

## TB161 (Rev2) - Determining Transformer Size in kVA for a Machine

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### Overview

This document will help you in determining the size (kVA) of the transformer that is required for your machine.

### Background

In order to determine the total power requirements of your machine, you will need to add all of the power requirements of each individual component that is installed on the machine. The components listed in the tables below consist of standard and some optional components that may be installed on a machine. If your machine has a component installed that is not listed below, you will need to determine its power requirements and add it accordingly. Once you know the total power requirements of the machine, you just need to apply the formula below to determine the minimum size of the transformer that is required.

$kVA = kW / PF$  where PF is the Power Factor which is typically 0.8

### Centroid supplied DC system transformer kVA ratings:

110VAC Low power transformer - 1.86kVA

220VAC High power transformer - 2.3kVA

### Component Power Rating

Component	Power(kW)
10inlb DC Motor	0.20
17inlb DC Motor	0.35
29inlb DC Motor	0.60
40inlb DC Motor	0.80
35inlb AC Motor	0.75
50inlb AC Motor	1.00
100inlb AC Motor	2.00
150inlb AC Motor	3.00
200inlb AC Motor	4.00
10hp Spindle Motor	7.50
15hp Spindle Motor	11.00
20hp Spindle Motor	15.00
Spindle Chiller	0.95
Swingarm ATC Motor	0.55
Carousel ATC Motor	0.45
Flood Pump	0.75
Lube Pump	0.15
Chip Auger	0.25
Chip Washdown Pump	0.75

**Example 1**

We have an A532 machine that has a 10hp spindle motor. It is a 4-axis machine that is using 2kW AC motors for X, Y, and Z and a 750W AC motor for W. It also has a spindle chiller, swingarm ATC, flood and lube pumps installed on the machine. The minimum transformer size that is required is determined in the table below.

<b>Component</b>	<b>Power(kW)</b>
10hp Spindle Motor	7.50
X-axis Motor	2.00
Y-axis Motor	2.00
Z-axis Motor	2.00
W-axis Motor	0.75
Spindle Chiller	0.95
Swingarm ATC Motor	0.55
Flood Pump	0.75
Lube Pump	0.15
<b>Total Power(kW)</b>	<b>16.65</b>
<b>Transformer(kVA)</b>	<b>20.81</b>

**Example 2**

We have an A532 machine that has a 20hp spindle motor with a spindle chiller installed. It has 2kW AC motors installed on X and Y axes. It has a 4.5kW AC motor installed on Z. It also has a tilt table installed that has 750W AC motors on both the 4th and 5th axes. It has a swingarm ATC installed on the machine. It also has a chip auger and flood, lube, and chip washdown pumps. The minimum transformer size that is required is determined in the table below.

<b>Component</b>	<b>Power(kW)</b>
20hp Spindle Motor	15.00
X-axis Motor	2.00
Y-axis Motor	2.00
Z-axis Motor	4.50
A-axis Motor	0.75
B-axis Motor	0.75
Spindle Chiller	0.95
Swingarm ATC Motor	0.55
Chip Auger	0.25
Flood Pump	0.75
Lube Pump	0.15
Chip Washdown Pump	0.75
<b>Total Power(kW)</b>	<b>28.40</b>
<b>Transformer(kVA)</b>	<b>35.50</b>

**Example 3**

We have a mill with a 10hp spindle motor. There are 29inlb DC motors installed on X, Y, and Z axes. It also has a flood and lube pump installed on the machine. The minimum transformer size that is required is determined in the table below.

<b>Component</b>	<b>Power(kW)</b>
10hp Spindle Motor	7.50
X-axis Motor	0.60
Y-axis Motor	0.60
Z-axis Motor	0.60
Flood Pump	0.75
Lube Pump	0.15
<b>Total Power(kW)</b>	<b>10.20</b>
<b>Transformer(kVA)</b>	<b>12.75</b>

If you need any more assistance in determining any kind of power related calculations, there is a handy power calculator at [http://dieselserviceandsupply.com/power\\_calculator.aspx](http://dieselserviceandsupply.com/power_calculator.aspx).

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**Document History**

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