



Buck Boost Transformers

Secondary Voltage 24/48



Steps for selecting the proper buck-boost transformer

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

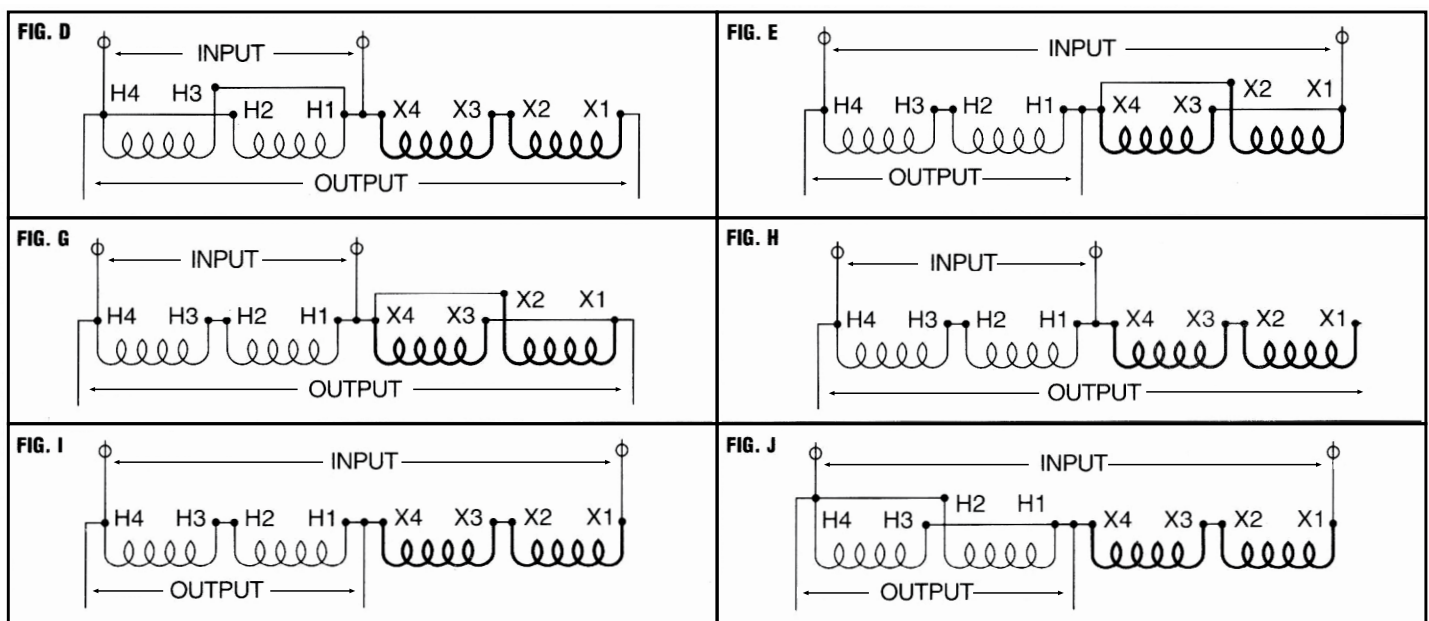
- **Line Voltage:** The voltage that you want to buck (decrease) or boost (increase). This can be found by measuring the supply line voltage with a voltmeter.
- **Load Voltage:** The voltage at which your equipment is designed to operate. This is listed on the nameplate of the load equipment.
- **Load 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 use 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 3												Single Phase				
Single Phase			Boosting									Bucking				
Line Voltage (Available)			230	380	416	425	430	435	440	440	450	460	277	480	480	504
Line Voltage (Output)			277	420	457	467	473	457	462	484	472	483	230	436	456	480
Δ Catalog No. (See footnote)												Bucking				
T-1-81061	Load	KVA Amps	0.29 1.04	0.44 1.04	0.48 1.04	0.49 1.04	0.49 1.04	0.95 2.08	0.96 2.08	0.50 1.04	0.98 2.08	1.01 2.08	0.29 1.25	0.50 1.15	1.05 2.29	1.10 2.29
	Fuse or Breaker Maximum Size		3	3	3	3	3	6	6	3	6	6	3	3	6	6
T-1-81062	Load	KVA Amps	0.58 2.08	0.87 2.08	0.95 2.08	0.97 2.08	0.99 2.08	1.90 4.17	1.93 4.17	1.01 2.08	1.97 4.17	2.01 4.17	0.58 2.50	1.00 2.29	2.09 4.58	2.20 4.58
	Fuse or Breaker Maximum Size		6	6	6	6	6	10	10	6	10	10	6	6	10	10
T-1-81063	Load	KVA Amps	0.87 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	0.86 3.75	1.50 3.44	3.14 6.88	3.30 6.88
	Fuse or Breaker Maximum Size		10	6	6	6	6	15	15	6	15	15	6	6	15	15
T-1-81064	Load	KVA 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
	Fuse or Breaker Maximum Size		15	10	10	10	10	15	15	10	15	15	10	10	15	15
T-1-81065	Load	KVA 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
	Fuse or Breaker Maximum Size		20	15	15	15	15	30	30	15	30	30	15	15	30	30
T-1-81066	Load	KVA 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
	Fuse or Breaker Maximum Size		25	25	25	25	25	45	45	25	45	45	20	20	45	45
T-1-37920	Load	KVA 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
	Fuse or Breaker Maximum Size		35	30	30	30	30	60	60	30	60	60	30	30	60	60
T-1-37921	Load	KVA 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	31.35 68.75	33.00 68.75
	Fuse or Breaker Maximum Size		50	50	45	45	45	90	90	45	90	90	40	40	90	90
T-1-37922	Load	KVA 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
	Fuse or Breaker Maximum Size		70	60	60	60	60	110	110	60	110	110	60	60	110	110
T-1-37923	Load	KVA 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
	Fuse or Breaker Maximum Size		100	90	90	90	90	175	175	90	175	175	80	80	175	175
T-1-37924	Load	KVA 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
	Fuse or Breaker Maximum Size		175	150	150	150	150	300	300	150	300	300	150	150	300	300
T-2-43570	Load	KVA Amps	43.30 156.30	65.60 156.30	71.40 156.30	73.00 156.30	73.90 156.30	142.80 312.50	144.40 312.50	75.60 156.30	147.50 312.50	150.90 312.50	43.10 187.50	74.90 171.90	156.80 343.80	165.00 343.80
	Fuse or Breaker Maximum Size		250	225	225	225	225	450	450	225	450	450	200	200	450	450
T-2-43571*	Load	KVA Amps	57.70 208.30	87.50 208.30	95.20 208.30	97.30 208.30	98.50 208.30	190.40 416.70	192.50 416.70	100.80 208.30	196.70 416.70	201.30 416.70	57.50 250.00	99.90 229.20	209.00 458.30	220.00 458.30
	Fuse or Breaker Maximum Size		350	300	300	300	300	600	600	300	600	600	300	300	600	600
Connection Diagram			D	H	H	H	H	G	G	H	G	G	J	I	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-2-43571	1	1	1	1	2	2	2	2

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

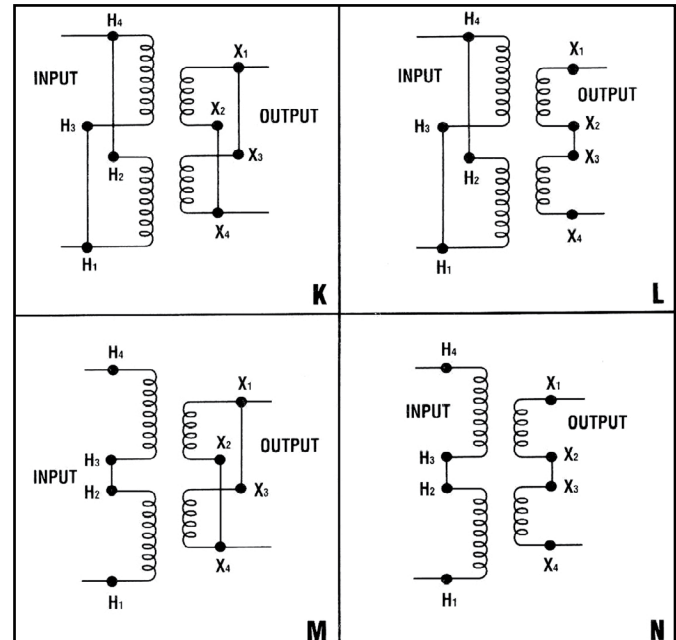


Input Voltage 240 x 480, Output Voltage 24 x 48: 60 Hz

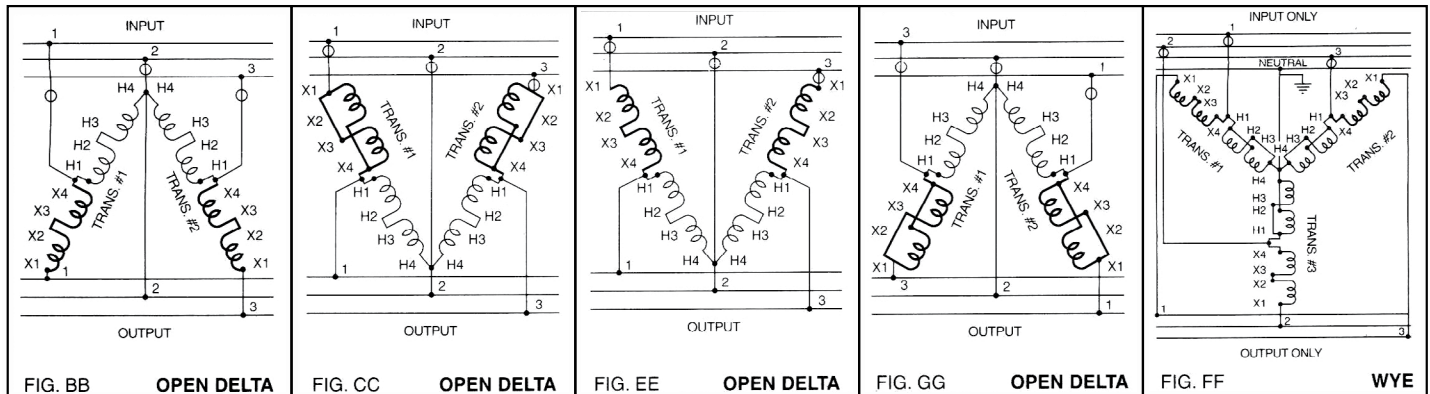
Units rated 240 x 480V Input: 24 x 48V Output

Input	Output	Connection Diagram
240	24	K
240	48	L
480	24	M
480	48	N

Catalog Number	Insulating Transformer Rating	Maximum Current Output	
		24V	48V
T-1-81061	*50 VA	2.08	1.04
T-1-81062	*100 VA	4.16	2.08
T-1-81063	*150 VA	6.24	3.12
T-1-81064	*0.25 KVA	10.40	5.20
T-1-81065	*0.50 KVA	20.80	10.40
T-1-81066	*0.75 KVA	31.20	15.60
T-1-37920	1.00 KVA	41.60	20.80
T-1-37921	1.50 KVA	62.40	31.20
T-1-37922	2.00 KVA	83.20	41.60
T-1-37923	3.00 KVA	125.00	62.50
T-1-37924	5.00 KVA	208.00	104.00
T-2-43570	7.50 KVA	312.00	156.00
T-2-43571	10.00 KVA	416.00	208.00

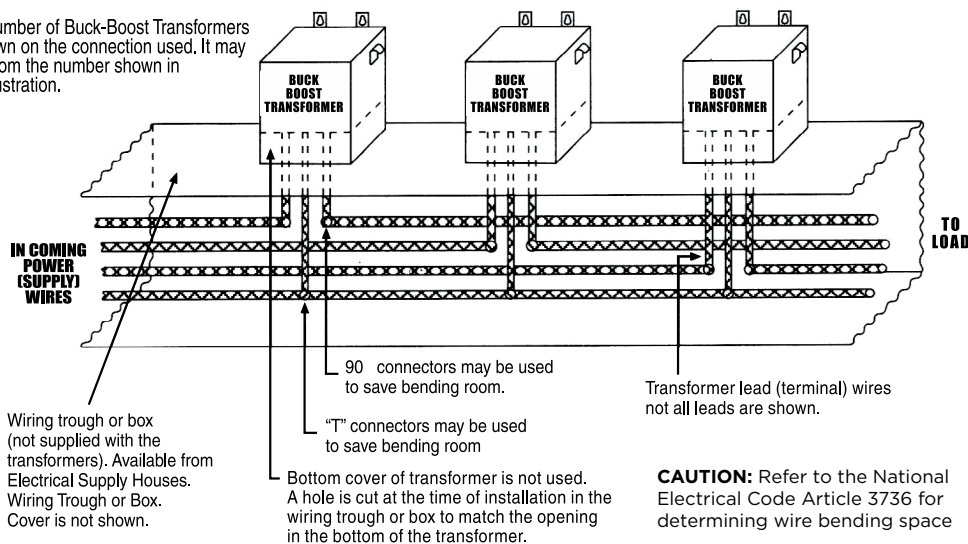


Connection Diagrams - Three Phase



Typical Buck Boost Autotransformer Installation

The number of Buck-Boost Transformers is shown on the connection used. It may vary from the number shown in this illustration.



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								
Single Phase			Boosting							Bucking								
Line Voltage (Available)	399Y 230		380	430	440	460	460	480	480	440	440	460	460	480	480	500	500	
Line Voltage (Output)	480		420	473	462	506	483	528	504	400	419	438	418	457	436	455	477	
Δ Catalog No. (See footnote)										Bucking								
T-1-81061	Load	KVA Amps	0.86 1.04	0.76 1.04	0.85 1.04	1.66 2.08	0.91 1.04	1.74 2.08	0.95 1.04	1.82 2.08	0.79 1.14	1.58 2.18	1.66 2.18	0.83 1.14	1.73 2.18	0.86 1.14	0.90 1.14	1.80 2.18
	Fuse or Breaker Maximum Size		3	3	3	6	3	6	3	6	3	6	6	3	6	3	3	6
T-1-81062	Load	KVA 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
	Fuse or Breaker Maximum Size		6	6	6	10	6	10	6	10	6	10	10	6	10	6	6	10
T-1-81063	Load	KVA 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
	Fuse or Breaker Maximum Size		10	6	6	15	6	15	6	15	6	15	15	6	15	6	6	15
T-1-81064	Load	KVA 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
	Fuse or Breaker Maximum Size		15	10	10	15	10	15	10	15	10	15	15	10	15	10	10	15
T-1-81065	Load	KVA 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
	Fuse or Breaker Maximum Size		20	15	15	30	15	30	15	30	15	30	30	15	30	15	15	30
T-1-81066	Load	KVA 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
	Fuse or Breaker Maximum Size		25	25	25	45	25	45	25	45	20	40	40	20	40	20	20	40
T-1-37920	Load	KVA 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
	Fuse or Breaker Maximum Size		35	30	30	60	30	60	30	60	30	60	60	30	60	30	30	60
T-1-37921	Load	KVA Amps	25.90 31.20	22.69 31.20	25.55 31.20	49.93 62.40	27.34 31.20	52.20 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 65.52	25.92 34.32	27.05 34.32	54.13 65.52
	Fuse or Breaker Maximum Size		50	45	45	90	45	90	45	90	40	80	80	40	80	40	40	80
T-1-37922	Load	KVA 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
	Fuse or Breaker Maximum Size		70	60	60	110	60	110	60	110	60	110	110	60	110	60	60	110
T-1-37923	Load	KVA 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
	Fuse or Breaker Maximum Size		100	90	90	175	90	175	90	175	80	175	175	80	175	80	80	175
T-1-37924	Load	KVA 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	79.26 114.50	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
	Fuse or Breaker Maximum Size		175	150	150	300	150	300	150	300	150	300	300	150	300	150	150	300
T-2-43570	Load	KVA Amps	129.30 156.00	113.43 156.00	127.75 156.00	249.66 312.00	136.72 156.00	261.01 312.00	142.67 156.00	272.36 312.00	118.89 171.60	237.75 327.60	248.53 327.60	124.24 171.60	259.31 327.60	129.59 171.60	135.23 171.60	270.66 327.60
	Fuse or Breaker Maximum Size		250	225	225	450	225	450	225	450	200	400	400	200	400	200	200	400
T-2-43571*	Load	KVA Amps	173.10 208.00	151.25 208.00	170.33 208.00	332.89 416.00	182.29 208.00	348.02 416.00	190.22 208.00	363.15 416.00	158.52 228.50	317.00 436.80	331.37 436.80	165.65 228.80	345.75 436.80	172.78 228.80	180.31 228.80	360.88 436.80
	Fuse or Breaker Maximum Size		350	300	300	600	300	600	300	600	300	600	600	300	600	300	300	600
Quantity Required			3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Connection Diagram			F-F	B-B	B-B	G-G	B-B	G-G	B-B	G-G	E-E	C-C	C-C	E-E	C-C	E-E	E-E	C-C

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-2-43571	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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