

1. Record Nr.	UNINA9910760288603321
Autore	Sokol Yevgen
Titolo	Detection of Corona Discharge in Electric Networks // edited by Yevgen Sokol, Vitalii Babak, Artur Zaporozhets, Oleg Gryb, Ihor Karpaliuk
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	3-031-44025-0
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (238 pages)
Collana	Studies in Systems, Decision and Control, , 2198-4190 ; ; 509
Altri autori (Persone)	BabakVitalii ZaporozhetsArtur GrybOleg KarpaliukIhor
Disciplina	620
Soggetti	Engineering mathematics Engineering - Data processing Electrical engineering Electronics Mathematical and Computational Engineering Applications Electrical and Electronic Engineering Electronics and Microelectronics, Instrumentation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Preface -- Contents -- Development of Approaches to the Quality of Electricity Supply -- Influence of Corona Discharge on Electric Power Supply Parameters -- Detection of Corona Discharge in Power Supply System -- Theoretical Principles of Acoustic Radiation Created by Corona Discharge -- Recognition of Corona Discharge Presence by Spectral Characteristics of Acoustic Radiation -- Instruments for Identification of Corona Discharge Presence by Spectral Characteristics of Acoustic Radiation -- Theoretical Basis of Determination of Corona Discharge Coordinates by Acoustic Radiation -- Instruments for Corona Discharge Coordinate Search as a Source of Acoustic Radiation -- Prospects for the Development of Corona Discharge Detection Method by Spectral Acoustic Radiation -- Economic Effect of the Use of the

Sommario/riassunto

The book is devoted to the solution of the problem of determining the presence of corona discharge on electrical equipment with acoustic radiation. It is shown that corona discharge leads not only to irreversible losses of electrical energy, but also interferes with the transmission of high-frequency signals, deteriorates insulating elements, can become a source of conditions for the occurrence of a destructive arc discharge and is one of the factors of changing the continuity of the electrical system as a whole. The book describes the processes in a corona discharge that lead to the occurrence of acoustic waves. The authors analyzed acoustic radiation from a corona discharge reproduced in laboratory conditions. The received acoustic signals were processed by Fourier transform. Thus, the features of the spectral function, which belong specifically to the corona discharge in electrical networks with industrial frequency current, were determined. Based on the inverse Fourier transform, a simplified model of the acoustic radiation of the corona discharge was constructed. The authors proposed a method for detecting the presence of a corona discharge based on the spectral characteristics of acoustic radiation. Techniques were developed to determine the presence of a corona discharge for the creation of stationary and mobile devices. The advantages of the method of detecting the presence of corona discharge by the acoustic spectrum are shown. The method makes it possible to determine the presence of a corona discharge remotely, even out of direct sight, regardless of the time of day and regardless of the season. The book states that determining the presence of a corona discharge is not enough, it is still necessary to determine its location. The method of finding the coordinates of the corona discharge as a source of sound was described. Methods of searching for corona discharge coordinates with a fixed scanning device and a moving scanning device are proposed. A UAV is proposed as a mobile platform for the scanning system. The influence of the Doppler effect on acoustic measurements when the UAV speed changes was taken into account. The authors have shown that the use of coronal discharge detection with UAVs will not only enable the prevention of coronal discharge, but also increase the frequency of surface inspections. This will allow timely measures to be taken to improve the reliability of the power system operation. The book is intended for the researchers, postgraduate students and students specialized in theory and calculations of electrical systems.
