

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-70: Particular requirements for milking machines
(standards.iteh.ai)

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-70: Règles particulières pour les machines à traire
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Partie 2-70: Règles particulières pour les machines à traire**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-70: Particular requirements for milking machines**

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 non-governmental 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.
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This part of International Standard IEC 60335 has been prepared by sub-committee 61H: Safety of electrically-operated farm appliances, of IEC technical committee 61: Safety of household and similar electrical appliances.

This consolidated version of IEC 60335-2-70 consists of the second edition (2002) [documents 61H/164/FDIS and 61H/169/RVD] and its amendment 1 (2007) [documents 61H/234/CDV and 61H/239/RVC].

The technical content is therefore identical to the base edition and its amendment(s) and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

The French version of this standard has not been voted upon.

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fourth edition (2001) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Safety requirements for milking machines.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type
- *test specifications: in italic type*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and associated noun are also in bold.

The following differences exist in the countries indicated below:

- 25.7: Ordinary PVC sheathed supply cords are permitted (Australia, New Zealand).

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result 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.

INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another part 2 of IEC 60335, the relevant part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features which impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-70: Particular requirements for milking machines

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of **milking machines**, to be used in stalls and in the open, that are designed for milking farm animals, such as cows, the **rated voltage** of the **milking machine** being not more than 250 V for single-phase operation and 480 V for other operations.

NOTE 101 Examples of such machines are:

- bucket **milking machines**;
- direct-to-can **milking machines**;
- milking **pipeline machines**;
- recorder **milking machines**;
- independent air and milk transport **milking machines**.

NOTE 102 A detailed description of the types of **milking machines** covered by this standard is given in ISO 3918 and is indicated in Annex AA.

NOTE 103 The upper limit for the **rated voltage** of 250 V single-phase may be exceeded in cases where 480 V split-phase motors are required.

NOTE 104 This standard applies to **milking sub-assemblies** supplied by one manufacturer to form a complete **milking machine**. It can be used as guidance for the safety of **milking machines** formed from **sub-assemblies** supplied by different manufacturers.

NOTE 105 Attention is drawn to the fact that:

- for **milking machines** intended to be used in vehicles or on board ships, additional requirements may be necessary;
- in many countries, additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

2 Normative references

This clause of Part 1 is applicable.

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and public areas*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

- **vacuum pumps** and those of a **pulsation system** are operated at **rated vacuum** during continuous operation;
- releser milk pumps are operated with the vacuum system being operated at **rated vacuum** of the **vacuum pump**;
- during milking the **vacuum pump**, the **pulsation system** and the **releser milk pump** are operated continuously according to the manufacturer's instructions,
- during cleaning the **vacuum pump**, the **pulsation system** and the **releser milk pump** and cleaning system are operated continuously according to the manufacturer's instructions

3.101

sub-assembly

part that in association with other parts, forms a complete **milking machine**

3.102

milking machine

complete machine installation for milking, usually comprising vacuum and pulsation systems, one or more clusters and other components

3.103

milking unit

assembly of **milking machine** components that is replicated in an installation so that more than one animal may be milked at one time

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3.104

vacuum pump

air pump that produces a vacuum in the system

3.105

pulsation system

system in which cyclic pressure changes, initiated either pneumatically or electrically, are produced in the chambers of the **milking units**

3.106

releser milk pump

device for pumping milk out of the vacuum system

3.107

rated vacuum

vacuum assigned to the **vacuum pump** or pulsation system by the manufacturer

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 Addition:

The manufacturer shall provide a suitable test-assembly and installation instructions to enable the **milking machine** or its **sub-assemblies** to be tested.

5.101 Where tests are specified in this standard that require the **milking machine** to be operated under **normal operation**, the tests are to be carried out for each of the **normal operation** conditions given for milking and cleaning operations.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Replacement

Milking machines or **sub-assemblies** shall be of **class I, class II** or **class III**, with respect to protection against electric shock.

Class III milking machines or **sub-assemblies** shall have a **rated voltage** not exceeding 24 V.

Compliance is checked by inspection and by the relevant tests.

6.2 Addition:

Parts of a **milking machine** or **sub-assembly** that contain electrical components and that may be cleaned with a water jet according to the instructions, shall be at least IPX6. Other electrical parts shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Milking machines or **sub-assemblies** that are not marked IPX6 and that are installed according to the manufacturer's instructions, in areas where water jet cleaning is likely, shall be marked with the substance of "DO NOT HOSE" or with symbol ISO 7000-0073 combined with the prohibition sign of ISO 3864-1, except for colours.

Vacuum pumps and pulsation systems shall be marked with the **rated vacuum** in kPa.

7.6 Addition:

Do not hose

NOTE This symbol incorporates symbol ISO 7000-0073 combined with the prohibition sign of ISO 3864-1, except for colours.

7.12 Addition:

The **milking machine** shall be furnished with instructions that contain all details necessary for maintaining and operating the machine and for replacing spare parts. In particular, details shall be given of:

- on how to clean the **milking machine** assembly on completion of installation;
- the frequency of maintenance procedures and details of all parts requiring replacement or adjustment;
- the reference numbers of all parts and, where applicable, **sub-assemblies** used in the installation.

The manufacturers of **sub-assemblies** shall provide appropriate instructions for user maintenance of their **sub-assemblies**.

If the “Do not hose” symbol is marked on the appliance, its meaning shall be explained in the instructions.

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Modification:

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge and children playing with the appliance are not required.

7.12.1 Addition:

The manufacturer of the **milking machine** shall provide instructions that shall include the substance of the following:

- a wiring diagram;
- that the installation shall be integrate into an effective equipotential bonding system;
- that parts which are not marked IPX6 shall be installed in a location where they are not likely to be cleaned with the aid of a high pressure water jet;
- that the installation is to be installed according to the relevant section of the wiring rules.

NOTE 101 Attention is drawn to IEC 60364-7-705.

The manufacturers of **sub-assemblies** shall provide appropriate instructions for installation of their **sub-assemblies**.

7.14 Addition:

Markings required by the addition to 7.1 shall have a height not less than:

- 5 mm for headlines;
- 3 mm for other lettering.

The height of the “Do not hose” symbol shall be at least 25 mm.

7.15 Addition:

Each separate **sub-assembly** shall be marked with the relevant markings.

The “Do not hose” symbol shall be visible after the appliance has been installed.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.7 Replacement:

Appliances are operated as follows

- *during milking, until steady conditions are established;*
- *during cleaning, for the maximum time specified in the instructions.*

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

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15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 Addition:

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The tests of 19.2 and 19.3 are replaced by the test of 19.101.

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*Moving parts of **vacuum pumps** are locked as long as is necessary to obtain steady conditions.*

19.101 *The **milking machine** is operated under **normal operation** and supplied at **rated voltage**.*

Any operation, or any defect that may be expected in normal use is applied. Only one fault condition is reproduced at a time, the tests being made consecutively. During the tests, the temperature of windings shall not exceed the values shown in Table 8.

NOTE 1 Examples of fault conditions are:

- a programme controller stopping in any position;
- disconnection and reconnection of one or more phases of the supply during any part of the programme;
- open-circuiting or short-circuiting of electrical components such as resistors, capacitors, inductors and the like;
- failure of magnetic valves;
- disconnection of the water supply;
- disconnection of the cleaning-water supply.

NOTE 2 In general, tests are limited to those cases *that* may be expected to give the most unfavourable results.

NOTE 3 For the purpose of these tests, thermal controls are not short-circuited.