


Motor Model File [JSON]

For a **PMSM BLDC** machine configured to use the **PMSM Variable Ld/Lq** motor type, a JSON file is required to define the motor characteristics. The file must contain the following information:

Parameter (JSON key)	Value type	Unit	Description	Example
PolePairs	int		Number of pole pairs of the machine.	"PolePairs": 2
DqTransform AngleOffset	double	degree	<div style="border: 1px solid red; padding: 5px; margin-bottom: 10px;">  Due to a known issue, this value is not taken into consideration during the simulation, however it must still be specified by the user. </div> <p>Angle offset applied to the D-Q Transform, before Id and Iq are referenced to look up Ld, Lq, and Fm. A value of 0 indicates that the D axis is aligned with Phase A when the rotor angle =0. In other words, the active power reaches a maximum when Id is at a maximum. This is the default behavior.</p> <p>For more information, see the D-Q Transform description.</p>	"DqTransformAngleOffset": 0
Ra	double	Ohm	Phase A Resistance of the machine	"Ra": 0.04
Rb	double	Ohm	Phase B Resistance of the machine	"Rb": 0.04
Rc	double	Ohm	Phase C Resistance of the machine	"Rc": 0.04
Id_axis	double[]	A	One dimensional array of the current values along the Direct axis of the stator. This array must be the same size as Iq_axis , and its values must be arranged in ascending order.	"Id_axis": [-50.0, 0.0, 50.0],
Iq_axis	double[]	A	One dimensional array of the current values along the Quadratic axis of the stator. This array must be the same size as Id_axis , and its values must be arranged in ascending order.	"Iq_axis": [-50.0, 0.0, 50.0],
Ld	double[][]	H	Two dimensional array of the Direct inductance values. The size of this array must be n x n, where n is equal to the number of current values in Id_axis and Iq_axis . Figure 1 below describes how the inductance values are mapped from the JSON file array to the Ld table.	"Ld": [[0.0004, 0.0004, 0.00041], [0.0004, 0.0004, 0.00043], [0.0004, 0.0004, 0.0004]],

Lq	double[][]	H	<p>Two dimensional array of the Quadratic inductance values.</p> <p>The size of this array must be $n \times n$, where n is equal to the number of current values in Id_axis and Iq_axis.</p> <p>Figure 1 below describes how the inductance values are mapped from the JSON file array to the Lq table.</p>	<pre>"Lq": [[0.0004, 0.0004], [0.0004, 0.00043], [0.0004, 0.0004], [0.0004, 0.0004]]</pre>
Fm	double[][]	Wb	<p>Two dimensional array of the Permanent Magnet Flux Linkage values.</p> <p>The size of this array must be $n \times n$, where n is equal to the number of current values in Id_axis and Iq_axis.</p> <p>Figure 1 below describes how the inductance values are mapped from the JSON file array to the Permanent Magnet Flux Linkage table.</p>	<pre>"Fm": [[0.1, 0.1, 0.1], [0.1, 0.1, 0.1], [0.1, 0.1, 0.1]]</pre>

