



**CABINET OF MINISTERS OF UKRAINE**  
**RESOLUTION**

**No. 153 of 27 February 2019**  
**Kyiv**

**On Approval of the Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products**

*{As amended by the CM Resolution  
No. 1097 of 11.11.2020}*

In accordance with [Article 5](#) of the Law of Ukraine ‘On Technical Regulations and Conformity Assessment’, the Cabinet of Ministers of Ukraine hereby **resolves**:

1. Approve the [Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products](#) as attached hereto.

2. The State Agency on Energy Efficiency and Energy Saving shall ensure the implementation of the Technical Regulation approved by this Resolution.

3. The attached amendment shall be introduced to [the list of types of products subject to state market surveillance by state market surveillance authorities](#), approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1069 of 28 December 2016 (Official Journal of Ukraine, 2017, No. 50, p. 1550).

4. This Resolution shall enter into force after six months following its publication.

**Prime Minister of Ukraine**

**VOLODYMYR GROYSMAN**

**Ind. 21**

## **TECHNICAL REGULATION**

### **on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products**

#### **General Provisions**

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

This Technical Regulation is based on the Commission Regulation (EU) 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.

2. This Technical Regulation shall not apply to:

drinking water circulators, except as regards information requirements set out in the **fifth indent** of Annex 1, point 2;

*{The second indent of point 2 as amended by the CM Resolution No. 1097 of 11.11.2020}*

circulators integrated in products and placed on the market no later than 1 January 2029 as replacement for identical circulators integrated in products and placed on the market no later than 12 September 2022, except as regards information requirements set out in the **sixth indent** of Annex 1, point 2.

*{The third indent of point 2 as amended by the CM Resolution No. 1097 of 11.11.2020}*

3. For the purpose of this Technical Regulation the terms shall have the following meaning:

‘standalone circulator’ means a circulator designed to operate independently from the product;

‘glandless circulator’ means a circulator with the rotor directly coupled to the impeller and the rotor immersed in the pumped medium;

‘pump casing’ means the part intended for connection to the pipeline of a heating system or the secondary circuit of a cooling distribution system;

‘product’ means an appliance that generates and/or transfers heat medium;

‘circulator’ means an impeller pump 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;

‘drinking water circulator’ means a circulator specifically designed to be used in the recirculation of drinking water;

‘circulator integrated in product’ means a circulator designed to operate as a part of a product having at least one of the following design characteristics:

pump casing is constructed as to be installed and operated inside an appliance;

is constructed so that its operating speed is controlled by the appliance it is integrated in;

is constructed with such safety features that do not allow for its operation in standalone mode (under ISO IP classes);

is designated as an attachment for use as a component of the appliance when performing type examination or affixing the mark of conformity with technical regulations.

Other terms used herein shall have meanings set out in the Laws of Ukraine ‘On Technical Regulations and Conformity Assessment’, ‘On State Market Surveillance and Control of Non-Food Products’, ‘On Standardization’ and in the Technical Regulation establishing a framework for the setting of ecodesign requirements for energy-related products, approved by the Resolution of the Cabinet of Ministers of Ukraine of 3 October 2018 No. 804 (Official Journal of Ukraine, 2018, No. 80, p. 2678).

## **Ecodesign Requirements**

4. The ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products are set out in [Annex 1](#).

5. Compliance with ecodesign requirements shall be measured in accordance with requirements set out in [Annex 2](#), point 1.

6. The calculation method for the energy efficiency index of glandless standalone circulators and glandless circulators integrated in products is set out in [Annex 2](#), point 2.

## **Conformity Assessment**

7. Conformity of glandless standalone circulators and glandless circulators integrated in products with the requirements of this Technical Regulation shall be assessed by applying the internal design control procedure or the management procedure for assessing conformity set out, respectively, in [Annexes 3](#) and [4](#) to the Technical Regulation establishing a framework for the setting of ecodesign requirements for energy-related products, approved by the Resolution of the Cabinet of Ministers of Ukraine of 3 October 2018 No. 804.

## **State Market Surveillance**

8. Verification of conformity of glandless standalone circulators and glandless circulators integrated in products with the requirements of this Technical Regulation in the course of state market surveillance shall be made in accordance with the requirements set out in [Annex 3](#).

## **Indicative Benchmarks**

9. The indicative benchmarks for the best-performing glandless standalone circulators and glandless circulators integrated in products available on the market are identified as  $EEI \leq 0,2$ .

## **Correlation Table**

10. The correlation table between the provisions of the 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, and this Technical Regulation is set out in [Annex 4](#).

**ECODESIGN REQUIREMENTS**  
**for glandless standalone circulators and glandless circulators integrated in products**

**Energy efficiency requirements**

1. After three years following the date the [Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products](#) (hereinafter referred to as Technical Regulation) enters into force, 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 2](#), point 2 thereto.

*{Point 1 as amended by the CM Resolution No. 1097 of 11.11.2020}*

**Product information requirements**

2. After three years following the date the Technical Regulation enters into force:

*{The first indent of point 2 as amended by the CM Resolution No. 1097 of 11.11.2020}*

the energy efficiency index of glandless standalone circulators, calculated in accordance with [Annex 2](#) to the Technical Regulation, shall be indicated on the name plate and packaging of the product and in the technical documentation as follows: ‘EEI ≤ 0, [xx]’;

for glandless standalone circulators and glandless circulators integrated in products the following information shall be provided: ‘The benchmark for most efficient circulators available on the market is  $EEI \leq 0,2$ .’;

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

for drinking water circulators, the following information shall be provided on the packaging and in the technical documentation: ‘This circulator is suitable for drinking water only.’;

circulators integrated in products and placing on the market no later than 1 January 2029 as replacement for identical circulators integrated in products and placed on the market no later than 12 September 2022, or their packaging must clearly indicate the product(s) for which they are intended.

*{The sixth indent of point 2 as amended by the CM Resolution No. 1097 of 11.11.2020}*

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 manufacturers, and nothing must impair its visibility.

## **MEASUREMENT METHODS and methodology for calculating the energy efficiency index**

### **Measurement methods**

1. For the purposes of compliance and verification of compliance of circulators with the requirements of the **Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products** (hereinafter referred to as Technical 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 national standards, compliance to which grants presumption of conformity with the Technical Regulation.

### **Methodology for calculating the energy efficiency index**

2. When measuring glandless standalone circulators equipped with pump casing they shall be considered as a single set.

For a glandless standalone circulator that has no casing, measurement shall be made as for a glandless standalone circulator equipped with a pump casing, identical to the one intended for installation of the circulator.

Glandless circulators integrated in products shall be dismantled from the product and the energy efficiency index shall be measured with the reference pump casing.

Measurement of a glandless circulator with no casing, intended for integration in products, shall be made with the reference pump casing.

In this case, ‘reference pump casing’ means the manufacturer-supplied pump casing with in-line inlet and outlet ports, intended for connection to the pipeline of a heating system or the secondary circuit of a cooling distribution system.

3. 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 rate of fluid that flows through the outlet cross-section of the circulator per unit of time (cub. meters per hour).

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

1) find the point where  $Q \cdot H$  is maximum and define the flow and head at this point as:  $Q_{100\%}$  and  $H_{100\%}$ ;

2) calculate the hydraulic power delivered by the circulator to the fluid being pumped at this point ( $P_{hyd}$ , W) as follows:

$$P_{hyd} = Q \cdot H \cdot k .$$

where  $k$  is a constant depending on the fluid being used and defined as the product of the fluid density and the standard gravity factor ( $9,81^2$  meters per second);

3) calculate the reference power as:

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

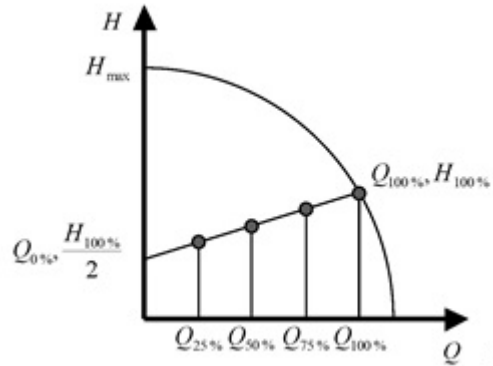
$$1 \text{ W} \leq P_{hyd} \leq 2 \text{ 500 W},$$

where  $P_{ref}$  stands for the reference power (in watts) of the circulator at the given head and flow.

‘Reference power’ means a relation between hydraulic power and power consumption of a circulator, taking into account the dependency between circulator efficiency and size;

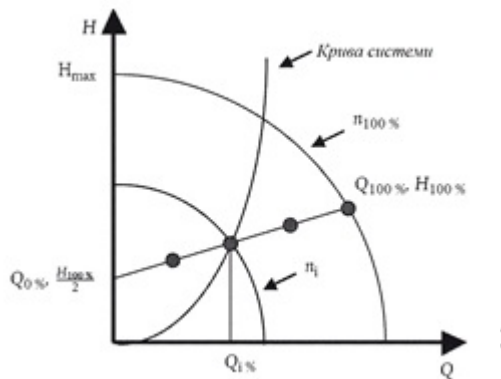
4) define the reference control curve as the straight line between the points:

$$(Q_{100\%}, H_{100\%}) \text{ та } (Q_0\%, \frac{H_{100\%}}{2})$$



5) select a setting of the circulator ensuring that the circulator on the selected curve reaches the maximum point. For circulators integrated in products, the reference control curve must be followed by means of adjusting the system curve and the circulator speed.

The system curve refers to a relation between head and flow ( $H = f(Q)$ ), resulted from friction in a heating system or a cooling distribution system as presented on the chart below:



6) measure the electrical power consumed by the circulator at the specified point of operation ( $P_L$ ) and the head ( $H$ ) at the flows:

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

7) calculate the power of the circulator ( $P_L$ ) as follows:

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

$$\text{та } P_L = P_{L, \text{meas}} \cdot \text{if } H_{\text{meas}} \leq H_{\text{ref}},$$

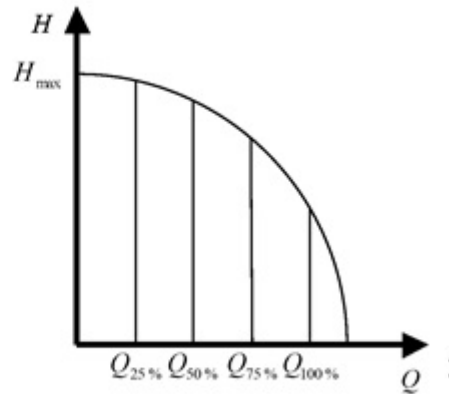
where  $H_{\text{ref}}$  is the head on the reference control curve at the different flows;

8) calculate the weighted average circulator power ( $P_{L, \text{avg}}$ ) as follows:

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

where  $P_{L, \text{XX}\%}$  is the circulator power at the different flows, obtained as a result of measurement, and this load profile:

Подача (ВІДСОТКІВ)	Час (ВІДСОТКІВ)
100	6
75	15
50	35
25	44



9) calculate the energy efficiency index as:

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

where  $C_{20\%}$  equals to 0,49;

$C_{\text{XX}\%}$  means a scaling factor that ensures that at the time of defining the scaling factor only  $\text{XX}\%$  of circulators of a certain type have an  $EEI \leq 0,2$ .

The energy efficiency index (EEI) for circulators integrated in products and designed for primary circuits of solar heating systems or heat pumps is calculated as follows:

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

where  $C_{20\%}$  equals to 0,49;

$n_s$  is the pump operating speed (rpm), specified as follows:

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

where  $n_{100\%}$  is the rpm in this mode, defined at  $Q_{100\%}$  and  $H_{100\%}$ .

**REQUIREMENTS**  
**for verifying conformity of circulators with the requirements of the**  
**Technical Regulation on Approval of the Technical Regulation on**  
**Ecodesign Requirements for Glandless Standalone Circulators and**  
**Glandless Circulators Integrated in Products during state market**  
**surveillance**

1. Allowable tolerances referred to in this Annex are only applied by state market surveillance authorities and shall not be used by the manufacturer or importer to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

2. Conformity verification of circulators with the requirements of the [Technical Regulation on Approval of the Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products](#) (hereinafter referred to as Technical Regulation) is made by market surveillance authorities with regard for the following:

1) one circulator per model shall be tested;

2) a circulator model shall be considered to comply with the requirements of the Technical Regulation, if:

performance indicators in the technical documentation and the values used to calculate these indicators are not more favourable for the manufacturer or importer than the results of the corresponding measurements;

the declared values meet any requirements laid down in the Technical Regulation, and the product information provided by the manufacturer or importer does not contain values that are more favourable for the manufacturer or importer than the declared values;

when a circulator is checked by market surveillance authorities, the readings of relevant parameters and values are within the allowable tolerances indicated in the Table;

3) if the results referred to in the second or third indent of subpoint 2 of this point are not achieved, the model shall be considered not to comply with the requirements of the Technical Regulation;

4) if the result referred to in the fourth indent of subpoint 2 of this point is not achieved, state market surveillance authorities shall select three additional circulators of the same model for testing;

5) the model shall be considered to comply with the requirements of the Technical Regulation if the arithmetical mean for these three circulators is within the allowable tolerances indicated in the Table;

6) if the result referred to in subpoint 5 of this point is not achieved, the model shall be considered not to comply with the requirements of the Technical Regulation.

3. State market surveillance authorities shall use the measurement and calculation methods set out in [Annex 2](#) to the Technical Regulation.

State market surveillance authorities shall use only allowable tolerances indicated in the Table below, taking into account the requirements set out in subpoints 1 to 6 of point 2 of this Annex. No other tolerances, such as those set out in national standards that are identical to the European harmonised standards or in any other measurement method, shall be applied.



Parameters	Verification tolerances
Energy efficiency index	the value shall not be greater than the declared value by more than 7 %

**CORRELATION TABLE**  
**between the provisions of the 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, and the Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products**

Provision of the Commission Regulation (EC)	Provisions of the Technical Regulation
Article 1, Part One	point 1
Article 1, Part Two	point 2
First indent of Article 2	first indent of point 3
Point 1 of Article 2	sixth indent of point 3
Point 2 of Article 2	third indent of point 3
Point 3 of Article 2	second indent of point 3
Point 4 of Article 2	fifth indent of point 3
Point 5 of Article 2	eighth indent of point 3
Point 6 of Article 2	seventh indent of point 3
Point 7 of Article 2	fourth indent of point 3
Article 3	points 4 to 6
Article 4	point 7
Article 5	point 8
Article 6	point 9
Article 7	
Article 8	

Annex I

Annex 1

Annex II

Annex 2

Annex III

Annex 3

Annex IV

point 9

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**APPROVED**  
**by the Resolution of the Cabinet of Ministers of Ukraine**  
**No. 153 of 27 February 2019**

**AMENDMENT**  
**to be introduced to the list of types of products subject to state**  
**market surveillance by state market surveillance authorities**

The [list](#) shall be supplemented with point 48<sup>1</sup> to read as follows:

“48 <sup>1</sup> . Glandless standalone circulators and glandless circulators integrated in products	Resolution by the Cabinet of Ministers of Ukraine of 27 February 2019 No. 153 “On Approval of the Technical Regulation on Ecodesign Requirements for Glandless Standalone Circulators and Glandless Circulators Integrated in Products”	State Service of Ukraine on Food Safety and Consumer Protection’.
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