



## Admission Agreement to the Danish Energy Agency's List of Heat Pumps; Varmepumpelisten

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This agreement is between:

Applicant	and	Secretariat of Varmepumpelisten (on behalf of the Danish Energy Agency)
Street, number		Gregersensvej 2
Postal code, city		2630 Taastrup
Country		Denmark

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### Introduction

The purpose of the Danish Energy Agency's list of heat pumps, i.e. Varmepumpelisten, is to provide homeowners with an overview of energy efficient heat pumps where the performance and efficiency of the heat pumps are documented by a third party. This agreement gives suppliers the opportunity to get their heat pumps admitted to Varmepumpelisten provided that the heat pumps meet the admission requirements.

The Danish Energy Agency imposes certain requirements for the heat pumps as well as the supplier documentation thereof. Moreover, the heat pumps can be selected for sampling tests and supervision by the Danish Energy Agency. Subsequently, the sampling tests are carried out by the Secretariat of Varmepumpelisten on behalf of the Danish Energy Agency.

### Admission procedure

In order to get a heat pump admitted to the Danish Energy Agency's list of heat pumps, the Supplier must sign this agreement. As soon as the Secretariat has received a signed agreement, a form is sent to the Supplier, which he/she is to fill out and return to the Secretariat with the documentation for the heat pump in question.

When the Secretariat has received all the material, a reply is expected within seven working days. The Secretariat reserves the right to extend the response time during peak periods. The Supplier will be informed if the reply cannot be given within the deadline of the response time.

The Secretariat informs the Supplier in writing whether the heat pump in question can be admitted to Varmepumpelisten. Shortly after the Supplier has been notified about the admission of a heat pump, a picture and information about the heat pump will be available online on the Danish Energy Agency's list of heat pumps, unless otherwise is agreed between the Secretariat and the Supplier.

Regarding questions, requiring of documents and the admission of heat pumps, please contact:

E-mail: [varmepumpelisten@teknologisk.dk](mailto:varmepumpelisten@teknologisk.dk)

Phone: +45 7220 2880

Telephone hours: Monday to Friday at 9.00 am to 11.30 am.

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## Admission requirements for ground source heat pumps and air to water heat pumps

### Product requirements

- The product must be a ground source heat pump or an air to water heat pump with a heating capacity of less than 25 kW
- The heat pump must comply with the efficiency requirements of the Danish Energy Agency
- The energy efficiency index (EEI) of all circulation pumps must not exceed 0.23. This includes brine pumps for ground source collectors
- The heat pump must comply with other current regulatory requirements and Danish legislation
- The heat pump must be available on the Danish market from the time of admission to the Danish Energy Agency's list of heat pumps
- The SCOP of the heat pump must be provided in accordance with the current version of EN14825
- The SCOP must not include contributions from reversible operation
- Air to water heat pumps must be intended for Nordic climate and be able to defrost at temperatures of -15°C or below

The heat pumps must comply with all requirements stated in the Commission Delegated Regulation (EU) 811/2013 and the Commission Regulation (EU) 813/2013, which define the requirements of the energy label, the annual efficiency and the sound power level etc.

## Admission requirements for air to air heat pumps

### Product requirements

- The product must be an air to air heat pump with a heating capacity of less than 12 kW
- The heat pump must comply with the efficiency requirements of the Danish Energy Agency
- The heat pump must comply with other current regulatory requirements and Danish legislation
- The heat pump must be available on the Danish market from the time of admission to the Danish Energy Agency's list of heat pumps
- The heat pump must be capable of regulation to an indoor temperature of maximum +10 °C by means of an integrated control
- The heat pump must be intended for Nordic climate and be able to defrost at temperatures of -15°C or below

The heat pumps must comply with all requirements stated in the Commission Delegated Regulation (EU) 626/2011 and the Commission Regulation (EU) 206/2012, which define the requirements of the energy label, the annual efficiency and the sound power level etc.

## Requirements of annual efficiency at space heating (ground source heat pumps and air to water heat pumps)

The Commission Regulation (EU) 813/2013 imposes requirements for the annual efficiency of heat pumps, which depend on whether the heat pump in question is a low- or high-temperature heat pump. By low-temperature heat pump is meant a product that cannot deliver water for heating at an outlet temperature of 52 °C at the design reference conditions.

Heat pumps for space heating and heat pumps for combined space heating and heating of domestic hot water with the exception of low-temperature heat pumps:

The annual efficiency at space heating must not be below 100 % which is equal to:

SCOP = 2.70 for ground source heat pumps

SCOP = 2.58 for air to water heat pumps

Low-temperature heat pumps:

The annual efficiency at space heating must not be below 115 % which is equal to:

SCOP = 3.08 for ground source heat pumps

SCOP = 2.95 for air to water heat pumps

The above requirements are adjusted every two years, for the first time on 26 September 2017.

## Requirements for energy efficiency (SCOP) of air to air heat pumps and other air-conditioning systems

The Commission Regulation (EU) 206/2012 imposes requirements for the energy efficiency of air to air heat pumps, which depend on the capacity of the heat pump and the type of refrigerant, see table below.

	SEER	SCOP
If the GWP of the refrigerant is >150 for a capacity <6 kW	4.60	3.80
If the GWP of the refrigerant is <150 for a capacity <6 kW	4.14	3.42
If the GWP of the refrigerant is >150 for a capacity 6-12 kW	4.30	3.80
If the GWP of the refrigerant is <150 for a capacity 6-12 kW	3.87	3.42

For example: an air to air heat pump with a capacity (heating capacity) of 8 kW and using R-404A as a refrigerant must as a minimum have a SCOP of 3.8 to comply with the requirements of the Commission Regulation (EU) 206/2012 regarding energy efficiency. This is because the capacity is > 6 kW and the refrigerant R-404A has a GWP > 150 (GWP: Global Warming Potential for R-404A = 3922).

The purpose of these differentiated requirements is to loosen the criteria for products containing refrigerants with a low GWP. The GWP of the most common refrigerants appears from the table on page 6 in the instruction manual, appendix 1.

## Requirements for heat pump suppliers

- There must be an agent for Denmark within the EU, who is responsible for the contact with the Danish Energy Agency
- The Supplier must be able to refer to a Danish-speaking contact person in connection with inquiries from Danish consumers
- The Supplier must refer to a list of selected installation contractors, who can install the product in question
- The Supplier must provide a link to a website that contains further information about the heat pump
- Every year in March, the sales figures for the heat pumps on the Danish Energy Agency's list of heat pumps, Varmepumpelisten, must be sent to the Secretariat together with the sales total for the Suppliers' heat pumps that have not been admitted on the list. The information is treated confidentially.

## Requirements for heat pump documentation

- An accredited SCOP test report carried out in accordance with the current version of EN14825 is prepared by an independent and accredited laboratory (third-party test), whose accreditation authority is a member of ILAC (International Laboratory Accreditation Cooperation). The test report must clearly state that it is accredited. Alternatively, documentation for the accreditation as well as a declaration, which states that the testing is carried out according to this, must be made available by the test laboratory. The accredited test laboratory can carry out the testing in the manufacturer's laboratory if this is a part of their described and accredited test methodology. If so, the test laboratory must still be able to provide an accredited test report that clearly states that it is accredited. Alternatively, the test laboratory can provide documentation for the accreditation as well as a declaration that states that the heat pump in question is tested according to the accreditation.
- CE declaration
- Energy labelling in pdf-format
- File with a photo of the heat pump and the rating plate in JPEG, GIF or PNG-format
- Documentation of links to selected installation contractors (link to website or pdf)
- User and installation manuals as well as maintenance manual in Danish
- Piping diagram and circuit diagram (applies only to ground source heat pumps and air to water heat pumps)

Further information about the admission of heat pumps to the Danish Energy Agency's list of heat pumps, Varmepumpelisten, can be found in the instructions in Appendix 1.

## General terms and conditions

If a product is modified after the admission to the list of heat pumps in ways that affect the energy efficiency and quality of the heat pump, a new application for the admission to Varmepumpelisten must be filed. The Supplier is responsible for informing the Secretariat if the heat pump is modified or withdrawn from the Danish market.

If a heat pump fails the test in connection with sampling tests, the Secretariat will remove the product from the list of heat pumps. View Appendix 1 for information about sampling tests and procedures. The Danish Energy Agency reserves the right to publish the results of the sampling tests as well as pass on the results to relevant authorities. The Danish Energy Agency disclaims the responsibility for potential damage, which the heat pump or the Supplier may cause to a third party in connection with the sampling tests.

Concurrently with the development, the Danish Energy Agency can alter the requirements for the admission to Varmepumpelisten. Changes in the present Admission Agreement as well as the appendix must be notified with a minimum of two months in advance, unless otherwise is agreed between the Supplier and the Secretariat.

This agreement can be terminated without reason by both parties with two months' notice. Any violation of the terms and conditions of the agreement can result in immediate termination of the agreement and removal of heat pumps admitted to the list of heat pumps.

I, the undersigned, hereby confirm that I am familiar with and agree to the requirements, terms and conditions as well as the procedure concerning sampling tests stated in the present Admission Agreement and in Appendix 1. I also confirm the entering into the "Admission Agreement to the Danish Energy Agency's List of Heat Pumps, Varmepumpelisten." I hereby solemnly declare that the provided information is accurate and reliable.

Date:

Date:

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Signature - for the suppliers

Signature for Secretariat for Varmepumpelisten  
(On behalf of the Danish Energy Agency)

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Name in CAPITAL LETTERS

Name in CAPITAL LETTERS

## Appendix 1: Instructions for applicants for admission to the Danish Energy Agency's List of Heat Pumps, Varmepumpelisten

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### Gain admission to Varmepumpelisten

The Danish Energy Agency's list of heat pumps, Varmepumpelisten, is a part of the Agency's website, SparEnergi.dk, which provides information about energy consumption and energy solutions. Consumers can find the most energy efficient heat pumps on Varmepumpelisten. The list covers ground source heat pumps, air to water heat pumps and air to air heat pumps.

Varmepumpelisten is a consumer guarantee that the consumers are buying a heat pump that meet all the legal requirements, and that the performance and efficiency of the product are tested in an independent laboratory accredited to carry out the relevant measurements.

Here, you find the Danish Energy Agency's list of heat pumps: [Varmepumpelisten](#)

Heat pumps that meet the efficiency requirements of relevant EU regulations, the Danish building code and other requirements in the Agreement can be admitted to Varmepumpelisten. It is merely required that the Importer or the Manufacturer of the heat pump provides the Secretariat with documentation for the heat pump together with a signed Admission Agreement. Heat pumps are admitted to the list according to the latest version of the Agreement. For the Admission Agreement and the information sheet, please apply to the Secretariat for Varmepumpelisten.

The Admission Agreement can also be downloaded via this link:

[Admission Agreement to the Danish Energy Agency's list of Heat Pumps, Varmepumpelisten](#)

### Who is behind the list?

The Danish Energy Agency is an agency under the Danish Ministry of Energy, Utilities and Climate. The Agency is responsible for the entire chain of tasks related to the production and supply of energy, distribution and consumption of energy, including energy efficiency and energy savings. Moreover, The Danish Energy Agency is responsible for the national CO<sub>2</sub> goals and the efforts to reduce the emission of greenhouse gasses.

The Secretariat for Varmepumpelisten on behalf of the Danish Energy Agency is responsible for the admission of products to the list of heat pumps; Varmepumpelisten.

### Contact information to the Secretariat:

Secretariat for Varmepumpelisten

E-mail: [varmepumpelisten@teknologisk.dk](mailto:varmepumpelisten@teknologisk.dk)

Phone: +45 7220 2880

Telephone hours: Monday to Friday at 9.00 am to 11.30 am

### Getting your product on Varmepumpelisten

#### **1** Enter into agreement

Before your products can be admitted to Varmepumpelisten, you have to enter into an agreement with the Danish Energy Agency. The agreement must be signed by a responsible representative for your company.

You can see the current terms and conditions as well as efficiency requirements in the agreement. You can always get help with the admission procedure from the Secretariat.

It is free of charge to get your products admitted to Varmepumpelisten. However, there might be expenditure related to the documentation required for the admission to the list. You must pay these costs.

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### 2 Submit documentation

When you have entered into an agreement, you must send an information sheet for each heat pump in question to the Secretariat, so that the Secretariat has all the necessary information to make an evaluation. For the information sheet, please apply to the Secretariat.

All documents mentioned in the agreement under "Documentation requirements" must be submitted together with the information sheet. If you have two technically identical products and one of these products has an accredited test report from a third party, the other heat pump can be admitted to the list of heat pumps based on the same test report. However, two information sheets must be filled out, even though the admission is based on the same documentation.

"Technically identical" heat pumps are completely identical in terms of components, performance and efficiency.

When applying for admission to Varmepumpelisten, the Secretariat will assess whether the heat pumps are identical. All submitted material is handled in confidence.

### 3 Admission to Varmepumpelisten

When the heat pump has been evaluated, the Secretariat sends an e-mail with the decision. If the heat pump meets the requirements, it is admitted to Varmepumpelisten. As long as the heat pump is on the list, you are welcome to refer to the list as well as mention that the heat pump has been admitted to the list. View your possibilities of applying the Danish Energy Agency's different banners concerning Varmepumpelisten as well as the possibilities of linking to the list and/or your own products at: [SparEnergi.dk/om-SparEnergi](http://SparEnergi.dk/om-SparEnergi).

#### Sampling tests

##### Scope of sampling tests

Sampling tests of ground source heat pumps, air to water heat pumps and air to air heat pumps on the Danish Energy Agency's list of heat pumps are initiated by the Danish Energy Agency and carried out by the Secretariat for Varmepumpelisten. The sampling tests are carried out in connection with the normal regulatory oversight of whether the heat pumps meet the ecodesign and energy labelling requirements.

The Danish Energy Agency reserves the right to check the heat pumps additionally in connection with specific efficiency or quality requirements that constitute the basis of the admission to Varmepumpelisten – and which are not included by the ecodesign and energy labelling requirements.

##### Selection of heat pumps

If a heat pump is selected for sampling, it must be sent to testing within two weeks (14 days). Remember that the 14 days also apply to the submitting of necessary information and a possible setting-up of the heat pump.

For ground source heat pumps and air to water heat pumps in particular apply that the heat pump must be set up and ready for operation before testing. This means that it must be assembled and submitted to a test, so that it immediately can be started and tested. According to agreement, a technician chosen by the Supplier can participate during set-up of the heat pump, so that the heat pump functions without problems during start-up. If the heat pump cannot be tested immediately after start-up, it will be dismantled, and the Supplier will be charged with the costs.

Air to air heat pumps must also be prepared before the test, so that they can be assembled and tested immediately after start-up.

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### Submission of information

When selecting the samples in connection with the sampling tests, the test laboratory sends a check list of the required information. If the test laboratory only has received the heat pump and insufficient or no information within the two weeks (14 days), the heat pump is automatically going to fail the test. When the sampling test is completed, the heat pump can be collected at the test laboratory by appointment. The company in question holds the expenses for the return transport of the heat pump.

### Conclusion of sampling tests and testing of heat pumps

If the result of the test shows that the heat pump does not meet the admission requirements, it fails the test, and it will be removed from Varmepumpelisten. This means that you no longer may state that the heat pump is admitted to Varmepumpelisten. If the heat pump fails the test, the Supplier pays the expenses for the testing.

If the test result of a single heat pump shows that it fails the test, you have the opportunity to test an additional three randomly selected units of the same model. The requirements for submitting these units for testing are the same as for the selection in connection with the sampling test.

The decision, whether a heat pump fails the test, and thus it is removed from the list of heat pumps, is first available when the test results of the three additional units confirm the non-compliance with the requirements – or if the Supplier chooses to accept the test results of the first unit.

Notice that if the measurements do not confirm the stated values for the heat pump when testing the three units, the Supplier must pay the expenses for all four tests.

The Secretariat will inform in writing about the test results and when required send you an invoice. The expenses for a test varies greatly – it depends on whether the heat pump could not be tested because of the lack of setting-up the heat pump, whether an entire test was completed or whether the Supplier has requested the testing of three additional units.

The Danish Energy Agency can choose to publish the test results. In connection with regulatory oversight (ecodesign and energy labelling), it is common practice that the test results are published.

The test is carried out by an accredited test laboratory.

Ground source heat pumps and air to water heat pumps are tested according to the verification procedure described in [the Commission Delegated Regulation \(EU\) No. 811/2013 Annex VIII](#) and [the Commission Regulation \(EU\) No. 813/2013 Annex IV](#)

Air to air heat pumps are tested according to the verification procedure described in [the Commission Regulation \(EU\) No. 206/2012 Annex III](#) and [the Commission Delegated Regulation \(EU\) No. 626/2011 Annex VIII](#).

Varmepumpelisten is continuously improved

### Varmepumpelisten must be on the agenda

With two months' notice, the Danish Energy Agency can change the admission requirements for Varmepumpelisten. Improvements and conditions are continuously discussed with the industry. Regulation, efficiency requirements and conditions can change in the future. Notice that the Danish Energy Agency can request documentation for more stringent and new requirements in the future.

### Documentation requirements

All documentation must be submitted by e-mail.

The test reports can be prepared in the following languages: Danish, English, German, Swedish and Norwegian. The user and installation instructions as well as the maintenance manual must be in Danish.

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The test reports must be prepared as stated in the Commission Regulation (EU) 813/2013 for liquid/water and air/water heat pumps and the Commission Regulation (EU) 206/2012 for air/air heat pumps. Moreover, the SCOP-value of a given heat pump must be stated at average climate conditions, calculated according to the current version of the standard EN14825. The calculation of SCOP is based on tests specified in EN14511. You can order the standards EN14825 and EN14511 at Danish Standards at [www.ds.dk](http://www.ds.dk).

### Reversible operation

The energy efficiency (SCOP) for radiator heating and floor heating are provided for ground source heat pumps and air to water heat pumps, respectively. The manufacturers are at liberty to provide data for one or both operation scenarios, documented in terms of a test report from a third-party accredited test laboratory. Varmepumpelisten does not provide information about the SCOP, where the consumption for standby as well as crank and/or case heater are subtracted in connection with the testing of products enabled to run in reversible operation. If the test report does not contain the correct efficiency data (SCOP) for one or both of the two operation scenarios (floor heating and radiator heating), this data can be obtained from the test laboratory, where the test has been carried out.

### Definition of SCOP

Seasonal Coefficient of Performance. A measure of the efficiency of a given heat pump calculated from a theoretical annual operating pattern. It is calculated based on several test points in part load, which have been adjusted for the provided temperatures, the annual profile for the outdoor temperature including the demands curve and power consumption not directly related to the operation.

### User instruction

The user instruction should minimize the risk of faulty operation and as a minimum it must contain information about the following:

- Personal, environmental and operational safety
- Instructions on energy-efficient operation
- Relevant drawings, diagrams and description of operating principle, service, repair and any regulatory requirements for service
- Results of functional and acceptance tests
- Description of possible errors and troubleshooting

### Installation manual

The installation manual must describe how to setup and connect the heat pump in a safe manner. Moreover, potential condensate drain systems must be described. The installation manual must contain a description and a principle diagram for the electrical wiring of the heat pump, and the requirements for the electrical fuse of the heat pump must be described. In addition, the nominal current, initial current, voltage and number of phases must be provided in the manual.

For ground source heat pumps and air to water heat pumps, it also applies that the installation manual must show how the individual parts of the heat pump are connected to the heat source system as well as how the heat pump is connected to the domestic hot water tank and the heat sink system. The principle diagram must show how the heat pump is connected to possible heat source and heat sink systems.

The installation manual must also contain a description of the operating principle, which indicates the operating mode of the heat pump, including an indication of automatic and manual control as well as information about mounted safety equipment. For outdoor air units, the function and design of the defrost system must be specified.

In connection with the installation manual, the operating range of the heat pump must be specified (maximum and minimum temperatures for the cold and warm side of the unit, respectively). For ground source heat pumps and air to water heat pumps, the mass flow for both the cold and the warm side of the unit must be specified. Moreover, it must be specified how to avoid that the heat pump works outside its operating range.



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The installation manual must be enclosed at installation of the unit, and it should as a minimum contain the necessary installation drawings, technical data and conditions which influence the personal, environmental and operational safety. It should also contain information about:

- Necessary insulation work
- Electrical installation and electrical connection
- Control and safety equipment with description of operating principle
- Sound power level (vibration and airborne noise – possible precautionary measures and site of installation)
- Drain outlet
- Performance test
- Commencement of operation and acceptance test
- Setup of the unit in terms of piping and wiring diagrams that clearly show the design of the heat pump with the individual components. The diagrams must be carried out according to current standards.

The installation manual for ground source heat pumps and air to water heat pumps must contain information about the following:

- Heat source system
- Heat sink system (if relevant)

The installation manual must also make it clear that:

The commencement of operation, adjustment, annual service and any intervention in the refrigeration system must be carried out by a person, who meets the qualification requirements to perform these tasks on the given type of heat pump according to the current legislation.

### Maintenance manual

The maintenance manual (which can be an integral part of the user instruction) must contain information on how the User is to control and maintain the heat pump. It should clearly specify the errors and maintenance work, which can be carried out by the User, and the errors and maintenance work, which must be carried out by a service company/ authorized company. If the heat pump has a refrigerant charge larger than 1 kilogramme, it must be specified that the unit must be examined at least once a year. The service must be carried out by a person, who meets the qualification requirements to perform the control duties on the given type of heat pump.

### Product requirements

#### Electric backup heating

If there is an electric backup heater (for supplementary heating), the User must have the possibility of opt-in and opt-out of the automatic connection of the electric heating cartridge in the heat pump system control.

The display of the control system must always show when the electric heating cartridge is operating, e.g. by a lighting icon on the display. Moreover, a light signal and preferably a sound signal should clearly signal if the heat pump is in fault condition.

#### Current Danish legislation and authority requirements

Heat pumps must be CE marked, which means that they have been constructed and built in accordance with all relevant, harmonized EU directives and regulations, EU safety standards and EU product standards.

Ecodesign is an EU regulation under the CE marking, and thus the CE certificate should specify that the heat pumps meet these requirements. The certificate should also contain a reference to the following regulations: the Commission Regulation (EU) no. 813/2013 for ground source heat pumps and air to water heat pumps as well as the Commission Regulation (EU) no. 206/2012 for air to air heat pumps.

Furthermore, national requirements must be complied with, including the requirements for heating systems specified in the Building Code in force at the time in question.

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### Requirements for suppliers

The Supplier must ensure that the User can always get in contact with a Danish-speaking person in case of questions regarding the heat pump. The person need not be physically located in Denmark.

### Reference to installation contractors

The Supplier must refer to installation contractors able to mount the heat pump legally or inform where the User can find qualified installation contractors. This can be done by referring to the list of skilled installers (Håndværkerlisten), which ensures that the installation contractor has the required education.

View the list of skilled installers: [Håndværkerlisten](#).

The reference can be made in written material such as the manuals or the company website etc. A print-out or a link is sufficient as documentation.

### The GWP of refrigerants (Global Warming Potential)

The requirements, cf. the Commission Regulation (EU) no. 206/2012 regarding the efficiency of air to air heat pumps, depend on the capacity and the global warming potential of the refrigerants. The GWPs of the most common refrigerants are disclosed in the below table:

Refrigerant	GWP (Global Warming Potential)
R-134a	1300
R-290	3
R-404a	3300
R-407a	2000
R-407c	1600
R-410a	2100
R-507	3300
R-600a	4
R-717	0
R-744	1