

INTERNATIONAL STANDARD

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60335-2-79

Second edition
2002-07

Household and similar electrical appliances – Safety –

Part 2-79: Particular requirements for high pressure cleaners and steam cleaners

*Appareils électrodomestiques et analogues –
Sécurité –*

*Partie 2-79:
Règles particulières pour les appareils de nettoyage
à haute pression et les appareils de nettoyage à vapeur*

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CONTENTS

FOREWORD	3
INTRODUCTION	5
1 Scope	6
2 Normative references.....	7
3 Definitions	7
4 General requirement.....	8
5 General conditions for the tests	8
6 Classification	9
7 Marking and instructions	9
8 Protection against access to live parts	11
9 Starting of motor-operated appliances	12
10 Power input and current.....	12
11 Heating.....	12
12 Void.....	13
13 Leakage current and electric strength at operating temperature	13
14 Transient overvoltages.....	13
15 Moisture resistance.....	13
16 Leakage current and electric strength	14
17 Overload protection of transformers and associated circuits.....	14
18 Endurance	14
19 Abnormal operation.....	15
20 Stability and mechanical hazards.....	17
21 Mechanical strength.....	18
22 Construction	19
23 Internal wiring.....	22
24 Components	22
25 Supply connection and external flexible cords.....	22
26 Terminals for external conductors	23
27 Provision for earthing.....	23
28 Screws and connections	23
29 Clearances, creepage distances and solid insulation	23
30 Resistance to heat and fire	23
31 Resistance to rusting	24
32 Radiation, toxicity and similar hazards	24
Annexes.....	28
Bibliography.....	28
Figure 101- Warning symbol.....	25
Figure 102 – Impact test apparatus	26
Figure 103 – Reactions on handle	27

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –Part 2-79: Particular requirements for
high pressure cleaners and steam cleaners

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

This part of International Standard IEC 60335 has been prepared by sub-committee 61J: Electrical motor-operated cleaning appliances for industrial use, of IEC technical committee 61: Safety of household and similar electrical appliances.

This second edition cancels and replaces the first edition published in 1995 and its amendment 1 (2000). It constitutes a technical revision.

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

FDIS	Report on voting
61J/128/FDIS	61J/133/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 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 electric high pressure cleaners and steam cleaners.

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 the associated noun are also in bold.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

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

The following differences exist in the countries indicated below.

- Clause 1: Different pressure limitations apply (USA).
- 6.1: Ground fault current interrupters are required for appliances rated 250 V or less, single phase (USA).
- 11.101: The losses of burners are subject to regulations (Germany). Smoke spot requirements are different (USA).
- 20.103: The fuel tank capacity is limited (USA).
- 21.101, 21.101.2 and 21.102: Different burner tests are required (USA).
- 25.7: Different power supply cord lengths are required (Canada, USA).
- Clause 32: The connection with the water mains is subject to regulations (Canada).

A bilingual version of this publication may be issued at a later date.

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.

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.

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.

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 that 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.

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-79: Particular requirements for high pressure cleaners and steam cleaners

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of high pressure cleaners for household, industrial and commercial use having a pressure not less than 2,5 MPa and not more than 25 MPa and with an input to the drive for the high pressure pump not exceeding 10 kW, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

It also applies to industrial and commercial steam cleaners even if the pressure is less than 2,5 MPa.

It is also applicable to appliances making use of other forms of energy for the motor, but it is necessary that their influence is taken into consideration.

As far as it is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision,
- playing with the appliance by young children.

NOTE 101 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, 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.

NOTE 102 This standard does not apply to

- appliances that are incorporated in process equipment;
- appliances intended to be used in locations where special conditions prevail, such as the presence of corrosive or explosive atmosphere (vapour or gas);
- audio, video and similar electronic apparatus (IEC 60065);
- appliances for medical purposes (IEC 60601);
- hand-held motor-operated electric tools (IEC 60745);
- personal computers and similar equipment (IEC 60950);
- transportable motor-operated electric tools (IEC 61029);
- steam cleaners for household use only (IEC 60335-2-54).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60364-1, *Electrical installations of buildings – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 61558-2-3, *Safety of power transformers, power supply units and similar – Part 2-3: Particular requirements for ignition transformers for gas and oil burners*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

operation of the appliance under the following conditions

The appliance is supplied at **rated voltage** and operated at **rated flow** and **rated pressure** with the nozzle and hose specified by the manufacturer fitted to it; all strainers and filters are in a clean operating condition and the **unloader valve** is set to the **rated pressure**. The **water heater**, if fitted, is operated at maximum power.

3.101

unloader valve

pressure operated valve which, when the pump pressure exceeds the preset value, returns the excess fluid to the inlet system. In addition it bypasses the total pump flow at reduced pressure when its outlet flow is cut off

3.102

safety valve

pressure operated valve which, when the pump or steam cleaner pressure exceeds the preset value, returns the excess fluid or steam to the inlet system or into the atmosphere

3.103

rated pressure

maximum pressure at the pump or at the steam cleaner assigned to the appliance by the manufacturer

3.104

permissible pressure

limiting pressure up to which an appliance and/or parts of the appliance can be operated without impairing its integrity

3.105

rated flow

flow at **rated pressure** at the nozzle assigned to the appliance by the manufacturer

3.106

water heater

means of heating water or **cleaning agent** by electricity, gas, liquid fuel or heat exchanger

3.107

cleaning agent

water with or without the addition of a soluble or miscible chemical

3.108

pressure switch

device which, in response to varying fluid pressure, provides a controlling function at a pre-set value

3.109

flow switch

device which, in response to a varying rate of fluid flow, provides a controlling function at a pre-set value

3.110

primary safety control

control device that responds directly to flame properties sensing the presence of flame and, in event of ignition failure or unintentional flame extinguishment, causes safety shut down

NOTE Primary safety controls are also known as flame failure devices.

3.111

trigger gun

device that shuts off the supply of fluid through its outlet if the trigger is not held in its operating position

3.112

continuous ignition

ignition by an energy source that is continuously maintained throughout the time the burner is in service, whether the burner is firing or not

3.113

rated temperature

maximum temperature of the cleaning agent assigned by the manufacturer

3.114

pencil jet nozzle

nozzle that gives a concentrated, parallel water jet; also called needle jet nozzle, solid jet nozzle or 0 degree jet nozzle

3.115

water jetter

high-pressure pipe-cleaning device, consisting of a nozzle at the end of a high-pressure hose

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.

5.1 Addition:

The burner is operated at rated power. Appliances intended for operation at more than one rated power are additionally tested at the most disadvantageous power.

The burner-air adjustment, where provided, is regulated to establish the air/fuel ratio to produce the combustion characteristics recommended in the user instructions. The combustion characteristics may be specified by the appearance of the flame, the percentage of carbon dioxide (CO₂) in the flue gases, or by other characteristics.

On appliances designed for use with a flue pipe, a section of flue pipe is attached to the appliance. Flue gas determinations are taken in this flue pipe.

The draught is adjusted to that recommended in the instructions for use.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Replacement:

Appliances shall be **class I**, **class II** or **class III** with respect to the protection against electric shock. However, **hand-held appliances** and hand-held parts of steam cleaners and high pressure cleaners shall be **class II** or **class III**.

Compliance is checked by inspection and by the relevant tests.

6.2 Replacement:

The appliances shall have a degree of protection against harmful ingress of water according to Table 101:

Table 101 – Degree of protection against harmful ingress of water

		Protection class (electric shock)	Protection degree (IEC 60529)
Steam cleaners	for indoor use only	I-II-III	IP X3
	for outdoor use	I-II-III	IP X5
	Hand-held parts	II	IPX7
		III	IP X3
High pressure cleaners	Hand-held appliances	II-III	IP X7
	Other types of appliances	I-II-III	IP X5
	Hand-held parts	II-III	IP X7

However, **fixed appliances** that are specified for installation in an independent room, where they will not be subject to spillage or splashing of water, shall be at least IPX0.

Compliance is checked by inspection and by the relevant tests.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

- **rated pressure** in Pascal;
- **permissible pressure** in Pascal;