Acme Electric®

Buck Boost Transformers

Secondary Voltage 16/32

HUBBELL

Steps for selecting the proper buck-boost transformer

You should have this information before selecting a buck-boost transformer:

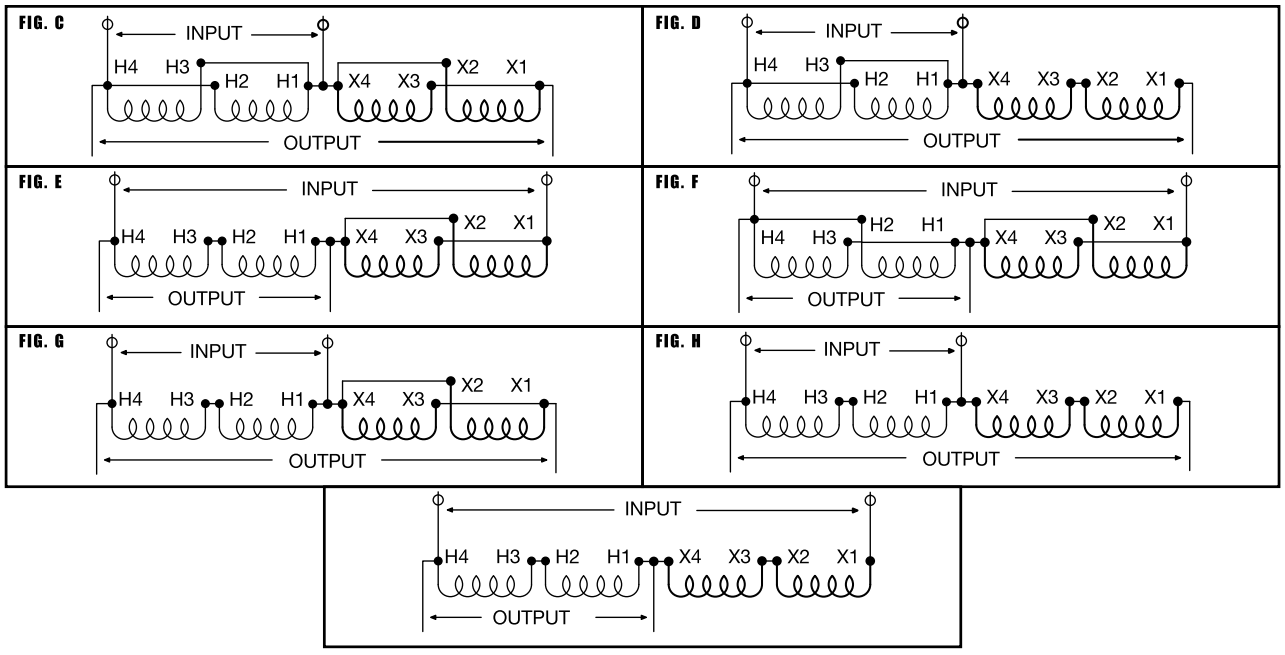
- Line Voltage: The voltage that you want to buck (decrease) or boost (increase). This can be found by measuring the supply line voltage with a voltmeter.
- Load Voltage: The voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.
- Load KVA or Load 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 cycles.
- Phase: The supply line should be the same as the equipment to be operated–either single or three phase.

4 Step Selection

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 highest 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.
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.

Connection Diagrams – Single Phase: Autotransformer Overcurrent Protection

- The symbol “O” used in these single phase connection diagrams illustrates where to field install an overcurrent protective device (typically a fuse or circuit breaker) when one input conductor is grounded and the other input conductor is ungrounded.
- When both input conductors are ungrounded, an overcurrent protection device is required to be installed in a series with each input conductor.
- When the input and output are reversed, always install the overcurrent protection device in series with the input conductor(s), as noted above.
- For additional information, refer to the National Electrical Code, Article 450-4.



CAUTION: DO NOT USE CONNECTIONS OTHER THAN THOSE SHOWN OR PROVIDED BY FACTORY

Single Phase Autotransformer Connections

Group 2

Single Phase			Boosting								Single Phase Bucking					
Line Voltage (Available)			95	100	105	208	215	215	220	225	135	240	240	245	250	255
Line Voltage (Output)			120	114	119	240	244	230	235	240	119	208	225	230	234	239
Δ **Catalog No.** *(See footnote)*											**Bucking**					
T-1-81054	**Load**	**KVA**	0.19	0.36	0.37	0.38	0.38	0.72	0.73	0.75	0.42	0.37	0.42	0.42	0.42	0.42
		Amps	1.56	3.13	3.13	1.56	1.56	3.13	3.13	3.13	3.54	1.77	3.54	3.54	3.54	3.54
	Fuse or Breaker Maximum Size		6	6	6	6	6	6	6	6	6	3	6	6	6	6
T-1-81055	**Load**	**KVA**	0.38	0.71	0.74	0.75	0.76	1.44	1.47	1.50	0.84	0.74	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 or Breaker Maximum Size		10	15	6	6	15	15	15	15	15	6	15	15	15	15
T-1-81056	**Load**	**KVA**	0.56	1.07	1.12	1.13	1.14	2.16	2.20	2.25	1.26	1.11	2.25	2.30	2.34	2.39
		Amps	4.69	9.38	9.38	4.69	4.69	9.38	9.38	9.38	10.63	5.31	10.00	10.00	10.00	10.00
	Fuse or Breaker Maximum Size		10	15	15	10	10	15	15	15	15	6	15	15	15	15
T-1-81057	**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	3.90	3.98
		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
	Fuse or Breaker Maximum Size		15	25	25	15	15	25	25	25	20	15	20	20	20	20
T-1-81058	**Load**	**KVA**	1.88	3.56	3.72	3.75	3.81	7.19	7.34	7.50	4.21	3.68	7.50	7.67	7.80	7.97
		Amps	15.63	31.25	31.25	15.83	15.63	31.25	31.25	31.25	35.42	17.71	33.33	33.33	33.33	33.33
	Fuse or Breaker Maximum Size		25	45	45	25	25	45	45	45	40	20	40	40	40	40
T-1-81058	**Load**	**KVA**	2.81	5.34	5.58	5.63	5.72	10.78	11.02	11.25	6.32	5.53	11.25	11.50	11.70	11.95
		Amps	23.44	46.88	46.88	23.44	23.44	46.88	46.88	46.88	53.13	26.56	50.00	50.00	50.00	50.00
	Fuse or Breaker Maximum Size		40	70	70	40	40	70	70	70	60	30	60	60	60	60
T-1-13073	**Load**	**KVA**	3.75	7.13	7.44	7.50	7.63	14.38	14.69	15.00	8.43	7.37	15.00	15.33	15.60	15.93
		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 or Breaker Maximum Size		50	90	90	50	50	90	90	90	80	40	80	80	80	80
T-1-13074	**Load**	**KVA**	5.63	10.69	11.16	11.25	11.44	21.56	22.03	22.50	12.64	11.05	22.50	23.00	23.40	23.90
		Amps	46.90	93.80	93.80	46.90	46.90	93.80	93.80	93.80	106.30	53.10	100.00	100.00	100.00	100.00
	Fuse or Breaker Maximum Size		80	150	150	70	70	125	125	125	125	60	125	125	125	125
T-1-13075	**Load**	**KVA**	7.50	14.25	14.88	15.00	15.25	28.75	29.38	30.00	16.86	14.73	30.00	30.67	131.20	31.87
		Amps	62.50	125.00	125.00	62.50	62.50	125.00	125.00	125.00	141.70	70.80	133.30	133.30	133.30	133.30
	Fuse or Breaker Maximum Size		100	200	200	90	90	175	175	175	175	80	175	175	175	175
T-1-13076	**Load**	**KVA**	11.25	21.32	22.31	22.50	22.88	43.13	44.06	45.00	25.29	22.10	45.00	46.00	46.80	47.80
		Amps	93.80	187.50	187.50	93.80	93.80	187.50	187.50	187.50	212.50	106.30	200.00	200.00	200.00	200.00
	Fuse or Breaker Maximum Size		150	300	300	150	150	250	250	250	250	125	250	250	250	250
T-1-13077	**Load**	**KVA**	18.75	35.63	37.19	37.50	38.13	71.80	73.44	75.00	42.15	36.83	75.00	76.67	78.00	79.67
		Amps	156.30	312.50	312.50	156.30	156.30	312.50	312.50	312.50	354.20	177.10	333.30	333.30	333.30	333.30
	Fuse or Breaker Maximum Size		250	450	450	225	225	450	450	450	400	200	400	400	400	400
T-2-13078*	**Load**	**KVA**	28.10	53.40	55.80	56.30	57.20	107.80	110.20	112.50	63.20	55.30	112.50	115.00	117.00	119.50
		Amps	234.40	468.80	468.80	234.40	234.40	468.80	468.80	468.80	531.30	265.60	500.00	500.00	500.00	500.00
	Fuse or Breaker Maximum Size		400	700	700	350	350	700	700	700	600	300	600	600	600	600
T-2-13079*	**Load**	**KVA**	37.50	71.30	74.40	75.00	76.30	143.80	146.90	150.00	84.30	73.70	150.00	153.30	156.00	159.30
		Amps	312.50	625.00	625.00	312.50	312.50	625.00	625.00	625.00	708.30	354.20	666.70	666.70	666.70	666.70
	Fuse or Breaker Maximum Size		500	1000	1000	450	450	1000	1000	1000	800	400	800	800	800	800
Connection Diagram			**D**	**C**	**C**	**H**	**H**	**G**	**G**	**G**	**F**	**I**	**E**	**E**	**E**	**E**

Δ The first digit of the catalog number appearing on the transformer name plate may be different than what is shown on this instruction sheet; example: T-1, T-2, T-3, etc.

Note: 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 (highlighted in gray) are suitable for 60 Hz only.

Important: Refer to the National Electrical Code Article 450-4 for Overcurrent Protection of an Autotransformer.

* Larger KVA buck-boost transformers utilize multiple conductors on the secondary (X) terminals as shown below:

Number of Leads per Termination

	H1	H2	H3	H4	X1	X2	X3	X4
T-2-13078	1	1	1	1	2	2	2	2
T-2-13079	1	1	1	1	2	2	2	2

All leads with same designation (ex. X1, X1) MUST be joined together for proper operation.

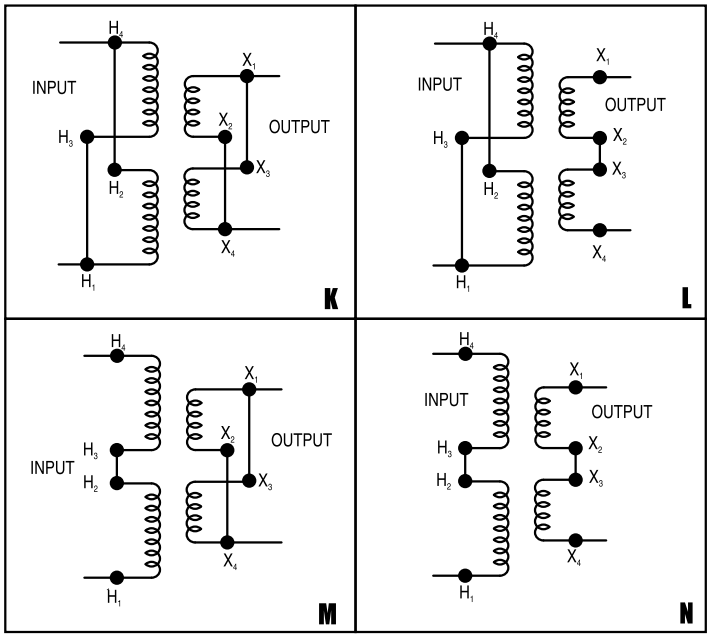
All sizes of 3/4 KVA and less are suitable for 50/60 Hz

Input Voltage 120 x 240, Output Voltage 16 x 32: 60 Hz

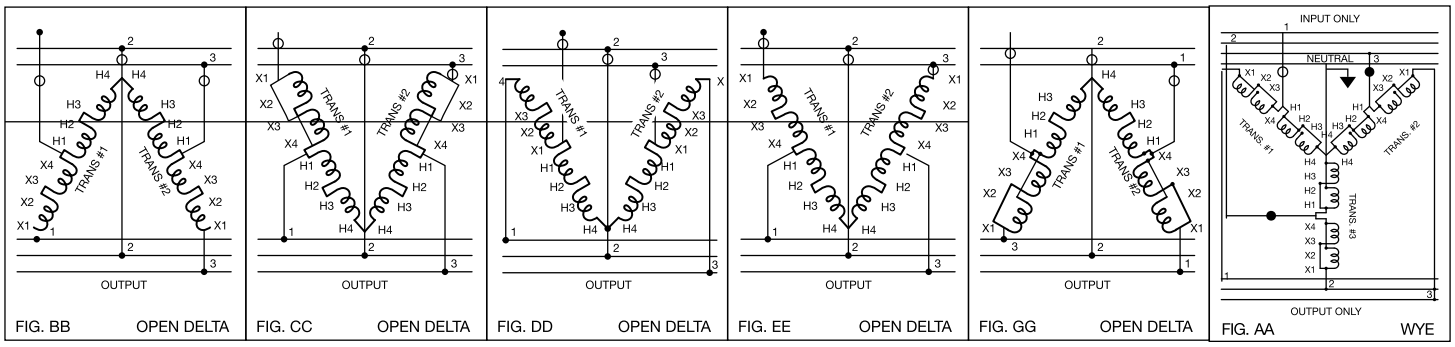
Units rated 120 x 240V Input: 12 x 24V Output

Input	Output	Connection Diagram
120	16	K
120	32	L
240	16	M
240	32	N

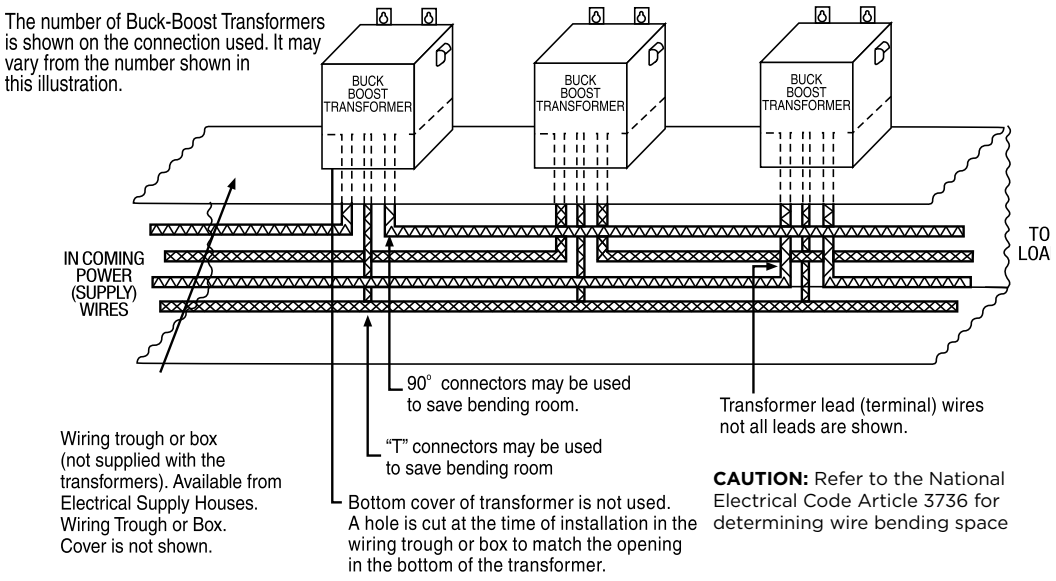
Catalog Number	Insulating Transformer Rating	Maximum Current Output	
		12V	24V
T-1-81054	*50 VA	3.12	1.56
T-1-81055	*100 VA	6.25	3.12
T-1-81056	*150 VA	9.38	4.69
T-1-81057	0.25 KVA	15.60	7.80
T-1-81058	0.50 KVA	31.20	15.60
T-1-81059	0.75 KVA	46.90	23.40
T-1-11073	1.00 KVA	62.50	31.20
T-1-11074	1.50 KVA	93.70	46.90
T-1-11075	2.00 KVA	125.00	62.50
T-1-11076	3.00 KVA	188.00	94.00
T-1-11077	5.00 KVA	312.00	156.00
T-2-11078	7.50 KVA	468.00	234.00
T-2-11078	10.00 KVA	625.00	312.00



Connection Diagrams – Three Phase



Typical Buck Boost Autotransformer Installation



CAUTION: Refer to the National Electrical Code Article 3736 for determining wire bending space

Autotransformer Overcurrent Protection

The symbol "O" used in these single phase connection diagrams illustrates where to field install an overcurrent protective device (typically a fuse or circuit breaker)

- When the input and output are reversed, always install the overcurrent protection device in series with the input conductor(s)
- For additional information, refer to the National Electrical Code, Article 450-4

CAUTION: DO NOT USE CONNECTIONS OTHER THAN THOSE SHOWN OR PROVIDED BY FACTORY

Three Phase Autotransformer Connections

Group 3

Three Phase			Boosting					Three Phase Bucking					
Line Voltage (Available)			183Y 106	208Y 120	195	208	225	240	245	250	256	265	272
Line Voltage (Output)			208	236	208	240	240	208	230	234	240	234	240
Δ **Catalog No.** *(See footnote)*								**Bucking**					
T-1-81054	**Load**	**KVA**	1.13	1.28	1.13	0.63	1.30	0.56	1.33	1.35	1.39	0.72	0.74
		Amps	3.13	3.13	3.13	1.56	3.13	1.56	3.33	3.34	3.33	1.77	1.77
	Fuse or Breaker Maximum Size		6	6	6	3	6	3	6	6	6	3	3
T-1-81055	**Load**	**KVA**	2.25	2.55	2.25	1.27	2.60	1.13	2.65	2.71	1.13	1.43	1.47
		Amps	6.25	6.25	6.25	3.13	6.25	3.13	6.66	6.68	3.13	3.54	3.54
	Fuse or Breaker Maximum Size		15	15	15	6	15	6	15	15	15	6	6
T-1-81056	**Load**	**KVA**	3.38	3.83	3.38	1.90	3.90	1.69	3.98	4.06	4.16	2.15	2.21
		Amps	9.38	9.38	9.38	4.69	9.38	4.69	9.99	10.02	10.00	5.31	5.31
	Fuse or Breaker Maximum Size		15	15	15	10	15	10	15	15	15	10	10
T-1-81057	**Load**	**KVA**	5.63	6.39	5.63	3.17	6.50	2.81	6.63	6.77	6.93	3.59	3.68
		Amps	15.63	15.63	15.63	7.81	15.63	7.81	16.64	16.69	16.67	8.85	8.85
	Fuse or Breaker Maximum Size		25	25	25	15	25	15	20	20	20	15	15
T-1-81058	**Load**	**KVA**	11.26	12.77	11.26	6.33	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	33.29	33.39	33.33	17.69	17.71
	Fuse or Breaker Maximum Size		45	45	45	25	45	20	40	40	40	20	20
T-1-81059	**Load**	**KVA**	16.89	19.16	16.89	9.50	19.49	8.44	19.89	20.30	20.78	10.76	11.04
		Amps	46.88	46.88	46.88	23.44	46.88	23.44	49.93	50.08	50.00	26.54	26.56
	Fuse or Breaker Maximum Size		70	70	70	35	70	30	60	60	60	30	30
T-1-13073	**Load**	**KVA**	22.52	25.55	22.52	12.67	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	66.58	66.67	66.67	35.39	35.42
	Fuse or Breaker Maximum Size		90	90	90	45	90	35	80	80	80	40	40
T-1-13074	**Load**	**KVA**	33.77	38.32	33.77	19.00	39.97	16.89	39.87	40.59	41.57	21.52	22.08
		Amps	93.75	93.75	93.75	46.88	93.75	46.88	99.86	100.16	100.00	53.08	53.13
	Fuse or Breaker Maximum Size		150	150	125	70	125	60	125	125	125	60	60
T-1-13075	**Load**	**KVA**	45.03	51.10	45.03	25.33	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	133.15	133.55	133.33	70.78	70.83
	Fuse or Breaker Maximum Size		200	200	175	90	175	70	175	175	175	80	80
T-1-13076	**Load**	**KVA**	67.55	76.64	67.55	38.00	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	199.73	200.32	200.00	106.17	106.25
	Fuse or Breaker Maximum Size		300	300	250	150	250	110	250	250	250	125	125
T-1-13077	**Load**	**KVA**	112.58	127.74	112.58	63.33	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	332.88	333.87	333.33	176.95	117.08
	Fuse or Breaker Maximum Size		450	450	450	225	450	175	400	400	400	200	200
T-2-13078*	**Load**	**KVA**	166.87	191.61	168.87	94.99	194.86	84.44	198.92	202.97	207.85	107.58	110.42
		Amps	468.75	468.75	468.75	234.38	468.75	234.38	499.32	500.80	500.00	265.42	265.63
	Fuse or Breaker Maximum Size		700	700	700	350	700	300	600	600	600	300	600
T-2-13079*	**Load**	**KVA**	225.17	255.48	225.17	126.66	259.81	112.58	265.22	270.63	277.13	143.44	147.22
		Amps	625.00	625.00	625.00	312.50	625.00	312.50	665.76	667.74	666.67	353.90	354.17
	Fuse or Breaker Maximum Size		1000	1000	1000	450	1000	350	800	800	800	400	400
Quantity Required			**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
Connection Diagram			**A-A**	**A-A**	**G-G**	**B-B**	**G-G**	**D-D**	**C-C**	**C-C**	**C-C**	**E-E**	**E-E**

Note: 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 (highlighted in gray) are suitable for 60 Hz only.
2) Connection diagrams A-A and F-F cannot be reverse connected.

Important: Refer to the National Electrical Code Article 450-4 for Overcurrent Protection of an Autotransformer.

* Larger KVA buck-boost transformers utilize multiple conductors on the secondary (X) terminals as shown below:

Number of Leads per Termination

	H1	H2	H3	H4	X1	X2	X3	X4
T-2-13078	1	1	1	1	2	2	2	2
T-2-13079	1	1	1	1	2	2	2	2

All leads with same designation (ex. X1, X1) MUST be joined together for proper operation.

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