SOLA HD

Products

Buck-Boost Transformers

Buck-Boost transformers are small, single phase, dry type distribution transformers designed and shipped as insulating/isolating transformers. They have a dual voltage primary and a dual voltage secondary. These transformers can be connected for a wide range of voltage combinations. The most common use is to buck (lower) or boost (raise) the supply voltage a small amount, usually 5 to 27%. Buck-Boost transformers are in compliance with NEC Article 210-9, Exception 1 when field connected as an autotransformer.

The major advantages of Buck-boost transformers are their low cost, compact size and light weight. They are also more efficient and cost less than equivalent isolation transformers. When connected as an autotransformer, they can handle loads up to 20 times the nameplate rating. A buck-boost transformer is the ideal solution for changing line voltage by small amounts.

On this page: Selection Steps, Fusing Buck-Boost Transformers, Applications, Accessories

When a buck-boost has the primary and secondary windings connected, per recommended instructions, it becomes an autotransformer. Now only the secondary windings are transforming voltage and current. The majority of the KVA load passes directly from the supply to the load. This is why buck-boost transformers can supply a load with a much larger KVA rating than the nameplate indicates.

Applications

Ideal for low voltage lighting control applications

Sola/Hevi-Duty buck-boost transformers are designed to supply power to low voltage lighting circuits, control panels or other systems requiring 12, 16, 24, 32, or 48 Volts. When connected as an insulating transformer (by following the wiring diagram on the inside of the transformer case), the transformer's capacity matches the nameplate KVA rating.

Sola/Hevi-Duty buck-boost transformers are also suited for low voltage landscape lighting. They are UL listed for outdoor service and their compact size makes them the perfect solution for providing power to accent lighting applications.

When using dimmers for low voltage applications, use only dimmers designed and rated for use with magnetic loads. We strongly recommend contacting the dimmer manufacturer for advice on your specific lighting application.

Selection Steps

1. **Input Line Voltage**
   Measure the supply voltage with a voltmeter.
2. **Voltage Required for the Load**
   Check the load equipment to determine the voltage requirement.

3. **KVA or Ampere Rating of the Load**
   Find either the load KVA or the load amperage requirements. This information is listed on the nameplate of the load equipment.
4. **Frequency**
   Either 50 or 60 Hz. The frequency of the transformer must match the frequency of the load.
5. **Number of Phases**
   Single or three phase line and load must match. (A transformer cannot convert single to three phase.) A common application is to make a single phase connection from a three phase supply by using one phase of the three phase supply circuit. Be careful not to overload that phase of the three phase supply. For buck-boost applications the supply must provide load KVA - not just the nameplate rating of the buck-boost. Refer to the Selection Tables.

Fusing Buck-Boost Transformers

For determining the correct size of breaker or fuse for a given range of input or output ampere ratings, refer to Section 450-4, of the National Electric Code (NEC).

"450-4, Autotransformers 600 Volts, Nominal or Less. (a) Overcurrent Protection. Each autotransformer 600 volts, nominal or less shall be protected by an individual overcurrent device installed in series with each ungrounded input conductor. Such overcurrent device shall be rated or set at not more than 125 percent of the rated full-load input current of the autotransformer. An overcurrent device shall not be installed in series with the shunt winding ...".

"...Exception. Where the rated input current of an autotransformer 9 amperes or more and 125 percent of this current does not correspond to a standard rating of a fuse or non-adjustable circuit breaker, the next higher standard rating described in Section 240-6 shall be permitted. Where the rated input current is less than 9 amperes, an overcurrent device rated or set at no more than 167 percent of the input current shall be permitted...".

Accessories

- Surge Suppression devices provide additional protection and longevity to any electronic equipment.

Specification Tables

Group 1 – 120 x 240 Volt Primary, 12/24 Volt Secondary

c UL us E77014

KVA	Catalog Number	Maximum Secondary Amperage		Height (inch)	Width (inch)	Depth (inch)	Ship Weight lbs (kg)	Design Style	Elec Conn
		12 V	24 V						
Non–Encapsulated – 50/60 Hz, Single Phase									
0.05	**HS19B50**	4.16	2.08	6	4	3	2 (0.91)	2	1
0.1	**HS19B100**	8.33	4.16	6	4	3	4 (1.82)	2	1
0.15	**HS19B150**	12.5	6.25	7.5	4	4	5 (2.27)	2	1
0.25	**HS19B250**	20.8	10.4	7.5	4	4	8 (3.64)	2	1
Encapsulated – 60 Hz, Single Phase									
0.5	**HS19F500B**	41.6	20.8	10	6	5	22 (10.0)	3	1
0.75	**HS19F750B**	62.5	31.2	10	6	5	27 (12.27)	3	1
1	**HS19F1B**	83.3	41.6	10	6	5	28 (12.73)	3	1
1.5	**HS19F1.5A**	125	62.5	12	10	7	38 (17.27)	4	1
2	**HS19F2A**	166.6	83.3	12	10	7	45 (20.45)	4	1
3	**HS19F3A**	250	125	12	10	7	55 (25.0)	4	1
5	**HS19F5A**	416.5	208.3	17	14	9	100 (45.45)	4	1
7.5	**HS19F7.5A**	625	312.5	17	14	9	135 (61.36)	4	1

Group 2 – 120 x 240 Volt Primary, 16/32 Volt Secondary

c UL us E77014

KVA	Catalog Number	Maximum Secondary Amperage		Height (inch)	Width (inch)	Depth (inch)	Ship Weight lbs (kg)	Design Style	Elec Conn
		16 V	32 V						
Non–Encapsulated – 50/60 Hz, Single Phase									
0.15	**HS20B150**	9.38	4.69	8	4	4	6 (2.73)	2	2
0.25	**HS20B250**	15.6	7.81	8	4	4	8 (3.64)	2	2
Encapsulated – 60 Hz, Single Phase									
0.5	**HS20F500B**	31.2	15.6	10	6	5	22 (10.0)	3	2
0.75	**HS20F750B**	46.8	23.4	10	6	5	27 (12.27)	3	2
1	**HS20F1B**	62.5	31.2	10	6	5	28 (12.73)	3	2
1.5	**HS20F1.5A**	93.7	46.8	12	10	7	38 (17.27)	4	2
2	**HS20F2A**	125	62.5	12	10	7	45 (20.45)	4	2
3	**HS20F3A**	187.5	93.7	12	10	7	55 (25.0)	4	2
5	**HS20F5A**	312	156	17	14	9	100 (45.45)	4	2
7.5	**HS20F7.5A**	468	234	17	14	9	135 (61.36)	4	2

Note: Weights and dimensions may change and should not be used for construction purposes.

Specification Tables – continued

Group 3 – 240 x 480 Volt Primary, 24/48 Volt Secondary

c UL us E77014

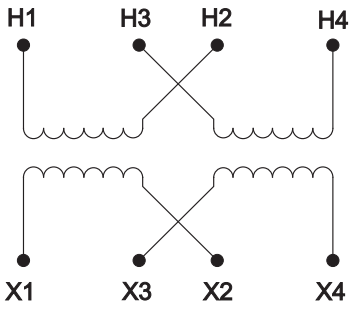
KVA	Catalog Number	Maximum Secondary Amperage		Height (inch)	Width (inch)	Depth (inch)	Ship Weight (lbs)	Design Style	Elec Conn
		24 V	48 V						
Non–Encapsulated – 50/60 Hz, Single Phase									
0.15	**HS22B150**	6.25	3.13	8	4	3	5	2	3
0.25	**HS22B250**	10.4	5.2	8	4	3	8	2	3
Encapsulated – 60 Hz, Single Phase									
0.5	**HS22F500B**	20.8	10.4	8	6	5	22	3	3
0.75	**HS22F750B**	31.2	15.6	10	6	5	27	3	3
1	**HS22F1B**	41.6	20.8	10	6	5	28	3	3
1.5	**HS22F1.5A**	62.5	31.2	12	10	7	38	4	3
2	**HS22F2A**	83.3	41.6	12	10	7	45	4	3
3	**HS22F3A**	125	62.5	12	10	7	55	4	3
5	**HS22F5A**	208	104	17	14	9	100	4	3
7.5	**HS22F7.5A**	312	156	17	14	9	135	4	3

Electrical Connections for Low Voltage Applications

⏚ = Earth Ground

120 X 240 Volt Primary,
12/24 Volt Secondary
Taps: None

1

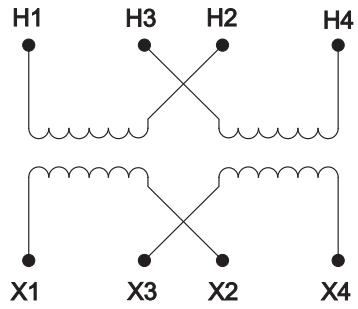


Primary Voltage	Interconnect	Connect Lines To
240	H2 to H3	H1 & H4
120	H1 to H3 H2 to H4	H1 & H4
Secondary Voltage	**Interconnect**	**Connect Lines To**
24	X2 to X3	X1 & X4
12-0-12	X2 to X3 X2 to ⏚	X1-X2-X4
12	X1 to X3 X2 to X4	X1 & X4

HS19 and S19 Series

120 X 240 Volt Primary,
16/32 Volt Secondary
Taps: None

2

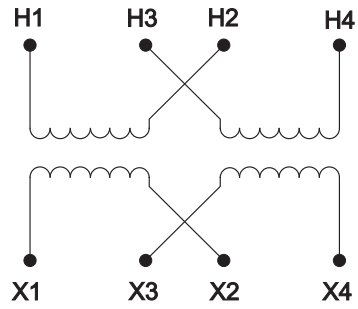


Primary Voltage	Interconnect	Connect Lines To
240	H2 to H3	H1 & H4
120	H1 to H3 H2 to H4	H1 & H4
Secondary Voltage	**Interconnect**	**Connect Lines To**
32	X2 to X3	X1 & X4
16-0-16	X2 to X3 X2 to ⏚	X1-X2-X4
16	X1 to X3 X2 to X4	X1 & X4

HS20 and S20 Series

240 X 480 Volt Primary,
24/48 Volt Secondary
Taps: None

3



Primary Voltage	Interconnect	Connect Lines To
480	H2 to H3	H1 & H4
240	H1 to H3 H2 to H4	H1 & H4
Secondary Voltage	**Interconnect**	**Connect Lines To**
48	X2 to X3	X1 & X4
24-0-24	X2 to X3 X2 to ⏚	X1-X2-X4
24	X1 to X3 X2 to X4	X1 & X4

HS22 and S22 Series