

Abstract

A system and a method for protecting electric motors and their respective control circuits are described, wherein it is possible to distinguish whether a situation of surge current results from a overload or from a short-circuit on the motor (1). This is achieved by means of a protection system for protecting a control circuit (2) of an electric motor (1) and protecting the electric motor (1), the control circuit (2) comprising a set of switches (Ch) to control the speed of the motor (1), the system comprising a control central (7) connected to the control circuit (2), the central control (7) selectively commanding the switches (Ch), the central control (7) measuring an electricity conduction time (T_c) of each of the switches (Ch) and measure a disturbance time (T_d) passed between the beginning of the conduction of one of the switches (Ch) and the occurrence of a surge current, the surge being measured by means of a surge detector (3) which compares the value of a current (I_{RS}) that flows through the control circuit (2) to a predetermined current (I_{LIMIT}) value, the central (7) making a comparison between said the disturbance time (T_d) and the conduction time (T_c) to determine whether the surge current results from an overload or from a short-circuit on the electric motor (1) or any of the switches (Ch). The invention also refers to a method for protecting a control circuit (2) of an electric motor (1) and protecting the electric motor (1), the speed control of the motor (1) being carried out by selectively commanding a set of switches (Ch), the method comprising the steps of measuring an electricity conduction time (T_c) of each of the switches (Ch), measuring the disturbance time (T_d) passed between the beginning of conduction of one of the switches (Ch) and the occurrence of a surge, comparing the disturbance time (T_d) with the conduction time (T_c). In addition, the present invention refers to an electric motor (1) that is controlled by a set of switches (Ch), the control of the switches (Ch) being carried out by a control central (7) capable of measuring and comparing said times (T_d , T_c).



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