7 | 48.5 | 15.0 |

### APPLICATIONS

- DC Motors
- DC Relays
- Industrial Machinery
- Battery Chargers
- Solenoids

### ELECTRICAL SPECIFICATIONS

#### AC INPUT

Input voltage is selectable by transformer taps for 115 or 230 Vac (10% taps are provided).

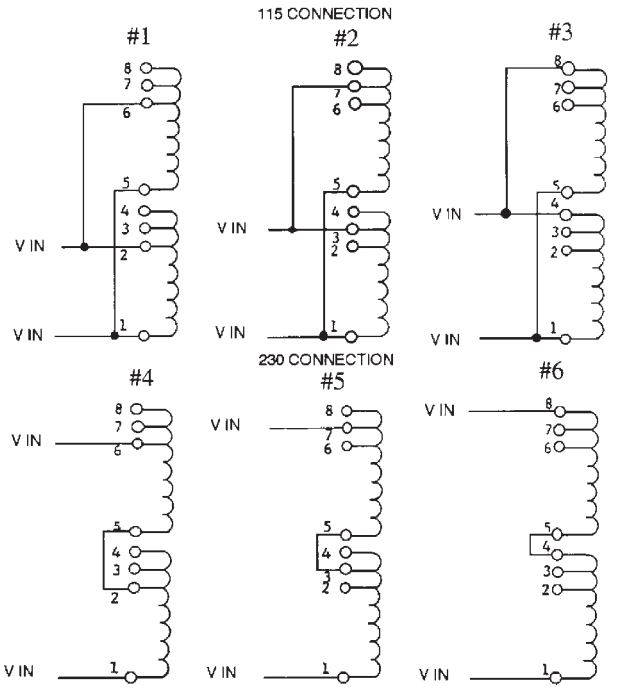
#### DC OUTPUT

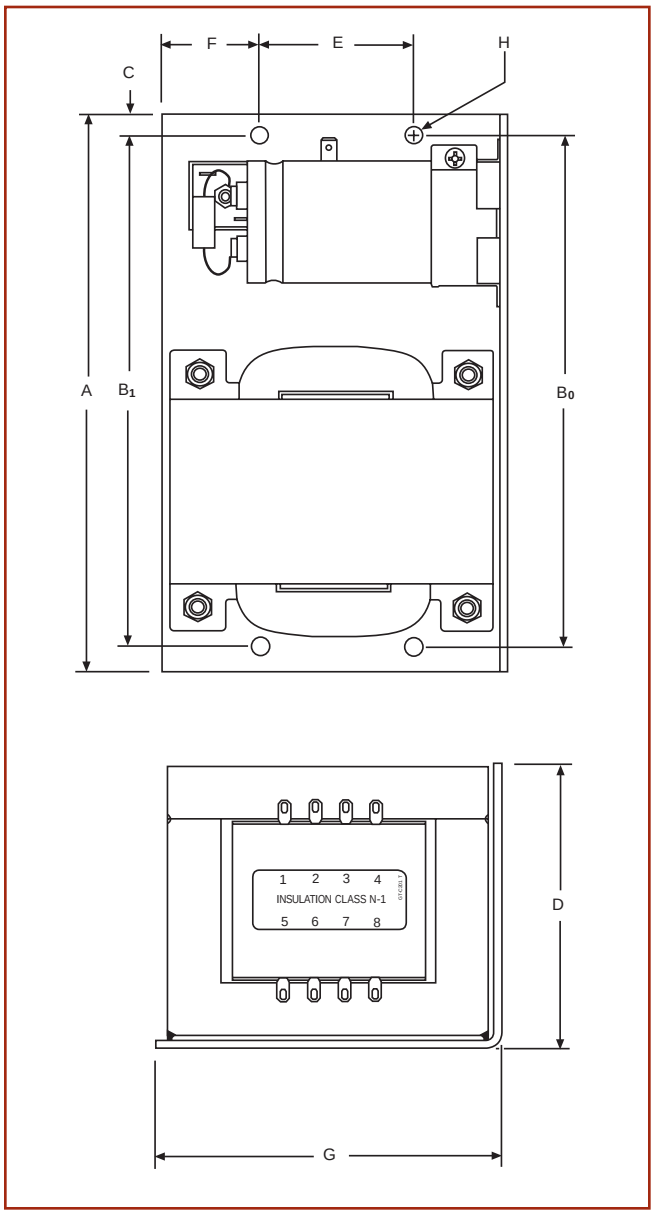
VOLTAGE RATINGS: 7, 12, 16, 20, 24, 48 Volts

MAXIMUM RIPPLE: 3% rms at nominal line voltage, at full rated load

# Electrical & Mechanical Specifications

## JUMPER CONNECTION




## AC INPUT VOLTAGE

Input voltage is selectable by transformer taps for 115 or 230 Vac (10% taps are provided).

| TAP (Vac) | NOMINAL (Vac) | HIGH-LINE (Vac) | JUMPER CONNECTION |
|---|---|---|---|
| 115, -10% | 103.5 | 113.9 | #1 |
| 115, NOM | 115.0 | 126.5 | #2 |
| 115, +10% | 126.5 | 139.2 | #3 |
| 230, -10% | 207.0 | 227.7 | #4 |
| 230, NOM | 230.0 | 253.0 | #5 |
| 230, +10% | 253.0 | 278.3 | #6 |

Frequency: 47 to 63 Hz with 10% ± primary taps.

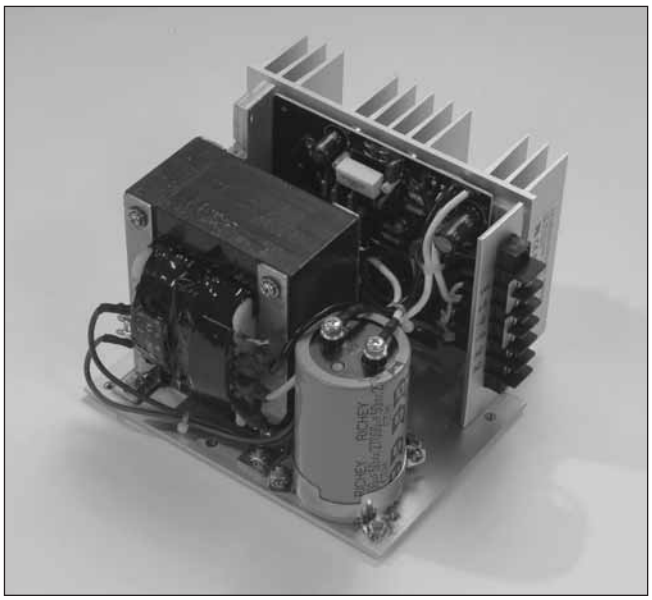
| | A | | $B_0$ | | $B_1$ | | C | | D | | E | | F | | G | | H MTG. DIA. | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SERIES | In. | (mm) | In. | (mm) | In. | (mm) | In. | (mm) | In. | (mm) | In. | (mm) | In. | (mm) | In. | (mm) | In. | Lbs. | (kg) |
| 15B | 4.62 | (117.3) | 4.00 | (101.6) | NA | NA | .31 | (7.9) | 2.09 | (53.1) | 1.60 | (40.6) | .31 | (7.9) | 2.75 | (69.8) | .20 | 1.7 | (0.8) |
| 30B | 5.88 | (149.3) | 5.38 | (136.6) | NA | NA | .25 | (6.3) | 2.72 | (69.1) | 2.19 | (55.6) | .31 | (7.9) | 3.25 | (82.5) | .22 | 2.6 | (1.2) |
| 60B | 6.25 | (158.7) | 5.65 | (143.5) | 5.15 | (130.8) | .25 | (6.3) | 3.00 | (76.2) | 2.73 | (69.3) | .35 | (8.9) | 3.71 | (94.2) | .22 | 4.0 | (1.8) |
| 100B | 7.12 | (180.8) | 6.42 | (163.1) | 5.87 | (149.1) | .35 | (8.9) | 3.25 | (82.5) | 2.88 | (73.1) | .30 | (7.6) | 4.00 | (101.6) | .22 | 6.7 | (3.0) |
| 200B | 8.10 | (205.7) | 7.50 | (190.5) | 6.90 | (175.3) | .25 | (6.3) | 3.88 | (98.5) | 3.80 | (96.5) | .30 | (7.6) | 5.00 | (127.0) | .26 | 12.2 | (5.5) |
| 500B | 9.00 | (228.6) | 8.24 | (207.6) | NA | NA | .35 | (8.9) | 4.62 | (117.3) | 2.50 | (63.5) | 1.56 | (39.6) | 5.62 | (142.7) | .28 | 20.0 | (9.1) |
| 750B | 9.50 | (241.3) | 8.50 | (215.9) | NA | NA | .50 | (12.7) | 5.56 | (141.2) | 6.62 | (168.1) | .50 | (12.7) | 8.00 | (203.2) | .28 | 28.5 | (12.9) |

Inside mounting hole center line dimension applicable to Blackline 60B, 100B and 200B Series only.

$B_0$ - Outside mounting hole center line. $B_1$ - Inside mounting hole center line.

# Regulated Linear Power Supplies

## SPS Blueline Series 2.0 to 144 Watts of DC Power



The "SPS Blueline" series provides 15 to 120 watts of DC power with adjustable output voltages and selectable inputs of 115/230 VAC, 47-440 Hz. Floating outputs on most models and optional OVP on most models for greater versatility.

### FEATURES

- Adjustable output voltage
- Selectable input 120/240 Vac, 50/60 Hz
- Wide operating temperature range
- Remote sense capability on each output
- Overvoltage protection available on all outputs
- Overload protection with automatic recovery
- UL Recognized, CSA Certified
- Most outputs rated SELV

### APPLICATIONS

- Personal Computers
- Instrumentation
- Control Concepts
- Data Processing
- Microprocessor Circuits
- Electronic Circuits

| CATALOG NO. | OUTPUT VDC | OUTPUT AMPS |
|---|---|---|
| SPS-3012 | 12 | 1.8 |
| SPS-6012 | 12 | 5.0 |
| SPS-12012 | 12 | 10.0 |
| **(*)** SPS-152428 | 24/28 | 0.8/0.6 |
| SPS-302428 | 24/28 | 1.2/1.0 |
| SPS-602428 | 24/28 | 2.5/2.0 |
| SPS-1202428 | 24/28 | 6.0/5.0 |

All outputs are potentiometer adjustable
(*) 120 Vac operation only

### ELECTRICAL SPECIFICATIONS

#### AC INPUT

INPUT VOLTAGE: 120/(240) Vac on most models

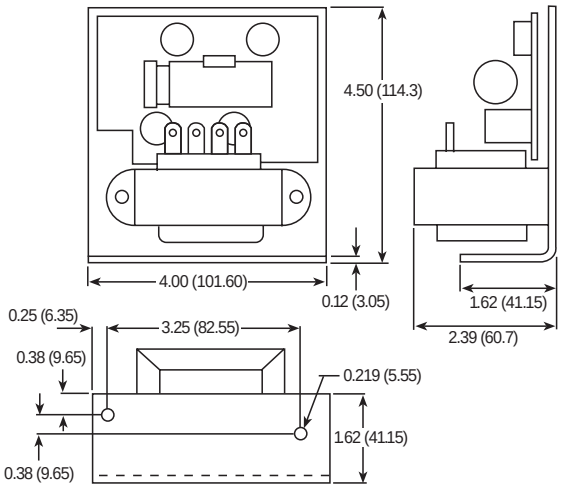
INPUT FREQUENCY: 50/60 Hz

#### DC OUTPUT

OUTPUT VOLTAGE/CURRENT: See selection chart

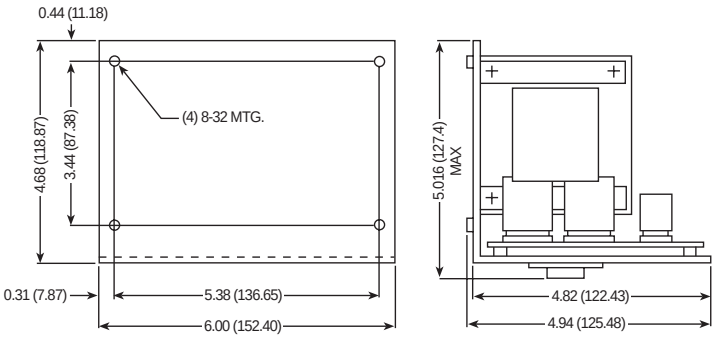
VOLTAGE ADJUSTMENT RANGE: ± 5% minimum

## SPS 15 SERIES



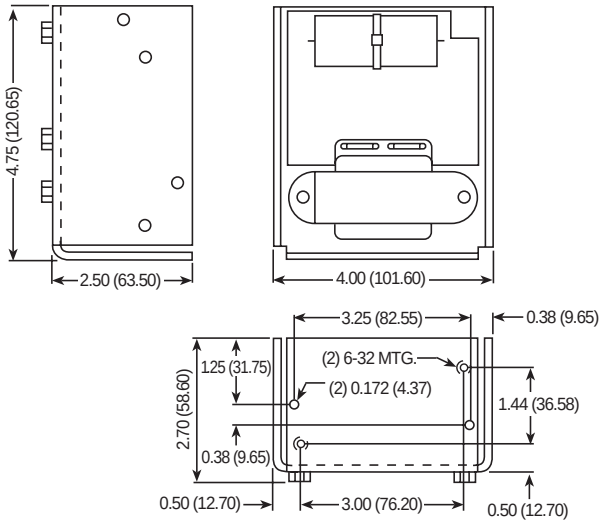

Weight: 2.14 lbs (1.3 kg)

## SPS 60 SERIES



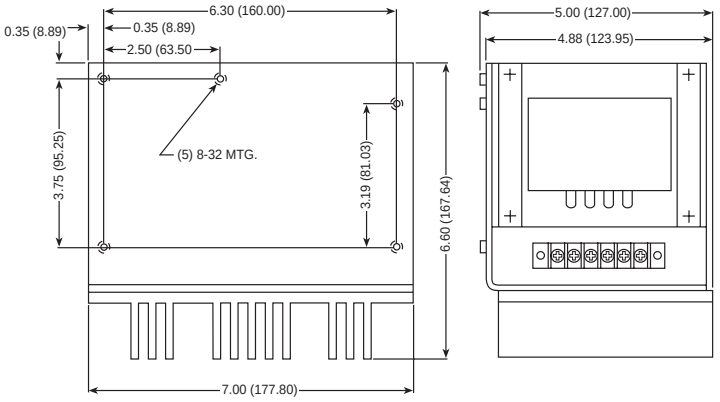

Weight: 7.1 lbs (3.2 kg)

## SPS 30 SERIES




Weight: 3.3 lbs (1.5 kg)

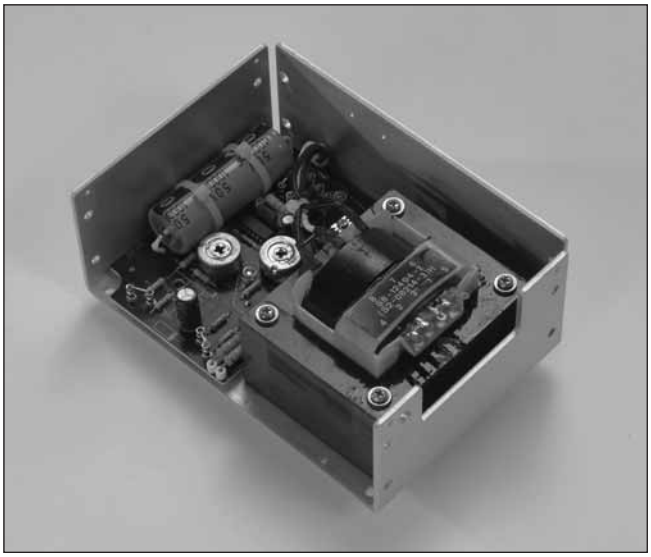
## SPS 120 SERIES




Weight: 12.4 lbs (5.6 kg)

# Regulated Linear Power Supplies

## SPW Series 15 Watts to 175 Watts



The "SPW" series regulated linear power supplies are accepted world-wide for selectable AC input voltages of 100 through 240 V and meet UL, CSA and TUV standards. These units have overload protection with automatic recovery and 100% burn-in. All 5V output models have built-in over voltage protection.

### FEATURES

- Worldwide AC input range
- Worldwide safety standards
- Industry standard package
- Built-in OVP on 5V output
- Optional OVP for other outputs
- Overload protection with automatic recovery
- 100% burn-in
- Recognized to UL, CSA Certified, and CE Listed

### APPLICATIONS

- Personal Computers
- Instrumentation
- Control Concepts
- Data Processing
- Microprocessor Circuits
- Electronic Circuits

### ELECTRICAL SPECIFICATIONS

#### AC INPUT

INPUT VOLTAGE: 100/120/220/230/240 selectable

INPUT FREQUENCY: 47 to 63 Hz typical 60 Hz

#### DC OUTPUT

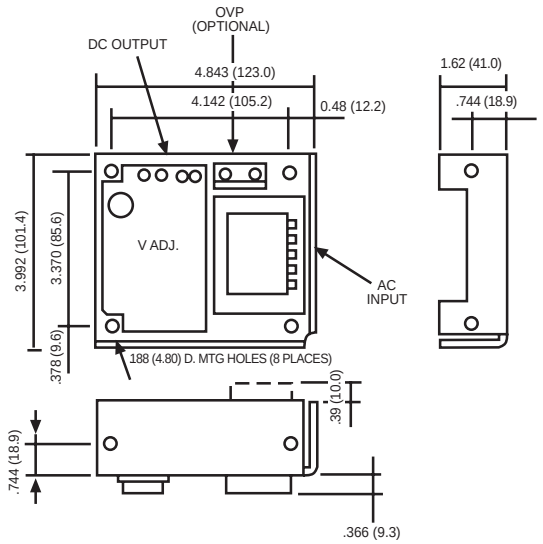
OUTPUT ADJUSTMENT RANGE: ± 5% minimum

| CATALOG NO. | OUTPUT 1 VDC | OUTPUT 1 AMPS |
|---|---|---|
| SPWS-53-OV | 5 | 3.0 |
| SPWS-1217 | 12 | 1.7 |
| SPWS-2412 | 24 | 1.2 |
| SPWS-2424 | 24 | 2.4 |
| SPWS-2436 | 24 | 3.6 |
| SPWS-2448 | 24 | 4.8 |
| SPWS-2472 | 24 | 7.2 |

### AC INPUT JUMPER INFORMATION

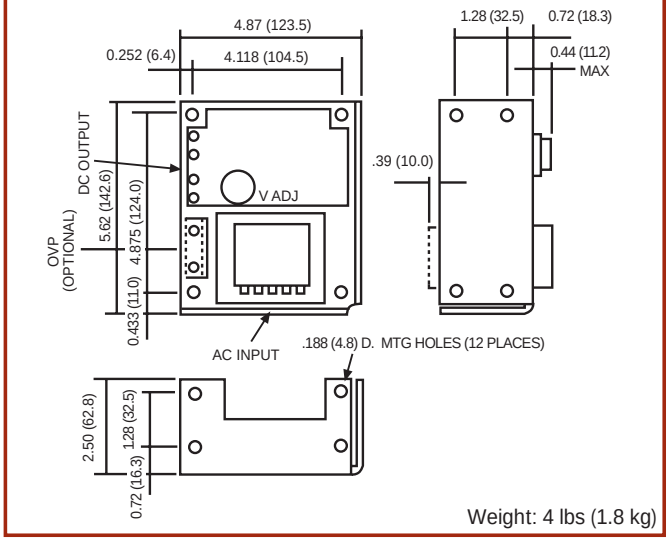
| FOR USE AT | 100Vac | 120Vac | 220Vac | 230/240Vac |
|---|---|---|---|---|
| Jumper | 1-3, 2-4 | 1-3, 2-4 | 2-3 | 2-3 |
| Apply AC | 1 & 5 | 1 & 4 | 1 & 5 | 1 & 4 |

## A CASE



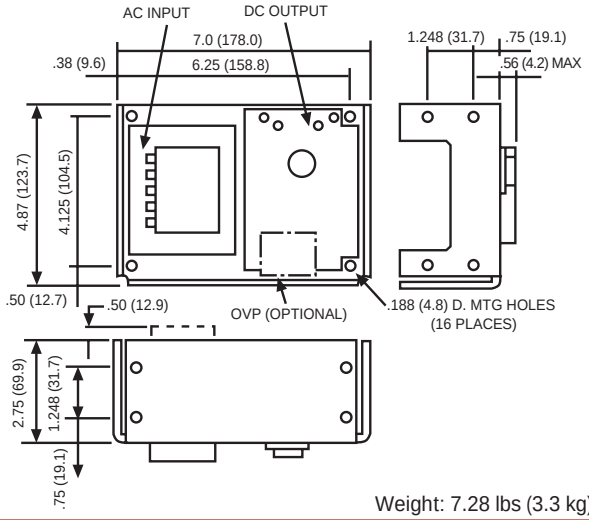

Weight: 2.43 lbs (1.1 kg)

## B CASE



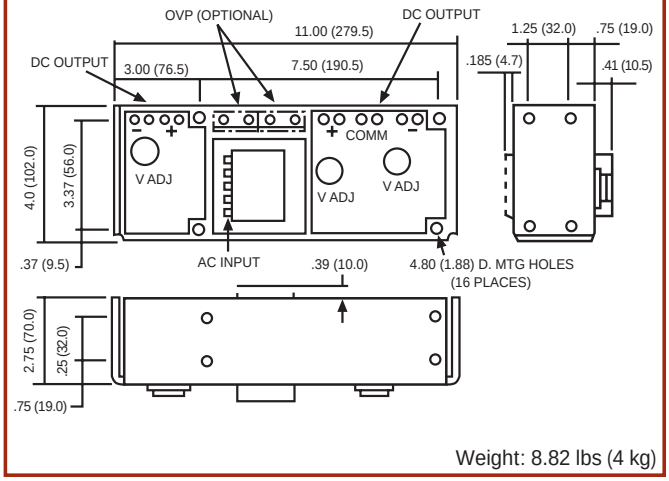

Weight: 4 lbs (1.8 kg)

## C CASE



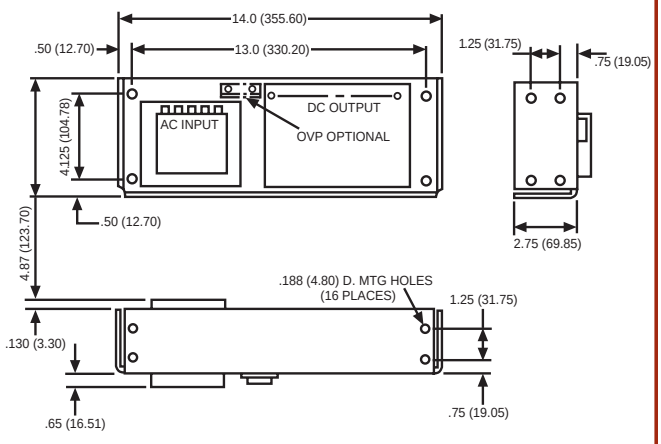

Weight: 7.28 lbs (3.3 kg)

## D CASE




Weight: 8.82 lbs (4 kg)

## E CASE




Weight: 8.82 lbs (4 kg)

**NOTE:** Dimensions are in inches (mm)

# Frequently Asked Questions

**Q** What is a power supply and what does it do?

**A** A power supply is an electronic device that converts AC line power to one or more individual DC outputs.

**Q** What is an unregulated power supply and where are they used?

**A** An unregulated power supply provides DC voltage for applications that do not require close tolerance DC output regulation. Typical applications for unregulated power supplies are DC motors, relays, and solenoids.

**Q** What is a regulated linear DC power supply and where are they used?

**A** This is a power supply that, through additional circuitry,series pass transistors and linear IC's; provides a regulated, low noise DC voltage. Typical applications are IC's, micro-processors, keyboards and disc drives.

**Q** How are the input connections made on linears?

**A** All of the linear power supplies offered require the AC input to be connected directly to the transformer.

**Q** How are the output connections made on linears?

**A** All of the output connections on the linears are via solder barrett terminals. The linears require the customer to solder directly to the turret terminals.

**Q** What is a switching power supply?

**A** This is a supply which converts the AC source to a high voltage (typically 350 VDC). This high voltage is used in turning on and off power switching transistors or MOSFETs to produce a DC current and voltage. The high voltage and high switching frequency (20 KHz to 100 KHz) allows a switchmode power supply to be more efficient. That is, it needs less AC current to produce equivalent DC current than a linear power supply, resulting in less heat and a smaller package.

**Q** Can power supplies be operated at line frequencies other than 60 Hz?

**A** Yes, the Standard Power line of DC power supplies operates on 50 to 60 Hz.

**Q** What is efficiency?

**A** Efficiency is the ratio of the output power to input power. It is generally measured at full load and nominal line conditions and expressed as a percentage.

**Q** What is overvoltage protection (OVP)?

**A** Overvoltage protection is a protection mechanism for the load circuitry that prevents the output voltage from exceeding a preset limit.

**Q** If a switcher's output shuts down the overvoltage protection circuit, can the unit turn on by itself?

**A** No, you must manually re-cycle (turn off, then turn on) the AC input power.

**Q** Do all power supplies require an AC ground?

**A** Yes, all AC input connections require a ground. On the switching power supplies, the ground is provided on the AC barrier strip or chassis. Linear power supplies have AC grounding directly on the transformer or chassis.

**Q** Can a power supply be loaded according to its wattage rating alone?

**A** No, each output on a power supply is rated for voltage and current. The power supply is selected for each application according to the voltage and current requirements.

**Q** What is meant by regulation in a power supply?

**A** Regulation is the change in value of DC output voltage resulting from a change in either the output's load or the AC line voltage.

**Q** What is a regulator?

**A** The regulator is the part of the power supply that controls the output voltage level when there is a change in the line or load.

**Q** What is remote sensing?

**A** Remote sensing is a method of moving the point of regulation from the output terminals to the load.

**Q** Why should the sense terminals be connected in either local or remote?

**A** If the sense leads are not connected, this could cause the output voltage to go high. If the output has over-voltage protection, the output will shut down.

**Q** Are there any special considerations that provisions must be made for when remote sensing?

**A** Yes, when remote sensing is used, the sense leads must be as short as possible and twisted to avoid picking up stray noise.

**Q** What is foldback current limit?

**A** Foldback current limit is a protective circuit of the power supply output. The foldback current limit is preset at 120% of the rated output current of the supply. If this output value is exceeded, the circuit folds back the current so that only 40% of the rated current is delivered. This prevents the power supply from trying to deliver more than it is capable of and overheating.

**Q** If the current limit foldback is activated, does the power supply have to be manually reset?

**A** No, the unit will reset automatically.

**Q** What would be some possible causes of a power supply overheating?

**A** **A.** Outputs overloaded.

**B.** Poor ventilation.

**C.** Improper connection on primary side of transformer.

**D.** AC input voltage too high.

**E.** Power supply is running at full load in an environment that exceeds temperature specs. The power supply should be derated.

**Q** What are floating outputs?

**A** Floating outputs are outputs on the supply that do not share a common return which enable the user to switch polarities.

**Q** What is switching frequency?

**A** Switching frequency is the rate at which the high source voltage is switched in a switching regulator.

**Q** What is the switching frequency of Standard Power switchers?

**A** 20 to 100 KHz.

**Q** What is meant by the adjustment range of the output of a power supply?

**A** The adjustment range is how much the output of the supply can be adjusted or changed from its rated output. This is expressed as a percentage and is accomplished through the use of a potentiometer.

**Q** What is ripple?

**A** Ripple or PARD, as it is sometimes referred to, is the Periodic and Random Deviation of the output voltage. This is usually noise induced from other sources.

**Q** What is hold-up time?

**A** Hold-up time is the total time an output will remain within its regulation after the input line voltage has been turned off.

**Q** What is the mean time between failure (MTBF)?

**A** The MTBF is the parameter used to compare the reliabilities of power supplies. It is expressed in hours.

**Q** Are UL designations acceptable everywhere?

**A** Not necessarily. There are similar agencies all over the world, but their specifications for safety vary. Many of Standard Power's products are certified to CSA and CE licensed by TUV for IEC and VDE.

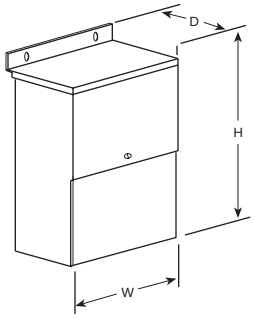
# ACME® TRANSFORMER™ GENERAL INFORMATION

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

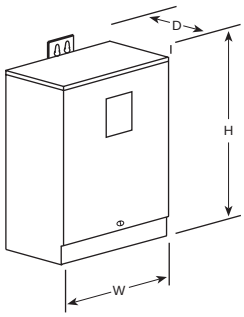
# Design Figures

## Sections I, II, III & IV

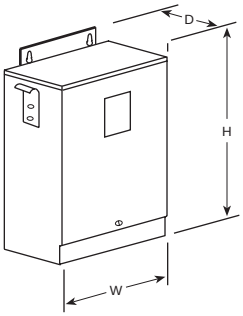
**These drawings are for reference only.**
**Contact factory for certified drawings.**



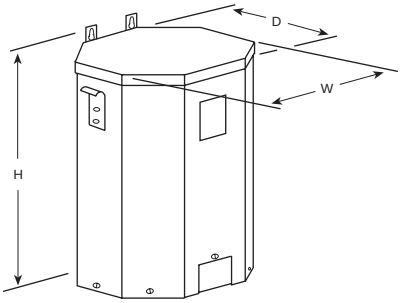

**Design A**



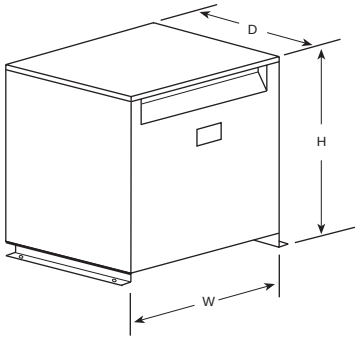

**Design B**



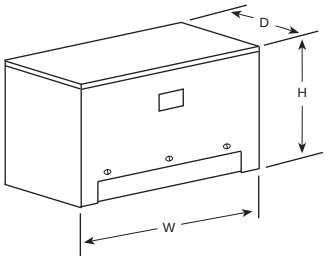

**Design C**



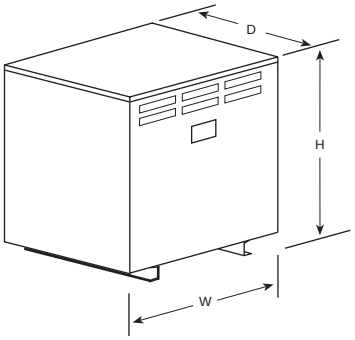

**Design D**



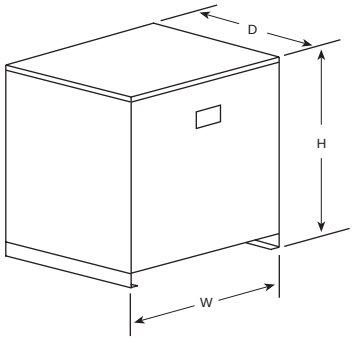

**Design E**



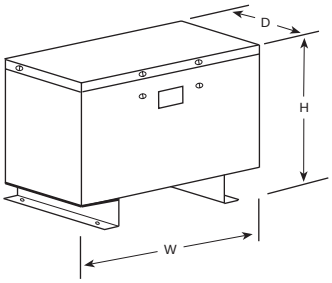

**Design F**




**Design G**




**Design H**

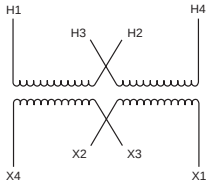



**Design I**

# Wiring Diagrams

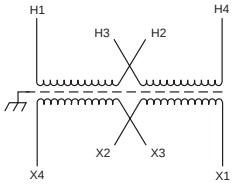
## Sections I, II, III & IV

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



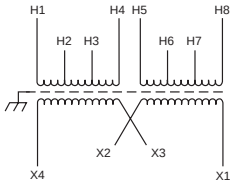

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 480 | H1-H4 | H2 to H3 | |
| 240 | H1-H3 & H2-H4 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4 |

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



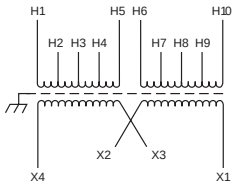

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 480 | H1-H4 | H2 to H3 | |
| 240 | H1-H3 & H2-H4 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4 |

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



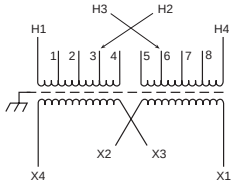

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 252 | H1-H8 | H1 to H5<br>H4 to H8 | |
| 240 | H1-H7 | H1 to H5<br>H3 to H7 | |
| 228 | H1-H6 | H1 to H5<br>H2 to H6 | |
| 504 | H1-H8 | H4 to H5 | |
| 492 | H1-H8 | H3 to H5 | |
| 480 | H1-H7 | 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<br>X2 to X4 | X1-X4 |

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



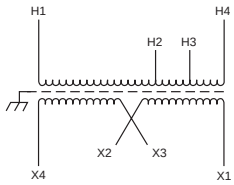

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 216 | H1-H10 | H1 to H9<br>H10 to H2 | |
| 228 | H1-H10 | H1 to H8<br>H10 to H3 | |
| 240 | H1-H10 | H1 to H7<br>H10 to H4 | |
| 252 | H1-H10 | H1 to H6<br>H10 to H5 | |
| 432 | H1-H10 | H2 to 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<br>X2 to X4 | X1-X4 |

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



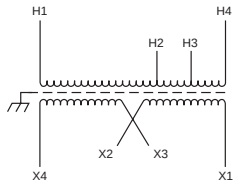

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 216 | H1-H4 | H1, H3, 8 &<br>H2, H4, 1 | |
| 228 | H1-H4 | H1, H3, 7 &<br>H2, H4, 2 | |
| 240 | H1-H4 | H1, H3, 6 &<br>H2, H4, 3 | |
| 252 | H1-H4 | H1, H3, 5 &<br>H2, H4, 4 | |
| 432 | H1-H4 | 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<br>X2 to X4 | X1-X4 |

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



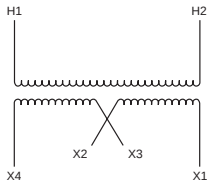

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 208 | H1 & H4 | | |
| 198 | H1 & H3 | | |
| 187 | H1 & H2 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 |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

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



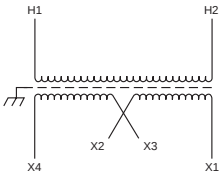

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 277 | H1 & H4 | | |
| 263 | H1 & H3 | | |
| 250 | H1 & H2 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 |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

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



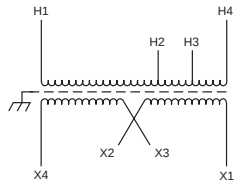

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1-H2 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4 |

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



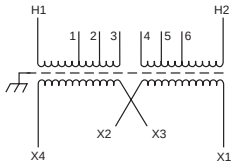

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1-H2 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4 |

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



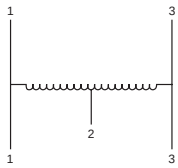

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1-H4 | | |
| 570 | H1-H3 | | |
| 540 | H1-H2 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4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

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



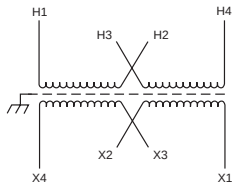

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 540 | H1-H2 | 1-6 | |
| 555 | H1-H2 | 1-5 | |
| 570 | H1-H2 | 2-6 | |
| 585 | H1-H2 | 2-5 | |
| 600 | H1-H2 | 3-5 | |
| 615 | H1-H2 | 2-4 | |
| 635 | H1-H2 | 3-4 | |
| **Secondary Volts** | |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

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



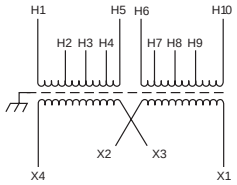

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 240 | 1-3 | | |
| **Secondary Volts** | | | |
| 240 | | | 1-3 |
| 120 | | | 1-2 or 2-3 |
| 120/240 | | | 1-2-3 |

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



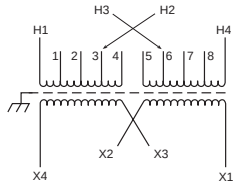

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 240 | H1-H4 | H2 to H3 | |
| 120 | H1-H3 &<br>H2-H4 | | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4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

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



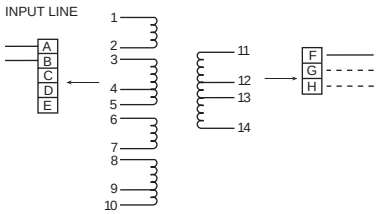

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 190 | H1 & H7 | H1 to H6<br>H2 to H7 | |
| 200 | H1 & H8 | H1 to H6<br>H3 to H8 | |
| 208 | H1 & H9 | H1 to H6<br>H4 to H9 | |
| 220 | H1 & H10 | H1 to H6<br>H5 to H10 | |
| 380 | H1 & H7 | H2 & 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<br>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<br>X2 to X4 | X1-X4 |

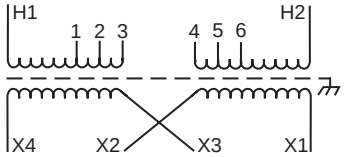
## 16 POWER LINE CONDITIONER




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

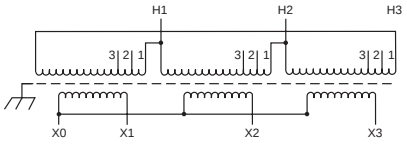
**NOTE:** To prevent externally shorting, all leads marked "INSULATE" must be individually capped with wire nuts or equivalent. Insulate leads individually!

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



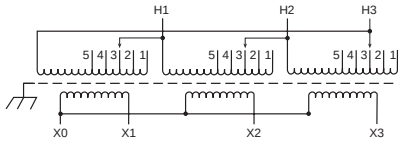

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 218 | H1 & H2 | 3 to 4 | |
| 213 | H1 & H2 | 2 to 4 | |
| 208 | H1 & H2 | 3 to 5 | |
| 203 | H1 & H2 | 2 to 5 | |
| 198 | H1 & H2 | 1 to 5 | |
| 192 | H1 & H2 | 2 to 6 | |
| 187 | H1 & H2 | 1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

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



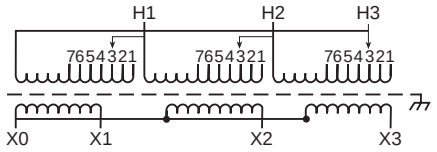

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 240 | H1, H2, H3 | 1 | |
| 228 | H1, H2, H3 | 2 | |
| 216 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

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



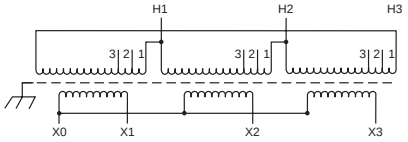

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 252 | H1, H2, H3 | 1 | |
| 246 | H1, H2, H3 | 2 | |
| 240 | H1, H2, H3 | 3 | |
| 234 | H1, H2, H3 | 4 | |
| 228 | H1, H2, H3 | 5 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 20 PRIMARY: 380 Volts Delta
**SECONDARY: 220Y/127 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



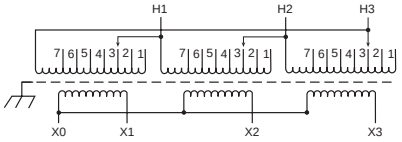

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 399 | H1, H2, H3 | 1 | |
| 390 | H1, H2, H3 | 2 | |
| 380 | H1, H2, H3 | 3 | |
| 371 | H1, H2, H3 | 4 | |
| 361 | H1, H2, H3 | 5 | |
| 352 | H1, H2, H3 | 6 | |
| 342 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 220 | | | X1, X2,X3 |
| 127<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 21 PRIMARY: 480 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 2, 5% BNFC



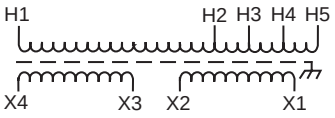

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 480 | H1, H2, H3 | 1 | |
| 456 | H1, H2, H3 | 2 | |
| 432 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 22 PRIMARY: 480 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 2, 2½% ANFC, 4, 2½% BNFC



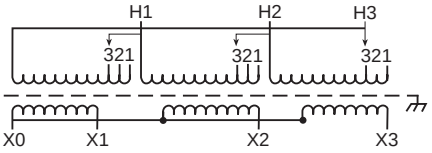

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 | |
| 492 | H1, H2, H3 | 2 | |
| 480 | H1, H2, H3 | 3 | |
| 468 | H1, H2, H3 | 4 | |
| 456 | H1, H2, H3 | 5 | |
| 444 | H1, H2, H3 | 6 | |
| 432 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 23 PRIMARY: 120/208/240/277 Volts SECONDARY: 120/240 Volts



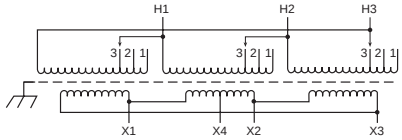

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 277 | H1, H5 | | |
| 240 | H1, H4 | | |
| 208 | H1, H3 | | |
| 120 | H1, H2 | | |
| **Secondary Volts** | | | |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 240 | | X2 to X3 | X1-X4 |

## 24 PRIMARY: 380 Volts Delta SECONDARY: 220Y/127 Volts TAPS: 2, 5% BNFC



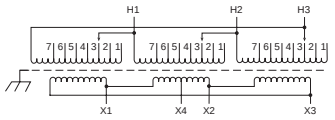

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 380 | H1, H2, H3 | 1 | |
| 361 | H1, H2, H3 | 2 | |
| 342 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 220 | | | X1, X2, X3 |
| 127<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 25 PRIMARY: 480 Volts Delta SECONDARY: 240 Volts Delta/120 Volts TAPS: 2, 5% BNFC



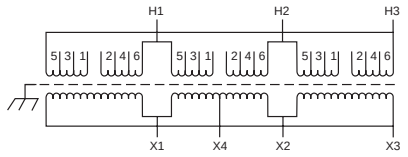

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 480 | H1, H2, H3 | 1 | |
| 456 | H1, H2, H3 | 2 | |
| 432 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 240 | | | X1, X2, X3 |
| 120 | | | X1, X4 or<br>X2, X4 |

## 26 PRIMARY: 480 Volts Delta SECONDARY: 240 Volts Delta/120 Volts TAPS: 2, 2½% ANFC, 4, 2½% BNFC



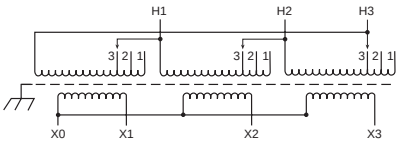

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 | |
| 492 | H1, H2, H3 | 2 | |
| 480 | H1, H2, H3 | 3 | |
| 468 | H1, H2, H3 | 4 | |
| 456 | H1, H2, H3 | 5 | |
| 444 | H1, H2, H3 | 6 | |
| 432 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 240 | | | X1, X2, X3 |
| 120 | | | X1, X4 or<br>X2, X4 |

## 27 PRIMARY: 480 Volts Delta SECONDARY: 240 Volts Delta/120 Volts TAPS: 2, 2½% ANFC, 4, 2½% BNFC



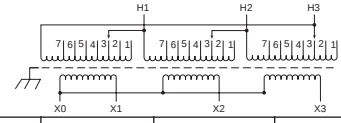

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 to 2 | |
| 492 | H1, H2, H3 | 2 to 3 | |
| 480 | H1, H2, H3 | 1 to 4 | |
| 468 | H1, H2, H3 | 3 to 4 | |
| 456 | H1, H2, H3 | 1 to 6 | |
| 444 | H1, H2, H3 | 3 to 6 | |
| 432 | H1, H2, H3 | 5 to 6 | |
| **Secondary Volts** | | | |
| 240 | | | X1, X2, X3 |
| 120 | | | X1, X4 or<br>X2, X4 |

## 28 PRIMARY: 600 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 2, 5% BNFC



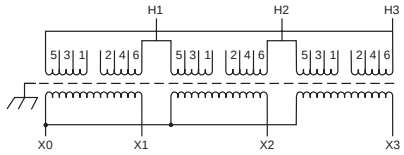

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1, H2, H3 | 1 | |
| 570 | H1, H2, H3 | 2 | |
| 540 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 29 PRIMARY: 600 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 2, 2½% ANFC, 4, 2½% BNFC



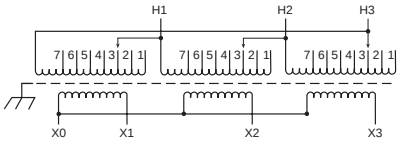

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 630 | H1, H2, H3 | 1 | |
| 615 | H1, H2, H3 | 2 | |
| 600 | H1, H2, H3 | 3 | |
| 585 | H1, H2, H3 | 4 | |
| 570 | H1, H2, H3 | 5 | |
| 555 | H1, H2, H3 | 6 | |
| 540 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 30
**PRIMARY: 600 Volts Delta**
**SECONDARY: 208Y/120 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



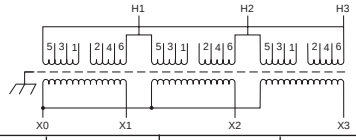

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 630 | H1, H2, H3 | 1 to 2 | |
| 615 | H1, H2, H3 | 2 to 3 | |
| 600 | H1, H2, H3 | 1 to 4 | |
| 585 | H1, H2, H3 | 3 to 4 | |
| 570 | H1, H2, H3 | 1 to 6 | |
| 555 | H1, H2, H3 | 3 to 6 | |
| 540 | H1, H2, H3 | 5 to 6 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 31
**PRIMARY: 480 Volts Delta**
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



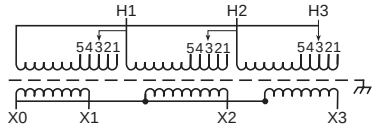

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 | |
| 492 | H1, H2, H3 | 2 | |
| 480 | H1, H2, H3 | 3 | |
| 468 | H1, H2, H3 | 4 | |
| 456 | H1, H2, H3 | 5 | |
| 444 | H1, H2, H3 | 6 | |
| 432 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 480 | | | X1, X2, X3 |
| 277 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 32
**PRIMARY: 480 Volts Delta**
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



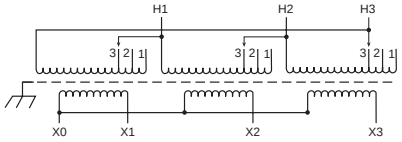

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 to 2 | |
| 492 | H1, H2, H3 | 2 to 3 | |
| 480 | H1, H2, H3 | 1 to 4 | |
| 468 | H1, H2, H3 | 3 to 4 | |
| 456 | H1, H2, H3 | 1 to 6 | |
| 444 | H1, H2, H3 | 3 to 6 | |
| 432 | H1, H2, H3 | 5 to 6 | |
| **Secondary Volts** | | | |
| 480 | | | X1, X2, X3 |
| 277 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 33
**PRIMARY: 380 Volts Delta**
**SECONDARY: 208/120 Volts**
**TAPS: 2-2½% ANFC and BNFC**



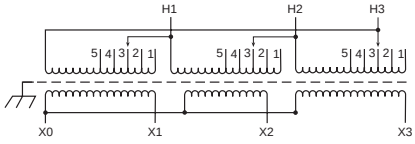

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 399 | H1, H2, H3 | 1 | |
| 390 | H1, H2, H3 | 2 | |
| 380 | H1, H2, H3 | 3 | |
| 371 | H1, H2, H3 | 4 | |
| 361 | H1, H2, H3 | 5 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 34
**PRIMARY: 460 Volts Delta**
**SECONDARY: 460Y/266 Volts**
**TAPS: 1-5% ANFC and BNFC**



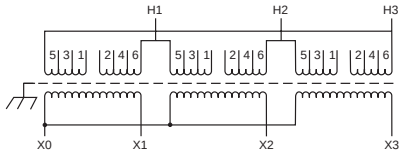

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 483 | 105 | 1 |
| 460 | 100 | 2 |
| 437 | 95 | 3 |
| **Secondary Volts** | | |
| 460 | | X1, X2, X3 |
| 266 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 35
**PRIMARY: 460 Volts Delta**
**SECONDARY: 460Y/266 Volts**
**TAPS: 2-2½% ANFC and BNFC**



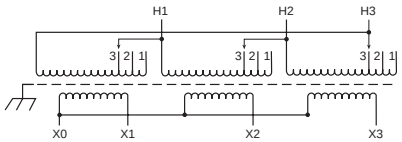

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 483 | 105 | 1 |
| 472 | 102.5 | 2 |
| 460 | 100 | 3 |
| 449 | 97.5 | 4 |
| 437 | 95 | 5 |
| **Secondary Volts** | | |
| 460 | | X1, X2, X3 |
| 266 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 36
**PRIMARY: 460 Volts Delta**
**SECONDARY: 460Y/266 Volts**
**TAPS: 2-2½% ANFC and BNFC**



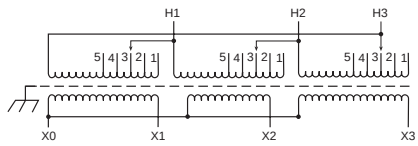

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 483 | 105 | 1 to 2 |
| 472 | 102.5 | 2 to 3 |
| 460 | 100 | 1 to 4 |
| 449 | 97.5 | 3 to 4 |
| 437 | 95 | 4 to 5 |
| **Secondary Volts** | | |
| 460 | | X1, X2, X3 |
| 266 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 37
**PRIMARY: 460 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 1-5% ANFC and BNFC**



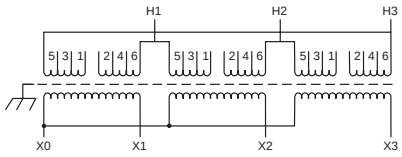

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 483 | 105 | 1 |
| 460 | 100 | 2 |
| 437 | 95 | 3 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 38
**PRIMARY: 460 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 2-2½% ANFC and BNFC**



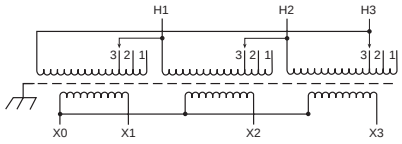

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 483 | 105 | 1 |
| 472 | 102.5 | 2 |
| 460 | 100 | 3 |
| 449 | 97.5 | 4 |
| 437 | 95 | 5 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 39
**PRIMARY: 460 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 2-2½% ANFC and BNFC**



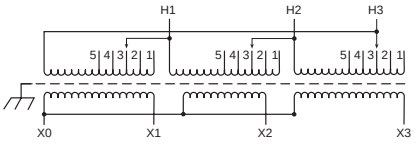

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 483 | 105 | 1 to 2 |
| 472 | 102.5 | 2 to 3 |
| 460 | 100 | 1 to 4 |
| 449 | 97.5 | 3 to 4 |
| 437 | 95 | 4 to 5 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 40
**PRIMARY: 575 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 1-5% ANFC and BNFC**



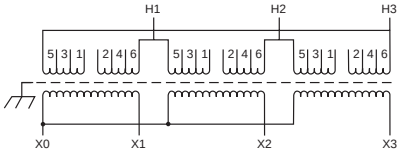

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 604 | 105 | 1 |
| 575 | 100 | 2 |
| 546 | 95 | 3 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 41
**PRIMARY: 575 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 2-2½% ANFC and BNFC**



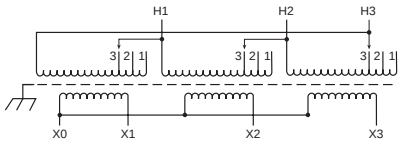

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 604 | 105 | 1 |
| 589 | 102.5 | 2 |
| 575 | 100 | 3 |
| 561 | 97.5 | 4 |
| 546 | 95 | 5 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 42
**PRIMARY: 575 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 2-2½% ANFC and BNFC**



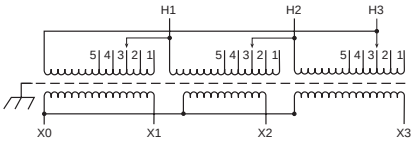

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 604 | 105 | 1 to 2 |
| 589 | 102.5 | 2 to 3 |
| 575 | 100 | 1 to 4 |
| 561 | 97.5 | 3 to 4 |
| 546 | 95 | 4 to 5 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 43
**PRIMARY: 575 Volts Delta**
**SECONDARY: 460Y/266 Volts**
**TAPS: 1-5% ANFC and BNFC**



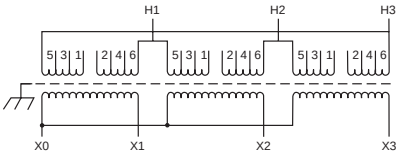

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 604 | 105 | 1 |
| 575 | 100 | 2 |
| 546 | 95 | 3 |
| **Secondary Volts** | | |
| 460 | | X1, X2, X3 |
| 266 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 44
**PRIMARY: 575 Volts Delta**
**SECONDARY: 460Y/266 Volts**
**TAPS: 2-2½% ANFC and BNFC**



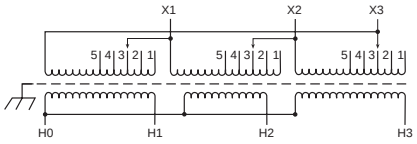

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 604 | 105 | 1 |
| 589 | 102.5 | 2 |
| 575 | 100 | 3 |
| 561 | 97.5 | 4 |
| 546 | 95 | 5 |
| **Secondary Volts** | | |
| 460 | | X1, X2, X3 |
| 266 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 45
**PRIMARY: 575 Volts Delta**
**SECONDARY: 460Y/266 Volts**
**TAPS: 2-2½% ANFC and BNFC**



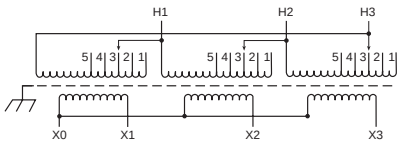

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 604 | 105 | 1 to 2 |
| 589 | 102.5 | 2 to 3 |
| 575 | 100 | 1 to 4 |
| 561 | 97.5 | 3 to 4 |
| 546 | 95 | 4 to 5 |
| **Secondary Volts** | | |
| 460 | | X1, X2, X3 |
| 266 1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 46
**PRIMARY: 208 Volts Delta**
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 2½% ANFC, 2, 2½% BNFC**



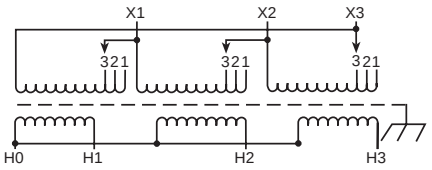

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 218 | X1, X2, X3 | 1 | |
| 213 | X1, X2, X3 | 2 | |
| 208 | X1, X2, X3 | 3 | |
| 203 | X1, X2, X3 | 4 | |
| 198 | X1, X2, X3 | 5 | |
| **Secondary Volts** | | | |
| 480 | | | H1, H2, H3 |
| 277 1 phase | | | H1 to H0<br>H2 to H0<br>H3 to H0 |

## 47
**PRIMARY: 416 Volts Delta**
**SECONDARY: 208Y/120 Volts**
**TAPS: 2, 2½% ANFC, 2, 2½% BNFC**



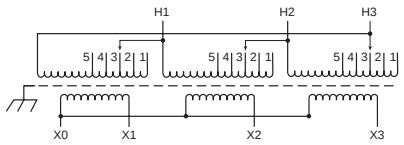

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 437 | H1, H2, H3 | 1 | |
| 426 | H1, H2, H3 | 2 | |
| 416 | H1, H2, H3 | 3 | |
| 406 | H1, H2, H3 | 4 | |
| 395 | H1, H2, H3 | 5 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 48
**PRIMARY: 208 Volts Delta**
**SECONDARY: 480Y/ 277 Volts**
**TAPS: 2, 5% BNFC**



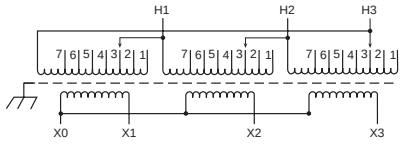

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 208 | X1, X2, X3 | 1 | |
| 198 | X1, X2, X3 | 2 | |
| 187 | X1, X2, X3 | 3 | |
| **Secondary Volts** | | | |
| 480 | | | H1, H2, H3 |
| 277<br>1 phase | | | H1 to H0<br>H2 to H0<br>H3 to H0 |

## 49
**PRIMARY: 600 Volts Delta**
**SECONDARY: 208Y/120 Volts**
**TAPS: 2, 2½% ANFC, 2, 2½% BNFC**



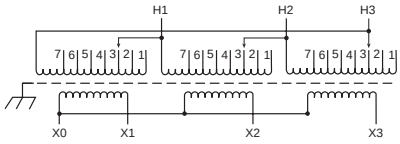

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 630 | H1, H2, H3 | 1 | |
| 615 | H1, H2, H3 | 2 | |
| 600 | H1, H2, H3 | 3 | |
| 585 | H1, H2, H3 | 4 | |
| 570 | H1, H2, H3 | 5 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 50
**PRIMARY: 600 Volts Delta**
**SECONDARY: 380Y/220 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



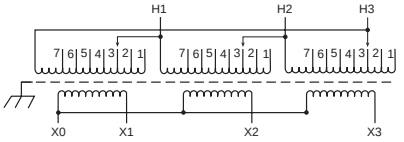

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 630 | H1, H2, H3 | 1 | |
| 615 | H1, H2, H3 | 2 | |
| 600 | H1, H2, H3 | 3 | |
| 585 | H1, H2, H3 | 4 | |
| 570 | H1, H2, H3 | 5 | |
| 555 | H1, H2, H3 | 6 | |
| 540 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 380 | | | X1, X2, X3 |
| 220<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 51
**PRIMARY: 600 Volts Delta**
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



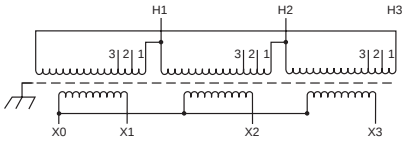

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 630 | H1, H2, H3 | 1 | |
| 615 | H1, H2, H3 | 2 | |
| 600 | H1, H2, H3 | 3 | |
| 585 | H1, H2, H3 | 4 | |
| 570 | H1, H2, H3 | 5 | |
| 555 | H1, H2, H3 | 6 | |
| 540 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 480 | | | X1, X2, X3 |
| 277<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 52
**PRIMARY: 600 Volts Delta**
**SECONDARY: 600Y/347 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



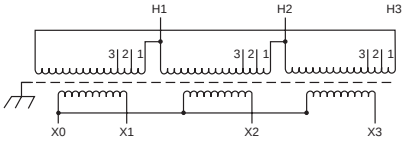

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 630 | H1, H2, H3 | 1 | |
| 615 | H1, H2, H3 | 2 | |
| 600 | H1, H2, H3 | 3 | |
| 585 | H1, H2, H3 | 4 | |
| 570 | H1, H2, H3 | 5 | |
| 555 | H1, H2, H3 | 6 | |
| 540 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 600 | | | X1, X2, X3 |
| 347<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 53
**PRIMARY: 600 Volts Delta**
**SECONDARY: 380Y/220 Volts**
**TAPS: 2, 5% BNFC**



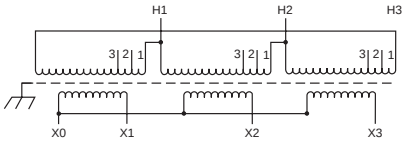

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1, H2, H3 | 1 | |
| 570 | H1, H2, H3 | 2 | |
| 540 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 380 | | | X1, X2, X3 |
| 220<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 54
**PRIMARY: 600 Volts Delta**
**SECONDARY: 600Y/347 Volts**
**TAPS: 2, 5% BNFC**



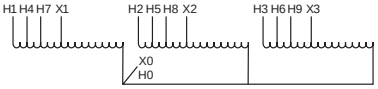

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1, H2, H3 | 1 | |
| 570 | H1, H2, H3 | 2 | |
| 540 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 600 | | | X1, X2, X3 |
| 347<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 55
**PRIMARY: 600 Volts Delta**
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 5% BNFC**



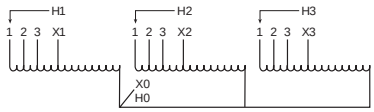

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 600 | H1, H2, H3 | 1 | |
| 570 | H1, H2, H3 | 2 | |
| 540 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 480 | | | X1, X2, X3 |
| 277<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 56
**PRIMARY: 600 Volts**
**SECONDARY: 480 Volts**
**TAPS: 2, 5% BNFC**



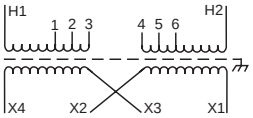

| Primary Volts | Alt Rating | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|---|
| 600 | 480 | H1, H2, H3 | | |
| 570 | 456 | H4, H5, H6 | | |
| 540 | 432 | H7, H8, H9 | | |
| **Secondary Volts** | | | | |
| 480 | 380 | | | X1, X2, X3 |
| 277<br>1 phase | 220<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 57
**PRIMARY: 600 Volts**
**SECONDARY: 480 Volts**
**TAPS: 2, 5% BNFC**



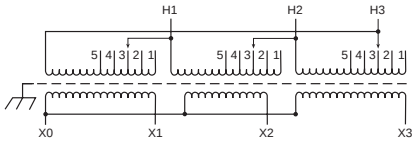

| Primary Volts | Alt Rating | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|---|
| 600 | 480 | H1, H2, H3 | 1 | |
| 570 | 456 | H1, H2, H3 | 2 | |
| 540 | 432 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | | |
| 480 | 380 | | | X1, X2, X3 |
| 277<br>1 phase | 220<br>1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 58
**PRIMARY: 208 Volts**
**SECONDARY: 120/240 Volts**
**TAPS: 2, 5% BNFC**



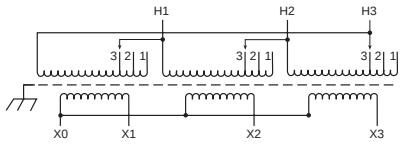

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 208 | H1 & H2 | 3 to 4 | |
| 198 | H1 & H2 | 2 to 5 | |
| 187 | H1 & H2 | 1 to 6 | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1-X4 |
| 120/240 | | X2 to X3 | X1-X2-X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1-X4 |

## 59
**PRIMARY: 230 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 2-2½% ANFC and 2-2½% BNFC**



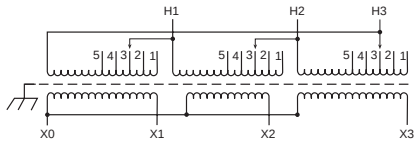

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 242 | 105 | 1 |
| 236 | 102.5 | 2 |
| 230 | 100 | 3 |
| 224 | 97.5 | 4 |
| 219 | 95 | 5 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133<br>1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 60
**PRIMARY: 208 Volts Delta**
**SECONDARY: 208Y/120 Volts**
**TAPS: 2-5% BNFC**



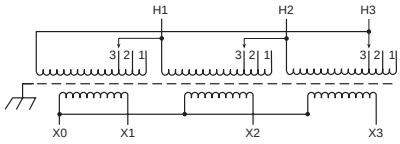

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 208 | 100 | 1 |
| 198 | 95 | 2 |
| 187 | 90 | 3 |
| **Secondary Volts** | | |
| 208 | | X1, X2, X3 |
| 120<br>1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 61
**PRIMARY: 208 Volts Delta**
**SECONDARY: 208Y/120 Volts**
**TAPS: 2-2½% ANFC and 2-2½% BNFC**



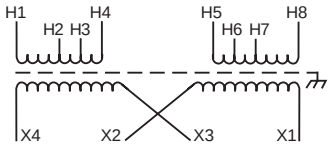

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 218 | 105 | 1 |
| 213 | 102.5 | 2 |
| 208 | 100 | 3 |
| 203 | 97.5 | 4 |
| 198 | 95 | 5 |
| **Secondary Volts** | | |
| 208 | | X1, X2, X3 |
| 120<br>1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 62
**PRIMARY: 230 Volts Delta**
**SECONDARY: 230Y/133 Volts**
**TAPS: 1-5% ANFC and 1-5% BNFC**



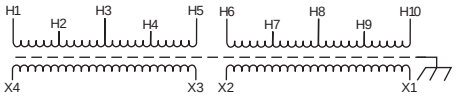

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 241 | 105 | 1 |
| 230 | 100 | 2 |
| 218 | 95 | 3 |
| **Secondary Volts** | | |
| 230 | | X1, X2, X3 |
| 133<br>1 phase | | X1 & X0<br>X2 & X0<br>X3 & X0 |

## 63
**PRIMARY: 120/208/240/277 Volts**
**SECONDARY: 120/240 Volts**



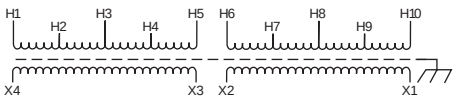

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 120 | H1 & H8 | H1 to H6<br>H3 to H8 | |
| 208 | H1 & H8 | H2 to H7 | |
| 240 | H1 & H8 | H3 to H6 | |
| 277 | H1 & H8 | H4 to H5 | |
| **Secondary Volts** | | | |
| 240 | | X2 to X3 | X1 & X4 |
| 120/240 | | X2 to X3 | X1, X3, X4 |
| 120 | | X1 to X3<br>X2 to X4 | X1 & X4 |

## 64
**PRIMARY: 190/208/220/240 x 380/440/480 Volts**
**SECONDARY: 120/240 Volts**



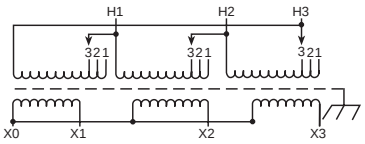

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 190 | H1& H7 | H1 to H6<br>H2 to H7 | |
| 208 | H1 & H8 | H1 to H6<br>H3 to H8 | |
| 220 | H1 & H9 | H1 to H6<br>H4 to H9 | |
| 240 | H1& H10 | H1 to H6<br>H5 to H10 | |
| 380 | H1 & H7 | H2 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<br>X2 to X4 | X1 - X4 |

## 65
**PRIMARY: 190/200/208/220 x 380/400/416/440 Volts**
**SECONDARY: 110/220 Volts**



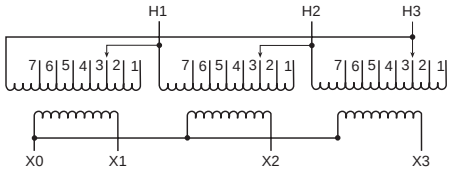

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 190 | H1 & H7 | H1 to H6<br>H2 to H7 | |
| 200 | H1 & H8 | H1 to H6<br>H3 to H8 | |
| 208 | H1 & H9 | H1 to H6<br>H4 to H9 | |
| 220 | H1 & H10 | H1 to H6<br>H5 to H10 | |
| 380 | H1 & H7 | H2 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<br>X2 to X4 | X1-X4 |

## 66 PRIMARY: 416 Volts Delta
**SECONDARY: 208Y/120 Volts**
**TAPS: 2, 5% BNFC**



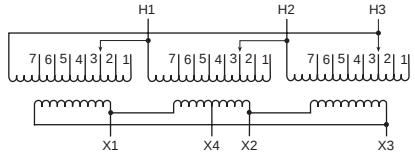

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 437 | H1, H2, H3 | 1 | |
| 416 | H1, H2, H3 | 2 | |
| 395 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 67 PRIMARY: 480 Volts Delta
**SECONDARY: 208Y/120 Volts**
**TAPS: 2-2½% ANFC, 4, 2½% BNFC**



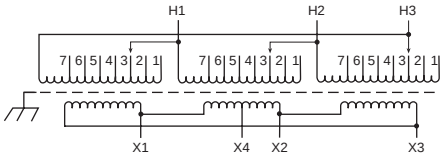

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 | |
| 492 | H1, H2, H3 | 2 | |
| 480 | H1, H2, H3 | 3 | |
| 468 | H1, H2, H3 | 4 | |
| 456 | H1, H2, H3 | 5 | |
| 444 | H1, H2, H3 | 6 | |
| 432 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 68 PRIMARY: 480 Volts Delta
**SECONDARY: 240 Volts Delta/120 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



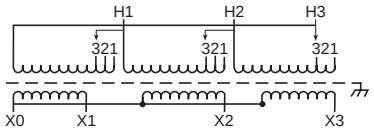

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 | |
| 492 | H1, H2, H3 | 2 | |
| 480 | H1, H2, H3 | 3 | |
| 468 | H1, H2, H3 | 4 | |
| 456 | H1, H2, H3 | 5 | |
| 444 | H1, H2, H3 | 6 | |
| 432 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 240 | | | X1, X2, X4 |
| 120 | | | X1, X4, or<br>X2, X4 |

## 69 PRIMARY: 600 Volts Delta
**SECONDARY: 240 Delta/120 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



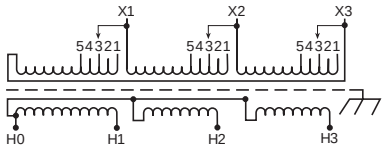

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 630 | 105 | 1 |
| 615 | 102.5 | 2 |
| 600 | 100 | 3 |
| 585 | 97.5 | 4 |
| 570 | 95 | 5 |
| 555 | 92.5 | 6 |
| 540 | 90 | 7 |
| **Secondary Volts** | | |
| 240 | | X1, X2, X3 |
| 120 | | X1, X4, or<br>X2, X4 |

## 70 PRIMARY: 240 Volts Delta
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 5% BNFC**



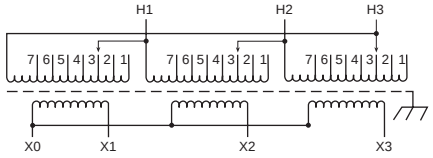

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 240 | 100 | 1 |
| 228 | 95 | 2 |
| 216 | 90 | 3 |
| **Secondary Volts** | | |
| 480 | | X1, X2, X3 |
| 277 1 phase | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 71 PRIMARY: 240 Volts Delta
**SECONDARY: 480Y/277 Volts**
**TAPS: 2, 2½% ANFC & BNFC**



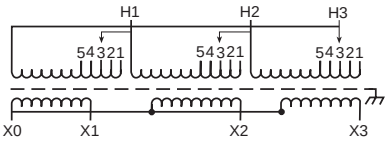

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 252 | X1, X2, X3 | 1 | |
| 246 | X1, X2, X3 | 2 | |
| 240 | X1, X2, X3 | 3 | |
| 234 | X1, X2, X3 | 4 | |
| 228 | X1, X2, X3 | 5 | |
| **Secondary Volts** | | | |
| 480 | | | H1, H2, H3 |
| 277 1 phase | | | H1 to H0<br>H2 to H0<br>H3 to H0 |

## 72 PRIMARY: 380 Volts Delta
**SECONDARY: 208Y/120 Volts**
**TAPS: 2, 2½% ANFC, 4, 2½% BNFC**



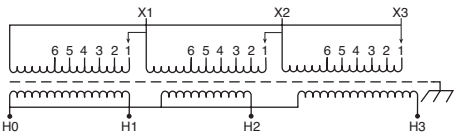

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 399 | 105 | 1 |
| 390 | 102.5 | 2 |
| 380 | 100 | 3 |
| 371 | 97.5 | 4 |
| 361 | 95 | 5 |
| 352 | 92.5 | 6 |
| 342 | 90 | 7 |
| **Secondary Volts** | | |
| 208 | | X1, X2, X3 |
| 120 1 phase | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 73 PRIMARY: 440 Volts Delta
**SECONDARY: 220Y/127 Volts**
**TAPS: 2, 5% ANFC & BNFC**



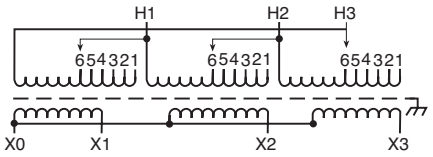

| Primary Volts | % | Connect Leads to Tap No. |
|---|---|---|
| 484 | 110 | 1 |
| 462 | 105 | 2 |
| 440 | 100 | 3 |
| 418 | 95 | 4 |
| 396 | 90 | 5 |
| **Secondary Volts** | | |
| 220 | | X1, X2, X3 |
| 127 1 phase | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 74 PRIMARY: 190/200/210/220/230/240 Volts Delta SECONDARY: 400Y/231 Volts



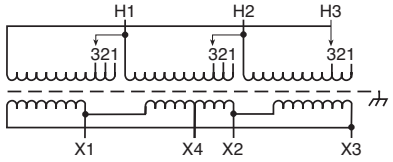

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 240 | X1, X2, X3 | 1 | |
| 230 | X1, X2, X3 | 2 | |
| 220 | X1, X2, X3 | 3 | |
| 210 | X1, X2, X3 | 4 | |
| 200 | X1, X2, X3 | 5 | |
| 190 | X1, X2, X3 | 6 | |
| **Secondary Volts** | | | |
| 400 | | | H1, H2, H3 |
| 231 1 phase | | | H1 to H0<br>H2 to H0<br>H3 to H0 |

## 75 PRIMARY: 190/200/210/220/230/240 Volts Delta SECONDARY: 400Y/231 Volts



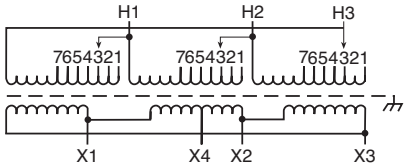

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 240 | H1, H2, H3 | 1 | |
| 230 | H1, H2, H3 | 2 | |
| 220 | H1, H2, H3 | 3 | |
| 210 | H1, H2, H3 | 4 | |
| 200 | H1, H2, H3 | 5 | |
| 190 | H1, H2, H3 | 6 | |
| **Secondary Volts** | | | |
| 400 | | | X1, X2, X3 |
| 231 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 76 PRIMARY: 400 Volts Delta SECONDARY: 240 Volts Delta/120 Volts TAPS: 2, 5% BNFC



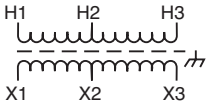

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 400 | H1, H2, H3 | 1 | |
| 380 | H1, H2, H3 | 2 | |
| 360 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 240 | | | X1, X2, X3 |
| 120 | | | X1 to X4 or X2 to X4 |

## 77 PRIMARY: 400 Volts Delta SECONDARY: 240 Delta/120 Volts TAPS: 2, 2 ½% ANFC, 4, 2 ½% BNFC



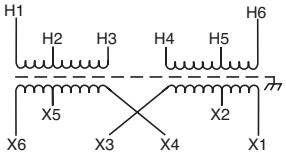

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 420 | H1, H2, H3 | 1 | |
| 410 | H1, H2, H3 | 2 | |
| 400 | H1, H2, H3 | 3 | |
| 390 | H1, H2, H3 | 4 | |
| 380 | H1, H2, H3 | 5 | |
| 370 | H1, H2, H3 | 6 | |
| 360 | H1, H2, H3 | 7 | |
| **Secondary Volts** | | | |
| 240 | | | X1, X2, X3 |
| 120 | | | X1 to X4 or X2 to X4 |

## 78 PRIMARY: 277/480 Volts SECONDARY: 208/277 Volts TAPS: NONE



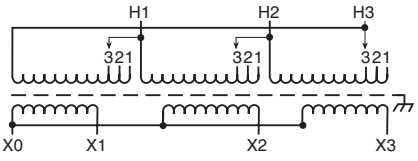

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 277 | H1 & H2 | | |
| 480 | H1 & H3 | | |
| **Secondary Volts** | | | |
| 208 | | | X1 to X2 |
| 277 | | | X1 to X3 |

## 79 PRIMARY: 277/480 Volts SECONDARY: 208/277 Volts TAPS: NONE



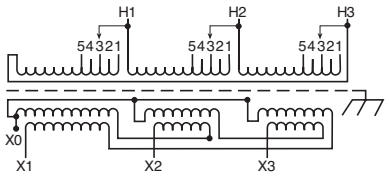

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 277 | H1 - H5 | H2 to H4 | |
| 480 | H1 - H6 | H3 to H4 | |
| **Secondary Volts** | | | |
| 208 | | X2 to X4 | X1- X5 |
| 277 | | X3 to X4 | X1- X6 |

## 80 PRIMARY: 480 Volts Delta SECONDARY: 208Y/120 Volts TAPS: 1-5% ANFC & 1-5% BNFC



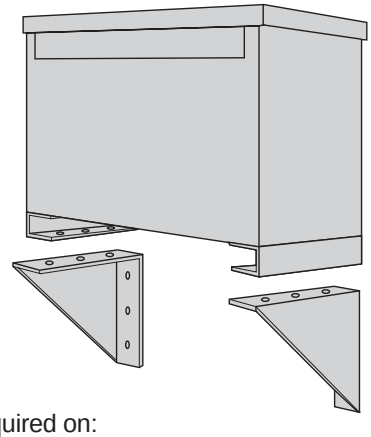

| Primary Volts | Connect Primary Lines To | Inter-Connect | Connect Secondary Lines To |
|---|---|---|---|
| 504 | H1, H2, H3 | 1 | |
| 480 | H1, H2, H3 | 2 | |
| 456 | H1, H2, H3 | 3 | |
| **Secondary Volts** | | | |
| 208 | | | X1, X2, X3 |
| 120 1 phase | | | X1 to X0<br>X2 to X0<br>X3 to X0 |

## 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<br>X2 to X0<br>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 |

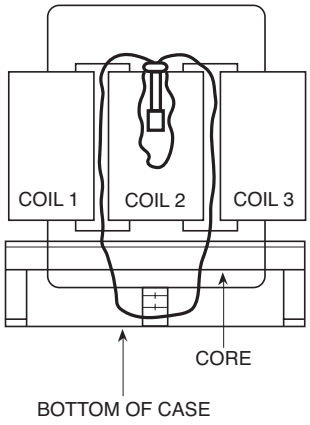



**Figure 1**

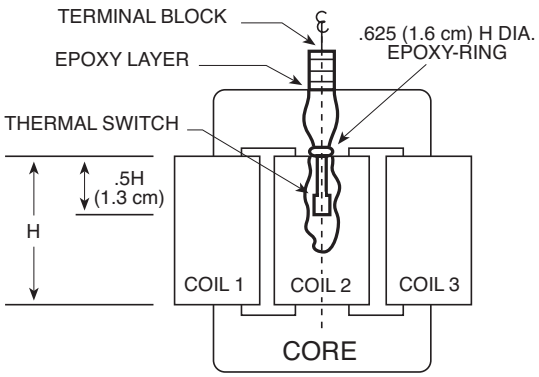



**Figure 2**

## 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 | 37½ 1-phase<br>27 - 45 3-phase | 2 -14<br>250 mcm - 6 | 8<br>4 | ¼ - 20 x ¾ | 8 |
| Lug 2 | 50 - 75 1-phase<br>51 - 118 3-phase | 250 mcm - 6 | 12 | ¼ - 20 x ¾<br>¼ - 20 x 1¾ | 8<br>8 |
| Lug 3 | 100 -167 1-phase<br>145 - 300 3-phase | 250 mcm - 6<br>600 mcm - 2 | 3<br>22 | ¼ - 20 x ¾<br>⅜ - 16 x 2 | 3<br>16 |
| Lug 4 | 440 - 660 3-phase | 600 mcm - 2 | 29 | ⅜ - 16 x 2 | 8 |

## Weather Shields

| Catalog No. | Approx. Ship Weight Lbs. (Kg.) |
|---|---|
| WS-A-1 | 6 (2.7) |
| WS-A-2 | 7 (3.2) |
| WS-A-3 | 8 (3.6) |
| WS-A-4 | 8 (3.6) |
| WS-A-5 | 10 (4.5) |
| WS-A-6 | 10 (4.5) |
| WS-A-8 | 7 (3.2) |
| WS-A-53 | 7 (3.2) |
| WS-A-58 | 10 (4.5) |
| WS-A-60 | 9.5 (4.3) |
| WS-B-1 | 31 (14.1) |
| WS-B-2 | 31 (14.1) |
| WS-B-3 | 30 (13.6) |
| WS-B-4 | 32 (14.5) |
| WS-B-5 | 35 (15.9) |

## Spare Parts

### TOP COVER

| CATALOG NO. | APPROX. SHIP WEIGHT Lbs. (Kg.) |
|---|---|
| SA-1-701319 | 14 (6.4) |
| SA-2-701319 | 16 (7.3) |
| SA-3-701319 | 20 (9.1) |
| SA-4-701319 | 34 (15.4) |
| SA-6-701319 | 17 (7.7) |

### FRONT/REAR PANEL

| CATALOG NO. | APPROX. SHIP WEIGHT Lbs. (Kg.) |
|---|---|
| SA-1-701321 | 13 (5.9) |
| SA-2-701321 | 15 (6.8) |
| SA-3-701321 | 21 (9.5) |
| SA-4-701321 | 35 (15.9) |
| SA-7-701321 | 16 (7.3) |

### SIDE PANEL

| CATALOG NO. | APPROX. SHIP WEIGHT Lbs. (Kg.) |
|---|---|
| SA-1-701320 | 11 (5.0) |
| SA-2-701320 | 13 (5.9) |
| SA-3-701320 | 19 (8.6) |
| SA-4-701320 | 34 (15.4) |

# Specification Guide for Dry Type Distribution Transformers, Including Opti-Miser® 30 KVA & Larger

## 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.

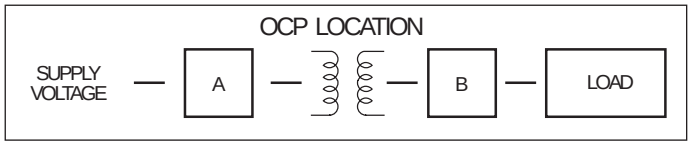
Acme's transformers are designed and manufactured to comply with UL Standard 506, 1561, 1012, or 1062 and carry the applicable UL Listing Label. Because of the continuous product evolutions at Acme, it is best that you contact the factory for the current file and guide numbers associated with the listings.

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

UL Listed UL 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<br>< 9, ≥ 2<br>< 2 | 125 ①<br>167 max.<br>300 max. | Not Required | |
| 2 | Main | 1Ø<br>3Ø | More than 2<br>Not Applicable | Primary & Secondary ② | A & B | 9<br><9, 2<br><2 | 125 ①<br>167 max.<br>300 max. | 9<br><9 | 125 ①<br>167 max. |
| 3 | Feeder Circuit with OCP | 1Ø | 2 | None on Either | — | | Not Required | | Not Required |
| 4 | Feeder Circuit with OCP | 1Ø<br>3Ø | More than 2<br>Not Applicable | Secondary Only ② | B | | Not Required | 9<br><9 | 125 ①<br>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<br>H3221 | 155<br>180 | .25-5.0<br>7.5-25.0 | 3.0-6.0<br>7.5-75.0 |
| | Panel Tran® | 1062 | YEFR | E56936V1 | N/A | H3180<br>H3221 | 180<br>180 | 5.0<br>7.5-25.0 | N/A<br>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<br>X3221 | 130<br>155 | .25-3.0<br>5.0-15.0 | N/A<br>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.



**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

# ALPHANUMERICAL CATALOG NUMBER INDEX

# ACME ELECTRIC 10-YEAR LIMITED* WARRANTY

Acme Electric Corporation (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 Corporation'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, photocell and timer — 3 years; Standard Power™ DC Power Supplies — 2 years; 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® TRANSFORMER™

**Shielded for cleaner power™**