



UL 60730-2-22

STANDARD FOR SAFETY

Automatic Electrical Controls – Part 2-22:
Particular Requirements for Thermal Motor
Protectors

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UL Standard for Safety for Automatic Electrical Controls – Part 2-22: Particular Requirements for Thermal Motor Protectors, UL 60730-2-22

First Edition, Dated April 7, 2017

Summary of Topics

This first edition of ANSI/UL 60730-2-22 adopts the first edition of IEC 60730-2-22 with national differences.

The new requirements are substantially in accordance with Proposal(s) on this subject dated January 20, 2017.

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ANSI/UL 60730-2-22-2017

UL 60730-2-22

**Standard for Automatic Electrical Controls – Part 2-22: Particular
Requirements for Thermal Motor Protectors**

First Edition

April 7, 2017

This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 60730-2-22 as an American National Standard (ANSI) occurred on April 7, 2017. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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Preface (UL)

This UL Standard is based on IEC Publication 60730-2-22: first edition Automatic Electrical Controls – Part 2-22: Particular Requirements for Thermal Motor Protectors. IEC publication 60730-2-22 is copyrighted by the IEC.

This edition has been issued to satisfy UL Standards policy.

This UL Standard 60730-2-22, Standard for Automatic Electrical Controls – Part 2-22: Particular Requirements for Thermal Motor Protectors, is to be used in conjunction with the fifth edition of UL 60730-1. The requirements for thermal motor protectors are contained in this Part 2 Standard and UL 60730-1.

Requirements of this Part 2 Standard, where stated, amend the requirements of UL 60730-1.

Where a particular subclause of UL 60730-1 is not mentioned in UL 60730-2-22, the UL 60730-1 subclause applies.

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Note – Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

NATIONAL DIFFERENCES

GENERAL

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60730-2-22, Automatic electrical controls – Part 2-22: Particular requirements for thermal motor protectors copyright 2014 are indicated by notations (differences) and are presented in bold text.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are national differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUTOMATIC ELECTRICAL CONTROLS— Part 2-22: Particular requirements for thermal motor protectors

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and nongovernmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

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6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60730-22 has been prepared by IEC technical committee 72: Automatic electrical controls.

The text of this standard is based on the following documents:

FDIS	Report on voting
72/941/FDIS	72/950/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 2-22 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the fourth edition (2010) of that standard¹. Consideration may be given to future editions of, or amendments to, IEC 60730-1.

¹ A fifth edition of IEC 60730-1 was published in 2013.

This Part 2-22 supplements or modifies the corresponding clauses in IEC 60730-1 so as to convert that publication into the IEC standard: Safety requirements for automatic electrical thermal motor protectors.

Where this Part 2-22 states "addition", "modification", or "replacement", the relevant requirement, test specification or explanatory matter in Part 1 should be adapted accordingly. Where no change is necessary, this Part 2-22 indicates that the relevant clause or 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 "in some countries" notes regarding differing national practice are contained in the following subclauses:

- 7.2.6 (Canada, USA)
- 12.2 (Canada, Japan, USA)
- 17.101.2.1.2 (Canada, USA)
- 18.1.3.101.2 (Canada, USA)
- BB.17.205.1.2 (Canada, USA)

In this publication:

1) The following print types are used:

- Requirements proper: in roman type;
- *Test specifications: in italic type;*
- Explanatory matter; in small roman type;
- Words defined in Clause 2: **bold**.

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2) Subclauses, notes, tables and figures which are additional to those in part 1 are numbered starting from 101, additional annexes are lettered AA, BB, etc.

A list of all parts of the IEC 60730 series, under the general title *Automatic electrical controls for household and similar use*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

101.DV DE Modification of the explanatory note (1) in the part 2 by adding the following:

– Words in SMALL ROMAN CAPITALS in the text are defined in clause 2.

102.DV DE Modification of the explanatory note (2) in the part 2 by adding the following:

The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

AUTOMATIC ELECTRICAL CONTROLS – Part 2-22: Particular requirements for thermal motor protectors

1 Scope and normative references

This clause of Part 1² is applicable except as follows:

² References to "Part 1" in this document pertain to the fourth edition of IEC 60730-1 published in 2010.

1.1 Replacement:

This part of IEC 60730 applies to the partial evaluation of THERMAL MOTOR PROTECTORS as defined in IEC 60730-1 for household and similar use, including heating, air conditioning and similar applications as well as for sealed (hermetic and semi-hermetic type) motor-compressors.

NOTE A THERMAL MOTOR PROTECTOR is considered an INTEGRATED CONTROL since its protective functionality is dependent on the correct mounting and fixing in or on a motor and which can only be fully tested in combination with the relevant motor. This dependency is illustrated by:

- the ability of the THERMAL MOTOR PROTECTOR to accurately and reliably sense the heat of the motor windings; thus, addressing the over-temperature protection due to motor overload conditions;
- the ability of the THERMAL MOTOR PROTECTOR to accurately and reliably sense the current due to motor locked-rotor conditions; thus, reducing the response time and not being adversely affected by heat-sink at the assembly spot in the application;
- the influence of the motor's electromagnetic field on the switch behaviour of the THERMAL MOTOR PROTECTOR; particularly, affecting the arc direction between the contacts resulting in uneven wear of the contact material and eventually leading to failure of operation.

Requirements concerning the testing of the combination of sealed (hermetic and semi-hermetic type) motor-compressors and THERMAL MOTOR PROTECTORS are given in IEC 60335-2-34.

This standard applies to THERMAL MOTOR PROTECTORS using NTC or PTC thermistors, additional requirements for which are contained in Annex J.

1.1DV DE Modification of 1.1 to by adding the following note after the third paragraph:

NOTE Thermal motor protectors that are off-winding (not integrated with the motor winding) to the motor are covered under the scope of this part 2 and may be considered incorporated controls with respective to the requirements of this standard. Thermal protectors with integral heating elements (resistors, thermistors and the like) are considered voltage maintained thermal cutouts and are covered under UL 60730-2-9.