

## HIGH RELIABILITY SINGLE-PHASE UNINTERRUPTIBLE POWER SUPPLY

Răzvan-Daniel ALBU<sup>1</sup>, Florin POPENȚIU-VLĂDICESCU<sup>2</sup>

**Rezumat:** Prin reducerea numărului de component electronice (comutatoare, tranzistoare de putere, bobine, inductanțe voluminoase și transformatoare) nu se reduce doar costul ci crește și fiabilitatea. Lucrarea prezintă o sursă de tensiune neîntreruptibilă monofazată cu convertoare în punte pe care aplicăm principiul reducerii componentelor rezultând convertoare în semipunte cu un număr redus de comutatoare electronice.

**Abstract.** Generally, the largest cost reduction is achieved by reducing the number of switches employed in a converter power circuit. Diodes are less expensive than active switches and apart from this; there is also a cost reduction from eliminating all the circuitry for driving active switches. Reducing the number of switches and passive elements in uninterruptible power supply topologies not only reduces the cost of the whole system but also provides some other advantages such as greater compactness, smaller weight, and higher reliability.

**Keywords:** uninterruptible power supply (UPS), pulse-width modulation (PWM), low total harmonic distortion (THD), high reliability

### 1. Introduction

If we need to supply clean and uninterrupted power to equipment in critical applications, under essentially any normal or abnormal utility power conditions, including outages for up to 15 minutes, we will use a Uninterruptible power supplies (UPS's). Such critical applications are: computers, industrial controls, life support systems, etc.

In order to be able to supply power in the absence of input to the power source, the UPS employs some form of bulk energy-storage mechanism [10, 8]. Most UPS systems use batteries, usually lead acid, as bulk energy-storage mechanism. Other schemes may employ the mechanical inertia of a large flywheel coupled to the shaft of a rotating machine or the stored magnetic energy in the field of a super-conducting coil.

The most widely used storage devices are maintenance-free gel batteries because of their portability and low-maintenance requirements [8]. The conversion process between ac and dc storage is typically electronic.

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<sup>1</sup>Eng. Junior Researcher, Faculty of Electrical Engineering and Information Technology, Chair of Electronics, University of Oradea, Romania, e-Mail: ralbu@uoradea.ro

<sup>2</sup>Prof. PhD, Faculty of Electrical Engineering and Information Technology, UNESCO Chair in Information Technologies, Academy of Romanian Scientists, e-Mail: popentiu@imm.dtu.dk.