

**Contents**

|    |   |     |
|----|---|-----|
| 01 | <b>Rafał PIOTUCH, Ryszard PAŁKA</b> - Comparison of Two Synchronous Motors with Interior Magnets  | 1   |
| 02 | <b>Adam BIERNAT</b> - Coil-turn short-circuit of PMSM influence on the transformed phase voltage frequency pattern  | 5   |
| 03 | <b>Grzegorz BARTOSIK<sup>1</sup>, Henryk BANACH</b> - Optimal operation of the separately excited dc motor  | 10  |
| 04 | <b>Krzysztof BIEŃKOWSKI, Krzysztof JACKIEWICZ</b> - Control parameters impact on mechanical characteristics of double-phase switched reluctance motor   | 13  |
| 05 | <b>Maciej BOGUMIŁ, Konrad DĄBAŁA, Zdzisław KRZEMIĘŃ</b> - Thermal calculations and tests of brushless motor with liquid-cooled frame  | 17  |
| 06 | <b>Andrzej BYTNAR, Sławomir WRÓBLEWSKI</b> - Automatic Diagnostics of Vibration and Technical Condition of Turbogenerator Stator Core's Teeth   | 21  |
| 07 | <b>Konrad DĄBAŁA, Renata SULIMA</b> - Evaluation of the influence of applying high efficiency electrical motors for the energy saving   | 26  |
| 08 | <b>Michał DROGOSZ, Krzysztof BIEŃKOWSKI, Jerzy GRYGORCZUK, Bartosz KĘDZIORA</b> - Impact of tubular reluctance motor design parameters on the performance of ground penetrator for space missions | 30  |
| 09 | <b>Paweł EWERT, Marcin MUSIAŁ</b> - Detecting of misalignment of the drive systems with induction motor supplied by a frequency converter   | 34  |
| 10 | <b>Rafał GABOR, Piotr MYNAREK, Marcin KOWOL</b> - The concept and calculation of switched reluctance motor with external-rotor designed for the electric bike                                     | 39  |
| 11 | <b>Pavlo GAKAL, Olena OVIANNYKOVA, Jerzy PRZYBYSZ, Oleksii TRETIAK</b> - Analysis of the temperature field of the rotor of 550-MW turbogenerator with direct hydrogen cooling                     | 43  |
| 12 | <b>Alejandro J. FERNANDEZ GOMEZ, Tadeusz SOBCZYK</b> - Distortion of currents fault signature in induction motors with faulty cage under influence of mechanical torque oscillations              | 48  |
| 13 | <b>Zbigniew GORYCA</b> - The driver of DC brushless motor for the stirrer   | 53  |
| 14 | <b>Adam GOZDOWIAK, Piotr KISIELEWSKI, Ludwik ANTAL</b> - Field-circuit analysis of double ground faults in the turbogenerator excitation winding  | 57  |
| 15 | <b>Maciej GWOZDZIEWICZ, Paweł ZALAS, Jan ZAWILAK</b> - Starting process of medium power line start permanent magnet synchronous motor   | 62  |
| 16 | <b>Andrzej HERBST</b> - General purpose IE4 class synchronous motor with an integrated frequency converter  | 65  |
| 17 | <b>Grzegorz KAMIŃSKI, Paweł GÓRALSKI</b> - The results of common circuit reluctance motor static torques measurements   | 69  |
| 18 | <b>Grzegorz KAMIŃSKI, Paweł GÓRALSKI, Michał BURSA, Michał DOMAŃSKI</b> - Electrical machines with rotor integrated with self-brake thread gear   | 73  |
| 19 | <b>Marcin KOWOL, Janusz KOŁODZIEJ, Marian ŁUKANISZYN</b> - Optimization results of a permanent magnetic (PM) gear   | 78  |
| 20 | <b>Roman KROK, Marian PASKO</b> - Revitalization of operating turbogenerators   | 83  |
| 21 | <b>Zdzisław KRZEMIĘŃ</b> - Aging of permanent magnets used in electric machines   | 87  |
| 22 | <b>Jakub LORENCKI, Stanisław RADKOWSKI</b> - The results of diagnostic studies carried out on the switched reluctance motor   | 91  |
| 23 | <b>Włodzimierz PRZYBOROWSKI<sup>1</sup>, Jerzy DROSIK</b> - Proposed standardization of two pole turbo-generators design and ratings parameters   | 96  |
| 24 | <b>Włodzimierz PRZYBOROWSKI<sup>1</sup>, Zdzisław HRYCIÓW</b> - Problems of calculation natural frequencies of turbo-generators rotors, based on 800 MW unit                                      | 100 |
| 25 | <b>Włodzimierz PRZYBOROWSKI</b> - Electropiezoelasticity equations of disc piezoelectric motor  | 104 |
| 26 | <b>Włodzimierz PRZYBOROWSKI</b> - Problems of increasing power of turbo-generators  | 108 |
| 27 | <b>Adam ROGALSKI</b> - Selected characteristics of linear induction motor   | 114 |
| 28 | <b>Lucjan SETLAK, Emil RUDA</b> - Modern technological solutions, analysis and simulation of selected components of architecture HVDC aircraft in line with the concept of MEA/ AEA               | 118 |
| 29 | <b>Marcin SKÓRA, Czesław T. KOWALSKI</b> - Analysis of vibrations caused by controller fault in PM BLDC motor drive   | 126 |
| 30 | <b>Jan SZCZYPIOR, Rafał JAKUBOWSKI, Adam BIERNAT, Mateusz RZESZOWSKI</b> - Project, design and tests of in-wheel outer-rotor PMSM for electric car application. Part 1                            | 131 |
| 31 | <b>Jan SZCZYPIOR, Rafał JAKUBOWSKI, Adam BIERNAT, Mateusz RZESZOWSKI</b> - Project, design and tests of In-wheel outer-rotor PMSM for electric car application. Part 2                            | 138 |
| 32 | <b>Przemysław SZULIM<sup>1</sup>, Stanisław RADKOWSKI</b> - The process of construction of the analytical magnetic model of brushless synchronous motor. Part 1: Field model                      | 147 |

# PRZEGŁĄD ELEKTROTECHNICZNY Vol 2017, No 2

## Contents

|    |   |     |
|----|---|-----|
| 33 | Andrzej WAINDOK, Paweł PIEKIELNY - Transient Analysis of a Railgun with Iron Core   | 152 |
| 34 | Dawid WAJNERT, Bronisław TOMCZUK - Simulation for the determination of the hybrid magnetic bearing's electromagnetic parameters   | 157 |
| 35 | Krzysztof WRÓBEL, Krzysztof TOMCZEWSKI - Characteristics of switched reluctance drives with different power converters  | 161 |
| 36 | Grzegorz KAMIŃSKI, Tomasz WYGONOWSKI - Possibility of using linear synchronous motor as drive in PRT (personal rapid transit) vehicles  | 166 |
| 37 | Paweł ZALAS, Maciej GWOŹDZIEWICZ, Jan ZAWILAK - Starting process of large power synchronous motor   | 170 |
| 38 | Tomasz ZAWILAK, Jan ZAWILAK - Synchronous motors excited by permanent magnets in high power drives  | 173 |
| 39 | Szymon LIPŃSKI, Jan ZAWILAK - Three-Dimensional Thermal Model of a Line-Start Permanent Magnet Synchronous Motor Using Computational Fluid Dynamics   | 177 |
| 40 | Karol BASIŃSKI, Bartłomiej UFNALSKI, Lech M. GRZESIAK - Particle swarm based repetitive spline compensator for servo drives   | 181 |
| 41 | Tahar ALILI, Abdelaziz BOUCHIKHI, Mohamed RIZOUGA - Neon Spatio-Temporal Distributions in a DC Glow Discharge   | 188 |
| 42 | Jacek STĘPIEŃ, Jacek KOŁODZIEJ, Witold MACHOWSKI, Ryszard GOLAŃSKI, Juliusz GODEK - Modified Ethernet protocol for automotive systems   | 192 |
| 43 | Jacek STĘPIEŃ, Jacek KOŁODZIEJ, Witold MACHOWSKI - Personal wireless sensor networks standards ANT/ANT+ and Smart Bluetooth   | 198 |
| 44 | Jacek DĄBROWSKI, Ewa KRAC, Krzysztof GÓRECKI - Analysis of long-time efficiency of photovoltaic installation  | 202 |
| 45 | Krzysztof GÓRSKI, Krzysztof GÓRECKI - Modelling thermal properties of planar transformers   | 206 |
| 46 | Miroslaw GIERCZAK, Krzysztof STOJEK, Andrzej DZIEDZIC - Temperature distribution on a quad-core microprocessor and quad-core microprocessor / heat sink structure   | 210 |
| 47 | Janusz PODLIŃSKI, Katarzyna GARASZ, Artur BERENDT, Jerzy MIZERACZYK - Electrohydrodynamic Flow Evolution in a Narrow Wire-Plate Electrostatic Precipitator  | 214 |
| 48 | Maria JĘDRUSIK, Arkadiusz ŚWIERCZOK - Reduction of PM2.5 particle emission by electrostatic precipitator  | 219 |
| 49 | Artur BERENDT, Jerzy MIZERACZYK, Janusz PODLIŃSKI - Electrostatic particle precipitation in a two-phase fluid in a needle-to-plate negative DC corona discharge   | 224 |
| 50 | Maria JĘDRUSIK, Arkadiusz ŚWIERCZOK, Dariusz ŁUSZKIEWICZ - Physical and numerical modelling of gas flow in electrostatic precipitator   | 228 |
| 51 | Andrzej NOWAK, Paweł NOWAK, Miroslaw KURZ, Czesław RYGUŁA - Study of the effect of the stiffness of the anvil beam for vibration propagation in the system of collecting electrodes   | 232 |
| 52 | Andrzej KRUPA, Anatol JAWOREK, Artur MARCHEWICZ, Arkadiusz T. SOBCZYK, Tadeusz CZECH, Teresa ANTES, Łukasz ŚLIWIŃSKI, Andrzej OTTAWA, Michał SZUDYGA, Adam CHARCHALIS - Submicron particles emission control by electrostatic agglomeration | 237 |
| 53 | Stanisław KISZŁO, Michał SZYMAŃSKI - Medium voltage glass fibre reinforced plastic insulator cores test   | 242 |
| 54 | Tomasz POPŁAWSKI, Monika WEŻGOWIEC - Computer implementation of creeping trend model to predict wind power capacity   | 246 |
| 55 | Volodymyr KHOMA, Vitalii IVANYUK - High Sensitive Wiretap Detector: Design and Modeling   | 250 |
| 56 | Karol WRÓBEL - Predictive speed control with finite control set of induction motor – comparison study   | 255 |
| 57 | Borys SEMENOWICZ, Piotr BOGUSŁAWSKI - Contactless hybrid current limiter  | 259 |
| 58 | Stanisław BEDNAREK, Julian PŁOSZAJSKI - Evaluation of suitability of relativistic beam particles to production of the pulsed high magnetic fields   | 264 |
| 59 | Jacek REZMER, Adam SKOPEC, Czesław STEC - Application of state variables in the analysis of the distribution of transients for the local short-circuit in the multiphase transmission line  | 268 |
| 60 | Sylwester FILIPIAK, Andrzej STOBIECKI, Franciszek STRZELCZYK - Application of evolutionary programming to optimization of reliability power distribution grids  | 273 |
| 61 | Tadeusz KACZOREK - Determinants of the matrices of solutions to the standard and positive linear electrical circuits  | 278 |
| 62 | Andrzej ŁEBKOWSKI - Electric Vehicle Data Recorder  | 284 |
| 63 | Jarosław GUZIŃSKI <sup>1</sup> , Haitham ABU-RUB <sup>2</sup> , Patryk STRANKOWSKI - Speed Sensorless AC Drive with Inverter LC Filter and Fault Detection Using Load Torque Signal   | 289 |