

0.050 to 10 KVA

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Products

- *Single-Phase Encapsulated: 50 VA through 10 KVA**

Applications

- *For correcting voltage line drops, landscape lighting, low voltage lighting, international voltage adaptation and motor applications*
- *Note: Buck-boost transformers do not compensate for fluctuating line voltages.*

Specifications

- *Encapsulated with electrical grade resin*
- *Cores of high quality electrical steel*
- *60 Hz operation*
- *NEMA 3R-rated enclosures*
- *135°C temperature rise, 180°C insulation class or 95°C temperature rise, 130°C insulation class depending on kVA size*
- *Heat-cured ASA-61 gray powder coat finish*

Features, Functions, Benefits

- *Slotted mounting holes for quick and easy mounting*
- *Convenient wall mount design with lifting hooks above 5 KVA*
- *Permanently affixed wiring diagram*

Standards

- *Built in accordance with NEMA, ANSI, UL and CSA standards*

***Options and Accessories**

- *CE Marked units available as custom*
- *Other sizes and voltages available as custom*

Buck-Boost – Powerformer™

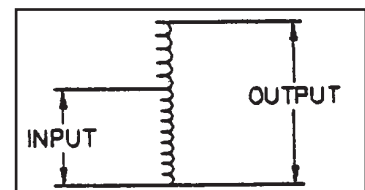
Jefferson Electric single-phase Buck-Boost transformers are the most economical means available for stepping voltages up or down in many common applications. They can be used as isolating (or insulating) transformers for transforming standard line voltages to low secondary voltages. They are also used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

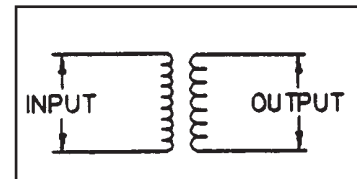
The difference between an autotransformer and an isolation transformer.

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 to the 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.

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 (416-Series = 60 Hz, 516-Series = 50 Hz).

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 416-14, with 81 added on the end, is 416-1481.

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

Buck-Boost – Powerformer™

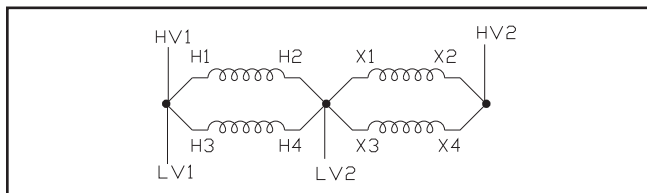
Single-Phase KVA Capacity of Encapsulated Powerformers™

Maximum load capabilities

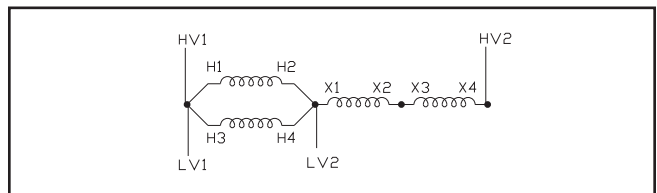
| Low Voltage (LV) | High Voltage (HV) | Catalog Number | Load Required* | 01 .100 KVA | 11 .150 KVA | 21 .250 KVA | 31 .500 KVA | 41 .750 KVA | 51 1.0 KVA | 61 1.5 KVA | 71 2.0 KVA | 81 3.0 KVA | 91 5.0 KVA | Wiring Diagram |
|------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| 95 | 120 | 416-12 | KVA | .37 | .56 | .94 | 1.8 | 2.8 | 3.7 | 5.6 | 7.5 | 11.2 | 18.8 | 2 |
| | | | AMPS | 3.95 | 5.93 | 9.89 | 19.7 | 29.6 | 39.5 | 59.3 | 79.1 | 118 | 197 | |
| 100 | 120 | 416-11 | KVA | .50 | .75 | 1.25 | 2.50 | 3.7 | 5.0 | 7.5 | 10.0 | 15.0 | 25.0 | 2 |
| | | | AMPS | 5.0 | 7.5 | 12.5 | 25.0 | 37.0 | 50.0 | 75.0 | 100 | 150 | 250 | |
| 106 | 120 | 416-12 | KVA | .75 | 1.12 | 1.87 | 3.7 | 5.6 | 7.5 | 11.2 | 15.0 | 22.5 | 37.0 | 1 |
| | | | AMPS | 7.07 | 10.5 | 17.6 | 34.9 | 52.8 | 70.7 | 105 | 141 | 212 | 349 | |
| 109 | 120 | 416-11 | KVA | 1.00 | 1.50 | 2.50 | 5.0 | 7.5 | 10.0 | 15.0 | 20.0 | 30.0 | 50.0 | 1 |
| | | | AMPS | 9.17 | 13.7 | 22.9 | 45.8 | 68.8 | 91.7 | 137 | 183 | 275 | 458 | |
| 120 | 132 | 416-11 | KVA | 1.10 | 1.65 | 2.75 | 5.5 | 8.2 | 11.0 | 16.5 | 22.0 | 33.0 | 55.0 | 1 |
| | | | AMPS | 9.17 | 13.7 | 22.9 | 45.8 | 68.8 | 91.7 | 137 | 183 | 275 | 458 | |
| 120 | 136 | 416-12 | KVA | .85 | 1.27 | 2.12 | 4.2 | 6.3 | 8.5 | 12.7 | 17.0 | 25.5 | 42.0 | 1 |
| | | | AMPS | 7.08 | 10.5 | 17.6 | 35.0 | 52.5 | 70.8 | 105 | 141 | 212 | 350 | |
| 120 | 144 | 416-11 | KVA | .60 | .90 | 1.50 | 3.0 | 4.5 | 6.0 | 9.0 | 12.0 | 18.0 | 30.0 | 2 |
| | | | AMPS | 5.0 | 7.5 | 12.5 | 25.0 | 37.5 | 50.0 | 75.0 | 100 | 150 | 250 | |
| 120 | 152 | 416-12 | KVA | .47 | .71 | 1.18 | 2.3 | 3.5 | 4.7 | 7.1 | 9.5 | 14.2 | 23.0 | 2 |
| | | | AMPS | 3.91 | 5.91 | 9.83 | 19.1 | 29.1 | 39.1 | 59.1 | 79.1 | 118 | 191 | |
| 200 | 240 | 416-14 | KVA | .50 | .75 | 1.25 | 2.5 | 3.7 | 5.0 | 7.5 | 10.0 | 15.0 | 25.0 | 2 |
| | | | AMPS | 2.50 | 3.75 | 6.25 | 12.5 | 18.7 | 25.0 | 37.5 | 50.0 | 75.0 | 125 | |
| 208 | 236 | 416-12 | KVA | .73 | 1.10 | 1.84 | 3.6 | 5.5 | 7.3 | 11.0 | 14.7 | 22.1 | 36.8 | 4 |
| | | | AMPS | 3.53 | 5.28 | 8.82 | 17.4 | 26.4 | 35.3 | 52.8 | 70.7 | 106 | 174 | |
| 212 | 240 | 416-12 | KVA | .75 | 1.12 | 1.87 | 3.7 | 5.6 | 7.5 | 11.2 | 15.0 | 22.5 | 37.0 | 4 |
| | | | AMPS | 3.53 | 5.28 | 8.82 | 17.4 | 26.4 | 35.3 | 52.8 | 70.7 | 106 | 174 | |
| 208 | 230 | 416-11 | KVA | .95 | 1.4 | 2.3 | 4.7 | 7.1 | 9.5 | 14.3 | 19.0 | 28.6 | 47.6 | 4 |
| | | | AMPS | 4.58 | 6.88 | 11.4 | 22.9 | 34.4 | 45.8 | 68.8 | 91.7 | 137 | 229 | |
| 218 | 240 | 416-11 | KVA | 1.00 | 1.5 | 2.5 | 5.0 | 7.5 | 10.0 | 15.0 | 20.0 | 30.0 | 50.0 | 4 |
| | | | AMPS | 4.58 | 6.88 | 11.4 | 22.9 | 34.4 | 45.8 | 68.8 | 91.7 | 137 | 229 | |
| 225 | 240 | 416-12 | KVA | 1.5 | 2.25 | 3.75 | 7.5 | 11.2 | 15.0 | 22.5 | 30.0 | 45.0 | 75.0 | 3 |
| | | | AMPS | 6.66 | 10.0 | 16.6 | 33.3 | 49.7 | 66.6 | 100 | 133 | 200 | 333 | |
| 230 | 276 | 416-14 | KVA | .57 | .86 | 1.43 | 2.8 | 4.3 | 5.7 | 8.6 | 11.5 | 17.2 | 28.7 | 2 |
| | | | AMPS | 2.50 | 3.75 | 6.25 | 12.5 | 18.7 | 25.0 | 37.5 | 50.0 | 75.0 | 124 | |
| 240 | 252 | 416-11 | KVA | 2.1 | 3.15 | 5.25 | 10.5 | 15.7 | 21.0 | 31.5 | 42.0 | 63.0 | 105 | 3 |
| | | | AMPS | 8.75 | 13.1 | 21.8 | 43.7 | 65.4 | 87.5 | 131 | 175 | 262 | 437 | |
| 240 | 264 | 416-11 | KVA | 1.1 | 1.65 | 2.75 | 5.5 | 8.2 | 11.0 | 16.5 | 22.0 | 33.0 | 55.0 | 4 |
| | | | AMPS | 4.58 | 6.87 | 11.4 | 22.9 | 34.1 | 45.8 | 68.7 | 91.6 | 137 | 229 | |
| 240 | 272 | 416-12 | KVA | .85 | 1.27 | 2.12 | 4.2 | 6.3 | 8.5 | 12.7 | 17.0 | 25.5 | 42.0 | 4 |
| | | | AMPS | 3.54 | 5.29 | 8.83 | 17.5 | 26.2 | 35.4 | 52.9 | 70.8 | 106 | 175 | |
| 240 | 288 | 416-14 | KVA | .60 | .90 | 1.50 | 3.0 | 4.5 | 6.0 | 9.0 | 12.0 | 18.0 | 30.0 | 2 |
| | | | AMPS | 2.5 | 3.75 | 6.25 | 12.5 | 18.7 | 25.0 | 37.5 | 50.0 | 75.0 | 125 | |
| 437 | 480 | 416-14 | KVA | 1.00 | 1.50 | 2.50 | 5.0 | 7.5 | 10.0 | 15.0 | 20.0 | 30.0 | 50.0 | 4 |
| | | | AMPS | 2.28 | 3.43 | 5.72 | 11.4 | 17.1 | 22.8 | 34.3 | 45.7 | 68.6 | 114 | |
| 457 | 480 | 416-14 | KVA | 2.0 | 3.0 | 5.0 | 10.0 | 15.0 | 20.0 | 30.0 | 40.0 | 60.0 | 100 | 3 |
| | | | AMPS | 4.37 | 6.56 | 10.9 | 21.8 | 32.8 | 43.7 | 65.6 | 87.5 | 131 | 218 | |
| 480 | 504 | 416-14 | KVA | 2.1 | 3.15 | 5.25 | 10.5 | 15.7 | 21.0 | 31.5 | 42.0 | 63.0 | 105 | 3 |
| | | | AMPS | 4.37 | 6.56 | 10.9 | 21.8 | 32.8 | 43.7 | 65.6 | 87.5 | 131 | 218 | |
| 480 | 528 | 416-14 | KVA | 1.1 | 1.65 | 2.75 | 5.5 | 8.2 | 11.0 | 16.5 | 22.0 | 33.0 | 55.0 | 4 |
| | | | AMPS | 2.29 | 3.43 | 5.72 | 11.4 | 17.0 | 22.9 | 34.3 | 45.8 | 68.7 | 114 | |

* Load required is calculated based on the low voltage as the load.

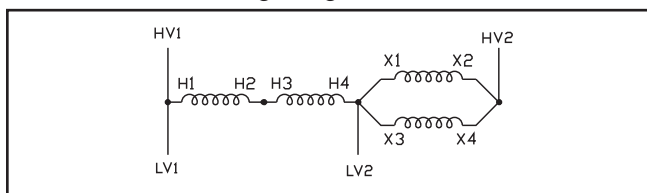
Buck-Boost Wiring Diagram 1



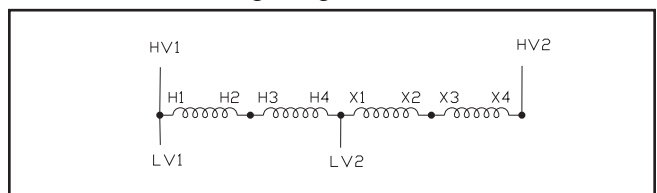
Buck-Boost Wiring Diagram 2



Buck-Boost Wiring Diagram 3



Buck-Boost Wiring Diagram 4



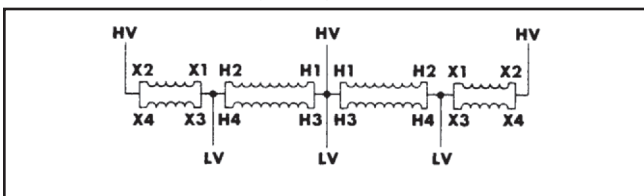
Version JE901.0411

Three-Phase KVA Capacity of Encapsulated Powerformers™ Connected in Open-Delta Maximum load capabilities requiring two Powerformers

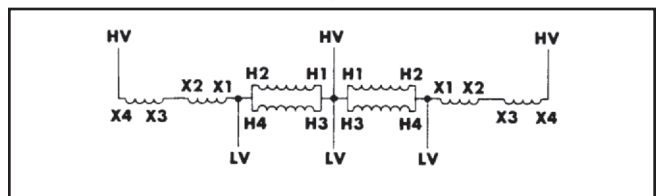
| Low Voltage (LV) | High Voltage (HV) | Catalog Number | Load Required* | 01 .100 KVA | 11 .150 KVA | 21 .250 KVA | 31 .500 KVA | 41 .750 KVA | 51 1.0 KVA | 61 1.5 KVA | 71 2.0 KVA | 81 3.0 KVA | 91 5.0 KVA | Wiring Diagram |
|------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| 200 | 240 | 416-14xx | KVA | 0.86 | 1.29 | 2.1 | 4.3 | 6.4 | 8.6 | 12.9 | 17.2 | 25.0 | 43.0 | 10 |
| | | | Amperes | 2.1 | 3.1 | 5.1 | 10.3 | 15.4 | 20.7 | 31.0 | 41.4 | 60.1 | 103.4 | |
| 208 | 236 | 416-12xx | KVA | 1.27 | 1.91 | 3.1 | 6.3 | 9.5 | 12.7 | 19.1 | 25.5 | 38.2 | 63.7 | 12 |
| | | | Amperes | 3.1 | 4.7 | 7.6 | 15.4 | 23.2 | 31.1 | 46.7 | 62.4 | 93.4 | 155.8 | |
| 212 | 240 | 416-12xx | KVA | 1.29 | 1.94 | 3.2 | 6.4 | 9.7 | 12.9 | 19.4 | 25.8 | 38.0 | 64.0 | 12 |
| | | | Amperes | 3.1 | 4.7 | 7.7 | 15.4 | 23.3 | 31.0 | 46.7 | 62.1 | 91.4 | 154.0 | |
| 208 | 230 | 416-11xx | KVA | 1.65 | 2.47 | 4.1 | 8.2 | 12.3 | 16.5 | 24.7 | 33.0 | 49.5 | 82.5 | 12 |
| | | | Amperes | 4.1 | 6.2 | 10.3 | 20.6 | 30.9 | 41.4 | 62.0 | 82.8 | 124.3 | 207.1 | |
| 218 | 240 | 416-11xx | KVA | 1.73 | 2.59 | 4.3 | 8.6 | 12.9 | 17.3 | 25.9 | 34.6 | 51.0 | 86.0 | 12 |
| | | | Amperes | 4.2 | 6.2 | 10.3 | 20.7 | 31.0 | 41.6 | 62.3 | 83.2 | 122.7 | 206.9 | |
| 225 | 240 | 416-12xx | KVA | 2.59 | 3.89 | 6.4 | 12.9 | 19.4 | 25.9 | 38.9 | 51.9 | 77.0 | 129 | 11 |
| | | | Amperes | 6.2 | 9.4 | 15.4 | 31.0 | 46.7 | 62.3 | 93.6 | 124.8 | 185.2 | 310.3 | |
| 229 | 240 | 416-11xx | KVA | 3.46 | 5.18 | 8.6 | 17.3 | 25.9 | 34.6 | 51.8 | 69.2 | 103 | 173 | 11 |
| | | | Amperes | 8.3 | 12.5 | 20.7 | 41.6 | 62.3 | 83.2 | 124.6 | 166.5 | 247.8 | 416.2 | |
| 230 | 253 | 416-14xx | KVA | 1.81 | 2.72 | 4.5 | 9.0 | 13.6 | 18.1 | 27.2 | 36.3 | 54.0 | 90.0 | 9 |
| | | | Amperes | 4.1 | 6.2 | 10.3 | 20.5 | 31.0 | 41.3 | 62.1 | 82.8 | 123.2 | 205.4 | |
| 230 | 276 | 416-14xx | KVA | 0.99 | 1.49 | 2.4 | 4.9 | 7.4 | 9.9 | 14.9 | 19.9 | 29.0 | 49.0 | 10 |
| | | | Amperes | 2.1 | 3.1 | 5.0 | 10.2 | 15.5 | 20.7 | 31.2 | 41.6 | 60.7 | 102.5 | |
| 240 | 252 | 416-11xx | KVA | 3.64 | 5.47 | 9.1 | 18.2 | 27.2 | 36.4 | 54.7 | 72.8 | 109 | 182 | 11 |
| | | | Amperes | 8.3 | 12.5 | 20.8 | 41.7 | 62.3 | 83.4 | 125.3 | 166.8 | 249.7 | 417.0 | |
| 240 | 264 | 416-11xx | KVA | 1.9 | 2.86 | 4.7 | 9.5 | 14.2 | 19.0 | 28.6 | 38.1 | 57.0 | 95.0 | 12 |
| | | | Amperes | 4.2 | 6.3 | 10.3 | 20.8 | 31.1 | 41.6 | 62.5 | 83.3 | 124.7 | 207.8 | |
| 240 | 272 | 416-12xx | KVA | 1.47 | 2.2 | 3.6 | 7.3 | 11.0 | 14.7 | 22.0 | 29.4 | 44.1 | 73.6 | 12 |
| | | | Amperes | 3.1 | 4.7 | 7.6 | 15.5 | 23.3 | 31.2 | 46.7 | 62.4 | 93.6 | 156.2 | |
| 240 | 288 | 416-14xx | KVA | 1.03 | 1.55 | 2.5 | 5.1 | 7.7 | 10.3 | 15.5 | 20.7 | 31.0 | 51.0 | 10 |
| | | | Amperes | 2.1 | 3.1 | 5.0 | 10.2 | 15.4 | 20.6 | 31.1 | 41.5 | 62.1 | 102.2 | |
| 437 | 480 | 416-14xx | KVA | 1.73 | 2.59 | 4.3 | 8.6 | 12.9 | 17.3 | 25.9 | 34.6 | 51.0 | 86.0 | 12 |
| | | | Amperes | 2.1 | 3.1 | 5.2 | 10.3 | 15.5 | 20.8 | 31.2 | 41.6 | 61.3 | 103.4 | |
| 457 | 480 | 416-14xx | KVA | 3.46 | 5.18 | 8.6 | 17.3 | 25.9 | 34.6 | 51.8 | 69.2 | 103 | 173 | 11 |
| | | | Amperes | 4.2 | 6.2 | 10.3 | 20.8 | 31.2 | 41.6 | 62.3 | 83.2 | 123.9 | 208.1 | |
| 480 | 504 | 416-14xx | KVA | 3.64 | 5.47 | 9.1 | 18.2 | 27.2 | 36.4 | 54.7 | 72.8 | 109 | 183 | 11 |
| | | | Amperes | 4.2 | 6.3 | 10.4 | 20.8 | 31.2 | 41.7 | 62.7 | 83.4 | 124.9 | 209.6 | |
| 480 | 528 | 416-14xx | KVA | 1.9 | 2.86 | 4.7 | 9.5 | 14.2 | 19.0 | 28.6 | 38.1 | 57.0 | 95.0 | 12 |
| | | | Amperes | 2.1 | 3.1 | 5.1 | 10.4 | 15.5 | 20.8 | 31.3 | 41.7 | 62.3 | 103.9 | |

* Load required is calculated based on the low voltage as the load.

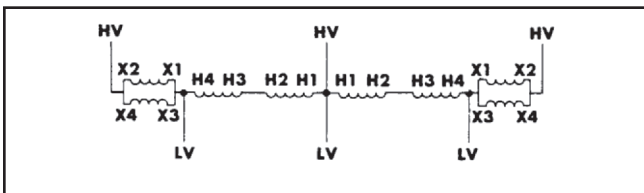
Buck-Boost Wiring Diagram 9



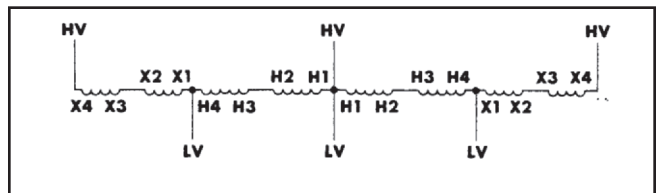
Buck-Boost Wiring Diagram 10



Buck-Boost Wiring Diagram 11



Buck-Boost Wiring Diagram 12



Buck-Boost – Powerformer™

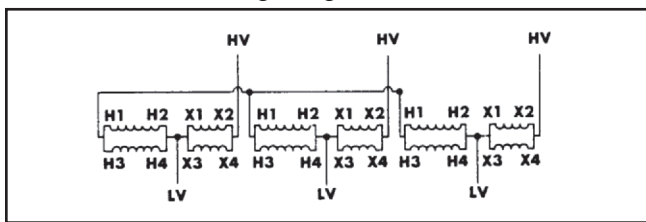
Three-Phase KVA Capacity of Encapsulated Powerformers™ Connected in Wye

Maximum load capabilities requiring three Powerformers

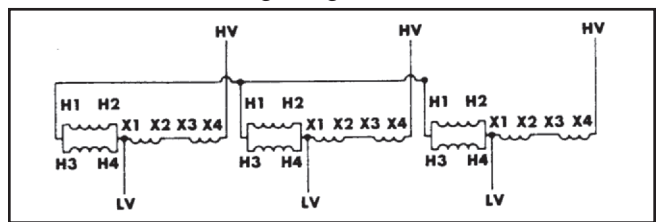
| Low Voltage (LV) | High Voltage (HV) | Catalog Number | Load Required* | 01 .100 KVA | 11 .150 KVA | 21 .250 KVA | 31 .500 KVA | 41 .750 KVA | 51 1.0 KVA | 61 1.5 KVA | 71 2.0 KVA | 81 3.0 KVA | 91 5.0 KVA | Wiring Diagram |
|------------------|-------------------|----------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|----------------|
| 164 | 208 | 416-12 | KVA | 1.1 | 1.7 | 2.8 | 5.6 | 8.4 | 11.2 | 16.8 | 22.0 | 34.0 | 56.0 | 6 |
| | | | AMPS | 3.89 | 5.89 | 9.79 | 18.9 | 29.4 | 38.9 | 58.9 | 78.9 | 117 | 197 | |
| 173 | 208 | 416-11 | KVA | 1.5 | 2.2 | 3.7 | 7.5 | 11.2 | 15.0 | 22.5 | 30.0 | 45.0 | 75.0 | 6 |
| | | | AMPS | 5.0 | 7.5 | 12.5 | 25.0 | 37.0 | 50.0 | 75.0 | 100 | 150 | 250 | |
| 183 | 208 | 416-12 | KVA | 2.2 | 3.3 | 5.6 | 11.2 | 16.8 | 22.5 | 33.7 | 45.0 | 67.0 | 112 | 5 |
| | | | AMPS | 7.07 | 10.5 | 17.6 | 34.9 | 52.8 | 70.7 | 105 | 141 | 212 | 354 | |
| 189 | 208 | 416-11 | KVA | 3.0 | 4.5 | 7.5 | 15.0 | 22.5 | 30.0 | 45.0 | 60.0 | 90.0 | 150 | 5 |
| | | | AMPS | 9.17 | 13.7 | 22.9 | 45.8 | 68.8 | 91.7 | 137 | 183 | 275 | 458 | |
| 208 | 229 | 416-11 | KVA | 3.3 | 4.9 | 8.2 | 16.5 | 24.7 | 33.0 | 49.5 | 66.0 | 99.0 | 165 | 5 |
| | | | AMPS | 9.17 | 13.7 | 22.9 | 45.8 | 68.8 | 91.7 | 137 | 183 | 275 | 458 | |
| 208 | 235 | 416-12 | KVA | 2.5 | 3.8 | 6.3 | 12.7 | 19.1 | 25.5 | 38.2 | 51.0 | 76.5 | 127 | 5 |
| | | | AMPS | 7.08 | 10.5 | 17.6 | 35.0 | 52.5 | 70.8 | 105 | 141 | 212 | 350 | |
| 208 | 249 | 416-11 | KVA | 1.8 | 2.7 | 4.5 | 9.0 | 13.5 | 18.0 | 27.0 | 36.0 | 54.0 | 90.0 | 6 |
| | | | AMPS | 5.0 | 7.5 | 12.5 | 25.0 | 37.5 | 50.0 | 75.0 | 100 | 150 | 250 | |
| 208 | 263 | 416-12 | KVA | 1.4 | 2.1 | 3.5 | 7.1 | 10.6 | 14.2 | 21.4 | 28.0 | 42.0 | 71.0 | 6 |
| | | | AMPS | 3.91 | 5.91 | 9.83 | 19.1 | 29.1 | 39.1 | 59.1 | 79.1 | 118 | 191 | |
| 346 | 416 | 416-14 | KVA | 1.5 | 2.2 | 3.7 | 7.5 | 11.2 | 15.0 | 22.5 | 30.0 | 45.0 | 75.0 | 6 |
| | | | AMPS | 2.5 | 3.75 | 6.25 | 12.5 | 18.5 | 25.0 | 37.5 | 50.0 | 75.0 | 125 | |
| 367 | 416 | 416-12 | KVA | 2.2 | 3.3 | 5.6 | 11.2 | 16.8 | 22.5 | 33.7 | 45.0 | 67.0 | 112 | 8 |
| | | | AMPS | 3.53 | 5.28 | 8.82 | 17.4 | 26.4 | 35.3 | 52.8 | 70.7 | 106 | 174 | |
| 378 | 416 | 416-11 | KVA | 3.0 | 4.5 | 7.5 | 15.0 | 22.5 | 30.0 | 45.0 | 60.0 | 90.0 | 150 | 8 |
| | | | AMPS | 4.58 | 6.88 | 11.4 | 22.9 | 34.4 | 45.8 | 68.8 | 91.7 | 137 | 229 | |
| 390 | 416 | 416-12 | KVA | 4.5 | 6.7 | 11.2 | 22.5 | 33.7 | 45.0 | 67.5 | 90.0 | 135 | 225 | 7 |
| | | | AMPS | 6.66 | 10.0 | 16.6 | 33.3 | 49.7 | 66.6 | 100 | 133 | 200 | 333 | |
| 397 | 416 | 416-11 | KVA | 6.0 | 9.0 | 15.0 | 30.0 | 45.0 | 60.0 | 90.0 | 120 | 180 | 300 | 7 |
| | | | AMPS | 8.73 | 13.1 | 21.8 | 43.6 | 65.5 | 87.3 | 131 | 174 | 262 | 436 | |
| 398 | 438 | 416-14 | KVA | 3.1 | 4.7 | 7.8 | 15.7 | 23.6 | 31.5 | 47.2 | 63.0 | 94.0 | 157 | 5 |
| | | | AMPS | 4.56 | 6.82 | 11.3 | 22.6 | 33.9 | 45.6 | 68.2 | 91.3 | 136 | 229 | |
| 398 | 478 | 416-14 | KVA | 1.7 | 2.5 | 4.3 | 8.6 | 12.9 | 17.2 | 25.9 | 34.0 | 51.0 | 86.0 | 6 |
| | | | AMPS | 2.50 | 3.75 | 6.25 | 12.5 | 18.7 | 25.0 | 37.5 | 50.0 | 75.0 | 125 | |
| 416 | 437 | 416-11 | SKVA | 6.3 | 9.4 | 15.7 | 31.5 | 47.2 | 63.0 | 94.5 | 126 | 189 | 315 | 7 |
| | | | AMPS | 8.75 | 13.1 | 21.8 | 43.7 | 65.4 | 87.5 | 131 | 175 | 262 | 437 | |
| 416 | 443 | 416-12 | KVA | 4.8 | 7.2 | 12.0 | 24.0 | 36.0 | 48.0 | 72.0 | 96.0 | 144 | 240 | 7 |
| | | | AMPS | 6.66 | 10.0 | 16.6 | 33.3 | 50.0 | 66.6 | 100 | 133 | 200 | 333 | |
| 416 | 457 | 416-11 | KVA | 3.3 | 4.9 | 8.2 | 16.5 | 24.7 | 33.0 | 49.5 | 66.0 | 99.0 | 165 | 8 |
| | | | AMPS | 4.58 | 6.87 | 11.4 | 22.9 | 34.1 | 45.8 | 68.7 | 91.6 | 137 | 229 | |
| 416 | 471 | 416-12 | KVA | 2.5 | 3.8 | 6.3 | 12.7 | 19.1 | 25.5 | 38.2 | 51.0 | 76.5 | 127 | 8 |
| | | | AMPS | 3.54 | 5.29 | 8.83 | 17.5 | 26.2 | 35.4 | 52.9 | 70.8 | 106 | 175 | |
| 416 | 498 | 416-14 | KVA | 1.8 | 2.7 | 4.5 | 9.0 | 13.5 | 18.0 | 27.0 | 36.0 | 54.0 | 90.0 | 6 |
| | | | AMPS | 2.5 | 3.75 | 6.25 | 12.5 | 18.7 | 25.0 | 37.5 | 50.0 | 75.0 | 125 | |

* Load required is calculated based on the low voltage as the load.

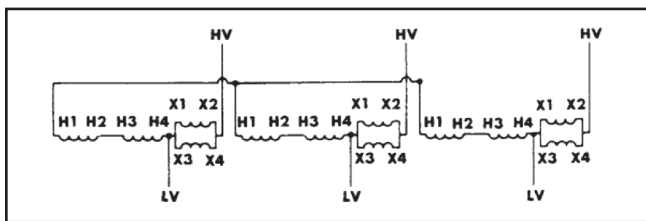
Buck-Boost Wiring Diagram 5



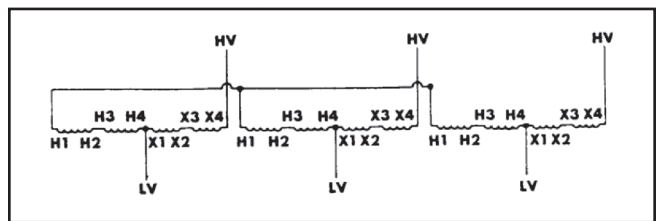
Buck-Boost Wiring Diagram 6



Buck-Boost Wiring Diagram 7



Buck-Boost Wiring Diagram 8



Version JE901.0411

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Buck-Boost – Powerformer™

Single-Phase - 600V Class - 60Hz -

.050 – 1 KVA: 130°C Insulation Class • 1.5 – 10 KVA: 180°C Insulation Class

| KVA | Catalog Number | Temp Rise °C | Fig. | Height A (in.) | Width B (in.) | Depth C (in.) | Wiring Diagram | Est. Ship Wgt. (lbs.) | |
|-------------------------------------|----------------|--------------|------|----------------|---------------|---------------|----------------|-----------------------|------|
| 120 x 240 V – 12/24 V 60 Hz | | | | | | | | | |
| .050 | 416-1100-000 | 95 | 2 | 8.03 | 3.31 | 3.08 | S240B | 4.4 | |
| .100 | 416-1101-000 | | 2 | 8.03 | 3.31 | 3.08 | | 4.8 | |
| .150 | 416-1111-000 | | 2 | 8.03 | 3.31 | 3.08 | | 5.6 | |
| .250 | 416-1121-000 | | 2 | 8.03 | 3.31 | 3.08 | | 6.7 | |
| .500 | 416-1131-000 | | 2 | 10.19 | 5.06 | 4.59 | | 15.0 | |
| .750 | 416-1141-000 | | 2 | 10.19 | 5.06 | 4.59 | | 17.0 | |
| 1 | 416-1151-000 | | 2 | 10.19 | 5.06 | 4.59 | | 19.5 | |
| 1.5 | 416-1161-000 | 135 | 3 | 12.50 | 6.69 | 5.34 | | 35.0 | |
| 2 | 416-1171-000 | | 3 | 12.50 | 6.69 | 5.34 | | 41.2 | |
| 3 | 416-1181-000 | | 3 | 14.56 | 7.56 | 7.15 | | 48.0 | |
| 5 | 416-1191-000 | | 3 | 14.56 | 7.56 | 7.15 | | 90.5 | |
| 7.5 | 416-2101-000 | | 4 | 16.12 | 13.50 | 8.55 | | 130.0 | |
| 10 | 416-2111-000 | | 4 | 16.12 | 13.50 | 8.55 | | 158.0 | |
| 120 x 240 V – 16/32 V 60 Hz | | | | | | | | | |
| .100 | 416-1201-000 | 95 | 2 | 8.03 | 3.31 | 3.08 | S240C | 4.8 | |
| .150 | 416-1211-000 | | 2 | 8.03 | 3.31 | 3.08 | | 5.6 | |
| .250 | 416-1221-000 | | 2 | 8.03 | 3.31 | 3.08 | | 6.7 | |
| .500 | 416-1231-000 | | 2 | 10.19 | 5.06 | 4.59 | | 15.0 | |
| .750 | 416-1241-000 | | 2 | 10.19 | 5.06 | 4.59 | | 17.0 | |
| 1 | 416-1251-000 | | 2 | 10.19 | 5.06 | 4.59 | | 19.5 | |
| 1.5 | 416-1261-000 | | 135 | 3 | 12.50 | 6.69 | | 5.34 | 35.0 |
| 2 | 416-1271-000 | 3 | | 12.50 | 6.69 | 5.34 | | 41.2 | |
| 3 | 416-1281-000 | 3 | | 14.56 | 7.56 | 7.15 | | 48.0 | |
| 5 | 416-1291-000 | 3 | | 14.56 | 7.56 | 7.15 | | 90.5 | |
| 7.5 | 416-2201-000 | 4 | | 16.12 | 13.50 | 8.55 | | 130.0 | |
| 10 | 416-2211-000 | 4 | | 16.12 | 13.50 | 8.55 | | 158.0 | |
| 240 x 480 V – 24/48 Vs 60 Hz | | | | | | | | | |
| .100 | 416-1401-000 | 95 | 2 | 8.03 | 3.31 | 3.08 | | S480E | 4.8 |
| .150 | 416-1411-000 | | 2 | 8.03 | 3.31 | 3.08 | 5.6 | | |
| .250 | 416-1421-000 | | 2 | 8.03 | 3.31 | 3.08 | 6.7 | | |
| .500 | 416-1431-000 | | 2 | 10.19 | 5.06 | 4.59 | 15.0 | | |
| .750 | 416-1441-000 | | 2 | 10.19 | 5.06 | 4.59 | 17.0 | | |
| 1 | 416-1451-000 | | 2 | 10.19 | 5.06 | 4.59 | 19.5 | | |
| 1.5 | 416-1461-000 | | 135 | 3 | 12.50 | 6.69 | 5.34 | | 35.0 |
| 2 | 416-1471-000 | 3 | | 12.50 | 6.69 | 5.34 | 41.2 | | |
| 3 | 416-1481-000 | 3 | | 14.56 | 7.56 | 7.15 | 48.0 | | |
| 5 | 416-1491-000 | 3 | | 14.56 | 7.56 | 7.15 | 90.5 | | |
| 7.5 | 416-2401-000 | 4 | | 16.12 | 13.50 | 8.55 | 130.0 | | |
| 10 | 416-2411-000 | 4 | | 16.12 | 13.50 | 8.55 | 158.0 | | |

Note: Housing dimensions subject to change without notice. Contact factory where dimension verification is critical.



Buck-Boost – Powerformer™

Figure 2

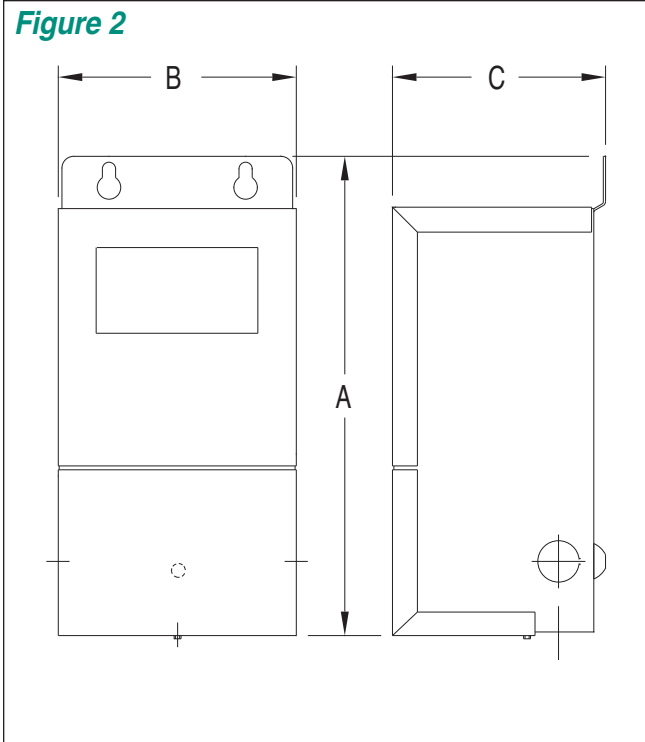


Figure 3

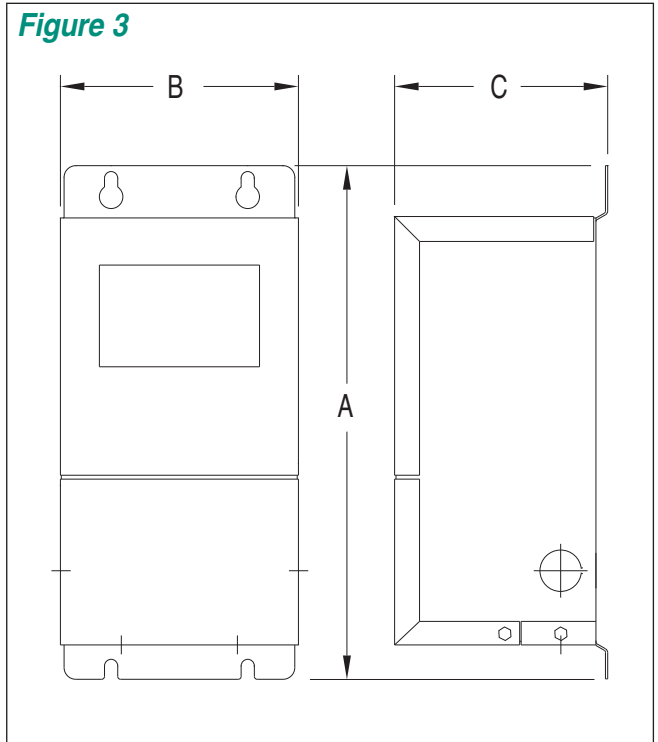
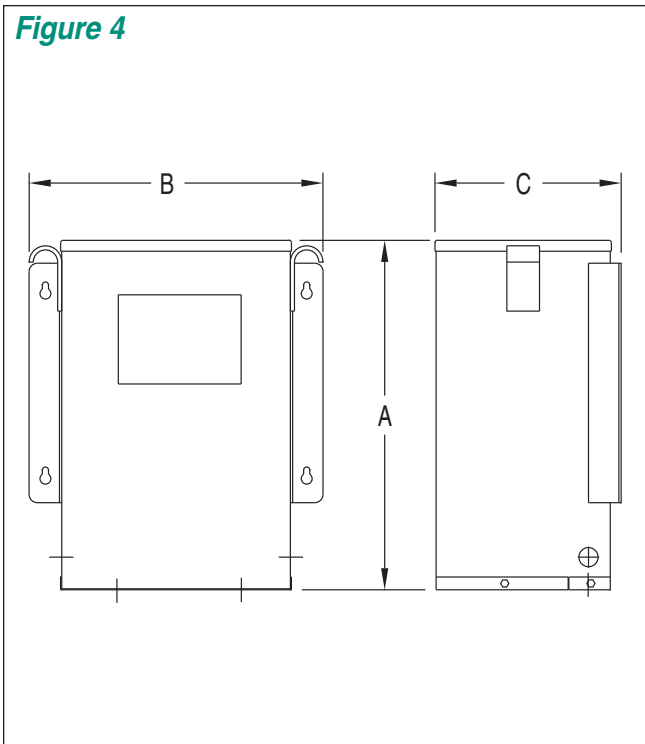


Figure 4

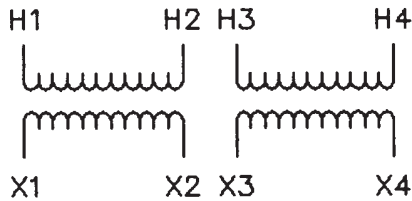


Version JE901.0411

S240B Wiring Diagram & Connections*

Wiring Diagram

Primary: 120 X 240
Secondary: 12/24



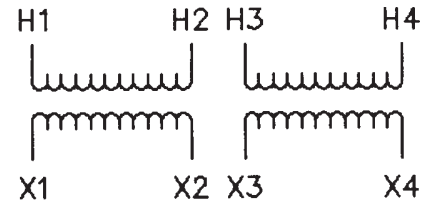
Connections

| Primary Volts | Interconnect | Primary Lines Connect To |
|---------------|----------------------|----------------------------|
| 240 | H2 to H3 | H1-H4 |
| 120 | H1 to H3 H2 to H4 | H1-H4 |
| Sec. Volts | Interconnect | Secondary Lines Connect To |
| 24 | X2 to X3 | X1-X4 |
| 12 | X1 to X3 X2 to X4 | X1-X4 |

S240C Wiring Diagram & Connections*

Wiring Diagram

Primary: 120 X 240
Secondary: 16/32



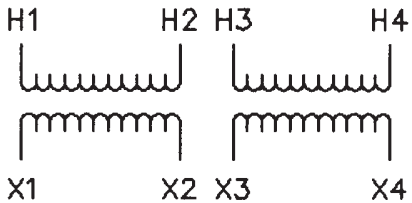
Connections

| Primary Volts | Interconnect | Primary Lines Connect To |
|---------------|----------------------|----------------------------|
| 240 | H2 to H3 | H1-H4 |
| 120 | H1 to H3 H2 to H4 | H1-H4 |
| Sec. Volts | Interconnect | Secondary Lines Connect To |
| 32 | X2 to X3 | X1-X4 |
| 16 | X1 to X3 X2 to X4 | X1-X4 |

S480E Wiring Diagram & Connections*

Wiring Diagram

Primary: 240 X 480
Secondary: 24/48



Connections

| Primary Volts | Interconnect | Primary Lines Connect To |
|---------------|----------------------|----------------------------|
| 480 | H2 to H3 | H1-H4 |
| 240 | H1 to H3 H2 to H4 | H1-H4 |
| Sec. Volts | Interconnect | Secondary Lines Connect To |
| 48 | X2 to X3 | X1-X4 |
| 24 | X1 to X3 X2 to X4 | X1-X4 |

NOTE: Electrostatic shields are optionally available and not shown in all wiring diagrams.