

电力系统

一种基于电源周期平均模型的单相 PWM逆变器准PID控制器

孙晓明¹, 刘涤尘¹, 黄涌², 钱薇¹, 熊元新¹

1. 武汉大学电气工程学院, 2. 华中电网公司技术中心

摘要:

提出了一种基于电源周期平均模型的单相PWM逆变器准PID控制器, 其来源于对三角波比较控制方法的深入分析, 从而为常用PI控制器的参数整定提供了比较严谨的理论公式, 使参数整定变得快捷。由于准PID控制器自身已具备比较优越的性能, 因此可为中低档逆变器直接采用, 或用作高精度智能PID控制逆变器的初始状态, 以保证系统启动的稳定性和安全性, 并且使智能控制算法能更好地发挥其优势。准PID控制器的提出同时也说明了单相PWM逆变器不适宜使用严格的PID控制器的原因。

关键词: 电源周期平均模型 单相PWM逆变器 准PID控制器 PI参数整定

A Quasi-PID Controller of Single-phase PWM Inverter Based on Source Period Averaging Model

SUN Xiao-ming¹, LIU Di-chen¹, HUANG Yong², QIAN Wei¹, XIONG Yuan-xin¹

1. Wuhan University

2. Technical Center of Central China Grid Company Limited

Abstract:

A quasi-PID controller of single-phase PWM inverter based on source period averaging model, which is derived from further analysis of the control method of triangle-carrier comparison, is proposed in this paper. And the relatively accurate theoretical formulas are provided for the parameter setting of the PI controller and make the setting process more easily. Due to the good performance of the quasi-PID controller, it can be either introduced into inferior inverters directly, or accepted as the initial values by high accurate intelligent PID control inverters so as to ensure the stability and safety at system start-up and make the intelligent control algorithm go into much better effect. Furthermore, the proposition of the quasi-PID controller also presents the reason that the strict PID controller is not suitable for the single-phase PWM inverter.

Keywords: source period averaging model single-phase PWM inverter quasi-PID controller PI parameter setting

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通讯作者: 孙晓明

作者简介:

作者Email:

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