BLUE ANGEL

The German Ecolabel

Heat pumps

DE-UZ 230

Basic Award Criteria

Edition July 2023

Version 2

The Environmental Label is supported by the following four institutions:

Federal Ministry
for the Environment, Climate Action,
Nature Conservation and Nuclear Safety

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

Umwelt Bundesamt

The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labelling 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.

Jury Umweltzeichen

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.

RAL gGmbH

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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Version 1 (07/2023): First Edition, Expiry date: December 31, 2027
Version 2 (07/2025): Adjustments for the methode recording energy efficiency (3.2), update to the current version of DIN EN 12102-1:2023-11 and added limit value for devices up to 6 kilowatts of power (3.4 Noise emissions), Expiry date: December 31, 2027

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This document is a translation of a German original. In case of dispute, the original document should be taken as authoritative.

1 Introduction

1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, the German 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. The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets this requirement.

1.2 Background

Heat pumps are a key technology for replacing fossil fuel heating systems and are used to heat rooms and domestic hot water. They use renewable heat sources (e.g. water, geothermal energy, air) and thus reduce the consumption of fossil fuels. However, heat pumps can also contribute to the greenhouse effect if their direct and indirect emissions are not minimised. These greenhouse gas emissions arise during the generation of the electrical energy consumed by the heat pump (indirect emissions) and also through the release of refrigerants (direct emissions), which often have a very high greenhouse gas potential (GWP).
Therefore, these requirements are designed to ensure that heat pumps minimise their greenhouse gas emissions by avoiding the use of fluorinated refrigerants and promoting energy efficient operation. The assessment of energy-efficient operation according to the BAM compensation method takes into account how accurately the heat pump can supply the requested heating load with the temperature controller, thus providing a more comprehensive picture. Furthermore, these requirements also take into account any potential environmental impact that heat pumps may have during their life cycle, such as atmospheric degradation products from the refrigerants or noise emissions.

1.3 Objectives of the Environmental Label

This environmental label may be awarded to products that – above and beyond the legal regulations – use natural refrigerants and also stand out due to other environmentally friendly properties. This includes, in particular, an especially high energy efficiency and low noise emissions.

Therefore, following benefits for the environment and health are stated in the explanatory box:

2 Scope

These Basic Award Criteria apply to mass-produced heat pumps with an electrically driven compressor that are designed for heating rooms either with or without domestic water heating. This includes air/water heat pumps, brine/water heat pumps and water/water heat pumps with a nominal heating output of up to 70 kW (for outputting heat to water-based heating circuits in accordance with the nominal standards in EN 14511-2).

The following do not fall under the scope of these Basic Award Criteria:

- Reversible air/air heat pumps
- Air/air heat pumps that utilise exhaust air
- Hybrid systems
- Pure industrial water heat pumps

3 Requirements

3.1 Refrigerant

The heat pumps must be free of refrigerants containing halogens.

Compliance verification

The applicant shall declare compliance with the requirement and state the chemical and industrial name for the refrigerant and its GWP value.

3.2 Energy efficiency

The heat pumps must have a seasonal coefficient of performance (SCOP) for average climatic conditions of at least:

	Use in a medium temperature range (55 °C)	**Use in a low temperature range (35 °C)**
Air/water heat pumps	3.3 (corresponds to ηs = 130%)[1]	4.6 (corresponds to ηs = 180%)[1]
Brine/water heat pumps and direct exchange/water heat pumps	3.7 (corresponds to ηs = 140%)[1]	5.3 (corresponds to ηs = 205%)[1]
Water/water heat pumps	4.2 (corresponds to ηs = 160%)[1]	6.2 (corresponds to ηs = 240%)[1]

Compliance verification

The applicant shall submit a test document on determining the efficiency values of the heat pumps in accordance to the compensation method[2] at a testing institute accredited for DIN EN

[1] Using the conversion coefficient CC of 2.5 according to (EU) No 813/2013 and correction factors F(1) and F(2)

[2] Federal Institute for Materials Research and Testing (BAM): Test guideline for load-based performance testing - Hydronic heat pumps with electrically driven compressors for space heating. July 22, 2025, available at https://netzwerke.bam.de/Netzwerke/Content/DE/Downloads/Evpg/Heizen-Kuehlen-

14511:2019-07 according to DIN EN ISO/IEC 17025:2018-03. The individual tests can also be used as verification for a model series, see Paragraph 3.7.

3.3 Energy efficiency display

The devices must have an energy efficiency display. The energy consumption values and heat outputs must be displayed in accordance with the document "Bundesförderung für effiziente Gebäude – Liste der technischen FAQ – BEG EM" (Federal Funding for Efficient Buildings – List of technical FAQ – BEG EM). The energy consumption values must also include any auxiliary electricity required to operate electric heating rods and heat source pumps.

The display must show the following information:

- The measured average energy efficiency per month or quarter and also for each calendar year.
- A rating of the measured energy efficiency against an expected value, e.g. good – a little too low (means: "check where possible") – much too low (means: "take action").
- The associated explanations do not necessarily have to be shown on the display. A digital decision tree – i.e. in an app or on a website that can be accessed via a link or QR code in the operating instructions – can also be used. The important thing is that users have easy access to the information, ideally directly on the top level of the user interface.

The data must be recorded at regular intervals[3] and made available in a freely accessible and readable data format.

The operating instructions must contain information on the methods used to determine the energy efficiency, the assessment limits and information on possible causes of low efficiency and recommendations for action so that the user can remedy them either themselves or with the assistance of a specialist. Information on the data format and instructions on how to read the data should also be provided to the user in the operating instructions.

Compliance verification

The applicant shall describe the design of the energy efficiency display in an annex to the contract and submit the corresponding passages of the operating instructions.

3.4 Noise emissions

a) The A-weighted sound power level (L_{WA}) measured in accordance with DIN EN 12102-1:2023-11 must not exceed a maximum of 60 dB(A) for devices up to and including an output of 20 kilowatts and 65 dB(A) for devices with an output exceeding 20 kilowatts.

Lueften/bam%20test%20guideline%20-%20load-based%20testing%20of%20heat%20pumps.html
The version current at the time of application applies.

[3] The document with the technical FAQ on the BEG contains the following recommendation in this context: "relevant operating parameters (e.g. energy consumption values, generated heating outputs, operating hours, external temperature) should be provided in a machine-readable format (e.g. csv) for a period of at least 1 year on at least an hourly basis (average value) and for 10 years on at least a monthly basis (average value)" [Source: Bundesförderung für effiziente Gebäude - Liste der technischen FAQ BEG EM (Federal Funding for Efficient Buildings – List of technical FAQ – BEG EM) Version 5.0 (03/2023)]

Alongside this measurement in accordance with the existing standard (DIN EN 12102-1:2023-11), the manufacturer must also state the maximum expected sound power level and the sound power level in night-time mode.

Compliance verification

The applicant shall submit a test document on determining the A-weighted sound power level (L_{WA}) in accordance with DIN EN 12102-1:2023-11 that was produced by a testing institution accredited according to DIN EN ISO/IEC 17025:2018-03 and shall also submit a declaration on the results of the measurements of the maximum sound power level and the sound power level in night-time mode. The individual tests can also be used as verification for a model series, see Paragraph 3.7.

b) The installation instructions shall include clear instructions on how to select the installation site and how to carry out a low-noise installation both indoors and outdoors.

Compliance verification

The applicant shall submit the corresponding passages from the installation instructions.

3.5 Measures to guarantee the efficient and stable operation of the heat pump over many years

The manufacturer must

a) guarantee the provision of spare parts (equivalent parts) and software updates (functionality) for at least 15 years after the devices are launched on the market.

Compliance verification

The applicant shall declare compliance with the requirement.

b) The document designated as the user manual must contain clear instructions on which settings can positively or negatively influence the efficiency of the device (e.g. if it is possible to set a mode in which the device only uses the heating rod to generate heat). In addition, the user manual must contain clear instructions on when it makes sense to use a reduced night-time mode (e.g. information on the extent to which the building has been renovated, the type of radiators, etc.).

Compliance verification

The applicant shall submit the corresponding passages from the user manual.

3.6 Services

The applicant themselves or a contractually affiliated service partner must offer services that enable the environmentally friendly planning and reliable and energy efficient operation of the heat pumps.

The following services must be offered:

a) The manufacturer must offer tools and training for the professional planning, installation (including hydraulic balancing), maintenance and disposal of heat pumps by a specialist company. If the device is being commissioned by a specialist company, the manufacturer must be able to test and, if necessary, adapt relevant parameters via remote access.
b) The manufacturer or a qualified specialist company must offer various different maintenance contracts. They should also include an inspection according to section 60a of the Buildings Energy Act after a full heating period, although at least two years after the device is commissioned. In addition, the inspection should be repeated on a regular basis; this process can also be carried out by remote access.
c) Provision of maintenance services at standard customer service times.

Compliance verification

The applicant shall declare compliance with the requirements in a declaration submitted as an annex to the contract.

3.7 Model series

The ecolabel can also be awarded to a model series based on the individual tests according to the compensation method (see Paragraph 3.2) and EN 12102 (see Paragraph 3.4). At least 33% (rounded to the nearest whole number) of the devices in a model series must be tested.
Based on the definitions in the European Quality Label for Heat Pumps[4] and the European KEYMARK Scheme for Heat Pumps[5], a model series is considered to be a series of devices that use the same heat source and the same refrigerant circuit concept (design of the refrigerant circuit; design and type of device; performance profile of heat exchangers and compressors; control variables and control curves).

Compliance verification

The applicant shall submit the required test documents in Paragraphs 3.2 and 3.4 for at least 33% of the devices in the model series. For the other devices in the model series, the applicant shall submit product documentation verifying that these devices also comply with the requirements in Paragraphs 3.2 and 3.4. The submitted documents must also make it clear that the devices are part of a model series.

3.8 Outlook

The following aspects will be reviewed for the next revision of these Basic Award Criteria:

- Expanding the scope to include heat pumps with a higher output
- Energy efficiency limits and noise emission limits
- Revisions based on developments in the methods used to determine the energy efficiency and display the efficiency

[4] https://www.ehpa.org/quality/quality-label/
[5] https://keymark.eu/en/products/heatpumps/documents

4 Applicants and Parties Involved

Manufacturers or distributors of final products according to Paragraph 2 shall be eligible for application.

Parties involved in the award process are:
- RAL gGmbH to award the Blue Angel Environmental Label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the Environmental Label

The use of the Environmental Label by the applicant is governed by a contract on the use of the Environmental Label concluded with RAL gGmbH.

Within the scope of such contract, the applicant undertakes to comply with the requirements under Paragraph 3 while using the Environmental Label.

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, 2027.
They shall be extended by periods of one year each, unless terminated in writing by March 31, 2027 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.

The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organisations.

The Contract on the Use of the Environmental Label shall specify:
- Applicant (manufacturer/distributor)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.