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Part 2-11: Particular requirements for energy regulators

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IEC 60730-2-11 has been prepared by IEC technical committee 72: Automatic electrical controls. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2019. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) adoption to IEC 60730-1:2022 with all of its significant changes to IEC 60730-1:2013 IEC 60730-1:2013/AMD1:2015 and IEC 60730-1:2013/AMD2:2020.

Draft	Report on voting
72/1485/FDIS	72/1501/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60730 series, under the general title: *Automatic electrical controls,* can be found on the IEC website.

This part 2-11 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the sixth edition of that standard (2022). Consideration may be given to future editions of, or amendments to, IEC 60730-1.

This part 2-11 supplements or modifies the corresponding clauses in IEC 60730-1, so as to convert that publication into the IEC standard: Particular requirements for energy regulators.

Where this part 2-11 states "addition", "modification" or "replacement", the relevant requirement, test specification or explanatory matter in part 1 should be adapted accordingly.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies.

In the development of a fully international standard it has been necessary to take into consideration the differing requirements resulting from practical experience in various parts of the world and to recognize the variation in national electrical systems and wiring rules.

The reader's attention is drawn to the fact that Annex Q, Annex R, Annex S and Annex T list all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this document.

In this publication:

1) The following print types are used:
   - requirements proper: in roman type;
   - *test specifications: in italic type*;
   - explanatory matter: in smaller roman type;
   - Defined terms: **bold type**.
2) Subclauses, notes or items which are additional to those in Part 1 are numbered starting from 101, additional annexes are lettered AA, BB, etc.

stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

This clause of Part 1 is replaced by the following:

This document applies to **energy regulators**

- for use in, on, or in association with equipment for household appliance and similar use;

NOTE 1 Throughout this document, the word "equipment" means "appliance and equipment" and "controls" means "energy regulators".

- for equipment that is used by the public, such as equipment intended to be used in shops, offices, hospitals, farms and commercial and industrial applications;

EXAMPLE 1 **Energy regulators** for commercial catering, heating and air-conditioning equipment.

- that are **smart enabled energy regulators**;

EXAMPLE 2 Smart grid control, remote interfaces/control of energy-consuming equipment including computer or smart phone.

- that are AC or DC powered controls with a rated voltage not exceeding 690 V AC or 600 V DC;
- used in, on, or in association with equipment that use electricity, gas, oil, solid fuel, solar thermal energy, etc., or a combination thereof;
- utilized as part of a control system or controls which are mechanically integral with multifunctional controls having non-electrical outputs;
- using NTC or **PTC thermistors** and to discrete **thermistors**, requirements for which are contained in Annex J;
- that are mechanically or electrically operated, responsive to or controlling such characteristics as temperature, pressure, passage of time, humidity, light, electrostatic effects, flow, or liquid level, current, voltage, acceleration, or combinations thereof;
- as well as manual controls when such are electrically and/or mechanically integral with automatic controls.

NOTE 2 Requirements for manually actuated mechanical switches not forming part of an automatic control are contained in IEC 61058-1-1.

This document applies to

– the inherent safety of **energy regulators**, and
– **functional safety** of **energy regulators** of low complexity safety related systems and controls,
– controls where the performance (for example the effect of EMC phenomena) of the product can impair the overall safety and performance of the controlled system,
– the operating values, operating times, and operating sequences where such are associated with equipment safety.
– manual energy regulators which are electrically and/or mechanically integral with automatic controls.
– energy regulators incorporating electronic devices, requirements for which are contained in Annex H.
– the electrical and **functional safety** of controls capable of receiving and responding to communications signals, including signals for power billing rate and demand response.

  The signals can be transmitted to or received from external units being part of the **control** (wired), or to and from external units which are not part of the **control** (wireless) under test.

This document specifies the requirements for construction, operation and testing of automatic **energy regulators** used in, on, or in association with an equipment.

- apply to automatic **energy regulators** intended exclusively for industrial process applications unless explicitly mentioned in the relevant part 2 or the equipment standard. However, this document can be applied to evaluate automatic **energy regulators** intended specifically for industrial applications in cases where no relevant safety standard exists.
- take into account the **response value** of an **automatic action** of an **energy regulator**, if such a **response value** is dependent upon the method of mounting the **energy regulator** in the equipment. Where a **response value** is of significant purpose for the protection of the user, or surroundings, the value defined in the appropriate equipment standard or as determined by the manufacturer will apply.
- address the integrity of the output signal to the network devices, such as interoperability with other devices unless it has been evaluated as part of the control system.

2 Normative references

This clause of Part 1 is applicable.

3 Terms and definitions

3.5 Definitions of types of control according to construction

Additional definitions:

3.5.101
push-and-turn actuation
two-step **actuation** accomplished by first pushing, and then turning, the actuating member of the control

3.5.102
pull-and-turn actuation
two-step **actuation** accomplished by first pulling, and then rotating, the actuating member of the control

4 General

This clause of Part 1 is applicable.

This clause of Part 1 is applicable except as follows:

5.2 Methods of providing technical information

This clause of Part 1 is applicable except as follows:

Table 1 – Required technical information and methods of providing these information

	Information	Clause or subclause	Method
Replacement:			
7	Type of **control** according to construction and whether the **control** is electronic Energy regulators can be **push-and-turn actuation** and **pull-and-turn actuation**	3.5.101, 3.5.102	X
Replacement:			
15	Temperature limits of the **energy regulators**, if the minimum value (T_{min}) lower than 0 °C or the maximum value (T_{max}) other than 55 °C Preferred values of $\boldsymbol{T_{max}}$ are 30 °C, 55 °C, 70 °C, 85 °C, 105 °C, 125 °C, 150 °C. Preferred values of T_{min} are 0 °C, −10 °C, −20 °C, −30 °C, and −40 °C Automatic action at slow rate is not applicable	16.5 16.7 16.101	C
Addition to note i: For energy regulators, limits of the activating quantity are not declared (see 19.7 and 19.8).			

6 Protection against electric shock

This clause of Part 1 is applicable.

7 Provision for protective earthing

This clause of Part 1 is applicable.

8 Terminals and terminations

This clause of Part 1 is applicable.

9 Constructional requirements

This clause of Part 1 is applicable except as follows:

9.3 Actuation and operation

9.3.9 Pull-cord actuated control

Addition:

This subclause is not applicable to energy regulators classified as type 1.X or 2.X or type 1.Z or 2.Z.