PROCESS INDUSTRY PRACTICES

COMPLETE REVISION
September 2020

Electrical

PIP ELSAP04
Uninterruptible Power Supply (UPS)
System Specification

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

This Practice is subject to revision at any time.

PUBLISHING HISTORY

October 2001	*Issued*	*September 2020*	*Complete Revision*
July 2009	*Complete Revision*		
October 2015	*Complete Revision*		

Not printed with State funds

PIP ELSAP04
Uninterruptible Power Supply (UPS) System Specification

Table of Contents

Data Form

1. Scope

This Practice and the purchaser's *PIP ELSAP04-D* Data Sheet describe the minimum requirements for design, fabrication, inspection, testing, shipment, and documentation for a complete on-line, UPS system of either a pulse width modulated (PWM) or ferroresonant type.

A PWM-type UPS system includes a rectifier/charger, inverter, static bypass switch, manual bypass switches, transformers, and accessories. A ferroresonant-type UPS system includes a rectifier/charger, inverter, constant voltage or ferroresonant transformer, static bypass switch, manual bypass switches, transformers, and accessories.

2. References

Applicable parts of the following Practices and industry codes and standards shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Process Industry Practices (PIP)

- PIP ELSAP11 - *Design and Fabrication of Flooded-Cell Lead-Acid Batteries*
- PIP ELSAP12 - *Design and Fabrication of Valve-Regulated Lead-Acid Batteries*

2.2 Industry Codes and Standards

- American National Standards Institute (ANSI) and Institute of Electrical and Electronics Engineers (IEEE)
  - ANSI/IEEE C57.110 – *IEEE Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents*
  - IEEE C62.41.1 - *IEEE Guide on the Surge Environment in Low Voltage (1000V and less) AC Power Circuits*
  - IEEE 484 - *Recommended Practice for Installation Design and Installation of Vented Lead-Acid Batteries for Stationary Applications*
- Federal Communications Commission (FCC)
  - 47CFR15 - *Radio Frequency Devices*
- International Electrotechnical Commission (IEC)
  - IEC 62040-3 - *Uninterruptible Power System (UPS) – Part 3: Method of Specifying the performance and Test Requirements*
- National Electrical Manufacturers Association (NEMA)
  - NEMA PB1 - *Panelboards*
  - NEMA PE1 - *Uninterruptible Power Systems (UPS) – Specification and Performance Verification – National Adoption*
  - NEMA PE5 - *Utility Type Battery Chargers*
- National Electrical Testing Association (NETA)
  - *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems* (ATS)