►**B**

COMMISSION REGULATION (EC) No 641/2009

of 22 July 2009

implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products

(Text with EEA relevance)

(OJ L 191, 23.7.2009, p. 35)

Amended by:

		Official Journal		
		No	page	date
►**M1**	Commission Regulation (EU) No 622/2012 of 11 July 2012	L 180	4	12.7.2012

▼B

COMMISSION REGULATION (EC) No 641/2009

of 22 July 2009

implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council [1], and in particular Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

Whereas:

(1) Under Directive 2005/32/EC ecodesign requirements should be set by the Commission for energy-using products representing significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement in terms of their environmental impact without entailing excessive costs.

(2) Article 16(2), first indent, of Directive 2005/32/EC provides that, in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2) of that Directive, and after consulting the Ecodesign Consultation Forum, the Commission will, as appropriate, introduce an implementing measure for appliances in electric motor systems and heating equipment, such as for circulators.

(3) The Commission has carried out a preparatory study to analyse the technical, environmental and economic aspects of circulators typically used in buildings. The study has been developed together with stakeholders and interested parties from the Community and third countries, and the results have been made publicly available.

(4) Circulators consume much of the energy used in heating systems in buildings. Furthermore, most standard circulators operate continuously, regardless of heating needs. Circulators are therefore one of the priority products for which ecodesign requirements should be established.

(5) The environmental aspect of circulators that is identified as significant for the purposes of this Regulation is electricity consumption in the use phase.

[1] OJ L 191, 22.7.2005, p. 29.

▼B

(6) The preparatory study shows that approximately 14 million circulators are placed on the Community market annually and that their most significant environmental impact out of all life-cycle phases is the use phase energy consumption amounting to 50 TWh in 2005, corresponding to 23 million tonnes of CO_2 emissions. If no specific measures are taken, electricity consumption is predicted to increase to 55 TWh by 2020. The preparatory study shows that use phase electricity consumption can be significantly improved.

(7) The preparatory study shows that requirements regarding other ecodesign parameters referred to in Annex I, Part 1, of Directive 2005/32/EC are not necessary as power consumption of circulators in use phase is by far the most important environmental aspect.

(8) Circulators should be made more efficient by applying existing non-proprietary cost-effective technologies that can reduce the total combined costs of purchasing and operating circulators.

(9) Ecodesign requirements should harmonise electricity consumption requirements for circulators throughout the Community, thus contributing to the functioning of the internal market and to improving the environmental performance of these products.

(10) To increase the re-use and recycling of circulators, manufacturers should provide information on the assembly and dismantling of circulators.

(11) The ecodesign requirements should not have a negative impact on the functionality of circulators and should not negatively affect health, safety or the environment. In particular, the benefits of reducing electricity consumption during the use phase should more than offset any additional environmental impacts during the production phase.

(12) The ecodesign requirements should be introduced gradually in order to provide a sufficient timeframe for manufacturers to redesign products subject to this Regulation as appropriate. The timing for the introduction of these requirements should be such as to avoid negative impacts on the functionalities of circulators on the market, and to take into account cost impacts for manufacturers, in particular small and medium-sized enterprises, while ensuring timely achievement of the objectives of the Regulation.

▼B

(13) Conformity assessment and measurements of the relevant product parameters should be performed using reliable, accurate and reproducible measurement methods, which take into account the generally recognised state of the art measurement methods including, where available, harmonised standards adopted by the European standardisation bodies, as listed in Annex I to Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services ([1]).

(14) This Regulation should quickly ensure the placing on the market of technologies that reduce the life-cycle environmental impact of circulators, leading to estimated electricity savings of 23 TWh by 2020, corresponding to 11 Mt of CO_2 equivalent, compared with the situation, where no action is taken.

(15) In accordance with Article 8 of Directive 2005/32/EC, this Regulation should specify the applicable conformity assessment procedures.

(16) In order to facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2005/32/EC.

(17) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to ensure wide availability and easy accessibility of information on the life-cycle environmental performance of circulators.

(18) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2005/32/EC,

HAS ADOPTED THE FOLLOWING REGULATION:

▼M1

Article 1

Subject matter and scope

1. This Regulation establishes ecodesign requirements for the placing on the market of glandless standalone circulators and glandless circulators integrated in products.

2. This Regulation shall not apply to:

(a) drinking water circulators, except as regards the product information requirements of Annex I, point 2(1)(d);

([1]) OJ L 204, 21.7.1998, p. 37.

▼M1

(b) circulators integrated in products and placed on the market no later than 1 January 2020 as replacement for identical circulators integrated in products and placed on the market no later than 1 August 2015, except as regards the product information requirements of Annex I, point 2(1)(e).

Article 2

Definitions

For the purposes of this Regulation, the following definitions shall apply:

(1) 'circulator' means an impeller pump, with or without pump housing, which has the rated hydraulic output power of between 1 W and 2 500 W and is designed for use in heating systems or in secondary circuits of cooling distribution systems;

(2) 'glandless circulator' means a circulator with the rotor directly coupled to the impeller and the rotor immersed in the pumped medium;

(3) 'standalone circulator' means a circulator, designed to operate independently from the product;

(4) 'product' means an appliance that generates and/or transfers heat;

(5) 'circulator integrated in a product' means a circulator designed to operate as part of a product carrying at least one of the following design details:

(a) the pump housing is designed to be mounted and used inside a product;

(b) the circulator is designed to be speed controlled by the product;

(c) the circulator is designed for safety features not suitable for standalone operation (ISO IP classes);

(d) the circulator is defined as part of product approval or product CE marking;

(6) 'drinking water circulator' means a circulator specifically designed to be used in the recirculation of water intended for human consumption as defined in Article 2 of the Council Directive 98/83/EC ([1]);

(7) 'pump housing' means the part of an impeller pump which is intended to be connected to the pipe work of the heating systems or secondary circuits of the cooling distribution system.

▼B

Article 3

Ecodesign requirements

The ecodesign requirements for circulators are set out in Annex I.

([1]) OJ L 330, 5.12.1998, p. 32.

▼B

Compliance with ecodesign requirements shall be measured in accordance with requirements set out in Annex II, point 1.

The calculation method for the energy efficiency index of circulators is set out in Annex II, point 2.

Article 4

Conformity assessment

The procedure for assessing conformity referred to in Article 8 of Directive 2005/32/EC shall be the internal design control system set out in Annex IV to that Directive or the management system for assessing conformity set out in Annex V to that Directive.

Article 5

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2005/32/EC, for the requirements set out in Annex I to this Regulation, the authorities of the Member States shall apply the verification procedure described in Annex III to this Regulation.

Article 6

Benchmarks

The indicative benchmarks for best-performing circulators available on the market at the time of entry into force of this Regulation are set out in Annex IV.

▼M1

Article 7

Revision

The Commission shall review this Regulation before 1 January 2017, in the light of technological progress.

The review shall include the assessment of design options that can facilitate reuse and recycling.

The results of the review shall be presented to the Ecodesign Consultation Forum.

▼B

Article 8

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply in accordance with the following timetable:

1. from 1 January 2013, glandless standalone circulators shall meet the efficiency level defined in Annex I, point 1(1), with the exception of those specifically designed for primary circuits of thermal solar systems and of heat pumps;

▼B

2. from 1 August 2015, glandless standalone circulators and glandless circulators integrated in products shall meet the efficiency level defined in Annex I, point 1(2).

This Regulation shall be binding in its entirety and directly applicable in all Member States.

▼B

ANNEX I

ECODESIGN REQUIREMENTS

1. ENERGY EFFICIENCY REQUIREMENTS

1. From 1 January 2013, glandless standalone circulators, with the exception of those specifically designed for primary circuits of thermal solar systems and of heat pumps, shall have an energy efficiency index (EEI) of not more than 0,27, calculated in accordance with Annex II, point 2.

2. From 1 August 2015, glandless standalone circulators and glandless circulators integrated in products shall have an energy efficiency index (EEI) of not more than 0,23, calculated in accordance with Annex II, point 2.

▼M1

2. PRODUCT INFORMATION REQUIREMENTS

1. From 1 January 2013:

(a) the energy efficiency index of standalone circulators calculated in accordance with Annex II, shall be indicated on the name plate and packaging of the standalone circulator and in the technical documentation of the standalone circulator as follows: 'EEI ≤ 0,[*xx*]';

(b) the following information shall be provided on standalone circulators and on circulators integrated in products: 'The benchmark for the most efficient circulators is EEI ≤ 0,20.';

(c) information concerning disassembly, recycling, or disposal at end-of-life of components and materials, shall be made available for treatment facilities on standalone circulators and on circulators integrated in products;

(d) for drinking water circulators, the following information shall be provided on the packaging and in the documentation: 'This circulator is suitable for drinking water only';

(e) for circulators integrated in products and placed on the market no later than 1 January 2020 as replacement for identical circulators integrated in products and placed on the market no later than 1 August 2015, the replacement product or its packaging shall clearly indicate the product(s) for which it is intended.

Manufacturers shall provide information on how to install, use and maintain the circulator in order to minimise its impact on the environment.

The information listed above shall be visibly displayed on freely accessible websites of the circulator manufacturer.

2. From 1 August 2015, for circulators integrated in products, the energy efficiency index calculated in accordance with Annex II, shall be indicated on the name plate of the circulator and in the technical documentation of the product as follows: 'EEI ≤ 0,[*xx*]'.

▼B

ANNEX II

MEASUREMENT METHODS AND METHODOLOGY FOR CALCULATING THE ENERGY EFFICIENCY INDEX

1. MEASUREMENT METHODS

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements shall be made using a reliable, accurate and reproducible measurement procedure that takes into account the generally recognised state of the art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

▼M1

2. METHODOLOGY FOR CALCULATING THE ENERGY EFFICIENCY INDEX

The methodology for calculating the energy efficiency index (EEI) for circulators is as follows:

1. Standalone circulators with pump housing shall be measured as a complete unit;

   Standalone circulators without pump housing shall be measured with pump housing identical to the pump housing in which they are intended to be used;

   Circulators integrated in products shall be dismantled from the product and measured with a reference pump housing;

   Circulators without pump housing intended to be integrated in a product shall be measured with a reference pump housing;

   where 'reference pump housing' means a pump housing supplied by the manufacturer with inlet and outlet ports on the same axis and designed to be connected to the pipework of a heating system or secondary circuit of a cooling distribution system.

2. Where a circulator has more than one setting of head and flow, measure the circulator at the maximum setting.

   'Head' (H) means head (in metres) produced by the circulator at the specified point of operation.

   'Flow' (Q) means the volume flow rate of water through the circulator (m^3/hr).

3. Find the point where $Q \cdot H$ is maximum and define the flow and head at this point as: $Q_{100\ \%}$ and $H_{100\ \%}$.

4. Calculate the hydraulic power P_{hyd} at this point.

   'Hydraulic power' means an expression of the arithmetic product of the flow (Q), Head (H) and a constant.

   "P_{hyd}" means hydraulic power delivered by the circulator to the fluid being pumped at the specified point of operation (in watts).

5. Calculate the reference power as:

$$P_{ref} = 1{,}7 \cdot P_{hyd} + 17 \cdot (1 - e^{-0{,}3 \cdot P_{hyd}}),\ 1\ \text{W} \leq P_{hyd} \leq 2\,500\ \text{W}$$

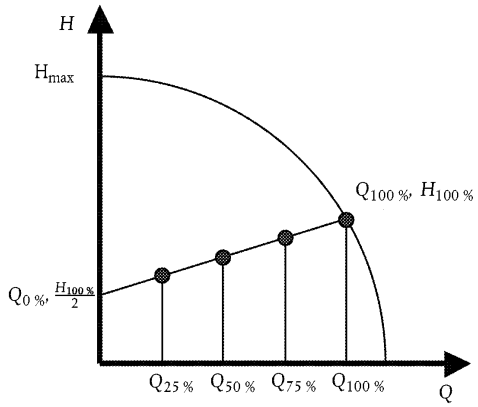
   'Reference power' means a relation between hydraulic power and power consumption of a circulator, taking into account the dependency between circulator efficiency and size.

   'P_{ref}' means the reference power (in watts) of the circulator in a given head and flow.

▼**M1**

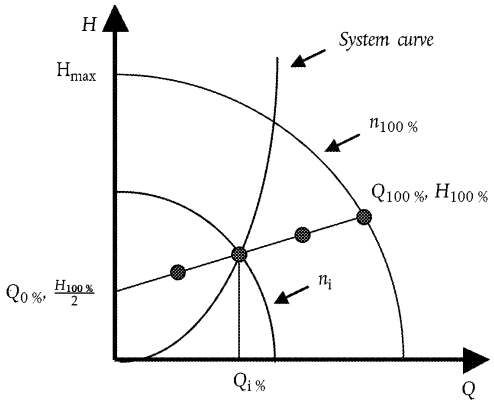
6. Define the reference control curve as the straight line between the points:

$(Q_{100\ \%}, H_{100\ \%})$ and $(Q_{0\ \%}, \frac{H_{100\ \%}}{2})$



7. Select a setting of the circulator ensuring that the circulator on the selected curve reaches $Q \cdot H = max\ point$. For circulators integrated in products follow the reference control curve by adjusting the system curve and speed of the circulator.

'System curve' means a relationship between flow and head ($H = f(Q)$) resulting from friction in the heating system or cooling distribution system, as presented in the following graph:



8. Measure P_1 and H at the flows:

$Q_{100\ \%}$, 0,75 · $Q_{100\ \%}$, 0,5 · $Q_{100\ \%}$, 0,25 · $Q_{100\ \%}$

'P_1' means the electrical power (in watts) consumed by the circulator at the specified point of operation.

9. Calculate P_L as follows:

$$P_L = \frac{H_{ref}}{H_{meas}} \cdot P_{1,meas},\ if\ H_{meas} \leq H_{ref}$$

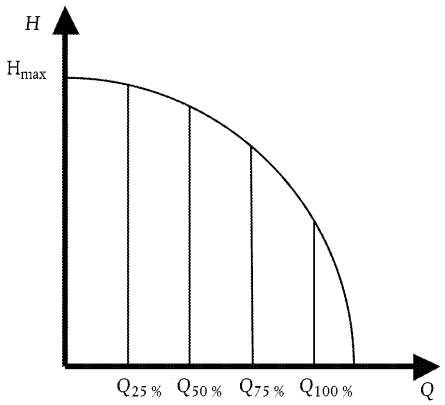
$$P_L = P_{1,meas},\ if\ H_{meas} > H_{ref}$$

Where H_{ref} is the head on the reference control curve at the different flows.

▼**M1**

10. Using the measured values of P_L and this load profile:

Flow [%]	Time [%]
100	6
75	15
50	35
25	44



Calculate the weighted average power $P_{L,avg}$ as:

$$P_{L,avg} = 0{,}06 \cdot P_{L,\,100\,\%} + 0{,}15 \cdot P_{L,\,75\,\%} + 0{,}35 \cdot P_{L,\,50\,\%} + 0{,}44 \cdot P_{L,\,25\,\%}$$

Calculate the energy efficiency index ([1]) as:

$$EEI = \frac{P_{L,avg}}{P_{ref}} \cdot C_{20\,\%}, \text{ where } C_{20\,\%} = 0{,}49$$

Except for circulators integrated in products designed for primary circuits of thermal solar systems and for heat pumps, where the energy efficiency index is calculated as:

$$EEI = \frac{P_{L,avg}}{P_{ref}} \cdot C_{20\%} \cdot \left(1 - e^{\left(-3{,}8 \cdot \left(\frac{n_s}{30}\right)^{1{,}36}\right)}\right)$$

where $C_{20\,\%} = 0{,}49$ and n_s is the specific speed defined as

$$n_s = \frac{n_{100\,\%}}{60} \cdot \frac{\sqrt{Q_{100\,\%}}}{H_{100\,\%}^{0{,}75}}$$

where

n_s [rpm] is specific speed of a circulator;

$n_{100\,\%}$ is rotational speed in rpm in this duty defined at $Q_{100\,\%}$ and $H_{100\,\%}$.

([1]) $C_{XX\,\%}$ means a scaling factor that ensures that at the time of defining the scaling factor only XX % of circulators of a certain type have an EEI ≤ 0,20.

▼B

ANNEX III

VERIFICATION PROCEDURE

For the purposes of checking conformity with the requirements laid down in Annex I, the authorities of the Member States shall use the measurement and calculation procedure set out in Annex II.

Member States authorities shall test a single circulator. If the energy efficiency index exceeds the values declared by the manufacturer by more than 7 %, the measurements shall be made on three more circulators. The model shall be considered to comply if the arithmetical mean of the measured values for the latter three circulators do not exceed the values declared by the manufacturer by more than 7 %.

Otherwise, the model shall be considered not to comply with the requirements of this Regulation.

In addition to the procedure set out in this Annex, Member States authorities shall use reliable, accurate and reproducible measurement methods, which take into account the generally recognised state of the art, including methods set out in documents the reference numbers of which have been published for that purpose in the *Official Journal of the European Union*.

▼B

ANNEX IV

INDICATIVE BENCHMARKS

At the time of the adoption of this Regulation, the benchmark for the best available technology on the market for circulators is EEI ≤ 0,20.