

Correctional Service Canada  
Technical Services Branch  
Electronic Security Systems Division

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**ELECTRONICS ENGINEERING  
STANDARDS**

**LARGE UNINTERRUPTIBLE POWER SUPPLY  
(7+kVA/Single Phase/208VAC)  
FOR USE IN  
FEDERAL CORRECTIONAL INSTITUTIONS**

**AUTHORITY**

This Specification is approved by the Correctional Service Canada for the procurement and installation of a Security Patrol System in Canadian federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address:

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## RECORD OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue.
1	5 6	Expanded power capacities Clarified Design Requirements

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## ABBREVIATIONS

The following abbreviations are used in this specification:

CER	Common Equipment Room
CSC	Correctional Service Canada
FAAS	Facility Alarm Annunciation System
MCCP	Main Communications and Control Post
SNMP	Simple Network Management Protocol
TCP/IP	Transport Control Protocol/Internet Protocol
UPS	Uninterruptible Power Supply

## 1 SCOPE

This standard defines the technical and performance requirements of the Correctional Service of Canada (CSC) for large (7 KVA or greater) Uninterruptible Power Supplies (UPSs) for use in federal correctional institutions.

## 2 GENERAL

Electronic security systems are run from mains power. Most institutions have generators to provide emergency power for essential security systems during loss of mains power. The UPS provides power while the generator is brought on line. It also performs a filtering and regulation function to protect the connected systems from voltage fluctuations and spikes. The UPS uses mains power when available to keep batteries recharged and to provide power when the mains supply fails.

## 3 ENVIRONMENTAL REQUIREMENTS

The UPS shall operate in the following conditions:

- a) Temperature: 0°C to 40°C; and
- b) Humidity: 0% to 95% non-condensing.

## 4 INPUT POWER REQUIREMENTS

The UPS shall accept the following input power conditions:

- a) Voltage: 208 VAC  $\pm$ 15%; and
- b) Frequency: 60 Hz  $\pm$ 3%.

Any change outside the above limits shall not damage the system. Note that the required supply circuit is approximately 30 A for every 4 KVA.

## 5 MECHANICAL REQUIREMENTS

The maximum dimensions, including external batteries, shall be:

- a) Height: 100 cm + 75cm for every 4 KVA over 8 KVA;
- b) Width: 50 cm;
- c) Depth: 100 cm; and
- d) Weight: 600 kg + 250kg for every 4 KVA over 8 KVA

## 6 DESIGN REQUIREMENTS

The UPS shall:

- a) Operate in an inline, double conversion mode;
- b) Exhibit an input power factor of 0.98 or better;
- c) Power conversion efficiency at full load of 90% or better;
- d) Provide a minimum of 60 minutes of power at full load;
- e) Provide a TCP/IP interface;
- f) Support SNMP management capability over a TCP/IP interface;
- g) Provide a web-based interface to configure all UPS settings;
- h) Provide a web-based interface to view all the below listed status with a minimum 1 week history;
- i) Provide a bypass capability for hot swap of batteries;
- j) Provide a bypass capability for hot swap of the converter;
- k) Auto self-test configurable to test at least once every 7 days;

- l) Provide a configurable, audible, time low battery warning;
- m) Provide a configurable, audible, fault alarm;
- n) Provide drivers for Windows and Linux systems to command computer system shutdown on low battery warning over TCP/IP;
- o) Recharge batteries to 90% or more within 12 hours;
- p) Handle 110% load for at least 1 minute;
- q) Have an MTBF of at least 5 years;
- r) Have labels identifying the manufacturer, model or assembly number, serial number, and mains power requirements permanently affixed to the exterior of the unit, and
- s) Report the following status to the FAAS over TCP/IP:
  - i. Bypass;
  - ii. Low battery; and
  - iii. Systems faults.

The UPS shall be rated and capable of operation 24 hours per day, seven days a week. The expected operational life span shall be a minimum of 10 years.

## 7 TECHNICAL REQUIREMENTS

The UPS shall provide output power with the following requirements:

- a) Voltage: 208 VAC  $\pm$ 5%;
- b) Frequency: 60 Hz  $\pm$ 3%;
- c) Regulation: <3% nominal voltage over the full load range;
- d) Design Power Factor: 0.8 lagging to 0.8 leading;
- e) Harmonic Distortion: <7% Total Harmonic Distortion over the full load range;
- f) Filtering: RF filters on power inputs and outputs;
- g) Synchronization: Automatic synchronization to acceptable mains input frequencies;

## 8 FUNCTIONAL REQUIREMENTS

The UPS shall:

- a) Provide status display on the web interface and on the UPS of:
  - iv. UPS on/off (on UPS only);
  - v. Battery charging/operation;
  - vi. Bypass on/off;
  - vii. Low battery alarm;
  - viii. System faults;
  - ix. Input voltage;
  - x. Input current;
  - xi. Output voltage; and
  - xii. Output current.
- b) Provide the following controls on the UPS:
  - a. Manual bypass;
  - b. DC breaker; and
  - c. UPS on/off.

## 9 INTERFERENCE

Performance of the UPS shall not be affected by the use of standard electronic equipment used at the institution. Distance limits of standard electronic equipment are as follows:

- a) 5 watt CB transceivers at 1 metre or more;
- b) 6 watt VHF and UHF transceivers at 1 metre or more;
- c) 25 mW 420-430 MHz Personal Portable Transmitters at 1 metre or more;
- d) Other radio frequency transmitting, receiving and distribution equipment at 5 metres or

- more; and
- e) Personal computer and/or computer work stations at 5 metres or more.

## **10 SAFETY**

The UPS shall meet the applicable CSA &UL standards for power conversion equipment in a controlled environment.