Buck-Boost Single-Phase Transformers

Encapsulated models from 0.05 to 10.0 kVA

Electrical/electronic equipment operates on standard supply voltage. Proper voltage is critical for a variety of applications, including AC motor loads, resistive heating loads, incandescent lighting or low voltage lighting. But when the supply voltage is constantly 5-20% too low ("brownout" conditions) or too high, equipment fails to operate at maximum efficiency. This can cause potentially serious problems.

Acme Electric Buck-boost transformers (autotransformers) provide a simple and economical means of correcting off-standard voltages. They offer tremendous capabilities and flexibility in kVA sizes and input/output voltage combinations. You essentially get 75 different transformers in one convenient package.

Any time a line voltage change in the 5-20% range is required, a buck-boost transformer should be considered as your first line of defense.

Where are buck-boost transformers used?

A typical buck-boost application is 120V in, 12V out for low voltage lighting or control circuitry. In most applications, this low voltage transformer is field connected as an autotransformer. Buck-boost transformers provide tremendous capabilities and flexibility in kVA sizes and input/output voltage combinations. Basically, you get 75 different transformers, all in one convenient package.

Other buck-boost applications include the following:

- Where low supply voltage exists because equipment is installed at the end of a bus system
- Where the supply system is operating at or over its design capacity
- Where overall consumer demands may be so high that the utility cuts back the supply voltage to the consumer, causing a "brownout."

Why use buck-boost instead of another type transformer ?

Take a look at this chart to see the advantages and disadvantages of using a buck-boost transformer (autotransformer) compared to a standard isolation transformer of the proper size and voltage combination.

Advantages and Disadvantages of Buck-Boost Transformers

Advantages	*Disadvantages*
• More efficient • Smaller and lighter • 5 to 10 times increase in kVA • Versatile and suitable for many applications • Lower cost compared to other approaches	• No circuit isolation • Cannot create a neutral • Application voltages and kVA don't match the nameplate voltages and kVA

Proper voltage is critical

With nearly two-thirds of all electrical loads being AC motor loads, maintenance of the proper voltage to that motor is very important. If the supply line voltage is not maintained, motor winding current is increased causing reduced motor torque and rising motor temperature, all of which results in the rapid loss of insulation life expectancy.

In addition to motor loads, the detrimental effects of low voltage on both resistive heating loads and incandescent lighting output are also illustrated in the chart.

When you have a lower than standard voltage, equipment damage and failure can result. Buck-boost transformers are an economical way to correct this potentially very serious problem.



T181050



T181058



T181065

Features

- UL and cUL listed and UL-3R enclosures meet or exceed all listing criteria including NEMA, ANSI and OSHA standards.
- Reduce (buck) or raise (boost) line voltage from 5–20%.
- Offer great flexibility – can be used in single-phase and three-phase configurations.
- All copper lead wire terminations.
- Long life, 80°C rise up to 0.15 kVA, and 115°C rise above 0.25 kVA.

Agency Approvals

cULus. (UL file no. E79947) Standard UL 506, listed in UL file as Style SR and ER for Units 150 VA and below.

CE. Rohs Directive 2011/65/EU and 2015/863/EU)

Buck-Boost Single-Phase Transformers

Selecting a Buck-Boost Transformer

You should have the following information before selecting a buck-boost transformer.

Line Voltage
The voltage that you want to buck (decrease) or boost (increase). This voltage can be determined by measuring the supply line voltage with a voltmeter.

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

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

Frequency
The supply line frequency must be the same as the frequency of the equipment to be operated – either 50 or 60 Hz.

Phase
The supply line should be the same as the equipment to be operated – either single- or three-phase.

Using the Selection Charts – A Four-Step Process

Here's how to use the transformer selection charts on the following pages:

1. A series of LINE VOLTAGE and LOAD VOLTAGE combinations are listed across the top of each selection chart. Select a LINE VOLTAGE and LOAD VOLTAGE combination from ANY of the charts that comes closest to matching the LINE VOLTAGE and LOAD VOLTAGE of your application.
2. Read down the column you have selected until you reach either the LOAD kVA or LOAD AMPS of the equipment you want to operate. You probably will not find the exact value of LOAD kVA or LOAD AMPS, so go to the next higher rating.
3. From this point, read across the column to the far left-hand side, and you have found the catalog number of the exact buck-boost transformer you need. Refer to the PDF links for dimensional drawings.
4. CONNECT the transformer according to the connection diagram specified at the bottom of the column where you selected your LINE VOLTAGE and LOAD VOLTAGE combination. This same connection information is packed with each buck-boost transformer.
5. Note: Three-phase applications require multiple separate single-phase buck boost transformers to be wired and mounted together. See single-phase transformer quantities required at the bottom of the three-phase application selection charts.

Full Load Current in Amps Single-Phase Circuits

kVA	120V	208V	240V	277V	380V	440V	480V	600V
0.05	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1
0.1	0.8	0.5	0.4	0.3	0.2	0.2	0.2	0.2
0.15	1.2	0.7	0.6	0.5	0.4	0.3	0.3	0.3
0.25	2	1.2	1	0.9	0.6	0.5	0.5	0.4
0.5	4.2	2.4	2.1	1.8	1.3	1.1	1	0.8
0.75	6.3	3.6	3.1	2.7	2	1.7	1.6	1.3
1	8.3	4.8	4.2	3.6	2.6	2.3	2.1	1.7
1.5	12.5	7.2	6.2	5.4	3.9	3.4	3.1	2.5
2	16.7	9.6	8.3	7.2	5.2	4.5	4.2	3.3
3	25	14.4	12.5	10.8	7.9	6.8	6.2	5
5	41	24	20.8	18	13.1	11.3	10.4	8.3
7.5	62	36	31	27	19.7	17	15.6	12.5
10	83	48	41	36	26	22.7	20.8	16.7
15	125	72	62	54	39	34	31	25
25	208	120	104	90	65	57	52	41
37.5	312	180	156	135	98	85	78	62
50	416	240	208	180	131	114	104	83
75	625	360	312	270	197	170	156	125
100	833	480	416	361	263	227	208	166
167	1391	802	695	602	439	379	347	278
250	2083	1203	1041	902	657	568	520	416

Full Load Amps Single-Phase AC Motors[1]

Horsepower	115V	208V	230V	Minimum Transformer KVA
1/6	4.4	2.4	2.2	0.53
1/4	5.8	3.2	2.9	0.7
1/3	7.2	4	3.6	0.87
1/2	9.8	5.4	4.9	1.18
3/4	13.8	7.6	6.9	1.66
1	16	8.8	8	1.92
1.5	20	11	10	2.4
2	24	13.2	12	2.88
3	34	18.7	17	4.1
5	56	30.8	28	6.72
7.5	80	44	40	9.6
10	100	55	50	12

1. When motor service factor is greater than 1, increase full load amps proportionally.

Example: If service factor is 1.15, increase above amp values by 15%.

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

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

For the latest prices, please check AutomationDirect.com.

Buck-Boost Single-Phase Transformers

Selection Chart

Single-Phase Application	Boosting								Bucking					
Line Voltage (Available)	95	100	105	110	189	208	215	220	125	132	230	245	250	252
Load Voltage (Output)	114	120	115	120	208	230	237	242	113	120	208	222	227	240

Buck-Boost Transformer Selection Chart

Part Number																	Drawing
T181050	Load	kVA	1.19	1.25	2.4	2.5	2.16	2.39	2.46	2.52	2.6	2.75	2.37	2.5	2.6	5.1	PDF
		Amps	10.42	10.4	20.8	20.8	10.4	10.4	10.4	10.4	22.8	22.8	11.4	11.4	11.4	21.8	
		Maximum Size of Fuse or Breaker	25	25	40	30	15	15	15	15	30	30	15	15	15	30	
T181051	Load	kVA	2.37	2.5	4.8	5	4.33	4.79	4.93	5.04	5.2	5.4	4.47	5	5.2	10.2	PDF
		Amps	20.83	20.83	41.67	41.67	20.83	20.83	20.83	20.83	46.8	46.8	22.8	22.8	22.8	43.7	
		Maximum Size of Fuse or Breaker	35	35	60	60	30	30	30	30	60	60	30	30	30	60	
T181052	Load	kVA	3.56	3.75	7.17	7.56	6.5	7.19	7.41	7.56	7.8	8.15	7.1	7.5	7.8	15.3	PDF
		Amps	31.25	31.25	62.5	62.5	31.25	31.25	31.25	31.25	68.5	69.5	34.4	34.4	34.4	65.5	
		Maximum Size of Fuse or Breaker	50	50	90	90	45	45	45	45	80	80	40	40	40	80	
T111683	Load	kVA	4.75	5	9.58	10	8.66	9.58	9.87	10	10.4	10.8	9.5	10	10	20.4	PDF
		Amps	41.67	41.67	83.31	83.31	41.67	41.67	41.67	41.67	91.5	91.5	45.8	45.8	45.8	87.5	
		Maximum Size of Fuse or Breaker	70	70	125	125	60	60	60	60	110	110	60	60	50	110	
T111684	Load	kVA	7.12	7.5	14.4	15.1	13	14.3	14.8	15.1	15	16.2	14.24	15	15.6	30.6	PDF
		Amps	62.5	62.5	125	125	62.5	62.5	62.5	62.5	138	138	68.6	68.6	68.6	132	
		Maximum Size of Fuse or Breaker	100	100	175	175	90	90	90	90	150	175	80	80	80	175	
T111685	Load	kVA	9.5	10	19.2	20.2	17.3	19.16	19.7	20.1	20.8	21.6	19	20	20.3	40.8	PDF
		Amps	83.3	83.3	166.6	166.6	83.3	83.3	83.3	83.3	183	183	91.6	91.6	91.2	175	
		Maximum Size of Fuse or Breaker	125	125	250	250	125	125	125	125	225	225	110	110	110	225	
T111686	Load	kVA	14.2	15	28.8	30	26	28.7	29.6	30.3	31.2	32.5	28.5	30	31.2	61	PDF
		Amps	125	125	250	250	125	125	125	125	275	275	136.8	136.8	136.8	263	
		Maximum Size of Fuse or Breaker	200	200	350	350	175	175	175	175	350	350	175	175	175	350	
T111687	Load	kVA	23.7	25	47.9	50	43.3	47.8	49.3	50.3	52	54	47.4	50	52	102	PDF
		Amps	208	208	416.6	416.6	208	208	208	208	457	457	228	228	228	437	
		Maximum Size of Fuse or Breaker	350	350	600	600	300	300	300	300	600	600	300	300	300	600	
CONNECTION DIAGRAM			D	D	C	C	H	H	H	H	F	F	I	I	I	E	

NOTES: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above the bold line are suitable for 50/60 Hz. All applications below the bold line are suitable for 60 Hz only. With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals.

Selection Chart continued on next page...

For the latest prices, please check AutomationDirect.com.

Buck-Boost Single-Phase Transformers

Selection Chart (continued)

Single-Phase Application	Boosting								Bucking					
Line Voltage (Available)	95	100	105	208	215	215	220	225	135	240	240	245	250	255
Load Voltage (Output)	120	114	119	240	244	230	235	240	119	208	225	230	234	239

Buck-Boost Transformer Selection Chart

Part Number																	Drawing
T181057	Load	kVA	0.94	1.78	1.86	1.88	1.91	3.59	3.67	3.75	2.11	1.84	3.75	3.83	3.9	3.98	PDF
		Amps	7.81	15.63	15.63	7.81	7.81	15.63	15.63	15.63	17.71	8.85	16.67	16.67	16.67	16.67	
		Maximum Size of Fuse or Breaker	15	25	25	15	15	25	25	25	20	15	20	20	20	20	
T181058	Load	kVA	1.88	3.56	3.72	3.75	3.81	7.19	7.34	7.5	4.21	3.68	7.5	7.67	7.8	7.97	PDF
		Amps	15.63	31.25	31.25	15.63	15.63	31.25	31.25	31.25	35.42	17.71	33.33	33.33	33.33	33.33	
		Maximum Size of Fuse or Breaker	25	45	45	25	25	45	45	45	40	20	40	40	40	40	
T181059	Load	kVA	2.81	5.34	5.58	5.63	5.72	10.78	11.02	11.25	6.32	5.53	11.25	11.5	11.7	11.95	PDF
		Amps	23.44	46.88	46.88	23.44	23.44	46.88	46.88	46.88	53.13	26.56	50	50	50	50	
		Maximum Size of Fuse or Breaker	40	70	70	40	40	70	70	70	60	30	60	60	60	60	
T113073	Load	kVA	3.75	7.13	7.44	7.5	7.63	14.38	14.69	15	8.43	7.37	15	15.33	15.6	15.93	PDF
		Amps	31.25	62.5	62.5	31.25	31.25	62.5	62.5	62.5	70.83	35.42	66.67	66.67	66.67	66.67	
		Maximum Size of Fuse or Breaker	50	90	90	50	50	90	90	90	80	40	80	80	80	80	
T113074	Load	kVA	5.63	10.69	11.16	11.25	11.44	21.56	22.03	22.5	12.64	11.05	22.5	23	23.4	23.9	PDF
		Amps	46.9	93.8	93.8	46.9	46.9	93.8	93.8	93.8	106.3	53.1	100	100	100	100	
		Maximum Size of Fuse or Breaker	80	150	150	70	70	125	125	125	125	60	125	125	125	125	
T113075	Load	kVA	7.5	14.25	14.88	15	15.25	28.75	29.38	30	16.86	14.73	30	30.67	31.2	31.87	PDF
		Amps	62.5	125	125	62.5	62.5	125	125	125	141.7	70.8	133.3	133.3	133.3	133.3	
		Maximum Size of Fuse or Breaker	100	200	200	90	90	175	175	175	175	80	175	175	175	175	
T113076	Load	kVA	11.25	21.38	22.31	22.5	22.88	43.13	44.06	45	25.29	22.1	45	46	46.8	47.8	PDF
		Amps	93.8	187.5	187.5	93.8	93.8	187.5	187.5	187.5	212.5	106.3	200	200	200	200	
		Maximum Size of Fuse or Breaker	150	300	300	150	150	250	250	250	250	125	250	250	250	250	
T113077	Load	kVA	18.75	35.63	37.19	37.5	38.13	71.88	73.44	75	42.15	36.83	75	76.67	78	79.67	PDF
		Amps	156.3	312.5	312.5	156.3	156.3	312.5	312.5	312.5	354.2	177.1	333.3	333.3	333.3	333.3	
		Maximum Size of Fuse or Breaker	250	450	450	225	225	450	450	450	400	200	400	400	400	400	
CONNECTION DIAGRAM			D	C	C	H	H	G	G	G	F	I	E	E	E	E	

NOTES: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above the bold line are suitable for 50/60 Hz. All applications below the bold line are suitable for 60 Hz only. With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals.

Selection Chart continued on next page...

Buck-Boost Single-Phase Transformers

Selection Chart (continued)

Single-Phase Application	Boosting										Bucking			
Line Voltage (Available)	230	380	416	425	430	435	440	440	450	460	277	480	480	504
Load Voltage (Output)	277	420	457	467	473	457	462	484	472	483	230	436	456	480

Buck-Boost Transformer Selection Chart

Part Number																Drawing
T181064	Load	kVA	1.44	2.19	2.38	2.43	2.46	4.76	4.81	2.52	4.92	5.03	1.44	2.5	5.23	5.5	PDF
		Amps	5.21	5.21	5.21	5.21	5.21	5.21	10.42	5.21	10.42	10.42	6.25	5.73	11.46	11.46	
		Maximum Size of Fuse or Breaker	15	10	10	10	10	15	15	10	15	15	10	10	15	15	
T181065	Load	kVA	2.89	4.38	4.76	4.86	4.93	9.52	9.62	5.04	9.83	10.06	2.88	5	10.45	11	PDF
		Amps	10.42	10.42	10.42	10.42	10.42	20.83	20.83	10.42	20.83	20.83	12.5	11.46	22.92	22.92	
		Maximum Size of Fuse or Breaker	20	15	15	15	15	30	30	15	30	30	15	15	30	30	
T181066	Load	kVA	4.33	6.56	7.14	7.3	7.39	14.28	14.44	7.56	14.75	15.09	4.31	7.49	15.68	16.5	PDF
		Amps	15.63	15.63	15.63	15.63	15.63	31.25	31.25	15.63	31.25	31.25	18.75	17.19	34.38	34.38	
		Maximum Size of Fuse or Breaker	25	25	25	25	25	45	45	25	45	45	20	20	45	45	
T137920	Load	kVA	5.77	8.57	9.52	9.73	9.85	19.04	19.25	10.08	19.67	20.13	5.75	9.99	20.9	22	PDF
		Amps	20.83	20.83	20.83	20.83	20.83	41.67	41.67	20.83	41.67	41.67	25	22.92	45.83	45.83	
		Maximum Size of Fuse or Breaker	35	30	30	30	30	60	60	30	60	60	30	30	60	60	
T137921	Load	kVA	8.66	13.13	14.28	14.59	14.78	28.56	28.88	15.13	29.5	30.19	8.63	14.99	31.35	33	PDF
		Amps	31.25	31.25	31.25	31.25	31.25	62.5	62.5	31.25	62.5	62.5	37.5	34.38	68.75	68.75	
		Maximum Size of Fuse or Breaker	50	50	45	45	45	90	90	45	90	90	40	40	90	90	
T137922	Load	kVA	11.54	17.5	19.04	19.46	19.71	38.08	38.5	20.17	39.33	40.25	11.5	19.98	41.8	44	PDF
		Amps	41.67	41.67	41.67	41.67	41.67	83.33	83.33	41.67	83.33	83.33	50	45.83	91.67	91.67	
		Maximum Size of Fuse or Breaker	70	60	60	60	60	110	110	60	110	110	60	60	110	110	
T137923	Load	kVA	17.31	26.25	28.56	29.19	29.56	57.13	57.75	30.25	59	60.38	17.25	29.98	62.7	66	PDF
		Amps	62.5	62.5	62.5	62.5	62.5	125	125	62.5	125	125	75	68.8	137.5	137.5	
		Maximum Size of Fuse or Breaker	100	90	90	90	90	175	175	90	175	175	80	80	175	175	
T137924	Load	kVA	28.9	43.8	47.6	48.6	49.3	95.2	96.2	50.4	98.3	100.6	28.8	50	104.5	110	PDF
		Amps	104.2	104.2	104.2	104.2	104.2	208.3	208.3	104.2	208.3	208.3	125	114.6	229.2	229.2	
		Maximum Size of Fuse or Breaker	175	150	150	150	150	300	300	150	300	300	150	150	300	300	
CONNECTION DIAGRAM			**D**	**H**	**H**	**H**	**H**	**G**	**G**	**H**	**G**	**G**	**J**	**I**	**E**	**E**	

NOTES: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above the bold line are suitable for 50/60 Hz. All applications below the bold line are suitable for 60 Hz only. With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals.

Selection Chart continued on next page...

Buck-Boost Three-Phase Transformers

Selection Chart (continued)

Three-Phase Application	Boosting							Bucking				
Line Voltage (Available)	189Y 109	196Y 113	201Y 116	208Y 120	189	208	220	219	230	250	255	264
Load Voltage (Output)	208	234	240	230	208	239	242	208	208	227	232	240

Buck-Boost Transformer Selection Chart

Part Number														Drawing
T181050	Load	kVA	7.51	4.22	4.33	8.3	3.75	4.15	4.37	7.9	4.15	4.51	4.6	4.76	PDF
		Amps	20.83	10.42	10.42	20.83	10.42	10.42	10.42	21.94	11.52	11.47	11.45	11.46	
		Maximum Size of Fuse or Breaker	30	20	20	30	15	15	15	30	15	15	15	15	
T181051	Load	kVA	15.01	8.44	8.66	16.6	7.51	8.3	8.73	15.8	8.3	9.02	9.2	9.53	PDF
		Amps	41.67	20.83	20.83	41.67	20.83	20.83	20.83	43.87	23.04	22.94	22.9	22.92	
		Maximum Size of Fuse or Breaker	60	35	35	60	30	30	30	60	30	30	30	30	
T181052	Load	kVA	22.52	12.67	12.99	24.9	11.26	12.45	13.1	23.71	12.45	13.53	13.8	14.29	PDF
		Amps	62.5	31.25	31.25	62.5	31.25	31.25	31.25	65.81	34.56	34.42	34.35	34.38	
		Maximum Size of Fuse or Breaker	90	50	50	90	45	45	45	80	40	40	40	40	
T111683	Load	kVA	30.02	16.89	17.32	33.2	15.01	16.6	17.46	31.61	16.6	18.04	18.4	19.05	PDF
		Amps	83.33	41.67	41.67	83.33	41.67	41.67	41.67	87.74	46.07	45.89	45.8	45.83	
		Maximum Size of Fuse or Breaker	125	70	70	125	60	60	60	110	60	60	60	60	
T111684	Load	kVA	45.03	25.33	25.98	49.8	22.52	24.9	26.2	47.41	24.9	27.06	27.6	28.58	PDF
		Amps	125	62.5	62.5	125	62.5	62.5	62.5	131.61	69.11	68.83	68.7	68.75	
		Maximum Size of Fuse or Breaker	175	100	100	175	90	90	90	175	80	80	80	80	
T111685	Load	kVA	60.04	33.77	34.64	66.4	30.02	33.2	34.93	63.22	33.2	36.08	36.81	38.11	PDF
		Amps	166.67	83.33	83.33	167.67	83.33	83.33	83.33	175.48	92.15	91.78	91.59	91.67	
		Maximum Size of Fuse or Breaker	250	125	125	250	125	125	125	225	110	110	110	110	
T111686	Load	kVA	90.07	50.66	51.96	99.59	45.03	49.8	52.39	94.83	49.8	54.13	55.21	57.16	PDF
		Amps	250	125	125	250	125	125	125	263.22	138.22	137.67	137.39	137.5	
		Maximum Size of Fuse or Breaker	350	200	200	350	175	175	175	350	175	175	175	175	
T111687	Load	kVA	150.11	84.44	86.6	165.99	75.06	82.99	87.32	158.05	82.99	90.21	92.02	95.26	PDF
		Amps	416.67	208.33	208.33	416.67	208.33	208.33	208.33	438.7	230.37	229.44	228.99	229.17	
		Maximum Size of Fuse or Breaker	600	350	350	600	300	300	300	600	300	300	300	300	
QUANTITY REQUIRED			**3**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	
CONNECTION DIAGRAM			**AA**	**FF**	**FF**	**AA**	**BB**	**BB**	**BB**	**CC**	**EE**	**EE**	**EE**	**EE**	

NOTES: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above the bold line are suitable for 50/60 Hz. All applications below the bold line are suitable for 60 Hz only. (2) Connection Diagrams AA and FF cannot be reverse connected.

Selection Chart continued on next page...

Buck-Boost Three-Phase Transformers

Selection Chart (continued)

Three-Phase Application	Boosting					Bucking					
Line Voltage (Available)	183Y 106	208Y 120	195	208	225	240	245	250	256	265	272
Load Voltage (Output)	208	236	208	240	240	208	230	234	240	234	240

Buck-Boost Transformer Selection Chart

Part Number														Drawing
T181057	Load	kVA	5.63	6.39	5.63	3.17	6.5	2.81	6.63	6.77	6.93	3.59	3.68	PDF
		Amps	15.63	15.63	15.63	7.81	15.63	7.81	16.64	16.69	16.67	8.85	8.85	
		Maximum Size of Fuse or Breaker	25	25	25	15	25	15	20	20	20	15	15	
T181058	Load	kVA	11.26	12.77	11.26	6.33	12.99	5.63	13.26	13.53	13.86	7.17	7.36	PDF
		Amps	31.25	31.25	31.25	15.63	31.25	15.63	33.29	33.39	33.33	17.69	17.71	
		Maximum Size of Fuse or Breaker	45	45	45	25	45	20	40	40	40	20	20	
T181059	Load	kVA	16.89	19.16	16.89	9.5	19.49	8.44	19.89	20.3	20.78	10.76	11.04	PDF
		Amps	46.88	46.88	46.88	23.44	46.88	23.44	49.93	50.08	50	26.54	26.56	
		Maximum Size of Fuse or Breaker	70	70	70	35	70	30	60	60	60	30	30	
T113073	Load	kVA	22.52	25.55	22.52	12.67	25.98	11.26	26.52	27.06	27.71	14.34	14.72	PDF
		Amps	62.5	62.5	62.5	31.25	62.5	31.25	66.58	66.67	66.67	35.39	35.42	
		Maximum Size of Fuse or Breaker	90	90	90	45	90	35	80	80	80	40	40	
T113074	Load	kVA	33.77	38.32	33.77	19	38.97	16.89	39.87	40.59	41.57	21.52	22.08	PDF
		Amps	93.75	93.75	93.75	46.88	93.75	46.88	99.86	100.16	100	53.08	53.13	
		Maximum Size of Fuse or Breaker	150	150	125	70	125	60	125	125	125	60	60	
T113075	Load	Load	45.03	51.1	45.03	25.33	51.96	22.52	53.04	54.13	55.43	28.69	29.44	PDF
			125	125	125	62.5	125	62.5	133.15	133.55	133.33	70.78	70.83	
		Maximum Size of Fuse or Breaker	200	200	175	90	175	70	175	175	175	80	80	
T113076	Load	kVA	67.55	76.64	67.55	38	77.94	33.77	79.57	81.19	83.14	43.03	44.17	PDF
		Amps	187.5	187.5	187.5	93.75	187.5	93.75	199.73	200.32	200	106.17	106.25	
		Maximum Size of Fuse or Breaker	300	300	250	150	250	110	250	250	250	125	125	
T113077	Load	kVA	112.58	127.74	112.58	63.33	129.9	56.29	132.61	135.32	138.56	71.72	73.5	PDF
		Amps	312.5	312.5	312.5	156.25	312.5	156.25	332.88	333.87	333.33	176.95	176.8	
		Maximum Size of Fuse or Breaker	450	450	450	225	450	175	400	400	400	200	200	
QUANTITY REQUIRED			**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	
CONNECTION DIAGRAM			**AA**	**AA**	**GG**	**BB**	**GG**	**DD**	**CC**	**CC**	**CC**	**EE**	**EE**	

NOTES: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above the bold line are suitable for 50/60 Hz. All applications below the bold line are suitable for 60 Hz only. (2) Connection Diagrams AA and FF cannot be reverse connected.

Selection Chart continued on next page...

Buck-Boost Three-Phase Transformers

Selection Chart (continued)

Three-Phase Application	Boosting								Bucking							
Line Voltage (Available)	399Y 230	380	430	440	460	460	480	480	440	440	460	460	480	480	500	500
Load Voltage (Output)	480Y 277	420	473	462	506	483	528	504	400	419	438	418	457	436	455	477

Buck-Boost Transformer Selection Chart

Part Number																		Drawing
T181064	Load	kVA	4.33	3.78	4.26	8.32	4.56	8.7	4.76	9.08	3.96	7.92	8.28	4.14	8.64	4.32	4.51	9.02	PDF
		Amps	5.2	5.2	5.2	10.4	5.2	10.4	5.2	10.4	5.72	10.92	10.92	5.72	10.92	5.72	5.72	10.92	
		Maximum Size of Fuse or Breaker	15	10	10	15	10	15	10	15	10	15	15	10	15	10	10	15	
T181065	Load	kVA	8.6	7.56	8.52	16.64	9.11	17.4	9.51	18.16	7.93	15.85	16.57	8.28	17.29	8.64	9.02	18.04	PDF
		Amps	10.4	10.4	10.4	20.8	10.4	20.8	10.4	20.8	11.44	21.84	21.84	11.44	21.84	11.44	11.44	21.84	
		Maximum Size of Fuse or Breaker	20	15	15	30	15	30	15	30	15	30	30	15	30	15	15	30	
T181066	Load	kVA	12.9	11.34	12.77	24.97	13.67	26.1	14.27	27.24	11.89	23.77	24.85	12.42	25.93	12.96	13.52	27.07	PDF
		Amps	15.6	15.6	15.6	31.2	15.6	31.2	15.6	31.2	17.16	32.76	32.76	17.16	32.76	17.16	17.16	32.76	
		Maximum Size of Fuse or Breaker	25	25	25	45	25	45	25	45	20	40	40	20	40	20	20	40	
T137920	Load	kVA	17.3	15.12	17.03	33.29	18.23	34.8	19.02	36.31	15.85	31.7	33.14	16.57	34.57	17.28	18.03	36.09	PDF
		Amps	20.8	20.8	20.8	41.6	20.8	41.6	20.8	41.6	22.88	43.68	43.68	22.88	43.68	22.88	22.88	43.68	
		Maximum Size of Fuse or Breaker	35	30	30	60	30	60	30	60	30	60	60	30	60	30	30	60	
T137921	Load	kVA	25.9	22.69	25.55	49.93	27.34	52.2	28.53	54.47	23.78	47.55	49.71	24.85	51.86	25.92	27.05	54.13	PDF
		Amps	31.2	31.2	31.2	62.4	31.2	62.4	31.2	62.4	34.32	65.52	65.52	34.32	65.52	34.32	34.32	65.52	
		Maximum Size of Fuse or Breaker	50	45	45	90	45	90	45	90	40	80	80	40	80	40	40	80	
T137922	Load	kVA	34.6	30.25	34.07	66.58	36.46	69.6	38.04	72.63	31.7	63.4	66.27	33.13	69.15	34.56	36.06	72.18	PDF
		Amps	41.6	41.6	41.6	83.2	41.6	83.2	41.6	83.2	45.76	87.36	87.36	45.76	87.36	45.76	45.76	87.36	
		Maximum Size of Fuse or Breaker	70	60	60	110	60	110	60	110	60	110	110	60	110	60	60	110	
T137923	Load	kVA	52	45.45	51.18	100.03	54.69	104.57	57.07	109.12	47.63	95.25	99.57	49.77	103.89	51.92	54.18	108.44	PDF
		Amps	62.5	62.5	62.5	125	62.5	125	62.5	125	68.75	131.25	131.25	68.75	131.25	68.75	68.75	131.25	
		Maximum Size of Fuse or Breaker	100	90	90	175	90	175	90	175	80	175	175	80	175	80	80	175	
T137924	Load	kVA	86.1	75.62	85.17	166.44	91.15	174.01	95.11	181.57	79.26	158.5	165.69	82.83	172.87	86.39	90.16	180.44	PDF
		Amps	104	104	104	208	104	208	104	208	114.4	218.4	218.4	114.4	218.4	114.4	114.4	218.4	
		Maximum Size of Fuse or Breaker	175	150	150	300	150	300	150	300	150	300	300	150	300	150	150	300	
QUANTITY REQUIRED			**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	
CONNECTION DIAGRAM			**FF**	**BB**	**BB**	**GG**	**BB**	**GG**	**BB**	**GG**	**EE**	**CC**	**CC**	**EE**	**CC**	**EE**	**EE**	**CC**	

NOTES: (1) Inputs and Outputs may be reversed; kVA capacity remains constant. All applications above the bold line are suitable for 50/60 Hz. All applications below the bold line are suitable for 60 Hz only. (2) Connection Diagrams AA and FF cannot be reverse connected.

Buck-Boost Single-Phase Transformers 120x240 Primary

HUBBELL® Acme Electric®

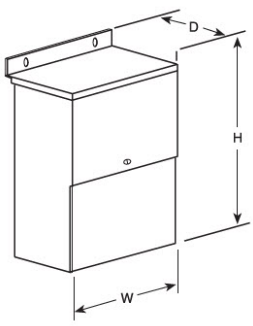
Single-Phase Buck-Boost Transformers Specifications[1] 120x240 Primary Volts – 12/24 Secondary Volts – 60 Hz							
Part Number	Price	Insulating Transformer Rating (kVA)	Secondary Maximum Current Output (A)		Weight (lb [kg])	Case Design	Dimensional Drawing
			12V	24V			
T181050		0.25	20.8	10.4	10 [4.5]	B	PDF
T181051			41.6	20.8	15 [6.8]	B	PDF
T181052		0.75	62.5	31.25	19 [8.6]	B	PDF
T111683		1	83.2	41.6	24 [10.9]	B	PDF
T111684		1.5	125	62.5	30 [13.6]	B	PDF
T111685		2	166	83.2	38 [17.2]	B	PDF
T111686		3	250	125	55 [24.9]	C	PDF
T111687		5	416.6	208	75 [34]	C	PDF

1. All units have ground studs for use with non-metallic conduit. All sizes of 0.75 kVA and less are suitable for 50/60 Hz. Additional field wiring boxes may be required when using units as autotransformers. See Dimensional Drawings link for product drawings and dimensions.

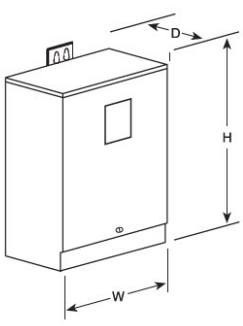
Single-Phase Buck-Boost Transformers Specifications[1] 120x240 Primary Volts – 16/32 Secondary Volts – 60 Hz							
Part Number	Price	Insulating Transformer Rating (kVA)	Secondary Maximum Current Output (A)		Weight (lb [kg])	Case Design	Dimensional Drawing
			16V	32V			
T181057		0.25	15.6	7.8	10 [4.5]	B	PDF
T181058		0.5	31.2	15.6	15 [6.8]	B	PDF
T181059		0.75	46.9	23.4	19 [8.6]	B	PDF
T113073		1	62.5	31.2	24 [10.9]	B	PDF
T113074		1.5	93.7	46.9	30 [13.6]	B	PDF
T113075		2	125	62.5	38 [17.2]	B	PDF
T113076		3	187.5	93.8	55 [24.9]	C	PDF
T113077		5	312	156	75 [34]	C	PDF

1. All units have ground studs for use with non-metallic conduit. All sizes of 0.75 kVA and less are suitable for 50/60 Hz. Additional field wiring boxes may be required when using units as autotransformers. See Dimensional Drawings link for product drawings and dimensions.

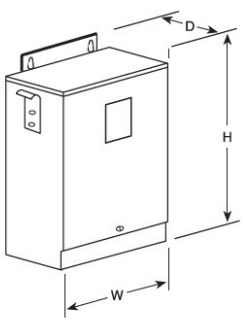
Buck-Boost Transformers Case Design



Design A



Design B



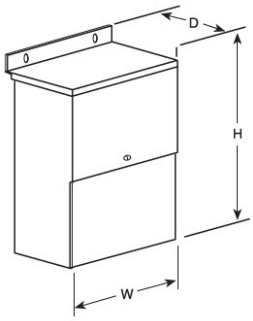
Design C

Buck-Boost Single-Phase Transformers 240x480 Primary

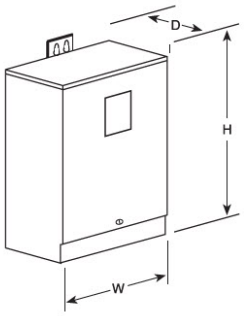
HUBBELL® Acme Electric®

Single-Phase Buck-Boost Transformers Specifications 240X480 Primary Volts – 24/48 Secondary Volts – 60 Hz							
Part Number	*Price*	*Insulating Transformer Rating (kVA)*	*Secondary Maximum Current Output (A)*		*Weight (lb [kg])*	*Case Design*	*Dimensional Drawing*
			24V	*48V*			
T181064		0.25	10.4	5.2	10 [4.5]	B	PDF
T181065		0.5	20.8	10.4	15 [6.8]	B	PDF
T181066		0.75	31.2	15.6	19 [8.6]	B	PDF
T137920		1	41.6	20.8	24 [10.9]	B	PDF
T137921		1.5	62.4	31.2	30 [13.6]	B	PDF
T137922		2	83.2	41.6	38 [17.2]	B	PDF
T137923		3	125	62.5	55 [24.9]	C	PDF
T137924		5	208	104	75 [34]	C	PDF

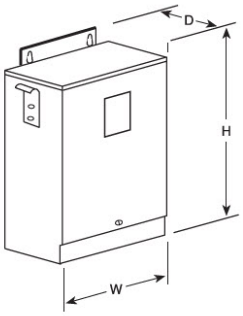
Buck-Boost Transformers Case Design



Design A



Design B



Design C

Buck-Boost Single-Phase Transformers

Wiring Diagrams

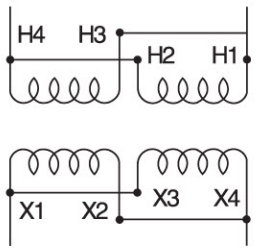
Units Rated 120x240V Input, 12/24V Output		
Input	*Output*	*Connection Diagram*
120	12	K
120	24	L
240	12	M
240	24	N

Units Rated 120x240V Input, 16/32V Output		
Input	*Output*	*Connection Diagram*
120	16	K
120	32	L
240	16	M
240	32	N

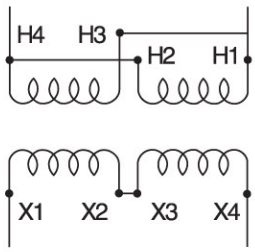
Units Rated 240x480V Input, 24/48V Output		
Input	*Output*	*Connection Diagram*
240	24	K
240	48	L
480	24	M
480	48	N

Low Voltage Lighting Wiring Diagrams

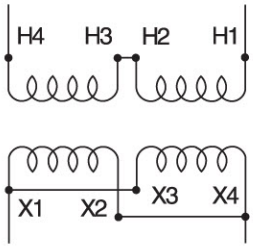
K



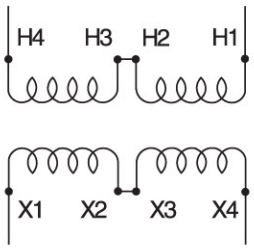
L



M



N



Buck-Boost Single-Phase Transformers

Wiring Diagrams –Single-Phase

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

Figure C

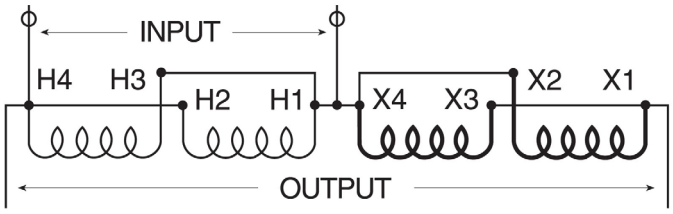


Figure D

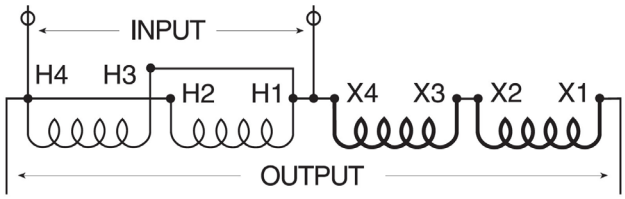


Figure E

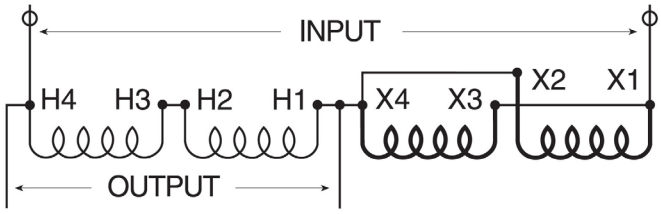


Figure F

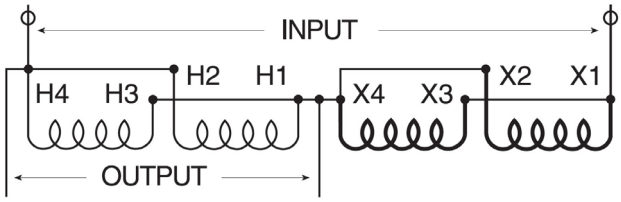


Figure G

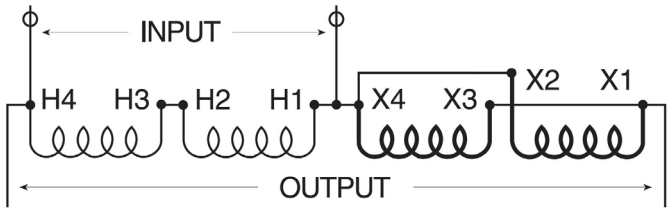


Figure H

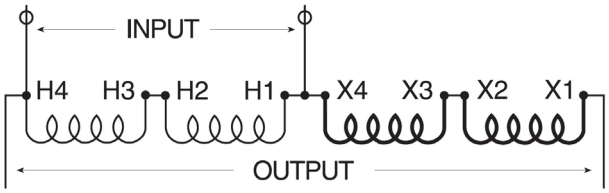


Figure I

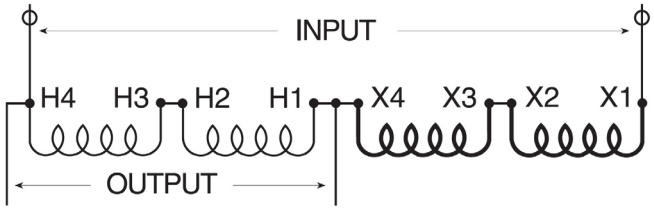
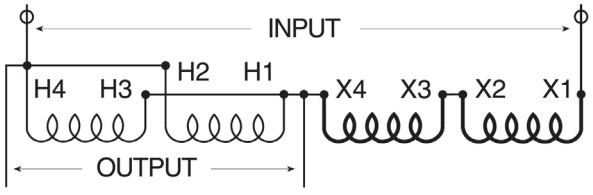


Figure J



Buck-Boost Single-Phase Transformers

Wiring Diagrams – Buck-Boost – Single-Phase for Three-Phase Applications

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

Note 2: Cannot be reverse connected.

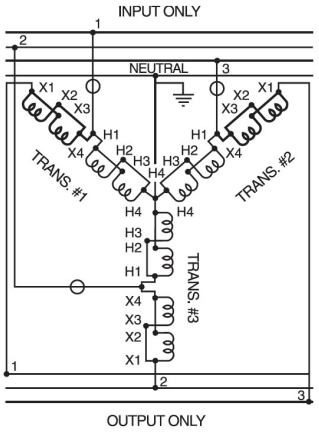


FIG. AA **WYE**
Note 2

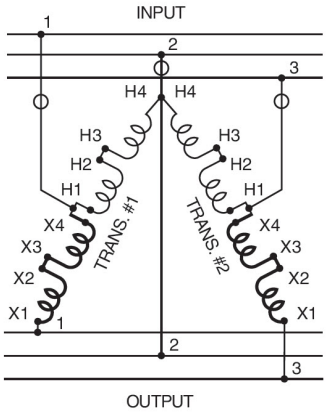


FIG. BB **OPEN DELTA**

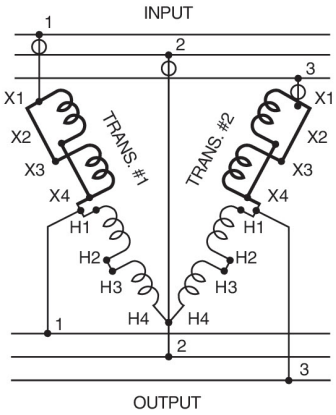


FIG. CC **OPEN DELTA**

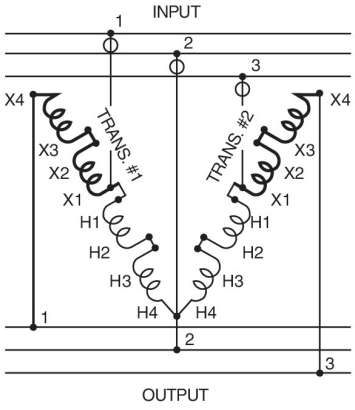


FIG. DD **OPEN DELTA**

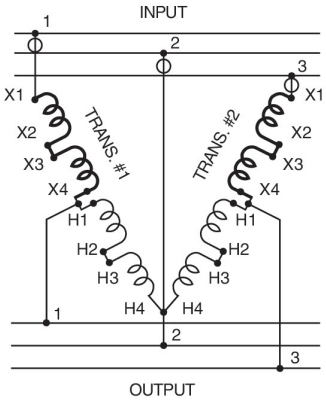


FIG. EE **OPEN DELTA**

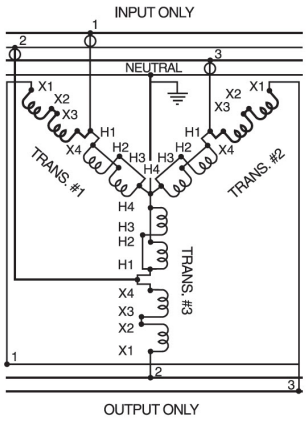


FIG. FF **WYE**
Note 2

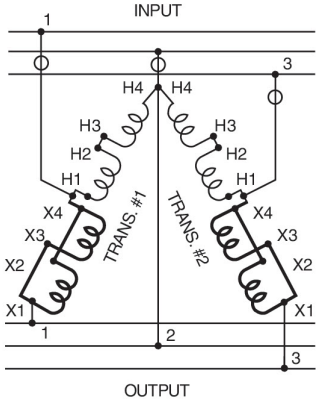


FIG. GG **OPEN DELTA**

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