

ICRERA 2024
13th INTERNATIONAL CONFERENCE ON RENEWABLE
ENERGY RESEARCH AND APPLICATIONS

Speaker's name and affiliation

Prof. Kiyoshi Ohishi, Nagaoka University of Technology,
Niigata, Japan (ohishi@vos.nagaokaut.ac.jp)



Tutorial title

High Power Factor IPMSM Drive System Using Electrolytic Capacitor-less Inverter

Abstract:

Home appliances such as residential air conditioners are based on the variable speed drives for AC motors such as IPMSM and IM. These variable speed drives always require the simple and low-cost system configurations without the large electrolytic capacitors, reactors, and power devices that consist of PFC converters. This tutorial surveys and analyzes the proposed and advanced control techniques to achieve high input power factor and sinusoidal source current control in electrolytic capacitor-less inverters. The investigated control methods consist of control algorithms based on the energy flow between input and output of the electrolytic capacitor-less inverter, and all of them are useful as high-power factor control methods for compressor drive motors such as air conditioners. Moreover, these techniques realize the variable speed drives for AC motors to meet power supply harmonics regulations (IEC61000-3-2).

Keywords:

- 1) Electrolytic Capacitor-less Inverter
- 2) IPMSM Drive System
- 3) Power Factor
- 4) Harmonics Regulation