

# Buck-Boost Single-Phase Transformers



## Encapsulated models from 0.05 to 10.0 kVA

Electrical/electronic equipment operates on standard supply voltage. Proper voltage is critical for a variety of applications, including AC motor loads, resistive heating loads, incandescent lighting or low voltage lighting. But when the supply voltage is constantly 5-20% too low ("brownout" conditions) or too high, equipment fails to operate at maximum efficiency. This can cause potentially serious problems.

Acme Electric Buck-boost transformers (autotransformers) provide a simple and economical means of correcting off-standard voltages. They offer tremendous capabilities and flexibility in kVA sizes and input/output voltage combinations. You essentially get 75 different transformers in one convenient package.

Any time a line voltage change in the 5-20% range is required, a buck-boost transformer should be considered as your first line of defense.

### Where are buck-boost transformers used?

A typical buck-boost application is 120V in, 12V out for low voltage lighting or control circuitry. In most applications, this low voltage transformer is field connected as an autotransformer. Buck-boost transformers provide tremendous capabilities and flexibility in kVA sizes and input/output voltage combinations. Basically, you get 75 different transformers, all in one convenient package.

Other buck-boost applications include the following:

- Where low supply voltage exists because equipment is installed at the end of a bus system
- Where the supply system is operating at or over its design capacity
- Where overall consumer demands may be so high that the utility cuts back the supply voltage to the consumer, causing a "brownout."

### Why use buck-boost instead of another type transformer ?

Take a look at this chart to see the advantages and disadvantages of using a buck-boost transformer (autotransformer) compared to a standard isolation transformer of the proper size and voltage combination.

#### Advantages and Disadvantages of Buck-Boost Transformers

| Advantages                                                                                                                                                                                                                                            | Disadvantages                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• More efficient</li> <li>• Smaller and lighter</li> <li>• 5 to 10 times increase in kVA</li> <li>• Versatile and suitable for many applications</li> <li>• Lower cost compared to other approaches</li> </ul> | <ul style="list-style-type: none"> <li>• No circuit isolation</li> <li>• Cannot create a neutral</li> <li>• Application voltages and kVA don't match the nameplate voltages and kVA</li> </ul> |

### Proper voltage is critical

With nearly two-thirds of all electrical loads being AC motor loads, maintenance of the proper voltage to that motor is very important. If the supply line voltage is not maintained, motor winding current is increased causing reduced motor torque and rising motor temperature, all of which results in the rapid loss of insulation life expectancy.

In addition to motor loads, the detrimental effects of low voltage on both resistive heating loads and incandescent lighting output are also illustrated in the chart.

When you have a lower than standard voltage, equipment damage and failure can result. Buck-boost transformers are an economical way to correct this potentially very serious problem.



T181050



T181058



T181065

### Features

- UL and cUL listed and UL-3R enclosures meet or exceed all listing criteria including NEMA, ANSI and OSHA standards.
- Reduce (buck) or raise (boost) line voltage from 5 - 20%.
- Offer great flexibility – can be used in single-phase and three-phase configurations.
- All copper lead wire terminations.
- Long life, 80°C rise up to 0.15 kVA, and 115°C rise above 0.25 kVA.

### Agency Approvals

cULus. (UL file no. E79947) Standard UL 506, listed in UL file as Style SR and ER for Units 150VA and below.

CE. Rohs Directive 2011/65/EU and 2015/863/EU



# Buck-Boost Single-Phase Transformers



## Selecting a Buck-Boost Transformer

You should have the following information before selecting a buck-boost transformer.

### Line Voltage

The voltage that you want to buck (decrease) or boost (increase). This voltage can be determined 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 Hz.

### Phase

The supply line should be the same as the equipment to be operated – either single- or three-phase.

## Using the Selection Charts – A Four-Step Process

Here's how to use the transformer selection charts on the following pages:

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 higher 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. Refer to the PDF links for dimensional drawings.
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. This same connection information is packed with each buck-boost transformer.
5. Note: Three-phase applications require multiple separate single-phase buck boost transformers to be wired and mounted together. See single-phase transformer quantities required at the bottom of the three-phase application selection charts.

| Full Load Current in Amps<br>Single-Phase Circuits |      |      |      |      |      |      |      |      |
|----------------------------------------------------|------|------|------|------|------|------|------|------|
| kVA                                                | 120V | 208V | 240V | 277V | 380V | 440V | 480V | 600V |
| 0.05                                               | 0.4  | 0.2  | 0.2  | 0.2  | 0.1  | 0.1  | 0.1  | 0.1  |
| 0.1                                                | 0.8  | 0.5  | 0.4  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  |
| 0.15                                               | 1.2  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.3  |
| 0.25                                               | 2    | 1.2  | 1    | 0.9  | 0.6  | 0.5  | 0.5  | 0.4  |
| 0.5                                                | 4.2  | 2.4  | 2.1  | 1.8  | 1.3  | 1.1  | 1    | 0.8  |
| 0.75                                               | 6.3  | 3.6  | 3.1  | 2.7  | 2    | 1.7  | 1.6  | 1.3  |
| 1                                                  | 8.3  | 4.8  | 4.2  | 3.6  | 2.6  | 2.3  | 2.1  | 1.7  |
| 1.5                                                | 12.5 | 7.2  | 6.2  | 5.4  | 3.9  | 3.4  | 3.1  | 2.5  |
| 2                                                  | 16.7 | 9.6  | 8.3  | 7.2  | 5.2  | 4.5  | 4.2  | 3.3  |
| 3                                                  | 25   | 14.4 | 12.5 | 10.8 | 7.9  | 6.8  | 6.2  | 5    |
| 5                                                  | 41   | 24   | 20.8 | 18   | 13.1 | 11.3 | 10.4 | 8.3  |
| 7.5                                                | 62   | 36   | 31   | 27   | 19.7 | 17   | 15.6 | 12.5 |
| 10                                                 | 83   | 48   | 41   | 36   | 26   | 22.7 | 20.8 | 16.7 |
| 15                                                 | 125  | 72   | 62   | 54   | 39   | 34   | 31   | 25   |
| 25                                                 | 208  | 120  | 104  | 90   | 65   | 57   | 52   | 41   |
| 37.5                                               | 312  | 180  | 156  | 135  | 98   | 85   | 78   | 62   |
| 50                                                 | 416  | 240  | 208  | 180  | 131  | 114  | 104  | 83   |
| 75                                                 | 625  | 360  | 312  | 270  | 197  | 170  | 156  | 125  |
| 100                                                | 833  | 480  | 416  | 361  | 263  | 227  | 208  | 166  |
| 167                                                | 1391 | 802  | 695  | 602  | 439  | 379  | 347  | 278  |
| 250                                                | 2083 | 1203 | 1041 | 902  | 657  | 568  | 520  | 416  |

| Full Load Amps<br>Single-Phase AC Motors <sup>1</sup> |      |      |      |                         |
|-------------------------------------------------------|------|------|------|-------------------------|
| Horsepower                                            | 115V | 208V | 230V | Minimum Transformer KVA |
| 1/6                                                   | 4.4  | 2.4  | 2.2  | 0.53                    |
| 1/4                                                   | 5.8  | 3.2  | 2.9  | 0.7                     |
| 1/3                                                   | 7.2  | 4    | 3.6  | 0.87                    |
| 1/2                                                   | 9.8  | 5.4  | 4.9  | 1.18                    |
| 3/4                                                   | 13.8 | 7.6  | 6.9  | 1.66                    |
| 1                                                     | 16   | 8.8  | 8    | 1.92                    |
| 1.5                                                   | 20   | 11   | 10   | 2.4                     |
| 2                                                     | 24   | 13.2 | 12   | 2.88                    |
| 3                                                     | 34   | 18.7 | 17   | 4.1                     |
| 5                                                     | 56   | 30.8 | 28   | 6.72                    |
| 7.5                                                   | 80   | 44   | 40   | 9.6                     |
| 10                                                    | 100  | 55   | 50   | 12                      |

1. When motor service factor is greater than 1, increase full load amps proportionally.

**Example:** If service factor is 1.15, increase above amp values by 15%.

$$1 \text{ Phase kVA} = \frac{\text{Volts} \times \text{Amps}}{1000}$$

Note: If motors are started more than once per hour, increase minimum transformer kVA by 20%.

# Buck-Boost Single-Phase Transformers



## Selection Chart

| Single-Phase Application | Boosting |     |     |     |     |     |     |     | Bucking |     |     |     |     |     |
|--------------------------|----------|-----|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|
| Line Voltage (Available) | 95       | 100 | 105 | 110 | 189 | 208 | 215 | 220 | 125     | 132 | 230 | 245 | 250 | 252 |
| Load Voltage (Output)    | 114      | 120 | 115 | 120 | 208 | 230 | 237 | 242 | 113     | 120 | 208 | 222 | 227 | 240 |

| Buck-Boost Transformer Selection Chart |      |                                 |       |       |       |       |       |       |       |       |      |      |       |       |       |      | Drawing                    |
|----------------------------------------|------|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|------|----------------------------|
| Part Number                            |      |                                 |       |       |       |       |       |       |       |       |      |      |       |       |       |      |                            |
| <a href="#"><u>T181050</u></a>         | Load | kVA                             | 1.19  | 1.25  | 2.4   | 2.5   | 2.16  | 2.39  | 2.46  | 2.52  | 2.6  | 2.75 | 2.37  | 2.5   | 2.6   | 5.1  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 10.42 | 10.4  | 20.8  | 20.8  | 10.4  | 10.4  | 10.4  | 10.4  | 22.8 | 22.8 | 11.4  | 11.4  | 11.4  | 21.8 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 25    | 25    | 40    | 30    | 15    | 15    | 15    | 15    | 30   | 30   | 15    | 15    | 15    | 30   |                            |
| <a href="#"><u>T181051</u></a>         | Load | kVA                             | 2.37  | 2.5   | 4.8   | 5     | 4.33  | 4.79  | 4.93  | 5.04  | 5.2  | 5.4  | 4.47  | 5     | 5.2   | 10.2 | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 20.83 | 20.83 | 41.67 | 41.67 | 20.83 | 20.83 | 20.83 | 20.83 | 46.8 | 46.8 | 22.8  | 22.8  | 22.8  | 43.7 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 35    | 35    | 60    | 60    | 30    | 30    | 30    | 30    | 60   | 60   | 30    | 30    | 30    | 60   |                            |
| <a href="#"><u>T181052</u></a>         | Load | kVA                             | 3.56  | 3.75  | 7.17  | 7.56  | 6.5   | 7.19  | 7.41  | 7.56  | 7.8  | 8.15 | 7.1   | 7.5   | 7.8   | 15.3 | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 31.25 | 31.25 | 62.5  | 62.5  | 31.25 | 31.25 | 31.25 | 31.25 | 68.5 | 69.5 | 34.4  | 34.4  | 34.4  | 65.5 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 50    | 50    | 90    | 90    | 45    | 45    | 45    | 45    | 80   | 80   | 40    | 40    | 40    | 80   |                            |
| <a href="#"><u>T111683</u></a>         | Load | kVA                             | 4.75  | 5     | 9.58  | 10    | 8.66  | 9.58  | 9.87  | 10    | 10.4 | 10.8 | 9.5   | 10    | 10    | 20.4 | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 41.67 | 41.67 | 83.31 | 83.31 | 41.67 | 41.67 | 41.67 | 41.67 | 91.5 | 91.5 | 45.8  | 45.8  | 45.8  | 87.5 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 70    | 70    | 125   | 125   | 60    | 60    | 60    | 60    | 110  | 110  | 60    | 60    | 50    | 110  |                            |
| <a href="#"><u>T111684</u></a>         | Load | kVA                             | 7.12  | 7.5   | 14.4  | 15.1  | 13    | 14.3  | 14.8  | 15.1  | 15   | 16.2 | 14.24 | 15    | 15.6  | 30.6 | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 62.5  | 62.5  | 125   | 125   | 62.5  | 62.5  | 62.5  | 62.5  | 138  | 138  | 68.6  | 68.6  | 68.6  | 132  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 100   | 100   | 175   | 175   | 90    | 90    | 90    | 90    | 150  | 175  | 80    | 80    | 80    | 175  |                            |
| <a href="#"><u>T111685</u></a>         | Load | kVA                             | 9.5   | 10    | 19.2  | 20.2  | 17.3  | 19.16 | 19.7  | 20.1  | 20.8 | 21.6 | 19    | 20    | 20.3  | 40.8 | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 83.3  | 83.3  | 166.6 | 166.6 | 83.3  | 83.3  | 83.3  | 83.3  | 183  | 183  | 91.6  | 91.6  | 91.2  | 175  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 125   | 125   | 250   | 250   | 125   | 125   | 125   | 125   | 225  | 225  | 110   | 110   | 110   | 225  |                            |
| <a href="#"><u>T111686</u></a>         | Load | kVA                             | 14.2  | 15    | 28.8  | 30    | 26    | 28.7  | 29.6  | 30.3  | 31.2 | 32.5 | 28.5  | 30    | 31.2  | 61   | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 125   | 125   | 250   | 250   | 125   | 125   | 125   | 125   | 275  | 275  | 136.8 | 136.8 | 136.8 | 263  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 200   | 200   | 350   | 350   | 175   | 175   | 175   | 175   | 350  | 350  | 175   | 175   | 175   | 350  |                            |
| <a href="#"><u>T111687</u></a>         | Load | kVA                             | 23.7  | 25    | 47.9  | 50    | 43.3  | 47.8  | 49.3  | 50.3  | 52   | 54   | 47.4  | 50    | 52    | 102  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 208   | 208   | 416.6 | 416.6 | 208   | 208   | 208   | 208   | 457  | 457  | 228   | 228   | 228   | 437  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 350   | 350   | 600   | 600   | 300   | 300   | 300   | 300   | 600  | 600  | 300   | 300   | 300   | 600  |                            |

| CONNECTION DIAGRAM | D | D | C | C | H | H | H | H | F | F | I | I | I | E |
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

NOTES: (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 are suitable for 60Hz only. With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals.

Selection Chart continued on next page...

# Buck-Boost Single-Phase Transformers



## Selection Chart (continued)

| Single-Phase Application | Boosting |     |     |     |     |     |     |     | Bucking |     |     |     |     |     |
|--------------------------|----------|-----|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|
| Line Voltage (Available) | 95       | 100 | 105 | 208 | 215 | 215 | 220 | 225 | 135     | 240 | 240 | 245 | 250 | 255 |
| Load Voltage (Output)    | 120      | 114 | 119 | 240 | 244 | 230 | 235 | 240 | 119     | 208 | 225 | 230 | 234 | 239 |

| Buck-Boost Transformer Selection Chart |      |                                 |       |       |             |              |              |              |              |             |             |             |           |              |             |              | Drawing                    |
|----------------------------------------|------|---------------------------------|-------|-------|-------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|-----------|--------------|-------------|--------------|----------------------------|
| Part Number                            |      |                                 |       |       |             |              |              |              |              |             |             |             |           |              |             |              |                            |
| <a href="#"><u>T181057</u></a>         | 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         | 3.9         | 3.98         | <a href="#"><u>PDF</u></a> |
|                                        |      | 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        |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 15    | 25    | 25          | 15           | 15           | 25           | 25           | 25          | 20          | 15          | 20        | 20           | 20          | 20           |                            |
| <a href="#"><u>T181058</u></a>         | Load | kVA                             | 1.88  | 3.56  | 3.72        | 3.75         | 3.81         | 7.19         | 7.34         | 7.5         | 4.21        | 3.68        | 7.5       | 7.67         | 7.8         | 7.97         | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 15.63 | 31.25 | 31.25       | 15.63        | 15.63        | 31.25        | 31.25        | 31.25       | 35.42       | 17.71       | 33.33     | 33.33        | 33.33       | 33.33        |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 25    | 45    | 45          | 25           | 25           | 45           | 45           | 45          | 40          | 20          | 40        | 40           | 40          | 40           |                            |
| <a href="#"><u>T181059</u></a>         | Load | kVA                             | 2.81  | 5.34  | 5.58        | 5.63         | 5.72         | 10.78        | 11.02        | 11.25       | 6.32        | 5.53        | 11.25     | 11.5         | 11.7        | 11.95        | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 23.44 | 46.88 | 46.88       | 23.44        | 23.44        | 46.88        | 46.88        | 46.88       | 53.13       | 26.56       | 50        | 50           | 50          | 50           |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 40    | 70    | 70          | 40           | 40           | 70           | 70           | 70          | 60          | 30          | 60        | 60           | 60          | 60           |                            |
| <a href="#"><u>T113073</u></a>         | Load | kVA                             | 3.75  | 7.13  | <b>7.44</b> | <b>7.5</b>   | <b>7.63</b>  | <b>14.38</b> | <b>14.69</b> | <b>15</b>   | <b>8.43</b> | <b>7.37</b> | <b>15</b> | <b>15.33</b> | <b>15.6</b> | <b>15.93</b> | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 31.25 | 62.5  | <b>62.5</b> | <b>31.25</b> | <b>31.25</b> | <b>62.5</b>  | <b>62.5</b>  | <b>62.5</b> | 70.83       | 35.42       | 66.67     | 66.67        | 66.67       | 66.67        |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 50    | 90    | 90          | 50           | 50           | 90           | 90           | 90          | 80          | 40          | 80        | 80           | 80          | 80           |                            |
| <a href="#"><u>T113074</u></a>         | Load | kVA                             | 5.63  | 10.69 | 11.16       | 11.25        | 11.44        | 21.56        | 22.03        | 22.5        | 12.64       | 11.05       | 22.5      | 23           | 23.4        | 23.9         | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 46.9  | 93.8  | 93.8        | 46.9         | 46.9         | 93.8         | 93.8         | 93.8        | 106.3       | 53.1        | 100       | 100          | 100         | 100          |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 80    | 150   | 150         | 70           | 70           | 125          | 125          | 125         | 125         | 60          | 125       | 125          | 125         | 125          |                            |
| <a href="#"><u>T113075</u></a>         | Load | kVA                             | 7.5   | 14.25 | 14.88       | 15           | 15.25        | 28.75        | 29.38        | 30          | 16.86       | 14.73       | 30        | 30.67        | 31.2        | 31.87        | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 62.5  | 125   | 125         | 62.5         | 62.5         | 125          | 125          | 125         | 141.7       | 70.8        | 133.3     | 133.3        | 133.3       | 133.3        |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 100   | 200   | 200         | 90           | 90           | 175          | 175          | 175         | 175         | 80          | 175       | 175          | 175         | 175          |                            |
| <a href="#"><u>T113076</u></a>         | Load | kVA                             | 11.25 | 21.38 | 22.31       | 22.5         | 22.88        | 43.13        | 44.06        | 45          | 25.29       | 22.1        | 45        | 46           | 46.8        | 47.8         | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 93.8  | 187.5 | 187.5       | 93.8         | 93.8         | 187.5        | 187.5        | 187.5       | 212.5       | 106.3       | 200       | 200          | 200         | 200          |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 150   | 300   | 300         | 150          | 150          | 250          | 250          | 250         | 250         | 125         | 250       | 250          | 250         | 250          |                            |
| <a href="#"><u>T113077</u></a>         | Load | kVA                             | 18.75 | 35.63 | 37.19       | 37.5         | 38.13        | 71.88        | 73.44        | 75          | 42.15       | 36.83       | 75        | 76.67        | 78          | 79.67        | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 156.3 | 312.5 | 312.5       | 156.3        | 156.3        | 312.5        | 312.5        | 312.5       | 354.2       | 177.1       | 333.3     | 333.3        | 333.3       | 333.3        |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 250   | 450   | 450         | 225          | 225          | 450          | 450          | 450         | 400         | 200         | 400       | 400          | 400         | 400          |                            |

| CONNECTION DIAGRAM | D | C | C | H | H | G | G | G | F | I | E | E | E | E |
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

NOTES: (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 are suitable for 60Hz only. With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals.

Selection Chart continued on next page...

# Buck-Boost Single-Phase Transformers



## Selection Chart (continued)

| Single-Phase Application | Boosting |     |     |     |     |     |     |     |     |     | Bucking |     |     |     |
|--------------------------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|
| Line Voltage (Available) | 230      | 380 | 416 | 425 | 430 | 435 | 440 | 440 | 450 | 460 | 277     | 480 | 480 | 504 |
| Load Voltage (Output)    | 277      | 420 | 457 | 467 | 473 | 457 | 462 | 484 | 472 | 483 | 230     | 436 | 456 | 480 |

| Buck-Boost Transformer Selection Chart |      |                                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Drawing                    |
|----------------------------------------|------|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------------|
| Part Number                            |      |                                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                            |
| <a href="#"><u>T181064</u></a>         | Load | kVA                             | 1.44  | 2.19  | 2.38  | 2.43  | 2.46  | 4.76  | 4.81  | 2.52  | 4.92  | 5.03  | 1.44  | 2.5   | 5.23  | 5.5   | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 5.21  | 5.21  | 5.21  | 5.21  | 5.21  | 5.21  | 10.42 | 5.21  | 10.42 | 10.42 | 6.25  | 5.73  | 11.46 | 11.46 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 15    | 10    | 10    | 10    | 10    | 15    | 15    | 10    | 15    | 15    | 10    | 10    | 15    | 15    |                            |
| <a href="#"><u>T181065</u></a>         | Load | kVA                             | 2.89  | 4.38  | 4.76  | 4.86  | 4.93  | 9.52  | 9.62  | 5.04  | 9.83  | 10.06 | 2.88  | 5     | 10.45 | 11    | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 10.42 | 10.42 | 10.42 | 10.42 | 10.42 | 20.83 | 20.83 | 10.42 | 20.83 | 20.83 | 12.5  | 11.46 | 22.92 | 22.92 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 20    | 15    | 15    | 15    | 15    | 30    | 30    | 15    | 30    | 30    | 15    | 15    | 30    | 30    |                            |
| <a href="#"><u>T181066</u></a>         | Load | kVA                             | 4.33  | 6.56  | 7.14  | 7.3   | 7.39  | 14.28 | 14.44 | 7.56  | 14.75 | 15.09 | 4.31  | 7.49  | 15.68 | 16.5  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 15.63 | 15.63 | 15.63 | 15.63 | 15.63 | 31.25 | 31.25 | 15.63 | 31.25 | 31.25 | 18.75 | 17.19 | 34.38 | 34.38 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 25    | 25    | 25    | 25    | 25    | 45    | 45    | 25    | 45    | 45    | 20    | 20    | 45    | 45    |                            |
| <a href="#"><u>T137920</u></a>         | Load | kVA                             | 5.77  | 8.57  | 9.52  | 9.73  | 9.85  | 19.04 | 19.25 | 10.08 | 19.67 | 20.13 | 5.75  | 9.99  | 20.9  | 22    | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 20.83 | 20.83 | 20.83 | 20.83 | 20.83 | 41.67 | 41.67 | 20.83 | 41.67 | 41.67 | 25    | 22.92 | 45.83 | 45.83 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 35    | 30    | 30    | 30    | 30    | 60    | 60    | 30    | 60    | 60    | 30    | 30    | 60    | 60    |                            |
| <a href="#"><u>T137921</u></a>         | Load | kVA                             | 8.66  | 13.13 | 14.28 | 14.59 | 14.78 | 28.56 | 28.88 | 15.13 | 29.5  | 30.19 | 8.63  | 14.99 | 31.35 | 33    | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 31.25 | 31.25 | 31.25 | 31.25 | 31.25 | 62.5  | 62.5  | 31.25 | 62.5  | 62.5  | 37.5  | 34.38 | 68.75 | 68.75 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 50    | 50    | 45    | 45    | 45    | 90    | 90    | 45    | 90    | 90    | 40    | 40    | 90    | 90    |                            |
| <a href="#"><u>T137922</u></a>         | Load | kVA                             | 11.54 | 17.5  | 19.04 | 19.46 | 19.71 | 38.08 | 38.5  | 20.17 | 39.33 | 40.25 | 11.5  | 19.98 | 41.8  | 44    | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 41.67 | 41.67 | 41.67 | 41.67 | 41.67 | 83.33 | 83.33 | 41.67 | 83.33 | 83.33 | 50    | 45.83 | 91.67 | 91.67 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 70    | 60    | 60    | 60    | 60    | 110   | 110   | 60    | 110   | 110   | 60    | 60    | 110   | 110   |                            |
| <a href="#"><u>T137923</u></a>         | Load | kVA                             | 17.31 | 26.25 | 28.56 | 29.19 | 29.56 | 57.13 | 57.75 | 30.25 | 59    | 60.38 | 17.25 | 29.98 | 62.7  | 66    | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 62.5  | 62.5  | 62.5  | 62.5  | 62.5  | 125   | 125   | 62.5  | 125   | 125   | 75    | 68.8  | 137.5 | 137.5 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 100   | 90    | 90    | 90    | 90    | 175   | 175   | 90    | 175   | 175   | 80    | 80    | 175   | 175   |                            |
| <a href="#"><u>T137924</u></a>         | Load | kVA                             | 28.9  | 43.8  | 47.6  | 48.6  | 49.3  | 95.2  | 96.2  | 50.4  | 98.3  | 100.6 | 28.8  | 50    | 104.5 | 110   | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 104.2 | 104.2 | 104.2 | 104.2 | 104.2 | 208.3 | 208.3 | 104.2 | 208.3 | 208.3 | 125   | 114.6 | 229.2 | 229.2 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 175   | 150   | 150   | 150   | 150   | 300   | 300   | 150   | 300   | 300   | 150   | 150   | 300   | 300   |                            |

| CONNECTION DIAGRAM | D | H | H | H | H | G | G | H | G | G | J | I | E | E |
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

NOTES: (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 are suitable for 60Hz only. With larger kVA buck-boost units, it is necessary to utilize multiple conductors on the secondary (X) terminals.

Selection Chart continued on next page...

# Buck-Boost Three-Phase Transformers



## Selection Chart (continued)

| Three-Phase Application  | Boosting    |             |             |             |     |     |     | Bucking |     |     |     |     |
|--------------------------|-------------|-------------|-------------|-------------|-----|-----|-----|---------|-----|-----|-----|-----|
| Line Voltage (Available) | 189Y<br>109 | 196Y<br>113 | 201Y<br>116 | 208Y<br>120 | 189 | 208 | 220 | 219     | 230 | 250 | 255 | 264 |
| Load Voltage (Output)    | 208         | 234         | 240         | 230         | 208 | 239 | 242 | 208     | 208 | 227 | 232 | 240 |

| Buck-Boost Transformer Selection Chart |      |                                 |        |        |        |        |        |        |        |        |        |        |        |        |                            |
|----------------------------------------|------|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------------------|
| Part Number                            |      |                                 |        |        |        |        |        |        |        |        |        |        |        |        | Drawing                    |
| <a href="#"><u>T181050</u></a>         | Load | kVA                             | 7.51   | 4.22   | 4.33   | 8.3    | 3.75   | 4.15   | 4.37   | 7.9    | 4.15   | 4.51   | 4.6    | 4.76   | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 20.83  | 10.42  | 10.42  | 20.83  | 10.42  | 10.42  | 10.42  | 21.94  | 11.52  | 11.47  | 11.45  | 11.46  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 30     | 20     | 20     | 30     | 15     | 15     | 15     | 30     | 15     | 15     | 15     | 15     |                            |
| <a href="#"><u>T181051</u></a>         | Load | kVA                             | 15.01  | 8.44   | 8.66   | 16.6   | 7.51   | 8.3    | 8.73   | 15.8   | 8.3    | 9.02   | 9.2    | 9.53   | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 41.67  | 20.83  | 20.83  | 41.67  | 20.83  | 20.83  | 20.83  | 43.87  | 23.04  | 22.94  | 22.9   | 22.92  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 60     | 35     | 35     | 60     | 30     | 30     | 30     | 60     | 30     | 30     | 30     | 30     |                            |
| <a href="#"><u>T181052</u></a>         | Load | kVA                             | 22.52  | 12.67  | 12.99  | 24.9   | 11.26  | 12.45  | 13.1   | 23.71  | 12.45  | 13.53  | 13.8   | 14.29  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 62.5   | 31.25  | 31.25  | 62.5   | 31.25  | 31.25  | 31.25  | 65.81  | 34.56  | 34.42  | 34.35  | 34.38  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 90     | 50     | 50     | 90     | 45     | 45     | 45     | 80     | 40     | 40     | 40     | 40     |                            |
| <a href="#"><u>T111683</u></a>         | Load | kVA                             | 30.02  | 16.89  | 17.32  | 33.2   | 15.01  | 16.6   | 17.46  | 31.61  | 16.6   | 18.04  | 18.4   | 19.05  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 83.33  | 41.67  | 41.67  | 83.33  | 41.67  | 41.67  | 41.67  | 87.74  | 46.07  | 45.89  | 45.8   | 45.83  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 125    | 70     | 70     | 125    | 60     | 60     | 60     | 110    | 60     | 60     | 60     | 60     |                            |
| <a href="#"><u>T111684</u></a>         | Load | kVA                             | 45.03  | 25.33  | 25.98  | 49.8   | 22.52  | 24.9   | 26.2   | 47.41  | 24.9   | 27.06  | 27.6   | 28.58  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 125    | 62.5   | 62.5   | 125    | 62.5   | 62.5   | 62.5   | 131.61 | 69.11  | 68.83  | 68.7   | 68.75  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 175    | 100    | 100    | 175    | 90     | 90     | 90     | 175    | 80     | 80     | 80     | 80     |                            |
| <a href="#"><u>T111685</u></a>         | Load | kVA                             | 60.04  | 33.77  | 34.64  | 66.4   | 30.02  | 33.2   | 34.93  | 63.22  | 33.2   | 36.08  | 36.81  | 38.11  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 166.67 | 83.33  | 83.33  | 167.67 | 83.33  | 83.33  | 83.33  | 175.48 | 92.15  | 91.78  | 91.59  | 91.67  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 250    | 125    | 125    | 250    | 125    | 125    | 125    | 225    | 110    | 110    | 110    | 110    |                            |
| <a href="#"><u>T111686</u></a>         | Load | kVA                             | 90.07  | 50.66  | 51.96  | 99.59  | 45.03  | 49.8   | 52.39  | 94.83  | 49.8   | 54.13  | 55.21  | 57.16  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 250    | 125    | 125    | 250    | 125    | 125    | 125    | 263.22 | 138.22 | 137.67 | 137.39 | 137.5  |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 350    | 200    | 200    | 350    | 175    | 175    | 175    | 350    | 175    | 175    | 175    | 175    |                            |
| <a href="#"><u>T111687</u></a>         | Load | kVA                             | 150.11 | 84.44  | 86.6   | 165.99 | 75.06  | 82.99  | 87.32  | 158.05 | 82.99  | 90.21  | 92.02  | 95.26  | <a href="#"><u>PDF</u></a> |
|                                        |      | Amps                            | 416.67 | 208.33 | 208.33 | 416.67 | 208.33 | 208.33 | 208.33 | 438.7  | 230.37 | 229.44 | 228.99 | 229.17 |                            |
|                                        |      | Maximum Size of Fuse or Breaker | 600    | 350    | 350    | 600    | 300    | 300    | 300    | 600    | 300    | 300    | 300    | 300    |                            |

| QUANTITY REQUIRED | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|

| CONNECTION DIAGRAM | AA | FF | FF | AA | BB | BB | BB | CC | EE | EE | EE | EE |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|

NOTES: (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 are suitable for 60Hz only. (2) Connection Diagrams AA and FF cannot be reverse connected.

Selection Chart continued on next page...

# Buck-Boost Three-Phase Transformers



## Selection Chart (continued)

| Three-Phase Application  | Boosting    |             |     |     |     | Bucking |     |     |     |     |     |
|--------------------------|-------------|-------------|-----|-----|-----|---------|-----|-----|-----|-----|-----|
| Line Voltage (Available) | 183Y<br>106 | 208Y<br>120 | 195 | 208 | 225 | 240     | 245 | 250 | 256 | 265 | 272 |
| Load Voltage (Output)    | 208         | 236         | 208 | 240 | 240 | 208     | 230 | 234 | 240 | 234 | 240 |

| Buck-Boost Transformer Selection Chart |      |                                 |        |        |        |        |       |        |        |        |        |        |         |
|----------------------------------------|------|---------------------------------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|---------|
| Part Number                            |      |                                 |        |        |        |        |       |        |        |        |        |        | Drawing |
| <a href="#"><u>T181057</u></a>         | Load | kVA                             | 5.63   | 6.39   | 5.63   | 3.17   | 6.5   | 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    |
|                                        |      | Maximum Size of Fuse or Breaker | 25     | 25     | 25     | 15     | 25    | 15     | 20     | 20     | 20     | 15     | 15      |
| <a href="#"><u>T181058</u></a>         | 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   |
|                                        |      | Maximum Size of Fuse or Breaker | 45     | 45     | 45     | 25     | 45    | 20     | 40     | 40     | 40     | 20     | 20      |
| <a href="#"><u>T181059</u></a>         | Load | kVA                             | 16.89  | 19.16  | 16.89  | 9.5    | 19.49 | 8.44   | 19.89  | 20.3   | 20.78  | 10.76  | 11.04   |
|                                        |      | Amps                            | 46.88  | 46.88  | 46.88  | 23.44  | 46.88 | 23.44  | 49.93  | 50.08  | 50     | 26.54  | 26.56   |
|                                        |      | Maximum Size of Fuse or Breaker | 70     | 70     | 70     | 35     | 70    | 30     | 60     | 60     | 60     | 30     | 30      |
| <a href="#"><u>T113073</u></a>         | 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                            | 62.5   | 62.5   | 62.5   | 31.25  | 62.5  | 31.25  | 66.58  | 66.67  | 66.67  | 35.39  | 35.42   |
|                                        |      | Maximum Size of Fuse or Breaker | 90     | 90     | 90     | 45     | 90    | 35     | 80     | 80     | 80     | 40     | 40      |
| <a href="#"><u>T113074</u></a>         | Load | kVA                             | 33.77  | 38.32  | 33.77  | 19     | 38.97 | 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    | 53.08  | 53.13   |
|                                        |      | Maximum Size of Fuse or Breaker | 150    | 150    | 125    | 70     | 125   | 60     | 125    | 125    | 125    | 60     | 60      |
| <a href="#"><u>T113075</u></a>         | Load | Load                            | 45.03  | 51.1   | 45.03  | 25.33  | 51.96 | 22.52  | 53.04  | 54.13  | 55.43  | 28.69  | 29.44   |
|                                        |      |                                 | 125    | 125    | 125    | 62.5   | 125   | 62.5   | 133.15 | 133.55 | 133.33 | 70.78  | 70.83   |
|                                        |      | Maximum Size of Fuse or Breaker | 200    | 200    | 175    | 90     | 175   | 70     | 175    | 175    | 175    | 80     | 80      |
| <a href="#"><u>T113076</u></a>         | Load | kVA                             | 67.55  | 76.64  | 67.55  | 38     | 77.94 | 33.77  | 79.57  | 81.19  | 83.14  | 43.03  | 44.17   |
|                                        |      | Amps                            | 187.5  | 187.5  | 187.5  | 93.75  | 187.5 | 93.75  | 199.73 | 200.32 | 200    | 106.17 | 106.25  |
|                                        |      | Maximum Size of Fuse or Breaker | 300    | 300    | 250    | 150    | 250   | 110    | 250    | 250    | 250    | 125    | 125     |
| <a href="#"><u>T113077</u></a>         | Load | kVA                             | 112.58 | 127.74 | 112.58 | 63.33  | 129.9 | 56.29  | 132.61 | 135.32 | 138.56 | 71.72  | 73.5    |
|                                        |      | Amps                            | 312.5  | 312.5  | 312.5  | 156.25 | 312.5 | 156.25 | 332.88 | 333.87 | 333.33 | 176.95 | 176.8   |
|                                        |      | Maximum Size of Fuse or Breaker | 450    | 450    | 450    | 225    | 450   | 175    | 400    | 400    | 400    | 200    | 200     |

| QUANTITY REQUIRED | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|
|-------------------|---|---|---|---|---|---|---|---|---|---|---|

| CONNECTION DIAGRAM | AA | AA | GG | BB | GG | DD | CC | CC | CC | EE | EE |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|
|--------------------|----|----|----|----|----|----|----|----|----|----|----|

NOTES: (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 are suitable for 60Hz only. (2) Connection Diagrams AA and FF cannot be reverse connected.

Selection Chart continued on next page...

# Buck-Boost Three-Phase Transformers

## Selection Chart (continued)



| Three-Phase Application  | Boosting    |     |     |     |     |     |     |     | Bucking |     |     |     |     |     |     |     |
|--------------------------|-------------|-----|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|
| Line Voltage (Available) | 399Y<br>230 | 380 | 430 | 440 | 460 | 460 | 480 | 480 | 440     | 440 | 460 | 460 | 480 | 480 | 500 | 500 |
| Load Voltage (Output)    | 480Y<br>277 | 420 | 473 | 462 | 506 | 483 | 528 | 504 | 400     | 419 | 438 | 418 | 457 | 436 | 455 | 477 |

### Buck-Boost Transformer Selection Chart

| Part Number                    |      |                                 |      |       |       |        |       |        |       |        |       |        |        |       |        |       |       |        | Drawing                    |
|--------------------------------|------|---------------------------------|------|-------|-------|--------|-------|--------|-------|--------|-------|--------|--------|-------|--------|-------|-------|--------|----------------------------|
| <a href="#"><u>T181064</u></a> | Load | kVA                             | 4.33 | 3.78  | 4.26  | 8.32   | 4.56  | 8.7    | 4.76  | 9.08   | 3.96  | 7.92   | 8.28   | 4.14  | 8.64   | 4.32  | 4.51  | 9.02   | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 5.2  | 5.2   | 5.2   | 10.4   | 5.2   | 10.4   | 5.2   | 10.4   | 5.72  | 10.92  | 10.92  | 5.72  | 10.92  | 5.72  | 5.72  | 10.92  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 15   | 10    | 10    | 15     | 10    | 15     | 10    | 15     | 15    | 10     | 15     | 10    | 15     | 10    | 10    | 15     |                            |
| <a href="#"><u>T181065</u></a> | Load | kVA                             | 8.6  | 7.56  | 8.52  | 16.64  | 9.11  | 17.4   | 9.51  | 18.16  | 7.93  | 15.85  | 16.57  | 8.28  | 17.29  | 8.64  | 9.02  | 18.04  | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 10.4 | 10.4  | 10.4  | 20.8   | 10.4  | 20.8   | 10.4  | 20.8   | 11.44 | 21.84  | 21.84  | 11.44 | 21.84  | 11.44 | 11.44 | 21.84  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 20   | 15    | 15    | 30     | 15    | 30     | 15    | 30     | 15    | 30     | 30     | 15    | 30     | 15    | 15    | 30     |                            |
| <a href="#"><u>T181066</u></a> | Load | kVA                             | 12.9 | 11.34 | 12.77 | 24.97  | 13.67 | 26.1   | 14.27 | 27.24  | 11.89 | 23.77  | 24.85  | 12.42 | 25.93  | 12.96 | 13.52 | 27.07  | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 15.6 | 15.6  | 15.6  | 31.2   | 15.6  | 31.2   | 15.6  | 31.2   | 17.16 | 32.76  | 32.76  | 17.16 | 32.76  | 17.16 | 17.16 | 32.76  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 25   | 25    | 25    | 45     | 25    | 45     | 25    | 45     | 20    | 40     | 40     | 20    | 40     | 20    | 20    | 40     |                            |
| <a href="#"><u>T137920</u></a> | Load | kVA                             | 17.3 | 15.12 | 17.03 | 33.29  | 18.23 | 34.8   | 19.02 | 36.31  | 15.85 | 31.7   | 33.14  | 16.57 | 34.57  | 17.28 | 18.03 | 36.09  | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 20.8 | 20.8  | 20.8  | 41.6   | 20.8  | 41.6   | 20.8  | 41.6   | 22.88 | 43.68  | 43.68  | 22.88 | 43.68  | 22.88 | 22.88 | 43.68  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 35   | 30    | 30    | 60     | 30    | 60     | 30    | 60     | 30    | 60     | 60     | 30    | 60     | 30    | 30    | 60     |                            |
| <a href="#"><u>T137921</u></a> | Load | kVA                             | 25.9 | 22.69 | 25.55 | 49.93  | 27.34 | 52.2   | 28.53 | 54.47  | 23.78 | 47.55  | 49.71  | 24.85 | 51.86  | 25.92 | 27.05 | 54.13  | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 31.2 | 31.2  | 31.2  | 62.4   | 31.2  | 62.4   | 31.2  | 62.4   | 34.32 | 65.52  | 65.52  | 34.32 | 65.52  | 34.32 | 34.32 | 65.52  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 50   | 45    | 45    | 90     | 45    | 90     | 45    | 90     | 40    | 80     | 80     | 40    | 80     | 40    | 40    | 80     |                            |
| <a href="#"><u>T137922</u></a> | Load | kVA                             | 34.6 | 30.25 | 34.07 | 66.58  | 36.46 | 69.6   | 38.04 | 72.63  | 31.7  | 63.4   | 66.27  | 33.13 | 69.15  | 34.56 | 36.06 | 72.18  | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 41.6 | 41.6  | 41.6  | 83.2   | 41.6  | 83.2   | 41.6  | 83.2   | 45.76 | 87.36  | 87.36  | 45.76 | 87.36  | 45.76 | 45.76 | 87.36  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 70   | 60    | 60    | 110    | 60    | 110    | 60    | 110    | 60    | 110    | 110    | 60    | 110    | 60    | 60    | 110    |                            |
| <a href="#"><u>T137923</u></a> | Load | kVA                             | 52   | 45.45 | 51.18 | 100.03 | 54.69 | 104.57 | 57.07 | 109.12 | 47.63 | 95.25  | 99.57  | 49.77 | 103.89 | 51.92 | 54.18 | 108.44 | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 62.5 | 62.5  | 62.5  | 125    | 62.5  | 125    | 62.5  | 125    | 68.75 | 131.25 | 131.25 | 68.75 | 131.25 | 68.75 | 68.75 | 131.25 |                            |
|                                |      | Maximum Size of Fuse or Breaker | 100  | 90    | 90    | 175    | 90    | 175    | 90    | 175    | 80    | 175    | 175    | 80    | 175    | 80    | 80    | 175    |                            |
| <a href="#"><u>T137924</u></a> | Load | kVA                             | 86.1 | 75.62 | 85.17 | 166.44 | 91.15 | 174.01 | 95.11 | 181.57 | 79.26 | 158.5  | 165.69 | 82.83 | 172.87 | 86.39 | 90.16 | 180.44 | <a href="#"><u>PDF</u></a> |
|                                |      | Amps                            | 104  | 104   | 104   | 208    | 104   | 208    | 104   | 208    | 114.4 | 218.4  | 218.4  | 114.4 | 218.4  | 114.4 | 114.4 | 218.4  |                            |
|                                |      | Maximum Size of Fuse or Breaker | 175  | 150   | 150   | 300    | 150   | 300    | 150   | 300    | 150   | 300    | 300    | 150   | 300    | 150   | 150   | 300    |                            |

| QUANTITY REQUIRED | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| CONNECTION DIAGRAM | FF | BB | BB | GG | BB | GG | BB | GG | EE | CC | CC | EE | CC | EE | EE | CC |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

NOTES: (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 are suitable for 60Hz only. (2) Connection Diagrams AA and FF cannot be reverse connected.

# Buck-Boost Single-Phase Transformers

## 120x240 Primary



### Single-Phase Buck-Boost Transformers Specifications<sup>1</sup> 120x240 Primary Volts – 12/24 Secondary Volts – 60Hz

| Part Number             | Price    | Insulating Transformer Rating (kVA) | Secondary Maximum Current Output (A) |       | Weight (lb [kg]) | Case Design | Dimensional Drawing |
|-------------------------|----------|-------------------------------------|--------------------------------------|-------|------------------|-------------|---------------------|
|                         |          |                                     | 12V                                  | 24V   |                  |             |                     |
| <a href="#">T181050</a> | \$130.00 | 0.25                                | 20.8                                 | 10.4  | 10 [4.5]         | B           | <a href="#">PDF</a> |
| <a href="#">T181051</a> | \$166.00 | 0.5                                 | 41.6                                 | 20.8  | 15 [6.8]         | B           | <a href="#">PDF</a> |
| <a href="#">T181052</a> | \$214.00 | 0.75                                | 62.5                                 | 31.25 | 19 [8.6]         | B           | <a href="#">PDF</a> |
| <a href="#">T111683</a> | \$244.00 | 1                                   | 83.2                                 | 41.6  | 24 [10.9]        | B           | <a href="#">PDF</a> |
| <a href="#">T111684</a> | \$310.00 | 1.5                                 | 125                                  | 62.5  | 30 [13.6]        | B           | <a href="#">PDF</a> |
| <a href="#">T111685</a> | \$400.00 | 2                                   | 166                                  | 83.2  | 38 [17.2]        | B           | <a href="#">PDF</a> |
| <a href="#">T111686</a> | \$568.00 | 3                                   | 250                                  | 125   | 55 [24.9]        | C           | <a href="#">PDF</a> |
| <a href="#">T111687</a> | \$869.00 | 5                                   | 416.6                                | 208   | 75 [34]          | C           | <a href="#">PDF</a> |

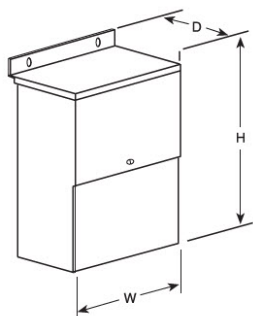
1. All units have ground studs for use with non-metallic conduit. All sizes of 0.75 kVA and less are suitable for 50/60 Hz. Additional field wiring boxes may be required when using units as autotransformers. See Dimensional Drawings link for product drawings and dimensions.

### Single-Phase Buck-Boost Transformers Specifications<sup>1</sup> 120x240 Primary Volts – 16/32 Secondary Volts – 60Hz

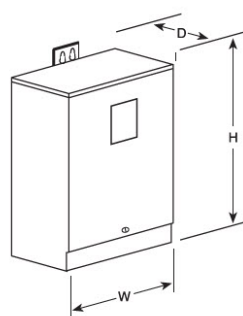
| Part Number             | Price      | Insulating Transformer Rating (kVA) | Secondary Maximum Current Output (A) |      | Weight (lb [kg]) | Case Design | Dimensional Drawing |
|-------------------------|------------|-------------------------------------|--------------------------------------|------|------------------|-------------|---------------------|
|                         |            |                                     | 16V                                  | 32V  |                  |             |                     |
| <a href="#">T181057</a> | \$159.00   | 0.25                                | 15.6                                 | 7.8  | 10 [4.5]         | B           | <a href="#">PDF</a> |
| <a href="#">T181058</a> | \$177.00   | 0.5                                 | 31.2                                 | 15.6 | 15 [6.8]         | B           | <a href="#">PDF</a> |
| <a href="#">T181059</a> | \$229.00   | 0.75                                | 46.9                                 | 23.4 | 19 [8.6]         | B           | <a href="#">PDF</a> |
| <a href="#">T113073</a> | \$274.00   | 1                                   | 62.5                                 | 31.2 | 24 [10.9]        | B           | <a href="#">PDF</a> |
| <a href="#">T113074</a> | \$332.00   | 1.5                                 | 93.7                                 | 46.9 | 30 [13.6]        | B           | <a href="#">PDF</a> |
| <a href="#">T113075</a> | \$407.00   | 2                                   | 125                                  | 62.5 | 38 [17.2]        | B           | <a href="#">PDF</a> |
| <a href="#">T113076</a> | \$626.00   | 3                                   | 187.5                                | 93.8 | 55 [24.9]        | C           | <a href="#">PDF</a> |
| <a href="#">T113077</a> | \$1,058.00 | 5                                   | 312                                  | 156  | 75 [34]          | C           | <a href="#">PDF</a> |

1. All units have ground studs for use with non-metallic conduit. All sizes of 0.75 kVA and less are suitable for 50/60 Hz. Additional field wiring boxes may be required when using units as autotransformers. See Dimensional Drawings link for product drawings and dimensions.

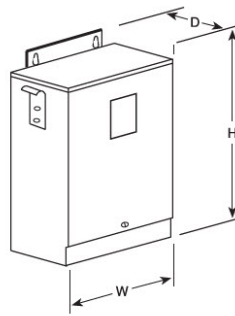
## Buck-Boost Transformers Case Design



Design A



Design B



Design C

# Buck-Boost Single-Phase Transformers

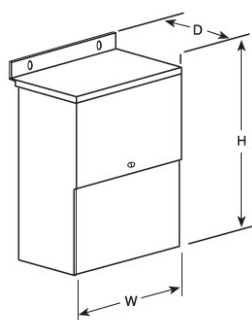
## 240x480 Primary



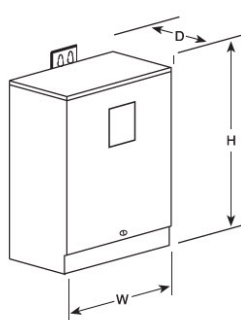
### Single-Phase Buck-Boost Transformers Specifications 240X480 Primary Volts – 24/48 Secondary Volts – 60Hz

| Part Number             | Price    | Insulating Transformer Rating (kVA) | Secondary Maximum Current Output (A) |      | Weight (lb [kg]) | Case Design | Dimensional Drawing |
|-------------------------|----------|-------------------------------------|--------------------------------------|------|------------------|-------------|---------------------|
|                         |          |                                     | 24V                                  | 48V  |                  |             |                     |
| <a href="#">T181064</a> | \$156.00 | 0.25                                | 10.4                                 | 5.2  | 10 [4.5]         | B           | <a href="#">PDF</a> |
| <a href="#">T181065</a> | \$193.00 | 0.5                                 | 20.8                                 | 10.4 | 15 [6.8]         | B           | <a href="#">PDF</a> |
| <a href="#">T181066</a> | \$250.00 | 0.75                                | 31.2                                 | 15.6 | 19 [8.6]         | B           | <a href="#">PDF</a> |
| <a href="#">T137920</a> | \$269.00 | 1                                   | 41.6                                 | 20.8 | 24 [10.9]        | B           | <a href="#">PDF</a> |
| <a href="#">T137921</a> | \$336.00 | 1.5                                 | 62.4                                 | 31.2 | 30 [13.6]        | B           | <a href="#">PDF</a> |
| <a href="#">T137922</a> | \$417.00 | 2                                   | 83.2                                 | 41.6 | 38 [17.2]        | B           | <a href="#">PDF</a> |
| <a href="#">T137923</a> | \$617.00 | 3                                   | 125                                  | 62.5 | 55 [24.9]        | C           | <a href="#">PDF</a> |
| <a href="#">T137924</a> | \$967.00 | 5                                   | 208                                  | 104  | 75 [34]          | C           | <a href="#">PDF</a> |

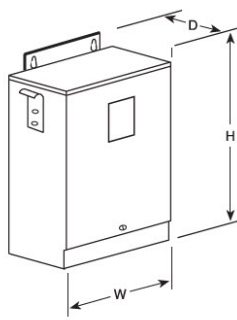
### Buck-Boost Transformers Case Design



Design A



Design B



Design C

# Buck-Boost Single-Phase Transformers



## Wiring Diagrams

### Units Rated 120x240 V Input, 12/24 V Output

| Input | Output | Connection Diagram |
|-------|--------|--------------------|
| 120   | 12     | K                  |
| 120   | 24     | L                  |
| 240   | 12     | M                  |
| 240   | 24     | N                  |

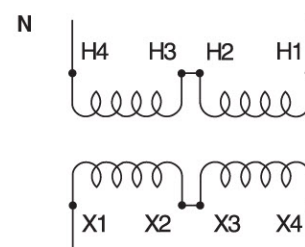
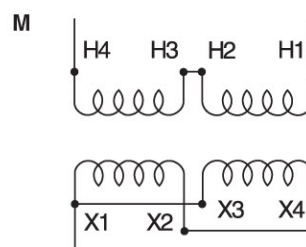
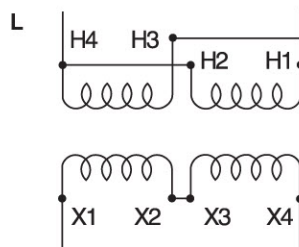
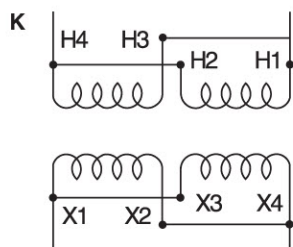
### Units Rated 120x240 V Input, 16/32 V Output

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

### Units Rated 240x480 V Input, 24/48 V Output

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

## Low Voltage Lighting Wiring Diagrams



# Buck-Boost Single-Phase Transformers



## Wiring Diagrams –Single-Phase

**Note:** The symbol **O** used in these connection diagrams indicates where to field-install the over-current protective device, typically a fuse or circuit breaker.

**Figure C**

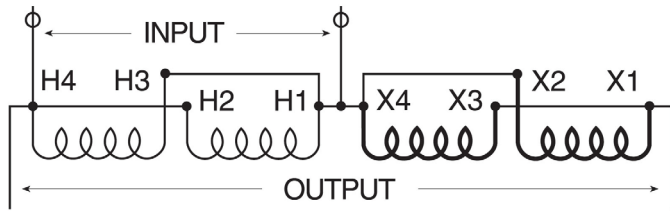


**Figure D**

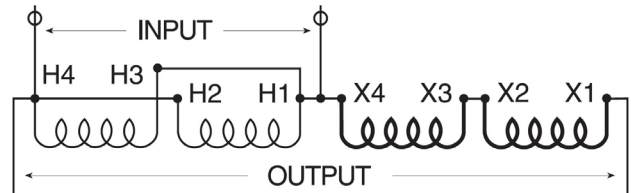


**Figure E**

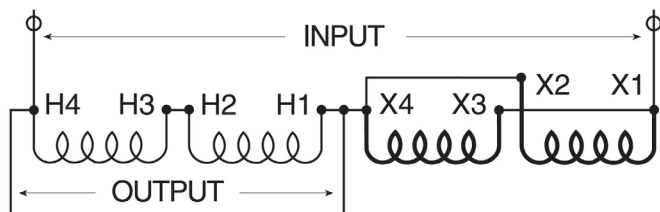


**Figure F**

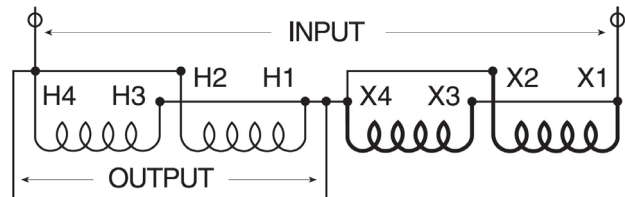


**Figure G**

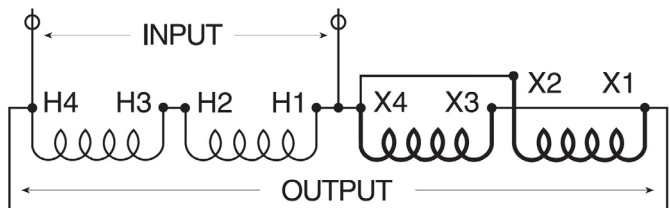


**Figure H**

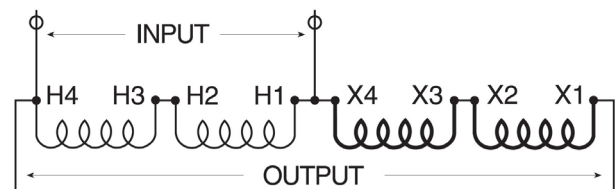


**Figure I**

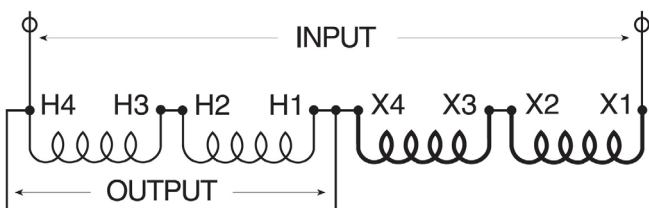
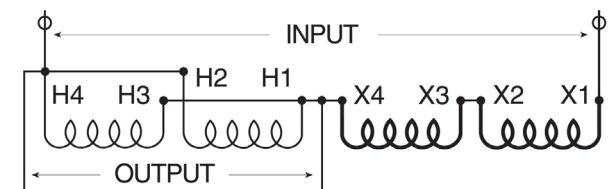


**Figure J**



# Buck-Boost Single-Phase Transformers



## Wiring Diagrams – Buck-Boost – Single-Phase for Three-Phase Applications

**Note 1:** The symbol **O** used in these connection diagrams indicates where to field-install the over-current protective device, typically a fuse or circuit breaker.

**Note 2:** Cannot be reverse connected.

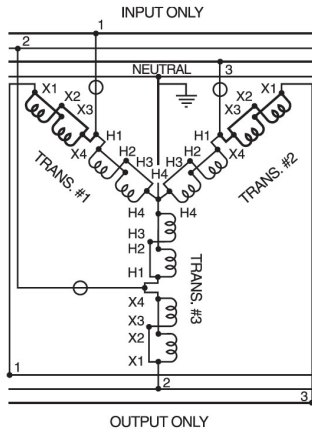


**FIG. AA**  
Note 2  
**WYE**

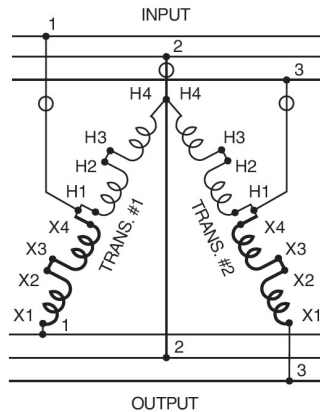


**FIG. BB**  
**OPEN DELTA**

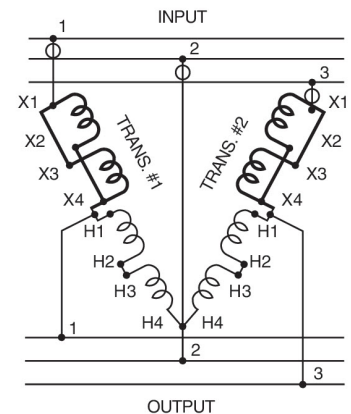


**FIG. CC**  
**OPEN DELTA**

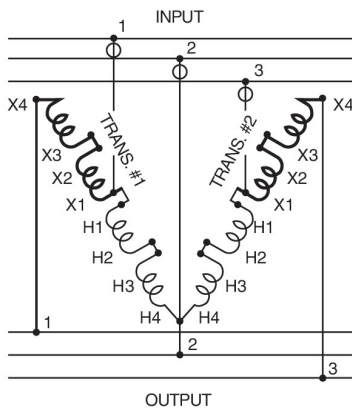


**FIG. DD**  
**OPEN DELTA**

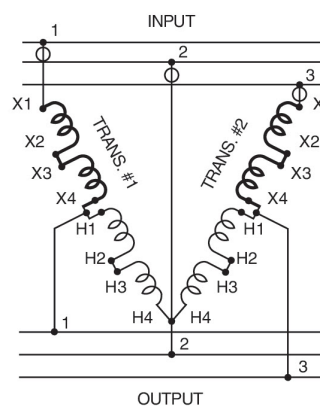


**FIG. EE**  
**OPEN DELTA**

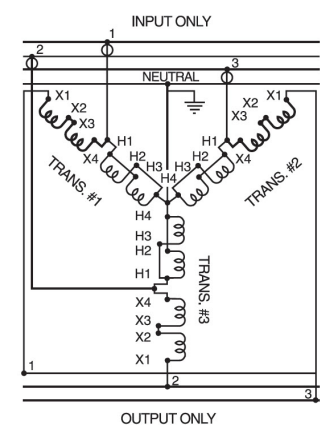


**FIG. FF**  
Note 2  
**WYE**

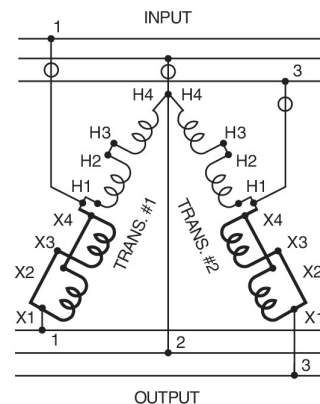


**FIG. GG**  
**OPEN DELTA**

**IMPORTANT:** Refer to the N.E.C. (National Electrical Code) Article 450-4 for overcurrent protection of an autotransformer. These connection diagrams are packed with each buck-boost transformer. Do not use connections other than those shown above.