

# **BLUE ANGEL**

**The German Ecolabel**



## **Uninterruptible Power Supply Systems**

**DE-UZ 182**

**Basic Award Criteria**

**Edition February 2013**

**Version 1**

## The Environmental Label is supported by the following four institutions:



The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.



The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labeling and Environmentally friendly Procurement" acts as office of the Environmental Label Jury and develops the technical criteria of the Basic Criteria for Award of the Blue Angel.



The Environmental Label Jury is the independent, decision-making body for the Blue Angel and includes representatives from environmental and consumer associations, trade unions, industry, the trade, crafts, local authorities, academia, the media, churches, young people and the German federal states.



The RAL gGmbH is the awarding body for the Environmental Label. It organises the process for developing the relevant award criteria in independent expert hearings – which involve all relevant interest groups.

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**Prolongation without any change for 2 years, until 31.12.2018**

## **Table of Contents**

1	Introduction	3
1.1	Preface	3
1.2	Background	3
1.3	Objective of the environmental label	3
1.4	Compliance with legal requirements	4
1.5	Definitions of terms	5
2	Scope	5
3	Requirements	5
3.1	Energy efficiency	5
3.2	Material requirements for plastics used in the housing and housing parts	7
3.3	Requirements for batteries	8
3.3.1	Exclusion of batteries containing cadmium	8
3.3.2	Requirements for the quality of the batteries	9
3.3.3	Requirements for the lifespan of the batteries	9
3.3.4	Requirements for the electronic charging system	10
3.3.5	Guarantee terms for the batteries	10
3.4	Durability	10
3.5	Recycling-compatible construction	10
3.6	Consumer information	11
3.6.1	Instructions for use	11
3.6.2	Disposal information	11
4	Applicants and Parties Involved	12
5	Use of the Environmental Label	12

Draft Contract

## **1 Introduction**

### **1.1 Preface**

In cooperation with the Federal Minister for the Environment, Nature Conservation and Nuclear Safety, the Federal Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

Upon application to RAL gGmbH and on the basis of a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH, the permission to use the Environmental Label may be granted to all products, provided that they comply with the requirements as specified hereinafter.

### **1.2 Background**

According to expert estimates, approx 2.5 GW of power was being permanently used by uninterruptible power supply systems in Germany in 2011. These systems were being operated at part load with an average efficiency level of 80%. If we compare this with the already achievable increases in efficiency in this load range then it is possible to make CO<sub>2</sub> savings of several hundred tonnes per year by using highly-efficient uninterruptible power supply systems. Lead batteries are still currently being used in uninterruptible power supply systems. As other chemical energy storage systems achieve greater market maturity in future, the environmental label should ultimately only be issued to energy storage media using less environmentally dangerous materials. Until this time, the environmental label can be used to ensure that those lead batteries used in uninterruptible power supply systems deliver the greatest possible lifespan in order to keep the useful value of this environmentally dangerous and unhealthy material as high as possible.

### **1.3 Objective of the environmental label**

Climate protection, a reduction in energy consumption, a minimisation of stand-by energy losses and the prevention of hazardous materials and waste are important objectives of environmental protection.

The environmental label for uninterruptible power supply systems should identify products that stand out due to the following environmental characteristics:

- High energy efficiency

- Low consumption of resources
- Reduction in the amount of harmful substances and emissions
- Avoidance of environmentally harmful materials

#### 1.4 Compliance with legal requirements

The observance of relevant existing laws and legal requirements is a prerequisite for those products awarded with the environmental label. In particular, this includes the following:

- The EU directives<sup>1</sup> implemented in German law in the Electrical and Electronic Equipment Act (ElektroG)<sup>2</sup> are observed.
- The EU Directive 2006/66/EC<sup>3</sup> transposed into German law by the Batteriegelgesetz (BattG)<sup>4</sup> is observed.
- The substance requirements defined by the EU Chemicals Regulation REACH (1907/2006/EC)<sup>5</sup> and Regulation EC No. 1272/2008<sup>6</sup> (or Directive 67/548/EEC) are observed.

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<sup>1</sup> Directive on Waste from Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment or its revisions: Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment;

Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS), Directive 2002/95/EC of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment or its revisions: Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

<sup>2</sup> Law for the sale, return and environmental disposal of electrical and electronic equipment, BGBl. I, No. 17 (23.05.2005).

<sup>3</sup> Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators, OJ no. L 339, Page 39, 2007, No. L 139 Page 40.

<sup>4</sup> German Batteries Act (Batteriegelgesetz) from 25.06.2009, BGBl. I S. 1582.

<sup>5</sup> Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94, as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

<sup>6</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No 1907/2006.

## 1.5 Definitions of terms

**Uninterruptible Power Supply (UPS)** systems describe intermediate circuit AC converter systems fitted with semiconductor valve elements with storage equipment for electrical energy in the DC intermediate circuit that are used for bridging power outages.

## 2 Scope

These Basic Award Criteria are valid for static uninterruptible power supply systems with an output of at least 5 kW that are designed for bridging power outages.

## 3 Requirements

### 3.1 Energy efficiency

The requirements for the following types of operation must both be observed.

#### Double conversion operation

The efficiency of UPS systems > 25 kW in double conversion operation, meeting the VFI-SS-111 classification in accordance with EN 62040 Part 3 for linear loads must not be less than:

- 94.5 % at an electrical output performance of 100% of the rated output
- 94.5 % at an electrical output performance of 75 % of the rated output
- 94 % at an electrical output performance of 50 % of the rated output
- 93 % at an electrical output performance of 25 % of the rated output

The efficiency of UPS systems > 25 kW in double conversion operation, meeting the VFI-SS-111 classification in accordance with EN 62040 Part 3 for non-linear loads must not be less than:

- 93.5 % at an electrical output performance of 100% of the rated output
- 93.5 % at an electrical output performance of 75 % of the rated output
- 93 % at an electrical output performance of 50 % of the rated output
- 92 % at an electrical output performance of 25 % of the rated output

The efficiency of UPS systems  $\leq 25$  kW in double conversion operation, meeting the VFI-SS-111 classification in accordance with EN 62040 Part 3 for linear loads must not be less than:

- 94 % at an electrical output performance of 100% of the rated output
- 94 % at an electrical output performance of 75 % of the rated output
- 93.5 % at an electrical output performance of 50 % of the rated output
- 93 % at an electrical output performance of 25 % of the rated output

The efficiency of UPS systems  $\leq 25$  kW in double conversion operation, meeting the VFI-SS-111 classification in accordance with EN 62040 Part 3 for non-linear loads must not be less than:

- 93 % at an electrical output performance of 100% of the rated output
- 93 % at an electrical output performance of 75 % of the rated output
- 92.5 % at an electrical output performance of 50 % of the rated output
- 92 % at an electrical output performance of 25 % of the rated output

#### Optimised energy efficiency mode

The following requirements are valid in the event that the "ITIC curve"<sup>7</sup> is observed.

The efficiency level in optimised energy efficiency mode of UPS systems  $> 25$  kW for linear loads and non-linear loads must not be less than:

- 99% at an electrical output performance of 100% of the rated output
- 99% at an electrical output performance of 75 % of the rated output
- 99% at an electrical output performance of 50 % of the rated output
- 98 % at an electrical output performance of 25 % of the rated output

The efficiency level in optimised energy efficiency mode of UPS systems  $\leq 25$  kW for linear loads and non-linear loads must not be less than:

- 98 % at an electrical output performance of 75 % of the rated output
- 98 % at an electrical output performance of 50 % of the rated output
- 98 % at an electrical output performance of 25 % of the rated output

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<sup>7</sup> A power acceptability curve defined by the "Information Technology Industry Council" that describes the maximum voltage deviation in relation to the duration of the deviation that a power supply must be able to tolerate.

- 97.5 % at an electrical output performance of 15 % of the rated output

### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1 to the Contract and submit a measurement report (Annex 2) carried out by a test laboratory accredited according to DIN EN ISO/IEC 17025 that documents compliance with the relevant data for this requirement (here: efficiency level in relation to the electrical output performance). Measurement reports completed by the applicant are recognised as being of an equivalent standard when the test laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).*

### **3.2 Material requirements for plastics used in the housing and housing parts**

The plastics may not contain as constituent parts any substances classified as:

- a) carcinogenic in categories 1 or 2 according to Table 3.2 or categories 1A and 1B according to Table 3.1 of Annex VI to EC Regulation 1272/2008<sup>8</sup>
- b) mutagenic in categories 1 or 2 according to Table 3.2 or categories 1A and 1B according to Table 3.1 of Annex VI to EC Regulation 1272/2008
- c) reprotoxic in categories 1 or 2 according to Table 3.2 or categories 1A and 1B according to Table 3.1 of Annex VI to EC Regulation 1272/2008
- d) particularly alarming for other reasons according to the criteria of Annex XIII to the REACH Regulation, insofar as they are included in the List (so-called "list of candidates"<sup>9</sup>) set up in accordance with REACH, Article 59, Paragraph 1

<sup>8</sup> Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No 1907/2006, Annex VI on harmonized classification and labelling of hazardous substances, Part 3: Harmonized classification and labelling, Tables, Table 3.2, – List of harmonized classification and labelling of dangerous substances from Annex I to Directive 67/548/EEC

short: GHS Regulation [http://www.reach-info.de/ghs\\_verordnung.htm](http://www.reach-info.de/ghs_verordnung.htm), each as amended.

The GHS Regulation (Global Harmonization System) that has come into force on January 20, 2009, replaces the old Directives 67/548/EEC and 1999/45/EC. According to the said regulation, substances are classified, labelled and packed until December 1, 2010 according to Directive 67/548/EEC (Dangerous Substances Directive) while mixtures are classified, labelled and packed until June 1, 2015 according to Directive 1999/45/EC (Dangerous Preparations Directive). Notwithstanding this, the classification, labelling and packaging of substances and preparations may be performed according to the provisions of the GHS Regulation already before December 1, 2010 or June 1, 2015, respectively. In such case, the provisions of the Dangerous Substances Directive or Dangerous Preparations Directive shall not be applicable.



Halogenated polymers shall not be permitted. Neither may halogenated organic compounds be added as flame retardants. In addition, the use of flame-retardant materials that are rated as acutely toxic to aquatic organisms with long-term effects according to Tables 3.1 or 3.2 of Annex VI of EC regulation 1272/2008 and classified with the hazard statement code H410 or with the risk phrase R 50/53 is prohibited.

The following shall be exempt from this rule:

- process-related, technically unavoidable impurities
- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass
- plastic parts with a mass of less than 25 grams

#### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1 and submit a written declaration from the plastics manufacturer or guarantee the provision of these documents to RAL gGmbH. The declaration in Annex P-M confirms that the excluded substances have not been added to the plastics and provides a chemical description of the flame-retardant materials used including the CAS number and its rating. The applicant shall state which plastics are used in the housing for parts with a mass  $\geq$  25 grams and provide a list of the plastics used in the housing according to Annex P-L25.*

### **3.3 Requirements for batteries**

#### **3.3.1 Exclusion of batteries containing cadmium**

All of the batteries used by the UPS system must be free of cadmium.

#### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1.*

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<sup>9</sup> Link to the list of candidates of Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH):  
<http://echa.europa.eu/web/guest/candidate-list-table>

### 3.3.2 Requirements for the quality of the batteries

All of the batteries used in the UPS system must, as far as possible, have the same spectral internal resistance. The difference between the spectral internal resistance of the batteries used must not exceed a maximum of 30%.

#### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1. The applicant shall submit a measurement report according to Annex 3 carried out by a test laboratory accredited according to DIN EN ISO/IEC 17025 that confirms that all of the batteries used in the system fulfil the requirements. Measurement reports completed by the applicant are recognised as being of an equivalent standard when the test laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).*

### 3.3.3 Requirements for the lifespan of the batteries

UPS  $\geq$  25 kW

All of the batteries used in the UPS system must be long-life batteries (category "High Performance" with a lifespan of 10-12 years or "Long Life" with a lifespan of 12 or more years) according to EUROBAT<sup>10</sup>.

UPS < 25 kW

All of the batteries used in the UPS system must be long-life batteries (category "General Purpose" with a lifespan of 6-9 years or a longer lifespan) according to EUROBAT.

#### **Compliance Verification**

*The applicant shall submit a test report (Annex 4) carried out by a test laboratory accredited according to DIN EN ISO/IEC 17025 that confirms that all of the batteries used in the system fulfil the requirements. Test reports completed by the applicant are recognised as being of an equivalent standard when the test laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory).*

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<sup>10</sup> Testing according to EUROBAT based on DIN EN 60896-21.

### **3.3.4 Requirements for the electronic charging system**

In order to avoid passing on mains fluctuations to the batteries, a protective mechanism (e.g. DC/DC converter or similar) must be installed upstream of the batteries.

#### ***Compliance Verification***

*The applicant shall declare compliance with the requirements in Annex 1.*

### **3.3.5 Guarantee terms for the batteries**

The manufacturer offers a sensible guarantee based on the "pro rata temporis" <sup>11</sup> principle for the batteries.

#### ***Compliance Verification***

*The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding pages of the product documentation / guarantee terms.*

### **3.4 Durability**

The applicant undertakes to make sure that the supply of spare parts for the repair of the systems is guaranteed during ongoing production and for at least 10 years following the termination of production.

Spare parts are those parts which, typically, may break down within the scope of the ordinary use of a product (exception: batteries, see 3.3.4.) Other parts which normally exceed the life of the product are not to be considered as spare parts.

The product documentation shall include information on the above requirements.

#### ***Compliance Verification***

*The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding pages of the product documentation.*

### **3.5 Recycling-compatible construction**

The system shall be designed and constructed in such a way that it is possible to easily and quickly dismantle it for the purpose of separating the recyclable components and materials. This means:

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<sup>11</sup> Guarantees based on the "pro rata temporis" principle provide a pro rata refund in the event of the failure of the UPS system for an agreed time period depending on the time of the failure. The guarantee period must not necessarily cover the whole declared lifespan of the system but should cover at least a relevant proportion of the lifespan (e.g. 9 years for a battery with a 12 year lifespan).

- having suitable connections that can be removed using standard tools and these connecting joints shall be easily accessible
- plastics should be made out of only one polymer or plastic parts whose mass is greater than 25 grams are labelled in accordance with the ISO standard 11469 to enable the different plastics to be clearly sorted
- instructions for dismantling the system shall be available for those handling old appliances with the aim of recycling as many resources as possible.

### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1 and submit instructions that describe the professional disposal of the UPS system (Annex 5 to the Contract). The instructions can be provided either in writing, photo documentation, drawings or video format.*

## **3.6 Consumer information**

### **3.6.1 Instructions for use**

The end consumer must be provided with understandable product documentation when purchasing the system that includes information on at least the following areas:

- Optimal ventilation conditions when installing the UPS
- Power consumption during operation
- Information on energy efficient use
- Information on maximising the lifespan of the batteries
- Chemical system in the battery and safety instructions for exchanging them

In addition, the information listed above is to be published on a freely accessible internet site that can be easily accessed via the manufacturer's own internet site.

### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1 to the Contract, state the Internet link where this information can be accessed and submit the corresponding pages of the product documentation as Annex 6.*

### **3.6.2 Disposal information**

The product documentation shall provide the following information in an easily readable form (comparable wording is allowed):

- All batteries are to be fundamentally disposed of in the relevant recycling system provided for this purpose; it is not permitted to dispose of batteries in the household rubbish.
- Information about the possibilities for disposing of the batteries - particularly the location (address) where people can dispose of their batteries - is to be included in the product documentation. In addition, the product documentation is to include instructions - relating to the whole product - in accordance with the law for the sale, return and environmental disposal of electrical and electronic equipment (ElektroG).

### **Compliance Verification**

*The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding excerpts from the product documentation (Annex 6).*

## **4 Applicants and Parties Involved**

- 4.1** Manufacturers or distributors of products according to Paragraph 2 shall be eligible for application.
- 4.2** Parties involved in the award process are:
- RAL gGmbH to award the Blue Angel eco-label,
  - the federal state being home to applicant's production site,
  - Umweltbundesamt, (Federal Environmental Agency) which after the signing of the contract receives all data and documents submitted in application for the Blue Angel in order to be able to further develop the Basic Award Criteria.

## **5 Use of the Environmental Label**

- 5.1** The terms governing the use of the Environmental Label by the applicant are stipulated by a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH.
- 5.2** Within the scope of such contract, the applicant undertakes to comply with the requirements under Paragraph 3 while using the environmental label.
- 5.3** Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until December 31, 2018.

They shall be extended by periods of one year each, unless terminated in writing by March 31, 2018 or March 31 of the respective year of extension.

After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

- 5.4** The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the eco-label on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organizations.
- 5.5** The Contract on the Use of the Environmental Label shall specify:
  - 5.5.1** Applicant (manufacturer/distributor)
  - 5.5.2** Brand / trade name, product designation
  - 5.5.3** Distributor (label user), i.e. the marketing organization under Paragraph 5.4

# CONTRACT

No.

on the Award of the Environmental Label

RAL gGmbH as the label-awarding agency and the firm of

**(Applicant/Distributor)**

as the applicant conclude the following

Contract on the Use of the Environmental Label:

S P E C I M E N

1. Under the following conditions the applicant shall be entitled to use the Environmental Label for the labelling of the product / product group / project: **"Uninterruptible Power Supply Systems"** for

**"(Brand/Trade Name)"**

This shall not include the right to use the Environmental Label as part of a brand. Unless otherwise agreed, the Environmental Label shall only be used in the above given shape and colour. The entire inner surrounding text shall always be identical as regards font size, form, thickness and colour and it shall be easy to read.

2. The Environmental Label according to Paragraph 1 may only be used for the above-mentioned product / product group / project.
3. If the Environmental Label is used for advertising purposes or other applicant activities, the applicant shall make sure that it is exclusively used in connection with the above-named product / product group / project for which the use of the Environmental Label has been granted and settled under this contract. The applicant shall be solely responsible for the way the label is used, above all, in advertising.
4. During the entire period of label use, the product / product group / project to be labelled shall comply with all requirements and conditions for the use of the label as specified in the "Basic Criteria for Award of the Environmental Label RAL-UZ 182", as amended. This shall also apply to the reproduction of the Environmental Label (including surrounding text). Claims for damages against RAL gGmbH, especially on the grounds of third party objections to applicant's use of the label and the accompanying advertising shall be ruled out.
5. If the "Basic Criteria for Award of the Environmental Label" provide for checks by third parties, the applicant shall bear the costs accruing in connection therewith.
6. Should the applicant himself or third parties find out that the applicant does not comply with the conditions as stipulated in Paragraphs 2-5, the applicant shall be

liable to inform RAL gGmbH and stop the use of the Environmental Label until the conditions are complied with again. Should the applicant be incapable of restoring the state required for the use of the label immediately or should the applicant seriously offend against this contract, RAL gGmbH may, if necessary, withdraw the Environmental Label and prohibit the applicant from using the label any longer. Claims for damages against RAL gGmbH because of the withdrawal of the label shall be ruled out.

7. The Contract on the Use of the Environmental Label may be terminated for good reason.

Examples of good reasons are:

- unpaid contributions
- substantiated risk of injury and death.

In such case, the applicant's continued use of the Environmental Label shall be prohibited. The applicant shall not be entitled to bring a claim for damages against RAL gGmbH (see above: Paragraph 6, Sentence 3).

8. The applicant undertakes to pay RAL gGmbH an amount according to the "Entgeltordnung für das Umweltzeichen" (Schedule of Fees for the Environmental Label), as amended, for the period of use.
9. According to the "Basic Criteria for Award of the Environmental Label RAL-UZ 182" this contract will run until 31.12.2018. It shall be extended by periods of one year each, unless terminated in writing by 31.03.2018 or March 31 of the respective year of extension. After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.
10. Products / projects marked with the Environmental Label and the advertising for these products / projects may reach the consumer only when naming the company of the

**(Applicant/Distributor).**

Sankt Augustin, this ... day of .....20..

Place, Date

RAL gGmbH  
Management

(Signature of authorized person  
and company stamp)