JEFFERSON®
Buck-Boost Transformers

0.050 to 10 KVA

TYPICAL APPLICATIONS

- *Voltage line drops*
- *Landscape lighting*
- *Low voltage lighting*
- *International voltage adaptation*
- *Motors*

For the name of your local representative, or for technical assistance, call

1-800-892-3755

Jefferson Electric®

Buck-Boost Transformers

features & benefits

- *Copper leadwire termination used for the primary, secondary and ground for easy, flexible connections.*
- *Heavy sheet metal enclosures for better durability in severe industrial applications.*
- *Large connection compartment with knockouts for ease of wiring and installation.*
- *Encapsulated with electrical grade epoxy and silica sand to completely seal the core and coils from moisture and contaminants.*
- *Heat applied ASA-61 Gray Powder Coat Finish to resist corrosion in industrial environments.*
- *Quiet operation for more flexibility in choice of mounting locations.*
- *Convenient lifting hooks on all units above 3 KVA to make installation easier.*
- *Type NEMA 3R enclosures for outdoor use to protect against rain, sleet or ice.*
- *Cores made from high quality electrical steel for increased efficiency and lower operating costs.*
- *Built in accordance with ANSI C57.12.*
- *Convenient wall mount design.*
- *UL Listed and CSA Approved.*
- *50/60 Hz. operation on transformers 2 KVA and smaller for more versatility.*
- *Slotted mounting holes for quick and easy mounting.*
- *180°C insulation system standard with 115°C temperature rise for longer, more reliable life.*
- *Wiring diagram permanently affixed to wiring compartment cover to avoid loss.*
- *Meets or exceeds all applicable NEMA, ANSI, OSHA, UL and CSA requirements.*
- *Made in U.S.A.*

Jefferson Electric single-phase Buck-Boost transformers are the most economical means available for stepping voltages up or down in many common applications. They can be used as isolating (or insulating) transformers for transforming standard line voltages to low secondary voltages. Also to buck or boost off-standard line voltages to satisfy standard load voltage requirements when hooked in Auto Configuration.

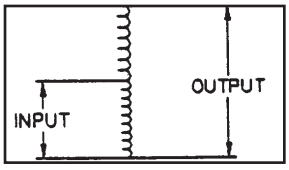
These transformers are designed for use on single- or three-phase circuits to supply 12/24 or 16/32 volt secondaries with 120/240 volt primary, and 24/48 volt secondaries with 240/480 volt primary.

When used in Auto Configuration, these small, compact and lightweight units will handle a large KVA load in comparison to their physical size and relative cost. When used as isolation transformers, they have innumerable low voltage applications.

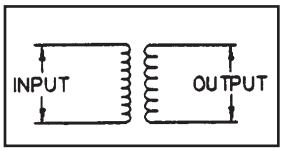
The difference between an autotransformer and an isolation transformer.

In an autotransformer, the input (or primary) and the output (or secondary) are electrically connected, while in an isolation transformer they are completely separated, as shown at right.

Only a portion of the electrical energy is changed in an autotransformer, the remainder flowing directly between the primary and secondary. In an isolation transformer, all the energy is transformed. For these reasons, an autotransformer is smaller, lighter and less costly than a comparable isolation transformer.



Autotransformer



Isolation (or Insulating) Transformer

Solve over/under line voltage problems efficiently and economically.

Electrical equipment is manufactured to operate most efficiently when the line voltage is equal to or nearly equal to the nameplate rating of the equipment. A motor operated at a voltage substantially under its nameplate rating may run constantly on the starting windings, resulting in overheating and possible burn-out. The same motor operated at a voltage substantially over its nameplate rating is subject to excessive heat rise, often extending beyond the insulation temperature limits, which may eventually cause the motor to burn out.

CAUTION: *Buck-Boost transformers will not compensate for fluctuating line voltages. They should only be used when line voltage is relatively constant.*

Buck-Boost Transformers

How to Use the Buck-Boost Rapid Selector Charts:

You will need the following information:

Line voltage:

This can be determined by measuring the supply line voltage with a voltmeter.

Load voltage:

The voltage at which your equipment was designed to operate. Usually listed on the equipment nameplate.

Load KVA or load amps:

One of these will usually be listed on the nameplate. You do not need both.

Supply line and equipment frequencies:

This will be either 50 or 60 cycles. The supply line frequency must be the same as the frequency of the equipment to be operated.

Supply line and equipment phase:

Either single-phase or three-phase. The line phase must be the same as the equipment.

The type of electrical configuration:

Delta or Wye.

Follow These Five Easy Steps:

1. Find the appropriate single-phase, three-phase delta or three-phase wye table.
2. Read down the voltage column and find the nearest ratio of required load voltage to line voltage for the application desired. (High and low voltage may be either input or output voltage depending on the circumstances.)
3. Reading horizontally across the line beginning with your application voltage ratio, locate in one of the KVA columns a KVA capacity equal to or larger than your load requirement.
4. Note the two digit number at the top of the KVA column listing the KVA capacity you require.
5. In the catalog number column, add these two digits to the catalog number next to the voltage ratio you found in step one.

EXAMPLE: (Assume the following information)

1. A reasonably constant line voltage of 440 volts.

2. A required equipment voltage of 480 volts.

3. 26.0 KVA load capacity needed.

4. Single-phase line and equipment.

In the voltage column, 437 is closest to our line voltage of 440. The 480 high voltage meets our requirements exactly.

Reading horizontally across this line, find 30.0 KVA, the closest larger KVA to our required 26.0.

Going to the very top of this column, take the two digit number, 81, and add it on the end of the catalog number on the same line as our high/low voltage. The catalog number 216-14, with 81 added on the end, is 216-1481.

The listings here do not cover all the possible applications of these versatile transformers. Please call for advice or a quotation on special applications.

Single-Phase • 600V Class

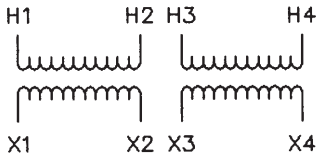
KVA	Catalog Number	Taps	Temp. Rise °C	Dimensions (Inches)				Wiring Diagram	Approx. Ship Wt. (lbs)
				Figure	Height A	Width B	Depth C		
120 x 240 Volts – 12/24 Volts									
.050*	216-1100-000	None	55	1	8.25	3.63	3.5	60A	5.25
.100*	216-1101-000			1	8.25	3.63	3.5		6.13
.150*	216-1111-000			1	8.25	3.63	3.5		7.25
.250*	216-1121-000		115	1	9.38	4.38	4.06		11
.500*	216-1131-000			1	9.38	4.38	4.06		14
.750*	216-1141-000			1	11.5	5.13	4.75		19
1*	216-1151-000			1	11.5	5.13	4.75		26
1.5*	216-1161-000			1	13	5.88	5.31		30
2*	216-1171-000			1	13	5.88	5.31		41
3	216-1181-000			1	15.63	7.5	6.75		65
5	216-1191-000			2	15.63	7.5	6.75		78
7.5	216-2101-000			2	21.16	16.00	10.75		175
10	216-2111-000			2	21.16	16.00	10.75		200
120 x 240 Volts – 16/32 Volts									
.050*	216-1200-000	None	55	1	8.25	3.63	3.5	60B	5.25
.100*	216-1201-000			1	8.25	3.63	3.5		6.13
.150*	216-1211-000			1	8.25	3.63	3.5		7.25
.250*	216-1221-000		115	1	9.38	4.38	4.06		11
.500*	216-1231-000			1	9.38	4.38	4.06		14
.750*	216-1241-000			1	11.5	5.13	4.75		19
1*	216-1251-000			1	11.5	5.13	4.75		26
1.5*	216-1261-000			1	13	5.88	5.31		31
2*	216-1271-000			1	13	5.88	5.31		41
3	216-1281-000			1	15.63	7.5	6.75		65
5	216-1291-000			2	15.63	7.5	6.75		78
7.5	216-2201-000			2	22.18	16.00	10.75		175
10	216-2211-000			2	25.18	16.00	10.75		200
240 x 480 Volts – 24/48 Volts									
.050*	216-1400-000	None	55	1	8.25	3.63	3.5	60C	5.25
.100*	216-1401-000			1	8.25	3.63	3.5		6.13
.150*	216-1411-000			1	8.25	3.63	3.5		7.25
.250*	216-1421-000		115	1	9.38	4.38	4.06		11
.500*	216-1431-000			1	9.38	4.38	4.06		14
.750*	216-1441-000			1	11.5	5.13	4.75		19
1*	216-1451-000			1	11.5	5.13	4.75		26
1.5*	216-1461-000			1	13	5.88	5.31		30
2*	216-1471-000			1	13	5.88	5.31		41
3	216-1481-000			1	15.63	7.5	6.75		65
5	216-1491-000			1	15.63	7.5	6.75		78
7.5	216-2401-000			2	22.18	16.00	10.75		175
10	216-2411-000			2	25.18	16.00	10.75		200

NOTE: Housing dimensions subject to change without notice. Contact factory where dimensions are critical.

* 50/60 Hertz

Wiring Diagram 60A

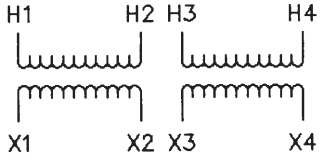
PRIMARY: 120 X 240
SECONDARY: 12/24 TAPS: None



Primary		
Volts	**Inter-Connect**	**Connect Primary Lines To**
240	H2 to H3	H1-H4
120	H1 to H3 H2 to H4	H1-H4
Secondary		
Volts	**Inter-Connect**	**Connect Secondary Lines To**
24	X2 to X3	X1-X4
12	X1 to X3 X2 to X4	X1-X4

Wiring Diagram 60B

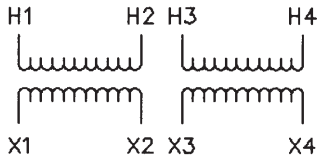
PRIMARY: 120 X 240
SECONDARY: 16/32 TAPS: None



Primary		
Volts	**Inter-Connect**	**Connect Primary Lines To**
240	H2 to H3	H1-H4
120	H1 to H3 H2 to H4	H1-H4
Secondary		
Volts	**Inter-Connect**	**Connect Secondary Lines To**
32	X2 to X3	X1-X4
16	X1 to X3 X2 to X4	X1-X4

Wiring Diagram 60C

PRIMARY: 240 X 480
SECONDARY: 24/48 TAPS: None



Primary		
Volts	**Inter-Connect**	**Connect Primary Lines To**
480	H2 to H3	H1-H4
240	H1 to H3 H2 to H4	H1-H4
Secondary		
Volts	**Inter-Connect**	**Connect Secondary Lines To**
48	X2 to X3	X1-X4
24	X1 to X3 X2 to X4	X1-X4

Figure 1

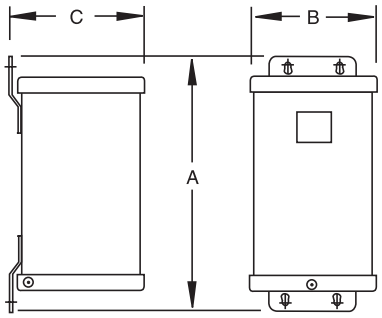
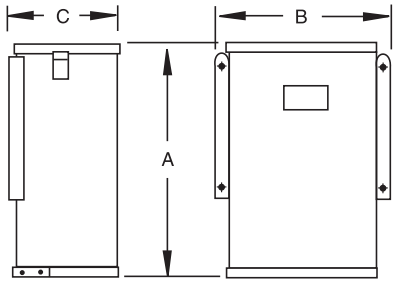


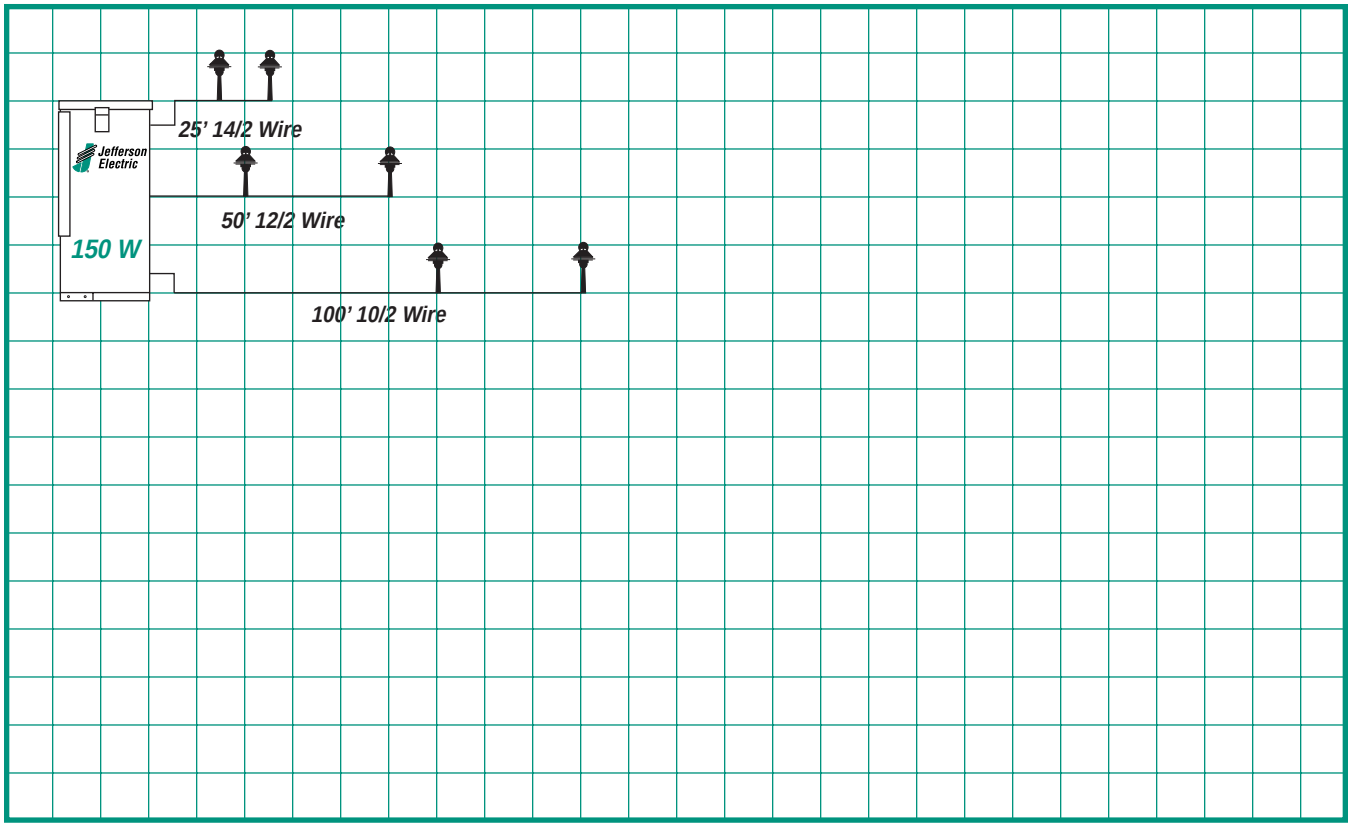
Figure 2



BUCK-BOOST

A typical low voltage installation showing three separate runs on a 150 W Power Supply

One square equals 10”



Voltage Drop Formula

$$\frac{\text{Total Watts on Cable}}{\text{Cable Size Divider}} \times \text{Length of Run} = \textbf{Voltage Drop}$$

LAMP CHARACTERISTICS VS. VOLTAGE		
Voltage at Lamp	**Life Expectancy of Lamp**	**Rated Candlepower**
+10%	2/3 Rated	350%
+5%	3/4 Rated	160%
12.0	As Rated	100%
-5%	2X Rated	80%
-10%	3X Rated	74%
-15%	5X Rated	65%
-20%	9X Rated	50%

CABLE CHART	
Cable Size	**Cable Size Divider**
#18	790
#16	1100
#14	1750
#12	3750
#10	5960
#8	9480
#6	10,075