



Sizing Transformers

DONGAN ELECTRIC MANUFACTURING CO. • 2987 FRANKLIN • DETROIT, MI 48207
 800.428.2626 • 313.567.8500 • FAX 313.567.8828 • www.dongan.com

HOW TO DETERMINE TRANSFORMER kVA RATINGS

Transformer Load expressed in amperes:

Select the appropriate kVA size from the selection charts listed on this page or by using the single phase or three phase sizing formula listed below. Be sure to select a transformer kVA rating equal to or greater than the anticipated connected load.

$$\text{Single Phase kVA} = \frac{\text{Load Voltage} \times \text{Load Amps}}{1000} \quad \text{kVA} = \frac{\text{Volt Amperes}}{1000}$$

$$\text{Three Phase kVA} = \frac{\text{Load Voltage} \times \text{Load Amps} \times 1.73}{1000} \quad \text{VA} = \text{kVA} \times 1000$$

Transformer Load expressed in kVA:

Select the appropriate size from the selection charts. Be sure to select a transformer kVA rating equal to or greater than the anticipated connected load.

Transformer Load expressed in wattage:

Convert wattage into a kVA rating by using the formula listed below. Or you may refer to the equipment nameplate to obtain the ampere requirements of the connected load. Be sure to select a transformer kVA rating equal to or greater than the anticipated connected load.

$$\text{kVA} = \frac{\text{Wattage}}{(1000 \times \text{Power Factor of the Load})}$$

Transformer Load expressed in motor horsepower:

Select the appropriate size kVA rating from the motor horsepower charts on this page. Be sure to select a transformer kVA rating equal to or greater than the anticipated load requirements.

Note:

High Ambient Temperature Applications: Derate the transformer nameplate kVA 8% for each 10°C above 40°C up to 60°C. Consult factory for ambients above 60°C.

High Altitude Applications: To allow for reduced cooling at higher elevations derate the transformer nameplate kVA by .3% for each 330 feet over 3300 feet above sea level.

kVA / Ampacity Ratings for Single Phase AC Voltages													
kVA	12V	16V	24V	32V	48V	120V	208V	240V	277V	380V	415V	480V	600V
.050	4.2	3.1	2.1	1.6	1.0	.42	.24	.21	.18	.13	.12	.10	.08
.100	8.3	6.2	4.2	3.3	2.0	.83	.48	.42	.36	.26	.24	.21	.17
.150	12.5	9.4	6.3	4.6	3.1	1.3	.72	.63	.54	.39	.36	.31	.25
.250	20.8	15.6	10.4	7.8	5.2	2.1	1.2	1.0	.90	.66	.60	.52	.42
.500	41.7	31.2	20.8	15.6	10.4	4.2	2.4	2.1	1.8	1.3	1.2	1.0	.83
.750	62	47	31.3	23.4	16.6	6.3	3.6	3.1	2.7	2.0	1.8	1.6	1.3
1	83	62	41.7	31.2	20.8	8.3	4.8	4.2	3.6	2.6	2.4	2.1	1.7
1.5	125	94	62	47	31.2	12.5	7.2	6.3	5.4	3.9	3.6	3.1	2.5
2	166	125	83	62.5	41.6	16.7	9.6	8.3	7.2	5.3	4.8	4.2	3.3
3	250	188	125	94	62	25.0	14.4	12.5	10.8	7.9	7.2	6.3	5.0
5	416	312	208	156	104	41.7	24.0	20.8	18.1	13.2	12.0	10.4	8.3
7.5						62	36.1	31.3	27.1	19.7	18.1	15.6	12.5
10						83	48.1	41.7	36.1	26.3	24.1	20.8	16.7
15						125	72	62	54	39.5	36.1	31.3	25.0
25						208	120	104	90	65	60	52	41.7
37.5						312	180	156	135	98	90	78	62
50						416	240	208	180	131	120	104	83
75						625	360	312	270	197	180	156	125
100						833	480	416	361	263	240	208	166

kVA / Ampacity Ratings for Three Phase AC Voltages								
kVA	200V	208V	240V	380V	415V	480V	575V	600V
3	8.6	8.3	7.2	4.5	4.1	3.6	3.0	2.8
6	17.3	16.6	14.4	9.1	8.3	7.2	6.0	5.7
9	26.0	25.0	21.6	13.6	12.5	10.8	9.0	8.6
15	43.3	41.6	36.1	22.8	20.8	18.0	15.0	14.4
25	72	69	60	38.0	34.8	30.1	25.1	24.0
30	86	83	72	45.6	41.7	36.1	30.1	28.9
45	130	125	108	68	62	54	45.2	43.3
75	216	208	180	114	104	90	75	72
112.5	325	312	270	171	156	135	113	108
150	433	416	361	228	208	180	150	144

Full Load Amperes - Single Phase AC Motor Voltages						
HP	115V	200V	208V	230V	Minimum Transformer kVA	Std. Dongan Size
1/6	4.4	2.5	2.4	2.2	.53	.750
1/4	5.8	3.3	3.2	2.9	.70	.750
1/3	7.2	4.1	4.0	3.6	.87	1
1/2	9.8	5.6	5.4	4.9	1.18	1.5
3/4	13.8	7.9	7.6	6.9	1.68	2
1	16	9.2	8.8	8	1.92	2
1 1/2	20	11.5	11	10	2.40	3
2	24	13.8	13.2	12	2.88	3
3	34	19.6	18.7	17	4.10	5
5	56	32.2	30.8	28	6.72	7.5
7 1/2	80	46	44	40	9.60	10
10	100	57.5	55	50	12.0	15

Full Load Amperes - Three Phase AC Motor Voltages						
HP	208V	230V	460V	575V	Min. Transformer kVA	Std. Dongan Size
1/2	2.4	2.2	1.1	.9	0.9	3
3/4	3.5	3.2	1.6	1.3	1.2	3
1	4.6	4.2	2.1	1.7	1.5	3
1 1/2	6.6	6.0	3.0	2.4	2.1	3
2	7.5	6.8	3.4	2.7	2.7	3
3	10.6	9.6	4.8	3.9	3.8	6
5	16.7	15.2	7.6	6.1	6.3	9
7 1/2	24.2	22	11	9	9.2	15
10	30.8	28	14	11	11.2	15
15	46.2	42	21	17	16.6	25
20	59.4	54	27	22	21.6	25
25	74.8	68	34	27	26.6	30
30	88	80	40	32	32.4	45
40	114	104	52	41	43.2	45
50	143	130	65	52	52	75
60	169	154	77	62	64	75
75	211	192	96	77	80	112.5
100	273	248	124	99	103	112.5
125	343	312	156	125	130	150
150	396	360	180	144	150	150

Note:

Increase transformer kVA by 20% when motors are started more than once per hour.

Multiply motor ampacity by 1.1 and 1.25 respectively for 90% and 80% power factors.