SINGLE-PHASE COMPENSATED INDUCTION MOTOR

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Single-phase compensated induction motor's characteristics calculation methodology is offered.

Key words: Single-phase compensated induction motor, induction motor, circuit model, equation, characteristic

A three-phase asynchronous electric motor which working principle based on using rotating magnetic field created by m-phase current's system is well known. It is structurally simple, cheap and reliable. Therefore induction motor is widely used in practice, especially in a variant with the short-circuit rotor.

However looking on the terms of creation of circulating magnetic-field an asynchronous engine has defects main from that is a consumption an engine from the network of feed of two types of electric powers - active that grows into mechanical, with a transmission on the billow of rotor for привода of working mechanism that results in inevitable thermal losses (heating of обмоток, magnetic losses in steel, mechanical, additional, a current), and also reactive for creation of circulating magnetic-field. Thus a reactive-power does not grow into other types of energy, and only creates terms for the electromechanics converting of active energy into the magnetic field. An unproductive reactive current increases the general current of machine and network of feed, increasing losses in them. Efficiency of engine and his power-factor diminish hereupon. For example, for the engines of small (to 11 kW) and middle (to 100 kW) power a power-factor presents 0,7-0,9. A starting current of asynchronous engine is large enough and in 4-7 times exceeds the nominal, here starting moment of engine presents only 0,8÷2,0 from nominal, that largely limits his application in low-powered networks and for the occasion of mechanisms with the large inertia masses. Yet more ponderable defects have monophase engines that at a monophase alternating current create the pulsating magnetic field at a zero starting moment. ККД and cosφ of monophase engine is yet below, than in a three-phase. For a removal or even послаблення some of these lacks of asynchronous engine запропоновано method of internal capacity indemnification of reactive-power.

An aim of researches is development of facilities for the removal of lacks of monophase condenser asynchronous engine by transformation of him on diphasic with the use of phase-shifting element as a condenser of electric capacity.

To our opinion these methods of internal capacity indemnification of reactive-power on maintenance are analogical to each other, although a single-phase condenser engine a long ago is known, and a three-phase is compensated is a modern invention. For creation of three-phase variant of the compensated asynchronous engine in a base serial asynchronous engine the phase zone of 60^o puttee of статора is divided into two identical parts displaced one in relation to other in slots core of статора on the corner θ = of 30^o.

Like compensated induction motor is spatially displaced inter se two обмотки of статора of monophase condenser engine is included also on the chart of turning transformer on an electric capacity.

The brought methodology over allows to conduct calculations on results that necessary descriptions of single-phase motor are built. The analysis of the got descriptions gives an opportunity to determine the change of parameters of single-phase compensated induction motor, charts of his puttee and others like that. for the increase of power efficiency of engine and improvement of his starting characteristics.