
REQUEST FOR INFORMATION**RFI-2017-111500001-004**Static UPS Power Supplies for the ESS Accelerator Systems

EUROPEAN SPALLATION SOURCE ERIC

Dear Sir or Madam,

The European Spallation Source ERIC hereby invites companies to submit information regarding Static UPS Power Supplies for the ESS Accelerator Systems.

This Request for Information (RFI) consist of this cover page and the following Annexes:

- Annex A: Instructions
- Annex B: ESS Terms of Reference

All communications concerning this RFI, including requests for clarifications, must be made in English and submitted by email to the contact person indicated below.

Responses, complete with any supporting documentation, shall be sent by email to the contact person indicated below, in English before or latest by the closing date and time stipulated in this RFI. Responses shall refer to the title and reference number of this RFI in the subject.

Your Response and all supporting documents must reach the below contact person:

no later than: 21 June 2017, 16:00 hrs. CEST

Yours Sincerely,

Cristina Echenagusia

Procurement and Logistics Administrator
Supply, Procurement and Logistics Division
European Spallation Source ERIC

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ANNEX A - INSTRUCTIONS

ESS is requesting information from companies regarding Static UPS Power Supplies for the ESS Accelerator Systems.

Companies shall submit their Responses in English.

The purpose of this RFI is to identify potential suppliers, design choices, supply capabilities, price indications and lead-time of Static UPS Power Supplies for the ESS Accelerator Systems. Responses to this RFI are indicative only.

Companies shall bear all costs associated with the preparation and submission of any documentation. This RFI does not bind the ESS in any way with regard to any decision or action to be taken, and the ESS reserves the right not to launch a procurement process for the activities covered by the present RFI, or for part of those activities only.

1. CONTENTS OF THE RESPONSE

Companies wishing to participate should include the following information in their responses, as far as available:

- A. Cover letter with name, VAT No., address, e-mail and telephone number of the company's focal point for the RFI;
- B. Description of relevant products portfolio and technical characteristics, addressing the requirements in Annex B. Brief presentation of Company and description of Company's production facilities. Suggestions for technical solutions and designs addressing the requirements in Annex B;
- C. Price indication;
- D. Lead-time information;
- E. Products safety related information.

2. CONFIDENTIALITY

"Confidential Information" means any scientific, technical, financial, commercial or other information of any nature and in any form provided by participants in this RFI to the ESS and which is not in the public domain.

ESS will, in the event of receiving confidential information appropriately marked as confidential:

- A. Keep the Confidential Information strictly confidential;
- B. Make available the Confidential Information only to those of its officers and employees who need to have access to it for the purpose of this RFI;
- C. Not pass the Confidential Information to any third party, even under a confidentiality agreement, without the prior written consent of the Company providing the information; and
- D. Use the Confidential Information only for purposes of this RFI.

ANNEX B – TERMS OF REFERENCE

ESS is requesting information from companies regarding Static UPS Power Supplies for the ESS Accelerator Systems.

Please find below the Table of Content:

- 1. INTRODUCTION**
- 2. REQUIREMENTS**
- 3. SYSTEM FUNCTIONALITY**
- 4. TECHNICAL REQUIREMENTS**
- 5. TEMPERATURE REQUIREMENTS**

1. INTRODUCTION

Two types of Static UPS are of interest in this RFI:

- “Central UPS”, which are larger UPS systems of a rated power from 20-200 kW supplying a dedicated UPS power distribution network and provisioned with generator power for endurance during power outages
- “Local UPS”, which are smaller, self-contained, UPS systems of a rated power from 2-10 kW intended for installation in standard 19” racks and provisioned with mains power, for EMI-filtering and controlled shutdown of equipment

The UPS system will provide power for Accelerator Systems, mainly controls for Vacuum and Cryogenic Cooling Systems (CRYO).

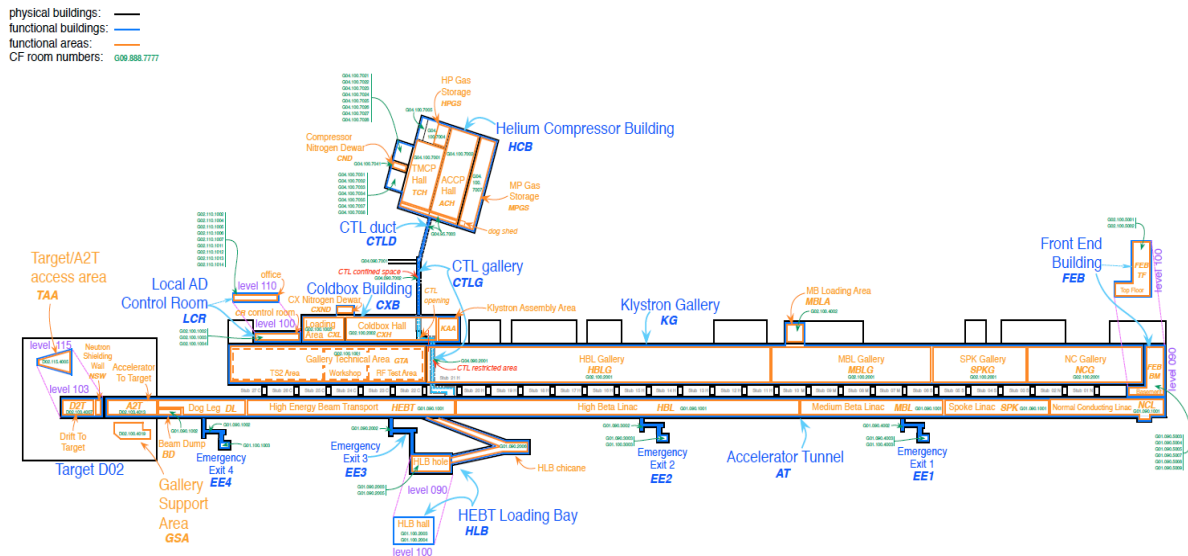


Figure 1: Accelerator Building layout, ESS-0052867

Two types of UPS solutions are considered, “Central UPS”, where a group of larger UPS power supplies will power a UPS power distribution network and “Local UPS”, where small stand-alone UPS systems are installed in a 19” rack, powering a specific piece of equipment.

The “Central UPS” systems will preferably be installed inside electrical rooms with access controls; however, there will be UPS installations in other areas where non-electrical staff will be working. In particular, there will be no dedicated battery rooms available for the “Central UPS” systems, therefore battery enclosures and battery types must be compatible with a “normal” environment.

“Central UPS” systems will generally all be provisioned with Back-Up power from Diesel Generators. For rack-mounted, “Local UPS”, this will not be the case. These units will run on ordinary mains power.

Since requirements are not stable yet, it is preferred that the “Central UPS” are constructed as modular system, the module boundaries to be defined by the contractor, so that Power, MTTR and the MTBF can be optimised for the application over the life-time of the installation.

2. REQUIREMENTS

The “Central UPS” installation shall be designed and constructed according to the following requirements:

1. The equipment shall be CE-marked (Conformité Européenne) and comply with the requirements of SS-EN 62040 “Uninterruptible power systems (UPS)”
2. The UPS type shall be “Double Conversion Topology with Bypass” class “VFI-SS-111” according to SS-EN 62040-3.
3. The UPS shall fulfil SS-EN 62040-1-1 with respect to safety and general requirements if the equipment is installed outside of a restricted access location (outside of electrical room).
4. The UPS shall fulfil SS-EN 62040-1-2 with respect to safety and general requirements if the equipment is installed inside a restricted access location (electrical room with access control)
5. The UPS shall fulfil the standard SS-EN 62040-2 with respect to EMC.
6. The rectifier system (front-end) shall be of an active type and shall not generate more than 5% Total Harmonic Distortion of the Current (THDI) onto the feeding network.
7. It shall be possible to perform manual and automatic load testing of the batteries during normal operation without any disturbances to the downstream loads. Battery charging and charge management shall be according to the battery manufacturers requirements.
8. The UPS system shall have two connection points for incoming mains, one for the rectifier and one for the internal bypass, intended for permanent connection.
9. The UPS system shall have a total efficiency higher than 95% in Double Conversion mode at full rated load.
10. The UPS systems shall be equipped with a selectable “Energy Saver System” or equivalent system for minimum Total Lifecycle Costs (TLC). When the “Energy Saver System” is engaged, the load transfer time shall be less than 2 msec.
11. Protection against back feeding of the feeding network according to SS 436 40 00, ed. 2, s. 551.7, and IEC 62040-1 shall be permanently installed in the UPS.

The “Local UPS” systems shall fulfil similar requirements, except for item “8”, and with the additional requirements:

12. The “Local UPS” system and any batteries shall be fitted in an enclosure that is compatible with installation inside a standard 19” rack.

13. The cooling air-flow shall be "Front-To-Back".
14. It shall be possible to disconnect UPS power from the front of the UPS crate to allow the load to be serviced or removed safely.

3. SYSTEM FUNCTIONALITY

The equipment shall communicate operational status and alarms via suitable local status indications (local display, indicators, audible signals) and remotely via a TCP/IP network. The protocols are TBD. The signals are sent to a control room for facility operations.

The following values and indications should be available locally and remotely:

- Operation mode (normal, battery and bypass),
- Input voltage, current and frequency,
- Output voltage, current and frequency,
- Battery status, battery current and voltage,
- Event log showing the event number, type of event, date and time.

The time and date used for the event log and other stored values shall be synchronised to a central time source (NTP server).

It shall be possible to monitor and control the operation of the UPS system from a central control room using the ESS on-site SCADA network via suitable IP-based protocols (TBD). The supplier shall as part of the contract provide all the necessary software and hardware for this interface as well as documentation. Software for automatic shutdown and monitoring of the system must accompany the UPS.

The UPS system shall provide inputs for emergency stop as well as Environmental Monitoring and Protection (EMP) which, when activated, will shut off the UPS and disconnect the batteries.

Batteries for "Central UPS" shall be installed in cabinets next to the UPS equipment or preferably integrated into the UPS equipment enclosures. The batteries shall be valve regulated type, long-life (10 year operation) and either absorbed or gel electrolyte that are suitable for operation in areas occupied by people and machinery.

Batteries for "Local UPS" shall be contained within the UPS enclosure, be of a high quality, the chemistry and packaging shall be compatible with installation in close proximity with electronics, for example sealed Li-Ion battery packs or ultra-capacitors.

It shall be possible to service and test the stand-alone UPS systems and battery systems without disconnecting power to the load. During this service, it is acceptable that the UPS functionality is disabled or reduced.

4. TECHNICAL REQUIREMENTS

Table 1: Technical requirements

Parameter	Parameter value
<u>UPS Performance:</u>	
Rated power:	2-8 kW with $\cos \phi = 0.9$ (rack mounted units). 20-40 kW with $\cos \phi = 0.9$ ("Central UPS" system).
Backup time:	15 minutes at rated power.
<u>Input:</u>	
Voltage:	3 phase 230/400V (TN-S, PE)
Voltage range:	340 – 440 (+10 % / -15 %)
Frequency:	45 – 65 Hz (50 Hz, ± 15 %)
Power factor:	0.99
THDI	< 5%
<u>Output:</u>	
Voltage:	3 phase 230/400V (TN-S)
Voltage regulation:	± 3 V RMS
Frequency:	50 Hz
Frequency regulation:	$\pm 0.5 - 2.0$ Hz (Configurable, Double-Conversion mode)
Voltage distortion:	< 2% for resistive load. < 5% for non-linear load.

5. TEMPERATURE REQUIREMENTS

The ambient conditions at the Gallery Buildings are the following:

Table 2: Ambient conditions in the gallery buildings

Room number	Room temperature	Humidity

Klystron Gallery (G02.100.2001)	+22,5°C ±5°C up to 3 meters above floor level	Max 80% RH
Test Stand Area (G02.100.1001)	+22,5°C ±5°C up to 3 meters above floor level	Max 80% RH

Table 3: Ambient conditions inside 19" racks

19" Rack Assy	Air temperature	Humidity
Klystron Gallery (G02.100.2001)	+25°C ±5°C up to 3 meters above floor level, cooling air provided at the front of the racks.	Max 80% RH