LV (600V) Dry-Type Transformers

- Industrial Control
- Encapsulated 600 Volt Class
- Ventilated 600 Volt Class
- High Voltage General Purpose
- DOE 2016 Efficiency Compliant

FEDERAL PACIFIC

Federal Pacific History

In 1987, the Electro-Mechanical Corporation acquired the dry-type transformer division of Federal Pacific Electric in Des Plaines, Illinois. It was moved to Bristol, Virginia and the name was changed to Federal Pacific (FP). A new 100,000 square foot facility was constructed where time-proven designs and modern technology were combined and deployed under new management. Expansion in early 1993 provided an additional 36,000 square feet of manufacturing space.

Federal Pacific Today

Federal Pacific is a major manufacturer of dry-type transformers which serve the industrial, construction, commercial, mining, OEM and utility markets. The product scope is 50 VA through 10,000 KVA and 120 volts through 34,500 volts. The 600 volt class offering includes industrial control transformers, encapsulated/compound-filled general purpose and buck-boost transformers, ventilated designs for general purpose applications, electrostatically shielded transformers and a complete line of motor drive isolation transformers. The medium voltage offering includes core and coil transformers, general purpose designs, padmount transformers, unit substation transformers, vacuum pressure impregnated transformers (VPI), and VPI/epoxy shielded transformers. K-Factor rated transformers are offered for the entire product scope.

Distribution

Regional warehouse stocks have been implemented across the United States, ensuring quick delivery of all products anywhere in the country.

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Single & Three Phase Encapsulated and Ventliated Transformer Naming Convention

(using T48LH2Y-75 as an example)

T	**Type**	T = Three Phase, Ventilated N = Three Phase, Encapsulated S = Single Phase, Ventilated P = Single Phase, Encapsulated K = Single Phase, Buck Boost
48	**Primary**	**Single or Three Phase** 20 = 208 24 = 240 48 = 480 60 = 600 Three phase primary windings will be Delta connected. **Single Phase Only** 1X = 120 x 240 2X = 240 x 480 27 = 277
LH	**Material/Temperature Rise**	**150° C / 115° C / 80° C** Aluminum Unshielded: LH / LF / LB Aluminum Shielded: SH / SF / SB Copper Shielded: CH / CF / CB Copper Unshielded: GH / GF / GB
2Y	**Secondary**	**Single Phase** 21 = 120/240 12 = 12/24 16 = 16/32 24 = 24/48 **Three Phase** 2Y = 208Y/120 2D = 240/(120LT)* 3Y = 380Y/220 40 = 400Y/231 42 = 480Y/277 * 120LT applies to ventilated units only
-	**Separator**	KVA Separator
75	**KVA**	
	(-K-Factor)	K1 = has no identifier K4 = K4 K13 = K13 K20 = K20
	-N/T	Applicable to encapsulated transformers only N = No Taps T = Taps

Single-Phase Transformer Quick Reference Guide

Single Phase Encapsulated Transformers						
Part Number = Family [-KVA] [-N/T] (P2X only for taps)						
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**Taps Available**
CU	115°C	N	120x240V - 120/240V 208V - 120/240V 277V - 120/240V	P1XGF21 P20GF21 P27GF21	1, 1.5, 2, 3	N Y Y
			240x480V - 120/240V	P2XGF21	0.05, 0.1, 0.15, 0.25, 0.5, 0.75, 1, 2	N
					3	[-T]
			480V - 120/240V 600V - 120/240V	P48GF21 P60GF21	1, 1.5, 2, 3	Y
		Y	240x480V - 120/240V	P2XCF21	3	N
AL	115°C	N	120x240V - 120/240V 208V - 120/240V 277V - 120/240V 240x480V - 120/240V 480V - 120/240V	P1XLF21 P20LF21 P27LF21 P2XLF21 P48LF21	5, 7.5, 10, 15	N Y Y [-T] (All), [-N] (7.5-15 KVA) Y
		Y	240x480V - 120/240V	P2XSF21	5	N
			600V - 120/240V	P60SF21	5, 7.5, 10, 15	Y

Single Phase Ventilated Dry-Type Transformers						
Part Number = Family [-KVA]						
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**Taps Available**
AL	150°C	N	240x480V - 120/240V	S2XLH21	15, 25, 37, 50, 75, 100, 167	Y
		Y	600V - 120/240V	S60SH21		
CU	150°C	N	240x480V - 120/240V	S2XGH21		
		Y		S2XCH21		

Single Phase Encapsulated Buck-Boost Transformers						
Part Number = Family [-KVA]						
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**Taps Available**
CU	115°C	N	120x240V - 12/24V 120x240V - 16/32V 240x480V - 24/48V	K1XGF12 K1XGF16 K2XGF24	0.05, 0.1, 0.15, 0.25, 0.5, 0.75, 1, 2, 3	N
AL	115°C	N	120x240V - 12/24V 120x240V - 16/32V 240x480V - 24/48V	K1XLF12 K1XLF16 K2XLF24	5	

Single Phase FEC Epoxy Encapsulated (Industrial Control) Transformers						
Part Number = Family [KVA] [Suffix]						
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**Taps Available**
CU	55°C	N	240x480V - 120V 230x460V - 115V 220x440V - 110V	FA[KVA]JK	0.50, 0.75, 0.100, 0.150, 0.200, 0.250, 0.300, 0.350, 0.500, 0.750	N
			240x480V - 24V	FB[KVA]JK		
			120x240V - 24V	FC[KVA]JK		
			208/277V - 120V	FF[KVA]XK		
			200/220/440V - 23/110V 208/230/460V - 24/115V 240/480V - 25/120V	FJ[KVA]XK		
			240x480V - 120V	FK[KVA]JJ		

Three-Phase Transformer Quick Reference Guide

Three Phase Ventilated Dry-Type Transformers							
Part Number = Family [-KVA] [-K Factor] (K Factor only required for K4, K13 and K20 products)							
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**K-Factor Available**	**Taps Available**
AL	150°C	N	208Δ-480Y 480Δ-208Y 480Δ-240Δ/120LT 480Δ-400Y 480Δ-480Y	T20LH42 T48LH2Y T48LH2D T48LH40 T48LH42	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	Y
		Y	208Δ-208Y 240Δ-208Y 480Δ-208Y 480Δ-240Δ/120LT 600Δ-208Y	T20SH2Y T24SH2Y T48SH2Y T48SH2D T60SH2Y	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	
	115°C	N	208Δ-480Y 480Δ-208Y 480Δ-240Δ/120LT 480Δ-400Y 480Δ-480Y	T20LF42 T48LF2Y T48LF2D T48LF40 T48LF42	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	
		Y	208Δ-208Y 240Δ-208Y 480Δ-208Y 480Δ-240Δ/120LT 600Δ-208Y	T20SF2Y T24SF2Y T48SF2Y T48SF2D T60SF2Y	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	
	80°C	N	208Δ-480Y 480Δ-208Y 480Δ-240Δ/120LT 480Δ-400Y 480Δ-480Y	T20LB42 T48LB2Y T48LB2D T48LB40 T48LB42	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	
		Y	208Δ-208Y 240Δ-208Y 480Δ-208Y 480Δ-240Δ/120LT 600Δ-208Y	T20SB2Y T24SB2Y T48SB2Y T48SB2D T60SB2Y	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	
CU	150°C	Y	480Δ-208Y	T48CH2Y	15, 30, 45, 75, 112.5, 150, 225, 300, 500	K1, K4 K13, K20	
	115°C			T48CF2Y			
	80°C			T48CB2Y			

Three Phase Encapsulated Dry-Type Transformers							
Part Number = Family [-KVA]							
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**K-Factor Available**	**Taps Available**
CU	115°C	N	480Δ-208Y 480Δ-240Δ	N48GF2Y N48GF2D	3, 6	N/A	Y
		Y	240Δ-208Y 480Δ-208Y 480Δ-240Δ	N24CF2Y N48CF2Y N48CF2D			
AL	115°C	N	480Δ-208Y 480Δ-240Δ	N48LF2Y N48LF2D	9, 15		
		Y	240Δ-208Y 480Δ-208Y 480Δ-240Δ	N24SF2Y N48SF2Y N48SF2D			

Three Phase Ventilated Drive Isolation Dry-Type Transformers							
Part Number = [KVA] Family							
Conductor	**Temp Rise (Celsius)**	**Electrostatic Shield**	**Primary/Secondary**	**Family**	**KVA Available**	**K-Factor Available**	**Taps Available**
AL	150°C	N	230Δ-230Y	AEMD	7.5, 11, 15, 20, 34, 40, 51, 63, 75, 93, 118, 145, 175, 220, 275, 330, 440, 550, 660, 750	K1	Y
			230Δ-460Y	AFMD			
			460Δ-230Y	CEMD			
			460Δ-460Y	CFMD			
			230Δ-575Y	AHMD			
			460Δ-575Y	CHMD			
			575Δ-230Y	DEMD			
			575Δ-460Y	DFMD			
			575Δ-575Y	DHMD			

Transformer Basics

A transformer is a static, passive electrical device that converts alternating electrical voltage from one value to another without modifying the frequency or amount of electrical power. A transformer links together two or more electrical circuits through the process of electromagnetic induction. A simple transformer consists of two coils of electrical wire wrapped around a common closed magnetic iron circuit (or "core"). The coils are electrically isolated from one another but magnetically linked through the core, allowing electrical power to be transferred from one coil to the other.

Transformers are primarily used to increase ("step-up") or decrease ("step-down") voltage from their input ("primary") to their output ("secondary"). The amount of voltage change is determined by the construction of the transformer, effectively the ratio of the number of turns in the primary coil to the number of turns in the secondary coil. A secondary use of transformers is to electrically isolate the input from the output circuit while maintaining the same input and output voltage.

Electrostatically Shielded Transformers

Electrostatically shielded transformers are designed to protect primary systems from unwanted high-frequency signals generated by loads connected to a transformer's secondary. While all transformers with separate primary and secondary windings provide some isolation from load circuits, transients and electrical noise can be transmitted through the internal capacitance of the transformer windings. These disturbances may have a detrimental effect on sensitive electronic equipment and can cause improper operation. Electrostatic shielding diverts these unwanted signals to ground and help prevent electrical disturbances from being transmitted to the load circuits.

UL Listed electrostatically shielded transformers provide all the quality features of the transformer plus an electrostatic shield consisting of a single turn, full height, copper or aluminum strip placed between the primary and secondary windings with a lead run to the transformer ground.

Typical applications for Electrostatically Shielded Transformers include:

- Hospital Operating Rooms
- X-Ray Equipment
- Computer Installations
- Data Processing
- Instrumentation
- Programmable Controllers

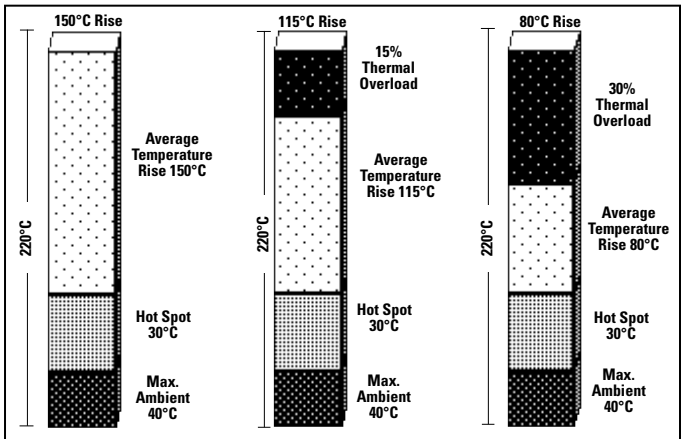
Optional Temperature Rise Transformers

Transformers are specifically designed for optimum performance on systems with a continuous high loading factor. Optional Temperature Rise Transformers feature either 80°C or 115°C temperature rise (vs. 150°C typical) utilizing a 220°C insulation system which provides extended life and inherent overload capability (15% for 115°C and 30% for 80°C). (See chart below.) These transformers provide lower losses and can minimize operating costs, depending on loading factors and local energy costs.

K-Factor Transformers

Modern electronic switching elements can produce non-linear or non-sinusoidal wave shapes in the current on the load side of a transformer, which can introduce harmonic distortion. The distortions can couple with the fundamental current wave and create current pulses that exceed the nameplate ampere rating of the power source and cause transformers to run hotter than expected.

A K-Factor Transformer is designed to handle harmonic content in its load current without exceeding its operating temperature limits. A specific K-Factor rating indicates that a transformer can supply its rated KVA load output to a load with a specified amount of harmonic content. For more detail on K-Factor Transformers refer to Federal Pacific's K-Factor Transformer Application Note.



Definition of Average Temperature Rise

Transformer Selection Considerations

Selection Steps

- Determine the system supply voltage available (Primary voltage).
- Determine the required load voltage rating (Secondary voltage).
- Determine the KVA rating of the load. (If the load rating is given only in amperes, the proper KVA size of the transformer can be selected from the Full Load Current Rating Tables below. The KVA capacity of the transformer must equal or be greater than the load rating.
- Select a transformer model using the Quick Selection Guide for the desired transformer type.

Full Load Current Ratings

Single Phase Transformers				
KVA Rating	Full Load Current (Amperes)			
	120 V	240 V	480 V	600 V
.050	0.42	0.21	0.1	0.08
.075	0.63	0.31	0.16	0.13
.100	0.83	0.42	0.21	0.17
.150	1.25	0.63	0.31	0.25
.250	2.08	1.04	0.52	0.42
.500	4.17	2.08	1.04	0.83
.750	6.25	3.13	1.56	1.25
1	8.33	4.17	2.08	1.67
1.5	12.5	6.25	3.13	2.5
2	16.7	8.33	4.17	3.33
3	25	12.5	6.25	5
5	41.7	20.8	10.4	8.33
7.5	62.5	31.3	15.6	12.5
10	83.3	41.7	20.8	16.7
15	125	62.5	31.2	25
25	208	104	52	41.7
37.5	312	156	78.1	62.5
50	417	208	104	83.3
75	625	312	156	125
100	833	417	208	167
167	1392	696	348	278
333	2775	1387	694	555

$$\text{Single-Phase KVA} = \frac{\text{Volts x Load Amperes}}{1000}$$

Three Phase Transformers				
KVA Rating	Full Load Current (Amperes)			
	208 V	240 V	480 V	600 V
3	8.33	7.22	3.61	2.89
6	16.6	14.4	7.22	5.77
9	25	21.6	10.8	8.66
15	41.6	36.1	18	14.4
25	69.4	60.1	30.1	24.1
30	83.3	72.2	36.1	28.9
37.5	104	90.2	45.1	36.1
45	125	108	54.1	43.3
50	139	120	60.1	48.1
60	166	144	72.2	57.7
75	208	180	90.2	72.2
100	278	241	120	96.2
112.5	312	271	135	108
150	416	361	180	144
225	625	541	271	217
300	833	722	361	289
400	1110	962	481	385
500	1388	1203	601	481
750	2082	1804	902	722
1000	2776	2406	1203	962

$$\text{Three-Phase KVA} = \frac{\text{Volts x Load Amperes x 1.73}}{1000}$$

Connections

Many single-phase transformers are manufactured with series multiple winding construction and a dual voltage primary or secondary designation (e.g. 240x480V to 120/240V). These transformers will have two windings on the primary or secondary that can be connected either in series for the higher voltage or in parallel for the lower voltage. Transformers with primary voltage ratings containing an "x" can only be connected for one or the other of the two voltages. Transformers with secondary voltage ratings separated by a forward slash "/", the windings can be connected to provide either or both voltages (three wire operation).

Three-phase transformers are provided with a Delta primary for three wire input and either a Wye secondary for four wire output or a Delta secondary for three wire output. Transformers with a 240 volt Delta secondary may have a 120 volt single-phase lighting tap as a standard feature.

Transformer Selection Considerations

Altitude

Standard self-cooled dry-type transformers are designed for operation with normal temperature rise at altitudes up to 3300 ft. above sea level. The transformer rated KVA should be reduced by 0.3% for each 330 ft. the transformer is installed above 3300 ft.

Angular Displacement

The angular displacement of a three-phase transformer is the time angle expressed in degrees between the line-to-neutral voltage of a specified high voltage terminal and the line-to-neutral voltage of a specified low voltage terminal.

The angular displacement between the high voltage and low voltage terminal voltages of three-phase transformers with Delta-Delta connections is zero degrees.

The angular displacement for three-phase transformers with Delta-Wye connections is 30 degrees with the low voltage lagging the high voltage.

Balanced Loading

Single-phase loads connected to the secondary of a transformer must be distributed so as not to overload any one winding of the transformer.

Single-phase transformers generally have two secondary windings that can be connected for 120/240 volt three wire operation. When so arranged, care must be taken when connecting 120 volt loads to assure that the total connected load on each secondary winding does not exceed one-half the nameplate KVA rating.

When connecting single-phase loads on a three-phase transformer, each phase must be considered as a single-phase transformer. The single-phase loading on each phase of a three-phase transformer must not exceed one-third of the nameplate KVA rating. For example, a 45 KVA three-phase transformer with a 208Y/120 Volt secondary should not have any 120 volt single-phase loads distributed such that more than 15 KVA of single-phase load is applied to any one phase.

Banking

Three single-phase transformers can be properly connected to supply a three-phase load. The single-phase units can be used in a three-phase bank with Delta connected primary and Wye or Delta connected secondary. The equivalent three-phase capacity would be three times the nameplate rating of each single-phase transformer. For example, three 15 KVA single-phase transformers will, when properly banked, accommodate a 45 KVA three-phase load.

Overcurrent Protection

(Reference N.E.C. Article 450)

Primary Protection Only

If secondary protection is not provided, a transformer must be protected by an individual overcurrent device on the primary side. The primary overcurrent device must be rated: No more than 125% of the rated primary current or the next higher standard device rating (for primary currents of 9 amperes or more); no more than 167% of the rated primary current (for 2 amperes to 9 amperes); and no more than 300 % of the rated primary current (for ratings less than 2 amperes). An individual transformer primary protective device is not necessary where the primary circuit overcurrent protective device provides the required protection.

Primary & Secondary Protection

If the transformer secondary is protected by an overcurrent protective device rated no more than 125% of the transformer rated secondary current (or the next higher standard rating device), an individual primary protective device is not required provided the primary feeder circuit overcurrent device is rated no more than 250% of the transformer rated primary current.

Parallel Operation

Transformers with the same KVA ratings can be connected in parallel if required conditions are met. Single-phase transformers must have the same voltage rating, tap settings and frequency rating. Plus, the impedance values of the transformers must be within 7.5% of each other. When paralleling three-phase transformers, the same conditions would apply and, in addition, the angular displacement of the transformers must be the same.

Polarity

Transformer polarity is an indication of the direction of current flow through the high voltage terminals with respect to the direction of current flow through the low voltage terminals at any given instant in the alternating cycle. Primary and secondary terminals are said to have the same (or additive) polarity when, at a given instant, the current enters the primary terminal in question and leaves the secondary terminal in question in the same direction as though the two terminals formed a continuous circuit.

Single-phase transformers rated 600 volts and below normally have additive polarity.

The polarity of a three-phase transformer is fixed by the internal connections between phases. It is usually designated by means of a vector diagram showing the angular displacement of the windings and a sketch showing the markings of the terminals.

Transformer Selection Considerations

Reverse Feed (Back Feed) or Step-Up Operation

Step-down transformers may be reverse-fed for step-up operation to increase voltage. This means that the incoming power is connected to the low voltage terminals (typically designated by X# in wiring diagrams) and the load is connected to the high voltage terminals (typically designated by H#). If the low voltage is Wye, the X0 terminal must NOT be connected in any way. Likewise, if the low voltage is Delta with a 120 volt lighting tap (high-leg), the X4 terminal must NOT be connected in any way.

CAUTION: Much higher than normal inrush currents may occur with reverse feed operation and may cause nuisance fuse blowing or breaker tripping. For this reason, fuses and breakers with time-delay characteristics must be used.

If a breaker is used for incoming over-current protection, it must be a thermal-magnetic type breaker, not a magnetic-only type breaker.

Sound Levels

A humming sound is an inherent characteristic of transformers due to the vibration caused by alternating flux in the magnetic core. Sound levels will vary according to transformer size. Attention to installation methods can help reduce any objectionable noise. When possible, locate the transformer in an area where the ambient sound will be equal to or greater than the transformer sound level. Avoid locating units in corners. Make connections with flexible conduits and couplings to prevent transmitting vibration to other equipment. Larger units should be installed on flexible mountings to isolate the transformer from the building structure. For more detail on transformer sound refer to Federal Pacific's Understanding Transformer Noise white paper.

Temperature

Insulation system limiting temperatures for dry-type transformers are classified by industry standards based on a 40°C ambient for ventilated transformers, 25°C ambient for encapsulated transformers.

Federal Pacific Dry-Type Transformers

Overview

Federal Pacific encapsulated and ventilated dry-type transformers rated 600 volts and below are available in a wide variety of types and ratings to provide reliable and versatile electrical distribution for lighting and power loads in industrial and commercial applications.

Ratings in the 600V class are available from .050 through 333 KVA in single-phase configurations and from 3 through 1500 KVA in three-phase. All standard primary and secondary voltage ratings are provided to match load requirements to the distribution system.

The air-cooled dry-type construction requires no special vaults for installation. The units may be located in almost any indoor location convenient to the load being served. Most transformers are also available for outdoor installations. Maintenance requires only periodic inspection of cable connections and removal of any dust accumulation.

All Federal Pacific three-phase transformers and most single-phase models are provided with taps in the primary winding to compensate for input voltage variations. The taps will provide a range of voltage adjustment above and/or below the nominal voltage rating of the transformer. The available quantity, location, and percentage of the tap connections are shown in the transformer specifications. All transformers are furnished with a nameplate showing the terminal and tap arrangements.

Application

Federal Pacific UL & CUL Listed encapsulated dry-type transformers can be used in industrial, commercial, institutional, and residential installations for economical, efficient distribution of power. Encapsulated units are ideal for dusty industrial areas and are suitable for Indoor and Outdoor applications. Typical loads served include tanning beds, motors, lighting, heating, ranges, air conditioners, exhaust fans, control circuits, appliances, and portable tools. Other applications are found in pumping stations, mining and shipboard distribution systems.

Construction

Encapsulated Dry-Type Transformers

An encapsulated dry-type transformer is a totally enclosed, compound filled transformer. The core and coil assembly is embedded in a polyester resin compound, which provides solid insulation. The embedding compound has an extremely high heat transfer rate, which permits a design of minimum size and weight. The compound-filled assembly is completely encased in a sturdy steel housing and cannot be damaged by dust, moisture, or adverse atmospheric conditions.

Federal Pacific encapsulated transformers are designed based on a 25°C ambient, 115°C rise, 180°C insulation system. Due to low enclosure temperature rise, no UL-506 special markings are needed to indicate clearance between the enclosure and adjacent surfaces. Sound level problems are negligible with encapsulated transformers because the core and coils are rigidly encased in the polyester resin, which is mechanically strong and acts as sound deadening material. Average sound levels are consistently below NEMA standards. A large wiring compartment with knockouts permits fast wiring connections. Compartment temperatures can attain temperatures reaching 90°C; therefore 90°C cable should be used. Encapsulated units are supplied with flexible cable leads marked with easy identification, and are supplied with wall-mounting brackets to reduce installation time.

Ventilated Dry-Type Transformers

The design features of Federal Pacific UL & CUL Listed ventilated dry-type transformers assure versatile, economical, and reliable distribution of power. All transformers are fully tested to insure trouble-free installation and operation. Availability across a variety of material, temperature, K-factor and enclosure sizes makes these transformers suitable for a wide variety of applications.

Federal Pacific ventilated dry-type transformers incorporate wire and/or strip wound coils in a barrel wound configuration. Horizontal and vertical spacers are strategically positioned in the windings to brace the winding layers and allow maximum ventilation. The electrical grade core steel is arranged in a construction designed to accommodate the coils. The insulation system has received a 220°C continuous rating from Underwriters Laboratories, Inc. derived from the average conductor temperature rise of 150°C, hotspot temperature gradient of 30°C, and a maximum ambient temperature of 40°C. Terminals are sized to carry the full current capacity of the transformers and a flexible grounding conductor is installed between the core and coil assembly and the transformer enclosure.

The core and coil assembly is anchored to the enclosure through a vibration dampening system to reduce noise levels. Units through 600 KVA are provided with neoprene isolating pads while larger units are furnished with three layer rubber and cork pads. Front accessible wiring compartments are approved for 90°C cable. Enclosures are rigidly braced and covers are fastened with slotted hex head screws for ease of removal. A rugged steel base supported by mounting feet opened outward provides safe handling with a forklift and easy attachment to mounting pad.

This combination of materials and the care taken in construction and workmanship, not only give Federal Pacific Type Ventilated Dry-Type Transformers a long operating life but helps insure their quiet operation.

Federal Pacific Dry-Type Transformers

Sound Levels

Federal Pacific transformers are designed, built, and comply with NEMA maximum sound level requirements as measured in accordance with NEMA ST 20-2014.

Average Sound Level, Decibels				
	Self Cooled Ventilated			Self Cooled Sealed
	A	B	C	D
Equivalent Winding kVA Range	K Factor = 1 K Factor = 4 K Factor = 9	K Factor = 13 K Factor = 20	Forced Air When Fans Running	
3.00 and below	40	40	67	45
3.01 to 9.00	40	40	67	45
9.01 to 15.00	45	45	67	50
15.01 to 30.00	45	45	67	50
30.01 to 50.00	45	48	67	50
50.01 to 75.00	50	53	67	55
75.01 to 112.50	50	53	67	55
112.51 to 150.00	50	53	67	55
150.01 to 225.00	55	58	67	57
225.01 to 300.00	55	58	67	57
300.01 to 500.00	60	63	67	59
500.01 to 700.00	62	65	67	61
700.01 to 1000.00	64	67	67	63
Greater than 1000	Consult Factory			

Note 1: Consult factory for non-linear requirements exceeding a K-factor rating of 20.

Note 2: When the fans are not running columns A & B apply

Note 3: Sound levels are measured using the A-weighted scale (dB (A)

Industry Standards & Certifications

Federal Pacific dry-type transformers are UL® Listed and are designed, tested, and manufactured in accordance with applicable industry standards of ANSI, NEMA and IEEE:

- UL-5085, UL 1561, UL 1562
- CUL
- IEEE C57.12.01 - as referred to by NEMA ST-20
- IEEE C57.12.91 - as referred to by NEMA ST-20
- NEMA ST-20
- EPACT 2005
- Meets DOE Efficiency Levels as required by 10 CFR 431

DOE 2016 Efficiency Levels for Dry-Type Distribution Transformers			
Single Phase		Three Phase	
kVA	Efficiency Level (%)	kVA	Efficiency Level (%)
15	97.7	15	97.89
25	98.0	30	98.23
37	98.2	45	98.40
50	98.3	75	98.60
75	98.5	112.5	98.74
100	98.6	150	98.83
157	98.7	225	98.94
250	98.8	300	99.02
333	98.9	500	99.14
		750	99.23
		1000	99.28

Tested Performance

Federal Pacific performs a series of tests to ensure proper operation, adherence to applicable standards and product quality. Tests performed include:

Ratio Test is performed on rated voltage connection and tap connections to assure the proper turns ratio on all connections.

Polarity Test and **Phase Relation** tests are made to ensure proper polarity and marking because of their importance in paralleling or banking two or more transformers.

No-load (Excitation) Loss Test determines the losses of a transformer which is excited at rated voltage and frequency, but which is not supplying a load. Transformer excitation loss consists mainly of the iron loss in the transformer core.

Load Loss Test determines the amount of losses in the transformer when carrying full rated load. These losses consist primarily of I2R losses in the primary and secondary winding and ensure that specifications of the transformer design are met.

Excitation Current Test determines the current necessary to maintain transformer excitation.

Resistance Test is performed on the transformer windings and is used to determine I2R loss.

Impedance Test is made to insure that transformer design standards are attained.

Dielectric Test (applied and induced potential) checks the insulation and workmanship to demonstrate that the transformer has been designed and manufactured to meet the insulation tests required by the standards.

Applied Potential Tests are made by impressing between windings and between each winding and ground, a low frequency voltage.

Induced Potential Tests call for over-exciting the transformer by applying between the terminals on one winding a voltage of twice the normal voltage developed in the winding for a period of 7200 cycles.

Single-Phase Encapsulated Technical Data

Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Wall Mount Bracket
						H	W	D		
115°	N	120x240V - 120/240V	P1XGF21-1	5	N	11.25	5.25	6.5	28	Built-In
			P1XGF21-1.5			13.25	6.25	7.75	45	
			P1XGF21-2						50	
			P1XGF21-3						60	
			P1XLF21-5			15	10.187	10.625	110	
			P1XLF21-7.5						150	
			P1XLF21-10			17	13.187	13.125	175	
			P1XLF21-15						270	
	N	208V - 120/240V	P20GF21-1	6	-2@5%	11.25	5.25	6.5	28	Built-In
			P20GF21-1.5			13.25	6.25	7.75	45	
			P20GF21-2						50	
			P20GF21-3						60	
			P20LF21-5			15	10.187	10.625	110	
			P20LF21-7.5						150	
			P20LF21-10			17	13.187	13.125	175	
			P20LF21-15						270	
	N	240x480V - 120/240V	P2XGF21-0.05-N	1	N	8.25	3.25	4.25	8	Built-In
			P2XGF21-0.075-N						9	
			P2XGF21-0.1-N						10	
			P2XGF21-0.15-N			9.25	4	5	14	
			P2XGF21-0.25-N						15	
			P2XGF21-0.5-N			11.25	5.25	6.5	21	
			P2XGF21-0.75-N						25	
			P2XGF21-1-N						28	
			P2XGF21-1.5-N			13.25	6.25	7.75	45	
			P2XGF21-2-N						50	
			P2XLF21-7.5-N			15	13.187	13.125	150	
			P2XLF21-10-N			17	13.187	13.125	175	
			P2XLF21-15-N						270	
	Y	240x480V - 120/240V	P2XCF21-3-N	10	N	13.25	6.25	7.75	60	Built-In
			P2XSF21-5-N			15	10.187	10.625	110	
	N	240x480V -120/240V	P2XGF21-3-T	8	+2/-4@2.5%	13.25	6.25	7.75	60	Built-In
			P2XLF21-5-T			15	10.187	10.625	110	
			P2XLF21-7.5-T						150	
			P2XLF21-10-T			17	13.187	13.125	175	
			P2XLF21-15-T						270	
	N	277V - 120/240V	P27GF21-1	7	-2@5%	11.25	5.25	6.5	28	Built-In
			P27GF21-1.5			13.25	6.25	7.75	45	
			P27GF21-2						50	
			P27GF21-3						60	
			P27LF21-5			15	10.187	10.625	110	
			P27LF21-7.5						150	
			P27LF21-10			17	13.187	13.125	175	
			P27LF21-15						270	
	N	480V -120/240V	P48GF21-1	2	-2@5%	11.25	5.25	6.5	28	Built-In
			P48GF21-1.5			13.25	6.25	7.75	45	
			P48GF21-2						50	
			P48GF21-3						60	
			P48LF21-5			15	10.187	10.625	110	
			P48LF21-7.5						150	
			P48LF21-10			17	13.187	13.125	175	
			P48LF21-15						270	
	Y	600V - 120/240V	P60CF21-1	3	-2@5%	11.25	5.25	6.5	28	Built-In
			P60CF21-1.5			13.25	6.25	7.75	45	
			P60CF21-2						50	
			P60CF21-3						60	
			P60SF21-5			15	10.187	10.625	110	
			P60SF21-7.5						150	
			P60SF21-10			17	13.187	13.125	175	
			P60SF21-15						270	

Single-Phase Ventilated Technical Data

Conductor	Temp Rise (Celsius)	Electro-static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	240x480V - 120/240V	S2XLH21-15	K1	9	+2/-4@2.5%	33	16.625	18.375	170	WS-3	WMB-3
				S2XLH21-25							195		
				S2XLH21-37				37	22.375	19.875	270	WS-4	
				S2XLH21-50							300		
				S2XLH21-75				45.5	24.75	20	450	WS-5	WMB-4
				S2XLH21-100				52	25.375	23	610	WS-7	
				S2XLH21-167				60	33.375	26	1070	WS-9	N/A
	150°	Y	600V - 120/240V	S60SH21-15		11	+2/-4@2.5%	33	16.625	18.375	170	WS-3	WMB-3
				S60SH21-25							195		
				S60SH21-37				37	22.375	19.875	270	WS-4	
				S60SH21-50							300		
				S60SH21-75				45.5	24.75	20	450	WS-5	WMB-4
				S60SH21-100				52	25.375	23	610	WS-7	
				S60SH21-167				60	33.375	26	1070	WS-9	N/A
CU	150°	N	240x480V - 120/240V	S2XGH21-15	K1	9	+2/-4@2.5%	33	16.625	18.375	220	WS-3	WMB-3
				S2XGH21-25							260		
				S2XGH21-37				37	22.375	19.875	405	WS-4	
				S2XGH21-50							340		
				S2XGH21-75				52	25.375	23	720	WS-3	WMB-4
				S2XGH21-100							925		
				S2XGH21-167				60	33.375	26	1210	WS-9	N/A
		Y		S2XCH21-15		9A	+2/-4@2.5%	33	16.625	18.375	220	WS-3	WMB-3
				S2XCH21-25							260		
				S2XCH21-37				37	22.375	19.875	405	WS-4	
				S2XCH21-50							340		
				S2XCH21-75				52	25.375	23	720	WS-7	WMB-4
				S2XCH21-100							925		
				S2XCH21-167				60	33.375	26	1210	WS-9	N/A

Three-Phase Encapsulated Technical Data

Temp Rise (Celsius)	Electro-static Shield	Primary/ Secondary	Part Number	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
						H	W	D			
115°	Y	240Δ - 208Y	N24CF2Y-3	12	-2@5%	12.062	12.125	8.375	95	N/A	Built-In
			N24CF2Y-6			14.562	20.125	10.625	225		
			N24SF2Y-9						270		
			N24SF2Y-15			16.062	21.125	15.125	435		
		480Δ - 208Y	N48CF2Y-3	15	-2@5%	12.062	12.125	8.375	95		
			N48CF2Y-6			14.562	20.125	10.625	225		
			N48SF2Y-9						270		
			N48SF2Y-15			16.062	21.125	15.125	435		
		480Δ - 240Δ	N48CF2D-3	16	-2@5%	12.062	12.125	8.375	95		
			N48CF2D-6			14.562	20.125	10.625	225		
			N48SF2D-9						270		
			N48SF2D-15			16.062	21.125	15.125	435		
	N	480Δ - 208Y	N48GF2Y-3	13	-2@5%	12.062	12.125	8.375	95		
			N48GF2Y-6			14.562	20.125	10.625	225		
			N48LF2Y-9						270		
			N48LF2Y-15			16.062	21.125	15.125	435		
		480Δ - 240Δ	N48GF2D-3	14	-2@5%	12.062	12.125	8.375	95		
			N48GF2D-6			14.562	20.125	10.625	225		
			N48LF2D-9						270		
			N48LF2D-15			16.062	21.125	15.125	435		

Three-Phase Ventilated Technical Data

15 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-15	K1	23	+2/-2@2.5%	29	17.125	19.375	245	WS-2	WMB-3
			480Δ-208Y	T48LH2Y-15		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-15		21							
			480Δ-400Y	T48LH40-15		27							
			480Δ-480Y	T48LH42-15		20							
		Y	208Δ-208Y	T20SH2Y-15	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SH2Y-15		26	+2/-4@2.5%						
			480Δ-208Y	T48SH2Y-15		18							
			480Δ-240Δ/120LT	T48SH2D-15		17							
			600Δ-208Y	T60SH2Y-15		24							
	115°	N	208Δ-480Y	T20LF42-15	K1	23	+2/-2@2.5%						WMB-3
			480Δ-208Y	T48LF2Y-15		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-15		21							
			480Δ-400Y	T48LF40-15		27							
			480Δ-480Y	T48LF42-15		20							
		Y	208Δ-208Y	T20SF2Y-15	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SF2Y-15		26	+2/-4@2.5%						
			480Δ-208Y	T48SF2Y-15		18							
			480Δ-240Δ/120LT	T48SF2D-15		17							
			600Δ-208Y	T60SF2Y-15		24							
	80°	N	208Δ-480Y	T20LB42-15	K1	23	+2/-2@2.5%	34	22.375	19.875	415	WS-4	WMB-3
			480Δ-208Y	T48LB2Y-15		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-15		21							
			480Δ-400Y	T48LB40-15		27							
			480Δ-480Y	T48LB42-15		20							
		Y	208Δ-208Y	T20SB2Y-15	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SB2Y-15		26	+2/-4@2.5%						
			480Δ-208Y	T48SB2Y-15		18							
			480Δ-240Δ/120LT	T48SB2D-15		17							
			600Δ-208Y	T60SB2Y-15		24							
CU	150°	Y	480Δ-208Y	T48CH2Y-15	K1	18	+2/-4@2.5%	29	17.125	19.375	285	WS-2	WMB-3
	115°			T48CF2Y-15		18							
	80°			T48CB2Y-15		18		34	22.375	19.875	465	WS-4	WMB-3

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-15-K4	K4	18	+2/-4@2.5%	29	17.125	19.375	245	WS-2	WMB-3
	115°			T48SF2Y-15-K4									
	80°			T48SB2Y-15-K4				34	22.375	19.875	415	WS-4	
CU	150°	Y	480Δ-208Y	T48CH2Y-15-K4	K4	18		29	17.125	19.375	285	WS-2	
	115°			T48CF2Y-15-K4									
	80°			T48CB2Y-15-K4				34	22.375	19.875	465	WS-4	
AL	150°	Y	480Δ-208Y	T48SH2Y-15-K13	K13	18	+2/-4@2.5%	29	17.125	19.375	245	WS-2	WMB-3
	115°			T48SF2Y-15-K13									
	80°			T48SB2Y-15-K13				34	22.375	19.875	415	WS-4	
CU	150°	Y	480Δ-208Y	T48CH2Y-15-K13	K13	18		29	17.125	19.375	285	WS-2	
	115°			T48CF2Y-15-K13									
	80°			T48CB2Y-15-K13				34	22.375	19.875	465	WS-4	
AL	150°	Y	480Δ-208Y	T48SH2Y-15-K20	K20	18	+2/-4@2.5%	29	17.125	19.375	245	WS-2	WMB-3
	115°			T48SF2Y-15-K20									
	80°			T48SB2Y-15-K20				34	22.375	19.875	415	WS-4	
CU	150°	Y	480Δ-208Y	T48CH2Y-15-K20	K20	18		29	17.125	19.375	285	WS-2	
	115°			T48CF2Y-15-K20									
	80°			T48CB2Y-15-K20				34	22.375	19.875	465	WS-4	

Three-Phase Ventilated Technical Data

30 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-30	K1	23	+2/-2@2.5%	34	22.375	19.875	415	WS-4	WMB-3
			480Δ-208Y	T48LH2Y-30		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-30		21							
			480Δ-400Y	T48LH40-30		27							
			480Δ-480Y	T48LH42-30		20							
		Y	208Δ-208Y	T20SH2Y-30	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SH2Y-30		26	+2/-4@2.5%						
			480Δ-208Y	T48SH2Y-30		18							
			480Δ-240Δ/120LT	T48SH2D-30		17							
			600Δ-208Y	T60SH2Y-30		24							
	115°	N	208Δ-480Y	T20LF42-30	K1	23	+2/-2@2.5%						
			480Δ-208Y	T48LF2Y-30		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-30		21							
			480Δ-400Y	T48LF40-30		27							
			480Δ-480Y	T48LF42-30		20							
		Y	208Δ-208Y	T20SF2Y-30	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SF2Y-30		26	+2/-4@2.5%						
			480Δ-208Y	T48SF2Y-30		18							
			480Δ-240Δ/120LT	T48SF2D-30		17							
			600Δ-208Y	T60SF2Y-30		24							
	80°	N	208Δ-480Y	T20LB42-30	K1	23	+2/-2@2.5%	37	26	19.875	455	WS-18A	WMB-4
			480Δ-208Y	T48LB2Y-30		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-30		21							
			480Δ-400Y	T48LB40-30		27							
			480Δ-480Y	T48LB42-30		20							
		Y	208Δ-208Y	T20SB2Y-30	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SB2Y-30		26	+2/-4@2.5%						
			480Δ-208Y	T48SB2Y-30		18							
			480Δ-240Δ/120LT	T48SB2D-30		17							
			600Δ-208Y	T60SB2Y-30		24							
CU	150°	Y	480Δ-208Y	T48CH2Y-30	K1	18	+2/-4@2.5%	34	22.375	19.875	465	WS-4	WMB-3
	115°			T48CF2Y-30									
	80°			T48CB2Y-30									

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-30-K4	K4	18	+2/-4@2.5%	34	22.375	19.875	415	WS-4	WMB-3
	115°			T48SF2Y-30-K4									
	80°			T48SB2Y-30-K4				37	26	19.875	455	WS-18A	WMB-4
CU	150°	Y	480Δ-208Y	T48CH2Y-30-K4	K4	18		34	22.375	19.875	465	WS-4	WMB-3
	115°			T48CF2Y-30-K4									
	80°			T48CB2Y-30-K4									
AL	150°	Y	480Δ-208Y	T48SH2Y-30-K13	K13	18		34	22.375	19.875	415	WS-4	WMB-3
	115°			T48SF2Y-30-K13									
	80°			T48SB2Y-30-K13				43	28.5	23.5	685	WS-18	WMB-4
CU	150°	Y	480Δ-208Y	T48CH2Y-30-K13	K13	18		34	22.375	19.875	465	WS-4	WMB-3
	115°			T48CF2Y-30-K13									
	80°			T48CB2Y-30-K13									
AL	150°	Y	480Δ-208Y	T48SH2Y-30-K20	K20	18		34	22.375	19.875	415	WS-4	WMB-3
	115°			T48SF2Y-30-K20				37	26	19.875	455	WS-18A	WMB-4
	80°			T48SB2Y-30-K20				43	28.5	23.5	685	WS-18	
CU	150°	Y	480Δ-208Y	T48CH2Y-30-K20	K20	18		34	22.375	19.875	465	WS-4	WMB-3
	115°			T48CF2Y-30-K20									
	80°			T48CB2Y-30-K20	Consult Factory								

Three-Phase Ventilated Technical Data

45 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-45	K1	23	+2/-2@2.5%	37	26	19.875	455	WS-18A	WMB-4
			480Δ-208Y	T48LH2Y-45		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-45		21							
			480Δ-400Y	T48LH40-45		27							
			480Δ-480Y	T48LH42-45		20							
		Y	208Δ-208Y	T20SH2Y-45	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SH2Y-45		26	+2/-4@2.5%						
			480Δ-208Y	T48SH2Y-45		18							
			480Δ-240Δ/120LT	T48SH2D-45		17							
			600Δ-208Y	T60SH2Y-45		24							
	115°	N	208Δ-480Y	T20LF42-45	K1	23	+2/-2@2.5%	43	28.5	23.5	685	WS-18	WMB-4
			480Δ-208Y	T48LF2Y-45		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-45		21							
			480Δ-400Y	T48LF40-45		27							
			480Δ-480Y	T48LF42-45		20							
		Y	208Δ-208Y	T20SF2Y-45	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SF2Y-45		26	+2/-4@2.5%						
			480Δ-208Y	T48SF2Y-45		18							
			480Δ-240Δ/120LT	T48SF2D-45		17							
			600Δ-208Y	T60SF2Y-45		24							
	80°	N	208Δ-480Y	T20LB42-45	K1	23	+2/-2@2.5%						
			480Δ-208Y	T48LB2Y-45		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-45		21							
			480Δ-400Y	T48LB40-45		27							
			480Δ-480Y	T48LB42-45		20							
		Y	208Δ-208Y	T20SB2Y-45	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SB2Y-45		26	+2/-4@2.5%						
			480Δ-208Y	T48SB2Y-45		18							
			480Δ-240Δ/120LT	T48SB2D-45		17							
			600Δ-208Y	T60SB2Y-45		24							
CU	150°	Y	480Δ-208Y	T48CH2Y-45	K1	18	+2/-4@2.5%	37	26	19.875	520	WS-18A	WMB-4
	115°			T48CF2Y-45									
	80°			T48CB2Y-45				43	28.5	23.5	775	WS-18	

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-45-K4	K4	18	+2/-4@2.5%	37	26	19.875	455	WS-18A	WMB-4
	115°			T48SF2Y-45-K4				43	28.5	23.5	685	WS-18	
	80°			T48SB2Y-45-K4									
CU	150°	Y	480Δ-208Y	T48CH2Y-45-K4	K4	18		37	26	19.875	520	WS-18A	
	115°			T48CF2Y-45-K4				43	28.5	23.5	775	WS-18	
	80°			T48CB2Y-45-K4									
AL	150°	Y	480Δ-208Y	T48SH2Y-45-K13	K13	18		37	26	19.875	455	WS-18A	WMB-4
	115°			T48SF2Y-45-K13				43	28.5	23.5	685	WS-18	
	80°			T48SB2Y-45-K13									
CU	150°	Y	480Δ-208Y	T48CH2Y-45-K13	K13	18		37	26	19.875	520	WS-18A	
	115°			T48CF2Y-45-K13				43	28.5	23.5	775	WS-18	
	80°			T48CB2Y-45-K13									
AL	150°	Y	480Δ-208Y	T48SH2Y-45-K20	K20	18		43	28.5	23.5	685	WS-18	WMB-4
	115°			T48SF2Y-45-K20									
	80°			T48SB2Y-45-K20			+2/-4@2.5%	46	32	28	1045	WS-10B	N/A
CU	150°	Y	480Δ-208Y	T48CH2Y-45-K20	K20	18		43	28.5	23.5	775	WS-18	WMB-4
	115°			T48CF2Y-45-K20									
	80°			T48CB2Y-45-K20		Consult Factory							

Three-Phase Ventilated Technical Data

75 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-75	K1	23	+2/-2@2.5%	43	28.5	23.5	685	WS-18	WMB-4
			480Δ-208Y	T48LH2Y-75		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-75		21							
			480Δ-400Y	T48LH40-75		27							
			480Δ-480Y	T48LH42-75		20							
		Y	208Δ-208Y	T20SH2Y-75	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SH2Y-75		26	+2/-4@2.5%						
			480Δ-208Y	T48SH2Y-75		18							
			480Δ-240Δ/120LT	T48SH2D-75		17							
			600Δ-208Y	T60SH2Y-75		24							
	115°	N	208Δ-480Y	T20LF42-75	K1	23	+2/-2@2.5%	46	32	28	1045	WS-10B	N/A
			480Δ-208Y	T48LF2Y-75		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-75		21							
			480Δ-400Y	T48LF40-75		27							
			480Δ-480Y	T48LF42-75		20							
		Y	208Δ-208Y	T20SF2Y-75	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SF2Y-75		26	+2/-4@2.5%						
			480Δ-208Y	T48SF2Y-75		18							
			480Δ-240Δ/120LT	T48SF2D-75		17							
			600Δ-208Y	T60SF2Y-75		24							
	80°	N	208Δ-480Y	T20LB42-75	K1	23	+2/-2@2.5%						
			480Δ-208Y	T48LB2Y-75		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-75		21							
			480Δ-400Y	T48LB40-75		27							
			480Δ-480Y	T48LB42-75		20							
		Y	208Δ-208Y	T20SB2Y-75	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SB2Y-75		26	+2/-4@2.5%						
			480Δ-208Y	T48SB2Y-75		18							
			480Δ-240Δ/120LT	T48SB2D-75		17							
			600Δ-208Y	T60SB2Y-75		24							
CU	150°	Y	480Δ-208Y	T48CH2Y-75	K1	18	+2/-4@2.5%	43	28.5	23.5	775	WS-18	WMB-4
	115°			T48CF2Y-75									
	80°			T48CB2Y-75				46	32	28	1155	WS-10B	N/A

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-75-K4	K4	18	+2/-4@2.5%	43	28.5	23.5	685	WS-18	WMB-4
	115°			T48SF2Y-75-K4				46	32	28	1045	WS-10B	N/A
	80°			T48SB2Y-75-K4									
CU	150°	Y	480Δ-208Y	T48CH2Y-75-K4	K4	18		43	28.5	23.5	775	WS-18	WMB-4
	115°			T48CF2Y-75-K4				46	32	28	1155	WS-10B	N/A
	80°			T48CB2Y-75-K4		18A							
AL	150°	Y	480Δ-208Y	T48SH2Y-75-K13	K13	18	+2/-4@2.5%	46	32	28	1045	WS-10B	N/A
	115°			T48SF2Y-75-K13									
	80°			T48SB2Y-75-K13				46	32	28	1205	WS-10B	
CU	150°	Y	480Δ-208Y	T48CH2Y-75-K13	K13	18		46	32	28	1155	WS-10B	
	115°			T48CF2Y-75-K13									
	80°			T48CB2Y-75-K13									
AL	150°	Y	480Δ-208Y	T48SH2Y-75-K20	K20	18	+2/-4@2.5%	46	32	28	1045	WS-10B	N/A
	115°			T48SF2Y-75-K20									
	80°			T48SB2Y-75-K20		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-75-K20	K20	18	+2/-4@2.5%	46	32	28	1155	WS-10B	
	115°			T48CF2Y-75-K20									
	80°			T48CB2Y-75-K20		18A		46	32	28	1355	WS-10B	

Three-Phase Ventilated Technical Data

112 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-112	K1	23	+2/-2@2.5%	46	32	28	1045	WS-10B	N/A
			480Δ-208Y	T48LH2Y-112		22	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-112		21							
			480Δ-400Y	T48LH40-112		27							
			480Δ-480Y	T48LH42-112		20							
		Y	208Δ-208Y	T20SH2Y-112	K1	19	+2/-2@2.5%						
			240Δ-208Y	T24SH2Y-112		26	+2/-4@2.5%						
			480Δ-208Y	T48SH2Y-112		18							
			480Δ-240Δ/120LT	T48SH2D-112		17							
			600Δ-208Y	T60SH2Y-112		24							
	115°	N	208Δ-480Y	T20LF42-112	K1	23A	+2/-2@2.5%	46	32	28	1205	WS-10B	N/A
			480Δ-208Y	T48LF2Y-112		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-112		21A							
			480Δ-400Y	T48LF40-112		27A							
			480Δ-480Y	T48LF42-112		20A							
		Y	208Δ-208Y	T20SF2Y-112	K1	19A	+2/-2@2.5%						
			240Δ-208Y	T24SF2Y-112		26A	+2/-4@2.5%						
			480Δ-208Y	T48SF2Y-112		18A							
			480Δ-240Δ/120LT	T48SF2D-112		17A							
			600Δ-208Y	T60SF2Y-112		24A							
	80°	N	208Δ-480Y	T20LB42-112	K1	23A	+2/-2@2.5%						
			480Δ-208Y	T48LB2Y-112		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-112		21A							
			480Δ-400Y	T48LB40-112		27A							
			480Δ-480Y	T48LB42-112		20A							
		Y	208Δ-208Y	T20SB2Y-112	K1	19A	+2/-2@2.5%						
			240Δ-208Y	T24SB2Y-112		26A	+2/-4@2.5%						
			480Δ-208Y	T48SB2Y-112		18A							
			480Δ-240Δ/120LT	T48SB2D-112		17A							
			600Δ-208Y	T60SB2Y-112		24A							
CU	150°	Y	480Δ-208Y	T48CH2Y-112	K1	18	+2/-4@2.5%	46	32	28	1155	WS-10B	N/A
	115°			T48CF2Y-112		18							
	80°			T48CB2Y-112		18A		46	32	28	1355	WS-10B	

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-112-K4	K4	18	+2/-4@2.5%	46	32	28	1045	WS-10B	N/A
	115°			T48SF2Y-112-K4		18A					1205		
	80°			T48SB2Y-112-K4				51	36	30.5	1520	WS-12A	
CU	150°	Y	480Δ-208Y	T48CH2Y-112-K4	K4	18		46	32	28	1155	WS-10B	
	115°			T48CF2Y-112-K4									
	80°			T48CB2Y-112-K4		18A		51	36	30.5	1750	WS-12A	
AL	150°	Y	480Δ-208Y	T48SH2Y-112-K13	K13	18A	+2/-4@2.5%	46	32	28	1205	WS-10B	N/A
	115°			T48SF2Y-112-K13				51	36	30.5	1520	WS-12A	
	80°			T48SB2Y-112-K13		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-112-K13	K13	18	+2/-4@2.5%	46	32	28	1155	WS-10B	N/A
	115°			T48CF2Y-112-K13		18A					1355		
	80°			T48CB2Y-112-K13		Consult Factory							
AL	150°	Y	480Δ-208Y	T48SH2Y-112-K20	K20	18A	+2/-4@2.5%	46	32	28	1205	WS-10B	N/A
	115°			T48SF2Y-112-K20				51	36	30.5	1520	WS-12A	
	80°			T48SB2Y-112-K20		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-112-K20	K20	18A	+2/-4@2.5%	46	32	28	1355	WS-10B	N/A
	115°			T48CF2Y-112-K20				51	36	30.5	1750	WS-12A	
	80°			T48CB2Y-112-K20		Consult Factory							

Three-Phase Ventilated Technical Data

150 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-150	K1	23A	+2/-2@2.5%	46	32	28	1205	WS-10B	N/A
			480Δ-208Y	T48LH2Y-150		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-150		21A							
			480Δ-400Y	T48LH40-150		27A							
			480Δ-480Y	T48LH42-150		20A							
		Y	208Δ-208Y	T20SH2Y-150		19A	+2/-2@2.5%						
			240Δ-208Y	T24SH2Y-150		26A	+2/-4@2.5%						
			480Δ-208Y	T48SH2Y-150		18A							
			480Δ-240Δ/120LT	T48SH2D-150		17A							
			600Δ-208Y	T60SH2Y-150		24A							
	115°	N	208Δ-480Y	T20LF42-150	K1	23B	+2/-2@3%	51	36	30.5	1645	WS-12A	N/A
			480Δ-208Y	T48LF2Y-150		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-150		21A							
			480Δ-400Y	T48LF40-150		27A							
			480Δ-480Y	T48LF42-150		20A							
		Y	208Δ-208Y	T20SF2Y-150		19B	+2/-2@3%						
			240Δ-208Y	T24SF2Y-150		23B							
			480Δ-208Y	T48SF2Y-150		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SF2D-150		17A							
			600Δ-208Y	T60SF2Y-150		24A							
	80°	N	208Δ-480Y	T20LB42-150	K1	23B	+2/-2@3%						
			480Δ-208Y	T48LB2Y-150		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-150		21A							
			480Δ-400Y	T48LB40-150		27A							
			480Δ-480Y	T48LB42-150		20A							
		Y	208Δ-208Y	T20SB2Y-150		19B	+2/-2@3%						
			240Δ-208Y	T24SB2Y-150		23B							
			480Δ-208Y	T48SB2Y-150		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SB2D-150		17A							
			600Δ-208Y	T60SB2Y-150		24A							
CU	150°	Y	480Δ-208Y	T48CH2Y-150	K1	18A	+2/-4@2.5%	46	32	28	1355	WS-10B	N/A
	115°			T48CF2Y-150		18A		51	36	30.5	1750	WS-12A	
	80°			T48CB2Y-150		18A							

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-150-K4	K4	18A	+2/-4@2.5%	46	32	28	1205	WS-10B	N/A
	115°			T48SF2Y-150-K4				51	36	30.5	1645	WS-12A	
	80°			T48SB2Y-150-K4				72.75	53.375	36.875	2500	WS-16	
CU	150°	Y	480Δ-208Y	T48CH2Y-150-K4	K4	18A		46	32	28	1355	WS-10B	
	115°			T48CF2Y-150-K4				51	36	30.5	1750	WS-12A	
	80°			T48CB2Y-150-K4									
AL	150°	Y	480Δ-208Y	T48SH2Y-150-K13	K13	18A	+2/-4@2.5%	51	36	30.5	1645	WS-12A	N/A
	115°			T48SF2Y-150-K13				72.75	53.375	36.875	2500	WS-16	
	80°			T48SB2Y-150-K13		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-150-K13	K13	18A	+2/-4@2.5%	51	36	30.5	1750	WS-12A	N/A
	115°			T48CF2Y-150-K13									
	80°			T48CB2Y-150-K13		Consult Factory							
AL	150°	Y	480Δ-208Y	T48SH2Y-150-K20	K20	Consult Factory							
	115°			T48SF2Y-150-K20		18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	80°			T48SB2Y-150-K20		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-150-K20	K20	18A	+2/-4@2.5%	51	36	30.5	1750	WS-12A	N/A
	115°			T48CF2Y-150-K20		Consult Factory							
	80°			T48CB2Y-150-K20		18A	+2/-4@2.5%	72.75	53.375	36.875	2550	WS-16	N/A

Three-Phase Ventilated Technical Data

225 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-225	K1	23B	+2/-2@3%	51	36	30.5	1645	WS-12A	N/A
			480Δ-208Y	T48LH2Y-225		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-225		21A							
			480Δ-400Y	T48LH40-225		27A							
			480Δ-480Y	T48LH42-225		20A							
		Y	208Δ-208Y	T20SH2Y-225	K1	19B	+2/-2@3%						
			240Δ-208Y	T24SH2Y-225		23B							
			480Δ-208Y	T48SH2Y-225		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SH2D-225		17A							
			600Δ-208Y	T60SH2Y-225		24A							
	115°	N	208Δ-480Y	T20LF42-225	K1	23C	+2/-2@3.5%	72.75	53.375	36.875	2500	WS-16	N/A
			480Δ-208Y	T48LF2Y-225		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-225		21A							
			480Δ-400Y	T48LF40-225		27A							
			480Δ-480Y	T48LF42-225		20A							
		Y	208Δ-208Y	T20SF2Y-225	K1	19C	+2/-2@3.5%						
			240Δ-208Y	T24SF2Y-225		26C							
			480Δ-208Y	T48SF2Y-225		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SF2D-225		17A							
			600Δ-208Y	T60SF2Y-225		24A							
	80°	N	208Δ-480Y	T20LB42-225	K1	23C	+2/-2@3.5%						
			480Δ-208Y	T48LB2Y-225		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-225		21A							
			480Δ-400Y	T48LB40-225		27A							
			480Δ-480Y	T48LB42-225		20A							
		Y	208Δ-208Y	T20SB2Y-225	K1	19C	+2/-2@3.5%						
			240Δ-208Y	T24SB2Y-225		26C							
			480Δ-208Y	T48SB2Y-225		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SB2D-225		17A							
			600Δ-208Y	T60SB2Y-225		24A							
CU	150°	Y	480Δ-208Y	T48CH2Y-225	K1	18A	+2/-4@2.5%	51	36	30.5	1750	WS-12A	N/A
	115°			T48CF2Y-225		18A		72.75	53.375	36.875	2550	WS-16	
	80°			T48CB2Y-225		18A							

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-225-K4	K4	18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	115°			T48SF2Y-225-K4									
	80°			T48SB2Y-225-K4									
CU	150°	Y	480Δ-208Y	T48CH2Y-225-K4	K4	18A		51	36	30.5	1750	WS-12A	
	115°			T48CF2Y-225-K4				72.75	53.375	36.875	2550	WS-16	
	80°			T48CB2Y-225-K4									
AL	150°	Y	480Δ-208Y	T48SH2Y-225-K13	K13	18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	115°			T48SF2Y-225-K13									
	80°			T48SB2Y-225-K13		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-225-K13	K13	18A	+2/-4@2.5%	72.75	53.375	36.875	2550	WS-16	N/A
	115°			T48CF2Y-225-K13									
	80°			T48CF2Y-225-K13		Consult Factory							
AL	150°	Y	480Δ-208Y	T48SH2Y-225-K20	K20	18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	115°			T48SF2Y-225-K20									
	80°			T48SB2Y-225-K20		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-225-K20	K20	18A	+2/-4@2.5%	72.75	53.375	36.875	2550	WS-16	N/A
	115°			T48CF2Y-225-K20									
	80°			T48CB2Y-225-K20		Consult Factory							

Three-Phase Ventilated Technical Data

300 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-300	K1	23C	+2/-2@3.5%	72.75	53.375	36.875	2500	WS-16	N/A
			480Δ-208Y	T48LH2Y-300		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-300		21A							
			480Δ-400Y	T48LH40-300		27A							
			480Δ-480Y	T48LH42-300		20A							
		Y	208Δ-208Y	T20SH2Y-300		19C	+2/-2@3.5%						
			240Δ-208Y	T24SH2Y-300		26C							
			480Δ-208Y	T48SH2Y-300		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SH2D-300		17A							
			600Δ-208Y	T60SH2Y-300		24A							
	115°	N	208Δ-480Y	T20LF42-300	K1	23C	+2/-2@3.5%						
			480Δ-208Y	T48LF2Y-300		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LF2D-300		21A							
			480Δ-400Y	T48LF40-300		27A							
			480Δ-480Y	T48LF42-300		20A							
		Y	208Δ-208Y	T20SF2Y-300		19C	+2/-2@3.5%						
			240Δ-208Y	T24SF2Y-300		26C							
			480Δ-208Y	T48SF2Y-300		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SF2D-300		17A							
			600Δ-208Y	T60SF2Y-300		24A							
	80°	N	208Δ-480Y	T20LB42-300	K1	23E	+1/1@5%						
			480Δ-208Y	T48LB2Y-300		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LB2D-300		21A							
			480Δ-400Y	T48LB40-300		27A							
			480Δ-480Y	T48LB42-300		20A							
		Y	208Δ-208Y	T20SB2Y-300		19E	+1/1@5%						
			240Δ-208Y	T24SB2Y-300		26D	+1/1@4%	72.75	53.375	36.875	3340	WS-16	N/A
			480Δ-208Y	T48SB2Y-300		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SB2D-300		17A							
			600Δ-208Y	T60SB2Y-300		24A							
CU	150°	Y	480Δ-208Y	T48CH2Y-300	K1	18A	+2/-4@2.5%						
	115°			T48CF2Y-300		18A							
	80°			T48CB2Y-300		Consult Factory							

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-300-K4	K4	18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	115°			T48SF2Y-300-K4				72.75	53.375	36.875	3340		
	80°			T48SB2Y-300-K4									
CU	150°	Y	480Δ-208Y	T48CH2Y-300-K4	K4	18A		72.75	53.375	36.875	2550		
	115°			T48CF2Y-300-K4									
	80°			T48CB2Y-300-K4		Consult Factory							
AL	150°	Y	480Δ-208Y	T48SH2Y-300-K13	K13	18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	115°			T48SF2Y-300-K13				72.75	53.375	36.875	3340		
	80°			T48SB2Y-300-K13		Consult Factory							
CU	150°	Y	480Δ-208Y	T48CH2Y-300-K13	K13	18A	+2/-4@2.5%	72.75	53.375	36.875	2550	WS-16	N/A
	115°			T48CF2Y-300-K13		Consult Factory							
	80°			T48CF2Y-300-K13									
AL	150°	Y	480Δ-208Y	T48SH2Y-300-K20	K20	18A	+2/-4@2.5%	72.75	53.375	36.875	2500	WS-16	N/A
	115°			T48SF2Y-300-K20		Consult Factory							
	80°			T48SB2Y-300-K20									
CU	150°	Y	480Δ-208Y	T48CH2Y-300-K20	K20	18A	+2/-4@2.5%	72.75	53.375	36.875	2550	WS-16	N/A
	115°			T48CF2Y-300-K20		Consult Factory							
	80°			T48CB2Y-300-K20									

Three-Phase Ventilated Technical Data

500 kVA Transformers

Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	N	208Δ-480Y	T20LH42-500	K1	23E	+1/-1@5%	72.75	53.375	36.875	3340	WS-16	N/A
			480Δ-208Y	T48LH2Y-500		22A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48LH2D-500		21A							
			480Δ-400Y	T48LH40-500		27A							
			480Δ-480Y	T48LH42-500		20A							
		Y	208Δ-208Y	T20SH2Y-500	K1	19E	+1/-1@5%						
			240Δ-208Y	T24SH2Y-500		26D	+1/-1@4%						
			480Δ-208Y	T48SH2Y-500		18A	+2/-4@2.5%						
			480Δ-240Δ/120LT	T48SH2D-500		17A							
			600Δ-208Y	T60SH2Y-500		24A							
	115°	N	208Δ-480Y	T20LF42-500	K1	Consult Factory							
			480Δ-208Y	T48LF2Y-500									
			480Δ-240Δ/120LT	T48LF2D-500									
			480Δ-400Y	T48LF40-500									
			480Δ-480Y	T48LF42-500									
		Y	208Δ-208Y	T20SF2Y-500	K1								
			240Δ-208Y	T24SF2Y-500									
			480Δ-208Y	T48SF2Y-500									
			480Δ-240Δ/120LT	T48SF2D-500									
			600Δ-208Y	T60SF2Y-500									
	80°	N	208Δ-480Y	T20LB42-500	K1								
			480Δ-208Y	T48LB2Y-500									
			480Δ-240Δ/120LT	T48LB2D-500									
			480Δ-400Y	T48LB40-500									
			480Δ-480Y	T48LB42-500									
		Y	208Δ-208Y	T20SB2Y-500	K1								
			240Δ-208Y	T24SB2Y-500									
			480Δ-208Y	T48SB2Y-500									
			480Δ-240Δ/120LT	T48SB2D-500									
			600Δ-208Y	T60SB2Y-500									
CU	150°	Y	480Δ-208Y	T48CH2Y-500	K1	18A	+2/-4@2.5%	72.75	53.375	36.875	3570	WS-16	N/A
	115°			T48CF2Y-500		Consult Factory							
	80°			T48CB2Y-500									

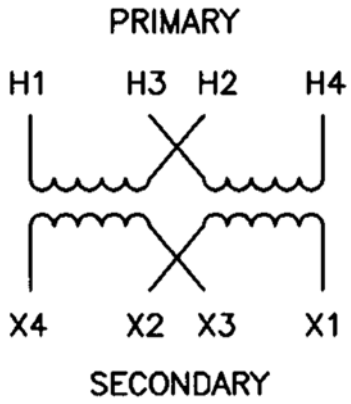
Conductor	Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	K Factor	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather Shield	Wall Mount Bracket
								H	W	D			
AL	150°	Y	480Δ-208Y	T48SH2Y-500-K4	K4	Consult Factory							
	115°			T48SF2Y-500-K4									
	80°			T48SB2Y-500-K4									
CU	150°	Y	480Δ-208Y	T48CH2Y-500-K4	K4								
	115°			T48CF2Y-500-K4									
	80°			T48CB2Y-500-K4									
AL	150°	Y	480Δ-208Y	T48SH2Y-500-K13	K13	Consult Factory							
	115°			T48SF2Y-500-K13									
	80°			T48SB2Y-500-K13									
CU	150°	Y	480Δ-208Y	T48CH2Y-500-K13	K13								
	115°			T48CF2Y-500-K13									
	80°			T48CF2Y-500-K13									
AL	150°	Y	480Δ-208Y	T48SH2Y-500-K20	K20	Consult Factory							
	115°			T48SF2Y-500-K20									
	80°			T48SB2Y-500-K20									
CU	150°	Y	480Δ-208Y	T48CH2Y-500-K20	K20								
	115°			T48CF2Y-500-K20									
	80°			T48CB2Y-500-K20									

Wiring Diagrams

Single-Phase

Diagram #1

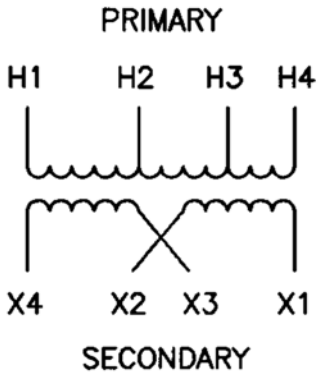
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240 x 480	120/240	NONE



VOLTS	CONNECTIONS	LINE LEADS
480	H2 - H3	H1, H4
240	H1 - H3, H2 - H4	H1, H4
240	X2 - X3	X1, X4
240/120	X2 - X3	X1, X2, X4
120	X1 - X3, X2 - X4	X1, X4

Diagram #2

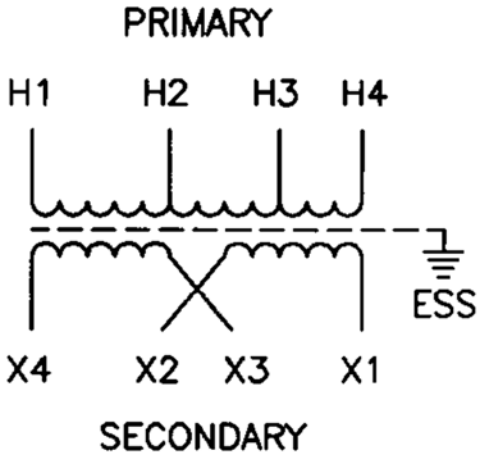
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480	120/240	2-5% FCBN



VOLTS	CONNECTIONS	LINE LEADS
480		H1, H4
456		H1, H3
432		H1, H2
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #3

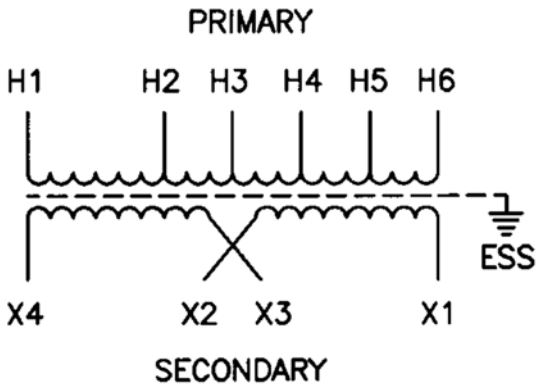
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
600	120/240	2-5% FCBN



VOLTS	CONNECTIONS	LINE LEADS
600		H1, H4
570		H1, H3
540		H1, H2
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #4

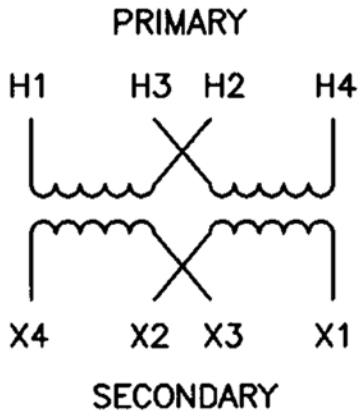
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
600	120/240	4 - 2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
600		H1, H6
585		H1, H5
570		H1, H4
555		H1, H3
540		H1, H2
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #5

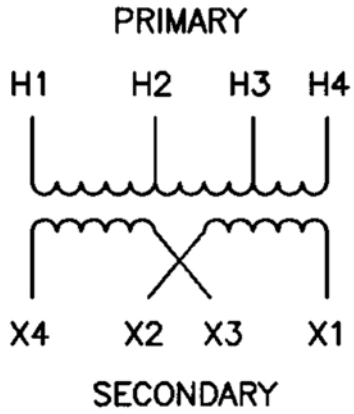
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
120 x 240	120/240	NONE



VOLTS	CONNECTIONS	LINE LEADS
240	H2-H3	H1, H4
120	H1-H3, H2-H4	H1, H4
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #6

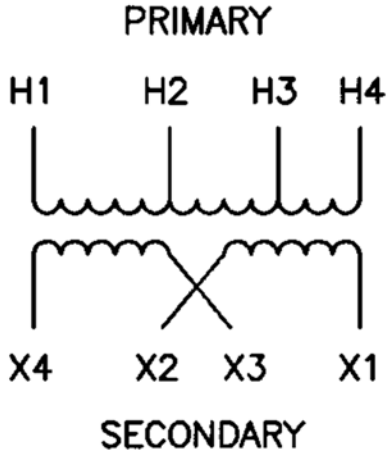
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
208	120/240	2-5% FCBN



VOLTS	CONNECTIONS	LINE LEADS
208		H1, H4
198		H1, H3
187		H1, H2
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #7

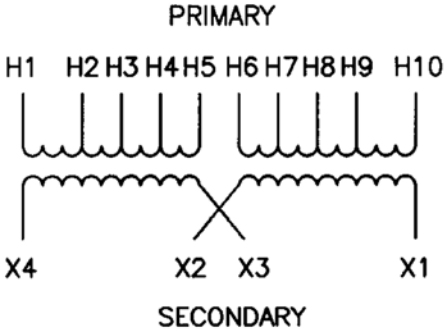
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
277	120/240	2-5% FCBN



VOLTS	CONNECTIONS	LINE LEADS
277		H1, H4
263		H1, H3
249		H1, H2
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #8

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240 x 480	120/240	2 - 2 1/2% FCAN & 4 - 2 1/2% FCBN



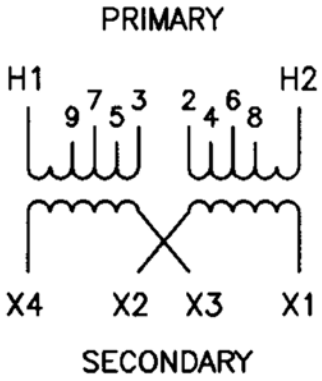
VOLTS	CONNECTIONS	LINE LEADS
252	H1-H6, H10-H5	H1, H10
240	H1-H7, H10-H4	H1, H10
228	H1-H8, H10-H3	H1, H10
216	H1-H9, H10-H2	H1, H10
504	H5-H6	H1, H10
492	H5-H7	H1, H10
480	H4-H7	H1, H10
468	H4-H8	H1, H10
456	H3-H8	H1, H10
444	H3-H9	H1, H10
432	H2-H9	H1, H10
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Wiring Diagrams

Single-Phase

Diagram #9

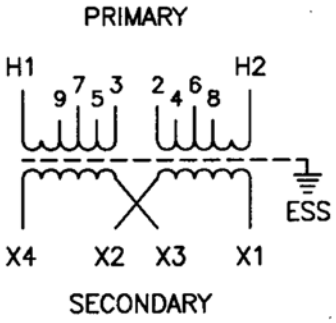
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240 x 480	120/240	2 - 2 1/2% FCAN & 4 - 2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2
492	3 TO 4	H1, H2
480	4 TO 5	H1, H2
468	5 TO 6	H1, H2
456	6 TO 7	H1, H2
444	7 TO 8	H1, H2
432	8 TO 9	H1, H2
252	2 TO H1, 3 TO H2	H1, H2
240	4 TO H1, 5 TO H2	H1, H2
228	6 TO H1, 7 TO H2	H1, H2
216	8 TO H1, 9 TO H2	H1, H2
240	X2 TO X3	X1, X4
240/120	X2 TO X3	X1, X2, X4
120	X1 TO X3, X2 TO X4	X1, X4

Diagram #9A

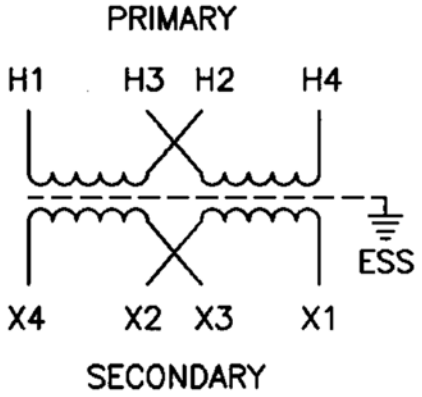
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240 x 480	120/240	2 - 2 1/2% FCAN & 4 - 2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2
492	3 TO 4	H1, H2
480	4 TO 5	H1, H2
468	5 TO 6	H1, H2
456	6 TO 7	H1, H2
444	7 TO 8	H1, H2
432	8 TO 9	H1, H2
252	2 TO H1, 3 TO H2	H1, H2
240	4 TO H1, 5 TO H2	H1, H2
228	6 TO H1, 7 TO H2	H1, H2
216	8 TO H1, 9 TO H2	H1, H2
240	X2 TO X3	X1, X4
240/120	X2 TO X3	X1, X2, X4
120	X1 TO X3, X2 TO X4	X1, X4

Diagram #10

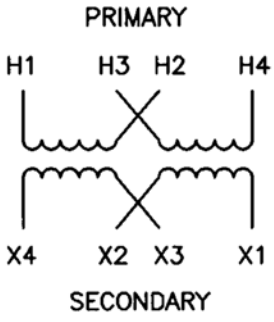
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240 x 480	120/240	NONE



VOLTS	CONNECTIONS	LINE LEADS
480	H2-H3	H1, H4
240	H1-H3, H2-H4	H1, H4
240	X2-X3	X1, X4
240/120	X2-X3	X1, X2, X4
120	X1-X3, X2-X4	X1, X4

Diagram #10A

	PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
(A)	120 x 240	12/24	NONE
(B)	120 x 240	16/32	NONE
(C)	240 x 480	24/48	NONE



(A)

VOLTS	CONNECTIONS	LINE LEADS
240	H2-H3	H1, H4
120	H1-H3, H2-H4	H1, H4
24	X2-X3	X1, X4
12	X1-X3, X2-X4	X1, X4

(B)

VOLTS	CONNECTIONS	LINE LEADS
240	H2-H3	H1, H4
120	H1-H3, H2-H4	H1, H4
32	X2-X3	X1, X4
16	X1-X3, X2-X4	X1, X4

(C)

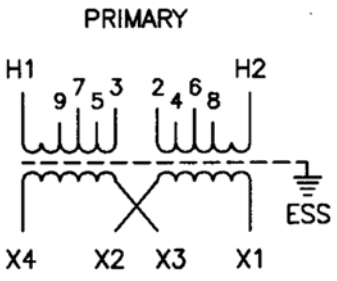
VOLTS	CONNECTIONS	LINE LEADS
480	H2-H3	H1, H4
240	H1-H3, H2-H4	H1, H4
48	X2-X3	X1, X4
24	X1-X3, X2-X4	X1, X4

Wiring Diagrams

Three-Phase

Diagram #11

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
600	120/240	2 - 2 1/2% FCAN & 4 - 2 1/2% FCBN



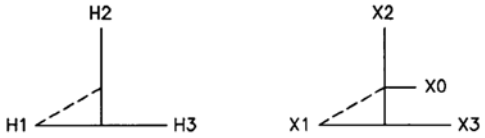
SECONDARY

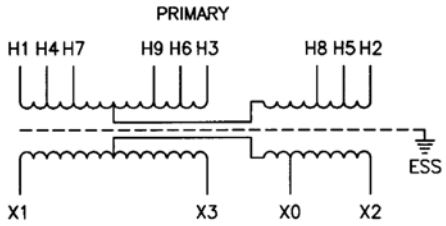
VOLTS	CONNECTIONS	LINE LEADS
630	2 TO 3	H1, H2
615	3 TO 4	H1, H2
600	4 TO 5	H1, H2
585	5 TO 6	H1, H2
570	6 TO 7	H1, H2
555	7 TO 8	H1, H2
540	8 TO 9	H1, H2
240	X2 TO X3	X1, X4
240/120	X2 TO X3	X1, X2, X4
120	X1 TO X3, X2 TO X4	X1, X4

Diagram #12

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240Δ	208Y/120	2-5% FCBN

Ø DEGREE ANGULAR DISPLACEMENT





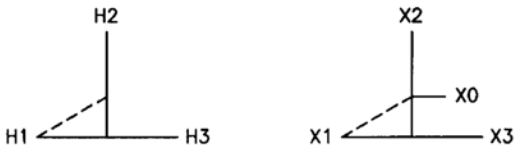
SECONDARY

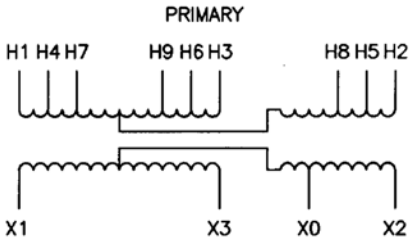
VOLTS	CONNECTIONS	LINE LEADS
240		H1, H2, H3
228		H4, H5, H6
216		H7, H8, H9
208Y/120		X0, X1, X2, X3

Diagram #13

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	208Y/120	2-5% FCBN

Ø DEGREE ANGULAR DISPLACEMENT

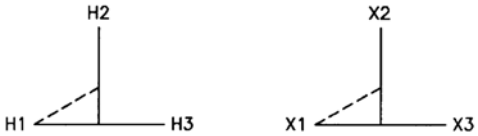


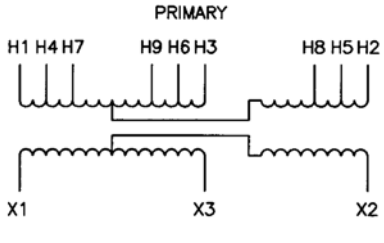


VOLTS	CONNECTIONS	LINE LEADS
480		H1, H2, H3
456		H4, H5, H6
432		H7, H8, H9
208Y/120		X0, X1, X2, X3

Diagram #14

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	240Δ	2-5% FCBN



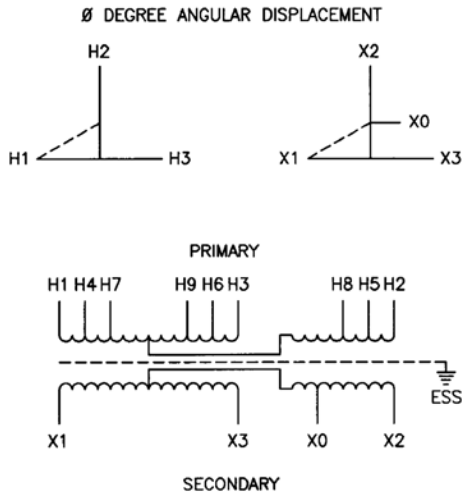


SECONDARY

VOLTS	CONNECTIONS	LINE LEADS
480		H1, H2, H3
456		H4, H5, H6
432		H7, H8, H9
240		X1, X2, X3

Diagram #15

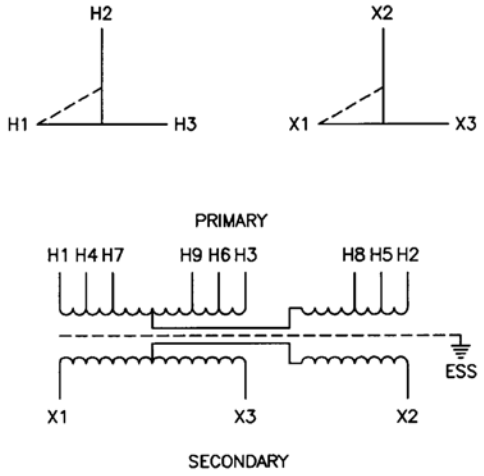
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	208Y/120	2-5% FCBN



VOLTS	CONNECTIONS	LINE LEADS
480		H1, H2, H3
456		H4, H5, H6
432		H7, H8, H9
208Y/120		X0, X1, X2, X3

Diagram #16

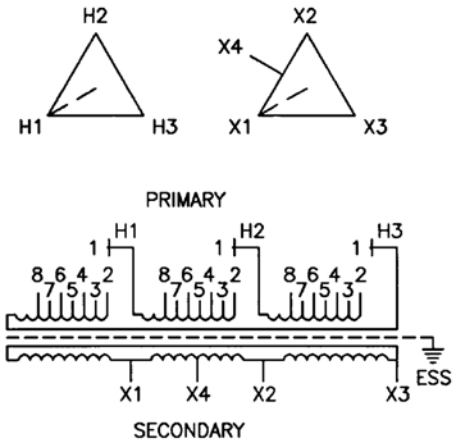
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	240	2-5% FCBN



VOLTS	CONNECTIONS	LINE LEADS
480		H1, H2, H3
456		H4, H5, H6
432		H7, H8, H9
240		X1, X2, X3

Diagram #17

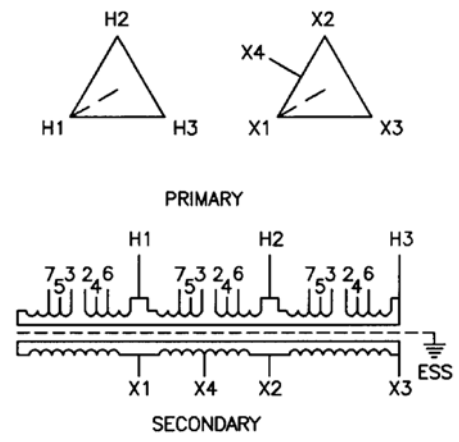
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	240Δ/120 LT	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
240		X1, X2, X3

Diagram #17A

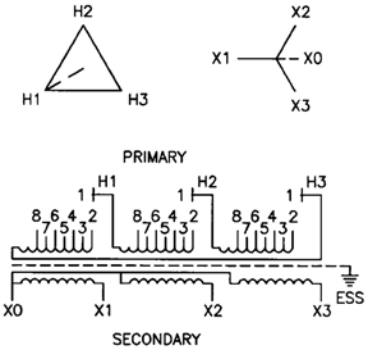
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	240Δ/120 LT	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2, H3
492	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
468	4 TO 5	H1, H2, H3
456	5 TO 6	H1, H2, H3
444	4 TO 7	H1, H2, H3
432	6 TO 7	H1, H2, H3
240		X1, X2, X3

Diagram #18

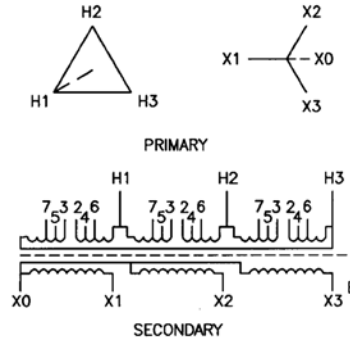
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	208Y/120	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #18A - 18B

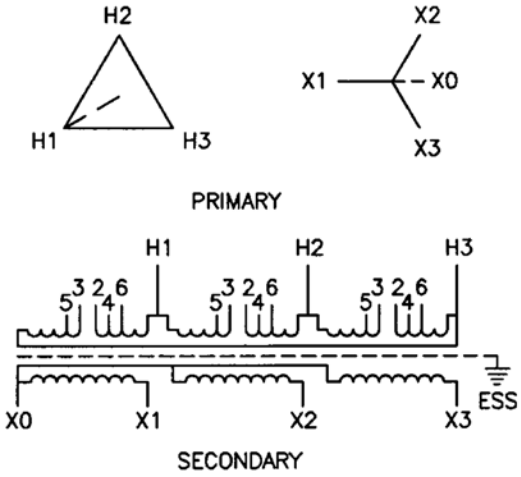
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	208Y/120	(A) 2-2 1/2% FCAN & 4-2 1/2% FCBN (B) 2-3% FCAN & 2-3% FCBN



(A)		
VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2, H3
492	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
468	4 TO 5	H1, H2, H3
456	5 TO 6	H1, H2, H3
444	4 TO 7	H1, H2, H3
432	6 TO 7	H1, H2, H3
208Y/120		X0, X1, X2, X3
(B)		
VOLTS	CONNECTIONS	LINE LEADS
509	2 TO 3	H1, H2, H3
494	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
466	4 TO 5	H1, H2, H3
451	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #19A - 19E

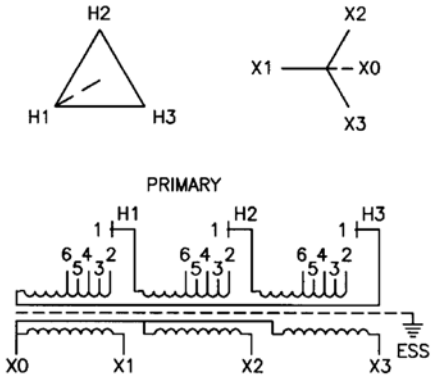
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
208Δ	208Y/120	(A) 2-2 1/2% FCAN & 2-2 1/2% FCBN (B) 2-3% FCAN & 2-3% FCBN (C) 2-3 1/2% FCAN & 2-3 1/2% FCBN (D) 1-4% FCAN & 1-4% FBCN (E) 1-5% FCAN & 1-5% FCBN



(A)		
VOLTS	CONNECTIONS	LINE LEADS
218	2 TO 3	H1, H2, H3
213	2 TO 5	H1, H2, H3
208	3 TO 4	H1, H2, H3
203	4 TO 5	H1, H2, H3
198	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3
(B)		
VOLTS	CONNECTIONS	LINE LEADS
220	2 TO 3	H1, H2, H3
214	2 TO 5	H1, H2, H3
208	3 TO 4	H1, H2, H3
202	4 TO 5	H1, H2, H3
196	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3
(C)		
VOLTS	CONNECTIONS	LINE LEADS
223	2 TO 3	H1, H2, H3
215	2 TO 5	H1, H2, H3
208	3 TO 4	H1, H2, H3
201	4 TO 5	H1, H2, H3
193	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3
(D)		
VOLTS	CONNECTIONS	LINE LEADS
216	2 TO 3	H1, H2, H3
208	3 TO 4	H1, H2, H3
200	4 TO 5	H1, H2, H3
208Y/120		X0, X1, X2, X3
(E)		
VOLTS	CONNECTIONS	LINE LEADS
218	2 TO 3	H1, H2, H3
208	3 TO 4	H1, H2, H3
198	4 TO 5	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #19

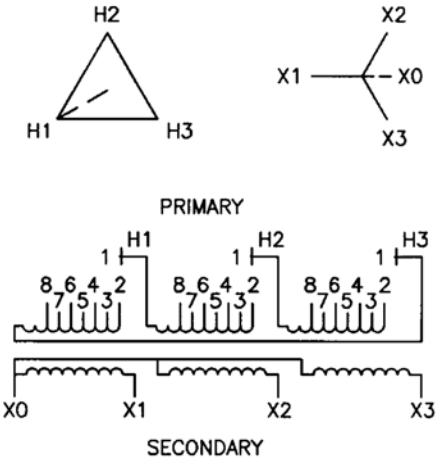
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
208Δ	208Y/120	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
218	1 TO 2	H1, H2, H3
213	1 TO 3	H1, H2, H3
208	1 TO 4	H1, H2, H3
203	1 TO 5	H1, H2, H3
198	1 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #20

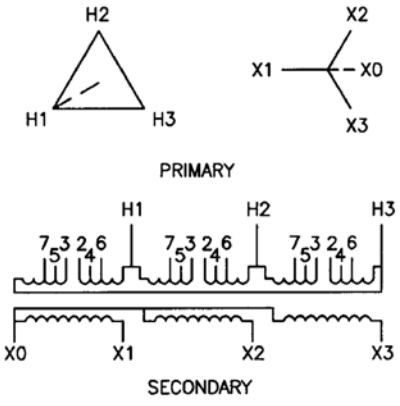
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	480Y/277	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
480Y/277		X0, X1, X2, X3

Diagram #20A

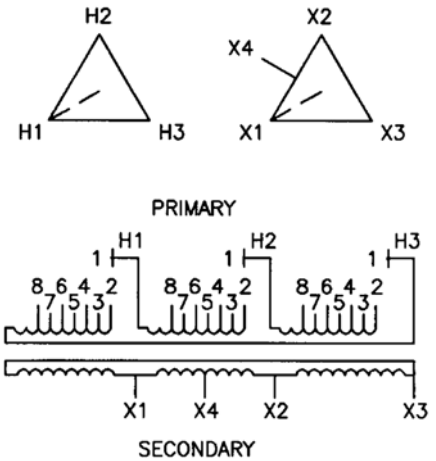
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	480Y/277	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2, H3
492	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
468	4 TO 5	H1, H2, H3
456	5 TO 6	H1, H2, H3
444	4 TO 7	H1, H2, H3
432	6 TO 7	H1, H2, H3
480Y/277		X0, X1, X2, X3

Diagram #21

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	240Δ/120 LT	2-2 1/2% FCAN & 4-2 1/2% FCBN



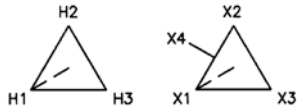
VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
240		X1, X2, X3

Wiring Diagrams

Three-Phase

Diagram #21A

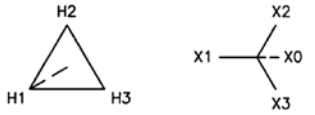
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	240Δ/120 LT	2-2 1/2% FCAN & 4-2 1/2% FCBN

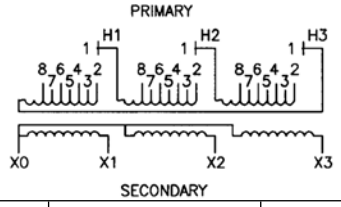


VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2, H3
492	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
468	4 TO 5	H1, H2, H3
456	5 TO 6	H1, H2, H3
444	4 TO 7	H1, H2, H3
432	6 TO 7	H1, H2, H3
240		X1, X2, X3

Diagram #22

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	208Y/120	2-2 1/2% FCAN & 4-2 1/2% FCBN

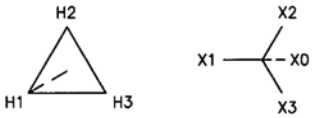


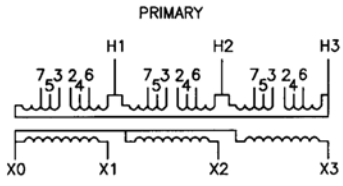


VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #22A - 22B

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	208Y/120	(A) 2-2 1/2% FCAN & 4-2 1/2% FCBN (B) 2-3% FCAN & 2-3% FCBN



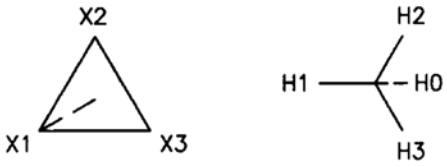


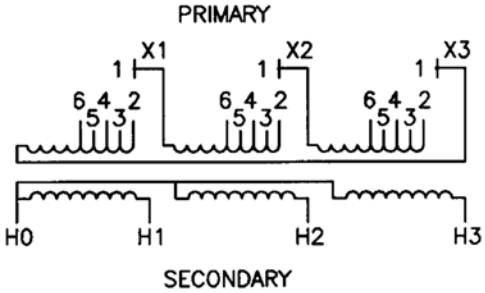
(A) VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2, H3
492	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
468	4 TO 5	H1, H2, H3
456	5 TO 6	H1, H2, H3
444	4 TO 7	H1, H2, H3
432	6 TO 7	H1, H2, H3
208Y/120		X0, X1, X2, X3

(B) VOLTS	CONNECTIONS	LINE LEADS
509	2 TO 3	H1, H2, H3
494	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
466	4 TO 5	H1, H2, H3
451	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #23

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
208Δ	480Y/277	2-2 1/2% FCAN & 2-2 1/2% FCBN

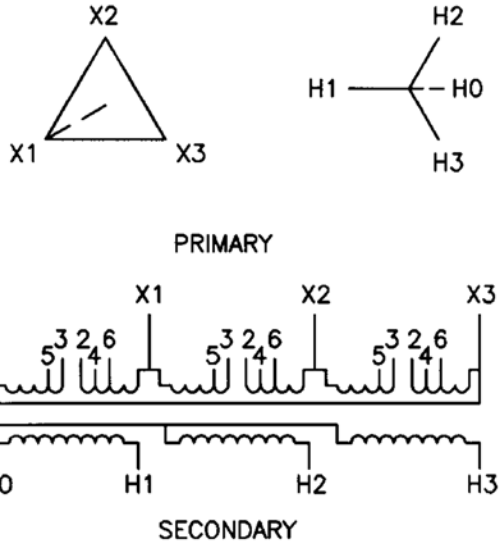




VOLTS	CONNECTIONS	LINE LEADS
218	1 TO 2	X1, X2, X3
213	1 TO 3	X1, X2, X3
208	1 TO 4	X1, X2, X3
203	1 TO 5	X1, X2, X3
198	1 TO 6	X1, X2, X3
480Y/277		H0, H1, H2, H3

Diagram #23A-23E

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
208Δ	480Y/277	(A) 2-2 1/2% FCAN & 2-2 1/2% FCBN (B) 2-3% FCAN & 2-3% FCBN (C) 2-3 1/2% FCAN & 2-3 1/2% FCBN (D) 1-4% FCAN & 1-4% FCBN (E) 1-5% FCAN & 1-5% FCBN



(A) VOLTS	CONNECTIONS	LINE LEADS
218	2 TO 3	X1, X2, X3
213	2 TO 5	X1, X2, X3
208	3 TO 4	X1, X2, X3
203	4 TO 5	X1, X2, X3
198	5 TO 6	X1, X2, X3
480Y/277		H0, H1, H2, H3

(B) VOLTS	CONNECTIONS	LINE LEADS
220	2 TO 3	X1, X2, X3
214	2 TO 5	X1, X2, X3
208	3 TO 4	X1, X2, X3
202	4 TO 5	X1, X2, X3
196	5 TO 6	X1, X2, X3
480Y/277		H0, H1, H2, H3

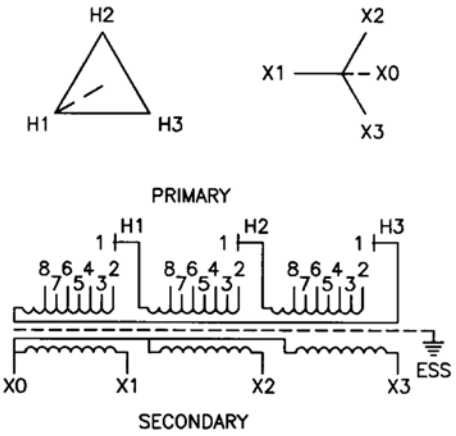
(C) VOLTS	CONNECTIONS	LINE LEADS
223	2 TO 3	X1, X2, X3
215	2 TO 5	X1, X2, X3
208	3 TO 4	X1, X2, X3
201	4 TO 5	X1, X2, X3
193	5 TO 6	X1, X2, X3
480Y/277		H0, H1, H2, H3

(D) VOLTS	CONNECTIONS	LINE LEADS
216	2 TO 3	X1, X2, X3
208	3 TO 4	X1, X2, X3
200	4 TO 5	X1, X2, X3
480Y/277		H0, H1, H2, H3

(E) VOLTS	CONNECTIONS	LINE LEADS
218	2 TO 3	X1, X2, X3
208	3 TO 4	X1, X2, X3
198	4 TO 5	X1, X2, X3
480Y/277		H0, H1, H2, H3

Diagram #24

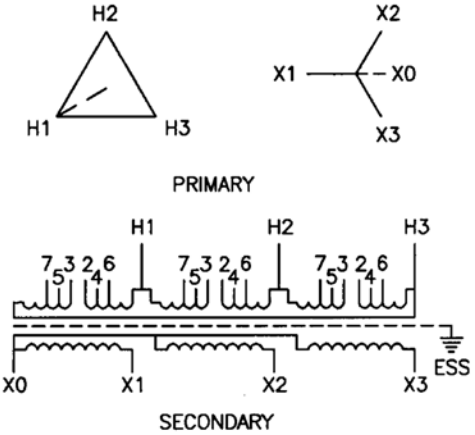
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
600Δ	208Y/120	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
630	1 TO 2	H1, H2, H3
615	1 TO 3	H1, H2, H3
600	1 TO 4	H1, H2, H3
585	1 TO 5	H1, H2, H3
570	1 TO 6	H1, H2, H3
555	1 TO 7	H1, H2, H3
540	1 TO 8	H1, H2, H3
208Y/120		X0, X1, X2, X3

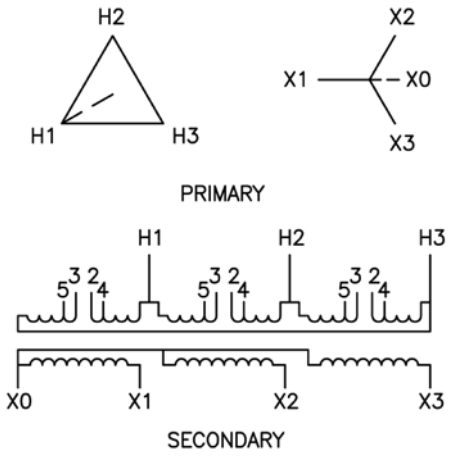
Diagram #24A

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
600Δ	208Y/120	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
630	2 TO 3	H1, H2, H3
615	2 TO 5	H1, H2, H3
600	3 TO 4	H1, H2, H3
585	4 TO 5	H1, H2, H3
570	5 TO 6	H1, H2, H3
555	4 TO 7	H1, H2, H3
540	6 TO 7	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #25

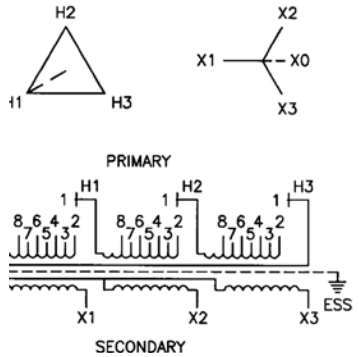


Catalog Numbers AEMD, AFMD, AHMD		
Volts	**Connections**	**Line Leads**
242	2 TO 3	H1, H2, H3
230	3 TO 4	H1, H2, H3
219	4 TO 5	H1, H2, H3
Secondary*		X0, X1, X2, X3
Catalog Numbers CEMD, CFMD, CHMD		
Volts	**Connections**	**Line Leads**
483	2 TO 3	H1, H2, H3
460	3 TO 4	H1, H2, H3
437	4 TO 5	H1, H2, H3
Secondary*		X0, X1, X2, X3
Catalog Numbers DEMD, DFMD, DHMD		
Volts	**Connections**	**Line Leads**
604	2 TO 3	H1, H2, H3
575	3 TO 4	H1, H2, H3
546	4 TO 5	H1, H2, H3
Secondary*		X0, X1, X2, X3

**Secondary voltages in accordance with catalog number.*

Diagram #26

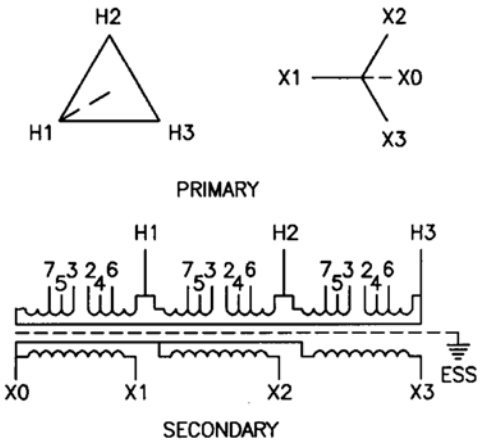
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240Δ	208Y/120	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
252	1 TO 2	H1, H2, H3
246	1 TO 3	H1, H2, H3
240	1 TO 4	H1, H2, H3
234	1 TO 5	H1, H2, H3
228	1 TO 6	H1, H2, H3
222	1 TO 7	H1, H2, H3
216	1 TO 8	H1, H2, H3
208Y/120		X0, X1, X2, X3

Diagram #26A - 26D

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
240Δ	208Y/120	(A) 2-2 1/2% FCAN & 4-2 1/2% FCBN (B) 2-3% FCAN & 2-3% FCBN (C) 2-3 1/2% FCAN & 2-3 1/2% FCBN (D) 1-4% FCAN & 1-4% FBCN



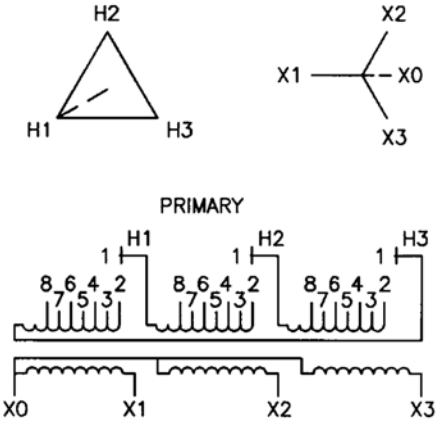
(A)		
VOLTS	**CONNECTIONS**	**LINE LEADS**
252	2 TO 3	H1, H2, H3
246	2 TO 5	H1, H2, H3
240	3 TO 4	H1, H2, H3
234	4 TO 5	H1, H2, H3
228	5 TO 6	H1, H2, H3
222	4 TO 7	H1, H2, H3
216	6 TO 7	H1, H2, H3
208Y/120		X0, X1, X2, X3
(B)		
VOLTS	**CONNECTIONS**	**LINE LEADS**
254	2 TO 3	H1, H2, H3
247	2 TO 5	H1, H2, H3
240	3 TO 4	H1, H2, H3
233	4 TO 5	H1, H2, H3
226	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3
(C)		
VOLTS	**CONNECTIONS**	**LINE LEADS**
256	2 TO 3	H1, H2, H3
248	2 TO 5	H1, H2, H3
240	3 TO 4	H1, H2, H3
232	4 TO 5	H1, H2, H3
224	5 TO 6	H1, H2, H3
208Y/120		X0, X1, X2, X3
(D)		
VOLTS	**CONNECTIONS**	**LINE LEADS**
250	2 TO 3	H1, H2, H3
240	3 TO 4	H1, H2, H3
230	4 TO 5	H1, H2, H3
208Y/120		X0, X1, X2, X3

Wiring Diagrams

Three-Phase

Diagram #27

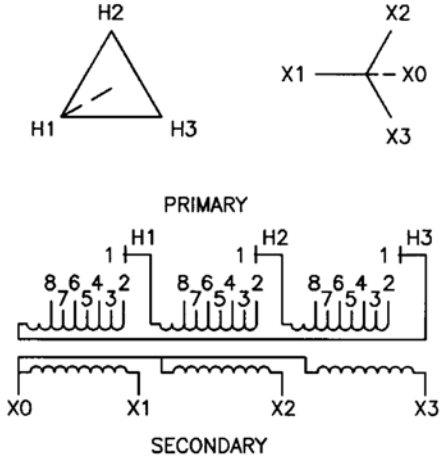
PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	400Y/231	2-2 1/2% FCAN & 4-2 1/2% FCBN



VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
400Y/231		X0, X1, X2, X3

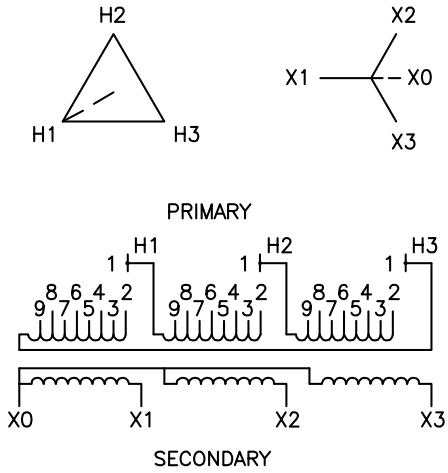
Diagram #27A

PRIMARY VOLTAGE	SECONDARY VOLTAGE	TAPS
480Δ	400Y/231	2-2 1/2% FCAN & 4-2 1/2% FCBN



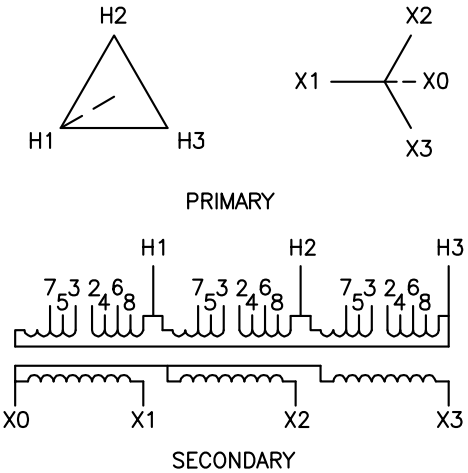
VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
444	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
400Y/231		X0, X1, X2, X3

Diagram #28



VOLTS	CONNECTIONS	LINE LEADS
504	1 TO 2	H1, H2, H3
492	1 TO 3	H1, H2, H3
480	1 TO 4	H1, H2, H3
468	1 TO 5	H1, H2, H3
456	1 TO 6	H1, H2, H3
440	1 TO 7	H1, H2, H3
432	1 TO 8	H1, H2, H3
420	1 TO 9	H1, H2, H3
220Y/127		X0, X1, X2, X3

Diagram #29



VOLTS	CONNECTIONS	LINE LEADS
504	2 TO 3	H1, H2, H3
492	2 TO 5	H1, H2, H3
480	3 TO 4	H1, H2, H3
468	4 TO 5	H1, H2, H3
456	5 TO 6	H1, H2, H3
440	4 TO 7	H1, H2, H3
428	6 TO 7	H1, H2, H3
420	7 TO 8	H1, H2, H3
220Y/127		X0, X1, X2, X3

Buck-Boost Transformers

Operation

Electrical and electronic equipment is designed to operate on a standard supply voltage. When the supply voltage is constantly too high or too low, (usually greater than ± 5%), the equipment may fail to operate at maximum efficiency. A Buck-Boost transformer is a simple and economical means of correcting this off-standard voltage up to ± 20%. A Buck-Boost transformer will NOT stabilize a fluctuating voltage.

Buck-Boost transformers are suitable for use in a three-phase autotransformer bank in either direction to supply 3-wire loads. They are also suitable for use in a three-phase autotransformer bank which provides a neutral return for unbalanced current. They are not suitable for use in a three-phase autotransformer bank to supply a 4-wire load when the source is only a 3-wire circuit, having no neutral.

Application

A Buck-Boost Transformer has four separate windings, two windings in the primary and two windings in the secondary. The unit is designed for use as an isolating transformer or as an auto-transformer. As an autotransformer the unit can be connected to Buck (decrease) or Boost (increase) a supply voltage.

As isolating transformers, these units can accommodate a high voltage of 120x240 volts (K1XGF12 and K1XGF16 series) or 240x480 volts (K2XGF24 series.) For the units with two 12 volt secondaries, the low voltage output can be 12 volts, 24 volts, or 3-wire 24/12 volts. For the units with two 16 volt secondaries, the output voltages can be 16 volts, 32 volts, or 3-wire 32/16 volts. For the units with two 24 volt secondaries, the output voltages can be 24 volts, 48 volts, or 3 wire 48/24 volts.

Autotransformers are more economical and physically smaller than equivalent two-winding transformers designed to carry the same load. They will perform the same function as two-winding transformers with the exception of isolating two circuits. Since autotransformers may transmit line disturbances directly, they may be prohibited in some areas by local building codes, before applying them, consult local codes.

Note: Three autotransformers are not used in closed Delta connections as they introduce into the circuit a phase shift.

Selection

To select the proper transformer for Buck-Boost applications, determine:

1. Input Line Voltage- the voltage that you want to Buck (decrease) or Boost (increase). This can be found by measuring the supply line voltage with a voltmeter.

2. Output Load Voltage- the voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.

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

4. Number of Phases- single- or three-phase line and load should match because a transformer is not capable of converting single-phase to three-phase. It is, however, a common application to make a single-phase transformer connection from a three-phase supply by use of one leg of the three-phase supply circuit. Care must always be taken not to overload the leg of the three-phase supply. This is particularly true in a Buck-Boost application because the supply must provide the load KVA, not just the nameplate rating of the Buck-Boost transformer.

5. Frequency- the supply line frequency must be the same as the frequency of the equipment to be operated - either 50 or 60 hertz.

Using Buck-Boost Selection Tables

1. Choose the selection table with the correct number of phases. Tables I, III and V for single-phase applications and Tables II, IV and VI for three-phase applications. Tables I and II are for 120x240-12/24 volt units, tables III and IV are for 120x240-16/32 volt units and tables V and VI are for 240x480-24/48 volt units.

2. Line/Load voltage combinations are listed across the top of the selection table. Use the boosting or bucking columns where appropriate.

3. Follow the selected column down until you find either the load KVA or load amps of your application. If you do not find the exact value, go on to the next highest rating.

4. Follow across the table to the far left-hand side to find the catalog number of the transformer you need.

5. Follow the column of your line/load voltage to the bottom to find the connection diagram for this application. NOTE: Connection diagrams show low voltage and high voltage connection terminals. Either can be input or output depending on buck or boost application.

6. In the case of three-phase loads, two (open Delta) or three (Wye) single-phase transformers are required as indicated in the "quantity required" line at the bottom of Table II, IV or VI. Select depending on whether a Wye connected bank of three transformers with a neutral is required or whether an open Delta connected bank of two transformers for a Delta connected load will be suitable.

For line/load voltages not listed on table, use the pair listed on the table that is slightly above your application for reference. Then apply the first formula at the bottom of the page to determine "New" output voltage. The new KVA rating can be found using the second formula.

Buck-Boost Technical Data

Temp Rise (Celsius)	Electro static Shield	Primary/ Secondary	Part Number	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)	Weather shield	Wall Mount Bracket
						H	W	D			
115°	N	120x240V - 12/24V	K1XGF12-0.05	10A	N	8.25	3.25	4.25	8	Not Required	Built-In
			K1XGF12-0.1						10		
			K1XGF12-0.15			9.25	4	5	14		
			K1XGF12-0.25						15		
			K1XGF12-0.5			11.25	5.25	6.5	21		
			K1XGF12-0.75						25		
			K1XGF12-1						28		
			K1XGF12-1.5			13.25	6.25	7.75	45		
			K1XGF12-2						50		
			K1XGF12-3						60		
			K1XLF12-5			15	10.187	10.625	110		
		120x240V - 16/32V	K1XGF16-0.05	10A	N	8.25	3.25	4.25	8	Not Required	Built-In
			K1XGF16-0.1						10		
			K1XGF16-0.15			9.25	4	5	14		
			K1XGF16-0.25						15		
			K1XGF16-0.5			11.25	5.25	6.5	21		
			K1XGF16-0.75						25		
			K1XGF16-1						28		
			K1XGF16-1.5			13.25	6.25	7.75	45		
			K1XGF16-2						50		
			K1XGF16-3						60		
			K1XLF16-5			15	10.187	10.625	110		
		240x480V - 24/48V	K2XGF24-0.05	10A	N	8.25	3.25	4.25	8	Not Required	Built-In
			K2XGF24-0.1						10		
			K2XGF24-0.15			9.25	4	5	14		
			K2XGF24-0.25						15		
			K2XGF24-0.5			11.25	5.25	6.5	21		
			K2XGF24-0.75						25		
			K2XGF24-1						28		
			K2XGF24-1.5			13.25	6.25	7.75	45		
			K2XGF24-2						50		
			K2XGF24-3						60		
			K2XLF24-5			15	10.187	10.625	110		

Buck-Boost Selection Tables

120 x 240 Volts Primary - 12/24 Volts Secondary • Buck - Boost Dry-Type Transformers

AMPS = Load Amps
KVA = Load Circuit KVA

Single-Phase

TABLE I

Catalog Number		BOOSTING								BUCKING					
	Line Voltage	96	100	105	109	189	208	218	220	125	132	229	245	250	252
	Load Voltage	115	120	116	120	208	229	240	242	114	120	208	223	227	240
K1XGF12-0.05	KVA	0.24	0.25	0.48	0.50	0.43	0.48	0.50	0.50	0.52	0.55	0.48	0.51	0.52	1.05
	AMPS	2.08	2.08	4.17	4.17	2.08	2.08	2.08	2.08	4.58	4.58	2.29	2.29	2.29	4.38
K1XGF12-0.1	KVA	0.48	0.50	0.96	1.00	0.87	0.95	1.00	1.01	1.04	1.10	0.95	1.02	1.04	2.10
	AMPS	4.17	4.17	8.33	8.33	4.17	4.17	4.17	4.17	9.17	9.17	4.58	4.58	4.58	8.75
K1XGF12-0.15	KVA	0.72	0.75	1.44	1.50	1.30	1.43	1.50	1.51	1.56	1.65	1.43	1.53	1.56	3.15
	AMPS	6.25	6.25	12.50	12.50	6.25	6.25	6.25	6.25	13.75	13.75	6.87	6.87	6.87	13.13
K1XGF12-0.25	KVA	1.20	1.25	2.41	2.50	2.17	2.38	2.50	2.52	2.60	2.75	2.39	2.55	2.60	5.25
	AMPS	10.42	10.42	20.83	20.83	10.42	10.42	10.42	10.42	22.92	22.92	11.46	11.46	11.46	21.88
K1XGF12-0.5	KVA	2.40	2.50	4.81	5.00	4.33	4.77	5.00	5.04	5.21	5.50	4.77	5.10	5.21	10.50
	AMPS	20.83	20.83	41.67	41.67	20.83	20.83	20.83	20.83	45.83	45.83	22.92	22.92	22.92	43.75
K1XGF12-0.75	KVA	3.60	3.75	7.22	7.49	6.5	7.15	7.49	7.56	7.81	8.25	7.16	7.66	7.81	15.75
	AMPS	31.25	31.25	62.50	62.50	31.25	31.25	31.25	31.25	68.75	68.75	34.37	34.37	34.37	65.63
K1XGF12-1	KVA	4.80	5.00	9.63	9.99	8.66	9.53	9.99	10.08	10.42	11.00	9.54	10.21	10.42	21.00
	AMPS	41.67	41.67	83.33	83.33	41.67	41.67	41.67	41.67	91.67	91.67	45.83	45.83	45.83	87.50
K1XGF12-1.5	KVA	7.20	7.5	14.44	14.99	12.99	14.30	14.99	15.13	15.62	16.50	14.31	15.31	15.62	31.50
	AMPS	62.50	62.50	125.00	125.00	62.50	62.50	62.50	62.50	137.50	137.50	68.75	68.75	68.75	131.25
K1XGF12-2	KVA	9.60	10.00	19.25	19.98	17.32	19.07	19.98	20.17	20.83	22.00	19.08	20.42	20.83	42.00
	AMPS	83.33	83.33	166.67	166.67	83.33	83.33	83.33	83.33	183.33	183.33	91.67	91.67	91.67	175.00
K1XGF12-3	KVA	14.40	15.00	28.88	29.98	25.99	28.60	29.98	30.25	31.25	33.00	28.62	30.62	31.25	63.00
	AMPS	125.00	125.00	250.00	250.00	125.00	125.00	125.00	125.00	275.00	275.00	137.50	137.50	137.50	262.50
K1XLF12-5	KVA	24.00	25.00	48.13	49.96	43.31	47.67	49.96	50.42	52.08	55.00	47.71	51.04	52.08	105.00
	AMPS	208.33	208.33	416.67	416.67	208.33	208.33	208.33	208.33	458.33	458.33	229.17	229.17	229.17	437.50
	*DIAGRAM	B	B	A	A	D	D	D	D	A	A	D	D	D	C

Three-Phase

TABLE II

Catalog Number		BOOSTING									BUCKING				
	Line Voltage	189Y/109	195Y/113	200Y/115	208Y/120	416Y/240	416Y/240	189	208	220	218	229	250	255	264
	Load Voltage	208Y/120	234Y/135	240Y/139	229Y/132	458Y/264	437Y/252	208	229	242	208	208	227	232	240
K1XGF12-0.05	KVA	1.50	0.84	0.87	1.65	1.65	3.15	0.75	0.83	0.87	1.57	0.83	0.90	0.92	0.95
	AMPS	4.17	2.08	2.08	4.17	2.08	4.17	2.08	2.08	2.08	4.38	2.29	2.29	2.29	2.29
K1XGF12-0.1	KVA	3.00	1.69	1.73	3.30	3.30	6.30	1.50	1.65	1.75	3.15	1.65	1.80	1.84	1.91
	AMPS	8.33	4.17	4.17	8.33	4.17	8.33	4.17	4.17	4.17	8.75	4.58	4.58	4.58	4.58
K1XGF12-0.15	KVA	4.5	2.53	2.60	4.95	4.95	9.46	2.25	2.48	2.62	4.72	2.48	2.71	2.76	2.86
	AMPS	12.50	6.25	6.25	12.50	6.25	12.50	6.25	6.25	6.25	13.13	6.87	6.87	6.88	6.88
K1XGF12-0.25	KVA	7.50	4.22	4.33	8.26	8.26	15.76	3.75	4.13	4.37	7.87	4.13	4.51	4.60	4.76
	AMPS	20.83	10.42	10.42	20.83	10.42	20.83	10.42	10.42	10.42	21.88	11.46	11.46	11.46	11.46
K1XGF12-0.5	KVA	15.00	8.44	8.66	16.51	16.51	31.52	7.50	8.26	8.73	15.73	8.26	9.02	9.20	9.53
	AMPS	41.67	20.83	20.83	41.67	20.83	41.67	20.83	20.83	20.83	43.75	22.92	22.92	22.92	22.92
K1XGF12-0.75	KVA	22.51	12.67	12.99	24.77	24.77	47.28	11.25	12.38	13.10	23.60	12.39	13.53	13.80	14.29
	1AMPS	62.50	31.25	31.25	62.50	31.25	62.50	31.25	31.25	31.25	65.63	34.37	34.37	34.37	34.38
K1XGF12-1	KVA	30.01	16.89	17.32	33.02	33.02	63.05	15.00	16.51	17.46	31.47	16.53	18.04	18.40	19.05
	AMPS	83.33	41.67	41.67	83.33	41.67	83.33	41.67	41.67	41.67	87.50	45.83	45.83	45.83	45.83
K1XGF12-1.5	KVA	45.01	25.66	25.98	49.54	49.54	94.57	22.51	24.77	26.20	47.20	24.79	27.06	27.60	28.58
	AMPS	125.00	62.50	62.50	125.00	62.50	125.00	62.50	62.50	62.50	131.25	68.75	68.75	68.75	68.75
K1XGF12-2	KVA	60.02	33.77	34.64	66.05	66.05	126.09	30.01	33.02	34.93	62.93	33.05	36.08	36.81	38.11
	AMPS	166.67	83.33	83.33	166.67	83.33	166.67	83.33	83.33	83.33	175.00	91.67	91.67	91.67	91.67
K1XGF12-3	KVA	90.02	50.66	51.96	99.07	99.07	189.14	45.01	49.54	52.39	94.40	49.58	54.13	55.21	57.16
	AMPS	250.00	125.00	125.00	250.00	125.00	250.00	125.00	125.00	125.00	262.50	137.50	137.50	137.50	137.50
K1XLF12-5	KVA	150.04	84.44	86.60	165.12	165.12	315.23	75.02	82.56	87.32	157.33	82.63	90.21	92.02	95.26
	AMPS	416.67	208.33	208.33	416.67	208.33	416.67	208.33	208.33	208.33	437.50	229.17	229.17	229.17	229.17
No. of Transformers		3	3	3	3	3	3	2	2	2	2	2	2	2	2
*DIAGRAM		F	E	E	F	J	K	G	G	G	H	G	G	G	G

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}}$ x Input Actual Voltage = Output New Voltage.

Output KVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}}$ x Output KVA = New KVA Rating.

Buck-Boost Selection Tables

120 x 240 Volts Primary - 16/32 Volts Secondary • Buck - Boost Dry-Type Transformers

AMPS = Load Amps
KVA = LoadCircuit KVA

Single-Phase

TABLE III

Catalog Number		BOOSTING								BUCKING					
	Line Voltage	95	100	105	208	215	215	220	225	135	240	240	245	250	255
	Load Voltage	120	113	119	236	244	229	235	240	120	212	225	230	234	239
K1XGF16-0.05	KVA	0.19	0.35	0.37	0.37	0.38	0.72	0.73	0.75	0.42	0.38	0.75	0.77	0.78	0.80
	AMPS	1.56	3.13	3.13	1.56	1.56	3.12	3.13	3.12	3.54	1.77	3.33	3.33	3.33	3.33
K1XGF16-0.1	KVA	0.38	0.71	0.74	0.74	0.76	1.43	1.47	1.50	0.84	0.75	1.50	1.53	1.56	1.59
	AMPS	3.13	6.25	6.25	3.13	3.13	6.25	6.25	6.25	7.08	3.54	6.67	6.67	6.67	6.67
K1XGF16-0.15	KVA	0.56	1.06	1.12	1.11	1.14	2.15	2.20	2.25	1.27	1.13	2.25	2.30	2.34	2.39
	AMPS	4.69	9.38	9.38	4.69	4.69	9.37	9.37	9.37	10.63	5.31	10.00	10.00	10.00	10.00
K1XGF16-0.25	KVA	0.94	1.77	1.86	1.84	1.90	3.58	3.67	3.75	2.11	1.88	3.75	3.83	3.91	3.98
	AMPS	7.81	15.63	15.63	7.81	7.81	15.62	15.62	15.62	17.71	8.85	16.67	16.67	16.67	16.67
K1XGF16-0.5	KVA	1.88	3.54	3.72	3.68	3.81	7.17	7.33	7.50	4.22	3.75	7.50	7.66	7.81	7.97
	AMPS	15.63	31.25	31.25	15.63	15.63	31.25	31.25	31.25	35.42	17.71	33.33	33.33	33.33	33.33
K1XGF16-0.75	KVA	2.82	5.31	5.58	5.53	5.71	10.75	11.00	11.25	6.33	5.63	11.25	11.48	11.72	11.95
	AMPS	23.44	46.88	46.88	23.44	23.44	46.87	46.87	46.87	53.13	26.56	50.00	50.00	50.00	50.00
K1XGF16-1	KVA	3.76	7.08	7.44	7.37	7.61	14.33	14.67	15.00	8.44	7.50	15.00	15.31	15.62	15.94
	AMPS	31.25	62.50	62.50	31.25	31.25	62.50	62.50	62.50	70.83	35.42	66.67	66.67	66.67	66.67
K1XGF16-1.5	KVA	5.64	10.63	11.16	11.05	11.42	21.50	22.00	22.50	12.66	11.25	22.50	22.97	23.44	23.91
	AMPS	46.88	93.75	93.75	46.88	46.88	93.75	93.75	93.75	106.25	53.13	100.00	100.00	100.00	100.00
K1XGF16-2	KVA	7.52	14.71	14.88	14.73	15.23	28.67	29.33	30.00	16.88	15.00	30.00	30.62	31.25	31.87
	AMPS	62.50	125.00	125.00	62.50	62.50	125.00	125.00	125.00	141.67	70.83	133.33	133.33	133.33	133.33
K1XGF16-3	KVA	11.28	21.25	22.31	22.10	22.84	43.00	44.00	45.00	25.31	22.50	45.00	45.94	46.87	47.81
	AMPS	93.75	187.50	187.50	93.75	93.75	187.50	187.50	187.50	212.50	106.25	200.00	200.00	200.00	200.00
K1XLF16-5	KVA	18.80	35.42	37.19	36.83	38.07	71.67	73.33	75.00	42.19	37.50	75.00	76.56	78.12	79.69
	AMPS	156.25	312.50	312.50	156.25	156.25	312.50	312.50	312.50	354.17	177.08	333.33	333.33	333.33	333.33
*DIAGRAM		B	A	A	D	D	C	C	C	A	D	C	C	C	C

Three-Phase

TABLE IV

Catalog Number		BOOSTING					BUCKING					
	Line Voltage	183Y/106	208Y/120	195	208	225	240	245	250	256	265	272
	Load Voltage	208Y/120	236Y/136	208	236	240	208	230	234	240	234	240
K1XGF16-0.05	KVA	1.12	1.28	1.13	0.64	1.30	0.56	1.33	1.35	1.39	0.72	0.74
	AMPS	3.13	3.13	3.12	1.56	3.12	1.56	3.33	3.33	3.33	1.77	1.77
K1XGF16-0.1	KVA	2.25	2.55	2.25	1.28	2.60	1.13	2.65	2.71	2.77	1.43	1.47
	AMPS	6.25	6.25	6.25	3.13	6.25	3.13	6.67	6.67	6.67	3.54	3.54
K1XGF16-0.15	KVA	3.37	3.83	3.38	1.91	3.90	1.69	3.98	4.06	4.16	2.15	2.21
	AMPS	9.38	9.38	9.37	4.69	9.37	4.69	10.00	10.00	10.00	5.31	5.31
K1XGF16-0.25	KVA	5.61	6.38	5.63	3.19	6.50	2.81	6.63	6.77	6.93	3.59	3.68
	AMPS	15.63	15.62	15.62	7.81	15.62	7.81	16.67	16.67	16.67	8.85	8.85
K1XGF16-0.5	KVA	11.23	12.76	11.26	6.38	12.99	5.63	13.26	13.53	13.86	7.17	7.36
	AMPS	31.25	31.25	31.25	15.63	31.25	15.63	33.33	33.33	33.33	17.71	17.71
K1XGF16-0.75	KVA	16.84	19.14	16.89	9.58	19.49	8.44	19.89	20.30	20.78	10.76	11.04
	1AMPS	46.88	46.88	46.87	23.44	46.87	23.44	50.00	50.00	50.00	26.56	26.56
K1XGF16-1	KVA	22.45	25.52	22.52	12.76	25.98	11.26	26.52	27.06	27.71	14.34	14.72
	AMPS	62.50	62.50	62.50	31.25	62.50	31.25	66.67	66.67	66.67	35.42	35.42
K1XGF16-1.5	KVA	33.68	38.28	33.77	19.14	38.97	16.89	39.78	40.59	41.57	21.52	22.08
	AMPS	93.75	93.75	93.75	46.88	93.75	46.88	100.00	100.00	100.00	53.13	53.13
K1XGF16-2	KVA	44.90	51.04	45.03	25.52	51.96	22.52	53.04	54.13	55.43	28.69	29.44
	AMPS	125.00	125.00	125.00	62.50	125.00	62.50	133.33	133.33	133.33	70.83	70.83
K1XGF16-3	KVA	67.36	76.56	67.55	38.28	77.94	33.77	79.57	81.19	83.14	43.03	44.17
	AMPS	187.50	187.50	187.50	93.75	187.50	93.75	200.00	200.00	200.00	106.25	106.25
K1XLF16-5	KVA	112.26	127.59	112.58	63.80	129.90	56.29	132.61	135.32	138.56	71.72	73.61
	AMPS	312.50	312.50	312.50	156.25	312.50	156.25	333.33	333.33	333.33	177.08	177.08
No. of Transformers		3	3	2	2	2	2	2	2	2	2	2
*DIAGRAM		F	F	H	G	H	L	H	H	H	G	G

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}}$ x Input Actual Voltage = Output New Voltage.

Output KVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}}$ x Output KVA = New KVA Rating.

Buck-Boost Selection Tables

240 x 480 Volts Primary - 24/48 Volts Secondary • Buck - Boost Dry-Type Transformers

AMPS = Load Amps
KVA = Load Circuit KVA

Single-Phase

TABLE V

Catalog Number		BOOSTING									BUCKING				
	Line Voltage	230	380	416	425	430	435	440	450	460	132	277	480	480	504
	Load Voltage	276	418	458	468	473	457	462	495	483	126	231	436	457	480
K2XGF24-.050	KVA	0.29	0.44	0.48	0.49	0.49	0.95	0.96	0.52	1.01	0.28	0.29	0.50	1.00	1.05
	AMPS	1.04	1.04	1.04	1.04	1.04	2.08	2.08	1.04	2.08	2.19	1.25	1.15	2.19	2.19
K2XGF24-.100	KVA	0.58	0.87	0.95	0.97	0.99	1.90	1.93	1.03	2.01	0.55	0.58	1.00	2.00	2.10
	AMPS	2.08	2.08	2.08	2.08	2.08	4.17	4.17	2.08	4.17	4.38	2.50	2.29	4.38	4.38
K2XGF24-.150	KVA	0.86	1.31	1.43	1.46	1.48	2.85	2.89	1.55	3.02	0.83	0.87	1.50	3.00	3.15
	AMPS	3.13	3.13	3.13	3.13	3.13	6.25	6.25	3.13	6.25	6.56	3.75	3.44	6.56	6.56
K2XGF24-.250	KVA	1.44	2.18	2.38	2.43	2.46	4.76	4.81	2.58	5.03	1.38	1.44	2.50	5.00	5.25
	AMPS	5.21	5.21	5.21	5.21	5.21	10.42	10.42	5.21	10.42	10.94	6.25	5.73	10.94	10.94
K2XGF24-.500	KVA	2.88	4.35	4.77	4.87	4.93	9.52	9.63	5.16	10.06	2.75	2.89	5.00	10.00	10.50
	AMPS	10.42	10.42	10.42	10.42	10.42	20.83	20.83	10.42	20.83	21.88	12.50	11.46	21.88	21.88
K2XGF24-.750	KVA	4.31	6.53	7.15	7.30	7.39	14.27	14.44	7.73	15.09	4.13	4.33	7.50	15.00	15.75
	AMPS	15.63	15.63	15.62	15.63	15.63	31.25	31.25	15.63	31.25	32.81	18.75	17.19	32.81	32.81
K2XGF24-1	KVA	5.75	8.71	9.53	9.74	9.85	19.03	19.25	10.31	20.13	5.50	5.77	10.00	20.00	21.00
	AMPS	20.83	20.83	20.83	20.83	20.83	41.67	41.67	20.83	41.67	43.75	25.00	22.92	43.75	43.75
K2XGF24-1.5	KVA	8.63	13.06	14.30	14.61	14.78	28.55	28.88	15.47	30.19	8.25	8.66	15.00	30.00	31.50
	AMPS	31.25	31.25	31.25	31.25	31.25	62.50	62.50	31.25	62.50	65.63	37.50	34.37	65.63	65.63
K2XGF24-2	KVA	11.50	17.42	19.07	19.48	19.71	38.06	38.50	20.63	40.25	11.00	11.54	20.00	40.00	42.00
	AMPS	41.67	41.67	41.67	41.67	41.67	83.33	83.33	41.67	83.33	87.50	50.00	45.83	87.50	87.50
K2XGF24-3	KVA	17.25	26.13	28.60	29.22	29.56	57.09	57.75	30.94	60.38	16.50	17.31	30.00	60.00	63.00
	AMPS	62.50	62.50	62.50	62.50	62.50	125.00	125.00	62.50	125.00	131.25	75.00	68.75	131.25	131.25
K2XLF24-5	KVA	28.75	43.54	47.67	48.70	49.27	95.16	96.25	51.56	100.63	27.50	28.85	50.00	100.00	105.00
	AMPS	104.17	104.17	104.17	104.17	104.17	208.33	208.33	104.17	208.33	218.75	125.00	114.58	218.75	218.75
*DIAGRAM		B	D	D	D	D	C	C	D	C	C	B	D	C	C

Three-Phase

TABLE VI

Catalog Number		BOOSTING								BUCKING							
	Line Voltage	399Y/230	380	430	440	460	460	480	480	440	440	460	460	480	480	500	500
	Load Voltage	480Y/277	418	473	462	506	483	528	504	400	419	438	418	457	436	455	476
K2XGF24-.050	KVA	0.86	0.75	0.85	1.67	0.91	1.74	0.95	1.82	0.79	1.59	1.66	0.83	1.73	0.87	0.90	1.80
	AMPS	1.04	1.04	1.04	2.08	1.04	2.08	1.04	2.08	1.15	2.19	2.19	1.15	2.19	1.15	1.15	2.19
K2XGF24-.100	KVA	1.73	1.51	1.71	3.33	1.83	3.49	1.91	3.64	1.59	3.18	3.32	1.66	3.46	1.73	1.80	3.61
	AMPS	2.08	2.08	2.08	4.17	2.08	4.17	2.08	4.17	2.29	4.38	4.38	2.29	4.38	2.29	2.29	4.38
K2XGF24-.150	KVA	2.59	2.26	2.56	5.00	2.74	5.23	2.86	5.46	2.38	4.76	4.98	2.49	5.20	2.60	2.71	5.41
	AMPS	3.13	3.13	3.13	6.25	3.13	6.25	3.13	6.25	3.44	6.56	6.56	3.44	6.56	3.44	3.44	6.56
K2XGF24-.250	KVA	4.32	3.77	4.27	8.34	4.56	8.71	4.76	9.09	3.97	7.94	8.30	4.15	8.66	4.33	4.51	9.02
	AMPS	5.21	5.21	5.21	10.42	5.21	10.42	5.21	10.42	5.73	10.94	10.94	5.73	10.94	5.73	5.73	10.94
K2XGF24-.500	KVA	8.64	7.54	8.53	16.67	9.13	17.43	9.53	18.19	7.94	15.88	16.60	8.30	17.32	8.66	9.02	18.04
	AMPS	10.42	10.42	10.42	20.83	10.42	20.83	10.42	20.83	11.46	21.88	21.88	11.46	21.88	11.46	11.46	21.88
K2XGF24-.750	KVA	12.96	11.31	12.80	25.01	13.69	26.14	14.29	27.28	11.91	23.82	24.90	12.45	25.98	12.99	13.53	27.06
	1AMPS	15.62	15.63	15.63	31.25	15.63	31.25	15.63	31.25	17.19	32.81	32.81	17.19	32.81	17.19	17.19	32.81
K2XGF24-1	KVA	17.28	15.08	17.07	33.34	18.26	34.86	19.05	36.37	15.88	31.75	33.20	16.60	34.64	17.32	18.04	36.08
	AMPS	20.83	20.83	20.83	41.67	20.83	41.67	20.83	41.67	22.92	43.75	43.75	22.92	43.75	22.92	22.92	43.75
K2XGF24-1.5	KVA	25.92	22.62	25.60	50.01	27.39	52.29	28.58	54.56	23.82	47.63	49.80	24.90	51.96	25.98	27.06	54.13
	AMPS	31.25	31.25	31.25	62.50	31.25	62.50	31.25	62.50	34.38	65.63	65.63	34.38	65.63	34.37	34.37	65.63
K2XGF24-2	KVA	34.55	30.17	34.14	66.68	36.52	69.72	38.11	72.75	31.75	63.51	66.40	33.20	69.28	34.64	36.08	72.17
	AMPS	41.67	41.67	41.67	83.33	41.67	83.33	41.67	83.33	45.83	87.50	87.50	45.83	87.50	45.83	45.83	87.50
K2XGF24-3	KVA	51.83	45.25	51.20	100.03	54.78	104.57	57.16	109.12	47.63	95.26	99.59	49.80	103.92	51.96	54.13	108.25
	AMPS	62.50	62.50	62.50	125.00	62.50	125.00	62.50	125.00	68.75	131.25	131.25	68.75	131.25	68.75	68.75	131.25
K2XLF24-5	KVA	86.39	75.42	85.34	166.71	91.29	174.29	95.26	181.87	79.39	158.77	165.99	82.99	173.21	86.60	90.21	180.42
	AMPS	104.17	104.17	104.17	208.33	104.17	208.33	104.17	208.33	114.58	218.75	218.75	114.58	218.75	114.58	114.58	218.75
No. of Transformers		3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
*DIAGRAM		E	G	G	H	G	H	G	H	G	H	H	G	H	G	G	H

Output voltage for lower input voltage can be found by: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}}$ x Input Actual Voltage = Output New Voltage.

Output KVA available at reduced input voltage can be found by: $\frac{\text{Actual Input Voltage}}{\text{Rated Input Voltage}}$ x Output KVA = New KVA Rating.

Buck-Boost Connection Diagram

Single-Phase

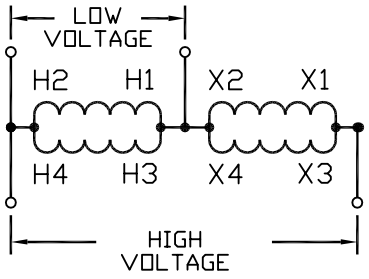


FIGURE A

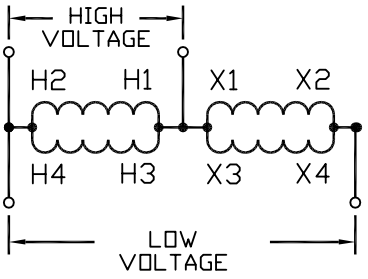


FIGURE A1

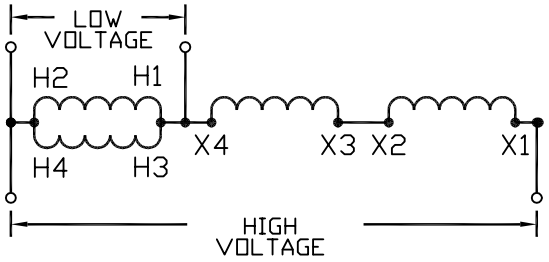


FIGURE B

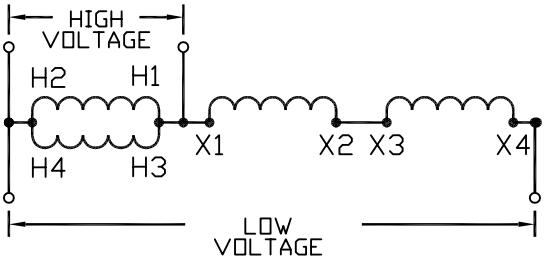


FIGURE B1

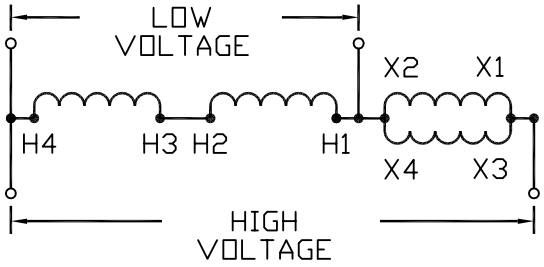


FIGURE C

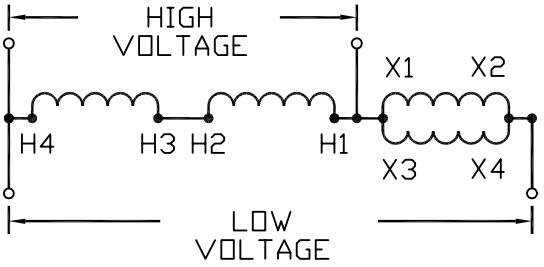


FIGURE C1

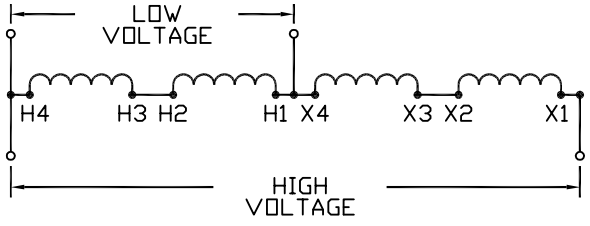


FIGURE D

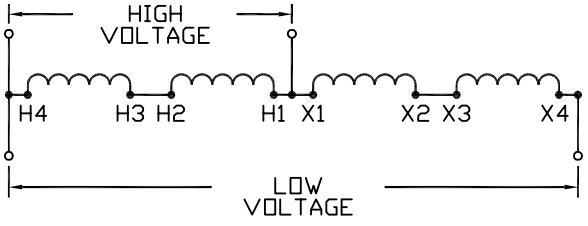


FIGURE D1

Buck-Boost Connection Diagram

Three-Phase Open Delta

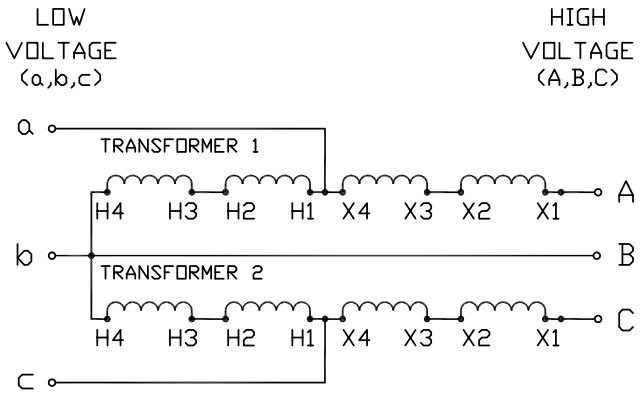


FIGURE G

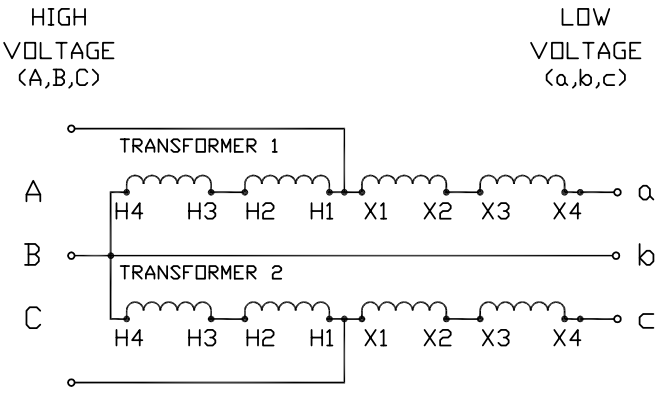


FIGURE L

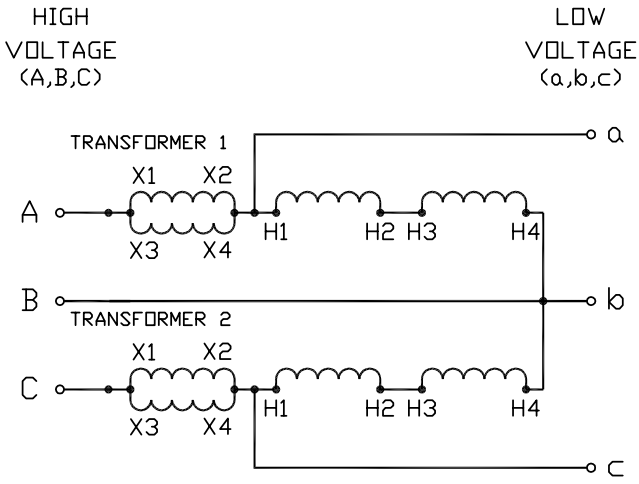


FIGURE H

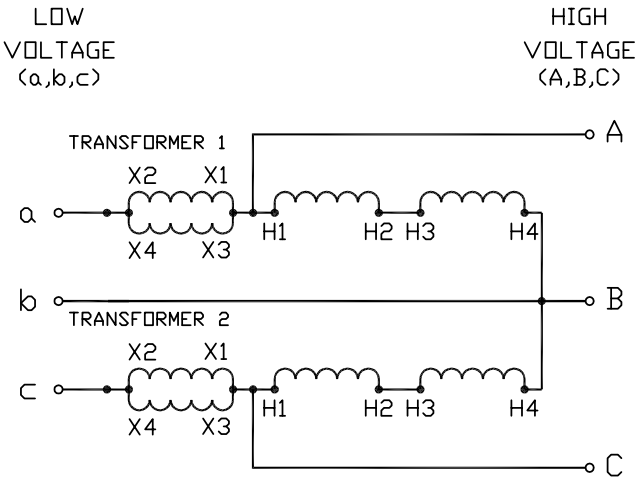


FIGURE H1

Buck-Boost Connection Diagram

Three-Phase Open Delta

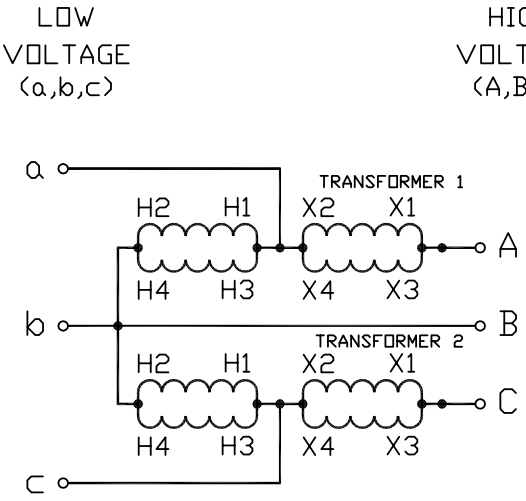


FIGURE M

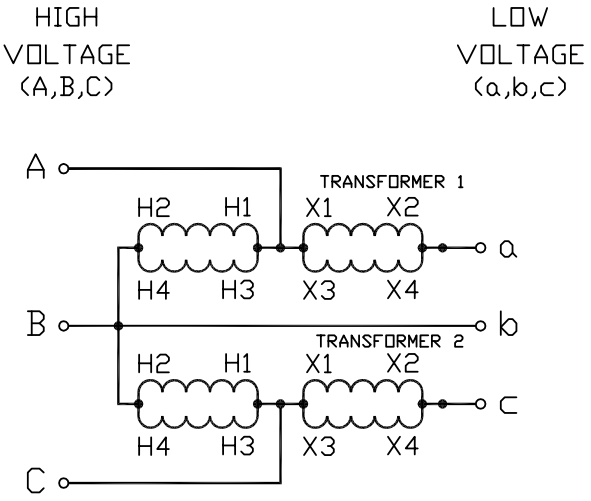


FIGURE M1

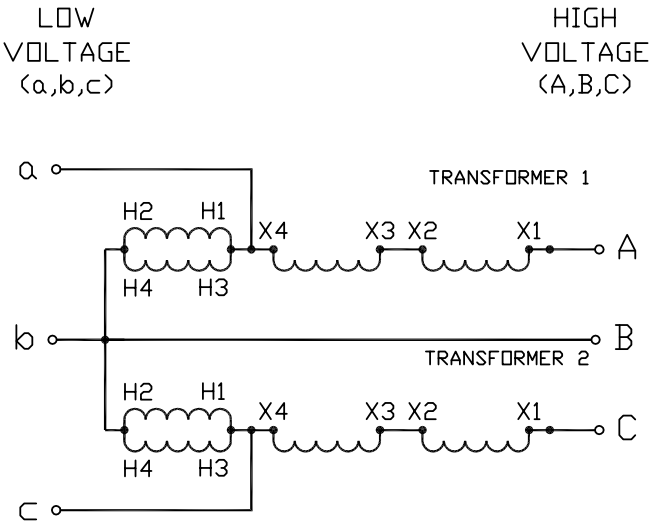


FIGURE N

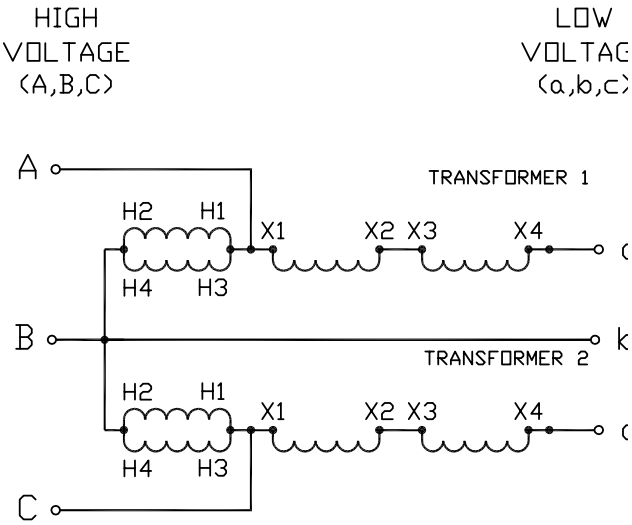


FIGURE N1

Buck-Boost Connection Diagram

Three-Phase WYE

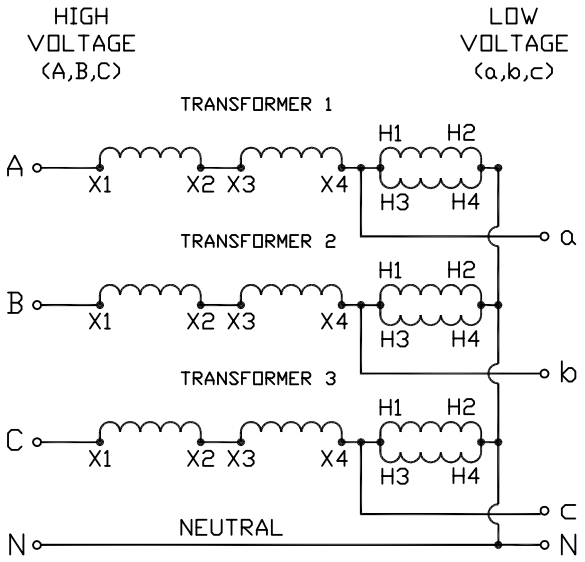


FIGURE E

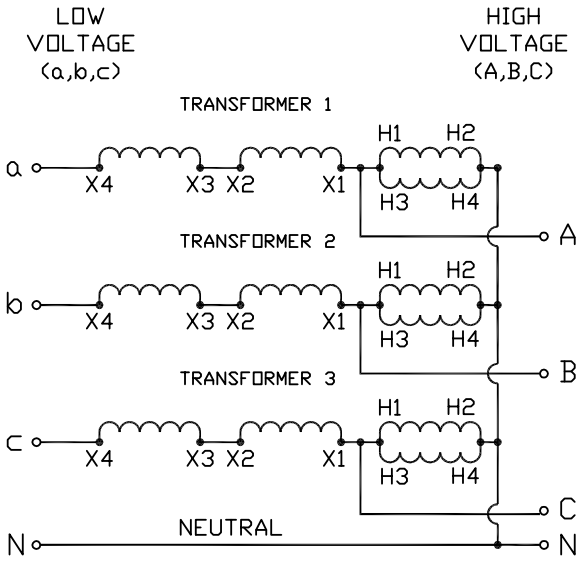


FIGURE E1

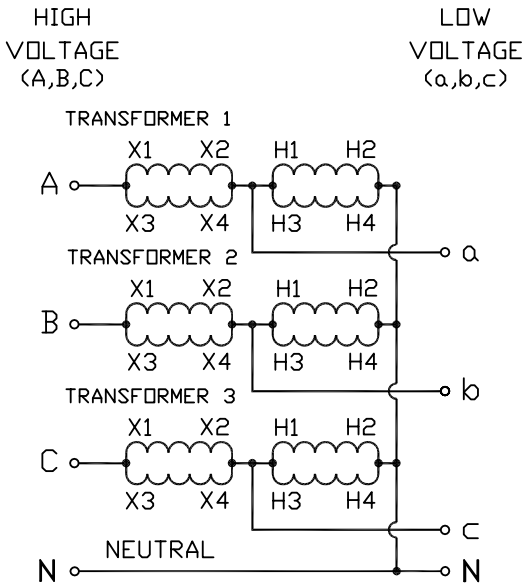


FIGURE F

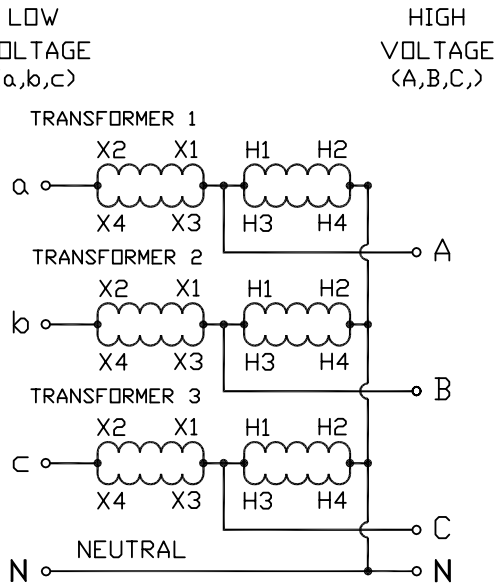


FIGURE F1

NOTE: All Wye connected buck-boost connections MUST have a source neutral for proper operation. They can not be used to create or derive a neutral from a 3-phase 3-wire system.

Buck-Boost Connection Diagram

Three-Phase WYE

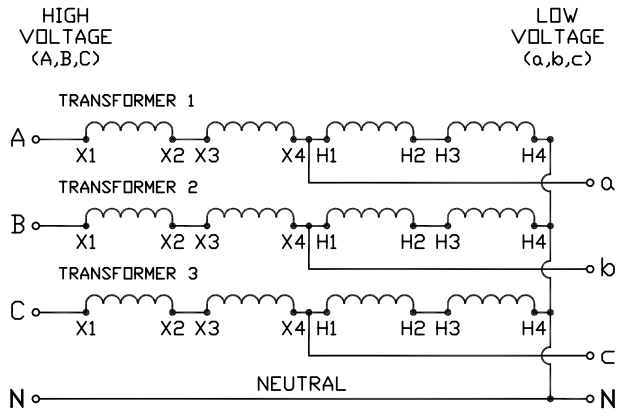


FIGURE J

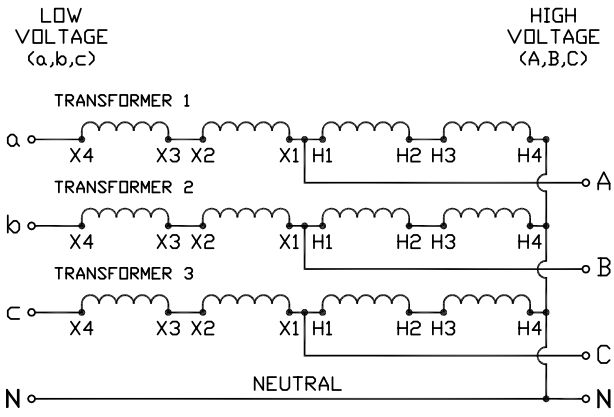


FIGURE J1

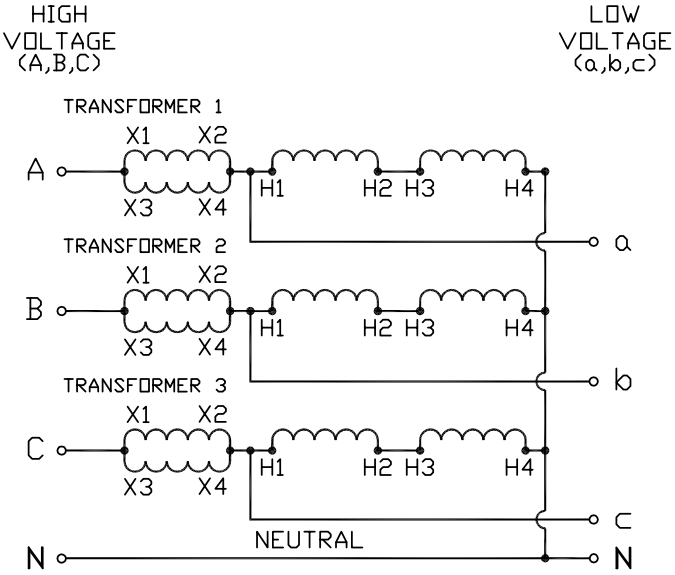


FIGURE K

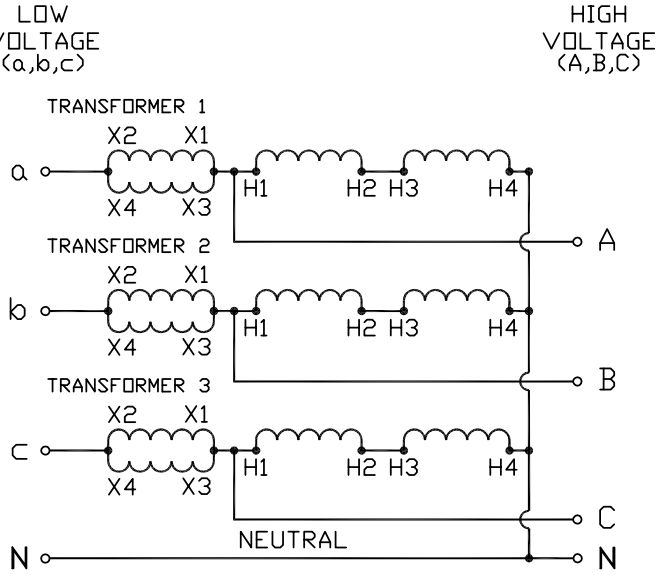


FIGURE K1

NOTE: All Wye connected buck-boost connections MUST have a source neutral for proper operation. They can not be used to create or derive a neutral from a 3-phase 3-wire system.

Epoxy Encapsulated Copper-Wound Industrial Control Transformers

Features

- Epoxy encapsulated coils
- Secondary fuse clips where applicable
- Optional Primary Fusing
- Molded terminal barriers
- 10-32 screw terminals
- Molded-in terminals
- Phil-slot screws
- Laminations of the finest silicon steel minimize core losses and increase performance and efficiency.
- Copper magnet wire assures efficient operation.
- UL 506 Listed
- CSA Certified
- Insulation materials of the highest rating available for the temperature class.
- Mounting brackets are heavy gauge steel to add strength to core construction and provide stable mounting. Slotted mounting feet permit easy installation.
- Attractive black finish; easy-to read nameplate with complete rating data and wiring diagram.

Industrial Control Transformer Selection Considerations

Selecting a transformer for industrial control circuit applications requires knowledge of the following terms:

INRUSH VA is the product of load voltage **(V)** multiplied by the current **(A)** that is required during circuit start-up. It is calculated by adding the **Inrush VA** requirements of all devices (contactors, timers, relays, pilot lights, solenoids, etc.), which will be energized together. **Inrush VA** requirements are best obtained from the component manufacturer.

SEALED VA is the product of load voltage **(V)** multiplied by the current **(A)** that is required to operate the circuit after initial start-up or under normal operating conditions. It is calculated by adding the **Sealed VA** requirements of all electrical components of the circuit that will be energized at any given time. **Sealed VA** requirements are best obtained from the component manufacturer. **Sealed VA** is also referred to as steady state VA.

PRIMARY VOLTAGE is the voltage available from the electrical distribution system and its operational frequency, which is connected to the transformer supply voltage terminals.

SECONDARY VOLTAGE is the voltage required for load operation which is connected to the transformer load voltage terminals.

Once the circuit variables have been determined, transformer selection is a simple 5-step process as follows:

1. Determine the Application Inrush VA by using the following industry accepted formula:

$$\textbf{Application Inrush VA} = \sqrt{(\textbf{Inrush VA})^2 + (\textbf{Sealed VA})^2}$$

2. Refer to the Regulation Data Chart. If the primary voltage is basically stable and does not vary by more than 5% from nominal, the 90% secondary voltage column should be used. If the primary voltage varies between 5 and 10% of nominal, the 95% secondary voltage column should be used.

3. After determining the proper secondary voltage column, read down until a value equal to or greater than the Application Inrush VA is found. In no case should a figure less than the Application Inrush VA be used.

4. Read left to the Transformer VA Rating column to determine the proper transformer for this application. As a final check, make sure that the Transformer VA rating is equal to or greater than the total sealed requirements. If not, select a transformer with a VA rating equal to or greater than the total Sealed VA.

5. Refer to the specification section of this catalog to determine the proper catalog number based on the transformer VA, and primary and secondary voltage requirements.

To comply with NEMA standards, which require all magnetic devices to operate successfully at 85% of rated voltage, the 90% secondary voltage column is most often used in selecting a transformer.

Regulation Data Chart

Transformer VA Rating	Inrush VA at 20% Power Factor		
	95% Sec. Voltage	90% Sec. Voltage	85% Sec. Voltage
25	100	130	150
50	170	200	240
75	310	410	540
100	370	540	730
150	780	930	1150
200	810	1150	1450
250	1400	1900	2300
300	1900	2700	3850
350	3100	3650	4800
500	4000	5300	7000
750	8300	11000	14000

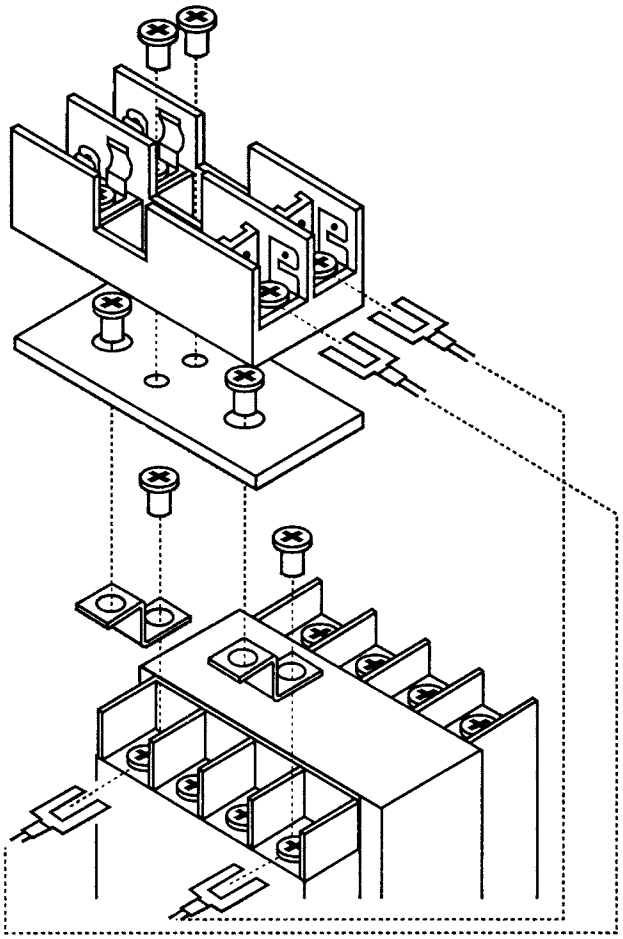
Primary Fusing

Primary Fusing Capability

In compliance with the requirements of UL508 and the National Electrical Code, industrial control transformers, rated 50VA and larger, can be ordered with the provision for factory-mounted dual primary class cc fusing capability. The primary fuse block is mounted by the customer on the transformer and wired to the primary terminals. The primary fusing option will add 1-3/8" to the "C" dimension of the transformer.

Primary Fuse Kit

In addition to factory installed primary fusing capability, Federal Pacific offers a primary fuse kit for field installation. The primary fuse kit includes a 2-pole class cc fuse block, instructions and all associated mounting and wiring hardware. Additionally, this fuse kit will fit most competitor's units. To order this kit, use catalog number FPFK-1. The primary fuse kit, when installed, will add a maximum of 11/16" to the transformer "A" dimension and 1-15/16" to the "C" dimension.



Typical Primary Fuse Kit Installation

Primary Overcurrent Protection Industrial Control Transformers

Overcurrent protection on both the primary and secondary sides of transformers is specified in UL508 and the National Electrical Code. The maximum acceptable ratings are shown below. Due to high inrush currents present when a transformer is initially energized, it is recommended that the primary fuse be time delay, to prevent nuisance trips during startup.

MAXIMUM ACCEPTABLE RATING OF PRIMARY OVERCURRENT PROTECTION

Primary Voltage	50	75	100	150	200	250	300	350	500	750
115	1-1/4 (2)	1-8/10 (3-2/10)	2-1/2 (4)	3-1/2 (6-1/4)	5 (8)	5	6-1/4	7-1/2	10	15
120	1-1/4 (2)	1-8/10 (3)	2-1/4 (4)	3-1/2 (6-1/4)	5 (8)	5	6-1/4	7	10	15
200	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	2-1/4 (3-1/2)	3 (5)	3-1/2 (6-1/4)	4-1/2 (7-1/2)	5 (8)	6-1/4	9
208	6/10 (1-1/8)	1 (1-8/10)	1-4/10 (2-1/4)	2 (3-1/2)	2-8/10 (4-1/2)	3-1/2 (6)	4 (7)	5 (8)	6	9
220	6/10 (1-1/8)	1 (1-6/10)	1-1/4 (2-1/4)	2 (3-2/10)	2-1/2 (4-1/2)	3-2/10 (5-6/10)	4 (6-1/4)	4-1/2 (7-1/2)	5-6/10	8
230	6/10 (1)	8/10 (1-6/10)	1-1/4 (2)	1-8/10 (3-2/10)	2-1/2 (4)	3-2/10 (5)	3-1/2 (6-1/4)	4-1/2 (7-1/2)	5	8
240	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-8/10 (3)	2-1/2 (4)	3 (5)	3-1/2 (6-1/4)	4 (7)	5	7-1/2
277	1/2 (8/10)	8/10 (1-1/4)	1 (1-8/10)	1-6/10 (2-1/2)	2 (3-1/2)	2-1/2 (4-1/2)	3-2/10 (5)	3-1/2 (6/1/4)	5 (9)	6-1/4
380	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	1-8/10 (3-2/10)	2-1/4 (3-1/2)	2-1/2 (4-1/2)	3-1/2 (6-1/4)	5-6/10 (9)
400	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1-1/8 (1-8/10)	1-1/2 (2-1/2)	1-8/10 (3)	2-1/4 (3-1/2)	2-1/2 (4)	3-1/2 (6-1-4)	5-6/10 (9)
415	3/10 (6/10)	1/2 (8/10)	6/10 (1-1/8)	1 (1-8/10)	1-4/10 (2-1/4)	1-8/10 (3)	2 (3-1/2)	2-1/2 (4)	3-1/2 (6)	5 (9)
440	3/10 (1/2)	1/2 (8/10)	6/10 (1-1/8)	1 (1-6/10)	1-1/4 (2-1/4)	1-6/10 (2-8/10)	2 (3-2/10)	2-1/4 (3-1/2)	3-2/10 (5-6/10)	5 (8)
460	3/10 (1/2)	4/10 (8/10)	6/10 (1)	8/10 (1-6/10)	1-1/4 (2)	1-6/10 (2-1/2)	1-8/10 (3-2/10)	2-1/4 (3-1/2)	3-2/10 (5)	4-1/2 (8)
480	3/10 (1/2)	4/10 (3/4)	6/10 (1)	8/10 (1-1/2)	1-1/4 (2)	1-1/2 (2-1/2)	1-8/10 (3)	2 (3-1/2)	3 (5)	4-1/2 (7-1/2)
550	1/4 (4/10)	4/10 (6/10)	1/2 (8/10)	8/10 (1-1/4)	1 (1-8/10)	1-1/4 (2-1/4)	1-6/10 (2-1/2)	1-8/10 (3)	2-1/2 (4-1/2)	4 (6-1/4)
575	1/4 (4/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	1 (1-6/10)	1-1/4 (2)	1-1/2 (2-1/2)	1-8/10 (3)	2-1/2 (4)	3-1/2 (6-1/4)
600	2/10 (4/10)	3/10 (6/10)	1/2 (8/10)	3/4 (1-1/4)	8/10 (1-6/10)	1-1/4 (2)	1-1/2 (2-1/2)	1-6/10 (2-8/10)	2-1/4 (4)	3-1/2 (6-1/4)

If the rated primary current is less than 2 amps, the maximum rating of the overcurrent device is 300% for power circuits, shown above, or 500% for control circuits, shown above in (brackets). If the rated primary current is 2 amps or more, the maximum rating of the overcurrent device is 250%.
All figures assume secondary overcurrent protection per UL/NEC.
Reference: NEC 430 - 72(c) exception #2, 450 - 3(b) 1 & 2, UL508 32.7, UL845 11.16 & 11.17

Secondary Overcurrent Protection Industrial Control Transformers

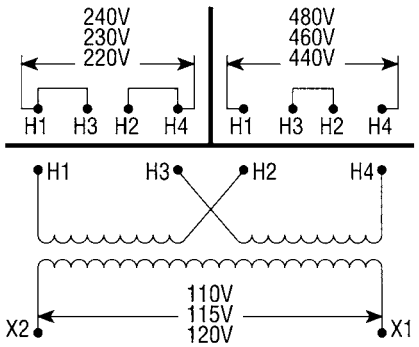
MAXIMUM ACCEPTABLE RATING OF SECONDARY OVERCURRENT PROTECTION

Primary Voltage	50	75	100	150	200	250	300	350	500	750
23	3-1/2	5	7	10	12	15	20	20	30	45
24	3-2/10	5	6-1/4	10	12	15	20	20	30	40
25	3-2/10	5	6-1/4	10	12	15	15	20	25	40
90	8/10	1-1/4	1-8/10	2-1/2	3-1/2	4-1/2	5	6-1/4	9	12
95	8/10	1-1/4	1-6/10	2-1/2	3-1/2	4	5	6	8	12
100	8/10	1-1/4	1-6/10	2-1/2	3-2/10	4	5	5-6/10	8	12
110	3/4	1-1/8	1-1/2	2-1/4	3	3-1/2	4-1/2	5	7-1/2	10
115	6/10	1	1-4/10	2	2-8/10	3-1/2	4	5	7	10
120	6/10	1	1-1/4	2	2-1/2	3-2/10	4	4-1/2	6-1/4	10
220	3/10	1/2	3/4	1-1/8	1-1/2	1-8/10	2-1/4	2-1/2	3-1/2	5-6/10
230	3/10	1/2	6/10	1	1-4/10	1-8/10	2	2-1/2	3-1/2	5
240	3/10	1/2	6/10	1	1-1/4	1-6/10	2	2-1/4	3-2/10	5

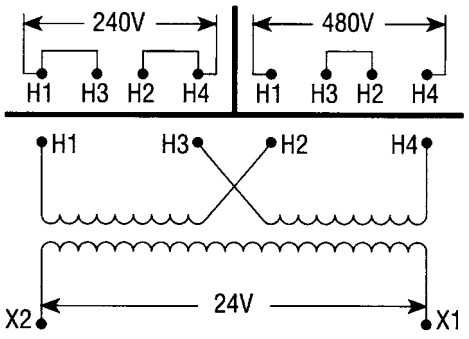
If the rated secondary current is less than 9 amps, the maximum rating of the overcurrent device is 167%.
If the rated secondary current is 9 amps or more, the maximum rating of the overcurrent device is 125%.
If 125% does not correspond to a standard fuse rating, the next highest standard rating may be used.
Reference: NEC 430 - 72(c) exception #2, 450 - 3(b) 1 & 2, UL508 32.7, UL845 11.16 & 11.17.

Industrial Control Transformers Technical Data

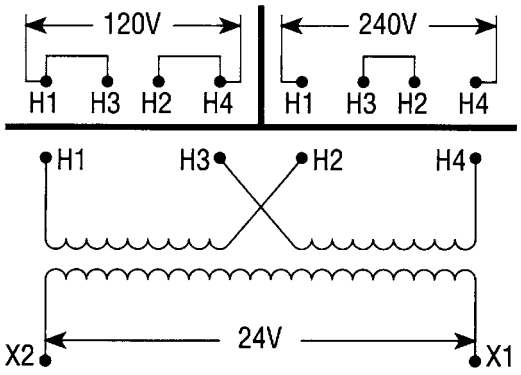
Conductor	Temp Rise (Celsius)	Electro-static Shield	Primary/ Secondary	Part Number	Wiring Diagram	Taps	Dimensions (inches)			Weight (lbs)
							H	W	D	
CU	55°	N	240x480V - 120V 230x460V - 115V 220x440V - 110V	FA050JK	IC1	N	2.562	3	3	2.6
				FA075JK			2.562	3	3.5	3.5
				FA100JK			2.875	3.375	3.375	4.2
				FA150JK			3.187	3.75	4	6.7
				FA200JK			3.812	4.5	4	8.5
				FA250JK			3.812	4.5	4.375	10
				FA300JK			3.812	4.5	4.75	11.3
				FA350JK			3.812	4.5	5.25	13.6
				FA500JK			4.75	5.25	5.5	19.2
				FA750JK			4.75	5.25	7	28.1
			240x480V - 24V	FB050JK	IC2	N	2.562	3	3	2.7
				FB075JK			2.562	3	3.5	3.5
				FB100JK			2.875	3.375	3.375	4.2
				FB150JK			3.187	3.75	4	6.7
				FB200JK			3.812	4.5	4	8.5
				FB250JK			3.812	4.5	4.375	10.1
				FB300JK			3.812	4.5	4.75	11.4
				FB350JK			3.812	4.5	5.25	13.4
				FB500JK			4.75	5.25	5.625	17.5
			120x240V - 24V	FC050JK	IC3	N	2.562	3	3	2.6
				FC075JK			2.562	3	3.5	3.6
				FC100JK			2.875	3.375	3.375	4.4
				FC150JK			3.187	3.75	4	6.7
				FC200JK			3.812	4.5	4	8.3
				FC250JK			3.812	4.5	4.375	10.1
				FC300JK			3.812	4.5	4.75	11.2
				FC350JK			3.812	4.5	5.25	13.2
				FC500JK			4.75	5.25	5.625	17.5
			208/277V - 120V	FF050XK	IC4	N	2.562	3	3	2.9
				FF075XK			2.562	3	3.5	3.8
				FF100XK			2.875	3.375	3.375	4.5
				FF150XK			3.187	3.75	4	6.9
				FF200XK			3.812	4.5	4	8.7
				FF250XK			3.812	4.5	4.375	10.2
				FF300XK			3.812	4.5	4.75	11.4
				FF350XK			3.812	4.5	5.25	13.7
				FF500XK			4.75	5.25	5.375	17.2
				FF750XK			4.75	5.25	7	25.7
			200/220/440V - 23/110V 208/230/460V - 24/115V 240/480V - 25/120V	FJ050XK	IC5	N	2.562	3	3.25	3.4
				FJ075XK			2.875	3.375	3.5	4.8
				FJ100XK			3.187	3.75	3.625	5.9
				FJ150XK			3.187	3.75	4.375	7.9
				FJ200XK			3.812	4.5	4.5	10.6
				FJ250XK			3.812	4.5	5.25	13.9
				FJ300XK			4.75	5.25	5.125	15.5
				FJ350XK			4.75	5.25	5.375	16.8
				FJ500XK			4.75	5.25	6.875	23.4
			240x480 - 120x240	FK050JJ	IC6	N	2.562	3	3	2.6
				FK075JJ			2.562	3	3.5	3.5
				FK100JJ			2.875	3.375	3.375	4.2
				FK150JJ			3.187	3.75	4	6.7
				FK200JJ			3.812	4.5	4	8.5
				FK250JJ			3.812	4.5	4.375	10
				FK300JJ			3.812	4.5	4.875	11.8
				FK350JJ			3.812	4.5	5.25	13.6
				FK500JJ			4.75	5.25	5.25	17.5
				FK750JJ			4.75	5.25	7	26.4



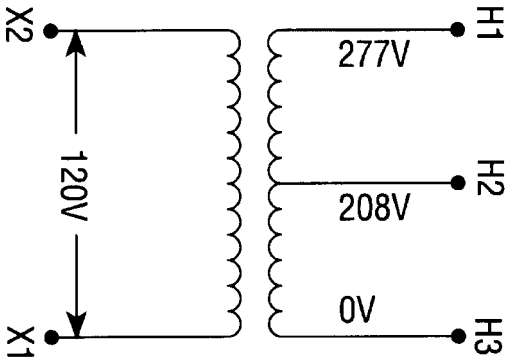
IC1



IC2



IC3



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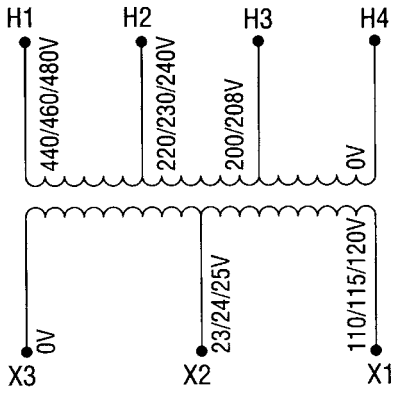
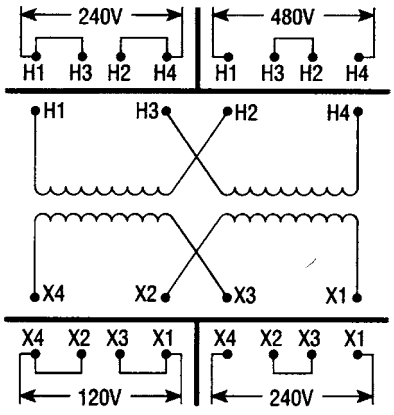


IC5



IC6

Motor Drive Isolation Transformers

Motor drive isolation transformers are designed to meet the requirements of SCR controlled variable speed motor drives. They are specifically constructed to withstand the mechanical forces associated with SCR drive duty cycles and to isolate the line from most SCR generated voltage spikes and transient feedback. Similarly, the two-winding construction also aids in reducing some types of line transients that can cause misfiring of the SCR's.

The units are UL Listed and incorporate all the features of Federal Pacific's three-phase ventilated transformers. The transformers can also be supplied as core and coil units with UL component recognition.

Delta-Wye designs are available for all commonly used primary and secondary voltages. All units include primary taps consisting of one 5% FCAN and one 5% FCBN.

7.5 KVA - 220 KVA

275 KVA - 750 KVA

Motor Drive Isolation Technical Data

Conductor	Motor HP	KVA	Primary/Secondary				Approximate Dimensions (Inches)			Weight (lbs)	Weather Shield
			230Δ - 230Y	230Δ - 460Y	460Δ - 230Y	460Δ- 460Y	H	W	D		
AL	3 & 5	7.5	7.5AEMD	7.5AFMD	7.5CEMD	7.5CFMD	29	17.125	19.375	145	WS-2
	7.5	11	11AEMD	11AFMD	11CEMD	11CFMD				160	
	10	15	15AEMD	15AFMD	15CEMD	15CFMD				185	
	15	20	20AEMD	20AFMD	20CEMD	20CFMD	34	22.375	19.875	285	WS-4
	25	34	34AEMD	34AFMD	34CEMD	34CFMD				320	
	30	40	40AEMD	40AFMD	40CEMD	40CFMD				340	
	40	51	51AEMD	51AFMD	51CEMD	51CFMD				380	
	50	63	63AEMD	63AFMD	63CEMD	63CFMD	37	26	19.875	485	WS-18A
	60	75	75AEMD	75AFMD	75CEMD	75CFMD				485	
	75	93	93AEMD	93AFMD	93CEMD	93CFMD	43	28.5	23.5	665	WS-18
	100	118	118AEMD	118AFMD	118CEMD	118CFMD				675	
	125	145	145AEMD	145AFMD	145CEMD	145CFMD	46	32	28	915	WS-10B
	150	175	175AEMD	175AFMD	175CEMD	175CFMD	51	42.125	26	1270	WS-12A
	200	220	220AEMD	220AFMD	220CEMD	220CFMD				1320	
	250	275	275AEMD	275AFMD	275CEMD	275CFMD	55.25	44.375	27.25	1450	N/A
	300	330	330AEMD	330AFMD	330CEMD	330CFMD	60.5	50.375	34.25	1720	
	400	440	440AEMD	440AFMD	440CEMD	440CFMD				2085	
	500	550	550AEMD	550AFMD	550CEMD	550CFMD	72	53.375	44.375	2750	
	600	660	660AEMD	660AFMD	660CEMD	660CFMD				3100	
	700	750	750AEMD	750AFMD	750CEMD	750CFMD	76.75	53.375	44.375	3150	

Conductor	Motor HP	KVA	Voltages - Primary-Delta, Secondary - Wye, 60 Hz					Approximate Dimensions (Inches)			Weight (lbs)	Weather Shield
			230Δ - 575Y	460Δ - 575Y	575Δ - 230Y	575Δ -460Y	575Δ -575Y	H	W	D		
AL	3 & 5	7.5	7.5AHMD	7.5CHMD	7.5DEMD	7.5DFMD	7.5DHMD	29	17.125	19.375	145	WS-2
	7.5	11	11AHMD	11CHMD	11DEMD	11DFMD	11DHMD				160	
	10	15	15AHMD	15CHMD	15DEMD	15DFMD	15DHMD				185	
	15	20	20AHMD	20CHMD	20DEMD	20DFMD	20DHMD	34	22.375	19.875	285	WS-4
	25	34	34AHMD	34CHMD	34DEMD	34DFMD	34DHMD				320	
	30	40	40AHMD	40CHMD	40DEMD	40DFMD	40DHMD				340	
	40	51	51AHMD	51CHMD	51DEMD	51DFMD	51DHMD				380	
	50	63	63AHMD	63CHMD	63DEMD	63DFMD	63DHMD	37	26	19.875	485	WS-18A
	60	75	75AHMD	75CHMD	75DEMD	75DFMD	75DHMD				485	
	75	93	93AHMD	93CHMD	93DEMD	93DFMD	93DHMD	43	28.5	23.5	665	WS-18
	100	118	118AHMD	118CHMD	118DEMD	118DFMD	118DHMD				675	
	125	145	145AHMD	145CHMD	145DEMD	145DFMD	145DHMD	46	32	28	915	WS-10B
	150	175	175AHMD	175CHMD	175DEMD	175DFMD	175DHMD	51	42.125	26	1270	WS-12
	200	220	220AHMD	220CHMD	220DEMD	220DFMD	220DHMD				1320	
	250	275	275AHMD	275CHMD	275DEMD	275DFMD	275DHMD	55.25	44.375	27.25	1450	N/A
	300	330	330AHMD	330CHMD	330DEMD	330DFMD	330DHMD	60.5	50.375	34.25	1720	
	400	440	440AHMD	440CHMD	440DEMD	440DFMD	440DHMD				2085	
	500	550	550AHMD	550CHMD	550DEMD	550DFMD	550DHMD	72	53.375	44.375	2750	
	600	660	660AHMD	660CHMD	660DEMD	660DFMD	660DHMD				3100	
	700	750	750AHMD	750CHMD	750DEMD	750DFMD	750DHMD	76.75	53.375	44.375	3150	

Transformer Accessories

Terminal Lug Kits

Catalog Number	KVA Sizes	Terminal Lug Quantity	Lug Cable Range	Quantity Cables Per Lug	Hardware Quantity - Bolt Size	Approximate Weight in Pounds
50400	15 - 25 15-25 -30-37-1/2	7	#14 - 1/0	1	(7) - 1/4 - 20 x 1"	1
50401	37 1/2 - 50 45-50-60-75	3 7	#14 - 1/0 #6 - 250MCM	1 1	(3) - 1/4 - 20 x 1" (7) - 5/16 - 18 x 1 1/2"	3
50402	75-100 100-112-150	6 6	#6 - 350MCM #6 - 350MCM	2 1	(6) - 1/2 - 13 x 2" (3) - 5/16 - 18 x 1 1/2" (6) - 3/8 - 16 x 1 1/2"	6
50403*	225	3 4	#4 - 500MCM #2 - 600MCM	1 2	(3) - 3/8 - 16 x 1 1/2" (4) - 1/2 - 13 x 2"	6
50404*	300	3 12	#6 - 350MCM #4 - 500MCM	2 1	(3) - 1/2 - 13 x 2" (9) - 3/8 - 16 x 2"	8
50405*	400-500	16 3	300-800MCM #2 - 600MCM	1 2	(13) - 1/2 - 13 x 2 1/2"	15

Notes:

1. Screw type lugs suitable for aluminum or copper conductor.

**2. Catalog numbers 50403, 50404, and 50405 to be used only on transformers with one primary and one secondary (two windings total) and at lease one delta winding. Also, one winding must have a voltage of 480V or above while the other winding must have a voltage of 208V or above or be 240 Delta with a 120 lighting tap (high-leg). For example, voltages of 480-208Y/120 and 480-240/120LT are acceptable connections for these lugs.*

Weather Shield Kits

Catalog Number	Overhang Extension (2 top & 2 bottom)	Approximate Weight in Pounds	Catalog Number	Overhang Extension (2 top & 2 bottom)	Approximate Weight in Pounds
WS-2	2 - 1/16 inches each side	10	WS-10A	2 - 1/16 inches each side	16
WS-3	2 - 1/16 inches each side	10	WS-10B	2 - 1/16 inches each side	16
WS-4	2 - 1/16 inches each side	15	WS-12	2 - 1/16 inches each side	22
WS-5	2 - 1/16 inches each side	15	WS-12A	2 - 1/16 inches each side	20
WS-6	2 - 1/16 inches each side	16	WS-14	2 - 1/16 inches each side	28
WS-7	2 - 1/16 inches each side	16	WS-16	2 - 1/16 inches each side	35
WS-8	2 - 1/16 inches each side	17	WS-18	2 - 1/16 inches each side	15
WS-9	2 - 1/16 inches each side	18	WS-18A	2 - 1/16 inches each side	12
WS-10	2 - 1/16 inches each side	20			

WEATHERSHIELD NOTE: Weathershield catalog numbers are listed in the technical data sections for each product. Addition of a weathershield kit converts the transformer from NEMA 2 to NEMA 3R - UL® listed product.

Wall Mount Brackets

Catalog Number	Type	Approximate Weight in Pounds	Use With . . .
WMB-3	Indoor/Outdoor	24	Wall mount bracket catalog numbers are listed in technical data sections for each product.
WMB-4	Indoor/Outdoor	60	

Primary Fuse Kit

Catalog Number	Approximate Weight in Pounds	Use With . . .
FPFK-1	1	Industrial Control Transformers

GLOSSARY

A

Air-Cooled - A transformer cooled by the natural circulation of air over and/or through the core and coils or forced air by using fans.

Ambient Noise Level - The sound level of the surrounding area of a transformer as measured in decibels.

Ambient Temperature - Temperature of the surrounding air which comes in contact with the transformer.

Ampere - Unit of current flow.

ANSI - American National Standards Institute.

ANSI-61 - A light grey paint used on dry type transformers.

ASTM - American Society for Testing Materials.

Autotransformer - A transformer in which at least two windings have a common section.

B

Banked Transformers - When two or more single-phase transformers are connected together to supply a three-phase load.

BIL - Acronym for basic impulse insulation levels, a specific insulation level expressed in kilovolts of the crest value of a standard lightning impulse.

Buck-Boost Transformers - An insulating transformer which has two primary windings and two secondary windings. These windings can be interconnected so that the transformer will be changed from an insulating transformer to a "bucking" or "boosting" autotransformer.

C

C° - Temperature in degrees Centigrade (Celsius).

Cast-coil Transformer - A transformer with coils cast in an epoxy resin.

Center Tap - A reduced-capacity tap at the mid-point in a winding.

Coil - A number of turns of wire wound on a form.

Conductor Losses - Losses caused by the resistance of a transformer winding, measured at 25, 50, 75, and 100 per cent of load.

Continuous Duty - A requirement of service that demands operation at a constant load for an indefinite period.

Continuous Rating - The load that a transformer can handle indefinitely without exceeding the specified temperature rise.

Control Transformer - A transformer which is designed for good voltage regulation characteristics when low power factor, large inrush currents are drawn.

Core - The steel which carries the magnetic flow.

Core Loss - Losses caused by a magnetization of the core and its resistance to magnetic flux.

Current Transformer - A transformer designed to have its primary winding connected in series with the circuit and used for transforming current into a value suitable for measurement of control.

D

Decibel - (DB) The standard unit for the measurement of sound intensity.

Delta - (Δ) A standard three-phase connection with the ends of each phase winding connected in series to form a closed loop, 120 degrees from the other.

Delta-Wye - (Δ-Y) A term used indicating the method of connection for both primary (Δ) and secondary (Y) windings of a three-phase transformer bank.

Dielectric Test - A test conducted at higher than rated nameplate voltage to determine the effectiveness of insulating materials and electrical clearances.

Distribution Transformer - A transformer for transferring electrical energy from a primary distribution circuit to a consumer service circuit.

Dry-Type Transformer - A transformer that is cooled by air as opposed to a transformer that is immersed in oil.

Dual Winding - A winding that consists of two separate windings connected in series to handle a specific voltage and KVA, or in parallel to handle the same KVA at one half the series connected voltage.

E

Electrostatic Shield - A grounded conductor sheet placed between the primary and secondary winding to reduce or eliminate line-to-line or line-to-ground noise.

Exciting Current - (No-Load Current) Current which flows in any winding used to excite the transformer when all other windings are open-circuited, expressed in per cent of the rated current of a winding.

F

FCAN - Full capacity above normal taps.

FCBN - Full capacity below normal taps.

Fan Cooled - A mechanical means of accelerating heat dissipation to lower the temperature rise of the transformer.

Frequency - The number of times an AC voltage will alternate from positive to negative and back again within a specified period of time, expressed in cycles per second and identified as Hz.

Full Capacity Tap - A tap designed to deliver the rated capacity of the transformer.

G

Ground - Connected to earth or to some conducting body that serves in place of earth.

Grounding Transformer - A special three-phase autotransformer for establishing a neutral on a three-wire delta secondary. (Also referred to as a "Zig-Zag transformer".)

H

Hertz - A term meaning cycles per second, abbreviated Hz.

High Voltage Windings - A term applied to two winding transformers, designates the winding with greater voltage, identified by H1, H2, etc.

Hi Pot - A standard test on dry-type transformers consisting of extra-high potentials (high voltage) impressed on the windings.

I

IEEE - Institute of Electrical and Electronic Engineers.

Impulse Tests - Dielectric tests consisting of the application of a high-frequency steep-wave-front voltage between windings and between windings and ground. (Used to determine BIL.)

Impedance - The vector sum of resistance and reactance which limits the current flow in an AC circuit. Impedance is identified in percentage and is used to determine the interrupting capacity of circuit breakers which protect the primary circuit. (Symbol Z)

Induced Potential Test - A standard dielectric test which verifies the integrity of insulating materials and electrical clearances between turns and layers of a transformer winding.

Insulating Materials - Those materials used to electrically insulate the transformer windings from each other and ground. (Rated 80° C rise, 115° C rise and 150° C rise.)

Insulating Transformer - A transformer that insulates the primary from the secondary winding. (Also called an isolating transformer.)

K

KVA - Kilovolt Ampere rating designates the output which a transformer can deliver at rated voltage and frequency without exceeding a specified temperature rise.

L

Line Conditioner - Portable or hard wire devices that will stabilize voltage, suppress electrical noise and act as surge suppressors against lightning discharges.

Liquid Transformer - A transformer with core and coils immersed in liquid (as opposed to a dry-type transformer).

Load - The KVA or VA requirement which the transformer must supply.

Load Losses - The losses which are the result of a current flowing to the load. Load losses would include all losses incurred above and beyond the no-load losses.

M

Mid-tap - A reduced-capacity tap midway in a winding, usually the secondary.

Multiple Winding - A winding which consists of two or more sections that can be paralleled for a specific mode of operation.

N

NEC - National Electric Code.

NEMA - National Electrical Manufacturers Association.

Noise Isolation Transformer - A transformer that is designed to provide both common and transverse mode noise attenuation.

Noise Level - The relative intensity of sound, measured in db.

No-Load Losses - The losses incurred when a transformer is excited but without a load connected to the secondary. These include core loss, dielectric loss, and exciting current I^2R loss.

O

OSHA - Occupational Safety and Health Act. Federal regulation setting minimum safety standards for compliance in industrial and commercial installations.

P

Parallel Operation - Transformers may be connected in parallel, provided that the electrical characteristics are suitable for such operation.

Percent IR - (%IR) Percent Resistance. The voltage drop due to conductor resistance at rated current expressed in percent of rated voltage.

Percent IX - (%IX) Percent Reactance. The voltage drop due to reactance at rated current expressed in percent of rated voltage.

Percent IZ - (%IZ) Percent Impedance. The voltage drop due to impedance at rated current expressed in percent of rated voltage.

Phase - Classification of an AC circuit. Usually, circuits are rated single-phase two wire or three wire or three-phase three wire or four wire. Single-phase transformers can be used on a three-phase source when two wires of the three-phase system are connected to the primary of the transformer. The secondary will be single-phase.

Polarity Tests - A standard test on transformers to determine instantaneous direction of the voltages in the primary compared to the **secondary.**

Potential Transformer - A transformer that is designed to have its primary winding connected parallel with a circuit and used for transforming voltage to a value suitable for measurement or control.

Power Conditioning - The means to correct voltage fluctuations and electrical noise problems common to incoming power sources.

Power Factor - The ratio of watts to volt amperes in a circuit. (% watts/VA)

Primary Voltage - The input circuit voltage for which the primary winding is designed.

R

Rating - The characteristics such as volt-ampere capacity, voltages, frequency and temperature rise that a transformer is designed to.

Ratio Test - A standard test of transformers to determine the ratio of the primary to the secondary voltage.

Reactance - A component of impedance produced by either inductance or capacitance in an AC circuit.

Reactor - A device for introducing inductive reactance into a circuit for motor starting, operating transformers in parallel and controlling current.

Regulation - The per cent change in output voltage from full load to no-load.

S

Scott Connection - A transformer connection usually used to get a two-phase output from the secondary of a transformer with a three-phase input to the primary or vice versa. It can also be used to provide three-phase to three-phase transformation.

Secondary Voltage Rating - Designates the load-circuit voltage for which the secondary winding is designated.

Series/multiple - A winding of two similar coils that can be connected for series operation or multiple (parallel) operation.

Star Connection - Same as WYE connection.

Step Down Transformer - High voltage winding is connected to the power source input and the low voltage winding to the output load.

Step Up Transformer - Low voltage winding is connected to the power source (input) and the high voltage winding is connected to the output load.

T

T-Connection - A Scott connected three-phase transformer utilizing two primary and two secondary coils.

Tap - A connection in a transformer winding which has the effect of changing the nominal voltage ratio of the transformer. (Taps are usually placed on the high voltage winding to correct for high or low voltage conditions found on the low voltage output side.)

Temperature Rise - The increase over ambient temperature of the winding due to energizing and loading.

Total Losses - Losses represented by the sum of the no-load and the load losses.

Transformer - A transformer is a static electrical device, which by electro-magnetic induction, transfers electrical energy from one circuit to another circuit, usually with changed values of voltage and current.

U

UL - Underwriters' Laboratories. Establishes standards for transformers.

Universal Taps - A combination of six primary voltage taps consisting of 4-2 1/2% FCBN and 2-2 1/2% FCAN.

V

Volt Amperes - The current flowing in a circuit multiplied by the voltage of that circuit. (The output rating of a transformer.)

W

WYE Connection (Y) - A three-phase connection in which similar ends of each phase winding are connected together at a common point which forms the electrical neutral and is often grounded.

Z

Zig-Zag Transformer - Commonly used term for a grounding transformer.

Electro-Mechanical Corporation Overview

Federal Pacific is a division of Electro-Mechanical Corporation, a privately held, American-owned company founded in 1958. It is headquartered in Bristol, Virginia (USA) and for more than 53 years has manufactured a wide variety of products used in the generation, transmission, distribution and control of electricity. These products, along with various electrical equipment repair and maintenance services, are used by a diverse mix of Energy (coal, oil and gas), Electric Utility and Industrial customers worldwide.

Electro-Mechanical Corporation has earned a "customer oriented" reputation by keeping its focus on providing the best value to its customers through quality products and services. With six manufacturing companies and two repair and service companies, Electro-Mechanical Corporation has over 650,000 square feet of modern manufacturing facilities, located in Virginia, Tennessee and Mexico.

The Electro-Mechanical Corporation consists of:

Federal Pacific

Federal Pacific - Dry-type transformers from .050 KVA through 10,000 KVA single and three phase, up to 34.5 kV, 150 kV BIL with UL® approval through 15 kV; Vacuum pressure impregnation and epoxy shielded transformers. Medium voltage switchgear including air-insulated livefront, deadfront, SCADA-controlled, automatic transfer, primary metering and wall-mounted padmounted and metal-enclosed switchgear. ISO9001:2008 Registered.

MAFESA is Electro-Mechanical Corporation's manufacturing facility in Mexico for stock low-voltage transformers.

The Electro-Mechanical Corporation Research and Technology Center (RTC) - a facility dedicated to developing new and innovative products for electrical power distribution. The mission of RTC is to develop, engineer, prototype and test products that will provide practical solutions to enhance the safety and productivity of electrical distribution equipment.

Line Power Manufacturing Corporation - Custom engineered electrical distribution and control apparatus including low and medium voltage metal-enclosed switchgear, power control centers, motor controls, and substations. Electrical power distribution systems and components used in mining. ISO 9001:2008 Registered.

Line Power Manufacturing Corporation

Metal Castings Company - Permanent mold and sand cast aluminum products.

Metal Castings Company

EMC Custom Solutions - The Custom Solutions Group specializes in the innovative design and creation of custom medium voltage switchgear for Data Center, Solar Energy and other alternative energy, mission-critical projects worldwide.

Machinery Components Division - Manufactures prototype and machined component products.

Electric Motor Repair & Sales Company - Electric motor and apparatus repair and new equipment sales. Equipment for the Electric Motor Repair and Transformer Manufacturing Industries including winding machines, coil spreaders, dynamometers and transformer core cutting machines.

Line Power Parts & Rebuild - Complete electrical equipment remanufacturing and onsite electrical equipment service. The parts service department provides replacement components manufactured by Electrical Group companies as well as commonly used OEM parts.

Federal Pacific Dry-Type Transformer Products

Industrial Control - 50 through 750 VA
Encapsulated 600 Volt Class
Three-Phase 3 through 15 kVA • Buck-Boost 50 VA through 5 kVA • Single-Phase 50 VA through 25 kVA
Ventilated 600 Volt Class
Single-Phase 15 through 167 kVA • Three-Phase 15 through 1000 kVA • K-Factor Rated Three-Phase 15 through 500 kVA • Motor Drive Isolation Three-Phase 7.5 through 750 kVA
High Voltage General Purpose
Three-Phase 2.4 and 5 kV Class, 15 through 1500 kVA • Three-Phase 8.6 and 15 kV Class, 112.5 through 1500 kVA
Pad-Mounted
Single- and Three-Phase 2.4, 5 and 15 kV Class, 112.5 through 2500 kVA
Unit Substation and High Voltage Power
Three-Phase 2.4 through 34.5 kV Class, 112.5 through 10000 kVA High Voltage General Purpose Three-Phase 2.4 and 5 kV Class, 15 through 1500 kVA • Three-Phase 8.6 and 15 kV Class, 112.5 through 1500 kVA
Vacuum Pressure Impregnated (VPI) and VPI/Epoxy Shielded
600 Volt Class through 34.5 kV Class, 112.5 through 10000 kVA
Specialty Transformers
600 Volt Class through 34.5 kV Class, 50 VA through 10000 kVA
ABS Certified Marine Duty Transformers for Marine, Petro-Chem and Offshore Applications

Federal Pacific Switchgear Products

Live-Front Pad-Mounted Switchgear - 15 kV • 27 kV
Manual, Automatic Transfer, Remote Supervisory Controlled Models
Live-Front/Dead-Front Pad-Mounted Switchgear - 15 kV • 27 kV
Manual, Automatic Transfer, Remote Supervisory Controlled Models
Dead-Front Pad-Mounted Switchgear - 15 kV • 27 kV
Manual, Automatic Transfer, Remote Supervisory Controlled Models
Pad-Mounted Capacitor Banks
Primary Metering Dead-Front Pad-Mounts - 15 kV • 27 kV • 38 kV
Fused Sectionalizer Dead-Front Pad-Mounts - 15 kV • 27 kV
Metal-Enclosed Switchgear - 5 to 38 kV
Manual, Automatic Source Transfer, Remote-Supervisory Control, Shunt Trip
Wall-Mounted Equipment - 15 kV • 27 kV
Wall-Mounted Switch Cabinets, Wall-Mounted Fuse Cabinets
Unit Substations - 5 to 38 kV
Vacuum Reclosers - 15 kV
Custom-Engineered Products - 5 to 121 kV
Portable Substations - Trailer, Skid and Track Mounted
Components
Micro-Processor and Stored-Energy Switch Operators, SCADA-Controlled Switch Operators

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