SQUARE D
GROUPE SCHNEIDER

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Application Tables and Wiring Diagrams Sorgel Buck and Boost Transformers

SINGLE PHASE

Buck and Boost transformers are insulating transformers which have 120 X 240 volt primaries and either 12/24 or 16/32 volt secondaries. When used as insulating transformers, they carry the full load stated on the nameplate. Their primary use and value is that the primary and secondary of a buck and boost transformer can be interconnected for use as an autotransformer. By varying the two primary windings and two secondary windings connection, numerous voltage ratios and current ratings can be obtained.

In applications where a slight adjustment in voltage (either downwards or upwards) is desirable or necessary, the use of a buck and boost transformer is one of the most economical and compact means of accomplishing adjustments of this type.

When used as an autotransformer, the Buck and Boost transformer can carry loads in excess of its nameplate rating. The increased ampacity is dependent on the ratio and voltage to which the transformer is subjected. For selection and exact load rating when used as an autotransformer, refer to Tables 1 through 10 which follow.

KVA	Catalog Number	Catalog Number	°C Temp Rise	Dimensions Height	Width	Depth	Weight Pounds	Mounting	Enclosure*
.050	50SV43A	50SV46A	55	5.0	4.5	3.5	4	Wall	I-O
.100	100SV43A	100SV46A	55	5.5	4.5	3.5	5	Wall	I-O
.150	150SV43A	150SV46A	55	5.0	4.9	3.8	6	Wall	I-O
.250	250SV43F	250SV46F	115	5.5	5.3	4.1	13	Wall	I-O
.500	500SV43F	500SV46F	115	6.2	6.2	4.7	16	Wall	I-O
.750	750SV43F	750SV46F	115	6.7	6.2	4.7	18	Wall	I-O
1.0	1S43F	1S46F	115	8.2	7.0	5.4	24	Wall	I-O
1.5	1.5S43F	1.5S46F	115	8.3	8.7	6.6	33	Wall	I-O
2.0	2S43F	2S46F	115	9.5	8.7	6.6	42	Wall	I-O
3.0	3S43F	3S46F	115	13.0	7.75	8.5	60	Wall	I-O

*ENCLOSURE CODE: I = Indoor, O = Outdoor
Note: Catalog numbers shown in shaded blocks are available from Distribution Center or stocking distributors.

Refer to tables that follow for guidelines in selecting the correct transformer that supplies the required voltage for a specific KVA load.

- Single Phase Loads—If load voltages of 115V, 120V, 230V or 240V are required, refer to Tables 1, 2, 3 or 4 respectively.
- Three Phase Loads—(Power or Lighting, but available voltage must be a 3-phase, 4-wire system with neutral for lighting.)

  If load voltages of 230V, 240V, 460V or 480V are required, refer to Tables 5, 6, 7 or 8 respectively.
- Three Phase Loads—(Open delta connection for 3 wire power loads only. Requires only 3-phase, 3-wire available voltage.)

  If load voltages of 230V or 240V are required, refer to Tables 9 or 10 respectively.

SELECTION

1. Calculate LOAD KVA:

   Single Phase KVA = $\frac{\text{Load Volts x Load Amperes}}{1000}$

   Three Phase KVA = $\frac{\text{Load Volts x Load Amperes x 1.73}}{1000}$
2. Select the "Desired Load Voltage" table nearest the voltage required.
3. Check for the nearest "Available Voltage" to the actual voltage measured.
4. Follow down the vertical column of the voltage measured and select a load KVA value EQUAL TO or GREATER THAN calculated (never smaller), then move horizontally to the left and select the transformer catalog number.

   Remember, for three-phase, two or three transformers may be required as shown at the table heading.
5. Use the correct wiring diagram number at the bottom of the "Load KVA" for the selected load KVA.

EXAMPLES

1. A single phase air conditioner requires 16.7 amperes at 120 volts. The existing line voltage is 110 volts.

   KVA = $\frac{120 \times 16.7}{1000}$ = 2 KVA

   From Table 2, pick the 109 volt column of "Available Voltage". Move down to 2.5 KVA. Move left to select 1-250SV43F. Wiring Diagram is number 1.
2. A fluorescent lighting load requires 18 amperes per phase with a 480Y/277 volt supply. The available voltage measures only 436 volts, phase to phase.

   KVA = $\frac{480 \times 18 \times 1.73}{1000}$ = 15 KVA

   From Table 8, pick the 436Y/252 column of "Available Voltage". Move down to 15 KVA. Move left to 500SV43F. Note, 3 transformers are required. Wiring Diagram is number 10.
3. A 230 volt, 3 phase motor draws 30 amperes. The available voltage is 218 volts.

   KVA = $\frac{230 \times 30 \times 1.73}{1000}$ = 12 KVA

   From Table 9, pick the 219 volt column of "Available Voltage". Move down to 17.2 KVA. Move left to 500SV43F. Note, two are required. Wiring Diagram is number 5.

TABLE 1

Single Phase, 60 Hz

Desired Load Voltage: 115V **One Transformers Required**

Transformer Catalog Numbers	Available Voltage							
	91	96	101	105	127	130	138	146
	Three Phase Load KVA							
50SV43A	—	0.25	—	0.5	0.5	—	0.25	—
50SV46A	0.18	—	0.37	—	—	0.37	—	0.18
100SV43A	—	0.5	—	1	1	—	0.5	—
100SV46A	0.37	—	0.75	—	—	0.75	—	0.37
150SV43A	—	0.75	—	1.5	1.5	—	0.75	—
150SV46A	0.56	—	1.12	—	—	1.12	—	0.56
250SV43F	—	1.25	—	2.5	2.5	—	1.25	—
250SV46F	0.94	—	1.88	—	—	1.88	—	0.94
500SV43F	—	2.5	—	5	5	—	2.5	—
500SV46F	1.88	—	3.75	—	—	3.75	—	1.88
750SV43F	—	3.75	—	7.5	7.5	—	3.75	—
750SV46F	2.81	—	5.62	—	—	5.62	—	2.81
1S43F	—	5	—	10	10	—	5	—
1S46F	3.75	—	7.5	—	—	7.5	—	3.75
1.5S43F	—	7.5	—	15	15	—	7.5	—
1.5S46F	5.62	—	11.25	—	—	11.25	—	5.62
2S43F	—	10	—	20	20	—	10	—
2S46F	7.5	—	15	—	—	15	—	7.5
3S43F	—	15	—	30	30	—	15	—
3S46F	11.25	—	22.5	—	—	22.5	—	11.25
Wiring Diag.	2	2	1	1	1	1	2	2

TABLE 2

Single Phase, 60 Hz

Desired Load Voltage: 120V **One Transformers Required**

Transformer Catalog Numbers	Available Voltage							
	95	100	106	109	132	136	144	152
	Three Phase Load KVA							
50SV43A	—	0.25	—	0.5	0.5	—	0.25	—
50SV46A	0.18	—	0.37	—	—	0.37	—	0.18
100SV43A	—	0.5	—	1	1	—	0.5	—
100SV46A	0.37	—	0.75	—	—	0.75	—	0.37
150SV43A	—	0.75	—	1.5	1.5	—	0.75	—
150SV46A	0.56	—	1.12	—	—	1.12	—	0.56
250SV43F	—	1.25	—	2.5	2.5	—	1.25	—
250SV46F	0.94	—	1.88	—	—	1.88	—	0.94
500SV43F	—	2.5	—	5	5	—	2.5	—
500SV46F	1.88	—	3.75	—	—	3.75	—	1.88
750SV43F	—	3.75	—	7.5	7.5	—	3.75	—
750SV46F	2.81	—	5.62	—	—	5.62	—	2.81
1S43F	—	5	—	10	10	—	5	—
1S46F	3.75	—	7.5	—	—	7.5	—	3.75
1.5S43F	—	7.5	—	15	15	—	7.5	—
1.5S46F	5.62	—	11.25	—	—	11.25	—	5.62
2S43F	—	10	—	20	20	—	10	—
2S46F	7.5	—	15	—	—	15	—	7.5
3S43F	—	15	—	30	30	—	15	—
3S46F	11.25	—	22.5	—	—	22.5	—	11.25
Wiring Diag.	2	2	1	1	1	1	2	2

TABLE 3

Single Phase, 60 Hz

Desired Load Voltage: 230V **One Transformers Required**

Transformer Catalog Numbers	Available Voltage							
	203	208	216	219	242	245	253	261
	Three Phase Load KVA							
50SV43A	—	0.5	—	1	1	—	0.5	—
50SV46A	0.37	—	0.75	—	—	0.75	—	0.37
100SV43A	—	1	—	2	2	—	1	—
100SV46A	0.75	—	1.5	—	—	1.5	—	0.75
150SV43A	—	1.5	—	3	3	—	1.5	—
150SV46A	1.12	—	2.25	—	—	2.25	—	1.12
250SV43F	—	2.5	—	5	5	—	2.5	—
250SV46F	1.88	—	3.75	—	—	3.75	—	1.88
500SV43F	—	5	—	10	10	—	5	—
500SV46F	3.75	—	7.5	—	—	7.5	—	3.75
750SV43F	—	7.5	—	15	15	—	7.5	—
750SV46F	5.62	—	11.25	—	—	11.25	—	5.62
1S43F	—	10	—	20	20	—	10	—
1S46F	7.5	—	15	—	—	15	—	7.5
1.5S43F	—	15	—	30	30	—	15	—
1.5S46F	11.25	—	22.5	—	—	22.5	—	11.25
2S43F	—	20	—	40	40	—	20	—
2S46F	15	—	30	—	—	30	—	15
3S43F	—	30	—	60	60	—	30	—
3S46F	22.5	—	45	—	—	45	—	22.5
Wiring Diag.	4	4	3	3	3	3	4	4

TABLE 4

Single Phase, 60 Hz

Desired Load Voltage: 240V **One Transformers Required**

Transformer Catalog Numbers	Available Voltage							
	212	218	225	229	252	256	264	272
	Three Phase Load KVA							
50SV43A	—	0.5	—	1	1	—	0.5	—
50SV46A	0.37	—	0.75	—	—	0.75	—	0.37
100SV43A	—	1	—	2	2	—	1	—
100SV46A	0.75	—		—	—		—	0.75
150SV43A	—	1.5	—	3	3	—	1.5	—
150SV46A	1.12	—	2.25	—	—	2.25	—	1.12
250SV43F	—	2.5	—	5	5	—	2.5	—
250SV46F	1.88	—	3.75	—	—	3.75	—	1.88
500SV43F	—	5	—	10	10	—	5	—
500SV46F	3.75	—	7.5	—	—	7.5	—	3.75
750SV43F	—	7.5	—	15	15	—	7.5	—
750SV46F	5.62	—	11.25	—	—	11.25	—	5.62
1S43F	—	10	—	20	20	—	10	—
1S46F	7.5	—	15	—	—	15	—	7.5
1.5S43F	—	15	—	30	30	—	15	—
1.5S46F	11.25	—	22.5	—	—	22.5	—	11.25
2S43F	—	20	—	40	40	—	20	—
2S46F	15	—	30	—	—	30	—	15
3S43F	—	30	—	60	60	—	30	—
3S46F	22.5	—	45	—	—	45	—	22.5
Wiring Diag.	4	4	3	3	3	3	4	4

TABLE 5

Three Phase, 60 Hz

Desired Load Voltage: 230Y/133 **Three Transformers Required**

Transformer Catalog Numbers	Available Voltage			
	181Y/105	192Y/111	203Y/117	208Y/120
	Three Phase Load KVA			
50SV43A	—	0.75	—	1.5
50SV46A	0.56	—	1.12	—
100SV43A	—	1.5	—	3
100SV46A	1.12	—	2.25	—
150SV43A	—	2.25	—	4.5
150SV46A	1.69	—	3.38	—
250SV43F	—	3.75	—	7.5
250SV46F	2.81	—	5.62	—
500SV43F	—	7.5	—	15
500SV46F	5.62	—	11.25	—
750SV43F	—	11.25	—	22.5
750SV46F	8.45	—	16.9	—
1S43F	—	15	—	30
1S46F	11.25	—	22.5	—
1.5S43F	—	22.5	—	45
1.5S46F	16.9	—	33.8	—
2S43F	—	30	—	60
2S46F	22.5	—	45	—
3S43F	—	45	—	90
3S46F	33.8	—	67.6	—
Wiring Diag.	8	8	7	7

TABLE 6

Three Phase, 60 Hz

Desired Load Voltage: 240Y/138 **Three Transformers Required**

Transformer Catalog Numbers	Available Voltage			
	189Y/109	200Y/115	212Y/122	218Y/126
	Three Phase Load KVA			
50SV43A	—	0.75	—	1.5
50SV46A	0.56	—	1.12	—
100SV43A	—	1.5	—	3
100SV46A	1.12	—	2.25	—
150SV43A	—	2.25	—	4.5
150SV46A	1.69	—	3.38	—
250SV43F	—	3.75	—	7.5
250SV46F	2.81	—	5.62	—
500SV43F	—	7.5	—	15
500SV46F	5.62	—	11.25	—
750SV43F	—	11.25	—	22.5
750SV46F	8.45	—	16.9	—
1S43F	—	15	—	30
1S46F	11.25	—	22.5	—
1.5S43F	—	22.5	—	45
1.5S46F	16.9	—	33.8	—
2S43F	—	30	—	60
2S46F	22.5	—	45	—
3S43F	—	45	—	90
3S46F	33.8	—	67.6	—
Wiring Diag.	8	8	7	7

TABLE 7

Three Phase, 60 Hz

Desired Load Voltage: 460Y/265 **Three Transformers Required**

Transformer Catalog Numbers	Available Voltage			
	406Y/235	418Y/242	432Y/250	438Y/253
	Three Phase Load KVA			
50SV43A	—	1.5	—	3
50SV46A	1.12	—	2.25	—
100SV43A	—	3	—	6
100SV46A	2.25	—	4.5	—
150SV43A	—	4.5	—	9
150SV46A	3.38	—	6.76	—
250SV43F	—	7.5	—	15
250SV46F	5.62	—	11.25	—
500SV43F	—	15	—	30
500SV46F	11.25	—	22.5	—
750SV43F	—	22.5	—	45
750SV46F	16.9	—	33.8	—
1S43F	—	30	—	60
1S46F	22.5	—	45	—
1.5S43F	—	45	—	90
1.5S46F	33.8	—	67.6	—
2S43F	—	60	—	120
2S46F	45	—	90	—
3S43F	—	90	—	180
3S46F	67.6	—	135	—
Wiring Diag.	10	10	9	9

TABLE 8

Three Phase, 60 Hz

Desired Load Voltage: 480Y/277 **Three Transformers Required**

Transformer Catalog Numbers	Available Voltage			
	424Y/245	436Y/252	450Y/260	457Y/264
	Three Phase Load KVA			
50SV43A	—	1.5	—	3
50SV46A	1.12	—	2.25	—
100SV43A	—	3	—	6
100SV46A	2.25	—	4.5	—
150SV43A	—	4.5	—	9
150SV46A	3.38	—	6.76	—
250SV43F	—	7.5	—	15
250SV46F	5.62	—	11.25	—
500SV43F	—	15	—	30
500SV46F	11.25	—	22.5	—
750SV43F	—	22.5	—	45
750SV46F	16.9	—	33.8	—
1S43F	—	30	—	60
1S46F	22.5	—	45	—
1.5S43F	—	45	—	90
1.5S46F	33.8	—	67.6	—
2S43F	—	60	—	120
2S46F	45	—	90	—
3S43F	—	90	—	180
3S46F	67.6	—	135	—
Wiring Diag.	10	10	9	9

TABLE 9

Three Phase, 60 Hz
Desired Load Voltage: 230V
(Open Delta-Power Loads Only) **Two Transformers Required**

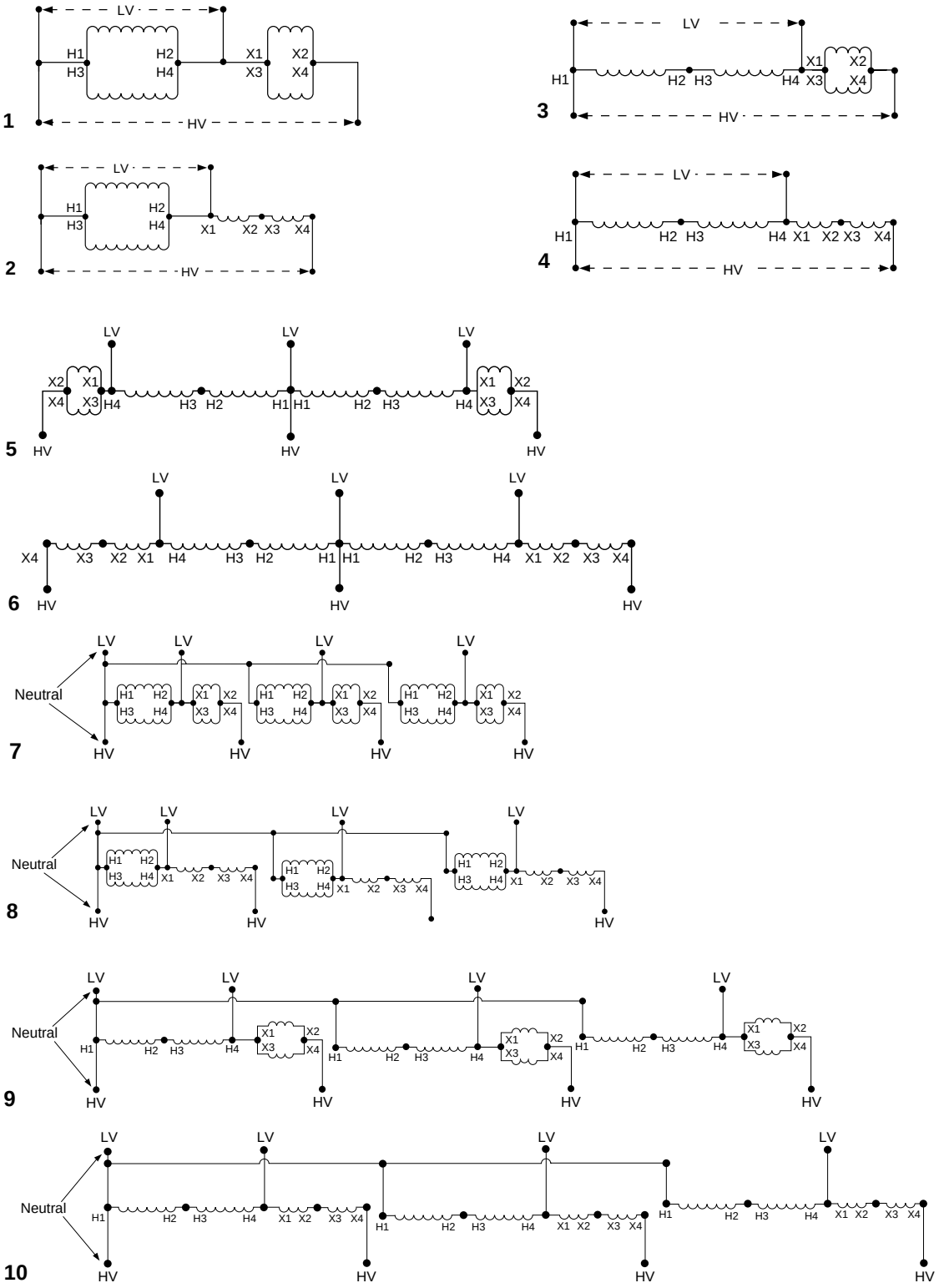
Transformer Catalog Numbers	Available Voltage							
	212	218	225	229	252	256	264	272
	Three Phase Load KVA							
50SV43A	—	0.86	—	1.72	1.72	—	0.86	—
50SV46A	0.64	—	1.29	—	—	1.29	—	0.64
100SV43A	—	1.72	—	3.43	3.43	—	1.72	—
100SV46A	1.29	—	2.58	—	—	2.58	—	1.29
150SV43A	—	2.58	—	5.16	5.16	—	2.58	—
150SV46A	1.94	—	3.88	—	—	3.38	—	1.94
250SV43F	—	4.3	—	8.6	8.6	—	4.3	—
250SV46F	3.23	—	6.45	—	—	6.45	—	3.23
500SV43F	—	8.6	—	17.2	17.2	—	8.6	—
500SV46F	6.45	—	12.9	—	—	12.9	—	6.45
750SV43F	—	12.9	—	25.8	25.8	—	12.9	—
750SV46F	9.7	—	19.4	—	—	19.4	—	9.7
1S43F	—	17.2	—	34.3	34.3	—	17.2	—
1S46F	12.9	—	25.8	—	—	25.8	—	12.9
1.5S43F	—	25.8	—	51.6	51.6	—	25.8	—
1.5S46F	19.4	—	38.8	—	—	38.8	—	19.4
2S43F	—	34.3	—	68.8	68.8	—	34.3	—
2S46F	25.8	—	51.6	—	—	51.6	—	25.8
3S43F	—	51.6	—	103.2	103.2	—	51.6	—
3S46F	38.8	—	77.6	—	—	77.6	—	38.8
Wiring Diag.	6	6	5	5	5	5	6	6

TABLE 10

Three Phase, 60 Hz
Desired Load Voltage: 240V
(Open Delta-Power Loads Only) **Two Transformers Required**

Transformer Catalog Numbers	Available Voltage							
	212	218	225	229	252	256	264	272
	Three Phase Load KVA							
50SV43A	—	0.86	—	1.72	1.72	—	0.86	—
50SV46A	0.64	—	1.29	—	—	1.29	—	0.64
100SV43A	—	1.72	—	3.43	3.43	—	1.72	—
100SV46A	1.29	—	2.58	—	—	2.58	—	1.29
150SV43A	—	2.58	—	5.16	5.16	—	2.58	—
150SV46A	1.94	—	3.88	—	—	3.88	—	1.94
250SV43F	—	4.3	—	8.6	8.6	—	4.3	—
250SV46F	3.23	—	6.45	—	—	6.45	—	3.23
500SV43F	—	8.6	—	17.2	17.2	—	8.6	—
500SV46F	6.45	—	12.9	—	—	12.9	—	6.45
750SV43F	—	12.9	—	25.8	25.8	—	12.9	—
750SV46F	9.7	—	19.4	—	—	19.4	—	9.7
1S43F	—	17.2	—	34.3	34.3	—	17.2	—
1S46F	12.9	—	25.8	—	—	25.8	—	12.9
1.5S43F	—	25.8	—	51.6	51.6	—	25.8	—
1.5S46F	19.4	—	38.8	—	—	38.8	—	19.4
2S43F	—	34.3	—	68.8	68.8	—	34.3	—
2S46F	25.8	—	51.6	—	—	51.6	—	25.8
3S43F	—	51.6	—	103.2	103.2	—	51.6	—
3S46F	38.8	—	77.6	—	—	77.6	—	38.8
Wiring Diag.	6	6	5	5	5	5	6	6

WIRING DIAGRAMS



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