Altair® FluxMotor® 2026

Direct Current Permanent Magnet Machine - Inner rotor

Motor Factory - Test - Working point

General user information

Altairhyperworks.com

Contents

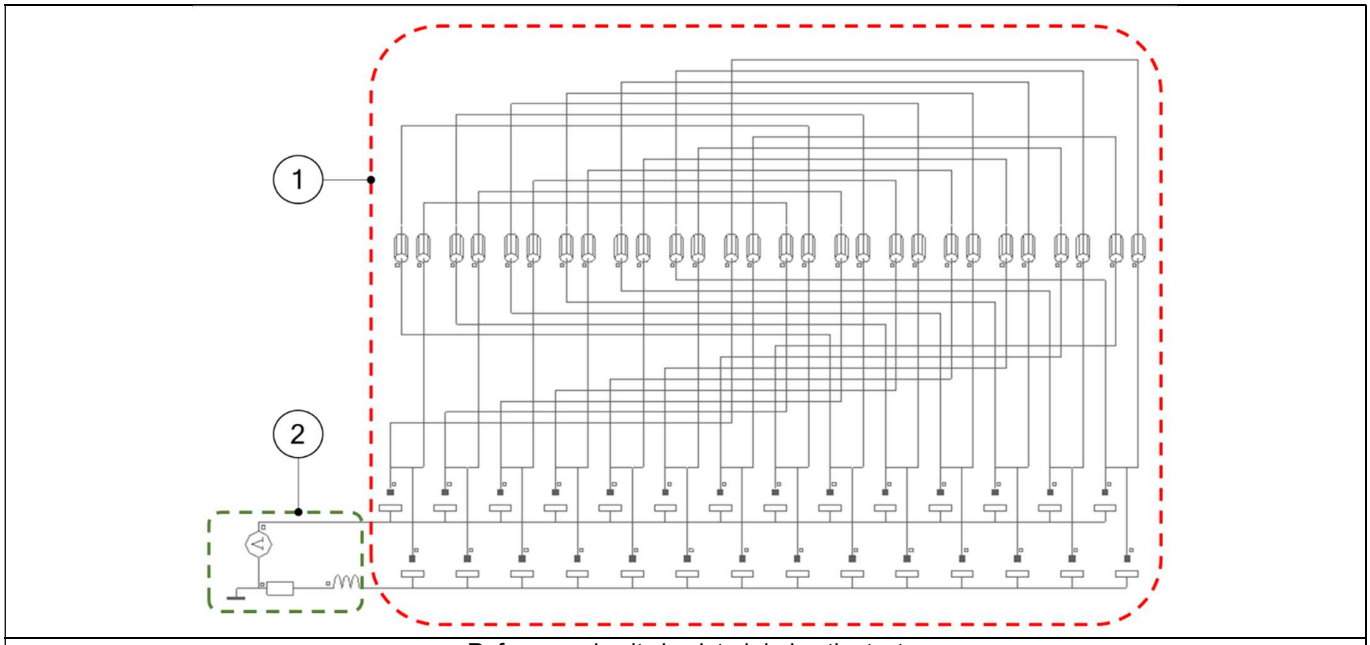
1 WORKING POINT – CONSTANT SPEED – MOTOR & GENERATOR – U-N

1.1 Overview

1.1.1 Positioning and objective

The aim of the test "**Working point – Constant Speed – U-N"** is to characterize the behavior of the machine when operating at constant speed connected to an external circuit composed of a DC voltage source and a parasitic impedance.

Note 1: The working point is mainly imposed by the external source voltage and the machine rotation speed. Since these variables have a great influence on the electrical and the mechanical sides, the working point may correspond either to a motor or a to a generator behavior.



Reference circuit simulated during the test	
1	Circuit representation of the DC machine (including brushes – commutator segment contacts)
2	Circuit feeding the DC machine (including a DC voltage source and parasitic impedances)

All the results are computed from a Finite Element Analysis (Flux) - Transient application. The results of this test give an overview of the electromagnetic behavior of the considered machine at a given working point.
The general data of the machine such as power balance, machine constant and torque ripple are computed and displayed.
The magnetic flux density is also computed in every region of the machine magnetic circuit to evaluate the design.

Warning 1: A minimum of two complete revolutions are considered for reaching a steady state behavior of the machines. However, sometimes there is not enough time to ensure a good convergence of our process; in this case the user is advised to compute a higher number of revolutions (please, see the next sections for further information).

Warning 2: Please note that power motor convention will be maintained even if the machine behaves as a generator for the selected working point.