Starting of the three phase reluctance motor from a single phase supply

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Abstract

An analysis of the starting process of a three-phase reluctance motor when fed from a single-phase supply is presented. This analysis is aimed, mainly, at the determination of the variations in the different machine parameters as it pulls into synchronism. Special attention is given to the calculation of both the positive and negative sequence impedances. These impedances play an important role in the proper selection of the phase converter capacitance needed for ensuring satisfactory operation. For this purpose, the symmetrical component concept along with classical synchronous machine theory have been effectively employed. The devised mathematical model could also help in studying the asynchronous operation of synchronous machines when fed from either three-phase or single-phase power supplies. The effect of the value of the selected phase converter capacitance on the performance of the reluctance motor during starting and normal running conditions is investigated.