

A 3Y/3Y Pole-Changing Winding of High-Power Asynchronous Motors

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Abstract : Requirement for pole-changing motors emerged at the very early times of asynchronous motor design. Different solutions have been elaborated and some of them are generally used. An alternative is the so called 3 Y/3 Y pole-changing winding. This paper deals with high power application of this solution. A complete and comprehensive study is introduced, including features and design guidelines. The method presented in this paper is especially suitable for pole numbers being close to each other. The study also reveals that the method is more advantageous than the existing solutions for high power motors with 1:3 pole ratio. Using this motor, a new and complete drive supply system has been proposed as most appropriate arrangement of high power main naval propulsion drive. Further, the method makes possible to extend the pole ratio to 1:6, 1:9, 1:12, etc. At the end, the proposal is further extended to the here so far missing 1:4, 1:5, 1:7 etc. pole ratios. A complete proposal for the theoretically infinite range has been given in this way.

Keywords : induction motor, pole changing 3Y/3Y, pole phase modulation, pole changing 1:3, 1:6

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