SECTION 1

DRY-TYPE DISTRIBUTION TRANSFORMERS

600 Volt Class and Below Single and Three Phase

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

Transformer Questions & Answers

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

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

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

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

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

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

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

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

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

10. How do you select transformers?

(1) Determine primary voltage and frequency.

(2) Determine secondary voltage required.

(3) Determine the capacity required in volt-amperes.

This is done by multiplying the load current (amperes) by the load voltage (volts) for single phase. For example: if the load is 40 amperes, such as a motor, and the secondary voltage is 240 volts, then 240 x 40 equals 9600 VA. A 10 KVA (10,000

volt-amperes) transformer is required. ALWAYS SELECT THE TRANSFORMER LARGER THAN THE ACTUAL LOAD. This is done for safety purposes and allows for expansion, in case more load is added at a later date. For 3 phase KVA, multiply rated volts x load amps x 1.73 (square root of 3) then divide by 1000.

(**4**) Determine whether taps are required. Taps are usually specified on larger transformers.

(5) Use the selection charts in Section I.

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

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

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

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

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

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

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

Referring to Figure A, small fractional KVA transformers use insulation class 130°C. Compound filled transformers use insulation class 180°C. Larger ventilated transformers are designed to use 220°C insulation.

All of these insulation systems will normally have the same number of years operating life. A well designed transformer, observing these temperature limits, will have a life expectancy of 20-25 years.

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

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

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

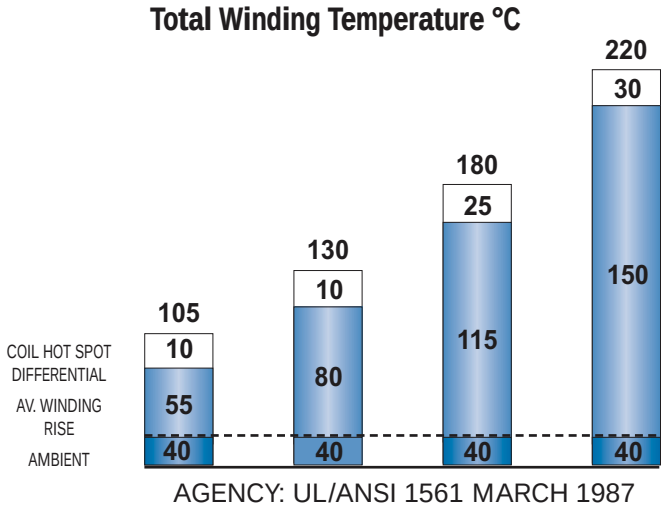


Figure A

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

Calculate as follows:

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

20.8 Amperes

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

520 Amps

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

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

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

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

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

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

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

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

23. What color are ACME Dry-Type Transformers? ASA 61 (NEMA) light gray is used on all enclosed transformers from .050 to 500 KVA.

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

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

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

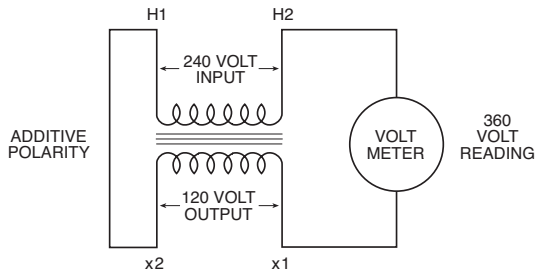
25. Can transformers listed in this catalog be reconnected as autotransformers to increase their KVA rating? Several standard single phase transformers listed in this catalog can be connected as autotransformers. The KVA capacity will be greatly increased when used as an autotransformer, in comparison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

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

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

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

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



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

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

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

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

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

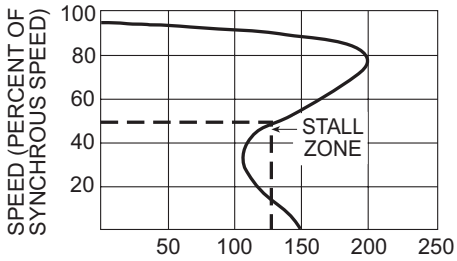
34. How are transformers sized to operate Three Phase induction type squirrel cage motors? The minimum transformer KVA rating required to operate a motor is calculated as follows:

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

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

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

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



TORQUE (PERCENT OF FULL LOAD TORQUE)
SPEED vs TORQUE FOR A TYPICAL THREE PHASE INDUCTION TYPE SQUIRREL CAGE MOTOR

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

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

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

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

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

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

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

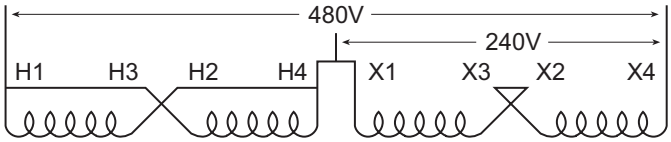


Figure 1

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

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

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

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

Enclosure Definitions

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

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

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

Definitions Pertaining to Enclosures

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

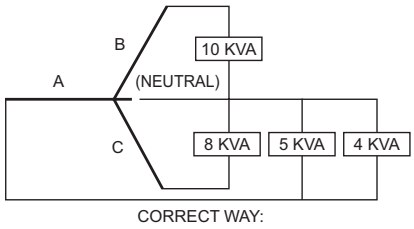
Non-Ventilated — means constructed to provide no intentional circulation of external air through the enclosure.

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

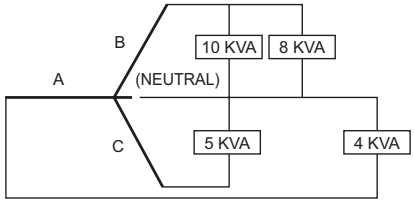
Outdoor Locations — are those areas exposed to the weather.

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

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

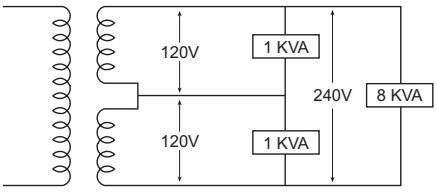


CORRECT WAY:

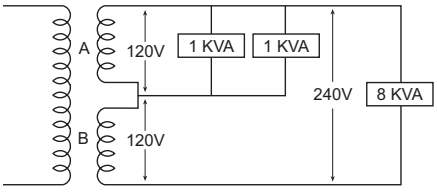


INCORRECT WAY:

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



CORRECT WAY:



INCORRECT WAY:

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

(1) Distribute power at high voltage.

(2) Eliminate double wiring.

(3) Operate 120 volt equipment from power circuits.

(4) Insulate circuits/establish separately derived circuits.

(5) Provide 3-wire secondary circuits.

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

(7) Provide electrostatic shielding for transient noise protection.

Steps for Selecting the Proper Transformer

SINGLE PHASE LOADS

1. Determine electrical load

A. Voltage required by load.

B. Amperes or KVA capacity required by load.

C. Frequency in Hz (cycles per second).

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

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

2. Determine supply voltage

A. Voltage of supply (source).

B. Frequency in Hz (cycles per second).

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

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

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

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

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

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

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

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

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

Single Phase Example

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

Answer: Compute the KVA required.

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

For each lighting fixture

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

TABLE 1

Full Load Current in Amperes – Single Phase Circuits

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

TABLE 2

Full Load Amperes Single Phase A.C. Motors ①

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

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

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

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

THREE PHASE LOADS

1. Determine electrical load

A. Voltage required by load.

B. Amperes or KVA required by load.

C. Frequency in Hz (cycles per second).

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

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

2. Determine supply voltage

A. Voltage of supply (source).

B. Frequency in Hz (cycles per second).

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

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

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

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

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

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

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

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

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

Three Phase Example

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

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

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

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

Heater — 4 KVA

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

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

TABLE 3

Full Load Current in Amperes – Three Phase Circuits

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

TABLE 4

Full Load Amperes Three Phase A.C. Motors ①

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

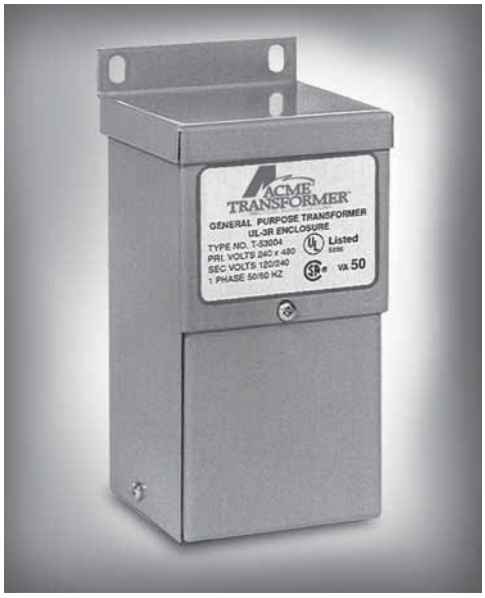
① When motor service factor is greater than 1, increase full load amps proportionally. **Example:** If service factor is 1.15, increase above amp values by 15%.

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

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

UL-3R Enclosures

SINGLE PHASE, .05 to .150 KVA



FEATURES

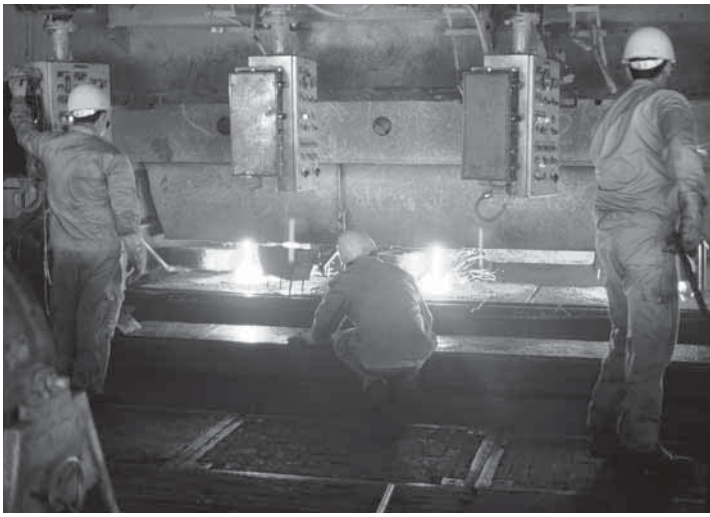
- **UL listed, CSA certified and UL-3R enclosure** meets or exceeds all listing criteria including NEMA, ANSI and OSHA standards.
- **Easy and convenient installation** to meet your requirements, the transformer can be mounted in any position.
- **Long Life** UL class 130°C insulation system. Transformers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

SINGLE PHASE, .250 to 25 KVA

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

FEATURES

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



Shielded Power in Many Design Styles

THREE PHASE 3 to 75 KVA

FEATURES

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

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

NEW

316 STAINLESS STEEL TRANSFORMERS

FEATURES

- 3R enclosure.
- Comply with NEC Class 1, Division 2, when installed per NEC 501-2 (b).
- Encapsulated construction.
- Single phase: 0.25 – 25 KVA.
  Three phase: 3 – 7.5 KVA.
- Core and Coil assembly completely encapsulated in polyester or epoxy seals out all moisture, eliminating corrosion and deterioration of insulation.
- Electrostatic shielding.

APPLICATIONS

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

SINGLE PHASE 37.5 to 250 KVA
THREE PHASE 25 to 1000 KVA

FEATURES

- **With weather shield, UL Type 3R enclosure** type 2 enclosure without weather shield. UL listed and CSA certified.
- **UL Class 220°C** insulation system, 150°C rise.
- **Extra large wiring** compartment for easier installation and cooler case temperatures.
- **NEMA standard bus bar terminals,** no special tools needed to make clearly marked connections. Tap changing easily accomplished with jumpers.
- **Aluminum windings** for increased insulation life, cooler operation, lower losses.
- **Noise and vibration isolating pads** standard to assure **quiet** operation.
- **Large permanently legible nameplates** on front.
- **Single phase units** can be banked for 3 phase service.
- **All units have ground studs** for use with non-metallic conduit.
- **Suitable for wall or "trapeze" mounting**. Wall brackets are available for units up to 50 KVA single and 75 KVA three phase.
- **Other models** are available with class 220°C insulation and either 115°C or 80°C rise operating temperature. Refer to Opti-Miser® Section.
- **Termination** — single phase 37.5 to 100 KVA, copper bus; 167 to 250 KVA, aluminum bus. Three phase 27 to 225 KVA, copper bus; 275 to 1000 KVA, aluminum bus.
- **Electrostatic shielding** provided on all 60 Hz isolation transformers.
- **Electrostatic shielding** not available on Groups D1 and G1.

NEW

LN SERIES
LOW NOISE TRANSFORMERS

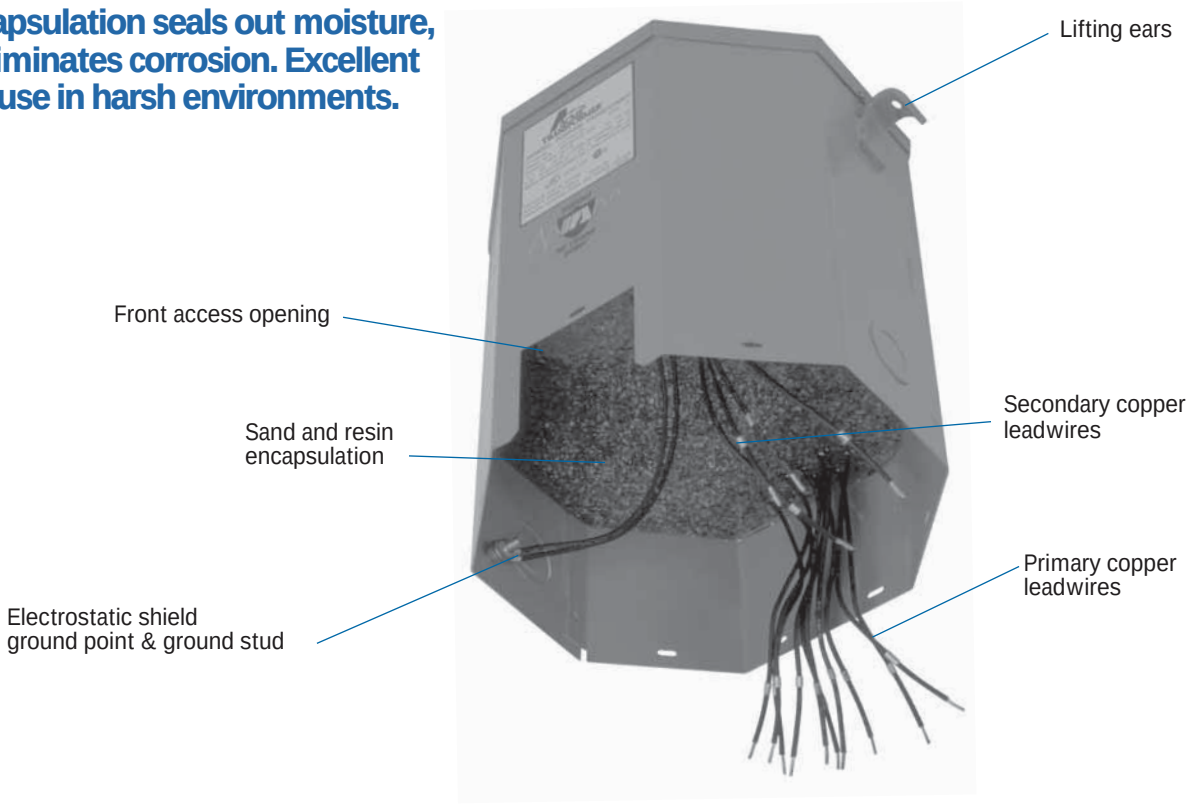
FEATURES

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

APPLICATIONS

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

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



Wound Core construction for lower losses and quiet operation.

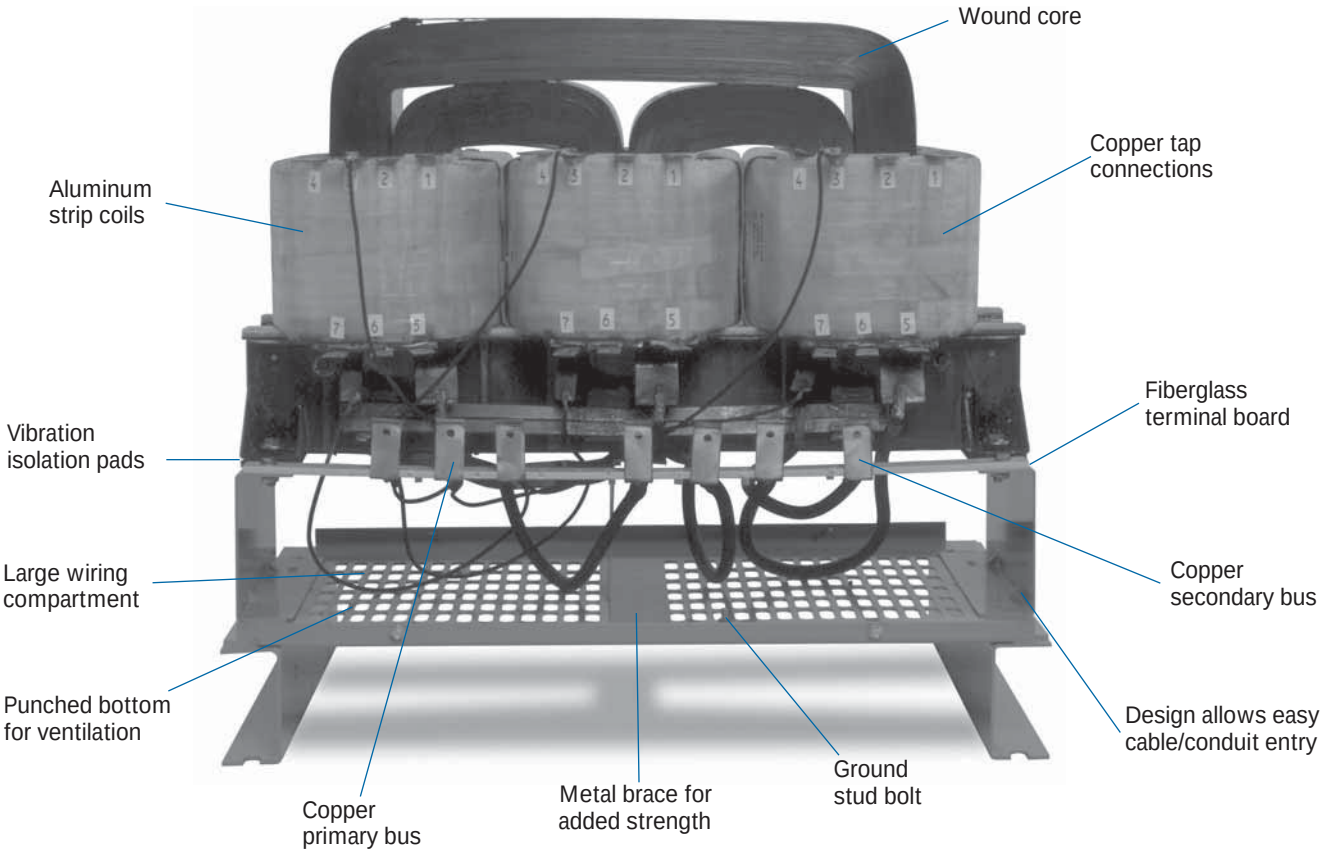


Photo representative of Drive Isolation Transformer

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

SELECTION CHARTS

SINGLE PHASE

GROUP I

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
① .05	T-1-53004	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	W	0.875 (2.2)	NA	1–A
① .10	T-1-53005	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	W	0.875 (2.2)	NA	1–A
① .15	T-1-53006	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	W	0.875 (2.2)	NA	1–A
① .25	T-2-53007-S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	0.50-0.75 (1.3-1.9)	NA	2–B
① .50	T-2-53008-S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	2–B
① .75	T-2-53009-S	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	2–B
1.00	T-2-53010-S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	2–B
1.50	T-2-53011-S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	2–B
2.00	T-2-53012-S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	2–B
3.00	T-2-53013-S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	2–C
3.00	T-2-53013-4S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	3–C
5.00	T-2-53014-S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	2–C
5.00	T-2-53014-4S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	3–C
7.50	T-2-53515-3S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	4–D
10.00	T-2-53516-3S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	4–D
15.00	T-2-53517-3S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	4–D
25.00	T-2-53518-3S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	4–D
37.50	T-2-53019-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	280 (127.0)	F②	NA	WS-A-1	5–E
50.00	T-2-53020-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	350 (158.8)	F②	NA	WS-A-1	5–E
75.00	T-2-53021-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	430 (195.0)	F	NA	WS-A-3	5–E
100.00	T-2A-53022-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	525 (238.0)	F	NA	WS-A-4	5–E
167.00	T-1-53023-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1050 (476.3)	F	NA	WS-A-5	5–E
250.00	T-2-53024-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1440 (653.2)	F	NA	WS-A-5	5–E

NEW

GROUP I – 316SS

316 STAINLESS STEEL

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
0.25	T-2-53007-SS	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	NA	NA	2-B
0.50	T-2-53008-SS	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	NA	NA	2-B
0.75	T-2-53009-SS	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	NA	NA	2-B
1.00	T-2-53010-SS	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	NA	NA	2-B
1.50	T-2-53011-SS	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	NA	NA	2-B
2.00	T-2-53012-SS	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	NA	NA	2-B
3.00	T-2-53013-SS	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	NA	NA	3-C
5.00	T-2-53014-SS	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	NA	NA	3-C
7.50	T-2-53515-SS	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	NA	NA	4-D
10.00	T-2-53516-SS	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	NA	NA	4-D
15.00	T-2-53517-SS	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	NA	NA	4-D
25.00	T-2-53518-SS	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	NA	NA	4-D

① Suitable for 50/60 Hz.

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

GROUP IA

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
7.50	TC-53515-3S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	100 (45.4)	W	0.75-1.25 (1.9-3.2)	NA	4–D
10.00	TC-53516-3S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	120 (54.4)	W	0.75-1.25 (1.9-3.2)	NA	4–D
15.00	TC-53517-3S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	160 (72.6)	W	1.00-1.50 (2.5-3.8)	NA	4–D
25.00	TC-53518-3S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	4–D
37.50	TC-53019-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	295 (133.8)	F②	NA	WS-A-1	5–E
50.00	TC-53020-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	378 (172.0)	F②	NA	WS-A-1	5–E
75.00	TC-53021-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	468 (212.3)	F	NA	WS-A-3	5–E
100.00	TC-53022-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	768 (348.4)	F	NA	WS-A-4	5–E

GROUP II

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
37.50	TE-2-53019-3S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	430 (195.0)	F②	NA	NA	5–H
50.00	TE-2-53020-3S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	430 (195.0)	F②	NA	NA	5–H
75.00	TE2A-53021-3S	35.47 (90.1)	31.90 (81.0)	26.90 (68.3)	525 (238.0)	F	NA	NA	5–H
100.00	TE-1-53022-3S	42.00 (106.7)	40.00 (101.6)	30.00 (76.2)	775 (352.0)	F	NA	NA	5–H

GROUP III

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
1.0	T-3-53040-S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	13–B
1.5	T-3-53041-S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	13–B
2.0	T-3-53042-S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	13–B
3.0	T-3-53043-S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	13–C
5.0	T-3-53044-S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	13–C
7.5	T-3-53545-S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	13–D
10.0	T-3-53546-S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	13–D
15.0	T-3-53547-S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	13–D
25.0	T-3-53548-S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	13–D

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

GROUP IV

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
① .05	T-1-53104	6.41 (16.3)	3.14 (8.0)	3.05 (7.7)	4 (1.8)	W	0.875 (2.2)	NA	8–A
① .10	T-1-53105	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	5 (2.3)	W	0.875 (2.2)	NA	8–A
① .15	T-1-53106	7.16 (18.2)	3.89 (9.9)	3.67 (9.3)	7 (3.2)	W	0.875 (2.2)	NA	8–A
① .25	T-2-53107-S	8.68 (22.0)	4.08 (10.4)	3.88 (9.9)	10 (4.5)	W	0.50-0.75 (1.3-1.9)	NA	9–B
① .50	T-2-53108-S	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	9–B
① .75	T-2-53109-S	9.68 (24.6)	4.75 (12.1)	4.50 (11.4)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	9–B
1.00	T-2-53110-S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	9–B
1.50	T-2-53111-S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	9–B
2.00	T-2-53112-S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	9–B
3.00	T-2-53113-1S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	10–C
5.00	T-2-53114-1S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	10–C
7.50	T-2-53615-1S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	10–D
10.00	T-2-53616-1S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	10–D
15.00	T-2-53617-1S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	10–D
25.00	T-2-53618-1S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	10–D
37.50	T-2-53119-3S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	275 (125.0)	F ②	NA	WS-A-1	11-E
50.00	T-2-53120-3S	29.90 (76.0)	28.15 (71.5)	22.37 (56.8)	340 (154.0)	F ②	NA	WS-A-2	11–E
75.00	T-2-53121-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	420 (191.0)	F	NA	WS-A-3	11–E
100.00	T-2A-53122-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	525 (238.0)	F	NA	WS-A-4	11–E
167.00	T-1-53123-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	700 (318.0)	F	NA	WS-A-5	11–E

GROUP V

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
1.0	T-2-53140-1S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	6–B
1.5	T-2-53141-1S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	6–B
2.0	T-2-53142-1S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	6–B
3.0	T-2-53143-1S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	6–C
5.0	T-2-53144-1S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	6–C
7.5	T-2-53645-1S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	6–D
10.0	T-2-53646-1S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	6–D
15.0	T-2-53647-1S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	6–D
25.0	T-2-53648-1S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	6–D
37.5	T-2-53649-1S	25.48 (64.7)	24.39 (62.0)	19.37 (49.2)	257 (117.0)	F ②	N/A	WS-A-1	58–E
50.0	T-2-53650-3S	25.48 (64.7)	24.39 (62.0)	19.37 (49.2)	340 (154.2)	F ②	N/A	WS-A-1	17–E
NEW 75.0	T-2-53651-3S	35.40 (89.9)	31.90 (81.0)	26.88 (68.2)	420 (190.5)	F ②	N/A	WS-A-3	17–E

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

GROUP VI

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
1.0	T-2-53170-1S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	7–B
1.5	T-2-53171-1S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	7–B
2.0	T-2-53172-1S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	7–B
3.0	T-2-53173-1S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	7–C
5.0	T-2-53174-1S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	7–C
7.5	T-2-53675-1S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	7–D
10.0	T-2-53676-1S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	125 (56.7)	W	0.75-1.25 (1.9-3.2)	NA	7–D
15.0	T-2-53677-1S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	170 (77.1)	W	1.00-1.50 (2.5-3.8)	NA	7–D
25.0	T-2-53678-1S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	250 (113.0)	W	1.00-1.50 (2.5-3.8)	NA	7–D

GROUP VII

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
1.0	T-2-79740-S	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	23 (10.4)	W	0.50-0.75 (1.3-1.9)	NA	23–B
1.5	T-2-79741-S	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	23–B
2.0	T-2-79742-S	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	37 (16.8)	W	0.50-0.75 (1.3-1.9)	NA	23–B
3.0	T-2-79743-S	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	23–C
5.0	T-2-79744-S	14.38 (36.5)	10.31 (26.2)	7.13 (18.1)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	23–C
7.5	T-2-79745-S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	105 (47.6)	W	0.75-1.25 (1.9-3.2)	NA	63–D
10.0	T-2-79746-S	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	124 (56.2)	W	0.75-1.25 (1.9-3.2)	NA	63–D
15.0	T-2-79747-S	16.94 (43.0)	14.12 (35.9)	11.59 (29.4)	171 (77.6)	W	1.00-1.50 (2.5-3.8)	NA	63–D
25.0	T-2-79748-S	18.44 (46.8)	16.13 (41.0)	13.34 (33.9)	261 (118.4)	W	1.00-1.50 (2.5-3.8)	NA	63–D

GROUP VIII

AUTO-TRANSFORMERS

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
1.0	T-2-53060	9.06 (23.0)	4.37 (11.1)	4.20 (10.7)	15 (6.8)	W	0.50-0.75 (1.3-1.9)	NA	12–B
1.5	T-2-53061	9.68 (24.6)	4.50 (11.4)	4.51 (11.5)	19 (8.6)	W	0.50-0.75 (1.3-1.9)	NA	12–B
2.0	T-2-53062	10.50 (26.7)	5.50 (14.0)	5.13 (13.0)	24 (10.9)	W	0.50-0.75 (1.3-1.9)	NA	12–B
3.0	T-2-53063	11.62 (29.5)	5.50 (14.0)	5.13 (13.0)	30 (13.6)	W	0.50-0.75 (1.3-1.9)	NA	12–B
5.0	T-2-53064	13.00 (33.0)	5.50 (14.0)	5.13 (13.0)	38 (17.2)	W	0.50-0.75 (1.3-1.9)	NA	12–B
7.5	T-2-53065	11.50 (29.2)	10.31 (26.2)	7.13 (18.1)	55 (24.9)	W	0.75-1.25 (1.9-3.2)	NA	12–C
10.0	T-2-53066	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	12–D
15.0	T-2-53067	15.19 (38.6)	13.50 (34.3)	10.84 (27.5)	115 (52.2)	W	0.75-1.25 (1.9-3.2)	NA	12–D

GROUP IX

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	F P	146
1.0	2 17437	10.50 26.7	5.50 14.0	5.13 13.0	24 10.9		0.50 0.75 1.3 1.9			14	
2.0	2 17439	13.00 33.0	5.50 14.0	5.13 13.0	38 17.2		0.50 0.75 1.3 1.9			14	
3.0	2 49873	11.50 29.2	10.31 26.2	7.13 18.1	55 24.9		0.75 1.25 1.9 3.2			14	
5.0	2 52520	14.38 36.5	10.31 26.2	7.13 18.1	75 34.0		0.75 1.25 1.9 3.2			14	
7.5	2 52794	15.19 38.6	13.50 34.3	10.84 27.5	115 52.2		0.75 1.25 1.9 3.2			14	
10.0	2 52795	15.19 38.6	13.50 34.3	10.84 27.5	125 56.7		0.75 1.25 1.9 3.2			14	
15.0	2 52796	16.94 43.0	14.12 35.9	11.59 29.4	170 77.1		1.00 1.50 2.5 3.8			14	
25.0	2 52797	18.44 46.8	16.13 41.0	13.34 33.9	300 136.0		1.00 1.50 2.5 3.8			14	
37.5	2 69218 ①	25.48 16.5	24.39 62.0	19.37 49.2	285 129.0			1		15	
50.0	2 69219 ①	29.41 74.7	28.15 71.5	22.37 56.8	380 172.0			2		15	
75.0	2 69220 ①	35.47 91.2	31.90 81.0	26.88 68.3	445 201.8			3		15	
100.0	2 69221 ①	41.52 90.1	32.90 83.6	29.87 75.9	525 238.0			4		15	

✱ CE Marked

GROUP X

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	F P	146
1.0	2 79260	10.50 26.7	5.50 14.0	5.13 13.0	24 10.9		0.50 0.75 1.3 1.9			64	
2.0	2 79261	13.00 33.0	5.50 14.0	5.13 13.0	38 17.2		0.50 0.75 1.3 1.9			64	
3.0	2 79262	11.50 29.2	10.31 26.2	7.13 18.1	55 24.9		0.75 1.25 1.9 3.2			64	
5.0	2 79263	14.38 36.5	10.31 26.2	7.13 18.1	75 34.0		0.75 1.25 1.9 3.2			64	
7.5	2 79264	15.19 38.6	13.50 34.3	10.84 27.5	115 52.2		0.75 1.25 1.9 3.2			64	
10.0	2 79265	15.19 38.6	13.50 34.3	10.84 27.5	125 56.7		0.75 1.25 1.9 3.2			64	
15.0	2 79266	16.94 43.0	14.12 35.9	11.59 29.4	170 77.1		1.00 1.50 2.5 3.8			64	
25.0	2 79267	18.44 46.8	16.13 41.0	13.34 33.9	300 136.1		1.00 1.50 2.5 3.8			64	

✱ CE Marked

GROUP XI

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	F P	146
1.0	2 79300	10.50 26.7	5.50 14.0	5.13 13.0	24 10.9		0.50 0.75 1.3 1.9			65	
2.0	2 79301	13.00 33.0	5.50 14.0	5.13 13.0	38 17.2		0.50 0.75 1.3 1.9			65	
3.0	2 79302	11.50 29.2	10.31 26.2	7.13 18.1	55 24.9		0.75 1.25 1.9 3.2			65	
5.0	2 79303	14.38 36.5	10.31 26.2	7.13 18.1	75 34.0		0.75 1.25 1.9 3.2			65	
7.5	2 79304	15.19 38.6	13.50 34.3	10.84 27.5	115 52.2		0.75 1.25 1.9 3.2			65	

✱ CE Marked

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

② Maximum exciting current 5% at 50 Hz.

NEW

GROUP XII

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	F P	146
0.25	12 250	8.68 22.0	4.08 10.4	3.88 9.9	12 5.4		0.50 0.75 1.3 1.9			78	
0.50	12 500	9.06 23.0	4.37 11.1	4.20 10.7	19 8.6		0.50 0.75 1.3 1.9			78	
1.00	12 1000	10.50 26.7	5.50 14.0	5.13 13.0	30 13.6		0.50 0.75 1.3 1.9			78	
3.00	12 3000	11.50 29.2	10.31 26.2	7.13 18.1	58 26.3		0.75 1.25 1.9 3.2			78	
5.00	12 5000	14.38 36.5	10.31 26.2	7.13 18.1	80 36.3		0.75 1.25 1.9 3.2			78	
10.00	12 10000	15.19 38.6	13.50 34.3	10.84 27.5	125 56.7		0.75 1.25 1.9 3.2			79	
15.00	12 15000	16.94 43.0	14.12 35.9	11.59 29.4	161 70.0		1.00 1.50 2.5 3.8			79	

SELECTION CHARTS — THREE PHASE

GROUP A

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.) HEIGHT	WIDTH	DEPTH	APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
15.0	T-3-79367-1S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.0)	F ①			48
30.0	2 79368 4	25.50 64.8	24.40 62.0	19.40 49.3	330 150.0	①		1	46
45.0	2 79369 4	25.50 64.8	24.40 62.0	19.40 49.3	400 181.0	①		1	46
75.0	2 79370 4	29.41 74.7	28.15 71.5	22.37 56.8	530 240.0	①		2	46
112.5	2 79371 4	35.47 90.1	31.90 81.0	26.90 68.3	750 340.0			3	46
150.0	2 79372 4	41.52 105.5	32.90 83.6	29.87 75.9	950 430.9			4	46
225.0	2 79373 4	41.52 105.5	32.90 83.6	29.87 75.9	1200 544.0			4	46
300.0	3 79374 4	45.60 115.8	39.50 100.3	35.50 90.2	1550 703.0			5	46
500.0	2 79376 2	57.80 146.8	45.00 114.3	41.50 105.4	3500 1588.0			7	②

GROUP B

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	F P	146
9.0	2 53360 1	14.03 36.0	17.77 45.1	11.52 29.3	180 81.6		0.75 1.25 1.9 3.2			18	
15.0	3 53361 1	18.86 48.0	20.30 51.6	9.03 23.0	250 113.0	①				18	
30.0	3 53362 4	25.50 64.8	24.39 61.9	19.37 49.2	325 147.0	①		1		19	
45.0	3 53363 4	25.50 64.8	24.39 61.9	19.37 49.2	350 158.8	①		1		19	
75.0	3 53364 4	29.41 74.7	28.15 71.5	22.37 56.8	450 204.1	①		2		19	
112.5	2 53365 4	35.47 90.1	31.90 81.0	26.88 68.3	696 294.8			3		19	
150.0	2 53366 4	41.52 105.5	32.90 84.0	29.87 75.9	978 412.8			4		19	
225.0	2 53367 4	41.52 105.5	32.90 84.0	29.87 75.9	1200 544.0			4		19	

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

GROUP D

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
3.0	T-2A-53308-1S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	21–F
6.0	T-2A-53309-1S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	21–F
9.0	T-2A-53310-1S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	21–F
15.0	T-3-53311-1S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	21–I
25.0	T-3-53393-3S	25.48 (64.7)	24.39 (61.9)	19.37 (49.2)	290 (132.0)	F ①	NA	WS-A-1	22–E
30.0	T-3-53312-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	290 (132.0)	F ①	NA	WS-A-1	22–E
37.5	T-3-53394-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WS-A-1	22–E
45.0	T-3-53313-3S	25.50 (64.7)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WS-A-1	22–E
50.0	T-3-53403-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	475 (216.0)	F ①	NA	WS-A-2	22–E
75.0	T-3-53314-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	500 (226.8)	F ①	NA	WS-A-2	22–E
112.5	T-2A-53315-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WS-A-3	22–E
150.0	T-3-53316-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	970 (440.0)	F	NA	WS-A-4	22–E
225.0	T-3-53317-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1200 (544.0)	F	NA	WS-A-4	22–E
300.0	T-3-53318-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	NA	WS-A-5	22–E
500.0	T-2-53319-3S	57.80 (146.8)	45.60 (115.8)	41.50 (105.4)	2480 (1125.0)	F	NA	WS-A-7	22–G
750.0	T-2-53321-3S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	3600 (1633.0)	F	NA	WS-A-6	22–G
1000.0	T-1-53322-2S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	4300 (1950.0)	F	NA	WS-A-6	80–G

NEW

GROUP DI

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
30.0	T-79804-3S	29.59 (75.2)	25.15 (63.9)	22.50 (57.2)	360 (163.3)	F	NA	WS-A-8	22–E
45.0	T-79805-3S	29.59 (75.2)	25.15 (63.9)	22.50 (57.2)	430 (195.0)	F	NA	WS-A-8	22–E
75.0	T-79806-3S	29.59 (75.2)	25.15 (63.9)	22.50 (57.2)	530 (240.4)	F	NA	WS-A-8	22–E
*112.5	T-79807-3	35.90 (91.2)	31.90 (81.0)	26.90 (68.3)	630 (285.8)	F	NA	WS-A-3	67–E

* Non-Shielded Unit

GROUP D2

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
15.0	TC-53311-1S*	18.90 (48.0)	20.30 (51.6)	9.00 (22.9)	245 (111.1)	F ①	NA	NA	21–I
30.0	TC-53312-3S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	346 (157.0)	F ①	NA	WS-A-1	22–E
45.0	TC-53313-3S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	397 (180.1)	F ①	NA	WS-A-1	22–E
75.0	TC-53314-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	521 (236.3)	F ①	NA	WS-A-2	22–E
112.5	TC-53315-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	766 (347.5)	F	NA	WS-A-3	22–E
150.0	TC-53316-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1026 (465.4)	F	NA	WS-A-4	22–E
225.0	TC-53317-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1300 (589.7)	F	NA	WS-A-4	22–E
300.0	TC-1-53318-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1551 (703.5)	F	NA	WS-A-5	22–E
500.0	TC-53319-3S	57.80 (146.8)	45.00 (114.3)	41.50 (105.4)	2819 (1278.7)	F	NA	WS-A-7	22–E

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

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

NEW

GROUP D3

LOW NOISE (minus 3db)

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

KVA	CATALOG NO	APPRO I C HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
30.0	3 53312 3	29.48 74.9	28.15 71.5	22.37 56.8	360 163.3	①		2		22	
45.0	3 53313 3	29.48 74.9	28.15 71.5	22.37 56.8	417 189.2	①		2		22	
75.0	3 53314 3	35.47 90.1	31.90 81.0	26.88 68.3	536 243.1	①		3		22	
112.5	3 53315 3	41.50 105.4	32.90 83.6	29.90 75.9	760 344.7			4		22	
150.0	3 53316 3	41.50 105.4	32.90 83.6	29.90 75.9	950 430.9			4		22	
225.0	3 53317 3	41.50 105.4	32.90 83.6	29.90 75.9	1256 569.7			4		22	

GROUP E

NON-VENTILATED TRANSFORMERS

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

KVA	CATALOG NO	APPRO I C HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
30.0	2 53312 3	29.41 74.7	28.15 71.5	22.37 56.8	425 193.0	①				22	
45.0	2 53313 3	35.47 90.1	31.90 81.0	26.90 68.3	575 261.0					22	
75.0	2 53314 3	41.52 105.5	32.90 83.6	29.87 75.9	965 438.0					22	
112.5	3 53315 3	45.60 115.8	39.50 100.3	35.50 90.2	1450 658.0					22	

GROUP F

ENCAPSULATED TRANSFORMERS, 115° C RISE

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

KVA	CATALOG NO	APPRO I C HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
30.0	3 79312 3	24.81 63.0	27.13 68.9	11.14 28.3	613 278.1					22	
45.0	3 79313 3	25.31 64.3	30.18 76.7	12.76 32.4	780 354.0					22	
75.0	3 79314 3	26.82 68.1	34.68 88.1	15.25 38.7	1126 511.0					22	

NEW

GROUP F 316 SS

316 STAINLESS STEEL ENCAPSULATED TRANSFORMERS, 115° C RISE

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

KVA	CATALOG NO	APPRO I C HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
3.0	2 53308	10.38 26.4	12.37 31.4	7.47 19.0	75 34.0					21	
6.0	2 53309	11.83 30.0	14.17 36.0	8.82 22.4	140 63.5					21	
9.0	2 53310	14.03 35.6	17.77 45.1	11.52 29.3	180 81.6					21	
15.0	3 53311	18.86 47.9	20.30 51.6	9.03 22.9	250 113.0					21	
30.0	3 79312	24.81 63.0	27.13 68.9	11.14 28.3	613 278.1					22	
45.0	3 79313	25.31 64.3	30.18 76.7	12.76 32.4	780 354.0					22	
75.0	3 79314	26.82 68.1	34.68 88.1	15.25 38.7	1126 511.0					22	

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

GROUP G

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

KVA ②	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
3.0	T-2A-53328-1S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	25–F
6.0	T-2A-53329-1S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	25–F
9.0	T-2A-53340-1S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	25–F
15.0	T-3-53341-1S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	25–I
30.0	T-3-53342-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	325 (147.0)	F ①	NA	WS-A-1	26–E
45.0	T-3-53343-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WS-A-1	26–E
75.0	T-3-53344-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	500 (226.8)	F ①	NA	WS-A-2	26–E
112.5	T-2A-53345-3S	35.47 (91.2)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	WS-A-3	26–E
150.0	T-3-53346-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1125 (510.0)	F	NA	WS-A-4	26–E
225.0	T-3-53347-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1200 (544.0)	F	NA	WS-A-4	26–E
300.0	T-3-53348-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1550 (703.0)	F	NA	WS-A-5	26–G
500.0	T-1-53349-3S	62.00 (157.5)	54.00 (137.2)	42.00 (106.7)	2675 (1213.0)	F	NA	WS-B-3	27–G
750.0	T-2-53350-3S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	3408 (1545.8)	F	NA	WS-A-6	26–G

NEW

GROUP GI

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
30.0	T-79844-3S	29.59 (75.2)	25.15 (63.9)	22.50 (57.2)	365 (165.6)	F	NA	WS-A-8	26–E
45.0	T-79845-3S	29.59 (75.2)	25.15 (63.9)	22.50 (57.2)	460 (208.7)	F	NA	WS-A-8	26–E
75.0	T-79846-3S	29.59 (75.2)	25.15 (63.9)	22.50 (57.2)	530 (240.4)	F	NA	WS-A-8	26–E
*112.5	T-79847-3	35.90 (91.2)	31.90 (81.0)	26.90 (68.3)	630 (285.8)	F	NA	WS-A-3	68–E

* Non-Shielded Unit

NEW

GROUP G2

LOW NOISE (minus 3 db)
480 DELTA PRIMARY VOLTS –– 240 DELTA / 120 TAP SECONDARY VOLTS
MAY BE USED ON A 4 WIRE 480Y/277 VOLT SUPPLY –– 3Ø, 60 Hz

KVA	CATALOG NO	APPRO I DIMENSIONS C			APPRO SHIP EIGHT	T PE MTG	KNOCKOUTS	EATHER SHIELD	D		
		HEIGHT	IDTH	DEPTH	L K	F F	I C	P N	D B	F P	146
30.0	3 53342 3	29.48 74.9	28.15 71.5	22.37 56.8	360 163.3	①		2		26	
45.0	3 53343 3	29.48 74.9	28.15 71.5	22.37 56.8	417 189.2	①		2		26	
75.0	3 53344 3	35.47 90.1	31.90 81.0	26.88 68.3	536 243.1	①		3		26	
112.5	3 53345 3	41.50 105.4	32.90 83.6	29.90 75.9	800 362.9			4		26	
150.0	3 53346 3	41.50 105.4	32.90 83.6	29.90 75.9	950 430.9			4		26	
225.0	3 53347 3	41.50 105.4	32.90 83.6	29.90 75.9	1256 569.7			4		26	

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

GROUP H

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
30.0	TE-3-53342-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ①	NA	NA	26–H
45.0	TE-2-53343-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	750 (340.0)	F	NA	NA	26–H
75.0	TE-2-53344-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1125 (510.0)	F	NA	NA	26–H
112.5	TE-3-53345-3S	45.59 (115.8)	39.50 (100.3)	35.50 (90.2)	1150 (522.0)	F	NA	NA	26–H

GROUP I

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
15.0	T-3-3500015-3S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	31–I
30.0	T-2A-3500030-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	325 (147.0)	F ①	NA	WS-A-1	31–E
45.0	T-2A-3500045-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WS-A-1	31–E
75.0	T-3-3500075-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ①	NA	WS-A-2	31–E
112.5	T-2A-3500112-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	710 (322.0)	F	NA	WS-A-3	31–E
150.0	T-2A-3500150-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1155 (524.0)	F	NA	WS-A-4	31–E
225.0	T-2A-3500225-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1210 (548.8)	F	NA	WS-A-4	31–E
300.0	T-3-3500300-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1600 (726.0)	F	NA	WS-A-5	31–E
500.0	TTBD-3500500-3S	62.00 (157.5)	54.00 (137.2)	42.00 (106.7)	2620 (1188.0)	F	NA	WS-B-3	32–G

GROUP J

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
3.0	T-2A-79330-1S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	28–F
6.0	T-2A-79331-1S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	140 (63.5)	W	0.75-1.25 (1.9-3.2)	NA	28–F
9.0	T-2A-79332-1S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	180 (81.6)	W	0.75-1.25 (1.9-3.2)	NA	28–F
15.0	T-3-79333-1S	18.86 (47.9)	20.30 (51.6)	9.03 (22.9)	250 (113.0)	F ①	NA	NA	28–I
30.0	T-13102-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	325 (147.0)	F ①	NA	WS-A-1	29–E
45.0	T-13103-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	400 (181.0)	F ①	NA	WS-A-1	29–E
75.0	T-13104-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	600 (272.0)	F ①	NA	WS-A-2	29–E

GROUP K

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
30.0	T-3-79334-3S	24.81 (63.0)	27.13 (68.9)	11.14 (28.3)	613 (278.1)	F	NA	NA	29–I
45.0	T-3-79335-3S	25.31 (64.3)	30.18 (76.7)	12.76 (32.4)	780 (354.0)	F	NA	NA	29–I
75.0	T-3-79336-3S	26.82 (68.1)	34.68 (88.1)	15.25 (38.7)	1126 (511.0)	F	NA	NA	29–I

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

GROUP M

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
3.0	2 79516 1	10.38 26.4	12.37 31.4	7.47 19.0	75 34.0		0.75 1.25 1.9 3.2			55	
6.0	2 79517 1	11.83 30.0	14.17 36.0	8.82 22.4	140 63.5		0.75 1.25 1.9 3.2			55	
9.0	2 79518 1	14.03 38.8	17.77 45.1	11.52 29.3	180 81.6		0.75 1.25 1.9 3.2			55	
15.0	3 79519 1	18.86 47.9	20.30 51.6	9.03 22.9	250 113.0	①				55	
30.0	2 79520 3	29.41 74.7	28.15 71.5	22.37 56.8	400 181.0	①		2		51	
45.0	2 79521 3	29.41 74.7	28.15 71.5	22.37 56.8	425 193.0	①		2		51	
75.0	3 79522 3	29.41 74.7	28.15 71.5	22.37 56.8	700 318.0	①		2		51	
112.5	2 79523 3	35.47 90.1	31.90 81.0	26.88 68.3	750 340.0			3		51	
150.0	2 79524 3	41.52 105.5	32.90 83.6	29.87 75.9	1125 510.0			4		51	

GROUP 0

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
3.0	2 79268 1	10.38 26.4	12.37 31.4	7.47 19.0	75 34.0		0.75 1.25 1.9 3.2			60	
6.0	2 79269 1	11.83 30.0	14.17 36.0	8.82 22.4	140 63.5		0.75 1.25 1.9 3.2			60	
9.0	2 79270 1	14.03 36.0	17.77 45.1	11.52 29.3	180 81.6		0.75 1.25 1.9 3.2			60	
15.0	3 79271 1	18.86 48.0	20.30 51.6	9.03 22.9	245 111.0	①				60	
30.0	2 79272 4	25.50 64.8	24.39 61.9	19.37 49.2	300 136.0	①		1		61	
45.0	2 79273 4	25.48 64.7	24.39 61.9	19.37 49.2	365 166.0	①		1		61	
75.0	2 79274 4	29.41 74.7	28.15 71.5	22.37 56.8	500 227.0	①		2		61	
112.5	2 79275 4	35.47 90.1	31.90 81.0	26.88 68.3	700 318.0			3		61	
150.0	2 79276 4	41.52 105.5	32.90 83.6	29.87 75.9	970 440.0			4		61	
225.0	2 79277 4	41.52 105.5	32.90 83.6	29.87 75.9	1200 544.0			4		61	

GROUP P

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
30.0	13142 3	25.50 64.8	24.39 61.9	19.37 49.2	299 135.6	①		1		69	
45.0	13143 3	25.48 64.7	24.39 61.9	19.37 49.2	353 160.1	①		1		69	
75.0	13144 3	29.41 74.7	28.15 71.5	22.37 56.8	463 210.0	①		2		69	

GROUP Q

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
15.0	3 79693 1	18.86 48.0	20.30 51.6	9.03 22.9	245 111.1	①				70	
30.0	2 79694 4	25.50 64.8	24.39 61.9	19.37 49.2	330 149.7	①		1		71	
45.0	2 79695 4	25.48 64.7	24.39 61.9	19.37 49.2	380 172.4	①		1		71	
75.0	2 79696 4	29.41 74.7	28.15 71.5	22.37 56.8	455 206.4	①		2		71	
112.5	2 79697 4	35.47 90.1	31.90 81.0	26.88 68.3	687 311.6			3		71	
150.0	2 79698 4	41.52 105.5	32.90 83.6	29.87 75.9	973 441.3			4		71	

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

GROUP R

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

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
3.0	T-2A-79708-4S	10.38 (26.4)	12.37 (31.4)	7.47 (19.0)	75 (34.0)	W	0.75-1.25 (1.9-3.2)	NA	33–F
6.0	T-2A-79709-4S	11.83 (30.0)	14.17 (36.0)	8.82 (22.4)	120 (54.4)	W	0.75-1.25 (1.9-3.2)	NA	33–F
9.0	T-2A-79710-4S	14.03 (36.0)	17.77 (45.1)	11.52 (29.3)	175 (79.4)	W	0.75-1.25 (1.9-3.2)	NA	33–F
15.0	T-3-79711-4S	18.86 (48.0)	20.30 (51.6)	9.03 (22.9)	245 (111.1)	F ①	NA	NA	33–I
30.0	T-3-79712-3S	25.50 (64.8)	24.39 (61.9)	19.37 (49.2)	295 (133.8)	F ①	NA	WS-A-1	72–E
45.0	T-3-79713-3S	25.48 (64.7)	24.39 (61.9)	19.37 (49.2)	353 (160.1)	F ①	NA	WS-A-1	72–E
75.0	T-3-79714-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	457 (207.3)	F ①	NA	WS-A-2	72–E
112.5	T-2A-79715-3S	35.47 (90.1)	31.90 (81.0)	26.88 (68.3)	679 (308.0)	F	NA	WS-A-3	72–E

GROUP T

380 DELTA PRIMARY VOLTS –– 220Y/127 SECONDARY VOLTS –– 3Ø, 50/60 Hz

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
15.0	T-3-79551-1S	20.80 (52.8)	20.90 (53.1)	10.20 (25.9)	435 (197.3)	F	NA	NA	24–I
30.0	T-2A-79552-3S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	365 (165.6)	F ①	NA	WS-A-1	20–E
45.0	T-2A-79553-3S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	468 (212.3)	F ①	NA	WS-A-2	20–E
75.0	T-2A-79554-3S	35.47 (90.1)	31.90 (80.0)	26.88 (68.3)	693 (314.3)	F	NA	WS-A-3	20–E
112.5	T-2A-79555-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	970 (440.0)	F	NA	WS-A-4	20–E
150.0	T-2-79556-3S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	1100 (499.0)	F	NA	WS-A-4	20–E
225.0	T-3-79557-3S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1600 (725.7)	F	NA	WS-A-5	20–E

GROUP U

440 DELTA PRIMARY VOLTS –– 220Y/127 SECONDARY VOLTS –– 3Ø, 50/60 Hz

KVA	CATALOG NO.	APPROX. DIMENSIONS Inches (Cm.)			APPROX. SHIP WEIGHT Lbs. (Kg.)	TYPE MTG. W – Wall F – Floor	KNOCKOUTS Inches (Cm.)	WEATHER SHIELD P/N	Wiring Diagrams & Design Figures Begin on Page 146
		HEIGHT	WIDTH	DEPTH					
10.0	TF-22010-5S	18.90 (48.0)	20.30 (51.6)	9.00 (22.9)	245 (111.1)	F ①	NA	NA	73–I
15.0	TF-22015-5S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	291 (132.0)	F ①	NA	WS-A-1	73–E
25.0	TF-22025-5S	25.50 (64.8)	24.40 (62.0)	19.40 (49.3)	375 (170.1)	F ①	NA	WS-A-1	73–E
50.0	TF-22050-5S	29.41 (74.7)	28.15 (71.5)	22.37 (56.8)	437 (198.2)	F ①	NA	WS-A-2	73–E
100.0	TF-220100-5S	41.52 (105.5)	32.90 (83.6)	29.87 (75.9)	725 (328.9)	F	NA	WS-A-4	73–E
200.0	TF-220200-5S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1025 (464.9)	F	NA	WS-A-5	73–E
250.0	TF-220250-5S	45.60 (115.8)	39.50 (100.3)	35.50 (90.2)	1600 (725.8)	F	NA	WS-A-5	73–E
300.0	TF-220300-5S	57.84 (146.9)	45.50 (115.6)	41.50 (105.4)	1700 (771.12)	F	NA	WS-A-7	73–G
500.0	TF-220500-5S	62.80 (159.5)	54.00 (137.2)	41.50 (105.4)	2418 (1096.8)	F	NA	WS-A-6	73–G

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

NEW

GROUP V

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

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
15.0	3 79083	18.86 47.9	20.30 51.6	9.03 22.9	300 136.1	①				75	
20.0	2 79084	29.90 75.9	28.15 71.5	22.37 56.8	500 226.8	⑤		2		74	
30.0	2 79085	29.90 75.9	28.15 71.5	22.37 56.8	511 231.8	⑤		2		74	
45.0	2 79087	25.50 64.8	24.39 62.0	19.37 49.2	540 244.9	⑤		1		74	
75.0	2 79088	35.90 91.2	31.90 81.0	26.88 68.3	703 318.9			3		74	

NEW

GROUP W

400 DELTA PRIMARY VOLTS 240 DELTA/120 SECONDARY VOLTS 3 , 60 Hz

KVA	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
15.0	3 79068 1	18.86 47.9	20.30 51.6	9.03 22.9	250 113.4	①		/		76	
30.0	3 79069 3	25.48 64.7	24.39 62.0	19.37 49.2	300 136.1	⑤		1		77	
45.0	3 79070 3	25.48 64.7	24.39 62.0	19.37 49.2	365 165.6	⑤		1		77	
75.0	3 79071 3	29.40 74.7	28.15 71.5	22.37 56.8	475 215.5	⑤		2		77	

AUTO-TRANSFORMERS②

600 PRIMARY VOLTS –– 480 SECONDARY VOLTS –– 3Ø, 60 Hz

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

KVA 600 P 480V S	KVA 480 P 380 S	CATALOG NO	APPRO I C DIMENSIONS HEIGHT	IDTH	DEPTH	APPRO SHIP EIGHT L K	T PE MTG F F	KNOCKOUTS I C	EATHER SHIELD P N	D B	D F P	146
15.0	12.0	2 52703 1③	15.21 38.6	19.25 48.9	7.37 18.7	104 47.2					56	
30.0	24.0	2 52705 1③	15.21 38.6	19.25 48.9	7.37 18.7	152 68.9					56	
45.0	36.0	2 52707 1③	15.21 38.6	19.25 48.9	7.37 18.7	156 70.8					56	
75.0	60.0	3 52710 1③	18.86 47.9	20.30 51.6	9.03 22.9	300 136.1	①				56	
112.5	90.0	2 52712 1④	25.50 64.8	24.40 62.0	19.40 49.3	325 147.0	⑤		1		57	
150.0	120.0	2 52713 1④	25.50 64.8	24.40 62.0	19.40 49.3	350 158.8	⑤		1		57	
225.0	180.0	2 52715 1④	29.41 74.7	28.15 71.5	22.37 56.8	600 272.0	⑤		2		57	
300.0	240.0	2 52717 1④	29.41 74.7	28.15 71.5	22.37 56.8	650 294.8	⑤		2		57	
450.0	360.0	2 52718 1④	35.47 90.1	31.90 81.0	26.88 68.3	750 340.0			3		57	
500.0	400.0	2 52719 1④	35.47 90.1	31.90 81.0	26.88 68.3	790 358.3			3		57	

① Wall mounting brackets use PL-79911.

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

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

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

⑤ Wall mounting brackets use PL-79912.

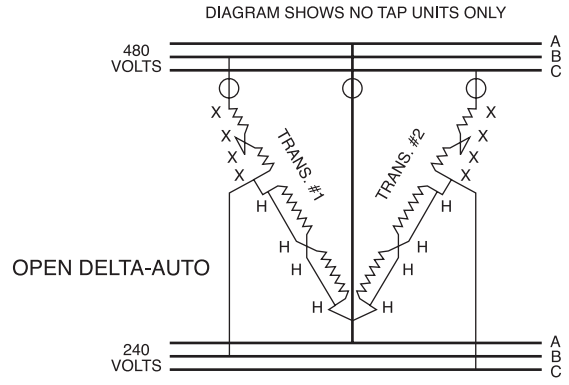
Economical Auto Arrangements

Using two single phase transformers

THREE PHASE

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

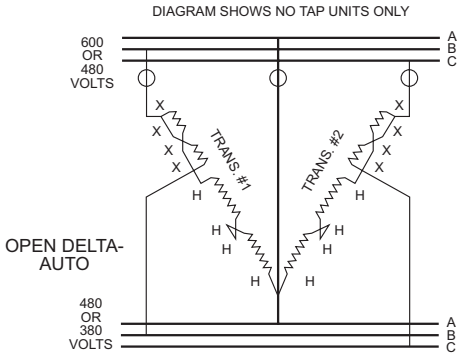
KVA ①	Q ②	CAT NO. ③	PRI FLA	SEC FLA	MFB
3.0	2	2 53010	3.60	7.20	10
5.0	2	2 53011	6.00	12.00	10
6.0	2	2 53012	7.20	14.40	15
10.0	2	2 53013 4	12.00	24.00	15
17.0	2	2 53014 4	20.50	40.80	30
26.0	2	2 53515 3	31.50	63.00	40
34.0	2	2 53516 3	41.00	81.60	60
52.0	2	2 53517 3	63.00	125.00	80
86.0	2	2 53518 3	104.00	206.30	150
130.5	2	2 53019 3	157.00	314.00	200
173.0	2	2 53020 3	209.00	418.00	300
259.0	2	2 53021 3	312.00	623.00	400
346.0	2	2 53022 3	417.00	834.00	600
578.0	2	1 53023 3	696.00	1392.00	1000
865.0	2	1 53024 3	1041.00	2082.00	1600



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

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

P 600V S 480V KVA ①	P A	S A	P 480V S 380V KVA ①	P A	S A	Q ②	CAT NO. ③ ④	MFB
8.0	7.70	9.60	6.5	7.80	9.60	2	2 53010	15
12.0	11.55	14.40	9.5	11.55	14.40	2	2 53011	15
17.0	16.33	20.41	13.5	16.33	20.41	2	2 53012	25
25.0	24.06	30.01	20.0	24.06	30.01	2	2 53013 4	30
43.0	41.38	51.70	34.0	41.38	51.70	2	2 53014 4	60
64.0	61.59	77.00	51.0	61.59	77.00	2	2 53515 3	80
86.0	82.76	103.44	68.0	82.76	103.44	2	2 53516 3	110
129.0	124.13	155.20	103.0	124.13	155.20	2	2 53517 3	175
216.0	207.85	259.80	172.0	207.85	259.80	2	2 53518 3	300
324.0	311.78	389.70	259.0	311.78	389.70	2	2 53019 3	400
433.0	416.67	520.83	346.0	416.67	520.83	2	2 53020 3	600
650.0	625.00	781.00	519.0	625.00	781.00	2	2 53021 3	800
865.0	833.00	1040.00	692.0	833.00	1051.00	2	2 53022 3	1200
1445.0	1391.00	1738.00	1156.0	1391.00	1756.00	2	1 53023 3	2000
2164.0	2083.00	2602.00	1731.0	2083.00	2629.00	2	1 53024 3	3000



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

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

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

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

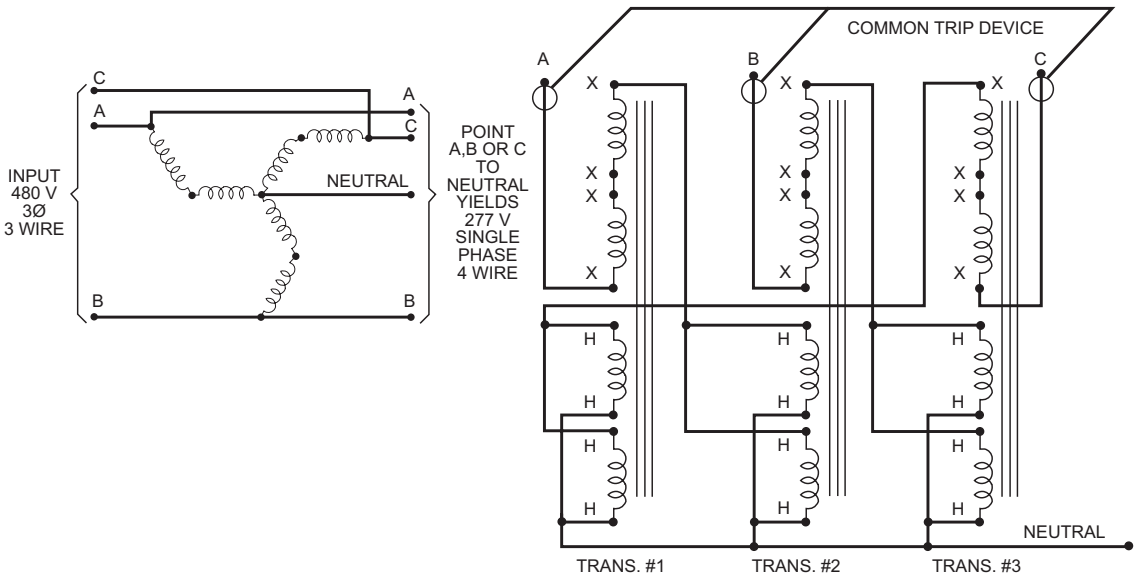
Auto Zig-Zag Grounding Transformers

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

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

Use 3 Pieces of Type No.④	Available In	Nameplate KVA For Each Tfmr.	No. of Tfmr. Required	Three Phase KVA	Max. Continuous Amp. Load Per Phase (277 Volts)
T-2-53010-S	No Taps Only	1.0	3	10.80	12.50
T-2-53011-S	No Taps Only	1.5	3	15.60	18.75
T-2-53012-S	No Taps Only	2.0	3	20.70	25.00
T-2-53013-4S	Taps & No Taps	3.0	3	31.20	37.50
T-2-53014-4S	Taps & No Taps	5.0	3	51.90	62.50
T-2-53515-3S	With Taps Only	7.5	3	78.00	93.50
T-2-53516-3S	With Taps Only	10.0	3	103.80	125.00
T-2-53517-3S	With Taps Only	15.0	3	156.00	187.50
T-2-53518-3S	With Taps Only	25.0	3	259.50	312.00
T-2-53019-3S	With Taps Only	37.5	3	390.00	468.00
T-2-53020-3S	With Taps Only	50.0	3	519.00	625.00
T-2-53021-3S	With Taps Only	75.0	3	780.00	935.00
T-2A-53022-3S	With Taps Only	100.0	3	1038.00	1250.00
T-1-53023-3S	With Taps Only	167.0	3	1734.00	2085.00

See Footnote ②



O = Fuse Location NEC 450-4, 1990. ③

① Applicable for the above connection only.

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

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

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

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

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

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

THREE PHASE

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

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

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

① Cannot Be Reverse Connected.