



Buck and Boost Dry-Type Transformers

Indoor / Outdoor

Instructions for the Selection, Safe Handling, Installation and Operation of Buck and Boost Dry-Type Transformers

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. Tables I, III and V for single phase and Tables II, IV and VI for three phase transformers. Tables I and II are for 120 x 240 - 12/24 volts, tables III and IV are for 120 x 240 - 16/32 volts and tables V and VI are for 240 x 480 - 24/48 volts.
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 to the next highest rating.
4. **Now follow across the table** to the far left-hand side to find the 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 Table II, IV or VI. 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. Wye connected banks should be used with 3-phase, 4 wire supplies only.

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 Table II, IV or VI to determine "New" output voltage. The new KVA rating can be found using the second formula.

Operating and Installation Instructions for Encapsulated Dry-Type Transformers

General

The encapsulated dry-type transformer is a totally enclosed, non-ventilated, compound filled, insulating transformer which has been completely assembled at the factory and is ready for operation. These transformers are completely encased in a sturdy steel housing. A large wiring compartment with conduit knockouts permits fast wiring connections. This wiring compartment is accessible by a removable cover.

Inspection

The transformer should be unpacked as soon as it is received and examined for possible damage during shipment. Should damage be found, a claim should be filed immediately with the transportation company.

Handling

Care should be exercised in handling dry-type transformers. Lifting eyes or similar lifting means are provided on most sizes.

Installation

These encapsulated dry-type transformers are UL listed for indoor/outdoor applications. They may be installed on walls, beams, platforms, or other locations. They are ideal for applications in dusty industrial areas. Dry-type transformers must be protected by lightning arresters or other suitable equipment from outside lines which may cause lightning and switching surges to be transmitted to the transformer. The enclosure should be grounded to a water pipe or similar type of effective common ground. Transformers should not be loaded beyond their nameplate rating since overloads will result in a reduced life expectancy.

Connections

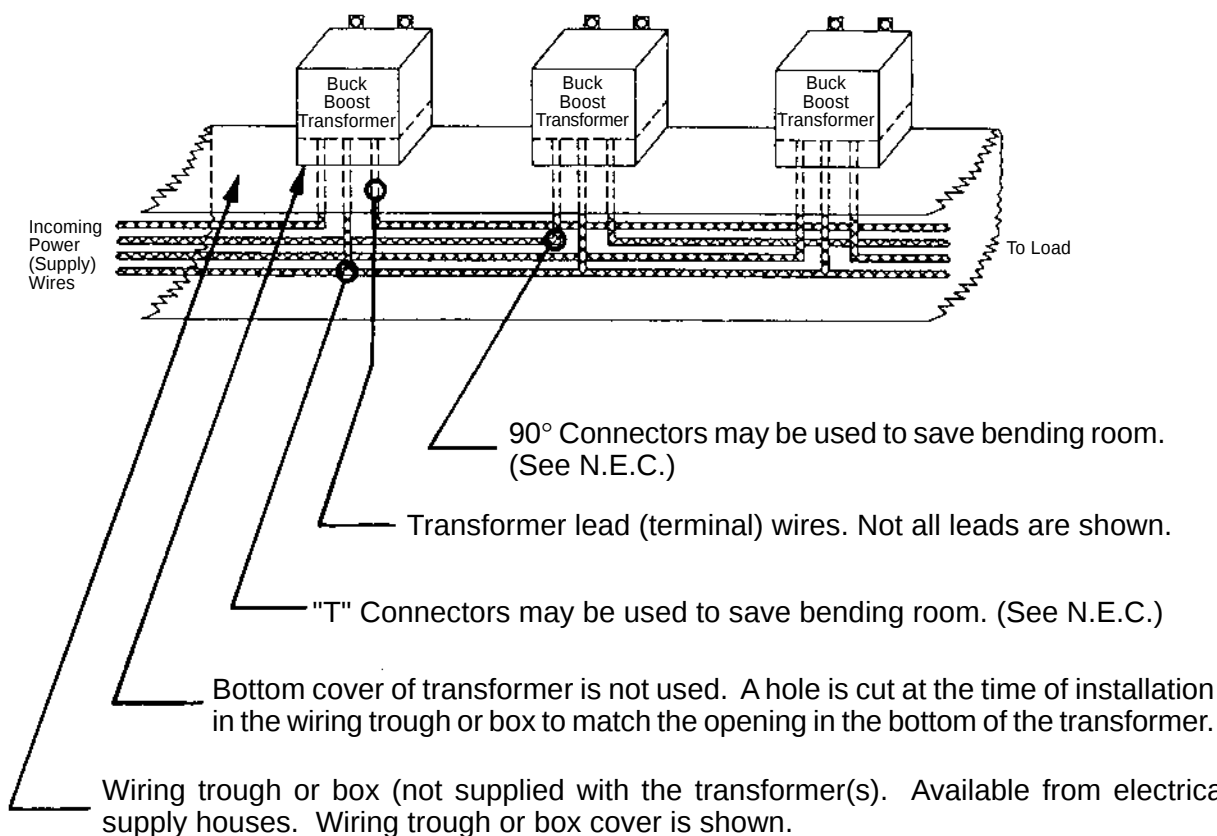
Refer to the nameplate for voltage combinations, frequency, number of phases, and tap connections. All leads not being used must be properly insulated.

Maintenance

Practically no maintenance is required on a dry-type transformer. Encapsulated types only require wiping off dust or dirt from the outside of the case.

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.



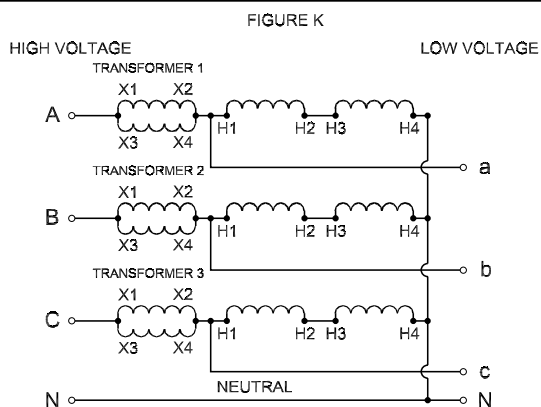
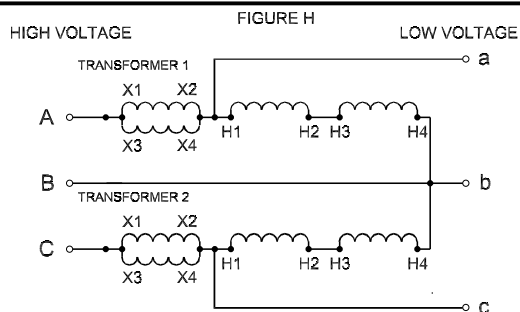
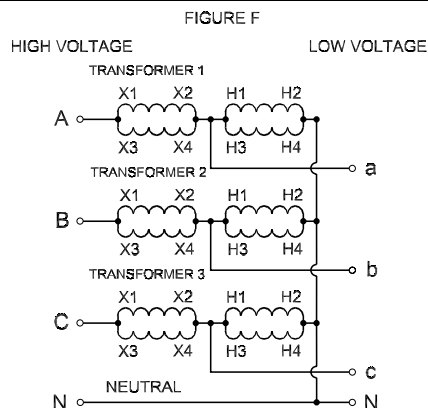
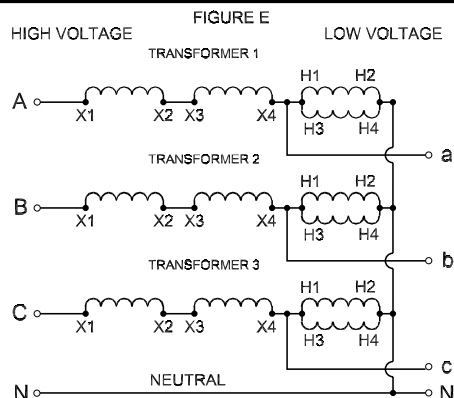
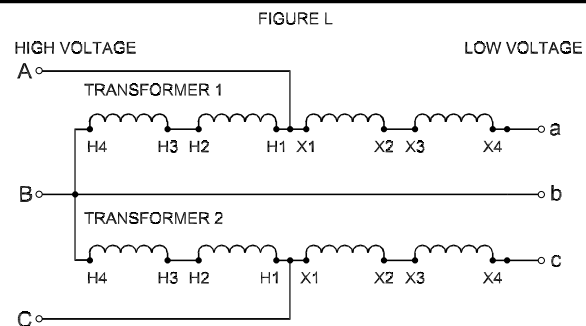
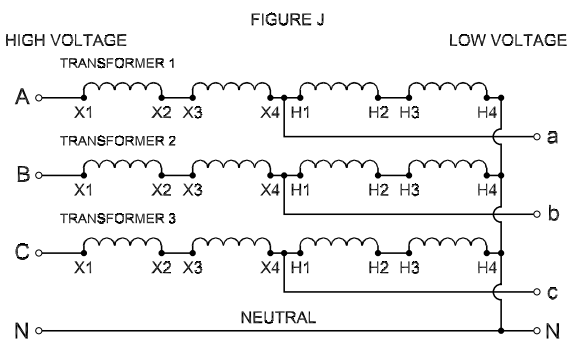
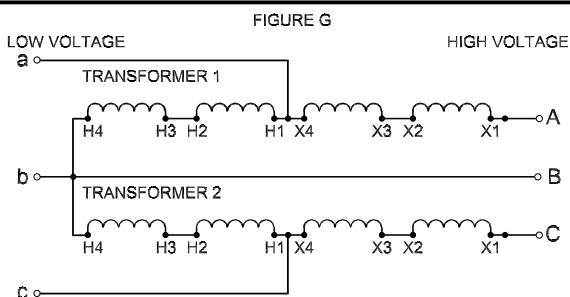
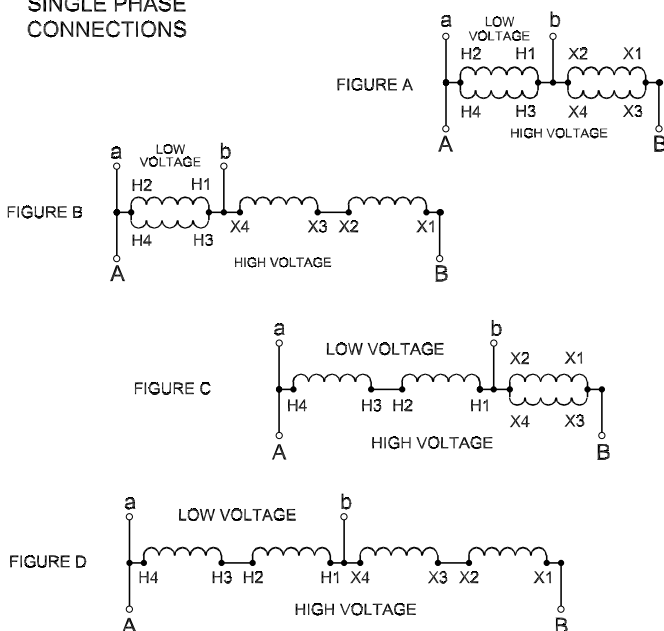
Buck-Boost Connection Diagram

Use the following information for single-phase autotransformer connections.

NOTE: Inputs and outputs may be reversed; KVA capacity remains constant. All applications are suitable for 60 Hz. only.

IMPORTANT: Refer to the N.E.C. (National Electrical Code) Article 450-4 for overcurrent protection of an autotransformer.

SINGLE PHASE CONNECTIONS



WARNING : FIGURES E, F, J & K CAN ONLY BE USED WHEN THE SOURCE IS A FOUR WIRE SUPPLY SYSTEM.

120 x 240 Volts Primary - 12/24 Volts Secondary

Table I — SINGLE PHASE

Line Voltage Load Voltage		BOOSTING								BUCKING					
		96	100	105	109	189	208	218	220	125	132	229	245	250	252
0.05 KVA	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
	FUSE**	4*	4*	6	6	3	3	3	3	6	6	3	3	3	6
0.075 KVA	KVA	0.36	0.38	0.72	0.75	0.65	0.72	0.75	0.76	0.78	0.83	0.72	0.77	0.78	1.58
	AMPS	3.13	3.12	6.25	6.25	3.12	3.13	3.13	3.13	6.87	6.88	3.44	3.44	3.44	6.56
	FUSE**	6	6	10	10	5*	5*	5*	5*	10	10	5*	5*	5*	10
0.1 KVA	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
	FUSE**	8*	8*	15	15	6	6	6	6	12*	12*	6	6	6	12*
0.15 KVA	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
	FUSE**	10	10	20	20	10	10	10	10	20	20	10	10	10	20
0.25 KVA	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
	FUSE**	20	20	30	30	15	15	15	15	30	30	15	15	15	30
0.5 KVA	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
	FUSE**	35	35	60	60	30	30	30	30	60	60	30	30	30	60
0.75 KVA	KVA	3.60	3.75	7.22	7.49	6.50	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
	FUSE**	50	50	90	90	45	45	45	45	80	80	40	40	40	80
1 KVA	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	8.33	41.67	41.67	41.67	41.67	91.67	91.67	45.83	45.83	45.83	87.50
	FUSE**	70	70	125	125	60	60	60	60	110	110	60	60	60	110
1.5 KVA	KVA	7.20	7.50	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
	FUSE**	100	100	175	175	90	90	90	90	175	175	80	80	80	175
2 KVA	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
	FUSE**	125	125	250	250	125	125	125	125	225	225	110	110	110	225
3 KVA	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
	FUSE**	200	200	350	350	175	175	175	175	350	350	175	175	175	350
5 KVA	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
	FUSE**	350	350	600	600	300	300	300	300	600	600	300	300	300	600
DIAGRAM		B	B	A	A	D	D	D	D	A	A	D	D	D	C

*Non NEC standard fuse size (NEC 240-6), check with local authorities for use of next larger standard size.

**Maximum fuse or circuit breaker size per NEC 450-4.

Table II — THREE PHASE

Line Voltage Load Voltage		BOOSTING								BUCKING					
		189Y/109	195Y/113	200Y/115	208Y/120	416Y/240	416Y/240	189	208	220	218	229	250	255	264
0.05 KVA	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
	FUSE**	6	4*	4*	6	3	6	3	3	6.00	6	3	3	3	3
0.075 KVA	KVA	2.25	1.27	1.30	2.48	2.48	4.73	1.13	1.24	1.31	2.36	1.24	1.35	1.38	1.43
	AMPS	6.25	3.12	3.12	6.25	3.13	6.25	3.12	3.13	3.13	6.56	3.44	3.44	3.44	3.44
	FUSE**	10	6	6	10	5*	10	5*	5*	5*	10	5*	5*	5*	5*
0.1 KVA	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
	FUSE**	15	8*	8*	15	6	12*	6	6	6	12*	6	6	6	6
0.15 KVA	KVA	4.50	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
	FUSE**	20	10	10	20	10	20	10	10	10	20	10	10	10	10
0.25 KVA	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
	FUSE**	30	20	20	30	15	30	15	15	15	30	15	15	15	15
0.5 KVA	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
	FUSE**	60	35	35	60	30	60	30	30	30	60	30	30	30	30
0.75 KVA	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
	AMPS	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
	FUSE**	90	50	50	90	45	90	45	45	45	80	40	40	40	40
1 KVA	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
	FUSE**	125	70	70	125	60	110	60	60	60	110	60	60	60	60
1.5 KVA	KVA	45.01	25.33	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
	FUSE**	175	100	100	175	90	175	90	90	90	175	80	80	80	80
2 KVA	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
	FUSE**	250	125	125	250	125	225	125	125	125	225	110	110	110	110
3 KVA	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
	FUSE**	350	200	200	350	175	350	175	175	175	350	175	175	175	175
5 KVA	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
	FUSE**	600	350	350	600	300	600	300	300	300	600	300	300	300	300
Number 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

*Non NEC standard fuse size (NEC 240-6), check with local authorities for use of next larger standard size.

**Maximum fuse or circuit breaker size per NEC 450-4.

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

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

120 x 240 Volts Primary - 16/32 Volts Secondary

Table III — SINGLE PHASE

Line Voltage Load Voltage		BOOSTING								BUCKING					
		95	100	105	208	215	220	225	135	240	240	245	250	255	
		120	113	119	236	244	229	235	240	120	212	225	230	234	239
0.05 KVA	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
	FUSE**	3	5*	5*	2.5*	2.5*	5*	5*	5*	5*	2.5*	5*	5*	5*	5*
0.075 KVA	KVA	0.28	0.53	0.56	0.55	0.57	1.07	1.10	1.12	0.63	0.56	1.12	1.15	1.17	1.20
	AMPS	2.34	4.69	4.69	2.34	2.34	4.69	4.69	4.69	5.31	2.66	5.00	5.00	5.00	5.00
	FUSE**	4*	8*	8*	4*	4*	8*	8*	8*	6	3	6	6	6	6
0.1 KVA	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
	FUSE**	6	10	10	5*	5*	10	10	10	10	5*	10	10	10	10
0.15 KVA	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
	FUSE**	8*	15	15	8*	8*	15	15	15	15	6	15	15	15	15
0.25 KVA	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
	FUSE**	15	25	25	12*	12*	25	25	25	20	10	20	20	20	20
0.5 KVA	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
	FUSE**	25	45	45	25	25	45	45	45	40	20	40	40	40	40
0.75 KVA	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
	FUSE**	40	70	70	35	35	70	70	70	60	30	60	60	60	60
1 KVA	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
	FUSE**	50	90	90	45	45	90	90	90	80	40	80	80	80	80
1.5 KVA	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
	FUSE**	80	150	150	70	70	125	125	125	100	50	100	100	100	100
2 KVA	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
	FUSE**	100	200	200	90	90	175	175	175	150	75	150	150	150	150
3 KVA	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
	FUSE**	150	300	300	150	150	250	250	250	200	100	200	200	200	200
5 KVA	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	312.5	312.50	156.25	156.25	312.50	312.50	312.50	354.17	177.08	333.33	333.33	333.33	333.33
	FUSE**	250	450	450	225	225	450	450	450	400	200	400	400	400	400
DIAGRAM		B	A	A	D	D	C	C	C	A	D	C	C	C	C

*Non NEC standard fuse size (NEC 240-6), check with local authorities for use of next larger standard size.

**Maximum fuse or circuit breaker size per NEC 450-4.

Table IV — THREE PHASE

Line Voltage Load Voltage		BOOSTING						BUCKING					
		183V/106	208V/120	195	208	225	240	240	245	250	256	265	272
		208V/120	236V/136	208	236	240	208	230	234	240	240	234	240
0.05 KVA	KVA	1.12	1.28	1.13	0.64	1.30	0.65	1.33	1.35	1.39	1.39	0.72	0.74
	AMPS	3.13	3.13	3.12	1.56	3.12	1.80	3.33	3.33	3.33	3.33	1.77	1.77
	FUSE**	5*	5*	5*	2.5*	5*	2.5*	5*	5*	5*	5*	2.5*	2.5*
0.075 KVA	KVA	1.68	1.91	1.69	0.96	1.95	0.97	1.99	2.03	2.08	2.08	1.08	1.10
	AMPS	4.69	4.69	4.69	2.34	4.69	2.70	5.00	5.00	5.00	5.00	2.66	2.66
	FUSE**	8*	8*	8*	4*	8*	3	6	6	6	6	3	3
0.1 KVA	KVA	2.25	2.55	2.25	1.28	2.60	1.30	2.65	2.71	2.77	2.77	1.43	1.47
	AMPS	6.25	6.25	6.25	3.13	6.25	3.61	6.67	6.67	6.67	6.67	3.54	3.54
	FUSE**	10	10	10	5*	10	5*	10	10	10	10	5*	5*
0.15 KVA	KVA	3.37	3.83	3.38	1.91	3.90	1.95	3.98	4.06	4.16	4.16	2.15	2.21
	AMPS	9.38	9.38	9.37	4.69	9.37	5.41	10.00	10.00	10.00	10.00	5.31	5.31
	FUSE**	15	15	15	8*	15	6	15	15	15	15	6	6
0.25 KVA	KVA	5.61	6.38	5.63	3.19	6.50	3.25	6.63	6.77	6.93	6.93	3.59	3.68
	AMPS	15.63	15.62	15.62	7.81	15.62	9.01	16.67	16.67	16.67	16.67	8.85	8.85
	FUSE**	25	25	25	12*	25	10	20	20	20	20	10	10
0.5 KVA	KVA	11.23	12.76	11.26	6.38	12.99	6.50	13.26	13.53	13.86	13.86	7.17	7.36
	AMPS	31.25	31.25	31.25	15.63	31.25	18.03	33.33	33.33	33.33	33.33	17.71	17.71
	FUSE**	45	45	45	25	45	20	40	40	40	40	20	20
0.75 KVA	KVA	16.84	19.14	16.89	9.58	19.49	9.74	19.89	20.30	20.78	20.78	10.76	11.04
	AMPS	46.88	46.88	46.87	23.44	46.87	27.04	50.00	50.00	50.00	50.00	26.56	26.56
	FUSE**	70	70	70	35	70	30	60	60	60	60	30	30
1 KVA	KVA	22.45	25.52	22.52	12.76	25.98	12.99	26.52	27.06	27.71	27.71	14.34	14.72
	AMPS	62.50	62.50	62.50	31.25	62.50	36.06	66.67	66.67	66.67	66.67	35.42	35.42
	FUSE**	90	90	90	45	90	40	80	80	80	80	40	40
1.5 KVA	KVA	33.68	38.28	33.77	19.14	38.97	19.49	39.78	40.59	41.57	41.57	21.52	22.08
	AMPS	93.75	93.75	93.75	46.88	93.75	54.09	100.00	100.00	100.00	100.00	53.13	53.13
	FUSE**	150	150	125	70	125	60	125	125	125	125	60	60
2 KVA	KVA	44.90	51.04	45.03	25.52	51.96	25.98	53.04	54.13	55.43	55.43	28.69	29.44
	AMPS	125.00	125.00	125.00	62.50	125.00	72.12	133.33	133.33	133.33	133.33	70.83	70.83
	FUSE**	200	200	175	90	175	80	175	175	175	175	80	80
3 KVA	KVA	67.36	76.56	67.55	38.28	77.94	38.97	79.57	81.19	83.14	83.14	43.03	44.17
	AMPS	187.50	187.50	187.50	93.75	187.50	108.17	200.00	200.00	200.00	200.00	106.25	106.25
	FUSE**	300	300	250	150	250	125	250	250	250	250	125	125
5 KVA	KVA	112.26	127.59	112.58	63.80	129.90	64.95	132.61	135.32	138.56	138.56	71.72	73.61
	AMPS	312.50	312.50	312.50	156.25	312.50	180.29	333.33	333.33	333.33	333.33	177.08	177.08
	FUSE**	450	450	450	225	450	200	400	400	400	400	200	200
Number of Transformers		3	3	2	2	2	2	2	2	2	2	2	2
DIAGRAM		F	F	H	G	H	L	H	H	H	H	G	G

*Non NEC standard fuse size (NEC 240-6), check with local authorities for use of next larger standard size.

**Maximum fuse or circuit breaker size per NEC 450-4.

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

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

240 x 480 Volts Primary - 24/48 Volts Secondary

Table V — SINGLE PHASE

Line Voltage Load Voltage		BOOSTING									BUCKING				
		230	380	416	425	430	435	440	450	460	132	277	480	480	504
0.05 KVA	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
	FUSE**	2"	1.5"	1.5"	1.5"	1.5"	3	3	1.5"	3	3	1.5"	1.5"	3	3
0.075 KVA	KVA	0.43	0.65	0.72	0.73	0.74	1.43	1.44	0.77	1.51	0.41	0.43	0.75	1.50	1.58
	AMPS	1.56	1.56	1.56	1.56	1.56	3.13	3.13	1.56	3.13	3.28	1.88	1.72	3.28	3.28
	FUSE**	3	2.5"	2.5"	2.5"	2.5"	5"	5"	2.5"	5"	5"	2.5"	2.5"	5"	5"
0.1 KVA	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
	FUSE**	4"	3	3	3	3	6	6	3	6	6	3	3	6	6
0.15 KVA	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
	FUSE**	6	5"	5"	5"	5"	10	10	5"	10	10	5"	5"	10	10
0.25 KVA	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
	FUSE**	10	8"	8"	8"	8"	15	15	8"	15	15	8"	8"	15	15
0.5 KVA	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
	FUSE**	20	15	15	15	15	30	30	15	30	30	15	15	30	30
0.75 KVA	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
	FUSE**	25	25	25	25	25	45	45	25	45	40	20	20	40	40
1 KVA	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
	FUSE**	35	30	30	30	30	60	60	30	60	60	30	30	60	60
1.5 KVA	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
	FUSE**	50	45	45	45	45	90	90	45	90	80	40	40	80	80
2 KVA	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
	FUSE**	70	60	60	60	60	110	110	60	110	110	60	60	110	110
3 KVA	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
	FUSE**	100	90	90	90	90	175	175	90	175	175	80	80	175	175
5 KVA	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
	FUSE**	175	150	150	150	150	300	300	150	300	300	150	150	300	300
DIAGRAM		B	D	D	D	D	C	C	D	C	C	B	D	C	C

*Non NEC standard fuse size (NEC 240-6), check with local authorities for use of next larger standard size.

**Maximum fuse or circuit breaker size per NEC 450-4.

Table VI — THREE PHASE

Line Voltage Load Voltage		BOOSTING								BUCKING							
		399Y/230	380	430	440	460	460	480	480	440	440	460	460	480	480	500	500
0.05 KVA	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	2.19	2.19
	FUSE**	2"	1.5*	1.5*	3	1.5*	3	1.5*	3	1.5*	3	3	1.5*	3	1.5*	3	3
0.075 KVA	KVA	1.30	1.13	1.28	2.50	1.37	2.61	1.43	2.73	1.19	2.38	2.49	1.24	2.60	1.30	1.35	2.71
	AMPS	1.56	1.56	1.56	3.13	1.56	3.13	1.56	3.13	1.72	3.28	3.28	1.72	3.28	1.72	1.72	3.28
	FUSE**	3	2.5*	2.5*	5*	2.5*	5*	2.5*	5*	2.5*	5*	5*	2.5*	5*	2.5*	2.5*	5*
0.1 KVA	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
	FUSE**	4*	3	3	6	3	6	3	6	3	6	6	3	6	3	3	6
0.15 KVA	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
	FUSE**	6	5*	5*	10	5*	10	5*	10	5*	10	10	5*	10	5*	5*	10
0.25 KVA	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
	FUSE**	10	8*	8*	15	8*	15	8*	15	8*	15	15	8*	15	8*	8*	15
0.5 KVA	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
	FUSE**	20	15	15	30	15	30	15	30	15	30	30	15	30	15	15	30
0.75 KVA	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
	AMPS	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
	FUSE**	25	25	25	45	25	45	25	45	20	40	40	20	40	20	20	40
1 KVA	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
	FUSE**	35	30	30	60	30	60	30	60	30	60	60	30	60	30	30	60
1.5 KVA	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
	FUSE**	50	45	45	90	45	90	45	90	40	80	80	40	80	40	40	80
2 KVA	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
	FUSE**	70	60	60	110	60	110	60	110	60	110	110	60	110	60	60	110
3 KVA	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
	FUSE**	100	90	90	175	90	175	90	175	80	175	175	80	175	80	80	175
5 KVA	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
	FUSE**	175	150	150	300	150	300	150	300	150	300	300	150	300	150	150	300
Number 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

*Non NEC standard fuse size (NEC 240-6), check with local