

EL226. Automatic Temperature Control System for Heating

[EL226-1999/6/2011-10]



1. Scope

This Criteria applies to the products that use the commercial power source (220V) among the automatic temperature control systems for heating that keep the heating temperature through controlling the hot water header's valve by temperature or time setting, in the heating system using warm water below supply water temperature of 120°C and common pressure 980kPa (hereinafter called 'Temperature Controller').

2. Definitions

2.1

"Temperature Controller" means the system consisting of the temperature controller, control device, actuator and hot water header.

2.2

Hot water header is classified into the valve-equipped hot water header and the valve-connecting hot water header according to the flow control part installation.

2.3

The flow control type is classified into "open-close type" and "proportional control type". "Open-close type" means that the valve stays in only one side of 'Open' and 'Close', and "Proportional control type" means that the valve is continuously opened or closed in proportion to temperature.

2.4

Driving type is classified into "Self-commutated type" and "Line-commutated type". "Self-commutated type" means the system that doesn't require the external power and opens/closes the valve by using the heat transfer medium's expansion and contraction by indoor temperature or heating water's temperature difference. "Line-commutated type" means the system that senses the indoor temperature or heating water's

temperature and opens/closes the valve by using the external power source such as the electric energy.

2.5

The power consumption status of line-commutated type's product is classified into "Inactive mode", "Standby mode", and "Active mode". "Inactive mode" means the state that the power is connected but the power is turned off by using the temperature controller or the controller's power switch. "Standby mode" means the state that the temperature controller's power switch is turned on and the valve waits for the next control signal at one position of 'Open' or 'Close'. "Active mode" means the state that the valve is opened or closed.

3. Certification Criteria

3.1 Environmental Criteria

3.1.1

With respect to use of chemical substances in manufacturing process and recyclability of the parts of the product at disposal stage, the product shall comply with the following requirements.

Note) This Criteria shall not applied on materials which are exempted from Hazardous Substances Restriction lists on EU Directive 2002/95/EC and lead in solder of printed circuit board (PCB). However, in case of revision of EU Directive 2002/95/EC, this shall follow revised EU Directive which is applicable at the time the application for eco-label certification.

3.1.1.1

Lead, cadmium, mercury and their compounds, and hexavalent chromium compounds shall not be used in the product.

3.1.1.2

Content of lead, cadmium, mercury and hexavalent chromium in the parts of the product shall comply with one of the following requirements.

a) The applicant shall have an appropriate system to control the content of hazardous substances as following requirements.

| Substance | Pb | Cd | Hg | Cr ⁶⁺ |
|-----------------|-------|------|-------|------------------|
| Content [mg/kg] | ≤1000 | ≤100 | ≤1000 | ≤1000 |

b) Provided that the applicant does not have an appropriate system for the control of hazardous substances, the content of hazardous substances in the parts of the product shall comply with the following requirements.

| Substance | Pb | Cd | Hg | Cr ⁶⁺ (note) |
|-----------------|-------|------|-------|-------------------------|
| Content [mg/kg] | ≤1000 | ≤100 | ≤1000 | ≤1000 |

Note) In case the content of total chromium (Cr) is 1000 mg/kg or less, it is regarded as equivalent

3.1.1.3

PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenylethers) and short-chain chlorinated paraffin (C= 10~13) whose chlorine concentration is 50% or more shall not be used in the product.

3.1.2

With respect to the opening/closing time of valve and consumed electric power in accordance with energy consumption in use stage shall satisfy the following requirements.

3.1.2.1

With respect to the opening/closing time of valve in order to reduce the loss of heating energy generated in accordance with a delay in the valve opening/closing time shall satisfy the following requirements.

| Division | Opening/closing type | Proportional Control type |
|----------------------------|----------------------|---------------------------|
| Opening/closing time [sec] | ≤ 10 | ≤ 30 |

3.1.2.2

With respect to the energy consumption of line-commutated temperature control valve shall satisfy the following requirements.

| Division | Off-mode | Standby-mode | Operate-mode |
|------------------------|----------|--------------|--------------|
| Energy consumption [W] | 0 | ≤ 2.0 | ≤ 5.0 |

3.2 Quality Criteria:

The product quality should satisfy the certification criteria of the “Regulations regarding the Promotion of High-efficiency Energy Equipment Distribution” in accordance with the Energy Use Rationalization Act. However, the items related to “3.1.2 in 3.1 Environmental Criteria” are excluded.

3.3 Consumer Information

3.3.1

Indication on the items that the product contributes to the reasons for certification (energy-saving) during its consumption stage

3.3.2

Way of controlling temperature maintenance, etc.

4. Test Methods

| Certification Criteria | | Test and Verification Methods | |
|------------------------|-------|--|--|
| Environmental Criteria | 3.1.1 | 3.1.1.1 | Verification of submitted documents |
| | | 3.1.1.2 | Submitted documents in accordance with 'Verification and Test Method 4.2' |
| | | 3.1.1.3 | Verification of submitted documents |
| | 3.1.2 | 3.1.2.1 | Test report by an accredited testing laboratory in accordance with "provisions concerning supply promotion of high efficiency energy equipment" of 'heating auto-controlling temperature certification criteria and measuring method' or equivalent certificates |
| | | 3.1.2.2 | Test report by an accredited testing laboratory in accordance with 'Test Methods 4.1 and 4.3.' |
| Quality Criteria | | Test report by an accredited testing laboratory in accordance with "provisions concerning supply promotion of high efficiency energy equipment" of 'heating auto-controlling temperature certification criteria and measuring method' or equivalent certificates | |
| Consumer Information | | Verification of submitted documents | |

4.1 General Matters

4.1.1

Five test samples shall be required for each applied product. However, if more than five test samples are needed, the former requirement shall not be required.

4.1.2

Test samples shall be collected at random by a certification institute from products in market or those in storage at the production site.

4.1.3

Test results of five samples shall comply with the certification criteria.

4.1.4

Test result shall be numerically set according to KS Q 5002 (Statistical interpretation method of the data – Part 1: Statistical description of the data).

4.2 Compliance verification and test method regarding the control of hazardous substances

4.2.1

Verification method for the hazardous substance management system

Note) This is the method to verify the compliance with the requirement of the restriction of the use of lead, cadmium, mercury and their compounds, and hexavalent chromium compounds in the parts of the product. This method is applicable to verify that the applicant properly controls PBBs (polybrominated biphenyls), PBDEs (polybrominated diphenylethers) and short-chain chlorinated paraffins (C=10~13).

4.2.1.1

Compliance verification shall be done by one of the following documents or more.

- a) Explanatory note on the management system, established by the manufacturer on purpose to control the hazardous substances when each part of the product is supplied from the suppliers, and relevant documents
- b) Test result conducted by the manufacturer in order to control the hazardous substances when each part of the product is supplied from the suppliers (In this case, test method including pre-conditioning method applied shall be specified in detail)
- c) Certificate issued by the accredited third party showing that each part of the product satisfies the relevant requirements (e.g. Certificate of eco-label according to 'EL 763. Electric and Electronic Parts')
- d) Other documents showing that the manufacturer properly controls the hazardous substances when each part of the product is supplied from the suppliers.

4.2.1.2

In case the compliance of the management system cannot be verified by '4.2.1.1' or the test result for specific parts of the product is required by deliberation committee of eco-label certification, compliance verification shall be done by the following '4.2.2 Test

method for measuring the content of the hazardous substances' for the parts collected at random by eco-label certification body.

4.2.2

Test method for measuring the content of the hazardous substances

Note) This is one of the test methods applicable to verify the content of lead (Pb), cadmium (Cd), mercury (Hg) and hexavalent chromium (Cr^{6+}) contained in the parts of the product. The content of the hazardous substances can be also verified according to the internationally recognized test methods. In this case, test method including pre-conditioning method shall be specified in detail and the specified test method shall be approved by deliberation committee of eco-label certification.

4.2.2.1

Test samples shall be homogenized by pre-conditioning method such as pulverization of each part.

4.2.2.2

Analysis method of lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr^{6+}), total chromium (Cr)

a) Lead (Pb), cadmium (Cd): KS M 0016 (General rules for atomic absorption spectrochemical analysis), KS M 0032 (General rules for ICP emission spectrochemical analysis) and inductively coupled plasma mass spectrometry (ICP-MS)

b) Mercury (Hg): Atomic absorption spectrochemical analysis by using gold amalgamation method and KS M 0016 (General rules for atomic absorption spectrochemical analysis)

c) Hexavalent chromium (Cr^{6+}): Ultraviolet spectrophotometric analysis by diphenylcarbazide and Ultraviolet spectrophotometric analysis by lead acetate trihydrate

d) Total chromium (Cr): KS M 0016 (General rules for atomic absorption spectrochemical analysis), KS M 0032 (General rules for ICP emission spectrochemical analysis) and inductively coupled plasma mass spectrometry (ICP-MS)

4.3 Power consumption testing method

4.3.1

The power consumption of line-commutated type's automatic temperature controller is measured with 1 valve of hot water header by connecting the temperature controller, control device, actuator and hot water header.

4.3.2

Inactive mode's power supply: After the rated voltage is given to the product and the temperature controller or the controller's power switch is turned off, the power supply is measured.

4.3.3

Stand-by mode's power supply: When the product's temperature controller and the controller's power switch becomes active and the valve waits for the control signal at the opening or closing position, the power supply is measured.

Note) When the power supply is different on the opening or closing position, the bigger value is taken.

4.3.4

Active mode's power supply: The power supply is measured when the valve is opened or closed. At this time, the control circuit's power supply is included.

5. Reasons for Certification

“Energy-saving”

Common Criteria, Notice No. 2012-36, the Ministry of Environment

1. Eco-label products must follow the following provisions with regard to the proper treatment of environmental pollution substances, such as air and water wastes and noxious chemical substances emitted in the process of manufacturing or service operation.

A. When first applying for certification, the product manufacturer should observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located for a period of one year prior to the date of application. Any case of violation of the penalty clause will be verified by confirming documents involved during a period of one year to the date of application. Regarding any violation not related to the penalty clause, confirmation will be made on the completion of appropriate measures.

B. A person who has received a certification of eco-labeling shall observe the environment related laws and agreements pertaining to the region where the production factory or the place of service operation is located during the period of certification. However, regarding any violation besides a penalty, confirmation will be made on the completion of appropriate measures.

2. As a general rule, information for consumers shall be indicated on the surface of the product in such a way not to be easily erased. However, in case that indication on the surface of the product is impossible or undesirable, it can be indicated on the appropriate part such as product packaging, product guidebook and user's manual that consumers can recognize. However, the service information should be indicated inside and outside of the place of service operation. In case that indication inside and outside of the place of service operation is impossible or undesirable, it can be indicated on the appropriate part such as an agreement, letter of delivery, letter of guarantee, and PR materials that consumers can recognize.

3. In order to establish fair trade and to protect consumer, the applicant for eco-label and the holder of eco-label license shall observe the Act on the Fairness of

Indication and Advertisement with respect to the environmental aspects of the product.

4. For Various standards referred in the certification criteria by target product, the latest revised edition applies at the date of application, if not specified otherwise.

5. In applying the quality related criteria for each target product, if no standard is available that can be applied as the quality criteria, the president of Korea Environmental Industry & Technology Institute (KEITI) (hereafter referred to as "president of KEITI") may establish and operate the quality criteria for the product involved after review by a competent committee.