INSTRUCTIONS

GEI-99853A

APPLICATION AND CONNECTION DATA FOR BUCK-BOOST TRANSFORMERS

DESCRIPTION

General Electric B-B transformers are insulated units rated 120/240 volts high voltage and 12/24 and 16/32 volts low voltage. When connected as autotransformers in single-phase or three-phase circuits, they can be used to change voltage on loads greatly in excess of the rating shown on the nameplate.

Because autotransformers may transmit line disturbances directly to the load, their use in some areas may be prohibited by local codes.

NOTE

BE SURE THAT AUTOTRANSFORMERS ARE PERMISSIBLE IN YOUR LOCALE.

APPLICATION

Efficient operation of electrical equipment requires that line voltage be at or near the nameplate rating of the equipment. In order to match available line voltage (whether it be too high or low) with equipment voltage, buck-boost transformers provide the most convenient and least expensive method.

Do not use buck-boost transformers to solve a fluctuating voltage problem. They should be used to compensate for high or low voltage conditions only when the available line voltage is reasonably constant.

5-STEP SELECTION

Buck-Boost applications are quick and easy to solve when you follow these easy steps. (See example below as you follow these steps).

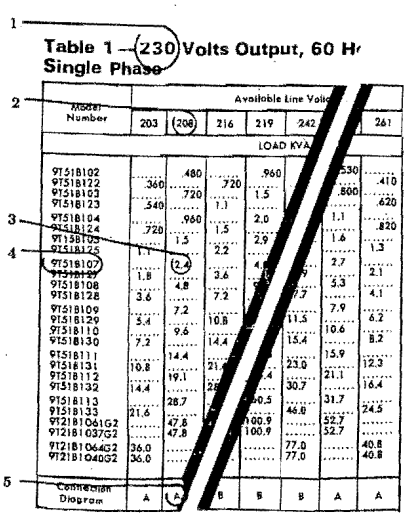
FOR BOOSTING UP AVAILABLE VOLTAGES:

1. Select the table having the same output voltage as the voltage required for the equipment you want to operate.
   Example: 230 volt, single phase air conditioner — Table 1.
2. Select the available line voltage column located in that table.
   Example: 208 volts single phase available (Column 2 — Table 1).
3. Select the proper kva required by your equipment then read down the available line voltage column until you find it. If your kva is not listed, go on to the next higher kva.
   Example: Air conditioner needs 2.4 kva volts at 230 volts.
4. Select the GE model number. Read directly left across the model number column.
   Example: Based on the above application, 1-9T51B107 will provide the proper voltage correction.
5. Select the correct connection diagram for your customer. Read down to the bottom of the available line voltage column you've been working with and the wiring diagram is referenced.
   Example: Connection diagram "A".

FOR BUCKING DOWN AVAILABLE VOLTAGES:

Since buck-boost transformers can be used in reverse, so can the quick-selection tables. Simply use the "available line voltage" column for your desired output voltage and select the proper table by your available line voltage (titled "Output" in the tables).

EXAMPLE: 5-Step Selection



SELECTION TABLES

Table 1 — 230 Volts Output, 60 Hertz Single Phase

Model Number	Available Line Voltage 203	208	216	219	242	245	253	261
	LOAD KVA*							
9T51B102		.480		.960	1.0		.530	
9T51B122	.360		.720			.770		.410
9T51B103		.720		1.5	1.6		.800	
9T51B123	.540		1.1			1.2		.620
9T51B104		.960		2.0	2.1		1.1	
9T51B124	.720		1.5			1.6		.820
9T51B105		1.5		2.9	3.1		1.6	
9T51B125	1.1		2.2			2.3		1.3
9T51B107		2.4		4.8	5.1		2.7	
9T51B127	1.8		3.6			3.9		2.1
9T51B108		4.8		9.6	10.1		5.3	
9T51B128	3.6		7.2			7.7		4.1
9T51B109		7.2		14.4	15.2		7.9	
9T51B129	5.4		10.8			11.5		6.2
9T51B110		9.6		19.2	20.2		10.6	
9T51B130	7.2		14.4			15.4		8.2
9T51B111		14.4		28.8	30.3		15.9	
9T51B131	10.8		21.6			23.0		12.3
9T51B112		19.1		38.4	40.4		21.1	
9T51B132	14.4		28.8			30.7		16.4
9T51B113		28.7		57.5	60.5		31.7	
9T51B133	21.6		43.2			46.0		24.5
9T21B1061G2		47.8		95.9	100.9		52.7	
9T21B1037G2		47.8		95.9	100.9		52.7	
9T21B1064G2	36.0		72.0			77.0		40.8
9T21B1040G2	36.0		72.0			77.0		40.8
Connection Diagram	A	A	B	B	B	B	A	A

Table 2 — 240 Volts Output, 60 Hertz Single Phase

Model Number	Available Line Voltage 208# 212	218	225	229	252	256	264	272
	LOAD KVA*							
9T51B102		.500		1.0	1.1		.550	
9T51B122	.380		.750			.800		.430
9T51B103		.750		1.5	1.6		.825	
9T51B123	.570		1.2			1.2		.640
9T51B104		1.0		2.0	2.1		1.1	
9T51B124	.750		1.5			1.6		.850
9T51B105		1.5		3.0	3.2		1.7	
9T51B125	1.2		2.3			2.4		1.3
9T51B107		2.5		5.0	5.3		2.8	
9T51B127	1.9		3.8			4.0		2.2
9T51B108		5.0		10.0	10.5		5.5	
9T51B128	3.8		7.5			8.0		4.3
9T51B109		7.5		15.0	15.8		8.3	
9T51B129	5.7		11.3			12.0		6.4
9T51B110		10.0		20.0	21.0		11.0	
9T51B130	7.5		15.0			16.0		8.5
9T51B111		15.0		30.0	31.5		16.5	
9T51B131	11.3		22.5			24.0		12.8
9T51B112		20.0		40.0	42.0		22.0	
9T51B132	15.0		30.0			32.0		17.0
9T51B113		30.0		60.0	63.0		33.0	
9T51B133	22.5		45.0			48.0		25.5
9T21B1061G2		50.0		100.0	105.0		55.0	
9T21B1037G2		50.0		100.0	105.0		55.0	
9T21B1064G2	37.5		75.0			80.0		42.5
9T21B1040G2	37.5		75.0			80.0		42.5
Connection Diagram	A	A	B	B	B	B	A	A

*Load kva is the maximum load at voltages shown when transformers are connected as autotransformers, according to the diagram referenced and shown on back page.

#When 208 is the available line voltage, use the 212 voltage column. This will result in output voltage of 236 volts, which should be sufficient for most applications.

Table 3 — 115 Volts Output, 60 Hertz Single Phase

Model Number	Available Line Voltage 91	96	101	105	127	130	138	146
	LOAD KVA*							
9T51B102		.240		.480	.539		.290	
9T51B122	.160		.360			.410		.230
9T51B103		.360		.720	.800		.440	
9T51B123	.270		.540			.610		.350
9T51B104		.480		.960	1.1		.580	
9T51B124	.360		.720			.820		.460
9T51B105		.720		1.5	1.6		.870	
9T51B125	.540		1.1			1.3		.690
9T51B107		1.2		2.4	2.7		1.5	
9T51B127	.900		1.8			2.1		1.2
9T51B108		2.4		4.8	5.3		2.9	
9T51B128	1.8		3.6			4.1		2.3
9T51B109		3.6		7.2	8.0		4.4	
9T51B129	2.7		5.4			6.1		3.5
9T51B110		4.8		9.6	10.6		5.8	
9T51B130	3.6		7.2			8.2		4.6
9T51B111		7.2		14.4	15.9		8.6	
9T51B131	5.4		10.8			12.2		6.9
9T51B112		9.6		19.2	21.2		11.5	
9T51B132	7.2		14.4			16.3		9.2
9T51B113		14.4		28.8	31.8		17.3	
9T51B133	10.8		21.6			24.4		13.7
9T21B1061G2		24.0		48.0	53.0		28.8	
9T21B1037G2		24.0		48.0	53.0		28.8	
9T21B1064G2	18.0		36.0			41.0		22.9
9T21B1040G2	18.0		36.0			41.0		22.9
Connection Diagram	C	C	D	D	D	D	C	C

Table 4 — 120 Volts Output, 60 Hertz Single Phase

Model Number	Available Line Voltage 95	100	106	109	132	136	144	152
	LOAD KVA*							
9T51B102		.250		.500	.550		.300	
9T51B122	.190		.380			.430		.240
9T51B103		.380		.750	.830		.450	
9T51B123	.290		.570			.640		.360
9T51B104		.500		1.0	1.1		.600	
9T51B124	.380		.750			.850		.480
9T51B105		.750		1.5	1.7		.900	
9T51B125	.570		1.2			1.3		.720
9T51B107		1.3		2.5	2.8		1.5	
9T51B127	.940		1.9			2.2		1.2
9T51B108		2.5		5.0	5.5		3.0	
9T51B128	1.9		3.8			4.3		2.4
9T51B109		3.8		7.5	8.3		4.5	
9T51B129	2.9		5.7			6.4		3.6
9T51B110		5.0		10.0	11.0		6.0	
9T51B130	3.8		7.5			8.5		4.8
9T51B111		7.5		15.0	16.5		9.0	
9T51B131	5.7		11.3			12.8		7.2
9T51B112		10.0		20.0	22.0		12.0	
9T51B132	7.5		15.0			17.0		9.5
9T51B113		15.0		30.0	33.0		18.0	
9T51B133	11.3		22.5			25.5		14.3
9T21B1061G2		25.0		50.0	55.0		30.0	
9T21B1037G2		25.0		50.0	55.0		30.0	
9T21B1064G2	18.8		38.0			43.0		23.8
9T21B1040G2	18.8		38.0			43.0		23.8
Connection Diagram	C	C	D	D	D	D	C	C

*Load kva is the maximum load at voltages shown when transformers are connected as autotransformers, according to the diagram referenced and shown on back page.

‡ Warning — 3 phase autotransformers should never be used to obtain 4 wire output with 3 wire input.

Table 5 — 230 Volts, 3 Wire Output, 60 Hertz Three Phase

Quantity Required per Bank	Model No.	Available Line Voltage ‡			
		181Y/105	192Y/111	203Y/117	208Y/120
		Three Phase Load KVA*			
3	9T51B102	.....	.830	.....	1.7
3	9T51B122	.620	.....	1.3	.....
3	9T51B103	.....	1.2	.....	2.5
3	9T51B123	.930	.....	1.9	.....
3	9T51B104	.....	1.7	.....	3.4
3	9T51B124	1.2	.....	2.5	.....
3	9T51B105	.....	2.5	.....	5.0
3	9T51B125	1.9	.....	3.7	.....
3	9T51B107	.....	4.2	.....	8.3
3	9T51B127	3.1	.....	6.2	.....
3	9T51B108	.....	8.3	.....	16.6
3	9T51B128	6.2	.....	12.5	.....
3	9T51B109	.....	12.5	.....	25.0
3	9T51B129	9.3	.....	18.7	.....
3	9T51B110	.....	16.6	.....	33.2
3	9T51B130	12.5	.....	25.0	.....
3	9T51B111	.....	25.0	.....	50.0
3	9T51B131	18.7	.....	37.0	.....
3	9T51B112	.....	33.0	.....	66.0
3	9T51B132	25.0	.....	50.0	.....
3	9T51B113	.....	50.0	.....	100.0
3	9T51B133	37.5	.....	75.0	.....
3	9T21B1061G2	.....	83.0	.....	167.0
3	9T21B1037G2	.....	83.0	.....	167.0
3	9T21B1064G2	62.0	.....	125.0	.....
3	9T21B1040G2	62.0	.....	125.0	.....
	Connection Diagram ‡	F	F	G	G

Table 6 — 240 Volts, 3 Wire Output, 60 Hertz Three Phase

Quantity Required per Bank	Model No.	Available Line Voltage ‡			
		189Y/109	200Y/115	208Y/120 # 212Y/122	218Y/126
		Three Phase Load KVA*			
3	9T51B102	.....	.870	.....	1.7
3	9T51B122	.650	.....	1.3	.....
3	9T51B103	.....	1.3	.....	2.6
3	9T51B123	.970	.....	2.0	.....
3	9T51B104	.....	1.7	.....	3.5
3	9T51B124	1.3	.....	2.6	.....
3	9T51B105	.....	2.6	.....	5.2
3	9T51B125	2.3	.....	3.9	.....
3	9T51B107	.....	4.3	.....	8.7
3	9T51B127	3.2	.....	6.5	.....
3	9T51B108	.....	8.7	.....	17.3
3	9T51B128	6.5	.....	13.0	.....
3	9T51B109	.....	13.0	.....	26.0
3	9T51B129	9.7	.....	19.5	.....
3	9T51B110	.....	17.3	.....	34.6
3	9T51B130	13.0	.....	26.0	.....
3	9T51B111	.....	26.0	.....	52.0
3	9T51B131	19.5	.....	39.0	.....
3	9T51B112	.....	35.0	.....	70.0
3	9T51B132	26.0	.....	52.0	.....
3	9T51B113	.....	52.0	.....	104.0
3	9T51B133	39.0	.....	78.0	.....
3	9T21B1061G2	.....	87.0	.....	173.0
3	9T21B1037G2	.....	87.0	.....	173.0
3	9T21B1064G2	65.0	.....	130.0	.....
3	9T21B1040G2	65.0	.....	130.0	.....
	Connection Diagram ‡	F	F	G	G

When 208Y/120 volts is the available line voltage, the 212Y/122 column may be used to obtain 236 volts which should be satisfactory for most applications.

Table 7 — 460 Volts, 3 Wire Output, 60 Hertz Three Phase

Quantity Required per Bank	Model No.	Available Line Voltage — 3 or 4 Wire			
		406	416	432	438
		Three Phase Load KVA*			
3	9T51B102	.....	1.66	.....	3.32
3	9T51B122	1.25	.....	2.49	.....
3	9T51B103	.....	2.48	.....	4.96
3	9T51B123	1.87	.....	3.73	.....
3	9T51B104	.....	3.31	.....	6.62
3	9T51B124	2.49	.....	4.97	.....
3	9T51B105	.....	4.97	.....	9.94
3	9T51B125	3.73	.....	7.46	.....
3	9T51B107	.....	8.28	.....	16.6
3	9T51B127	6.22	.....	12.4	.....
3	9T51B108	.....	16.6	.....	33.2
3	9T51B128	12.5	.....	24.9	.....
3	9T51B109	.....	24.8	.....	59.6
3	9T51B129	18.7	.....	37.3	.....
3	9T51B110	.....	33.1	.....	66.2
3	9T51B130	24.9	.....	49.7	.....
3	9T51B111	.....	49.7	.....	99.4
3	9T51B131	37.3	.....	74.6	.....
3	9T51B112	.....	66.3	.....	133.0
3	9T51B132	49.7	.....	99.5	.....
3	9T51B113	.....	99.3	.....	198.6
3	9T51B133	74.6	.....	149.0	.....
3	9T21B1061G2	.....	166.0	.....	332.0
3	9T21B1037G2	.....	166.0	.....	332.0
3	9T21B1064G2	125.0	.....	249.0	.....
3	9T21B1040G2	125.0	.....	249.0	.....
	Connection Diagram ‡	H	H	I	I

* The load kva in tables 7, 8, 9 and 10 is the maximum load at voltages shown when transformers are connected as autotransformers according to the diagram referenced and shown on back page.

§ This model can be found in single phase 480-120 volt listing.

Table 8 — 480 Volts, 3 Wire Output, 60 Hertz Three Phase

Quantity Required per Bank	Model No.	Available Line Voltage — 3 or 4 Wire		
		424	436	450
		Three Phase Load KVA*		
3	9T51B102	.....	1.74	.....
3	9T51B122	1.3	.....	2.6
3	9T51B103	.....	2.6	.....
3	9T51B123	1.95	.....	3.9
3	9T51B104	.....	3.5	.....
3	9T51B124	2.6	.....	5.2
3	9T51B105	.....	5.2	.....
3	9T51B125	3.9	.....	7.8
3	9T51B107	.....	8.7	.....
3	9T51B127	6.5	.....	13.0
3	9T51B108	.....	17.4	.....
3	9T51B128	13.0	.....	26.0
3	9T51B109	.....	26.0	.....
3	9T51B129	19.5	.....	39.0
3	9T51B110	.....	35.0	.....
3	9T51B130	26.0	.....	52.0
3	9T51B111	.....	52.0	.....
3	9T51B131	39.0	.....	78.0
3	9T51B112	.....	69.0	.....
3	9T51B132	52.0	.....	104.0
3	9T51B113	.....	104.0	.....
3	9T51B133	78.0	.....	156.0
3	9T21B1061G2	.....	174.0	.....
3	9T21B1037G2	.....	174.0	.....
3	9T21B1064G2	130.0	.....	260.0
3	9T21B1040G2	130.0	.....	260.0
	Connection Diagram ‡	H	H	I

Table 9 — 480 Volts, 3 Wire Output, 60 Hertz Three Phase

Quantity Required Per Bank	Model No.	Available Line Voltage	
		600	575
		Three Phase Load KVA*	
2	9T51B8	4.3	.....
2	9T51B88	.....	4.1
2	9T51B9	6.5	.....
2	9T51B89	.....	6.2
2	9T51B10	8.6	.....
2	9T51B90	.....	8.3
2	9T51B11	13.0	.....
2	9T51B91	.....	12.4
2	9T51B12	17.2	.....
2	9T51B92	.....	16.5
2	9T51B13	25.8	.....
2	9T51B93	.....	24.8
2	9T21B1004G2§	43.2	.....
2	9T21B1016G2¶	.....	41.0
2	9T21B1005G2§	65.0	.....
2	9T21B1017G2¶	.....	62.0
2	9T21B1006G2§	86.0	.....
2	9T21B1018G2¶	.....	83.0
2	9T21B9103§	130.0	.....
2	9T51B9111§	.....	124.0
2	9T21B9104§	216.0	.....
2	9T21B9112¶	.....	207.0
2	9T23B2622§	324.0	.....
2	9T23B2663§	432.0	.....
	Connection Diagram	J	K

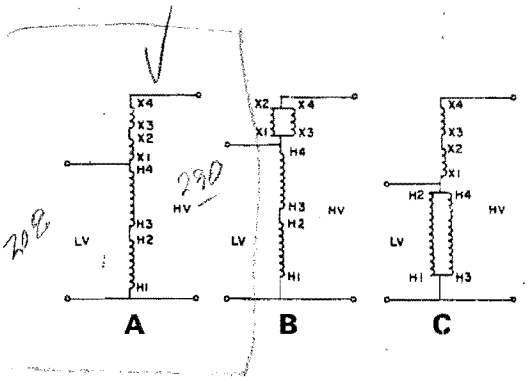
Table 10 — 480 Volts Output, 60 Hertz Single Phase

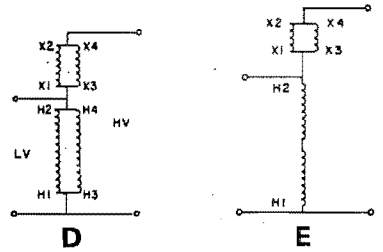
Model No.	Available Line Voltage	
	600	575
	Load KVA*	
9T51B8	2.5	.....
9T51B88	.....	2.4
9T51B9	3.7	.....
9T51B89	.....	3.6
9T51B10	5.0	.....
9T51B90	.....	4.8
9T51B11	7.5	.....
9T51B91	.....	7.2
9T51B12	10.0	.....
9T51B92	.....	9.6
9T51B13	15.0	.....
9T51B93	.....	14.3
9T21B1004G2§	25.0	.....
9T21B1016G2¶	.....	24.0
9T21B1005G2§	37.5	.....
9T21B1017G2¶	.....	36.0
9T21B1006G2§	50.0	.....
9T21B1018G2¶	.....	48.0
9T21B9103§	75.0	.....
9T21B9111§	.....	72.0
9T21B9104§	125.0	.....
9T21B9112¶	.....	120.0
9T23B2662§	187.0	.....
9T23B2663§	250.0	.....
Connection Diagram	B	E

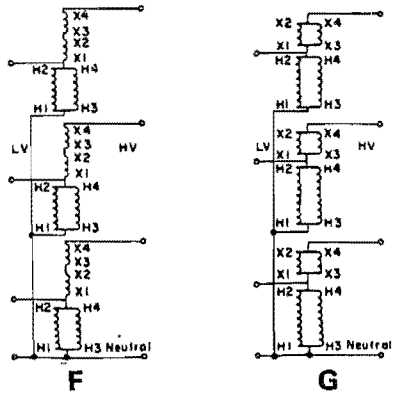
‡ Warning — 3 phase autotransformers should never be used to obtain 4 wire output with 3 wire input.

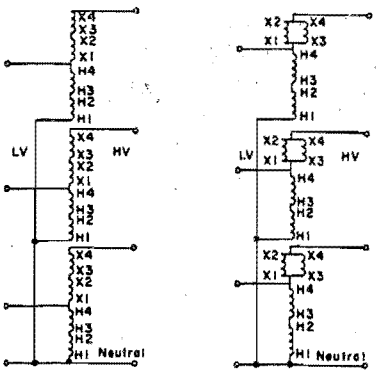
¶ This model can be found in single phase 600-120 volt listing.

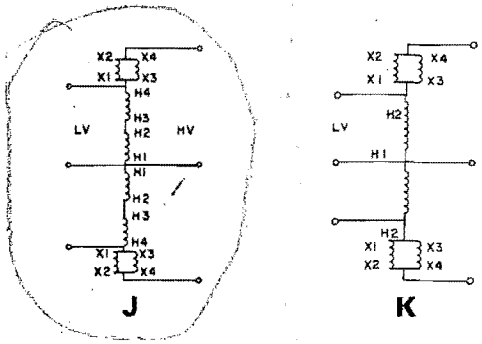
CONNECTION DIAGRAMS











WARNING: If input is 3 wire only, "neutral" connection must be isolated and insulated.