

Selection Steps

- A. Use the following steps below to manually select a transformer.
- B. Find the electrical load requirements. These are:
 - 1. Load operating voltage.
 - 2. Load frequency (expressed in Hz).
 - 3. Determine load size - usually expressed in kVA, amperage or horsepower.
 - 4. Is the load designed to operate on single phase or three phase power?

This information is available from the equipment manufacturer and is typically listed on the nameplate of the equipment.

- C. Know the supply voltage conditions:
 - 1. Available source voltage.
 - 2. Available source frequency (a transformer will not change frequency. The frequency of the supply voltage and the needed load voltage must be equal).
 - 3. Number of phases on power source.
- D. Determine the transformer kVA rating:
 - 1. If the load is expressed in kVA, select the appropriate transformer from the following selection charts (make sure the selected transformer's kVA rating is equal to or greater than the required load kVA).
 - 2. If the load is expressed in amperage, use either the appropriate kVA formula listed below or the appropriate sizing chart on the next page.

$$kVA (1\emptyset) = \frac{\text{Volts} \times \text{Amps}}{1000}$$

$$kVA (3\emptyset) = \frac{\text{Volts} \times \text{Amps} \times 1.732}{1000}$$



- 3. If the load is expressed in wattage, either utilize the formula below to convert to kVA or refer to the equipment nameplate to obtain amperage requirement.

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

- 4. If the load is a motor and expressed in horsepower, refer to the motor horsepower charts on the next page.

Some sizes may require an optional weather shield (order separately) for outdoor use.

Always size the transformer to the load requirements.

Single Phase: Full Load Current Chart

kVA Rating	120 V	208 V	240 V	277 V	480 V	600 V
Amperes						
0.05	0.42	0.24	0.21	0.18	0.1	0.08
0.075	0.63	0.36	0.31	0.27	0.16	0.13
0.1	0.83	0.48	0.42	0.36	0.21	0.17
0.15	1.3	0.72	0.63	0.54	0.31	0.25
0.25	2.1	1.2	1	0.9	0.52	0.42
0.5	4.2	2.4	2.1	1.8	1.4	0.83
0.75	6.3	3.6	3.1	2.7	1.6	1.3
1	8.3	4.8	4.2	3.6	2.1	1.7
1.5	12.5	7.2	6.3	5.4	3.1	2.5
2	16.7	9.6	8.3	7.2	4.2	3.3
3	25	14.4	12.5	10.8	6.3	5
5	41.7	24	20.8	18.1	10.4	8.3
7.5	62.5	36.1	31.3	27.1	15.6	12.5
10	83.3	48.1	41.7	36.1	20.8	16.7
15	125	72.1	62.5	54.2	31.3	25.0
25	208.3	120.2	104.2	90.3	52.1	41.7
37.5	312.5	180.3	156.3	135.4	78.1	62.5
50	416.7	240.4	208.3	180.5	104.2	83.3
75	625	361	313	271	156	125.0
100	833	481	417	361	208	167.0
167	1392	803	696	603	348	278.0
200	1667	962	833	722	417	333.0
250	2083	1202	1042	903	521	417.0

Three Phase: Full Load Current Chart

kVA Rating	208 V	240 V	480 V	600 V
Amperes				
3	8.3	7.2	3.6	2.9
6	16.7	14.4	7.2	5.8
9	25	21.7	10.8	8.7
15	41.6	36.1	18	14.4
30	83.3	72.2	36.1	28.9
45	125	108.3	54.1	43.3
75	208.2	180.4	90.2	72.2
112.5	312	271	135	108.0
150	416	361	180	144.0
225	625	541	271	217.0
300	833	722	361	289.0
500	1388	1203	601	481.0

Single Phase Motor Chart: AC, Motor Horsepower Amperage

Horse Power	115 V	208 V	230 V	460 V	575 V	Mini Tfmr. kVA	Std. NEMA kVA Size
1/6	4.4	2.4	2.2	1.1	0.9	0.53	0.75
1/4	5.8	3.2	2.9	1.4	1.2	0.7	0.75
1/3	7.2	4	3.6	1.8	1.4	0.87	1
1/2	9.8	5.4	4.9	2.5	2	1.2	1.5
3/4	13.8	7.6	6.9	3.5	2.8	1.7	2
1	16	8.8	8	4	3.2	1.9	2
1 1/2	20	11	10	5	4	2.4	3
2	24	13.2	12	6	4.8	2.9	3
3	34	18.7	17	8.5	6.8	4.1	5
5	56	30.8	28	14	11.2	6.7	7.5
7.5	80	44	40	21	16	9.6	10
10	100	55	50	26	20	12	15

Three Phase Motor Chart: AC, Motor Horsepower Amperage

Horse Power	208 V	230 V	460 V	575 V	Mini Tfmr. kVA	Std. NEMA kVA Size
1/2	2.2	2	1	0.8	0.9	3.0
3/4	3.1	2.8	1.4	1.1	1.2	3.0
1	4	3.6	1.8	1.4	1.5	3.0
1 1/2	5.7	5.2	2.6	2.1	2.1	3.0
2	7.5	6.8	3.4	2.7	2.7	3.0
3	10.7	9.6	4.8	3.9	3.8	6.0
5	16.7	15.2	7.6	6.1	6.3	9.0
7 1/2	24	22	11	9	9.2	15.0
10	31	28	14	11	11.2	15.0
15	46	42	21	17	16.6	30.0
20	59	54	27	22	21.6	30.0
25	75	68	34	27	26.6	30.0
30	88	80	40	32	32.4	45.0
40	114	104	52	41	43.2	45.0
50	143	130	65	52	52	75.0
60	170	154	77	62	64	75.0
75	211	192	96	77	80	112.5
100	273	248	124	99	103	112.5
125	342	312	156	125	130	150.0
150	396	360	180	144	150	150.0
200	528	480	240	192	200	225.0

Three things to keep in mind:

1. Motor horsepower charts are based on 1800 RPM squirrel cage induction motors. If using another type of motor, check running amperage against the chart and adjust as necessary.
2. Increase required transformer kVA by 20% if motors are started more than once per hour.
3. If your motor service factor is greater than 1, proportionally increase full load amperage. (i.e. – if service factor is 1.10, increase full load amperage by 10%).

Are there any special application considerations?

- A. **For ambient conditions over 40°C**, derate the transformer nameplate kVA by 8% for each 10°C above 40°C.
- B. **For high altitude applications**, derate the transformer nameplate kVA by 0.3% for every 330 feet over 3300 feet above sea level. This assures proper transformer convection cooling.
- C. Some applications may require a transformer design that limits the BTU output of the unit at full load or a design to withstand and mitigate specific electrical anomalies.