

Buck-Boost Transformers

Application

The 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 insulating transformer or as an autotransformer. As an autotransformer the unit can be corrected to Buck (decrease) or Boost (increase) a supply voltage. When connected in either the Buck or Boost mode, the unit is no longer an insulating transformer but is an autotransformer.

Autotransformers are more economical and physically smaller than equivalent two-winding transformers and are designed to carry 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, care should be taken to assure that they are acceptable to local code.

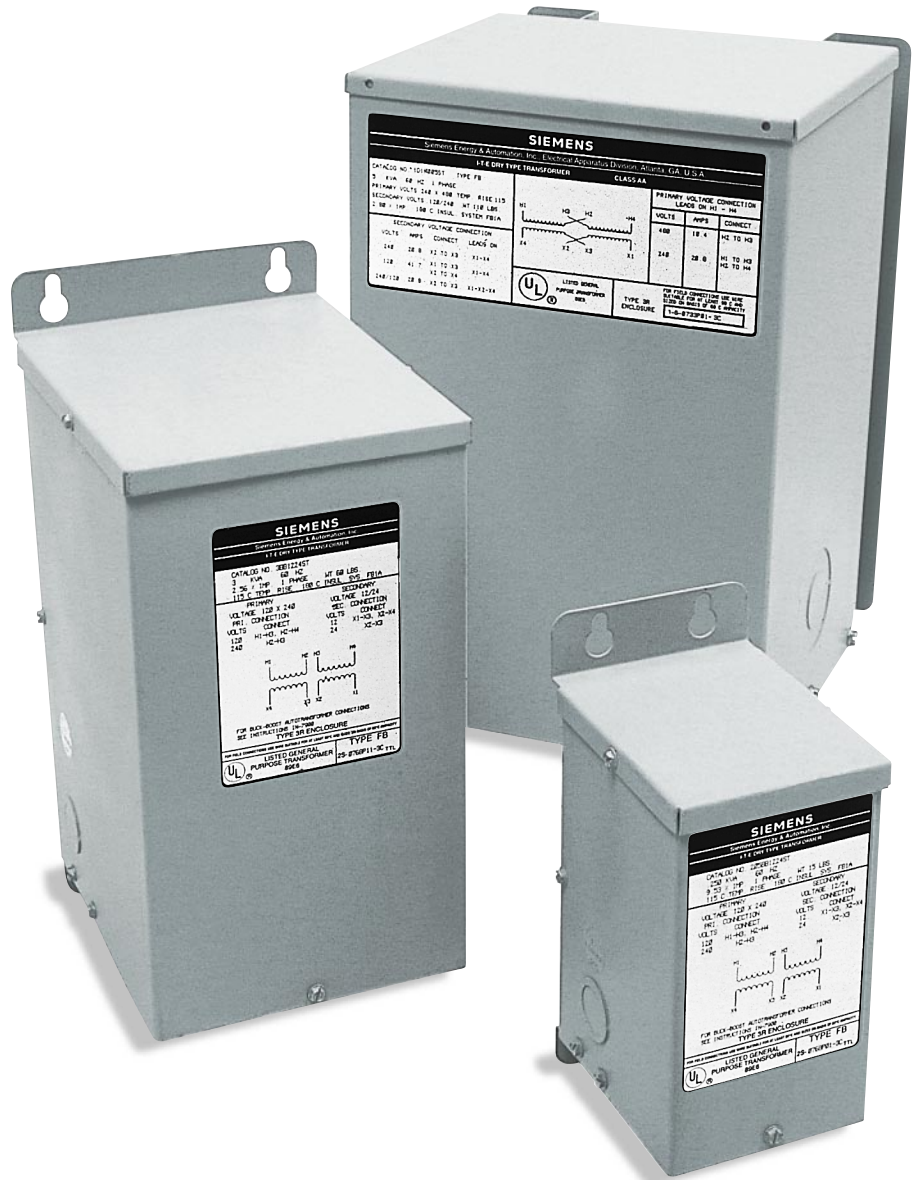
Note: Autotransformers are not used in closed delta connections as they introduce into the circuit a phase shift which makes them uneconomical.

As insulating transformers these units can accommodate a high voltage of 120, 240, or 480 volts. For units with two 12 volt secondaries, two 16 volt secondaries, or two 24 volt secondaries, the output can be wired for either secondary voltage, or for 3-wire secondary. The unit is rated (KVA) as any conventional transformer.

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 $\pm 5\%$) the equipment fails to operate at maximum efficiency. A Buck-Boost transformer is a simple and economical means of correcting this off-standard voltage up to $\pm 20\%$. A Buck-Boost Transformer will NOT, however, stabilize a fluctuating voltage.

Buck-Boost transformers are suitable for use as a three phase autotransformer bank in either direction to supply 3-wire loads. They are also suitable for



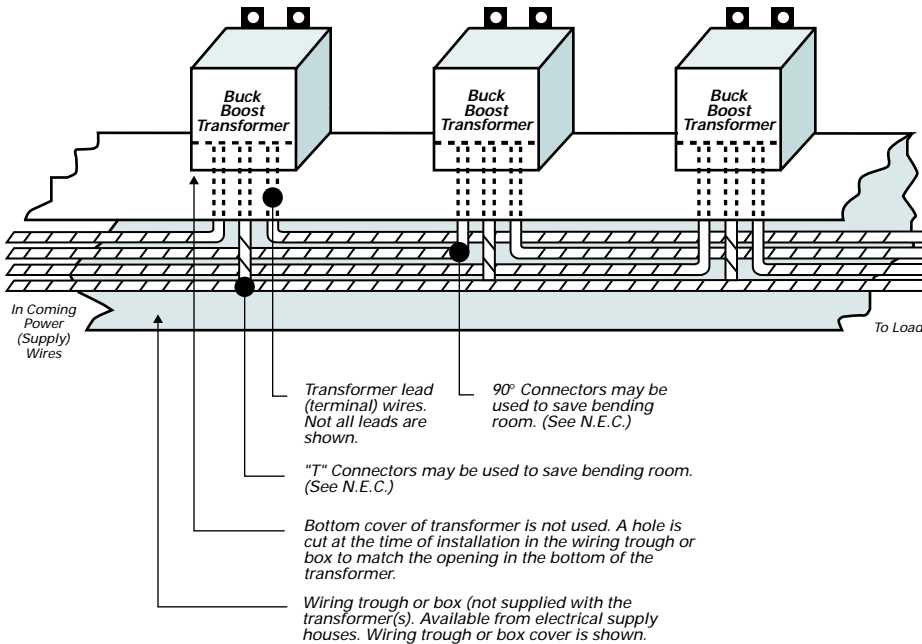
use in a three-phase autotransformer bank which provides a neutral return for unbalanced current. They are NOT suitable for use in a three phase

autotransformer bank to supply a 4-wire unbalanced load when the source is a 3-wire circuit.

120 x 240 Pri. - 12/24 Sec.		120 x 240 Pri. - 16/32 Sec.		240 x 480 Pri. - 24/48 Sec.	
KVA	Catalog Number	KVA	Catalog Number	KVA	Catalog Number
.050	050BB1224	.050	050BB1632	.050	050BB2448
.100	100BB1224	.100	100BB1632	.100	100BB2448
.150	150BB1224	.150	150BB1632	.150	150BB2448
.250	205BB1224	.250	205BB1632	.250	205BB2448
.500	505BB1224	.500	505BB1632	.500	505BB2448
.750	705BB1224	.750	705BB1632	.750	705BB2448
1.00	1BB1224	1.00	1BB1632	1.00	1BB2448
1.50	105BB1224	1.50	105BB1632	1.50	105BB2448
2.00	2BB1224	2.00	2BB1632	2.00	2BB2448
3.00	3BB1224	3.00	3BB1632	3.00	3BB2448
5.00	5BB1224	5.00	5BB1632	5.00	5BB2448



Typical Three Phase Buck-Boost Autotransformer Installation



Use quantity of Buck-Boost Transformer(s) indicated on chart for connection to be made.
Quantity required may vary from quantity shown in this illustration.

CAUTION: Refer to National Electrical Code Article 373-4 for determining wire bending space.

How to Select the Proper Transformer

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. 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 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 for 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 cycles.

How to Use Selection Charts

1. Choose the selection table with the correct number of phases for single or three phase applications.
2. Line/Load voltage combinations are listed across the top of the selection table. Select a line/load voltage combination which comes closest to matching your application.
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 the next highest rating.
4. Now follow the column across the table to the far left-hand side to find the catalog number and KVA 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 either two or three single phase transformers are required as indicated in the "quantity required" line at the bottom of the table. The selection is dependent 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.
7. For line/load voltage not listed on the selection tables, use the pair listed above your application for reference. Then apply the first formula at the bottom of the table to determine "new" output voltage. The new KVA rating can be found using the second formula.

Buck-Boost Transformers

120 x 240 Volts Primary - 12/24 Volts Secondary - 60Hz - No Taps - Wall Mounted

Single Phase - Table 1		Boosting								Bucking					
Catalog Number	Line Voltage (Available)	95	100	105	109	189	208	215	220	125	132	229	245	250	252
Insulating Transformer Rating	Load Voltage (Output)	114	120	115	120	208	229	237	242	113	120	208	222	227	240
050BB2448 .050 KVA	KVA Amps	.24 2.08	.25 2.08	.50 4.17	.50 4.17	.43 2.08	.48 2.08	.49 2.08	.50 2.08	.52 4.59	.55 4.59	.48 2.29	.51 2.29	.52 2.29	1.05 4.38
100BB2448 .100 KVA	KVA Amps	.48 4.17	.50 4.17	.96 8.33	1.00 8.33	.87 4.17	.95 4.17	.99 4.17	1.01 4.17	1.04 9.16	1.10 9.16	.95 4.58	1.02 4.58	1.04 4.58	2.10 8.75
150BB2448 .150 KVA	KVA Amps	.72 6.25	.75 6.25	1.44 12.50	1.50 12.50	1.30 6.25	1.43 6.25	1.48 6.25	1.51 6.25	1.55 13.75	1.65 13.75	1.43 6.88	1.53 6.88	1.56 6.88	3.15 13.13
205BB2448 .250 KVA	KVA Amps	1.19 10.42	1.25 10.42	2.40 20.83	2.50 20.83	2.17 10.42	2.38 10.42	2.47 10.42	2.52 10.42	2.60 22.92	2.75 22.92	2.38 11.46	2.54 11.46	2.60 11.46	5.25 21.88
505BB2448 .500 KVA	KVA Amps	2.37 20.83	2.50 20.83	4.80 41.67	5.00 41.67	4.33 20.83	4.77 20.83	4.94 20.83	5.04 20.83	5.18 45.83	5.50 45.83	4.77 22.92	5.09 22.92	5.20 22.92	10.50 43.75
705BB2448 .750 KVA	KVA Amps	3.56 31.25	3.75 31.25	7.19 62.50	7.50 62.50	6.50 31.25	7.15 31.25	7.41 31.25	7.56 31.25	7.77 68.75	8.25 68.75	7.15 34.38	7.63 34.38	7.80 34.38	15.75 65.63
1BB2448 1.00 KVA	KVA Amps	4.75 41.67	5.00 41.67	9.58 83.33	10.00 83.33	8.67 41.67	9.53 41.67	9.88 41.67	10.08 41.67	10.36 91.66	11.00 91.66	9.53 45.83	10.17 45.83	10.40 45.83	21.00 87.50
105BB2448 1.50 KVA	KVA Amps	7.13 62.50	7.50 62.50	14.38 125.00	15.00 125.00	13.00 62.50	14.30 62.50	14.81 62.50	15.13 62.50	15.54 137.50	16.50 137.50	14.30 68.75	15.26 68.75	15.61 68.75	31.50 131.25
2BB2448 2.00 KVA	KVA Amps	9.50 83.33	10.00 83.33	19.17 166.66	20.00 166.66	17.33 83.33	19.07 83.33	19.75 83.33	20.17 83.33	20.72 183.33	22.00 183.33	19.07 91.66	20.35 91.66	20.81 91.66	42.00 175.00
3BB2448 3.00 KVA	KVA Amps	14.25 125.00	15.00 125.00	28.75 250.00	30.00 250.00	26.00 125.00	28.60 125.00	29.63 125.00	30.25 125.00	31.08 275.00	33.00 275.00	28.60 137.50	30.53 137.50	31.21 137.50	63.00 262.50
5BB2448 5.00 KVA	KVA Amps	23.75 208.33	25.00 208.33	47.92 416.66	50.00 416.66	43.33 208.33	47.67 208.33	49.37 208.33	50.42 208.33	51.79 458.33	55.00 458.33	47.67 229.17	50.88 229.17	52.02 229.17	105.00 437.50
Connection Diagram		B	B	A	A	D	D	D	D	A	A	D	D	D	C

Three Phase - Table 2		Boosting								Bucking					
Catalog Number	Line Voltage (Available)	189Y 109	195Y 113	200Y 115	208Y 120	416Y 240	416Y 240	189	208	220	218	229	250	255	264
Insulating Transformer Rating	Load Voltage (Output)	208	234	240	229	457	436	208	229	242	208	208	227	232	240
050BB2448 .050 KVA	KVA Amps	1.50 4.17	.84 2.08	.86 2.08	1.65 4.17	1.65 2.08	3.15 4.17	.75 2.08	.83 2.08	.87 2.08	1.58 4.39	.83 2.29	.90 2.29	.92 2.29	.95 2.29
100BB2448 .100 KVA	KVA Amps	3.00 8.33	1.69 4.17	1.73 4.17	3.30 8.33	3.30 4.17	6.29 8.33	1.50 4.17	1.65 4.17	1.75 4.17	3.15 8.75	1.65 4.58	1.80 4.58	1.84 4.58	1.90 4.58
150BB2448 .150 KVA	KVA Amps	4.50 12.50	2.54 6.25	2.60 6.25	4.96 12.50	4.96 6.25	9.44 12.50	2.26 6.25	2.48 6.25	2.62 6.25	4.73 13.13	2.48 6.88	2.71 6.88	2.76 6.88	2.86 6.88
205BB2448 .250 KVA	KVA Amps	7.50 20.83	4.22 10.42	4.33 10.42	8.30 20.83	8.25 10.42	15.75 20.83	3.75 10.42	4.13 10.42	4.37 10.42	7.88 21.88	4.13 11.46	4.50 11.46	4.61 11.46	4.76 11.46
505BB2448 .500 KVA	KVA Amps	15.01 41.67	8.44 20.83	8.66 20.83	16.60 41.67	16.50 20.83	31.50 41.67	7.50 20.83	8.26 20.83	8.73 20.83	15.76 43.75	8.26 22.92	9.01 22.92	9.21 22.92	9.53 22.92
705BB2448 .750 KVA	KVA Amps	22.52 62.50	12.67 31.25	12.99 31.25	24.90 62.50	24.75 31.25	47.25 62.50	11.26 31.25	12.39 31.25	13.10 31.25	23.64 65.63	12.39 34.38	13.52 34.38	13.82 34.38	14.29 34.38
1BB2448 1.00 KVA	KVA Amps	30.02 83.33	16.89 41.67	17.32 41.67	33.20 83.33	33.00 41.67	63.00 83.33	15.01 41.67	16.51 41.67	17.47 41.67	31.52 87.50	16.51 45.83	18.02 45.83	18.42 45.83	19.05 45.83
105BB2448 1.50 KVA	KVA Amps	45.03 125.00	25.33 62.50	25.98 62.50	49.80 125.00	49.50 62.50	94.50 125.00	22.52 62.50	24.77 62.50	26.20 62.50	47.28 131.25	24.77 68.75	27.03 68.75	27.63 68.75	28.53 68.75
2BB2448 2.00 KVA	KVA Amps	60.06 166.67	33.77 83.33	34.64 83.33	66.40 166.67	66.00 83.33	126.00 166.66	30.02 83.33	33.03 83.33	34.93 83.33	63.05 175.00	33.03 91.67	36.04 91.67	36.84 91.67	38.11 91.67
3BB2448 3.00 KVA	KVA Amps	90.07 250.00	50.66 125.00	51.96 125.00	99.59 250.00	99.00 125.00	189.00 250.00	45.03 125.00	49.54 125.00	52.39 125.00	94.57 262.50	49.54 137.50	54.06 137.50	55.25 137.50	57.16 137.50
5BB2448 5.00 KVA	KVA Amps	150.11 416.67	84.44 208.33	86.60 208.33	165.00 416.67	165.00 208.33	318.00 416.66	75.05 208.33	82.56 208.33	87.32 208.33	157.62 437.50	82.56 229.17	90.10 229.17	92.09 229.17	95.26 229.17
Quantity Required		3	3	3	3	3	3	2	2	2	2	2	2	2	2
Connection 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: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage}$.

Buck-Boost Transformers

120 x 240 Volts Primary - 16/32 Volts Secondary - 60Hz - No Taps - Wall Mounted

Single Phase - Table 3		Boosting								Bucking					
Catalog Number	Line Voltage (Available)	95	100	105	208	215	215	220	225	135	240	240	245	250	255
Insulating Transformer Rating	Load Voltage (Output)	120	114	119	240	244	230	235	240	119	208	225	230	234	239
050BB1632 .050 KVA	KVA Amps	.19 1.56	.36 3.12	.37 3.12	.37 1.56	.38 1.56	.72 3.12	.73 3.12	.73 3.12	.42 3.54	.37 1.77	.75 3.33	.77 3.33	.78 3.33	.80 3.33
100BB1632 .100 KVA	KVA Amps	.38 3.13	.72 6.25	.74 6.25	.74 3.13	.76 3.13	1.44 6.25	1.46 6.25	1.50 6.25	.84 7.09	.74 3.54	1.50 6.66	1.54 6.66	1.56 6.66	1.60 6.66
150BB1632 .150 KVA	KVA Amps	.56 4.69	1.06 9.38	1.12 9.38	1.12 4.69	1.14 4.69	2.16 9.38	2.20 9.38	2.26 9.38	1.26 10.64	1.10 5.30	2.26 10.02	2.30 10.02	2.34 10.02	2.40 10.02
205BB1632 .250 KVA	KVA Amps	.94 7.81	1.78 15.63	1.86 15.63	1.88 7.81	1.91 7.81	3.59 15.63	3.67 15.63	3.75 15.63	2.11 17.71	1.84 8.85	3.75 16.67	3.83 16.67	3.90 16.67	3.98 16.67
505BB1632 .500 KVA	KVA Amps	1.88 15.63	3.56 31.25	3.72 31.25	3.75 15.63	3.81 15.63	7.19 31.25	7.34 31.25	7.50 31.25	4.21 35.42	3.68 17.71	7.50 33.33	7.67 33.33	7.80 33.33	7.97 33.33
705BB1632 .750 KVA	KVA Amps	2.81 23.44	5.34 46.88	5.58 46.88	5.63 23.44	5.72 23.44	10.78 46.88	11.02 46.88	11.25 46.88	6.32 53.13	5.53 26.56	11.25 50.00	11.50 50.00	11.70 50.00	11.95 50.00
1BB1632 1.00 KVA	KVA Amps	3.75 31.25	7.13 62.50	7.44 62.50	7.50 31.25	7.63 31.25	14.38 62.50	14.69 62.50	15.00 62.50	8.43 70.83	7.37 35.42	15.00 66.67	15.33 66.67	15.60 66.67	15.93 66.67
105BB1632 1.50 KVA	KVA Amps	5.63 46.90	10.69 93.80	11.16 93.80	11.25 46.90	11.44 46.90	21.56 93.80	22.03 93.80	22.50 93.80	12.64 106.30	11.05 53.10	22.50 100.00	23.00 100.00	23.40 100.00	23.90 100.00
2BB1632 2.00 KVA	KVA Amps	7.50 62.50	14.25 125.00	14.88 125.00	15.00 62.50	15.25 62.50	28.75 125.00	29.38 125.00	30.00 125.00	16.86 141.70	14.73 70.80	30.00 133.30	30.67 133.30	31.20 133.30	31.87 133.30
3BB1632 3.00 KVA	KVA Amps	11.25 93.80	21.38 187.50	22.31 187.50	22.50 93.80	22.88 93.80	43.13 187.50	44.06 187.50	45.00 187.50	25.29 212.50	22.10 106.30	45.00 200.00	46.00 200.00	46.80 200.00	47.80 200.00
5BB1632 5.00 KVA	KVA Amps	18.75 156.30	35.63 312.50	37.19 312.50	37.50 156.30	38.13 156.30	71.88 312.50	73.44 312.50	75.00 312.50	42.15 354.20	36.83 177.10	75.00 333.30	76.67 333.30	78.00 333.30	79.67 333.30
Connection Diagram		B	A	A	D	D	C	C	C	A	D	C	C	C	C

Three Phase - Table 4		Boosting					Bucking					
Catalog Number	Line Voltage (Available)	183Y 106	208Y 120	195	208	225	240	245	250	256	265	272
Insulating Transformer Rating	Load Voltage (Output)	208	236	208	240	240	208	230	234	240	234	240
050BB1632 .050 KVA	KVA Amps	1.13 3.13	1.28 3.13	1.13 3.13	.62 1.56	1.30 3.13	.56 1.56	1.33 3.34	1.35 3.34	1.39 3.34	.72 1.77	.74 1.77
100BB1632 .100 KVA	KVA Amps	2.25 6.25	2.55 6.25	2.25 6.25	1.30 3.13	2.60 6.25	1.13 3.13	2.66 6.67	2.70 6.67	2.77 6.67	1.44 3.55	1.48 3.55
150BB1632 .150 KVA	KVA Amps	3.38 9.38	3.83 9.38	3.38 9.38	1.95 4.69	3.90 9.38	1.69 4.69	3.98 10.00	4.05 10.00	4.16 10.00	2.15 5.31	2.21 5.31
205BB1632 .250 KVA	KVA Amps	5.63 15.63	6.39 15.63	5.63 15.63	3.17 7.81	6.50 15.63	2.81 7.81	6.64 16.67	6.76 16.67	6.93 16.67	3.59 8.85	3.68 8.85
505BB1632 .500 KVA	KVA Amps	11.26 31.25	12.77 31.25	11.26 31.25	6.33 15.63	12.99 31.25	5.63 15.63	13.28 33.33	13.50 33.33	13.86 33.33	7.17 17.69	7.36 17.71
705BB1632 .750 KVA	KVA Amps	16.89 46.88	19.16 46.88	16.89 46.88	9.50 23.44	19.49 46.88	8.44 23.44	19.92 50.00	20.26 50.00	20.78 50.00	10.76 26.54	11.04 26.56
1BB1632 1.00 KVA	KVA Amps	22.52 62.50	25.55 62.50	22.52 62.50	12.67 31.25	25.98 62.50	11.26 31.25	26.56 66.67	27.02 66.67	27.71 66.67	14.34 35.39	14.72 35.42
105BB1632 1.50 KVA	KVA Amps	33.77 93.75	38.32 93.75	33.77 93.75	19.00 46.88	38.97 93.75	16.89 46.88	39.84 100.00	40.53 100.00	41.57 100.00	21.52 53.08	22.08 53.13
2BB1632 2.00 KVA	KVA Amps	45.03 125.00	51.10 125.00	46.03 125.00	25.33 62.50	51.96 125.00	22.52 62.50	53.11 133.33	54.04 133.33	55.43 133.33	28.69 70.78	29.44 70.83
3BB1632 3.00 KVA	KVA Amps	67.55 187.50	76.64 187.50	67.55 187.50	38.00 93.75	77.94 187.50	33.77 93.75	79.67 200.00	81.06 200.00	83.14 200.00	43.03 106.17	44.17 106.25
5BB1632 5.00 KVA	KVA Amps	112.58 312.50	127.74 312.50	112.58 312.50	63.33 156.25	129.90 312.50	56.29 156.25	132.79 333.33	135.09 333.33	138.56 333.33	71.72 176.95	73.61 177.08
Quantity Required		3	3	2	2	2	2	2	2	2	2	2
Connection Diagram		F	F	H	G	H	L	H	H	H	G	G

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

Buck-Boost Transformers

240 x 480 Volts Primary - 24/48 Volts Secondary - 60Hz - No Taps - Wall Mounted

Single Phase - Table 5		Boosting										Bucking			
Catalog Number	Line Voltage (Available)	230	380	416	425	430	435	440	440	450	460	277	480	480	504
Insulating Transformer Rating	Load Voltage (Output)	277	420	457	467	473	457	462	484	472	483	230	436	456	480
050BB1224 .050 KVA	KVA Load Amps	.29 1.04	.44 1.04	.48 1.04	.49 1.04	.49 1.04	.95 2.08	.96 2.08	.50 1.04	.98 2.08	1.01 2.08	.29 1.25	.50 1.15	1.05 2.29	1.10 2.29
100BB1224 .100 KVA	KVA Load Amps	.58 2.08	.87 2.08	.95 2.08	.97 2.08	.99 2.08	1.90 4.17	1.93 4.17	1.01 2.08	1.97 4.17	2.01 4.17	.58 2.50	1.00 2.29	2.09 4.58	2.20 4.58
150BB1224 .150 KVA	KVA Load Amps	.87 3.13	1.31 3.13	1.43 3.13	1.46 3.13	1.48 3.13	2.86 6.25	2.89 6.25	1.51 3.13	2.95 6.25	3.02 6.25	.86 3.75	1.50 3.44	3.14 6.88	3.00 6.88
205BB1224 .250 KVA	KVA Load Amps	1.44 5.21	2.19 5.21	2.38 5.21	2.43 5.21	2.46 5.21	4.76 5.21	4.81 10.42	2.52 5.21	4.92 10.42	5.03 10.42	1.44 6.25	2.50 5.73	5.23 11.46	5.50 11.46
505BB1224 .500 KVA	KVA Load Amps	2.89 10.42	4.38 10.42	4.76 10.42	4.86 10.42	4.93 10.42	9.52 20.83	9.62 20.83	5.04 10.42	9.83 20.83	10.06 20.83	2.88 12.50	5.00 11.46	10.45 22.92	11.00 22.92
705BB1224 .750 KVA	KVA Load Amps	4.33 15.63	6.56 15.63	7.14 15.63	7.30 15.63	7.39 15.63	14.28 31.25	14.44 31.25	7.56 15.63	14.75 31.25	15.09 31.25	4.31 18.75	7.49 17.19	15.68 34.38	16.50 34.38
1BB1224 1.00 KVA	KVA Load Amps	5.77 20.83	8.57 20.83	9.52 20.83	9.73 20.83	9.85 20.83	19.04 41.67	19.25 41.67	10.08 20.83	19.67 41.67	20.13 41.67	5.75 25.00	9.99 22.92	20.90 45.83	22.00 45.83
105BB1224 1.50 KVA	KVA Load Amps	8.66 31.25	13.13 31.25	14.28 31.25	14.59 31.25	14.78 31.25	28.56 62.50	28.88 62.50	15.13 31.25	29.50 62.50	30.19 62.50	8.63 37.50	14.99 34.38	31.25 68.75	33.00 68.75
2BB1224 2.00 KVA	KVA Load Amps	11.54 41.67	17.50 41.67	19.04 41.67	19.46 41.67	19.71 41.67	38.08 83.33	38.50 83.33	20.17 41.67	39.33 83.33	40.25 83.33	11.50 50.00	19.98 45.83	41.80 91.67	44.00 91.67
3BB1224 3.00 KVA	KVA Load Amps	17.31 62.50	26.25 62.50	28.56 62.50	29.19 62.50	29.56 62.50	57.13 125.00	57.75 125.00	30.25 62.50	59.00 125.00	60.38 125.00	17.25 75.00	29.98 68.80	62.70 137.50	66.00 137.50
5BB1224 5.00 KVA	KVA Load Amps	28.90 104.20	43.80 104.20	47.60 104.20	48.60 104.20	49.30 104.20	95.20 208.30	96.20 208.30	50.40 104.20	98.30 208.30	100.60 208.30	28.80 125.00	50.00 114.60	104.50 229.20	110.00 229.20
Connection Diagram		B	D	D	D	D	C	C	D	C	C	B	D	C	C

Three Phase - Table 6		Boosting								Bucking							
Catalog Number	Line Voltage (Available)	399Y 230	380	430	440	460	460	480	480	440	440	460	460	480	480	500	500
Insulating Transformer Rating	Load Voltage (Output)	480Y 277	420	473	462	506	483	528	504	400	419	438	418	457	436	455	477
050BB1224 .050 KVA	KVA Load Amps	.86 1.04	.76 1.04	.85 1.04	1.66 2.08	.91 1.04	1.74 2.08	.95 2.08	1.82 2.08	.79 1.14	1.58 2.18	1.66 2.18	.83 1.14	1.73 2.18	.86 1.14	.90 1.14	1.80 2.18
100BB1224 .100 KVA	KVA Load Amps	1.73 2.08	1.51 2.08	1.70 2.08	3.33 4.16	1.82 2.08	3.48 4.16	1.90 2.08	3.63 4.16	1.59 2.29	3.17 4.37	3.31 4.37	1.66 2.29	3.46 4.37	1.73 2.29	1.80 2.29	3.61 4.37
150BB1224 .150 KVA	KVA Load Amps	2.60 3.12	2.27 3.12	2.56 3.12	4.99 6.24	2.73 3.12	5.22 6.25	2.85 3.12	5.45 6.24	2.38 3.43	4.75 6.55	4.97 6.55	2.48 3.43	5.19 6.55	2.59 3.43	2.70 3.43	5.41 6.55
205BB1224 .250 KVA	KVA Load Amps	4.33 5.20	3.78 5.20	4.26 5.20	8.32 10.40	4.56 5.20	8.70 10.40	4.76 5.20	9.08 10.40	3.96 5.72	7.92 10.92	8.28 10.92	4.14 5.72	8.64 10.92	4.32 5.72	4.51 5.72	9.02 10.92
505BB1224 .500 KVA	KVA Load Amps	8.60 10.40	7.56 10.40	8.52 10.40	16.64 20.80	9.11 10.40	17.40 20.80	9.51 10.40	18.16 20.80	7.93 11.44	15.85 21.84	16.57 21.84	8.28 11.44	17.29 21.84	8.64 11.44	9.02 11.44	18.04 21.84
705BB1224 .750 KVA	KVA Load Amps	12.90 15.60	11.34 15.60	12.77 15.60	24.97 31.20	13.67 15.60	26.10 31.20	14.27 15.60	27.24 31.20	11.89 17.16	23.77 32.76	24.85 32.76	12.42 17.16	25.93 32.76	12.96 17.16	13.52 17.16	27.07 32.76
1BB1224 1.00 KVA	KVA Load Amps	17.30 20.80	15.12 20.80	17.03 20.80	33.29 41.60	18.23 20.80	34.80 41.60	19.02 20.80	36.31 41.60	15.85 22.88	31.70 43.68	33.14 43.68	16.57 22.88	34.57 43.68	17.28 22.88	18.03 22.88	36.09 43.68
105BB1224 1.50 KVA	KVA Load Amps	25.90 31.20	22.69 31.20	25.55 31.20	49.93 62.40	27.34 31.20	52.50 62.40	28.53 31.20	54.47 62.40	23.78 34.32	47.55 65.52	49.71 65.52	24.85 34.32	51.86 65.62	25.92 34.32	27.05 34.32	54.13 65.52
2BB1224 2.00 KVA	KVA Load Amps	34.60 41.60	30.25 41.60	34.07 41.60	66.58 83.20	36.46 41.60	69.60 83.20	38.04 41.60	72.63 83.20	31.70 45.76	63.40 87.36	66.27 87.36	33.13 45.76	69.15 87.36	34.56 45.76	36.06 45.76	72.18 87.36
3BB1224 3.00 KVA	KVA Load Amps	52.00 62.50	45.45 62.50	51.18 62.50	100.03 125.00	54.69 62.50	104.57 125.00	57.07 62.50	109.12 125.00	47.63 68.75	95.25 131.25	99.57 131.25	49.77 68.75	103.89 131.25	51.92 68.75	54.18 68.75	108.44 131.25
5BB1224 5.00 KVA	KVA Load Amps	86.10 104.00	75.62 104.00	85.17 104.00	166.44 208.00	91.15 104.00	174.01 208.00	95.11 104.00	181.57 208.00	79.26 114.40	158.50 218.40	165.69 218.40	82.83 114.40	172.87 218.40	86.39 114.40	90.16 114.40	180.44 218.40
Quantity Required		3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Connection 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: $\frac{\text{Rated Output Voltage}}{\text{Rated Input Voltage}} \times \text{Input Actual Voltage} = \text{Output New Voltage.}$

Buck-Boost Connection Diagrams

Single Phase

Diagram A

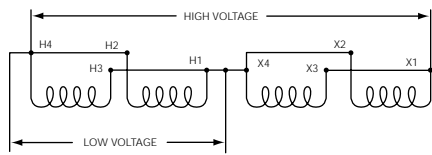


Diagram B

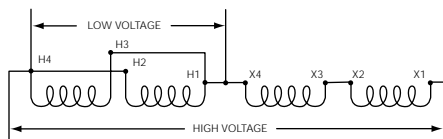


Diagram C

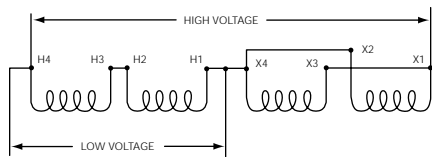


Diagram D

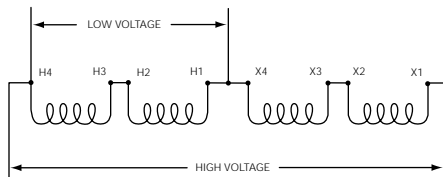
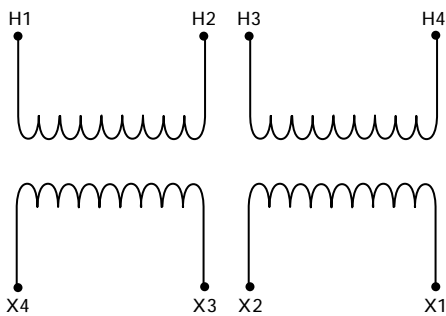


Diagram #1
(Standard Step-down application)



Three Phase

Diagram E ①

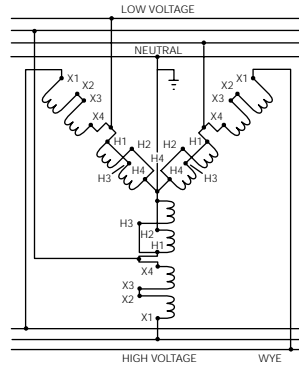


Diagram F ①

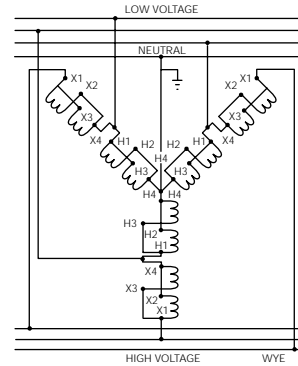


Diagram G

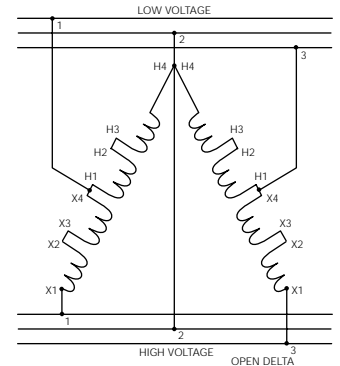


Diagram J ①

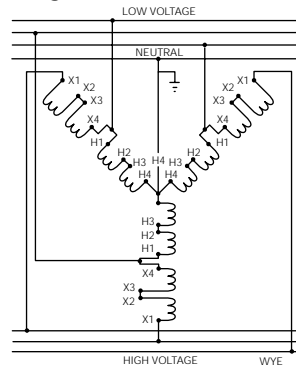


Diagram H

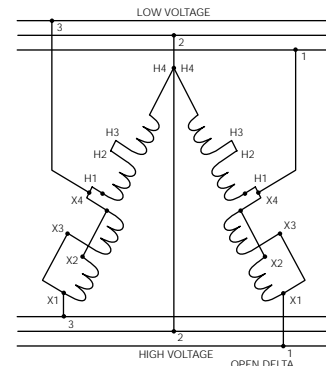


Diagram K ①

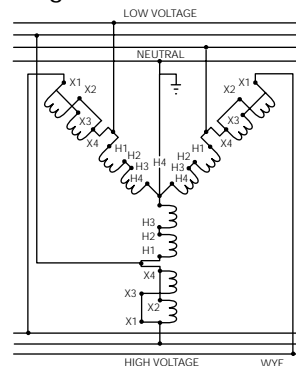
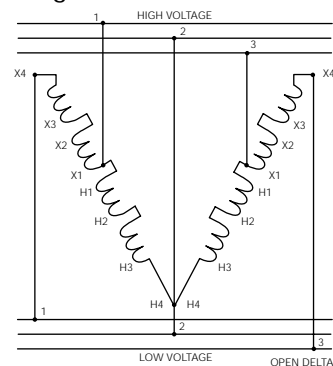


Diagram L



① The neutral XO should not be used when the source is a three wire supply.

NOTES

- Inputs and Outputs may be reversed: KVA capacity remains constant. All applications are suitable for 60Hz only.
- Refer to NEC 450-4 for overcurrent protection of an autotransformer.