

WOUND ROTOR SYNCHRONOUS MOTOR FED BY MATRIX CONVERTER

To develop dynamic model and simulate the transient behavior of 3-phase to 3-phase matrix converter fed 3-phase wound field synchronous motor at unity power factor by rotor field control operated in vector control mode using PI speed controller for (a) starting (b) speed reversal and (c) load perturbations.

ABSTRACT:

The matrix converter is the most general converter-type in the family of a.c. to a.c. direct converters. On the one hand, the matrix converter fulfills the requirements to provide a sinusoidal voltage at the load side and, on the other hand, it is possible to adjust the unity power factor on the mains side under certain conditions. Since there is no DC-link as in common converters, the matrix converter can be built as a full-silicon structure. However, a mains filter is necessary to smooth the pulsed currents on the input side of the matrix converter. Using a sufficiently high pulse frequency, the output voltage and input current both are shaped sinusoidally. This report describes the development and simulink simulation of dynamic model of 3-phase to 3-phase matrix converter. The main objective of feeding synchronous machine with 3-phase to 3-phase matrix converter is not obtained as switch of matrix converters needs additional auxiliary circuits to feed inductive loads. Hence ideology of 3-phase to 3-phase matrix converter fed 3-phase wound field synchronous motor at unity power factor by rotor field control operated in vector control mode using PI speed controller is presented.