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YEARS

Full Line Product Catalog

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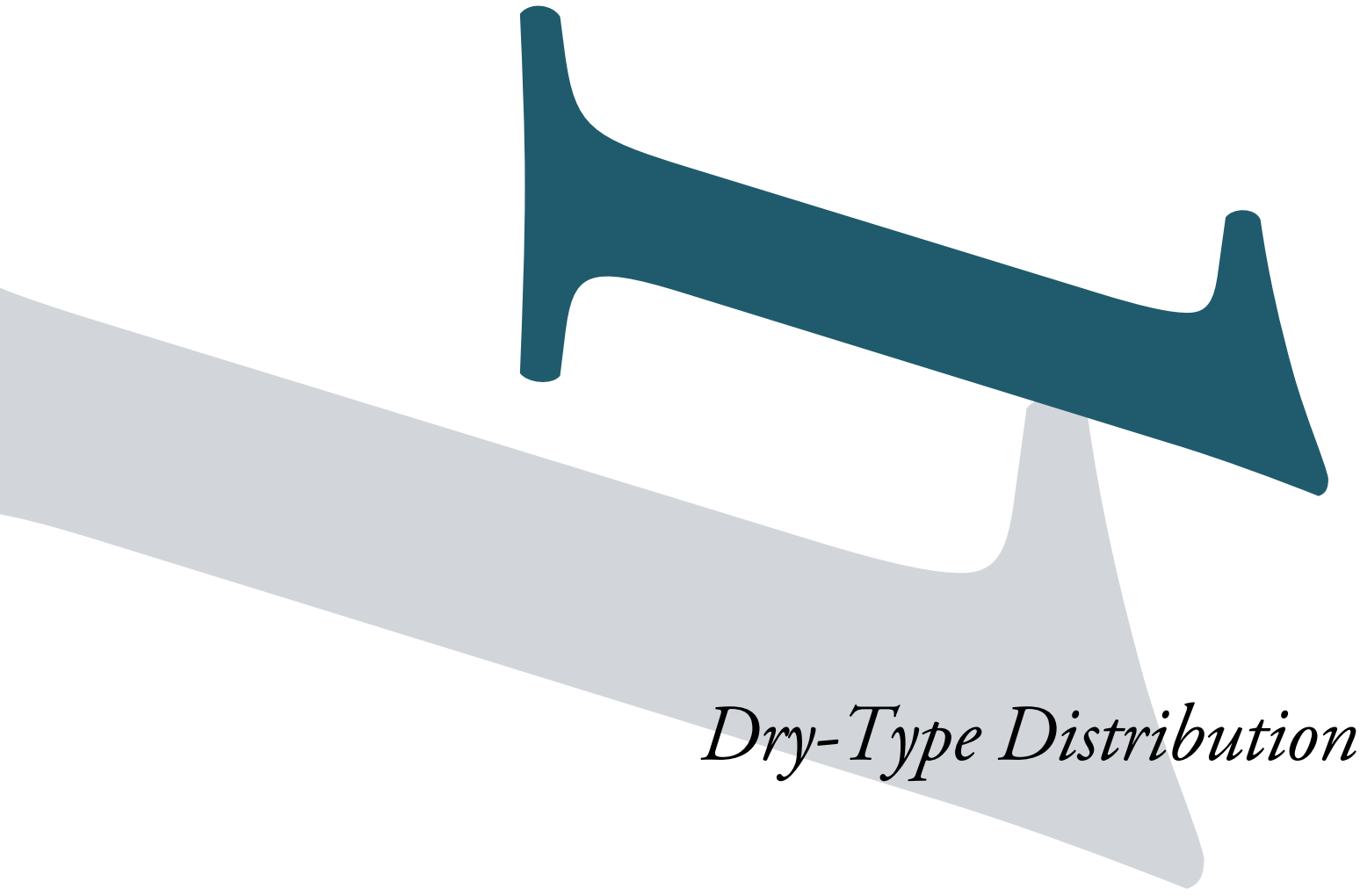


Dry-Type Distribution Transformers

Section 1

600 Volt Class and Below Single and Three Phase

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

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

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

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

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

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

7. Can Acme Transformers be reverse connected?
ACME dry-type distribution transformers can be reverse connected without a loss of kVA rating, but there are certain limitations. Transformers rated 1 kVA and larger single phase, 3 kVA and larger three phase can be reverse connected without any adverse effects or loss in kVA capacity. The reason for this limitation in kVA size is, the turns ratio is the same as the voltage ratio. Example: A transformer with a 480 volt input, 240 volt output can have the output connected to a 240 volt source and thereby become the primary or input to the transformer, then the original 480 volt primary winding will become the output or 480 volt secondary. On transformers rated below 1 kVA single phase, there is a turns ratio compensation on the low voltage winding. This means the low voltage winding has a greater voltage than the nameplate voltage indicates at no load. For example, a small single phase transformer having a nameplate voltage of 480 volts primary and 240 volts secondary, would actually have a no load voltage of approximately 250 volts, and a full load voltage of 240 volts. If the 240 volt winding were connected to a 240 volt source, then the output voltage would

consequently be approximately 460 volts at no load and approximately 442 volts at full load. As the kVA becomes smaller, the compensation is greater— resulting in lower output voltages. When one attempts to use these transformers in reverse, the transformer will not be harmed; however, the output voltage will be lower than is indicated by the nameplate.

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

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

10. How do you select transformers?

(1) Determine primary voltage and frequency.
(2) Determine secondary voltage required.
(3) Determine the capacity required in volt-amperes.

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

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

11. What terminations are provided?

Primary and Secondary Terminations are provided on ACME Dry-Type Transformers as follows:
No lugs— lead type connection on
0-25 kVA single phase
0-15 kVA three phase encapsulated units

Bus-bar terminations (drilled to NEMA standards)
37.5 -250 kVA single phase
150-500 kVA three phase
Lugs 15-112.5 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.

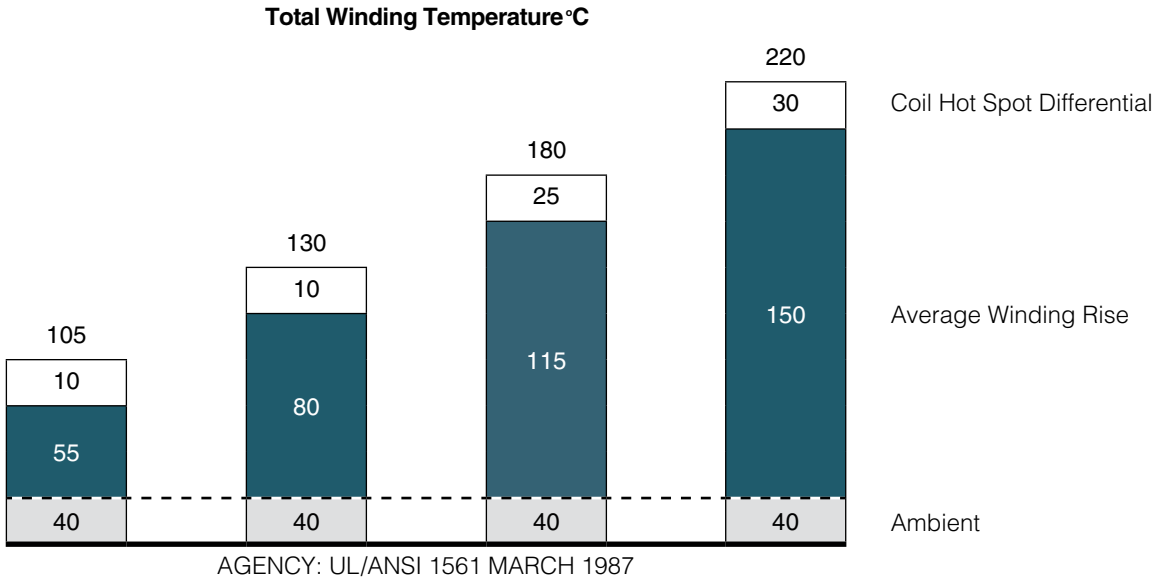


Figure A

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.

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:

$$\text{Normal Full Load Current} = \frac{\text{Nameplate Volt Amps}}{\text{Line Volts}} = \frac{10{,}000\ \text{VA}}{480\ \text{V}} = 20.8\ \text{Amperes}$$

$$\text{Maximum Short Circuit Amps} = \frac{\text{Full Load Amps}}{4\%} = \frac{20.8\ \text{Amps}}{4\%} = 520\ \text{Amps}$$

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:

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

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

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 35 for a special diagram which can be used to connect standard single phase off-the-shelf transformers in a three phase zig-zag manner. This system can be used for either grounding or developing a fourth wire from a three phase neutral. An example would be to change a 480 V — three phase — three wire system to a 480Y/277 V — three phase — four wire system.

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

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

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

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

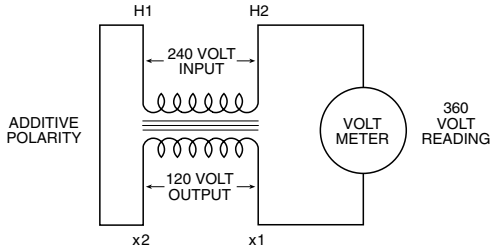
25. Can transformers listed in this catalog be reconnected as autotransformers to increase their kVA rating?
Several standard single phase transformers listed in this catalog can be connected as autotransformers. The kVA capacity will be greatly increased when used as an autotransformer, in comparison to the nameplate kVA as an insulating transformer. Examples of autotransformer applications are changing 600 volts to 480 volts in either single phase or three phase; changing 480 volts to 240 volts single or three phase or vice versa; or the developing of a fourth wire (neutral) from a 480 volt three phase three wire system for obtaining 277 volts single phase. This voltage is normally used for operating fluorescent lamps or similar devices requiring 277 volts. For further details showing kVA and voltage combinations for various autotransformer connections refer to Page 33 and 34 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 15 and 17 illustrate some typical transformer requirements for use with motor applications.

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

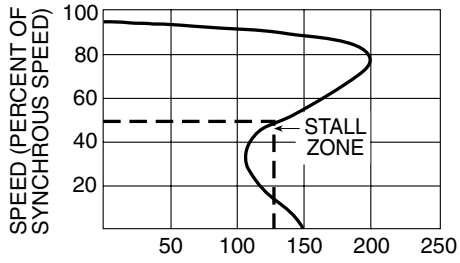
34. How are transformers sized to operate Three Phase induction type squirrel cage motors?
The minimum transformer kVA rating required to operate a motor is calculated as follows:

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

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

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

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



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 6.

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.

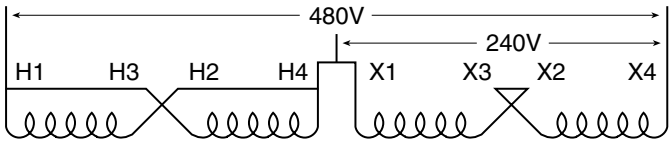


Figure 1

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.

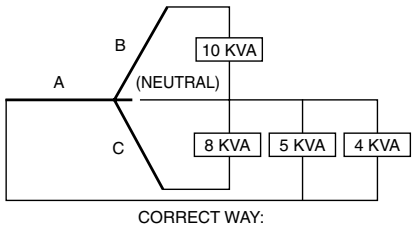
These loads are 10 kVA, 5 kVA, 8 kVA,and 4 kVA.

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.

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.



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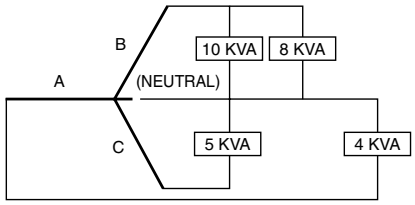

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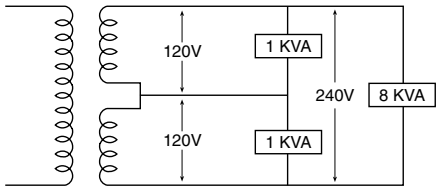

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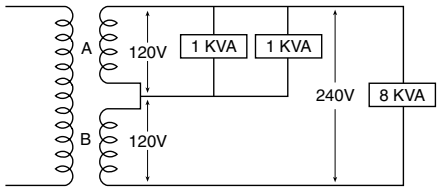


INCORRECT WAY:

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.

39. What are typical applications for transfomers?
ACME transformers should be specified to:
(1) Distribute power at high voltage.
(2) Eliminate double wiring.
(3) Operate 120 volt equipment from power circuits.
(4) Insulate circuits/establish separately derived circuits.
(5) Provide 3-wire secondary circuits.
(6) Buck and Boost (See Section 8).
(7) Provide electrostatic shielding for transient noise protection.

Enclosure Definitions	
Type 1 Enclosures	Intended for indoor use, primarily to provide a degree of protection against contact with the enclosed equipment.
Type 2 Enclosures	Intended for indoor use, primarily to provide a degree of protection against limited amounts of falling water and dirt.
Type 3R Enclosures	Intended for outdoor use, primarily to provide a degree of protection against falling rain, sleet and external ice formation.
Definitions Pertaining to Enclosures	
Ventilated	Constructed to provide for circulation of external air through the enclosure to remove excess heat, fumes or vapors.
Non-Ventilated	Constructed to provide no intentional circulation of external air through the enclosure.
Indoor Locations	Those areas protected from exposure to the weather.
Outdoor Locations	Those areas exposed to the weather.
Hazardous (Classified) Locations	Those areas, which may contain hazardous (classified) materials in sufficient quantity to create an explosion. See Article 500 of The National Electrical Code.

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:

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

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

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

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.

$$\frac{\text{1.3 Amps x 120 V}}{\text{3 phase}} = .156 \text{ kVA for each lighting fixture}$$

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	1203	1041	902	657	568	520	416

Table 2

Full Load Amperes Single Phase A.C. Motors ①

Horsepower	115V	208V	230V	Minimum Transformer 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%.

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

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

Three Phase Loads

1. Determine electrical load

A. Voltage required by load.
B. Amperes or kVA required by load.
C. Frequency in Hz (cycles per second).
D. Verify load is designed to operate on three phase.
All the above information is standard data normally obtained from equipment nameplates or instruction manuals.

2. Determine supply voltage

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

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

A. Select a transformer with a standard kVA capacity **equal to or greater than** that needed to operate the load.
B. Primary taps are available on most models to compensate for line voltage variations.
(Refer to question #2 in the Transformer Questions and Answers Section on page 6.)
C. When load ratings are given only in amperes, tables 3 and 4 or the following formulas may be used to determine proper kVA size for the required transformer.
(1) To determine three phase **kVA** when volts and amperes are known:

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

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

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

Three Phase Example

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

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

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

(The kVA can also be obtained from Table 4)

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

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

Table 3

Full Load Current in Amperes– Three Phase Circuits

kVA	208V	240V	380V	440V	480V	600V
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

Horsepower	208V	230V	460V	575V	Minimum Transformer 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	213	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%.

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

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

Encapsulated
Single Phase, .05 to .150 kVA

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

Encapsulated
Single Phase, .250 to 25 kVA

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

Features
- UL listed, CSA certified and UL-3R enclosures meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- Shielded for cleaner power.
- Encapsulated and completely enclosed design electrical grade silica and resin compounds completely enclose the core and coil to seal out all moisture and air. UL Type 3R enclosure for indoor or outdoor service. Encapsulation eliminates corrosion and insulation deterioration.
- Quiet operation with sound levels well below NEMA standards.
- Long life UL class 155°C insulation system. 115°C rise thru .750 kVA; 180°C insulation system, 115°C rise, 1 kVA and above.
- Available in 316 Stainless Steel and NEMA 4X enclosure.

Encapsulated
Three Phase, 3 to 75 kVA

Features

- UL listed, CSA certified and UL-3R enclosure meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- UL Class 180°C insulation system. 115°C rise.
- Extra large front access wiring compartment through 9 kVA; top access through 75 kVA for easier installation and cooler case temperatures.
- Completely enclosed — suitable for indoor/outdoor service. Consult selection charts for details. Excellent for dust or lint laden atmosphere.
- Encapsulated — electrical grade silica and resin compound completely encloses the core and coil. Encapsulation seals out all moisture and air, eliminating corrosion and insulation deterioration.
- High efficiency and excellent regulation.
- Sound levels below NEMA standards.
- Keyhole mounting slots permit installation of mounting bolts prior to hanging transformer and are accessible from the front. Lifting ears for easy installation.
- Wiring connections can be made outside of wiring compartment due to the use of flexible leads.
- 3-9 kVA provided with dual size knockouts in sides and bottom of wiring compartment.
- Termination — copper lead wire.
- Electrostatic shielding provided on all 60 Hz isolation transformers.
- Available in 316 Stainless Steel.

316 Stainless Steel

- 3R enclosure.
- Encapsulated construction.
- Single phase: 0.25 – 25 kVA.
  Three phase: 3 – 75 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.

Class 1 Division 2

- Encapsulated construction
- Three phase: 3 – 45kVA
- Groups A,B,C,D
- Temperature Class T3A
- Optional 316 Stainless Steel
- Electrostatic shielding

VENTILATED
Single Phase 37.5 to 250 kVA, Three Phase 15 to 1000 kVA

Features
- With weather shield, UL Type 3R enclosure or 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.
- Three phase units15-112.5 kVA have pre-installed lugs.

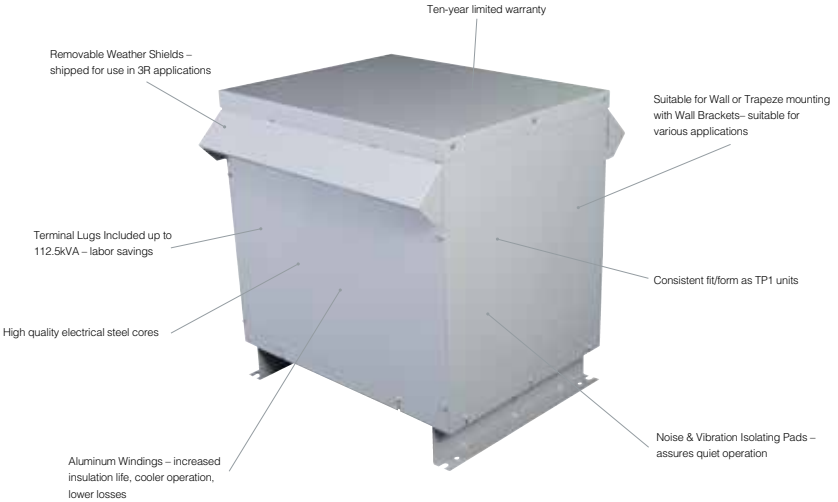
DOE
Three Phase 15 to 1000 kVA NEW

Our new line of general purpose transformers not only meets but exceeds the new, more stringent DOE 2016 Energy Efficiency Standards.

Designed with feedback from our customers, the line is fully compatible in size with comparable transformers meeting the old 2007 TP-1 standards.

Replacing older general purpose transformers with our DOE 2016 compliant equipment will result in increased profitability from lower operating costs as well as a positive impact on the environment from a reduced carbon footprint.

Features:
- Core Design. Cores are high-quality electrical steel from industry-leading suppliers
- 3R Compliant. All new units ship with weather shields already installed
- Flexibility. When a weather shield is not needed, it can easily be removed
- Terminal Lugs. Primary and secondary terminals come standard with lugs (up to 112.5kVA) for quicker, easier connections
- Isolating Pads. Extra padding reduces noise and vibration, assuring quiet operation
- Aluminum Windings. Aluminum provides increased insulation life, cooler operation, and lower losses
- Consistent Fit/Form. Enclosure sizes of DOE 2016 units are identical to TP-1 sizes



THREE PHASE EFFICIENCY STANDARD

kVA	TP1	DOE 2016
15	97.0%	97.89%
30	97.5%	98.23%
45	97.7%	98.40%
75	98.0%	98.60%
112.5	98.2%	98.74%
150	98.3%	98.83%
225	98.5%	98.94%
300	98.6%	99.02%
500	98.7%	99.14%
750	98.8%	99.23%
1000	98.9%	99.28%

SINGLE PHASE

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
1.0	T279740S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	23 (10.4)	W	0.50-0.75 (1.3-1.9)	NA	23	B
1.5	T279741S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	23	B
2.0	T279742S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	37 (16.8)	W	0.50-0.75 (1.3-1.9)	NA	23	B
3.0	T279743S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	23	C
5.0	T279744S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	23	C
7.5	T279745S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	105 (47.6)	W	0.75-1.25 (1.9-3.2)	NA	63	D
10.0	T279746S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	124 (56.2)	W	0.75-1.25 (1.9-3.2)	NA	63	D
15.0	T279747S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	171 (77.6)	W	1.00-1.50 (2.5-3.8)	NA	63	D
25.0	T279748S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	261 (118.4)	W	1.00-1.50 (2.5-3.8)	NA	63	D

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
*1.0	TF279300S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	65	B
*2.0	TF279301S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	65	B
*3.0	TF279302S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	65	C
*5.0	TF279303S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	65	C
*7.5	TF279304S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	65	D

*CE Marked

Maximum exciting current 5% at 50 Hz.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
*1.0	TF217437S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	14	B
*2.0	TF217439S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	14	B
*3.0	TF249873S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	14	C
*5.0	TF252520S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	14	C
*7.5	TF252794S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	14	D
*10.0	TF252795S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	14	D
*15.0	TF252796S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	14	D
*25.0	TF252797S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	300 (136.0)	W	1.00-1.50 (2.5-3.8)	NA	14	D

*CE Marked

All Wiring Diagrams begin on page 209.

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

EXPORT MODEL

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
*1.0	TF279260S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	64	B
*2.0	TF279261S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	64	B
*3.0	TF279262S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	64	C
*5.0	TF279263S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	64	C
*7.5	TF279264S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	64	D
*10.0	TF279265S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	64	D
*15.0	TF279266S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	64	D
*25.0	TF279267S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	300 (136.1)	W	1.00-1.50 (2.5-3.8)	NA	64	D

*CE Marked

Maximum exciting current 5% at 50 Hz.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
37.5	TP536491S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	257 (117.0)	F ②	N/A	WSA1	58	E
50.0	TP536503S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	340 (154.2)	F ②	N/A	WSA1	17	E
75.0	TP536513S	35.40 (89.9)	31.90 (81.0)	26.88 (68.2)	420 (190.5)	F	N/A	WSA3	17	E

Notes: 1.0 kVA through 25.0 kVA encapsulated (exempt from DOE 2016), 37.5 through 75 kVA DOE 2016 compliant

② Wall mounting brackets are available for these sizes, refer to page 217.

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

AUTO-TRANSFORMERS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
1.0	T253060	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	12	B
1.5	T253061	9.68 (24.6)	4.50 (11.4)	4.51 (11.5)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	12	B
2.0	T253062	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	12	B
3.0	T253063	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	12	B
5.0	T253064	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	12	B
7.5	T253065	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	12	C
10.0	T253066	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	12	D
15.0	T253067	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	12	D

All Wiring Diagrams begin on page 209.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
.05 ①	T153004	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	W	0.875 (2.2)	NA	1	A
.10 ①	T153005	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	W	0.875 (2.2)	NA	1	A
.15 ①	T153006	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	W	0.875 (2.2)	NA	1	A
.25 ①	T253007S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	0.50-0.75 (1.3-1.9)	NA	2	B
.50 ①	T253008S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	2	B
.75 ①	T253009S	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	2	B
1.00	T253010S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	2	B
1.50	T253011S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	2	B
2.00	T253012S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	2	B
3.00	T253013S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	2	C
3.00	T2530134S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	3	C
5.00	T253014S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	2	C
5.00	T2530144S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	3	C
7.50	T2535153S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	4	D
10.00	T2535163S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	4	D
15.00	T2535173S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	4	D
25.00	T2535183S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	4	D
37.50	TP530193S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	280 (127.0)	F ②	NA	WSA1	5	E
50.00	TP530203S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	350 (158.8)	F ②	NA	WSA1	5	E
75.00	TP530213S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	430 (195.0)	F	NA	WSA3	5	E
100.00	TP530223S	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	525 (238.0)	F	NA	WSA4	5	E
167.00	TP530233S	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	1050 (476.3)	F	NA	WSA5	5	E
250.00	TP530243S	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	1440 (653.2)	F	NA	WSA5	5	E

Notes: 0.05 through 25.0 kVA encapsulated (exempt from DOE 2016), 37.5 through 250.0 kVA DOE 2016 compliant

① Suitable for 50/60Hz

② Wall mounting brackets are available for these sizes, refer to page 217.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
0.25 ①	T253007SS	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	NA	NA	2	B
0.50 ①	T253008SS	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	NA	NA	2	B
0.75 ①	T253009SS	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	NA	NA	2	B
1.00	T253010SS	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	NA	NA	2	B
1.50	T253011SS	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	NA	NA	2	B
2.00	T253012SS	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	NA	NA	2	B
3.00	T253013SS	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	NA	NA	3	C
5.00	T253014SS	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	NA	NA	3	C
7.50	T253515SS	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	NA	NA	4	D
10.00	T253516SS	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	NA	NA	4	D
15.00	T253517SS	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	NA	NA	4	D
25.00	T253518SS	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	NA	NA	4	D

Notes: 0.25 through 25.0 kVA encapsulated (exempt from DOE 2016)

① Suitable for 50/60Hz

All Wiring Diagrams begin on page 209.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
7.50	TC535153S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	100 (45.4)	W	0.75-1.25 (1.9-3.2)	NA	4	D
10.00	TC535163S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	120 (54.4)	W	0.75-1.25 (1.9-3.2)	NA	4	D
15.00	TC535173S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	160 (72.6)	W	1.00-1.50 (2.5-3.8)	NA	4	D
25.00	TC535183S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	4	D
37.50	TPC530193S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	295 (133.8)	F ②	NA	WSA1	5	E
50.00	TPC530203S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	378 (172.0)	F ②	NA	WSA1	5	E

Notes: 7.5 through 25.0 kVA encapsulated (exempt from DOE 2016), 37.5 through 50.0 kVA DOE 2016 compliant

② Wall mounting brackets are available for these sizes, refer to page 217.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
37.50	TE2530193S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	430 (195.0)	F ②	NA	NA	5	H
50.00	TE2530203S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	430 (195.0)	F ②	NA	NA	5	H
75.00	TE2A530213S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	525 (238.0)	F	NA	NA	5	H
100.00	TE1530223S	42.00 (106.7)	40.00 (101.6)	30.00 (76.2)	775 (352.0)	F	NA	NA	5	H

Notes: 37.5 through 100.0 kVA non-ventilated (exempt from DOE 2016)

② Wall mounting brackets are available for these sizes, refer to page 217.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
0.25	GP12250S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	12 (5.4)	W	0.50-0.75 (1.3-1.9)	NA	78	B
0.50	GP12500S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	78	B
1.00	GP121000S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	78	B
3.00	GP123000S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	58 (26.3)	W	0.75-1.25 (1.9-3.2)	NA	78	C
5.00	GP125000S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	80 (36.3)	W	0.75-1.25 (1.9-3.2)	NA	78	C
10.00	GP1210000S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	78	D
15.00	GP1215000S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	161 (70.0)	W	1.00-1.50 (2.5-3.8)	NA	79	D

All Wiring Diagrams begin on page 209.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
.05 ①	T153104	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	W	0.875 (2.2)	NA	8	A
.10 ①	T153105	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	W	0.875 (2.2)	NA	8	A
.15 ①	T153106	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	W	0.875 (2.2)	NA	8	A
.25 ①	T253107S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	0.50-0.75 (1.3-1.9)	NA	9	B
.50 ①	T253108S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	9	B
.75 ①	T253109S	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	9	B
1.00	T253110S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	9	B
1.50	T253111S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	9	B
2.00	T253112S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	9	B
3.00	T2531131S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	10	C
5.00	T2531141S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	10	C
7.50	T2536151S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	10	D
10.00	T2536161S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	10	D
15.00	T2536171S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	10	D
25.00	T2536181S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	10	D
37.50	TP531193S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	275 (125.0)	F ②	NA	WSA1	11	E
50.00	TP531203S	29.90 (76.0)	28.15 (71.5)	22.37 (56.8)	340 (154.0)	F ②	NA	WSA2	11	E
75.00	TP531213S	35.47 (90.0)	31.90 (81.0)	26.88 (68.3)	430 (195.0)	F	NA	WSA3	11	E
100.00	TP531223S	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	525 (238.0)	F	NA	WSA4	11	E
167.00	TP531233S	45.60 (115.8)	39.5 (100.3)	35.5 (90.2)	1050 (476.3)	F	NA	WSA5	11	E

Notes: 0.05 kVA through 25.0 kVA encapsulated (exempt from DOE 2016), 37.5 through 167.0 kVA DOE 2016 compliant

① Suitable for 50/60Hz

② Wall mounting brackets are available for these sizes, refer to page 217.

All Wiring Diagrams begin on page 209.

THREE PHASE

190/200/208/220/230/240 DELTA PRIMARY VOLTS — 400Y/231 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0 ②	T379083S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	300 (136.1)	F ①	NA	STD.	75	E
15.0	T3015K0170BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	STD.	74	E
30.0	T3030K0170BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	STD.	74	E
45.0	T3045K0170BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	675 (306.1)	F ①	NA	STD.	74	E
75.0	T3075K0170BS	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	STD.	74	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0 ②	T2A792681S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	STD.	60	F
6.0 ②	T2A792691S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	STD.	60	F
9.0 ②	T2A792701S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	60	F
15.0 ②	T3792711S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.0)	F ①	NA	STD.	60	I
15.0	T3015K0064BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	STD.	61	E
30.0	T3030K0064BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	STD.	61	E
45.0	T3045K0064BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	441 (200.0)	F ①	NA	STD.	61	E
75.0	T3075K0064BS	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	STD.	61	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0 ②	T3793671S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.0)	F ①	NA	STD.	48	I
15.0	T3015K0034B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	YES ③	46	E
30.0	T3030K0034B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	YES ③	46	E
45.0	T3045K0034B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	YES ③	46	E
75.0	T3075K0034B	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	YES ③	46	E
112.5	T3112K0034B	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	NA	YES ③	46	E
150.0	T3150K0034B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1188 (538.9)	F	NA	YES ③	46	E
225.0	T3225K0034B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1500 (680.4)	F	NA	YES ③	46	E
300.0	T3300K0034B	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	1938 (879.0)	F	NA	YES ③	46	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

③ Add “S” to part number

All Wiring Diagrams begin on page 209.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
9.0 ②	T2A533601S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	18	F
15.0 ②	T3533611S	18.86 (48.0)	20.30 (51.6)	9.03 (23.0)	250 (113.0)	F ①	NA	STD.	18	I
15.0	T3015K0044B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	YES ③	19	E
30.0	T3030K0044B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	YES ③	19	E
45.0	T3045K0044B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	438 (198.6)	F ①	NA	YES ③	19	E
75.0	T3075K0044B	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	YES ③	19	E
112.5	T3112K0044B	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	870 (394.6)	F	NA	YES ③	19	E
150.0	T3150K0044B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1223 (554.7)	F	NA	YES ③	19	E
225.0	T3225K0044B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1500 (680.4)	F	NA	YES ③	19	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0 ②	T3796931S	18.90 (48.0)	20.30 (51.6)	9.00 (22.9)	245 (111.1)	F ①	NA	STD.	70	I
15.0	T3015K0074B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	YES ③	71	E
30.0	T3030K0074B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	YES ③	71	E
45.0	T3045K0074B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	475 (215.5)	F ①	NA	YES ③	71	E
75.0	T3075K0074B	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	YES ③	71	E
112.5	T3112K0074B	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	859 (389.6)	F	NA	YES ③	71	E
150.0	T3150K0074B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1216 (551.6)	F	NA	YES ③	71	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

③ Add “S” to part number

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
15.0	T3795511S	20.80 (52.8)	20.90 (53.1)	10.20 (25.9)	435 (197.3)	F	NA	NA	24	I
30.0	T2A795523S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	365 (165.6)	F ①	NA	WSA1	20	E
45.0	T2A795533S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	468 (212.3)	F ①	NA	WSA2	20	E
75.0	T2A795543S	35.47 (90.1)	31.90 (80.0)	26.88 (68.3)	693 (314.3)	F	NA	WSA3	20	E
112.5	T2A795553S	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	970 (440.0)	F	NA	WSA4	20	E

Notes: 50 Hz units (DOE 2016 exempt)

① Wall mounting brackets are available for these sizes, refer to page 217.

All Wiring Diagrams begin on page 209

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Weather Shield	Wiring Diagrams	Design Figures
10.0	TF220105S	18.90 (48.0)	20.30 (51.6)	9.00 (22.9)	245 (111.1)	F ①	NA	NA	73	I
15.0	TF220155S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	291 (132.0)	F ①	NA	WSA1	73	E
25.0	TF220255S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	375 (170.1)	F ①	NA	WSA1	73	E
50.0	TF220505S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	437 (198.2)	F ①	NA	WSA2	73	E

Notes: 50 Hz units (DOE 2016 exempt)

① Wall mounting brackets are available for these sizes, refer to page 217.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0 ②	T2A533081S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	STD.	21	F
6.0 ②	T2A533091S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	STD.	21	F
9.0 ②	T2A533101S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	21	F
15.0 ②	T3533111S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	STD.	21	I
15.0	T3015K0013B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	YES ③	22	E
30.0	T3030K0013B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	YES ③	22	E
45.0	T3045K0013B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	YES ③	22	E
75.0	T3075K0013B	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	YES ③	22	E
112.5	T3112K0013B	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	NA	YES ③	22	E
150.0	T3150K0013B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1213 (550.2)	F	NA	YES ③	22	E
225.0	T3225K0013B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1500 (680.4)	F	NA	YES ③	22	E
300.0	T3300K0013B	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	1938 (879.0)	F	NA	YES ③	22	E
500.0	T3500K0013B	57.80 (147.0)	45.60 (115.8)	41.50 (105.4)	3100 (1406.1)	F	NA	YES ③	22	G
750.0	T3750K0013B	62.80 (159.5)	54.00 (137.1)	41.50 (105.4)	4500 (2041.1)	F	NA	YES ③	22	G
1000.0	T3001M0012B	62.80 (159.5)	54.00 (137.1)	41.50 (105.4)	5375 (2438.0)	F	NA	YES ③	80	G

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

③ Add “S” to part number

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0 ②	TC533111S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.0)	F ①	NA	STD.	21	I
15.0	T3015K0013BC	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	353 (160.1)	F ①	NA	YES ③	22	E
30.0	T3030K0013BC	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	498 (225.9)	F ①	NA	YES ③	22	E
45.0	T3045K0013BC	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	572 (259.5)	F ①	NA	YES ③	22	E
75.0	T3075K0013BC	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	750 (340.2)	F	NA	YES ③	22	E
112.5	T3112K0013BC	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	1103 (500.3)	F	NA	YES ③	22	E
150.0	T3150K0013BC	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1477 (669.9)	F	NA	YES ③	22	E
225.0	T3225K0013BC	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1872 (849.1)	F	NA	YES ③	22	E
300.0	T3300K0013BC	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	2233 (1012.9)	F	NA	YES ③	22	E
500.0	T3500K0013BC	57.80 (147.0)	45.60 (115.8)	41.50 (105.4)	4059 (1841.1)	F	NA	YES ③	22	G
750.0	T3750K0013BC	62.80 (159.5)	54.00 (137.1)	41.50 (105.4)	6192 (2808.6)	F	NA	YES ③	22	G

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit, 115° C rise

③ Add “S” to part number

All Wiring Diagrams begin on page 209.

115° C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — MAY BE USED ON A 4 WIRE 480Y/277 VOLTS SUPPLY— 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0	T3015K0013BSF	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	STD.	22	E
30.0	T3030K0013BSF	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.3)	F ①	NA	STD.	22	E
45.0	T3045K0013BSF	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	STD.	22	E
75.0	T3075K0013BSF	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	STD.	22	E
112.5	T3112K0013BSF	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	NA	STD.	22	E
150.0	T3150K0013BSF	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1213 (550.2)	F	NA	STD.	22	E
225.0	T3225K0013BSF	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	2298 (1042.3)	F	NA	STD.	22	E
300.0	T3300K0013BSF	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	2319 (1051.9)	F	NA	STD.	22	E
500.0	T3500K0013BSF	57.80 (147.0)	45.60 (115.8)	41.50 (105.4)	4156 (1885.1)	F	NA	STD.	22	G

① Wall mounting brackets are available for these sizes, refer to page 217.

80° C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — MAY BE USED ON A 4 WIRE 480Y/277 VOLTS SUPPLY— 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0	T3015K0013BSB	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	378 (171.5)	F ①	NA	STD.	22	E
30.0	T3030K0013BSB	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	550 (249.5)	F ①	NA	STD.	22	E
45.0	T3045K0013BSB	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	755 (342.5)	F	NA	STD.	22	E
75.0	T3075K0013BSB	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	1054 (478.1)	F	NA	STD.	22	E
112.5	T3112K0013BSB	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1454 (659.5)	F	NA	STD.	22	E
150.0	T3150K0013BSB	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1729 (784.3)	F	NA	STD.	22	E

For Copper wound transformers consult factory.

① Wall mounting brackets are available for these sizes, refer to page 217.

115° C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz ENCAPSULATED TRANSFORMERS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
30.0	T3793123S	24.81 (63.0)	27.13 (68.9)	11.14 (28.3)	613 (278.1)	F	NA	STD.	22	I
45.0	T3793133S	25.31 (64.3)	30.18 (76.7)	12.76 (32.4)	780 (354.0)	F	NA	STD.	22	I
75.0	T3793143S	26.82 (68.1)	34.68 (88.1)	15.25 (38.7)	1126 (511.0)	F	NA	STD.	22	I

Notes: 30.0 through 75.0 kVA encapsulated (DOE 2016 exempt)

115° C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz 316 STAINLESS STEEL ENCAPSULATED TRANSFORMERS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0	T2A53308SS	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	NA	STD.	21	F
6.0	T2A53309SS	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	NA	STD.	21	F
9.0	T2A53310SS	14.03 (35.6)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	NA	STD.	21	F
15.0	T353311SS	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F	NA	STD.	21	I
30.0	T379312SS	24.81 (63.0)	27.13 (68.9)	11.14 (28.3)	613 (278.1)	F	NA	STD.	22	I
45.0	T379313SS	25.31 (64.3)	30.18 (76.7)	12.76 (32.4)	780 (354.0)	F	NA	STD.	22	I
75.0	T379314SS	26.82 (68.1)	34.68 (88.1)	15.25 (38.7)	1126 (511.0)	F	NA	STD.	22	I

Notes: 3.0 through 75.0 kVA units encapsulated (DOE 2016 exempt)

All Wiring Diagrams begin on page 209.

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

NEW

CLASS 1 DIV. 2 TRANSFORMERS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0	T3003K0011SCH	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	STD.	21	F
6.0	T3006K0011SCH	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	21	F
9.0	T3009K0011SCH	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	STD.	21	I
15.0	T3015K0013SCH	24.81 (63.0)	27.13 (68.9)	11.14 (28.3)	613 (278.1)	F	NA	STD.	22	I
30.0	T3030K0013SCH	25.31 (64.3)	30.18 (76.7)	12.76 (32.4)	780 (354.0)	F	NA	STD.	22	I
45.0	T3045K0013SCH	26.82 (68.1)	34.68 (88.1)	15.25 (38.7)	1126 (511.0)	F	NA	STD.	22	I

Notes: 3.0 through 45.0 kVA encapsulated (DOE 2016 exempt). For larger kVA sizes, contact us.

① Wall mounting brackets are available for these sizes.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0 ②	T2A533281S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	STD.	25	F
6.0 ②	T2A533291S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	STD.	25	F
9.0 ②	T2A533401S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	25	F
15.0 ②	T3533411S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	STD.	25	I
15.0	T3015K0023B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	YES ③	26	E
30.0	T3030K0023B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	YES ③	26	E
45.0	T3045K0023B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	YES ③	26	E
75.0	T3075K0023B	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	YES ③	26	E
112.5	T3112K0023B	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	NA	YES ③	26	E
150.0	T3150K0023B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1406 (637.8)	F	NA	YES ③	26	E
225.0	T3225K0023B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1500 (680.4)	F	NA	YES ③	26	E
300.0	T3300K0023B	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	1938 (879.0)	F	NA	YES ③	26	E
500.0	T3500K0023B	57.80 (147.0)	45.60 (115.8)	41.50 (105.4)	3344 (1516.8)	F	NA	YES ③	26	G
750.0	T3750K0023B	62.80 (159.5)	54.00 (137.1)	41.50 (105.4)	4260 (1932.3)	F	NA	YES ③	26	G

Notes: 3.0 kVA through 750.0 kVA provided with 120V lighting tap limited to 5% of nameplate rating.

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

③ Add “S” to part number

All Wiring Diagrams begin on page 209.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0 ②	T335000153S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	STD.	31	I
15.0	T3015K0053B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	YES ③	31	E
30.0	T3030K0053B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.3)	F ①	NA	YES ③	31	E
45.0	T3045K0053B	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	YES ③	31	E
75.0	T3075K0053B	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	YES ③	31	E
112.5	T3112K0053B	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	888 (402.8)	F	NA	YES ③	31	E
150.0	T3150K0053B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1444 (655.0)	F	NA	YES ③	31	E
225.0	T3225K0053B	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1513 (686.3)	F	NA	YES ③	31	E
300.0	T3300K0053B	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	2000 (907.2)	F	NA	YES ③	31	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

③ Add “S” to part number

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0 ②	T2A793301S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	STD.	28	F
6.0 ②	T2A793311S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	STD.	28	F
9.0 ②	T2A793321S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	28	F
15.0 ②	T3793331S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	STD.	28	I
15.0	T3015K0083BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	STD.	29	E
30.0	T3030K0083BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	NA	STD.	29	E
45.0	T3045K0083BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	STD.	29	E
75.0	T3075K0083BS	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	STD.	29	E
112.5	T3112K0083BS	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	NA	STD.	29	E
150.0	T3150K0083BS	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1213 (550.2)	F	NA	STD.	29	E
225.0	T3225K0083BS	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1500 (680.4)	F	NA	STD.	29	E
300.0	T3300K0083BS	45.60 (115.8)	39.50 (100.3)	35.50 (90.1)	1938 (879.0)	F	NA	STD.	29	E
500.0	T3500K0083BS	57.80 (147.0)	45.60 (115.8)	41.50 (105.4)	3344 (1516.8)	F	NA	STD.	29	G
750.0	T3750K0083BS	62.80 (159.5)	54.00 (137.1)	41.50 (105.4)	4260 (1932.3)	F	NA	STD.	29	G

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

All Wiring Diagrams begin on page 209.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
15.0	T3015K0323BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	STD.	69	E
30.0	T3030K0323BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.3)	F ①	NA	STD.	69	E
45.0	T3045K0323BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	STD.	69	E
75.0	T3075K0323BS	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	STD.	69	E

① Wall mounting brackets are available for these sizes, refer to page 217.

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

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Wiring Diagrams	Design Figures
3.0 ②	T2A795161S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	STD.	55	F
6.0 ②	T2A795171S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	STD.	55	F
9.0 ②	T2A795181S	14.03 (38.8)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	STD.	55	F
15.0 ②	T3795191S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	STD.	55	I
15.0	T3015K0093BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	300 (136.0)	F ①	NA	STD.	51	E
30.0	T3030K0093BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.3)	F ①	NA	STD.	51	E
45.0	T3045K0093BS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	NA	STD.	51	E
75.0	T3075K0093BS	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	NA	STD.	51	E
112.5	T3112K0093BS	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	NA	STD.	51	E
150.0	T3150K0093BS	41.52 (105.4)	32.90 (83.5)	29.87 (75.9)	1406 (637.8)	F	NA	STD.	51	E

① Wall mounting brackets are available for these sizes, refer to page 217.

② DOE 2016 exempt, encapsulated unit

All Wiring Diagrams begin on page 209.

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

AUTO TRANSFORMERS

kVA ①											
Primary 600V Secondary 480V	Primary 480V Secondary 380V	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.	Depth (Inches)(Cm.	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.	Weather Shield	Wiring Diagrams	Design Figures
15.0	12.0	T2527031③	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	104 (47.2)	W	NA	NA	56	F
30.0	24.0	T2527051③	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	152 (68.9)	W	NA	NA	56	F
45.0	36.0	T2527071③	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	156 (70.8)	W	NA	NA	56	F
75.0	60.0	T3527101③	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	300 (136.1)	F ⑤	NA	NA	56	I
112.5	90.0	T2A527121④	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F ①	NA	WSA1	57	E
150.0	120.0	T2A527131④	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	350 (158.8)	F ①	NA	WSA1	57	E
225.0	180.0	T2A527151④	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ①	NA	WSA2	57	E
300.0	240.0	T2A527171④	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	650 (294.8)	F	NA	WSA2	57	E
450.0	360.0	T2A527181④	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WSA3	57	E
500.0	400.0	T2A527191④	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	790 (358.3)	F	NA	WSA3	57	E

Notes: Autotransformer DOE 2106 exempt

① Wall mounting brackets are available for these sizes, refer to page 217.

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

All Wiring Diagrams begin on page 209.

ECONOMICAL AUTO ARRANGEMENTS

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

THREE PHASE

kVA ①	Quantity ②	Catalog Number ③	Primary Full Load Amps	Secondary Full Load Amps	Maximum Size Fuse or Breaker
3.0	2	T253010S	3.60	7.20	10
5.0	2	T253011S	6.00	12.00	10
6.0	2	T253012S	7.20	14.40	15
10.0	2	T2530134S	12.00	24.00	15
17.0	2	T2530144S	20.50	40.80	30
26.0	2	T2535153S	31.50	63.00	40
34.0	2	T2535163S	41.00	81.60	60
52.0	2	T2535173S	63.00	125.00	80
86.0	2	T2535183S	104.00	206.30	150
130.5	2	TP530193S	157.00	314.00	200
173.0	2	TP530203S	209.00	418.00	300
259.0	2	TP530213S	312.00	623.00	400
346.0	2	TP530223S	417.00	834.00	600
578.0	2	TP530233S	696.00	1392.00	1000
865.0	2	TP530243S	1041.00	2082.00	1600

① kVA capacity of three phase autotransformer bank, using two single phase, 60 Hz transformers connected open delta

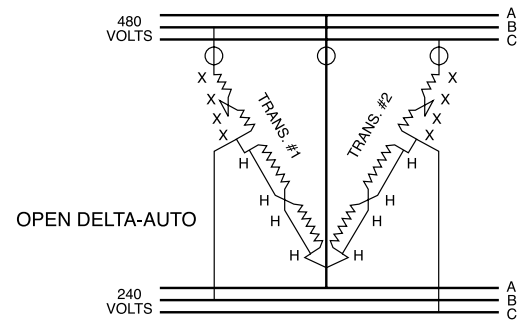
② Catalog No. is for 1 transformer, 2 units are required.

③ Can be reverse connected with no change in kVA.

④ For transformer dimensions, refer to appropriate table in section 1, page 23.

⑤ For proper overcurrent protection, refer to Article 450-4 of N.E.C.

DIAGRAM SHOWS NO TAP UNITS ONLY



OPEN DELTA-AUTO

⑤ 0 = Fuse location NEC 450-4, 2014

The diagram is 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.

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

Primary 600V Secondary 480V kVA ①	Primary Amps	Secondary Amps	Primary 480V Secondary 380V kVA ①	Primary Amps	Secondary Amps	Quantity ②	Catalog ③ Number ④	Maximum Size Fuse or Breaker
8.0	7.70	9.60	6.5	7.80	9.60	2	T253010S	15
12.0	11.55	14.40	9.5	11.55	14.40	2	T253011S	15
17.0	16.33	20.41	13.5	16.33	20.41	2	T253012S	25
25.0	24.06	30.01	20.0	24.06	30.01	2	T2530134S	30
43.0	41.38	51.70	34.0	41.38	51.70	2	T2530144S	60
64.0	61.59	77.00	51.0	61.59	77.00	2	T2535153S	80
86.0	82.76	103.44	68.0	82.76	103.44	2	T2535163S	110
129.0	124.13	155.20	103.0	124.13	155.20	2	T2535173S	175
216.0	207.85	259.80	172.0	207.85	259.80	2	T2535183S	300
324.0	311.78	389.70	259.0	311.78	389.70	2	TP530193S	400
433.0	416.67	520.83	346.0	416.67	520.83	2	TP530203S	600
650.0	625.00	781.00	519.0	625.00	781.00	2	TP530213S	800
865.0	833.00	1040.00	692.0	833.00	1051.00	2	TP530223S	1200
1445.0	1391.00	1738.00	1156.0	1391.00	1756.00	2	TP530233S	2000
2164.0	2083.00	2602.00	1731.0	2083.00	2629.00	2	TP530243S	3000

① kVA capacity of three phase autotransformer bank, using two single phase, 60 Hz transformers connected open delta.

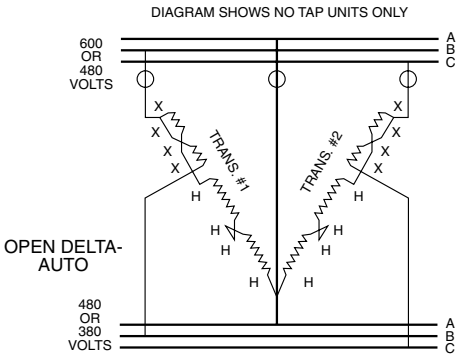
② Catalog No. is for 1 transformer, 2 units are required.

③ Can be reverse connected with no change in kVA.

④ For transformer dimensions, refer to appropriate table in section 1, page 23.

⑤ For proper overcurrent protection, refer to Article 450-4 of N.E.C

The diagram is 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.



⑤ **O** = Fuse Location NEC 450-4, 2014.

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

① Applicable for the above connection only.

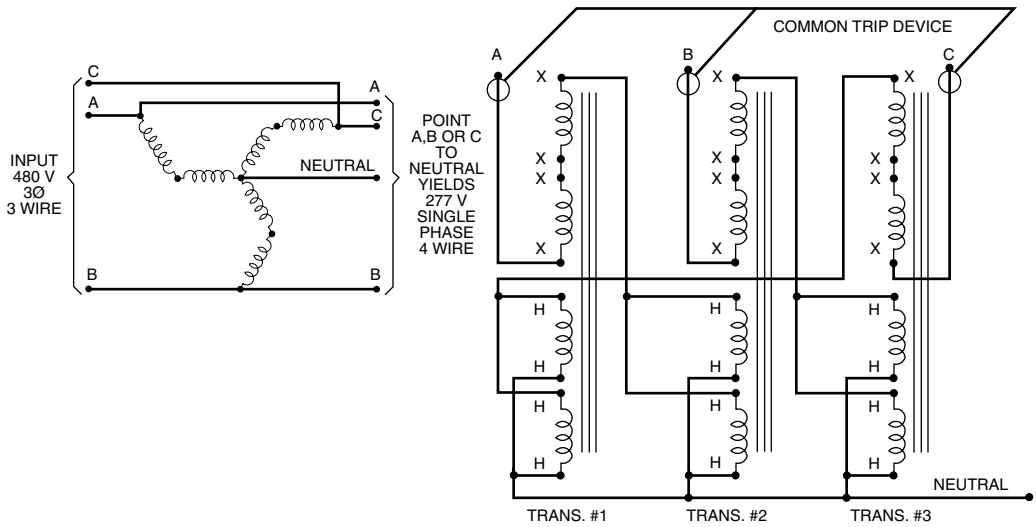
② Connection diagram (using 3 pieces of 1 phase, 60 hertz transformers connected zig-zag auto) for developing a neutral (4th wire) from a 3 phase, 3 wire supply.

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 23.

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

See Footnote ②



O = Fuse Location NEC 450-4, 2014. ③

Many non-standard voltage correction problems can be solved by using standard off-the-shelf single phase transformers. Drawings for these products can be downloaded from our website at hubbell-acmeelectric.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 Number
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 Number
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

Medium Voltage Transformers

Section 2

2.5 and 5 kV Single and Three Phase

Medium Voltage Transformers, 2.5–5kV Class

Medium voltage dry-type transformers are used to step down incoming high voltage power to utilization voltages for residential, commercial, institutional and industrial applications. Offering many advantages over liquid-filled transformers, they are ideally suited for indoor application close to the load for more efficient distribution of power at lower operating costs.

Acme Electric medium voltage dry-type transformers are air-cooled by natural convection, eliminating the principal hazards associated with liquid-filled transformers as well as the need for expensive fireproof vaults and venting systems for toxic gas. They are generally smaller, lighter, and easier to maintain than liquid-filled transformers, requiring only occasional cleaning and inspection. They are encased in a ventilated steel enclosure with no exposed live parts, making them ideal for installation in buildings such as hospitals, theaters, schools, office buildings, and factories.

Because Acme Electric gives close attention to detail and workmanship throughout design, production, and inspection, our medium voltage dry-type transformers are designed for economical, trouble-free service for a life expectancy of 25 years or more. In particular, we optimize the design for BIL levels, short circuit strength, losses, temperature rise, corona-free operation, and low sound levels so that there is no need to over-specify to ensure quality and long, economical performance.

DOE 2016 and CSA C802.2

Our new line of medium voltage transformers not only meets but exceeds the new, more stringent DOE 2016 Energy Efficiency Standards U.S. DOE 10 CFR Part 431Subpart K, and Canadian Energy Efficiency Regulations SOR/94-651.

- UL Listed
- All units are cUL Listed per UL-1562 and CSA C22.2 No. 47.

Basic Impulse Level

One of the most important considerations in the specification and design of medium voltage dry type transformers is the basic impulse level (BIL). This is the ability of the transformer to withstand impulse voltages impressed upon it by switching surges or lightning. BIL ratings are per IEEE Std C57.12.01.

Corona

Corona is the ionization of air surrounding a high voltage electrode. Corona discharge can reduce transformer life by

1. Gradually breaking down the chemistry of insulation system
2. Forming streamers or eroding tracks on the insulation or insulators, causing subsequent flashover
3. Reducing the transformer BIL level

Corona-free operation is a priority in all Acme Electric transformer designs. Through a combination of air spacing, insulating materials, and semiconducting tape, all of our medium voltage dry-type transformers have corona extinction levels that exceed their operating voltage level.

Coil Construction
Coils are wound with aluminum conductor and insulated with UL recognized Class 220º C materials such as DuPont Nomex®.

Continuous Wound Coil
The continuous layer wound coil consists of columns of rectangular magnet wire layers separated by axial cooling ducts inserted between various layers. This gives the coil a single column mass and maximum mechanical axial strength. Coils are also kept as round and tight as possible in order to provide maximum strength against radial short circuit forces.

The air ducts provide adequate air space between layers and coils, eliminating the need for flash barriers, which can restrict cooling air flow, increasing hot spot temperatures. During assembly, high voltage windings are positioned over low voltage windings to minimize axial stresses under short-circuit conditions.

All coils are preheated to drive out moisture, and then impregnated with high quality polyester resin to eliminate air-filled voids that can promote corona. This also reduces effective spacing necessary to maintain a high BIL.

Cores
Transformer cores are manufactured with grain oriented cold rolled high purity silicon steel having the highest possible silicon content compatible with magnetic steel production methods. All core steel has been annealed to relieve stresses and to assure flatness and optimum magnetic properties after slitting and processing.

Coil Taps
Coil taps are furnished in the high voltage winding to compensate for variations in the incoming supply voltage to the transformer. All Acme Electric medium voltage transformers are equipped with 2–2½% ANFC (Above Normal Full Capacity) and 2–2½% BNFC (Below Normal Full Capacity) high voltage taps that are easily accessible through removable panels on the front of the transformer.

Further, we are structured to provide custom specifications. If you need a medium voltage dry-type transformer with specifications different from those in our existing line, our engineers can design one for you. For assistance, contact your Acme representative or call 1-800-334-5214 for assistance in developing a solution to your needs.

Features
- Completely encased in a ventilated steel enclosure with no exposed live parts
- Air-cooled by natural convection
- Smaller, easier to maintain than liquid-filled transformers
- No additional fireproofing or venting needed
- Long life expectancy
- Covered under ACME's 3 year warranty
- Available with 3R Weathershield

Applications
- Residential applications
- Hospitals, clinics and other health care operations
- Educational facilities
- Office buildings
- Theaters, stadiums and other entertainment venues

SINGLE PHASE, 60Hz, 2.5kV & 5kV CLASS, NEMA 1 ENCLOSED, DOE 2016

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Design Figures
15	WB015KXX ①	28.3 (71.8)	20.3 (51.5)	16.3 (41.4)	255 (115.6)	F	NA	NA	E
25	WC025KXX ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	320 (145.1)	F	NA	NA	E
37.5	WC037KXX ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	400 (181.4)	F	NA	NA	E
50	WC050KXX ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	530 (240.4)	F	NA	NA	E
75	WC075KXX ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	690 (312.9)	F	NA	NA	E
100	WC100KXX ①	40.8 (103.6)	32.3 (82.0)	28.3 (71.8)	800 (362.8)	F	NA	NA	E
167	WC167KXX ①	40.8 (103.6)	32.3 (82.0)	28.3 (71.8)	1100 (498.9)	F	NA	NA	E
250	WC250KXX ①	40.8 (103.6)	32.3 (82.0)	28.3 (71.8)	1500 (680.3)	F	NA	NA	E
333	WC333KXX ①	48.0 (121.9)	48.0 (121.9)	32.0 (81.2)	2000 (907.1)	F	NA	NA	E
500	WC500KXX ①	54.0 (137.1)	60.0 (152.4)	40.0 (101.6)	3200 (1451.4)	F	NA	NA	G

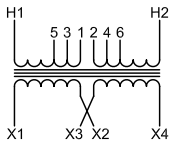
① Add appropriate voltage number code to catalog number

Available with 3R Weathershield

SINGLE PHASE VOLTAGE SELECTION

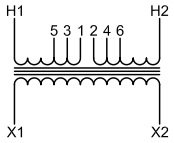
XX	Primary Volts	Secondary Volts	Wiring Diagrams
01	2400	120/240	1
02	2400	240/480	1
03	2400	600	2
04	4160	120/240	1
05	4160	240/480	1
06	4160	600	2
07	4800	120/240	1
08	4800	240/480	1
09	4800	600	2

SCH 1



LINE CONNECTION	VOLTAGE	JUMPER CONNECTION	LOAD CONNECTION	VOLTAGE	JUMPER CONNECTION
H1 - H2	105 %	1 - 2	X1 - X4	120	X1 - X3, X2 - X4
	102.5 %	2 - 3		240	X2 - X3
	100 %	3 - 4	X1 - X4	240	X1 - X3, X2 - X4
	97.5 %	4 - 5		480	X2 - X3
	95 %	5 - 6			

SCH 2



LINE CONNECTION	VOLTAGE	JUMPER CONNECTION	LOAD CONNECTION	VOLTAGE
H1 - H2	105 %	1 - 2	X1 - X2	600
	102.5 %	2 - 3		
	100 %	3 - 4		
	97.5 %	4 - 5		
	95 %	5 - 6		

THREE PHASE, 60Hz, 2.5kV & 5kV CLASS, NEMA 1 ENCLOSED, DOE 2016

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	N-1 Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Knockouts (Inches)(Cm.)	Optional Electrostatic Shield	Design Figures
15	WH015KYY ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	340 (154.2)	F	NA	NA	E
30	WI030KYY ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	450 (204.1)	F	NA	NA	E
45	WI045KYY ①	34.8 (88.3)	26.3 (66.8)	22.3 (56.6)	500 (226.7)	F	NA	NA	E
75	WI075KYY ①	40.8 (103.6)	32.3 (82.0)	28.3 (71.8)	810 (367.4)	F	NA	NA	E
112.5	WI112KYY ①	40.8 (103.6)	32.3 (82.0)	28.3 (71.8)	950 (430.9)	F	NA	NA	E
150	WI150KYY ①	48.0 (121.9)	48.0 (121.9)	32.0 (81.2)	1260 (571.5)	F	NA	NA	E
225	WI225KYY ①	48.0 (121.9)	48.0 (121.9)	32.0 (81.2)	1630 (739.3)	F	NA	NA	E
300	WI300KYY ①	48.0 (121.9)	48.0 (121.9)	32.0 (81.2)	2180 (988.8)	F	NA	NA	E
500	WI500KYY ①	54.0 (137.1)	60.0 (152.4)	40.0 (101.6)	2940 (907.1)	F	NA	NA	G
750	WI750KYY ①	54.0 (137.1)	60.0 (152.4)	40.0 (101.6)	4400 (1995.8)	F	NA	NA	G
1000	WI001MYY ①	72.0 (182.8)	68.0 (172.7)	48.0 (121.9)	6100 (2766.9)	F	NA	NA	G
1500	WI015MYY ①	84.0 (213.3)	84.0 (213.3)	48.0 (121.9)	8100 (3674.0)	F	NA	NA	G
2000	WI002MYY ①	84.0 (213.3)	84.0 (213.3)	48.0 (121.9)	9500 (4309.1)	F	NA	NA	G

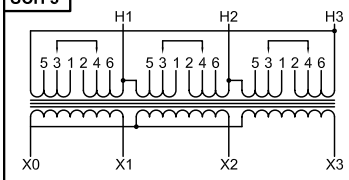
① Add appropriate voltage number code to catalog number

Available with 3R Weathershield

THREE PHASE VOLTAGE SELECTION

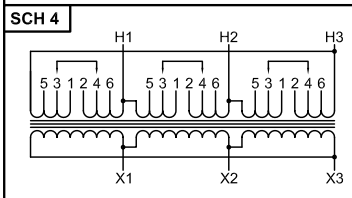
YY	Primary Volts	Secondary Volts	Wiring Diagrams
10	2400Δ	208Y120	3
11	2400Δ	240Δ	4
12	2400Δ	480Δ	4
13	2400Δ	480Y277	3
14	2400Δ	600Δ	4
15	2400Δ	600Y347	3
16	4160Δ	208Y120	3
17	4160Δ	240Δ	4
18	4160Δ	480Δ	4
19	4160Δ	480Y277	3
20	4160Δ	600Δ	4
21	4160Δ	600Y347	3
22	4800Δ	208Y120	3
23	4800Δ	240Δ	4
24	4800Δ	480Δ	4
25	4800Δ	480Y277	3
26	4800Δ	600Δ	4
27	4800Δ	600Y347	3

SCH 3



LINE CONNECTION	VOLTAGE	JUMPER CONNECTION	LOAD CONNECTION
(DELTA) H3 H1 H2	105 %	1 - 2	(WYE) X2 X1 X0 (NEUTRAL) X3
	102.5 %	2 - 3	
	100 %	3 - 4	
	97.5 %	4 - 5	
	95 %	5 - 6	

SCH 4



LINE CONNECTION	VOLTAGE	JUMPER CONNECTION	LOAD CONNECTION
(DELTA) H3 H1 H2	105 %	1 - 2	(DELTA) X3 X1 X2
	102.5 %	2 - 3	
	100 %	3 - 4	
	97.5 %	4 - 5	
	95 %	5 - 6	

Harmonic Mitigating Transformers

Section 3

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, and higher efficiency.

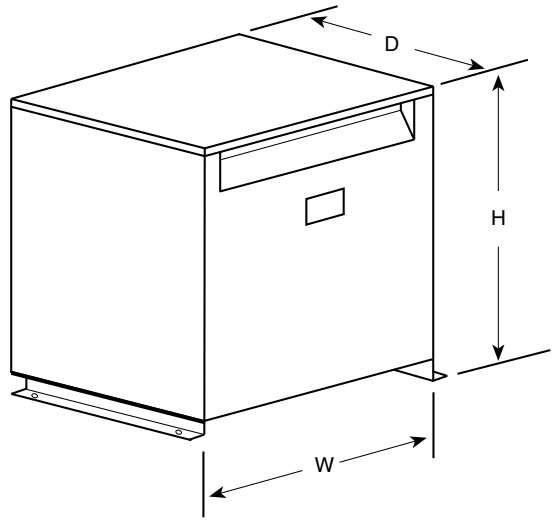
Features

- 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
- Copper conductor construction

Applications

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

Dimensional Diagram



480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Weather Shield	Wiring Diagrams	Design Figures
30.0	H3030K0014BCS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	360 (163.2)	F ①	WSA1	81	E
45.0	H3045K0014BCS	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	500 (226.8)	F ①	WSA1	81	E
75.0	H3075K0014BCS	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.2)	F ①	WSA2	81	E
112.5	H3112K0014BCS	35.47 (90.1)	31.90 (81.0)	26.88 (68.2)	938 (425.5)	F	WSA3	81	E
150.0	H3150K0014BCS	41.52 (105.5)	32.90 (83.5)	29.87 (75.9)	1213 (550.2)	F	WSA4	81	E
225.0	H3225K0014BCS	41.52 (105.5)	32.90 (83.5)	29.87 (75.9)	1872 (849.1)	F	WSA4	81	E

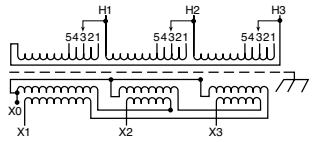
Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes, refer to page 217.

All Wiring Diagrams begin on page 209.

Harmonic Mitigating Transformers Wiring Diagram

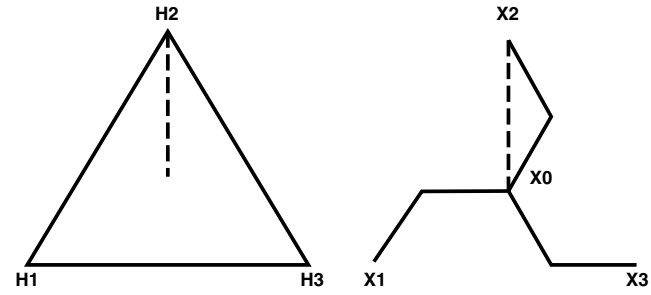
81 **PRIMARY: 480 Volts Delta**
SECONDARY: 208Y/120 Volts
TAPS: 2, 2 ½% ANFC, 2, 2 ½% BNFC



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

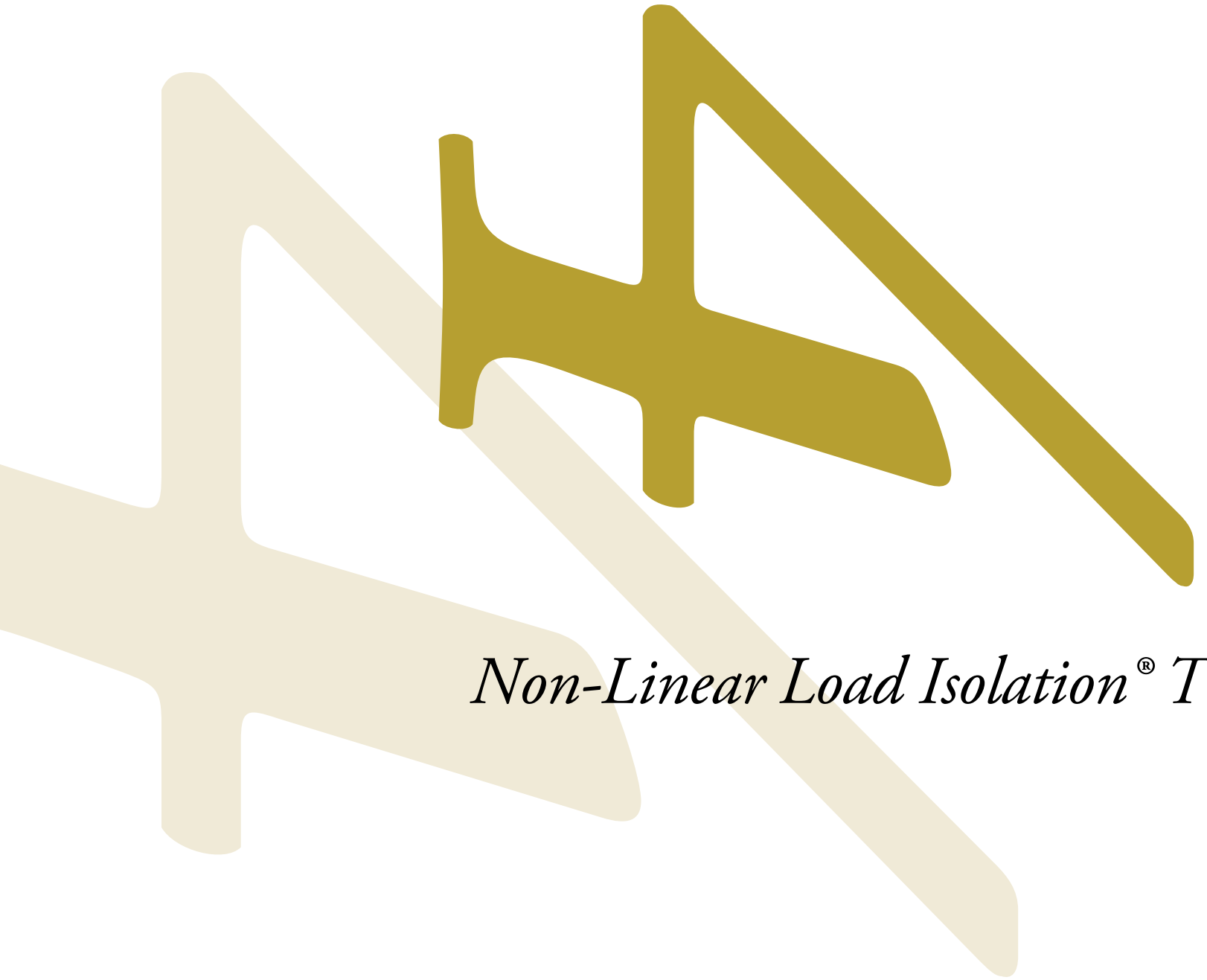
Diagram Showing Delta Primary and Zig-Zag Secondary

(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.



Non-Linear Load Isolation® Transformers

Section 4

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

Non-linear 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.

Features

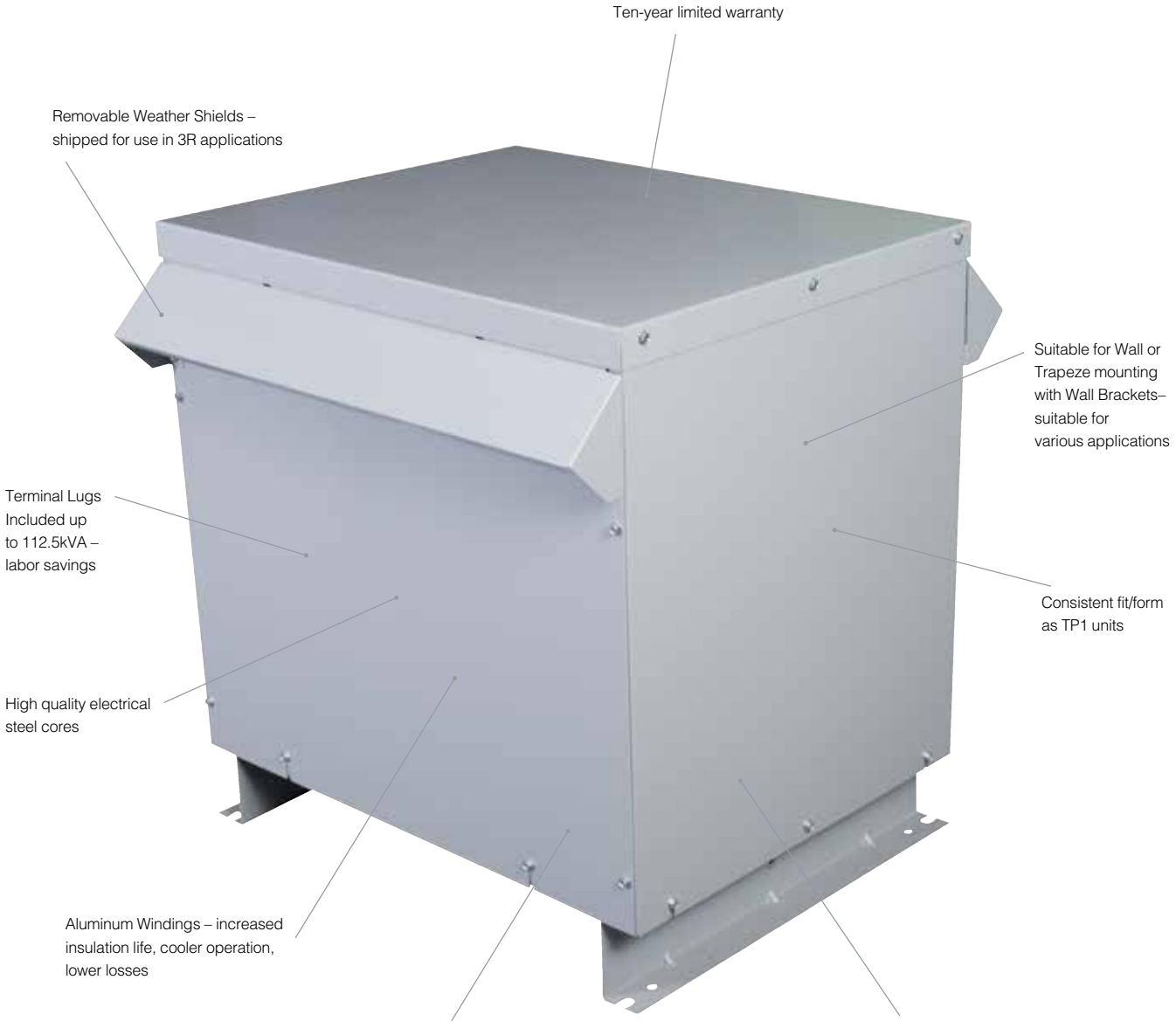
- Available in K-factors of 4, 13 and 20. Consult factory for other K-factors.
- 3R Compliant
- All new units ship with weather shields already installed Flexibility. When a weather shield is not needed, it can easily be removed Terminal Lugs.
- Primary and secondary terminals come standard with lugs (up to 112.5kVA) for quicker, easier connections.
- 150°C and 115°C temperature rise units. 80°C temperature rise consult factory.
- 10-year limited warranty.
- UL Listed and CSA Certified.
- Available in 480V and 208V primary, 15 through 225 kVA.
- Primary taps: (2) 2½% ANFC, (4) 2½% BNFC.
- Aluminum windings

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

K-Factor/Type of Load	
K1	Resistance heating, Incandescent lighting, Motors, Transformers, control/distribution
K4	Welders, Induction heaters, HID lighting, Fluorescent lighting, Solid state controls
K-13	Telecommunications equipment, Branch Circuits in classrooms and health care facilities
K-20	Main frame computers, Variable speed drives, Branch circuits with exclusive loads of Data Processing equipment, Desktop computers

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

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



Double-sized neutral conductor handles excessive neutral currents

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).

K FACTOR 13, 150°C RISE
208 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15	T3015K0064BK13S	25.50 (64.8)	24.40 (62.0)	19.37 (49.2)	366 (166.0)	F①	61	E
30	T3030K0064BK13S	25.50 (64.8)	24.90 (62.0)	19.37 (49.2)	522 (236.8)	F①	61	E
45	T3045K0064BK13S	29.40 (74.7)	28.15 (71.5)	22.37 (56.8)	667 (302.6)	F①	61	E
75	T3075K0064BK13S	35.40 (89.9)	31.90 (81.0)	26.87 (68.3)	938 (425.5)	F	61	E
112	T3112K0064BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1213 (550.2)	F	61	E
150	T3150K0064BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1700 (771.0)	F	61	E
225	T3225K0064BK13S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2165 (982.0)	F	61	E

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes,refer to page 217.

K FACTOR 20, 150°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15.0	T3015K0013BK20S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	366 (166.0)	F ①	22	E
30.0	T3030K0013BK20S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	500 (226.8)	F ①	22	E
45.0	T3045K0013BK20S	29.40 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F	22	E
75.0	T3075K0013BK20S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	938 (425.5)	F	22	E
112.5	T3112K0013BK20S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1213 (550.2)	F	22	E
150.0	T3150K0013BK20S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1600 (725.8)	F	22	E
225.0	T3225K0013BK20S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1938 (879.0)	F	22	E

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes, refer to page 217.

K FACTOR 13, 150°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15.0	T3015K0013BK13S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	366 (166.0)	F①	22	E
30.0	T3030K0013BK13S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	500 (226.8)	F①	22	E
45.0	T3045K0013BK13S	29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F①	22	E
75.0	T3075K0013BK13S	35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	938 (425.5)	F	22	E
112.5	T3112K0013BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1213 (550.2)	F	22	E
150.0	T3150K0013BK13S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1600 (725.8)	F	22	E
225.0	T3225K0013BK13S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1938 (879.0)	F	22	E

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes, refer to refer to page 217.

K FACTOR 4, 150°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15.0	T3015K0013BK4S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	325 (147.0)	F①	22	E
30.0	T3030K0013BK4S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	366 (166.0)	F①	22	E
45.0	T3045K0013BK4S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	500 (226.8)	F①	22	E
75.0	T3075K0013BK4S	29.40 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F	22	E
112.5	T3112K0013BK4S	35.40 (89.9)	31.90 (81.0)	26.87 (68.3)	938 (425.5)	F	22	E
150.0	T3150K0013BK4S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1213 (550.2)	F	22	E
225.0	T3225K0013BK4S	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1600 (725.8)	F	22	E

Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes, refer to refer to page 217.

K FACTOR 13, 115°C RISE
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Wiring Diagrams	Design Figures
15	T3015K0013BK13SF	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	366 (166.0)	F①	22	E
30	T3030K0013BK13SF	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	500 (226.8)	F	22	E
45	T3045K0013BK13SF	29.40 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F	22	E
75	T3075K0013BK13SF	35.40 (89.9)	31.90 (81.0)	26.87 (68.3)	938 (425.5)	F	22	E
112	T3112K0013BK13SF	41.52 (105.4)	32.90 (83.6)	29.88 (75.9)	1213 (550.2)	F	22	E
150	T3150K0013BK13SF	41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1600 (725.8)	F	22	E
225	T3225K0013BK13SF	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1938 (879.0)	F	22	E

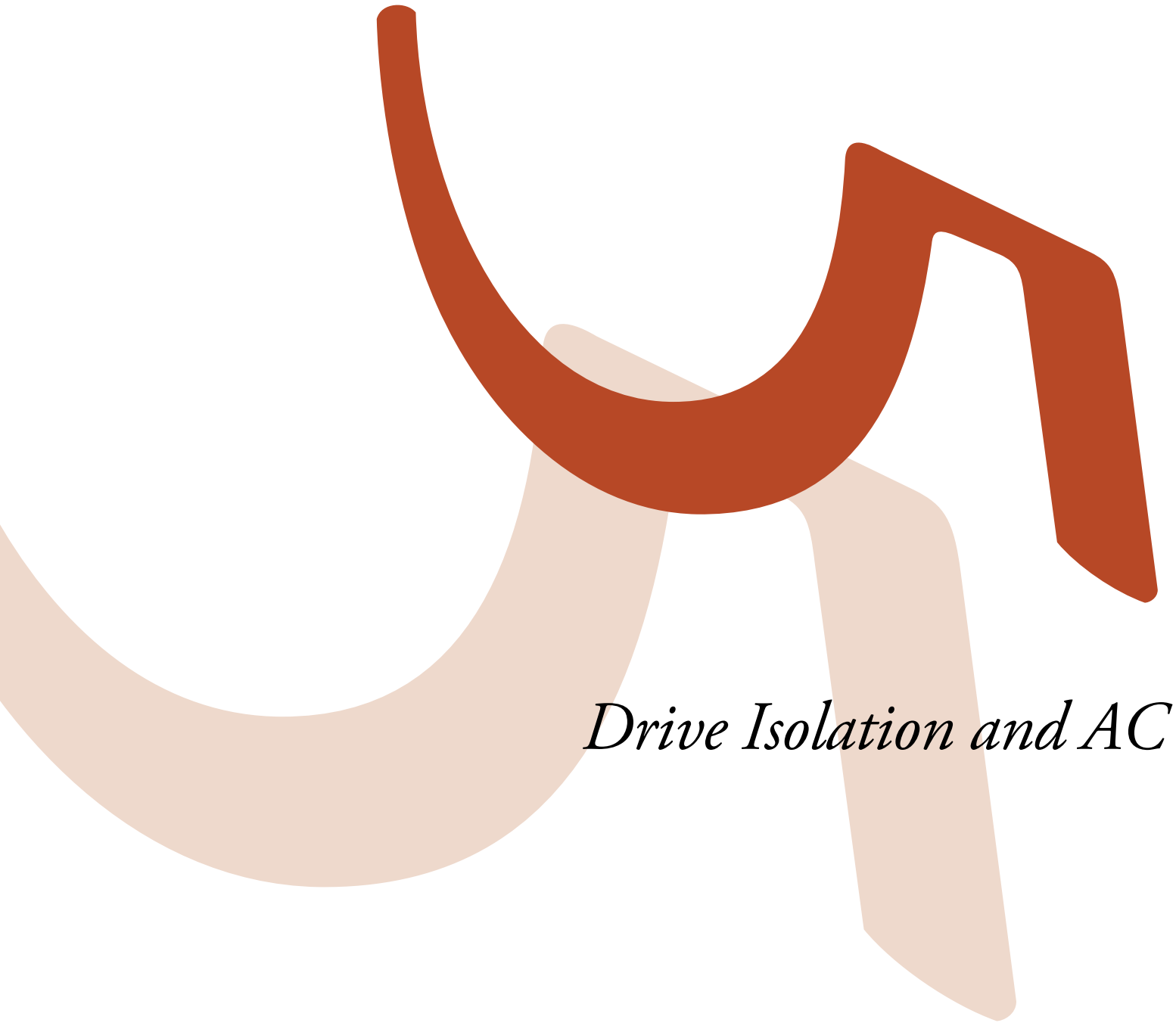
Notes: All models are DOE 2016 compliant

① Wall mounting brackets are available for these sizes, refer to page 217.

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

Non-Linear Load Isolation® Wiring Diagrams (refer to page 209)

Non-Linear Load Isolation® Design Figures (refer to page 208)



Drive Isolation and AC Line Reactors

Section 5

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.

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 880 kVA units, taps are 2-2½% ANFC and 2-2½% BNFC.
- Full range of kVA ratings cover all standard drive systems.
- Ample wiring compartment for easy cable entry.
- Optional wall mounting brackets for certain sizes.

Stress relief

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

Lower losses

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

Reduced short circuit forces

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

Selection instructions

If you know the motor horse-power, simply follow the drive system manufacturer's recommendation.

Or, select the corresponding kVA from the chart on the right.

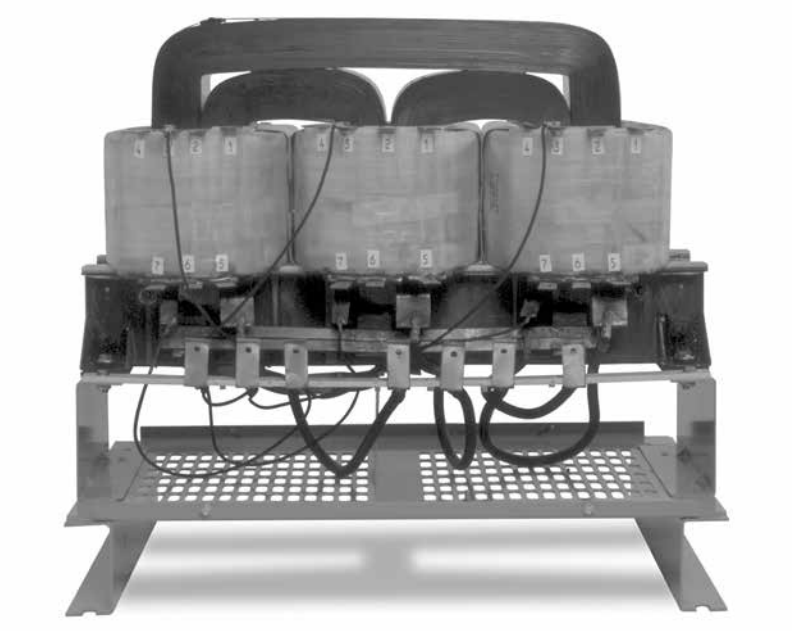
For example, a 40 Hp motor requires a 51 kVA DIT.

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 ADVANTAGE

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 440 kVA and larger use stacked 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

kVA	Primary 230V Delta Secondary 230Y/133 Catalog Number		Height③ (Inches)(Cm.)	Width③ (Inches)(Cm.)	Depth③ (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Weather Shield	Dimension Drawing
7.5	DTFA72S	(62)	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	180 (81.6)	W	NA	F
11.0	DTFA0112S		18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	I
14.0	DTFA0142S		18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	I
20.0	DTFA0202S		20.77 (52.8)	20.94 (53.2)	10.18 (25.9)	435 (197.0)	F ①	NA	I
27.0	DTFA0274S	(59)	25.48 (64.8)	24.39 (62.0)	19.40 (49.3)	302 (137.0)	F ②	WSA1	E
34.0	DTFA0344S		25.48 (64.8)	24.39 (62.0)	19.40 (49.3)	330 (150.0)	F ②	WSA1	E
40.0	DTFA0404S		25.48 (64.8)	24.39 (62.0)	19.40 (49.3)	370 (168.0)	F ②	WSA1	E
51.0	DTFA0514S		29.40 (74.7)	28.15 (71.5)	22.40 (56.9)	375 (170.0)	F ②	WSA2	E
63.0	DTFA0634S		29.40 (74.7)	28.15 (71.5)	22.40 (56.9)	495 (225.0)	F ②	WSA2	E
75.0	DTFA0754S		29.40 (74.7)	28.15 (71.5)	22.40 (56.9)	525 (238.0)	F ②	WSA2	E
93.0	DTFA0934S		35.40 (89.9)	31.90 (81.0)	26.90 (68.3)	685 (311.0)	F	WSA3	E
118.0	DTFA01184S		35.40 (89.9)	31.90 (81.0)	26.90 (68.3)	710 (322.0)	F	WSA3	E
145.0	DTFA01454S		41.52 (105.5)	32.90 (83.6)	29.90 (75.9)	980 (445.0)	F	WSA4	E
175.0	DTFA01754S		41.52 (105.5)	32.90 (83.6)	29.90 (75.9)	1110 (504.0)	F	WSA4	E
220.0	DTFA02204S		41.52 (105.5)	32.90 (83.6)	29.90 (75.9)	1120 (508.0)	F	WSA4	E

① Optional wall mounting kits – part # PL 79911 refer to page 217.

② Optional wall mounting kits – part # PL 79912 refer to page 217.

The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 209.

kVA	Primary 460V Delta Secondary 230Y/133 Catalog Number		Primary 460V Delta Secondary 460Y/266 Catalog Number		Height③ (Inches)(Cm.)	Width③ (Inches)(Cm.)	Depth③ (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Weather Shield	Dimension Drawing
7.5	DTGA72S	(37)	DTGB72S	(34)	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	180 (81.6)	W	NA	F
11.0	DTGA0112S		DTGB0112S		18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	I
14.0	DTGA0142S		DTGB0142S		18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	270 (123.0)	F ①	NA	I
20.0	DTGA0202S		DTGB0202S		20.77 (52.8)	20.94 (53.2)	10.18 (25.9)	435 (197.0)	F ①	NA	I
27.0	DTGA0274S	(38)	DTGB0274S	(35)	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	320 (145.0)	F ②	WSA1	E
34.0	DTGA0344S		DTGB0344S		25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	340 (154.0)	F ②	WSA1	E
40.0	DTGA0404S		DTGB0404S		25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	395 (179.0)	F ②	WSA1	E
51.0	DTGA0514S		DTGB0514S		29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	400 (181.0)	F ②	WSA2	E
63.0	DTGA0634S		DTGB0634S		29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	550 (250.0)	F ②	WSA2	E
75.0	DTGA0754S		DTGB0754S		29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	570 (259.0)	F ②	WSA2	E
93.0	DTGA0934S		DTGB0934S		35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	685 (311.0)	F	WSA3	E
118.0	DTGA01184S		DTGB01184S		35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	765 (347.0)	F	WSA3	E
145.0	DTGA01454S		DTGB01454S		41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	990 (449.0)	F	WSA4	E
175.0	DTGA01754S		DTGB01754S		41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1100 (499.0)	F	WSA4	E
220.0	DTGA02204S		DTGB02204S		41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1120 (508.0)	F	WSA4	E
275.0	DTGA002754S		DTGB002754S		45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	E
330.0	DTGA03304S		DTGB03304S		45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	G
440.0			DTGB04404S		57.84 (146.9)	45.50 (115.6)	41.49 (105.4)	2295 (1043.2)	F	WSA7	G
550.0			DTGB05504S		57.84 (146.9)	45.50 (115.6)	41.49 (105.4)	2580 (1172.7)	F	WSA7	G
660.0			DTGB06604S		62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	3700 (1678.3)	F	WSA6	G
770.0			DTGB07704S		62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	4044 (1838.2)	F	WSA6	G
880.0			DTGB008804S		62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	4230 (1922.7)	F	WSA6	G
990.0			DTGB9902S		62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	4285 (1947.7)	F	WSA6	G

① Optional wall mounting kits-part # PL79911, refer to page 209.

② Optional wall mounting kits-part # PL79912, refer to page 209.

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

The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 209.

kVA	Primary 575V Delta Secondary 230Y/133 Catalog Number		Primary 575V Delta Secondary 460Y/266 Catalog Number		Height③ (Inches)(Cm.)	Width③ (Inches)(Cm.)	Depth③ (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Mounting Type (Wall)(Floor)	Weather Shield	Dimension Drawing
7.5	DTHA72S	(40)	DTHB72S	(43)	15.21 (38.6)	19.25 (48.9)	7.37 (18.7)	180 (81.6)	W	NA	F
11.0	DTHA0112S		DTHB0112S		18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	265 (120.0)	F ①	NA	I
14.0	DTHA0142S		DTHB0142S		18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	270 (123.0)	F ①	NA	I
20.0	DTHA0202S		DTHB0202S		20.77 (52.8)	20.94 (53.2)	10.18 (25.9)	435 (197.0)	F ①	NA	I
27.0	DTHA0274S	(41)	DTHB0274S	(44)	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	320 (145.0)	F ②	WSA1	E
34.0	DTHA0344S		DTHB0344S		25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	340 (154.0)	F ②	WSA1	E
40.0	DTHA0404S		DTHB0404S		25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	395 (179.0)	F ②	WSA1	E
51.0	DTHA0514S		DTHB0514S		29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	400 (181.0)	F ②	WSA2	E
63.0	DTHA0634S		DTHB0634S		29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	550 (250.0)	F ②	WSA2	E
75.0	DTHA0754S		DTHB754S		29.90 (75.9)	28.15 (71.5)	22.37 (56.8)	570 (259.0)	F ②	WSA2	E
93.0	DTHA0934S		DTHB0934S		35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	685 (311.0)	F	WSA3	E
118.0	DTHA01184S		DTHB01184S		35.90 (91.2)	31.90 (81.0)	26.88 (68.3)	765 (347.0)	F	WSA3	E
145.0	DTHA01454S		DTHB01454S		41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	990 (449.0)	F	WSA4	E
175.0			DTHB01754S		41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1100 (499.0)	F	WSA4	E
220.0			DTHB02204S		41.52 (105.5)	32.90 (83.6)	29.88 (75.9)	1120 (508.0)	F	WSA4	E
275.0			DTHB002754S		45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	E
330.0			DTHB03304S		45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	2090 (948.0)	F	WSA5	G
440.0			DTHB04404S		57.84 (157.5)	45.50 (115.6)	41.49 (105.4)	2580 (1172.7)	F	WSA7	G
550.0			DTHB05504S		57.84 (157.5)	45.50 (115.6)	41.49 (105.4)	2640 (1200.0)	F	WSA7	G
660.0			DTHB006604S		62.84 (159.6)	54.00 (137.2)	41.49 (105.4)	3700 (1678.3)	F	WSA6	G

① Optional wall mounting kits-part # PL79911, refer to page 217.

② Optional wall mounting kits-part # PL79912, refer to page 217.

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

The number in ( )'s following the catalog number is the electrical wiring diagram number beginning on page 209.

Windings, Terminals and Construction

kVA	Primary Winding	Secondary Winding	Insulation System	Termination	Enclosure	Construction	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
275-330	AL foil	AL foil	220°C	AL bus	Ventilated		Wound/distributed gap
440-770	AL foil	AL foil	220°C	AL bus	Ventilated		Butt stacked/Step lap

Thermal Switch Kit - PL-79900

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

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

kVA	Mounting Position	Illustration
27.0-118.0	Bottom of the case	Figure 1
145-750	Top flange of the core bracket	Figure 2

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

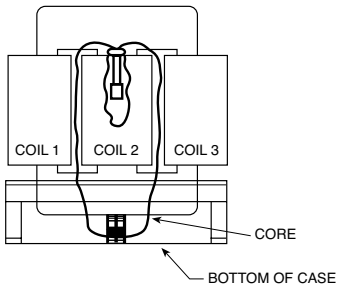
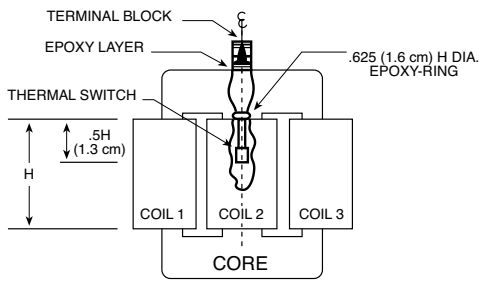


Figure 2



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

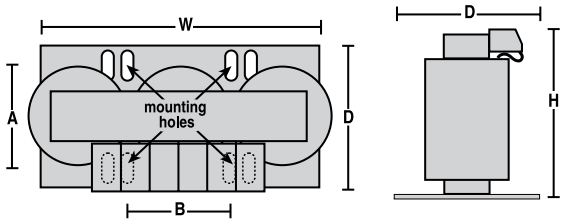
Benefits

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

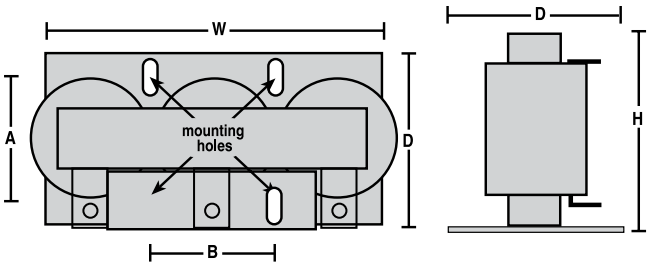
- Protection from damaging voltage drop.
- Elimination of nuisance tripping of drives or circuit breakers.
- Reduction of motor current surges and power line spike currents.
- Improvement in true power factor of capacitor input drives.
- Cooler, quieter operation.
- Reduction of harmonic distortion.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

AC Line Reactors Dimensional Drawings

1-60 HP; 2-80 Amp

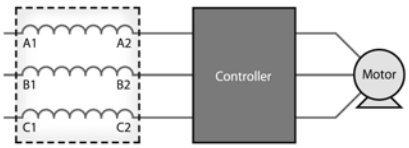


75-500 HP; 110-600 Amp



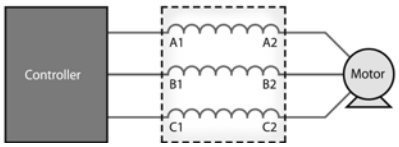
APPLYING AC LINE REACTORS

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.



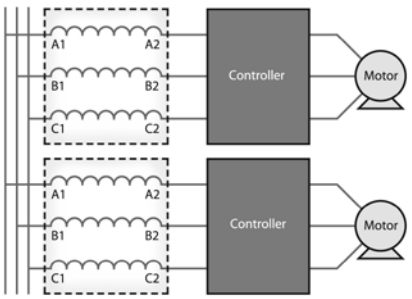
Input to Inverter/Drive

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.



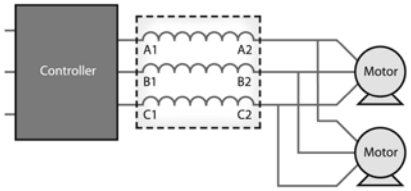
Output of Inverter/Drive (AC Drive only)

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 har-



Multiple Motors Controlled by a Single Drive (AC Drive only)

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

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

Motor*					Dimensions			Mounting Dimensions		
Catalog Number	H.P.	Amp	Reactor Amp	uH	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	A (Depth)	B (Width)	Weight (Lbs.)(Kg.)
ALRB002TBC ①	1	2.1	2	11027	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB003TBC ①	1.5	3	3	7351	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB004TBC ①	2	3.4	4	5513	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB006TBC ①	3	4.8	6	3676	3.875 (9.8)	4.25 (10.8)	3.125 (7.90)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRB008TBC ①	5	7.6	8	2757	4.75 (12.1)	6.50 (16.5)	3.75 (9.50)	2.10 (5.3)	2.00 (5.1)	5 (2.3)
ALRB012TBC ①	7.5	11	12	1838	4.75 (12.1)	6.50 (16.5)	3.75 (9.50)	2.10 (5.3)	2.00 (5.1)	6 (2.7)
ALRB016TBC ①	10	14	16	1378	4.75 (12.1)	6.50 (16.5)	3.75 (9.50)	2.30 (5.8)	2.00 (5.1)	6 (2.7)
ALRB025TBC ①	15	21	25	882	4.75 (12.1)	6.50 (16.5)	4.00 (10.2)	2.60 (6.6)	2.50 (6.4)	9 (4.1)
ALRB027TBC ①	20	27	27	817	4.75 (12.1)	6.50 (16.5)	4.00 (10.2)	2.60 (6.6)	2.50 (6.4)	9 (4.1)
ALRB035TBC ①	25	34	35	630	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	3.20 (8.1)	2.50 (6.4)	13 (5.9)
ALRB045TBC ①	30	40	45	490	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	3.20 (8.1)	3.00 (7.6)	14 (6.4)
ALRB055TBC ①	40	52	55	401	7.00 (17.8)	9.00 (22.9)	4.50 (11.4)	3.50 (8.9)	3.60 (9.1)	22 (10.0)
ALRB080TBC	60	77	80	276	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.60 (9.1)	23 (10.4)
ALRB110CBC	75	96	110	200	7.00 (17.8)	9.00 (22.9)	5.50 (14.0)	3.60 (9.1)	3.60 (9.1)	27 (12.2)
ALRB130CBC	100	124	130	170	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	3.50 (8.9)	3.60 (9.1)	34 (15.4)
ALRB160CBC	125	156	160	138	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	4.20 (10.7)	3.60 (9.1)	36 (16.3)
ALRB200CBC	150	180	200	110	7.00 (17.8)	9.00 (22.9)	8.00 (20.3)	4.20 (10.7)	3.60 (9.1)	55 (24.9)
ALRB250CBC	200	240	250	88	8.50 (21.6)	10.80 (27.4)	8.00 (20.3)	5.70 (14.5)	4.60 (11.7)	74 (33.6)
ALRB300CBC	250	302	300	74	8.50 (21.6)	10.80 (27.4)	8.00 (20.3)	5.20 (13.2)	4.60 (11.7)	85 (38.6)
ALRB360CBC	300	361	360	61	8.50 (21.6)	10.80 (27.4)	8.00 (20.3)	6.20 (15.2)	4.60 (11.7)	105 (47.6)
ALRB420CBC	350	414	420	53	8.50 (21.6)	10.80 (27.4)	8.50 (21.6)	6.20 (15.2)	4.60 (11.7)	113 (51.3)
ALRB480CBC	400	477	480	46	8.50 (21.6)	10.80 (27.4)	8.50 (21.6)	6.70 (17.0)	4.60 (11.7)	119 (54.0)

* Motor HP and Amp rated at 480 volts.

① CE Marked

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

Motor*					Dimensions			Mounting Dimensions		
Catalog Number	H.P.	Amp	Reactor Amp	uH	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	A (Depth)	B (Width)	Weight (Lbs.)(Kg.)
ALRC002TBC ①	1	2.1	2	18378	3.875 (9.8)	4.25 (10.8)	3.125 (7.9)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRC003TBC ①	1.5	3	3	12252	3.875 (9.8)	4.25 (10.8)	3.125 (7.9)	2.00 (5.1)	1.44 (3.7)	3 (1.4)
ALRC004TBC ①	2	3.4	4	9189	3.875 (9.8)	4.25 (10.8)	3.125 (7.9)	2.10 (5.3)	1.44 (3.7)	4 (1.8)
ALRC006TBC ①	3	4.8	6	6126	4.75 (12.1)	6.50 (16.5)	3.75 (9.5)	2.10 (5.3)	2.00 (5.1)	5 (2.3)
ALRC008TBC ①	5	7.6	8	4594	4.75 (12.1)	6.50 (16.5)	3.75 (9.5)	2.10 (5.3)	2.00 (5.1)	6 (2.7)
ALRC012TBC ①	7.5	11	12	3063	4.75 (12.1)	6.50 (16.5)	3.75 (9.5)	2.20 (5.6)	2.00 (5.1)	7 (3.2)
ALRC016TBC ①	10	14	16	2297	4.75 (12.1)	6.50 (16.5)	4.00 (10.2)	2.60 (6.6)	2.00 (5.1)	9 (4.1)
ALRC025TBC ①	15	21	25	1470	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	3.00 (7.6)	2.00 (5.1)	13 (5.9)
ALRC027TBC ①	20	27	27	1361	4.75 (12.1)	6.50 (16.5)	4.50 (11.4)	2.80 (7.1)	3.00 (7.6)	13 (5.9)
ALRC035TBC ①	25	34	35	1050	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.00 (7.6)	23 (10.4)
ALRC045TBC ①	30	40	45	817	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.00 (7.6)	23 (10.4)
ALRC055TBC ①	40	52	55	668	7.00 (17.8)	9.00 (22.9)	4.75 (12.1)	3.60 (9.1)	3.00 (7.6)	24 (10.9)
ALRC080TBC	60	77	80	459	7.00 (17.8)	9.00 (22.9)	5.75 (14.6)	4.60 (11.7)	3.60 (9.1)	34 (15.4)
ALRC110CBC	75	96	110	334	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	4.20 (10.7)	3.60 (9.1)	56 (25.4)
ALRC130CBC	100	124	130	283	7.00 (17.8)	9.00 (22.9)	6.50 (16.5)	4.20 (10.7)	3.60 (9.1)	56 (25.4)
ALRC160CBC	125	156	160	230	7.00 (17.8)	9.00 (22.9)	8.00 (20.3)	4.20 (10.7)	3.60 (9.1)	70 (31.8)
ALRC200CBC	150	180	200	184	8.50 (21.6)	10.80 (27.4)	8.25 (21.0)	5.90 (15.0)	3.60 (9.1)	76 (34.5)
ALRC250CBC	200	240	250	147	8.50 (21.6)	10.80 (27.4)	8.25 (21.0)	6.20 (15.7)	4.60 (11.7)	89 (40.4)
ALRC300CBC	250	302	300	123	10.93 (27.8)	16.50 (41.9)	8.13 (20.7)	6.20 (15.7)	4.60 (11.7)	106 (48.1)
ALRC360CBC	300	361	360	102	10.93 (27.8)	16.50 (41.9)	9.50 (24.1)	8.20 (20.8)	4.60 (11.7)	124 (56.2)
ALRC420CBC	350	414	420	88	10.93 (27.8)	16.50 (41.9)	9.50 (24.1)	8.20 (20.8)	4.60 (11.7)	124 (56.2)
ALRC480CBC	400	477	480	77	10.93 (27.8)	16.50 (41.9)	10.13 (25.7)	8.20 (20.8)	4.60 (11.7)	129 (58.5)
ALRC600CBC	500	590	600	61	10.93 (27.8)	16.50 (41.9)	10.13 (25.7)	8.20 (20.8)	7.20 (18.3)	190 (86.2)

* Motor HP and Amp rated at 480 volts.

① CE Marked

ENCAPSULATED LINE REACTORS NEW

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.

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

Motor*					Dimensions				
Catalog Number	H.P.	Amp	Reactor Amp	uH	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Dimensional Drawings	Weight (Lbs.)(Kg.)
ALRB002LWE	1	2.1	2	11027	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRB003LWE	1.5	3	3	7351	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRB004LWE	2	3.4	4	5513	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRB006LWE	3	4.8	6	3676	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRB008LWE	5	7.6	8	2757	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	24 (10.9)
ALRB012LWE	7.5	11	12	1838	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	24 (10.9)
ALRB016LWE	10	14	16	1378	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	25 (11.3)
ALRB025LWE	15	21	25	882	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	28 (12.7)
ALRB027LWE	20	27	27	817	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	28 (12.7)
ALRB035LWE	25	34	35	630	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	32 (14.5)
ALRB045LWE	30	40	45	490	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	33 (15.0)
ALRB055LWE	40	52	55	401	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	73 (33.1)
ALRB080LWE	60	77	80	276	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	75 (34.0)
ALRB110LWE	75	96	110	200	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	78 (35.4)
ALRB130LWE	100	124	130	170	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	85 (38.6)
ALRB160LWE	125	156	160	138	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	87 (39.5)

* Motor HP and Amp rated at 480 volts.

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

Motor*					Dimensions				
Catalog Number	H.P.	Amp	Reactor Amp	uH	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Dimensional Drawings	Weight (Lbs.)(Kg.)
ALRC002LWE	1	2.1	2	18378	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRC003LWE	1.5	3	3	12252	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRC004LWE	2	3.4	4	9189	9.68 (24.6)	4.75 (12.1)	4.5 (11.4)	A	10 (4.5)
ALRC006LWE	3	4.8	6	6126	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	24 (10.9)
ALRC008LWE	5	7.6	8	4594	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	24 (10.9)
ALRC012LWE	7.5	11	12	3063	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	26 (11.8)
ALRC016LWE	10	14	16	2297	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	28 (12.7)
ALRC025LWE	15	21	25	1470	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	32 (14.5)
ALRC027LWE	20	27	27	1361	11.5 (29.2)	10.31 (26.2)	7.13 (18.1)	B	32 (14.5)
ALRC035LWE	25	34	35	1050	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	74 (33.6)
ALRC045LWE	30	40	45	817	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	75 (34.0)
ALRC055LWE	40	52	55	668	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	75 (34.0)
ALRC080LWE	60	77	80	459	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	85 (38.6)
ALRC110LWE	75	96	110	334	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	107 (48.5)
ALRC130LWE	100	124	130	263	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	107 (48.5)
ALRC160LWE	125	156	160	230	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	C	121 (54.9)

* Motor HP and Amp rated at 480 volts.

Diagram A

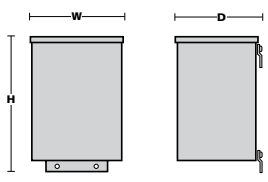


Diagram B

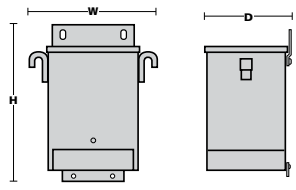
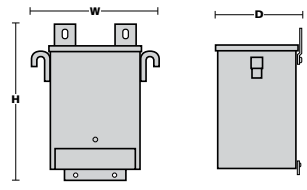


Diagram C



Industrial Control Transformers

Section **6**

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.

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.

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.

Table 1 Inrush VA

Normal VA Rating	Inrush VA @ 20% and 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

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

Table 2 Typical Magnetic Motor Starter and Contractor Data ① 60 Hz, 120 Volt, 3-Pole

Contractor		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	5	85	100	150	490	900	1200		VA Inrush
	Duty	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		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

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

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.

Primary Fuse Kit with Snap-on Secondary Fuse Block

Jumper Link Connections

Secondary Fuse Clips

Integrally Mounted Fuse Blocks

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.

Acme Industrial Control Transformers Meet or Exceed UL, CSA, NEMA & ANSI – Acme
Industrial Control Transformers 50 through 5000 VA are UL Listed, File E79947 and CSA certified, File 7357.
Laminations—High-permeability silicon steel continuously annealed to minimize core losses.
Magnet Wire—Copper magnet wire is coated with high temperature-resisting insulating film.
Coils—Precision wound by machine; total turns per coil automatically counted.
Mounting—Heavy steel mounting plates add strength to core construction and provide firm mounting, slotted to facilitate installation.
Terminal Boards—Sturdy phenolic terminal boards.
Sizing Primary Fuses:
Primary Amps < 2, fuse size is 300% of rated primary current.
Primary Amps 2< 9, fuse size is 167% of rated primary current.
Primary Amps ≥ 9, fuse size is 125% of rated primary current.
Sizing Secondary Fuses:
Secondary Amps < 9, fuse size is 167% of rated secondary current.
Secondary Amps ≥ 9, fuse size is 125% of rated secondary current.

TA SERIES PRIMARY FUSE KITS

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

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

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

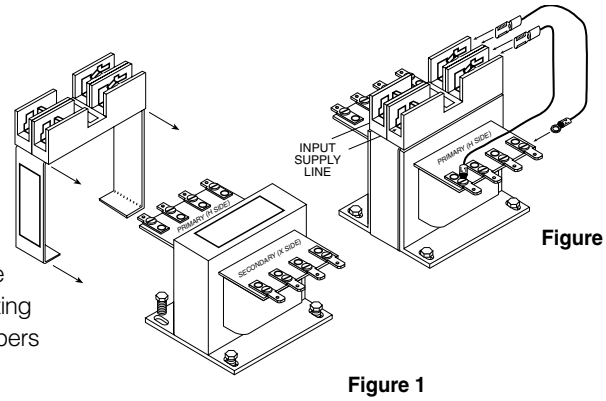


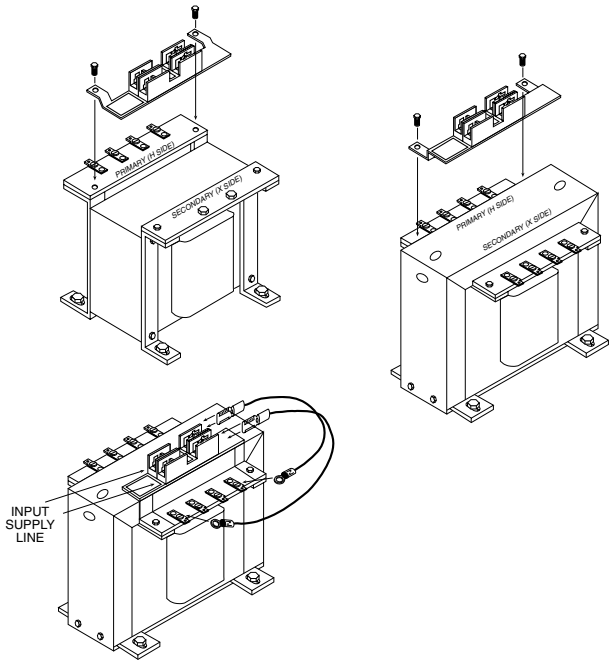
Figure 2

Figure 1

INSTRUCTIONS FOR TA SERIES PRIMARY FUSE KITS

Type PL112706 Through PL112707: 3000 - 5000 VA
Using 2 Class CC Dual Element Fuses (not supplied)

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



PRIMARY FUSE SIZING CHART ①

VA	120V	208V	230V	240V	277V	380V	416V	440V	460V	480V	550V	600V
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

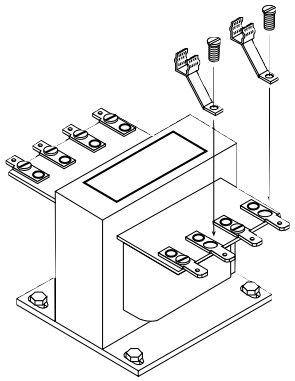
① Fuse size based on time delay class CC fuses.

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

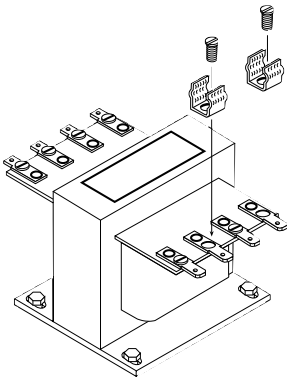
TA SERIES SECONDARY FUSE KITS

Type PL112700 Through PL112705:
Type PL112600, 601, 602: Use Dual Element Slow-Blow Fuse

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



PL112600/601 Fuse Kit



PL112602 Fuse Kit

INSTRUCTIONS FOR TA SERIES SECONDARY FUSE KITS

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

1. To attach secondary fuse kit PL-112603 to primary fuse kits PL112700 thru PL112707 snap the secondary single pole fuse block onto the unlabeled side of the primary double pole fuse block. (See Figure 1)
2. Install the fuse kits as instructed under the secondary fuse kit instructions on page 76.
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.

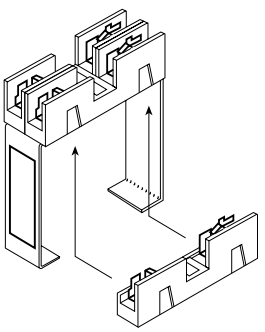


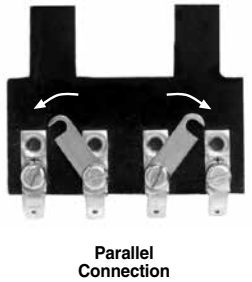
Figure 1

Jumper Link Connections

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

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

Series Connection



Parallel Connection

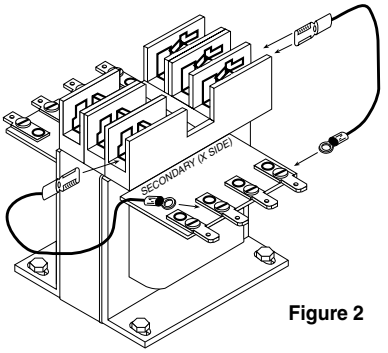


Figure 2

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

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

Applications

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

TB SERIES PRIMARY FUSE KITS

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

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

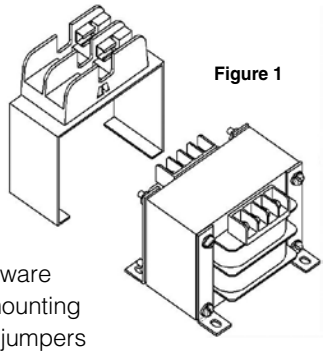


Figure 1

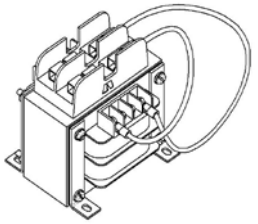


Figure 2

Fuse Kit adds approximately 1.75" to height of unit.

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.

PRIMARY FUSE SIZING CHART ①

VA	120V	208V	230V	240V	277V	380V	416V	440V	460V	480V	550V	600V
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.

SECONDARY FUSE SIZING CHART

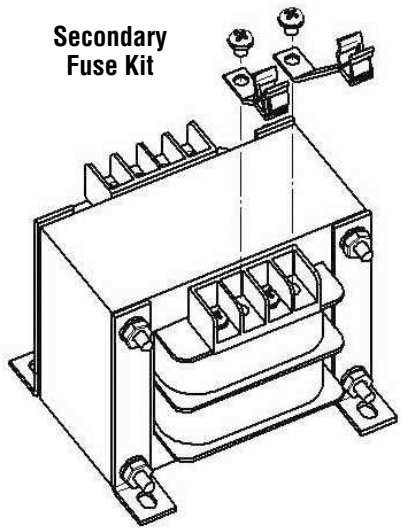
VA	24V	85V	91V	99V	100V	110V	115V	120V	125V	130V
50 VA	3.2	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6
75 VA	5.0	1.4	1.2	1.2	1.2	1.0	1.0	1.0	1.0	0.8
100 VA	6.0	1.5	1.5	1.5	1.5	1.5	1.5	1.2	1.2	1.2
150 VA	10.0	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0	1.5
250 VA	12.0	4.5	4.5	4.0	4.0	3.5	3.5	3.0	3.0	3.0
300 VA	15.0	5.5	5.5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

TB SERIES SECONDARY FUSE KITS

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

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

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



- 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).

INSTRUCTIONS FOR TB SERIES SECONDARY FUSE KITS

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

1. To attach secondary fuse kit PL 112603 to primary fuse kits PL112700 thru PL112705 snap the secondary single pole fuse block onto the unlabeled side of the primary double pole fuse block. (See Figure 1)
2. Install the fuse kits as instructed under the primary fuse kit instructions on page 78.
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.

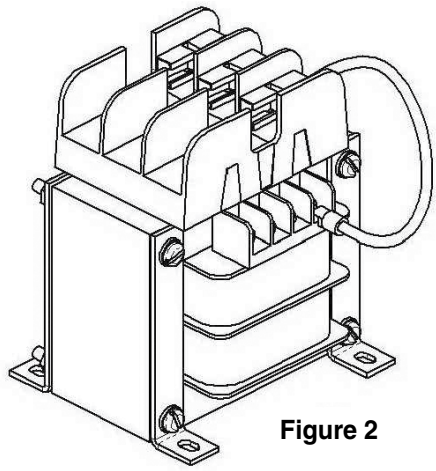
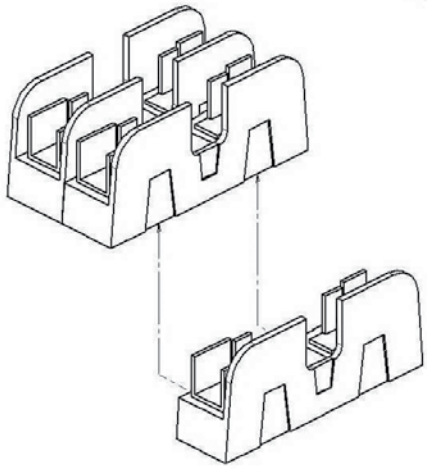


Figure 2

Figure 1



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

VA Rating	Catalog Number ②	Output Amps	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Size 24 Volts	Wiring Diagram
50	TB181141②	2.08	4.23	3.00	2.70	2.50	2.13	.22 x .50	4	PL112700	3 2/10 amp	A
			(10.7)	(7.6)	(6.8)	(6.4)	(5.4)	(0.6 x 1.3)	(1.8)			
75	TB181142 ②	3.13	4.74	3.00	2.70	2.50	2.61	.22 x .50	4	PL112700	5 amps	A
			(12.0)	(7.6)	(6.8)	(6.4)	(6.6)	(0.6 x 1.3)	(1.8)			
100	TB181143 ②	4.17	4.90	3.00	2.70	2.50	2.81	.22 x .50	4	PL112700	6 1/4 amps	A
			(12.4)	(7.6)	(6.8)	(6.4)	(7.1)	(0.6 x 1.3)	(1.8)			
150	TB181144 ②	6.25	4.78	3.75	3.40	3.13	2.63	.22 x .50	6	PL112701	10 amps	A
			(12.1)	(9.5)	(8.6)	(8.0)	(6.7)	(0.6 x 1.3)	(2.7)			
250	TB181146 ②	10.42	5.08	4.50	3.84	3.75	3.05	.22 x .50	9	PL112702	15 amps	A
			(12.9)	(11.4)	(9.8)	(9.5)	(7.7)	(0.6 x 1.3)	(4.1)			
350	TB181148 ②	14.58	6.12	4.50	3.84	3.75	4.06	.22 x .50	13	PL112702	20 amps	A
			(15.5)	(11.4)	(9.8)	(9.5)	(10.3)	(0.6 x 1.3)	(5.9)			
500	TB181149 ②	20.83	5.90	5.25	4.47	4.38	4.19	.31 x .50	16	PL112704	30 amps	A
			(15.0)	(13.3)	(11.4)	(11.1)	(10.6)	(0.8 x 1.3)	(7.3)			
750	TB181150	31.25	7.53	5.25	4.47	4.38	5.25	.31 x .50	24	PL112704	—	A
			(19.1)	(13.3)	(11.4)	(11.1)	(13.3)	(0.8 x 1.3)	(10.9)			
1000	TB181151	41.67	7.43	6.75	5.72	5.75	3.81	.31 x .50	26	PL112705	—	A
			(18.9)	(17.1)	(14.5)	(14.6)	(9.7)	(0.8 x 1.3)	(11.8)			

② See chart for integrally mounted fuse block catalog number suffix.

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

VA Rating	Catalog Number	Output Amps	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit ① Part Number	Secondary Fuse Size 24 Volts	Wiring Diagram
50	TB81321	2.08	4.08	3.75	3.40	3.13	2.19	.22 x .50	4	PL112701	*	3 2/10 amp	D
			(10.4)	(9.5)	(8.6)	(8.0)	(5.6)	(0.6 x 1.3)	(1.8)				
75	TB81322	3.13	4.31	3.75	3.40	3.13	2.31	.22 x .50	5	PL112701	*	5 amps	D
			(10.9)	(9.5)	(8.6)	(8.0)	(5.9)	(0.6 x 1.3)	(2.3)				
100	TB81323	4.17	4.52	3.75	3.40	3.13	2.63	.22 x .50	5	PL112701	*	6 1/4 amps	D
			(11.5)	(9.5)	(8.6)	(8.0)	(6.7)	(0.6 x 1.3)	(2.3)				
150	TB81324	6.25	4.75	4.50	3.84	3.75	3.05	.22 x .50	9	PL112702	*	10 amps	D
			(12.1)	(11.4)	(9.8)	(9.5)	(7.7)	(0.6 x 1.3)	(4.1)				
250	TB81325	10.42	5.24	4.65	4.15	4.06	3.25	.22 x .50	11	PL112702	*	15 amps	D
			(13.3)	(11.8)	(10.5)	(10.3)	(8.3)	(0.6 x 1.3)	(5.0)				
350	TB81326	14.58	6.02	5.25	4.47	4.38	4.00	.31 x .50	18	PL112704	*	20 amps	D
			(15.3)	(13.3)	(11.4)	(11.1)	(10.2)	(0.8 x 1.3)	(8.2)				
500	TB81327	20.83	6.51	5.25	4.47	4.38	4.19	.31 x .50	19	PL112704	*	30 amps	D
			(16.5)	(13.3)	(11.4)	(11.1)	(10.6)	(0.8 x 1.3)	(8.6)				
750	TB81328	31.25	7.08	6.75	5.78	5.75	3.81	.31 x .50	26	PL112705	*	—	D
			(18.0)	(17.1)	(14.7)	(14.6)	(9.7)	(0.8 x 1.3)	(11.8)			33 amps	
1000	TB81329	41.67	8.10	6.75	5.72	5.75	4.63	.31 x .50	33	PL112705	*	—	D
			(20.6)	(17.1)	(14.5)	(14.6)	(11.8)	(0.8 x 1.3)	(15.0)				

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 79.

* See fusing chart for secondary fuse kits.

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

VA Rating	Catalog Number	Output Amps @115V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit ① Part Number	Secondary Fuse Size 115 Volts	Wiring Diagram
50	TB81301	0.43	4.35	3.00	2.70	2.50	2.61	.22 x .50	4	PL112700	*	6/10 amp	E
			(11.0)	(7.6)	(6.8)	(6.4)	(6.6)	(0.6 x 1.3)	(1.8)				
75	TB81302	0.65	4.74	3.00	2.70	2.50	2.81	.22 x .50	4	PL112700	*	1 amp	E
			(12.0)	(7.6)	(6.8)	(6.4)	(7.1)	(0.6 x 1.3)	(1.8)				
100	TB81303	0.87	4.45	3.75	3.40	3.13	2.44	.22 x .50	5	PL112701	*	1 1/4 amps	E
			(11.3)	(9.5)	(8.6)	(8.0)	(6.2)	(0.6 x 1.3)	(2.3)				
150	TB81304	1.30	5.00	3.75	3.84	3.13	3.06	.22 x .50	5	PL112701	*	2 amps	E
			(12.7)	(9.5)	(9.8)	(8.0)	(7.8)	(0.6 x 1.3)	(2.3)				
250	TB81305	2.17	5.68	4.50	3.84	3.75	4.06	.22 x .50	13	PL112702	*	3 1/2 amps	E
			(14.4)	(11.4)	(9.8)	(9.5)	(10.3)	(0.6 x 1.3)	(5.9)				
350	TB81306	3.04	6.30	4.65	4.15	4.06	4.75	.22 x .50	18	PL112702	*	5 amps	E
			(16.0)	(11.8)	(10.5)	(10.3)	(12.1)	(0.6 x 1.3)	(8.2)				
500	TB81307	4.35	6.22	5.25	4.47	4.38	4.56	.22 x .50	20	PL112704	*	7 amps	E
			(15.8)	(13.3)	(11.4)	(11.1)	(11.6)	(0.6 x 1.3)	(9.1)				
750	TB81308	6.52	6.82	6.75	5.78	5.75	3.69	.31 x .50	24	PL112705	*	10 amps	E
			(17.3)	(17.1)	(14.7)	(14.6)	(9.4)	(0.8 x 1.3)	(10.9)				
1000	TB81309	8.70	7.96	6.75	5.72	5.75	4.44	.31 x .50	31	PL112705	*	12 amps	E
			(20.2)	(17.1)	(14.5)	(14.6)	(11.3)	(0.8 x 1.3)	(14.1)				

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 79.

* See fusing chart for secondary fuse kits.

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

VA Rating	Catalog Number	Output Amps	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit ① Part Number	Secondary Fuse Size 115 Volts	Wiring Diagram
50	TB69300	0.43	4.44	3.00	2.70	2.50	2.61	.22 x .50	4	PL112700	*	6/10 amp	H
			(11.3)	(7.6)	(6.8)	(6.4)	(6.6)	(0.6 x 1.3)	(1.8)				
100	TB69301	0.87	5.21	3.00	2.70	2.50	3.26	.22 x .50	4	PL112700	*	1 4/10 amps	H
			(13.2)	(7.6)	(6.8)	(6.4)	(8.3)	(0.6 x 1.3)	(1.8)				
150	TB69302	1.30	5.10	3.75	3.40	3.13	3.06	.22 x .50	7	PL112701	*	2 amps	H
			(13.0)	(9.5)	(8.6)	(8.0)	(7.8)	(0.6 x 1.3)	(3.2)				
250	TB69303	2.17	5.38	4.50	3.84	3.75	3.50	.22 x .50	11	PL112702	*	3 1/2 amps	H
			(13.7)	(11.4)	(9.8)	(9.5)	(8.9)	(0.6 x 1.3)	(5.0)				
350	TB69304	3.04	5.90	4.65	4.15	4.06	3.81	.22 x .50	15	PL112702	*	5 amps	H
			(15.0)	(11.8)	(10.5)	(10.3)	(9.7)	(0.6 x 1.3)	(6.8)				
500	TB69305	4.35	6.22	5.25	4.47	4.38	4.56	.31 x .50	20	PL112704	*	7 amps	H
			(15.8)	(13.3)	(11.4)	(11.1)	(11.6)	(0.8 x 1.3)	(9.1)				
750	TB69306	6.52	6.82	6.75	5.78	5.75	3.81	.31 x .50	26	PL112705	*	10 amps	H
			(17.3)	(17.1)	(14.7)	(14.6)	(9.7)	(0.8 x 1.3)	(11.8)				
1000	TB69307	8.70	7.96	6.75	5.78	5.75	4.63	.31 x .50	33	PL112705	*	12 amps	H
			(20.2)	(17.1)	(14.7)	(14.6)	(11.8)	(0.8 x 1.3)	(15.0)				

* See fusing chart for secondary fuse kits.

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 79.

208/277 PRIMARY — 12 SECONDARY VOLTS — 50/60 Hz

VA Rating	Catalog Number	Output Amps @12V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.))	Wiring Diagram
50	TB080050	4.16	4.23	3.00	2.70	2.50	2.13	.22 x .50	4	L
			(10.74)	(7.62)	(6.85)	(6.35)	(5.41)	(0.6 x 1.3)	(1.8)	
75	TB080075	6.25	4.74	3.00	2.70	2.50	2.61	.22 x .50	4	L
			(12.03)	(7.62)	(6.85)	(6.35)	(6.62)	(0.6 x 1.3)	(1.8)	
100	TB080100	8.33	4.90	3.00	2.70	2.50	2.81	.22 x .50	4	L
			(12.44)	(7.62)	(6.85)	(6.35)	(7.13)	(0.6 x 1.3)	(1.8)	
150	TB080150	12.50	4.78	3.75	3.40	3.13	2.63	.22 x .50	6	L
			(12.14)	(9.52)	(8.63)	(7.95)	(6.68)	(0.6 x 1.3)	(2.7)	
250	TB080250	20.83	5.08	4.50	3.84	3.75	3.05	.22 x .50	9	L
			(12.90)	(11.43)	(9.75)	(9.52)	(0)	(0.6 x 1.3)	(4.1)	
350	TB080350	29.16	6.12	4.50	3.84	3.75	4.06	.22 x .50	13	L
			(15.54)	(11.43)	(9.75)	(9.52)	(10.31)	(0.6 x 1.3)	(5.9)	
500	TB080500	41.66	5.90	5.25	4.47	4.38	4.19	.31 x .50	16	L
			(14.98)	(13.33)	(11.35)	(11.12)	(10.64)	(0.8 x 1.3)	(7.25)	
750	TB080750	62.50	7.53	5.25	4.47	4.38	5.25	.31 x .50	24	L
			(19.12)	13.33)	11.35)	(11.12)	13.33)	(0.8 x 1.3)	(10.88)	
1000	TB081000	83.33	7.43	6.75	5.72	5.75	3.81	.31 x .50	26	L
			(18.87)	(17.14)	(14.52)	(4.60)	(9.67)	(0.8 x 1.3)	(11.79)	

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

VA Rating	Catalog Number ②	Output Amps @120V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit ① Part Number	Secondary Fuse Size 120 Volts	Wiring Diagram
50	TB81210 ②	0.42	4.23	3.00	2.70	2.50	2.13	.22 x .50	4	PL112700	*	6/10 amp	B
			(10.7)	(7.6)	(6.8)	(6.4)	(5.4)	(0.6 x 1.3)	(1.8)				
75	TB81201②	0.63	4.74	3.00	2.70	2.50	2.61	.22 x .50	4	PL112700	*	1 amp	B
			(12.0)	(7.6)	(6.8)	(6.4)	(6.6)	(0.6 x 1.3)	(1.8)				
100	TB81211②	0.83	4.90	3.00	2.70	2.50	2.81	.22 x .50	4	PL112700	*	1¼ amps	B
			(12.4)	(7.6)	(6.8)	(6.4)	(7.1)	(0.6 x 1.3)	(1.8)				
150	TB81212 ②	1.25	5.00	3.75	3.40	3.13	2.81	.22 x .50	6	PL112701	*	2 amps	B
			(12.7)	(9.5)	(8.6)	(8.0)	(7.1)	(0.6 x 1.3)	(2.7)				
250	TB81213 ②	2.08	4.18	4.50	3.84	3.75	3.13	.22 x .50	9	PL112702	*	3 2/10 amps	B
			(10.6)	(11.4)	(9.8)	(9.5)	(8.0)	(0.6 x 1.3)	(4.1)				
300	TB81200 ②	2.50	5.57	4.50	3.84	3.75	3.13	.22 x .50	10	PL112702	*	4 amps	B
			(14.1)	(11.4)	(9.8)	(9.5)	(8.0)	(0.6 x 1.3)	(4.5)				
350	TB81214 ②	2.92	6.32	4.50	3.84	3.75	3.83	.22 x .50	12	PL112702	*	4 1/2 amps	B
			(16.1)	(11.4)	(9.8)	(9.5)	(9.7)	(0.6 x 1.3)	(5.4)				
500	TB81215 ②	4.17	6.30	5.25	4.47	4.06	3.81	.22 x .50	15	PL112704	*	6 1/4 amps	B
			(16.0)	(13.3)	(11.4)	(10.3)	(9.7)	(0.6 x 1.3)	(6.8)				
750	TB81216 ②	6.25	6.65	5.25	4.47	4.38	5.13	.31 x .50	23	PL112704	*	10 amps	B
			(16.9)	(13.3)	(11.4)	(11.1)	(13.0)	(0.8 x 1.3)	(10.4)				
1000	TB81217 ②	8.33	7.58	6.75	5.78	5.75	3.69	.31 x .50	25	PL112705	*	12 amps	B
			(19.3)	(17.1)	(14.7)	(14.6)	(9.4)	(0.8 x 1.3)	(11.3)				

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 79.

② See chart for integrally mounted fuse block catalog number suffix.

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

VA Rating	Catalog Number②	Output Amps @120V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit ① Part Number	Secondary Fuse Size 120 Volts	Wiring Diagram
1500	TA281218	12.50	8.80	6.75	5.72	5.75	5.75	.31 x .50	43	PL112705	PL112601	15 amps	B
			(22.4)	(17.1)	(14.5)	(14.6)	(14.6)	(0.8 x 1.3)	(19.5)				
2000	TA281219	16.67	9.25	6.75	5.72	5.75	6.38	.31 x .50	49	PL112705	PL112601	20 amps	B
			(23.5)	(17.1)	(14.5)	(14.6)	(16.2)	(0.8 x 1.3)	(22.2)				
3000	TA281220	25.00	8.81	7.50	8.34	6.50	7.52	.41 x .81	70	PL112706	—	—	B
			(22.4)	(19.1)	(21.2)	(16.5)	(19.1)	(1.0 x 2.1)	(31.8)				
5000	TA281221	41.67	7.52	11.92	9.49	6.75	6.25	.41 x .81	125	PL112707	—	—	B
			(12.7)	(9.5)	(8.6)	(8.0)	(7.1)	(0.6 x 1.3)	(2.7)				

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 76.

② See chart for integrally mounted fuse block catalog number suffix.

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

VA Rating	Catalog Number ②	Output Amps @120V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit ① Part Number	Secondary Fuse Size 120 Volts	Wiring Diagram
50	TB81000	0.42	4.56	3.00	2.70	2.50	2.61	.22 x .50	4	PL112700	*	6/10 amp	C
			(11.6)	(7.6)	(6.8)	(6.4)	(6.6)	(0.6 x 1.3)	(1.8)				
75	TB81009	0.63	4.90	3.00	2.70	2.50	2.81	.22 x .50	4	PL112700	*	1 amp	C
			(12.4)	(7.6)	(6.8)	(6.4)	(7.1)	(0.6 x 1.3)	(1.8)				
100	TB81001	0.83	5.36	3.00	2.70	2.50	3.26	.22 x .50	5	PL112700	*	1 1/4 amps	C
			(13.6)	(7.6)	(6.8)	(6.4)	(8.3)	(0.6 x 1.3)	(2.3)				
150	TB81002	1.25	5.00	3.75	3.40	3.13	3.06	.22 x .50	7	PL112701	*	2 amps	C
			(12.7)	(9.5)	(8.6)	(8.0)	(7.8)	(0.6 x 1.3)	(3.2)				
250	TB81003	2.08	5.57	4.50	3.84	3.75	3.50	.22 x .50	11	PL112702	*	3 2/10 amps	C
			(14.1)	(11.4)	(9.8)	(9.5)	(8.9)	(0.6 x 1.3)	(5.0)				
300	TB81020	2.50	6.48	4.65	4.15	4.06	4.06	.22 x .50	15	PL112702	*	4 amps	C
			(16.5)	(11.8)	(10.5)	(10.3)	(10.3)	(0.6 x 1.3)	(6.8)				
350	TB81004	2.92	6.48	4.65	4.15	4.06	4.06	.22 x .50	15	PL112702	*	4 1/2 amps	C
			(16.5)	(11.8)	(10.5)	(10.3)	(10.3)	(0.6 x 1.3)	(6.8)				
500	TB81005	4.17	6.43	5.25	4.47	4.38	4.56	.31 x .50	21	PL112704	*	6 1/4 amps	C
			(16.3)	(13.3)	(11.4)	(11.1)	(11.6)	(0.8 x 1.3)	(9.5)				
750	TB81006	6.25	7.19	6.75	5.78	5.75	3.81	.31 x .50	25	PL112705	*	10 amps	C
			(18.3)	(17.1)	(14.7)	(14.6)	(9.7)	(0.8 x 1.3)	(11.3)				
1000	TB81007	8.33	7.96	6.75	5.78	5.75	4.63	.31 x .50	32	PL112705	*	12 amps	C
			(20.2)	(17.1)	(14.7)	(14.6)	(11.8)	(0.8 x 1.3)	(14.5)				
1500	TA281008	12.50	9.46	6.75	5.72	5.75	6.38	.31 x .50	47	PL112705	PL112601	15 amps	C
			(24.0)	(17.1)	(14.5)	(14.6)	(16.2)	(0.8 x 1.3)	(21.3)				
2000	TA253929	16.67	7.90	7.50	7.66	6.50	6.57	.41 x .81	55	PL112706	PL112601	20 amps	C
			(20.1)	(19.1)	(19.5)	(16.5)	(16.7)	(1.0 x 2.1)	(24.9)				
3000	TA253930	25.00	7.02	11.92	8.83	6.75	5.75	.41 x .81	75	PL112707	—	—	C
			(17.8)	(30.3)	(22.4)	(17.1)	(14.6)	(1.0 x 2.1)	(34.0)				
5000	TA253931	41.67	7.52	11.92	9.49	6.75	6.25	.41 x .81	110	PL112707	—	—	C
			(19.1)	(30.3)	(24.1)	(17.1)	(15.9)	(1.0 x 2.1)	(49.9)				

① Secondary Fuse Kit PL112603 may be substituted for PL112600 thru PL112602 when Primary Fuse Kit is used. See page 79 for "TB" units and page 76 for "TA" units.

* See fusing chart for secondary fuse kits.

② See chart for integrally mounted fuse block catalog number suffix

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

VA Rating @ 130V	Catalog Number	Output Amps	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Kit Part Number	Secondary Fuse Size 130 Volts	Wiring Diagram
50	TB32403	0.38	4.08	3.75	3.40	3.13	2.31	.22 x .50	5	PL112701	NA	6/10 amp	G
			(10.4)	(9.5)	(8.6)	(8.0)	(5.9)	(0.6 x 1.3)	(2.3)				
150	TB32404	1.15	4.75	4.50	3.84	3.75	3.05	.22 x .50	10	PL112702	NA	1 6/10 amps	G
			(12.1)	(11.4)	(9.8)	(9.5)	(7.7)	(0.6 x 1.3)	(4.5)				
250	TB32405	1.92	5.58	4.65	4.15	4.06	4.06	.22 x .50	16	PL112702	NA	3 2/10 amps	G
			(14.2)	(11.8)	(10.5)	(10.3)	(10.3)	(0.6 x 1.3)	(7.3)				
350	TB32669	2.69	6.23	4.65	4.15	4.06	5.50	.22 x .50	22	PL112702	NA	4 amps	G
			(15.8)	(11.8)	(10.5)	(10.3)	(14.0)	(0.6 x 1.3)	(10.0)				
500	TB32406	3.85	6.40	6.75	5.78	5.75	3.69	.22 x .50	23	PL112705	NA	6 1/4 amps	G
			(16.3)	(17.1)	(14.7)	(14.6)	(9.4)	(0.6 x 1.3)	(10.4)				
750	TB54523	5.77	7.08	6.75	5.78	5.75	4.13	.31 x .50	29	PL112705	NA	9 amps	G
			(18.0)	(17.1)	(14.7)	(14.6)	(10.5)	(0.8 x 1.3)	(13.2)				
1000	TB54524	7.69	8.56	6.75	5.78	5.75	4.88	.31 x .50	35	PL112705	NA	12 amps	G
			(21.7)	(17.1)	(14.7)	(14.6)	(12.4)	(0.8 x 1.3)	(15.9)				
1500	TA254525	11.54	6.75	7.50	7.66	6.50	5.42	.41 x .81	55	PL112706	PL-112601	20 amps	G
			(17.1)	(19.1)	(19.5)	(16.5)	(13.8)	(1.0 x 2.1)	(24.9)				
2000	TA281202	15.39	7.45	7.50	7.66	6.50	6.12	.41 x .81	55	PL112706	PL-112601	25 amps	G
			(18.9)	(19.1)	(19.5)	(16.5)	(15.5)	(1.0 x 2.1)	(24.9)				
3000	TA281203	23.08	7.02	11.92	8.83	6.75	5.75	.41 x .81	70	PL112707	—	—	G
			(17.8)	(30.3)	(22.4)	(17.1)	(14.6)	(1.0 x 2.1)	(31.8)				
5000	TA281205	38.46	7.52	11.92	9.49	6.75	6.25	.41 x .81	110	PL112707	—	—	G
			(19.1)	(30.3)	(24.1)	(17.1)	(15.9)	(1.0 x 2.1)	(49.9)				

CONNECTION DETAILS FOR WIRING DIAGRAM G

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

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

VA Rating	Catalog Number	Output Amps @120V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Wiring Diagram
50	TB83210	0.42	4.13	3.00	2.70	2.50	2.30	.22 x .50	4	PL112700	J
			(10.5)	(7.6)	(6.8)	(6.4)	(5.8)	(0.6 x 1.3)	(1.8)		
100	TB83212	0.83	4.90	3.00	2.70	2.50	3.35	.22 x .50	4	PL112700	J
			(12.4)	(7.6)	(6.8)	(6.4)	(8.5)	(0.6 x 1.3)	(1.8)		
150	TB83213	1.25	4.92	3.75	3.40	3.13	2.81	.22 x .50	6	PL112701	J
			(12.5)	(9.5)	(8.6)	(8.0)	(7.1)	(0.6 x 1.3)	(2.7)		
250	TB83215	2.08	5.38	4.50	3.84	3.75	3.05	.22 x .50	9	PL112702	J
			(13.7)	(11.4)	(9.8)	(9.5)	(7.7)	(0.6 x 1.3)	(4.1)		
500	TB83218	4.17	6.06	5.25	4.47	4.06	4.06	.22 x .50	13	PL112704	J
			(15.4)	(13.3)	(11.4)	(10.3)	(10.3)	(0.6 x 1.3)	(5.9)		
750	TB83219	6.25	6.43	5.25	4.47	4.38	5.30	.31 x .50	21	PL112704	J
			(16.3)	(13.3)	(11.4)	(11.1)	(13.0)	(0.8 x 1.3)	(9.5)		
1000	TB83220	8.33	7.34	6.75	5.78	5.75	3.69	.31 x .50	24	PL112705	J
			(18.6)	(17.1)	(14.7)	(14.6)	(9.4)	(0.8 x 1.3)	(10.9)		
1500	TA83221	12.50	8.80	6.75	5.72	5.75	5.02	.31 x .50	43	PL112705	J
			(22.4)	(17.1)	(14.5)	(14.6)	(12.8)	(0.8 x 1.3)	(19.5)		
2000	TA83222	16.67	9.15	6.75	5.72	5.75	5.42	.31 x .50	48	PL112705	J
			(23.2)	(17.1)	(14.5)	(14.6)	(13.8)	(0.8 x 1.3)	(21.8)		
3000	TA83223	25.00	7.00	7.50	7.66	6.50	5.55	.41 x .81	51	PL112706	J
			(17.8)	(19.1)	(19.5)	(16.5)	(14.1)	(1.0 x 2.1)	(23.1)		
5000	TA83224	41.67	7.06	11.92	8.75	6.75	5.75	.41 x .81	90	PL112707	J
			(17.9)	(30.3)	(22.2)	(17.1)	(14.6)	(1.0 x 2.1)	(40.8)		

INTEGRALLY MOUNTED FUSE BLOCKS

120X240-12/24: 50-500VA (F2 Option Only)
240X480-120/115/110: 50-2000VA

Add Suffix to Catalog Number	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.

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

VA Rating	Catalog Number	Output Amps @115V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)	Primary Fuse Block Part Number	Secondary Fuse Size 115 Volts	Wiring Diagram
50	TA254535	0.43	4.12	3.75	3.21	3.13	2.19	.22 x .50	4	PL112701	6/10 amp	F
			(10.5)	(9.5)	(8.2)	(8.0)	(5.6)	(0.6 x 1.3)	(1.8)			
100	TA254536	0.87	4.56	3.75	3.21	3.13	2.31	.22 x .50	5	PL112701	1 1/4 amps	F
			(11.6)	(9.5)	(8.2)	(8.0)	(5.9)	(0.6 x 1.3)	(2.3)			
150	TA254537	1.30	5.00	3.75	3.21	3.13	3.06	.22 x .50	10	PL112701	2 amps	F
			(12.7)	(9.5)	(8.2)	(8.0)	(7.8)	(0.6 x 1.3)	(4.5)			
250	TA254538	2.17	5.49	4.50	3.84	3.75	3.50	.22 x .50	11	PL112702	3 1/2 amps	F
			(13.9)	(11.4)	(9.8)	(9.5)	(8.9)	(0.6 x 1.3)	(5.0)			
350	TA281197	3.04	6.03	4.88	4.15	4.06	4.38	.22 x .50	17	PL112703	5 amps	F
			(15.3)	(12.4)	(10.5)	(10.3)	(11.1)	(0.6 x 1.3)	(7.7)			
500	TA254539	4.35	6.76	4.88	4.15	4.06	5.75	.22 x .50	23	PL112703	7 amps	F
			(17.1)	(12.4)	(10.5)	(10.3)	(14.6)	(0.6 x 1.3)	(10.4)			
750	TA281240	6.52	7.19	6.75	5.72	5.75	3.69	.31 x .50	25	PL112705	10 amps	F
			(18.3)	(17.1)	(14.5)	(14.6)	(9.4)	(0.8 x 1.3)	(11.3)			
1000	TA281241	8.70	7.77	6.75	5.72	5.75	4.44	.31 x .50	30	PL112705	12 amps	F
			(19.7)	(17.1)	(14.5)	(14.6)	(11.3)	(0.8 x 1.3)	(13.6)			

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

VA Rating	Catalog Number	Output Amps @12V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.)))	Primary Fuse Block Part Number	Wiring Diagram
50	TA83300	4.17	4.13	3.00	2.59	2.50	2.30	.22 x .50	4	PL112700	I
			(10.5)	(7.6)	(6.6)	(6.4)	(5.8)	(0.6 x 1.3)	(1.8)		
100	TA83301	8.33	4.90	3.00	2.59	2.50	3.35	.22 x .50	4	PL112700	I
			(12.4)	(7.6)	(6.6)	(6.4)	(8.5)	(0.6 x 1.3)	(1.8)		
150	TA83302	12.50	4.92	3.75	3.21	3.13	2.81	.22 x .50	6	PL112701	I
			(12.5)	(9.5)	(8.2)	(8.0)	(7.1)	(0.6 x 1.3)	(2.7)		
250	TA83303	20.83	5.38	4.50	3.84	3.75	3.05	.22 x .50	9	PL112702	I
			(13.7)	(11.4)	(9.8)	(9.5)	(7.7)	(0.6 x 1.3)	(4.1)		
500	TA83304	41.67	6.06	4.88	4.15	4.06	4.06	.22 x .50	13	PL112703	I
			(15.4)	(12.4)	(10.5)	(10.3)	(10.3)	(0.6 x 1.3)	(5.9)		
750	TA83305	62.50	6.43	5.25	4.47	4.38	4.00	.31 x .50	21	PL112704	I
			(16.3)	(13.3)	(11.4)	(11.1)	(10.2)	(0.8 x 1.3)	(9.5)		
1000	TA83306	83.33	7.30	6.75	5.72	5.75	3.69	.31 x .50	24	PL112705	I
			(18.5)	(17.1)	(14.5)	(14.6)	(9.4)	(0.8 x 1.3)	(10.9)		

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

VA Rating	Catalog Number	Output Amps @120V	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	F	Approximate Ship Weight (Lbs.)(Kg.))	Primary Fuse Block Part Number	Wiring Diagram
50	TA83310	0.42	4.13	3.00	2.59	2.50	2.30	.22 x .50	4	PL112700	K
			(10.5)	(7.6)	(6.6)	(6.4)	(5.8)	(0.6 x 1.3)	(1.8)		
100	TA83311	0.83	4.90	3.00	2.59	2.50	3.35	.22 x .50	4	PL112700	K
			(12.4)	(7.6)	(6.6)	(6.4)	(8.5)	(0.6 x 1.3)	(1.8)		
150	TA83312	1.25	4.92	3.75	3.21	3.13	2.81	.22 x .50	6	PL112701	K
			(12.5)	(9.5)	(8.2)	(8.0)	(7.1)	(0.6 x 1.3)	(2.7)		
250	TA83313	2.08	5.38	4.50	3.84	3.75	3.05	.22 x .50	9	PL112702	K
			(13.7)	(11.4)	(9.8)	(9.5)	(7.7)	(0.6 x 1.3)	(4.1)		
500	TA83314	4.17	6.06	4.88	4.15	4.06	4.06	.22 x .50	13	PL112703	K
			(15.4)	(12.4)	(10.5)	(10.3)	(10.3)	(0.6 x 1.3)	(5.9)		
750	TA83315	6.25	6.43	5.25	4.47	4.38	4.00	.31 x .50	21	PL112704	K
			(16.3)	(13.3)	(11.4)	(11.1)	(10.2)	(0.8 x 1.3)	(9.5)		
1000	TA83316	8.33	7.34	6.75	5.72	5.75	3.69	.31 x .50	24	PL112705	K
			(18.6)	(17.1)	(14.5)	(14.6)	(9.4)	(0.8 x 1.3)	(10.9)		

TA & TB SERIES PROTECTIVE DEVICES — Primary Fuse Kits

FUSES ARE NOT INCLUDED. CONSULT CATALOG FOR PROPER FUSE SELECTION

Catalog Number	Approximate Ship Weight (Lbs.)(Kg.)
PL112700	1 (0.5)
PL112701	1 (0.5)
PL112702	1 (0.5)
PL112703	1 (0.5)
PL112704	1 (0.5)
PL112705	1 (0.5)
PL112706	1 (0.5)
PL112707	1 (0.5)

TA SERIES PROTECTIVE DEVICES — Secondary Fuse Kits

FOR USE WITH INDUSTRIAL CONTROL TRANSFORMERS THROUGH 1500 VA

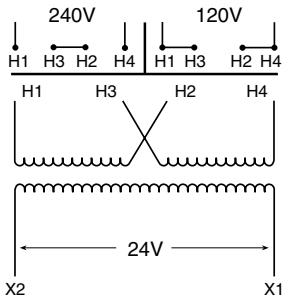
Catalog Number	Approximate Ship Weight (Lbs.)(Kg.)
PL112600	0.5 (0.2)
PL112601	0.5 (0.2)
PL112602	1 (0.5)
PL112603	1 (0.5)

TB SERIES PROTECTIVE DEVICES — Secondary Fuse Kits

Catalog Number	VA	Description	Approximate Ship Weight (Lbs.)(Kg.)
PL79924		Fuse Kit: Secondary Fuse 1/4" x 1-1/4" w/ARM	1.0 (0.5)
PL79928	50–350	Link: Small Jumper Links (Qty. 2)	1.0 (0.5)
PL79929	500 & 750	Link: Large Jumper Links (Qty. 2)	1.0 (0.5)
PL79930	50–350	Fuse Kit: Secondary Fuse Midget w/ARM	1.0 (0.5)
PL79931	500 & 1000	Fuse Kit: Secondary Fuse Midget w/ARM	1.0 (0.5)

TA SERIES OPEN CORE AND COIL WIRING DIAGRAMS

A



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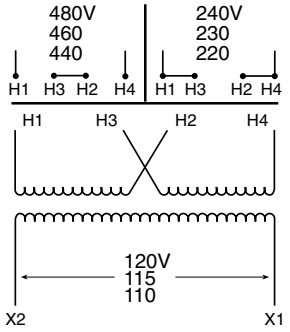

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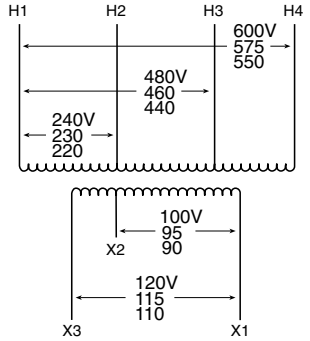

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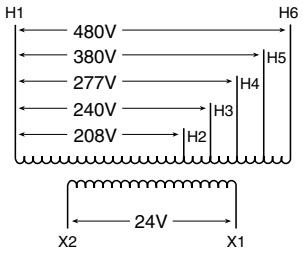

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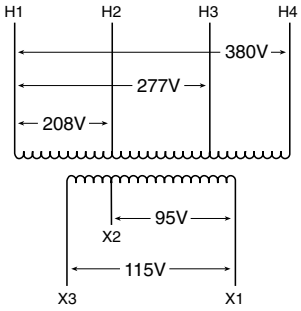

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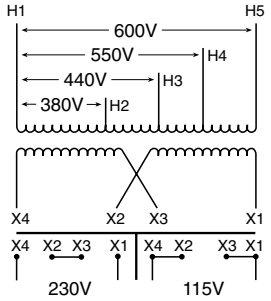

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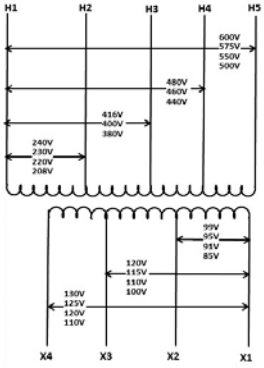

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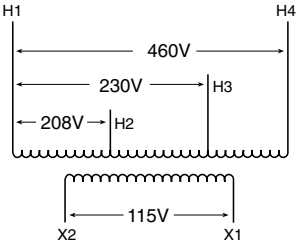

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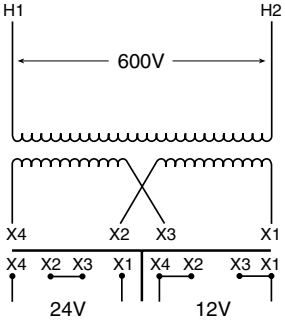

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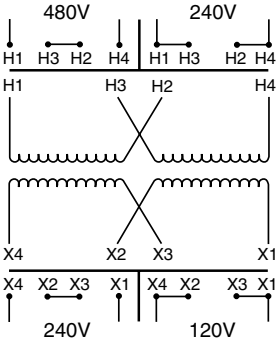

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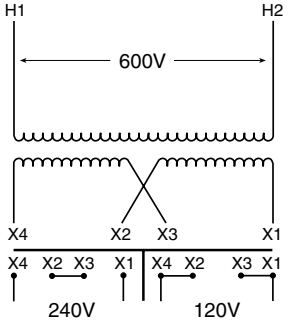
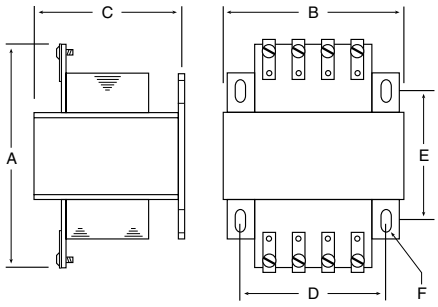


TA SERIES OPEN CORE AND COIL DIMENSIONAL DRAWINGS

50 VA THRU 2 kVA



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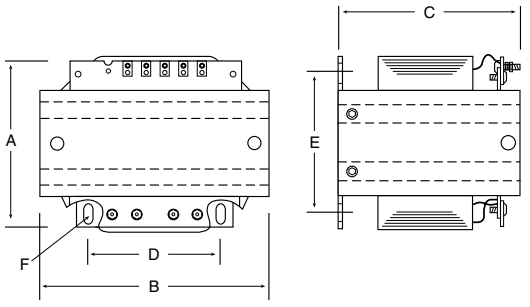

TB SERIES OPEN CORE AND COIL WIRING DIAGRAMS

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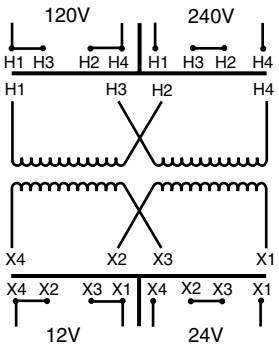

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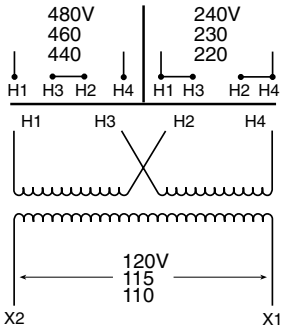

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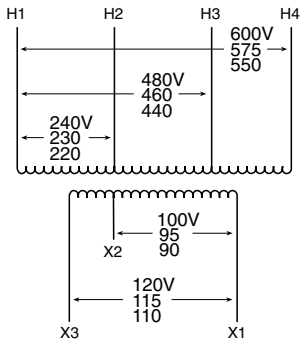

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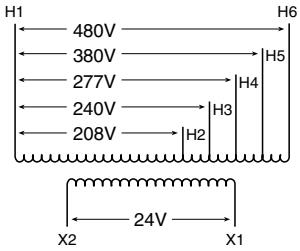

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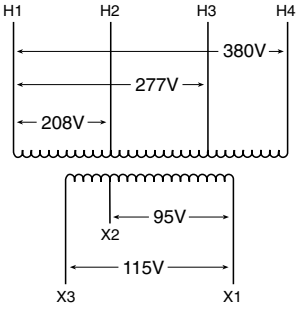

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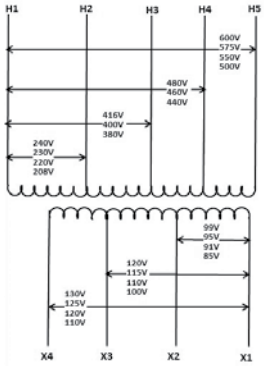

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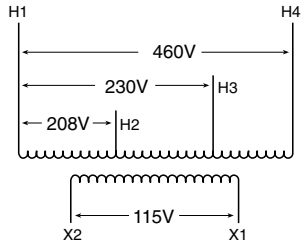

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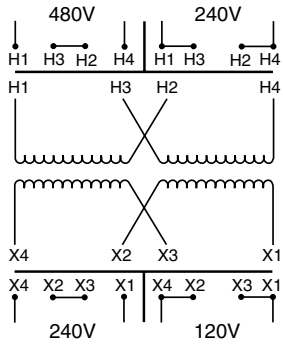

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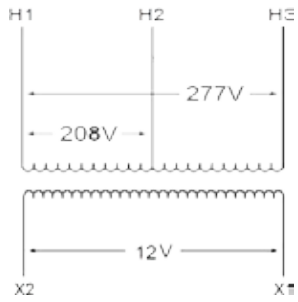
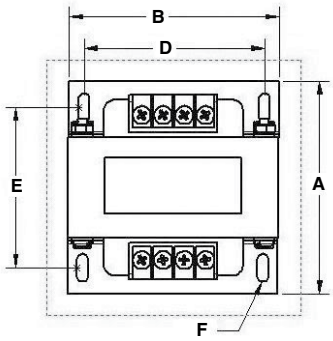
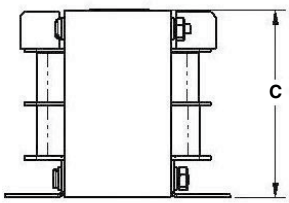


TB SERIES OPEN CORE AND COIL DIMENSIONAL DRAWINGS





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.

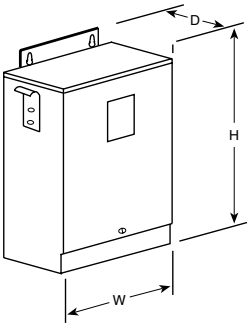
Features

- 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

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

VA Rating	Catalog Number	Output Amps	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Wiring Diagram ① ②
1000	T181217	8.33	13.10	10.31	7.13	55	B
			(33.3)	(26.2)	(18.1)	(24.9)	
2000	T181219	16.67	14.77	10.31	7.13	80	B
			(37.5)	(26.2)	(18.1)	(36.3)	
3000	T181220	25.00	14.77	10.31	7.13	100	B
			(37.5)	(26.2)	(18.1)	(45.4)	
5000	T181221	41.67	13.85	13.25	10.19	140	B
			(35.2)	(33.7)	(25.9)	(63.5)	
10000	T181223	83.3	16.47	13.88	12.94	308	B
			(41.8)	(35.3)	(32.9)	(139.7)	

① See page 88 for electrical diagram.
② See page 78 for fuse sizing information.
For secondary fuse size, multiply output amps x 1.25.



Encapsulated
1000 VA–10000 VA

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

VA Rating	Catalog Number	Output Amps	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Wiring Diagram ① ②
2000	T153929	16.67	14.77	10.31	7.13	80	C
			(37.5)	(26.2)	(18.1)	(36.3)	
3000	T153930	25.00	13.85	13.25	10.19	130	C
			(35.2)	(33.7)	(25.9)	(59.0)	
5000	T153931	41.67	13.85	13.25	10.19	140	C
			(35.2)	(33.7)	(25.9)	(63.5)	

① See page 88 for electrical diagram.
② See page 78 for fuse sizing information.
③ For secondary fuse size, multiply output amps x 1.25.

AE/CE SERIES INDUSTRIAL CONTROL TRANSFORMERS

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

Cooler. Cleaner. More Compact.

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

Features

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

CE Series for Global Applications

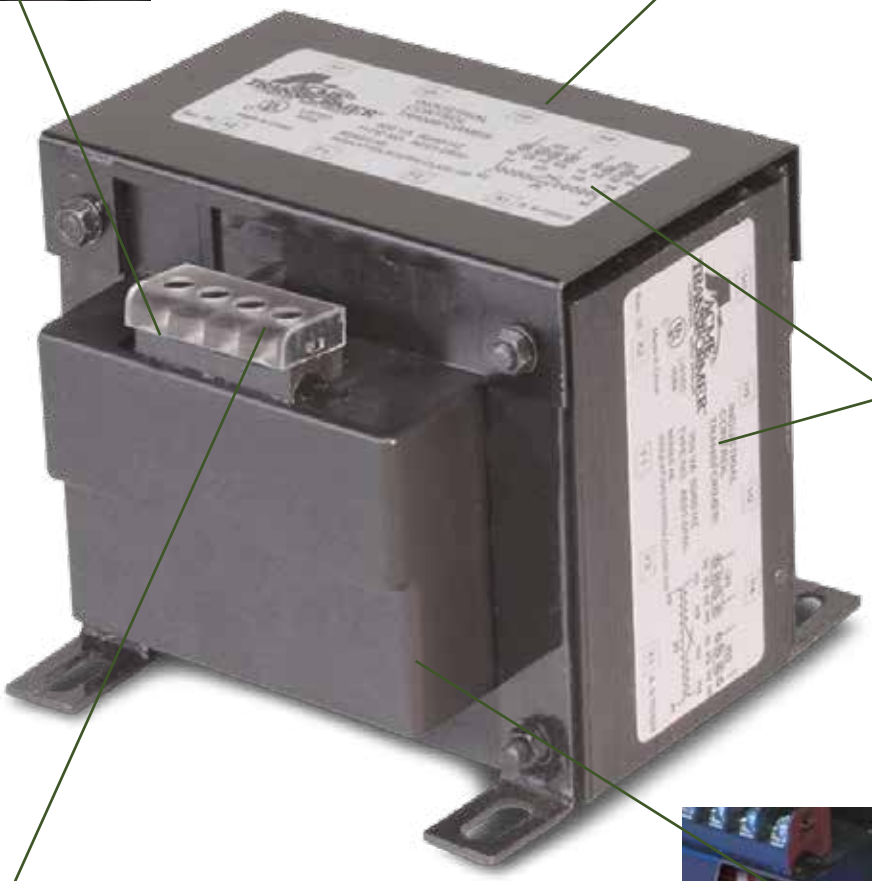
Acme's CE Series Encapsulated Industrial Control Transformers carry the CE mark, indicating it complies with the requirements established by the International Electrotechnical Commission (IEC) for use of control circuit transformers in the countries of the European Union. Regulations that apply to control transformers include Low Voltage Directive 2006/95/EC and Electromagnetic Compatibility (EMC) Directive 2004/108/EC.

CE

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 (AE/CE Series) style.



Dual labels for identification of fused modules

AC/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.

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

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

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

VA Rating	Catalog Number	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.)
50	AE020050	3.28 (8.3)	3.00 (7.6)	2.78 (7.0)	2.25 (5.7)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	3.0 (1.4)
75	AE020075	3.28 (8.3)	3.00 (7.6)	3.09 (7.8)	2.53 (6.4)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
100	AE020100	3.28 (8.3)	3.41 (8.6)	3.41 (8.6)	2.53 (6.4)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
150	AE020150	4.03 (10.2)	3.75 (9.5)	3.41 (8.6)	3.28 (8.3)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	7.0 (3.2)
250	AE020250	4.38 (11.1)	4.50 (11.4)	4.03 (10.2)	3.75 (9.5)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.0 (4.1)
300	AE020300	5.13 (13.0)	4.50 (11.4)	4.97 (12.6)	3.88 (9.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	11.0 (5.0)
350	AE020350	5.25 (13.3)	4.50 (11.4)	4.97 (12.6)	4.16 (10.5)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.0 (5.9)
500	AE020500	6.31 (16.0)	5.25 (13.3)	4.97 (12.6)	5.25 (13.3)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	AE020750	6.81 (17.3)	5.25 (13.3)	4.97 (12.6)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

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

VA Rating	Catalog Number	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.
50	AE070050	2.84 (7.2)	3.00 (7.6)	2.81 (7.1)	2.16 (5.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.6 (1.2)
100	AE070100	3.41 (6.6)	3.41 (8.6)	3.09 (7.8)	2.69 (6.8)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	4.2 (1.9)
150	AE070150	3.88 (9.8)	3.75 (9.5)	3.41 (8.6)	3.09 (7.8)	3.09 (7.8)	.20 x .40 (0.5 x 1.0)	6.7 (3.1)
250	AE070250	4.16 (10.5)	4.50 (11.4)	4.03 (10.2)	3.28 (8.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.5 (4.3)
350	AE070350	5.19 (13.1)	4.50 (11.4)	4.03 (10.2)	4.38 (11.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	13.4 (6.1)
500	AE070500	5.88 (14.9)	5.25 (13.3)	4.66 (11.8)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	AE070750	6.81 (17.3)	5.25 (13.3)	4.66 (11.8)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

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

AE SERIES

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

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

AE SERIES

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

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

AE SERIES

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

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

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

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

VA Rating	Catalog Number	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.
50	CE020050	3.28 (8.3)	3.28 (8.3)	2.81 (7.1)	2.25 (5.7)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	2.7 (1.2)
100	CE020100	4.03 (10.2)	3.75 (9.5)	3.13 (7.9)	3.22 (8.1)	3.16 (8.0)	.20 x .40 (0.5 x 1.0)	4.3 (1.9)
150	CE020150	4.03 (10.2)	4.50 (11.4)	3.41 (8.6)	2.81 (7.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.8 (3.0)
250	CE020250	4.78 (12.1)	4.50 (11.4)	4.03 (10.2)	4.06 (10.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.7 (4.4)
350	CE020350	5.53 (14.0)	5.25 (13.3)	4.03 (10.2)	4.28 (10.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.5 (6.1)
500	CE020500	7.25 (18.4)	5.25 (13.3)	4.69 (11.9)	6.00 (15.2)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.6 (8.9)
750	CE020750	6.81 (17.3)	5.28 (13.4)	4.69 (11.9)	5.75 (14.6)	4.44 (11.2)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

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 — CE SERIES

VA Rating	Catalog Number	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg..)
50	CE050050	4.03 (10.2)	3.41 (8.6)	3.09 (7.8)	2.47 (6.2)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	2.7 (1.2)
150	CE050150	3.88 (9.8)	4.34 (11.0)	3.41 (8.6)	2.88 (7.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.7 (3.0)
250	CE050250	5.13 (13.0)	4.50 (11.4)	4.03 (10.2)	4.38 (11.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.5 (4.3)
350	CE050350	5.91 (15.0)	5.25 (13.3)	4.03 (10.2)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	13.3 (6.0)
500	CE050500	5.91 (15.0)	5.25 (13.3)	4.66 (11.8)	4.63 (11.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	CE050750	7.09 (18.0)	5.25 (13.3)	4.66 (11.1)	5.81 (14.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	27.0 (12.2)

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

CE SERIES

VA Rating	Catalog Number	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.
50	CE030050	3.00 (7.6)	3.00 (7.6)	2.81 (7.1)	2.25 (5.7)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.5 (1.1)
75	CE030075	3.28 (8.3)	3.28 (8.3)	2.81 (7.1)	2.25 (5.7)	2.81 (7.1)	.20 x .40 (0.5 x 1.0)	3.5 (1.6)
100	CE030100	3.28 (8.3)	3.75 (9.5)	3.09 (7.8)	2.53 (6.4)	3.13 (7.9)	.20 x .40 (0.5 x 1.0)	4.0 (1.8)
150	CE030150	3.88 (9.8)	4.50 (11.4)	3.47 (8.8)	2.53 (6.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.5 (2.9)
250	CE030250	4.13 (10.4)	4.50 (11.4)	4.03 (10.2)	3.22 (8.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.2 (4.2)
350	CE030350	5.00 (12.7)	5.25 (13.3)	4.03 (10.2)	3.75 (9.5)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	12.7 (5.8)
500	CE030500	5.53 (14.0)	5.25 (13.3)	4.66 (11.8)	4.28 (10.8)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	19.0 (8.6)
750	CE030750	7.03 (17.8)	5.25 (13.3)	4.66 (11.8)	5.41 (13.7)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

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

CE SERIES

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

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

CE SERIES

VA Rating	Catalog Number	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.
50	CE040050	3.53 (8.9)	3.00 (7.6)	2.81 (7.1)	2.53 (6.4)	2.53 (6.4)	.20 x .40 (0.5 x 1.0)	2.6 (1.2)
100	CE040100	3.53 (8.9)	3.75 (9.5)	3.22 (8.1)	2.53 (6.4)	3.13 (8.0)	.20 x .40 (0.5 x 1.0)	4.3 (1.9)
150	CE040150	3.53 (8.9)	4.34 (11.0)	3.41 (8.6)	2.53 (6.4)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	6.7 (3.0)
250	CE040250	4.03 (10.2)	4.50 (11.4)	4.22 (10.7)	3.22 (8.1)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	9.4 (4.3)
350	CE040350	4.91 (12.4)	4.50 (11.4)	4.22 (10.7)	4.06 (10.3)	3.75 (9.5)	.20 x .40 (0.5 x 1.0)	13.0 (5.9)
500	CE040500	6.00 (15.2)	5.25 (13.3)	4.69 (11.9)	4.78 (12.1)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	18.8 (8.5)
750	CE040750	6.81 (17.3)	5.25 (13.3)	4.69 (11.9)	5.75 (14.6)	4.38 (11.1)	.31 x .69 (0.8 X 1.7)	26.0 (11.8)

PRIMARY FUSE SIZING CHART
RECOMMENDED RATING FOR CURRENT LIMITING CLASS CC FUSES

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

SECONDARY FUSE SIZING CHART
RECOMMENDED RATING FOR CURRENT LIMITING MIDGET FUSES

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

CONNECTION DETAILS FOR AE05 & CE05

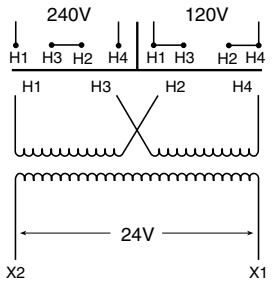
H1-H2	H1-H3	H1-H4	X1-X2	X1-X3	X1-X4
208			85	100	110
220	380	440	91	110	120
230	400	460	95	115	125
240	416	480	99	120	130

FUSE KITS AND ACCESSORIES

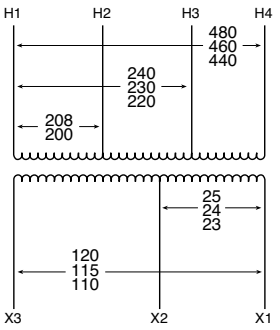
Catalog Number	VA	Description	Approximate Ship Weight (Lbs.)(Kg.)
PL79920	50-750	Fuse Kit: Primary Fuse Block EIC Series (2 Class CC Blocks)	1.0 (0.5)
PL79921	150-750	Fuse Kit: Primary & Secondary Fuse Block EIC Series (2 Class CC and 1 Midget Blocks)	1.0 (0.5)
PL79922	50-750	Fuse Kit: Primary Fuse Block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

AE AND CE WIRING DIAGRAMS

WIRING FOR AE01 & CE01



WIRING FOR AE02 & CE02



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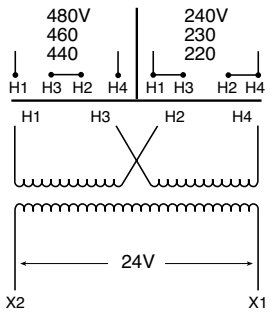
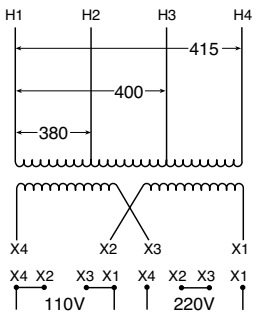


WIRING FOR CE04



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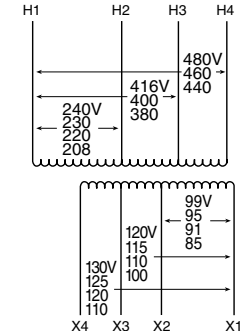
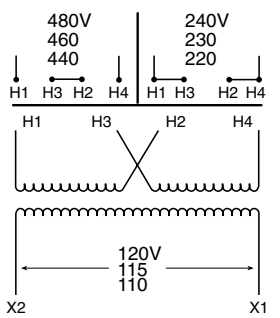
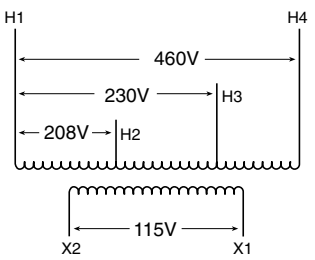


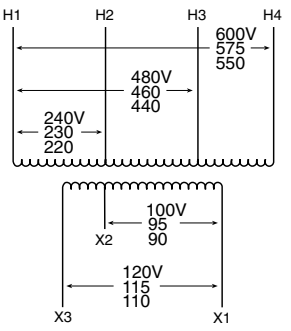
WIRING FOR AE06 & CE06



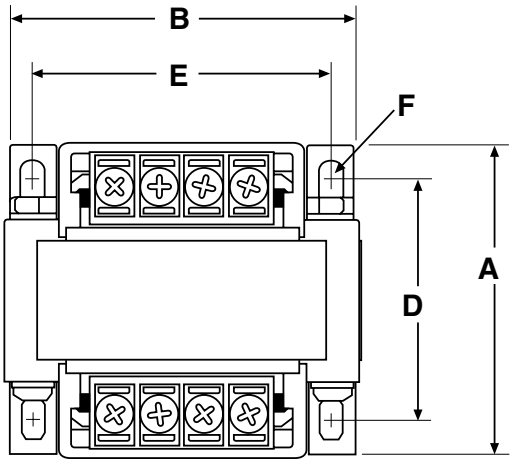
WIRING FOR AE07

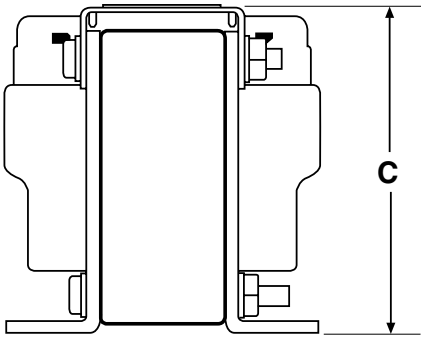


WIRING FOR AE 12



AE AND CE SERIES DIMENSIONAL DRAWINGS





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 Series for Global Applications

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,2006/95/EC
- Electromagnetic Compatibility (EMC) Directive,2004/108/EC

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.

CE

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

VA Rating	Catalog Number	European Rating*	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.)	Wiring Diagram
1000	FS11000	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)	A

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

VA Rating	Catalog Number	European Rating*	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.)	Wiring Diagram
1000	FS21000	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)	B
1500	FS21500	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)	B
2000	FS22000	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)	B
3000	FS23000	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)	B

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

VA Rating	Catalog Number	European Rating*	Approximate Dimensions (Inches)(Cm.) A	B	C	D	E	Mounting Slot F	Approximate Ship Weight (Lbs.)(Kg.)	Wiring Diagram
50	FS350	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)	C
150	FS3150	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)	C
250	FS3250	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)	C
350	FS3350	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)	C
500	FS3500	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)	C
750	FS3750	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)	C
1000	FS31000	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)	C
1500	FS31500	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)	C
2000	FS32000	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)	C
3000	FS33000	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)	C

FUSE KITS — FOR FINGER/GUARD® INDUSTRIAL CONTROL TRANSFORMERS

Catalog Number	Description
PL79905	PRIMARY FUSE KIT FOR CLASS CC FUSES
PL79906	PRIMARY & SECONDARY FUSE KIT FOR CLASS CC PRIMARY FUSES & MIDGET SECONDARY FUSE
PL79907	PRIMARY FUSE KIT FOR MIDGET FUSES
PL79908	PRIMARY & SECONDARY FUSE KIT FOR MIDGET FUSES

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

CONNECTION DETAILS WIRING DIAGRAM 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

SECONDARY FUSE SIZING CHART
RECOMMENDED RATING FOR CURRENT LIMITING MIDGET FUSES

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

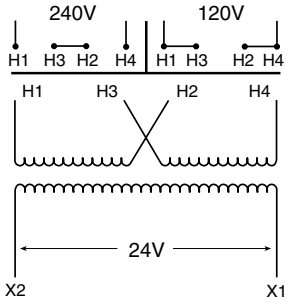
PRIMARY FUSE SIZING CHART
RECOMMENDED RATING FOR CURRENT LIMITING CLASS CC FUSES

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

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

FINGER/GUARD® WIRING DIAGRAMS

A



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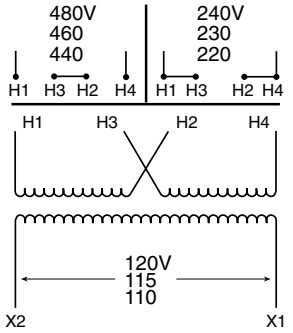

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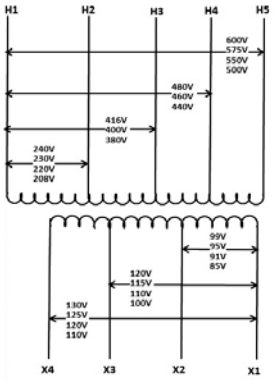
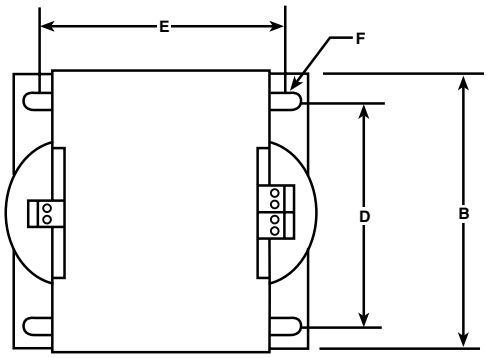
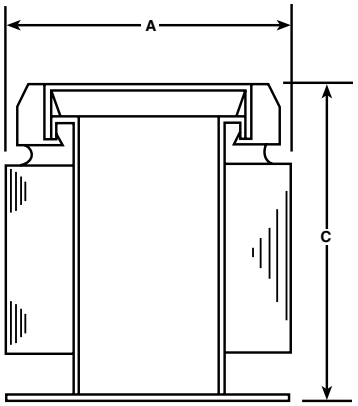


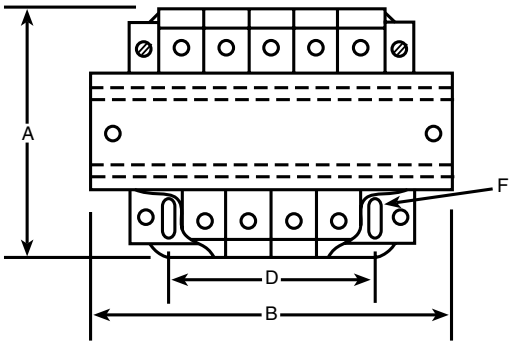
FINGER/GUARD® DIMENSIONAL DRAWINGS

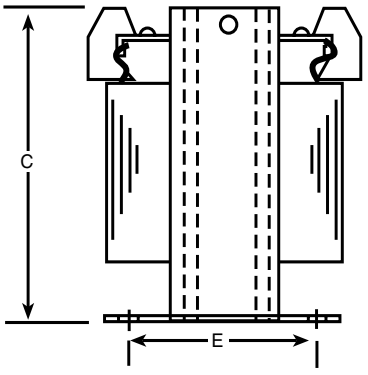
50 VA THRU 2 kVA





3 kVA





DIN-Rail Power Supplies/Receptacles and Low Voltage Lighting Transformers

Section 7

DM Series Mounted Power Supplies NEW

Duplex Receptacles NEW

Low Voltage Lighting Transformers

DM SERIES 0.6 TO 20 AMPS

Acme's new flagship line of DM 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.

Currently available in single phase and three phase models from 0.6 to 20 Amps (15-480 watts) these new power supplies provide the convenience of DIN-rail mounting for a toolless installation and the versatility of a standard auto-ranging input to cover the most applications with the fewest models. The slim 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. All units are UL 508 listed and can be used at full-rated power.

Solution Ease

The DM families auto-ranging input feature provides you the versatility of using one power supply to address input voltages from 90-264 volts for single phase applications and 340-575 on three phase applications automatically–no adjustments required during installation.

Space Saving

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

Installation Made Easy

All housings conveniently snap onto standard 35 mm DIN-rail assuring permanent mounting without the use of any tools.

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
- Up to Three-year limited warranty

Industries

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

Applications

- Industrial/Machine control
- Process control
- Conveying equipment
- Material handling
- Packaging
- Robotics
- Welding

DM SERIES FEATURES

DC power now comes in a smaller package. Our slimline single phase models measure as small as 32 mm wide to conserve valuable space on the DIN Rail and in the overall control cabinet!

SINGLE PHASE

Catalog Number	Output Power (Watts Max)	Amp Rating	Voltage Range AC	Voltage Range DC	Output Voltage	Efficiency (1)	Operating Temperature	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
DM112045	54 W	4.5–3.4	90–254 VAC	—	12 VDC (10–16 adj)	86%	-10°C to +60°C	4.88 (124)	1.97 (50)	4.13 (105)	1.08 (0.49)
DM124025	60 W	2.5–2.1	90–254 VAC	—	24 VDC (22–28 adj)	87%	-10°C to +60°C	4.88 (124)	1.97 (50)	4.13 (105)	1.08 (0.49)
DM12420	480 W	20.0–17.1	90–254 VAC	—	24 VDC (22–28 adj)	90%	-10°C to +60°C	5.12 (130)	6.14 (156)	4.96 (126)	4.96 (2.25)
DM13613	480 W	13.3–12.0	90–254 VAC	—	36 VDC (34–40 adj)	90%	-10°C to +60°C	5.12 (130)	6.14 (156)	4.96 (126)	4.96 (2.25)
DM1480125	60 W	1.25–1.15	90–254 VAC	—	48 VDC (46–52 adj)	89%	-10°C to +60°C	4.88 (124)	1.97 (50)	4.13 (105)	1.08 (0.49)
DM14810	480 W	10.0–9.2	90–254 VAC	—	48 VDC (46–52 adj)	90%	-10°C to +60°C	5.12 (130)	6.14 (156)	4.96 (126)	4.96 (2.25)

Frequency: 47-63 Hz for all models

1. Depends upon specific model selection, output voltage and/or upon 120 or 240 VAC operation.

SLIMLINE SINGLE PHASE

Catalog Number	Output Power (Watts Max)	Amp Rating	Voltage Range AC	Output Voltage	Efficiency (1)	Operating Temperature	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
DM11206S	72 W	6.0 - 4.8	90-264 VAC	12 VDC (12-15 adj)	87%	-20°C to +60°C	4.88 (124)	1.26 (32)	4.02 (102)	0.92 (0.42)
DM11208S	96 W	8.0 - 6.4	90-264 VAC	12 VDC (12-15 adj)	89%	-20°C to +60°C	4.88 (124)	1.57 (40)	4.45 (113)	1.37 (0.62)
DM11215S	180 W	15.0	90-264 VAC	12 VDC (12-15 adj)	88%	-20°C to +60°C (1)	4.88 (124)	2.36 (60)	4.45 (113)	1.98 (0.9)
DM124033S	80 W	3.4 - 2.8	90-264 VAC	24 VDC (24-28 adj)	90%	-20°C to +60°C	4.88 (124)	1.26 (32)	4.02 (102)	0.92 (0.42)
DM12405S	120 W	5.0 - 4.3	90-264 VAC	24 VDC (24-28 adj)	91%	-20°C to +60°C	4.88 (124)	1.57 (40)	4.45 (113)	1.37 (0.62)
DM12410S	240 W	10.0	90-264 VAC	24 VDC (24-28 adj)	92%	-20°C to +60°C (1)	4.88 (124)	2.36 (60)	4.45 (113)	1.98 (0.9)
DM148017S	80 W	1.7 - 1.4	90-264 VAC	48 VDC (48-56 adj)	90%	-20°C to +60°C	4.88 (124)	1.26 (32)	4.02 (102)	0.92 (0.42)
DM148025S	120 W	2.5 - 2.1	90-264 VAC	48 VDC (48-56 adj)	91%	-20°C to +60°C	4.88 (124)	1.57 (40)	4.45 (113)	1.37 (0.62)
DM14805S	240 W	5.0	90-264 VAC	48 VDC (48-56 adj)	92%	-20°C to +60°C (1)	4.88 (124)	2.36 (60)	4.45 (113)	1.98 (0.9)

Frequency: 47-63 Hz for all models

1. Depends upon specific model selection, output voltage and/or upon 120 or 240 VAC operation.

THREE PHASE

Catalog Number	Output Power (Watts Max)	Amp Rating	Voltage Range AC	Voltage Range DC	Output Voltage	Efficiency (1)	Operating Temperature	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
DM32405	120 W	5.0 - 4.3	340-575 VAC	450-820 VDC	24 VDC (24-28 adj)	89%	-10°C to +60°C	4.96 (126)	2.56 (65)	4.65 (118)	1.65 (0.75)
DM32410	240 W	10.0 - 8.6	340-575 VAC	450-820 VDC	24 VDC (24-28 adj)	89%	-10°C to +60°C	5.12 (130)	3.43 (87)	4.96 (126)	2.76 (1.25)
DM32420	480 W	20.0 - 17.1	340-575 VAC	450-820 VDC	24 VDC (24-28 adj)	90%	-10°C to +60°C	5.12 (130)	6.14 (156)	4.96 (126)	4.85 (2.20)

Frequency: 47-63 Hz for all models

1. Depends upon specific model selection, output voltage and/or upon 120 or 240 VAC operation.

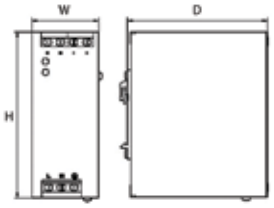
PLASTIC

Catalog Number	Output Power (Watts Max)	Amp Rating	Voltage Range AC	Output Voltage	Efficiency (1)	Operating Temperature	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
DMP1504	20 W	4.4 - 3.64	90-264 VAC	5 VDC (4.5-5.5 adj)	75%	-10°C to +50°C	3.54 (90)	0.90 (22.8)	4.02 (102)	0.35 (0.16)
DMP1120125	15 W	1.25 - 1.07	90-264 VAC	12 VDC (10-14 adj)	78%	-10°C to +50°C	3.54 (90)	0.90 (22.8)	4.02 (102)	0.29 (0.13)
DMP112025	30 W	3.0 - 2.14	90-264 VAC	12 VDC (10-14 adj)	84%	-10°C to +50°C	3.54 (90)	0.90 (22.8)	4.02 (102)	0.35 (0.16)
DMP11204	50 W	5.0 - 3.57	90-264 VAC	12 VDC (10-14 adj)	83%	-10°C to +50°C	3.54 (90)	1.26 (32)	4.02 (102)	0.51 (0.23)
DMP11502	30 W	2.14 - 1.67	90-264 VAC	15 VDC (14-18 adj)	84%	-10°C to +50°C	3.54 (90)	0.90 (22.8)	4.02 (102)	0.35 (0.16)
DMP124006	15 W	0.68 - 0.54	90-264 VAC	24 VDC (22-28 adj)	81%	-10°C to +50°C	3.54 (90)	0.90 (22.8)	4.02 (102)	0.29 (0.13)
DMP1240125	30 W	1.36 - 1.07	90-264 VAC	24 VDC (22-28 adj)	85%	-10°C to +50°C	33.54 (90)	0.90 (22.8)	4.02 (102)	0.35 (0.16)
DMP12402	50 W	2.27 - 1.79	90-264 VAC	24 VDC (22-28 adj)	85%	-10°C to +50°C	3.54 (90)	1.26 (32)	4.02 (102)	0.51 (0.23)
DMP14801	50 W	1.09 - 0.96	90-264 VAC	48 VDC (46-52 adj)	85%	-10°C to +50°C	3.54 (90)	1.26 (32)	4.02 (102)	0.51 (0.23)

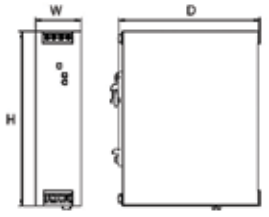
Frequency: 47-63 Hz for all models

1. Depends upon specific model selection, output voltage and/or upon 120 or 240 VAC operation.

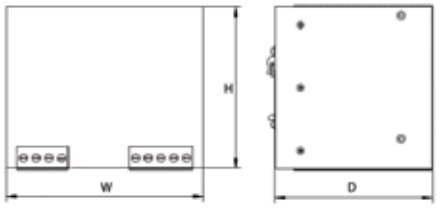
DM SERIES DIMENSIONAL DRAWINGS



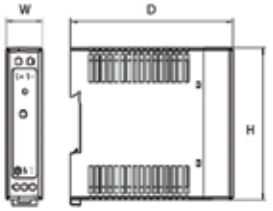
Single Phase



Slim Line



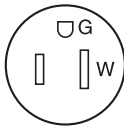
Three Phase



Plastic

DIN RAIL UTILITY BOX
15 and 20 Ampere

Hubbell's DIN Rail Utility Box offers a labor saving way to provide utility power to any control cabinet. Installing the DIN Rail Utility Box is as easy as snapping the box onto a 35mm DIN Rail and connecting the line, neutral and ground wires to the terminal block. Utility power for fans, lights, laptop computers, testers or any other power requirement. All Hubbell DIN Rail Utility Boxes may be mounted either vertically or horizontally on the DIN Rail.



15A 125V
NEMA 5-15F
UL CSA
0.5H P

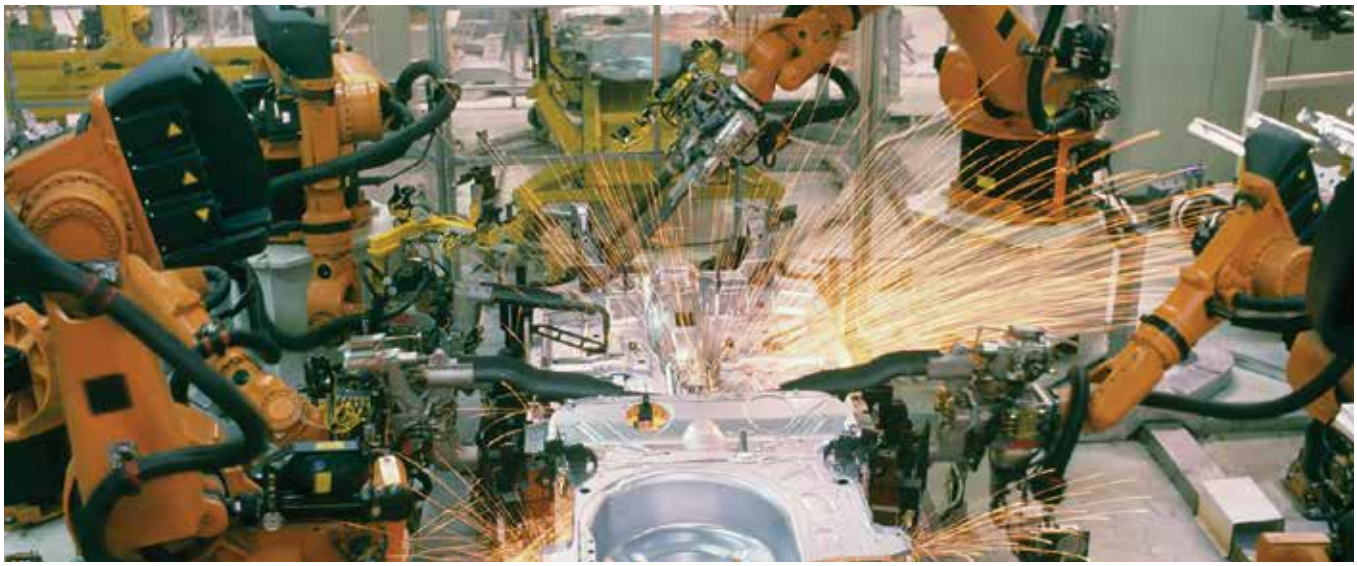
20A 125V
NEMA 5-20R
UL CSA
1 HP

DUPLEX RECEPTACLES

Catalog Number		Color	Description
15A 125V NEMA 5-15R UL CSA 0.5 HP	20A 125V NEMA 5-20R UL CSA 1 HP		
DRUB15	DRUB20	Gray	DIN-Rail mounted duplex receptacles.

GFCI DUPLEX RECEPTACLES

Catalog Number		Color	Description
15A 125V NEMA 5-15R UL CSA 0.5 HP	20A 125V NEMA 5-20RUL CSA 1 HP		
DRUBGFI15	DRUBGFI20	Gray	DIN-Rail mounted GFCI duplex receptacles.
DRUBGFI15AC	DRUBGFI20AC	Gray	DIN-Rail mounted duplex receptacles with aux GFCI contacts.



WHY LOW VOLTAGE LIGHTING?

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

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

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!

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.

The convenient "Selection Guide" below 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.

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

LOW VOLTAGE GENERAL PURPOSE TRANSFORMERS

Features

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

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

VA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	CB Rating)	CB Style	Dimensional Drawings
100	T179600S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	15 AMP	Push To Reset Thermal Breaker	A
150	T179620S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	20 AMP	Push To Reset Thermal Breaker	A
300	T179621S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	11 (5.0)	40 AMP	Push To Reset Thermal Breaker	A
600	T179622S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	15 (6.8)	60 AMP	Magnetic Toggle On/Off Breaker	A
750	T179603S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	18 (8.2)	75 AMP	Magnetic Toggle On/Off Breaker	A
1000	T179604S	11.93 (30.3)	5.41 (13.7)	5.20 (13.2)	26 (11.8)	100 AMP	Magnetic Toggle On/Off Breaker	A

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

VA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	CB Rating)	CB Style	Dimensional Drawings
100	T179605S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	7 AMP	Push To Reset Thermal Breaker	A
150	T179623S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	10 AMP	Push To Reset Thermal Breaker	A
300	T179624S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	11 (5.0)	20 AMP	Push To Reset Thermal Breaker	A
600	T179625S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	15 (6.8)	40 AMP	Push To Reset Thermal Breaker	A
750	T179608S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	18 (8.2)	50 AMP	Push To Reset Thermal Breaker	A
1000	T179609S	11.93 (30.3)	5.41 (13.7)	5.20 (13.2)	26 (11.8)	50 AMP	Magnetic Toggle On/Off Breaker	A

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

VA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	CB Rating)	CB Style	Dimensional Drawings
100	T179615S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	7 AMP	Push To Reset Thermal Breaker	A
150	T179629S	9.01 (22.9)	4.08 (10.4)	3.88 (9.9)	7 (3.2)	10 AMP	Push To Reset Thermal Breaker	A
300	T179630S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	11 (5.0)	20 AMP	Push To Reset Thermal Breaker	A
600	T179631S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	15 (6.8)	40 AMP	Push To Reset Thermal Breaker	A
750	T179618S	11.68 (29.7)	4.66 (11.8)	4.57 (11.6)	18 (8.2)	50 AMP	Push To Reset Thermal Breaker	A
1000	T179619S	11.93 (30.3)	5.41 (13.7)	5.20 (13.2)	26 (11.8)	50 AMP	Magnetic Toggle On/Off Breaker	A

BUCK-BOOST TRANSFORMERS

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.

120 X 240 VOLT INPUT — 12/24 VOLT OUTPUT — 1Ø, 60 Hz

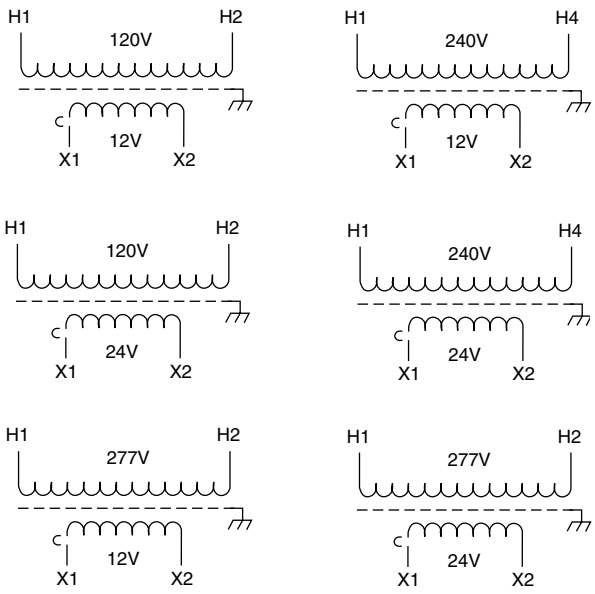
Catalog Number	Insulating Transformer Rating	Secondary Maximum Current Output 12V	Secondary Maximum Current Output 24V	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
T181047	0.05 kVA	4.16	2.08	6.38 (16.2)	3.19 (8.1)	3.00 (7.6)	4 (1.8)
T181048	0.10 kVA	8.32	4.16	6.62 (16.8)	3.75 (9.5)	3.62 (9.2)	5 (2.3)
T181049	0.15 kVA	12.52	6.25	7.12 (18.1)	3.75 (9.5)	3.62 (9.2)	7 (3.2)
T181050	0.25 kVA	20.80	10.40	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)
T181051	0.50 kVA	41.60	20.80	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)
T181052	0.75 kVA	62.50	31.25	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)
T111683	1.00 kVA	83.20	41.60	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)
T111684	1.50 kVA	125.00	62.50	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)
T111685	2.00 kVA	166.00	83.20	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)
T111686	3.00 kVA	250.00	125.00	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)
T111687	5.00 kVA	416.00	208.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)
T211688	7.50 kVA	625.00	312.50	21.19 (53.8)	13.50 (34.3)	10.84 (27.5)	125 (56.7)
T211689	10.00 kVA	833.00	416.60	21.19 (53.8)	13.50 (34.3)	10.84 (27.5)	160 (72.6)

277 VOLT INPUT — 12/24 VOLT OUTPUT — 1Ø, 60 Hz

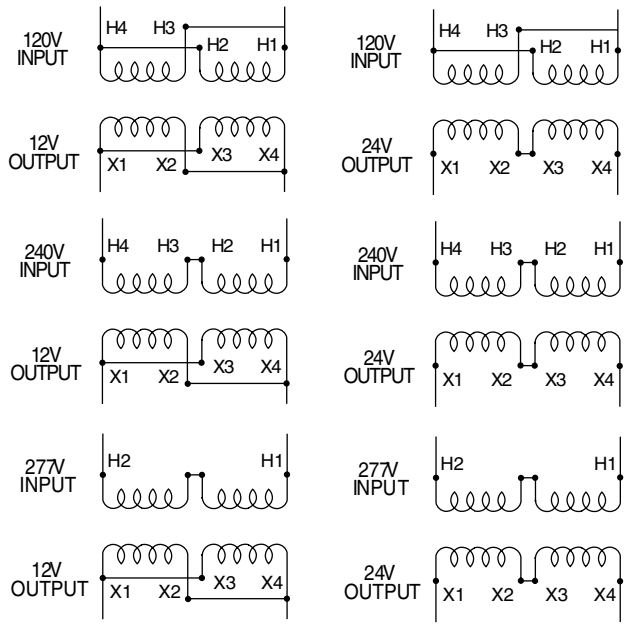
NEW

Catalog Number	Insulating Transformer Rating	Secondary Maximum Current Output 12V	Secondary Maximum Current Output 24V	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
T1100V0370BC	0.10 kVA	8.32	4.16	6.62 (16.8)	3.75 (9.5)	3.62 (9.2)	5 (2.3)
T1150V0370BC	0.15 kVA	12.52	6.25	7.12 (18.1)	3.75 (9.5)	3.62 (9.2)	7 (3.2)
T1250V0370BC	0.25 kVA	20.80	10.40	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)
T1500V0370BC	0.50 kVA	41.60	20.80	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)
T1001K0370BC	1.00 kVA	83.20	41.60	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)
T1150K0370BC	1.50 kVA	125.00	62.50	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)

LOW VOLTAGE GENERAL PURPOSE TRANSFORMER



BUCK BOOST WIRING DIAGRAMS

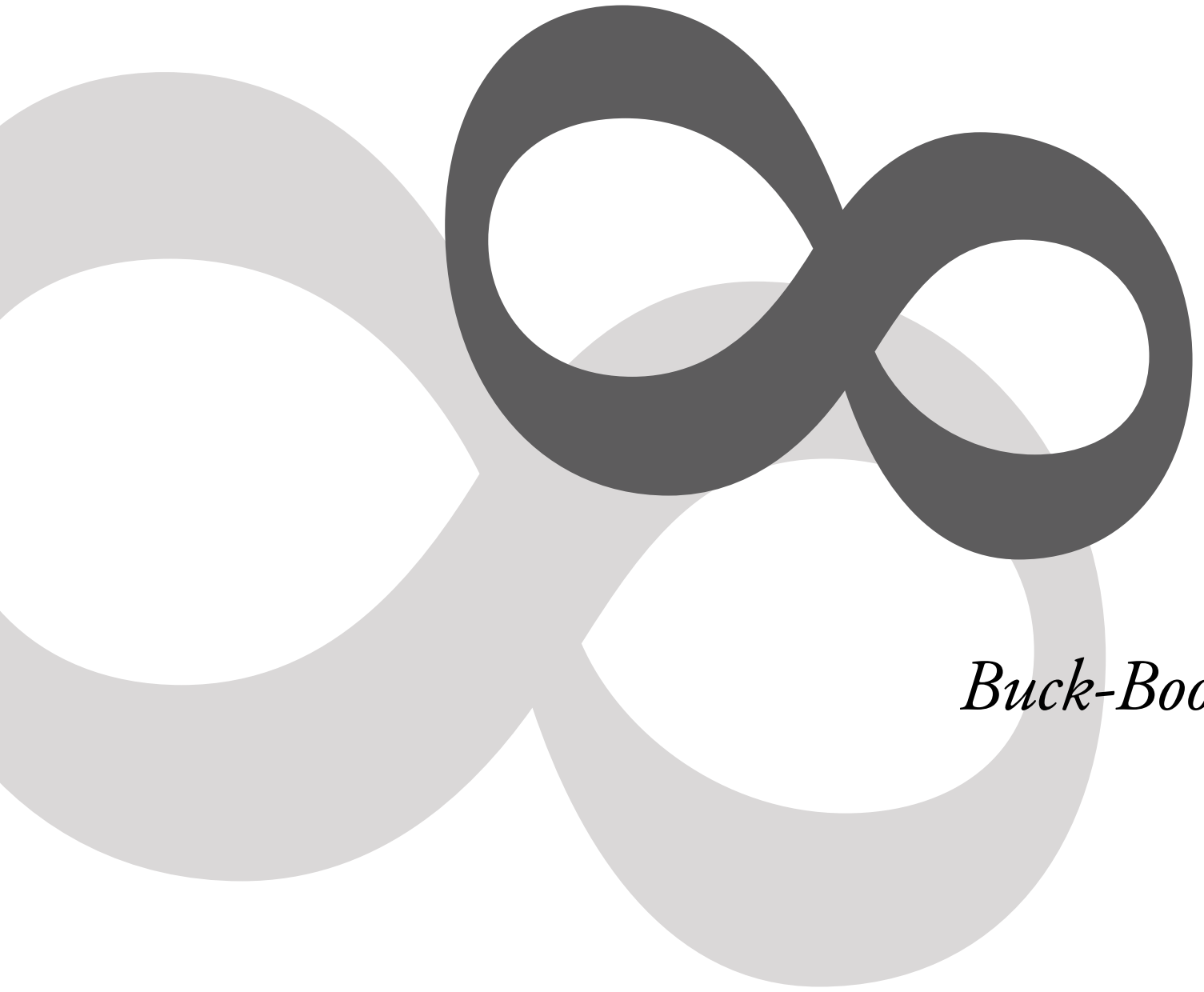


Voltage Drop Chart		
Voltage at Lamp	Life Expectancy of Lamp	% of Rated Candlepower
13.2	2/3 Rated Life	350
12.6	3/4 Rated Life	180
12.0	As Rated	100
11.5	2X Rated Life	80
11.0	3X Rated Life	74
10.5	5X Rated Life	65
10.0	9X Rated Life	50

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

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



Buck-Boost Transformers

Section 8

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.

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.

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

T211688

T111683

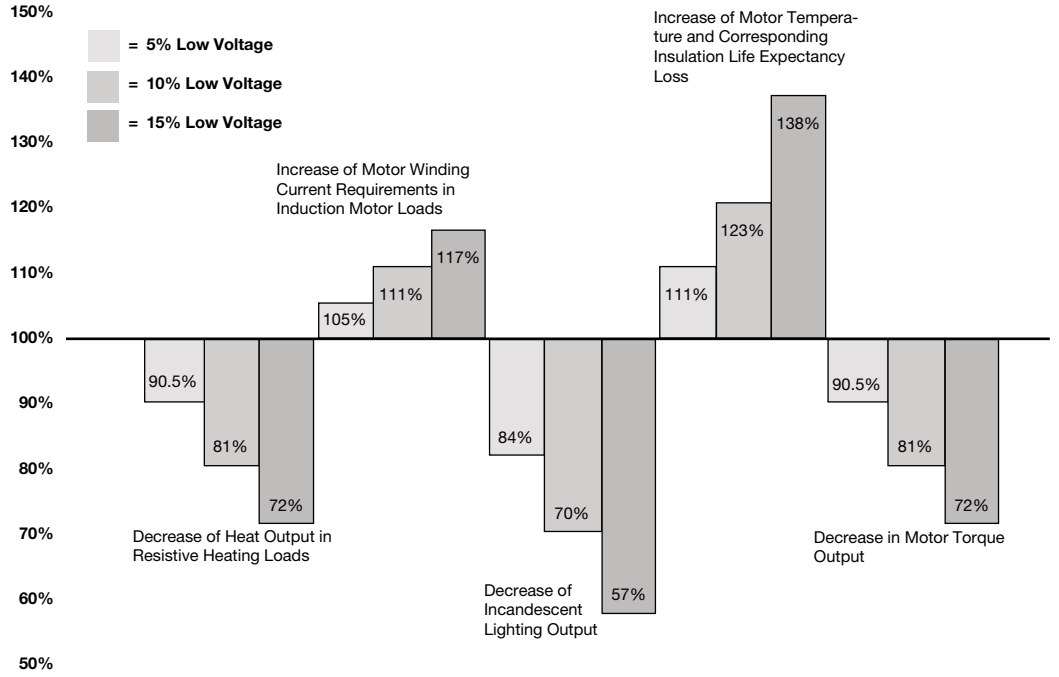
Encapsulated
Single Phase, .05 to 10.0 kVA

Features
- UL listed, CSA certified and UL 3R enclosure, meets or exceeds all listing criteria, including NEMA, ANSI, and OSHA standards
- Flexibility, can be used in single phase and three pase configurations
- Reduce (buck) or raise (boost) line voltage from 5 - 20%
- All copper lead wire terminations
- Long Life, 80° C rise up to 0.15 kVA, and 115° C rise above 0.25 kVA
- Can be used in Three Phase applications

Encapsulated
Three Phase, 3.0 to 150 kVA NEW

Features
- UL listed, CSA certified and UL 3R enclosure, meets or exceeds all listing criteria, including NEMA, ANSI, and OSHA standards
- One unit, instead of multiple for 3 phase applications
- Time and installation cost savings as units come pre-wired from the factory
- Smaller footprint compared to using three individual single phase units
- Long Life, UL class 180° C insulation system, 115° C rise

HOW LOW VOLTAGE AFFECTS VARIOUS EQUIPMENT OPERATIONS AND FUNCTIONS



QUESTIONS AND 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.

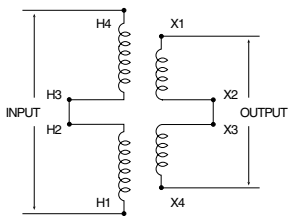


Figure 1. Buck-boost transformer connected as a low voltage insulating transformer (primary and secondary windings shown series connected).

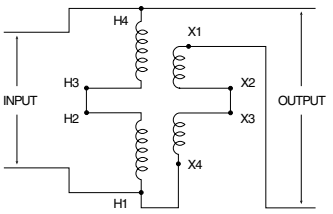


Figure 2. Same buck-boost transformer connected as a boosting autotransformer. The connection from H1 to X4 "converted" the unit to an autotransformer.

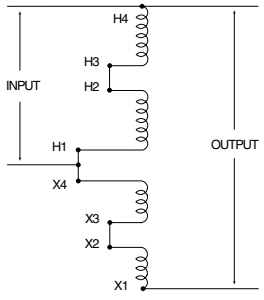


Figure 3. Illustration No. 2 shown with the primary and secondary windings "straightened".

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.

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:

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

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

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

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

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

$$\text{Maximum Secondary Amps} = \frac{\text{Volts x Amps x 1.73}}{\text{Secondary Volts}}$$

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

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?

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

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

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

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

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 135-136).

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 126 for easy 4-step selection, then go to the charts. Also, pages 15 and 17 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.

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

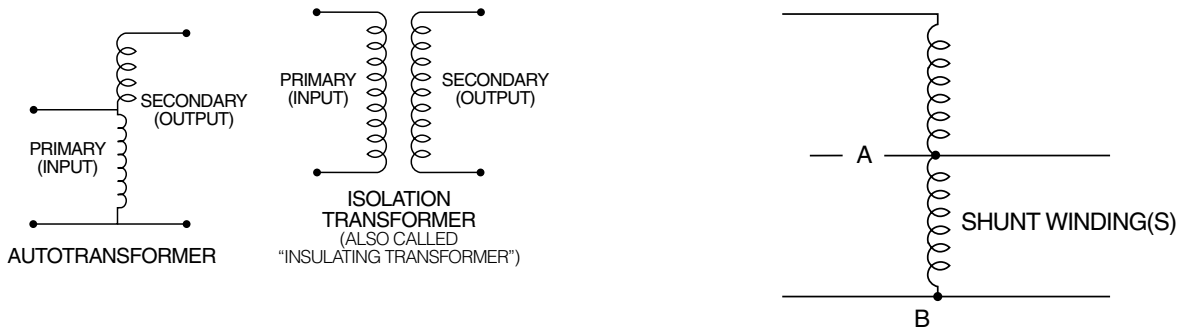
25. Your catalog indicates that a buck-boost transformer is suitable for connecting as an AUTOTRANS-FORMER. What is the definition of an autotransformer and how does it differ from an isolation transformer?
An autotransformer is a transformer in which the primary (input) and the secondary (output) are 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.

Diagram 450-4



26. Buck-boost transformers are almost always installed as auto-transformers. Does the N.E.C. (National Electrical Code) permit the use of autotransformers?
Yes. Please refer to N.E.C. Article 450-4, "Autotransformers 600 Volts, Nominal, or Less." Item (a) explains how to overcurrent protect an autotransformer; item (b) explains that an insulating transformer such as a buck-boost transformer may be field connected as an autotransformer.

27. When a buck-boost transformer is connected as an autotransformer such as boosting 208V to 230V, the kVA is greatly increased. What is the procedure for determining the size (ampere rating) of the overcurrent protective device such as a fuse or circuit breaker?
The National Electrical Code Article 450-4 addresses overcurrent protection of autotransformers. A copy is reproduced below for easy reference.

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

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

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

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

28. I have noted the reprint of the N.E.C. (National Electrical Code), Article 450-4 shown in the previous question covering autotransformer overcurrent protection. Could you explain this article in detail by citing an example?
An example of an everyday application is always a good way to explain the intent of the "Code." Example: A 1 kVA transformer Catalog No. T111683 has a primary of 120 x 240V and a secondary of 12 x 24V. It is to be connected as an autotransformer at the time of installation to raise 208V to 230V single phase.

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

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

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.

Max. amp rating of the overcurrent device = 46 amps x 125% = 57.5 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.

Max. size of the fuse or circuit breaker = 60 amps

SELECTING A 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 133 and 135 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.

Single Phase Application			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**
Catalog Number																
T181047	Load	kVA	0.24	0.25	0.48	0.50	0.43	0.48	0.49	0.50	0.52	0.54	0.47	0.50	0.52	1.02
		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
		Maximum Size of Fuse or Breaker	6	6	10	10	6	6	6	6	10	10	6	6	6	10
T181048	Load	kVA	0.47	0.50	0.96	1.01	0.87	0.96	0.99	1.01	1.04	1.08	0.95	1.00	1.04	2.04
		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
		Maximum Size of Fuse or Breaker	10	10	15	15	10	10	10	10	15	15	10	10	10	15
T181049	Load	kVA	0.71	0.75	1.43	1.51	1.30	1.43	1.48	1.51	1.56	1.62	1.42	1.50	1.56	3.00
		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
		Maximum Size of Fuse or Breaker	15	15	20	20	15	15	15	15	20	20	15	15	15	15
T181050	Load	kVA	1.19	1.25	2.40	2.50	2.16	2.39	2.46	2.52	2.60	2.75	2.37	2.50	2.60	5.10
		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
		Maximum Size of Fuse or Breaker	25	25	40	30	15	15	15	15	30	30	15	15	15	30
T181051	Load	kVA	2.37	2.50	4.80	5.00	4.33	4.79	4.93	5.04	5.20	5.40	4.47	5.00	5.20	10.20
		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
		Maximum Size of Fuse or Breaker	35	35	60	60	30	30	30	30	60	60	30	30	30	60
T181052	Load	kVA	3.56	3.75	7.17	7.56	6.50	7.19	7.41	7.56	7.80	8.15	7.10	7.50	7.80	15.30
		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
		Maximum Size of Fuse or Breaker	50	50	90	90	45	45	45	45	80	80	40	40	40	80
T111683	Load	kVA	4.75	5.00	9.58	10.00	8.66	9.58	9.87	10.00	10.40	10.80	9.50	10.00	10.00	20.40
		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
		Maximum Size of Fuse or Breaker	70	70	125	125	60	60	60	60	110	110	60	60	50	110
T111684	Load	kVA	7.12	7.50	14.40	15.10	13.00	14.30	14.80	15.10	15.00	16.20	14.24	15.00	15.60	30.60
		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
		Maximum Size of Fuse or Breaker	100	100	175	175	90	90	90	90	150	175	80	80	80	175
T111685	Load	kVA	9.50	10.00	19.20	20.20	17.30	19.16	19.70	20.10	20.80	21.60	19.00	20.00	20.30	40.80
		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
		Maximum Size of Fuse or Breaker	125	125	250	250	125	125	125	125	225	225	110	110	110	225
T111686	Load	kVA	14.20	15.00	28.80	30.00	26.00	28.70	29.60	30.30	31.20	32.50	28.50	30.00	31.20	61.00
		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
		Maximum Size of Fuse or Breaker	200	200	350	350	175	175	175	175	350	350	175	175	175	350
T111687	Load	kVA	23.70	25.00	47.90	50.00	43.30	47.80	49.30	50.30	52.00	54.00	47.40	50.00	52.00	102.00
		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
		Maximum Size of Fuse or Breaker	350	350	600	600	300	300	300	300	600	600	300	300	300	600
T111688 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
		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
		Maximum Size of Fuse or Breaker	500	500	1000	1000	450	450	450	450	800	800	400	400	400	800
T111689 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
		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
		Maximum Size of Fuse or Breaker	700	700	1200	1200	600	600	600	600	1200	1200	600	600	600	1200
See Page 136 for Connection Diagrams			**D**	**D**	**C**	**C**	**H**	**H**	**H**	**H**	**F**	**F**	**I**	**I**	**I**	**E**

① See chart on page 135, 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 135.

Single Phase Application			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**
Catalog Number																
T181054	Load	kVA	0.19	0.36	0.37	0.38	0.38	0.72	0.73	0.75	0.42	0.37	0.75	0.77	0.78	0.80
		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
		Maximum Size of Fuse or Breaker	6	6	6	6	6	6	6	6	6	3	6	6	6	6
T181055	Load	kVA	0.38	0.71	0.74	0.75	0.76	1.44	1.47	1.50	0.84	0.74	1.50	1.53	1.56	1.59
		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
		Maximum Size of Fuse or Breaker	10	15	6	6	15	15	15	15	15	6	15	15	15	15
T181056	Load	kVA	0.56	1.07	1.12	1.13	1.14	2.16	2.20	2.25	1.26	1.11	2.25	2.30	2.34	2.39
		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
		Maximum Size of Fuse or Breaker	10	15	15	10	10	15	15	15	15	6	15	15	15	15
T181057	Load	kVA	0.94	1.78	1.86	1.88	1.91	3.59	3.67	3.75	2.11	1.84	3.75	3.83	3.90	3.98
		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
		Maximum Size of Fuse or Breaker	15	25	25	15	15	25	25	25	20	15	20	20	20	20
T181058	Load	kVA	1.88	3.56	3.72	3.75	3.81	7.19	7.34	7.50	4.21	3.68	7.50	7.67	7.80	7.97
		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
		Maximum Size of Fuse or Breaker	25	45	45	25	25	45	45	45	40	20	40	40	40	40
T181059	Load	kVA	2.81	5.34	5.58	5.63	5.72	10.78	11.02	11.25	6.32	5.53	11.25	11.50	11.70	11.95
		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
		Maximum Size of Fuse or Breaker	40	70	70	40	40	70	70	70	60	30	60	60	60	60
T113073	Load	kVA	3.75	7.13	7.44	7.50	7.63	14.38	14.69	15.00	8.43	7.37	15.00	15.33	15.60	15.93
		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
		Maximum Size of Fuse or Breaker	50	90	90	50	50	90	90	90	80	40	80	80	80	80
T113074	Load	kVA	5.63	10.69	11.16	11.25	11.44	21.56	22.03	22.50	12.64	11.05	22.50	23.00	23.40	23.90
		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
		Maximum Size of Fuse or Breaker	80	150	150	70	70	125	125	125	125	60	125	125	125	125
T113075	Load	kVA	7.50	14.25	14.88	15.00	15.25	28.75	29.38	30.00	16.86	14.73	30.00	30.67	31.20	31.87
		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
		Maximum Size of Fuse or Breaker	100	200	200	90	90	175	175	175	175	80	175	175	175	175
T113076	Load	kVA	11.25	21.38	22.31	22.50	22.88	43.13	44.06	45.00	25.29	22.10	45.00	46.00	46.80	47.80
		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
		Maximum Size of Fuse or Breaker	150	300	300	150	150	250	250	250	250	125	250	250	250	250
T113077	Load	kVA	18.75	35.63	37.19	37.50	38.13	71.88	73.44	75.00	42.15	36.83	75.00	76.67	78.00	79.67
		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
		Maximum Size of Fuse or Breaker	250	450	450	225	225	450	450	450	400	200	400	400	400	400
T213078 ①	Load	kVA	28.10	53.40	55.80	56.30	57.20	107.80	110.20	112.50	63.20	55.30	112.50	115.00	117.00	119.50
		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
		Maximum Size of Fuse or Breaker	400	700	700	350	350	700	700	700	600	300	600	600	600	600
T213079 ①	Load	kVA	37.50	71.30	74.40	75.00	76.30	143.80	146.90	150.00	84.30	73.70	150.00	153.30	156.00	159.30
		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
		Maximum Size of Fuse or Breaker	500	1000	1000	450	450	1000	1000	1000	800	400	800	800	800	800
See Page 136 for Connection Diagrams			**D**	**C**	**C**	**H**	**H**	**G**	**G**	**G**	**F**	**I**	**E**	**E**	**E**	**E**

① See chart on page 135.

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 135.

Single Phase Application			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**
Catalog Number																
T181061	Load	kVA	0.29	0.44	0.48	0.49	0.49	0.95	0.96	0.50	0.98	1.01	0.29	0.50	1.05	1.10
		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
		Maximum Size of Fuse or Breaker	3	3	3	3	3	6	6	3	6	6	3	3	6	6
T181062	Load	kVA	0.58	0.87	0.95	0.97	0.99	1.90	1.93	1.01	1.97	2.01	0.58	1.00	2.09	2.20
		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
		Maximum Size of Fuse or Breaker	6	6	6	6	6	10	10	6	10	10	6	6	10	10
T181063	Load	kVA	0.87	1.31	1.43	1.46	1.48	2.86	2.89	1.51	2.95	3.02	0.86	1.50	3.14	3.30
		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
		Maximum Size of Fuse or Breaker	10	6	6	6	6	15	15	6	15	15	6	6	15	15
T181064	Load	kVA	1.44	2.19	2.38	2.43	2.46	4.76	4.81	2.52	4.92	5.03	1.44	2.50	5.23	5.50
		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
		Maximum Size of Fuse or Breaker	15	10	10	10	10	15	15	10	15	15	10	10	15	15
T181065	Load	kVA	2.89	4.38	4.76	4.86	4.93	9.52	9.62	5.04	9.83	10.06	2.88	5.00	10.45	11.00
		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
		Maximum Size of Fuse or Breaker	20	15	15	15	15	30	30	15	30	30	15	15	30	30
T181066	Load	kVA	4.33	6.56	7.14	7.30	7.39	14.28	14.44	7.56	14.75	15.09	4.31	7.49	15.68	16.50
		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
		Maximum Size of Fuse or Breaker	25	25	25	25	25	45	45	25	45	45	20	20	45	45
T137920	Load	kVA	5.77	8.57	9.52	9.73	9.85	19.04	19.25	10.08	19.67	20.13	5.75	9.99	20.90	22.00
		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
		Maximum Size of Fuse or Breaker	35	30	30	30	30	60	60	30	60	60	30	30	60	60
T137921	Load	kVA	8.66	13.13	14.28	14.59	14.78	28.56	28.88	15.13	29.50	30.19	8.63	14.99	31.35	33.00
		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
		Maximum Size of Fuse or Breaker	50	50	45	45	45	90	90	45	90	90	40	40	90	90
T137922	Load	kVA	11.54	17.50	19.04	19.46	19.71	38.08	38.50	20.17	39.33	40.25	11.50	19.98	41.80	44.00
		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
		Maximum Size of Fuse or Breaker	70	60	60	60	60	110	110	60	110	110	60	60	110	110
T137923	Load	kVA	17.31	26.25	28.56	29.19	29.56	57.13	57.75	30.25	59.00	60.38	17.25	29.98	62.70	66.00
		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
		Maximum Size of Fuse or Breaker	100	90	90	90	90	175	175	90	175	175	80	80	175	175
T137924	Load	kVA	28.90	43.80	47.60	48.60	49.30	95.20	96.20	50.40	98.30	100.60	28.80	50.00	104.50	110.00
		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
		Maximum Size of Fuse or Breaker	175	150	150	150	150	300	300	150	300	300	150	150	300	300
T243570①	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
		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
		Maximum Size of Fuse or Breaker	250	225	225	225	225	450	450	225	450	450	200	200	450	450
T243571①	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
		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
		Maximum Size of Fuse or Breaker	350	300	300	300	300	600	600	300	600	600	300	300	600	600
See Page 136 for Connection Diagrams			**D**	**H**	**H**	**H**	**H**	**G**	**G**	**H**	**G**	**G**	**J**	**I**	**E**	**E**

① See chart on page 135.

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 135.

Three Phase Application			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**
Catalog Number														
T181047	Load	kVA	1.50	0.84	0.87	1.66	0.75	0.83	0.87	1.58	0.83	0.90	0.92	0.95
		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
		Maximum Size of Fuse or Breaker	10	6	6	10	6	6	6	10	6	6	6	6
T181048	Load	kVA	3.00	1.69	1.73	3.32	1.50	1.66	1.75	3.16	1.66	1.80	1.84	1.91
		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
		Maximum Size of Fuse or Breaker	15	10	10	15	10	10	10	15	10	10	10	10
T181049	Load	kVA	4.50	2.53	2.60	4.98	2.25	2.49	2.62	4.74	2.49	2.71	2.76	2.86
		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
		Maximum Size of Fuse or Breaker	20	15	15	20	15	15	15	20	15	15	15	15
T181050	Load	kVA	7.51	4.22	4.33	8.30	3.75	4.15	4.37	7.90	4.15	4.51	4.60	4.76
		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
		Maximum Size of Fuse or Breaker	30	20	20	30	15	15	15	30	15	15	15	15
T181051	Load	kVA	15.01	8.44	8.66	16.60	7.51	8.30	8.73	15.80	8.30	9.02	9.20	9.53
		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
		Maximum Size of Fuse or Breaker	60	35	35	60	30	30	30	60	30	30	30	30
T181052	Load	kVA	22.52	12.67	12.99	24.90	11.26	12.45	13.10	23.71	12.45	13.53	13.80	14.29
		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
		Maximum Size of Fuse or Breaker	90	50	50	90	45	45	45	80	40	40	40	40
T111683	Load	kVA	30.02	16.89	17.32	33.20	15.01	16.60	17.46	31.61	16.60	18.04	18.40	19.05
		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
		Maximum Size of Fuse or Breaker	125	70	70	125	60	60	60	110	60	60	60	60
T111684	Load	kVA	45.03	25.33	25.98	49.80	22.52	24.90	26.20	47.41	24.90	27.06	27.60	28.58
		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
		Maximum Size of Fuse or Breaker	175	100	100	175	90	90	90	175	80	80	80	80
T111685	Load	kVA	60.04	33.77	34.64	66.40	30.02	33.20	34.93	63.22	33.20	36.08	36.81	38.11
		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
		Maximum Size of Fuse or Breaker	250	125	125	250	125	125	125	225	110	110	110	110
T111686	Load	kVA	90.07	50.66	51.96	99.59	45.03	49.80	52.39	94.83	49.80	54.13	55.21	57.16
		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
		Maximum Size of Fuse or Breaker	350	200	200	350	175	175	175	350	175	175	175	175
T111687	Load	kVA	150.11	84.44	86.60	165.99	75.06	82.99	87.32	158.05	82.99	90.21	92.02	95.26
		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
		Maximum Size of Fuse or Breaker	600	350	350	600	300	300	300	600	300	300	300	300
T211688 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
		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
		Maximum Size of Fuse or Breaker	1000	500	500	1000	450	450	450	800	400	400	400	400
T211689 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
		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
		Maximum 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 136-137 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 133.

Three Phase Application			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**
Catalog Number													
T181054	Load	kVA	1.13	1.28	1.13	0.63	1.30	0.56	1.33	1.35	1.39	0.72	0.74
		Amps	3.13	3.13	3.13	1.56	3.13	1.56	3.33	3.34	3.33	1.77	1.77
		Maximum Size of Fuse or Breaker	6	6	6	3	6	3	6	6	6	3	3
T181055	Load	kVA	2.25	2.55	2.25	1.27	2.60	1.13	2.65	2.71	2.77	1.43	1.47
		Amps	6.25	6.25	6.25	3.13	6.25	3.13	6.66	6.68	6.67	3.54	3.54
		Maximum Size of Fuse or Breaker	15	15	15	6	15	6	15	15	15	6	6
T181056	Load	kVA	3.38	3.83	3.38	1.90	3.90	1.69	3.98	4.06	4.16	2.15	2.21
		Amps	9.38	9.38	9.38	4.69	9.38	4.69	9.99	10.02	10.00	5.31	5.31
		Maximum Size of Fuse or Breaker	15	15	15	10	15	10	15	15	15	10	10
T181057	Load	kVA	5.63	6.39	5.63	3.17	6.50	2.81	6.63	6.77	6.93	3.59	3.68
		Amps	15.63	15.63	15.63	7.81	15.63	7.81	16.64	16.69	16.67	8.85	8.85
		Maximum Size of Fuse or Breaker	25	25	25	15	25	15	20	20	20	15	15
T181058	Load	kVA	11.26	12.77	11.26	6.33	12.99	5.63	13.26	13.53	13.86	7.17	7.36
		Amps	31.25	31.25	31.25	15.63	31.25	15.63	33.29	33.39	33.33	17.69	17.71
		Maximum Size of Fuse or Breaker	45	45	45	25	45	20	40	40	40	20	20
T181059	Load	kVA	16.89	19.16	16.89	9.50	19.49	8.44	19.89	20.30	20.78	10.76	11.04
		Amps	46.88	46.88	46.88	23.44	46.88	23.44	49.93	50.08	50.00	26.54	26.56
		Maximum Size of Fuse or Breaker	70	70	70	35	70	30	60	60	60	30	30
T113073	Load	kVA	22.52	25.55	22.52	12.67	25.98	11.26	26.52	27.06	27.71	14.34	14.72
		Amps	62.50	62.50	62.50	31.25	62.50	31.25	66.58	66.67	66.67	35.39	35.42
		Maximum Size of Fuse or Breaker	90	90	90	45	90	35	80	80	80	40	40
T113074	Load	kVA	33.77	38.32	33.77	19.00	38.97	16.89	39.87	40.59	41.57	21.52	22.08
		Amps	93.75	93.75	93.75	46.88	93.75	46.88	99.86	100.16	100.00	53.08	53.13
		Maximum Size of Fuse or Breaker	150	150	125	70	125	60	125	125	125	60	60
T113075	Load	kVA	45.03	51.10	45.03	25.33	51.96	22.52	53.04	54.13	55.43	28.69	29.44
		Amps	125.00	125.00	125.00	62.50	125.00	62.50	133.15	133.55	133.33	70.78	70.83
		Maximum Size of Fuse or Breaker	200	200	175	90	175	70	175	175	175	80	80
T113076	Load	kVA	67.55	76.64	67.55	38.00	77.94	33.77	79.57	81.19	83.14	43.03	44.17
		Amps	187.50	187.50	187.50	93.75	187.50	93.75	199.73	200.32	200.00	106.17	106.25
		Maximum Size of Fuse or Breaker	300	300	250	150	250	110	250	250	250	125	125
T113077	Load	kVA	112.58	127.74	112.58	63.33	129.90	56.29	132.61	135.32	138.56	71.72	73.50
		Amps	312.50	312.50	312.50	156.25	312.50	156.25	332.88	333.87	333.33	176.95	176.80
		Maximum Size of Fuse or Breaker	450	450	450	225	450	175	400	400	400	200	200
T213078 ①	Load	kVA	166.87	191.61	168.87	94.99	194.86	84.44	198.92	202.97	207.85	107.58	110.42
		Amps	468.75	468.75	468.75	234.38	468.75	234.38	499.32	500.80	500.00	265.42	265.63
		Maximum Size of Fuse or Breaker	700	700	700	350	700	300	600	600	600	300	300
T213079 ①	Load	kVA	225.17	255.48	225.17	126.66	259.81	112.58	265.22	270.63	277.13	143.44	147.22
		Amps	625.00	625.00	625.00	312.50	625.00	312.50	665.76	667.74	666.67	353.90	354.17
		Maximum 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 136-137 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 134.

Three Phase Application			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**
Catalog Number																		
T181061	Load	kVA	0.86	0.76	0.85	1.66	0.91	1.74	0.95	1.82	0.79	1.58	1.66	0.83	1.73	0.86	0.90	1.80
		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
		Maximum Size of Fuse or Breaker	3	3	3	6	3	6	3	6	3	6	6	3	6	3	3	6
T181062	Load	kVA	1.73	1.51	1.70	3.33	1.82	3.48	1.90	3.63	1.59	3.17	3.31	1.66	3.46	1.73	1.80	3.61
		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
		Maximum Size of Fuse or Breaker	6	6	6	10	6	10	6	10	6	10	10	6	10	6	6	10
T181063	Load	kVA	2.60	2.27	2.56	4.99	2.73	5.22	2.85	5.45	2.38	4.75	4.97	2.48	5.19	2.59	2.70	5.41
		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
		Maximum Size of Fuse or Breaker	10	6	6	15	6	15	6	15	6	15	15	6	15	6	6	15
T181064	Load	kVA	4.33	3.78	4.26	8.32	4.56	8.70	4.76	9.08	3.96	7.92	8.28	4.14	8.64	4.32	4.51	9.02
		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
		Maximum Size of Fuse or Breaker	15	10	10	15	10	15	10	15	10	15	15	10	15	10	10	15
T181065	Load	kVA	8.60	7.56	8.52	16.64	9.11	17.40	9.51	18.16	7.93	15.85	16.57	8.28	17.29	8.64	9.02	18.04
		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
		Maximum Size of Fuse or Breaker	20	15	15	30	15	30	15	30	15	30	30	15	30	15	15	30
T181066	Load	kVA	12.90	11.34	12.77	24.97	13.67	26.10	14.27	27.24	11.89	23.77	24.85	12.42	25.93	12.96	13.52	27.07
		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
		Maximum Size of Fuse or Breaker	25	25	25	45	25	45	25	45	20	40	40	20	40	20	20	40
T137920	Load	kVA	17.30	15.12	17.03	33.29	18.23	34.80	19.02	36.31	15.85	31.70	33.14	16.57	34.57	17.28	18.03	36.09
		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
		Maximum Size of Fuse or Breaker	35	30	30	60	30	60	30	60	30	60	60	30	60	30	30	60
T137921	Load	kVA	25.90	22.69	25.55	49.93	27.34	52.20	28.53	54.47	23.78	47.55	49.71	24.85	51.86	25.92	27.05	54.13
		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
		Maximum Size of Fuse or Breaker	50	45	45	90	45	90	45	90	40	80	80	40	80	40	40	80
T137922	Load	kVA	34.60	30.25	34.07	66.58	36.46	69.60	38.04	72.63	31.70	63.40	66.27	33.13	69.15	34.56	36.06	72.18
		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
		Maximum Size of Fuse or Breaker	70	60	60	110	60	110	60	110	60	110	110	60	110	60	60	110
T137923	Load	kVA	52.00	45.45	51.18	100.03	54.69	104.57	57.07	109.12	47.63	95.25	99.57	49.77	103.89	51.92	54.18	108.44
		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
		Maximum Size of Fuse or Breaker	100	90	90	175	90	175	90	175	80	175	175	80	175	80	80	175
T137924	Load	kVA	86.10	75.62	85.17	166.44	91.15	174.01	95.11	181.57	79.26	158.50	165.69	82.83	172.87	86.39	90.16	180.44
		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
		Maximum Size of Fuse or Breaker	175	150	150	300	150	300	150	300	150	300	300	150	300	150	150	300
T243570	Load	kVA	129.30	113.43	127.75	249.66	136.72	261.01	142.67	272.36	118.89	237.75	248.53	124.24	259.31	129.59	135.23	270.66
		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
		Maximum Size of Fuse or Breaker	250	225	225	450	225	450	225	450	200	400	400	200	400	200	200	400
T243571 ①	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
		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
		Maximum 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 136-137 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 135.

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 sui able for 60 Hz only. (2) Connection Diagrams A-A and F-F cannot be reverse connected.

SPECIFICATIONS ① - SINGLE PHASE

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

Catalog Number	Insulating Transformer Rating	Secondary Maximum Current Output 12 V	24 V	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Dimensional Drawings
T181047	0.05 kVA	4.16	2.08	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	A
T181048	0.10 kVA	8.32	4.16	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	A
T181049	0.15 kVA	12.52	6.25	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	A
T181050	0.25 kVA	20.80	10.40	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	B
T181051	0.50 kVA	41.60	20.80	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	B
T181052	0.75 kVA	62.50	31.25	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)	B
T111683	1.00 kVA	83.20	41.60	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	B
T111684	1.50 kVA	125.00	62.50	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	B
T111685	2.00 kVA	166.00	83.20	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	B
T111686	3.00 kVA	250.00	125.00	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	C
T111687	5.00 kVA	416.60	208.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	C
T211688	7.50 kVA	625.00	312.50	20.81 (52.9)	11.12 (28.2)	10.84 (27.5)	125 (56.7)	D
T211689	10.00 kVA	833.00	416.60	20.81 (52.9)	11.75 (29.8)	11.59 (29.4)	160 (72.6)	D

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

Catalog Number	Insulating Transformer Rating	Secondary Maximum Current Output 16 V	32 V	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Dimensional Drawings
T181054	0.05 kVA	3.12	1.56	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	A
T181055	0.10 kVA	6.25	3.12	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	A
T181056	0.15 kVA	9.38	4.69	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	A
T181057	0.25 kVA	15.60	7.80	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	B
T181058	0.50 kVA	31.20	15.60	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	B
T181059	0.75 kVA	46.90	23.40	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)	B
T113073	1.00 kVA	62.50	31.20	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	B
T113074	1.50 kVA	93.70	46.90	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	B
T113075	2.00 kVA	125.00	62.50	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	B
T113076	3.00 kVA	187.50	93.80	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	C
T113077	5.00 kVA	312.00	156.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	C
T213078	7.50 kVA	468.00	234.00	20.81 (52.9)	11.12 (28.2)	10.84 (27.5)	125 (56.7)	D
T213079	10.00 kVA	625.00	312.00	20.81 (52.9)	11.75 (29.8)	10.84 (27.5)	160 (72.6)	D

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.

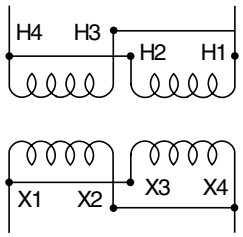
Dimensional Drawings page 136.

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

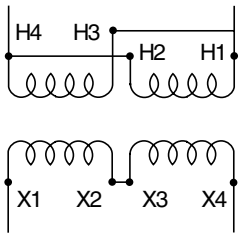
Catalog Number	Insulating Transformer Rating	Secondary Maximum Current Output 24 V	48 V	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Dimensional Drawings
T181061	0.05 kVA	2.08	1.04	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	A
T181062	0.10 kVA	4.16	2.08	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	A
T181063	0.15 kVA	6.24	3.12	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	A
T181064	0.25 kVA	10.40	5.20	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	B
T181065	0.50 kVA	20.80	10.40	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	B
T181066	0.75 kVA	31.20	15.60	9.68 (24.6)	4.75 (12.1)	4.51 (11.5)	19 (8.6)	B
T137920	1.00 kVA	41.60	20.80	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	B
T137921	1.50 kVA	62.40	31.20	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	B
T137922	2.00 kVA	83.20	41.60	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	B
T137923	3.00 kVA	125.00	62.50	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	C
T137924	5.00 kVA	208.00	104.00	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	C
T243570	7.50 kVA	312.00	156.00	20.81 (52.9)	11.12 (28.2)	10.84 (27.5)	135 (61.2)	D
T243571	10.00 kVA	416.00	208.00	20.81 (52.9)	11.75 (29.8)	11.59 (29.4)	160 (72.6)	D

LOW VOLTAGE LIGHTING WIRING DIAGRAMS

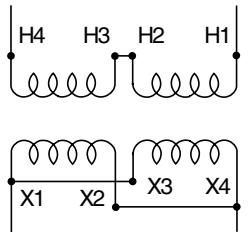
K



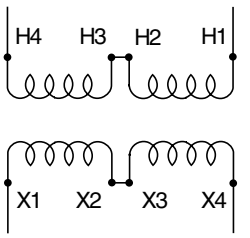
L



M



N



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

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

Units Rated 240 x 480 V Input: 24/48 V Output

Input	Output	Connection Diagram
240	24	K
240	48	L
480	24	M
480	48	N

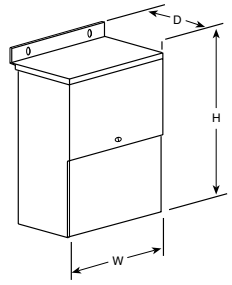
Number of Leads per Termination

	H1	H2	H3	H4	X1	X2	X3	X4
T213078	1	1	1	1	2	2	2	2
T213079	1	1	1	1	2	2	2	2
T243571	1	1	1	1	2	2	2	2
T211688	1	1	1	1	2	2	2	2
T211689	1	1	1	1	2	2	2	2

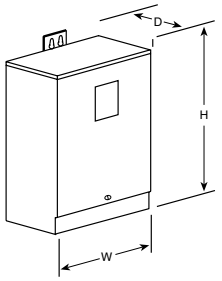
① All units have ground studs for use with non-metallic conduit. All sizes of 0.75 kVA and less are suitable for 50/60 Hertz. Additional field wiring box may be required when using units as autotransformers.

Dimensional Drawings page 136.

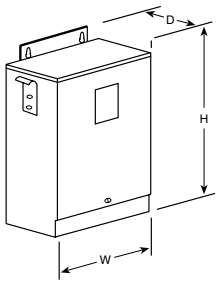
BUCK-BOOST DIMENSIONAL DRAWINGS - SINGLE PHASE



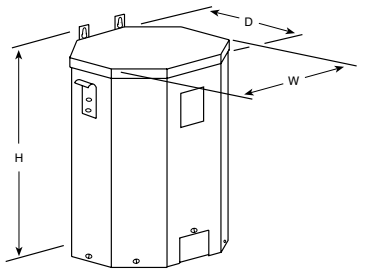
Design A



Design B



Design C



Design D

BUCK-BOOST WIRING DIAGRAMS ① - SINGLE PHASE

Figure C

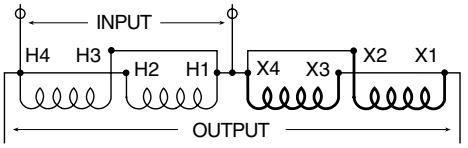


Figure D

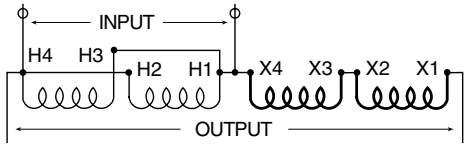


Figure E

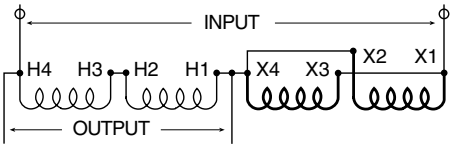


Figure F

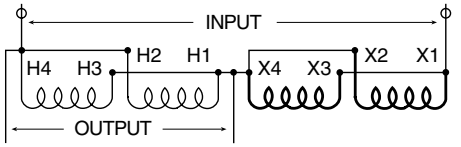


Figure G

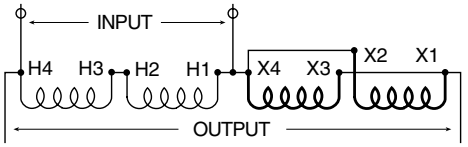


Figure H

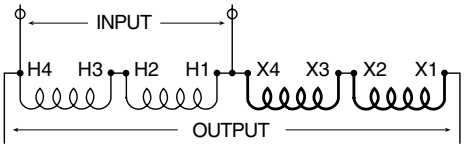


Figure I

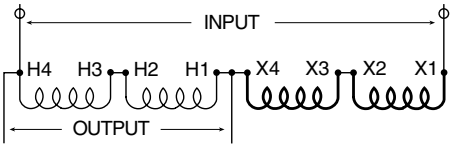
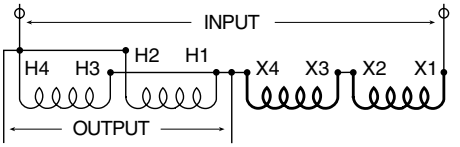


Figure J



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.

BUCK-BOOST WIRING DIAGRAMS ① - SINGLE PHASE FOR THREE PHASE APPLICATIONS

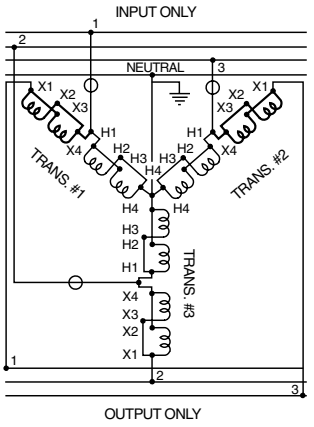


FIG. AA **WYE**

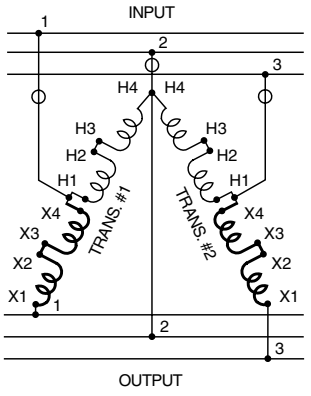


FIG. BB **OPEN DELTA**

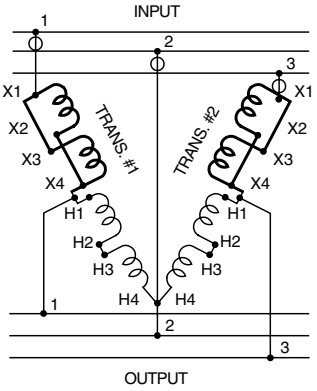


FIG. CC **OPEN DELTA**

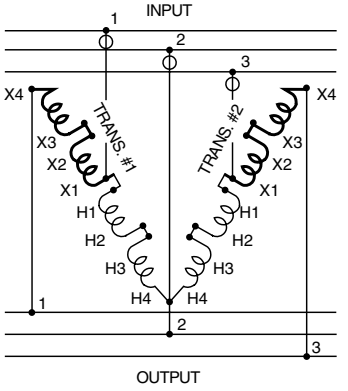


FIG. DD **OPEN DELTA**

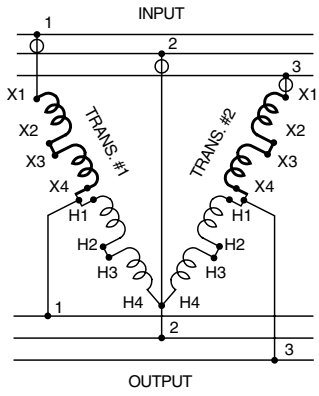


FIG. EE **OPEN DELTA**

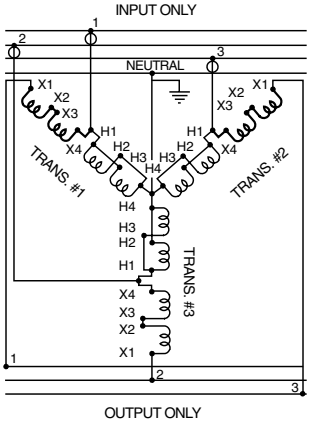


FIG. FF **WYE**

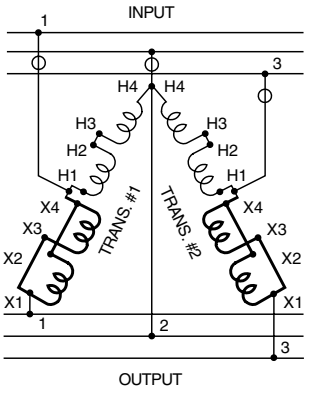


FIG. GG **OPEN DELTA**

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

② Cannot be reverse connected.

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

THREE PHASE BUCK-BOOST

Buck Boost transformers are the ideal solution anytime a line voltage change in the 5-15% range is required in single phase or three phase applications.

Until now, three phase applications required multiple separate single phase Buck Boost Transformers to be wired and mounted together. Acme Electric's **NEW 3 Phase Auto Buck Boost Transformers** remove the need for multiple separate units and provide the same great electrical advantages standard Buck Boost Transformers offer in one simple and convenient package.

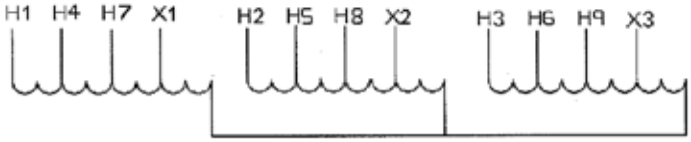
Acme Electric's NEW 3 Phase Auto Buck Boost Transformers are the best economical solutions available for three phase applications, requiring only one transformer and reducing the overall footprint. Additionally, the transformers are assembled and prewired at the factory, a considerable time and installation cost savings.

Acme Electric's **NEW 3 Phase Auto Buck Boost Transformers** are UL Listed with a 10 year warranty and are currently being offered in Type 3R enclosures.

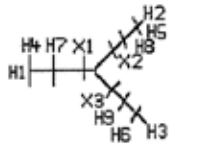
240 PRIMARY VOLTS — 208 SECONDARY VOLTS

kVA	Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Dimensional Drawing
3	A3003K0310B	15.19(38.6)	13.50(34.3)	10.84(27.5)	120(54.0)	D
6	A3006K0310B	15.19(38.6)	13.50(34.3)	10.84(27.5)	120(54.0)	D
9	A3009K0310B	15.19(38.6)	13.50(34.3)	10.84(27.5)	130(58.5)	D
15	A3015K0310B	15.19(38.6)	13.50(34.3)	10.84(27.5)	130(58.5)	D
30	A3030K0310B	18.86(47.9)	20.30(51.6)	9.03(22.9)	250(112.5)	I
45	A3045K0310B	18.86(47.9)	20.30(51.6)	9.03(22.9)	270(121.5)	I
75	A3075K0310B	24.81(63.0)	27.13(68.9)	11.14(28.3)	400(180.0)	I
112.5	A3112K0310B	24.81(63.0)	27.13(68.9)	11.14(28.3)	600(270.0)	I
150	A3150K0310B	24.81(63.0)	27.13(68.9)	11.14(28.3)	650(292.5)	I

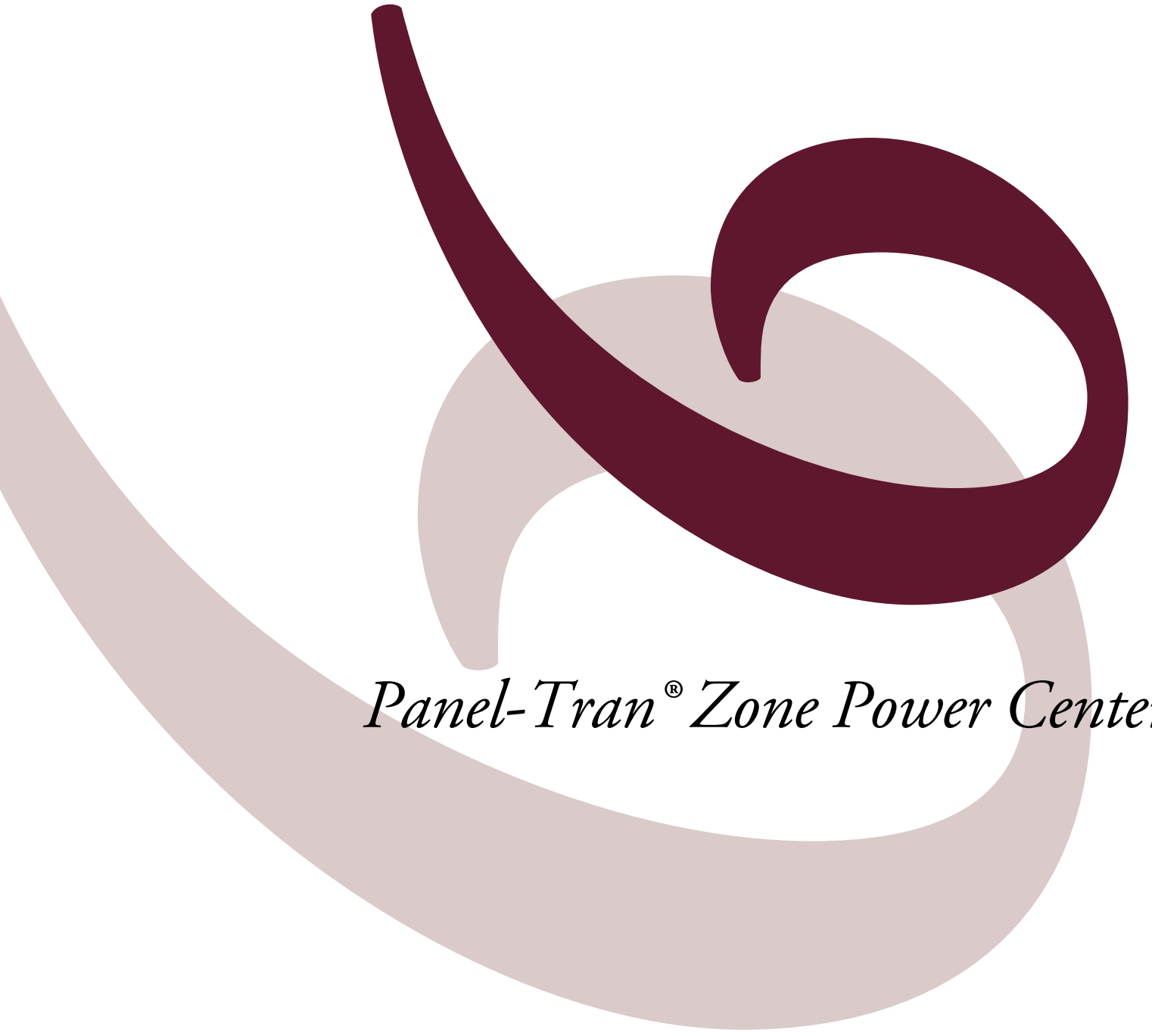
CONNECTION DIAGRAM



PRIMARY VOLTS	%	CONNECT LEADS TO TAP NO.
252	105	H1-H2-H3
240	100	H4-H5-H6
228	95	H7-H8-H9
SECONDARY LINES TO X1-X2-X3		



0° ANGULAR DISPLACEMENT



Panel-Tran® Zone Power Center Transformers

Section **9**

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

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
- Available with bolt-in or snap-in breakers

304 STAINLESS STEEL PANEL-TRANS®

Features

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

Applications

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

ELECTRICAL CHARACTERISTICS

Single Phase

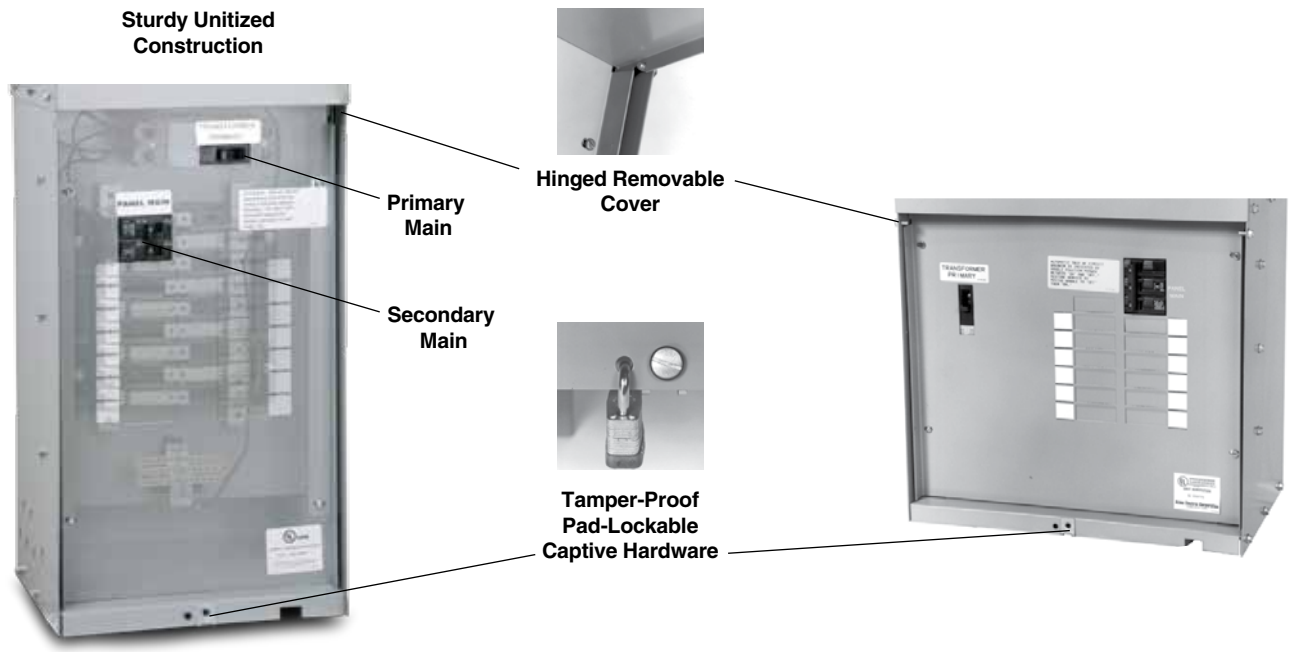
Primary Voltage: 480 Volts; 60 Hz, 2 – 5% BNFC taps
Secondary Voltage: 240/120 Volts Single Phase, 60 Hz, Three wire system
kVA's Available: 5, 7.5, 10, 15 and 25 kVA
Optional: 600 volts primary voltage available

Three Phase

Primary Voltage: 480 Volts Delta; 60 Hz with 2 – 5% BNFC taps
Secondary Voltage: 208Y/120 Volts Three Phase, 60 Hz, Four wire system
kVA's Available: 9, 15, 22.5 and 30 kVA
Insulation Class: 180°C, UL recognized system, 115°C rise
Regulation: 2 – 3% at unity power factor
Optional: 600 volts primary voltage available

- **UL-3R Enclosures** All Panel-Tran® enclosures are UL-3R listed for indoor and outdoor use.
- **Transformer Assembly** Acme totally encapsulated distribution transformers are designed for general purpose indoor/outdoor operation. Panel-Tran® can be installed in a wide variety of atmospheric and environmental conditions. A 180°C, UL recognized insulation system is used. Panel-Tran® units are electrostatically shielded to provide transient voltage protection at no extra cost.
- **Panel Assembly** The power panel assembly will accommodate one-inch, 1, 2 or 3-pole, common trip, duplex secondary branch circuit breakers and ground fault circuit breakers. Per UL and NEC requirements, the Panel-Tran® assembly comes fully equipped with primary and secondary main circuit breakers. Branch circuit breakers should be obtained from our local distributor once you have established your branch circuit requirements.
- **Panel-Tran® — Why?** Panel-Tran® eliminates the normal tangled masses of secondary circuit feeders and gives your industrial commercial distribution systems new flexibility. Use your high voltage bus to full advantage by putting power where the problem is. Reduce cost — save space — keep flexible.
- **Panel-Tran® — Where?** Anywhere 120, 208 or 240 volt branch circuits are required. Typically, Panel-Tran® is best applied in situations similar to the following: Powering foreman centers, vending machine areas, factory test set- ups, office buildings, mining applications, assembly lines, portable or temporary power sources, parking lots, small machine set-ups, light industrial areas, warehouses, and numerous other locations. Use where your branch circuits may require future change or expansion.
- **UL Listed** Panel-Tran® has been listed by Underwriters' Laboratories for both indoor and outdoor operation under their unit substation classification, file number E-56936. In addition, Panel-Tran® is UL listed as suitable for use as Service Entrance Equipment.
- **Meets The NEC** Panel-Tran® fully complies with Article 450-3 of the latest edition of the NEC.
- **Protection** A primary main breaker protects the transformer and acts as a disconnect device. This primary main breaker has a high interrupting capacity to handle fault conditions. A secondary main breaker, between the transformer and the panel, is required by the N.E.C.
- **Branch Circuits** Typical 1" snap-in or bolt-incircuit 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.
- **Connections** All Panel-Tran® connections will accept copper or aluminum conductor.

FEATURES



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

SNAP-IN BREAKERS
480 PRIMARY VOLTS — 240/120 SECONDARY VOLTS — 1Ø, 60 Hz

Single Phase

kVA	Catalog Number	Secondary Maximum Circuit ① 120 V (1-pole)	240 V (2-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
5.0	PT061150005LS	8	4	32.13 (81.6)	13.25 (33.7)	7.63 (19.4)	120 (54.4)
7.5	PT061150007LS	8	4	32.13 (81.6)	15.88 (40.3)	11.00 (27.9)	160 (72.6)
10.0	PT061150010LS	8	4	34.38 (87.3)	15.88 (40.3)	11.00 (27.9)	185 (83.9)
15.0	PT061150015LS	12	6	34.38 (87.3)	17.13 (43.5)	12.38 (31.4)	240 (109.0)
25.0	PT061150025LS	20	10	41.88 (106.4)	17.88 (45.4)	13.50 (34.3)	330 (150.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

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

Single Phase

kVA	Catalog Number	Secondary Maximum Circuit ① 120 V (1-pole)	240 V (2-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
5.0	PT061150005SS	8	4	32.13 (81.6)	13.25 (33.7)	7.63 (19.4)	120 (54.4)
7.5	PT061150007SS	8	4	32.13 (81.6)	15.88 (40.3)	11.00 (27.9)	160 (72.6)
10.0	PT061150010SS	8	4	34.38 (87.3)	15.88 (40.3)	11.00 (27.9)	185 (83.9)
15.0	PT061150015SS	12	6	34.38 (87.3)	17.13 (43.5)	12.38 (31.4)	240 (109.0)
25.0	PT061150025SS	20	10	41.88 (106.4)	17.88 (45.4)	13.50 (34.3)	330 (150.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

SNAP-IN BREAKERS
480 VOLTS to 240/120 VOLTS

Circuit Breaker Data

kVA	480 Volts primary breakers	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

BOLT-IN BREAKERS
480 PRIMARY VOLTS — 240/120 SECONDARY VOLTS — 1Ø, 60 Hz

Single Phase

kVA	Catalog Number	Secondary Maximum Circuit ① 120 V (1-pole)	Secondary Maximum Circuit ① 240 V (2-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
5.0	PT0B1150005LS	16	8	38.00 (96.5)	15.88 (40.3)	11.00 (27.9)	165 (74.8)
7.5	PT0B1150007LS	16	8	38.00 (96.5)	15.88 (40.3)	11.00 (27.9)	165 (74.8)
10.0	PT0B1150010LS	16	8	38.00 (96.5)	17.13 (43.5)	12.38 (31.4)	240 (108.8)
15.0	PT0B1150015LS	16	8	38.00 (96.5)	17.13 (43.5)	12.38 (31.4)	240 (109.0)
25.0	PT0B1150025LS	28	14	45.20 (114.8)	17.88 (45.4)	13.50 (34.3)	330 (150.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

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

Single Phase

kVA	Catalog Number	Secondary Maximum Circuit ① 120 V (1-pole)	Secondary Maximum Circuit ① 240 V (2-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
5.0	PT0B1150005SS	16	8	38.00 (96.5)	15.88 (40.3)	11.00 (27.9)	165 (74.8)
7.5	PT0B1150007SS	16	8	38.00 (96.5)	15.88 (40.3)	11.00 (27.9)	165 (74.8)
10.0	PT0B1150010SS	16	8	34.38 (87.3)	17.13 (43.5)	12.38 (31.4)	240 (108.8)
15.0	PT0B1150015SS	16	8	34.38 (87.3)	17.13 (43.5)	12.38 (31.4)	240 (109.0)
25.0	PT0B1150025SS	28	14	41.88 (106.4)	17.88 (45.4)	13.50 (34.3)	330 (150.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

BOLT-IN BREAKERS
480 VOLTS to 240/120 VOLTS

Circuit Breaker Data

kVA	480 Volts primary breakers	240/120 Volts secondary main	Maximum Rating of Secondary Breakers
5.0	ED42B025L (25A)	B230H (30A)	20 amps
7.5	ED42B025L (25A)	B240H (40A)	30 amps
10.0	ED42B035L (35A)	B250H (50A)	40 amps
15.0	ED42B050L (50A)	B270H (70A)	60 amps
25.0	ED42B090L (90A)	B2125 (125A)	100 amps

SNAP-IN BREAKERS
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

Three Phase

kVA	Catalog Number	Secondary Maximum Circuit ① 10 120 V (1-pole)	30 208 V (3-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
9.0	PTBA3150009LS	12	4	33.75 (85.7)	22.13 (56.2)	7.63 (19.4)	255 (116.0)
15.0	PTBA3150015LS	12	4	35.13 (89.2)	22.13 (56.2)	12.38 (31.4)	385 (175.0)
22.5	PTBA3150022LS	18	6	38.25 (97.2)	30.25 (76.8)	13.38 (34.0)	535 (243.0)
30.0	PTBA3150030LS	24	8	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	680 (308.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

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

Three Phase

kVA	Catalog Number	Secondary Maximum Current Output ① 120 V (1-pole)	208 V (3-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
9.0	PTBA3150009SS	12	4	33.75 (85.7)	22.13 (56.2)	7.63 (19.4)	255 (116.0)
15.0	PTBA3150015SS	12	4	35.13 (89.2)	22.13 (56.2)	12.38 (31.4)	385 (175.0)
22.5	PTBA3150022SS	18	6	38.25 (97.2)	30.25 (76.8)	13.38 (34.0)	535 (243.0)
30.0	PTBA3150030SS	24	8	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	680 (308.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

SNAP-IN BREAKERS
480 VOLTS DELTA to 208Y/120 VOLTS

Circuit Breaker Data

kVA	480 Volts primary breakers	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

BOLT-IN BREAKERS
480 DELTA PRIMARY VOLTS — 208Y/120 SECONDARY VOLTS — 3Ø, 60 Hz

Three Phase

kVA	Catalog Number	Secondary Maximum Circuit ① 10 120 V (1-pole)	30 208 V (3-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
9.0	PTBB3150009LS	15	7	33.75 (85.7)	22.13 (56.2)	7.63 (19.4)	255 (116.0)
15.0	PTBB3150015LS	15	7	35.13 (89.2)	22.13 (56.2)	12.38 (31.4)	385 (175.0)
22.5	PTBB3150022LS	27	13	43.75 (111.1)	33.00 (83.8)	13.38 (34.0)	680 (308.0)
30.0	PTBB3150030LS	27	13	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	680 (308.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

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

Three Phase

kVA	Catalog Number	Secondary Maximum Current Output ① 120 V (1-pole)	208 V (3-pole)	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)
9.0	PTBB3150009SS	15	7	33.75 (85.7)	22.13 (56.2)	7.63 (19.4)	255 (116.0)
15.0	PTBB3150015SS	15	7	35.13 (89.2)	22.13 (56.2)	12.38 (31.4)	385 (175.0)
22.5	PTBB3150022SS	27	13	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	535 (243.0)
30.0	PTBB3150030SS	27	13	43.75 (111.1)	33.00 (83.8)	13.75 (34.9)	680 (308.0)

① The number of secondary circuits shown is only a representation of circuits. Please contact the factory for exact number of secondary circuits available.

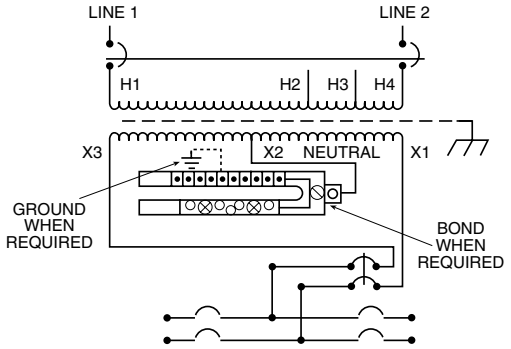
BOLT-IN BREAKERS
480 VOLTS DELTA to 208Y/120 VOLTS

Circuit Breaker Data

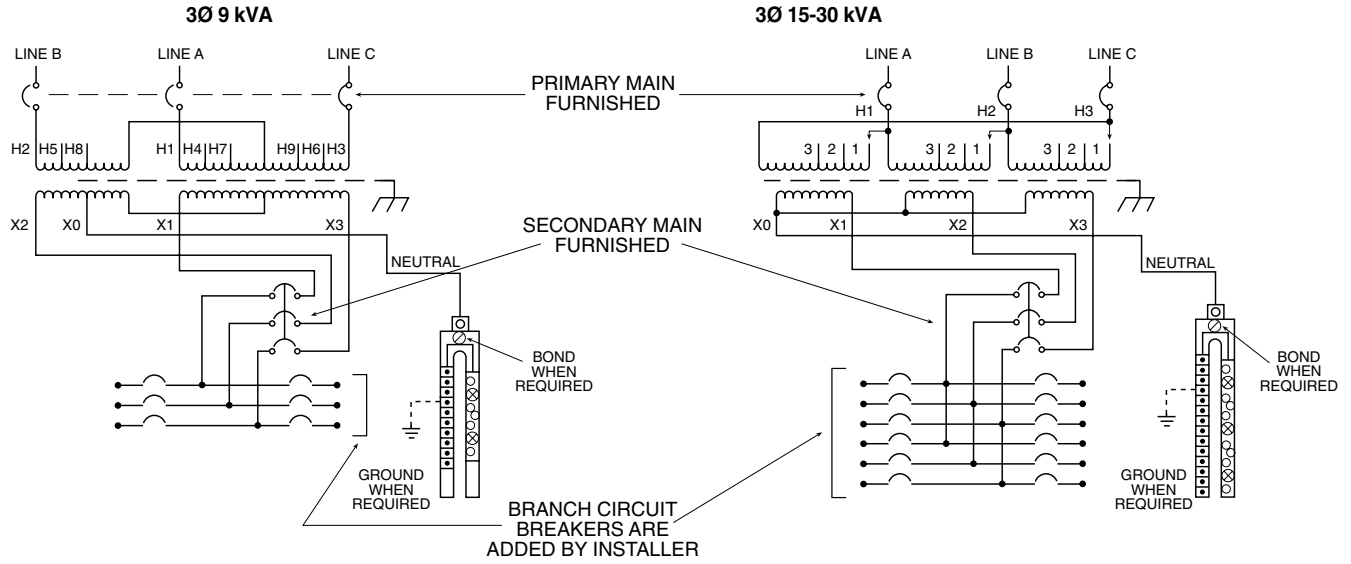
kVA	480 Volts primary breakers	208Y/120 Volts secondary main	Maximum Rating of Secondary Breakers
9.0	ED43B025L (25A)	B330H (30A)	25 amps
15.0	ED43B040L (40A)	B350H (50A)	40 amps
22.5	ED43B070L (70A)	B370H (70A)	60 amps
30.0	ED43B090L (90A)	B3100 (100A)	80 amps

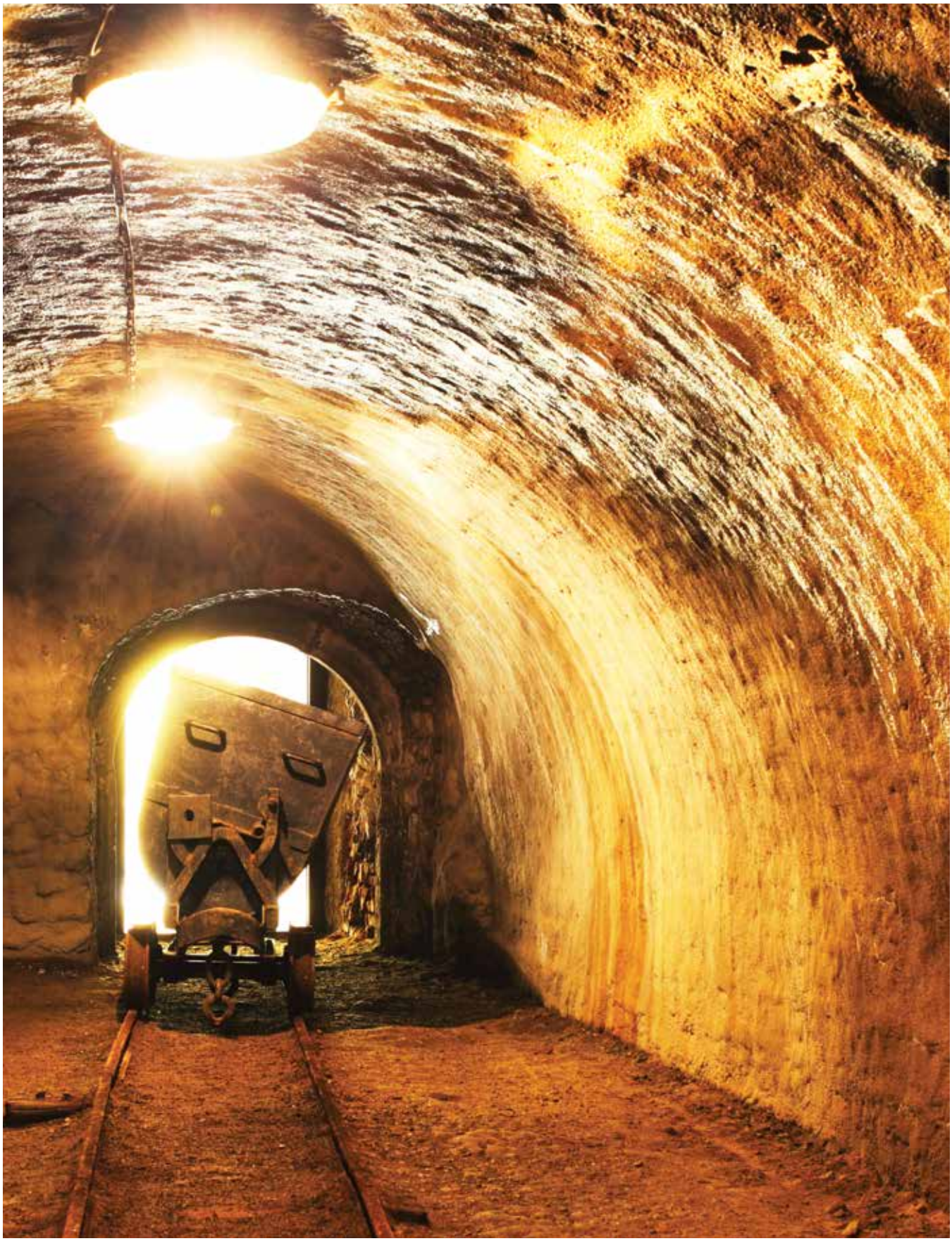
PANEL-TRANS® ZONE POWER CENTERS WIRING DIAGRAMS — SINGLE PHASE

Wiring Diagram 1Ø 5-25 kVA



PANEL-TRANS® ZONE POWER CENTERS WIRING DIAGRAMS — THREE PHASE






Air Conditioning, refrigeration and Appliance Transformers

Section 10

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

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:

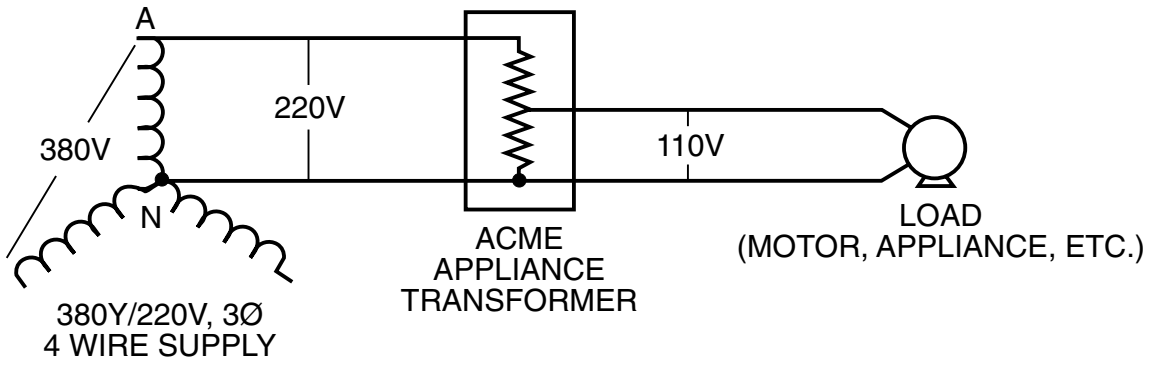
1. Line supply voltage not matching the appliance motor nameplate voltage, (e.g., supply voltage is 380Y/220V, three phase, four wire. Appliance motor operates on 110 V, single phase. See schematic).
2. Low voltage due to inadequate wiring capacity in the electrical distribution system.
3. Low voltage 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 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 units 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).

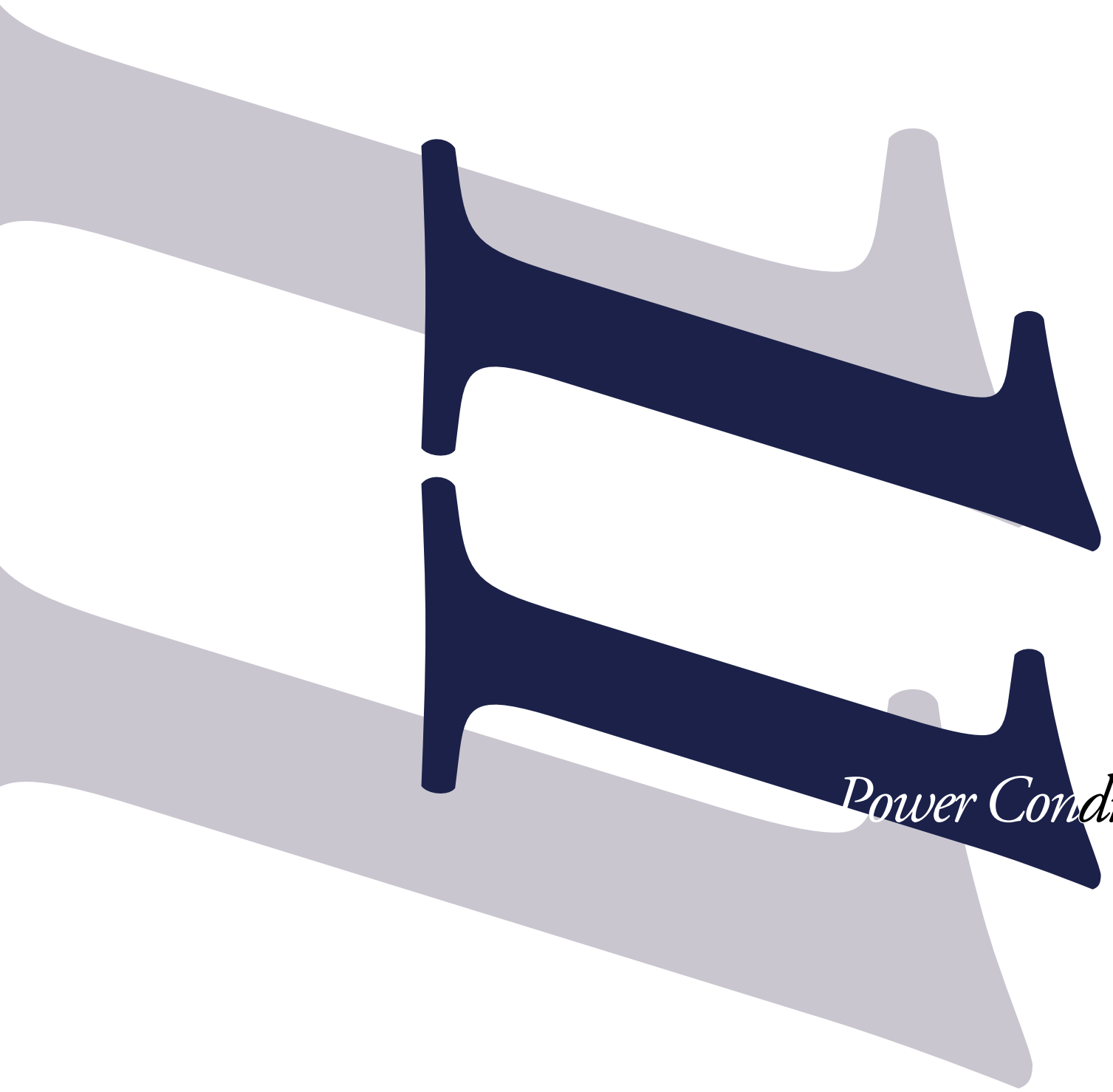
4. Add 10% for high starting current and overloading to obtain VA size of transformers.

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.

200/220/240 PRIMARY VOLTS — 115 SECONDARY VOLTS — 1Ø, 50/60 HZ

VA Rating	Catalog Number	Output Amps	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Connections (Ft.) (M)
200	T160830 ①	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
300	T160831 ①	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
400	T160832 ①	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
500	T160833 ①	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
1000	T160834 ①	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
2000	T160835 ①	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.



Power Conditioning Products

Section 11

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

NEW

Hard-Wired SPD

NEW

SPIKESHIELD® Branch Panel Wired-In Surge Protective Devices
External Type 1 SPD Products

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

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

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

Common Mode: 120 db
Transverse Mode: 60 db

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

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

Features

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

Applications

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

Specifications

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

② All hardwired models will accommodate these primary input voltages.

Specifications

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

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

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

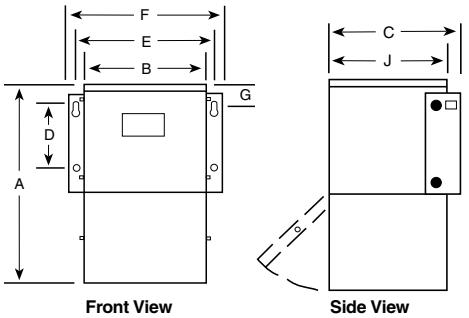
kVA Size	Catalog Number	APPROXIMATE DIMENSIONS (Inches)(Cm.) ③ A	B	C	D	E	F	G	H	J	Mounting Type (Wall)(Floor)	Weight (Lbs.)(Kg.)	Figure	Wiring Diagrams
0.25	T169430	15.50	6.30	5.80	5.63	8.13	9.30	1.2	.41 x .81	5.00	F&W	37	II	16
		(39.4)	(16.0)	(14.7)	(14.3)	(20.7)	(23.6)	(3.0)	(1.0 x 2.1)	(12.7)		(16.8)		
0.35	T169431	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	51	II	16
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)		(23.1)		
0.50	T169432	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	53	II	16
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)		(24.0)		
0.75	T169433	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	65	II	16
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)		(29.5)		
1.00	T169434	18.50	6.50	8.55	5.63	8.13	9.50	2.3	.41 x .81	7.75	F&W	82	II	16
		(47.0)	(16.5)	(21.7)	(14.3)	(20.7)	(24.1)	(5.8)	(1.0 x 2.1)	(19.7)		(37.2)		
2.00	T169435	19.00	10.50	10.20	6.00	12.00	13.25	2.3	.44 x .63	9.40	F&W	142	III	16
		(48.3)	(26.7)	(25.9)	(15.2)	(30.5)	(33.7)	(5.8)	(1.1 x 1.6)	(23.9)		(64.4)		
3.00	T169436	19.00	10.50	10.20	6.00	12.00	13.25	2.3	.44 x .63	9.40	F&W	176	III	16
		(48.3)	(26.7)	(25.9)	(15.2)	(30.5)	(33.7)	(5.8)	(1.1 x 1.6)	(23.9)		(79.8)		
5.00	T169437	22.00	12.54	12.20	6.00	14.00	15.25	2.3	.44 x .63	11.40	F&W	295	III	16
		(55.9)	(31.9)	(31.0)	(15.2)	(35.6)	(38.7)	(5.8)	(1.1 x 1.6)	(29.0)		(134.0)		
10.00	T169438	23.06	27.31	24.06	18.00	25.50	—	—	.56	—	F&W ①	605	IV	16
		(58.6)	(69.4)	(61.1)	(45.7)	(64.8)			(1.4)			(274.0)		
15.00	T169439	23.06	40.13	24.06	18.00	38.31	—	—	.56	—	F	880	IV	16
		(58.6)	(101.9)	(61.1)	(45.7)	(97.3)			(1.4)			(399.0)		

① Wall mounting brackets required for this size. Refer to Page 217.
③ Dimensions not suitable for construction. Contact factory.

All Wiring Diagrams begin on page 209.

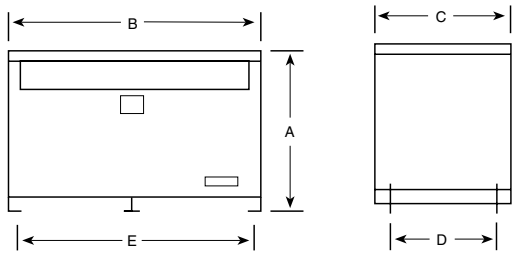
CONSTANT VOLTAGE REGULATORS DIMENSIONAL DRAWINGS

Figure II and III



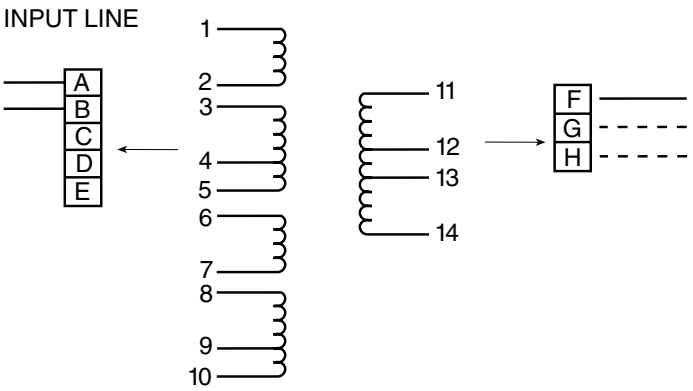
Front View Side View

Figure IV



Front View Side View

Power Line Conditioner



Input Connections Insulate

Volts	Connect	Isolate
120	1, 3, 6, 8 to A 2, 5, 7, 10 to B	4, 9
208	1, 6 to A 4, 9 to B 2, 3 to C 7, 8 to D	5, 10
240	1, 6 to A 5, 10 to B 2, 3 to C 7, 8 to D	4, 9
480	1 to A 10 to B 2, 3 to C 5, 6 to D 7, 8 to E	4, 9

Output Connections

Volts	Connect	Output Lines To
120	11 to F 12 to G 14 to H	F, G
208	11 to F 12 to G 14 to H	F, G, H
240	11 to F 12 to G 13 to H	F, H
480	11 to F 12 to G 14 to H	F, H

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

HARD-WIRED SPD

Hubbell hard-wired SPDs are multi-phase surge protective devices and noise filters in compact and affordable packages. The compact designs allow surge suppression to be installed adjacent to power panels or directly on sensitive equipment in harsh electrical conditions.

Hubbell hard-wired systems are versatile and compact surge protective devices designed to provide high-quality surge suppression for a wide variety of commercial, industrial or institutional applications. Hubbell hard-wired devices can be used in a network of surge suppression applications or as a stand-alone surge suppressor.

Superior Performance
Hubbell hard-wired SPDs utilize a high-energy suppression circuit that provides from 50,000 to 100,000 peak amps of surge current rating per phase. Hubbell hard-wired SPDs contain a suppression circuit that not only provides additional transient suppression, but also noise filtration. Hard-wired SPD units provide reliable operation by incorporating the latest engineering developments. Each MOV is individually fused and the products are contained in a NEMA Type 4 housing. Hubbell hard-wired SPDs incorporate the latest overvoltage technology innovations. The hard-wired series provides superior overvoltage withstand capability for systems with unstable power without compromising transient clamping performance.

Easy Installation
Hubbell hard-wired SPDs mount directly to the panel through a nippled connection. They allow easymounting near the circuit breaker in order to reduce lead lengths and improve surge suppression.

10-year Warranty
Hubbell hard-wired SPDs have a 10-year warranty.

Features
- NEMA 4X Enclosure
- Overvoltage technology
- EMI/RFI Noise Rejection
- LED Status Indication
- Suppression Status Alarm
- Coordinated Fuse Technology

Advantages
- Allows installation in outdoor applications
- Superior overvoltage withstand and surge suppression
- Increased transient suppression
- Provides visual indication of the suppressor status
- Provides immediate alarm if suppression is ever damaged
- Thermal fuse capable of passing extreme surge currents

Benefits
- Provides surge suppression to vulnerable equipment powered from weather-exposed panels
- Longer product life and increased tolerance to unstable power conditions
- Improves surge suppression to the equipment
- Allows immediate response if suppressor is damaged
- Warns if operating with reduced or without surge suppression
- Provides premium surge suppression while managing thermal effects from MOV end of life

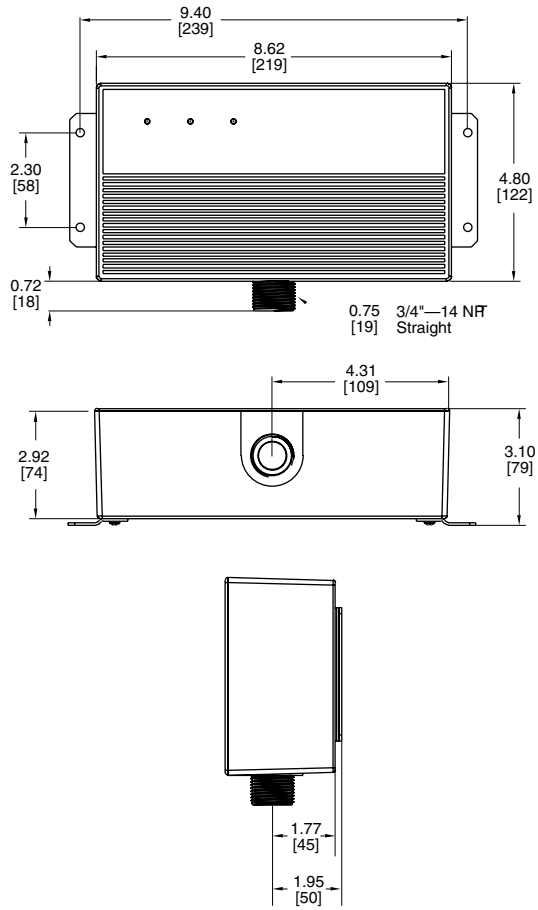
HARD-WIRED SPD

Performance
- Short Circuit Current Rating 200 kA
- Fusing Individually fused MOVs
- Filtering EM/RFI Noise Rejection Yes

Mechanical Description
- Dimensions 8.62” x 4.80” x 2.92”
- Housing Rating NEMA 4X
- Connection Method #10 AWG
- Mounting Method/Circuit Type Parallel
- Thermal Fusing Yes
- Operating Frequency 50/60 Hz
- Operating Altitude Sea Level-12,000’ (3,658 m)
- Storage Temperature -40˚ F to +149˚ F (-40˚ C to +65˚ C)
- Operating Temperature -4˚ F to +160˚ F (-20˚ C to +71˚ C)

Diagnostics
- Green status LED, audible alarm, dry contacts

Listings and Performance
- cULus 1449 3rd edition Type 2 SPD, UL 1283 (Wye products only), CSA C22.2 No. 8-M1986



Hard-Wired SPD NEW

Model Number	Surge Current	Configuration	Voltage	MCOV	I_n	VPR L-N	VPR L-G	VPR L-L	VPR N-G
HBL3W100C	100kA	1 Ø, 3-wire+G	120V/240	150V	20kA	900V	1200V	1500V	700V
HBL4W100C	100kA	3 Ø, Wye, 4-wire+G	120V/208Y ①	150V	20kA	900V	1200V	1500V	700V
HBL8W100C	100kA	3 Ø, Wye, 4-wire+G	277V/480Y ②	320V	20kA	1200V	2000V	2500V	1000V
HBL9W100C	100kA	3 Ø, Delta, 3-wire	480V Delta	840V	20kA	N/A	N/A	3000V	N/A

① 120/208Y series also applies to the following voltage 127/220Y

② 277/480Y series also applies to the following voltages 220/380Y, 230/400Y, and 240/415Y

TYPE 1 SPD'S

Hubbell brand Spikeshield Type 1 Surge Protective Devices (SPDs)are compact and affordable arresters available in either singleor multi-phase models. Spikeshield SPDs offer a simple meansto bring down initial surges to manageable levels in a cascaded SPD system. Their compact design allows surge suppressionto be installed adjacent to power panels or directly on sensitive equipment.

Type 1 SPDs are versatile and compact devices designed to provide high-quality surge suppression for a wide variety of commercial, industrial or institutional applications. Hubbell brand Spikeshield Type 1 SPDs can be used in a cascaded network of suppression applications or as stand-alone surge suppression. Type 1 SPDs can also be installed on the electric meter, on well pumps or on other sensitive electronic equipment. NEMA Type 4X rated housing allows installations outdoors.

Superior Performance
Spikeshield Type 1 SPDs utilize high-energy suppression circuitry that can be located at any point in the electrical system. They have the flexibility to be used with or without an Overcurrent Protection Device (OCPD).

Type 1 SPDs provide surge suppression for equipment from severe transient activity. Each MOV is individually fused and the products are enclosed in a NEMA Type 4X housing suitable for installing outdoors or in other harsh environments.

Easy Installation
Spikeshield Type 1 SPDs are some of the most versatile, yet compact surge protective devices available on the market today. This compact package can be mounted on an electrical panel, meter socket, or inside electrical control cabinets.

10-year Warranty
The HBL3W50 warranty is 10 years. The HBLSDSA36 warranty is 2 years. The HBL4SA40, HBL8SA40 warranty is 2 years.

Features
- NEMA 4X Enclosure
- Compact Design
- Designed for Type 1 Applications
- LED Status Indication
- Coordinated Fuse Technology

Advantages
- Allows installation in outdoor applications
- Easily mounts even in restricted spaces
- Can be installed with or without an Overcurrent Protective Device (OCPD)
- Provides visual indication of the suppressor status
- Fuses capable of passing extreme surge currents

Benefits
- Provides surge suppression to vulnerable equipment powered from weather exposed panels
- Transient suppression is located at the most efficient connection point
- Improves surge suppression to the equipment
- Allows for flexibility in installation locations
- Allows immediate indication if suppressor requires replacement
- Provides premium surge suppression while managing thermal effects from MOV end of life

Mechanical Description
- Housing Rating NEMA 4X
- Connection Method
  HBL3W50* #12 AWG
  HBLSDSA36* #14 AWG
  HBL4SA40
  HBL8SA40 #12 AWG
- Mounting Method/Circuit Type Close Nippled

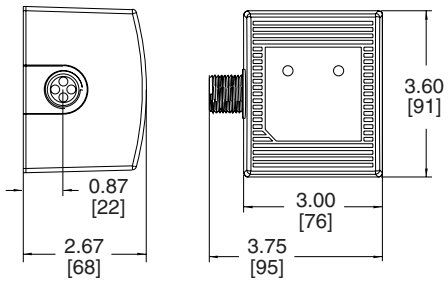
- Thermal Fusing
- Operating Frequency 50/60 Hz
- Operating Altitude Sea Level-12,000' (3,658 m)
- Storage Temperature -40˚ F to +149˚ F (-40˚ C to +65˚ C)
- Operating Temperature -40˚ F to +149˚ F (-40˚ C to +65˚ C)

Diagnostics
- Green status LED

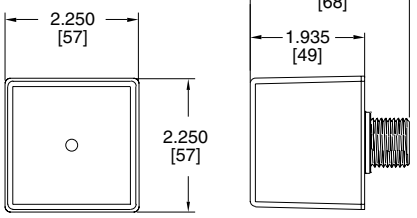
Listings and Performance
- *cULus Listed to 1449 Type 1 SPD, CSA C22.2 No. 8-M1986, C233.1-87

**cULus Listed per UL 1449 Type 1 SPD, CSA C22.2 No. 269.1-14

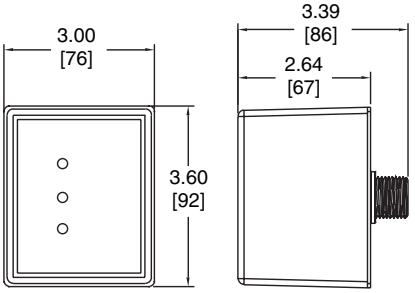
HBL3W50



HBLSDSA36



HBL4SA40, HBL5SA40, HBL8SA40, HBL9SA40, HBL10SA40 and HBL11SA40



HBL3W50

The HBL3W50 series provide high-quality surge suppression in a compact and versatile package. This product is ideal for panel builders as well as manufacturers and integrators of instrumentation cabinets for industrial, commercial, and residential applications for single-phase power systems.

HBL3W50 SPDs incorporate the latest overvoltage technology innovations. The series provides superior overvoltage withstand for systemswith unstable power without compromising transient clamping performance.

HBL3W50

Model Number	Surge Current	Configuration	Voltage	MCOV	SCCR	I_n	VPR L-N	VPR L-G	VPR L-L
HBL3W50	50kA	1 Ø, 3-wire+G, side mounted	120V/240	150V L-N, L-G 300V L-L	25kA	10kA	700V	800V	1200V

HBLSDSA36

The HBLSDSA36 Type 1 SPD is designed and listed for indoor or outdoor installation and surge suppression for single-phase three-wire 120/240 Vac 60 Hz electrical services. Two HBLSDSA36 Type 1 SPDs can be installed to provide surge suppression on120/208V threephase four-wire services.

HBLSDSA36

							VPR			
Model Number	Surge Current	Configuration	Voltage	MCOV	SCCR	I_n	L-N	L-G	L-L	N-G
HBLSDSA36	36kA	1 Ø, 3-wire, back mounted	120V/240	150V	22kA	10kA	700V	N/A	1200V	N/A

HBL4SA40, HBL8SA40

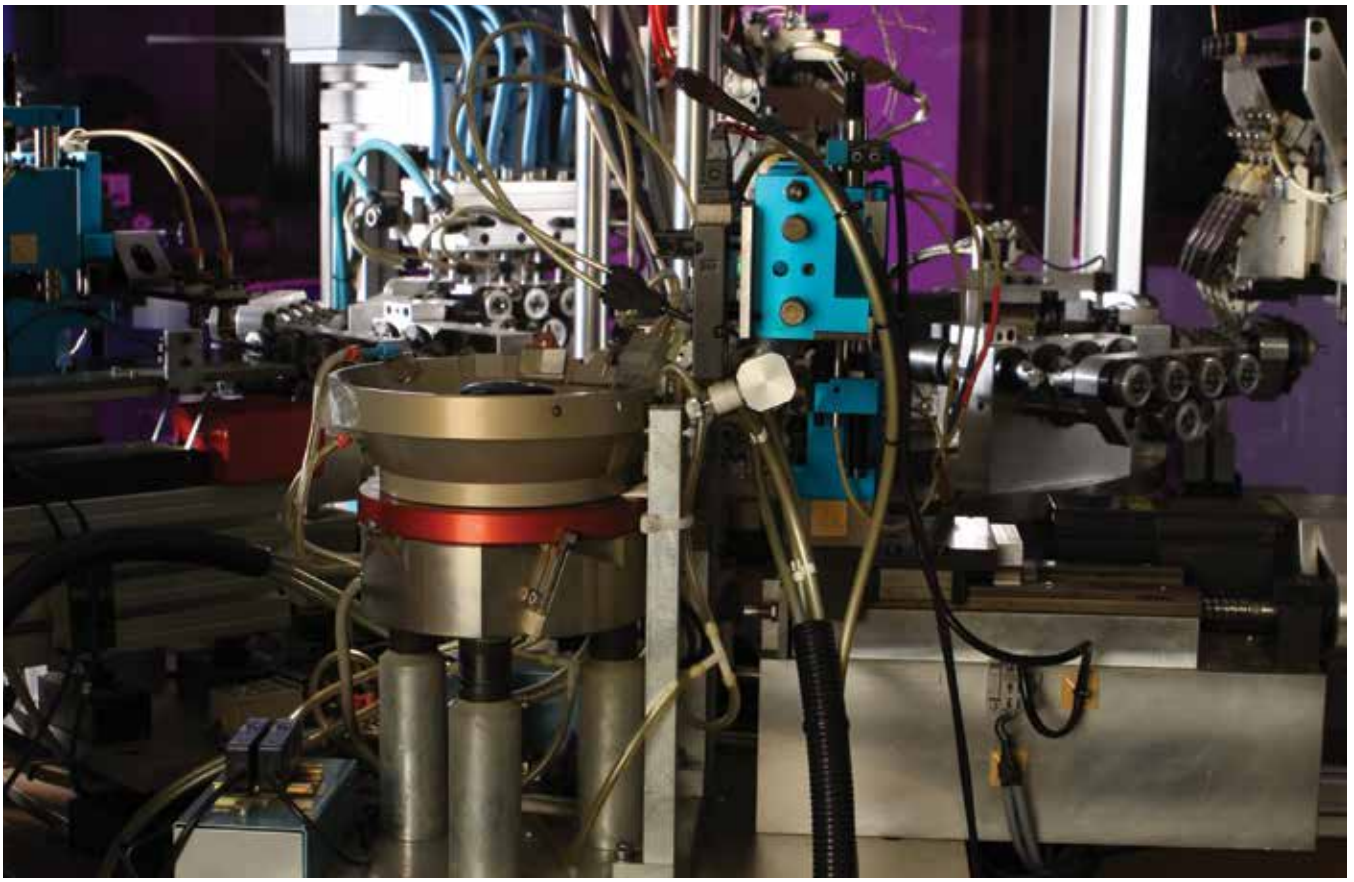
The HBL4SA40, ,HBL8SA40 Type 1 SPD is designed and listed for indoor or outdoor installation and surge suppression of three-phase grounded electrical services from 120/208 Vac up to 480 Vac line to line and is used extensively in service entrance panels to provide an efficient and economical means of surge suppression.

HBL4SA40, HBL8SA40

								VPR			
Model Number	Modes of Protection	Surge Current per Phase	Configuration	Voltage	MCOV	SCCR	I_n	L-N	L-G	L-L	N-G
HBL4SA40	6	40kA	3 Ø, 4-wire	208Y/120V①	180V L-N 360V L-L	200kA	10kA	700V	N/A	1200V	N/A
HBL8SA40	6	40kA	3 Ø, 4-wire	208Y/120V①	420V L-N 840V L-L	200kA	10kA	1500V	N/A	2500V	N/A

① Applicable voltages: 220Y/127V, 208Y/120V

② Applicable voltages: 480Y/277V, 415Y/240V, 400Y/230V, 380Y/220V



Amveco Toroidal Solutions

Section 12

Acme Electric's Amveco brand specializes in the design and construction of class-leading toroid magnetics, for the most challenging applications, including the medical and communications industry.

Small Size
Most toroids are smaller than their E-I transformer counter- parts. They are particularly well suited where low height is a consideration.

Low Stray Magnetic Field
Toroids have no air gaps since the primaries and secondaries are wound uniformly around the entire core. As a result, toroids emit very low radiated magnetic fields. This makes the toroid ideal for applications involving high sensitivity circuitry.

Low Mechanical Hum
The core of a toroid is formed from a single strip of grain- oriented electrical grade silicon steel tightly wound in the form of a clock spring with the ends spot-welded in place. The copper wire is wound over polyester film, forming a silent, stable unit without the use of environmentally unfriendly glues or varnishes.

Low Weight
Toroids weigh up to 50% less, than conventional laminated transformers thanks to their higher efficiency levels. Low weight simplifies end product design by reducing mounting hardware and supporting enclosure requirements.

Low No-Load Losses
Compared to conventional E-I transformers, toroids exhibit extremely low no-load losses. In applications where a circuit is in a "stand-by" mode for long periods, the potential cost reduction for power can be significant, sometimes 80-90%.

High Efficiency
Due to its unique construction, toroids are typically between 15 and 30% more efficient than the conventional type.

Low Operating Temperature
Since most of the losses in a toroid are copper wire, the toroid cools off quicker than the conventional E-I type with more iron. At half the load, the toroid's temperature rise is only about 30% of what it is at full load.

Easy To Mount
A single-center screw easily and quickly mounts the toroid, avoiding costly mechanical design and practical problems associated with conventional E-I-laminated transformers.

Safety Standards
Acme Electric proudly holds Certificates from both North American and International Safety Standard Testing Laboratories.
- UL 506 General Purpose Transformers (File # E 122978)
- UL 1950 Information Technology Equipment, Electrical Business Equipment (File # E 138299)
- UL60601-1 Medical and Dental Equipment (File # E 138299)
- UL 1446, Class B, Class F and Class H Insulation Systems (File # E 123069)
- CSA 22.2 No. 66-1988 Specialty Transformers (File # LR 86989)
- CSA 22.2 No. 601.1 M90 Medical Standard for Canada (File # E 138299)
- IEC 601.1 (Medical Standard for International Installations) (File # E 152649)

OVERALL COMPARISON OF 250VA E-I CORE ISOLATION TRANSFORMER VS. 250 VA TOROIDAL ISOLATION TRANSFORMER

Feature	250VA E-I Core Transformer	250VA Toroid Transformer
Height	4.7" (119mm)	2.2" (56mm)
Width	3.9" (99mm)	4.5" (114mm)
Depth	4.3" (109mm)	4.5" (114mm)
Volume	78.8 sqs.in. (508.4cm2)	35.0 sq.in. (225.8cm2)
Weight	10 lbs. (4.5 kg)	5 lbs. (2.3 kg)
Mounting Requirements	Four corner bolts	Sinle bolt through center
No Load Losses	10.0 W	1.5 W
Continuity of Magnetic Path	50% of grain perpendicular	100% parallel grain orientation
Air Gaps	Approximately 180 (60 laminations x 3)	None
Magnetic Properties of Core	Affected by clamping, welding, banding, etc.	Optimized prior to winding and remains stable
Coupling Factor	Limited by bobbin width and layers of windings	Maximized by even winding distribution and close proximity to core

Primary to Secondary Insulation

Polyester film-Class B (130˚C)

Four layers minimum between windings

Meets test requirement of 4000V RMS for 1 minute between primary and secondary

Windings

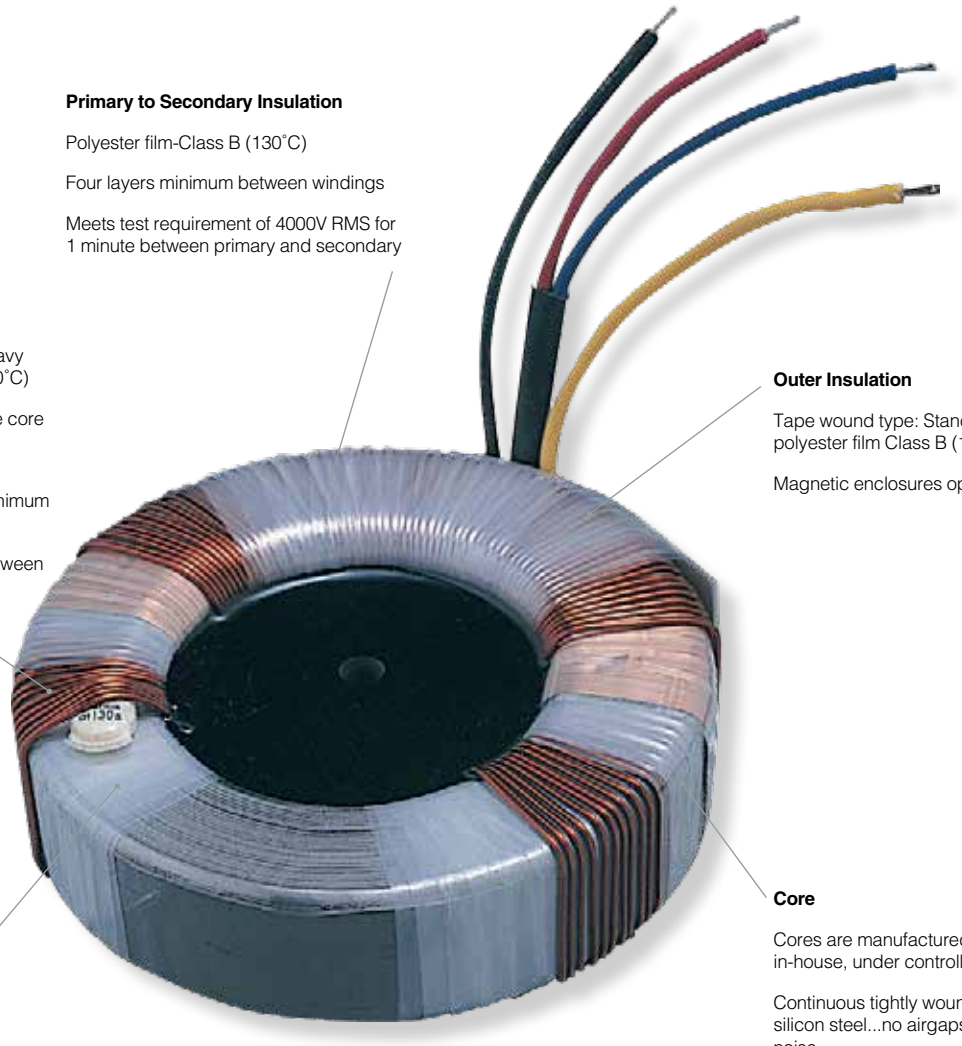
Base coat of Polyester. Heavy topcoat of amide imide (200˚C)

Wound uniformly over entire core

Better heat dissipation

Windings configured for minimum flux leakage

Low voltage maintained between adjacent turns



Outer Insulation

Tape wound type: Standard two layers polyester film Class B (130˚C)

Magnetic enclosures optional

Core Insulation

All cores: 100% surface coverage of four layers of 2 mil polyester film Class B (130˚C)

Protects, insulates and cushions the core from windings and reduces vibration

Core

Cores are manufactured and annealed in-house, under controlled conditions

Continuous tightly wound grain oriented silicon steel...no airgaps, no mechanical noise

Lathed radial corners... compact design, most efficient use of materials

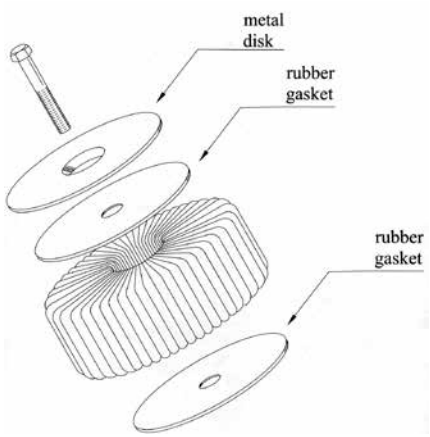
No core caps necessary

DIMENSIONS OF METAL MOUNTING DISK AND INSULATION PAD

Power Rage (VA)	OD inch (mm)	Hole inch (mm)	Thickness inch (mm)	Recommended Hardware
20	1.7 (45)	0.18 (4.5)	.04 (1)	#8
40-60	2.4 (60)	0.20 (5.2)	.04 (1)	#10
100-150	2.8 (70)	0.26 (6.6)	.04 (1)	1/4"
200-350	3.5 (90)	0.26 (6.6)	0.05 (1.3)	1/4"
425-800	4.4 (110)	0.26 (6.6)	0.06 (1.5)	1/4"
800-120	5.2 (130)	0.33 (8.4)	0.07 (1.7)	5/16"
1200-1500	5.6 (145)	0.41 (10.3)	0.07 (1.7)	3/8"

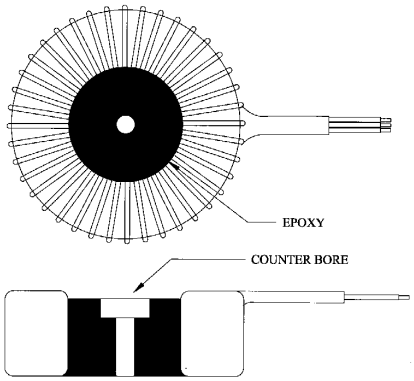
Metal disk with Insulating Pads

Up to 1500VA



Potted Centerhole

All sizes

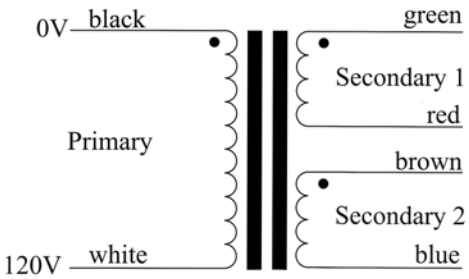


TOROIDAL TRANSFORMERS – North American Voltage 120V/60Hz

Our standard lines of toroidal transformers are designed for step up or step down general purpose applications in North American and international markets.

Features

- 120V, 60Hz
- Many, popular secondary voltage options
- 18 to 1000VA ratings available
- Listed as recognized/certified components (UL and CSA)
- Class A (105°C)
- Disk mounting hardware included
- 10" color-coded self leads
- Wiring configurations with color codes



Winding Configurations With Color Codes

Figure 1
Single 120V/60Hz Primary w/ Dual Secondaries

Figure 2
Single 120V/60Hz Primary w/ Single Secondary

PRIMARY VOLTAGE — 120V 60Hz

Part Number	Nominal Power (VA)	Secondary Voltage (Volts)	Secondary Current (Amps)	Core Loss (Watts)	Copper Loss (Watts)	OD x H Inches (mm)	Weight Lbs. (kg)	Mounting Hardware
AA50182009	18	2 x 9	1.0	3.0	0.20	2.5 x 1.3 (64 x 33)	0.7 (0.3)	#8
AA50182012		2 x 12	0.7	3.0	0.20			
AA50182015		2 x 15	0.6	3.0	0.20			
AA50182018		2 x 18	0.5	3.0	0.20			
AA50362009	36	2 x 9	2.0	5.8	0.25	2.9 x 1.5 (74 x 38)	1.1 (0.5)	#10
AA50362012		2 x 12	1.5	5.8	0.25			
AA50362015		2 x 15	1.2	5.8	0.25			
AA50362018		2 x 18	1.0	5.8	0.25			
AA50602009	60	2 x 9	3.3	8.6	0.45	3.3 x 1.4 (84 x 36)	1.6 (0.7)	#10
AA50602012		2 x 12	2.5	8.6	0.45			
AA50602015		2 x 15	2.0	8.6	0.45			
AA50602018		2 x 18	1.7	8.6	0.45			
AA50902012	90	2 x 12	3.8	12.0	0.60	3.7 x 1.5 (94 x 38)	1.9 (0.9)	#10
AA50902015		2 x 15	3.0	12.0	0.60			
AA50902018		2 x 18	2.5	12.0	0.60			
AA50902022		2 x 22	2.0	12.0	0.60			
AA51152012	115	2 x 12	4.8	16.0	0.90	3.9 x 1.5 (99 x 38)	2.2 (1)	1/4"
AA51152015		2 x 15	3.8	16.0	0.90			
AA51152018		2 x 18	3.2	16.0	0.90			
AA51152022		2 x 22	2.6	16.0	0.90			
AA51702012	170	2 x 12	7.1	19.0	1.20	3.9 x 1.9 (99 x 48)	3.1 (1.4)	1/4"
AA51702015		2 x 15	5.7	19.0	1.20			
AA51702018		2 x 18	4.7	19.0	1.20			
AA51702022		2 x 22	3.9	19.0	1.20			
AA52201220	220	220	1.0	20.0	1.40	4.5 x 1.8 (114 x 46)	4 (1.8)	1/4"
AA52202018		2 x 18	6.1	20.0	1.40			
AA52202022		2 x 22	5.0	20.0	1.40			
AA52202024		2 x 24	4.6	20.0	1.40			
AA53601220	360	220	1.6	22.0	1.70	4.5 x 2.4 (114 x 61)	5.4 (2.5)	1/4"
AA53602024		2 x 24	7.5	22.0	1.70			
AA53602030		2 x 30	6.0	22.0	1.70			
AA53602033		2 x 33	5.5	22.0	1.70			
AA53602038		2 x 38	4.7	22.0	1.70			
AA54501220	450	220	2.1	27.0	2.00	5.4 x 2 (137 x 51)	6.5 (3)	1/4"
AA54502030		2 x 30	7.5	27.0	2.00			
AA54502033		2 x 33	6.8	27.0	2.00			
AA54502038		2 x 38	5.9	27.0	2.00			

PRIMARY VOLTAGE — 120V 60Hz (CONT.)

Part Number	Nominal Power (VA)	Secondary Voltage (Volts)	Secondary Current (Amps)	Core Loss (Watts)	Copper Loss (Watts)	OD x H Inches (mm)	Weight Lbs. (kg)	Mounting Hardware
AA55501220	550	220	2.5	31.0	2.40	5.4 x 2.6 (137 x 66)	8.5 (3.7)	1/4"
AA55502030		2 x 30	9.2	31.0	2.40			
AA55502033		2 x 33	8.3	31.0	2.40			
AA55502038		2 x 38	7.2	31.0	2.40			
AA56501120	650	120	5.4	36.0	3.10	5.4 x 2.8 (137 x 71)	9.5 (4.3)	5/16"
AA56502024		2 x 24	13.5	36.0	3.10			
AA56502030		2 x 30	10.8	36.0	3.10			
AA56502042		2 x 42	7.7	36.0	3.10			
AA57901120	790	120	6.6	45.0	3.80	5.8 x 2.8 (147 x 71)	11.5 (5.2)	5/16"
AA57902024		2 x 24	16.5	45.0	3.80			
AA57902030		2 x 30	13.2	45.0	3.80			
AA57902042		2 x 42	9.4	45.0	3.80			
AA50001120	1000	120	8.3	45.0	3.80	6.5 x 2.6 (165 x 66)	12.4 (5.6)	5/16"
AA50002024		2 x 24	20.8	45.0	3.80			
AA50002030		2 x 30	16.7	45.0	3.80			
AA50002042		2 x 42	11.9	45.0	3.80			

Note: Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

TOROIDAL TRANSFORMER – INTERNATIONAL VOLTAGE 2x117V, 50/60Hz

Features

- 2 x 117V/50-60Hz primaries
- Many popular secondary voltage options
- 15 to 990VA ratings available
- Listed as recognized/certified components (UL and CSA)
- Class A (105°C)
- Disk mounting hardware included
- 10" color coded self leads
- Wiring configurations with color codes

PRIMARY VOLTAGE — 2 X 117V 50/60 Hz

Part Number	Nominal Power (VA)	Secondary Voltage (Volts)	Secondary Current (Amps)	Core Loss (Watts)	Copper Loss (Watts)	OD x H Inches (mm)	Weight Lbs. (kg)	Mounting Hardware
AA50152006	15	2 x 6	1.25	3.0	0.20	2.5 x 1.3 (64 x 33)	0.7 (0.3)	#8
AA50152009		2 x 9	0.83	3.0	0.20			
AA50152012		2 x 12	0.62	3.0	0.20			
AA50152015		2 x 15	0.5	3.0	0.20			
AA50152018		2 x 18	0.42	3.0	0.20			
AA50152022		2 x 22	0.3	3.0	0.20			
AA50302006	30	2 x 6	2.5	5.8	0.25	3.0 x 1.5 (76 x 38)	1.1 (0.5)	#10
AA50302009		2 x 9	1.67	5.8	0.25			
AA50302012		2 x 12	1.25	5.8	0.25			
AA50302015		2 x 15	1	5.8	0.25			
AA50302018		2 x 18	0.88	5.8	0.25			
AA50302022		2 x 22	0.68	5.8	0.25			

PRIMARY VOLTAGE — 2 X 117V 50/60 Hz (CONT.)

Part Number	Nominal Power (VA)	Secondary Voltage (Volts)	Secondary Current (Amps)	Core Loss (Watts)	Copper Loss (Watts)	OD x H Inches (mm)	Weight Lbs. (kg)	Mounting Hardware
AA50502006		2 x 6	4.2	8.6	0.45			
AA50502009		2 x 9	2.8	8.6	0.45			
AA50502012		2 x 12	2.1	8.6	0.45			
AA50502015	50	2 x 15	1.7	8.6	0.45	3.2 x 1.4 (81 x 36)	1.6 (0.7)	#10
AA50502018		2 x 18	1.4	8.6	0.45			
AA50502022		2 x 22	1.1	8.6	0.45			
AA50502024		2 x 24	1	8.6	0.45			
AA50952009		2 x 9	2.8	16.0	0.90			
AA50952012		2 x 12	2.1	16.0	0.90			
AA50952015		2 x 15	3.2	16.0	0.90			
AA50952018	95	2 x 18	2.6	16.0	0.90	3.9 x 1.5 (99 x 38)	2.2 (1)	1/4"
AA50952022		2 x 22	2.2	16.0	0.90			
AA50952024		2 x 24	2	16.0	0.90			
AA50952028		2 x 28	1.7	16.0	0.90			
AA50952030		2 x 30	1.6	16.0	0.90			
AA51402012		2 x 12	5.8	19.0	1.20			
AA51402015		2 x 15	4.7	19.0	1.20			
AA51402018		2 x 18	3.9	19.0	1.20			
AA51402022	140	2 x 22	3.2	19.0	1.20	3.9 x 1.9 (99 x 48)	3 (1.4)	1/4"
AA51402024		2 x 24	2.9	19.0	1.20			
AA51402028		2 x 28	2.5	19.0	1.20			
AA51402030		2 x 30	2.3	19.0	1.20			
AA51402117		2 x 117	0.6	19.0	1.20			
AA51852012		2 x 12	7.7	20.0	1.40			
AA51852015		2 x 15	6.16	20.0	1.40			
AA51852018		2 x 18	5.1	20.0	1.40			
AA51852022	185	2 x 22	4.2	20.0	1.40	4.5 x 1.9 (114 x 48)	4 (1.8)	1/4"
AA51852024		2 x 24	3.9	20.0	1.40			
AA51852028		2 x 28	3.3	20.0	1.40			
AA51852030		2 x 30	3.1	20.0	1.40			
AA51852117		2 x 117	0.8	20.0	1.40			
AA52402015		2 x 15	8	22.0	1.70			
AA52402018		2 x 18	6.7	22.0	1.70			
AA52402024	240	2 x 24	5	22.0	1.70	4.5 x 2.1 (114 x 53)	4.8 (2.2)	1/4"
AA52402030		2 x 30	4	22.0	1.70			
AA52402038		2 x 38	3.2	22.0	1.70			
AA52402117		2 x 117	1	22.0	1.70			

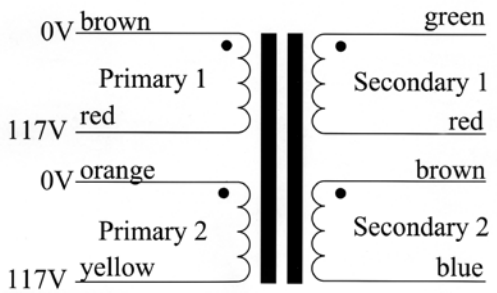
PRIMARY VOLTAGE — 2 X 117V 50/60 Hz (CONT.)

Part Number	Nominal Power (VA)	Secondary Voltage (Volts)	Secondary Current (Amps)	Core Loss (Watts)	Copper Loss (Watts)	OD x H Inches (mm)	Weight Lbs. (kg)	Mounting Hardware
AA53002015	300	2 x 15	10	22.0	1.70	4.6 x 2.6 (117 x 66)	5.7 (2.6)	1/4"
AA53002018		2 x 18	8.3	22.0	1.70			
AA53002024		2 x 24	6.2	22.0	1.70			
AA53002030		2 x 30	5	22.0	1.70			
AA53002038		2 x 38	5	22.0	1.70			
AA53002117		2 x 117	1.3	22.0	1.70			
AA53752018	375	2 x 18	10.4	27.0	2.00	5.4 x 2.0 (137 x 51)	6.7 (3)	1/4"
AA53752024		2 x 24	7.8	27.0	2.00			
AA53752030		2 x 30	6.3	27.0	2.00			
AA53752038		2 x 38	4.9	27.0	2.00			
AA53752117		2 x 117	4.9	27.0	2.00			
AA54602024	460	2 x 24	9.6	31.0	2.40	5.4 x 2.6 (137 x 66)	7.9 (3.6)	1/4"
AA54602030		2 x 30	7.7	31.0	2.40			
AA54602038		2 x 38	6	31.0	2.40			
AA54602117		2 x 117	2	31.0	2.40			
AA56252024	625	2 x 24	13	36.0	3.10	5.5 x 3.2 (140 x 81)	9.5 (4.3)	1/4"
AA56252030		2 x 30	10.4	36.0	3.10			
AA56252033		2 x 33	9.5	36.0	3.10			
AA56252038		2 x 38	8.2	36.0	3.10			
AA56252117		2 x 117	2.7	36.0	3.10			
AA58002024	800	2 x 24	16.7	45.0	3.80	6.4 x 2.7 (163 x 69)	12.3 (5.6)	5/16"
AA58002030		2 x 30	13.3	45.0	3.80			
AA58002038		2 x 38	10.5	45.0	3.80			
AA58002048		2 x 48	8.2	45.0	3.80			
AA58002117		2 x 117	3.4	45.0	3.80			
AA59902024	990	2 x 24	20.6	45.0	3.80	6.5 x 3.0 (165 x 76)	15.2 (6.9)	5/16"
AA59902042		2 x 42	11.8	45.0	3.80			
AA59902055		2 x 55	9	45.0	3.80			
AA59902117		2 x 117	4.2	45.0	3.80			

Note: Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

Winding Configurations With Color Codes

Dual 117V 50/60Hz Primaries w/ Dual Secondaries
Multiple primaries must be connected in series or parallel.



MEDICAL GRADE HIGH ISOLATION TOROIDAL TRANSFORMERS

Medical grade isolation transformers are installed in numerous medical power applications due to the advantages toroids have compared to other transformer constructions. The designs and constructions of medical transformers are greatly impacted by rigorous rules, guidelines, and laws that dictate specific requirements such as spacing, creepage distances, and leakage current maximums.

Quad Primaries: 100V, 120V, 220V, 240V - 50/60Hz

Part Number	Nominal (VA)	Secondary Current at 120V (Amps)	Secondary Current at 240V (Amps)	OD x H Inches (mm)	Weight Lbs. (kg)
MT0100DS	100 VA	0.83	0.42	4.0 x 2.0 (102 x 51)	2.7 (1.2)
MT0100SS	100 VA	0.83		4.0 x 2.0 (102 x 51)	2.7 (1.2)
MT0230DS	230 VA	1.92	0.96	4.6 x 2.4 (117 x 61)	5.2 (2.4)
MT0230SS	230 VA	1.92		4.6 x 2.4 (117 x 61)	5.2 (2.4)
MT0400DS	400 VA	3.33	1.67	5.5 x 2.5 (140 x 64)	8 (3.6)
MT0400SS	400 VA	3.33		5.5 x 2.5 (140 x 64)	8 (3.6)
MT0600DS	600 VA	5	2.5	6.2 x 3.1 (157 x 79)	13 (5.9)
MT0600SS	600 VA	5		6.2 x 3.1 (157 x 79)	13 (5.9)
MT0750DS	750 VA	6.25	3.12	6.6 x 3.0 (168 x 79)	14 (6.4)
MT0750SS	750 VA	6.25		6.6 x 3.0 (168 x 79)	14 (6.4)
MT1000DS	1000 VA	8.33	4.16	6.9 x 3.5 (175 x 89)	20 (9.1)
MT1500DS	1500 VA	12.5	6.25	8.2 x 4.0 (208 x 102)	28 (12.7)
MT2000DS	2000 VA	16.6	8.33	9.1 x 4.4 (231 x 112)	35 (15.9)
MT2500DS	2500 VA	20.8	10.4	9.4 x 4.5 (239 x 114)	39 (17.7)
MT3000DS	3000 VA	25	12.5	10.0 x 4.3 (254 x 109)	47 (21.3)
MT3750DS	3750 VA	31.2	15.6	10.5 x 4.9 (267 x 124)	65 (29.5)
MT5000DS	5000 VA	41.6	20.8	11.6 x 5.4 (295 x 137)	78 (35.4)
MT6250DS	6250 VA	52	26	12.0 x 5.6 (305 x 143)	90 (40.8)
MT7500DS	7500 VA	62.5	31.2	12.0 x 5.5 (305 x 140)	100 (45.4)
MT8750DS	8750 VA	72.9	36.4	12.5 x 5.5 (318 x 140)	110 (49.9)
MT10000DS	10000 VA	83.3	41.6	13.0 x 5.2 (330 x 132)	120 (54.4)

Note: Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

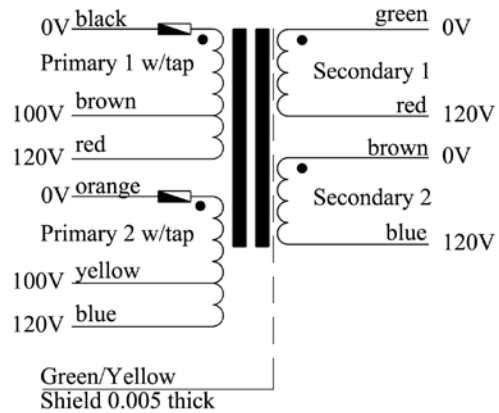
(suffix) SS = (Single Secondary) Secondary 1 only

(suffix) DS = (Dual Secondary) Secondary 1 & 2

Units rated below 1000VA come with metal disk and insulating pads.

Units rated 1000VA and larger are center potted.

Part numbers MT100 through MT5000 carry full TUV BAUARTMARK.



LOW PROFILE PC MOUNT TRANSFORMERS

Our 70000-series PC Mount toroidal step-down transformers offer the same features as our non-encapsulated toroidal power transformers, namely, very low EMR (magnetic stray fields), quiet operation, low temperature rise, low profile, low no-load current and very low no-load losses.

The cores are produced from a continuous strip of high grade silicon steel, and the windings are placed concentrically around the core. This is the ideal magnetic path, lacking air gaps or discontinuities thereby optimizing the use of magnetic flux for power transformation and significantly reducing idling currents when the load is removed.

Additionally, the transformers are designed for PCB mounting and can be secured prior to the soldering process through the use of a central screw receptacle that will accommodate either M4/M5 metric machine screws, or self-tapping types.

Benefits

- Low profile
- Low magnetic field radiation
- Acoustic noise virtually eliminated
- Small size
- High efficiency
- Low leakage losses
- High isolation (4000VAC primary to secondary)

Features

- Safety standard certifications (UL 506, UL 1950, UL File E122978, E138299)
- VDE 0805, IEC 950, EN 60950
- UL recognized for insulation Class A (105C). Meets all requirements of Class E(125°C)
- UL and VDE certifications to +40°C (1.6VA - 25VA)
- Hipot testing at 4000V between primary and secondary. (VDE0550)
- Maximum ambient temperature of +60°C for 1.6VA-25VA, +40°C for 35VA and 50VA models

PRIMARY VOLTAGE — 115V or 230V at 50/60 Hz

Part Number	Power (VA)	Secondary Voltage (V)	Secondary Current (mA)	No Load Voltage (V)	No Load Current (mA)	Reg %	Δt (°C)	Eff %	Length (Inches) (mm.)	Width (Inches) (mm.)	Height (Inches) (mm.)	Weight Lbs. (kg)	Pin Layout X In. (mm.)	Pin Layout Y In. (mm.)	Pin Size In. (mm.)
70000K	1.6	2 x 7	114	2 x 8.9	1	29	10	77	1.56 (39.6)	1.56 (39.6)	0.73 (18.5)	0.18 (82)	1.4 (35.56)	1.4 (35.56)	0.04 x 0.02 (1.0 x 0.5)
70001K		2 x 9	89	2 x 11.6											
70002K		2 x 12	67	2 x 15.4											
70003K		2 x 15	53	2 x 19.3											
70004K		2 x 18	44	2 x 23.4											
70005K		2 x 22	36	2 x 28.2											
70010K	3.2	2 x 7	229	2 x 10.2	1.5	43	20	70	1.76 (44.7)	1.76 (44.7)	0.77 (19.5)	0.24 (110)	40.64	40.64	0.04 x 0.02 (1.0 x 0.5)
70011K		2 x 9	178	2 x 13.0											
70012K		2 x 12	133	2 x 17.3											
70013K		2 x 15	107	2 x 21.4											
70014K		2 x 18	89	2 x 25.7											
70015K		2 x 22	73	2 x 31.3											

PRIMARY VOLTAGE — 115V or 230V at 50/60 Hz (CONT.)

Part Number	Power (VA)	Secondary Voltage (V)	Secondary Current (mA)	No Load Voltage (V)	No Load Current (mA)	Reg %	Δt (°C)	Eff %	Length (Inches) (mm.)	Width (Inches) (mm.)	Height (Inches) (mm.)	Weight Lbs. (kg)	Pin Layout X In. (mm.)	Pin Layout Y In. (mm.)	Pin Size In. (mm.)
70020K		2 x 7	357	2 x 9.7											
70021K		2 x 9	278	2 x 12.4											
70022K	5	2 x 12	208	2 x 17.0	2	40	29	68	1.96 (49.7)	1.96 (49.7)	0.77 (19.5)	0.32 (144)	45.72	45.72	0.04 x 0.02 (1.0 x 0.5)
70023K		2 x 15	167	2 x 21.3											
70024K		2 x 18	139	2 x 25.5											
70025K		2 x 22	114	2 x 30.5											
70030K		2 x 7	500	2 x 9.5											
70031K		2 x 9	389	2 x 12.2											
70032K	7	2 x 12	292	2 x 16.2	3	34	25	74	1.96 (49.7)	1.96 (49.7)	0.91 (23.1)	0.38 (174)	45.72	45.72	0.04 x 0.02 (1.0 x 0.5)
70033K		2 x 15	233	2 x 20.3											
70034K		2 x 18	194	2 x 24.3											
70035K		2 x 22	159	2 x 29.7											
70040K		2 x 7	714	2 x 8.3											
70041K		2 x 9	556	2 x 10.8											
70042K	10	2 x 12	417	2 x 14.4	3	20	24	82	2.17 (55)	2.17 (55)	1.02 (26)	0.56 (252)	50.8	50.8	0.04 x 0.02 (1.0 x 0.5)
70043K		2 x 15	333	2 x 18.0											
70044K		2 x 18	278	2 x 21.7											
70045K		2 x 22	227	2 x 26.3											
70050K		2 x 7	1071	2 x 8.9											
70051K		2 x 9	833	2 x 11.1											
70052K	15	2 x 12	625	2 x 14.8	4	23	27	80	2.36 (60)	2.36 (60)	1.04 (26.3)	0.67 (304)	55.88	55.88	0.04 x 0.02 (1.0 x 0.5)
70053K		2 x 15	500	2 x 18.5											
70054K		2 x 18	417	2 x 22.2											
70055K		2 x 22	341	2 x 27.2											
70060K		2 x 7	1785	2 x 8.3											
70061K		2 x 9	1377	2 x 10.7											
70062K	25	2 x 12	1041	2 x 14.3	5	19	28	83	2.36 (60)	2.36 (60)	1.48 (37.5)	0.96 (435)	55.88	55.88	0.04 x 0.02 (1.0 x 0.5)
70063K		2 x 15	832	2 x 17.8											
70064K		2 x 18	694	2 x 21.4											
70065K		2 x 22	568	2 x 26.2											
70070K		2 x 7	2500	2 x 8.0											
70071K		2 x 9	1944	2 x 10.6											
70072K	35	2 x 12	1458	2 x 14.0	7	17.7	31	81	2.83 (72)	2.83 (72)	1.48 (37.5)	1.16 (525)	66.04	66.04	0.04 x 0.04 (1.0 x 1.0)
70073K		2 x 15	1167	2 x 17.6											
70074K		2 x 18	972	2 x 20.9											
70075K		2 x 22	795	2 x 25.7											

PRIMARY VOLTAGE — 115V or 230V at 50/60 Hz (CONT.)

Part Number	Power (VA)	Secondary Voltage (V)	Secondary Current (mA)	No Load Voltage (V)	No Load Current (mA)	Reg %	Δt (°C)	Eff %	Length (Inches) (mm.)	Width (Inches) (mm.)	Height (Inches) (mm.)	Weight Lbs. (kg)	Pin Layout X In. (mm.)	Pin Layout Y In. (mm.)	Pin Layout Pin Size In. (mm.)
70080K	50	2 x 7	3571	2 x 8.1	8	15.5	30	86	3.24 (82.4)	3.24 (82.4)	1.48 (37.5)	1.51 (685)	76.2	76.2	0.04 x 0.04 (1.0 x 1.0)
70081K		2 x 9	2777	2 x 10.4											
70082K		2 x 12	2083	2 x 13.9											
70083K		2 x 15	1666	2 x 17.3											
70084K		2 x 18	1388	2 x 20.8											
70085K		2 x 22	1136	2 x 25.4											

Notes: Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

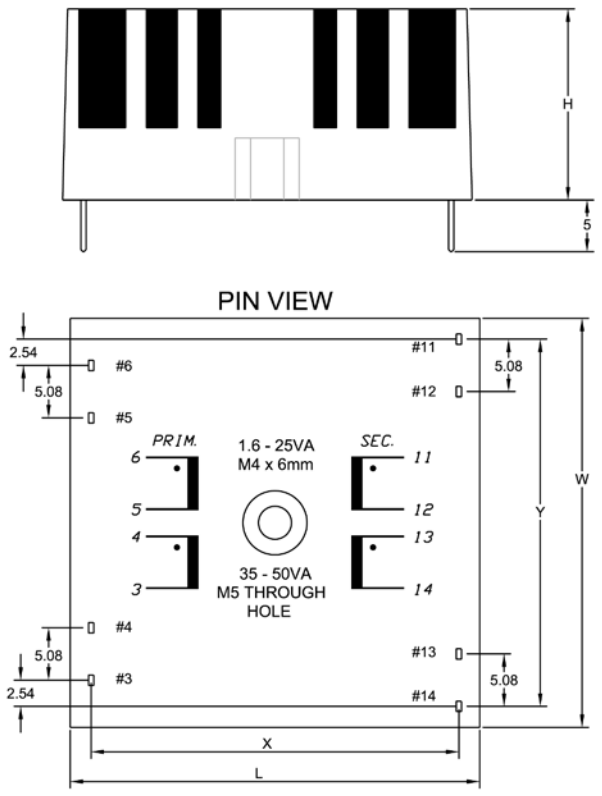
For 230V operation, connect primaries in series by connecting pins 5 & 4 together and apply 230 volts across pins 6 & 3.

For 115V operation, connect primaries in parallel by connecting pins 6 & 4 together and pins 5 & 3 together; apply 115V across pins 6 & 5.

To parallel the secondaries, connect pins 14 to 12 and 13 to 11; take the output across pins 14 & 13.

To place the secondaries in series, connect pins 13 to 12 and take the output across pins 14 & 11.

Wire Diagram and Pin Layout



LOW PROFILE MINIATURE TRANSFORMERS

The 62000-series Miniature toroidal step-down transformers offers the design engineer the same features as our larger toroidal power transformers, namely, very low EMR (magnetic stray fields), quiet operation, low temperature rise, low profile, low no-load current and very low no-load losses.

The cores are produced from a continuous strip of high grade silicon steel, and the windings are placed concentrically around the core. This is the ideal magnetic path, lacking air gaps or discontinuities thereby optimizing the use of magnetic flux for power transformation and significantly reducing idling currents when the load is removed.

Benefits

- Lower Stray field
- Higher Efficiency
- Reduced “Standby” Current
- Reduced Weight

Features

- Safety standard certifications (UL 506, UL File E122978)
- UL recognized for insulation Class A (105°C). Meets all requirements of Class E(125°C)
- UL certifications to +40°C (1.6VA - 25VA)
- Hipot testing at 4000V between primary and secondary.
- Maximum ambient temperature of +60°C
- Epoxy potted center with through hole for M4 bolt

PRIMARY VOLTAGE — 115V or 230V at 50/60 Hz

Part Number	Power (VA)	Secondary Voltage (V)	Secondary Current (mA)	No Load Voltage (V)	No Load Current (mA)	Reg %	Δt (°C)	Eff %	Outside Dimensions (Inches)(mm.)	Inside Dimensions (Inches)(mm.)	Height (Inches)(mm.)	Weight Lbs. (kg)
62000P2S02	1.6	2 x 7	114	2 x 8.94	1	29	10	77	1.48 (37.5)	0.28 (7)	0.67 (17)	0.16 (71)
62001P2S02		2 x 9	89	2 x 11.63								
62002P2S02		2 x 12	67	2 x 15.43								
62003P2S02		2 x 15	53	2 x 19.30								
62004P2S02		2 x 18	44	2 x 23.41								
62005P2S02		2 x 22	36	2 x 28.19								
62010P2S02	3.2	2 x 7	229	2 x 10.2	1.5	41	20	70	1.65 (42)	0.28 (7)	0.69 (17.5)	0.2 (89)
62011P2S02		2 x 9	178	2 x 13.0								
62012P2S02		2 x 12	133	2 x 17.3								
62013P2S02		2 x 15	107	2 x 21.4								
62014P2S02		2 x 18	89	2 x 25.7								
62015P2S02		2 x 22	73	2 x 30.5								
62020P2S02	5	2 x 7	357	2 x 9.7	2	45	29	70	1.85 (47)	0.24 (6)	0.71 (18)	0.25 (115)
62021P2S02		2 x 9	278	2 x 12.4								
62022P2S02		2 x 12	208	2 x 17.0								
62023P2S02		2 x 15	167	2 x 21.3								
62024P2S02		2 x 18	139	2 x 25.5								
62025P2S02		2 x 22	114	2 x 30.5								

PRIMARY VOLTAGE — 115V or 230V at 50/60 Hz (CONT.)

Part Number	Power (VA)	Secondary Voltage (V)	Secondary Current (mA)	No Load Voltage (V)	No Load Current (mA)	Reg %	Δt (°C)	Eff %	Outside Dimensions (Inches)(mm.)	Inside Dimensions (Inches)(mm.)	Height (Inches)(mm.)	Weight Lbs. (kg)
62030P2S02	7	2 x 7	500	2 x 9.5	3	34	25	74	1.85 (47)	0.24 (6)	0.85 (21.5)	0.32 (145)
62031P2S02		2 x 9	389	2 x 12.2								
62032P2S02		2 x 12	292	2 x 16.2								
62033P2S02		2 x 15	233	2 x 20.3								
62034P2S02		2 x 18	194	2 x 24.3								
62035P2S02		2 x 22	159	2 x 29.7								
62040P2S02	10	2 x 7	714	2 x 8.3	3	20	24	82	2.11 (53.5)	0.27 (6.8)	0.93 (23.5)	0.48 (216)
62041P2S02		2 x 9	556	2 x 10.8								
62042P2S02		2 x 12	417	2 x 14.4								
62043P2S02		2 x 15	333	2 x 18.0								
62044P2S02		2 x 18	278	2 x 21.7								
62045P2S02		2 x 22	227	2 x 26.3								
62050P2S02	15	2 x 7	1071	2 x 8.9	4	23	27	81	2.26 (57.5)	0.28 (7)	0.94 (24)	0.58 (262)
62051P2S02		2 x 9	833	2 x 11.1								
62052P2S02		2 x 12	625	2 x 14.8								
62053P2S02		2 x 15	500	2 x 18.5								
62054P2S02		2 x 18	417	2 x 22.2								
62055P2S02		2 x 22	341	2 x 27.2								
62060P2S02	25	2 x 7	1785	2 x 8.3	5	19	28	84	2.28 (58)	0.54 (13.8)	1.36 (34.5)	0.86 (388)
62061P2S02		2 x 9	1377	2 x 10.7								
62062P2S02		2 x 12	1041	2 x 14.2								
62063P2S02		2 x 15	832	2 x 17.8								
62064P2S02		2 x 18	694	2 x 21.4								
62065P2S02		2 x 22	568	2 x 26.2								
62070P2S02	35	2 x 7	2500	2 x 8.4	7	17.7	31	85	2.83 (72)	0.67 (17)	1.32 (33.5)	1 (453)
62071P2S02		2 x 9	1944	2 x 10.6								
62072P2S02		2 x 12	1458	2 x 14.0								
62073P2S02		2 x 15	1166	2 x 17.6								
62074P2S02		2 x 18	972	2 x 20.9								
62075P2S02		2 x 22	795	2 x 25.7								
62080P2S02	50	2 x 7	3571	2 x 8.1	8	15.5	30	86	3.07 (78)	0.89 (22.5)	1.38 (35)	1.48 (670)
62081P2S02		2 x 9	2777	2 x 10.4								
62082P2S02		2 x 12	2083	2 x 13.8								
62083P2S02		2 x 15	1666	2 x 17.3								
62084P2S02		2 x 18	1388	2 x 20.7								
62085P2S02		2 x 22	1136	2 x 25.4								

Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

For 230V/240V operation, connect primaries in series by connecting black and red lead wires together and apply 230V across yellow and violet leads wires.

For 115V/120V operation, connect primaries in parallel by connecting yellow and red lead wires together and black and violet leads wires.

To parallel the secondaries, connect green and brown wires and red and blue together. To put the secondaries in series, the red and brown wires are connected together. Take the output across the green and blue wires.

AC SERIES PC MOUNT CURRENT TRANSFORMERS

Current transformers (CTs) are used for measurement of electric currents and can be known as instrument transformers. When current in a circuit is too high to directly apply to measuring instruments, a current transformer produces a reduced current accurately proportional to the current in the circuit, which can be conveniently connected to measuring and recording instruments. A current transformer also isolates the measuring instruments from what may be very high voltage in the monitored circuit.

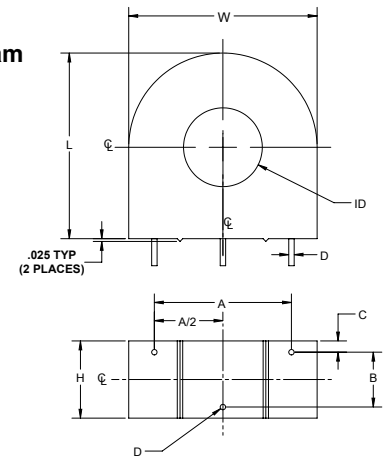
Applications

- Sensing Overload Current
- Ground Fault Detection
- Metering
- Coupling Analog to Digital Circuits

Features

- Current range from 5 - 200 A
- Frequency 50/60 Hz
- Fully encapsulated
- Primary to secondary insulation 4 kV AC
- Operating temperature range: -40° C to + 120° C

AC Series Diagram



Part Number	Rated Ip (Amps)	Turns Ratio	Frequency	DC Resistance (DCR) (@ Nominal)	RCF (@10%)	Pin Layout 100 Ω	500 Ω	2k Ω	5k Ω	Size Code
AC1005	5	1000:1	50/60 Hz	41.8 Ohm	1.040	0.100	0.450	1.350	1.800	A
AC1010	10	1000:1	50/60 Hz	41.8 Ohm	1.035	0.100	0.450	1.000	1.300	A
AC1015	15	1000:1	50/60 Hz	41.8 Ohm	1.030	0.100	0.430	0.800	1.000	A
AC1020	20	1000:1	50/60 Hz	41.8 Ohm	1.030	0.100	0.420	0.700	0.800	A
AC1025	25	1000:1	50/60 Hz	48 Ohm	1.020	0.100	0.400	1.000	1.200	B
AC1030	30	1000:1	50/60 Hz	48 Ohm	1.020	0.100	0.400	0.850	1.100	B
AC1040	40	1000:1	50/60 Hz	49.3 Ohm	1.020	0.100	0.450	0.750	1.000	C
AC1050	50	1000:1	50/60 Hz	49.3 Ohm	1.020	0.100	0.440	0.700	0.800	C
AC1060	60	1000:1	50/60 Hz	24 Ohm	1.020	0.100	0.380	0.600	0.700	D
AC1075	75	1000:1	50/60 Hz	24 Ohm	1.015	0.100	0.350	0.500	0.600	D
AC1100	100	1000:1	50/60 Hz	21.3 Ohm	1.015	0.100	0.350	0.500	0.600	E
AC1150	150	1000:1	50/60 Hz	11 Ohm	1.010	0.100	0.320	0.550	0.600	F
AC1200	200	1000:1	50/60 Hz	11 Ohm	1.010	0.100	0.300	0.450	0.600	F

Notes: Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

RCF: Ratio Correction Factor Multiple current readings by this factor to compensate for transformer losses

Size Code	W	L	H	A	B	C	D	ID
A	0.938	0.938	0.438	0.6	0.3	0.069	0.032	0.375
B	1.188	1.188	0.563	0.8	0.4	0.082	0.04	0.45
C	1.375	1.375	0.563	1	0.4	0.082	0.04	0.575
D	1.5	1.5	0.625	1.2	0.4	0.112	0.04	0.575
E	1.75	1.75	0.563	1.4	0.4	0.082	0.04	0.75
F	2.188	2.188	0.813	1.8	0.5	0.156	0.04	0.94

TOROIDAL POWER INDUCTORS

Many of the same features offered by our toroidal transformers are also true for our tor DC filtering and AC circuits. A toroidal DC filter choke for line frequency operation used in conjunction with a toroidal power transformer allows our engineering to design a small size transformer. Using toroidal DC filter chokes also reduces the size of the required filter capacitors.

Part Number	Current I DC (Amps)	Current RMS (Amps)	Inductance (mH)	Power (WS)	Core Losses (W)	Copper Losses (W)	OD x HT Inches (mm.)	Weight Lbs. (kg)
L0540	5	3.5	40	0.5	1.5	12.8	3.8 x 1.9 (97 x 48)	2.5 (1.1)
L0560	5	3.5	60	0.75	3	13.8	4.6 x 2.0 (117 x 51)	4 (1.8)
L1020	10	7	20	1	4	16.7	5.5 x 2.0 (140 x 51)	6 (2.7)
L1040	10	7	40	2	5	23.4	5.5 x 2.4 (140 x 61)	8 (3.6)
L1060	10	7	60	3	7	28.6	5.9 x 2.8 (150 x 71)	11.5 (5.2)
L1510	15	10.6	10	1.13	4	18.7	5.5 x 2.0 (140 x 51)	6 (2.7)
L1515	15	10.6	15	1.69	5	22.7	5.5 x 2.4 (140 x 61)	7.5 (3.4)
L1520	15	10.6	20	2.25	5	26.3	5.5 x 2.4 (140 x 61)	8 (3.6)
L1540	15	10.6	40	4.5	8	37.8	6.5 x 2.8 (165 x 71)	15 (6.8)
L2010	20	14.1	10	2	5	23.2	5.5 x 2.4 (140 x 61)	8 (3.6)
L2015	20	14.1	15	3	7	28.4	5.9 x 2.8 (150 x 71)	11.5 (5.2)
L2020	20	14.1	20	4	8	32.8	6.5 x 2.8 (165 x 71)	14 (6.4)
L2040	20	14.1	40	8	12	42.8	8.0 x3.5 (203 x 89)	27 (12.3)
L3005	30	21.2	5	2.25	5	26.1	5.5 x 2.4 (140 x 61)	8.5 (3.9)
L3010	30	21.2	10	4.5	8	37.8	6.5 x 2.8 (165 x 71)	15 (6.8)
L3015	30	21.2	15	6.75	11	45.9	8.0 x 3.0 (203 x 76)	22 (10)
L3020	30	21.2	20	9	13	43.2	8.0 x 3.5 (203 x 89)	28 (12.7)
L4005	40	28.3	5	4	8	32	6.5 x 2.8 (165 x 71)	14 (6.4)
L4010	40	28.3	10	8	13	43.2	8.0 x 3.5 (203 x 89)	27 (12.3)
L4015	40	28.3	15	12	20	56	10.0 x3.4 (254 x 86)	39 (17.7)
L5005	50	35.3	5	6.25	11	35	8.0 x 3.0 (203 x 76)	23 (10.4)
L5010	50	35.3	10	12.5	20	57.5	10.0 x 3.4 (254 x 86)	39 (17.7)
L6005	60	42.4	5	9	12	43.2	8.0 x 3.5 (203 x 89)	29 (13.2)

Notes: Electrical measurements @ 20°C ambient temperature. All data subject to change without prior notice.

ENCLOSED MEDICAL ISOLATION TRANSFORMERS

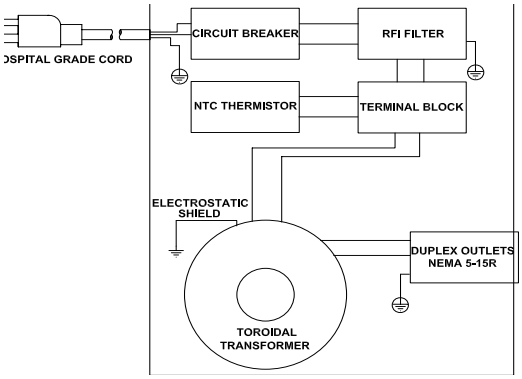
Acme Electric now offers a line of fully enclosed medical isolation transformers, featuring Amveco Toroidal Power technology. For medical grade applications, these units provide additional safety and protection. When using electronic devices in a medical, these medical grade transformers will bring the equipment into compliance with the UL 60601 medical safety standard. The transformers operate at 120V 60Hz input with 120V output. They have built in RFI filtering and in-rush current limiting. The transformer design utilizes toroidal transformer which offers light weight, high efficiency, quiet operation, cool overall temperature, and low stray magnetic field.

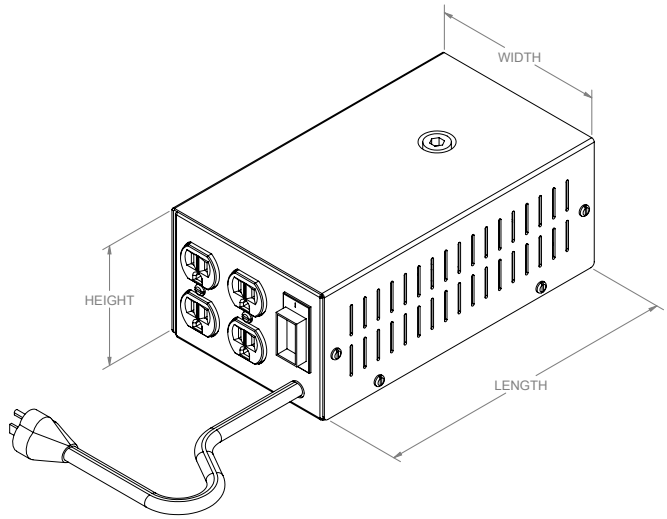
Features

- Fully enclosed medical isolation transformers housed in white aluminum enclosure
- Designed for North American 120V 60Hz input operation
- UL listed to UL 60601-1 and c-UL listed to CSA C22.2 No.601.1.
- High efficiency toroidal transformer design yielding overall compact size and low weight.
- Low leakage design. Less than 100 µA leakage current.
- Built in filtering with RFI interference and inrush protection.
- Surge suppression
- 10 ft hospital grade power cord
- Duplex 'green-dot' hospital grade outlets
- On/Off circuit breaker
- Floor standing or wall mount

ENCLOSED MEDICAL ISOLATION TRANSFORMERS 120 VOLT PRIMARY — 120 SECONDARY VOLT — 60 Hz

VA	Catalog Number	Width (Inches)(Cm.)	Height (Inches)(Cm.)	Length (Inches)(Cm.)	Weight (Lbs.)(Kg.)	Load Regulation	NEMA PLUG	Hospital Grade Duplex Outlets
300	AS30327	5.63 (14.3)	4.13 (10.5)	10.00 (25.4)	10 (4.5)	4.5%	5-15P	(2) 5-15R
600	AS30328	7.13 (18.1)	4.13 (10.5)	12.50 (31.7)	17 (7.7)	2.9%	5-15P	(3) 5-15R
900	AS30329	7.13 (18.1)	4.13 (10.5)	12.50 (31.7)	26 (11.8)	1.5%	5-15P	(4) 5-15R
1200	AS30330	9.13 (23.2)	4.13 (10.5)	14.00 (35.6)	32 (14.5)	1.4%	5-15P	(4) 5-15R
1800	AS30331	9.13 (23.2)	4.13 (10.5)	14.00 (35.6)	37 (16.8)	1.7%	5-20P	(4) 5-20R





Electrical Enclosures

Section 13

NEW

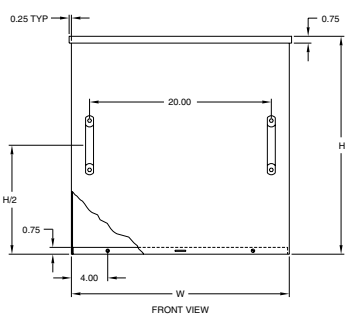
WORLD CLASS ELECTRICAL ENCLOSURES

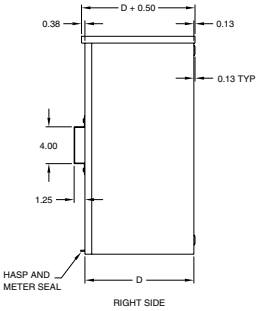
WCT SERIES ENCLOSURES
NEMA 3R SCREW COVER WALL-MOUNT

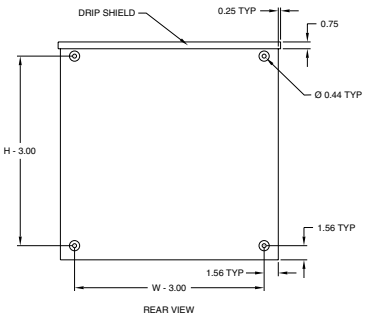
Applications
Designed for use as transformer housings, junction boxes, and service boxes.

Construction
- Drip shield top and smooth seamless sides and front
- A slip-on removable cover is securely fastened with plated screws located along bottom edge
- No gasketing is required
- Mounting holes on back of cabinet
- Door handles provided
- Hasp for padlocking and provisions for meter seal are provided
- Grounding provisions provided
- For removal of cover, move downward, then outward

Finish
- ANSI-61 gray polyester powder inside and out







Industry Standards
UL 50, Types 1 & 3R
CSA Certified, Type 1 & 3R
NEMA/EEMAC Type 1 & 3R

UL File E23553

CSA File LL66078

WCT SERIES SCREW COVER ENCLOSURES

Catalog Number	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)
WCT242412	14/14	24.00 (61.0)	24.00 (61.0)	12.00 (30.5)
WCT303012	12/12	30.00 (76.2)	30.00 (76.2)	12.00 (30.5)
WCT363012	12/12	36.00 (91.4)	30.00 (71.5)	12.00 (30.5)
WCT363612	12/12	36.00 (91.4)	36.00 (91.4)	12.00 (30.5)
WCT483616	12/12	48.00 (122.0)	36.00 (91.4)	16.00 (40.6)

CT SERIES ENCLOSURES
NEMA 3R SINGLE DOOR HINGE COVER

Applications
Enclosures are designed as a housing for current and voltage transformers, recorders, meters, junction, service box, relay and/or for terminal instrumentation.

Construction
- Manufactured from 14 and 12 gauge carbon steel
- Fully seam welded and ground smooth, with weep hole
- Drip shield
- Lift off hinges, gasketed doors
- Supplied with non-locking 1/4 turn latch
- Meter seal provisions
- Mounting holes in back
- Supplied with studs in back of enclosure

Finish
- ANSI 61 polyester powder inside and out

Industry Standards
UL Listed Type 3R

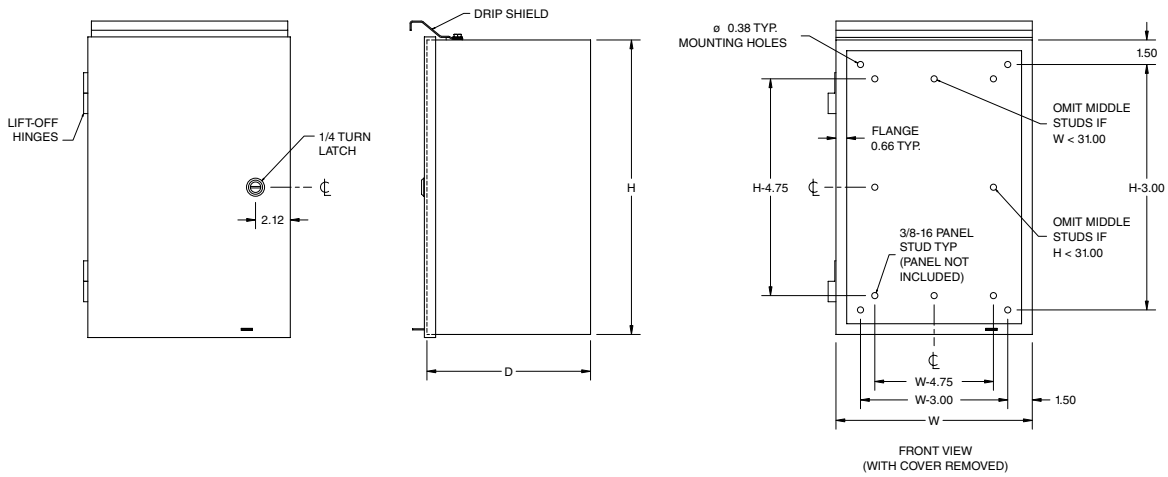
UL File E23553

CSA File LL66078

CT SERIES SINGLE DOOR HINGE COVER ENCLOSURES

Catalog Number	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Panel Catalog
CTSD121810	14	18.00 (45.7)	12.00 (30.5)	10.00 (25.4)	WBP1812
CTSD182410	14	24.00 (61.0)	18.00 (45.7)	10.00 (25.4)	WBP2418
CTSD202010	14	20.00 (50.8)	20.00 (50.8)	10.00 (25.4)	WBP2020
CTSD202412	14	24.00 (61.0)	20.00 (50.8)	12.00 (30.5)	WBP2420
CTSD242412	14	24.00 (61.0)	24.00 (61.0)	12.00 (30.5)	WBP2424
CTSD243012	14	30.00 (76.2)	24.00 (61.0)	12.00 (30.5)	WBP3024
CTSD243612	14	36.00 (91.4)	24.00 (61.0)	12.00 (30.5)	WBP3624
CTSD303612	12	36.00 (91.4)	30.00 (76.2)	12.00 (30.5)	WBP3630

Note: Second numerical value of catalog # represents height.



CT SERIES ENCLOSURES
NEMA 3R DOUBLE DOOR HINGE COVER

Applications
Enclosures are designed as a housing for current and voltage transformers, recorders, meters, junction, service box, relay and/or for terminal instrumentation.

Construction
- Manufactured from 14 and 12 gauge carbon steel
- Fully seam welded and ground smooth, with weep hole
- Drip shield
- Lift off hinges, gasketed doors
- Supplied with non-locking “T” handle
- Meter seal provisions
- Mounting holes in back
- Supplied with studs in back of enclosure

Finish
- ANSI 61 polyester powder inside and out

Industry Standards
UL Listed Type 3R

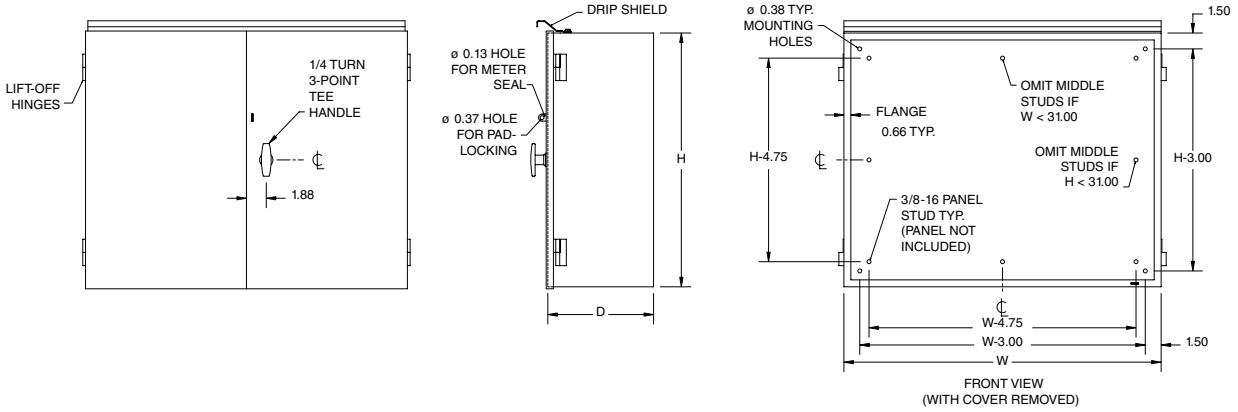
UL File E23553

CSA File LL66078

CT SERIES SINGLE DOOR HINGE COVER ENCLOSURES

Catalog Number	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Panel Catalog Number*
CTDD302410	14	24.00 (61.0)	30.00 (76.2)	10.00 (25.4)	WBP3024
CTDD303012	12	30.00 (76.2)	30.00 (76.2)	12.00 (30.5)	WBP3030DD
CTDD303612	12	36.00 (91.4)	30.00 (76.2)	12.00 (30.5)	WBP3630
CTDD362412	14	24.00 (61.0)	36.00 (91.4)	12.00 (30.5)	WBP3624
CTDD363012	12	30.00 (76.2)	36.00 (91.4))	12.00 (30.5)	WBP3630
CTDD363212	12	32.00 (81.3)	36.00 (91.4)	12.00 (30.5)	WBP3236DD
CTDD363612	12	36.00 (91.4)	36.00 (91.4))	12.00 (30.5)	WBP3636DD
CTDD363616	12	36.00 (91.4)	36.00 (91.4)	16.00 (40.6)	WBP3636DD
CTDD443012	12	30.00 (76.2)	44.00 (76.2)	12.00 (30.5)	WBP3044DD
CTDD424212	12	42.00 (106.7)	42.00 (106.7)	12.00 (30.5)	WBP4242DD
CTDD484816	12	48.00 (121.9)	48.00 (121.9))	16.00 (40.6)	WBP4848DD

Note: Second numerical value of catalog # represents height.



N412 - SSC ULTIMATE SERIES ENCLOSURES
NEMA 4X SINGLE DOOR WALL-MOUNT

Applications
N412SSC ULTIMATE Stainless Steel Series Enclosures are designed to house and protect electrical and electronic components from harsh, dirty environments. For use in installations where dirt, dust, oil, water, or other contaminants are present. It is typically used in the following areas where corrosion-resistant protection is needed: food processing plants, pharmaceutical manufacturing facilities, petrochemical plants, pulp and paper processing, and waste water treatment facilities. Streamlined styling, flush latching, and attractive Stainless Steel finish complement any high tech electronic equipment.

Construction
- Bodies and doors fabricated from 14 gauge 304 or 316L Stainless Steel
- Continuously Plasma welded seams
- Increased tub opening for better access
- Concealed hinges
- Doors are interchangeable and easily removable
- Ground stud located in door
- 1/4-turn semi-flush oil tight latches are supplied to hold door securely closed
- Print pocket is provided
- Doors are sealed with poured-in-place polyurethane gasket**
- Mounting holes in rear of enclosure

Finish
- All exterior surfaces have a smooth grained finish

Industry Standards
UL 508, Types 4, 4X, 12 & 13
CSA Certified, Types 4, 4X, 12 & 13
NEMA/EEMAC Type 4, 4X, 12 & 13

Wall mounting brackets required to maintain UL/CSA external mounting requirements.

UL File E64791

CSA File LL66078

N412-SSC ULTIMATE SERIES SINGLE DOOR STAINLESS ENCLOSURES

Catalog Number 304 SS	Catalog Number 316L SS	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Back Panel Catalog Number* White	Back Panel Catalog Number* 304 SS	Back Panel Catalog Number* G	Back Panel Size A&B (Inches)(Cm.)	C (Inches)(Cm.)	E
N412121206SSC	N412121206SSAC	14/14	12.0 (30.5)	12.0 (30.5)	6.0 (15.2)	NP1212C	—	NP1212CG	10.2x10.2 (25.9x25.9)	6.0 (15.2)	—
N412161206SSC	N412161206SSAC	14/14	16.0 (40.6)	12.0 (30.5)	6.0 (15.2)	NP1612C	NP1612SSC	NP1612CG	14.2x10.2 (36.1x25.9)	8.0 (20.3)	—
N412161606SSC	N412161606SSAC	14/14	16.0 (40.6)	16.0 (40.6	6.0 (15.2)	NP1616C	NP1616SSC	NP1616CG	14.2x14.2 (36.1x36.1)	8.0 (20.3)	—
N412201606SSC	N412201606SSAC	14/14	20.0 (50.8)	16.0 (40.6)	6.0 (15.2)	NP2016C	NP2016SSC	NP2016CG	18.2x14.2 (46.2x36.1)	10.0 (25.4)	—
N412202006SSC	N412202006SSAC	14/14	20.0 (50.8)	20.0 (50.8)	6.0 (15.2)	NP2020C	NP2020SSC	NP2020CG	18.2x18.2 (46.2x46.2)	10.0 (25.4)	—
N412161208SSC	N412161208SSAC	14/14	16.0 (40.6)	12.0 (30.5)	8.0 (20.3)	NP1612C	NP1612SSC	NP1612CG	14.2x10.2 (36.1x25.9)	8.0 (20.3)	—
N412161608SSC	N412161608SSAC	14/14	16.0 (40.6)	16.0 (40.6)	8.0 (20.3)	NP1616C	NP1616SSC	NP1616CG	14.2x14.2 (36.1x36.1)	8.0 (20.3)	—
N412162008SSC	N412162008SSAC	14/14	16.0 (40.6)	20.0 (50.8)	8.0 (20.3)	NP2016C	NP2016SSC	NP2016CG	14.2x18.2 (36.1x46.2)	8.0 (20.3)	—
N412201608SSC	N412201608SSAC	14/14	20.0 (50.8)	16.0 (40.6)	8.0 20.3)	NP2016C	NP2016SSC	NP2016CG	18.2x14.2 (46.2x36.1)	10.0 (25.4)	—
N412202008SSC	N412202008SSAC	14/14	20.0 (50.8)	20.0 (50.8)	8.0 (20.3)	NP2020C	NP2020SSC	NP2020CG	18.2x18.2 (46.2x46.2)	10.0 (25.4)	—
N412241608SSC	N412241608SSAC	14/14	24.0 (61.0)	16.0 (40.6)	8.0 (20.3)	NP2416C	NP2416SSC	NP2416CG	22.2x14.2 (56.4x36.1)	10.0 (25.4)	—

N412-SSC ULTIMATE SERIES SINGLE DOOR STAINLESS ENCLOSURES (CONT.)

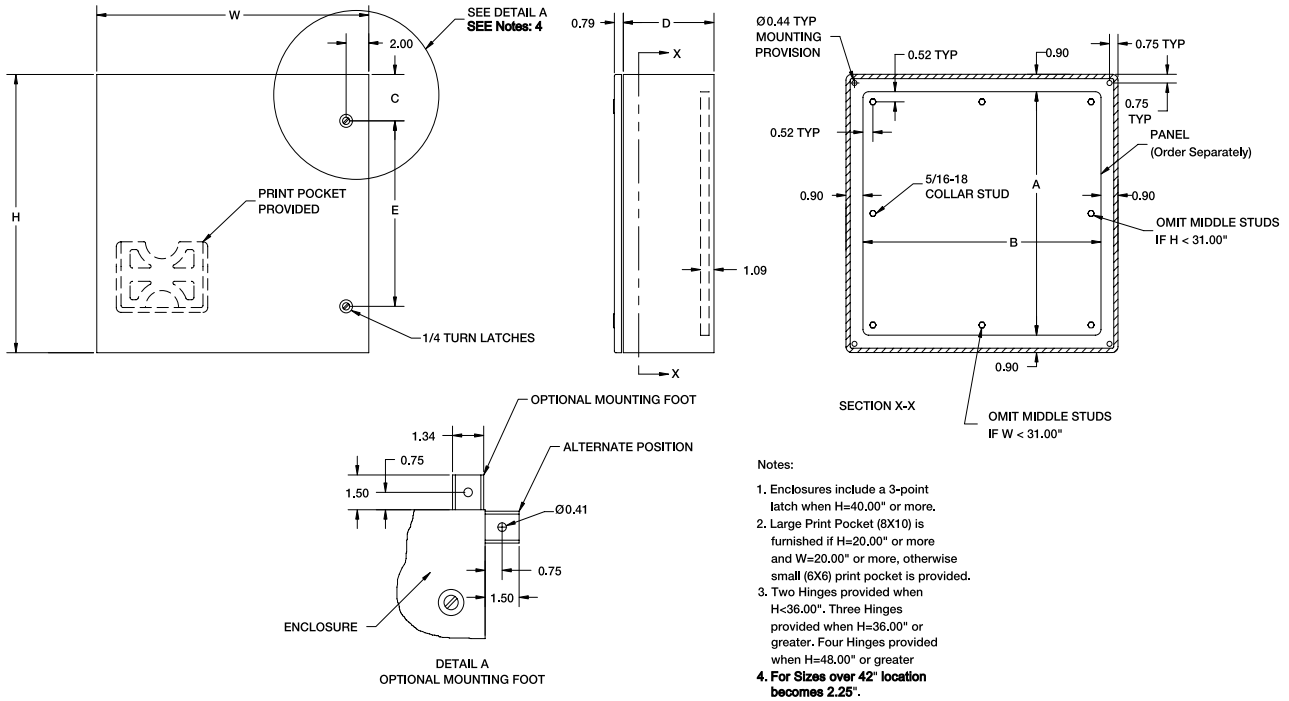
Catalog Number 304 SS	Catalog Number 316L SS	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Back Panel Catalog Number* White	Back Panel Catalog Number* 304 SS	Back Panel Catalog Number* G	Back Panel Size A&B (Inches)(Cm.)	C (Inches) (Cm.)	E
N412242008SSC	N412242008SSAC	14/14	24.0 (61.0)	20.0 (50.8)	8.0 (20.3)	NP2420C	NP2420SSC	NP2420CG	22.2x18.2 (56.4x46.2)	12.0 (30.5)	—
N412242408SSC	N412242408SSAC	14/14	24.0 (61.0)	24.0 (61.0)	8.0 (20.3)	NP2424C	NP2424SSC	NP2424CG	22.2x22.2 (56.4x56.4)	4.0 (10.2)	16.0 (40.6)
N412302408SSC	N412302408SSAC	14/14	30.0 (76.2)	24.0 (61.0)	8.0 (20.3)	NP3024C	NP3024SSC	NP3024CG	28.2x22.2 (71.6x56.4)	4.0 (10.2)	22.0 (55.9)
N412303008SSC	N412303008SSAC	14/14	30.0 (76.2)	30.0 (76.2)	8.0 (20.3)	NP3030C	NP3030SSC	NP3030CG	28.2x28.2 (71.6x71.6)	4.0 (10.2)	22.0 (55.9)
N412362408SSC	N412362408SSAC	14/14	36.0 (91.4)	24.0 (61.0)	8.0 (20.3)	NP3624C	NP3624SSC	NP3624CG	34.2x22.2 (86.9x56.4)	4.0 (10.2)	28.0 (71.1)
N412363008SSC	N412363008SSAC	14/14	36.0 (91.4)	30.0 (76.2)	8.0 (20.3)	NP3630C	NP3630SSC	NP3630CG	34.2x28.2 (86.9x71.6)	4.0 (10.2)	28.0 (71.1)
N412161210SSC	N412161210SSAC	14/14	16.0 (40.6)	12.0 (30.5)	10.0 (25.4)	NP1612C	NP1612SSC	NP1612CG	14.2x10.2 (36.1x25.9)	8.0 (20.3)	—
N412161610SSC	N412161610SSAC	14/14	16.0 (40.6)	16.0 (40.6)	10.0 (25.4)	NP1616C	NP1616SSC	NP1616CG	14.2x14.2 (36.1x36.1)	8.00 (20.3)	—
N412162010SSC	N412162010SSAC	14/14	16.0 (40.6)	20.0 (50.8)	10.0 (25.4)	NP1620C	NP1620SSC	NP1620CG	14.2x18.2 (36.1x46.7)	8.0 (20.3)	—
N412201610SSC	N412201610SSAC	14/14	20.0 (50.8)	16.0 (40.6)	10.0 (25.4)	NP2016C	NP2016SSC	NP2016CG	18.2x14.2 (46.7x36.1)	10.0 (25.4)	—
N412202010SSC	N412202010SSAC	14/14	20.0 (50.8)	20.0 (50.8)	10.0 (25.4)	NP2020C	NP2020SSC	NP2020CG	18.2x18.2 (46.7x46.7)	10.0 (25.4)	—
N412241610SSC	N412241610SSAC	14/14	24.0 (61.0)	16.0 (40.6)	10.0 (25.4)	NP2416C	NP2416SSC	NP2416CG	22.2x14.2 (56.4x36.1)	10.0 (25.4)	—
N412242010SSC	N412242010SSAC	14/14	24.0 (61.0)	20.0 (50.8)	10.0 (25.4)	NP2020C	NP2020SSC	NP2020CG	18.2x18.2 (46.7x46.7)	10.0 (25.4)	—
N412242410SSC	N412242410SSAC	14/14	24.0 (61.0)	24.0 (61.0)	10.0 (25.4)	NP2424C	NP2424SSC	NP2424CG	22.2x22.2 (56.9x56.9)	4.0 (10.2)	16.0 (40.6)
N412302410SSC	N412302410SSAC	14/14	30.0 (76.2)	24.0 (61.0)	10.0 (25.4)	NP3024C	NP3024SSC	NP3024CG	28.2x22.2 (71.6x56.4)	4.0 (10.2)	22.0 (55.9)
N412303010SSC	N412303010SSAC	14/14	30.0 (76.2)	30.0 (76.2)	10.0 (25.4)	NP3030C	NP3030SSC	NP3030CG	28.2x28.2 (71.6x71.6)	4.0 (10.2)	22.0 (55.9)
N412362410SSC	N412362410SSAC	14/14	36.0 (91.4)	24.0 (61.0)	10.0 (25.4)	NP3624C	NP3624SSC	NP3624CG	34.2x22.2 (86.9x56.4)	4.0 (10.2)	28.0 (71.1)
N412363010SSC	N412363010SSAC	14/14	36.0 (91.4)	30.0 (76.2)	10.0 (25.4)	NP3630C	NP3630SSC	NP3630CG	34.2x28.2 (86.9x71.6)	4.0 (10.2)	28.0 (71.1)
N412363610SSC	N412363610SSAC	14/14	36.0 (91.4)	36.0 (91.4)	10.0 (25.4)	NP3636C	NP3636SSC	NP3636CG	34.2x34.2 (86.9x86.9)	4.0 (10.2)	28.0 (71.1)
N412423610SSC	N412423610SSAC	14/14	42.0 (106.7)	36.0 (91.4)	10.0 (25.4)	NP4236C	NP4236SSC	NP4236CG	40.2x34.2 (102.1x86.9)	21.0 (53.3)	—
N412483610SSC	N412483610SSAC	14/14	48.0 (121.9)	36.0 (91.4)	10.0 (25.4)	NP4836C	NP4836SSC	NP4836CG	46.2x34.2 (117.3x86.9)	24.0 (61.0)	—
N412603610SSC	N412603610SSAC	14/14	60.0 (152.4)	36.0 (91.4)	10.0 (25.4)	NP6036C	NP6036SSC	NP6036CG	58.2x34.2 (147.8x86.9)	30.0 (76.2)	—
N412202012SSC	N412202012SSAC	14/14	20.0 (50.8)	20.0 (50.8)	12.0 (30.5)	NP2020C	NP2020SSC	NP2020CG	18.2x18.2 (46.2x46.2)	10.0 (25.4	—
N412242412SSC	N412242412SSAC	14/14	24.0 (61.0)	24.0 (61.0)	12.0 (30.5)	NP2424C	NP2424SSC	NP2424CG	22.2x22.2 (56.4x56.4)	4.0 (10.2)	16.0 (40.6)
N412302412SSC	N412302412SSAC	14/14	30.0 (76.2)	24.0 (61.0)	12.0 (30.5)	NP3024C	NP3024SSC	NP3024CG	28.2x22.2 (71.6x56.4)	4.0 (10.2)	22.0 (55.9)
N412362412SSC	N412362412SSAC	14/14	36.0 (91.4)	24.0 (61.0)	12.0 (30.5)	NP3624C	NP3624SSC	NP3624CG	34.2x22.2 (86.9x56.4)	4.0 (10.2)	28.0 (71.1)
N412363012SSC	N412363012SSAC	14/14	36.0 (91.4)	30.0 (76.2)	12.0 (30.5)	NP3630C	NP3630SSC	NP3630CG	34.2x28.2 (86.9x71.6)	4.0 (10.2)	28.0 (71.1)

N412-SSC ULTIMATE SERIES SINGLE DOOR STAINLESS ENCLOSURES (CONT.)

Catalog Number 304 SS	Catalog Number 316L SS	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Back Panel Catalog Number* White	Back Panel Catalog Number* 304 SS	Back Panel Catalog Number* G	Back Panel Size A&B (Inches)(Cm.)	C (Inches) (Cm.)	E
N412363612SSC	N412363612SSAC	14/14	36.0 (91.4)	36.0 (91.4)	12.0 (30.5)	NP3636C	NP3636SSC	NP3636CG	34.2x34.2 (86.9x86.9)	4.0 (10.2)	28.0 (71.1)
N412423612SSC	N412423612SSAC	14/14	42.0 (106.7)	36.0 (91.4)	12.0 (30.5)	NP4236C	NP4236SSC	NP4236CG	40.2x34.2 (102.1x86.9)	21.0 (53.3)	—
N412483612SSC **	N412483612SSAC	14/14	48.0 (121.9)	36.0 (91.4)	12.0 (30.5)	NP4836C	NP4836SSC	NP4836CG	46.2x34.2 (117.3x86.9)	24.0 (61.0)	—
N412603612SSC **	N412603612SSAC **	14/14	60.0 (152.4)	36.0 (91.4)	12.0 (30.5)	NP6036C	NP6036SSC	NP6036CG	58.2x34.2 (147.8x86.9)	30.0 (76.2)	—

** Enclosures are supplied with closed cell neoprene gasket (not foam-in-place).

* Back panels must be ordered separately.



Notes:

1. Enclosures include a 3-point latch when H=40.00" or more.
2. Large Print Pocket (8X10) is furnished if H=20.00" or more and W=20.00" or more, otherwise small (6X6) print pocket is provided.
3. Two Hinges provided when H<36.00". Three Hinges provided when H=36.00" or greater. Four Hinges provided when H=48.00" or greater
4. **For Sizes over 42" location becomes 2.25".**

N412 - WSSC ULTIMATE SERIES ENCLOSURES
NEMA 4X SINGLE DOOR WALL-MOUNT WITH WINDOW

Applications
N412WSSC ULTIMATE Stainless Steel Series Enclosures are designed to house and protect electrical and electronic components from harsh, dirty environments. For use in installations where dirt, dust, oil, water, or other contaminants are present. It is typically used in the following areas where corrosion-resistant protection is needed: food processing plants, pharmaceutical manufacturing facilities, petrochemical plants, pulp and paper processing, and waste water treatment facilities. Streamlined styling, flush latching, and attractive Stainless Steel finish complement any high tech electronic equipment.

Construction
- Bodies and doors fabricated from 14 gauge 304 Stainless Steel
- Continuously Plasma welded seams
- Increased tub opening for better access
- Concealed hinges
- Plexiglass viewing window
- Doors are interchangeable and easily removable
- Grounding provisions provided (tub only)
- 1/4-turn semi-flush oil tight latches are supplied to hold door securely closed
- Print pocket is provided
- Doors are sealed with poured-in-place polyurethane gasket**
- Mounting holes in rear of enclosure

Finish
- All exterior surfaces have a smooth grained finish

Industry Standards
UL 508, Types 4, 4X, 12 & 13
CSA Certified, Types 4, 4X, 12 & 13
NEMA/EEMAC Type 4, 4X, 12 & 13

Wall mounting brackets required to maintain UL/CSA external mounting requirements.

UL File E64791

CSA File LL66078

N412WSSC ULTIMATE SERIES SINGLE DOOR WITH WINDOW STAINLESS ENCLOSURES

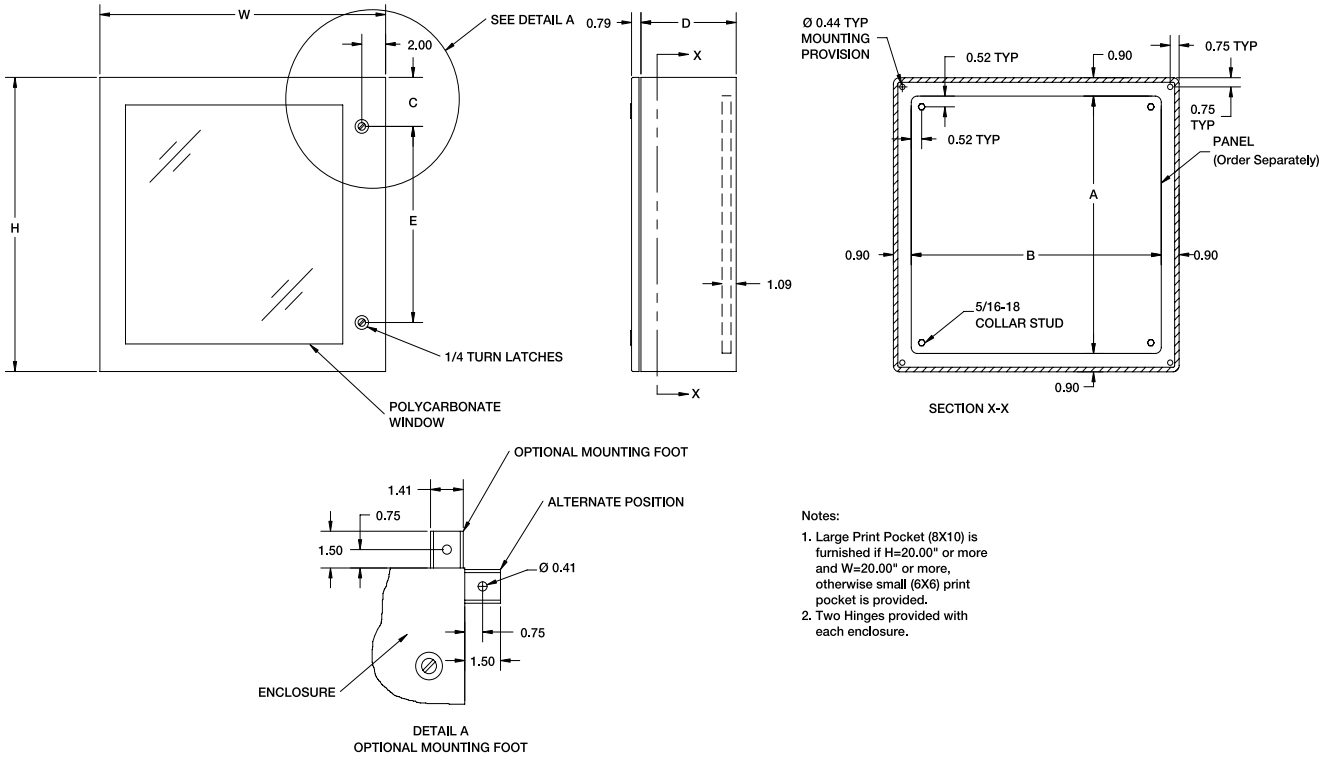
Catalog Number	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Viewable Window Area (Inches)(Cm.)	Back Panel Catalog White	Back Panel Catalog G	Back Panel Size A&B (Inches)(Cm.)	C (Inches)(Cm.)	E (Inches)(Cm.)
N412121206WSSC	14/14	12.00 (30.5)	12.00 (30.5)	6.00 (15.2)	7.50 x 6.25 (191 x 159)	NP1212C	NP1212CG	10.2x10.2 (25.9x25.9)	6.00 (15.2)	—
N412161206WSSC	14/14	16.00 (40.6)	12.00 (30.5)	6.00 (15.2)	1.50 x 6.25 (292 x 159)	NP1612C	NP1612CG	14.2x10.2 (36.1x25.9)	8.00 (20.3)	—
N412201606WSSC	14/14	20.00 (50.8)	16.00 (40.6)	6.00 (15.2)	15.50 x 10.25 (394 x 260)	NP2016C	NP2016CG	18.2x14.2 (46.2x36.1)	10.00 (25.4)	—
N412202006WSSC	14/14	20.00 (50.8)	20.00 (50.8)	6.00 (15.2)	15.50 x 14.25 (394 x 362)	NP2020C	NP2020CG	18.2x18.2 (46.2x46.2)	10.00 (25.4)	—
N412242006WSSC	14/14	24.0 (61.0)	20.00 (50.8)	6.00 (15.2)	19.50 x 14.25 (495 x 362)	NP2420C	NP2420CG	22.2x18.2 (56.4x46.2)	12.00 (30.5)	—
N412242406WSSC	14/14	24.0 (61.0)	24.0 (61.0)	6.00 (15.2)	19.50 x 18.25 (495 x 464)	NP2424C	NP2424CG	22.2x22.2 (56.4x56.4)	4.00 (10.2)	16.00 (40.6)

N412WSSC ULTIMATE SERIES SINGLE DOOR WITH WINDOW STAINLESS ENCLOSURES (CONT.)

Catalog Number	Body/Door Steel Gauge	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Viewable Window Area (Inches)(Cm.)	Back Panel Catalog White	Back Panel Catalog G	Back Panel Size A&B (Inches)(Cm.)	C (Inches)(Cm.)	E (Inches)(Cm.)
N412302406WSSC	14/14	30.0 (76.2)	24.0 (61.0)	6.00 (15.2)	25.50 x 18.25 (64.8 x 46.4)	NP3024C	NP3024CG	28.2x22.2 (71.6x56.4)	4.00 (10.2)	22.00 (55.9)
N412121208WSSC	14/14	12.00 (30.5)	12.00 (30.5)	8.0 (20.3)	7.50 x 6.25 (19.1 x 15.9)	NP1212C	NP1212CG	10.2x10.2 (25.9x25.9)	6.00 (15.2)	—
N412161208WSSC	14/14	16.00 (40.6)	12.00 (30.5)	8.0 (20.3)	11.50 x 6.25 (29.2 x 15.9)	NP1612C	NP1612CG	14.2x10.2 (36.1x25.9)	8.00 (20.3)	—
N412201608WSSC	14/14	20.0 (50.8)	16.00 (40.6)	8.0 (20.3)	15.50 x 10.25 (39.4 x 26.0)	NP2016C	NP2016CG	18.2x14.2 (46.2x36.1)	10.00 (25.4)	—
N412202008WSSC	14/14	20.0 (50.8)	20.0 (50.8)	8.0 (20.3)	15.50 x 14.25 (39.4 x 36.2)	NP2020C	NP2020CG	18.2x18.2 (46.2x46.2)	10.00 (25.4)	—
N412242008WSSC	14/14	24.0 (61.0)	20.0 (50.8)	8.0 (20.3)	19.50 x 14.25 (49.5 x 36.2)	NP2420C	NP2420CG	22.2x18.2 (56.4x46.2)	12.00 (30.5)	—
N412242408WSSC	14/14	24.0 (61.0)	24.0 (61.0)	8.0 (20.3)	19.50 x 18.25 (49.5 x 46.4)	NP2424C	NP2424CG	22.2x22.2 (56.4x56.4)	4.00 (10.2)	16.00 (40.6)
N412302408WSSC	14/14	30.0 (76.2)	24.0 (61.0)	8.0 (20.3)	25.50 x 18.25 (64.8 x 46.4)	NP3024C	NP3024CG	28.2x22.2 (71.6x56.4)	4.00 (10.2)	22.00 (55.9)
N412161210WSSC	14/14	16.0 (40.6)	12.00 (30.5)	10.0 (25.4)	11.50 x 6.25 (29.2 x 15.9)	NP1612C	NP1612CG	14.2x10.2 (36.1x25.9)	8.00 (20.3)	—
N412201610WSSC	14/14	20.0 (50.8)	16.0 (40.6)	10.0 (25.4)	15.50 x 10.25 (39.4 x 26.0)	NP2016C	NP2016CG	18.2x14.2 (46.2x36.1)	10.00 (25.4)	—
N412202010WSSC	14/14	20.0 (50.8)	20.0 (50.8)	10.0 (25.4)	15.50 x 14.25 (39.4 x 36.2)	NP2020C	NP2020CG	18.2x18.2 (46.2x46.2)	10.00 (25.4)	—
N412242010WSSC	14/14	24.0 (61.0)	20.0 (50.8)	10.0 (25.4)	19.50 x 14.25 (49.5 x 36.2)	NP2420C	NP2420CG	22.2x18.2 (56.4x46.2)	12.00 (30.5)	—
N412242410WSSC	14/14	24.0 (61.0)	24.0 (61.0)	10.0 (25.4)	19.50 x 18.25 (49.5 x 46.4)	NP2424C	NP2424CG	22.2x22.2 (56.4x56.4)	4.00 (10.2)	16.00 (40.6)
N412302410WSSC	14/14	30.0 (76.2)	24.0 (61.0)	10.0 (25.4)	25.50 x 18.25 (64.8 x 46.4)	NP3024C	NP3024CG	28.2x22.2 (71.6x56.4)	4.00 (10.2)	22.00 (55.9)
N412202012WSSC	14/14	20.0 (50.8)	20.0 (50.8)	12.00 (30.5)	15.50 x 14.25 (39.4 x 36.2)	NP2020C	NP2020CG	18.2x18.2 (46.2x46.2)	10.00 (25.4)	—
N412242012WSSC	14/14	24.0 (61.0)	20.0 (50.8)	12.00 (30.5	19.50 x 14.25 (49.5 x 36.2)	NP2420C	NP2420CG	22.2x18.2 (56.4x46.2)	12.00 (30.5)	—
N412242412WSSC	14/14	24.0 (61.0)	24.0 (61.0)	2.00 (30.5)	19.50 x 18.25 (49.5 x 46.4)	NP2424C	NP2424CG	22.2x22.2 (56.4x56.4)	4.00 (10.2	16.00 (40.6)
N412302412WSSC	14/14	30.0 (76.2)	24.0 (61.0)	12.00 (30.5)	25.50 x 18.25 (64.8 x 46.4)	NP3024C	NP3024CG	28.2x22.2 (71.6x56.4)	4.00 (10.2)	22.00 (55.9)
N412242416WSSC**	14/14	24.0 (61.0)	24.0 (61.0)	12.00 (30.5	19.50 x 18.25 (49.5 x 46.4)	NP2424C	NP2424CG	22.2x22.2 (56.4x56.4)	4.00 (10.2)	16.00 (40.6)
N412242420WSSC**	14/14	24.0 (61.0)	24.0 (61.0)	12.00 (30.5)	19.50 x 18.25 (49.5 x 46.4)	NP2424C	NP2424CG	22.2x22.2 (56.4x56.4)	4.00 (10.2)	16.00 (40.6)
N412302420WSSC**	14/14	30.0 (76.2)	24.0 (61.0)	20.0 (50.8)	25.50 x 18.25 (64.8 x 46.4)	NP3024C	NP3024CG	28.2x22.2 (71.6x56.4)	4.00 (10.2)	22.00 (55.9)

*Back panels must be ordered separately.

**Enclosures are supplied with closed cell neoprene gasket (not foam-in-place).



Notes:

1. Large Print Pocket (8X10) is furnished if H=20.00" or more and W=20.00" or more, otherwise small (6X6) print pocket is provided.
2. Two Hinges provided with each enclosure.

N412 - CSSST ULTIMATE SERIES SLOPE-TOP ENCLOSURES NEMA 12, 13, 4 & 4X STAINLESS SINGLE DOOR

Applications

N412CSSST ULTIMATE Series Enclosures are designed to house and protect electrical and electronic components from harsh, dirty environments. For use in installations where dirt, dust, oil, water, or other contaminants are present. Streamlined styling, flush latching, and attractive durable finish complement any high tech electronic equipment.

Construction

- Bodies and doors fabricated from 14 gauge 304 stainless steel.
- Continuously Plasma welded seams
- Increased tub opening for better access
- 20˚ sloped top
- Sloped “Top tub flange”
- Concealed hinges
- Doors are interchangeable and easily removable
- Grounding provisions provided
- 1/4-turn semi-flush oil tight latches are supplied to hold door securely closed
- Print pocket is provided
- Doors are sealed with poured-in-place polyurethane gasket**
- Mounting holes in rear of enclosure

Finish

- All exterior surfaces have a smooth grained finish

Industry Standards
UL 508, Types 4, 4X, 12 & 13
CSA Certified, Types 4, 4X, 12 & 13
NEMA/EEMAC Type 4, 4X, 12 & 13

Wall mounting brackets required to maintain UL/CSA external mounting requirements.

UL File E64791

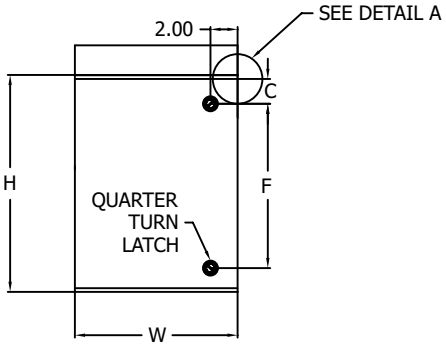
CSA File LL66078

N412 — CSSST ULTIMATE SERIES ENCLOSURES NEMA 4X STAINLESS SLOPE TOP SINGLE DOOR

Catalog Number	Height (Inches)(Cm.)	Width (Inches)(Cm.)	Depth (Inches)(Cm.)	Back Panel Catalog Number* White	304 SS	G	Back Panel Size A&B (Inches)(Cm.)
N412161208CSSST	16.0 (40.6)	12.00 (50.8)	8.0 (20.3)	NP1612	NP1612SSC	NP1612G	14.2x10.2 (36.1x25.9)
N412161608CSSST	16.0 (40.6)	12.00 (50.8)	8.0 (20.3)	NP1616	NP1616SSC	NP1616G	14.2x14.2 (36.1x36.1)
N412201608CSSST	20.0 (50.8)	16.0 (40.6)	8.0 (20.3)	NP2016	NP2016SSC	NP2016G	18.2x14.2 (46.2x36.1)
N412201612CSSST	20.0 (50.8)	16.0 (40.6)	12.0 (30.5)	NP2016	NP2016SSC	NP2016G	18.2x14.2 (46.2x36.1)
N412202008CSSST	20.0 (50.8)	20.0 (50.8)	8.0 (20.3)	NP2020	NP2020SSC	NP2020G	18.2x18.2 (46.2x46.2)
N412202012CSSST	20.0 (50.8)	20.0 (50.8)	12.00 (50.8)	NP2020	NP2020SSC	NP2020G	18.2x18.2 (46.2x46.2)
N412242008CSSST	24.0 (61.0)	20.0 (50.8)	8.0 (20.3)	NP2420	NP2420SSC	NP2420G	22.2x18.2 (56.4x46.2)
N412242408CSSST	24.0 (61.0)	24.0 (61.0)	8.0 (20.3)	NP2424	NP2424SSC	NP2424G	22.2x22.2 (56.4x56.4)
N412242412CSSST	24.0 (61.0)	24.0 (61.0)	12.0 (30.5)	NP2424	NP2424SSC	NP2424G	22.2x22.2 (56.4x56.4)
N412302408CSSST	30.0 (76.2)	24.0 (61.0)	8.0 (20.3)	NP3024	NP3024SSC	NP3024G	28.2x22.2 (71.6x56.4)
N412302412CSSST	30.0 (76.2)	24.0 (61.0)	12.0 (30.5)	NP3024	NP3024SSC	NP3024G	28.2x22.2 (71.6x56.4)
N412303008CSSST	30.0 (76.2)	30.0 (76.2)	8.0 (20.3)	NP3030	NP3030SSC	NP3030G	28.2x28.2 (71.6x71.6)
N412363008CSSST	36.0 (91.4)	30.0 (76.2)	8.0 (20.3)	NP3630	NP3630SSC	NP3630G	34.2x28.2 (86.9x71.6)
N412363012CSSST	36.0 (91.4)	30.0 (76.2)	12.00 (50.8)	NP3630	NP3630SSC	NP3630G	34.2x28.2 (86.9x71.6)
N412363016CSSST	36.0 (91.4)	30.0 (76.2)	16.0 (40.6)	NP3630	NP3630SSC	NP3630G	34.2x28.2 (86.9x71.6)
N412363612CSSST	36.0 (91.4)	36.0 (91.4)	12.00 (50.8)	NP3636	NP3636SSC	NP3636G	34.2x34.2 (86.9x86.9)
N412483616CSSST**	48.0 (121.9)	36.0 (91.4)	16.0 (40.6)	NP4836	NP4836SSC	NP4836G	46.2x34.2 (117.3x86.9)
N412603616CSSST**	60.0 (152.4)	36.0 (91.4)	16.0 (40.6)	NP6036	NP6036SSC	NP6036G	58.2x34.2 (147.8x86.9)

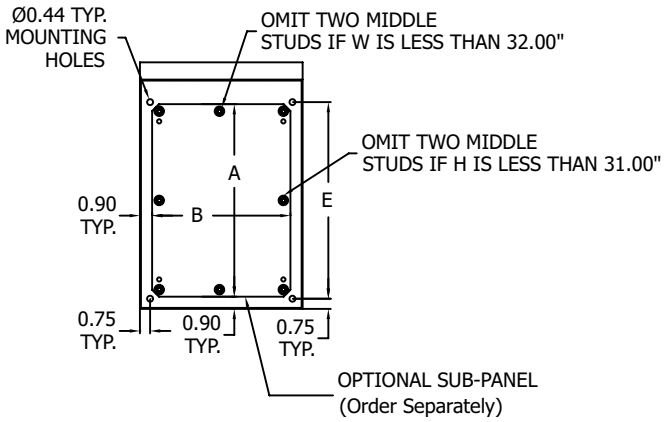
*Back panels must be ordered separately.

**Enclosures are supplied with closed cell neoprene gasket (not foam-in-place).

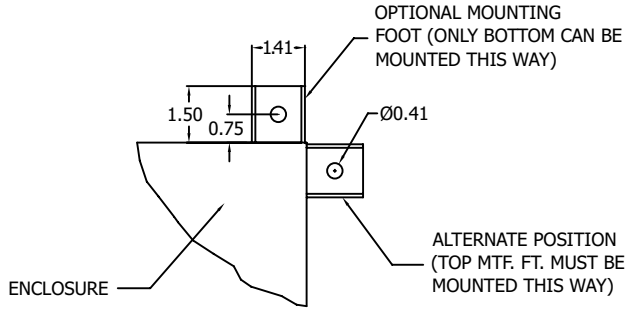


FRONT VIEW

RIGHT VIEW



SECTION A-A



DETAIL A
(OPTIONAL MOUNTING FOOT)

Notes:

1. Large Print Pocket (8 X 10) is furnished if H=20.00" or more and W=20.00" or more Otherwise, small (6 X 6) print pocket is provided.

2. Two Hinges provided with H<36.00". Three Hinges provided when H=36.00" or greater. Four Hinges provided when H=48.00" or greater.

ENCLOSURE DEFINITIONS AND CLASSIFICATIONS

Industry Definitions

The National Electrical Manufacturers Association (NEMA) is a US Manufacturers Organization which actively promotes standardized product specifications for electrical apparatus.

While NEMA does not actually test products, it establishes the performance criteria for enclosures intended for specific environments.

NEMA standards describe each type of enclosure in general and functional terms, and specifically omits reference to construction details. In other words NEMA specifies what an enclosure must do, not how to manufacture it. This is also true about the EN 60.529/IEC 529.

NEMA performance criteria and test methods are used by Underwriters Laboratories (UL) and Canadian Standards Association (CSA) as guidelines for investigation and listing of electrical enclosures.

The tested enclosures are then authorized to carry a label by UL or CSA to prove it has passed the required tests and meets the applicable UL and CSA standard.

NEMA CLASSIFICATIONS
DEFINITIONS – NON-HAZARDOUS LOCATIONS

Type 3

Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, sleet, and external ice formation. NEMA Standard 1-10-1979.

Type 4X

Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water. NEMA Standard 1-10-1979.

ENCLOSURES TYPES NON-HAZARDOUS LOCATIONS

Type Designation	National Electrical Manufacturers Association (Nema Standard 250) and Electrical and Electronic Mfg. Association of Canada (EEMAC)	Underwriters Laboratories Inc. (Ul 50 And Ul 508)	Canadian Standards Association (Standard C22.2 No. 94)
3R	Enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against falling rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain and snow; undamaged by the external formation of ice on the enclosure.
4X	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.	Indoor or outdoor use; provides a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external formation of ice on the enclosure; resists corrosion.
	This material is reproduced from NEMA. The preceding descriptions, however, are not intended to be complete representations of National Electrical Manufacturers Association standards for enclosures nor those of the Electrical and Electronic Manufacturers Association of Canada.	This material is reproduced from Underwriters Laboratories Inc. Standard for Safety for Cabinets and Boxes, UL 50, Copyright 1997 and Industrial Control Equipment, UL 508, Copyright 1996 by Underwriters Laboratories Inc. Underwriters Laboratories Inc. (UL) shall not beresponsible to anyone for the use of or reliance upon a UL Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or connection with the use, interpretation of, or reliance upon a UL Standard.	This material is reproduced from the Canadian Standards Association.

ENCLOSURE ALTERATIONS/RECOMMENDATIONS

1. Prepping Cutout And Punched Holes

A. All cutouts and punching of holes must be free of burrs and sanded smooth for proper fit of accessories.

B. All holes / bare metal must be painted to prevent rusting of the steel, ensure the U.L. rating of the enclosure, and to maintain the integrity of the enclosure finish.

2. Mounting Instructions

Wall mounted enclosures have either an internal mounting means or external mounting feet. Proper fasteners must be used in all mounting holes to secure the enclosure to the wall.

3. Door Closing Adjustments

If the surface on which the enclosure is mounted is not flat, the door may not open and close properly. Also, if heavy equipment is mounted on a large door,the door may sag slightly. If the top of the door strikes the lip which extends around the body opening, place metal shims behind the mounting foot which is located at the bottom of the enclosure and closest to the door hinge. Place the shims between the mounting foot and the wall or mounting surface. Be sure all mounting screws are tightened securely.

4. Panel Installation

When the interior panel is being installed, it may be necessary to bend one or more mounting studs slightly to permit the panel to fit in place. Simply position the panel on the studs that line up properly and pry the other studs into position with a suitable screwdriver inserted through the panel holes.

5. Removing Hinge Pins From Continuous Hinges

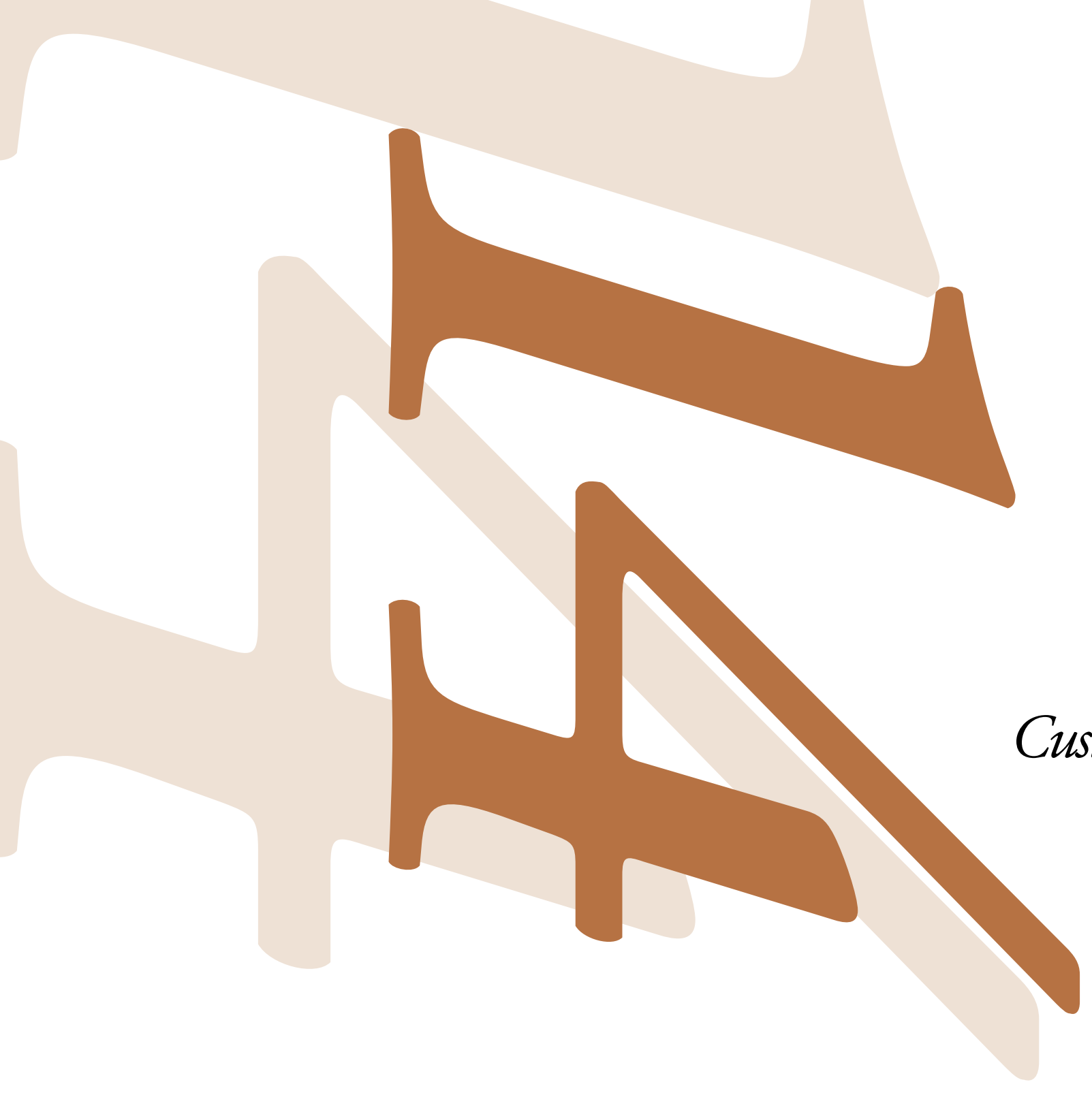
This can be a difficult operation requiring one or more people. This procedure is best accomplished by using a small diameter punch to drive the hinge pin toward the bottom of the enclosure. Lay the wall-mounted and floor-mounted or free-standing enclosure on its back side. When the hinge pin protrudes about two inches below the bottom hinge barrel, bend the end of the pin 180° so it is shaped like the letter “J”. Use an electric or air powered vibrating hammer fitted with a tool which has a hole in the end to fit over the hinge pin, and drive the hinge pin out while opening and closing the door. To install the hinge pin, straighten the pin and drive it in with the vibrating hammer while opening and closing the door. Most hinge pins have one end chamfered, so be sure to start the chamfered end first when installing the pin.

6. Print Pocket

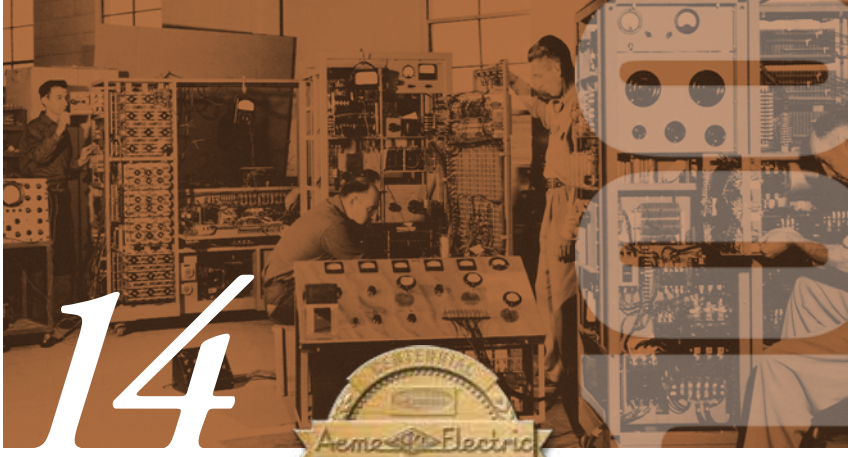
The print pocket on the door can be mounted in any location or position using the self adhesive strip, or removed entirely.

7. Lifting Enclosures By Eyebolts

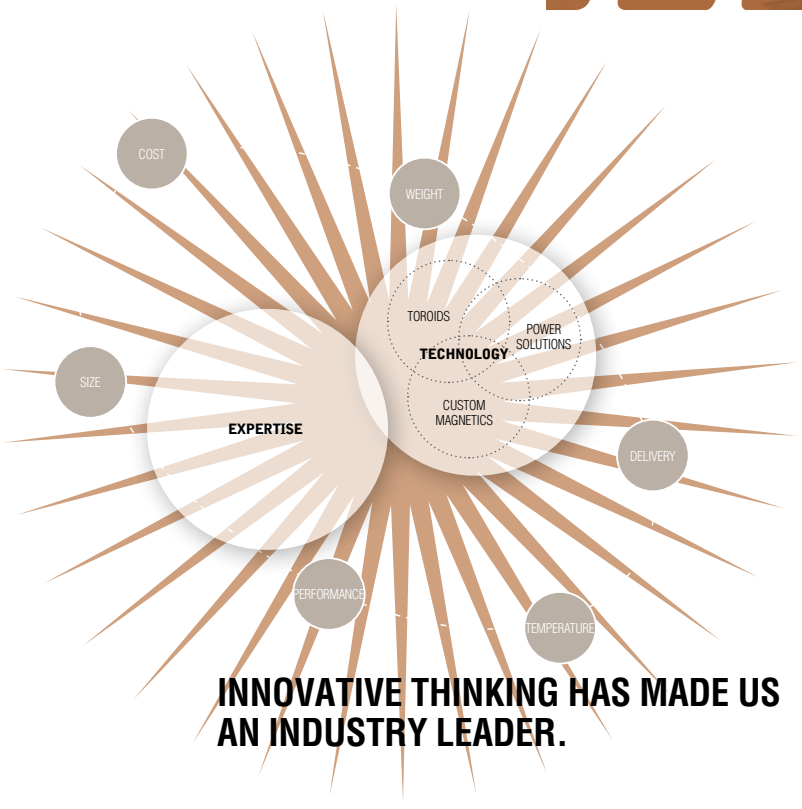
To lift an enclosure which has eyebolts or mounting feet, be sure to use all the eyebolts and top mounting feet provided. Arrange the chains and cables with spreader bars so you are lifting straight up on the eyebolts or top mounting feet. Eyebolts are used for lifting, shipping, and moving purposes. It is the customers responsibility to ensure that lifting eyes are tightened to maintain proper seal /NEMA/and UL rating (factory installed rubber washers must be used).



Custom Solutions



Section **14**



INNOVATIVE THINKING HAS MADE US AN INDUSTRY LEADER.

Whatever your power distribution needs, Acme Electric can deliver high performing, efficient, and reliable magnetic products designed specifically for your manufacturing requirements. From large-scale projects to one-of-a-kind prototypes, our engineers understand the demands of the industry you support and will work with your team from initial concept through testing, production, installation, and service. We draw on over a century of magnetic experience and technology to meet your specific requirements for size, cost, weight, temperature, performance, reliability, regulatory compliance, and delivery.

TOROIDS

Acme Electric's Amveco brand specializes in the design and construction of class-leading toroid magnetics, both standard and custom, for the most challenging applications, including the medical and communications industry. Increasingly useful for their small size and low weight, our power toroids are appropriate for

- Current Transformers from low to high voltage
- Inductors
- Low Profile Miniature Transformers
- Low Profile PC-Mount Transformers
- Medical Grade Isolation Transformers

Because they are designed for optimum efficiency, our toroids operate with demonstrated reductions in stray magnetic fields, mechanical hum, no-load losses, operating temperatures, size, and weight. Our production capabilities are flexible and allow for a variety of dimensions not restricted by set standards of core cap or lamination sizes.

HIGH FREQUENCY CUSTOM MAGNETICS

Acme Electric's Actown brand of custom designed and built high frequency magnetics range from five-ton units to miniatures measured in millimeters. Our specialized products extend the boundaries of size, weight, performance, and endurance to meet your specific performance and dependability specifications.

Utilizing a wide array of materials and manufacturing processes we are able to offer products for various applications including low noise, harmonic mitigation, 12 pulse and 18 pulse drive isolation transformer, low temperature rise, reactors, chokes, and power quality.

Acme Electric's Actown technologies are the answer to today's custom power magnetics critical performance and dependability requirements.

TIGHTpak™ TOROIDAL INDUCTORS

The TIGHTpak™ technology is a revolutionary and proprietary manufacturing process unique to Acme Electric that brings toroidal inductors one step closer to ideal.

TIGHTpak™ Toroidal Inductors are designed to allow more turns per single layer of windings, allowing the engineer to work with components that exhibit behavior closer to ideal than previously possible. In addition, keeping a toroid's geometry to a single layer minimizes complexity and maximizes design efficiency. TIGHTpak™ Toroids are the ideal solution when your application requires low temperature rise, smaller footprint, low noise, or additional inductance.

CUSTOM COILS

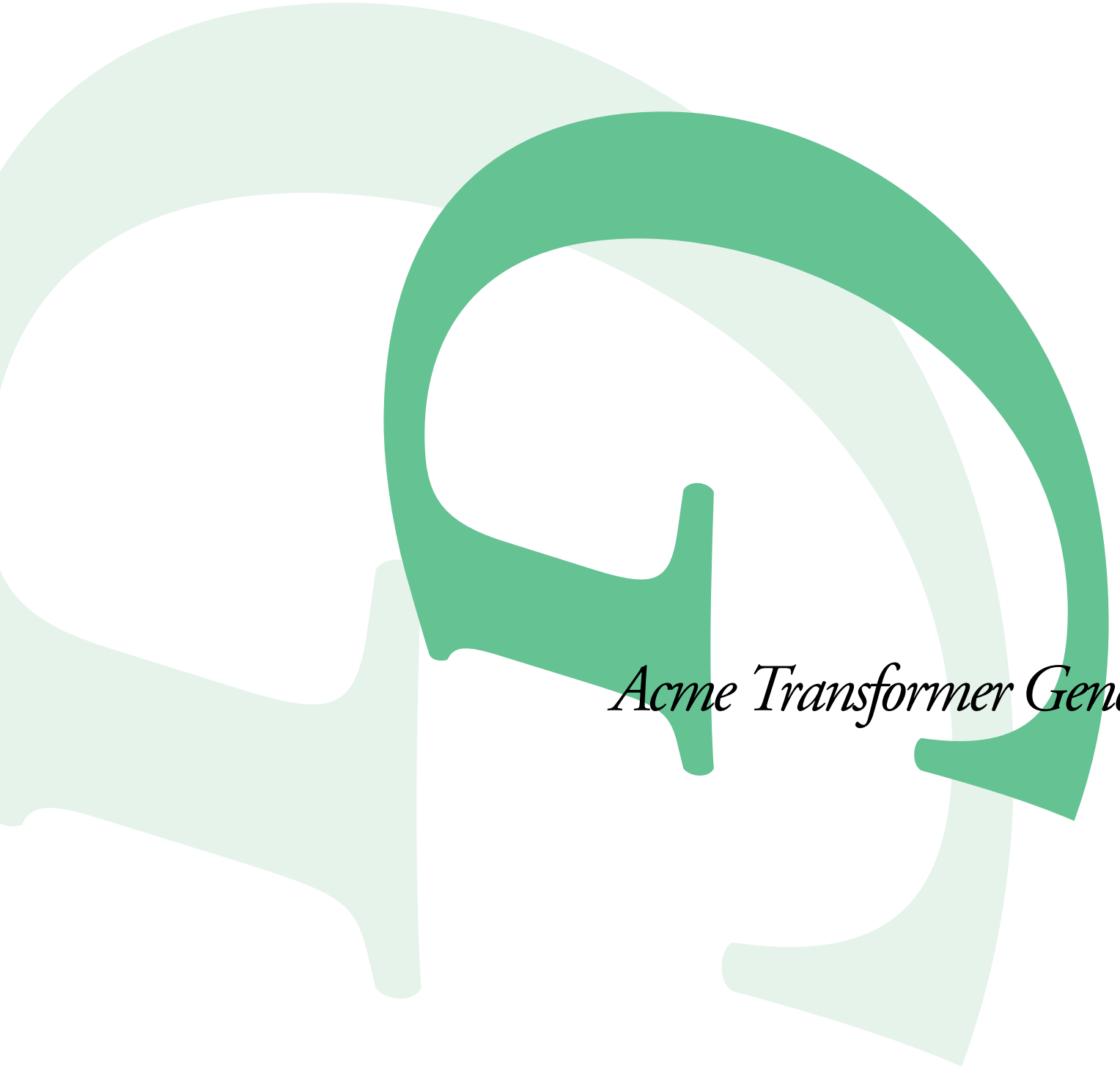
Acme Electric's custom coils range from a relay of simple coils wound on a bobbin to highly sophisticated encapsulated coils used to control aircraft fuel delivery. Sizes range from ultra-small, fine wire-wound sense coils for circuit breakers to very large, high-power coils for electric brakes and large contractor applications. Depending on your needs, we can encapsulate these coils via injection molding, transfer molding, vacuum potting, and various protective air-dried or baked-on varnishes.

LOW AND MEDIUM VOLTAGE POWER DISTRIBUTION

Acme Electric manufactures a full line of dry-type low and medium, voltage distribution magnetics using both copper and aluminum conductors. Our product offering covers the full spectrum of applications, ranging from commercial general power distribution and high harmonic conditions to specific industrial motor drive/factory automations systems, to low voltage landscape lighting applications. All of our products are designed to meet or exceed the standards established by UL, CSA, CE, NEMA, ANSI, and IEEE.

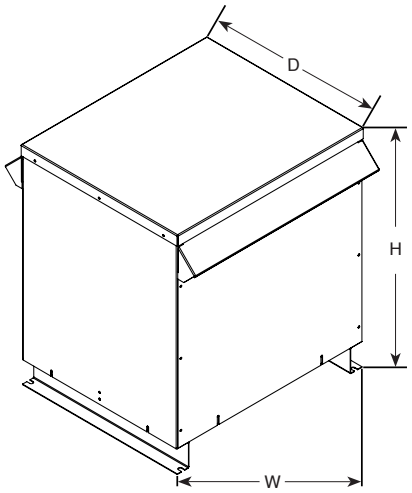
Our low voltage distribution products (600 volts and below) cover a wide array applications between from 50VA through 1000KVA. Our medium voltage transformers (2.5kV to 15kV) are sized between 15 kVA and 2000 kVA.

In addition to this extensive product line, our experienced design engineers are able to develop custom designs and prototypes to meet all customer specific requirements, ranging from special kVA, voltage combinations and performance characteristics to special mounting configurations/footprints, enclosures, and terminations.



Acme Transformer General Information

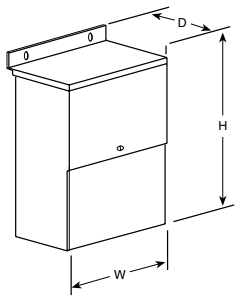
Section G



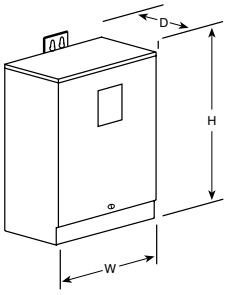
Design Figures, Wiring Diagrams, Accessories, Specification Guides, Industry Standards and Alphanumerical Catalog Number Index

DESIGN FIGURES - Section 1, 2, 3, 4 and 5

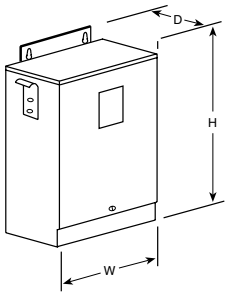
These drawings are for reference only. Contact factory for certified drawings.



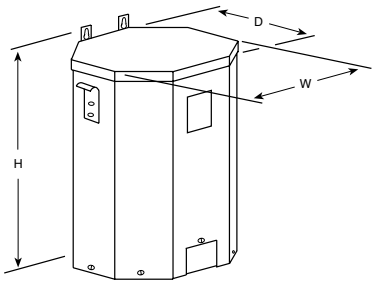
Design A



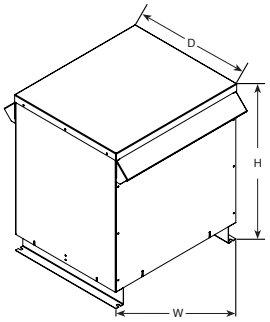
Design B



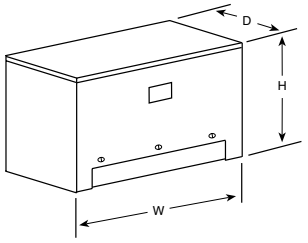
Design C



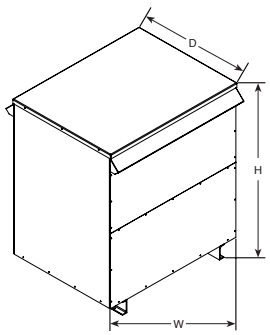
Design D



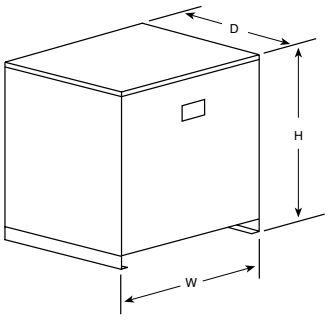
Design E



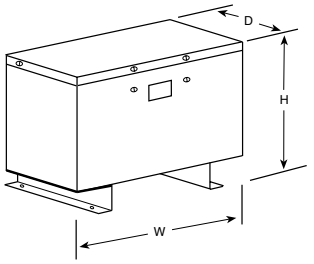
Design F



Design G



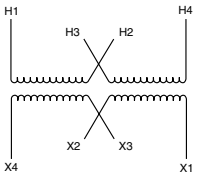
Design H



Design I

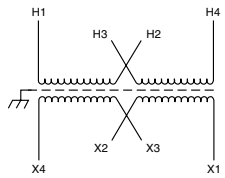
Wiring Diagrams - Section 1, 2, 3, 4 and 5

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



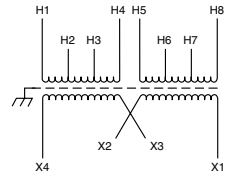
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1-H4	H2 to H3	
240	H1-H3 & H2-H4		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

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



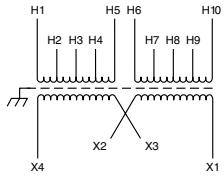
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1-H4	H2 to H3	
240	H1-H3 & H2-H4		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

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



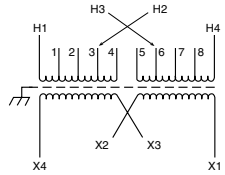
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
252	H1-H8	H1 to H5 H4 to H8	
240	H1-H7	H1 to H5 H3 to H7	
228	H1-H6	H1 to H5 H2 to H6	
504	H1-H8	H4 to H5	
492	H1-H8	H3 to H5	
480	H1-H7	H3 to H5	
468	H1-H7	H2 to H5	
456	H1-H6	H2 to H5	
Secondary Volts			
240		X2 to X3	X1-X4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

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



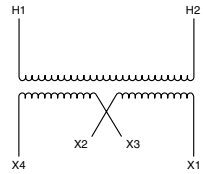
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
216	H1-H10	H1 to H9 H10 to H2	
228	H1-H10	H1 to H8 H10 to H3	
240	H1-H10	H1 to H7 H10 to H4	
252	H1-H10	H1 to H6 H10 to H5	
432	H1-H10	H2 to H9	
444	H1-H10	H3 to H9	
456	H1-H10	H3 to H8	
468	H1-H10	H4 to H8	
480	H1-H10	H4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

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



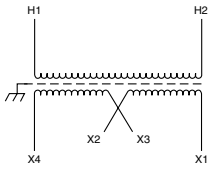
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
216	H1-H4	H1, H3, 8 & H2, H4, 1	
228	H1-H4	H1, H3, 7 & H2, H4, 2	
240	H1-H4	H1, H3, 6 & H2, H4, 3	
252	H1-H4	H1, H3, 5 & H2, H4, 4	
432	H1-H4	H2, 1 & H3, 8	
444	H1-H4	H2, 2 & H3, 8	
456	H1-H4	H2, 2 & H3, 7	
468	H1-H4	H2,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

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



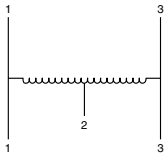
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1-H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

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



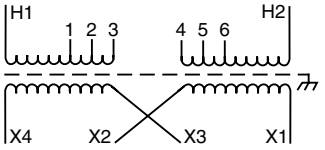
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1-H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

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



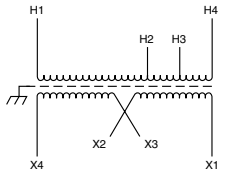
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	1-3		
Secondary Volts			
240			1-3
120			1-2 or 2-3
120/240			1-2-3

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



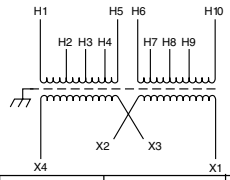
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
218	H1 & H2	3 to 4	
213	H1 & H2	2 to 4	
208	H1 & H2	3 to 5	
203	H1 & H2	2 to 5	
198	H1 & H2	1 to 5	
192	H1 & H2	2 to 6	
187	H1 & H2	1 to 6	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2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

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



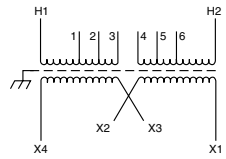
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1-H4		
570	H1-H3		
540	H1-H2		
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

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



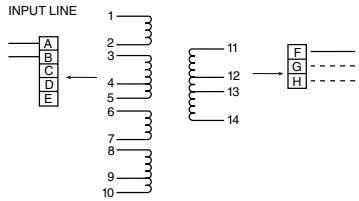
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1 & H7	H1 to H6 H2 to H7	
200	H1 & H8	H1 to H6 H3 to H8	
208	H1 & H9	H1 to H6 H4 to H9	
220	H1 & H10	H1 to H6 H5 to H10	
380	H1 & H7	H2 & H6	
400	H1 & H8	H3 & H6	
416	H1 & H9	H4 & H6	
440	H1 & H10	H5 & H6	
Secondary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

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



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

16 POWER LINE CONDITIONER

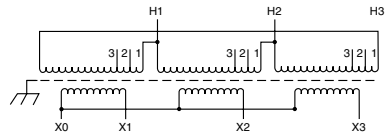


Input Connections Insulate		& Insulate
Volts	**Connect**	
120	1, 3, 6, 8 to A 2, 5, 7, 10 to B	4, 9
208	1, 6 to A 4, 9 to B 2, 3 to C 7, 8 to D	5, 10
240	1, 6 to A 5, 10 to B 2, 3 to C 7, 8 to D	4, 9
480	1 to A 10 to B 2, 3 to C 5, 6 to D 7, 8 to E	4, 9

Output Connections Output		Lines To
Volts	**Connect**	
120	11 to F 12 to G 14 to H	F, G
120/240	11 to F 12 to G 14 to H	F, G, H
208	11 to F 12 to G 13 to H	F, H
240	11 to F 12 to G 14 to H	F, H

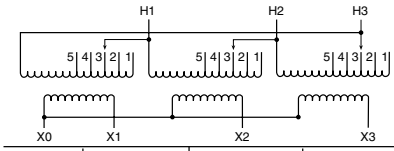
NOTE: To prevent externally shorting, all leads marked "INSULATE" must be individually capped with wire nuts or equivalent. Insulate leads individually!

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



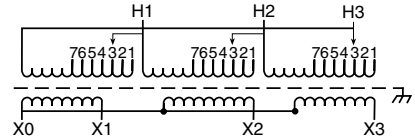
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	H1, H2, H3	1	
228	H1, H2, H3	2	
216	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



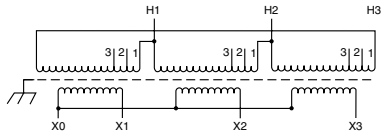
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
252	H1, H2, H3	1	
246	H1, H2, H3	2	
240	H1, H2, H3	3	
234	H1, H2, H3	4	
228	H1, H2, H3	5	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



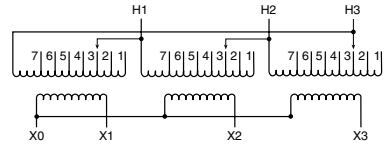
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
399	H1, H2, H3	1	
390	H1, H2, H3	2	
380	H1, H2, H3	3	
371	H1, H2, H3	4	
361	H1, H2, H3	5	
352	H1, H2, H3	6	
342	H1, H2, H3	7	
Secondary Volts			
220			X1, X2,X3
127 1 phase			X1 to X0 X2 to X0 X3 to X0

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



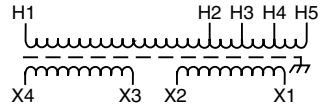
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1, H2, H3	1	
456	H1, H2, H3	2	
432	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



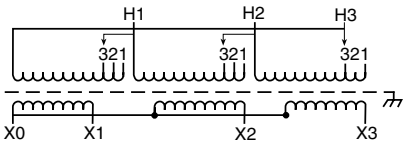
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



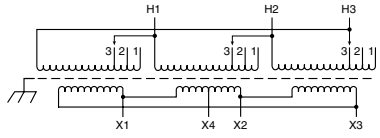
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1, H5		
240	H1, H4		
208	H1, H3		
120	H1, H2		
Secondary Volts			
120		X1 to X3 X2 to X4	X1-X4
120/240		X2 to X3	X1-X2-X4
240		X2 to X3	X1-X4

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



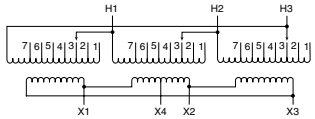
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
380	H1, H2, H3	1	
361	H1, H2, H3	2	
342	H1, H2, H3	3	
Secondary Volts			
220			X1, X2, X3
127 1 phase			X1 to X0 X2 to X0 X3 to X0

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



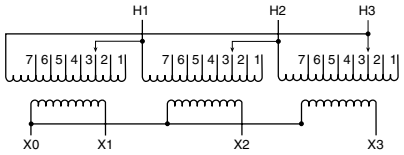
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
480	H1, H2, H3	1	
456	H1, H2, H3	2	
432	H1, H2, H3	3	
Secondary Volts			
240			X1, X2, X3
120			X1, X4 or X2, X4

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



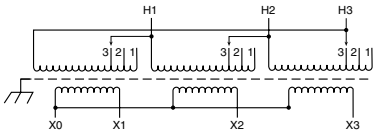
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
240			X1, X2, X3
120			X1, X4 or X2, X4

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



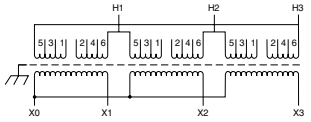
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary LinesTo
504	H1, H2, H3	1	
492	H1, H2, H3	2	
480	H1, H2, H3	3	
468	H1, H2, H3	4	
456	H1, H2, H3	5	
444	H1, H2, H3	6	
432	H1, H2, H3	7	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

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



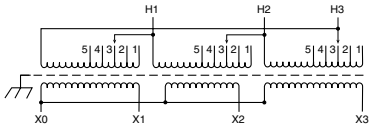
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1, H2, H3	1	
570	H1, H2, H3	2	
540	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



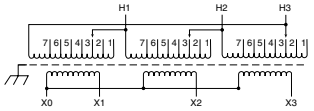
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1 to 2	
492	H1, H2, H3	2 to 3	
480	H1, H2, H3	1 to 4	
468	H1, H2, H3	3 to 4	
456	H1, H2, H3	1 to 6	
444	H1, H2, H3	3 to 6	
432	H1, H2, H3	5 to 6	
Secondary Volts			
480			X1, X2,X3
277 1 phase			X1 to X0 X2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

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



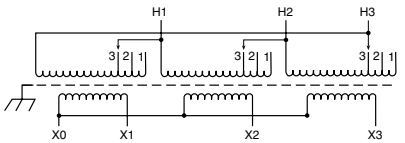
Primary Volts	%	Connect Leads to Tap No.
483	105	1
472	102.5	2
460	100	3
449	97.5	4
437	95	5
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

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



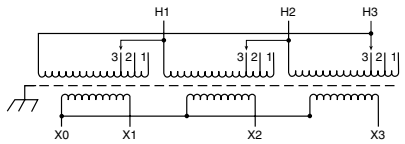
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
555	H1, H2, H3	6	
540	H1, H2, H3	7	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



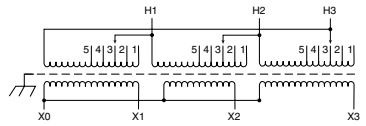
Primary Volts	%	Connect Leads to Tap No.
483	105	1
460	100	2
437	95	3
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

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



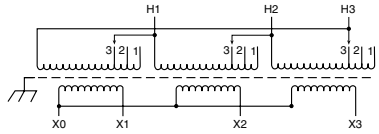
Primary Volts	%	Connect Leads to Tap No.
483	105	1
460	100	2
437	95	3
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

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



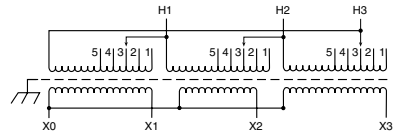
Primary Volts	%	Connect Leads to Tap No.
483	105	1
472	102.5	2
460	100	3
449	97.5	4
437	95	5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

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



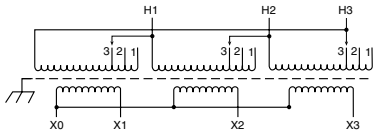
Primary Volts	%	Connect Leads to Tap No.
604	105	1
575	100	2
546	95	3
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

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



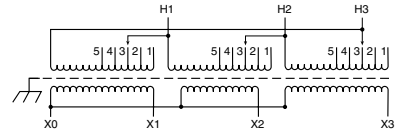
Primary Volts	%	Connect Leads to Tap No.
604	105	1
589	102.5	2
575	100	3
561	97.5	4
546	95	5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

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



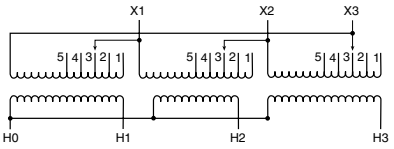
Primary Volts	%	Connect Leads to Tap No.
604	105	1
575	100	2
546	95	3
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

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



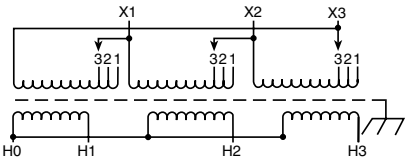
Primary Volts	%	Connect Leads to Tap No.
604	105	1
589	102.5	2
575	100	3
561	97.5	4
546	95	5
Secondary Volts		
460		X1, X2, X3
266 1 phase		X1 & X0 X2 & X0 X3 & X0

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



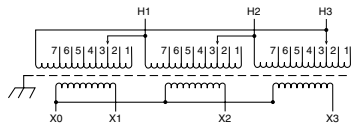
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
218	X1, X2, X3	1	
213	X1, X2, X3	2	
208	X1, X2, X3	3	
203	X1, X2, X3	4	
198	X1, X2, X3	5	
Secondary Volts			
480			H1, H2, H3
277 1 phase			H1 to H0 H2 to H0 H3 to H0

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



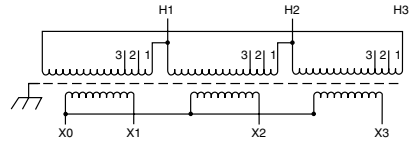
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
208	X1, X2, X3	1	
198	X1, X2, X3	2	
187	X1, X2, X3	3	
Secondary Volts			
480			H1, H2, H3
277 1 phase			H1 to H0 H2 to H0 H3 to H0

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



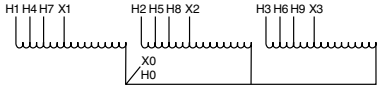
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
630	H1, H2, H3	1	
615	H1, H2, H3	2	
600	H1, H2, H3	3	
585	H1, H2, H3	4	
570	H1, H2, H3	5	
555	H1, H2, H3	6	
540	H1, H2, H3	7	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

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



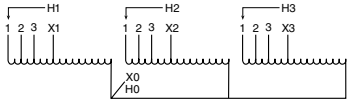
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	H1, H2, H3	1	
570	H1, H2, H3	2	
540	H1, H2, H3	3	
Secondary Volts			
480			X1, X2, X3
277 1 phase			X1 to X0 X2 to X0 X3 to X0

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



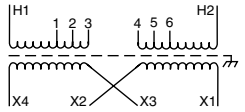
Primary Volts	Alt Rating	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	480	H1, H2, H3		
570	456	H4, H5, H6		
540	432	H7, H8, H9		
Secondary Volts				
480	380			X1, X2, X3
277 1 phase	220 1 phase			X1 to X0 X2 to X0 X3 to X0

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



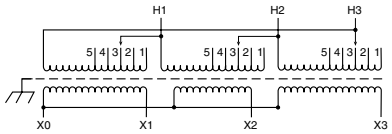
Primary Volts	Alt Rating	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
600	480	H1, H2, H3	1	
570	456	H1, H2, H3	2	
540	432	H1, H2, H3	3	
Secondary Volts				
480	380			X1, X2, X3
277 1 phase	220 1 phase			X1 to X0 X2 to X0 X3 to X0

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



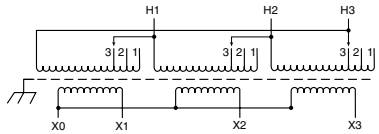
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
208	H1 & H2	3 to 4	
198	H1 & H2	2 to 5	
187	H1 & H2	1 to 6	
Secondary Volts			
240		X2 to X3	X1-X4
120/240		X2 to X3	X1-X2-X4
120		X1 to X3 X2 to X4	X1-X4

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



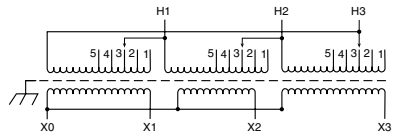
Primary Volts	%	Connect Leads to Tap No.
242	105	1
236	102.5	2
230	100	3
224	97.5	4
219	95	5
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

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



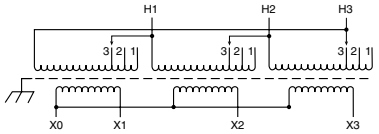
Primary Volts	%	Connect Leads to Tap No.
208	100	1
198	95	2
187	90	3
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 & X0 X2 & X0 X3 & X0

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



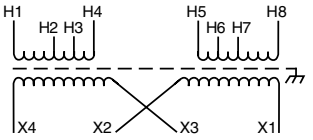
Primary Volts	%	Connect Leads to Tap No.
218	105	1
213	102.5	2
208	100	3
203	97.5	4
198	95	5
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 & X0 X2 & X0 X3 & X0

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



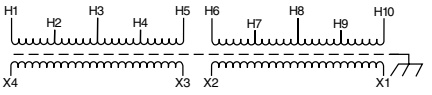
Primary Volts	%	Connect Leads to Tap No.
241	105	1
230	100	2
218	95	3
Secondary Volts		
230		X1, X2, X3
133 1 phase		X1 & X0 X2 & X0 X3 & X0

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



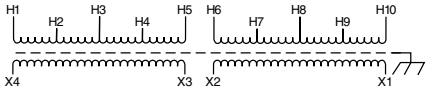
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
120	H1 & H8	H1 to H6 H3 to H8	
208	H1 & H8	H2 to H7	
240	H1 & H8	H3 to H6	
277	H1 & H8	H4 to H5	
Secondary Volts			
240		X2 to X3	X1 & X4
120/240		X2 to X3	X1, X3, X4
120		X1 to X3 X2 to X4	X1 & X4

64 PRIMARY: 190/208/220/240 x 380/416/440/480 Volts SECONDARY: 120/240 Volts



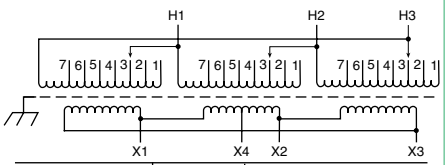
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1& H7	H1 to H6 H2 to H7	
208	H1 & H8	H1 to H6 H3 to H8	
220	H1 & H9	H1 to H6 H4 to H9	
240	H1& H10	H1 to H6 H5 to H10	
380	H1 & H7	H2 to H6	
416	H1 & H8	H3 to H6	
440	H1 & H9	H4 to H6	
480	H1 & H10	H5 to H6	
Secondary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

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



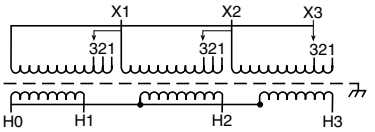
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
190	H1 & H7	H1 to H6 H2 to H7	
200	H1 & H8	H1 to H6 H3 to H8	
208	H1 & H9	H1 to H6 H4 to H9	
220	H1 & H10	H1 to H6 H5 to H10	
380	H1 & H7	H2 to H6	
400	H1 & H8	H3 to H6	
415	H1 & H9	H4 to H6	
440	H1 & H10	H5 to H6	
Secondary Volts			
220		X2 to X3	X1-X4
110/220		X2 to X3	X1-X2-X4
110		X1 to X3 X2 to X4	X1-X4

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



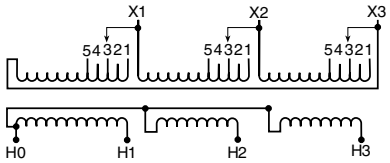
Primary Volts	%	Connect Leads to Tap No.
630	105	1
615	102.5	2
600	100	3
585	97.5	4
570	95	5
555	92.5	6
540	90	7
Secondary Volts		
240		X1, X2, X3
120		X1, X4, or X2, X4

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



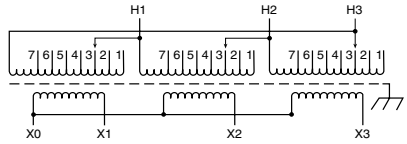
Primary Volts	%	Connect Leads to Tap No.
240	100	1
228	95	2
216	90	3
Secondary Volts		
480		H1, H2, H3
277 1 phase		H1 to H0 H2 to H0 H3 to H0

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



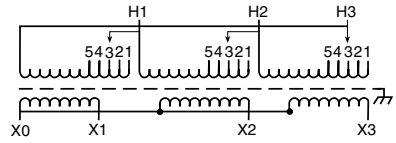
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
252	X1, X2, X3	1	
246	X1, X2, X3	2	
240	X1, X2, X3	3	
234	X1, X2, X3	4	
228	X1, X2, X3	5	
Secondary Volts			
480			H1, H2, H3
277 1 phase			H1 to H0 H2 to H0 H3 to H0

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



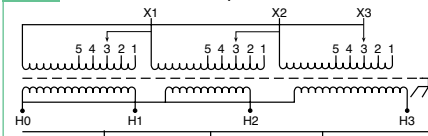
Primary Volts	%	Connect Leads to Tap No.
399	105	1
390	102.5	2
380	100	3
371	97.5	4
361	95	5
352	92.5	6
342	90	7
Secondary Volts		
208		X1, X2, X3
120 1 phase		X1 to X0 X2 to X0 X3 to X0

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



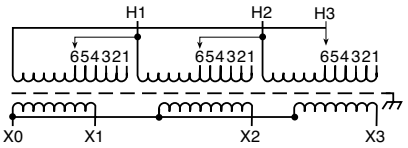
Primary Volts	%	Connect Leads to Tap No.
484	110	1
462	105	2
440	100	3
418	95	4
396	90	5
Secondary Volts		
220		X1, X2, X3
127 1 phase		X1 to X0 X2 to X0 X3 to X0

74 PRIMARY: 190/200/208/220/ 240 Volts Delta SECONDARY: 400Y/231 Volts



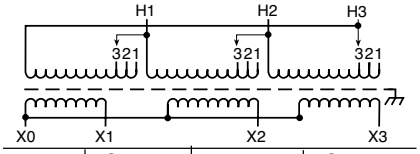
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	X1, X2, X3	1	
220	X1, X2, X3	2	
208	X1, X2, X3	3	
200	X1, X2, X3	4	
190	X1, X2, X3	5	
Secondary Volts			
400			H1, H2, H3
231 1 phase			H1 to H0 H2 to H0 H3 to H0

75 PRIMARY: 190/200/208/220/240 Volts Delta SECONDARY: 400Y/231 Volts



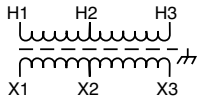
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
240	H1, H2, H3	1	
230	H1, H2, H3	2	
220	H1, H2, H3	3	
210	H1, H2, H3	4	
200	H1, H2, H3	5	
190	H1, H2, H3	6	
Secondary Volts			
400			X1, X2, X3
231 1 phase			X1 to X0 X2 to X0 X3 to X0

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



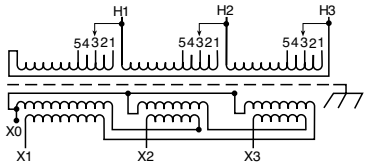
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
504	H1, H2, H3	1	
480	H1, H2, H3	2	
456	H1, H2, H3	3	
Secondary Volts			
208			X1, X2, X3
120 1 phase			X1 to X0 X2 to X0 X3 to X0

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



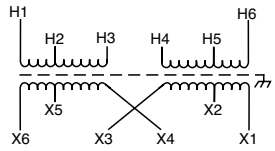
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1 & H2		
480	H1 & H3		
Secondary Volts			
208			X1 to X2
277			X1 to X3

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



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

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



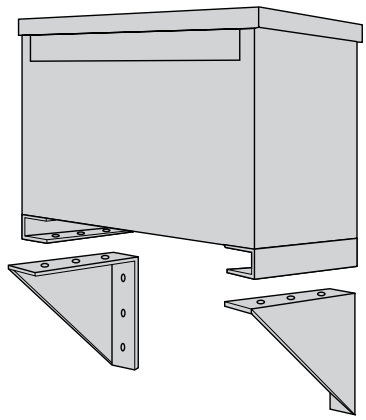
Primary Volts	Connect Primary Lines To	Inter-Connect	Connect Secondary Lines To
277	H1 - H5	H2 to H4	
480	H1 - H6	H3 to H4	
Secondary Volts			
208		X2 to X4	X1 - X5
277		X3 to X4	X1 - X6

WALL MOUNTING BRACKET

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

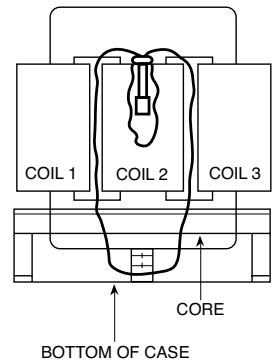


Figure 1

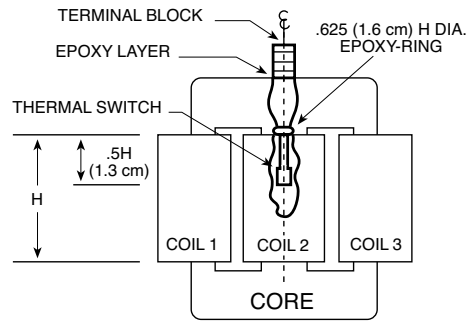


Figure 2

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.

Lug Kits

		Kit Contains			
Catalog Number	Transformer kVA size	Wire Range Al or Cu	Quantity	Nuts and Bolts	Quantity
Lug 1	37 1/2 1-phase	2 -14	8	1/4 - 20 x 3/4	8
	27 - 45 3-phase	250 mcm - 6	4		
Lug 2	50 - 75 1-phase	250 mcm - 6	12	1/4 - 20 x 3/4	8
	51 - 118 3-phase			4 - 20 x 1 3/4	8
Lug 3	100 -167 1-phase	250 mcm - 6	3	1/4 - 20 x 3/4	3
	145 - 300 3-phase	600 mcm - 2	22	3/8 - 16 x 2	16
Lug 4	440 - 660 3-phase	600 mcm - 2	29	3/8 - 16 x 2	8

Weather Shields

Catalog Number	Weight (Lbs.)(Kg.)
WSA1	6 (2.7)
WSA2	7 (3.2)
WSA3	8 (3.6)
WSA4	8 (3.6)
WSA5	10 (4.5)
WSA6	10 (4.5)
WSA8	7 (3.2)
WSB3	30 (13.6)
WSB4	32 (14.5)

SPARE PARTS

Top Cover

Catalog Number	Weight (Lbs.)(Kg.)
SA1701319	14 (6.4)
SA2701319	16 (7.3)
SA3701319	20 (9.1)
SA4701319	34 (15.4)
SA6701319	17 (7.7)

Side Panel

Catalog Number	Weight (Lbs.)(Kg.)
SA1701320	11 (5.0)
SA2701320	13 (5.9)
SA3701320	19 (8.6)
SA4701320	34 (15.4)

Front/Rear Panel

Catalog Number	Weight (Lbs.)(Kg.)
SA1701321	13 (5.9)
SA2701321	15 (6.8)
SA3701321	21 (9.5)
SA4701321	35 (15.9)
SA7701321	16 (7.3)

SPECIFICATION GUIDE FOR DRY TYPE DISTRIBUTION TRANSFORMERS

1.0 Dry Type Transformers:

1.0.0 The following information should be utilized only by trained technical personnel. If you need assistance, please contact Acme's Technical Services Department at 800-334-5214.

1.0.1 Provide dry type, enclosed and ventilated transformers as indicated herein. Transformers shall be Acme or approved equal.

1.0.2 Transformers shall be designed, constructed and rated in accordance with UL, CSA, NEMA, ANSI, IEEE, and OSHA standards.

1.0.3 Transformers rated 27 kVA and larger, single and three phase shall be the ventilated type, incorporating a 220 degree C insulation system and designed not to exceed 150 degree C temperature rise above a 40 degree C ambient under full load conditions. Taps are to be provided on the primary side of the transformer as follows:

(a) 2 - 2.5% above normal full capacity.
4 - 2.5% below normal full capacity.
-or-

(b) 2 - 2.5% above normal full capacity.
2 - 2.5% below normal full capacity.

Alternate 1: 115 degree C rise transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 115 degree C temperature rise above a 40 degree C ambient under full load conditions. In addition, the transformer shall have the ability to carry a continuous 15% overload without exceeding a 150 degree C rise above ambient.

Alternate 2: 80 degree C rise Transformers shall incorporate a 220 degree C insulation system and be designed not to exceed 80 degree C temperature rise above a 40 degree C ambient under full load conditions. In addition, the transformer shall have the ability to carry a continuous 30% overload without exceeding a 150 degree C rise above ambient.

1.0.4 Transformer enclosure finish must be ASA 61 gray powder polyurethane paint. Transformer enclosure temperature shall not exceed 50 degrees C plus the ambient under any condition of loading at any specified temperature rise at or below 150 degrees C.

1.0.5 Transformer enclosure shall be UL/NEMA Type 2 and UL 3R Listed with the addition of a weather shield and shall be so marked on the transformer.

1.0.6 Transformer shall incorporate an electrostatic shield for the attenuation of voltage spikes, line noise, and transients.

1.0.7 Single phase transformers and three phase transformers terminate in copper or aluminum bus bar.

1.0.8 Transformer coils designed and manufactured for increased insulation life, cooler operation, and lower losses.

1.0.9 Transformers must operate at audible sound levels below NEMA Standard ST-20. Sound levels will not exceed the following:

30 - 50 kVA	45 db
51 - 150 kVA	50 db
151 - 300 kVA	55 db
301 - 500 kVA	60 db
501 - 750 kVA	65 db

Transformers must incorporate vibration isolation pads in their construction located between the transformer core and coil assembly and the transformer case. External vibration isolation pads will not be used as they tend to increase audible noise. Transformers shall be floor mounted on a concrete pad. All connections to the transformer will be made by means of flexible metallic conduit.

1.0.10 Transformer enclosure shall be grounded per the National Electric Code.

1.0.11 Transformers shall be dry-type 600 volt class, kVA rating as indicated. Contractor to provide all necessary lugs for all transformers.

1.0.12 Complete shop drawings must be submitted for approval on all dry type transformers.

1.0.13 Typical performance data must be submitted for approval on all transformers. Factory tests must be made in accordance with the latest revisions of ANSI Test Code C57.12.91 for Dry Type Transformers. Performance data provided must contain but not be limited to:

(a) No load losses.

(b) Full load losses.
(c) Polarity and phase rotation.
(d) Impedance at reference temperature.
(e) Efficiencies at 25, 50, 75, and 100% load.
(f) Regulation at 100% and 80% power factor.
(g) Audible sound level.
(h) Dimensions and weight.
(i) Applied potential test.
(j) Induced potential test.
(k) Excitation current.
(l) IR, IX, and IZ percentages.
(m) Reference and ambient temperature.

1.0.14 Warranty: Transformers must be warranted against defects in materials, workmanship, and performance for ten years from date of manufacture.

(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 AND 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.

Underwriters' Laboratories, Inc. is an independent not for profit organization which tests products for safety.

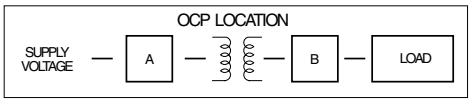
Acme's transformers are designed and manufactured to comply with UL Standard 506, 1561, 1012, or 1062 and carry the applicable UL Listing Label. Because of the continuous product evolutions at Acme, it is best that you contact the factory for the current file and guide numbers associated with the listings.

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))

						Primary		Secondary	
Case	Type of Supply Voltage	Phase	Number of Wires on Secondary	Protection Required	OCP Location	Current (amps)	OCP (% of Rating)	Current (amps)	OCP (% of Rating)
1	Main	10	2	Primary Only	A	≥9 <9, ≥2 <2	125 ① 167 Maximum 300 Maximum	Not Required	
2	Main	10 30	More Than 2 Not Applicable	Primary and Secondary ②	A and B	≥9 <9, ≥2 <2	125 ① 167 Maximum 300 Maximum	≥9 <9	125 ① 167 Maximum
3	Feeder Circuit with OCP	10	2	None on Either	—		Not Required		Not Required
4	Feeder Circuit with OCP	10 30	More Than 2 Not Applicable	Secondary Only ②	B		Not Required	9 <9	125 ① 167 Maximum

Acme® Transformer™ Products vs. U/L Insulation Systems & U/L Standards

Acme Construction Style	Acme Catalog Product Name	U/L Standard	U/L Product Catalog	U/L File Number	U/L Listed Control Number	U/L Insulation Number	Insulation System Temperature/C	kVA Single Phase	kVA Three Phase
Enclosed	General Purpose and Buck-Boost	506	XPTQ	E79947V1	50B8	B3223	130	.50-.150	N/A
Compound Filled (Encapsulated)	General Purpose and Buck-Boost and DIT	506	XPTQ	E79947V1	50B8	X3221 H3221	155 180	.25-5.0 7.5-25.0	N/A 7.5-75.0
	Panel Trans®	1062	YEFR	E56936V1	N/A	H3180 H3221	180 180	5.0 7.5-25.0	N/A 9.0-30.0
	Hardwired CVR	1012	QQFU	E86492V1	6B81	B3223 X3221	130 155	.25-3.0 5.0-15.0	N/A N/A
	Portable PLC	1012	QQFU	E86492V1	60B1	B3223	130	.25-2.0	N/A
Open Core & Coil	Industrial Control	506	XPTQ	E79947V1	50B8	B3223	130	.050-5.0	N/A
Air Cooled Ventilated & Non Ventilated	General Purpose Opti-Miser® & DIT	1561	XQNX	E12547V3	542B	C3222	220	37.5-250.0	25-1000
Enclosed	Air Conditioning and Refrigeration Appliance	NONE	NONE	NONE	N/A	NONE	130	.085-2.0	N/A

① % of rated current (or next higher standard rating).

② In cases where the secondary is overcurrent protected, the primary overcurrent protection rating can be no more than 250% (2.5 times) full load amps (shown on above chart). For example, if a 10 kVA, single phase transformer has a 480V primary and a 120/240 secondary, and the secondary is overcurrent protected, maximum primary overcurrent protection rating is 20.8 amps (full load current) x 2.5 (250%) = 52. Therefore, use a standard 50 amp fuse or breaker selected from NEC Section 240-6 (below).

Section 240-6 of the 1999 National Electrical Code. The standard ampere ratings for fuses and inverse time circuit breakers shall be considered 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000 and 6000 amperes.

Exception: Additional standard ratings for fuses shall be considered 1, 3, 6, 10, and 601. “Extracted by permission from ANSI/NFPA 70-1999, National Electrical Code®, Copyright©,1999, National Fire Protection Association, Boston, MA.”

Acme Electric–Power Distribution Products Division has never used polychlorinated biphenyls (PCBs) in the manufacture of our quality products.

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.

OUR HISTORY IS
STRONG, ENGAGING AND DEDICATED...
JUST LIKE OUR **PEOPLE.**

Acme Electric Celebrates A Centennial Year To Be Proud Of!

In 1917, Acme Electric began its legacy of producing top performing electrical products in Cleveland, OH. Founded as Acme Electric and Machine Company, the product offering consisted of motor-driven battery chargers, electrical appliances, and electrical generators.

Throughout the 100 years of Acme Electric's existence, we have developed a bold offering of transformer product lines from Low Voltage Distribution Transformers to our NEW Medium Voltage Distribution and 3 Phase Buck Boost Transformers.

As we grow, Acme Electric will continue the tradition of commitment to a diversified mix of Power Quality and Power Conversion products.

2017 will be a year of celebrating new product releases that will solidify Acme Electric's position for the next 100 years.

Learn more about us at **hubbell-acmeelectric.com**

HUBBELL® Acme Electric®

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Warranty Certificate

Acme Electric 10-Year Limited* Warranty

Acme Electric (Acme) warrants to the original purchaser to correct by repair, replacement or refund of original purchase price, at Acme's option, products manufactured and sold by its Power Distribution Products Division, that may fail in service within the applicable period as set forth below, from the date of manufacture provided however, that conditions of operation have been normal at all times, and that the equipment has not been subjected to abnormal stress from such causes as incorrect primary voltage or frequency, improper ventilation or improper use. This warranty is made on the condition that prompt notice of defect is given to Acme in writing within the warranty period, and that Acme's inspection reveals to its satisfaction that the original purchaser's claim is valid under the terms of this warranty. Acme's obligation under this warranty, which is in lieu of all other warranties, express or implied, including the implied warranty of fitness for a particular purpose and merchantability, is limited to replacing or repairing defective products or parts, free of charge, provided they are returned to the factory, or refund of original purchase price, at Acme's option. However, purchased components (except for timers and photocells used in low voltage lighting power supplies) including but not limited to capacitors, circuit breakers, terminal blocks, batteries, fuses and tubes shall not be covered under this warranty. Repairs or replacement deliveries shall not interrupt or prolong the term of this warranty. Acme will not be liable for any special, indirect, consequential or incidental damages, including, without limitation, from loss of use, data, function or profits deriving out of or in connection with the use or performance of the product and shall have no liability for payment of any other damages whether in an action of contract, strict liability or tort. The remedy provided herein states Acme Electric's entire liability and buyer's sole and exclusive remedy here under. Rights may vary in certain states.

***Warranty Period:**

Standard Catalog Transformers 10-year limited — Medium Voltage Transformer 3-year limited — Custom products 1-year.
Din Rail Power Supplies 2-year limited — Electrical Enclosures 1 year limited — Surge Protective Devices 2 or 10-year limited

HUBBELL®

Acme Electric®

10 YEARS WARRANTY

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.

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Shielded for Cleaner Power™

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